Welcome - Getting Started

This document contains information about the Dell™ 3110cn Printer.

This course prepares technicians to provide an excellent Customer Experience while resolving common printing issues as they pertain to the 3110cn.

RTS Dates:	Americas - 07/18/2006
Departments:	Global Technical Curriculum Development
Contributing Sources:	Editor Americas Services Program Management WW Services Program Management Menu Simulations Service Documentation
Contacting Dell:	To contact Dell regarding issues with this training material, click the following link: Feedback.

Using this Material

The following sections provide information to help you effectively use this training material.

Navigating the Material

To navigate through this course, select topics using either the left navigation menu or the Previous/Next buttons at the top right corner of each page.

This course is designed to be completed in the order in which the topics are presented. However, refresher training can be accomplished in any desired order.

Important Symbols

The following symbols are used to emphasize important notations in this material:

A NOTE indicates important information that helps you make better use of your computer.

A WARNING indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

A CAUTION indicates a potential for property damage, personal injury, or death.

Browser Requirements

Dell's online courses are designed to work with Internet Explorer® 5.x and later, Netscape® versions 6.x and later, and Mozilla® 1.0.1. If you experience problems with the courseware related to your browser, please contact us: us_dcse@dell.com

Additional Required Software

Adobe® Acrobat® (.pdf) files require Acrobat Reader®. You can download Acrobat Reader and get additional information from Adobe's website: http://www.adobe.com/products/acrobat/.

Course Introduction

Goal

This course prepares you to provide an excellent Customer Experience while resolving common printing issues as they pertain to the Dell™ 3110cn Color Laser Printer.

Objectives

Given the information from this course and available tools, you will be able to perform the activities that demonstrate the following objectives and pass the knowledge check with a score of 80% or higher:

- Describe the 3110cn's features and capabilities to a customer.
- Describe the 3110cn's media path and media guidelines to a customer.
- Advise the customer where the media guidelines can be found in the documentation provided with the printer.
- Describe the 3110cn's support offerings to a customer and determine which offering the customer's product carries.
- Help a customer set up and configure the 3110cn for client or stand-alone use.
- Help a customer configure the 3110cn for use on a small peer-to-peer network.
- Troubleshoot common laser printer call drivers with a customer:
    - Configuration issues
    - Media jams
    - Network connectivity issues
    - Print quality issues

Curriculum Delivery Method

This course facilitates training lead by an instructor in a classroom setting.

Activities

The following activities provide learners with the opportunity to demonstrate their mastery of the learning objectives:

Activity	Classroom	Online
Classroom discussion	√	
Peer interaction	√	√
Hands-on use of the product	√	
Tear-down labs	√	Where lab printers are available
Simulations	√	√

Required Materials

The following materials are required for effective classroom facilitation of this course:

- An in-class network not connected to the corporate network
    - A wireless access point/router (provides DHCP functionality)
    - A 3110cn with wireless capabilities installed (optional)
    - Hubs and/or switches suitable to provide enough ports for participant workgroups
    - At least one 3110cn per participant workgroup
    - One computer per participant workgroup on which participants can do the following:
        - Install and remove drivers and manipulate print properties

- Access the 3110cn via the wireless point or wired connection

- One computer per participant on which participants can access any assessments relevant to the class.

Product Features Overview

The 3110cn Color Laser Printer represents Dell's follow-on for the 3100cn printer. This printer is classified as a medium workgroup network printer.

This program grouping delivers the highest features at the lowest price in the market. Target customers are medium and large workgroup networked users, typically medium and large business and corporate departmental workgroups, looking for the best value and performance combination to print documents.

The following table outlines the features of the Dell™ 3110cn Color Laser Printer compared to its predecessor, the 3100cn printer.

Product Comparison		
Feature	3100cn	3110cn
Technology	Rotary toner carousel, 4-pass electro-photographic system using OPC drum > IBT belt > Paper transfer	Tandem electrophotographic 1-pass system using four OPC drum/toner cartridges and direct transfer transport belt
Performance	Speed Color: 5 PPM (letter) Mono: 25 PPM (letter) First Print Output Time (FPOT) Color: 17 sec or less Mono: 16 sec or less Mhz processor: 300 MHz	Speed Color: 17 PPM (A4) / 17.5 PPM (letter) Mono: 30 PPM (A4) / 31.4 PPM (letter) First Print Output Time (FPOT) Color: 17 sec or less Mono: 16 sec or less Mhz processor: 400 MHz
Interfaces	Integrated USB 2.0 - High-speed, type B connector Integrated Parallel - IEEE 1284, standard/ECP Integrated Ethernet - 10Base-T/100Base-TX, TCP/IP (standard) Optional Interfaces: Multi-Protocol Card (MPC)	Integrated USB 2.0 - High-speed, type B connector Integrated Parallel - IEEE 1284, standard/ECP Integrated Ethernet - 10Base-T/100Base-TX, TCP/IP (standard) Optional Interfaces: Multi-Protocol Card (MPC) Wireless LAN dongle (MPC card required for WLAN)
Page Descriptor Language	PCL5, PCL6, PS3	
Memory	RAM: 64 MB base, 576 MB (64+512 MB) maximum Optional: 64, 128, or 512 MB Type: 144-pin SoDIMM, non-ECC	RAM: 128 MB base, 1152 MB (128+1024 MB) maximum Optional: 256, 512, or 1024 MB Type: 200-pin DDR2 SoDIMM ROM: 16 MB (executive) + 8 MB (fonts)
Maximum Resolution	600 dpi resolution, 2400 dpi (image quality)	600 dpi resolution, 2400 dpi (image quality)
Duty Cycle	Average: 1600 pages/month Maximum 45,000 pages/month (@ 25% color use) Maximum 60,000 pages/month (@ 100% mono use)	Average: 2000 pages/month Maximum: 60,000 pages/month
Life Cycle	100,000 pages or 5 years, whichever comes first.	
Operating System Support	Windows® 2003 Server Windows 2000 Server Windows NT 4.0 Windows 2000 Professional Windows 98 Windows Millenium Windows NT 4.0 Windows XP Novell Netware 4.2/5.1/6.0 and Linux 8.0/7.3/AS 2.1 capable, OS not supported	Windows 2000 Professional Windows 2000 Server Windows 2003 Server Windows XP Windows XP (x64) Windows NT 4.0 Novell® Netware® (3.x/4.x/5.x/6/6.5)* Linux® (Red Hat® ES4, English)* SUSE® 9.2/9.3 (English)** Turbolinux™ 10 Desktop (English)** UNIX® (Red Hat AS 2.1)** HP-UX® (11.i)** Solaris™ (9/10, English)** Mac® OS X (10.2.8/10.3.9/10.4.x)**

		*Customers with Gold contracts can receive "best effort" support, but may be subject to additional fees. **Drivers available but not supported by Dell. (Optional MPC may be needed for protocols required by non-Microsoft® operating systems.)
Firmware	Firmware upgradeable using local or networked connections.	
Remote Management	Embedded Web Server: Allows for remote configuration and viewing through a Web browser across the network. OpenManage™ Printer Manager: Allows a hierarchical view of all networked printers. Should provide one-to-many capability for installation and updates, user-set parameters for alerting and reporting, and document management tools.	

Consumables and CRUs

The Dell™ 3110cn Color Laser Printer incorporates many parts that can be replaced by the customer. Customer-replacable parts can be divided into two categories: consumables and CRUs.

- A consumable is an item that wears out or has a measured life expectancy and must be replaced periodically.
- A CRU is an item installed or replaced by the customer, such as optional items available for the printer.

In many cases, there is little distinction between the two terms since, for instance, the fuser has a life expectancy of 100,000 pages and needs to be replaced at the end of that lifetime. However, if the fuser prematurely fails and the customer contacts technical support for assistance, the fuser will be sent for the customer to replace. No service technician is needed.

A third category of parts are Field Replaceable Units (FRUs). These types of parts are intended to be replaced by qualified field service personnel only. These parts are sent with a field technician to the customer's location after the customer has called Dell Technical Support and troubleshooting has determined the need for a parts replacement.

Removal and replacement procedures for consumables, CRUs, and FRUs can be found in the Disassembly section of this document.

Consumables

3110cn Consumables	
Item	Expected Replacement Cycle
Black Toner Cartridge	5000 pages*
Black Toner Cartridge (High Yield)	8000 pages*
Cyan Toner Cartridge	4000 pages*
Cyan Toner Cartridge (High Yield)	8000 pages*
Magenta Toner Cartridge	4000 pages*
Magenta Toner Cartridge (High Yield)	8000 pages*
Yellow Toner Cartridge	4000 pages*
Yellow Toner Cartridge (High Yield)	8000 pages*
Fuser Assembly	100,000 pages**
Feed and Separator Rollers	100,000 pages**
Paper Transfer Belt	100,000 pages**

*All page counts are based on 5% page coverage.
**Included in the 100,000 Maintenance Kit.

CRUs

3110cn CRUs
Item
550-Sheet Feeder Assembly
Duplexer Unit

Multi-Protocol Card (MPC)
Wireless LAN Adapter*
256 MB Expansion RAM
512 MB Expansion RAM
1024 MB Expansion RAM

*MPC required for wireless LAN

FRUs

For a complete list of the components Dell Service Providers (DSPs) can remove and instructions for doing so, see Disassembly in the Field Service Information section of this document. The Disassembly section also includes all CRUs since the DSP can remove and replace anything a customer can.

Service Offerings Overview

This section describes the Dell™ 3110cn Color Laser Printer warranty and support information based on region.

The 3110cn is a medium workgroup printer with many warranty and support options. Options may vary by region. Use the left menu to see the details for your region.

United States

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service (parts and labor) 7 x 24 Toll-free technical support Online technical support
Upgrade Options	Years 2, 3, and 4 Next Business Day On-Site Service (parts and labor) Fuser Maintenance Kit 2-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 3-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 4-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 3-year Printer Gold Technical Support
Additional Options	7 x 24 Dedicated computer hardware support line 7 x 24 Software support line for installation and basic configuration Online support tools and e-support services Fee-based advanced software support
Toner	Lifetime Cartridge and Toner Warranty 4 hour toner replacement available 4 hour emergency toner information (PowerPoint®) NOTE: Dell does not support the use of third-party toner cartridges. Any damage caused to the toner cartridge or printer from the use of any non-Dell supplies is not covered by the warranty.

Technical Support

Dell Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell system will be directed to that system's manufacturer.

Asia-Pacific

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service 7 x 24 Toll-free technical support Online technical support
Upgrade Options	Years 2, 3, and 4 Next Business Day On-Site Service (parts and labor) Fuser Maintenance Kit 2-year Same Day On-Site Service (parts and labor) 3-year Same Day On-Site Service (parts and labor) 4-year Same Day On-Site Service (parts and labor)
Additional Options	7 x 24 Dedicated computer hardware support line 7 x 24 Software support line for installation and basic configuration Online support tools and e-support services Fee-based advanced software support
Toner	No toner cartridge warranty

Technical Support

Dell Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell system will be directed to that system's manufacturer.

Americas International

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service (parts and labor) 7 x 24 Toll-free technical support Online technical support
Upgrade Options	Years 2, 3, and 4 Next Business Day On-Site Service (parts and labor) Fuser Maintenance Kit 2-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 3-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 4-year Same Day On-Site Service (parts and labor) 5x10, 4 hr response 3-year Printer Gold Technical Support (Canada) 5-year Printer Gold Technical Support (Latin Americas)
Additional Options	7 x 24 Dedicated computer hardware support line 7 x 24 Software support line for installation and basic configuration Online support tools and e-support services Fee-based advanced software support
Toner	Lifetime Cartridge and Toner Warranty 4 hour toner replacement 4 hour emergency toner information (PowerPoint®) NOTE: Dell does not support the use of third-party toner cartridges. Any damage caused to the toner cartridge or printer

	from the use of any non-Dell peripherals is not covered by the customer's warranty.

Technical Support

Dell Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell branded system will be directed to that system's manufacturer.

China

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service (parts and labor) 7 x 24 Toll-free technical support Online technical support
Upgrade Options	Years 2, 3, and 4 Next Business Day On-Site Service (parts and labor) Fuser Maintenance Kit 2-year Same Day On-Site Service (parts and labor) 3-year Same Day On-Site Service (parts and labor) 4-year Same Day On-Site Service (parts and labor)
Additional Options	7 x 24 Dedicated computer hardware support line 7 x 24 Software support line for installation and basic configuration Online support tools and e-support services Fee-based advanced software support
Toner	No toner cartridge warranty

Technical Support

Dell Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell branded system will be directed to that system's manufacturer.

Europe, Middle East, & Africa

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service 10 x 5 (8:00 - 18:00, Monday through Friday) telephone technical support (some local exceptions to hours) 30-days *Getting Started* support for installation and basic configuration Online Support Tools and E-support Services Fuser Maintenance Kit
Upgrade Options	Years 2, 3, 4, and 5 Next Business Day On-Site Service (parts and labor) 1 to 5 year Dell™ Printer Business Support
Additional Options	Installation Option available
Toner	Lifetime Toner Cartridge Warranty NOTE: Dell™ does not support the use of third-party toner cartridges. Any damage caused to the toner cartridge or printer

	from the use of any non-Dell peripherals is not covered by the customer's warranty.

Technical Support

Dell™ Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell™ technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell branded system will be directed to that system's manufacturer.

Japan

The following is a list of the available warranty service offerings for the Dell™ 3110cn Color Laser Printer:

3110cn Service Offerings	
Service	Service Description
Standard Service	1-year Next Business Day On-Site Service (parts and labor) 7 x 24 Toll-free technical support Online technical support
Upgrade Options	Years 2, 3, and 4 Next Business Day On-Site Service (parts and labor) Fuser Maintenance Kit 2-year Same Day On-Site Service (parts and labor) 3-year Same Day On-Site Service (parts and labor) 4-year Same Day On-Site Service (parts and labor)
Additional Options	7 x 24 Dedicated computer hardware support line 7 x 24 Software support line for installation and basic configuration Online support tools and e-support services Fee-based advanced software support
Toner	No toner cartridge warranty

Technical Support

Dell Technical Support will verify hardware functionality and provide basic software configuration support on the 3110cn printer.

Dell technicians are not responsible for providing hardware support on any non-Dell system to which a customer may have attached the 3110cn printer. Support for any non-Dell system will be directed to that system's manufacturer.

Chassis Features Overview

The following images and charts illustrate the external layout of the Dell™ 3110cn Color Laser Printer chassis and highlight its features.

Front Side Features

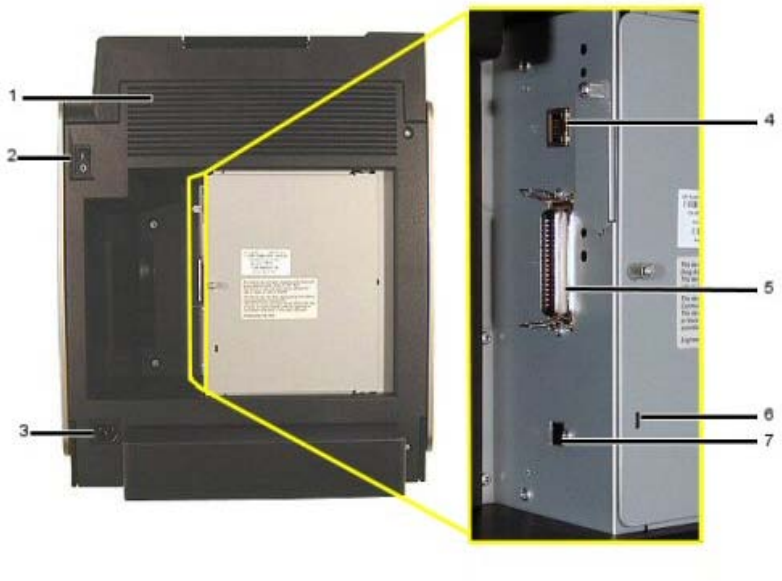
Front Side Features		
	Item	Description
1	Front cover	Opens to provide access to the fuser, toner cartridges, paper transfer belt (and optional duplex unit)
2	MPF cover	Opens for use as a multipurpose feeder for envelopes, labels, letterhead, etc.
3	250-sheet tray	Integrated 250-sheet paper tray

Top Features

Top Features		
	Item	Description

1	Operator panel	Used for printer status, configuration, operational intervention, and fault display
2	Top exit tray	Paper exits the printer, face down (250-sheet capacity)
3	Paper exit extender	Flips up and unfolds to accommodate longer paper exited and stacked in the top exit area

Back Side Features



Back Side Features		
	Item	Description
1	Main ventilation duct	Air intake to cool interior components
2	Power switch	Turns the printer on and off
3	AC power receptacle	Use the AC power cord provided with the printer and connect to a wall outlet
4	Ethernet port	10BaseT/100BaseTX RJ-45 Ethernet connection
5	1284 parallel	IEEE 1284, parallel, standard 36-pin Centronics™ style connection
6	Controller cover and Kensington® lock connection	Provides access to optional MPC and/or expansion RAM, and the lock connection provides for ability to secure the CRUS insde the controller shiled compartment.
7	USB port	High-speed USB 2.0 type B connection

Right Side Features

Right Side Features		
	Item	Description
1	Front cover release	Opens the front cover
2	Exhaust vent	Cooling and ventilation exhaust vent

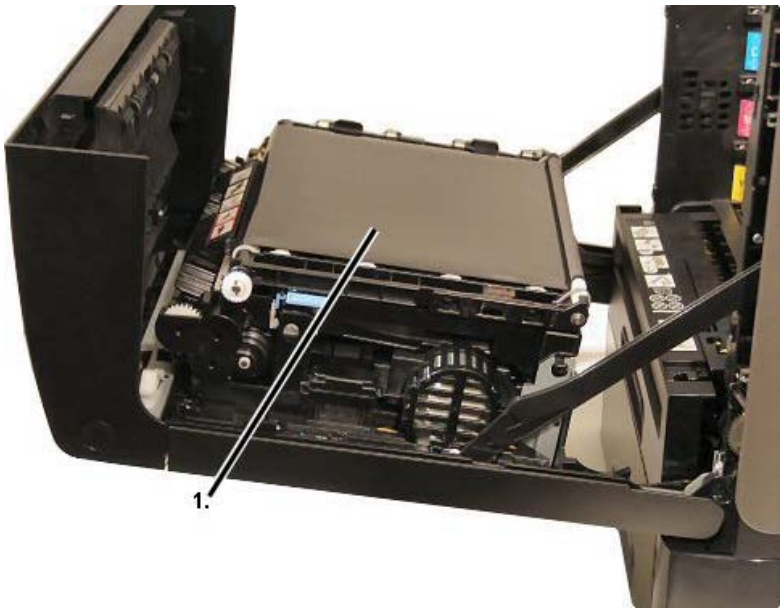
Left Side Features

Left Side Features		
	Item	Description
1	Duplex fan intake	Air intake for optional duplex unit

Chassis Features, Internal

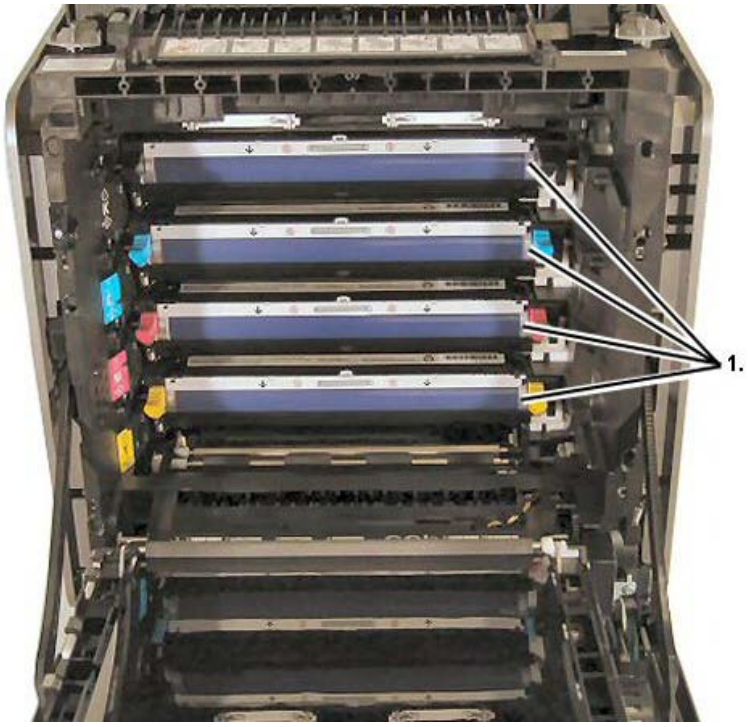
The following images and charts illustrate the major interior components seen when the front cover has been opened on the Dell™ 3110cn Color Laser Printer.

Installed Inside the Front Cover



Inside the Front Cover		
	Item	Description
1	Paper transfer belt	Moves the paper upward and sequentially across the toner cartridge units
2	Duplex option	Allows printing on both sides of the paper

Toner Cartridge Bay



Inside the Toner Cartridge Bay		
	Item	Description
1	Toner cartridges: Black (top) Cyan Magenta Yellow (bottom)	Self-contained cartridge integrates toner, developer, charge roller, and a PC drum for each color. Available in low- and high-yield capacities.

Above the Toner Cartridge Bay

Above the Toner Cartridge Bay		
	Item	Description
1	Fuser unit	Heats and presses the toner to the paper for a smudge-free finish

Chassis Lab

If you have access to a 3110cn Color Laser Printer, take a few minutes to compare the printer to what you have read in this document. Then answer the following questions as if a customer were asking them:

- How many toner cartridges are there?
- How many drum cartridges are there?
  - Why are there the same amount of drums as toner cartridges?
- Where is the LCD?
- Where is the power connection and the power switch?
- Which cables are needed to set up the printer?
  (Remember to ask how the customer intends to connect the printer for use—via USB, parallel, network?)
- Do the cables ship with the printer?
- What is the maximum number of media trays and capacity (of each) the 3110cn printer can accept?
- Where can you load media?
- What is the easiest way to print on both sides of the page?

Print Process Overview

Although the basic print (xerography) process concept remains the same across all types of laser printers, each product has design differences that make it unique.

Previous Dell color laser printers used different techniques to transfer the developed image to the final media (i.e., paper):

- The 3000cn, 3010cn, and 3100cn printers use an intermediate belt transfer (IBT) design in which each developed color image is overlaid on top of the prior image using a rubberized charged belt. From the IBT belt, the aggregate developed image is transferred to the paper.
- The 5100cn and 5110cn implement a drum-to-drum transfer to build the aggregate developed image. The developed images begin simultaneously on each of four primary color drums. Then the images from the lower two drums are transferred to the lower secondary drum, and the images from the upper two drums are transferred to the upper secondary drum. From the two secondary drums, the images are combined on a single tertiary drum. From the tertiary drum, the aggregate developed image is transferred to the paper.

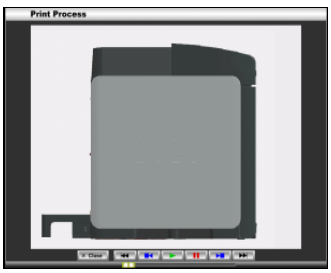
The Dell 3110cn introduces a variation to the print process called tandem xerography.

How this process differs from other color technologies is that instead of each color's developed image being transferred to an intermediate surface prior to being transferred to paper, each developed image is instead transferred directly to the paper as in a monochrome laser printer. The big difference is that each image is overlaid in tandem (i.e., one after the other) directly to the final media, such as paper.

The following is a brief explanation of how this process works:

- As paper is released from the registration rollers, it is guided up and onto the transfer belt.
- The registration rollers and transfer belt rotate at a precise speed upward. The paper is held to the surface of the transfer belt using a high-voltage charge.
- Movement of the paper and building the developed image on the yellow drum is first (the lowest of the four) and is timed so the paper arrives at the drum at the same moment the rotation of the drum is nearest the paper.
- As the paper continues the upward travel, the yellow developed image is transferred to the paper.
- The timing and building of each developed color image continues as the paper travels upward. The next color is magenta, then cyan, then black, with each color overlaying the last.
- After all four colors have been overlaid directly on the paper surface, the paper is guided into the fuser, which permanently fuses the toner to the paper surface.

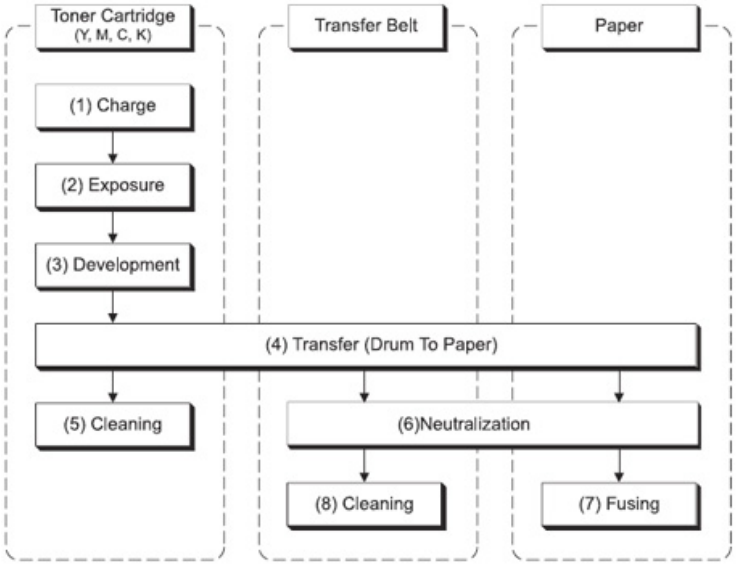
Click the image below to open a simulation of the print process in a separate browser window.



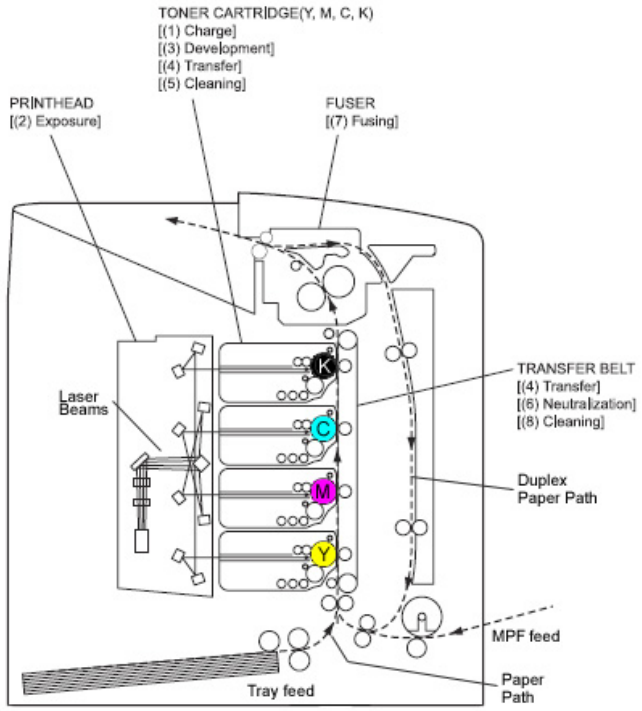
All this happens in a continuous manner. Simply put, the yellow part of the image may be completely finished, but the black may have only just begun. This is because as the paper moves up the length of the page, yellow is transferred to the paper first and black is the last color laid onto the page. The colors are developed and transferred to the page in tandem.

The following is a block flow diagram of the tandem xerography print process implemented in the 3110cn color laser printer:

(1) Charge:..... Drum surface is charged with electricity.
(2) Exposure: ..... Image unit is exposed to laser beams.
(3) Development: ..... Image is developed with toner.
(4) Transfer: ..... Four-color finished toner image on the Drum is transferred onto the paper.
(5) Cleaning: ..... Remaining toner on the drum is collected.
(6) Neutralization:..... Electric charge of the paper is eliminated.
(7) Fusing:..... Toner on the paper is fixed by heat and pressure.
(8) Cleaning: ..... Remaining toner on the belt is collected.



This next diagram is a schematic view of the tandem xerography print process implemented in the 3110cn color laser printer:

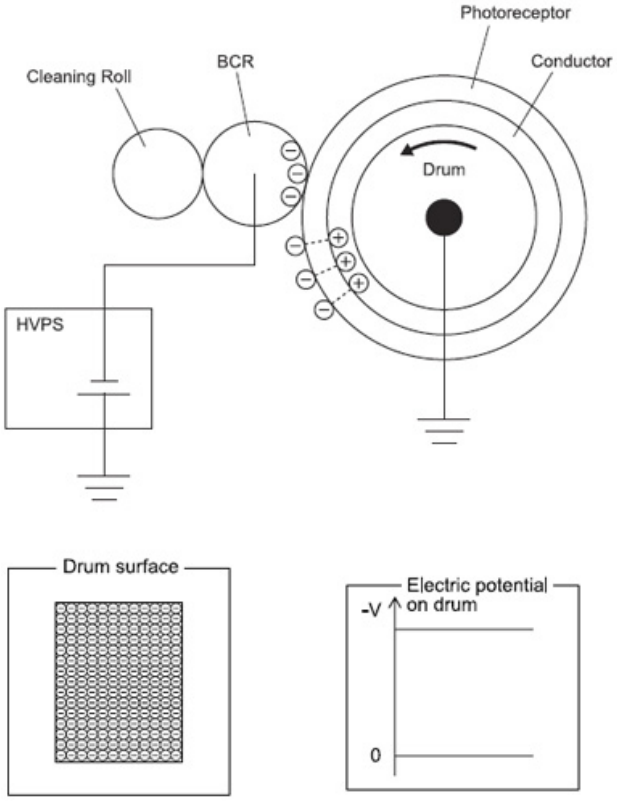


1. Charge

In the charging process, the drum surface is rotating at a constant speed and is uniformly charged with a high voltage negative potential applied to the BCR (bias charge roller). This process is performed in parallel for yellow, magenta, cyan, and black colors.

- The BCR is kept in contact with the drum and rotates following the rotations of the drum. The BCR is a conductive roll and receives a negative high voltage DC from the high voltage power supply (HVPS).
- The drum surface is uniformly and negatively charged with DC bias voltage. The drum surface is a photoreceptor (which is an insulator in the dark and a conductor in the light), and the drum inside is composed of a conductor.
- The cleaning roll is a sponge, which contacts the BCR to catch excess toner.

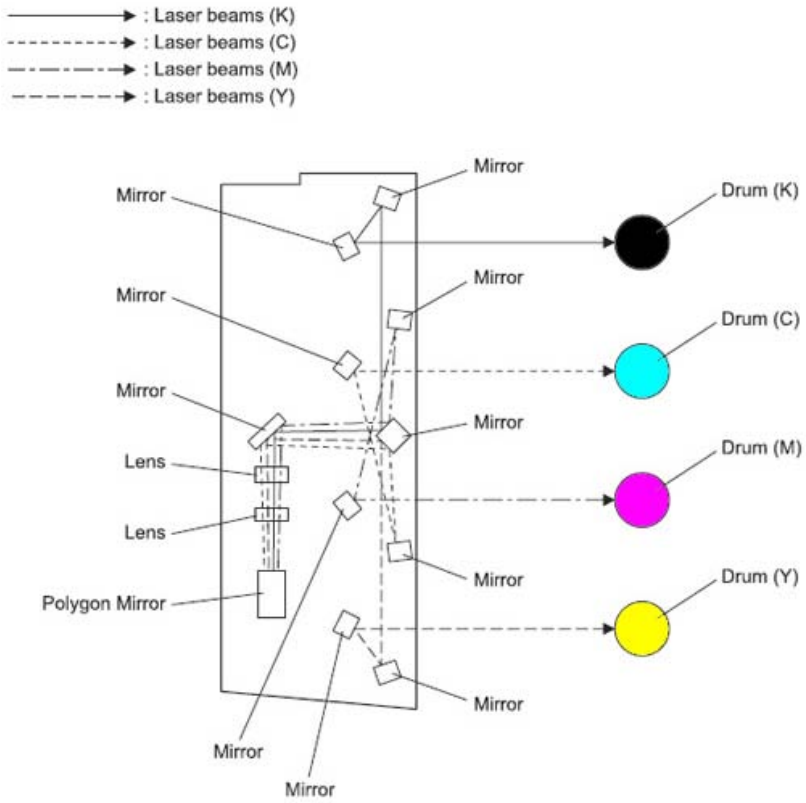
NOTE:
The cleaning roll, BCR, and drum are integrated within the toner cartridge unit.



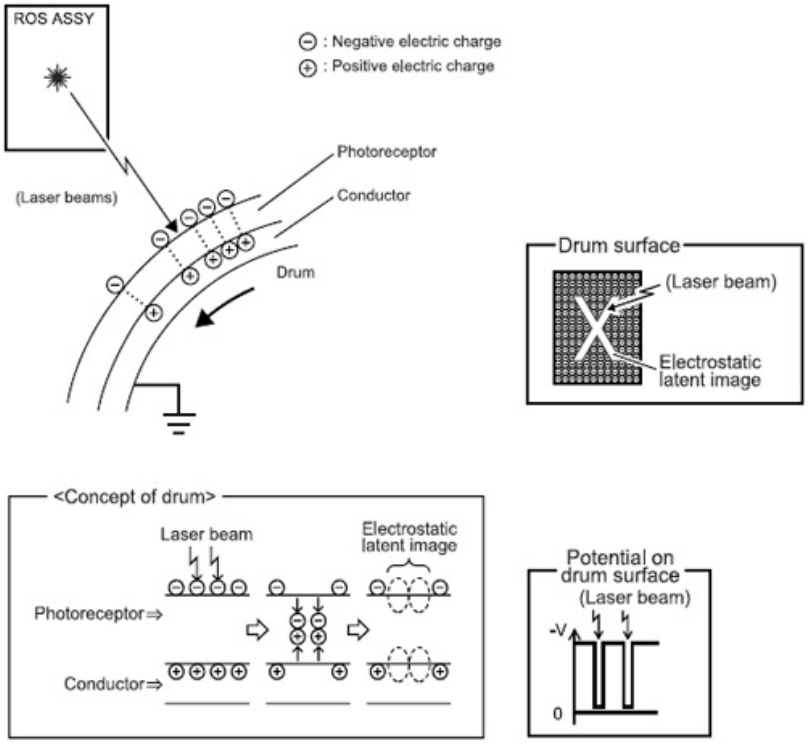
2. Exposure

In the exposure process, the negatively charged drum surface is scanned by a laser beam to form an invisible electrostatic latent image on the drum surface. Each place the laser beam strikes the drum causes that point (aka pixel) to discharge towards ground potential in effect, becoming positive with respect to the original charge. This process is performed in parallel for yellow, magenta, cyan, and black colors.

- Laser beams are emitted from laser diodes in the printhead. The laser beams strike a rotating polygon mirror then are collimated with lenses and reflected using several fixed mirrors. The end result is the surface of each color drum being scanned from end to end in an axial direction.



- The laser beam is irradiated according to the printing data (image data) output from the printer controller. The laser beam is activated (turned on and off) for each pixel. A pixel represents the smallest point of data comprising a character or picture.
- Any point the laser irradiates forms part of the latent image on the drum. Those areas not irradiated do not become part of the latent image.
- The irradiated areas form the latent image which is, in effect, an invisible area on the drum where the surface has been discharged towards ground potential.

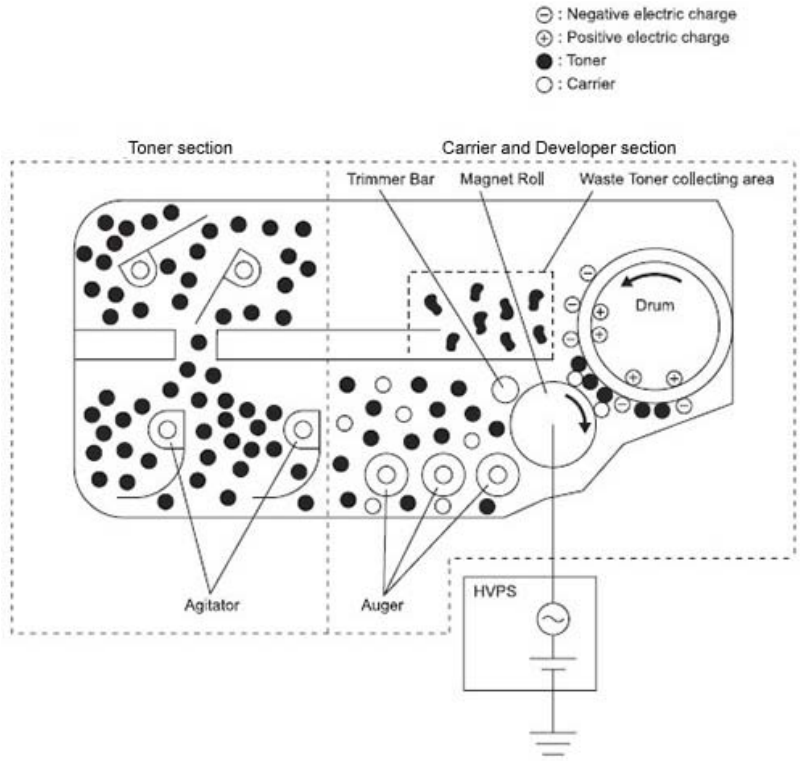


3. Development

In the development process, toner is electrostatically attracted to the invisible electrostatic latent image on the drum surface and forms a

visible image on the drum.

- The toner in the toner section of the cartridge is agitated and then fed into the carrier/developer section of the cartridge. The agitators and augers are driven by the toner motor and the developer motor.
- The toner fed into the carrier/developer section and the carrier are agitated by an auger and supplied to a magnetic roller (mag-roll) in the vicinity of the drum surface. The agitation of the toner and carrier causes the two materials to become charged (toner-negative, carrier-positive) and they are attracted to each other.
- The carrier component is a magnetic substance. Since the carrier is electrostatically combined with the toner, the combined substance is magnetically attracted to the mag-roll. The combined substance is commonly referred to as developer.
- The developer layer on the mag-roll is trimmed to an even thickness using a trimmer bar. The trimmer bar is simply a bar or rod placed a set distance (gap) from the mag-roll. As the mag-roller rotates, the excess carrier/toner is scraped off, allowing only enough developer to pass through the gap, forming an even thickness across the surface of the mag-roll.
- The mag-roll surface is covered by a thin semiconductive sleeve. A developing bias voltage (DBv) is supplied to the sleeve from the HVPS. The DBv is formed of two components: a negative DC voltage and an AC voltage. The mag-roll is kept at the constant negative DC voltage in close proximity to the photoreceptor layer of the drum. The AC voltage component of the DBv causes the developer on the mag-roll surface to oscillate, causing the toner component of the developer to be attracted to the drum.
- The negatively charged toner is attracted only to the drum surface area where the negative charge on the drum has been decreased by irradiation of the laser beam. A developed image can now be seen on the drum.



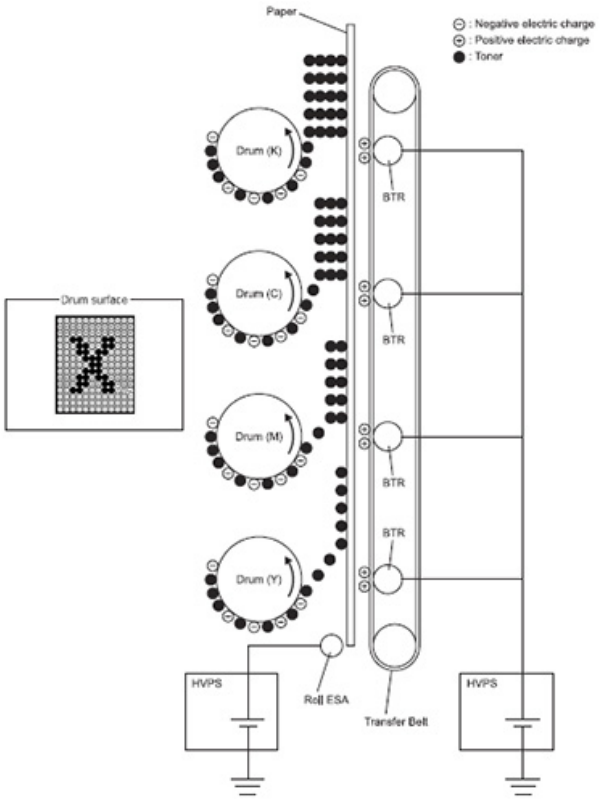
4. Transfer

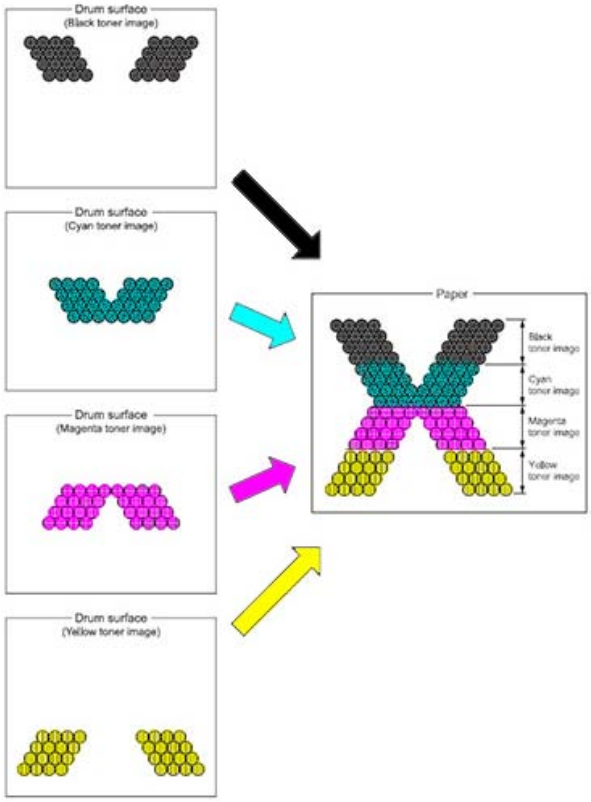
In the transfer process, the developed image formed on the drum surface is transferred onto the surface of the paper. The toner is transferred onto the paper in the order of yellow, magenta, cyan, then black. Three major components comprise the transfer process in the 3110cn color laser printer:

- BTR
  The BTR (bias transfer roller) is a conductive roller to which a positive voltage is applied from the HVPS. The BTR contacts the back side of the belt and conducts the positive voltage to the belt. There are four BTRs, one for each color.
- Transfer Belt

The transfer belt is a conductive belt to which a positive voltage is applied using the BTR. The negatively charged toner image on the drum surface is drawn by the positive charge on the belt. Because the paper is between the drum and the paper, the toner image is transferred from the drum to the paper. The transfer belt feeds the paper upward in the direction of fuser unit.

- Roll ESA
  The roll ESA (electric static attachment) is a conductive roll which applies a positive voltage from the HVPS to precondition the paper as it transitions onto the belt surface. This is done to improve toner transfer efficiency from the drum to paper.

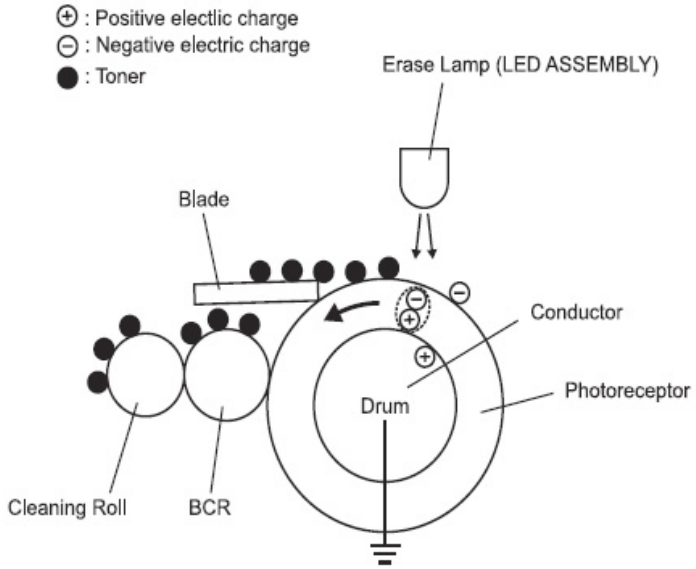




5. Clean the Toner Cartridge

Cleaning the toner cartridge involves removing excess toner from the drum and BCR surfaces and eliminating excess charge from the drum surface.

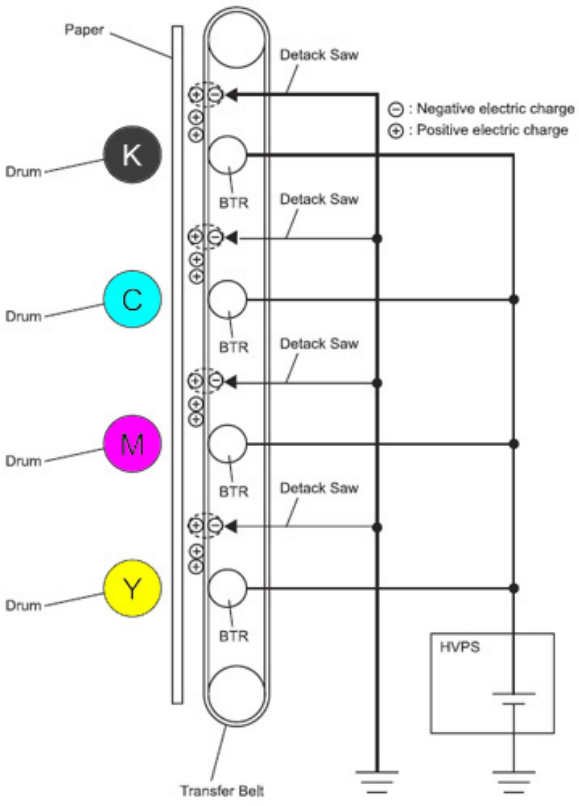
- Drum Cleaning
  The cleaning blade contacts the surface of the drum and removes excess toner by scraping the toner from the surface.
- Cleaning Roll
  The cleaning roll counter-rotates and contacts the surface of the BCR and removes excess toner by brushing the BCR.
- Charge Cleaning (Erasure)
  Any residual charge on the drum surface hinders the drum from being uniformly charged, which may lead to print quality problems. The excess charge on the surface of the drum is eliminated by irradiating the drum using the erase lamp (LED assembly).



6. Neutralization

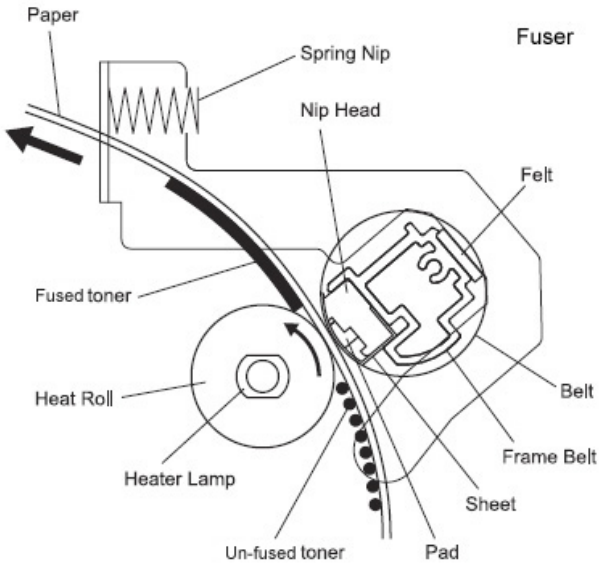
In the neutralization process, the charge on the paper is neutralized or eliminated by the detack saw. The charge must be removed to prevent the toner on the paper from spreading to surrounding surfaces.

- Detack Saw
  The detack saw is a metal serrated strip connected to ground potential. There are four detack saws, located above each BTR and positioned several millimeters away from the inside back of the belt. Any excess positive charge on the transfer belt is drained to ground immediately following the toner transfer from drum to paper.

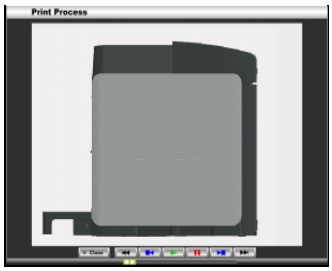


7. Fusing

Toner is a powder. If the toner is not affixed to the media, it would easily smudge and soon be unreadable. The fusing process is a technique used to affix, or fuse, the toner to the media, making it permanent. During the fusing process, the toner and media are quickly heated to a high temperature while being pressed together. The toner powder melts and the pressure forces the molten toner to fuse onto the media.



Click the image below to open a simulation of the print process in a separate browser window.



8. Clean the Transfer Belt

After the entire print process has completed, a cleaning blade in contact with the belt surface removes any residual toner particles.

Summary

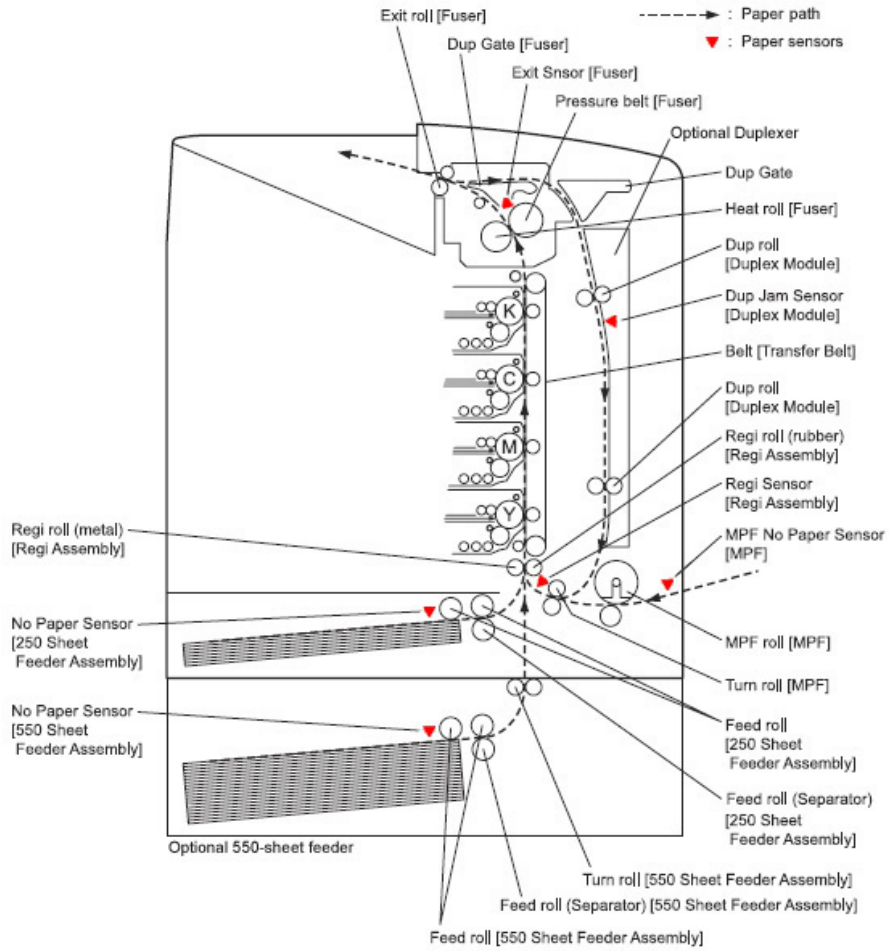
Although the printing process for all laser printers is basically identical, the way in which this process is accomplished can vary greatly according to the individual design of the product.

In light of this fact, it is very important that you familiarize yourself with the basic print process so you can recognize these subtle differences when addressing a troubleshooting situation for any specific product.

Media Path

The Dell™ 3110cn Color Laser Printer has a very simple media path (hereinafter referred to as the paper path). The following graphic shows the paper path and the locations of the various sensors used to detect paper location:

Paper Path in the Dell 3110cn Color Laser Printer



As evident in the graphic, the paper path most closely resembles the letter *C* as paper is fed from the tray, moves up through the printer, and comes out the top. The following is a general operational description of the paper path shown in the graphic:

250-Sheet Paper Feeder
Multi-Purpose Feeder (MPF)
550-Sheet Paper Feeder (Optional)

Media begins *faceup* from the 250- or 550-sheet trays (*facedown* from the MPF) and is fed to the registration roller (regi) assembly. If the paper source has no paper, the printer provides the appropriate message on the operator panel.

Registration and Paper Alignment

The function of registration is twofold:

- The leading edge of the paper is registered (aligned) to the paper path.
- The printer receives the signal that paper is ready to begin transit up into the transfer area.

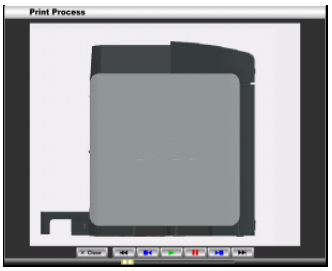
Transfer of Image to Paper

The registration rollers begin to turn at a precise speed. As the paper is fed upward, an electrical charge attracts and holds the paper against the transfer belt. The transfer belt is also rotating upwards at the same speed as the registration rollers. The lowest drum, yellow, has been rotating in an upward direction and a developed image has been forming on its surface. As the paper arrives at the drum-to-belt apogee, a bias transfer roller (BTR) causes the developed image (toner) to transfer from the drum to the paper. As the paper continues upward, this process is repeated in succession for the magenta, cyan, and black colors. After all four colors are overlaid on the paper, the toner must be fused to the paper to make it permanent.

