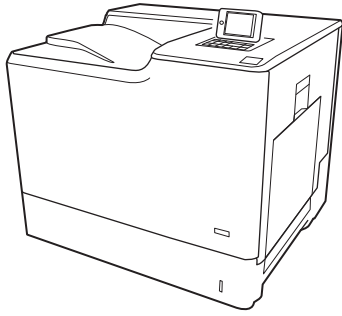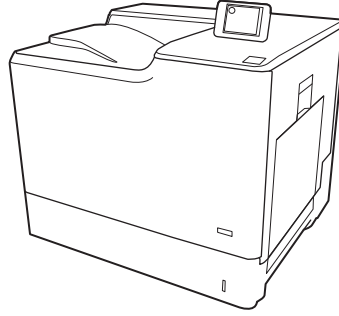# Color LaserJet Enterprise M652
Color LaserJet Enterprise M653
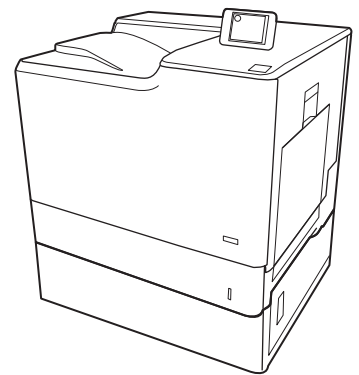# Color LaserJet Enterprise MFP M681
Color LaserJet Enterprise MFP M682

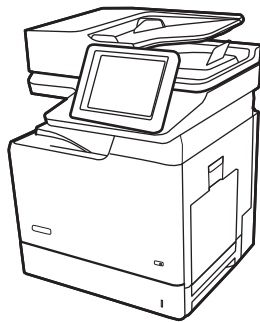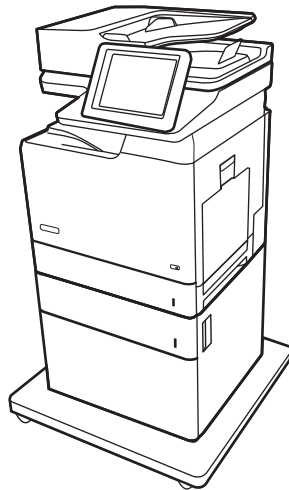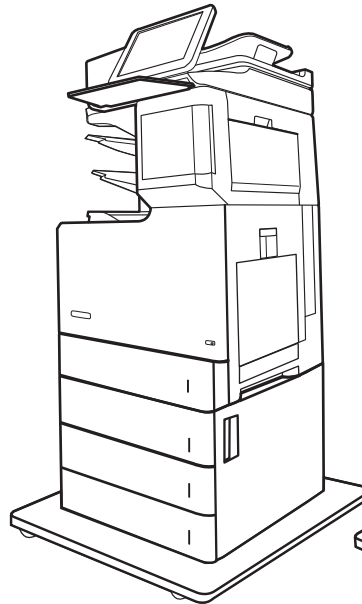## Troubleshooting Manual

M652n
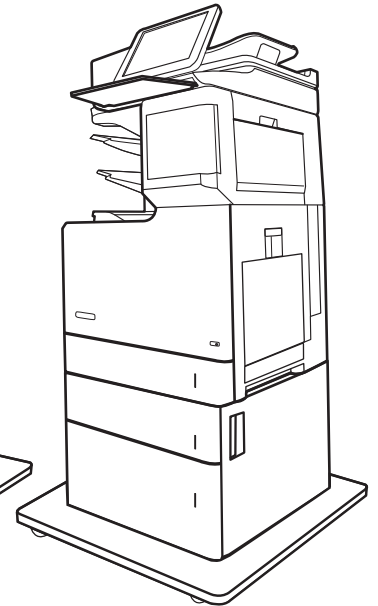M652dn

M653dn
M653dh

M653x

M681dh
Flow M681f

M681f

Flow M681z

Flow M682z

www.hp.com/support/colorlj652
www.hp.com/support/colorlj653
www.hp.com/support/colorljM681MFP
www.hp.com/support/colorljM682MFP

For printer part removal and part number
information, see the Repair Manual.

HP Color LaserJet Enterprise M652, M653, MFP M681, M682

Troubleshooting Manual

Conventions used in this guide

☼ **TIP:** Helpful hints or shortcuts.

🗎 **NOTE:** Information that explains a concept or how to complete a task.

☼ **Reinstallation tip:** Reinstallation helpful hints, shortcuts, or considerations.

🗎 **IMPORTANT:** Information that help the user to avoid potential printer error conditions.

⚠ **CAUTION:** Procedures that the user must follow to avoid losing data or damaging the printer.

⚠ **WARNING!** Procedures that the user must follow to avoid personal injury, catastrophic loss of data, or extensive damage to the printer.

For additional service and support information

HP service personnel, go to the Service Access Work Bench (SAW) at http://sawpro.glb.itcs.hp.com.

Channel partners, go to HP Channel Services Network (CSN) at www.hp.com/partners/csn .

At these locations, find information on the following topics:

- Install and configure

- Printer specifications

- Up-to-date control panel message (CPMD) troubleshooting

- Solutions for printer issues and emerging issues

- Remove and replace part instructions and videos

- Service advisories

- Warranty and regulatory information

Channel partners, access training materials in the HP University and Partner Learning Center at https://content.ext.hp.com/sites/LMS/HPU.page.

To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.

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1 Theory of operation

For additional service and support

HP service personnel, go to the Service Access Work Bench (SAW) at http://h41302.www4.hp.com/km/saw/home.do.

Channel partners, go to HP Channel Services Network (CSN) at https://h30125.www3.hp.com/hpcsn.

At these locations, find information on the following topics:

- Install and configure
- Printer specifications
- Up-to-date control-panel message (CPMD) troubleshooting
- Solutions for printer issues and emerging issues
- Remove and replace part instructions and videos
- Service advisories
- Warranty & regulatory information

To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.

Basic operation

The printer routes all high-level processes through the formatter, which stores font information, processes the print image, and communicates with the host computer.

The basic printer operation comprises the following systems:

- The engine-control system, which includes the power supply and the DC controller printed circuit assembly (PCA)

- The laser scanner system, which forms the latent image on the photosensitive drum

- The image-formation system, which transfers a toner image onto the paper

- The pickup, feed, and delivery system, which uses a system of rollers and belts to transport the paper through the printer

- Accessory (optional paper feeder)

Figure 1-1 Relationship among the main printer systems
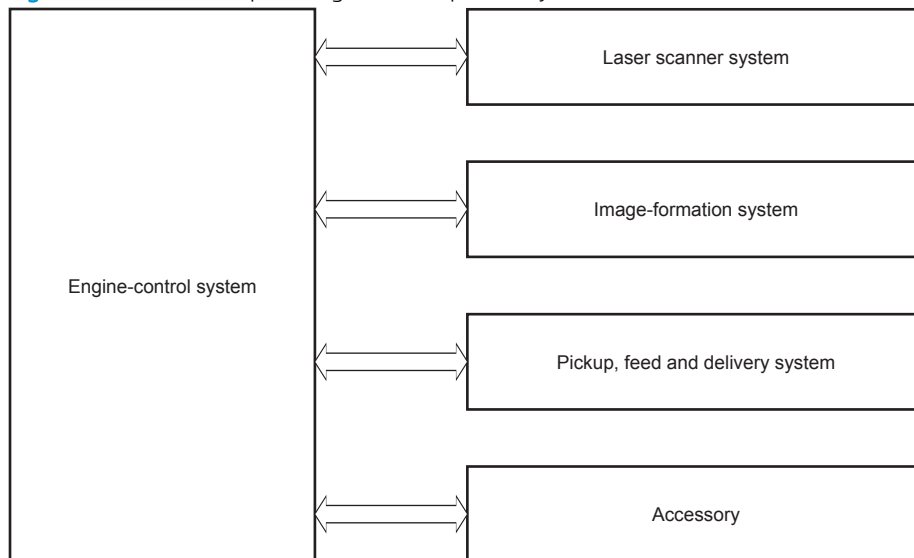
Sequence of operation

The DC controller PCA controls the operating sequence, as described in the following table.

Table 1-1 Sequence of operation

Period	Duration	Description
Waiting	From the time the power is turned on, the door is closed, or when the printer exits Sleep mode until the printer is ready for printing.	• Detects the fuser • Heats the fuser sleeve in the fuser • Pressurizes the pressure roller in the fuser • Detects the toner cartridges • Alienates all of the developing rollers from the photosensitive drums in the toner cartridges • Alienates all of the transfer rollers from the photosensitive drums in the toner cartridges • Rotates and stops each motor • Rotates and stops each fan • Detects the ITB • Cleans the ITB and secondary transfer roller
Standby	From the end of the waiting sequence, the last rotation until the formatter receives a print command, or until the printer is turned off.	• Is in the Ready state • Enters Sleep mode if the formatter sends the sleep command • Rotates and stops each fan • Calibrates if the formatter sends the calibration command
Initial rotation	From the time the formatter receives a print command until the paper enters the paper path.	• Rotates each motor • Rotates each fan • Activates the high-voltage power supply • Prepares the laser scanner unit • Warms the fuser to the correct temperature

Table 1-1 Sequence of operation (continued)

Period	Duration	Description
Printing	From the time the first sheet of paper enters the paper path until the last sheet has passed through the fuser.	- Forms the image on the photosensitive drums - Transfers the toner to the paper - Fuses the toner image onto the paper
Last rotation	From the time the last sheet of paper exits the fuser until the motors stop rotating.	- Moves the last printed sheet into the output bin - Stops each motor - Stops each fan - Stops the high-voltage power supply - Stops the laser scanner unit - Turns the fuser heater off - If another print command is received, the printer enters the initial rotation period when the last rotation is complete.

Formatter-control system

The formatter performs the following functions:

- Controls sleep mode

- Receives and processes print data from the various printer interfaces

- Monitors control panel functions and relays printer status information through the control panel and the network or bi-directional interface

- Develops and coordinates data placement and timing with the DC controller PCA

- Stores font information

- Communicates 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.

Sleep mode

📝 **NOTE:** **To modify sleep settings**: At the control panel, select the Settings menu, select the General menu, select the Energy Settings menu, and then select Sleep Settings.

This feature conserves power after the printer has been idle for an adjustable period of time. When the printer is in Sleep mode, the printer retains all settings, downloaded fonts, and macros. The default setting is for Sleep mode to be enabled, and the printer enters Sleep mode after a 30-second idle time.

The printer firmware uses a combination of timers and Sleep settings to control when the printer enters a different state as well as what states the printer will enter. The available states are listed below, in descending order, from using the most power to using the least power:

- **Active**: The printer control panel is fully illuminated. The power button light is illuminated.

- **Shallow sleep**: The printer control panel is dim and the content is grayed out, but is still readable. The power button light is illuminated.

- **Sleep**: The printer control panel is off (blacked out). The power button light blinks once every three seconds.

- **Deep sleep**: The printer control panel is off (blacked out). The power button light blinks once every three seconds. The control panel and power button appearance is the same in this state as the sleep state. However, the printer is drawing less than 1 watt of power in the deep sleep state (as opposed to 6 watts of power in the sleep state).

- **Off**: This state is entered by pressing the power button or removing power from the printer. The power button light is not illuminated.

📝 **NOTE:** In some countries/regions, Sleep mode cannot be turned off.

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

- The printer receives a print job, valid data, or a PML or PJL command.

- A control-panel button is pressed or the touchscreen is touched.

- A cover or door is opened.

- The engine self-test switch is pressed.

- A paper tray, other than Tray 1, is opened.

  📝 **NOTE:** If the printer is in the deep sleep state, opening a paper tray will not cause the printer to exit Sleep mode.

📝 **NOTE:** Printer error messages override the Sleep message. Some messages, such as 49 errors, do not allow the printer to enter Sleep mode. Other messages allow the printer to enter Sleep mode at the appropriate time, but the error message continues to appear.

Printer job language (PJL)

PJL is an integral part of printer configuration, in addition to the standard printer command language (PCL) and PostScript (PS). With standard cabling, the printer 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 device port:** The printer can inform the host about the control-panel settings, and the control-panel settings can be changed from the host.

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

- **Context-sensitive switching:** The printer 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 printer in landscape mode, the subsequent print jobs print in landscape only if they are formatted for landscape printing.

Printer management language (PML)

PML allows remote configuration of the printer and status read-back from the printer through the I/O ports.

Control panel

The M652n and M652dn control panel is a 6.85 cm (2.7 in) four-line color display with numeric keypad and additional buttons for navigating control panel menus. The M653dn, M653x, and M653dh control panel is a 10.9 cm (4.3 in) full-color SVGA with infrared touchscreen and adjustable viewing angle. The M681/M682 control panel is a 20.3 cm (8 in) full-color SVGA with infrared touchscreen and adjustable viewing angle.

The M681/M682 control panel has a diagnostic mode to allow testing of the touchscreen, Home button, and speaker. The control panels do not require calibration.

The M653dn, M653x, and M653dh control panel has a diagnostic button on the back with some diagnostic capabilities.

See the Control-panel checks section of this manual for more information on accessing control panel diagnostics.

Easy-access USB port

This printer features easy-access USB printing, for quickly printing files without sending them from a computer. The printer accepts standard USB flash drives in the USB port near the control panel. It supports the following types of files:

- **.pdf**: A portable document format file used to present and exchange documents reliably, independent of software, hardware, or operating system.

- **.prn**: A generic file created by choosing "Print to File" within the Print dialog box.

- **.pcl**: A file created in the Printer Command Language (PCL) which describes the layout of text and graphics for the document.

- **.ps**: A file created in the Adobe PostScript language. These files can contain images, text or a combination thereof.

- **.cht**: A vector graphics format file supported by a variety of charting and graphics software.

The USB port is disabled by default. Follow the instructions in the printer user guide to enable the USB port and print USB documents.

Wireless

The M653x and Flow M682z models contain a wireless card to enable wireless direct printing over a 802.11b/g/n wireless connection.

📝 **NOTE:** This card does not enable the printer to connect to the network.

CPU

The formatter incorporates a 1.2 GHz processor.

Input/output (I/O)

The printer has three I/O interfaces:

- Hi-Speed USB 2.0

- 10/100/1000 Ethernet LAN connection with IPv4 and IPv6

- Easy-access USB printing (no computer required)

Memory

The formatter incorporates different types of memory and storage to store the printer firmware as well as print-job data and user settings.

embedded MultiMedia Card (eMMC)

The embedded MultiMedia Card (eMMC) on the formatter stores the firmware for the M652/M653 models. A remote firmware upgrade process is used to overwrite and upgrade the firmware. If a hard disk drive (HDD) is installed on the M652/M653 models, the firmware will automatically transfer to the HDD. Print jobs may also be stored on the eMMC for printing privately or at a later time.

Hard disk drive (HDD)

The hard disk drive (HDD) on the formatter stores the firmware for the M681/M682 models. A remote firmware upgrade process is used to overwrite and upgrade the firmware. Print jobs may also be stored on the HDD for printing privately or at a later time.

Fax PCA

The fax PCA allows the transmission and receipt of faxes. Fax jobs are stored temporarily on the PCA.

Nonvolatile random access memory (NVRAM)

The printer uses NVRAM to store printer and user configuration settings. The contents of NVRAM are retained when the printer is turned off or disconnected.

Random access memory (RAM)

The RAM on the formatter serves as a temporary storage area for printing and system operation.

HP Memory Enhancement technology (MEt)

MEt effectively doubles the amount of standard memory through a variety of font- and data-compression methods.

NOTE: MEt is available only in when printing in printer command language (PCL) mode. It is not functional when printing in PostScript (PS) mode.

Engine-control system

The engine-control system receives commands from the formatter and interacts with the other main systems to coordinate all printer functions. The engine-control system consists of the following components:

- DC controller

- Low-voltage power supply

- High-voltage power supplies

- Fuser power supply

Figure 1-2 Engine-control system
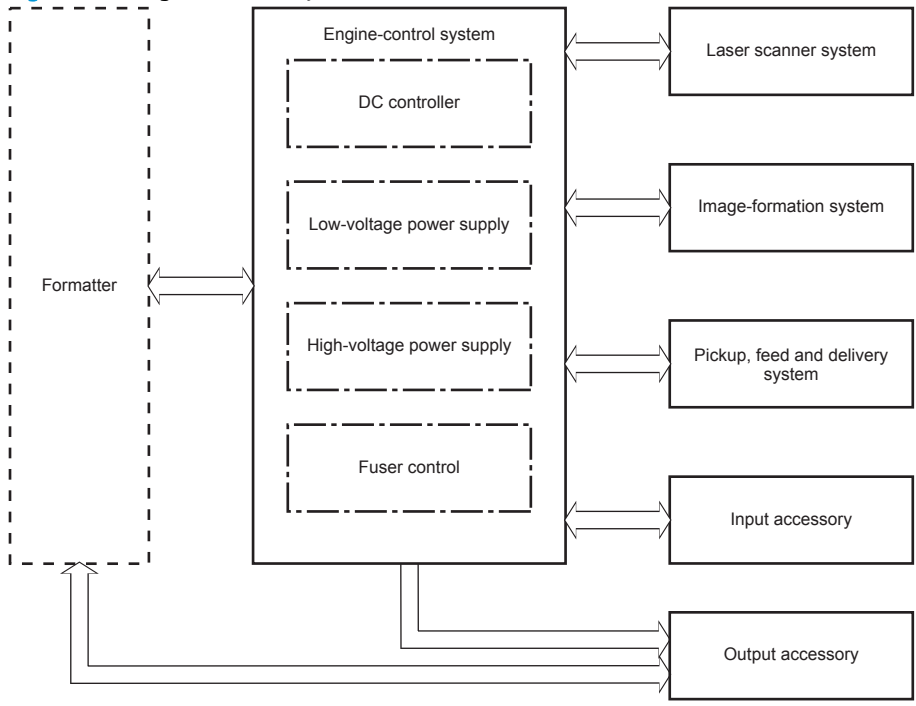
DC controller

The DC controller controls the operation of the printer and its components. The DC controller starts the printer operation when the printer power is turned on and the power supply sends DC voltage to the DC controller. After the printer enters the standby period, the DC controller sends out various signals to operate motors, solenoids, and other printer components based on the print command and image data that the host computer sends.

Figure 1-3 DC controller block diagram
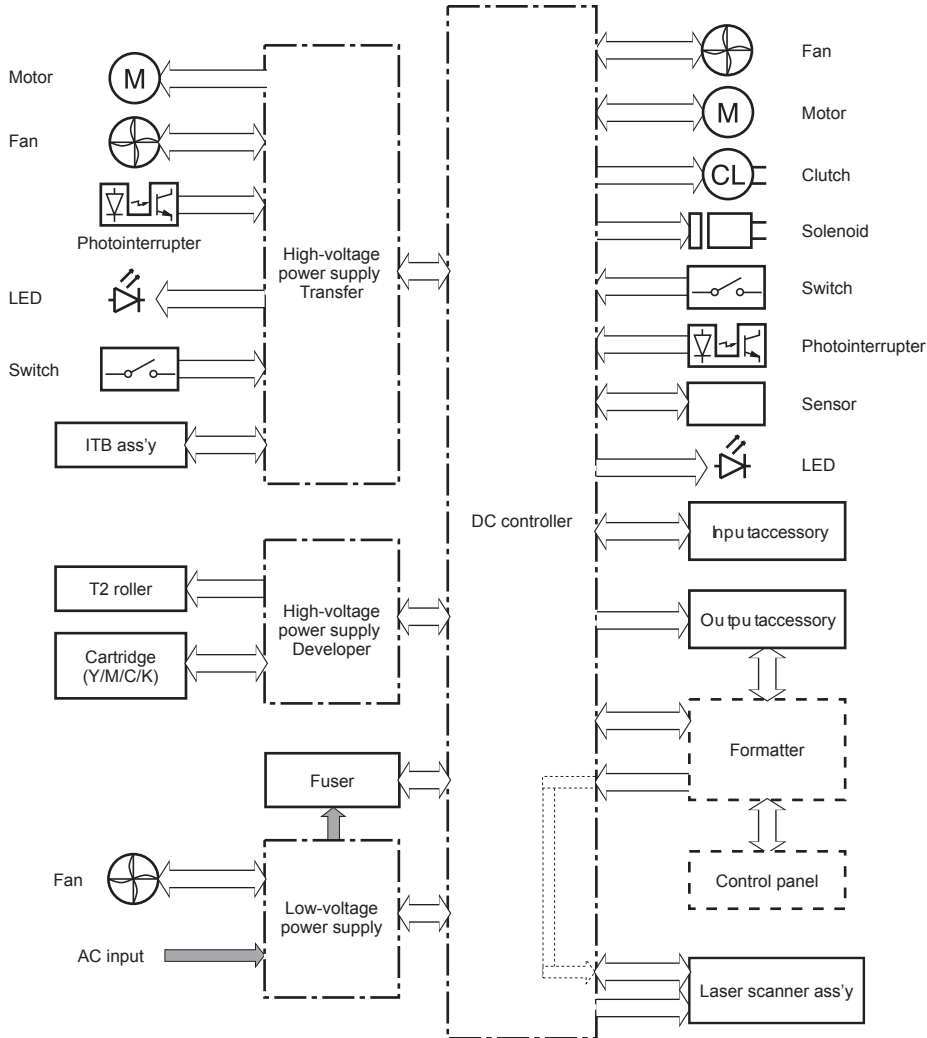
Motors

The printer has eight motors. The motors drive the components in the paper-feed and image-formation systems.

The DC controller monitors the fuser motor, the scanner motor, and drum motors 1, 2, and 3 to determine if a motor has failed. It notifies the formatter when it encounters the following conditions:

- Startup failure: the motor does not reach a specified speed within a specified time from when the motor starts.

- Rotational failure: the rotational speed of the motor is not in the specified range for a specified time after the motor reaches a specified speed.

Table 1-2 Motors

Abbreviation	Name	Purpose	Failure detection	Replacement part number
M1	Drum motor 1	Drives the yellow photosensitive drum and yellow developing roller	Yes	Drum motor (RM2-1956-000CN)
M2	Drum motor 2	Drives the magenta photosensitive drum, magenta developing roller, cyan photosensitive drum, and cyan developing roller	Yes	Drum motor (RM2-1956-000CN)
M3	Drum motor 3	Drives the black photosensitive drum, black developing roller, and ITB	Yes	Drum motor (RM2-1956-000CN)
M4	Fuser motor	Drives the pressure roller and delivery roller; the pressurization and release of the pressure roller; and the engagement and disengagement of the primary and secondary transfer rollers	Yes	Fuser drive assembly (RM2-1934-000CN)
M5	Pickup motor	Drives the registration roller, Tray 1 pickup roller, Tray 2 pickup roller, and Tray 2 feed roller	No	Paper pickup drive assembly (RM2-6556-000CN)
M6	Developer disengagement motor	Drives the engagement and disengagement of the developing rollers	Yes	Stepping motor (RK2-7757-000CN)
M7	Scanner motor	Drives the scanner mirror	Yes	Laser scanner assembly (RM2-1237-000CN)
M8	Duplex reverse motor	Drives the duplex reverse roller	No	Right door (RM2-6622-000CN)

Fans

The printer has six fans for preventing the temperature from rising in the printer and for cooling the printed pages.

The DC controller determines if there is a fan failure and notifies the formatter if the fan locks for a specified time from when the fan starts.

Table 1-3 Fans

Abbreviation	Name	Cooling area	Type	Speed	Replacement part number
FM1	Power supply fan	Around the low-voltage power supply unit	Intake	Full/half	Fan (RK2-7953-000CN)
FM2	Cartridge fan	Around the toner cartridges	Intake	Full	Fan (RK2-6124-000CN)
FM3	Left upper front fan	Around the fuser Around the delivery assembly	Intake	Full/half	Fan (RK2-7951-000CN)
FM4	Left upper rear fan	Around the fuser Around the delivery assembly	Intake	Full/half	Fan (RK2-7949-000CN)
FM5	Front fan	Fuser	Intake	Full/half	Fan (RK2-6124-000CN)
FM6	Rear fan	Around the low-voltage power supply assembly Around the formatter	Intake	Full/half	Fan (RK2-6124-000CN)

Solenoids

Table 1-4 Solenoids

Abbreviation	Component name	Replacement part number
SL1	Primary transfer roller disengagement solenoid	Right door assembly (RM2-6622-000CN)
SL2	Tray 1 pickup solenoid	Right door assembly (RM2-6622-000CN)
SL3	Duplex reverse solenoid	Right door assembly (RM2-6622-000CN)

Clutches

Table 1-5 Clutches

Abbreviation	Component name
CL1	Tray 2 pickup clutch
CL2	Duplex re-pickup clutch

Switches

Table 1-6 Switches

Abbreviation	Component name	Replacement part number
SW1	24V interlock switch	Interlock switch cable assembly (RM2-8449-000CN; part not available)
SW2	ITB toner collection near full switch	Lever full flag (RC4-6528-000CN; part not available)
SW3	Right door switch	Right door assembly (RM2-6622-000CN)
SW4	Power supply switch	Power supply switch assembly (RM2-1947-000CN)
SW5	Tray 2 media size switch	Size detect switch assembly (RM2-1946-000CN; part not available)
SW6	Front door microswitch	Microswitch (RK2-0535-000CN)
SW101	Test print switch	Part not available

Sensors

Table 1-7 Sensors

Abbreviation	Component name	Replacement part number
SR11	Registration sensor	Registration assembly (RM2-1957-000CN)
SR12	Registration media width sensor 1	Registration assembly (RM2-1957-000CN)
SR13	Registration media width sensor 2	Registration assembly (RM2-1957-000CN)
SR14	Tray 2 media out sensor	Paper pick-up roller assembly (RM2-1275-000CN)
SR51	Drum home position sensor Y	Main drive assembly (RM2-1927-000CN)
SR52	Drum home position sensor MC	Main drive assembly (RM2-1927-000CN)
SR53	Drum home position sensor K	Main drive assembly (RM2-1927-000CN)
SR54	Developer alienation sensor	Main drive assembly (RM2-1927-000CN)
SR62	FD1 media full sensor	Paper delivery assembly (RM2-6621-000CN)
SR66	Duplex flapper position sensor	Paper delivery assembly (RM2-6621-000CN)
SR94	Duplex feed sensor	Right door assembly (RM2-6622-000CN)
SR95	Tray 1 media out sensor	Right door assembly (RM2-6622-000CN)
SR1901	ITB alienation sensor	ITB maintenance kit (P1B93-67901)
SR8611	Fuser output sensor 1	Fuser kit (110V) (RM2-1928-000CN) Fuser kit (220V) (RM2-1929-000CN)
SR8612	Fuser pressure release sensor	Fuser kit (110V) (RM2-1928-000CN) Fuser kit (220V) (RM2-1929-000CN)
SR8613	Fuser output sensor 2	Fuser kit (110V) (RM2-1928-000CN) Fuser kit (220V) (RM2-1929-000CN)
SR8615	Fuser loop sensor	Fuser kit (110V) (RM2-1928-000CN) Fuser kit (220V) (RM2-1929-000CN)

Low-voltage power supply

The low-voltage power-supply (LVPS) circuit converts the AC power from the wall receptacle into the DC voltage that the printer components use.

📝 IMPORTANT: Make sure to plug the printer into the correct power source (110/220V).

Figure 1-4 Low-voltage power-supply circuit
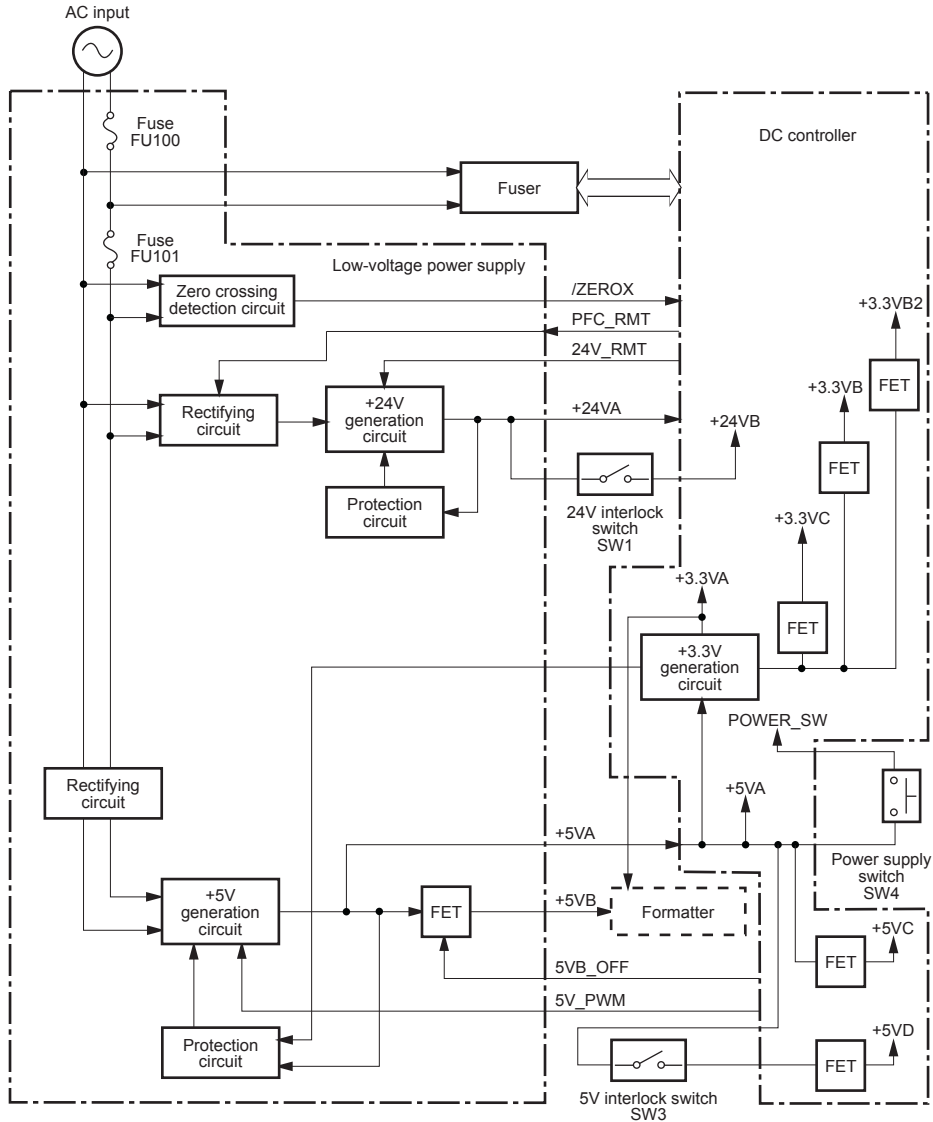
Low-voltage power supply voltages description

The low-voltage power supply converts the AC power into three DC voltages, which it then subdivides, as described in the following table.

Table 1-8 Converted DC voltages

Main DC voltage	Sub-voltage	Behavior
+24 V	+24 VA	Constantly supplied
		Stopped during active OFF or inactive OFF
	+24 VB	Interrupted when the right door is open (SW1/SW3)
+5 V	+5 VA	Constantly supplied
	+5 VB	Constantly supplied
		Stopped during active OFF or inactive OFF
	+5 VC	Constantly supplied
		Stopped during active OFF or inactive OFF
	+5VD	Constantly supplied
		Stopped during active OFF or inactive OFF
		Stopped when the front door or the right door is opened (SW1/SW3)
+3.3 V	+3.3 VA	Constantly supplied
	+3.3 VB	Constantly supplied
		Stopped during inactive OFF
	+3.3V B2	Constantly supplied
		Stopped during inactive OFF
		Intermittent supplied during active OFF
	+3.3 VC	Constantly supplied
		Stopped during active OFF or inactive OFF

Over-current/over-voltage protection

The low-voltage power supply automatically stops supplying the DC voltage to the printer components whenever it detects excessive current or abnormal voltage. The low-voltage power supply has a protective circuit against over-current and over-voltage to prevent failures in the power supply circuit.

⚠ **CAUTION:** If DC voltage is not being supplied from the low-voltage power supply, the protective function might be running. In this case, turn the power switch off and unplug the power cord.

Do not turn the power switch on until the root cause is found and corrected.

If the protective function is active, the DC controller notifies the formatter of a low-voltage power supply failure. In addition, the low-voltage power supply has two fuses to protect against over-current. If over-current flows into the AC line, the fuse stops the AC power.

Sleep mode operation

Sleep mode conserves energy by stopping the power to several components when the printer is idle. If the DC controller detects voltage that is too high when the printer is in Sleep mode, it determines that the low-voltage power supply has failed, and it notifies the formatter.

Low-voltage power supply failure detection

The DC controller determines a low-voltage power supply failure and notifies the formatter when the low-voltage power supply does not supply +24 V.

Low-voltage power supply functions

The printer has the following low-voltage power supply functions.

Table 1-9 Low-voltage power supply functions

Function	Supported feature
Sleep mode	No
Power supply voltage detection	No
Automatic power OFF	No
Automatic power ON/OFF	No
Active OFF	Yes
Inactive OFF	Yes
Network mode	No
Power switch illumination	No
Low-voltage power supply failure detection	No
Power save mode	No

High-voltage power supplies

The DC controller controls the high-voltage power supplies (HVPS) to generate biases. The high-voltage power supplies deliver the high-voltage biases to the following components used to transfer toner during the image-formation process:

- Primary charging roller (in the toner cartridges)

- Developing roller (in the toner cartridges)

- Primary transfer roller

- Secondary transfer roller

- Pressure roller

- ITB cleaning brush

High-voltage power supply circuits

The high-voltage power supplies contains the following separate circuits.

Figure 1-5 High-voltage power supply circuits
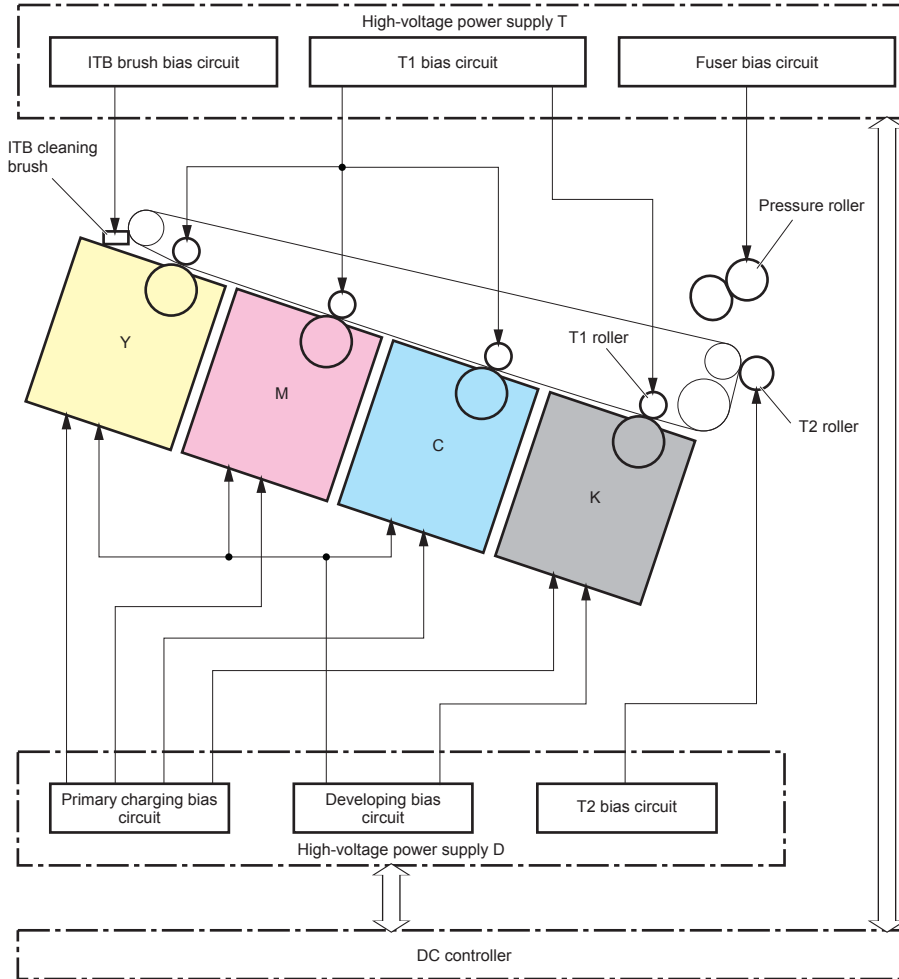
Table 1-10 High-voltage power supply circuits

Circuit	Description
Primary-charging-bias generation	The primary charging bias negatively charges the surface of the photosensitive drum to prepare for image formation.
Developing-bias generation	The developing bias adheres toner to an electrostatic latent image formed on the photosensitive drums.
Primary-transfer-bias generation	The primary transfer bias transfers the toner from each photosensitive drum onto the ITB.
Secondary-transfer-bias generation	The positive secondary transfer bias transfers the toner image from the ITB onto the paper. The negative bias transfers residual toner on the secondary transfer roller back to the ITB. The residual toner on the ITB is deposited in the toner collection unit.

Fuser bias

The printer uses instant-on fusing, which allows faster increases in fuser temperature to print the first page faster when a printer is coming out of low-power mode. The fuser bias is DC positive for improved print quality. The fuser bias circuit is located in the high-voltage power supply, HVPS (T).

Fuser control

The DC controller and components in the fuser perform the following functions related to fuser operation:

- Control fuser temperature
- Detect fuser failures
- Prevent excessive temperature rise
- Detect remaining life in the fuser
- Determine if the correct fuser is installed

Fuser circuits

The fuser heater control circuit and the fuser heater safety circuit control the fuser temperature according to commands from the DC controller. The fuser consists of the following major components:
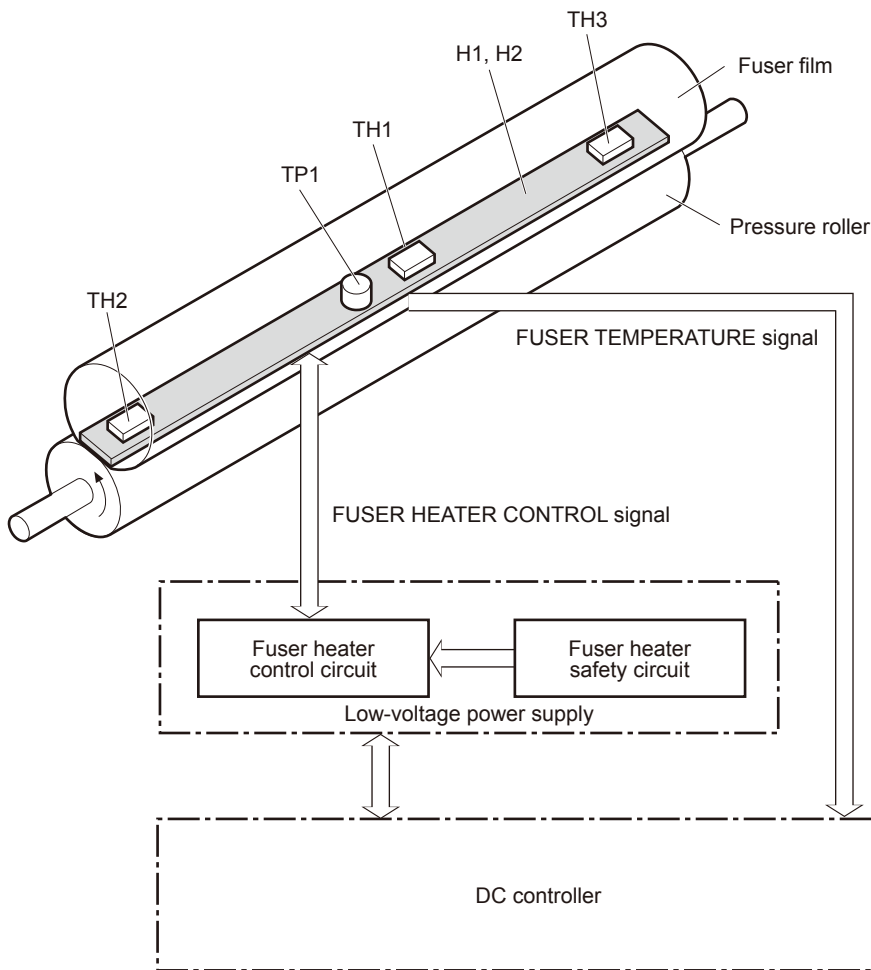
Table 1-11 Fuser components

Type of component	Abbreviation	Name	Function
Heaters	H1	Fuser main heater	Heats the center of the fuser sleeve
	H2	Fuser sub-heater	Heats the edge of the fuser sleeve

Table 1-11 Fuser components (continued)

Type of component	Abbreviation	Name	Function
Thermistors (Contact type)	TH1	Main thermistor	Detects the center temperature of the fuser heater
	TH2	Sub-thermistor 1	Detects the temperature at one end of the fuser heater
	TH3	Sub-thermistor 2	Detects the temperature at one end of the fuser heater
Thermoswitch (Non-contact type)	TP1	Thermoswitch	Prevents an abnormal temperature rise in the fuser heater

Fuser control functions

The printer has the following fuser control functions.

Table 1-12 Low-voltage power supply functions

Failure detection function	Supported feature
Fuser temperature control	Yes
Fuser failure detection	Yes
Frequency detection circuit failure detection	Yes
Fuser pressure release mechanism failure detection	Yes
Fuser type discrepancy detection	Yes
Fuser type identification detection	No
Fuser presence detection	Yes
Fuser life detection	Yes
Relay failure detection	No
Pressure roller cleaning	Yes

Fuser temperature control

The temperatures of the two rollers in the fuser fluctuate according to the stage of the printing process. The DC controller sends commands to the fuser-control circuit to adjust temperatures.

Figure 1-6 Fuser temperature-control circuit
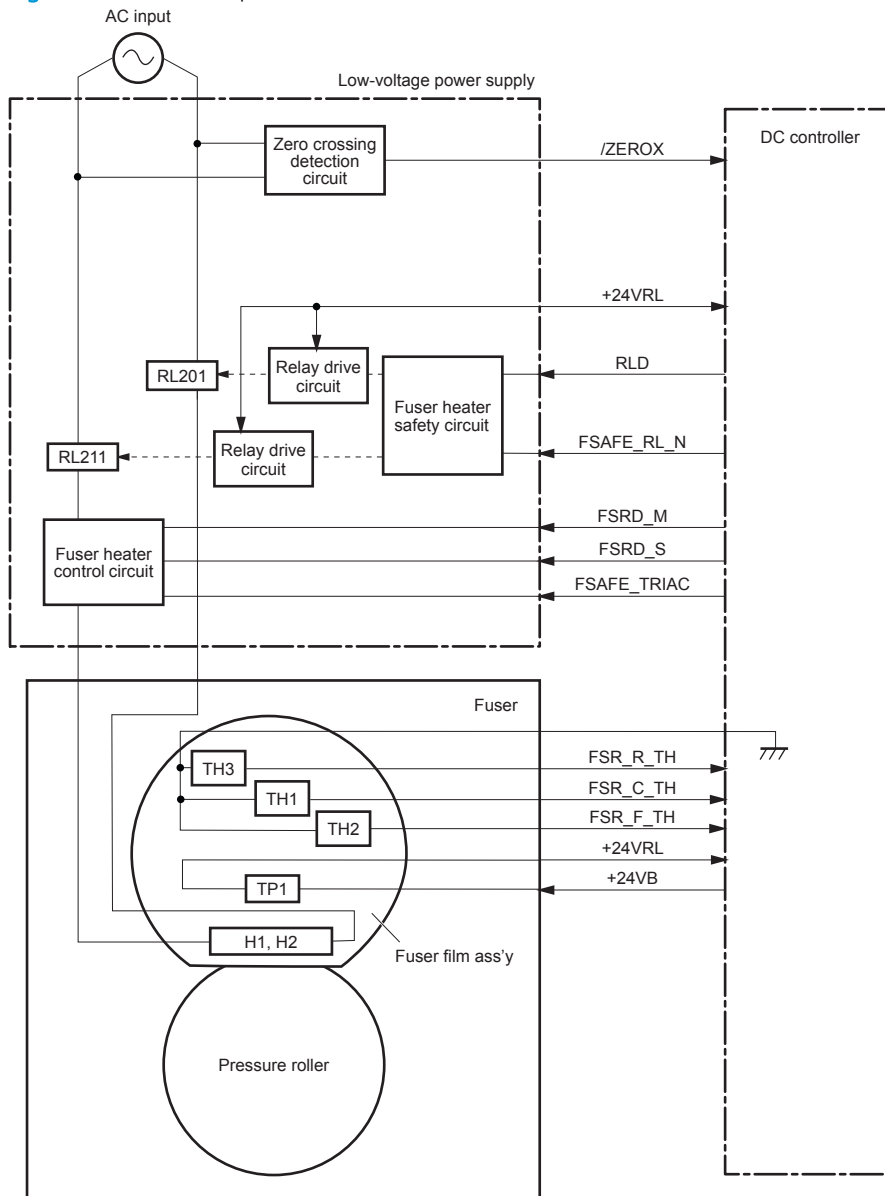
Fuser heater protection

Fuser heater protection is a feature that detects excessive temperatures in the fuser and interrupts the power supply to the fuser heater.

The following three protective components prevent the fuser heater from excessive rising temperature:

- **DC controller**: When a thermistor or sub-thermistor detects a temperature above a certain threshold, the DC controller interrupts power to the specific heater.

- **Fuser-heater safety circuit**: The fuser heater safety circuit monitors the detected temperature of the sub-thermistors.

- **Thermoswitch**: If the temperature in the heaters is abnormally high, and the temperature in the thermoswitch exceeds a specified value, the contact to the thermoswitch breaks.

Fuser unit life detection

The fuser life is tracked by fuser rotations, and not by the number of pages printed. This is a more accurate tracking method since the fuser rotates for every print job. There will be variations in fuser life depending on customer usage. Customers who are running one- and two-page intermittent jobs with long pauses between each job might reach the fuser low message sooner due to the fuser rotating more times per page than it would for larger print jobs.

Fuser identification

The printer detects the type and presence of the fuser. The DC controller notifies the formatter when it fails to detect the type (110V or 220V) or presence of the fuser.

NOTE: This printer detects if a fuser of the correct voltage for the printer is installed. If a fuser of the incorrect voltage is installed, the DC controller notifies the formatter and an error message is displayed on the control panel.

Engine laser scanner system

The laser scanner system forms the latent electrostatic image on the photosensitive drums inside each of the toner cartridges.

The DC controller receives instructions from the formatter regarding the image of the page to be printed. The DC controller signals the lasers to emit light, and the laser beams pass through lenses and onto the scanner mirror, which rotates at a constant speed. The mirror reflects the beam onto the photosensitive drum in the pattern required for the image, exposing the surface of the drum so it can receive toner.

The main components of the laser scanner system are the laser assembly and the scanner motor assembly, which are controlled by signals sent from the DC controller.

Figure 1-7 Laser scanner system
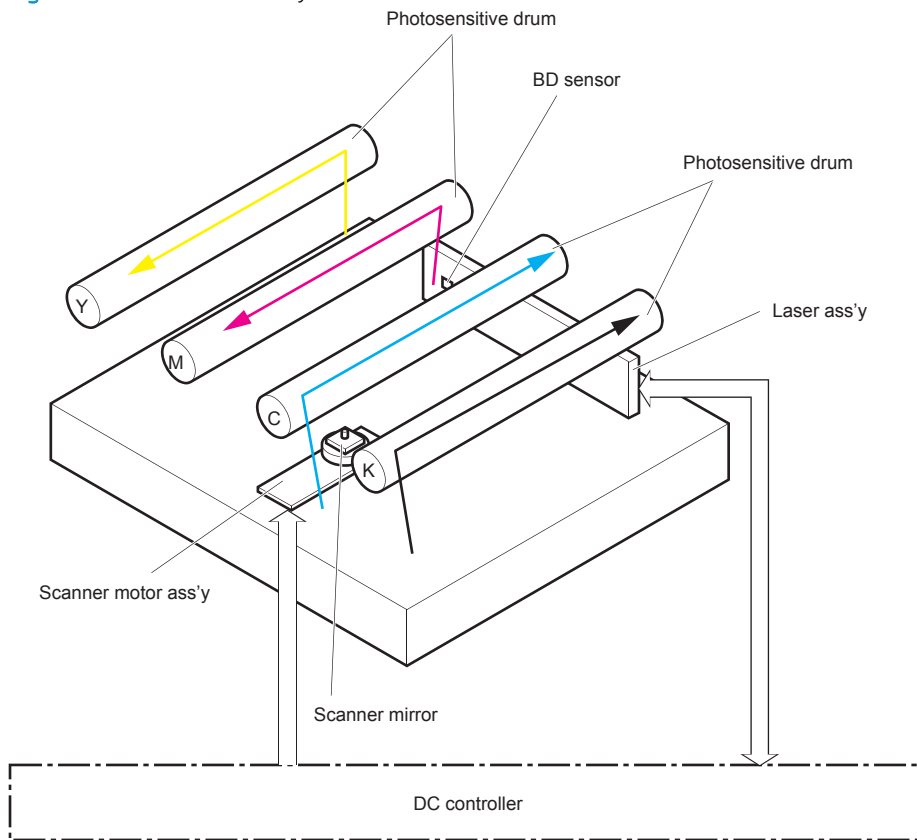
Laser scanner failure detection

The DC controller determines an optical unit failure and notifies the formatter of the error status when any of the following occurs:

- BD sensor failure detection

- **Laser scanner motor startup failure:** The scanner motor does not reach a specified rotation frequency within a specified period of time from when the laser scanner starts up.

- **Laser scanner motor abnormal rotation:** The laser scanner motor does not reach a specified rotational frequency within a specified period of time during a print operation.

- Laser scanner failure detection

For example, the control panel will show a 51.00.XX error message when a laser scanner error occurs. The control panel messages document may then be consulted for appropriate troubleshooting steps.

Safety

The laser scanner assembly has a mechanical laser shutter. For the safety of users and service technicians, the laser shutter interrupts the optical path of the laser scanner assembly when the front door (SW1/SW3) or right door (SW1/SW3) are opened.

Image-formation process

The image-formation system creates the printed image on the paper. The system consists of the following components:

- Toner cartridges

- Intermediate transfer belt (ITB)

- Primary transfer roller

- Secondary transfer roller

- Fuser

- Laser scanner

- High-voltage power supplies

The DC Controller controls the internal components of the image formation system (according to commands received from the formatter) to form the toner image on the photosensitive drum surface. The toner image is then transferred to the print media and fused.

Figure 1-8 Image-formation system
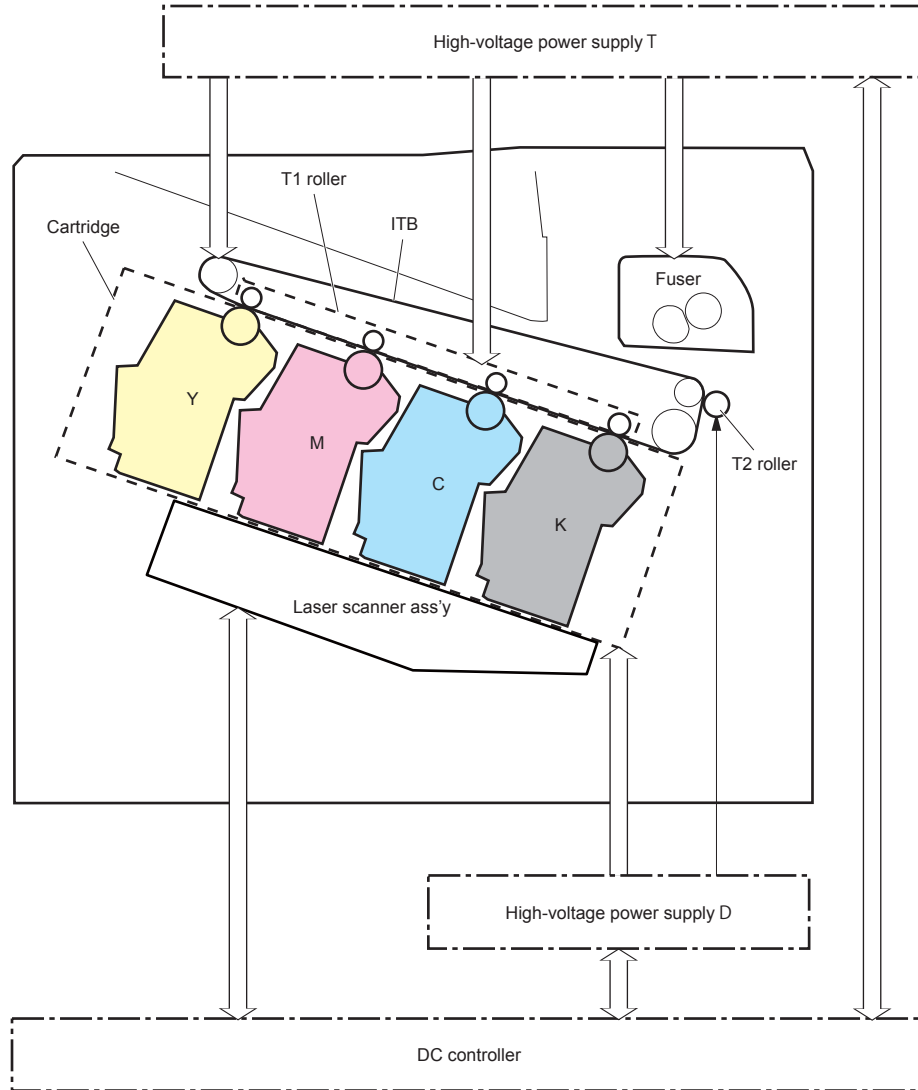
Figure 1-9 Image-formation system motors
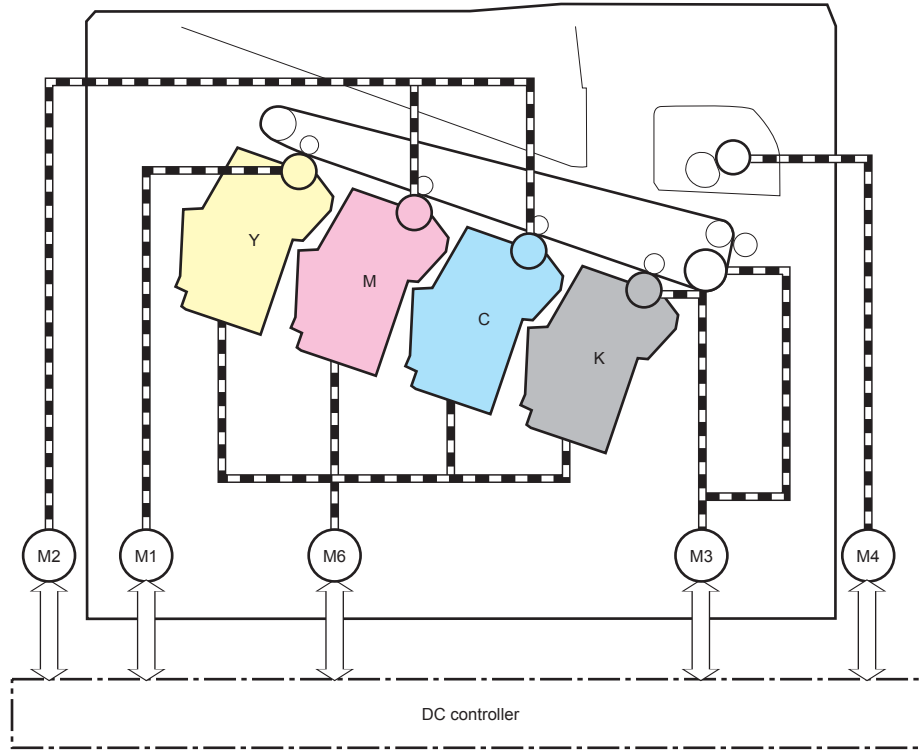
Abbreviation	Component name
M1	Drum motor 1
M2	Drum motor 2
M3	Drum motor 3
M4	Fuser motor
M6	Developer alienation motor

Figure 1-10 Image formation system sensors

Figure 1-10 Image formation system sensors
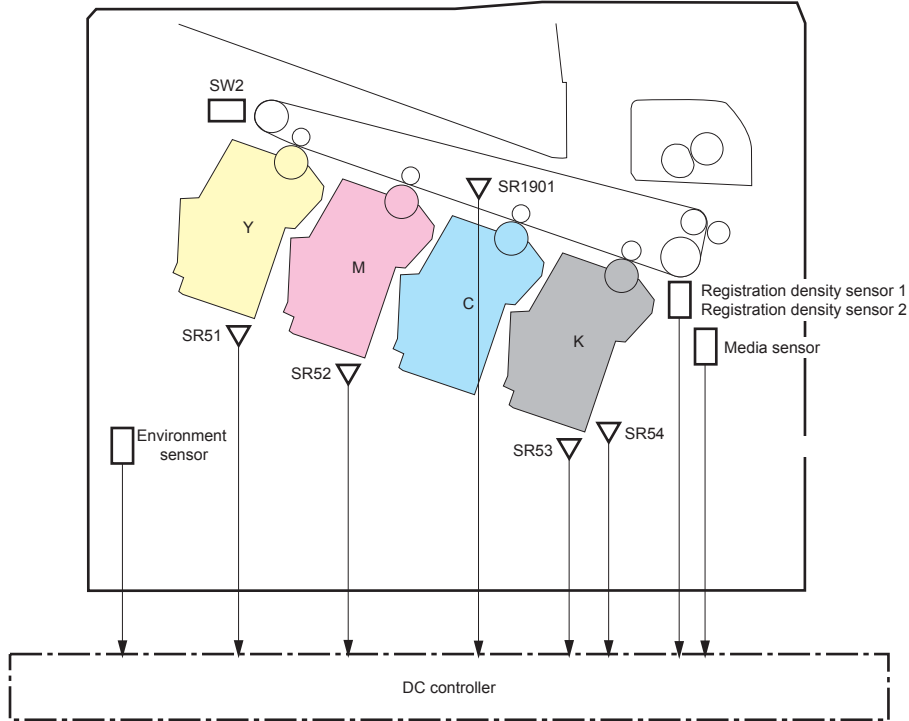
Table 1-13 Image formation system electrical component list

Abbreviation	Component name
SW2	ITB Toner collection near full switch
SR51	Drum home position sensor Y
SR52	Drum home position sensor MC
SR53	Drum home position sensor K
SR54	Developer alienation sensor
SR1901	ITB alienation sensor
–	Registration density sensor 1
–	Registration density sensor 2
–	Environment sensor
–	Media sensor

The image-formation process consists of ten steps divided into six functional blocks.

Figure 1-11 Image-formation process

Legend:
- : Paper path
- : Direction of drum rotation
- : Functional block
- : Step
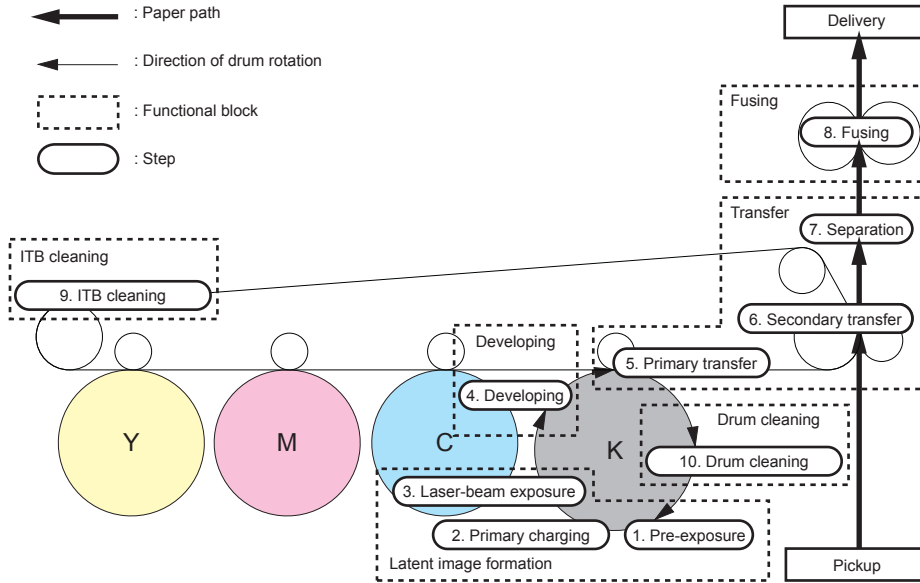
Table 1-14 Image formation process

Functional block	Steps	Description
Latent image formation	1. Pre-exposure 2. Primary charging 3. Laser-beam exposure	An invisible latent image forms on the surface of the photosensitive drums.
Development	4. Development	Toner adheres to the electrostatic latent image on the photosensitive drums.
Transfer	5. Primary transfer 6. Secondary transfer 7. Separation	The toner image transfers to the ITB and then to the paper.
Fusing	8. Fusing	The toner fuses to the paper to make a permanent image.
ITB cleaning	9. ITB cleaning	Residual toner is removed from the ITB.
Drum cleaning	10. Drum cleaning	Residual toner is removed from the photosensitive drums.

Step 1: Pre-exposure

Light from the pre-exposure LED strikes the surface of the photosensitive drum to remove any residual electrical charges from the drum surface.

Figure 1-12 Pre-exposure

LED

Photosensitive drum
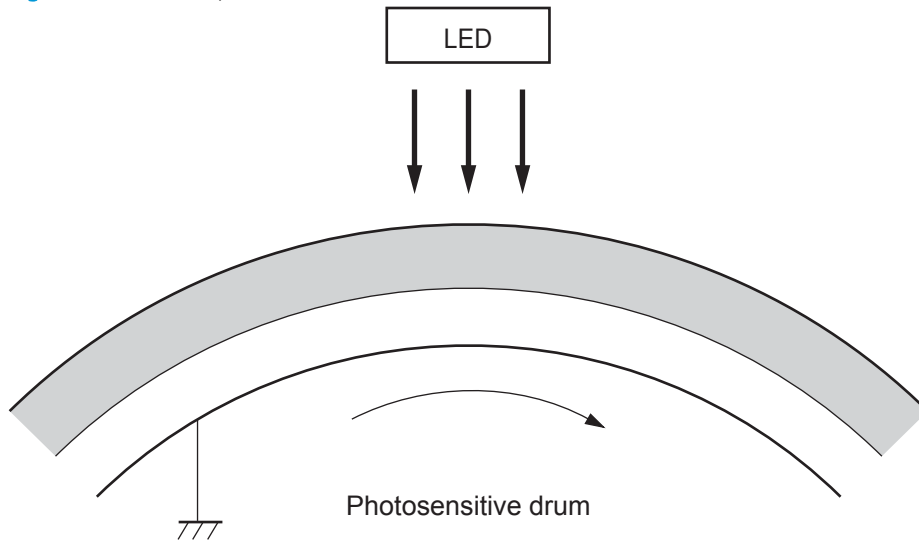
Step 2: Primary charging

The primary-charging roller contacts the photosensitive drum and charges the drum with negative potential.

Figure 1-13 Primary charging

Primary charging roller

Primary charging bias

Photosensitive drum
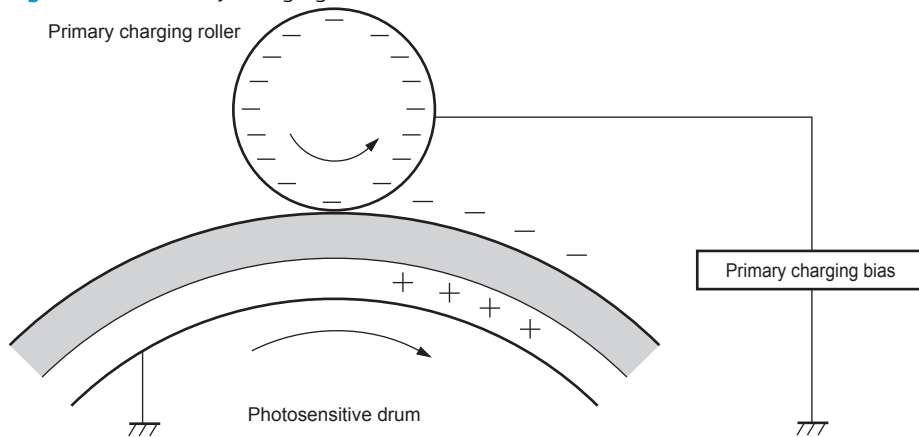
Step 3: Laser-beam exposure

The laser beam strikes the surface of the photosensitive drum in the areas where the image will form. The negative charge neutralizes in those areas, which are then ready to accept toner.

Figure 1-14 Laser-beam exposure

Laser beam

Photosensitive drum
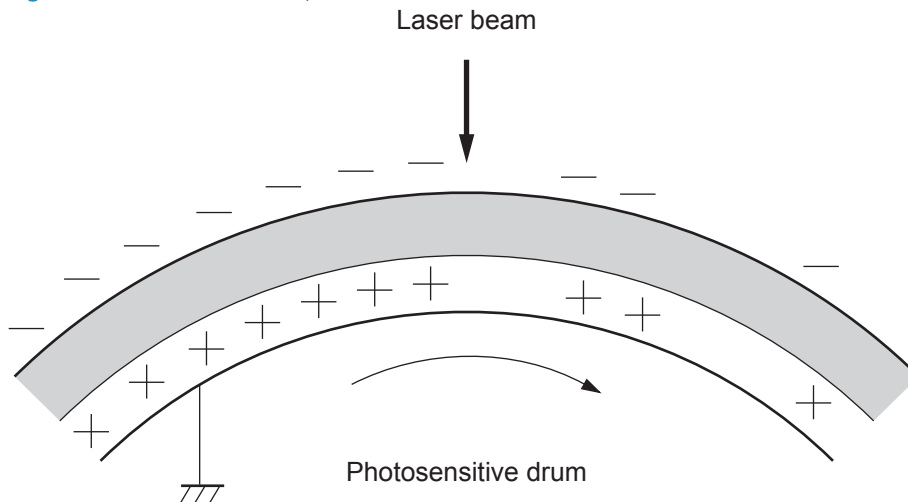
Step 4: Development

Toner acquires a negative charge as the developing cylinder contacts the developing blade. Because the negatively-charged surface of the photosensitive drums have been neutralized where they have been struck by the laser beam, the toner adheres to those areas on the drums. The latent image becomes visible on the surface of each drum.

Figure 1-15 Development

Developer roller

Developer blade

Developing bias

Photosensitive drum
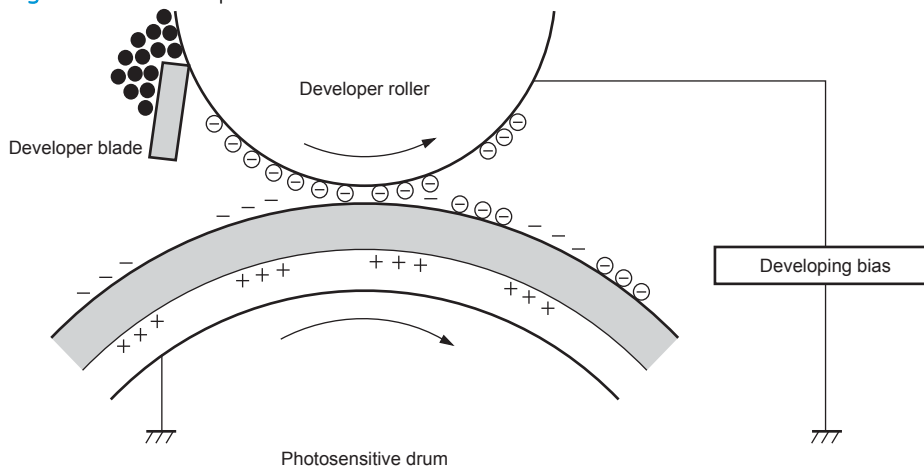
Step 5: Primary transfer

The positively-charged primary-transfer rollers contact the ITB, giving the ITB a positive charge. The ITB attracts the negatively-charged toner from the surface of each photosensitive drum, and the complete toner image transfers onto the ITB.

Figure 1-16 Primary transfer
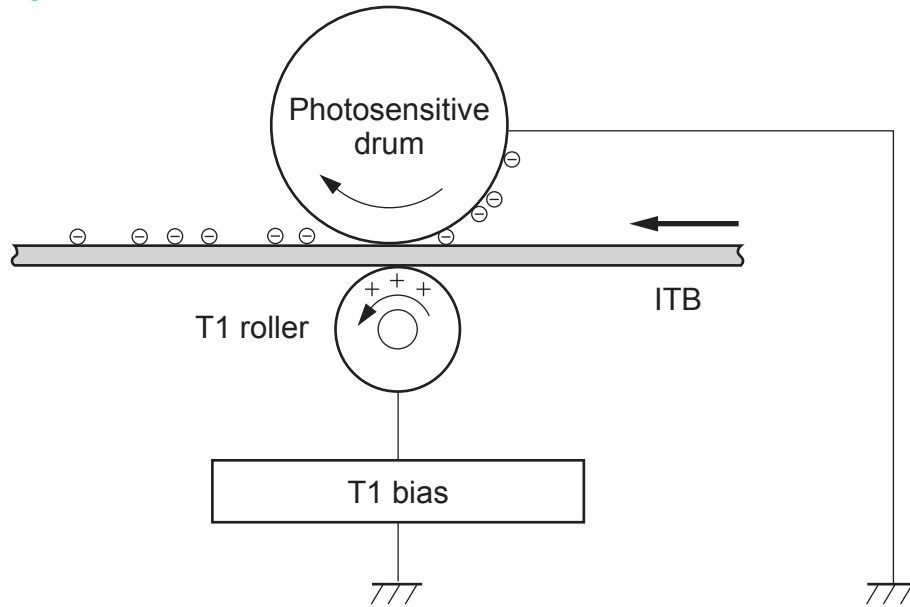
Step 6: Secondary transfer

The paper acquires a positive charge from the secondary-transfer roller, and attracts the negatively-charged toner from the surface of the ITB. The complete toner image transfers onto the paper.

Figure 1-17 Secondary transfer
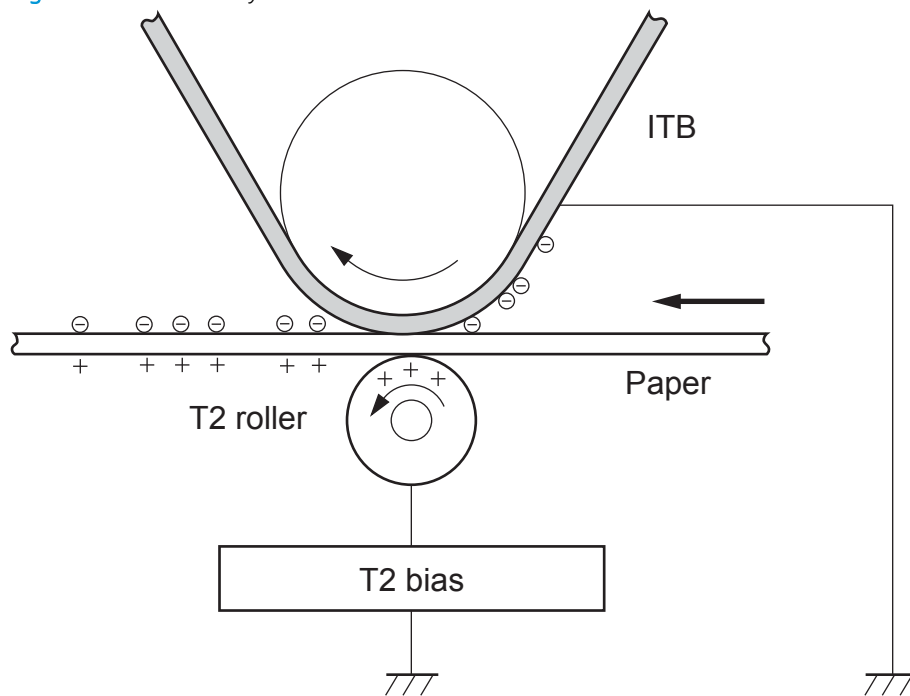
Step 7: Separation

The stiffness of the paper causes it to separate from the ITB as the ITB bends. The static-charge eliminator removes excess charge from the paper to make sure that the toner fuses correctly.

Figure 1-18 Separation
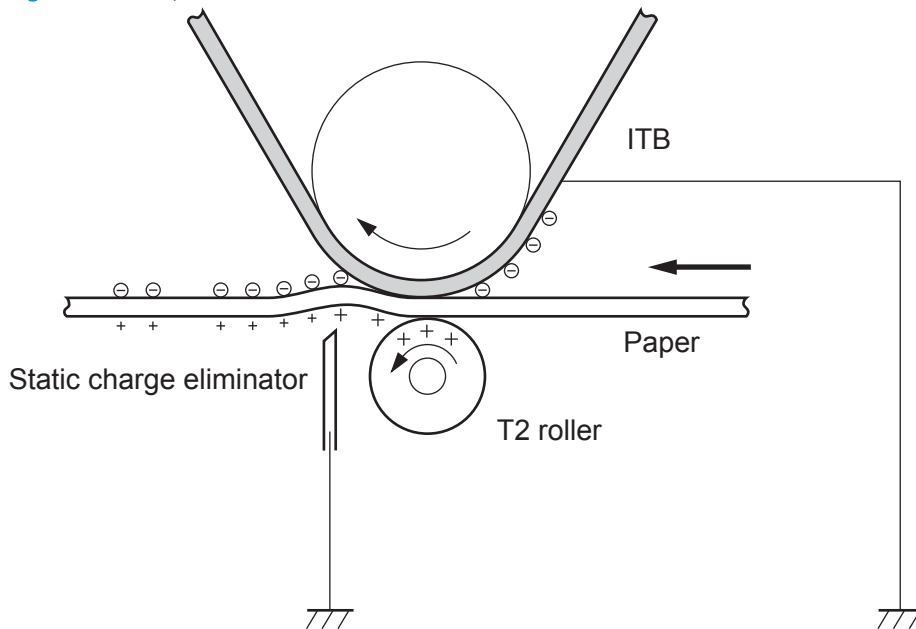
Step 8: Fusing

To create the permanent image, the paper passes through heated, pressurized rollers to melt the toner onto the page. Fusing bias is added to the pressure roller to improve the print quality.

Figure 1-19 Fusing
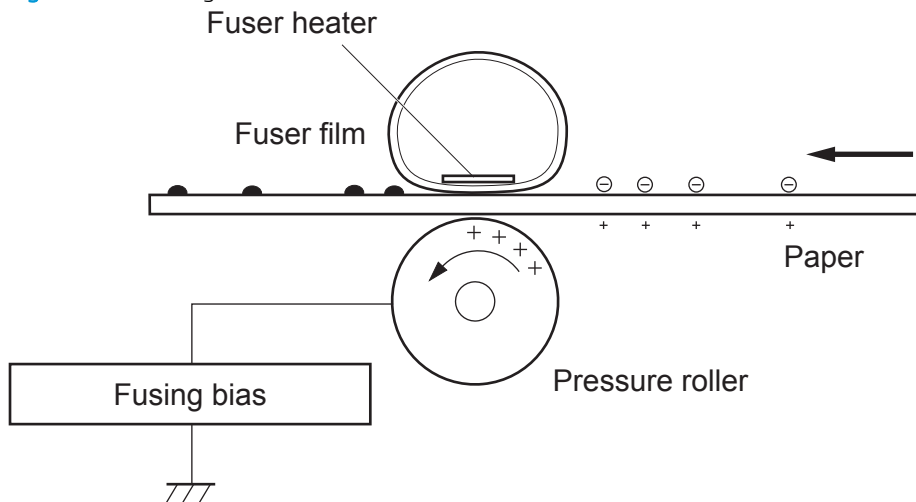
Step 9: ITB cleaning

The cleaning blade scrapes the residual toner off the surface of the ITB. The residual toner feed screw deposits residual toner in the toner collection unit. The residual toner which cannot be removed by the cleaning blade is charged by the ITB cleaning brush, and then transferred from the ITB surface to the photosensitive drum by the primary transfer (T1) roller.

Figure 1-20 ITB Cleaning
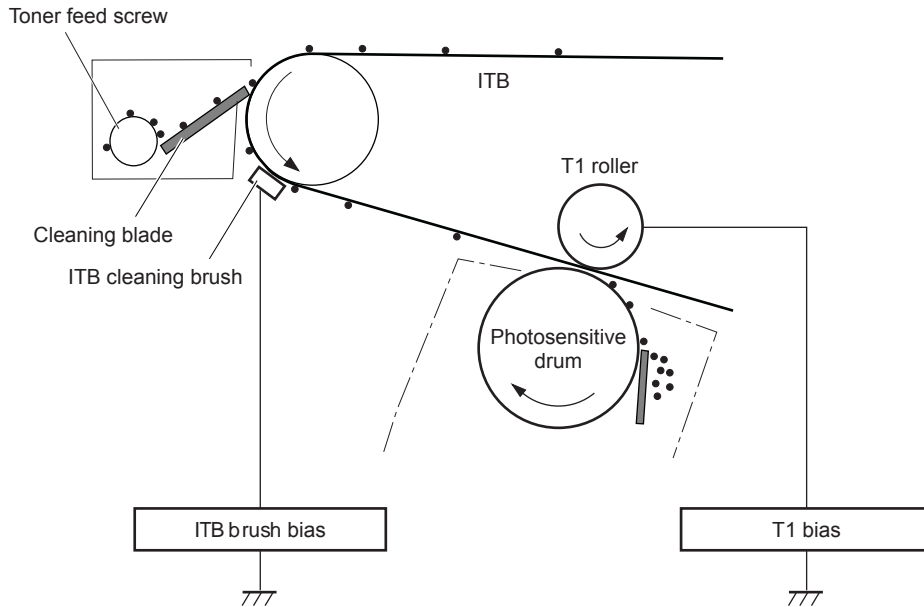
Step 10: Drum cleaning

The cleaning blade scrapes the residual toner off the surface of the photosensitive drum. The toner feed screw deposits the residual toner in the toner collection unit.

Figure 1-21 Drum cleaning
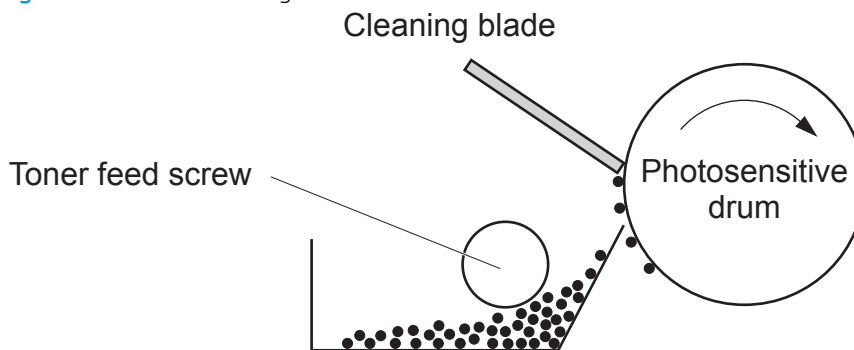
Toner cartridges

The printer has four toner cartridges, one for each color: cyan, magenta, yellow, and black.

Design

Each toner cartridge is filled with toner and consists of the following components:

- Photosensitive drum
- Developer roller
- Primary-charging roller
- Memory chip

The DC controller rotates the drum motor to drive the photosensitive drum, developer roller, and the primary-charging roller.

Figure 1-22 Toner cartridge system
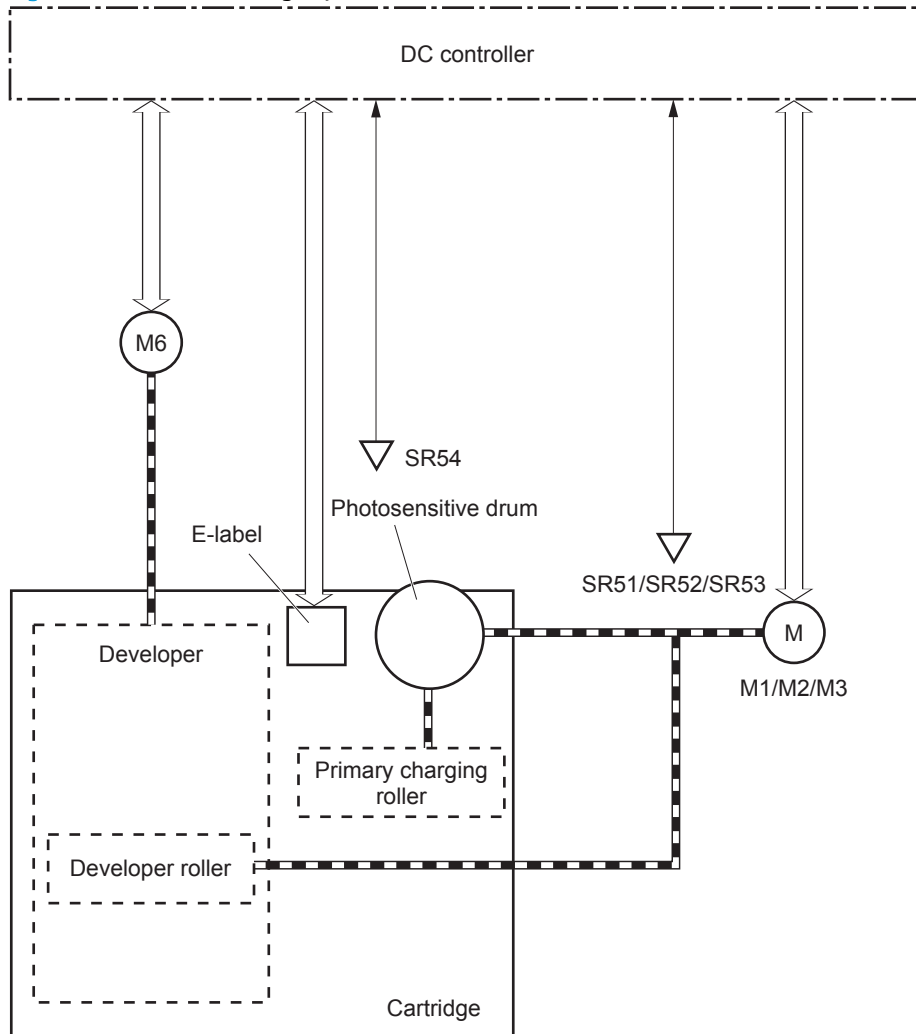
Table 1-15 Toner cartridge functions

Function	Applied

Table 1-15 Toner cartridge functions (continued)

Cartridge presence detection	Yes
Toner level detection	Yes
Cartridge life detection	Yes
Cartridge mis-installation detection	Yes
Developer alienation control	Yes
Developer alienation motor failure detection	Yes
Drum discharge mechanism	No

Memory chip

The memory chip is non-volatile memory that stores information about the usage of the toner cartridge and helps protect the customer from counterfeit cartridges. This chip is also used to detect the presence of a cartridge within the printer or when a cartridge is installed in the wrong slot. The printer reads and writes the data in the memory chip.

JetIntelligence

JetIntelligence supports two features for managing toner cartridges.

- The authentication feature allows customers to specify the use of only genuine HP toner cartridges in the printer.

- The anti-theft feature enables locking a cartridge to a specific printer or fleet of printers.

Authentication

The genuine HP authentication feature allows a customer to specify that only genuine HP supplies can be used in a printer. If a non-HP or used supply is installed, the printer will not print. This feature is disabled by default, and can be enabled or disabled from the control panel or the Embedded Web Server (EWS).

If a genuine HP toner cartridge from another printer is moved to a printer with this feature enabled, the toner cartridge will authenticate and print, unless the toner cartridge has passed the low state. If the toner cartridge has passed the low state, an **Unauthorized Cartridge** message displays on the control panel.

If a non-HP toner cartridge is used in a printer with this feature enabled, the message **Unauthorized Cartridge** appears on the control-panel display.

NOTE: If a customer suspects they have a counterfeit cartridge, they should report it by going to www.hp.com/go/anticounterfeit and selecting **Report now**.

Anti-theft

The toner cartridge anti-theft feature allows a customer to configure the printer to automatically lock genuine HP toner cartridges to a specific printer or fleet of printers when they are installed. A locked toner cartridge will only work in the specified printer or fleet of printers. This feature prevents toner cartridges from being stolen and used in another printer, or from being moved from an authorized printer to an unauthorized printer. This feature is disabled by default, and can be enabled or disabled from the control panel, the Embedded Web Server (EWS), or Web Jetadmin.

When the anti-theft feature is enabled, the toner cartridge in a printer will only work in the specified printer or fleet of printers. If a locked toner cartridge is moved to another printer, the cartridge will not print and the message **Protected Cartridge** appears on the control-panel display.

NOTE: When a toner cartridge is locked to a specific printer or fleet of printers, it cannot be unlocked. This is a permanent operation.

Toner seal

The toner cartridge seal is opened automatically when the toner cartridge is installed into the printer.

Toner level and cartridge life detection

Toner level detection: The DC controller detects the remaining toner in the cartridge by the optical detection method and then notifies the formatter of the remaining toner level.

Cartridge life detection: Cartridge life detection is measured in two ways.

1. Toner level:

    – For the first 75% of cartridge life, toner level is measure through pixel counting by the DC controller. Once the level reaches 25%, the toner level sensor utilizes electrical properties to determine the amount of toner remaining.

2. Rotations of internal components (OPC and developer roller):

    – The DC controller monitors these two life parameters and reports them to the formatter as percent life remaining. End of cartridge life is determined by the lower value of the two.

Developing unit engagement and disengagement control

The printer can print in full-color mode or in black-only mode. To print in black-only mode, the printer disengages the developing rollers in the cyan, magenta, and yellow toner cartridges, which maximizes the life of the cartridges.

