DEClaser 5100 Printer

Service Guide

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Preface

This book is for Digital Service engineers to help them repair and service the DEClaser 5100 printer. Before using this book, you must attend the specific Digital Service training course and all other prerequisite training courses. Section D.1 lists all recommended courses.

Conventions

The following conventions are used in this guide:

Convention	Description
Note:	Notes provide additional information.
Caution:	Cautions contain information to prevent damage to the equipment or software.
Warning:	Warnings contain information to prevent personal injury.
On Line	All control panel keys are represented by a box with the name of the key inside the box.
Value	When this symbol appears next to a control panel message, it shows that a string of numbers normally accompanies the message. For example, in the Parity=*Value* message, the value can be one of five different words.
$\overline{PRNT}$	A line over a signal name indicates that when the signal is asserted, the signal is low.

How to Use this Guide

You can use this guide as a combined training document and for reference information.

Use the table of contents or the fault isolation procedures (FIP)s to find the section number of the information you need. The section header numbers (1.3, 2.3 and so on) are printed at the top of each page.

- Chapter 1 identifies the significant external and internal components of the standard printer and of the optional equipment.
- Chapter 2 describes the paper handling, electromechanical operation, and the xerographic processes.
- Chapter 3 describes the control panel operation.
- Chapter 4 describes the test prints and several miscellaneous procedures.
- Chapter 5 contains the start FIP and the total call concept (TCC) procedure.
- Chapter 6 contains FIPs for fixing power, control panel, and error message malfunctions.
- Chapter 7 contains the paper jam FIPs.
- Chapter 8 contains the image defect FIPs.
- Chapter 9 contains procedures for removing and replacing field replaceable units (FRU)s.
- Chapter 10 contains the FRU part numbers.
- Appendix A contains a map of the control panel key menus and a glossary-style description of each feature and value.
- Appendix B contains information on how to connect and configure the DEClaser 5100 printer.
- Appendix C contains the printer specifications.
- Appendix D contains information about tools, training, and documentation.

Notes:

DSG-000172

1

Physical and Functional Description

This chapter provides a physical and functional description of the DEClaser 5100 printer and of the optional printer equipment.

1.1 Product and Servicing Safety Notes

Note: *The DEClaser 5100 printer complies with all United States government safety regulations applicable to ozone gas emissions and laser beam light exposure.*

Laser Safety: *The DEClaser 5100 printer complies with 21 CFR Chapter 1, Subchapter J, as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard, according to the Radiation Control for Health and Safety Act of 1968. The DEClaser 5100 printer does not emit hazardous light because the laser beam is totally enclosed during all modes of customer operation and maintenance.*

Warning: *Use of controls or adjustment procedures other than those specified in this manual could result in hazardous laser light exposure.*

1.2 Physical Description

Figure 1–1 presents a view of the front and right side of the printer. The names and functions of the items are described in Table 1–1.

