

Service Manual



Copyright © 2005 Xerox Corporation. All Rights Reserved. Unpublished rights reserved under the copyright laws of the United States. Contents of this publication may not be reproduced in any form without permission of Xerox Corporation.

Copyright protection claimed includes all forms of matters of copyrightable materials and information now allowed by statutory or judicial law or hereinafter granted, including without limitation, material generated from the software programs which are displayed on the screen such as styles, templates, icons, screen displays, looks, etc.

XEROX®, The Document Company®, the stylized X®, CentreWare®, infoSMART®, Made For Each Other®, Phaser®, PhaserSMART®, and Walk-Up™ are trademarks of Xerox Corporation in the United States and/or other countries.

Adobe® Reader®, Illustrator®, PageMaker®, Photoshop®, PostScript®, ATM®, Adobe Brilliant® Screens, Adobe Garamond®, Adobe Jenson™, Birch®, Carta®, IntelliSelect®, Mythos®, Quake®, and Tekton® are trademarks of Adobe Systems Incorporated in the United States and/or other countries.

Apple®, AppleTalk®, LaserWriter®, LocalTalk®, Macintosh®, Mac OS®, TrueType®, Apple Chancery®, Chicago®, Geneva®, Monaco®, New York®, and QuickDraw® are trademarks of Apple Computer, Inc. in the United States and/or other countries.

PCL® and HP-GL® are trademarks of Hewlett-Packard Corporation in the United States and/or other countries.

IBM® is a trademark of International Business Machines Corporation in the United States and/or other countries.

Windows®, Windows NT®, and Wingdings® are trademarks of Microsoft Corporation in the United States and/or other countries.

Novell®, NetWare®, NDPS®, NDS®, Novell Directory Services®, IPX™, and Novell Distributed Print Services™ are trademarks of Novell, Incorporated in the United States and/or other countries.

Sun® and Sun Microsystems® are trademarks of Sun Microsystems, Incorporated in the United States and/or other countries.

UNIX® is a trademark in the United States and other countries, licensed exclusively through X/Open Company Limited.

As an ENERGY STAR® partner, Xerox Corporation has determined that this product meets the ENERGY STAR guidelines for energy efficiency. The ENERGY STAR name and logo are registered U.S. marks.



Warning: The following servicing instructions are for use by qualified service personnel only. To avoid personal injury, do not perform any servicing other than that contained in the operating instructions, unless you are qualified to do so.

First Printing: July 2005

071-0877-00

Service Terms

Cautions, Notes, and Warnings

Note: A note indicates an operating or maintenance procedure, practice or condition that is necessary to efficiently accomplish a task. A note can provide additional information related to a specific subject or add a comment on the results achieved through a previous action.

Caution: A caution statement indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in damage to, or destruction of, equipment.

Warning: A warning statement indicates an operating or maintenance procedure, practice or condition that, if not strictly observed, could result in injury or loss of life.

Product Terms

Caution: A personal injury hazard exists that may not be apparent. For example, a panel may cover the hazardous area.

Warning: A personal injury hazard exists in the area where you see the sign.

Symbols Marked on the Product



DANGER high voltage.



Protective ground (earth) symbol.



Hot surface on or in the printer. Use caution to avoid personal injury.



Avoid pinching fingers in the printer. Use caution to avoid personal injury.



The surface is hot while the printer is running. After turning off the power, wait 30 minutes.



Use caution (or draws attention to a particular component). Refer to the manual(s) for information.

Power Safety Precautions

Power Source

For 110 VAC printers, do not apply more than 140 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord and connector. For 220 VAC printers, do not apply more than 264 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord. This manual assumes that the reader is a qualified service technician.

Plug the three-wire power cord (with grounding prong) into a grounded AC outlet only. If necessary, contact a licensed electrician to install a properly grounded outlet. If the product loses its ground connection, contact with conductive parts may cause an electrical shock.

Disconnecting Power

Turning the power off using the On/Off switch does not completely de-energize the printer. You must also disconnect the printer power cord from the AC outlet. Position the power cord so that it is easily accessible during servicing so that you may power down the printer during an emergency.

Disconnect the power plug by pulling the plug, not the cord.

Disconnect the power cord in the following cases:

- if the power cord or plug is frayed or otherwise damaged,
- if any liquid or foreign material is spilled into the case,
- if the printer is exposed to any excess moisture,
- if the printer is dropped or damaged,
- if you suspect that the product needs servicing or repair,
- whenever you clean the product.

Electrostatic Discharge (ESD) Precautions

Some semiconductor components, and the respective sub-assemblies that contain them, are vulnerable to damage by Electrostatic Discharge (ESD). These components include Integrated Circuits (ICs), Large-Scale Integrated Circuits (LSIs), field-effect transistors and other semiconductor chip components. The following techniques will reduce the occurrence of component damage caused by static electricity.

Be sure the power to the chassis or circuit board is off, and observe all other safety precautions.

- Before handling any semiconductor components assemblies, drain the electrostatic charge from your body. This can be accomplished by touching an earth ground source or by wearing a wrist strap device connected to an earth ground source. Wearing a wrist strap will also prevent accumulation of additional bodily static charges. Be sure to remove the wrist strap before applying power to the unit to avoid potential shock.
- After removing a static sensitive assembly from its anti-static bag, place it on a grounded conductive surface. If the anti-static bag is conductive, you may ground the bag and use it as a conductive surface.
- Do not use freon-propelled chemicals, as they can generate electrical charges that may damage some devices.
- Do not remove a static sensitive replacement component or electrical sub-assembly from its protective package until you are ready to install it.
- Before removing the protective material from the leads of a replacement device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
- Minimize body motions when handling unpackaged replacement devices. Simple motions such as your clothes brushing together or lifting a foot from a carpeted floor can generate enough static electricity to damage a static sensitive device
- Handle IC's and EPROM's carefully to avoid bending pins.
- Pay attention to the direction of parts when mounting or inserting them on Printed Circuit Boards (PCB's).

Service Safety Summary

General Guidelines

Note: The material presented here is intended as a safety reminder for qualified service personnel. Refer also to the preceding Power Safety Precautions.

Avoid servicing alone

Do not perform internal service or adjustment of this product unless another person capable of rendering first aid or resuscitation is present.

Use care when servicing with power

Dangerous voltages may exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on. Disconnect power before removing the power supply shield or replacing components.

Do not wear jewelry

Remove jewelry prior to servicing. Rings, necklaces and other metallic objects could come into contact with dangerous voltages and currents.

Power Source

This product is intended to operate from a power source that will not apply more than 264 volts rms for a 220 volt AC outlet or 140 volts rms for a 110 volt AC outlet between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

Warning Labels

Read and obey all posted warning labels. Warning labels are displayed on potentially dangerous printer components. As you service the printer, check to make certain that all warning labels remain in place.

Safety Interlocks

Make sure all covers and the printer's control panel are in place and all interlock switches are functioning correctly after you have completed a printer service call. If you bypass an interlock switch during a service call, use extreme caution when working on or around the printer.

CLASS 1 LASER PRODUCT

The Phaser 3500 Laser Printer is certified to comply with Laser Product Performance Standards set by the U.S. Department of Health and Human Services as a Class 1 Laser Product. This means that this is a class of laser product that does not emit hazardous laser radiation; this is possible only because the laser beam is totally enclosed during all modes of customer operation. The laser is not hazardous during servicing if you follow the procedures specified in the manual.

Servicing Electrical Components

Before starting any service procedure, switch off the printer power and unplug the power cord from the wall outlet. If you must service the printer with power applied, be aware of the potential for electrical shock.

Warning: Turning the power off by using the On/Off switch does not completely de-energize the printer. You must also disconnect the printer power cord from the AC outlet. Position the power cord so that it is easily accessible during servicing.

Warning: Do not touch any electrical component unless you are instructed to do so by a service procedure.

Caution: When servicing mechanical components within the printer, manually rotate drive assemblies, rollers, and gears.

Warning: Do not try to manually rotate or manually stop the drive assemblies while any printer motor is running.

Warning: This printer uses heat to fuse the toner image to media. The Fuser Assembly is VERY HOT. Turn the printer power off and wait at least 5 minutes for the Fuser to cool before you attempt to service the Fuser Assembly or adjacent components.

Regulatory Specifications

Regulatory Specifications for this printer can be found in the User Guide and on the Xerox Website.

Contents

Service Terms	ii
Cautions, Notes, and Warnings	ii
Product Terms	ii
Symbols Marked on the Product	iii
Power Safety Precautions	iv
Power Source	iv
Disconnecting Power	iv
Electrostatic Discharge (ESD) Precautions	v
Service Safety Summary	vi
General Guidelines	vi
CLASS 1 LASER PRODUCT	vi
Servicing Electrical Components	vii
Regulatory Specifications	vii

1 Service Call Procedures

Servicing Instructions	1-2
Service Preventive Maintenance Procedure	1-3
Recommended Tools	1-3
Cleaning	1-3

2 Repair Analysis Procedures

Introduction	2-2
Accessing Fault History	2-2
Using the Troubleshooting Procedures	2-3
Service Diagnostics	2-4
Entering Service Diagnostics	2-4
Service Diagnostics Menu Map	2-5
Service Diagnostic Control Panel Button Descriptions	2-5
Troubleshooting Error Messages	2-10
Jam At Tray [1] [2] [3] (Jam 0)	2-11
Jam At Top (Jam 1)	2-11
Jam At Exit (Jam 2)	2-12
Jam At Rear (Duplex Jam 1)	2-12
Jam At Duplex (Duplex Jam 2)	2-14
Check Cartridge, Invalid Print Cartridge, Non-Xerox Cartridge, Replace Print Cartridge	2-14
Close Fuser Door	2-14
Close Top Cover	2-15
Fuser Failure, Engine Fuser Low Heat Error, or Engine Fuser Over Heat Error ..	2-15
Laser Failure	2-15
Output Tray Is Full	2-16

General Troubleshooting	2-17
Control Panel Troubleshooting	2-17
No Control Panel Display after Power Is Turned ON	2-17
Control Panel LED is On, Control Panel Display Is Blank	2-17
Power Supply Troubleshooting	2-18
Taking Voltage Measurements	2-18

3 Image-Quality Troubleshooting

Image-Quality Problems Overview	3-2
Repeating Defects	3-3
Print Cartridge	3-3
Transfer Roller	3-3
Fuser	3-3
Repeating Defects Measurement Table	3-3
Control Panel (Internal) Test Print	3-4
Deletions	3-4
Fusing	3-4
Resolution	3-5
Registration and Skew	3-5
Skips or Smears	3-6
Image-Quality Troubleshooting	3-7
No Image/Blank Prints	3-7
Light Prints	3-7
Black Prints	3-8
Dark Image	3-8
Background Contamination	3-8
Ghosting	3-9
Non-Uniform Image	3-9
Black Spots/Marks	3-10
Spot or Vertical Deletions	3-10
Horizontal Bands	3-10
Character Defects	3-10
Unfused Image	3-11
Skewed Image	3-11
Skips/Smears	3-11
OHP Print Distortion	3-11

4 Repairs and Adjustments

Overview	4-2
Standard Orientation of the Printer	4-2
General Notes on Disassembly	4-3
Preparation	4-3
Notations in the Disassembly Text	4-3

Covers	4-4
Right Cover	4-4
Left Cover	4-5
Rear Cover	4-6
Top Cover	4-8
Control Panel and LCD Display	4-10
Open Cover	4-11
Tray 1 (MPT) Assembly	4-12
Tray 1 Knock-Up Plate	4-14
Tray 1 Pick-Up Rack	4-15
Inner Cover	4-16
Transfer Roller	4-17
Retard Assembly	4-18
Tray 1 Separator (Holder) Pad Assembly	4-19
Feed2 Idle Unit	4-20
Registration Assembly	4-21
PTL Board	4-23
Main Drive Assembly and Registration (Feed) Clutch	4-24
Feed Clutch	4-24
Main Drive Assembly	4-25
Tray 1 Pick-Up Assembly and Pick Rollers	4-26
Tray 1 Pick Roller Only	4-26
Pick Roller and Shaft Removal	4-27
Tray 2 Pick-Up Assembly and Rollers	4-29
Feed 2 Unit	4-32
Developer Drive Assembly	4-33
Connector Board	4-34
Tray 1 (MPT) Solenoid	4-35
Main Solenoid	4-36
Fuser Assembly	4-37
Exit Solenoid Assembly	4-38
Exit and Duplex Rollers	4-39
Exit Gear	4-40
Tray Full Actuator	4-40
Duplex Roller	4-41
Laser (LSU) Assembly and Lower Cover	4-42
LSU Lower Cover	4-43
Left Side Cooling Supply Fan and Duct	4-44
Toner Sensor Board and CRUM	4-45
Cover Open Board and Harness Cover	4-46
Main Board and Shield	4-47
Power Supply and Shield	4-48
Fuser Gear Assembly	4-50
Paper Size Sensor	4-51

5 Parts List

Using the Parts List	5-2
PL 8.1 Main Assembly	5-3
PL 8.1 Parts List Table	5-4
PL 8.2 Cover Assembly	5-7
PL 8.2 Parts List Table	5-8
PL 8.3 Frame Assembly	5-9
PL 8.3 Parts List Table	5-11
PL 8.4 Fuser Assembly	5-17
PL 8.4 Parts List Table	5-18
PL 8.9 Tray 2 Cassette	5-20
PL 8.9 Parts List Table	5-21
PL 8.10 Tray 3 Cassette	5-22
PL 8.10 Parts List Table	5-23
PL 8.11 Duplex Assembly	5-25
PL 8.11 Parts List Table	5-26

6 General Information and Specifications

Printer Configurations	6-2
Printer Options and Supplies	6-2
Consumable and Service Part Life Expectancy	6-3
Parts of the Printer	6-4
Front View	6-4
Rear View	6-4
Control Panel	6-5
Menu Map	6-5
Error and Warning Messages	6-5
Printer Specifications	6-6
Printer Location and Clearance	6-6
Printer Physical Specifications	6-7
Functional Specifications	6-7
Electrical Specifications	6-8
Environmental Specifications	6-8
Media and Tray Specifications	6-9

7 Wiring Data

Block Diagram	7-2
---------------------	-----

8 Theory of Operation

Overview of the Phaser 3500 Laser Printer	8-2
Summary of the Printing Process	8-2
Print Modes	8-3
Printer Paper Path	8-4
Duplex Paper Path.	8-4
Paper Feed Sequence	8-5
Paper Transport	8-5
Paper Feed Drive	8-5
Major Assemblies and Functions	8-6
Imaging	8-6
Print Cartridge	8-6
Laser Scan Unit (LSU)	8-7
Transfer Roller	8-7
Fuser Assembly	8-7
Sensor Functions	8-8
Paper Empty Sensor	8-8
Tray 1 Paper Empty Sensor	8-8
Registration Sensor.	8-8
Fuser Exit Sensor	8-8
Cover Open Sensor.	8-8
Duplex Unit Sensor	8-8
Printer Controls	8-9
Image Processor Function.	8-9
Print Engine Control	8-9
Main Board	8-10
Power Supply	8-11
Paper Size Control	8-12
Paper Pick Auto-Select.	8-12
Toner Control	8-12
Laser Light Intensity Control	8-13
Fuser Temperature Control	8-13

1 Service Call Procedures

This section includes the following:

- [Servicing Instructions](#) on page 1-2
- [Service Preventive Maintenance Procedure](#) on page 1-3

Servicing Instructions

The service flowchart is an overview of the path a service technician should take, using this manual, to service the print engine and options.

Step 1: Identify the Problem

1. Verify the problem reported and check for any error codes and write them down.
 2. Print normal customer prints and service test prints and look for any of the following:
 - any image quality problems in the test prints.
 - any mechanical or electrical abnormalities present.
 - any unusual noise or smell coming from the printer.
 3. View the fault and jam histories and look at the total print count for the printer.
 4. Verify the AC input power supply is within proper specifications by measuring the voltage at the electric outlet while the printer is running.
-

Step 2: Inspect and Clean the Printer

5. Switch OFF printer power and disconnect the AC power cord from the wall outlet.
 6. Verify the power cord is free from damage or short circuit and is connected properly.
 7. Remove the Print Cartridge and protect it from light, then inspect the printer interior and remove any foreign matter, obstructions, or loose toner.
 8. Inspect the interior of the printer for damaged wires, loose connections, toner leakage, and damaged or obviously worn parts.
 - Do not use solvents or chemical cleaners to clean the printer interior.
 - Do not use any type of oil or lubricant on printer parts.
 - Use only an approved toner vacuum.
 9. Clean all rubber rollers with a lint-free cloth, dampened slightly with cold water.
 10. Replace any service items that have reached their 150,000 end-of-life.
-

Step 3: Find the Cause of the Problem

11. Use the Repair Analysis Procedures to find the cause of the problem.
 12. Use Diagnostics to check printer and optional components.
 13. Use the Wiring Diagrams to locate test points.
 14. Take voltage readings at various test points as instructed in the appropriate troubleshooting procedure.
-

Step 4: Correct the Problem

15. Use the Parts List to locate a part number.
 16. Use the Repair and Adjustments Procedures to replace the part.
-

Step 5: Final Checkout

17. Test the printer to be sure you have corrected the initial problem and there are no additional problems present.
-

Service Preventive Maintenance Procedure

Perform the following procedures whenever you check, service, or repair a printer. Cleaning the printer, as outlined in the following steps, assures proper operation of the printer and reduces the probability of having to service the printer in the future.

The frequency of use and the type of paper a customer prints on determines how critical and how often cleaning the machine is necessary. Record the number of sheets printed.

Recommended Tools

- Toner vacuum cleaner
- Clean water
- Clean, dry, lint-free cloth
- Black light protective bag

Cleaning

- Never apply alcohol to any parts in the printer.
 - Never use a damp cloth to clean up toner.
 - If you remove the Print Cartridge, place it in a light protective bag. Exposure to light can degrade its performance and result in early failure.
1. Record number of sheets printed.
 2. Print several sheets of paper to check for problems or defects.
 3. Print several cleaning sheets to clear up image-quality problems.
 4. Turn off the printer.
 5. Remove any debris or foreign objects.
 6. Remove any loose toner from the interior of the printer using a Type II toner vacuum only.
 7. Remove and clean the paper trays.
 8. Clean pick rollers with a slightly damp, lint-free cloth.

2 Repair Analysis Procedures

This section includes the following:

- [Introduction](#) on page 2-2
- [Service Diagnostics](#) on page 2-4
- [Troubleshooting Error Messages](#) on page 2-10
- [General Troubleshooting](#) on page 2-17
- [Power Supply Troubleshooting](#) on page 2-18

Introduction

This section covers troubleshooting procedures for the Phaser 3500 Laser Printer. When an error first occurs, record the error message and code and then cycle power to the printer to see if the error recurs. Be sure to follow the [Service Call Procedures](#) on page 1-1 before servicing the printer.

To troubleshoot image-quality problems, see [image-quality Troubleshooting](#) on page 3-1.

Accessing Fault History

Any code associated with an error message or jam can be viewed by displaying the **Fault History** or **Jam History** on the Control Panel.

1. View the printer's fault history on the Control Panel.
 - a. Go to **Troubleshooting --> Service Tools --> Fault History** or **Jam History**.
If the printer is connected to a network and has a TCP/IP address, you can view the printer's web page using a web browser.
 - b. Open a web browser.
 - c. Enter the printer's IP address as the URL.
 - d. Select the Troubleshoot link and the fault history will be displayed.

Fault History Code	Printer Error Message
41	Insufficient Memory
44	Output Tray Is Full
5A	Laser Failure
53	Replace Print Cartridge
55	Invalid Print Cartridge
56	Fuser Failure/Open Fuser Error
57	Fuser Failure/Low Heat Error
58	Fuser Failure/Over Heat Error

Jam History Code	Jam Error Message
01	Jam At Tray 1, 2, or 3 (Jam 0)
02	Jam At Top (Jam 1)
03	Jam At Exit (Jam 2)
04	Jam At Rear (Duplex Jam 1)
05	Jam At Duplex (Duplex Jam 2)

Using the Troubleshooting Procedures

1. Each **Step** in a Troubleshooting Procedure instructs you to perform a certain action or procedure. The steps are to be followed sequentially until the problem is fixed or resolved.
2. The **Actions and Questions** box contains additional information and/or additional procedures you must follow to isolate the problem.
3. When a procedure instructs you to test a component using service diagnostics, see the [Service Diagnostics Menu Map](#) on page 2-5 for the detailed steps and functions for testing parts of the printer.
4. The action is followed by a question. If your response to the question is “**Yes**”, then follow the instructions for a “**Yes**” reply. If your response to the question is “**No**”, then follow the instructions for a “**No**” reply.
5. Troubleshooting Procedures may ask you to take voltage readings or test for continuity at certain test points within the printer. For detailed diagrams, see Section 7, [Wiring Data](#) on page 7-1 for complete information on test point locations and signal names.
6. Troubleshooting Procedures often ask you to replace a printer component, see [Repairs and Adjustments](#) on page 4-1 for detailed steps in removing and replacing all major components of the printer. Section 5, [Parts List](#) on page 5-1, details the location, quantity, and part number for all spared printer components.

Service Diagnostics

The printer has built-in diagnostics to aid in troubleshooting problems. The Service Diagnostics Menu provides a means to test sensors, motors, switches, clutches, fans and solenoids. Diagnostics also contain built-in test prints, cleaning procedures, printer status and some NVRAM access.

Service diagnostics are to be executed through the control panel by a certified service technician only. The printer must be rebooted to enter Service Diagnostics.

Entering Service Diagnostics

1. Turn the printer power OFF.
2. Hold down the **OK** button and turn the printer back ON.
3. Continue to hold the button until the following message is displayed on the Control Panel: **“Diagnostic Mode” / “Press Menu Key”**, and then release the **OK** button.
4. Press the **Menu** button and use the Arrow buttons to scroll through the available functions (see the following Service Diagnostic Menu Map Table).

Service Diagnostics Menu Map

Service Diagnostic Control Panel Button Descriptions

Button	Function
BACK	Returns to the prior higher level menu structure, if available. Stops the actively running test.
CANCEL	Terminates the current test.
MENU	Cycles through all of the top level menu items.
UP	Scrolls up one menu item within a menu list. This control does not 'wrap'. Used to increment values in tests requiring user input.
DOWN	Scrolls up one menu item within a menu list. This control does not 'wrap'. Used to increment values in tests requiring user input.
OK	Enters the highlighted menu. Executes the current test item. Used to select the value entered by the user.

Main Menu	Sub Menu	Description/Function	Control Panel Display
Optins Interface	Tray 3 Interface	Tests the interface between the main controller and the Tray 3 interface board.	Tray 3 Interface: Pass /Fail :x.x.x
	Duplex Interface	Tests the interface between the main controller and the duplex interface board.	Duplex Interface Pass/Fail :x.x.x
Test Pattern	Simplex	Prints the test print page in simplex mode. The Control Panel will display the papers location during the print process. This process will print continuously until stopped by the user.	Simplex Print Start -> Feed On -> Exit On
	Duplex	Prints the test print page in 2-sided or duplex mode. This process will print continuously until stopped by the user.	Duplex Print Start -> Feed On -> Exit On -> Duplex On
Motor/Fan	Main Motor	Main drive motor runs when the OK button is pressed and stops when the Cancel button is pressed.	Main Motor Running Test ON/OFF

Main Menu	Sub Menu	Description/Function	Control Panel Display
	DEV Motor	Developer motor runs when the OK button is pressed and stops when the Cancel button is pressed.	DEV Motor Running Test ON/OFF
	Laser Motor	Laser motor runs when the OK button is pressed and stops when the Cancel button is pressed.	Laser Motor Running Test ON/OFF
	Duplex Motor	Duplex motor runs when the OK button is pressed and stops when the Cancel button is pressed.	Duplex Motor Running Test ON/OFF
	Tray 3 Motor (If installed)	Tray 3 motor runs when the OK button is pressed and stops when the Cancel button is pressed. If Tray 3 is not installed, test does not run.	Tray 3 Motor Running Test ON/OFF Tray 3 Not Installed
	Main Fan	Main fan runs when the OK button is pressed and stops when the Cancel button is pressed.	Main Fan Running Test ON/OFF
	SMPS Fan	SMPS fan runs when the OK button is pressed and stops when the Cancel button is pressed.	SMPS Main Running Test ON/OFF
	Duplex Fan	Duplex fan runs when the OK button is pressed and stops when the Cancel button is pressed	Duplex Fan Running Test ON/OFF
Solenoid/ Clutch	Tray 1 Solenoid	When the OK button is pressed the Tray 1 solenoid is turned on for 200ms, and then it automatically stops.	Tray 1 Solenoid ON/OFF
	Tray 2 Solenoid	When the OK button is pressed the Tray 2 solenoid is turned on for 200ms, and then it automatically stops.	Tray 2 Solenoid ON/OFF
	Tray 3 Solenoid	When the OK button is pressed the Tray 3 solenoid is turned on for 200ms, and then it automatically stops. When Tray 3 is not installed, this function does not work.	Tray 3 Solenoid ON/OFF Tray 3 Not Installed

Main Menu	Sub Menu	Description/Function	Control Panel Display
	Reg Clutch	When the OK button is pressed, the registration clutch and main motor turn on for 200ms, and then they automatically stop. You can visually observe this test by removing the Top Cover and Print Cartridge.	Reg Clutch ON/OFF
	Duplex Solenoid	When the OK button is pressed, the duplex solenoid is turned on for 200ms, and then it automatically stops.	Duplex Solenoid ON/OFF
	Tray 3 Clutch	When the OK button is pressed, the Tray 3 clutch and motor turn on for 200ms, and then they automatically stop.	Tray 3 Clutch ON/OFF
Sensors	Paper Size Sensor	Place paper in the tray and compare the size with the control panel display.	Example: Tray2: Legal Tray3: Letter
	T1 NP Sensor	Pull out Tray 1 and manually toggle the actuator.	Tray 1 W/Out Paper or With Paper
	T2 NP Sensor	Pull out Tray 2 and manually toggle the actuator.	Tray 2 W/Out Paper or With Paper
	T3 NP Sensor	Pull out Tray 3 and manually toggle the actuator. When Tray 3 is not installed, this function does not work.	Tray 3 W/Out Paper or With Paper Tray 3 Not Installed
	Duplex Sensor	With the rear cover open, push a piece of paper into the duplex path and watch the control panel display.	Duplex Sensor W/Out Paper or With Paper
	Cover Open Sensor	Open the top cover and toggle the actuator.	Cover Open/Closed
	Feed Sensor	Open the top cover, remove the print cartridge, and then actuate the sensor	Feed Sensor W/Out Paper or With Paper
	Exit Sensor	Open the rear cover, and insert paper into the exit path.	Exit Sensor W/Out Paper or With Paper
	Out Bin Sensor	Actuate the output sensor.	Out Bin Sensor Not Full/Full

Main Menu	Sub Menu	Description/Function	Control Panel Display
	Tray 2 Out Sensor	Remove Tray 2 from the printer.	Tray 2 IN/OUT
	Tray 3 Out Sensor	Remove Tray 3 from the printer.	Tray 3 IN/OUT
	Fuser Door Sensor	Open the rear cover and actuate the fuser door sensor.	Fuser Door Sensor Closed/Opened
HVPS	Dev Bias DC	Developer Bias DC is applied when the OK button is pressed, and then goes off when the Cancel button is pressed.	Dev Bias DC ON/OFF
	Dev Bias AC	Developer Bias AC is applied when OK is pressed and goes off when Cancel is pressed.	Dev Bias AC ON/OFF
	Charge Roll Voltage	Charge Roller Voltage (+1200V) is supplied when OK is pressed and goes off when Cancel is pressed.	Charge Roll ON/OFF
	Transfer Roll (+)	Positive Transfer Voltage (+1200V) is supplied when OK is pressed and goes off when Cancel is pressed. [%d] is the value of the ADC.	Transfer Roll (+) [%d] ON/OFF
	Transfer Roll (-)	Negative Transfer Voltage (-800V) is supplied when OK is pressed and goes off when Cancel is pressed. Measure voltage with a DMM, if required.	Transfer Roll (-) ON/OFF
	Pre-transfer Lamp (PTL)	PTL turns on when OK is pressed and goes off when Cancel is pressed. Visual confirmation is possible with the cover open and the Print Cartridge removed.	Pre-transfer Lamp ON/OFF
Laser Scan Unit	Laser Diode_0	Laser Diode0 On is displayed when the laser diode is on. In the other case Laser Diode0 Off is displayed.	Laser Diode0 ON/OFF
	Laser Diode_1	Laser Diode1 On is displayed when the laser diode is on. In the other case Laser Diode0 Off is displayed.	Laser Diode1 ON/OFF

Main Menu	Sub Menu	Description/Function	Control Panel Display
	L Motor Ready	This tests if the laser unit is ready and capable of printing, or at a stable polygon motor speed.	Laser Ready Test Pass/Fail
Fuser	Fuser Temp.	<p>When the Target Temp is displayed, INput the temperature you would like to set with the arrow buttons. Press the OK button.</p> <p>The target temperature and the real temperature will be displayed on the bottom line.</p> <p>Default is T:190</p> <p>Note: You can adjust the temperature value while in diagnostics, however, once you exit the temperature will return to the default.</p>	Target/Current T: 190, C: XX
Read OPC Cycle		The total rotating number of the OPC drum is displayed on the bottom line of the control panel display when the process is on.	Total OPC-Cycle XXXX

Troubleshooting Error Messages

Error	Description	Page
Jam At Tray [1 2 3] (JAM 0)	<p>The leading edge of the paper doesn't pass the registration sensor or the sensor does not turn ON.</p> <ul style="list-style-type: none"> ■ After paper pick, paper is not fed. ■ After paper pick, paper enters the printer but does not reach the registration sensor in the specified time. ■ After paper pick, the registration sensor turns ON and tries to pick again but the paper does not reach the registration sensor in the specified time. 	page 2-11
Jam At Top (JAM 1)	<p>The paper is between the registration sensor and the exit sensor.</p> <ul style="list-style-type: none"> ■ The leading edge of the paper passes the registration sensor but the trailing edge does not pass through the registration sensor in the specified time. (The registration sensor cannot be OFF). ■ The leading edge of the paper passes the registration sensor, but the paper cannot reach the exit sensor in the specified time. (The exit sensor cannot be ON). 	page 2-11
Jam At Exit (JAM 2)	<ul style="list-style-type: none"> ■ The trailing edge of the paper passes the registration sensor, but the paper does not pass the exit sensor in the specified time. 	page 2-12
Jam at Rear (Duplex JAM 1)	<ul style="list-style-type: none"> ■ The trailing edge of the paper passes the exit sensor, but does not reach the duplex sensor in the specified amount of time. 	page 2-12
Jam at Duplex (Duplex JAM 2)	<ul style="list-style-type: none"> ■ The leading edge of the paper passes the duplex sensor, but the leading edge of the paper does not reach the registration sensor in the specified time. 	page 2-14
Check Cartridge, Invalid Print Cartridge, Non-Xerox Cartridge	<ul style="list-style-type: none"> ■ A print cartridge is not detected. ■ A non-Xerox print cartridge is installed. ■ The toner sensor board is malfunctioning. 	page 2-14
Close Fuser Door	<ul style="list-style-type: none"> ■ The fuser door sensor or actuator is malfunctioning or damaged. 	page 2-14
Close Top Cover.	<ul style="list-style-type: none"> ■ Top cover is damaged ■ Sensor or actuator is damaged. 	page 2-15
Fuser Failure, Engine Fuser Low Heat Error, Engine Overheat Error	<ul style="list-style-type: none"> ■ Fuser is damaged or malfunctioning. 	page 2-15
Laser Failure	<ul style="list-style-type: none"> ■ The laser unit is malfunctioning or damaged. 	page 2-15
Output Tray is Full	<ul style="list-style-type: none"> ■ The outbin full sensor or actuator is malfunctioning or damaged. 	page 2-16

Jam At Tray [1] [2] [3] (Jam 0)

Step	Actions and Questions	Yes	No
1.	<ol style="list-style-type: none"> 1. Check the side guides for the inoperative tray for damage or improper seating. 2. Are guides damaged or loose? 	Replace the Tray.	Go to Step 2.
2.	<ol style="list-style-type: none"> 1. Check the surface of the pick-up rollers for dirt or damage. 2. Are the rollers dirty or damaged? 	Clean rollers with a soft cloth very slightly dampened with water or replace if damaged.	Go to Step 3.
3.	<ol style="list-style-type: none"> 1. Do the Registration Rollers turn freely? 	Go to Step 4.	Replace Registration Assembly.
4.	<ol style="list-style-type: none"> 1. Is the Registration/Feed Sensor Actuator damaged or binding? 	Repair or replace the actuator and/or sensor.	Go to Step 5.
5.	<ol style="list-style-type: none"> 1. Use service diagnostics to check the operation of the tray solenoids. 2. Do the tray solenoids operate correctly? 	Go to Step 6.	Replace the inoperative solenoid.
6.	<ol style="list-style-type: none"> 1. Use service diagnostics to check the operation of the Regi Clutch and Feed Clutch. 2. Do the clutches operate correctly? 	Go to Step 7.	Replace the defective clutch.
7.	<ol style="list-style-type: none"> 1. If paper feeds into the printer and the Jam error message appears, use service diagnostics to check the feed sensor operation. 2. Does the feed sensor operate correctly? 	Replace the Main Board	Replace the defective sensor or actuator.

Jam At Top (Jam 1)

Step	Actions and Questions	Yes	No
1.	<ol style="list-style-type: none"> 1. Clean the paper path of any obstructions, dirt or debris. 2. Did this correct the problem 	Complete.	Go to Step 2.
2.	<ol style="list-style-type: none"> 1. Use service diagnostics to test the operation of the Registration roller and clutch. 2. Does the registration roller and clutch operate correctly? 	Go to Step 3.	Replace the Registration Assembly.

Step	Actions and Questions	Yes	No
3.	<ol style="list-style-type: none"> 1. Use service diagnostics to test the exit sensor. 2. Does the sensor operate correctly? 	Go to Step 4.	Replace the exit sensor.
4.	<ol style="list-style-type: none"> 1. Replace the Fuser Assembly and retest. 2. Did this correct the problem? 	Complete.	Replace the SMPS.

