HP PageWide Enterprise Color 765 and MFP 780/785
HP PageWide Pro 755 and MFP 774/779
HP PageWide Managed Color E75160 and MFP E77650-E77660/P77440/P77940/P75250

Troubleshooting Manual

Edition 2, 5/2018

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 one of the following Web-based Interactive Search Engines (WISE) sites:

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

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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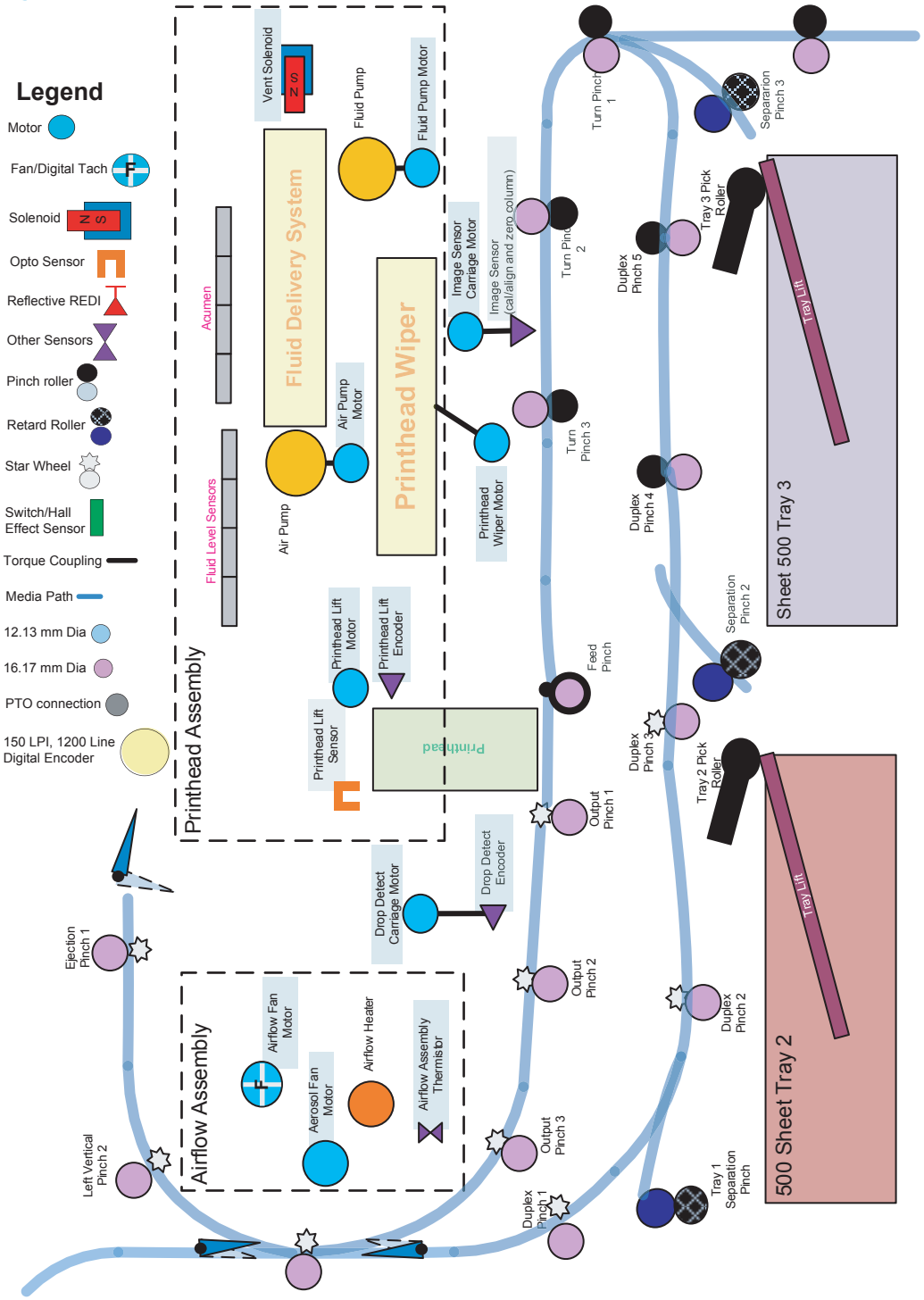
1 Theory of operation

Basic operation

Function structure

HP recommends printing the following document (on A3 size paper) for troubleshooting reference. It is available on the HP Web-based Interactive Search Engines (WISE). See HP Web-based Interactive Search Engines (WISE) on page 3.

Figure 1-1 Printer printing system



HP Web-based Interactive Search Engines (WISE)

The printer print system document is available on the HP Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search information by printer name.

NOTE: Make sure that this document is printed on A3 size paper.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Operation sequence

The engine-control system on the main printed circuit board MPCA controls the operational sequences. The following table describes the durations and the operations for each period of a print operation from when the printer is turned on to when the motors stop rotating.

Table 1-1 Operation sequence

Period	Duration	Purpose
Initial startup and calibrations	When the printer is set up for the first time from the factory. NOTE: Startup is disabled if the temperature is 5°C (41°F) or lower. The recommend temperature range for this function is 15°C (59°F) to 40°C (104°F).	This one-time setup process gets the printer ready to print for the first time. • **Fluid replacement**—The printer flushes the shipping and handling fluid out of the printhead and replaces it with ink. No pages are printed. • **Pen energy calibration (TTOE)**—No pages are printed. • **Die alignment**—The printer aligns the 14 die on the printhead active face, and then prints and internally analyzes one page. • **Die density leveling**—The printer measures and compensates for the drop variation, and then prints and internally analyzes multiple pages.
Servicing operations	Performed just before the printhead enters the capped state after printing, when leaving the capped state after a print job is initiated, or during printer idle times when a print job is not impacted.	Servicing maintains print quality by removing debris and excess ink. Nozzle presence detection is employed to replace missing nozzles. • **Nozzle presence detection**—The optical scan carriage detects and disables inoperable nozzles, and replaces them with operable nozzles. • **Printhead servicing**—The web wipe on the printhead wiper moves under the printhead to clean the active face and fires the nozzles into the ink collection unit to clear clogged or blocked nozzles.
Print preparation	From the time the printer receives a print command until paper enters the print zone.	Prepares the printer for a print job. • The printhead leaves the capping state as the printhead wiper moves away from the printhead. • If needed, some servicing occurs. • The printhead lowers to the printing position. The media type and printing mode determine the print zone height. • The printer picks paper from one of the input trays. • Every page from Tray 1 is measured for edge detection. For Tray 2/3 and optional Trays 3, 4 and 5, the printer performs media edge detection after printing the first sheet. The last sheet of each job is also measured for edge detection if at least five sheets have been printed. • The printer monitors environmental conditions. The printer can slow the print speed if conditions are significantly different from a normal office environment (23°C (73.4°F), 50% relative humidity). • The formatter PCA processes print data and transmits the data to the printhead.

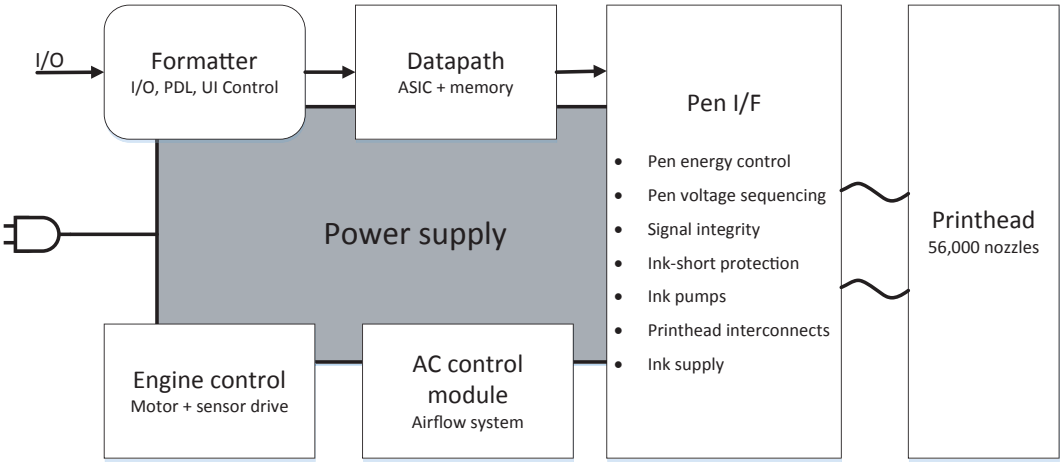
Table 1-1 Operation sequence (continued)

Period	Duration	Purpose
Printing	From the start of media pick in the designated input tray until the last sheet is delivered to the designated output bin.	Processes the print job. • The page is picked from the designated tray and travels through the media path to the print zone. • As the page passes under the printhead, the printhead applies ink to the page. • The page then enters the airflow assembly area where heated air might be applied to reduce the moisture content of the page. • For Simplex print jobs, the page then proceeds to the output bin (face-down). • For Duplex print jobs, the page then advances until the trailing edge of the media moves past the left side vertical path sensor. The page then reverses direction and proceeds down through the duplex path and underneath the left duplexer (service fluid container). Then the page turns upward, and re-enters the print zone. Ink is then applied to the second side of the page by the printhead. • The process continues until all the pages of the print job are completed. The process might be interrupted by occasional printhead servicing events if the job includes many pages.
End of print job	Performed after the print job is completed, and continues until the next job is initiated.	This period puts the printer in a state where it's ready for the next print job. • After a short dwell interval, the printhead will be allowed to cap. • If needed, servicing or nozzle presence detection occurs, but these events are interruptible if another job is initiated. • The printhead moves to the capping position. • The printhead wiper moves to cap the printhead.
Standby	The printer is sitting idle, waiting for the next print job to be initiated.	This period is intended to conserve energy while the printer is sitting idle. Certain functions might be disabled to save power, and then restarted when needed. The printer has two standby modes: • **Idle mode**—The printhead is capped and the printer is ready to immediately start a new job • **Sleep 1 mode**—After the printer is inactive for about 10 minutes (a setting that can be adjusted from the control panel or the Embedded Web Server), the control panel turns off and the power LED blinks to indicate the unit is in Sleep mode. When in Sleep mode, the printer must wake up and go to idle mode before all printer functions are available. The printer is designed to wake up from Sleep mode based on certain interactions with the printer, such as touching the control panel or opening a paper tray. • **Sleep 2 mode-**After the printer is inactive for a longer period of time (typically 2 hours), the engine controller powers down to minimize power consumptions. This setting can be adjusted from the control panel.

System control

The system control coordinates all the other systems, according to commands from the MPCA.

Figure 1-2 System control



- MPCA
- Data path
- Engine control
- Pen interface
- Power supply
- AC control module

MPCA digital ASIC

The MPCA digital ASIC contains dual ARM CPUs (one at 512 MB and one at 600MHz) that execute firmware code that provides high-level device control. The digital ASIC uses a standard PCIe interface to pass data to the formatter ASIC.

MPCA analog ASIC

The MPCA ASIC generates the system voltage for the MPCA, formatter drives the scanner and ADF motors, manages the real-time clock, and drives the fax speaker.

Formatter and data path

IMPORTANT: Do not simultaneously install a replacement trusted platform module (TPM), hard disk drive (HDD MFP), eMMC (SFP) and formatter PCA. Remove and install each part separately, making sure to turn the printer power on between installations. Failure to do so results in an unusable printer.

The formatter controller ASIC controls the input/output (I/O) control, the user interface, and the rendering of page description language files into printer-specific commands.

Input/output (I/O) control

The printers support 10/100/1000 Ethernet, 802.11 wireless and NFC (some 765 and 780/785 models), a rear USB host port, a rear USB device port, a walk-up USB host port, and analog fax port (some 780/785 models).

The formatter PCA controls the USB device and USB host. The optional dual USB host port accessory is also connected to the formatter after user installation.

Wireless and NFC I/O are provided via a separate radio module.

User interface

The printers contain either a 4.3-in (765 models) or an 8-in (780/785 models) color graphics display. For wireless models, there is an icon on the control panel to denote that the wireless feature is enabled. The printers include a walk-up USB host port for connection to thumb drives.

Formatter digital ASIC

The formatter digital ASIC has dual ARM CPUs (1.2 GHz) that execute firmware code that provides high-level device control. The digital ASIC uses a standard PCIe interface to pass data to the engine control ASIC. The formatter firmware is located on either a 320 GB hard-disk drive (HDD) on 780/785 models, or an embedded 8 GHz MultiMedia Card (eMMC) or optional HDD on 765 models.

Additionally, the formatter digital ASIC manages the real-time clock, interfaces to the mass storage controller ASIC, provides control of USB ports, and interfaces with the Ethernet LAN ASIC and fax module.

Formatter Ethernet ASIC

The formatter Ethernet ASIC connects to the formatter digital ASIC with a PCIe interface to transmit and receive network packets.

Formatter mass storage ASIC

The formatter mass storage ASIC bridges between the formatter digital ASIC (via PCIe interface) and the mass storage device (via SATA interface). The 780/785 models use a rotating media HDD, while the 765 models use eMMC an optional HDD is available.

Formatter memory

Formatter memory is installed on-board and there is support for additional DIMM memory installation. The size of the memory on the formatter is 1.5 GB for 765 models and 2.5-3.0 GB for 780/785 models. An optional 1GB DIMM is available as a customer accessory.

Real-time clock

The real-time clock (RTC) allows the fax module to time-stamp outgoing faxes. It also determines the elapsed time between printhead and ISS calibration events. The RTC uses a separate device connected to the formatter digital ASIC, along with a crystal and a battery.

Late point differentiation configuration (LPDC)

Allows the channel partner to configure the speed to the printer depending on the customer's order. LPDC configuration is stored on the Trusted Platform Module (TPM). There are three methods to program the speed to the printer.

- Automatic
- Off line
- Manual

Engine control

The engine controller digital ASIC receives high-level commands from the MPCA, and it then provides low-level control to the print mechanism. In particular, the engine controller digital ASIC and its firmware control motors, system sensors, and the printhead. The engine controller analog ASICs integrate motor drivers, voltage regulators, sensor interfaces, and supervisory circuits.

Engine controller digital ASIC

The engine controller digital ASIC has a high-performance 480 MHz ARM CPU and DSP co-processors that execute firmware code to provide low-level engine control. It also drives a FPGA which then creates the printhead 15 high-speed LVDS transmission signals. The signals are routed from the engine PCA to the printhead via two large FFC cables. The engine controller digital ASIC receives pre-rendered data from the MPCA digital ASIC over a standard PCIe interface.

When a printer enters Sleep mode, many functions of the printer go into a low-power mode. If a print job is received while the printer is in Sleep mode, the printer will take a short period of time to "wake up". This can take up to 15 seconds, which will delay the first page out (FPO) time accordingly.

Engine controller analog ASICs

The engine uses six analog ASICs to generate the system voltages for the engine, drive the engine motors, control various engine sensors, and monitor printhead power delivery for correct operation.

The engine contains 24 motors, 3 solenoids and 2 fans:

NOTE: The air flow fan is created using a DC motor.

Certain models might have fewer motors, depending upon the exact configuration of the paper trays.

Motors

- Tray 1 pick motor
- Tray 2 lift motor
- Tray 3 lift motor
- Tray 1 separation motor
- Tray 2 separation motor
- Tray 3 separation motor
- Duplex diverter motor
- Duplex entry motor
- Duplex exit motor
- Finisher diverter motor
- Vertical motor

- Deskew motor (front)
- Deskew turn motor (back)
- Scanning carriage motor
- Stack control motor
- Printhead wiper motor
- Eject motor
- Drop detect carriage motor
- Print zone feed motor
- Ink pump motor
- Ink prime motor
- Air flow fan motor (for the air flow fan)
- Printhead lift motor

Solenoids

- Tray 2 pick solenoid (E-clutch)
- Tray 3 pick solenoid (E-clutch)
- Ink prime vent solenoid

Fans

- Airflow fan

  Aerosol fan

Most motors are DC motors with encoder feedback, to provide precision servo control. These motors are driven directly by one of the engine analog ASICs.

The printer uses many sensors to track the media as it travels through the paper path. Most of these are optical reflective edge detection interrupter (REDI) sensors, which are used in conjunction with mirrors to sense the presence or absence of paper in the paper path. These are carefully aligned and calibrated at the factory, so care must be taken when servicing these sensors. See the remove and Replace chapter of the *Repair* manual for more details.

Other printed circuit assemblies

In addition to hosting the system ASICs, the engine printed circuit assembly (PCA) incorporates many of the circuits required to interface with sensors and other sub-system components. In some cases, this circuitry is located on a smaller remote PCAs (SLBs) to optimize cable interconnects. The following table lists the various PCAs in the base mechanism engine/MPCA.

IMPORTANT: Do not simultaneously install a replacement trusted platform module (TPM), hard disk drive (HDD MFP), eMMC (SFP) and formatter PCA. Remove and install each part separately, making sure to turn the printer power on between installations. Failure to do so results in an unusable printer.

Name	Description/Function	Name	Description/Function
Left door PCA	Distribution	Main bin full sensor PCA	Main bin paper out sensor
Printhead lift encoder PCA	Printhead lift	Heat zone temperature thermistor PCA	Air flow assembly temperature sense
Feed motor encoder PCA	Feed motor	Contact size detect PCA	Paper length/width detect
Left front upper PCA	Distribution	SIM PCA	SHAID and distribution
Air flow assembly PCA	Air flow assembly	TT dashboard PCA	Tabletop control panel interface
Center rear lower PCA	Distribution	HE1 PCA	Hall effect sensor
Left rear lower PCA	Distribution	Button on/off PCA	Base mechanism on/off interface
AC control module PCA	AC control for air flow assembly	Power button interface PCA	Base mechanism on/off button
Printhead registration sensor PCA	Printhead sensor	eMMC module PCA (8 GB)	eMMC module
Main logic PCA	MPCA and engine	Power button PCA	Base mechanism on/off button
Through beam optical drop detect (TBODD) PCA	TBODD sensor	Light pipe PCA	Light pipe LED
Drop detect carriage PCA	TBODD carriage	Main bin LED PCA	Main bin LED
Opto OOP lift plate sensor PCA	Tandem tray sensor	Hall effect left door PCA	Left door hall effect
Separation PCA	Tandem tray distribution	Temperature/humidity sensor/NVM/HE PCA	Multiple sensors
Connector width adjust sensor PCA	Multi-purpose tray sensor	Carriage drop detect motor PCA	Motor cable connect
Duplex spittoon contact PCA	Duplex spittoon contact	Flatbed scan interconnect PCA	Flatbed scan interface
Duplex spittoon EEPROM PCA	Duplex spittoon EEPROM	ADF PCA	ADF interface
Right rear lower PCA	Distribution	eMMC module PCA (16 GB)	eMMC module
Left rear upper PCA	Distribution	Acumen contact PCA	Acumen PCA

Pen interface (I/F)

The printhead is the key component that differentiates this printer from other inkjet printers. The conventional approach is to print a page in horizontal swaths by moving a “scanning” printhead horizontally over a fixed sheet of paper, advancing the paper a fixed amount, and then printing the next swath. This printer moves the paper underneath a fixed page-wide printhead in a single, smooth motion.

Single-pass page-wide printing requires that data and power be delivered to the printhead at a very high rate, while also maintaining good control of paper position as it moves past the printhead nozzles.

The engine printed circuit assembly (PCA) sends power and data to the printhead via two large flat flexible cables (80 pins for the data and 26 pins for the power). The printhead PCA routes power and data to 14 printhead die, which are attached to the printhead PCA using a flexible tab circuit and wire-bonding process.

The printers also contain electronics to control the ink supply station (ISS). The SIM PCA has several functions. It detects low-ink conditions by detecting presence of ink and/or ink foam in the X-chamber. The SIM PCA also collects and distributes electrical signals that drive the ink pump and prime motors, engage the solenoids, and

read the ink supply acumen data. All data communications between the ISS and engine PCA are routed through a single 20-pin FFC.

Each ink supply has a memory tag that stores information about its type of ink, the amount of ink remaining, and other critical data. It uses a special authentication scheme to ensure that only genuine HP supplies are used and the printer is not damaged by using invalid supplies. Acumen uses a two-line serial bus which, along with 3.3 V and ground, is cabled via the SIM PCA to the engine PCA and the engine control digital ASIC.

Power supply

The power supply module converts 100-240 VAC to 34 VDC to power the system. The power supply module has a sleep mode that reduces power consumption in system low-power modes. When in its sleep mode, the power supply generates less than 20 W.

The power supply module supplies 34 V to the engine PCA. The power supply module has two operating modes, depending upon the state of its nSLEEP input pin:

- **Printing** = up to 170 W (nSLEEP = high logic level)
- **Sleep mode** = < 20 W (nSLEEP = low logic level)

The power supply is a self-contained module that can be replaced if it is defective (see the Remove and Replace chapter of the *Repair* manual).

To ensure safe operation, the power supply will “latch off” if a persistent over-current fault condition exists. This would typically be caused by a short-circuit from 34 V to ground in the printer. Less severe faults can cause the power supply to latch off, if present for an extended period of time, or if the printer is operated above the recommended operating temperature range. In addition, the power supply output is split into 7 “rails”, each with separate output fusing as an additional safety feature.

NOTE: The power supply includes fusible links for the AC output from the power supply to the AC control module, and then to the airflow assembly.

AC control module

The AC control module performs the following functions related to the heating elements in the air flow assembly:

- Low-cost voltage monitor
  a. The voltage of the outlet, which the printer is attached, is monitored to ensure the printer remains operational, even in a low-quality-power environment. This is done by instantly shutting off heater power until the minimum voltage threshold is met. Hysteresis is included to avoid rapid fluctuations in voltage.
  b. This circuit generates a frequency modulated signal that is sent across the isolation barrier, and interpreted by firmware in the engine.
- Isolation
  – Isolates the low voltage heater control signals from the high voltage AC power that is applied to the heater. This is a safety feature to ensure line transients (i.e. lightning) aren’t coupled into the low voltage system, which could cause damage to the printer or user.
- AC switch

  - Switches AC power on/off to the heater using TRIACs.

- Heating Element Configuration
  - Using relays, the heating element configuration is changed between series and parallel, in coordination with applied voltage. This is done to have a predictable temperature profile that is functional across the full range of worldwide voltages (90-240VAC).

Cabling system

The printer cabling system includes both discrete cables and flat-flexible conductor (FFC) cables.

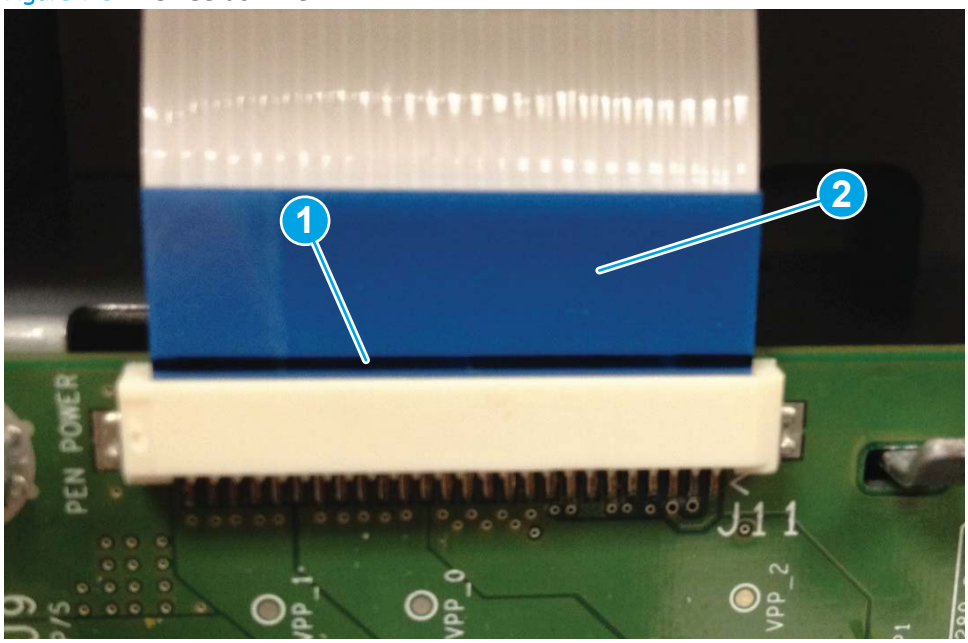
CAUTION: Cables and printed circuit assemblies (PCAs) are sensitive to electrostatic discharge (ESD). If an ESD workstation or mat is not available, touch the sheet-metal chassis to provide a static ground before touching an ESD-sensitive assembly. Protect the ESD-sensitive assemblies by placing them in ESD pouches when they are out of the printer.

Flat Flexible Cables

The printer flat flexible cables (FFCs) have several standard attributes.

- Each end of the cable has a contrasting color line (callout 1) that shows the shape and depth of insertion into the PCA connector. Each end of the cable has a support tape (callout 2), typically blue, on the non-conductor side.

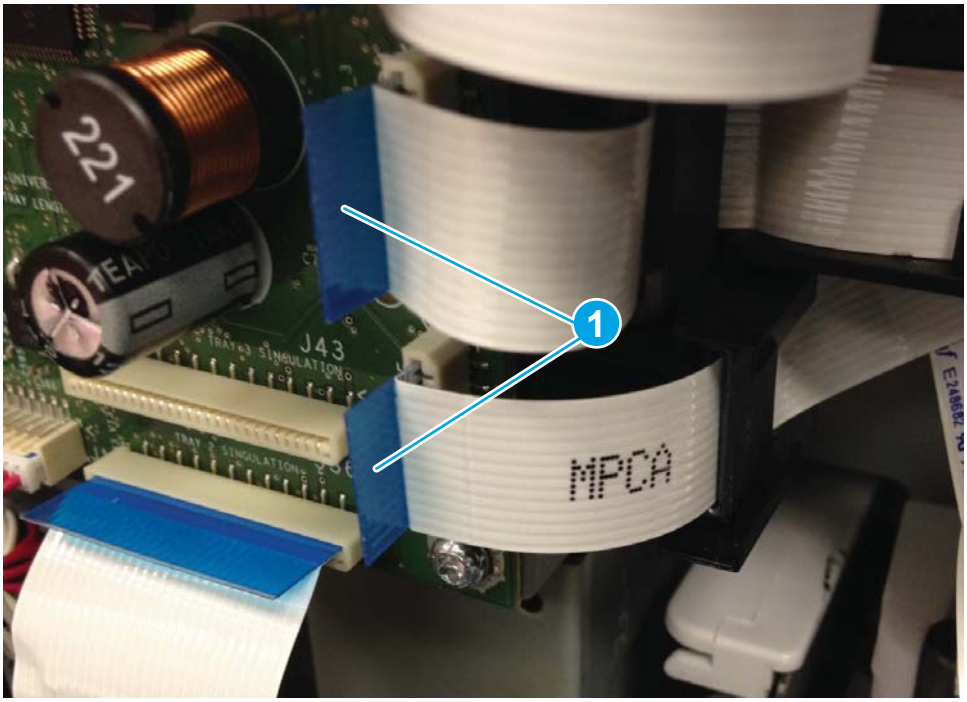
Figure 1-3 FFC insertion line



- Each end of the FFC has a support tape (typically blue) on the non-conductor side.

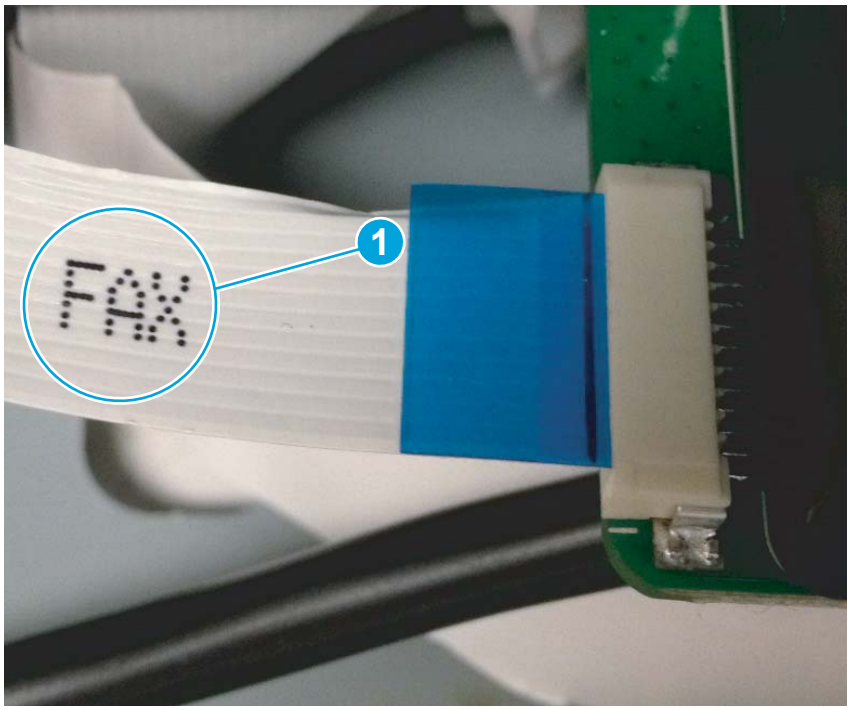
  The support tape usually has a free region (callout 1) for use as a handle to insert and remove the cable.

  Figure 1-4 FFC support tape

- Some FFCs have a label printed on them that shows the function or the corresponding connector number.

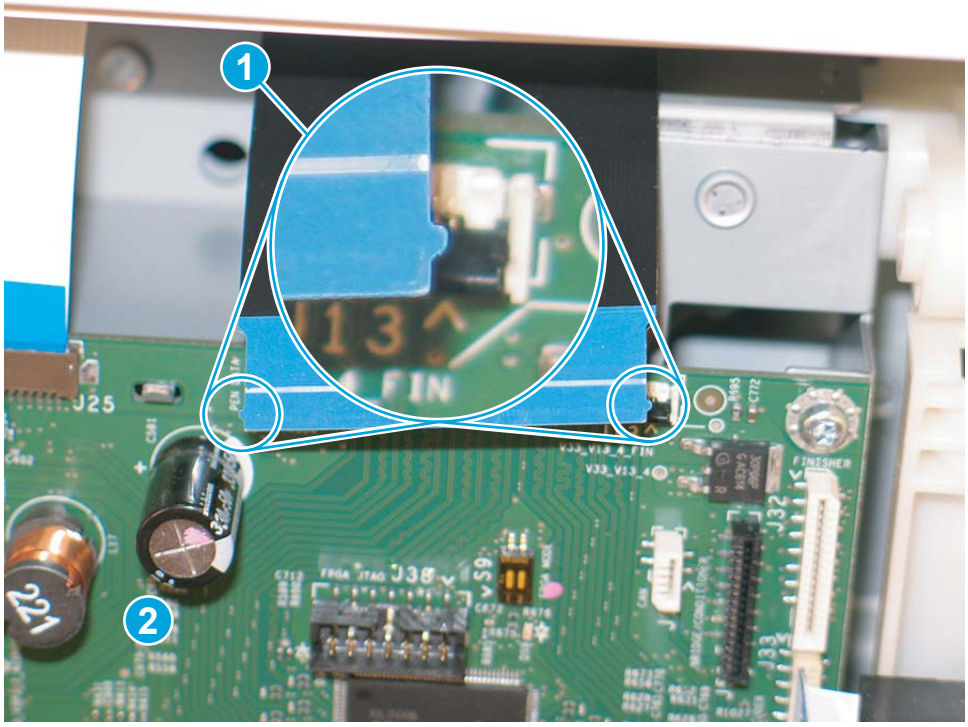
  Figure 1-5 FFC label

- The 0.5 mm (fine pitch) FFC ends have an extra wing feature (callout 1) that locks into the PCA connector (callout 2) and defines the installation motion. These FFC cables also have gold contacts instead of tin contacts to prevent dendrite growth between lines.

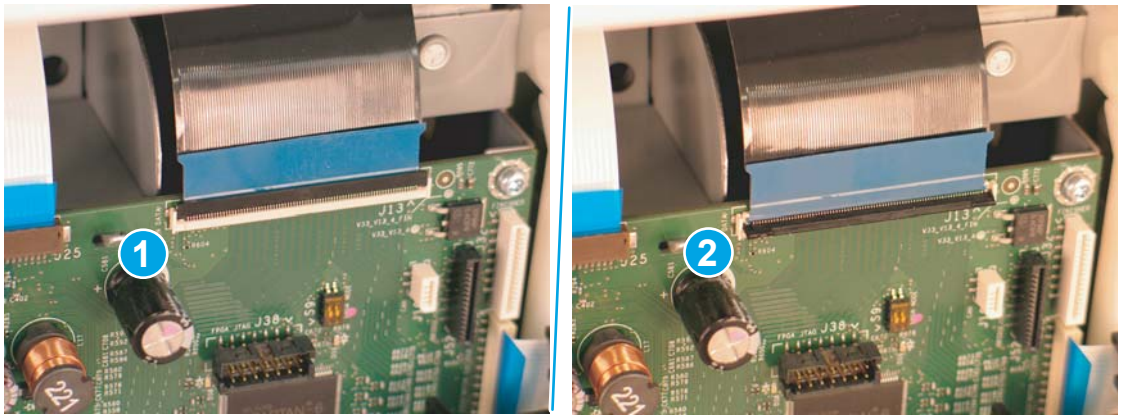
⚠ CAUTION: FFCs must be inserted and removed straight into a connector, not rocked in side-to-side.

Figure 1-6 FFC wing feature



- The example shown in the following figure is a zero insertion force (ZIF) connector. Open the latch to remove or install a FFC in a ZIF connector. This figure shows the latch in the closed (callout 1) position, and in the open (callout 2) position. See Zero insertion force on page 22 for more information.

Figure 1-7 ZIF connector

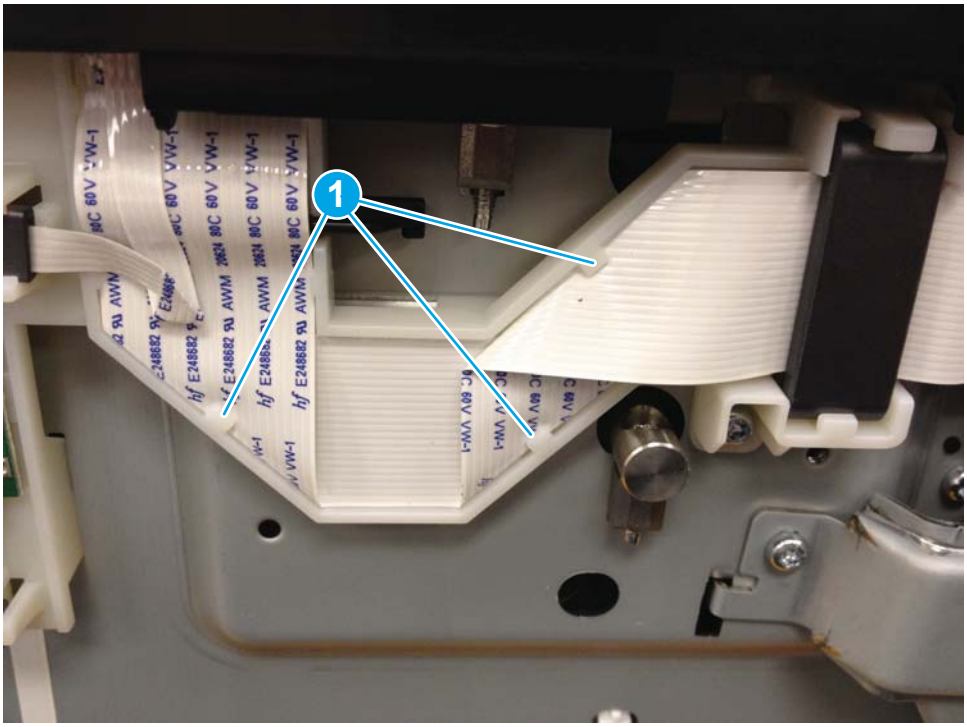


FFC routing

The printer FFCs are routed using a set of common retaining methods.

- Hook arms (callout 1) retain the edges of the FFCs. Installation and removal involves sequentially positioning and releasing the FFC edges under the hooks.

Figure 1-8 FFC hook arm retainers

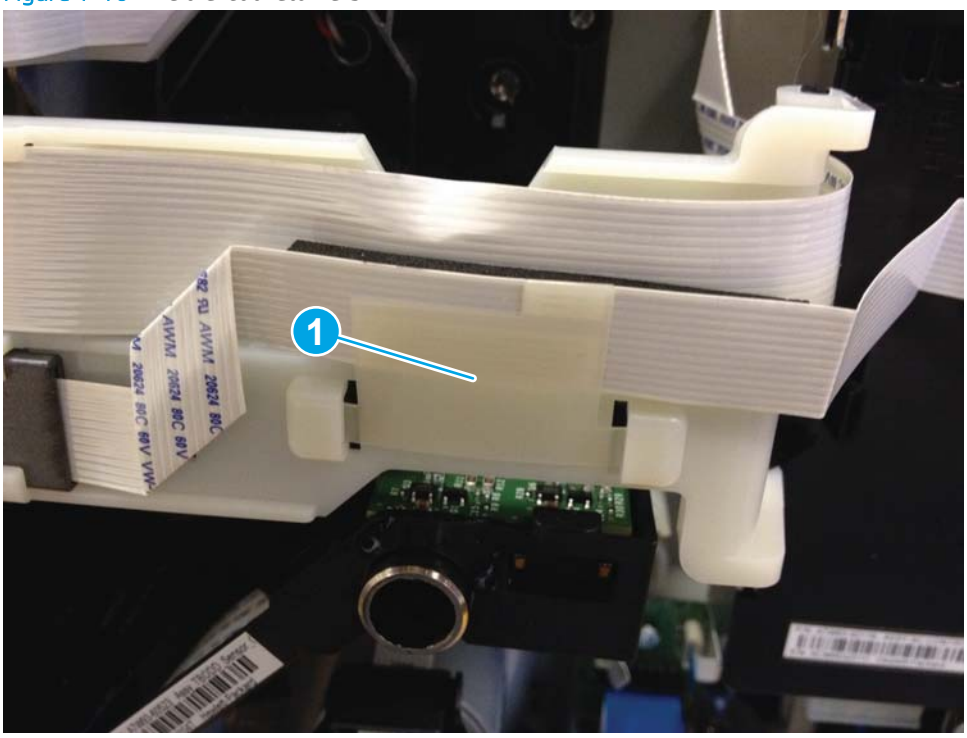


- Pill bumps also retain the edges of the FFCs. The FFC is pressed down against the plastic mount until the edges are positioned under the bumps. Removal involves lifting the FFC out of the bumps.

Figure 1-9 FFC pill bump retainers

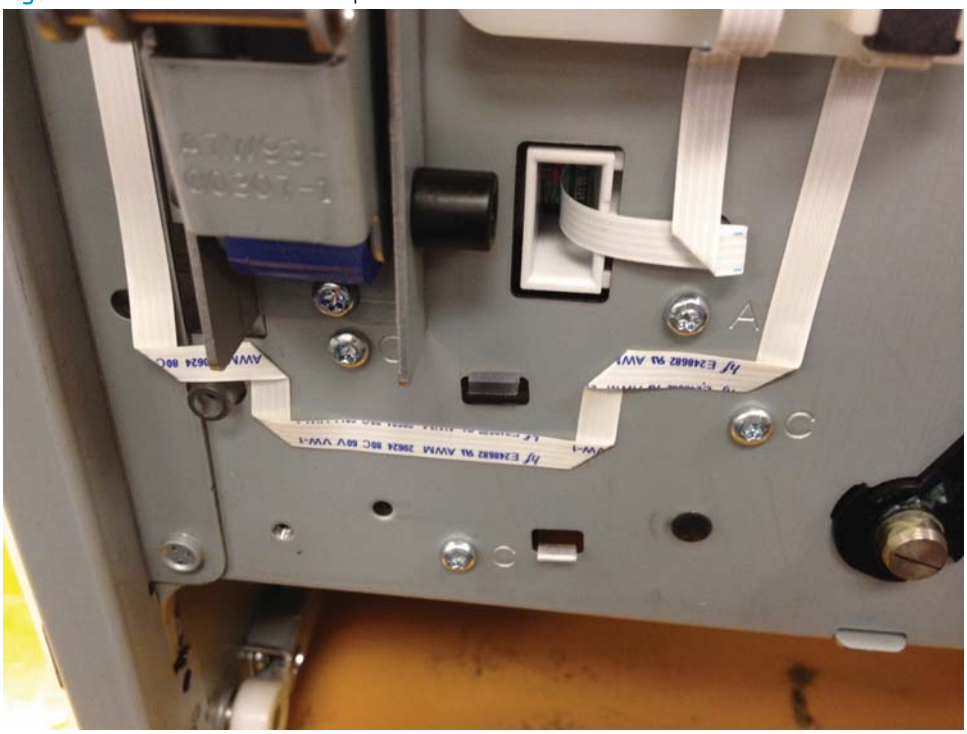
- Die-cut pieces (callout 1), adhered to FFCs and hooked into plastic mounts, are used to prevent wear in regions where vibration or motion might damage the FFC.

Figure 1-10 FFC die-cut retainers



- Double-sided-tape (DST) is used to secure FFCs directly to a sheet-metal or plastic part. This is a special case, acceptable only for some simple electrical circuits, due to EMC or EMI risks.

Figure 1-11 FFC double-sided tape retainer



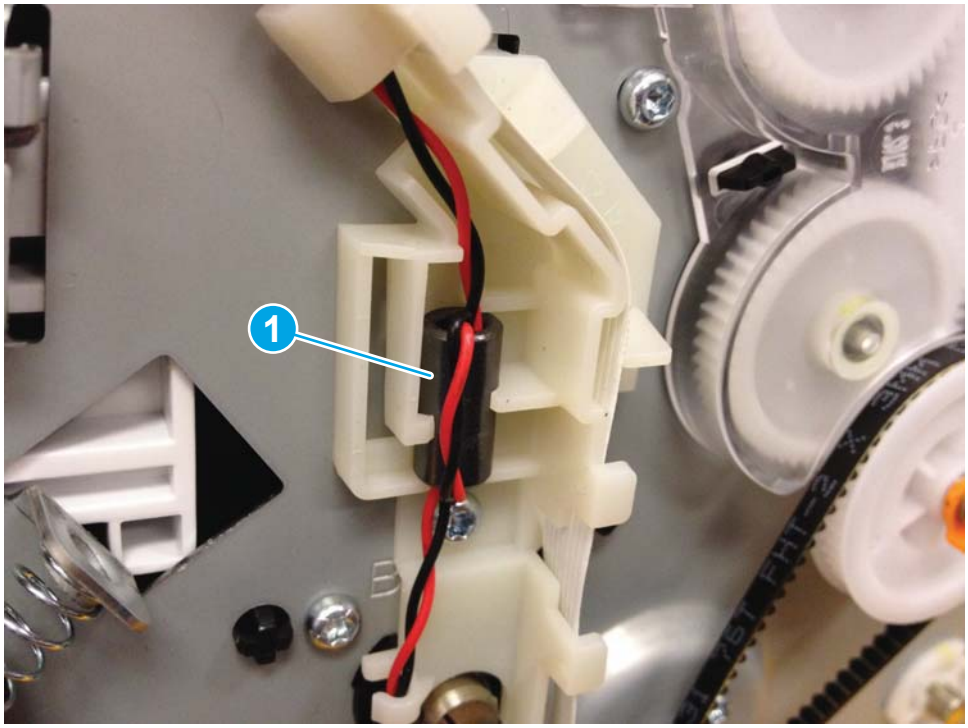
Discrete cables

NOTE: Remove discrete cable connectors by grasping the connector body rather than pulling on the wires.

The printer discrete cables share many standard attributes.

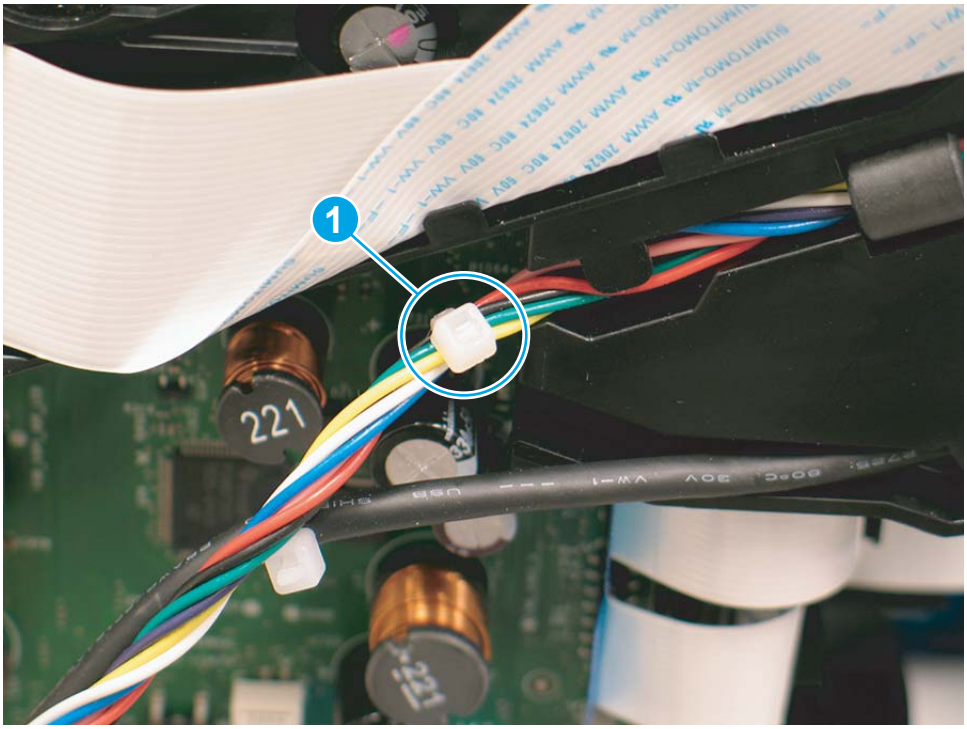
- Ferrites (callout 1) might be located in a stationary location or slide freely along the wires.

Figure 1-12 Discrete cable ferrite



- Tie-wraps (callout 1) constrain the wire bundle and the define position for installation.

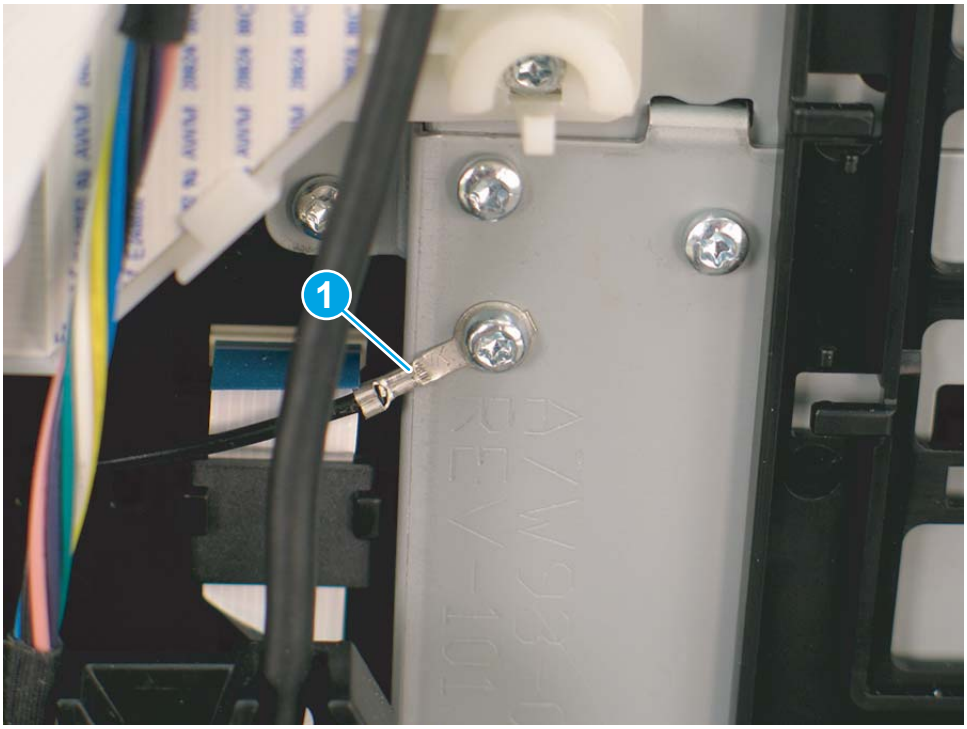
Figure 1-13 Discrete cable tie-wraps



Ground wires

Ground wires (callout 1) on several components, including the document feeder and FAX modules, must be secured to the indicated locations to perform correctly.

Figure 1-14 Ground wires

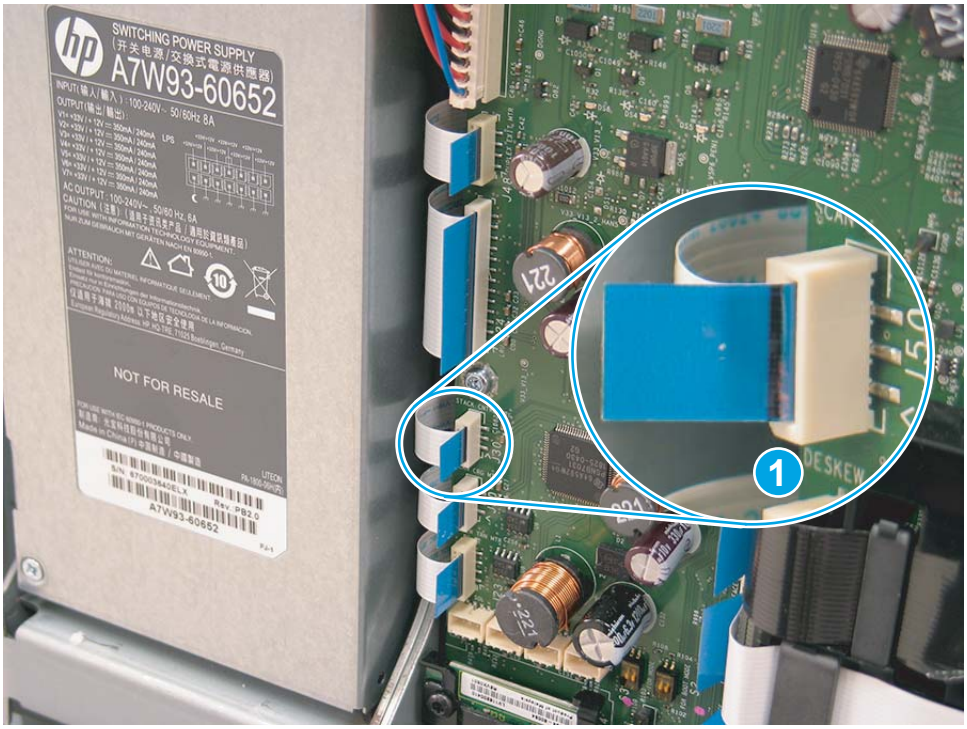


Connectors

FFC connectors on PCAs are oriented so the installation line is visible when holding the blue support handle.

NOTE: When correctly installed, the installation line is parallel to the edge of the connector body (callout 1).

Figure 1-15 Connectors



Low insertion force

The standard low insertion force (LIF) connectors require a straight-in motion when removing and installing the FFC. Friction between the conductive arms of the connector retain the FFC.

Zero insertion force

NOTE: This printer uses very few of this type of connector.

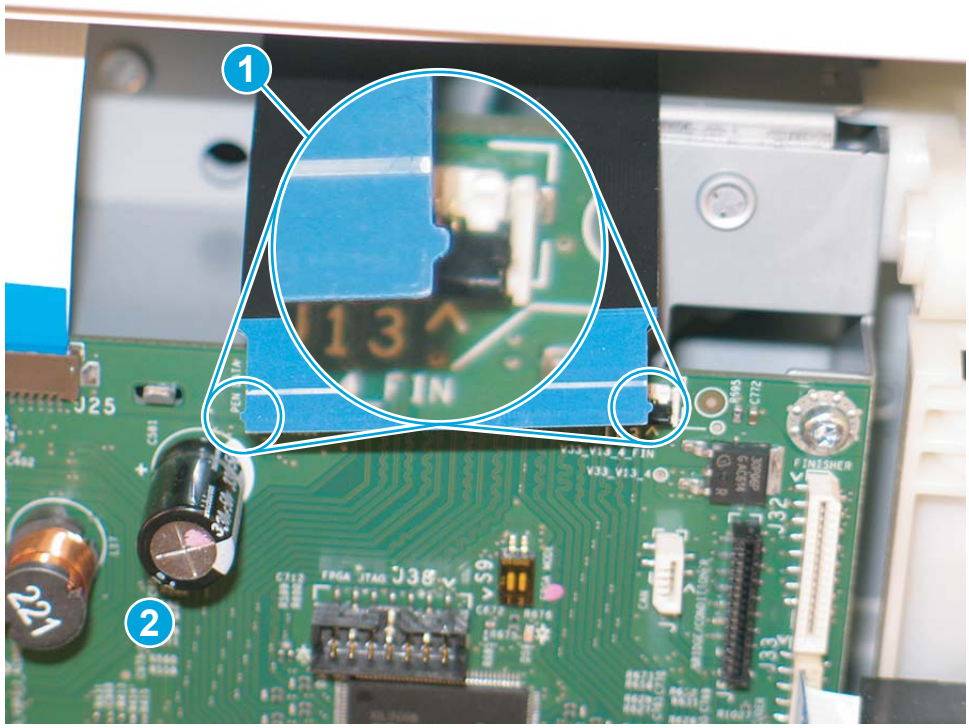
Zero insertion force (ZIF) connectors use a mechanical locking method to secure 0.5 mm (fine pitch) FFCs with extra wing features at each end. These wing features interface with posts on the PCA connector and are then secured by a rotating lock-door.

ZIF connectors

Following are examples of where ZIF connectors are used in the printer.

- Main printed circuit board (MPCA) to printhead assembly
- MPCA to control panel PCA

Figure 1-16 FFC wing feature



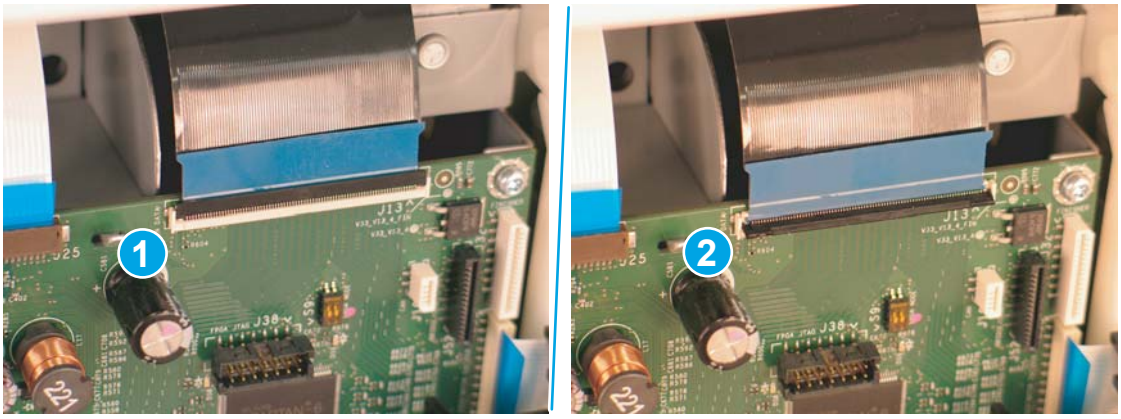
Follow these instructions to install a ZIF connector

1. Rotate the lock-door open.
2. Place the FFC into the bottom of the installation zone at a slight angle.
3. Stand the FFC upright in the connector to trap the wing features behind the locking posts.
4. Rotate the lock-door closed.

NOTE: To remove the FFC, rotate the lock-door open.

The example shown in the following figure is a ZIF connector. This figure shows the latch in the closed (callout 1) position, and in the open (callout 2) position.

Figure 1-17 ZIF connector



Ferrites

The printer cabling system includes many ferrites to enable proper EMC/EMI performance for regulatory agencies. All ferrites on FFCs and discrete cables must be included and located in the intended position to make sure performance matches the tested behavior.

CAUTION: Ferrites are fragile. Use care when removing or installing them.

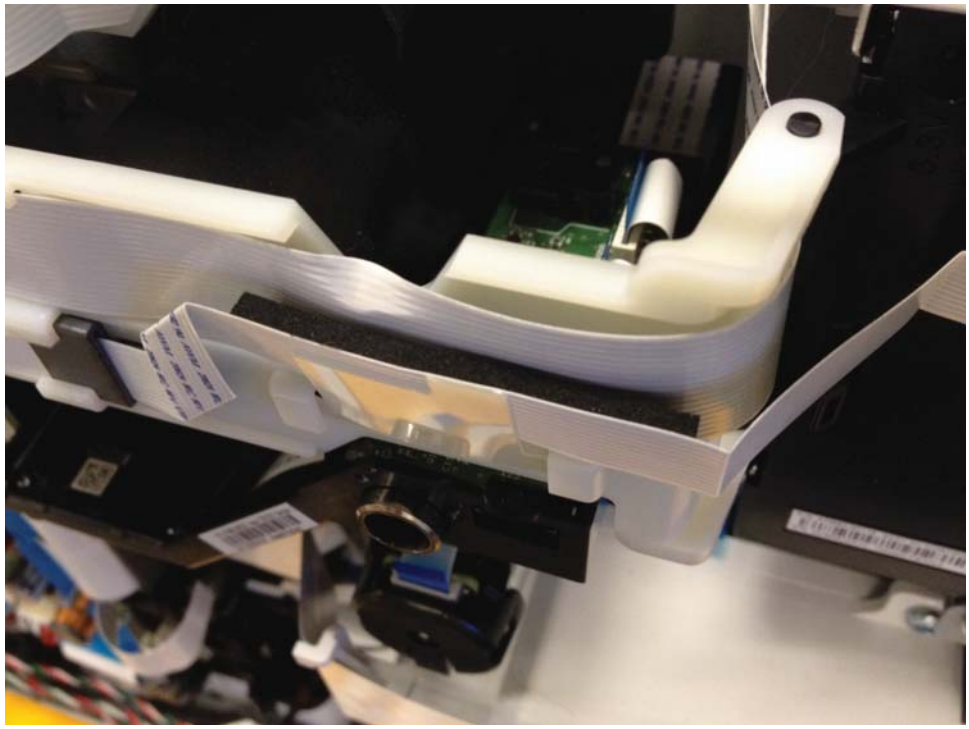
Cable management

The printer cabling system uses several distribution PCAs to connect many sensors and motors to the main PCA (MPCA) in a controlled manner. One FFC delivers signals, power, and ground lines from the MPCA to the distribution PCA. Then FFCs connect from the distribution PCA to individual components. The printer has several rooftop modules that integrate to the common engine. Cable routing of the different rooftops to the MPCA creates the top layer of cable routing in the rear region.

Spacing

Proper spacing is required between FFCs to prevent crosstalk, maintain signal integrity, and perform to EMC/EMI expectations. The printer cables utilize plastic mounts, die-cut spacers adhered to FFCs, and foam adhered to FFCs to maintain spacing to other FFCs or sheet-metal components. All spacing must be maintained for proper performance.

Figure 1-18 FFC spacing



Electrostatic discharge prevention

Electrostatic charge might build up on plastic and metal surfaces due to tape removal, dry conditions, or other causes. Exposing the conductors at the ends of FFCs and discrete cables to these surfaces might cause electrostatic discharge (ESD) and damage the cables.

Print subsystem

Printhead

The fundamental purpose of the printhead is to convert the digital firing instructions from the printer electronics into properly formed and timed microscopic drops of the four ink colors. The printhead spans the full length of a ledger/A3-size sheet (297 mm (11.0 in /297 mm) by (17 in/431.8mm), which allows the printhead to be statically positioned within the printer and have the media move sideways underneath it; printing the entire page in a single motion.

Figure 1-19 Printhead components

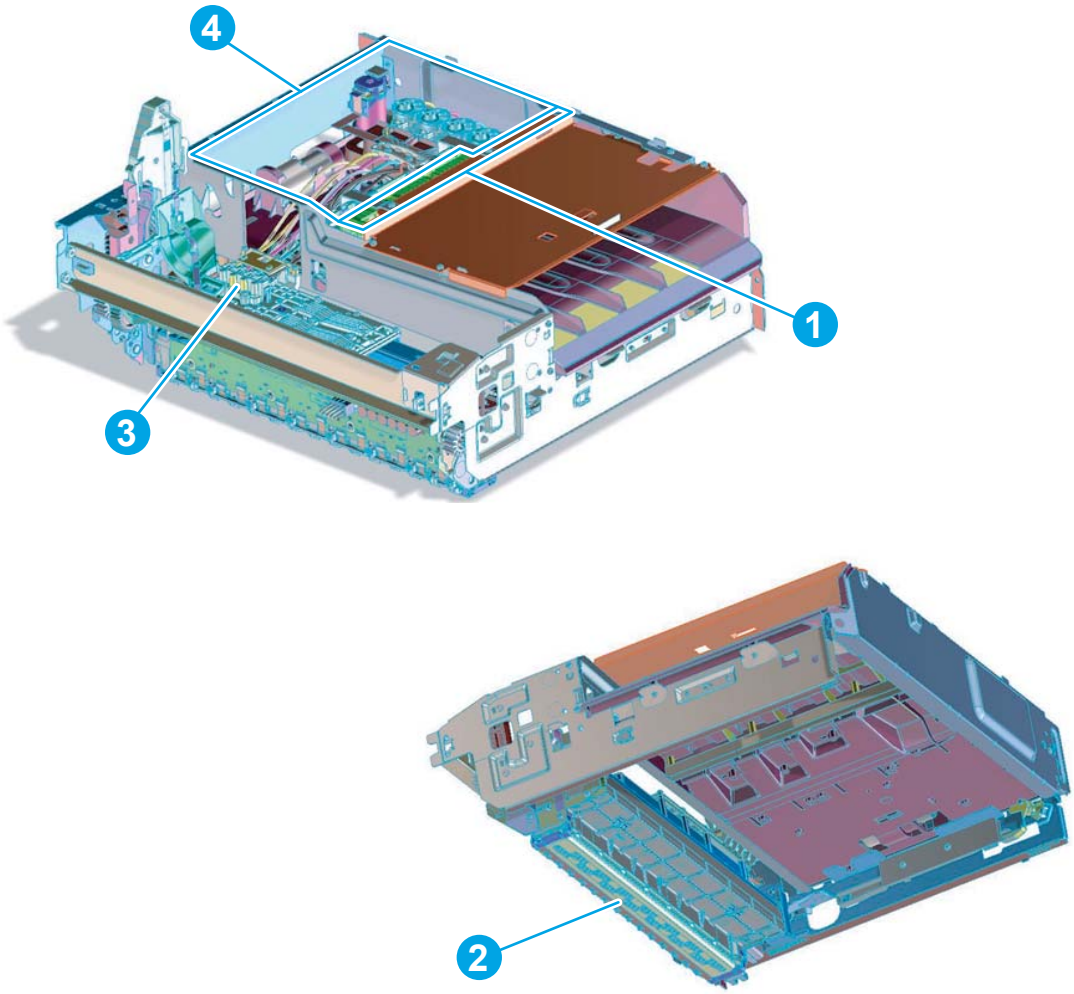


Table 1-2 Printbar components

Item	Description
1	Cartridge connections
2	Thermal inkjet (TIJ) die array
3	Data/power flow and regulation
4	Ink flow channels and pressure regulation

The printhead has a fixed array of 14 thermal inkjet (TIJ) dice oriented in two staggered rows. Each die contains more than 1,000 nozzles for each of the four ink colors—black (K), cyan (C), magenta (M) and yellow (Y).

Behind the dice array are the ink flow channels and pressure regulation mechanisms that supply the dice array with ink at the proper pressure and flow. The dice must also be fed power and data at the appropriate levels and rates, which is the function of the onboard electronic circuitry. Finally, situated at the top of the printhead, are connections to four cartridge receptacles, one for each color. These cartridges are connected by tubes to the printhead and supply the ink necessary for its operation.

Printhead air management system

The printhead uses a passive air gain management system. Air can enter the printhead from the following sources:

- Die outgassing (from air in the ink).
- Air entering nozzles due to temperature or pressure variations.
- Air entry through the printhead and tubing materials.
- Air entry through the nozzles due to shipment vibration.

Air that enters the printhead is warehoused. There is no mechanism to remove the air in the field. Of the various mechanisms for air entry, the first three are generally benign, and rarely cause issues during the expected life of the printer. The fourth mechanism generally occurs during shipment. When not printing, the print bar is kept in a zero-clearance condition that does not allow lateral motion of the print bar. This condition is automatic and requires no user intervention to activate.

Printhead lift

The printhead lift is responsible for positioning the printhead within the printer and moving it up and down as required. This vertical motion is both to establish proper spacing to the paper during printing, and to raise it to access the active face or to perform necessary calibrations.

During printing, the lift mechanism sets the printhead height depending on the type of paper, image content, and other print job specific information.

Print cartridges

These printers have new, state-of-the-art pigmented inks. They are filtered using proprietary processes to prevent printhead contamination. These inks are designed to produce optimal print quality on ColorLok office papers, but also produce very good print quality on regular office papers and specialty paper.

Optical scan carriage

The optical scan carriage has an optical sensor used for calibration. Its motion is along the long axis of the printhead. This sensor is used by a number of printer calibration features that are important for proper subsystem function. The Through Beam Optical Drop Detect (TBODD) sensor is located on the optical scan carriage.

Print system operational states

Startup

When it leaves the factory, the printhead is initially filled with an inert ink-substitute called Shipping and Handling Fluid (SHF). This fluid, essential for the manufacture and transportation of the printhead, must be flushed and

replaced with actual ink. This is accomplished during the Startup phase. The flushing process automatically commences when user chooses to initialize the system, following the prompts to install ink supplies and paper, and then confirms they want to perform initialization. The SHF is removed by sustained printhead operation and replaced by ink from the supplies. The process terminates once all the SHF is flushed from the printhead.

Special host supplies are supplied with the printer prior to its first use. These host (or setup) supplies can only be used to initialize the printer. If they are inserted in an already initialized printer, they will be rejected—**do not use setup supplies**. These supplies contain additional ink so that there is a 100 percent ink level after the startup is complete.

NOTE: The initial startup is immediately followed by calibrations. Total time for startup and calibrations is approximately 25 minutes.

Pen energy calibration

The printer automatically runs a pen energy calibration called Thermal Turn On Energy (TTOE) after start up. This calibration varies the energy to each die while watching the die temperature. At optimal pen energy, all of the energy will go to ejecting the drop. If the energy is too low, then the drop is not ejected and the fire pulse will heat up the die. If the energy is too high, then some of that energy will go to ejecting the drop but the rest will go to heating up the die. During TTOE, the printer varies the pen energy to the die and then watches the die temperature. Once the optimal energy setting is found, the printer increases the energy slightly to make sure that the die will always fire ink. If TTOE fails for some reason, there are default values that have been stored in the printer. These energy values are higher than optimal but not too high to cause a problem. The pen will have no problem surviving printer life with the default values.

Die alignment

Fourteen die comprise the printhead active face each with associated positional tolerances. An active calibration must be performed to prevent errors and allow a uniform ink application to the paper (without any gaps or overlaps between adjacent die). The die alignment is done by printing a special diagnostic image on a sheet of paper and then scanning it with the optical scan carriage. Die alignment is performed as part of initial unit startup, and can be performed manually as part of the print quality recovery tool.

Die density leveling

Tolerances are also associated with the drops fired by the individual printhead die. Variations are measured and compensated by another active calibration to produce a visually uniform ink application to the paper. Another set of diagnostic images are printed and scanned by the optical scan carriage to achieve this die density leveling. Die alignment and die density leveling are usually paired together.

Nozzle presence detection

In printing, all the ink is applied in a single smooth motion of the paper past the printhead; any inoperable nozzle can show up as a noticeable streak. The operational state of each of the thousands of nozzles on the printhead is periodically measured. The printhead lift raises the printhead, and the Through-Beam Optical Drop-Detect (TBODD) assembly on the optical scan carriage watches for drop presence as each nozzle is fired. Inoperable nozzles are turned off and other operable nozzles are used on subsequent printed pages to apply the missing ink. Nozzle presence detection is fully interruptible by new incoming print jobs.

Media edge position detection

The printer uses a learning algorithm to define media center as a function of input source—all trays, including optional accessory trays, are all tracked independently. The calibration scanner is located upstream of the print zone. A measurement is taken roughly every five pages. The rear edge is measured just after being deskewed.

As paper is scanned, the media center database is updated. The image is registered to the page using the media center database.

Servicing and capping

When in the capped state, the printhead is fully raised, the printhead wiper is positioned underneath, and the printhead cap is engaged against the printhead active face. Storing the printhead in a capped state re-humidifies the nozzles when not in active use

Service spitting is the firing of the nozzles to help maintain nozzle health. This also is effective at clearing ink plugs, external debris, or color mixing. These error conditions might occur when uncapping the printhead, or between pages when nozzles prepare for printing, or following a job or service wipe.

Service spitting to correct these error conditions might occur when uncapping can also be implemented by using menus on the control panel.

Printing

The printing state begins by the printbar leaving the capping state, and being lowered to the printing position after the service sled moves out of the way. At the same time, a sheet of paper is picked from one of the three trays and the leading edge staged at the entrance to the print zone. Once the print data has been sent, the sheet of paper is fed at a constant velocity through the print zone and the ink applied by the printbar.