Figure 1-23 Developer roller engagement and alienation control

Developing unit is disengaged   Developing unit is engaged
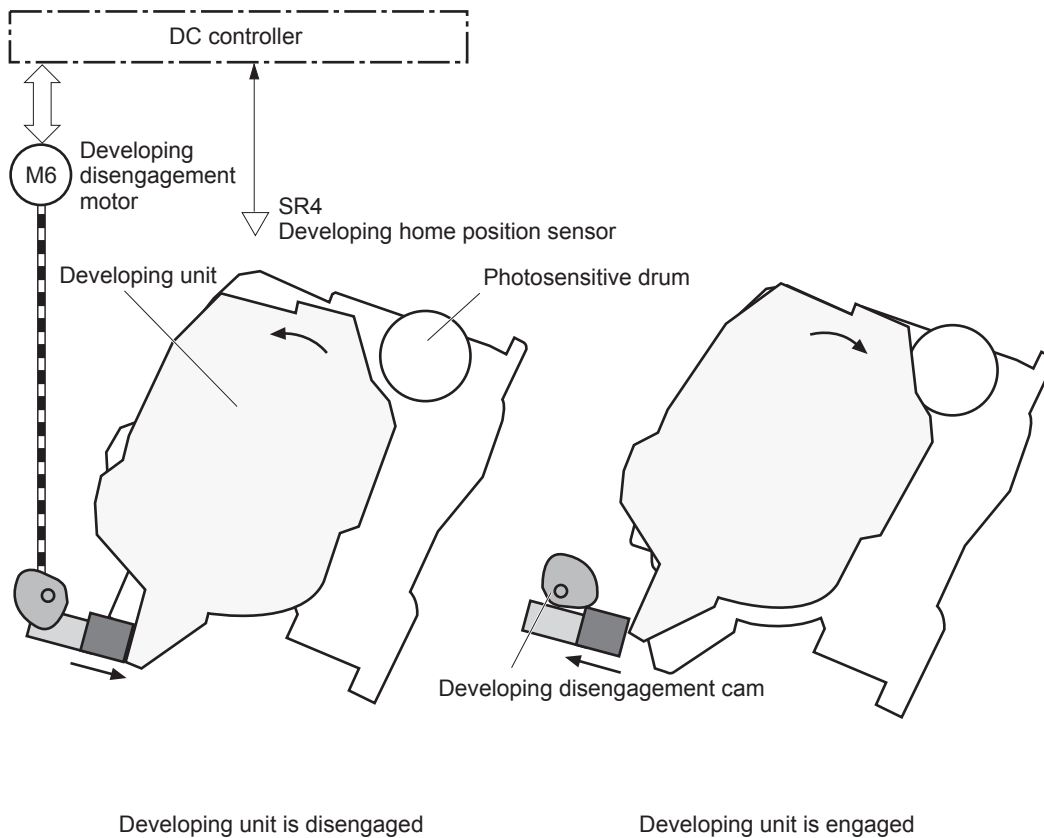
The developer roller engagement and alienation control operates as follows: When the printer is turned on and when each print job is completed, all four of the developing units are disengaged from the photosensitive drums.

● The drive of the developer alienation motor rotates the developer alienation cam.

● As the cam rotates, the developing unit engages with or separates from the photosensitive drum.

When the print mode is full color, the developing units engage with the drums. When the print mode is black-only, only the black developing unit engages with the drum.

The DC controller determines a developer alienation motor failure and notifies the formatter when it does not detect a specified signal from the developer alienation sensor during the developing unit engagement and disengagement operation.

Intermediate transfer belt (ITB) unit

The ITB unit accepts the toner images from the photosensitive drums and transfers the completed image to the paper. The ITB unit has the following main components:

- Intermediate transfer belt (ITB)
- ITB-drive roller
- Primary-transfer roller
- ITB cleaner

Drum motor 3 drives the ITB drive roller, which rotates the ITB. The motion of the ITB causes the primary transfer rollers to rotate. The ITB cleaner cleans the ITB surface.

Figure 1-24 ITB Unit
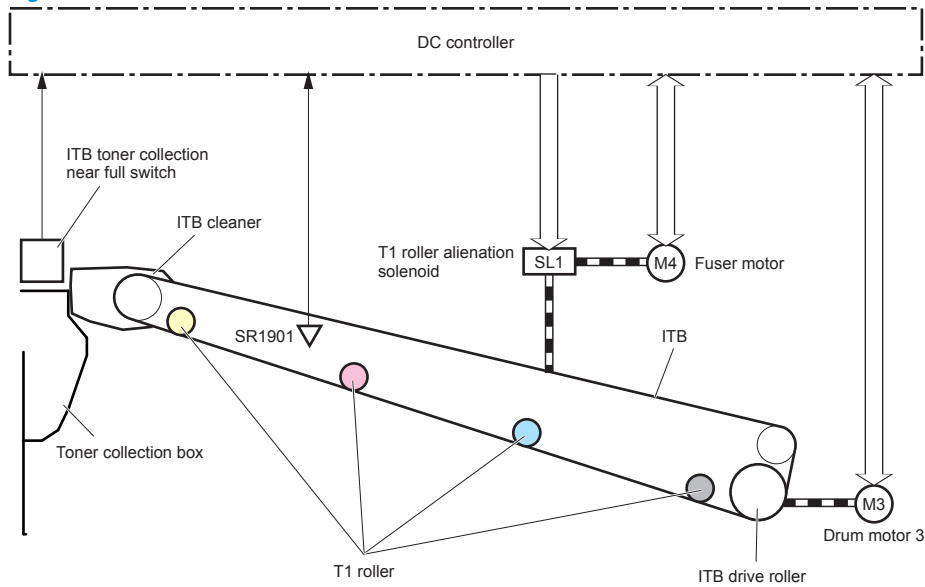
Table 1-16 ITB assembly functions

Function	Applied
T1 roller alienation control	Yes
T1 roller alienation mechanism failure detection	Yes
ITB ass'y life detection	Yes
ITB ass'y presence detection	No
Blade cleaning mechanism	Yes
Electrostatic cleaning mechanism	Yes
ITB toner collection box full detection	Yes
ITB toner collection box presence detection	No
ITB perimeter detection	Yes
ITB seal detection sensor failure detection	No

Primary-transfer roller engagement and disengagement control

Depending on the requirements of the print job, the primary-transfer rollers engage with the ITB so it can receive toner from the photosensitive drums. The primary-transfer rollers have three engagement states.

Table 1-17 Primary-transfer roller engagement states

All rollers disengaged	The ITB is disengaged from all the four photosensitive drums. This state is the home position for the ITB unit.
All rollers engaged	The ITB is engaged with all four photosensitive drums. This is the state for full-color printing.
Black roller engaged	The ITB is engaged with only the black photosensitive drum. This is the state for black-only printing.

Figure 1-25 Three states of primary-transfer roller engagement and disengagement
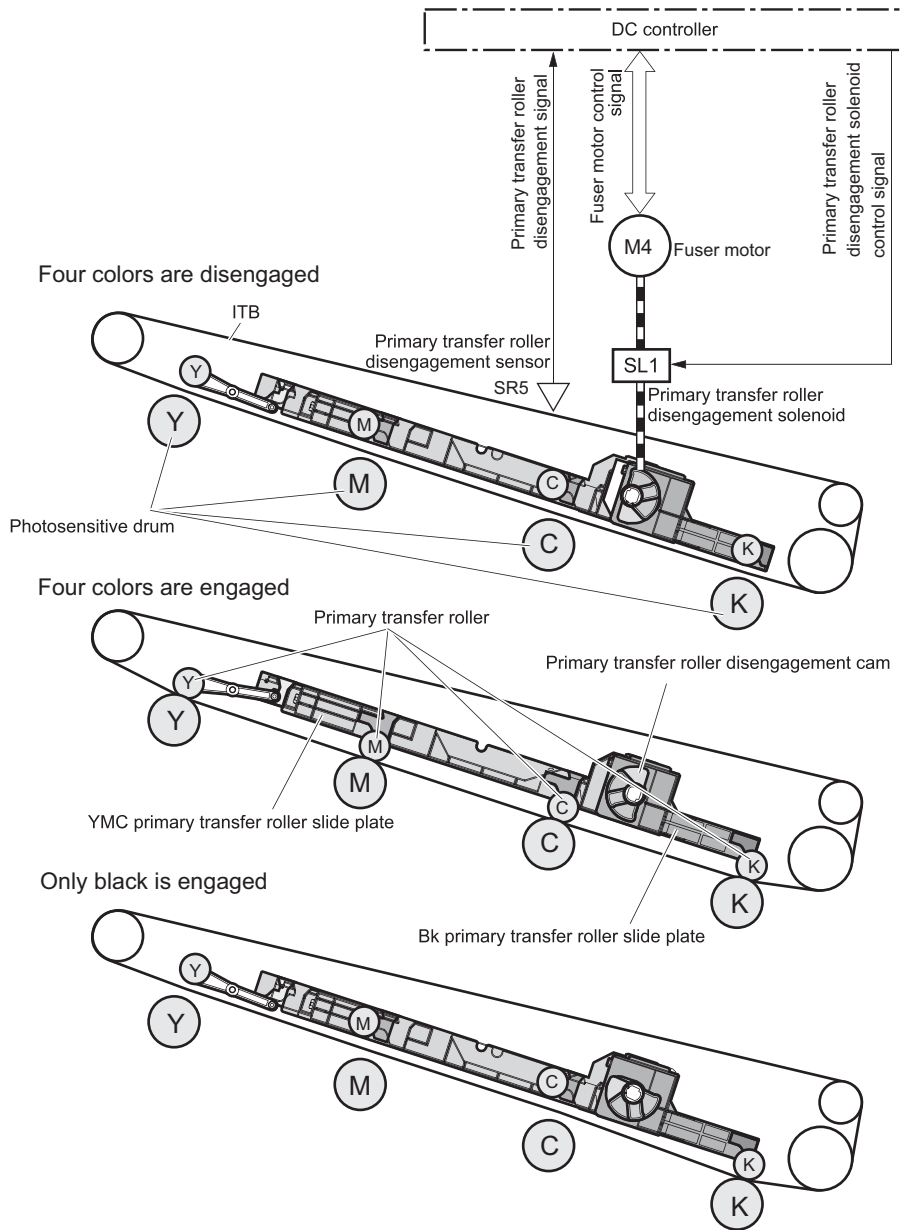
The primary-transfer-roller disengagement motor rotates or reverses to place the primary-transfer-roller disengagement cam into one of three positions. The cam causes the transfer-roller slide plate to move to the right or left. This movement causes the primary-transfer rollers to move up to engage the ITB with the photosensitive drum or down to disengage it.

The DC controller expects to receive a signal from the ITB home-position sensor when the primary-transfer roller engages or disengages. If the DC controller does not receive this signal, but detects that the primary-transfer-roller disengagement motor is rotating, the DC controller determines that the primary-transfer-disengagement mechanism has failed, and notifies the formatter. The formatter will then display a **59.00.F0** message on the control panel.

ITB unit detection

The DC controller monitors several signals from the ITB unit to detect status.

ITB unit life detection	The DC controller detects whether the ITB unit is new by monitoring the new ITB unit sensor. The DC controller determines the ITB unit is at end of life and notifies the formatter when a specified number of pages are printed after the ITB unit is replaced. If swapping ITB units between two printers for troubleshooting purposes, be sure to return the ITB units to their original printers to maintain the correct life count. NOTE: When installing a new ITB, refer to the instructions for resetting the ITB life counter in the installation guide provided with the replacement part.
ITB unit presence detection	The DC controller detects the presence of an ITB unit by monitoring the primary-transfer roller disengagement sensor. The DC controller turns on the primary-transfer disengagement solenoid for specified times during an initial rotation period when the following events occur: ● The printer is turned on ● The printer exits sleep mode ● The door is closed The DC controller determines the absences of an ITB unit and notifies the formatter when it does not detect a specified signal from the new primary-transfer roller disengagement sensor.

ITB cleaning mechanism

The cleaning blade in the ITB cleaner scrapes the residual toner off the ITB surface and deposits the residual toner into the toner collection unit. The residual toner feed screw deposits the residual toner to the residual toner feed unit. The ITB motor and the residual toner feed motor drive the screw. The residual toner that cannot be removed by the cleaning blade is charged by the ITB cleaning brush, and then transferred from the ITB surface to the photosensitive drum by the primary transfer (T1) roller. The DC controller detects whether the toner collection unit is full by using the toner collection unit full sensor, and then notifies the formatter.

Figure 1-26 ITB cleaning process
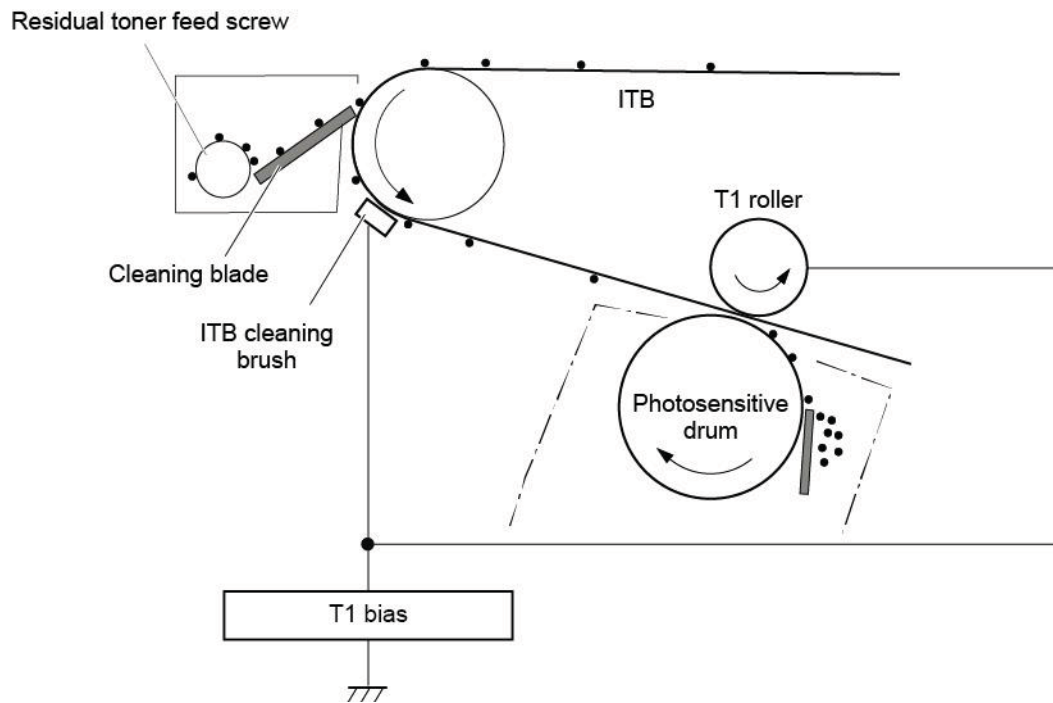
Secondary transfer roller functions

The secondary transfer roller transfers the image from the ITB onto the paper.

The printer has the following secondary transfer roller functions.

Table 1-18 Secondary transfer roller functions

Function	Supported feature
Secondary transfer roller cleaning mechanism	Yes
Secondary transfer roller presence detection	No
Secondary transfer roller life detection	No
Secondary transfer roller alienation control	Yes

Calibration

The printer calibrates itself to maintain proper print quality. The calibration corrects color-misregistration and color-density variation due to environmental changes or internal variation in the printer.

The printer has the following calibration functions.

Table 1-19 Calibration functions

Function	Supported feature
Color-plane registration correction control	Yes
Environment correction control	Yes
Image density control (DMAX)	Yes
Image halftone control (DHALF)	Yes
Registration density sensor failure detection	Yes
Color sensor control	No
Gray axis control (GAS)	No
Environment sensor failure detection	Yes

Pickup, feed, and delivery system

The DC controller controls the pickup, feed, and delivery system according to commands from the formatter. The pickup, feed, and delivery system uses a series of rollers to move the paper through the printer.

The pickup, feed, and delivery system consists of the following three functional blocks. The DC controller controls each block to pick up, feed and deliver the paper.

- **Pickup-and-feed-block**: Controls the movement of the paper from each pickup source to the fuser inlet

- **Fuser-and-delivery-block**: Controls the movement of the paper from the fuser to the delivery destination

- **Duplex block**: Controls the movement of the paper from the duplex switchback unit to the duplex re-pickup unit.

Figure 1-27 Pickup, feed, and delivery system

Fuser-and-delivery block

Simplex paper path

Pickup-and-feed block

Simplex paper path
Duplex paper path

Duplex block
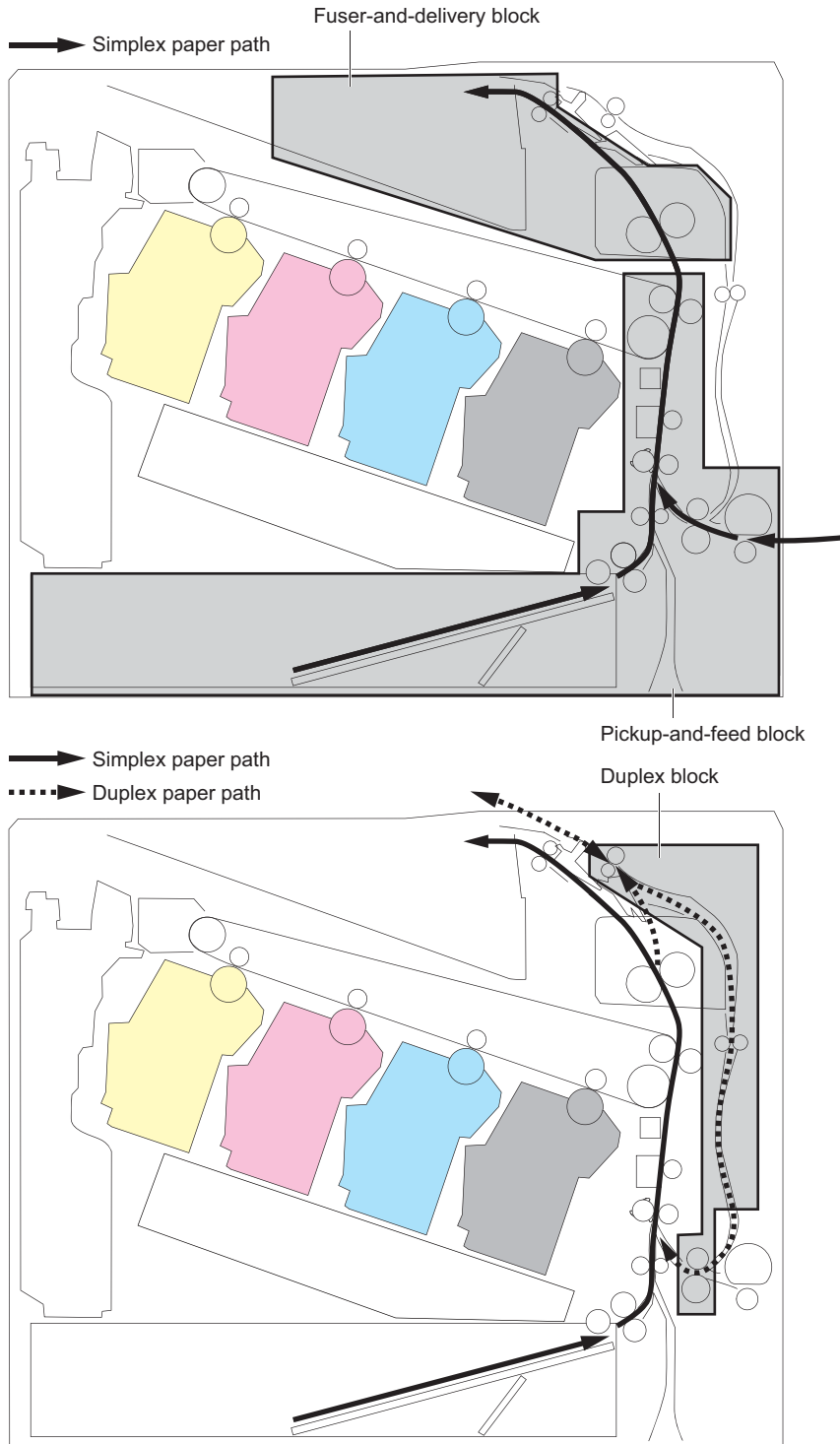
Photo sensors and switches

The following figure shows the sensors and switches for the pickup, feed, and delivery system.

Figure 1-28 Pickup, feed, and delivery system photo sensors and switches
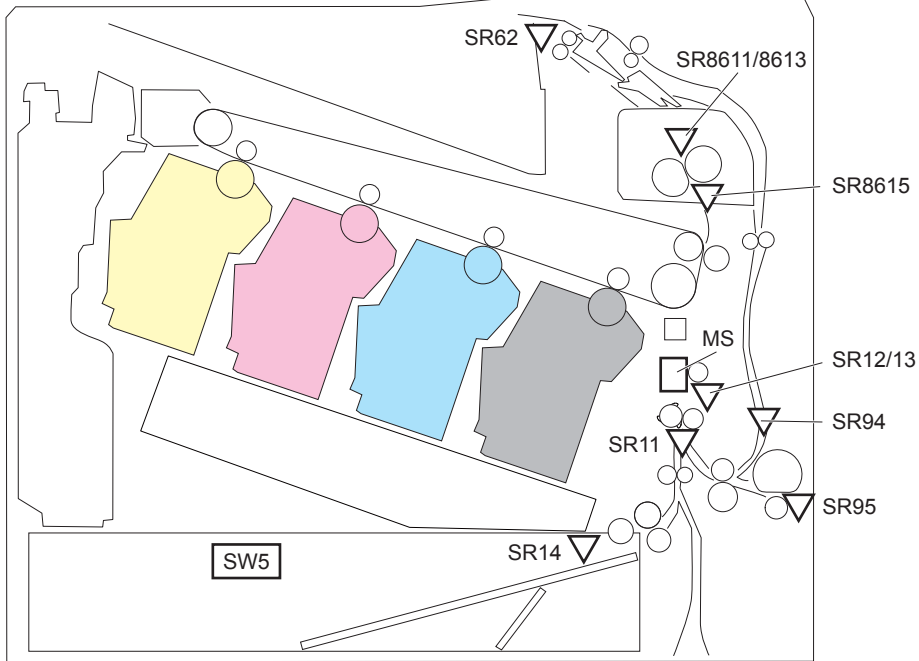
Table 1-20 Photo sensors and switches

Abbreviation	Component name
SR11	Registration sensor
SR12	Registration media width sensor 1
SR13	Registration media width sensor 2
SR14	Tray 2 media out sensor
SR62	FD1 media full sensor
SR94	Duplex feed sensor
SR95	Tray 1 media out sensor
SR8611	Fuser output sensor 1
SR8613	Fuser output sensor 2
SR8615	Fuser loop sensor
SW5	Tray 2 media size switch 1
MS	Media sensor

Motors, clutches, and solenoids

The following figure shows the motors, clutches, and solenoids for the pickup, feed, and delivery system.

Figure 1-29 Pickup, feed, and delivery system motors, clutches, and solenoids
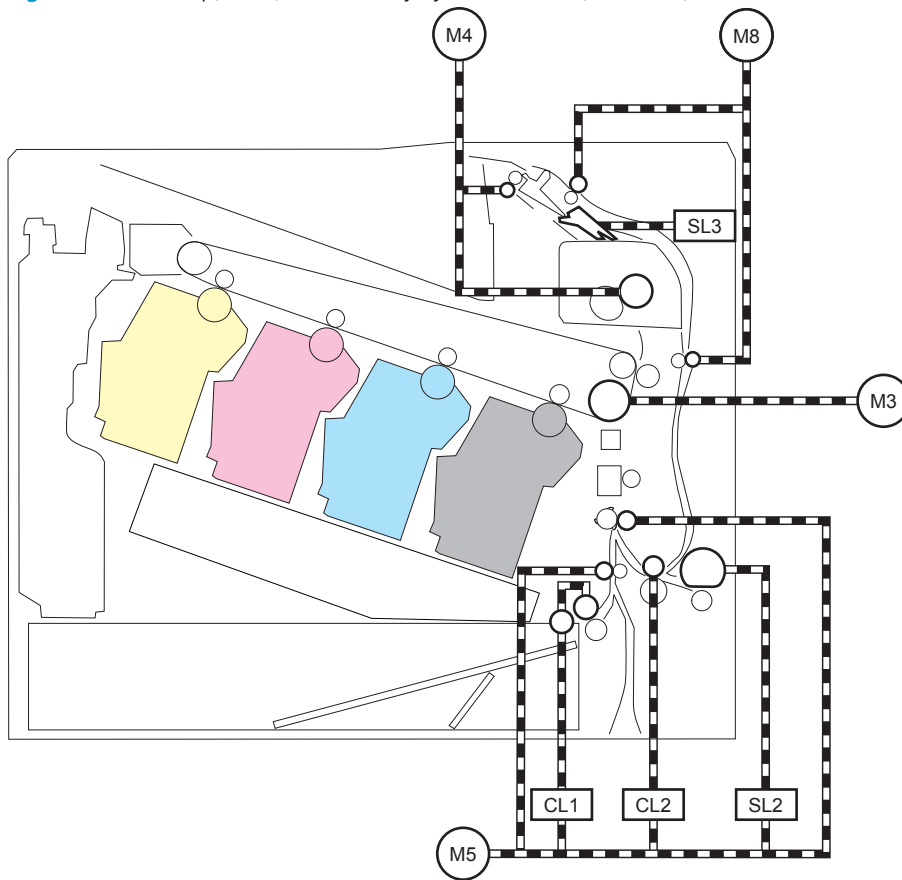
Table 1-21 Motors, clutches, and solenoids

Abbreviation	Component	Replacement part number
M3	Drum motor 3	Drum motor assembly (RM2-1956-000CN)
M4	Fuser motor	Fuser motor assembly (RM2-1955-000CN)
M5	Pickup motor	Paper pickup assembly (RM2-6556-000CN)
M8	Duplex reverse motor	Right door assembly (RM2-6622-000CN)
SL2	Tray 1 pickup solenoid	Right door assembly (RM2-6622-000CN)
SL3	Duplex reverse solenoid	Right door assembly (RM2-6622-000CN)
CL1	Tray 2 pickup clutch	Lifter drive assembly (RM2-6669-000CN)
CL2	Duplex re-pickup clutch	Right door assembly (RM2-6622-000CN)

Paper trays

Tray 2 media type detection

The printer selects the optimal print mode based upon the media type detected by the media sensor. The media sensor consists of an optical sensor, which detects the surface texture of the paper, and an ultrasonic sensor, which measures the thickness of the paper. The formatter informs the DC controller that the printer is in auto-sense mode and the DC controller changes the fuser mode based on media type.

Following are the print modes detected by the printer:

- Normal

- Heavy media 1

- Heavy media 2

- Heavy media 3

- Light media 1

- Light media 2

- Light media 3

- Glossy media 1

- Glossy media 2

- Glossy media 3

- Glossy

- OHT

- Designated media 1

- Designated media 2

- Designated media 3

The DC controller determines a media sensor error and reports it to the formatter when the value detected by the media sensor is out of a specified range of values.

Figure 1-30 Media sensors

Ultrasonic sensor

Optical sensor

Registration ass'y
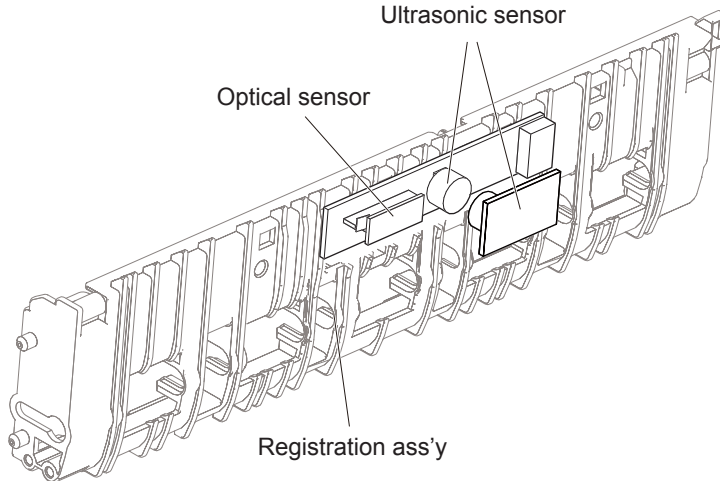
Feed speed control

The DC controller adjusts the feed speed to improve the print quality depending on the paper type. The paper is fed at a specified speed according to the print mode designated by the formatter.

Table 1-22 Print mode and feed speed

Print mode	Feed speed[1]		Media sensor detection
	Full color	Monochrome	
Auto	–	–	Yes
Normal	1/1	1/1	Yes
Heavy media 1	3/4	3/4	No
Heavy media 2	1/2	1/2	Yes
Heavy media 3	1/3	1/3	Yes
Light media 1	1/1	1/1	Yes
Light media 2	1/1	1/1	Yes
Light media 3	1/2	1/2	Yes
Glossy media 1	1/3	1/3	Yes
Glossy media 2	1/3	1/3	Yes
Glossy media 3	1/3	1/3	Yes
Glossy film	1/3	1/3	Yes
Photo media 1	–	–	No
Photo media 2	–	–	No
Photo media 3	–	–	No
Envelope 1	1/3	1/3	No
Envelope 2	–	–	No
Envelope 3	–	–	No

Table 1-22 Print mode and feed speed (continued)

Print mode	Feed speed[1]		Media sensor detection
	Full color	Monochrome	
OHT	1/3	1/3	Yes
Label	1/2	1/2	No
Designated media 1	1/2	1/2	No
Designated media 2	1/3	1/3	No
Designated media 3	3/4	3/4	No

1/1 speed = 210 mm/s
1/2 speed = 105 mm/s
1/3 speed = 70 mm/s

Table 1-23 Pickup, feed and delivery system functions

Function	Supported
Tray 2 media size detection	Yes
Tray 2 presence detection	Yes
Tray 2 media surface detection	No
Tray 2 media presence detection	Yes
Tray 2 media level detection	No
Tray 2 lift-up control	Yes
Tray 2 lift-down control	No
Tray 2 multiple-feed prevention mechanism	Yes
Tray 1 media presence detection	Yes
Tray 1 media width detection	No
Tray 1 last-media detection	No
Skew-feed prevention mechanism	Yes
Feed speed control	Yes
Loop control	Yes
Media detection	Yes
OHT detection	Yes
Image leading edge positioning	Yes
Media length detection	Yes
Media width detection	Yes
Pressure roller pressure release control	Yes
Output bin media-full detection	Yes
Automatic delivery	Yes

Table 1-23 Pickup, feed and delivery system functions (continued)

Function	Supported
Duplex switchback control	Yes
Duplex feed control	Yes

Duplexing unit

The duplexing unit reverses the paper and feeds it through the paper path to print the second side.

Duplexing reverse and duplex feed control

The duplex reverse control reverses the paper after the first side is printed and feeds it to the duplex re-pickup position to print the second side of the page.

1. At a specified time after the first side of a page is printed, the duplex reverse motor rotates, and the duplex reverse solenoid is turned on.

2. The duplex flapper moves, and the paper feeds to the duplex reverse unit.

3. After a specified period of time, the duplex reverse motor reverses, and the paper feeds to the duplex feed unit.

4. The duplex reverse motor and the pickup motor move the paper to the duplex re-pickup position.

5. The duplex reverse motor and the duplex feed clutch stop, and the paper feed operation pauses.

6. After a specified period of time, the duplex reverse motor rotates, and the duplex feed clutch is turned on. The paper is then picked up again.

Jam detection/prevention

The printer uses the following sensors to detect the paper as it moves through the paper path and to report to the DC controller if the paper has jammed.

- Registration sensor (SR11)

- Registration media width sensor 1 (SR12)

- Registration media width sensor 2 (SR13)

- FD1 (output bin) media full sensor (SR62)

- Duplex feed sensor (SR94)

- Fuser output sensor 1 (SR8611)

- Fuser output sensor 2 (SR8613)

- Fuser loop sensor (SR8615)

- PF (paper feeder) feed sensor (PS3602) — 550-sheet paper feeder only

- PD (paper deck) cassette 1 feed sensor (PS3401) — 1x550-sheet paper-feeder, 3x550-sheet paper-feeder, and 2,550-sheet paper-feeder only

- PD (paper deck) cassette 2 feed sensor (PS4501) — 3x550-sheet paper-feeder and 2,550-sheet paper-feeder only

- PD (paper deck) cassette 3 feed sensor (PS5601) — 3x550-sheet paper-feeder only

Figure 1-31 Paper-path jam detection sensors
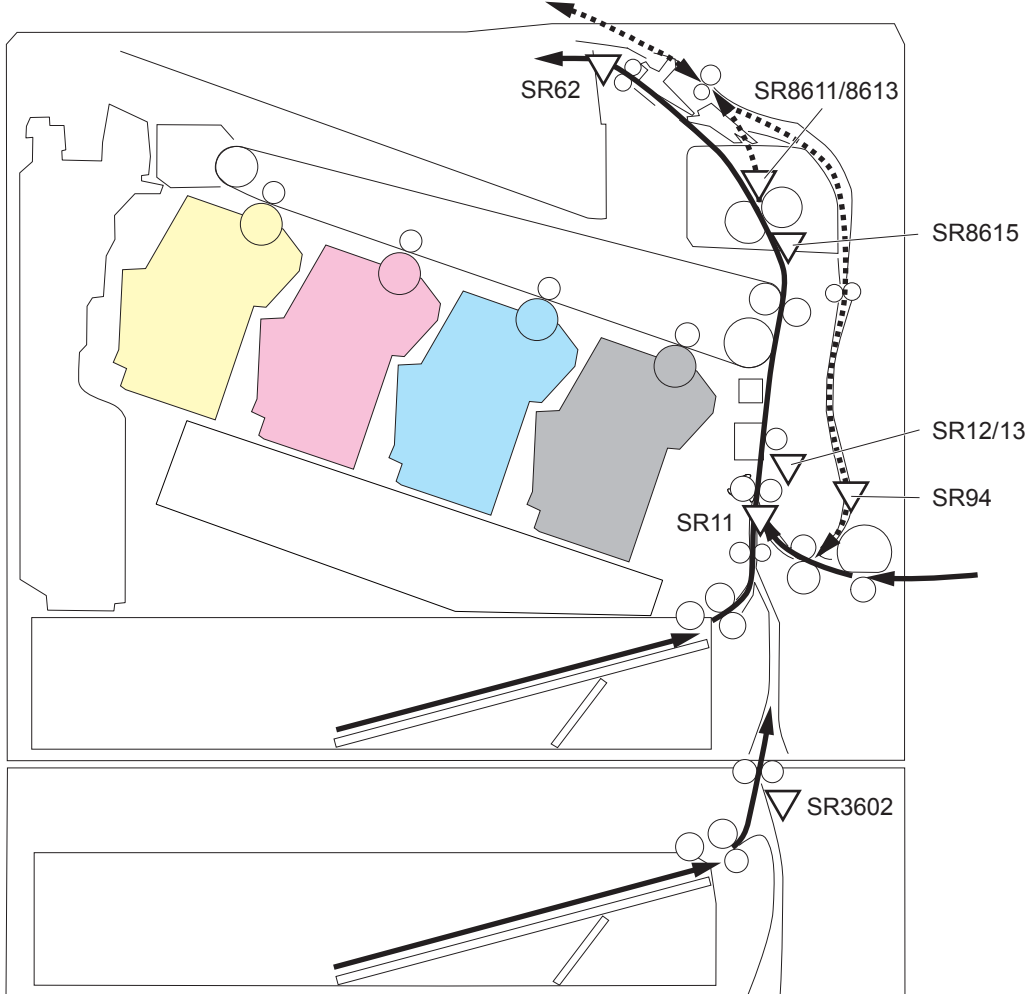
The printer determines that a jam has occurred if one of these sensors detects paper at an inappropriate time. The DC controller stops the print operation and notifies the formatter.

Figure 1-32 paper-feeder paper-path jam detection sensors
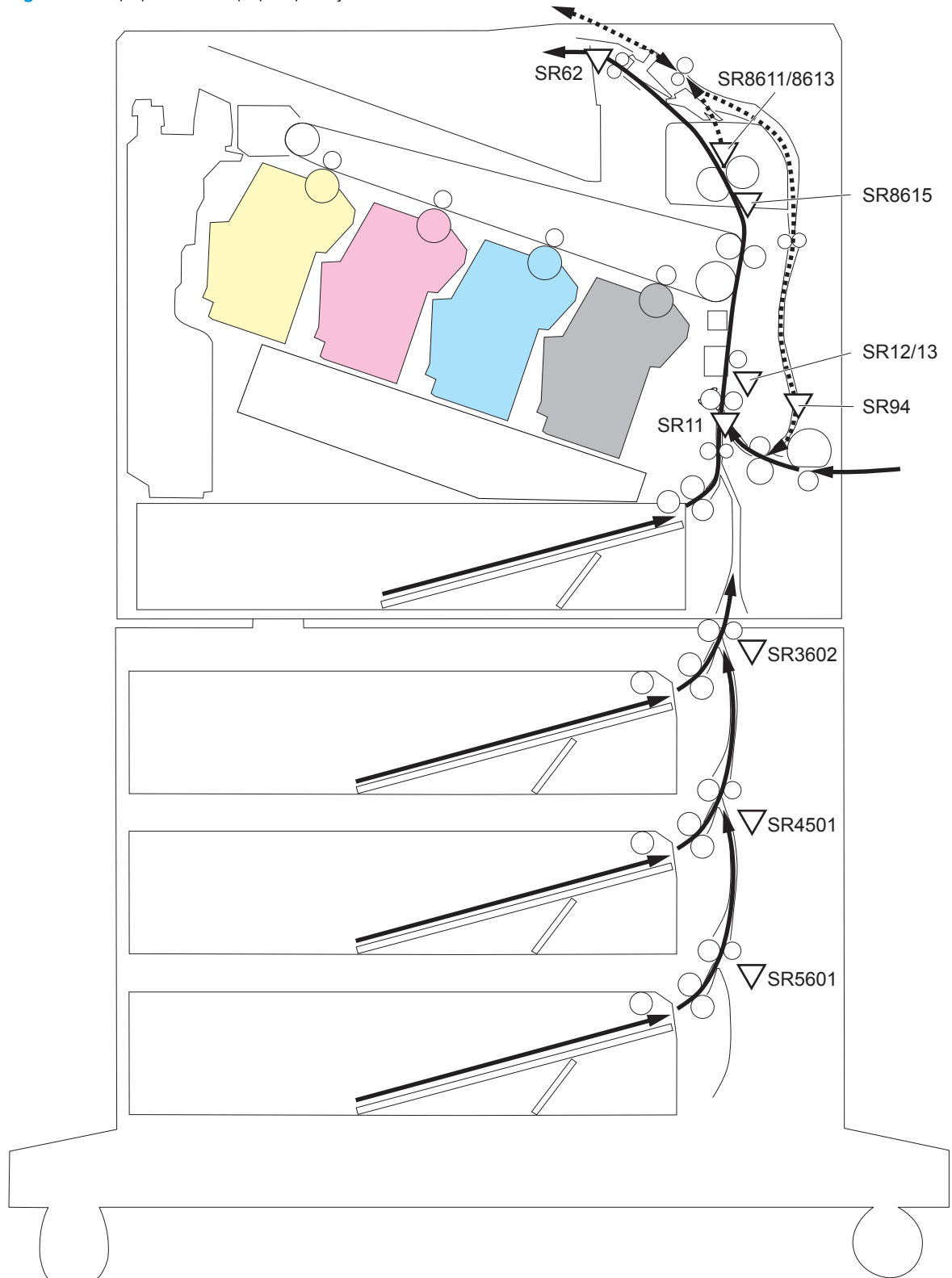
Table 1-24 Jams that the printer detects

Jam	Supported feature
No pick jam 1	Yes
No pick jam 2	Yes
No pick jam 3	Yes
No pick jam 4	No
Pickup stay jam 1	Yes
Pickup stay jam 2	No
Pickup stay jam 3	No
Pickup stay jam 4	No
Fuser delivery delay jam 1	Yes
Fuser delivery delay jam 2	No
Fuser delivery delay jam 3	No
Fuser delivery delay jam 4	No
Fuser delivery stay jam 1	Yes
Fuser delivery stay jam 2	No
Fuser delivery stay jam 3	No
Fuser delivery stay jam 4	No
Residual paper jam 1	Yes
Residual paper jam 2	No
Residual paper jam 3	No
Residual paper jam 4	No
Door open jam 1	Yes
Door open jam 2	No
Door open jam 3	No
Door open jam 4	No
Fuser wrap jam1	Yes
Fuser wrap jam2	No
Fuser wrap jam3	No
Fuser wrap jam4	No
Duplex switchback jam1	No
Duplex switchback jam2	No
Duplex switchback jam3	No
Duplex switchback jam4	No
Duplex re-pickup jam 1	Yes

Table 1-24 Jams that the printer detects (continued)

Jam	Supported feature
Duplex re-pickup jam 2	No
Duplex re-pickup jam 3	No
Duplex re-pickup jam 4	No
Delivery delay jam 1	Yes
Delivery delay jam 2	No
Delivery delay jam 3	No
Delivery delay jam 4	No
Delivery stay jam 1	No
Delivery stay jam 2	No
Delivery stay jam 3	No
Delivery stay jam 4	No
Multiple feed jam 1	No
Multiple feed jam 2	No
Multiple feed jam 3	No
Multiple feed jam 4	No
Duplex feed delay jam 1	Yes
Inappropriate to the delivery path Jam 1	No
Inappropriate to the delivery path Jam 2	No

Fuser wrapping jam detection

The printer includes controls for detecting when a jam occurs causing the paper to wrap around the fuser roller.

Loop control

The loop control stabilizes the paper feed operation before the paper enters the fuser. If the pressure roller rotates slower than the secondary transfer roller, the paper loop increases and an image defect or paper crease occurs. If the pressure roller rotates faster than the secondary transfer roller, the paper loop decreases and a vertical scanning magnification failure occurs because the pressure roller pulls the paper.

To prevent these problems, the loop sensor detects the paper loop before the paper enters the fuser. The DC controller adjusts the rotational speed of the fuser motor according to the output signals from the loop sensor and maintains the paper loop. The DC controller slows the fuser motor when the sensor is off and speeds up the motor when the sensor is on.

Pressure roller pressurization and depressurization control

To prevent excessive wear on the pressure roller and help with jam-clearing procedures, the pressure roller pressurizes only during printing and standby. The DC controller reverses the fuser motor. The fuser motor rotates the fuser pressure-release cam.

The pressure roller depressurizes under the following conditions:

- The printer is turned off

- Any failure occurs

- During power-save mode

- A paper jam is detected

If the DC controller does not sense the fuser pressure-release sensor for a specified period after it reverses the fuser motor, it notifies the formatter that a fuser pressure-release mechanism failure has occurred.

Input accessories

📝 **NOTE:** Optional 1x550-sheet, 3x550 sheet, and 2,550 paper feeders are available for this printer. The printer supports up to three of these paper feeders at a time.

550-sheet paper feeder

The 550-sheet paper feeder is installed under the printer. It picks up paper and feeds it into the printer.

Figure 1-33 550-sheet paper feeder
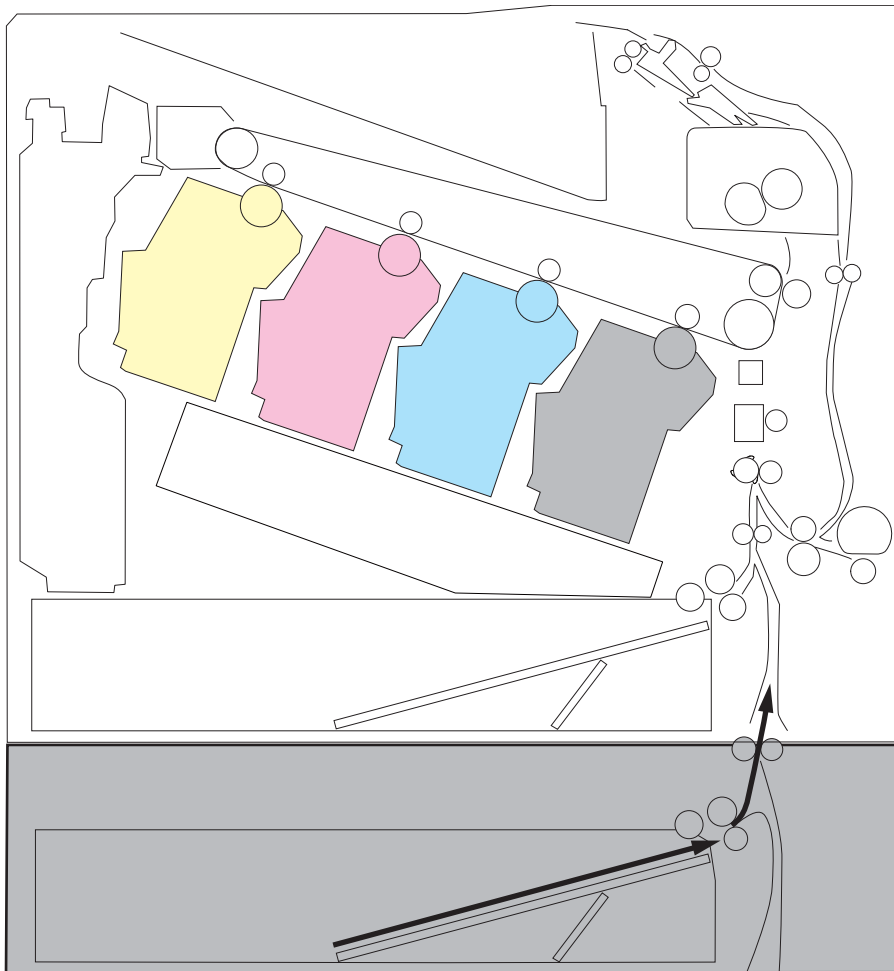
550-sheet paper feeder controller

The paper feeder controller controls the operational sequence of the paper feeder.

Figure 1-34 550-sheet paper feeder driver PCA
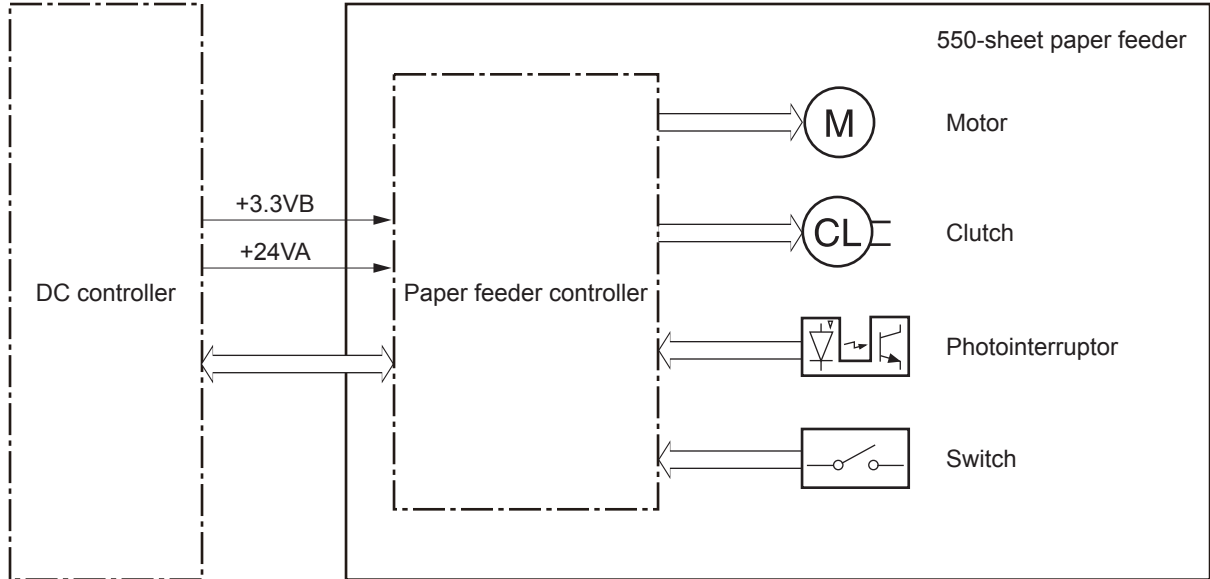
550-sheet paper feeder motor control

The 550-sheet paper feeder has one motor for lifting the tray and feeding paper.

Table 1-25 550-sheet paper feeder motor control

Component		Drives	Failure detection
M3602	Feed motor (550-sheet paper feeder)	Tray pickup roller (B5L24-67904)	No
		Tray feed roller (RM2-6684-000CN)	
		Paper feed assembly (RM2-5145-000CN)	
		Lifter drive assembly (RM2-6669-000CN)	

550-sheet paper feeder electrical components

The paper feeder contains several motors, solenoids, sensors, and switches, as described in the following table.

Table 1-26 550-sheet paper feeder electrical components

Component type	Abbreviation	Component name	Replacement part number
Motor	M3602	Feed motor (550-sheet paper feeder)	Paper feed assembly (RM2-5145-000CN)
Clutch	CL3602	Tray pick up clutch (550-sheet paper feeder)	Lifter drive assembly (RM2-5149-000CN)
Switches	SW3601	Right door switch (550-sheet paper feeder)	Right door (RM2-5146-000CN)
	SW3602	Tray detection switch (550-sheet paper feeder)	Switch button (WC2-5806-000CN)
Sensors	PS3601	Tray media-out sensor (550-sheet paper feeder)	Paper pick up assembly (RM2-5154-000CN)

Component type	Abbreviation	Component name	Replacement part number
	PS3602	Feed sensor (550-sheet paper feeder)	Paper feed assembly (RM2-5145-000CN)

550-sheet paper feeder paper pickup

The 550-sheet paper feeder picks up one sheet from the paper-feeder tray and feeds it to the printer.

Figure 1-35 Paper pickup and feed operation (550-sheet paper feeder)
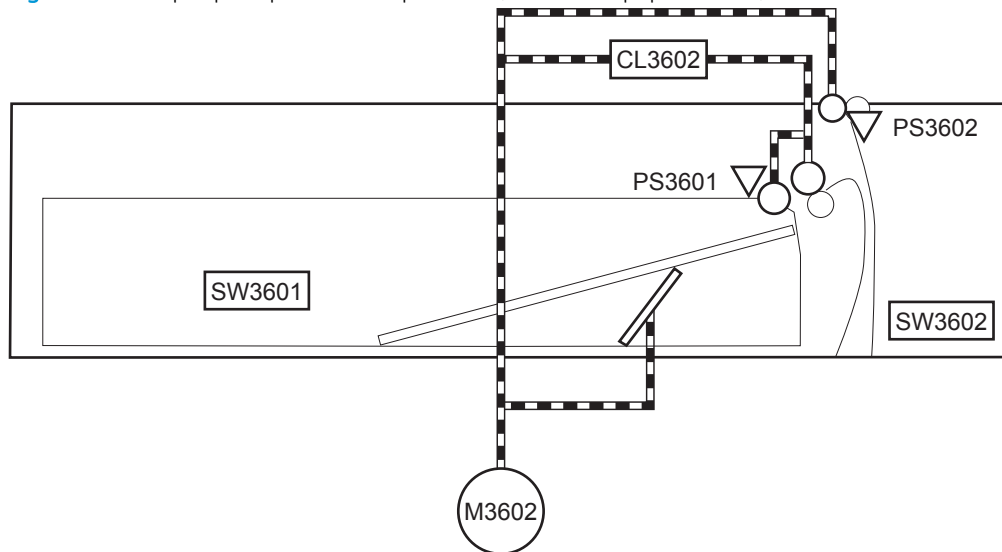
Table 1-27 Pickup feed components (1x550-sheet paper feeder)

Abbreviation	Component	Replacement part number
M3602	Feed motor (550-sheet paper feeder)	Paper feed assembly (RM2-5145-000CN)
CL3602	Tray pickup clutch (550-sheet paper feeder)	Part not available
SW3601	Media size switch	
SW3602	Door switch	
PS3601	Tray media-out sensor (550-sheet paper feeder)	Paper pick up assembly (RM2-5154-000CN)
PS3602	Feed sensor (550-sheet paper feeder)	Paper feed assembly (RM2-5145-000CN)

550-sheet paper feeder multiple feed prevention

The multiple-feed prevention for the 550-sheet paper feeder is operated in the same way as that of the printer base.

550-sheet paper feeder tray presence detection

The presence detection for the 550-sheet paper feeder is the same way as that of the printer base.

550-sheet paper feeder tray lift operation

The 550-sheet paper feeder keeps the paper stack surface at the correct pickup position. The tray lift operation occurs under the following conditions:

- The printer is turned on.
- The tray is inserted.
- The paper stack surface of the tray lowers.

The sequence occurs as follows:

1. The feeder tray-lifting motor rotates and the lifter moves up.

2. When the paper-feeder media-stack-surface sensor detects the stack surface of the paper, the lifting motor stops.

3. The lifting motor rotates again to lift the lifter when the paper-feeder media-stack-surface sensor detects the stack surface, and then lowers during printing.

If a tray media-stack-surface sensor does not detect a stack surface within a specified period after the lifting motor starts rotating, the paper feeder driver determines that the lifting motor has failed and notifies the formatter through the DC controller.

The paper-feeder driver notifies the formatter if either of the paper-feeder media-stack-surface sensors fails to detect the stack surface within a specified period from when a lift-up operation starts.

550-sheet paper feeder jam detection

The 550-sheet paper feeder uses the feed sensor (SR21) and right door switch (SW20) to detect the presence of paper and to check whether paper has jammed.

The 550-sheet paper feeder detects the following jams:

- **Media input delay jam 1 (550-sheet paper feeder)**: Paper did not reach the registration sensor in time.

- **Media input delay jam 2 (550-sheet paper feeder)**: Paper did not reach the source tray feed sensor in time.

- **Media input delay jam 3 (550-sheet paper feeder)**: Paper did not reach the tray 3 feed sensor in time.

- **Pickup stationary jam (550-sheet paper feeder)**: The feed sensor does not detect the trailing edge of paper within a specified time after the sensor detects the leading edge.

- **Residual paper jam (550-sheet paper feeder)**: The feed sensor detects the presence of paper for a specified time during an automatic delivery operation.

- **Right door open jam (550-sheet paper feeder)**: The right door open is detected during a paper feed operation.

550-sheet paper-feeder

Figure 1-36 Paper path (1x550-sheet paper-feeder)
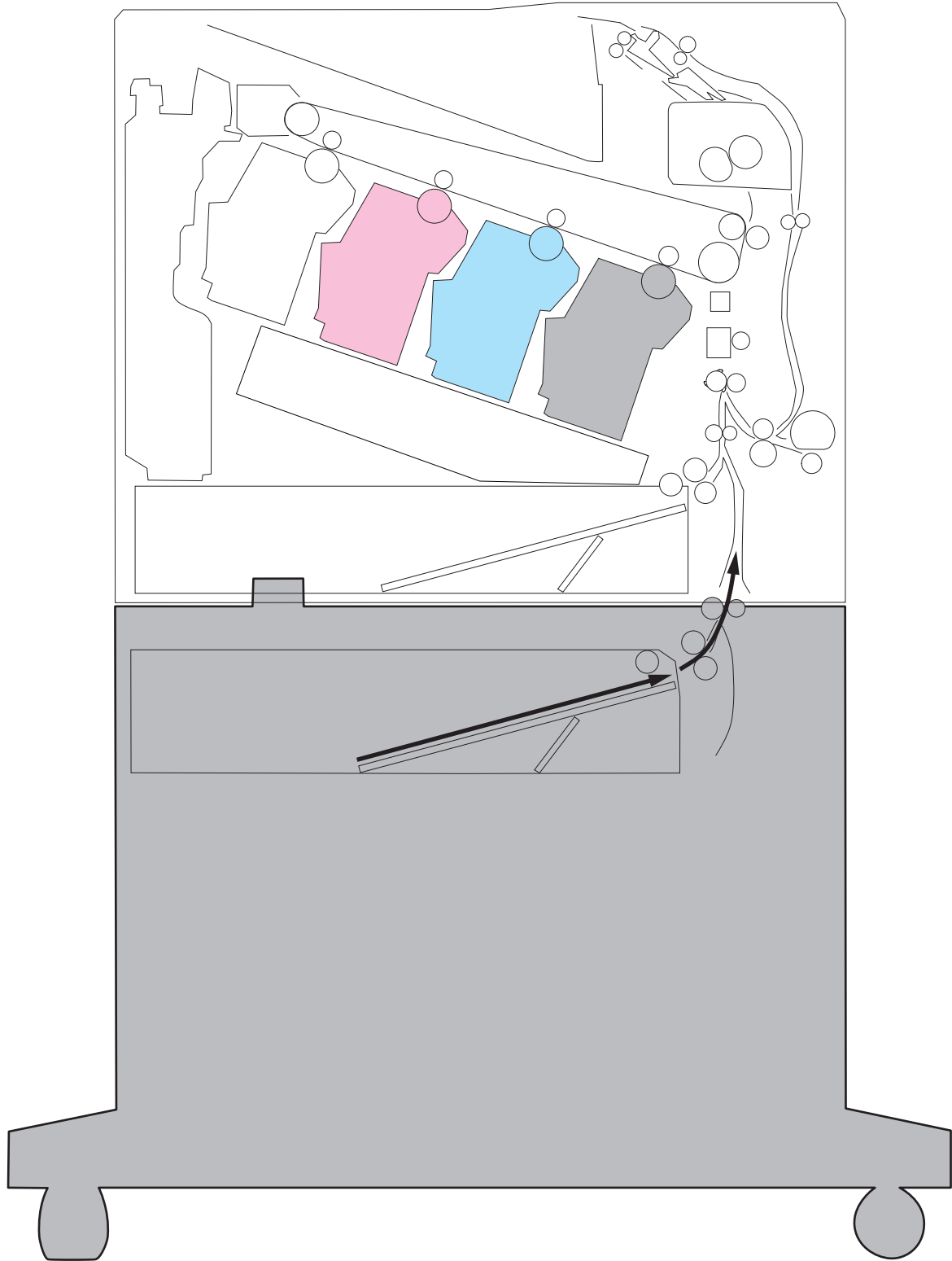
Figure 1-37 Paper path (3x550-sheet paper-feeder)
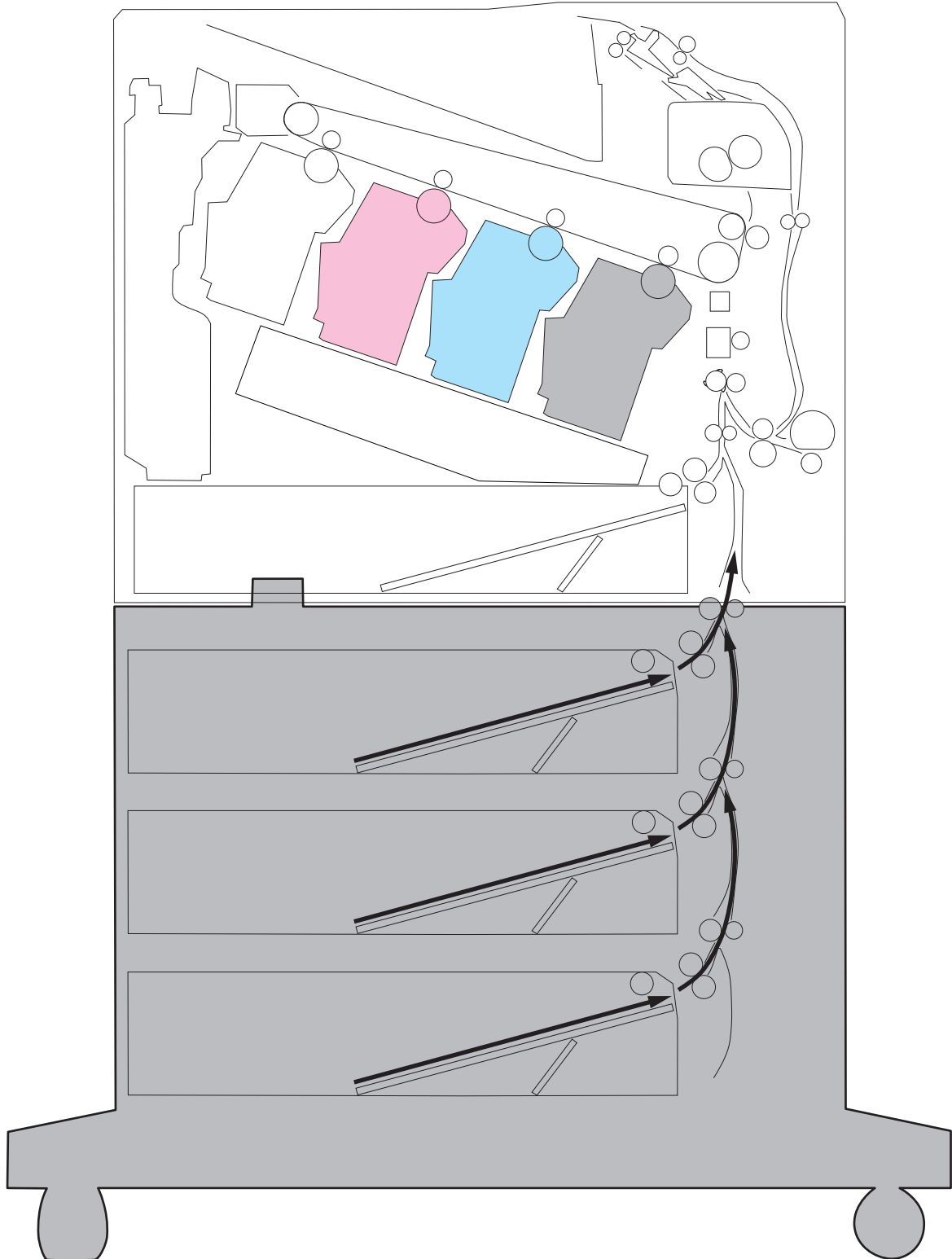
Figure 1-38 Paper path (2,550-sheet paper-feeder)
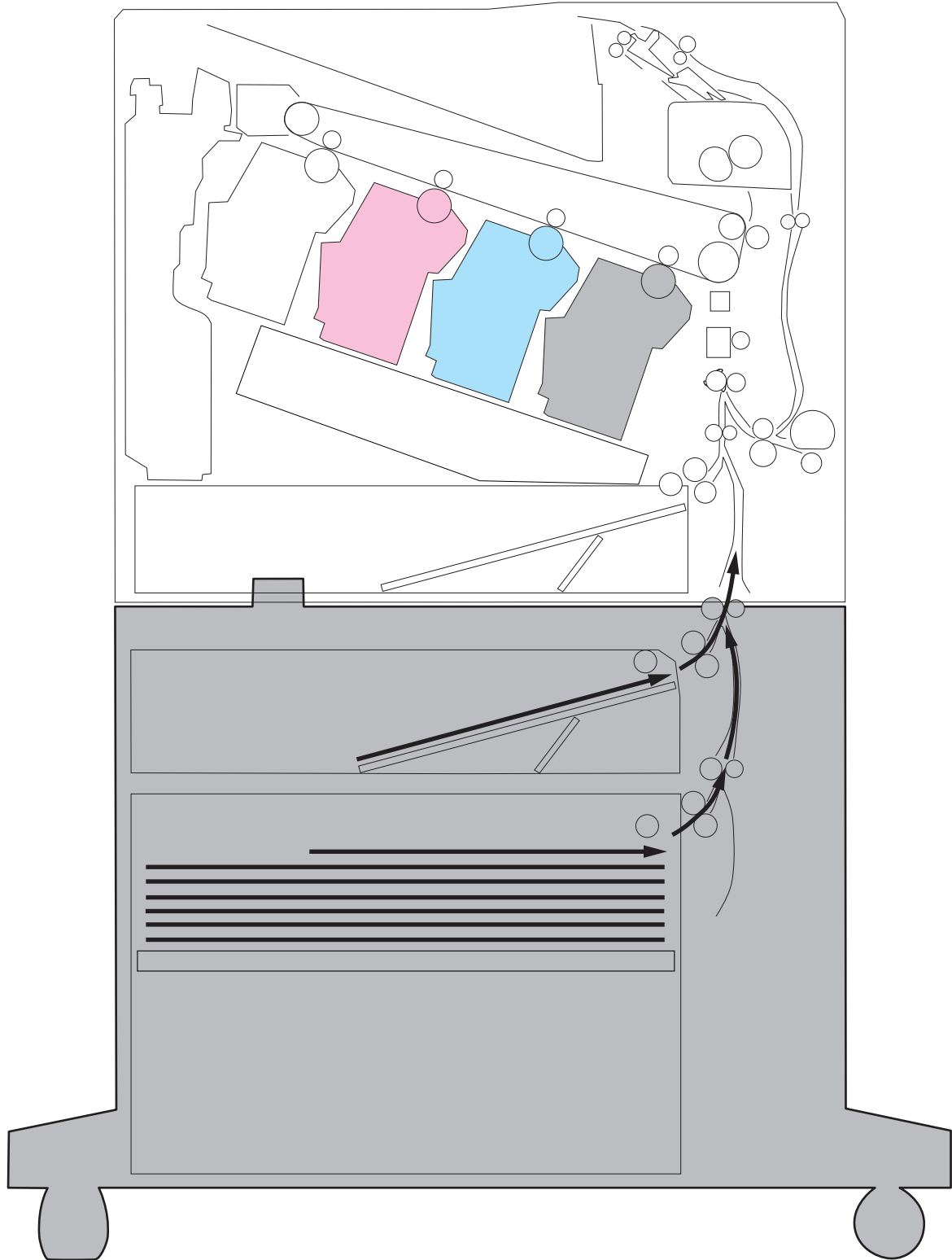
Figure 1-39 paper-feeder controller

1x550-sheet paper deck/3x550-sheet paper deck/2550-sheet paper deck
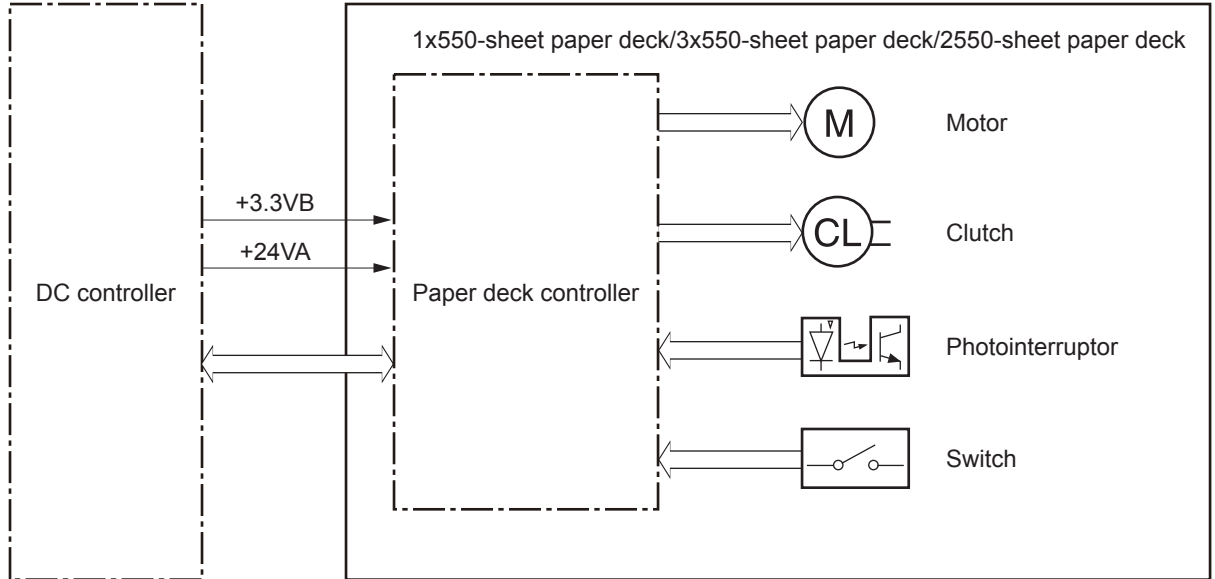
Table 1-28 Paper-feeder electrical component list

Component type	Abbreviation	Component name	1x550 PD	3x550 PD	2,550 PD
Motor	M3401	PD cassette 1 lifter motor	Yes	Yes	Yes
	M3402	PD feed motor 1	Yes	Yes	Yes
	M4501	PD cassette 2 lifter motor	No	Yes	Yes
	M4502	PD feed motor 2	No	Yes	Yes
	M5601	PD cassette 3 lifter motor	No	Yes	No
	M5602	PD feed motor 3	No	Yes	No
Clutch	CL3401	PD cassette 1 pickup clutch	Yes	Yes	Yes
	CL4501	PD cassette 2 pickup clutch	No	Yes	Yes
	CL5601	PD cassette 3 pickup clutch	No	Yes	No
Switch	SW3401	PD Cassette 1 media size switch 1	Yes	Yes	Yes
	SW3402	PD Cassette 1 media size switch 2	Yes	Yes	Yes
	SW4501	PD Cassette 2 media size switch 1	No	Yes	Yes
	SW4502	PD Cassette 2 media size switch 2	No	Yes	No
	SW5601	PD Cassette 3 media size switch 1	No	Yes	No
	SW5602	PD Cassette 3 media size switch 2	No	Yes	No
	SW3403	PD door switch	Yes	Yes	Yes
Photointerrupter	PS3401	PD cassette 1 feed sensor	Yes	Yes	Yes
	PS3402	PD cassette 1 media out sensor	Yes	Yes	Yes
	PS3403	PD cassette 1 media surface sensor	Yes	Yes	Yes
	PS3413	PD pickup roller alienation sensor	Yes	Yes	Yes

Table 1-28 Paper-feeder electrical component list (continued)

Component type	Abbreviation	Component name	1x550 PD	3x550 PD	2,550 PD
	PS4501	PD cassette 2 feed sensor	No	Yes	Yes
	PS4502	PD cassette 2 media out sensor	No	Yes	Yes
	PS4503	PD cassette 2 media surface sensor	No	Yes	Yes
	PS5601	PD cassette 3 feed sensor	No	Yes	No
	PS5602	PD cassette 3 media out sensor	No	Yes	No
	PS5603	PD cassette 3 media surface sensor	No	Yes	No

Motor control

Component name		Components driven
M3401	PD Cassette 1 lifter motor	Lift up the cassette 1
M3402	PD feed motor 1	Cassette pickup roller, cassette feed roller, and feed roller
M4501	PD Cassette 2 lifter motor	Lift up the cassette 2 or tray [1]
M4502	PD feed motor 2	Cassette pickup roller, cassette feed roller, tray pickup roller, tray feed roller, and feed roller [1]
M5601	PD Cassette 3 lifter motor	Lift up the cassette 3 [2]
M5602	PD feed motor 3	Cassette pickup roller, cassette feed roller and feed roller [2]

[1] Only for 3x550-sheet paper-feeder and 2,550-sheet paper-feeder
[2] Only for 3x550-sheet paper-feeder

Pickup-and-feed Operation

The paper-feeder picks up the sheet of paper one by one in the paper-feeder cassette and feeds it to the printer.

Figure 1-40 1x550-sheet paper-feeder/3x550-sheet paper-feeder electrical components
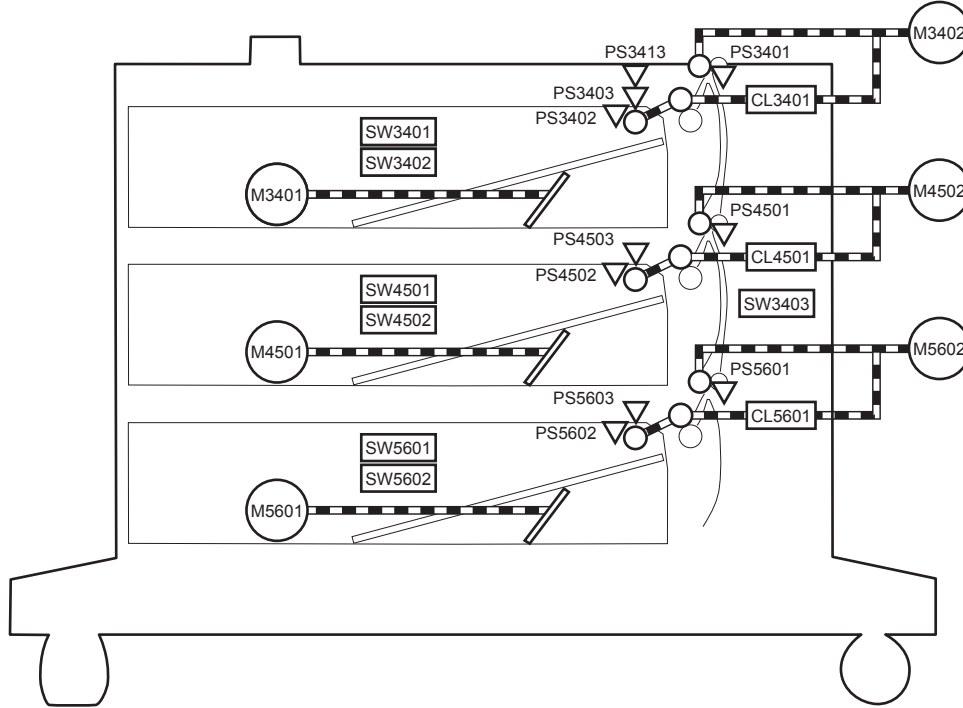
Table 1-29 Electrical component list (1x550-sheet paper-feeder/3x550-sheet paper-feeder)

Abbreviation	Component name	1x550 PD	3x550 PD
M3401	PD cassette 1 lifter motor	Yes	Yes
M3402	PD feed motor 1	Yes	Yes
M4501	PD cassette 2 lifter motor	No	Yes
M4502	PD feed motor 2	No	Yes
M5601	PD cassette 3 lifter motor	No	Yes
M5602	PD feed motor 3	No	Yes
CL3401	PD cassette 1 pickup clutch	Yes	Yes
CL4501	PD cassette 2 pickup clutch	No	Yes
CL5601	PD cassette 3 pickup clutch	No	Yes
SW3401	PD Cassette 1 media size switch 1	Yes	Yes
SW3402	PD Cassette 1 media size switch 2	Yes	Yes
SW4501	PD Cassette 2 media size switch 1	No	Yes
SW4502	PD Cassette 2 media size switch 2	No	Yes
SW5601	PD Cassette 3 media size switch 1	No	Yes
SW5602	PD Cassette 3 media size switch 2	No	Yes
SW3403	PD door switch	Yes	Yes
PS3401	PD cassette 1 feed sensor	Yes	Yes
PS3402	PD cassette 1 media out sensor	Yes	Yes

Table 1-29 Electrical component list (1x550-sheet paper-feeder/3x550-sheet paper-feeder) (continued)

Abbreviation	Component name	1x550 PD	3x550 PD
PS3403	PD cassette 1 media surface sensor	Yes	Yes
PS3413	PD pickup roller alienation sensor	Yes	Yes
PS4501	PD cassette 2 feed sensor	No	Yes
PS4502	PD cassette 2 media out sensor	No	Yes
PS4503	PD cassette 2 media surface sensor	No	Yes
PS5601	PD cassette 3 feed sensor	No	Yes
PS5602	PD cassette 3 media out sensor	No	Yes
PS5603	PD cassette 3 media surface sensor	No	Yes

Figure 1-41 Outline of electrical component (2,550-sheet paper-feeder)
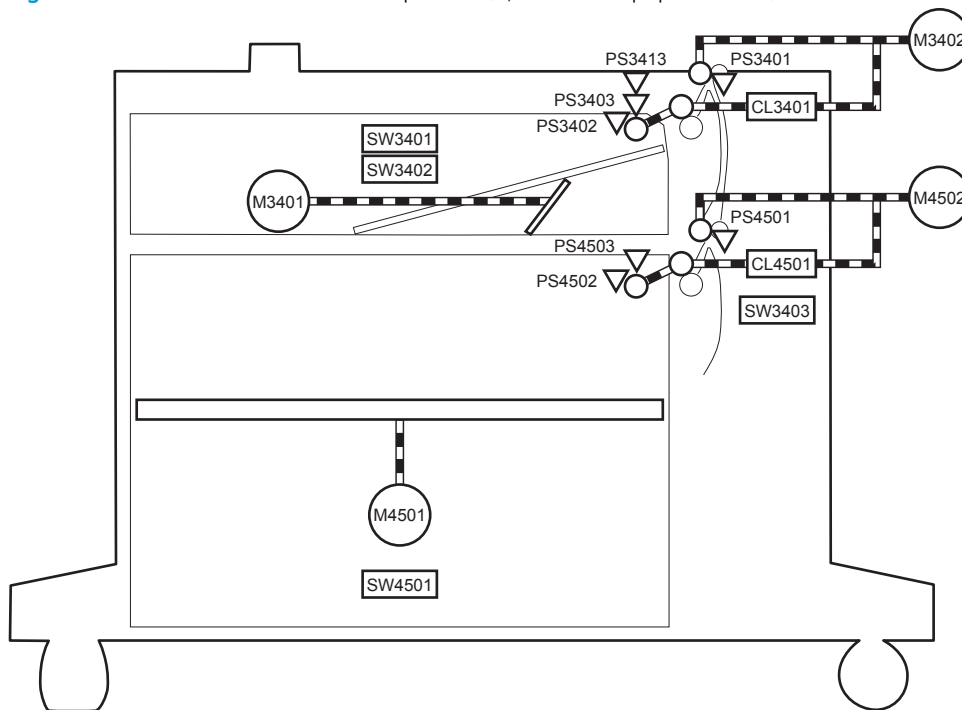
Table 1-30 Electrical component list (2,550-sheet paper-feeder)

Abbreviation	Component name
M3401	PD cassette 1 lifter motor
M3402	PD feed motor 1
M4501	PD cassette 2 lifter motor
M4502	PD feed motor 2
CL3401	PD cassette 1 pickup clutch
CL4501	PD cassette 2 pickup clutch
SW3401	PD Cassette 1 media size switch 1

Table 1-30 Electrical component list (2,550-sheet paper-feeder) (continued)

Abbreviation	Component name
SW3402	PD Cassette 1 media size switch 2
SW4501	PD Cassette 2 media size switch 1
SW3403	PD door switch
PS3401	PD cassette 1 feed sensor
PS3402	PD cassette 1 media out sensor
PS3403	PD cassette 1 media surface sensor
PS3413	PD pickup roller alienation sensor
PS4501	PD cassette 2 feed sensor
PS4502	PD cassette 2 media out sensor
PS4503	PD cassette 2 media surface sensor

Table 1-31 Paper-feeder functions

Function	Supported
Cassette lift-up control	Yes
Cassette presence detection	Yes
Cassette media size detection	Yes
Cassette media stack surface detection	Yes
Cassette media out detection	Yes
Cassette media level detection	No
Multiple-feed prevention	Yes
Automatic delivery	Yes

Staple stacker multi bin mailbox

The staple stacker multi bin mailbox (SSMBM) is installed on the upper side of the printer, and it delivers the print media to output tray after the staple process. The SSMBM controller controls the operation sequence of the SSMBM.

Figure 1-42 Staple stacker multi bin mailbox paper path
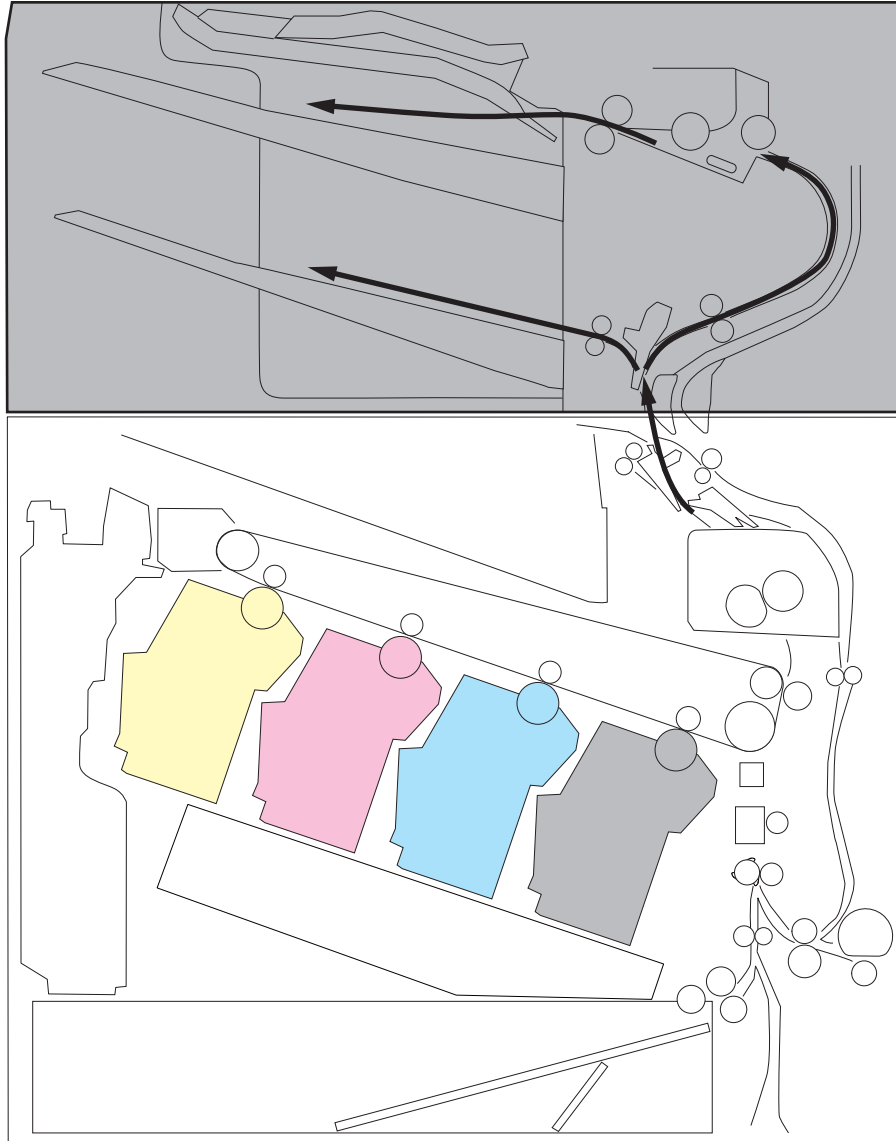
Figure 1-43 SSMBM controller
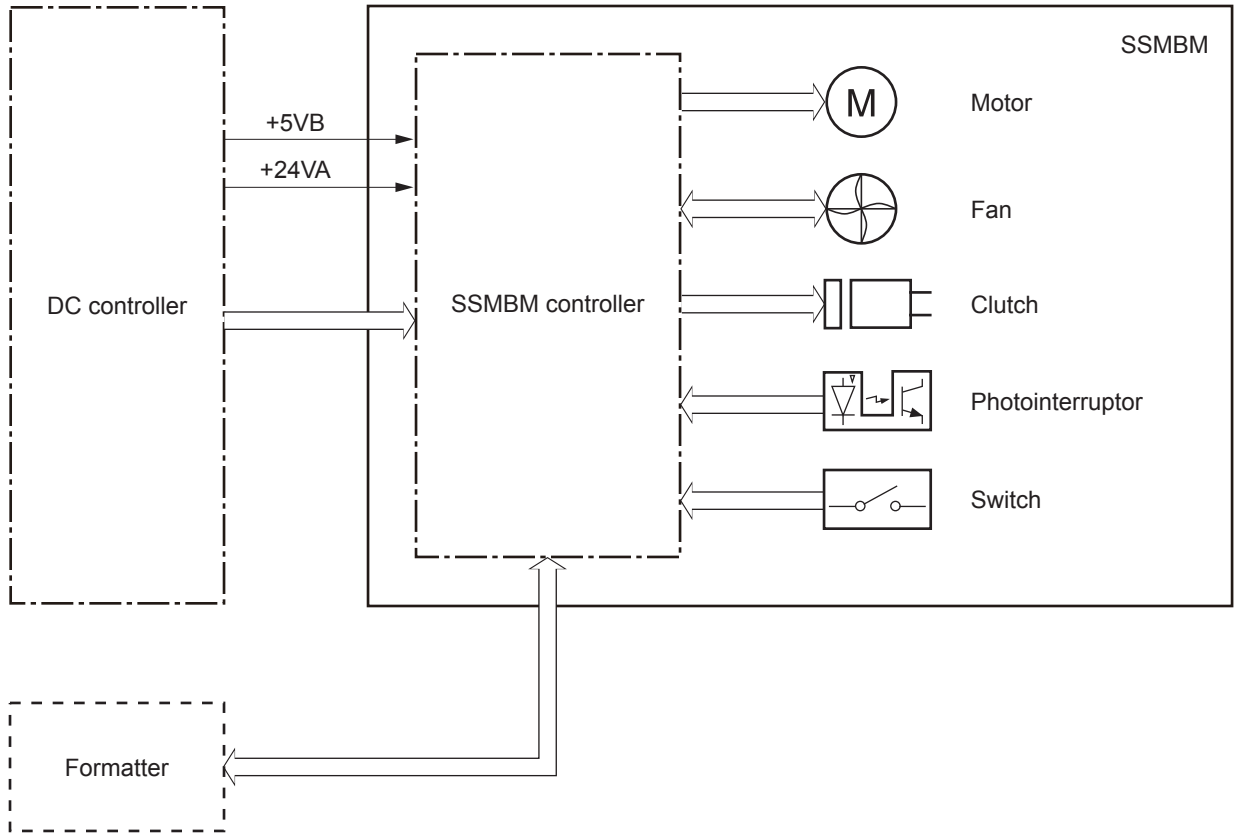
Component type	Abbreviation	Component name
		Replacement part number
Motor	M11	SS output motor
		Upper paper feed assembly (RM2-6810-000CN)
	M12	SS feed motor
		Motor, stepping, DC (RK2-8149-000CN)
	M14	Jogger motor
		Jog assembly (RM2-1066-000CN)
	M15	Y alignment motor
		Upper paper feed assembly (RM2-6810-000CN)
	M16	Staple motor
		Stapler assembly (RK2-8148-000CN)
	M17	Lifter motor
		Upper paper feed assembly (RM2-6810-000CN)
Fan	FAN11	MBM fan
		Fan (RK2-8153-000CN)

Component type	Abbreviation	Component name
		Replacement part number
Solenoid	SL11	Inlet flapper solenoid
		Lower paper feed assembly (RM2-6815-000CN)
	SL12	Stamp solenoid
		Lower paper feed assembly (RM2-6815-000CN)
	SL13	Output bin 2 flapper solenoid
		Lower paper feed assembly (RM2-6815-000CN)
Photointerrupter	PS101	Bin 1 media presence sensor
		Upper paper feed assembly (RM2-6810-000CN)
	PS102	SS exit sensor
		Upper paper feed assembly (RM2-6810-000CN)
	PS103	Staple inlet sensor
		Stapler assembly (RK2-8148-000CN)
	PS104	Y alignment home position sensor
		Upper paper feed assembly (RM2-6810-000CN)
	PS105	Bin 1 media full sensor
		Jog assembly (RM2-1066-000CN)
	PS106	Alienation home position sensor
		Upper paper feed assembly (RM2-6810-000CN)
	PS107	Jogger home position sensor
		Jog assembly (RM2-1066-000CN)
	PS108	Bin 2 media presence sensor
		Lower paper feed assembly (RM2-6815-000CN)
	PS109	Bin 2 media full sensor
		Lower paper feed assembly (RM2-6815-000CN)
	PS110	SS inlet sensor
		Lower paper feed assembly (RM2-6815-000CN)

Component type	Abbreviation	Component name
		Replacement part number
	PS111	Bin 1 upper limit sensor
		Lower paper feed assembly (RM2-6815-000CN)
	PS112	Bin 1 lower limit sensor
		Lower paper feed assembly (RM2-6815-000CN)
	PS113	Staple low sensor
		Stapler assembly (RK2-8148-000CN)
	PS114	Staple ready sensor
		Stapler assembly (RK2-8148-000CN)
	PS115	Staple home position sensor
		Stapler assembly (RK2-8148-000CN)
Switch	SW2	SS door switch
		Upper paper feed assembly (RM2-6810-000CN)
	SW11	Staple door switch
		Upper paper feed assembly (RM2-6810-000CN)

Motor Control

The SSMBM has six motors for the paper feed, paper alignment, output bin lift up/down, and staple operations.