Jam At Exit (Jam 2)

Step	Action and Questions	Yes	No
1.	<ol style="list-style-type: none"> 1. Is the Exit Sensor Actuator damaged or binding? 	Repair or replace the actuator and/or sensor.	Go to Step 2.
2.	<ol style="list-style-type: none"> 1. Inspect the Exit Roller Assembly. 2. Use service diagnostics to test the main drive to exit. 3. Is the exit roller damaged or binding? 	Replace the Exit Roller Assembly.	Go to Step 3.
3.	<ol style="list-style-type: none"> 1. Visually inspect the Fuser. 2. Is there paper wrapped around the Fuser rollers? 	Remove obstruction and clean Fuser rollers.	Go to Step 4.
4.	<ol style="list-style-type: none"> 1. Is the Fuser Assembly operational. 2. Do the Fuser gears rotate when the Main motor is on? 	Go to Step 5.	Replace the Fuser Assembly.
5.	<ol style="list-style-type: none"> 1. Use the embedded diagnostics to check the Exit Sensor. 2. Is the sensor operational? 	Replace Main Board.	Replace SMPS.

Jam At Rear (Duplex Jam 1)

Step	Actions and Questions	Yes	No
1.	<ol style="list-style-type: none"> 1. Does paper jam after reversal but before reaching duplex sensor? 	Go to Step 2.	Go to Step 3.
2.	<ol style="list-style-type: none"> 1. Replace Transport Roller Shaft Assembly. 2. Does problem recur? 	Replace Duplex Assembly.	Complete
3.	<ol style="list-style-type: none"> 1. Use service diagnostics to check the operation of the Duplex Sensor. 2. Does the sensor operate correctly? 	Go to Step 4.	Replace the Duplex Sensor and/or Actuator.

Step	Actions and Questions	Yes	No
4.	1. Inspect the Duplex Assembly. Is any paper wrapped around the Duplex rollers?	Remove obstruction and clean rollers.	Go to Step 5.
5.	1. Use service diagnostics to check the exit sensor. 2. Does the sensor operate correctly?	Go to Step 6.	Replace the exit sensor and/or actuator.
6.	1. Inspect the exit and duplex roller assemblies. 2. Are the rollers damaged or binding?	Replace the exit or duplex roller as necessary.	Go to Step 7.
7.	1. Inspect the duplex assembly for damage.	Replace the duplex assembly.	Go to Step 8.
8.	1. Does the Feed Roller Assembly operate properly without binding?	Replace Main Board.	Replace the Feed Roller Assembly.

Jam At Duplex (Duplex Jam 2)

Step	Actions and Questions	Yes	No
1.	1. Does the paper jam after reversal but before reaching the duplex sensor?	Replace the transport roller shaft.	Go to Step 2.
2.	1. Use service diagnostics to test the duplex sensor. 2. Does the sensor operate correctly?	Go to Step 3.	Replace the duplex sensor.
3.	1. Inspect the exit and duplex rollers for any signs of damage or binding.	Replace the problem roller.	Go to Step 4.
4.	1. Replace the Duplex Assembly. 2. Does the problem still occur?	Replace the Main Board.	Replace the Power Supply Board.

Check Cartridge, Invalid Print Cartridge, Non-Xerox Cartridge, Replace Print Cartridge

Step	Action and Questions	Yes	No
1.	1. Open the top cover and ensure that the Print Cartridge is properly seated. 2. Does the error clear after reseating the cartridge?	Complete	Go to Step 2.
2.	1. Check the Print Cartridge for damage. 2. Does the cartridge contain toner and appear to be operating properly?	Go to Step 3.	Replace Print Cartridge.
3.	1. Reseat all harness connections to the Toner Sensor (CRUM) Board. 2. Does the error clear?	Complete	Go to Step 4.
4.	1. Check continuity between the Toner Sensor (CRUM) Board and CN6 on the Main Board. 2. Does the harness show continuity?	Replace the Toner Sensor Board.	Replace Harness.

Close Fuser Door

Step	Action and Questions	Yes	No
1.	1. Visually inspect the fuser door close tab for damage. 2. Is the tab broken?	Replace the Fuser.	Go to Step 2.

Step	Action and Questions	Yes	No
2.	1. Verify the sensor and actuator on the Fuser is operating correctly.	Replace the Main Board.	Replace the Fuser. Replace the SMPS.

Close Top Cover

Step	Action and Questions	Yes	No
1.	1. Visually inspect the top cover and the top cover actuator. 2. Is the top cover or actuator damaged?	Replace the Top Cover.	Go to Step 2.
2.	1. Use diagnostics to test the cover open sensor. 2. Does the sensor function properly?	Replace the Main Board.	Replace the Sensor.

Fuser Failure, Engine Fuser Low Heat Error, or Engine Fuser Over Heat Error

Step	Action and Questions	Yes	No
1.	1. Does the error report Fuser Failure?	Go to Step 2.	Go to Step 3.
2.	1. Check the thermistor. 2. Is the circuit open?	Replace the Fuser.	Replace the Main Board.
3.	1. Check the line voltages across the thermostats. 2. Are they open?	Replace the Fuser.	Go to Step 4.
4.	1. Is the Fuser getting power?	Replace the Fuser.	Replace the SMPS. Replace the Main Board.

Laser Failure

Step	Actions and Questions	Yes	No
1.	1. Reseat the connections to the laser and visually inspect the laser unit for damage. 2. Did this correct the problem?	Complete	Go to Step 2.

Step	Actions and Questions	Yes	No
2.	<ol style="list-style-type: none"> 1. Use diagnostics to check the laser motor function. 2. Did the laser motor fail? 	Replace the Laser Unit.	Replace the Main Board.

Output Tray Is Full

Step	Actions and Questions	Yes	No
1.	<ol style="list-style-type: none"> 1. Check the Output Tray sensor and actuator for obvious damage. 2. Is the actuator damaged? 	Replace the actuator.	Go to Step 2.
2.	<ol style="list-style-type: none"> 1. Use diagnostics to test the output tray sensor. 2. Does the sensor operate correctly? 	Replace the Main Board.	Replace the Output Tray Sensor.

General Troubleshooting

The following procedures cover Control Panel and Start-up problems with the printer when no specific error code or Control Panel message is displayed.

Control Panel Troubleshooting

No Control Panel Display after Power Is Turned ON

1. Verify that power cord is securely plugged into both the printer and the grounded, three prong AC outlet with the appropriate power available.
2. Ensure that all covers are securely closed.
3. Verify the Top Cover, Print Cartridge, and Fuser interlocks are functional.
4. Verify voltages at the Main Board, see [Power Supply Troubleshooting](#) on page 2-18.
5. Replace the Power Supply Board.
6. Replace the Main Board.
7. Replace the Control Panel.

Control Panel LED is On, Control Panel Display Is Blank

1. Remove and reseat the Control Panel wiring to the Main Board.
2. Replace the Control Panel.
3. Replace the Main Board.

Power Supply Troubleshooting

1. Check the voltage at the AC wall outlet, there should be approximately 110 VAC (or 220 VAC if the printer is a 220 V model) at the AC wall outlet?
2. Check the power cord for defects, damage, or a loose connection.
3. Check the AC switch harness for continuity.
4. Verify the Power Supply is operating correctly.

Taking Voltage Measurements

To locate connectors or test points, refer to [Wiring Data](#) on page 7-1 for more information.

Unless otherwise specified, the following voltage tolerances are used within this section

Stated	Measured
+3.3 VDC	+3.135 to +3.465 VDC
+5.0 VDC	+4.75 to +5.25 VDC
+24.0 VDC	+21.6 to +26.4 VDC
0.0 VDC	Less than +0.5 VDC

3 Image-Quality Troubleshooting

This section covers the following:

- [Image-Quality Problems Overview](#) on page 3-2
- [Control Panel \(Internal\) Test Print](#) on page 3-4
- [Image-Quality Troubleshooting](#) on page 3-7

Image-Quality Problems Overview

Image-quality defects can be attributed to printer components, consumables, media, internal software, external software applications, and environmental conditions. To successfully troubleshoot image-quality problems, as many variables as possible must be eliminated.

The following guidelines should be used before troubleshooting an image-quality problem:

- Use an unopened ream of approved media for evaluating image-quality problems

Note: See the approved media list, [Media and Tray Specifications](#) on page 6-9, for media that has been tested and approved for use with the Phaser 3500 Laser Printer.

- Generate the [Control Panel \(Internal\) Test Print](#) on page 3-4, and see if the image-quality problem still exists
- When analyzing a image-quality defect, first determine if the defect is repeating or random. Repeating defects can often be associated with a particular component.
- Inspect the surfaces of all rollers in the paper path for obvious defects.

Repeating Defects

Some image-quality problems can be associated with specific assemblies, the most common problems and the associated assemblies are listed below. Also, see the specific image-quality troubleshooting procedure for more information.

Print Cartridge

- Streaks
- Fine Lines
- Banding in Process Direction
- Uneven Density
- Voids
- Repeating Defects

Transfer Roller

- Toner on the back side of the printed page (simplex mode)
- Light Prints
- Repeating Defects
- Spots on Image

Fuser

- Hot or Cold Offsetting
- Repeating Defects
- Voids

Repeating Defects Measurement Table

Assembly	Component	Distance between Defects	Typical Defect
Print Cartridge	Developer Roller	50 mm (1.97 in.)	Horizontal image band
	Drum	94 mm (3.70 in.)	White spots on black image or black spots on white
	Drum Charge Rollers	38 mm (1.50 in.)	Black spots
	Supply Roller	42 mm (1.65 in.)	Light or dark horizontal image bands
Transfer Roller	Transfer Roller	56 mm (2.20 in.)	Image ghost
Fuser Assembly	Heat Roller	126 mm (4.96 in.)	Black spots and image ghost
	Pressure Roller	126 mm (4.96 in.)	Black spots on back

Control Panel (Internal) Test Print

A test print is available to aid in determining the quality of output from the printer and to assist in troubleshooting image-quality problems. Each area of the test print is used for a image-quality parameter. The following pages explain each of the areas and the image-quality parameters. Follow these guidelines when generating the test print:

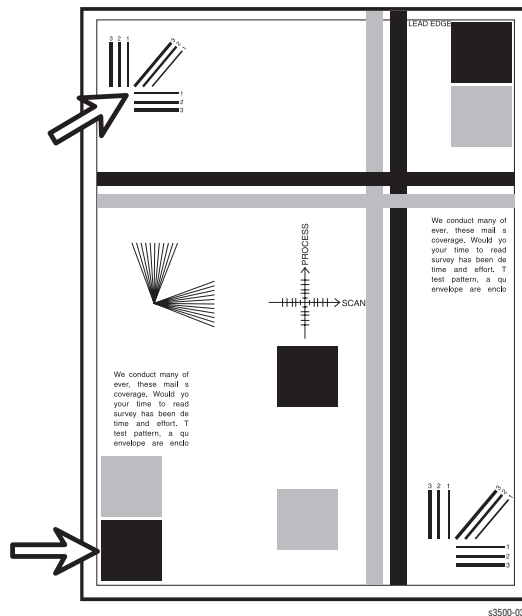
- Use supported paper from a fresh, unopened ream
- Print five copies of the test print.
- Discard the first two prints and retain the remaining prints for image-quality analysis.

Deletions

Inspect the test print for the presence of deletions or unprinted spots. If these are found, see [Spot or Vertical Deletions](#) on page 3-10.

Fusing

Rub the image three times at the indicated points with a soft cloth or tissue. The toner should not lift off of the surface of the print. If the image smears or toner lifts off the image onto the cloth, see [Unfused Image](#) on page 3-11.

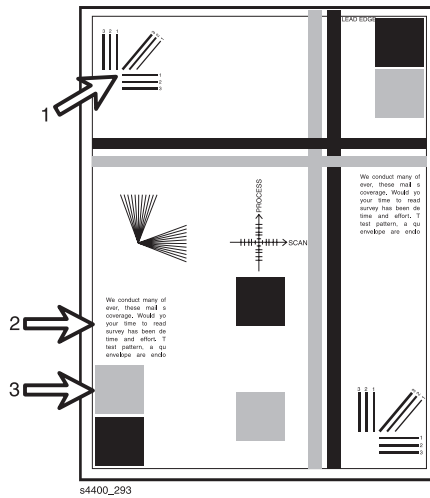


Resolution

Observe the three resolution check points on several test prints.

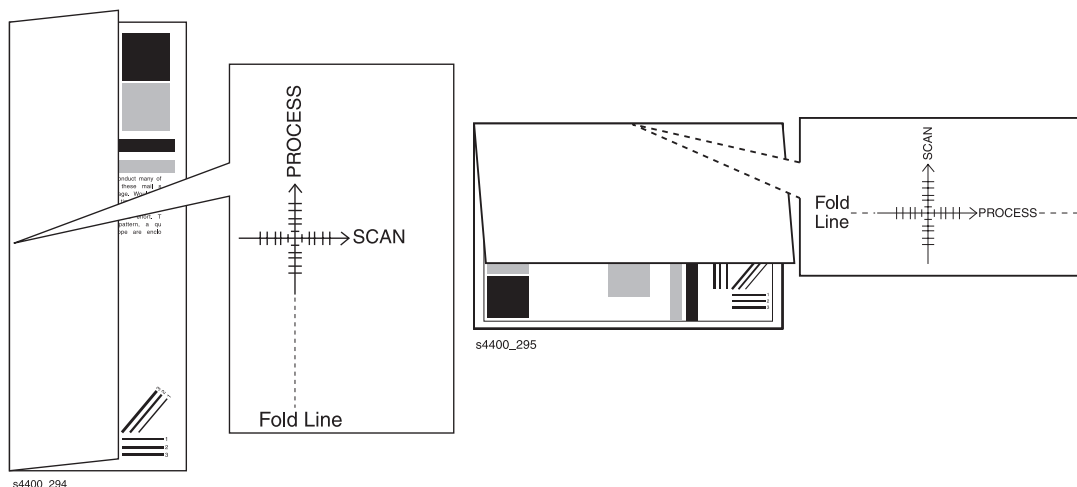
- Ensure that the 2 pixel horizontal, vertical, and diagonal lines are clear and continuous. The diagonal lines might appear to be narrower than the others.
- Characters in the text paragraphs should be uniform and equal in density.
- The halftone patches should be uniform in appearance.

If the image does not meet the criteria, see [Non-Uniform Image](#) on page 3-9 or [Character Defects](#) on page 3-10.



Registration and Skew

Fold the paper from two consecutive test prints in half (first side edge to side edge and then top edge to bottom edge). Observe the fold lines with reference to the crosshairs of the printed target. The fold line should be aligned perpendicular to the target crosshairs and should be within ± 2.0 mm of the target crosshairs (each line on the target is 1.0 mm). If the image does not meet the criteria, see [Skewed Image](#) on page 3-11.



Skips or Smears

Check the test print in the indicated areas for loss, stretching, or distortion of the image in bands across the process direction that make the image seem distorted, blurred, or compressed. If these faults are observed, see [Skips/Smears](#) on page 3-11.

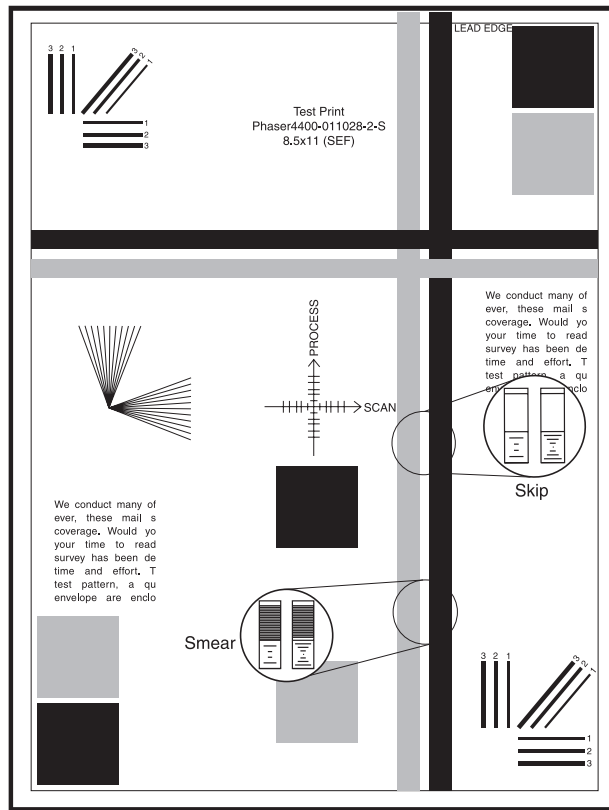


Image-Quality Troubleshooting

The following table provides examples and descriptions, possible causes, and the solutions for troubleshooting various image or printing defects that may be observed in the Phaser 3500 Laser Printer.

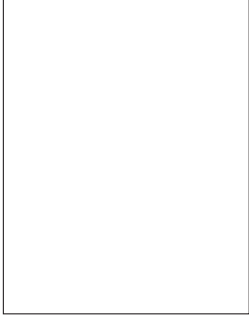
Image Defect	Possible Causes	Solutions
No Image/Blank Prints Prints have no visible image.  <small>s3500-043</small>	<ul style="list-style-type: none"> ■ Sealing tape or shipping restraint was not removed from the cartridge. ■ Low or no toner ■ Defective ground to the Print Cartridge or OPC Drum ■ Malfunctioning solenoid or drive. ■ Main Board ■ Incorrect high-voltage output from the Power Supply Board. ■ Multiple sheet feeding 	<ol style="list-style-type: none"> 1. Ensure that sealing tape and shipping restraint have been removed. 2. Verify Print Cartridge ground. 3. Verify continuity between the cartridge ground and frame. 4. Ensure the feed solenoid is functioning properly. 5. Replace in the following order: <ul style="list-style-type: none"> ■ Print Cartridge ■ Main Board ■ Power Supply Board ■ Laser Assembly
Light Prints All areas of the print are light with no ghosting.	<ul style="list-style-type: none"> ■ Unsupported Media (paper) ■ Seal tape or shipping restraint was not removed from the cartridge. ■ Incorrect Control Panel settings ■ Low toner ■ Transfer Roller ■ Laser contamination or obstruction ■ Incorrect high-voltage output ■ Low ambient temperature (<10° C) 	<ol style="list-style-type: none"> 1. Verify paper meets printer specifications. Print 20 to 30 pages using the recommended paper. 2. Verify image-quality menu is not set to "draft." 3. Ensure that the sealing tape and the shipping restraint have been removed. 4. Verify low toner warning is not displayed on control panel. Remove the Print Cartridge and shake, reinstall or replace. 5. Inspect the Transfer Roller for contamination and verify high-voltage contacts. Replace as required. 6. Inspect the Laser assembly for any obstructions; clean the laser exit window. 7. Replace the Power Supply Board.



Image Defect	Possible Causes	Solutions
<p>Black Prints</p> <p>The prints are completely black, has no visible image.</p>  <p>s3500-045</p>	<ul style="list-style-type: none"> ■ No charge voltage ■ Power Supply Board ■ Print Cartridge ■ Main board ■ Laser is always ON 	<ol style="list-style-type: none"> 1. Verify the high-voltage contacts are operational and make good contact with the print cartridge. 2. Replace in the following order: <ul style="list-style-type: none"> ■ Print Cartridge ■ Power Supply Board ■ Main Board ■ Laser Assembly
<p>Dark Image</p> <p>All areas of the print are too dark.</p>	<ul style="list-style-type: none"> ■ Incorrect Control Panel settings ■ Print Cartridge ■ Incorrect high-voltage outputs (Developer Bias voltage) ■ Laser assembly 	<ol style="list-style-type: none"> 1. Verify Remote Control Panel setting for the Print Density menu is not set to "dark." 2. Verify that the high-voltage contacts are operational and make good contact with the print cartridge. 3. Replace the following in order: <ul style="list-style-type: none"> ■ Print Cartridge ■ Power Supply Board ■ Laser assembly
<p>Background Contamination</p> <p>Uniform toner contamination in non-image area.</p>  <p>s3500-046</p>	<ul style="list-style-type: none"> ■ Media (paper) ■ Operating environment ■ Print Cartridge ■ Transfer Roller ■ Incorrect High Voltage outputs 	<ol style="list-style-type: none"> 1. Verify that paper meets printer specifications. Print 20 to 30 pages using recommended paper. If using recycled paper, try non-recycled paper. 2. Printer is installed in specified environment. 3. Replace Print Cartridge. 4. Inspect Transfer Roller for contamination and good electrical contact, replace if required. 5. Clean the Pre-transfer Lamp. 6. Replace Power Supply Board.



Image Defect	Possible Causes	Solutions
<p>Ghosting</p> <p>Image from the previous page prints on consecutive pages.</p> 	<ul style="list-style-type: none"> ■ Operating environment ■ Media (paper) ■ Print Cartridge ■ Transfer Roller ■ Fuser assembly ■ Incorrect high-voltage outputs. 	<ol style="list-style-type: none"> 1. Printer is installed in specified environment? 2. Verify that paper meets printer specifications. Print 20 to 30 pages using recommended paper. 3. Determine ghosting pitch and replace the corresponding assembly. <p>NOTE: See Repeating Defects on page 3-3 for defect pitch.</p> <ol style="list-style-type: none"> 4. Replace Power Supply Board.
<p>Non-Uniform Image</p> <p>The Line darkness and solid-area density image vary across the print.</p> 	<ul style="list-style-type: none"> ■ Print Cartridge ■ Print Cartridge grounding ■ Unstable high voltage output ■ Transfer Roller contamination ■ Laser Window or optic contamination 	<ol style="list-style-type: none"> 1. Ensure that Cartridge is not out of toner. Inspect Drum for deterioration or contamination. 2. If defective, replace the Print Cartridge. 3. Verify Print Cartridge ground. Check continuity between cartridge ground contact and frame ground. Ensure that drum contact is clean and undamaged. 4. Inspect the Transfer Roller spring tension and bearing contacts. 5. Remove Laser assembly, clean window, or replace assembly as necessary. 6. Replace Power Supply Board.



Image Defect	Possible Causes	Solutions
<p>Black Spots/Marks</p> <p>There are spots and/or marks of toner on the printed side of the page.</p>  <p>s3500-051</p>	<ul style="list-style-type: none"> ■ Print Cartridge ■ Fuser Assembly ■ Paper transports ■ Transfer Roller 	<ol style="list-style-type: none"> 1. Replace the Print Cartridge. <p>NOTE: See Repeating Defects on page 3-3 for defect pitch.</p> <ol style="list-style-type: none"> 2. Inspect /clean/replace Fuser Assembly as necessary. 3. Clean contamination from paper transports and exit rollers. 4. Clean or replace the Transfer Roller.
<p>Spot or Vertical Deletions</p> <p>Solid areas are marked with irregular white spots.</p>  <p>s3500-052</p>	<ul style="list-style-type: none"> ■ Damp paper ■ Foreign matter contamination of printer components ■ Print Cartridge ■ Transfer Roller 	<ol style="list-style-type: none"> 1. Replace paper. 2. Check printer components for surface contamination or paper scraps. Clean as required. 3. If deletions repeat every 94 mm, replace Print Cartridge. <p>NOTE: See Repeating Defects on page 3-3 for defect pitch.</p> <ol style="list-style-type: none"> 4. Remove the Transfer Roller and clean (dust off). If deletions repeat every 56 mm, replace Transfer Roller.
<p>Horizontal Bands</p> <p>Dark bands appearing in the horizontal direction.</p>	<ul style="list-style-type: none"> ■ Print Cartridge ■ Fuser Assembly ■ Transfer Roller ■ Incorrect high-voltage outputs ■ Laser Assembly 	<ol style="list-style-type: none"> 1. Replace the Print Cartridge. 2. Inspect /clean/replace Fuser Assembly as necessary. 3. Inspect the Transfer Roller spring tension and bearing contacts. 4. Replace Power Supply Board. 5. Replace Laser Assembly.
<p>Character Defects</p> <p>Garbled print, missing, repeating or scrambled characters are problems relating to font data or character generation.</p>	<ul style="list-style-type: none"> ■ Loose/defective interface cables; cable not within specification. ■ Optional DIMM memory ■ Main Board 	<ol style="list-style-type: none"> 1. Inspect cable connections; verify that cables meet specified requirements. 2. Replace optional DIMM memory. 3. Replace Main Board.

Image Defect	Possible Causes	Solutions
Unfused Image Part or all of the image is unfused.	<ul style="list-style-type: none"> ■ Paper quality (damp paper) ■ Operating environment ■ Remote Control Panel settings ■ Fuser Assembly ■ Main Board 	<ol style="list-style-type: none"> 1. Paper is too thick, damp or contains a high percentage of cotton. 2. Printer is not installed in specified environment. 3. Verify Remote Control Panel settings, such as envelope. 4. Inspect /clean/replace Fuser assembly as necessary. 5. Replace Main Board.
Skewed Image The printed image is not parallel with the sides of the page.	<ul style="list-style-type: none"> ■ Paper ■ Paper tray ■ Pick-up roller assembly/ Paper transportation ■ Fuser Assembly 	<ol style="list-style-type: none"> 1. Inspect paper for damage. Replace as necessary. 2. Check paper tray for damage. Properly install fresh paper in the paper tray. 3. Inspect Pick-up roller assembly. Replace as necessary. 4. Inspect paper transportation areas for proper operation. 5. Inspect /clean/replace Fuser assembly as necessary.
Skips/Smears Skips, loss or stretching of the image in bands across the process direction. Smears, the distortion of the image in bands across the process direction. Causes image to appear blurred or compressed.	<ul style="list-style-type: none"> ■ Paper transportation ■ Main drive motor assembly ■ Fuser Assembly ■ Print Cartridge 	<ol style="list-style-type: none"> 1. Inspect paper transportation areas for proper operation. 2. Inspect main drive motor assembly for damage or worn gears. Replace as necessary. 3. Inspect /clean/replace Fuser assembly as necessary. 4. Replace Print Cartridge.
OHP Print Distortion Trembling appearance when printing on transparencies.	<ul style="list-style-type: none"> ■ Remote Control Panel settings ■ Recommended Media ■ Transfer roller voltage 	<ol style="list-style-type: none"> 1. Verify Remote Control Panel is configured to Transparency mode. 2. Verify transparency meets printer specifications. 3. Inspect the Transfer Roller spring tension and bearing contacts. 4. Replace Power Supply Board.

4 Repairs and Adjustments

This section covers the following:

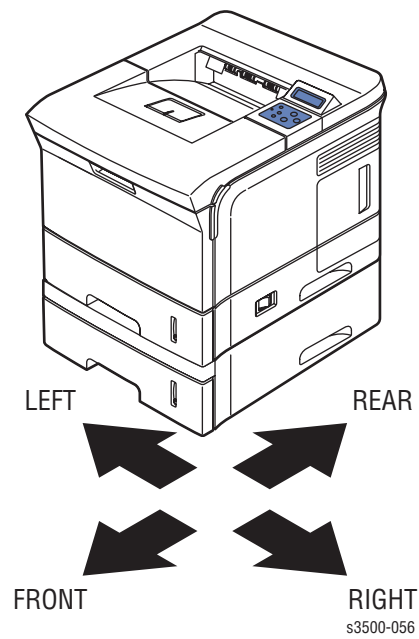
- [Overview](#) on page 4-2
- [General Notes on Disassembly](#) on page 4-3
- [Covers](#) on page 4-4
- [Control Panel and LCD Display](#) on page 4-10
- [Open Cover](#) on page 4-11
- [Tray 1 \(MPT\) Assembly](#) on page 4-12
- [Inner Cover](#) on page 4-16
- [Transfer Roller](#) on page 4-17
- [Retard Assembly](#) on page 4-18
- [Tray 1 Separator \(Holder\) Pad Assembly](#) on page 4-19
- [Feed2 Idle Unit](#) on page 4-20
- [Registration Assembly](#) on page 4-21
- [Main Drive Assembly and Registration \(Feed\) Clutch](#) on page 4-24
- [Tray 1 Pick-Up Assembly and Pick Rollers](#) on page 4-26
- [Tray 2 Pick-Up Assembly and Rollers](#) on page 4-29
- [Developer Drive Assembly](#) on page 4-33
- [Connector Board](#) on page 4-34
- [Tray 1 \(MPT\) Solenoid](#) on page 4-35
- [Main Solenoid](#) on page 4-36
- [Fuser Assembly](#) on page 4-37
- [Exit Solenoid Assembly](#) on page 4-38
- [Exit and Duplex Rollers](#) on page 4-39
- [Laser \(LSU\) Assembly and Lower Cover](#) on page 4-42
- [Left Side Cooling Supply Fan and Duct](#) on page 4-44
- [Toner Sensor Board and CRUM](#) on page 4-45
- [Main Board and Shield](#) on page 4-47
- [Power Supply and Shield](#) on page 4-48
- [Fuser Gear Assembly](#) on page 4-50
- [Paper Size Sensor](#) on page 4-51

Overview

This section contains the removal and replacement procedures for selected parts of the printer according to the Service Parts List. Not all Replacement Procedures are included in this Service Manual. In most cases, to reinstall a part, simply reverse the Removal Procedure shown. In some instances, the Replacement Procedure is included, because it may contain special steps. For specific assemblies and parts, see [Parts List](#) on page 5-1.

Standard Orientation of the Printer

When needed, the orientation of the printer is called out in the procedure for locating printer parts. Refer to the printer orientation graphic for locating the right, left, front and back sides of the printer.

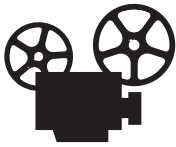


General Notes on Disassembly

Preparation

Before you begin any Removal and Replacement Procedure:

1. Switch OFF the printer power and disconnect the power cord from the wall outlet.
2. Remove the Print Cartridge and protect it from exposure to light by covering it with a light proof bag or by placing it in a light-tight container.
3. Disconnect all computer interface cables from the printer.
4. Wear an electrostatic discharge wrist strap to help prevent damage to the sensitive electronics of the printer circuit boards.
5. Remove the Fuser Assembly or wait at least 5 minutes after you have switched OFF printer power for the Fuser to cool before you work on or around the Fuser.
6. Tray 2 can interfere with the removal of many printer parts. Remove Tray 2 before further disassembly.



Wherever this video icon appears throughout the manual, detailed instructions for that procedure are available with videos on the Phaser 3500 Product Training CD-ROM.

Note: Part names that appear in the disassembly procedures may not exactly match the names that appear in the Parts List. For example, a part called the Registration Transport Assembly may appear on the Parts List as Assembly, Transport Regi.

Caution: Many parts are secured by plastic tabs. DO NOT over flex or force these parts. Do not over torque the screws threaded into plastic parts. Always use the correct type and size screw. Using the wrong screw can damage tapped holes. Do not use excessive force to either remove or install either a screw or a printer part. A spring hook is required for removal and replacement of the various springs in the printer. Springs can be damaged using pliers or other tools for this task.

Warning: Unplug the AC power cord from the wall outlet before removing any printer part.

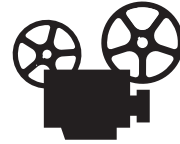
Notations in the Disassembly Text

- The notation “(item X)” points to a numbered callout in the illustration corresponding to the disassembly procedure being performed.
- The notation “PLX.X.X” indicates that this component is listed in the Parts List.
- Bold arrows in an illustration show direction of movement when removing or replacing a component.

Covers

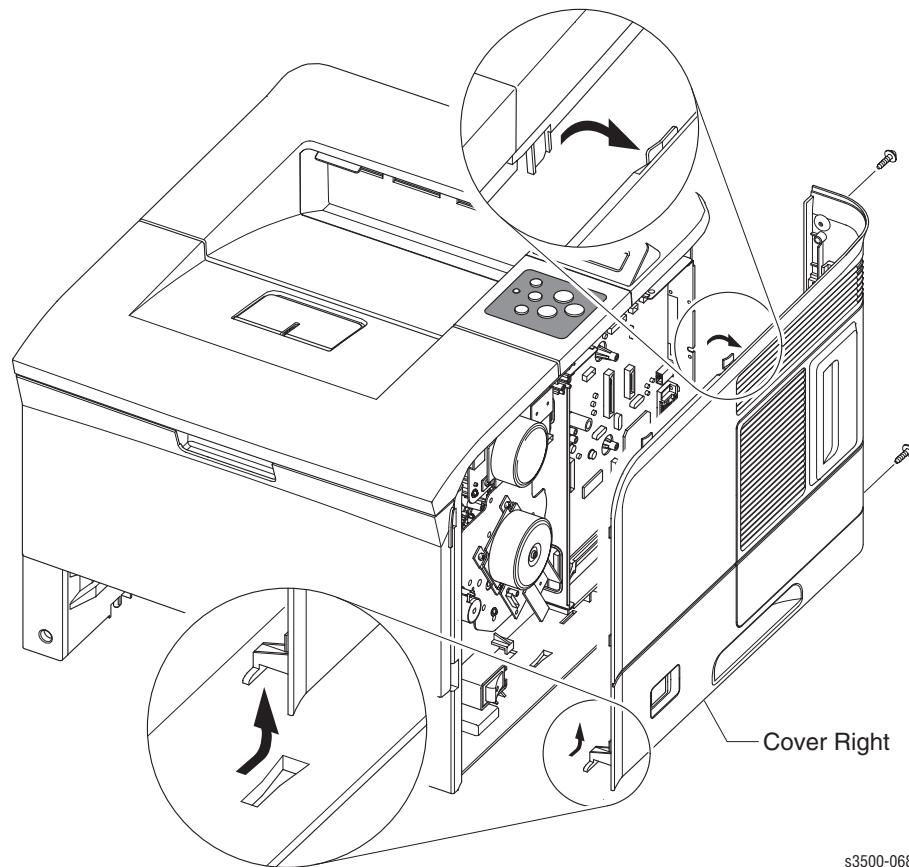
Right Cover

1. Disconnect the power cord.
2. Remove the Duplex Unit.
3. Remove the 2 rear screws securing the Right Cover to the rear of the printer.



Note: In the next step, ensure the power switch is in the OFF position in order to free the Right Cover.