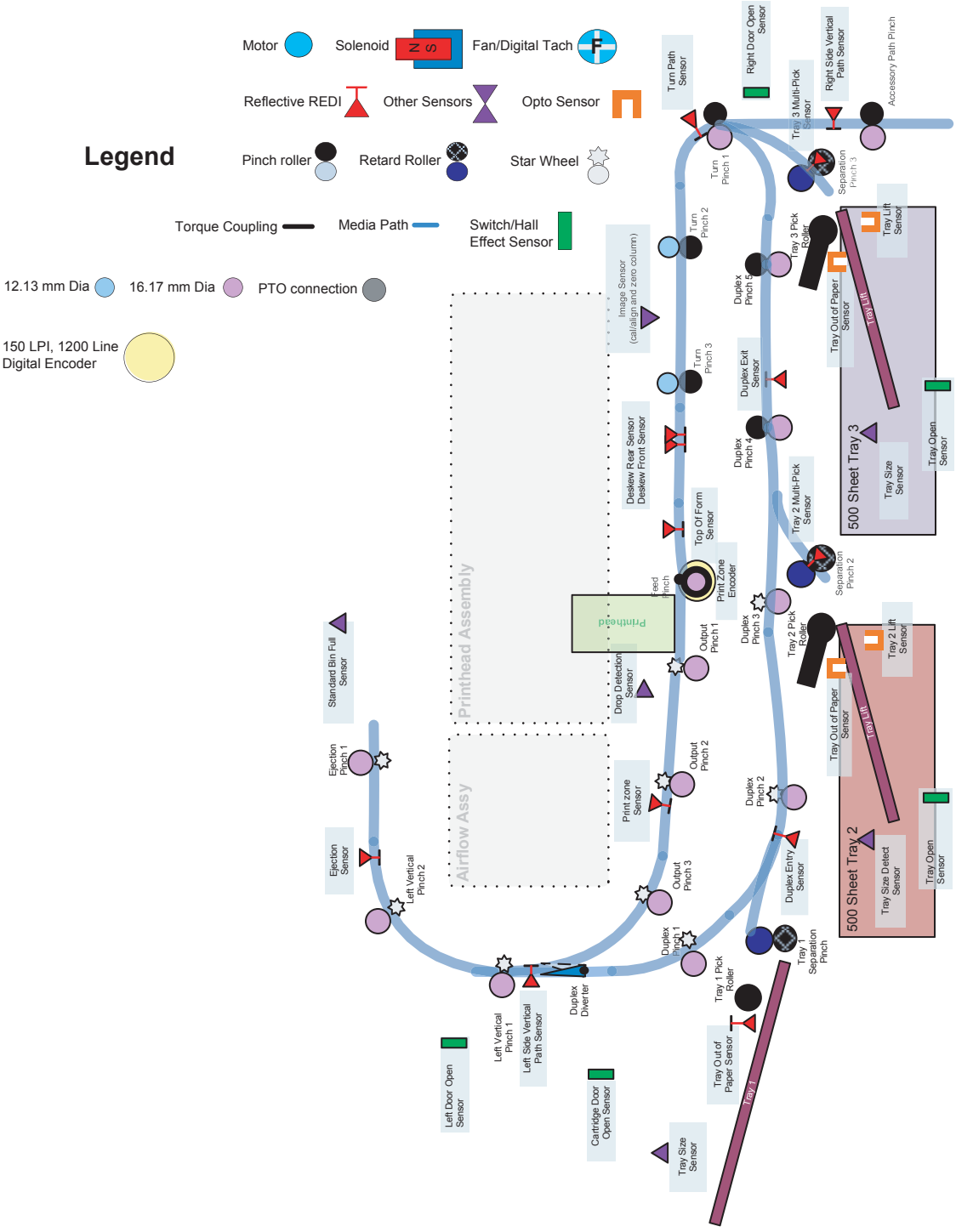
In the case of one-sided printing, the inked sheet is moved up, over and out to the output tray. For two-sided printing, the sheet is moved until its trailing edge is past the merge to the vertical path, and then it is reversed down through the duplex path underneath the maintenance ink module, and reintroduced into the print zone for inking of the second side.

This process continues until all the pages of the print job are completed. If the print job is large enough, it can be interrupted by servicing processes.

Paper-handling system

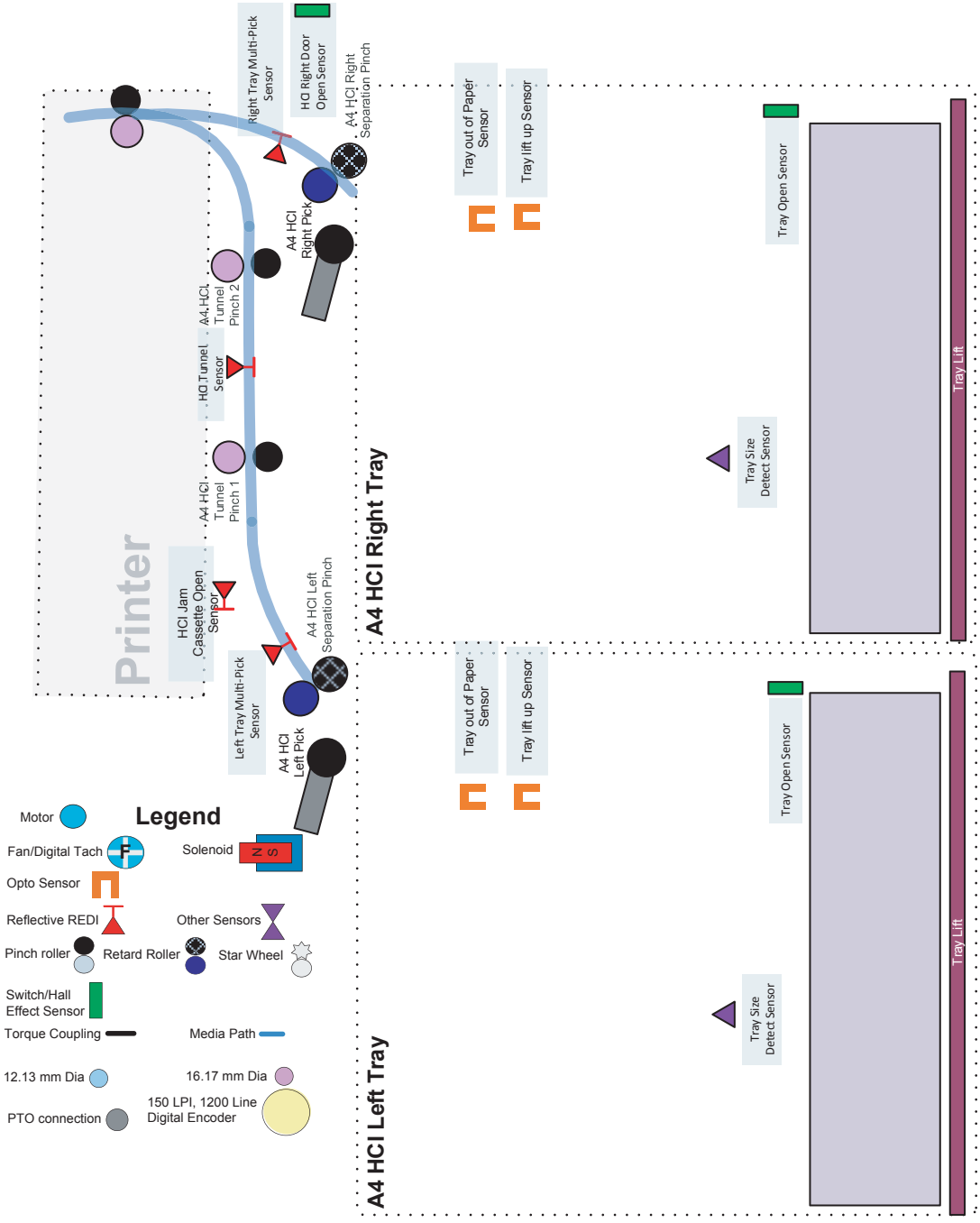
Printer sensors

Figure 1-20 Print engine sensors



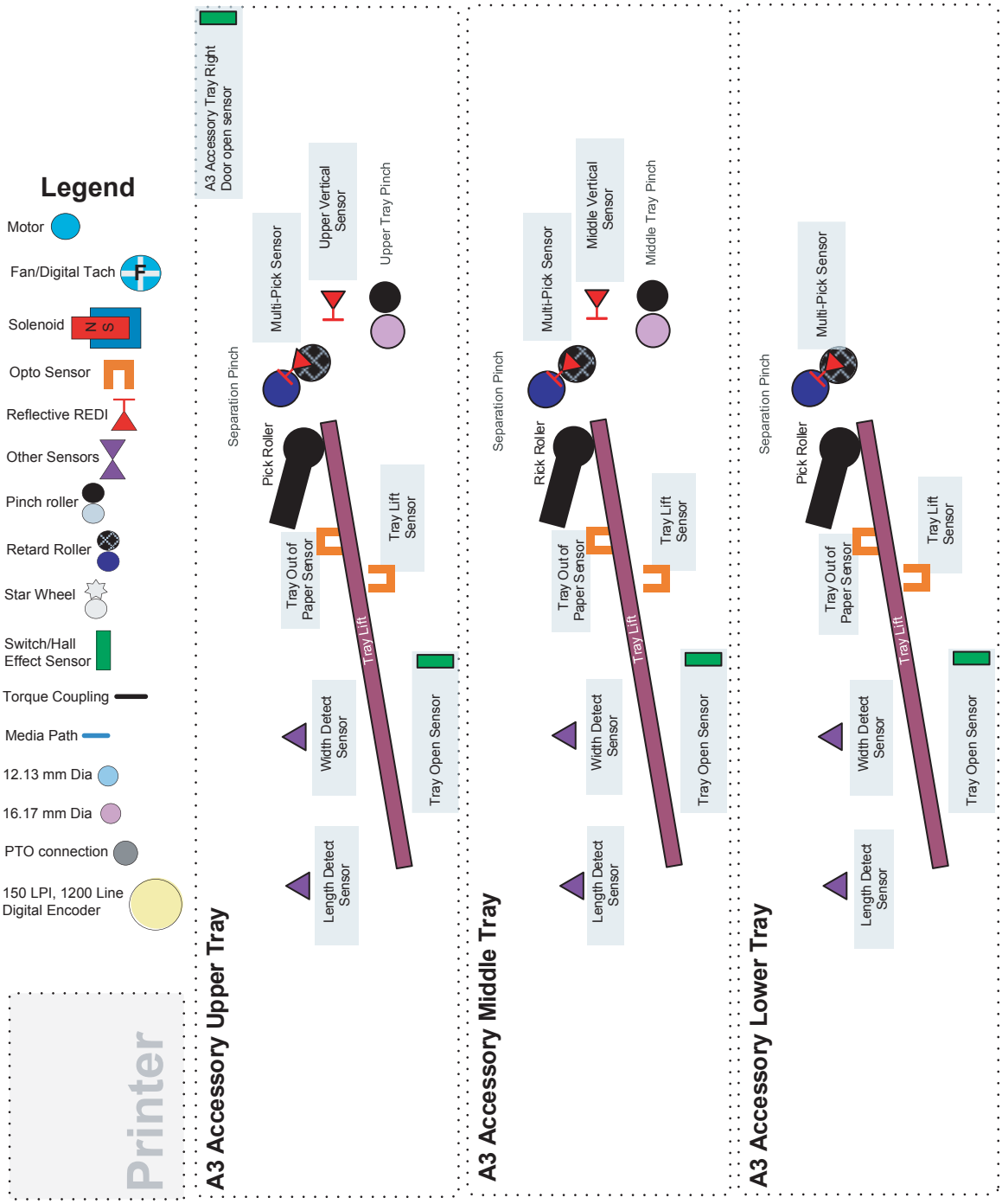
High Capacity Input (HCI) sensors

Figure 1-21 HCI sensors



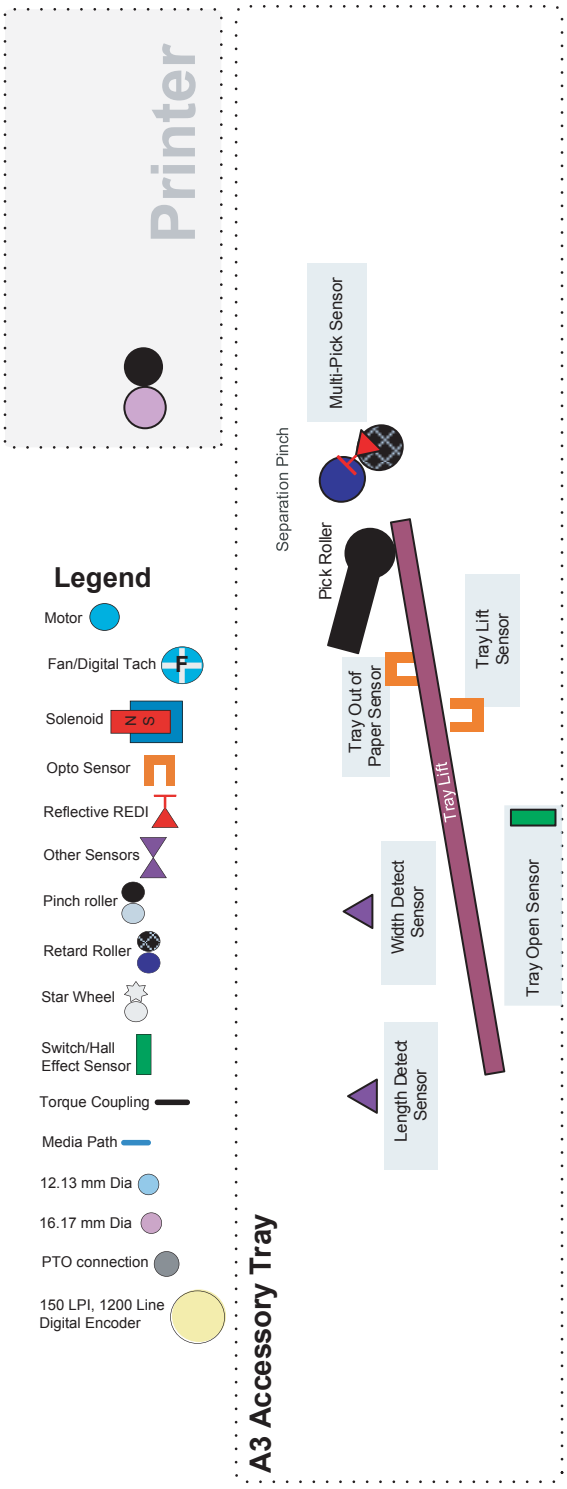
3x550 tray sensors

Figure 1-22 3x550 Tray sensors



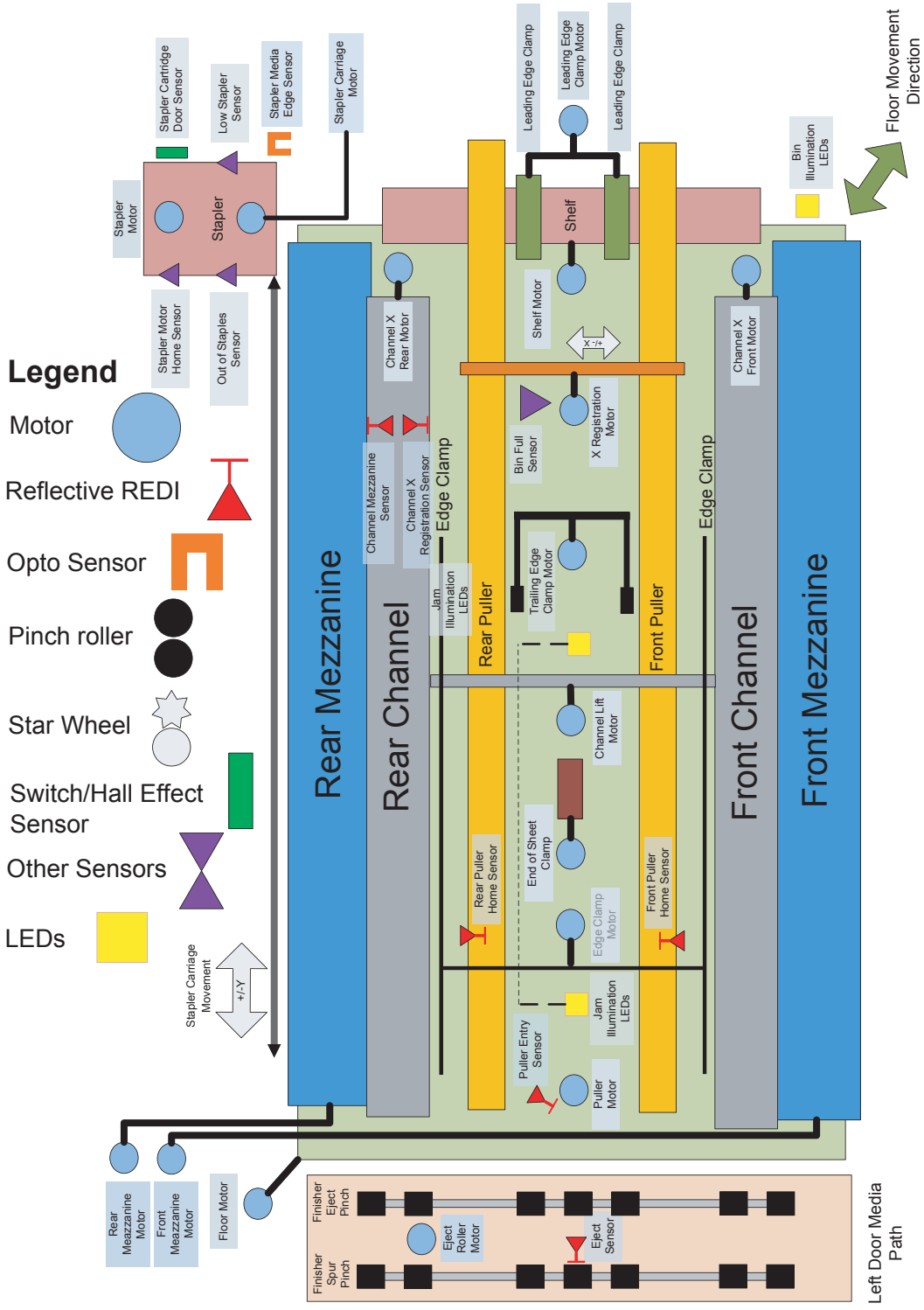
1x550 tray sensors

Figure 1-23 1x550 tray sensors

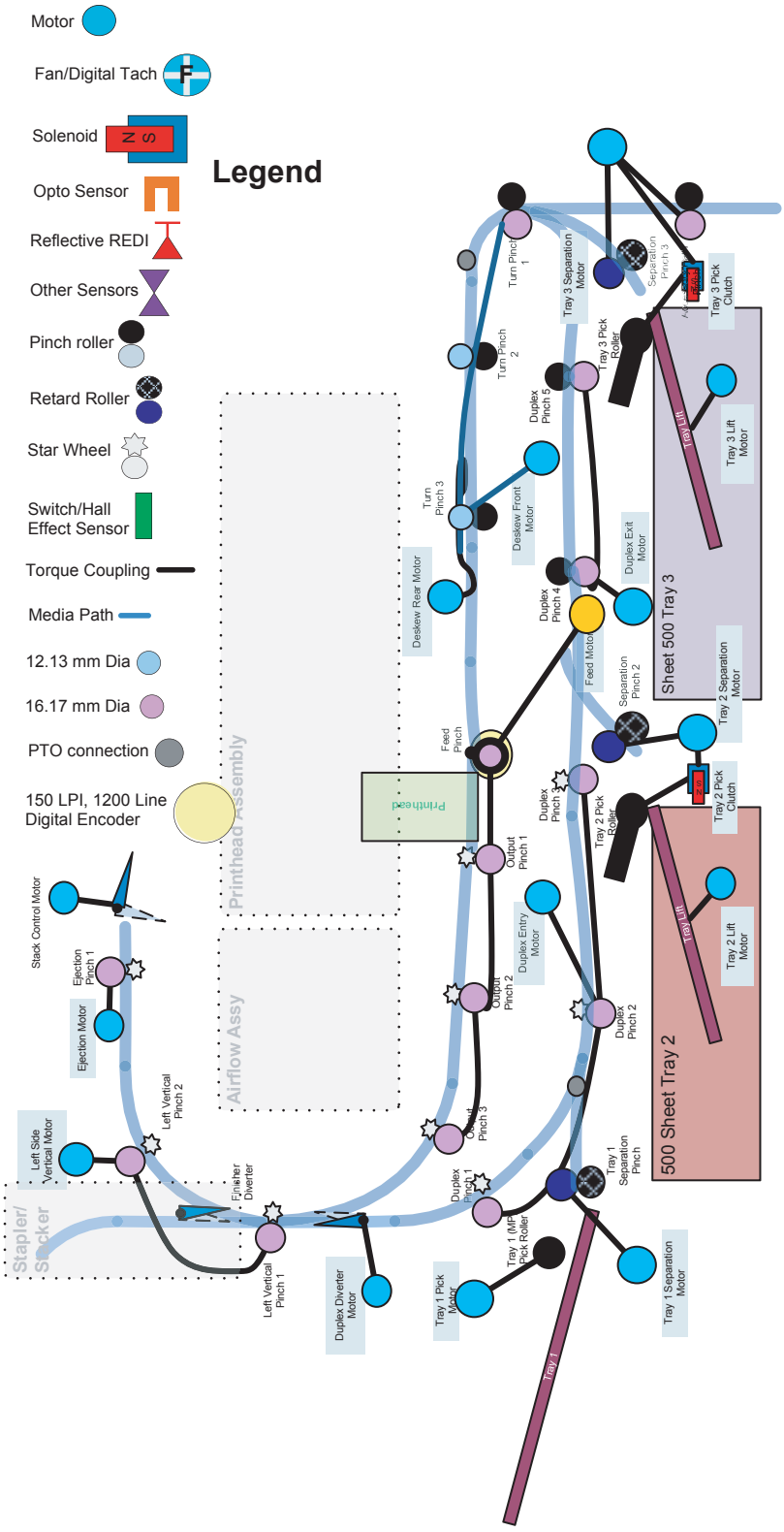


Inline finisher sensors

Figure 1-24 Inline finisher sensors

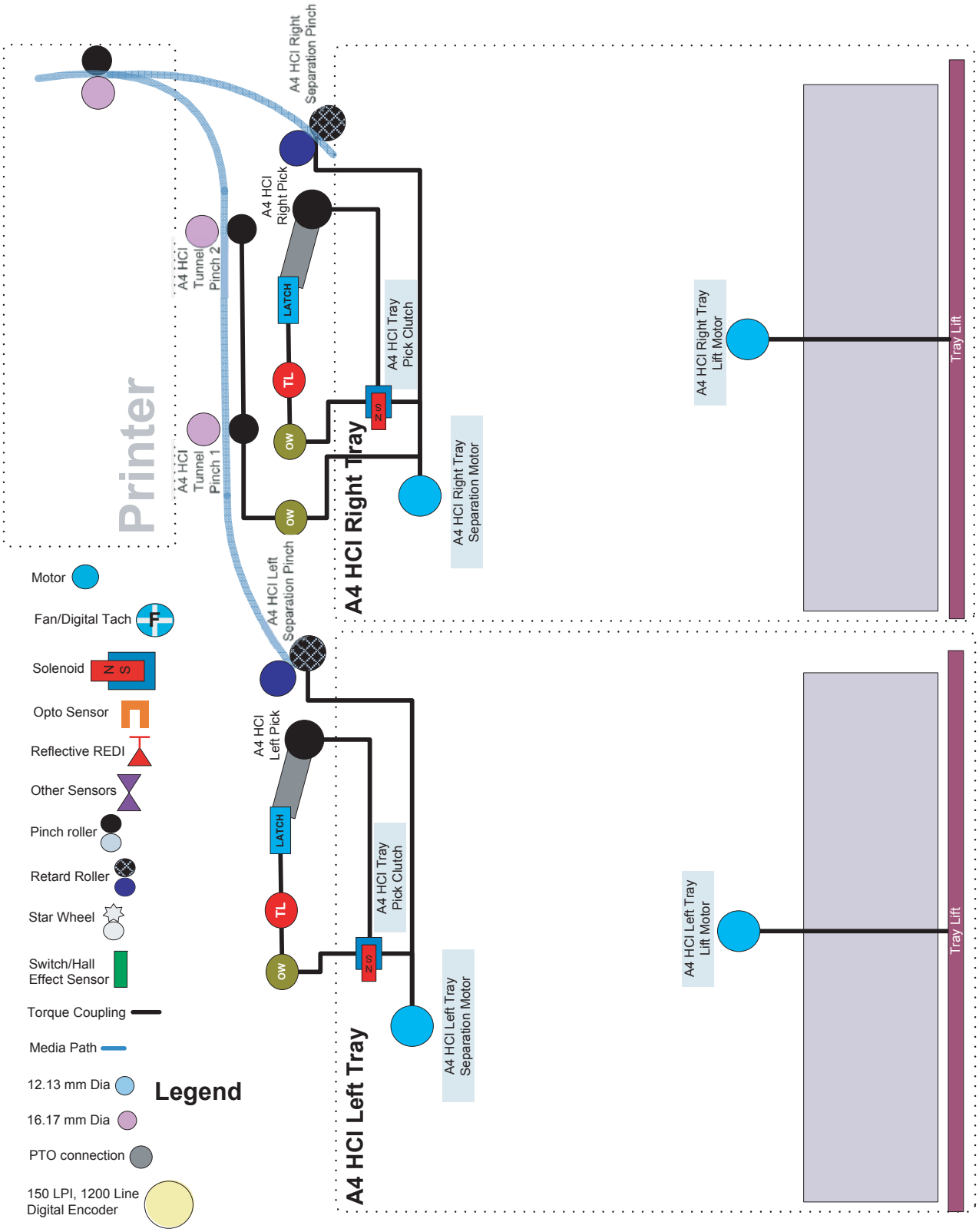


Printer motors/solenoids



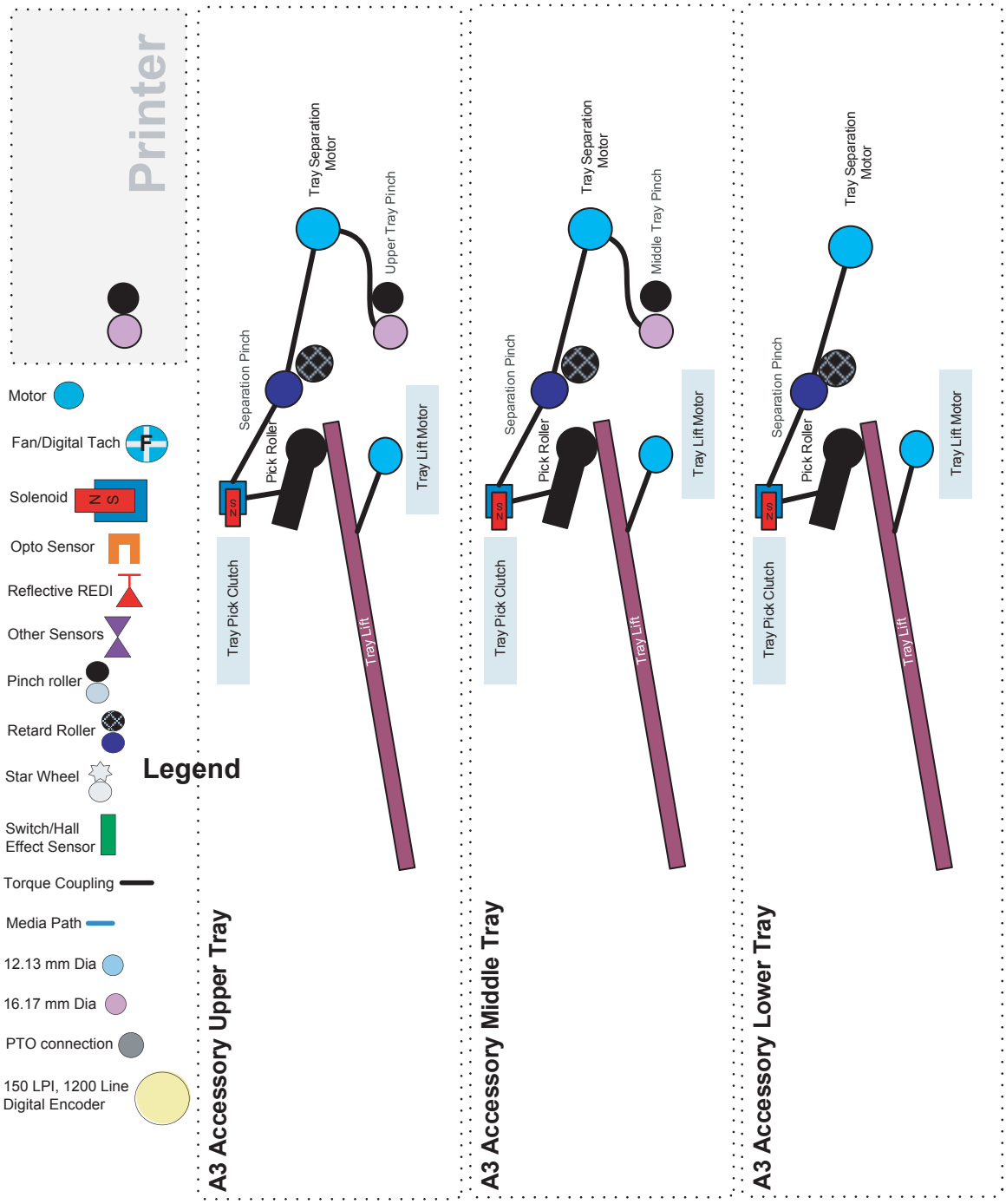
High capacity input (HCI) motors/solenoids

Figure 1-25 HCI motors/solenoids



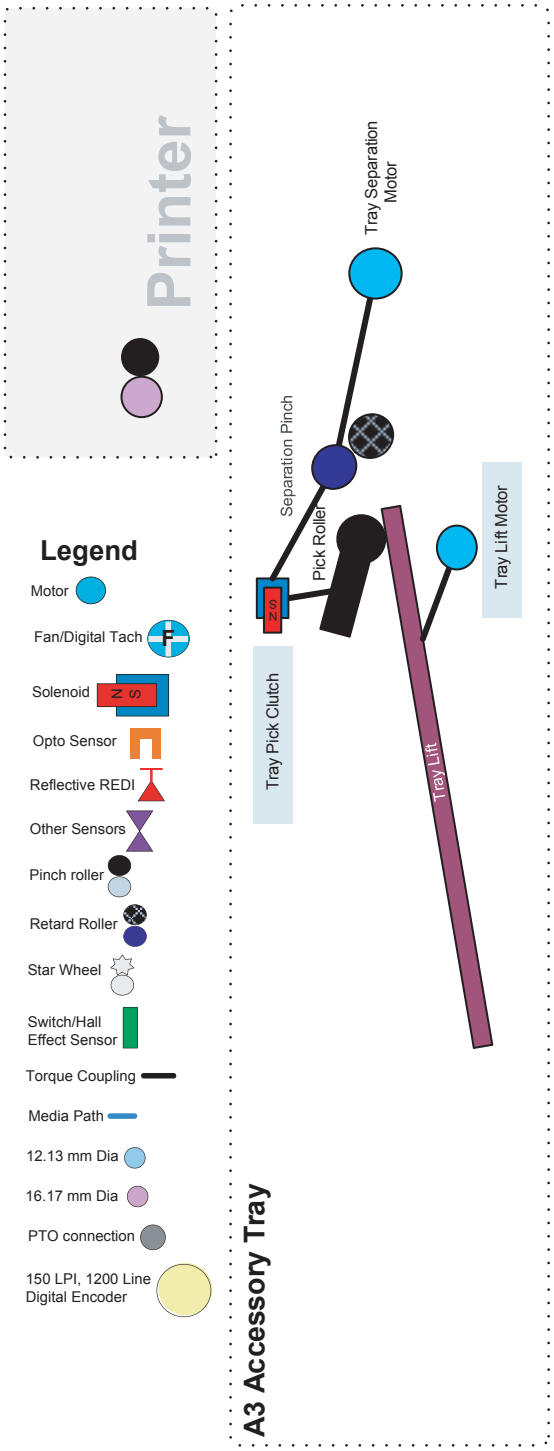
3x550 tray motors/solenoids

Figure 1-26 3x550 tray motors/solenoids



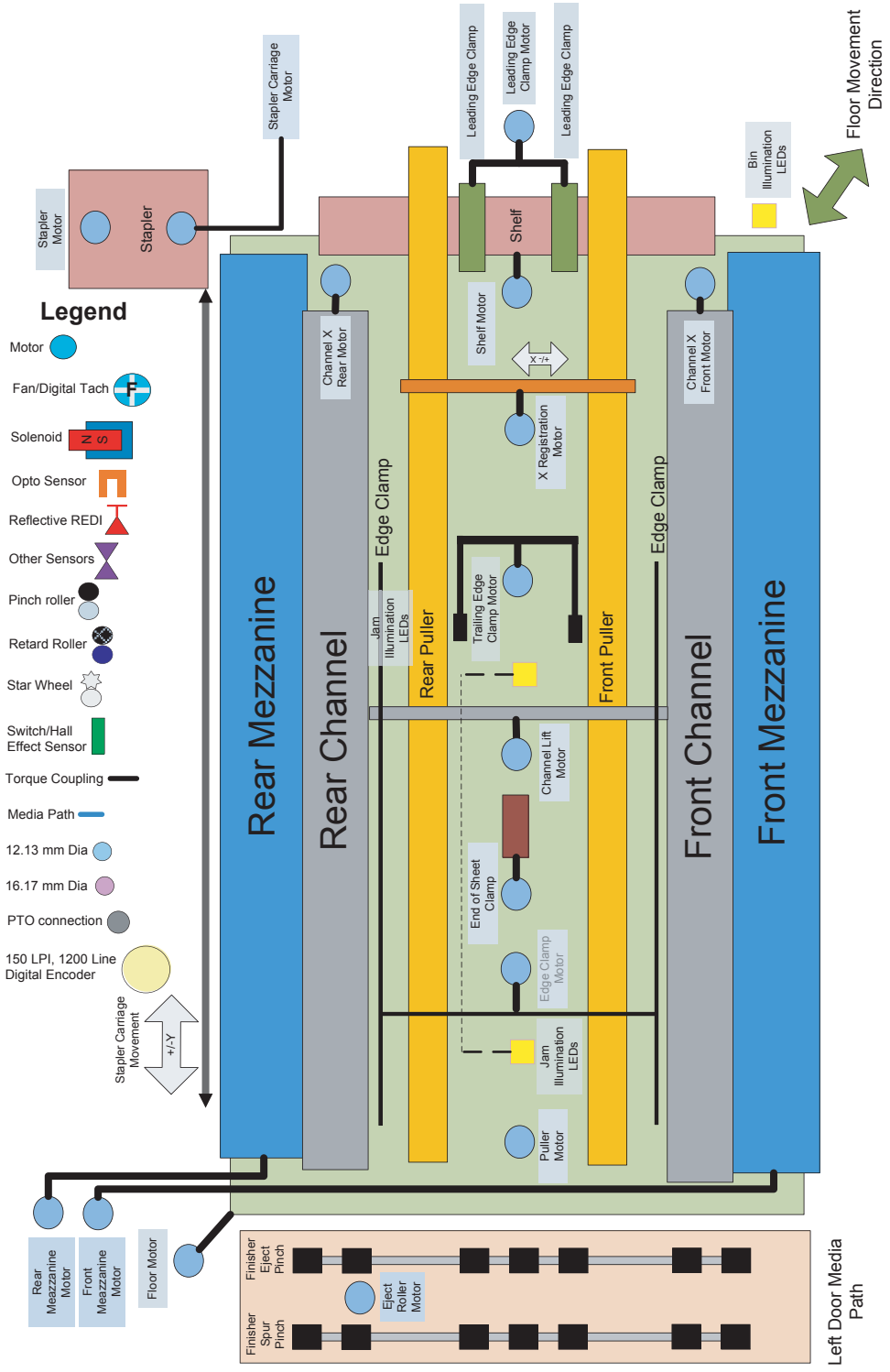
1x550 tray motors/solenoids

Figure 1-27 1x550 tray motors/solenoids



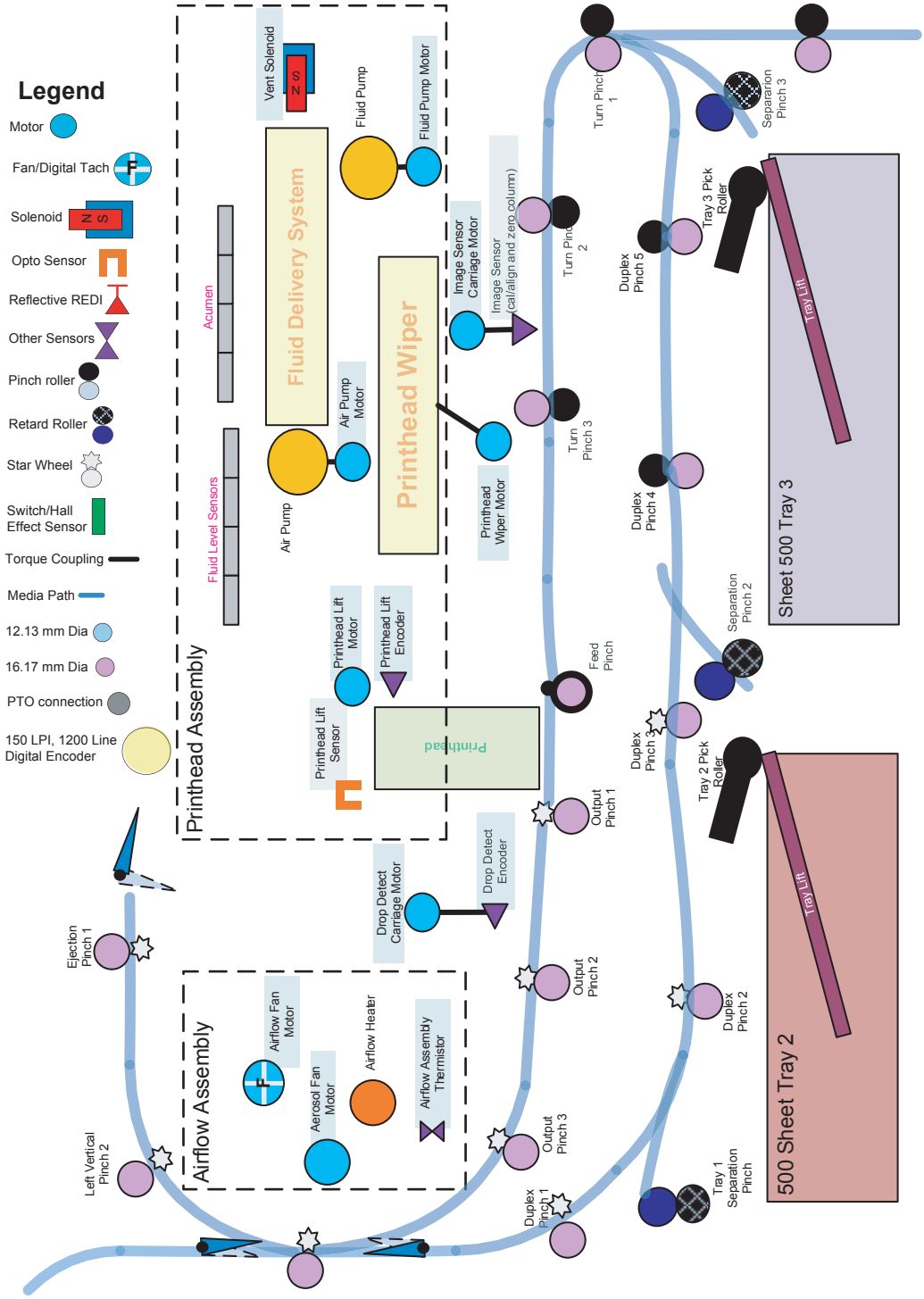
Inline finisher motors

Figure 1-28 Inline finisher motors



Printer printing system

Figure 1-29 Printer printing system



Input trays

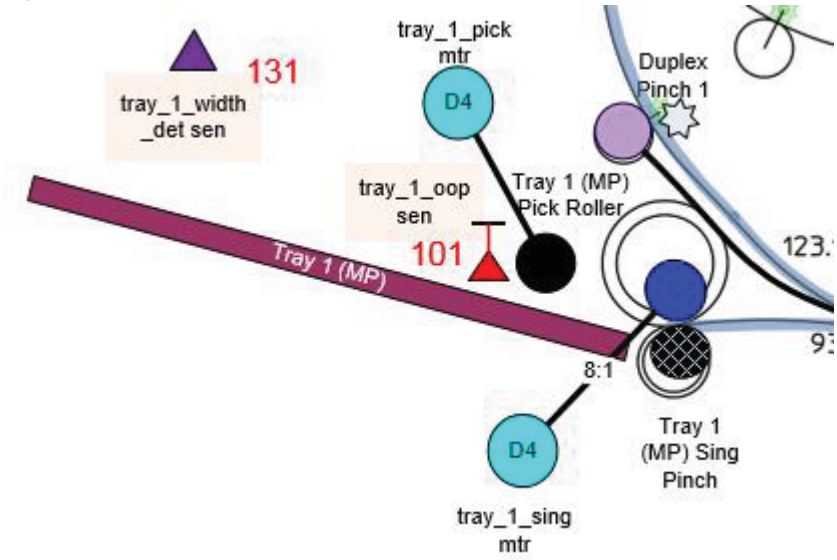
Tray 1 (Multipurpose)

Tray 1 consists of two subsystems.

- The media support tray with media guides and width sensor.
- The pick and separation system.

The pick and separation system includes the upper pick roller, the lower separation roller, a lift plate, two motors, and an out-of-paper (OOP) sensor.

Figure 1-30 Tray 1 pick and separation system



When a sheet is picked, the following sequence occurs:

1. Both motors are started simultaneously.
2. The **tray_1_pick** motor drives the upper pick roller forward and moves the lift plate upwards, so the paper contacts the pick roller. The lift plate spring controls the force applied by the lift plate to the pick roller.
3. The lift plate will lower after the page enters the roller nip.
4. The **tray_1_sing** motor turns the lower separation roller in the reverse direction. There is a slip clutch on the separation roller and when only one sheet of media is in the nip, the roller is forced to follow the upper pick roller and paper as it moves forward. As the separation roller is over-driven in the forward direction, a reverse torque is applied by the slip clutch. This action will separate multiple-fed sheets so that only one page at a time enters the printer. The separation spring controls the force applied by the separation roller and the pick roller.

The OOP sensor is attached to the lift plate. It is a REDI type sensor using a mirror attached to the upper paper guide. Paper present in the tray will block the light path from the sensor to the mirror.

NOTE: Both the pick roller and the separation roller are replaceable in the field.

Trays 2/5 (A3/A4 main trays)

Some printer models support up to three 550-sheet letter A3/A4 size main trays. Each tray includes the following components:

- A removable tray body that holds the printer paper. The tray body includes the following components:
  - Width and length adjusters to support and align the paper.
  - A lift plate to raise the paper.
- A Hall Effect sensor determines if the tray is closed. The sensor is located at the back of the printer and detects a magnet located in the tray body.
- A lift mechanism with a DC motor and encoder mounted on the rear wall that engages the lift plate to raise the paper to the height where it can be picked and fed into the printer.
- A size detect module mounted on the rear wall to detect the paper size loaded in the tray based on the position of the width adjusters.
- A pick system mounted above the tray to feed paper into the paper path. The pick system includes the following components:
  - A replaceable pick roller.
  - An electric solenoid to engage the pick gear train.
  - A spring plunger to raise the pick arm when the paper tray is opened.
- A separation system mounted above the tray to separate multiple sheets of paper into single sheets. The separation system includes the following components:
  - Two replaceable separation tires.
  - A torque limiter to provide resistance to the lower roller for paper separation.
  - A DC motor and encoder to drive the mechanism.
  - An optical sensor to determine if the paper stack is raised to the correct height.
  - An optical sensor to detect if there is paper loaded in the tray.
  - An optical sensor and reflector to detect paper presence at the separation rollers.
  - A spring mechanism to separate the tires when the tray is open to aid in jam clearing and roller replacement.

Following is the operational sequence for paper pick and feed from Trays 2-x. This process repeats for each page:

1. The lift mechanism raises the lift plate until the tray lift sensor detects that it is raised to the correct height.
2. The paper presence sensor is checked to be sure paper is loaded before proceeding.
3. The electric solenoid is engaged to connect the pick shaft to the drive train.
4. The motor runs, turning the pick roller and the separation tires and advancing the paper out of the tray into the separation system.

5. The electric solenoid is disengaged after paper is detected at the separation roller sensor, but the motor continues to turn the separation tires and advance the paper into the printer.

6. After the trailing edge of the paper leaves the separation tires the motor stops.

In between each page, the lift motor may make small motor moves to adjust the height of paper stack as paper is depleted from the tray.

After a sheet is picked, it is not uncommon for an additional sheet to be left in the separation roller. If the sensor detects this has occurred on the last page of a print job, the tray will lower, the electric solenoid will engage to lift the pick roller, and the motor will run in reverse to pull the sheet back in the input tray.

NOTE: The construction and operation of Tray 4, 5, and 6 is a similar sequence.

1x550-sheet tray

The 1x550-sheet tray is a table top or floor standing input capacity accessory for the printer (both have the same operational mode). It holds 550 sheets of additional input capacity (media sizes A5 up to A3).

The accessory is driven by the lift motor and the separation motors. In addition to the two motors, an electric clutch arrangement transfers torque from the separation motor to the pick shaft.

The lift motor lifts the paper stack to the pick roller and keeps the paper stack at the correct height while the paper stack is depleted. The separation motor drives the tray paper drive components.

In the forward direction, the separation motor drives the counter rotating separation system and also the pick shaft. The drive of the separation system feeds and separates sheets into the print mechanism.

During the forward separation motor rotation, an e-clutch (which is electrically powered) transfers torque to the pick shaft to pick sheets from the stack.

A reverse separation motor rotation has two functions:

- It moves sheets left on the curved separation wall (or sheets separated by the separation system) back into the stack (healing).
- When the e-clutch is engaged it raises the pick arm away from the paper stack which allows sheets being healed to return to the input stack.

Sheets picked from the accessory are fed into the vertical path of the printer, where a reversing separation motor from Trays 2-x (depending on printer configuration) turns the vertical path shaft in reverse, which drives sheets into the turn roller path

3x550-sheet tray

The 3x550-sheet accessory is a floor standing accessory for the printer. It holds an additional 1650 sheets of additional input capacity (media sizes A5-11x17). The accessory is a duplicate of the 1x550-sheet tray with two additional trays in one accessory.

The accessory functions similarly to the 1x550-sheet tray. It uses a two motor arrangement. In each tray a lift motor and a separation motor drive the system, and an electric clutch engages the pick roller when the clutch is activated.

For all trays, the lift motor lifts the paper stack to the paper position sensor and out of the paper sensor. The lift motor keeps the top sheet of the stack in the optimal position to pick it onto the curved pick wall.

Picking from Tray 4 is done the in the same way as the 1x550-sheet tray. Rotating the Tray 4 separation motor forward, and then engaging the clutch to pick a sheet of paper into the paper path.

Tray 5 and Tray 6 perform in the same manner (separation motor runs forward, and the clutch is engaged to pick a sheet).

To feed a sheet up the accessory vertical path (while picking from Tray 5 or Tray 6), the separation motors in the downstream trays are run in reverse. This rotates the vertical path turn shafts which are linked to the separation system by a set of gears.

For example; when picking from Tray 6, the Tray 6 separation motor rotates in the forward direction and the vertical path feed shafts for Tray 5 and Tray 4 (the downstream trays) rotate the associated separation motors in reverse to activate the vertical path shafts.

4,000-sheet HCI tray

Two optional 2000-sheet A4 size accessory trays are available for the printer: These optional trays use the same media pick and feed system as Trays 2-x. See Trays 2/5 (A3/A4 main trays) on page 41 or more information.

Tray sensors

The Trays 1 and 2 (A4 and A3) and optional accessory trays (A3) contain the following sensors (HCI tray not included):

- A Hall Effect sensor and magnet determines if the tray is closed.
- A flag/opto sensor determines if there is paper in the tray.
- A flag/opto sensor determines if the lift plate is in the lifted position.
- A separation REDI sensor and REDI sensors in the paper path determine if the printer successfully picked the paper.

Paper size detection

The paper size detection system utilizes movable surfaces on the rear of the input tray to interact with a size detect module when the input tray is installed in the printer. These surfaces on the tray press a combination of mechanical buttons on the module that indicates to the printer the position of the paper adjusters. On A4 size trays the movable surface consists simply of a rotating barrel that is positioned by the rear width adjuster. On A3 size trays, in addition to a barrel, a sliding piece positioned by the length adjuster is also used. The size detect modules are located on the rear wall of the printer chassis directly behind the input trays. Each module includes three spring-loaded buttons which, when pressed, actuate respective electrical switches on a printed circuit board. The combination of activated electrical switches communicates to the printer the position of the width adjuster (for A4 trays) or the position of both the width and length adjusters (for A3 trays), along with the presumed paper size.

Paper path zones

Turnpath/deskew

The turnpath zone is the paper path between separation pinch of Tray 3 and turnshaft 2 as well as the paper path between duplex exit shaft 5 and turnpath 2 that is between accessory vertical path roller1 and turnshaft 2. This zone has only one roller, turn 1 roller, which is driven by deskew-turn motor. This zone also has only one paper edge sensor, deskew-turn sensor, which is housed in the right door paper guide and is downstream of turn 1 roller. Turnpath is the region where different paper paths (duplex path, simplex path from Tray 3 and vertical path from accessory trays) come together to feed into the deskew zone. The function of turnpath is to collect paper from different sources and feed into the deskew zone.

The deskew zone is the paper path between turnshaft 2 and the feed roller. This zone has four half-length shafts, turnshaft 2 front/rear and turnshaft 3 front/rear. The two front half shafts are driven by the deskew motor, independent of the two rear halves, which are driven by the deskew-turn motor. The deskew zone also has two edge detect sensors, deskew and deskew-offset, past turnshaft 3, which together measure the paper skew. In response to this measured skew, two pairs of half-shafts are driven at different speeds for a particular distance to achieve skew correction. Skew correction is completed before the paper leading edge reaches the top-of-form (TOF) sensor, which is another edge detect sensor in the deskew zone, upstream of the feed roller.

A jam in turnpath occurs when paper arrives at the TOF sensor, any of the two deskew sensors, or to the deskew-turn sensor after a specified time period. Jams can also be declared if paper is determined to not clear any of these sensors in time. When the control panel indicates removing a jam at the right door, the right paper tray may be removed to access and remove jammed paper. This tray may be pulled out using any combination of the three green handles. When pulled out, the tray remains attached to the printer via telescoping links. If needed, the right tray can be completely separated from the printer by removing two black locks on the front and rear white chassis rails.

The deskew zone also houses the calibration scanner on the upper paper guide in between the turnshaft 2 pair and turnshaft 3 pair. Some portion of the upper paper guide in this region is made of glass. The calibration scanner is used for print head calibrations, skew system calibrations, and print margin calibrations. It is also used to detect the zero column of paper dynamically during printer's operation. During print head calibrations, the paper is pushed up closer to the scan glass by a pressure plate. This plate is housed inside of the right tray and can be deployed by the duplex exit motor running in reverse.

Print zone

This is the section of the paper path between the feed roller and output 1 pinch roller. The feed roller, which has a high resolution digital quadrature encoder, precisely controls the paper in the paper feed direction. Printing of the image is controlled by this encoder to reduce errors from rotational velocity variation of the feed roller. The feed roller is precisely positioned in the axial direction by a bias spring in the rear of the shaft and a center pivot at the front. For approximately the last 20 mm (0.78 in) of a page, the paper is controlled by the output 1 pinch roller through a series of high accuracy gears.

A combination of the feed roller, paper bias guides, platen, floating star-wheel carrier and output 1 pinch roller controls the paper vertical position during printing. The user can remove the left duplex module after opening the left door for jam access. This opens the pinches at output 1, 2 and 3 to facilitate removal of jammed paper.

The print zone contains no paper path sensors. If a jam occurs in the print zone, it is not detected until the leading edge of the paper is determined to be late in reaching the jam sensor in the output path.

When a user pulls on jammed paper in the print zone that is still partially in the feed roller pinch, the servo control detects a slight movement of the feed roller and assists the user by applying a forward torque to the roller. This feature reduces the pulling force needed by the user and which reduces the chance of leaving torn pieces of paper in the paper path.

Left duplex / service fluid container

After opening the left door, the left duplexer can be pulled out of the printer to clear jams. The left duplexer remains attached to the printer, but can be completely removed by releasing the left duplexer latch on the rear duplexer mounting rail. The duplex assembly also serves as an ink-collection unit for the printhead (termed the service fluid container).

The left duplexer includes an EEPROM that is used to detect if the left duplexer is present, stores the occurrence of a startup event, and records the number of ink spits. The EEPROM information prevents the left duplexer (service fluid container) from experiencing more than one start up event, and also disables the printer when the service fluid container is full (printing is restored when a replacement unit is installed).

Output

The output path begins at output pinch roller 1 and continues to eject pinch. Three REDI sensors in this path detect leading and trailing edges and jams.

The feed motor drives the output pinch 1, 2 and 3 rollers. The vertical motor drives rollers vertical pinch 1 and 2. The Eject pinch is the only roller driven by the eject motor. All the pinch rollers in the output and exit path are star wheels to prevent roller tracking on wet or damp ink. However, the feed roller pinch is solid and has a high amount of force for media control in the print zone.

The vertical path paper guides and drive rollers are attached to the left door. The left door can be opened for jam clearance, and includes a hall-effect sensor to determine if it is closed.

Ejection

The eject portion of the paper path includes the zone from vertical pinch 2 to the eject roller. The eject motor only rotates the eject roller.

To control media the printer has 4 sheet kickers that straddle each eject cot. The sheet kickers help direct the trailing edge of the media towards the output bin.

The eject system also has a bail which is used to control output stack quality. The bail is controlled by an eject drive shaft with a cross pin that interacts with the bail.

The bail has 3 modes:

- Down with full bail weight mode. This mode is used for A4 printed in portrait mode and all smaller media.
- Counter weighted with a spring mode. This mode is used for larger media that needs to push under the bail.
- Bail up mode. This mode can be used for media that is too light to get under the bail when in counter weight mode.

Jam detection

The product makes use of various device sensors to detect and report printer jams.

Jam detection during boot

When the product is powered on and was left in an uncapped state, the state of the following REDI sensors is checked to identify if paper was left in the paper path when the printer was previously shutdown.

- DESKEW
- DESKEW_TURN
- DUPLEX_JAM1
- DUPLEX_JAM3
- EJECT_TRIGGER
- PZONE_JAM
- PZONE_TOF
- VERTICAL_JAM

If any of the above sensors indicate paper presence, the printer will attempt to flush the paper path. If unsuccessful, the printer reports a power on jam.

NOTE: While booting into service mode, sensors are read to determine paper presence, but the printer will not attempt to flush the paper and instead proceed to reporting a power-on jam if paper is detected.

Jam detection during print

The printer detects paper jams that occur when a door is opened while printing or when paper jams in the paper path.

Door open jams while printing

If the left or right doors are opened while processing a job, paper motion is halted, and a jam reported. This condition is detected and reported when the left or right door Hall Effect sensors indicate the door has been opened, and the printer is processing a job.

NOTE: Opening Tray 1 when the printer is printing does not cause a jam.

The following sensors are monitored for the left and right doors:

- DOOR_LEFT (Hall Effect)
- DOOR_LEFT_SAFETY (Hall Effect)
- DOOR_RIGHT (Hall Effect)

NOTE: If the front door (ink supply door) is opened during print operation, the printer will complete printing any pages which have been successfully picked and then halt, waiting for the front door to be closed. A jam is not reported for this condition.

Paper path jams while printing

The following REDI sensors are used to detect paper movement through the paper path during printing. If paper fails to arrive or leave a given sensor position at the expected time, then a paper jam is reported, entered into the event log and presented displayed on the control panel as one of the following:

- EJECT_TRIGGER
- VERTICAL_JAM
- PZONE_JAM
- PZONE_TOF
- DESKEW
- DESKEW_OFFSET
- DESKEW_TURN
- TRAY_ACCY_VERT_PATH
- TRAY_X_MULTIPICK
- DUPLEX_JAM3
- DUPLEX_JAM1

- TRAY_4_JAM
- TRAY_5_JAM

Paper path jams may occur while recovering from a previous error (such as a residual paper jam) and other errors (including paper jams) which halt printer transport of paper. These jams are recoverable. If paper is detected in the paper path when the printer re- initializes, the printer attempts are made to eject it into the standard output bin. If unsuccessful, a residual paper jam error occurs.

Jam event codes

NOTE: For instructions about clearing specific jams in the printer, see the Clear jams section in the printer troubleshooting manual.

When a paper jam is detected, a jam condition is reported as an event code and/or control-panel message. Event code and control-panel message descriptions and solutions are provided in a separate *Control Panel Message Document*.

The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engines. Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Motor stalls

When a motor is detected to have stalled unexpectedly, a motor stall condition is reported. Motor stalls are uniquely identified by a different event code indicating a stall occurred as opposed to a paper jam. The control panel messaging and recovery behavior of stall events is very similar to paper jams in most cases.

Servicing system

Printhead wiper

The printhead wiper system keeps the printhead nozzles firing correctly throughout the life of the printer as it performs the wiping and capping functions.

- The wiping function cleans the nozzles of ink residue and particulates.
- The capping function keeps the nozzles moist during storage and when the printer is idle.

The printhead wiper system uses its own motor to power the horizontal sled motion as it perform its functions.

The web fabric is on a supply reel that advances after wiping takes place. Advancing is done by backing into a stationary trigger mechanism located on the rear frame that turns a gear to advance the web. Because the web is on a supply reel, the web will eventually run out of material. The printer reports a low-web condition with approximately 12,000 pages remaining. If the sled is not replaced after the low warning is given and the printer continues to be used, the printer mechanism will reach a point where the web is so low that the unit will stop functioning until a new sled is installed. The estimated life of a printhead wiper is approximately 150,000 pages.

To perform the capping function, the printhead wiper moves underneath the printhead (which is elevated from the print position). This allows the rubber cap to seal the print nozzles from the environment.

Service fluid and aerosol management systems

There are two types of service fluid, shipping fluid and ink. New printheads are filled with shipping fluid to prevent nozzles from clogging. Printing with shipping fluid results in very poor print quality. Shipping fluid must be discharged from the printhead and replaced with ink before the printhead is used for printing. Once all the shipping fluid is replaced with ink, the printhead periodically discharges ink out the nozzles before, between, and after printed pages in order to prevent the nozzles from clogging.

The service fluid management system is contained entirely within the duplexer module. Service fluid is discharged out of the nozzles of the printhead through the holes in the platen and into the container inside the duplexer module. Absorbers in the container capture the service fluid and prevent it from leaking out when the duplexer module is tipped.

The service fluid is discharged out of the nozzles in drops. As the drop travels through the air, it starts to break up into multiple droplets of varying size. Some of the droplets are called aerosol because they are so small that they are lighter than air. Aerosol can float inside the printer and collect on the lens of optical sensors, producing false failures.

The aerosol management system transports the aerosol and collects it in a safe place where it can do the printer no harm. It consists of an aerosol fan, mounted on the rear wall of the air flow assembly, which creates air flow that pulls the aerosol through the holes in the platen and into the aerosol filter inside the duplexer module. Most of the aerosol is captured in the aerosol filter. Over time, the aerosol filter will get clogged and must be replaced. Some aerosol does pass through the aerosol filter and get into the aerosol fan. If too much aerosol gets to the aerosol fan, the fan stalls.

There is an EPROM memory device on the duplexer module that keeps track of how much service fluid has been discharged into it. When the duplexer module is full of service fluid, it must be replaced. Because the aerosol filter is inside the duplexer module, replacing the duplexer module also replaces the aerosol filter.

Figure 1-31 Service fluid and aerosol management system

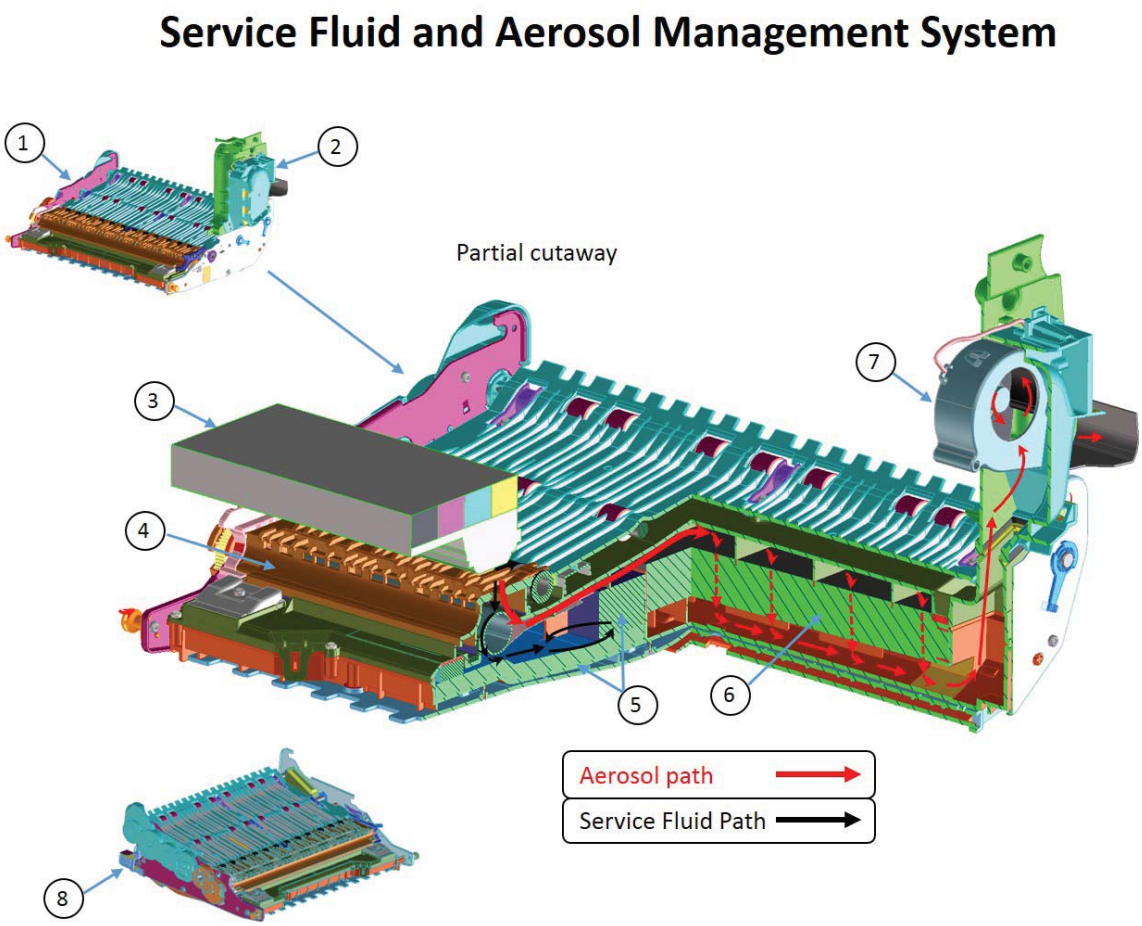


Table 1-3 Service Fluid and Aerosol Management System Components

Item	Description
1	Duplexer Module
2	Air Flow Rear Wall Assembly
3	Printhead
4	Platen (component of the service fluid container/left duplex module)
5	Absorbers (component of the service fluid container/left duplex module)
6	Aerosol Filter (component of the service fluid container/left duplex module)
7	Aerosol Fan
8	EPROM memory device (component of the service fluid container/left duplex module)

Airflow system

Function

The airflow system conditions the printed pages to avoid page curling due to the ink on the page.

The setting of the airflow system is dictated by the attributes of the image to be printed on the page and the ambient air temperature.

The airflow system functionally consists of a fan and heating elements. The pressurized air is blown on the page through the nozzles that are placed on the paper path of the airflow system between print and eject zone.

Heating

Heating elements are programmed to heat the air for variable temperatures above ambient.

Independent of the ambient temperature maximum air temperature allowed is 56°C (133°F).

Each side (front and rear) of the heating element is protected by a thermal fuse which would open the circuit if elevated temperatures are sustained due to unexpected malfunctions to the rest of the system.

Airflow

The fan produces airflow which dissipates heat generated by the heating element coil. Heated air is exhausted on to the page.

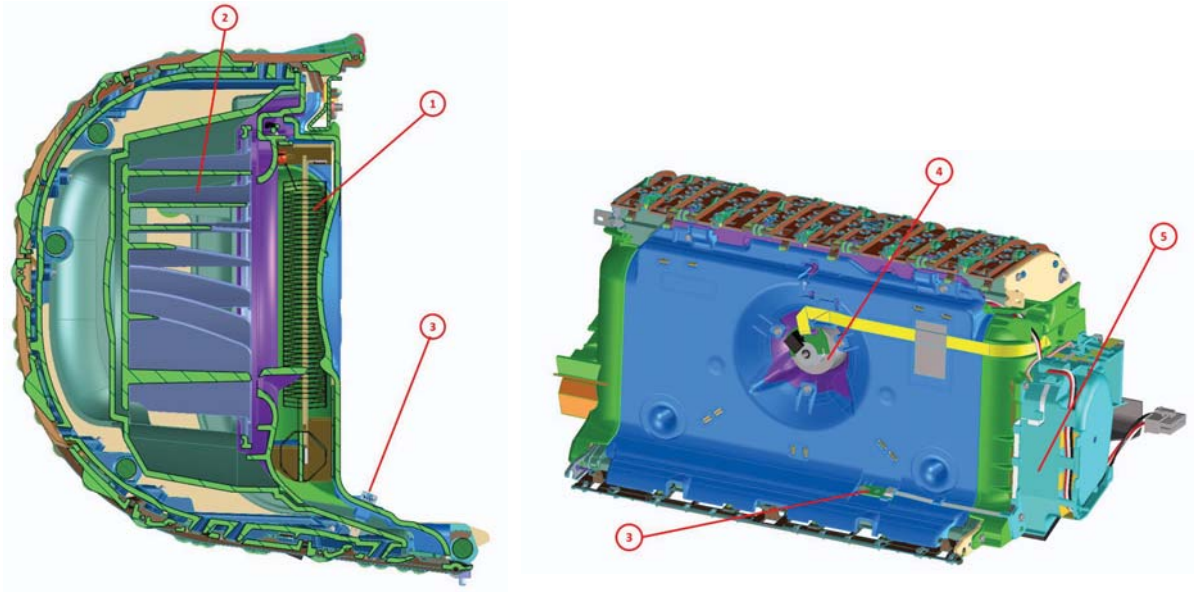
The control schemes for the airflow are varied in combination with the heating element controls.

Modes

Mode	Description
1	Fan speed: 1700 RPM, Air Temperature: Ambient + 32° F (0° C)
2	Fan speed: 1700 RPM, Air Temperature: Ambient + 41° F (5° C)
3	Fan speed: 1700 RPM, Air Temperature: Ambient + 79-90° F (15 °C)
4	Fan speed: 1700 RPM, Air Temperature: Ambient + 79-90° F (26-32° C)
5	Fan speed: 2200 RPM, Air Temperature: Ambient + 79-90° (26-32° C)
6	Fan speed: 2800 RPM, Air Temperature: Ambient + 79-90° (26-32° C)

Components

Figure 1-32 Airflow system components



Item	Description
1	Heating Element
2	Impeller/Fan
3	Thermistor
4	Motor
5	Aerosol System

Document feeder system

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 WF class, this ADF 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 1-33 Document feeder sensors

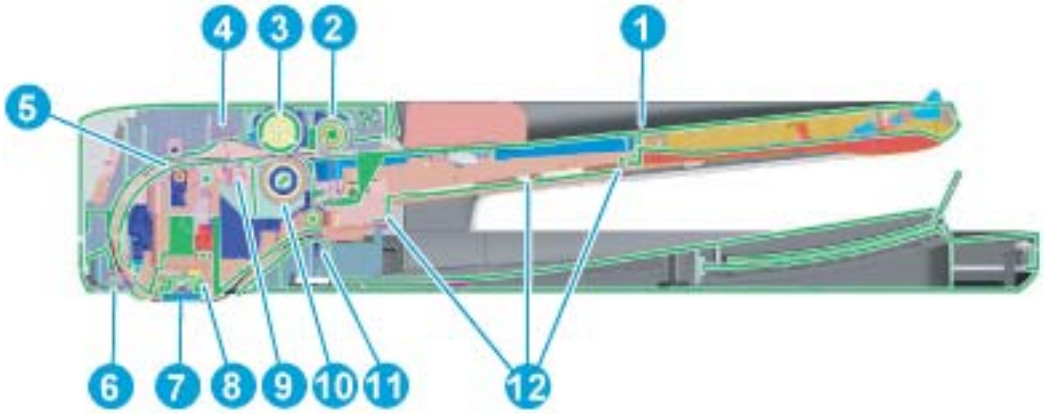


Table 1-4 Document feeder sensors

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 1-34 Document feeder paper path

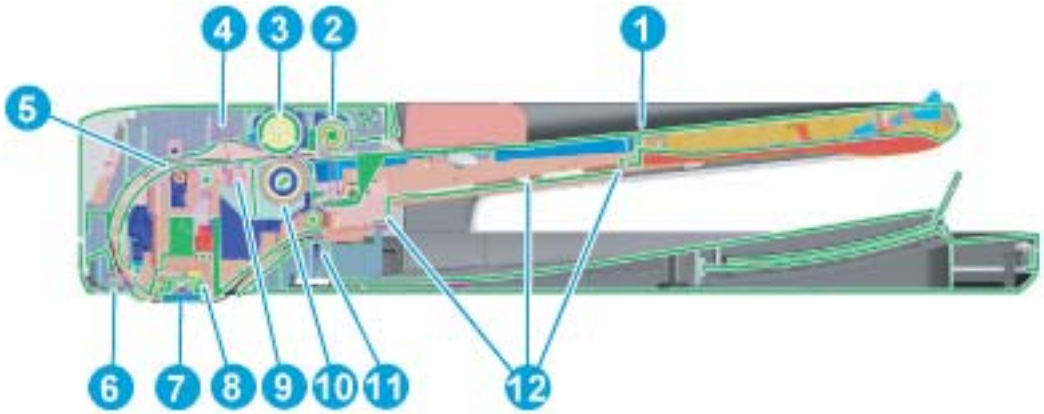


Table 1-5 Document feeder paper path

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.
2	Pre-pick roller	8	Back-side scan module

Table 1-5 Document feeder paper path (continued)

Item	Description	Item	Description
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 closed.
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 paper 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 the 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

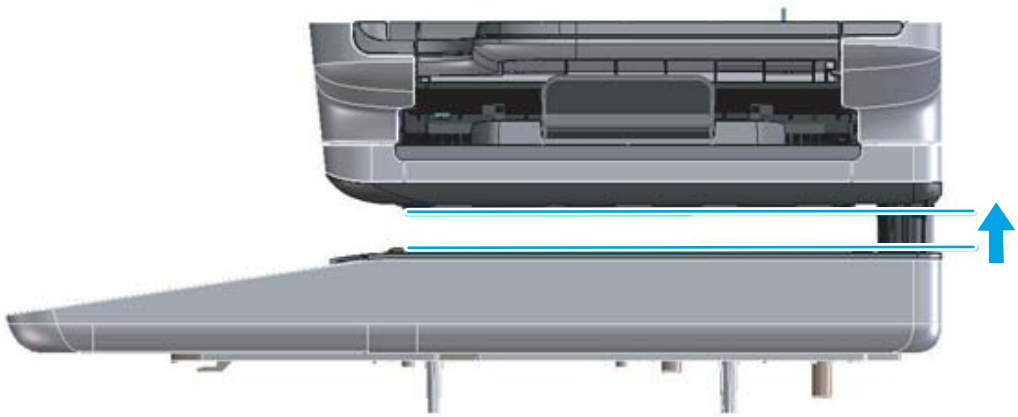
Sliding side guides on the input tray make sure that the paper stack is correctly aligned at the center of the input tray when paper is loaded in the tray. The correct position of the loaded paper is parallel with the direction of travel into the document feeder paper path.