Table 1-32 Motor list

Component name		Components driven	Replacement part number
M11	SS output motor	Output bin 1 delivery roller, exit feed roller	Upper paper feed assembly (RM2-6810-000CN)
M12	SS feed motor	Output bin 2 delivery roller, inlet feed roller	Lower paper feed assembly (RM2-6815-000CN)
M14	Jogger motor	Jogger guide	Jog assembly (RM2-1066-000CN)
M15	Y alignment motor	Alignment roller	Upper paper feed assembly (RM2-6810-000CN)
		Engage/disengage the output bin 1 delivery roller	
M16	Staple motor	Staple	Stapler assembly (RK2-8148-000CN)
M17	Lifter motor	Lift up/down the output bin 1	Upper paper feed assembly (RM2-6810-000CN)

The SSBM detects the following motor failures:

- Jogger motor failure

- Y alignment motor failure

- Staple motor failure

Fan Control

The SSMBM fan prevents the temperature from rising in the SSMBM assembly.

Component name		Cooling area	Type	Speed
FAN11	MBM fan	Inside of the SSMBM	Intake	Full/Low

The SSBM detects the following fan failure:

- Fan motor 1 failure (MBM fan)

Delivery Operation

The SSMBM deliver a print media from the printer to the specified output bin for each print job. (Mailbox mode)

Figure 1-44 Motors and solenoids
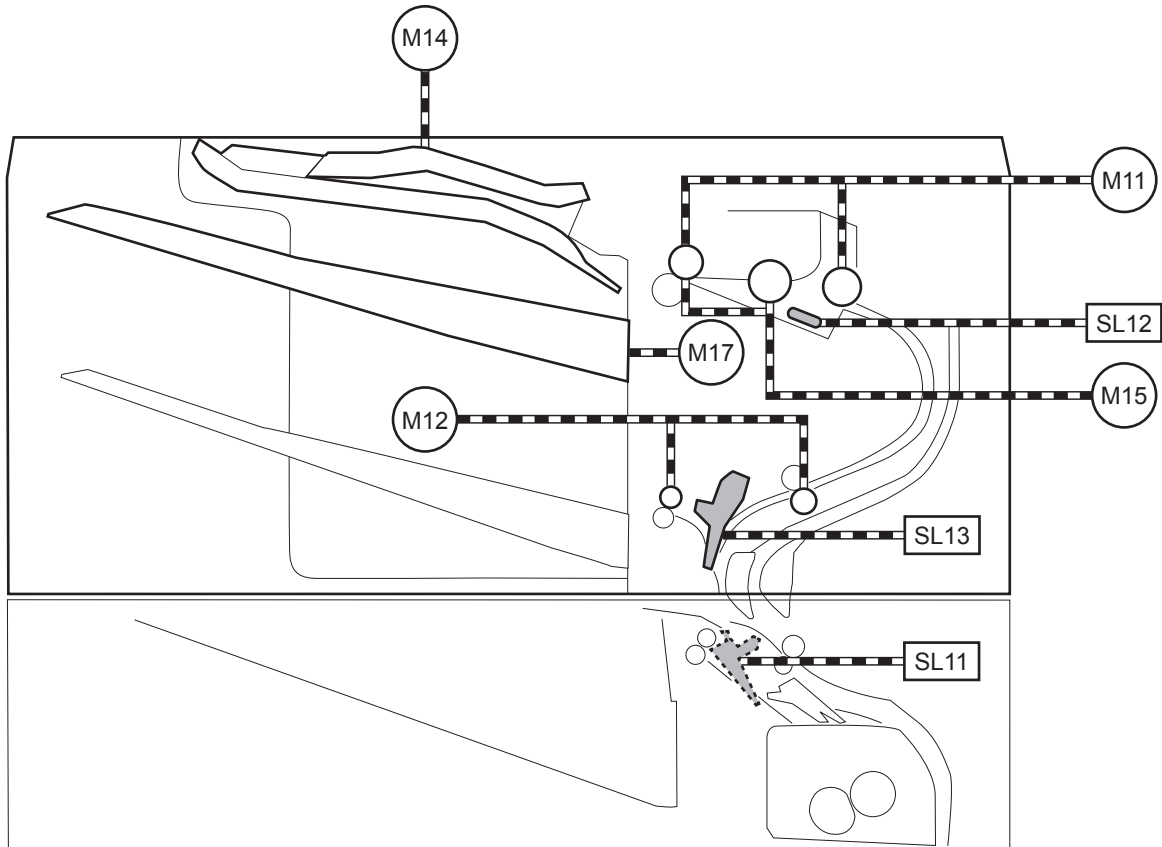
Table 1-33 Electrical component list

Abbreviation	Component name	Replacement part number
M11	SS output motor	Upper paper feed assembly (RM2-6810-000CN)

Table 1-33 Electrical component list (continued)

Abbreviation	Component name	Replacement part number
M12	SS feed motor	Lower paper feed assembly (RM2-6815-000CN)
M14	Jogger motor	Jog assembly (RM2-1066-000CN)
M15	Y alignment motor	Upper paper feed assembly (RM2-6810-000CN)
M16	Staple motor	Stapler assembly (RK2-8148-000CN)
M17	Lifter motor	Upper paper feed assembly (RM2-6810-000CN)
SL11	Inlet flapper solenoid	Lower paper feed assembly (RM2-6815-000CN)
SL12	Stamp solenoid	Lower paper feed assembly (RM2-6815-000CN)
SL13	Output bin 2 flapper solenoid	Lower paper feed assembly (RM2-6815-000CN)

Figure 1-45 Stapler/stacker sensors and switches
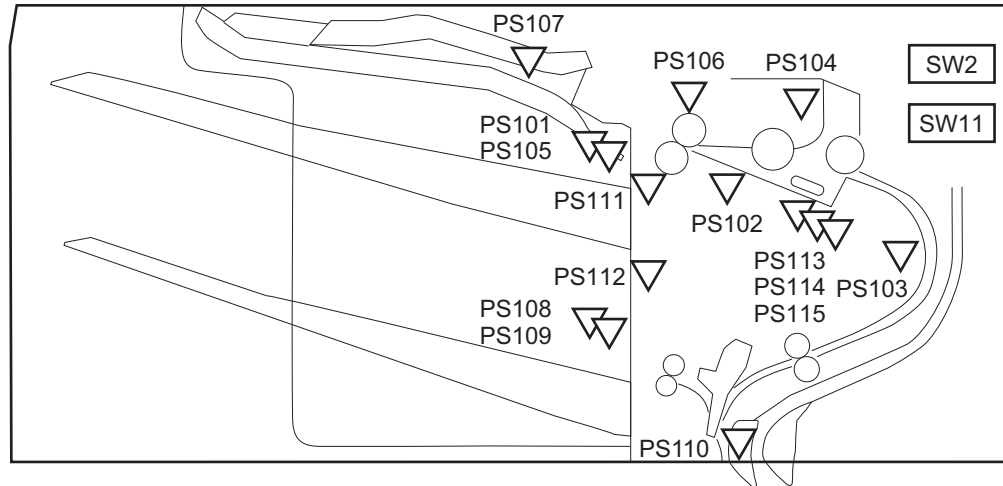
Abbreviation	Component name	Replacement part number
PS101	Bin 1 media presence sensor	Upper paper feed assembly (RM2-6810-000CN)
PS102	SS exit sensor	Upper paper feed assembly (RM2-6810-000CN)
PS103	Staple inlet sensor	Stapler assembly (RK2-8148-000CN)
PS104	Y alignment home position sensor	Upper paper feed assembly (RM2-6810-000CN)
PS105	Bin 1 media full sensor	Jog assembly (RM2-1066-000CN)
PS106	Alienation home position sensor	Upper paper feed assembly (RM2-6810-000CN)
PS107	Jogger home position sensor	Jog assembly (RM2-1066-000CN)
PS108	Bin 2 media presence sensor	Lower paper feed assembly (RM2-6815-000CN)
PS109	Bin 2 media full sensor	Lower paper feed assembly (RM2-6815-000CN)
PS110	SS inlet sensor	Lower paper feed assembly (RM2-6815-000CN)
PS111	Bin 1 upper limit sensor	Lower paper feed assembly (RM2-6815-000CN)
PS112	Bin 1 lower limit sensor	Lower paper feed assembly (RM2-6815-000CN)

Abbreviation	Component name	Replacement part number
PS113	Staple low sensor	Stapler assembly (RK2-8148-000CN)
PS114	Staple ready sensor	Stapler assembly (RK2-8148-000CN)
PS115	Staple home position sensor	Stapler assembly (RK2-8148-000CN)
SW2	SS door switch	Upper paper feed assembly (RM2-6810-000CN)
SW11	Staple door switch	Upper paper feed assembly (RM2-6810-000CN)

Table 1-34 Stapler/stacker functions

Function	Applied
Mailbox mode	Yes
Stacker mode	No
Function separator mode	No
Job separator mode	No
Collator mode	No
Staple control	Yes
Automatic delivery	Yes

Scanning and image capture system (M681/M682)

The scanner is a carriage-type platen scanner which includes the frame, glass, scan module, and a scan control board (SCB). The scanner has a sensor to detect legal-sized media and a switch to indicate when the document feeder is opened.

The document feeder and control panel are attached to the scanner. If the scanner fails, it can be replaced as a whole unit. The scanner replacement part does not include the document feeder, control panel, or SCB.

Document feeder system (M681/M682)

Document feed system

This section describes the following:

- Sensors in the document feeder
- Document feeder paper path
- Simplex single-pass scanning
- Electronic duplexing (e-duplex) single-pass scanning
- Deskew operation
- Document feeder hinges

The printer supports single-pass electronic duplexing (e-duplex) copy jobs. Two separate scan modules scan the front-side and back-side of an e-duplex copy job page in a single pass through the document feeder.

For the M681 models, the document feeder supports a smart background, which auto-crops and adjusts the image extents.

Sensors in the document feeder

The document feeder contains the following sensors:

- **ADF paper present sensor**: Detects whether a document is present in the document feeder. If paper is present in the document feeder when copies are made, the printer scans the document using the document feeder. If no paper is present when copies are made, the printer scans the document using the scanner glass.

- **ADF Y (length) sensor**: Detects whether a legal-size original is present in the document feeder.

- **ADF jam cover sensor**: Detects whether the document feeder cover is open or closed.

- **ADF paper path deskew sensor**: Detects the top of the page as it enters the deskew rollers.

- **ADF paper path pick success sensor**: Detects a successful one page feed from the document feeder tray.

  📝 NOTE: This sensor uses ultrasonic sound to detect a multi-page paper feed.

- **Paper path sensor 1**: Detects the top of the page as it approaches the front-side scan module (document feeder glass).

Figure 1-46 Document feeder sensors

Figure 1-46 Document feeder sensors
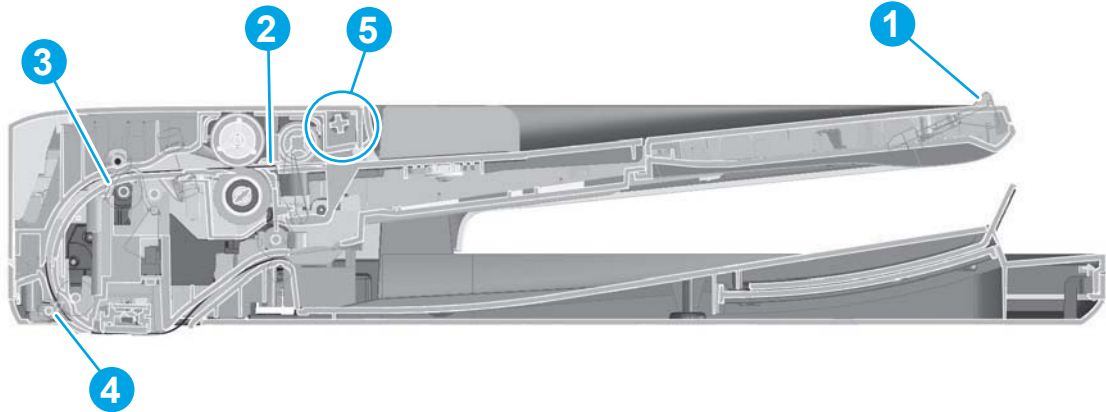
Table 1-35 Document feeder sensors

Item	Description
1	ADF Y (length) sensor
2	ADF paper present sensor
3	ADF deskew sensor
4	Paper path sensor 1 NOTE: For an e-duplex copy job, this sensor is used to activate the front-side scan module (in the scanner base) and the front-side background selector (in the document feeder), if needed.
5	ADF jam cover sensor (open the jam access cover and insert a folded piece of paper to activate the flag)

Document feeder paper path

Figure 1-47 Document feeder paper path
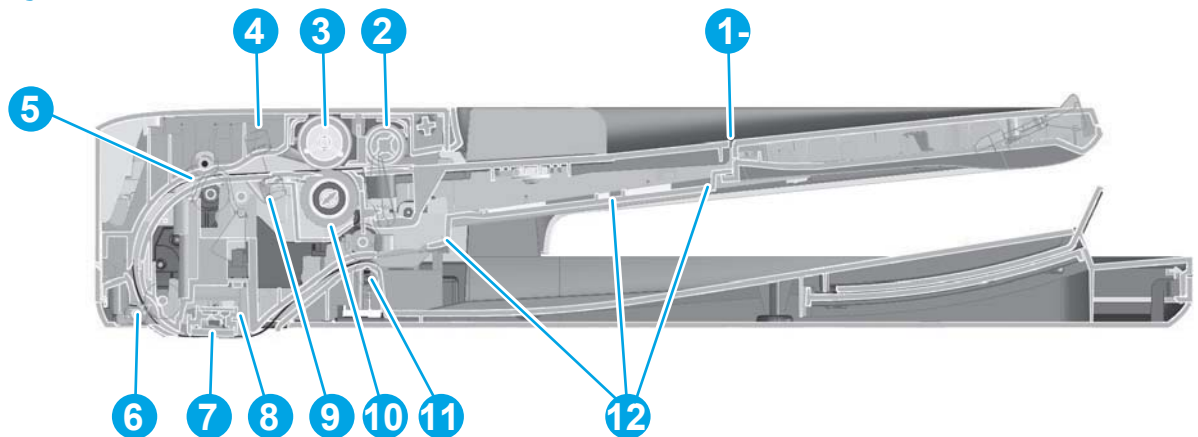
Table 1-36 Document feeder paper path

Item	Description	Item	Description
1	Input tray	7	Front-side scan module NOTE: This scan module (document feeder glass) is located in the scanner base.

Table 1-36 Document feeder paper path (continued)

Item	Description	Item	Description
2	Pre-pick roller	8	Back-side scan module
3	Pick roller	9	ADF pick success transmitter
4	ADF pick success receiver	10	Separator roller
5	Deskew drive roller	11	Exit drive roller
6	Prescan drive roller	12	Lift plate

Document feeder simplex operation

Following is the basic sequence of operation for a document feeder simplex job.

1. The ADF jam cover sensor detects when the cover door is in the closed position.

2. The ADF paper present sensor activates when paper is loaded onto the input tray.

3. The feed motor rotates to raise the lift plate and starts to pick the loaded paper.

4. The ADF multi-pick (ultrasonic) sensor activates when the leading edge of the media is driven past the sensor. The printer firmware registers a successful pick operation.

5. The ADF paper path deskew activates when the leading edge of the paper passes it. The printer firmware registers the leading edge of the paper position.

6. The leading edge of the paper drives into the nip point of the deskew drive roller and the deskew pinch rollers. This creates a buckle of paper by the nip point for pick-skew correction.

7. The deskew motor rotates the deskew drive roller to pull the paper into the prescan drive roller.

8. The pick motor stops turning and allows both the pick and feed roller to turn freely while the paper is pulled in by the deskew drive roller.

9. The feed motor rotates to drive the paper into the prescan front-side sensor. The firmware registers the leading edge position of the paper as the multi-pick sensor activates.

10. The feed motor continues to rotate and drive the leading edge of the paper through the preset distance from the multi-pick sensor to the front-side scan zone. The scanner begins the scanning and data retrieval process.

11. The ADF multi-pick (ultrasonic) sensor deactivates when the trailing edge of the paper passes the sensor. The firmware registers the trailing edge of the paper position.

12. The feed motor continues to rotate and drive the trailing edge of the paper through the preset distance from the ADF multi-pick (ultrasonic) sensor to the front-side scan zone. The scanner ends the scanning and data retrieval process.

13. The feed motor continues to rotate and ejects the trailing edge of the paper into the output bin.

14. One of the following occurs:

- If the copy job is complete, the ADF paper present sensor deactivates. The feed motor reverses rotation to raise the pick roller.

- If the copy job is not complete, the ADF paper present sensor is active. The printer firmware detects additional pages in the input tray and the process repeats.

Document feeder e-duplex operation

Following is the basic sequence of operation for a document feeder simplex job.

NOTE: For an e-duplex copy job, the background scan operation begins immediately after the simplex sequence of operation ends.

1. The feed motor continues to drive the paper until the leading edge activates the prescan back-side sensor. The printer firmware registers the position of the leading edge of the paper.

2. The feed motor continues to rotate to drive the leading edge of the paper through the preset distance from prescan back-side sensor to the back-side background selector scan zone. The back-side background scan module begins scanning and retrieval of the data.

3. The prescan back-side sensor deactivates when the trailing edge of the paper passes it. The printer firmware registers the trailing edge of the paper position.

4. The feed motor continues to rotate to drive the trailing edge of the paper edge past the back-side background selector scan zone.

5. The feed motor continues to rotate and ejects the trailing edge of the paper into the output bin.

6. One of the following occurs:

- If the copy job is complete, the ADF paper present sensor deactivates. The feed motor reverses rotation to raise the pick roller.

- If the copy job is not complete, the ADF paper present sensor is active. The printer firmware detects additional pages in the input tray and the process repeats.

Deskew operation

Sliding side guides on the input tray make sure that the paper stack is correctly aligned at the center of the input tray when paper is loaded in the tray. The correct position of the loaded paper is parallel with the direction of travel into the document feeder paper path

The document feeder further reduces paper skew due to improper loading of paper in the input tray by buckling the paper to create a paper buffer.

The document feeder aligns the leading edge of the paper parallel with the deskew drive rollers before it is driven further into the document feeder paper path.

Figure 1-48 Deskew operation

Document feeder hinges

📝 **NOTE:** The left and right document feeder hinges are different parts. During repairs, they must be clearly identified and installed in the correct orientation. The parts are keyed so they cannot be installed in the wrong position.

The document feeder hinges allow positioning the assembly vertically above the scanner glass to accommodate the placement of books and other objects up to 25 mm (1.0 in) in height on the scanner glass. The document feeder still closes (the bottom of the document feeder is kept parallel to the scanner glass) and allows the printer to operate.

The document feeder hinges provide height adjustment of 25 mm (1.0 in) when a maximum downward force of 4.5 kg (10 lb) is applied at the front edge of the assembly, with the fulcrum (such as the spine of a book) centered on the scanner glass and parallel to its long axis.

The document feeder will withstand a downward force of at least 4.5 kg (10 lb) applied at the front edge center of the assembly—when the fulcrum (such as the spine of a book) is located anywhere on the scanner glass and parallel to its long axis—without breaking, deforming, detaching or experiencing performance degradation.

The document feeder hinges support the assembly in the open position and prevent the document feeder from suddenly closing in a damaging or loud manner.

The hinges can hold the document feeder static in all positions higher than 100 mm (3.93 in); measured at the front of the assembly. Less than 2.3 kg (5 lb) of force is required to open or close the document feeder.

The hinges allow the document feeder to open to an angle of between 60º and 80º from the horizontal position (this angle will not allow the printer to tip over).

Figure 1-49 Document feeder open (book mode)
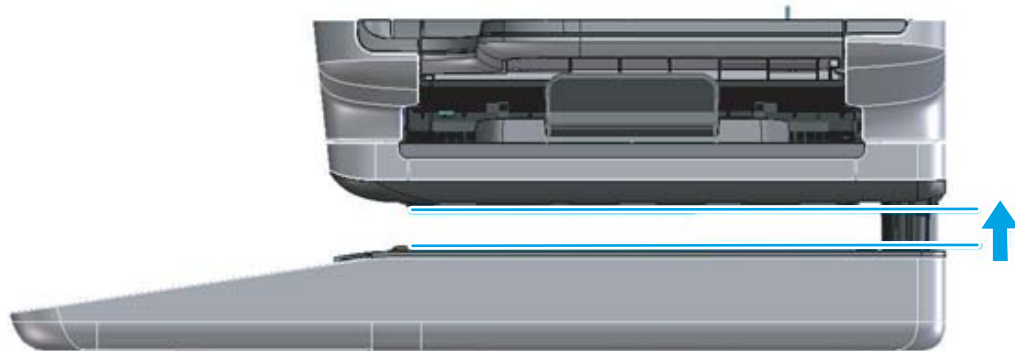
Figure 1-50 Document feeder open (60º to 80º)

2 Solve problems

For additional service and support

HP service personnel, go to the Service Access Workbench (SAW) at http://sawpro.glb.itcs.hp.com.

Channel partners, go to HP Channel Services Network (CSN) at www.hp.com/partners/csn .

At these locations, find information on the following topics:

- Install and configure

- Printer specifications

- Up-to-date control panel message (CPMD) troubleshooting

- Solutions for printer issues and emerging issues

- Remove and replace part instructions and videos

- Service advisories

- Warranty and regulatory information

Channel partners, access training materials in the HP University and Partner Learning Center at https://content.ext.hp.com/sites/LMS/HPU.page.

To access HP PartSurfer information from any mobile device, go to http://partsurfermobile.hp.com/ or scan the Quick Response (QR) code below.

Solve problems checklist

Solve problems checklist

If the printer is not correctly functioning, complete the steps (in the order given) in the following checklist. If the printer fails a checklist step, follow the corresponding troubleshooting suggestions for that step. If a checklist step resolves the problem, skip the remaining checklist items.

1. If the control panel is blank or black, check the following before proceeding:

   ❑ Check to make sure that the printer is not in Sleep mode (tap the touchscreen control panel or press a button on the LCD control panel).

   ❑ Check the power cable.

   ❑ Check that the power is turned on.

   ❑ Make sure that the line voltage is correct for the printer power configuration. (See the label that is on the back of the printer for voltage requirements.) If a power strip is in use, and its voltage is not within specifications, connect the printer directly into the electrical outlet. If it is already connected into the outlet, try a different outlet.

   NOTE: The following conditions indicate that the printer has frozen while in Sleep mode. Opening a door, tapping the control panel (touchscreen control panels), or pressing a control panel button (LCD control panels) causes the printer to wake up from Sleep mode.

   - The control panel home button LED is illuminated.

   - The power-switch LED flashes once every three to five seconds.

   If the control panel is not responding to touch (touchscreen control panels), or if it appears black or blank, try the following:

   a. Turn the printer power off, and then on again.

   b. Verify that the control panel is correctly functioning by accessing the control panel diagnostics. See the control panel checks section of this manual.

   TIP: The LED on the formatter will blink if the control panel is not detected or the cables are not properly seated.

If the control panel does not respond to the diagnostic button, try the following:

- Try printing from a host computer. Does the printer print a test page?

- Is the printer HP Embedded Web Server (EWS) accessible?

- Turn the power off.

- Reseat the cable connections on the bottom of the control panel assembly and the control panel connectors at the formatter.

- Turn the printer power on, and then check for functionality of the control panel by tapping the touchscreen or pressing a button on the LCD control panel.

   c.   If the error persists, replace the control panel assembly.

2.   The control panel should indicate a Ready, Paused, or Sleep mode on status. If an error message displays, resolve the error.

3.   For network connection errors, check the cables.

   a.   Check the network cable connections between the printer and the computer or network port. Make sure that the connections are secure.

> **NOTE:** The network LEDs should be illuminated and flashing.

   b.   Make sure that the cables are not faulty by trying different cables, if possible.

   c.   Check the network connection. Verify that the port is active.

4.   Print a configuration page. If the printer is connected to a network, an HP Jetdirect page also prints.

Print a configuration page from a touchscreen control panel

   a.   From the Home screen on the printer control panel, select Reports.

   b.   Select Configuration/Status Pages.

   c.   Select Configuration Page.

> **TIP:** Multiple report pages can be selected, and then printed together.

   d.   Select Print to print the pages.

Print a configuration page from an LCD control panel

   a.   From the Home screen on the printer control panel, use the arrow buttons to navigate to Reports, and then select OK.

   b.   Open the following menus:

- Configuration/Status Pages

- Configuration Page

   c.   Select Print, and then select OK to print the pages.

> **TIP:** Multiple report pages can be selected, and then printed together.

- If the pages do not print, check that at least one tray contains paper.

TIP: Make sure that the selected paper size and type meet HP specifications. Also open the **Trays** menu on the printer control panel and verify that the tray is configured correctly for the paper type and size.

- If the page jams in the printer, follow the instructions on the control panel to clear the jam.

- If the page does not print correctly, the problem is with the printer hardware.

- If the page prints correctly, the printer hardware is working. The problem is with the host computer, with the print driver, or with the program.

5. Print a supplies status page and then check that the maintenance items below are not at their end-of-life.

TIP: If a maintenance item needs to be replaced, order the part number provided below.

Print a supplies status page from a touchscreen control panel

a. From the Home screen on the printer control panel, select Reports.

b. Open the following menus:

- Configuration/Status Pages

- Supplies Status Page

c. Select Print to print the page, and then check the maintenance items (listed below in this step).

TIP: Multiple report pages can be selected, and then printed together.

Print a supplies status page from an LCD control panel

a. From the Home screen on the printer control panel, use the arrow keys to navigate to Reports, and then select OK.

b. Open the following menus:

- Configuration/Status Pages

- Supplies Status Page

c. Select Print, and then select OK to print the page, and then check the maintenance items (listed below in this step).

TIP: Multiple report pages can be selected, and then printed together.

NOTE: HP long-life consumables and maintenance kit life specifications are estimations. Actual individual life/yield during normal use varies depending on usage, environment, media, and other factors. Estimated life is not an implied guarantee or warrantable.

- Fuser assembly; estimated life: 150,000 pages

  - RM2-1928-000CN (110V)

  - RM2-1929-000CN (220V)

- Document feeder maintenance kit; estimated life: 150,000 pages

  - 5851-7202

6. Verify that the correct print driver for this printer is installed. Check the program to make sure that the print driver for this printer is used. The print driver is on the CD that came with the printer, or can be downloaded from this website: www.hp.com/support/colorljM652, www.hp.com/support/colorljM653, www.hp.com/support/colorljM681MFP or www.hp.com/support/colorljM682MFP.

7. Print a short document from a different program that has worked in the past. If this solution works, the problem is with the program. If this solution does not work (the document does not print), complete these steps:

    a. Try printing the job from another computer that has the printer software installed.

    b. If the printer is connected to the network, connect the printer directly to a host computer with a USB cable. Redirect the printer to the correct port, or reinstall the software (make sure to select the new connection type).

Print configuration report

NOTE: Depending on the model, up to three pages print when printing a configuration page. In addition to the main configuration page, the HP embedded Jetdirect configuration pages print.

Print the configuration page from a touchscreen control panel

1. From the Home screen on the printer control panel, select Reports.

2. Select Configuration/Status Pages.

3. Select Configuration Page.

4. Select Print to print the pages.

   TIP: Multiple report pages can be selected, and then printed together.

Print the configuration page from an LCD control panel

1. From the Home screen on the printer control panel, use the arrow keys to navigate to Reports, and then select OK.

2. Select Configuration/Status Pages, and then select OK.

3. Select Configuration Page, and then select OK.

4. Select Print, and then select OK to print the pages.

   TIP: Multiple report pages can be selected, and then printed together.

Print settings menu map

To more easily navigate individual settings, print a report of the complete menu system.

Print the settings menu map from a touchscreen control panel

1. From the Home screen on the printer control panel, select Reports.

2. Select Configuration/Status Pages.

3. Select Settings Menu Map.

4. Select Print to print the report.

   💡 TIP: Multiple report pages can be selected, and then printed together.

Print the menu map from an LCD control panel

1. From the Home screen on the printer control panel, use the arrow keys to navigate to Reports, and then select OK.

2. Select Configuration/Status Pages.

3. Select Settings Menu Map, and then select OK.

4. Select Print, and then select OK to print the pages.

   💡 TIP: Multiple report pages can be selected, and then printed together.

Print current settings pages

Printing the current settings page provides a map of the user configurable settings that might be helpful in the troubleshooting process.

Print the current settings page from a touchscreen control panel

1. From the Home screen on the printer control panel, select Reports .

2. Select Configuration/Status Pages.

3. Select Current Settings Page.

4. Select Print to print the report.

   💡 TIP: Multiple report pages can be selected, and then printed together.

Print the current settings page from an LCD control panel

1. From the Home screen on the printer control panel, use arrow keys to navigate to Reports, and then select OK.

2. Select Configuration/Status Pages.

3. Select Current Settings Page, and then select OK.

4. Select Print, and then select OK to print the pages.

   💡 TIP: Multiple report pages can be selected, and then printed together.

Print event log

Printing the event log might be helpful in the troubleshooting process. For more information, see the Interpret control panel messages and event log entries section in the printer troubleshooting manual.

Print the event log from the Troubleshooting menu from a touchscreen control panel

1.   From the Home screen on the printer control panel, select Support Tools .

2.   Select Troubleshooting.

3.   Select Event Log.

4.   The event log displays on the screen. Select Print to print the page.

Print the event log from the Troubleshooting menu from an LCD control panel

1.   From the Home screen on the printer control panel, use the arrow keys to navigate to Support Tools, and then select OK.

2.   Select Troubleshooting, and then select OK.

3.   Select Event Log.

4.   Select Print, and then select OK to print the page.

Print the event log from the Service menu from a touchscreen control panel

1.   From the Home screen on the printer control panel, select Support Tools .

2.   Select Service.

3.   On the sign-in screen, select the Service Access Code option from the drop-down list.

4.   Enter the following service access code for the printer:

    ●   05065217 (M652)

    ●   05065317 (M653)

    ●   05068117 (M681)

    ●   05068217 (M682)

5.   Select Event Log.

6.   The event log displays on the screen. Select Print to print the page.

Print the event log from the Service menu from an LCD control panel

1.   From the Home screen on the printer control panel, use the arrow keys to navigate to Support Tools, and then select OK.

2.   Select Service, and then select OK.

3.   On the sign-in screen, select Service Access Code from the drop-down list.

4.   Enter the following service access code for the printer:

- 05065217 (M652)

- 05065317 (M653)

- 05068117 (M681)

- 05068217 (M682)

5. Select Event Log.

6. Select Print, and then select OK to print the page.

Clear the event log from a touchscreen control panel

1. From the Home screen on the printer control panel, select Support Tools.

2. Open the Service menu.

3. On the sign-in screen, select Service Access Code from the drop-down list.

4. Enter the following service access code for the printer:

- 05065217 (M652)

- 05065317 (M653)

- 05068117 (M681)

- 05068217 (M682)

5. Select Event Log.

6. Select Clear, and then select OK.

Clear the event log from an LCD control panel

1. From the Home screen on the printer control panel, use the arrow keys to navigate to Support Tools, and then select OK.

2. Select Service, and then select OK.

3. On the sign-in screen, select Service Access Code from the drop-down list, and then select OK.

4. Enter the following service access code for the printer:

- 05065217 (M652)

- 05065317 (M653)

- 05068117 (M681)

- 05068217 (M682)

5. Select Event Log.

6. Select Clear, and then select OK.

Pre-boot menu options

The Pre-boot menus are available prior to the printer initializing.

⚠ **CAUTION:** The Format Disk option (printers with a hard-disk drive only) performs a disk initialization for the entire disk. The operating system, firmware files, and third party files (among other files) will be completely lost. HP does not recommend this action.

💡 **TIP:** The Pre-boot menu can be remotely accessed by using a telnet network protocol to establish an administration connection to the printer. See Remote Admin on page 109.

Open the Pre-boot menu from a touchscreen control panel

1. Touch the middle of the control panel display when you see the 1/8 under the logo.

Figure 2-1 Open the Pre-boot menu
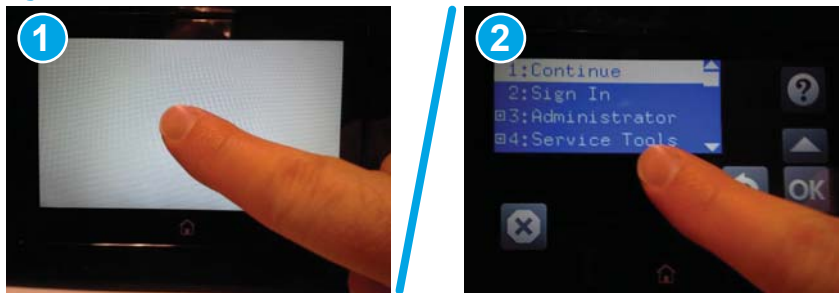
2. On the Pre-boot menu screen, use the following buttons to navigate the tests.

Figure 2-2 Pre-boot menu
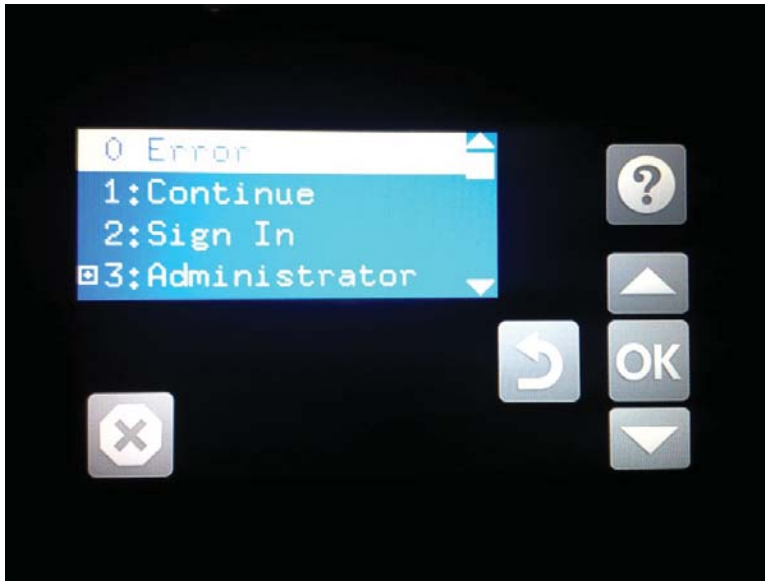
	Use this button to see more information about a selected item.
	Use this button to scroll up through menu items.
	Use this button to select a highlighted menu item.
	Use this button to scroll down through menu items.
	Use this button to go back to the previous menu.
	Not used.
	Use this button to exit a diagnostic test.

3. Use the arrow buttons on the touchscreen to navigate the Pre-boot menu.

4. Select OK to select a menu item.

Open the Pre-boot menu from an LCD control panel

1. Press the Cancel ⊗ button when you see the 1/8 under the logo.

2. Use the arrow buttons on the control panel to navigate the Pre-boot menu.

3. Select OK to select a menu item.

Cold reset using the Pre-boot menu from a touchscreen control panel

⚠ CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Touch the middle of the control panel display when you see the 1/8 under the logo.

Figure 2-3 Open the Pre-boot menu
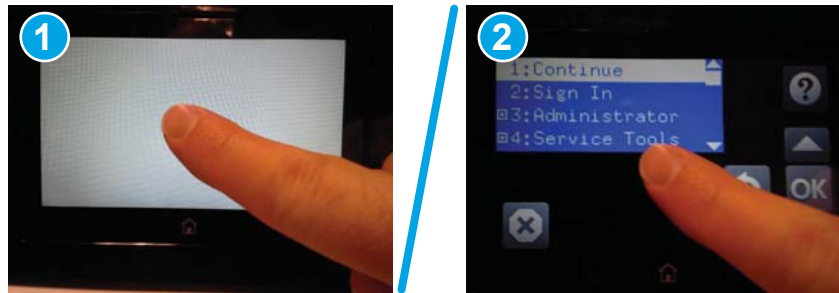
2. Use the ▼ button to highlight the +3:Administrator item, and then touch the OK.

3. Use the ▼ button to highlight the +8:Startup Options item, and then select OK.

4. Use the ▼ button to highlight the 2 Cold Reset item, and then select OK to select it.

5. Select Home to return to the main Pre-boot menu and highlight the 1:Continue item, and then select OK.

📝 NOTE: The printer will initialize.

Cold reset using the Pre-boot menu from an LCD control panel

⚠ CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Press the Cancel ⊗ button when you see the 1/8 under the logo.

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then select OK.

3. Use the down arrow ▼ button to highlight the +8:Startup Options item, and then select OK.

4. Use the down arrow ▼ button to highlight the 2 Cold Reset item, and then select OK.

5. Select the Home to return to the main Pre-boot menu and highlight the 1:Continue item, and then select OK.

NOTE: The printer will initialize.

NOTE: Some of the pre-boot options in the following tables are not supported by the current version of the printer firmware and are included for information only. Future versions of firmware will support these options.

Table 2-1 Pre-boot menu options (1 of 7)

Menu option	First level	Second level	Third level	Description
Continue				Selecting the Continue item exits the Pre-boot menu and continues the normal boot process.
				If a selection is not made in the initial menu within 30 seconds, the printer returns to a normal boot (the same as selecting Continue).
				If the user navigates to another menu, the timeout does not apply.
Sign In				Enter the administrator PIN or service PIN if one is required to open the Pre-boot menu.
Administrator				This item navigates to the Administrator submenus.
				If authentication is required (and the user is not already signed in) the Sign In prompt displays. The user is required to sign in.
	Download	Network		This item initiates a Pre-boot firmware download process. A USB Thumbdrive option will work on all FutureSmart printers. USB or Network connections are not currently supported.
		USB		
		USB Thumbdrive		
	Format Disk			This item reinitializes the disk and cleans all disk partitions.
				CAUTION: Selecting the Format Disk item removes **all** data.
				A delete confirmation prompt is **not** provided.
				The system is **not** bootable after this action and a **99.09.67** error displays on the control panel. A firmware download must be performed to return the system to a bootable state.
	Partial Clean			This item reinitializes the disk (removing all data except the firmware repository where the master firmware bundle is downloaded and saved).
				CAUTION: Selecting the Partial Clean item removes **all** data except the firmware repository. A delete confirmation prompt is **not** provided.
				CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).
				This allows a user to reformat the disk by removing the firmware image from the active directory without having to download new firmware code (printer remains bootable).

Table 2-1 Pre-boot menu options (1 of 7) (continued)

Menu option	First level	Second level	Third level	Description
Administrator	Change Password			Select this item to set or change the administrator password.
(continued)	Clear Password			Select the Clear Password item to remove a password from the control panel menus. Before the password is actually cleared, a message will be shown asking to confirm that the password should be cleared. Select OK to confirm the action.
				When the confirmation prompt displays, select OK to clear the password.

Table 2-2 Pre-boot menu options (2 of 7)

Menu option	First level	Second level	Third level	Description
Administrator	Manage Disk	Clear disk		Select the Clear disk item to enable using an external device for job storage. Job storage is normally enabled only for the Boot device. This will be grayed out unless the **99.09.68** error is displayed.
(continued)		Lock Disk		Select the Lock Disk item to lock (mate) a new secure disk to this printer.
				The secure disk already locked to this printer will remain accessible to this printer. Use this function to have more than one encrypted disk accessible by the printer when using them interchangeably.
				The data stored on the secure disk locked to this printer always remains accessible to this printer.
		Leave Unlocked		Select the Leave Unlocked item to use a new secure disk in an unlocked mode for a single service event. The secure disk that is already locked to this printer will remain accessible to this printer and uses the old disk's encryption password with the new disk.
				The secure disk that is already locked to this printer remains accessible to this printer.
		Clear Disk Pwd		Select the Clear Disk Pwd item to continue using the non-secure disk and clear the password associated with the yet-to-be installed secure disk.
				CAUTION: Data on the missing secure disk will be permanently inaccessible.
		Retain Password		Select the Retain Password item to use the non-secure disk for this session only, and then search for the missing secure disk in future sessions.
		Boot Device	Secure Erase	Select the Secure Erase item to erase all of the data on the disk and unlock it if required.
				This might take a long time.
				NOTE: The system will be unusable until the system files are reinstalled. The ATA secure-erase command is a one-pass overwrite, which erases the entire disk including firmware. The disk remains an encrypted disk.

Table 2-2 Pre-boot menu options (2 of 7) (continued)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Manage Disk (continued)	Boot Device (continued)	Erase/Unlock	Select the Erase/Unlock item to cryptographically erase all data on the disk and unlock the disk to allow a user to gain access to it from any printer. **NOTE:** The system will be unusable until the system files are reinstalled. It erases the encryption key. The encryption key is erased, so the disk becomes a non-encrypted disk.
			Get Status	This item provides disk status information if any is available.

Table 2-3 Pre-boot menu options (3 of 7)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Manage Disk (continued)	Internal Device		Select the Internal Device item to erase the internal device or get a status about the internal device.
			Secure Erase	Select the Secure Erase item to erase all of the data on the disk and unlock it if required. This might take a long time. **NOTE:** The system will be unusable until the system files are reinstalled. The ATA secure-erase command erases the entire disk, including firmware. The disk remains an encrypted disk.
			Erase/Unlock	Select the Erase/Unlock item to cryptographically erase all of the data on disk and unlock the disk to allow the user to gain access to it from any printer. **NOTE:** The system will be unusable until the system files are reinstalled. The HP High Performance Secure Hard Disk is erased.
			Get Status	This item provides disk status information if any is available.
		External Device		Select the External Device item to erase the external device or get status about the external device.
			Secure Erase	Select the Secure Erase item to erase all of the data on the disk and unlock it if required. This might take a long time. **NOTE:** The system will be unusable until the system files are reinstalled. The ATA secure-erase command erases the entire disk, including firmware. The disk remains an encrypted disk.
			Erase/Unlock	Select the Erase/Unlock item to cryptographically erase all of the data on disk and unlock the disk to allow a user to gain access to it from any printer. **NOTE:** The system will be unusable until the system files are reinstalled. The encryption key is erased, so the disk becomes a non-encrypted disk.
			Get Status	This item provides disk status information if any is available.

Table 2-4 Pre-boot menu options (4 of 7)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Configure LAN NOTE: This configuration is only active when the Pre-boot menu is open.	IP Mode [DHCP]		The network can be configured to obtain the network settings from a DHCP server or as static. Use this item for automatic IP address acquisition from the DHCP server.
		IP Mode [STATIC]		Use this item to manually assign the network addresses.
			IP Address	Use this item to manually enter the IP addresses.
			Subnet Mask	Use this item to manually enter the subnet mask.
			Default Gateway	Use this item to manually enter the default gateway.
			Save	Select the Save item to save the manual settings.

Table 2-5 Pre-boot menu options (5 of 7)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Startup Options			Select the Startup Options item to specify options that can be set for the next time the printer is turned on and initializes to the **Ready** state.
		Show Revision		**Not currently functional**: Select the Show Revision item to allow the printer to initialize and show the firmware version when the printer reaches the **Ready** state. Once the printer power is turned on the next time, the Show Revision item is unchecked so that the firmware revision is not shown.
		Cold Reset		Select the Cold Reset item to clear the IP address and all customer settings. (This item also returns all settings to factory defaults.) NOTE: Items in the Service menu are not reset.
		Skip Disk Load		Select the Skip Disk Load item to disable installed third-party applications.
		Skip Cal		Select the Skip Cal item to skip the printer calibration for the very next power-initialization cycle only.
		Lock Service		CAUTION: Select the Lock Service item to lock the Service menu access (both in the Pre-boot menu and the Device Maintenance menu). Service personnel must have the administrator remove the Lock Service setting before they can open the Service menu.
		Skip FSCK		Select the Skip FSCK item to disable Chkdisk/ScanVolume during startup.

Table 2-5 Pre-boot menu options (5 of 7) (continued)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Startup Options (continued)	First Power		**Not currently functional**: This item allows the printer to initialize as if it is the first time it has been turned on.
				For example, the user is prompted to configure first-time settings like date/time, language, and other settings.
				Select this item so that it is enabled for the next time the printer power is turned on.
				When the printer power is turned on the next time, this item is unchecked so that the pre-configured settings are used during configuration, and the first-time setting prompt is not used.
		Embedded Jetdirect Off		Select the Embedded Jetdirect Off item to disable the embedded HP Jetdirect.
				By default this item is unchecked so that HP Jetdirect is always enabled.
		WiFi Accessory		Select the WiFi Accessory item to enable the wireless accessory.

Table 2-6 Pre-boot menu options (6 of 7)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Diagnostics			Diagnostic items are useful to diagnose hardware components and their interface connections. Use these items to troubleshoot specific hardware components, and the interface between them and other components.
		Memory	Do Not Run	Use the Do Not Run item to exclude the Memory diagnostic when executing multiple diagnostics.
			Short	Use the Short item to select a brief memory test. **NOTE:** This test requires about **four** minutes to execute.
			Long	Use the Long item to select an extended memory test. **NOTE:** This test requires about **twenty** minutes to execute.
		Disk	Do Not Run	Use the Do Not Run item to exclude the Disk diagnostic when executing multiple diagnostics.
			Short	Use the Short item to select a brief firmware self-test. **NOTE:** This test requires about **two or three** minutes to execute.
			Long	Use the Long item to select an extended firmware self-test. **NOTE:** This test requires about **sixty** minutes to execute.

Table 2-6 Pre-boot menu options (6 of 7) (continued)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Diagnostics (continued)	Disk (continued)	Optimized	Use the Optimized item to select a test that checks the active sectors on the disk. **NOTE:** This test requires about **thirty** minutes to execute.
			Raw	Use the Raw item to select a test that checks every sector on the disk. **NOTE:** This test requires about **fifty** minutes to execute.
			Smart	Use the Smart item to select a very brief test that checks the drive self-monitoring analysis and reporting technology (SMART) status—the drive detects and reports reliability indicators to help anticipate disk failures (SMART status).
		CPB		Use the CPB item to verify the integrity of the copy processor board (CPB) and the formatter PCA connections.
		Run Selected		Select the Run Selected item to execute a selected test. **NOTE:** If more than one test is selected, they are executed in sequence.

Table 2-7 Pre-boot menu options (7 of 7)

Menu option	First level	Second level	Third level	Description
Administrator (continued)	Remote Admin	Start Telnet		The Remote Admin item allows a service technician to access to the printer Pre-boot menu remotely, and to navigate the menu selections from a remote location. **IMPORTANT:** A Remote Admin connection must be initiated by a person that is physically present at the printer. This person will also need to provide a randomly generated PIN to the remote service technician. **NOTE:** For more information about using the Remote Admin function, see Remote Admin on page 109.
		Stop Telnet		
		Refresh IP		
	System Triage	Copy Logs		If the printer will not boot to the **Ready** state, or the diagnostic log feature found in the Troubleshooting menu is not accessible, then use the System Triage item to copy the diagnostic logs to a USB flash drive at the next printer start up. The files can then be sent to HP to help diagnose the problem.
	Change Svc PWD			Use this item to change the Service menu personal identification number (PIN).
	Reset Svc PWD			If the Service menu personal identification number (PIN) has been changed, use this item to reset it to the original PIN.

Table 2-7 Pre-boot menu options (7 of 7) (continued)

Menu option	First level	Second level	Third level	Description
Service Tools	Reset Password			Use this item to reset the Pre-boot administrator password.
	Subsystems			For manufacturing use only. Do not change these values.
Developer Tools	Netexec			For development use only. Do not change these values.

Remote Admin

The Remote Admin feature allows remote access the printer Pre-boot menu (BIOS environment). The printer functions as a telnet server which uses the telnet networking protocol to transmit text data. Any computer (with telnet installed and enabled) can function as the telnet client to remotely display and interact with the Pre-boot menu.

IMPORTANT: While the Remote Admin function allows remote access the Pre-boot menu, for security reasons the Remote Admin connection must be initiated by a person that is physically present at the printer.

This section describes the following Remote Admin items.

- Required software and network connection

- Connect a remote connection

- Disconnect a remote connection

Required software and network connection

Before using the Remote Admin feature, make sure that the telnet network protocol is installed, and enabled, on the remote telnet client computer.

NOTE: This section describes enabling and configuring the telnet feature for computers using a Windows® operating system.

HP recommends that the telnet client computer be a Windows based system, however, there are other operating systems that support the telnet network protocol. For information about enabling and configuring the telnet network protocol for other operating systems, see the owner's manual for that operating system.

Telnet client

Enable the Windows telnet client

All computers using the Windows operating system have the telnet client installed, however, the telnet client function might not be enabled by default.

NOTE: The figures and menus in this section are for the Windows 7 Enterprise® operating system. Screens and menu selections might vary slightly for other operating systems.

1. Use the **Start** menu to open the **Control Panel**, and then click the **Programs** item to select it.

Figure 2-4 Open the Control Panel
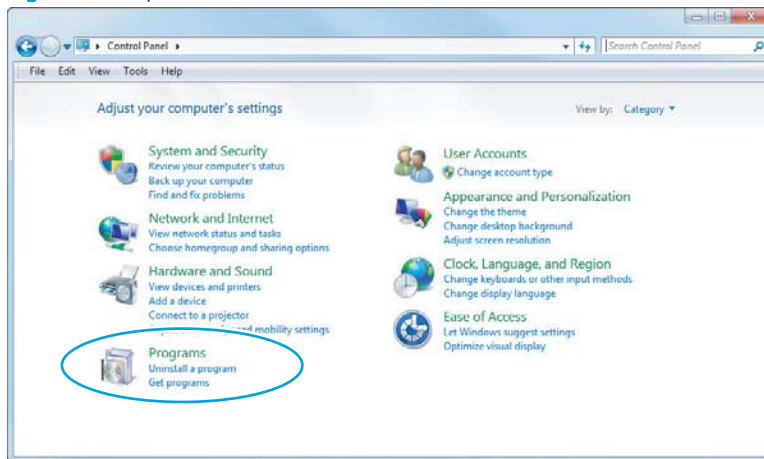
2. Click the **Turn Windows features on or off** item to select it.

Figure 2-5 Turn Windows features on or off
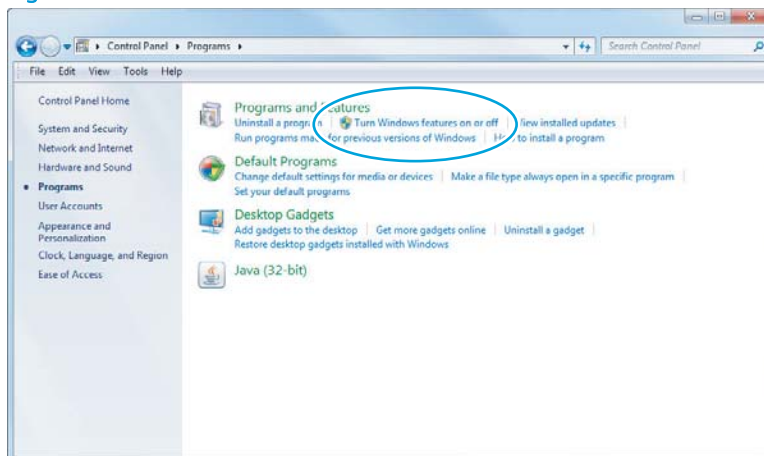
3. In the **Windows Features** box, scroll down to **Telnet Client**. If the check box is not checked, click the box to select it, and then click the **OK** button.

☀ TIP: If the check box is already checked then the telnet client function is already enabled. Click the **Cancel** button.

Figure 2-6 Enable the telnet client feature
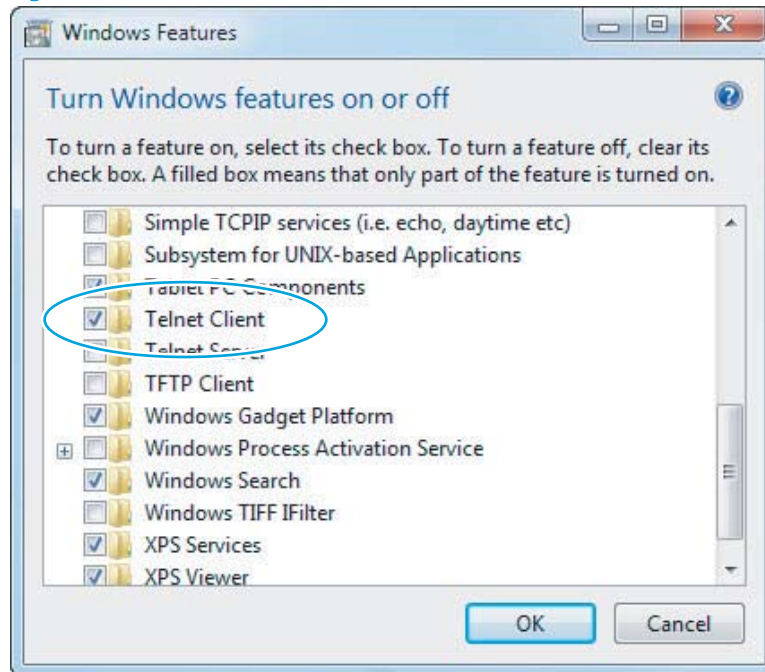
Network connection

The remote telnet client computer must have direct network access to the printer for the Remote Admin function to operate. This means that the telnet client computer must be on the same network as the printer. The Remote Admin function cannot be accessed through a network firewall or other remote access network security programs.

If a private network is not accessible, ask the network administrator to set up a virtual private network (VPN) connection to the network.

Connect a remote connection

Start the telnet server function at the printer

For security reasons the Remote Admin feature must be initiated by a person that is physically present at the printer. The following steps must be performed by a person that is physically present at the printer.

📝 NOTE: This person might need to sign in with an administrator or service password depending on how the printer is configured.

1. Turn the printer on.

2. The HP logo displays on the printer control panel. When a "1/8" with an underscore displays, touch the middle of the screen to open the Pre-boot menu.

3. Use the arrow buttons on the touchscreen to scroll down and highlight the **+3:Administrator** item, and then touch the OK button to select it.

Figure 2-7 Select the +3:Administrator item

```
 1:Continue
 2:Sign In
+3:Administrator
+4:Service Tools
```
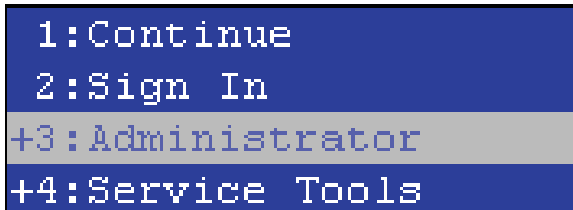
4. Use the arrow buttons on the touchscreen to scroll down and highlight the **+A:Remote Admin** item, and then touch the OK button to select it.

Figure 2-8 Select the +A:Remote Admin item

```
+7:Configure LAN
+8:Startup Options
 9:Diagnostics
+A:Remote Admin
```
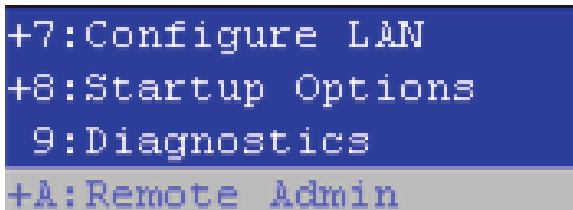
5. Use the arrow buttons on the touchscreen to scroll down and highlight the **1:Start Telnet** item, and then touch the OK button to select it.

Figure 2-9 Select the 1:Start Telnet item

```
 1:Start Telnet
 2:Stop  Telnet
 3:Refresh IP
```
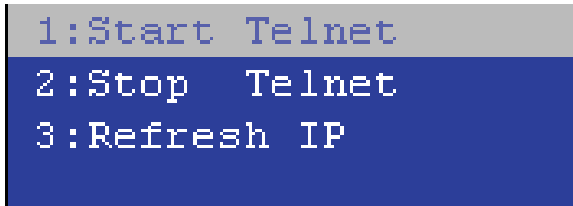
6. Do one of the following

   ● If a connecting message displays briefly, go to step 7.

   Figure 2-10 Telnet connecting message

```
    Start Telnet
Connecting...
```
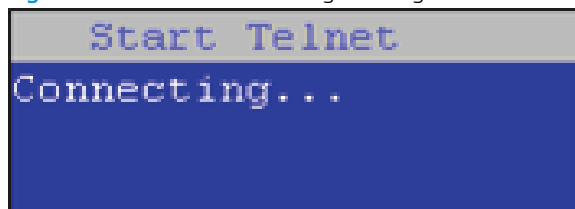
   ● If an error message displays, use the steps below to identify the problem.

Figure 2-11 Telnet error message

```
      Start Telnet
Unable to connect
Contact network
administrator.
```
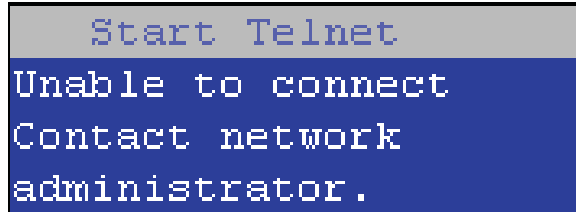
a. The printer network cable is not correctly connected.

b. The BIOS LAN settings are incorrect.

○ The printer should be configured to use a static IP address, but is configured to use DHCP instead.

○ The printer is configured to use a static IP address, but the IP address is incorrect.

c. The printer is correctly configured to use DHCP, but the DHCP server is not turned on or is malfunctioning.

7. When the printer telnet server function is initialized, the following screen appears. Use the information on this screen to connect the remote telnet client computer to the printer.

📝 NOTE: The printer is now ready to receive remote telnet client commands.

● **IP**: The static or dynamically allocated IP address for the printer.

● **Port**: The standard telnet port (23).

● **Pin**: A randomly generated 4-digit personal identification number (PIN).

Figure 2-12 Telnet server function initialized

```
      Start Telnet
IP: 16.88.109.66
Port: 23
Pin : 4031
```
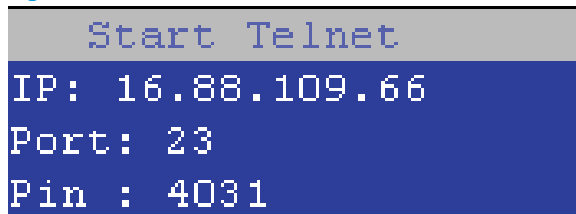
Start the telnet client function at the remote computer

The following steps establish a Remote Admin connection from a remote computer to the printer.

1. From the **Start** menu click **Run** to open a dialog box, type `cmd` in the **Open** field, and then click the **OK** button to open a Windows command window.

Figure 2-13 Open a command window
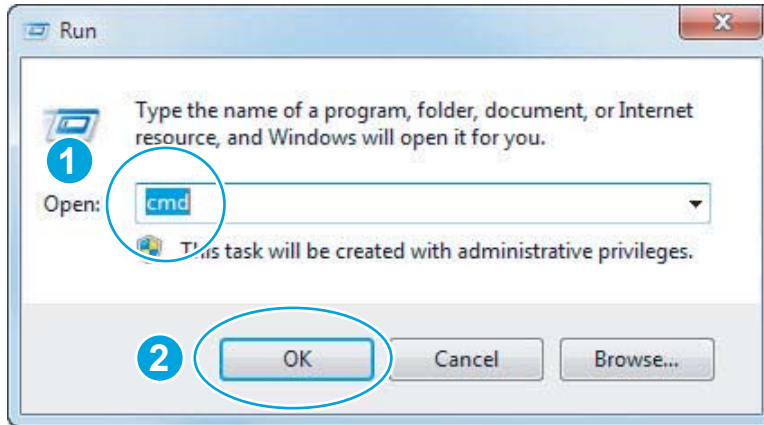
2. From any displayed directory, type `telnet` at the prompt, and then press the **Enter** key.

Figure 2-14 Start a telnet session
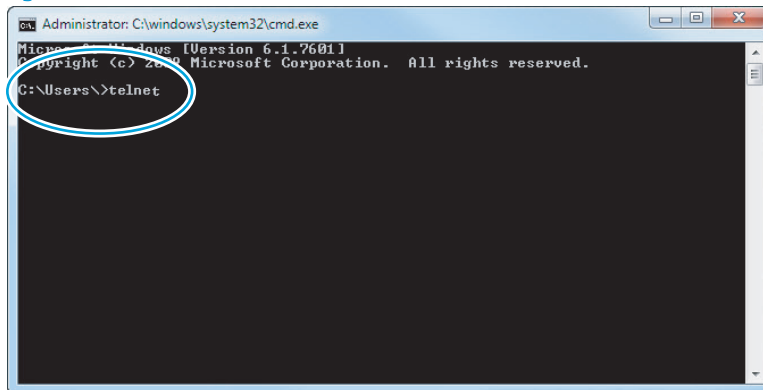
3. Type `o <IP ADDRESS>` at the telnet prompt, and then press the **Enter** key.

📝 NOTE: For `<IP ADDRESS>`, substitute the IP address that was displayed in step 7 in Start the telnet server function at the printer on page 111.

🔅 TIP: If the telnet connection fails to establish a connection, the printer is probably behind a firewall or on a different network that the remote telnet client computer. See Network connection on page 111.

Figure 2-15 Establish a telnet connection
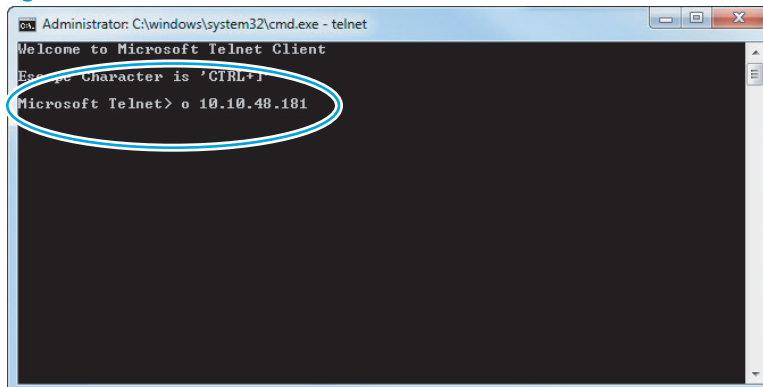
4. Type the PIN that was displayed in step <u>7</u> in <u>Start the telnet server function at the printer on page 111</u> at the prompt, and then press the **Enter** key.

📝 IMPORTANT: Make sure to type the PIN correctly. After five incorrect PIN entries, the printer terminates the Remote Admin connection. The Remote Admin feature must be re-initiated at the printer. See <u>Start the telnet server function at the printer on page 111</u>.

Figure 2-16 Enter the PIN
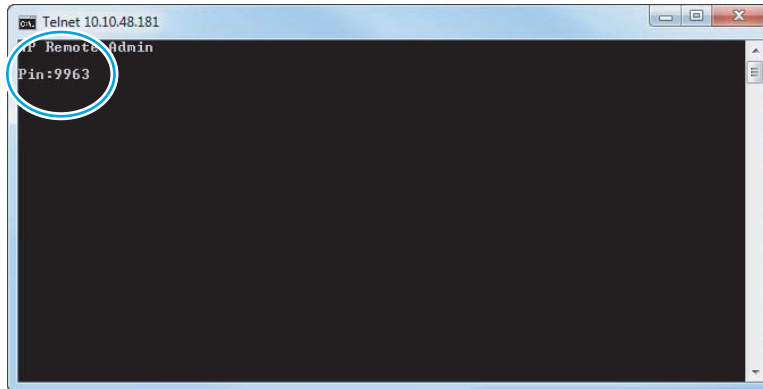
5. The following screen displays when the correct PIN is entered and the Remote Admin connection is successful. For information about the Pre-boot menu and options, see <u>Pre-boot menu options on page 99</u>.

📝 NOTE: Because a Remote Admin connection is an unsecure telnet network protocol connection, the following Pre-boot menu items are disabled for the remote telnet client computer.

● The **+3:Administrator** menu **4:Change Password** item.

● The **+3:Administrator** menu **5:Clear Password** item.

● The **+3:Administrator** menu **6:Disk Manage** item.

Figure 2-17 Remote Admin window
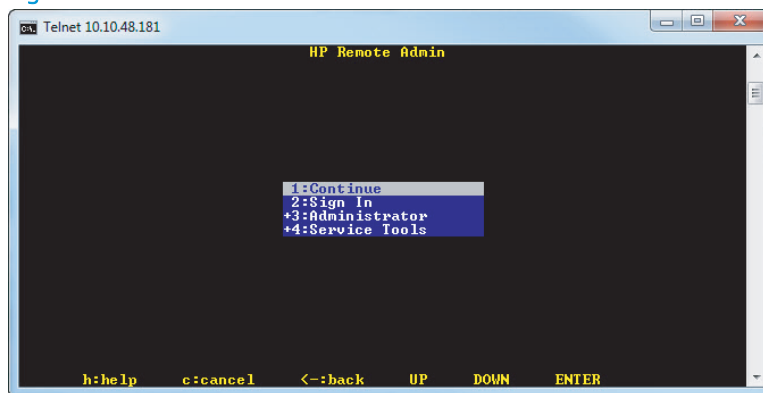
Disconnect a remote connection

The Remote Admin connection can be terminated from the printer control panel or the remote telnet client computer.

📝 NOTE: The following procedure describes terminating a Remote Admin connection from the remote telnet client computer.

1. From the Pre-boot main menu, use the arrow buttons on the keyboard to scroll down to the **+3:Administrator** item, and then press the **Enter** key.

Figure 2-18 Access the administrator menu
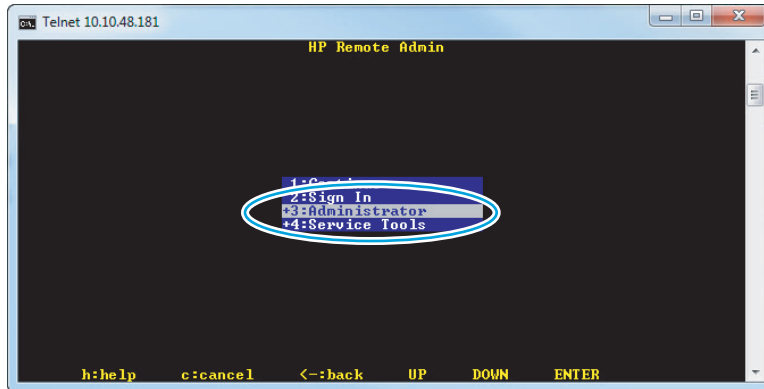
2. Use the arrow buttons on the keyboard to scroll down to the **+A:Remote Admin** item, and then press the **Enter** key.

Figure 2-19 Access the remote admin menu
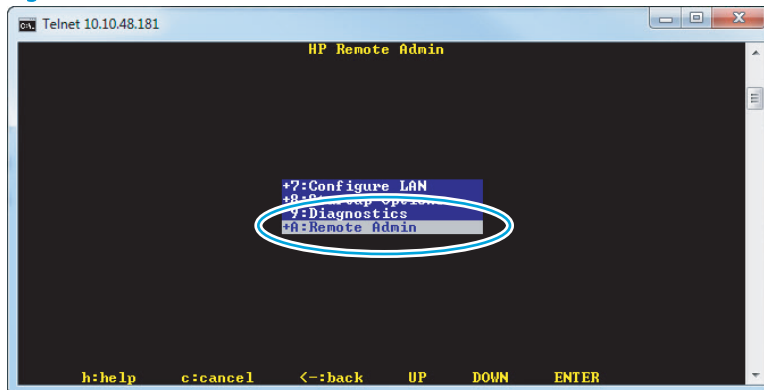
3. Use the arrow buttons on the keyboard to scroll down to the **2:Stop Telnet** item, and then press the **Enter** key. The Remote Admin connection between the printer and the remote telnet client computer terminates.

📝 **IMPORTANT:** The printer remains in the Pre-boot menu. Have the person that is physically present at the printer do the following:

- Touch the Home button to return to the main Pre-boot menu and highlight the **1:Continue** item, and then touch the OK button. The printer will continue to initialize.

Figure 2-20 Terminate the telnet connection

Troubleshooting process

Determine the problem source

When the printer malfunctions or encounters an unexpected situation, the printer control panel alerts you to the situation. This section contains a pre-troubleshooting checklist to filter out many possible causes of the problem. A troubleshooting flowchart helps you diagnose the root cause of the problem. The remainder of this chapter provides steps for correcting problems.

- Use the troubleshooting flowchart to pinpoint the root cause of hardware malfunctions. The flowchart guides you to the section of this chapter that contains steps for correcting the malfunction.

Before beginning any troubleshooting procedure, check the following issues:

- Are supply items within their rated life?

- Are supply items Genuine HP supplies?

- Does the configuration page reveal any configuration errors?

📝 NOTE: The customer is responsible for checking supplies and for using supplies that are in good condition.

Troubleshooting flowchart

This flowchart highlights the general processes that you can follow to quickly isolate and solve printer hardware problems.

Each row depicts a major troubleshooting step. A "yes" answer to a question allows you to proceed to the next major step. A "no" answer indicates that more testing is needed. Go to the appropriate section in this chapter, and follow the instructions there. After completing the instructions, go to the next major step in this troubleshooting flowchart.

Table 2-8 Troubleshooting flowchart

1 Power on	Is the printer on and does a readable message display?		Follow the power-on troubleshooting checks. See Power subsystem on page 120.
	Yes ↓	No →	After the control panel display is functional, see step 2.
2 Control panel messages	Does the message **Ready** display on the control panel?		After the errors have been corrected, go to step 3. See the control panel messages document (CPDM) on the printer support website.
	Yes ↓	No →	
3 Event log	Open the Troubleshooting menu and print an event log to see the history of errors with this printer. Does the event log print?		If the event log does not print, check for error messages. See the control panel messages document (CPDM) on the printer support website. If paper jams inside the printer, clear the jam. See the clear paper jams section of the printer troubleshooting manual.
	Yes ↓	No →	If error messages display on the control panel when you try to print an event log, see the control panel messages document (CPDM) in the printer troubleshooting manual. After successfully printing and evaluating the event log, see step 4.
4 Information pages	Open the Reports menu and print the configuration pages to verify that all the accessories are installed. Are all the accessories installed?		If accessories that are installed are not listed on the configuration page, remove the accessory and reinstall it. After evaluating the configuration pages, see step 5.
	Yes ↓	No →	
5 Print quality	Does the print quality meet the customer's requirements?		Compare the images with the print quality report. See the solve image quality section of the printer troubleshooting manual
	Yes ↓	No →	After the print quality is acceptable, see step 6.
6 Interface	Can the customer print successfully from the host computer?		Verify that all I/O cables are connected correctly and that a valid IP address is listed on the HP Jetdirect configuration page.
	Yes. This is the end of the troubleshooting process.	No →	If error messages display on the control panel when you try to print an event log, see the control panel messages document (CPDM) on the printer support website. When the customer can print from the host computer, this is the end of the troubleshooting process.

Power subsystem

Power-on checks

The basic printer functions should start up when the printer is connected into an electrical outlet and the power switch is pushed to the *on* position. If the printer does not start, use the information in this section to isolate and solve the problem.

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

Power-on troubleshooting overview

During normal operation, a cooling fan begins to spin briefly after the printer power is turned on. Place your hand over the vents at the rear of the printer, next to the formatter, or on the on the rear of the scanner (MFPs only). If the fan is operating, you will feel air passing out of the printer. You can lean close to the printer and hear the fan operating.

After the fan is operating, the main motor turns on (unless the left door or cartridge access door is open, a jam condition is sensed, or the paper-path sensors are damaged). You might be able to visually and audibly determine if the main motor is turned on.

If the fan and main motor are operating correctly, the next troubleshooting step is to isolate print engine, formatter, and control panel problems.

If the control panel is blank when you turn on the printer, check the following items:

1. Make sure that the printer is connected directly into an active electrical outlet (not a power strip) that delivers the correct voltage.

2. Make sure that the power switch is in the *on* position.

3. Make sure that the fan runs briefly, which indicates that the power supply is operational.

4. Make sure that the control panel display wire harness is connected.

5. Make sure the power switch is in the on position, and then verify that the heartbeat LED is blinking.

6. Remove any external solutions, and then try to turn the printer on again.

Troubleshooting a blank display, black display, no display, or no power situation

Customers usually report that the control panel display is not showing anything. It is very important to collect as much information as possible from the customer about the issue to help resolve it.

Following are some printer behaviors the customer might encounter:

- The control panel is completely blank (no LEDs or back light).

- The control panel is blank, but there might be LEDs illuminated.

- The control panel is blank (LEDs are on or flashing) and the back light is on (but no text is visible).

Following are some possible causes of a blank control panel display:

- No power to the printer.

- The control panel contrast setting is not correctly adjusted.

- The formatter connector(s) are not fully seated into the connector(s) on the DC controller.

- The memory DIMM is missing, faulty, incorrectly installed, or is not fully seated.

- A faulty component is installed on the formatter (for example a memory DIMM, fax PCA, network PCA, USB device, or other component).

- The formatter is defective.

- The control panel connector is not fully seated, or the control panel is defective.

- The DC controller is defective.

Following are some questions to ask the customer:

- Was the printer newly installed or has the printer been properly functioning?

    – For a new install, investigate to see if there was any shipping damage to the printer.

    – Did the customer notice any damage to the shipping box or any visible damage to the printer?

- What happened just prior to the control panel going blank?

    – Was the printer serviced recently?

    – Has a power outage recently occurred?

    – Has a lightning storm recently occurred?

    – Did the customer recently add a memory DIMM or install a third-party component?

- Make sure to get a complete description of the failure.

    – Is the control panel display completely blank (might be faint text and no back light)?

    – Is the control panel display back light on?

    – Are any of the LEDs (Ready, Data, or Attention) illuminated?

    – Has a print job been sent to the printer? The customer might report that their print jobs seemed to print, but when they go to the printer the control panel display is blank.

Recommended actions

If the control panel display is completely blank (no LEDs illuminated or no back light) check to see if the printer is getting power. Listen for fans or any printer initialization sounds when the power is turned on.

If there are no signs of power, then perform the following:

1. Make sure that the printer is plugged directly into an active electrical outlet (not a power strip or interruptible power supply) that delivers the correct voltage.

    ☼ TIP: Try using a different power cable if possible.

2. Turn the printer power on, and make sure that the fan(s) run briefly (this indicates that the power supply is operational).

3. Turn the printer power off.

4. Make sure that the control panel display wire harness (and/or flat cable) is properly connected (and fully seated), and then turn the printer power on again.

5. Verify the status LEDs are illuminated, but the control panel display is blank. If applicable: Check if the contrast setting is adjusted to very low. If so, try turning the contrast knob to see if the control panel display becomes visible.

6. From a host computer, send a print job to the printer.

    📝 NOTE: If the print job correctly prints, then the problem is most likely to a defective control panel.

7. Turn the printer power off, and then make sure that the memory DIMM is installed in the correct slot and is fully seated.

    📝 NOTE: For some printers, there may be more than one memory DIMM installed. Some printers have third-party solutions/applications or fonts that use memory.

8. Remove all of the components/accessories installed on the formatter (for example, hard drive, solid-state drive, memory DIMM(s), fax PCA, network PCA, USB devices, or other devices).

    - **For printers with a interconnect board (ICB)**: Make sure that the formatter is fully seated.

    - Take out or disconnect all removable components on the formatter (SSD, HDD, or other devices).

      📝 IMPORTANT: This is important because the formatter or a component on the formatter might be defective or shorted which causes the printer to lose power.

9. **For printers with a interconnect board (ICB)**: Reinstall the formatter.

    Make sure that all of the connectors on the formatter are correctly connected and fully seated.

10. Turn the printer power on, and then check the control panel display.

11. If the printer control panel is properly working, replace each removed component (one at a time) to determine which one is causing the problem.

    ⚠ CAUTION: Turn the printer power off, and then on again, after replacing a component on the formatter.

12. If the control panel display is still blank after performing the above troubleshooting steps, replace the formatter.

Control panel checks

NOTE: The printer includes a diagnostic test mode for the touchscreen control panels.

- Control panel diagnostics

- Control panel diagnostic flowcharts

Control panel diagnostics

- Touchscreen diagnostic mode

- Control panel system diagnostics

Touchscreen diagnostic mode

Use the diagnostics in this section to test the control panel hardware and embedded firmware. These tests are useful for checking control panel functionality independent of the printer control panel system diagnostics. To test the control panel using the system diagnostics, see Control panel system diagnostics on page 128.

1. **M652, M653 models**: Locate the diagnostic-tests access button on the back of the control panel.

Figure 2-21 Diagnostic-tests access button (M652, M653)

2. **M681, M682 models**: Locate the diagnostic-tests access button on the back of the control panel.

    Figure 2-22 Diagnostic-tests access button (M681, M682)

3. **M681/M682 only**: Press the diagnostics-access button. Repeatedly pressing the button cycles through the available diagnostics.

    Figure 2-23 Press the diagnostics-access button (M681, M682)

4. A yellow screen appears (after the first press of the button) indicating that the control panel firmware is version A (a magenta screen indicates version B firmware).

NOTE: If a different color appears on the screen, contact your global business unit (GBU) to determine the firmware version.

TIP: After 4 seconds of inactivity, the diagnostic mode times out and is exited.

Figure 2-24 Control panel version A yellow screen
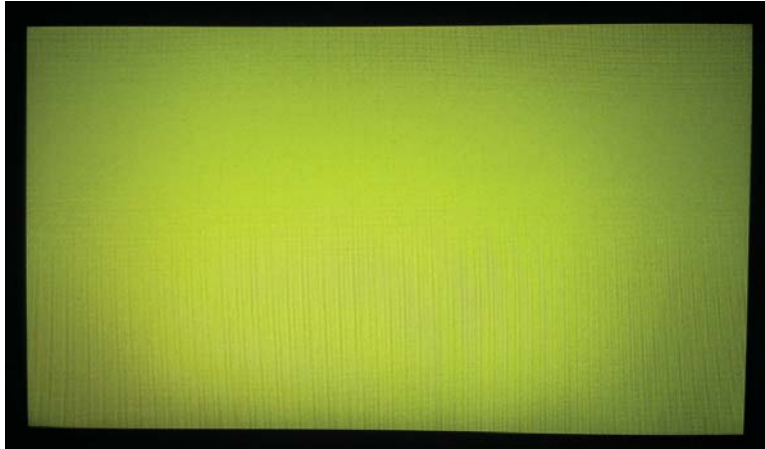
5. Touch the screen to cycle the screen through the following:

- A red screen.
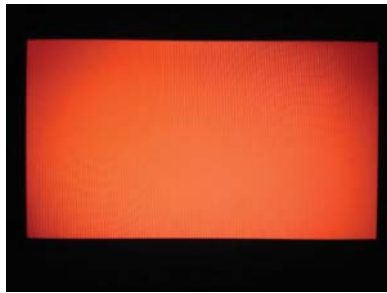
- A green screen.

- A blue screen.
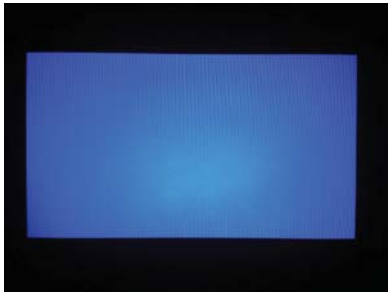
- Five brightness levels of a white screen.
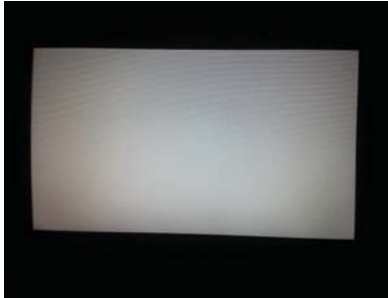
- A final black screen.

  TIP: When the final black screen displays, press the Home button to cycle through the diagnostic screens and test its functionality.
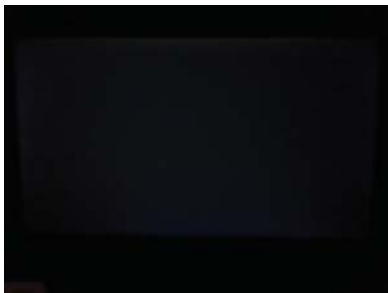
6. Pressing the diagnostic-tests button with the black screen displayed, exits the diagnostic mode.

Figure 2-25 Exit the diagnostic mode
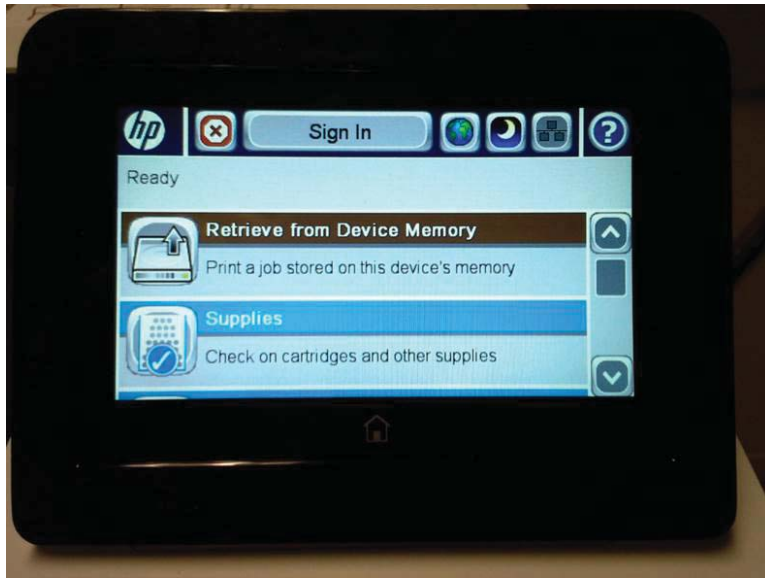
Control panel system diagnostics

Use the diagnostics in this section to test the control panel hardware and display using the printer firmware system diagnostics.

- Open the control panel system diagnostic tests

- Screen test

- Touch test

- SoftKey test

- Backlight test

- Sound test

- Keyboard test (MFP Flow models only)

- Version

Open the control panel system diagnostic tests

Open the control panel system diagnostic tests from a touchscreen control panel

1. Turn the printer power off, and then on again.

2. Touch the middle of the control panel display when you see the 1/8 under the logo.

Figure 2-26 Open the Pre-boot menu
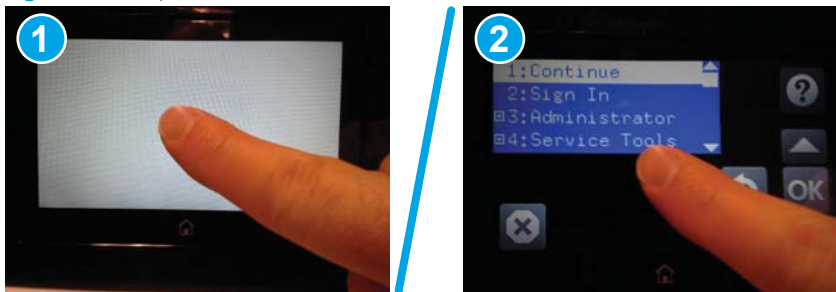
3. On the Pre-boot menu screen, use the following buttons to navigate the tests.

Figure 2-27 Pre-boot menu
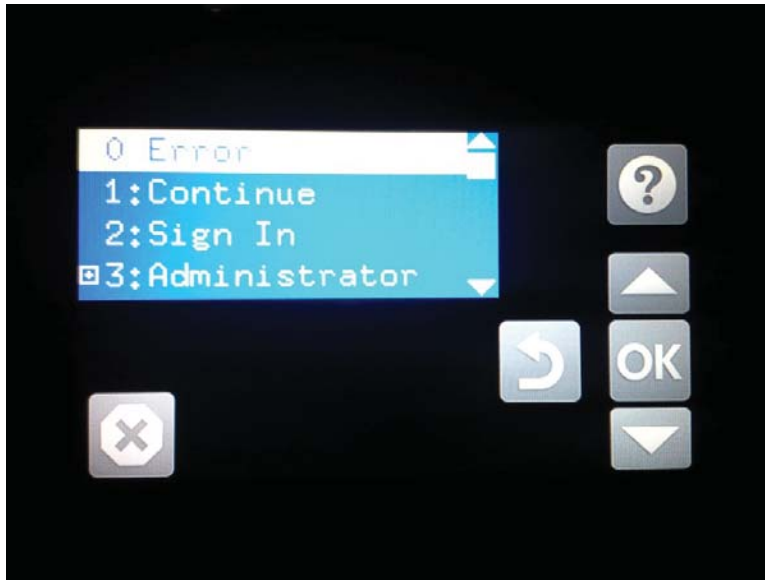
	Use this button to see more information about a selected item.
	Use this button to scroll up through menu items.
	Use this button to select a highlighted menu item.
	Use this button to scroll down through menu items.
	Use this button to go back to the previous menu.
	Not used.
	Use this button to exit a diagnostic test.

4. Use the down arrow ▼ button to scroll to +3 Administration, and then press the OK button to select it.

Figure 2-28 Access the administration menu
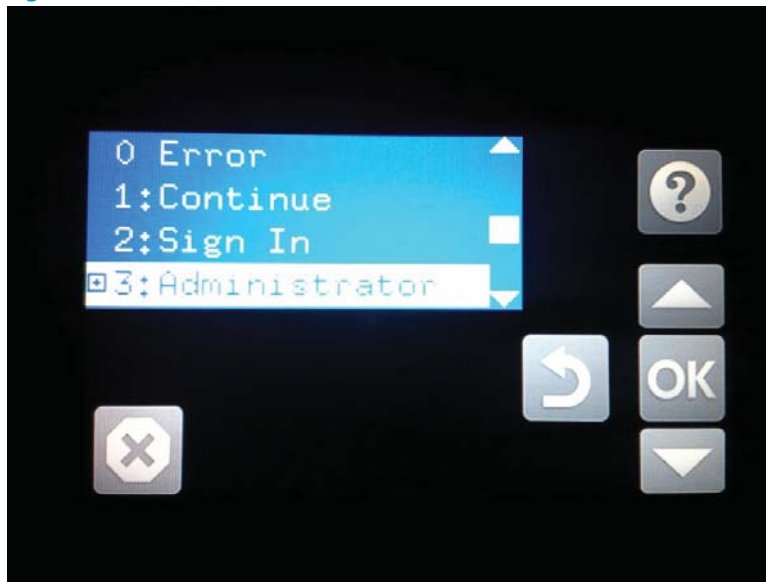
5. Use the down arrow ▼ button to scroll to +E CP Diagnostics, and then press the OK button to select it.