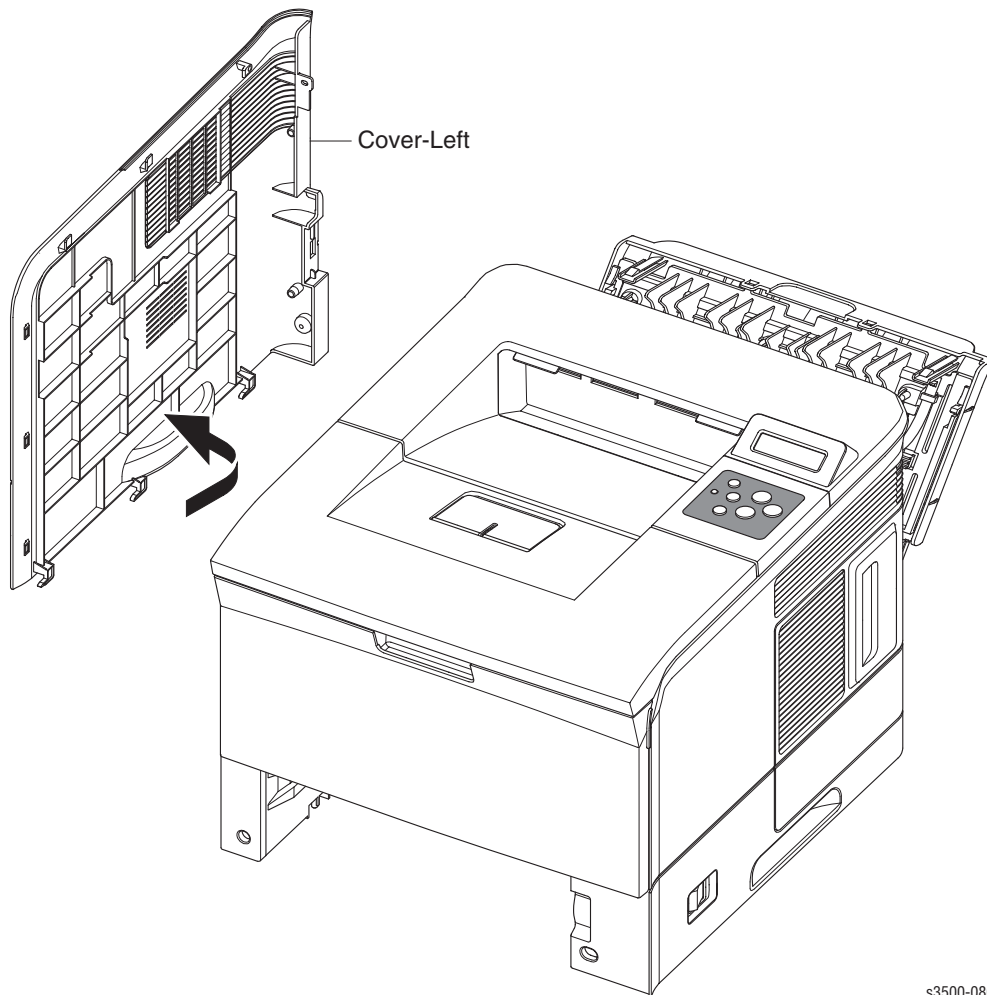
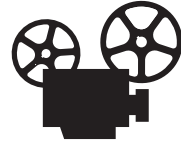
4. Slide the Right Cover towards the rear of the printer to release the 3 tabs, and remove it from the printer.



s3500-068

Left Cover

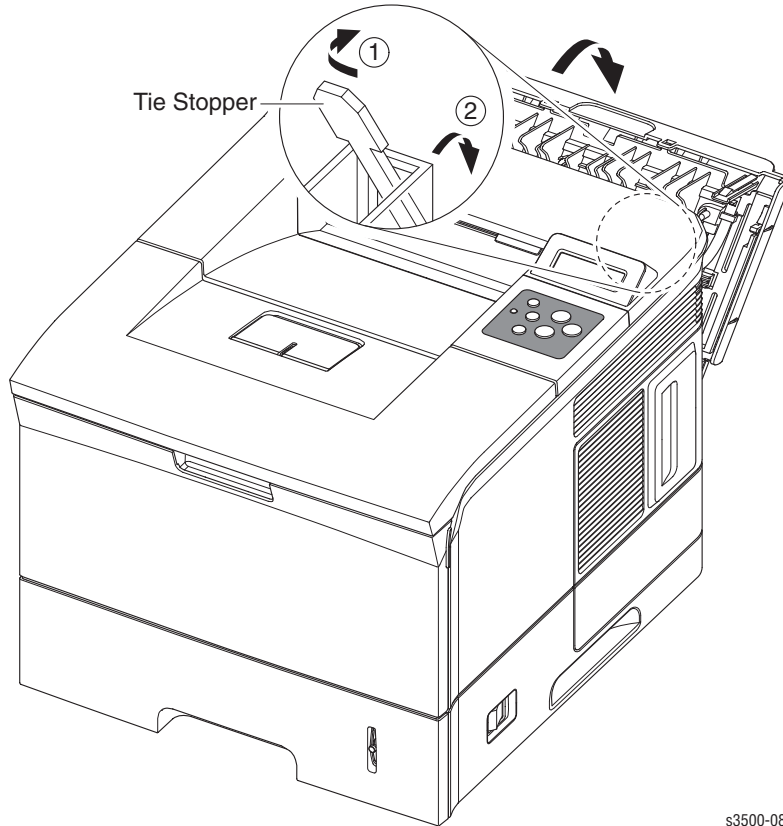
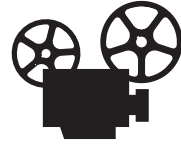
1. Disconnect the power cord.
2. Remove the Duplex Unit.
3. Open the Rear Cover for access to the rear top screw.
4. Remove 2 screws, from the rear of the printer, securing the Left Cover.
5. Close the Rear Cover.
6. Slide the left cover towards the rear of the printer to release the 3 tabs securing it to the printer.



s3500-080

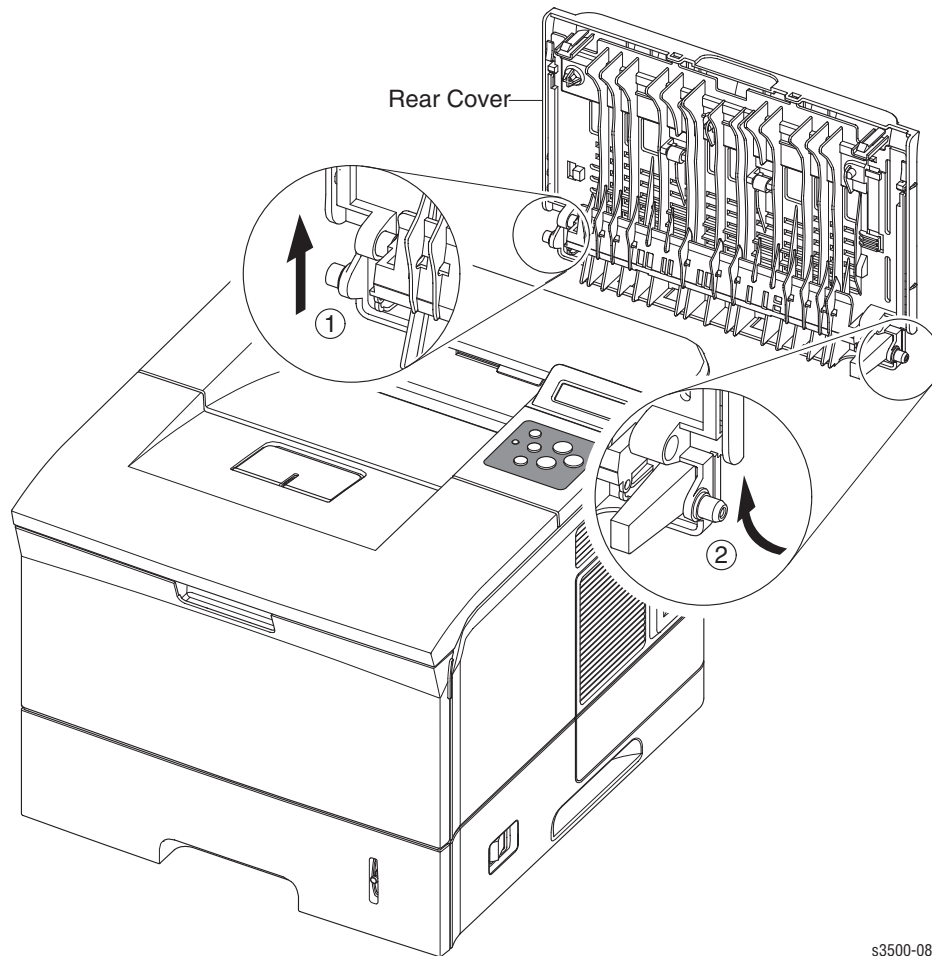
Rear Cover

1. Open the Rear Cover.
2. Release the Restraining Strap (tie stopper).



s3500-081

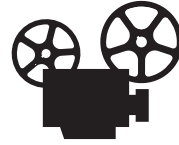
3. To release the 2 posts securing the Rear Cover; Lift up on the left (printer left) hinge pin, then slide the Rear Cover to the left to free the right hinge pin and remove the Rear Cover from the printer.



s3500-082

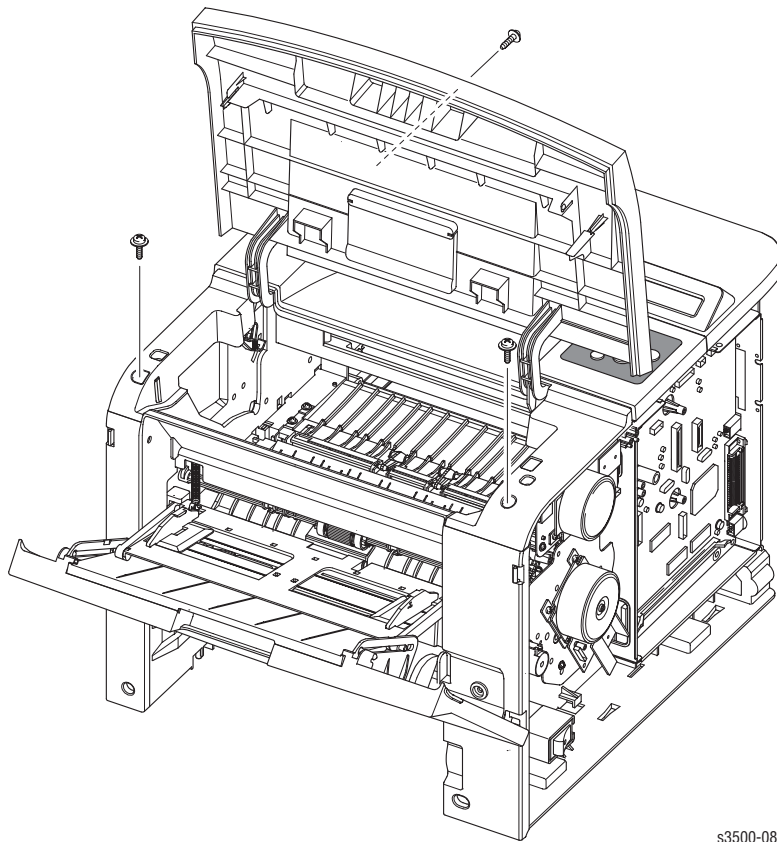
Top Cover

1. Remove the Print Cartridge and protect it from light exposure.
2. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5



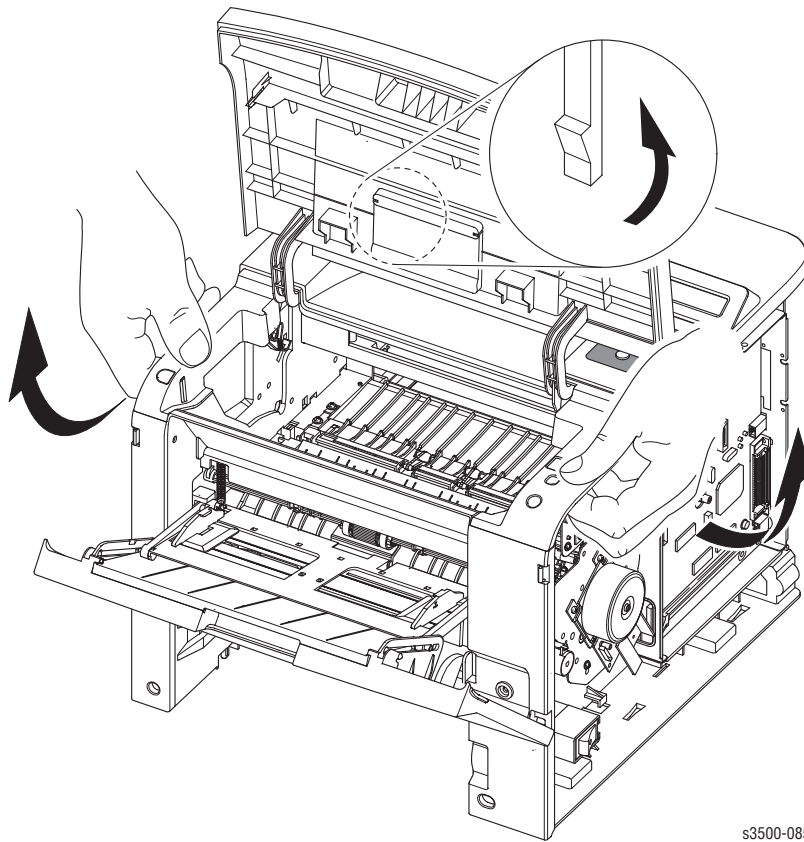
Note: Open the Rear and Top Covers for access.

3. Remove the 2 screws located on the front of the Top Cover.
4. On the rear, left side of the printer, remove 1 screw securing the Top Cover.



s3500-083

5. Release 3 tabs, one on the left, one on the right, and one on the rear of the Top Cover.

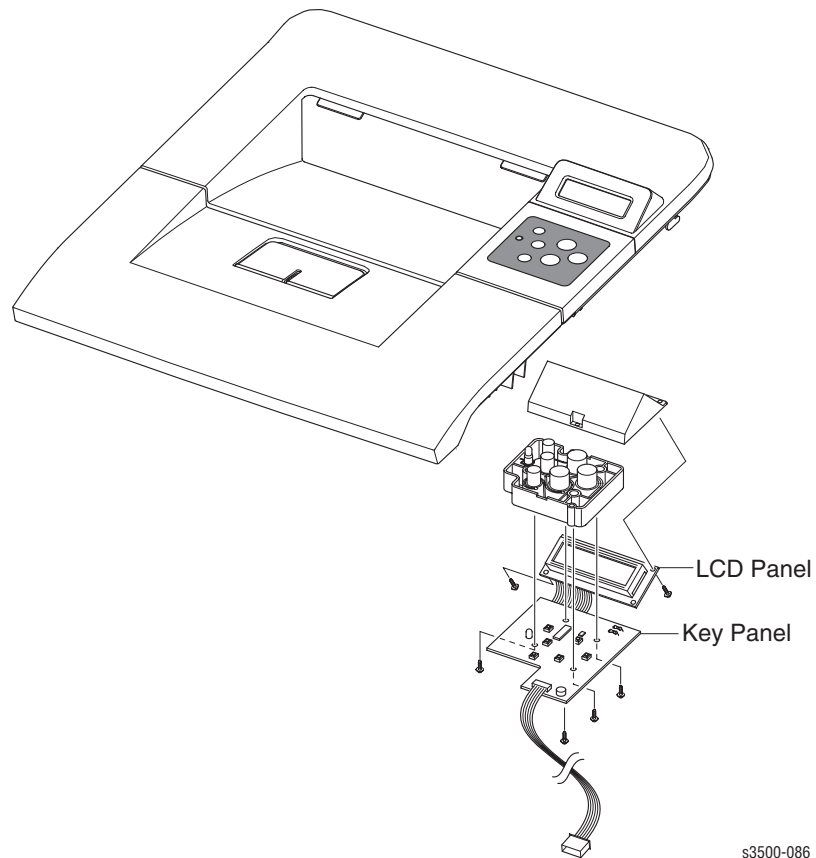


6. Disconnect the Control Panel wiring harnesses from the Main Board, note the connector location and routing for reassembly.

Control Panel and LCD Display

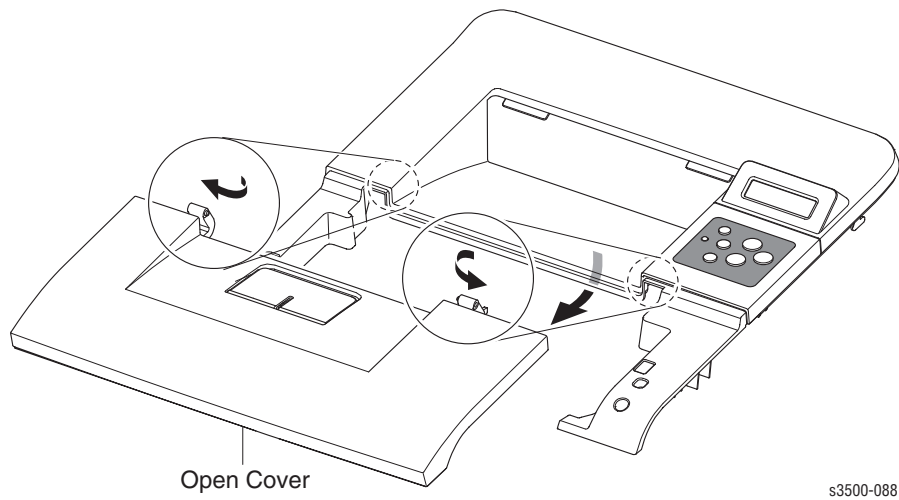
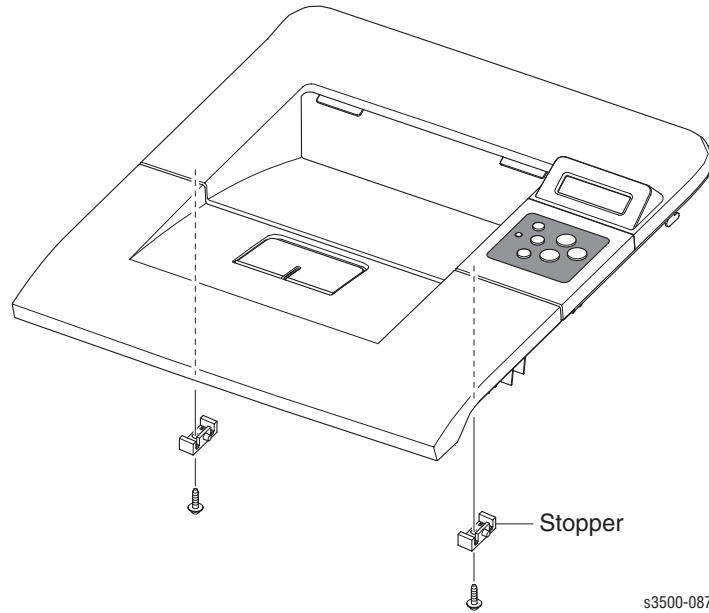
1. Remove:
 - [Top Cover](#) on page 4-8
2. Remove the 6 screws securing the LCD and control panel and remove from the top cover.
 - 2 screws to the LCD Board.
 - 4 screws on the key panel board.

Note: DO NOT remove the 3 screws securing the plastic portion of the LCD display.



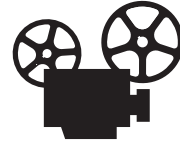
Open Cover

1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
2. Remove the 2 screws and stoppers from the Open Cover.
3. Remove the Open Cover from the Top Cover by flexing the 2 tabs as shown below.

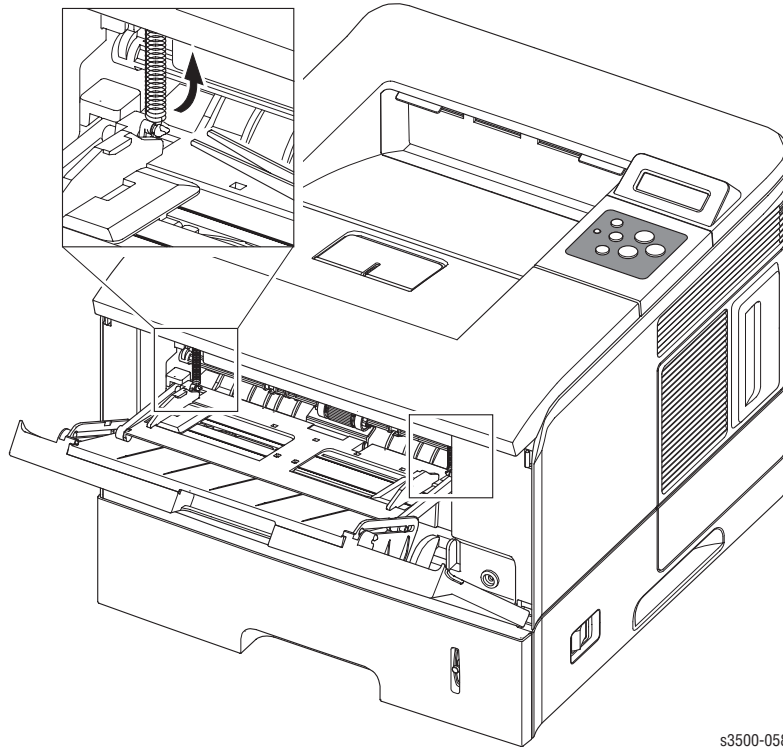


Tray 1 (MPT) Assembly

1. Open Tray 1.
2. Unhook the 2 springs connecting the Knock-up Plate to the Pick-Up Rack.



Note: DO NOT unhook the springs from the Pick-Up Rack.

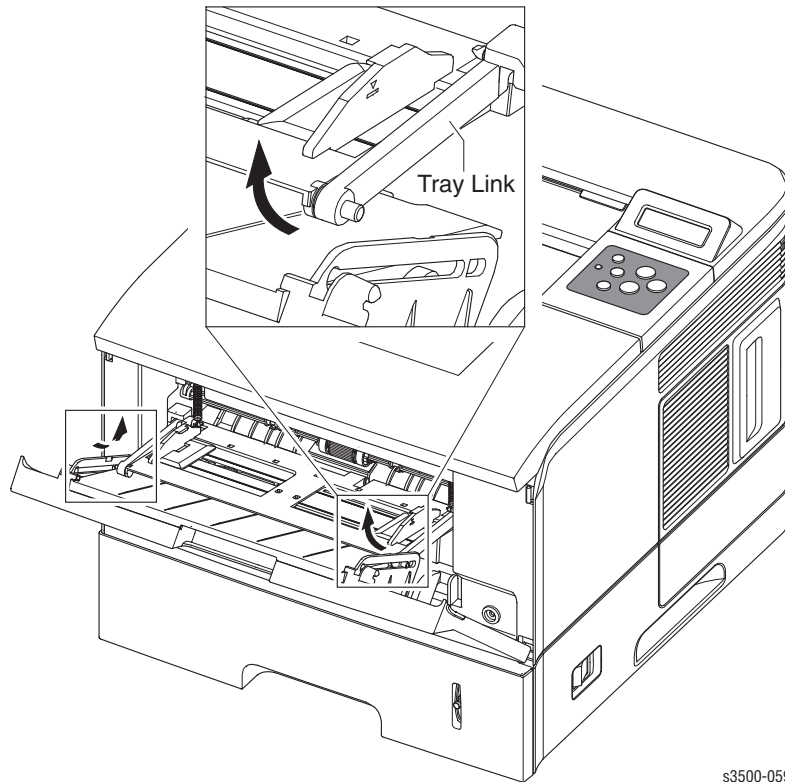


s3500-058

Note: In the next step, if you exert too much pressure you can break the tracks.

3. Flex the left and right side tracks to disengage the Knock-Up Plate from the Tray 1 Assembly.

Caution: Tray 1 and the Knock-Up Plate contain unsecured plastic parts that fall off and are easy to lose.



s3500-059

4. Slide Tray 1 to the right side of the printer to release the 4 pivot points securing the Tray, then remove the Tray 1 Assembly from the printer.

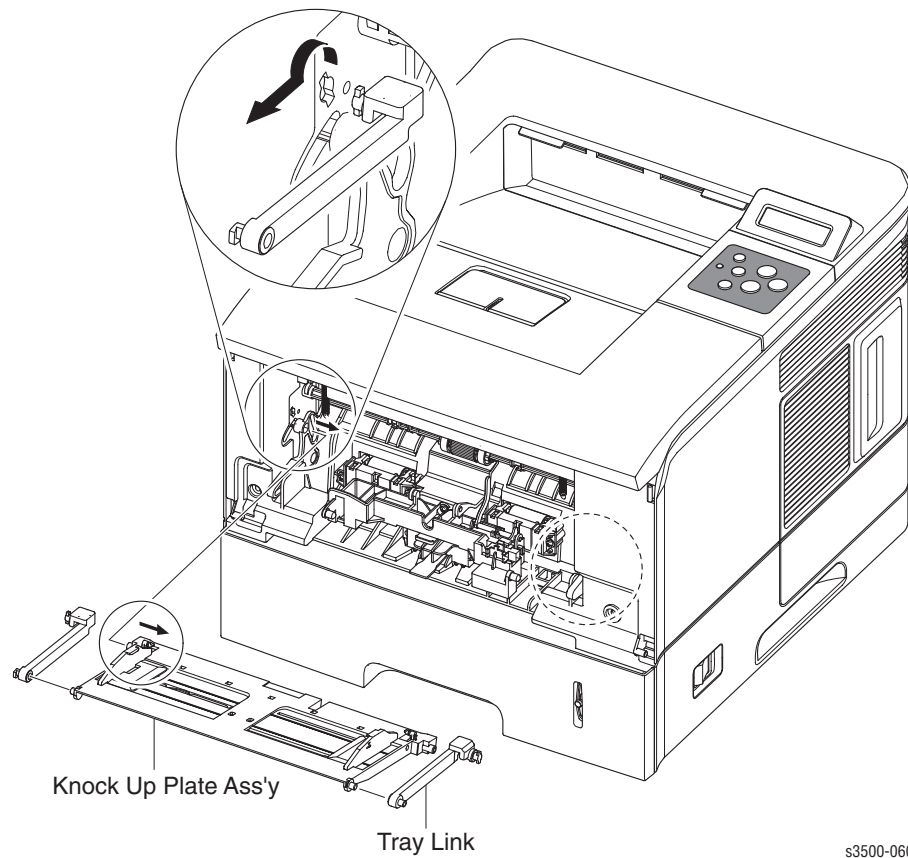
Tray 1 Knock-Up Plate

1. Follow all the steps for removing the [Tray 1 \(MPT\) Assembly](#) on page 4-12.
2. Rotate the tray links down slightly until they come free from the printer.

Note: The tray links are marked “L” for the left and “R” for the right.

3. To free the Knock-Up Plate, carefully spread the slotted hinge piece to release the post, then remove the Knock-Up Plate.

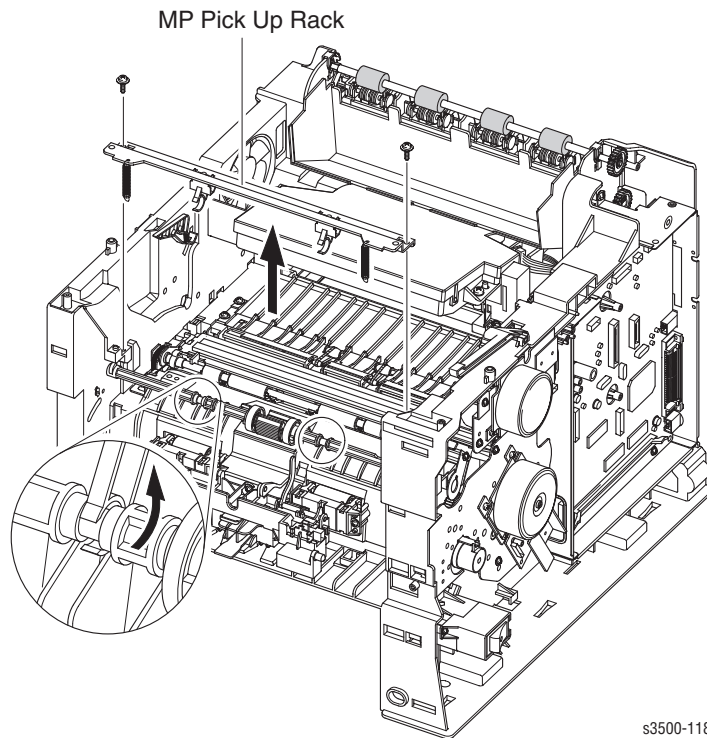
Note: Tray 1 and the Knock-up Plate contain unsecured plastic parts that fall off and are easy to lose.



Tray 1 Pick-Up Rack

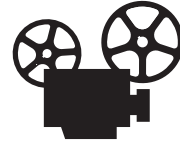
1. Remove 2 screws securing the Pick-Up Rack and remove the rack.
2. Separate the clips from the Pick Roller shaft and remove the Pick-Up Rack.

Caution: Do not remove or loose the springs.

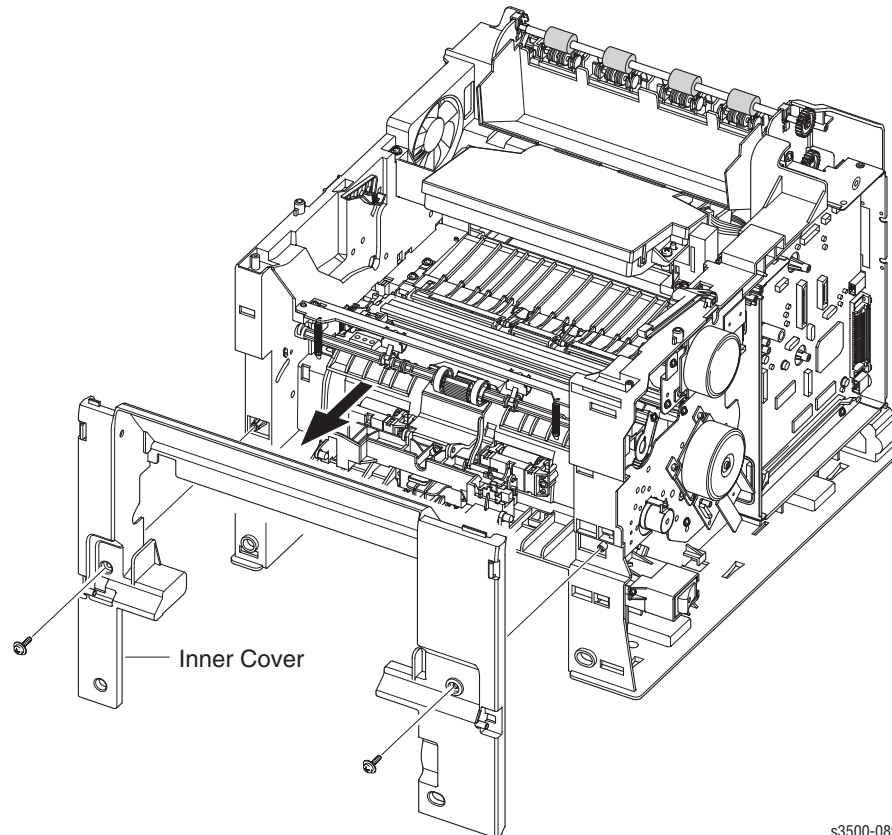


s3500-118

Inner Cover



1. Remove:
 - Tray 1 (MPT) Assembly on page 4-12
 - Top Cover on page 4-8
2. Open or remove Tray 2 for better access.
3. Remove 2 screws securing the Inner Cover to the printer frame.
4. Remove the Inner Cover.



s3500-089

Transfer Roller

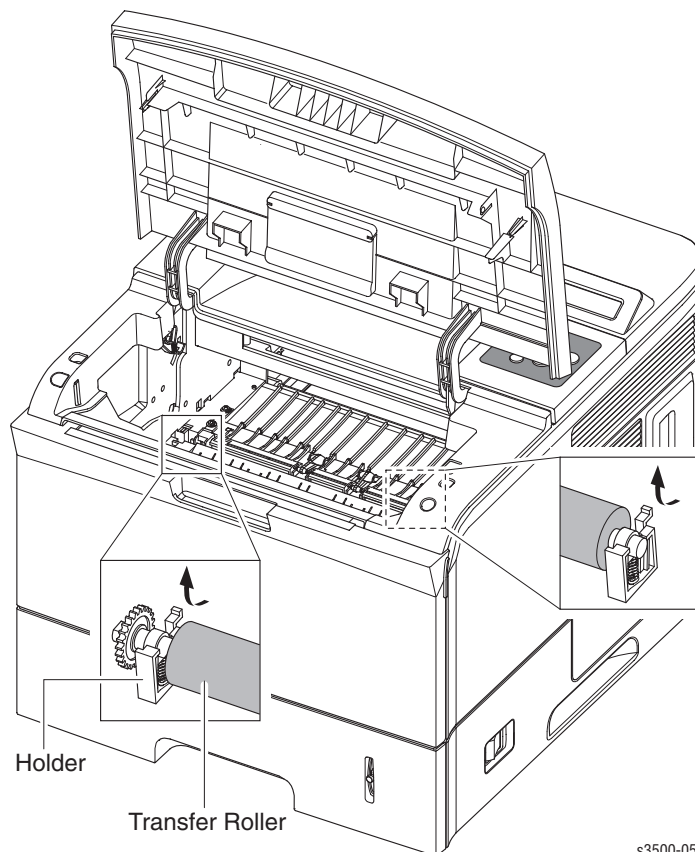
Caution: Do not touch the surface of the Transfer Roller.

1. Open the Top Cover.
2. Remove the Print Cartridge and protect it from exposure to light.
3. Remove the cap from the left side of the Transfer Roller.
4. Pinch the bearing clips on both ends of the Transfer Roller.

Note: The gear on the left end of the Transfer Roller shaft is not secured in place. Hold the gear when removing the roller to prevent it from falling into the printer.