Fusing the Toner

As the paper enters the fuser, it passes between a pair of rollers. One roller is a heat roller and the other is a pressure roller. As the paper passes between these rollers, the combination of heat and pressure make the toner image permanent on the paper. After the paper has been fused, the exit rollers pass the paper out of the printer onto the top exit tray. If an optional duplexer has been installed and this page is intended to be two-sided, the exit rollers reverse and the paper is fed back into the duplex path of the printer

The following is a simulation of the main paper path. Click the image below to open the simulation in a separate browser window.

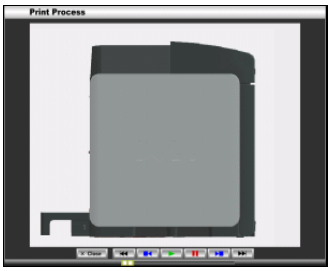


Duplexing (Two-Sided Printing)

The fuser exit rollers reverse direction just before the bottom edge of the paper arrives. A plastic guide called the duplex gate prevents the paper from re-entering the fuser slot and instead diverts the paper down into the duplex path. The most common duplex operation produces a finished product the user can read like a book. This is also called portrait, long-edge binding. When the paper reaches the end of the duplex path, it is guided through a 180-degree turn which effectively flips the paper over and places the edge of the paper at the registration assembly.

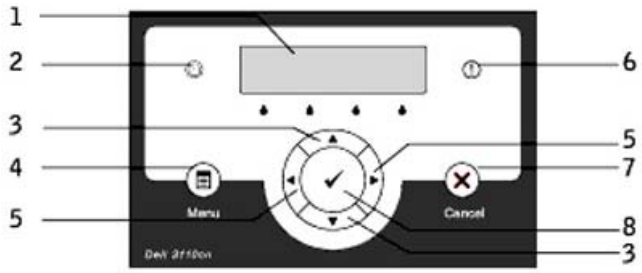
At this point in the process, things become a little more complicated. If the paper is fed up through the path, the image is transferred, fused, etc., just as it was for the first side; when the user picks up the finished product, he or she discovers the print on the second side of the paper is upside down from that on the first side. To correct this problem, the entire image for the second side (stored in memory on the ESS control board) is rotated 180 degrees. In effect, when the image is printed on the second side, it is printed upside down. Now, when the user picks up the finished product, the page can be flipped right to left and read from top to bottom, just like a book.

The following is a simulation of the duplex paper path. Click the image below to open the simulation in a separate browser window.



Operator Panel Overview

The following section illustrates the functions of the operator panel for the Dell™ 3110cn Color Laser Printer.



3110cn Operator Panel Functions			
	Button Name	Illustration	Function
1	LCD display		View messages and graphics describing the current state of the printer and indicating possible printer problems you must resolve.
2	Power LED		• Off – Power is off. • Solid green – Printer is on but idle. • Blinking green – Printer is warming up, processing data, or printing a job.

3	Up and down navigation buttons		Navigate up and down the lists within the selected menu.
4	Menu button		Opens the menu index.
5	Left and right navigation buttons		Navigate from one menu item list to the next or previous item.
6	Error LED		Lights orange when an error occurs and blinks when an irrecoverable error occurs.
7	Cancel button		Cancels the current operation of the printer.
8	Select button		Initiates the action selected.

Operator Panel Menus

The following table lists the different menu options available within the operator panel for the Dell™ 3110cn Color Laser Printer. The menu options are listed in the order in which they appear while navigating the menu structure from the operator panel console.

Access the menus by pressing the Menu button on the operator panel. For specific information on each menu item, refer to "Using the Printer Menus." This information can also be found in the 3110cn User's Guide in the "Understanding Printer Menus" section.

A working simulation of the 3110cn Menu system can be accessed here.

3110cn Operator Panel Menus			
Report/List	Admin Menu	Tray Settings	Stored Print*
Printer Settings	Wired Network	MPF	Secure Print
Panel Settings	Wireless Net**	Tray 1	Proof Print
PCL Fonts List	Parallel	Tray 2***	
PCL Macro List	USB Settings		
PS Fonts List	System Settings		
Job History	Maintenance		
Error History	PCL		
Print Meter	Postscript		
Color Test Page	Panel Settings		

*Appears if base RAM (128 MB) and optional RAM is 256 MB or larger.
**Appears if optional wireless LAN is installed (MPC card is prerequisite for WLAN).
***Appears if optional 550-sheet paper feeder unit is installed.

To download the entire User's Guide, visit the "Appendixes - Other Links" section of this document.

Operator Panel Messages

The following table contains a list of common messages and error codes, along with a description of what each code or message means.

NOTE:
This table is not all-inclusive. The printer can report many other possible errors that are not in the following table. This table is intended to highlight the more common issues users may see and actions that can be taken to resolve those issues.

Frequent references are made to the Owner's Manual. To download the Owner's Manual, visit the "Other Links" page of this document.

3110cn Operator Panel Messages		
General Printer-Related Messages		
Message	Problem	Resolution
First and second lines display together. Third line and fourth line cycle.		
Example: (*initial display*) nnn-nnn Restart Printer (*next*) Contact Support If Message Returns	*nnn-nnn* indicates a possible printer problem.	Turn off the printer, wait 5 seconds, then turn it on. If this does not resolve the problem, contact Dell Technical Support. See "Contacting Dell" in the Owner's Manual.
010-354 Restart Printer (*next*) Contact Support If Message Returns	Excessive temperature or humidity detected.	Ensure the printer has been installed in an environment that does not exceed temperature or humidity specifications. If this does not resolve problem, contact Dell.
016-300 to 016-315 Restart Printer (*next*) Contact Support If Message Returns	A printer internal error has occurred.	Turn off the printer, wait 5 seconds, then turn it on. If this does not resolve the problem, contact Dell.
016-316 Restart Printer (*next*) Reseat Memory Contact Support	The printer detected an unsupported optional memory module.	Reseat the optional memory module. If this does not resolve the problem, contact Dell.
016-330 to 016-337 Restart Printer (*next*) Reseat MPC Contact Support	An error has occurred using the optional MPC (multi-protocol card).	Turn the printer off and ensure the following: • The MPC is securely mounted and connected to the ESS (electronic subsystem) board; reseat if necessary. • The wireless USB LAN adapter is securely inserted into the MPC WLAN socket. • A non-Dell wireless USB device is not being used. If this does not resolve the problem, contact Dell.
016-338 Restart Printer (*next*) Reseat Wireless Contact Support	An error occurred during the wireless option check.	Turn off the printer, wait 5 seconds, then turn it on. If this does not resolve the problem, contact Dell.
016-340 to 016-370 Restart Printer (*next*) Contact Support If Message Returns	A printer internal error has occurred.	Turn off the printer, wait 5 seconds, then turn it on. If this does not resolve the problem, contact Dell.

General Operations-Related Messages		
Message	**Problem**	**Resolution**
Close Front Cover 077-300 (*next*) Front Cover Is Open	The printer has detected the front cover is open.	Close the front cover and proceed with printer operations. If this does not resolve the problem, contact Dell.
Out of Memory 016-700 (*next*) Job too Large Press Set	The printer has detected the print job is larger than the usable memory capacity of the printer.	Reduce the size of the print job or add additional optional memory to the printer. If this does not resolve the problem, contact Dell.
Disk Full 016-980 (*next*) Job too Large Press Set	The printer has detected the print job is larger than the usable memory capacity of the RAM disk for the printer.	Reduce the size of the print job or add additional optional memory to the printer. If this does not resolve the problem, contact Dell.
PDL Error 016-720 (*next*) Data Violation Press Set	A page descriptor language (PDL) error has occurred. The PDL code received by the printer could not be interpreted correctly.	The printer received PCL or PostScript® data it cannot recognize. PCL and Adobe's PostScript are two commonly used PDLs. Two suggested courses of action: • If a PostScript driver was used, try using the PCL driver (or vice versa). • The PDL code may need to be converted to a PDL compatible with the printer. If this does not resolve the problem, contact Dell. NOTE: This error should be very rare. There are instances when PDL code used on obscure or uncommon printers may be incompatible with this printer. In this case, the customer should open the document on the system where the printer drivers are installed and resave the document using this printer as the default printer. The 3110cn Color Laser Printer supports these PDL versions: • PCL5e • PCL6 • PS3
Invalid Job 016-799 (*next*) Data Violation Press Set	Paper size parameters specified by the application and paper sizes available in the printer do not match.	Ensure the paper size specified by the application matches the sizes available in the printer. If this does not resolve the problem, contact Dell.
Ready to Print 193-700 (*next*) non-DELL Toner Installed	Use of non-Dell or refilled cartridges is enabled.	This error code is displayed whenever the printer is set to allow non-Dell or refilled toner cartridges to be used. NOTE: When non-Dell toner is used, the printer may be severely damaged and may not be covered by the warranty.
Over Heat 042-700 (*next*) cooling down Please Wait...	The OHP (transparencies) temperature sensor detected high temperature.	Printing transparencies carries more heat through the printer than printing on paper. Allow the printer to cool for 5 minutes before continuing. If this does not resolve the problem, contact Dell.
Ready to Print 142-700 (*next*) Over Heat Turned Halfmode	The OHP (transparencies) temperature sensor detected high temperature and print speed has been reduced to half speed.	Same conditions as error message 042-700, but the print speed has been reduced by half. Printer should regain normal speed after a sufficient cooldown.
Paper Jam-Related Messages		
Message	**Problem**	**Resolution**
Paper Jam 07n-nnn (*next*)	Error 07n-nnn relates to paper jam problems. *XXX* and *YYY* indicate a position	

Open XXX Remove Paper at YYY (*next*) Open & Close Front cover	to be opened or checked. Message cycles in pairs indicated; some errors produce only two message pairs.	
Example: (*initial display*) Paper Jam 071-100 (*next*) Open Tray 1 Remove Paper (*next*) Open & Close Front cover (*return to initial*)	250-sheet feeder jam, paper misfeed.	Clear the paper path as directed by the LCD display. If this does not resolve the problem, contact Dell.

Paper and Tray Settings-Related Messages		
Message	**Problem**	**Resolution**
Load Tray N (or MPF) 024-9nn (*next*) Load Tray N (or MPF) XX (*next*) Load Tray N (or MPF) YY	All 024-9nn errors relate to paper type or size mismatches per the print job submitted to the printer. 024-910 or 965 = Tray 1 024-911 or 966 = Tray 2 024-912 or 969 = MPF *XX* = Paper size *YY* = Paper type	
Tray Detached 024-946 and 024-947 (*next*) Push In Tray N	Paper Tray *N* may not be pushed all the way in: 024-946 = Tray 1 024-947 = Tray 2	Pull out the indicated paper tray and push it all the way back into the tray opening. If this does not resolve the problem, contact Dell.
Load Tray MPF 024-969 (*next*) Load Tray MPF Letter (*next*) Load Tray MPF Label	Paper size mismatch or No suitable paper found for the print job submitted.	As directed by the LCD display, verify and load the correct size or type of paper needed by the print job submitted. If this does not resolve the problem, contact Dell.
Load Tray 1 077-912 (*next*) Push In Tray 1	Tray 1 is missing when Tray 2 is selected.	The paper path for Tray 2 is up through Tray 1. Tray 1 must be inserted when printing is selected from Tray 2. If this does not resolve the problem, contact Dell.

Transfer Belt-Related Messages		
Message	**Problem**	**Resolution**
CRUM ID 009-371 (*next*) Reseat Belt Unit	A communication error with the transfer belt CRUM was detected.	Reseat the transfer belt assembly. If this does not resolve the problem, contact Dell.
Insert Belt Unit 094-910 (*next*) Insert Belt Unit	Transfer belt unit was not detected.	Ensure the transfer belt unit is installed and/or reseat it to ensure it was properly installed. If this does not resolve the problem, contact Dell.
Ready to Print 094-422 (*next*) Belt Unit is close to (*next*) Life	The transfer belt unit has a life expectancy of 100,000 pages and needs to be replaced soon.	This is a warning message that the transfer belt unit will need replacement soon. This unit is a consumable that can be ordered from www.dell.com/supplies.
Belt Unit 094-911 (*next*) Replace	The life expectancy of 100,000 pages has been reached and the transfer belt unit needs to be replaced.	Replace the transfer belt unit. It is a consumable that can be ordered from www.dell.com/supplies. If this does not resolve the problem, contact Dell.

Belt Unit		

Fuser Assembly-Related Messages		
Message	**Problem**	**Resolution**
010-317 Restart Printer (*next*) Reseat Fuser Contact Support	The outer levers on both sides of the fuser unit are not securely locked.	Confirm that the outer levers on each end of the fuser unit are securely locked. If this does not resolve problem, contact Dell.
010-351 Replace Fuser (*next*) Replace Fuser	The life expectancy of 100,000 pages has been reached, and the fuser needs to be replaced.	Replace the fuser assembly. If this does not resolve the problem, contact Dell.
010-377 to 010-395 Reseat Fuser (*next*) Contact Support If Message Returns	The fuser logic has detected one of several possible errors: • Temperature may have exceeded its high/low temperature limits • Fuser continuity checks have failed • Fuser warm-up time was exceeded • Other fuser conditions not listed here	An error in this range may possibly be corrected by turning off the printer, reseating the fuser, then turning the printer back on. If this does not resolve the problem, contact Dell.
010-359 CRUM ID (*next*) Reseat Fuser	A communication error with the fuser assembly CRUM was detected.	Reseat the fuser assembly. If this does not resolve the problem, contact Dell.
Ready to Print 010-421 (*next*) Replace Fuser Soon	The fuser assembly has a life expectancy of 100,000 pages and needs to be replaced soon.	This message warns the user that the fuser assembly needs replacement soon. It is a consumable that can be ordered from www.dell.com/supplies.
093-964 CRUM ID (*next*) Reseat Fuser Contact Support	A communication error with the fuser assembly CRUM was detected.	Reseat the fuser assembly. If this does not resolve the problem, contact Dell.

Toner Cartridge-Related Messages		
Message	**Problem**	**Resolution**
009-360 to 009-370 Restart Printer (*next*) Reseat (X) Cartridge Contact Support	Toner cartridge *X* may not be seated correctly, or a CRUM ID error has occurred: 009-360 or 369 = (Y)ellow 009-361 or 368 = (M)agenta 009-362 or 367 = (C)yan 009-363 or 370 = Blac(K)	Open the printer front door. Remove and fully reinsert the cartridge indicated by the error on the LCD display. If this does not resolve the problem, contact Dell.
Ready to Print 093-423 to 093-426 (*next*) X Cartridge is close to (*next*) Life	Toner cartridge *X* is nearly empty and needs to be replaced soon: 093-423 = (Y)ellow 093-424 = (M)agenta 093-425 = (C)yan 093-426 = Blac(K)	The toner cartridges are consumables. Replacements can be ordered from www.dell.com/supplies. If this does not resolve the problem, contact Dell.
Error X Cart 093-919 to 093-922 (*next*) Check X Cart Contact Support	The seal on toner cartridge *X* may not have been removed prior to installing the cartridge: 093-919 = (Y)ellow 093-920 = (M)agenta 093-921 = (C)yan 093-922 = Blac(K)	Remove and inspect toner cartridge *X* and check if the seal was not removed or was broken on initial removal. If this does not resolve the problem, contact Dell.
Replace Cart 093-930 to 093-933 (*next*)	Toner cartridge *X* is empty and needs to be replaced:	The toner cartridges are consumables. Replacements can be ordered from www.dell.com/supplies. If this does not resolve the problem, contact Dell.

Replace X Cartridge	093-930 = (Y)ellow 093-931 = (M)agenta 093-932 = (C)yan 093-933 = Blac(K)	
Insert Print Cart 093-970 to 093-973 (*next*) Insert X Cartridge	Toner cartridge *X* was not detected: 093-970 = (Y)ellow 093-971 = (M)agenta 093-972 = (C)yan 093-973 = Blac(K)	Open the printer front door. Remove and fully reinsert the toner cartridge indicated by the error on the LCD display. If this does not resolve the problem, contact Dell.

Operator Panel Locking

Enabling Panel Lock

NOTE:
Disabling the operator panel menus does not prevent access to the Stored Print and Tray Settings menus.

1. Press Menu.
2. Press ▼ until Admin Menu appears, and then press ▶ or ✔.
3. Press ▼ until Panel Settings appears, and then press ▶ or ✔.
4. Panel Lock is displayed. Press ▶ or ✔.
5. Press ▼ until Enable appears, and then press ✔.
6. Press ◀.
7. Press ▼ until Change Password appears, and then press ▶ or ✔.
8. Enter the old password. If no password is set, enter *0000*. Press ✔.
9. Enter the new password and then press ✔.
10. Re-enter the password to confirm the one you entered, and then press ✔.

The password has been changed.

Disabling Panel Lock

1. Press Menu.
2. Press ▼ until Admin Menu appears, and then press ◀ or ✔.
3. Press ▼ until Panel Settings appears, and then press ◀ or ✔.
4. Panel Lock is displayed. Press ◀ or ✔.
5. Press ▼ until Disable appears, and then press ✔.

Resetting the Default Panel Lock Password

If you forget the panel lock password, this process recovers the factory default panel lock password of *0000*.

1. Turn off the printer.
2. While holding Menu, turn on the printer.
3. Continue to hold Menu until the display indicates Ready to Init.
4. Release Menu and press ✔.
5. Press ◀ to select Yes, and then press ✔.

The display briefly indicates the password has been initialized.

Overview

Now that you have a firm grasp of the Dell™ 3110cn Color Laser Printer's physical properties, it is time to prepare the printer for use. The next few pages describe the basics of setting up and configuring laser printers. Chapters within this section appear roughly in the order in which you set up the printer for use.

- "Setup" explains how to physically set up the 3110cn.
- "Basic Configuration" explains how to connect the printer to a computer. It also discusses installing and configuring the printer driver.
- "Networking" contains information on the networking capabilties, setting IP addresses, resetting network parameters, etc.

The 3110cn does not support the Dell wireless printer adapter 3300. The 3110cn supports an optional USB wireless LAN interface, the 3310 USB WLAN adapter. For removal and replacement instructions for the optional wireless adapter, refer to the wireless LAN removal section of this document.

Additional Wireless information can be found in the New Products training pages for the 3310 USB wireless adapter.

Setup Overview

Shipping Box

The 3110cn's shipping box is relatively simple to open. There are 4 nylon locks, 2 on each side near the corners. Rotate the inner knob of each lock 90-degrees (CW or CCW) and pull the lock from the box side. When all 4 locks have been removed, lift the entire box top from the box base.

When customers open the box, they find the following items included with the 3110cn printer:

- Placemat
- Power cord
- Drivers and Utilities CD
- Owner's Manual
- Interior box containing Toner/Print cartridges (x4)

NOTE:
The 3110cn does not ship with any data cables.

Placemat

The placemat should be the first thing the customer takes out of the box. It provides easy-to-follow instructions for setting up the printer and connecting it to a computer. The placemat also describes how to install drivers and order additional toner.

NOTE:
The placemat frequently becomes entrapped inside the top of the shipping box when the customer lifts the box top from the box base.

Drivers and Utilities CD

The Drivers and Utilities CD is used to install the drivers and utilities on the applicable computer environment.

Because workgroup printers such as the 3110cn are designed to function on a network, you do not have the option of having the drivers factory installed — even when you purchase the 3110cn printer with a computer.

The drivers must be manually installed using the Drivers and Utilities CD

Owner's Manual

The Owner's Manual provides basic information about setting up, using, and maintaining the 3110cn printer.

Location

After unpacking the 3110cn printer (or maybe even before), customers need to have a good place to install the printer. Hopefully, customers will not have too many questions about where to put their laser printers, but here are a few rules of thumb—just in case:

- Allow for adequate ventilation. Laser printers generate a lot of heat. Avoid enclosures and make sure the printer has plenty of room for air to flow around all sides.
- Place the laser printer on a stable surface. Laser printers can be very heavy and can cause bodily injury if they fall on someone.
- Make sure the media trays are easily accessible. Adding paper should not be a difficult task.
- Keep the exit tray clear of all obstructions.
- Keep the back of the printer far enough away from the wall. You need access to the connectors.
- Leave room in front of the printer for the front cover to open. You need to open the front cover to access the toner cartridges and other customer-replaceable devices.

Power

The following list and graphics describe and show the power connection and power switch near the back-right corner of the Dell™ 3110cn Color Laser Printer:

Power Connection

This is the power cord receptacle connection. The connection shown here is common for all countries, no matter what the voltage. The country where the printer can be used is determined by the components in the following table:

- The power cord PLUG configuration
- The Low Voltage Power Supply; 100/115 or 230 volt units
- Fuser assembly; 100, 115, or 230 volt units

Power Switch

The switch turns the printer on and off when power is connected. The power switch for the 3110cn is located at the top left corner at the back of the chassis.

CAUTION:
Laser printers should NEVER be plugged into a UPS. Additionally, the use of power strips or extension cords should be discouraged. If a power strip or extension cord is absolutley necessary:

- They should be as short as possible
- They must be rated equal to, or better than, the power rating (amps) of the printer
- If applicable, the (earth) ground must be continuous from the original power cord

Toner

The Dell™ 3110cn Color Laser Printer implements Toner, Developer, Charge Roller, and Drum in self-contained cartridge assemblies. Consequently, the vast majority of issues that relate to print quality problems can be resolved by replacement of the offending cartridge.

Toner Cartridges

*Also known as **Print Cartridges***

The 3110cn uses a separate toner/print cartridge for each color:
(from Top to Bottom)

- Black (K)
- Cyan (C)
- Magenta (M)
- Yellow (Y)

Except for color, each cartridge is functionally identical (see note) to the others.

Instructions for replacing the toner cartridges in the 3110cn are found in the toner removal section of this document.

NOTE:
Toner/print cartridges can not be accidentally interchanged. Each cartridge utilizes a key tab unique to itself and prevents the insertion of a cartridge where it should not go.

Media

The 3110cn printer has 3 possible media sources:

- The multipurpose feeder (MPF) can be used for card stock, envelopes, and other odd sizes that can not be used in the paper trays.
- The integrated 250-sheet feeder can hold up to 250 sheets of 20lb paper.
- An Optional 550-sheet feeder is available for the 3110cn printer and can hold up to 550 sheets of 20lb paper.

Each tray can be configured from A5-size (short), and all common sizes up to Legal-size (long).

For details on loading Media into the various trays of the 3110cn printer, refer to the "Loading Print Media" section of the 3110cn User's Guide.

Basic Configuration Overview

After setting up the Dell™ 3110cn Color Laser Printer, the next step is to configure it to work with an attached client computer or a network. The next few pages discuss configuring the printer to work when attached to a computer.

To configure the 3110cn to work with a local computer or connected to a network, customers must do the following:

1. Physically connect the 3110cn to the computer or network.
2. Install the 3110cn driver on the computer.

In this section, we will also discuss the following:

- Using the 3110cn with non-Microsoft® operating systems.
- Controlling individual print jobs with the Print dialog.
- Configuring the 3110cn using the Properties dialog.

Connecting the Printer

Connecting to a Local Computer

The 3110cn can connect directly to a client computer using a USB 2.0 cable or an IEEE-1284 parallel cable.

- To connect the 3110cn using a USB cable, insert the box-like end (a.k.a., type B end) of the USB cable into the USB port on the back of the printer. Then insert the flat end (a.k.a., type A end) of the cable into an open USB port on the client computer.
- To connect the 3110cn using an IEEE-1284 parallel cable, connect the large Centronic's type connector to the parallel port on the back of the printer and flip the locking clips into the cable flange. Then connect the (DB)25-pin end of the cable to the parallel port on the client computer.

Connecting to a Network

To connect the 3110cn to a network, simply connect a Cat-5 cable to the 3110cn's RJ-45 network port on the back of the printer. Then connect the other end of the cable to an open port in a hub, switch, or router.

Although the 3110cn supports DHCP, your network may require the printer be asigned a static IP. Your customer's network administrator must make this determination.

For more information about networking the 3110cn, refer to the "Networking" section of this document.

Client and Network Driver Installation

Many customers attach the Dell™ 3110cn Color Laser Printer directly to a computer and use the printer locally. Using the printer locally requires what the installation utility calls a “personal installation.” The following procedure describes the client driver installation procedure.

Dell ships the drivers for all printers on the Drivers and Utilities CD that accompanies each printer. The installation utility launches automatically on inserting the CD into a drive. If necessary, you can launch the installation utility manually by running `setup.exe` from the root directory of the CD.

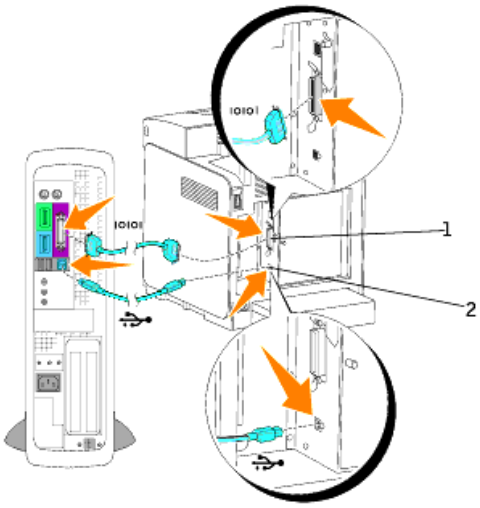
If `setup.exe` does not work, you can find out the name of the file for the specific CD by typing **`autorun.inf`** at a command prompt. If the command prompt does not originate from the root directory of the CD drive, you must specify the path to the file.

Dell uses a standard user interface on the driver installation utility.

Client Driver Installation

The following procedure illustrates the steps necessary to install the driver for client (personal stand-alone) printing. Additional reference information can be found in the "Installing Software in Windows®" section of the 3110cn User's Guide.

Client Driver Installation	
1.	Turn the printer on. Connect the printer to the computer with a USB 2.0 or IEEE1284 Parallel printer cable, turn the computer on, and wait for it to boot to Windows. NOTE: This cable is not included with the printer and needs to be purchased separately.

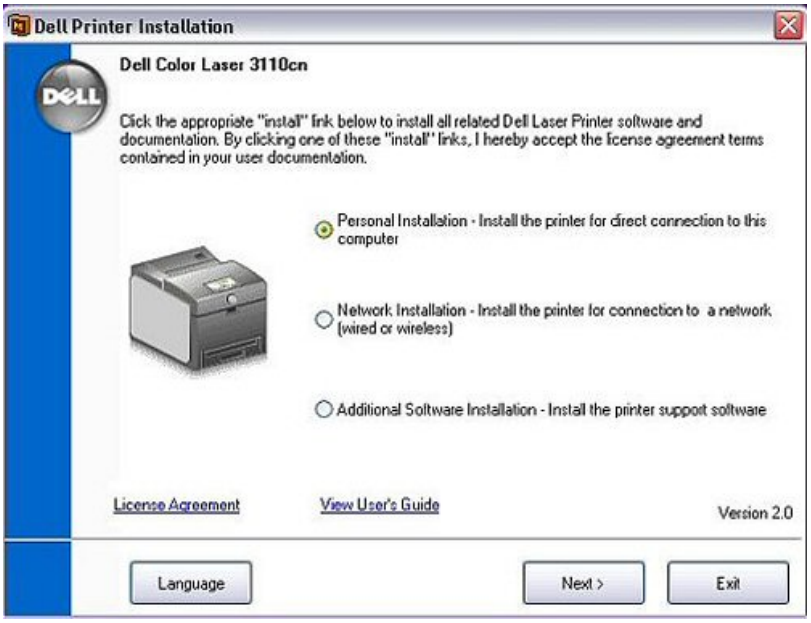


1	Parallel port
2	USB port

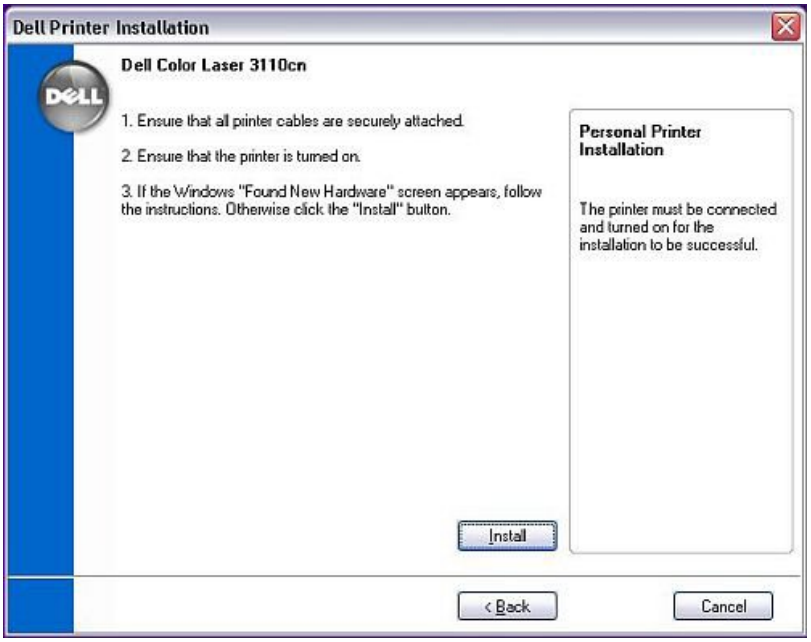
2. Cancel the Found New Hardware Wizard if it appears.

3. Put the Drivers and Utilities CD in the CD-ROM drive, and then wait until the first installation screen appears.

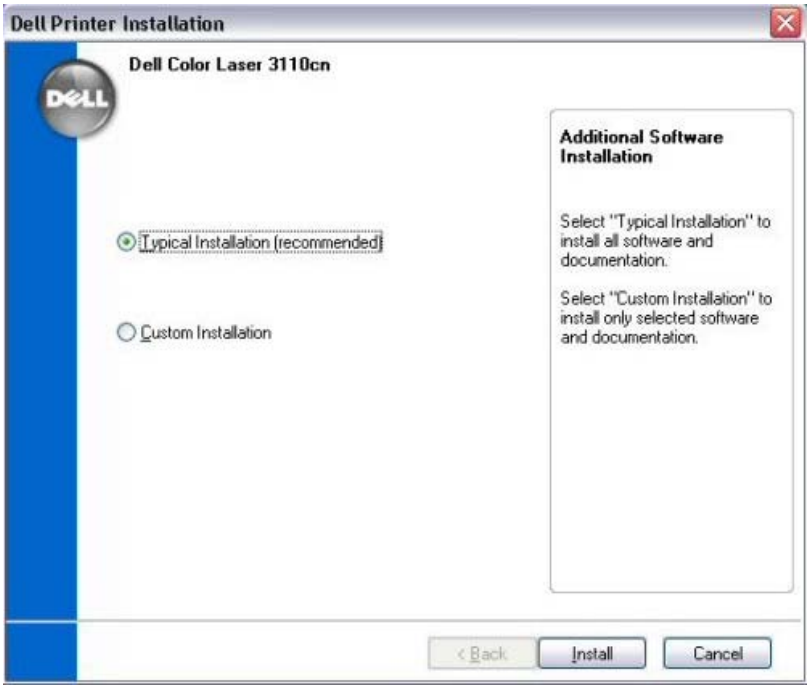
4. Click Personal Installation - Install the printer for direct connection to this computer and then click Next.



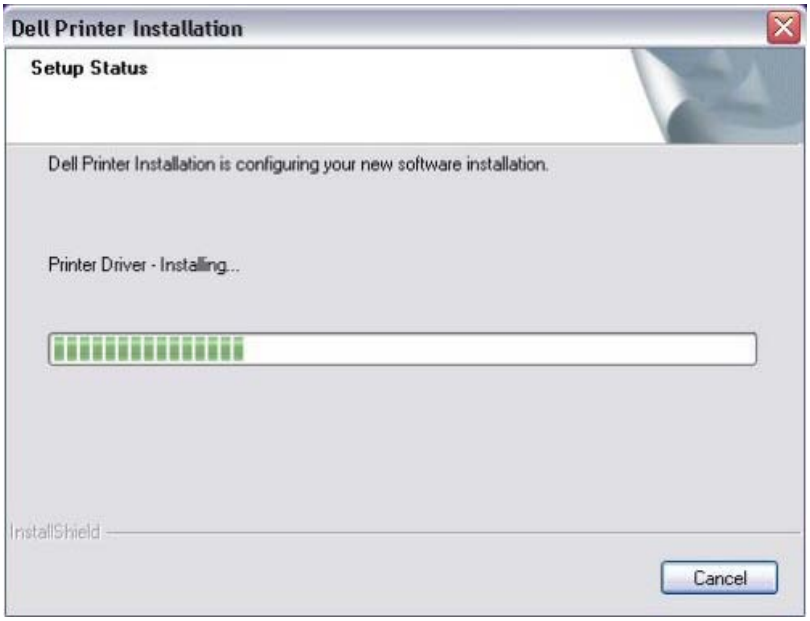
5. Make sure the cable is plugged in and the printer is turned on. Click Next to proceed.



6. Select Typical Installation and then click Next to proceed.



7. Wait for the driver installation to complete.



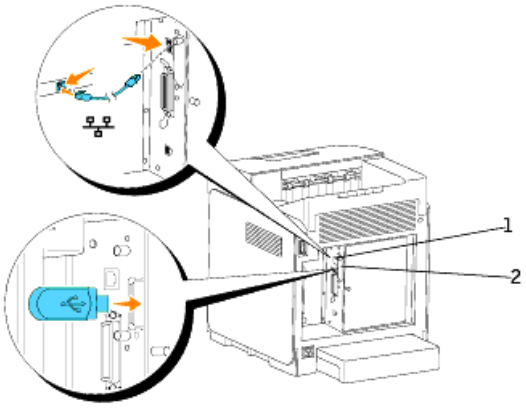
8. The Congratulations! screen appears. Print the test page successfully to finish the installation.

9. Once the test page has been printed successfully, click OK and the Order Printer Supplies icon appears on the Windows desktop. The installation is complete.

Network Driver Installation

The following procedure illustrates the steps necessary to install the 3110cn printer for networked printing. Additional reference information can be found in the "Installing Software in Windows" section of the 3110cn User's Guide.

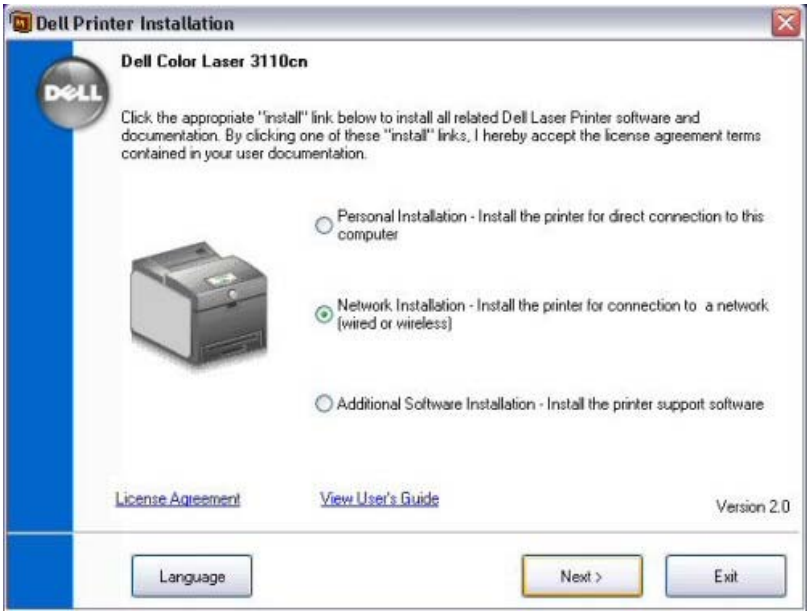
Network Driver Installation	
1.	Turn the printer on. Connect the printer to the network using a standard Cat-5 network interface cable. NOTE: This cable is not included with the printer and needs to be purchased separately.



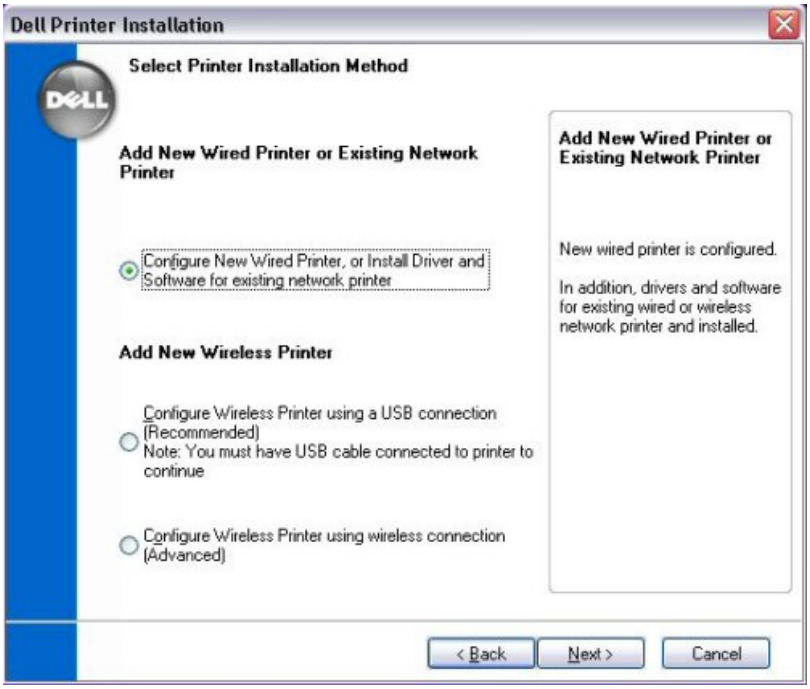
1	Ethernet port
2	Optional wireless LAN adaptor slot

2. Insert the 3110cn Drivers and Utilities CD and allow it to initialize.

3. Select Network Installation - Install the printer for connection to a network and then click Next.

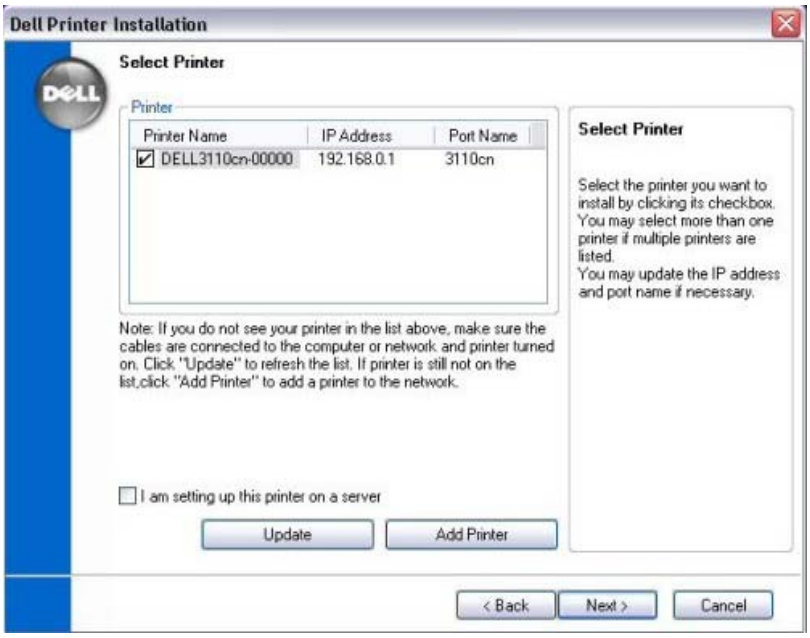


4. Select Configure New Wired Printer, or Install Driver and Software for existing network printer and then click Next.

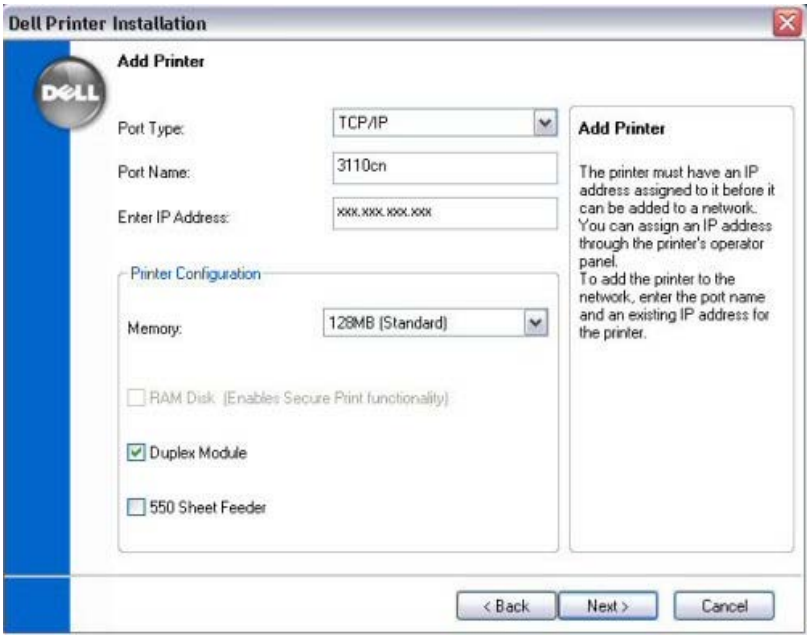


5. Select the printer you would like to install, and then click Next to proceed.

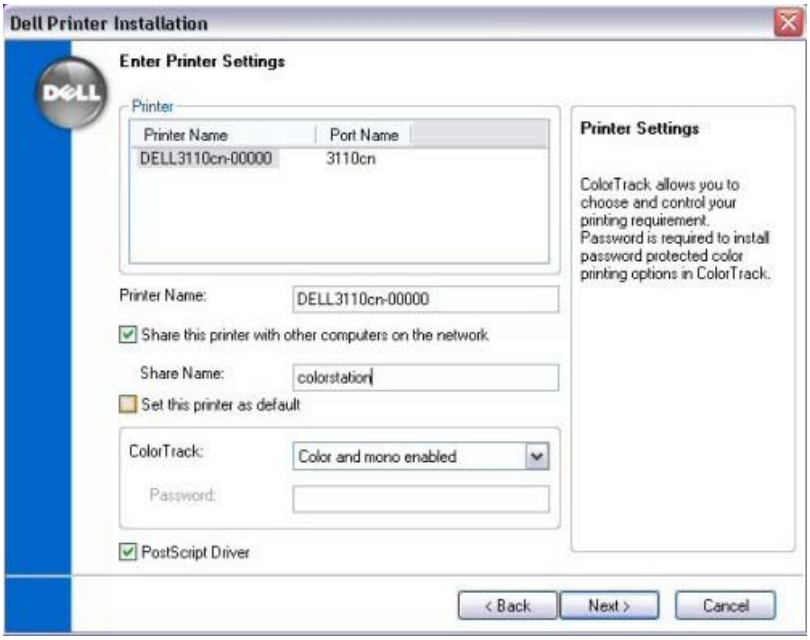
NOTE:
If the printer was listed, it was selected, and Next was clicked, the next 2 screens will NOT be seen.
If you did NOT see the 3110cn listed and Update did NOT reveal the printer, clicking Add Printer will include the next 2 screens.



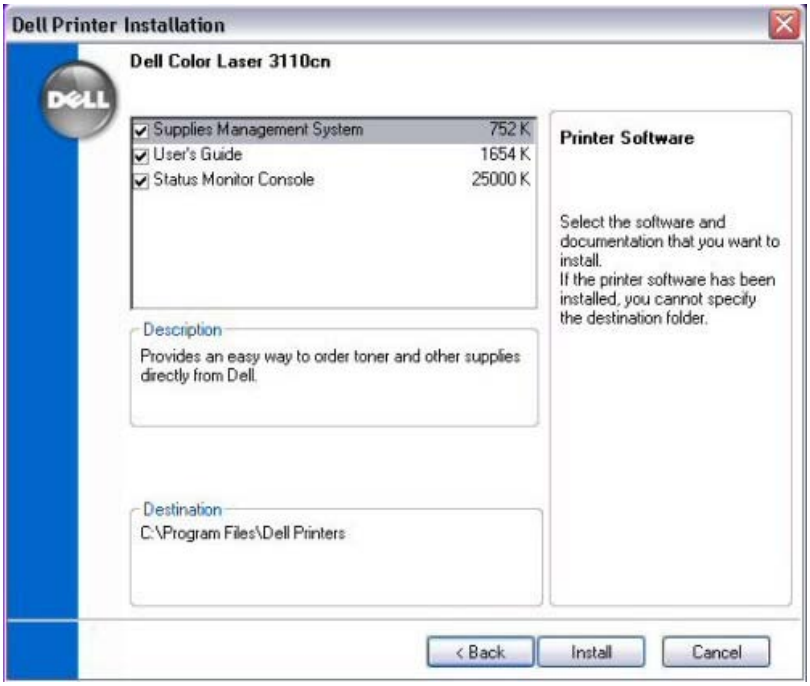
6. Update the port type, port name, IP address, and configuration information as necessary.



7. Enter a printer name and then select the desired sharing options. Select the PostScript® Driver check box if you want to enable PostScript.



8. Select the check boxes for the software items you want to install.



9. Wait while the installation completes.

10. Once the Congratulations! screen appears, click Print Test Page to print a sample page, or click Finish to complete the installation.

11. The Order Printer Supplies icon appears on the Windows desktop.

Non-Microsoft Operating Systems

It is commonly understood that not everyone uses Microsoft® operating systems for their software solutions. Finding the necessary drivers to enable Dell™-branded devices to work with non-Microsoft operating systems can be problematic.

The 3110cn Color Laser Printer is designed to work well with non-Microsoft operating systems, especially when used as a network printer. The drivers for various non-Microsoft operating systems are included on the Drivers and Utilities CD.

Linux

The Drivers and Utilities CD includes an RPM (Red Hat's® Package Manager) for the 3110cn printer. In Linux®, drivers and other applications are called packages. Red Hat developed the RPM format to help users install these packages. Most other Linux distributions also support the RPM format, making it easier for developers and customers like to install a package, regardless of the distribution they use.

Look for the RPM file in the Linux folder of the CD. Then follow the instructions for the Package Manager bundled with your customer's Linux distribution.

The CD also contains ".tar" files, a Linux/UNIX® file compression format similar to a .zip file in the Windows® world. These ".tar" files include support for the following:

- Linux distributions that do not support the RPM method
- HP-UX® (HP's UNIX)

- Solaris® (Sun's UNIX distribution)

If a customer does not have the Drivers and Utilities CD, the files are generally not available on the external Dell support website.

NOTE:
The website only includes driver files for Microsoft operating systems, usually only those that are available during the product's life.

Macintosh

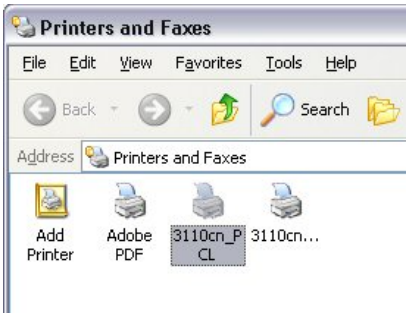
While a Macintosh® PPD file is included on the Drivers and Utilities CD, the Macintosh operating system also includes a generic PostScript® driver. Customers can use whichever driver they are more comfortable with.

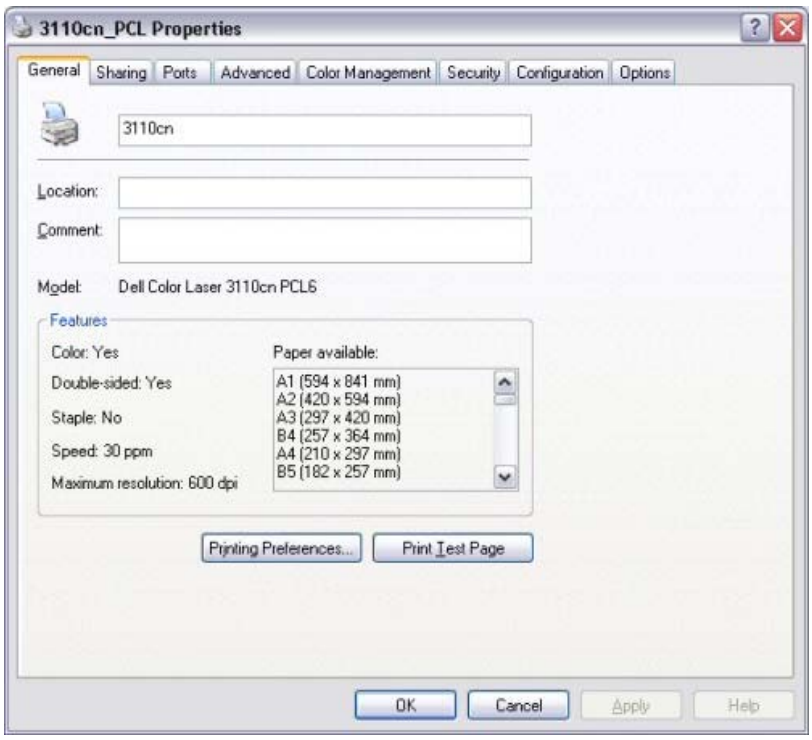
Print Properties

The 3110cn Print Properties dialog allows the customer to control or review the current printer settings. You can also use the dialog to print a test page.

Unlike most Windows® dialogs, the 3110cn Print Properties dialog can display different options depending on how it is called up. To make sure you and the customer are looking at the same version of the dialog, always have the customer open the dialog from Printers and Faxes.

The following procedure explains how to open the 3110cn Print Properties dialog.

Opening the Color Laser Printer 3110cn Print Properties Dialog	
1.	Open the Printers and Faxes Control Panel applet. • In Windows XP, click Start > Settings > Printers and Faxes. The Printers and Faxes applet will open. • In Windows 2000, click Start > Settings > Printers. 
2.	Right-click the 3110cn icon and then click Properties. The 3110cn Print Properties window should open. NOTE: For more information about the 3110cn Print Properties, refer to the "Printer Settings" section of the "Printing" topic in the 3110cn printer User's Guide.



Print Preferences

The Printing Preferences dialog allows the customer to control the default printing options on the 3110cn printer.

There are two ways to access the Printing Preferences dialog:

- From the 3110cn Print Properties dialog, click the Print Preferences button.
- From Printers and Faxes, right-click the 3110cn icon and then click Print Preferences in the resulting context menu.

The driver uses the Printing Preferences dialog to set the preferences for a single print job and to set printing defaults.

- To set preference for the current job, do either of the following:
  - From the Print dialog, click Print Preferences.
  - From the 3110cn Print Properties dialog, click Printing Preferences on the General tab.
- To reset the defaults for all future jobs, click Restore Defaults from each of the Printing Preferences tabs.

NOTE:
Preferences can be set independently in each of the printing preferences windows. Example: Selecting "Confidential" in the *Watermark Tab*, then clicking Restore Defaults from the *Print Setup* tab will not reset the watermark to "No Watermark". The Restore Defaults button only affects the functions for that tab.

Bundled Software

The 3110cn Color Laser printer ships with the following software on the Drivers and Utilities CD:

Dell Printer Driver
: A Driver enables a computer to communicate with the 3110cn. For more information about installing the driver, see the "Client and Network Diver Installation" section of this document.

User's Guide
: This document is a compiled Windows® Help file that contains instructions for using the 3110cn Color Laser printer. This file must be saved to your local hard drive then opened from the location where it was saved.

All bundled software can be installed from the Drivers and Utilities CD, as selected from the appropriate screen of the CD installation.

Networking Overview

The 3110cn color laser printer is equipped with an integrated Ethernet card for directly connecting the printer to network environments. The printer can also be attached to a wireless network but requires the purchase of an additional wireless adapter.

For information on wireless networking, refer to Dell Printer Wireless USB 3310 Adapter training documentation.

The following information is related to the networking capabilities of the 3110cn.

Printing a Printer Settings Page

The DHCP functionality of the 3110cn is enabled by default, allowing it to connect to a network and attain an IP address from the DHCP server. Once the printer has been turned on and connected to the network, print a "Printer Settings" page to view the network settings information of the printer.

To print a "Printer Settings" page, take the following actions:

1. When *Ready to Print* appears in the LCD, press Menu button.
2. *Report/List* is displayed. Press the right arrow or Select button.

3. *Printer Settings* is displayed. Press the Select button.
4. The "Printer Settings" page prints.
5. Under the heading "Wired Network," find the line "IP Address" to verify or obtain the assigned IP address.

NOTE:
If the IP address is 0.0.0.0 and the printer is connected to a DHCP network, wait a few minutes for the IP address to resolve automatically, and then try printing the "Printer Settings" page again. If the IP address is still zeroes, contact the network administrator for assistance.

The following graphic is a small illustration of the "Printer Settings" page. Click the image to open a full-size photo of the page in a separate Web browser window.

You can use the "Printer Settings" report to not only find the 3110cn's IP address but also other network-related information such as the physical (MAC) address, port name, and printer network name.

Clearing NVRAM

Wired Connection

To restore the default network settings for a hard-wired connection, take the following actions.

NOTE:
This restores network settings and the EWS password to factory default. The default username is admin and the password is blank (no password).

1. Press the Menu button.
2. Press the down arrow button until *Admin Menu* appears, and then press the right arrow or Select button.
3. Press the down arrow button until *Wired Network* is displayed. Press the right arrow or Select button.
4. Press the down arrow button until *Reset LAN* appears, and then press the right arrow or Select button.
5. The *Are you sure?* message appears on the operator panel, press the Select button.
6. The display momentarily indicates *Initializing...* followed by *Initialized* followed by *Restart Printer to apply setting*. The display returns to *Wired Network* and *Reset LAN*.
7. Turn the printer off, wait a few moments, and then turn the printer on.