📝 NOTE: An administrator password might be required to continue.

Figure 2-29 Access the diagnostics menu

Screen test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 128.

2. With 1 Screen Test highlighted, press the OK button to select it.

Figure 2-30 Open the screen test

3. The blue vertical gradient screen appears.

Figure 2-31 Blue vertical gradient screen
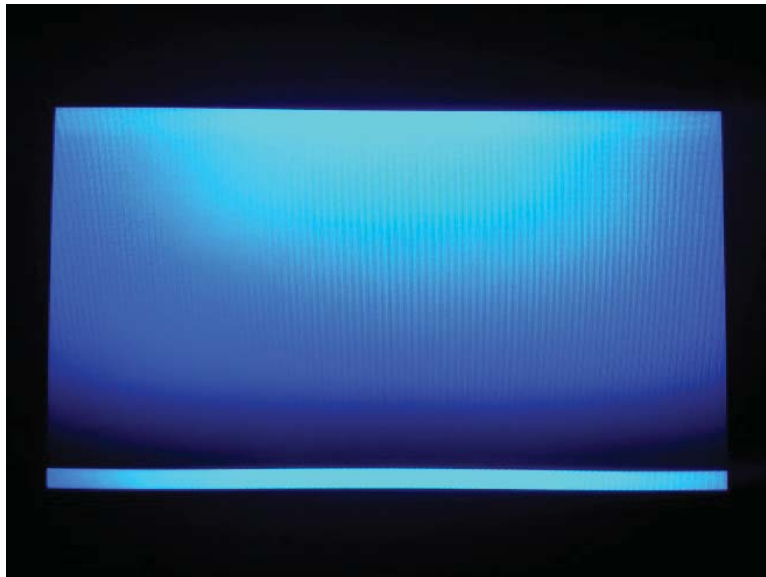
4. Select the touchscreen to scroll though the remaining touchscreen test screens.

NOTE: Select the Home button to exit the test.

	Green vertical gradient
	Red vertical gradient
	Blue horizontal gradient
	Green horizontal gradient
	Red horizontal gradient
	Blue with black horizontal interlaced
	Green with black horizontal interlaced
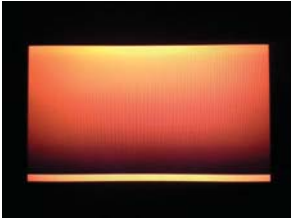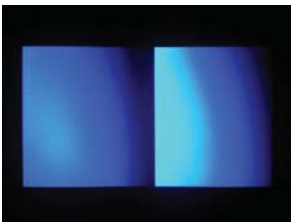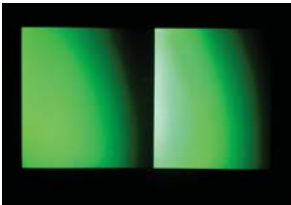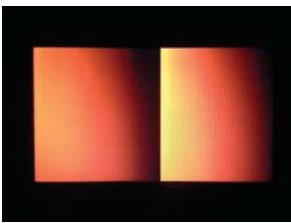
	Red with black horizontal interlaced
	Blue with black vertical interlaced
	Green with black vertical interlaced
	Red with black vertical interlaced
	Black with white center
	White with black center
	Checkerboard
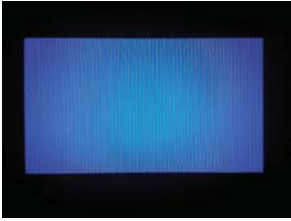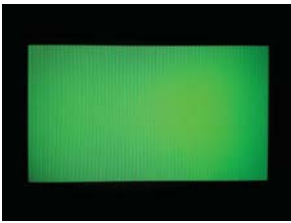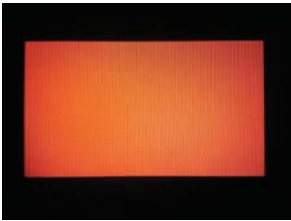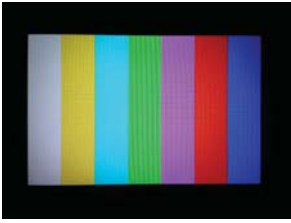
Multicolor stripes
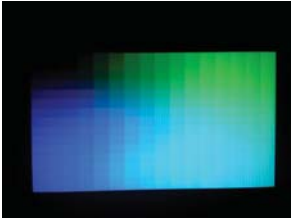
Blue green grid meshing

Touch test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 128.

2. Use the down arrow ▼ button to scroll to 2 Touch Test, and then press the OK button to select it.

   Figure 2-32 Open the touch test
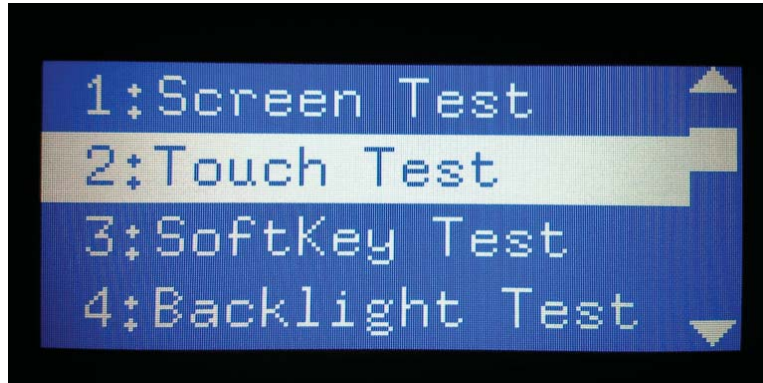
3. Use your finger to touch the white grid on the display.

   Figure 2-33 Touch the white grid
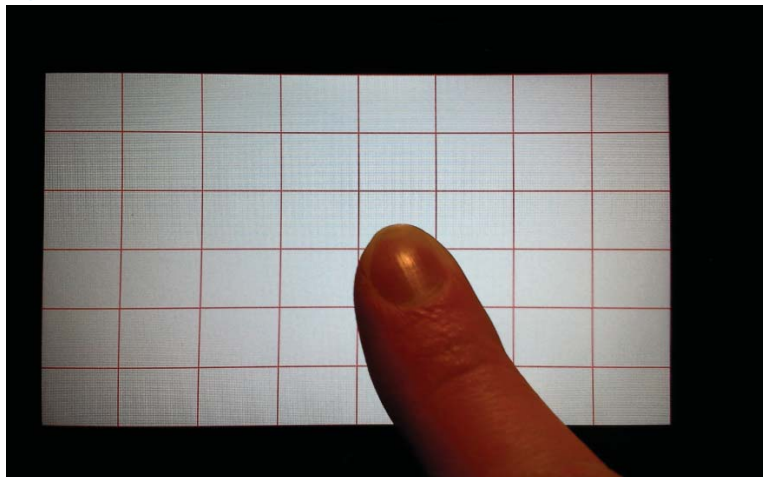
4. A mark appears on the grid where it was touched.

> **NOTE:** Select the Home button to exit the test.

Figure 2-34 Verify the mark
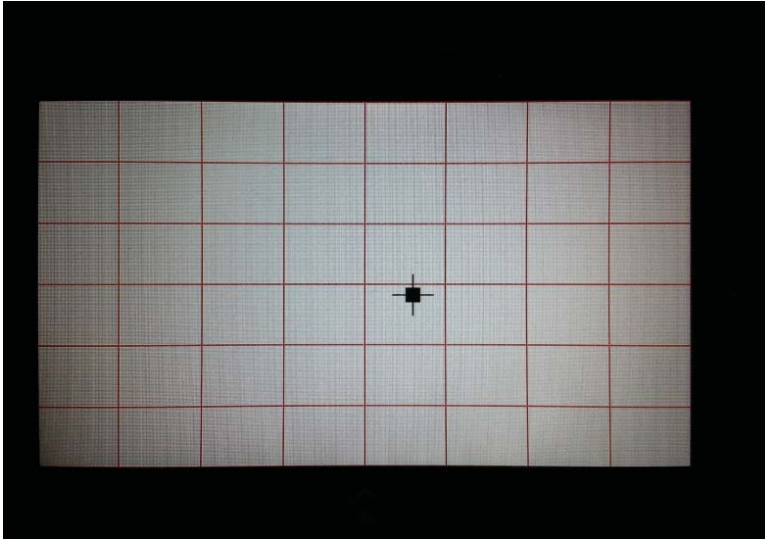
SoftKey test

1. Open the control panel system diagnostic tests. See .

2. Select 3 SoftKey Test, and then select OK.

Figure 2-35 Open the softkey test
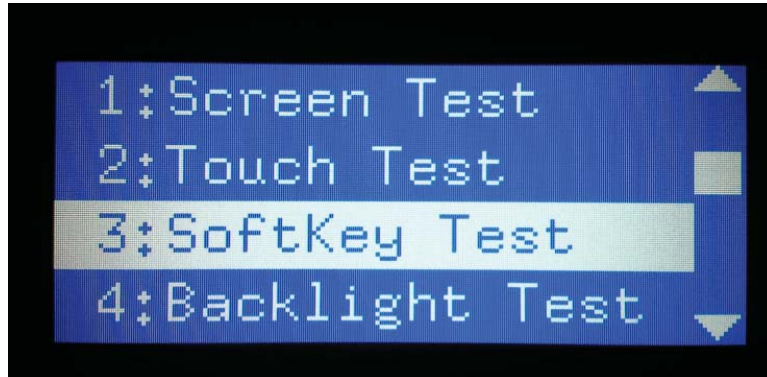
3. When prompted, select the Home button.

Figure 2-36 Touch the Home button
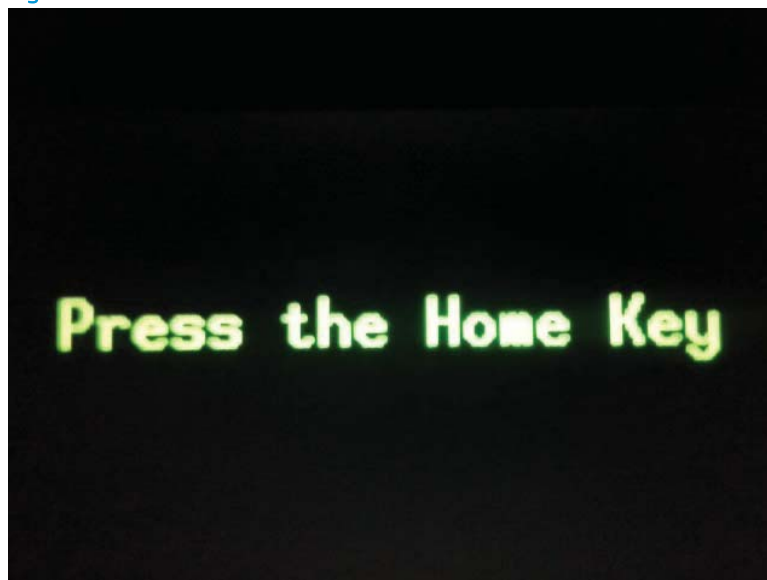
4.   If the test is successful, the following screen appears on the display.

📝 **NOTE:**   Touch the screen to exit the test.

Figure 2-37 Successful test

Backlight test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 128.

2. Use the down arrow ▼ button to scroll to 4 Backlight Test, and then select OK.

   After selecting the 4 Backlight Test, the screen automatically dims, and then returns to full brightness.

   📝 NOTE: Touch any key to exit the test.

   Figure 2-38 Open the backlight test

Sound test

1. Open the control panel system diagnostic tests. See .

2. Select 5 Sound Test, and then select OK .

    After selecting the 5 Sound Test, the printer emits a series of audible tones.

    📝 **NOTE:** Touch any key to exit the test.

    Figure 2-39 Open the sound test

Keyboard test (MFP Flow models only)

IMPORTANT: The control panel system diagnostic tests include a 6 Keyboard Test item. This test is **not** valid for the non-Flow MFP, even though this option is present in the control panel system diagnostic tests menu.

If the 6 Keyboard Test is opened on a non-Flow MFP, the printer power must be turned off to exit the test.

HP does not recommend turning the printer power off during the control panel system diagnostic tests.

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 128.

2. Select 6 Keyboard Test, and then select OK.

Figure 2-40 Open the keyboard test
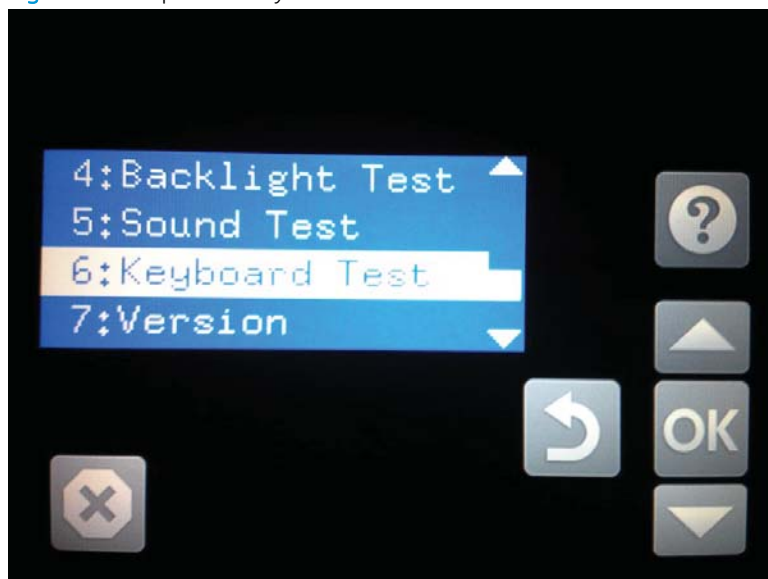
3. When prompted, select the H key on the keyboard or the Home button to exit the test.

Version

1. Open the control panel system diagnostic tests. See .

2. Select 7 Version, and then select OK.

   📝 **NOTE:** Touch any key to exit the test.

   Select 7 Version to view the following types of information:

   📝 **NOTE:** The following types of information are for the control panel only, not the printer.

   - Panel ID

   - Hardware (version)

   - Firmware (version)

   - KB Hw (version)

   - KB Firm (version)

   - LCD Vendor

   - Touch Controller Version

   Figure 2-41 Open the sound test

Control panel diagnostic flowcharts

Use the flowcharts in this section to troubleshoot the following control panel problems.

- Touchscreen is blank, white, or dim (no image).

- Touchscreen is slow to respond or requires multiple presses to respond.

- Touchscreen has an unresponsive zone.

- No control panel sound.

- Home button is unresponsive.

- Hardware integration pocket (HIP) is not functioning (control panel functional).

Touchscreen black, white, or dim (no image)

📝 **NOTE:** To open the diagnostic function, press the button on the back of the control panel.

Figure 2-42 Touchscreen blank, white, or dim (no image)
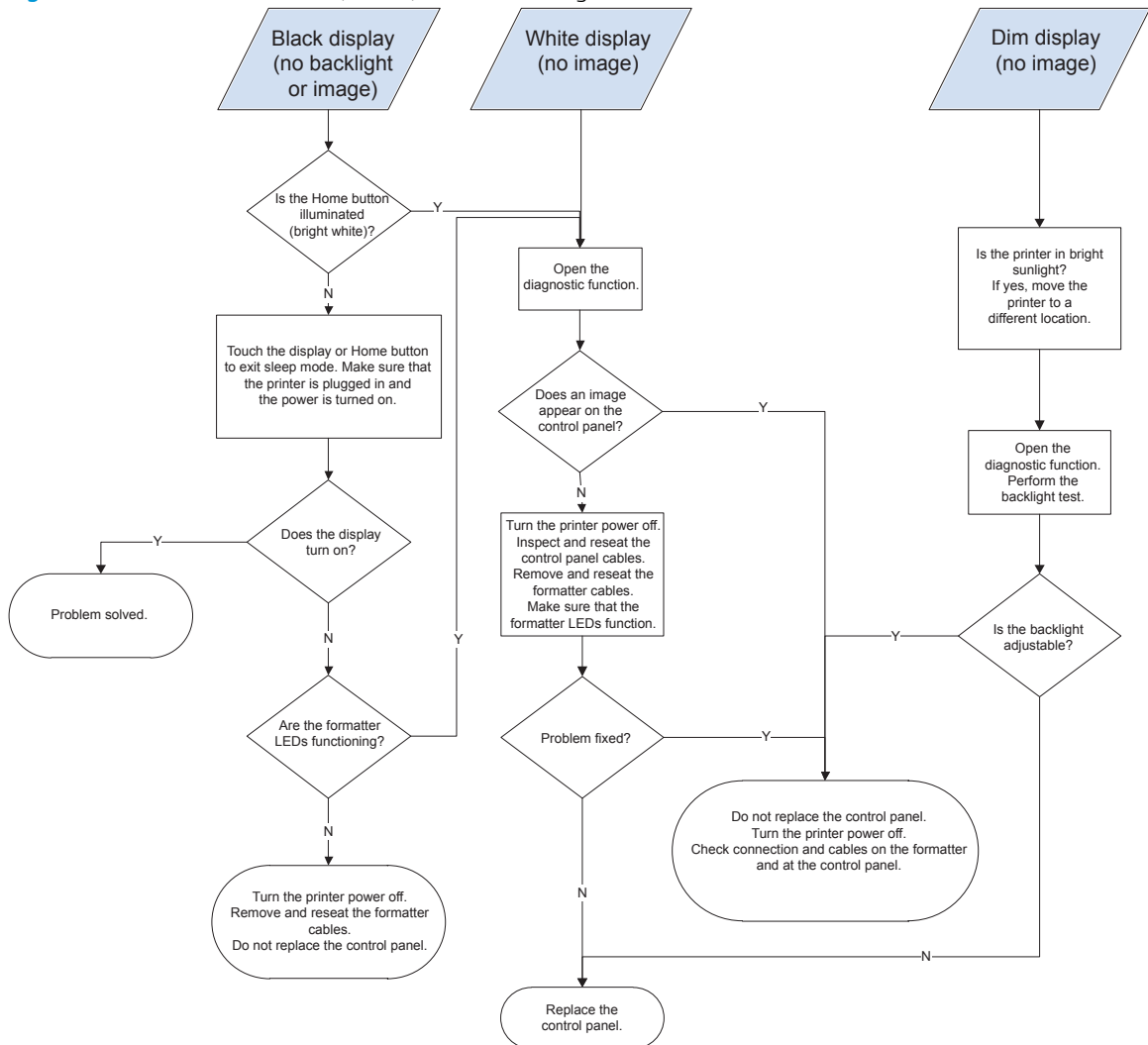
Touchscreen has an unresponsive zone

📝 **NOTE:** To open the diagnostic function, press the button on the back of the control panel.

Figure 2-43 Touchscreen has an unresponsive zone
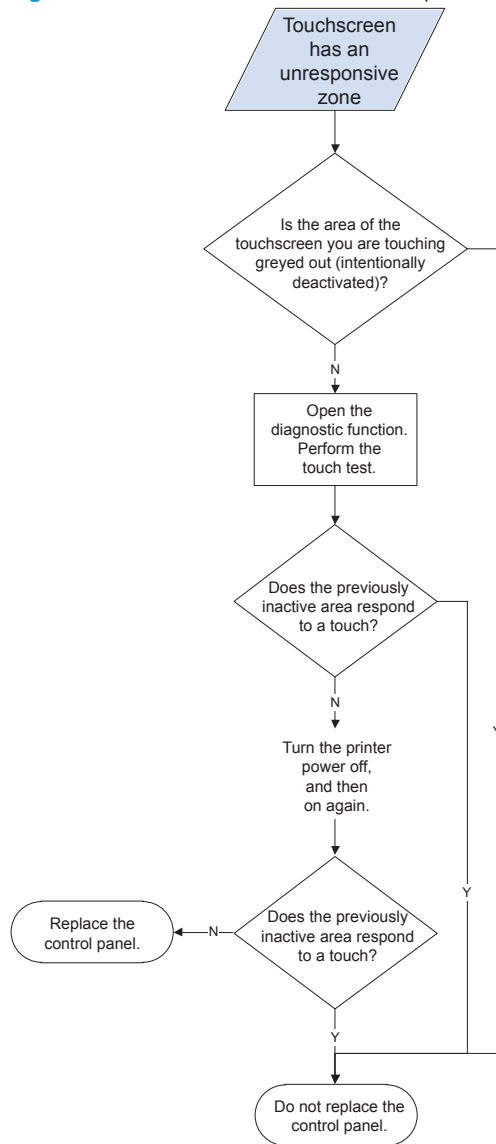
No control panel sound

Figure 2-44 No control panel sound
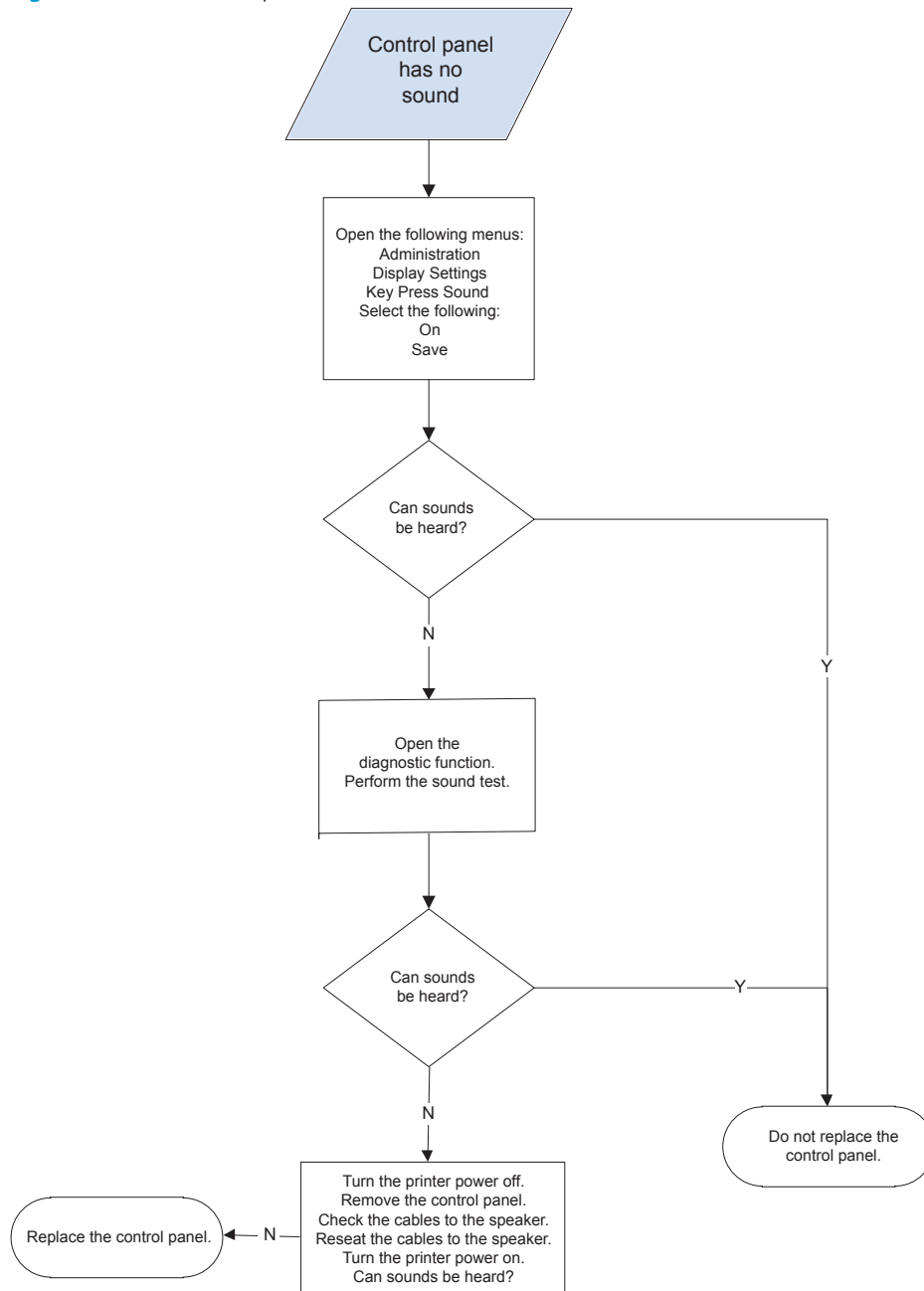
Home button is unresponsive

Figure 2-45 Home button is unresponsive
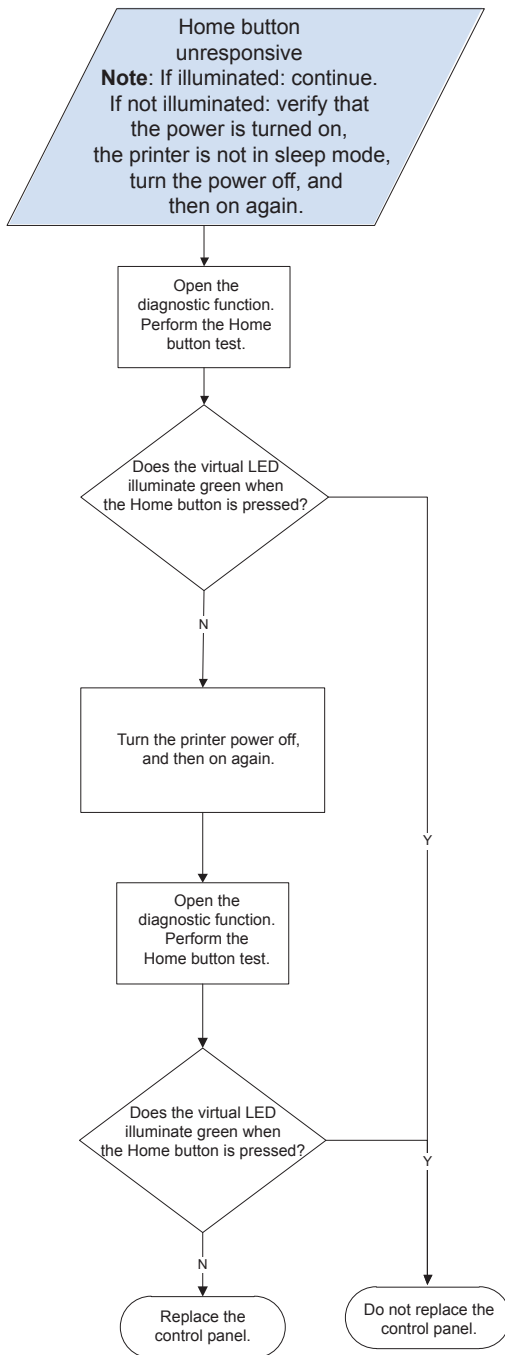
Hardware integration pocket (HIP) is not functioning (control panel functional)

Figure 2-46 Hardware integration pocket (HIP) is not functioning (control panel functional)

Hardware integration
pocket (HIP)
not functional
(control panel
functional)

Check that all installed hardware integration
pocket devices are within HP specifications.
The control panel provides only 0.5 Amps to
the port. If an installed device attempts to draw
more power than is provided, the port is
automatically disabled. Troubleshoot third-party
devices with the device manufacturer.
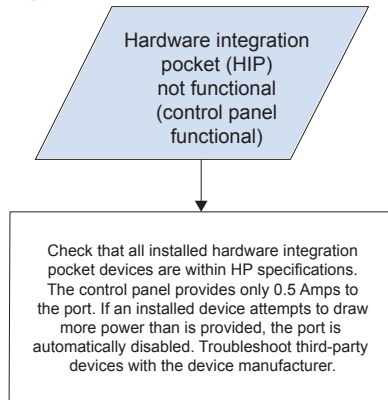
Scanning subsystem (MFP)

Calibrate the scanner

Use this procedure to properly position the copied image on the page.

☼ **TIP:**   This adjustment might be required after the scanner or document feeder is replaced.

1.   From the Home screen on the printer control panel, select Support Tools.

2.   Select Calibrations.

3.   Select Calibrate Scanner, and then follow the instructions provided on the screen.

Tools for troubleshooting

Individual component diagnostics

Tools for troubleshooting: LED diagnostics

LED, engine, and individual diagnostics can identify and troubleshoot printer problems.

Understand lights on the formatter

Two LEDs on the formatter indicate that the printer is functioning correctly.
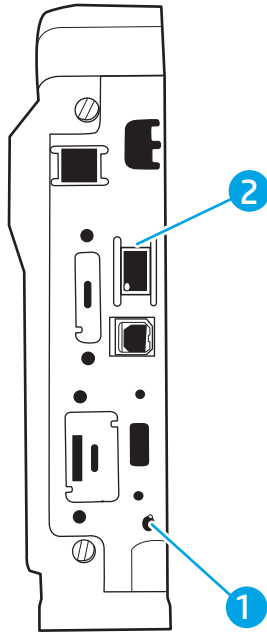
1	Heartbeat LED
2	HP Jetdirect LEDs

Heartbeat LED

The heartbeat LED indicates that the formatter is functioning correctly. While the product is initializing after it is turned 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 following table describes the heartbeat LED operation while the product is executing the firmware boot process.

📝 NOTE: When the initialization process completes, the heartbeat LED should be illuminated solid green.

If after initialization, the heartbeat LED is not solid green, see .

Table 2-9 Heartbeat LED, product initialization

Product initializing state	Heartbeat LED, normal state	Heartbeat LED, error state
No power (power cable disconnected or power switch off)	Off	Not applicable
Power on (immediately after the power switch pressed)	Red, solid • Duration should be 1 second or less	Red, solid • Firmware error; problem finding hardware and booting the serial peripheral interface flash memory – Boot process halted Replace the formatter.
Serial peripheral interface (SPI) flash memory boot	Green, solid	Red, solid • Firmware error; problem corrupt or missing SPI flash memory – Boot process halted Replace the formatter.
HW checks on board DRAM	Green, solid	Red, solid • Power on self check failure – Boot process halted Replace the formatter.
Control panel connection initializes	Green, solid NOTE: Control panel communication successful. If an error occurs, a message should appear on the control panel display.	Yellow, fast flash • Formatter to control panel connection failed – Boot process continues Check the cables between the formatter and control panel for damage. Make sure that the cables are fully seated.
Pre-boot menu available (including diagnostics)	Green, solid	Red, solid • Diagnostic failure – Follow diagnostic instructions Turn the power off, and then on again to restart the initialization process.
Accessing disk for firmware image	Green, solid NOTE: If applicable, disk error messages appear on the control panel display.	Yellow, fast flash • Control panel not connected
Firmware boot	Green, solid NOTE: If applicable, error messages appear on the control panel display.	Yellow, fast flash • Control panel not connected
Product operational	Green, heartbeat blink NOTE: If applicable, error messages appear on the control panel display.	Yellow, fast flash • Control panel not connected

Table 2-9 Heartbeat LED, product initialization (continued)

Product initializing state	Heartbeat LED, normal state	Heartbeat LED, error state
49.XX.YY error or initialization freezes	Not applicable	LED off NOTE: An error message (for example, **49.XX.YY**) might appear on the control panel display. Eventually a formatter connection missing message will appear. Turn the power off, and then on again to restart the initialization process. If the error persists, perform a firmware upgrade.
Control panel connection interrupted after the product is operational	Not applicable	Yellow, fast flash ● Control panel not connected
Flat flexible cable (FFC) between the formatter and DC controller is not connected or damaged	Not applicable	Yellow, solid ● Formatter to DC controller connection failed Check the cable between the formatter and DC controller for damage. Make sure that the cable is fully seated.
Sleep Mode	Green, slow blink	Not applicable
Approaching Sleep Mode	Green, slow blink	Not applicable
Wake up from Sleep Mode	Follows initialization progression	Follows initialization progression
Approaching wake up from Sleep Mode	Follows initialization progression	Follows initialization progression

The following table describes the heartbeat LED operation when the product completes the firmware boot process and is in the **Ready** state.

Table 2-10 Heartbeat LED, product operational

LED color	Description
Green	● Normal operation – Formatter is operating normally – Firmware is operating normally – Control panel is connected
Yellow	● Formatter cannot connect to the control panel – Check control panel connections – Verify control panel functionality
Red	● Formatter error or failure

Table 2-10 Heartbeat LED, product operational (continued)

LED color	Description
	– Serial peripheral interface (SPI) flash memory boot error
	– Power on self test (formatter) failed
	– Diagnostic (formatter) failed
Off	TIP: The heartbeat LED is off if the power cable is disconnected, the product power switch is in the off position, or the product is in Sleep Mode.
	● Firmware or system freeze
	– Check control panel for an error message
	– Control panel failure
	NOTE: This condition is not usually caused by a formatter failure. Turn the power off, and then on again. If the error persists, perform a firmware upgrade.

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 all the network cable connections. In addition, try to manually configure the link settings on the embedded print server by using the printer control panel menus.

1. From the Home screen on the printer control panel, select Settings.

2. Open the following menus:

   ● Networking

   ● Ethernet

   ● Link Speed

3. Select the appropriate link speed.

Tools for troubleshooting: Engine diagnostics

The printer contains extensive internal engine diagnostics that help in troubleshooting print quality, paper path, noise, assembly, and timing issues.

Engine test button

To verify that the printer engine is functioning, print an engine test page. Use a small pointed object to depress the test-page switch located on the rear of the printer. The test page should have a series of lines that are parallel to the short end of the page. The test page can use only Tray 2 as the paper source, so make sure that paper is loaded in Tray 2.

Figure 2-47 Engine test button

Test print switch
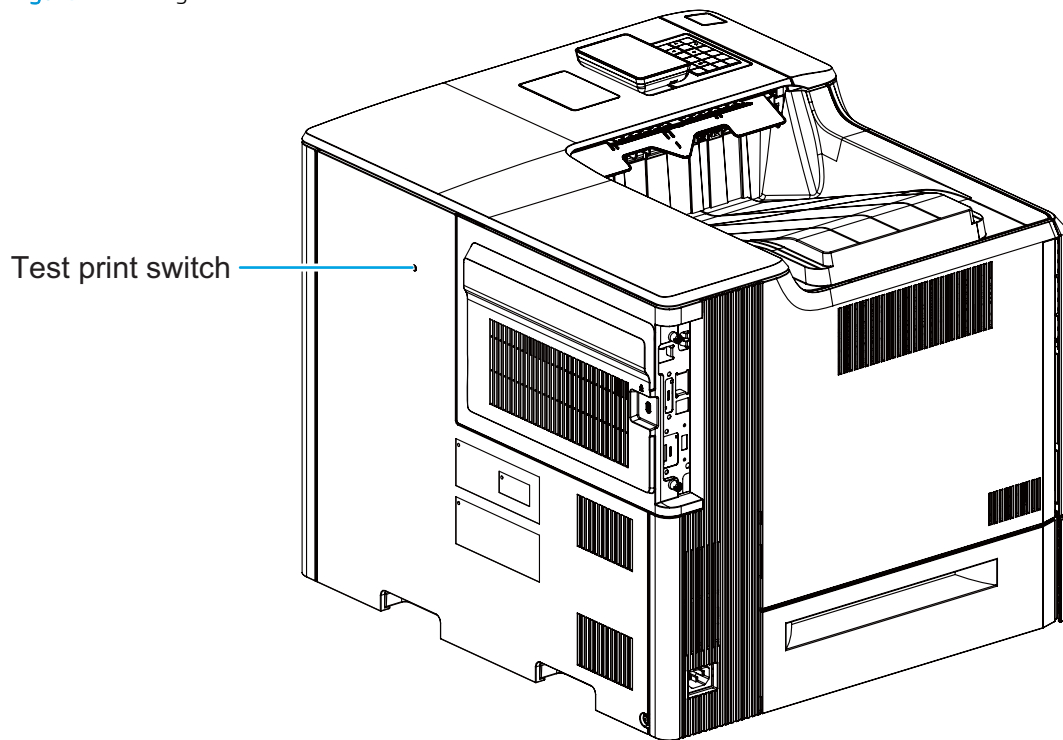
Defeating interlocks

Different tests can be used to isolate different types of issues. For assembly or noise isolation, run the diagnostic test when the front door or right door is open. To operate the printer with the doors open, the interlock switch levers must be depressed to simulate a closed-cover position.

⚠ WARNING! Be careful when performing printer diagnostics to avoid risk of injury. Only trained service personnel should open and run the diagnostics with the covers removed. Never touch any of the power supplies when the printer is turned on.

💡 TIP: Fold a stiff piece of paper, for example a business card or index card, into a 10 mm (.375 in) strip, and insert the strip into the slots for the front door and right door logic switches.

1. Open the front door, and then insert a folded piece of paper into one slot (callout 1).

Figure 2-48 Defeating interlocks (front door)
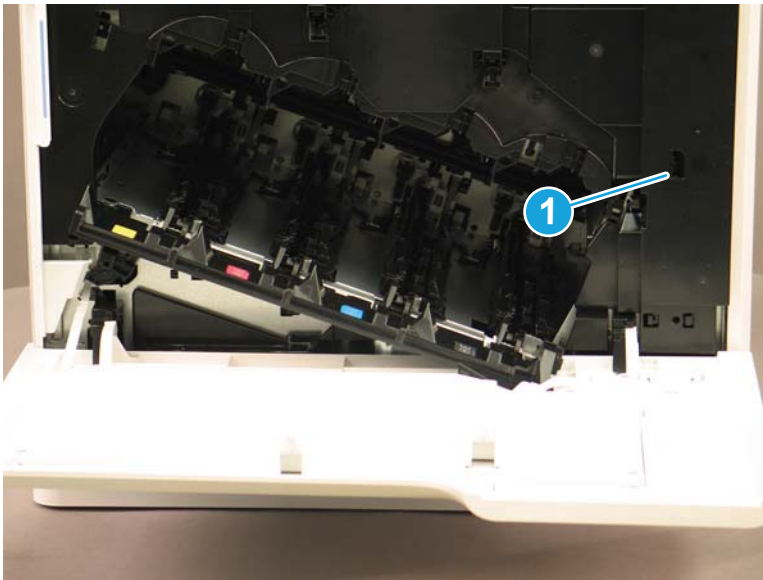
2. Open the right door, and then insert a folded piece of paper into two slots (callout 1).

Figure 2-49 Defeating interlocks (right door)
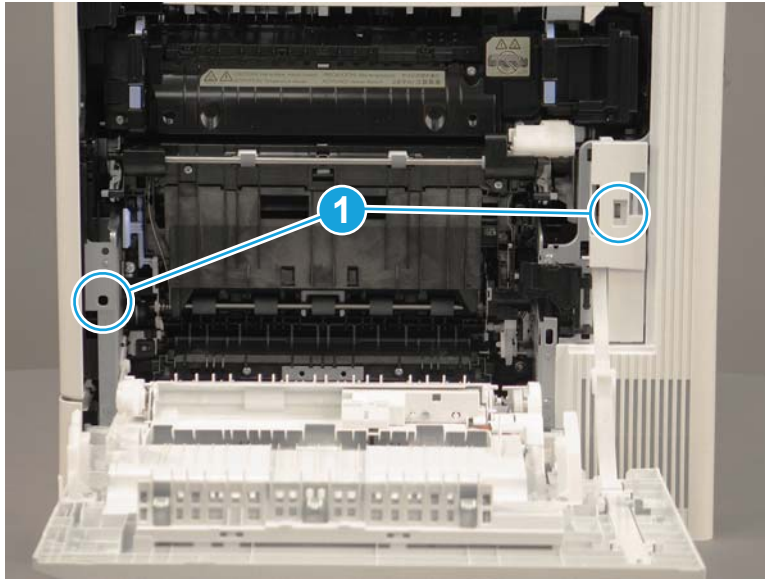
Disable cartridge check

Use this diagnostic test to print internal pages or send an external job to the printer when the toner cartridge is removed or exchanged. Supply errors are ignored while the printer is in this mode. When the printer is in this mode, access the troubleshooting menus and print internal pages (the print quality pages will be the most useful). This test can be used to isolate problems, such as noise, and to isolate print-quality problems that are related to the toner cartridge.

> **NOTE:** Do not remove or exchange the toner cartridge until after beginning the disable cartridge check diagnostic.

Disable cartridge check from a touchscreen control panel

1. From the Home screen on the printer control panel, select Support Tools.

2. Open the following menus:

   - Troubleshooting

   - Diagnostic Tests

   - Disable Cartridge Check

Disable cartridge check from an LCD control panel

1. From the Home screen on the printer control panel, use the arrow keys to navigate to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostics, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Disable Cartridge Check, and then press the OK button to select it.

Tools for troubleshooting: Paper path and sensor diagnostic tests

Use these diagnostic tests to manually test the printer sensors, switches.

📝 NOTE: The menu list of sensors and switches for the Paper path sensors test, Manual Sensor Test, and the Tray/Bin Manual Sensor Test varies depending on which optional accessories are installed.

The tables in this section describe the sensor tests available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

Paper path test

This diagnostic test generates one or more test pages. Use these pages to isolate the cause of jams.

To isolate a problem, specify which input tray to use, specify whether to use the duplex path, and specify the number of copies to print. Multiple copies can be printed to help isolate intermittent problems. The following options become available after beginning the diagnostic feature:

- Print Test Page: Run the paper-path test from the default settings: Tray 2, no duplex, and one copy. To specify other settings, scroll down the menu, and select the setting, and then scroll back up and select Print Test Page to start the test.

- Source Tray: Select Tray 1, Tray 2, or the optional tray.

- Test Duplex Path: Enable or disable two-sided printing.

- Number of Copies: Set the numbers of copies to be printed; the choices are 1, 10, 50, 100, or 500.

Access the paper path test from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

    - Troubleshooting

    - Diagnostic Tests

    - Paper Path Test

3. Select the paper-path test options for the test.

Access the paper path test from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Tests, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Paper Path Test, and then press the OK button.

Paper path sensors test

This test displays the status of each paper-path sensor and allows viewing of sensor status while printing internal pages.

Access the paper path sensors test from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

   - Troubleshooting

   - Diagnostic Tests

   - Paper Path Sensors

Access the paper path sensors test from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Tests, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Paper Path Sensors, and then press the OK button.

📝 NOTE: Exiting the Paper Path Sensors menu and then reentering the test will clear the test values from the previous test.

The menu list of sensors and motors for the Paper path sensors test varies depending on which optional accessories are installed.

The following table describes the sensor tests available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

Table 2-11 Paper-path sensors diagnostic tests

Sensor name	Sensor/Switch number	Replacement part number	Descriptions
Tray 3 feed sensor[1]	SR21	RM2-5145-000CN	Paper feed assembly
Registration sensor	SR6	RM2-1957-000CN	Registration assembly
Fuser loop 1 sensor	PS1	RM2-1928-000CN (110 V)	Fuser
		RM2-1929-000CN (220 V)	
Front media width sensor	SR13	RM2-1957-000CN	Registration assembly
Rear media width sensor	SR14	RM2-1957-000CN	Registration assembly
Fuser pressure release sensor	SR11	RM2-1928-000CN (110 V)	Fuser
		RM2-1929-000CN (220 V)	

Table 2-11 Paper-path sensors diagnostic tests (continued)

Sensor name	Sensor/Switch number	Replacement part number	Descriptions
Fuser output sensor	SR9	RM2-1928-000CN (110 V)	Fuser
		RM2-1929-000CN (220 V)	
Developer alienation sensor	SR4	RM2-1927-000CN	Main drive assembly
Output bin full sensor	SR10	RM2-6621-000CN	Paper delivery assembly

[1] Only appears if optional accessories are installed.

Manual sensor tests

The table in this section lists the sensors and switches available in the Manual Sensor Test.

Access the manual sensor test from a touchscreen control panel

The Manual Sensor Test screen shows the sensor number, sensor name (M553x only), sensor state (active or inactive), and the number of times the sensor has been toggled (activated).

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

    ● Troubleshooting

    ● Diagnostic Tests

    ● Manual Sensor Test

3. Activate the desired sensor, and then check the control panel display to verify the sensor state (active or inactive).

    ● The State virtual LED next to the sensor number and sensor name illuminates green when the sensor is active.

    ● The Toggle virtual LED next to the sensor number and sensor name illuminates green after the sensor is activated and increments by one each time the sensor is interrupted (activated or deactivated).

        For example, opening the front door increments the SW1 Front door opening/closing Toggle item count two times—once when the door is opened, and once when the door is closed.

4. Touch the Reset Sensors button to reset the Toggle count item.

    -or-

    Touch the Cancel button or the Return arrow button to exit the Manual Sensor Test screen and return to the Diagnostic Tests menu.

Access the manual sensor test from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Tests, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Manual Sensor Test, and then press the OK button.

5. Activate the desired sensor, and then check the control panel display to verify the sensor state (active or inactive).

    ☼ TIP: Press the return arrow ↩ button to reset the sensor or press the Cancel ✖ button to exit the test.

- The State virtual LED next to the sensor number and sensor name illuminates green when the sensor is active.

- The Toggle virtual LED next to the sensor number and sensor name illuminates green after the sensor is activated and increments by one each time the sensor is interrupted (activated or deactivated).

  For example, opening the cartridge door increments the SW4 Front door opening/closing Toggle item count two times—once when the door is opened, and once when the door is closed.

NOTE: The following table describes the sensor tests available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

For a diagram of sensor locations, see Sensors and switches on page 169.

Table 2-12 Manual sensor diagnostic tests

Sensor or switch	Replacement Part number	Description
PS1 Fuser loop 1 sensor	B5L35-67902 (110 V)	Fuser
	B5L36-67902 (220 V)	
SR6 Registration sensor	RM2-0093-000CN (M553n)	Registration assembly
	RM2-0018-000CN (M552dn, M553dn, M553x, M577)	
SR9 Fuser output sensor	B5L35-67902 (110 V)	Fuser
	B5L36-67902 (220 V)	
SR10 Output bin full sensor	RM2-0092-000CN (M553n)	Paper delivery assembly
	RM2-0016-000CN (M552dn, M553dn, M553x, M577)	
SR11 Fuser pressure release sensor	B5L35-67902 (110 V)	Fuser
	B5L36-67902 (220 V)	
SR13 Front Media width sensor	RM2-0017-000CN	Paper pickup assembly
SR13N Front Media width sensor		
SR14 Rear media width sensor	RM2-0017-000CN	Paper pickup assembly
SR14N Rear media width sensor		
SR21 Tray 3 feed sensor[1]	RM2-5145-000CN	Paper feed assembly
SW3 Right door opening/closing sensor	WC2-5806-000CN	Switch button assembly
SW4 Front door opening/closing sensor	RM2_7133-000CN	Switch PCA assembly

[1] Only appears if optional accessories are installed.

Tray/bin manual sensor test

The table in this section lists the sensors and switches available in the Tray/Bin Manual Sensor Test.

Access the tray/bin manual sensor test from a touchscreen control panel

The Tray/Bin Manual Sensor Test screen shows the sensor number, sensor name, sensor state (active or inactive), and the number of times the sensor has been toggled (activated).

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

    - Troubleshooting

    - Diagnostic Tests

    - Tray/Bin Manual Sensor Test

3. Activate the desired sensor, and then check the control panel display to verify the sensor state (active or inactive).

    - The State virtual LED next to the sensor number and sensor name illuminates green when the sensor is active.

    - The Toggle virtual LED next to the sensor number and sensor name illuminates green after the sensor is activated and increments by one each time the sensor is interrupted (activated or deactivated).

      For example, opening the front door increments the SW4 Front door opening/closing sensor Toggle item count two times—once when the door is opened, and once when the door is closed.

4. Touch the Reset Sensors button to reset the Toggle count item.

    -or-

    Touch the Cancel or the Return arrow button to exit the Tray/Bin Manual Sensor Test screen and return to the Diagnostic Tests menu.

Access the tray/bin manual sensor test from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Tests, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Tray/Bin manual Sensor Test, and then press the OK button.

5. Activate the desired sensor, and then check the control panel display to verify the sensor state (active or inactive).

    ☼ TIP: Press the return arrow ⤺ button to reset the sensor or press the Cancel ⊗ button to exit the test.

- The State virtual LED next to the sensor number and sensor name (M605x and M606x only) illuminates green when the sensor is active.

- The Toggle virtual LED next to the sensor number and sensor name (M605x and M606x only) illuminates green after the sensor is activated and increments by one each time the sensor is interrupted (activated or deactivated).

  For example, opening Tray 2 increments the SW5 Tray 2 detection switch Toggle item count two times—once when the tray is opened, and once when the tray is closed.

NOTE: The following table describes the sensor tests available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

Table 2-13 Tray/bin manual sensors

Sensor or switch name	Replacement part number	Descriptions
SR5 Tray 2 paper sensor	RM2-1946-000CN (part not available)	Size detect switch
SR8 Tray 1 paper sensor	RM2-6807-000CN	Right door assembly
SR10 Output bin media out sensor	RM2-6621-000CN	Paper delivery assembly
SR12 Cassette media out sensor	RM2-6556-000CN	Paper pickup assembly
SR20 Tray 3-X media out sensor[1]	RM2-6556-000CN	Paper pickup assembly **NOTE:** Also associated with the media presence sensor.
SR21 Tray 3 feed sensor[1]	RM2-5145-000CN	Paper feeder assembly
SW20 Right door sensor[1]	RM2-6807-000CN	Right door assembly
SW21 Tray 3 cassette sensor[1]	WC2-5803-000CN	Switch button assembly

[1] Only appears if optional accessories are installed.

Tools for troubleshooting: Print/stop test

Use this diagnostic test to isolate the cause of problems such as image-formation defects and jams within the engine. During this test, stop the paper anywhere along the printer paper path. The test can be programmed to stop printing internal pages or an external print job when the paper reaches a certain position. The test can also be programmed to stop from 0 to 60,000 ms. If the timer is set to a value that is greater than the job-print time, the printer can recover in one of two ways:

- After the print job is completed press OK button to return to the Troubleshooting menu before the timer times out.

- After the timer times out, touch the Stop button. Activate the door switch to restart the engine and return it to a normal state.

NOTE: Do not try to perform a print/stop test while the printer is calibrating, because restarting the printer might be necessary. If a jam message displays on the control panel during testing, activate the door switch.

Access the print/stop test from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

   - Troubleshooting

   - Diagnostic Tests

   - Print/Stop Test

3. Enter a range, and then touch the OK button.

Access the print/stop test from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Test, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Print/Stop Test, and then press the OK button.

Tools for troubleshooting: Component tests

Use the procedure below to test various printer mechanical and electromechanical assemblies.

📝 **NOTE:** The menu list of components for the Component Test varies depending on which optional accessories are installed.

The table in this section describes the components available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

Individual component diagnostics (special-mode test)

This test activates individual parts independently to isolate problems.

📝 **NOTE:** The front door or right side door interlocks must be defeated to run the component tests. Some tests might require that the ITB and toner cartridges be removed. A control panel display prompt appears indicate removing some, or all of the cartridges, during certain tests.

Access the individual component diagnostics from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

   ● Troubleshooting

   ● Diagnostic Tests

   ● Component Test

3. Select the component test options for the test.

Access the individual component diagnostics from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Troubleshooting, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Diagnostic Test, and then press the OK button.

4. Use the down arrow ▼ button to scroll to Component Test, and then press the OK button.

📝 **NOTE:** The table in this section describes the components available with an optional 1x550-sheet paper feeder installed.

For trays other than Tray 1 or Tray 2, the tray number associated with a sensor or switch depends on the number and type of accessories installed.

Table 2-14 Component test details

Component test	Item tested	Replacement part number	Comments
Feed roller clutch	CL1	RM2-2091-000CN Lifter drive assembly	Activates the specified clutch.
Drum motors	M1 M2 M3	RM2-1956-000CN	Activates the specified motor.
Fuser drive assembly	M4	RM2-1934-000CN	Activates the specified motor.
Tray 2 pickup motor	M5	RM2-1222-000CN Pickup drive assembly	Activates the specified motor.
Fuser pressure release motor	M6		Activates the specified motor.
Laser Scanner motor	M7	RM2-1237-000CN Laser/scanner assembly	Activates the specified motor.
Duplexer pickup motor	M8		Activates the specified motor.
Tray 3 pickup motor[1]	M20	RM2-5145-000CN Paper feed assembly	Activates the specified motor.
Tray 2 pickup solenoid	SL1	RM2-0090-000CN (M553n) RM2-0022-000CN (M552dn, M553dn, M553x, M577) Tray 1 roller alienation (part of secondary transfer assembly)	Activates the specified solenoid.
Tray 1 pickup solenoid	SL2	RM2-1235-000CN Paper pickup assembly	Activates the specified solenoid.
Duplex switchback solenoid	SL3		Activates the specified solenoid.
Tray 3-X pickup solenoid	Not applicable	RM2-5154-000CN Paper pickup assembly	Activates the specified solenoid.
Repeat	Not applicable	Not applicable	Choose Off to execute the test once. Choose On to execute the test continuously.

[1]   Only appears if optional accessories are installed.

Scanner tests (MFP only)

Use these diagnostic tests to manually test the document feeder and scanner sensors.

Scanner tests

This section lists the sensors available in the Scanner Tests.

Use the scanner tests

The Scanner Tests screen shows the sensor name, sensor state (active or inactive), and the number of times the sensor has been toggled (activated).

1. From the Home screen on the printer control panel, scroll to and touch the Support Tools button.

2. Open the following menus:

    - Troubleshooting

    - Diagnostic Tests

    - Scanner Tests

    - Sensors

3. Touch the sensor name on the Scanner Tests screen to display a sensor location graphic on the control panel display.

4. Activate the desired sensor, and then check the control panel display to verify the sensor state (active or inactive).

    - The State virtual LED next to the sensor number and sensor name illuminates green when the sensor is active.

    - The Toggle virtual LED next to the sensor number and sensor name illuminates green after the sensor is activated and increments by one each time the sensor is interrupted (activated or deactivated).

        For example, opening and closing the flatbed cover increments the Flatbed Cover Toggle item count two times—once when the door is opened, and once when the door is closed.

5. Touch the Reset Sensors button to reset the Toggle count item.

    -or-

    Touch the Cancel button to exit the Scanner Tests screen, and then touch the Cancel button again to return to the Diagnostic Tests menu.

Scanner sensor tests

- ADF paper present

- ADF Y (length)

- ADF jam cover

- ADF paper path deskew

- ADF paper path pick success

- Paper path sensor 1 (unreachable)
- Flatbed Y (length)
- Flatbed cover

Diagrams

Use the diagrams in this section to identify printer components.

Diagrams: Block diagrams

Use the diagrams in this section to identify printer sensors, switches, and assemblies.

Sensors and switches

Figure 2-50 Printer base, sensors and switches block diagram
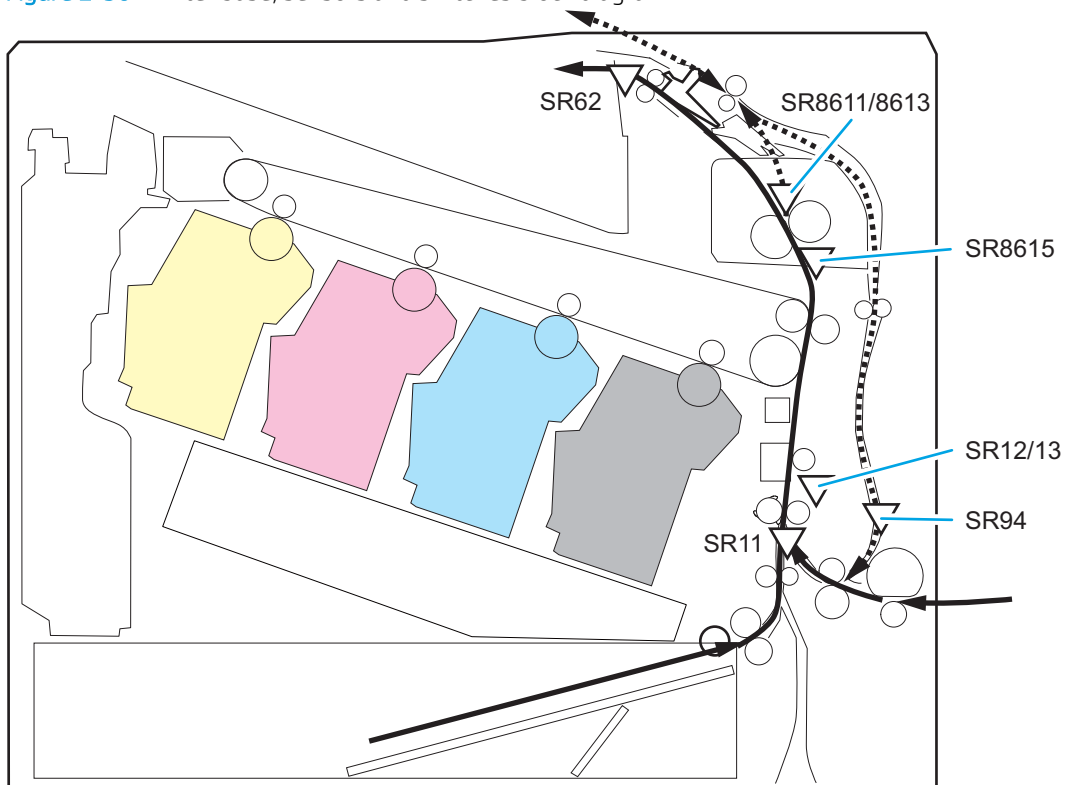
Table 2-15 Product base, sensors and switches block diagram

Sensor	Description	Sensor	Description
SR11	Registration sensor	SR94	Duplex feed sensor (duplex models only)
SR12	Registration media width sensor 1	SR8611	Fuser output sensor 1
SR13	Registration media width sensor 2	SR8613	Fuser output sensor 1
SR62	FD1 media full sensor	SR8615	Fuser loop sensor

Figure 2-51 1x550-sheet paper feeder, sensors and switches block diagram
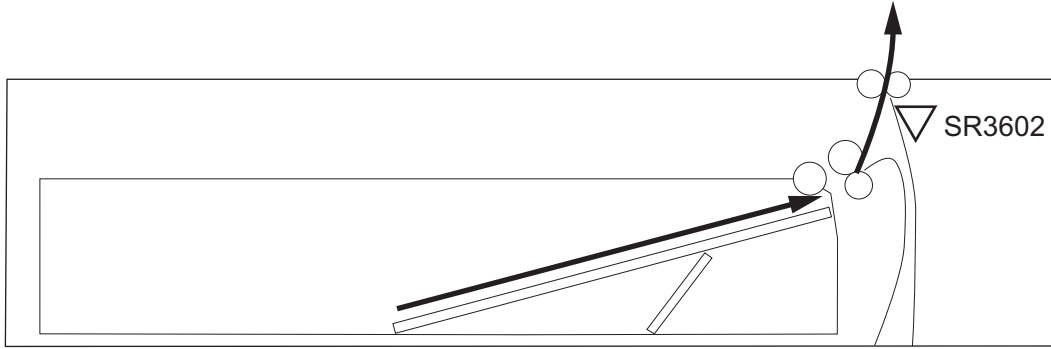
Table 2-16 1x500-sheet paper feeder, sensors and switches block diagram

Sensor	Description
PS3602	Paper feeder sensor (550-sheet feeder only)

Figure 2-52 Paper deck, sensors and switches block diagram
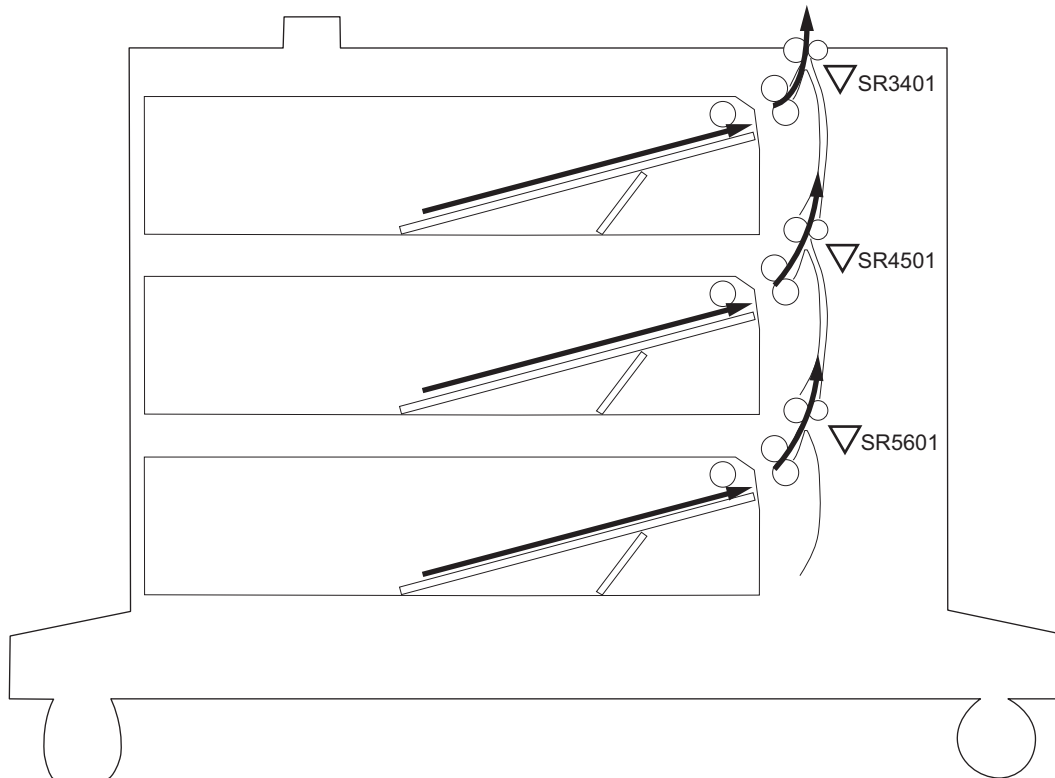
Table 2-17 Paper deck, sensors and switches block diagram

Sensor	Description
PS3401	Paper deck cassette 1 feed sensor (1x550-sheet paper deck, 3x550-sheet paper deck, and HCI only)
PS4501	Paper deck cassette 2 feed sensor (3x550-sheet paper deck and HCI only)
PS5601	Paper deck cassette 3 feed sensor (3x550-sheet paper deck only)

Figure 2-53 HCI, sensors and switches block diagram

▽SR3401

▽SR4501
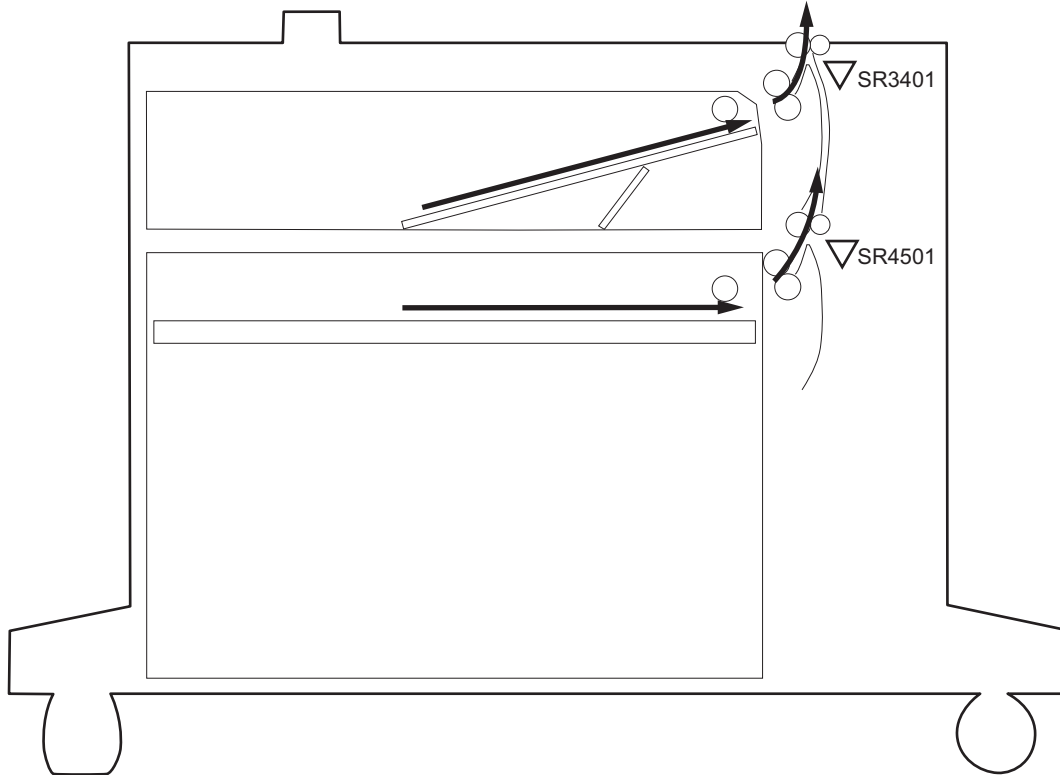
Table 2-18 HCI, sensors and switches block diagram

Sensor	Description
PS3401	HCI cassette 1 feed sensor
PS4501	HCI cassette 2 feed sensor

Figure 2-54 HP Stapling Mailbox, sensors and switches block diagram
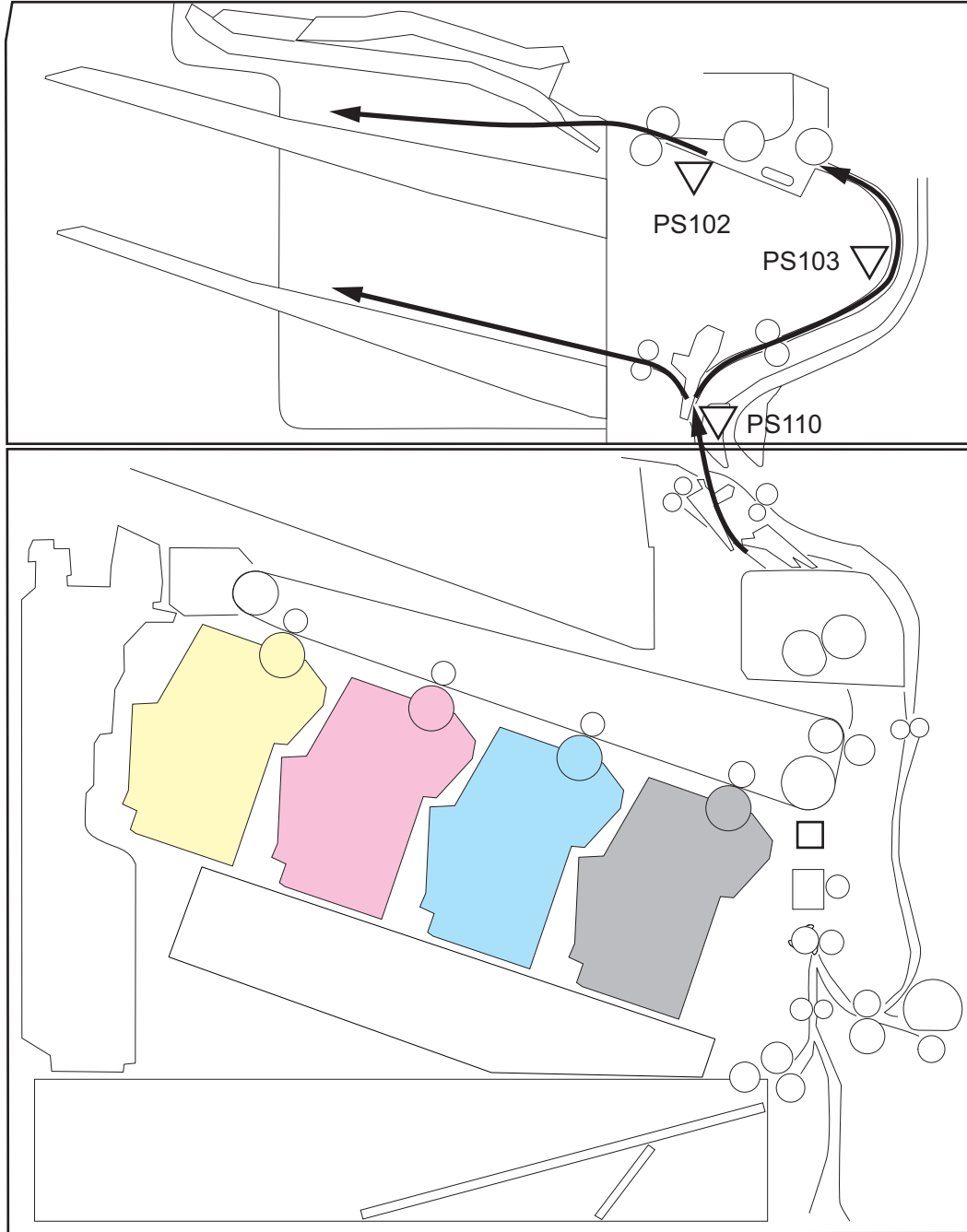
Table 2-19 HP Stapling Mailbox, sensors and switches block diagram

Sensor	Description
PS102	Stapler/stacker exit sensor
PS103	Staple inlet sensor
PS110	Stapler/stacker inlet sensor

Cross section diagrams

Figure 2-55 Printer base, cross section diagram
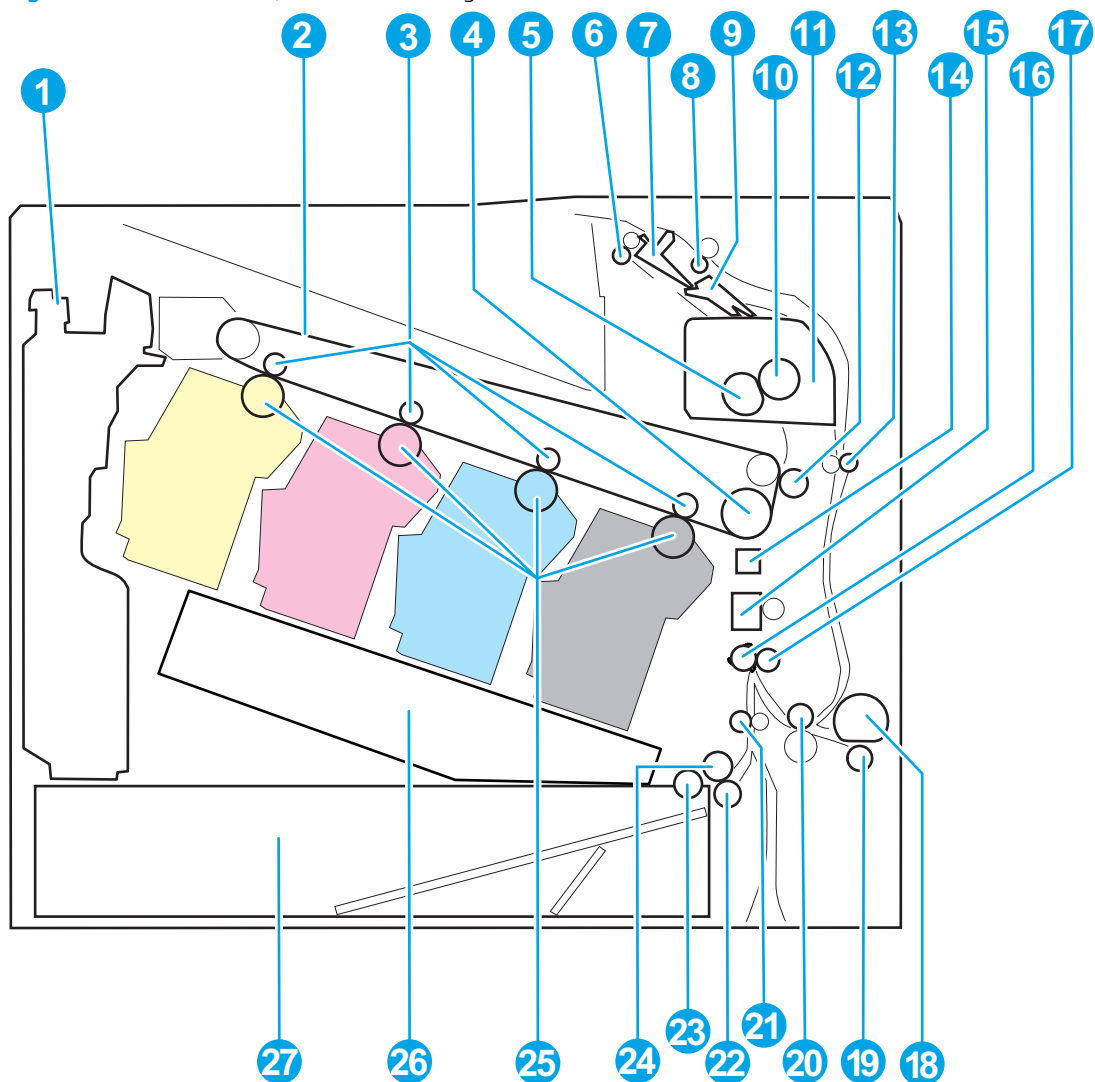
Table 2-20 Product base, cross section diagram

Item	Description	Item	Description
1	Toner collection unit	15	Media sensor
2	ITB	16	Registration shutter
3	T1 roller	17	Registration roller
4	ITB drive roller	18	Tray 1 pickup roller
5	Fuser film	19	Tray 1 separation roller
6	Output roller	20	Duplex re-pickup roller
7	Output accessory flapper	21	Intermediate feed roller
8	Duplex switchback roller	22	Tray 2 separation roller
9	Duplex flapper	23	Tray 2 pickup roller

Item	Description	Item	Description
10	Pressure roller	24	Tray 2 feed roller
11	Fuser	25	Photosensitive drum
12	T2 roller	26	Laser scanner assembly
13	Duplex feed roller	27	Tray 2
14	Registration density sensor		

Figure 2-56 1x550-sheet paper feeder, cross section diagram
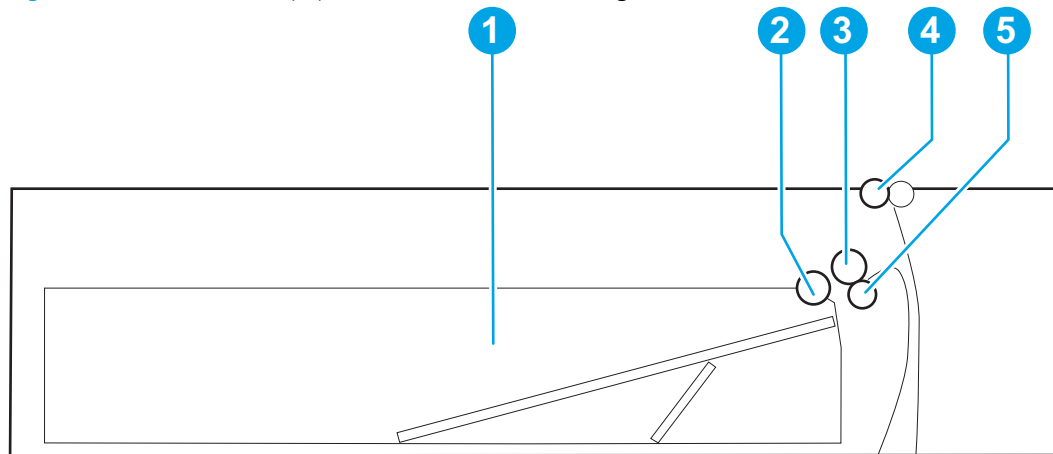
Table 2-21 1x550-sheet paper feeder, cross section diagram

Item	Description
1	Cassette
2	Cassette pickup roller
3	Cassette feed roller
4	Feed roller
5	Cassette separation roller

Figure 2-57 Paper deck, 1x550, cross section diagram
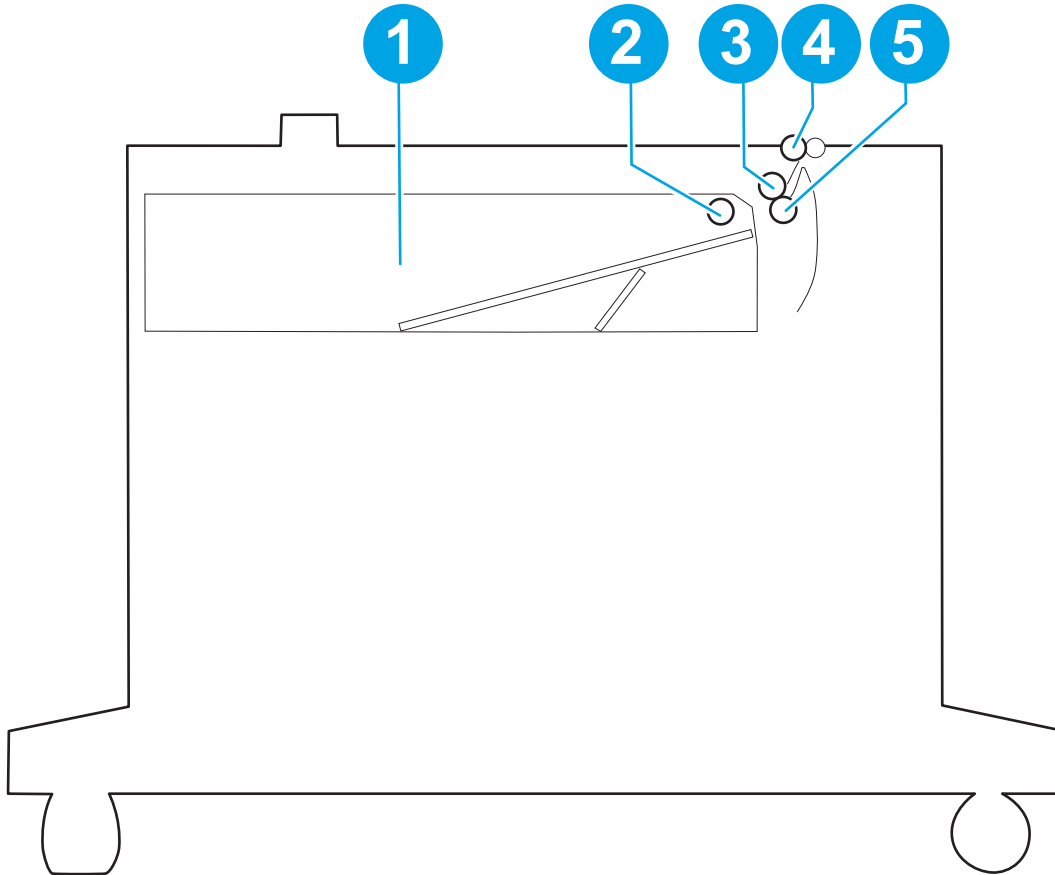
Table 2-22 Paper deck, 1x550, cross section diagram

Item	Description
1	Cassette
2	Cassette pickup roller
3	Cassette feed roller
4	Feed roller
5	Cassette separation roller

Figure 2-58 Paper deck, 3x550, cross section diagram

Figure 2-58 Paper deck, 3x550, cross section diagram
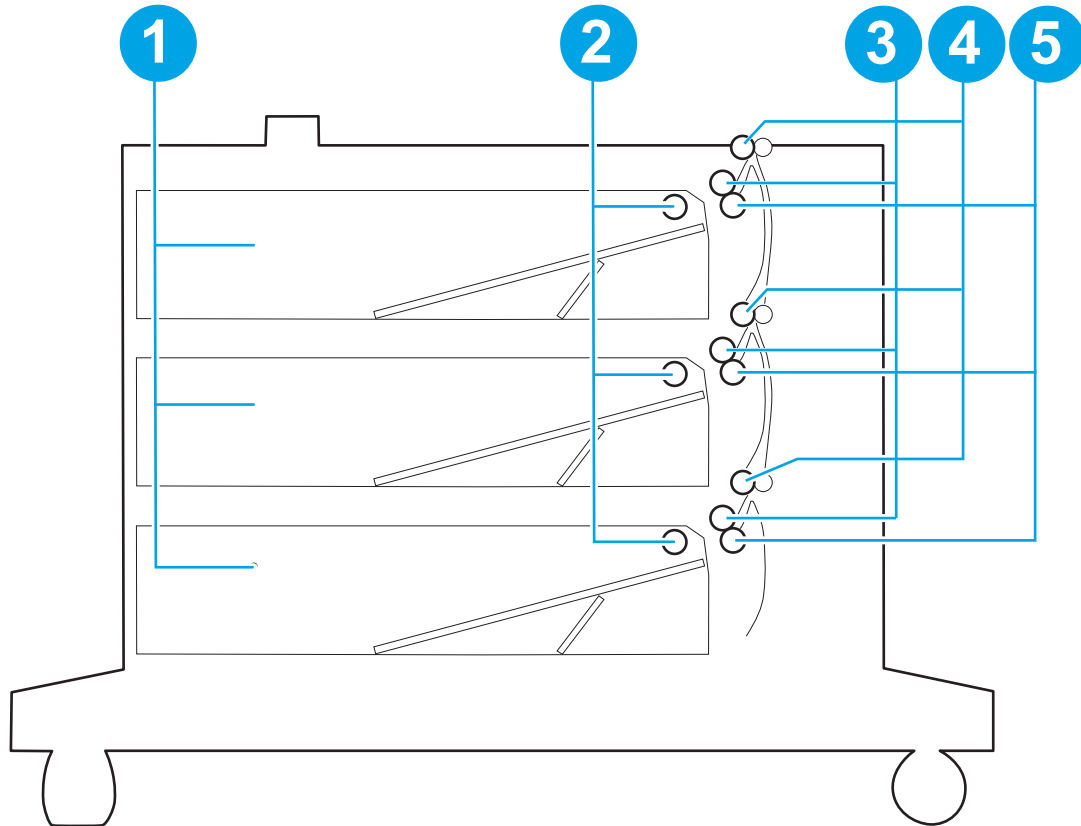
Table 2-23 Paper deck, 3x550, cross section diagram

Item	Description
1	Cassette
2	Cassette pickup roller
3	Cassette feed roller
4	Feed roller
5	Cassette separation roller

Figure 2-59 HCI, cross section diagram
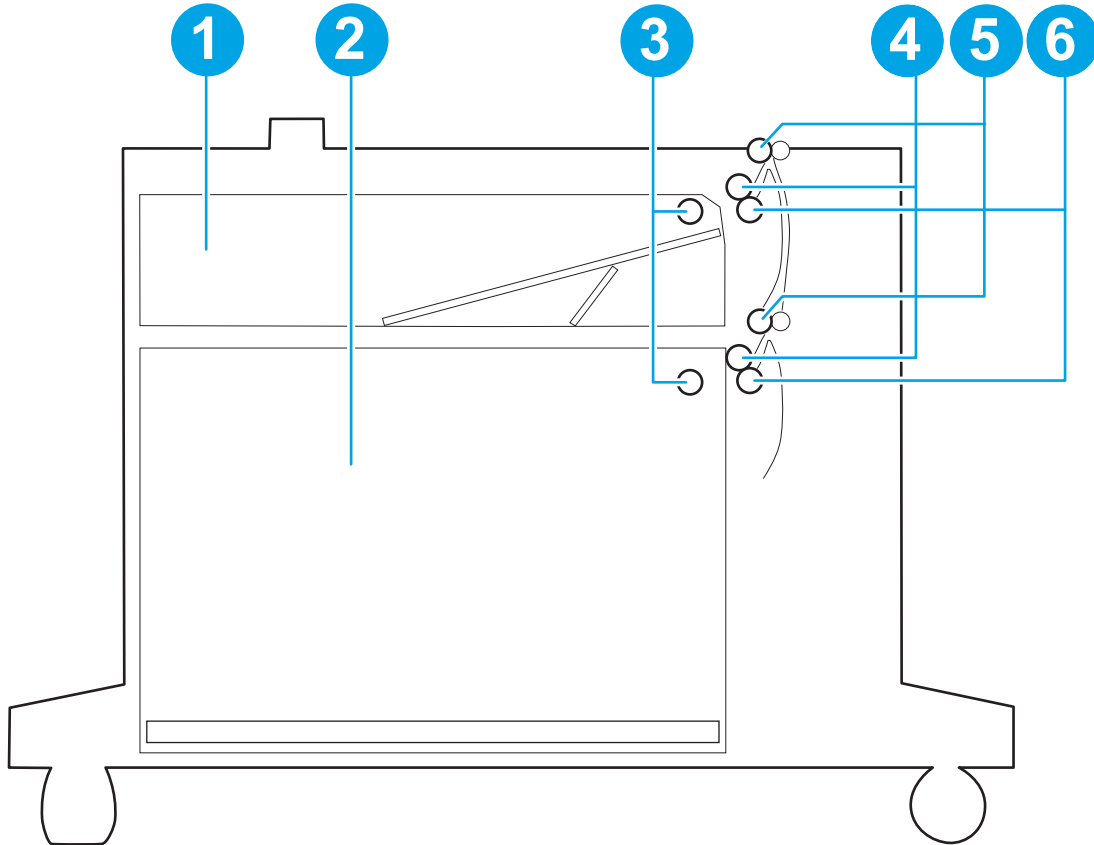
Table 2-24 HCI, cross section diagram

Item	Description	Item	Description
1	Cassette	4	Cassette feed roller
2	Paper tray	5	Feed roller
3	Cassette pickup roller	6	Cassette separation roller

Figure 2-60 HP Stapling Mailbox, cross section diagram
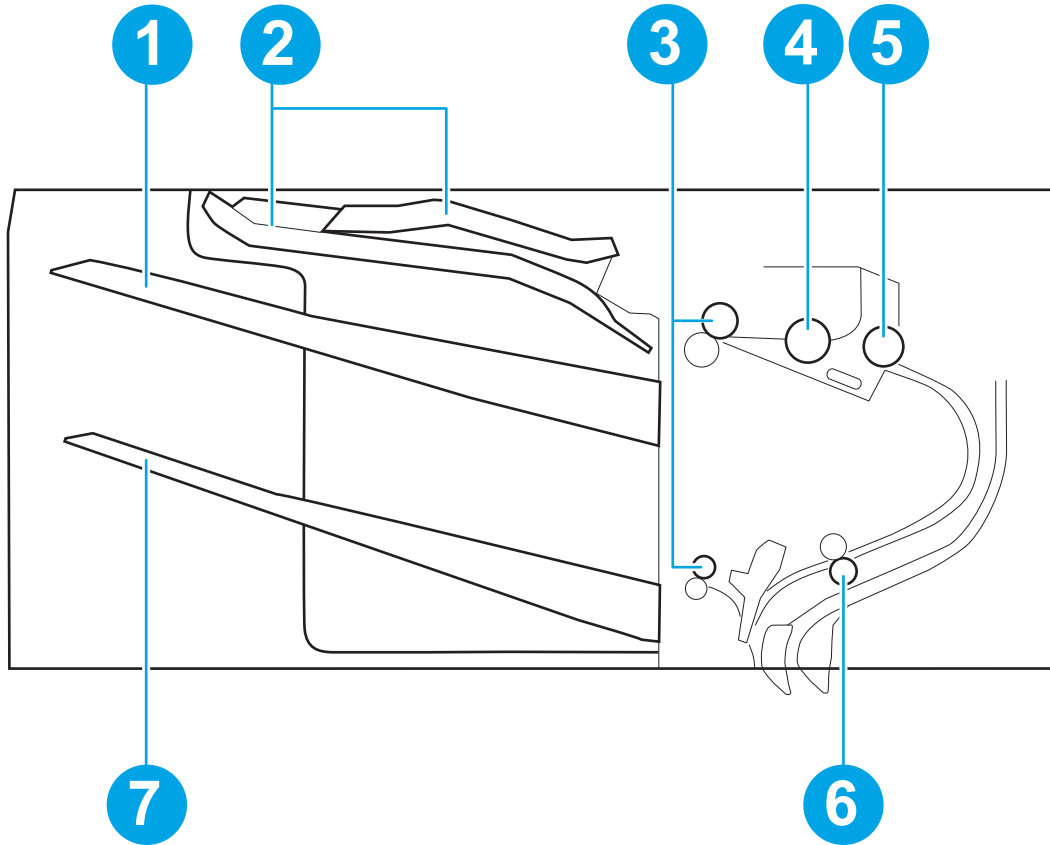
Table 2-25 HP Stapling Mailbox, cross section diagram

Item	Description	Item	Description
1	Output bin 1	5	Exit feed roller
2	Jogger guide	6	Inlet feed roller
3	Output bin delivery roller	7	Output bin 2
4	Alignment roller		

Printed circuit assembly (PCA) connector locations

Use the diagrams in this section to identify printer PCA connector locations.