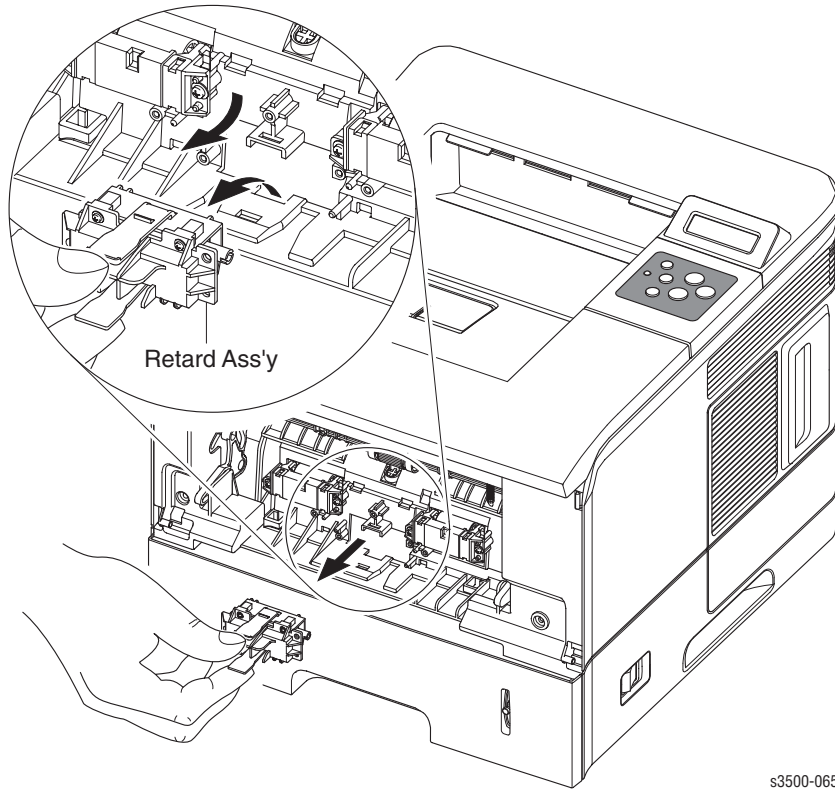
Note: The 2 bearing clips are not interchangeable, and the levers face the rear of the printer. The clip with the ground contact goes on the gear side of the Transfer Roller.

5. Slide the roller slightly to the right so the end of the shaft clears the lip on the printer case and lift the Transfer Roller, together with the Bearing Clips and the Transfer Roller Gear, out of the printer.



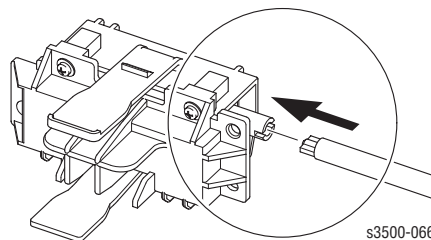
Retard Assembly

1. Remove:
 - Tray 1 (MPT) Assembly on page 4-12
2. Squeeze the lock as shown below and take out the retard assembly.



Reassembly Notes

Note: When reassembling the retard roller, insert the left end of the retard shaft through the retard roller first.

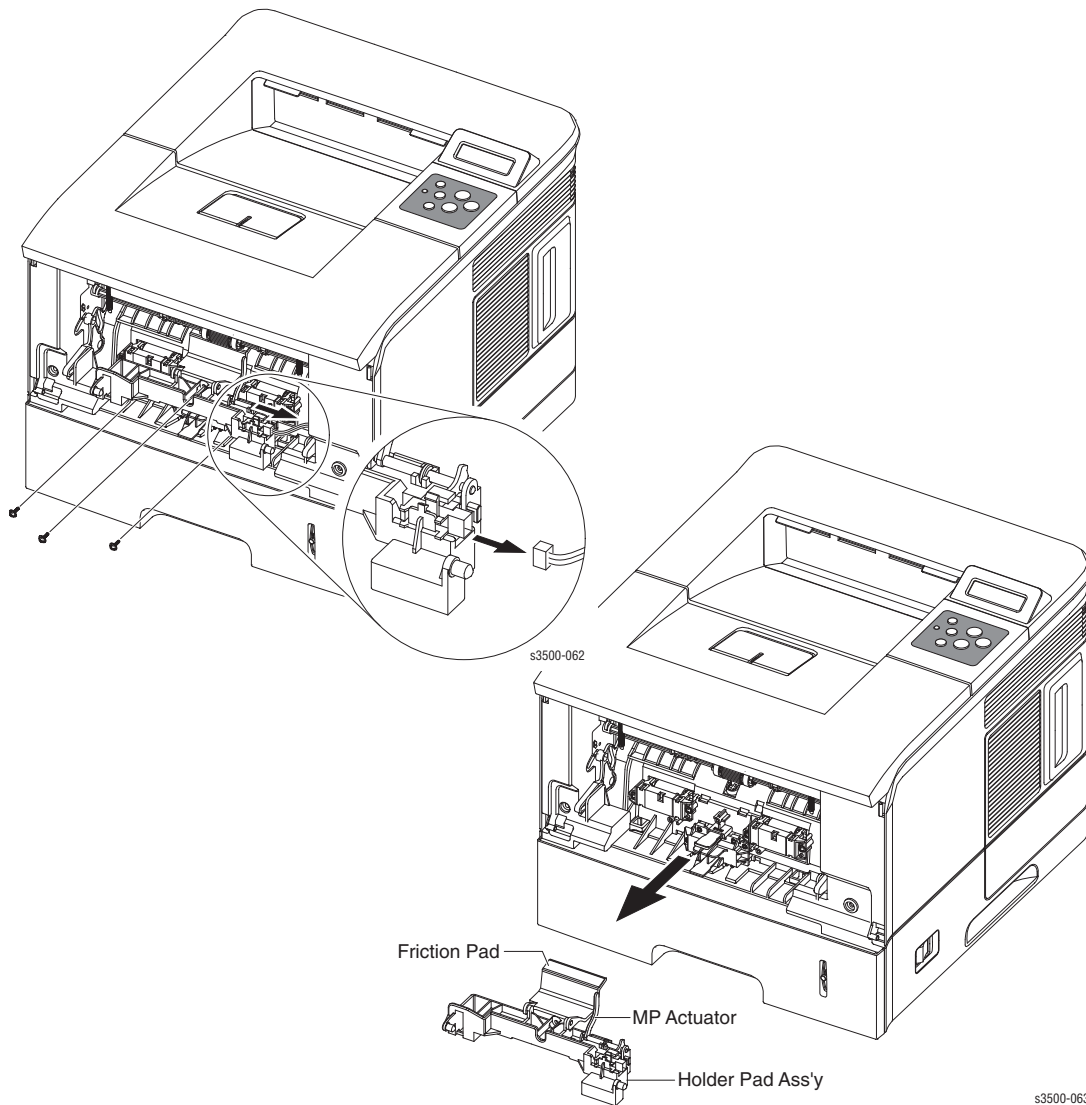


Tray 1 Separator (Holder) Pad Assembly

1. Remove:
 - Tray 1 (MPT) Assembly on page 4-12
 - Tray 1 Knock-Up Plate on page 4-14
 - Retard Assembly on page 4-18
2. Disconnect the connector from the Separator Pad Assembly.

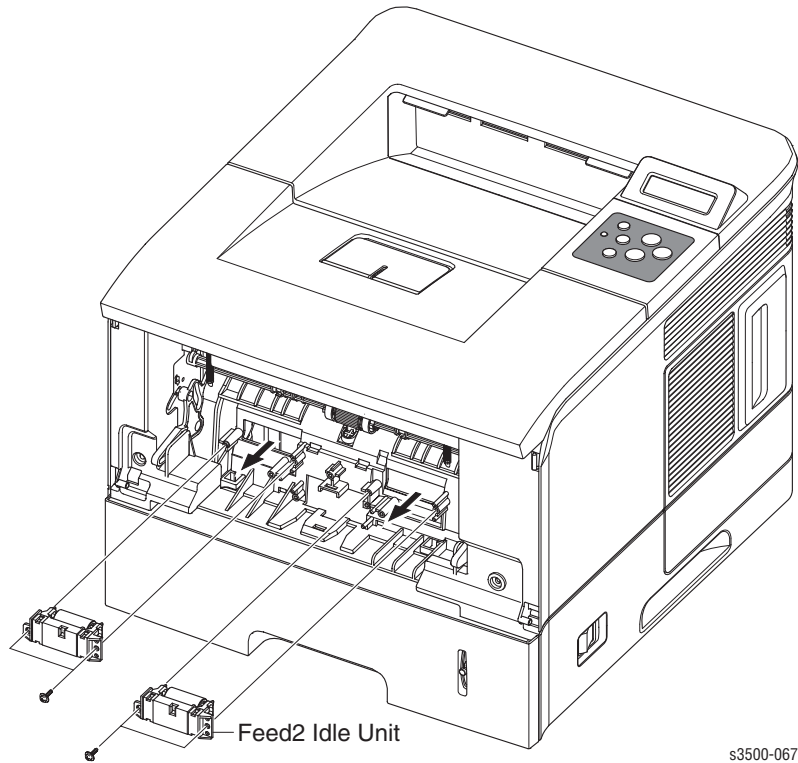
Caution: Be careful not to break the actuator flag.
There is a spring located behind the separator pad, do not loose the spring.

3. Remove the 3 screws shown below and then remove the Separator Pad Assembly from the printer.



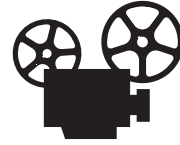
Feed2 Idle Unit

1. Remove:
 - Tray 1 (MPT) Assembly on page 4-12
 - Retard Assembly on page 4-18
 - Tray 1 Separator (Holder) Pad Assembly on page 4-19
2. Remove 4 screws, 2 for each of the feed idle units.
3. Remove each idle unit.

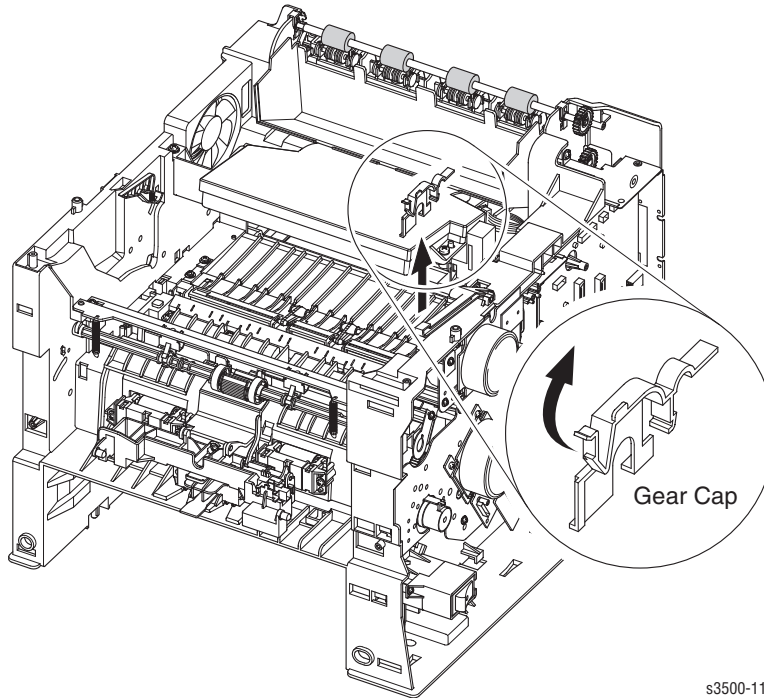


s3500-067

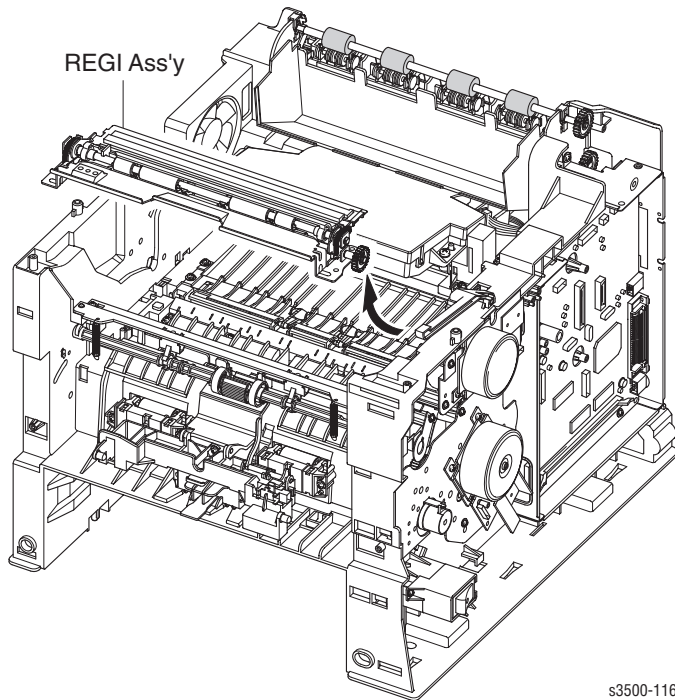
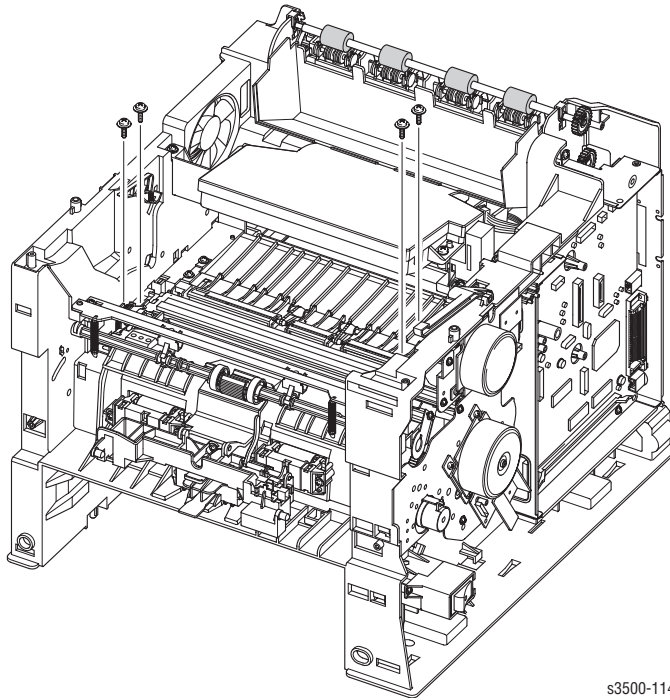
Registration Assembly



1. Remove:
 - [Covers](#) on page 4-4
 - [Left Cover](#) on page 4-5
 - [Top Cover](#) on page 4-8
2. Remove the Gear Cap located on the right side of the Registration Assembly, the release is on the front of the cap.

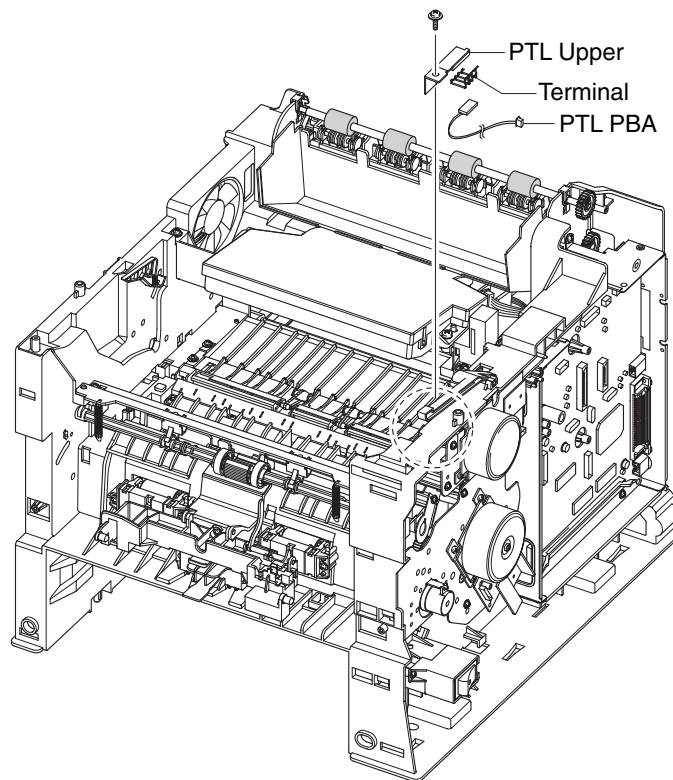


3. Remove the 4 screws securing the Registration Assembly to the printer.
4. Remove the Registration Assembly from the printer.



PTL Board

1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
 - Registration Assembly on page 4-21
2. Disconnect the wiring harness.
3. Remove 1 screw and take out the PTL board.



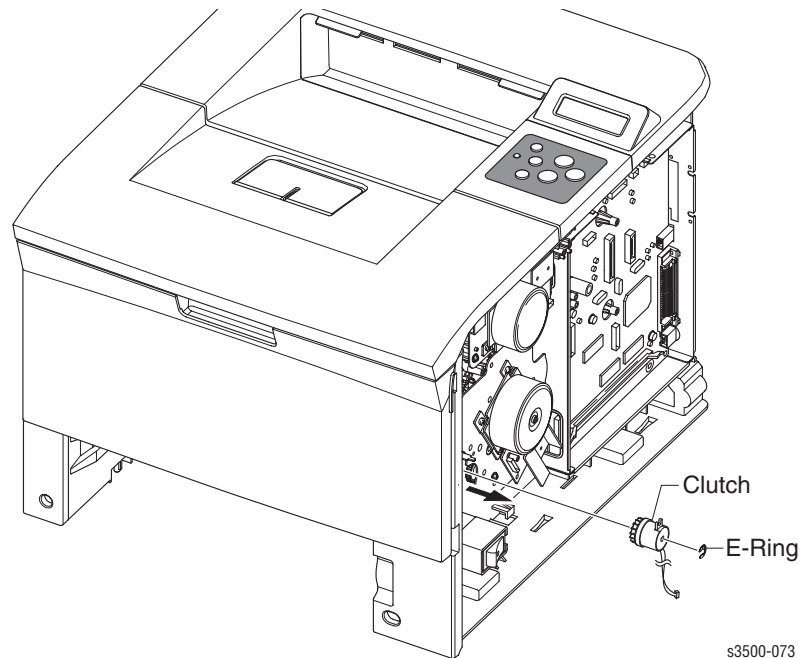
s3500-117

Main Drive Assembly and Registration (Feed) Clutch

1. Remove:
 - Covers on page 4-4

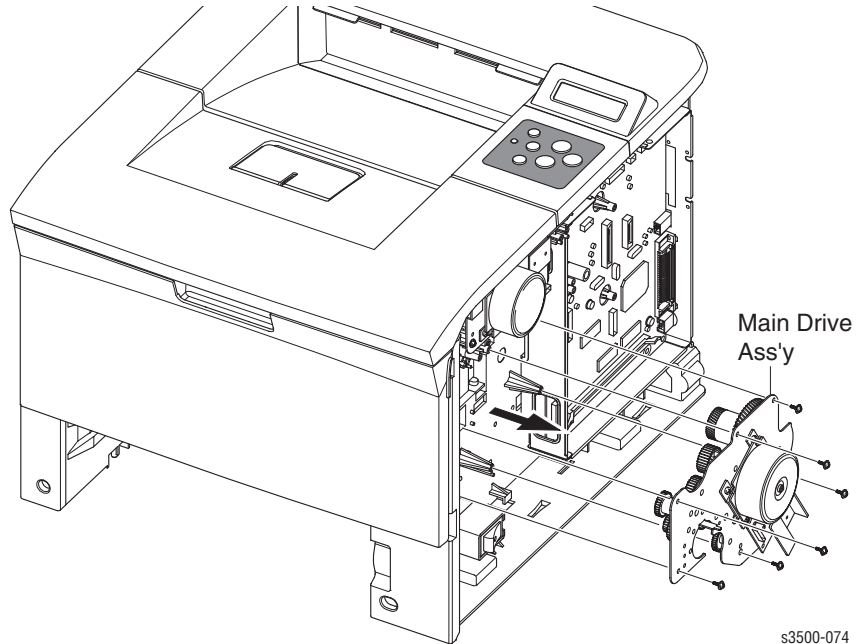
Feed Clutch

1. Loosen the grounding bracket screw attached to the plate on the Main Drive Assembly, and rotate the grounding bracket to gain access to the e-ring.
2. Remove the e-ring securing the clutch to the feed roller shaft.
3. Disconnect the connector to the connector board, and remove the clutch from the printer.



Main Drive Assembly

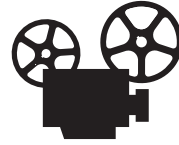
1. Disconnect 1 connector from the main motor assembly.
2. Remove the 6 screws securing the Main Drive to the printer.
3. Remove the Main Drive from the printer.



Replacement Notes

Note: There are numbers for replacing each of the 6 screws in the appropriate order when reassembling the Main Drive Assembly. There is a veristor that is secured underneath the number 3 screw.

Tray 1 Pick-Up Assembly and Pick Rollers

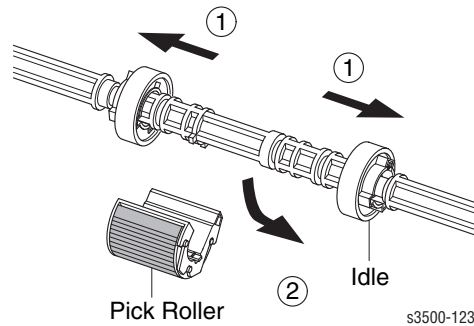


Tray 1 Pick Roller Only

Note: If you are only removing the Pick Roller, and not the shaft, it may be necessary to rotate the shaft, release the solenoid, and then rotate the shaft gear clockwise to position the roller properly.

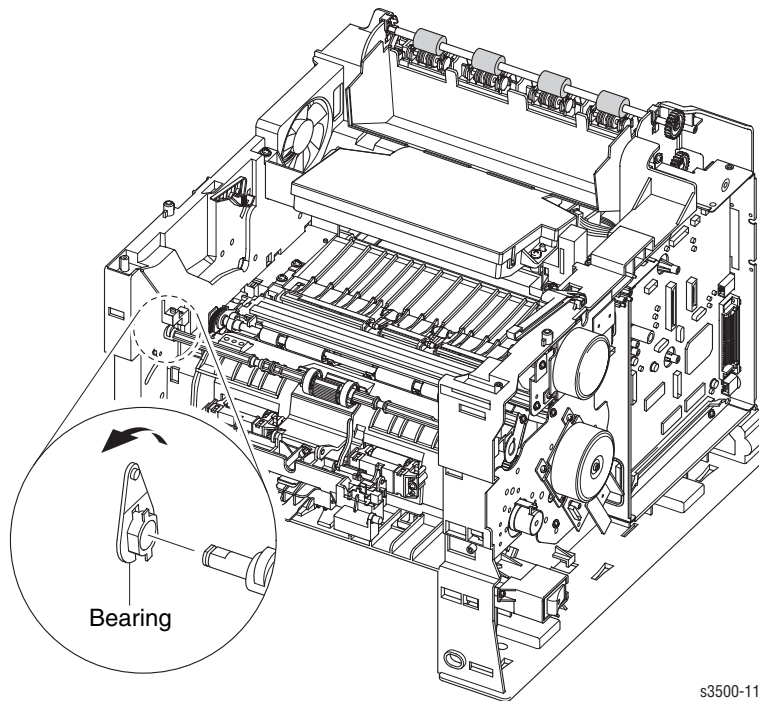
Caution: Do not break the pick shaft by trying to force the pick roller off.

1. Slide the idle gears outward. Release the locking tab on the pick roll assembly and slide the roller to the right.



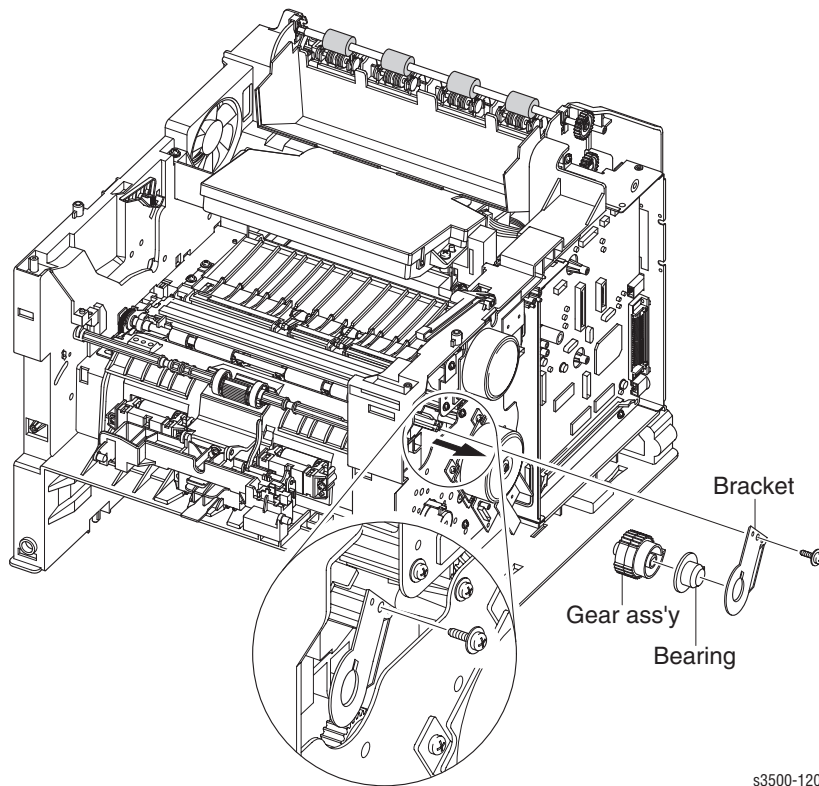
Pick Roller and Shaft Removal

1. Remove:
 - Covers on page 4-4.
 - Left Cover on page 4-5.
 - Top Cover on page 4-8.
 - Tray 1 (MPT) Assembly on page 4-12.
 - Inner Cover on page 4-16.
 - Main Drive Assembly and Registration (Feed) Clutch on page 4-24.
2. On the left side of the printer, remove the locking bearing on the front of the shaft by rotating it in the direction of the arrows shown below.

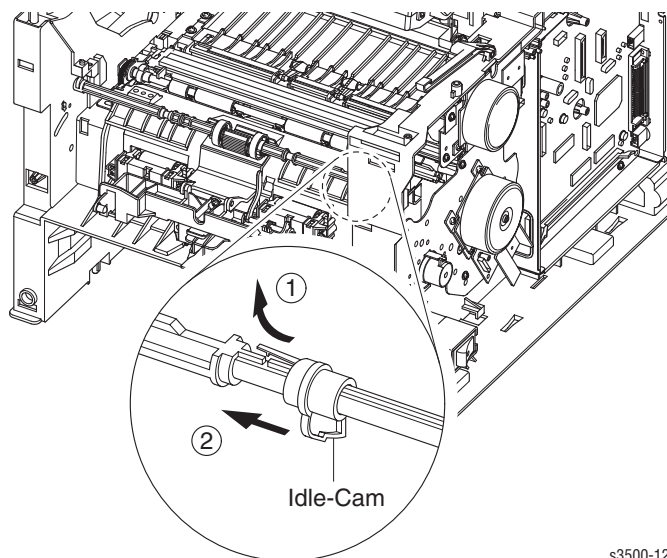


s3500-119

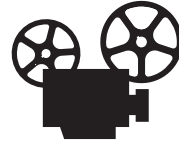
3. Remove 1 screw, on the right end of the shaft, securing the bracket, remove the bracket with the bearing.



4. Remove the right side gear from the shaft.
5. Lift the latch on the idle cam and slide the shaft to the right, through the cam, to free it from the printer.

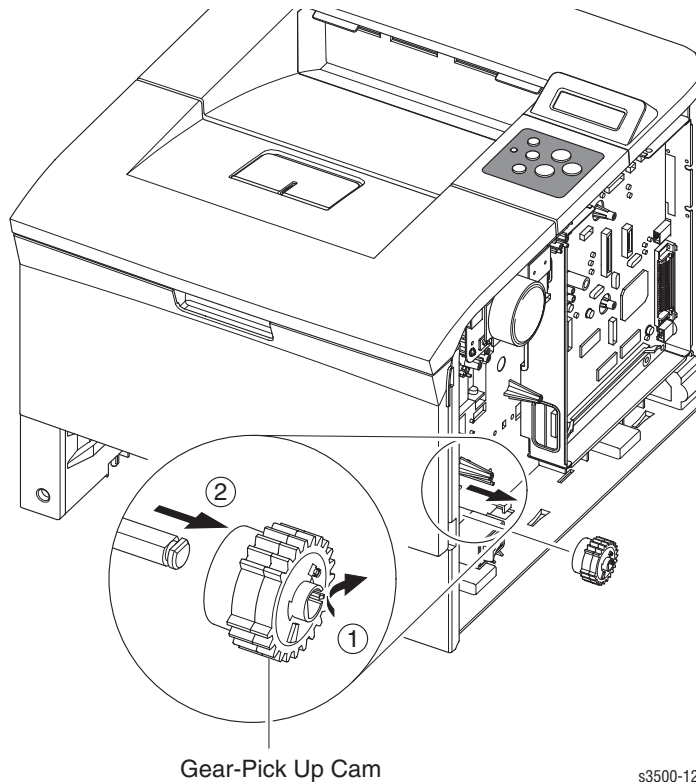


Tray 2 Pick-Up Assembly and Rollers



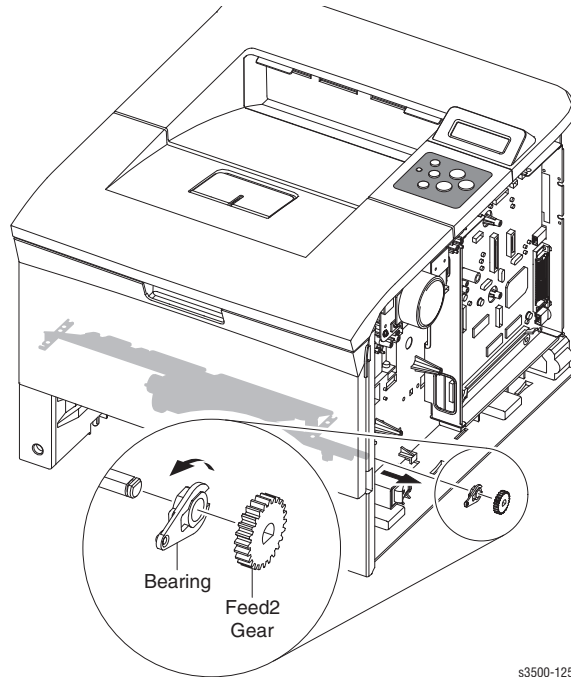
Note: It is not necessary to remove the entire assembly in order to remove the Pick Rollers.

1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
 - Tray 1 (MPT) Assembly on page 4-12
 - Inner Cover on page 4-16
 - Main Drive Assembly and Registration (Feed) Clutch on page 4-24
 - Tray 2 and Tray 3 (if installed)
2. Release the latch on the pick-up cam and slide off the right side of the shaft.

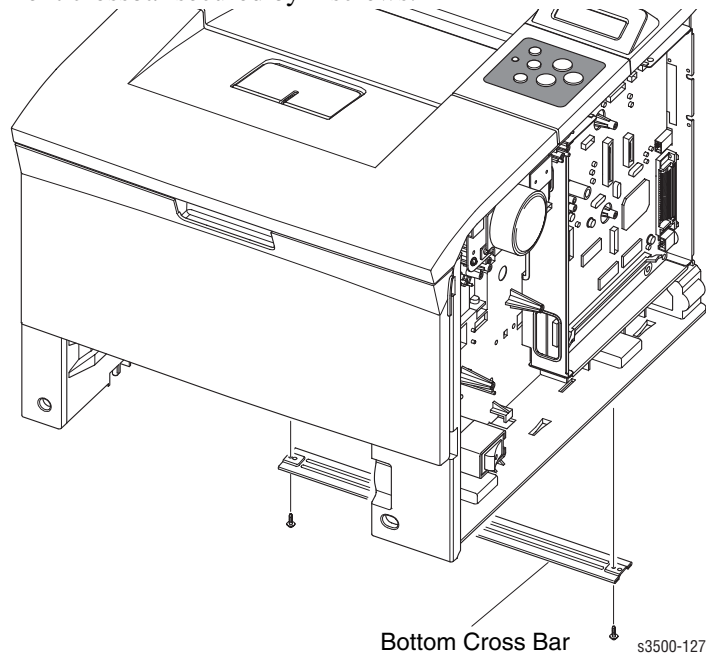


s3500-124

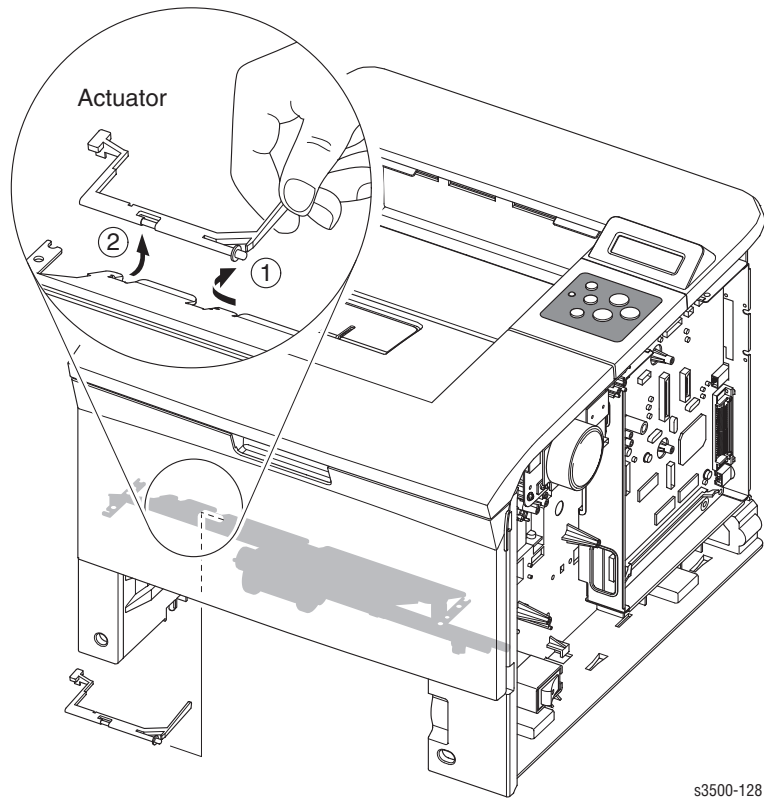
3. Remove the e-clip from the feed shaft.
4. Remove the locking bearing, rotating in the direction of the arrow as shown below.