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 the paper is driven further into the document feeder paper path.

NOTE: If the page to be copied is smaller than the minimal sliding guide setting, do not use the document feeder for the copy job. Attempting to copy too small of a page using the document feeder can result in document feeder jams and/or damage to the original page. Instead, use the flatbed glass to copy the page.

Figure 1-35 Deskew operation



Document feeder hinges

The document feeder hinges allow positioning the feeder 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 feeder is kept parallel to the scanner glass) and allows the printer to operate.

The document feeder will withstand a downward force of about 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 and causing damage or a loud noise.

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 1-36 Document feeder open (book mode)

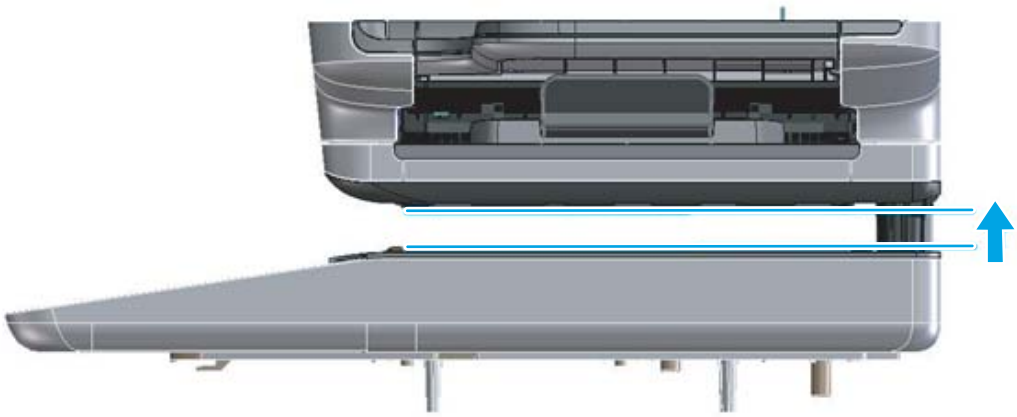


Figure 1-37 Document feeder open (60º to 80º)

Scanning and image capture system (780/785)

The scanner is a carriage-type platen scanner that includes the frame, glass, scan module, and a scan control board (SCB). The scanner has a sensor to detect legal-sized paper 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.

Fax functions and operation

The following sections describe the printer fax capabilities.

Computer and network security features

The printer can send and receive fax data over telephone lines that conform to public switch telephone network (PSTN) standards. The secure fax protocols make it impossible for computer viruses to be transferred from the telephone line to a computer or network.

The following printer features prevent virus transmission:

- No direct connection exists between the fax line and any devices that are connected to the USB or Ethernet ports.
- The internal firmware cannot be modified through the fax connection.
- All fax communications go through the fax subsystem, which does not use Internet data-exchange protocols.

PSTN operation

The PSTN operates through a central office (CO) that generates a constant voltage on the TIP and RING wires, usually 48 V. A device goes off-hook by connecting impedance, such as 600 Ω for the USA, across the TIP and RING so that a line current can flow. The CO can detect this current and send impulses like dial tones. The printer generates more signaling tones, such as dialing digits, to tell the CO how to connect the call. The printer can also detect tones, such as a busy tone from the CO, which tells it how to behave.

When the call is connected, the CO behaves like a wire connecting the sender and receiver. This is the period during which all of the fax signaling and data transfer occurs. When a call is completed, the circuit opens again and the line-current flow ceases, removing the CO connection from both the sender and the receiver.

On most phone systems, the TIP and RING signals appear on pins three and four of the RJ-11 modular jack (the one on the fax card, as defined in the common 6-wire RJ standard). These two signals do not have to be polarized because all the equipment works with TIP on one pin and RING on the other pin. This means that cables of either polarity can interconnect and still work.

These basic functions of PSTN operation are assumed in the design of the fax subsystem. The printer generates and detects the signaling tones, currents, and data signals that are required to transmit and receive faxes using the PSTN.

The fax subsystem

The MPCA, fax card, firmware, and software all contribute to the printer fax functionality. The designs of the formatter and fax card, along with parameters in the firmware, determine the majority of the regulatory requirements for telephony on the printer.

The fax subsystem is designed to support V.34 fax transmission, medium speeds (such as V.17 fax), and the lower speeds of older fax machines.

Fax card in the fax subsystem

The fax card contains the modem chipset (DSP and CODEC) that controls the basic fax functions of tone generation and detection, along with channel control for fax transmissions. The CODEC and its associated circuitry act as the third-generation silicon data access arrangement (DAA) to comply with worldwide regulatory requirements.

Safety isolation

The fax card provides safety isolation between the high-voltage, transient-prone environment of the telephone network (telephone network voltage—TNV) and the low-voltage analog and digital circuitry of the formatter (secondary extra-low voltage—SELV). This safety isolation provides both customer safety and printer reliability in the telecom environment.

Any signals that cross the isolation barrier do so magnetically. The breakdown voltage rating of barrier- critical components is greater than 5 kV.

Safety-protection circuitry

In addition to the safety barrier, the fax card protects against overvoltage and overcurrent events.

Telephone overvoltage events can be either differential mode or common mode. The event can be transient in nature (a lightning-induced surge or ESD) or continuous (a power line crossed with a phone line). The fax card protection circuitry provides a margin of safety against combinations of overvoltage and overcurrent events.

Common mode protection is provided by the selection of high-voltage, barrier-critical components (transformer and relay). The safety barrier of the fax card PCA and the clearance between the fax card and surrounding components also contribute to common mode protection.

A voltage suppressor (a crowbar-type thyristor) provides differential protection. This device becomes low impedance at approximately 300 V differential, and crowbars to a low voltage.

Data path

TIP and RING are the two-wire paths for all signals from the telephone network. All signaling and data information comes across them, including fax tones and fax data.

The telephone network uses DC current to determine the hook state of the telephone, so the line current must be present during a call. The silicon DAA provides a DC holding circuit to keep the line current constant during a fax call.

The silicon DAA converts the analog signal to a digital signal for DSP processing, and also converts the digital signal to an analog signal for transmitting data through a telephone line.

The magnetically coupled signals that cross the isolation barrier go through a transformer.

The DSP in the fax card communicates with the ASIC on the formatter using the high-speed serial interface.

Ring detect

Ring detect is performed by the line voltage monitoring module of the silicon DAA, and is a combination of voltage levels and cadence (time on and time off). Both must be present to detect a valid ring. The CODEC works with DSP and the firmware to determine if an incoming signal is an answerable ring.

Line current control

The DC current from the CO needs to have a path to flow from TIP to RING. The DC impedance emulation line modulator and DC termination modules in the silicon DAA act as a DC holding circuit, and work with the firmware to achieve the voltage-current characteristic between TIP and RING. The impedance (the current- voltage characteristic) changes in correspondence to certain special events (for example, pulse dialing or when the printer goes on-hook).

Fax page storage in flash memory

Fax pages are the electronic images of the document page. They can be created in one of three ways:

- Scanned, to be sent to another fax machine.
- Generated, to be sent by the computer.
- Received from a fax machine, to be printed.

The printer automatically stores all fax pages in flash memory. After these pages are written into flash memory, they are stored until the pages are sent to another fax machine, printed on the printer, transmitted to the computer, or erased by the user.

These pages are stored in flash memory, which is the nonvolatile memory that can be repeatedly read from, written to, and erased. The printer can have different amounts of flash memory, shared between firmware, customer settings, job storage and fax storage.

NOTE: The exact amount of flash memory depends upon the model and options of the printer.

Advantages of flash memory storage

Fax pages that are stored in flash memory are persistent. They are not lost as a result of a power failure, no matter how long the power is off. Users can reprint faxes if a cartridge runs out of ink or the printer experiences other errors while printing faxes.

The printer also has scan-ahead functionality that makes use of flash memory. Scan-ahead automatically scans pages into flash memory before a fax job is sent. This allows the sender to pick up the original document immediately after it is scanned, eliminating the need to wait until the fax transmission is complete.

Because fax pages are stored in flash memory rather than RAM, more RAM is available to handle larger and more complicated copy and print jobs.

Output accessories

- Inline finisher

Inline finisher

MPCA digital ASIC

The finisher MPCA digital ASIC contains a CPU operating at 1.2 GHz that executes firmware code that provides high-level device control. The digital ASIC uses a standard PCIe interface to pass data to the engine control ASIC.

Finisher control

The finisher controller digital ASIC receives high-level commands from the MPCA, and it then provides low-level control to the finisher mechanism. In particular, the finisher controller digital ASIC and its firmware control motors and system sensors. The finisher controller analog ASICs integrate motor drivers, voltage regulators, sensor interfaces, and supervisory circuits.

Finisher controller digital ASIC

The finisher controller digital ASIC has a high-performance 1.3 GHz ARM A7 CPU and DSP co-processors that execute firmware code to provide low-level finisher control. Depending on settings the finisher will enter Sleep mode within 60 seconds of completing the last page. In sleep mode the finisher is turned off. If a print job is received while the printer is in Sleep mode, the printer will take a short period of time to "wake up" and during this time an additional “wake up” command will be sent to the finisher. This finisher “wake up” time can take up to 10 seconds. This time will be transparent to the user as it is accomplished within the “wake up” time for the engine.

Finisher controller analog ASICs

The finisher uses four analog ASICs to generate the system voltages for the finisher, drive the finisher motors, and to control various finisher sensors for correct operation. The engine contains 16 motors:

- Eject roller motor
- Trailing edge clamp motor
- Channel X rear motor

- Channel X front motor
- End-of-sheet clamp motor
- X registration motor
- Channel lift motor
- Edge clamp motor
- Puller motor
- Front mezzanine motor
- Rear mezzanine motor
- Floor motor
- Shelf motor
- Leading edge clamp motor
- Stapler motor
- Stapler carriage motor

Inline finisher sensors

- Eject sensor
- Puller entry sensor
- Rear puller home sensor
- Front puller home sensor
- X registration sensor
- Mezzanine sensor
- Stapler motor home sensor
- Stapler staple low sensor
- Stapler staple out sensor
- Stapler door present sensor
- Stapler edge sensor
- Bin full sensor

Engine controller analog ASICs

The engine uses four analog ASICs to generate the system voltages for the engine, drive the engine motors and control various engine sensors, for correct operation. The engine contains 16 motors. One of these motors is used to divert the sheet from the engine paper path to the finisher:

- Diverter motor

Other printed circuit assemblies (PCAs)

In addition to hosting the finisher system ASICs, the finisher main printed circuit assembly (MPCA) incorporates many other circuits required to interface with sensors and other sub-system components. In some cases, this circuitry is located on a smaller remote PCAs (SLBs) to optimize cable interconnects. The following table lists the various PCAs in the finisher mechanism/MPCA:

PCA name	Description/function
Stapler stacker top left PCA	Distribution
Distribution channel PCA	Distribution
LED bin illumination PCA	LED board
Bin full sensor PCA	Bin full
Stapler stacker rear channel PCA	Distribution
Stapler stacker top right PCA	Distribution
Media path PCA	Distribution
Bin empty infrared PCA	Bin empty
Stapler stacker staple carriage PCA	Distribution and edge sensing
HE1 stapler door	Stapler door sensing
Stapler stacker front channel ground PCA	Grounding path for front and rear channels (2 boards)

Power supply

The finisher does not have a separate power supply (the engine supplies all finisher power requirements).

Cabling system

The printer cabling system includes both discrete cables and flat-flexible conductor (FFC) cables.

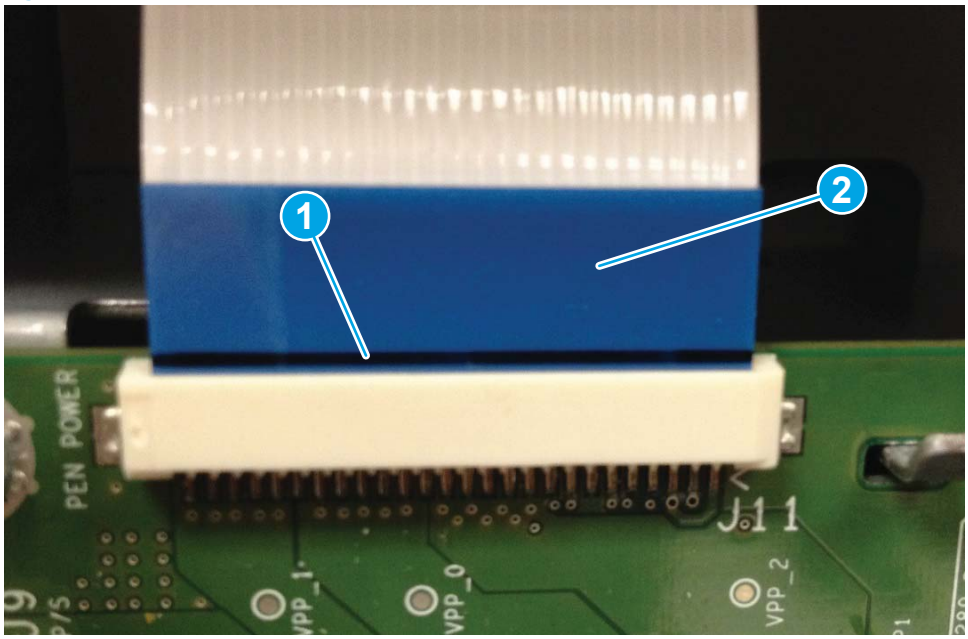
⚠ CAUTION: Cables and printed circuit assemblies (PCAs) are sensitive to electrostatic discharge (ESD). If an ESD workstation or mat is not available, touch the sheet-metal chassis to provide a static ground before touching an ESD-sensitive assembly. Protect the ESD-sensitive assemblies by placing them in ESD pouches when they are out of the printer.

Flat Flexible Cables

The printer flat flexible cables (FFCs) have several standard attributes.

- Each end of the cable has a contrasting color line (callout 1) that shows the shape and depth of insertion into the PCA connector. Each end of the cable has a support tape (callout 2), typically blue, on the non-conductor side.

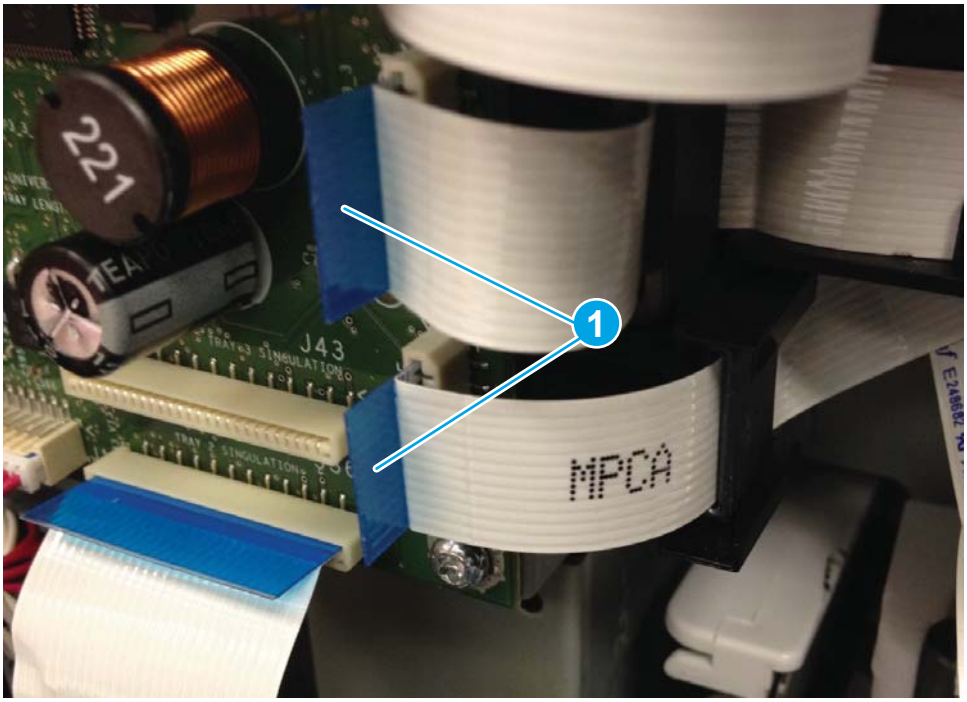
Figure 1-38 FFC insertion line



- Each end of the FFC has a support tape (typically blue) on the non-conductor side.

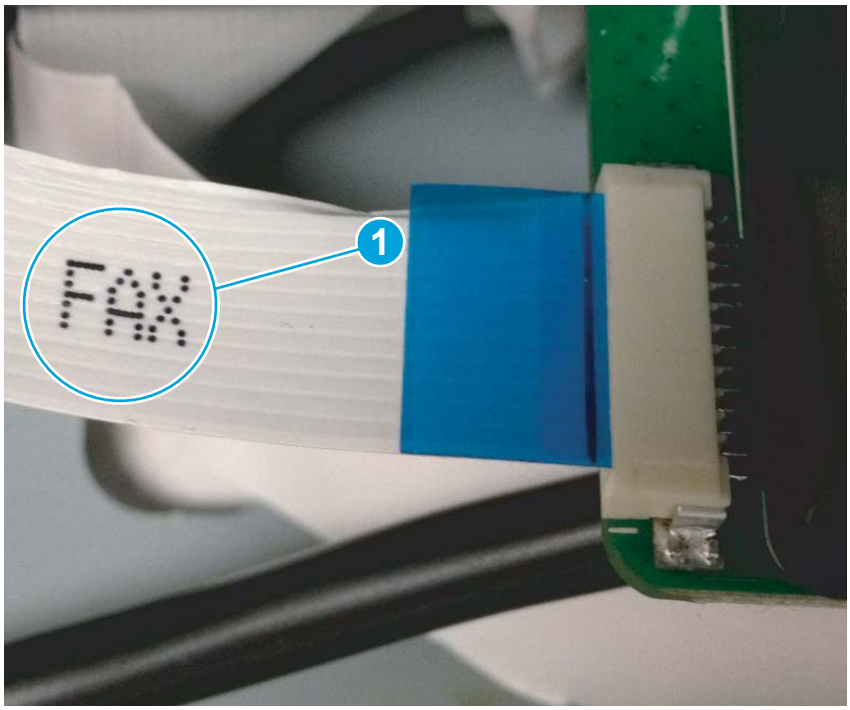
  The support tape usually has a free region (callout 1) for use as a handle to insert and remove the cable.

  Figure 1-39 FFC support tape

- Some FFCs have a label printed on them that shows the function or the corresponding connector number.

  Figure 1-40 FFC label

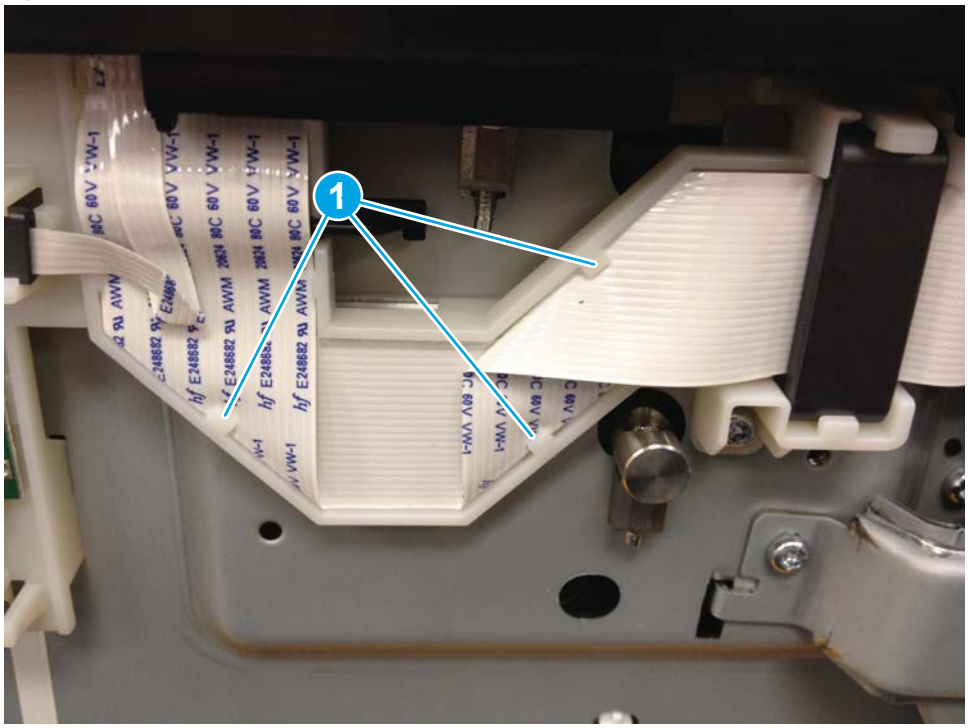
  

FFC routing

The printer FFCs are routed using a set of common retaining methods.

- Hook arms (callout 1) retain the edges of the FFCs. Installation and removal involves sequentially positioning and releasing the FFC edges under the hooks.

Figure 1-41 FFC hook arm retainers

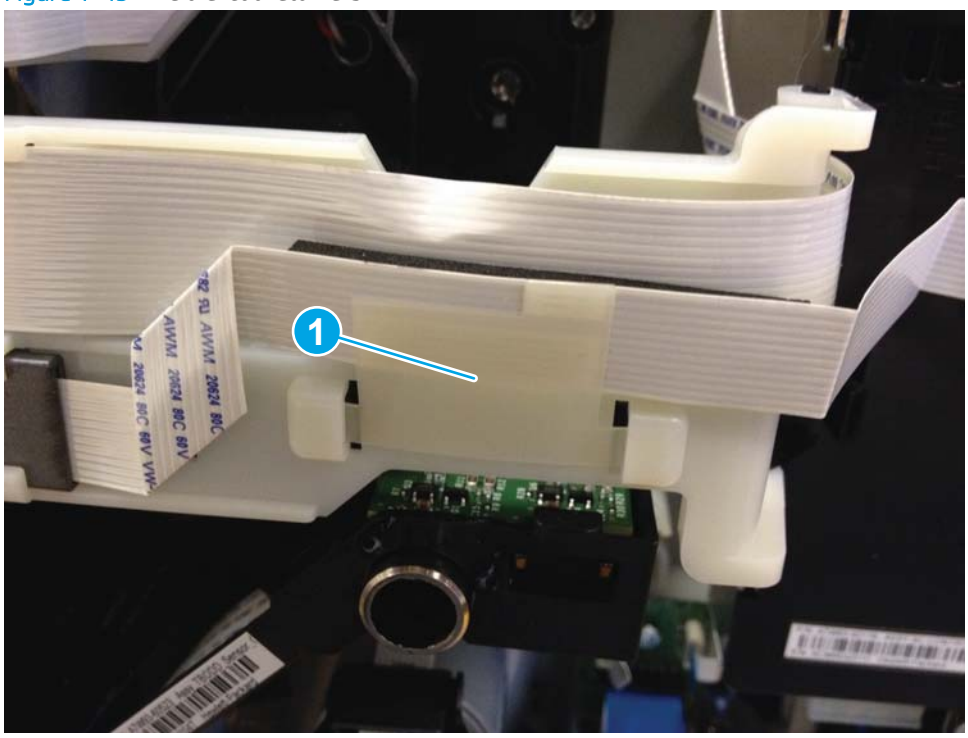


- Pill bumps also retain the edges of the FFCs. The FFC is pressed down against the plastic mount until the edges are positioned under the bumps. Removal involves lifting the FFC out of the bumps.

Figure 1-42 FFC pill bump retainers

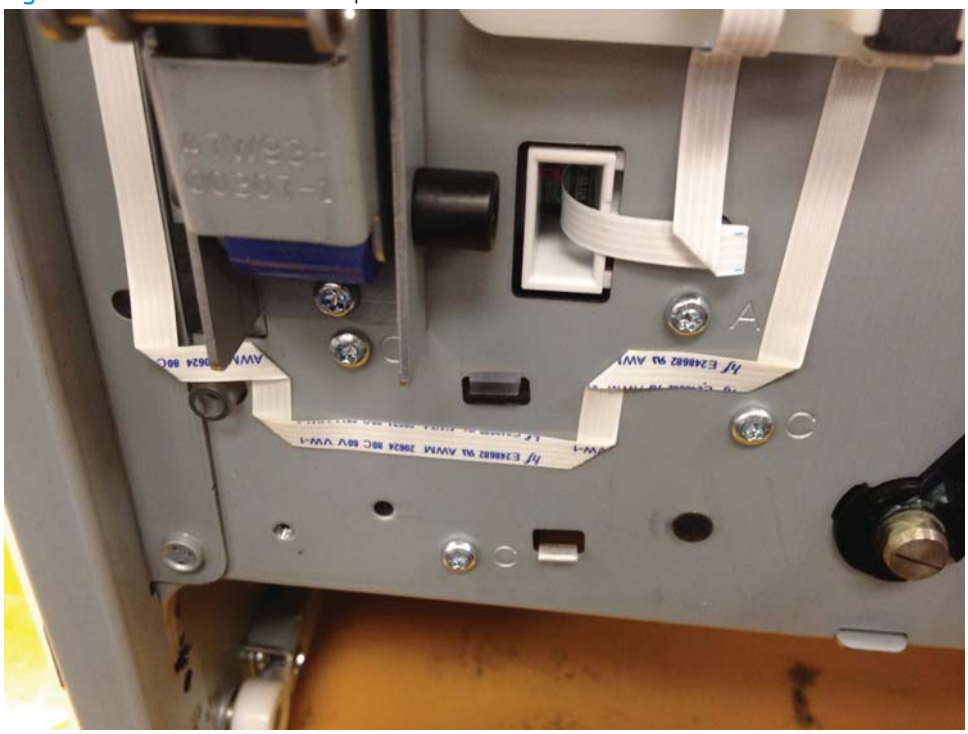
- Die-cut pieces (callout 1), adhered to FFCs and hooked into plastic mounts, are used to prevent wear in regions where vibration or motion might damage the FFC.

Figure 1-43 FFC die-cut retainers



- Double-sided-tape (DST) is used to secure FFCs directly to a sheet-metal or plastic part. This is a special case, acceptable only for some simple electrical circuits, due to EMC or EMI risks.

Figure 1-44 FFC double-sided tape retainer



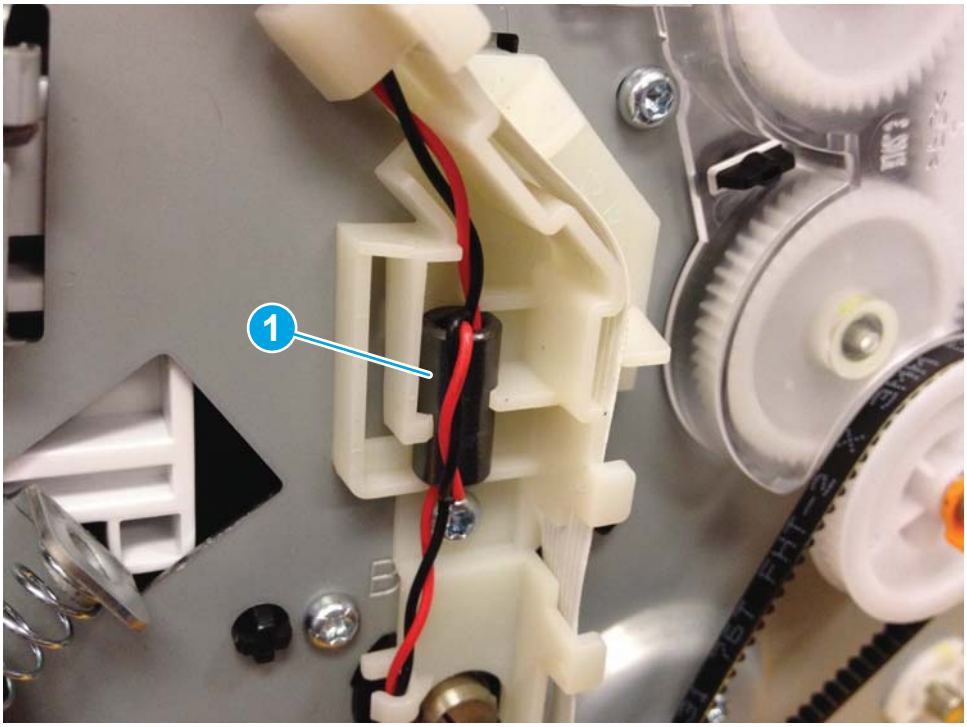
Discrete cables

NOTE: Remove discrete cable connectors by grasping the connector body rather than pulling on the wires.

The printer discrete cables share many standard attributes.

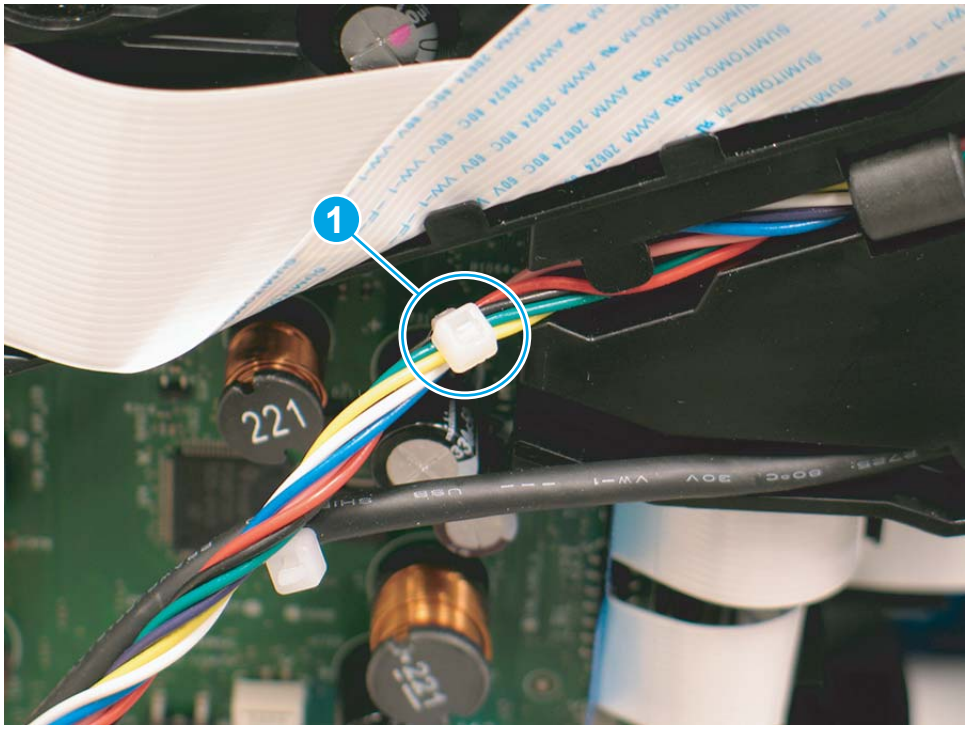
- Ferrites (callout 1) might be located in a stationary location or slide freely along the wires.

Figure 1-45 Discrete cable ferrite



- Tie-wraps (callout 1) constrain the wire bundle and the define position for installation.

Figure 1-46 Discrete cable tie-wraps

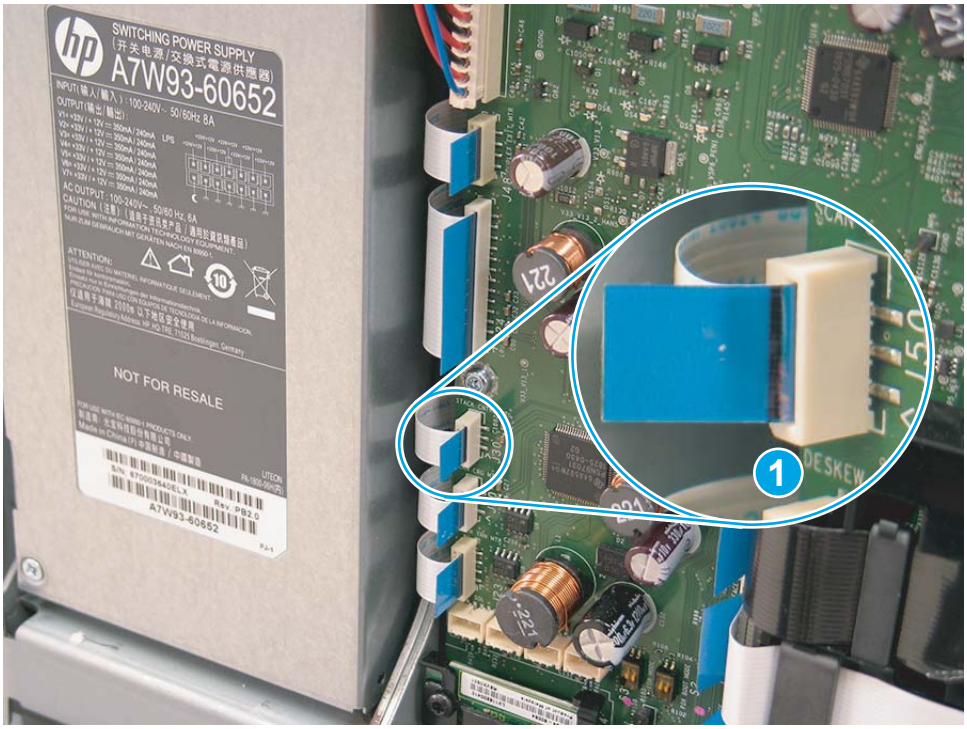


Connectors

FFC connectors on PCAs are oriented so the installation line is visible when holding the blue support handle.

NOTE: When correctly installed, the installation line is parallel to the edge of the connector body (callout 1).

Figure 1-47 Connectors



Ferrites

The printer cabling system includes many ferrites to enable proper EMC/EMI performance for regulatory agencies. All ferrites on FFCs and discrete cables must be included and located in the intended position to make sure performance matches the tested behavior.

⚠ CAUTION: Ferrites are fragile. Use care when removing or installing them.

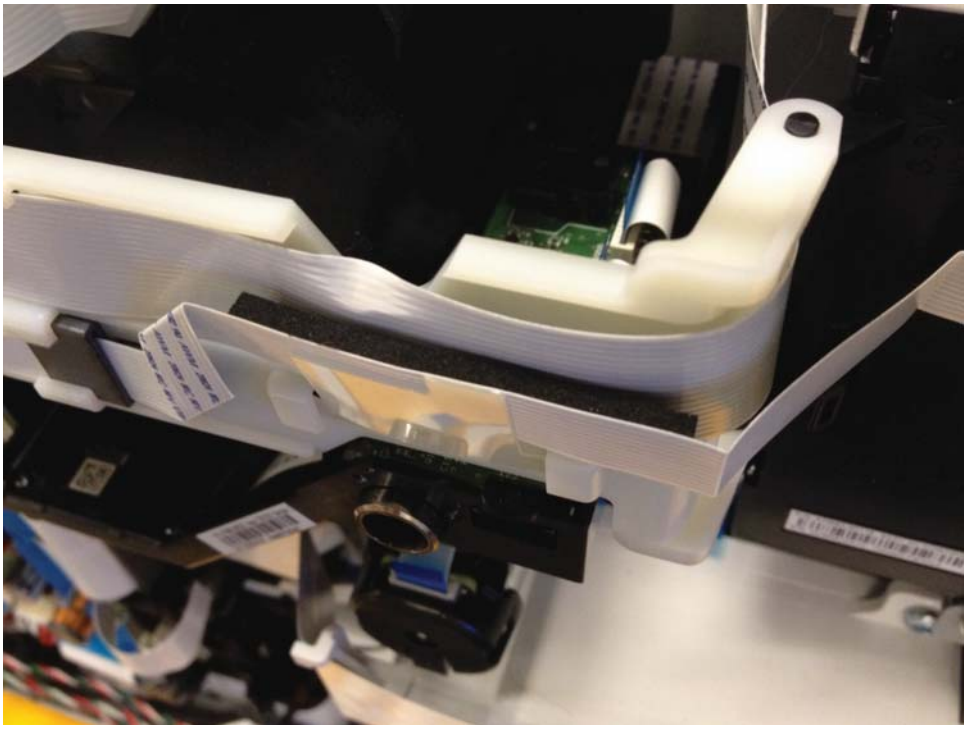
Cable management

The printer cabling system uses several distribution PCAs to connect many sensors and motors to the main PCA (MPCA) in a controlled manner. One FFC delivers signals, power, and ground lines from the MPCA to the distribution PCA. Then FFCs connect from the distribution PCA to individual components. The printer has several rooftop modules that integrate to the common engine. Cable routing of the different rooftops to the MPCA creates the top layer of cable routing in the rear region.

Spacing

Proper spacing is required between FFCs to prevent crosstalk, maintain signal integrity, and perform to EMC/EMI expectations. The printer cables utilize plastic mounts, die-cut spacers adhered to FFCs, and foam adhered to FFCs to maintain spacing to other FFCs or sheet-metal components. All spacing must be maintained for proper performance.

Figure 1-48 FFC spacing



Electrostatic discharge prevention

Electrostatic charge might build up on plastic and metal surfaces due to tape removal, dry conditions, or other causes. Exposing the conductors at the ends of FFCs and discrete cables to these surfaces might cause electrostatic discharge (ESD) and damage the cables.

Inline finisher paper-handling system

The following diagram describe the inline finisher hardware design.

Figure 1-49 Inline finisher control diagram (front)

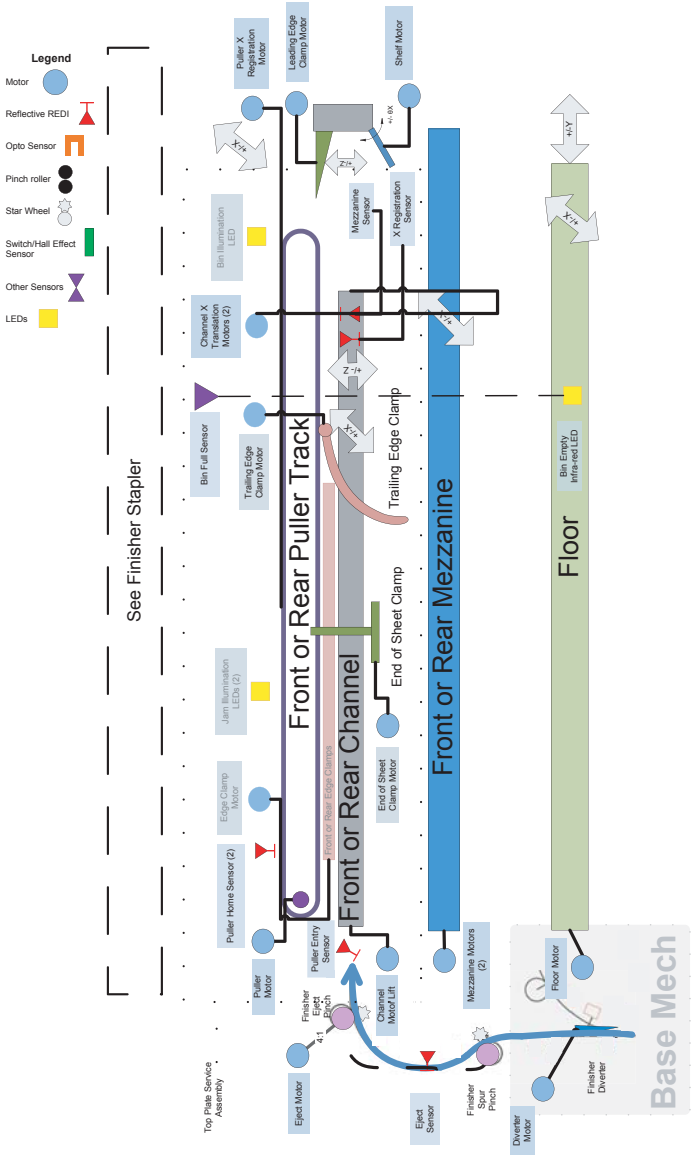


Figure 1-50 Inline finisher sensor control diagram (front)

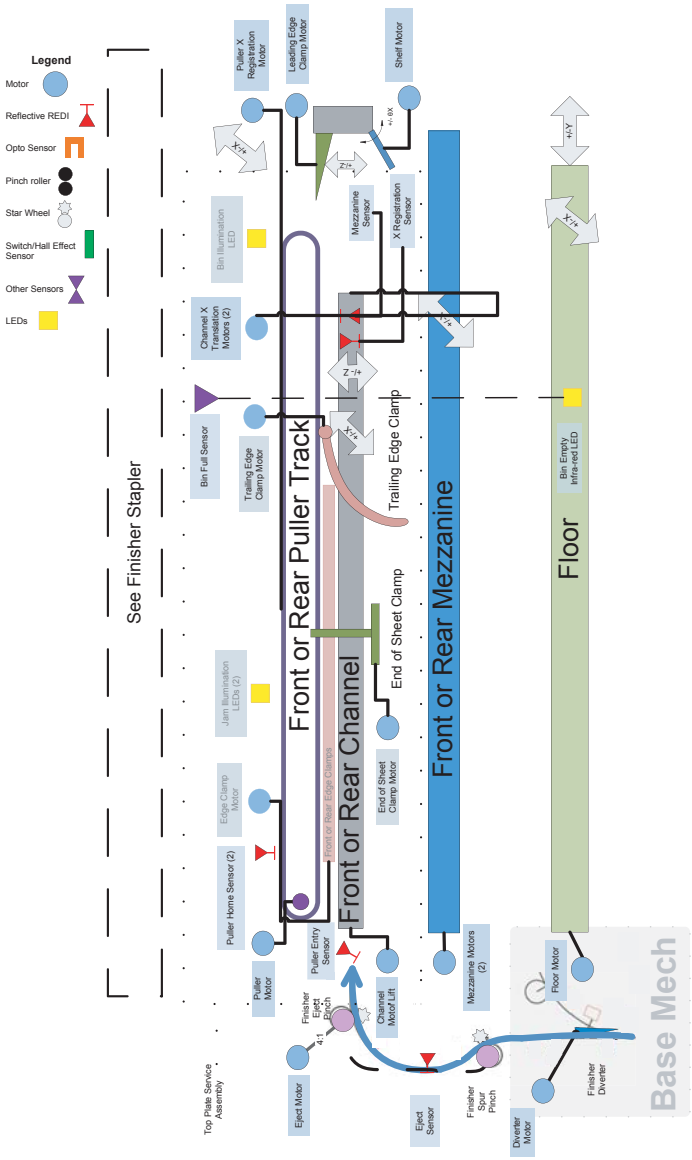


Figure 1-51 Inline finisher motor control diagram (front)

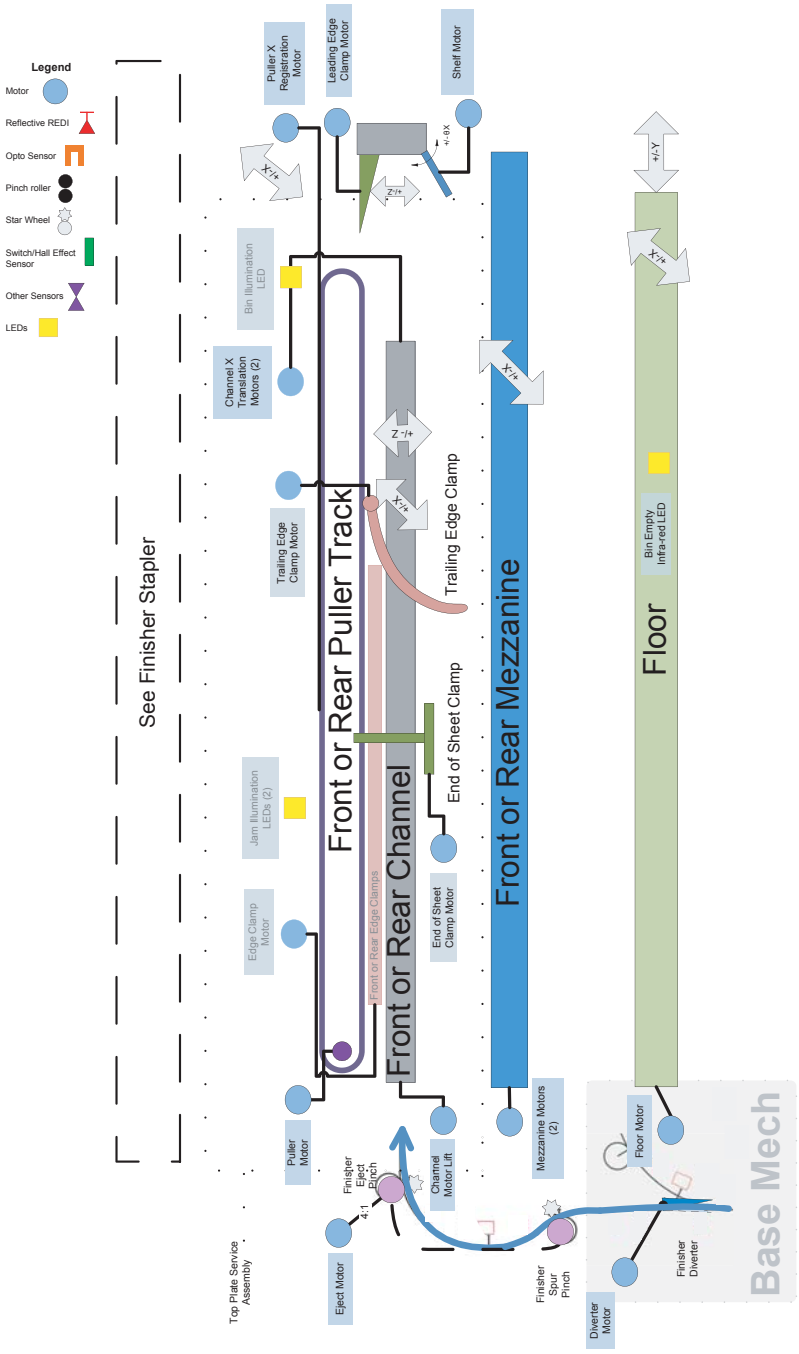


Figure 1-52 Inline finisher sensor diagram (1 of 2)

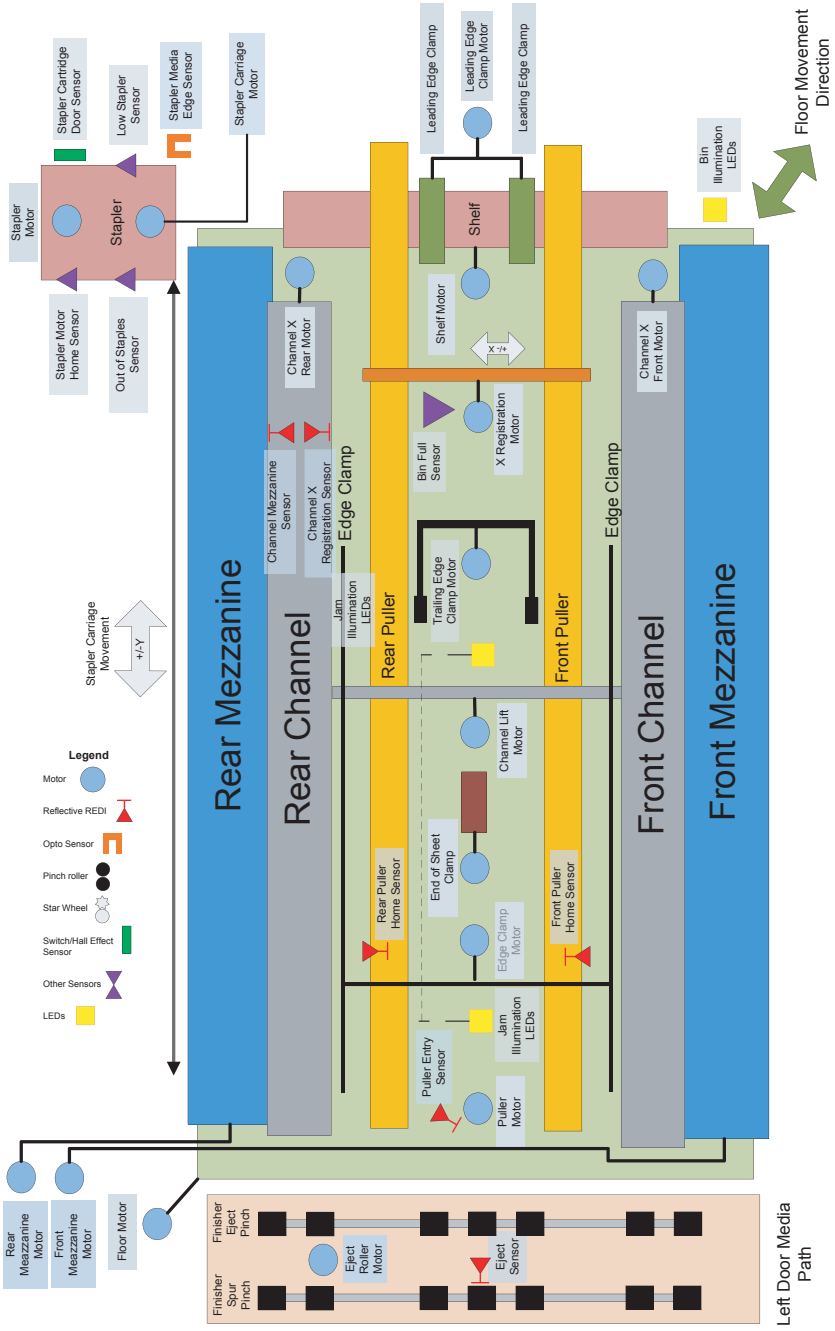


Figure 1-53 Inline finisher sensor diagram (2 of 2)

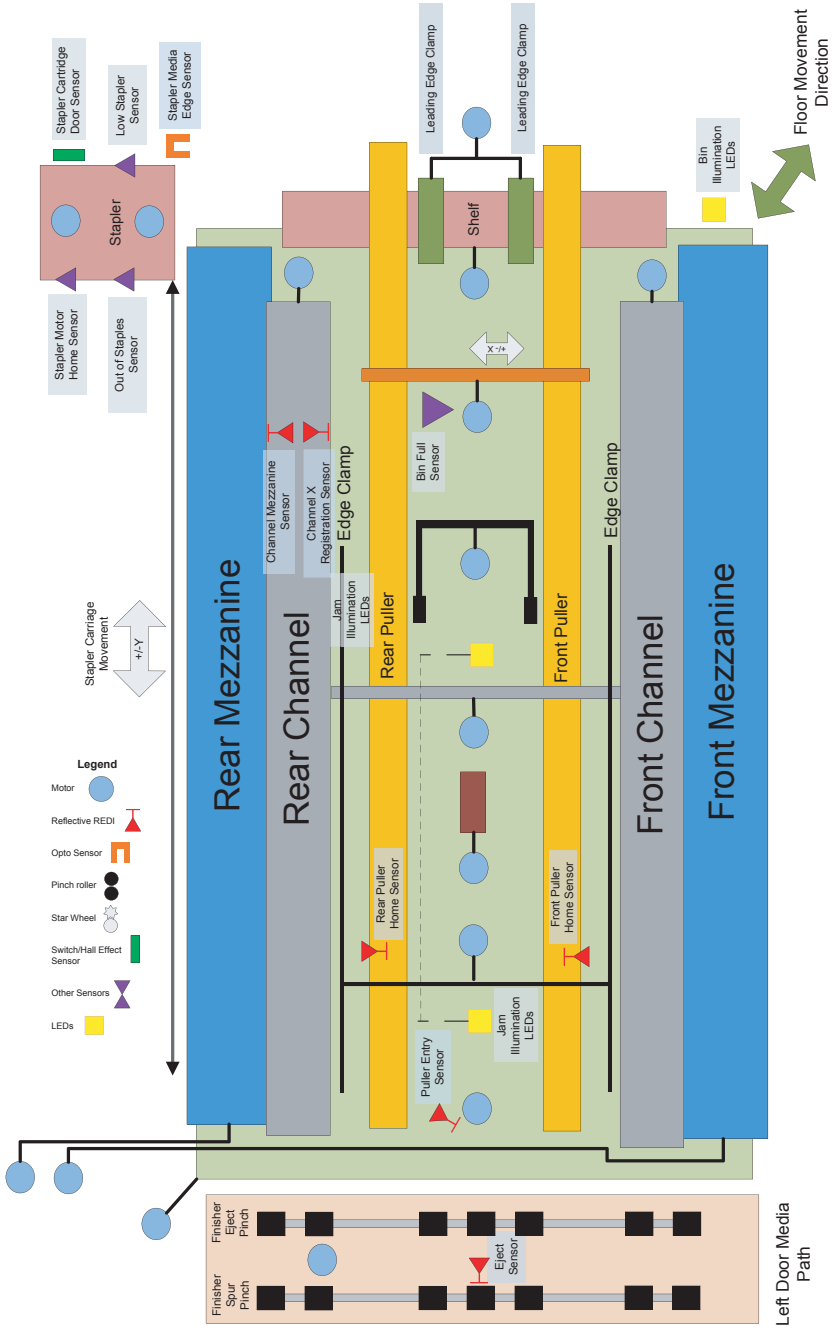


Figure 1-54 Inline finisher motor diagram

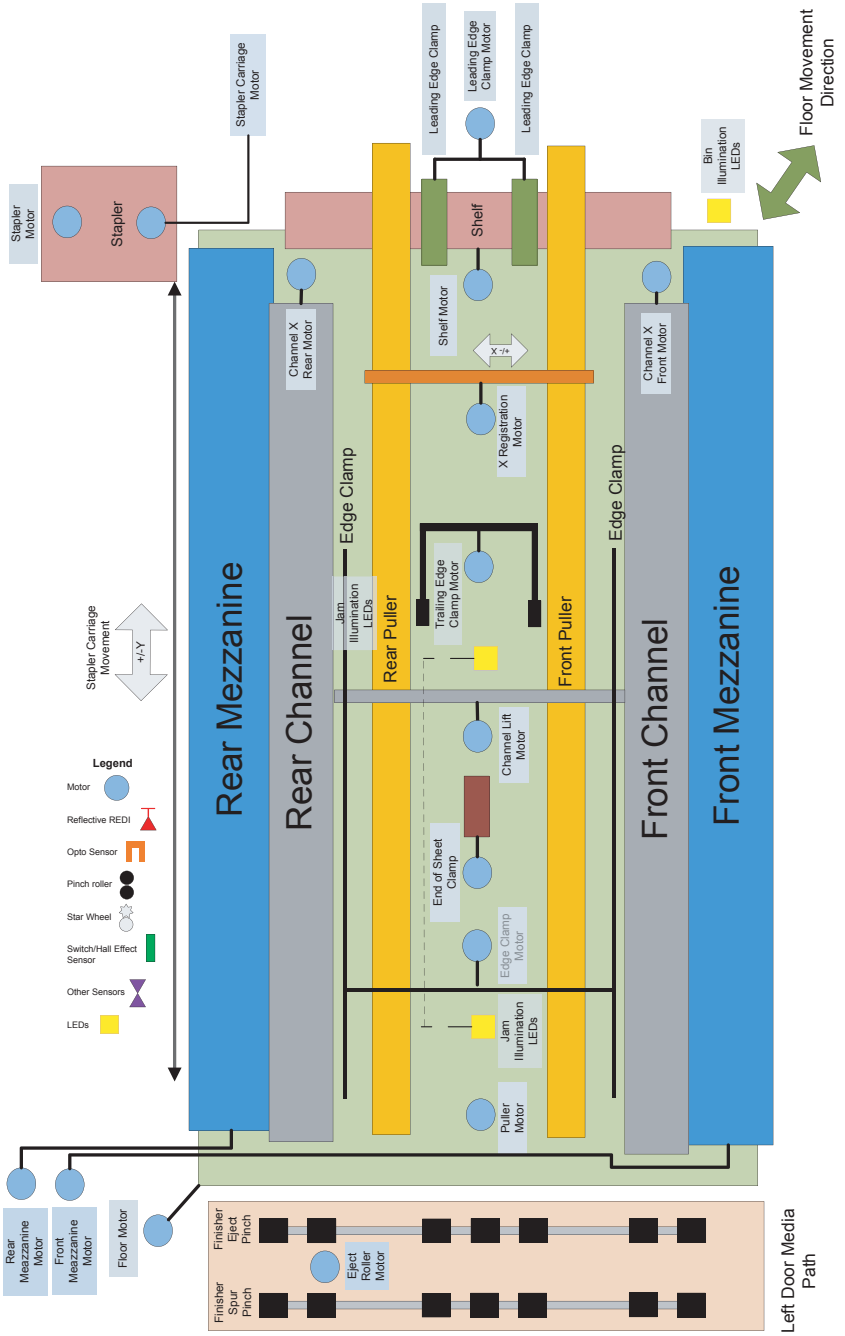


Figure 1-55 Inline finisher stapler control diagram

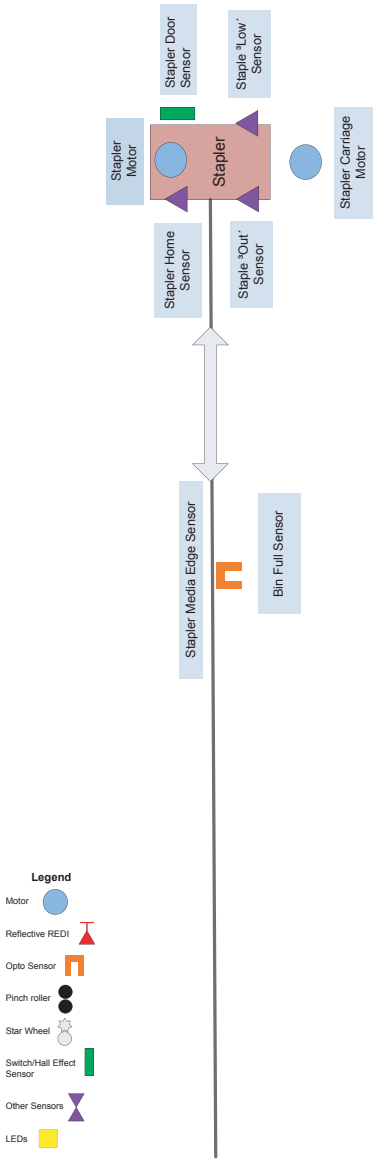


Figure 1-56 Inline finisher stapler sensor diagram

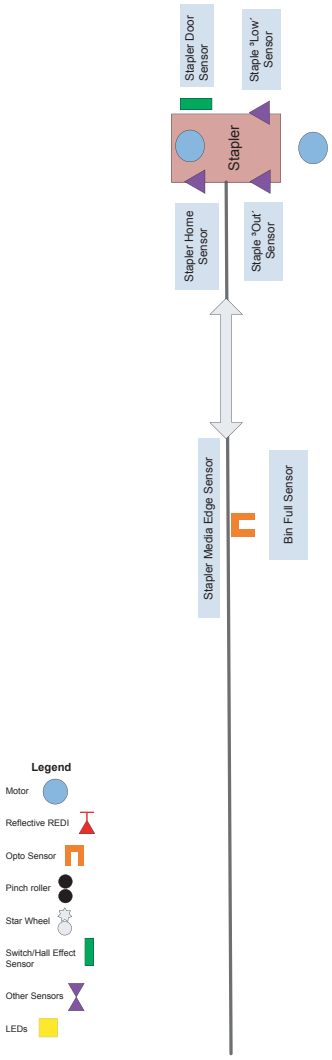
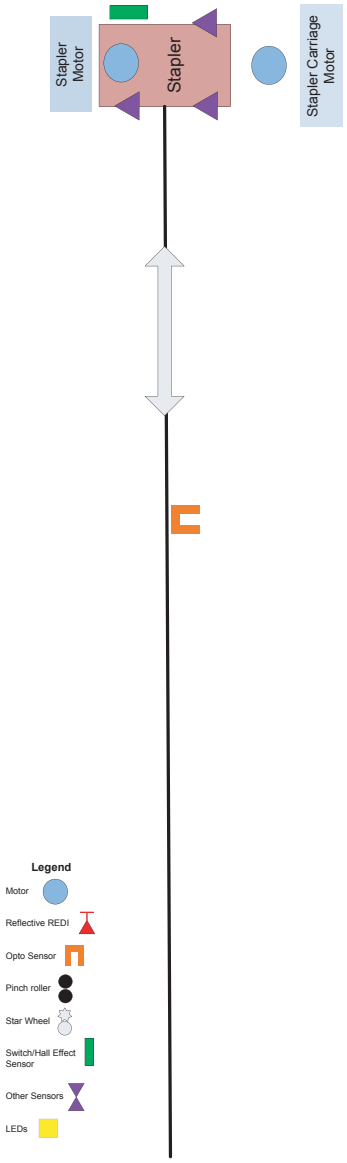


Figure 1-57 Inline finisher stapler motor control diagram



Inline finisher operation

The basic operation of the finisher is to accept pages of a supported size and orientation and modify their positions in both X and Y orientation to build a neat and orderly stack. The finisher supports stacks that are stapled or not stapled and outputs them in either an offset or non-offset position. Once the job is dropped onto the output floor, the floor presents the job to the user. The finisher only accepts the following media sizes and orientations:

NOTE: The finisher cannot process print jobs that contain mixed media sizes or orientations within a single job.

- Letter long edge feed (landscape)
- Letter short edge feed (portrait)
- A4 long edge feed (landscape)
- A4 short edge feed (portrait)
- Legal short edge feed
- Ledger (11x17) short edge feed
- A3 short edge feed

Print job processing

The following list summarizes inline finisher print job processing:

- Job preparation
- Media transport
- Media registration
- Job completion (with or without stapling)

Job preparation

Job preparation involves moving the media handling components of the finisher into the correct location for the specific size and orientation of the media required for the print job.

This involves moving the media puller clamps into the media “receive” position, the media transport channels to the required width and height of the incoming sheet, and the mezzanines to the correct width to support the sheets during accumulation.

Media transport

Media transport is the moving of each piece of media from the engine to the finisher. This process starts with the directing of the media to the finisher by the finisher diverter (located in the left door extension).

The media is transported two sets of drive/roller star wheels (the finisher spur pinch and the “finisher eject pinch). The eject sensor monitors the projected leading edge of the sheet to the actual edge and declares a jam if either the leading edge arrives too soon or too late. In addition, the sensor also monitors the trailing edge and reports a jam if the correct timing is not met.

After the finisher eject pinch wheels, the method of transport changes from pinch rollers to puller clamps attached to belts. The puller entry sensor provides the media leading edge position input to achieve this transition at engine print speed. The puller clamps are guided in two tracks and are moved in the paper feed direction by a set of belts. The clamps open as they are moved around the “turn” on either end of the track.

The puller clamps contain a set of rollers that form a pinch to hold the leading edge of the sheet when the clamp moved past the turn and is closed. The puller clamps are placed in the receive (open) position as part of job preparation. As the media enters the open clamps they are moved in the transport direction closing the clamps and pinching the sheet. The clamps then transport the media from the receive position to the registration position.

To increase throughput the puller system can increase the transport speed beyond the engine print speed. During this transport the front and rear edges of the sheet are constrained in the front and rear channels to separate the incoming media from the existing registered sheets to improve jam performance and job quality.

Media registration

Media registration involves measuring the position of the rear edge of the sheet being transported using the X registration sensor and placing each sheet in the correct position to build a well-defined neat and orderly stack.

This movement is accomplished by the X registration system that can shift the puller tracks in the X direction. After the movement to achieve the correct X position is completed the channels are moved outward to release the sheet and the media is advanced in the feed direction until the leading edge contacts a set of four Y registration walls.

When the media edge contacts the walls any remaining media skew is removed. After initial contact with the walls the media is in a pre-strip position; at this time the trailing edge clamps (TEC) are lowered to hold the media in the registered position.

After the TEC puller clamps are lowered the puller clamps continue to move in the transport direction, with the media motion stopped by the walls the sheet is pulled out of the pinch rollers in the puller clamps. With the leading edge of the media released from the puller clamp the leading edge clamp (LEC) closes and pinches the stack to maintain registration during the processing of the next page.

After the LEC are closed the edge clamps (EC) are lowered to control edge curl on the front and rear edges of the stack. This active control of the leading and side edges of the sheet improves handling performance and lowers the potential for jams. Larger format media sizes (legal, ledger, and A3) required the use of an end of sheet clamp (EoSC) to further control the trailing edge of the sheet. This process of sheet registration in both the X and Y directions is repeated until the entire job has been processed.

Job completion

Job completion is the process of transporting the completed job to the stapler module (if required) and dropping the stack onto the moving output floor.

Job completion with stapling

- If the job is to be stapled the TEC, LEC, EC, and EoSC are raised and the mezzanines move the accumulated stack to the stapler module.

  The stapler module is attached to a carriage system that can move the stapler the entire the length of the back edge of the stack to allow stapling in a variety of corner positions. As the stack enters the stapler module the stapler media edge sensor detects the edge of the stack to ensure the correct corner placement of the staple. After the stapling process is complete, the moving output floor is positioned to the correct offset location (if offset is desired) and then stapled job is transported to the drop position. At the drop position the LEC is closed the mezzanines are moved outward and the shelf is opened.

  This sequence of motions drops the completed stack in a controlled fashion onto the output floor. After the job has been dropped and if there are no additional finisher jobs the output floor will be extended to present the output to the user.

Job completion without stapling

- If the job is not stapled the TEC, EC and EoSC are raised, but, the LEC remains pinched.

  The moving output floor is positioned to the correct offset position (if offset is desired) the mezzanines are moved outward and the shelf is opened.

  This sequence of motions drops the completed stack in a controlled fashion onto the output floor. After the job has been dropped and if there are no additional finisher jobs the output floor will be extended to present the output to the user.

Jetlink communication

Communication between the engine and the finisher is accomplished through a communication protocol called Jetlink.

The engine communicates using high level commands that define the attributes of the job (size, orientation, media type, stapled, staple position, offset, etc.). Once this definition is complete, the finisher operates independently processing each sheet and the requested specific job completion tasks.

Jam detection

The printer uses sensors to detect and report printer jams.

Jam detected during initialization

When the finisher power is turned on, the following (REDI or Opto) sensors are checked to identify if paper was left in the paper path when the finisher was previously shutdown:

- Eject sensor (REDI)
- Puller entry sensor (REDI)
- X registration sensor (REDI)
- Stapler media edge sensor (Opto)

If any of the above sensors indicate paper presence, the finisher reports a power on jam to the engine.

Jam detected during print

The finisher detects paper jams that occur when a door is opened while printing or when paper jams in the paper path.

Door open jams while printing

If the stapler cartridge door is opened while the finisher is processing a job, the following sequence of events occurs:

- The engine stops picking pages.
- The finisher receives and registers all picked pages
- The pages are dropped to the finisher floor.
- The stapler moves the carriage to the customer access area.

This condition is detected and reported when the door Hall Effect sensors indicate the door has been opened, and the finisher is processing a job. When the stapler door is closed the following sequence of events occurs:

- The finisher verify that the door is closed.
- The engine picks and prints pages remaining in the job.
- The finisher receives and registers the remaining pages.
- The pages are dropped on top the previously dropped pages (with zero offset).

NOTE: If the cartridge door (printer) is opened during print operation, the printer will complete printing any pages which have been successfully picked and then halt, waiting for the front door to be closed. A jam is not reported for this condition.

Paper path jams while printing

REDI sensors detect paper movement through the paper path during printing. If paper fails to arrive or leave a given sensor position at the expected time, then a paper jam is reported. Paper path jams are entered into the event log and an error message appears on the control-panel display.

The following inline finisher uses the following paper path REDI sensors:

- Eject sensor
- Puller entry sensor
- X registration sensor
- Stapler edge detect sensor

Jam event codes

When a paper jam is detected, a jam condition is recorded as an event code and/or a message appears on the control-panel display.

For instructions about clearing specific jams in the finisher, see the Clear jams section in the printer troubleshooting manual.

Event code and control-panel message descriptions and solutions are provided in a separate Control Panel Message Document (CPMD).

The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko

- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Motor stalls

When a motor stops unexpectedly, a motor stall condition is reported.

Motor stalls are uniquely identified by a different event code (indicating a stall occurred as opposed to a paper jam). The control panel messaging and recovery behavior of stall events are similar to paper jams (in most cases).

2 Solve problems

Problem-solving checklist

Follow these steps when trying to solve a problem with the printer.

- Step 1: Check that the printer power is on
- Step 2: Check the control panel for error messages
- Step 3: Test print functionality
- Step 4: Test copy functionality (MFP models only)
- Step 5: Test the fax sending functionality (785f/785zs/785z+)
- Step 6: Test the fax receiving functionality (fax models only)
- Step 7: Try sending a print job from a computer
- Step 8: Test the Plug and Print USB Drive printing functionality
- Factors that affect printer performance

Step 1: Check that the printer power is on

1. Make sure that the printer is plugged in and turned on. The power button should be lit with a white light. If it is not, press the power button. If the power button does not light up, check the following conditions.