DC controller connections

Each of the connections on the DC controller PCA is indicated in the following figure.

Figure 2-61 DC controller PCA connectors
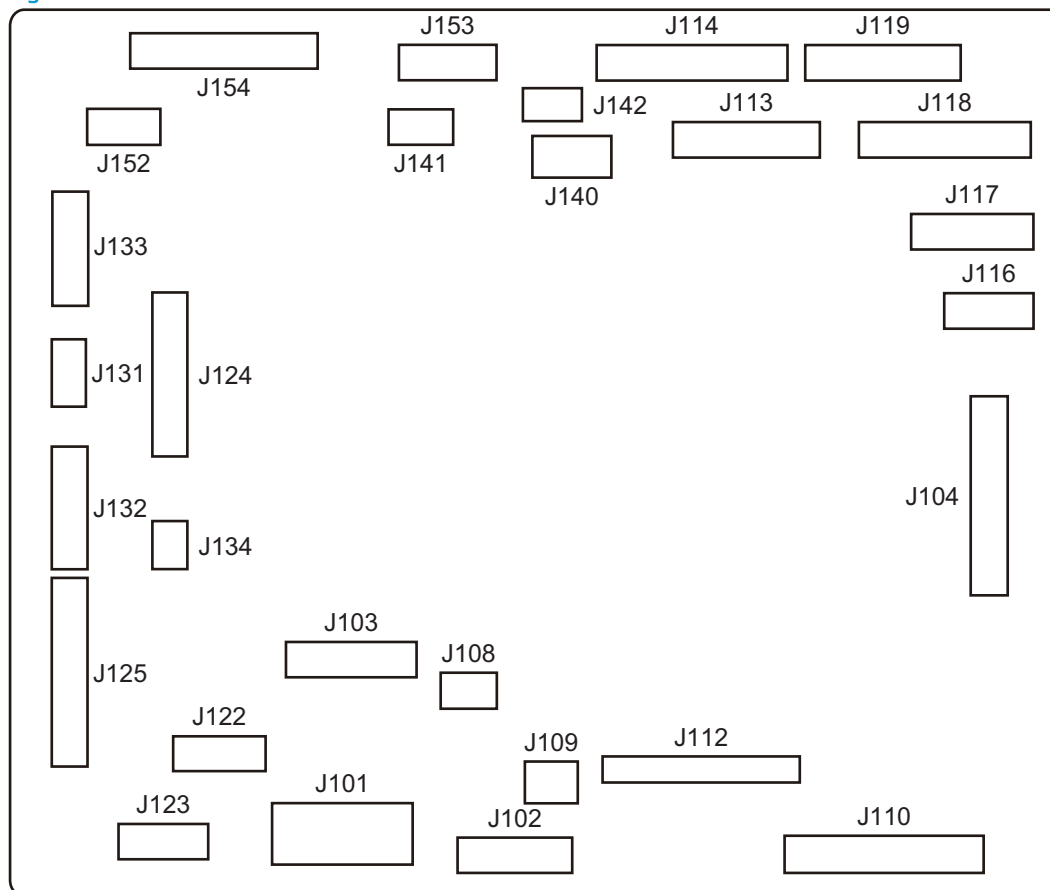
Table 2-26 DC controller connectors

Item	Description	Item	Description
J101	Low-voltage power supply	J122	Pickup motor
J102	Low-voltage power supply	J123	Tray 2 media size switch
			Laser scanner assembly
J103	Low-voltage power supply	J124	Tray 1 pickup solenoid
			Duplex feed sensor
			Tray 1 media out sensor
			Environment sensor
			Cartridge fan
			Tray 2 pickup clutch

Table 2-26 DC controller connectors (continued)

Item	Description	Item	Description
J104	Formatter	J125	Input accessory
			E-label
J108	24V interlock switch	J131	Media sensor
J109	5V interlock switch	J132	Registration density sensor assembly
J110	Laser scanner assembly	J133	Duplex re-pickup clutch
			Registration sensor
			Registration media width sensor 1
			Registration media width sensor 2
J112	High-voltage power supply D	J134	Tray 2 media out sensor
J113	High-voltage power supply T	J140	Not used
J114	High-voltage power supply T	J141	Not used
J116	Output accessory (MFP only)	J142	Not used
J117	Drum home position sensor Y	J152	Power supply switch
	Drum home position sensor MC		FD1 media full sensor
	Drum home position sensor K		
	Developer alienation sensor		
J118	Drum motor 3	J153	Duplex flapper position sensor
	Fuser motor		Duplex switchback solenoid
	T1 roller alienation solenoid		Duplex switchback motor
J119	Drum motor 1	J154	Fuser
	Drum motor 2		

Formatter PCA (M652, M653)

Each of the connections on the M652 and M653 formatter PCA is indicated in the following figure.

Figure 2-62 Formatter PCA connectors (M652, M653)
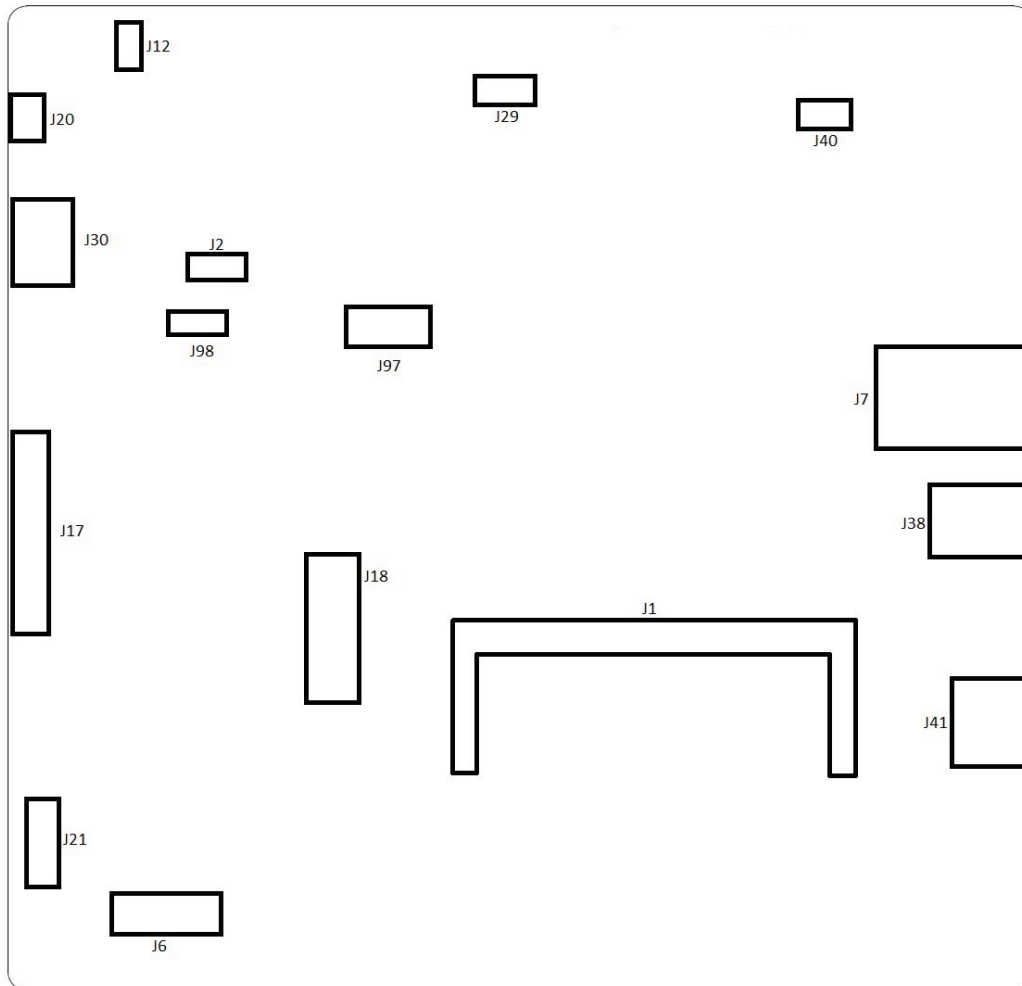
Table 2-27 Formatter PCA connectors (M652, M653)

Item	Description	Item	Description
J1	SO-DIMM	J21	Internal USB ports (AA module) connector
J2	Control panel power	J29	IOD connector
J6	Engine power	J30	Control panel HDMI
J7	Ethernet	J38	Host USB
J12	HIP cable connector	J40	Wireless/BLE module connector
J17	Engine VIF	J41	Device USB
J18	HDD riser connector	J97	eMMC connector
J20	Walk-up USB cable connector	J98	Aux connector

Formatter PCA (M681, M682)

Each of the connections on the M681 and M682 formatter PCA is indicated in the following figure.

Figure 2-63 Formatter PCA connectors (M681, M682)
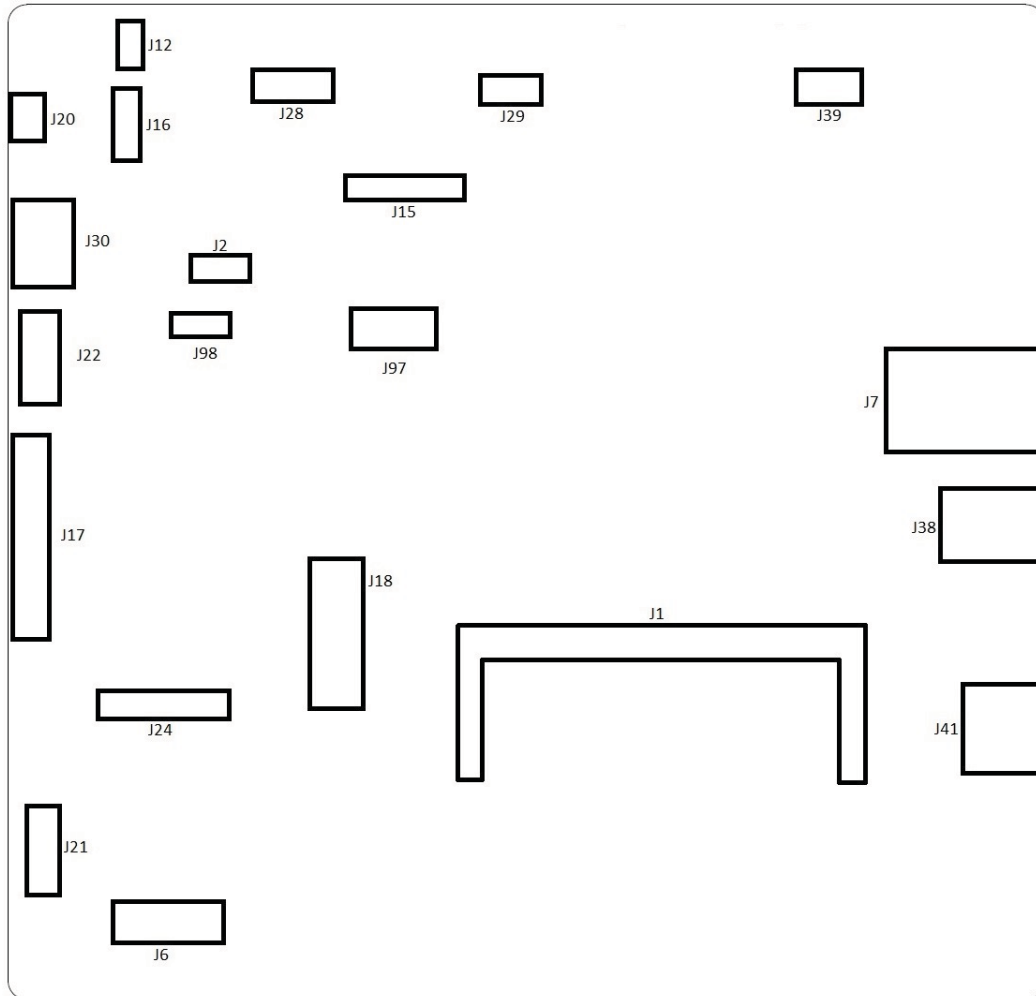
Table 2-28 Formatter PCA connectors (M681, M682)

Item	Description	Item	Description
J1	SO-DIMM	J21	Internal USB ports (AA module) connector
J6	Engine power	J28	CAN connector for output device
J7	Ethernet	J29	IOD connector
J12	HIP cable connector	J30	Control panel HDMI
J15	Fax card connector	J38	Host USB
J16	Control panel power	J39	Wireless/BLD module connector
J17	Engine VIF	J41	Device USB
J18	HDD riser connector	J97	eMMC connector
J20	Walk-up USB cable connector	J98	Aux connector

1x550-sheet paper feeder controller PCA connections

Each of the connections on the 1x550-sheet paper feeder controller PCA is indicated in the following figure.

Figure 2-64 1x550-sheet paper feeder controller PCA connectors
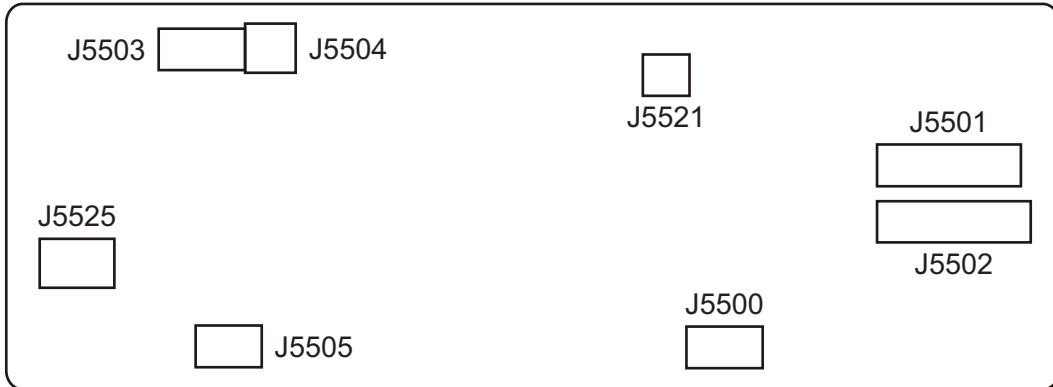
Table 2-29 1x550-sheet paper feeder controller PCA connectors

Item	Description	Item	Description
J5500	Not used	J5504	Paper feeder door switch
J5501	Printer or paper feeder	J5505	Paper feeder media size switch
J602	Paper feeder	J5521	Paper feeder pickup clutch
J5503	Paper feeder feed sensor	J5525	Paper feeder feed motor
	Paper feeder media out sensor		

Paper decks

Each of the connections on the paper deck controller PCA is indicated in the following figure.

Figure 2-65 Paper deck controller PCA connectors, 1x550

J5000

J5002

J5007

J5017

J5005

J5003

J5006

J5004

J5018

J5020
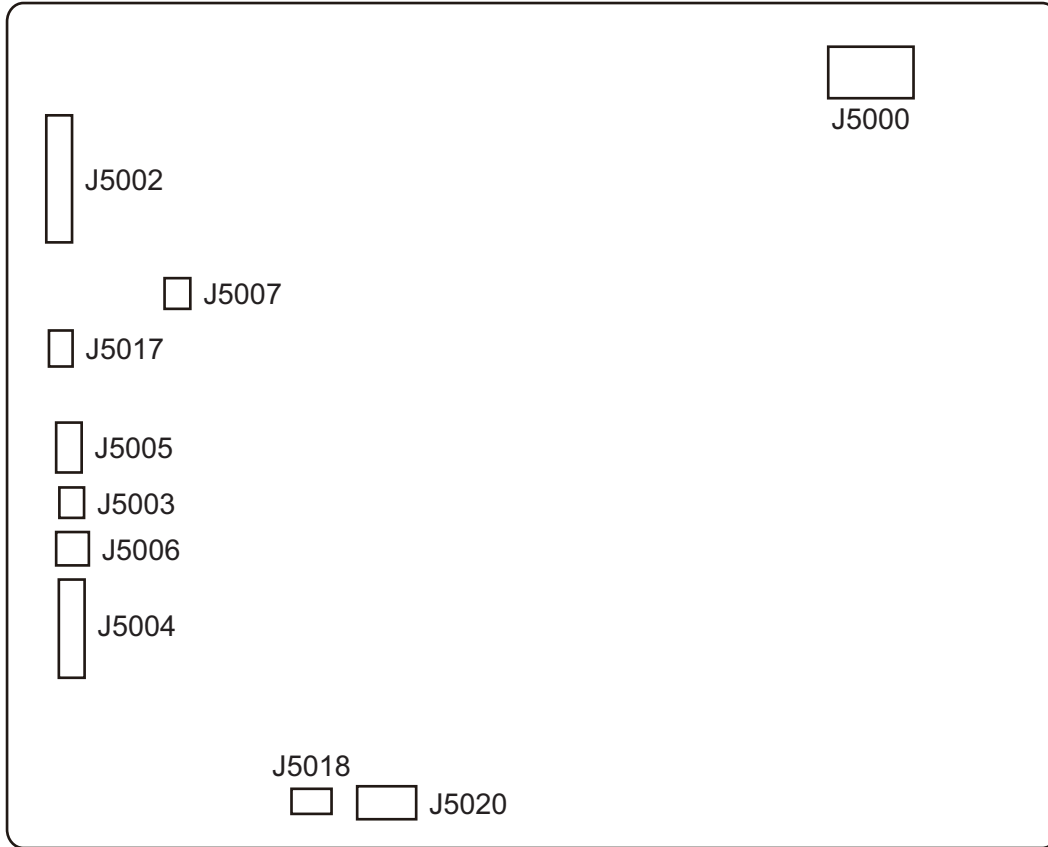
Table 2-30 Paper deck controller PCA connectors, 1x550

Item	Description	Item	Description
J5000	Not used	J5006	Paper deck door switch
J5002	Printer	J5007	Paper deck cassette 1 lifter motor
J5003	Paper deck cassette 1 media size switch 2	J5017	Paper deck cassette 1 pickup clutch
J5004	Paper deck cassette 1 feed sensor	J5018	Paper deck pickup roller alienation sensor
	Paper deck cassette 1 media out sensor		
	Paper deck cassette 1 media surface sensor		
J5005	Paper deck cassette 1 media size switch 1	J5020	Paper deck feed motor 1

Figure 2-66 Paper deck controller PCA connectors, 3x550 and 2,550

J5019

J5000

J5001

J5002

J5015

J5007

J5023

J5017

J5005

J5003

J5006

J5004

J5013

J5026

J5009   J5018   J5011   J5021   J5014   J5010

J5020   J5022
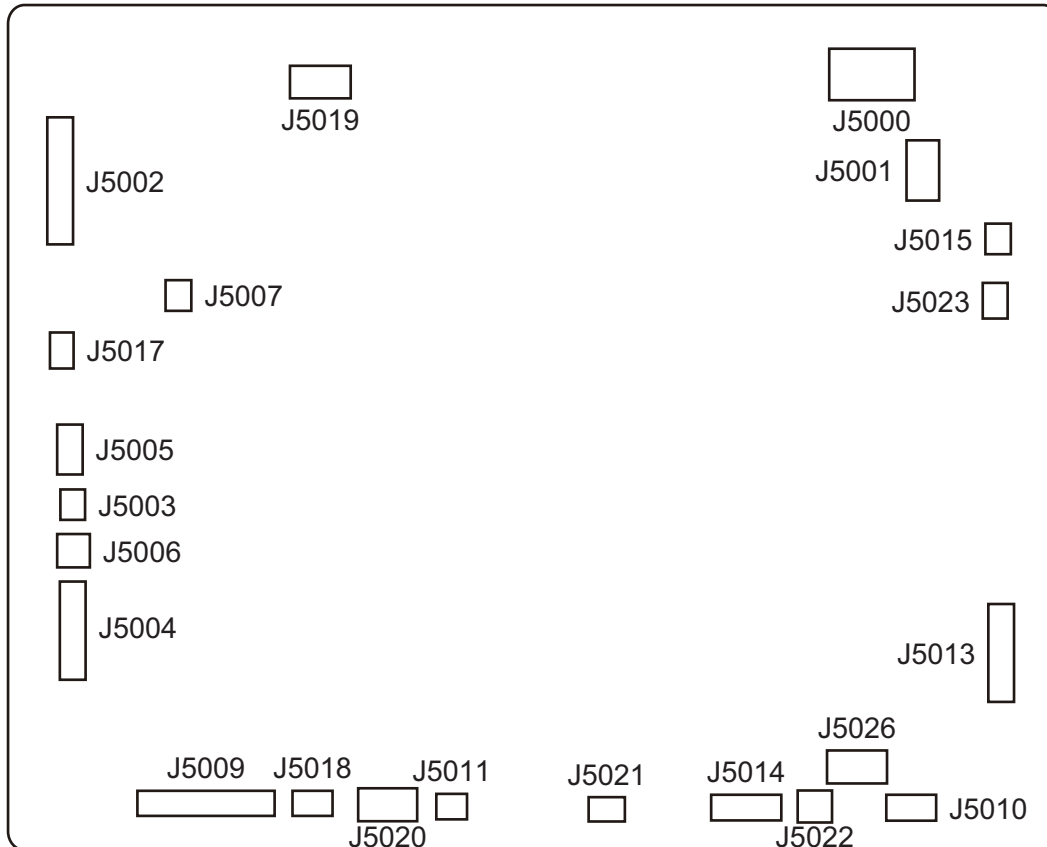
Table 2-31 Paper deck controller PCA connectors, 3x550 and 2,550

Item	Description	Item	Description
J5000	Not used	J5013	Paper deck cassette 3 feed sensor (3x550-sheet paper deck only)
			Paper deck cassette 3 media out sensor (3x550-sheet paper deck only)
			Paper deck cassette 3 media surface sensor (3x550-sheet paper deck only)
J5001	Paper deck feed motor 3 (3x550-sheet paper deck only)	J5014	Paper deck cassette 3 media size switch 2 (3x550-sheet paper deck only)
			Paper deck cassette 3 media size switch 1 (3x550-sheet paper deck only)
J5002	Printer or paper feeder	J5015	Paper deck cassette 3 lifter motor (3x550-sheet paper deck only)
J5003	Paper deck cassette 1 media size switch 2	J5017	Paper deck cassette 1 pickup clutch
J5004	Paper deck cassette 1 feed sensor	J5018	Paper deck pickup roller alienation sensor
	Paper deck cassette 1 media out sensor		
	Paper deck cassette 1 media surface sensor		
J5005	Paper deck cassette 1 media size switch 1	J5019	Paper deck cassette 2 lifter motor (2,550-sheet paper deck only)

Paper deck controller PCA connectors, 3x550 and 2,550 (continued)

Item	Description	Item	Description
J5006	Paper deck door switch	J5020	Paper deck feed motor 1
J5007	Paper deck cassette 1 lifter motor	J5021	Paper deck cassette 2 pickup clutch
J5009	Paper deck cassette 2 feed sensor Paper deck cassette 2 media out sensor Paper deck cassette 2 media surface sensor	J5022	Paper deck cassette 2 media size switch 2 (3x550-sheet paper deck only)
J5010	Paper deck cassette 2 media size switch 1	J5023	Paper deck cassette 3 pickup clutch (3x550-sheet paper deck only)
J5011	Paper deck cassette 2 lifter motor (3x550-sheet paper deck only)	J5026	Paper deck feed motor 2

Stapling mailbox

Each of the connections on the HP Stapling Mailbox controller PCA is indicated in the following figure.

Figure 2-67 HP Stapling Mailbox controller PCA connectors
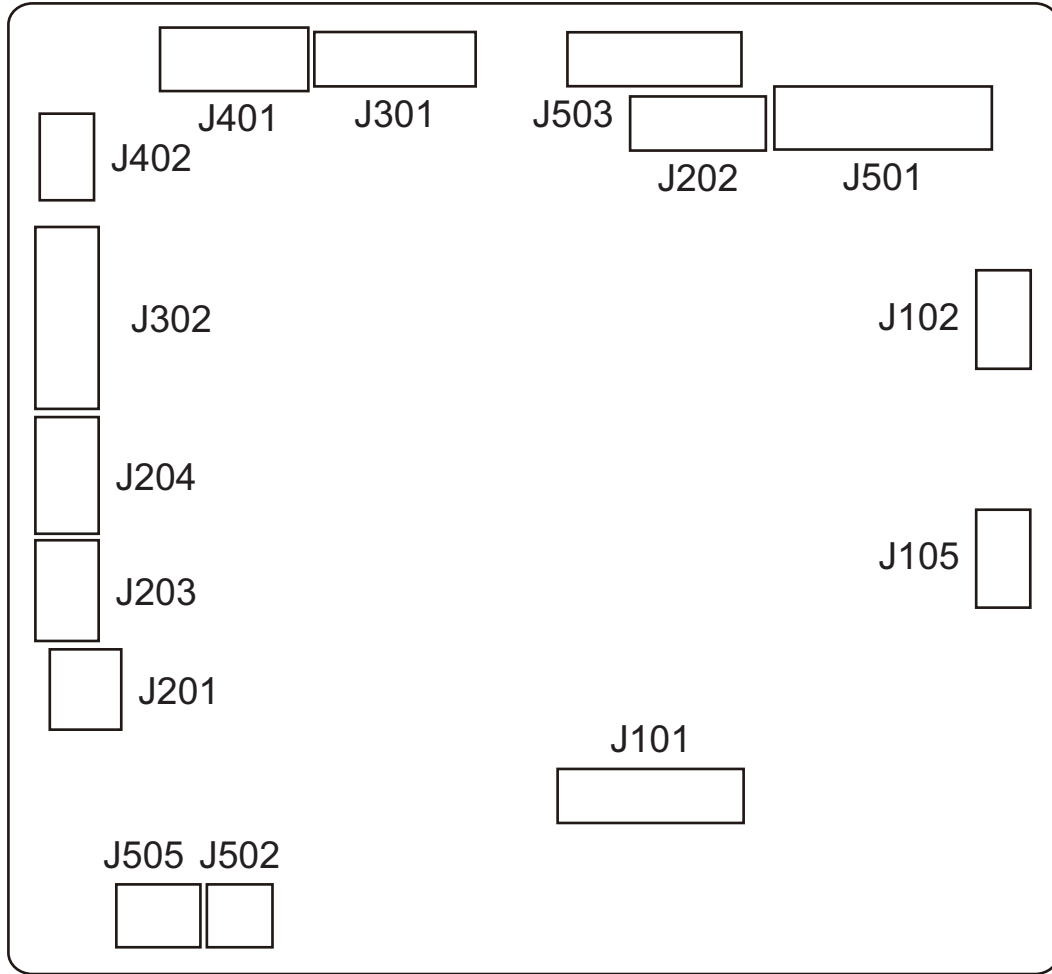
Figure 2-67 HP Stapling Mailbox controller PCA connectors

Table 2-32 HP Stapling Mailbox controller PCA connectors

Item	Description	Item	Description
J101	Printer	J302	Y alignment motor
			Alienation home position sensor
			Stapler/stacker door switch
J102	Not used	J401	Jogger motor
			Jogger home position sensor
J105	Not used	J402	Stapler/stacker feed motor
J201	Staple door switch	J501	Bin 2 media presence sensor
			Bin 2 media full sensor
			Stapler/stacker inlet sensor
			Output bin 2 flapper solenoid

Table 2-32 HP Stapling Mailbox controller PCA connectors (continued)

Item	Description	Item	Description
J202	Lifter motor	J502	Inlet flapper solenoid
	Bin 1 upper limit sensor		
	Bin 1 lower limit sensor		
J203	Stapler	J503	Bin 1 media presence sensor
			Stapler/stacker exit sensor
			Staple inlet sensor
			Stamp solenoid
J204	Stapler	J505	Mailbox fan
J301	Stapler/stacker output motor		
	Y alignment home position sensor		
	Bin 1 media full sensor		

Scanner assembly

Each of the connections on the scanner controller PCA is indicated in the following figure.

Figure 2-68 Scanner controller PCA connectors
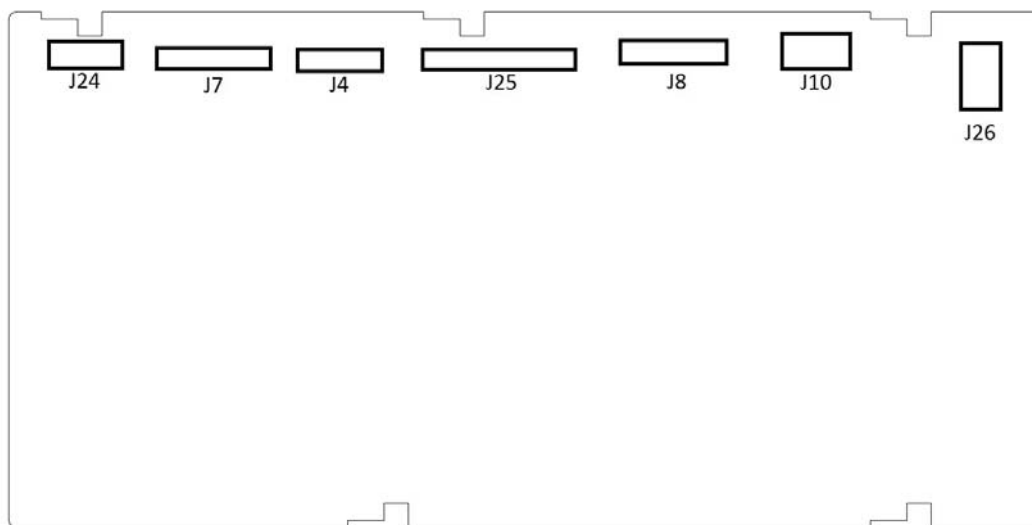
Table 2-33 Scanner controller PCA connectors

Item	Description	Item	Description
J4	ADF sensors	J24	ADF motor
J7	ADF side 2 scan data	J25	Flatbed side1 scan data
J8	Flatbed motor and sensors	J26	Scanner power
J10	Scanner data		

Diagrams: External plug and port locations

Use the following figure to locate and identify the printer external port locations.

Figure 2-69 External plug and port locations (M652, M653)
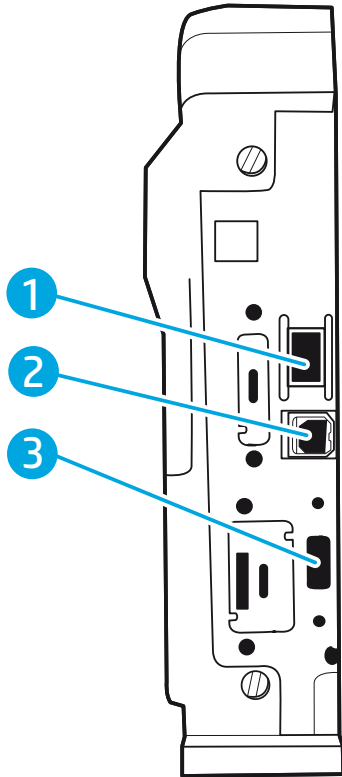
1	Local area network (LAN) Ethernet 10/100/1000 network port
2	Hi-Speed USB 2.0 printing port
3	USB port for connecting external USB devices (this port might be covered)
	NOTE: For easy-access USB printing, use the USB port near the control panel.

Figure 2-70 External plug and port locations (M681, M682)
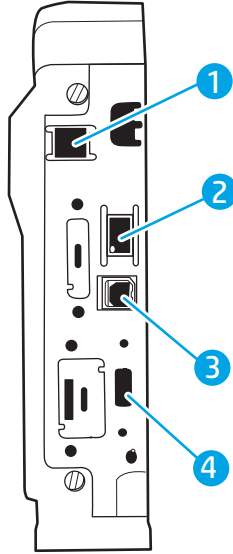
1	Fax port (f and z models only. The port is covered for the dh models.)
2	Local area network (LAN) Ethernet 10/100/1000 Ethernet network port
3	Hi-Speed USB 2.0 printing port
4	USB port for connecting external USB devices (this port might be covered) NOTE: For easy-access USB printing, use the USB port near the control panel.

Diagrams: Locations of major assemblies

Use the figure in this section to identify and locate major components and assemblies in the printer.

Main assemblies (printer base)

Figure 2-71 Main assemblies
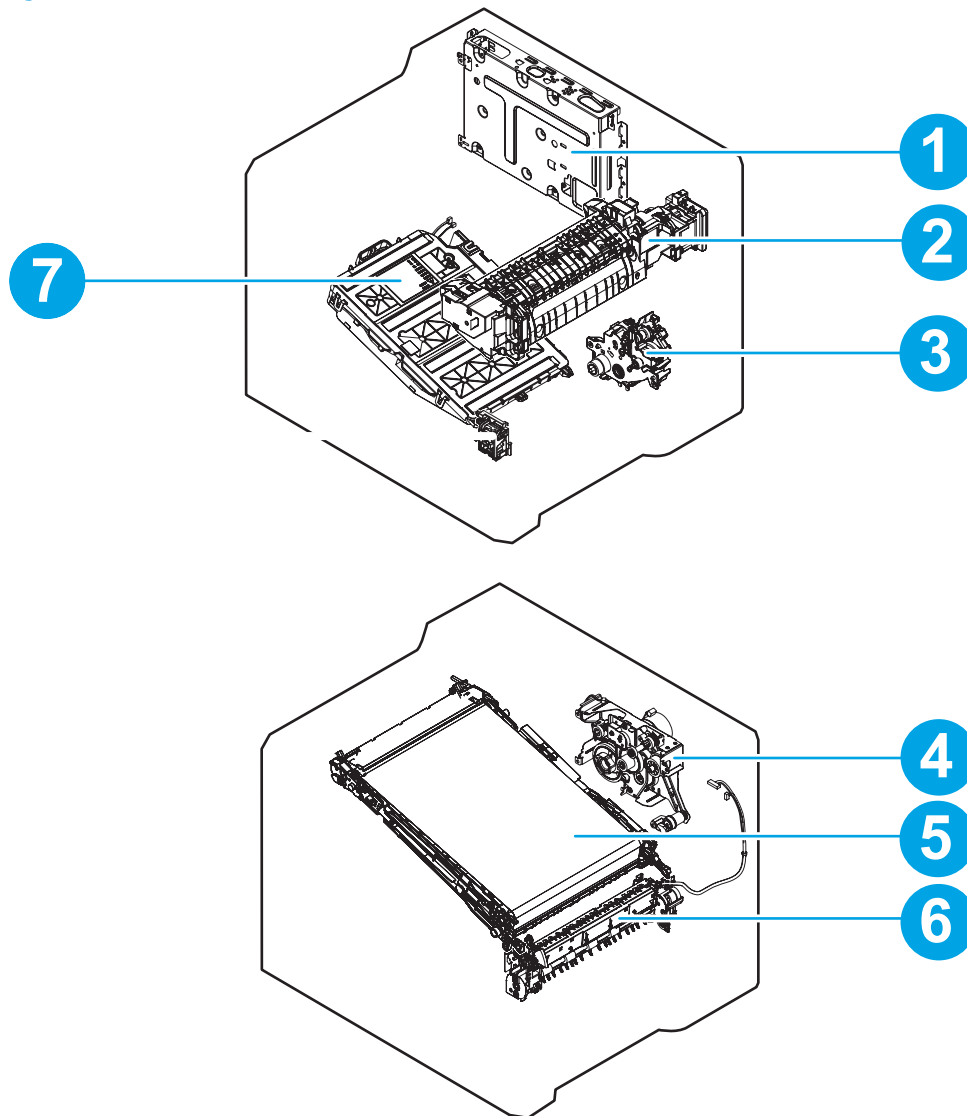
Table 2-34 Main assemblies (printer base)

Item	Description	Item	Description
1	Formatter case assembly	5	ITB assembly
2	Fuser	6	Registration assembly
3	Lifter drive assembly	7	Laser scanner assembly
4	Fuser drive assembly		

Figure 2-72 Main assemblies
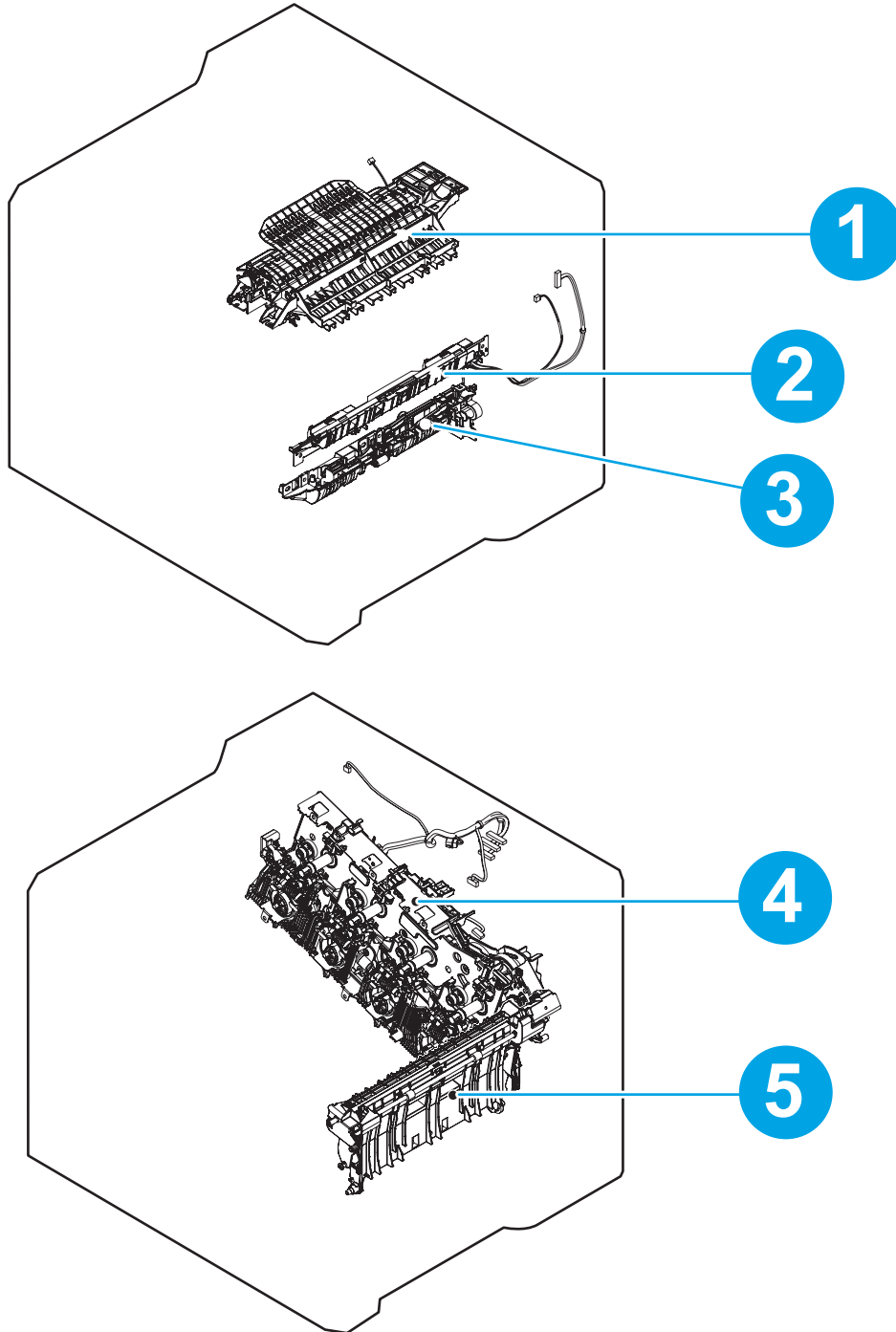
Table 2-35 Main assemblies (printer base)

Item	Description	Item	Description
1	Delivery assembly	4	Main drive assembly
2	Registration density sensor assembly	5	T2 assembly
3	Pickup assembly		

Motor and fans

Figure 2-73 Motors
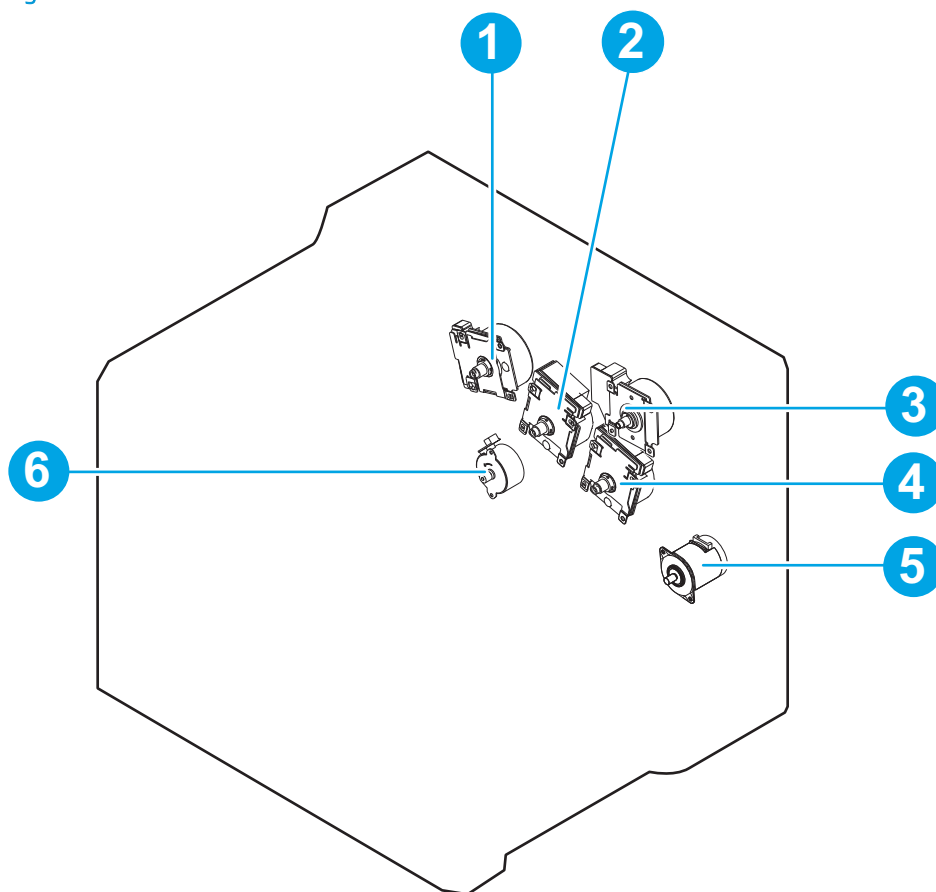
Table 2-36 Motors

Item	Description	Item	Description
1	Drum motor 1	4	Drum motor 3
2	Drum motor 2	5	Pickup motor
3	Fuser motor	6	Developer alienation motor

Figure 2-74 Fans
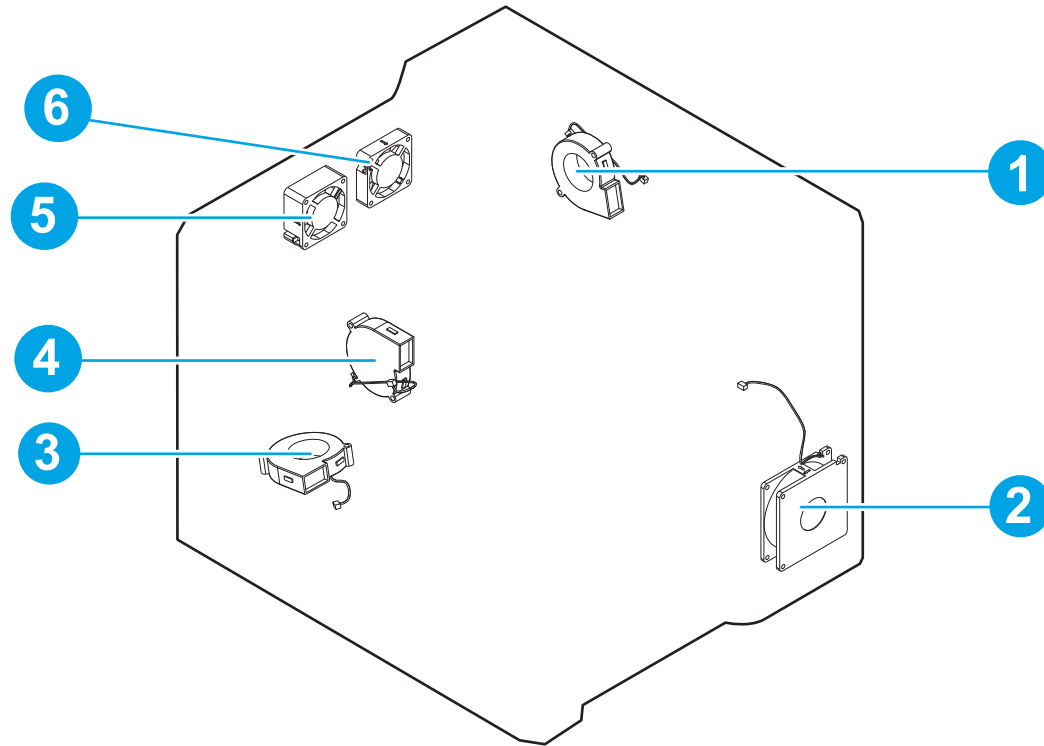
Table 2-37 Fans

Item	Description	Item	Description
1	Rear fan (FM6)	4	Front fan (FM5)
2	Power supply fan (FM1)	5	Left upper front fan (FM3)
3	Cartridge fan (FM2)	6	Left upper rear fan (FM4)

Rollers and toner collection unit

Figure 2-75 Rollers
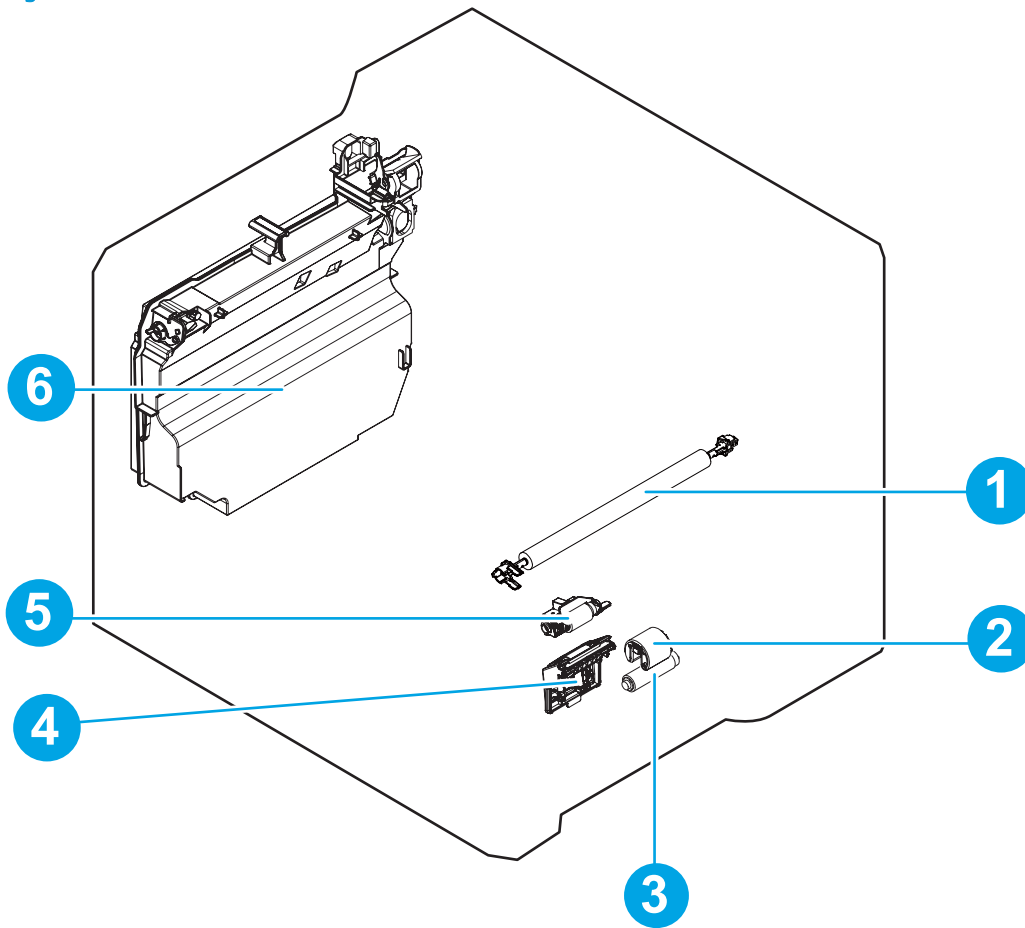
Table 2-38 Rollers

Item	Description	Item	Description
1	T2 roller assembly	4	Tray 2 separation roller assembly
2	Tray 1 pickup roller	5	Tray 2 pickup roller assembly
3	Tray 1 separation roller	6	Toner collection unit

Printed circuit assemblies (PCAs; printer base)

Figure 2-76 PCAs (printer base)
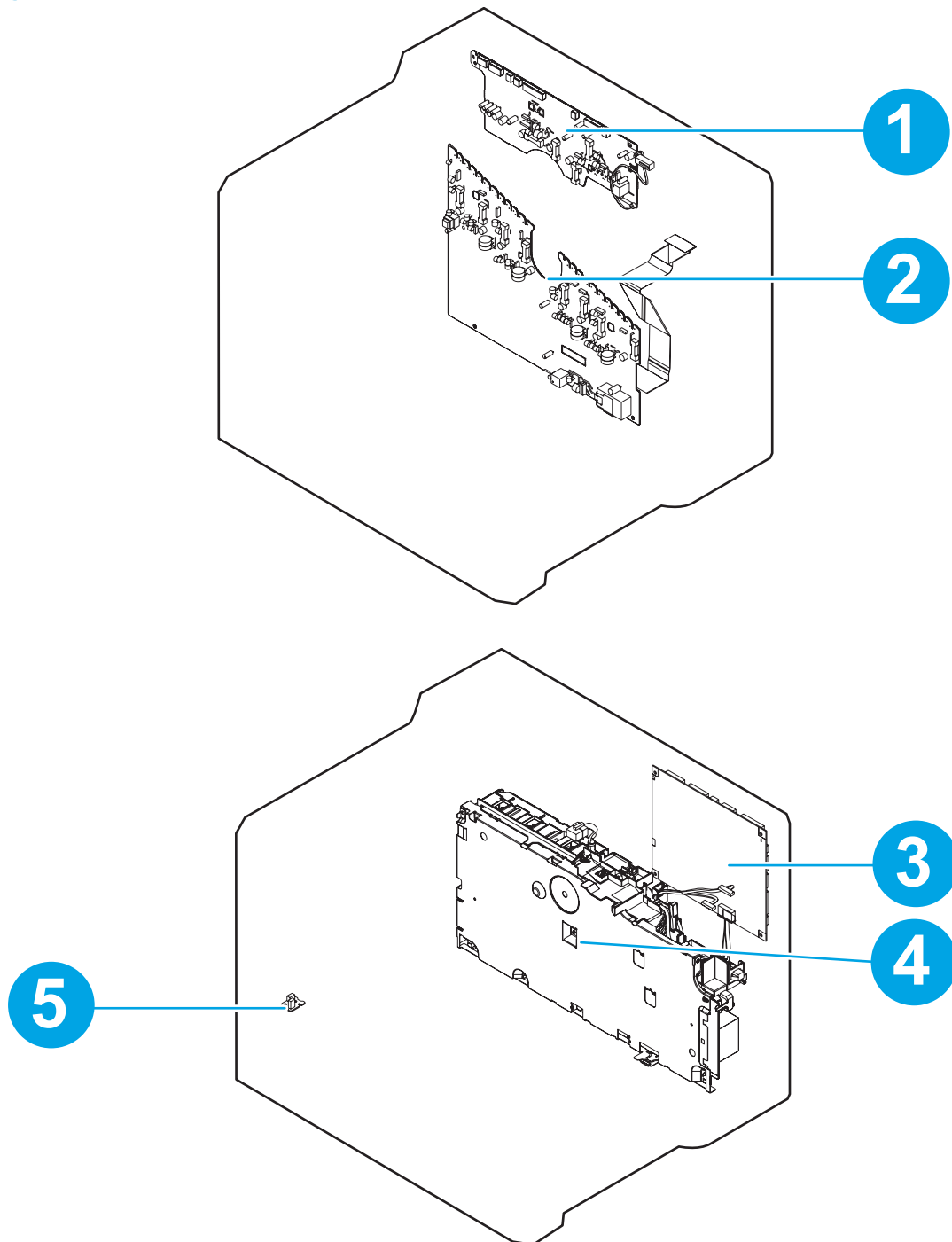
Table 2-39 PCAs (printer base)

Item	Description	Item	Description
1	High-voltage power supply T (transfer) PCA	4	Low-voltage power supply
2	High-voltage power supply D (developer) PCA	5	Environment sensor
3	DC controller PCA		

Diagrams: General timing chart

Figure 2-77 General timing chart

Timing chart two consecutive prints on LTR paper (Full-color 1/1 speed mode)

	Operation	STBY	INTR	PRINT	LSTR	STBY
1	Tray 2 pickup clutch					
2	Registration sensor					
3	Fuser output sensor					
4	Fuser motor					
5	Scanner motor					
6	TOP signal					
7	Drum motor 1					
8	Drum motor 2					
9	Drum motor 3					
10	Pickup motor					
11	Primary charging bias (Y)					
12	Primary charging bias (M)					
13	Primary charging bias (C)					
14	Primary charging bias (K)					
15	Developing bias (Y)					
16	Developing bias (M)					
17	Developing bias (C)					
18	Developing bias (K)					
19	T1 bias (Y/M/C)					
20	T1 bias (K)					
21	T2 bias					
22						
23						
24						

Diagrams: General circuit diagrams

Figure 2-78 General circuit diagram for the printer base (1 of 3)

Figure 2-79 General circuit diagram for the printer base (2 of 3)

Figure 2-80 General circuit diagram for the printer base (3 of 3)

M681/M682

\<Output accessory\>

M652/M653

2.7" & 4.3" control panel

NFC PCA

Wifi antenna

HDMI cable

USB cable

USB cable

DC controller PCA

Formatter

M652/M653/M681/M682

IOD PAC

Formatter

DC contoller PCA
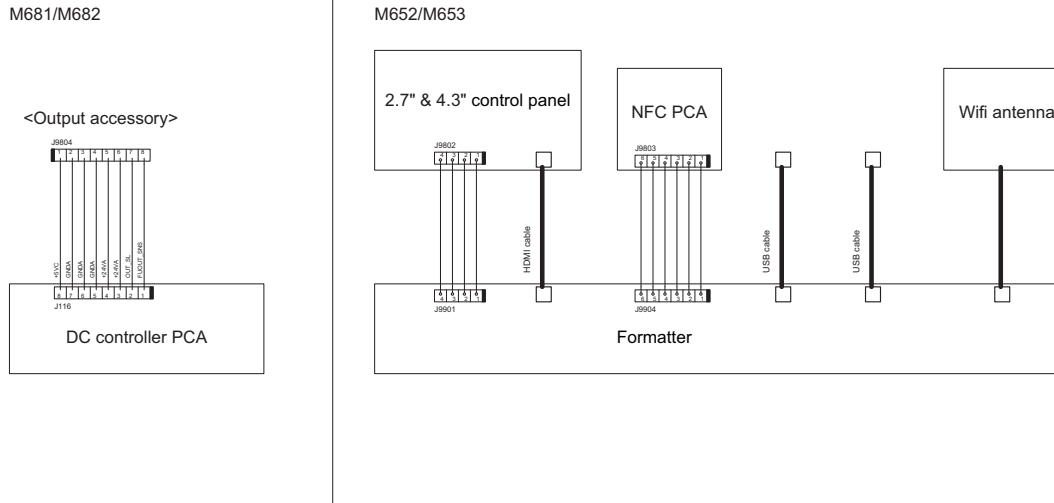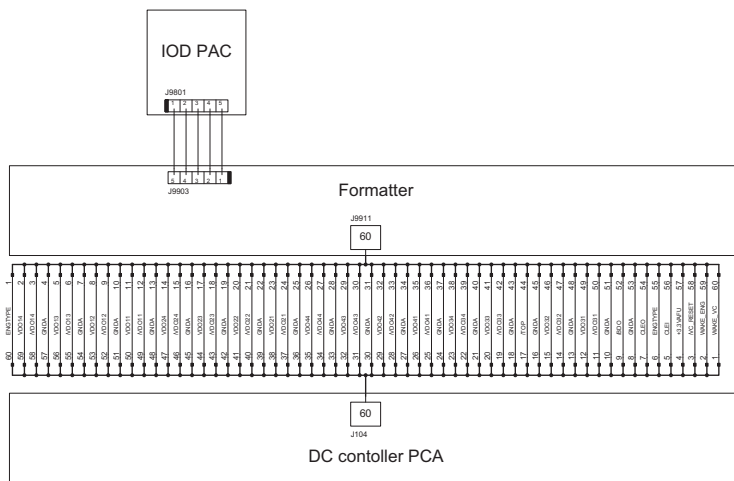
Figure 2-81 General circuit diagram for the 550-sheet feeder

Paper feeder controller PCA
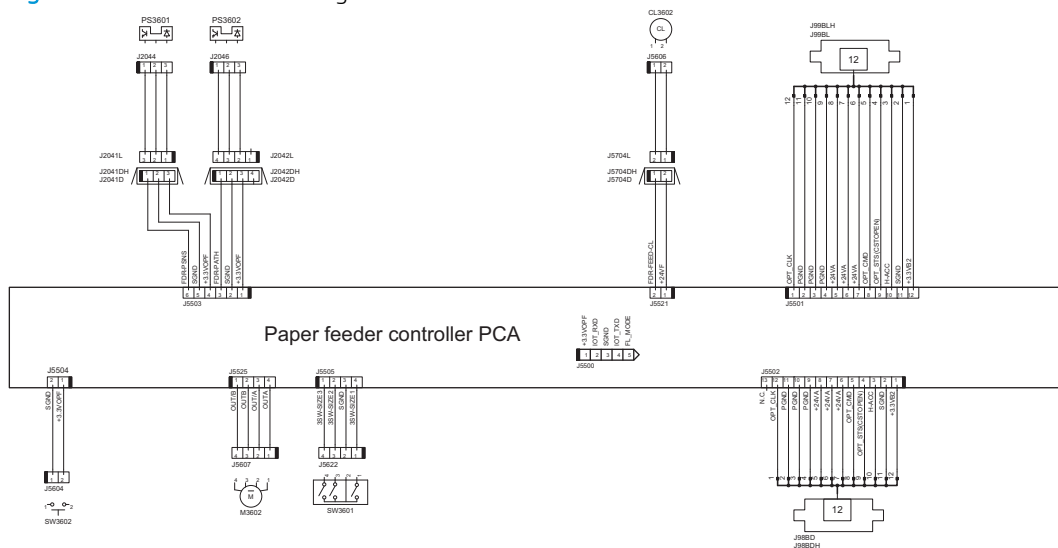
Figure 2-82 General circuit diagram for the 1x550-sheet and 3x550-sheet paper decks
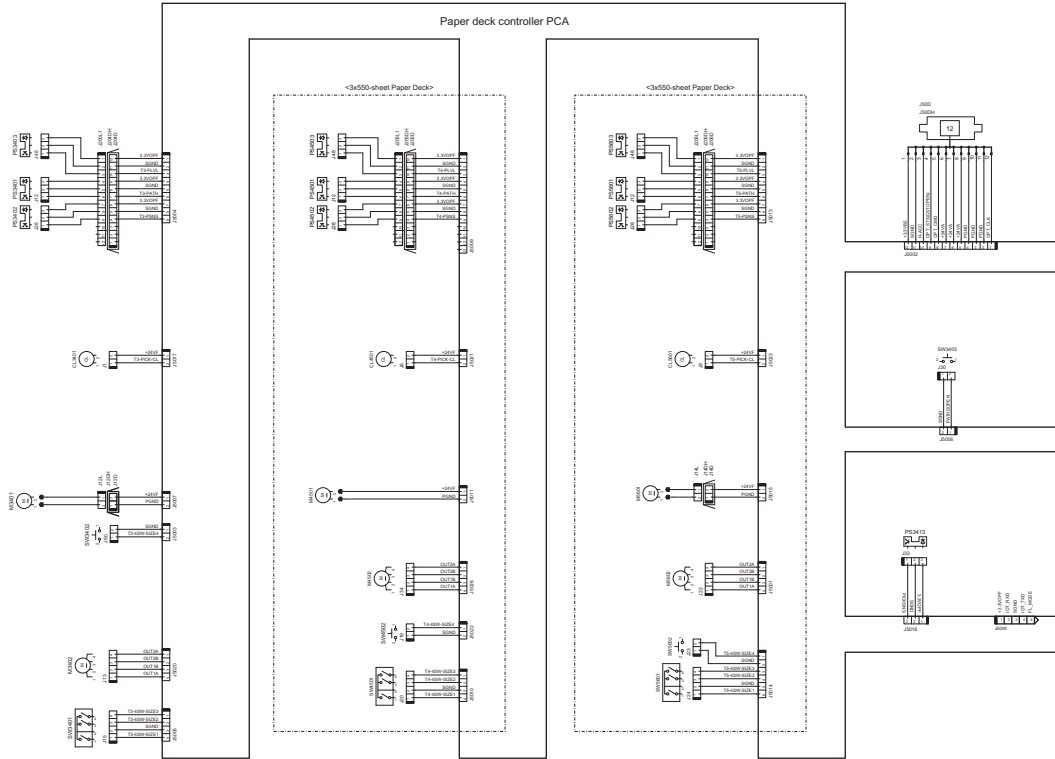
Figure 2-83 General circuit diagram for the 2,550-sheet paper deck
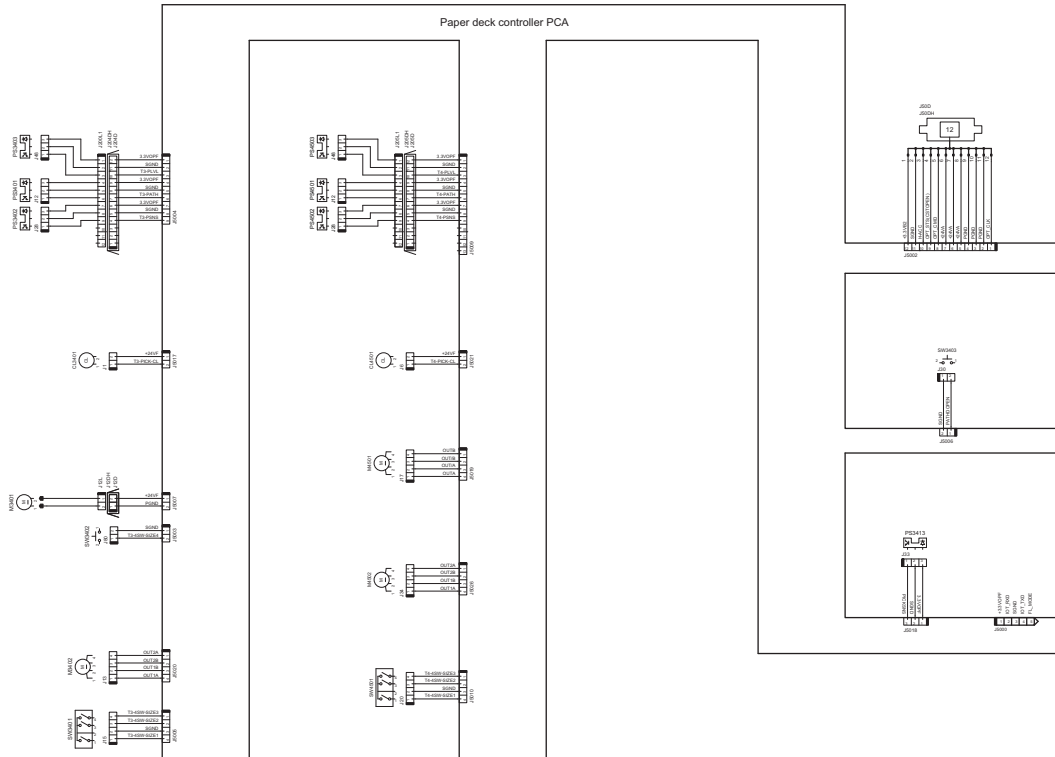
Figure 2-84 General circuit diagram for the stapling mailbox

SSMBM controller PCA
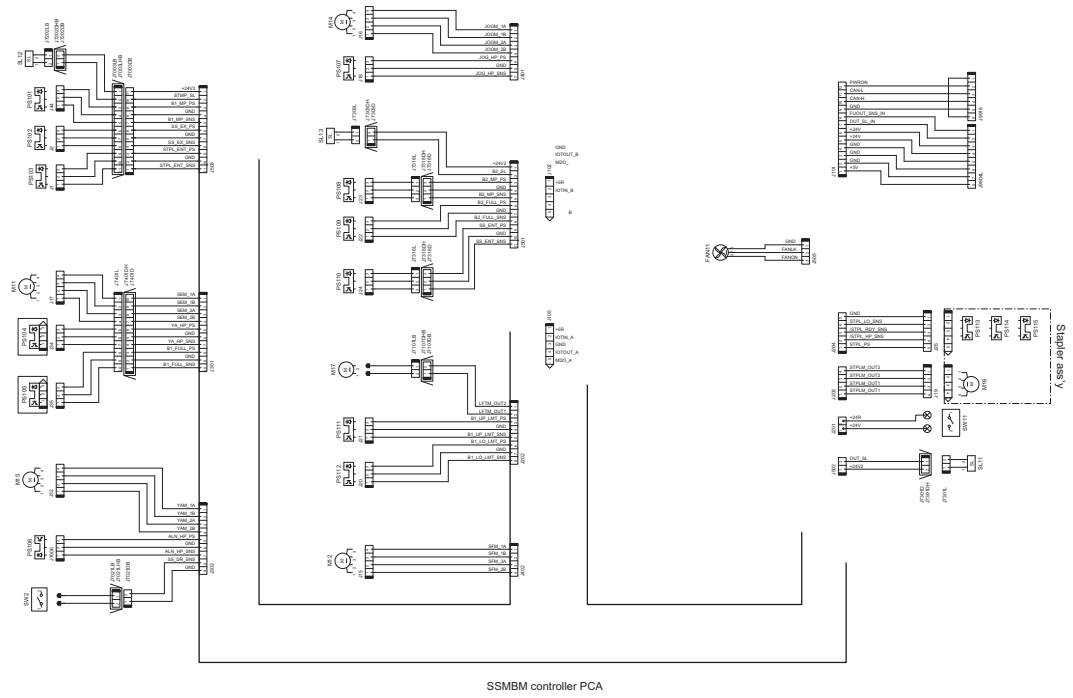
Internal test and information pages

Print the configuration page

Depending on the model, up to three pages print when you print a configuration page. In addition to the main configuration page, the fax accessory page (MFP fax models only), and the HP embedded Jetdirect configuration pages print.

Print a configuration page from a touchscreen control panel

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

1. From the Home screen on the printer control panel, select Reports.

2. Select Configuration/Status Pages.

3. Select Configuration Page to select it.

4. Select the View button (touchscreens only) to view the information on the control panel, or select Print to print the pages.

Print a configuration page from an LCD control panel

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

1. From the Home screen on the printer control panel, select Reports.

2. Select Configuration/Status Pages

3. Select Configuration Page .

4. Select Print, and then select OK to print the pages.

Figure 2-85 Configuration page

Figure 2-85 Configuration page

1	**Device Information**, including the firmware version, usage statistics, and the service ID.	6	**Memory**
2	**Installed Personalities and Options** information, including installed printer languages and hard disk information.	7	**Event Log** information that shows the most recent entries in the log.
3	**HP Web Services** status information	8	**Security** information that includes encryption information and current security settings.
4	**Calibration Information** that shows when the printer most recently performed a calibration.	9	**Paper Trays and Options** information that shows installed trays and current paper size/type settings.
5	**Color Density** information		

HP embedded Jetdirect page

The third configuration page—this is the second page for non-fax models—is the HP embedded Jetdirect page, which contains the following information.

Always make sure the status line under the general information line indicates: **I/O Card Ready**.

Figure 2-86 HP embedded Jetdirect page

1	**General Information** indicates the printer status, model number, hardware firmware version, port select, port configuration, auto negotiation, manufacturing identification, and manufactured date.	4	**TCP/IP** information, including the IP address
2	**Security Settings** information	5	**IPv4** information
3	**Network Statistics** indicates the total packets received, unicast packets received, bad packets received, framing errors received, total packets transmitted, unsendable packets, transmit collisions, and transmit late collisions.	6	**IPv6** information

Finding important information on the configuration pages

Certain information, such as the firmware date codes, the IP address, and the email gateways, is especially helpful while servicing the printer. This information is on the various configuration pages.

Table 2-40 Important information on the configuration pages

Type of information	Specific information	Configuration page
Firmware date codes When you use the remote firmware upgrade procedure, all of these firmware components are upgraded.	Engine firmware revision	Look on the main configuration page, under "Device Information."
	Firmware datecode	Look on the main configuration page, under "Device Information."
	HP embedded Jetdirect firmware version	Look on the HP embedded Jetdirect page, under "General Information."
Accessories and internal storage All optional devices that are installed on the printer should be listed on the main configuration page. In addition, separate pages print for the optional paper handling devices and the fax accessory. These pages list more detailed information for those devices.	Embedded HP Jetdirect	Look on the main configuration page, under "Installed Personalities and Options." Shows model and ID.
	Total RAM	Look on the main configuration page, under "Memory."
	Duplex unit	Look on the main configuration page, under "Paper Trays and Options."
Finishing accessories	Installed finishing accessory type	Look on the main configuration page, under "Paper Trays and Options."
Engine cycles and event logs Total page counts and maintenance kit counts are important for ongoing printer maintenance. The configuration page lists only the three most recent errors. To see a list of the 50 most recent errors, print an event log from the Troubleshooting menu.	Engine cycles	Look on the main configuration page, under "Device Information."
Event log information	Event log information	Look on the main configuration page, under "Event Log."

Control panel menus

You can perform basic printer setup by using the control panel menus. Use the HP Embedded Web Server for more advanced printer setup. To open the HP Embedded Web Server, enter the printer IP address or host name in the address bar of a web browser.

NOTE: Where applicable, the M681–M682 printer displays a View button.

- Reports menu

- Settings menu

- Copy menu (MFP only)

- Scan menu (MFP only)

- Fax menu (fax models only)

- Print menu

- Supplies menu

- Trays menu

- Support Tools menu

Reports menu

To display: At the printer control panel, select Reports.

Table 2-41 Reports menu

First level	Second level	Values	Description
Configuration/Status Pages	Settings Menu Map	Print	Shows a map of the entire control panel system and the selected values for each setting.
		View	
	Current Settings Page	Print	Shows a summary of the current settings for the printer. This might be helpful if you plan to make changes and need a record of the present configuration.
		View	
	Configuration Page	Print	Shows the printer settings and installed accessories.
		View	
	How to Connect Page	Print	Shows the network information typically needed to connect the printer to a network.
		View	

Table 2-41 Reports menu (continued)

First level	Second level	Values	Description
Configuration/Status Pages (continued)	Supplies Status Page	Print View	Shows the approximate remaining life for the supplies; reports statistics on total number of pages and jobs processed, serial number, page counts, and maintenance information. HP provides approximations of the remaining life for the supplies as a customer convenience. The actual remaining supply levels might be different from the approximations provided.
	Usage Page	Print View	Shows a count of all paper sizes that have passed through the printer; lists whether they were simplex, duplex, monochrome, or color; and reports the page count.
	File Directory Page	Print View	Shows the file name and folder name for files that are stored in the printer memory.
	Web Services Status Page	Print View	Shows the detected Web Services for the printer.
	Color Usage Job Log	Print View	Shows color jobs completed by the printer.
Fax Reports (MFP fax models only)	Fax Activity Log	Print View	Contains a list of the faxes that have been sent from or received by this printer.
	Billing Codes Report	Print View	Provides a list of billing codes that have been used for outgoing faxes. This report shows how many sent faxes were billed to each code.
	Blocked Fax List	Print View	A list of phone numbers that are blocked from sending faxes to this printer.
	Speed Dial List	Print View	Shows the speed dials that have been set up for this printer.
	Fax Call Report	Print View	A detailed report of the last fax operation, either sent or received.
Other Pages	Demonstration Page	Print	Prints a demonstration page.
	RGB samples	Print	Prints color samples for different RGB values. Use the samples as a guide for matching printed colors.
	CMYK samples	Print	Prints color samples for different CMYK values. Use the samples as a guide for matching printed colors.

Table 2-41 Reports menu (continued)

First level	Second level	Values	Description
Other Pages	PCL Font List	Print	Prints the available PCL fonts.
(continued)	PS Font List	Print	Prints the available PS fonts.