5. Remove the gear by sliding off the shaft.
6. Turn the printer onto its left side.
7. Remove the front crossbar secured by 2 screws.

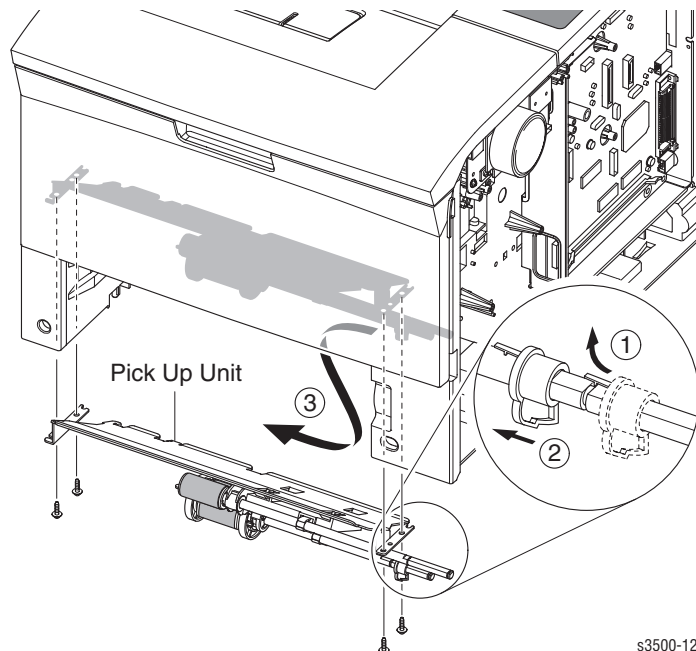


8. Slide the actuator down and remove it from the printer.



s3500-128

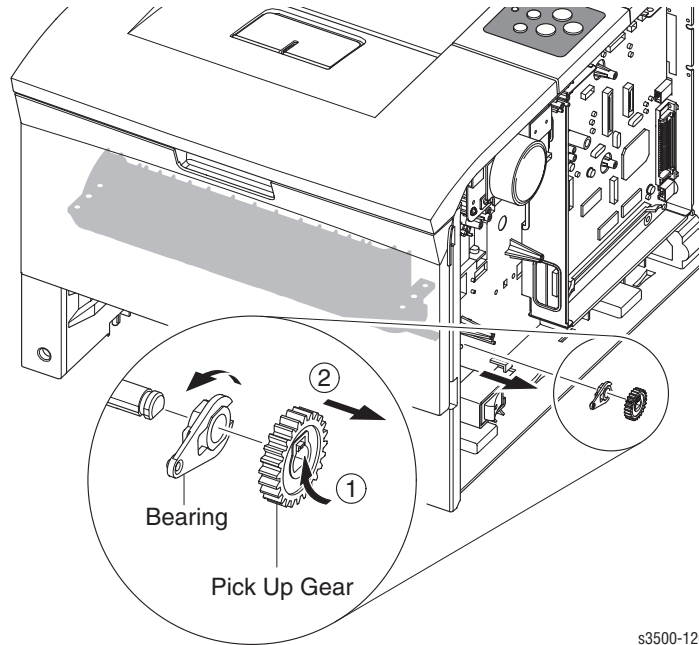
9. Remove the 4 screws securing the pick assembly and maneuver the pick assembly out of the printer.



s3500-129

Feed 2 Unit

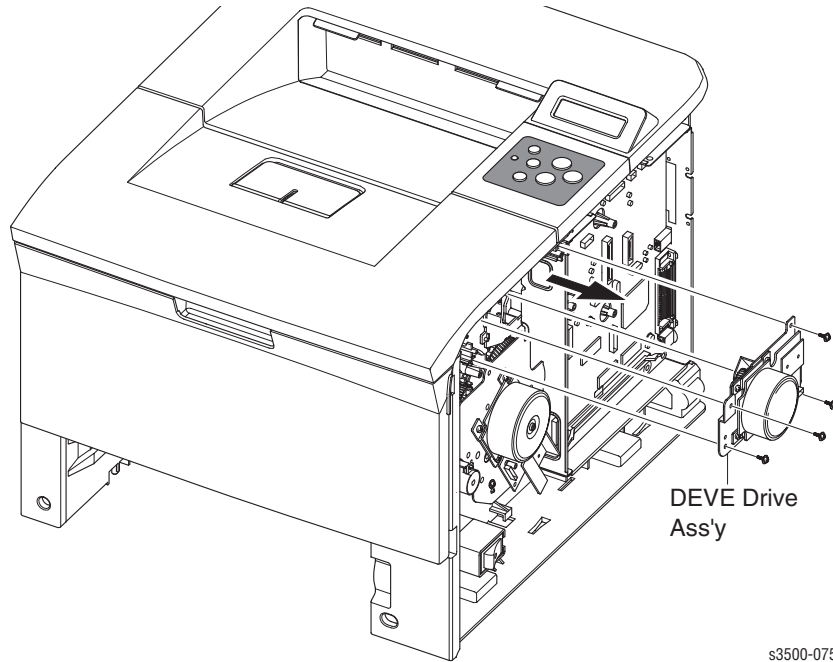
1. Perform all steps for [Tray 2 Pick-Up Assembly and Rollers](#) on page 4-29.
2. Remove the pick up gear.
3. Remove remove the locking bearing.
4. Remove the 4 screws securing the Feed 2 Unit to the printer and remove the assembly.



s3500-126

Developer Drive Assembly

1. Remove:
 - [Covers](#) on page 4-4
2. Disconnect the connector from the developer drive assembly.
3. Remove 4 screws securing the developer drive to the printer.

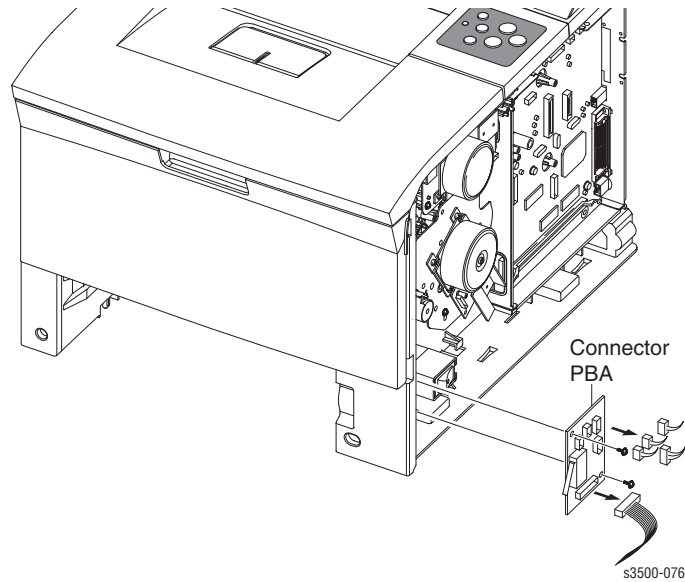


Replacement Notes

Note: There are numbers for replacing each of the 4 screws in the appropriate order when reassembling the Developer Drive Assembly.

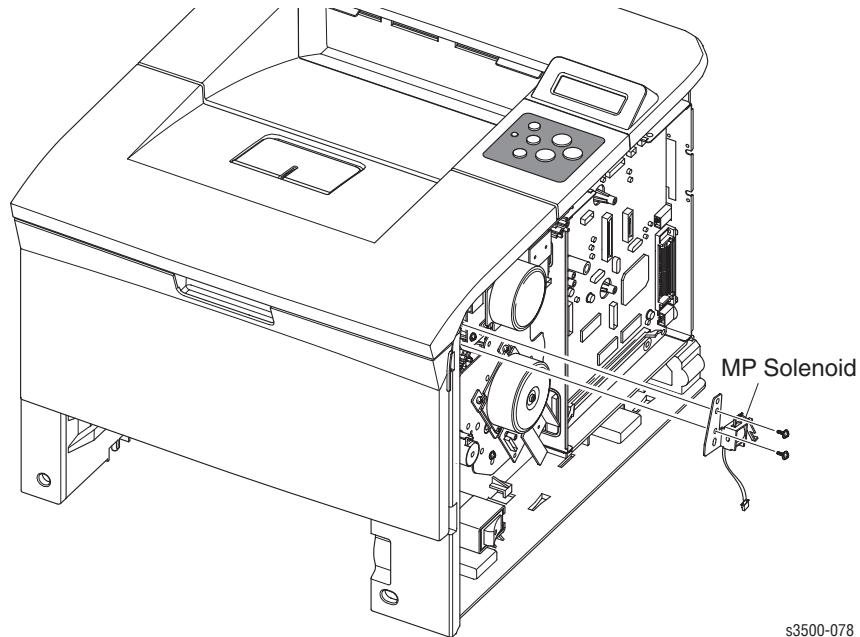
Connector Board

1. Remove:
 - Covers on page 4-4
2. Disconnect all connectors to the connector board.
3. Remove 1 screw securing the board to the chassis.
4. Remove the connector board.



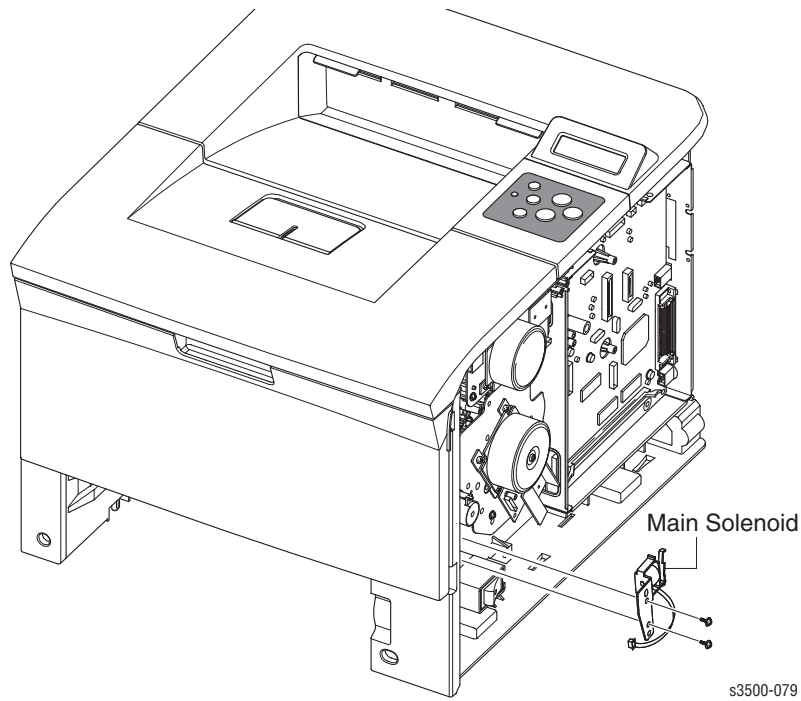
Tray 1 (MPT) Solenoid

1. Remove:
 - [Covers](#) on page 4-4
2. Disconnect the connector to the Tray 1 Solenoid.
3. Remove 1 screw securing the Tray 1 Solenoid.



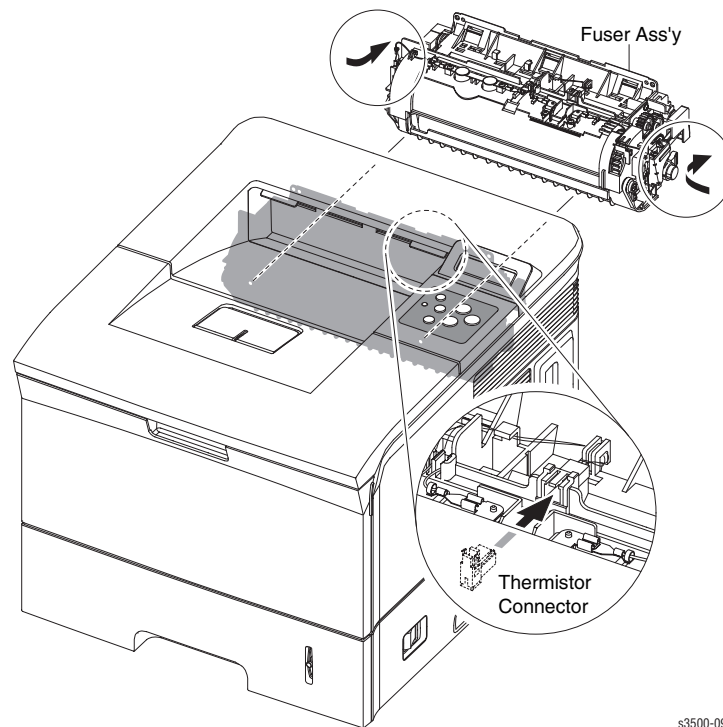
Main Solenoid

1. Remove:
 - [Covers](#) on page 4-4
 - [Feed Clutch](#) on page 4-24
2. Disconnect the connector to the Main Solenoid.
3. Remove 1 screw securing the Main Solenoid.



Fuser Assembly

1. Remove:
 - [Rear Cover](#) on page 4-6
2. Pull the locking lever and take out the Fuser Assembly.

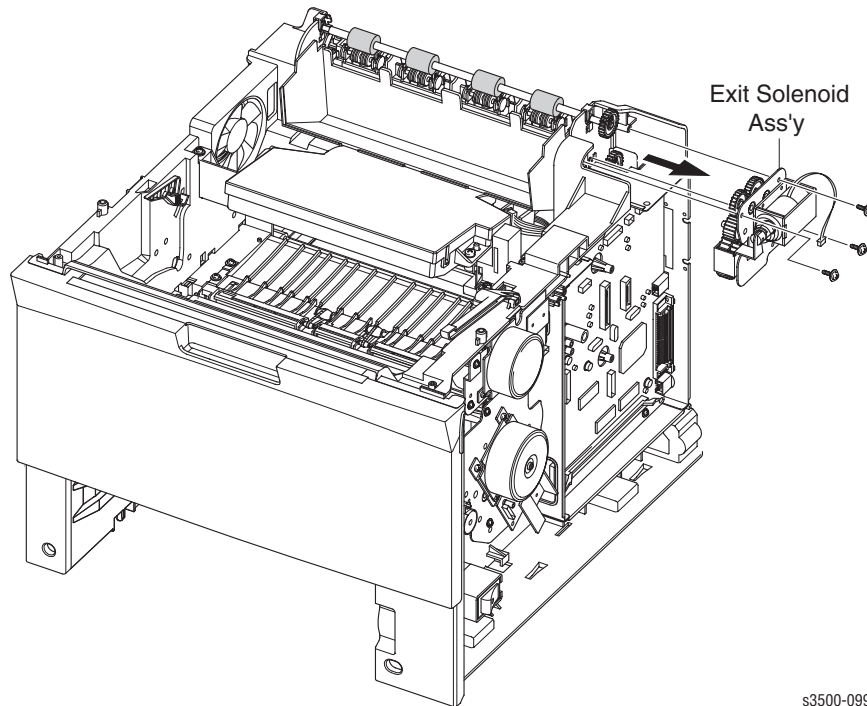


s3500-090

Exit Solenoid Assembly

1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
2. Disconnect the connector running to the main board.
3. Remove 3 screws securing the solenoid to the printer.
4. Remove the solenoid assembly.

Note: There is a resistor attached by the upper right hand screw. When reassembling the printer, ensure the resistor is in place.



s3500-099

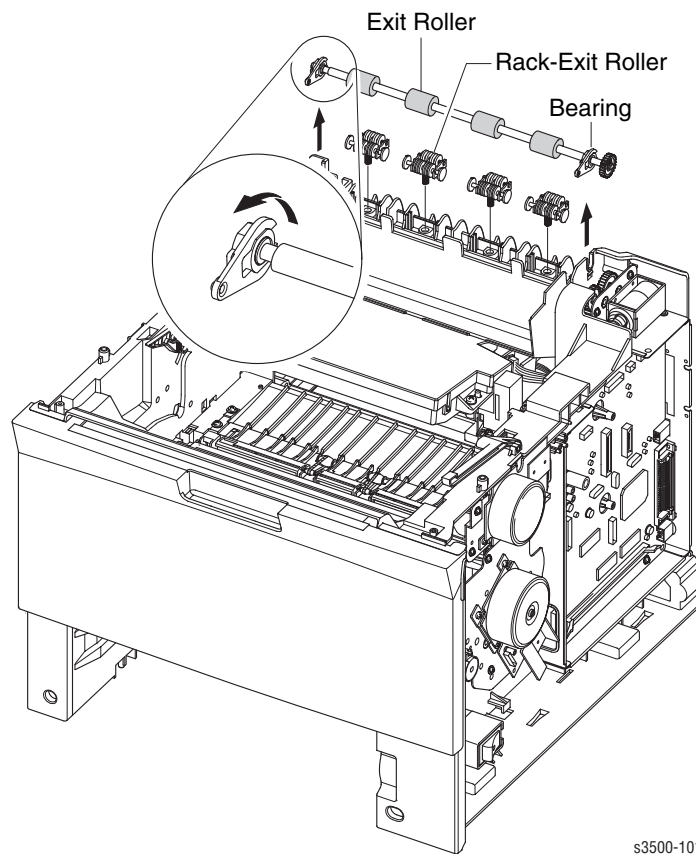
Exit and Duplex Rollers

1. Remove:

- Covers on page 4-4
- Left Cover on page 4-5
- Top Cover on page 4-8

Note: When you remove the exit rollers, the rollers underneath are spring loaded and can become lost if not careful.

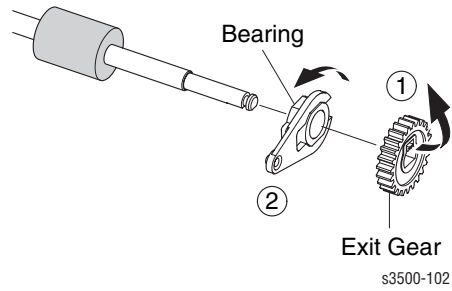
2. Remove the locking bearings from both ends of the shaft.



s3500-101

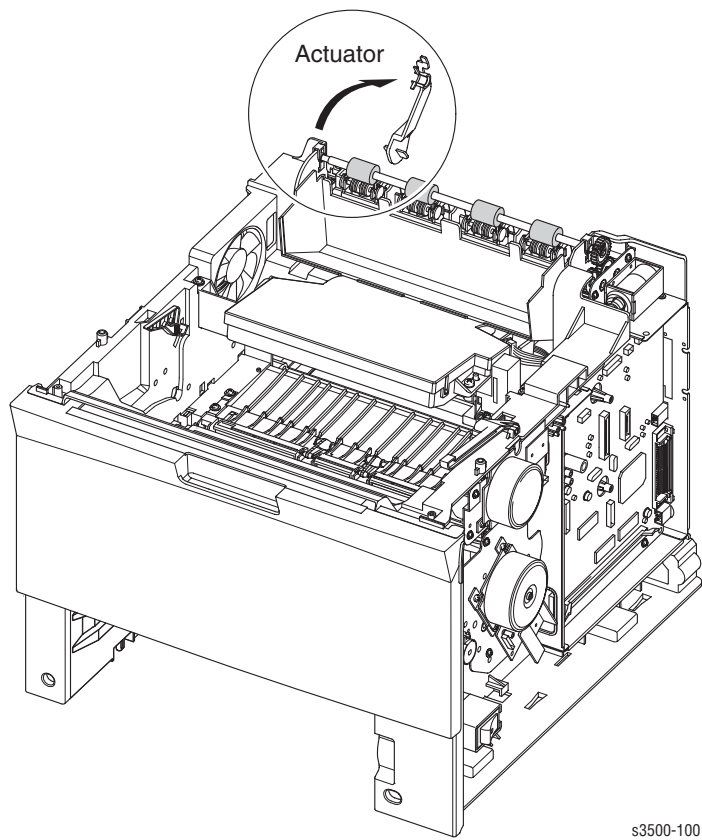
Exit Gear

1. Remove the bearing in order to remove the gear.



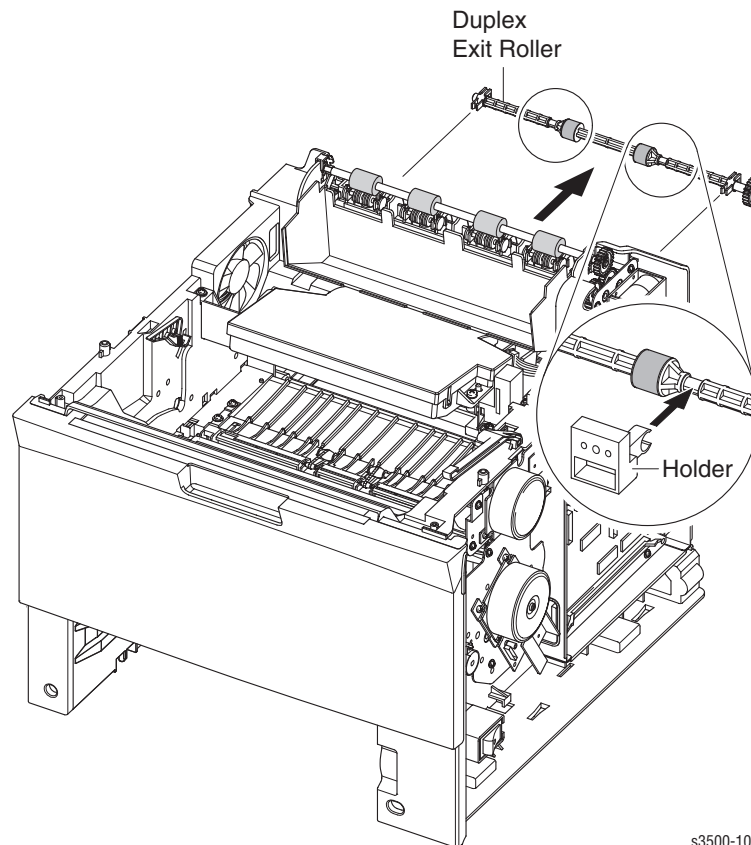
Tray Full Actuator

1. Remove the actuator from the exit roller.



Duplex Roller

1. Using a small flatblade screwdriver, spread apart the bearings on both side of the duplex roller and remove from the printer.

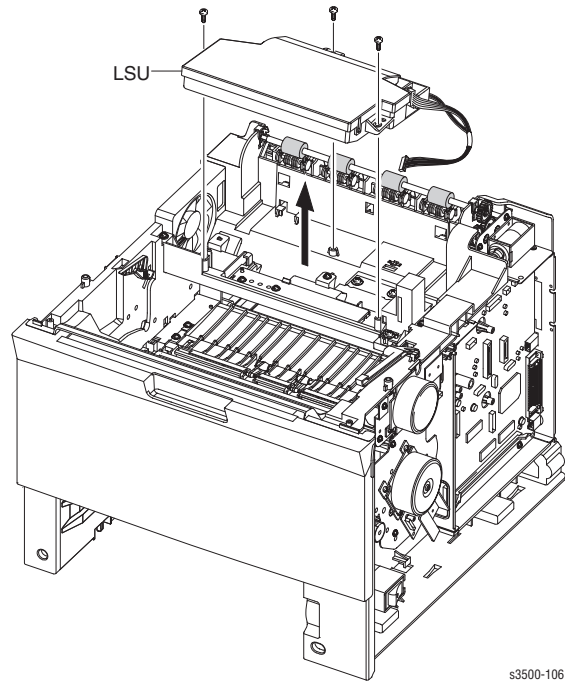


s3500-103

Laser (LSU) Assembly and Lower Cover

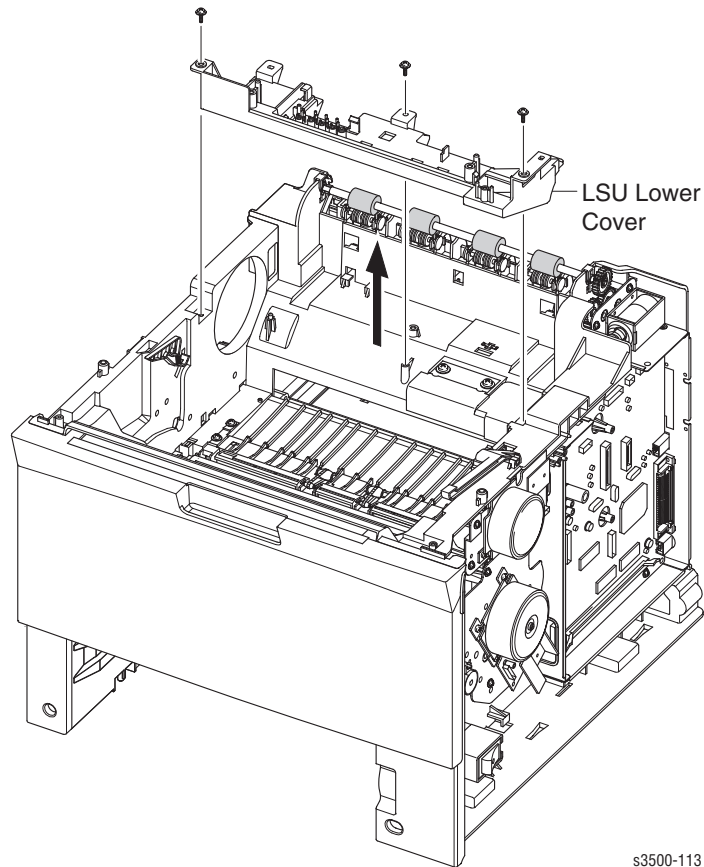
1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
2. Remove the cover-frame exit cover.
3. Disconnect the connector from the LSU to the Main Board.
4. Remove the 3 screws securing the LSU to the chassis.
5. Remove the LSU from the printer.

Note: The screws are numbered and need to be replaced and tightened in the correct order.



LSU Lower Cover

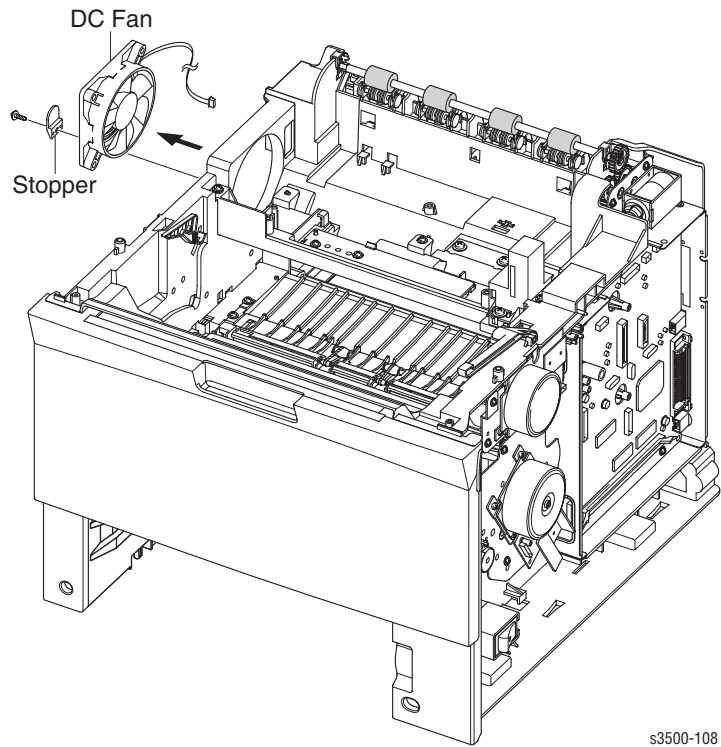
1. Remove 1 screw securing the fan duct.
2. Remove the fan and duct to access the screw in the next step.
3. Remove 3 screws securing the LSU Cover and remove the cover.
4. Disconnect all the connectors running to the LSU Cover.



s3500-113

Left Side Cooling Supply Fan and Duct

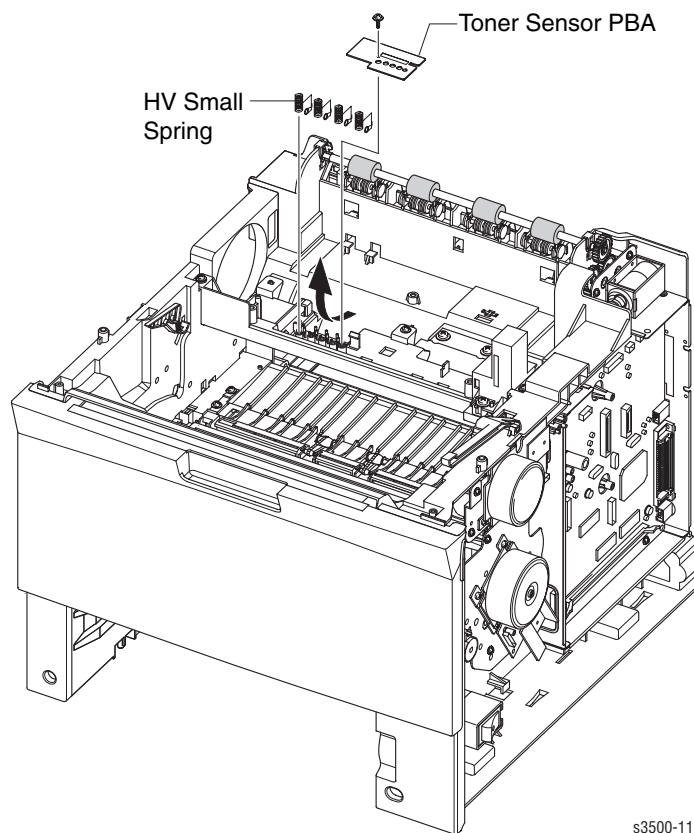
1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
 - Laser (LSU) Assembly and Lower Cover on page 4-42
2. Disconnect the connector to the Toner Sensor Board.
3. Remove 1 screw to remove the fan from the printer.



s3500-108

Toner Sensor Board and CRUM

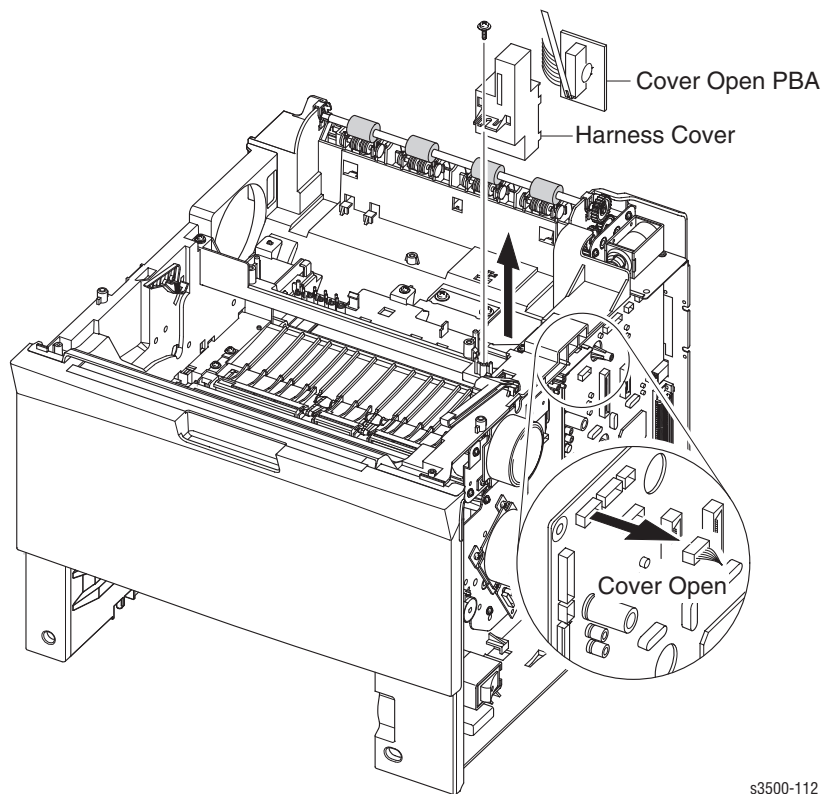
1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
 - Laser (LSU) Assembly and Lower Cover on page 4-42
2. Disconnect all connectors running to the toner sensor board.
3. Remove 2 screws securing the toner sensor board to the LSU cover.
4. Release the 2 locking tabs to remove the board.



s3500-111

Cover Open Board and Harness Cover

1. Remove:
 - Covers on page 4-4
 - Left Cover on page 4-5
 - Top Cover on page 4-8
 - Laser (LSU) Assembly and Lower Cover on page 4-42
2. Remove 1 screw securing the cover open housing harness cover.
3. Release the latching tab and remove the cover open housing harness cover.
4. Disconnect the connector from the main board.
5. Using a small flatbladed screwdriver, release the 4 tabs to remove the cover open board.



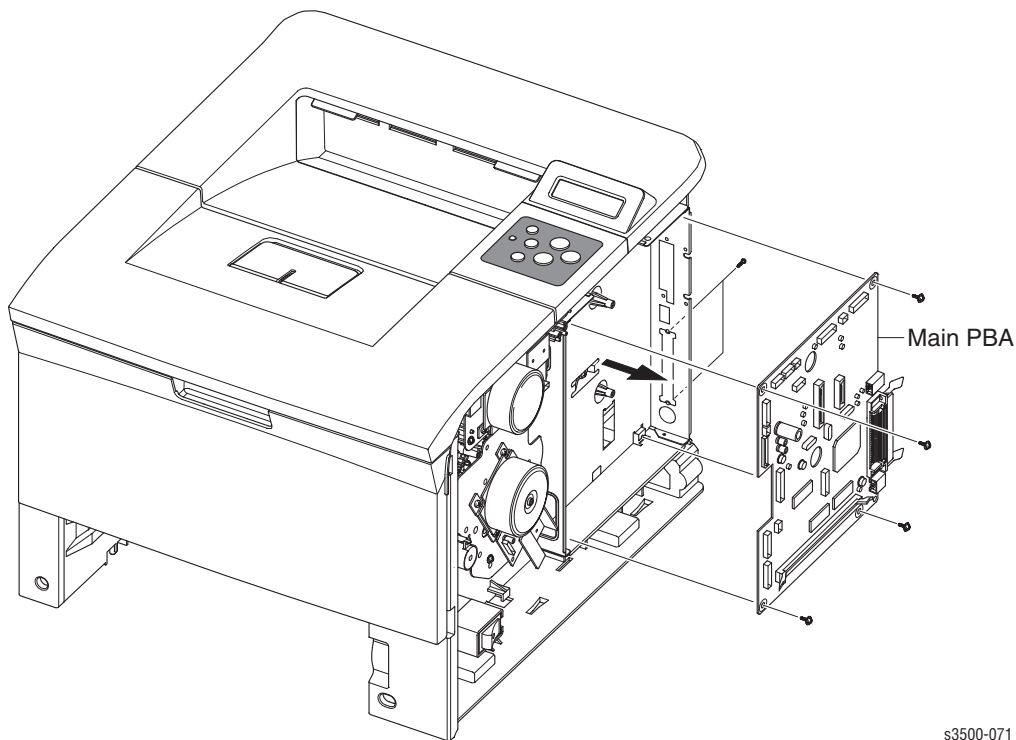
s3500-112

Main Board and Shield

Note: If the NIC Board is installed, it must be removed to access screws to the main board.