Wireless Connection

NOTE:
The Wireless Net menu item is not available unless the MPC and WLAN 3310 options have been installed.

To restore the default network settings for a wireless connection, take the following actions:

1. Press the Menu button.
2. Press the down arrow button until *Admin Menu* appears, and then press the right arrow or Select button.
3. Press the down arrow button until *Wireless Net* appears. Press the right arrow or Select button.
4. Press the down arrow button until *Reset Wireless* appears, and then press the right arrow or Select button.
5. The *Are you sure?* message appears on the operator panel, press the Select button.
6. The display momentarily indicates *Initialized* followed by *Restart Printer to apply setting* then returns to *Wireless Net* and *Reset Wireless*.
7. Turn the printer off, wait a few moments, and then turn the printer on.

Setting a Static IP Address

Using the Operator Control Panel

To enter the TCP/IP address from your printer's operator panel, first you must configure the printer to allow a static IP. To do so, take the following steps.

NOTE:
Navigation hint:
While setting the addresses, holding the up or down buttons longer than 2 seconds causes the number to increment or decrement in units of 10.

1. Press the Menu button.
2. Press the down arrow button until *Admin Menu* appears, and then press the right arrow or Select button.
3. Press the down arrow button until *Wired Network* is displayed, and then press the right arrow or Select button.
4. Press the down arrow button until *TCP/IP* is displayed, and then press the right arrow or Select button.
5. Press the down arrow button until *IP Address* is displayed, and then press the right arrow or Select button. The currently assigned IP address (or 0.0.0.0) is displayed.
6. Press the down arrow button until *Get IP Address* is displayed, and then press the right arrow or Select button.
7. Press the down arrow button until *Panel* is displayed, and then press the right arrow or Select button.
8. The display momentarily indicates *Restart Printer to apply setting* then returns to *Get IP Address* and *Panel*. Note the asterisk next to *Panel*. This asterisk indicates that the default setting is now Panel, therefore the operator panel is now the source for the IP address setting.
9. Turn the printer off, wait a few moments, then turn the printer on.

To configure the static IP address, follow these steps:

10. Press the Menu button.
11. Press the down arrow button until *Admin Menu* appears, and then press the right arrow or Select button.
12. Press the down arrow button until *Wired Network* is displayed, and then press the right arrow or Select button.
13. Press the down arrow button until *TCP/IP* is displayed, and then press the right arrow or Select button.
14. Press the down arrow button until *IP Address* is displayed, and then press the right arrow or Select button.
15. The current *IP Address* (likely all zeroes) is displayed. Use the up and down arrows to set the first octet to the value desired, and then press the right arrow to move to the next octet.
16. Repeat step 15 until all four octets have been set, and then press the Select button.
17. The display momentarily indicates *Restart Printer to apply setting* the returns to *IP Address* and the new IP address just set. Do not turn off the printer yet.

To configure the subnet mask address, take the following steps:

18. Press the left arrow button once (*IP address* displays), and then press the down arrow button once to display *Subnet Mask*. Press the Select button.
19. The current *Subnet Mask* is displayed. Use the up and down arrows to set the first octet to the value desired, and then press the right arrow to move to the next octet.
20. Repeat step 19 until all four octets have been set, and then press the Select button.
    NOTE:
    Mask validation occurs preventing the subnet mask from being set to an invalid address for the IP address desired. Attempts to do so causes the display to momentarily indicate *Unable to change settings*.
21. The display momentarily indicates *Restart Printer to apply setting*, and then returns to display *Subnet Mask* and the new address just set. Do not turn off the printer yet.

To configure the gateway address, follow these steps:

22. Press the left arrow button once (*Subnet Mask* displays), and then press the down arrow button once to display *Gateway Address*. Press the Select button.
23. The current *Gateway Address* is displayed. Use the up and down arrows to set the first octet to the value desired, and then press the right arrow to move to the next octet.
24. Repeat step 23 until all four octets have been set, and then press the Select button.
25. The display momentarily indicates *Restart Printer to apply setting* then returns to display *Gateway Address* and the new address just set.
26. Turn the printer off, wait a few moments, and then turn the printer on.
27. Print a "Printer Settings" page to verify the settings were correctly established.

Using the Embedded Web Server

To enter the TCP/IP address using the EWS, take the following steps.

NOTE:
You must have the EWS password before you can change these settings using the EWS.

NOTE:
The printer must already have an IP address and be accesible on the network before this method can be used.

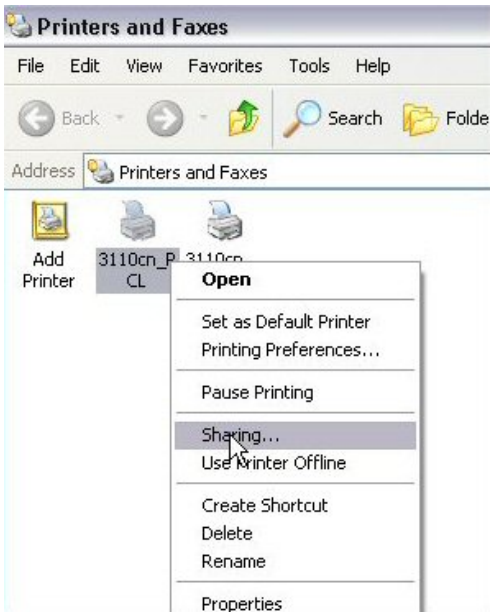
1. Open a browser window on any PC connected to the same subnet as the printer, enter the IP address of the printer into the address bar, and then press <Enter> or click Go.
2. The EWS of the target printer should be displayed. In the left-hand menu, click the Print Server Settings link.
3. Click the Print Server Settings tab and then click the TCP/IP link.
4. In the TCP/IP Settings box, select Manual from the IP Address Mode drop-down menu.
5. Set the IP address, the subnet mask, and gateway address to the desired values.
6. Scroll to the bottom of the page and click the Apply New Settings or Restart printer to apply new settings (suggested).

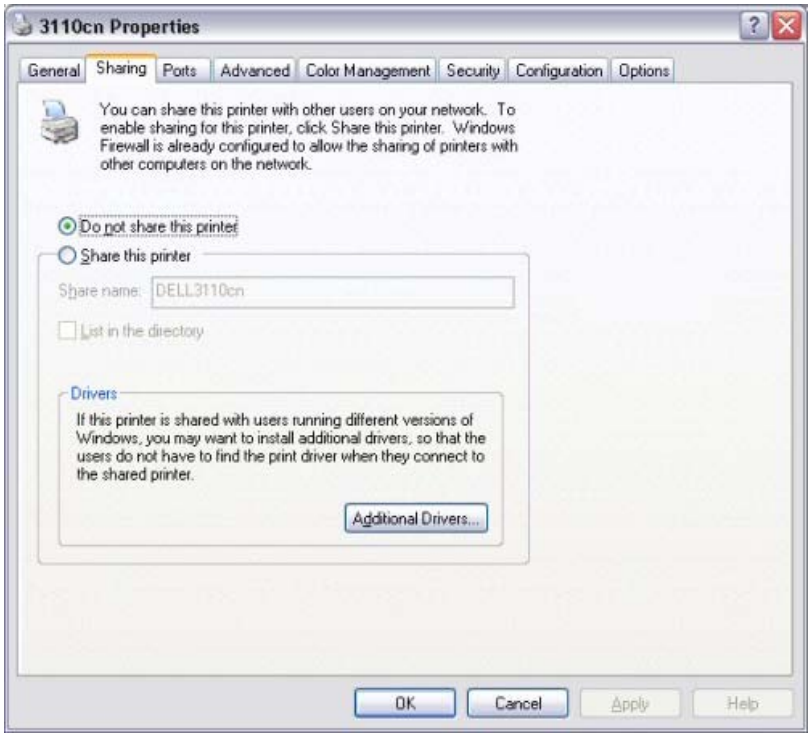
   NOTE:
   Mask validation prevents the subnet mask from being set to an invalid address for the IP address desired. If the subnet mask is invalid, the message *Subnet Mask ... Please enter correctly* displays and the previous screen reappears so the subnet mask can be corrected.

7. Enter the username (the Administrator username) and password then click OK.

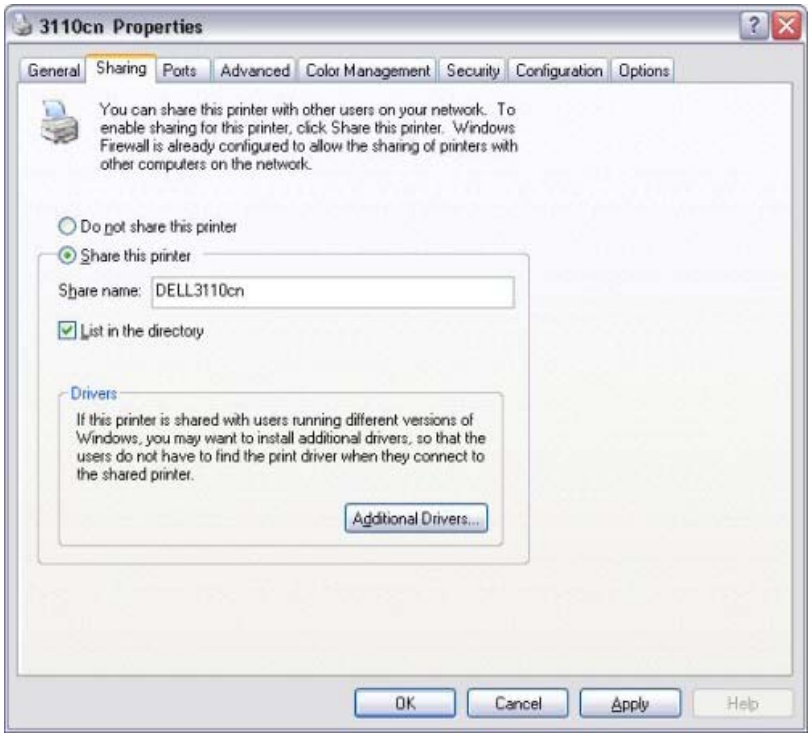
Network Print Sharing

The following procedure outlines the process for setting up file and print sharing in Windows® XP.

Windows XP Print Sharing	
1.	Ensure the printer has been installed and is functioning normally before setting up a printer to be shared.
2.	Click Start, and then select Printers and Faxes to open the Printers and Faxes window.
3.	Right click on the printer you wish to share and then select Select... from the context menu. 
4.	The 3110cn Properties windows opens with the Sharing tab open and *Do not share this printer* preselected



5. Select the item Share this printer. The default share name can be used or can be changed to anything desired. To publish the printer in the Active Directory, check the box List in the directory.



6. Click Apply and then click OK.

Embedded Web Server Utility

Like all currently shipping Dell™ printers, the 3110cn features a Web-based interface—the Embedded Web Server (EWS)—customers can use to configure the printer without having to connect it locally to a computer. When the 3110cn printer is connected to a network, the EWS is available.

Because the EWS is Web-based, it operates through a simple and familiar user interface. To access the EWS, type the printer's IP address into the Address bar of a Web browser and press <Enter>. The browser displays the first page of the EWS. The simulation in this section illustrates the EWS for the 3110cn's predecessor product, the 3100cn. However, the embedded EWS utility is the same for the 3000cn, 3010cn, 3100cn, and 3110cn printers for navigational purposes.

NOTE:
The EWS is only available when the 3110cn is connected using the network interface. The EWS is not available when using a USB or Parallel cable connection.

Capabilities

The following table lists the EWS menus and explains their purpose.

NOTE:
Some of the EWS menus access submenus of other items. Not all menus appear in the following table.

EWS Menus

Menu Category	Description
Printer Status	Get immediate feedback on printer supply status. When toner is running low, click the Order Supplies link on the first screen to order additional toner cartridges.
Printer Jobs	List the jobs currently in the queue or those already completed.
Printer Settings	Change printer settings, view the operator panel remotely, and update the print server firmware.
Printer Server Settings	Allows one to view and change current network settings. You must have the 3110cn Administrator password to make any changes in this section.
Copy Printer Settings	Quickly clone the printer's settings to another printer or printers on the network just by typing each printer's IP address. You must be a network administrator to use this feature.
Printer Information	Keep track of printing trends, such as paper usage and types of jobs being printed.
Tray Settings	View and adjust tray settings for the printer.
Printer Information	Get the information you need for service calls, inventory reports, or the status of current memory and engine code levels.
E-Mail Alert	Receive an e-mail when the printer needs supplies or intervention. For specific instructions on using this feature, save the User's Guide to your hard drive. The Users Guide is a compiled HTML file and must be saved to your hard drive and opened locally to properly display.
Set Password	Lock the EWS with a password so other users do not inadvertently change the printer settings you have selected. You must have the 3110cn Administrator password to make any changes in this section.

Simulation

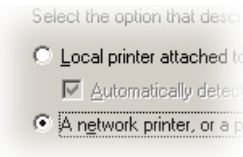
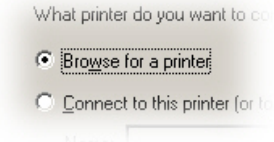
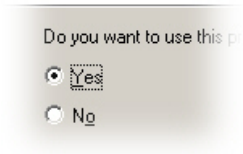
The 3110cn and predecesor models (3000cn, 3010cn and 3100cn) all use the same basic EWS design and layout.
Click this link to launch a simulation of the 3110cn EWS.

Accessing the Networked Printer

Again, the easiest way to access a shared Dell™ 3110cn Color Laser Printer is to let the driver installation utility find and access the remote printer. If the customer does not have the installation media or encounters a problem with the installation, use Windows® File and Printer Sharing to access the shared printer.

The following procedure explains how to access a 3110cn when it is attached to another computer on the network and shared with Windows File and Printer Sharing.

Accessing a 3110cn With Windows File and Printer Sharing

1.	Make sure the printer is shared correctly and gather the information you need to access it: • Computer name or IP address • Share name of the printer on the remote computer	
2.	From the Windows XP Printers and Faxes dialog (listed as Printers in the Windows 2000 interface), take one of the following actions: • Click Add a Printer in the Printer Tasks area of the dialog. • Double-click the Add Printer icon. The Add Printer Wizard opens.	
3.	When the Add Printer Wizard opens, click Next. The wizard displays the Local or Network Printer screen.	
4.	Select the A network printer, or a printer attached to another computer option and click Next. The wizard displays the Specify Printer screen.	
5.	Select the Browse for a printer radio button and click Next. The wizard displays the Browse for Printer screen. If you know the name of the host computer and printer, you can also choose to enter these names or the URL to the printer.	
6.	Choose the printer from the list and click Next. The wizard warns you that you are about to install a driver and that drivers may contain malware.	
7.	Click Yes to connect to the remote computer and install the printer driver. The wizard installs the printer driver and then a dialog opens to ask the customer if this printer should be the default printer.	
8.	Click Yes or No and then click Next. • If the 3110cn should be the default printer, click Yes. • To use some other printer as the default and use the 3110cn only occasionally, click No. The wizard displays the Completing Add Printer Wizard screen.	
9.	Click Finish to complete the installation process. The wizard closes. You may be asked to print a test or alignment page. Printing this page is a good idea to verify that the drivers are installed correctly and that the client computer can communicate with the printer through the host.	

The computer can now print to the remote printer.

Wireless Networking

The Dell™ 3110cn Color Laser Printer can be used on a wireless network by puchasing the Dell Printer Wireless USB 3310 Adapter. The wireless adpater plugs into the MPC card.

Refer to the Dell Printer Wireless USB 3310 Adapter training material for more information.

Call Drivers and Troubleshooting Overview

A call driver is a reason for customers to call Dell. The more frequently customers call for a specific reason, the more significant the call driver.

These call drivers are historically among the top drivers for *all* printers, but they appear here in alphabetical order. Numeric ranking of call drivers varies slightly over time.

The following pages discuss these call drivers in greater detail:

- Image quality issues
- Jam and misfeed issues
- Noise issues
- Setup and configuration issues

The following pages cover the various diagnostic tests can be used to diagnose problems that may occur in the 3110cn printer:

- Digital Input and Digital Output Reference chart
- Digital Input tests
- Digital Output tests

Image Quality Issues

A discussion on print quality actually consists of many smaller areas of discussion. Customer perception, configuration, paper quality, contamination, device failure—these are all topics of discussion that can be placed into the larger and more generic category of print quality.

Common Causes

Customer Perception

The customer's perception of what good print quality is can often cause false issues if not addressed through education about the product's capabilities and limitations. For example, if a customer attempts to print photos on a color laser printer using glossy ink-jet paper, the result will not be successful, and the customer should realize that type of printing is not what the printer was designed to do.

Briefly explaining to the customer that color laser printers are designed for color business graphics printing, not reproduction of photographs usually corrects this expectation. If the customer is using ink-jet glossy paper, you may want to explain the difference between ink-jet and laser paper. These different types of paper are specifically designed according to the print process of the intended printing process and will never achieve the desired results on a printer that is not designed to use them (thus the package labeling indicating the type of printer).

Configuration

Configuration is a major cause of print quality false issues. The customer may expect a high-quality print and not achieve the desired quality simply because the printer's color quality setting is factory defaulted to a setting of medium- or low-quality color to conserve toner.

This mis perception can be corrected quickly and in most cases permanently if you take a moment to educate customers about the adjustments they can make to their printer to achieve a more desirable result.

Paper Quality

Paper quality can drastically affect the quality of the finished print. If a paper surface is too smooth, such as ink-jet glossy photo paper, the laser printer toner does not fuse correctly to the paper. On the other hand, if the paper surface is too rough, the toner does not fuse properly into the surface, causing deletions or deletion spots. Be sure to check that the proper specification paper is installed in the printer when addressing any print quality issue. If possible, install paper from a freshly opened ream as a first step in troubleshooting.

Contamination

Contamination of various components along the paper path can display as print quality defects. Often this problem can be resolved by

cleaning the rollers along the path such as feed rollers, transfer roll, charge roll, and PC drum. When added defects such as smears, vertical lines, or spots appear on print, always check the fuser hot roller for contamination as a first step. When labels or other papers that contain adhesive backing are fed through the paper path, the adhesive has a tendency to bleed out onto the fuser hot roll during the fuse process. This causes print quality defects such as spotting, lines, and smearing.

Device Failure

Failure of a specific device such as a motor can lead to print quality defects as well. For instance, failure of the yellow developer motor on the 5100cn causes the yellow toner not to dispense properly, ending in a print or prints devoid of yellow color.

Summary

Many different elements can affect print quality. In the following sections, we will discuss causes of different print quality issues for each product and how to determine the best steps to resolve the issue.

Print Quality Samples

The 3110cn operator panel refers to the report containing an image quality sample set for the printer as the ContaminationChk.

You may want to print this set of pages for several reasons:

- As a test page set to prove all colors are printing correctly.
- To determine if a defect is occurring on all colors or on a specific color.
- To determine the distance between occurrences of the defect using the measurement rulers found on the edges of the color pages.
- To determine if a specific roller is causing the print defect, and also to determine the FRU (assembly) location of the roller causing the print defect.

The following procedure explains how to print the "ContaminationChk" pages to use as a tool in determining proper cause and resolution of image quality issues.

1. Press and hold the up arrow (▲) and down arrow (▼), and then turn on the printer.
2. Release the arrows when *Diagnosing...* appears on the operator panel.
3. *Customer Mode* should appear on the operator panel.
4. Press the down arrow (▼) until the LCD displays *Test Print*.
5. Press the Select (✔) button.
6. Press the down arrow (▼) until the LCD displays *ContaminationChk*.
7. Press Select (✔).
8. The LCD displays *Busy* while the 3110cn prints the "ContaminationChk" pages.
9. Examine the test pages to determine if the defect is being duplicated and also which pages are displaying the defect.
10. If only a specific color page is reproducing the defect, then that color toner cartridge is causing the issue. You can verify this if an identical known good cartridge is available to swap for testing purposes.
11. If the image defect appears on all color pages, then measure the distance between repetitions of the defect using the ruled edges of the color test pages.

    NOTE:
    You can overlap one page and align it with the page underneath it to make a straight edge across the page and get an accurate measurement on the ruled edge. An example of this technique is shown in the embedded "ContaminationChk" pages sample page below.

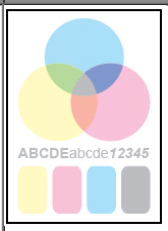
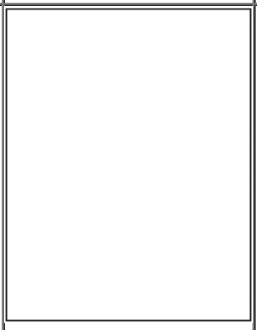
    CAUTION:
    Use only the Customer mode test pages when testing print quality. Otherwise, improper user adjustment of software settings may cause you to make an incorrect or false hardware failure diagnosis.

12. Click the thumbnail below to open the sample page in a separate window.

The following table contains examples of common print quality defects and lists possible causes. Below the table is a diagram that illustrates locations of all internal rollers and their dimensions for use in further diagnosing print quality issues.

NOTE:
Before commencing troubleshooting, check the paper transfer path. Make sure there are no foreign materials on the transfer path,

such as staples, paper clips, scraps of paper, and so on.

3110cn Print Quality		
Symptom	Illustration	Troubleshooting Suggestions
Print is too light.		• The print cartridges may be low or need to be replaced. Confirm the amount of toner in each print cartridge and replace it with a new one if necessary. • Deselect the Toner Saving Mode check box on the Advanced tab in the printer driver. • If you are printing on an uneven print surface, change the paper type settings in the Tray Settings menu. • Verify that the correct print media is being used. Try different print media if it is available.
Blank pages.		• Make sure the packaging material is removed from the print cartridges. • Check the print cartridges to make sure they are installed correctly. • The print cartridges may be low or need to be replaced. Confirm the amount of toner in each print cartridge and replace it with a new one if necessary.
Part or all of the page prints in black.		• Check the print cartridges to make sure they are installed correctly. • Enable the Change All Colors to Black Text Smoothing option on the Advanced tab in the Printer Properties dialog box.
Vertical deletions.		• A print cartridge is damaged. Replace the print cartridge with a new one. Use the "ContaminationChk" test pages to separate the individual colors and determine which cartridge needs replaced.
Horizontal deletions.		• This type of deletion points to a defect in one of the bias transfer rollers. Print the "ContaminationChk" pages in Customer Diagnostics mode and determine if the defect can be isolated to a single color. • All 4 bias transfer rollers are contained within the transfer belt assembly. Use the "ContaminationChk" pages to determine the distance between the defect repetitions, and then use the roller diameter test sheet to verify that the distance matches the diameter of a bias transfer roller. • Once you have verified that the defect is being caused by a bias transfer roller, replace the transfer belt. • This defect symptom can also be caused by contaminated HVPS-to-transfer belt contacts. Locate the four metal power contacts on the top-left side of the transfer belt assembly and clean them with a lint-free cloth.

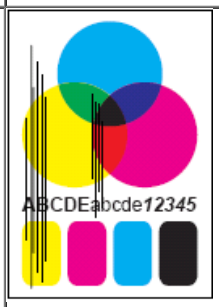
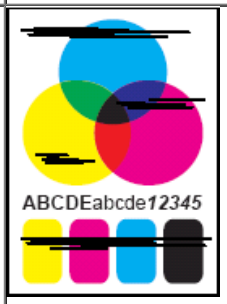
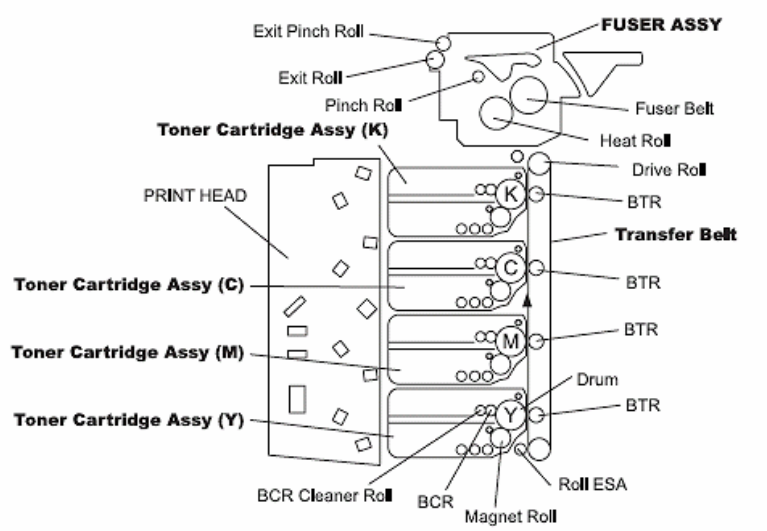
		
Vertical streaks.		• The print cartridges may be low or need to be replaced. Confirm the amount of toner in each print cartridge and replace it with a new one if necessary. • If you are using pre-printed forms, make sure the media can withstand temperatures of 0° to 35° C.
Faded image on left and right sides of the page.		• This problem occurs when the printer is operating in a location where relative humidity reaches 85% or more. Adjust the humidity or relocate the printer to an appropriate environment. • Make sure paper being used is stored in the same location as the printer. Often, customers store paper in a separate location with a very different temperature and humidity level, such as a closet or storage room. • If this is the case, advise the customer to bring replacement paper to the same location and allow at least 24 hours for the humidity to adjust in the paper before attempting to use it.
Horizontal streaks.		• Use the "ContaminationChk" test pages to separate the individual colors and determine which cartridge needs replaced. • Determine the toner cartridge which exhibits the defect, and then swap with a known good cartridge if possible. • Replace the defective cartridge.
Random deletions.		• Check for contamination on the transfer belt assembly. • Swap the installed paper with different paper that falls within acceptable specifications. • Swap the transfer belt assembly if a known good transfer belt assembly is available. • Replace the transfer belt if the contamination.
Random spots.		• Use the "ContaminationChk" test pages to separate the individual colors and determine which cartridge needs replaced. • Determine the toner cartridge which exhibits the defect, and then swap with a known good cartridge if possible. • Replace the defective cartridge.

		
Image is not completely fused to the paper.		• If you are printing on an uneven print surface, change the paper type settings in the Tray Settings menu. • Verify that the print media is within the printer specifications. • Substitute a new ream of paper and try printing again. • If the previous steps do not resolve the issue, the fuser is not working properly. Replace the fuser.

Print Process Roller Location Reference

The following illustrations are provided as a visual reference for the locations of the rollers involved in the 3110cn print process. Use them to help determine the causes of repeating marks and voids in print.



Roll	Parts name	Roll diameter (mm)	Interval (mm)
Drum	Toner Cartridge ASSY	24	75.4
BCR	Toner Cartridge ASSY	9	28.8
BCR Cleaner Roll	Toner Cartridge ASSY	8	25.9
Sleeve (K)	Toner Cartridge ASSY	16	25.2
Sleeve (Y,M,C)	Toner Cartridge ASSY	16	22.3
1st BTR	Transfer Belt	12	37.7
Roll ESA	Transfer Belt	9	28.3
Drive Roll	Transfer Belt	18.1	56.9
Fuser Roll	FUSER ASSY	26.32	82.7
Fuser Belt	FUSER ASSY	30	94.2
Pinch Roll	FUSER ASSY	6	18.8
Exit Roll	FUSER ASSY	13.75	43.2
Exit Pinch Roll	FUSER ASSY	10	31.4

Paper Jam Issues

The following section refers to paper jam issues for the Dell™ Color Laser Printer 3110cn.

Paper Jam Definition

A series of sensors are used to track paper as it moves through the printer. Jam messages result when a sheet is over a sensor at the wrong time or fails to reach the next sensor in time. When a jam occurs, the printer uses a corresponding failure code or error message to show the likely problem location.

If the jam happens consistently, inspect the rollers and sensors in the area described by the printer. The sensor tests in the various diagnostics utilities of the printer should be used to check for proper sensor operation.

When a sensor fails a diagnostic test, first clean the inner surfaces of the sensor and then perform the test again. Toner or paper dust buildup can cause a sensor not to function properly.

Intermittent jams may indicate media or mechanical problems as well. Plain paper should be substituted to test functionality if the feed problem or jam has occurred with a special media (e.g., labels, card stock).

NOTE:
Always clean and inspect all paper feed rollers as a preventative maintenance step whenever you perform service on Dell laser printers to avoid unnecessary paper jam and feed issues due to debris buildup on the rollers. Perform this cleaning procedure on the base tray feed (pick) rollers, as well as on the feed (pick) rollers for any additional trays.

Paper Jam Causes

When paper is jammed in the printer, one of two conditions may exist:

1. The paper is stopped and physically damaged.
   - This error may be due to an obstruction in the paper path, or the paper may be damaged before the printing process begins. Check for obstructions in the area indicated by the jam message.
   - In addition, check for obstructions in other locations which may have damaged the paper and caused it to eventually jam. Finally, check the ream of paper for damage including folded (dog-eared) corners, tears, and unsupported hole punches or perforations. It may be useful to try a fresh ream of paper in the printer.
   - Wipe clean the inner surfaces of any involved sensor with a cloth or swap to remove any toner buildup and debris, and then perform a test of the sensor using the proper diagnostic test for that printer.
2. The paper is stopped but has no visible damage.
   - The paper did not reach a sensor in the specified amount of time. This could indicate a logic error with a controller card.
   - More severe underlying problem caused the paper to jam, such as worn out rollers or a dead feed roller engine.

NOTE:
In either case listed in step 2, check the secondary error codes in the "Error Messages" section of this document.

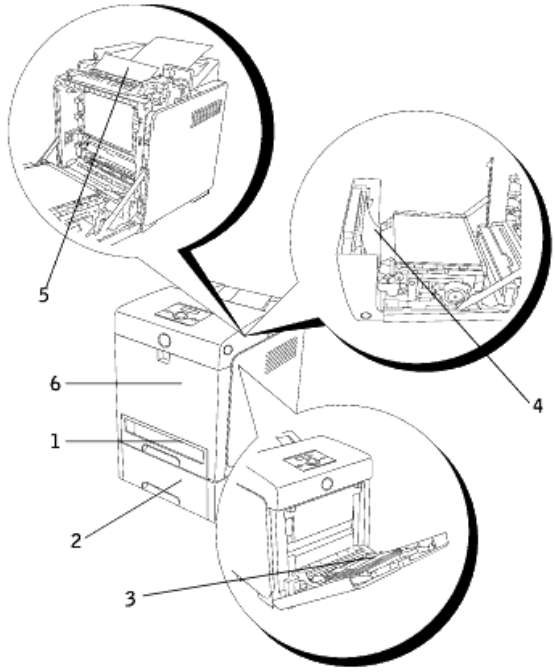
In short, a paper jam is nothing more than one or both of the following two conditions:

1. Paper is where it should not be.
2. Paper is not where it should be.

Paper jam causes can often be difficult to isolate, but you can use a few easy troubleshooting steps to find the cause of any paper jam. A few of these troubleshooting steps are as follows:

- Remove the paper and substitute paper from a freshly opened ream of proper-weight paper.
- Check the functionality of all sensors using the proper diagnostic tests (i.e., the corresponding DI test in Customer Diagnostics mode).
- For jams located in the area of the optional trays, remove the trays one at a time, attempt to print from different trays such as the MPF tray, clear NVRAM, and attempt to print the test pages to further isolate the area experiencing a paper jam issue.

The diagram below illustrates locations where paper jams can occur.



Paper Jam Locations	
	Jam Location
1	Standard 250-sheet tray
2	Optional 550-sheet feeder
3	Multipurpose feeder
4	Optional duplexer
5	Fuser
6	Front cover

For detailed information regarding clearing procedures for specific paper jams, refer to the "Clearing Jams" section of the User's Guide.

Additional information regarding specific paper jam error messages can be found in the "Operator Panel Messages" section of this document.

Noise Issues

Like all mechanical devices, the Dell™ 3110cn Color Laser Printer makes noise when it works. Sometimes customers have unrealistic expectations about the kinds of noise it should or should not make.

Noise issues in the 3110cn can come from any part that moves, and there are *many* moving parts:

- Motors
- Toner cartridge
- Rollers and roller feed assemblies
- Gear assemblies

The best course of action is to isolate the specific part causing the noise issue if possible. Try reseating components or swapping with known good parts from another printer if possible.

Incompatible media can cause the 3110cn to work harder than it was designed to work, in which case the excessive noise is indirectly caused by the media being used. Make sure the media in the printer falls within the 3110cn printer's media guidelines as specified in the "Paper Handling" topic of the User's Guide.

Setup and Configuration Issues

Setup and configuration calls are usually the easiest to handle. In most cases, the equipment functions properly; the customer just needs some help understanding how to make it work.

You can find most of the answers you need to handle setup and configuration calls in the User's Guide and Owner's Manual.

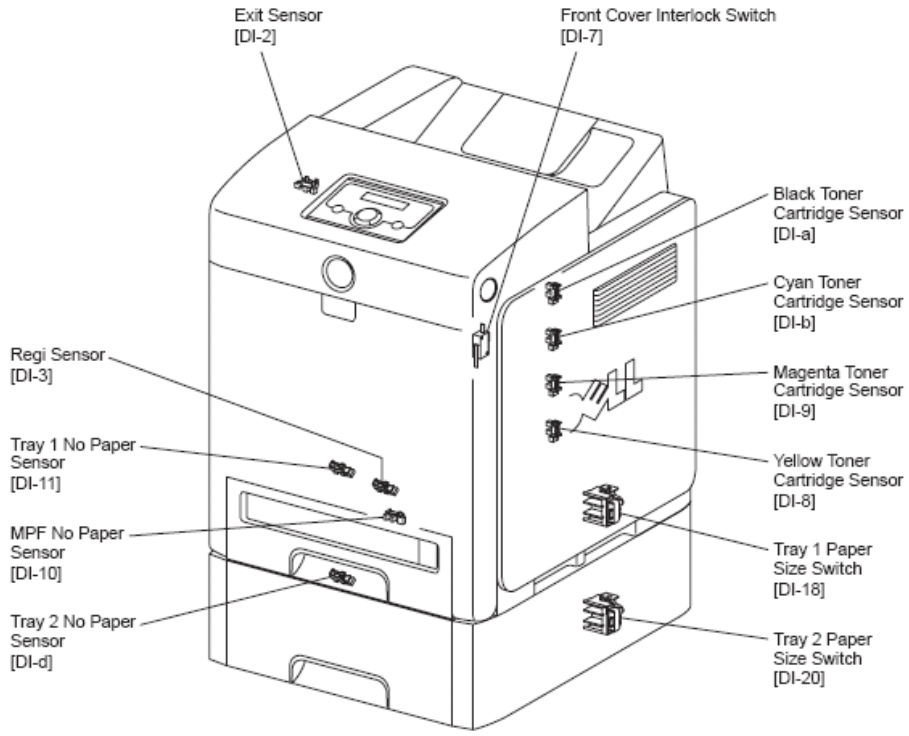
Additional information for specific setup and configuration issues can be found in the "Setup and Configuration" section of this document.

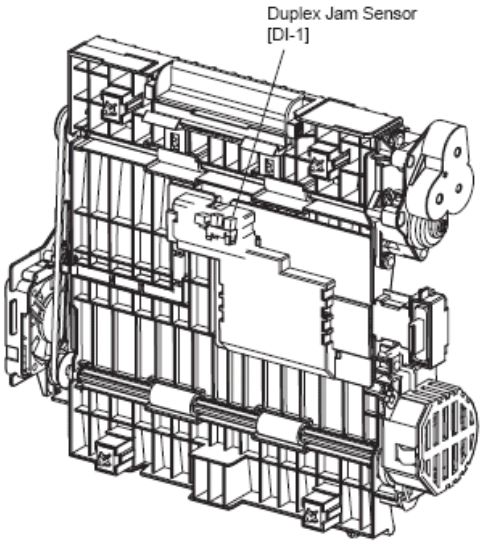
Digital Input and Digital Output Reference

The following illustrations are included as a reference for the physical location of internal compnents for testing purposes. The information regarding specific Digital Input (DI) and Digital Output (DO) tests can be found on the respective pages in this document.

Digital Input Tests Reference

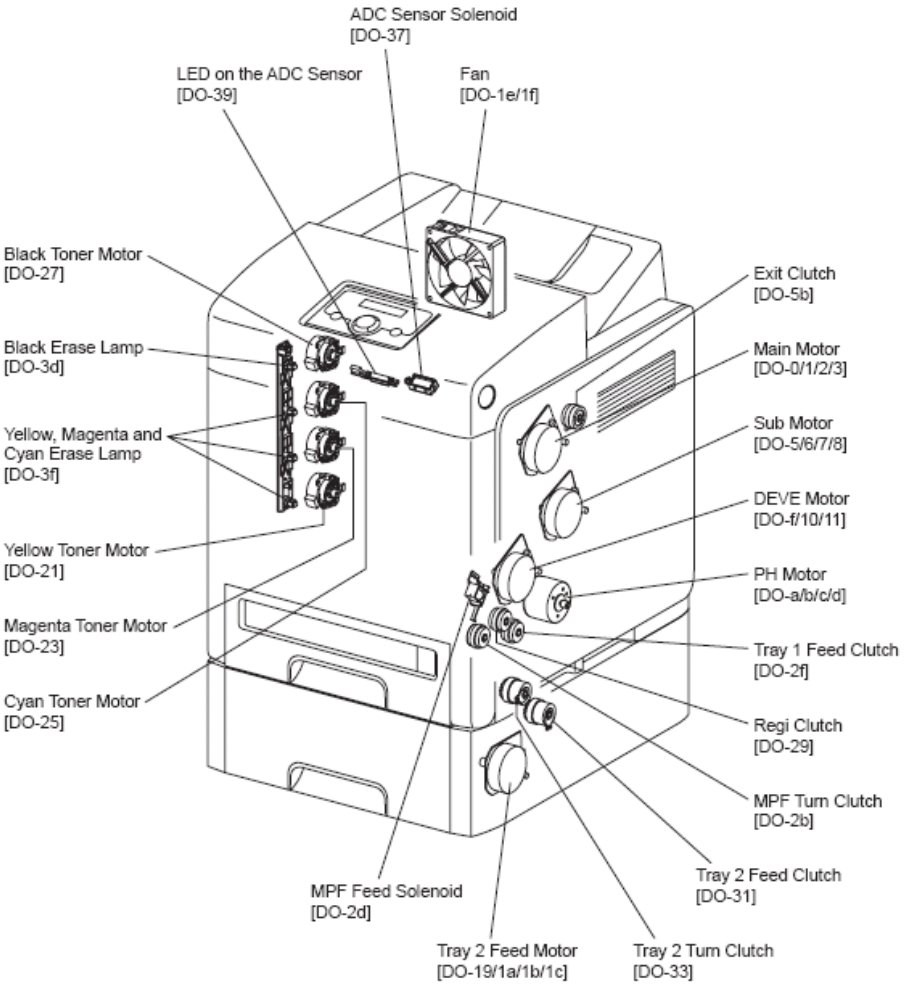
The following illustrations reference the physical locations of components in regard to the DI test procedures.

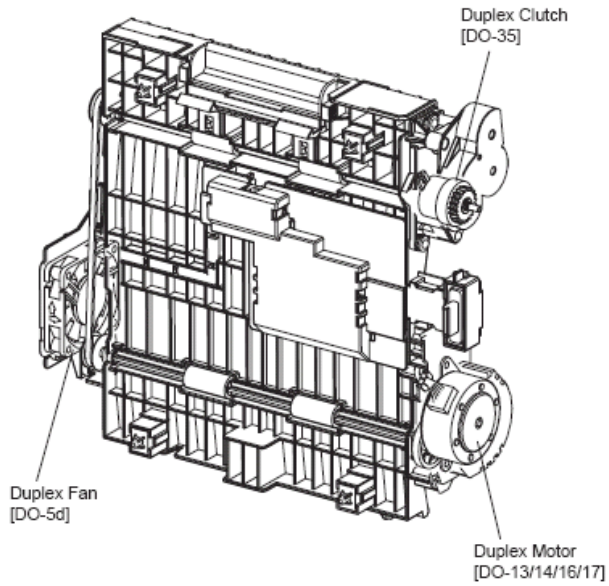




Digital Output Tests Reference

The following illustrations reference the physical locations of components in regard to the DO test procedures.





Digital Input Tests

The following table contains a list of Customer mode IOT Diags>Digital Input (DI) tests and a description of what each test does. Suggestions about replacing defective parts and troubleshooting adjustments are given to help resolve related issues.

These tests can be accessed by entering Customer mode, choosing the IOT option, and then choosing the DI Tests option. Perform the following steps to enter Customer mode:

1. Press and hold the up arrow (▲) and down arrow (▼), and then turn on the printer.
2. Release the arrows when *Diagnosing...* appears on the operator panel.
3. *Customer Mode* should appear on the operator panel.
4. Press the down arrow (▼) until the LCD displays *IOT Diag*.
5. Press the Select (✔) button.
6. Press the down arrow (▼) until the LCD displays *Digital Input*.
7. Press Select (✔).
8. The LCD displays *Digital Input* and *DI- 1 Off*.
9. Press the down arrow (▼) until the LCD displays the desired DI test, and then press Select (✔) to run the test.

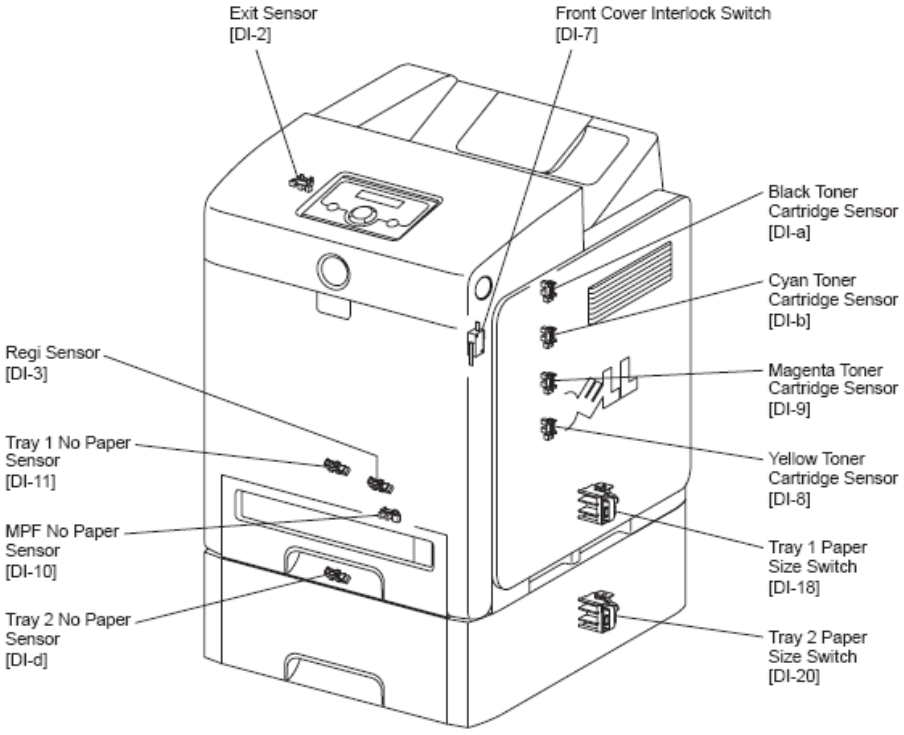
Exit Customer Diagnostic mode using the following steps:

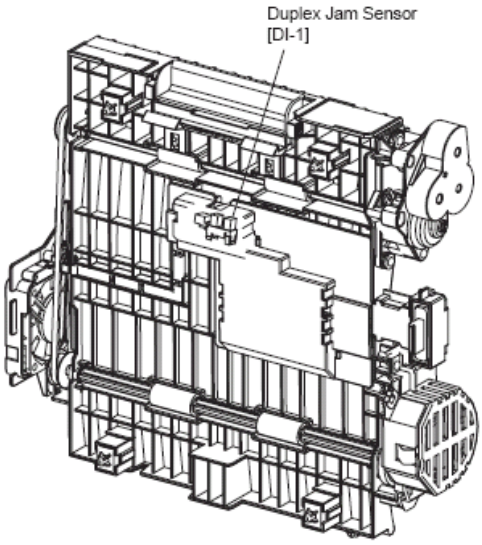
1. Turn the printer off.
2. Ensure all doors, covers, and interlocks are restored to normal operating state.
3. Turn the printer back on.

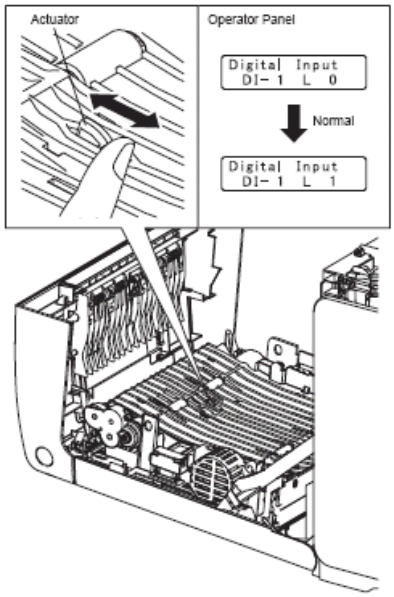
NOTE:
The Digital Input tests can not be run in conjunction with any other tests (i.e., Digital Output tests).

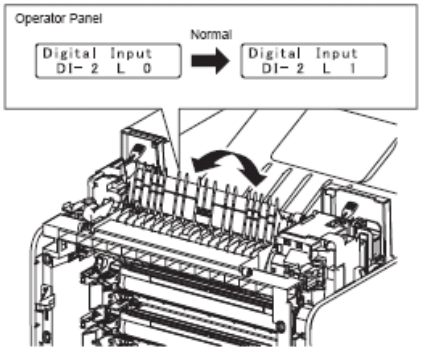
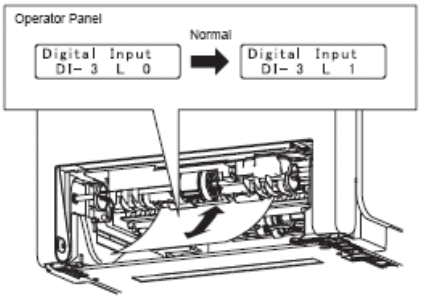
WARNING:
Covers are never to be removed by a customer while the printer is plugged into AC power because serious injury could result.

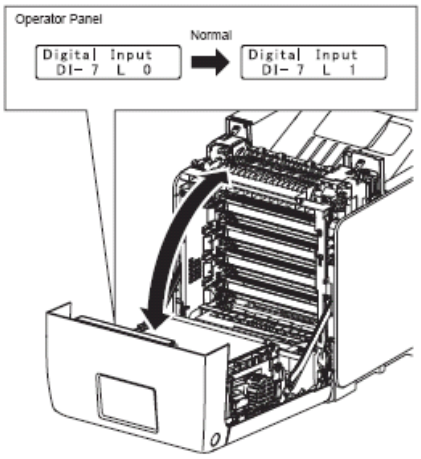
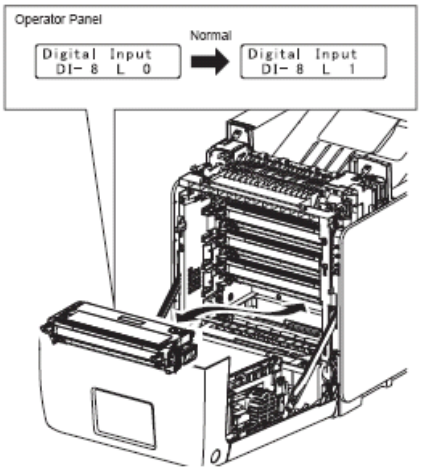
The following illustrations reference the physical locations of components in regard to the DI test procedures.

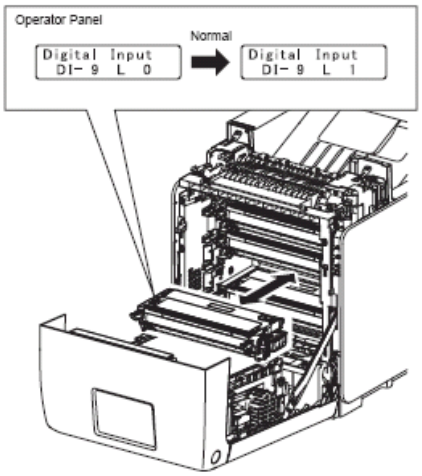
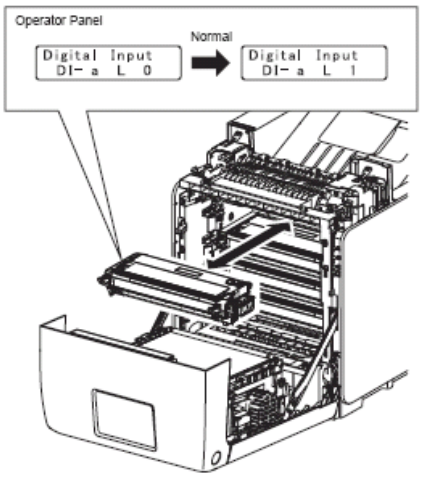


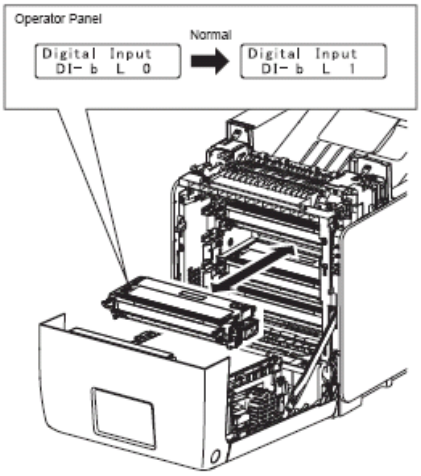
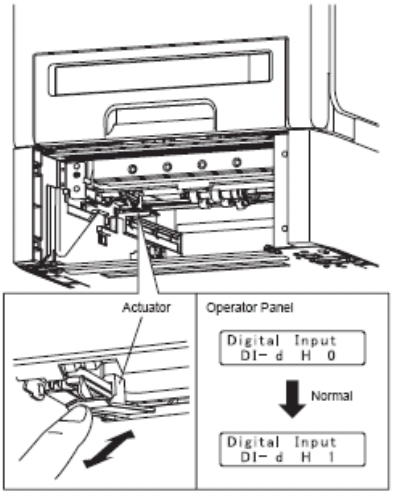


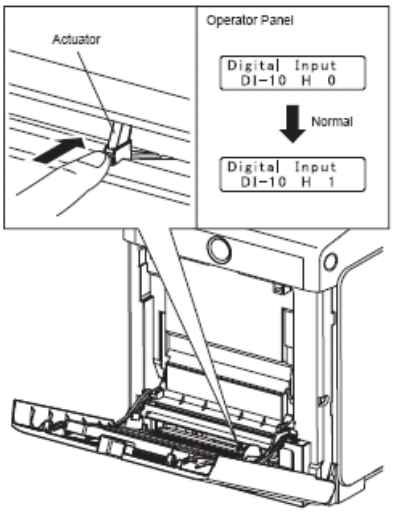
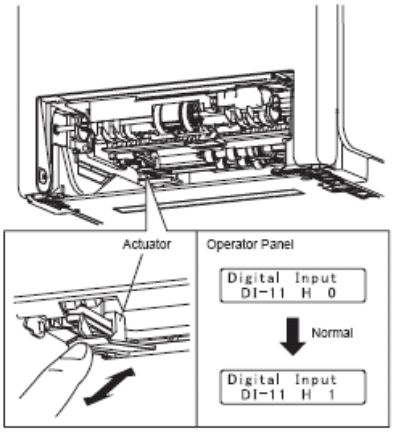
Test Number	Function Tested	Test Notes
DI- 1	Duplex jam sensor (if installed)	NOTE:When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-1. 3) Open the Front Cover. 4) Remove the Transfer Belt. 5) Check the sensor.  6) Press the "Cancel" key to stop the test. 7) Replace the Transfer Belt. 8) Close the Front Cover.
DI- 2	Exit sensor	

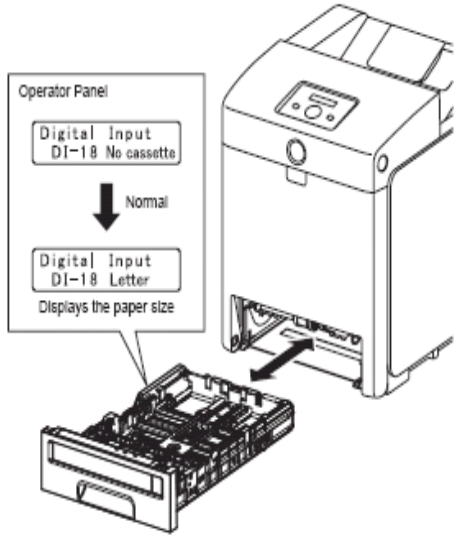
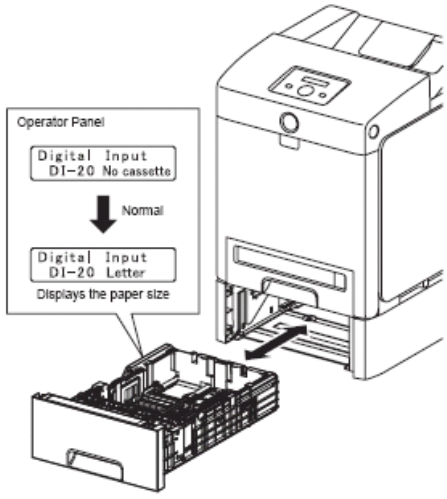
		NOTE: Fuser is very hot, so pay sufficient attention to avoid burns, etc. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-2. 3) Open the Front Cover. 4) Check the sensor by lifting, lowering, etc., the fuser exit guide plate.  5) Press the "Cancel" key to stop the test. 6) Close the Front Cover.
DI- 3	Registration sensor	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-3. 3) Remove the 250 paper cassette. 4) Insert the paper into the paper path of the Regi assy.  5) Press the "Cancel" key to stop the test. 6) Replace the 250 paper cassette.
DI-4	ROS ready	(Not used)
DI-7	Front cover interlock switch	

		1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-7. 3) Check the Switch by opening, closing, etc. the front cover.  4) Press the "Cancel" key to stop the test. 5) Close the Front Cover.
DI-8	Yellow toner cartridge sensor	NOTE: When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-8. 3) Open the Front Cover 4) Check the Sensor by removing, inserting, etc. the cartridge.  5) Press the "Cancel" key to stop the test. 6) Close the Front Cover.
DI-9	Magenta toner cartridge sensor	

		NOTE: When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-9. 3) Open the Front Cover 4) Check the Sensor by removing, inserting, etc. the cartridge.  5) Press the "Cancel" key to stop the test. 6) Close the Front Cover.
DI-a	Black toner cartridge sensor	NOTE: When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-b. 3) Open the Front Cover 4) Check the Sensor by removing, inserting, etc. the cartridge.  5) Press the "Cancel" key to stop the test. 6) Close the Front Cover.
DI-b	Cyan toner cartridge sensor	

		NOTE: When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-a. 3) Open the Front Cover 4) Check the Sensor by removing, inserting, etc. the cartridge.  5) Press the "Cancel" key to stop the test. 6) Close the Front Cover.
DI-d	Tray 2 no paper sensor	NOTE: The no paper sensor is in the option feeder. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-d. 3) Remove the Paper Cassette 4) Check the Sensor.  5) Press the "Cancel" key to stop the test. 6) Replace the paper cassette.
DI-e	Duplex fan alarm	(Not used)
DI-f	Tray 2 feed motor alarm	(Not used)
DI-10	MPF no paper sensor	

		NOTE: Remove the paper of the MPF before executing the test. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-10. 3) Open the MPF Cover. 4) Check the sensor.  5) Press the "Cancel" key to stop the test. 6) Close the MPF Cover.
DI-11	Tray 1 no paper sensor	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-11. 3) Remove the paper cassette. 4) Check the sensor.  5) Press the "Cancel key to stop the test. 6) Replace the paper cassette.
DI-12	Main motor alarm	(Not used)
DI-13	Sub motor alarm	(Not used)
DI-14	OHP sensor	(Not used)
DI-15	Fan alarm	(Not used)
DI-16	Feed drive alarm	(Not used)
DI-17	DEVE motor alarm	(Not used)
DI-18	Tray 1 paper size switch	

		1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-18. 3) Check the switch by sliding the rear fence in the tray to the desired paper size, then re-inserting the tray.  4) Press the "Cancel key to stop the test.
DI-20	Tray 2 paper size switch	NOTE: The size switch is in the option feeder. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DI-20. 3) Check the switch by sliding the rear fence in the tray to the desired paper size, then re-inserting the tray.  4) Press the "Cancel key to stop the test.