   NOTE: When the printer power is off, press the power button. If it shows an amber light, the printer power supply is correctly functioning.

   - Make sure that the power cable is connected to the printer and the outlet.
   - Check the power source by connecting the power cable to a different outlet.

2. If the printer motors do not rotate make sure that the cartridges are installed and that the doors are all closed. The control panel displays messages to indicate these problems.
3. MFP models only: If the document feeder motor does not rotate, open the document feeder cover and remove any packing material or shipping tape.
4. MFP models only: If the scanner bulb does not light during copying, scanning, or faxing, see the Power subsystems section in the printer troubleshooting manual.

Step 2: Check the control panel for error messages

The control panel should indicate ready status. If an error message appears, resolve the error.

IMPORTANT: The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Step 3: Test print functionality

1. From the control panel Home screen, scroll to and select Reports.
2. Select Configuration/Status Pages.
3. Select the Configuration Page, and then select Print.
4. If the report does not print, make sure that paper is loaded in the trays, and check the control panel to see if paper is jammed inside the printer.

NOTE: Make sure that the paper in the tray meets specifications for this printer.

Step 4: Test copy functionality (MFP models only)

1. Place the configuration page into the document feeder and make a copy. If paper does not feed smoothly through the document feeder, you might need to clean the document feeder rollers and separation pad. Make sure that the paper meets specifications for this printer.
2. Place the configuration page on the scanner glass and make a copy.
3. If the print quality on the copied pages is not acceptable, clean the scanner glass and the small glass strip.

Step 5: Test the fax sending functionality (785f/785zs/785z+)

1. From the control panel Home screen, scroll to and then select Support Tools.
2. Select Troubleshooting.
3. Select Diagnostics Tests.
4. Select Run Fax Test to test the fax functionality.
5. Wait for the printer to check fax functionality. When the test is complete, a fax test report prints. If the test fails, follow the instructions on the report page to solve the problem.

Step 6: Test the fax receiving functionality (fax models only)

1. Use another fax machine to send a fax to the printer.
2. Review and reset the printer fax settings.

Step 7: Try sending a print job from a computer

1. Use a word-processing program to send a print job to the printer.
2. If the job does not print, make sure that you selected the correct printer driver.
3. Uninstall and then reinstall the printer software.

Step 8: Test the Plug and Print USB Drive printing functionality

1. Load a .PDF document or .JPEG photo onto a USB flash drive, and insert it in the USB port.
2. The message USB drive detected appears at the top of the control panel display.
3. Select Print.
4. Select Print from USB drive.
5. Select Choose to display a list of available files on the USB drive.

NOTE: If no documents are listed, try a different type of USB flash drive.

6. Select a file, and then select Print.
7. After the file prints, select the Back Arrow to return to the Print screen, or select Home to return to the printer home screen.

Factors that affect printer performance

Several factors affect the time it takes to print a job:

- The software that you are using and its settings
- The use of special paper (such as heavy paper or custom-size paper)
- Printer processing and download time
- The complexity and size of graphics
- The speed of the computer you are using

- The USB or network connection
- How much ink must be used to print the page
- The type of USB drive, if you are using one
- Environmental factors, such as low temperature or high humidity

Troubleshooting process

Determine the problem source

When the printer malfunctions or encounters an unexpected situation, the printer control panel might display an error message. This section contains a pre-troubleshooting checklist to filter out many possible causes of the problem. A troubleshooting flowchart helps to 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?

NOTE: HP consumable and maintenance kit life specifications are estimations. Actual individual life or yield during normal use will vary depending on usage, environment, media, and other factors. Estimated life is not an implied warranty.

  - Service fluid container (W1B44 / A7W93-67081): estimated life is 150,000 cycles.
  - Print head wiper (W1B43 / A7W93-67080): estimated life is 150,000 cycles.
  - Tray rollers (550-sheet feeders) (W1B45 / A7W93-67082): estimated life is 150,000 cycles.
  - **MFP only**: Document feeder (ADF) roller kit (J8J95A / 5851-7202): estimated life is 150,000 cycles.
- Are supply items Genuine HP supplies?
- Does the printer status 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 to follow that quickly isolate and solve printer hardware problems.

Each row depicts a major troubleshooting step. A “yes” answer to a question indicates that proceeding to the next major step is the correct action. 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.

HP Web-based Interactive Search Engines (WISE)

The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search by printer name.

- AMS
  - https://support.hp.com/wise/home/ams-en
  - https://support.hp.com/wise/home/ams-es
  - https://support.hp.com/wise/home/ams-pt
- APJ
  - https://support.hp.com/wise/home/apj-en
  - https://support.hp.com/wise/home/apj-ja
  - https://support.hp.com/wise/home/apj-ko
  - https://support.hp.com/wise/home/apj-zh-Hans
  - https://support.hp.com/wise/home/apj-zh-Hant
- EMEA
  - https://support.hp.com/wise/home/emea-en

Table 2-1 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 98.
	Yes ↓	No →	After the control-panel display is functional, see step 2.
2 **Control-panel messages**	Does an error message appear on the control panel display?		After the errors have been corrected, go to step 3. See the control-panel messages document (CPDM) for this printer.
	Yes ↓	No →	**IMPORTANT:** The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engine (WISE). See HP Web-based Interactive Search Engines (WISE) on page 97.

Table 2-1 Troubleshooting flowchart (continued)

<table>
<tr><td rowspan="3">3

Event log</td><td colspan="2">Open the Support Tools Troubleshooting sub menu and print an event log to see the history of errors with this printer.

Does the event log print?</td><td rowspan="3">If the event log does not print, check for error messages. See the control-panel messages document (CPDM) for this printer.

IMPORTANT: The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engine (WISE). See HP Web-based Interactive Search Engines (WISE) on page 97.

If paper jams inside the printer, clear the jam. See the clear paper jams section of the printer troubleshooting manual.

After successfully printing and evaluating the event log, see step 4.</td></tr>
<tr><td>Yes ↓</td><td>No →</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="3">4

Information pages</td><td colspan="2">Open the Reports menu and print the printer status pages to verify printer information and printhead information.

Are all the accessories installed?</td><td rowspan="3">Evaluate the printer status pages.

After evaluating the printer status pages, see step 5.

NOTE: Resolve any problems found by evaluating the status page. IF the printer problem is resolved, the troubleshooting process is complete.</td></tr>
<tr><td>Yes ↓</td><td>No →</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="3">5

Print quality</td><td colspan="2">Does the print quality meet the customer's requirements?</td><td rowspan="3">Open the Support Tools Troubleshooting Print Quality Pages sub menu and print a print quality report. Follow the instructions on the report page.

Compare the customer's images with the print quality section of the printer troubleshooting manual.

After the print quality is acceptable, see step 6.</td></tr>
<tr><td>Yes ↓</td><td>No →</td></tr>
<tr><td></td><td></td></tr>
<tr><td rowspan="3">6

Interface</td><td colspan="2">Can the customer print successfully from the host computer?</td><td rowspan="3">Verify that all I/O cables are connected correctly and that a valid IP address is listed on the printer status page.

If error messages display on the control panel when you try to print an event log, see the control-panel messages document (CPDM) for this printer.

IMPORTANT: The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engine (WISE). See HP Web-based Interactive Search Engines (WISE) on page 97.

When the customer can print from the host computer, this is the end of the troubleshooting process.</td></tr>
<tr><td>Yes. This is the end of the troubleshooting process.</td><td>No →</td></tr>
<tr><td></td><td></td></tr>
</table>

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.

NOTE: When printer power is off, briefly push in on the power switch. If it lights up amber, the power supply is correctly functioning.

If the control-panel display remains blank, perform power-on checks to find the cause of the problem.

Power-on troubleshooting overview

Various sounds should be heard during normal startup.

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. It should be illuminated white.
3. Make sure that the power supply is operational. With the printer power off, briefly push in on the power switch. If it lights up amber, the power supply is correctly functioning.
4. Check the control-panel connectors at the control-panel end and the formatter.
5. Make sure the power switch is in the on position, and then verify that the heartbeat LED on the formatter is illuminated and/or blinking.
6. Remove any external solutions, and then try to turn the printer on again.

   Check the main PCA (MPCA) and formatter heartbeat LEDs for correct functionality (see the following figures and tables).

NOTE: The MPCA in the printer appears slightly different than the one shown in this section. However, the operation described below is valid for this printer.

Figure 2-1 MPCA LEDs

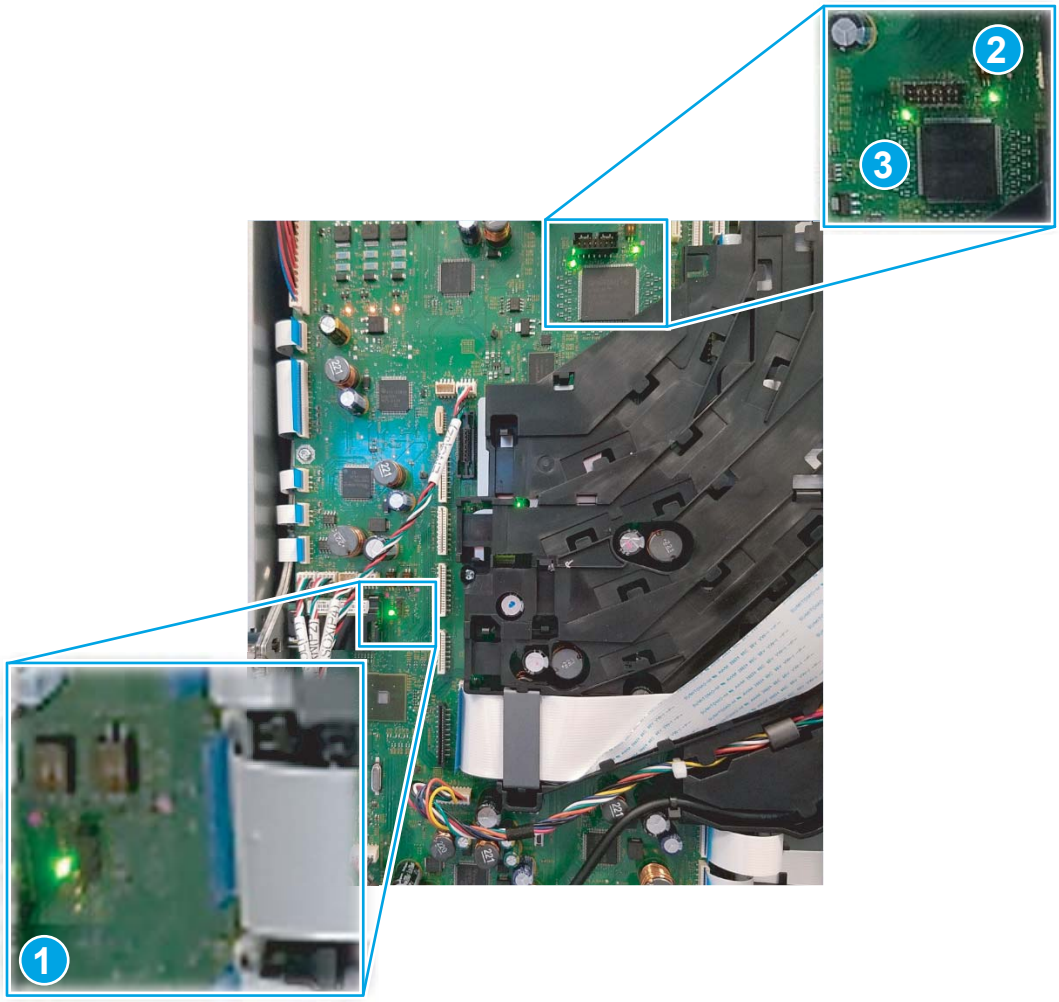


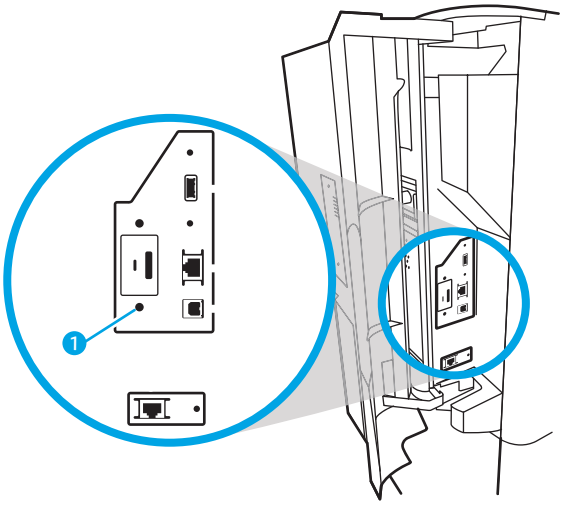
Table 2-2 MPCA LEDs

Item	Description
1	Heartbeat LED (four blinks per second)
2	Heartbeat LED (one blink per second)
3	FPGA programmed NOTE: Illuminates when the FPGA is programmed (at every printer initialization).

Table 2-3 MPCA LED sequence at printer power on

Time from Power on (mm:ss)	Item	Description
00:30	1	Formatter digital ASIC heartbeat LED starts blinking after the power button is pressed.
00:25	2	FPGA programmed LED (2) illuminates (and remains on).
00:26	3	FPGA heartbeat LEDs begins blinking after FPGA starts up.

Figure 2-2 Formatter heartbeat LED



item	Description
1	Formatter heartbeat LED NOTE: After the printer initializes, the heartbeat LED blinks.

Control panel checks

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

- Troubleshooting a blank display, black display, no display, or no power situation
- Control panel diagnostics
- Control panel diagnostic flowcharts

The control-panel display illuminates when the printer power is turned on and the printer is initializing. This indicates the following:

- The control panel flat-flexible cable (FFC) and wire harness are connected at the control panel and the formatter.

If the control-panel display does not illuminate during printer initialization, first verify that the control panel FFC and wire harness connections at both ends are connected and fully seated.

Secondly, check to make sure that the MPCA and formatter heartbeat LEDs are functioning—nonexistent or incorrectly functioning LEDs indicate that there is a problem with the MPCA or formatter. See Figure 2-31 MPCA LEDs on page 133 and Figure 2-2 Formatter heartbeat LED on page 101.

If the control panel is not functioning after the product initialization is complete, see Troubleshooting a blank display, black display, no display, or no power situation on page 102.

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 possible causes of a blank control-panel display:

- No power to the printer.
- The control-panel connectors at the formatter are not fully seated.
- A faulty component is installed on the formatter (for example a fax PCA, USB device, eMMC, or other component).
- The formatter is defective.
- The control panel connector is not fully seated, or the control panel 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, or has a power outage recently occurred?
  - Has a lightning storm recently occurred?
  - Did the customer recently install a third-party component?
- Make sure to get a complete description of the failure.

- Is the control-panel display completely blank?
- 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, check to see if the printer is getting power. Listen for startup sounds when the power is turned on.

IMPORTANT: Check the MPCA and formatter LEDs for correct functionality. See Figure 2-31 MPCA LEDs on page 133 and Figure 2-2 Formatter heartbeat LED on page 101.

NOTE: With the printer power off, briefly push in on the power switch. If it lights up amber, the power supply is correctly functioning.

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 normal startup sounds occur.
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. From a host computer, send a print job to the printer.

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

6. Turn the printer power off, and then make sure that the eMMC (SFP printers only) is fully seated.
7. Turn the printer power on, and then check the control-panel display.
8. Run the control panel diagnostics. If the issue persists, replace the control panel.

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 108.

1. 765 PRINTERS: Locate the diagnostic-tests access button on the back of the control panel.

Figure 2-3 Diagnostic-tests access button (765 printers)

2. **M780/785 printers**: Locate the diagnostic-tests access button on the back of the control panel.

Figure 2-4 Diagnostic-tests access button (780/785 printers)

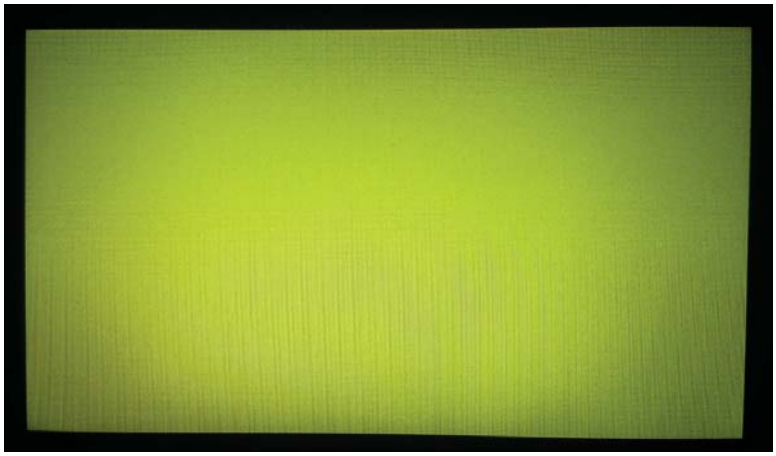
3. **780/785 printers**: Press the diagnostics-access button. Repeatedly pressing the button cycles through the available diagnostics.

Figure 2-5 Press the diagnostics-access button (780/785 printers)

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).

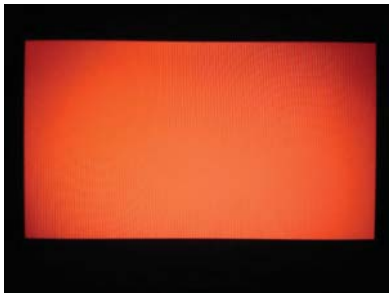
TIP: After 4 seconds of inactivity, the diagnostic mode times out and is exited.

Figure 2-6 Control panel version A yellow screen

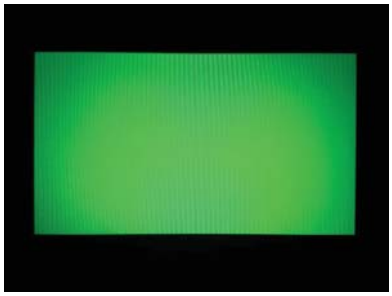


5. Touch the screen to cycle the screen through the following:

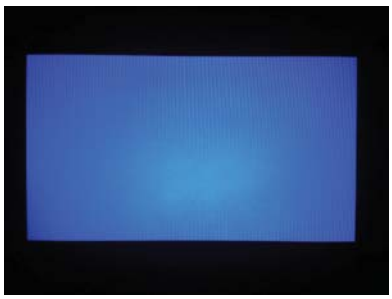
   - A red screen.



- A green screen.



- A blue screen.



- Five brightness levels of a white screen.

- A final black screen.

TIP: When the final black screen displays, select Home to cycle through the diagnostic screens and test its functionality.

6. Selecting the diagnostic-tests with the black screen displayed, exits the diagnostic mode.

Figure 2-7 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.

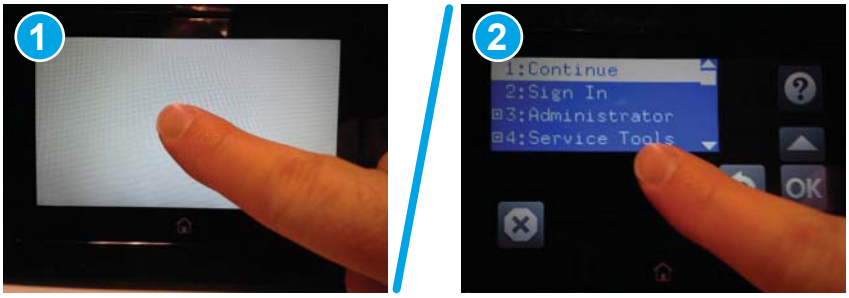
- Open the control panel system diagnostic tests
- Screen test
- Touch test
- SoftKey test
- Backlight test
- Sound test
- Keyboard test (780/785 Flow models only)
- Version

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

Figure 2-8 Open the Pre-boot menu



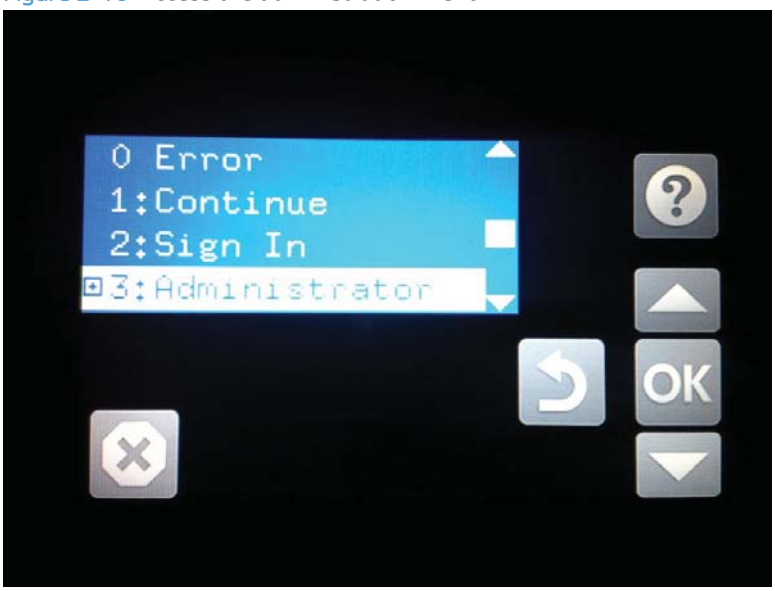
3. On the Pre-boot menu screen, use the following selections to navigate the tests.

Figure 2-9 Pre-boot menu

	Select to see more information about a selected item.
	Select to scroll up through menu items.
	Select to select a highlighted menu item.
	Select to scroll down through menu items.
	Select to go back to the previous menu.
	Not used.
	Select to exit a diagnostic test.

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

Figure 2-10 Access the administration menu



5. Use the down arrow ▼ to scroll to +E CP Diagnostics, and then press the OK to select it.

NOTE: An administrator password might be required to continue.

Figure 2-11 Access the diagnostics menu

Screen test

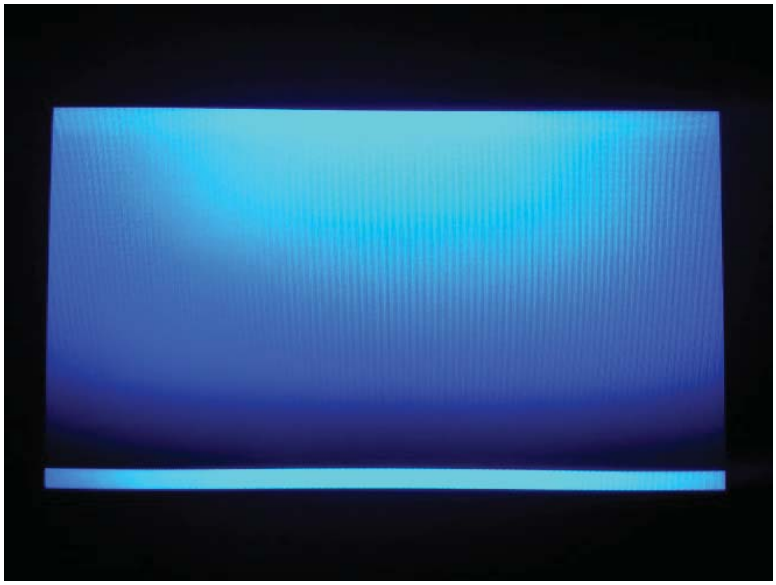
1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
2. With 1 Screen Test highlighted, press the OK to select it.

   Figure 2-12 Open the screen test

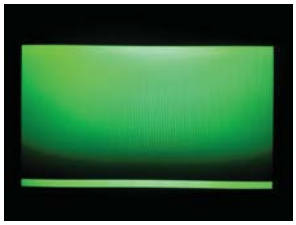
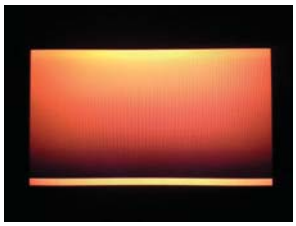
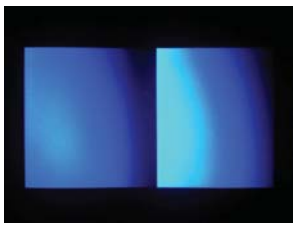
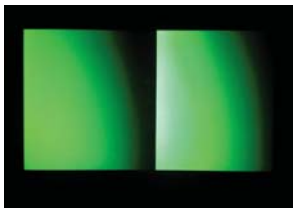
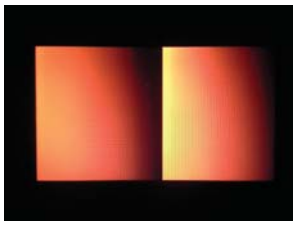
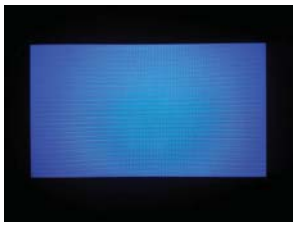
3. The blue vertical gradient screen appears.

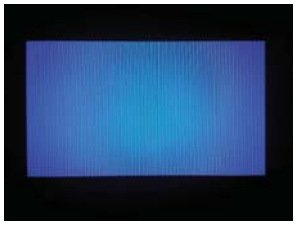
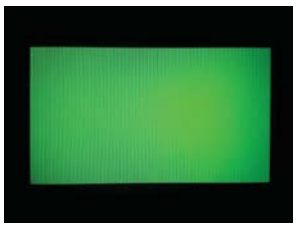
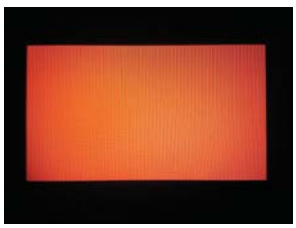
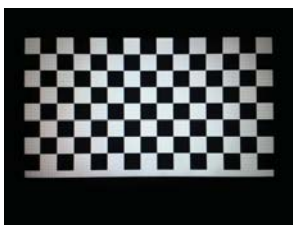
   Figure 2-13 Blue vertical gradient screen

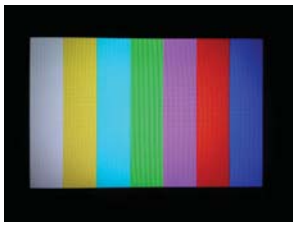
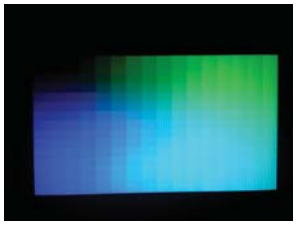
   

4. Select the touchscreen to scroll though the remaining touchscreen test screens.

NOTE: Select Home 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

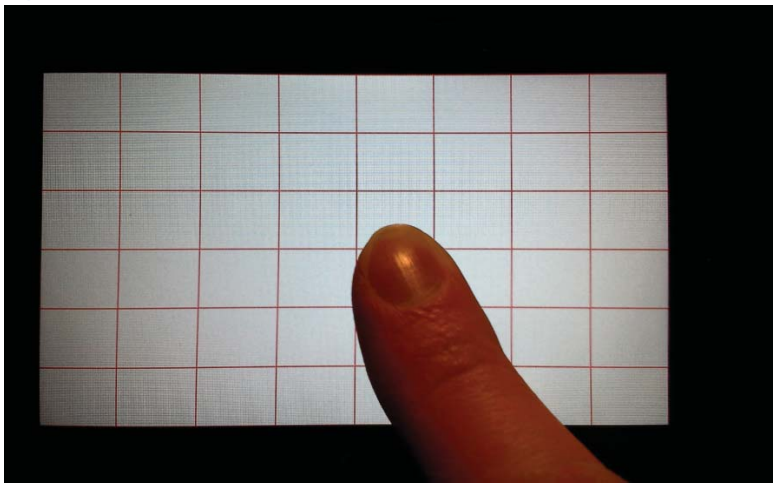
Touch test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
2. Use the down arrow ▼ to scroll to 2 Touch Test, and then press OK to select it.

Figure 2-14 Open the touch test

3. Use your finger to touch the white grid on the display.

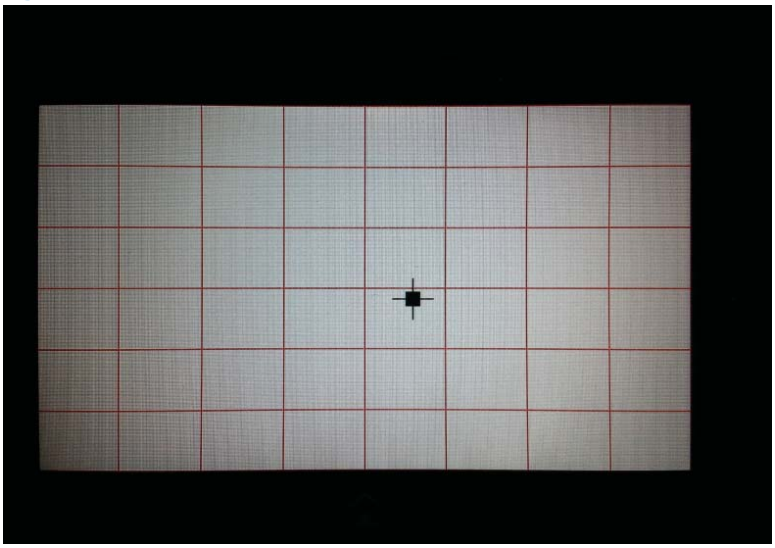
Figure 2-15 Touch the white grid



4. A mark appears on the grid where it was touched.

NOTE: Select Home to exit the test.

Figure 2-16 Verify the mark



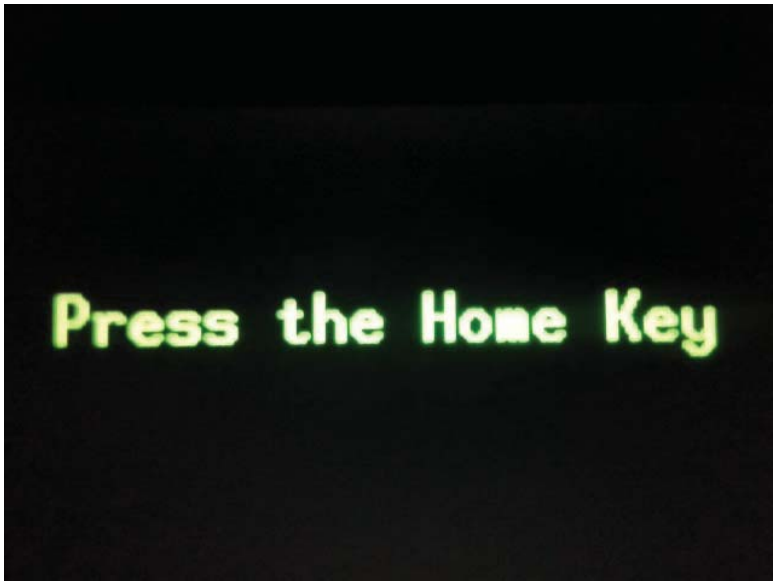
SoftKey test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
2. Select 3 SoftKey Test, and then select OK.

Figure 2-17 Open the softkey test

3. When prompted, select Home.

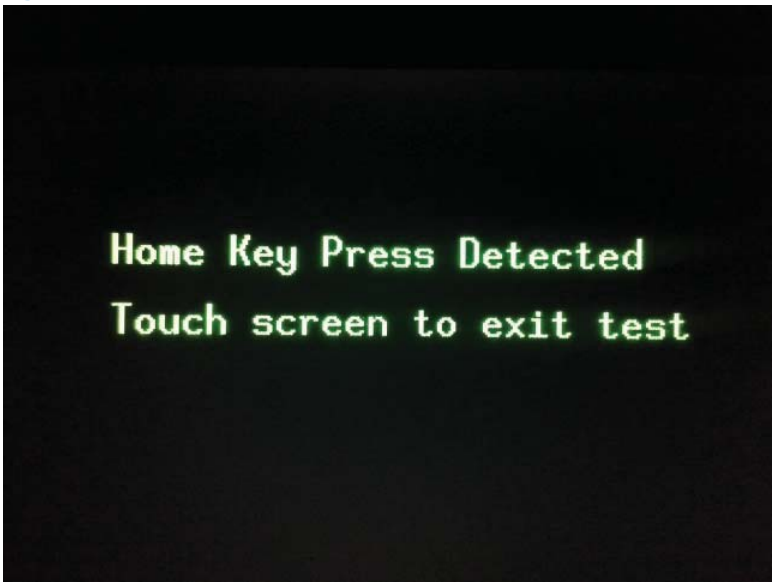
Figure 2-18 Select Home



4. If the test is successful, the following screen appears on the display.

NOTE: Touch the screen to exit the test.

Figure 2-19 Successful test



Backlight test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
2. Use the down arrow ▼ 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 2-20 Open the backlight test

Sound test

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
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 2-21 Open the sound test

Keyboard test (780/785 Flow models only)

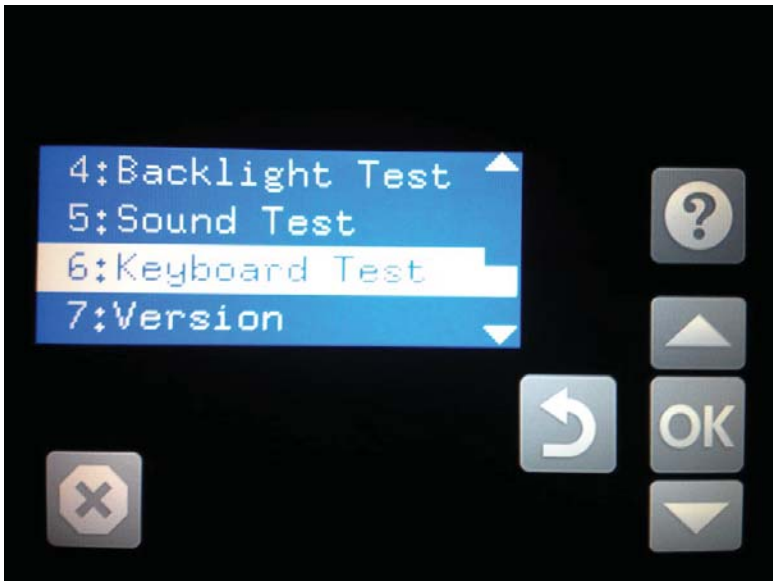
IMPORTANT: The control panel system diagnostic tests include a 6 Keyboard Test item. This test is **not** valid for the non-Flow 780/785, even though this option is present in the control panel system diagnostic tests menu.

If the 6 Keyboard Test is opened on a non-Flow 780/785, 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 108.
2. Select 6 Keyboard Test, and then select OK.

   Figure 2-22 Open the keyboard test

3. When prompted, select the H key on the keyboard or Home to exit the test.

Version

1. Open the control panel system diagnostic tests. See Open the control panel system diagnostic tests on page 108.
2. Select 7 Version, and then select OK.

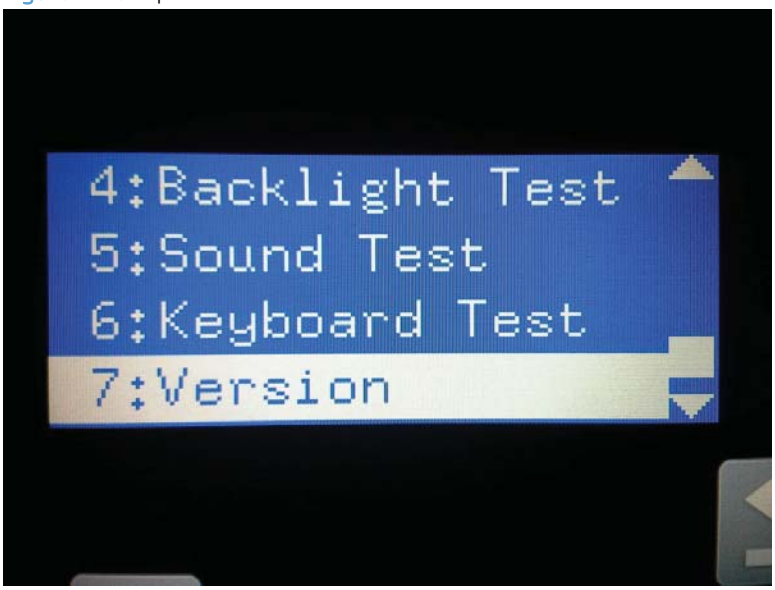
NOTE: Select any key to exit the test.

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 2-23 Open the sound test



Control panel diagnostic flowcharts

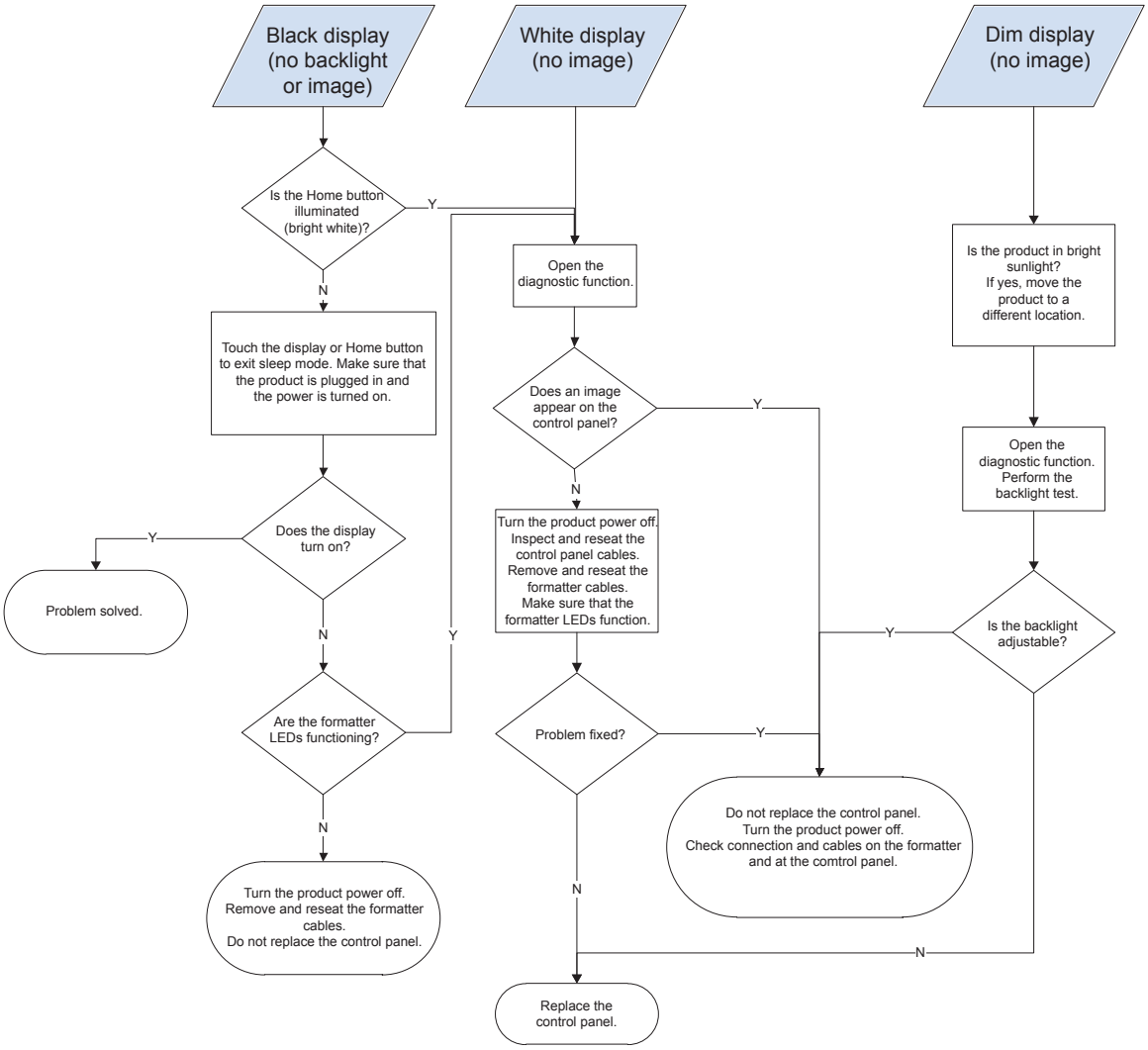
Use the flowcharts in this section to troubleshoot the following control panel problems.

- 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 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.

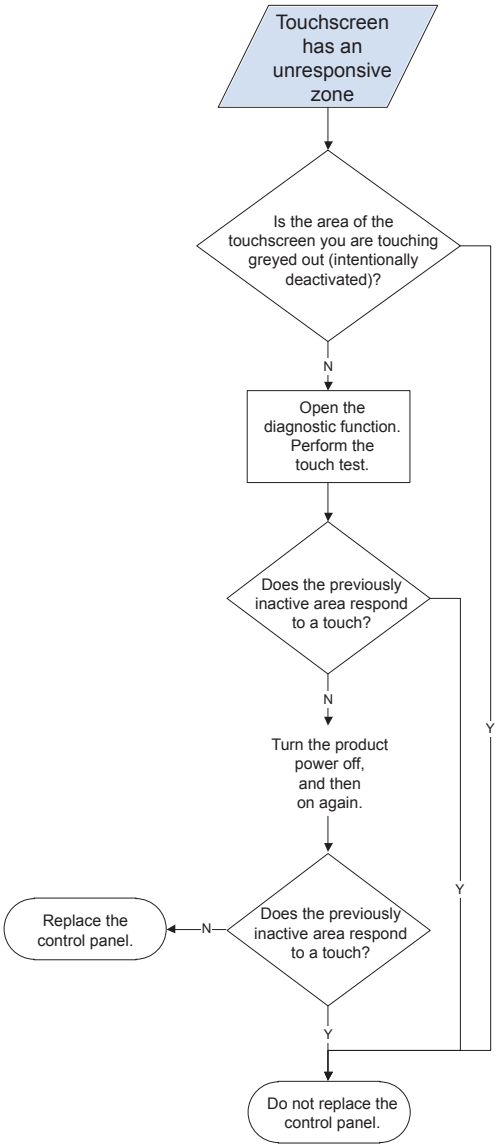
Figure 2-24 Touchscreen blank, white, or dim (no image)



Touchscreen has an unresponsive zone

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

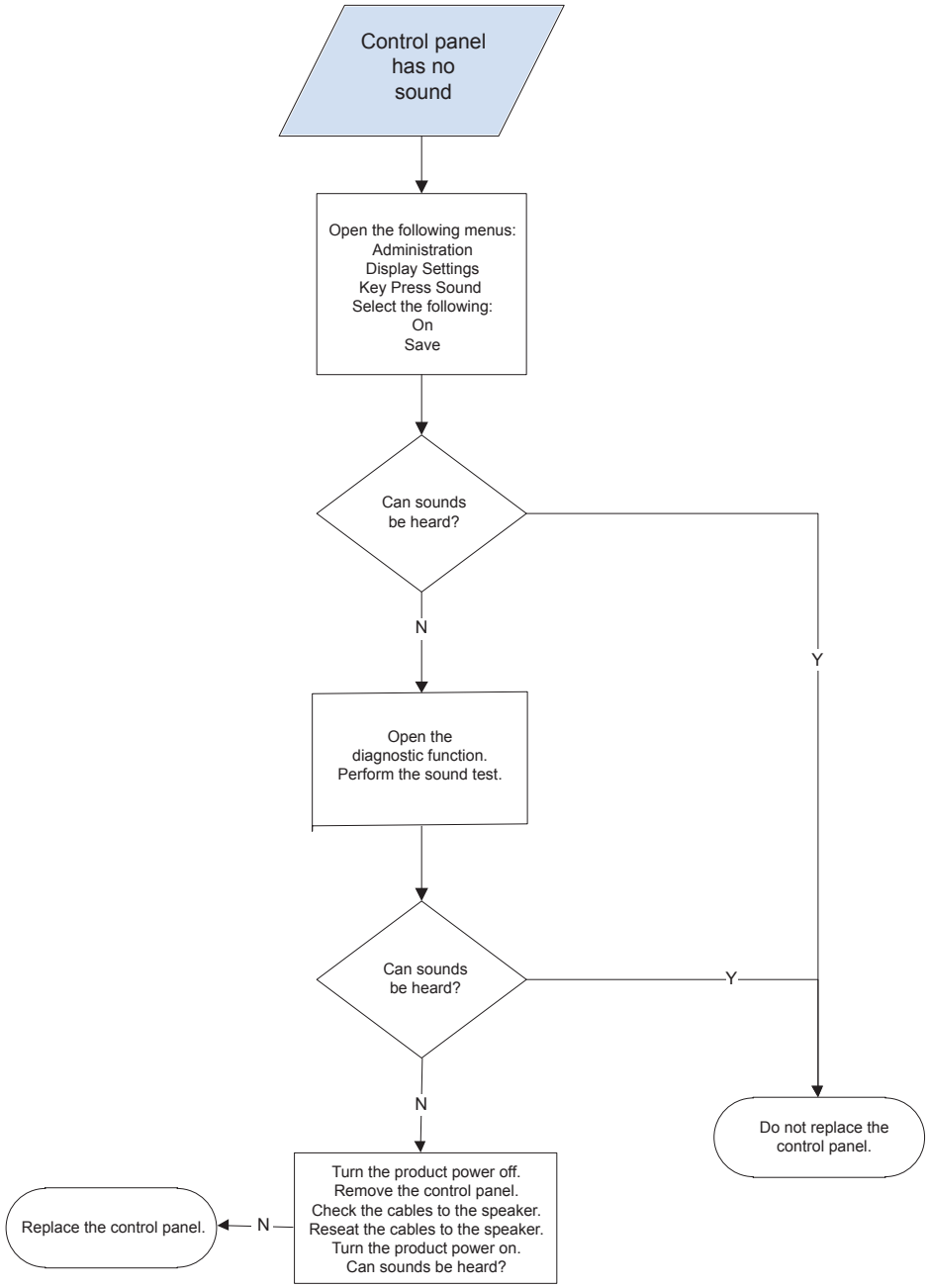
Figure 2-25 Touchscreen has an unresponsive zone



No control panel sound

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

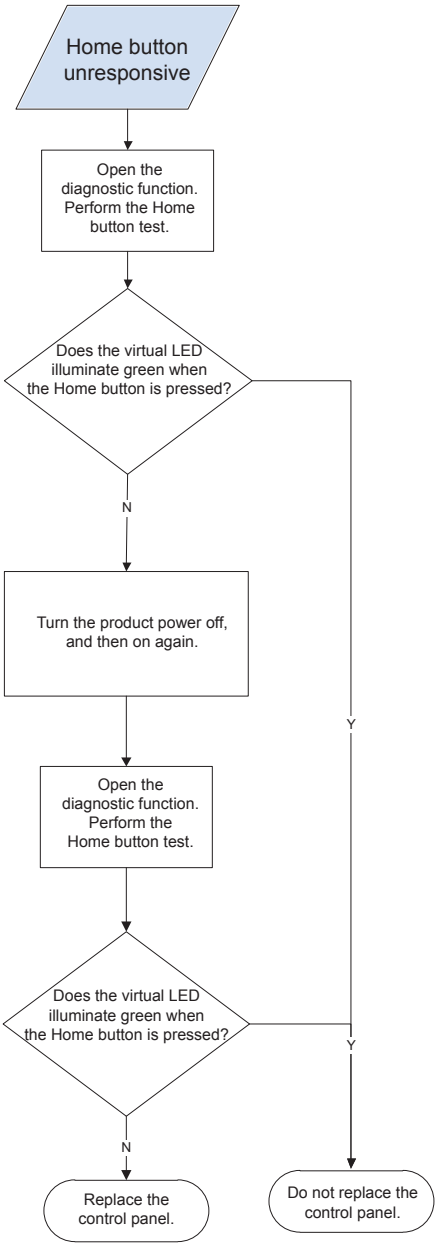
Figure 2-26 No control panel sound



Home key is unresponsive

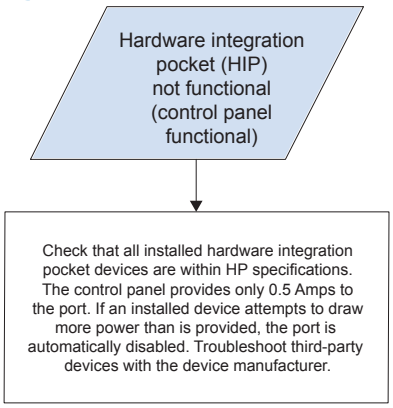
NOTE: To open the diagnostic function, press the button on the back of the control panel.

Figure 2-27 Home key is unresponsive



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

Figure 2-28 Hardware integration pocket (HIP) is not functioning (control panel functional)



Scanning subsystem (780/785)

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, scroll to and then select the Support Tools.
2. Select Maintenance.
3. Select Calibration/Cleaning.
4. Select Calibrate Scanner, and then select Start (follow the instructions provided on the screen).

Tools for troubleshooting

Print the configuration and printhead information pages

In addition to the printer configuration page, the printhead information page can also be printed.

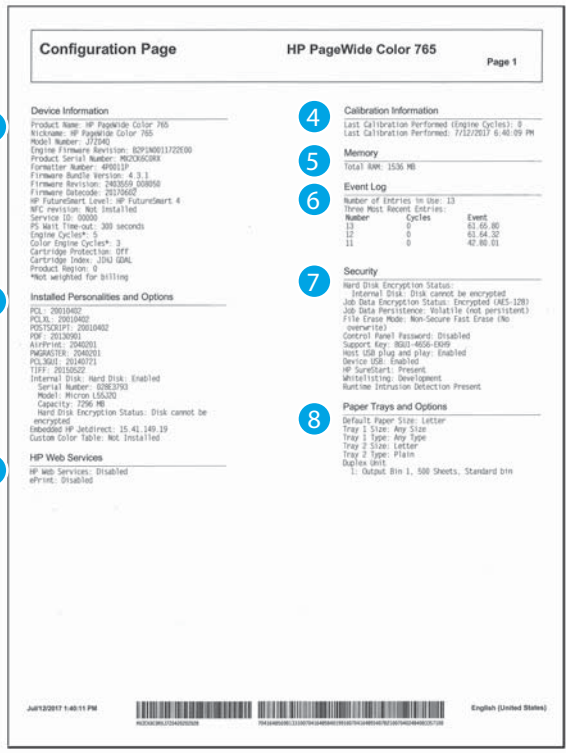
Print the configuration page and printhead information pages

Use the configuration and printhead information pages to view product information, view cartridge system information, and to help troubleshoot printer problems.

1. From the Home screen on the control panel select Reports.
2. Select Configuration/Status Pages.
3. Then select Configuration Page.
4. Select Print icon in lower right corner of screen.
5. If the report does not print, make sure that paper is loaded in the trays, and check the control panel to see if paper is jammed inside the printer.

NOTE: Make sure that the paper in the tray meets specifications for this printer.

Figure 2-29 Configuration page



1	**Device Information** includes the firmware version and the service ID.	5	**Memory** Includes installed memory count.
2	**Installed Personalities and Options** includes printer languages, options and Jetdirect information.	6	**Event Log** includes number of entries and list of last three entries in the log.

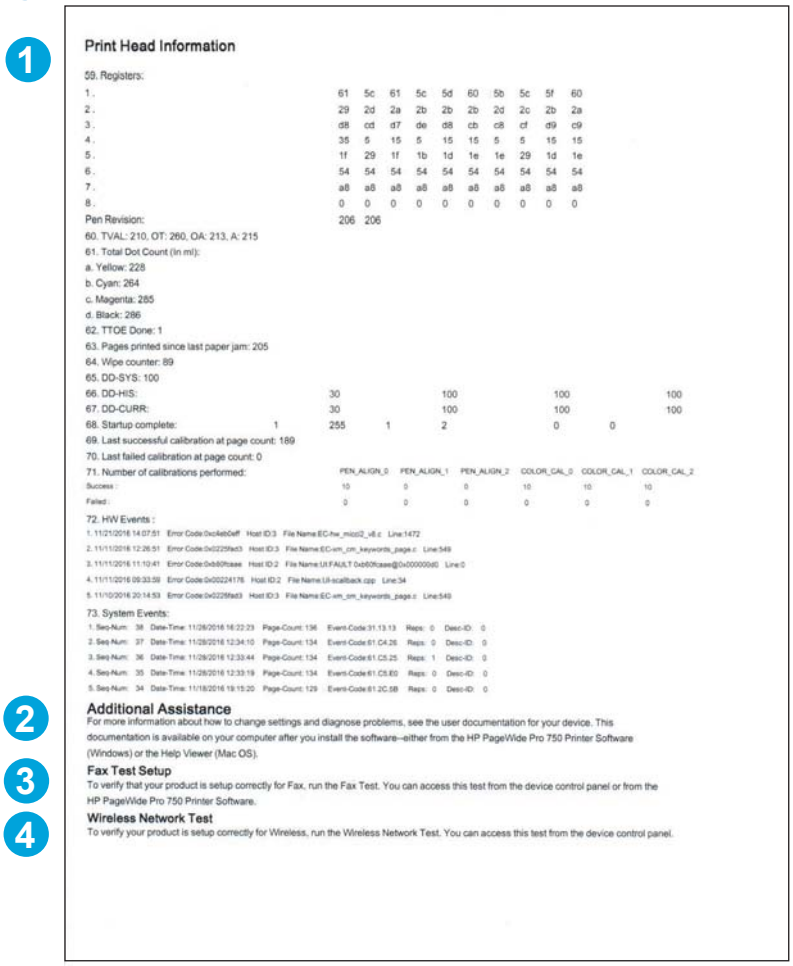
3	**HP Web Services**.	7	**Security** includes current state of all installed security systems.
4	**Calibration Information** includes page count and date of last calibration.	8	**Paper Trays and Options** includes printer hardware configuration.

Print Head Assembly Report

1. From the Home screen on the control panel select Support tools.
2. Select Pin and enter the service Pin number.
3. Then select Advanced service then Service Reports.
4. Then select Print head assembly report.
5. Select Print icon in lower right corner of screen.
6. If the report does not print, make sure that paper is loaded in the trays, and check the control panel to see if paper is jammed inside the printer.

NOTE: Make sure that the paper in the tray meets specifications for this printer.

Figure 2-30 Printhead information page



1	**Printhead Information** includes wipe counter and last successful calibration (at page count).	3	**Fax Test Setup** includes information about performing the printer fax test.
2	**Additional Assistance** includes locating changing settings and problem diagnostic information for customers.	4	**Wireless Network Test** includes information about performing the printer wireless functionality test.

Event log messages

See the printer control-panel message document (CPMD) for event-log entry descriptions and solutions.

IMPORTANT: The CPMD is not provided in this service manual. The CPMD for this printer is available on the HP Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

View or print an event log

1. From the Home screen, scroll to and then select Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Event Log
3. The Event log appears on the control-panel.

   NOTE: Select an event log entry to display more information about the error event. This information might be sufficient to resolve the error without referring to the control panel message document (CPMD).

4. Swipe your finger down or up the control-panel display to scroll through log entries, or use the printer icon at the bottom right corner of the screen print the event log.

Tools for troubleshooting: Individual component diagnostics

LED diagnostics

Understand lights on the main PCA (MPCA)

The LEDs on the main printed circuit assembly (MPCA) and the AC control module (ACCM) indicate that the printer is functioning correctly.

NOTE: The MPCA and ACCM in the printer appear slightly different than the ones shown in this section. However, the operation described below is valid for this printer.

MPCA LEDs

Figure 2-31 MPCA LEDs

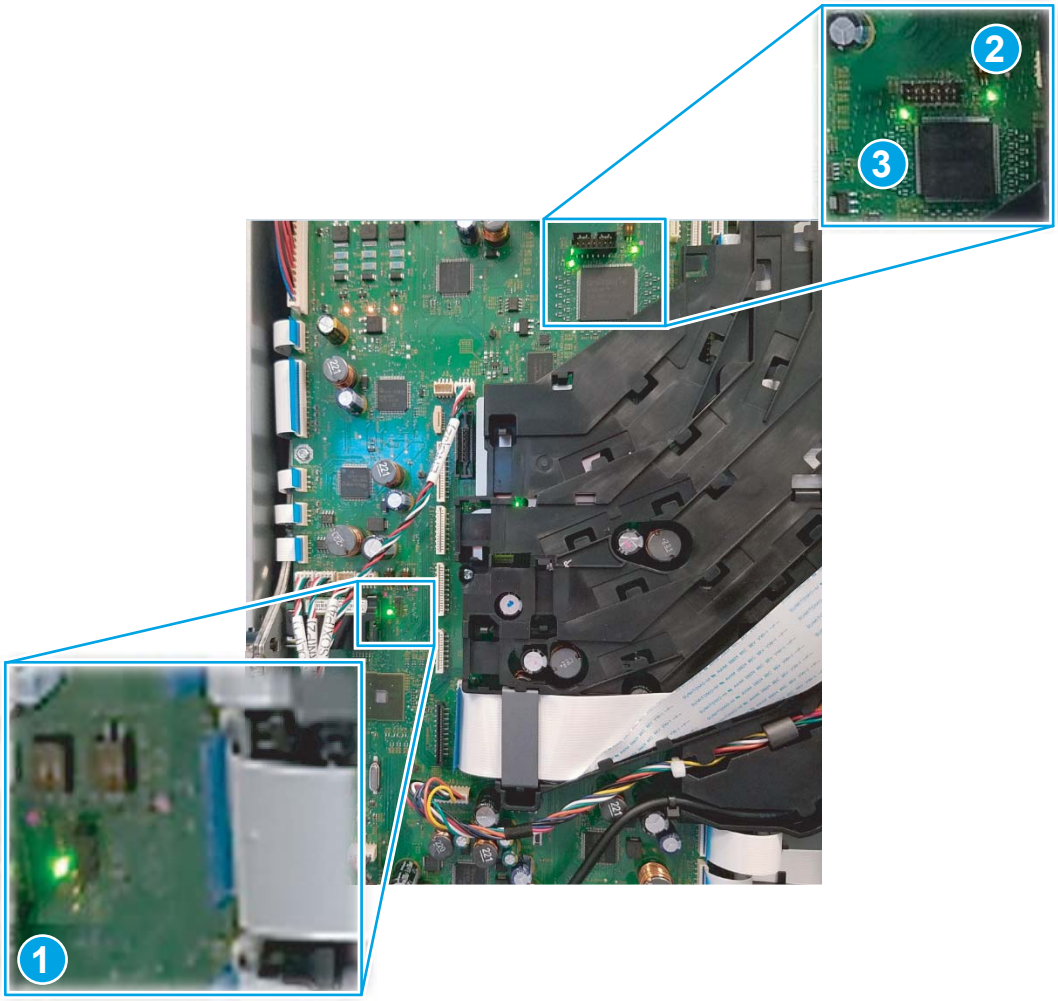


Table 2-4 MPCA LEDs

Item	Description
1	Heartbeat LED (four blinks per second)

Table 2-4 MPCA LEDs (continued)

Item	Description
2	Heartbeat LED (one blink per second)
3	FPGA programmed NOTE: Illuminates when the FPGA is programmed (at every printer initialization).

Table 2-5 MPCA LED sequence at printer power on

Time from Power on (mm:ss)	Item	Description
00:30	1	Formatter digital ASIC heartbeat LED starts blinking after the power switch is pressed.
00:25	2	FPGA programmed LED (2) illuminates (and remains on).
00:26	3	FPGA heartbeat LEDs begins blinking after FPGA starts up.
00:45	4	Print controller digital ASIC heartbeat LED starts blinking about one minute after the FPGA heartbeat LED starts up.
01:48	5	Printhead power LEDs illuminate.

ACCM LEDs

Figure 2-32 ACCM LEDs

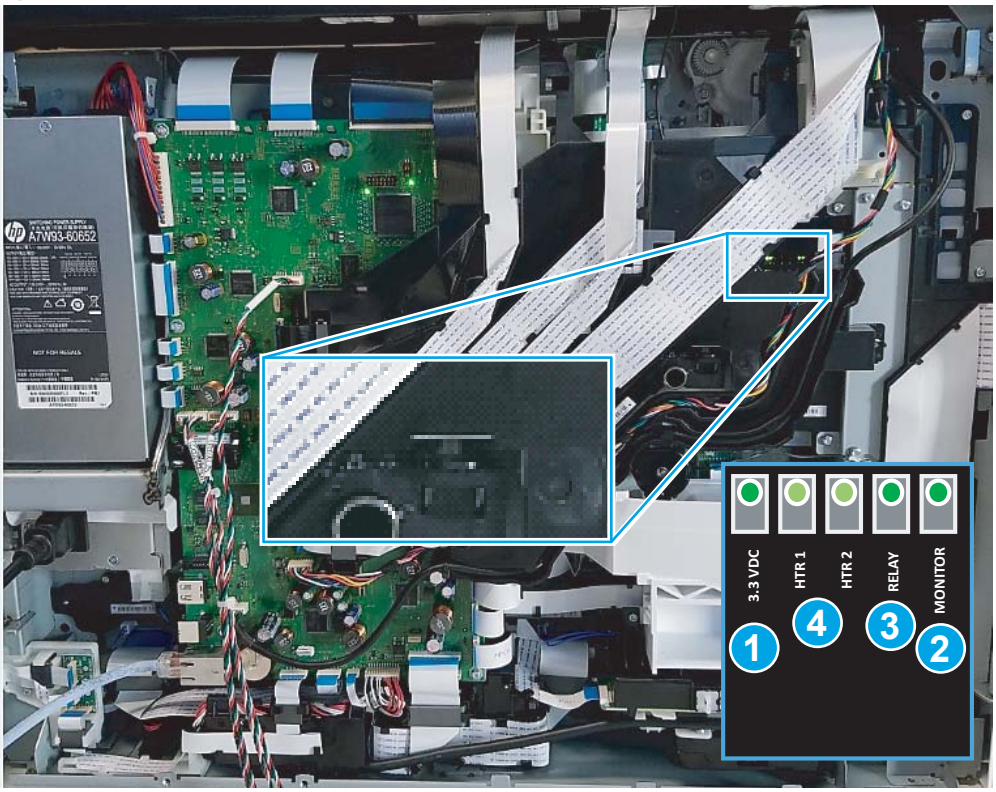


Table 2-6 ACCM LEDs

Item	Description	Item	Description
1	3.3 VDC (from MPCA)	3	Relay (ON = 120 VAC mode) NOTE: Illuminates when the FPGA is programmed (at every printer initialization).
2	VAC input power monitor	4	Heating element power

Table 2-7 ACCMA LED sequence at printer power on

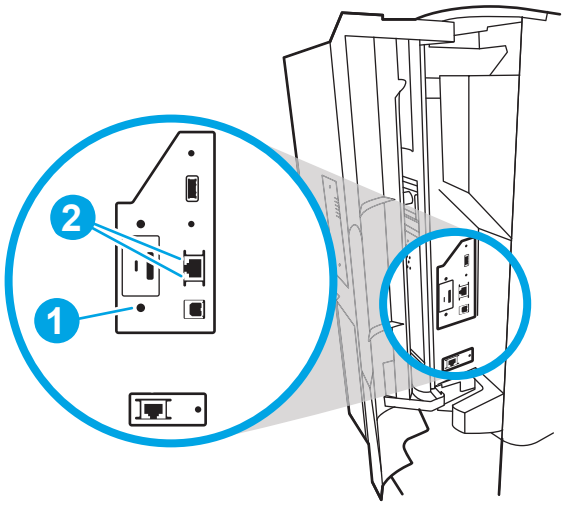
Time from Power on (mm:ss)	Item	Description
00:02	1	3.3 VDC LED illuminates (and remains on) a couple of seconds after power switch is pressed.
00:19	2	VAC input power monitor LED (2) illuminates (and remains on).

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 operational on page 139.

Table 2-8 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

Table 2-8 Heartbeat LED, product initialization (continued)

Product initializing state	Heartbeat LED, normal state	Heartbeat LED, error state
		– 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.
Valid SPI code (HW)	Green, solid	Red, solid Valid SPY code, issues with releasing ASIC and having BIOS run. BIOS tells PROSAC change from Red to Green for LED status. Replace formatter
Valid SPI code (FW)	Green, solid	Red, solid Corruption found by ASIC in BIOS or call for PROSAC to reset did not execute correctly. Boot process halted.
PROSAC not executing	Green, solid	Red, solid PROSAC not running (no ROM or SPI code) Boot process halted.
Missing or corrupt SPI	Green, solid	Red, flashing PROSAC did not load code correctly from SPI flash. The flash might be blank or corrupt. Boot process halted.
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

Table 2-8 Heartbeat LED, product initialization (continued)

Product initializing state	Heartbeat LED, normal state	Heartbeat LED, error state
		– 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
FFC I/F compromised	Green solid If applicable, error messages appear on the control panel display.	Yellow, solid • Engine cable/connector presence not detected.
Booting	Green, solid	Green, solid Booting BIOS but CE not executing Boot process halted.
Booting	Green, solid	Green, flashing Jedi executing normally, or in/exiting from 1W, or hung exiting from 1W with ASIC not booting.
Booting	Green, solid	Green, flashing Inactive off state, or PROSAC booting and the waiting for ASIC, or hung with ASIC not booting.
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

Table 2-8 Heartbeat LED, product initialization (continued)

Product initializing state	Heartbeat LED, normal state	Heartbeat LED, error state
Cables between the formatter and Engine controller board are not connected or damaged.	Not applicable	Yellow, solid • Formatter to engine controller connection failed Check the cables between the formatter and engine controller board. Make sure that the cables are 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 a ready state.

Table 2-9 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 – 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, scroll to and then select Settings.
2. Open the following menus:
   - Networking
   - Ethernet
   - Link Speed
3. Select the appropriate link speed, and then select OK.

Tools for troubleshooting: Engine diagnostics

Use this section to defeat the printer cartridge door, left door, and right door interlocks so that the printer is operational when the doors are remove or open.

Defeating interlocks

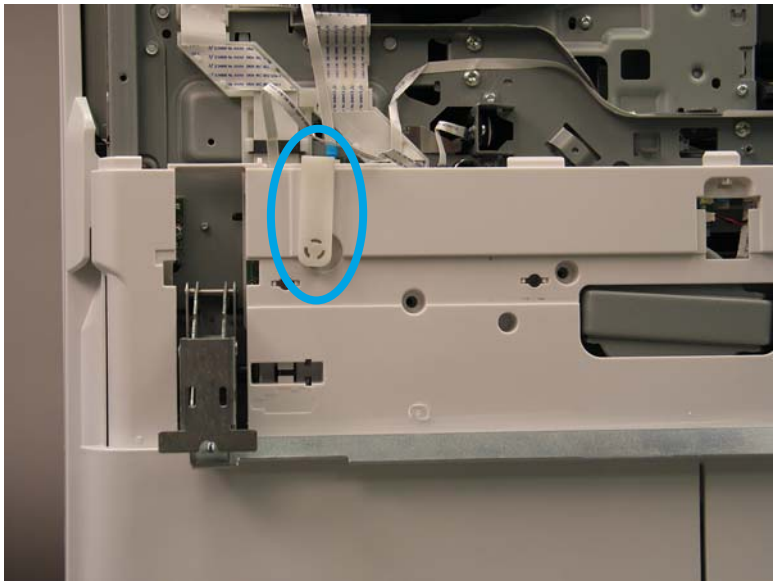
Different tests can be used to isolate different types of issues. For assembly or noise isolation, run the diagnostic test when the left door or right door is open, or the cartridge door is removed. When the printer doors are open or removed, the interlock tools simulate a closed-cover position or installed-cover condition.

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

NOTE: Two door interlock tools are available. One is for a cartridge door removed condition. The other tool is for a left and right door open condition.

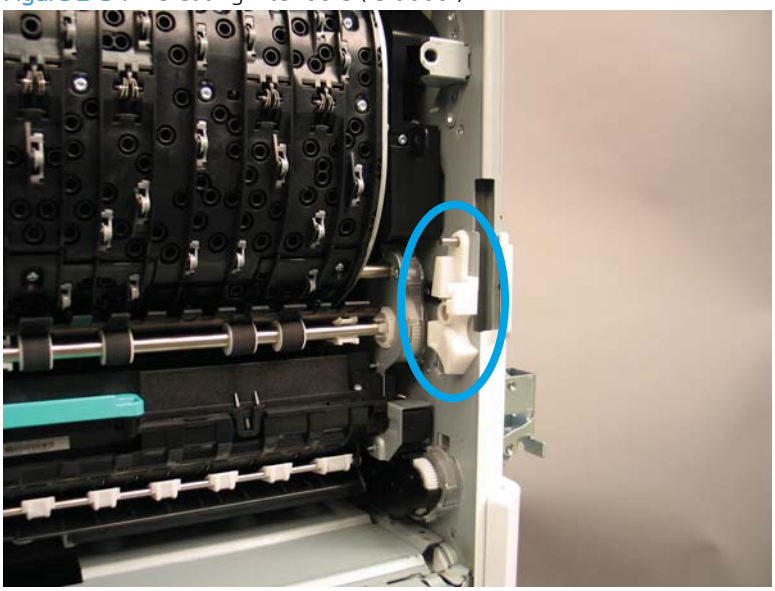
1. Remove the following covers:
   - Front tower cover
   - Cartridge door
   - Middle internal front cover
2. Place the door interlock tool as shown in the figure to defeat the interlock.

Figure 2-33 Defeating interlocks (cartridge door)



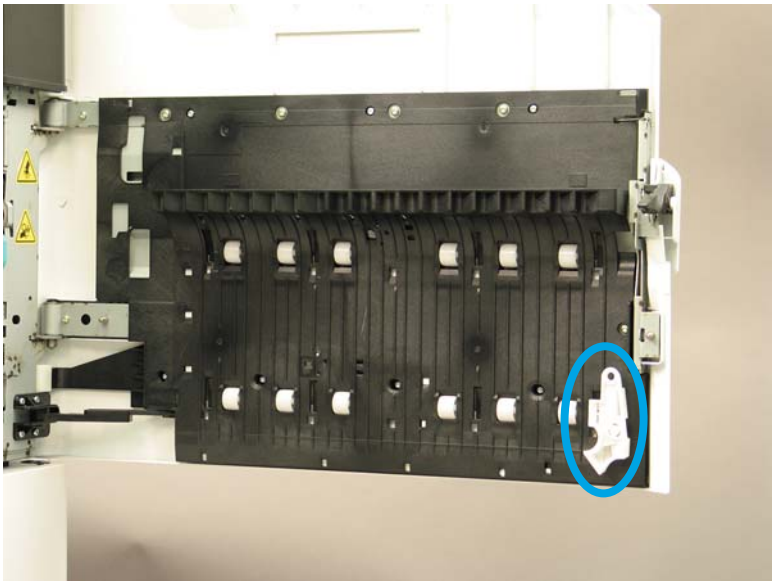
3. Open the left door, and then place the door interlock tool as shown in the figure to defeat the interlock.