NVRAM parameters are not transferable to the replacement board. These parameters include serial number and copy count. Serial Number can be reinstalled via CentreWare IS if the NIC Board is installed or via a downloadable PJI command. Observe proper ESD procedures when removing or replacing any circuit boards in the printer.

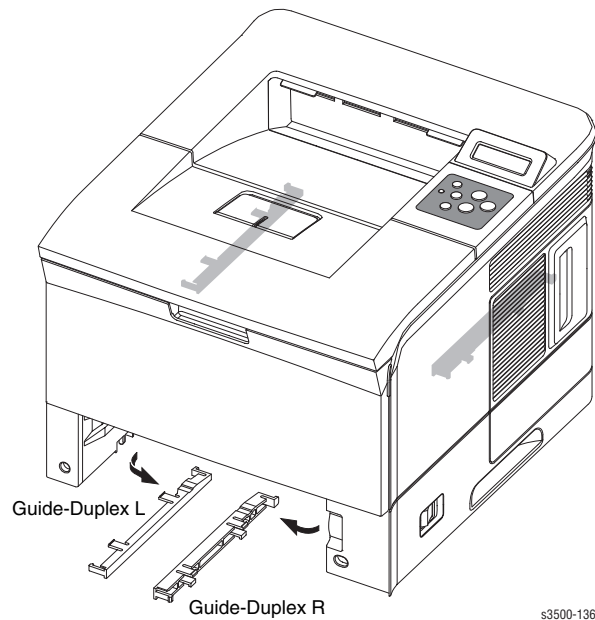
1. Remove:
 - **Covers** on page 4-4
2. Disconnect all connectors from the Main Board.
3. Remove the NIC card or the dummy bracket from the main board.
4. Remove the 6 screws (4 on the Main Board and 2 to the parallel connector) securing the Main Board to the printer, and then remove the Main Board.
5. Position the retainers on the parallel port connector straight out from the connector for removal.
6. Move the board toward the front of the printer so the connectors clear the bracket and remove the Main Board to the right.
7. Remove 1 screw in the center of the shield.
8. Turn the printer onto its left side and remove the rear crossbar and the right duplex guide.
9. Remove the right rear corner screw from the power supply shield to remove.



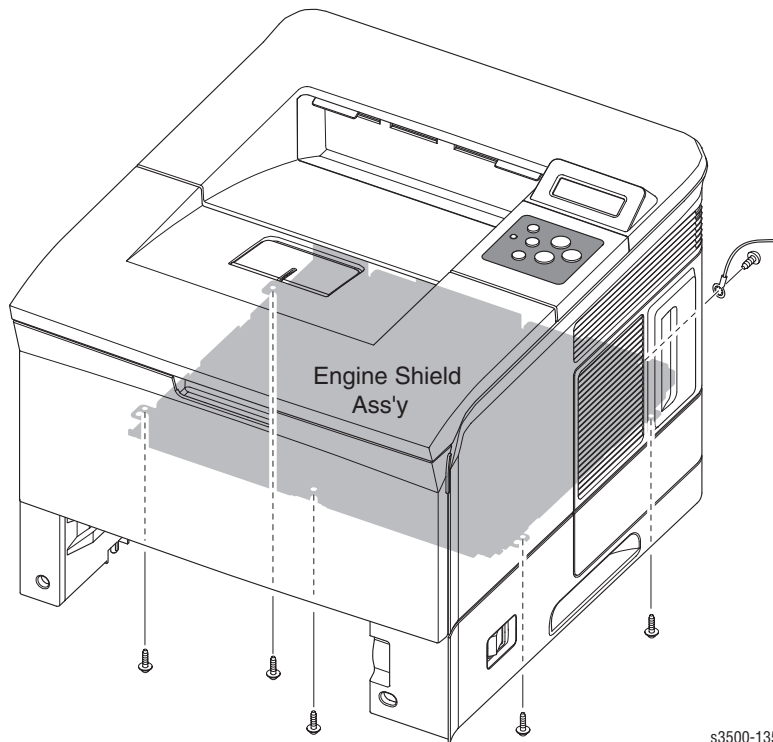
s3500-071

Power Supply and Shield

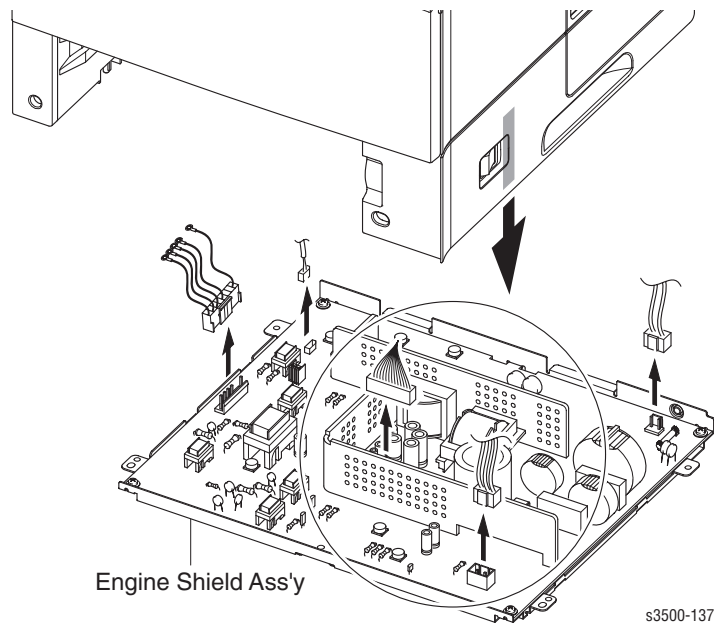
1. Remove:
 - Print Cartridge
 - Tray 2 and Tray 3 (if installed)
 - Covers on page 4-4
 - Rear Cover on page 4-6
 - Fuser Assembly on page 4-37
2. Turn the printer onto it's left side.
3. Remove the rear crossbar secured by 2 screws.
4. Remove the Tray 2 no paper actuator for better access.
5. Remove the left and right duplex unit guides.



6. Remove 5 screws from the power supply shield.
7. Remove 1 grounding screw from the rear of the power supply shield.



8. Pull out the shield slightly and disconnect all connectors to the power supply board.
9. Remove the power supply from the printer.



Fuser Gear Assembly

- 1.** Remove:
 - Print Cartridge
 - Tray 2 and Tray 3 (if installed)
 - [Covers](#) on page 4-4
 - [Rear Cover](#) on page 4-6.
 - [Fuser Assembly](#) on page 4-37
 - [Exit Solenoid Assembly](#) on page 4-38
 - [Main Board and Shield](#) on page 4-47
- 2.** Remove the 3 screws securing the fuser gear train and remove it from the printer.

Paper Size Sensor

Note: If the optional Tray 3 Feeder is installed, it must be removed before performing this procedure.

1. Remove:
 - Print Cartridge
 - Tray 2 and Tray 3 (if installed)
 - [Left Cover](#) on page 4-5
2. Disconnect CN 1 from the Paper Size Sensor.
3. Gently turn the printer upside down.

Note: The Paper Size Sensor can be removed and replaced without removing the rear crossbar. However, to provide improved access, remove the crossbar screw above the Paper Size Sensor and loosen the screw on the other side so you can swing the crossbar out of the way.

4. On the left side of the printer, remove 2 screws, one on either side of the rear crossbar, that secure the Paper Size Sensor to the printer chassis.
5. Pull up on the sensor assembly until it is clear of the mounting pins and then remove it from the printer.

5 Parts List

This section covers the following:

- [Using the Parts List](#) on page 5-2
- [PL 8.1 Main Assembly](#) on page 5-3
- [PL 8.2 Cover Assembly](#) on page 5-7
- [PL 8.3 Frame Assembly](#) on page 5-9
- [PL 8.4 Fuser Assembly](#) on page 5-17
- [PL 8.9 Tray 2 Cassette](#) on page 5-20
- [PL 8.10 Tray 3 Cassette](#) on page 5-22
- [PL 8.11 Duplex Assembly](#) on page 5-25

Using the Parts List

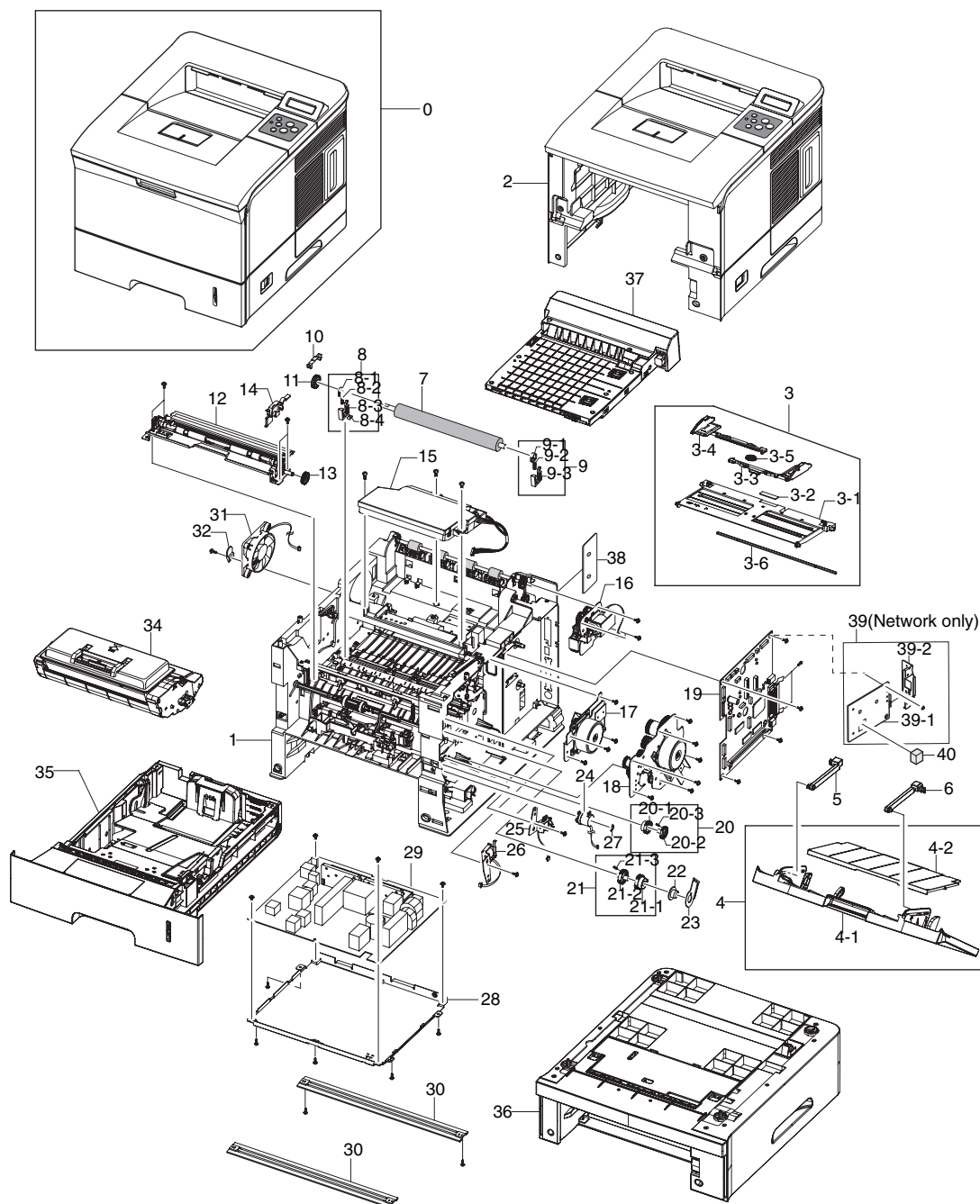
1. **No.:** The callout number from the exploded part diagram.
2. **Part Number:** The material part number used to order specific parts.
3. **Qty:** This number represents the parts per printer, not the number of parts supplied in the actual part order.
4. **Name/Description:** Details the name of the part to be ordered and the number of parts supplied per order.
5. Parts identified throughout this manual are referenced **PL #.#.#**; For example, PL 3.1.10 means the part is item 10 of Parts List 3.1.
6. A black triangle preceding a number followed by a parenthetical statement in an illustrated parts list means the item is a parent assembly, made up of the individual parts called out in parentheses.
7. The notation “**with X~Y**” following a part name indicates an assembly that is made up of components X through Y. For example, “1 (with 2~4)” means part 1 consists of part 2, part 3, and part 4.
8. An asterisk (*) following a part name indicates the page contains a note about this part.
9. The notation (NS) next to a part indicates that particular part is not spared, but contained in a kit or major assembly.
10. The notation “**J1<>J2 and P2**” is attached to a wire harness. It indicates that connector Jack 1 is attached to one end of the wire harness and connector J2 is attached to the other end that is plugged into P2.

Only parts showing part numbers are available for support. Parts not showing part numbers are available on the parent assembly.

Legend:

Identifier	Meaning
C	C-ring
E	E-ring
KL	K-clip
S	Screw

PL 8.1 Main Assembly



PL 8.1 Parts List Table

Main Assembly

Item No.	Description	Qty	Part Number
1	ELA UNIT FRAME BASE		
2	ELA HOU BASE HOUSING		
3	MEA UNIT KNOCK UP MP		050N00475
3.1	PLATE M KNOCK UP MP		
3.2	MPR PAD KNOCK UP MP		
3.3	PMO SIDE GUIDE MP R		
3.4	PMO SIDE GUIDE MP L		
3.5	GEAR PINION		
3.6	SHAFT REINFORCEMENT		
4	MEA UNIT COVER MP XRX		002N02410
4.1	COVER M MP XRX		
4.2	TRAY M EXTND MP		
5	TRAY M LINK MP L		012N00521
6	TRAY M LINK MP R		012N00522
7	ROLLER TRANSFER		022E29520
8	ELA UNIT HOLDER TR R		019E63470
8.1	PMO BUSHING TR		
8.2	SPRING ETC TR R HAWK		
8.3	PMO TRANSFER HOLDER		
8.4	IPR PLATE TR		
9	ELA UNIT HOLDER TR L		019E63480
9.1	PMO BUSHING TR		
9.2	SPRING ETC TR R HAWK		
9.3	PMO TRANSFER HOLDER		
10	PMO CAP TR		021N02248
11	GEAR TR29 (Transfer)		007N01013
12	ELA UNIT REGI (Registration Assembly)		022N02171
13	GEAR REGI Z25		007N01360
14	CAP M GEAR		807E06450
15	UNIT LSU (Laser Unit)		122N00242

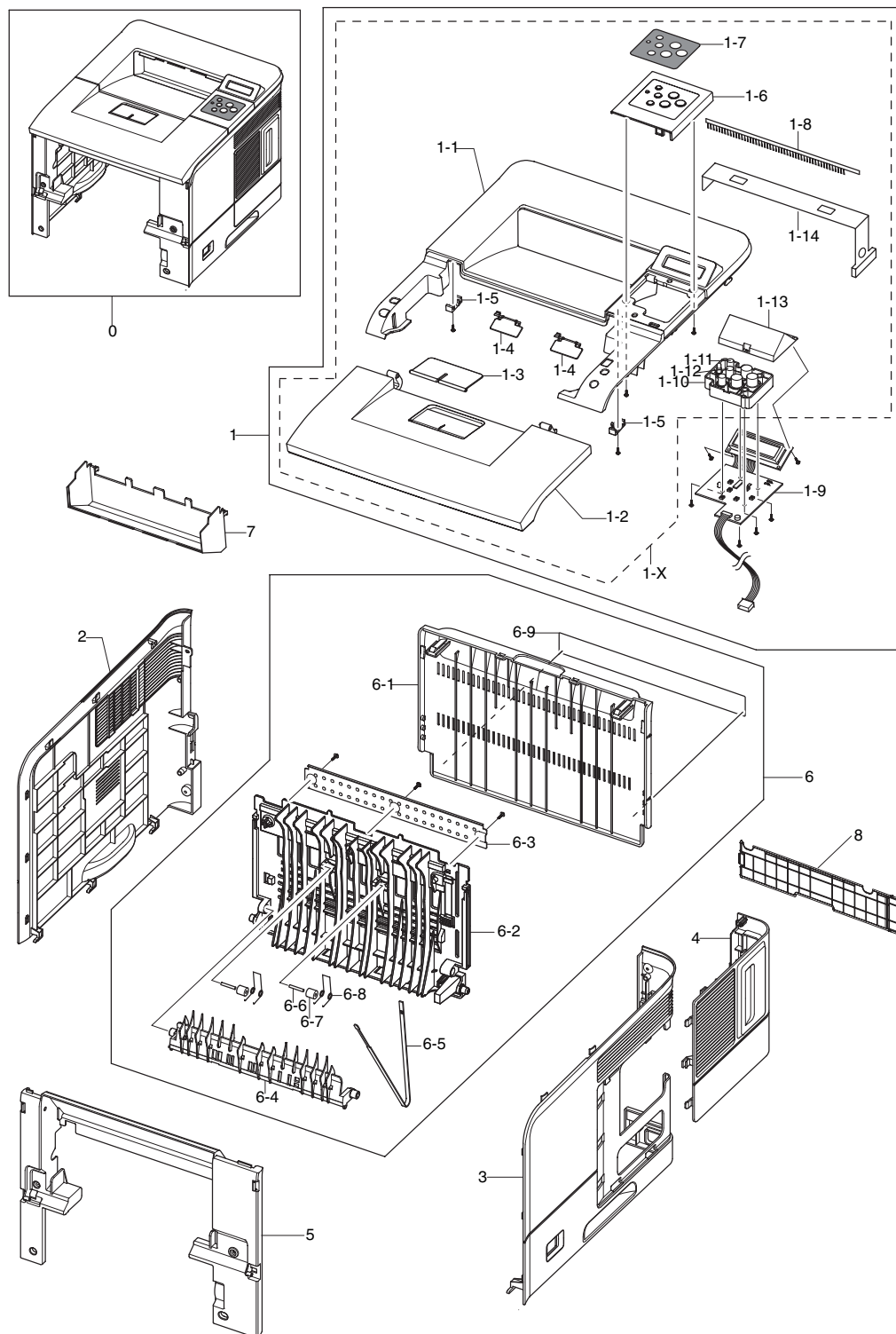
Main Assembly (Continued)

Item No.	Description	Qty	Part Number
16	ELA UNIT EXIT SOLENOID		121N01100
17	ELA UNIT DEVE MOTOR		127N07389
18	ELA UNIT MAIN MOTOR		127N07390
19	PBA MAIN (Main Board)		140N63016
20	MEA UNIT GEAR PICK UP		007N01361
20.1	GEAR M PICK UP CAM		
20.2	GEAR M PICK UP		
20.3	SPRINT ETC CAM MP		
21	MEA UNIT GEAR P/UP MP CARDINAL		007K13470
21.1	GEAR MP HOLDER CAM		
21.2	GEAR MP PICK UP		
21.3	SPRING ETC CAM MP		
22	BEARING PICK UP		
23	BRACKET P SHAFT MP		
24	MEP CLUTCH FEED		121N01101
25	SOLENOID MAIN		121E19250
26	SOLENOID MP		121N01102
27	RING E		
28	SHIELD P SMPS		
29	SMPS V1 HVPS - 110V SMPS V2 HVPS - 220V		105N02059 105N02060
30	BAR P CROSS BOTTOM		
31	FAN DC		127E14630
32	STOPPER M FAN80		
34	ELA UNIT DEVE (Print Cartridge) 6K Toner Cartridge 12K Toner Cartridge		106R01148 106R01149
35	ELA UNIT CASSETTE (Tray 2)		109R00756
36	ELA UNIT SCF (Optional Tray 3)		050N00476
37	ELA UNIT DUPLEX		084N00718
38	BRACKET P DUMMY CTRL		015N00555
39	ELA HOU NPCE High (Network Interface Card)		140N63021

Main Assembly (Continued)

Item No.	Description	Qty	Part Number
39.1	BRACKET NIC		
39.2	PBA SUB (NIC BOARD)		
40	STOPPER M NETWORK		

PL 8.2 Cover Assembly

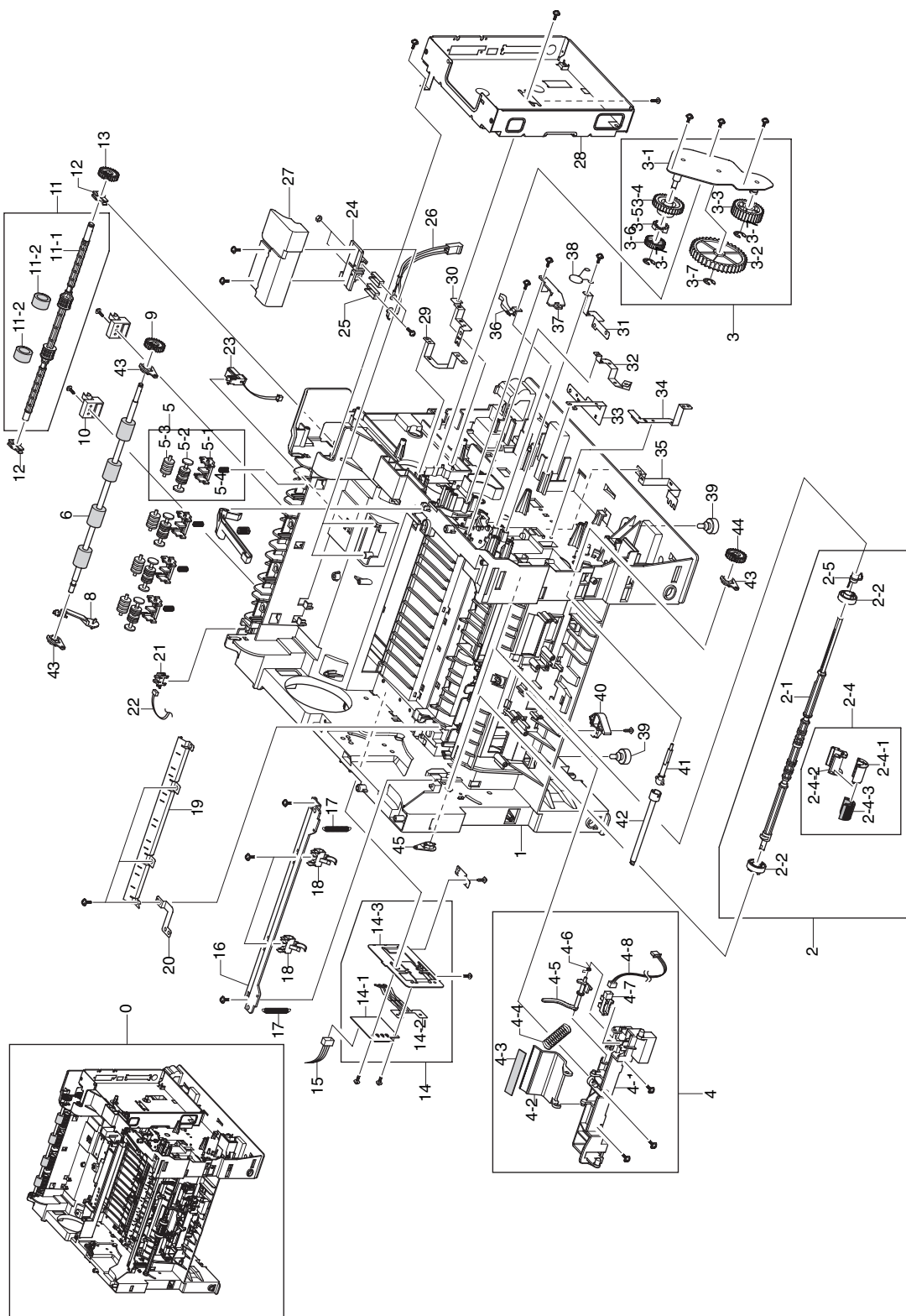


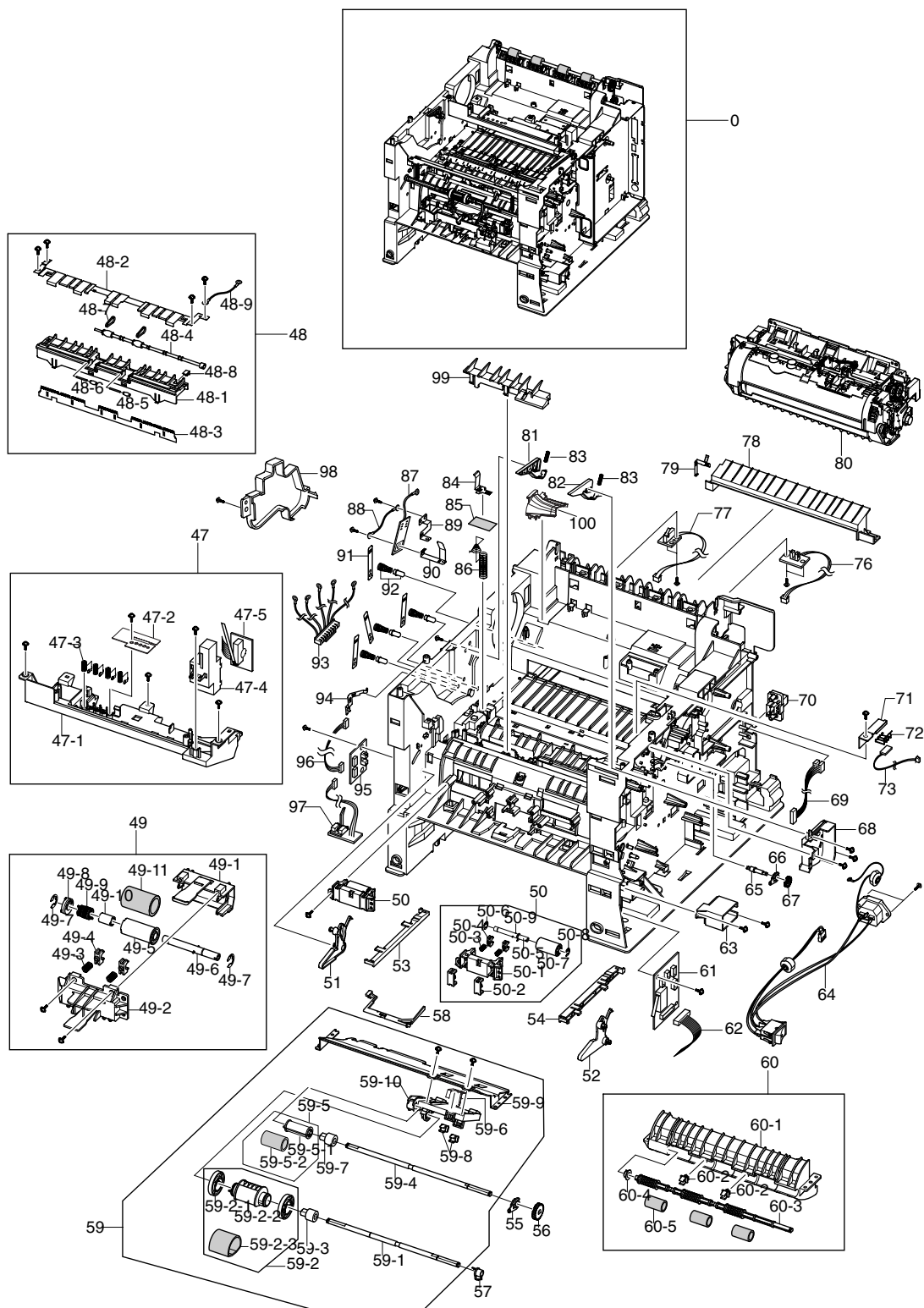
PL 8.2 Parts List Table

Cover Assembly

Item No.	Description	Qty	Part Number
1 (1-X)	AS UNIT COVER TOP		002N02411
1-1	COVER M TOP		
1-2	COVER M OPEN XRX		
1-3	PMO STACKER RX		002N02418
1-4	LEVER M STACKING 38		036N00030
1-5	STOPPER M HINGE OPEN		
1-6	COVER M OP PANEL XRX		
1-7	SHEET OVERLAY BUTTON		
1-8	MEC BRUSH ANTISTATIC		
1-9	PBA SUB PANEL B'D		123N00241
1-10	KEY M BUTTON XRX		
1-11	KEY M CANCEL		
1-12	CAP M LED XRX		
1-13	WINDOW M LCD		
1-14	GROUND TOP COVER		
2	COVER M LEFT		002N02413
3	COVER M RIGHT		002N02414
4	COVER M CONTROL BOX		002N02419
5	COVER M FRONT INNER		002N02415
6	MEA UNIT COVER REAR		002N02416
6.1	COVER M REAR		
6.2	PMO STACKER REAR		
6.3	ICT BRKT REAR COVER		
6.4	GUIDE M EXIT		
6.5	PMO STRIPE		001N00462
6.7	PEX ROLLER F/UP(2)		
6.8	SPRING ETC SEPARATION		
6.9	LABEL(P) JAM REMOVAL		
7	COVER M FRAME EXIT		002N02417
8	COVER M DUMMY DUP (FILLER PANEL)		002N02420

PL 8.3 Frame Assembly





PL 8.3 Parts List Table

Frame Assembly

Item No.	Description	Qty	Part Number
1	FRAME M BASE		
2	MEA UNIT PICK UP MP		022N02172
2-1	SHAFT M PICK UP MP		
2-2	PMO IDLE PICK UP MP		
2-4	ELA UNIT ROLLER P/UP MP		022N02182
2-4-1	HOLDER M PICKUP MP		
2-4-2	HOUSING M PICK UP MP		
2-4-3	RUBBER PICK UP MP		
2-5	CAM M SHAFT		
3	MEA UNIT GEAR IDLE		007N01362
3-1	BRACKET P GEAR IDLE		
3-2	GEAR FUSER IDLE 3		
3-3	GEAR M FUSER IDLE 2		
3-4	GEAR M FUSER DRV IN		
3-5	CLUTH M HUB		
3-6	GEAR RDCN FUSER OUT		
3-7	RING-E		
4	ELA HOU BASE HOLDER		022N02173
4-1	FRAME M HOLDER PAD		
4-2	HOLDER M PAD		
4-3	RPR FRICTION PAD MP		
4-4	SPRING ETC PAD		
4-5	PMO ACTUATOR EMPTY MP		
4-6	SPRING ETC EMPTY		
4-7	PHOTO INTERRUPTER		
4-8	CBF HARNESS MP EMPTY		
5	MEA RACK EXIT ROLLER		059K39110
5-1	PMO HOLDER EXIT ROLL		
5-2	PMO ROLLER FD F		
5-3	PMO ROLLER FD R		

Frame Assembly (Continued)

Item No.	Description	Qty	Part Number
5-4	SPRING EXIT ROLL FD		
6	ROLLER EXIT F/DOWN		006N01264
7	HOLDER M BUSHING EXIT		013E25770
8	PMO ACTUATOR OUT FULL		120N00479
9	GEAR M EXIT Z17		007N01364
10	HOLDER BUSHING EXIT (F/DOWN)		013E25770
11	MEA UNIT ROLL EXIT DUPLEX		006N01265
11-1	SHAFT M EXIT DUPLEX		
11-2	RMO RUBBER EXIT DUP		
12	BUSH M EXIT D7		013N13839
13	GEAR M EXIT DUP Z21		007N01363
14	ELA HOU CST SENSOR		110K14290
14-1	PBA SUB CASSETTE		
14-2	IPR PLATE SENSOR		
14-3	IPR BRACKET SENSOR		
15	CBF HARNESS P SIZE		
16	GUIDE P REGI UPPER		
17	SPRING ETC LEVER		
18	HOLDER M BUSHING TX		
19	GUIDE PLATE PAPER		
20	IPR P GROUND PLATE PAPER		
21	PHOTO INTERRUPTER		110K14300
23	CBF HARNESS THERM		
24	PMO HOUSING TERMINAL		
25	IPR TERMINAL FU		
26	CBF HARNESS FUSER		
27	CAP M HOUS TERM		
28	SHIELD P CTRL		
29	GROUND P MOTOR DEVE		
30	GROUND P GUIDE TR		
31	GROUND P REGI ROLLER		
32	GROUND P PICK UP MP		

Frame Assembly (Continued)

Item No.	Description	Qty	Part Number
33	GROUND P SCF MAIN		
34	GROUND P MOTOR MAIN		
35	GROUND P GUIDE DUP		
36	CAP M GUIDE HARNESS		
37	PMO DUMMY DEVE		
38	ELA HOU VARISTOR		
39	FOOT ML80		
40	PMO REMOVE LOCK CST		
41	SHAFT M GEAR RETARD		
42	SHAFT M COUPLING RETARD		
43	PMO BEARING SHAFT		
44	GEAR REGI Z25		
45	PMO BEARING SHAFT		
47	MEA UNIT FRAME LSU LOW		140N63017
47-1	FRAME M LSU LOWER		
47-2	PBA TONER SENSOR		
47-3	TERMINAL P DEVE		
47-4	CBFHARNESS TONER SENSOR		
47-5	CAP M COVER OPEN		
48	ELA UNIT FEED 3X5		022N02174
48-1	HOLDER M SAW		
48-2	GUIDE P TRANSFER FRONT		
48-3	PLATE P SAW		
48-4	SHAFT M ROLLER BELT		
48-5	ROLLER M IDLE BELT		
48-6	IEX SHAFT IDLE, F/UP		
48-7	RUBBER BELT FEED		
48-8	GUIDE M SHAFT BELT		
49	ELA UNIT RETARD		022N02175
49-1	FRAME M RETARD		
49-2	HOLDER M RETARD		
49-3	SPRING ETC PAD		