Figure 1–1 Front View

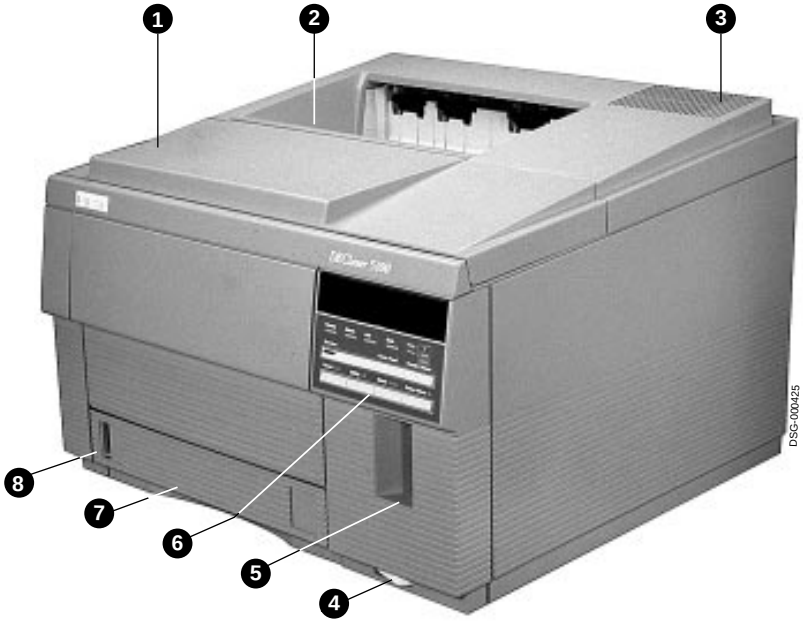


Table 1–1 Front View

❶	Top door and cover	Lifts for access to the EP-ED cartridge or for clearing paper jams. When closed, a plastic post pushes down the linkage to the interlock switch. The switch connects the +24VB power to the main motor and paper feed motor. See Section 2.1.3 for additional information.
❷	Face down tray delivery stack	Holds up to 250 sheets. This printer has no tray full or job offset features.
❸	Hot air exhaust	The main fan blows the hot air from inside the printer through this vent. Overheating might result if the vent is blocked.
❹	Power on/off switch	Connects to the main LVPSA switch by a mechanical linkage.
❺	Font cartridge slot	Holds up to two optional PCMCIA font cartridges. The cartridges can be hot swapped (with power applied) but the printer must be paused.
❻	Control panel	Consists of seven multipurpose keys, an alphanumeric display panel, and indicators that light or flash to show status conditions. See Chapter 3 for additional information.
❼	Internal paper cassette	Holds up to 250 sheets of xerographic paper. Internal cassettes are available in fixed or universal sizes. The universal cassette can be configured to accommodate the standard sized sheets listed in Table 2–1.
❽	Cassette full/empty indicator	The mechanical indicator links to and moves with the paper stack lifter inside the cassette.

1.2 Physical Description

Figure 1–2 shows the components that are accessible through the front tray of the printer. Table 1–2 describes the components.

Figure 1–2 Front Tray Open

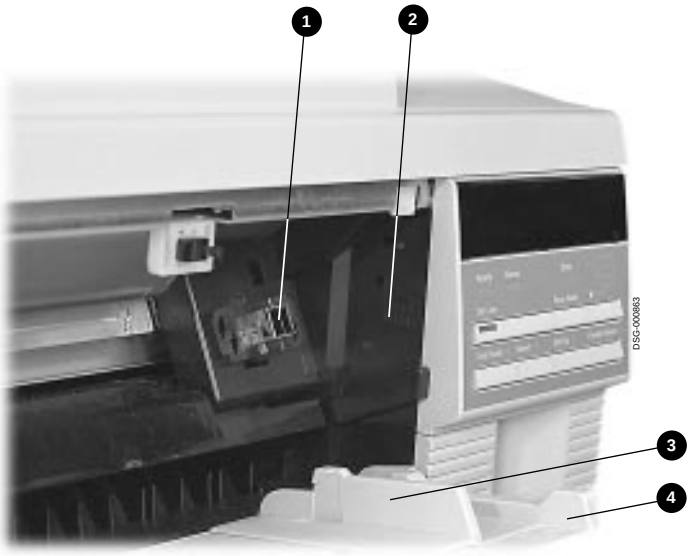


Table 1–2 Front Tray

❶	Envelope feeder connector	Connects the optional envelope feeder to the feed unit controller. It is hidden by a panel when no envelope feeder is installed. See Section 9.24 for envelope feeder and panel installation.
❷	Test print switch	Use a suitable tool to press this switch. When pressed, the DC control board feeds and prints one copy of the engine board test pattern from the internal cassette only. See Section 4.7 for additional information.
❸	Adjustable paper guides	The adjustable guide is moved to hold the media against the fixed guide. Image skewing, paper jams, or bad image positioning can occur if the adjustable guide is too loose or over-tightened.
❹	Front tray and door	Shown in the open position. The tray accommodates standard size cut sheets and envelopes. The tray is monitored by the paper end and front tray paper sensor.

1.2 Physical Description

Figure 1–3 shows the inside components that are accessible through the top door of the printer. Table 1–3 describes each component.