Digital Output Tests

The following table contains a list of Customer mode IOT Diags>Digital Output (DO) tests and a description of what each test does. Suggestions about replacing defective parts and troubleshooting adjustments are given to help resolve related issues.

These tests can be accessed by entering Customer mode, choosing the IOT option, and then choosing the DO Tests option. Perform the following steps to enter Customer mode:

1. Press and hold the up arrow (▲) and down arrow (▼), and then turn on the printer.
2. Release the arrows when you see *Diagnosing...* appear on the operator panel.
3. *Customer Mode* should appear on the operator panel.
4. Press the down arrow (▼) until the LCD displays *IOT Diag*.
5. Press the Select (✔) button.
6. Press the down arrow (▼) until the LCD displays *Digital Output*.
7. Press Select (✔).
8. The LCD displays *Digital Output, DO- 1 Off*.
9. Press the down arrow (▼) until the LCD displays the desired DO test, and then press Select (✔) to run the test.

Exit Customer Diagnostic mode using the following steps:

1. Turn the printer off.
2. Ensure all doors, covers, and interlocks are restored to normal operating state.
3. Turn the printer back on.

NOTE:
Several of the procedures in the table below refer to "cheating" the safety interlock system. This is accomplished by folding a piece of paper to a thickness where it can be pressed into the front cover interlock to simulate the cover latch being engaged. This makes the printer act as though the door is closed, allowing you to perform the tests and see the internal devices in operation.

WARNING:
NEVER direct a customer to cheat a safety interlock. Doing so may cause severe injury and leave you and Dell, Inc. liable for damages.

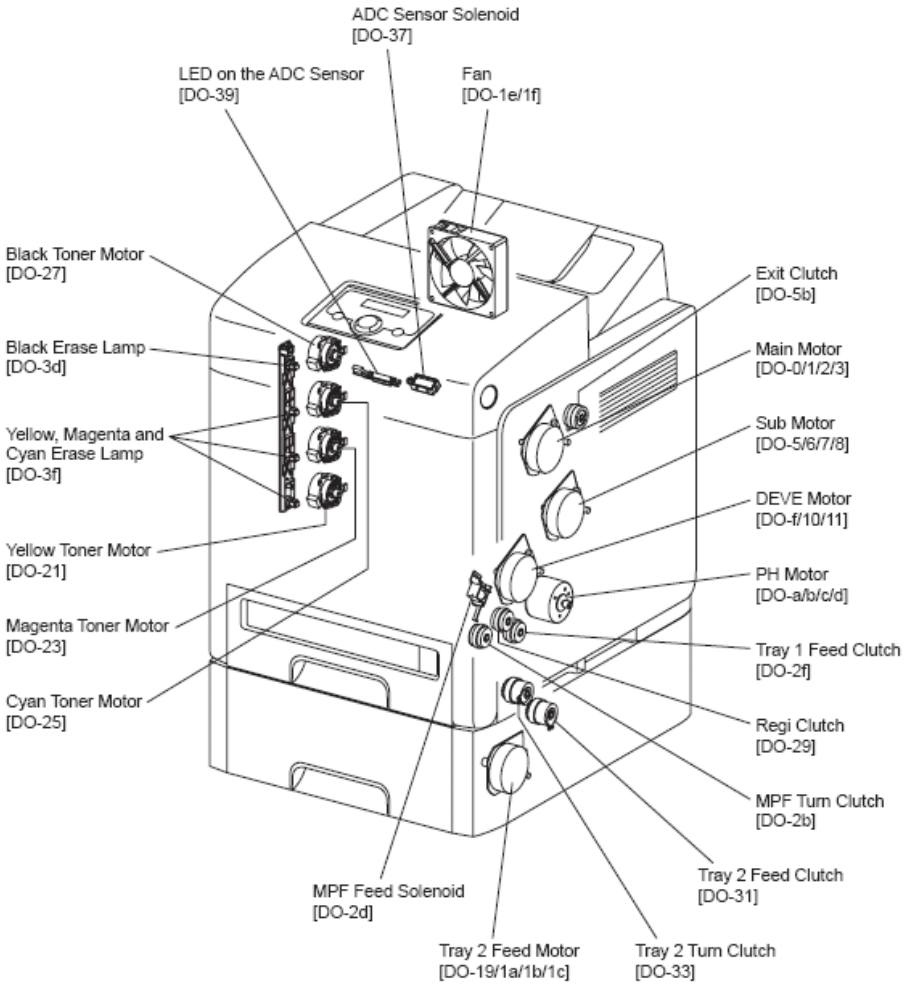
WARNING:
The Customer mode diagnostic tests described below are only to be performed by a Dell™ Imaging Service Force (ISF) certified technician. Covers are never to be removed by a customer while the printer is plugged into AC power because serious injury could result.

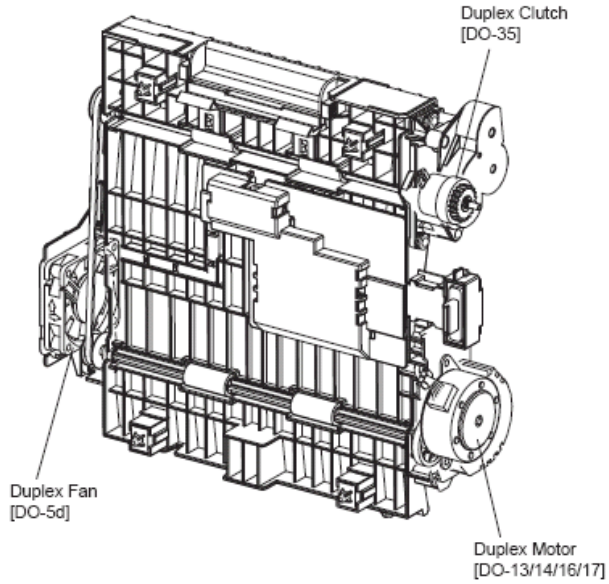
Manual Paper Feed Test Procedures

These sequences of DO tests can be used to manually feed paper through the 3110cn printer using the available paper paths.

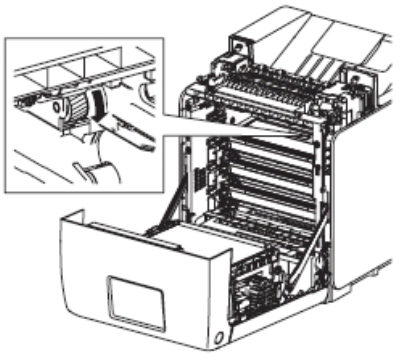
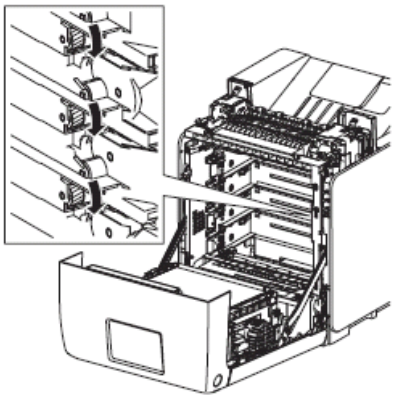
DO Tests and Functions

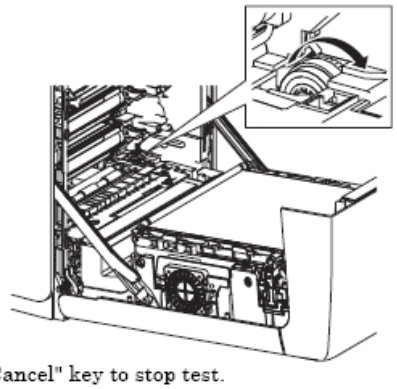
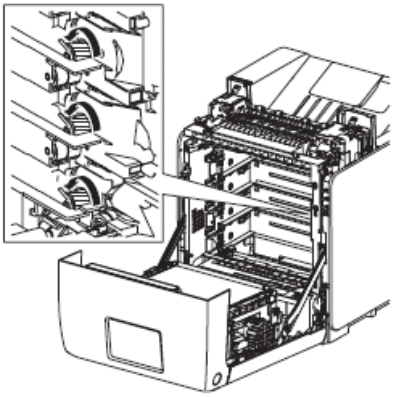
The following illustrations reference the physical locations of components in regard to the DO test procedures.

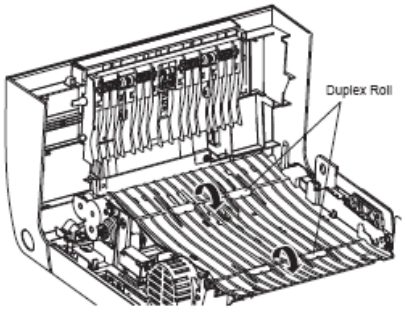
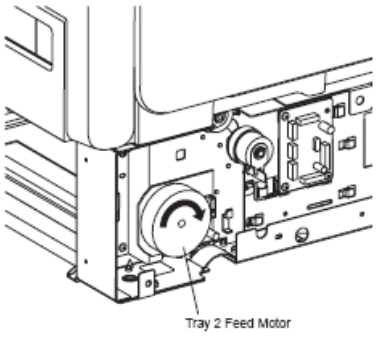


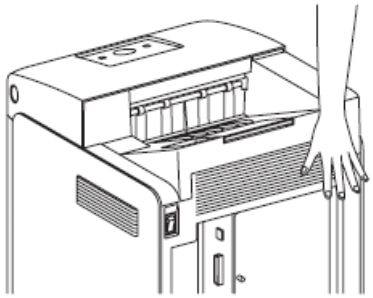
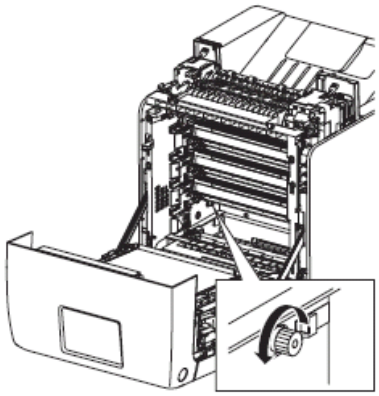


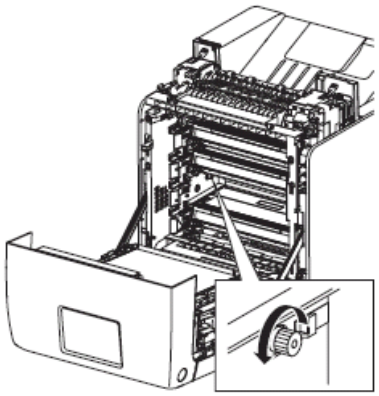
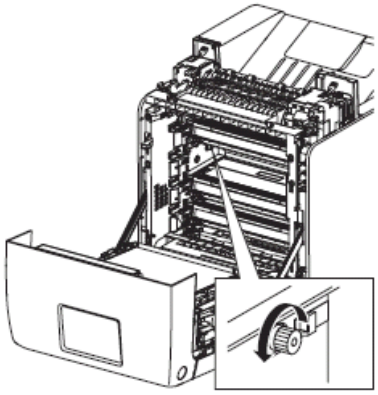
Test Number	Function Tested	Test Notes
DO- 0, 1, 2, 3	Main motor Drives Transfer Belt, Fuser, and Black Drum; 4-speeds (also drives Exit Rollers when DO-5b is executed)	

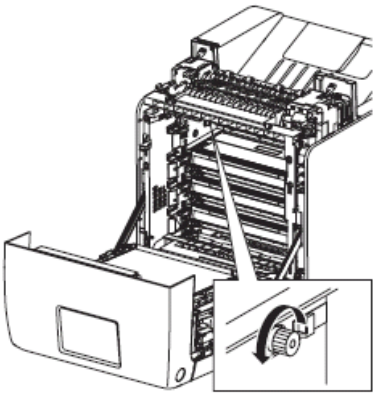
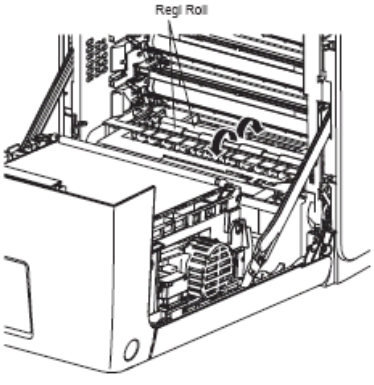
		NOTE: This procedure is for the technical staff. The customer checks are procedures 1, 5 and 6. The main motor is in the PC/DEVE DRIVE. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. The rotational speed of the motor is as follows. DO-3<DO-2<DO-0<DO-1 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the black toner cartridge. 4) Cheat the safety Interlock System. 5) Execute the DO-0. Observe the gear rotation. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater and replace the black toner cartridge. 8) Close the Front Cover.
DO- 5, 6, 7, 8	SUB motor Drives developer mag roller for Black and C-M-Y drums; 4-speeds	NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. The sub motor is in the PC/DEVE DRIVE. When performing operation for five minutes or longer with the front cover open, remove The rotational speed of the motor is as follows. DO-8<DO-7<DO-5<DO-6 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the all toner cartridges. 4) Cheat the safety Interlock System. 5) Execute the DO-5. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater and replace the all toner cartridges. 8) Close the Front Cover.
DO- a, b, c, d	PH motor Paper Handler motor, 4-speeds	

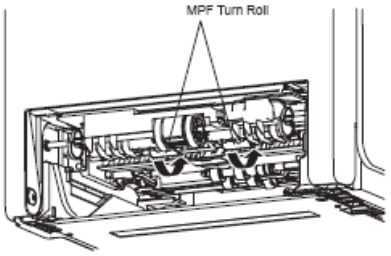
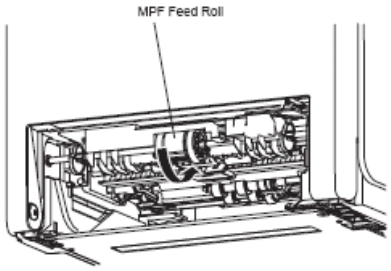
		NOTE: This procedure is for the technical staff. The customer checks are steps 1, 4 and 5. The PH motor is in the FEED DRIVE. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. The rotational speed of the motor is as follows. DO-d<DO-c<DO-a<DO-b 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-a. (The customer can confirm the motor noise only.)  5) Press the "Cancel" key to stop test. 6) Remove the cheater. 7) Close the Front Cover.
DO- f, 10, 11	DEVE motor Drives DEVEloper mag rollers motor for C-M-Y; 3-speeds	NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. The DEVE motor is in the PC/DEVE DRIVE. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. The rotational speed of the motor is as follows. DO-11<DO-10<DO-f 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the yellow, magenta and cyan toner cartridges. 4) Cheat the safety Interlock System. 5) Execute the DO-f. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater and replace the yellow, magenta and cyan toner cartridges. 8) Close the Front Cover.
DO-13, 14, 16, 17	Dup motor Duplex unit motor (if installed); 4-speeds	

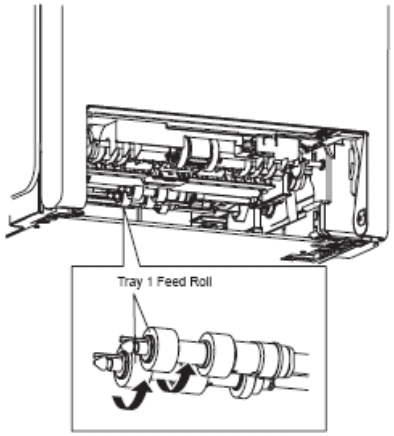
		NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. The motor is in the DUPLEX MODULE. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. The rotational speed of the motor is as follows. DO-17<DO-16<DO-14<DO-13 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Remove the transfer belt. 5) Execute the DO-13. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater and replace the transfer belt. 8) Close the Front Cover.
DO-19, 1a, 1b, 1c	Tray 2 feed motor Paper drive motor for tray 2 (if installed); 4-speeds	NOTE: This procedure is for the technical staff. The customer checks are steps 1, 4 and 5. The rotational speed of the motor is as follows. DO-1c<DO-1b<DO-19<DO-1a 1) turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 2 paper cassette. 3) Remove the left side cover of the Tray 2. 4) Execute the DO-19. (The customer can confirm the motor noise only.)  5) Press the "Cancel" key to stop the test. 6) Replace the left side cover of the Tray 2. 7) Replace the Tray 2 paper cassette.
DO-1e, 1f	Fan Main Fan intake; 2-speeds	

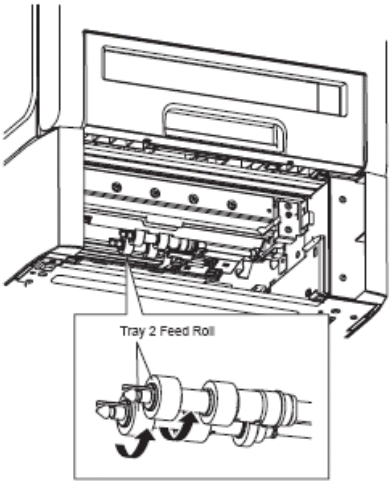
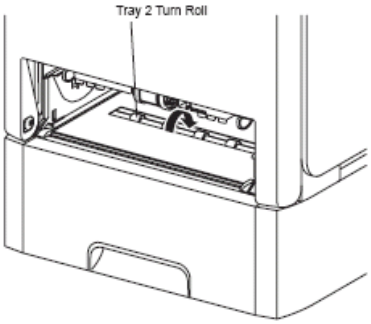
		NOTE: The rotational speed of the fan is as follows. DO-1f<DO-1e 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-1e.  3) Press the "Cancel" key to stop test.
DO-21	Yellow toner motor	NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Remove the yellow toner cartridge. 5) Execute the DO-21. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Replace the yellow toner cartridge. 8) Remove the cheater. 9) Close the Front Cover.
DO-23	Magenta toner motor	

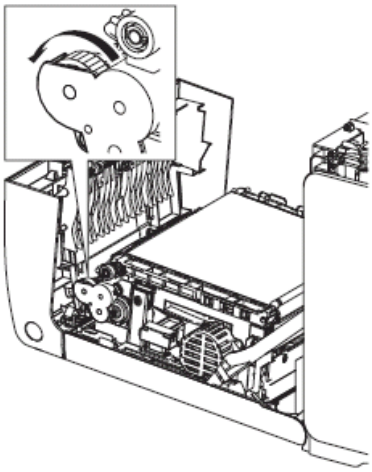
		NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the magenta toner cartridge. 4) Cheat the safety Interlock System. 5) Execute the DO-23. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater. 8) Replace the magenta toner cartridge. 9) Close the Front Cover.
DO-25	Cyan toner motor	NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the cyan toner cartridge. 4) Cheat the safety Interlock System. 5) Execute the DO-25. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater. 8) Replace the cyan toner cartridge. 9) Close the Front Cover.
DO-27	Black toner motor	

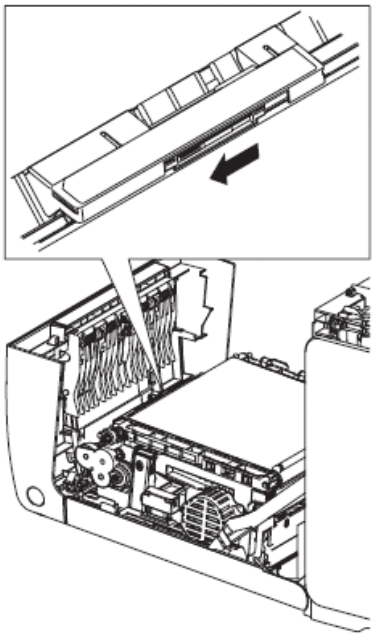
		NOTE: This procedure is for the technical staff. The customer checks are steps 1, 5 and 6. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Remove the black toner cartridge. 4) Cheat the safety Interlock System. 5) Execute the DO-27. (The customer can confirm the motor noise only.)  6) Press the "Cancel" key to stop test. 7) Remove the cheater. 8) Replace the black toner cartridge. 9) Close the Front Cover.
DO-29	Regi clutch REGIstration rollers clutch	NOTE: When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-29. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test as follows. NOTE: The regi roll rotates when the DO-a and the DO-29 are executed. This procedure is for the technical staff. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-a and the DO-29.  5) Confirm the Regi Roll rotation. 6) Press the "Cancel" key to stop the clutch. 7) Press the "▼" key to display the DO-a. 8) Press the "Cancel" key to stop the motor. 9) Remove the cheter and close the Front Cover.

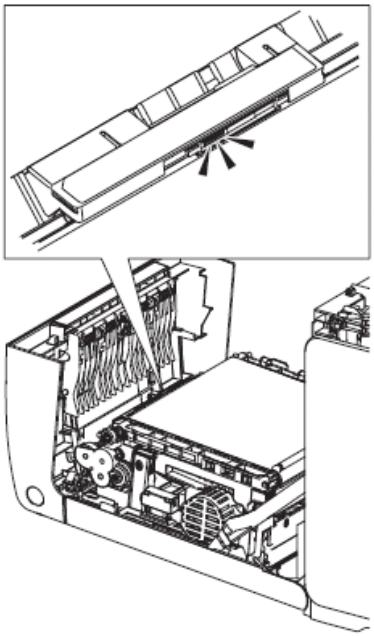
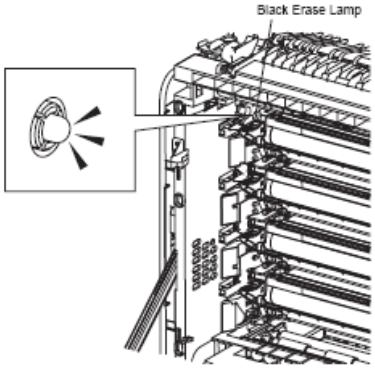
DO-2b	MPF turn clutch Multi-Purpose Feeder turn clutch, drives paper from MPF feed or (Duplex unit) into REGIstration rollers	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-2b. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The MPF turn roll rotates when the DO-a and the DO-2b are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 1 paper cassette. 3) Execute the DO-a and the DO-2b.  4) Confirm the Turn Roll rotation. 5) Press the "Cancel" key to stop the clutch. 6) Press the "▼" key to display the DO-a. 7) Press the "Cancel" key to stop the motor. 8) Replace the Tray 1 paper cassette.
DO-2d	MPF feed solenoid	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-2d. Upon hitting the "return" key, the operating noise of the solenoid "may" be heard. 3) Press the "Cancel" key to stop the solenoid. Combination test is as follows. NOTE: The MPF feed roll rotates when the DO-a and the DO-2d are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 1 paper cassette. 3) Execute the DO-a and the DO-2d.  4) Confirm the Feed Roll rotation. 5) Press the "Cancel" key to stop the clutch. 6) Press the "▼" key to display the DO-a. 7) Press the "Cancel" key to stop the motor. 8) Replace the Tray 1 paper cassette.
DO-2f	Tray 1 feed clutch	

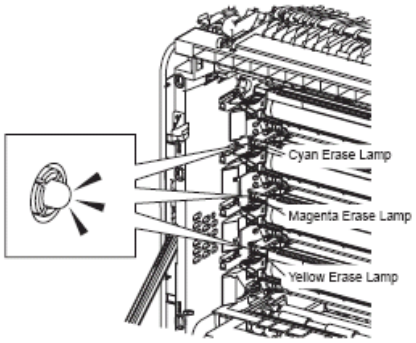
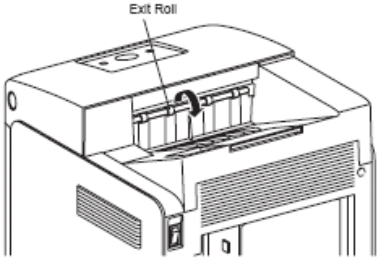
		1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-2f. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The Tray 1 feed roll rotates when the DO-a and the DO-2f are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 1 paper cassette. 3) Execute the DO-a and the DO-2f.  4) Confirm the feed Roll rotation. 5) Press the "Cancel" key to stop the clutch. 6) Press the "▼" key to display the DO-a. 7) Press the "Cancel" key to stop the motor. 8) Replace the Tray 1 paper cassette.
DO-31	Tray 2 feed clutch Feeds paper from tray 2 (if installed)	

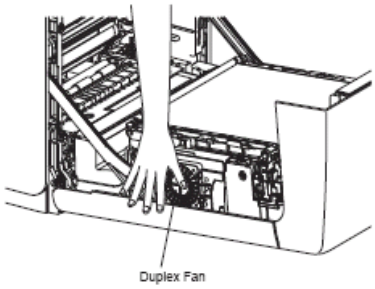
		1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-31. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The Tray 2 feed roll rotates when the DO-19 and the DO-31 are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 2 paper cassette. 3) Execute the DO-19 and the DO-31.  4) Confirm the feed Roll rotation. 5) Press the "Cancel" key to stop the clutch. 6) Press the "▼" key to display the DO-19. 7) Press the "Cancel" key to stop the motor. 8) Replace the Tray 2 paper cassette.
DO-33	Tray 2 turn clutch Feeds paper from tray 2 (if installed) up thru tray 1 into REGIstration roller	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-33. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The Tray 2 turn roll rotates when the DO-19 and the DO-33 are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Remove the Tray 1 paper cassette. 3) Execute the DO-19 and the DO-33.  4) Confirm the Turn Roll rotation. 5) Press the "Cancel" key to stop the clutch. 6) Press the "▼" key to display the DO-19. 7) Press the "Cancel" key to stop the motor. 8) Replace the Tray 1 paper cassette.
DO-35	Dup clutch *	

	Duplex Clutch, engages Exit rollers in reverse direction * Do not run if DO-5b is running.	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-35. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The duplex gear rotates when the DO-13 and the DO-35 are executed. This procedure is for the technical staff. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-13 and the DO-35.  5) Confirm the gear rotation. 6) Press the "Cancel" key to stop the clutch. 7) Press the "▼" key to display the DO-13. 8) Press the "Cancel" key to stop the motor. 9) Remove the cheater and close the Front Cover.
DO-37	ADC sensor solenoid Moves cleaning pad across ADC lens when executed; retracts when OFF.	

		NOTE: This procedure is for the technical staff. The customer checks are steps 1, 4 and 5. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-37. (The customer can confirm the motor noise only.)  5) Press the "Cancel" key to stop the solenoid. 6) Remove the cheater and clode the Front Cover.
DO-39	ADC sensor LED Illuminates ADC sensor LED when executed.	

		NOTE: This procedure is for the technical staff. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-39.  5) Press the "Cancel" key to stop the LED lighting. 6) Remove the cheater and clode the Front Cover.
DO-3d	Black drum erase lamp	NOTE: This procedure is for the technical staff. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-3d.  5) Press the "Cancel" key to stop the LED lighting. 6) Remove the cheater and close the Front Cover.
DO-3f	Yellow, magenta, and cyan drum erase lamp	

		NOTE: This procedure is for the technical staff. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-3f.  5) Press the "Cancel" key to stop the LED lighting. 6) Remove the cheater and clode the Front Cover.
DO-5b	Exit clutch * Drives Exit Rollers (if DO-0,1,2,3 is running) * Do not run if DO-35 is running.	1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-5b. Upon hitting the "return" key, the clutch will engage. 3) Press the "Cancel" key to stop the clutch. Combination test is as follows. NOTE: The exit roll rotates when the DO-0 and the DO-5b are executed. 1) Turn on the power and enter the Diagnostic Mode. 2) Execute the DO-0 and the DO-5b.  3) Confirm the Exit Roll rotation. 4) Press the "Cancel" key to stop the clutch. 5) Press the "▼" key to display the DO-0. 6) Press the "Cancel" key to stop the motor.
DO-5d	Duplex fan intake	

		NOTE:This procedure is for the technical staff. The customer checks are steps 1, 4 and 5. When performing operation for five minutes or longer with the front cover open, remove or cover all toner cartridges to avoid prolonged exposure to light. 1) Turn on the power and enter the Diagnostic Mode. 2) Open the Front Cover. 3) Cheat the safety Interlock System. 4) Execute the DO-5d. (The customer can confirm the fan noise only.)  5) Press the "Cancel" key to stop the test. 6) Remove the cheater and close the Front Cover.

Sequences of DO tests

Manual Feed Tests

These tests depend on the printer having all major paper path componnents installed and the front cover closed.

Because these tests run with NO sensor interaction, the paper will be fed "end-to-end". In other words, there will be no spacing between pages. It may be necessary to Start—Cancel—Start the last test of the sequence to duplicate the actions of a paper feed issue.

Paper Source	Speed	DO sequence (test+test+test...)
Tray-1 (250-sheet)	Low	DO-3 + DO-d + DO-29 + DO-5b + DO-2f
Tray-1 (250-sheet)	High	DO-1 + DO-b + DO-29 + DO-5b + DO-2f
Tray-2 (550-sheet)	Low	DO-3 + DO-d + DO-29 + DO-5b + DO-1c + DO-33 + DO-31
Tray-2 (550-sheet)	High	DO-1 + DO-b + DO-29 + DO-5b + DO-1a + DO-33 + DO-31
MPF		DO-3 + DO-d + DO-29 + DO-5b + DO-2b + DO-2d

Safety Precautions

Observe the following safety precautions before performing any installation or break/fix procedures involving disassembly or re-assembly:

- Turn off the system and any attached peripherals.
- Disconnect the system and any attached peripherals from AC power, and then remove the battery.
- Disconnect any telephone or telecommunications lines from the system.
- Use a wrist grounding strap and mat when working inside any computer system to avoid electrostatic discharge (ESD) damage.
- After removing any system component, carefully place the removed component on an anti-static mat.
- Wear shoes with non-conductive rubber soles to help reduce the chance of being shocked or seriously injured in an electrical accident.

Standby Power

Dell products with standby power must be completely unplugged before opening the case. Systems that incorporate standby power are essentially powered while turned off. The internal power allows the system to be remotely turned on (wake on LAN), suspended into a sleep mode, and have other advanced power management features. After unplugging the system, allow the charge to drain from the circuits by waiting approximately 30 to 45 seconds before removing components.

ESD

ESD is a major concern when handling components, especially expansion cards and system boards. Very slight charges can damage circuits in ways that may not be obvious, such as intermittent problems or a shortened product lifespan.

WARNING:
Do not use an ESD grounding strap when working on the internal parts of a monitor, like the CRT, because the stored voltage is extremely harmful.

To prevent static damage, do the following:

- Use an ESD wrist strap that is properly grounded.

- If a strap is not available, discharge static electricity from your body *before* you touch any of your computer's electronic components, by touching an unpainted metal surface on the computer chassis. Periodically touch an unpainted metal surface to remove any static charge your body may have accumulated.
- Handle all static-sensitive components in a static-safe area. If possible, use anti-static floor pads and workbench pads.
- When handling static-sensitive components, grab them by the sides, not the top. Avoid touching pins and circuit boards.
- When unpacking a static-sensitive component from its shipping carton, do not remove the component from the anti-static packing material until you are ready to install the component. Before unwrapping the anti-static packaging, be sure to discharge static electricity from your body.
- Before transporting a static-sensitive component, place it in an anti-static container or packaging.

Lifting Equipment

CAUTION:
Do not lift greater than 50 pounds independently. Always obtain assistance from a second person or utilize a mechanical lifting device.

Adhere to the following guidelines when lifting equipment:

1. Get a firm balanced footing. Keep your feet apart for a stable base, and point your toes out.
2. Bend your knees. Do not bend at the waist.
3. Tighten stomach muscles. Abdominal muscles support your spine when you lift, offsetting the force of the load.
4. Lift with your legs, not your back.
5. Keep the load close. The closer it is to your spine, the less force it exerts on your back.
6. Keep your back upright, whether lifting or setting down the load. Do not add the weight of your body to the load. Avoid twisting your body and back.
7. Follow the same techniques in reverse to set the load down.

Disassembly Overview

The following table lists the Customer and Field Replaceable Units (CRUs and FRUs) for the Dell™ 3110cn Color Laser Printer.

You will need the following special tools for the disassembly of this printer:

- #2 Phillips magnetic screwdriver with 6-inch shaft
- Spring removal tool or small needle-nose pliers
- Small flat-head screwdriver

NOTE:
Development of these materials is a long and tedious process. Some of the pictures shown in the disassembly procedures may show additional parts removed than the procedure describes. This is done as a matter of convenience to the author and may not reflect actual disassembly requirements.

3110cn Printer CRU and FRU List	
Covers	**Electronics**
Cover–Rear	Electronic Subsystem (ESS) Control Board
Cover–Right	High Voltage Power Supply (HVPS)
Cover–Left	LED (Erase) Assembly
Cover–Top	Low Voltage Power Supply (LVPS)
Cover–MPF	Machine Control Unit (MCU)
Cover–Front	Memory (Option)
	Multi-Protocol Card (MPC)(Option)
	Operator Panel
	Printhead (ROS) Assembly
	Wireless LAN Adapter (Option)
CRUs	**Sensors / Switches**
250-Sheet Paper Tray	Humidity Sensor
250-Sheet Tray Feed Rollers	Interlock Switch Assembly
250-Sheet Tray Rear Cover	Paper Size Switch Assembly
250-Sheet Tray Separator Roller	Power Switch
550-Sheet Feeder/Screws (Option)	Toner Cartridge Sensor Assembly
550-Sheet Paper Tray (Option)	
550-Sheet Tray Feed Rollers (Option)	
550-Sheet Tray Rear Cover (Option)	
550-Sheet Tray Separator Roller (Option)	
Duplex Gate	
Duplex Unit (Option)	
Fuser Assembly	
MPF Feed Roller	
MPF Separator Roller Assembly	
Paper Exit Extender	
Paper/Transfer Belt	
Rubber Feet (x4)	
Spur Assembly (x2)	
Toner Cartridges	
Mechanical / Chassis	
Arm Assembly–Left	
Arm Assembly–Right	
ESS Shield Box	
Exit Chute Assembly	
Main Fan Assembly	
Feed Drive Assembly	
Integrated Feeder Assembly (Registration Assembly)	
Motor Assembly–Photoconductor / Developer Drive	
Motor Assembly–Toner Dispenser	
MPF Feed Solenoid	

250-Sheet Paper Tray

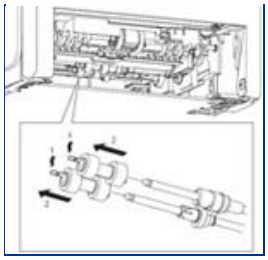
The following table outlines the steps for removing and replacing the internal 250-sheet paper tray.

Removing and Replacing the Internal 250-Sheet Paper Tray	
1.	Before removing the paper tray, orient the front of the printer to face you.
2.	Grasp the paper tray handle and pull the tray straight out. When the tray stops, lift it slightly to pull it out completely. 
3.	Reverse the previous step to replace the paper tray.

250-Sheet Tray Feed Rollers

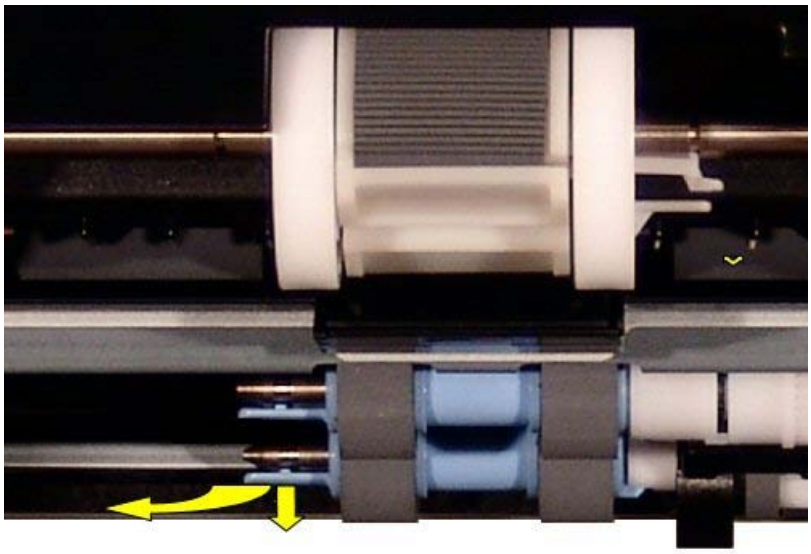
The following table outlines the steps for removing and replacing the internal 250-sheet tray feed rollers.

Removing and Replacing the Internal 250-Sheet Tray Feed Rollers	
1.	Before removing the internal 250-sheet tray feed rollers: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray.
2.	Click to enlarge

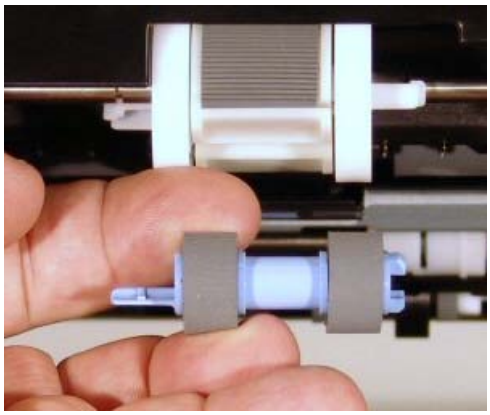


To locate the rollers, peer inside the area from where the 250-sheet paper tray was removed. Approximately a third of the distance back from the front of the unit are two roller assemblies. They are blue plastic with two grey rubber tires on each roller.

Rotate the roller to be removed so the tab at the end of the roller is easily seen. Slightly bend the tab to release the hook from the tip of the shaft.



3. Pull the roller assembly off the end of the shaft.



4. Repeat steps 2 and 3 for the remaining roller assembly.

5. Reverse the previous steps to replace the internal 250-sheet tray feed rollers.
As the roller is slid onto the shaft, it may need to be rotated to engage the key slots.

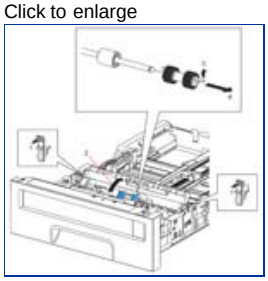
250-Sheet Tray Rear Cover

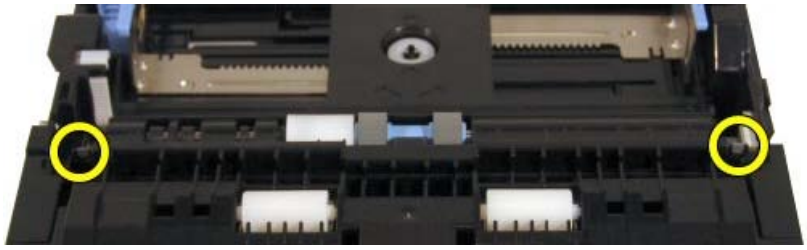
The following table outlines the steps for removing and replacing the 250-sheet tray rear cover.

Removing and Replacing the 250-Sheet Tray Rear Cover	
1.	Before removing the 250-sheet tray rear cover: • Remove the internal 250-sheet paper tray.
2.	Depress the center of the 250-sheet tray rear cover while pulling it straight out (see diagram). 
3.	Reverse the previous step to replace the 250-sheet tray rear cover.

250-Sheet Tray Separator Roller

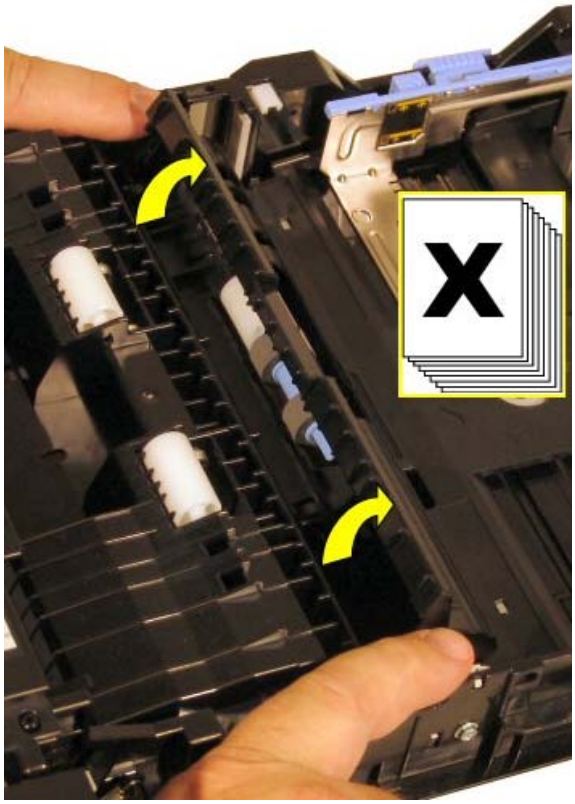
The following table outlines the steps for removing and replacing the internal 250-sheet tray separator roller assembly.

Removing and Replacing the Internal 250-Sheet Tray Separator Roller Assembly	
1.	Before removing the internal 250-sheet tray separator roller assembly: • Remove the internal 250-sheet paper tray. • Remove all the paper from the tray.
2.	Click to enlarge  Orient the tray with the front facing you and locate the two gray handles near each side of the tray.



3. Fully open the cover.

NOTE:
Ensure that all paper has been removed from the tray. The separator cover will not open all the way if paper is still in the tray.



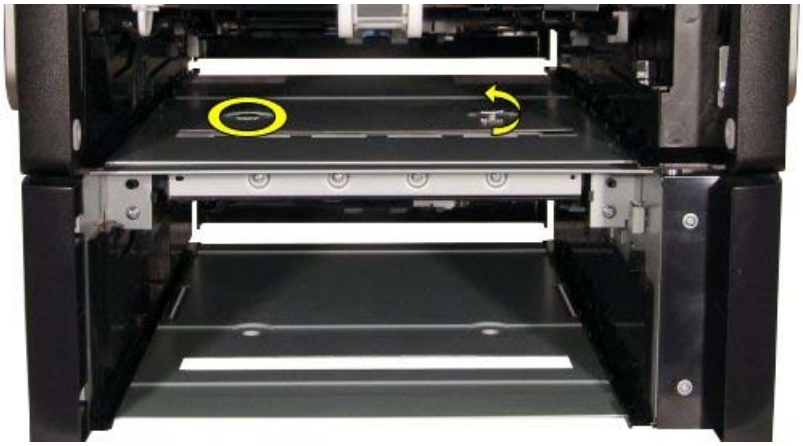
4. Rotate the roller so the tab at the end of the roller is easily seen. Slightly bend the tab to release the hook from the tip of the shaft, and then pull the roller assembly off the end of the shaft.

	
5.	Reverse the previous steps to replace the internal 250-sheet tray separator roller assembly.

550-Sheet Feeder/Screws (Option)

The following table outlines the steps for removing and replacing the optional 550-sheet feeder and mounting screws.

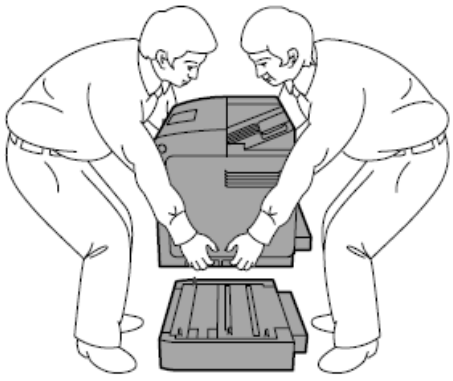
Removing and Replacing the 550-Sheet Feeder and Mounting Screws	
1.	Before removing the 550-sheet feeder: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray. • Remove the toner cartridges to reduce the overall weight of the printer.
2.	Peering inside the space from where the 250-sheet paper tray was removed, locate and remove the two screws on the bottom of the chassis. These screws are used to secure the printer to the optional 550-sheet paper feeder unit. If the screws are too tight, a coin can be used to loosen them.



NOTE:
At the time these pictures were taken, a production revision 550-sheet paper feed unit was not available. The unit shown in the image is functionally identical to the production revision except for the textured plastics.

3. CAUTION:
The back side of the printer is heavier than the front side. To prevent the printer from becoming unbalanced during lifting, carefully lift the printer with one person in the front and one person in the back. Never try to lift the printer while facing its right and left sides.

With one person positioned at the front of the printer and the other person behind the printer, lift the printer straight up and set it on the floor or a table suitable for its weight.



4. Reverse the previous steps to replace the 550-sheet feeder and mounting screws.

550-Sheet Paper Tray (Option)

The following table outlines the steps for removing and replacing the optional 550-sheet paper tray.

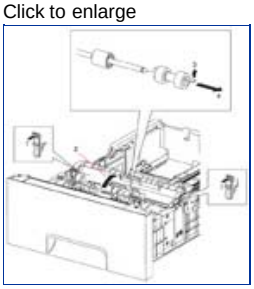
Removing and Replacing the Optional 550-Sheet Paper Tray	
1.	Before removing the paper tray, orient the front of the printer to face you.
2.	Grasp the paper tray handle and pull the tray straight out. When the tray stops, lift it slightly and continue to pull it out.  NOTE: At the time these pictures were taken, a production revision 550-sheet paper feed unit was not available. The unit shown in the image is functionally identical to the production revision except for the textured plastics.
3.	Reverse the previous step to replace the optional 550-sheet paper tray.

550-Sheet Tray Separator Roller (Option)

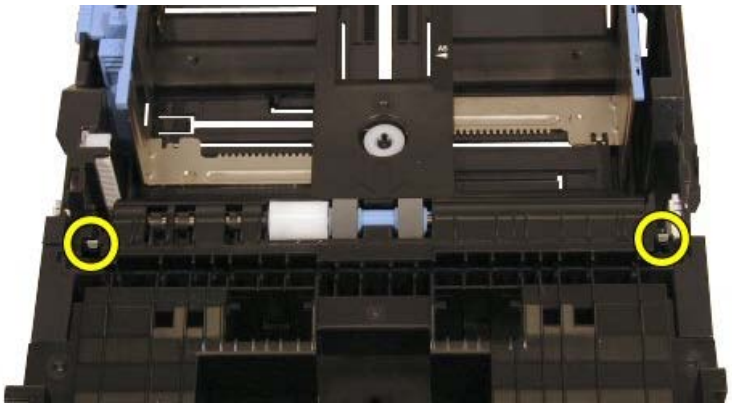
The following table outlines the steps for removing and replacing the optional 550-sheet tray separator roller assembly.

Removing and Replacing the 550-Sheet Tray Separator Roller Assembly	
1.	Before removing the 550-sheet tray separator roller assembly: • Remove the optional 550-sheet paper tray. • Remove all the paper from the tray.

2. Click to enlarge

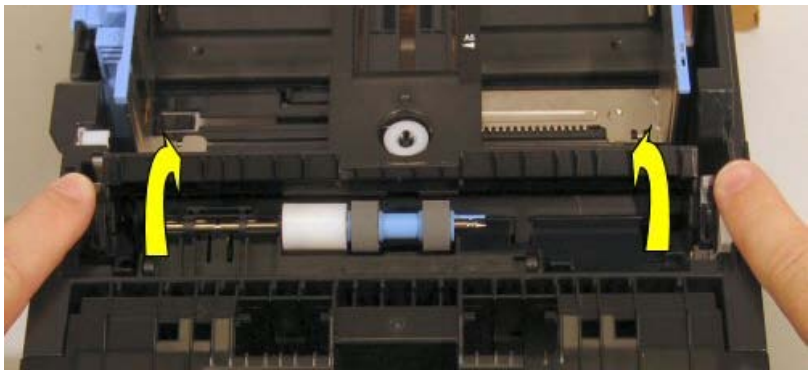


Orient the tray with the front facing you, and then locate the two gray handles near each side of the tray.

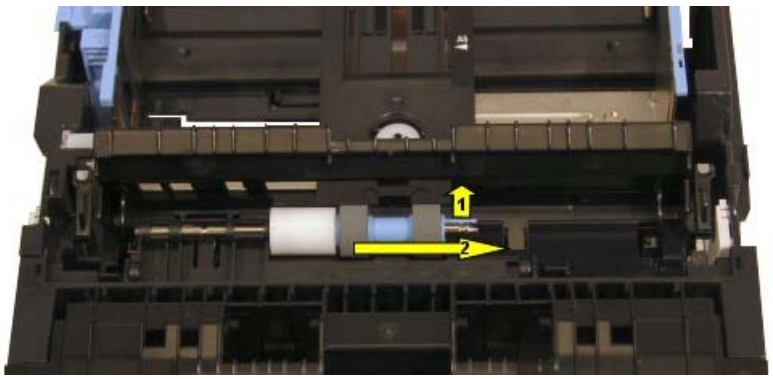


3. Fully open the cover.

NOTE:
Ensure that all paper has been removed from the tray. The separator cover will not open all the way if paper is still in the tray.



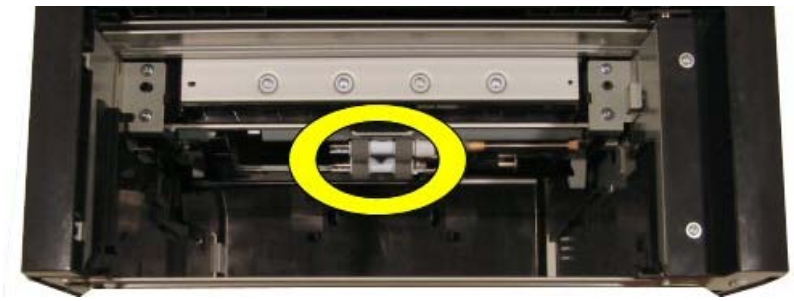
4. Rotate the roller so the tab at the end of the roller is easily seen. Slightly bend the tab (1) to release the hook from the tip of the shaft, and then pull the roller assembly off the end (2) of the shaft.