Settings menu

To display: At the printer control panel, select the Settings menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-42 Settings menu

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General	Date/Time Settings	Date/Time Format	Date Format		DD/MMM/YYYY	Use the Date/Time Settings menu to specify the date and time and to configure date/time settings.
					MMM/DD/YYYY	
					YYYY/MMM/DD	
			Time Format		12 hour (AM/PM)	Select the format that the printer uses to show the date and time, for example 12-hour format or 24-hour format.
					24 hours	
		Date/Time	Date		Select the time zone from a list.	Select the time zone, date, and time that the printer uses.
			Time		Select the date from a pop-up calendar.	
			Time Zone		Select the time from a pop-up keypad.	
	Energy Settings	Sleep Schedule	A list of scheduled events displays.	Select an event from the list to edit it.	For the selected event, change the time and days settings as desired.	Use to configure the printer to automatically wake up or go to sleep at specific times on specific days. Using this feature saves energy.
					Done	
					Select the trash can icon to delete the event.	**NOTE:** You must configure the date and time settings before you can use this feature.
			New event	Event Type		Select whether to add or edit a Wake event or a Sleep event, and then select the time and the days for the wake or sleep event.
				Time		Set the wake or sleep event time parameters.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Energy Settings (continued)	Sleep Schedule (continued)	New event (continued)	Event Days	Select days of the week from a list.	Set the wake or sleep event day parameters.
		Sleep Settings	Sleep After Inactivity Auto Off After Sleep Select one of these items: ● HP Auto Off/ Auto On (Wake on most events) ● Shut down (Wake on power button only)		Range: 1 to 110 minutes Default = 0 minutes	Set the number of minutes after which the printer enters Sleep or Auto Off mode. Touch the existing number to open the virtual keypad, and then increase or decrease the number of minutes.
	Display Settings	Display Brightness	A sliding bar displays with the indicator set in the middle. Move the indicator with your finger to select the desired brightness and then select Done.			Use to specify the intensity of the LCD control panel display.
		System Sound			On* Off	Use to specify whether you hear a sound when you touch the screen or press buttons on the control panel.
		Language Settings	Language		Select from a list of languages that the printer supports.	Use to select a different language for control panel messages and specify the default keyboard layout. When you select a new language, the keyboard layout automatically changes to match the factory default for the selected language.
			Keyboard Layout M681z/M682z only		Each language has a default keyboard layout. To change it, select from a list of layouts.	Select the default keyboard layout that matches the language you want to use.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Display Settings (continued)	Information Screen			Show connection information* Hide connection information	Use this menu item to display or hide connection information on the Home screen.
		Display Date and Time M681/M682 only			Yes* No	Select whether to display or hide the date and time on the control panel Home screen.
		Inactivity Timeout			Range: 10-300 seconds Default = 60 seconds	Specifies the amount of time that elapses between any activity on the control panel and when the printer resets to the default settings. When the timeout expires, the control panel display returns to the Home menu, and any user signed in to the printer is signed out.
		Clearable Warnings			Display during job* Display until cleared	Use this feature to set the period that a clearable warning displays on the control panel. If the On setting is selected, clearable warnings appear until the Clearable Warnings button is pressed. If the Job setting is selected, clearable warnings stay on the display during the job that generated the warning and disappear from the display when the next job starts.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Display Settings (continued)	Continuable Events			Auto-continue (10 seconds)* Touch OK to continue	Use this option to configure the printer behavior when the printer encounters certain errors. If the Auto-continue (10 seconds) option is selected, the job will continue after 10 seconds. If the Touch OK to continue option is selected, the job will stop and require the user to touch the OK button before continuing.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Jam Recovery				Auto* Off On	This printer provides a jam recovery feature that reprints jammed pages. Select one of the following options: Auto: The printer attempts to reprint jammed pages when sufficient memory is available. This is the default setting. Off: The printer does not attempt to reprint jammed pages. Because no memory is used to store the most recent pages, performance is optimal. NOTE: When using this option, if the printer runs out of paper and the job is being printed on both sides, some pages can be lost. On: The printer always reprints jammed pages. Additional memory is allocated to store the last few pages printed. This might cause a decrease in overall performance.
	Auto Recovery				Enabled Disabled*	The printer attempts to reprint jammed pages when sufficient memory is available. This is the default setting.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Enable AutoSend				Disable* Enable	Browse to the HP Embedded Web Server AutoSend configuration page for advanced set up and the HP online Privacy Statement Information. Use the Enable AutoSend menu to enable or disable the AutoSend feature. The AutoSend feature enables your product to periodically send product configuration information including serial number, event logs, page usage counts and supplies status information to HP web addresses (URLs), or email adresses. Information sent to HP is used to improve products and services, and o monitor the product if you have a relationship with HP that provides you services such as proactive cartridge replacement, pay-per-page contracts, support agreements, or usage tracking.
	Hold Off Print Job				On* Off	Enable this feature if you want to prevent print jobs from starting while a user is initiating a copy job from the control panel. Held print jobs start printing after the copy job is finished, provided that no other copy job is in the print queue.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General (continued)	Reset Factory Settings				Cancel Reset	Touch Reset to reset current user-specified default settings to the factory default settings.
Copy/Print	Copy Settings	Image Preview				Display a preview of the image before printing it.
	Enable Device USB				Enabled Disabled*	Enables the printer to open a file from a USB drive.
	Manage Stored Jobs	Job Sort Order			Job Name* Date	This option allows you list the jobs either alphabetically or chronologically.
		Retain Temporary Jobs After Reboot			Do not retain Personal jobs only All temporary jobs	Sets which temporary jobs will be retained in the event of a printer reboot.
		Temporary Job Storage Limit			1–300 Default = 32	Configure global settings for jobs that are stored in the printer memory. The Temporary Job Storage Limit feature specifies the number of temporary jobs that can be stored on the printer. The maximum allowed value is 300.
		Temporary Stored Job Retention			30 minutes 1 hour 4 hours 1 day 1 week 4 weeks	Configure global settings for jobs that are stored in the printer memory. The Temporary Stored Job Retention feature specifies the number of temporary jobs that can be stored on the printer. The maximum allowed value is 300.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Stored Jobs (continued)	Standard Stored Job Retention			30 minutes	Configure global settings for jobs that are stored in the printer memory.
					1 hour	
					4 hours	
					1 day	The Temporary Stored Job Retention feature specifies the number of standard jobs that can be stored on the printer. The maximum allowed value is 300.
					1 week	
					4 weeks	
	Default Print Options	Number of Copies		Range: 1-32000 Default = 1		Sets the default number of copies for a copy job. This default applies when the Copy function or the Quick Copy function is initiated from the printer Home screen.
		Paper Selection		Select from a list of sizes that the printer supports.		Configures the default paper size used for print jobs.
		Default Custom Paper Size	X Dimension	Range: 3-8.5 inches Default = 8.5 inches		Configures the default paper size that is used when the user selects Custom as the paper size for a print job.
			Y Dimension	Range: 5-14 inches Default = 14 inches		
			Use Inches	Enabled* Disabled		
		Output Sides		1-sided* 2-sided		Use to indicate whether the original document is printed on one or both sides, and whether the copies should be printed on one or both sides. For example, select the 1-sided original, 2-sided output option when the original is printed on one side, but you want to make two-sided copies.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Default Print Options (continued)	Staple			None Top left Top right Top left or right	Sets the position of the staple on the page.
		Output Bin			Automatically select Standard bin* Upper bin Middle bin	
		Resolution			FastRes1200 1200x1200dpi	Sets the resolution for sent documents. Higher resolution images have more dots per inch (dpi), so they show more detail. Lower resolution images have fewer dots per inch and show less detail, but the file size is smaller. Some file types, for example a file that will be processed with OCR, require a specific resolution. When these file types are selected, the Resolution setting might automatically change to a valid value.
		Edge-to-Edge			Normal (recommended)* Edge-to-Edge output	Use to avoid shadows that can appear along the edges of copies when the original document is printed close to the edges.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	PCL and PostScript Settings	Courier Font			Regular* Dark	Select which version of the Courier font you want to use. The factory default setting is Regular, which uses an average stroke width. The Dark setting can be used if a heavier Courier font is needed.
		Wide A4			Enabled Disabled*	Changes the printable area of A4-size paper. If you enable this option, eighty 10-pitch characters can be printed on a single line of A4 paper.
		Print PS Errors			Enabled Disabled*	Use this feature to select whether a PostScript (PS) error page is printed when the printer encounters a PS error.
		Print PDF Errors			Enabled Disabled*	Selects whether a PDF error page is printed when the printer encounters a PDF error.
		Personality			Auto* PCL PS PDF	Configures the default print language or personality for the printer. Normally you should not change the printer language. If you change the setting to a specific printer language, the printer does not automatically switch from one language to another unless specific software commands are sent to it.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	PCL and PostScript Settings (continued)	PCL	Font Settings	Font Source	Internal Disk resident	Selects the font source for the user-soft default font. The list of available options varies depending on the installed printer options.
				Font Number	Range: 0-110 Default = 0	Specifies the font number for the user-soft default font using the source that is specified in the Font Source menu. The printer assigns a number to each font and lists it on the PCL font list. The font number displays in the Font # column of the printout.
				Font Pitch	Range: 0.44-99.99 Default = 10	If the Font Source option and the Font Number setting indicate a contour font, then use this feature to select a default pitch (for a fixed-spaced font).
			PCL Settings	Form Length	Range: 5-128 Default = 60	Controls the PCL print-command options. PCL is a set of printer commands that HP developed to provide access to printer features. Use the Form Length feature to select the user-soft default vertical form length.
				Orientation	Portrait* Landscape	Select the orientation that is most often used for copy or scan originals. Select the Portrait option if the short edge is at the top or select the Landscape option if the long edge is at the top.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	PCL and PostScript Settings (continued)	PCL (continued)	PCL Settings (continued)	Symbol Set	Select from a list of symbol sets.	Select any one of several available symbol sets from the control panel. A symbol set is a unique grouping of all the characters in a font. The factory default value for this option is PC-8. Either PC-8 or PC-850 are recommended for line-draw characters.
				Append CR to LF	No* Yes	Configure whether a carriage return (CR) is appended to each line feed (LF) encountered in backwards-compatible PCL jobs (pure text, no job control). Select Yes to append the carriage return. The default setting is No. Some environments, such as UNIX, indicate a new line by using only the line-feed control code. This option allows the user to append the required carriage return to each line feed.
				Suppress Blank Pages	No* Yes	This option is for users who are generating their own PCL, which could include extra form feeds that would cause blank pages to be printed. When the Yes option is selected, form feeds are ignored if the page is blank.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	PCL and PostScript Settings (continued)	PCL (continued)	PCL Settings (continued)	Media Source Mapping	Standard* Classic	Use to select and maintain input trays by number when you are not using the printer driver, or when the software program has no option for tray selection. The following options are available: Standard: Tray numbering is based on newer HP LaserJet models. Classic: Tray numbering is based on HP LaserJet 4 and older models.
	Print Quality	Adjust Color	Tonal Range	Highlights		
				Midtones		
				Shadows		
			Cyan			
			Magenta			
			Yellow			
			Black			
		Image Registration	Tray	Tray 1		Specify tray to be adjusted
				Tray 2		
				Tray 3		
				Tray 4		
				Tray 5		
				Depends upon number of trays installed		

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Print Quality (continued)	Image Registration (continued)	Front-side Horizontal Shift Front-side Vertical Shift Back-side Horizontal Shift Back-side Vertical Shift		-5.00 mm to 5.00 mm	Shift the margin alignment to center the image on the page from top to bottom and from left to right. You can also align the image on the front with the image printed on the back. The direction that is perpendicular to the way the paper passes through the printer is referred to as X. This is also known as the scan direction. X1 is the scan direction for a single-sided page or for the second side of a two-sided page. X2 is the scan direction for the first side of a two-sided page. The direction that the paper feeds through the printer is referred to as Y. Y1 is the feed direction for a single-sided page or for the second side of a two-sided page. Y2 is the feed direction for the first side of a two-sided page. Use the Adjust Tray <X> menu to adjust the registration settings for each tray. Before adjusting these values, print a registration test page. It provides alignment guides in the X and Y directions so you can determine which adjustments are necessary. You can adjust values for X1 Shift, X2 Shift, Y1 Shift, and Y2 Shift.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Print Quality (continued)	Image Registration (continued)		Print Test Page		Use the Print Test Page option to print a page to test the image registration. It provides alignment guides in the X and Y directions so you can determine which adjustments are necessary.
		Auto Sense Behavior	Tray 1		Sense every page	
					Sense first page	
					Sense transparency only	
			All Other Trays		Sense first page	
					Sense transparency only	
		Adjust paper types			Select from a list of paper types	
					Reset Paper Types	
		Optimize			Normal Paper	
					Heavy paper	
					Envelope control	
					Tray 1	
					Background	
					Background 1	
					Uniformity Control	
					Tracking Control	
					Registration	
					Transfer Control	
					Moisture Control	
					Reset Optimize	
		Edge Control			Off	
					Light	
					Normal*	
					Maximum	

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays	Use Requested Tray			Exclusively* When available	Controls how the printer handles jobs that have specified a specific input tray. Two options are available: Exclusively: The printer never selects a different tray when the user has indicated that a specific tray should be used, even if that tray is empty. When available: The printer pulls from another tray if the specified tray is empty, even though the specific tray was indicated for the job.
		Manually Feed Prompt			Always* Prompt on mismatch	Indicate whether a prompt should appear when the type or size for a job does not match the specified tray and the printer pulls from the multipurpose tray instead. Two options are available: Always: A prompt always displays before using the multipurpose tray. Prompt on mismatch: A prompt displays only if the size or type do not match or the tray is empty

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays (continued)	Size/Type Prompt			Display* Do not display	Controls whether the tray configuration message displays whenever a tray is closed. Two options are available: Display: Shows the tray configuration message when a tray is closed. The user is able to configure the tray settings directly from this message. Do not display: Prevents the tray configuration message from automatically appearing.
		Use Another Tray			Allow* Do not allow	Use to turn on or off the control panel prompt to select another tray when the specified tray is empty. Two options are available: Allow: When this option is selected the user is prompted to either add paper to the selected tray or to choose a different tray. This is the factory default. Do not allow: When this option is selected, the user is not given the option of selecting a different tray. The printer prompts the user to add paper to the tray that was initially selected.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays (continued)	Alternative Letterhead Mode			Disabled* Enabled	Use to load letterhead or preprinted paper into the tray the same way for all print jobs, whether you are printing to one side of the sheet or to both sides of the sheet. When this option is selected, load the paper as you would for printing on both sides. See the user documentation that came with the printer for instructions about loading letterhead for printing on both sides. When this option is selected, the printer speed slows to the speed required for printing on both sides.
		Duplex Blank Pages			Automatic* Always	Controls how the printer handles two-sided jobs (duplexing). Two options are available: Automatic: Choose this option to skip printing blank sides during a two-sided print job. The printer can print jobs faster when blank sides are skipped. Always: Choose this option to print all sides of a two-sided job, even if one side is blank. This might be preferable for certain jobs that use paper types such as letterhead or prepunched paper.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays (continued)	Override A4/Letter			Yes* No	Prints on letter-size paper when an A4 job is sent but no A4-size paper is loaded in the printer (or to print on A4 paper when a letter-size job is sent but no letter-size paper is loaded). This option will also override A3 with ledger-size paper and ledger with A3-size paper.
Scan/Digital Send	E-mail Settings Network Folder Settings SharePoint Settings Scan to USB Drive Settings NOTE: The same options are available for each of these features, except where noted.	E-mail Setup NOTE: Email Settings only				Use to configure settings that apply to sending documents through email or saving documents to a folder on the network or on a USB multi-drive. The E-mail Setup Wizard feature configures the printer to send scanned images as email attachments. To open the printer HP Embedded Web Server and set up the email notification server, enter the printer IP address into a Web browser.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Scan/Digital Send (continued)	E-mail Settings Network Folder Settings SharePoint Settings Scan to USB Drive Settings (continued)	Image Preview			Make optional* Require preview Disable preview	Defines the default job options for each function. If you do not specify the job options when creating the job, the default options are used. For complete setup, go to the HP Embedded Web Server by typing the IP address of the printer into a Web browser. Use the Image Preview feature to scan a document and display a preview before completing the job. Select whether this feature is available on the printer. Make optional: The feature is optional, depending on the user who is signed in. Require preview Previews are required for all users. Disable preview: Previews are disabled for all users.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Scan/Digital Send (continued)	Digital Sending Software Setup	Allow Use of a DSS Server			Disabled	Configure how the printer interacts with the HP Digital Sending Software (DSS) server. HP DSS handles digital sending tasks, such as faxing, emailing, and sending scanned documents to a network folder or USB storage device.
		Allow Transfer to New DSS server			Enabled*	Use the Allow Use of a DSS Server and Allow Transfer to New DSS server options to configure the printer to use HP DSS.
Fax	Internal Fax Modem Setup					Use this wizard to set up options for faxing.
						1. Select your location from the list. Fax communication standards vary

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
						according to location.
						2. Type your company name and fax number. This information is used in the fax header, which appears at the top of each page in the fax.
						3. Verify that the date and time settings are correct.
						4. If you need to use a dialing prefix, type the prefix number in the box.
						5. Make sure that the printer is connected to a working phone line.
Fax (continued)	Fax Send Settings	Image Preview			Make optional Require preview Disable preview	Use the Image Preview feature to control the image preview behavior. • Make optional: Previews are optional for all users. • Require preview: Previews are required for all users. • Disable preview: Previews are disabled for all users.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Send Settings (continued)	Fax Dialing Settings	Redial on Error		Range: 0-9 Default = 2	These settings control how the fax modem dials the outgoing fax number when faxes are sent.
			Redial on No Answer		Range: 0-2 Default = 0	
			Redial on Busy		Range: 0-9 Default = 3	
			Redial Interval		Range: 1-5 Default = 5	
			Fax Send Speed		Fast (v.34-33.6k) Medium (v.17-14.4k)* Slow (v.29-9.6k)	
		General Fax Send Settings	Fax Number Confirmation		Radio button to enable or disable	If this feature is enabled, you must enter the fax number twice.
			PC Fax Send		Radio button to enable or disable	Enables users who have the correct driver installed to send faxes through the printer from their computers.
			Error Correction Mode		Radio button to enable or disable	When error-correction mode is enabled and an error occurs during fax transmission, the printer sends or receives the error portion again.
			Fax Header		Prepend* Overlay	Use to prepend or overlay the fax header page.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Send Settings (continued)	Billing Code Settings	Enable Billing Codes		Checkbox to enable or disable	When billing codes are enabled, a prompt displays that asks the user to enter the billing code for an outgoing fax. This prompt does not appear if the Allow users to edit billing codes check box is not checked. You can also use the billing codes report in the Reports menu to view the list of the billing codes that have been used for faxes that have been sent from the printer. The list is grouped by billing code and also shows fax details. This feature can be used for billing or usage tracking.
			Default Billing Code			Specify a default billing code for faxing. If you specify a default billing code, this code displays in the Billing Code field when the user sends an outgoing fax. If this field is blank, no default billing code is provided for the user.
			Minimum Length		Range: 1-16 Default = 1	Specify the required length of the billing code. Billing codes can be between 1 and 16 characters long.
			Allow users to edit billing codes		Checkbox to enable or disable	
	Fax Receive Settings	Fax Receive Setup	Rings To Answer		Range: 1-6 Default = 1	Use to configure settings for receiving faxes.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Receive Settings (continued)	Fax Receive Setup (continued)	Ringer Volume		Off	
					Low*	
					High	
			Fax Receive Speed		Fast (v.34-33.6k)	Select Medium (v. 17-14.4k) or Slow (v.29-9.6k) to improve the quality of received faxes.
					Medium (v.17-14.4k)*	
					Slow (v.29-9.6k)	
		Fax Printing Schedule			Always store	If you have concerns about the security of private faxes, use this feature to store faxes rather than having them automatically print. Open the Fax Printing Schedule sub-menu, and then you can choose to always store faxes, always print them, or you can set up a schedule for each day of the week.
					Always print*	
					Use schedule	
			Schedule Touch this to set up a fax printing schedule if you selected the Use Fax Printing Schedule option.	New Event Done Delete (trash can)	Begin Printing Begin Storing Time Event Days	If you are using a fax printing schedule, use this menu to configure when to print faxes.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Receive Settings (continued)	Blocked Fax Numbers	New Fax Number			The blocked fax list can contain up to 30 numbers. When the printer receives a call from one of the blocked fax numbers, it deletes the incoming fax. It also logs the blocked fax in the activity log along with job-accounting information. Add blocked numbers: Enter a fax number into the New Fax Number field, and then touch the arrow button to add a new number to the blocked fax list. To remove blocked numbers: Select a number and touch the trash can icon button to delete it from the blocked fax list. To clear all blocked numbers: Touch the Select All button to select all of the numbers from the blocked fax list, and then touch the trash can icon to delete the numbers. You also can use the Blocked Fax List report in the Information menu to view the list of the fax numbers that have been blocked on this printer.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Receive Settings (continued)	Default Job Options	Notification		Do not notify* Notify when job completes Notify only if job fails	Configure to receive notification about the status of a sent document. Do not notify: Turns off this feature. Notify when job completes: Select to receive notification for this job only. Notify only if job fails: Select to receive notification only if the job is not sent successfully.
				Print E-mail*		E-mail: Select to receive the notification in an email. Touch the text box following Email Address, and then enter the email address for the notification.
				Include Thumbnail		NOTE: When sending an analog fax, select Include Thumbnail to receive a thumbnail image of the first page of the fax in your notification.
				Notification E-mail address		Touch this text field, provide the email address to which you want notifications sent, and then touch the OK button.
			Stamp Received Faxes		On Off*	Use this option to add the date, time, sender's phone number, and page number to each page of the faxes that this printer receives.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (continued)	Fax Receive Settings (continued)	Default Job Options (continued)	Fit to Page		On* Off	Use to shrink faxes that are larger than Letter-size or A4-size so that they can fit onto a Letter-size or A4-size page. If this feature set to Disabled, faxes larger than Letter or A4 will flow across multiple pages.
			Paper Tray		Automatic* Select from a list of the trays.	
			Output Bin		Automatically select Standard bin Upper bin Middle bin	
			Out Sides		1-sided* 2-sided	Use to describe the layout for each side of the original document. First select whether the original document is printed on one side or both sides.
	Fax Forwarding	Enable Fax Forwarding			Disabled* Enabled	Use to forward received faxes to another fax machine.
			Type of Fax Job to Forward		All faxes Sent faxes Received faxes	Use to select the type of fax jobs that you want forwarded.
			Fax Forwarding Number			Provide the forwarding phone number, and then touch the OK button.
	Clear Fax Activity Log					Clears all events from the fax activity log.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Manage Supplies	Low Warning Thresholds			Black Cartridge	1-100%	Set the estimated percentage at which the printer notifies you when a toner cartridge is very low.
				Cyan Cartridge	Default = 5%	
				Magenta Cartridge		
				Yellow Cartridge		
	Low Warning Threshold Message				On	Displays a message on the control panel when a cartridge is very low.
					Off	
	Very Low Behavior	Black Cartridge			Stop	
		Color Cartridges			Continue	
		Transfer Kit			Prompt to continue	
		Fuser Kit				
		Document Feeder Kit				
		Staples			Stop	
					Continue	
	Restrict Color Use				Enable	Use this feature to enable, restrict, or disable color printing or copying.
					Disable Color	
					Color if allowed*	

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Manage Supplies (continued)	Color/Black Mix				Auto Mostly Color Pages Mostly Black Pages	Instructs the printer when to switch between color and monochrome printing modes for the best overall performance. Auto: Uses the mode that is appropriate for the first page of the job. If necessary, the printer switches modes during the middle of a job and then stays in that mode until the job is finished. Mostly Color Pages: The printer uses color mode for all jobs, even if the job contains no color pages. Mostly Black Pages: The printer uses monochrome mode until it detects a color page. The printer switches back to monochrome mode when it detects a sequence of several monochrome pages.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Manage Supplies (continued)	Store Usage Data				On supplies Not on supplies	The Store Usage Data provides a way to suppress the toner cartridges from storing most of the information gathered exclusively for the purpose of understanding the usage of the printer. Select the On supplies setting to store the data on the toner cartridge memory chip. Select the Not on supplies setting to suppress the information from being stored on the memory chip.
	Cartridge Protection				Off* Protect Cartridges	Select to permanently protect cartridges so that they can be used only in this product or fleet of products.
	Cartridge Policy				Off* Authorized HP	Set Authorized HP to allow only genuine HP cartridges to be used in this product.
Manage Stapler/ Stacker	Operation Mode				Mailbox Stacker Function Separator*	
	Job Offset				On Off	
Networking	Ethernet	Information	Print Security Report		Yes No*	Yes: Prints a page that contains the current security settings on the HP Jetdirect print server. No: A security settings page is not printed.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP	Host Name		Use the arrow buttons to edit the host name. **NPIXXXXXX***	An alphanumeric string, up to 32 characters, used to identify the printer. This name is listed on the HP Jetdirect configuration page. The default host name is NPIxxxxxx, where xxxxxx is the last six digits of the LAN hardware (MAC) address.
			IPV4 Settings	Config Method	Bootp DHCP* Auto IP Manual	Specifies the method that TCP/IPv4 parameters will be configured on the HP Jetdirect print server. Bootp (Bootstrap Protocol): Use for automatic configuration from a BootP server. DHCP (Dynamic Host Configuration Protocol): Use for automatic configuration from a DHCPv4 server. If selected and a DHCP lease exists, the DHCP Release menu and the DHCP Renew menu are available to set DHCP lease options. Auto IP: Use for automatic link-local IPv4 addressing. An address in the form 169.254.x.x is assigned automatically. If you set this option to the Manual setting, use the Manual Settings menu to configure TCP/IPv4 parameters.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP (continued)	IPV4 Settings (continued)	Default IP	Auto IP* Legacy	Specify the IP address to default to when the print server is unable to obtain an IP address from the network during a forced TCP/IP reconfiguration (for example, when manually configured to use BootP or DHCP). **NOTE:** This feature assigns a static IP address that might interfere with a managed network. Auto IP: A link-local IP address 169.254.x.x is set. Legacy: The address 192.0.0.192 is set, consistent with older HP Jetdirect printers.
				DHCP Release	Yes No*	
				DHCP Renew	Yes No*	
				Primary DNS	Range: 0-255 Default = **xxx.xxx.xx.xx**	Specify the IP address (n.n.n.n) of a Primary Domain Name System (DNS) Server.
				Secondary DNS	Range: 0-255 Default = **0.0.0.0**	Specify the IP address (n.n.n.n) of a Secondary DNS Server.
			IPV6 Settings	Enable	Off On*	Use this item to enable or disable IPv6 operation on the print server. Off: IPv6 is disabled. On: IPv6 is enabled.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP (continued)	IPV6 Settings (continued)	Address	Manual Settings Enable Address	Use this item to enable and manually configure a TCP/IPv6 address.
				DHCPV6 Policy	Router Specified Router Unavailable* Always	Router Specified: The stateful auto-configuration method to be used by the print server is determined by a router. The router specifies whether the print server obtains its address, its configuration information, or both from a DHCPv6 server. Router Unavailable: If a router is not available, the print server should attempt to obtain its stateful configuration from a DHCPv6 server. Always: Whether a router is available, the print server always attempts to obtain its stateful configuration from a DHCPv6 server.
				Primary DNS	Range: 0-255 Default = **xxx.xxx.xx.xx**	Specify the IP address (n.n.n.n) of a Primary Domain Name System (DNS) Server.
				Secondary DNS	Range: 0-255 Default = **0.0.0.0**	Specify the IP address (n.n.n.n) of a Secondary DNS Server.

Table 2-42 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP (continued)	Proxy Server		Select from a provided list.	Specifies the proxy server to be used by embedded applications in the printer. A proxy server is typically used by network clients for Internet access. It caches Web pages, and provides a degree of Internet security for those clients. To specify a proxy server, enter its IPv4 address or fully-qualified domain name. The name can be up to 255 octets. For some networks, you might need to contact your Internet Service Provider (ISP) for the proxy server address.
			Proxy Port		Range: 1-65535 Default = **00080**	Enter the port number used by the proxy server for client support. The port number identifies the port reserved for proxy activity on your network, and can be a value from 0 to 65535.
			Idle Timeout		Range: 0-3600 Default = **0270**	The time period, in seconds, after which an idle TCP print data connection is closed (default is 270 seconds, 0 disables the timeout).

Copy menu (MFP only)

To display: At the printer control panel, select the Copy menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-43 Copy menu (MFP only)

First level	Second level	Third level	Values	Description
Sides	Original Sides		1-sided*	Use to indicate whether the original document is printed on one or both sides.
			2-sided	
	Output Sides		1-sided*	Use to indicate whether the copies should be printed on one or both sides.
			2-sided	
Color/Black			Automatically detect*	Select how the copy should be printed.
			Color	
			Black/Gray	Automatically detect: Prints color documents in color, and black and white documents in black and white. For mixed documents, the printer will determine whether to print in color or black and white.
				Color: Prints documents in color.
				Black: Prints documents in black and white or grayscale.
Quick Sets and Defaults			Load	
			Save	
Options	Sides	Original Sides	1-sided*	
			2-sided	
		Output Sides	1-sided*	
			2-sided	
	Color/Black		Automatically detect*	Select how the copy should be printed.
			Color	
			Black/Gray	Automatically detect: Prints color documents in color, and black and white documents in black and white. For mixed documents, the printer will determine whether to print in color or black and white.
				Color: Prints documents in color.
				Black: Prints documents in black and white or grayscale.

Table 2-43 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Staple		None* Top left angled Top right angled	Sets the position of the staple on the page.
	Scan mode		Standard Document* Book Mode 2–sided ID	Book Mode allows the user to scan pages from a book. 2–sided ID allows the user to scan both sides of an identification card onto one sheet.
	Reduce/Enlarge		Automatic* Manual	Use to scale the size of the document up or down. Select one of the predefined percentages, or select the Scaling field and type a percentage between 25 and 400. The Auto option automatically scales the image to fit the paper size in the tray. NOTE: To reduce the image, select a scaling percentage that is less than 100. To enlarge the image, select a scaling percentage that is greater than 100.
	Original Size		Select from a list of sizes that the printer supports.	Describes the page size of the original document.
	Paper Selection		Paper Size Paper Type Paper Tray	For the best color and image quality, select the appropriate paper type from the control panel menu or from the print driver.
	Booklet	Booklet Format	(Checkbox)	Use to copy two or more pages onto one sheet of paper so you can fold the sheets in the center to form a booklet. The printer arranges the pages in the correct order. For example, if the original document has eight pages, the printer prints pages 1 and 8 on the same sheet.

Table 2-43 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Content Orientation		Auto Detect Portrait* Landscape	For some features to work correctly, you must specify the way the content of the original document is placed on the page. Portrait orientation means the short edge of the page is along the top. Landscape orientation means the long edge of the page is along the top. In the Orientation area, select whether the original document has a portrait or landscape orientation.
	Pages per Sheet		One (1)* Two (2) Four (4)	Copies multiple pages onto one sheet of paper. NOTE: Before using this screen, use the Content Orientation screen to describe the original document orientation.
	Image Adjustment	Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make text appear crisper, but decreasing it could make photographs appear smoother.
		Darkness		Use to improve the overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white and black in the colors.
		Contrast		Adjust the Contrast setting to increase or decrease the difference between the lightest and darkest color on the page.
		Background Cleanup		Adjust the Background Cleanup setting if you are having trouble copying a faint image.

Table 2-43 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Optimize Text/Picture		Text Mixed* Printed picture Photograph	Optimizes the output for a particular type of content. You can optimize the output for text, printed pictures, or a mixture. Text: Use to optimize the text portion of the copy where text and/or pictures are on the original. Mixed: Use for documents that contain a mix of text and graphics. Printed picture: Use for line drawings and preprinted images, such as magazine clippings or pages from books. Photograph: Best suited for making copies of printed pictures.
	Edge-to-Edge		Normal (recommended)* Edge-to-Edge output	Use to avoid shadows that can appear along the edges of copies when the original document is printed close to the edges.
	Erase Edges	Front Side	Apply same width to all edges Top edge Bottom edge Left edge Right edge	Use this menu item to remove blemishes, such as dark borders or staple marks, by cleaning the specified edges of the scanned image. In each of the text boxes enter the measurements, in millimeters or inches, for how much of the top edge, bottom edge, left edge, and right edge to clean.
		Back Side	Use inches Mirror front side Top edge Bottom edge Left edge Right edge	

Table 2-43 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Collate		Collate on (Sets in page order)* Collate off (Pages grouped)	If you are making more than one copy, select the Collate on (Sets in page order) option to assemble the pages in the correct order in each set of copies. Select the Collate off (Pages grouped) option to group the same pages together. For example, if you are making five copies of an original document that has two pages, all five first pages would be grouped together and all five second pages would be grouped together.
	Multi-feed Detection		On* Off	This setting stops the scanning process if it detects multiple-page feeds through the document feeder.

Scan menu (MFP only)

To display: At the printer control panel, select the Scan menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-44 Scan menu (MFP)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Email					
Scan to Network Folder	Folder Paths				
	File Name				
	Quick Sets and Defaults				
	Options	File Type and Resolution			
		Original sides		1-sided* 2-sided	Use to describe the layout for each side of the original document. First select whether the original document is printed on one side or both sides. Then touch the Orientation setting to indicate whether the original has portrait or landscape orientation. If it is printed on both sides, also select the 2-sided format that matches the original document.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	Color/Black		Automatically detect color or black* Automatically detect color or gray Color Black/Gray Black	Use to enable or disable color scanning. Automatically detect color or black: When pages without color are detected, the printer creates an image of the page in 1-bit black if other settings allow. If the other settings don't allow (File Type, for example), the image is in grayscale. Automatically detect color or gray: When pages without color are detected, the printer creates an image of the page in grayscale. Select this option for the best image quality for non-color pages. Color: Scans documents in color. Black/Gray: Scans documents in grayscale. Black: Scans documents in black and white with a compressed file size.
		Original Size		Select from a list of supported sizes.	Use to describe the page size of the original document.
		Content Orientation	Orientation	Automatically Detect Portrait* Landscape	For some features to work correctly, you must specify the way the content of the original document is placed on the page. Portrait orientation means the short edge of the page is along the top. Landscape orientation means the long edge of the page is along the top. In the Orientation area, select whether the original document has a portrait or landscape orientation.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	Image Adjustment	Darkness		Use to improve the overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white and black in the colors.
			Contrast		Adjust the Contrast setting to increase or decrease the difference between the lightest and darkest color on the page.
			Background Cleanup		Adjust the Background Cleanup setting if you are having trouble copying a faint image.
			Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make text appear crisper, but decreasing it could make photographs appear smoother.
			Automatic Tone		The printer automatically adjusts the Darkness, Contrast, and Background Cleanup settings to the most appropriate for the scanned document.
		Optimize Text/Picture		Text Mixed Printed picture Photograph	Text: Use for documents that contain mostly text. This option is also best suited for scanning documents with highlighter marks. Mixed: Use for documents that contain a mix of text and graphics Printed picture: Use for line drawings and preprinted images, such as magazines clippings or pages from books. Photograph: Use for photographic prints.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	Erase Edges		Apply same width to all edges (checkbox to enable or disable) Top Edge Bottom Edge Left Edge Right Edge	Use this menu item to remove blemishes, such as dark borders or staple marks, by cleaning the specified edges of the scanned image. In each of the text boxes enter the measurements, in millimeters or inches, for how much of the top edge, bottom edge, left edge, and right edge to clean.
		Cropping Options		Do not crop Crop to content Crop to paper	Use this menu item to automatically crop the scan for digital sending. Use the Crop to content option to scan the smallest possible area that has detectable content.
		Automatically Straighten		Off* Automatically Straighten on	Enable this feature prior to scanning to automatically straighten the scanned image when pages are skewed during scanning.
		Blank Page Suppression		Off* Suppress blank pages	Use to prevent blank pages in the original document from being included in the output document.
		Multi-feed Detection		On* Off	This setting stops the scanning process if it detects multiple-page feeds through the document feeder.
		Create Multiple Files		Disabled Enabled	Enable this item to scan pages into separate files based on a specified page limit. A page is one side of an original document. JPEG and TIFF have a limit of one page per file.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	Notification		Do not notify Notify when job completes Notify only if job fails Print E-mail	Configure to receive notification about the status of a sent document. Do not notify: Turns off this feature. Notify when job completes: Select to receive notification for this job only. Notify only if job fails: Select to receive notification only if the job is not sent successfully. Print: Select to print the notification at this printer. E-mail: Select to receive the notification to an email account.
			Include Thumbnail		Select Include Thumbnail to receive a thumbnail image of the first page of the job in your notification.
			Notification Email		E-mail: Select to receive the notification in an email. Touch the text box following Email Address, and then type the email address for the notification.
Scan to USB Drive	Destination				
	Job Name				

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options	File Type and Resolution	PDF PDF/A (Archivable) Searchable PDF (OCR) Searchable PDF/A (OCR) JPEG TIFF MTIFF XPS Text (OCR) Unicode Text (OCR)	NOTE: Not all of the following options are available for all file types. Resolution Quality and File Size High Compression (smaller file) PDF Encryption OCR Language Color/Grayscale TIFF/ MTIFF Compression Black TIFF/MTIFF Compression	NOTE: Not all of the following options are available for all file types. Resolution: Choose from a list of resolution settings. Quality and File Size: Choose from High (large file), Medium*, or Low (small file). High Compression (smaller file): Checkbox to enable or disable. PDF Encryption: Checkbox to enable or disable. Password is required if enabled. OCR Language: Choose from a list of languages. Color/Grayscale TIFF/ MTIFF Compression: Choose from LZW, TIFF 6.0, and TIFF (Post 6.0) Black TIFF/MTIFF Compression: Choose from Automatic, G3, G4, and LZW
		Original sides	1-sided* 2-sided		Use to describe the layout for each side of the original document. First select whether the original document is printed on one side or both sides. Then touch the Orientation setting to indicate whether the original has portrait or landscape orientation. If it is printed on both sides, also select the 2-sided format that matches the original document.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options (continued)	Color/Black		Automatically detect color or black*	Use to enable or disable color scanning.
				Automatically detect color or gray Color Black/Gray Black	Automatically detect color or black: When pages without color are detected, the printer creates an image of the page in 1-bit black if other settings allow. If the other settings don't allow (File Type, for example), the image is in grayscale. Automatically detect color or gray: When pages without color are detected, the printer creates an image of the page in grayscale. Select this option for the best image quality for non-color pages. Color: Scans documents in color. Black/Gray: Scans documents in grayscale. Black: Scans documents in black and white with a compressed file size.
		Original Size		Select from a list of supported sizes.	Use to describe the page size of the original document.
		Content Orientation		Automatically detect Portrait* Landscape	For some features to work correctly, you must specify the way the content of the original document is placed on the page. Portrait orientation means the short edge of the page is along the top. Landscape orientation means the long edge of the page is along the top. In the Orientation area, select whether the original document has a portrait or landscape orientation.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options (continued)	Image Adjustment	Darkness		Use to improve the overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white and black in the colors.
			Contrast		Adjust the Contrast setting to increase or decrease the difference between the lightest and darkest color on the page.
			Background Cleanup		Adjust the Background Cleanup setting if you are having trouble copying a faint image.
			Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make text appear crisper, but decreasing it could make photographs appear smoother.
			Automatic Tone		The printer automatically adjusts the Darkness, Contrast, and Background Cleanup settings to the most appropriate for the scanned document.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options (continued)	Optimize Text/Picture		Text Mixed Printed picture Photograph	Optimizes the output for a particular type of content. You can optimize the output for text, printed pictures, or a mixture. Text: Use to optimize the text portion of the copy when text and/or pictures are on the original. Mixed: Use for documents that contain a mix of text and graphics. Printed picture: Use for line drawings and preprinted images, such as magazine clippings or pages from books. Photograph: Best suited for making copies of printed pictures.
		Erase Edges		Apply same width to all edges Top Edge Bottom Edge Left Edge Right Edge	Use this menu item to remove blemishes, such as dark borders or staple marks, by cleaning the specified edges of the scanned image. In each of the text boxes enter the measurements, in millimeters or inches, for how much of the top edge, bottom edge, left edge, and right edge to clean.
		Cropping Options		Do not crop Crop to content Crop to paper	Use this menu item to automatically crop the scan for digital sending. Use the Crop to content option to scan the smallest possible area that has detectable content.
		Automatically Straighten		Off* Automatically Straighten on	Enable this feature prior to scanning to automatically straighten the scanned image when pages are skewed during scanning.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options (continued)	Blank Page Suppression		Off* Supress blank pages	Use to prevent blank pages in the original document from being included in the output document.
		Multi-feed Detection		On* Off	This setting stops the scanning process if it detects multiple-page feeds through the document feeder.
		Create Multiple Files		Disabled Enabled	Enable this item to scan pages into separate files based on a specified page limit. A page is one side of an original document. JPEG and TIFF have a limit of one page per file.
		Notification		Do not notify Notify when job completes Notify only if job fails Print E-mail	Configure to receive notification about the status of a sent document. Do not notify: Turns off this feature. Notify when job completes: Select to receive notification for this job only. Notify only if job fails: Select to receive notification only if the job is not sent successfully. Print: Select to print the notification at this printer. E-mail: Select to receive the notification to an email account.
			Include Thumbnail		Select Include Thumbnail to receive a thumbnail image of the first page of the job in your notification.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Options (continued)	Notification (continued)	Notification Email		E-mail: Select to receive the notification in an email. Touch the text box following Email Address, and then type the email address for the notification.
Scan to Job Storage				Folder	
				Job Name	
Scan to SharePoint®	Quick Sets			Select from a list of quick sets.	NOTE: To use this menu, you must first enable Scan to SharePoint® from the printer's Embedded Web Server (EWS) and then set up at least one Quick Set. Log in as Administrator on the EWS and select the **Scan/Digital Send** tab to find these options. Use Scan to SharePoint® to scan a document and save it to a SharePoint® site. To specifty a SharePoint® path, touch Load, and then select a Quick Set.
	Filename				
	Options	File Type and Resolution			
		Original sides		1-sided*	Use to describe the layout for each side of the original document. First select whether the original document is printed on one side or both sides. Then touch the Orientation setting to indicate whether the original has portrait or landscape orientation. If it is printed on both sides, also select the 2-sided format that matches the original document.
				2-sided	

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Options (continued)	Color/Black		Automatically detect color or black	Use to enable or disable color scanning.
				Automatically detect color or gray	Automatically detect color or black: When pages without color are detected, the printer creates an image of the page in 1-bit black if other settings allow. If the other settings don't allow (File Type, for example), the image is in grayscale.
				Color	
				Black/Gray	
				Black	
					Automatically detect color or gray: When pages without color are detected, the printer creates an image of the page in grayscale. Select this option for the best image quality for non-color pages.
					Color: Scans documents in color.
					Black/Gray: Scans documents in grayscale.
					Black: Scans documents in black and white with a compressed file size.
		Original Size		Select from a list of supported sizes.	Use to describe the page size of the original document.
		Content Orientation	Orientation	Automatically Detect	For some features to work correctly, you must specify the way the content of the original document is placed on the page. Portrait orientation means the short edge of the page is along the top. Landscape orientation means the long edge of the page is along the top. In the Orientation area, select whether the original document has a portrait or landscape orientation.
				Portrait*	
				Landscape	

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Options (continued)	Image Adjustment	Darkness		Use to improve the overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white and black in the colors.
			Contrast		Adjust the Contrast setting to increase or decrease the difference between the lightest and darkest color on the page.
			Background Cleanup		Adjust the Background Cleanup setting if you are having trouble copying a faint image
			Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make text appear crisper, but decreasing it could make photographs appear smoother.
			Automatic Tone		The printer automatically adjusts the Darkness, Contrast, and Background Cleanup settings to the most appropriate for the scanned document.
		Optimize Text/Picture		Text Mixed Printed picture Photograph	Text: Use for documents that contain mostly text. This option is also best suited for scanning documents with highlighter marks. Mixed: Use for documents that contain a mix of text and graphics. Printed picture: Use for line drawings and preprinted images, such as magazines clippings or pages from books. Photograph: Use for photographic prints.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Options (continued)	Erase Edges		Apply same width to all edges (checkbox to enable or disable) Top Edge Bottom Edge Left Edge Right Edge	Use this menu item to remove blemishes, such as dark borders or staple marks, by cleaning the specified edges of the scanned image. In each of the text boxes enter the measurements, in millimeters or inches, for how much of the top edge, bottom edge, left edge, and right edge to clean.
		Cropping Options		Do not crop Crop to content Crop to paper	Use this menu item to automatically crop the scan for digital sending. Use the Crop to content option to scan the smallest possible area that has detectable content.
		Automatically Straighten		Off* Automatically Straighten on	Enable this feature prior to scanning to automatically straighten the scanned image when pages are skewed during scanning.
		Blank Page Suppression		Off* Suppress blank pages	Use to prevent blank pages in the original document from being included in the output document.
		Multi-feed Detection		On* Off	This setting stops the scanning process if it detects multiple-page feeds through the document feeder.
		Create Multiple Files		Disabled* Enabled	Enable this item to scan pages into separate files based on a specified page limit. A page is one side of an original document. JPEG and TIFF have a limit of one page per file.

Table 2-44 Scan menu (MFP) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Options (continued)	Notification		Do not notify	Configure to receive notification about the status of a sent document
				Notify when job completes	
				Notify only if job fails	Do not notify: Turns off this feature.
				Print	
				E-mail	Notify when job completes: Select to receive notification for this job only.
					Notify only if job fails: Select to receive notification only if the job is not sent successfully.
					Print: Select to print the notification at this printer
					E-mail: Select to receive the notification to an email account.
		Include Thumbnail			Select Include Thumbnail to receive a thumbnail image of the first page of the job in your notification.
		Notification Email			E-mail: Select to receive the notification in an email. Touch the text box following Email Address, and then type the email address for the notification.

Fax menu (fax models only)

To display: At the printer control panel, select the Fax menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-45 Fax menu (fax models only)

First level	Second level	Third level	Values	Description
Dialing Prefix				
Fax Recipients				
Quick Sets and Defaults				
Options	Original Sides		1-sided* 2-sided	Use to describe the layout for each side of the original document. First select whether the original document is printed on one side or both sides. Then touch the Orientation setting to indicate whether the original has portrait or landscape orientation. If it is printed on both sides, also select the 2-sided format that matches the original document.
	Resolution		Standard (100 x 200dpi)* Fine (200 x 200dpi) Superfine (300 x 300dpi)	Select the resolution for outgoing faxes. If you increase the resolution, faxes might be clearer but they could transmit more slowly. Some file types, for example a file that will be processed with OCR, require a specific resolution. When these file types are selected, the Resolution setting might be automatically changed to a valid value.
	Original Size		Select from a list of sizes that the printer supports.	Use to describe the page size of the original document.
	Content Orientation	Orientation	Portrait* Landscape	For some features to work correctly, you must specify the way the content of the original document is placed on the page. Portrait: This setting means the short edge of the page is along the top. Landscape: This setting means the long edge of the page is along the top.

Table 2-45 Fax menu (fax models only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Image Adjustment	Darkness		Use to improve the overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white and black in the colors.
		Contrast		Adjust the Contrast setting to increase or decrease the difference between the lightest and darkest color on the page.
		Background Cleanup		Adjust the Background Cleanup setting if you are having trouble copying a faint image.
		Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make text appear crisper, but decreasing it could make photographs appear smoother.
		Automatic Tone		The printer automatically adjusts the Darkness, Contrast, and Background Cleanup settings to the most appropriate for the scanned document.
	Optimize Text/Picture		Text Mixed Printed picture Photograph	Optimizes the output for a particular type of content. You can optimize the output for text, printed pictures, or a mixture. Text: Use to optimize the text portion of the copy where text and/or pictures are on the original. Mixed: Use for documents that contain a mix of text and graphics. Printed picture: Use for line drawings and preprinted images, such as magazine clippings or pages from books. Photograph: Best suited for making copies of printed pictures.

Table 2-45 Fax menu (fax models only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Blank Page Suppression		Off* On	Prevents blank pages in the original document from being included in the output document.
	Multi-feed Detection		On* Off	Use this feature to prevent multiple pages being fed through the document feeder during document scans.
	Notification		Do not notify* Notify when job completes Notify only if job fails	Use to receive notification about the status of a sent document. Do not notify: Turns off this feature. Notify when job completes: Select to receive notification for this job only. Notify only if job fails: Select to receive notification only if the job is not sent successfully.
			Print E-mail	Print: Select to print the notification at this printer. E-mail: Select to receive the notification in an email. Touch the text box following Email Address, and then enter the email address for the notification.
		Include Thumbnail		When sending an analog fax, select Include Thumbnail to receive a thumbnail image of the first page of the fax in your notification.
		Notification E-mail address		Provide the email address that will receive notifications.

Print menu

To display: At the printer control panel, select the Print menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-46 Print Options menu

First level	Second level	Values	Description
Print from Job Storage	Stored Job to Print	Untitled	Print a job stored on the printer.
		Stored Faxes	
Print from USB Drive	Stored Job to Print	Choose file to print on USB drive.	Print a job stored on a USB drive.
Fax Polling	Fax Polling Number		

Supplies menu

To display: At the printer control panel, select the Supplies menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-47 Supplies menu

First level	Values	Description
Supplies Summary		
Black Cartridge	Status	
Cyan Cartridge	Order HP Part	
Magenta Cartridge	Pages Printed	
Yellow Cartridge	Approximate Pages Remaining	
Toner Collection Unit	Status	
Transfer Kit	Order HP Part	
Fuser Kit		
Document Feeder Kit		
Stapler 1		

Trays menu

To display: At the printer control panel, select the Trays menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-48 Trays menu

First level	Second level	Values	Description
Tray 1 Tray 2–x	Size	Select paper size from a list of supported sizes.	Choose the paper size for the tray
	Type	Select paper type from a list of supported types.	Choose the paper type for the tray.

Support Tools menu

Maintenance menu

📝 **NOTE:** Where applicable, only the touchscreen printers display a View button.

Backup/Restore menu

To display: At the printer control panel, select the Support Tools menu, select the Maintenance menu, and then select the Backup/Restore menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-49 Backup/Restore menu

First level	Second level	Third level	Values	Description
Back up Data	Back up Data		Back up Now	Initiate a backup.
			Cancel	
Restore Data			Insert a USB flash drive that contains the backup file in to the USB port near the control panel.	Restore data from an external source.

Calibration/Cleaning menu

To display: At the printer control panel, select the Maintenance menu, and then select the Calibrate/Cleaning menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-50 Calibrate/Cleaning menu

First level	Second level	Values	Description
Cleaning Page		Automatic Cleaning Interval	Use this menu to configure the settings for the product to automatically print a cleaning page.
		Off*	Select Off to disable automatic cleaning.
		1000 pages	
		2000 pages	Select a cleaning interval to set the number of pages to be printed before an automatic cleaning page is printed.
		5000 pages	
		10000 pages	
			Touch Print to manually print a cleaning page.
			NOTE: Cleaning pages print on the default paper size configured for the printer.
Quick Calibration		Start	The product automatically calibrates itself at various times. However, you can calibrate the product immediately if you see problems with print quality. Use this feature to perform a partial calibration. Use this calibration if color density or tone seems incorrect.
			Before calibrating the product, make sure that the Ready indicator displays on the control panel display. If a job is in progress, the calibration occurs when that job is complete.
Full Calibration		Start	The product automatically calibrates itself at various times. However, you can calibrate the product immediately if you see problems with print quality. Use this feature to perform a full calibration, which can take up to three minutes. Use this calibration if the color layers seem to be shifted on the page.
			Before calibrating the product, make sure that the Ready indicator displays on the control panel display. If a job is in progress, the calibration occurs when that job is complete.
Power On Calibration		No delay	This feature controls the timing of calibration when the printer wakes up or is turned on.
		Delay 15 minutes	
Calibrate Scanner (M681/M682 only)			Touch Start to calibrate the device scanner. Messages on the control panel display will lead you through the calibration process.

Table 2-50 Calibrate/Cleaning menu (continued)

First level	Second level	Values	Description
Prepare for Shipping			Touch Start to initiate a cleaning sequence that helps prepare the product for shipping. Excess toner will be transferred into the Toner Collection Unit to keep loose toner contained during shipping. This process takes about 2 minutes.
Reset Calibration		Reset Cancel	Use this feature to return the product to the factory-set default values for color calibration. Select Reset to reset the color calibration. The printer will restart with the factory-set defaults. Select Cancel to close the menu without resetting the color calibration.
Clean Document Feeder Settings M681/M682 only	Low Threshold Settings	Range: 0-100% Default = 10%	Configure cleaning settings for the document feeder.
	Very Low Settings	Stop Prompt to continue* Continue	Configure the printer action if the document feeder requires cleaning.

USB Firmware Upgrade menu

To display: At the printer control panel, select the Support Tools menu, select the Maintenance menu, and then select the USB Firmware Upgrade menu.

Insert a USB storage device with a firmware upgrade bundle into the USB port, and follow the on-screen instructions.

Troubleshooting menu

To display: At the printer control panel, select the Support Tools menu, and then select the Troubleshooting menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-51 Troubleshooting **menu**

First level	Second level	Third level	Fourth level	Values	Description
Reports	Configuration/Status Pages			Settings Menu Map	
				Current Settings Page	
				Configuration Page	
				How to Connect Page	
				Supplies Status Page	
				Usage Page	
				File Directory Page	
				Web Services Status Page	
				Color Usage Job Log	
	Fax Reports			Fax Activity Log	
				Billing Codes Report	
				Blocked Fax List	
				Fax Call Report	
	Other Pages			Demonstration Page	
				RGB Samples	
				CMYK Samples	
				PCL Font List	
				PS Font List	
Fax Tools Fax models only	Fax T.30 Trace	Print T.30 Report		Print	Use to print or configure the fax T.30 trace report. T.30 is the standard that specifies handshaking, protocols, and error correction between fax machines.

Table 2-51 Troubleshooting menu (continued)

First level	Second level	Third level	Fourth level	Values	Description
Fax Tools (continued)	Fax T.30 Trace (continued)	When to Print Report		Never automatically print* Print after every fax Print only after fax send jobs Print after any fax error Print only after fax send errors Print only after fax receive errors	Configure the T.30 report to print after certain events. You can choose to print the report after every fax job, every fax job sent, every fax job received, every send error, or every receive error.
	Fax V.34			On Off*	Use to disable V.34 modulations if several fax failures have occurred or if phone line conditions require it.
	JBIG Compression			On Off*	The JBIG compression reduces fax-transmission time, which can result in lower phone charges. However, using JBIG compression sometimes causes compatibility problems with older fax machines. If this occurs, turn off the JBIG compression.
	Fax Speaker Mode			Normal* Diagnostic	Used by a technician to evaluate and diagnose fax issues by listening to the sounds of fax modulations.
	Fax Service Log			Print* Cancel	The standard fax log includes basic information such as the time and whether the fax was successful. The detailed fax log shows the intermediate results of the redial process not shown in the standard fax log.
Print Quality Pages	PQ Troubleshooting Pages			Print	Use to print pages that can help you resolve problems with print quality.

Table 2-51 Troubleshooting menu (continued)

First level	Second level	Third level	Fourth level	Values	Description
Print Quality Pages (continued)	Diagnostics Page			Print	Use to print a diagnostics page. The page includes color swatches, diagnostic information, and calibration information.
	Color Band Test			Print	Use to print a page that helps you resolve problems with print quality.
Event Log				Print Delete (trash can)	Use to print a list of the 50 most recent events in the event log. For each event, the printed log shows the error number, page count, error code, and description or personality.
Paper Path Page				Print	Shows how many pages were printed from each tray.
Diagnostic Tests	Disable Cartridge Check				Use this diagnostic test to print internal pages or send an external job to the printer when the toner cartridge is removed or exchanged. Supply errors are ignored while the printer is in this mode.
	Paper Path Test	Number of Copies		Range: 1-500 Default = 1	Sets the default number of copies for a copy job. This default applies when the Copy or Quick Copy function is initiated from the printer Home screen. The factory default setting is 1.
		Paper Tray		Select from a list of the available trays.	Generates a test page for testing paper handling features. You can define the path that is used for the test in order to test specific paper paths.
		Output Sides		1-sided* 2-sided	
		Staple		None* Top left or right	

Table 2-51 Troubleshooting menu (continued)

First level	Second level	Third level	Fourth level	Values	Description
Diagnostic Tests (continued)	Paper Path Test (continued)	Output Bin		All Bins	
				Standard Bin*	
				Upper Bin	
				Middle Bin	
	Print/Stop Test			Stop Next Print Job	
				Delay	
	Paper Path Sensor Test			Select from a list of the printer sensors.	Initiates a test of the paper path sensors.
	Manual Sensor Test			Select from a list of available components. Reset Sensors	Test the printer sensors and switches for correct operation. Each sensor is displayed on the control panel screen, along with its status. Manually trip each sensor and watch for it to change on the screen. Press the Stop button to abort the test.
	Component Test			Select from a list of available components. Repeat	Use this item to exercise individual parts independently to isolate noise, leaking, or other issues. To start the test, select one of the components. The test will run the number of times specified by the Repeat option. The user might be prompted to remove parts from the printer during the test. Press the Stop button to abort the test.
	Continuous Scan (M682/M683)			2–sided	
	Run Fax Test(M681/ M682)			Start	
Generate Debug Data				Start	
Retrieve Diagnostic Data				Send to email	Create files that contain information about the printer that can help identify the cause of problems.
Retrieve Fax Diagnostic Data(M681/ M682)					Enter user access code to retrieve fax diagnostic data.

Service menu

To display: At the printer control panel, select the Support Tools menu, and then select the Service menu.

The Service menu is locked and requires a personal identification number (PIN) for access. This menu is intended for use by authorized service personnel. See the Service mode function section in the printer troubleshooting manual.

Control panel message document (CPMD)

Control panel messages and event log entries

The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Service Access Workbench (SAW) website. Click Service Access Workbench to access the website, and then search by printer name. The CPMD is available to channel partners through the HP Channel Services Network (CSN).

Improve print quality

Introduction

- [Print from a different software program](#)
- [Check the paper-type setting for the print job](#)
- [Check toner-cartridge status](#)
- [Print a cleaning page](#)
- [Visually inspect the toner cartridge](#)
- [Check paper and the printing environment](#)
- [Try a different print driver](#)
- [Calibrate the printer to align the colors](#)

If the printer is having print-quality problems, try the following solutions in the order presented to resolve the issue.

Print from a different software program

Try printing from a different software program. If the page prints correctly, the problem is with the software program from which you were printing.

Check the paper-type setting for the print job

Check the paper type setting when printing from a software program and the printed pages have smears, fuzzy or dark print, curled paper, scattered dots of toner, loose toner, or small areas of missing toner.

Check the paper type setting (Windows)

1. From the software program, select the **Print** option.
2. Select the printer, and then click the **Properties** or **Preferences** button.
3. Click the **Paper/Quality** tab.
4. From the **Paper Type** drop-down list, click the **More...** option.
5. Expand the list of **Type is:** options.
6. Expand the category of paper types that best describes your paper.
7. Select the option for the type of paper you are using, and click the **OK** button.
8. Click the **OK** button to close the **Document Properties** dialog box. In the **Print** dialog box, click the **OK** button to print the job.

Check the paper type setting (OS X)

1. Click the **File** menu, and then click the **Print** option.
2. In the **Printer** menu, select the printer.

3. By default, the print driver displays the **Copies & Pages** menu. Open the menus drop-down list, and then click the **Finishing** menu.

4. Select a type from the **Media Type** drop-down list.

5. Click the **Print** button.

Check toner-cartridge status

Follow these steps to check the estimated life remaining in the toner cartridges and if applicable, the status of other replaceable maintenance parts.

Step one: Print the supplies status page

1. From the Home screen on the printer control panel, select the Reports menu.

2. Select the Configuration/Status Pages menu.

3. Select Supplies Status Page, and then select Print to print the page.

Step two: Check supplies status

1. Look at the supplies status report to check the percent of life remaining for the toner cartridges and, if applicable, the status of other replaceable maintenance parts.

    Print quality problems can occur when using a toner cartridge that is at its estimated end of life. The supplies status page indicates when a supply level is very low. After an HP supply has reached the very low threshold, HP's premium protection warranty on that supply has ended.

    The toner cartridge does not need to be replaced now unless the print quality is no longer acceptable. Consider having a replacement available to install when print quality is no longer acceptable.

    If you determine that you need to replace a toner cartridge or other replaceable maintenance parts, the supplies status page lists the genuine HP part numbers.

2. Check to see if you are using a genuine HP cartridge.

    A genuine HP toner cartridge has the word "HP" on it, or has the HP logo on it. For more information on identifying HP cartridges go to www.hp.com/go/learnaboutsupplies.

Print a cleaning page

During the printing process paper, toner, and dust particles can accumulate inside the printer and can cause print-quality issues such as toner specks or spatter, smears, streaks, lines, or repeating marks.

Follow these steps to clean the printer's paper path.

1. From the Home screen on the printer control panel, swipe until the Support Tools menu displays. Touch the Support Tools icon to open the menu.

2. Open the following menus:

- Maintenance
- Calibration/Cleaning
- Cleaning Page

3. Select Print to print the page.

   A **Cleaning...** message displays on the printer control panel. The cleaning process takes a few minutes to complete. Do not turn the printer off until the cleaning process has finished. When it is finished, discard the printed page.

Visually inspect the toner cartridge

Follow these steps to inspect each toner cartridge.

1. Remove the toner cartridges from the printer, and verify that the sealing tape has been removed.

2. Check the memory chip for damage.

3. Examine the surface of the green imaging drum.

   ⚠ CAUTION: Do not touch the imaging drum. Fingerprints on the imaging drum can cause print-quality problems.

4. If you see any scratches, fingerprints, or other damage on the imaging drum, replace the toner cartridge.

5. Reinstall the toner cartridge, and print a few pages to see if the problem has resolved.

Check paper and the printing environment

Step one: Use paper that meets HP specifications

Some print-quality problems arise from using paper that does not meet HP specifications.

- Always use a paper type and weight that this printer supports.
- Use paper that is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, staples, and curled or bent edges.
- Use paper that has not been previously printed on.
- Use paper that does not contain metallic material, such as glitter.
- Use paper that is designed for use in laser printers. Do not use paper that is designed only for use in Inkjet printers.
- Use paper that is not too rough. Using smoother paper generally results in better print quality.

Step two: Check the environment

The environment can directly affect print quality and is a common cause for print-quality or paper-feeding issues. Try the following solutions:

- Move the printer away from drafty locations, such as open windows or doors, or air-conditioning vents.
- Make sure the printer is not exposed to temperatures or humidity outside of printer specifications.
- Do not place the printer in a confined space, such as a cabinet.

- Place the printer on a sturdy, level surface.

- Remove anything that is blocking the vents on the printer. The printer requires good air flow on all sides, including the top.

- Protect the printer from airborne debris, dust, steam, grease, or other elements that can leave residue inside the printer.

Step three: Set the individual tray alignment

Follow these steps when text or images are not centered or aligned correctly on the printed page when printing from specific trays.

1. From the Home screen on the printer control panel, select the Settings menu.

2. Select the following menus:

   - Copy/Print or Print

   - Print Quality

   - Image Registration

3. Select Tray, and then select the tray to adjust.

4. Select Print Test Page, and then follow the instructions on the printed pages.

5. Select Print Test Page again to verify the results, and then make further adjustments if necessary.

6. Select Done to save the new settings.

Try a different print driver

Try a different print driver when printing from a software program and the printed pages have unexpected lines in graphics, missing text, missing graphics, incorrect formatting, or substituted fonts.

Download any of the following drivers from the HP Web site: www.hp.com/support/colorljM652, www.hp.com/support/colorljM653, www.hp.com/support/colorljM681MFP or www.hp.com/support/colorljM682MFP.

HP PCL.6 driver **HP PCL 6 driver** **HP PCL-6 driver**	• Provided as the default driver on the printer CD. This driver is automatically installed unless you select a different one. • Recommended for all Windows environments • Provides the overall best speed, print quality, and printer-feature support for most users • Developed to align with the Windows Graphic Device Interface (GDI) for the best speed in Windows environments • Might not be fully compatible with third-party and custom software programs that are based on PCL 5
HP UPD PS driver	• Recommended for printing with Adobe® software programs or with other highly graphics-intensive software programs • Provides support for printing from postscript emulation needs, or for postscript flash font support

HP UPD PCL 5	• Recommended for general office printing in Windows environments
	• Compatible with previous PCL versions and older HP LaserJet printers
	• The best choice for printing from third-party or custom software programs
	• The best choice when operating with mixed environments, which require the printer to be set to PCL 5 (UNIX, Linux, mainframe)
	• Designed for use in corporate Windows environments to provide a single driver for use with multiple printer models
	• Preferred when printing to multiple printer models from a mobile Windows computer
HP UPD PCL 6	• Recommended for printing in all Windows environments
	• Provides the overall best speed, print quality, and printer feature support for most users
	• Developed to align with Windows Graphic Device Interface (GDI) for best speed in Windows environments
	• Might not be fully compatible with third-party and custom software programs that are based on PCL 5

Calibrate the printer to align the colors

Calibration is a printer function that optimizes print quality.

Follow these steps to resolve print-quality problems such as misaligned color, colored shadows, blurry graphics, or other print-quality issues.

1. From the Home screen on the printer control panel, select the Support Tools menu.

2. Select the following menus:

    • Maintenance

    • Calibration/Cleaning

    • Full Calibration

3. Select Start to start the calibration process.

    A **Calibrating** message will display on the printer control panel. The calibration process takes a few minutes to complete. Do not turn the printer off until the calibration process has finished.

4. Wait while the printer calibrates, and then try printing again.

Print quality troubleshooting guide

📝 **NOTE:** Use the procedures in this section to resolve most print-quality issues (for example, streaks or fading, missing black or other colors, blurred or fuzzy text, and ink streaks or smears). Try the following solutions in the order presented. When one of the solutions resolves the issue, there is no need to continue with the other procedures.

- Introduction
- Printer-specific image defects

Introduction

- Toner cartridges
- Check the paper-type setting for the print job
- Check paper and the printing environment
- Information to collect

Toner cartridges

Check toner-cartridge status

Print the supplies status page from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Reports button.

2. Select Configuration/Status Pages.

3. Select Supplies Status Page, and then select Print .

Print the supplies status page from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Reports, and then press the OK button.

2. Select Configuration/Status Pages.

3. Use the down arrow ▼ button to scroll to Supplies Status, and then press the OK button to select it.

4. Use the up arrow ▲ button to scroll to Print, and then press the OK button to print the page.

Check the supplies status page for the following information:

- Estimated percentage of cartridge or cartridges life remaining

- Approximate pages remaining

- Part number or numbers for HP toner cartridge or cartridges

- Number of pages printed

Visually inspect the toner cartridge or cartridges

1. Remove the toner cartridge or cartridges from the printer, and verify that the sealing tape has been removed.

2. Check the memory chip for damage.

3. Examine the surface of the imaging drum on the cartridge.

   ⚠ CAUTION: Do not touch the roller (imaging drum). Fingerprints on the imaging drum can cause print-quality problems.

4. If you see any scratches, fingerprints, or other damage on an imaging drum, replace the toner cartridge or cartridges.

5. If the imaging drum does not appear to be damaged, rock the toner cartridge or cartridges gently several times and reinstall it. Print a few pages to see if the problem has resolved.

Check the paper-type setting for the print job

Check the paper type setting when printing from a software program and the printed pages have smears, fuzzy or dark print, curled paper, scattered dots of toner, loose toner, or small areas of missing toner.

Check the paper type setting (Windows)

1. From the software program, select the **Print** option.

2. Select the printer, and then click the **Properties** or **Preferences** button.

3. Click the **Paper/Quality** tab.

4. From the **Paper Type** drop-down list, click the **More...** option.

5. Expand the list of **Type is:** options.

6. Expand the category of paper types that best describes your paper.

7. Select the option for the type of paper you are using, and click the **OK** button.

8. Click the **OK** button to close the **Document Properties** dialog box. In the **Print** dialog box, click the **OK** button to print the job.

Check the paper type setting (Mac OS X)

1. Click the **File** menu, and then click the **Print** option.

2. In the **Printer** menu, select the printer.

3. By default, the print driver displays the **Copies & Pages** menu. Open the menus drop-down list, and then click the **Finishing** menu.

4. Select a type from the **Media Type** drop-down list.

5. Click the **Print** button.

Check paper and the printing environment

Step one: Use paper that meets HP specifications

- Always use a paper type and weight that this printer supports.

- Use paper that is of good quality and free of cuts, nicks, tears, spots, loose particles, dust, wrinkles, voids, staples, and curled or bent edges.

- Use paper that has not been previously printed on.

- Use paper that does not contain metallic material, such as glitter.

- Use paper that is designed for use in laser printers. Do not use paper that is designed only for use in Inkjet printers.

- Use paper that is not too rough. Using smoother paper generally results in better print quality

Step two: Check the environment

The environment can directly affect print quality and is a common cause for print-quality or paper-feeding issues. Try the following solutions:

- Move the printer away from drafty locations, such as open windows or doors, or air-conditioning vents.

- Make sure the printer is not exposed to temperatures or humidity outside of printer specifications.

- Do not place the printer in a confined space, such as a cabinet.

- Place the printer on a sturdy, level surface.

- Remove anything that is blocking the vents on the printer. The printer requires good air flow on all sides, including the top.

- Protect the printer from airborne debris, dust, steam, grease, or other elements that can leave residue inside the printer.

Information to collect

- Configuration page

- Current settings page

- Supples status page

- Demo page

- Other pages support personnel may request

Printer-specific image defects

📝 **NOTE:** The image defects described in this section are printer-specific image defects.

- [Resolving print quality problems](#)

- [Repetitive image defect ruler](#)

- [Printer-specific image defects](#)

Resolving print quality problems

- [Introduction](#)

- [Troubleshoot print quality problems](#)

Introduction

The following information provides troubleshooting steps for solving image defect issues, including the following defects:

- Light print

- Gray background or dark print

- Blank pages

- Black pages

- Dark or light bands

- Dark or light streaks

- Missing toner

- Skewed images

- Colors that do not align

- Curled paper

Troubleshoot print quality problems

Table 2-52 Image defects table quick reference

Table 2-53 Light print on page 291	Table 2-54 Gray background or dark print on page 291	Table 2-55 Blank page — No print on page 292
Table 2-56 Black page on page 292	Table 2-57 Banding defects on page 293	Table 2-58 Streak defects on page 293
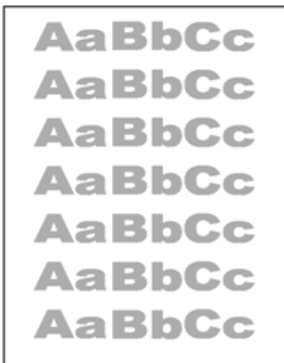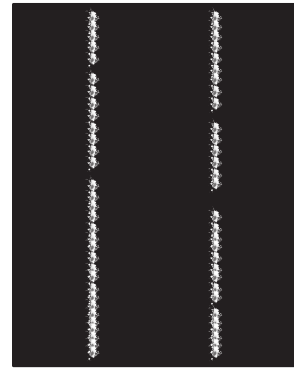
Table 2-52 Image defects table quick reference (continued)
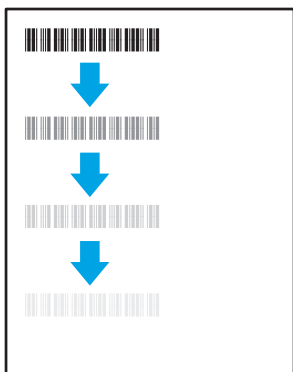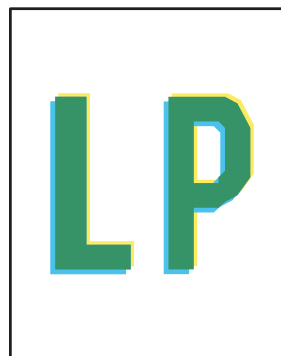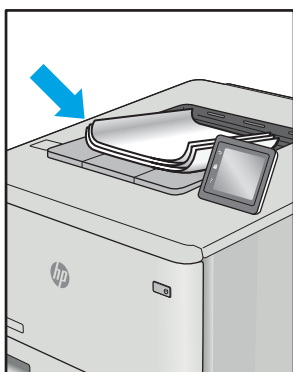
Image defects, no matter the cause, can often be resolved using the same steps. Use the following steps as a starting point for solving image defect issues.

1. Reprint the document. Print quality defects can be intermittent in nature or can go away completely with continued printing.

2. Check the condition of the cartridge or cartridges. If a cartridge is in a **Very Low** state (it has passed the rated life), replace the cartridge.

3. Make sure that the driver and tray print mode settings match the media that is loaded in the tray. Try using a different ream of media or a different tray. Try using a different print mode.

4. Make sure that the printer is within the supported operating temperature/humidity range.

5. Make sure that the paper type, size, and weight are supported by the printer. See the printer support page at support.hp.com for a list of the supported paper sizes and types for the printer.

NOTE: The term "fusing" refers to the part of the printing process where toner is affixed to paper.

The following examples depict letter-size paper that has passed through the printer short-edge first.

Table 2-53 Light print

Description	Sample	Possible solutions
Light print: The printed content on the entire page is light or faded.	AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc	1. Reprint the document. 2. Remove the cartridge, and then shake it to redistribute the toner. 3. **Mono models only:** Make sure that the Economode setting is disabled both at the printer control panel and in the print driver. 4. Make sure that the cartridge is installed correctly. 5. Print a Supply status page and check for life and usage of the cartridge. 6. Replace the cartridge. 7. If the problem persists, go to support.hp.com.

Table 2-54 Gray background or dark print

Description	Sample	Possible solutions
Gray background or dark print: The image or text is darker than expected.	AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc AaBbCc	1. Make sure that the paper in the trays has not already been run through the printer. 2. Use a different paper type. 3. Reprint the document. 4. **Mono models only:** From the Home screen on the printer control panel, go to the Adjust Toner Density menu, and then adjust the toner density to a lower level. 5. Make sure that the printer is in within the supported operating temperature and humidity range. 6. Replace the cartridge. 7. If the problem persists, go to support.hp.com.

Table 2-55 Blank page — No print

Description	Sample	Possible solutions
Blank page — No print: The page is completely blank and contains no printed content.		1. Make sure that the cartridge is genuine HP cartridges. 2. Make sure that the cartridge is installed correctly. 3. Print with a different cartridge. 4. Check the paper type in the paper tray and adjust the printer settings to match. If necessary, select a lighter paper type. 5. If the problem persists, go to support.hp.com.

Table 2-56 Black page

Description	Sample	Possible solutions
Black page: The entire printed page is black.		1. Visually inspect the cartridge to check for damage. 2. Make sure that the cartridge is installed correctly. 3. Replace the cartridge 4. If the problem persists, go to support.hp.com.

Table 2-57 Banding defects

Description	Sample	Possible solutions
Repetitive wide–pitch banding and Impulse bands: Dark or light lines which repeat down the length of the page. They might be sharp or soft in nature. The defect displays only in areas of fill, not in text or sections with no printed content.		1. Reprint the document. 2. Try printing from another tray. 3. Replace the cartridge. 4. Use a different paper type. 5. **Enterprise models only:** From the Home screen on the printer control panel, go to the Adjust Paper Types menu, and then choose a print mode that is designed for a slightly heavier media than what you are using. This slows the print speed and might improve the print quality. 6. If the problem persists, go to support.hp.com.

Table 2-58 Streak defects
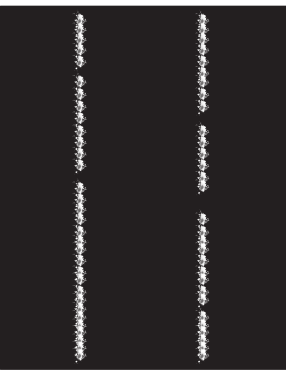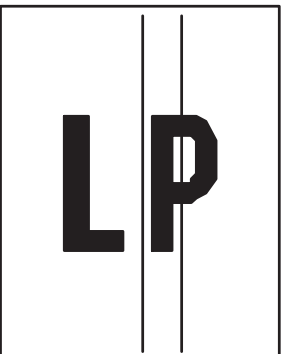
Description	Sample	Possible solutions
Light vertical streaks: Light streaks that usually span the length of the page. The defect displays only in areas of fill, not in text or sections with no printed content.		1. Reprint the document. 2. Remove the cartridge, and then shake it to redistribute the toner. 3. If the problem persists, go to support.hp.com. NOTE: Both light and dark vertical streaks can occur when the printing environment is outside the specified range for temperature or humidity. Refer to your printer's environmental specifications for allowable temperature and humidity levels.
Dark vertical streaks and ITB cleaning streaks (color models only): Dark lines which occur down the length of the page. The defect might occur anywhere on the page, in areas of fill or in sections with no printed content.		1. Reprint the document. 2. Remove the cartridge, and then shake it to redistribute the toner. 3. Print a cleaning page. 4. Check the toner level in the cartridge. 5. If the problem persists, go to support.hp.com.

Table 2-59 Fixing/fuser defects
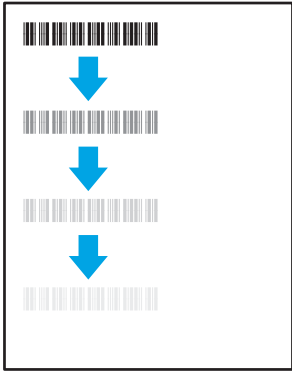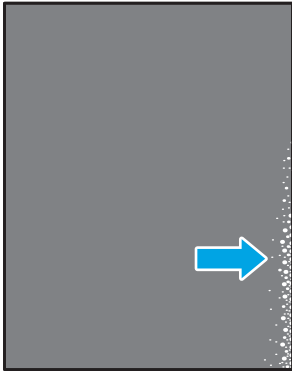
Description	Fixing/fuser	Possible solutions
Hot fuser offset (shadow): Slight shadows, or offsets, of the image repeated down the page. The repeated image might fade with each recurrence.		1. Reprint the document. 2. Check the paper type in the paper tray and adjust the printer settings to match. If necessary, select a lighter paper type. 3. If the problem persists, go to support.hp.com.
Poor fusing: Toner rubs off along either edge of page. This defect is more common at the edges of high-coverage jobs and on light media types but can occur anywhere on the page.		1. Reprint the document. 2. Check the paper type in the paper tray and adjust the printer settings to match. If necessary, select a heavier paper type. 3. **Enterprise models only:** From the printer control panel, go to the Edge-to-Edge menu and then select Normal. Reprint the document. 4. **Enterprise models only:** From the printer control panel, select Auto Include Margins and then reprint the document. 5. If the problem persists, go to support.hp.com.

Table 2-60 Image placement defects

Description	Sample	Possible solutions
Margins and skew: The image is not centered, or is skewed on the page. The defect occurs when the paper is not positioned properly as it is pulled from the tray and moves through the paper path.		1. Reprint the document. 2. Remove the paper and then reload the tray. Make sure that all the paper edges are even on all sides. 3. Make sure that the top of the paper stack is below the tray full indicator. Do not overfill the tray. 4. Make sure that the paper guides are adjusted to the correct size for the paper. Do not adjust the paper guides tightly against the paper stack. Adjust them to the indentations or markings in the tray. 5. If the problem persists, go to support.hp.com.

Table 2-61 Color plane registrations defects (color models only)
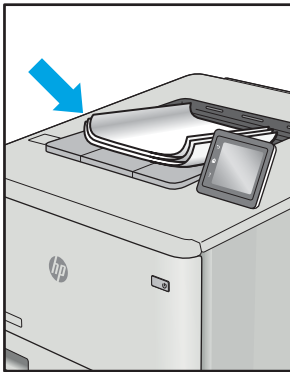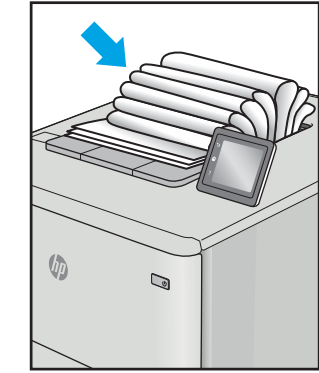
Description	Sample	Possible solutions
Color plane registrations: One or more color of the planes is not aligned with the other color planes. The primary error will typically occur with yellow.	**LP**	1. Reprint the document. 2. From the printer control panel, calibrate the printer. 3. If a cartridge has reached a **Very Low** state or the printed output is severely faded, replace the cartridge. 4. From the printer control panel use the Restore Calibration feature to reset the printer's calibration settings to the factory defaults. 5. If the problem persists, go to support.hp.com.

Table 2-62 Output defects

Description	Sample	Possible solutions
Output curl: Printed paper has curled edges. The curled edge can be along the short or long side of the paper. Two types of curl are possible: ● **Positive curl:** The paper curls toward the printed side. The defect occurs in dry environments or when printing high coverage pages. ● **Negative curl:** The paper curls away from the printed side. The defect occurs in high-humidity environments or when printing low coverage pages.		1. Reprint the document. 2. **Positive curl:** From the printer control panel, select a heavier paper type. The heavier paper type creates a higher temperature for printing. **Negative curl:** From the printer control panel, select a lighter paper type. The lighter paper type creates a lower temperature for printing. Try storing the paper in a dry environment prior or use freshly opened paper. 3. Print in duplex mode. 4. If the problem persists, go to support.hp.com.
Output stacking: The paper does not stack well in the output tray. The stack might be uneven, skewed, or the pages might be pushed out of the tray and onto the floor. Any of the following conditions can cause this defect: ● Extreme paper curl ● The paper in the tray is wrinkled or deformed ● The paper is a non-standard paper type, such as envelopes ● The output tray is too full		1. Reprint the document. 2. Extend the output bin extension. 3. If the defect is caused by extreme paper curl, complete the troubleshooting steps for Output curl. 4. Use a different paper type. 5. Use freshly opened paper. 6. Remove the paper from the output tray before the tray gets too full. 7. If the problem persists, go to support.hp.com.

Repetitive image defect ruler

When troubleshooting the source of some print image defects, one solution is to identify if it is a repetitive defect (does the print quality defect appear multiple times on the printed page?). If this is the case, use a ruler to measure occurrences of repetitive image defects to help solve image-quality problems. For more information, see Use a ruler to measure between repetitive defects on page 297.

Place the ruler next to the first occurrence of the defect on the page. Find the distance between identical defects and use the table below to identify the component that is causing the defect.

IMPORTANT: Do not use solvents or oils to clean rollers. Instead, rub the roller with lint-free paper. If dirt is difficult to remove, rub the roller with lint-free paper that has been dampened with water.

NOTE: Defects on the tray pickup rollers or the Tray 1 pickup roller do not cause a repetitive defect. Defects on these rollers cause a defect to appear only on the leading edge of the image.

TIP: To make a printer specific repetitive defect ruler, use a metric ruler to transfer the measurements in Table 2-63 Repetitive defects on page 296 to a transparency or the edge of a piece of paper—clearly label each ruler mark with the associated defective assembly.

Table 2-63 Repetitive defects

Assembly	Distance between defects
Primary charging roller[1]	27 mm (1.06 in)
Developer roller[11]	26 mm (1.02 in)
Registration roller	42 mm (1.65 in)
Secondary transfer roller	50 mm (1.97 in)
Fuser film[2]	75 mm (2.95 in)
Pressure roller[2]	79 mm (3.11 in)
Photosensitive drum[1]	75 mm (2.95 in)

[1] The primary charging roller, photosensitive drum and developer roller cannot be cleaned. If any of these rollers are indicated, replace the toner cartridge.

[2] The primary fuser sleeve unit or pressure roller cannot be cleaned because they are internal assemblies in the fuser. If one of these assemblies is causing the defect, replace the fuser.

Use a ruler to measure between repetitive defects

The figures in this section show color repetitive defect pages. However, the process for measuring repetitive defects is valid for mono pages.

1. Identify a repetitive defect on the page.

   ☼ **TIP:** Print a cleaning page to see if that resolves the defect.

   The example pages below show the following types of repetitive defects.

   📝 **NOTE:** These are examples only, other types of repetitive defects might appear on a page.

   - Lines (callout 1)
   - Smudges (callout 2)
   - Dots or spots (callout 3)

   Figure 2-87 Examples of repetitive defects
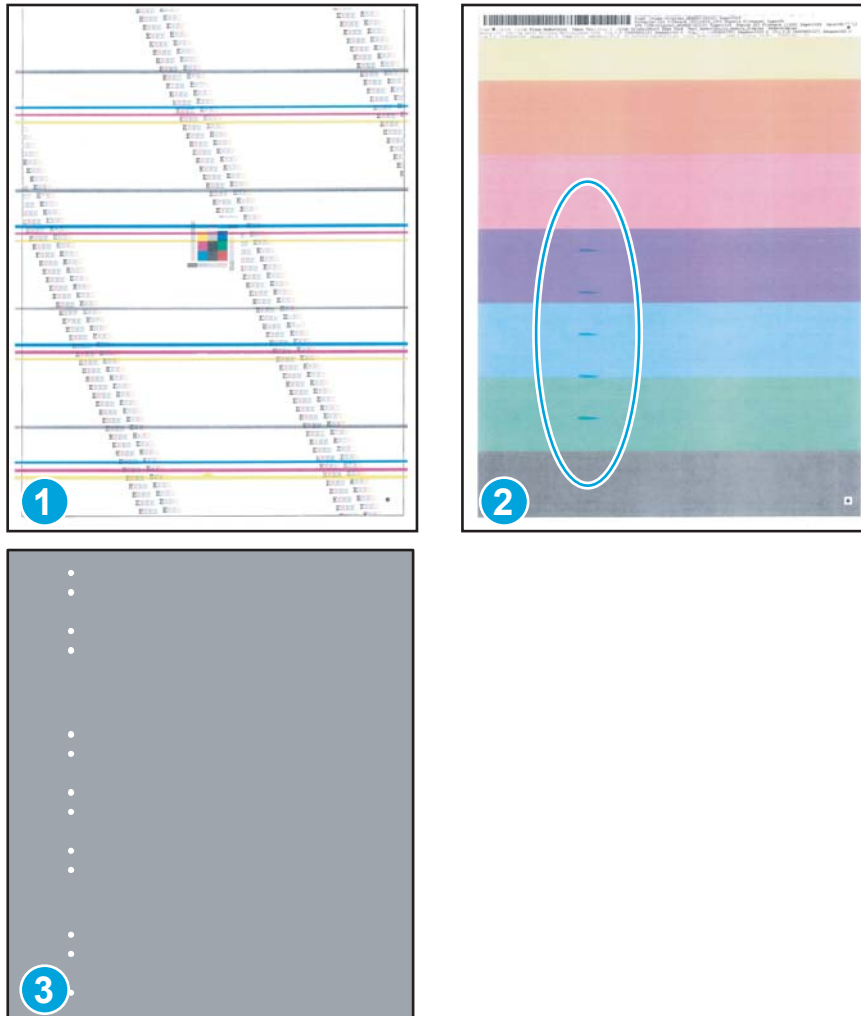
2. Position a metric ruler on the page with the "zero" ruler mark at one occurrence of the defect (callout 1).

Figure 2-88 Place the ruler on the page
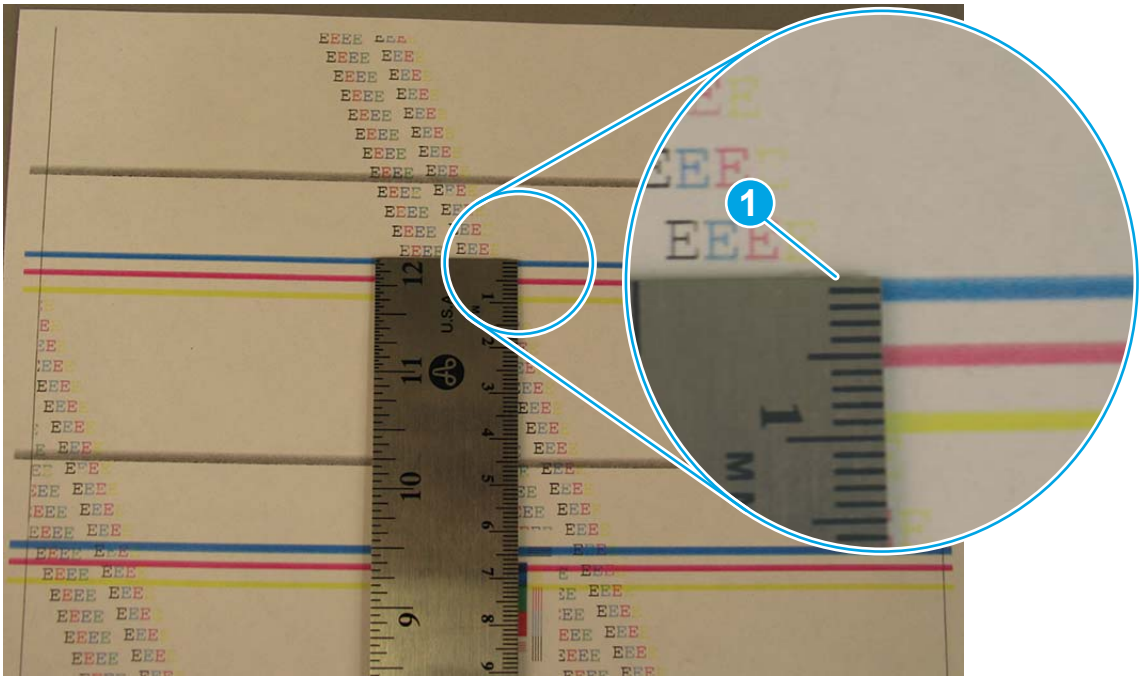
3. Locate the next occurrence of the defect (callout 1).

Figure 2-89 Locate the next repetitive defect
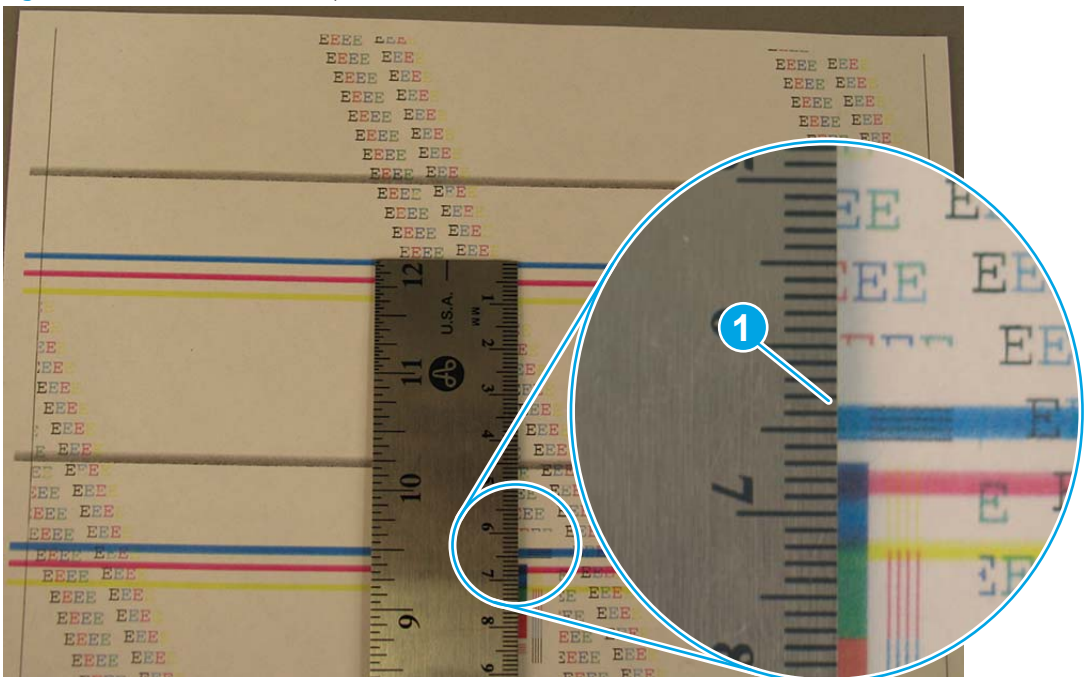
4. Measure the distance (in millimeters) between the two occurrences (callout 1), and then use Table 2-63 Repetitive defects on page 296 to determine the defective assembly.

☼ **TIP:** Always measure from and to the same point on the defects. For example, if the ruler is "zeroed" at the top edge of a defect, measure to the top edge of the next occurrence of that defect.

Figure 2-90 Determine the defective assembly
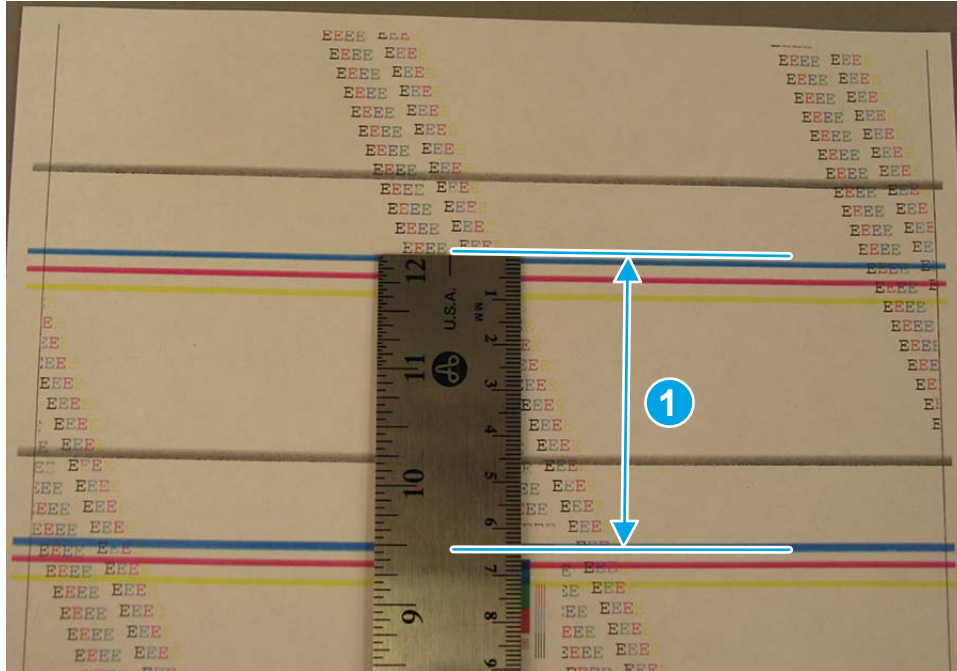
Printer-specific image defects

📝 NOTE: The image defects described in this section are printer-specific image defects.

- [Image defect events](#)

Image defect events

📝 NOTE: The image defects described in this section are defects that occurred during development and that could not be fully eliminated. Customers might observe these defects.

- [Developer ghosting](#)
- [RS banding](#)
- [DW gear fine-pitch banding](#)
- [AC banding](#)
- [Dark transfer band](#)
- [Trailing edge transfer](#)
- [Chicken tracks or dunes](#)
- [Mottle/graininess fixing](#)
- [Hot offset fixing](#)
- [Snail tracks/wrinkle](#)
- [Sharp streaks](#)
- [ITB streaks](#)
- [Streaks from Tray 1](#)
- [Cartridge stirring blade slap](#)

Developer ghosting

Figure 2-91 Developer ghosting
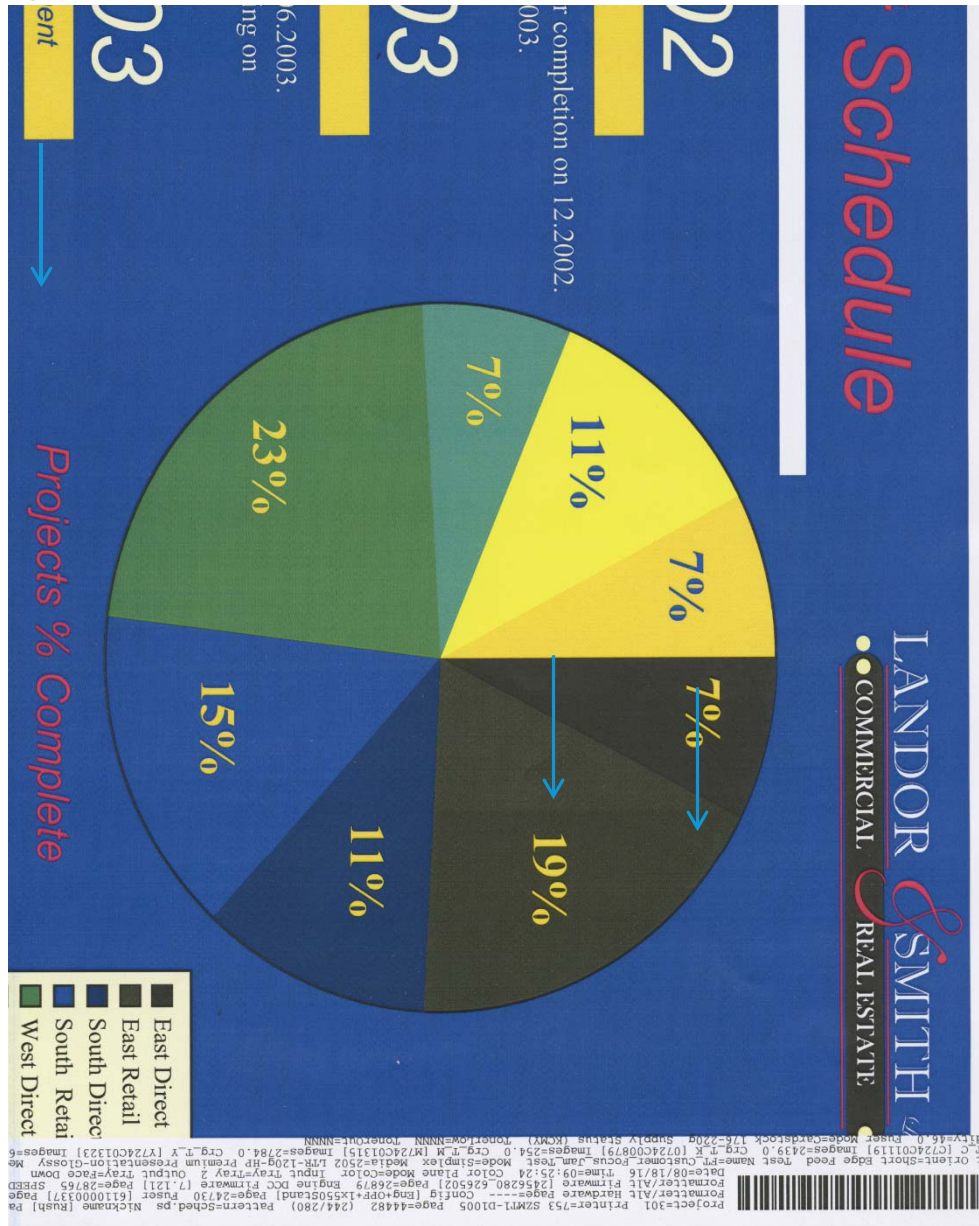
Description of the defect

This defect is a "ghost" image repeating at approximately 26.2 mm (1.0 in) intervals down the page. This usually occurs in an area of transition between a block or line image and a lighter, halftone region.

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text.

Solutions for the defect

- From the printer control panel, change the optimize mode to background 1.

- Open the following menus:

  ○ Setup

  ○ Copy/Print

  ○ Print Quality

  ○ Optimize

  ○ Background 1

  ○ Select On

- If changing the optimize mode does not affect the defect, replace the toner cartridge.