Figure 2-34 Defeating interlocks (left door)



4. Open the right door, and then place the door interlock tool as shown in the figure to defeat the interlock.

Figure 2-35 Defeating interlocks (right door)



Paper path test

Use the paper path test to perform Tests See the Service mode function section of the printer *Troubleshooting Manual* for more information.

NOTE: The paper path test uses paper. Make sure paper is loaded in the trays.

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Diagnostics Test

   NOTE: When prompted, select Continue.
3. Select Paper Path Test.

   Configure the following options:

   NOTE: The available options (for example, Paper Trays) depends on the printer configuration.

   - Number of Copies
   - Paper Trays
   - Output Sides
4. Select Print to begin the test.

   NOTE: If an error occurs during the test, a message appears on the control-panel display.

Scanner and document feeder tests (780/785 models only)

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

Scanner tests

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Open the following menus:
   - Support tools
   - Troubleshooting
   - Diagnostic tests
   - Continue
   - Manual scanner sensor test
3. Select the sensor name on the Flatbed Sensors screen to display a sensor location graphic on the control panel display.

   NOTE: See the Service mode function section of the printer *Troubleshooting Manual* for more information.
4. Activate the desired sensor and then check the control panel display to verify the sensor state (active or inactive).
   - The Status virtual LED next to the sensor number and sensor name illuminates green with 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 interrupter (activated or deactivated).
5. Select the Reset Sensors to reset the counter.

   -or-

   Select back arrow to exit the Sensor test menu and select back arrow again to return to Service menu.

Flatbed sensor tests

- Flatbed cover
- Flatbed (length long)
- Flatbed (length short)

Document feeder test

- ADF paper present
- ADF (length long)
- ADF (length short)
- ADF Slider sensor

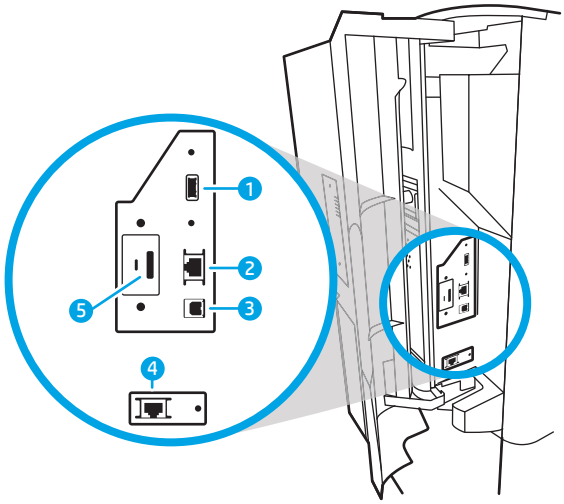
- Ultrasonic sensor (Flow models only)
- ADF Top of form
- ADF jam cover
- ADF paper path deskew
- ADF paper path pick success
- Paper path sensor 1 (unreachable)

Diagrams

- Plug/jack locations (external printer)
- Paper handling control diagrams

Plug/jack locations (external printer)

Figure 2-36 Plug/jack locations (external printer)



1	Host 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.
2	Local area network (LAN) Ethernet (RJ-45) network port
3	Hi-Speed USB 2.0 printing port
4	Fax port (fax models only)
5	Cable lock slot

Paper handling control diagrams

- Printer sensors
- High capacity input (HCI) sensors
- 3x550 tray sensors
- 1x550 tray sensors
- Inline finisher sensors
- Printer motors/solenoids
- High capacity input (HCI) motors/solenoids
- 3x550 tray motors/solenoids
- 1x550 tray motors/solenoids
- Inline finisher motors
- Printer printing system

IMPORTANT: The diagrams in this section are portions of an all-inclusive paper handling diagram that is too large to include here.

HP recommends downloading this document from the HP Web-based Interactive Search Engines (WISE), and then print it on A3 size paper to use as a troubleshooting reference.

Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

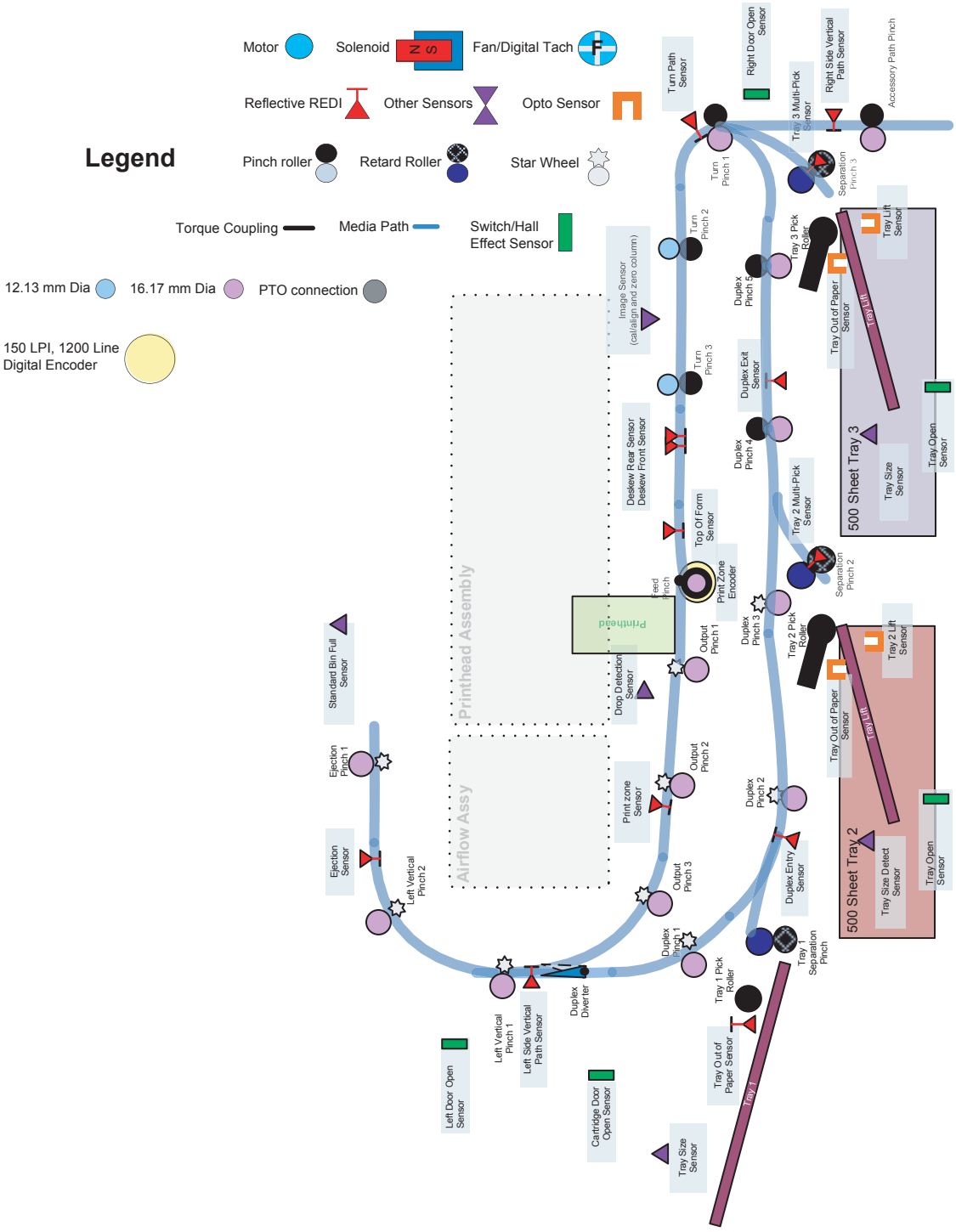
APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

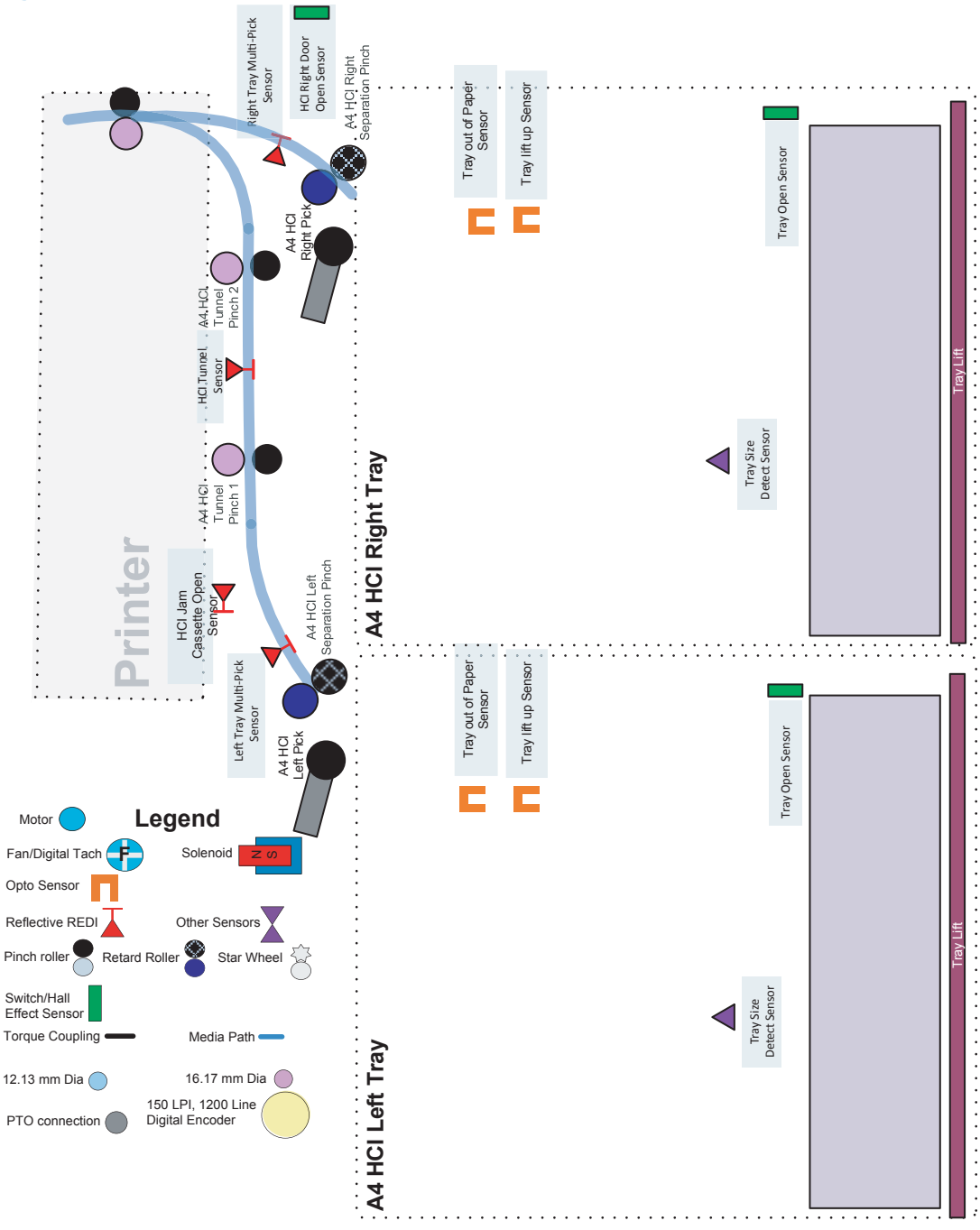
- https://support.hp.com/wise/home/emea-en

Figure 2-37 Print engine sensors



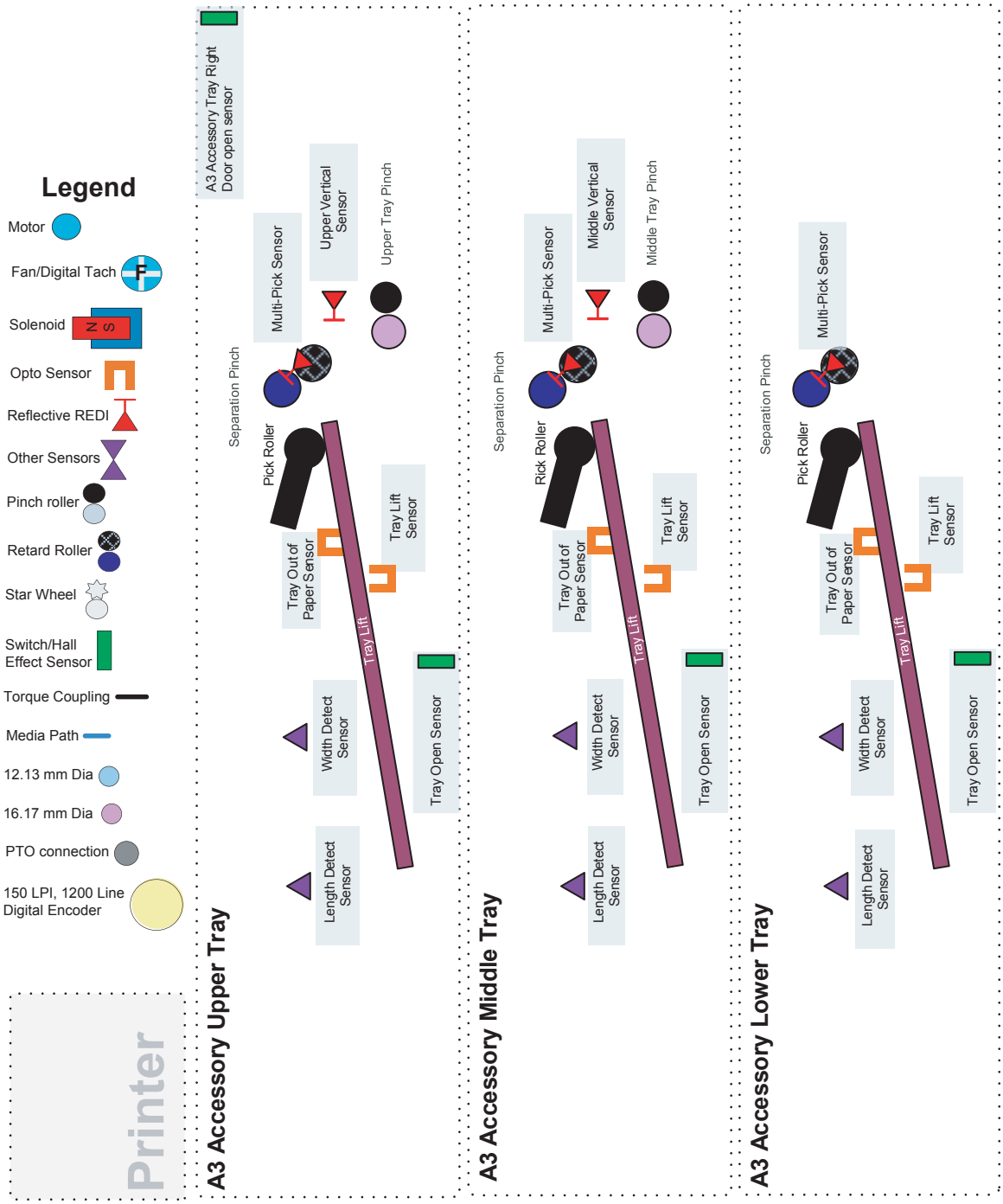
High capacity input (HCI) sensors

Figure 2-38 HCI sensors



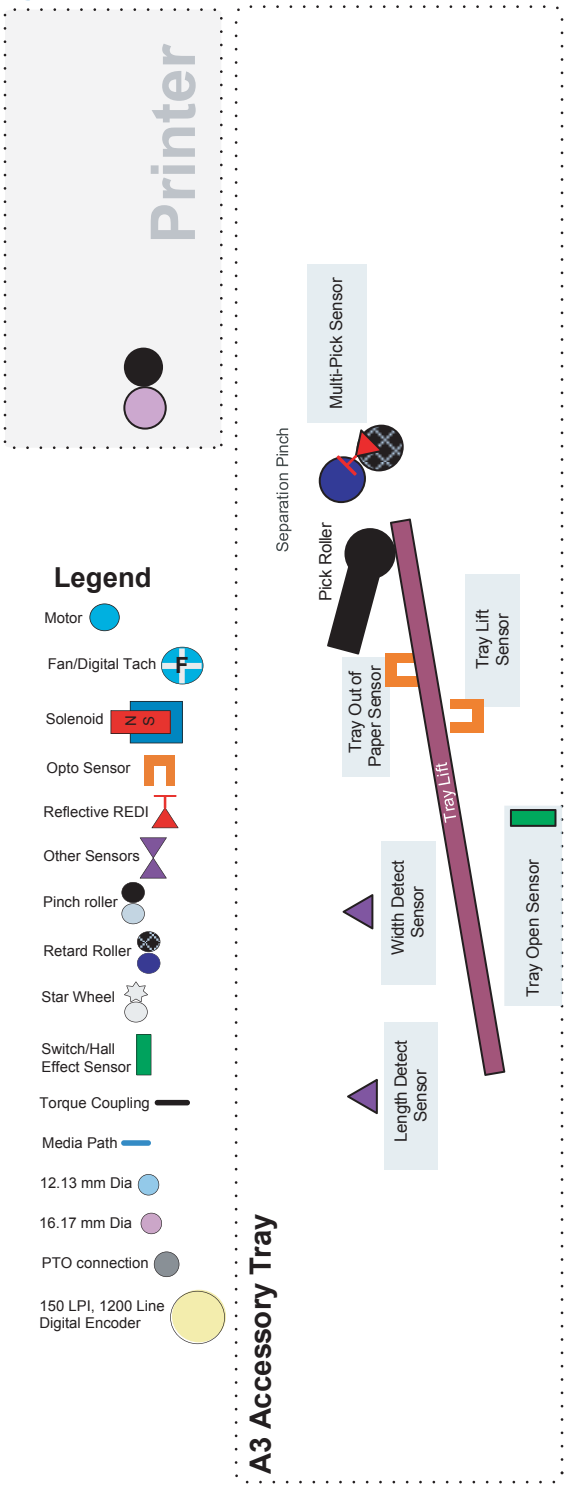
3x550 tray sensors

Figure 2-39 3x550 tray sensors



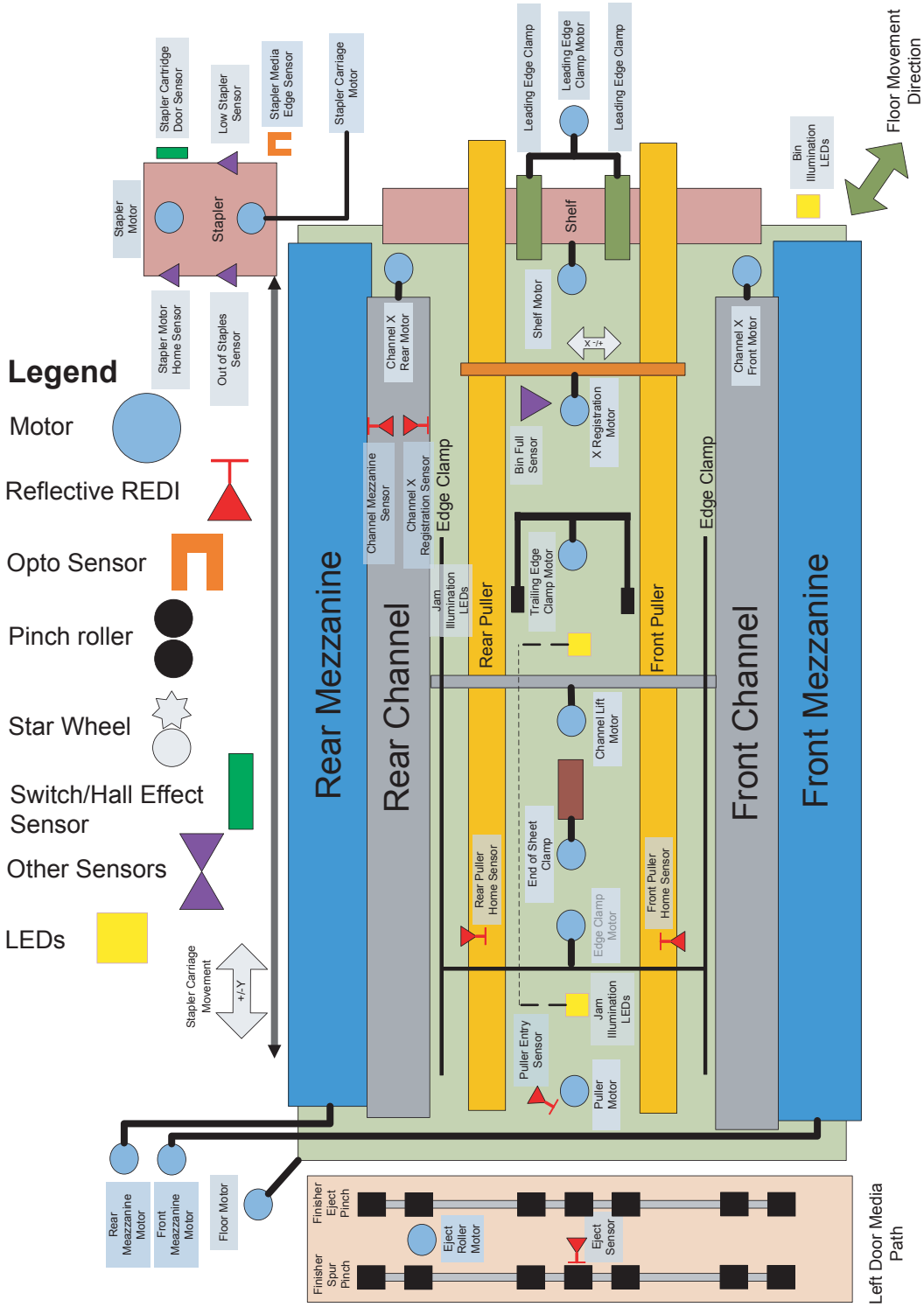
1x550 tray sensors

Figure 2-40 1x550 tray sensors



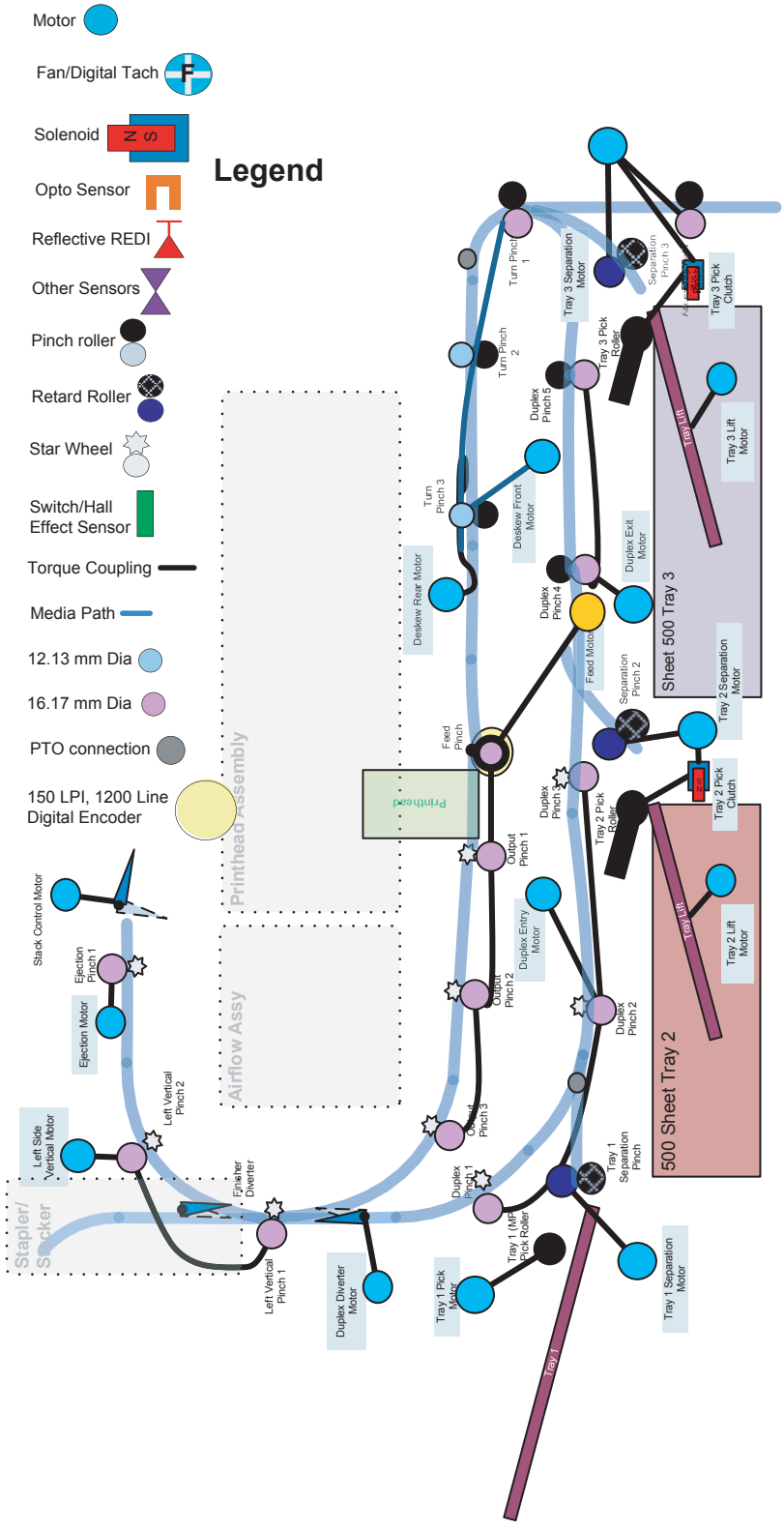
Inline finisher sensors

Figure 2-41 Inline finisher sensors



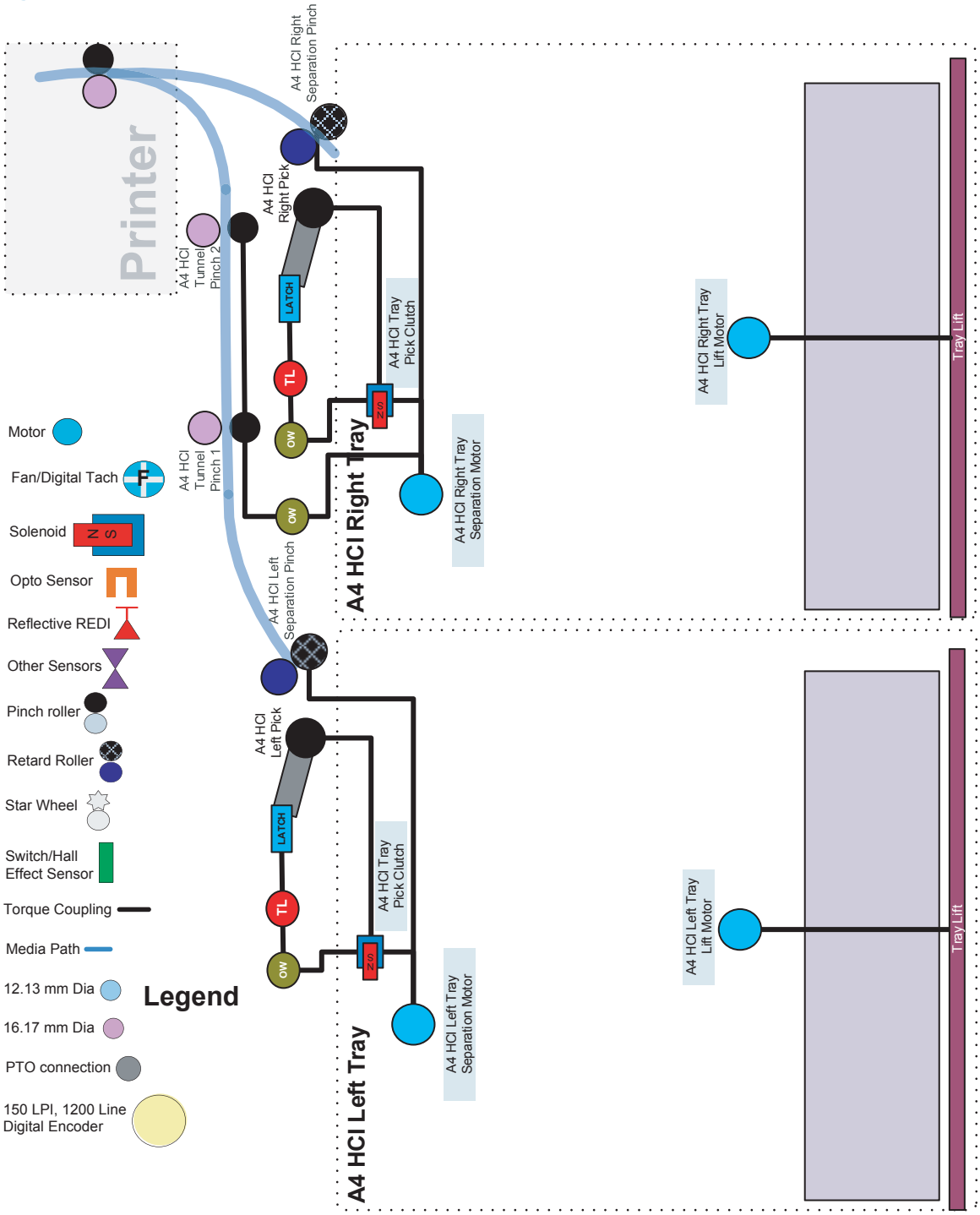
Printer motors/solenoids

Figure 2-42 Printer motors/solenoids



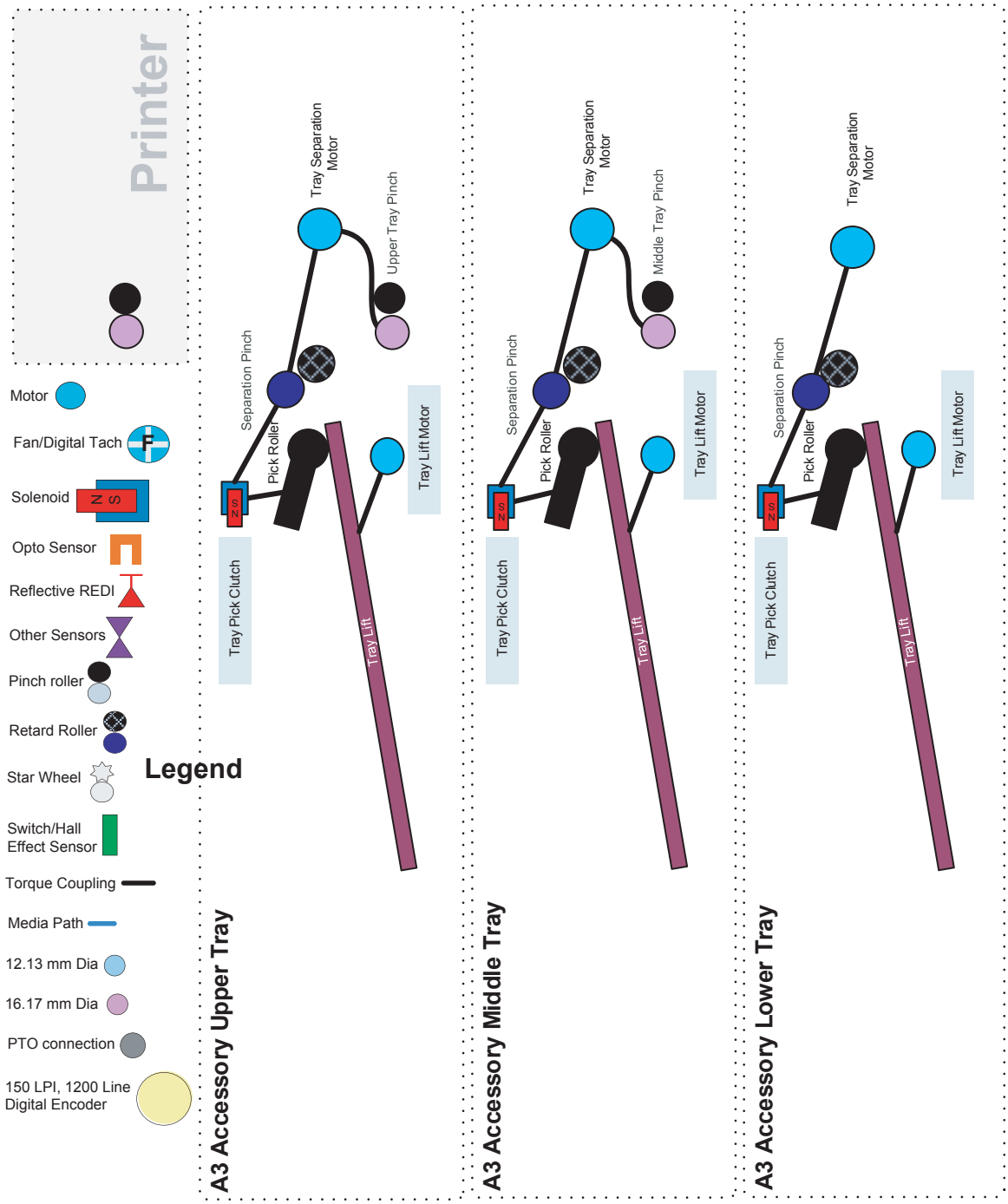
High capacity input (HCI) motors/solenoids

Figure 2-43 HCI motors/solenoids



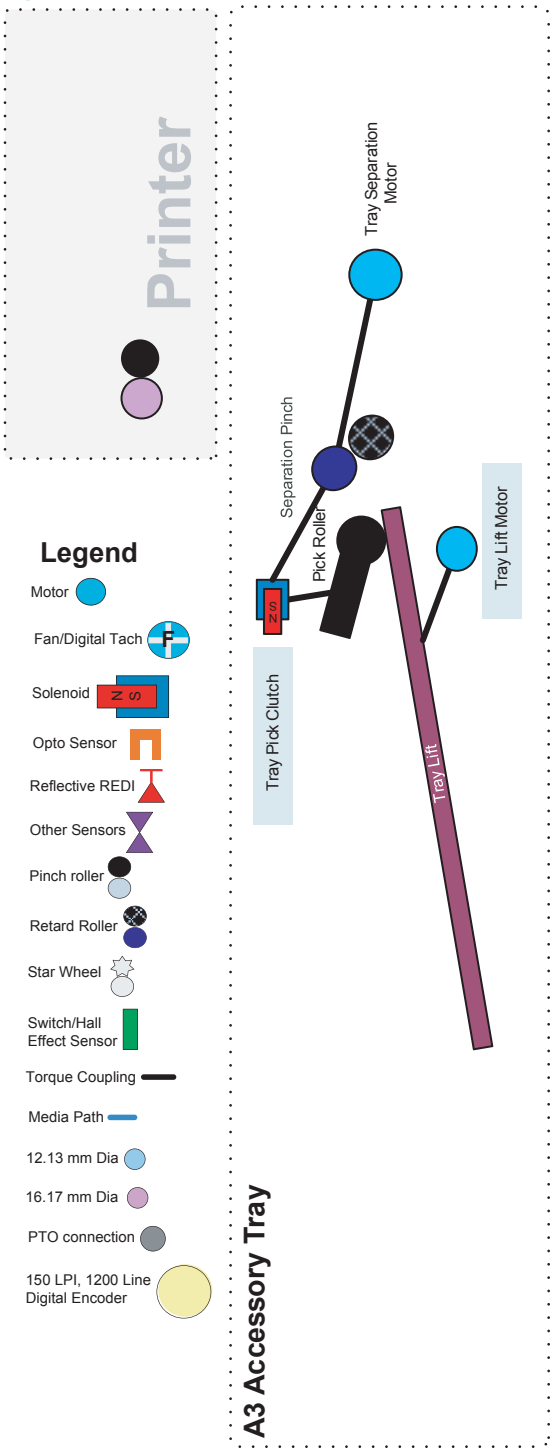
3x550 tray motors/solenoids

Figure 2-44 3x550 tray motors/solenoids



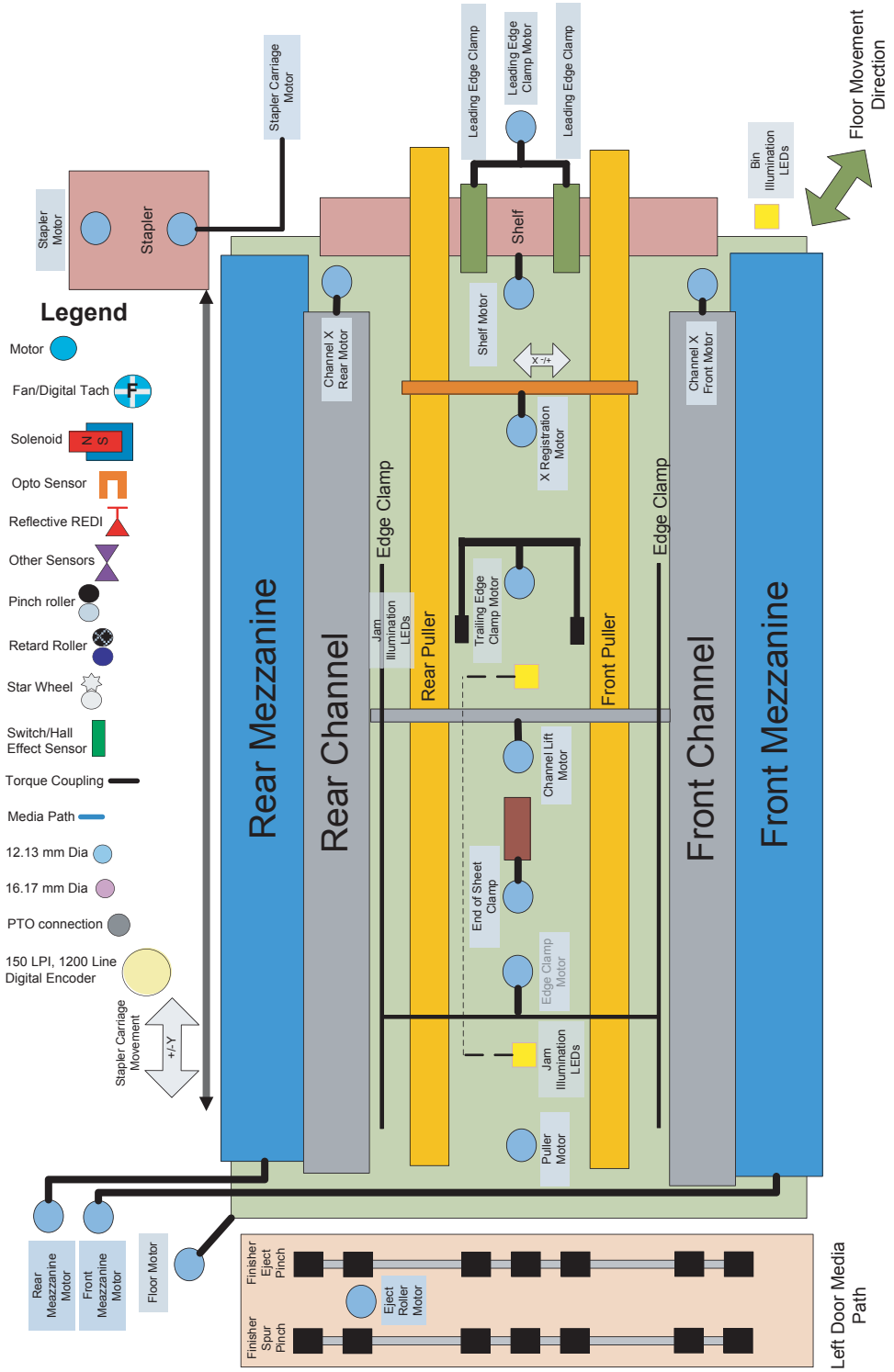
1x550 tray motors/solenoids

Figure 2-45 1x550 tray motors/solenoids



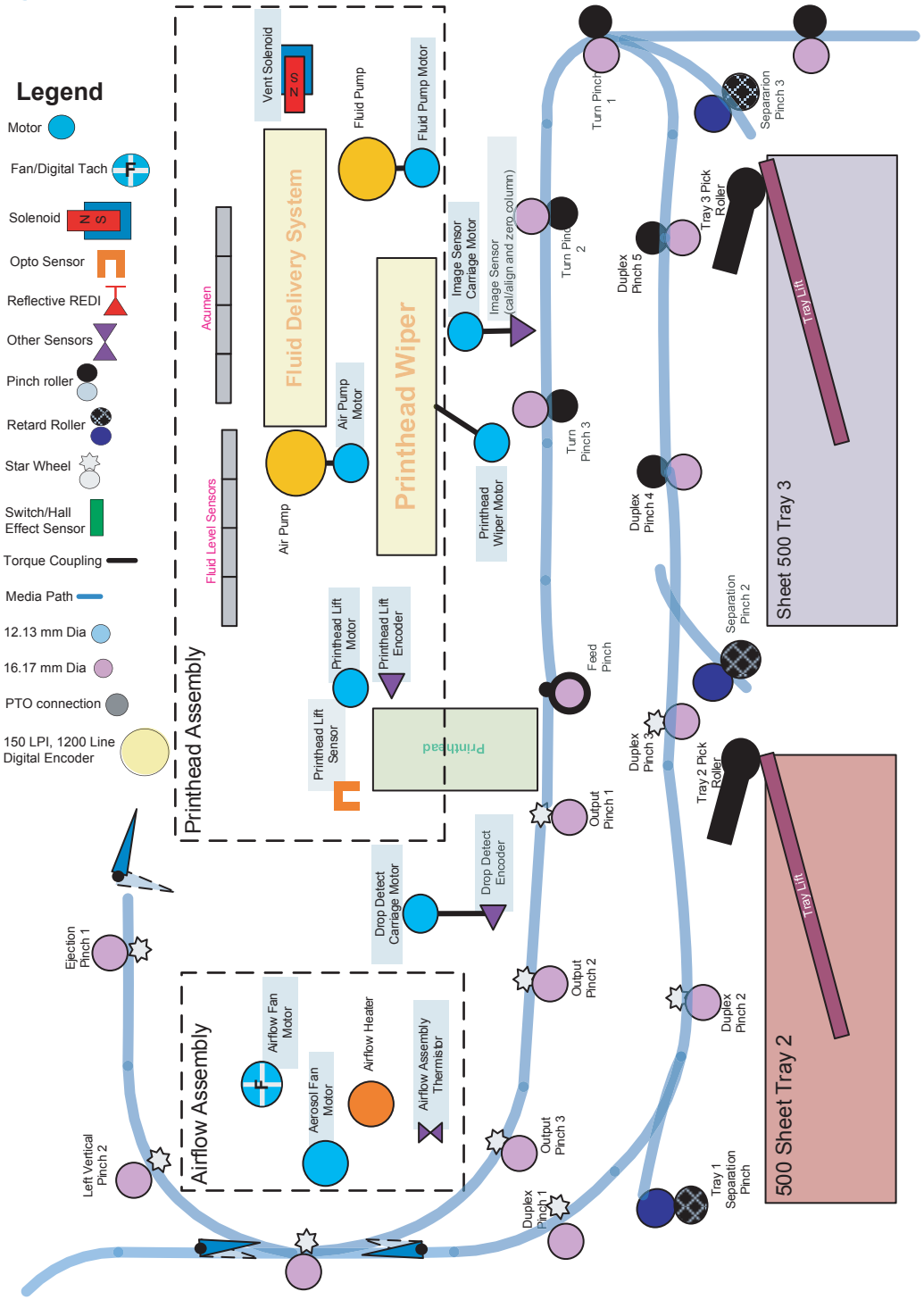
Inline finisher motors

Figure 2-46 Inline finisher motors



Printer printing system

Figure 2-47 Printer printing system



Print-quality troubleshooting tools

IMPORTANT: Use the following processes and tools to solve most (if not all) print-quality (PQ) problems. Only consider replacing a printhead after exhausting all other PQ solutions.

Internal print-quality test pages

Print-quality troubleshooting pages

Use the print-quality troubleshooting pages to help diagnose and solve print-quality problems.

NOTE: To get further assistance in print-quality troubleshooting, go to www.hp.com/support/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660 and select **PQ Troubleshooting Tools**.

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Open the following menus:
   - Troubleshooting

     NOTE: For more extensive print-quality troubleshooting tools, use the Service menu.

   - Print Quality Pages
3. Select one of the following documents to print:

   NOTE: After selecting a page, select Print to print the page.

   - Print Quality Report

     The Print Quality report help identify print-quality problems

   - Diagnostics Page

     The Diagnostic Page includes diagnostic and calibration information.

   - Advanced Print Quality Pages

     NOTE: HP-Authorized Service Providers best know how to interpret this information. HP recommends continuing only if you are working with a service provider.

     Select Continue to proceed, or select Cancel to exit the menu.

     Choose from the following Advanced Print Quality Pages, and then select Print.

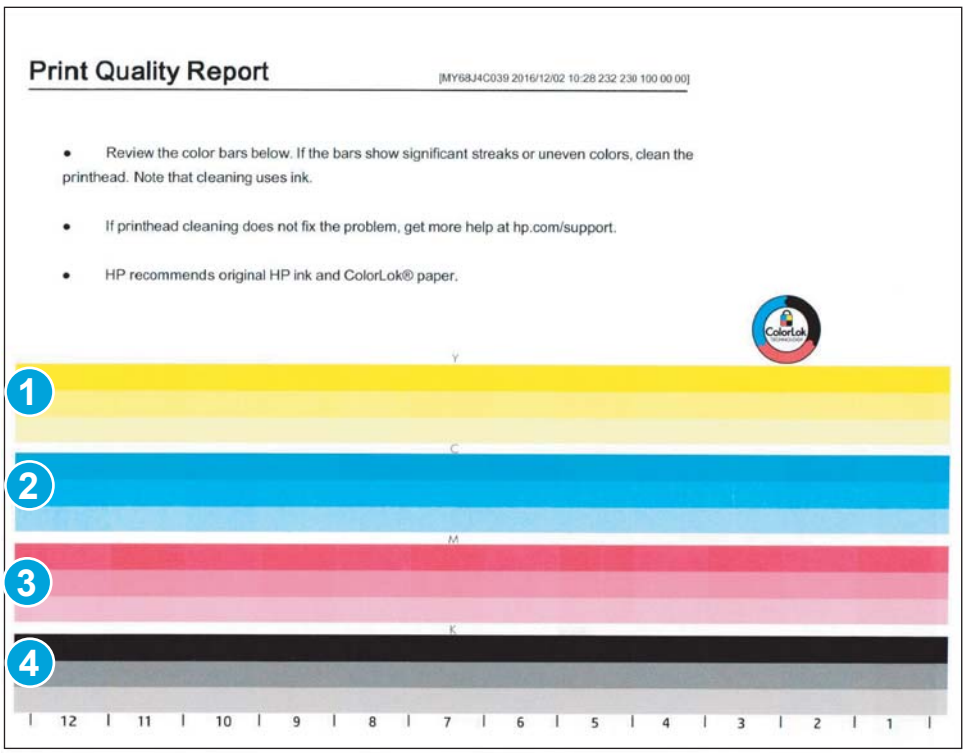
     - All colors
     - Dimensional Image Quality
     - Print quality service pages
     - Print quality test page
     - Printhead diagnostic page (odd)
     - Printhead diagnostic page (even)

- Single color black
- Single color cyan
- Single color magenta
- Single color yellow
- Streaks test
- Yellow streaks test page
- Stabilize the printhead

Print and interpret the print quality report

1. Load the printer with regular, unused white paper.
2. From the Home screen on the printer control panel, scroll to and select Support Tools.
3. Open the following menus:
   - Troubleshooting
   - Print Quality Pages
4. Select the Print Quality Report, and then select Print to print the page.

This page contains four bands of color, which are divided into the groups as indicated in the following illustration. By examining each group, you can isolate the problem to a particular cartridge.



Section	Cartridge
1	Yellow

Section	Cartridge
2	Cyan
3	Magenta
4	Black

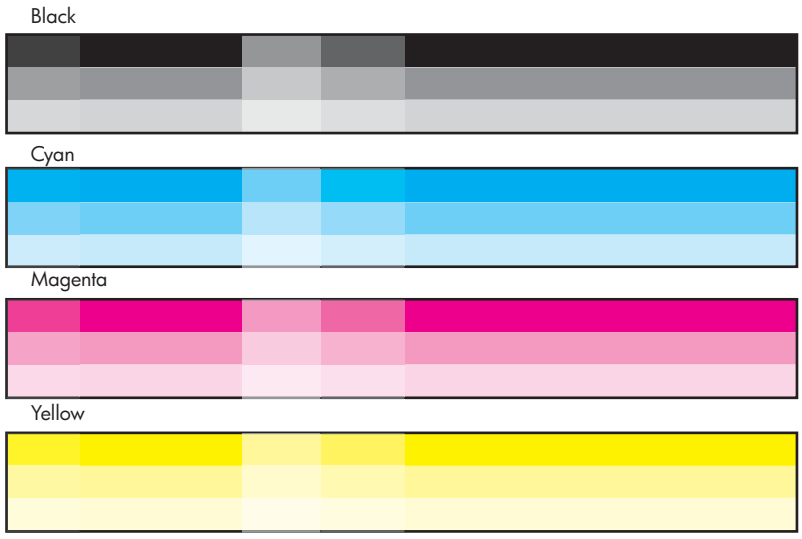
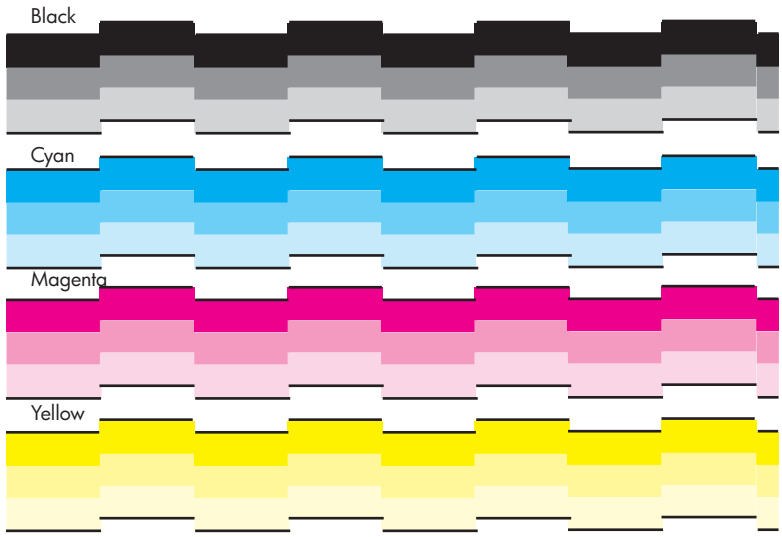
TIP: Mark this page with a “1” in a corner. If you clean the printhead later, you will want to keep track of which page was printed first, in order to note any progress.

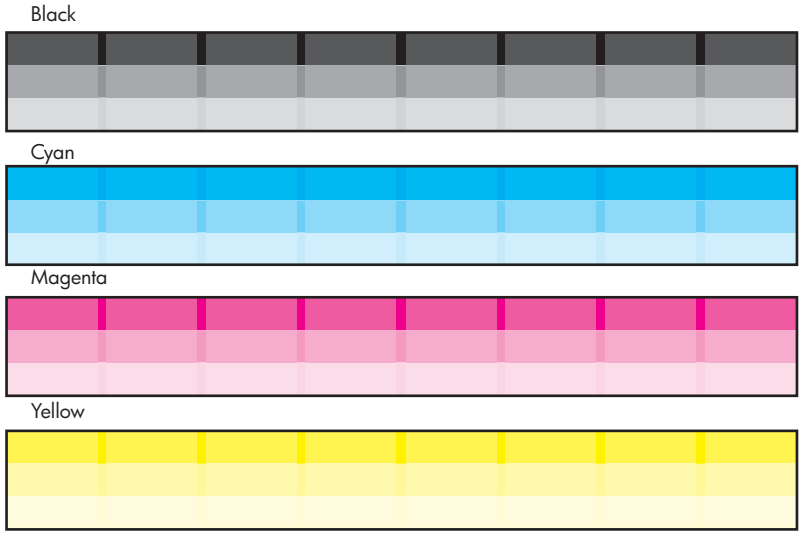
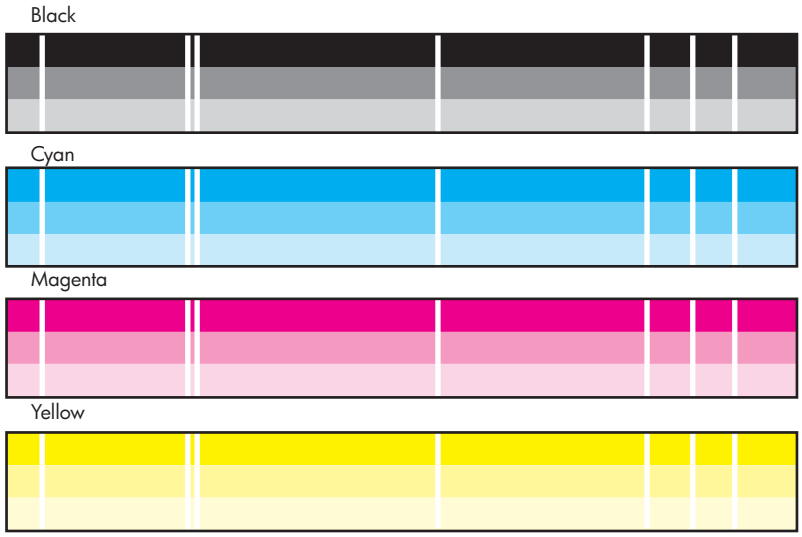
In general, if the ink system is working correctly, all the color bars are present and not streaked. Each bar has three distinct shades, but otherwise the color should not vary across the bar. The bars should also be evenly lined up. The black text on the page should not show ink streaks.

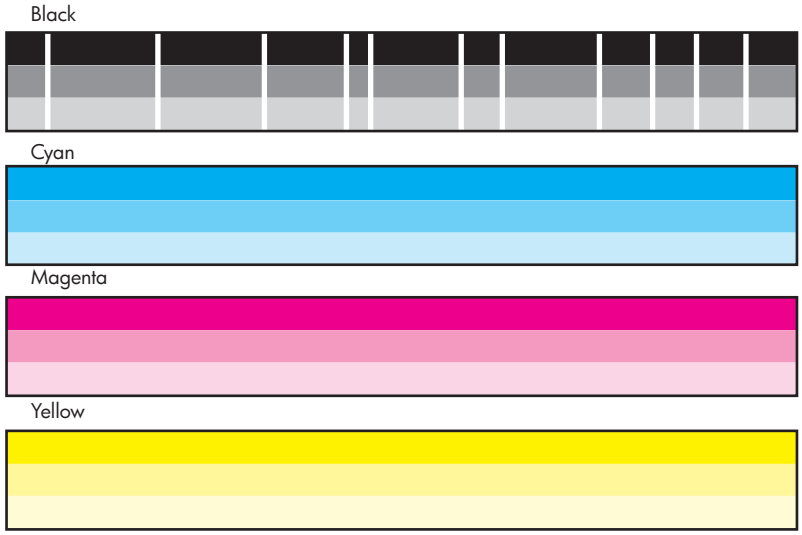
The following table shows some representative examples of defects on the print quality report.

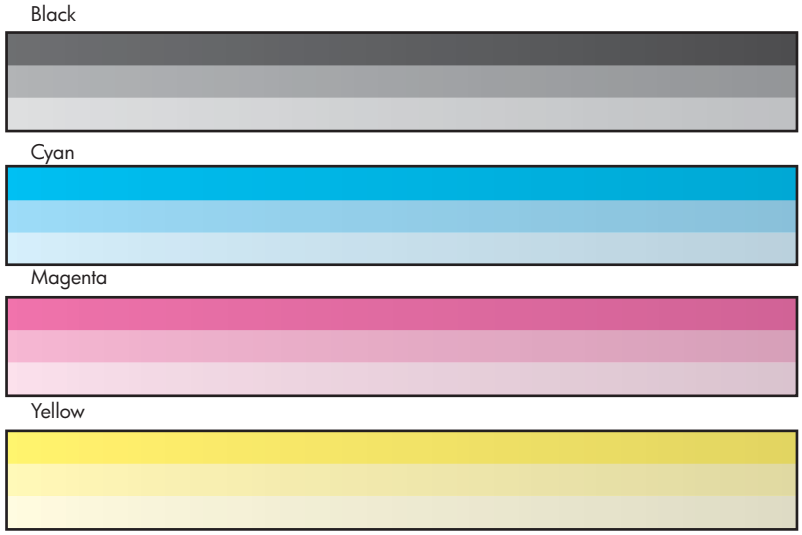
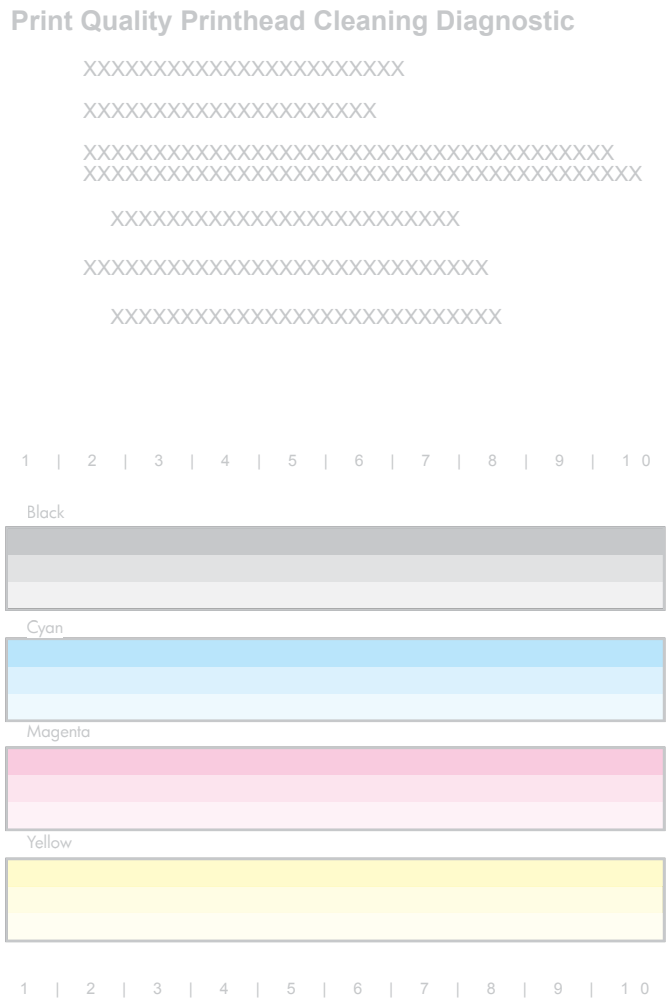
NOTE: The relative position of the color bars might be different than they appear on the printed report, but the defects are representative of the defects that are shown.

Defect	Example
Color variation across bar	

Defect	Example
Color intensity variation across bars	
Uneven bars	

Defect	Example
Vertical dark lines	
Vertical white lines on all bars	

Defect	Example
Vertical white lines on select bars	

Defect	Example
Shade gradations not sharp	
Page is blank or only partially printed	

If the print quality report shows defects like the ones above, clean the printhead as follows:

1. Load paper in the default input source tray (usually letter or A4 in Tray 2).
2. From the Home screen on the printer control panel, scroll to and select Support Tools.
3. Open the following menus:
   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support
4. Select Clean the Printhead, and then select Start to begin the cleaning process.

   The cleaning process has several steps. After each of them, the printer prints the print quality report again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

NOTE: The cleaning process takes about 4 minutes. Make sure clean unused paper is loaded in the default source tray (usually letter or A4 in Tray 2). HP recommends that this cleaning level be performed no more than twice within a 24–hour period to prevent the Service Fluid Container from overflowing.

5. Select OK. A print quality report prints. Compare this report to the previously printed report to confirm that the print quality improved.
6. If the print quality report still shows defects after a second cleaning, go to the next section to service the printer.

TIP: A printhead deep cleaning item is available in the Service menu (Advanced Service>Calibration/Cleaning then select Clean the Printhead (extensive). See Print quality advanced tools on page 265 for more information.

If the defect on the print quality report is color variation across the bars (see the table of defects above), and if the problem seems to go away after a cleaning, but then reoccurs in the same location on the color bar the next day, complete the following procedure:

1. Check to see if any of the following conditions are true:
   - Prior to the print quality problem, the printer was not used for more than three weeks.
   - The printer was recently moved or experienced a large temperature shift.
   - There was a recent paper jam.
   - The print quality problem seems to be getting better as the printer is used (especially if print jobs with dense backgrounds are printed).
2. If none of the conditions above are true, the color problem is likely to reoccur, even if a cleaning fixes it temporarily.

If the print quality report has no defects, then the ink system is working correctly. There is no reason to clean the printhead, which unnecessarily wastes ink and paper. Complete the following steps:

1. Retry the original print job. Just printing the print quality report can solve some problems. If the print job meets print quality standards, stop troubleshooting here.
2. If problems still exist on print jobs, review the earlier steps in this document: make sure the ink and paper is appropriate, and that the print settings are correct. In addition, these suggestions might help with some problems:
    - If you are printing an image, make sure it has sufficient resolution. Images that have been enlarged too much might appear fuzzy or blurry.
    - If the problem is confined to a band near the edge of a printout, use the software you installed with the printer or another software program to rotate the image 180°. The problem might not appear on the other end of the printout.
    - Always use the power switch to turn the printer off. This protects the printhead from exposure to air.
    - If yellow is missing from color jobs, there might be an ink sludge buildup on the printhead. Clean the printhead several times and then see if print quality has improved.

      TIP: A printhead deep cleaning item is available in the Service menu, Advanced Service, Calibration/Cleaning and select Clean the printhead (extensive). See Print quality advanced tools on page 265 for more information.
    - If all colors are experiencing poor print quality, there might be an issue with the web wipe not advancing.

      Remove the printhead wiper, and inspect it for damage or wear.
3. If the problem persists, install a replacement printhead.

IMPORTANT: Before replacing the printhead, make sure that you use all of the print-quality tools provided in the Service and Maintenance menus to try and resolve a print quality problem. See Service mode functions on page 345 for more information.

Calibrate the printer image sensor or stabilize the printhead

Calibration is a printer function that optimizes print quality. If you experience any image-quality problems, calibrate the printer color density or align the printhead.

1. Load paper in the default input source tray (usually letter or A4 in Tray 2).
2. From the Home screen on the printer control panel, scroll to and select Support Tools.
3. Open the following menus:
    - Maintenance
    - Calibration/Cleaning
    - Advanced Calibration Support
4. Select one of the following:
    - Stabilize Printhead
    - Calibrate the Image sensor
5. Select OK.

NOTE: During image sensor calibration, several internal test pages eject to the output bin. Discard these pages.

6. Print a Print Quality Report page and compare it to the previously printed page. If print quality does not improve, see the printer specific image quality section of the printer Troubleshooting Manual. See Printer specific image defects on page 258 for more information.

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 765 and M780–785 printer displays View.

- Reports menu
- Settings menu
- Copy menu (780/785 models only)
- Scan menu (780/785 models only)
- Fax menu (fax 780/785 models only)
- Print menu
- Supplies menu
- Trays menu
- Support Tools menu

Reports menu

To display: At the printer control panel, select Reports.

Table 2-10 Reports menu

First level	Second level	Values	Description
Configuration/Status Pages	Settings Menu Map	Print View	Shows a map of the entire control panel system and the selected values for each setting.
	Current Settings Page	Print View	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.
	Configuration Page	Print View	Shows the printer settings and installed accessories.
	How to Connect Page	Print View	Shows the network information typically needed to connect the printer to a network.
	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 (780/785 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.

Table 2-10 Reports menu (continued)

First level	Second level	Values	Description
Fax Reports (780/785 fax models only) (continued)	Blocked Fax List	Print View	A list of phone numbers that are blocked from sending faxes to 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.
	PCL Font List	Print	Prints the available PCL fonts.
	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 2-11 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 MMM/DD/YYYY YYYY/MMM/DD	Use the Date/Time Settings menu to specify the date and time and to configure date/time settings.
			Time Format		12 hour (AM/PM) 24 hours	Select the format that the printer uses to show the date and time, for example 12-hour format or 24-hour format.
		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. Done Select the trash can icon to delete the event.	Use to configure the printer to automatically wake up or go to sleep at specific times on specific days. Using this feature saves energy. **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.
				Event Days	Select days of the week from a list.	Set the wake or sleep event day parameters.
	Energy Settings	Sleep Settings	Sleep After Inactivity		Range: 1 to 118 minutes	Set the number of minutes after which the printer enters Sleep or Auto Off mode. Select the existing number to open the virtual keypad, and then increase or decrease the number of minutes.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
General continued	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 select 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.
		Language Settings	Keyboard Layout (780/785 models 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.
		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			Yes No*	Select whether to display or hide the date and time on the control panel Home screen.
		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 selected. 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 2-11 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)* Select 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 Select OK to continue option is selected, the job will stop and require the user to select OK before continuing.
	Quiet Mode				Off* On	Off: Normal printing. On: Produces less noise, but prints at half speed.
	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 2-11 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 addresses. Information sent to HP is used to improve products and services, and 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.
	Enable Online Help				Enable Disable *	Browse to the Online Help configuration page on the HP Embedded Web Server for advance setup and the HP Privacy Statement.
	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.
	Reset Factory Settings				Cancel Reset	Select Reset to reset current user-specified default settings to the factory default settings.
	Copy Settings (780/785 models only)	Image Preview			Make optional Require preview Disable 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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print continued	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			Off* 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.
		Standard Stored Job Retention			Off* 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 standard jobs that can be stored on the printer. The maximum allowed value is 300.
	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.	

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Default Print Options (continued)	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 1-sided original, 2-sided output option when the original is printed on one side, but you want to make two-sided copies.	
		Quality Level			General Office Professional* Presentation	Set the default print quality settings.
		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	

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Default Print Options (continued)	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.
	PCL and Postscripts 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.
		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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	PCL and PostScript Settings	PCL (continued)	Font Settings (continued)	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.
				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 is 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.

Table 2-11 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	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.
				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		Midtones Cyan Magenta Yellow Black	A sliding bar to adjust the midtones for each of the colors. Use your finger to move the indicator for each color r to the desired midtones, and then select Done .	
		Image Registration	Tray	Tray 1* Tray 2 Tray 3 Tray 4 Tray 5 Depends upon number of trays installed		Specify tray to be adjusted

Table 2-11 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		-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.
			Front-side Vertical Shift			
			Back-side Horizontal Shift			
			Back-side Vertical Shift			
		Image Registration		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.

Table 2-11 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* 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
		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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays (continued)	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.
		Alternative Letterhead Mode			Off* On	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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Copy/Print (continued)	Manage Trays (continued)	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.
		Image Rotation			Left to Right Right to Left Alternate	
		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 (780/785 models only)	E-mail 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 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Scan/Digital Send (780/785 models only) (continued)	E-mail 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.
	Network Folder Settings	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 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 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Scan/Digital Send (780/785 models only) (continued)	SharePoint® Settings	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 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.
	Scan to USB Drive Settings	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 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 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Scan/Digital Send (780/785 models only) (continued)	Digital Sending Software Setup	Allow Use of a DSS Server Allow Transfer to New DSS server			Enable or Disable Enable or Disable	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. 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 (780/785 models only)	Internal Fax Modem Setup					Use this wizard to set up options for faxing. 1. Select your location from the list. Fax communication standards vary 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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (780/785 models only) (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.
Fax (780/785 models only)	Fax Send Settings	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 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (780/785 models only) (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.
		Fax Receive Setup (continued)	Ringer Volume		Off Low* High	
			Fax Receive Speed		Fast (v.34-33.6k) Medium (v. 17-14.4k)* Slow (v.29-9.6k)	Select Medium (v. 17-14.4k) or Slow (v. 29-9.6k) to improve the quality of received faxes.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (780/785 models only) (continued)	Fax Receive Settings (continued)	Fax Printing Schedule			Always store Always print* Use schedule	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.
		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 select the arrow to add a new number to the blocked fax list. To remove blocked numbers: Select a number and select the trash can icon to delete it from the blocked fax list. To clear all blocked numbers: Select the Select All to select all of the numbers from the blocked fax list, and then select 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 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (780/785 models only) (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. Select 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		Select this text field, provide the email address to which you want notifications sent, and then select the OK.
			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.
			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.	

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Fax (780/785 models only) (continued)	Fax Receive Settings (continued)	Default Job Options (continued)	Output Bin		Automatically select Standard bin Upper bin Middle bin	
			Out sides		1-sided* 2-sided Pages flip up Enable / Disable	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.
Manage Supplies	Low Warning Thresholds			Black Cartridge Cyan Cartridge Magenta Cartridge Yellow Cartridge Service Fluid Container Printhead Wiper Document Feeder Kit Tray 1 Roller Kit Tray 2 Roller Kit	1-100% Default = 10%	Set the estimated percentage at which the printer notifies you when a toner cartridge is very low.
	Low Warning Threshold Message				On* Off	Displays a message on the control panel when a cartridge is very low.
	Very Low Behavior	Black Cartridge Color Cartridges Service Fluid Container Printhead Wiper Document Feeder Kit Tray 1 Roller Kit Tray 2 Roller Kit			Stop Continue* Prompt to continue	
		Staples			Stop Continue*	

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Manage Supplies (continued)	Restrict Color Use				Enable Color Disable Color Color if allowed*	Use this feature to enable, restrict, or disable color printing or copying.
	Color/Black Mix				Auto Detect* 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.
	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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Manage Supplies (continued)	Replace Printhead Wiper				Cancel Replace	Select Replace to replace supply now. Close all doors and have a replacement available before proceeding. After this process is started, it cannot be canceled.
	Reset Supplies				Document Feeder Kit Tray 1 Roller Kit Tray 2 Roller Kit	After replacing supply kit, select it from the list and select Reset.
	Manage Stapler/ Stacker	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.
		TCP/IP	Host Name		Use the arrow 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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP (continued)	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.
			IPV4 Settings	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.
				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.