Figure 1–3 Inside the Top Door

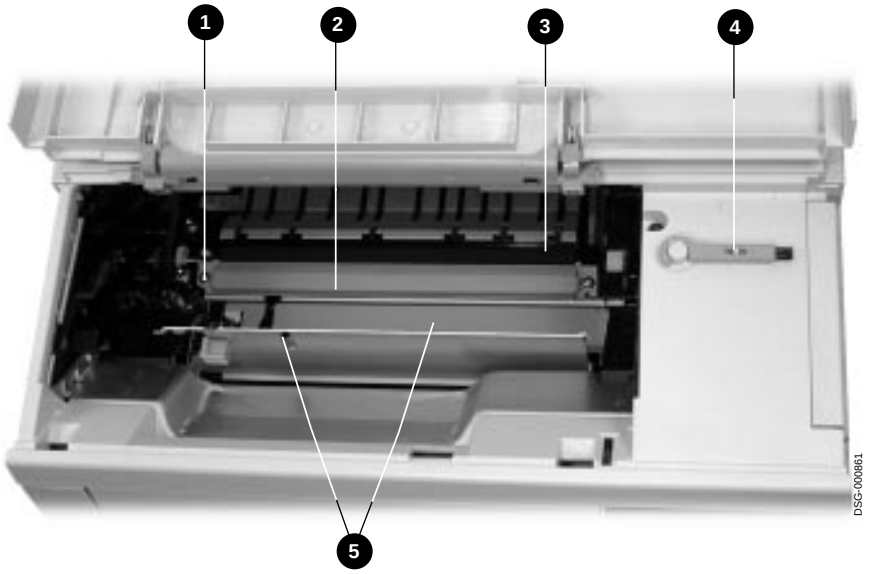


Table 1–3 Inside the Top Door

❶	EP-ED connector block	The EP-ED connector block is part of the HVPSA contact guide plate. The block carries the primary, development, toner sensor, and ground currents to the EP-ED cartridge. See Section 2.5.1 for more information.
❷	Jam clearance plate	Opens to allow removal of jammed paper. Lift the green handle to open the plate and disengage the upper oblique rollers.
❸	Transfer roller	The foam transfer roller is a crucial part of the xerographic process. (See Section 2.3.3 for additional information.) When you handle the transfer roller, only touch the extreme ends. Fingerprints on the roller can cause image defects.
❹	Cleaning brush	The cleaning brush is used to sweep toner and dust out of the static eliminator, which is located next to the transfer roller. The hooked end of the brush is useful for removing the transfer roller.
❺	Registration sensor	This sensor detects paper feeding from any of the standard or optional feed units. The DEClaser 5100 has no registration clutch or rollers.

1.2 Physical Description

Figure 1–4 shows the components that are accessible through the rear door of the printer. Table 1–4 describes each component.