Parts related to the defect

NOTE: The following item(s) might need to be repaired or replaced to prevent this defect form occurring.

- Toner cartridge

RS banding

Figure 2-92 RS banding

Description of the defect

This defect is soft, gradual bands that can be seen over a constant density area. It appears as slight gradients which repeat at 16.7 mm (0.6 in) and harmonics, such as 2.37 mm (0.09 in).

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text.

Solutions for the defect

- Reprint the document.

- If the defect continues, replace the toner cartridge.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Toner cartridge

DW gear fine-pitch banding

Figure 2-93 DW gear fine-pitch banding
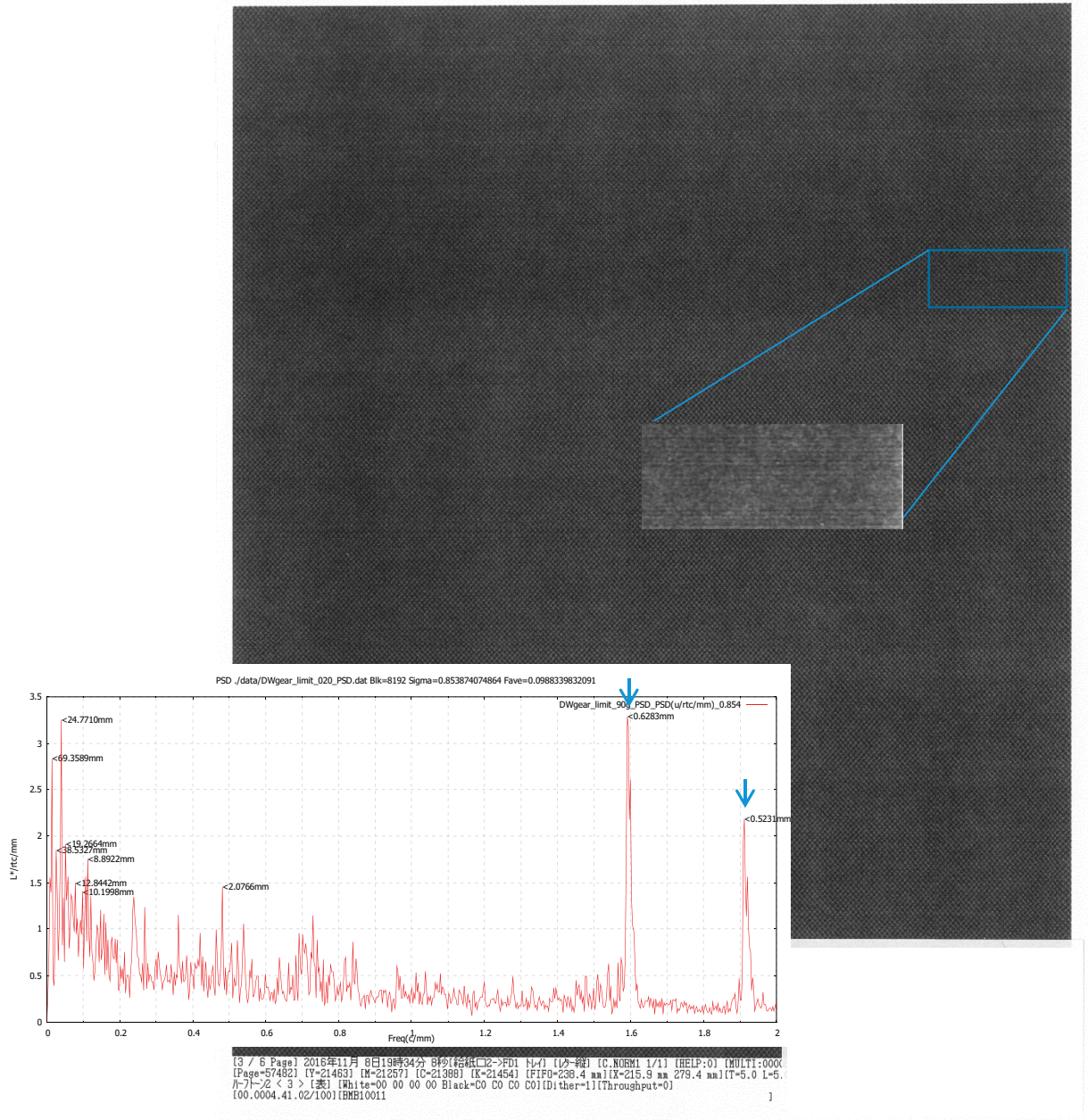
Description of the defect

The defect appears as alternating light and dark, evenly-spaced and repetitive horizontal lines. The 0.63 mm (0.02 in) and 0.52 mm (0.02 in) fine-pitch banding is caused by the DW gear tooth engagement. The alignment of the motor gear to the DW gear (white) to the drum drive gear (black) is the important factor for this banding. The two gear diameters on the DW gear cause the peaks in the power spectrum shown in the figure above.

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text.

Solutions for the defect

- From the printer control panel, change the tray type to mid-weight.

  - Open the following menus:

    - Trays

    - Select tray

    - Select Type

    - Select Mid-weight 96-110g

AC banding

Figure 2-94 AC banding

Description of the defect

This defect is alternating light and dark bands which repeat at the AC inlet line frequency in high-humidity environments. Since this defect occurs most often with 220 V inlet voltage, the line frequency is 50 Hz. Based on this frequency, the bands occur every 5.92 mm (0.23 in) when printing at full speed or 1.97 mm (0.08 in) when printing at one-third speed.

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text. It usually occurs in high-temperature and high-humidity environments on fully-acclimated paper (low resistivity). The defect occurs more often in 220 V units, which have higher voltage applied to the fuser heater.

Solutions for the defect

- Reprint the document using freshly-opened paper.

- Print in a drier environment.

- Replace the fuser.

Parts related to the defect

📝 NOTE: The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Fuser

- Paper

Dark transfer band

Figure 2-95 Dark transfer band
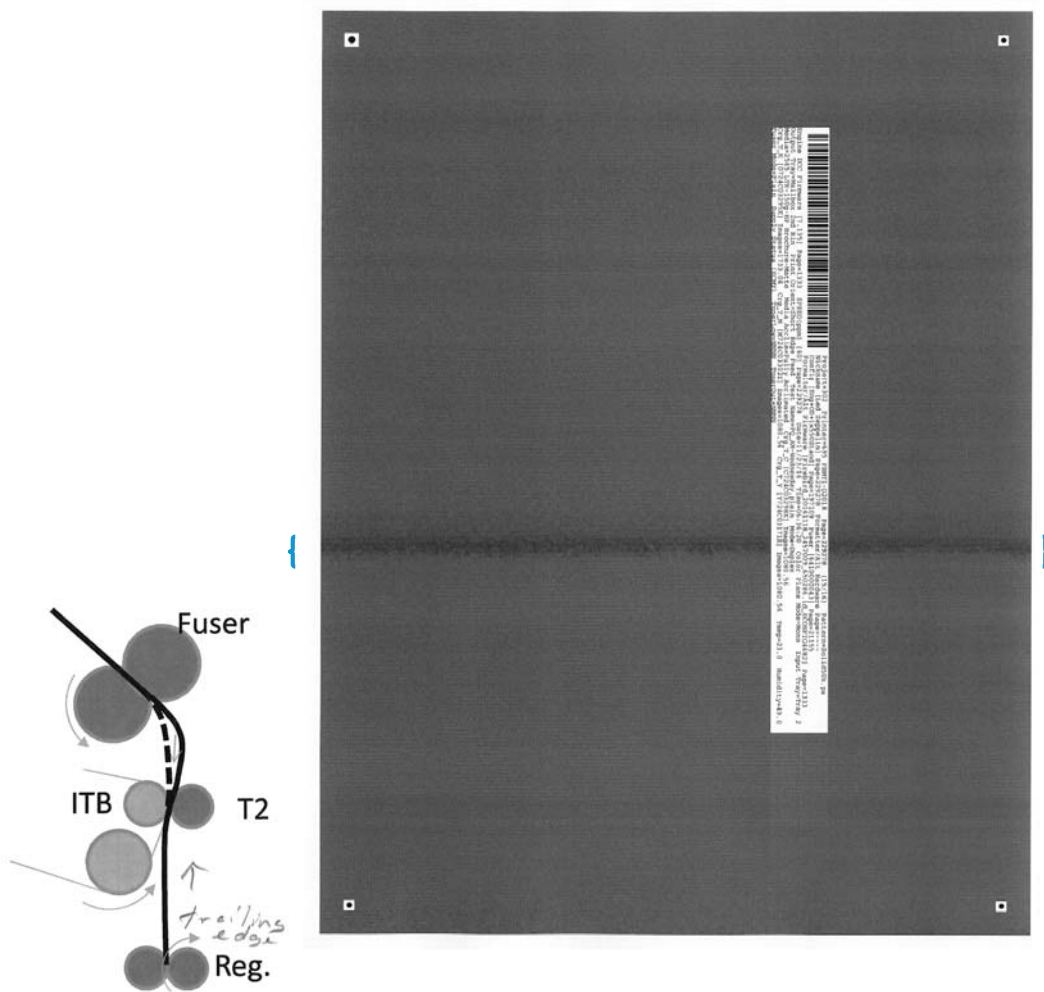
Description of the defect

This defect is a soft, dark band that can occur at various locations on the page, including 111.0 mm (4.4 in), 90.0 mm (3.5 in), or 76.0 mm (2.9 in) from the trailing edge. The dark band is caused by a media disturbance at the secondary transfer (T2) roller when the trailing/leading edge transitions in/out of either the registration feed roller or fuser nip. A damaged T2 roller support can produce a severe band.

Conditions that can cause the defect

The defect occurs on heavier or stiff paper, often on the second side of a duplex print.

Solutions for the defect

- Reprint the document.

- Try a different paper type.

- From the printer control panel, change the tray type to mid-weight.

  - Open the following menus:

- Trays

- Select tray

- Select Type

- Select Mid-weight 96-110g

Parts related to the defect

📝 NOTE: The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Transfer roller

- Paper

Trailing edge transfer

Figure 2-96 Trailing edge transfer
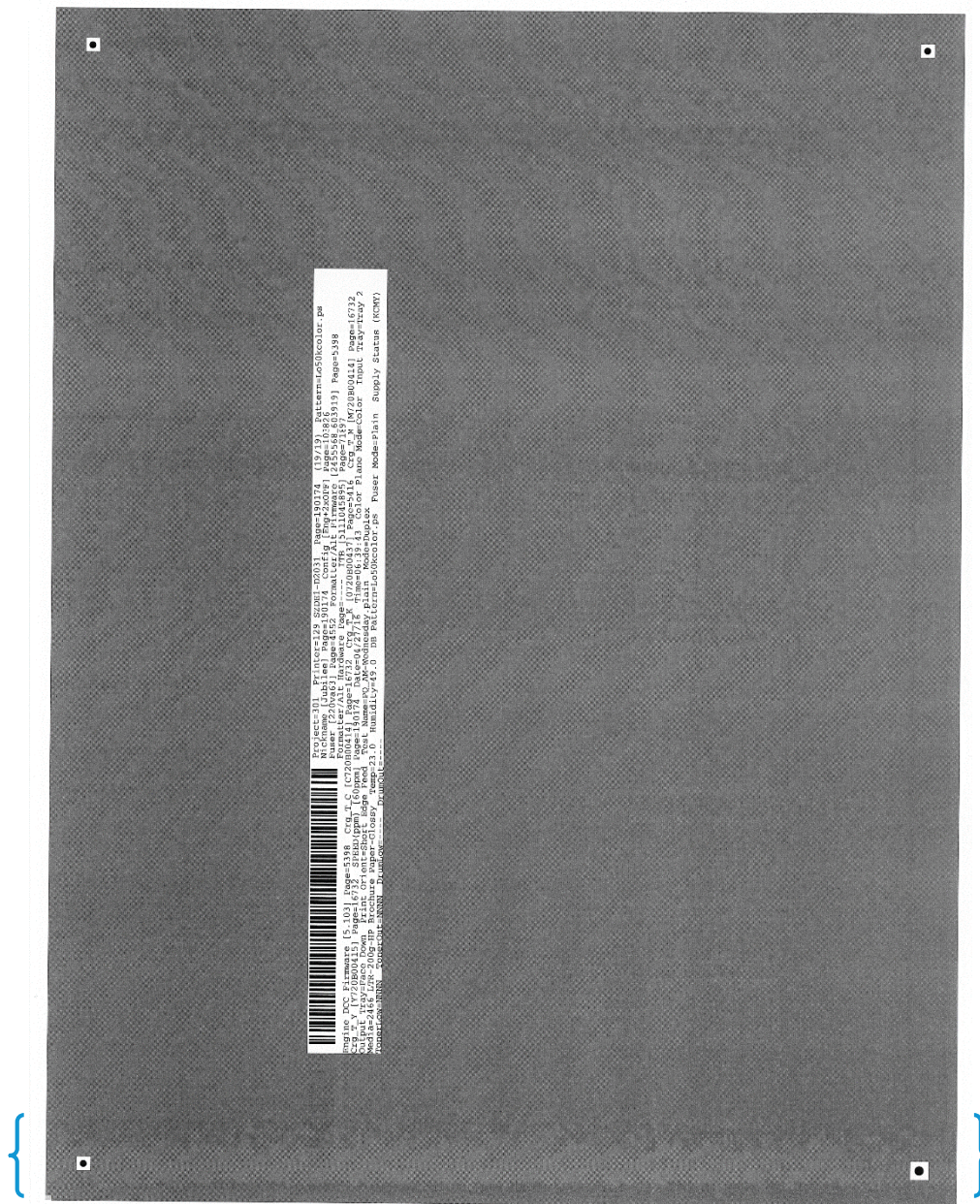
Description of the defect

The defect is a non-uniform light or dark region within 30 mm (1 in) of the trailing edge of the page.

Conditions that can cause the defect

The defect occurs on heavier or stiff paper, often on the second side of a duplex print.

Solutions for the defect

- Reprint the document.

- Try a different paper type.

- From the printer control panel, change the tray type to mid-weight.

  - Open the following menus:

    - Trays

    - Select tray

    - Select Type

    - Select Mid-weight 96-110g

Parts related to the defect

📝 NOTE: The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Transfer roller

- Paper

Chicken tracks or dunes

Figure 2-97 Chicken tracks or dunes

Description of the defect

This defect is track marks down the page caused by poor secondary transfer to paper whose resistance is out of range.

Conditions that can cause the defect

The defect appears on non-standard paper, such as TongBan glossy.

Solutions for the defect

- From the printer control panel, change the resistance mode to up.

  - Open the following menus:

    - Settings

    - Copy/Print

    - Print Quality

    - Adjust Paper Types

    - Select paper type.

    - Select Resistance Mode.

    - Select Up.

- Try a different paper type.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Transfer roller

- Paper

Mottle/graininess fixing

Figure 2-98 Mottle/graininess fixing

Description of the defect

This defect is large areas of fill that appear non-uniform, or mottled (marked with spots or smears of color). The defect is caused by the way in which the toner pile is pressed or melted into the paper. This leads to the density variance or uneven gloss.

Conditions that can cause the defect

The defect appears in large areas of fill and is more severe in low-temperature and low-humidity environments.

Solutions for the defect

- From the printer control panel, change the uniformity control mode.

  - Open the following menus:

    - Settings

    - Copy/Print

    - Print Quality

    - Optimize

    - Select Uniformity Control.

    - Select Alternate or Alternate 2.

- Try a smoother paper type.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Paper

- Toner

- Fuser

Hot offset fixing

Figure 2-99 Hot offset fixing

Description of the defect

This defect is excessive heat in the fuser causing toner to stick to the sleeve and get redeposited on the next rotation of the fuser sleeve 75 mm (3 in) down the page. This occurs mostly on the edges of the page.

Conditions that can cause the defect

The defect appears on glossy media, especially after any sort of pause, such as paper sensing, a paper-out condition, or stapling.

Solutions for the defect

- From the printer control panel, change the fuser temp mode to down.

  - Open the following menus:

    - Settings

    - Copy/Print

    - Print Quality

    - Adjust Paper Type

    - Select paper type.

    - Select Fuser Temp Mode.

    - Select Down.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Paper

- Toner

- Fuser

Snail tracks/wrinkle

Figure 2-100 Snail tracks/wrinkle

Description of the defect

This defect is a track or a wrinkle down the page due to fusing. Thin media bunches up and wrinkles in the fuser.

Conditions that can cause the defect

The defect appears on light or normal-weight paper. It most often appears on the second side of a duplex job. Side-to-side paper shift increases the wrinkle.

Solutions for the defect

- Make sure that the paper is centered in the tray.

- Reprint the document

Parts related to the defect

> 📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Transfer roller

- Paper

Sharp streaks

Figure 2-101 Sharp streaks

Description of the defect

This defect is a thin streak down the page in one color. This is due to a cartridge defect or debris caught in the cartridge blade.

Conditions that can cause the defect

The defect can appear in a new cartridge or in a cartridge used in a dirty environment.

Solutions for the defect

- Reprint the document.

- Replace the toner cartridge.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Toner cartridge

ITB streaks

ITB streaks
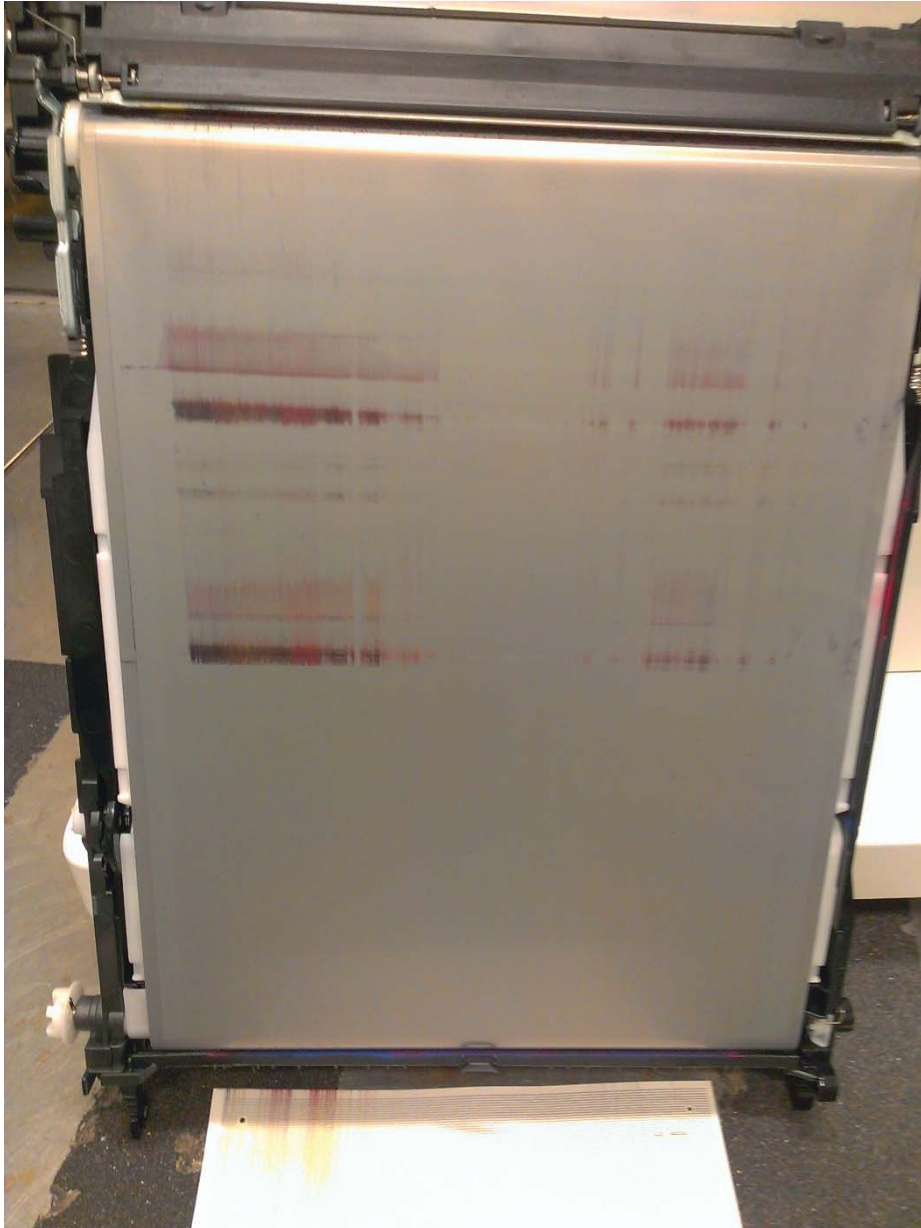
Description of the defect

This defect is streaks of various colors anywhere on the printed page. This is caused by waste toner that is not cleaned from the intermediate transfer belt (ITB). Printing high-coverage pages produces more toner that must be cleaned from the ITB. This toner can fill the area above the cleaning blade, overwhelming the blade, and leaking toner onto the ITB.

Conditions that can cause the defect

The defect appears most often in low-temperature and low-humidity environments.

Solutions for the defect

- Reprint the document.

- If the defect continues, replace the ITB.

Parts related to the defect

NOTE: The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- ITB

Streaks from Tray 1

Figure 2-103 Streaks from Tray 1 in high temperature and humidity
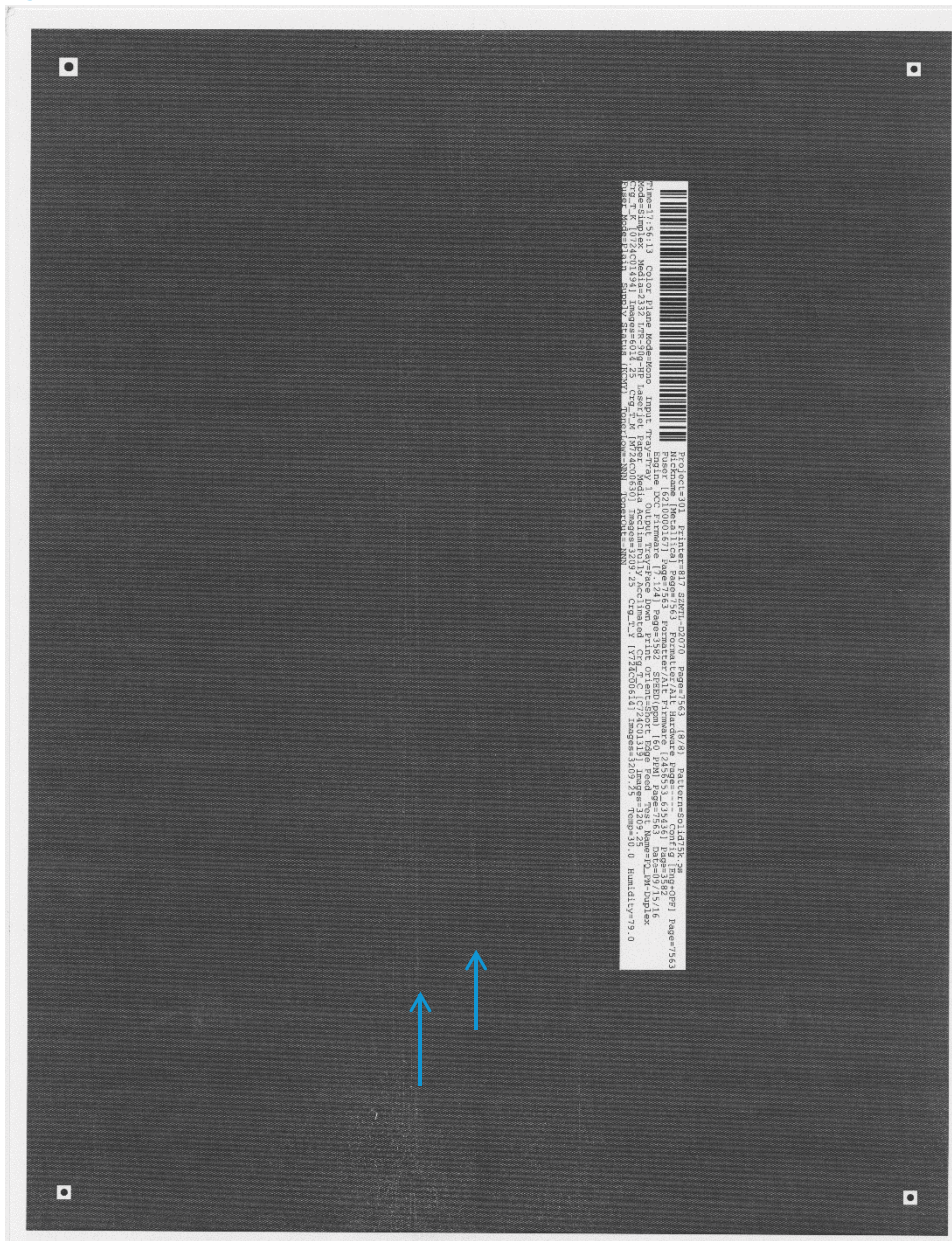
Description of the defect

This defect is light streaks, usually spanning the length of the page when printing from Tray 1. This is caused by toner clumping at the cartridge developer blade, which reduces the amount of toner available for transfer at that location.

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text. It usually occurs in high-temperature and high-humidity environments.

Solutions for the defect

- Print from a tray other than Tray 1.

- Print in a drier environment.

Parts related to the defect

NOTE: The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Toner cartridge

Cartridge stirring blade slap

Figure 2-104 Cartridge stirring blade slap

Description of the defect

This defect is repeating shock bands every 171.0 mm (6.7 in) down the page.

Conditions that can cause the defect

The defect appears in solid areas of fill, but not in text and occurs on older toner cartridges.

Solutions for the defect

- Reprint the document.

- If the defect continues, replace the toner cartridge.

Parts related to the defect

📝 **NOTE:** The following item(s) might need to be repaired or replaced to prevent this defect from occurring.

- Toner cartridge

Clean the printer

📝 NOTE: To clean the printer exterior, use a soft, water-moistened cloth.

- Clean the paper path

- Print a cleaning page

- Enable and configure auto cleaning (touchscreen control panels only)

- Check the scanner glass for dirt and smudges

- Clean the pickup rollers and separation pad in the document feeder (MFP only)

Clean the paper path

Over time, particles of toner and paper accumulate inside the printer. This can cause print-quality problems during printing. Cleaning the paper path eliminates or reduces these problems.

Clean the paper path and toner-cartridge areas every time that the toner cartridge is changed or whenever print-quality problems occur. As much as possible, keep the printer free from dust and debris.

Print a cleaning page

Print the cleaning page from a touchscreen control panel

1. From the Home screen on the printer control panel, swipe until the Support Tools menu displays. Touch the Support Tools icon to open the menu.

2. Open the following menus:

    - Maintenance

    - Calibration/Cleaning

    - Cleaning Page

3. Select Print to print the page.

    A **Cleaning...** message displays on the printer control panel. The cleaning process takes a few minutes to complete. Do not turn the printer off until the cleaning process has finished. When it is finished, discard the printed page.

Print the cleaning page from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Device Maintenance, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Calibration/Cleaning, and then press the OK button.

3. If necessary, use the down arrow ▼ button to scroll to Cleaning, and then press the OK button to print the page.

4. Follow the instruction on the printed cleaning page to finish the cleaning page process.

Enable and configure auto cleaning (touchscreen control panels only)

1. From the Home screen on the printer control panel, swipe until the Support Tools menu displays. Touch the Support Tools icon to open the menu.

2. Open the following menus:

   - Maintenance

   - Calibration/Cleaning

   - Cleaning Page

3. Select Print to print the page.

   A **Cleaning...** message displays on the printer control panel. The cleaning process takes a few minutes to complete. Do not turn the printer off until the cleaning process has finished. When it is finished, discard the printed page.

Check the scanner glass for dirt and smudges

Over time, specks of debris might collect on the scanner glass and white plastic backing, which can affect performance. Use the following procedure to clean the scanner if the printed pages have streaks, unwanted lines, black dots, poor print quality, or unclear text.

1. Press the power button to turn the printer off, and then disconnect the power cable from the electrical outlet.

2. Open the scanner lid.
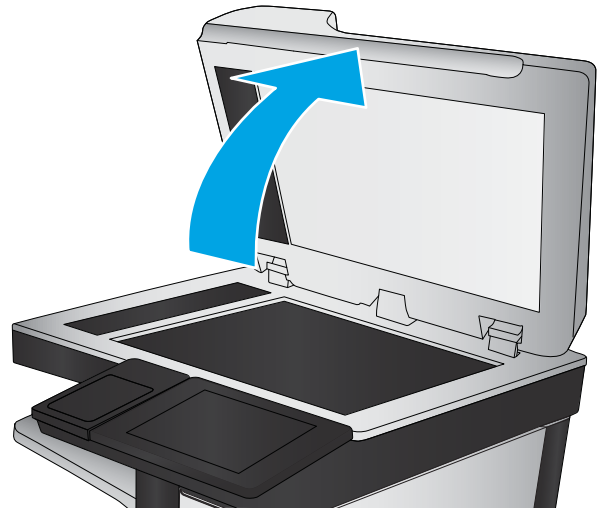
3. Clean the scanner glass and the document feeder strips with a soft cloth or sponge that has been moistened with nonabrasive glass cleaner.

   CAUTION: Do not use abrasives, acetone, benzene, ammonia, ethyl alcohol, or carbon tetrachloride on any part of the printer; these can damage the printer. Do not place liquids directly on the glass or platen. They might seep and damage the printer.

   NOTE: If you are having trouble with streaks on copies when you are using the document feeder, be sure to clean the small strip of glass on the left side of the scanner.
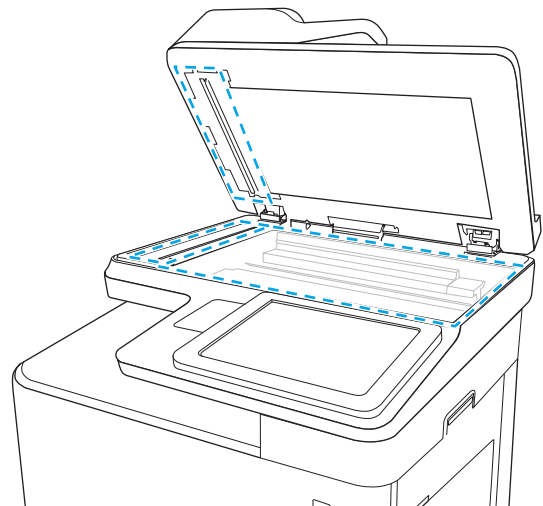
4. Dry the glass and white plastic parts with a chamois or a cellulose sponge to prevent spotting.

5. Connect the power cable to an outlet, and then press the power button to turn the printer on.

Clean the pickup rollers and separation pad in the document feeder (MFP only)

1. Lift the document-feeder latch.
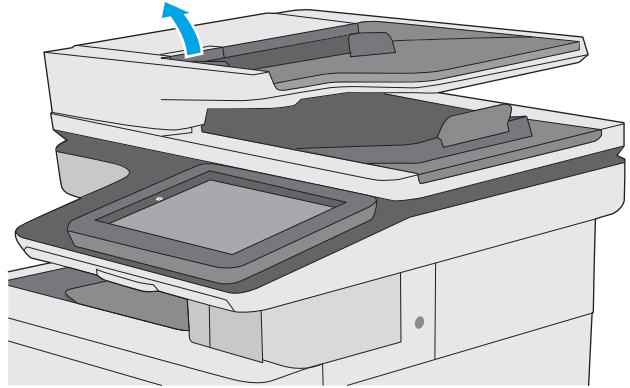
2. Open the document-feeder cover.
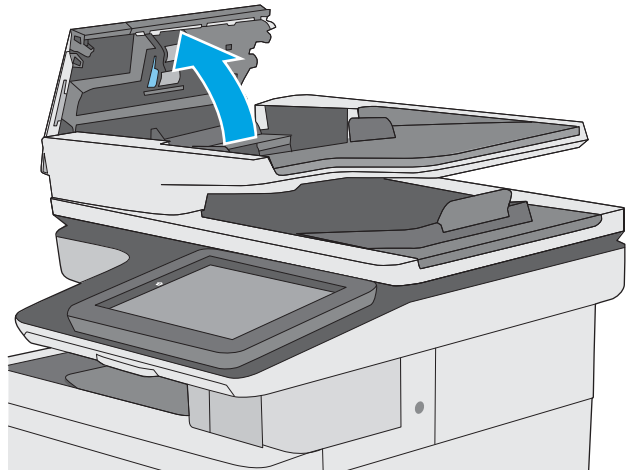
3. Remove any visible lint or dust from each of the feed rollers and the separation pad using compressed air or a clean lint-free cloth moistened with warm water.
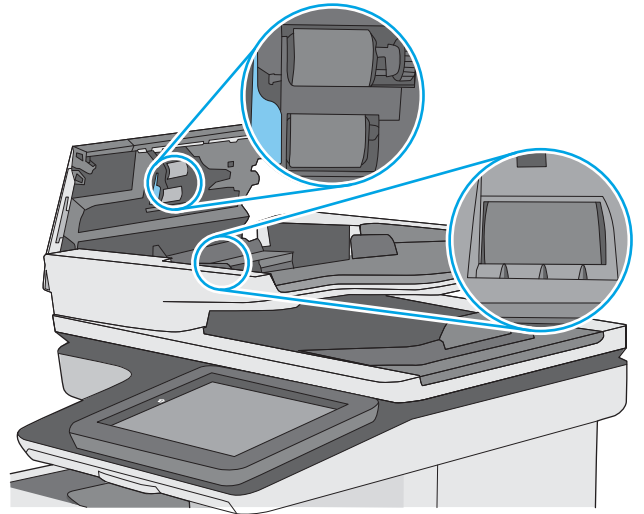
4. Close the document-feeder cover.

   NOTE: Verify that the latch on the top of the document-feeder cover is completely closed.

   If the error persists, install a document feeder maintenance kit (B5L52-67903).
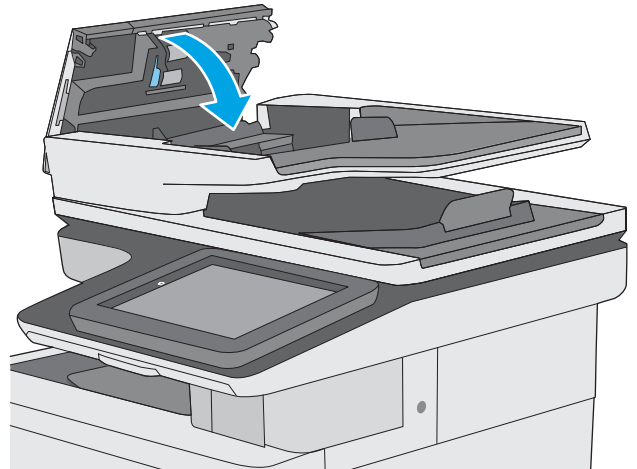
Solve paper handling problems

- [Printer feeds incorrect page size](#)

- [Printer pulls from incorrect tray](#)

- [Printer will not duplex or duplexes incorrectly](#)

- [Paper does not feed from Tray 2-X](#)

- [Output is curled or wrinkled](#)

- [Printer does not pick up paper or misfeeds](#)

- [Clear paper jams](#)

Printer feeds incorrect page size

Table 2-64 Printer feeds incorrect page size

Cause	Solution
The correct size paper is not loaded in the tray.	Load the correct size paper in the tray.
The correct size paper is not selected in the software program or printer driver.	Confirm that the settings in the software program and printer driver are correct, because the software program settings override the printer driver and control panel settings, and the printer driver settings override the control panel settings.
The correct size paper for the tray is not selected in the printer control panel.	From the control panel, select the correct size paper for the tray.
The paper size is not configured correctly for the tray.	Print a configuration page to determine the paper size for which the tray is configured.
The guides in the tray are not against the paper.	Verify that the paper guides are touching the paper.

Printer pulls from incorrect tray

Table 2-65 Printer pulls from incorrect tray

Cause	Solution
A driver for a different printer is in use.	Use a driver for this printer.
The specified tray is empty.	Load paper in the specified tray.
The paper size is not configured correctly for the input tray.	Print a configuration page or use the control panel to determine the paper size for which the tray is configured.
The guides in the tray are not against the paper.	Verify that the guides are touching the paper.

Printer will not duplex or duplexes incorrectly

Table 2-66 Printer will not duplex (print 2-sided jobs) or duplexes incorrectly

Cause	Solution
The duplex job is trying to use unsupported paper.	Verify that the paper is supported for duplex printing.

Cause	Solution
The printer driver is not set up for duplex printing.	Set up the printer driver to enable duplex printing.
The first page is printing on the back of preprinted forms or letterhead.	Load preprinted forms and letterhead in Tray 1 with the letterhead or printed side down, with the top of the page leading into the printer. For Tray 2-X, load the paper printed side up with the top of the page toward the right of the printer.
The printer model does not support automatic 2-sided printing.	The printer model does not support automatic 2-sided printing.

Paper does not feed from Tray 2-X

Table 2-67 Paper does not feed from Tray 2-X

Cause	Solution
The correct size paper is not loaded.	Load the correct size paper.
The input tray is empty.	Load paper in the input tray.
The correct paper type for the input tray is not selected in the printer control panel.	From the printer control panel, select the correct paper type for the input tray. Trays configured for a paper type with a specific weight range will not match a print job that specifies an exact weight, even if the specified weight is within the weight range.
Paper from a previous jam has not been completely removed.	Open the printer and remove any paper in the paper path. Closely inspect the fuser area for jams.
None of the optional trays appear as input tray options.	The optional trays only display as available if they are installed. Verify that any optional trays are correctly installed. Verify that the printer driver has been configured to recognize the optional trays.
An optional tray is incorrectly installed.	Print a configuration page to confirm that the optional tray is installed. If not, verify that the tray is correctly attached to the printer.
The paper size is not configured correctly for the input tray.	Print a configuration page or use the control panel to determine the paper size for which the tray is configured.
The guides in the tray are not against the paper.	Verify that the guides are touching the paper.

Output is curled or wrinkled

Table 2-68 Output is curled or wrinkled

Cause	Solution
Paper does not meet the specifications for this printer.	Use only paper that meets the HP paper specifications for this printer.
The correct paper type for the input tray is not selected in the printer control panel.	From the printer control panel, select the correct paper type for the input tray. Trays configured for a paper type with a specific weight range will not match a print job that specifies an exact weight, even if the specified weight is within the weight range.
Paper is damaged or in poor condition.	Remove paper from the input tray and load paper that is in good condition.
The printer is operating in an excessively humid environment.	Verify that the printing environment is within humidity specifications.

Table 2-68 Output is curled or wrinkled (continued)

Cause	Solution
The print job consist of large, solid-filled areas.	Large, solid-filled areas can cause excessive curl. Try using a different pattern.
Paper used was not stored correctly and might have absorbed moisture.	Remove paper and replace it with paper from a fresh, unopened package.
Paper has poorly cut edges.	Remove paper, flex it, rotate it 180 degrees or turn it over, and then reload it into the input tray. Do not fan paper. If the problem persists, replace the paper.
The specific paper type was not configured for the tray or selected in the software.	Configure the software for the paper (see the software documentation). Configure the tray for the paper.
The paper has previously been used for a print job.	Do not re-use paper.

Printer does not pick up paper or misfeeds

Use the following procedures if the printer will not pick or misfeeds paper.

The printer does not pick up paper

If the printer does not pick up paper from the tray, try these solutions.

NOTE: Tray 1 and Tray 2 are optimal for paper pickup when using special paper or media other than 20lb plain paper. For Tray 1 and Tray 2 the printer increases the number of attempts to pick up a page, which increases the reliability of successfully picking the page from the tray and decreases the possibility of a mis-pick jam.

HP recommends using Tray 1 or Tray 2 if the printer is experiencing excessive or reoccurring jams from trays other than Tray 1 and Tray 2, or for print jobs that require media other than 20lb plain paper.

HP recommends printing labels from Tray 2 only.

1. Open the printer and remove any jammed sheets of paper.

2. Load the tray with the correct size of paper for the job.

3. Make sure the paper size and type are set correctly on the printer control panel.

4. Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides to the appropriate indentation in the tray.

5. Check the printer control panel to see if the printer is waiting for an acknowledgment to the feed the paper manually prompt. Load paper, and continue.

6. The rollers above the tray might be contaminated. Clean the rollers with a lint-free cloth dampened with warm water.

The printer picks up multiple sheets of paper

If the printer picks up multiple sheets of paper from the tray, try these solutions.

1. Remove the stack of paper from the tray and flex it, rotate it 180 degrees, and flip it over. *Do not fan the paper*. Return the stack of paper to the tray.

2. Use only paper that meets HP specifications for this printer.

3. Use paper that is not wrinkled, folded, or damaged. If necessary, use paper from a different package.

4. Make sure the tray is not overfilled. If it is, remove the entire stack of paper from the tray, straighten the stack, and then return some of the paper to the tray.

5. Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides to the appropriate indentation in the tray.

6. Make sure the printing environment is within recommended specifications.

Paper does not feed automatically

Table 2-69 Paper does not feed automatically

Cause	Solution
Manual feed is selected in the software program.	Load Tray 1 with paper, or, if the paper is loaded, press the OK button.
The correct size paper is not loaded.	Load the correct size paper.
The input tray is empty.	Load paper into the input tray.
Paper from a previous jam has not been completely removed.	Open the printer and remove any paper in the paper path.
The paper size is not configured correctly for the input tray.	Print a configuration page or use the control panel to determine the paper size for which the tray is configured.
The guides in the tray are not against the paper.	Verify that the rear and width paper guides are touching the paper.

Clear paper jams

Paper path jam sensor locations

📝 **NOTE:** Use the figures below to identify the locations of sensors where reoccurring jams are found.

Figure 2-105 Printer jam sensors
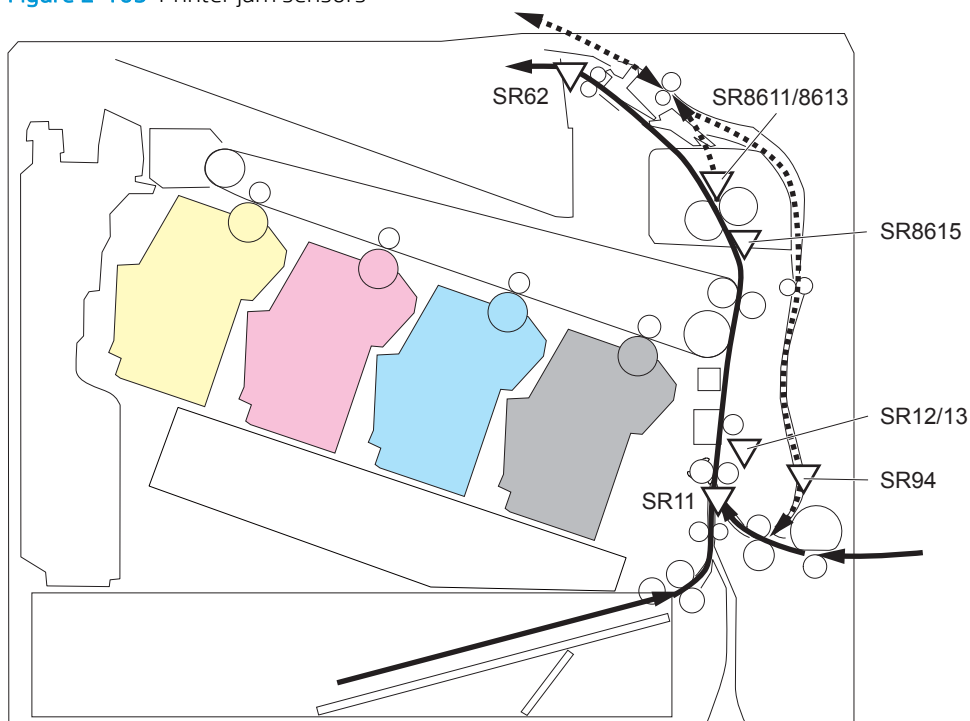
Table 2-70 Printer base jam sensors

Sensor	Description	Sensor	Description
SR11	Registration sensor	SR94	Duplex feed sensor
SR12	Registration media width sensor 1	SR8611	Fuser output sensor 1
SR13	Registration media width sensor 2	SR8613	Fuser output sensor 2
SR62	FD1 media full sensor	SR8615	Fuser loop sensor

Figure 2-106 1x550-sheet paper-feeder jam sensors
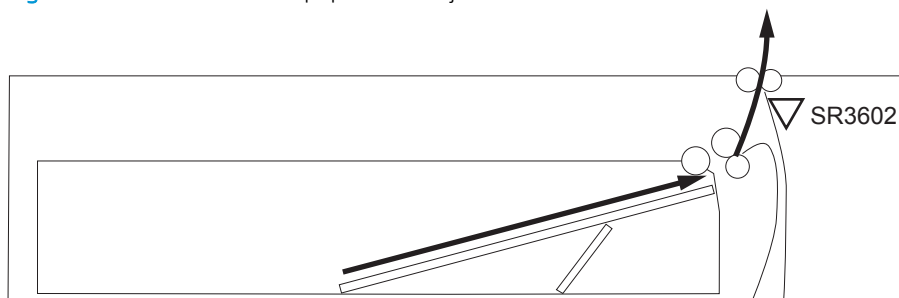
Table 2-71 1x550-sheet and 3x550-sheet paper-deck jam sensors

Sensor	Description
SR3602	1x550-sheet paper feeder media feed sensor

Figure 2-107 1x550-sheet and 3x550-sheet paper-deck jam sensors

▽ SR3401
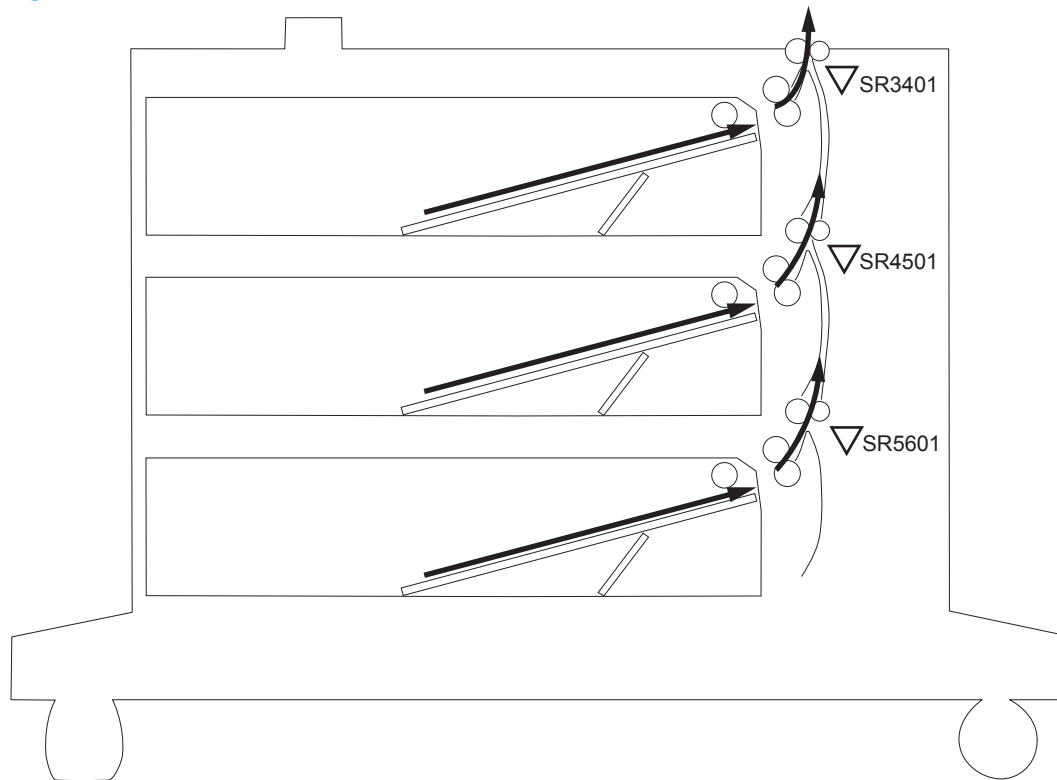
▽ SR4501

▽ SR5601

Table 2-72 1x550-sheet and 3x550-sheet paper-deck jam sensors

Sensor	Description
SR3401	PD cassette 1 media feed sensor
SR4501	PD cassette 2 media feed sensor (1x350-sheet paper deck only)
SR5601	PD cassette 3 media feed sensor (1x350-sheet paper deck only)

Figure 2-108 2,550-sheet paper deck jam sensors
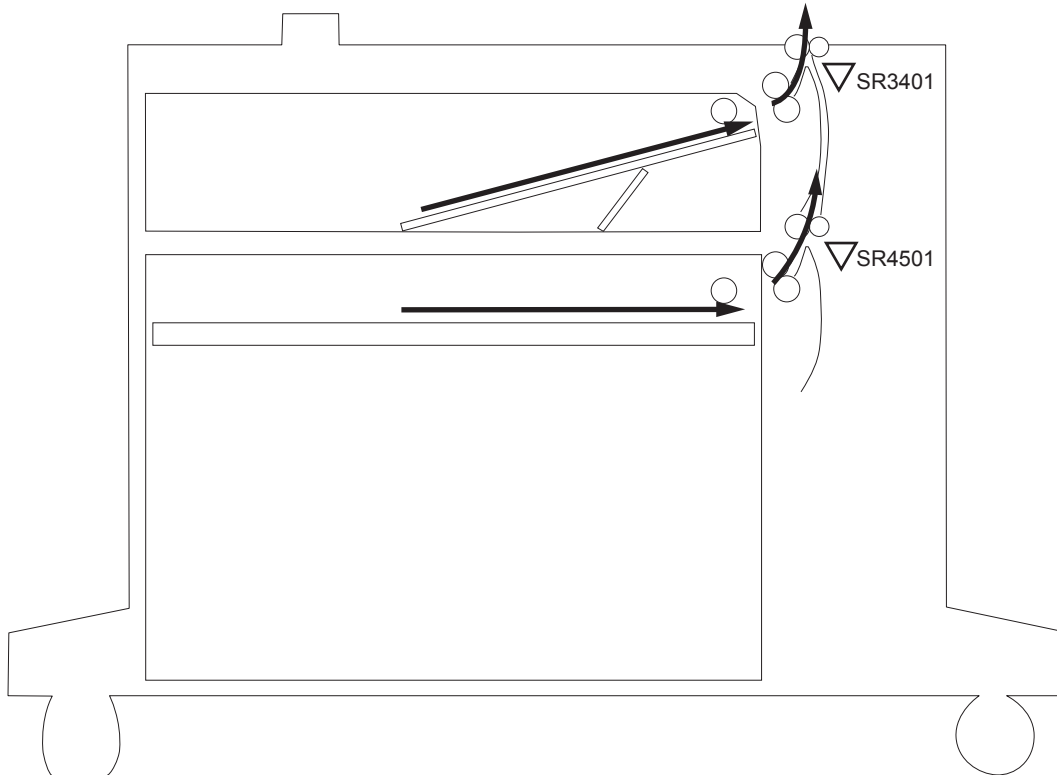
Table 2-73 2,550-sheet paper deck jam sensors

Sensor	Description
SR3401	PD cassette 1 media feed sensor
SR4501	PD cassette 2 media feed sensor

Figure 2-109 Document feeder jam sensors
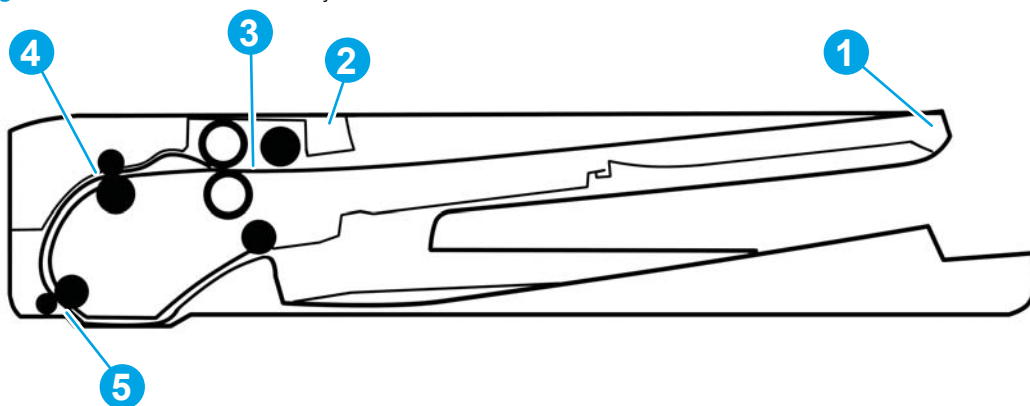
Table 2-74 Document feeder, sensors block diagram

Item	Description
1	Length sensor
2	Jam cover sensor

Document feeder, sensors block diagram (continued)

Item	Description
3	Paper present sensor
4	Deskew sensor
5	Paper path sensor

Auto-navigation for clearing paper jams

The auto-navigation feature assists in clearing jams by providing step-by-step instructions on the control panel. When you complete a step, the printer displays instructions for the next step until you have completed all steps in the procedure.

Experiencing frequent or recurring paper jams?

To reduce the number of paper jams, try these solutions.

📝 NOTE: To see a video that demonstrates how to load paper in a way that reduces the number of paper jams, click here.

1. Use only paper that meets HP specifications for this printer.

2. Use paper that is not wrinkled, folded, or damaged. If necessary, use paper from a different package.

3. Use paper that has not previously been printed or copied on.

4. Make sure the tray is not overfilled. If it is, remove the entire stack of paper from the tray, straighten the stack, and then return some of the paper to the tray.

5. Make sure the paper guides in the tray are adjusted correctly for the size of paper. Adjust the guides so they are touching the paper stack without bending it.

6. Make sure that the tray is fully inserted in the printer.

7. If you are printing on heavy, embossed, or perforated paper, use the manual feed feature and feed sheets one at a time.

8. Open the Trays menu on the printer control panel. Verify that the tray is configured correctly for the paper type and size.

9. Make sure the printing environment is within recommended specifications.

Clear paper jams in the document feeder

Use the following procedure to check for paper in all possible jam locations related to the document feeder. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **31.13.XX Jam in Document Feeder**

1. Lift the document-feeder latch.
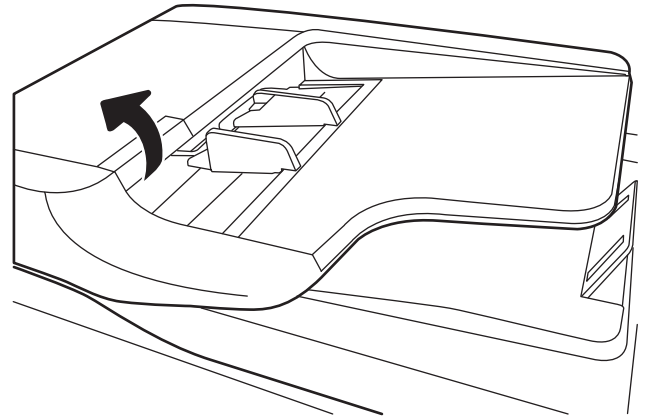
2. Open the document-feeder cover.
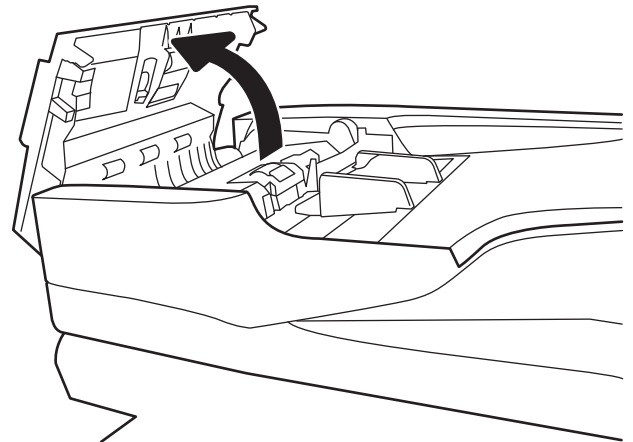
3. Gently remove any jammed paper.
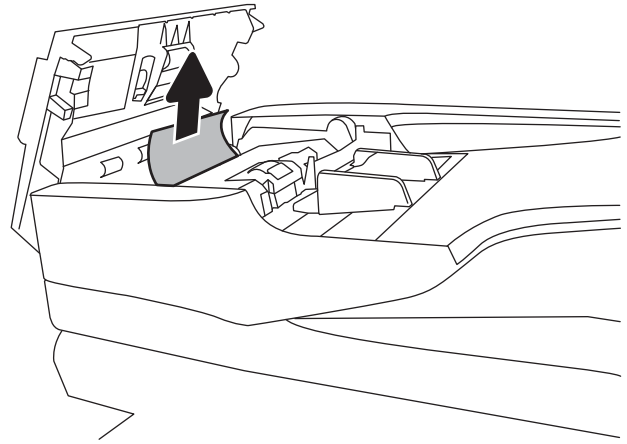
4. Close the document-feeder cover.
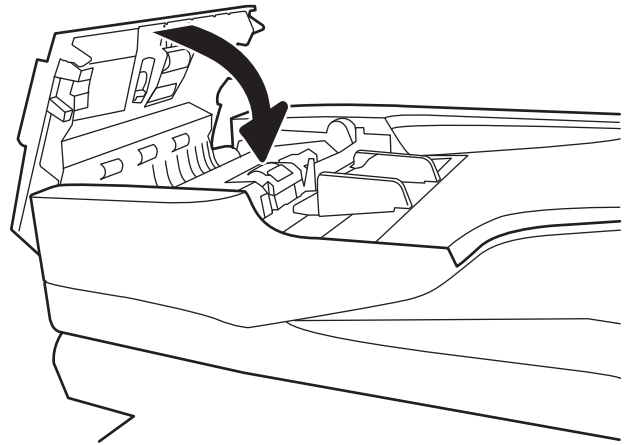
NOTE: To avoid jams, make sure the guides in the document feeder input tray are adjusted tightly against the document. Remove all staples, paper clips, or tape from original documents.

NOTE: Original documents that are printed on heavy, glossy paper can jam more frequently than originals that are printed on plain paper.

13.A1 tray 1 paper jam

Use the following procedure to check for paper in all possible jam locations related to Tray 1. When a jam occurs, the control panel displays control panel might display a message and an animation that assists in clearing the jam.

- **13.A1.XX Jam in tray 1**

1. If jammed paper is visible in Tray 1, clear the jam by gently pulling the paper straight out.
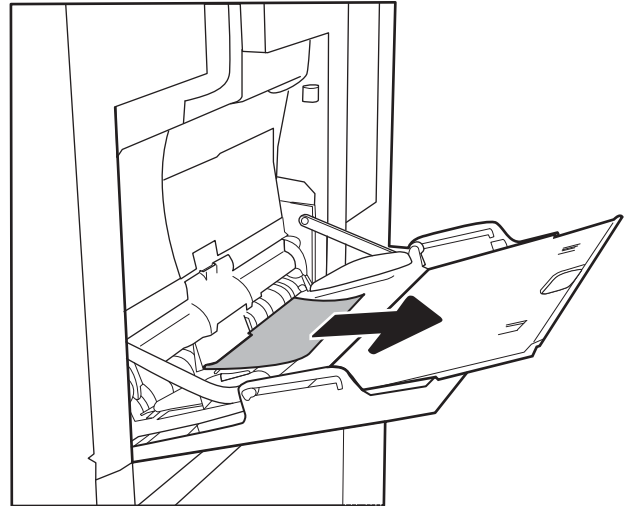
2. If you cannot remove the paper, or if no jammed paper is visible in Tray 1, close Tray 1 and open the right door.
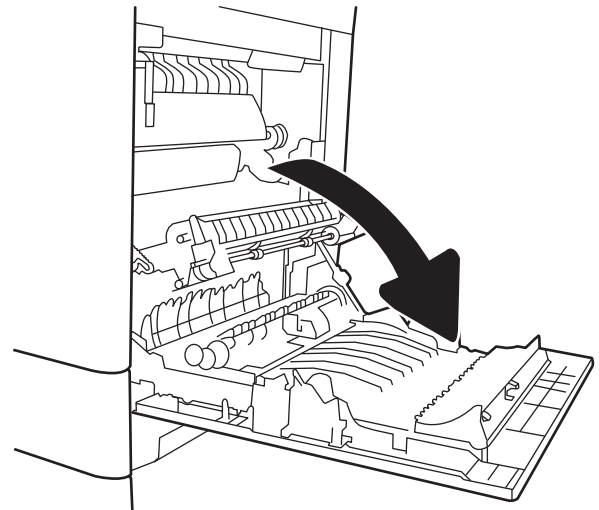
3. Gently pull out any jammed paper.
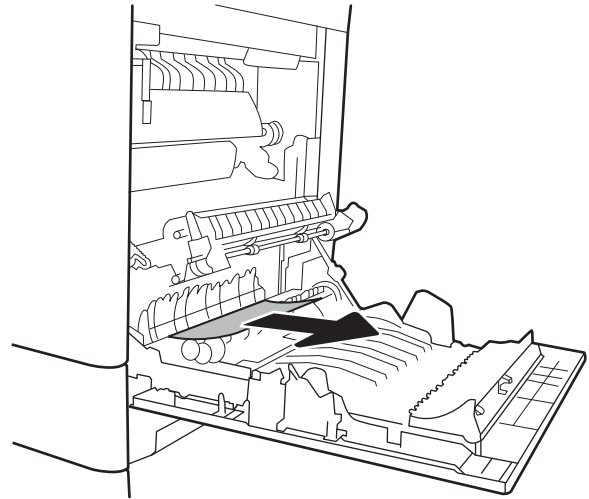
4. Close the right door.
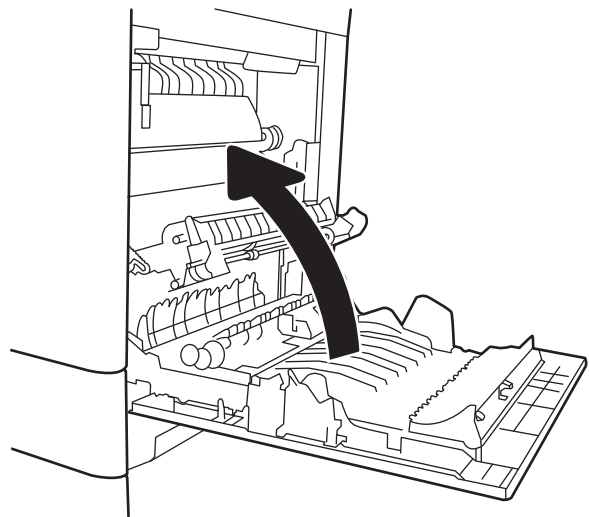
13.A2 tray 2 paper jam

Use the following procedure to check for paper in all possible jam locations related to Tray 2. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.A2.XX Jam in tray 2**

1. Pull the tray completely out of the printer by pulling and lifting it up slightly.
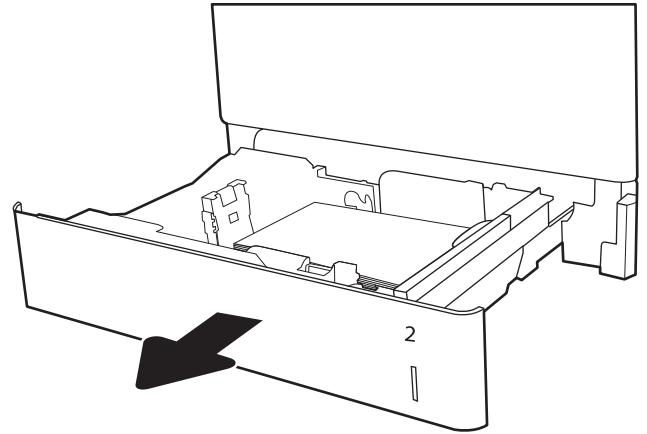
2. Remove any jammed or damaged sheets of paper. Verify that the tray is not overfilled and that the paper guides are adjusted correctly.
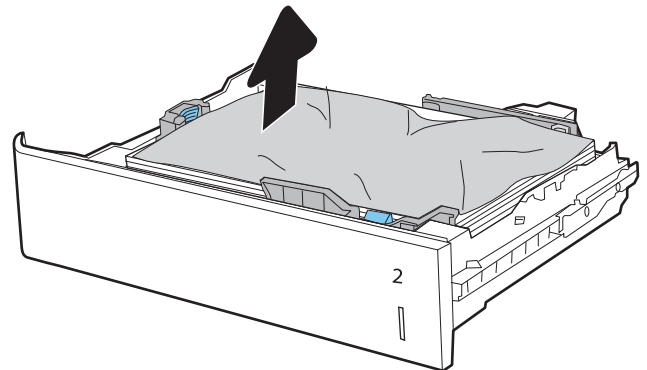
3. Gently remove any paper from the feed rollers inside the printer. First pull the paper to the left to release it, and then pull it forward to remove it.
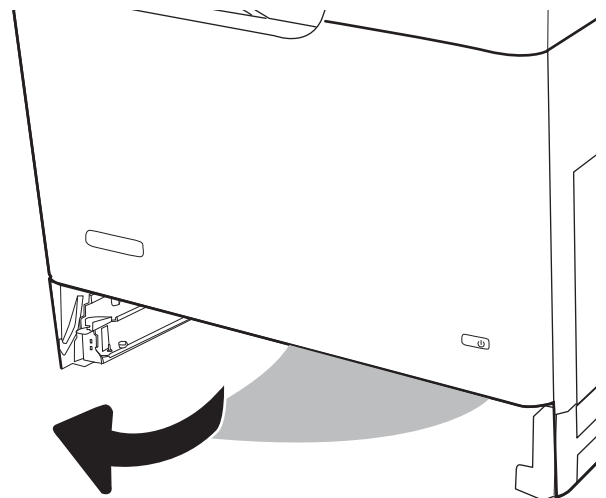
4. Install and close the tray.
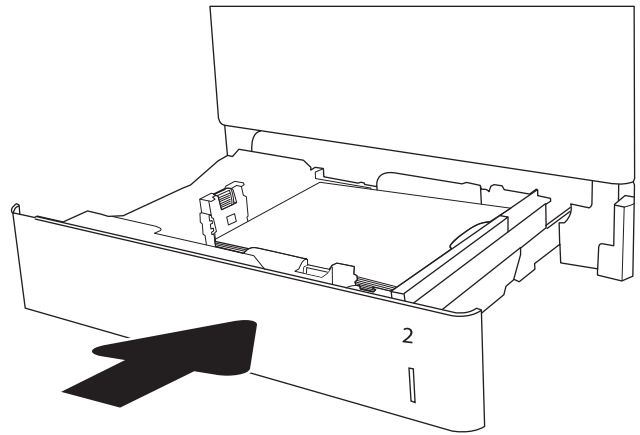
5. Open the right door.
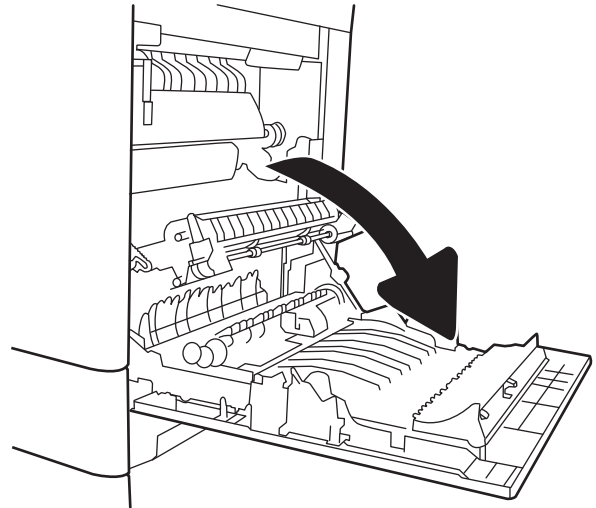
6. Gently pull out any jammed paper.

7. If paper is visible entering the bottom of the fuser, gently pull downward to remove it.

   CAUTION: Do not touch the rollers on the transfer roller. Contaminants can affect print quality.
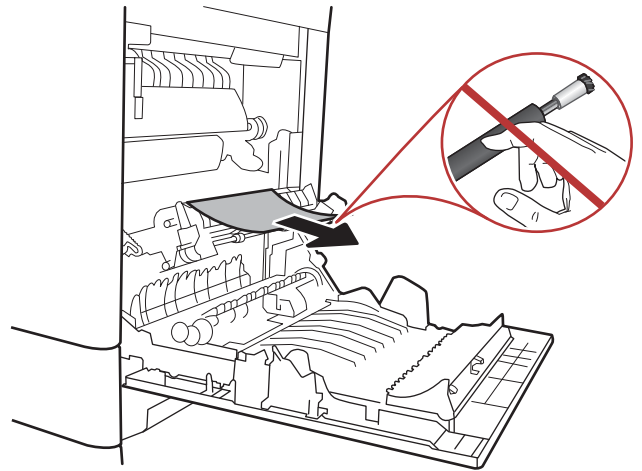
8. If paper is jammed as it enters the output bin, gently pull the paper out to remove it.
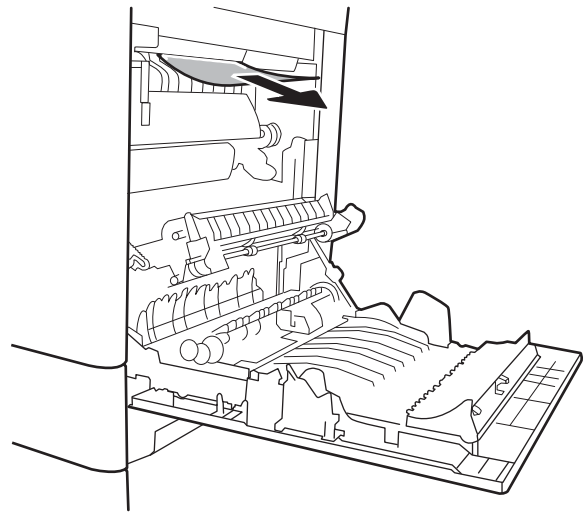
9. Paper could be jammed inside the fuser where it would not be visible. Grasp the fuser handles, lift up slightly, and then pull straight out to remove the fuser.

   CAUTION: The fuser can be hot while the printer is in use. Wait for the fuser to cool before handling it.
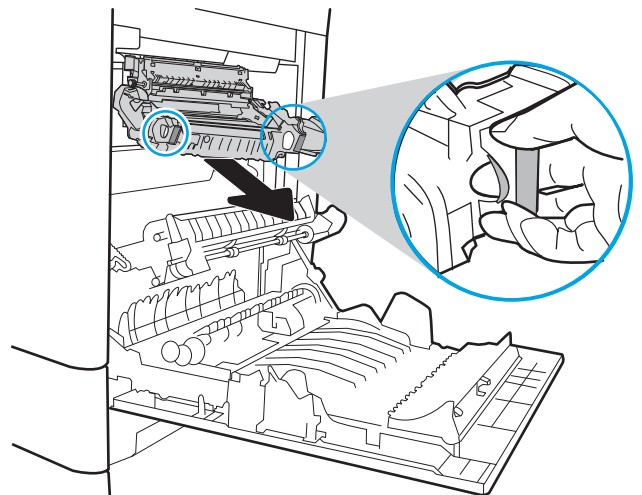
10. Open the jam-access door on the fuser. If paper is jammed inside the fuser, gently pull it straight up to remove it. If the paper tears, remove all paper fragments.

⚠ **CAUTION:** Even if the body of the fuser has cooled, the rollers that are inside could still be hot. Do not touch the fuser rollers until they have cooled.
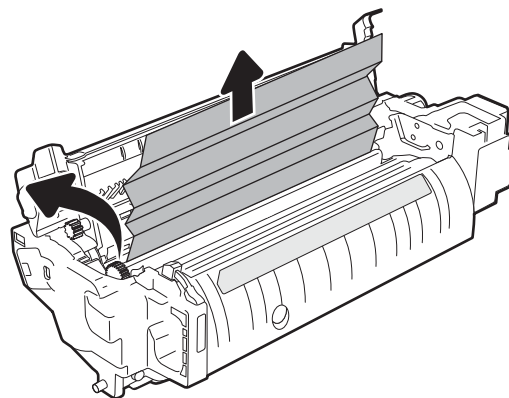
11. Close the jam-access door on the fuser, and push the fuser completely into the printer until it clicks into place.
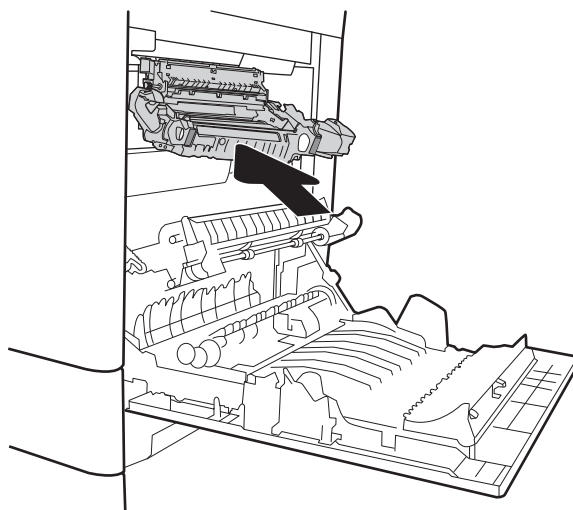
12. Close the right door.
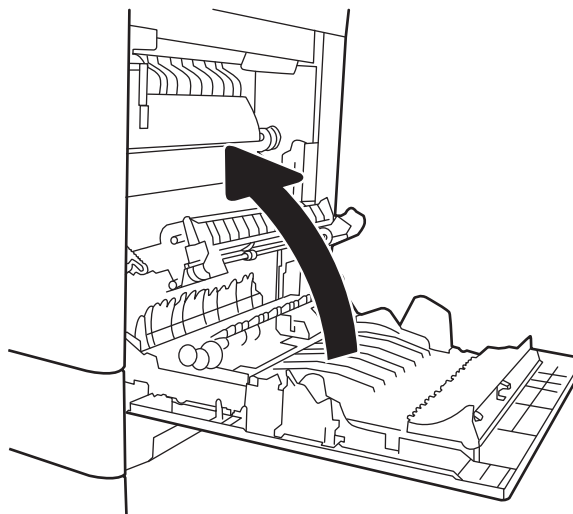
13.A3, 13.A4, 13.A5 tray 3, tray 4, tray 5 paper jam

Use the following procedure to check for paper in all possible jam locations related to the 550-sheet trays. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.A3.XX Jam in tray 3**

- **13.A4.XX Jam in tray 4**

- **13.A5.XX Jam in tray 5**

1. Pull the tray completely out of the printer by pulling and lifting it up slightly.
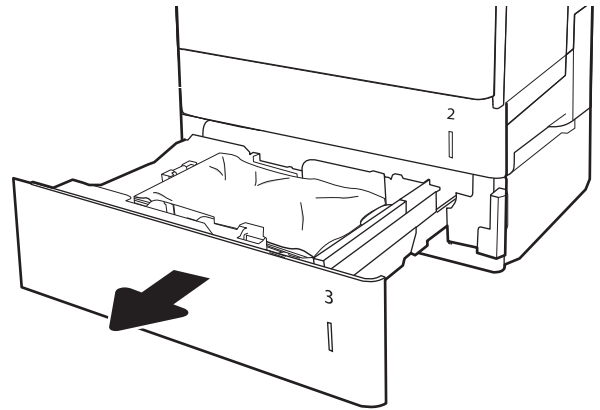
2. Remove any jammed or damaged sheets of paper. Verify that the tray is not overfilled and that the paper guides are adjusted correctly.
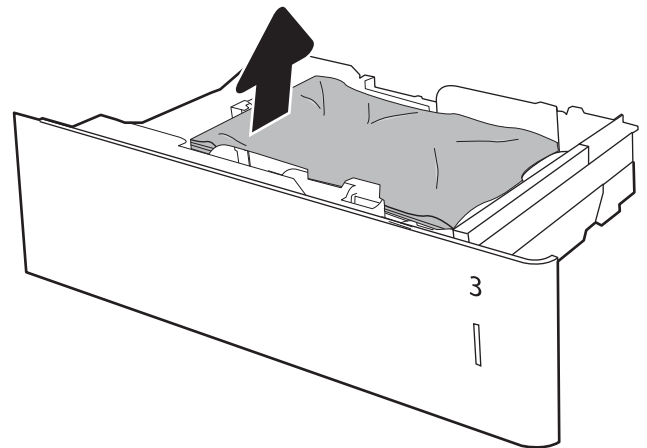
3. Remove any paper from the feed rollers inside the printer. First pull the paper to the left to release it, and then pull it forward to remove it.
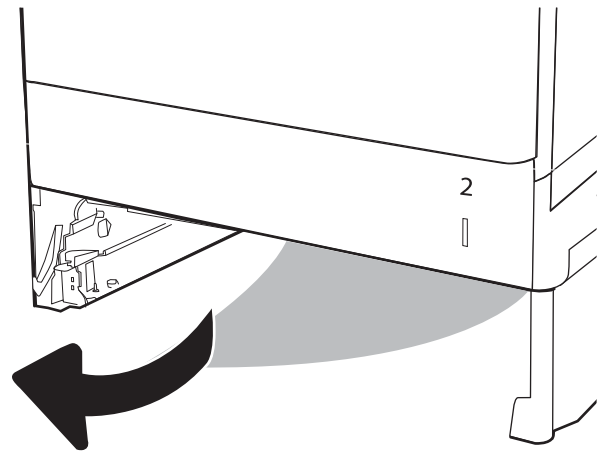
4. Install and close the tray.
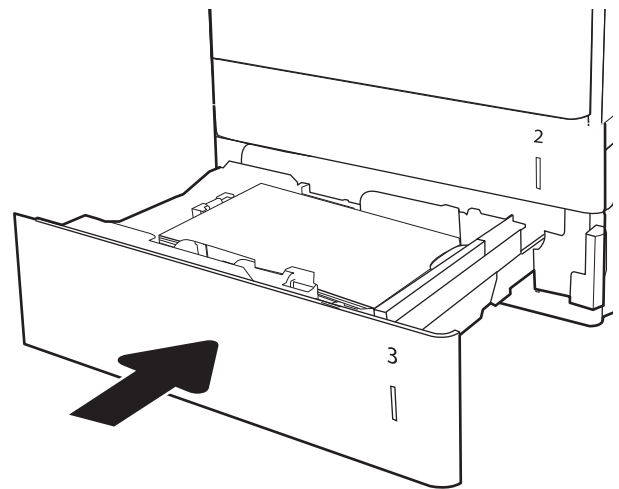
5. Open the lower-right door.
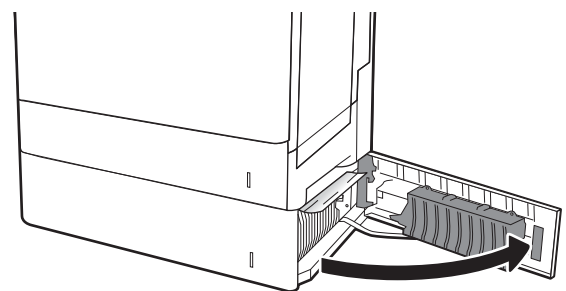
6. Gently pull out any jammed paper.
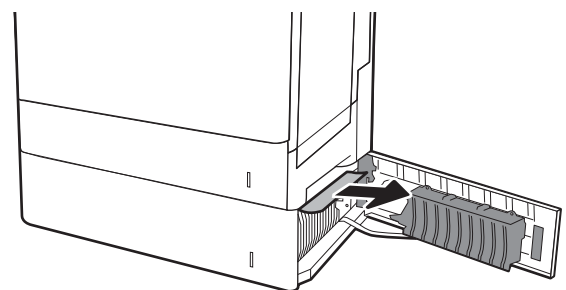
7. Close the lower-right door.
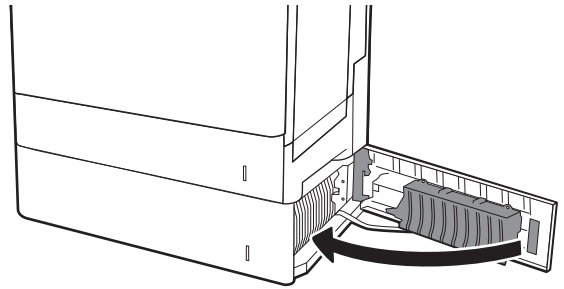
8. Open the right door.
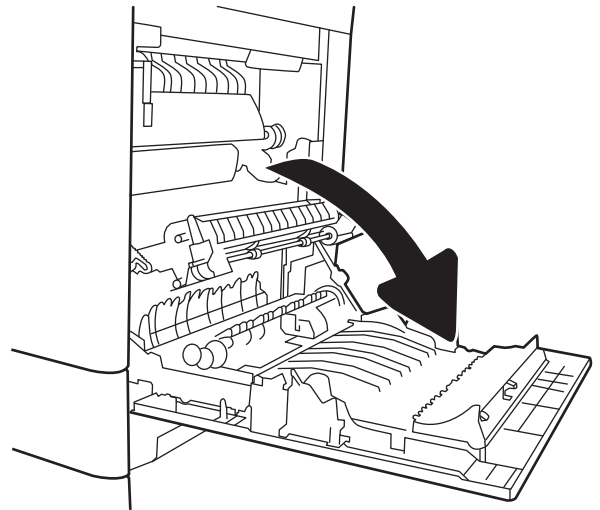
9. Gently pull out any jammed paper.
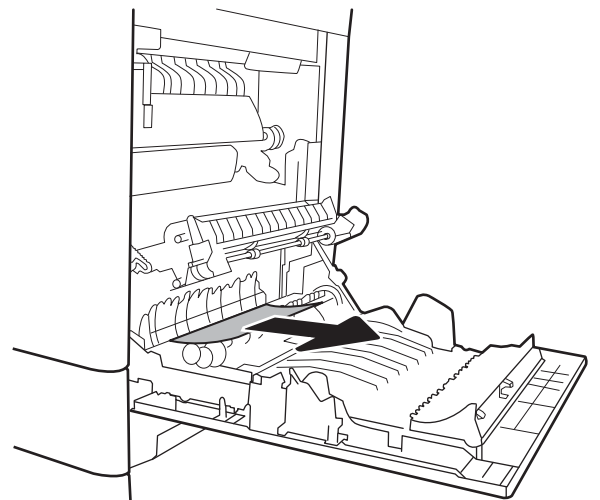
10. If paper is visible entering the bottom of the fuser, gently pull downward to remove it.

    CAUTION: Do not touch the rollers on the transfer roller. Contaminants can affect print quality.
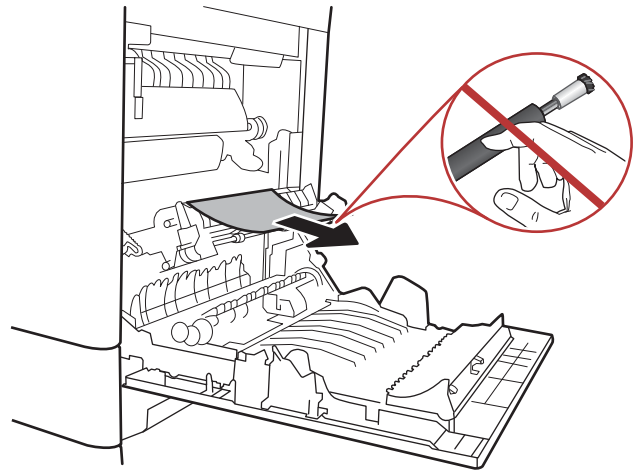
11. If paper is jammed as it enters the output bin, gently pull the paper downward to remove it.
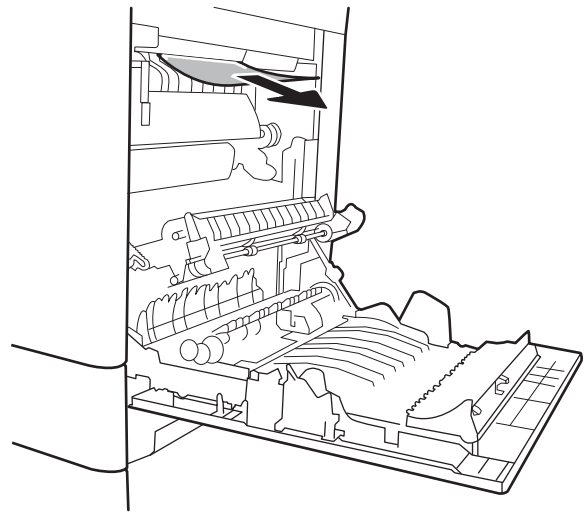
12. Paper could be jammed inside the fuser where it would not be visible. Grasp the fuser handles, lift up slightly, and then pull straight out to remove the fuser.

    CAUTION: The fuser can be hot while the printer is in use. Wait for the fuser to cool before handling it.
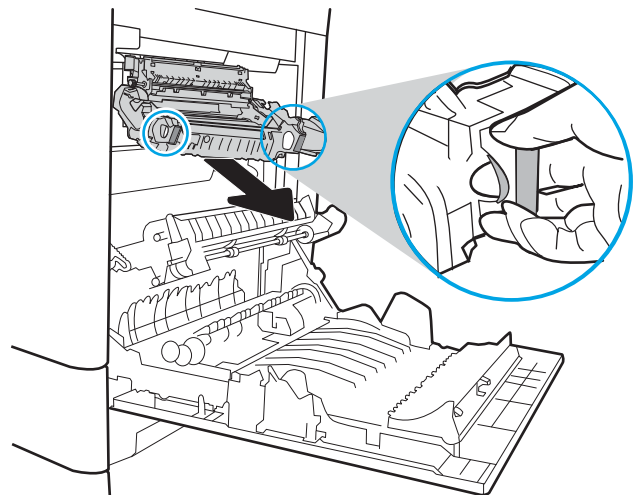
13. Open the jam-access door on the fuser. If paper is jammed inside the fuser, gently pull it straight up to remove it. If the paper tears, remove all paper fragments.