Frame Assembly (Continued)

Item No.	Description	Qty	Part Number
49-4	BUSH M RETARD 2		
49-5	HOUSING M RETARD		
49-6	SHAFT RETARD		
49-7	RING-E		
49-8	PMO HUB OUT RETARD		
49-9	SPRING TS		
49-10	PMO HUB IN RETARD		
49-11	RUBBER RETARD		
50	ELA UNIT FEED2 IDLE		022N02176
50-1	HOLDER IDLE FEED2		
50-2	CAP M IDLE FEED2		
50-3	SPRING ETC PAD		
50-4	BUSH M RETARD		
50-5	SHAFT IDLE FEED2		
50-6	RING-E		
50-7	ROLLER M IDLE FEED2		
50-9	SHAFT HUB IN		
51	STOPPER M KNOCK UP MP L		
52	STOPPER M KNOCK UP MP R		
53	RAIL M LEFT DUPLEX		032N00441
54	RAIL M RIGHT DUPLEX		032N00442
55	PMO BEARING SHAFT		
56	GEAR REGI E25		
57	BEARING PICK UP		
58	PMO ACTUATOR EMPTY		120E26090
59	ELA UNIT PICK UP		022N02183
59-1	SHAFT PICK UP		
59-2	MEA UNIT P/UP HOUSING (PICK ROLLER)		022N02177
59-2-1	PMO M IDLE PICK UP		
59-2-3	RUBBER PICK UP		
59-3	PMO M CAM PICKUP		
59-4	SHAFT FEED 1		

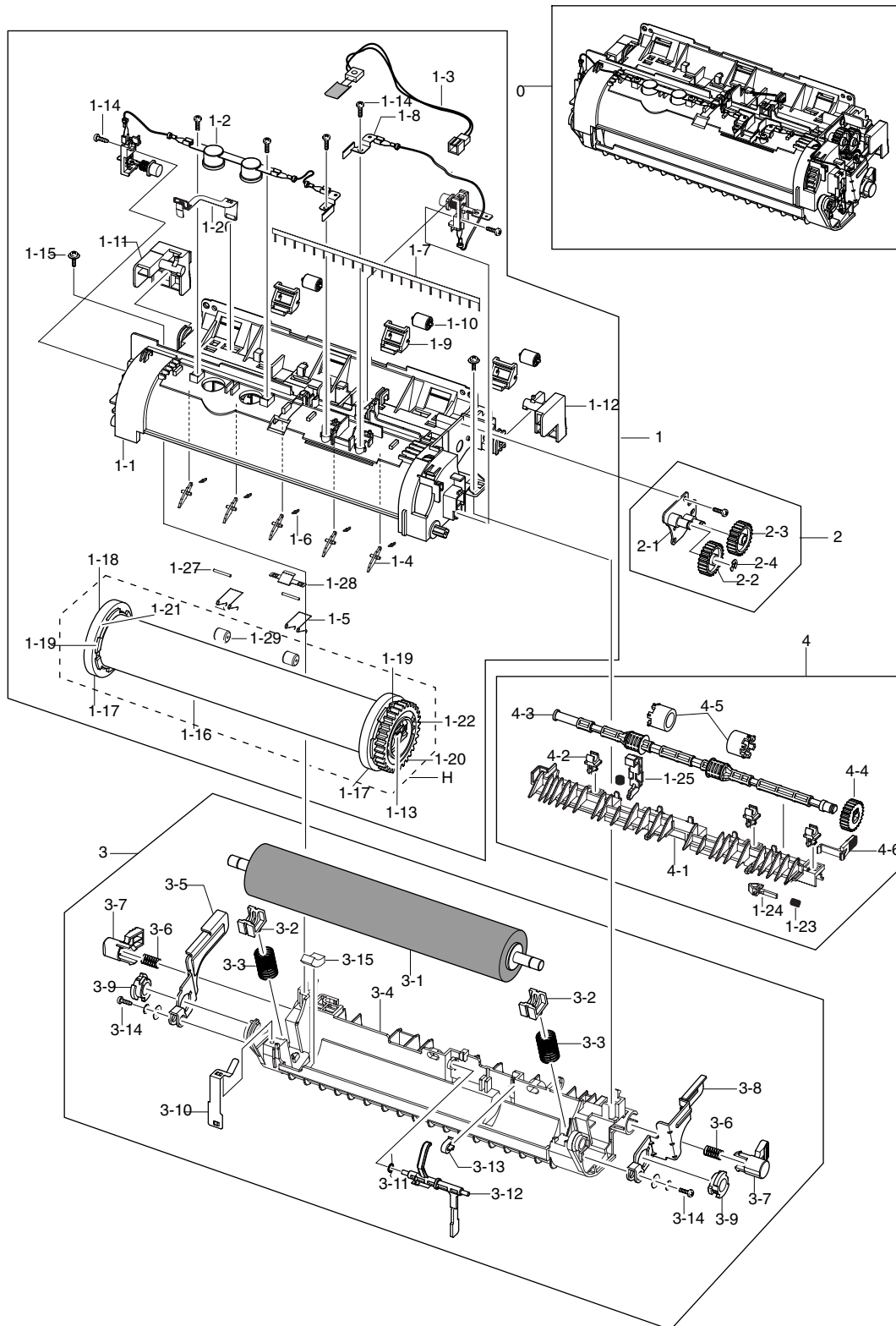
Frame Assembly (Continued)

Item No.	Description	Qty	Part Number
59-5	AS FEED 1 ROLL ASSY		022N02187
59-5-1	HOUSING M FEED1		
59-5-2	RUBBER FEED1		
59-6	GROUND P PICK UP MAIN		
59-7	BEARING PICK UP		
59-8	PMO BUSHING FEED		
59-9	GUIDE P FRONT DUP PICKUP		
59-10	GUIDE M SUPPORT PICKUP		
60	ELA UNIT FEED2		022N02178
60-1	FRAME M PICK UP		
60-2	PMO BUSHING FEED		
60-3	SHAFT M FEED2		
60-4	BEARING PICK UP		
60-5	RUBBER ROLLER FEED2		
61	PBA SUB JOINT		140N63022
62	CBF HARNESS TRAY OUT		
63	CAP M POWER		
64	CBF HARNESS INLET		152N11619
65	SHAFT M BELT GEAR		
66	PMO BEARING SHAFT		
67	GEAR M EXIT Z17		
68	CAP M DEVE MOTOR		
69	CBF HARNESS DUPLEX		
71	CAP M WIRE PTL LOWER		021N02249
72	TERMINAL P PTL		116N00243
73	CBF HARNESS PTL		
74	PBA SUB COVER OPEN		130N01399
76	PBA SUB EXIT SENSOR		130N01400
77	PBA FUSER SW		130N01401
78	GUIDE M FRONT		
79	TERMINAL P GUIDE FRONT		

Frame Assembly (Continued)

Item No.	Description	Qty	Part Number
80	ELA UNIT FUSER 110V ELA UNIT FUSER 220V		126N00242 126N00243
81	PMO GUIDE DEVE L		
82	PMO GUIDE DEVE R		
83	SPRING ETC GUIDE DEVE		
84	TERMINAL P TR KESTREL		
86	TERMINAL SPRING TR		
87	PBA MAIN ZENER		
88	CBF HARNESS EARTH		
89	GROUND P ZENER		
90	GROUND P FUSER		
91	TERMINAL P HV CARDINAL		
92	MEA UNIT TERMINAL TR		
93	CBF HARNESS HVPS		
94	IPR P GROUND OPC		
95	PBA SUB EMPTY SENSOR		140N63023
96	CBF HARNESS SENSOR		
97	PBA SUB FEED SENSOR		140N63024
98	CAP M HV		
99	CAP M SENSOR FEED		
100	DUCT M FAN		

PL 8.4 Fuser Assembly



PL 8.4 Parts List Table

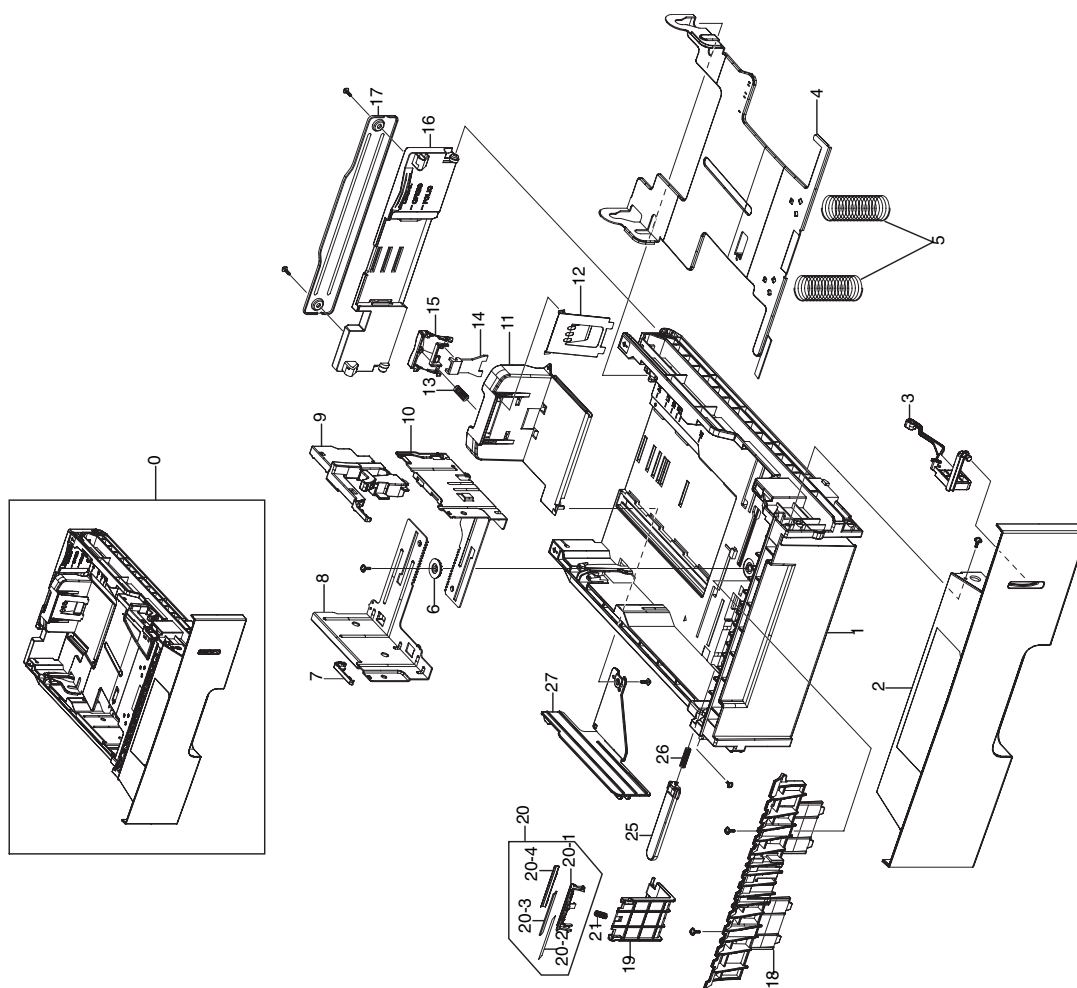
Fuser Assembly

Item No.	Description	Qty	Part Number
1	ELA UNIT FUSER 110V ELA UNIT FUSER 220V		126N00242 126N00243
1-1	COVER M FUSER UPPER		
1-2	THERMOSTAT (ELECTRODE P FU L)		
1-3	THERMISTOR		
1-4	PMO GUIDE CLAW GREEN		
1-5	SPRING TS		
1-6	SPRING SEPARATION		
1-7	MEC BRUSH ANTISTATIC		
1-8	ELECTRODE P FU R		
1-9	HOLDER M IDLE ROLLER		
1-10	PMO ROLLER UPPER DP		
1-11	HOLDER M LEVER L		
1-12	HOLDER M LEVER R		
1-13	ELECTRODE P SUPPORT		
1-14	SCREW		
1-15	SCREW		
1-16	ROLLER HEAT		
1-17	BALL BEARING		
1-18	CAP M END		
1-19	BUSH HR		
1-20	GEAR M FUSER Z49		
1-21	STOPPER SPACER		
1-22	ELECTRODE FU		
1-23	SPRING ETC GUIDE DEVE		
1-24	CAP M ACTUATOR UP		
1-25	COVER M REAR GUIDE UP		
1-26	ELECTRODE P SU CARBON		
1-27	IEX SHAFT IDLE F/UP		
1-28	HOLDER P SL CONNECTOR		

Fuser Assembly (Continued)

Item No.	Description	Qty	Part Number
1-29	PEX ROLLER F/UP(2)		
1-H	ELA UNIT ASSY HEAT ROLL		
2	MEA UNIT BRK GEAR FU		
2-1	BRACKET P FUSER		
2-2	GEAR IDLE 23		
2-3	GEAR M IDLE 25		
2-4	RING-E		
3	MEA UNIT FUSER LOWER		
3-1	ROLLER PRESSURE		
3-2	BUSH M PR		
3-3	SPRING PR ROLL		
3-4	COVER M FUSER LOWER		
3-5	LEVER P RELEASE L		
3-6	SPRING CS		
3-7	CAP M FUSER LOCK		
3-8	LEVER P RELEASE R		
3-9	HOLDER M PR SHAFT		
3-10	GROUND P HR		
3-11	SPRING ETC ACTUATOR		
3-12	PMO ACTUATOR EXIT		
3-13	CAP M ACTUATOR		
3-14	SCREW TAPTITE		
4	MEA UNIT GUIDE REAR		
4-1	GUIDE M REAR		
4-2	PMO BUSHING TX		
4-3	SHAFT M EXIT F UP		
4-4	GEAR M EXIT DUP Z21		
4-5	RUBBER EXIT F UP		

PL 8.9 Tray 2 Cassette

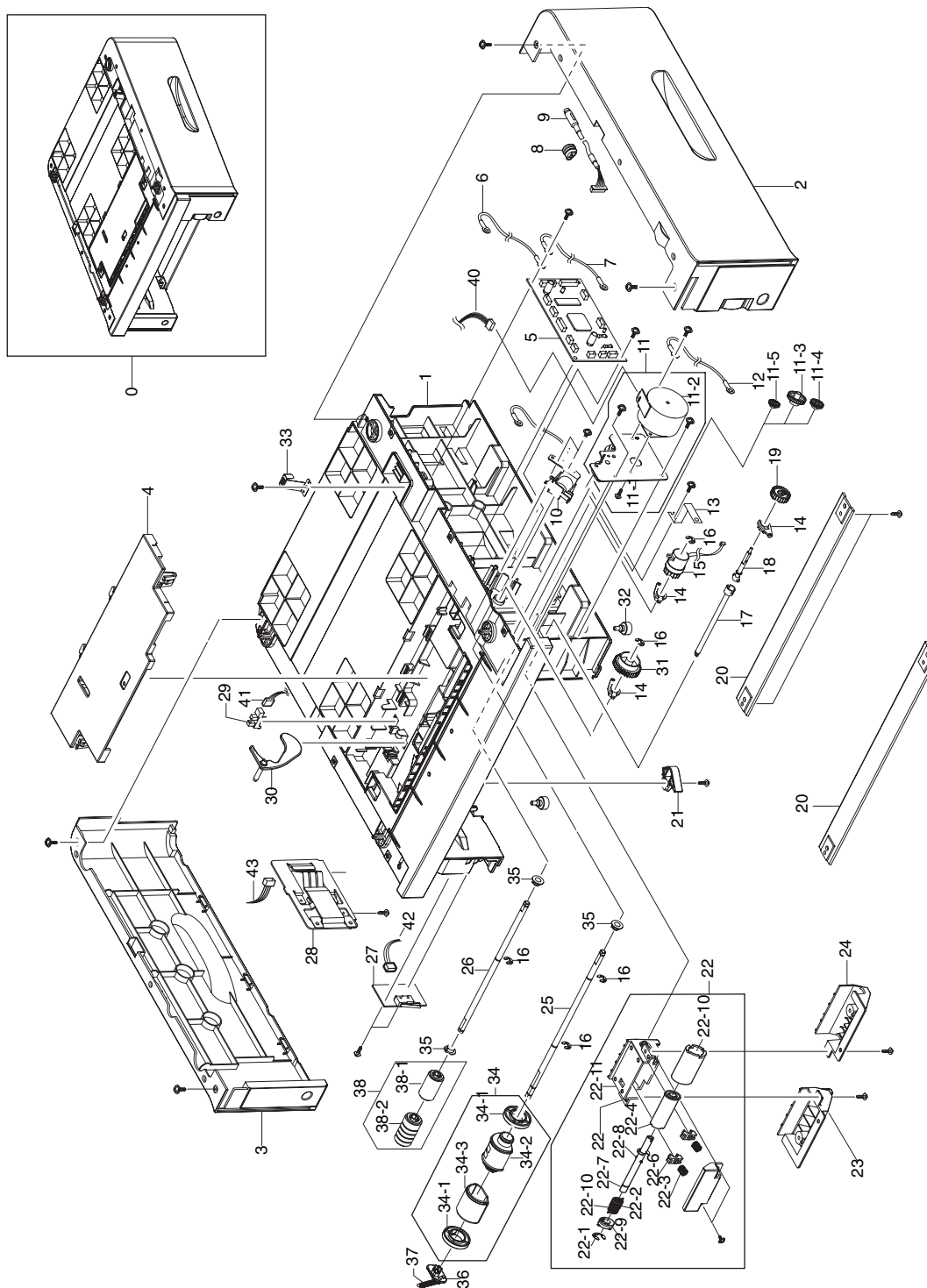


PL 8.9 Parts List Table

Tray 2 Assembly

Item No.	Description	Qty	Part Number
0	ELA UNIT CASSETTE		
1	FRAME M CASSETTE		
2	GUIDE M HANDLE		
3	INDICATOR EMPTY		
4	PLATE P KNOCK UP		
5	SPRING PLAT K/UP		
6	GEAR PINION		
7	CAP M GUIDE SIDE L		
8	GUIDE P SIDE L		
9	GUIDE M SIDE LOCK		
10	GUIDE P SIDE R		
11	GUIDE M REAR		
12	GUIDE P REAR PAPER		
13	SPRING ETC GUIDE PAPER		
14	GUIDE M LOCK		
15	GUIDE M REAR		
16	GUIDE M EXTENTION		
17	BRACKET P EXTENTION		
18	GUIDE M PAPER		
19	HOLDER M PAD HOUSING		
20	MEA UNIT HOLDER PAD		019N00831
20-1	HOLDER M PAD		
20-2	SHEET HOLDER PAD R2		
20-3	RPR FRICTION PAD		
20-4	IPR PLATE PAD		
21	SPRING EXIT ROLL FD		
25	PMO LOCKER PLATE		
26	SPRING LOCKER PLATE		
27	GUIDE M PAPER SIZE		

PL 8.10 Tray 3 Cassette



PL 8.10 Parts List Table

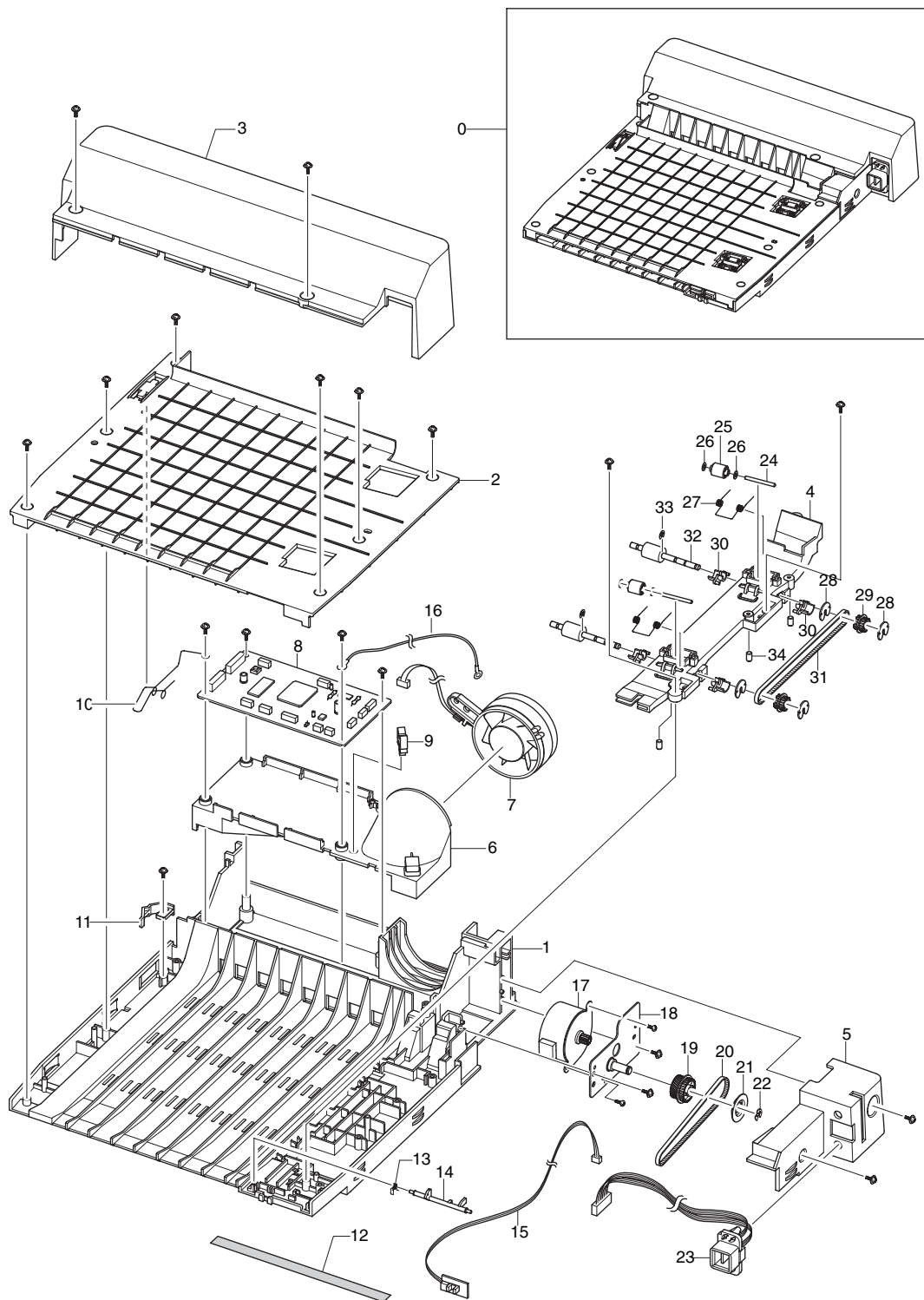
Tray 3 Cassette

Item No.	Description	Qty	Part Number
0	ELA UNIT SCF		
1	FRAME M SCF		
2	COVER M RIGHT SCF		
3	COVER M LEFT SCF		
4	COVER M DUMMY SCF		
5	PBA SCF		140N63018
6	CBF HARNESS OPE		
8	BUSH CABLE		
9	CBF HARNESS SCF INTERFACE		152N11620
10	SOLENOID MAIN		
11	ELA UNIT MOTOR SCF		127N07392
11-1	BRACKET P SCF MOTOR		
11-2	MOTOR STEP 7.5 DEG		
11-3	GEAR M SCF RDCN RETARD		
11-4	GEAR M SCF RDCN FEED		
11-5	GEAR M SCF RDCN PICK UP		
12	CBF HARNESS OPE		
13	IPR GROUND SPRING FEED		
14	PMO BEARING SHAFT		
15	MEP CLUTCH FEED SCF		121N01104
16	RING E		
17	SHAFT M COUPLING RETARD S		
18	SHAFT M GEAR RETARD		
19	GEAR REGI Z25		
20	BAR P CROSS BOTTOM		
21	PMO REMOVE LOCK CST		
22	ELA UNIT RETARD SCF		022N02179
22-1	RING E		
22-2	SPRING TS		
22-3	SPRING ETC PAD		

Tray 3 Cassette (Continued)

Item No.	Description	Qty	Part Number
22-4	HOUSING M RETARD		
22-5	HOLDER M RETARD		
22-6	BUSH M RETARD		
22-7	SHAFT RETARD		
22-8	SHAFT HUB IN		
22-9	PMO HUB OUT RETARD		
22-10	PMO HUB IN RETARD		
22-11	FRAME M RETARD		
22-12	RUBBER RETARD		
23	PMO M DUMMY SCF LEFT		
24	PMO M DUMMY SCF RIGHT		
25	SHAFT PICK UP SCF		
27	PBA SCF COVER OPEN		
28	ELA HOU CST SENSOR		
29	PHOTO INTERRUPTER		
30	PMO ACTUATOR EMPTY, SCF		120E26100
31	GEAR SCF PICK UP CAM		007N01366
32	FOOT ML80		
33	IPR GROUND TOP		
34	MEA UNIT PICK UP HOU		
34-1	PMO M IDLE PICK UP		
34-2	RUBBER PICK UP		
34-3	HOUSING M PICK UP		
35	PMO BUSHING FEED		
36	PMO M DUMMY SHAFT		
37	SPRING ES		
38	HOUSING M FEED1		
39	RUBBER FEED1		
40	CBF HARNESS MOTOR		
41	CBF HARNESS SCF EMPTY		
42	CBF HARNESS SCF CASSETTE		
43	CBF HARNESS SCF P SIZE		

PL 8.11 Duplex Assembly



PL 8.11 Parts List Table

Duplex Assembly

Item No.	Description	Qty	Part Number
0	ELA UNIT DUPLEX		
1	FRAME M DUPLEX		
2	GUIDE M UPPER DUP		
3	COVER M REAR DUP		
4	MEA ETC ALIGN DUP		
4-1	GUIDE M ALIGN DUP		
4-2	SHAFT IDLE ROLL DUP		
4-3	ROLLER M IDLE DUP		
4-4	PCT SLIP WASHER		
4-5	SPRING ETC DUP		
4-6	PULLEY M 18 DUMMY DUP		
4-7	PULLEY 18 DUP		
4-8	BUSH M FEED DUP		
4-9	BELT TIMMING		
4-10	ROLLER FEED DUP		
4-11	RING C		
4-12	ICT STUD PAPER GUIDE DP		
5	CAP M CONNECTOR DUP		
6	DUCT M FAN DUP		
7	FAN DC HAWK		
8	PBA SUB DPX SCF		
9	CABLE CLAMP		
10	IPR TERMINAL GND DUP		
11	LOCKER M DUP		
12	SHEET FRAME DUP		
13	SPRING TS		
14	PMO ACTUATOR FEED DUP		
15	PBA SUB MP SEN		
16	CBF HARNESS POWER GND		
17	MOTOR STEP		

Duplex Assembly

Item No.	Description	Qty	Part Number
18	BRACKET P MOTOR DUP		
19	PULLEY M 30 DUP		
20	BELT TIMING GEAR		
21	PULLEY M 30 DUMMY DUP		
22	RING E		
23	CBF HARNESS D JOINT		

6 General Information and Specifications

This section covers the following:

- [Printer Configurations](#) on page 6-2
- [Parts of the Printer](#) on page 6-4
- [Control Panel](#) on page 6-5
- [Control Panel](#) on page 6-5
- [Printer Specifications](#) on page 6-6
- [Media and Tray Specifications](#) on page 6-9

Printer Configurations

Features	Printer Configurations		
	3500B	3500N	3500DN
Maximum Print Speed Letter/A4	35 ppm	35 ppm	35 ppm
Memory (Standard) Up to 288 MB Optional	32 MB	32 MB	32 MB
PostScript and PCL Fonts	Yes	Yes	Yes
Default Resolution Maximum Resolution	600 x 600 dpi 1200 x 1200 dpi		
500-Sheet Feeder (Tray 3)	Optional	Optional	Optional
Network Interface	Optional	Standard	Standard
Automatic 2-Sided Printing (Separate Duplex Unit)	Optional	Optional	Standard
USB, Parallel Interface	Yes	Yes	Yes

Printer Options and Supplies

Options and Supplies

Item	Part Number
64 MB additional RAM memory	097S03389
128 MB additional RAM memory	097S03390
256 MB additional RAM memory	097S03391
Network Interface Card (NIC)	097S03386
Duplex Unit	097S03387
500-Sheet Feeder	097S03385
Standard-Capacity Print Cartridge (6,000 pages @ 5% area coverage)	106R01148
High-Capacity Print Cartridge (12,000 pages @ 5% area coverage)	106R01149

Consumable and Service Part Life Expectancy

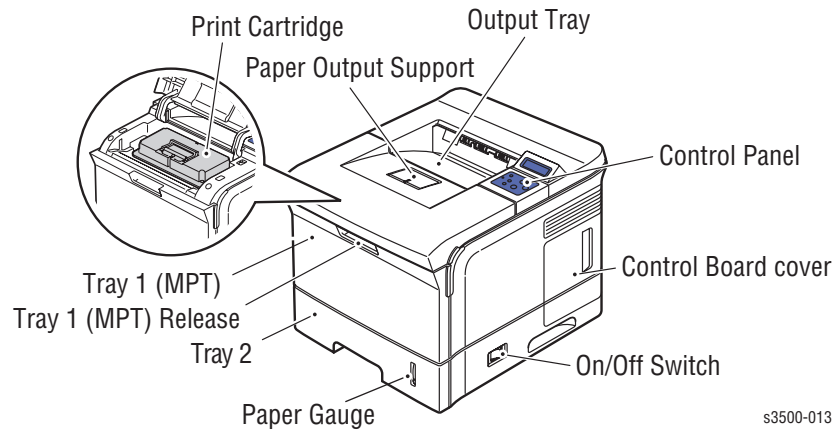
Consumable (toner/print cartridge) usage is tracked by the CRUM and monitored by the Main Board in order to display the near end-of-life and end-of-life messages. Life ratings are based on 5% coverage and an average 4 page job length.

Consumables	Print Life
Print Cartridge	High Capacity 12,000 pages Standard Capacity 6,000 pages
Service Parts	
Fuser Assembly	150,000 pages
Transfer Roller	150,000 pages
Feed Roller Kit	150,000 pages
Retard Roller	150,000 pages
Separator Pad	150,000 pages

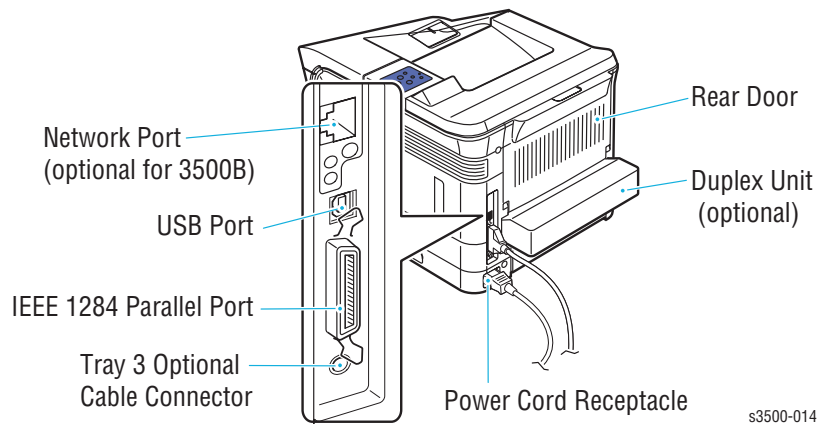
Note: The service parts are not tracked with an NVRAM counter and there is no replace or low warnings associated with these service parts.

Parts of the Printer

Front View



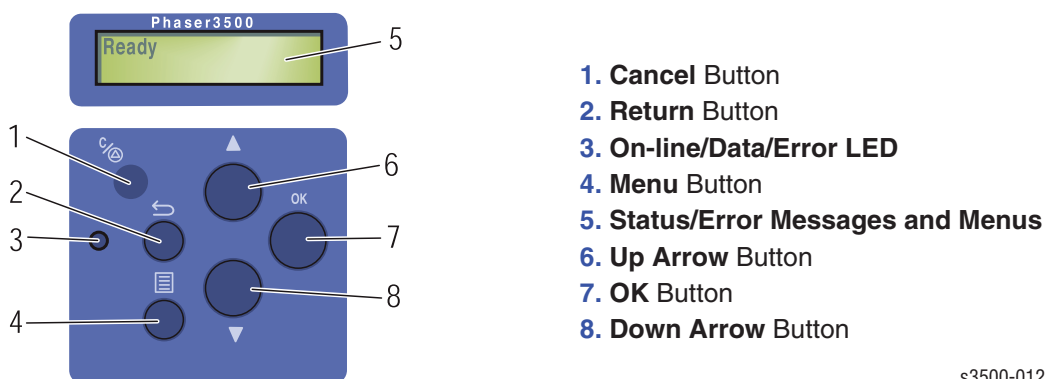
Rear View



Control Panel

The Control Panel has three components:

- Multi-colored Light Emitting Diode (LED) light
- Alphanumeric display
- Six-button cluster



s3500-012

The alphanumeric display provides status messages and control panel menus.

Menu Map

The Menu Map is a visual representation of the Control Panel settings and information pages. All Menu Map settings are documented in the *User Guide*.

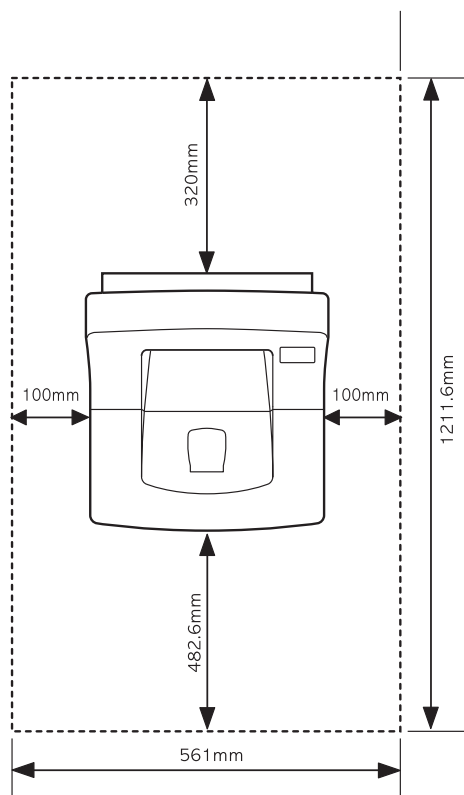
Error and Warning Messages

When there is a problem with the printer, the Control Panel LED (3) blinks orange for an error and a warning. An error or warning message is displayed in the Alphanumeric Display (5).