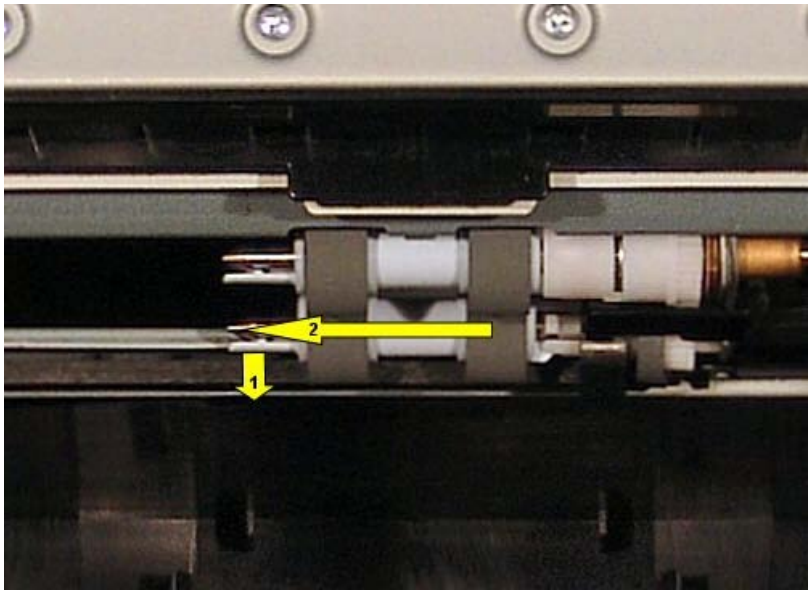


5. Reverse the previous steps to replace the 550-sheet tray separator roller assembly.

550-Sheet Tray Feed Rollers (Option)

The following table outlines the steps for removing and replacing the optional 550-sheet tray feed rollers.

Removing and Replacing the Optional 550-Sheet Tray Feed Rollers	
1.	Before removing the optional 550-sheet tray feed rollers: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 550-sheet paper tray.
2.	Click to enlarge  Peer inside the area from where the tray was removed. Approximately a third of the distance back from the front of the unit are two roller assemblies.  NOTE: At the time these pictures were taken, a production revision 550-sheet paper feed unit was not available. The unit shown in the image is functionally identical to the production revision except for the textured plastics.
3.	Rotate the roller to be removed so the tab at the end of the roller is easily seen. Slightly bend the tab (1) to release the hook from the tip of the shaft, and then pull the roller assembly (2) off the end of the shaft.

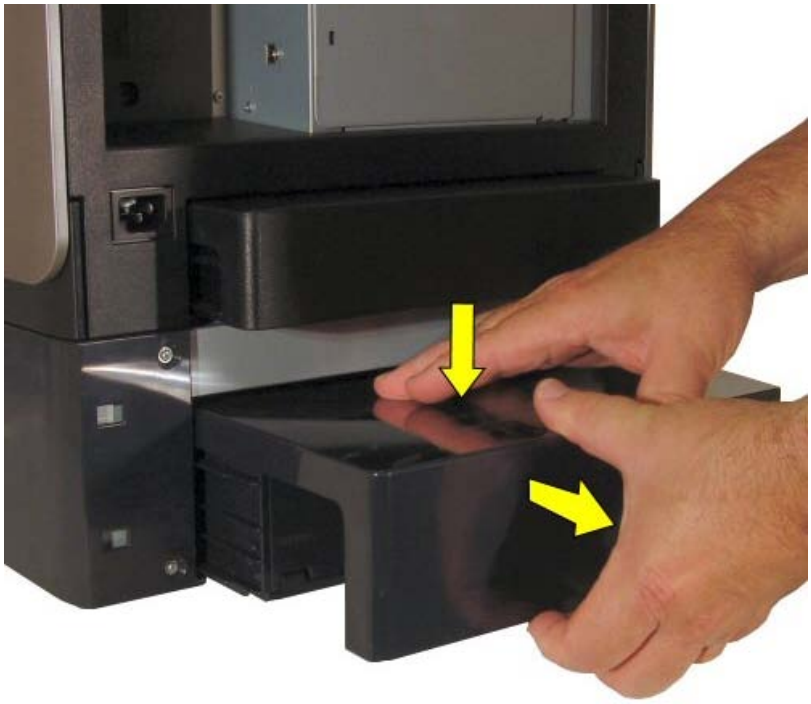


4.	Repeat step 3 for the remaining roller assembly.
5.	Reverse the previous steps to replace the internal 550-sheet tray feed rollers. As you slide the roller onto the shaft, you may need to rotate it to engage the key slots.

550-Sheet Tray Rear Cover (Option)

The following table outlines the steps for removing and replacing the optional 550-sheet tray rear cover.

Removing and Replacing the Optional 550-Sheet Tray Rear Cover	
1.	Before removing the optional 550-sheet tray rear cover: • Remove the optional 550-sheet paper tray.
2.	Depress the center of the 550-sheet tray rear cover while pulling it straight out (see diagram).



NOTE:
At the time these pictures were taken, a production revision 550-sheet paper feed unit was not available. The unit shown in the image is functionally identical to the production revision except for the textured plastics.

3. Reverse the previous steps to replace the optional 550-sheet tray rear cover.

Arm Assembly-Left

The following table outlines the steps for removing and replacing the left arm assembly that supports the front cover.

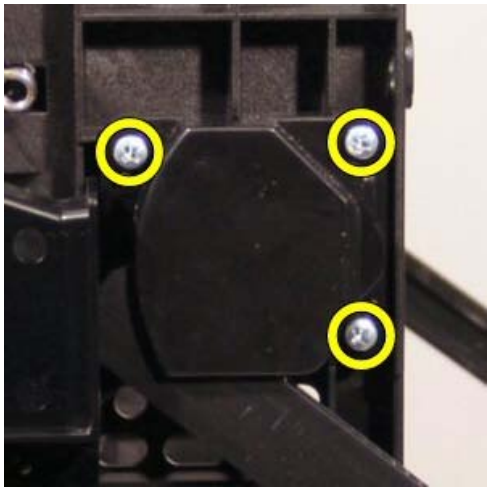
Removing and Replacing the Left Arm Assembly	
1.	Before removing the left arm assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the paper transfer belt assembly. • Remove the optional duplexer unit, if installed. • Remove the rear cover. • Remove the left cover.
2.	Open the MPF cover. With the front door already open and nearly horizontal, the MPF cover will only open another 2 to 3 inches. NOTE: Use care when performing the remaining steps since the front cover will be supported only with the remaining support arm. Assistance may be needed to help support the front cover.

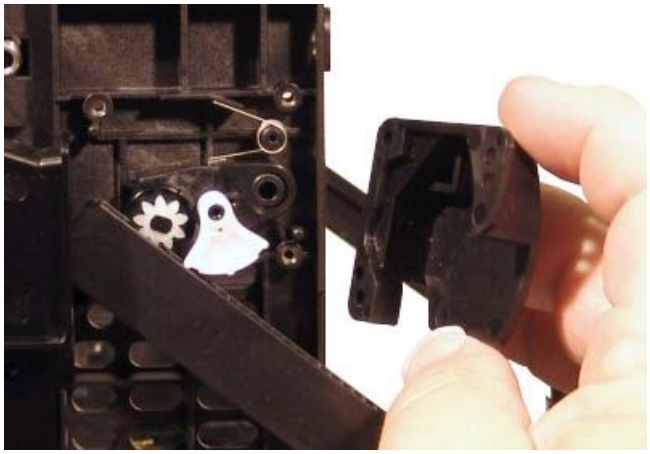
3. On the left side of the front cover, depress the tab inside the pivot pin and remove the pin.
The support arm should now be free of the front cover.

NOTE:
Press the support arm outward while removing the pivot pin. Any gap the pin encounters while being removed will cause the release hook to catch in the gap, making removal difficult.

4. On the left side of chassis, remove three 8 mm silver Tap screws from the left-side arm cover and carefully remove the cover.

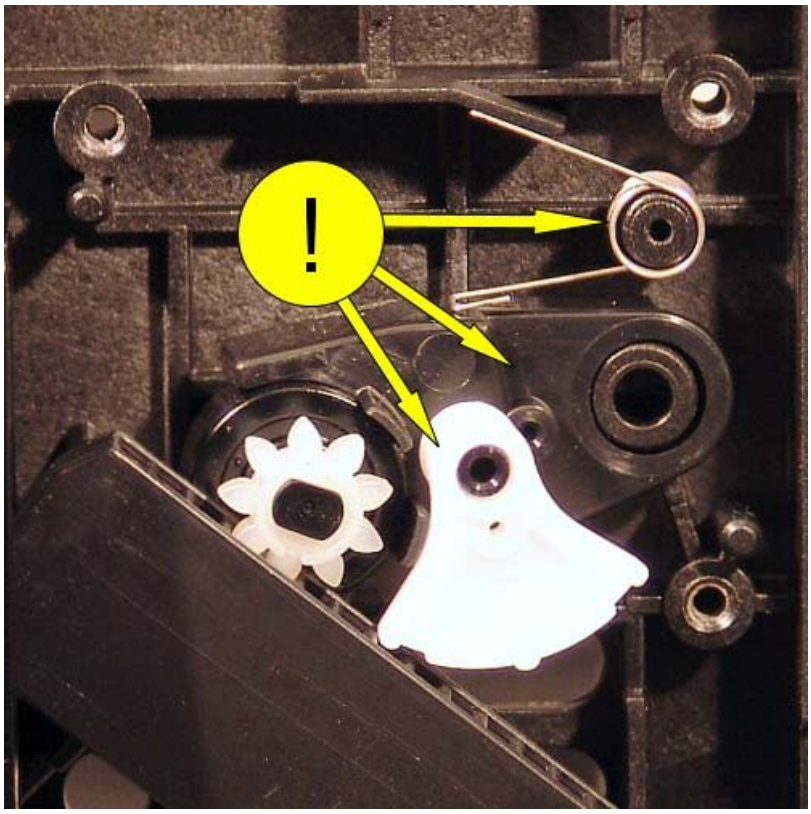
   CAUTION:
   Several small parts are contained within this cover. Use care when removing the left support arm so the parts do not fall out.





5. Being careful to capture the small parts, pull the support arm straight out.
Excluding the support arm, there should be three additional parts (outermost to innermost):

- Ratchet pawl
- Dampener assembly
- Tension spring



6. To reassemble, install the parts in the following order:

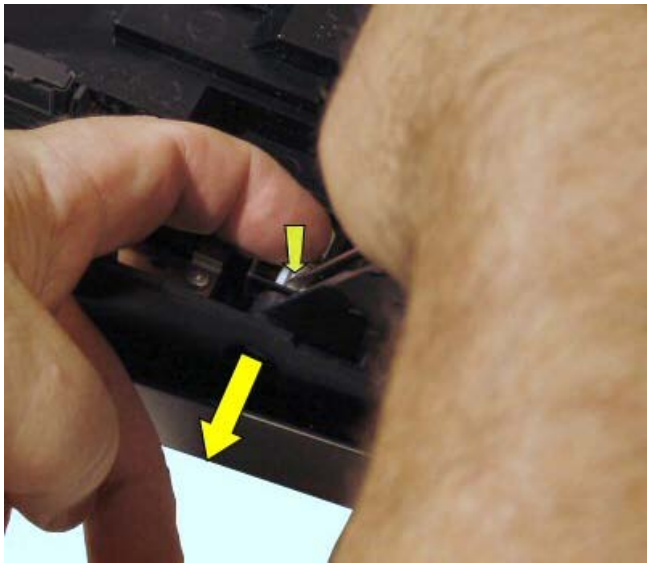
- Tension spring
- Dampener assembly
- Ratchet pawl
- Left support arm
- Arm cover
- Pivot pin on front cover

NOTE:
Install the tension spring and dampener assembly first (as shown), and then install the remaining components.

Arm Assembly-Right

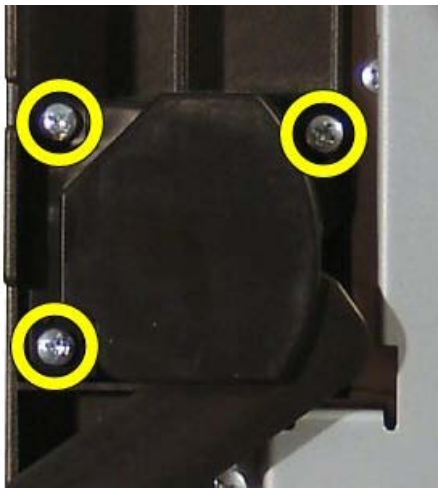
The following table outlines the steps for removing and replacing the right arm assembly that supports the front cover.

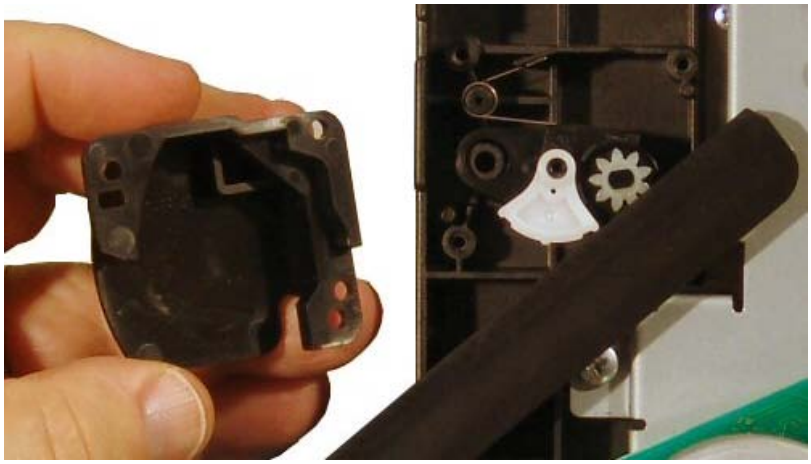
Removing and Replacing the Right Arm Assembly	
1.	Before removing the right arm assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the paper transfer belt assembly. • Remove the optional duplexer unit, if installed. • Remove the rear cover. • Remove the right cover.
2.	Open the MPF cover. With the front door already open and nearly horizontal, the MPF cover will only open another 2 to 3 inches. NOTE: Use care when performing the remaining steps since the front cover will be supported only with the remaining support arm. Assistance may be needed to help support the front cover. 
3.	On the right side of the front cover, depress the tab inside the pivot pin and remove the pin. The support arm should now be free of the front cover. NOTE: Press the support arm outwards while removing the pivot pin. Any gap the pin encounters while being removed will cause the release hook to catch in the gap, making removal difficult.



4. On the right side of chassis, remove three 8 mm silver Tap screws from the right-side arm cover and carefully remove the cover.

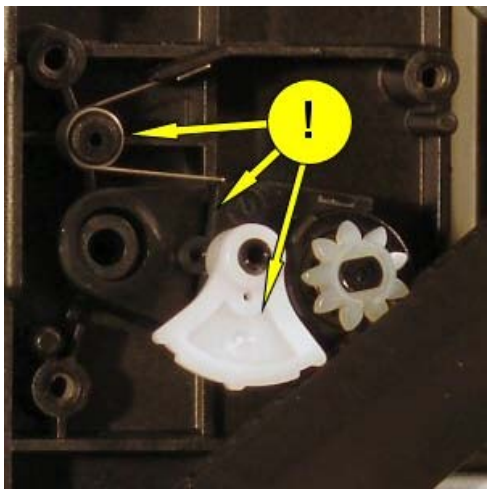
CAUTION:
Several small parts are contained within this cover. Use care when removing the right support arm so the parts do not fall out.





5. Being careful to capture the small parts, pull the support arm straight out.
Excluding the support arm, there should be three additional parts (outermost to innermost):

- Ratchet pawl
- Dampener assembly
- Tension spring



6. To reassemble, install the parts in the following order:

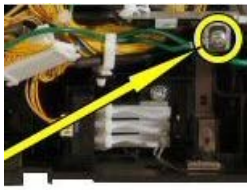
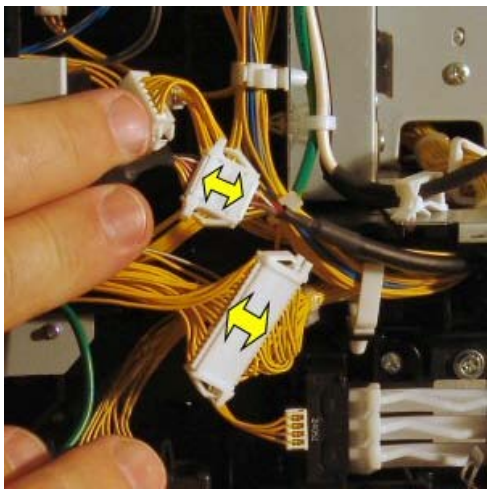
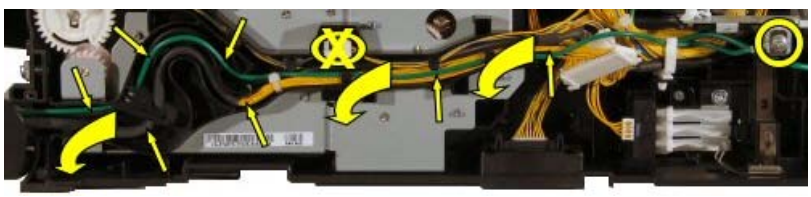
- Tension spring
- Dampener assembly
- Ratchet pawl
- Right support arm
- Arm cover
- Pivot pin on front cover

NOTE:
Install the tension spring and dampener assembly first (as shown), and then install the remaining components.

Cover-Front

The following table outlines the steps for removing and replacing the front cover.

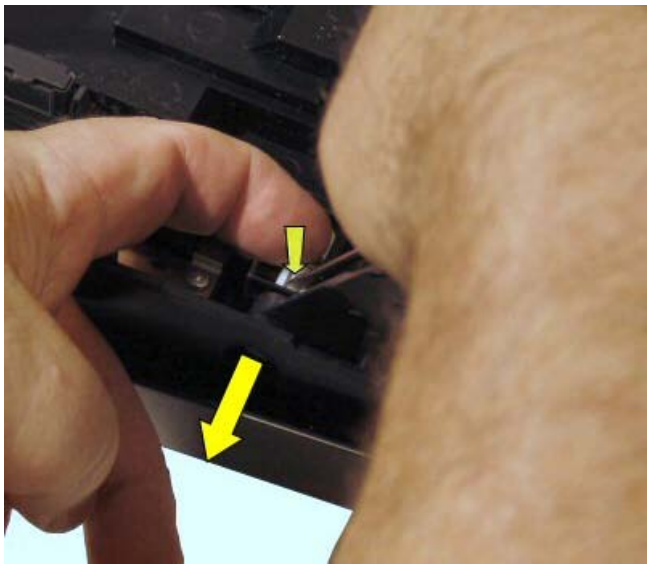
NOTE:
The front cover is an assembly that includes several parts. One of these parts is the exit chute assembly. The exit chute is shown here for clarity only and is not a FRU. If this part is bad, the entire front cover assembly must be replaced.

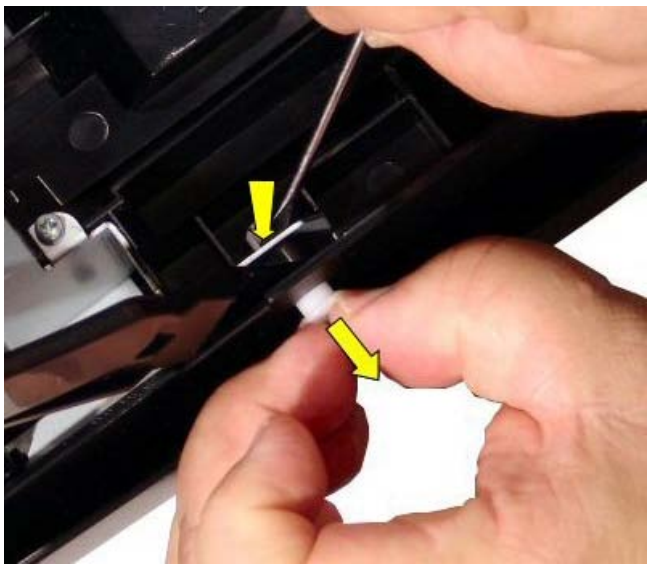
Removing and Replacing the Front Cover	
1.	Before removing the front cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the paper transfer belt assembly. Use care not to scratch the surface of the belt. • Remove the optional duplexer unit, if installed. • Remove the rear cover. • Remove the right cover.
2.	Remove the screw (one silver Tap screw) from the end of the green grounding wire connected to the chassis. The screw is located just behind the AC power line receptacle. 
3.	Separate the two multiwire inline connectors. One connector has seven multicolored wires enclosed in a black sheath. The other connector has 20 yellow wires. 
4.	Working from the rear of the printer towards the front, remove three wiring harness items: one ground wire and two multiwire cable assemblies from within the wire guide (duct). All three harness items remain attached to the front cover, and the wire guide (duct) remains attached to the feed drive assembly. 

5. Open the MPF cover. With the front door already open and nearly horizontal, the MPF cover will only open another 2 to 3 inches.

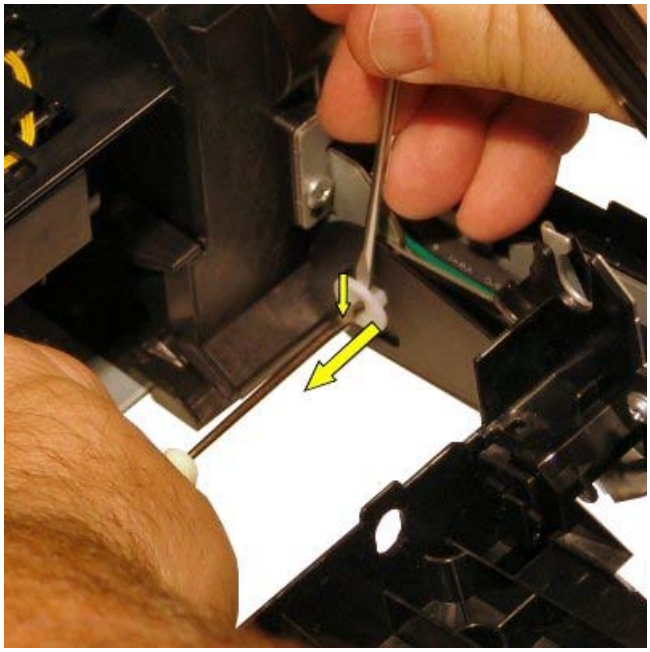
   NOTE:
   Use caution when performing steps 6 and 7 to prevent the front cover from dropping and breaking. Assistance may be needed to help support the cover during the removal process.

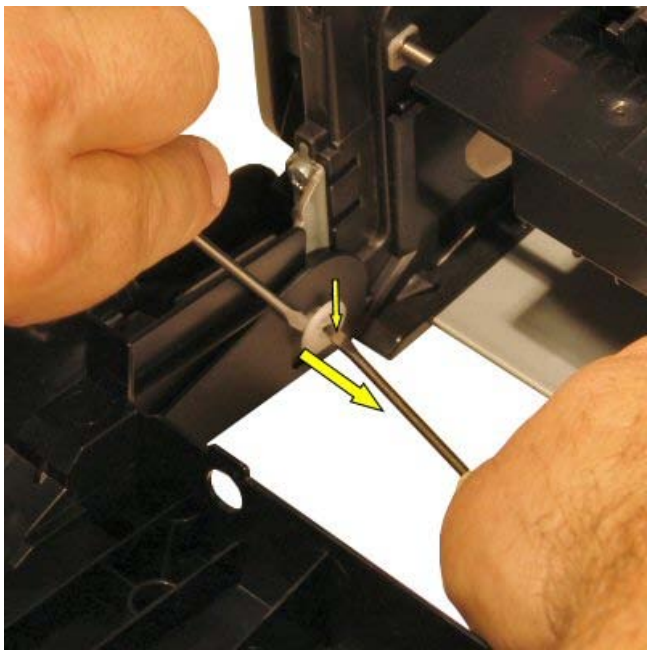
6. On the inside right and left sides of the front cover, depress the tab inside each of the two pivot pins for the arm assemblies and remove the pins.



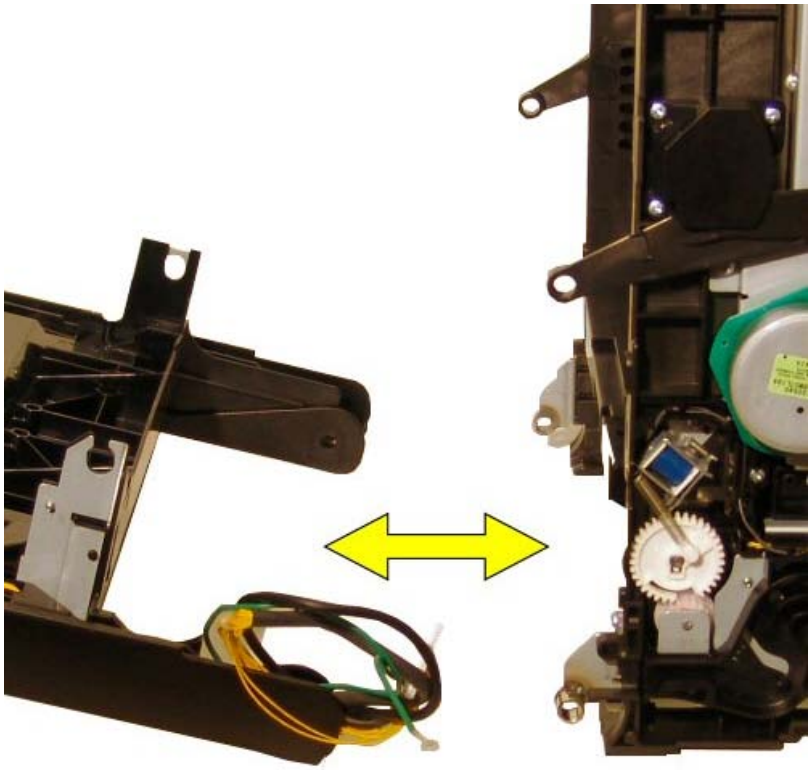


7. Inside the lower right and left sides of the front cover, depress the tab inside each of the two pivot pins and remove the pins.





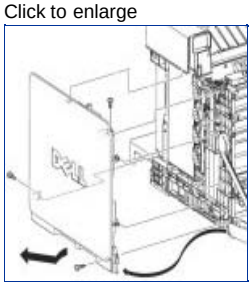
8. Remove the entire front cover assembly from the printer.

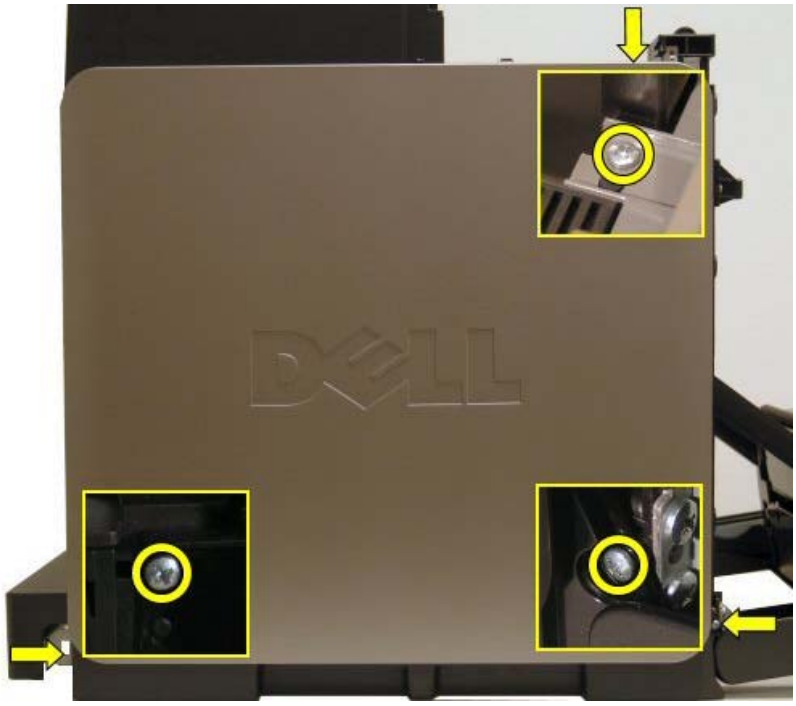


9.	Reverse the previous steps to replace the front cover.

Cover-Left

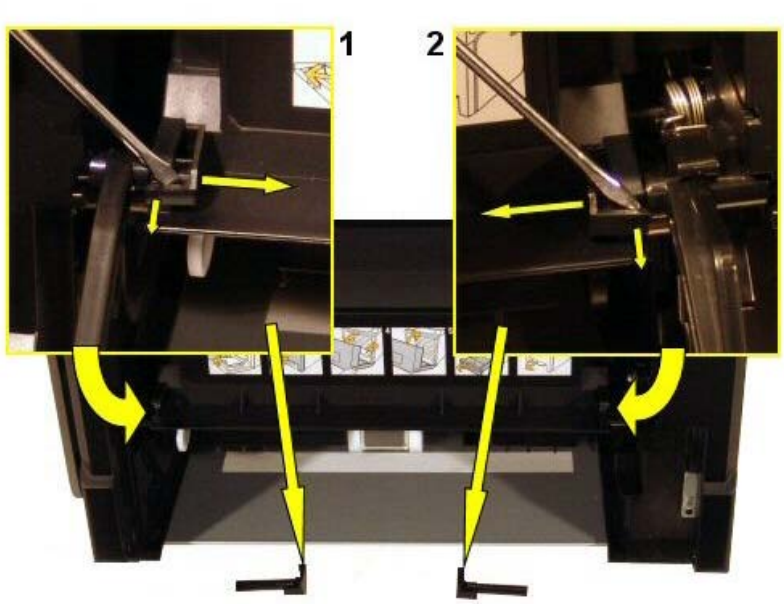
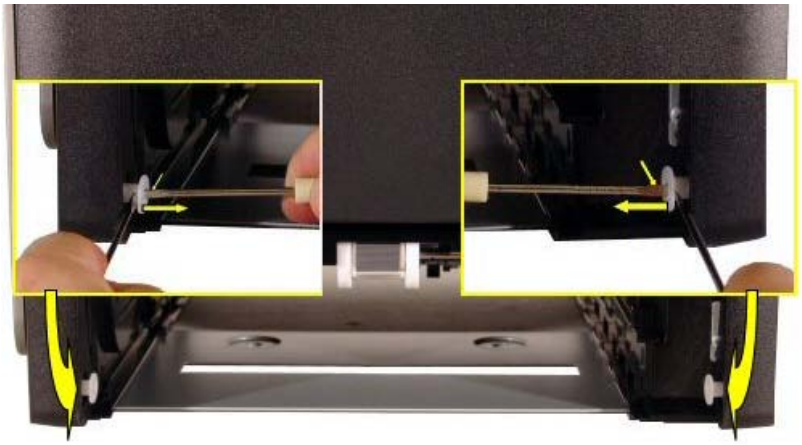
The following table outlines the steps for removing and replacing the left cover.

Removing and Replacing the Left Cover	
1.	Before removing the left cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. Click to enlarge 

2.	Remove three 10 mm silver Tap screws from the left cover. 
3.	Starting from the rear of the cover, pull out the cover far enough to release the top inside center catch. Continue to pull the cover outward and diagonally backward to release the two front hooks from the chassis. Remove the cover from the printer. 
4.	Reverse the previous steps to replace the left cover.

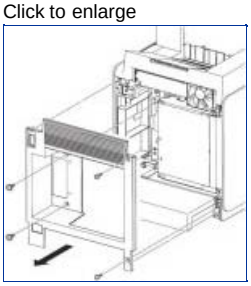
Cover-MPF

The following table outlines the steps for removing and replacing the MPF cover.

Removing and Replacing the MPF Cover	
1.	Before removing the MPF cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray. • Open the MPF cover.
2.	From the inside right and left sides of the MPF cover, slightly pull out the release clips and remove each pivot pin. 
3.	Inside the lower right and left sides of the front cover, depress the tab inside each of the two pivot pins and remove the pins. CAUTION: The pivot pins removed in this step also support the front cover. Do not open the front cover when these two pins are removed. 
4.	Reverse the previous steps to replace the MPF cover.

Cover-Rear

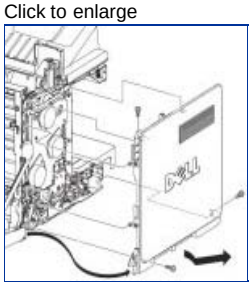
The following table outlines the steps for removing and replacing the rear cover.

Removing and Replacing the Rear Cover	
1.	Before removing the rear cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the optional USB WLAN, if installed. Click to enlarge 
2.	Remove four screws (two 10 mm Tap screws and two 8 mm flanged machine screws) from the rear cover. 
3.	Pull the left side (cable recess area) of the rear cover out slighly before the right side to help clear the parallel connector clips, and then pull the cover straight back.

4.	Reverse the previous steps to replace the rear cover.

Cover-Right

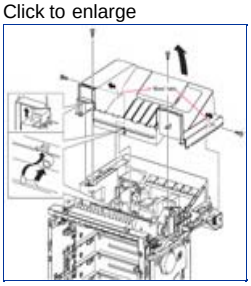
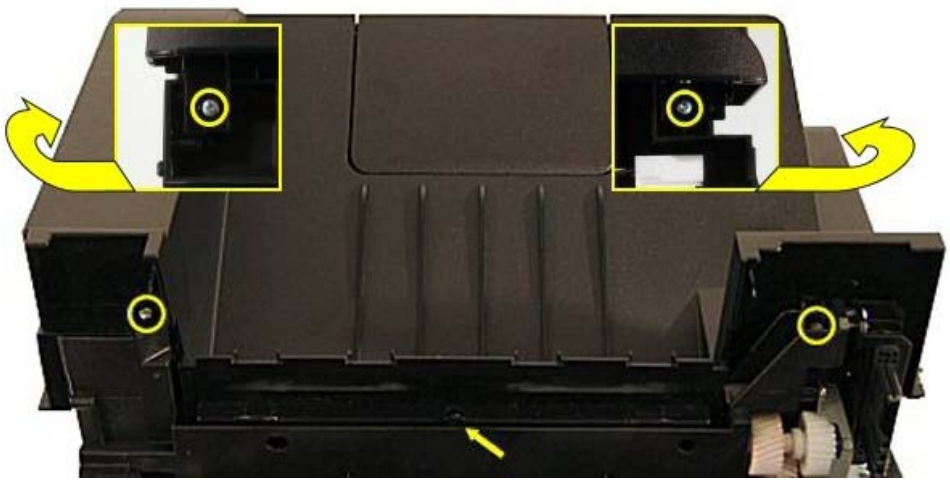
The following table outlines the steps for removing and replacing the right cover.

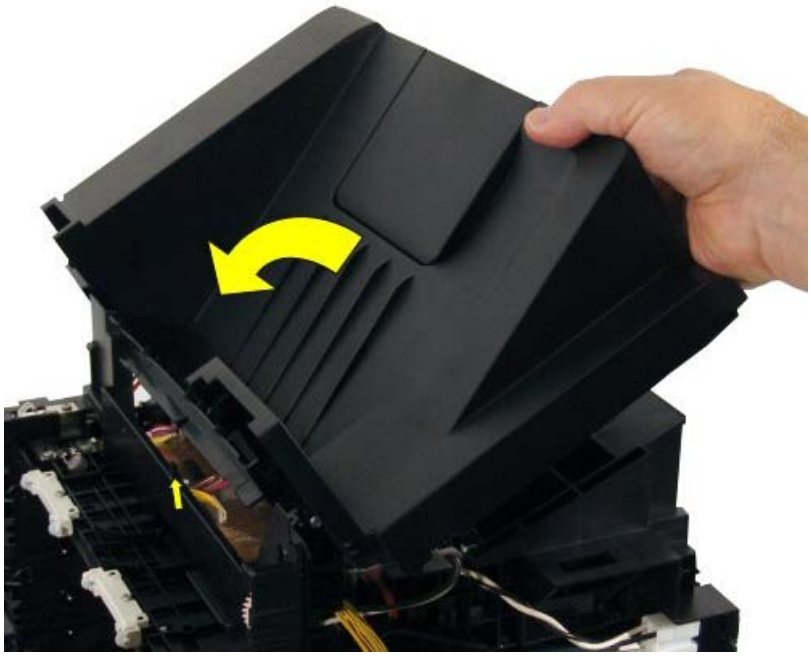
Removing and Replacing the Right Cover	
1.	Before removing the right cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. Click to enlarge 

2.	Remove three 10 mm silver Tap screws from the right cover. 
3.	Starting from the rear of the cover, pull out the cover far enough to release the top inside center catch. Continue to pull the cover outward and diagonally backward to release the two front hooks from the chassis. Remove the cover from the printer. 
4.	Reverse the previous steps to replace the right cover.

Cover-Top

The following table outlines the steps for removing and replacing the top cover.

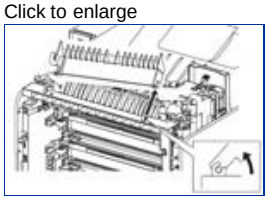
Removing and Replacing the Top Cover	
1.	Before removing the top cover: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. Click to enlarge 
2.	Remove four 10 mm silver Tap screws from the top cover: • Two are located along the left and right sides of the front edge. • Two are located on each side in the rear. 
3.	Release the top cover boss tabs from the mount points on the printer chassis; they are located where the last two screws were removed. Pull the rear part of the cover upward and toward the front of the printer until the front center catch releases.

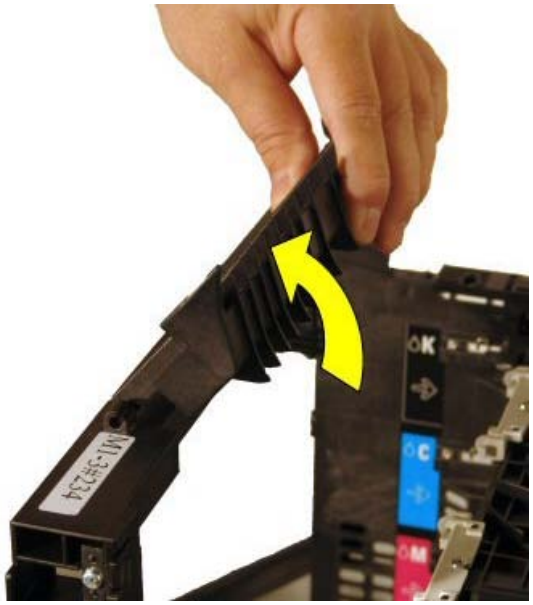


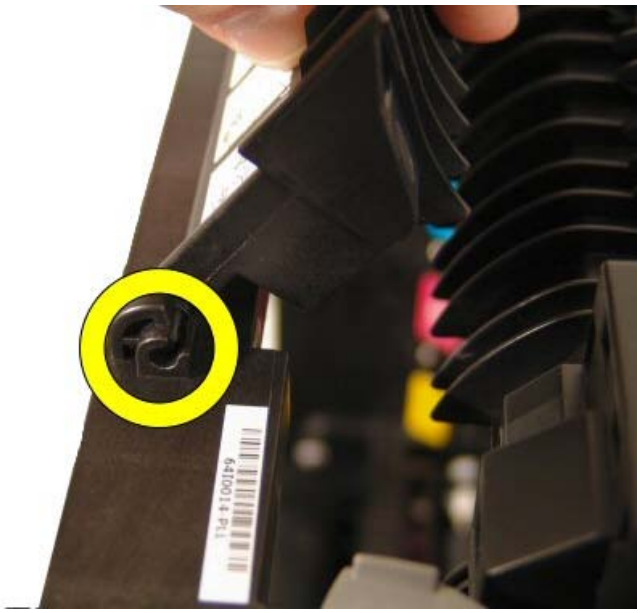
4.	Reverse the previous steps to replace the top cover. Ensure the front center catch is aligned and snapped into place as the cover is reinstalled.

Duplex Gate

The following table outlines the steps for removing and replacing the duplex gate.

Removing and Replacing the Duplex Gate	
1.	Before removing the duplex gate: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.
2.	Click to enlarge  CAUTION: The fuser may be hot. Allow the printer to cool for approximately 30 minutes before performing this task. Lift the duplex gate to approximately 45 degrees to align the flattened sides of the right-side pin with the open slot in the right-side mount.

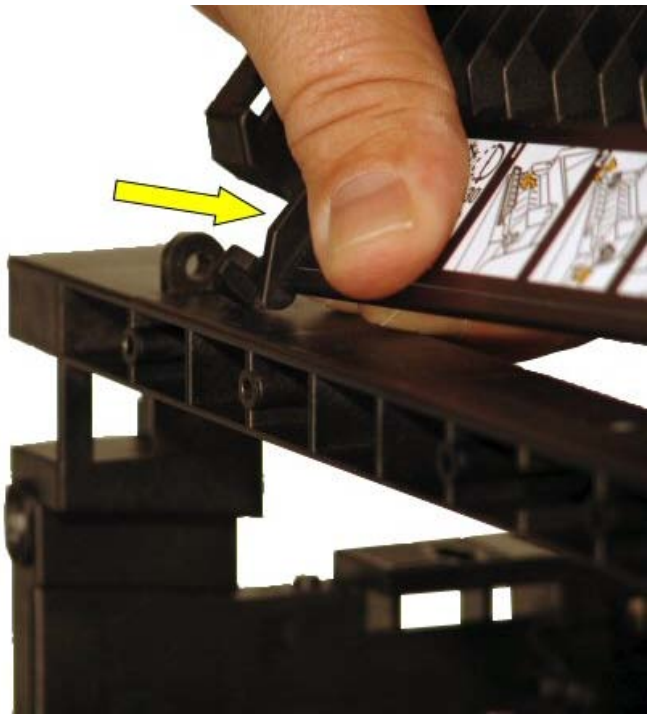




3. Following the 45-degree angle, pop the right-side pin out through the slotted opening.

CAUTION:
Do not lift the right side too far or the left-side pivot pin (step 4) may break off.

4. Slide the duplex gate to the right to free the left-side pin from the left-side mount.



5. Reverse the previous steps to replace the duplex gate.

Duplex Unit (Option)

The following table outlines the steps for removing and replacing the optional duplex unit.

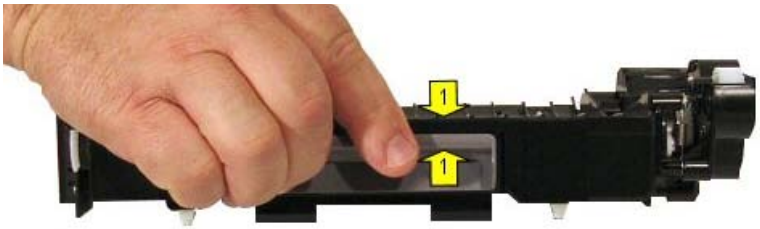
Removing and Replacing the Optional Duplex Unit	
1.	Before removing the optional duplex unit:

- Turn the printer off and remove the AC power cable from the back of the printer.
- Open the front cover by depressing the round button on the top-right side of the front cover.

NOTE:
Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.

- Remove the paper transfer belt. Use care not to scratch the surface of the belt.

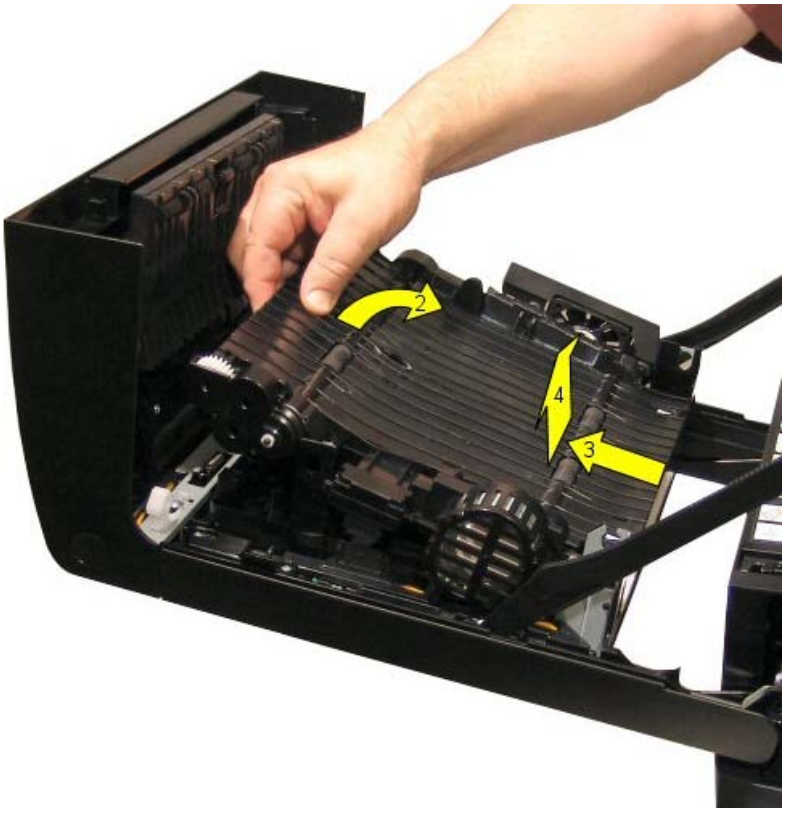
2. Under the top center of the duplex unit, squeeze the handle to release the duplex latch.
(see diagram)



3. After the latch has been released, remove the duplex unit as follows: (list numbers and image arrows coincide)
(see diagram)

NOTE:
In practice, once the latch has been released, it is one continous flow to pull up, forward, and lift the unit from the printer.

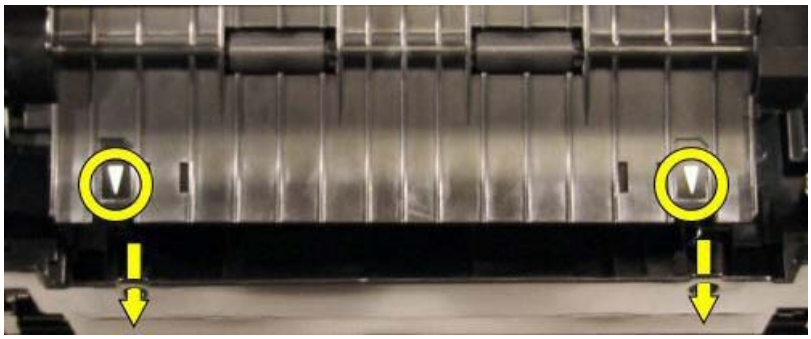
2. Rotate the duplex unit upward.
3. As the unit is being lifted, slide it slightly toward the operator panel to disengage the alignment pins from the lower edge of the front cover.
4. Lift the duplex unit straight up and out of the printer.



4. Reverse the previous steps to replace the duplex unit.

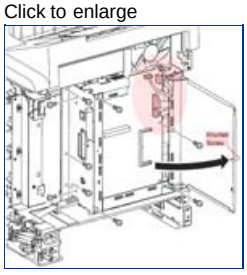
NOTE:

When reinstalling, ensure the arrows near the lower right and lower left corners of the duplex module are aligned with the holes in the bottom edge of the front cover assembly. See the following image for clarification:



ESS Control Board

The following table outlines the steps for removing and replacing the Electronic Sub-System (ESS) control board.

Removing and Replacing the ESS Control Board	
1.	Before removing the ESS control board: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the optional MPC, if installed.
2.	Click to enlarge  CAUTION: The ESS control board can be damaged by static electricity. Use all static prevention safeguards, including ESD wristbands and placemats. Loosen the knurled screw and open the metal door to expose the ESS control board.

3. Disconnect all four cables connected to the ESS control board.
(see diagram)

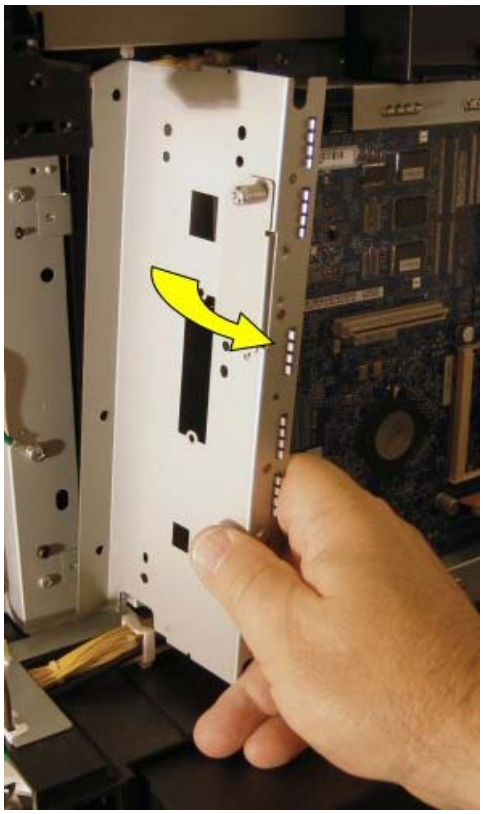
4. Remove the three 6 mm silver machine screws (with small heads) that attach the ESS I/O connectors to the I/O plate.
(see diagram item 1)

5. Remove seven 6mm silver machine screws that attach the I/O plate to the ESS shield box and chassis. (see diagram item 2)

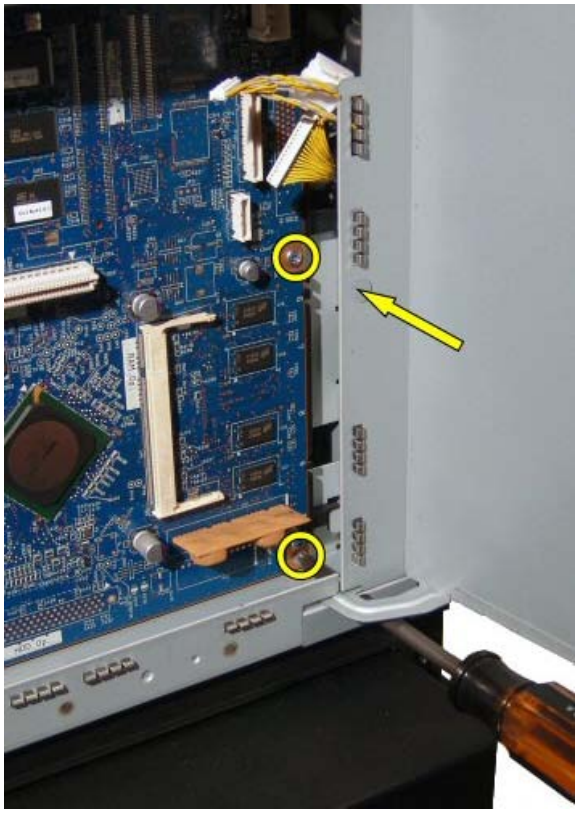
Inside bottom left

Inside top left

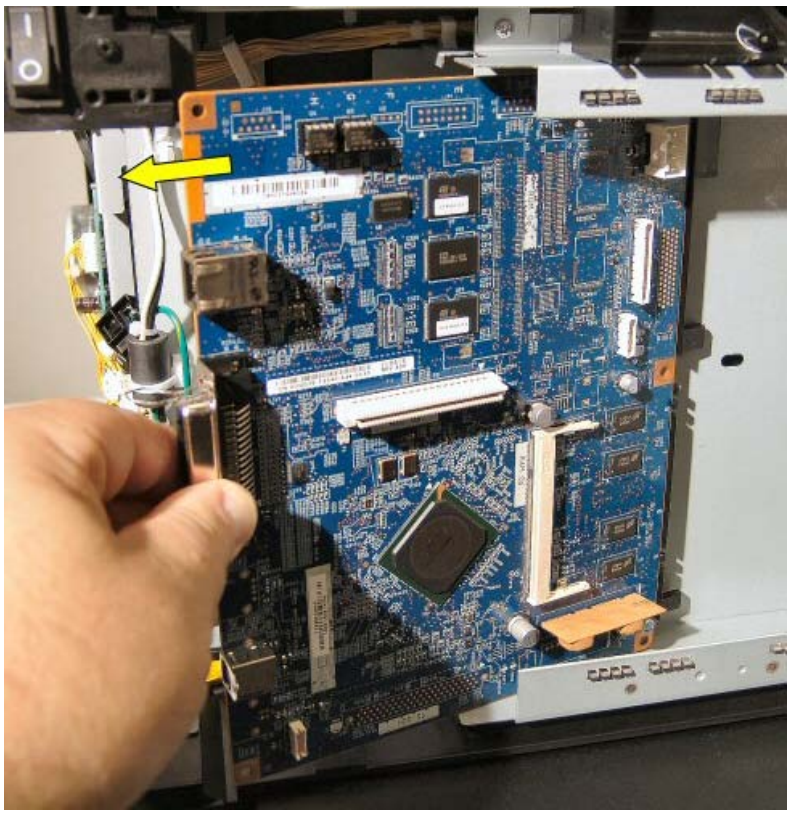
6. Remove the ESS I/O plate.



7. Remove two 6mm silver machine screws that attach the ESS control board to the inside right (viewed from the rear) of the shield box. (see diagram item 3)



8. Remove the ESS control board.



9. Remove the edge guide from the ESS control board. (see diagram)

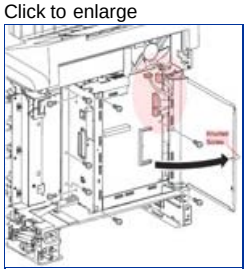
NOTE:
Removing the edge guide is not necessary unless the ESS control board is defective and is being replaced.

10.	Reverse the previous steps to replace the ESS control board. NOTE: Suggested screw replacement sequence: • Replace the two 6 mm silver machine screws that attach the ESS control board to the inside right (viewed from the rear) of the shield box. • Replace the three 6 mm silver machine screws (with small heads) that attach the ESS I/O connectors to the I/O plate. • Replace the seven 6 mm silver machine screws that attach the I/O plate to the ESS shield box and chassis. Leave the screws loose until all screws have been installed. Tighten the three ESS I/O connector screws first, followed by the rest.