⚠️ **CAUTION:** Even if the body of the fuser has cooled, the rollers that are inside could still be hot. Do not touch the fuser rollers until they have cooled.
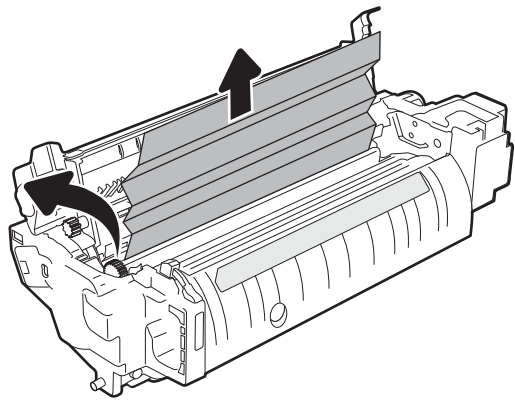
14. Close the jam-access door on the fuser, and push the fuser completely into the printer until it clicks into place.
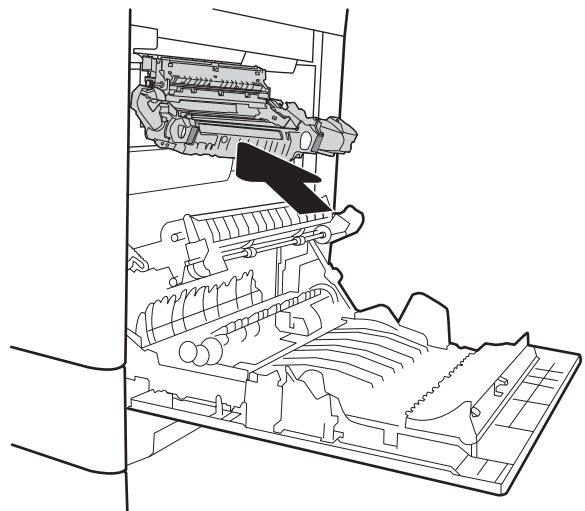
15. Close the right door.
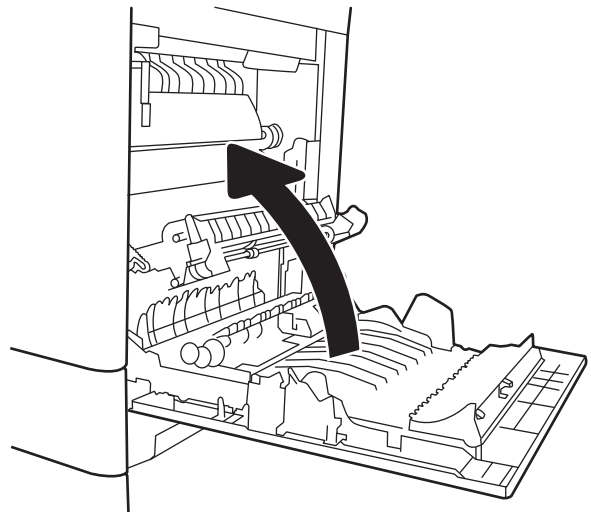
13.A 2000-sheet tray paper jam

Use the following procedure to check for paper in all possible jam locations related to the 2,000-sheet high-capacity tray. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.A4.XX Jam in tray 4**

1. Open the 2,000-sheet high-capacity input tray.
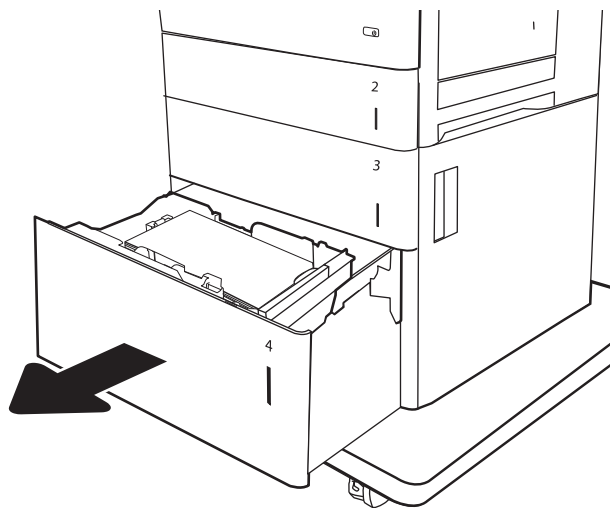
2. Remove any jammed or damaged sheets of paper. Verify that the tray is not overfilled and that the paper guides are adjusted correctly.
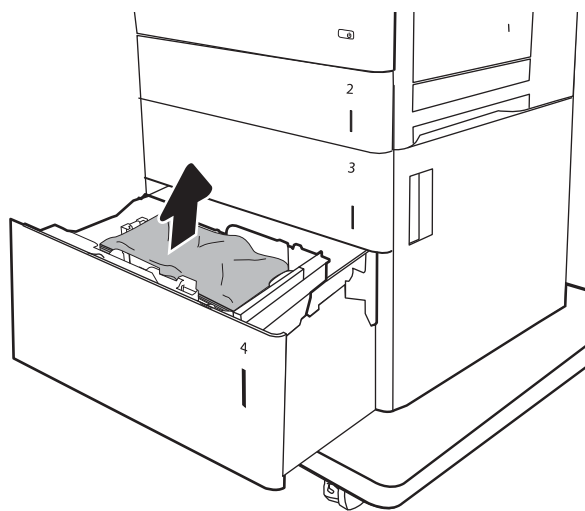
3. Remove the paper from the tray.
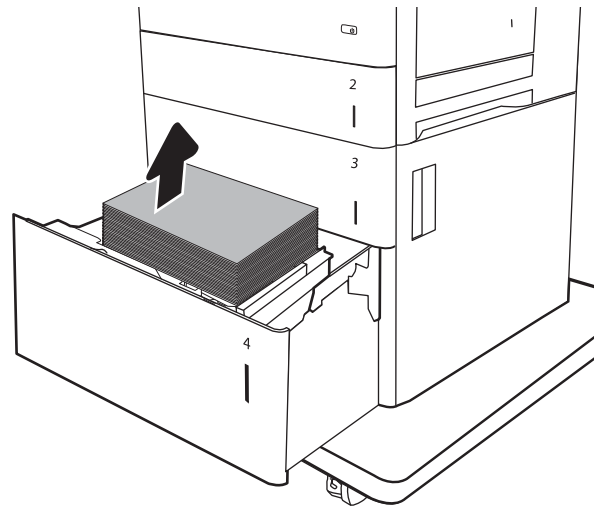
4. Press the release latch on the side of the tray to release it.
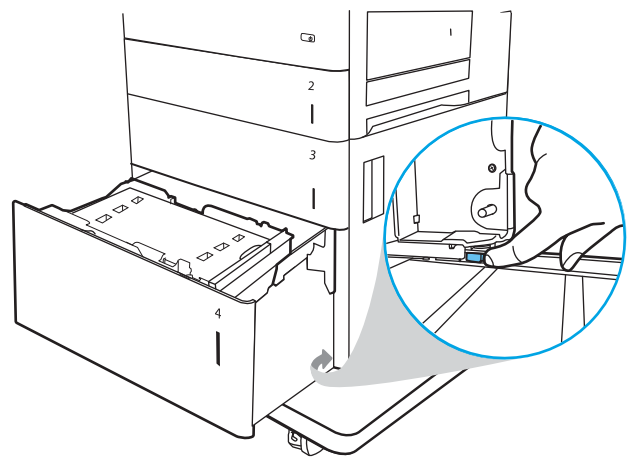
5. Lift the tray up and then pull it straight out to remove it.
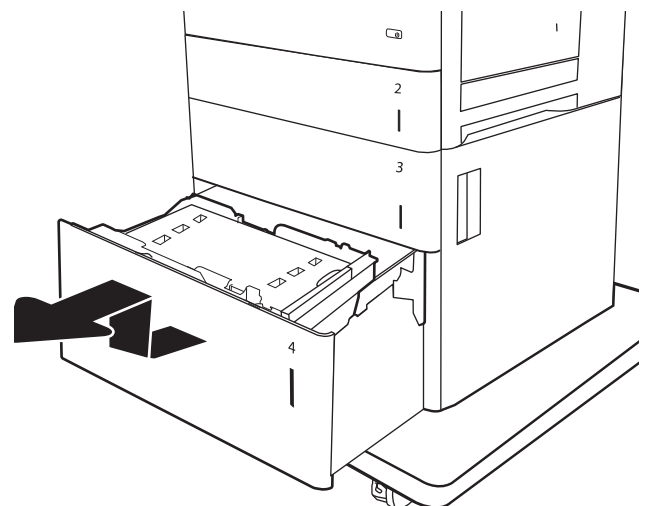
6. If jammed paper is in the feed area, pull it down to remove it. First pull the paper to the left to release it, and then pull it forward to remove it.
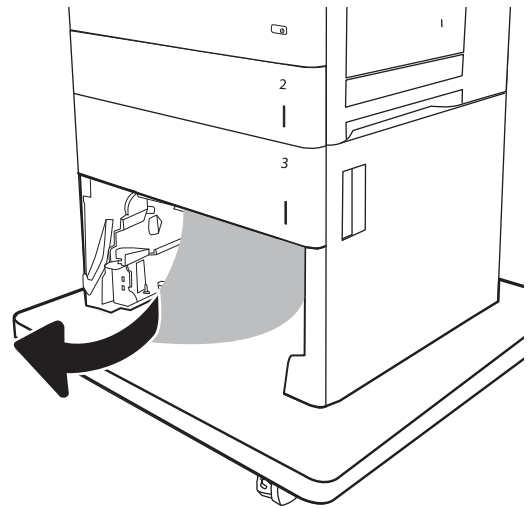
7. Install the tray, and then load full reams of paper into the tray. Verify that the tray is not overfilled and that the paper guides are adjusted correctly.

   NOTE: The tray holds 2,000 sheets of paper. For best results, load full reams of paper. Avoid dividing reams into smaller sections.
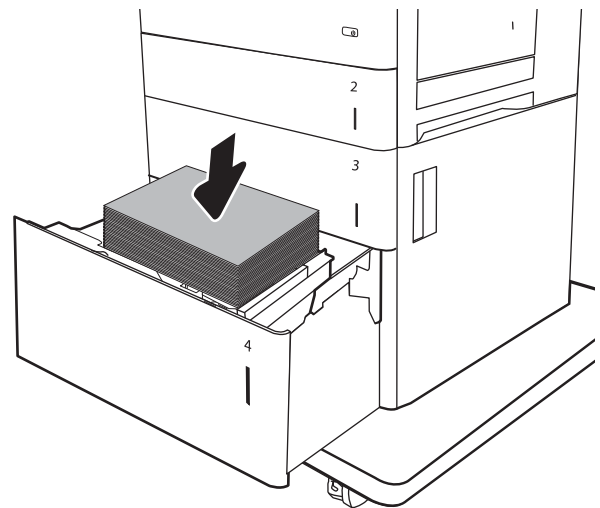
8. Close the tray.
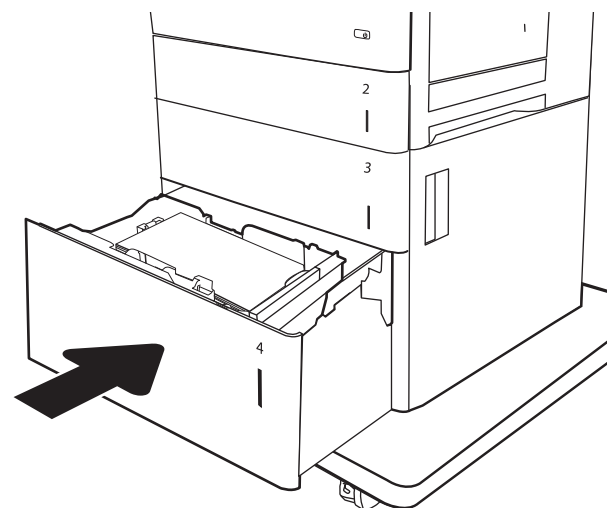
9. Open the lower-right door.
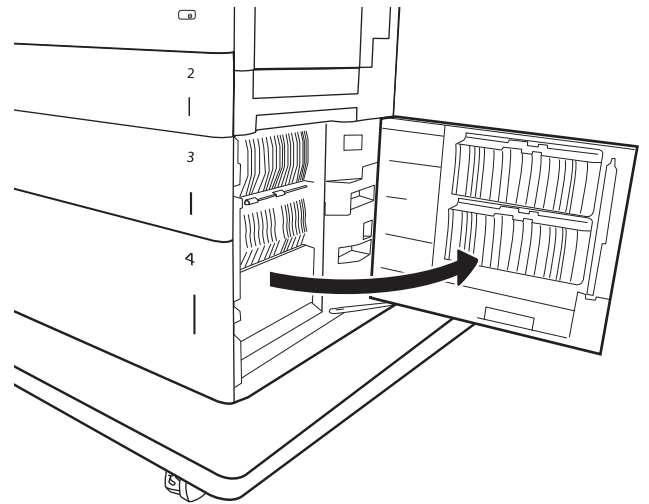
10. Remove any jammed paper.
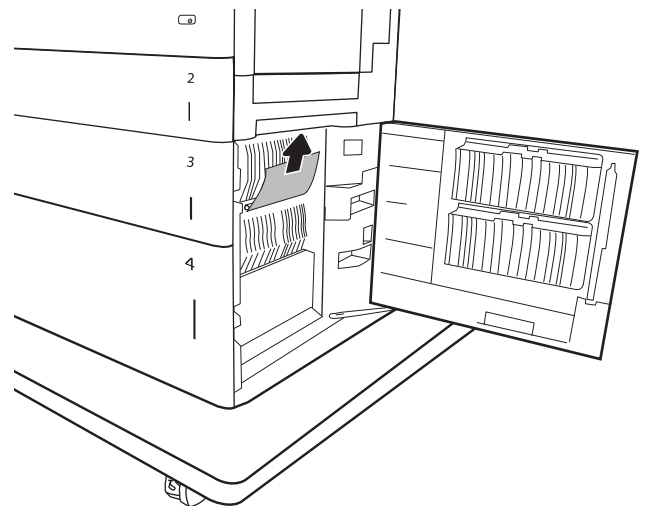
11. Close the lower-right door.

    NOTE: If, after clearing the jam, the printer control panel displays a message that there is no paper in the tray or the tray is overfilled, remove the tray and look behind it for any remaining paper.
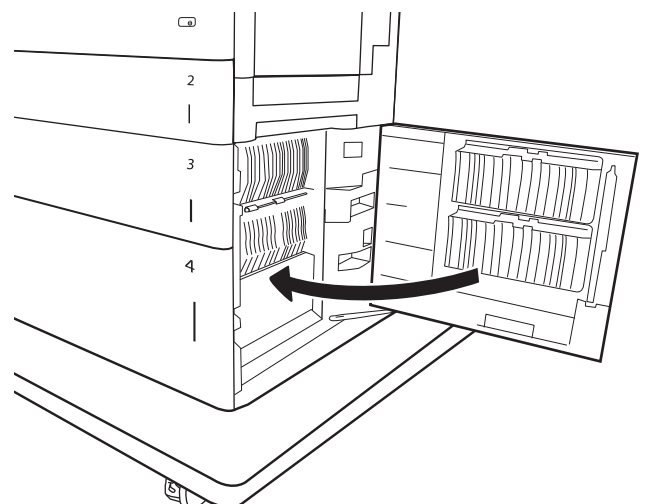
13.B9, 13.B2, 13.FF fuser paper jam

Use the following procedure to check for paper in all possible jam locations inside the right door. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.B9.XX Jam in fuser**

- **13.B2.XX Jam in <Cover or Door>.**

- **13.FF.EE Door Open Jam**

⚠ **CAUTION:** The fuser can be hot while the printer is in use. Wait for the fuser to cool before handling it.

1. Open the right door.
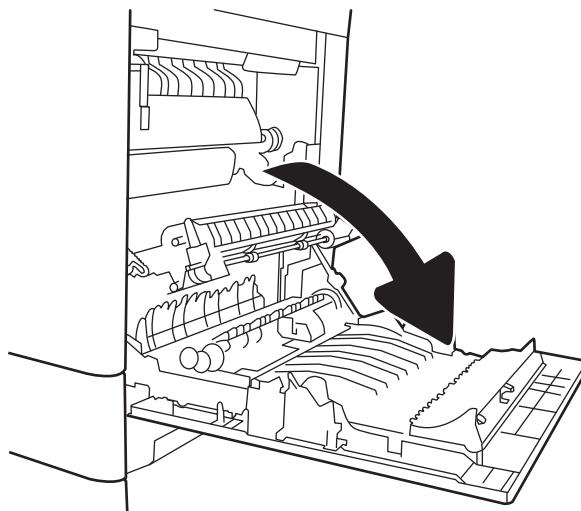
2. Gently pull out any jammed paper.
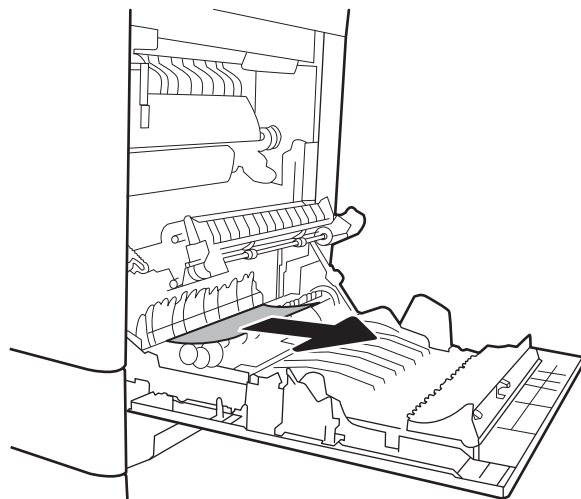
3. If paper is visible entering the bottom of the fuser, gently pull downward to remove it.

    CAUTION: Do not touch the rollers on the transfer roller. Contaminants can affect print quality.
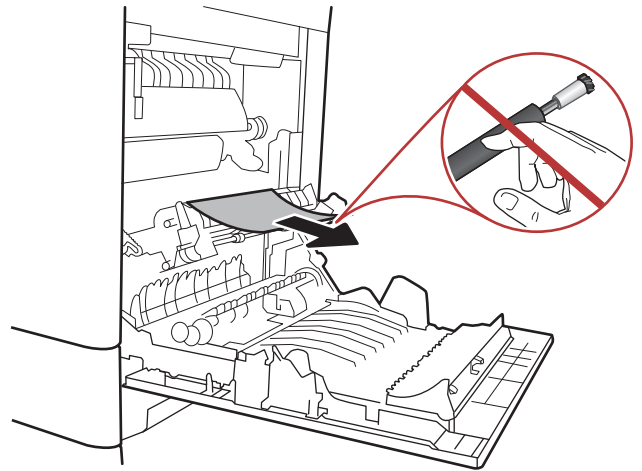
4. If paper is jammed as it enters the output bin, gently pull the paper downward to remove it.
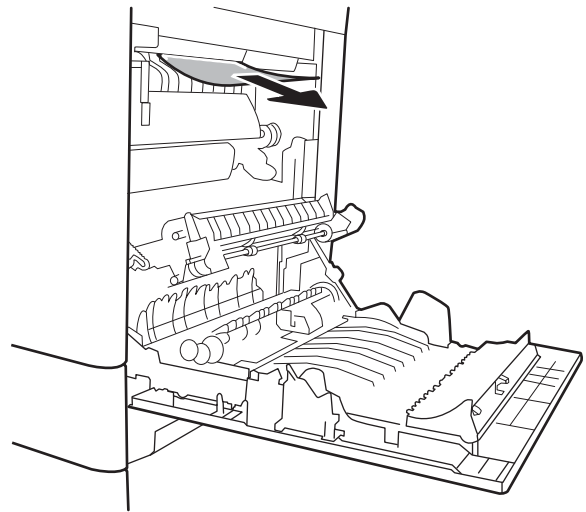
5. Paper could be jammed inside the fuser where it would not be visible. Grasp the fuser handles, lift up slightly, and then pull straight out to remove the fuser.

    CAUTION: The fuser can be hot while the printer is in use. Wait for the fuser to cool before handling it.
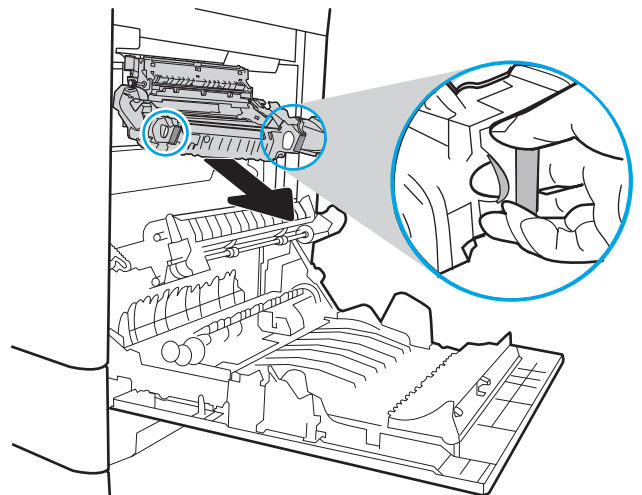
6. Open the jam-access door on the fuser. If paper is jammed inside the fuser, gently pull it straight up to remove it. If the paper tears, remove all paper fragments.

> **CAUTION:** Even if the body of the fuser has cooled, the rollers that are inside could still be hot. Do not touch the fuser rollers until they have cooled.
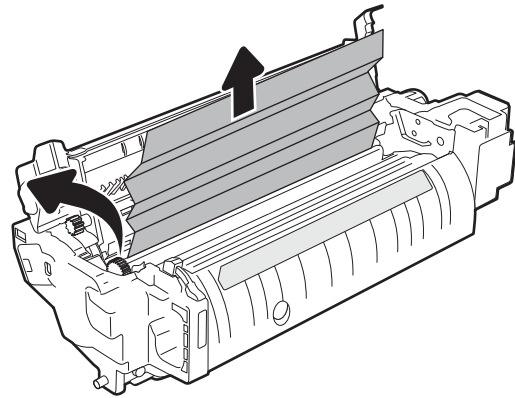
7. Close the jam-access door on the fuser, and push the fuser completely into the printer until it clicks into place.
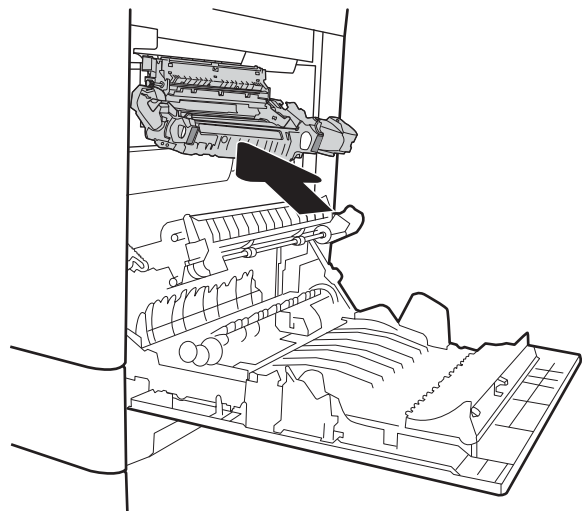
8. Close the right door.
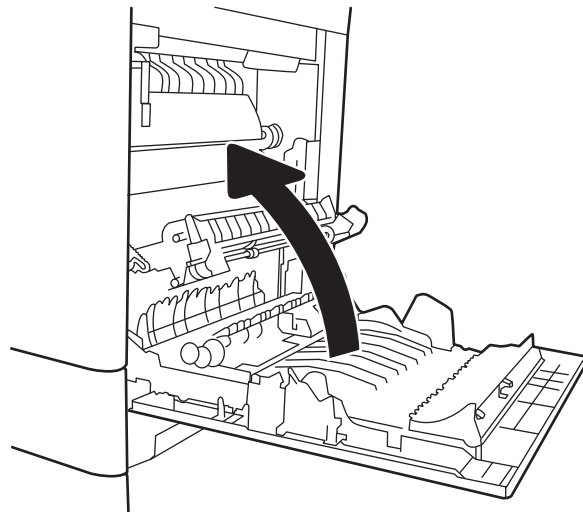
13.E1 output bin paper jam

Use the following procedure to clear jams in the output bin. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.E1.XX Jam at standard output bin**

1. If paper is visible in the output bin, grasp the leading edge and gently remove it.
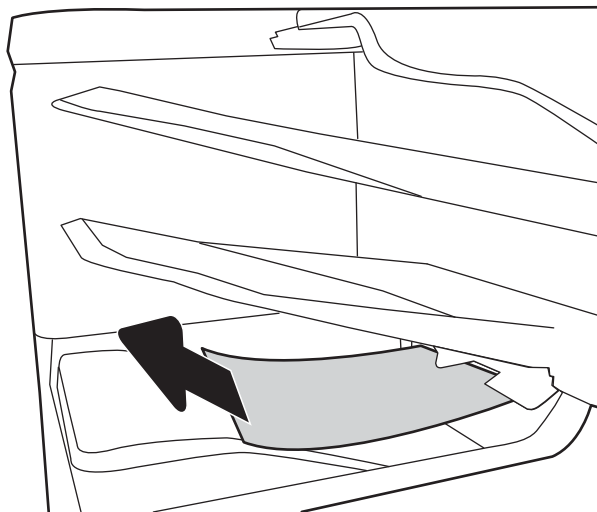
13.70.stapler/stacker paper jam

Use the following procedure to check for paper in the 3-bin stapler/stacker. When a jam occurs, the control panel might display a message and an animation that assists in clearing the jam.

- **13.70.xx Jam in at 3-bin stapler/stacker**

1. Gently remove any jammed paper from the stapler/stacker bins.
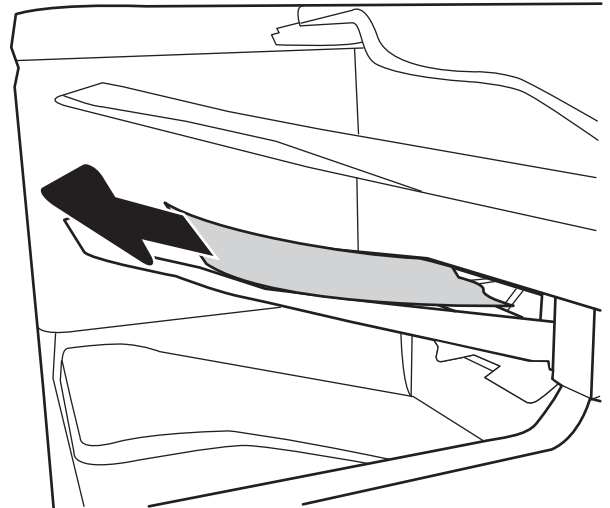
2. Open the stapler/stacker-right door.
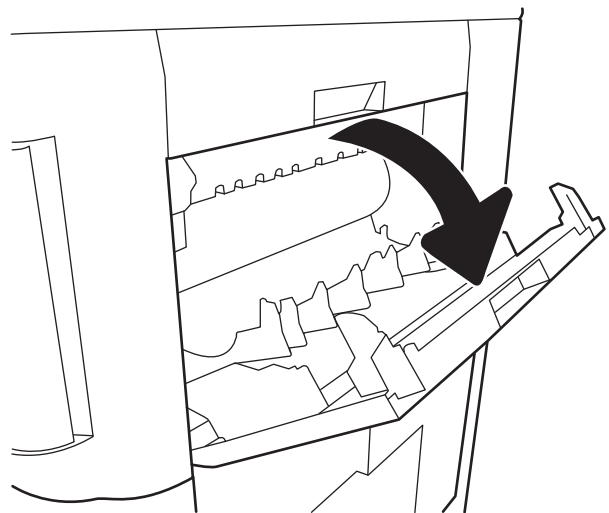
3. If jammed paper is visible, gently pull it straight out.
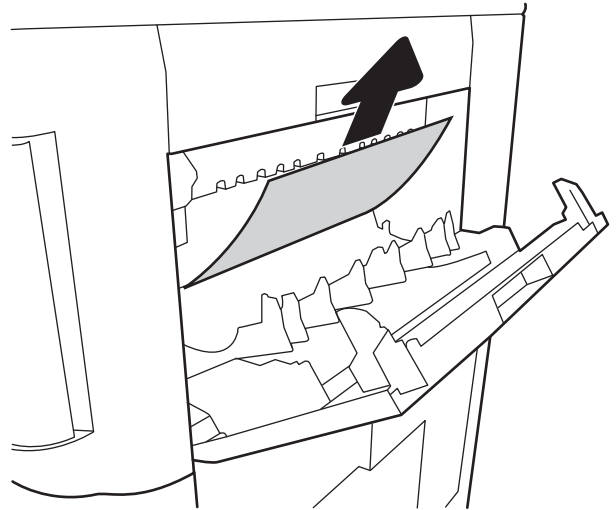
4. Close the stapler/stacker-right door.
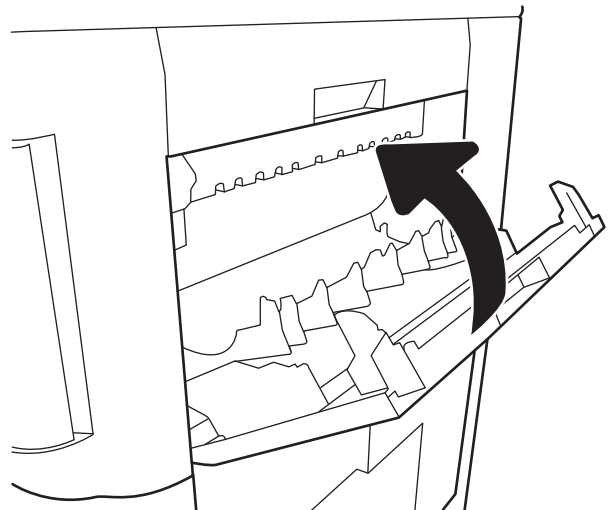
Clear staple jams in the 3-bin stapler/stacker

Use the following procedure to check for staples jammed in the 3-bin stapler/stacker. When a jam occurs, the control panel displays an animation that assists in clearing the jam.

1. Open the staple-cartridge door.
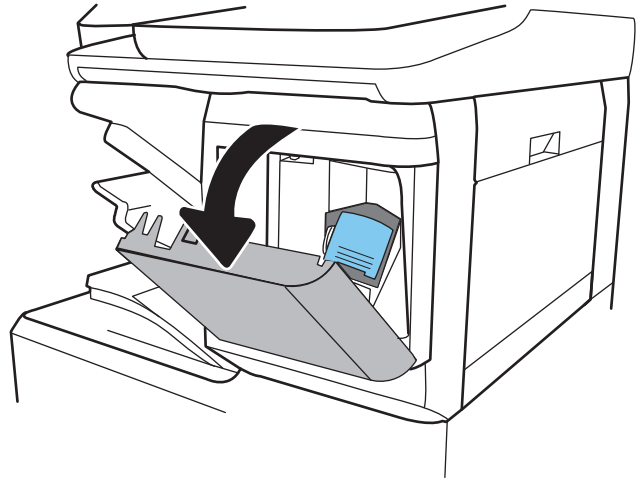
2. Grasp the colored tab on the staple cartridge, and then pull the staple cartridge straight out.
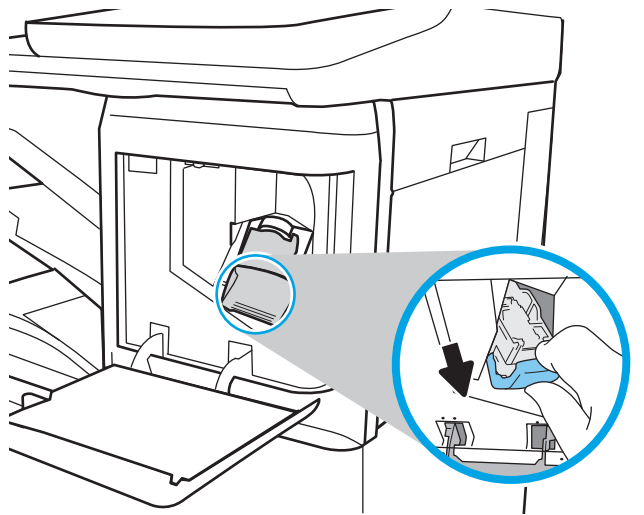
3. Lift up on the small lever at the back of the staple cartridge. Remove the jammed staples.
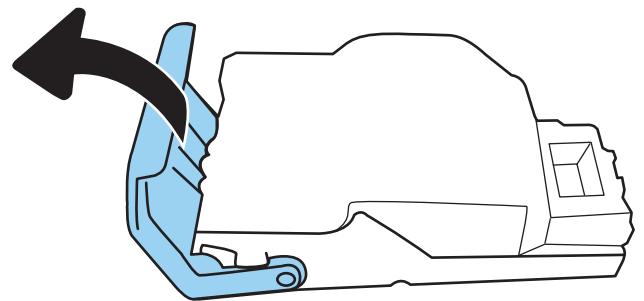
4. Close the lever at the back of the staple cartridge. Be sure that it snaps into place.
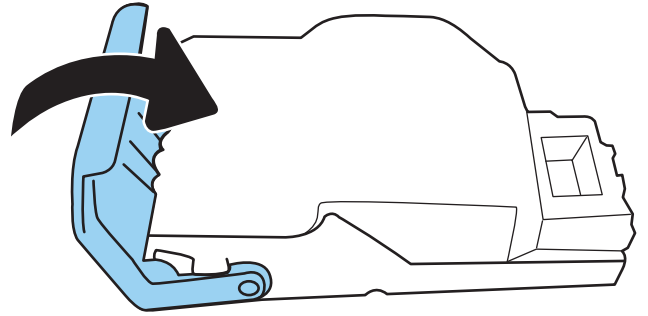
5. Insert the staple cartridge into the stapler and press the colored handle toward the printer until it snaps into place.
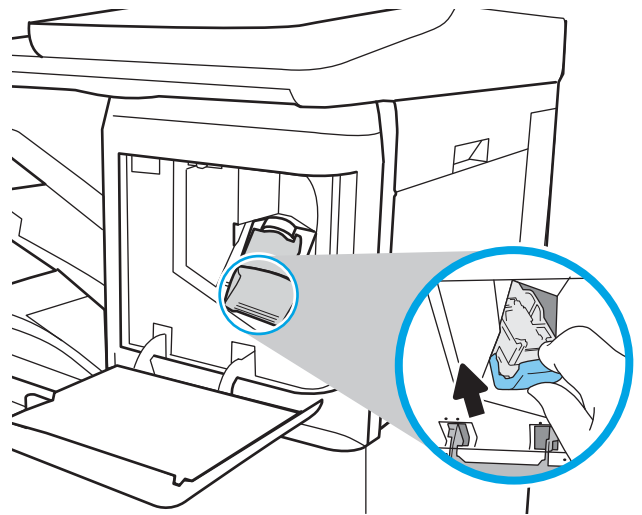
6. Close the staple-cartridge door.
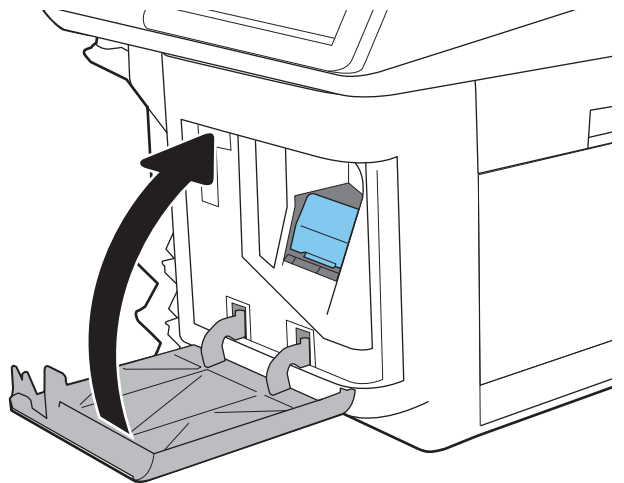
Change jam recovery

This printer provides a jam recovery feature that reprints jammed pages.

Change jam recovery from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Settings button.

2. Open the General menu, and then open the Jam Recovery menu.

3. Select one of the following options:

   - Automatic — The printer attempts to reprint jammed pages when sufficient memory is available. This is the default setting.

   - Off — The printer does not attempt to reprint jammed pages. Because no memory is used to store the most recent pages, performance is optimal.

     📝 NOTE: Some pages can be lost if the printer runs out of paper while printing a duplex job with Jam Recovery set to Off.

   - On — The printer always reprints jammed pages. Additional memory is allocated to store the last few pages printed.

Change jam recovery from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Settings, and then press the OK button.

2. Use the down arrow ▼ button to scroll to General, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Jam Recovery, and then press the OK button.

4. Use the down arrow ▼ button to scroll to an option, and then press the OK button to select it.

   - Automatic — The printer attempts to reprint jammed pages when sufficient memory is available. This is the default setting.

   - Off — The printer does not attempt to reprint jammed pages. Because no memory is used to store the most recent pages, performance is optimal.

     📝 NOTE: Some pages can be lost if the printer runs out of paper while printing a duplex job with Jam Recovery set to Off.

   - On — The printer always reprints jammed pages. Additional memory is allocated to store the last few pages printed.

Solve performance problems

📝 **NOTE:** Tray 1 and Tray 2 are optimal for paper pickup when using special paper or media other than 20lb plain paper. For Tray 1 and Tray 2 the printer increases the number of attempts to pick up a page, which increases the reliability of successfully picking the page from the tray and decreases the possibility of a mis-pick jam.

HP recommends using Tray 1 or Tray 2 if the printer is experiencing excessive or reoccurring jams from trays other than Tray 1 and Tray 2, or for print jobs that require media other than 20lb plain paper.

- Factors affecting print performance
- Print speeds
- The printer does not print or it prints slowly

Factors affecting print performance

Table 2-75 Solve performance problems

Problem	Cause	Solution
Pages print but are totally blank.	The document might contain blank pages.	Check the original document to see if content is present on all of the pages.
	The printer might be malfunctioning.	To check the printer, print a Configuration page.
Pages print very slowly.	Heavier paper types can slow the print job.	Print on a different type of paper.
	Complex pages can print slowly.	Proper fusing might require a slower print speed to ensure the best print quality.
	Large batches, narrow paper, and special paper such as gloss, transparency, cardstock, and HP Tough Paper can slow the print job.	Print in smaller batches, on a different type of paper, or on a different size of paper.
Pages did not print.	The printer might not be pulling paper correctly.	Make sure paper is loaded in the tray correctly.
	The paper is jamming in the printer.	Clear the jam.
	The USB cable might be defective or incorrectly connected.	- Disconnect the USB cable at both ends and reconnect it. - Try printing a job that has printed in the past. - Try using a different USB cable.
	Other devices are running on the host computer.	The printer might not share a USB port. If an external hard drive or network switchbox is connected to the same port as the printer, the other device might be interfering with the printer. To connect and use the printer, disconnect the other device or use two USB ports on the host computer.

Print speeds

Print speed is the number of pages that print in one minute. Print speed depends on different engine-process speeds or operational pauses between printed pages during normal printer operation. Factors that determine the print speed of the printer include the following:

- Page formatting time

    The printer must pause for each page to be formatted before it prints. Complex pages take more time to format, resulting in reduced print speed. However, most jobs print at full engine speed.

- Media size

    Legal-size media reduces print speed because it is longer than the standard Letter- or A4–size media. A reduce print speed is used when printing on narrow media to prevent the edges of the fuser from overheating.

- Media mode

    Some media types require a reduced print speed to achieve maximum print quality on that media. For example, glossy, heavy, and specialty media (for example, envelopes or photos) require a reduced print speed. To maximize the print speed for special media types, make sure that the correct media type in the print driver is selected.

- Printer temperature

    To prevent printer damage, print speed is reduced if the printer reaches a specific internal temperature (thermal slow down). The starting temperature of the printer, ambient environment temperature, and the print job size effect the number of pages that can be printed before the printer reduces the print speed. Thermal slow down reduces print speed by printing four pages and then pausing for an amount of time before printing continues.

- Other print speed reduction factors

    Other factors (especially during large print jobs) that can cause reduced print speeds include:

    - Density control sequence; occurs every 150 pages and takes about 120 seconds

The printer does not print or it prints slowly

The printer prints slowly

The printer prints slowly

If the printer prints, but it seems slow, try the following solutions.

1. Make sure the computer meets the minimum specifications for this printer. For a list of specifications, go to this Web site: www.hp.com/support/colorljM652, www.hp.com/support/colorljM653, www.hp.com/support/colorljM681MFP or www.hp.com/support/colorljM682MFP.

2. When the printer is configured to print on some paper types, such as heavy paper, the printer prints more slowly so it can correctly fuse the toner to the paper. If the paper type setting is not correct for the type of paper you are using, change the setting to the correct paper type.

3. If the host computer or the printer is connected to a wireless network, low signal quality or interference might be delaying print jobs.

The printer does not print

If the printer does not print at all, try the following solutions.

1. Make sure the printer is turned on and that the control panel indicates it is ready.

    ● If the control panel does not indicate the printer is ready, turn the printer off and then on again.

    ● If the control panel indicates the printer is ready, try sending the job again.

2. If the control panel indicates the printer has an error, resolve the error and then try sending the job again.

3. Make sure the cables are all connected correctly. If the printer is connected to a network, check the following items:

    ● Check the bottom LED next to the network connection on the printer. If the network is active, the light is green.

    ● Make sure that a network cable and not a phone cord is used to connect to the network.

    ● Make sure the network router, hub, or switch is turned on and that it is working correctly.

4. Install the HP software from the CD that came with the printer. Using generic printer drivers can cause delays clearing jobs from the print queue.

5. From the list of printers on your computer, right-click the name of this printer, click **Properties**, and open the **Ports** tab.

    ● If a network cable is used to connect to the network, make sure the printer name listed on the **Ports** tab matches the printer name on the printer configuration page.

    ● If a USB cable is used, and the printer is connected to a wireless network, make sure the box is checked next to **Virtual printer port for USB**.

6. If a personal firewall system on the computer is used, it might be blocking communication with the printer. Try temporarily disabling the firewall to see if it is the source of the problem.

7. If the host computer or the printer is connected to a wireless network, low signal quality or interference might be delaying print jobs.

Solve wired network problems

Introduction

Certain types of problems can indicate there is a network communication problem. These problems include the following issues:

- The periodic loss of ability to communicate with the printer

- The printer cannot be found during driver installation

- A periodic failure to print

Check the following items to verify that the printer is communicating with the network. Before beginning, print a configuration page from the printer control panel and locate the printer IP address that is listed on this page.

- Poor physical connection

- The computer is using the incorrect IP address for the printer

- The computer is unable to communicate with the printer

- The printer is using incorrect link and duplex settings for the network

- New software programs might be causing compatibility problems

- The computer or workstation might be set up incorrectly

- The printer is disabled, or other network settings are incorrect

NOTE: HP does not support peer-to-peer networking, as the feature is a function of Microsoft operating systems and not of the HP print drivers. For more information, go to Microsoft at www.microsoft.com.

Poor physical connection

1. Verify that the printer is attached to the correct network port using a cable of the correct length.

2. Verify that cable connections are secure.

3. Look at the network port connection on the back of the printer, and verify that the amber activity light flashes indicating network traffic, and the green link-status light is continuously lit indicating a network link.

4. If the problem continues, try a different cable or port on the hub.

The computer is using the incorrect IP address for the printer

1. Open the printer properties and click the **Ports** tab. Verify that the current IP address for the printer is selected. The printer IP address is listed on the printer configuration page.

2. If you installed the printer using the HP standard TCP/IP port, select the box labeled **Always print to this printer, even if its IP address changes**.

3. If you installed the printer using a Microsoft standard TCP/IP port, use the hostname instead of the IP address.

4. If the IP address is correct, delete the printer and then add it again.

The computer is unable to communicate with the printer

1. Test network communication by pinging the network.

   a. Open a command-line prompt on your computer.

      - For Windows, click **Start**, click **Run**, type `cmd`, and then press Enter.

      - For OS X, go to **Applications**, then **Utilities**, and open **Terminal**.

   b. Type `ping` followed by the IP address for your printer.

   c. If the window displays round-trip times, the network is working.

2. If the ping command failed, verify that the network hubs are on, and then verify that the network settings, the printer, and the computer are all configured for the same network.

The printer is using incorrect link and duplex settings for the network

HP recommends leaving these settings in automatic mode (the default setting). If you change these settings, you must also change them for your network.

New software programs might be causing compatibility problems

Verify that any new software programs are correctly installed and that they use the correct print driver.

The computer or workstation might be set up incorrectly

1. Check the network drivers, print drivers, and the network redirection settings.

2. Verify that the operating system is configured correctly.

The printer is disabled, or other network settings are incorrect

1. Review the configuration page to check the status of the network protocol. Enable it if necessary.

2. Reconfigure the network settings if necessary.

Solve wireless network problems

Introduction

Use the troubleshooting information to help resolve issues.

NOTE: To determine whether Wireless Print Direct printing is enabled on your printer, print a configuration page from the printer control panel

Wireless connectivity checklist

- ● Verify that the network cable is not connected.

- ● Verify that the printer and the wireless router are turned on and have power. Also make sure that the wireless radio in the printer is turned on.

- ● Verify that the service set identifier (SSID) is correct. Print a configuration page to determine the SSID. If you are not sure the SSID is correct, run the wireless setup again.

- ● With secured networks, verify that the security information is correct. If the security information is incorrect, run the wireless setup again.

- ● If the wireless network is working correctly, try accessing other computers on the wireless network. If the network has Internet access, try connecting to the Internet over a wireless connection.

- ● Verify that the encryption method (AES or TKIP) is the same for the printer as it is for the wireless access point (on networks using WPA security).

- ● Verify that the printer is within the range of the wireless network. For most networks, the printer must be within 30 m (100 ft) of the wireless access point (wireless router).

- ● Verify that obstacles do not block the wireless signal. Remove any large metal objects between the access point and the printer. Make sure poles, walls, or support columns containing metal or concrete do not separate the printer and wireless access point.

- ● Verify that the printer is located away from electronic devices that might interfere with the wireless signal. Many devices can interfere with the wireless signal including motors, cordless phones, security system cameras, other wireless networks, and some Bluetooth devices.

- Verify that the print driver is installed on the computer.

- Verify that you have selected the correct printer port.

- Verify that the computer and printer connect to the same wireless network.

- For OS X, verify that the wireless router supports Bonjour.

The printer does not print after the wireless configuration completes

1. Make sure that the printer is turned on and in the ready state.

2. Turn off any third-party firewalls on your computer.

3. Make sure that the wireless network is working correctly.

4. Make sure that your computer is working correctly. If necessary, restart the computer.

5. Verify that you can open the printer HP Embedded Web Server from a computer on the network.

The printer does not print, and the computer has a third-party firewall installed

1. Update the firewall with the most recent update available from the manufacturer.

2. If programs request firewall access when you install the printer or try to print, make sure you allow the programs to run.

3. Temporarily turn off the firewall, and then install the wireless printer on the computer. Enable the firewall when you have completed the wireless installation.

The wireless connection does not work after moving the wireless router or printer

1. Make sure that the router or printer connects to the same network that your computer connects to.

2. Print a configuration page.

3. Compare the service set identifier (SSID) on the configuration page to the SSID in the printer configuration for the computer.

4. If the numbers are not the same, the devices are not connecting to the same network. Reconfigure the wireless setup for the printer.

Cannot connect more computers to the wireless printer

1. Make sure that the other computers are within the wireless range and that no obstacles block the signal. For most networks, the wireless range is within 30 m (100 ft) of the wireless access point.

2. Make sure that the printer is turned on and in the ready state.

3. Make sure there are not more than 5 concurrent Wireless Print Direct users.

4. Turn off any third-party firewalls on your computer.

5. Make sure that the wireless network is working correctly.

6. Make sure that your computer is working correctly. If necessary, restart the computer.

The wireless printer loses communication when connected to a VPN

- Typically, you cannot connect to a VPN and other networks at the same time.

The network does not appear in the wireless networks list

- Make sure the wireless router is turned on and has power.

- The network might be hidden. However, you can still connect to a hidden network.

The wireless network is not functioning

1. Make sure that the network cable is not connected.

2. To verify if the network has lost communication, try connecting other devices to the network.

3. Test network communication by pinging the network.

   a. Open a command-line prompt on your computer.

      - For Windows, click **Start**, click **Run**, type `cmd`, and then press Enter.

      - For OS X, go to **Applications**, then **Utilities**, and open **Terminal**.

   b. Type `ping` followed by the router IP address.

   c. If the window displays round-trip times, the network is working.

4. Make sure that the router or printer connects to the same network that the computer connects to.

   a. Print a configuration page.

   b. Compare the service set identifier (SSID) on the configuration report to the SSID in the printer configuration for the computer.

   c. If the numbers are not the same, the devices are not connecting to the same network. Reconfigure the wireless setup for the printer.

Reduce interference on a wireless network

The following tips can reduce interference in a wireless network:

- Keep the wireless devices away from large metal objects, such as filing cabinets, and other electromagnetic devices, such as microwaves and cordless telephones. These objects can disrupt radio signals.

- Keep the wireless devices away from large masonry structures and other building structures. These objects can absorb radio waves and lower signal strength.

- Position the wireless router in a central location in line of sight with the wireless printers on the network.

Service mode functions

- Service menu

- Printer resets

- Format Disk and Partial Clean functions

Service menu

The Service menu is PIN-protected for added security. Only authorized service people have access to the Service menu. When selecting Service from the list of menus, the printer prompts the user to enter an eight-digit personal identification number (PIN).

📝 **NOTE:** The printer automatically exits the Service menu after about one minute if no items are selected or changed.

Open the Service menu from a touchscreen control panel

1. From the Home screen on the printer control panel, select Support Tools.

2. Open the Service menu.

3. On the sign-in screen, select Service Access Code from the drop-down list.

4. Enter the following service access code for the printer:

   - 05065217 (M652)

   - 05065317 (M653)

   - 05068117 (M681)

   - 05068217 (M682)

Open the service menu from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Support Tools, and then press the OK button.

2. Use the down arrow ▼ button to scroll to Service, and then press the OK button to select it.

3. Use the down arrow ▼ button to scroll to Service Access Code, and then press the OK button to select it.

4. Enter the following service access code for the printer:

   📝 **NOTE:** After entering the PIN, press the OK button.

   - 05065217 (M652)

   - 05065317 (M653)

   - 05068117 (M681)

   - 05068217 (M682)

The following menu items appear in the Service menu:

First level	Second level	Value	Description
Event Log	Print		Print or the event log.
Clear Event Log	Clear		Use this item to clear the printer event log.
Cycle Counts	Total Engine Cycles		Set the page count that was stored in NVRAM prior to installing a new formatter.
	Mono Cycle Count		Set the mono page printed count.
	Color Cycle Count		Set the color page printed count.
	Refurbish Cycle Count		Use this item to record the page count when the printer was refurbished.
Serial Number			Set the serial number.
Service ID			Use this item to show the date that the printer was first used on the control panel. This eliminates the need for users to keep paper receipts for proof of warranty.
Cold Reset Paper			When you perform a cold reset, the paper size that is stored in NVRAM is reset to the default factory setting. If you replace a formatter board in a country/region that uses A4 as the standard paper size, use this menu to reset the default paper size to A4. LETTER and A4 are the only available values.
New Registration Roller		Yes	Reset the counter for the registration roller after replacing the registration assembly.
		No	
New Transfer Kit		Yes	Reset the counter for the registration roller after replacing the transfer kit.
		No	
Low Alerts		Enable	Turn on (or off) low alerts (for supplies).
		Disable	
Reset Low Alerts			• Reset to level 1 • Reset to level 2 • Reset to level 3 • Set to non-HP managed mode
Test Support	Continuous Print from USB		
	Automatic Calibrations	Disabled	
		Enabled*	

Printer resets

Restore factory-set defaults

📝 **NOTE:** The printer restarts automatically after the reset operation completes.

Restore factory-set defaults from a touchscreen control panel

1. From the Home screen on the printer control panel, scroll to and touch the Settings button.

2. Open the following menus:

   ● General

   ● Reset Factory Settings

3. A verification message advises that completing the reset function might result in loss of data. Touch the Reset button to complete the process.

Restore factory-set defaults from an LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to scroll to Settings, and then press the OK button.

2. Use the down arrow ▼ button to scroll to General, and then press the OK button to select it.

3. Use the down arrow ▼ button to scroll to Reset Factory Settings, and then press the OK button to select it.

4. Use the down arrow ▼ button to scroll to Reset, and then press the OK button to select it.

5. A verification message advises that completing the reset function might result in loss of data. Select Reset to complete the process.

Restore the service ID

Restore the service ID

When replacing the formatter, the date is lost. Use this menu item to reset the date to the original date that the printer was first used. The date format is YYDDD. Use the following formula to calculate the dates:

1. To calculate YY, subtract 1990 from the calendar year. For instance, if the printer was first used in 2002, calculate YY as follows: 2002 – 1990 = 12. YY = 12.

2. Subtract 1 from 10 (October is the tenth month of the year): 10 – 1 = 9.

   ● Multiply 9 by 30: 9 x 30 = 270 or add 17 to 270: 270 + 17 = 287. Thus, DDD = 287.

Convert the service ID to an actual date

Use the printer Service ID number to determine whether the printer is still under warranty. Use the following formula to convert the Service ID into the installation date as follows:

1. Add 1990 to YY to get the actual year that the printer was installed.

2. Divide DDD by 30. If there is a remainder, add 1 to the result. This is the month.

3. The remainder from the calculation in step 2 is the date.

Using the Service ID 12287 as an example, the date conversion is as follows:

1. 12 + 1990 = 2002, so the year is 2002.

2. 287 divided by 30 = 9 with a remainder of 17. Because there is a remainder, add 1 to 9 to get 10, which represents October.

3. The remainder in step 2 is 17, so that is the date.

4. The complete date is 17-October-2002.

NOTE: A six-day grace period is built into the date system.

Printer cold reset

Cold reset using the Pre-boot menu from a touchscreen control panel

CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Touch in the middle of the control panel display when you see the 1/8 under the HP logo.

Figure 2-110 Open the Pre-boot menu

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then touch the OK button.

3. Use the down arrow ▼ button to highlight the +8:Startup Options item, and then touch the OK button.

4. Use the down arrow ▼ button to highlight the 2 Cold Reset item, and then touch the OK button to select it.

5. Touch the Home button to return to the main Pre-boot menu and highlight the 1:Continue item, and then touch the OK button.

NOTE: The printer will initialize.

Cold reset using the Pre-boot menu from an LCD control panel

CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Press the Cancel ⊗ button when you see the 1/8 under the HP logo.

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then press the OK button.

3. Use the down arrow ▼ button to highlight the +8:Startup Options item, and then press the OK button.

4.	Use the down arrow ▼ button to highlight the 2 Cold Reset item, and then press the OK button to select it.

5.	Touch the Home button to return to the main Pre-boot menu and highlight the 1:Continue item, and then touch the OK button.

	NOTE:	The printer will initialize.

Format Disk and Partial Clean functions

📝 **NOTE:** Only for products with an optional hard-disk drive (HDD) installed).

Active and repository firmware locations

The firmware bundle consists of multiple parts. The main components are the Windows CE Operating System and the printer/peripheral firmware files.

There are two locations/partitions on the hard drive where the firmware components are stored:

- The Active, where the operating system and firmware currently are executing.

- The Repository, the recovery location.

If the Active location is damaged, or a Partial Clean was performed, the printer automatically copies over the OS and firmware files from the Repository location and the printer recovers.

If both the Active and Repository locations are damaged, or a Format Disk was performed, then both locations are gone and the error message **99.09.67** displays on the control panel display. The user must upload the firmware to the printer in order for it to function again.

⚠ **CAUTION:** The Format Disk option performs a disk initialization for the entire disk. The operating system, firmware files, and third party files (among other files) will be completely lost. HP does not recommend this action.

Partial Clean

The Partial Clean option erases all data from the partitions, except for the firmware repository where a backup copy of the firmware file is stored. This allows the disk drive to be reformatted without having to download a firmware upgrade file to return the printer to a bootable state.

Characteristics of a Partial Clean

- Customer-defined settings, third-party solutions, firmware files, and the operating system are deleted.

- Rebooting the printer restores the firmware files from the Repository location, but does not restore any customer-defined settings.

- For previous HP products, a Hard Disk Initialization is similar to executing the Partial Clean function for this printer.

⚠ **CAUTION:** HP recommends backing-up printer configuration data before executing a Partial Clean to retain customer-defined settings (if needed). See the Backup/Restore item in the Device Maintenance menu.

Reasons for performing Partial Clean

- The printer continually boots up in an error state.

  📝 **NOTE:** Try clearing the error prior to executing a Partial Clean.

- The printer will not respond to commands from the control panel.

- Executing the Partial Clean function is helpful for troubleshooting hard disk problems.

- To reset the printer by deleting all solutions and customer-defined settings.

- The printer default settings are not properly working.

Execute a Partial Clean

Execute a Partial Clean from a touchscreen control panel

1. Touch in the middle of the control panel display when you see the 1/8 under the HP logo.

   Figure 2-111 Open the Pre-boot menu
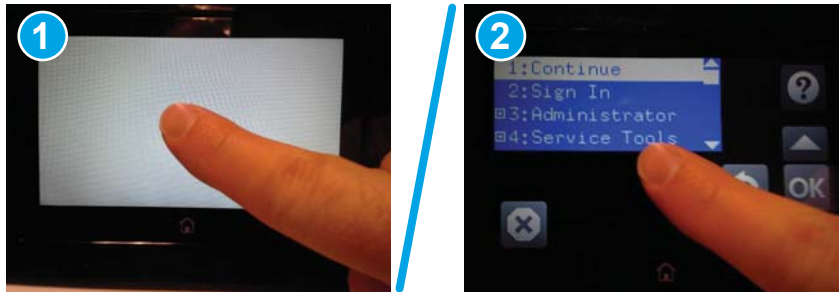
2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then touch the OK button.

3. Use the down arrow ▼ button to highlight Partial Clean and then touch the OK button.

4. Touch the OK button again.

5. Touch the Home button to highlight Continue, and then touch the OK button.

   📝 NOTE: The printer initializes.

Execute a Partial Clean from an LCD control panel

⚠ CAUTION: This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Press the Cancel ⊗ button when you see the 1/8 under the HP logo.

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then press the OK button.

3. Use the down arrow▼ button to highlight Partial Clean and then press the OK button.

4. Press the OK button again.

5. Press the Home button to highlight Continue, and then press the OK button.

   📝 NOTE: The printer initializes.

Format Disk

The Format Disk option erases the entire disk drive.

⚠ CAUTION: After executing a Format Disk option, the printer is *not* bootable.

Characteristics of a Format Disk

- Customer-defined settings, third-party solutions, firmware files, and the operating system are deleted.

  📝 NOTE: Rebooting the printer *does not* restore the firmware files.

- Rebooting the printer restores the firmware files from the Repository location, but does not restore any customer-defined settings.

- After executing the Format Disk function, the message **99.09.67** displays on the control panel.

- After executing the Format Disk function, the printer firmware must be reloaded.

⚠ CAUTION: HP recommends not using the Format Disk option unless an error occurs and the solution in the printer service manual recommends this solution. After executing the Format Disk function, the printer is unusable.

HP recommends backing-up printer configuration data before executing a Format Disk to retain customer-defined settings (if needed). See the Backup/Restore item in the Device Maintenance menu.

Reasons for performing Format Disk

- The printer continually boots up in an error state.

  📝 NOTE: Try clearing the error prior to executing a Format Disk.

- The printer will not respond to commands from the control panel.

- Executing the Format Disk function is helpful for troubleshooting hard disk problems.

- To reset the printer by deleting all solutions and customer-defined settings.

Execute a Format Disk

Execute a Format Disk from a touchscreen control panel

1. Touch in the middle of the control panel display when you see the 1/8 under the HP logo.

    Figure 2-112 Open the Pre-boot menu

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then touch the OK button.

3. Use the down arrow ▼ button to highlight Format Disk, and then touch the OK button.

4. Touch the OK button again.

    📝 NOTE: When the Format Disk operation is complete, reload the printer firmware.

Execute a Format Disk from an LCD control panel

⚠ **CAUTION:** This procedure resets all printer configurations and settings to factory defaults (customer configurations and settings are lost).

1. Press the Cancel ⊗ button when you see the 1/8 under the HP logo.

2. Use the down arrow ▼ button to highlight the +3:Administrator item, and then press the OK button.

3. Use the down arrow ▼ button to highlight Format Disk, and then press the OK button.

4. Press the OK button again.

📝 **NOTE:** When the Format Disk operation is complete, reload the printer firmware.

Firmware upgrades

To download the most recent firmware upgrade for the printer, go to:

- In the US, go to www.hp.com/support/colorljM652, www.hp.com/support/colorljM653, www.hp.com/support/colorljM681MFP or www.hp.com/support/colorljM682MFP.

  a. Select **Get drivers, Software, and Firmware**, and then select the appropriate product by name.

  📝 **NOTE:** More than one printer model might be listed. Make sure to select the correct model so that the upgraded firmware supports all of the printer functions.

  b. Select the driver language and operating system.

  c. Locate the firmware download, and then select **Download**.

- Outside the U.S., go to www.hp.com/support.

  a. Select your country/region.

  b. Select **Drivers & Downloads**.

  c. Enter the product name in the **Find my product** dialogue box, and then select **Go**.

  💡 **TIP:** Click on the **How do I find my product name/number?** link to see a short video on identifying the printer name and number.

  d. Select the appropriate product by name.

  📝 **NOTE:** More than one printer model might be listed. Make sure to select the correct model so that the upgraded firmware supports all of the printer functions.

  e. Select the driver language and operating system.

  f. Locate the firmware download, and then select **Download**.

- Determine the installed revision of firmware

- Perform a firmware upgrade

Determine the installed revision of firmware

📝 **NOTE:** Print a configuration page to determine the installed revision of firmware.

Print the configuration page from a touchscreen control panel

1. From the Home screen on the printer control panel, swipe (right), and the touch the Reports button.

2. Touch the Configuration/Status Pages item

3. Touch Configuration Page to select it.

   💡 **TIP:** Multiple report pages can be selected, and then printed together.

4. Touch the Print button to print the pages.

Print the configuration page from a LCD control panel

1. From the Home screen on the printer control panel, use the down arrow ▼ button to select the Print menu.

2. Use the right arrow ▶ button to scroll to Reports, and then press the OK button.

3. Use the down arrow ▼ button to scroll to Configuration/Status Pages, and then press the OK button.

4. Use the down arrow ▼ or ▲ buttons to scroll to Configuration Page, and then press the OK button to select it.

5. Use the down arrow ▼ and right arrow ▶ buttons to scroll to Print, and then press the OK button to print the pages.

   💡 **TIP:** Multiple report pages can be selected, and then printed together.

Figure 2-113 Configuration report

Perform a firmware upgrade

The firmware bundle is a .bdl file. This file requires an interactive upgrade method. The traditional FTP, LPR or Port 9100 methods of upgrading are not available. Use one of the following methods to upgrade the firmware for this printer.

HP Embedded Web Server

NOTE: The firmware update might take 10 minutes or longer based on the input/output (I/O) transfer rates and the time it takes for the printer to reinitialize.

1. Open an Internet browser window.

2. Enter the printer IP address in the URL line.

3. Select the **Firmware Upgrade** link from the **General** tab or from the **Troubleshooting** tab.

4. Browse to the location that the firmware upgrade file was downloaded to, and then select the firmware file —the file has a .bdl file extension. Select the Install button to perform the upgrade.

   NOTE: Do not close the browser window OR interrupt communication until the HP Embedded Web Server (EWS) displays the confirmation page.

5. After the printer reinitializes, print a configuration page and verify that the latest firmware version has been installed.

USB flash drive (control-panel menu)

📝 **NOTE:** USB flash drives that are not using a FAT32 format, or do not have a CD formatted partition, might not be recognized by the printer. If the printer does not recognize a USB flash drive, try using a different USB flash drive.

💡 **TIP:** The USB port on the printer must be enabled. If it is disabled, use the Enable Retrieve from USB item in the General Settings menu to enable it.

USB flash drive firmware (control-panel menu) update from a touchscreen control panel

1. Copy the .bdl file to a portable USB flash drive.

2. Turn the printer on, and then wait until it initializes.

3. From the Home screen on the printer control panel, swipe (right), and the touch the Support Tools item.

4. Open the following menus:

   ● Maintenance

   ● USB Firmware Upgrade

5. Insert the USB flash drive with the .bdl file on it into the USB port on the printer.

6. Touch the .bdl file, and then touch the Install button.

   📝 **NOTE:** If there is more than one .bdl file on the storage device, make sure to select the correct file for this printer.

7. When the upgrade is complete, the printer restarts.

   💡 **TIP:** Print a configuration page and verify that the upgrade firmware version was installed.

USB flash drive firmware (control-panel menu) update from a LCD control panel

1. Copy the .bdl file to a portable USB flash drive.

2. From the Home screen on the printer control panel, use the down arrow ▼ button to select the Print menu.

3. Use the right arrow ▶ button to scroll to and select the Support Tools menu, and then press the OK button.

4. Use the down arrow ▼ button to scroll to and select the Maintenance menu, and then press the OK button.

5. Use the down arrow ▼ button to scroll to and select the USB Firmware Upgrade menu, and then press the OK button.

6. Insert the USB flash drive with the .bdl file on it into the USB port on the printer.

7. Use the down arrow ▼ button to scroll to the appropriate .bdl file, and then press the OK button to select.

   📝 **NOTE:** If there is more than one .bdl file on the storage device, make sure to select the correct file for this printer.

8. Use the down arrow ▼ and right arrow ▶ buttons to scroll to Install, and then press the OK button to start the firmware upgrade.

   💡 **TIP:** Print a configuration page and verify that the upgrade firmware version was installed.

USB flash drive (Pre-boot menu)

IMPORTANT: Only use this method of performing a firmware upgrade if the printer cannot initialize to the **Ready** state.

USB flash drive firmware (Pre-boot menu) update from a touchscreen control panel

1. Copy the .bdl file to a portable USB flash drive.

2. Touch the middle of the control-panel display when you see the 1/8 under the logo.

   Figure 2-114 Open the Pre-boot menu
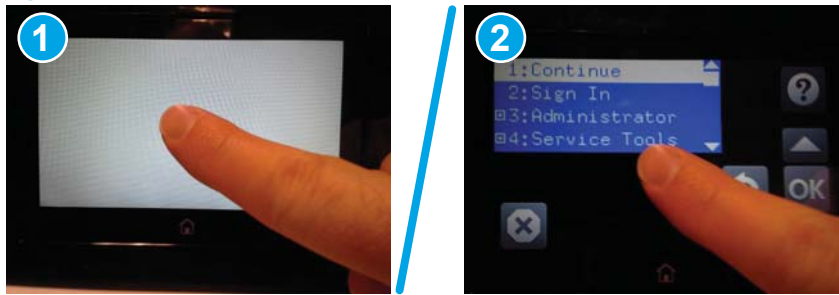
3. Touch the down arrow ▼ button to highlight +3 Administrator, and then touch the OK button.

4. If necessary, touch the down arrow ▼ button to highlight +1 Download, and then touch the OK button.

5. Insert the USB flash drive with the .bdl file on it into the USB port on the printer.

   NOTE: If the error message No USB Thumbdrive Files Found displays on the control-panel display, try using a different portable storage device.

6. Touch the down arrow ▼ button to highlight USB Thumbdrive, and then touch the OK button.

7. Touch the down arrow ▼ button to highlight the .bdl file, and then touch the OK button.

   NOTE: The upgrade process can take 10 minutes or longer to complete.

   TIP: If there is more than one .bdl file on the storage device, make sure to select the correct file for this printer.

8. When the message Complete displays on the control-panel display, turn the printer power off, and then on again.

9. Touch the OK button to begin the upgrade. When the upgrade is complete, the printer will initialize to the **Ready** state.

10. When the upgrade process is complete, print a configuration page and verify that the upgrade firmware version was installed.

USB flash drive firmware (Pre-boot menu) update from a LCD control panel

1. Copy the .bdl file to a portable USB flash drive.

2. Press the Cancel ⊗ button when you see the 1/8 under the logo.

3. Press the down arrow ▼ button to highlight +3 Administrator, and then press the OK button.

4.   If necessary, press the down arrow ▼ button to highlight +1 Download, and then press the OK button.

5.   Insert the USB flash drive with the .bdl file on it into the USB port on the printer.

📝 NOTE: If the error message No USB Thumbdrive Files Found displays on the control-panel display, try using a different portable storage device.

6.   Press the down arrow ▼ button to highlight USB Thumbdrive, and then press the OK button.

7.   Press the down arrow ▼ button to highlight the .bdl file, and then press the OK button.

📝 NOTE: The upgrade process can take 10 minutes or longer to complete.

🔅 TIP: If there is more than one .bdl file on the storage device, make sure to select the correct file for this printer.

8.   When the message Complete displays on the control-panel display, turn the printer power off, and then on again.

9.   When the upgrade process is complete, print a configuration page and verify that the upgrade firmware version was installed.

Solve fax problems

Fax troubleshooting information is not provided in this service manual. This information is available on the HP Service Access Workbench (SAW) Web site. Go to http://h41302.www4.hp.com/km/saw/home.do, and then use "fax troubleshooting" as the search term.

Solve email problems

Email troubleshooting information is not provided in this service manual. This information is available on the HP Service Access Workbench (SAW) Web site. Go to http://h41302.www4.hp.com/km/saw/home.do, and then use "email troubleshooting" as the search term.

A Printer specifications

-

Printer dimensions

- [Printer dimensions (M652, M653)](#)
- [Printer dimensions (M681, M682)](#)

Printer dimensions (M652, M653)

Table A-1 Dimensions for the n and dn models

	Printer fully closed	Printer fully opened
Height	**M652n and M652dn models:** 482 mm (19 in)	**M652n and M652dn models:** 482 mm (19 in)
	M653dn models: 510 mm (20 in)	**M653dn models:** 510 mm (20 in)
Depth	458 mm (18 in)	770 mm (30.3 in)
Width	510 mm (20 in)	963 mm (37.9 in)
Weight	26.8 kg (59 lb)	

Table A-2 Dimensions for the x model

	Printer fully closed	Printer fully opened
Height	510 mm (16.3 in)	510 mm (19.2 in)
Depth	458 mm (18 in)	770 mm (30.3 in)
Width	510 mm (20 in)	963 mm (37.9 in)
Weight	33.1 kg (72.9 lb)	

Table A-3 Dimensions for the 1 x 550-sheet paper feeder

Height	130 mm (5.1 in)
Depth	Tray closed: 458 mm (18 in)
	Tray opened: 770 mm (30.3 in)
Width	Door closed: 510 mm (20.7 in)
	Door opened: 510 mm (20.7 in)
Weight	6.3 kg (13.8 lb)

Table A-4 Dimensions for the printer with one 1 x 550-sheet paper feeder

	Printer fully closed	Printer fully opened
Height	**M652n and M652dn models:** 612 mm (14 in)	**M652n and M652dn models:** 612 mm (14 in)
	M653dn models: 640 mm (25.1 in)	**M653dn models:** 640 mm (25.1 in)
	M653x models: 770 mm (30.3 in)	**M653x models:** 770 mm (30.3 in)
Depth	458 mm (18 in)	770 mm (30.3 in)

Table A-4 Dimensions for the printer with one 1 x 550-sheet paper feeder (continued)

	Printer fully closed	Printer fully opened
Width	510 mm (20.7 in)	963 mm (37.9 in)
Weight	33.1 kg (72.9 lb)	

Table A-5 Dimensions for the 1 x 550-sheet paper feeder with stand

Height	450 mm (17.7 in)
Depth	Tray closed: 657 mm (25.8 in)
	Tray opened: 948 mm (37.3 in)
Width	Door closed: 657 mm (25.8 in)
	Door opened: 992 mm (39 in)
Weight	18.6 kg (41 lb)

Table A-6 Dimensions for the printer and the 1 x 550-sheet paper feeder with stand

	Printer and accessories fully closed	Printer and accessories fully opened
Height	**M652n and M652dn models:** 932 mm (36.6 in)	**M652n and M652dn models:** 932 mm (36.6 in)
	M653dn models: 960 mm (37.7 in)	**M653dn models:** 960 mm (37.7 in)
Depth	657 mm (25.8 in)	948 mm (37.3 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	45.4 kg (100 lb)	

Table A-7 Dimensions for the 3 x 550-sheet paper feeder with stand

Height	450 mm (17.7 in)
Depth	Tray closed: 657 mm (25.8 in)
	Tray open: 984 mm (37.3 in)
Width	Door closed: 657 mm (25.8 in)
	Door open: 992 mm (39 in)
Weight	22.7 kg (50 lb)

Table A-8 Dimensions for the printer and the 3 x 550-sheet paper feeder with stand

	Printer and accessories fully closed	Printer and accessories fully opened
Height	**M652n and M652dn models:** 932 mm (36.6 in)	**M652n and M652dn models:** 932 mm (36.6 in)
	M653dn models: 960 mm (37.7 in)	**M653dn models:** 960 mm (37.7 in)
Depth	657 mm (25.8 in)	984 mm (37.3 in)

Table A-8 Dimensions for the printer and the 3 x 550-sheet paper feeder with stand (continued)

	Printer and accessories fully closed	Printer and accessories fully opened
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	49.5 kg (109 lb)	

Table A-9 Dimensions for the High-capacity input feeder (HCI) with stand

Height	450 mm (17.7 in)
Depth	Tray closed: 657 mm (25.8 in)
	Tray open: 967 mm (38 in)
Width	Door closed: 657 mm (25.8 in)
	Door open: 992 mm (39 in)
Weight	25.2 kg (55.5 lb)

Table A-10 Dimensions for the printer and the High-capacity input feeder (HCI) with stand

	Printer and accessories fully closed	Printer and accessories fully opened
Height	**M652n and M652dn models:** 932 mm (36.6 in)	**M652n and M652dn models:** 932 mm (36.6 in)
	M653dn models: 960 mm (37.7 in)	**M653dn models:** 960 mm (37.7 in)
Depth	657 mm (25.8 in)	967 mm (38 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	52 kg (114.6 lb)	

Printer dimensions (M681, M682)

Table A-11 Dimensions for the M681dh and Flow M681f models

	Printer fully closed	Printer fully opened
Height	658 mm (25.9 in)	910 mm (35.8 in)
Depth	460 mm (18.1 in)	770 mm (30.3 in)
Width	510 mm (20 in)	963 mm (37.9 in)
Weight	28 kg (61.7 lb)	

Table A-12 Dimensions for the M681f models

	Printer fully closed	Printer fully opened
Height	1108 mm (43.6 in)	1360 mm (53.5 in)
Depth	657 mm (25.8 in)	948 mm (37.3 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	46.6 kg (102.7 lb)	

Table A-13 Dimensions for the Flow M681z models

	Printer fully closed	Printer fully opened
Height	1270 mm (50 in)	1529 mm (60.1 in)
Depth	657 mm (25.8 in)	967 mm (38 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	59.3 kg (130.7 lb)	

Table A-14 Dimensions for the Flow M682z models

	Printer fully closed	Printer fully opened
Height	1270 mm (50 in)	1529 mm (60.1 in)
Depth	657 mm (25.8 in)	770 mm (30.3 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	61.8 kg (136.2 lb)	

Table A-15 Dimensions for the 1 x 550-sheet paper feeder

Height	130 mm (5.1 in)
Depth	Tray closed: 458 mm (18 in)
	Tray opened: 770 mm (30.3 in)

Table A-15 Dimensions for the 1 x 550-sheet paper feeder (continued)

Width	Door closed: 510 mm (20.7 in)
	Door opened: 510 mm (20.7 in)
Weight	6.3 kg (13.8 lb)

Table A-16 Dimensions for the printer with one 1 x 550-sheet paper feeder

	Printer fully closed	Printer fully opened
Height	**M681dh and Flow M681f models:** 788 mm (31 in)	**M681dh and Flow M681f models:** 1040 mm (40.9 in)
	M681f models: 1238 mm (48.7 in)	**M681f models:** 1490 mm (58.6 in)
Depth	**M681dh and Flow M681f models:** 460 mm (18.1 in)	**M681dh and Flow M681f models:** 770 mm (30.3 in)
	M681f models: 657 mm (25.8 in)	**M681f models:** 948 mm (37.3 in)
Width	**M681dh and Flow M681f models:** 510 mm (20 in)	**M681dh and Flow M681f models:** 963 mm (37.9 in)
	M681f models: 657 mm (25.8 in)	**M681f models:** 992 mm (39 in)
Weight	**M681dh and Flow M681f models:** 34.3 kg (75.6 lb)	
	M681f models: 52.9 kg (116.6 lb)	

Table A-17 Dimensions for the 1 x 550-sheet paper feeder with stand

Height	450 mm (17.7 in)
Depth	Tray closed: 657 mm (25.8 in)
	Tray opened: 948 mm (37.3 in)
Width	Door closed: 510 mm (20.7 in)
	Door opened: 992 mm (39 in)
Weight	18.6 kg (41 lb)

Table A-18 Dimensions for the printer and the 1 x 550-sheet paper feeder with stand

	Printer fully closed	Printer fully opened
Height	1108 mm (43.6 in)	1360 mm (53.5 in)
Depth	657 mm (25.8 in)	948 mm (37.3 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	46.6 kg (102.7 lb)	

Table A-19 Dimensions for the 3 x 550-sheet paper feeder with stand

Height	450 mm (17.7 in)

Table A-19 Dimensions for the 3 x 550-sheet paper feeder with stand (continued)

Depth	Tray closed: 657 mm (25.8 in)
	Tray opened: 984 mm (37.3 in)
Width	Door closed: 657 mm (25.8 in)
	Door opened: 992 mm (39 in)
Weight	22.7 kg (50 lb)

Table A-20 Dimensions for the printer and the 3 x 550-sheet paper feeder with stand

	Printer fully closed	Printer fully opened
Height	1108 mm (43.6 in)	1360 mm (53.5 in)
Depth	657 mm (25.8 in)	984 mm (37.3 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	50.7 kg (111.7 lb)	

Table A-21 Dimensions for the High-capacity input tray with stand

Height	450 mm (17.7 in)
Depth	Tray closed: 657 mm (25.8 in)
	Tray opened: 967 mm (38 in)
Width	Door closed: 657 mm (25.8 in)
	Door opened: 992 mm (39 in)
Weight	25.2 kg (55.5 lb)

Table A-22 Dimensions for the printer and the High-capacity input tray with stand

	Printer fully closed	Printer fully opened
Height	1108 mm (43.6 in)	1360 mm (53.5 in)
Depth	657 mm (25.8 in)	967 mm (38 in)
Width	657 mm (25.8 in)	992 mm (39 in)
Weight	53.2 kg (117.2 lb)	

Printer space requirements

HP recommends that the following distances be added to the printer dimensions provided in this chapter to make sure there is sufficient space to open doors and covers, and to provide proper ventilation.

- From the left-side or right-side of the printer to an obstruction, add:

  - 430 mm (17 in)

- From the front-side of the printer to an obstruction, add:

  - 610 mm (24 in)

- From the back-side of the printer to an obstruction, add:

  - 460 mm (18 in)

Power consumption, electrical specifications, and acoustic emissions

See www.hp.com/support/colorljM652, www.hp.com/support/colorljM653, www.hp.com/support/colorljM681MFP or www.hp.com/support/colorljM682MFP for current information.

⚠ CAUTION: Power requirements are based on the country/region where the printer is sold. Do not convert operating voltages. This will damage the printer and void the printer warranty.

Operating-environment range

- [Operating-environment range (M652, M653)](#)
- [Operating-environment range (M681, M682)](#)

Operating-environment range (M652, M653)

Table A-23 Operating-environment specifications

Environment	Recommended	Allowed
Temperature	15° to 27°C (59° to 80.6°F)	10° to 30°C (50° to 86°F)
Relative humidity	30% to 70% relative humidity (RH)	10% to 80% RH
Altitude	Not applicable	0 to 3048 m (0 to 10,000 ft)

Operating–environment range (M681, M682)

Table A-24 Operating-environment specifications

Environment	Recommended	Allowed
Temperature	17° to 25°C (62.6° to 77°F)	15° to 30°C (59° to 86°F)
Relative humidity	30% to 70% relative humidity (RH)	10% to 80% RH
Altitude	Not applicable	0 to 3048 m (0 to 10,000 ft)

Certificates of Volatility

Figure A-1 Certificate of Volatility (1 of 2; M652, M653)

Hewlett-Packard Certificate of Volatility				
Model: **HP Color LaserJet Enterprise M65x series** **HP Color LaserJet Managed E650xx series**	**Part Number:** **Enterprise** J7Z98A=M652N J7Z99A=652DN J8A04A=653DN J8A05A=M653X J8A06A=653DH		**Managed** L3U55A=E65050DN L3U56A=E65060DN	**Address:** Hewlett Packard Company 11311 Chinden Blvd Boise, ID 83714

Volatile Memory				
Does the device contain volatile memory (Memory whose contents are lost when power is removed)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (SRAM, DRAM, etc): DDR3 - DRAM	Size: 1GB	User Modifiable: ☐ Yes ☒ No	Function: Operation system and print/scan buffer	Steps to clear memory: When the printer is powered off the memory is erased.
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory: .
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory:

Non-Volatile Memory				
Does the device contain non-volatile memory (Memory whose contents are retained when power is removed)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (Flash, EEPROM, etc): IOD EEPROM	Size: 32KB	User Modifiable: ☐ Yes ☒ No	Function: Store customer setting data for backup/restore	Steps to clear memory: There are no steps to clear this data.
Type (Flash, EEPROM, etc): SPI Flash	Size: 4MB	User Modifiable: ☒ Yes ☐No	Function: Contains the boot code and factory product configuration data required for the device to function. User modifications are limited to downloading digitally signed HP firmware images.	Steps to clear memory: There are no steps to clear this data
Type (Flash, EEPROM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory:

Mass Storage				
Does the device contain mass storage memory (Hard Disk Drive, Tape Backup)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (HDD, Tape, etc): HDD	Size: 320GB	User Modifiable: ☒ Yes ☐ No	Function: OS and user data	Steps to clear memory: Firmware update
Type (HDD, Tape, etc): EMMC	Size: 8GB	User Modifiable: ☒ Yes ☐ No	Function: OS and user data	Steps to clear memory: Firmware update

Figure A-2 Certificate of Volatility (2 of 2; M652, M653)

USB
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ☒ Yes ☐ No If Yes please describe below
Print jobs, HP digitally signed firmware upgrades, 3rd party application loading. USB ports can be disabled.
Can any data other than scan upload be sent to the USB device)? ☒ Yes ☐ No If Yes please describe below
Diagnostic service logs can be uploaded. Print files can be printed via a USB thumb drive.

RF/RFID	
Does the item use RF or RFID for receive or transmit of any data including remote diagnostics. (e.g. Cellular phone, Bluetooth) ☐ Yes ☒ No If Yes please describe below	
Purpose:	
Frequency:	Bandwidth:
Modulation:	Effective Radiate Power (ERP):
Specifications:	

Other Transmission Capabilities	
Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)? ☒ Yes ☐ No If Yes please describe below:	
Purpose: WiFi Direct Print	
Frequency: 2.4 GHz	Bandwidth: 2401 - 2495 MHz; depending on selected channel in 2.4GHz band. 5180 - 5825 MHz; depending on selected channel in 5GHz band.
Modulation:	Effective Radiate Power (ERP):
Specifications: 802.11 b/g/n	

Other Transmission Capabilities	
Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)? ☒ Yes ☐ No If Yes please describe below:	
Purpose: Device Beaconing, Secure Print Apps	
Frequency: 2.4 GHz	Bandwidth: 2400-2483.5 MHz; depending on selected channel.
Modulation:	Effective Radiate Power (ERP):
Specifications: BTLE4.0 compliant	

Other Capabilities
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ☐ Yes ☒ No If Yes please describe below:
Purpose:
Specifications:

Figure A-3 Certificate of Volatility (1 of 2; M681, M682)

Hewlett-Packard Certificate of Volatility		

Model:
HP Color LaserJet Enterprise M68x series
 	
HP Color LaserJet Managed E6750xx series
	Part Number:
	
	Enterprise
	J8A17A=M682Z
	J8A11A= M681F
	J8A13A=M681Z
	J8A17A=M682Z **Managed**
	  L3U70A= E67560Z
	  L3U66A=E67550DH
		Address:
		Hewlett Packard Company
		11311 Chinden Blvd
		Boise, ID 83714

Volatile Memory				
Does the device contain volatile memory (Memory whose contents are lost when power is removed)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (SRAM, DRAM, etc): DDR3 - DRAM	Size: 2GB- Ent 2.5GB - Flow	User Modifiable: ☐ Yes ☒ No	Function: Operation system and print/scan buffer	Steps to clear memory: When the printer is powered off the memory is erased.
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory: .
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory:

Non-Volatile Memory				
Does the device contain non-volatile memory (Memory whose contents are retained when power is removed)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (Flash, EEPROM, etc): IOD EEPROM	Size: 32KB	User Modifiable: ☐ Yes ☒ No	Function: Store customer setting data for backup/restore	Steps to clear memory: There are no steps to clear this data.
Type (Flash, EEPROM, etc): SPI Flash	Size: 4MB	User Modifiable: ☒ Yes ☐No	Function: Contains the boot code and factory product configuration data required for the device to function. User modifications are limited to downloading digitally signed HP firmware images.	Steps to clear memory: There are no steps to clear this data
Type (Flash, EEPROM, etc):	Size:	User Modifiable: ☐ Yes ☐ No	Function:	Steps to clear memory:

Mass Storage				
Does the device contain mass storage memory (Hard Disk Drive, Tape Backup)? ☒ Yes ☐ No If Yes please describe the type, size, function, and steps to clear the memory below				
Type (HDD, Tape, etc): HDD	Size: 320GB	User Modifiable: ☒ Yes ☐ No	Function: OS and user data	Steps to clear memory: Firmware update

USB
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ☒ Yes ☐ No If Yes please describe below
Print jobs, HP digitally signed firmware upgrades, 3rd party application loading. USB ports can be disabled.
Can any data other than scan upload be sent to the USB device)? ☒ Yes ☐ No If Yes please describe below
Diagnostic service logs can be uploaded. Print files can be printed via a USB thumb drive.

Certificate of Volatility (2 of 2; M681, M682)

RF/RFID
Does the item use RF or RFID for receive or transmit of any data including remote diagnostics. (e.g. Cellular phone, Bluetooth) ☐ Yes ☒ No If Yes please describe below
Purpose:
Frequency:	Bandwidth:
Modulation:	Effective Radiate Power (ERP):
Specifications:

Other Transmission Capabilities	
Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)? ☒ Yes ☐ No If Yes please describe below:	
Purpose: WiFi Direct Print	
Frequency: 2.4 GHz, 5GHz	Bandwidth: 2401 - 2495 MHz; depending on selected channel in 2.4GHz band. 5180 - 5825 MHz; depending on selected channel in 5GHz band.
Modulation:	Effective Radiate Power (ERP):
Specifications: 802.11 b/g/n	

Other Transmission Capabilities	
Does the device employ any other methods of non-wired access to transmit or receive any data whatsoever (e.g. anything other than standard hard wired TCP/IP, direct USB, or parallel connections)? ☒ Yes ☐ No If Yes please describe below:	
Purpose: Device Beaconing, Secure Print Apps	
Frequency: 2.4 GHz	Bandwidth: 2400-2483.5 MHz; depending on selected channel.
Modulation:	Effective Radiate Power (ERP):
Specifications: BTLE4.0 compliant	

Other Capabilities
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ☐ Yes ☒ No If Yes please describe below:
Purpose:
Specifications:

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