Figure 1–4 Rear Panel

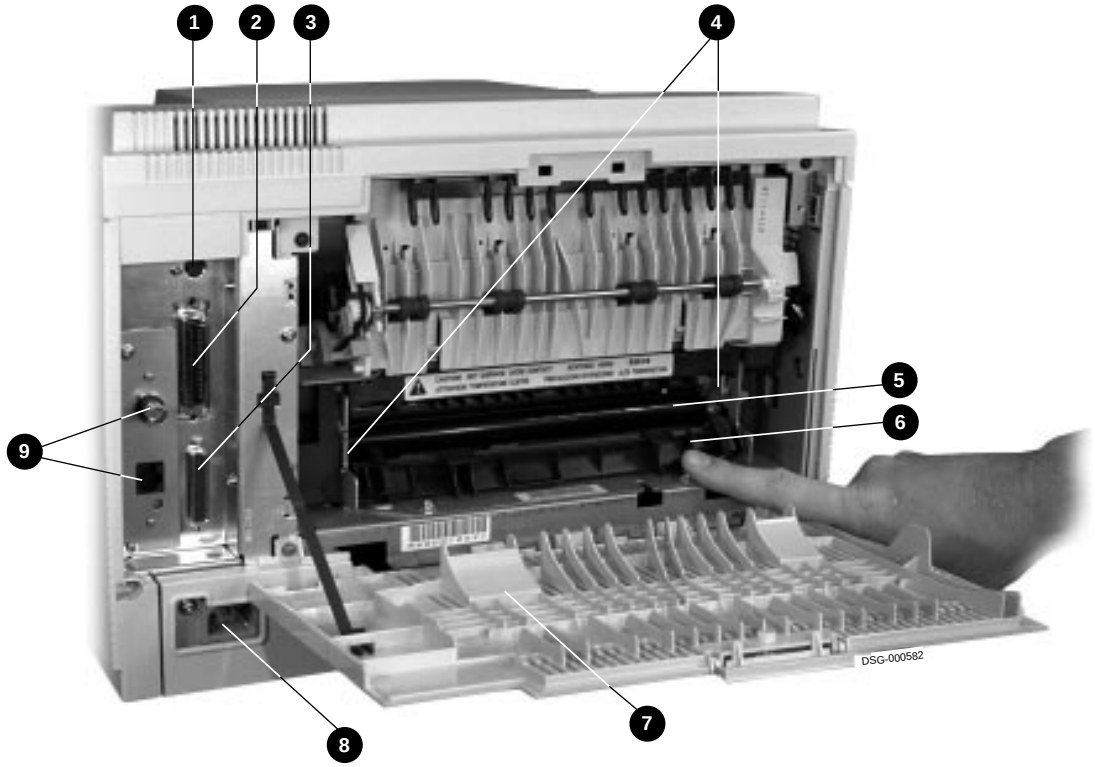


Table 1–4 Rear View

❶	LocalTalk port	This port connector is for connecting to an AppleTalk network. See Section B.3 for more information.
❷	Parallel (Centronics) port	Accepts a 36-pin connector cable. The connector is physically and electronically compatible with the Centronics protocol.
❸	Serial port	This 25-pin connector electronically and electrically complies with the EIA-232-D or CCITT V.24 interface specifications.
❹	Fusing assembly levers	These two levers release the pressure on the fusing pressure roller. The levers are up when the customer first receives the DEClaser 5100 or if the fusing unit is replaced. Operating the printer with one or both of the levers up, causes fusing failure or paper jams to occur.
❺	Fusing exit/rear door sensor	This sensor monitors the fusing exit paper path and the rear door.
❻	Fusing exit	The fusing exit opens to allow removal of jammed paper.
❼	Rear door	Press the latch to open the rear door to the position shown. The door opens to allow the user to clear paper jams.
❽	Power cord receptacle	Accepts the 115 or 220 Vac power line cord.
❾	DECmultiNET 100e connectors	These connectors accept standard Ethernet ThinWire or Thickwire connectors. See Section 1.6 for more information. If no DECmultiNET option is installed, a block-off plate can be seen in place of these connectors.

1.2 Physical Description

Figure 1–5 shows the components that are visible from underneath the printer. Table 1–5 describes each component.

Figure 1–5 LCIT Interconnection

Table 1–5 LCIT Interconnection

❶	Cassette paper feed roller	Feeds paper from the internal cassette into the oblique rollers. The roller is replaced during the 200K maintenance procedure described in Section 5.3.1.
❷	Size sensing switches	There are two sets of size sensing switches: one in the optional LCIT cassette slot and the other in the internal cassette slot. Each set consists of three switches. The size sensing switches read the configuration of the keys on the side of the installed cassette. This information is compared to the selected size by the firmware. A mismatch causes an error to display.
❸	LCIT interface connector	This 4-pin connector connects the LCIT controller board to the feed unit controller.
❹	HVPSA	The HVPSA supplies the xerographic charge and bias voltages.

1.3 Cassettes

Figure 1–6 is a picture of the universal LCIT cassette. Table 1–6 describes the cassette components.

Universal cassettes are available for the LCIT and for the internal cassette. The internal cassettes are shallower and have a paper path slot in front.