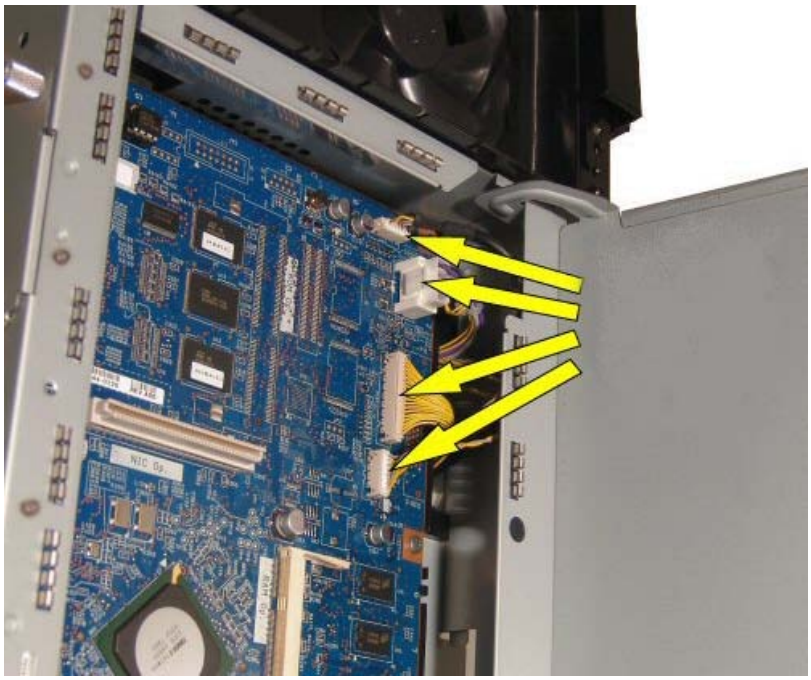
ESS Shield Box

The following table outlines the steps for removing and replacing the Electronic Sub-System (ESS) shield box.

NOTE:
Removing the ESS shield box is provided as a prerequisite step to replacing other parts. The ESS shield box is not a CRU or a FRU.

Removing and Replacing the ESS Shield Box	
1.	Before removing the ESS shield box: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. • Remove the top cover. • Remove the main fan assembly.
2.	Click to enlarge  Loosen the knurled screw and open the metal door to expose the ESS control board.

3. Disconnect the 4 cables identified in the image from the ESS control board.
(see diagram)

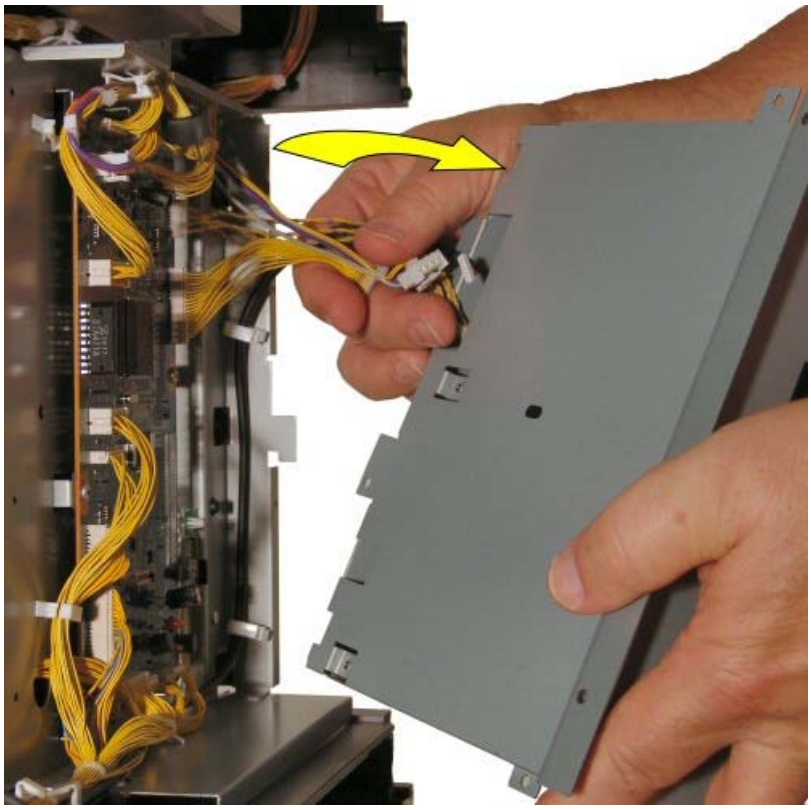


4. Remove seven 6mm silver machine screws that attach the ESS shield box to the chassis.
(see diagram item 1)

5. Slide the ESS shield box slightly to the left.
(see diagram item 2)

6. Carefully support and pull the ESS shield box away from the rear of the printer.
(see diagram item 3)

NOTE:
As the box is pulled away, carefully help guide the cables out of the access hole on the rear of the ESS box.



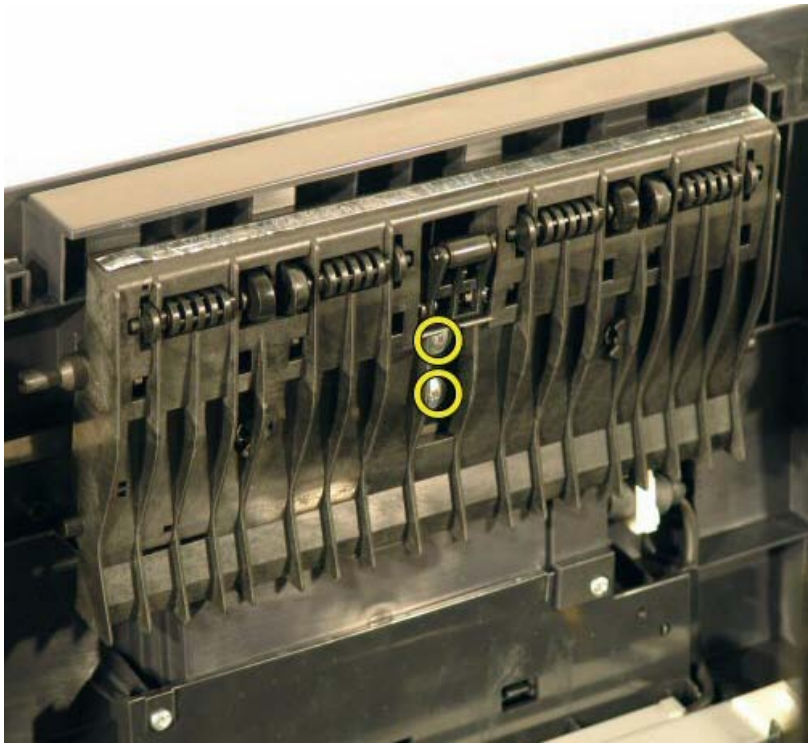
7.	Reverse the previous steps to replace the ESS shield box.

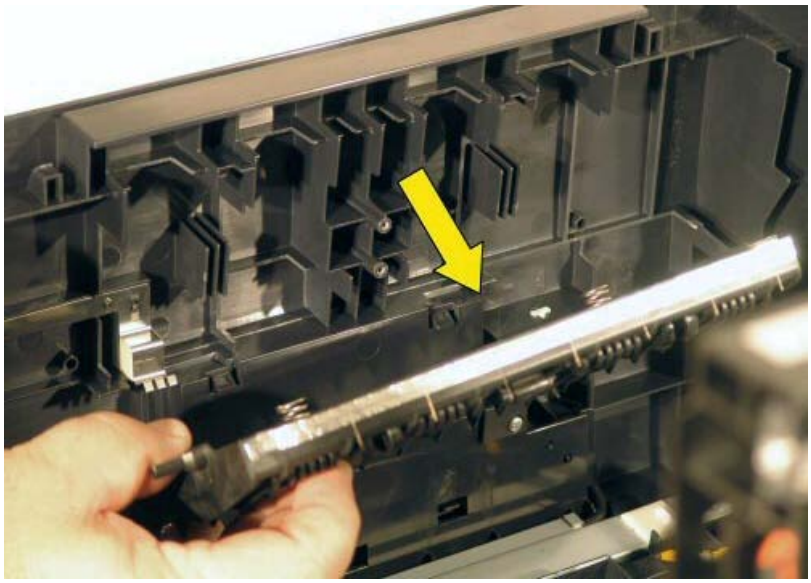
Exit Chute Assembly

The following table outlines the steps for removing and replacing the exit chute assembly.

NOTE:
Removing the exit chute assembly is provided as a prerequisite step to replacing the operator panel. This part is not a CRU or a FRU. If this part is bad, the entire front cover assembly must be replaced.

Removing and Replacing the Exit Chute Assembly	
1.	Before removing the exit chute assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.
2.	Remove the two 10 mm flanged Tap screws that attach the exit chute assembly to the inside top of the front cover.



3.	Remove the exit chute assembly from the printer. 
4.	Reverse the previous steps to replace the exit chute assembly.

Fan Assembly-Main

The following table outlines the steps for removing and replacing the main fan assembly.

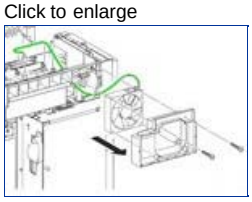
Removing and Replacing the Main Fan Assembly	
1.	Before removing the main fan assembly:

- Turn the printer off and remove the AC power cable from the back of the printer.
- Open the front cover by depressing the round button on the top-right side of the front cover.

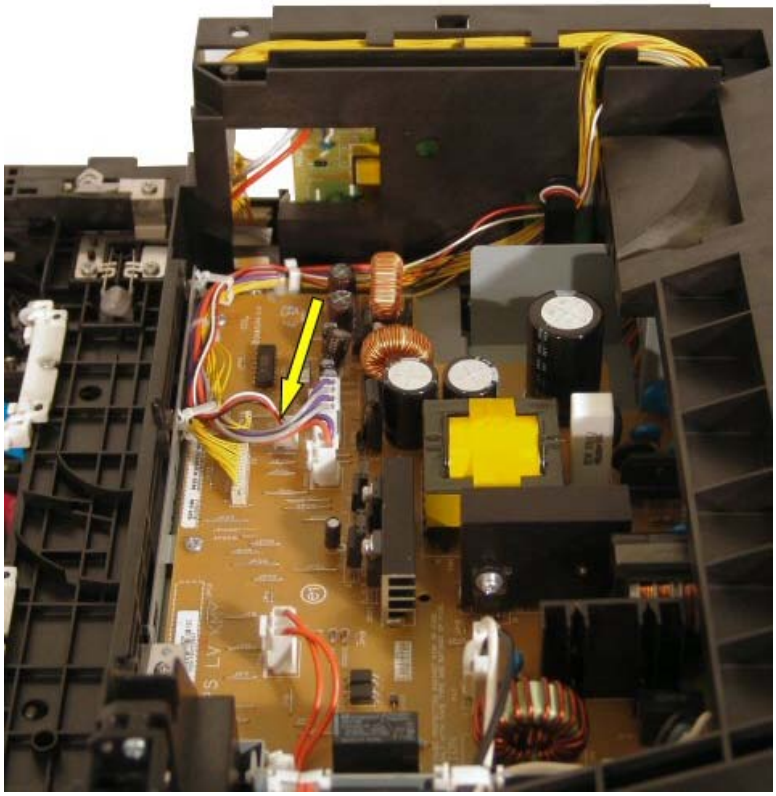
NOTE:
Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area.

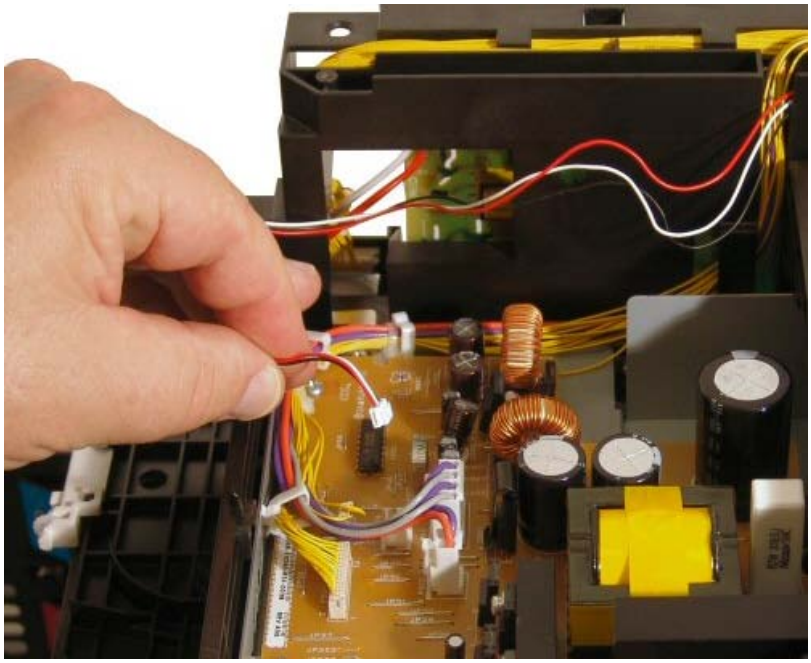
- Remove the fuser.
- Remove the rear cover.
- Remove the right cover.
- Remove the left cover.
- Remove the top cover.

Click to enlarge

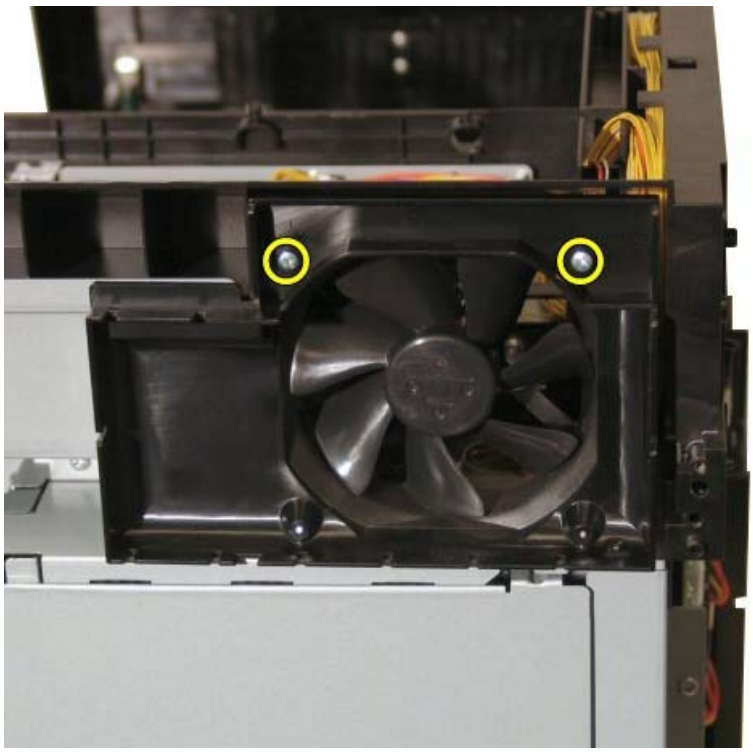


2. Disconnect fan connector P/J503 from the low voltage power supply, and then remove the fan wires from the chassis harness clamps.

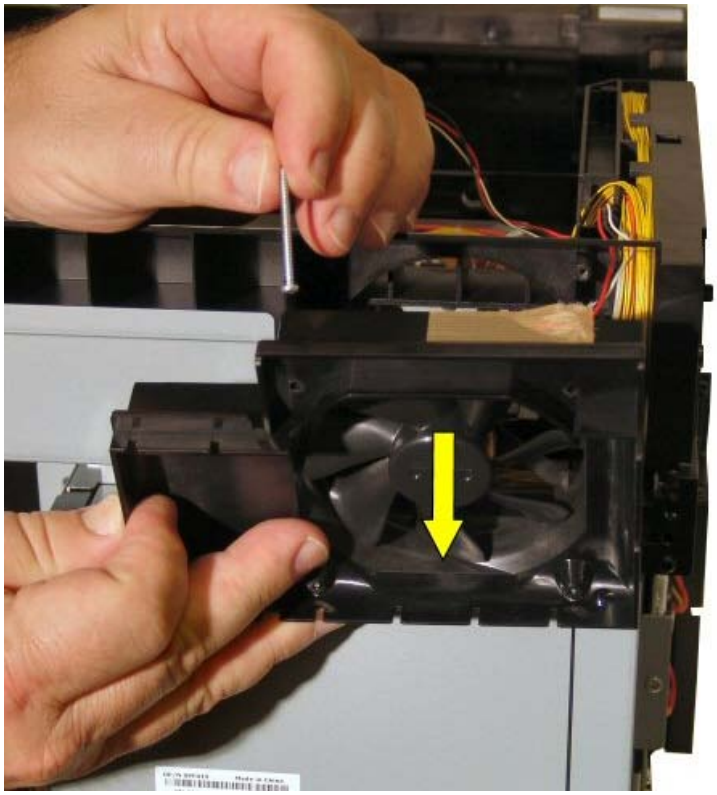




3. Remove the two 35 mm silver Tap screws that attach the fan and duct to the chassis.



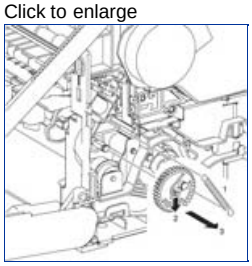
4. Remove the fan and duct from the printer.



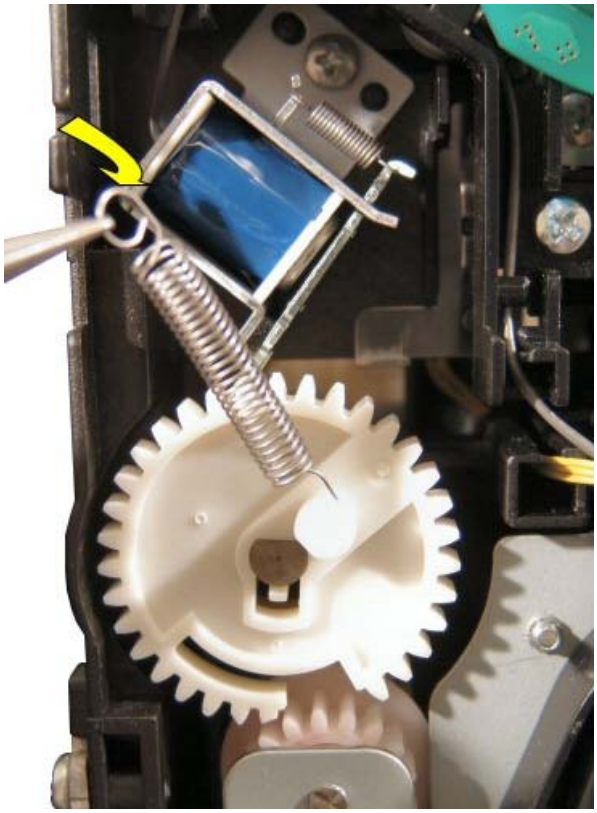
5.	Reverse the previous steps to replace the main fan assembly.

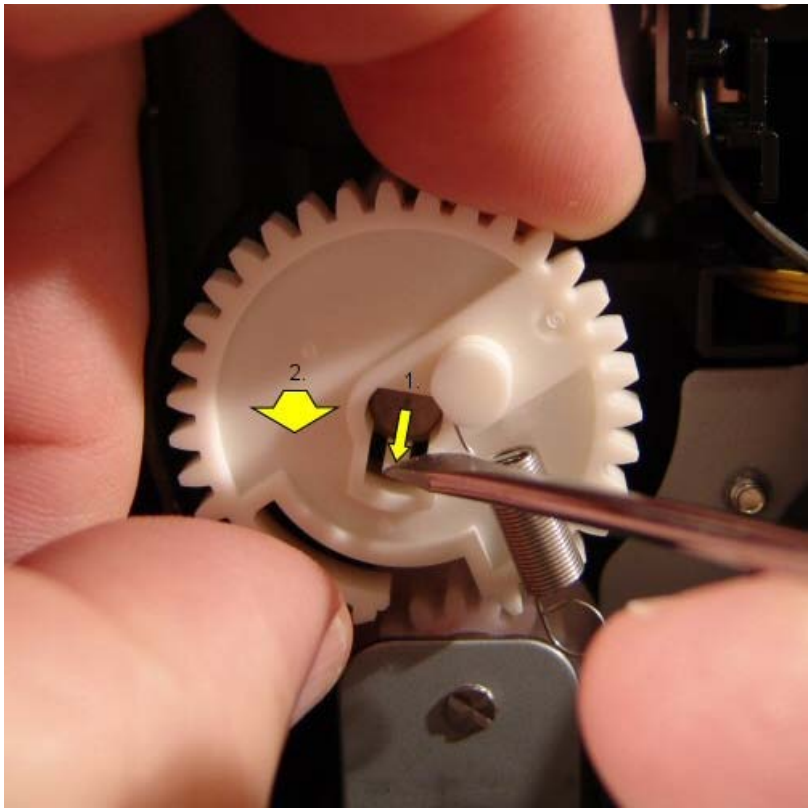
Feed Drive Assembly

The following table outlines the steps for removing and replacing the feed drive assembly.

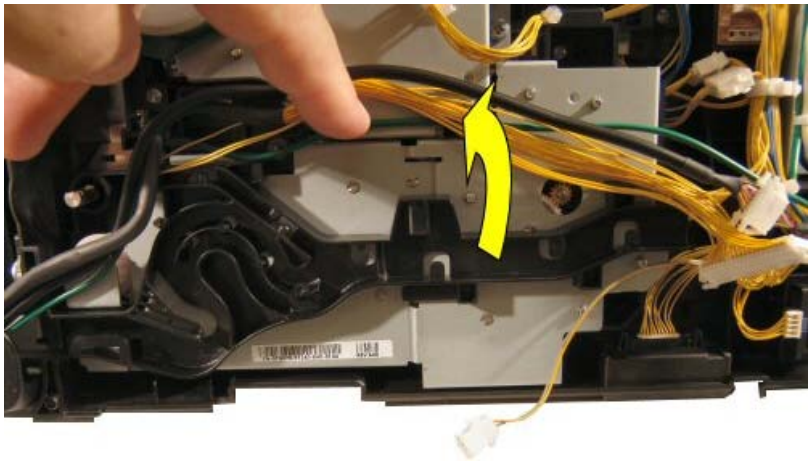
Removing and Replacing the Feed Drive Assembly	
1.	Before removing the feed drive assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover.
2.	Click to enlarge 

Remove the MPF feed spring, release the locking tab from the MPF gear, and then slide the gear from the MPF drive shaft.

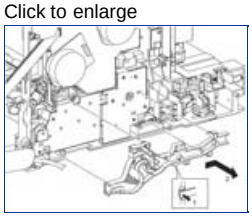




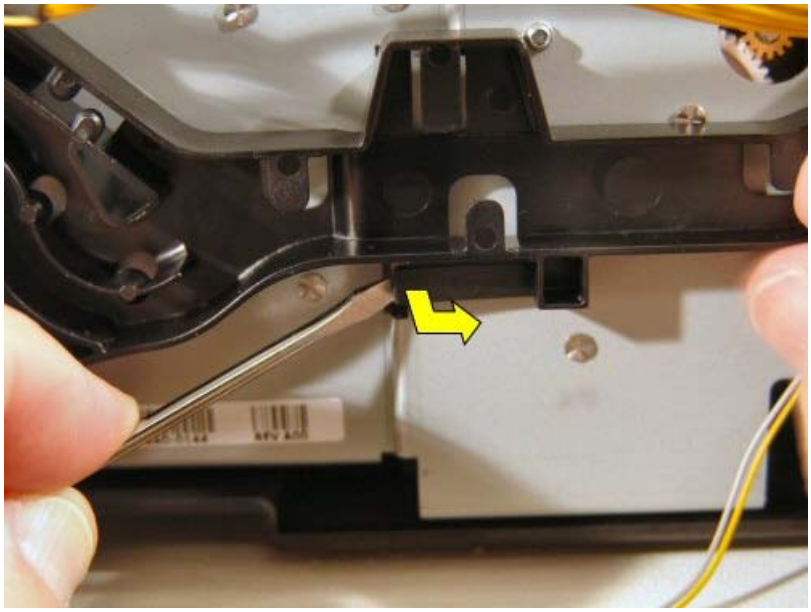
3. Remove all wires from the cable duct.



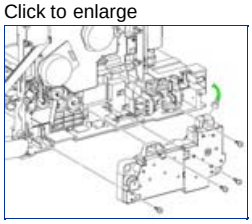
4. Click to enlarge



After all wires are removed, locate the locking tab under the duct. Pull the tab outward while sliding the duct towards the rear of the printer, and then remove the duct from the printer.

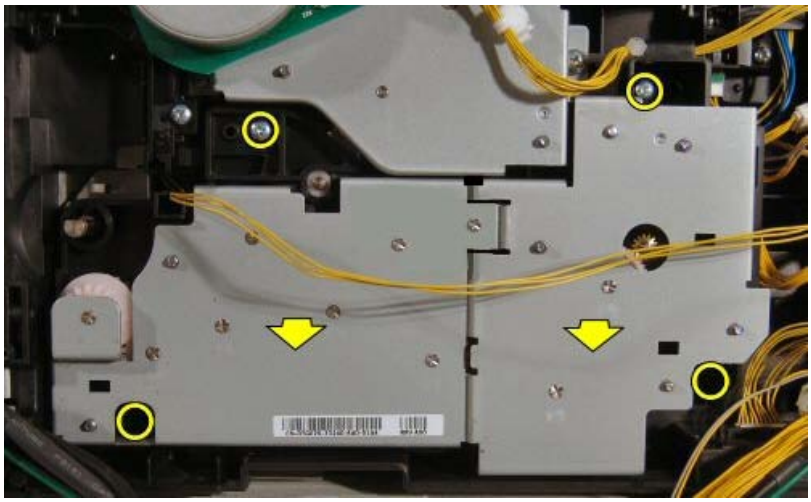


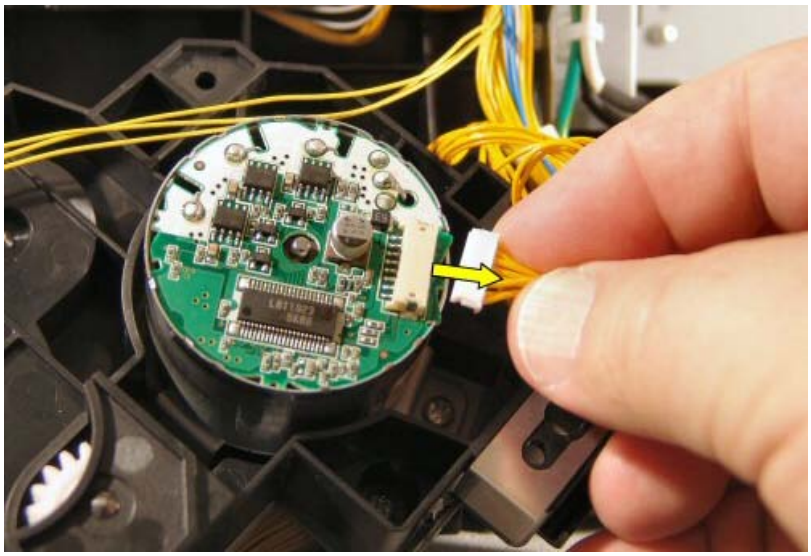
5. Click to enlarge



Remove the four 10 mm silver Tap screws that attach the feed drive assembly to the printer chassis, and then pull the feed drive assembly away from the printer.

NOTE:
The MPF feed solenoid pick arm may prevent the front end of the feed drive assembly from being easily removed. Simply lift the feed solenoid arm until the front of the feed drive assembly clears the pick arm.



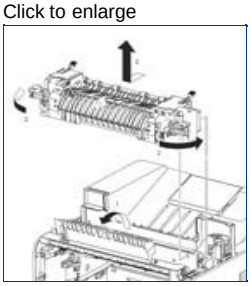
6.	Disconnect the cable to the drive motor as the assembly is withdrawn from the chassis. 
7.	Reverse the previous steps to replace the feed drive assembly.

Fuser Assembly

The following table outlines the steps for removing and replacing the fuser assembly.

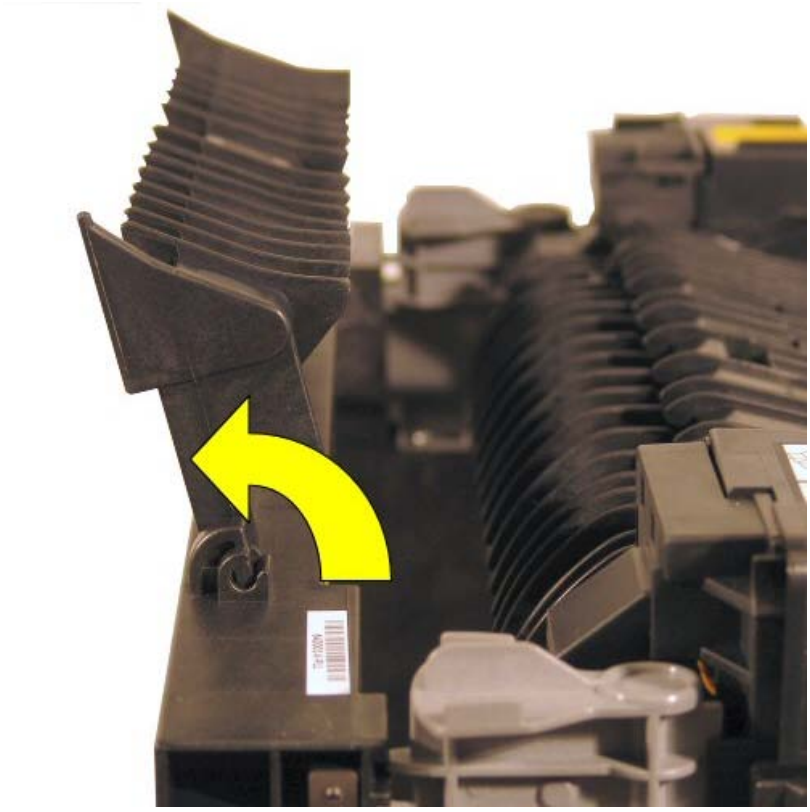
Removing and Replacing the Fuser Assembly	
1.	Before removing the fuser assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area.

2. Click to enlarge



CAUTION:
The fuser may be hot. Allow the printer to cool for approximately 30 minutes before performing this task.

Rotate the duplex gate to its upright position.



3. Rotate the right- and left-side fuser locking levers to their outmost positions.

4. Slide the fuser forward.

5. List the fuser straight up and out of the printer.

6. Reverse the previous steps to replace the fuser assembly.

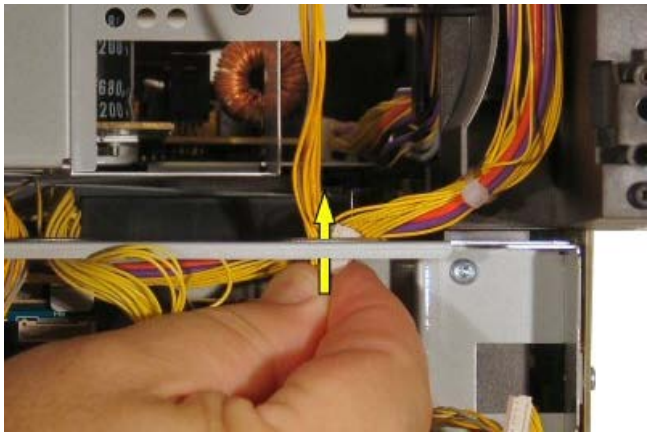
High Voltage Power Supply

The following table outlines the steps for removing and replacing the high voltage power supply (HVPS).

Removing and Replacing the HVPS
1. Before removing the HVPS: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. • Remove the top cover. • Remove the main fan assembly. • Remove the ESS shield box.

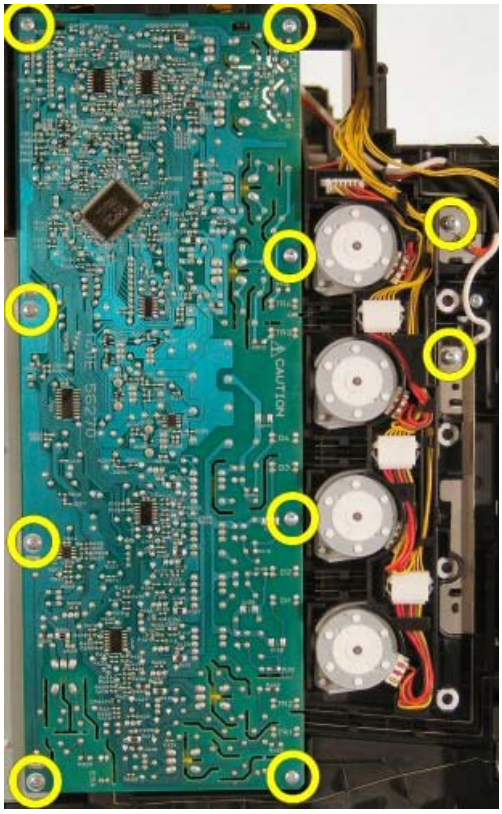
2. Disconnect the cable from connector J16 on the top center of the machine control unit (MCU).

3. Guide the cable up through the hole in the top of the chassis shield (see diagram).

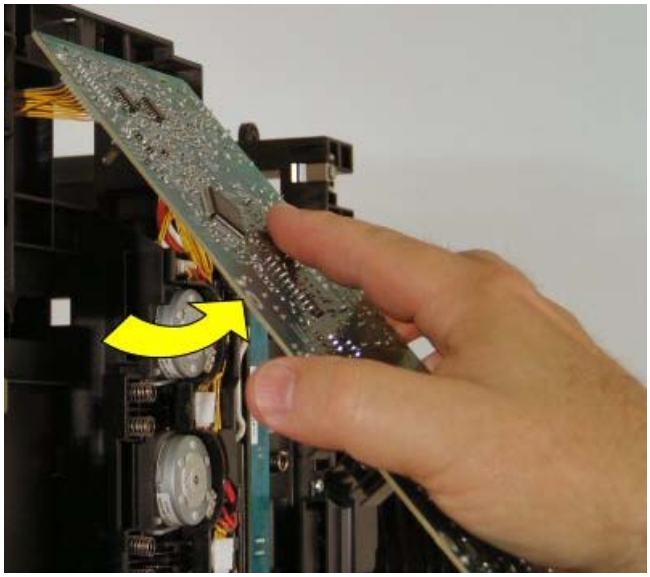


4. Remove the following:

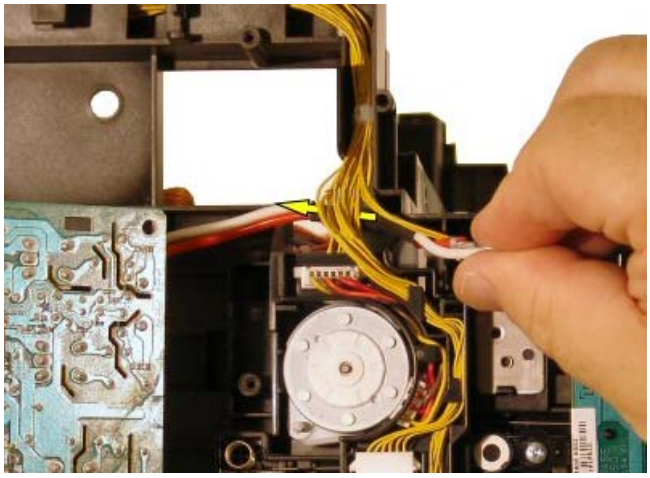
- The two 6 mm silver screws with lock washers that attach the red and white wires from the HVPS board to the toner cartridge high voltage contacts (see diagram)
- The eight screws (five 10 mm silver Tap screws and three 6 mm silver machine screws) that attach the HVPS board to the chassis (see diagram)



5. Angle the lower end of the HVPS upward to release it from its mounting points.



6. Carefully remove the HVPS board from the printer while guiding the wire harnesses out of the chassis.



7.	Reverse the previous steps to replace the HVPS.

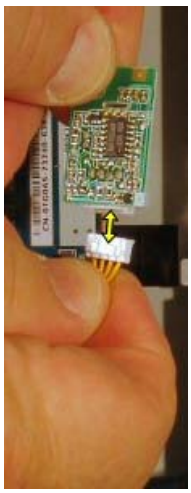
Humidity Sensor

The following table outlines the steps for removing and replacing the humidity sensor board.

Removing and Replacing the Humidity Sensor Board	
1.	Before removing the humidity sensor board: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the left cover. • Remove the top cover. • Remove the main fan assembly. • Remove the ESS shield box.
2.	The humidity sensor is a very small circuit board located in the rear area of the printer, between the MCU board and the left-side cover. It is mounted to the chassis using a nylon standoff spacer (circled in the image below).

3. Release the clips on the standoff spacer, and then pull the humidity sensor board away from the chassis (see diagram items 1 and 2).

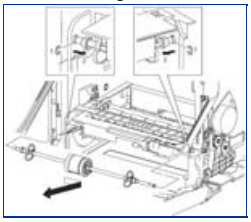
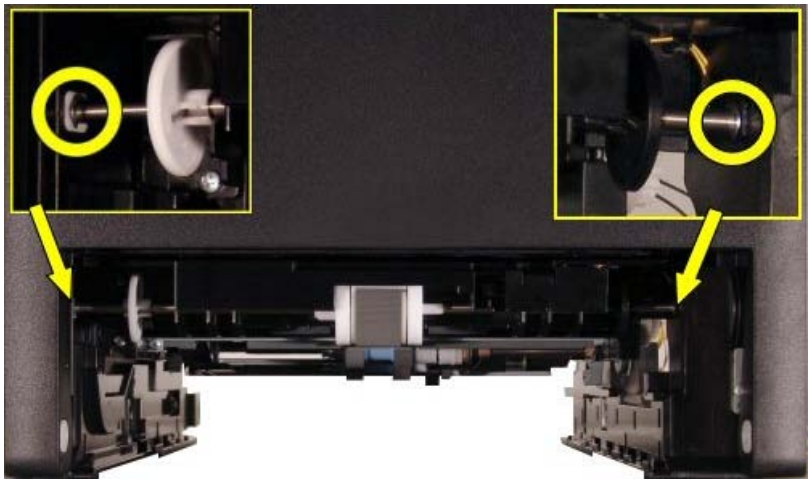
4. Unplug connector P/J261 from the humidity sensor board (see diagram item 3).

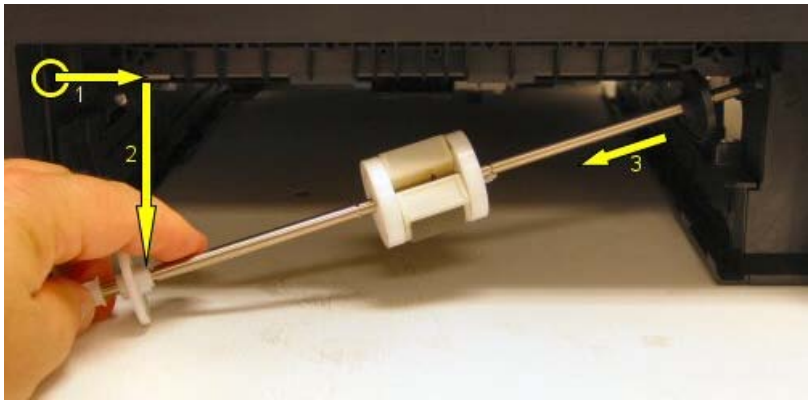


5. Reverse the previous steps to replace the humidity sensor board.

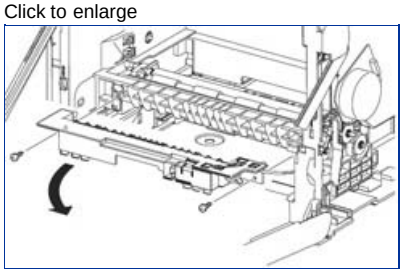
Integrated Feeder Assembly

The following table outlines the steps for removing and replacing the integrated feeder assembly.

Removing and Replacing the Integrated Feeder Assembly	
1.	Before removing the integrated feeder assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the feed drive assembly.
2.	Click to enlarge  Remove the circlip at each end of the MPF shaft assembly. CAUTION: As the MPF shaft assembly is removed, the bearings may slip off either end of the shaft. Use care so they are not accidentally lost. 
3.	• Slide both bearings toward the MPF roller as far as possible. • Slide the entire shaft to the right, and then lower the left end and angle it out of the chassis. • Slide the shaft to the left and remove it from the printer.

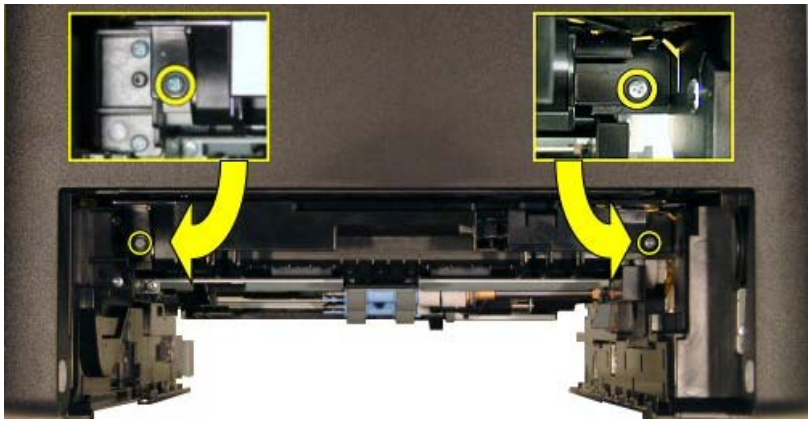


4. Click to enlarge

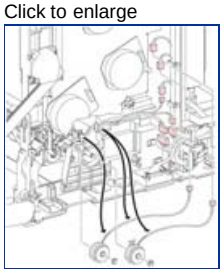


Remove the two 10 mm silver Tap screws at each end of the MPF chute assembly, and then remove the MPF chute from the printer.

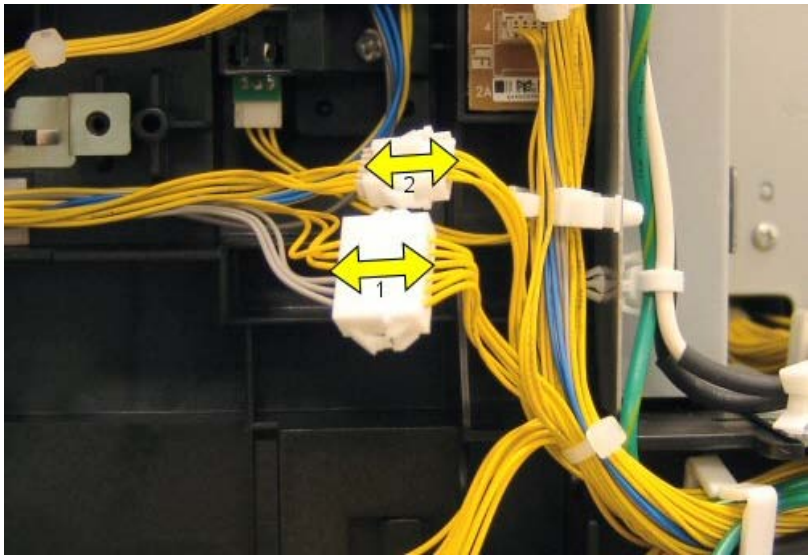
NOTE:
It is not necessary to remove the sensors or the wiring from the MPF chute assembly. At the completion of the following steps, pull the wiring through the chassis access holes to completely remove the MPF chute from the printer.

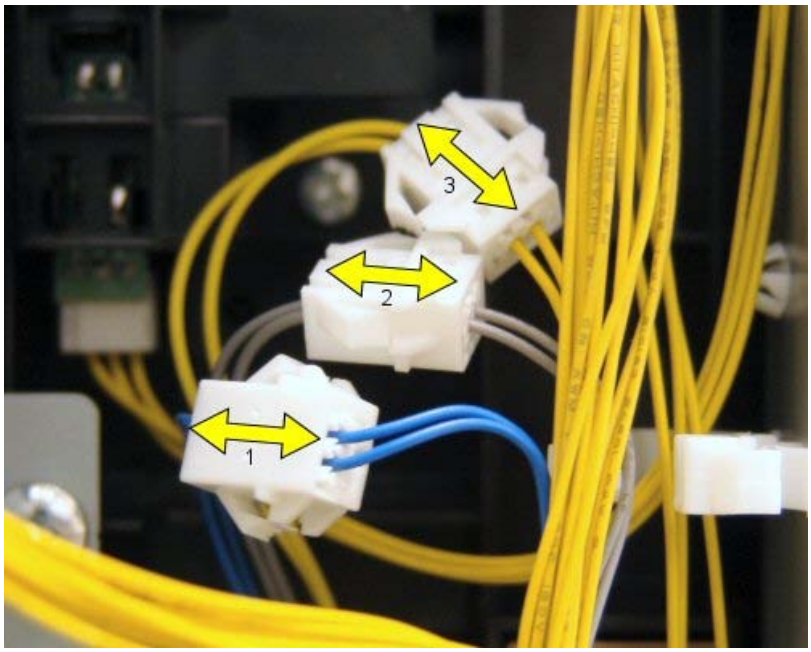


5. Click to enlarge

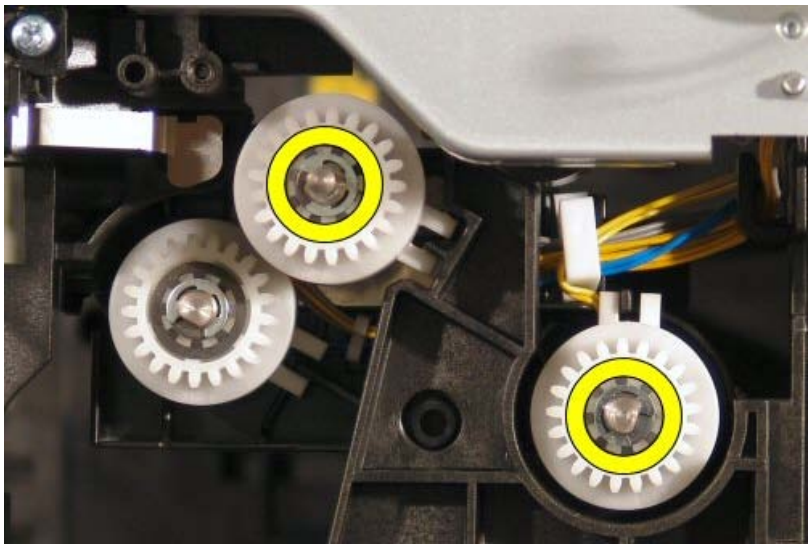


Separate all indicated connections and remove the cables from the chassis harness clamps.

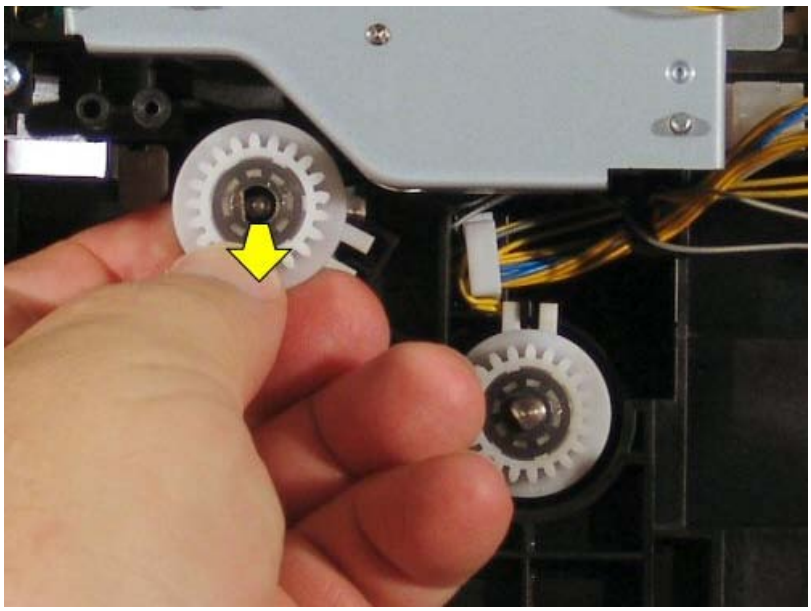


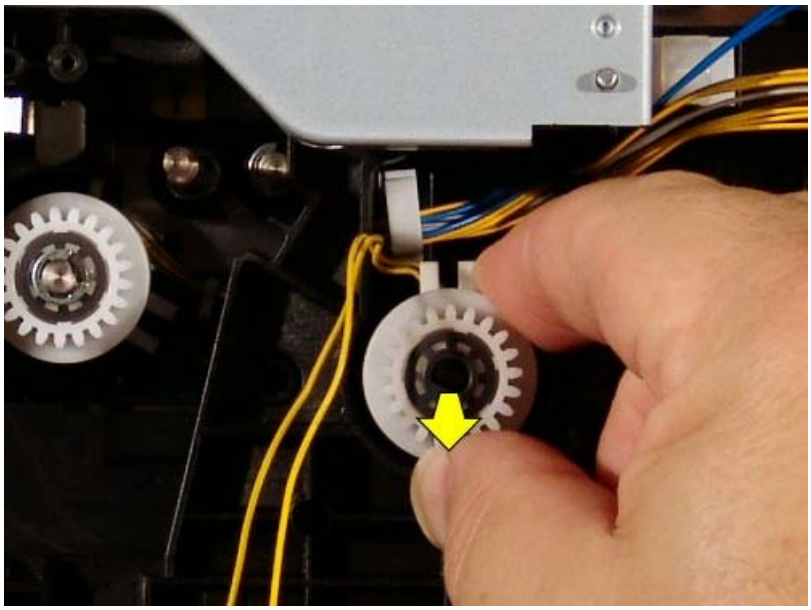


6. From front to rear, three clutches are on the right side of the printer. Remove the circlips from the second and third clutches.



7. Remove each clutch by sliding it off the end of each shaft. Take note which clutch goes where for reassembly purposes.





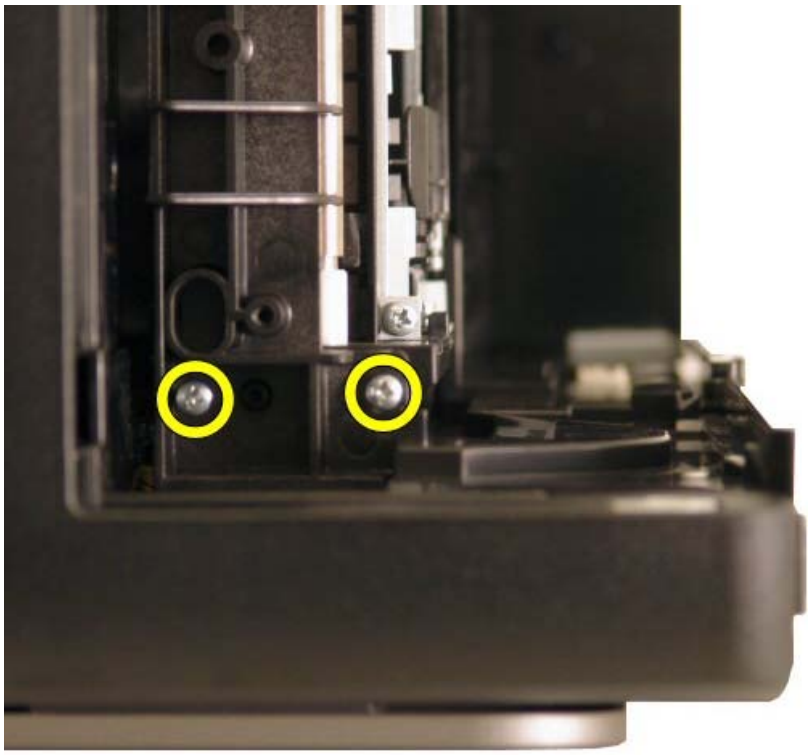
8. Lift the printer and place it on the left side with the bottom towards you. Remove the four 10 mm silver Tap screws attaching the bottom plate to the printer frame.

CAUTION:
Use assistance to lift the printer and lay it on the left side.

NOTE:
If the printer is installed on the optional 550-sheet paper feeder, it must be removed.

9. As viewed from the paper drawer opening at the front of the printer, remove two 10 mm silver Tap screws.

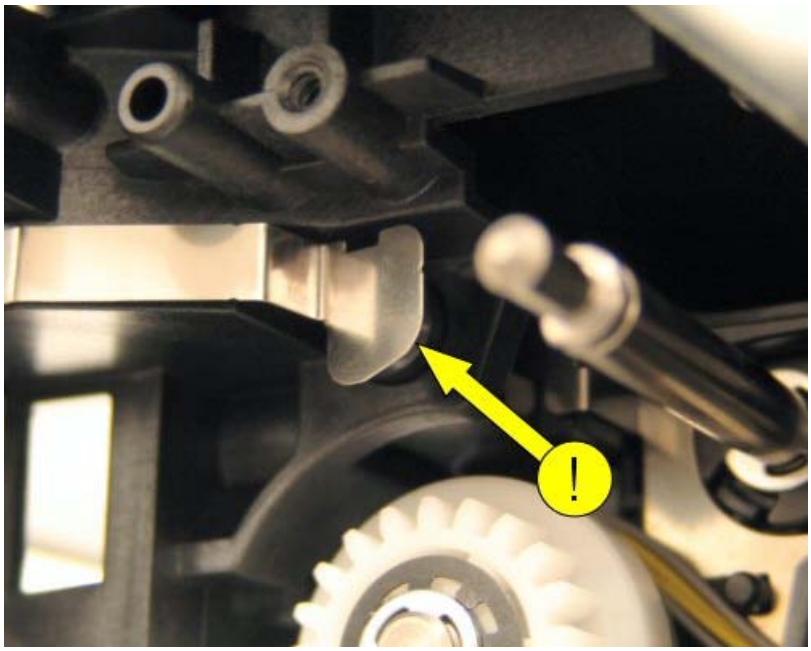
NOTE:
Support the integrated feeder assembly as these two screws are removed.