Table 2-11 Settings menu (continued)

First level	Second level	Third level	Fourth level	Fifth level	Values	Description
Networking (continued)	Ethernet (continued)	TCP/IP (continued)	IPV4 Settings	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.
				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 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 configuration from a DHCPv6 server. Always: Whether a router is available, the print server always attempts to obtain its 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 2-11 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 (780/785 models only)

To display: At the printer control panel, select the Copy menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-12 Copy menu (MFP only)

First level	Second level	Third level	Values	Description
Sides	Original Sides		1-sided* 2-sided	Use to indicate whether the original document is printed on one or both sides.
	Output Sides		1-sided* 2-sided	Use to indicate whether the copies should be printed on one or both sides.
Color/Black			Automatically detect* Color Black/Gray	Select how the copy should be printed. 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* Color Black/Gray	Select how the copy should be printed. 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 2-12 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Staple		None* Top left angled Top right Two Right Two left Two top Top Right angled	Sets the position of the staple on the page.
	Fold	V-fold C fold	Maximum Sheets per Set 1" (1–5) Advanced fold options (checkbox)	
		None*		
	Watermark	Text	Watermark text First page only (checkbox) Text Font Text Size Text Color	
		Image		
		Secure	Secure Watermark Text First page only (checkbox) Rotate text 45 degrees Text Font Text Size Background Color Background Pattern Darkness	

Table 2-12 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Stamps		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	This string is for explaining the idea that you can have up to 6 stamps on a page, and you can set up each one. NOTE: When selecting Top Center you need to choose one of the following stamps before the job can be started. • IP Address • ID • Device Information • Page number • Date & Time Select Done to add the stamp.
	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.

Table 2-12 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	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.
		Boarders on each page	(Checkbox)	Use this option to add boarders on each page.
	Hole Punch		None* Select the location and the number of stapes to place on the page. • Number of staples: 2, 3. 4 • Location: Left, Top, Right, Bottom	
	Content 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 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) Right then down Four (4) down the right	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.

Table 2-12 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Image Adjustment (continued)	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.
	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.

Table 2-12 Copy menu (MFP only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Erase Edges (continued)	Back Side	Use inches (checkbox to enable or disable) Mirror front side Top edge Bottom edge Left edge Right edge	
	Automatically Straighten		Off* Automatically straighten pn	
	Blank Page Suppression		Off* Suppress blank pages	
	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 (780/785 models only)

To display: At the printer control panel, select the Scan menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-13 Scan menu (780/785)

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			Load Save	
	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 select 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 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network folder (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 the list of resolution settings. Quality and File Size: Choose from High (large file), Medium , or Low (small file). High Compression (small 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.
		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 select 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 2-13 Scan menu (780/785) (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.
		Staple		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	
		Fold		None* V-fold C-fold	

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	Watermark	Text	Watermark text First page only (checkbox) Text Font Text Size Text Color	
			Image		
			Secure	Secure Watermark Text First page only (checkbox) Rotate text 45 degrees Text Font Text Size Background Color Background Pattern Darkness	
		Stamps		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	This string is for explaining the idea that you can have up to 6 stamps on a page, and you can set up each one. NOTE: When selecting Top Center you need to choose one of the following stamps before the job can be started. • IP Address • ID • Device Information • Page number • Date & Time Select Done to add the stamp.
		Original Size		Select from a list of supported sizes.	Use to describe the page size of the original document.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	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.
		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 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network Folder (continued)	Options (continued)	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.
		Erase Edges	Front Side	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.
			Back Side	Use inches Top Edge Bottom Edge Left Edge Right Edge	
		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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Network folder (continued)	Options (continued)	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.
		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. Select the text box following Email Address, and then type the email address for the notification.
Scan to USB Drive	Destination				

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB Drive (continued)	Job Name				
Quick Sets and Defaults				Load Save	
Scan to USB Drive	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 select 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 2-13 Scan menu (780/785) (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* 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.
		Staple		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	
		Fold		None* V-fold C-fold	

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB drive (continued)	Options (continued)	Watermark	Text	Watermark text First page only (checkbox) Text Font Text Size Text Color	
			Image		
			Secure	Secure Watermark Text First page only (checkbox) Rotate text 45 degrees Text Font Text Size Background Color Background Pattern Darkness	
		Stamps		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	This string is for explaining the idea that you can have up to 6 stamps on a page, and you can set up each one. NOTE: When selecting Top Center you need to choose one of the following stamps before the job can be started. • IP Address • ID • Device Information • Page number • Date & Time Select Done to add the stamp.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB drive (continued)	Options (continued)	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.
		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.
		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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB drive (continued)	Options (continued)	Image Adjustment (continued)	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 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	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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB drive (continued)	Options (continued)		Back Side	Use inches Top Edge Bottom Edge Left Edge Right Edge	
		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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to USB drive (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. Select the text box following Email Address, and then type the email address for the notification.
Scan to Job Storage	Options			Folder Job Name	

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	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 of both sides. Then select 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 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	Color/Black		Automatically detect color or black* Color Black/Gray	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 1–bit black if other settings allow. If the other settings don't allow (File Type, for example), the image is in grayscale. Color: Scans document in black and white with the compressed file size. Black/Gray: Scans document in grayscale.
		Staple		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	
		Fold		None* V-fold C-fold	
		Watermark	Text	Watermark text First page only (checkbox) Text Font Text Size Text Color	
			Image		

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	Watermark (continued)	Secure	Secure Watermark Text	
				First page only (checkbox)	
				Rotate text 45 degrees	
				Text Font	
				Text Size	
				Background Color	
				Background Pattern	
				Darkness	
		Stamps		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	This string is for explaining the idea that you can have up to 6 stamps on a page, and you can set up each one. NOTE: When selecting Top Center you need to choose one of the following stamps before the job can be started. • IP Address • ID • Device Information • Page number • Date & Time Select Done to add the stamp.
		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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	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 supported sizes.	Use to describe 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 panels menu or from the print driver.
		Booklet	Booklet Format Boarders on each page	(Checkbox) (Checkbox)	Use to copy two or more pages onto one sheet of paper so you can fold the sheets in the center to forma a booklet. The printer arranges the pages in the correct order. For example, if the original document has eight pages, the printer prints 1 and 8 on the same sheet.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	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 pages 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) Right then Down Four (4) Down then Right	Copies multiple pages onto one sheet of paper. NOTE: Before using this screen, us the Content Orientation screen to describe the original documentation orientation.
		Image Adjustment	Sharpness		Adjust the Sharpness setting to clarify or soften the image. For example, increasing the sharpness could make the text appear crisper, but decreasing it could make photographs appear smoother.
			Darkness		Use to improve overall quality of the copy. Adjust the Darkness setting to increase or decrease the amount of white or 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 if you are having trouble copying a faint image.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	Optimize Text/Picture		Text Mixed* Printed Picture Photograph	Optimize the output for a particular type of content. You can optimize the output for text, printed picture, or a mixture. Text: Use the 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 the line drawings and preprinted images, such as magazine clippings or pages from a book. 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 tope edge, bottom edge, left edge, and right edge to clean.
			Back Side	Apply same width to all edges Top Edge Bottom Edge Left Edge Right Edge	(Checkbox) Enable or Disable

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to Job Storage (continued)	Options (continued)	Multi-feed Detection		On* Off	This setting stops the scanning process if it detects multiple-page feeds through the document feeder.
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 specify a SharePoint® path, select Load, and then select a Quick Set.
	Filename				

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (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
		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 select 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 2-13 Scan menu (780/785) (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.
		Staple		Top Left	
				Top Center	
				Top Left	
				Top Left	
				Top Right	
				Bottom Left	
				Bottom Center	
				Bottom Right	
		Fold		None*	
				V-fold	
				C-fold	

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Options (continued)	Watermark	Text	Watermark text First page only (checkbox) Text Font Text Size Text Color	
			Image		
			Secure	Secure Watermark Text First page only (checkbox) Rotate text 45 degrees Text Font Text Size Background Color Background Pattern Darkness	
		Stamps		Top Left Top Center Top Left Top Left Top Right Bottom Left Bottom Center Bottom Right	This string is for explaining the idea that you can have up to 6 stamps on a page, and you can set up each one. NOTE: When selecting Top Center you need to choose one of the following stamps before the job can be started. • IP Address • ID • Device Information • Page number • Date & Time Select Done to add the stamp.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Quick Sets (continued)	Scan Mode		Standard Document* Book Mode 2–sided ID Copy	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.
		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.
		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.

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Quick Sets (continued)	Image Adjustment (continued)	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.
		Erase Edges	Front Side	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.
			Back Side	User Inches (checkbox to enable or disable) Top Edge Bottom Edge Left Edge Right Edge	

Table 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Quick Sets (continued)	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 2-13 Scan menu (780/785) (continued)

First level	Second level	Third level	Fourth level	Values	Description
Scan to SharePoint® (continued)	Quick Sets (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. Select the text box following Email Address, and then type the email address for the notification.

Fax menu (fax 780/785 models only)

To display: At the printer control panel, select the Fax menu.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-14 Fax menu (fax models only)

First level	Second level	Third level	Values	Description
Dialing Prefix				
Fax Recipients				
Quick Sets and Defaults			Load	
			Save	
	Scan Mode		Standard Document*	Book Mode allows the user to scan pages from a book.
			Book Mode	
			2–sided ID Copy	2-sided ID allows the user to scan both sides of an identification card onto one sheet.
Options	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 select 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	
	Resolution		Standard (100 x 200dpi)*	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.
			Fine (200 x 200dpi)	
			Superfine (300 x 300dpi)	
	Original Size		Select from a list of sizes that the printer supports.	Use to describe the page size of the original document.

Table 2-14 Fax menu (fax models only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	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.
	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 2-14 Fax menu (fax models 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.
	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. Select the text box following Email Address, and then enter the email address for the notification.

Table 2-14 Fax menu (fax models only) (continued)

First level	Second level	Third level	Values	Description
Options (continued)	Notification (continued)	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 Print.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-15 Print Options menu

First level	Second level	Values	Description
Print from Job Storage	Stored Job to Print	Untitled Stored Faxes	Print a job stored on the printer.
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 (780/785 models only)	Fax Polling Number		

Supplies menu

To display: At the printer control panel, select Supplies.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-16 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	
Service Fluid Container	Status	
Printhead Wiper	Order HP Part	
Document Feeder Kit		
Tray 1 Roller Kit		
Tray 2 Roller Kit		
Staples		

Trays menu

To display: At the printer control panel, select Trays.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-17 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 select screen printers display a View.

Backup/Restore menu

To display: At the printer control panel, select Support Tools, and then select Maintenance, select Backup/Restore.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-18 Backup/Restore menu

First level	Second level	Third level	Values	Description
Back up Data	Back up Data		Back up Now Cancel	Initiate a backup.
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.
USB Firmware Upgrade			Insert a USB flash drive that contains the firmware file in the USB port near the control panel.	Upgrades the firmware on the printer

Calibration/Cleaning menu

To display: At the printer control panel, select Support Tools, and then select Maintenance select Calibrate/Cleaning.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-19 Calibrate/Cleaning menu

First level	Second level	Values	Description
Advanced Calibration Support		Printhead status Stabilize the printhead Calibrate the image scanner Calibrate the print margin Calibrate print quality Clean the printhead Print Quality Report	Print quality report helps identify print quality problems.
Calibrate Scanner (780/786 models only)		Start	Select Start to calibrate the device scanner. Messages on the control panel display will lead you through the calibration process.

USB Firmware Upgrade menu

To display: At the printer control panel, select Support Tools, and then select Maintenance, select USB Firmware Upgrade.

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 Support Tools, and then select Troubleshooting.

In the following table, asterisks (*) indicate the factory default setting.

Table 2-20 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 T.30 Trace	When to Print Report		Never automatically 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. 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.
				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	

Table 2-20 Troubleshooting menu (continued)

First level	Second level	Third level	Fourth level	Values	Description
Fax Tools (continued)	Fax V.34			Enable Disable*	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	Print Quality Report Diagnostic Page Advanced Print Quality Pages			Print	Use to print a diagnostics page. The page includes color swatches, diagnostic information, and calibration information.
Event Log				Print	
Paper Path Page				Print	Shows how many pages were printed from each tray.
	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.

Table 2-20 Troubleshooting menu (continued)

First level	Second level	Third level	Fourth level	Values	Description
Paper Path Page (continued)	Paper Path Test (continued)	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	
Diagnostic Tests	Paper Path Test	Output Bin		All Bins Standard Bin* Upper Bin Middle Bin	
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 (780/785 models only)					Enter user access code to retrieve fax diagnostic data.
Set up Cartridge Substitute				On Off*	
Cartridge Prime				Start	Select Start to prime cartridges.

Service menu

To display: At the printer control panel, select Support Tools, and then select the Service.

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 Web-based Interactive Search Engines (WISE). Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Print quality troubleshooting guide

- Printer pre-checks
- Printer specific image defects

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. If the issue only occurs on copy print jobs (MFP models only), go to Copy quality troubleshooting (780/785) on page 257.

TIP: An all-inclusive paper handling diagram is available that is too large to include here. HP recommends downloading this document from the HP Web-based Interactive Search Engine (WISE) Web site, and then print it on A3 size paper to use as a troubleshooting reference.

Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Printer pre-checks

- Check the control-panel display
- Inspect the cartridges for damage
- Check the print settings
- Printer driver considerations
- Printhead status
- Cleaning procedures

- Resolve Ink smear/redeposit
- Copy quality troubleshooting (780/785)

Check the control-panel display

Check the control panel to see if it displays any messages that indicate that a supply needs to be replaced or that a supply is in the very low condition. If it does, replace the supply item.

Inspect the cartridges for damage

1. Remove each cartridge from the product and verify that there is no debris in the cartridge path.
2. Examine the metal connector of the cartridge.

CAUTION: Do not touch the metal connector that is on the edge of the cartridge. Fingerprints on the metal connector can cause print-quality problems.

NOTE: If there are scratches or other damage on the metal connector, replace the ink cartridge.

If a cartridge must be replaced, look on the cartridge or print the Printer Status Report to find the part numbers for genuine HP cartridges.

Figure 2-48 Examine the cartridges

3. If the metal connector does not appear to be damaged, push the cartridge gently back into its slot until it locks in place. Print a few pages to see if the problem has resolved.

Refilled or remanufactured cartridges

HP does not recommend using non-HP supplies, either new or remanufactured. Because they are not HP products, HP cannot control the design or quality of non-HP supplies. If you are using a refilled or remanufactured cartridge and are not satisfied with the print quality, replace the cartridge with a genuine HP cartridge.

NOTE: If you replace a non-HP cartridge with a genuine HP cartridge, the printhead still contains non-HP ink. Until the printhead is depleted of that ink and is supplied with ink from the newly installed genuine HP cartridge, the print defect might remain. Depleting the ink might require printing as many as several thousand pages of normal text.

Verify type of paper in use

The type of paper used can contribute to print-quality problems, such as those listed below:

- The printing is too light or seems faded in areas.
- Specks of ink are on the printed pages.
- Ink is smearing on the printed pages.
- Printed characters seem malformed.
- Printed pages are curled.

Check the type of paper used. Always use a paper type and weight that this printer supports. In addition, follow these guidelines when selecting paper:

- 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 is designed for use in inkjet printers.

NOTE: HP recommends using HP ColorLok paper. Go to www.youtube.com/watch?v=MEh2FRzEtXM to view a short video about ColorLok technology.

- Use paper that is not too rough. Using smoother paper generally results in better print quality.
- Check that the paper type is correctly set for the trays in use and that the paper type for the trays matches the paper type selected in the driver.

NOTE: Use the Tray Configuration dashboard menu to verify or change default paper types for each tray.

NOTE: Based on HP internal testing using a range of plain papers, HP highly recommends using papers with the ColorLok logo for this product. For more information, go to http://www.hp.com/go/printpermanence.

Check the print settings

Print quality settings

1. Open the print dialog box in the software program being used to send the print job.
2. Select your printer, and then click **Properties**. The printer properties dialog box opens.
3. Choose the correct tab to find the settings.
4. Review the following options, and then make changes if necessary.
   - Paper size: Make sure that the selected option matches the selected paper size.
   - Paper type: If one of the options matches required paper type exactly, select that option.
   - Print quality: If the print-quality of the print job is unacceptable, increase the print quality. To print more quickly, decrease the print quality.
5. Click **OK**, and then click **OK** again to start the print job.

Print in grayscale setting

1. Open the print dialog box in the software program being used to send the print job.
2. Select your printer, and then click **Properties**. The printer properties dialog box opens.
3. Choose the correct tab to find the color settings either under **Features** or **Color**.
4. Under **Color Options**, make sure that **Print in grayscale** is *not* selected.
5. Click **OK**, and then click **OK** again to start the print job.

NOTE: If these steps resolved the issue, further troubleshooting is not required. If the issue persists, continue to Printer driver considerations on page 249.

Printer driver considerations

Use the printer driver that best meets the print job. Use a different printer driver if the printed page has unexpected lines in graphics, missing text, missing graphics, incorrect formatting, or substituted fonts. The available print drivers are listed in this section.

HP PCL 6 driver

- This driver is provided as the default driver. This driver is automatically installed when using the printer CD.
- This driver is recommended for all Windows environments.
- This driver provides the overall best speed, print quality, and product-feature support for most users, and was developed to align with the Windows Graphic Device Interface (GDI) for the best speed in Windows environments.
- This driver might not be fully compatible with third-party and custom software programs that are based on PCL 5.
- Download this drive at http://www.hp.com/go/upd.

HP UPD PS driver

- This driver is recommended for printing with Adobe software programs or with other highly graphics-intensive software programs
- This driver provides support for printing from postscript emulation needs, or for postscript flash font support.
- Download this drive at http://www.hp.com/go/upd.

HP UPD PCL5

- This driver is recommended for general office printing in Windows environments.
- This driver is compatible with previous PCL versions and older HP Inkjet printers.
- This driver is the best choice for printing from third-party or custom software programs.
- This driver is the best choice when operating with mixed environments that require the product to be set to PCL 5 (UNIX, Linux, main frame).
- This driver is designed for use in corporate Windows environments to provide a single driver for use with multiple printer models. This driver is preferred when printing to multiple printer models from a mobile Windows computer.
- Download this drive at http://www.hp.com/go/upd.

HP UPD PCL6

- This driver is recommended for printing in all Windows environments.
- This driver provides the overall best speed, print quality, and product-feature support for most users, and was developed to align with the Windows Graphic Device Interface (GDI) for the best speed in Windows environments.

- This driver might not be fully compatible with third-party and custom software programs that are based on PCL 5.
- Download this drive at http://www.hp.com/go/upd.

Printhead status

When print-quality problems are detected, check the printhead status.

- If non HP ink is in use, the printhead status is: Not Available.
- If the printhead status indicates missing nozzles (poor health), perform a printhead cleaning procedure.

TIP: See Advanced Print Quality Pages in the **Service mode functions** section of the printer *Troubleshooting Manual*.

- If the printhead status is OK, print a nozzle health page and check the drop detect item to verify the gauge reading is correct.

TIP: See Major functionalities for PQ troubleshooting the printer *Troubleshooting Manual*.

If the gauge reading matches the nozzle health page pattern, other issues might be causing the print quality problem. **Do not** replace the printhead.

Check the printhead status

1. From the control panel Home screen, scroll to and select Support Tools.
2. Open the following menus:
   - Service

     NOTE: Use one of the following PIN numbers to access the menu:
     - 09078017 (MFP 780/785)
     - 09076517 (SFP 765)
   - Advanced Service
   - Status
3. Select Printhead Status, and then check the following:
   - Status:
     - OK: This indicates that the printhead is correctly functioning (no missing nozzles or a few compensated for missing nozzles).
     - Monitor Print Quality: This indicates that the number of missing nozzles might cause print quality problems for some print jobs (but not all print jobs). Performing a nozzle cleaning might solve the problem.
     - Attention Needed: This indicates that the printhead needs to be replaced because the printer cannot compensate for the number of missing nozzles.

NOTE: Only replace the printhead if the customer objects to output print quality.

– Not Available: This indicates that the printer detected non HP ink in use.

NOTE: Printhead status might not be reliable if non HP ink refilled cartridges are installed.

- Last Updated provides information on last update.
- Pages Since Status Date: The number of pages printed since the last drop detection.
- Pages Since Last Update: The number of pages printed since the last drop detection.
- Printhead Health Score: Contains the following information:

Table 2-21 Printhead health score

Printhead health score format: I - KKKK - CCCC - PPPPPP - MMMMM - pppppp - NN.WX.YZ						
I	KKKK	CCCC	MMMMM	PPPPPP	pppppp	NN.WX.YZ
NonHPInk	Kscore	CMYMaxScore	PH months	PH pages	Printer page count at last update	LastError

- Printhead Service Code provides service code information.

Cleaning procedures

Print quality report

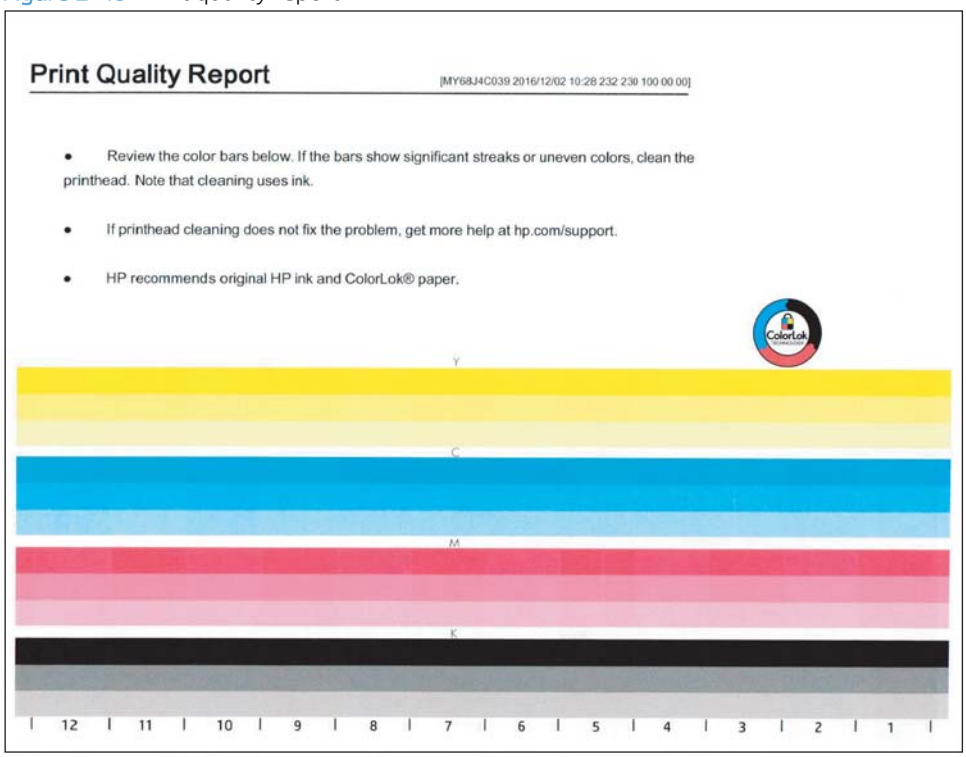
These steps involve printing a page with color bars to identify print-quality issues.

1. At the printer control panel, scroll to and then the select Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Print Quality Pages
3. Select Print Quality Report, and then select Print.

   This page contains four bands of color, which are divided into the groups as indicated in the figure below. By examining each group, you can determine if the problem is due to a particular cartridge.

NOTE: Each bar has three distinct shades, but otherwise the color should vary minimally across the bar. If any major defects appear in one or more color bars, clean the printhead as explained below. If all the color bars show little or no streaking, go to Resolve Ink smear/redeposit on page 254.

Figure 2-49 Print quality report



Printhead Cleaning

Use this procedure to clean the printhead.

NOTE: Always print a print quality report before cleaning the printhead so it can be compared to the report that prints after the cleaning process is complete. See Print quality report on page 252 for more information.

1. Load paper in the default input source tray (usually this is the A3 Tray 2 or the A4 Tray 3).
2. From the Home screen on the printer control panel, scroll to and select Support Tools, and then open the following menus:
   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support
3. Select Clean the Printhead, and then select Start to begin the cleaning process.

NOTE: The cleaning process takes about 2 minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

4. Select OK. A print quality report prints. Compare this report to the previously printed report to confirm that the print quality improved.

TIP: A printhead deep cleaning item is available in the Service menu. See Advanced Service, Calibration/Cleaning for more information.

Resolve Ink smear/redeposit

Perform a smear test

This process uses paper. Make sure there is clean unused paper in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access type area.
4. Enter the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select Sign In to enter the Service menu.

NOTE: The printer may restart to exit the Service menu. This can take several minutes.

6. Open the following menus:
   - Advance Service
   - Calibration
   - Cleaning
7. Select Smear Test, and then select OK.
8. Check the page that eject to the output bin for smeared or redeposited ink.

Resolve ink smear/redeposit problems

TIP: Ink smear/redeposit problems can appear on duplex or simplex printed pages at any location on the page, but might not be visible on the Print Quality Report page.

1. Print a Print Quality Report page.

NOTE: Make sure that genuine HP ink is in use.

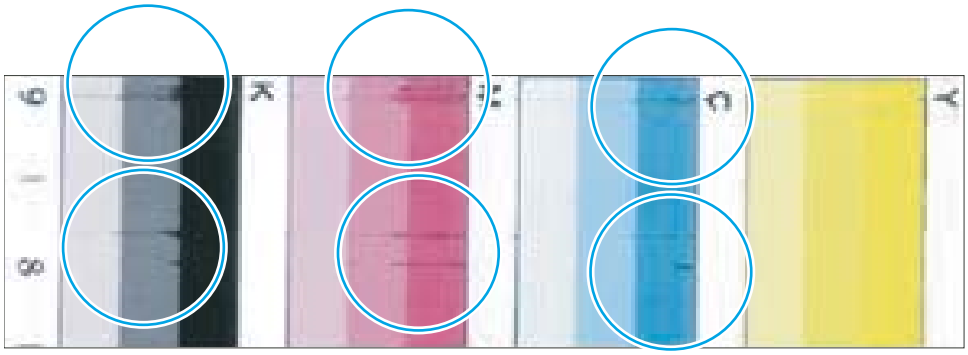
   a. From the Home screen on the printer control panel, scroll to and select Support Tools.
   b. Open the following menus:
      – Troubleshooting
      – Print Quality Pages
   c. Select Print Quality Report, and then select Print to print the page.
   d. Examine the page for ink smear/redeposit problems.

NOTE: Ink smear/redeposit problems might not be visible on the Print Quality Report page.

e. If the Print Quality Report Page shows the smear/redeposit defect, go to Printer specific image defects on page 258.

If the Print Quality Report page **does not** show the smear/redeposit defect, continue with the steps in this section to resolve the problem.

Figure 2-50 Ink smear/redeposit



2. Specify the Paper Type setting for the print job source tray.

   a. At the printer control panel, scroll to and then select Trays.

   b. Select the specific tray from the image that you want to configure (number of trays available is dependent on printer configuration).

   c. Select Type to display a list of available paper types.

   d. Scroll to and select the desired paper type.

   e. Select Done to return to the Trays menu, and then select Home to return to the Home screen.

   f. Print some additional pages and make sure that the smear/redeposit problem is resolved. If the problem is resolved, skip the remaining steps in this procedure.

3. Try using a different brand of paper.

   Print some additional pages and make sure that the smear/redeposit problem is resolved. If the problem is resolved, skip the remaining steps in this procedure.

4. Make sure that the correct paper type is in use, and that the paper type selection in the print driver is correct.

   a. Select the **Color** tab in the print driver settings.

   b. Deselect the **HP EasyColor** option.

   c. Check the **Ink Settings** item.

   d. Select from the following settings:

      – **Dry Time**: Use this item to change the print speed (default setting is 0). Select **Medium** or **Minimum** to reduce ink smears.

      – **Saturation**: Use this item to change the amount of ink used (default setting is 0). Select **-1** or **-2** to reduce ink smears.

5. From the Home screen on the printer control panel, scroll to and select Support Tools.

6. Open the following menus:

   - Troubleshooting
   - Event Log

   a. Check the event log for **61.DX.YZ** error entries (airflow system errors).

      If **61.DX.YZ** are found, see the printer control panel message document (CPMD) for solutions to the problem.

      NOTE: The message **Airflow Assembly for the printer is not functioning properly. Printing will slow down until it is repaired** might appear on the control-panel display when air flow assembly problems are present.

   b. If an airflow assembly problem is fixed, print some additional pages and make sure that the smear/redeposit problem is resolved. If the problem is resolved, skip the remaining steps in this procedure.

7. Remove, and then reinstall the service fluid container.
8. Try using a lower print quality setting.

   a. At the printer control panel, scroll, and then select Settings.

   b. Open the following menus:

      – Copy/Print
      – Print Quality
      – Adjust Colors

   c. Print some additional pages and make sure that the smear/redeposit problem is resolved. If the problem is resolved, skip the remaining steps in this procedure.

Copy quality troubleshooting (780/785)

Use the following procedures to resolve quality defects that occur only on copies.

Speckles on copies from the scan bed

Create a color copy, then rotate the original 180 degrees (do not turn the paper over) and make a second copy. Compare the location of the defect on the two copies.

- If the defect appears in a different position, clean the scanner glass using a soft, lint-free cloth that has been moistened with warm water. Dry the glass with a dry, soft, lint-free cloth.
- If the defect appears in the same location on both copies, contact your Global Business Unit (GBU).

Lines on copies from the document feeder

Mark the corner of a blank sheet of paper and create a copy from the document feeder.

Place the copy on the glass with the mark in the same orientation as the original. Make sure the page is even with the upper-left corner of the scan area.

The defect lines on the page should indicate the location of debris on the thin strip of glass to the left of the scan area. Use a fingernail or blunt object to loosen debris, and then clean the glass using a soft, lint-free cloth that has been moistened with warm water. Dry the glass with a dry, soft, lint-free cloth.

Printer specific image defects

NOTE: The image defects described in this section are printer-specific image defects.

TIP: An all-inclusive paper handling diagram is available that is too large to include here. HP recommends downloading this document from the HP Web-based Interactive Search Engine (WISE) Web site, and then print it on A3 size paper to use as a troubleshooting reference.

Go to the appropriate Web site (listed below), and then search by printer name.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

- Major functionalities for PQ troubleshooting
- Image-quality defects (printer specific)

Major functionalities for PQ troubleshooting

- Print quality tools suggested sequence
- Print Quality Report page
- Print a Print Head Diagnostic Page
- Print a Printhead Details page
- Print quality advanced tools

Print quality tools suggested sequence

Print Quality Tools

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access type area.
4. Enter the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select Sign In to enter the Service menu.

   NOTE: The printer may restart to exit the Service menu. This can take several minutes.
6. Open the following menus:
   - Advanced Service
   - Calibration/Cleaning

Print quality troubleshooting guide

Use the print quality troubleshooting guide to solve common print quality defects. This guide is useful if the print defect is not easily matched the defect samples included in this manual.

The guide contains instructions on how to assess print-quality problems.

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Print quality pages
   - Troubleshooting Guide
3. Select the Print to print the guide.

Print Quality Report page

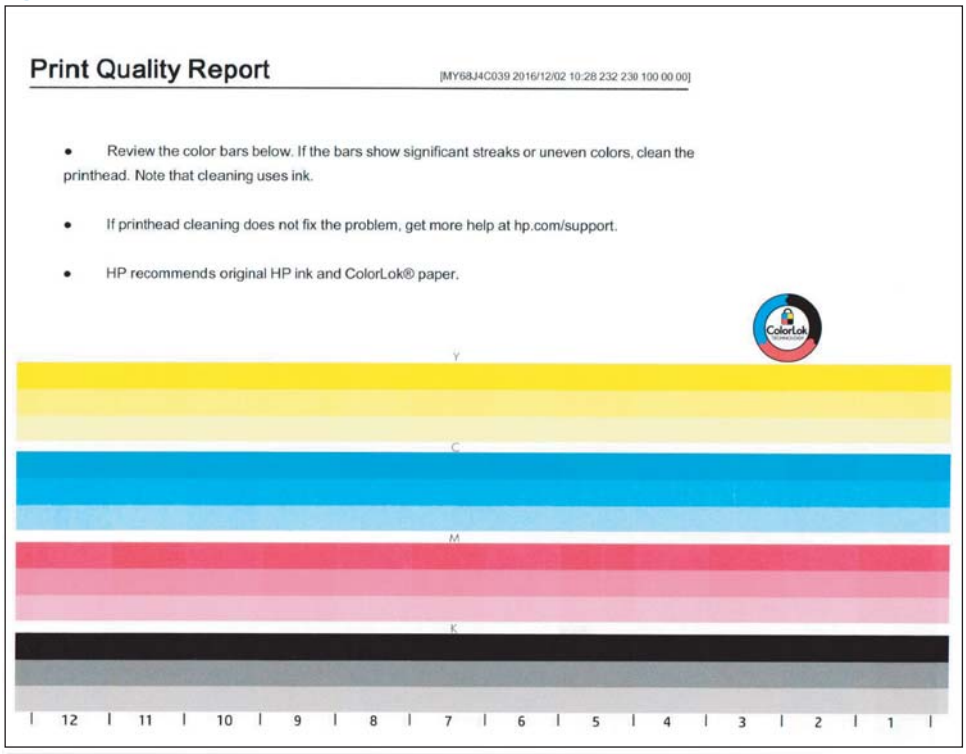
The Print Quality Report is a useful page which shows different density fill bar chart with four colors. There are numbers below the bar to indicate the printhead numbering, and the line in between indicates the printhead boundary.

Print the Print Quality Report page

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Print Quality Pages
3. Select Print Quality Report, and then select Print to print the page.

   This page contains four bands of color, which are divided into the groups as indicated in the figure below. By examining each group, you can determine if the problem is due to a particular cartridge.

   Figure 2-51 Print Quality Report page



Print a Print Head Diagnostic Page

The printhead diagnostic page is a useful page to determine the health of the print bar. There are thirteen blocks of lines, and each block represents a printhead die, and each line corresponds to a nozzle. Check whether the line is missing or being misdirected, to evaluate the health of the print bar.

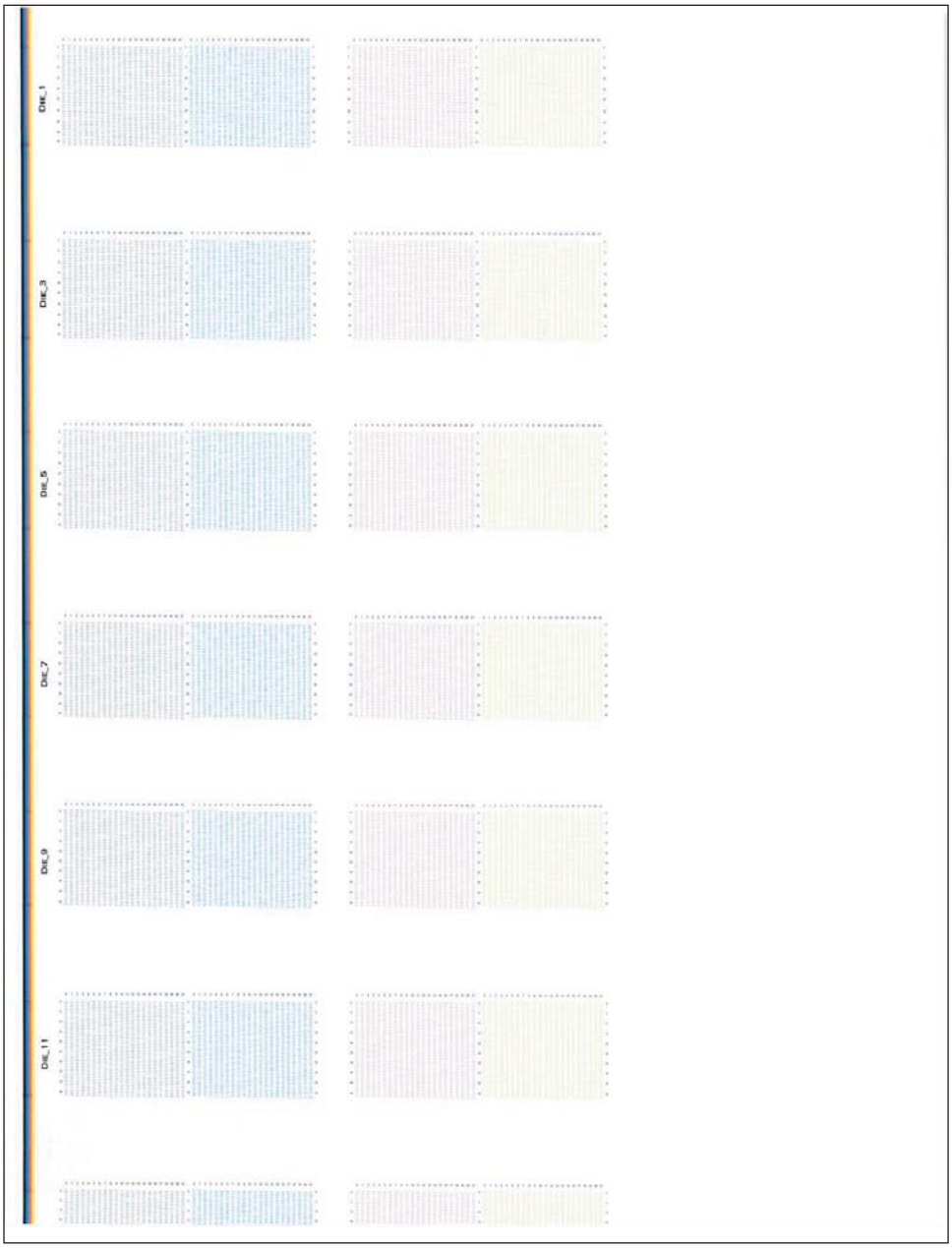
Print a Print Head Diagnostic Page

This process uses paper. Make sure there is clean unused paper in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Print Quality Pages
   - Advanced Print Quality Pages

3. Select Print Head Diagnostic Page, and then select Done to print nozzle health page.

Figure 2-52 Print Head Diagnostic Page



Print a Printhead Details page

The Printhead Details page is a useful page to find printhead and cartridge information.

- Generic product information (for example, the printer serial number and printhead wipe counts)
- Cartridge system information (for example, the printhead total pages and print zone jams count)

Print a Printhead Details page

This process uses paper. Make sure there is clean unused paper in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access type area.
4. Enter the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select Sign In to enter the Service menu.

   NOTE: The printer might restart to enter the Service menu. This can take several minutes.
6. Open the following menus:
   - Advance Service
   - Service Reports
   - Printhead

7. Select Printer icon located at the bottom left-hand corner of the display to print the page.

Figure 2-53 Printhead Details page

PRINTHEAD DETAILS

Product Information

1. Model Name: HP PageWide Pro 750
2. Serial Number: MY68J4C039
3. Service ID: 26294
4. Firmware Version: LIMOFWMP1A002.1646C.00
5. Printer Total Pages: 237
6. Real time Clock: 12/5/2016 08:17:35 AM
7. Date/Time: 12/5/2016 08:17:35 AM
8. Printhead Ambient Temperature: 234 C / 453 F
9. Printer Humidity: 15

Cartridge System information

10. Printhead Assembly Serial Number: BNB65O2001
11. Printhead Assembly Manufacturing date: 224-6-23
12. Printhead Assembly First Initialization Date: 209-5-3
13. Printhead Assembly Startup Date: 209-5-4
14. Printhead Serial Number: 2622001000014028
15. Printhead Wiper Serial Number:
16. Service Fluid Container Serial Number : -- NOT IMPLEMENTED --
17. Printhead Lift calibration: 382
18. Printhead Total Pages: 88
19. Nozzle Defects: 0
20. Black Nozzle Score: 2
21. Cyan Nozzle Score: 2
22. Magenta Nozzle Score: 2
23. Yellow Nozzle Score : 2
24. Printers Seen: 1
25. Print zone jams: 2
26. Pages since last print zone jam: 2
27. Startup service pages (Level 1 | Level 2 | Level 3): Lvl 1: 0 Lvl 2: 0 Lvl 3: 0
28. Uncap service pages (Level 0| Level 1 | Level 2 | Level 3 | Level 4): Lvl 0: 21 Lvl 1: 5 Lvl 2: 0 Lvl 3: 1 Lvl 4: 0
29. Cap service pages (Level 0| Level 1 | Level 2 | Level 3): Lvl 0: 45 Lvl 1: 0 Lvl 2: 0 Lvl 3: 0
30. Midjob service pages (Level 0 | Level 1): Lvl 0: 0 Lvl 1: 0
31. Dirty Power Up service pages (Level 0 | Level 1): Lvl 0: 2 Lvl 1: 0 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0
32. Pen Recovery service pages (Level 0 | Level 1 | Level 2): Lvl 0 : 0 Lvl 1: 2 Lvl 2: 0
33. Decap service pages (Level 0| Level 1 | Level 2 | Level 3): Lvl 0: 0 Lvl 1: 0 Lvl 2: 0 Lvl 3: 0
34. Decap Timed: 0
35. Print zone jam service pages: (Level 0 | Level 1): Lvl 0: 0 Lvl 1: 0
36. Background service pages: (Level 0 | Level 1 | Level 2): Lvl 0: 2 Lvl 1: 0 Lvl 2: 0 Lvl 3: 0 Lvl 4: 0
37. Last Printhead wipe at page: 233
38. Printhead wipe counts: 21
39. Web advance counts: 18
40. Printhead Black usage: 0
41. Printhead Cyan usage: 0
42. Printhead Magenta usage: 0
43. Printhead Yellow usage: 0
44. Printhead Ambient Temperature: 234 C / 453 F
45. Pump Cycles: 5
46. Pump Durations: 11500
47. Cumulative Printhead power on time: 3539
48. Black Cartridge Insertions: 0
49. Cyan Cartridge Insertions: 0
50. Magenta Cartridge insertions: 0
51. Yellow Cartridge insertions: 0
52. Drop Detect Status: 0
53. Last Printhead Calibration date: 224-12-2
54. Last Failure Events:
    1: 00.00.00 on 00-00-0000 at page 0 (0) times.
    2: 00.00.00 on 00-00-0000 at page 0 (0) times.
    3: 00.00.00 on 00-00-0000 at page 0 (0) times.
    4: 00.00.00 on 00-00-0000 at page 0 (0) times.
    5: 00.00.00 on 00-00-0000 at page 0 (0) times.
    6: 00.00.00 on 00-00-0000 at page 0 (0) times.
    7: 00.00.00 on 00-00-0000 at page 0 (0) times.
    8: 00.00.00 on 00-00-0000 at page 0 (0) times.
55. Black Non-HP: 0
56. Color Non-HP: 0
57. Altered Cartridge (YMCK): 2
58. Black Spit count: -1
59. Cyan Spit count: -1
60. Magneta Spit count: -1
61. Yellow Spit count: -1
62. Total Black count (ml): -1
63. Total Cyan count (ml): -1
64. Total Magenta count (ml): -1
65. Total Yellow count (ml): -1
66. Black Drop Detect history : -1
67. Cyan Drop Detect history: -1
68. Magenta Drop Detect history : -1
69. Yellow Drop Detect history : -1

Print quality advanced tools

NOTE: To use the extensive cleaning feature, use the Clean the Printhead (Extensive) item.

The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

Clean the Printhead (Extensive)

This process uses paper. Make sure there is clean unused paper in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

NOTE: The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access type area.
4. Enter the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select Sign In to enter the Service menu.

   NOTE: The printer might restart to enter the Service menu. This can take several minutes.
6. Open the following menus:
   - Advance Service
   - Calibration/Cleaning
7. Select Clean the Printhead (Extensive) item, and then select Start.

   Selecting Cancel exits the sub menu without performing a Clean the Printhead (Extensive) procedure and return to the Calibration/Cleaning menu.

   NOTE: This process take about 4 minutes to complete.

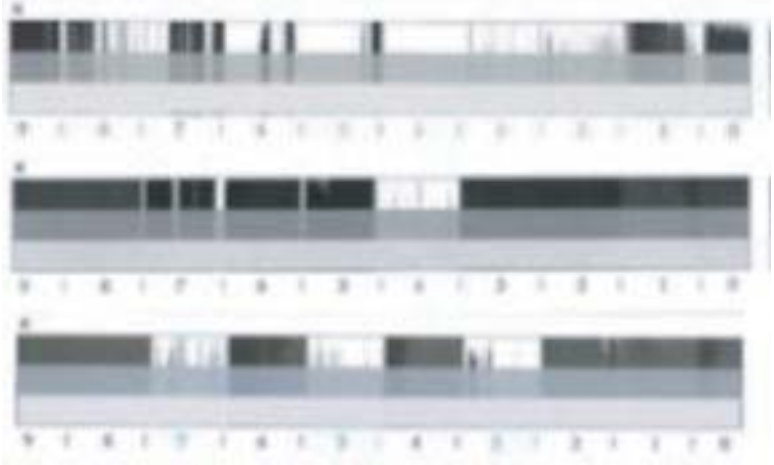
Image-quality defects (printer specific)

- Vertical bands
- White streaks across one or all colors
- Streaks improve down the page
- Streaks across the entire page – single or multiple colors consistent down the page
- Color mixing
- Color variation across bar
- Color intensity variation across bars
- Bars not even, columns of misaligned print, or vertical dark lines
- Streaks in yellow
- In-line streak(s) and drip(s)
- Large sections of wrong or missing color
- Vertical white lines
- Ink smear / redeposit

Vertical bands

IMPORTANT: This defect can be caused by using non HP genuine cartridges (or HP cartridges that have been refilled with non HP ink) and is not covered by the HP warranty.

Figure 2-54 Vertical bands



Description

Mainly appears in the black color plane, but can appear across all color planes.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. If random sections of missing print or areas of darker and lighter print appear, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

- Maintenance
- Calibration/Cleaning
- Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

The cleaning process has several steps. After each of them, the printer prints the print quality report page again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

NOTE: The cleaning process takes about 2 minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

4. Do one of the following:

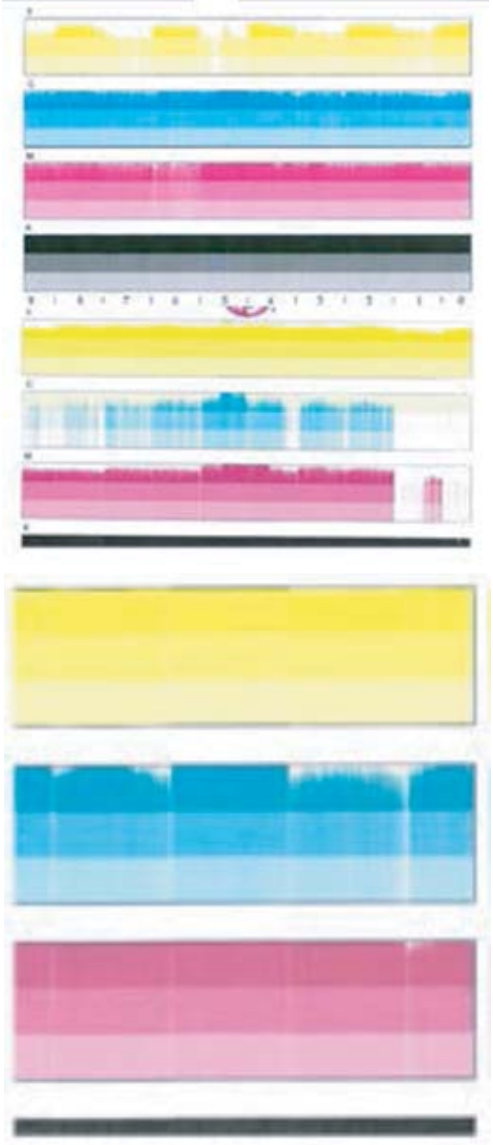
- If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

  NOTE: Perform one more printhead cleaning procedure for optimum print quality.

- If the print quality report page does not show improved and acceptable print quality, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

White streaks across one or all colors

Figure 2-55 White streaks across one or all colors



Description

This defect might be accompanied with streaking on the paper.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. If random sections of missing print or areas of darker and lighter print appear, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

   The cleaning process has several steps. After each of them, the printer prints the print quality report page again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

   NOTE: The cleaning process takes about 2minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

4. Do one of the following:

- If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

  NOTE: Perform one more printhead cleaning procedure for optimum print quality.

- If the print quality report page does not show improved or slightly improved print quality, do the following:

  ### Clean the Printhead (Extensive)

  The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

  a. From the Home screen on the printer control panel, scroll to and select the Support Tools.

  b. Select Service to display the Sign In screen.

  c. Make sure that Service Access Code displays in the Access type area.

  d. Enter the following service access personal identification number (PIN) for the printer:

     - 09078017 (MFP 780/785)
     - 09076517 (SFP 765)

  e. Select Sign In to enter the Service menu.

     NOTE: The printer may restart to exit the Service menu. This can take several minutes.

     Open the following menus:

- Advanced Service
- Calibration/Cleaning

f. Select Clean the Printhead (Extensive) item, and then select Start to begin the cleaning process.

5. Print a print quality report page (see Print Quality Report page on page 260). If the streak appears in the magenta color plane only, do the following:

a. Perform a Clean the Printhead procedure.

NOTE: Do not perform the printhead cleaning process more than four times.

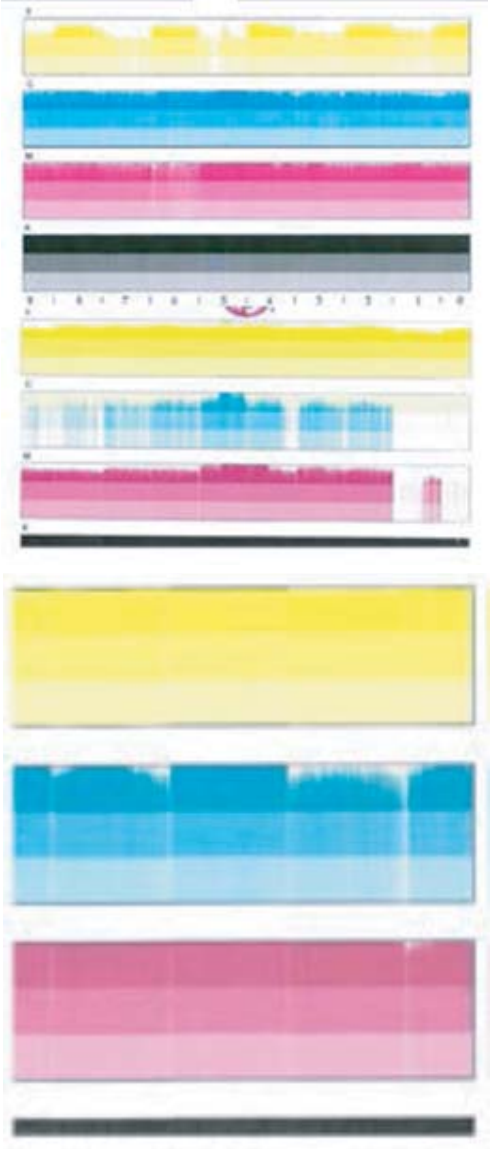
b. Print a print quality report page (see Print Quality Report page on page 260). If the print quality does not improve, replace the printhead assembly.

c. If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

NOTE: Perform one more printhead cleaning procedure for optimum print quality.

Streaks improve down the page

Figure 2-56 Streaks improve down the page



Description

Streaking is more pronounced in cyan, magenta, or yellow (black is minimally impacted).

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. If the print quality report page has multiple colors impacted with the top color planes being the most impacted and the lower color panes improving down the page, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   – Maintenance

   – Calibration/Cleaning

   – Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

   The cleaning process has several steps. After each of them, the printer prints the print quality report page again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

   NOTE: The cleaning process takes about 2 minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

If the print quality report page has consistent streaks throughout the page, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

4. Print a print quality report page (see Print Quality Report page on page 260). If the streak appears in the magenta color plane only, do the following:

   a. Perform a Clean the Printhead procedure.

      NOTE: Do not perform the printhead cleaning process more than four times.

   b. Print a print quality report page (see Print Quality Report page on page 260). If the print quality does not improve, replace the printhead assembly.

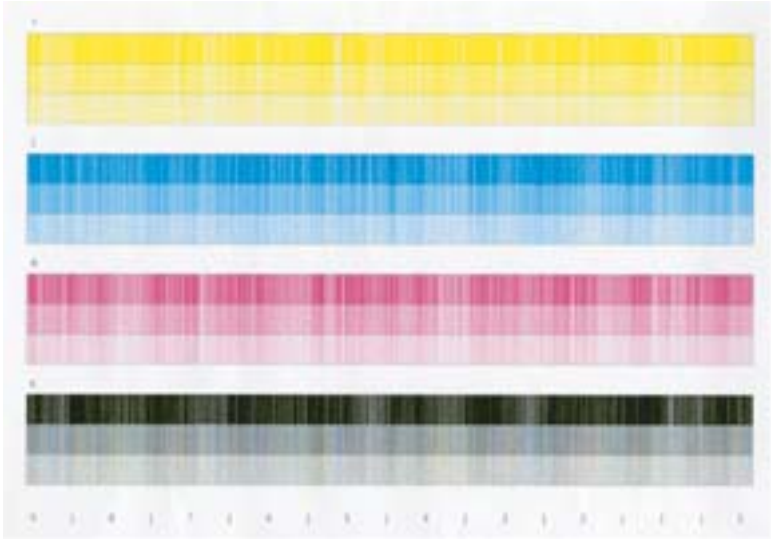
   c. If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

   d. If the print quality report page does not show improved print quality, ask the customer if the defect is always present and then check the following:

      – Remove a power strip if one is being used. Plug the printer directly into a wall receptacle that supplies the correct line voltage for this printer.

Streaks across the entire page – single or multiple colors consistent down the page

Figure 2-57 Streaks across the entire page



Description

Streaks appear across the entire page in single or multiple color planes and they are consistent down the page.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. Try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

   The cleaning process has several steps. After each of them, the printer prints the print quality report page again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

   NOTE: The cleaning process takes about 2 minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

NOTE: Perform one more printhead cleaning procedure for optimum print quality.

4. If the second print quality report page still shows streak throughout the page across multiple color planes, try the following:

   a. Perform a Clean the Printhead procedure.

   b. Print a print quality report page (see Print Quality Report page on page 260). If the print quality does not improve, replace the printhead assembly.

   c. If the third print quality report page shows fine streaks throughout the page, but in different locations that those on the second print quality report page, try the following:

      ### Clean the Printhead (Extensive)

      NOTE: The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

      a. From the Home screen on the printer control panel, scroll to and select the Support Tools.

      b. Select Service to display the Sign In screen.

      c. Make sure that Service Access Code displays in the Access type area. Select Enter Access Code item to display the on screen keypad.

      d. Enter the following service access personal identification number (PIN) for the printer:

         - 09078017 (MFP 780/785)
         - 09076517 (SFP 765)

      e. Select Sign In to enter the Service menu.

         NOTE: The printer might restart to enter the Service menu. This can take several minutes.

         Open the following menus:

         - Advance Service
         - Calibration/Cleaning

      f. Select Clean the Printhead (Extensive) item, and then select Start to begin the cleaning process.

      g. If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

         If the print quality report page shows any other defect than fine streaks, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

         If the streaking error persists, replace the printhead wiper.

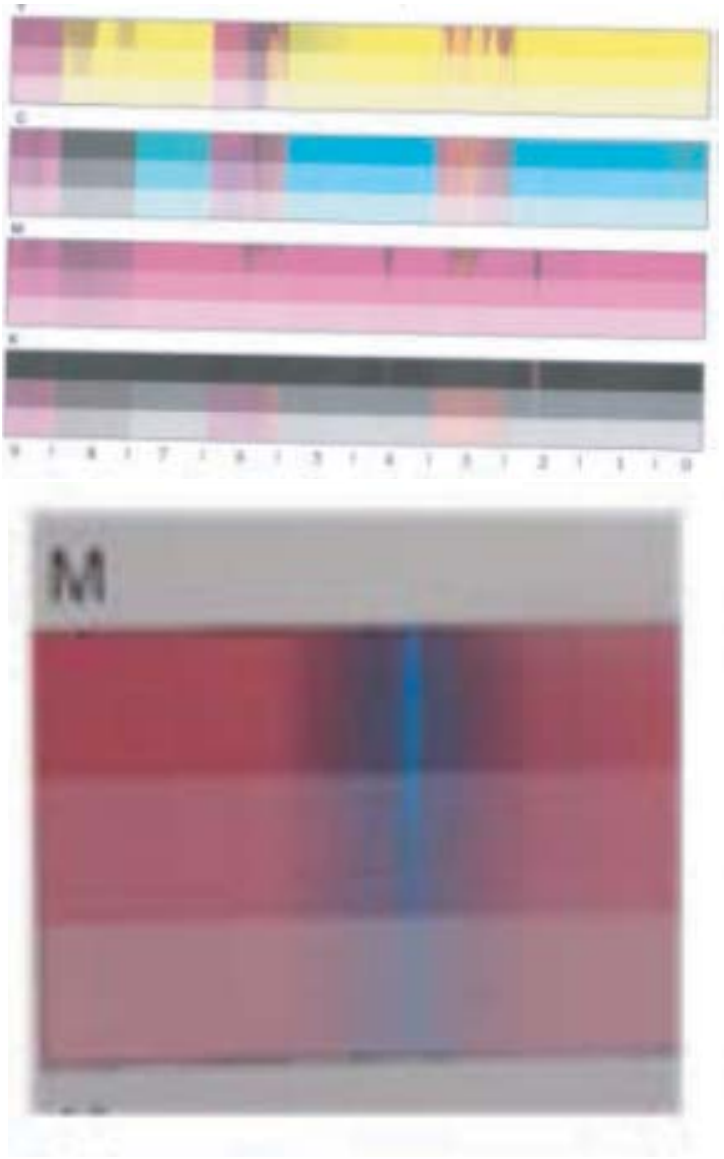
5. If the print quality report page shows fine streaks in the black color plane only, try the following:

a. Perform a Printhead Cleaning procedure.

b. If the streaking error persists, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

Color mixing

Figure 2-58 Color mixing



Description

Color mixing might be localized (not the entire die) or appear across an entire die.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. If the print quality report page shows ink mixing on a die pair, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   - Maintenance
   - Calibration/Cleaning
   - Advance Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

   The cleaning process has several steps. After each of them, the printer prints the print quality report page again. Evaluate each of these pages to determine if the original defect has been fixed – if it has, there is no reason to go on to the next cleaning stage.

   NOTE: The cleaning process takes about 4 minutes. Make sure clean unused paper is loaded in the default source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

e. If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.

   NOTE: Perform one more printhead cleaning procedure for optimum print quality.

f. If the color mixing error goes away or improves but is still present, Try the remaining solutions in this section. If the error persists, replace the printhead assembly.

4. If the print quality report page shows ink mixing with clusters of missing print, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

5. If the print quality report page shows localized ink mixing (not across an entire die) or ink mixing across an entire die, try the following:

Print one copy of a single color page

a. From the Home screen on the printer control panel, scroll to and select the Support Tools.

b. Open the following menus:

   - Troubleshooting
   - Print Quality Pages
   - Advanced Print Quality Pages

c. Select the single color page item to print the page.

   - Single Yellow Page, and then select Print.
   - Single Magenta Page, and then select Print.

- Single Cyan Page, and then select Print.
- Single Black Page, and then select Print.

d. Identify the page with a color mixing error, and then repeat printing that page ten times.

e. Do one of the following:

- If the color mixing error improves after printing the page ten times but is still present, replace the printhead assembly.
- If the color mixing error is no longer present, perform one more printhead cleaning procedure for optimum print quality.

NOTE: If the color mixing error returns, find out if the printer has recently been moved, and then perform the print one copy of a single color page procedure again.

Color variation across bar

Figure 2-59 Color variation across bar

Description

This defect appears as light and dark regions within a die for cyan and/or magenta.

Troubleshooting

1. Print a print quality report page (see Print Quality Report page on page 260).

NOTE: If the print quality report page shows a different defect, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

2. If the print quality report page shows light and dark regions within a die, try the following:

   - If the print quality report page shows improved and acceptable print quality, the troubleshooting process is complete.
   - If the print quality report page shows improvement but the defect remains, repeat the Clean the Printhead (Extensive) procedure (up to three times).

3. If the defect persists, try the following:

Calibrate the printer color density or align the printhead

a. Load plain letter-size or A4-size paper in the default input source tray (usually this is the A3 Tray 2 or the A4 Tray 3).

b. From the Home screen on the printer control panel, scroll to and select the Support Tools.

c. Open the following menus:

- Maintenance
- Calibration/Cleaning
- Advanced Calibration Support

d. Select one of the following:

- Stabilize the Printhead
- Calibrate the Image Sensor

e. Select Start.

NOTE: During color density calibration, several internal test pages eject to the output bin. Discard these pages.

4. Print a print quality report page (see Print Quality Report page on page 260) If the print quality report page shows light and dark regions within a die, try the following:

▲ Perform a Clean the Printhead (Extensive) procedure.

NOTE: The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

Clean the Printhead (Extensive)

a. From the Home screen on the printer control panel, scroll to and select the Support Tools.

b. Select Service to display the Sign In screen.

c. Make sure that Service Access Code displays in the Access type area.

d. Enter the following service access personal identification number (PIN) for the printer:

- 09078017 (MFP 780/785)
- 09076517 (SFP 765)

e. Select Sign In to enter the Service menu.

NOTE: The printer may restart to enter the Service menu. This can take several minutes.

Open the following menus:

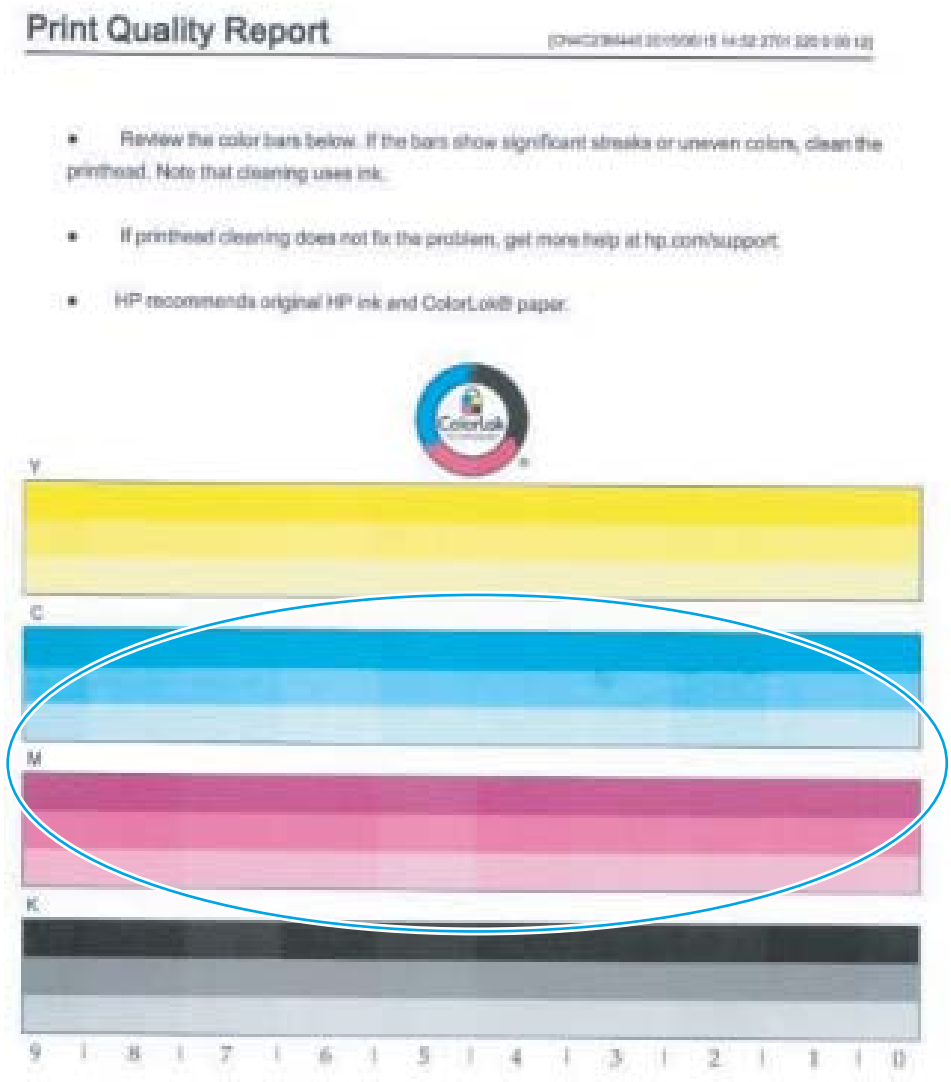
- Advanced Service
- Calibration/Cleaning

f. Select Clean the Printhead (Extensive) item, and then select Start to begin the cleaning process.

NOTE: Do not perform a Clean the Printhead (Extensive) procedure more than four times.

Color intensity variation across bars

Figure 2-60 Color intensity variation across bars



Description

The intensity of the color bars varies on the page.

Troubleshooting

1. From the Home screen on the printer control panel, scroll to and select Support Tools.
2. Open the following menus:
   - Troubleshooting
   - Print Quality Pages
   - Advanced Print Quality Pages
3. Perform the following items.

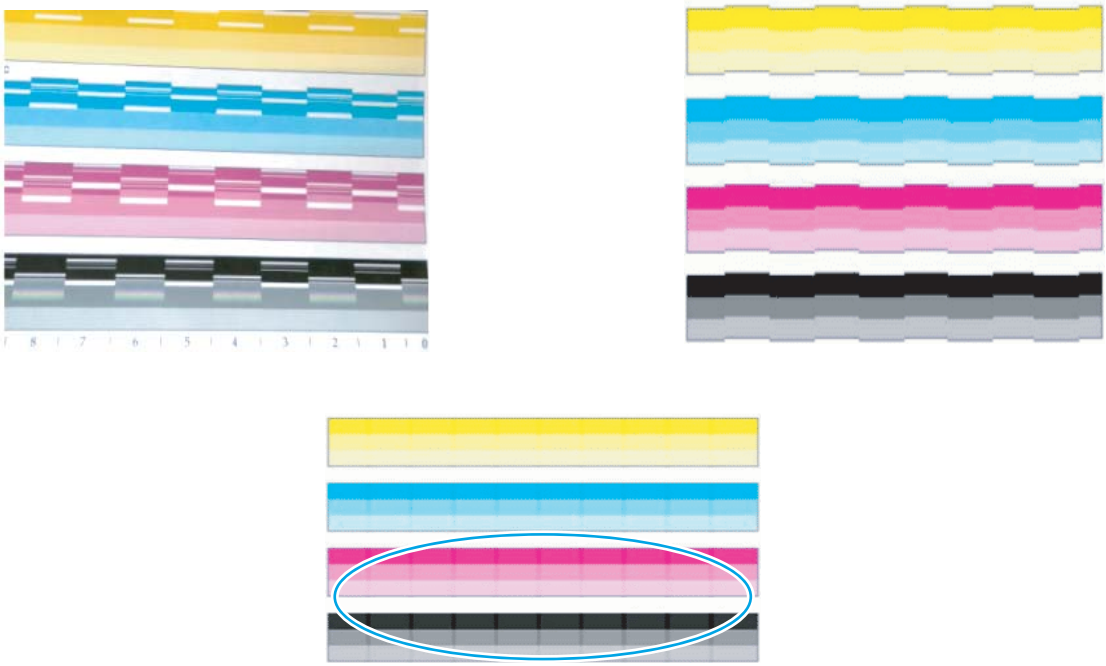
- Step 3: Nozzle Health Evaluation
  - Clean the Printhead
  - Print a Streak Test Page
  - Print a Nozzle Health Page

    NOTE: There are blocks of lines on the page and each block represents a printhead die, and each line corresponds to a nozzle.

    Check whether a line is missing or being misdirected to evaluate the health of the print bar.
- Step 4: Printhead Alignment Calibration
  - Align the Printhead (this item is located under Support Tools, Maintenance, Calibration/Cleaning, Advanced Calibration Support, select Stabilize Printhead).
  - Print an All Colors Page (Letter / A4)
- Step 5: Color Density Calibration
  - Calibrate the Image Sensor (this item is located under Support Tools, Maintenance, Calibration/Cleaning, Advanced Calibration Support , select Calibrate the Image Sensor).
  - Print an All Colors Page (Letter)
  - Print a Demonstration Page (located under Reports, Other Pages, select Demonstration Page).
  - Print a Print Quality Report page (this item is located under Support Tools, Troubleshooting, Print Quality Pages, select Print Quality Report).

Bars not even, columns of misaligned print, or vertical dark lines

Figure 2-61 Bars not even, columns of misaligned print, or vertical dark lines



Description

This defect appears as large areas of uneven bars, misaligned columns, or vertical dark lines on the page.

Troubleshooting

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access type area. Select Enter Access Code item to display the on screen keypad.
4. Enter the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select the Sign In to enter the Service menu.

NOTE: The printer may restart to enter the Service menu. This can take several minutes.

6. Open the following menus:
   - Service
7. Perform the items associated with the following Print Quality Tools guided workflow items:
   - Step 1: Nozzle Health Evaluation
     - Stabilize the Printhead (located under Support Tools, Service, Advanced Service, Calibration/Cleaning, then select Stabilize the Printhead).

NOTE: Ink is ejected through the nozzles, and then the printhead wiper wipes the printhead.

- Step 2: Drop Detect Status Check
  - Perform Drop Detect (located under Support Tools, Service, Advanced Service, Calibration/Cleaning, then select Perform Drop Detect).