Printer Specifications

Printer Location and Clearance

- Place the printer in a dust-free area where the temperature range is 50 degrees F to 89 degrees F (10 degrees C to 32 degrees C) and the relative humidity range is between 20% to 80%.
- Place the printer in an area where there is adequate space for ventilation, operation, and servicing. See the clearance graphic below.
- Do not block or cover the slots and openings on the printer. The printer can overheat without adequate ventilation.
- For altitudes under 2,050 meters (6,726 feet), use the **Low** Altitude setting. For altitudes over 2,050 meters (6,726 feet), use the **High** Altitude setting.
- Do not place the printer near a heat source.
- Do not place the printer in direct sunlight.
- Do not place the printer in line with the cold air flow from an air conditioning system.
- Place the printer on a level, solid surface with adequate strength for the weight of the printer.



s3500-018

Printer Physical Specifications

Print Engine Dimensions	Value
Height:	348 mm (13.7 inches) (without optional cassette)
Width:	396 mm (15.6 inches)
Depth:	453 mm (17.8 inches)
Weight:	17 Kg (38 lbs)

Functional Specifications

Characteristic	Specification
Printing process	Non-Impact Electrophotography
Color medium	Monochrome
Resolution / Addressability	True 600 x 600 dpi Addressable 1200 x 1200 dpi
Operating Modes	Running Mode: Print engine capable of making prints immediately. Ready Mode: 20 seconds from completion of a print. Sleep/ Low Power/ Power Saver Mode: Entered after a specified period of Print Engine inactivity since completion of the last print.
Continuous Operating Printing Speed ppm = pages per minute	Letter: Up to 35 ppm A4: Up to 33 ppm
Cleaning Cycle interval for continuous printing	
First Print-Out (in seconds)	10 seconds or less
Warm-Up Time	Power-on Boot: 40 seconds or less

Electrical Specifications

Characteristic	Specification
Primary line voltages	110 - 127 V Printer - (100 - 135 V) 13 amp circuit 220 - 240 V Printer - (180 - 264 V) 7-8 amp circuit
Primary line voltage frequency range	100 - 135 V Printer - 50/60 Hz \pm 3 Hz 220 - 240 V Printer - 50/60 Hz \pm 3 Hz
Power consumption	Printing: 550 Watts (average) Sleep: under 10 Watts

Environmental Specifications

Characteristic	Specification
Optimal Temperature	10 - 30 degrees C (50-60 degrees F)
Optimal Humidity	20% - 80% Relative Humidity
Altitude	
Operating	0 - 2,500 meters (8,200 ft.)
Low Altitude Setting	0 - 2,050 meters (6,726 ft.)
High Altitude Setting	2,050 - 2,500 meters (6,726 - 8,200 ft.)
Transportation	0 - 6,092 meters (20,000 ft.)
Acoustic Noise	
Idle	35.0db or less
Printing	49.0db or less

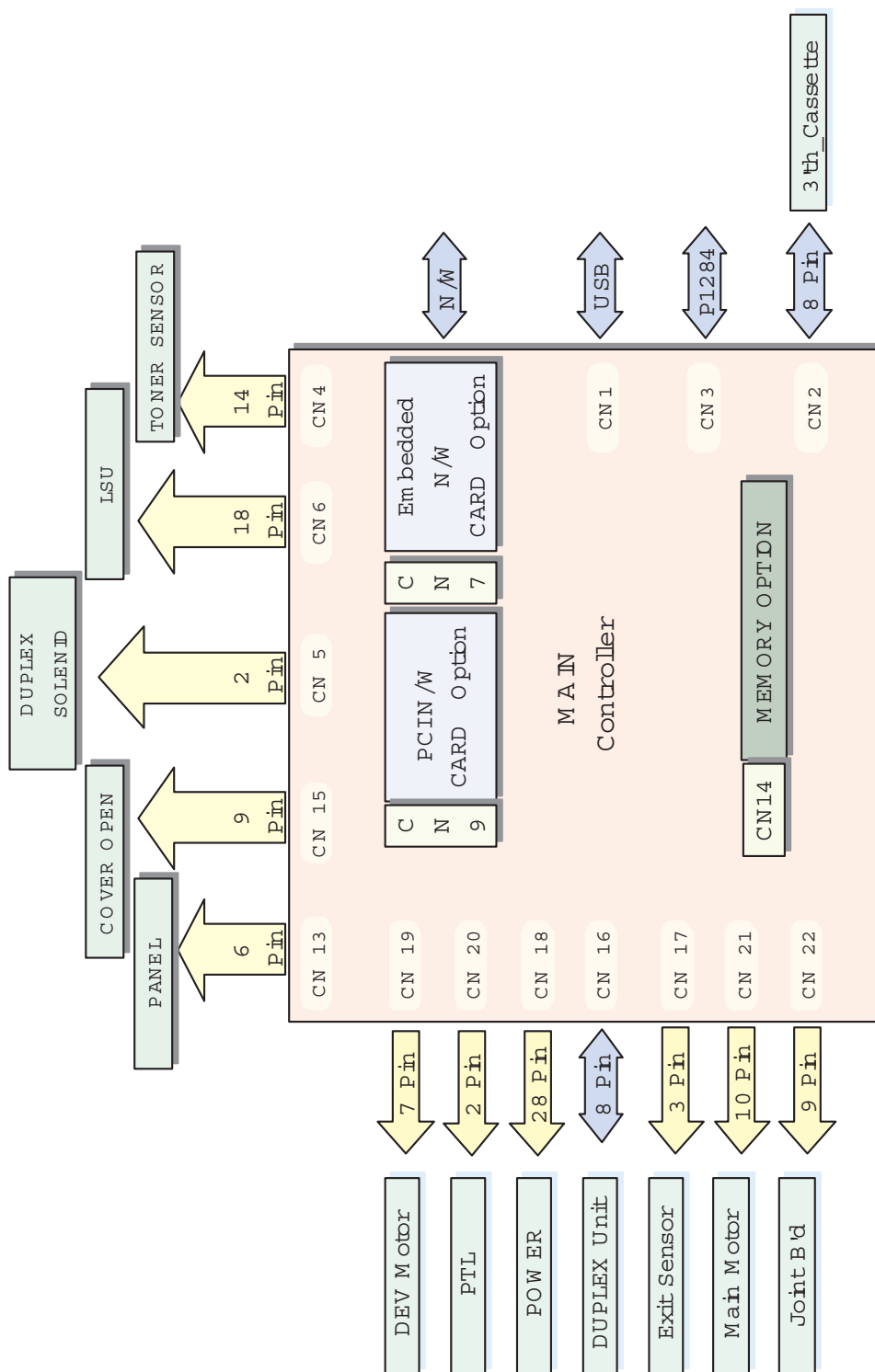
Media and Tray Specifications

Media Input Size/Weight

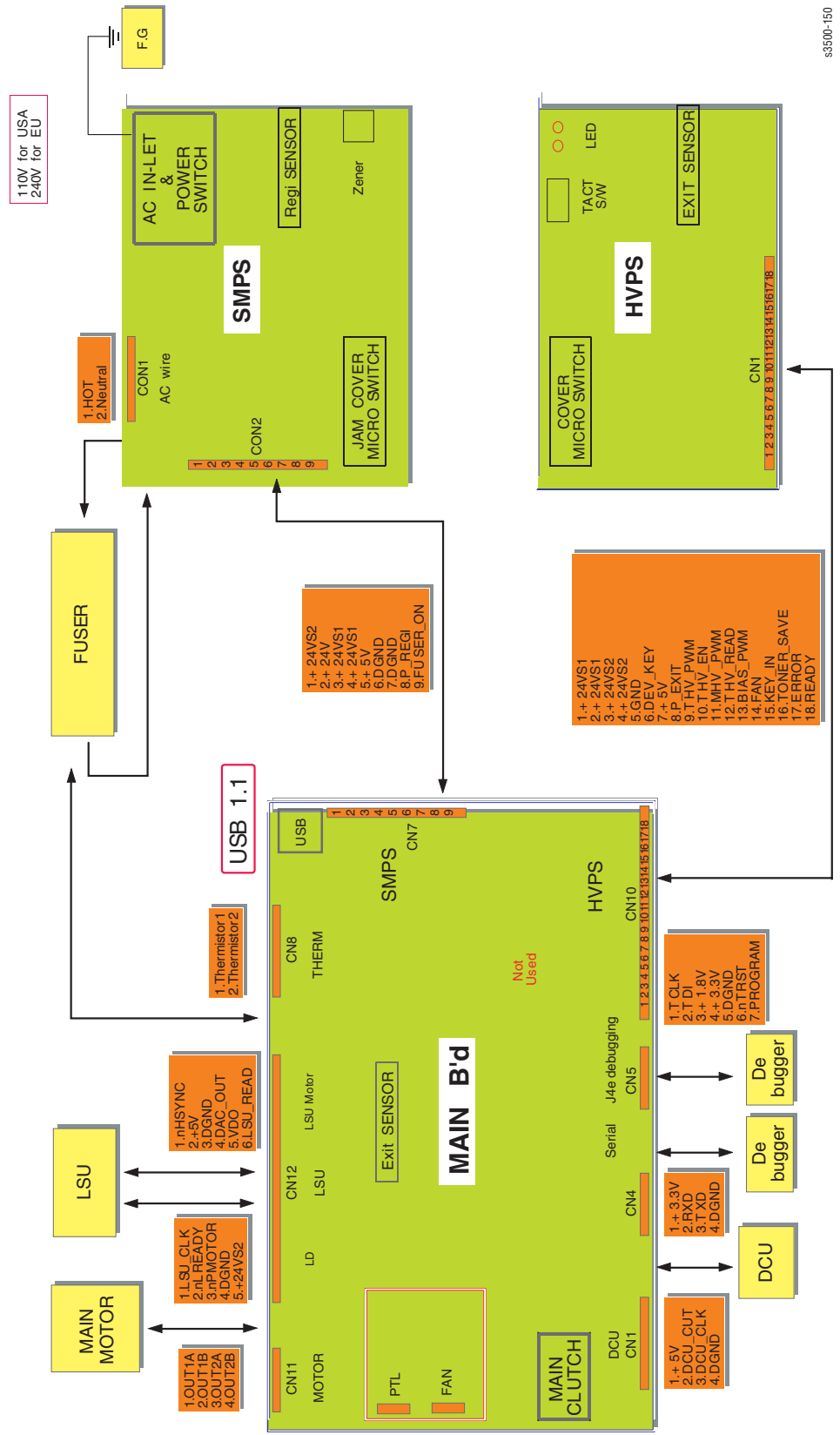
Source	Media Types	Media Sizes	Media Weights
Tray 1	Paper, Envelope, Paper Labels, Transparency.	A4, Letter, Legal, Folio, Executive, ISO and JISB5, A5	16 lb. ~ 28 lb. (60 ~ 176 gsm)
Tray 2	Paper, Cardstock Min: 76 mm x 127 mm (3 in. x 5 in.) Max: Legal	A4, Letter, Legal, Folio, Executive, ISO and JISB5, A5, A6, Statement Monarch, COM 10, C5, DL, 3" x 5"	16 lb. ~ 43 lb. (60 ~ 105 gsm) 65# Cover
Tray 3	Paper	A4, Letter, Legal, Folio, Executive, ISO and JISB5, A5	16 lb. ~ 28 lb. (60 ~ 105 gsm)
Duplex	Paper	A4, Letter, Legal, Folio	20 lb. ~ 24 lb. (75 ~ 90 gsm)

7 Wiring Data





s3500-149



8 Theory of Operation



This section covers the following:

- [Overview of the Phaser 3500 Laser Printer](#) on page 8-2
- [Printer Paper Path](#) on page 8-4
- [Major Assemblies and Functions](#) on page 8-6
- [Sensor Functions](#) on page 8-8
- [Printer Controls](#) on page 8-9
- [Power Supply](#) on page 8-11

Overview of the Phaser 3500 Laser Printer

Summary of the Printing Process

The Phaser 3500 Laser Printer is a desktop monochrome laser printer, applying the principals of an electrophotographic system.

The printing process is composed of the following:

Charging: The charge roller is negatively charged at approximately -1400 VDC by the high voltage power supply (HVPS). The charge roller is kept in contact with the drum surface to provide a uniform negative charge of approximately -800 VDC on the drum surface as it rotates at a constant speed.

Exposure: The laser unit emits laser beams in response to image data from the Main board. The laser beams are directed onto the drum surface through a system of mirrors and lenses. A rotating polygonal mirror causes the laser beams to scan the drum surface from end to end (axially) as it rotates. The beams are turned on to print a pixel and off when no printing is required. The negative charge on the drum surface is reduced to approximately -250 VDC at each point where the energized laser beam strikes, to form an invisible electrostatic latent image on the drum surface.

Development: Negatively charged toner particles from the toner hopper are applied to the supply roller and are then applied to the developer roller in a even layer controlled by the metering blade. The developer roller turns against the drum and the toner particles are attracted to the relatively positive latent image. The toner forms a visible image on the drum surface.

Pre-Clean: The pre-transfer lamp exposes the developed surface of the drum lowering the surface potential and thereby providing enhanced transfer efficiency.

Transfer: The finished toner image on the drum is transferred onto the print media using the voltage supplied by the transfer roller. The conductive transfer roller receives a high positive voltage (approximately +1000 VDC) from the HVPS that puts it at a higher potential than the drum. Since the transfer roller is located behind the print media, the toner image is attracted to the high potential and deposits on the surface of the print media.

Fixing: The finished toner image is impermanent and easily smeared. To fix the image, the print media goes through the Fuser where it passes between a pressure roller and the heat roller. The toner is fused onto the print media by the combination of heat and pressure.

The heat roller is heated by a heat element. The roller surface temperature is detected by a Thermistor. The information is fed back to the heater control to maintain a surface temperature of 185° C during printing and 145° C during standby. If the thermostats detect a Fuser overheat condition, it disconnects AC power to the Fuser.

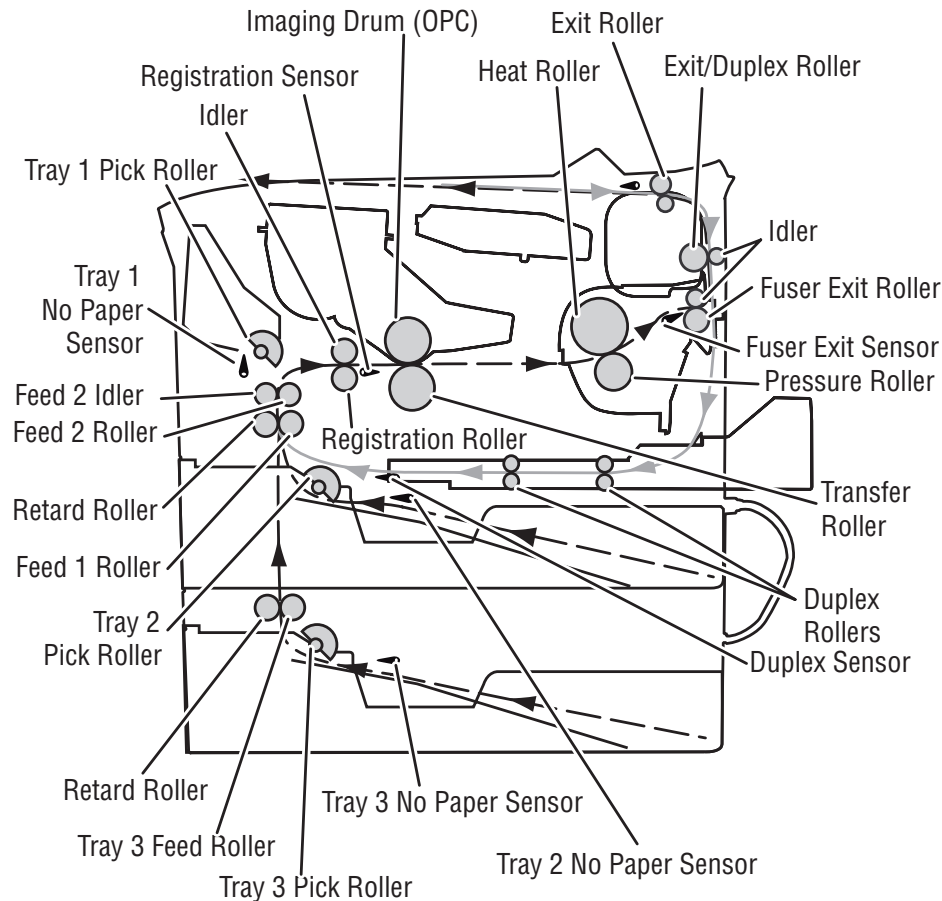
Cleaning: After the image is transferred to the print media, a cleaning blade inside the cartridge removes any remaining toner particles from the drum.

Print Modes

The Phaser 3500 Laser Printer provides four print modes:

- Draft mode: Uses a combination of reduced toner output and the lowest resolution (300 x 300 dpi) to extend print cartridge life.
- 300: Used for printing with a resolution of 300 x 300 dpi.
- 600: Used for printing with a resolution of 600 x 600 dpi.
- Enhanced mode: Used for printing on plain paper with an addressable resolution of 1200 x 1200 dpi.

Printer Paper Path



Media that meets printer specifications can be fed from Trays 1 and 2, or the optional Tray 3. If you use thick paper with a weight of more than 105 gsm (60 lbs), you must insert the paper into Tray 1 and select the paper type. Paper will exit the printer to the face down top tray. A door at the rear of the printer provides access for jam clearance.

The diagram below shows the paper path and identifies the major components of the printer. The simplex paper path is shown in black and the duplex path is shown in gray.

All major components of the printer are explained in greater detail under [Printer Controls](#) on page 8-9.

Duplex Paper Path

When 2-sided printing is selected, side two is printed first, the image being printed is the first image. After the first image is being printed the paper is reversed and is fed through the duplexer and back up to the feed roller with side one positioned for printing with the second image.

Paper Feed Sequence

When the Main Board is ready to feed paper, it energizes the **paper feed** solenoid. The solenoid armature releases the clutch and the pick-up roller makes one revolution. This drives the paper to the feed and retard rollers. The feed roller and retard roller drive the paper to the registration transport assembly which in turn drives the paper towards the transfer area. Before arriving at the transfer area, the paper actuates the Registration Sensor.

Paper Transport

The registration assembly continues to drive the paper into the transfer area, where the image is transferred from the drum to the paper.

After the image is transferred, the paper continues to the Fuser Assembly for fusing the image. In the Fuser Assembly, the heat roller is heated by a heat element and the paper passes in between the heat roller and the pressure roller, where toner is melted onto the paper forming a permanent image. The temperature of the heat roller is monitored by a thermistor that sends signals to the Main Board.

The Fuser drives the paper into the exit rollers and the exit rollers drive the paper into the output tray. When printing the first side of a duplex print job, the drive direction is reversed when the exit sensor is actuated. Paper is then directed into the Duplex Unit for printing on the second side.

Paper Feed Drive

The drive for all rollers is provided by the Main Drive Motor and a series of drive gears. The Main Motor is used for paper feed, fusing, and the duplex/exit roller reversal for 2-sided printing. When the main motor turns, all the paper path components also turn except the Pick-Up Roller. The Pick-Up Roller assembly includes a mechanical clutch, released by the feed solenoid. There is a separate Developer Motor for the Print Cartridge.

Major Assemblies and Functions

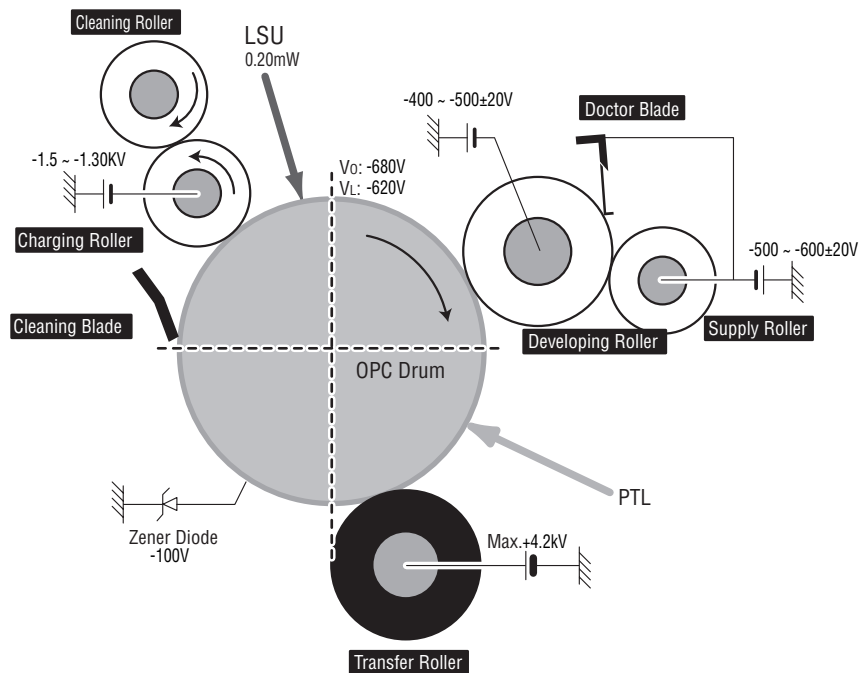
Imaging

After paper feed, the imaging process consists of the Laser Unit, Print Cartridge, Transfer Assembly, Fuser Assembly and Paper Exit.

Print Cartridge

The Print Cartridge receives image data in the form of pulsed laser light from the Laser Scan Unit and creates the image via the xerographic process. The Print Cartridge contains the following components:

- Charge Roller
- Drum
- Developer Roller (D/R)
- Supply Roller (S/R)
- Metering Blade
- Cleaning Blade



Laser Scan Unit (LSU)

The Laser Scan Unit receives the bit-mapped image data from the Main Board and uses that information to turn the laser beam on and off as required to correctly expose the drum. Image data transfer from the Main Board is controlled by a synchronization signal from the LSU so the vertical scanning line is synchronized with the printed page. The LSU contains the following components:

- Laser Diodes: Generates the laser beams.
- Rotating Polygon Mirror: Scans the laser beam across the drum, axially.
- Beam Detector: Synchronizes the left margin.
- Optical Lens System: Focuses the laser beam onto the surface of the drum.
- Mirrors: Reflect the laser beam onto the surface of the drum.

Transfer Roller

The transfer subsystem consists of the Pre-Transfer Lamp (PTL) and the Transfer Roller. The PTL exposes the drum surface after the latent image has been developed to lower surface potential of the drum. This provides enhanced transfer efficiency.

The transfer roller provides a high positive potential on the back of the print media. This potential attracts the negatively charged toner image from the drum and deposits it on the surface of the print media.

Fuser Assembly

The Fuser Assembly contains the entire Fuser Subsystem and is a field replaceable unit. The Fuser Assembly contains the following components:

- Heat Element and Heat Roller: A heat element generates the heat for the heat roller. The heat roller melts the toner so it adheres to the paper.
- Pressure Roller: Provides pressure on the opposite side of the print media so the heat roller can embed the melted toner in the media.
- Thermistor: Monitors the surface temperature of the Heat Roller. This information is used to control the heat lamp and thus keep the heat roller at the correct temperature.
- Thermostat: Prevents overheating damage when unexpected system faults occur.

Sensor Functions

Paper Empty Sensor

Media supply is monitored by the Paper Empty Sensor. When a tray runs out of paper, the sensor will send a signal to the Main Board, the control panel LED will blink orange, and the “No Paper in Tray {2|3}” message will display on the control panel.

Tray 1 Paper Empty Sensor

The Tray 1 paper empty sensors monitors paper from Tray 1. If Tray 1 is selected and there is not paper, a message appears on the control panel. If there is no paper in Tray 2 or Tray 3 and the printer is in auto-select mode, the printer will look for paper in all the trays and report “No Paper in Tray 1”.

Registration Sensor

The Registration Sensor has two purposes. First, it is used to monitor paper movement. If the paper takes too long getting to the sensor, or it stays at the sensor location too long, the Main Board will shut down the machine, the control panel LED will blink orange, and a “Jam” error message will display on the control panel.

Second, the signal generated by the sensor tells the Main Board that the paper is almost at the transfer area and it is time to start the xerographic process. It is important that the leading edge of the paper enters the transfer area at the same time as the leading edge of the developed image on the drum.

Fuser Exit Sensor

The Exit Sensor monitors paper exit and detects the “Jam at Exit” error if the paper takes too long getting to the sensor, or it stays at the sensor too long. At this point the Main Board will shut down the printer, the Control Panel LED will blink red, and a “Jam at Exit” error message will display on the Control Panel. The signal from the Exit Sensor is also used to control paper feed to the Duplex Unit for duplex print jobs.

Cover Open Sensor

The cover open sensor detects whether the top cover is open or closed. When the top cover is open the “Close Top Cover” message is displayed on the Control Panel.

Duplex Unit Sensor

The Duplex Unit slides into the rear of the printer above Tray 2. As paper leaves the Fuser Assembly and is picked up by the Exit Rollers, the drive direction is reversed to send the paper down to the Duplex Unit. As the paper leaves the Duplex Unit, it activates the Duplex Sensor. This activates the feed roller to position the paper for printing on the front side of the paper.

Printer Controls

Image Processor Function

The host computer connects to the Main Board using a bi-directional parallel, Universal Serial Bus (USB) cable, or via an optional Ethernet Network Card. The Main Board receives image data from the host computer, converts this to a bitmap image, and then sends the current image to the Laser Scanner Assembly.

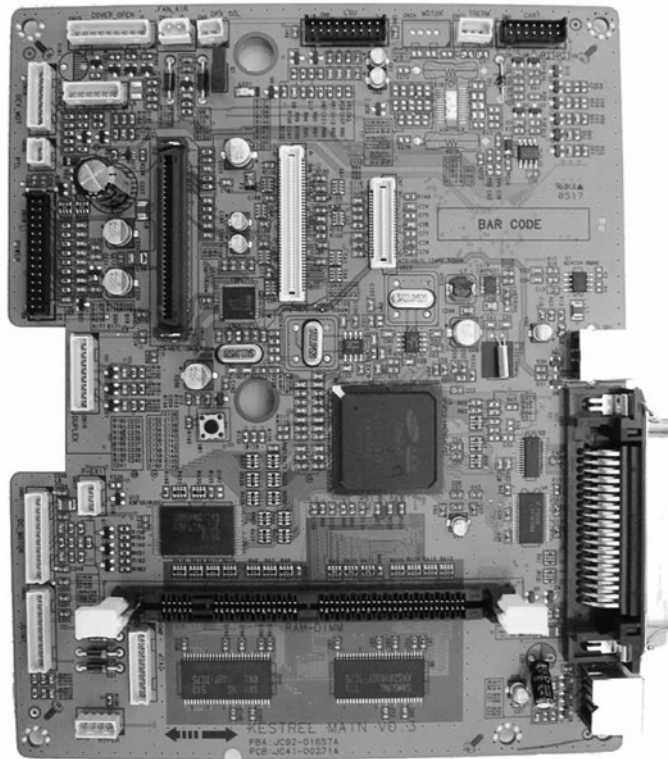
Print Engine Control

The engine control section provides all of the principle operating voltages and control signals for the following printer operations:

- Main Drive Motor
- Fuser Assembly
- High Voltage Power Supply (HVPS)
- Laser Scanner Unit (LSU)
- Sensors
- Solenoids
- Thermistor
- All parts related to the xerographic process
- Optional Paper Tray 3 and Tray 1

Main Board

The Main Board combines the Image Processor and Engine Control functions. It contains a 32 bit RISC processor and comes with a standard memory capacity of 32 Mbytes of RAM and 4 Mbytes of flash memory. The board provides one expansion slot that allows available memory to be expanded up to 288 Mbytes by adding an additional RAM DIMM.



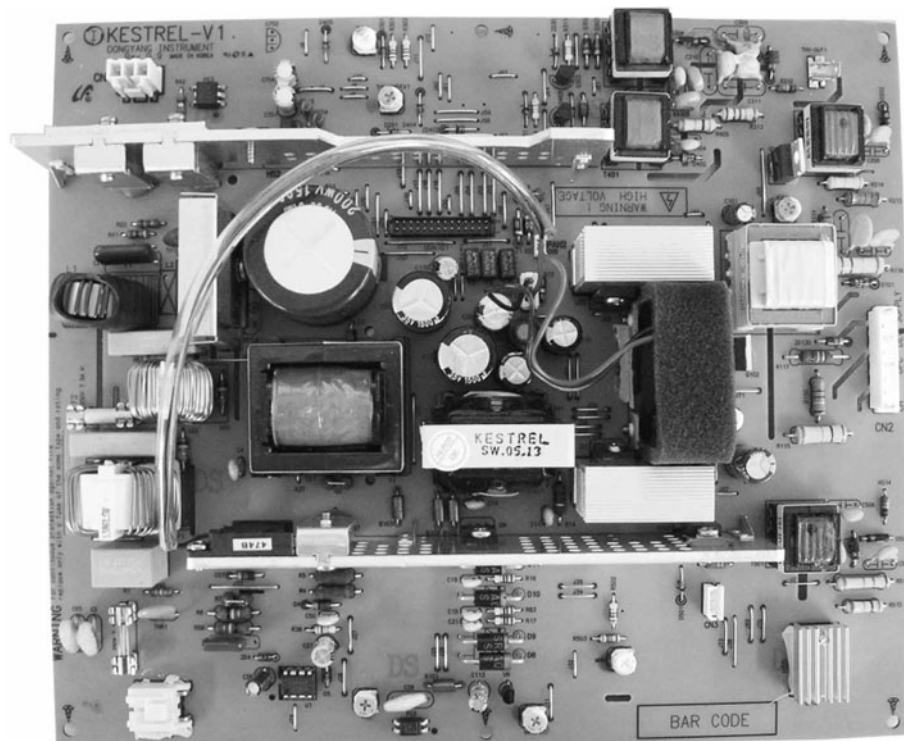
Power Supply

The HVPS section generates and supplies the following voltages:

- Transfer Voltage
- Charge Voltage
- Bias Voltage
- Supply Voltage

The Bias, Supply, and Charge voltages are used by the Print Cartridge.

The power distribution section receives AC voltage and creates the required DC outputs (3.3 VDC, 5 VDC, and 24 VDC) to power the printer components. It also supplies AC voltage to the Fuser Assembly.



Paper Size Control

The paper size selection for Tray 2 and Tray 3 is set by moving the paper guide in the tray. This in turn sets the plastic “fingers” on the side of the paper tray to a specific position. The position of the “fingers” activates the correct combination of the three paper size switches, located in each paper tray slot, for the selected paper size. Additionally, the back of the tray must be pulled down in order to select the two largest sizes; US Folio and Legal. Not all sizes can be used in both trays. See [Media and Tray Specifications](#) on page 6-9 for a complete listing of the media types for each tray. Additional media types can be used in Tray 1 (MPT). After inserting the media in Tray 1, use the Control Panel controls to select the media type.

Paper Size Switches are identified as SW1, SW2, and SW3

Paper Size	Paper Size Switch		
	SW1	SW2	SW3
LEGAL 14"	ON	ON	OFF
US FOLIO (LEGAL 13")	OFF	OFF	OFF
A4	OFF	ON	ON
LETTER	ON	OFF	OFF
EXECUTIVE	OFF	ON	OFF
B5	ON	OFF	OFF
B5, JIS-B5	OFF	OFF	ON
A5	ON	ON	ON
No Tray	OFF	OFF	OFF

Paper Pick Auto-Select

The default paper pick selection at power ON is Tray 2, Auto-Select ON is also default. If the default tray is empty, the printer will automatically switch to any other tray that contains paper unless Auto-Select is set to OFF.

Toner Control

Print Cartridge installation and Toner Level are detected by the Print Cartridge Interconnect Board and the associated signals are supplied to the Main Board. The CRUM not only detects cartridge presence, it also determines whether it is a genuine Xerox cartridge. When the toner remaining falls to 15%, the printer displays a low toner message on the Control Panel display.

Laser Light Intensity Control

Image data is transmitted to the laser diode in the Laser Unit as digital signals. The laser diode converts the image data from digital signals to optical signals; data expressed by blinking laser beams. The Laser Unit monitors the output to determine if variations in the light intensity from the laser beam, variations in the optical system (such as mirrors and lenses), or variations in drum sensitivity are preventing the system from obtaining a proper electrostatic image and, if necessary, adjusts the light intensity to attain a stable electrostatic image.

LSU Error Table

Error	Description	Error Message
Polygon Motor Error	The polygon motor speed cannot obtain a steady state.	Laser Failure
Hsync Error	The polygon motor speed is steady, but the Hsync signal is not generated.	Laser Failure

Fuser Temperature Control

During Fuser temperature control the printer's target temperature is set. The heat roller surface temperature is controlled to match the target temperature by turning the heat element ON/OFF. The heat roller surface temperature is detected by a Thermistor. If the Thermistor shows that the temperature is higher than the target, the heat element is turned OFF. If the detection result is low, the heater lamp is turned ON. The fuser control circuit keeps the Fuser temperature at 185° C during printing and at 145° C during standby.

- When the power voltage for the printer is too high or too low, the Fuser is stopped to protect the Fuser.
- When the AC voltage is not applied to the Fuser control circuit, the fuser will not work and a Fuser Low Heat Error will occur.
- When the temperature of the Fuser is too high, an "Engine Overheat" error occurs if the cooling operation is insufficient.

Fuser Error Table

Error	Description	Error Message
Open Heat Error	When warming up, the Fuser has been lower than 60 degrees C for over 35 seconds.	Fuser Failure
Low Heat Error	Stand-by: <ul style="list-style-type: none"> ■ Lower than 130 degrees C for over 10 seconds. Printing: <ul style="list-style-type: none"> ■ Up to 2 consecutive pages: Lower than 155 degrees C for over 7 seconds. ■ From 3 consecutive pages: Lower than 25 degrees C than the fixed fusing temperature over 7 seconds. 	Engine Low Heat Error
Over Heat Error	Temperature is higher than 230 degrees C over 10 seconds.	Engine Over Heat Error