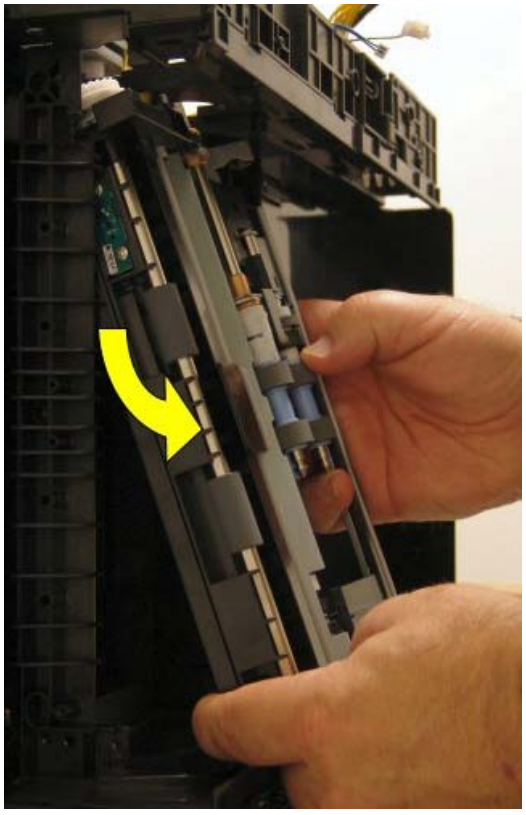


10. Facing the printer bottom, guide the integrated feeder assembly out of the printer.

CAUTION:

Use care when removing the integrated feeder assembly so you do not lose the grounding spring. The spring is approximately the same size and shape as the one used in a ball point pen and can easily fall out or shoot out of its receptacle as the assembly is removed.

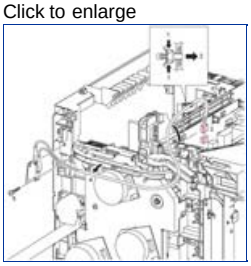
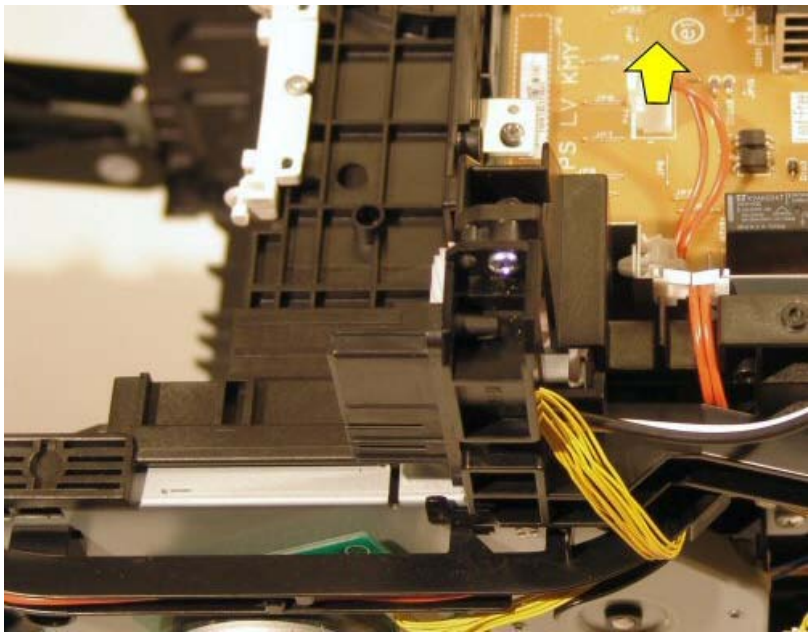


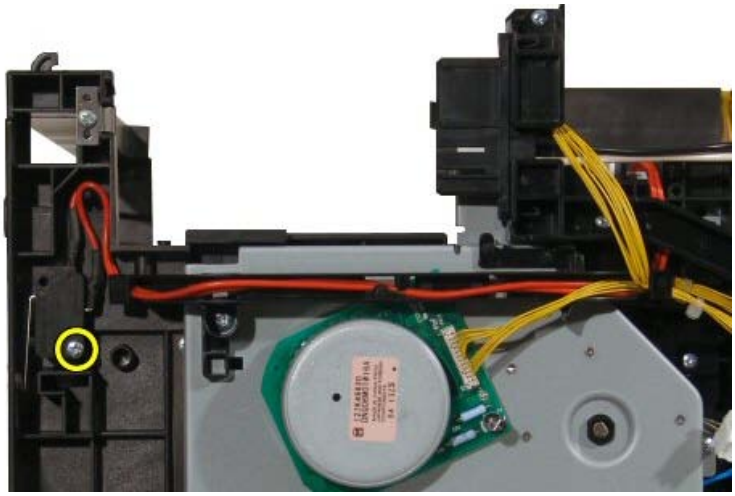


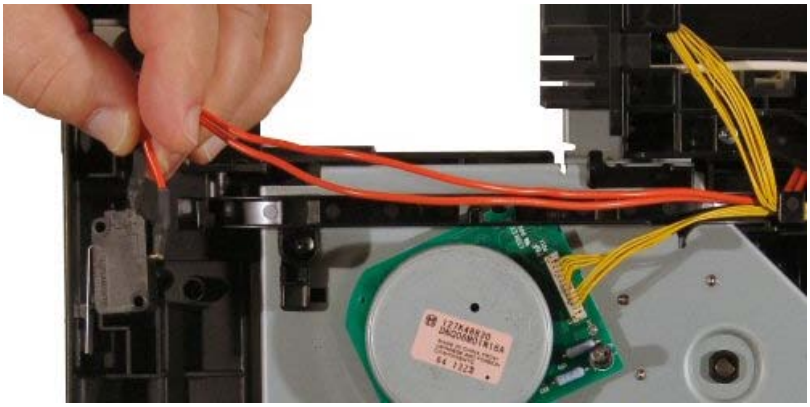
11.	Reverse the previous steps to replace the integrated feeder assembly.

Interlock Switch Assembly

The following table outlines the steps for removing and replacing the interlock switch assembly.

Removing and Replacing the Interlock Switch Assembly	
1.	Before removing the interlock switch assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. • Remove the top cover. Click to enlarge 
2.	Unplug the connector P/J44 from the low voltage power supply (LVPS), and then remove the harness clips from the LVPS chassis (see diagram items 1, 2, and 3). 
3.	Remove the 16 mm silver Tap screw attaching the interlock switch to the printer chassis (see diagram item 5).



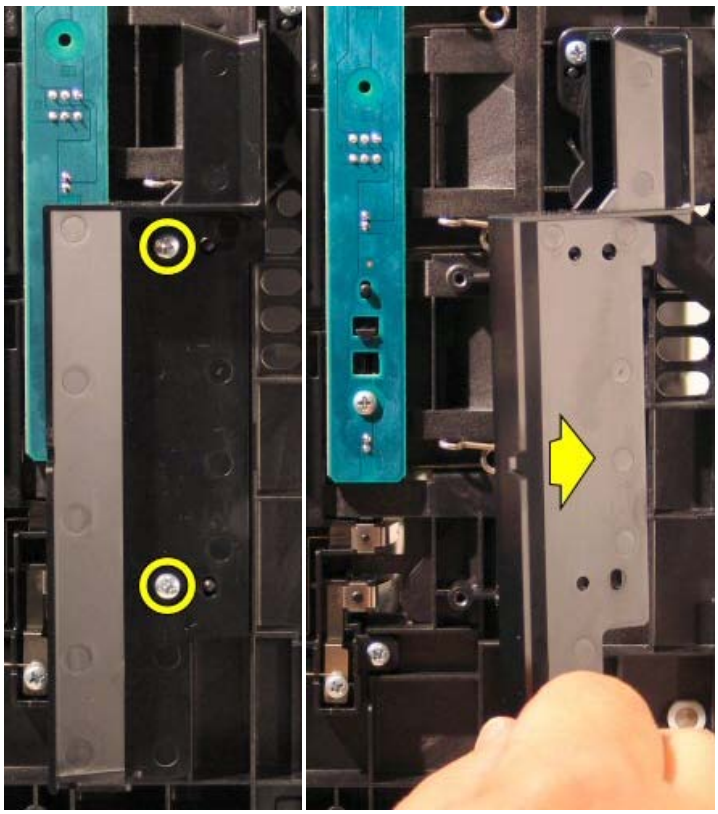
4.	Remove the interlock switch wires from within the wire guide located at the top of the photoconductor-developer drive assembly (see diagram item 4). 
5.	Reverse the previous steps to replace the interlock switch assembly.

LED (Erase) Assembly

The following table outlines the steps for removing and replacing the LED (erase) assembly.

Removing and Replacing the LED (Erase) Assembly	
1.	Before removing the LED (erase) assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the left cover.
2.	Remove the two 8 mm silver Tap screws attaching the air duct to the chassis, and then remove the air duct from the printer (see

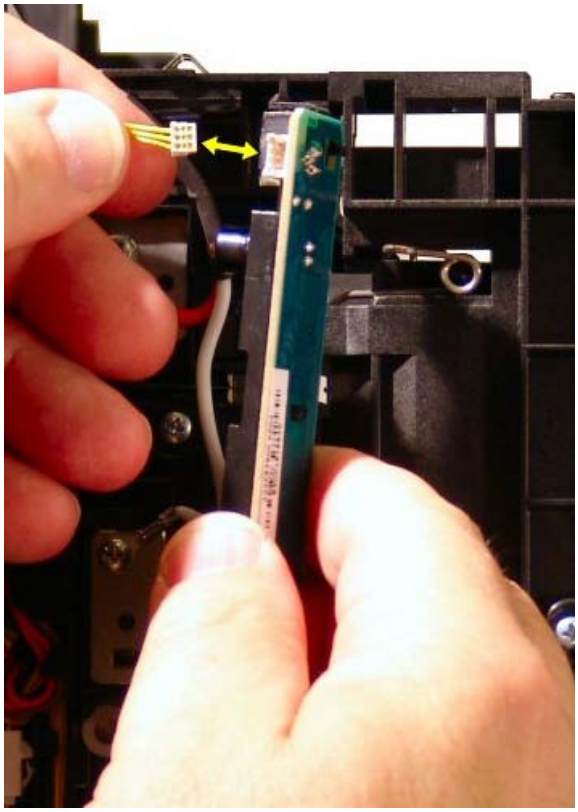
diagram item 1).



3. Remove the 10 mm silver Tap screw attaching the LED (erase) assembly to the printer chassis (see diagram item 2).

4. Depress the topmost clip and the lower interior clip (see diagram items 3).

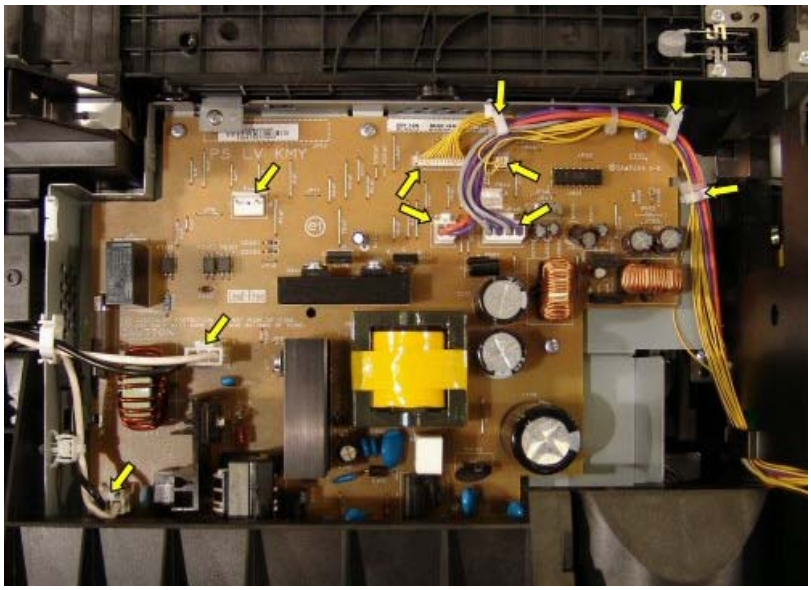
5. Withdraw the LED (erase) assembly and disconnect connector P/J141 (see diagram items 4 and 5).

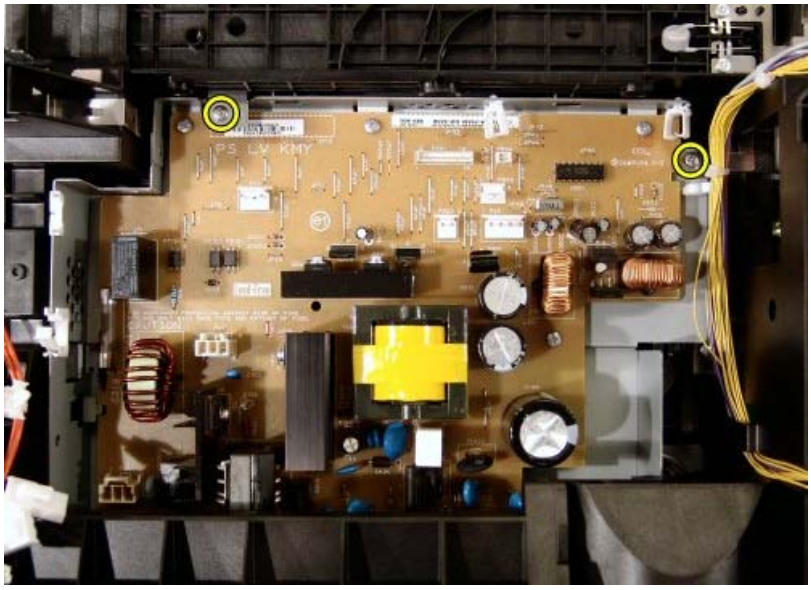


6. Reverse the previous steps to replace the LED (erase) assembly.

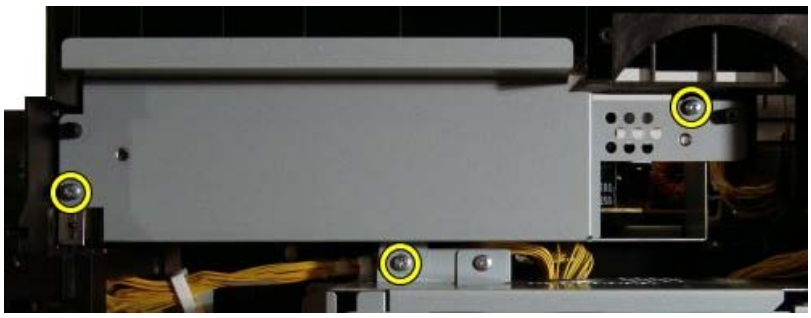
Low Voltage Power Supply

The following table outlines the steps for removing and replacing the low voltage power supply (LVPS).

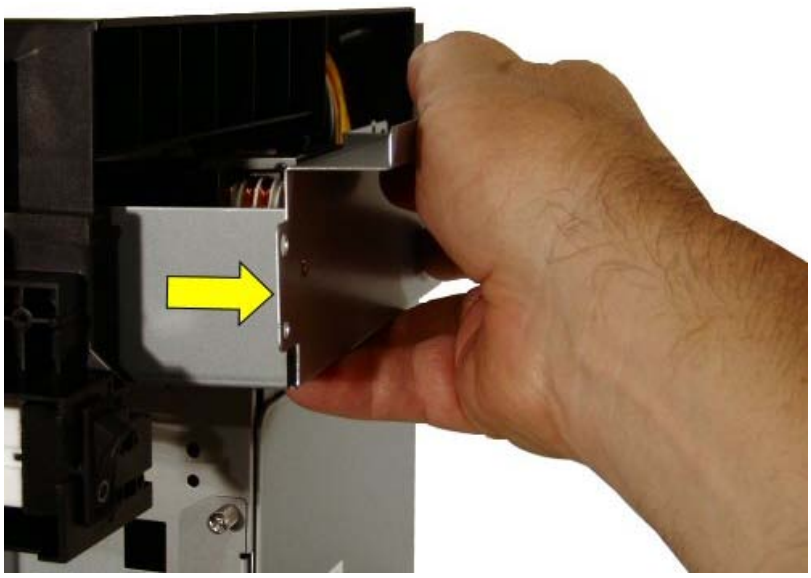
Removing and Replacing the LVPS	
1.	Before removing the LVPS: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. • Remove the top cover. • Remove the main fan assembly.
2.	Remove the seven connections (see diagram) from the LVPS, and then release all the cables from the harness clamps (see diagram). 
3.	Remove the two 6 mm silver machine screws connecting the LVPS frame ground to the printer frame ground.



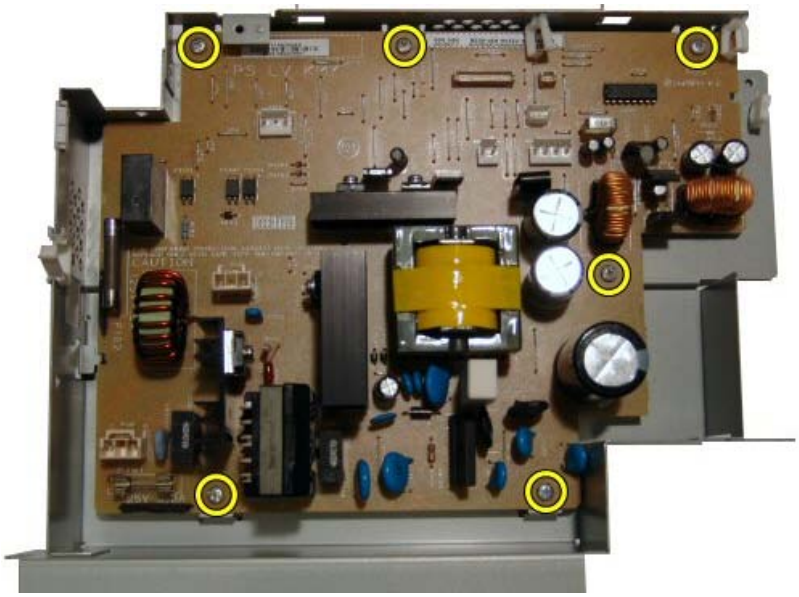
4. Remove the two 10 mm silver Tap screws and one 6 mm silver machine screw (see diagram) from the rear of the LVPS.



5. Remove the LVPS from the rear of the printer.



6. Locate and remove the six 6 mm silver machine screws that attach the LVPS board to the LVPS frame. The replacment LVPS must be attached to the original frame.



7.	Reverse the previous steps to replace the LVPS.

Machine Control Unit

The following table outlines the steps for removing and replacing the machine control unit (MCU) board.

Removing and Replacing the MCU Board	
1.	Before removing the MCU board, you must perform the NVM Save procedure. WARNING: This procedure must be performed before the MCU board is removed from the printer, or else important printer operational parameters will be lost. 1. Turn off the printer. 2. While pressing and holding the left (◀), right (▶), and Menu buttons on the operator panel, turn on the printer. 3. When the display indicates *Diagnosing...*, release the buttons. 4. After a few moments, the display should indicate *Developer/CE* and *Password*. 5. To enter the password, press the up (▲) button twice and then press Enter(✔). 6. The display should indicate *CE Mode* and *ESS Diag*. 7. Press the down (▼) button until *IOT Diag* is displayed, and then press Enter(✔). 8. Press the down (▼) button until *NVM Settings* is displayed, and then press Enter(✔). 9. Press the down(▼) key until *NVM Save* is displayed, and then press Enter(✔). 10. Press Enter(✔) twice to perform the NVM Save procedure. 11. After the NVM Save has completed, press Cancel until *IOT Diag* is displayed. 12. Press the down (▼) button until *Complete* is displayed. 13. Press Enter(✔) three times. *Ready to Print* is displayed.
2.	• Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.

- Remove the fuser.
- Remove the rear cover.
- Remove the left cover.
- Remove the top cover.
- Remove the main fan assembly.
- Remove the ESS shield box.

3. CAUTION:
The MCU board can be damaged by static electricity. Use all static prevention safeguards, including ESD wristbands and placemats.

Disconnect all cables (diagram item 1) from the MCU board, and then remove the six 6 mm silver machine screws (diagram item 2) that attach the MCU to the chassis. Remove the MCU board from the chassis.

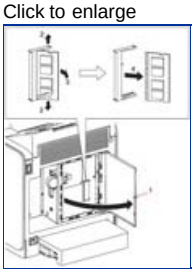
4. Reverse the previous steps to replace the MCU board. Ensure the top center of the MCU board is positioned under the protruding metal tab on the chassis (see diagram).

5. WARNING:
The LVM Load procedure must be performed to load printer operational parameters into the replacement MCU.

1. While pressing and holding the left (◀), right (▶), and Menu buttons on the operator panel, turn on the printer.
2. When the display indicates *Diagnosing...*, release the buttons.
3. After a few moments, the display should indicate *Developer/CE* and *Password*.
4. To enter the password, press the up (▲) button twice and then press Enter(✔).
5. The display should indicate *CE Mode* and *ESS Diag*.
6. Press the down (▼) button until *IOT Diag* is displayed, and then press Enter(✔).
7. Press the down (▼) button until *NVM Settings* is displayed, and then press Enter(✔).
8. Press the down (▼) button until *NVM Load* is displayed, and then press Enter(✔).
9. Press Enter(✔) twice to perform the NVM Load procedure.
10. After the NVM Load has completed, press Cancel until *IOT Diag* is displayed.
11. Press the down (▼) button until *Complete* is displayed.
12. Press Enter(✔) three times. *Ready to Print* is displayed.

Memory (Option)

The following table outlines the steps for removing and replacing the optional memory module.

Removing and Replacing the Optional Memory Module	
1.	Before removing the optional memory module: • Turn the printer off and remove the AC power cable from the back of the printer.
2.	Click to enlarge  CAUTION: The memory and ESS control board can be damaged by static electricity. Use all static prevention safeguards, including ESD wristbands and placemats. • Loosen the knurled screw and open the metal door to expose the ESS control board (item 1 in drawing). • On either side of the optional memory module, spread the memory module connector retaining clips far enough to release the memory (item 2 in drawing). • Continue to rotate the memory module up and away from the ESS control board (item 3 in drawing) until the module is loose. • Remove the optional memory module from the ESS control board memory connector (item 4 in drawing).
3.	Reverse the previous steps to replace the optional memory module.

Motor Assembly-PC/DDA

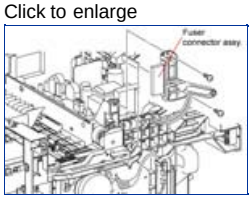
The following table outlines the steps for removing and replacing the photoconductor / developer drive assembly (PC/DDA).

Removing and Replacing the PC/DDA	
1.	Before removing the PC/DDA: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser.

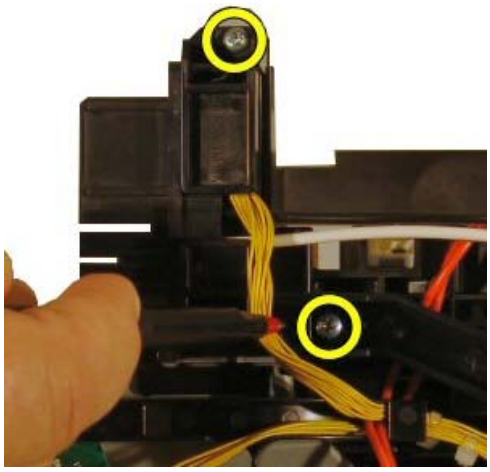
Remove the rear cover.

- Remove the right cover.
- Remove the left cover.
- Remove the top cover.
- Remove the interlock switch assembly. It is not necessary to disconnect the wiring from the LVPS.

2. Click to enlarge

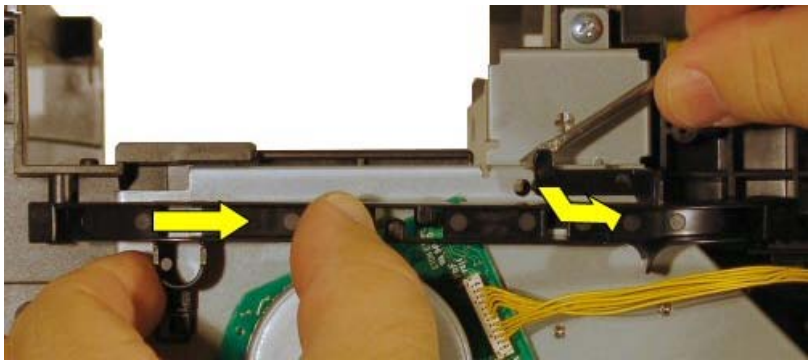


Remove the two 10 mm silver Tap screws that attach the fuser connector bracket to the top-right side of the chassis and remove the bracket. It is not necessary to disconnect the wiring from the LVPS.

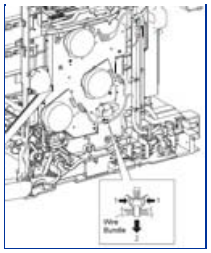


3. Remove the large-diameter 10 mm Tap screw located at the front end of the cable duct.

4. Lift the release tab and slide the cable duct rearward until the cable duct can be pulled out and removed.



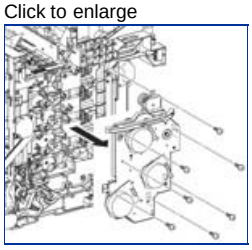
5. Click to enlarge



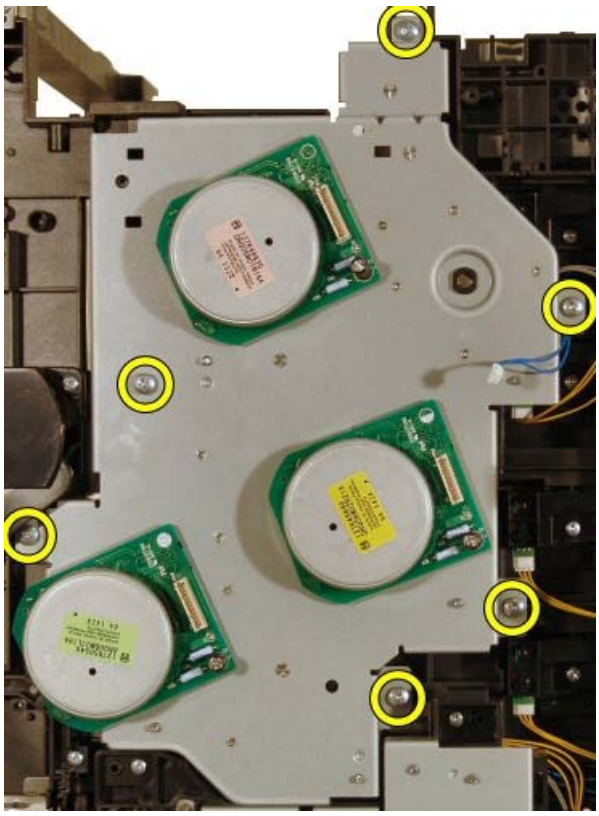
Separate the four connections and unclip the cable harness clamp from the PC/DDA.

NOTE:
As you face the PC/DDA, one of the connections is located to the right of the PC/DDA. (see insert). The wires exiting the PC/DDA (exit clutch) are blue and mate with a pair of yellow wires from the chassis.

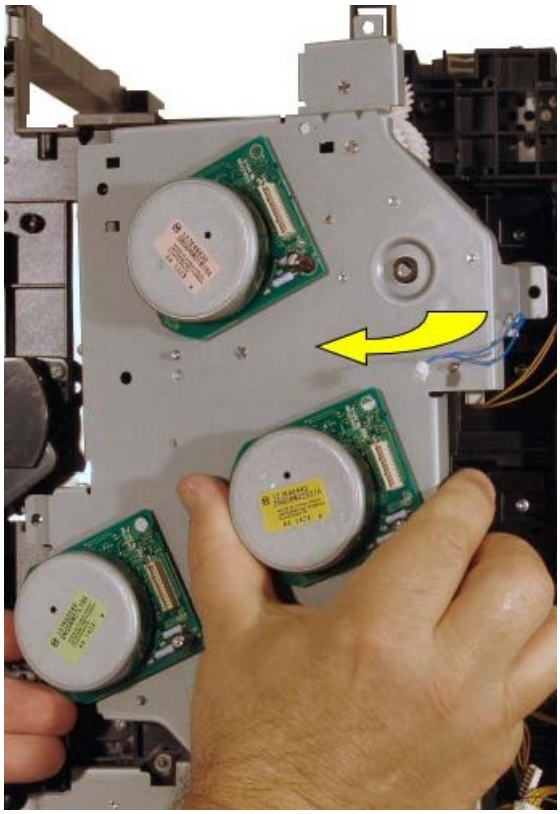
6. Click to enlarge



Remove the six large-diameter 10 mm Tap screws that attach the PC/DDA to the printer chassis. Remove the PC/DDA from the printer.



7. Remove the PC/DDA from the printer. As it is pulled away from the frame, the rear edge needs to be pulled out farther than the front edge so the PC/DDA clears the right arm assembly.



8. Reverse the previous steps to replace the PC/DDA.

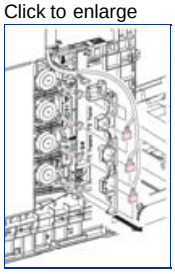
WARNING:
Ensure that the ends of all gear shafts are properly seated before tightening any screws. This can be done by simply rotating any of the motors so the PC/DDA sits flat on the screw bosses. Failure to do so can warp the PC/DDA assembly and cause the

	drive gears to bind.

Motor Assembly-Toner Dispenser

The following table outlines the steps for removing and replacing a toner dispenser motor assembly.

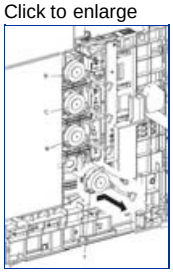
NOTE:
This procedure is common to all four toner dispenser motors, black, cyan, magenta, and yellow.

Removing and Replacing a Toner Dispenser Motor Assembly	
1.	Before removing a toner dispenser motor assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the left cover. Click to enlarge  NOTE: The following steps describe the procedure as written in the service manual and are provided as points of reference. Experience has shown that removal of all the connections is not required. The wiring has enough slack to position the duct harness so a defective toner dispenser motor can be removed and replaced.
2.	The following image is provided for reference only and shows how the wiring and duct should appear before removing any parts.

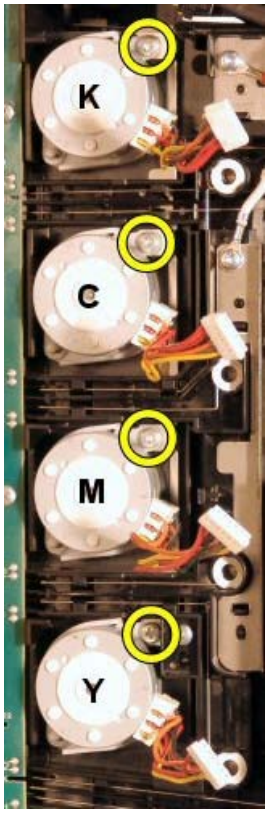
3. Separate the connections from all four toner dispenser motors, and then remove the wiring from the duct harness guide. Loop the wiring up and out of the way on top of the printer (see diagram).

4. Release the bottom then top hooks that attach the harness duct to the chassis. Pull the harness duct out far enough to remove the motor wiring from the harness duct (see diagram).

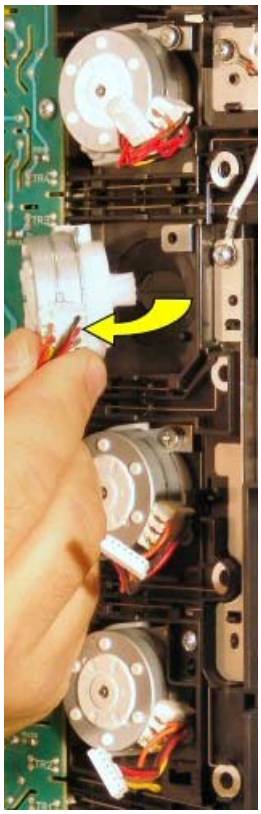
5. Click to enlarge



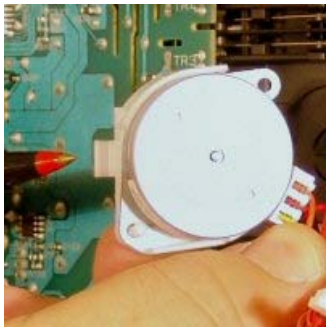
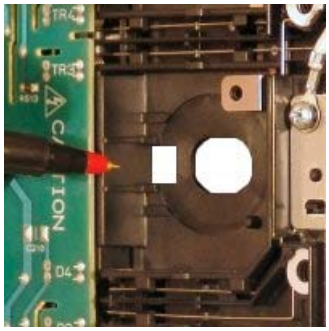
Remove the 8 mm silver Tap screw attaching the defective motor to the chassis.



6. Tilt the defective motor, move it forward far enough for the tab to clear the motor mount opening in the chassis, and then remove the motor.



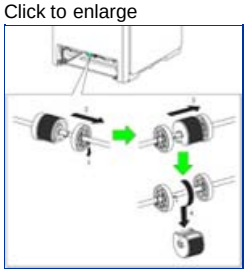
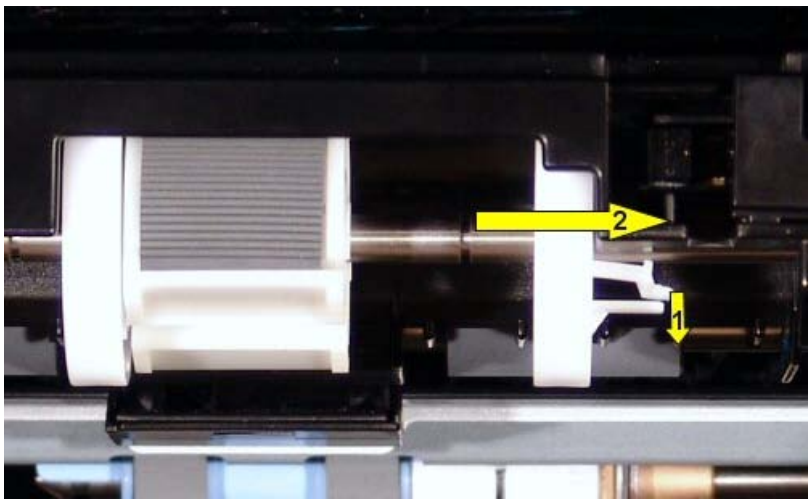
7. This image shows the motor mount tab and opening in the chassis.

8.	Reverse the previous steps to replace a toner dispenser motor assembly.

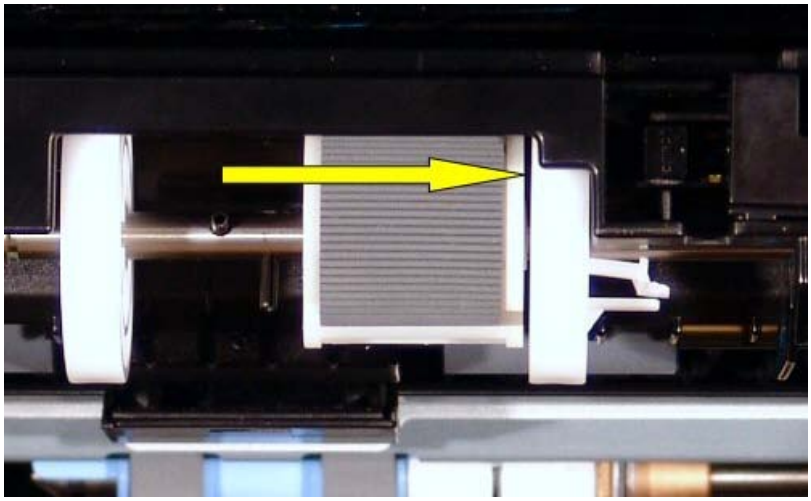
MPF Feed Roller

The following table outlines the steps for removing and replacing the multipurpose feeder (MPF) feed roller.

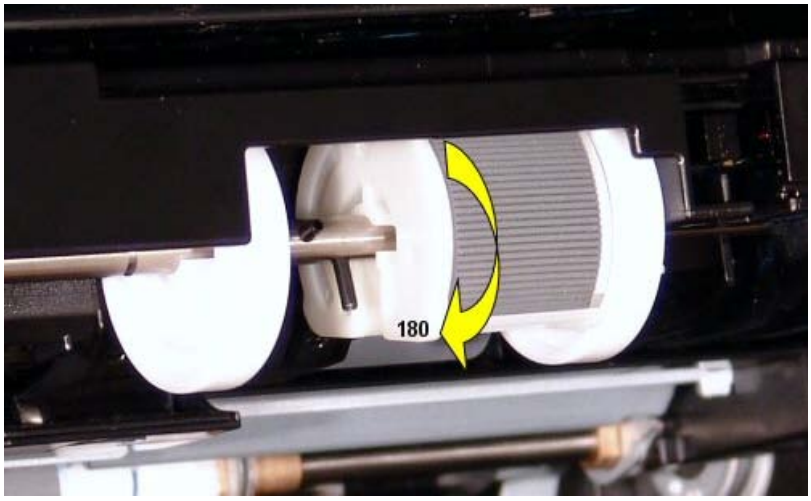
Removing and Replacing the MPF Feed Roller	
1.	Before removing the MPF feed roller: • Turn the printer off and remove the AC power cable from the back of the printer. • Remove the internal 250-sheet paper tray.
2.	Click to enlarge  Locate the MPF feed roller. Peer inside the area from where the 250-sheet paper tray was removed. Located in the front-center area is the MPF feed roller. On each side of the feed roller is a white plastic bobbin. Rotate the right bobbin so the locking tab is easily accessible. Slightly bend down the release tab and slide the bobbin to the far right. 

3. Slide the MPF feed roller to the right as far as possible, and then rotate the roller 180 degrees to remove it from the shaft.

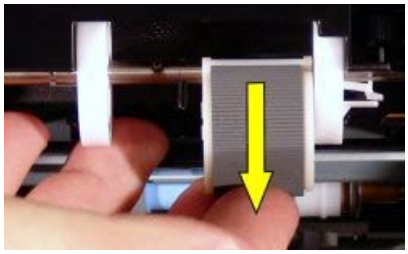
NOTE:
The MPF feed roller must be slid to the right past the downward-pointing pin before the roller can be rotated.



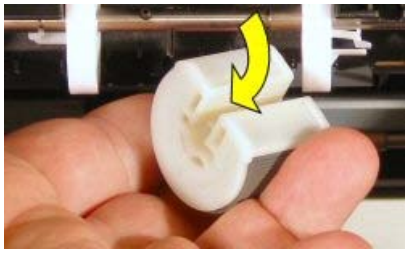
4. Rotate the MPF roller 180 degrees around the shaft.



5. Pull the roller straight down to remove it.



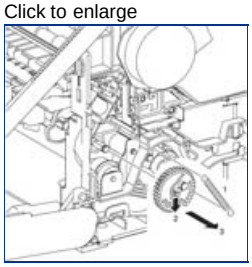
This image shows the MPF roller fully removed from the printer.

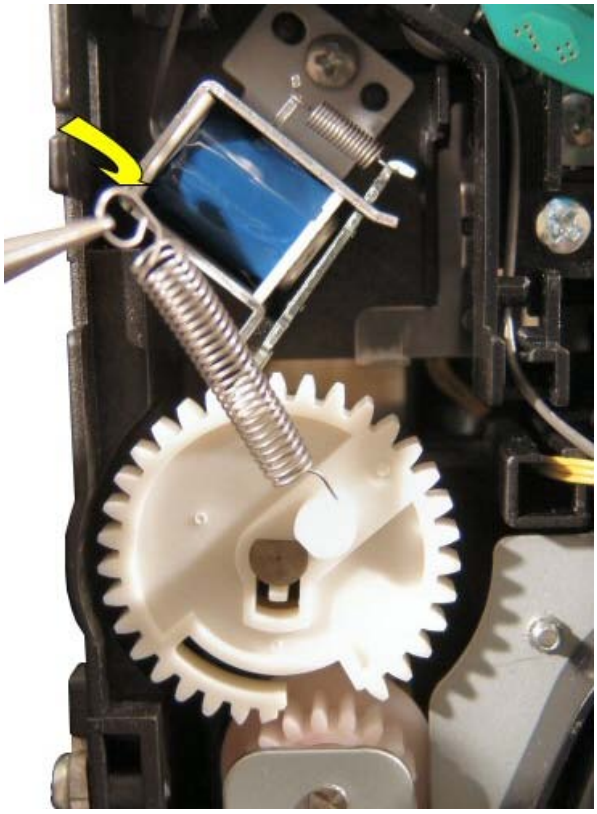


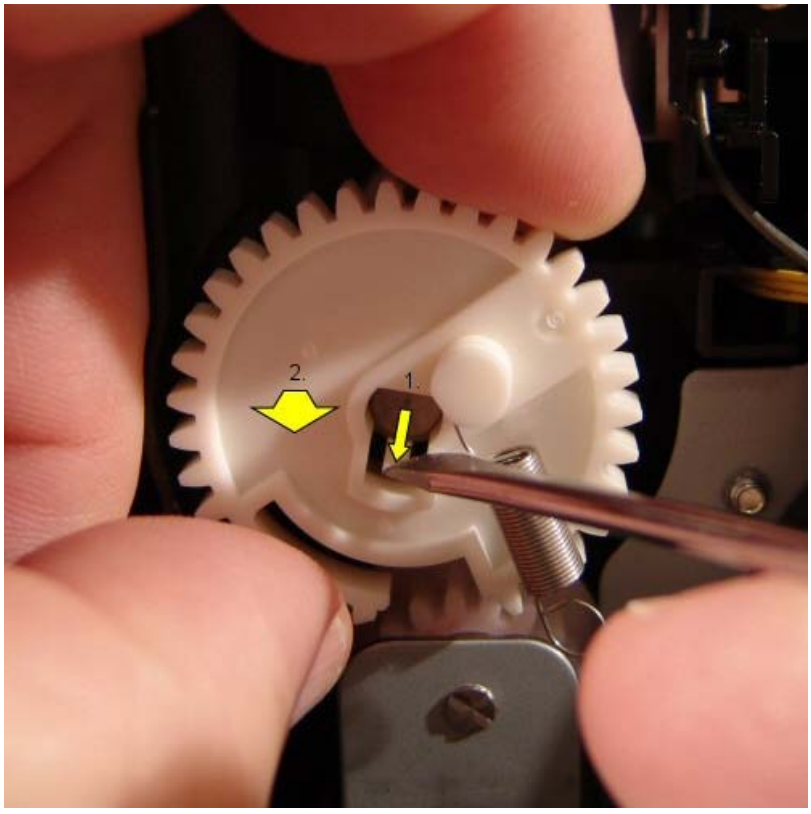
6.	Reverse the previous steps to replace the MPF feed roller.

MPF Feed Solenoid

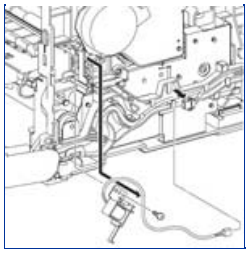
The following table outlines the steps for removing and replacing the multipurpose feeder (MPF) solenoid.

Removing and Replacing the MPF Solenoid	
1.	Before removing the MPF solenoid: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Do not expose the toner cartridges to light for more than 5 minutes. If the printer front door will be open more than 5 minutes, the toner cartridges should be removed and stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover.
2.	Click to enlarge  Remove the MPF feed spring, release the locking tab from the MPF gear, and then slide the gear from the MPF drive shaft.

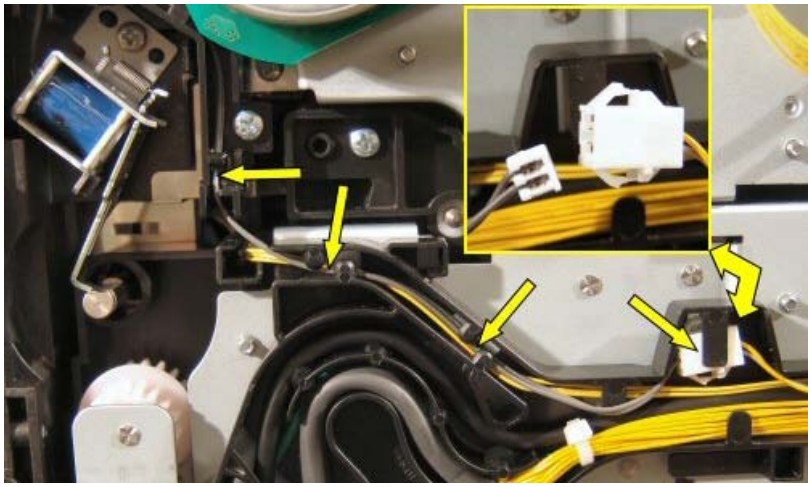




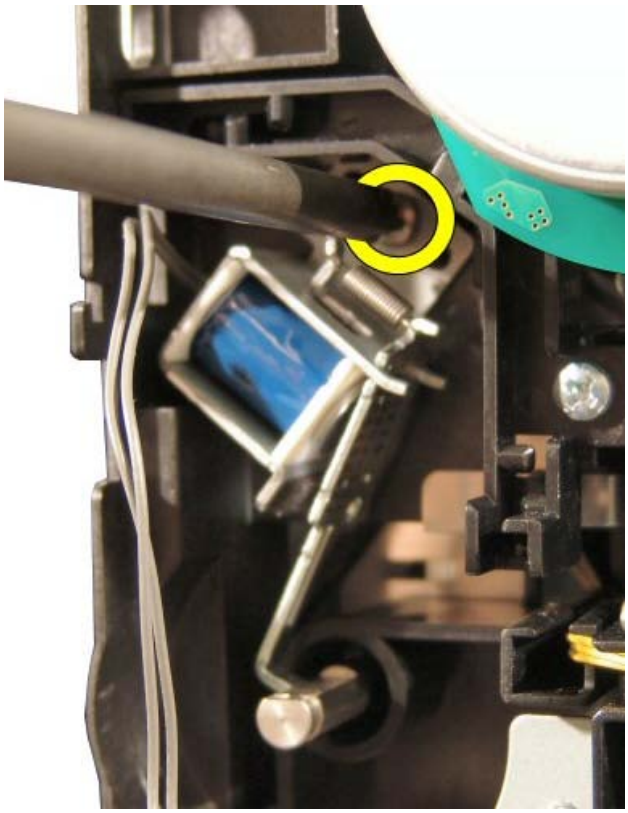
3. Click to enlarge



Locate and remove the inline connection (P/J256) from the cable duct. Separate the connection.



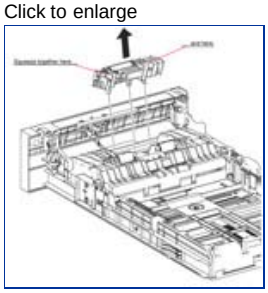
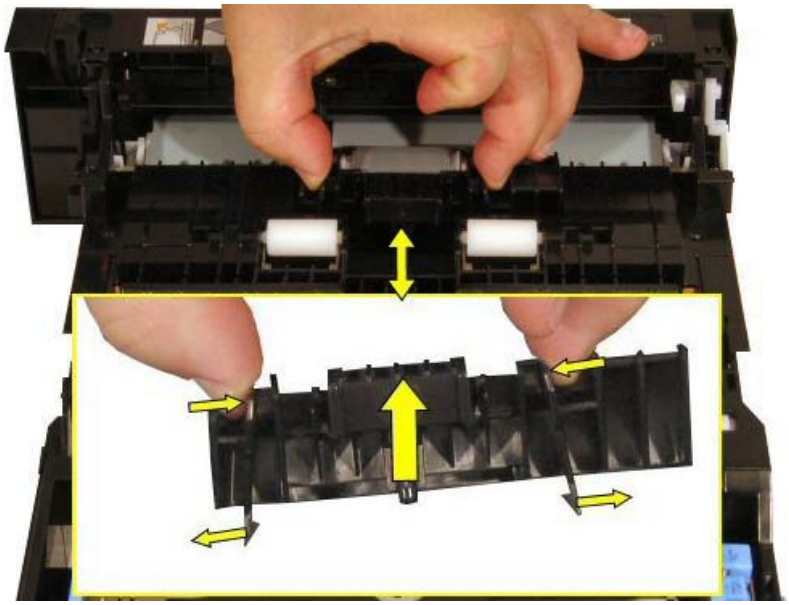
4. Remove the 8 mm silver Tap screw attaching the MPF solenoid to the chassis, and then remove the MPF feed solenoid.



5. Reverse the previous steps to replace the MPF feed solenoid.

MPF Separator Roller

The following table outlines the steps for removing and replacing the multipurpose feeder (MPF) separator roller assembly.

Removing and Replacing the MPF Separator Roller Assembly	
1.	Before removing the MPF separator roller assembly: • Remove the internal 250-sheet paper tray.
2.	Click to enlarge  Orient the tray as shown. At the points illustrated, press each of the clip tabs towards the center of the tray, and then lift the MPF separator roller straight up and out of the tray. 
3.	Reverse the previous step to replace the MPF separator roller assembly.

Multi-Protocol Card (Option)

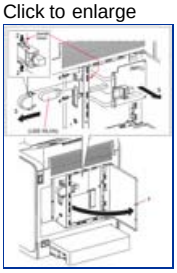
The following table outlines the steps for removing and replacing the optional multi-protocol card (MPC).

Removing and Replacing the Optional MPC

1. Before removing the optional MPC:

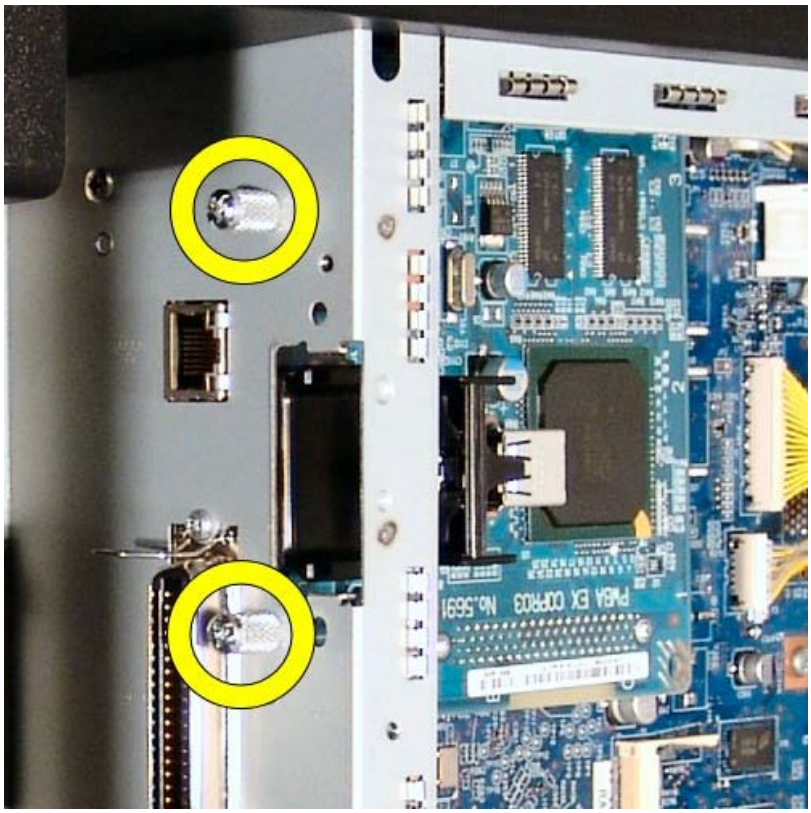
   - Turn the printer off and remove the AC power cable from the back of the printer.
   - Loosen the knurled screw and open the metal door to expose the MPC and ESS control board (see diagram item 1).
   - Remove the optional WLAN adapter, if installed.