    NOTE: Performs a color drop detect calibration.
  - Print a Streak (Yellow) Test (located under Support Tools, Troubleshooting, Print Quality Pages, Advanced Print Quality Pages, then select Streak (Yellow) Pages, and then select Print).
  - Print a Nozzle Health Page (located under Support Tools, Troubleshooting, Print Quality Pages, Advanced Print Quality Pages, then select Nozzle Health Page).

    NOTE: There are blocks of lines on the page and each block represents a printhead die, and each line corresponds to a nozzle.

    Check whether a line is missing or being misdirected to evaluate the health of the print bar.
- Step 3: Nozzle Health Evaluation
  - Clean the Printhead (located under Support Tools, Maintenance, Calibration/Cleaning, Advanced Calibration Support, then select Clean the Printhead).
  - Print a Streaks(Yellow) Test Page (located under Support Tools, Troubleshooting, Print Quality Pages, Advanced Print Quality Pages, then select Streaks (Yellow) Test).
  - Print a Nozzle Health Page (located under Support Tools, Troubleshooting, Print Quality Pages, Advanced Print Quality Pages, then select Nozzle Health Page).

    NOTE: There are blocks of lines on the page and each block represents a printhead die, and each line corresponds to a nozzle.

    Check whether a line is missing or being misdirected to evaluate the health of the print bar.
- Step 4: Printhead Alignment Calibration
  - Stabilize the Printhead (located under Support Tools, Maintenance, Calibration/Cleaning, Advanced Calibration Support, then select Stabilize the Printhead).
  - Print an All Colors Page (Letter / A4) (located under Support Tools, Service, Advanced Service, Calibration/Cleaning, Advanced Print Quality Pages, then select All Colors).
- Step 5: Color Density Calibration
  - Calibrate the Image Sensor (located under Support Tools, Maintenance, Calibration/Cleaning, Advanced Calibration Support, then select Calibrate the Image Sensor
  - Print an All Colors Page Page (Letter / A4) (located under Support Tools, Service, Advanced Service, Calibration/Cleaning, Advanced Print Quality Pages, then select All Colors).
  - Print a Demo Page (located under Reports, Other Pages, then select Demonstration Page, and then select Print).
  - Print a Print Quality Report page (located under Support Tools, Troubleshooting, Print Quality Pages, then select Print Quality Report).

Streaks in yellow

Figure 2-62 Streaks in yellow

Description

Streaks in the yellow color plane make greys appear purple, oranges appear pink, and greens appear blueish.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).

NOTE: If the print quality report page shows a different defect, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

3. Use the Service menu to perform a print a Streak (Yellow) Test page.

Print a streak test page

a. From the Home screen on the printer control panel, scroll to and select the Support Tools.

b. Make sure that Service Access Code displays in the Access Type area.

c. Type in the following service access personal identification number (PIN) for the printer:

   – 09078017 (MFP 780/785)

   – 09076517 (SFP 765)

d. Select Sign In located at the bottom of the keypad screen (just to the right of the number keys) to enter the Service menu.

NOTE: The printer might restart to enter the Service menu. This can take several minutes.

e. Open the following menus:

   – Advanced Service

   – Calibration/Cleaning

f. Select print a Streaks (Yellow) Test to print the page.

   Check to see if the page shows fine clustered together bluish lines in the green blocks or pinkish lines in the orange blocks.

4. Use the Service menu to perform a Clean the Printhead (Extensive) procedure.

NOTE: The Clean the Printhead (Extensive) process takes a considerable amount of time. The process uses a minimal amount of ink.

Clean the Printhead (Extensive)

a. From the Service menu Home screen, open the following menus:

   – Advanced Service

   – Calibration/Cleaning

b. Select Clean the Printhead (Extensive) to begin the procedure.

5. Print another Print a Streak (Yellow) Test Page and compare to the original printed earlier. Do one of the following:

   - If the page shows a different defect, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.
   - Turn the printer power off, and then wait 30 minutes. Turn the printer power on, and then perform a Yellow Streaks Recovery procedure.

CAUTION: Only use the Yellow Streaks Recovery procedure if magenta or cyan line show in the print a Streak (Yellow) Test page printed earlier.

The process takes about 36 minutes to complete. Do not interrupt the process or turn the printer power off during the process.

6. From the Service menu Home screen, select Advanced Service open the following menus:

- Status
- Calibration/Cleaning
- Setup Printhead Assembly
- Component Test

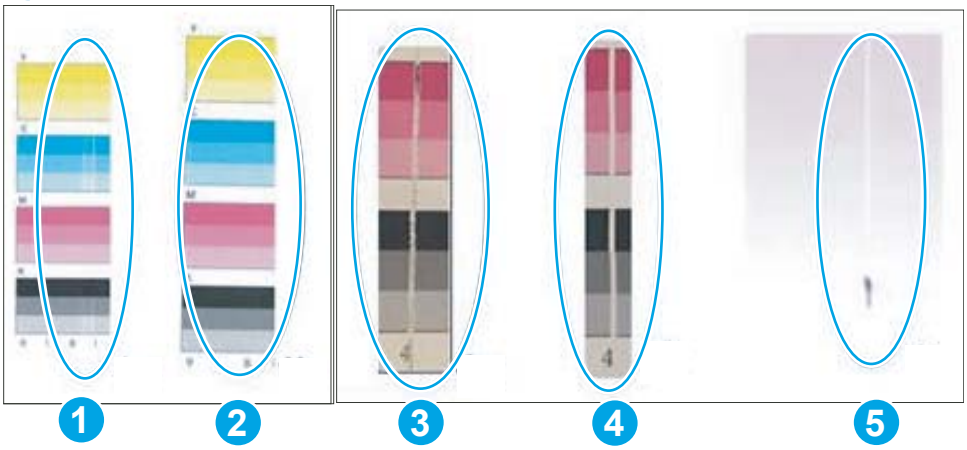
7. Select Calibration/Cleaning.
8. When Yellow Streaks Recover appears on the control panel display, and then select Start to begin the process.

Print another Streak Yellow Recovery Test page the page does not show improvement in the defect (or it shows a different defect), go to the image defect section of the printer troubleshooting manuals to solve the problem (see Image quality defects (printer specific) on page 24).

If the print a Streak (Yellow) Test page no defect, perform one more printhead cleaning procedure for optimum print quality.

In-line streak(s) and drip(s)

Figure 2-63 In-line streak(s) and drip(s)



Description

This defect might be accompanied with streaking on the paper.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).
3. If the print quality report page shows either multiple colors or a single color (other than magenta) with a small cluster of missing print (callouts 3/5 above), try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

- Maintenance
- Calibration/Cleaning
- Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

NOTE: Do not perform the printhead cleaning process more than three times.

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

e. If the print quality report page shows improved (callout 1) and acceptable print quality, the troubleshooting process is complete.

NOTE: Perform one more printhead cleaning procedure for optimum print quality.

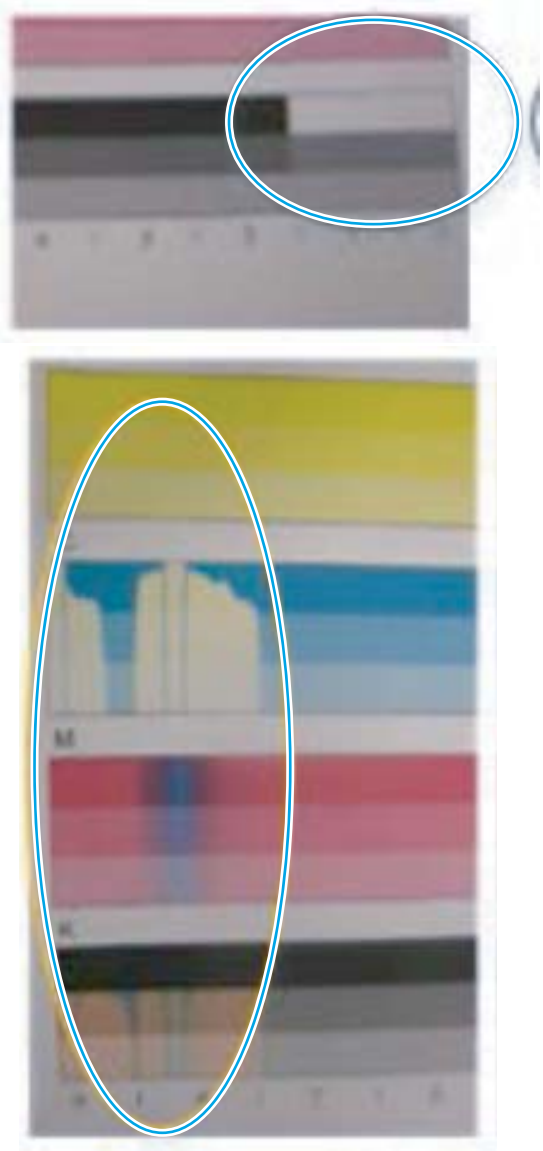
4. If the print quality report page shows some improvement (or no improvement in the defect), try the following:

   a. If the print quality report page shows some improvement but the defect remains, repeat the Clean the Printhead (Extensive) procedure (up to three times).

   b. If the print quality report page shows no improvement in the defect, use an Advanced Cleaning Kit to clean the printhead. Follow the instruction that come with the kit.

Large sections of wrong or missing color

Figure 2-64 Large sections of wrong or missing color



Description

Colors might be present at the top of the page, but go missing by the bottom of the page.

Troubleshooting

1. Make sure that genuine HP cartridges are installed.
2. Print a print quality report page (see Print Quality Report page on page 260).

   Check the print quality report page for the following:

   - The page shows no defect.
   - Printing multiple pages cause the defect to go away.

- The page shows color mixing.
- The defect shows across multiple colors

3. If the print quality report page shows any (or all) of the defects described above, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

NOTE: Do not perform the printhead cleaning process more than three times.

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

e. If the print quality report page shows improved (callout 1) and acceptable print quality, the troubleshooting process is complete.

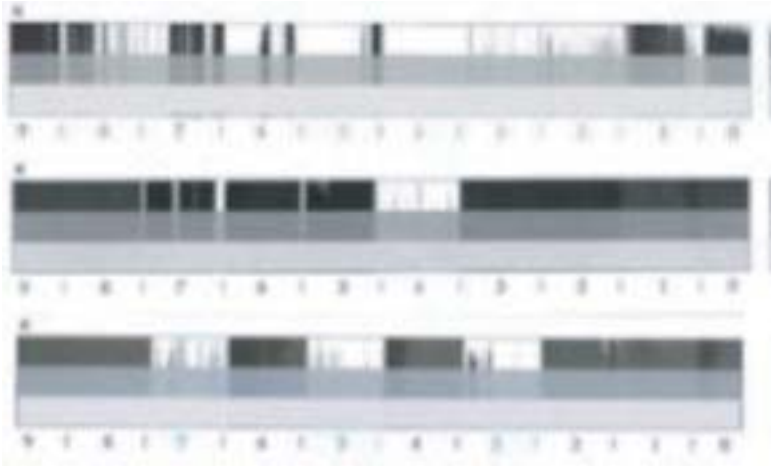
NOTE: Perform one more printhead cleaning procedure for optimum print quality.

f. If the print quality report page shows a defect not related to the die bounder or is improving, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

4. If the print quality report page shows a single color missing for an entire die, die pair, or the entire bar, replace the printhead assembly.

Vertical white lines

Figure 2-65 Vertical white lines



Description

This defect appears when the printer is first installed.

Troubleshooting

1. Print a print quality report page (see Print Quality Report page on page 260).
2. If the print quality report page shows white lines in the black color bar, try the following:

Clean the Printhead

NOTE: Do not perform the printhead cleaning process more than four times.

a. From the Home screen on the printer control panel, scroll to and select Support Tools.

b. Open the following menus:

   - Maintenance
   - Calibration/Cleaning
   - Advanced Calibration Support

c. Select Clean the Printhead, and then select Start to begin the cleaning process.

NOTE: Do not perform the printhead cleaning process more than three times.

d. Select OK. A print quality report page prints. Compare this report to the previously printed report to confirm that the print quality improved.

e. If the print quality report page shows improvement and acceptable print quality, the troubleshooting process is complete.

NOTE: Perform one more printhead cleaning procedure for optimum print quality.

f. If the print quality report page shows large sections of white lines (or anything else), go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

3. If the print quality report page shows streaks in the black color bar but the streak that are in different locations than they are on the first report page, try the following:

NOTE: The defect might be severe.

- Is this the first day of printer use (less than 100 pages printed)?
- Print the Printer Status Report and Print Head Information pages.

  Print the Printer Status Report and Print Head Information pages

  Make sure that paper is loaded in the default input tray (usually Tray 2).

  a. From the control panel Home screen, scroll to and select Service.

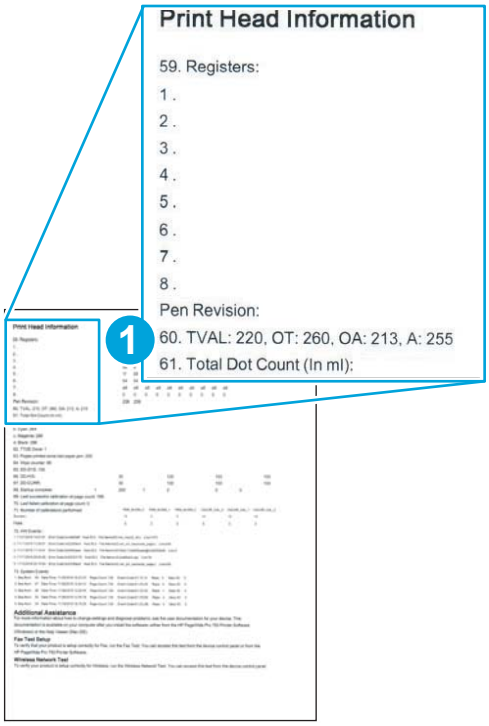
  b. Select Service Reports.

  c. Select General Product Information item.

  d. Select Printhead then select the printer icon (lower right corner of screen).

  NOTE: The printhead information page is the second page that prints.

  e. On the Print Head Information page, verify that the TVAL entry (callout 1) is less than a 180 value.

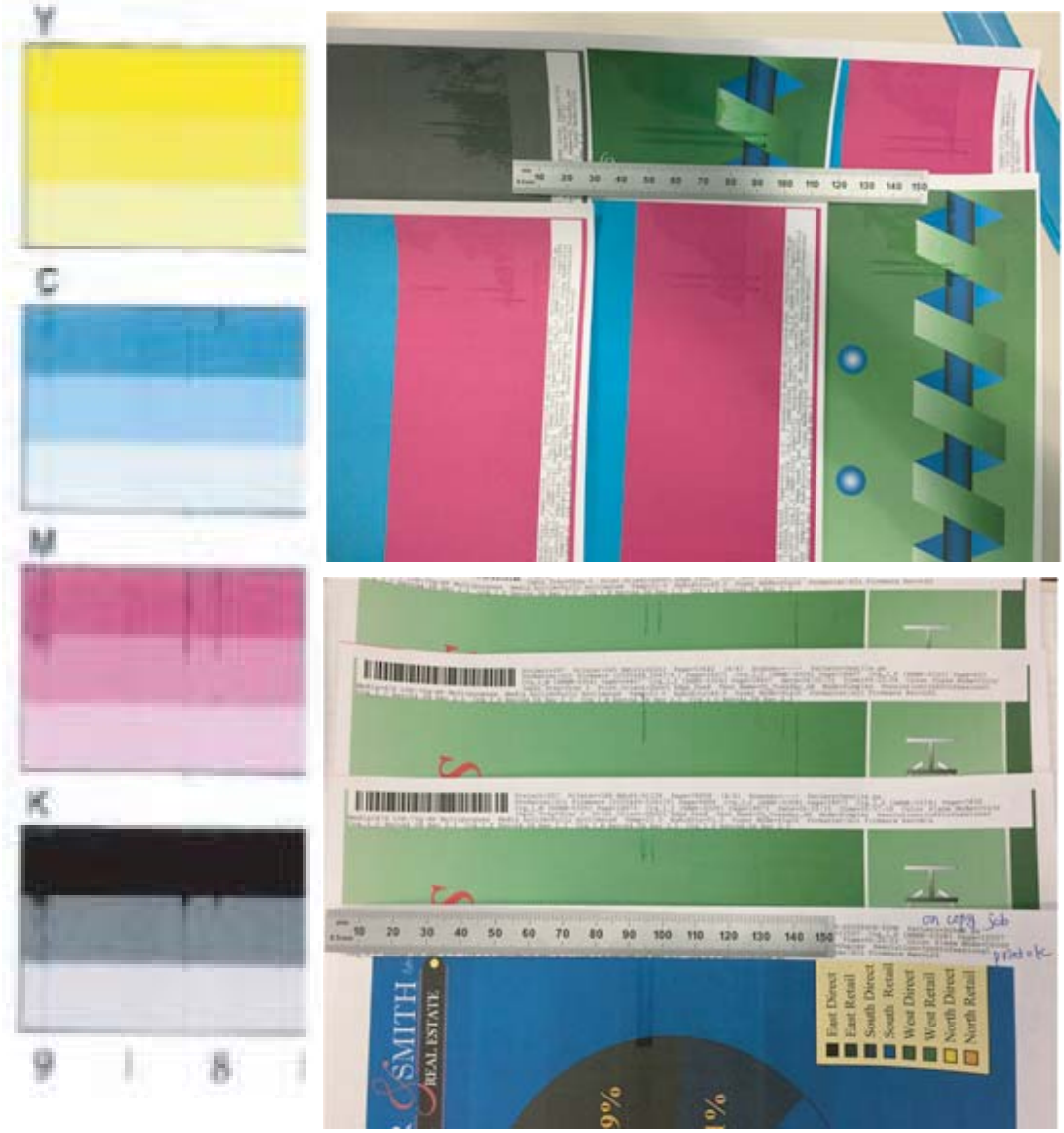


  f. After checking the TVAL entry, do one of the following:

  - TVAL less than 180: Let the printer sit idle for 24 hours. Print quality will recover.
  - TVAL greater than 180: let the printer sit idle for 30 minutes. Make sure that the environment where the printer is installed is above 15° (59°). Print quality will recover.

Ink smear / redeposit

Figure 2-66 Ink smear / redeposit



Description

This defect appears as smeared ink. It can appear on simplex and/or duplex print jobs, but it might not be visible on the Print Quality Report page.

Troubleshooting

1. Make sure genuine HP ink is installed.
2. Print a print quality report page (see Print Quality Report page on page 260).

NOTE: If the print quality report page shows a defect but it does not look like a smear or ink transfer defect, go to the image defects section of the printer troubleshooting manual to solve the problem (see Image-quality defects (printer specific) on page 266.

3. If the print quality report page shows nothing or smears on the page, try the following:

a. Make sure that the correct paper type is being used, and that the correct printer driver is selected.

b. Check the event log:

1. From the Home screen, scroll to and then select Support Tools.

2. Open the following menus:

   - Troubleshooting

3. Select Event Log item to display the log.

4. Check the event log for an airflow system **61.Dx.yz** error entry.

   NOTE: A **The Airflow Assembly for the printer is not functioning properly. Printing will slow down until it is repaired.** might also appear on the control-panel display.

5. After the airflow problem is resolved, send a print job to the printer and check the print quality. If print quality has improved and is acceptable, the troubleshooting process is complete.

4. If the page still shows the defect, try the following:

a. Remove, and then reinstall the service fluid container.

b. Use an Advanced Cleaning Kit to clean the printhead. Follow the instruction that come with the kit.

c. Send a print job to the printer and check the print quality. If print quality has improved and is acceptable, the troubleshooting process is complete.

5. Make sure that the correct paper type for the print job is being used.

   Send a print job to the printer and check the print quality. If print quality has improved and is acceptable, the troubleshooting process is complete.

6. Try using a different brand of paper.

   Send a print job to the printer and check the print quality. If print quality has improved and is acceptable, the troubleshooting process is complete.

Solve copy/scan problems (780/785)

Solve copy problems (780/785 models only)

If the printer is having copy quality problems, try the following solutions in the order presented to resolve the issue.

- Check the scanner glass for dirt and smudges
- Check the paper settings
- Clean the pickup rollers and separation pad in the document feeder

Try these few simple steps first:

- Use the flatbed scanner rather than the document feeder.
- Use high-quality originals.
- When using the document feeder, load the original document into the feeder correctly, using the paper guides, to avoid unclear or skewed images.

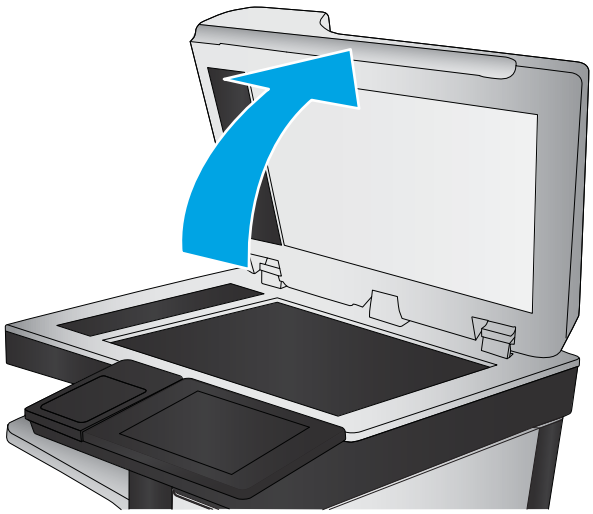
If the problem still exists, try these additional solutions. If they do not fix the problem, see “Improve print quality” for further solutions.

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.

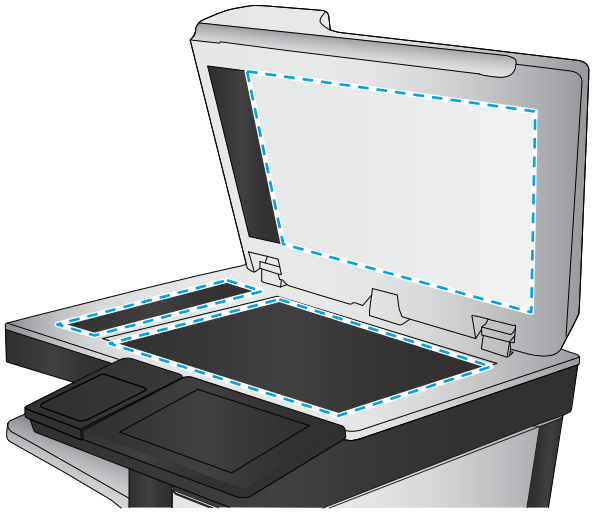


3. Clean the scanner glass, the document feeder strips, and the white plastic backing with a soft cloth or sponge that has been moistened with nonabrasive glass cleaner.

   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.

   TIP: A customer-self repair kit (CSR) is available for the white backing (document reflector).



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.

Check the paper settings

Follow these steps if copied pages have smears, fuzzy or dark print, curled paper, or areas where pigment has dropped out.

Check the paper size and type configuration

1. At the printer control panel, scroll to and select Trays.
2. Select a tray from the available trays shown in the image (the list of trays depends on the printer configuration).
3. Select Size, and then select from a list of paper sizes.
4. Select Type, and then select from a list of paper types.

NOTE: To access the Settings menus from the Trays menu, select settings (the gear icon in the lower-left corner of the screen).

5. Select Done to return to the Trays menu, or select Home to return to the Home screen.

Select the tray to use for the copy

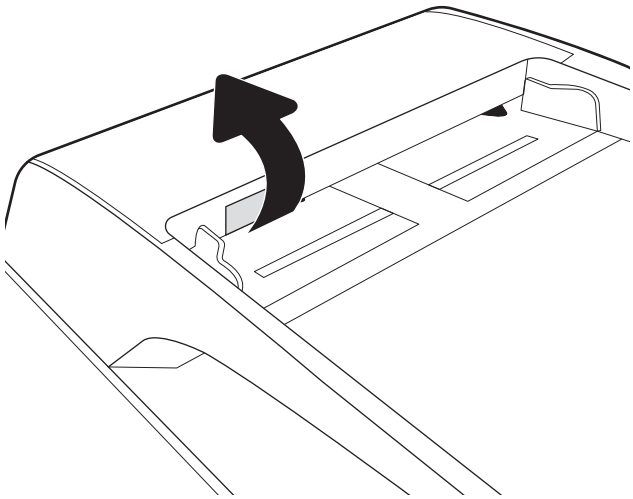
1. From the Home screen on the printer control, select Copy.
2. Select Options (in the lower left corner of the screen).
3. Then scroll to Scan Mode.
4. Select one of the following options:
   - Standard Document (default)
   - 2-sided ID Copy
5. Select from the following options:
   - Sides
   - Color/Black
   - Quick Sets and Defaults
6. If prompted, select Done to save the setting.

NOTE: These settings are temporary. After you have finished the job, the printer returns to the default settings.

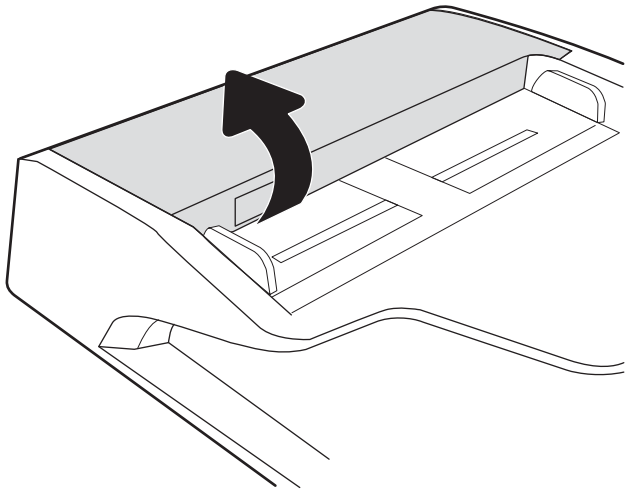
Clean the pickup rollers and separation pad in the document feeder

Follow these steps if the document feeder does not pick up pages correctly or produces skewed output.

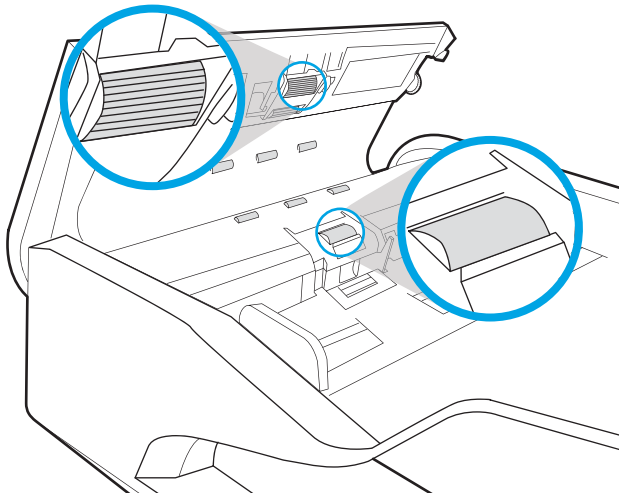
1. Lift the latch to release the document-feeder cover.



2. Open the document-feeder cover.

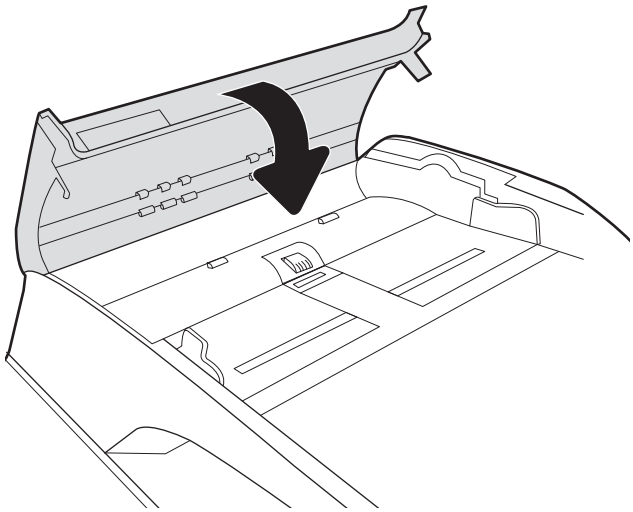


3. Remove any visible lint or dust from each of the feed rollers and the separation pad using compressed air or a clean lint-free cloth moistened with warm water.



4. Close the document-feeder cover.

   NOTE: Verify that the latch on the top of the document-feeder cover is completely closed.



If the problem persists, check the document feeder separation pad and rollers for damage or wear, and replace them if necessary.

NOTE: New rollers have a rough surface. As rollers wear, they become smooth.

Solve scan problems (780/785 models only)

- Check the scanner glass for dirt and smudges
- Check the image quality settings
- Check the color settings
- Optimize scan quality for text or pictures
- Clean the pickup rollers and separation pad in the document feeder

Try these few simple steps first:

- Use the flatbed scanner rather than the document feeder.
- Use high-quality originals.
- When using the document feeder, load the original document into the feeder correctly, using the paper guides, to avoid unclear or skewed images.

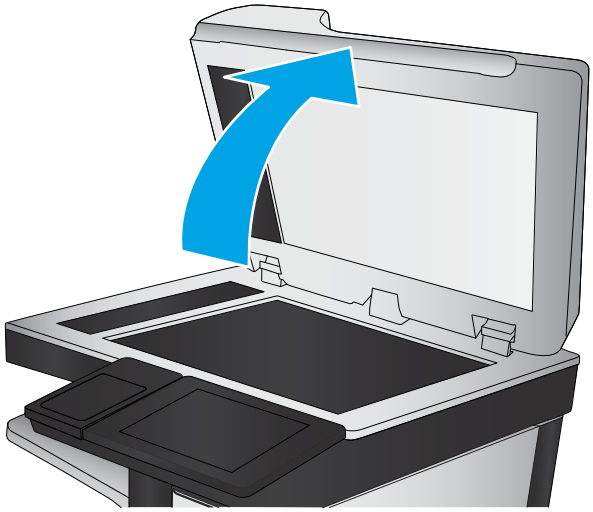
If the problem still exists, try these additional solutions. If they do not fix the problem, see “Improve print quality” for further solutions.

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.

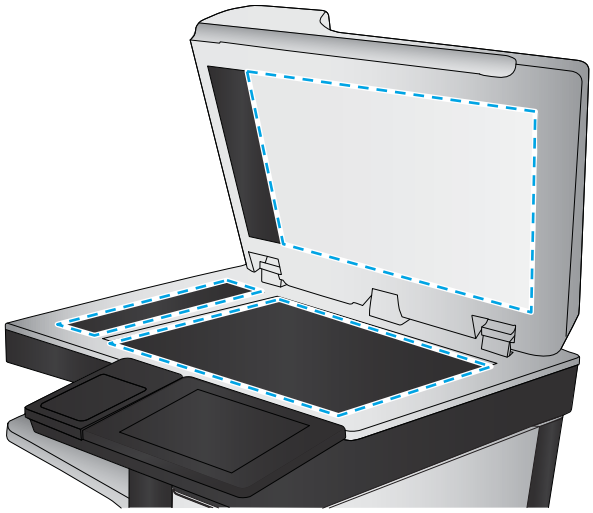
2. Open the scanner lid.



3. Clean the scanner glass, the document feeder strips, and the white plastic backing 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.

Check the image quality settings

Follow these steps to adjust the image quality setting:

1. From the Home screen on the printer control panel, select Copy.
2. Select Options (in the lower left corner of the screen).
3. Scroll to and select Scan Mode.
4. Select either the Standard Document or ID Card, and then select Done.
5. Then select Color/Black.
6. Select one of the following:

- Automatically detect (default)
- Color
- Black/Gray

7. Then select the number of Copies.
8. Use the back arrow or the Home to return to the main menu.

Check the color settings

Follow these steps to adjust the color setting:

1. From the Home screen on the printer control panel, select Copy.
2. Select Options (in the lower left corner of the screen).
3. Scroll to and select Scan Mode.
4. Select either the Standard Document or ID Card, and then select Done.
5. Select Color/Black. and then select one of the following options:
   - Automatically detect (default)
   - Color
   - Black/Gray
6. Then select the number of Copies.
7. Use the Back or the Home to return to the main menu.

Optimize scan quality for text or pictures

Optimize the scan job for the type of image being scanned: text, graphics, or photos.

NOTE: These settings are temporary. After you have finished the job, the printer returns to the default settings.

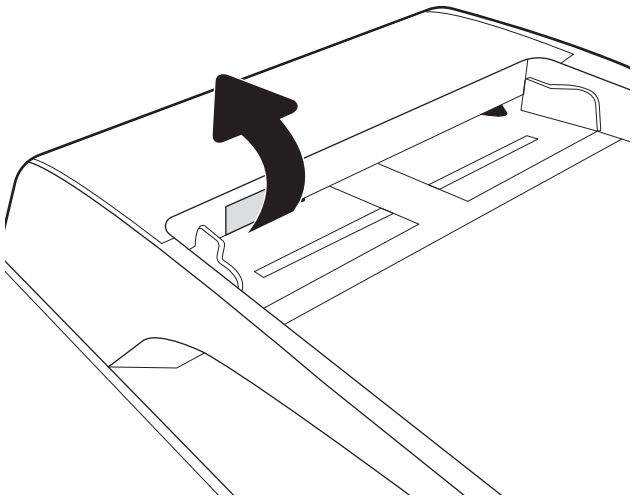
1. From the Home screen on the printer control panel, select Copy.
2. Select Options (in the lower left corner of the screen).
3. Then scroll to and select Scan Mode.
4. Select either the Standard Document or ID Card, and then select Done.
5. Then scroll to and select Optimize Text/Picture.
   - Automatically detect (default)
   - Text
   - Mixed
   - Printed picture
   - Photograph

6. Then select the number of copies.
7. Use the Back arrow or the Home to return to the main menu.

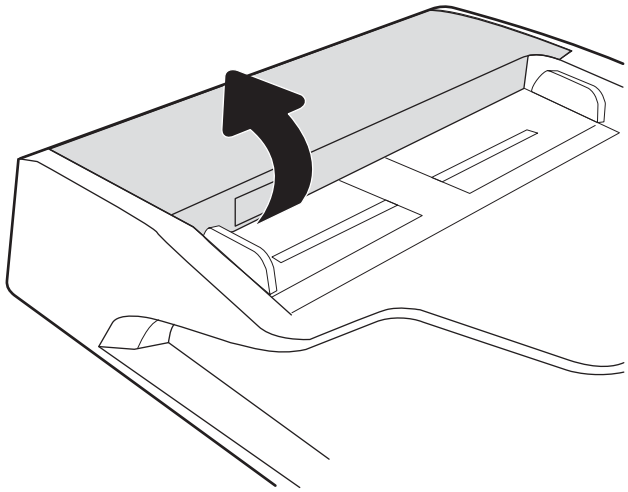
Clean the pickup rollers and separation pad in the document feeder

Follow these steps if the document feeder does not pick up pages correctly or produces skewed output.

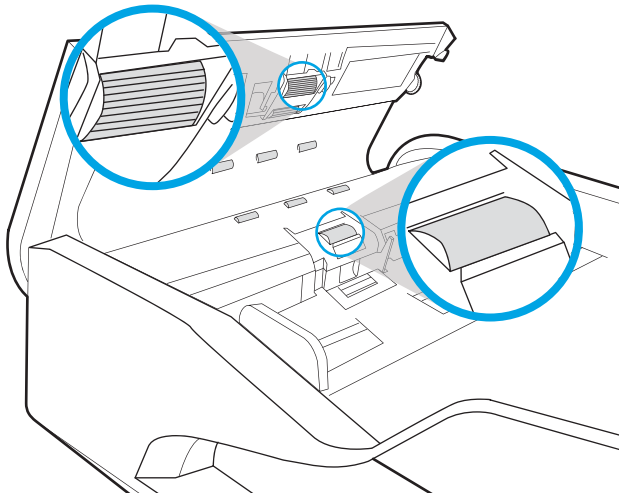
1. Lift the latch to release the document-feeder cover.



2. Open the document-feeder cover.

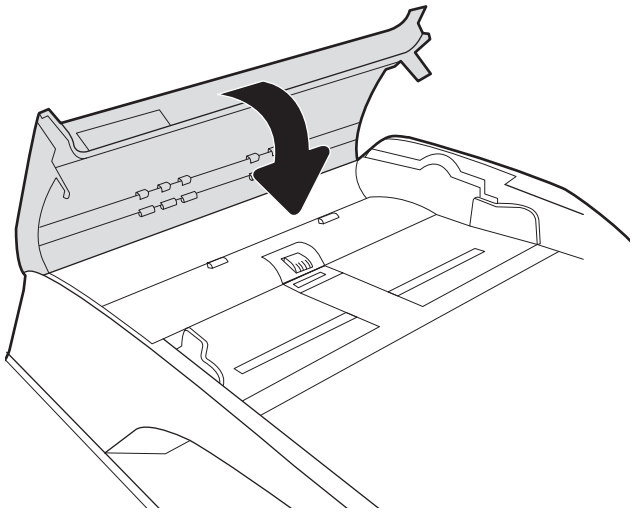


3. Remove any visible lint or dust from each of the feed rollers and the separation pad using compressed air or a clean lint-free cloth moistened with warm water.



4. Close the document-feeder cover.

   NOTE: Verify that the latch on the top of the document-feeder cover is completely closed.



If the problem persists, check the document feeder separation pad and rollers for damage or wear, and replace them if necessary.

NOTE: New rollers have a rough surface. As rollers wear, they become smooth.

Solve paper jam or feed problems

Printer does not pick up paper or misfeeds

The printer does not pick up paper

If the printer does not pick up paper from the tray, try these solutions.

1. Open the printer and remove any jammed sheets of paper.
2. Load the tray with the correct size of paper for your 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 you to acknowledge a prompt to feed the paper manually. 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.
7. If the error persists, the rollers might be worn. Replace the rollers.

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.
7. The rollers above the tray might be contaminated. Clean the rollers with a lint-free cloth dampened with warm water.
8. If the error persists, the rollers might be worn. Replace the rollers.

The document feeder jams, skews, or picks up multiple sheets of paper (MFP)

- The original might have something on it, such as staples or self-adhesive notes that must be removed.
- Check that all rollers are in place and that the roller-access cover inside the document feeder is closed.
- Make sure that the top document-feeder cover is closed.
- The pages might not be placed correctly. Straighten the pages and adjust the paper guides to center the stack.
- The paper guides must be touching the sides of the paper stack to work correctly. Make sure that the paper stack is straight and the guides are against the paper stack.
- The document feeder input tray or output bin might contain more than the maximum number of pages. Make sure the paper stack fits below the guides in the input tray, and remove pages from the output bin.
- Verify that there are no pieces of paper, staples, paper clips, or other debris in the paper path.
- Clean the document-feeder rollers and the separation pad. Use compressed air or a clean, lint-free cloth moistened with warm water. If misfeeds still occur, replace the rollers.

From the Home screen on the printer control panel, scroll to and select Support Tools, select Maintenance, select Calibration/Cleaning, select Clean Document Feeder Rollers item, and then select Next. Check the remaining life of the document feeder rollers, and replace them if necessary.

Clear paper jams

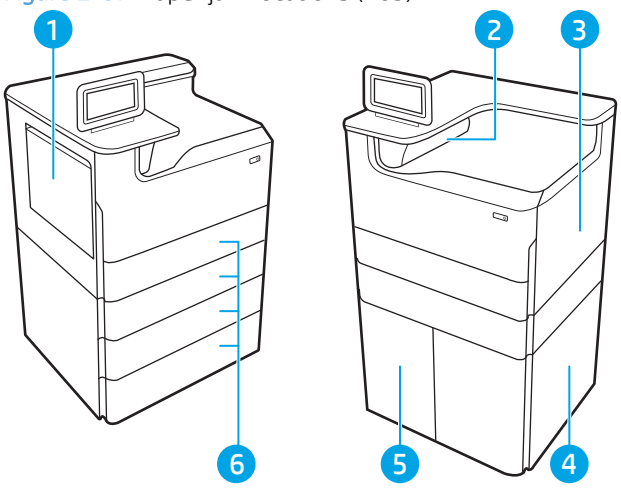
Introduction

The following information includes instructions for clearing paper jams from the printer.

- Paper jam locations (765 models)
- Paper jam locations (780/785)
- Auto-navigation for clearing paper jams
- Experiencing frequent or recurring paper jams?
- Clear paper jams in the document feeder (780/785)
- Clear paper jams in Tray 1
- Clear paper jams in Tray 2
- Clear paper jams in Tray 3
- Clear paper jams in the output bin
- Clear paper jams in the duplexer
- Clear paper jams in the 3x550-sheet trays
- Clear paper jams in the 4,000-sheet high-capacity input (HCI) tray
- Clear paper jams in the inner finisher (785zs model only)
- Clear staple jams (785zs model only)

Paper jam locations (765 models)

Figure 2-67 Paper jam locations (765)

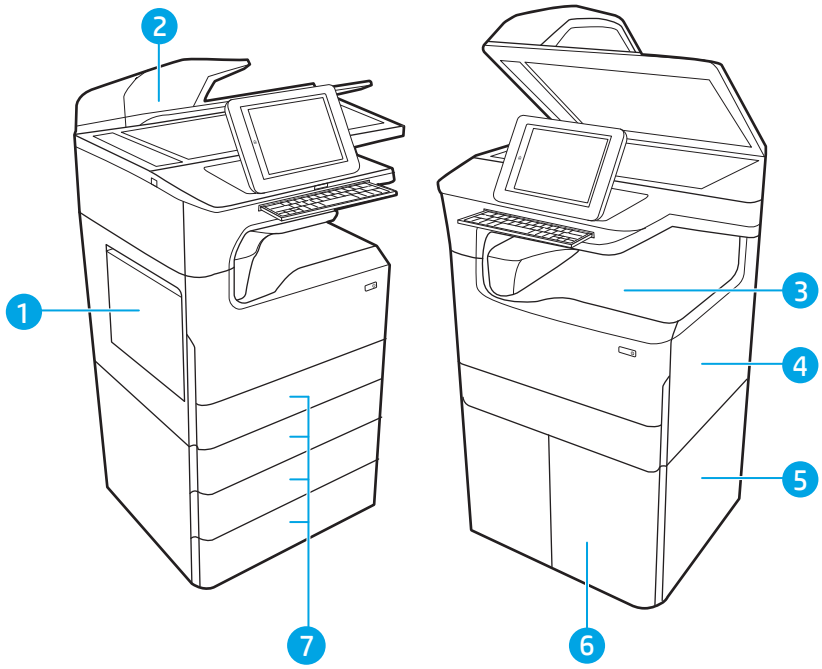


1	Tray 1 and left door
2	Output bin

3	Right door (duplexer)
4	Lower right door
5	4,000-sheet HCI feeder
6	550-sheet trays

Paper jam locations (780/785)

Figure 2-68 Paper jam locations (780/785)



1	Tray 1 and left door
2	Document feeder
3	Output bin or inner finisher (785zs model only)
4	Right door (duplexer)
5	Lower right door
6	4,000-sheet HCI feeder
7	550-sheet trays

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.

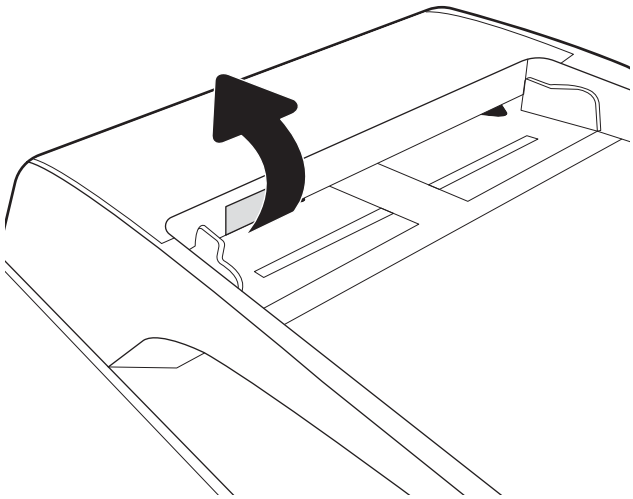
NOTE: To see a video that demonstrates how to load paper in a way that reduces the number of paper jams, click here.

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.

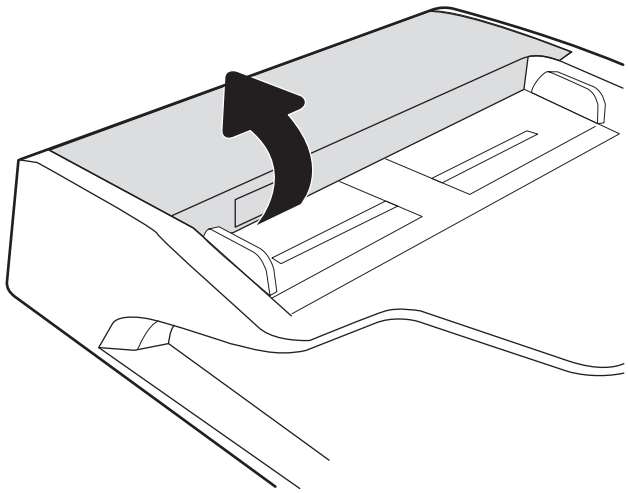
Clear paper jams in the document feeder (780/785)

The following information describes how to clear paper jams in the document feeder. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

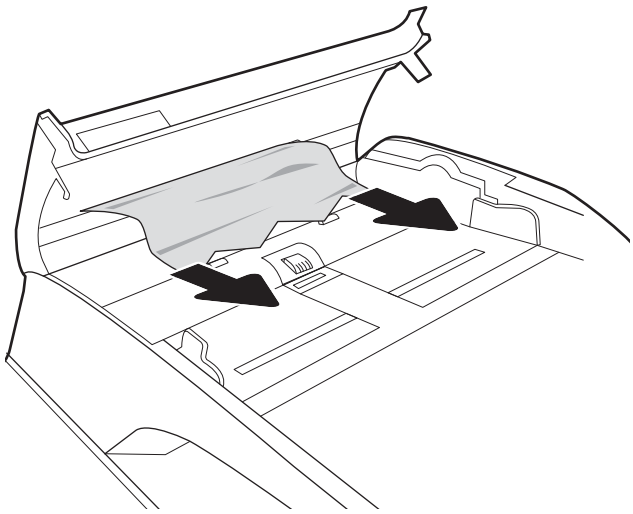
1. Lift the latch to release the document-feeder cover.



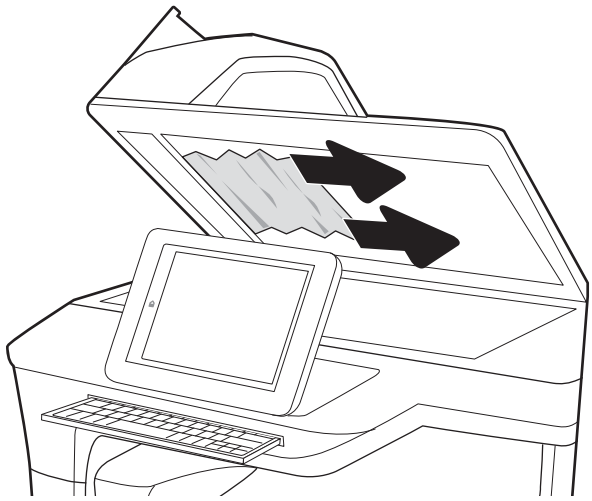
2. Open the document-feeder cover.



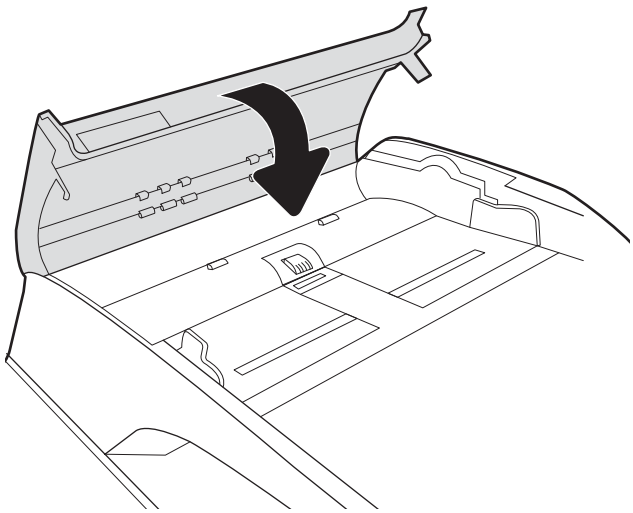
3. Remove any jammed paper.



4. Lift the scanner lid and remove any jammed paper from the bottom of the scanner lid.



5. Close the scanner lid and the document feeder cover.



6. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

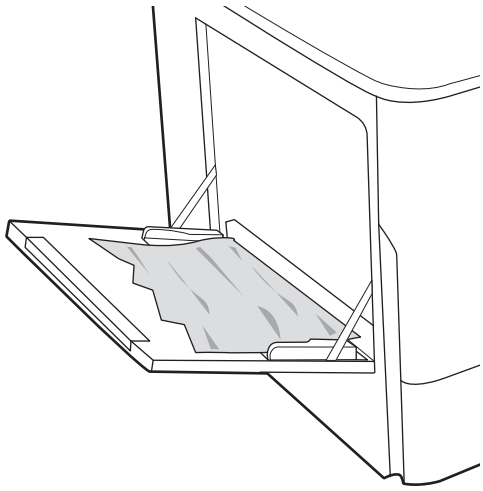
NOTE: To avoid jams, make sure the guides in the document-feeder input tray are adjusted tightly against the document. Remove all staples and paper clips from original documents.

NOTE: Original documents that are printed on heavy, glossy paper can jam more frequently than originals that are printed on plain paper.

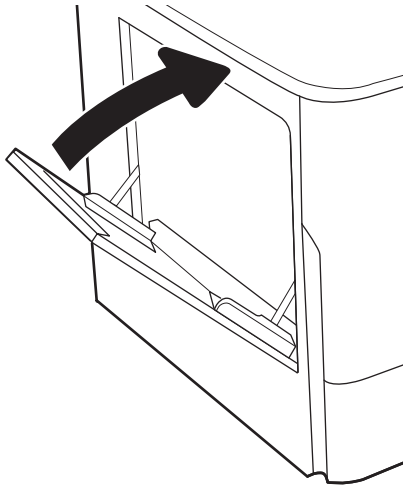
Clear paper jams in Tray 1

The following information describes how to clear a paper jam in Tray 1. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

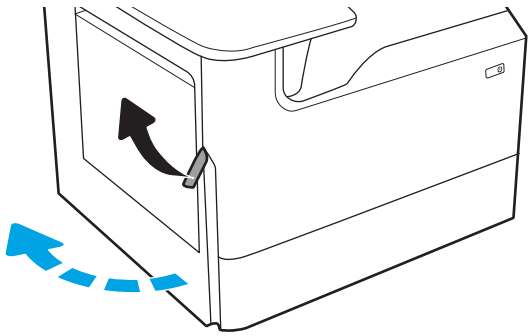
1. If jammed paper is visible in Tray 1, clear the jam by gently pulling the paper straight out.



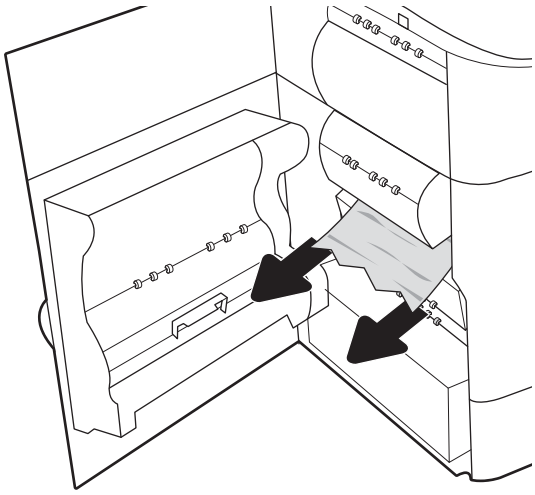
2. Close Tray 1.



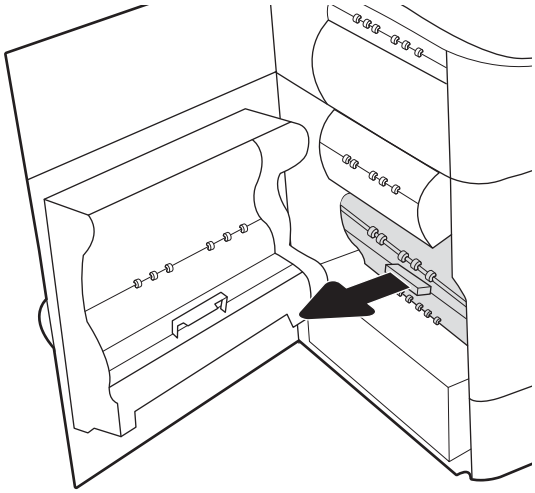
3. Open the left door.



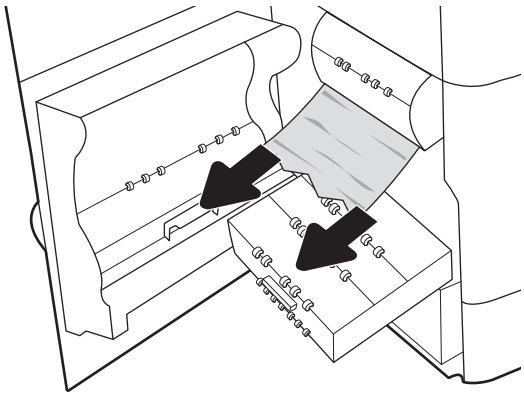
4. Pull any jammed paper straight out.



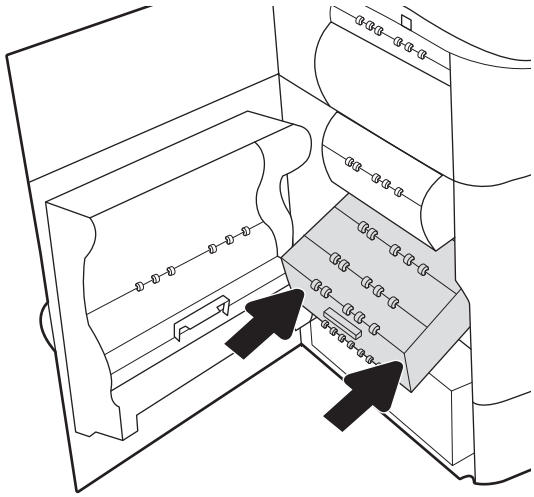
5. If no jammed paper is visible, pull the service fluid container out.



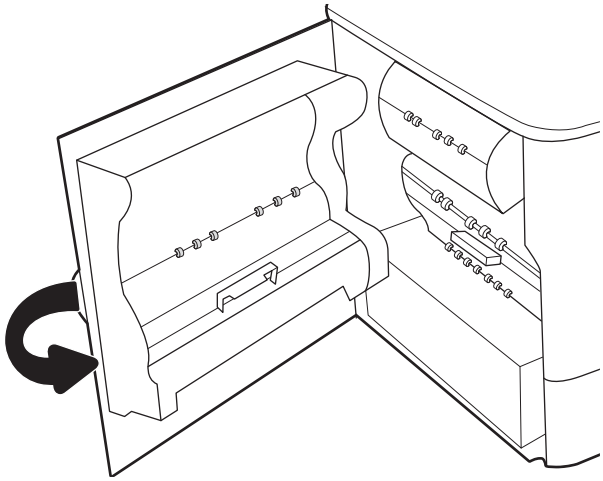
6. Pull any jammed paper straight out.



7. Push the service fluid container into the printer.



8. Close the left door.

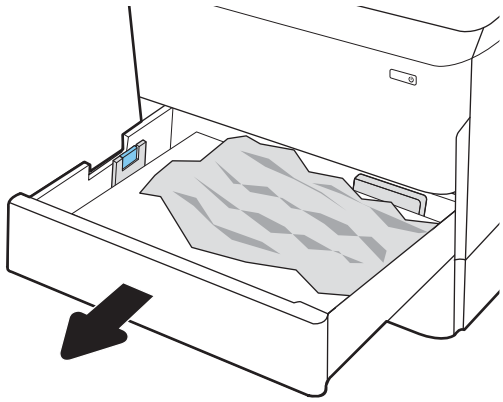


9. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

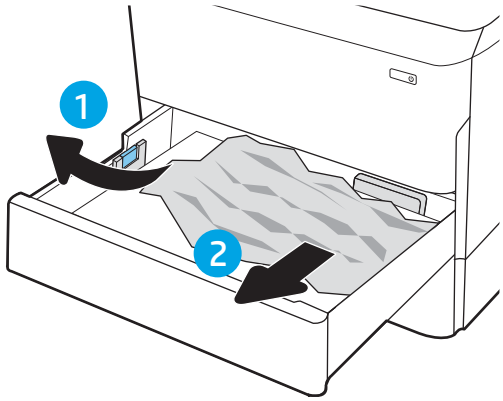
Clear paper jams in Tray 2

The following information describes how to clear a paper jam in Tray 2. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

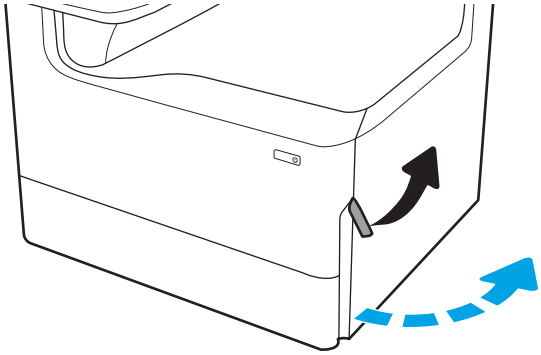
1. Open the tray.



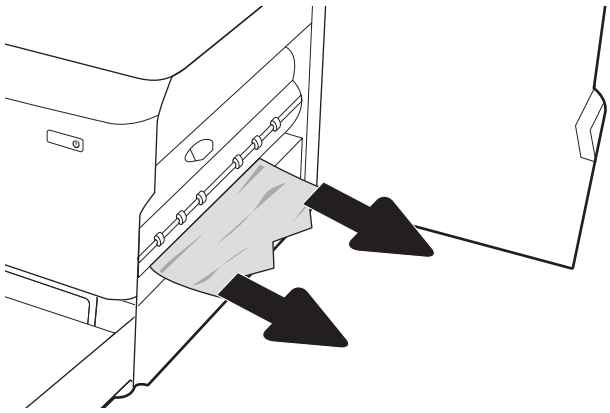
2. Remove the jammed paper from the feed rollers inside the printer. First pull the paper to the left, and then pull it forward to remove it.



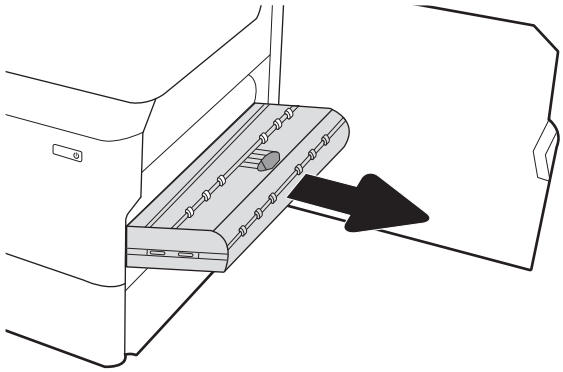
3. Open the right door.



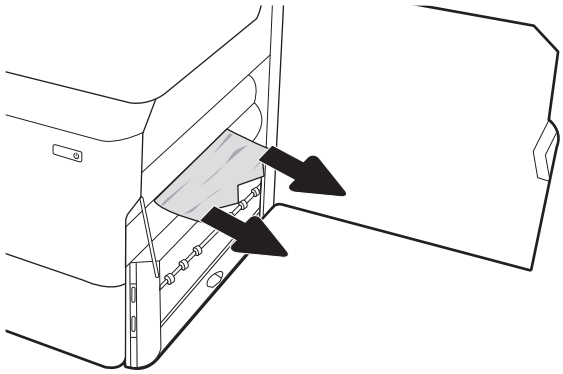
4. Remove any jammed paper.



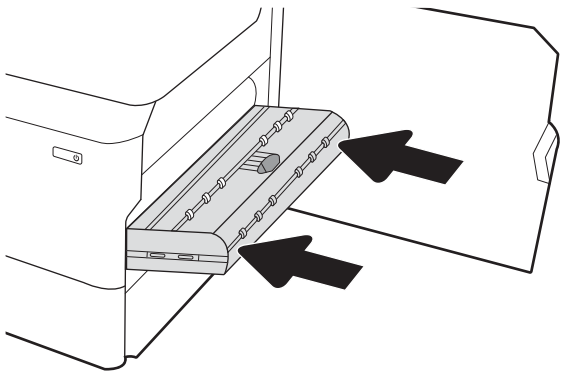
5. If no jammed paper is visible, remove the duplexer.



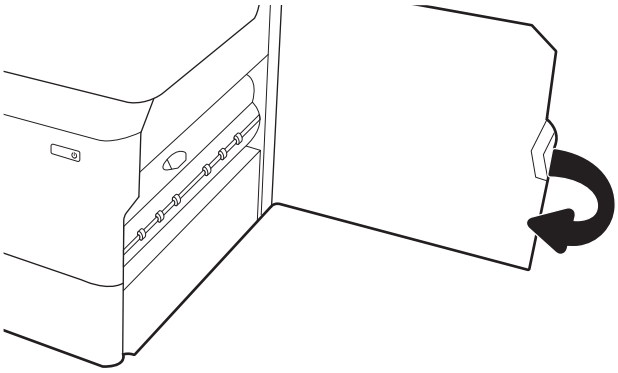
6. Pull any jammed paper straight out.



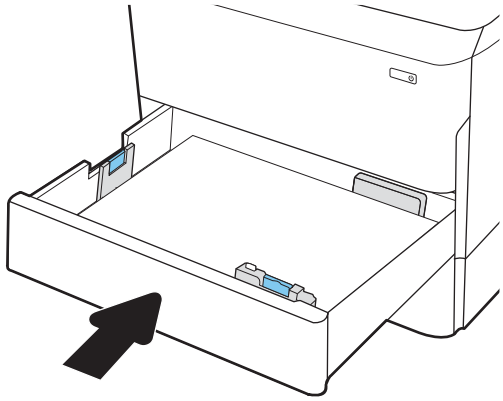
7. Reinstall the duplexer.



8. Close the right door.



9. Close the tray.



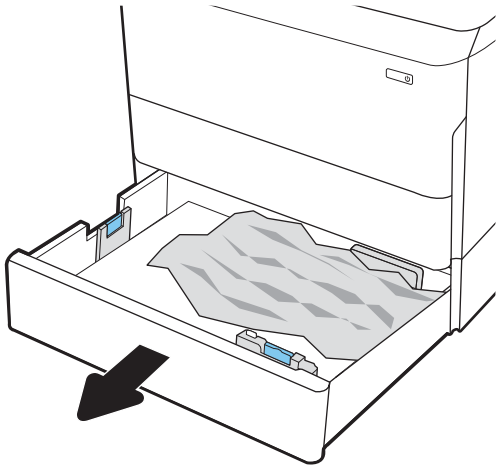
10. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

Clear paper jams in Tray 3

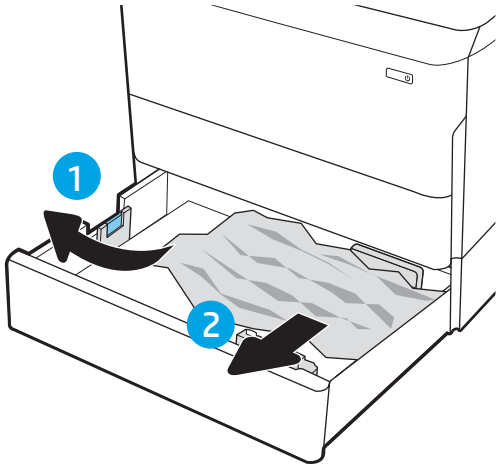
Use the following procedure to check for paper in all possible jam locations related to the 550-sheet trays. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

NOTE: The procedure to clear paper jams from the 1x550-sheet tray with cabinet stand is the same as for the table-top 1x550-sheet tray. Only the table-top tray is shown here.

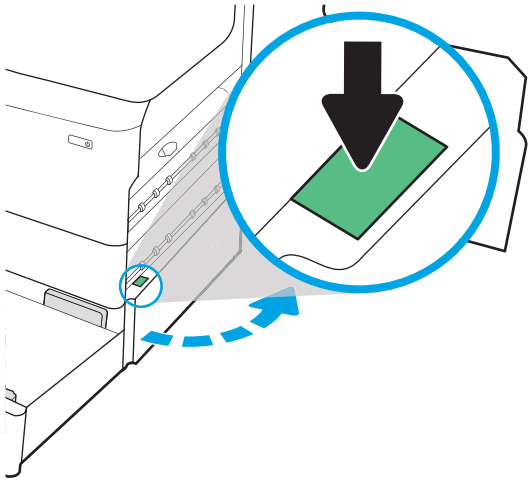
1. Open the tray.



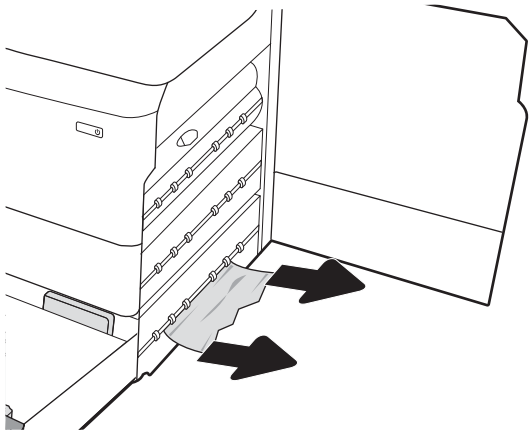
2. Remove the jammed paper from the feed rollers inside the printer. First pull the paper to the left, and then pull it forward to remove it.



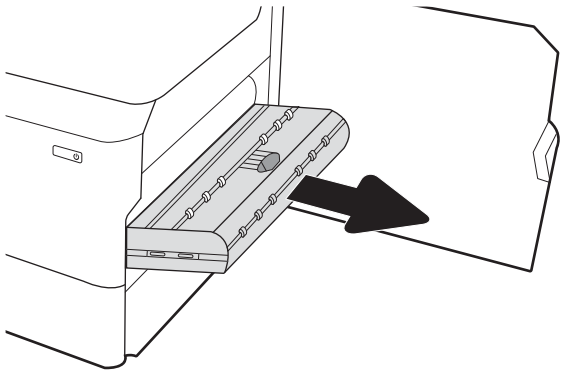
3. Open the right door and the lower-right door.



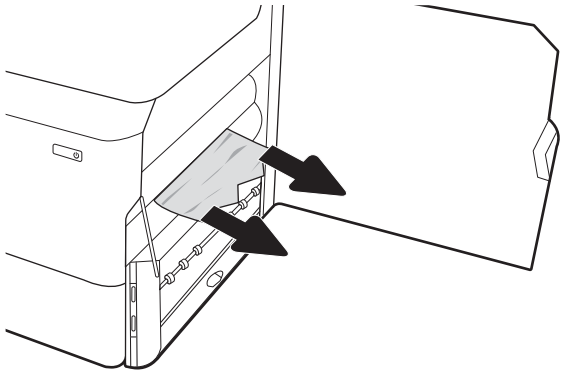
4. Gently pull out any jammed paper.



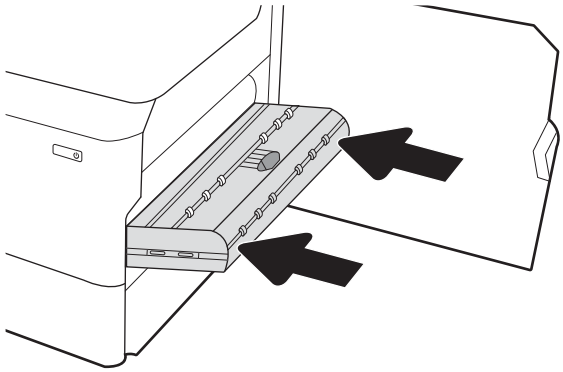
5. If no jammed paper is visible, remove the duplexer.



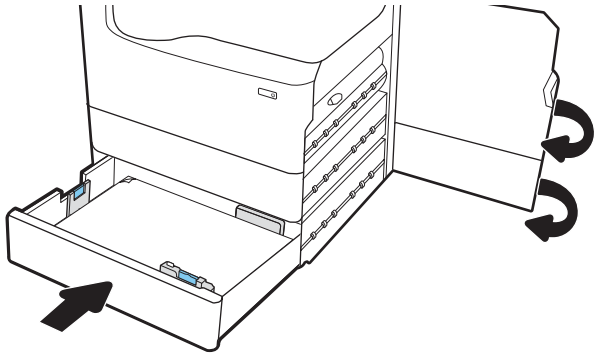
6. Pull any jammed paper straight out.



7. Reinstall the duplexer.



8. Close the lower-right door and the right door, and then close the tray.



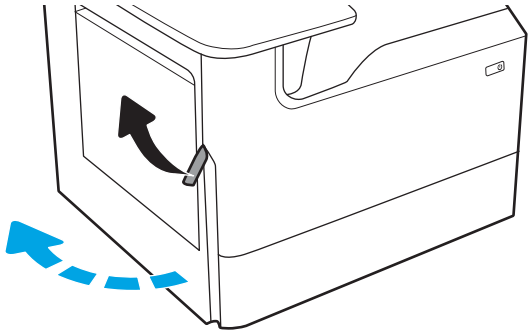
9. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

Clear paper jams in the output bin

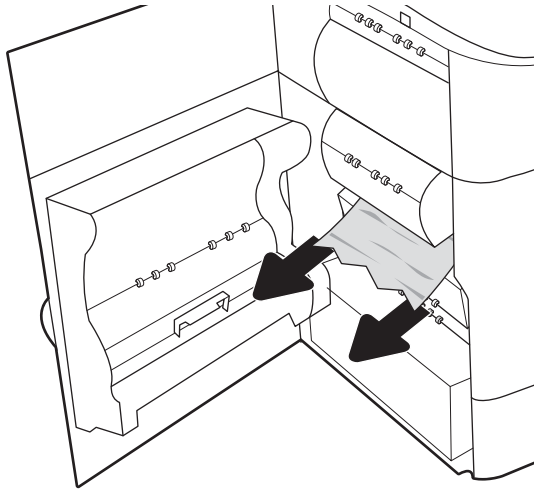
The following information describes how to clear a paper jam in the output bin. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

1. If paper is visible in the output bin, grasp the leading edge and remove it.

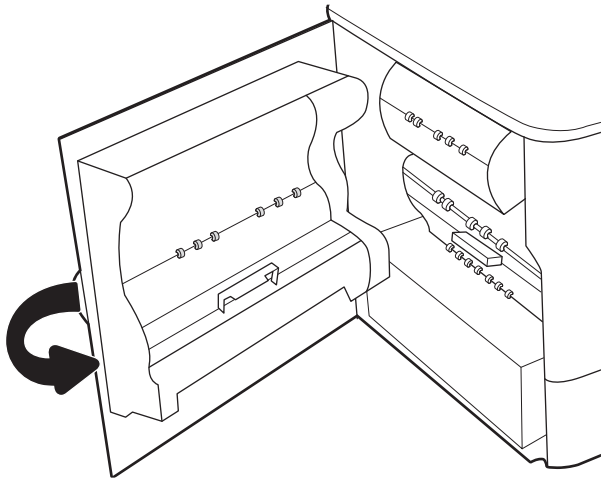
2. Open the left door.



3. Remove any jammed paper.



4. Close the left door.

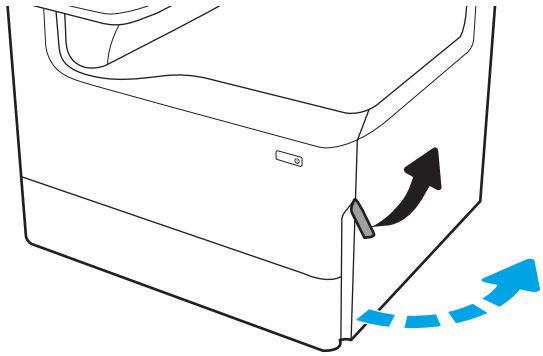


5. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

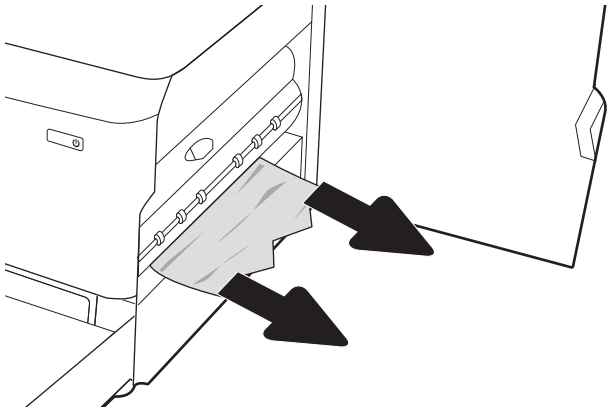
Clear paper jams in the duplexer

Use the following procedure to check for paper in all possible jam locations in the automatic duplexer. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

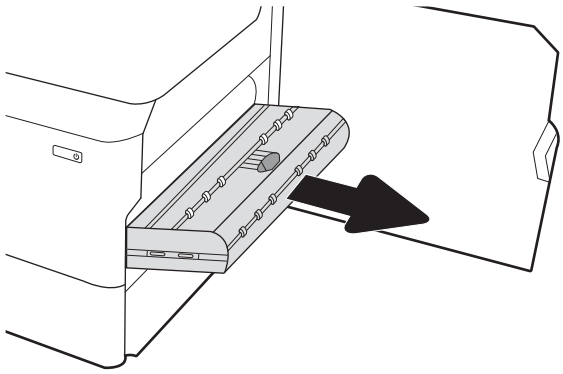
1. Open the right door.



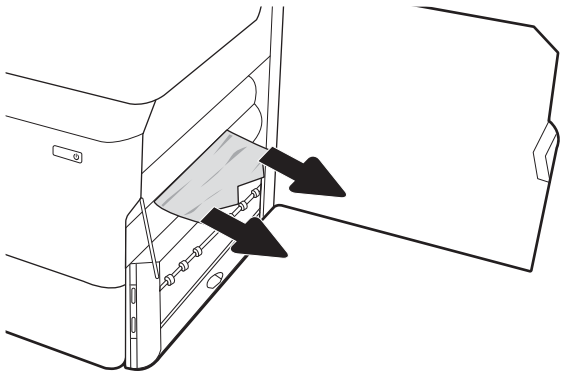
2. Remove any jammed paper.



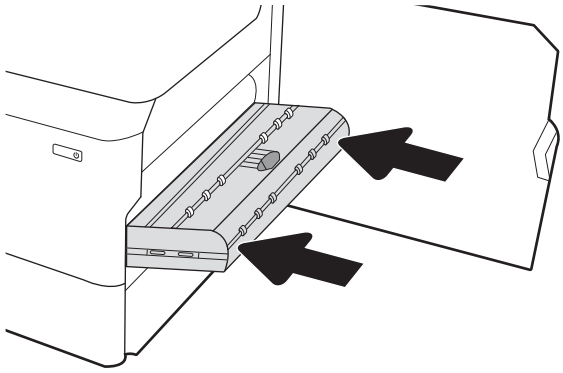
3. If no jammed paper is visible, remove the duplexer.



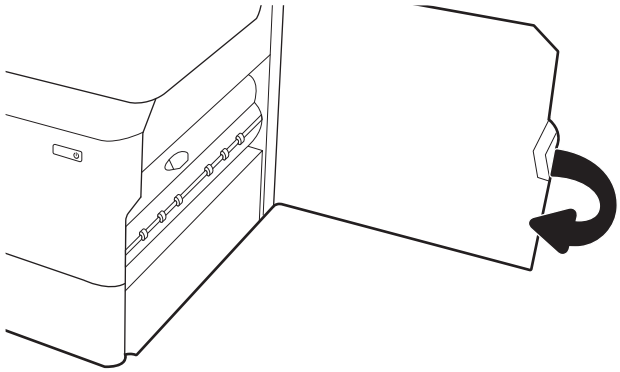
4. Pull any jammed paper straight out.



5. Reinstall the duplexer.



6. Close the right door.

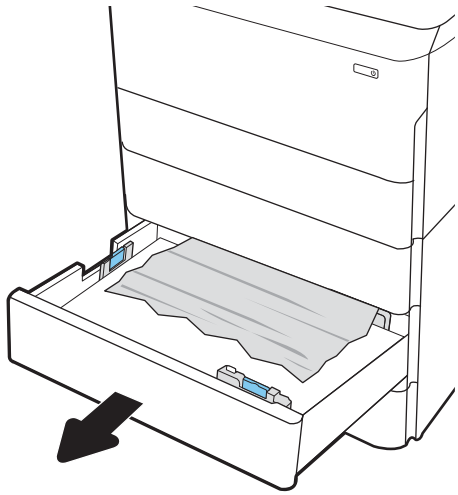


7. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

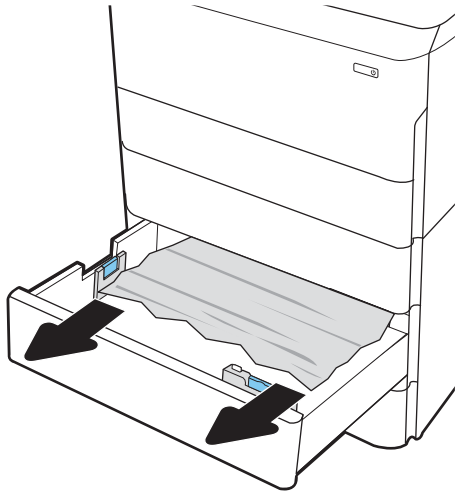
Clear paper jams in the 3x550-sheet trays

Use the following procedure to check for paper in all possible jam locations related to the 3x550-sheet trays. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

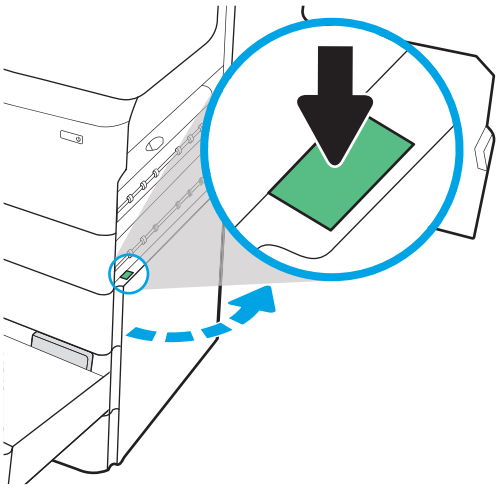
1. Open one of the trays.



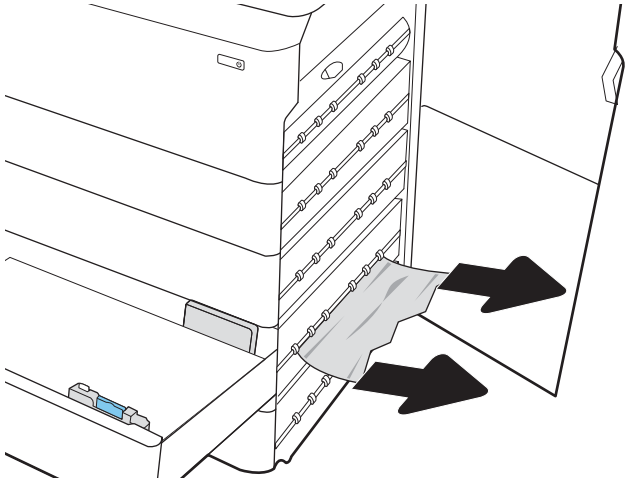
2. Remove the jammed paper from the feed rollers inside the printer. First pull the paper to the left, and then pull it forward to remove it.



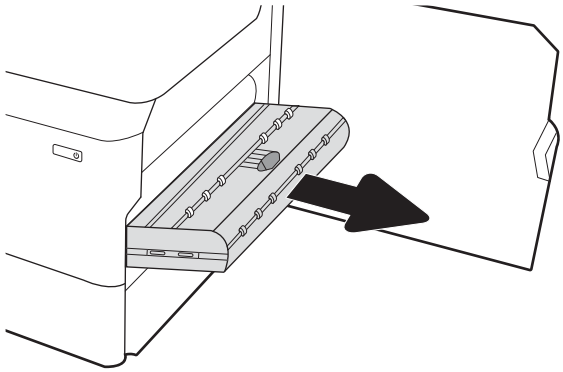
3. Open the right door and the lower-right door.



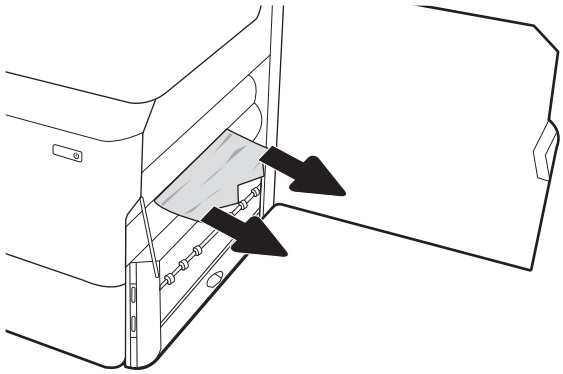
4. Gently pull out any jammed paper.



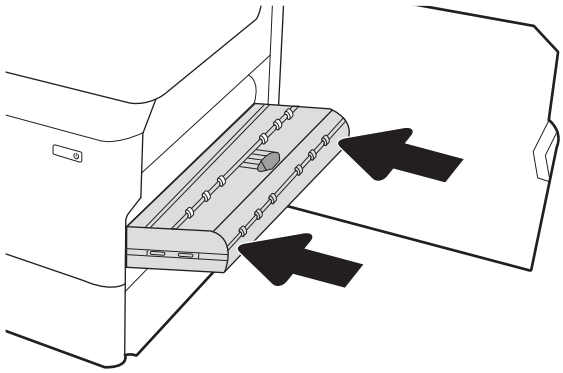
5. If no jammed paper is visible, remove the duplexer.



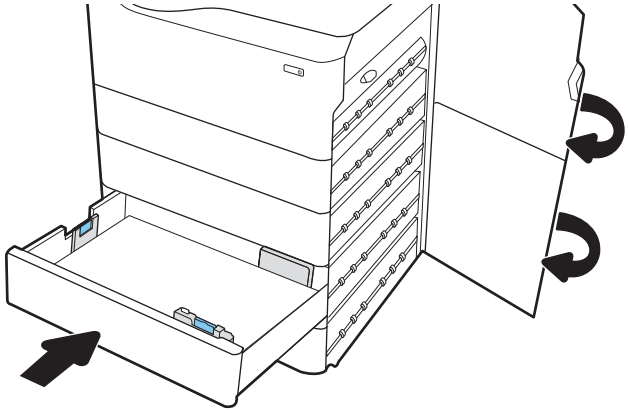
6. Pull any jammed paper straight out.



7. Reinstall the duplexer.



8. Close the right door and the lower-right door, and then close the tray.

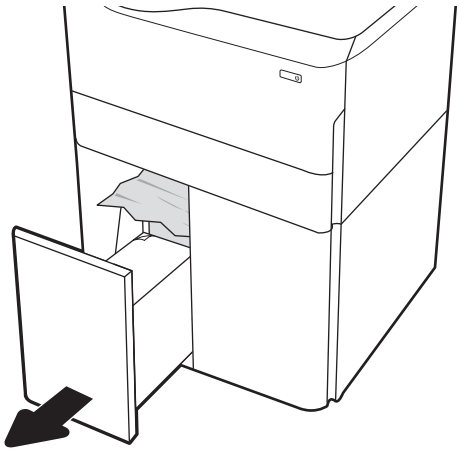


9. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

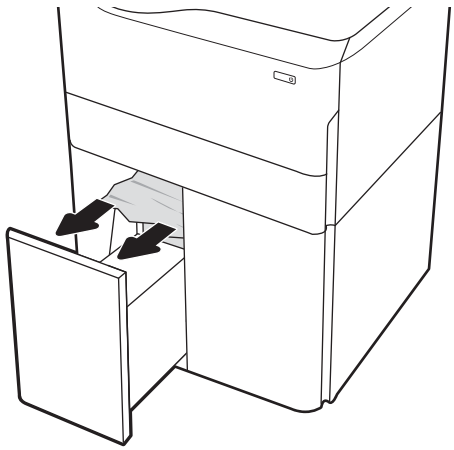
Clear paper jams in the 4,000-sheet high-capacity input (HCI) tray

The following information describes how to clear a paper jam in the 4,000-sheet high-capacity tray. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

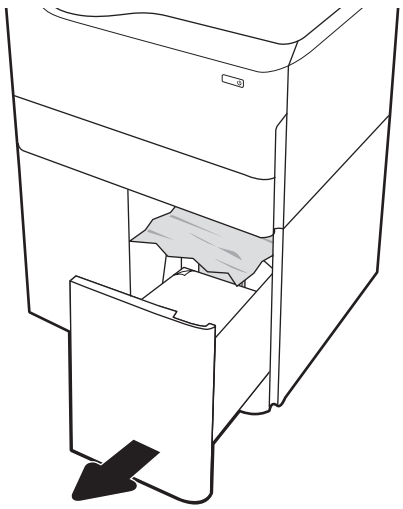
1. Open the left high-capacity input tray.



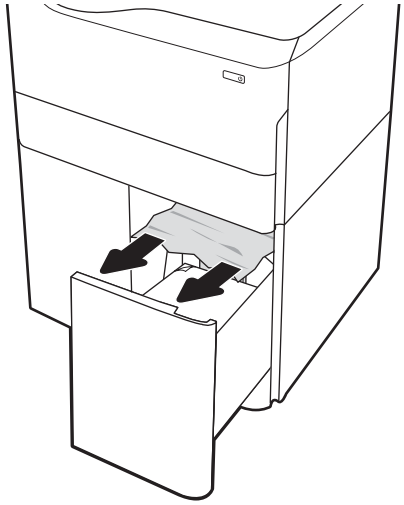
2. Remove the jammed paper from the feed rollers inside the printer. First pull the paper to the left, and then pull it forward to remove it.



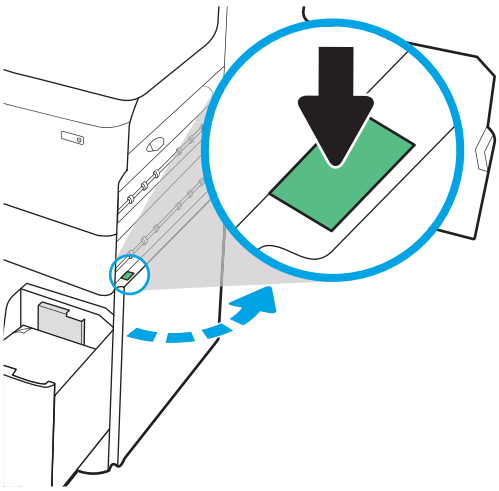
3. Close the left tray and open the right high-capacity input tray.



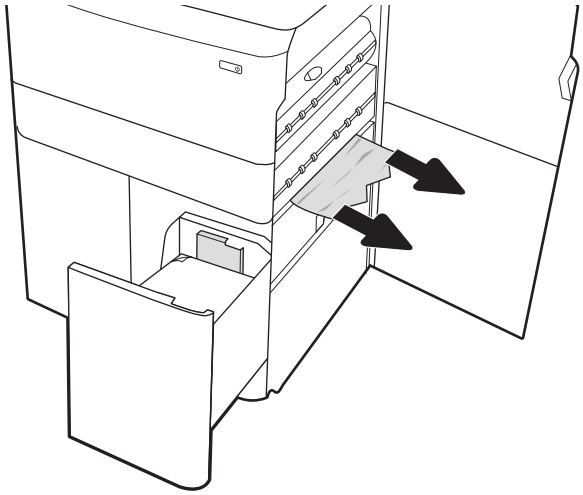
4. Remove the jammed paper from the feed rollers inside the printer. First pull the paper to the left, and then pull it forward to remove it.



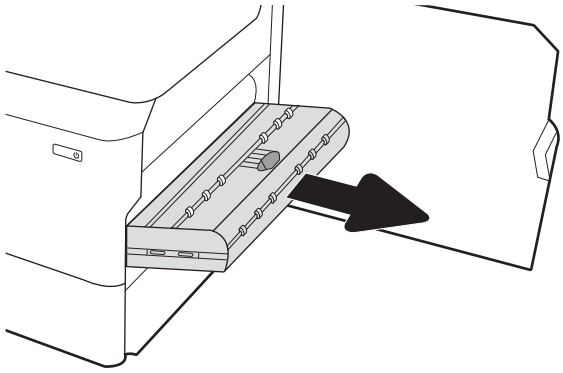
5. Open the right door and the lower right door.



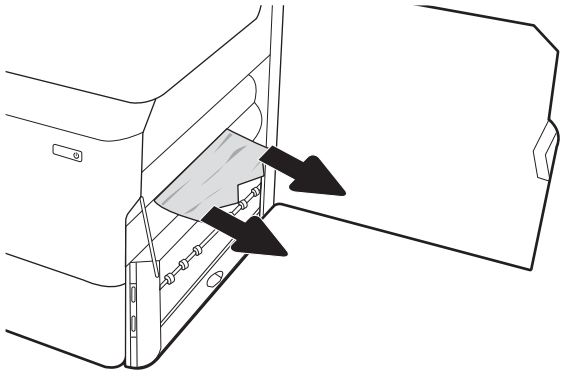
6. Remove any damaged sheets.



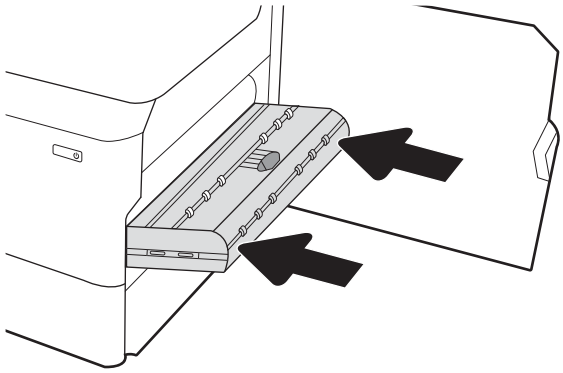
7. If no jammed paper is visible, remove the duplexer.



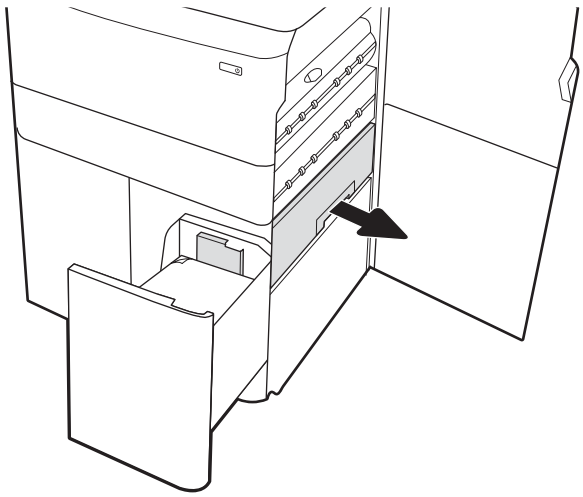
8. Pull any jammed paper straight out.



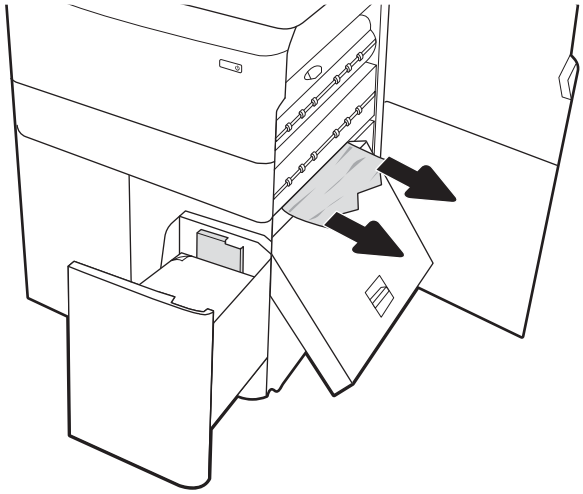
9. Reinstall the duplexer.



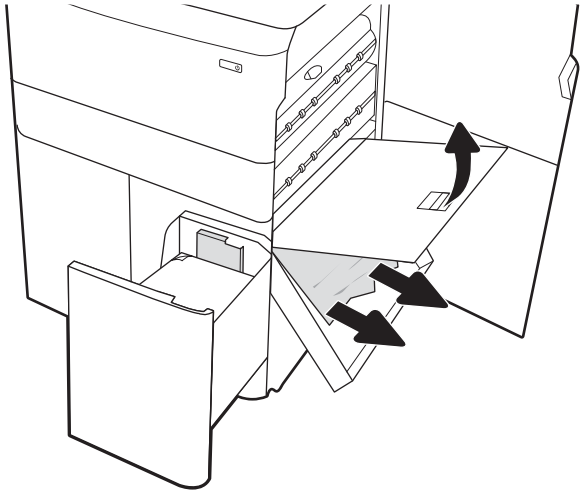
10. In the lower right door area, use the green handle to pull out the HCI jam cassette.



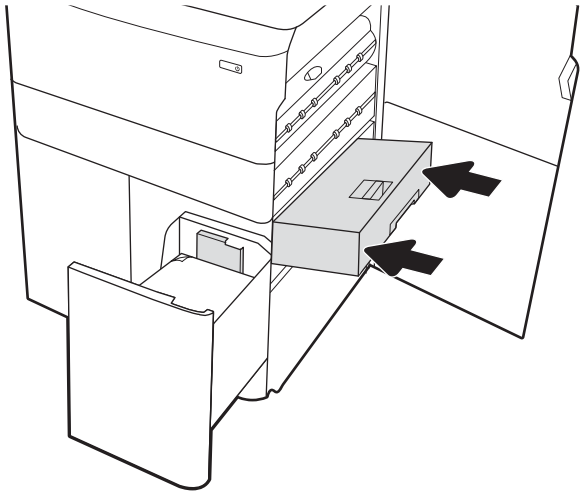
11. Remove any jammed paper from the jam cassette area.



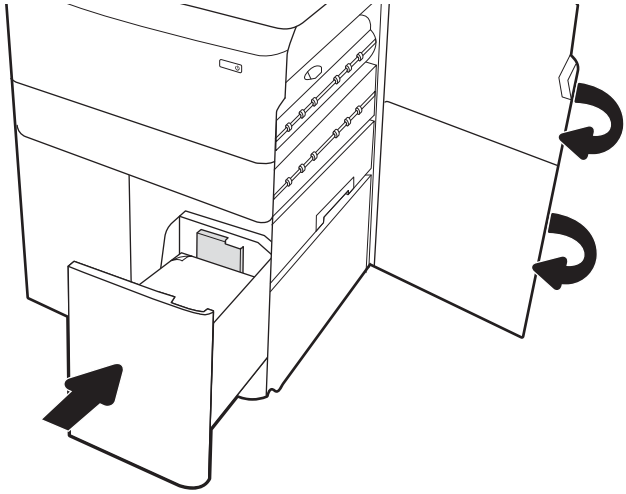
12. Use the green handle to open the top of the HCI jam cassette, and remove any jammed paper.



13. Close the jam cassette, and then reinstall it into the printer.



14. Close the right door and the lower right door, and then close the right tray.



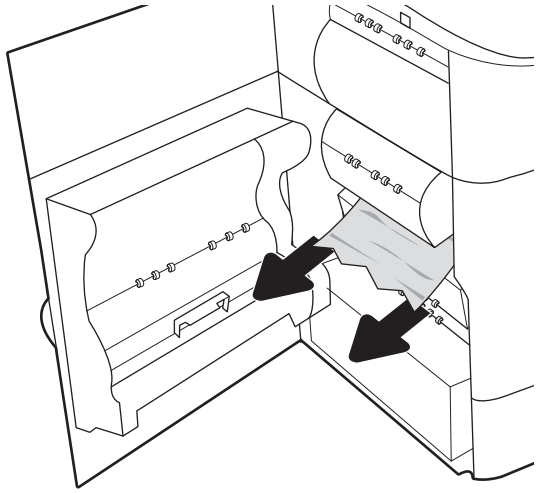
15. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

Clear paper jams in the inner finisher (785zs model only)

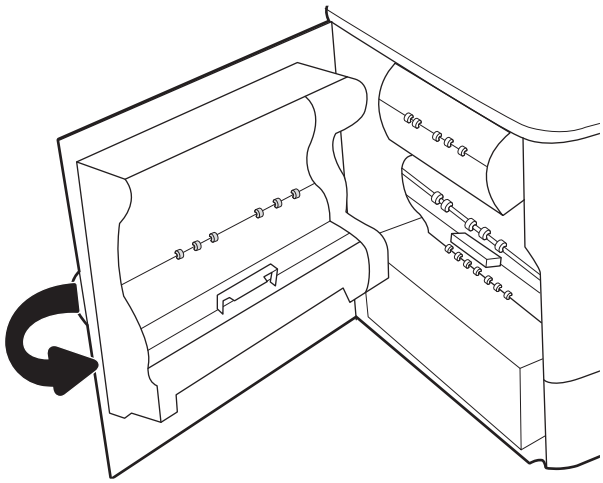
The following information describes how to clear a paper jam in the inner finisher. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

1. Remove any jammed paper from the inner finisher bins.

2. Open the left door. If jammed paper is visible inside the jam-access door, pull it straight out to remove it.



3. Close the left door.

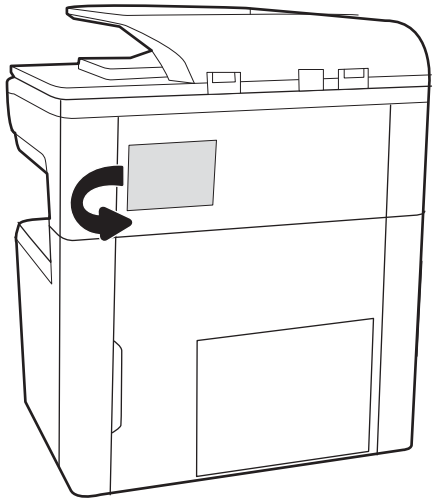


4. If there are remaining pages still in the printer, instructions on how to clear the remaining pages will display on the control panel.

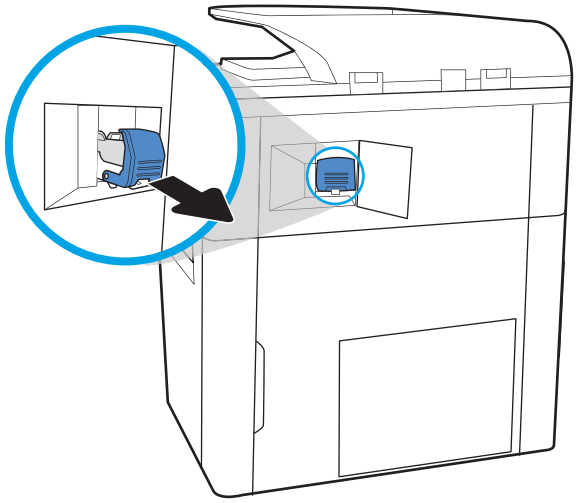
Clear staple jams (785zs model only)

The following information describes how to clear a staple jam. When a jam occurs, the control panel displays an error message and an animation that assist in clearing the jam.

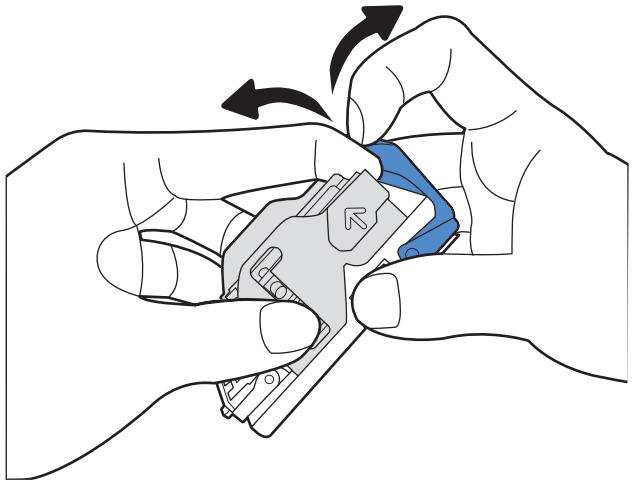
1. Open the stapler door.



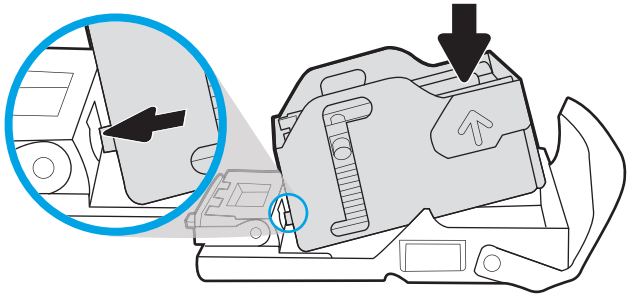
2. Pull the colored handle on the staple cartridge, and then pull the staple cartridge straight out.



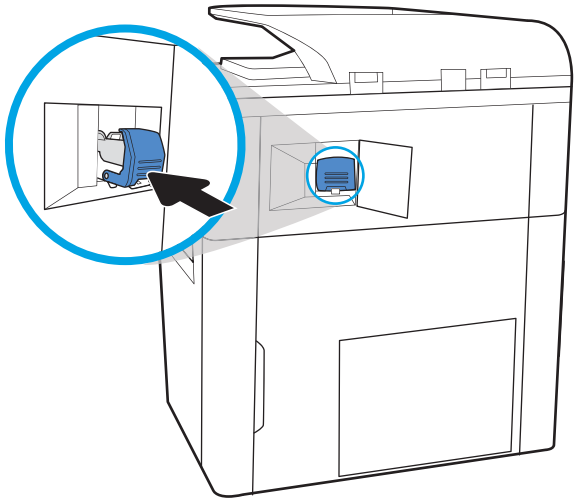
3. Lift up on the small lever at the back of the staple cartridge to separate the staple cartridge from the holder, and then remove any jammed staples.



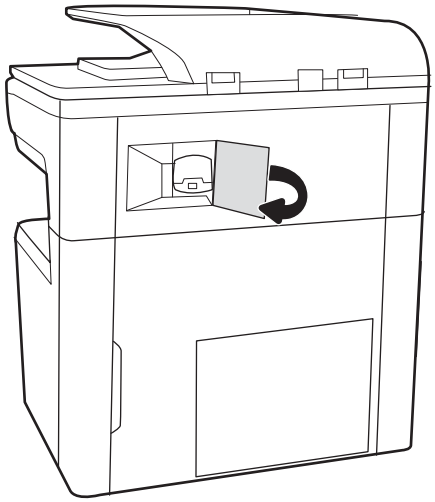
4. Close the lever at the back of the staple cartridge. Be sure that it snaps into place.



5. Insert the staple cartridge into the stapler and push on the colored handle until it snaps into place.



6. Close the stapler door.



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 or Tray 2, or for print jobs that require media other than 20lb plain paper.

Factors affecting print performance

Table 2-22 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 Printer Status Report page.
Pages print very slowly. NOTE: For more information, see The printer does not print or it prints slowly on page 341.	The environment where the printer is installed does not meet HP recommendations.	Move the printer to another location.
	The printer is in an error state.	Check the event log for subsystem errors. Resolve the errors as necessary.
	Print quality settings are incorrect for the print job.	Check the default print quality settings.
	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.

Table 2-22 Solve performance problems (continued)

Problem	Cause	Solution
	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.

The printer does not print or it prints slowly

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 do the following:

   Print a Configuration report.

   NOTE: Make sure that paper is loaded in the default input tray.

   a. From the control panel Home screen, scroll to and then select Reports.

   b. Open the following menus:
      - Configuration/Status Pages

   c. Select the checkbox next to Configuration Page, and then select Print to print the report.

   TIP: Select View (780/785 only) to view the page on the control-panel display without printing the page.

   If the page prints, the error is external to the printer (for example, a communication error).
3. Make sure the cables are all connected correctly. If the printer is connected to a network, check the following items:
   - Check the LED next to the network connection on the printer. If the network is active, the bottom light is solid amber, and the top LED is blinking 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 HP software for this printer (go to www.hp.com/support/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660). 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 Status Report 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. Check the control panel for an event log error message. Also check the event log for subsystem errors. Resolve the errors as necessary.

   ### Open the internal event log

   a. From the Home screen, scroll to and then select Support Tools.

   b. Open the following menus:

      - Troubleshooting
      - Event Log

   c. Swipe your finger down or up the control-panel display to scroll through log entries, or use the printer icon at the bottom right corner of the screen print the event log.

8. 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 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/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660.

2. If the host computer or the printer is connected to a wireless network, low signal quality or interference might be delaying print jobs.

Solve connectivity problems

- Solve USB connection problems
- Solve wired network problems

Solve USB connection problems

If you have connected the printer directly to a computer, check the cable.

- Verify that the cable is connected to the computer and to the printer.
- Verify that the cable is not longer than 2 m (6.65 ft). Try using a shorter cable.
- Verify that the cable is working correctly by connecting it to another printer. Replace the cable if necessary.

Solve wired network problems

Introduction

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 speed 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 and the green link-status light are lit.
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 speed 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.

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.

1. From the Home screen on the printer control panel, scroll to and select the Support Tools.
2. Select Service to display the Sign In screen.
3. Make sure that Service Access Code displays in the Access Type area.
4. Type in the following service access personal identification number (PIN) for the printer:
   - 09078017 (MFP 780/785)
   - 09076517 (SFP 765)
5. Select Sign In to enter the Service menu.

The following menu items appear in the Service menu:

Table 2-23 Service menu

First level	Second level	Value	Description
Event Log	Print icon NOTE: Select the printer icon located at the bottom right-hand corner of the screen.		Display or print the event log.
	Clear icon NOTE: Select the trash can icon located at the bottom right-hand corner of the screen.		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		Use this item to record the number of mono print jobs.
	Color Cycle Count		Use this item to record the number of color print jobs.
	Refurbish Cycle Count		Use this item to record the page count when the printer was refurbished.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Cycle Counts continued	Document Feeder Kit Count (780/785 models only)		Total number of pages since the document feeder kit was replaced.
	Document Feeder Kit Interval (780/785 models only)		Use this item to set the interval that causes the printer to prompt the customer to replace document feeder maintenance kit.
	Clean Rollers Count (780/785 models only)		Total number of pages since the document feeder rollers were cleaned.
	Clean Rollers Interval (780/785 models only)		Use this item to set the interval that causes the printer to prompt the customer to clean the document feeder rollers and separation pad.
	ADF Count (780/785 models only)		Set the total pages fed through the document feeder.
	Flatbed Count (780/785 models only)		Set the total pages scanned from the flatbed.
	ADF Simplex Count 780/785 models only)		Set the total single-sided pages fed through the document feeder.
	ADF Duplex Count (780/785 models only)		Set the total two-sided pages fed through the document feeder.
	Copy Scan Count (780/785 models only)		Set the total copy pages that have been scanned.
	Send Scan Count (780/785 models only)		Set the number of scanned pages sent to email.
	Fax Scan Count (Fax models only)		Set the number of scanned pages that have been faxed.
	Copy Pages Count (780/785 models only)		Set the number of scanned pages that have been printed.
Scanner Settings (780/785 models only) NOTE: Select Done to save setting changes. Select Clear All to reset all settings to zero.	Edge to Adjust ADF Settings	Glass: Rear edge Glass: Left edge ADF: Leading front edge ADF: Leading back edge ADF: Trailing front edge ADF: Trailing back edge ADF: Left side front ADF: Left side back	Select the desired adjustment parameter.
	Adjustment	(-20 to 20)	Set the calibration values. WARNING! Do not change these values unless instructed to do so.
Serial Number			Set the serial number.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Service ID		(five digits)	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	Letter A4		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. NOTE: The printer automatically restarts when this setting changes.
MPS Settings	Low Alerts	On Off	Turn low alerts (for supplies) on or off.
Advanced Service	Status	Printhead Status	Provides information on Status, Last update, Pages since last update, Printhead health score and Printhead service code User can also see the history from the last four status update. Select Print USB icon then select Done
		Drop Detect Status	Provides information on the following: • Status • Acceptable PWM range • Sensor 1 PWM • Sensor 2 PWM • Sensor 3 PWM • Sensor 4 PWM • Last calibration • Current count Select Done to exit menu.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Advanced Service continue	Status continue	Printhead Wiper Status	Provides information on the following items: • Web remaining • Web advances • Web advances at last check • Web check counter Select Done to exit menu.
		Service Fluid Container Status	Approximate life remaining Service fluid container kit Total Pages First install date Page count since last service Startup Performed with the service fluid container Insertion counter Number of SFC kits replaced EEPROM Version * Estimated levels. Actual levels may vary.
		Airflow System Status	Provides information on the following: • Line voltage configuration • Sag events • Surge events • Too few voltage samples • Other events Select Done to exit menu.
	Calibration/Cleaning	Stabilize the printhead	
		Preform drop detect	Select Start to perform the drop detect test.
		Smear Test	Select Start to perform the smear test.
		Calibrate printbar and perform drop detect	Select Start to calibrate the drop detect system.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Advanced Service continue	Calibration/Cleaning continue	Advance print quality pages	Select one of the following pages: • Print Quality Test Page • Dimensional Image Quality • All Colors • Single Color Black • Single Color Cyan • Single Color Magenta • Single Color Yellow • Streaks (Yellow) Test • Nozzle Health Page • Print Quality Service Pages • Printhead Diagnostics Page Select Print to print the page.
		Advanced Print Controls	Select one of more of the following: • Automatic nozzle substitution • Yellow • Magenta • Cyan • Black
		Reset Nozzle Health Data	Select Reset to reset the nozzle health data.
		Skew Correction	Select Factory calibration values. Enable or disable Skew auto-tuning Select paper size and then select Reset to reset the skew correction for the selected paper size.
		Calibrate Deskew	
		Calibrate Paper Path Sensors	Calibrating paper path sensors takes a few seconds. Load tray 2 with plain letter or A4, and then select Start to start the process.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Advanced Service continue	Sensors (continued)	Tray Sensors Input Path Sensors Deskew Sensors Print Zone Sensors Drop Detect Sensor Airflow System Sensors Duplex Path Sensors Output Path Sensors Bin Full Sensors	Select the sensor that you want to test on control panel, and then manually toggle the sensor on the printer. The **Status** will increment by one each time you manually toggle to the sensor. Select Done to exit the menu. NOTE: You can select any of the callouts for information and options.
	Component Tests	Tray Motors	Select the ray motor to test, and then select one of the callouts. Select a directional key to rotate the motor. Select directional key again to stop the motor. Select Done to exit the menu.
		Image Sensor Carriage Motor	Select a callout to run motor test. Select Start to perform the image sensor carriage motor test.
		Deskew Motors Feed Motor	Select a callout to run motor test, and then select a directional key to rotate the motor. Select the directional key again to stop the motor Select Done to exit the menu.
		Print Zone Motors Printhead Assembly Motors	Select a callout, and then select Start to test the specified motor. Select Done to exit the menu. NOTE: You can select any of the callouts for information and options.
		Printhead Wiper and Drop Detect	Select Drop detect carriage motor, and then select Start to perform the carriage motor test. Select Printhead Wiper Motor, and then select **Test type** • Uncap/cap the printhead • Web advance check Select Start to run the test.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Advanced Service (continued)	Component Tests (continued)	Airflow System Motors	Select a callout and then select Start to run the test. Select Done to exit the menu. NOTE: You can select any of the callouts for information and options.
		Duplex Path Motors	Select a callout to run motor test, and then select a directional key to rotate the motor. Select the directional key again to stop the motor Select Start to run the back plate lift test. Select Done to exit the menu.
		Left Vertical Path Motors	Select Vertical Motor, and then select a directional key to rotate the motor. Select directional key again to stop the motor. Select Duplex diverter, and then select test type • Simplex • Duplex • Cycle Select Start to run the test. Select Done to exit the menu.
		Output Path Motors	Select a callout to run motor test, and then select a directional key to rotate the motor. Select the directional key again to stop the motor Select Done to exit the menu.
		Stapler/Stacker Input Motors NOTE: For those models with Stapler/ Stacker installed.	Select Output bin 1 paper delivery motor, and then select a directional key to rotate the motor. Select the directional key again to stop the motor. Select Stapler/Stacker diverter, and then select Start to run the test. Select Done to exit the menu.

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
Advanced Service (continued)	Component Tests (continued)	Compiler Top Plate	Select a callout, and then select Start to run motor test. To test the jam clearance LED lights, select the LED light to be tested. Then select On or Off LED key to test LED light. Select Done to exit the menu.
		Mezzanine	Select the callout, and then select Start to run rest. This test engages the moving components in this system. Select Done to exit the menu.
		Bin Motors Select one of the options • Standard Bin Motor • Output Bin 1	Select a callout, and then select Start to run motor test. Select Done to exit the menu. NOTE: You can select any of the callouts for information and options.
	Setup Printhead Assembly		Select a callout to run motor test, and then select a directional key to rotate the motor. Select the directional key again to stop the motor Select Done to exit the menu.
PTT Test Mode			Test the internal modem for the analog fax accessory.
	Hook Operations	Go Off Hook Go On Hook	
	Generate Random Data	Select a value from the list.	
	Generate Dialing Tones/Pulses	Pulse Burst Tone Burst Continuous Tone	
	Generate/Dial Phone Number	Pulse Tone	
	Generate Single Modem Tone	Select a value from the list.	
	Fax Transmit Signal Loss	(0 to 30)	

Table 2-23 Service menu (continued)

First level	Second level	Value	Description
PTT Test Mode (continued)	Ring Settings	Ring Interval (ms (0 to 600) Ring Frequency High Limit (Hz (0 to 100) PBX Ring detect (On or Off)	
Test Support	Continuous Scan (780/785 models only))	2-sided Save to Disk	
	Continuous Copy (780/785 models only))	2-sided Save to Disk	
	Raw Scan (780/785 models only)	2-sided Mechanical Calibration	
	Continuous Print from USB		
	Automatic Calibrations		
	Runtime Configuration	Select a value from the list.	
Fac V29 Speed		V.29 9600* V.29 7200	Use this item to set the fax V.29 speed (baud rate).

Printer resets

Restore factory-set defaults

NOTE: The printer restarts automatically after the reset operation completes.

1. From the Home screen on the printer control panel, scroll to and select Settings.
2. Open the following menus:
   - General
   - Restore Factory Settings
3. Select Reset to complete the process, or select Cancel to return to the General settings menu.

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.

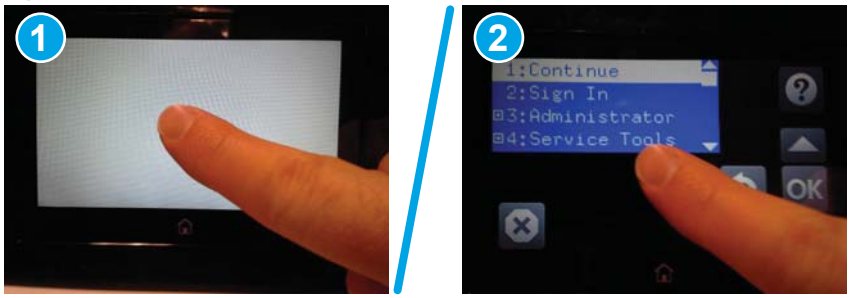
Printer cold reset

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

   Figure 2-69 Open the Pre-boot menu

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

Format Disk and Partial Clean functions

NOTE: Only for printers with a 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: 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.

Partial Clean

The Partial Clean option erases all partitions and data on the disk drive, 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 printers, 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.

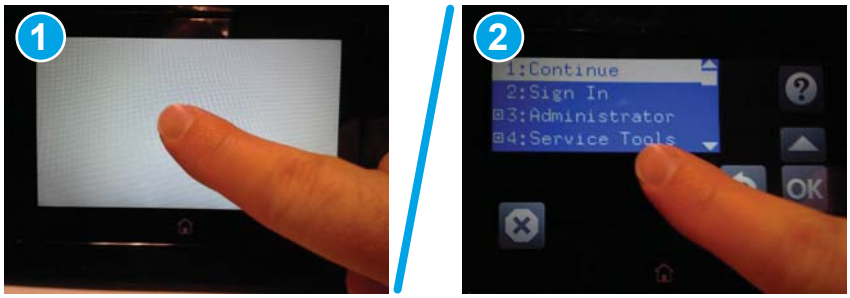
- The printer will not respond to commands from the control panel.
- Executing the Partial Clean function is helpful for troubleshooting hard disk problems.

- To reset the printer by deleting all solutions and customer-defined settings.
- The printer default settings are not properly working.

Execute a Partial Clean

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

   Figure 2-70 Open the Pre-boot menu



2. Use the down arrow ▼to highlight the +3:Administrator item, and then select OK.
3. Use the down arrow ▼ to highlight Partial Clean and then select OK.
4. Select OK again.
5. Select Home to highlight Continue, and then select OK.

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.

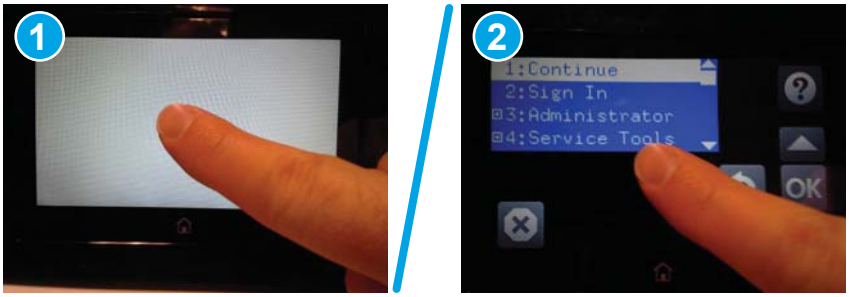
NOTE: Try clearing the error prior to executing a Format Disk.

- 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

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

Figure 2-71 Open the Pre-boot menu



2. Use the down arrow ▼ to highlight the +3:Administrator item, and then select OK.
3. Use the down arrow ▼ to highlight Format Disk, and then select OK.
4. Select OK 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/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660.

  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.

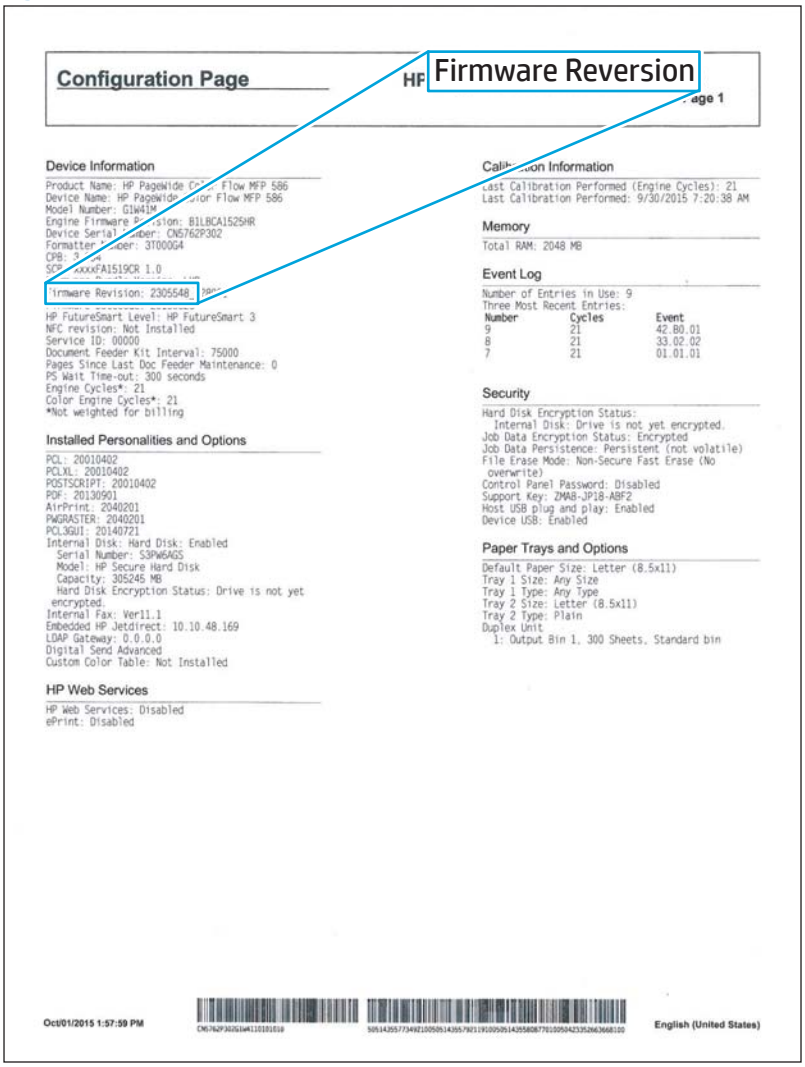
Determine the installed revision of firmware

1. From the Home screen on the printer control panel, scroll to and select Reports.
2. Open the following menus:
   - Reports
   - Configuration/Status pages
3. Select the check box next to Configuration page to select it.

4. Select Print to print the report.

TIP: Select View (780/785) to view the page on the screen.

Figure 2-72 Determine the installed revision of firmware



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.

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 and comes to Ready state.
3. From the Home screen on the printer control panel, swipe (right), and select Support Tools.
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. Select the .bdl file, and then select Install.

   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 automatically restarts.

   TIP: Print a configuration page and verify that the upgrade firmware version was installed.

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 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.

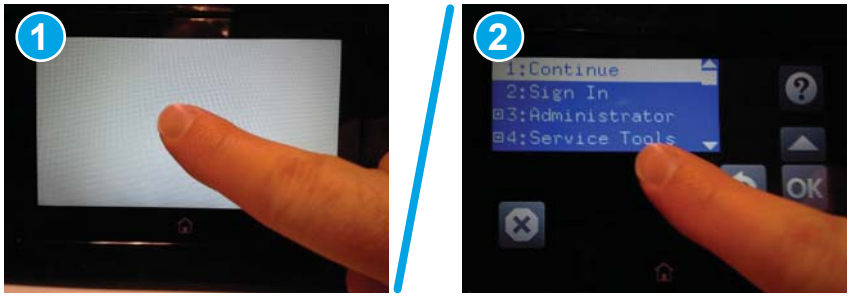
USB flash drive (Pre-boot menu)

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

   Figure 2-73 Open the Pre-boot menu

3. Select the down arrow ▼ to highlight +3 Administrator, and then select OK.
4. If necessary, select the down arrow ▼ to highlight +1 Download, and then select OK.
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. Select the down arrow ▼ to highlight USB Thumbdrive, and then select OK.
7. Select the down arrow ▼ to highlight the .bdl file, and then select OK.

   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. Select OK to begin the upgrade. When the upgrade is complete, the printer will initialize to a **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. Select Cancel when you see the 1/8 under the logo.
3. Select the down arrow ▼ to highlight +3 Administrator, and then select OK.
4. If necessary, select the down arrow ▼ to highlight +1 Download, and then select OK.

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. Select the down arrow ▼ to highlight USB Thumbdrive, and then select OK.

7. Select the down arrow ▼ to highlight the .bdl file, and then select OK.

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 Web-based Interactive Search Engine (WISE) Web site. Go to the appropriate Web site (listed below), and then use "fax troubleshooting" as the search term.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

Solve email problems

Email troubleshooting information is not provided in this service manual. This information is available on the HP Web-based Interactive Search Engine (WISE) Web site. Go to the appropriate Web site (listed below), and then use "email troubleshooting" as the search term.

AMS

- https://support.hp.com/wise/home/ams-en
- https://support.hp.com/wise/home/ams-es
- https://support.hp.com/wise/home/ams-pt

APJ

- https://support.hp.com/wise/home/apj-en
- https://support.hp.com/wise/home/apj-ja
- https://support.hp.com/wise/home/apj-ko
- https://support.hp.com/wise/home/apj-zh-Hans
- https://support.hp.com/wise/home/apj-zh-Hant

EMEA

- https://support.hp.com/wise/home/emea-en

A Printer specifications

Printer dimensions and weight

NOTE: These values are subject to change. For current information, go to www.hp.com/support/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660.

Table A-1 Dimensions for printer base model (SFP; all)

	Printer fully closed	Printer fully opened
Height	462 mm (18.2 in)	534 mm (21 in)
Depth	595 mm (23.4 in)	1,027 mm (40.4 in)
Width	600 mm (23.6 in)	1530 mm (60.2 in)
Weight (with cartridge)	45.6 kg (100.5 lb)	

Table A-2 Dimensions for base models (780dn, 785f; MFP)

	Printer fully closed	Printer fully opened
Height	682 mm (26.9 in)	995 mm (39.2 in)
Depth	628 mm (24.7 in)	1027 mm (40.4 in)
Width	604 mm (23.8 in)	1530 mm (60.2 in)
Weight (with cartridges)	68 kg (149.9 lb)	

Table A-3 Dimensions for 785zs (MFP)

	Printer fully closed	Printer fully opened
Height	1222 mm (48.1 in)	1535 mm (60.4 in)
Depth	685 mm (27 in)	1027 mm (40.4 in)
Width	604 mm (23.8 in)	1530 mm (60.2 in)
Weight (with cartridges)	122 kg (269 lb)	

Table A-4 Dimensions for the 1x550-sheet paper feeder

	Printer fully closed	Printer fully opened
Height	117 mm (4.6 in)	117 mm (4.6 in)
Depth	520 mm (20.5 in)	685 mm (27 in)
Width	600 mm (23.6 in)	600 mm (23.6 in)
Weight (with cartridge)	9.5 kg (21 lb)	

Table A-5 Dimensions for the 1x550-sheet paper feeder with stand

	Accessory fully closed	Accessory fully opened
Height	436 mm (17.2 in)	436 mm (17.2 in)
Depth	520 mm (20.5 in)	685 mm (27 in)
Width	600 mm (23.6 in)	600 mm (23.6 in)
Weight	28.6 kg (63 lb)	

Table A-6 Dimensions for the 3x550-sheet paper feeder with stand

	Printer fully closed	Printer fully opened
Height	436 mm (17.2 in)	436 mm (17.2 in)
Depth	520 mm (20.5 in)	685 mm (27 in)
Width	600 mm (23.6 in)	600 mm (23.6 in)
Weight (with cartridge)	34 kg (75 lb)	

Table A-7 Dimensions for the 4,000-sheet HCI with stand

	Accessory fully closed	Accessory fully opened
Height	436 mm (17.2 in)	436 mm (17.2 in)
Depth	520 mm (20.5 in)	685 mm (27 in)
Width	600 mm (23.6 in)	600 mm (23.6 in)
Weight	41.3 kg (91 lb)	

Printer space requirements

HP recommends that 30 mm (1.81 in) 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. See Printer dimensions and weight on page 368.

Power consumption, electrical specifications, and acoustic emissions

See www.hp.com/support/pwcolor760, www.hp.com/support/pwcolor780MFP, www.hp.com/support/pwcolor785MFP, www.hp.com/support/pwcolorE75160, www.hp.com/support/pwcolormfpE77650, www.hp.com/support/pwcolormfpE77660 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

Table A-8 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)

Certificate of Volatility

Figure A-1 Certificate of Volatility (750dn; 1 of 3)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Pro 750dn	Y3Z44A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 8GB eMMC	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-2 Certificate of Volatility (750dn; 2 of 3)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ No	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ No	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ No	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ Yes ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 8GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ Yes - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ Yes -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-3 Certificate of Volatility (750dn; 3 of 3)

RF/RFID			
Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)** ❒ Yes ❒ **No**			
Additional Information:			
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**			
Additional Information:			
Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes ❒ **No**			
Additional Information:			
Vendor Engineer/SME Representative Information			
Name: Date Completed: _1/24/2017_	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-4 Certificate of Volatility (750dw; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:		Manufacturer:	
HP PageWide Pro 750dw	Y3Z46A		Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683	
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ **Yes** ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ **Yes** ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 8GB eMMC	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ **Yes** ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-5 Certificate of Volatility (750dw; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 8GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-6 Certificate of Volatility (750dw; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration
If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)
Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps
Modulation_DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM
Effective Radiate Power (ERP) _20.5 dbm
Specifications_802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems
If yes, what is the frequency 2.4-2.5 GHz
Bandwidth___~2 MHz
Modulation____1 Mbps GFSK
Effective Radiate Power (ERP) ___less than 10 dbm
Specifications__BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems
If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:
Modulation: ISO/IEC 14443B;
Effective Radiate Power (ERP): 0 Watts (passive writer only).
Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-7 Certificate of Volatility (750dw; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes ❒ No			
Additional Information:			
Vendor Engineer/SME Representative Information			
Name: Date Completed: _1/24/2017_	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-8 Certificate of Volatility (772dn; 1 of 3)

Letter of Volatility				
Model Number:	Part Number:		Manufacturer:	
HP PageWide Pro MFP 772dn	Y3Z54A		Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683	
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 16GB eMMC	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-9 Certificate of Volatility (772dn; 2 of 3)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** - Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-10 Certificate of Volatility (772dn; 3 of 3)

RF/RFID			
Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)** ❒ Yes ❒ **No**			
Additional Information:			
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**			
Additional Information:			
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, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-11 Certificate of Volatility (772dw; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Pro MFP 772dw	W1B31A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 16GB eMMC	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-12 Certificate of Volatility (772dw; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-13 Certificate of Volatility (772dw; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_ WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_ 20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation_ DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications_ 802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_ Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications___BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems.

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-14 Certificate of Volatility (772dw; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-15 Certificate of Volatility (777z; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Pro MFP P777z	Y3Z55A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc): DDR3 DRAM (1 device)	Size: 256MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware	Process to Sanitize: Power Off printer
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device), Flash (1 device)	Size: 16GB eMMC and 256MB Flash	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (3 devices)	Size: 64kB, 32kB and 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-16 Certificate of Volatility (777z; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-17 Certificate of Volatility (777z; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation__DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications__802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications__BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems.

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-18 Certificate of Volatility (777z; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-19 Certificate of Volatility (75050dn; 1 of 3)

Letter of Volatility				
Model Number:	Part Number:		Manufacturer:	
HP PageWide Managed P75050dn	Y3Z45A		Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683	
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 8GB eMMC	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-20 Certificate of Volatility (75050dn; 2 of 3)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 8GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-21 Certificate of Volatility (75050dn; 3 of 3)

RF/RFID			
Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)** ❒ Yes ❒ **No**			
Additional Information:			
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**			
Additional Information:			
Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes ❒ **No**			
Additional Information:			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-22 Certificate of Volatility (75050dw; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:		Manufacturer:	
HP PageWide Managed P75050dw	Y3Z47A		Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683	
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ **Yes** ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ **Yes** ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 8GB eMMC	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ **Yes** ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-23 Certificate of Volatility (75050dw; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 8GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal connector enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-24 Certificate of Volatility (75050dw; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth 20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) 20.5 dbm

Specifications 802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth ~2 MHz

Modulation 1 Mbps GFSK

Effective Radiate Power (ERP) less than 10 dbm

Specifications BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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** - NFC ❒ No

If yes, what is the purpose: Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency 13.56 MHz; Bandwidth 848 kbit/s max:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-25 Certificate of Volatility (75050dw; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes ❒ No			
Additional Information:			
Vendor Engineer/SME Representative Information			
Name: Date Completed: _1/24/2017_	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-26 Certificate of Volatility (77740dn; 1 of 3)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Managed MFP P77740dn	Y3Z57A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ **Yes** ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ **Yes** ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 16GB eMMC	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ **Yes** ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-27 Certificate of Volatility (77740dn; 2 of 3)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-28 Certificate of Volatility (77740dn; 3 of 3)

RF/RFID			
Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)** ❒ Yes ❒ **No**			
Additional Information:			
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**			
Additional Information:			
Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ **Yes** - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-29 Certificate of Volatility (77740dw; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Managed MFP P77740dw	W1B33A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc):	Size:	User Modifiable: ❒ Yes ❒ No	Function:	Process to Sanitize:
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device)	Size: 16GB eMMC	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-30 Certificate of Volatility (77740dw; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-31 Certificate of Volatility (77740dw; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation_DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications_802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications___BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-32 Certificate of Volatility (77740dw; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-33 Certificate of Volatility (77740z; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Managed MFP P77740z	W1B39A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc): DDR3 DRAM (1 device)	Size: 256MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware	Process to Sanitize: Power Off printer
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device), Flash (1 device)	Size: 16GB eMMC and 256MB Flash	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (3 devices)	Size: 64kB, 32kB and 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-34 Certificate of Volatility (77740z; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-35 Certificate of Volatility (7740z; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation_DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications_802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications___BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-36 Certificate of Volatility (77740z; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-37 Certificate of Volatility (77750z; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Managed MFP P77750z	W1B37A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ Yes ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc): DDR3 DRAM (1 device)	Size: 256MB	User Modifiable: ❒ Yes ❒ No	Function: Contains decompressed system firmware	Process to Sanitize: Power Off printer
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ Yes ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device), Flash (1 device)	Size: 16GB eMMC and 256MB Flash	User Modifiable: ❒ Yes ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (3 devices)	Size: 64kB, 32kB and 32kB	User Modifiable: ❒ Yes ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-38 Certificate of Volatility (77750z; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-39 Certificate of Volatility (77750z; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ Yes - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation_DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications_802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ Yes - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications___BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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 - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-40 Certificate of Volatility (77750z; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

Figure A-41 Certificate of Volatility (77760z; 1 of 4)

Letter of Volatility				
Model Number:	Part Number:	Manufacturer:		
HP PageWide Managed MFP P77760z	W1B38A	Street Address: HP, Inc. 1115 SE 165th Ave, Suite 210 Vancouver, WA 98683		
Volatile Memory				
Does the item contain volatile memory (i.e., memory whose contents are lost when power is removed)? ❒ **Yes** ❒ No				
If the answer is "Yes", please provide the following information for each type (use additional sheets if required)				
Type (SRAM, DRAM, etc): DDR3 DRAM (3 devices)	Size 512MB + 512MB, and 512MB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains decompressed system firmware and print data during printing	Process to Sanitize: Power Off printer
Type (SRAM, DRAM, etc): DDR3 DRAM (1 device)	Size: 256MB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains decompressed system firmware	Process to Sanitize: Power Off printer
Non-Volatile Memory				
Does the item contain non-volatile memory (i.e., memory whose contents are retained when power is removed)? ❒ **Yes** ❒ No				
Type (eMMC, Flash, EEPROM, etc):eMMC (1 device), Flash (1 device)	Size: 16GB eMMC and 256MB Flash	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Type (eMMC, Flash, EEPROM, etc): EEPROM (3 devices)	Size: 64kB, 32kB and 32kB	User Modifiable: ❒ **Yes** ❒ No	Function: Contains system control data, user preferences, and user variables.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu Support tools Maintenance "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.

Figure A-42 Certificate of Volatility (77760z; 2 of 4)

Type (eMMC, Flash, EEPROM, etc): EEPROM (2 devices)	Size: 64kB, and 64kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains backup of critical system control data and critical user preferences.	Process to Sanitize: Cleared by backing up data from a previously reset system.
Type (eMMC, Flash, EEPROM, etc): Secure EEPROM	Size: 18kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains secure internal printer data.	Process to Sanitize: N/A
Type (eMMC, Flash, EEPROM, etc): EEPROM (1 device)	Size: 1kB	User Modifiable: ❒ Yes ❒ **No**	Function: Contains internal printer data.	Process to Sanitize: N/A
Media				
Does the item contain media storage capability (i.e., removable or non-removable disk drives, tape drives, memory cards, etc.)? ❒ **Yes** ❒ No				
Type (Disk, Tape, Memory Card, etc): Memory Card: eMMC module Removable: ❒ Yes ❒ No	Size: Upgrade option = 128GB	User Modifiable: ❒ **Yes** ❒ No	Function: System Firmware and firmware upgrade, system control data, user preferences, user variables, image data, and encrypted job storage and PIN printing.	Process to Sanitize: User preferences and user variables, image data, and encrypted job storage and PIN printing cleared by performing a reset from "Restore Factory Defaults". Access to this function can be found under: Home menu → Support tools → Maintenance → "Restore Factory Defaults" See the Administrator's Guide for more details. Note: Restoring the factory-defaults clears all customer data such as fax header, phonebook, and pages stored in memory. This procedure also returns many product settings to factory defaults.
Additional Information: The media storage capability described here is an option where the internal eMMC memory system can be upgraded from the standard 16GB to the optional 128GB. The fact this memory can be upgraded makes it "removable" from the upgrade standpoint, but it is not "removable" in the same fashion as is a USB thumb drive. Job storage is encrypted using an AES 256 encryption algorithm by default.				
USB				
Does the item accept USB input and if so, for what purpose (i.e Print Jobs, device firmware updates, scan upload)? ❒ **Yes** - Purpose is for Print Jobs, Device FW updates, scan uploads and 3rd part application loading. Can any data other than scan upload be sent to the USB device? ❒ **Yes** -Diagnostic service logs can be uploaded. Back-up of encrypted system settings. Supports Hardware Integration Pocket (HIP) devices.				
Additional Information: This product has both a USB device port and 2 USB host ports. Data on the USB host ports can be accessed from the device port. Also, an internal mini-B USB port enables an accessory option where a Hardware Integration Pocket (HIP) device can be added. The HIP option conforms to the HIP protocol and enables both HP and 3rd party hardware/software. The HIP device does not ship with the product and is added by the user as an option.				

Figure A-43 Certificate of Volatility (77760z; 3 of 4)

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Wifi ❒ No

If yes, what is the purpose_WiFi connectivity for printer activity such as print jobs and printer configuration

If yes, what is the frequency 2.4GHz ISM band (2400-2500MHz) and 5GHz U-NII-1,2,3 band (5.1-5.9GHz)

Bandwidth_20MHz and 40MHz; Typical speed for 20MHz BW = 50Mbps/ 40MHz BW = 100Mbps

Modulation_DSSS(Direct sequence spread spectrum), DBPSK, DQPSK, CCK, OFDM

Effective Radiate Power (ERP) _20.5 dbm

Specifications_802.11a/n

Additional Information: This product uses WiFi connectivity for printer activity such as print jobs and printer configuration.

RF/RFID

Does the item use RF or RFID for receive or transmit of **any** data including remote diagnostics. **(e.g. Cellular Phone, Wifi, Bluetooth)**

❒ **Yes** - Bluetooth 4.0 ❒ No

If yes, what is the purpose_Bluetooth 4.0 connectivity for easier attachment with printer Networking subsytems

If yes, what is the frequency 2.4-2.5 GHz

Bandwidth___~2 MHz

Modulation____1 Mbps GFSK

Effective Radiate Power (ERP) ___less than 10 dbm

Specifications___BT 4.0 compliant

Additional Information: This product uses Bluetooth 4.0 connectivity for easier attachment with printer Networking subsystems

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** - NFC ❒ No

If yes, what is the purpose: __Near-Field Authentication (NFC) with printer Networking subsystems

If yes, what is the frequency__13.56 MHz_____; Bandwidth_848 kbit/s max_____:

Modulation: ISO/IEC 14443B;

Effective Radiate Power (ERP): 0 Watts (passive writer only).

Specifications __RF Standard ISO/IEC 14443B and NFC Tag Type 4B

Additional Information: This product uses NFC connectivity for Authentication with printer Networking subsystems.

Figure A-44 Certificate of Volatility (77760z; 4 of 4)

Other Capabilities			
Does the device employ any other method of communications such as a Modem to transmit or receive any data whatsoever? ❒ Yes - FAX ❒ No If yes, what is the purpose: FAX Specifications: T.30 FAX protocol standard for FAX communication. Within T.30, we use V21 protocol as control channel Within T.30, we use V.17, V.29, and V.34 as data transfer protocols Speeds = Slow (9.6Kbps), Medium (14.4Kbps), and Fast (33.6Kbps). Default setting = Medium (14.4Kbps) Note: Kbps = thousand bits per second Note: If line transmission is poor, the data protocols may lower speed.			
Additional Information: This product can send and receive FAX transmissions over a standard telephone line.			
Vendor Engineer/SME Representative Information			
Name: Date Completed: 1/24/2017	**Title:** Lead EE R&D Engineer Lead FW R&D Engineer R&D FW Program Manager	**Office Phone:**	**Fax/Email:**

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