   Click to enlarge

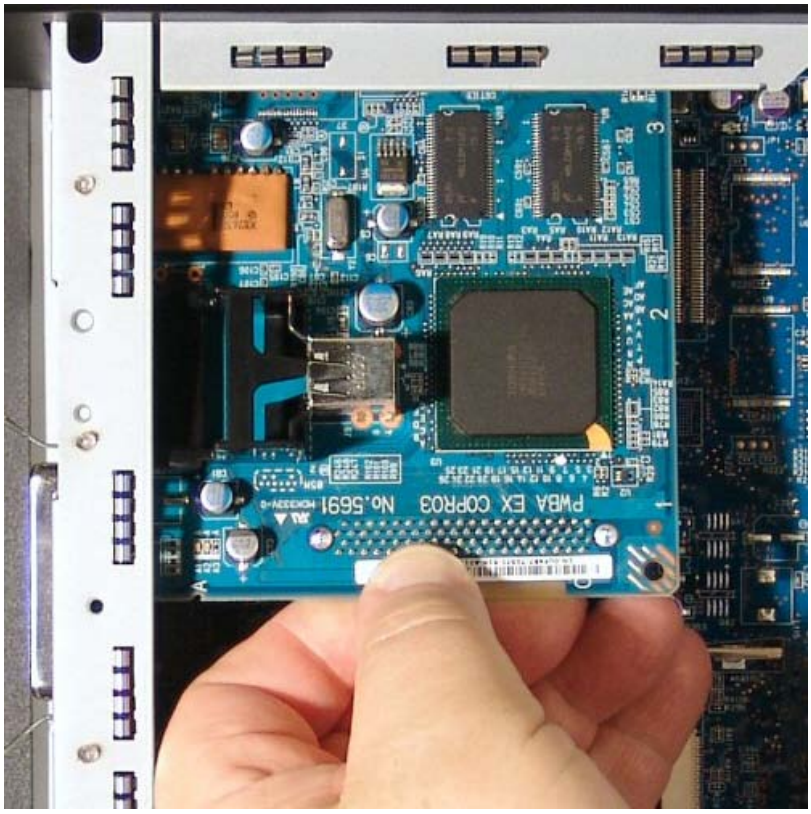
   

2. CAUTION:
   The MPC and ESS control board can be damaged by static electricity. Use all static prevention safeguards, including ESD wristbands and placemats.

   Remove the two knurled screws that attach the optional MPC to the ESS shield box (see diagram item 5).

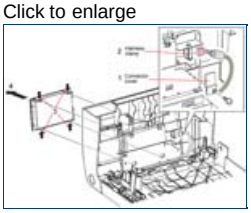
3. Grasp the MPC along the lower edge and carefully pull it out, separating the MPC connector from the ESS control board connector. Remove the MPC from the printer (see diagram item 6).



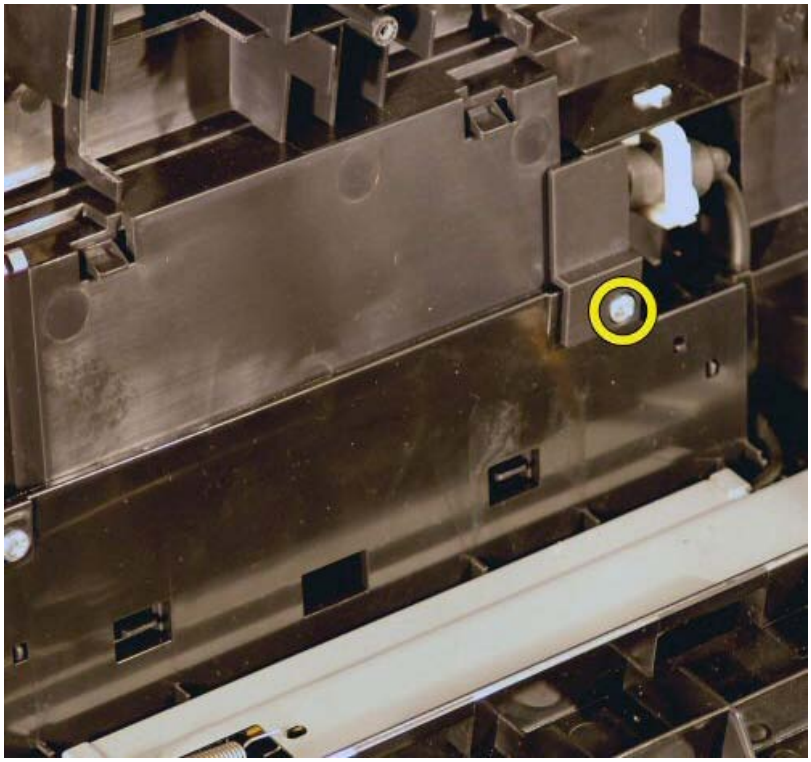
4.	Reverse the previous steps to replace the optional MPC.

Operator Panel

The following table outlines the steps for removing and replacing the operator panel.

Removing and Replacing the Operator Panel	
1.	Before removing the operator panel: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the exit chute assembly. Click to enlarge 
2.	Remove the 8 mm silver Tap screw attaching the connector cover to the inside top of the front cover. Remove the cover (see diagram

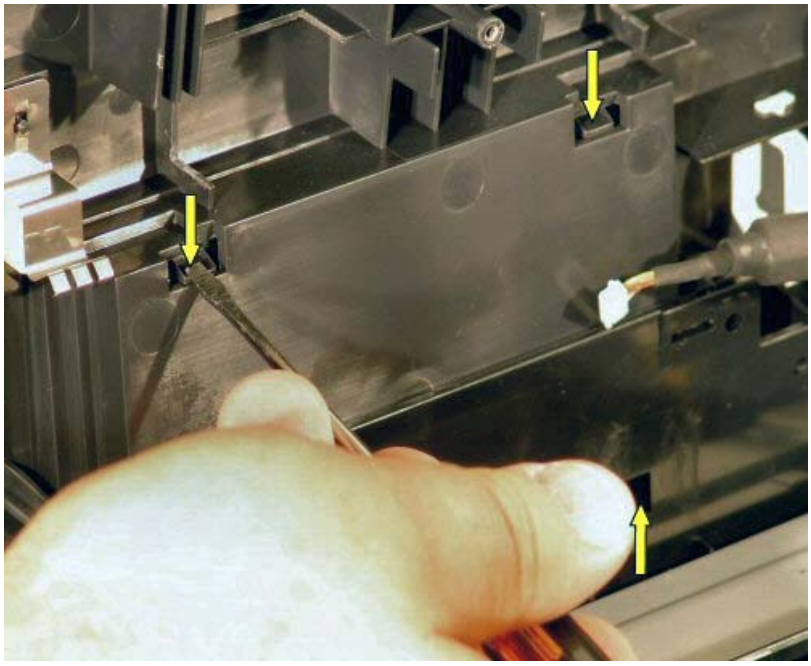
item 1).



3. Open the cable clamp and disconnect cable P/J20 from the rear-left side of the operator panel (see diagram item 2).

4. CAUTION:
With the front cover fully open, ensure the operator panel is prevented from falling out when the clips are released.

Release the clips at each of the four corners of the operator panel, and then remove the panel from the exterior side of the front cover (see diagram items 3 and 4).

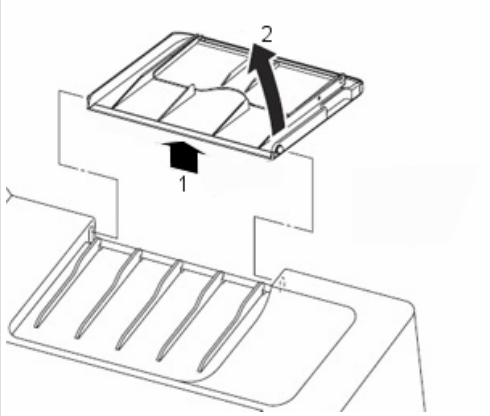


5.	Reverse the previous steps to replace the operator panel.

Paper Exit Extender

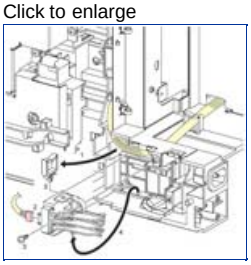
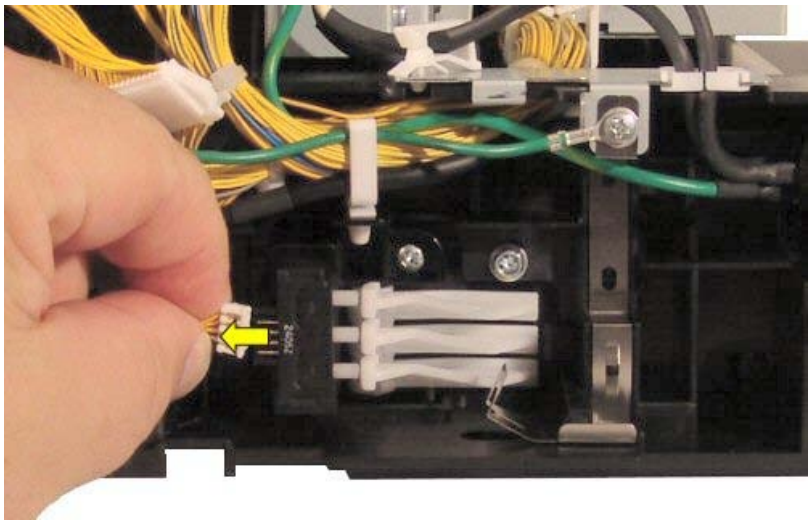
The following table outlines the steps for removing and replacing the paper exit extender.

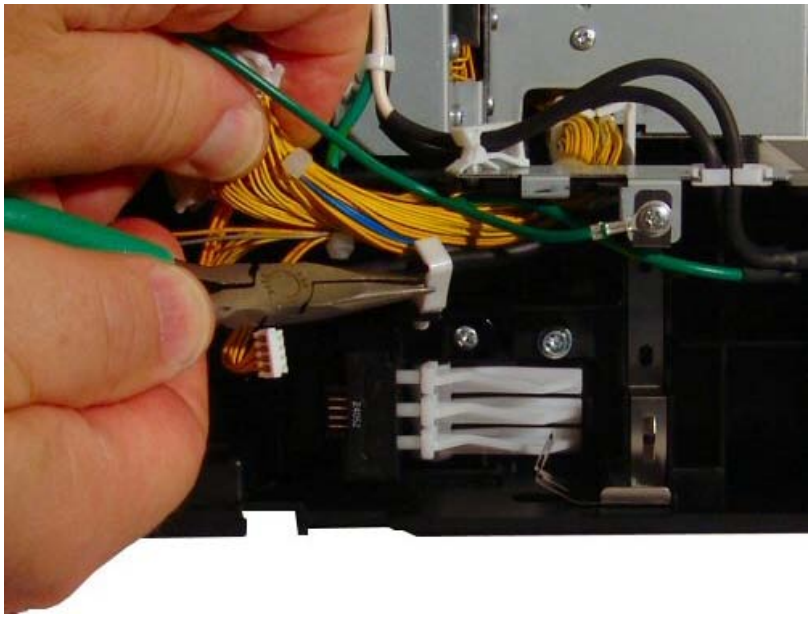
NOTE:
The RSL and removal/replacment procedures refer to this part as the cover extender. For clarification of naming versus function, this document refers to this part as the paper exit extender.

Removing and Replacing the Paper Exit Extender	
6.	Open the paper exit extender, flex the center upward until one of the pins on either side of the extender has cleared the pivot hole in the top cover, and then remove the extender. 
7.	Reverse the previous step to replace the paper exit extender.

Paper Size Switch Assembly

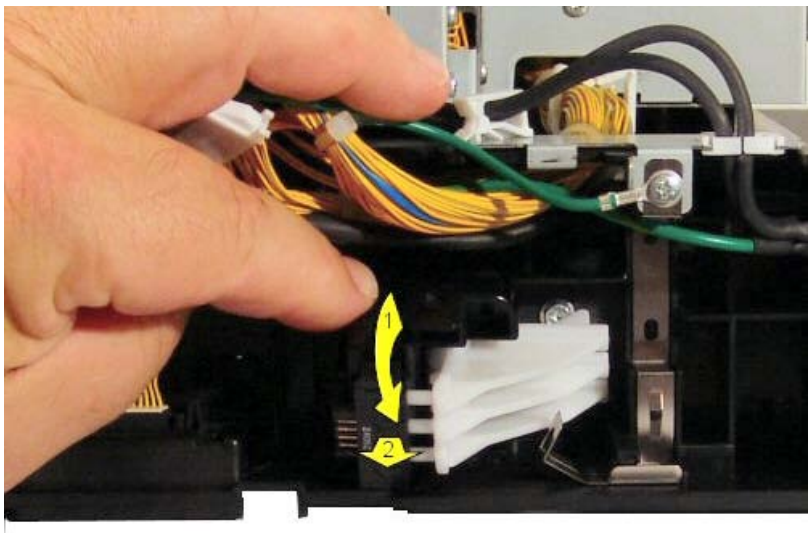
The following table outlines the steps for removing and replacing the paper size switch assembly.

Removing and Replacing the Paper Size Switch Assembly	
1.	Before removing the paper size switch assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. After removing the right cover, the front door can be closed to protect the toner cartridges from excessive light exposure. Click to enlarge 
2.	Disconnect P/J231 from the paper size switch assembly (see diagram item 2). 
3.	Open the harness clamp, remove the wiring from the clamp, and then remove the harness clamp (see diagram items 1 and 5). TIP: Gain extra slack in the wiring by first disconnecting the cable to the 550-sheet expansion connector (P/J273).



4. Remove the 10 mm silver Tap screw attaching the paper size switch assembly to the printer chassis (see diagram item 3).

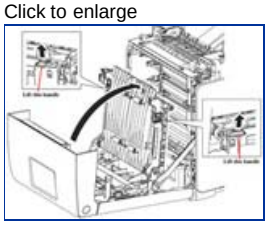
5. Tilt the top of the switch outward, and then lift it up and out to remove it from the printer (see diagram item 4).

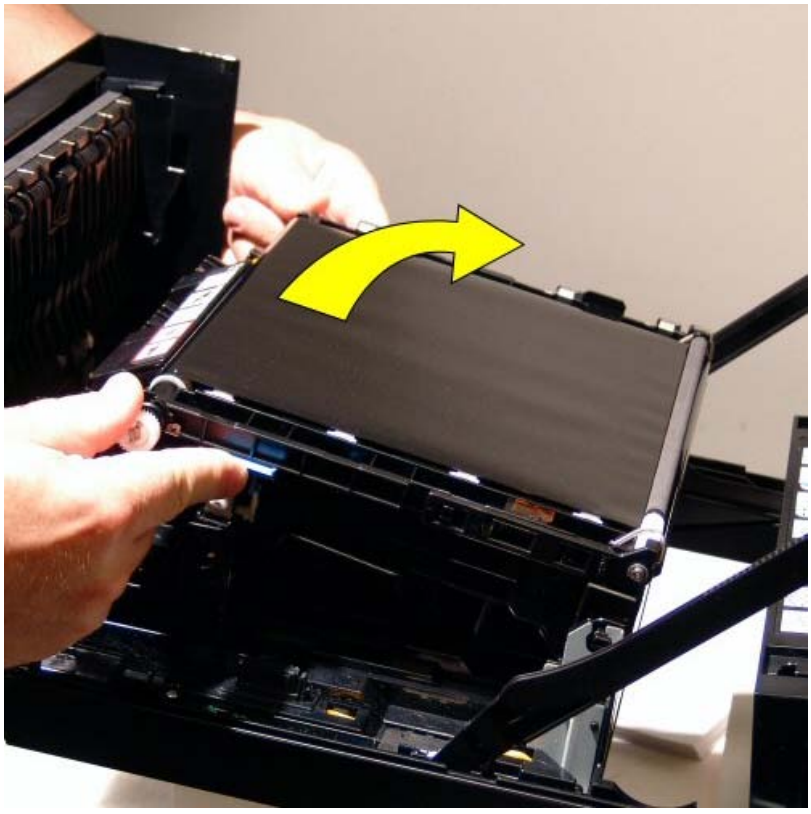


6.	Reverse the previous steps to replace the paper size switch assembly.

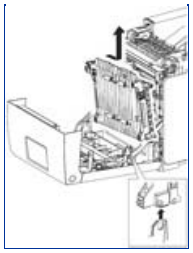
Paper Transfer Belt

The following table outlines the steps for removing and replacing the paper transfer belt.

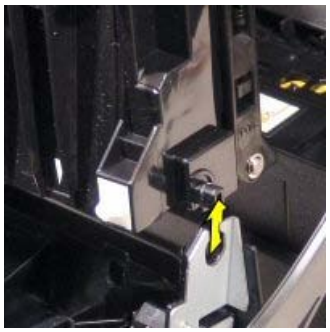
Removing and Replacing the Paper Transfer Belt	
1.	Before removing the paper transfer belt: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.
2.	CAUTION: Use care to keep from scratching or damaging the belt surface. After removal, set the unit aside (belt facing down) on a large, clean, smooth surface. Click to enlarge  At the front-left and front-right sides of the paper transfer belt, lift both release levers then rotate the front of the paper transfer belt upward.



3. Click to enlarge



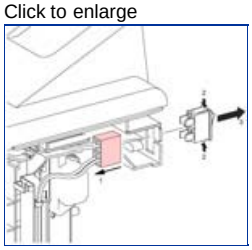
Lift the right-side pivot pin from the U-shaped slot. Then shift the transfer belt rightward to free the left-side pivot pin from its mount. Use care not to scratch the surface of the belt as it is lifted out of the printer.

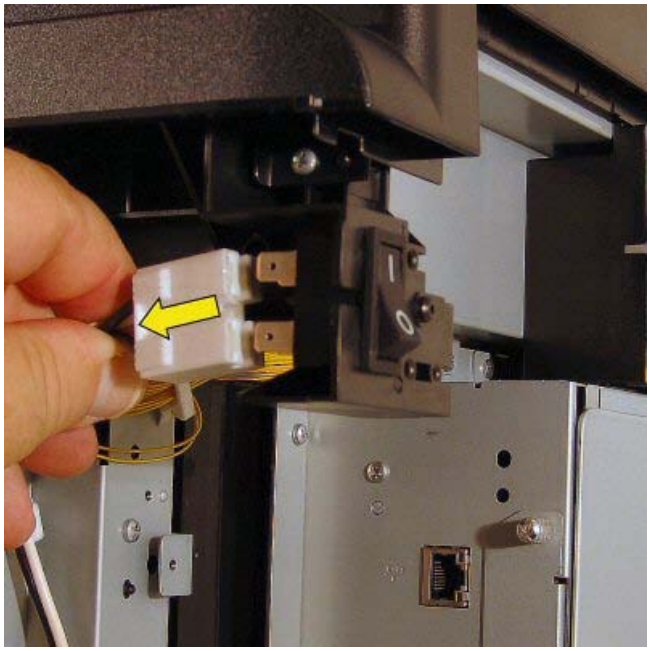
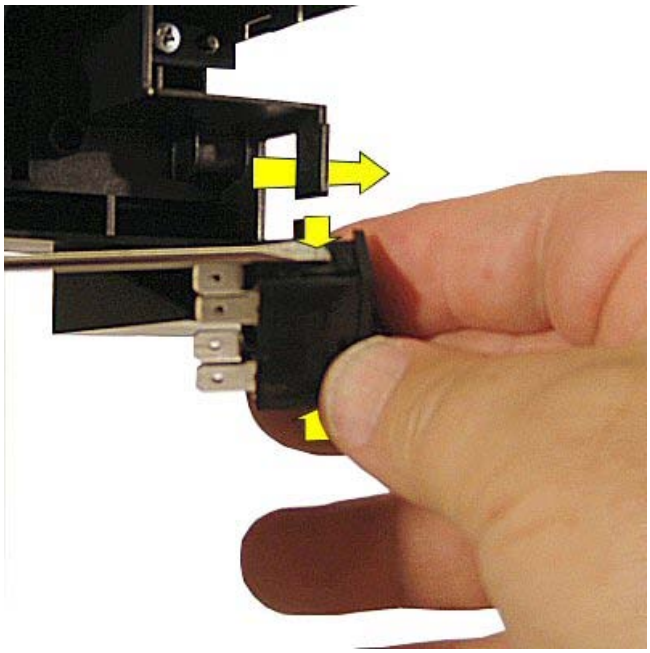


4.	Reverse the previous steps to replace the paper transfer belt.

Power Switch

The following table outlines the steps for removing and replacing the power switch assembly.

Removing and Replacing the Power Switch Assembly	
1.	Before removing the power switch assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. After removal of the right cover, the front door can be closed to protect the toner cartridges from excessive exposure to light. Click to enlarge 

2.	Remove the heavy-duty 4-lug connector (P/J481) from the rear of the power switch (see diagram item 1). 
3.	Using a small flat-blade screwdriver, alternately depress the retaining clips while rocking and withdrawing the switch from the chassis mount (see diagram items 2 and 3). 
4.	Reverse the previous steps to replace the main power switch assembly. Ensure the *1* is positioned at the top before reinserting the switch into the chassis mount.

Printhead (ROS) Assembly

The following table outlines the steps for removing and replacing the printhead (ROS) assembly.

Removing and Replacing the Printhead (ROS) Assembly

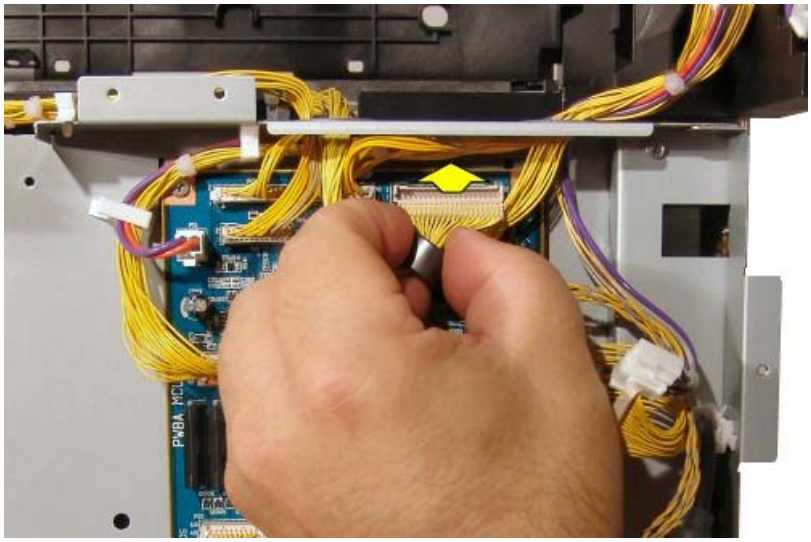
1. Before removing the printhead (ROS) assembly:

   - Turn the printer off and remove the AC power cable from the back of the printer.
   - Open the front cover by depressing the round button on the top-right side of the front cover.

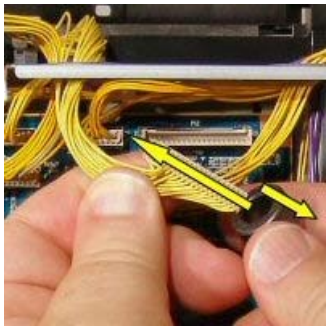
   NOTE:
   Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.

   - Remove the fuser.
   - Remove the rear cover.
   - Remove the right cover.
   - Remove the left cover.
   - Remove the top cover.
   - Remove the main fan assembly.
   - Remove the low voltage power supply.
   - Remove the ESS shield box.

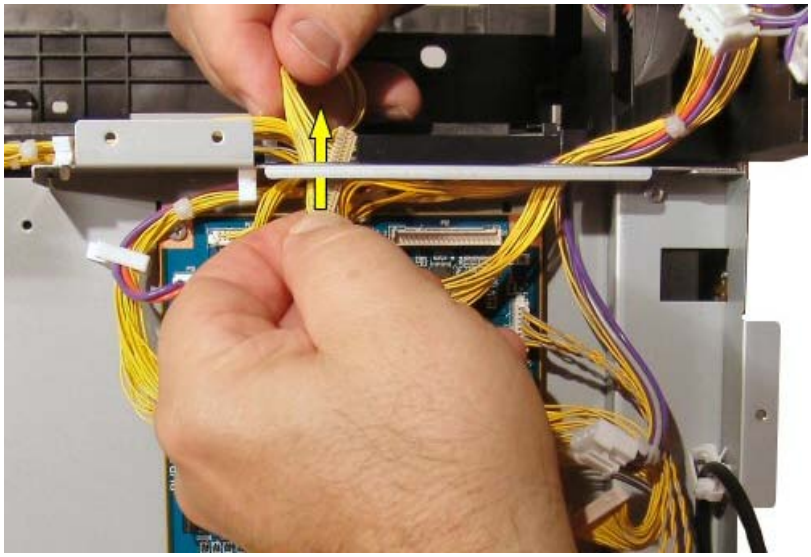
2. Disconnect the cable from J12 on the top right of the MCU.



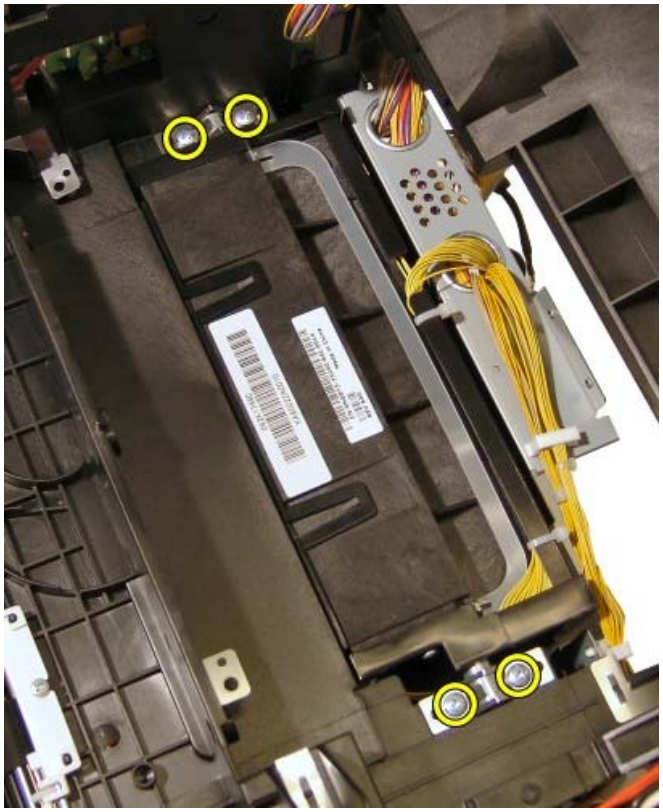
3. Remove the toroid core from around the wire harness (see diagram).

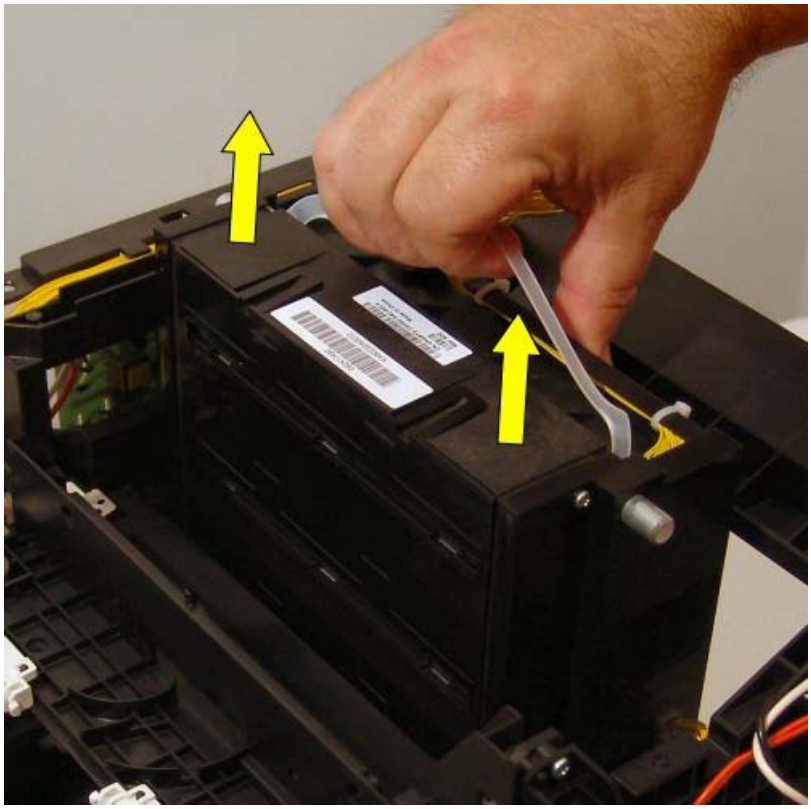
4. Guide the wire and connector up through the hole in the top of the chassis shield (see diagram).



5. Remove the four 10 mm large-diameter silver Tap screws that attach the two ROS springs to each side of the printer chassis. Remove the ROS springs (see diagram).



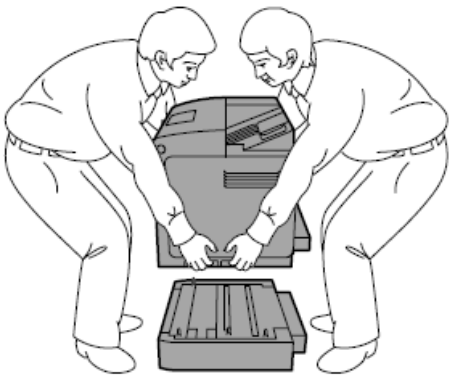
6. Using the handle on top of the printhead, lift the ROS printhead assembly straight out the top of the printer (see diagram).



7.	Reverse the previous steps to replace the printhead (ROS) assembly.

Rubber Feet

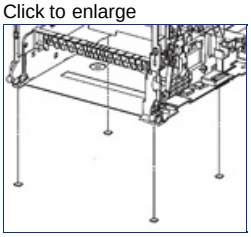
The following table outlines the steps for replacing any of the four rubber feet.

Replacing the Rubber Feet	
1.	CAUTION: • Ensure a second person is available to assist since the printer must be laid on its right or left side. • To lift the printer safely, remove the toner cartridges and lift the printer with one person facing the front and another facing the back. Never try to lift the printer while facing its right and left sides. 

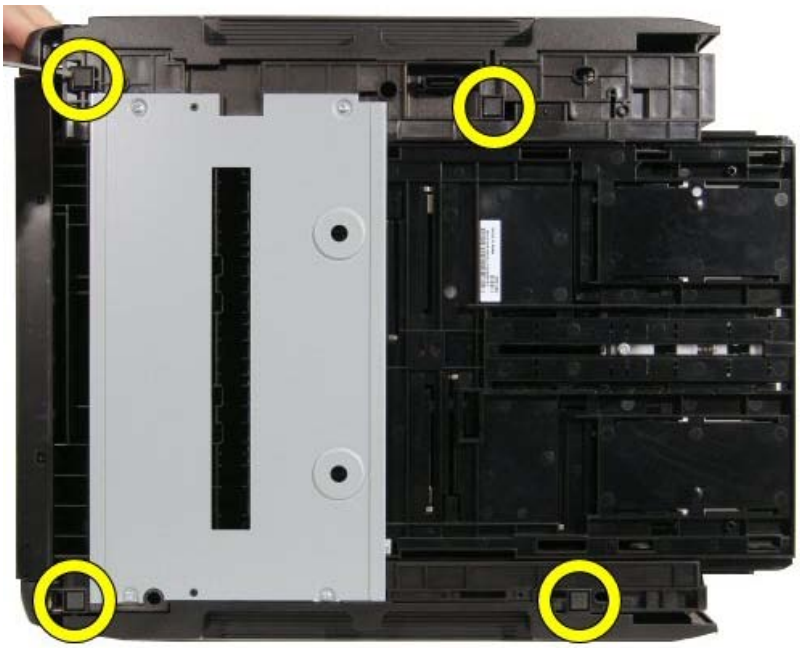
Before installing a replacement foot:

- Turn the printer off and remove the AC power cable from the back of the printer.
- Open the front cover and remove all four toner cartridges.
- Remove the 250-sheet paper tray.
- If applicable, remove the printer from the optional 550-sheet feeder unit.

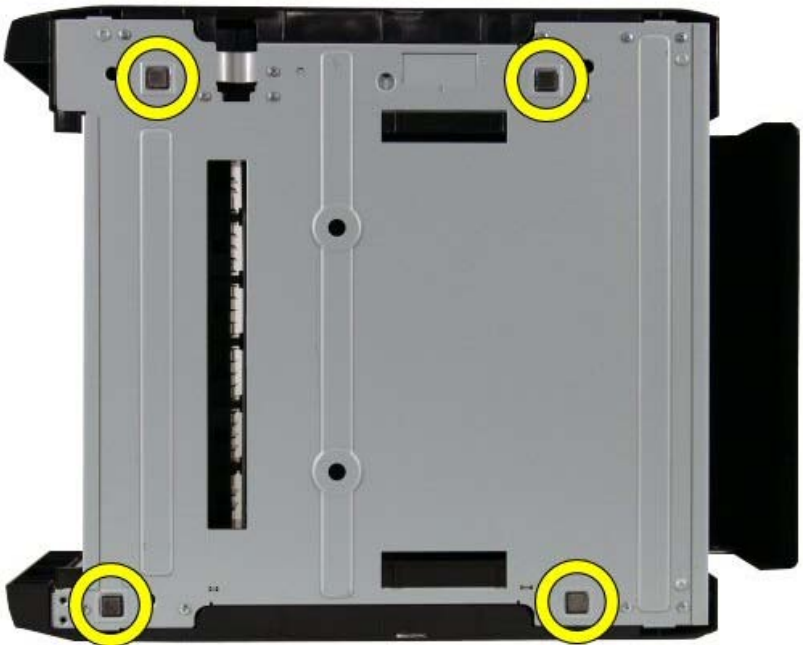
2. Click to enlarge



1. Lay the printer on its right or left side. Each of the four rubber feet are located within square borders molded into the bottom of the chassis.
2. Ensure any remaining residue from the missing or damaged foot has been removed.
3. Peel the plastic coating from the back of the replacement foot and press it into place. No glue is needed since the back of the foot is coated with self-stick adhesive.



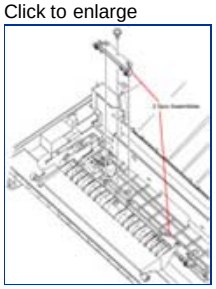
NOTE:
The rubber feet on the bottom of the optional 550-sheet feeder unit are located in the same general locations as those on the printer. Instead of a chassis mold, the location is stamped into the metal.

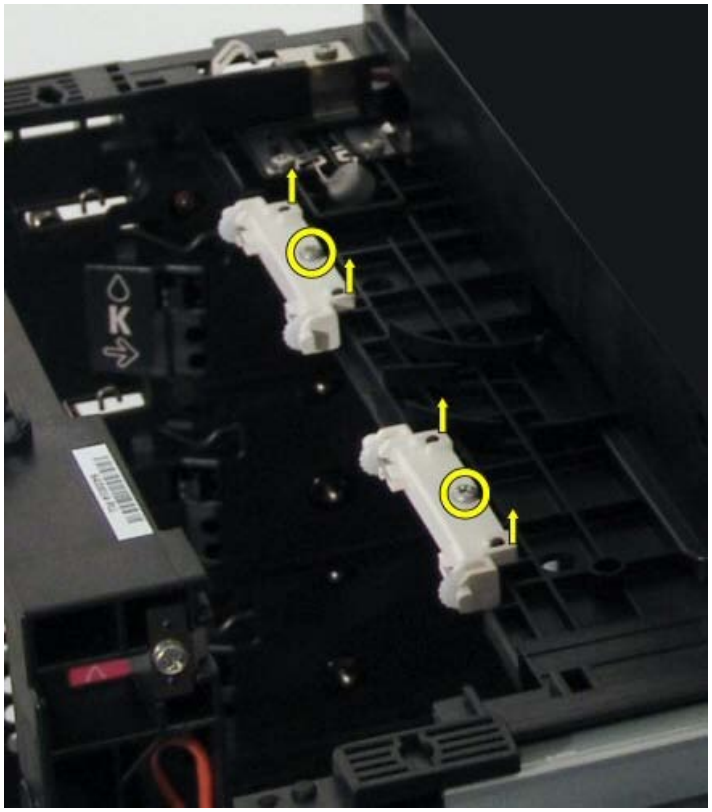


3.	Reverse the previous steps to return the printer to operation.

Spur Assembly

The following table outlines the steps for removing and replacing the spur assembly.

Removing and Replacing the Spur Assembly	
1.	Before removing the spur assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. CAUTION: The fuser may be hot. Allow the printer to cool for approximately 30 minutes before performing this task.
2.	Click to enlarge  Two spur assemblies are located under the fuser. Remove one 10 mm silver Tap screw from the center of each spur assembly being

	replaced, and then lift the assembly straight up and out of the printer. 
3.	Reverse the previous step to replace the spur assembly.

Toner Cartridge Sensor

The following table outlines the steps for removing and replacing a toner cartridge sensor.

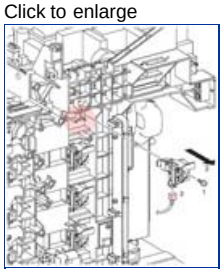
NOTE:
There are four toner cartridge sensors, one for each color: black, cyan, magenta, and yellow. Except for two additional prerequisite items needed for removal of the black sensor, this procedure is identical to all four sensors. The color images show the magenta sensor being removed.

Removing and Replacing a Toner Cartridge Sensor	
1.	Before removing a toner cartridge sensor assembly: • Turn the printer off and remove the AC power cable from the back of the printer. • Open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area. • Remove the fuser. • Remove the rear cover. • Remove the right cover. • Remove the left cover. • Remove the top cover.

NOTE:
The next two prerequisite items are necessary only if the black toner cartridge sensor is to be replaced. Otherwise, proceed to step 2.

- Remove the interlock switch assembly. It is not necessary to disconnect the wiring.
- Remove the photoconductor / developer drive assembly.

2. Click to enlarge



Remove the 10 mm silver Tap screw attaching the toner cartridge sensor to the printer chassis, and then remove the sensor.

3. As the assembly is removed, carefully disconnect P/J193 from the bottom of the sensor, and then remove the sensor from the printer.

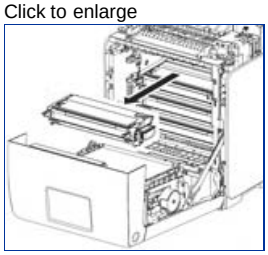
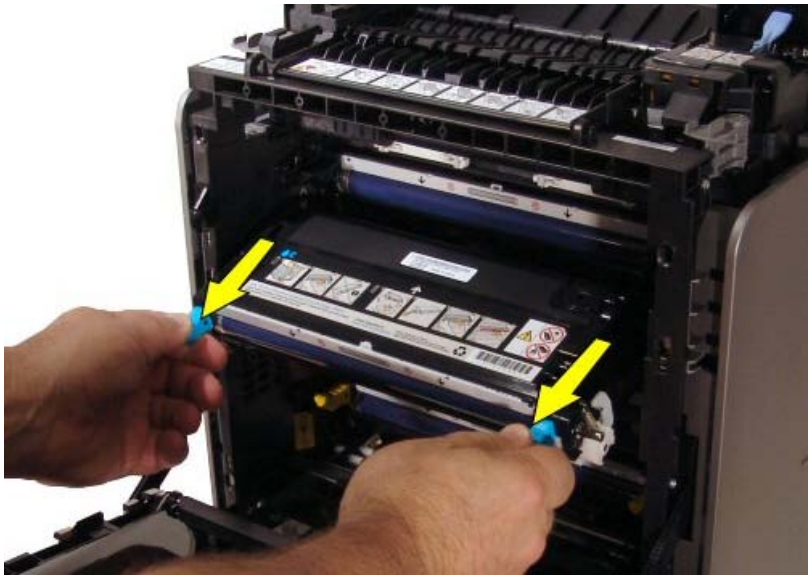
4. Reverse the previous steps to replace the toner cartridge sensor.

Toner Cartridges

Except for position, color, and capacity, each cartridge is identical. From top to bottom, the color position and capacities are as follows:

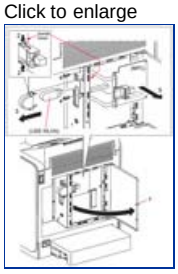
Position	Normal Capacity (p/n)	High Capacity (p/n)
Black (top)	5000 (PF028)	8000 (PF030)
Cyan	4000 (RF012)	8000 (PF029)
Magenta	4000 (MF790)	8000 (RF013)
Yellow (bottom)	4000 (NF555)	8000 (NF556)

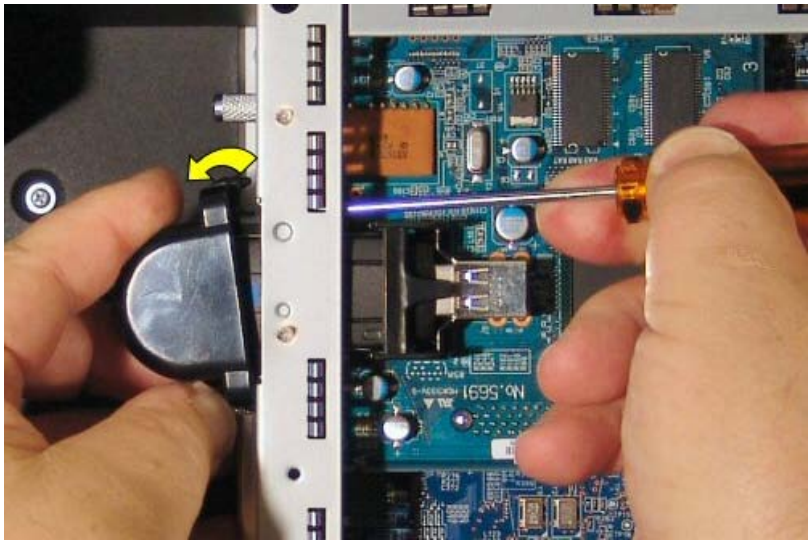
The following table outlines the steps for removing and replacing any of the four toner cartridges.

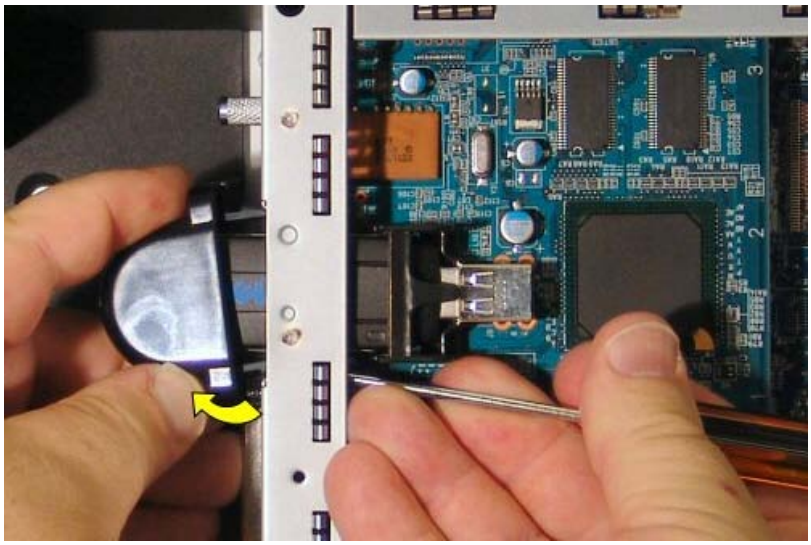
Removing and Replacing a Toner Cartridge	
1.	Before removing any of the toner cartridges, open the front cover by depressing the round button on the top-right side of the front cover. NOTE: Use caution when exposing the toner cartridge units to light for more than 5 minutes. If the printer front door is going to be open for more than 5 minutes, the toner cartridge units should be removed and carefully stored in a dark area.
2.	Click to enlarge  Grasp both the left and right handles of the cartridge, and then pull the cartridge straight out the front of the printer to remove it. 
3.	Reverse the previous steps to replace the toner cartridge.

Wireless LAN (Option)

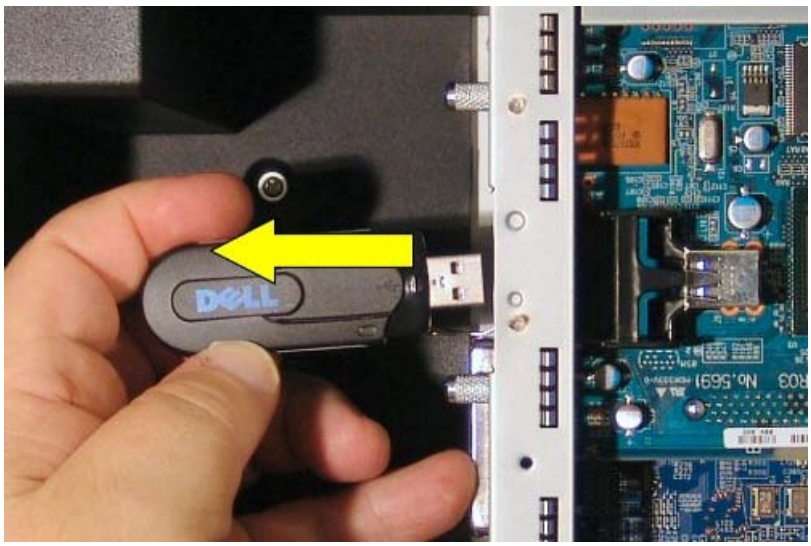
The following table outlines the steps for removing and replacing the optional USB wireless local area network (WLAN) adapter.

Removing and Replacing the Optional USB WLAN Adapter	
1.	Before removing the optional USB WLAN adapter: • Turn the printer off and remove the AC power cable from the back of the printer. • Loosen the knurled screw and open the metal door to expose the MPC and ESS control board (see diagram item 1). Click to enlarge  CAUTION: The MPC and ESS control board can be damaged by static electricity. Use all static prevention safeguards, including ESD wristbands and placemats. 
2.	Remove the WLAN access cover by releasing both retaining clips from within the ESS shield box (See diagram items 2 and 3). NOTE: Per diagram item 2, the USB WLAN cover has two clips attaching it to the ESS shield box. These clips can be released from inside the box by using a small screwdriver and leveraging the clips.





3. After the cover has been removed, remove the USB WLAN adapter from the socket on the MPC board (see diagram item 4).



4. Reverse the previous steps to replace the optional wireless LAN adapter.

Hardware Self-Assessment

The following self-assessment was created as a review for the Dell™ 3110cn color laser printer. The questions are similar to those on the DCSE certification test and are valuable to your preparation for the test.

1. True or false:
   The minimum memory configuration for the 3110cn printer is 640 MB.
   - (•) True
   - ( ) False

2. True or false:
   Before removing the ESS controller board on the 3110cn printer, you must remove the fuser.
   - (•) True
   - ( ) False

3. True or false:
   The 3110cn printer prints at letter speeds up to 31.4 PPM (letter).
   - (•) True
   - ( ) False

4. True or false:
   You must remove the ESS shield box before removing the machine control unit (MCU) on the 3110cn printer.
   - (•) True
   - ( ) False

5. True or false:
   The wireless option card for the 3110cn printer is listed as a mini PCI card.
   - (•) True
   - ( ) False

6. True or false:
   You must remove the printhead on the 3110cn printer to gain access to the fuser.
   - (•) True
   - ( ) False

7. True or false:
   The left cover must be removed on the 3110cn printer before removing the top cover.
   - (•) True
   - ( ) False

8. True or false:
   The main fan assembly must be removed on the 3110cn before removing the HVPS.
   - (•) True
   - ( ) False

9. Choose all that apply:
   Which parts must be removed before you can remove the fuser on the 3110cn printer?
   - [x] Left cover
   - [x] Top cover
   - [x] Rear cover
   - [x] AC power cable

10. Choose one:
    How many screws are used to secure the fuser on the 3110cn printer?
    - (•) One
    - ( ) Two
    - ( ) None
    - ( ) Three

Check Your Answers | Show the Correct Answers | Clear Answers

Labs Overview

The following lab sections are offered as guidelines to familiarize you with the different sections of this document about supporting the Dell™ 3110cn Color Laser Printer. Lab sections are as follows:

- Chassis
- Operator panel
- Media path
- Disassembly/reassembly
- Setup
- Configuration
- Networking
- Troubleshooting

Chassis Lab

If you have access to a Dell™ 3110cn Color Laser Printer, take a few minutes to compare the printer to what you have read in this document. Then answer the following questions as if you were speaking to a customer.

- How many toner cartridges are there?
- Where is the LCD?
- Will the 3110cn autosense paper size?
  - If so, where is the size switch located?
- Where is the MPF pick roller?
- Where can you load media in the 3110cn?
- Where is the AC cord attached?
- What kind of cables are needed?
  - For network operation?
  - For parallel operation?
  - For USB operation?
- Which cables ship with the printer?

Operator Panel Lab

If you have access to a Dell™ 3110cn Color Laser Printer, take a few minutes to compare the printer to what you have read in this document. Then answer the following questions as if you were speaking to a customer.

- How many button are there on the operator panel?
- What are they used for?
  - Menu button?
  - Left, right, up, and down arrows?
  - Enter (or Select) button?
  - Cancel button?
- How would I print a settings page from the operator panel?
- How is Customer mode accessed?

Media Path Lab

Take a few minutes to review what you have read in this document. Then answer the following questions as if you were speaking to a customer. If you have access to a Dell™ 3110cn Color Laser Printer, use it to illustrate the answers as you find them.

- What are the components of the media tray and what do they do?
- How does media progress through the 3110cn?
- Which duplexing options does the 3110cn support?
- What are some common problems that can occur when duplexing with the 3110cn?

Setup Lab

Take a few minutes to review what you have read in this document.

- If you have access to an Dell™ 3110cn Color Laser Printer, go through the setup procedure (without connecting it to a computer) and print a test page.
- If you do not have access to an 3110cn, answer the following questions as if you were speaking to a customer.
  - Which items come in the box with the 3110cn?
  - What are some things to keep in mind when choosing a location for the printer?
  - What differences are present in a printer that is configured for 220-V power?
  - How do you install the toner cartridges?
  - How do you install paper in the 3110cn paper tray?

Configuration Lab

Take a few minutes to review what you have read in this document.

- If you have access to an Dell™ 3110cn Color Laser Printer, go through the setup procedure (without connecting it to a computer) and print a test page.
- If you do not have access to an 3110cn, answer the following questions as if you were speaking to a customer.
  - Which connection options are available for the 3110cn?
  - What are the networking connectivity options for the 3110cn?
  - What does the acronym *RPM* mean when discussing non-Microsoft® operating system support for the 3110cn?
  - Locate the Printers and Faxes Control Panel applet in Windows® XP.
  - Which section of the 3110cn User's Guide discusses the Print Properties applet?

Networking Lab

If you have access to the equipment, this lab provides you with an opportunity to practice what you know.

1. Take a few minutes to plan what you want to accomplish.
2. Install the Dell™ 3110cn Color Laser Printer on a client computer and share it over the network.

3. Install the drivers for the 3110cn on a different computer on that network and print to the printer.
4. Attach the 3110cn directly to a network.
    - Attach a 3110cn to a router, and then connect one or several computers to the router.
    - Install the driver on the client computer(s) and successfully send print jobs to the 3110cn.

Troubleshooting Lab

Take a few minutes to think about why customers would call you about the Dell™ 3110cn Color Laser Printer.

- Make a list of five things you expect customers to call you about. Be sure to leave room to write between each item.
- Beside each call driver, write a brief description of where you can find the information the customer needs to resolve it.
- Write a brief explanation of what causes each issue and how to resolve it beside each item. Be sure to write as if you were speaking to a customer.

Dell™ 3110cn Printer : Document History

Document History	
Date	Page
Change	
Date: 2006-08-10	Page: Network Overview
Change: Added wireless networking information	
Date: 2006-08-03	Page: N/A
Change: Changed to actual 3110cn EWS simulator (vs. 3100); added Manual Paper feed tests	
Date: 2006-07-17	Page: N/A
Change: Corrections to EMEA Service Offerings; EWS simulator, Document Outline	
Date: 2006-07-12	Page: All
Change: Original Document posted	

Instructor Materials

The following instructor materials are password protected. Instructors/Trainers may obtain this password by sending an email to US Tech Support Training and Development. Please include your business case and CC your manager.

Instructor Guide
: This Microsoft® Word document provides directions for facilitating the training course.

Other Links

The following links provide some additional information about the 3110cn printer. This information is provided as additional reference material to aid in troubleshooting and resolving various customer issues and questions.

Additional Documentation

Lifting precautions techsheet
: This techsheet describes how to properly lift the 3110cn Laser printer.

Owner's Manual
: The Owner's Manual is a hardcopy book shipped with the printer.

Placemat
: The placemat provides initial installation and setup instructions. It is a large poster with simple instructions and graphics.

User's Guide
: The User's Guide ships on the Drivers and Utilities CD that accompanies the printer. When the customer installs the printer driver, the User's Guide installs on the computer's hard drive. This copy of the Users Guide must be saved to a folder on your hard drive before it will run properly.

Quick Reference Guide
: The Quick Reference Guide (QRG) is a handy reference of common printer instructions, functions, messages, menu's, etc.

100K Maintenance kit techsheet
: This is the 100k Maintenance Kit techsheet.

Optional 550-Sheet feeder techsheet
: This is the tech sheet on how to install the Optional 550-sheet feeder.

Optional Duplex Unit techsheet
: This is the techsheet on how to install the Optional Duplex unit.

Optional MPC and WLAN-3310 techsheet
: This is the techsheet on how to install the Optional MPC and WLAN-3310.

Print (Toner) Cartridges techsheet
: This is the techsheet on how to install the print cartridges.

Vendor Service Docs
: The vendor service documents provide detailed service information for the 3110cn printer.

Review

Previous Next

BACK TO: Dell Certified Systems Expert

Top