Figure 1–6 Universal Cassette

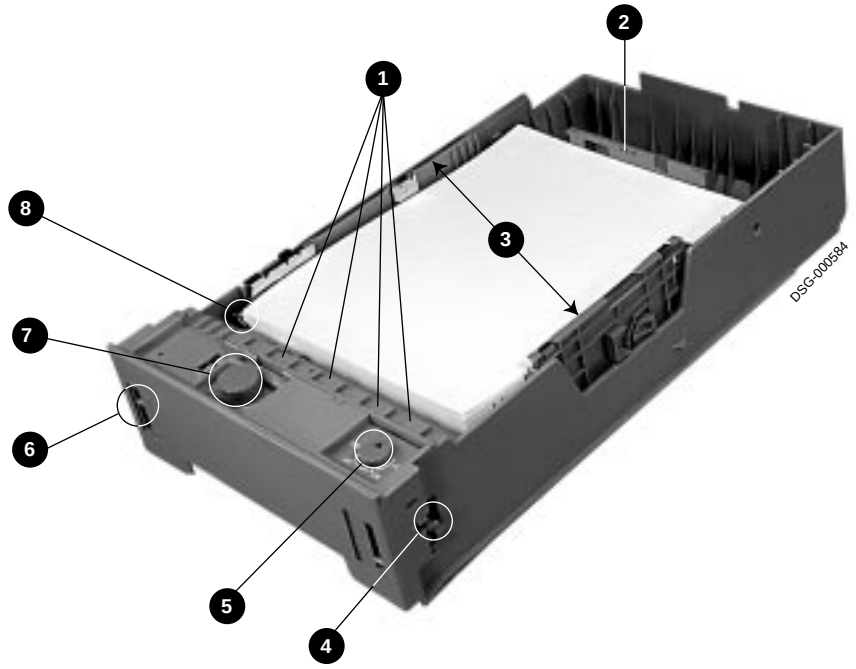


Table 1–6 Fixed and Universal Cassettes

❶	Paper path	Directs paper into the printer. When paper feeds from the LCIT it feeds through the front of the internal cassette. This area must be free of obstructions, adhesive matter, and in good physical condition.
❷	Rear paper guide	Holds the paper stack in good feeding position and controls stack alignment. If the rear guide is adjusted incorrectly, the paper stack might misalign and cause paper jams and registrations defects.
❸	Side guides	Hold the paper stack in position and controls stack alignment. The left side guide if fixed and the right side guide is adjustable. If the right side guide is adjusted incorrectly, the paper stack can misalign and cause skewing and jams.
❹	Size sensing keys	Actuate the size sensing switches on the side of the cassette slot. The size information is compared with the size entered in the menu or received from the host. If a mismatch occurs, a paper size error appears. Table 2–1 gives the key configuration for each paper size.
❺	Paper size adjuster	Sets the size-sensing keys. An incorrectly set paper size causes false paper jams or paper mismatch errors.
❻	Cassette full indicator	Shows the amount of paper remaining in the cassette.
❼	Spring balance knob	On the LCIT universal cassette only. Knob adjusts the spring pressure that lifts the stack up into the paper feed roller. Adjust the knob to position the indicator in the center of the window.
❽	Paper corner guide	Holds the corner of the paper stack down. During paper feeding, the corner of the top sheet of paper flicks out from under the guide while underlying sheets do not. This action prevents multiple sheet-feeding.

1.4 Optional Feeders

Figure 1–7 shows the DEClaser 5100 large capacity input tray (LCIT) and Table 1–7 identifies the components.

Figure 1–7 LCIT

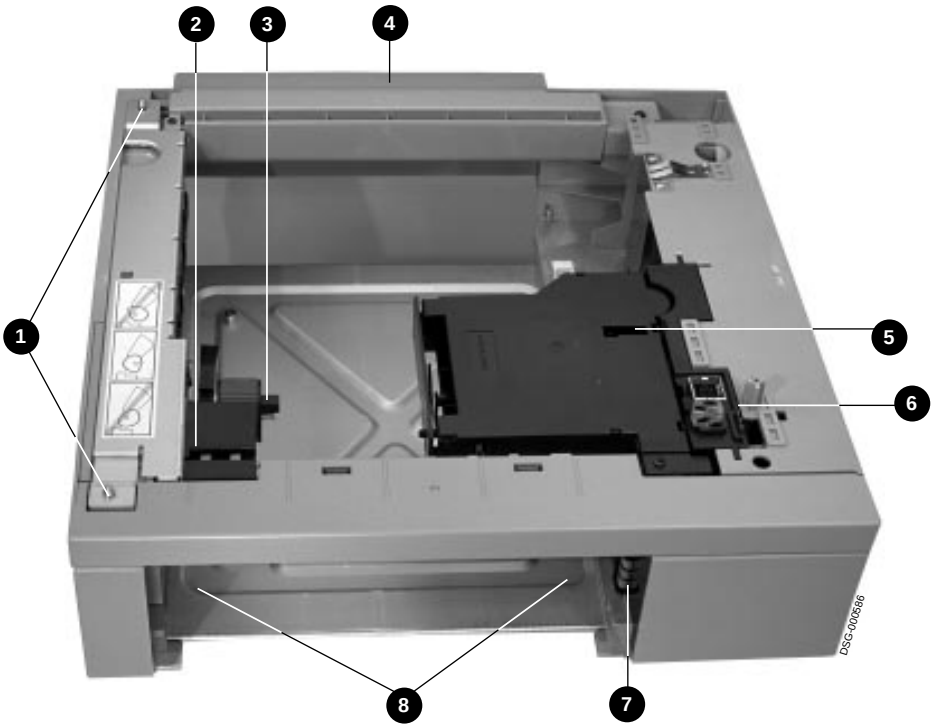


Table 1–7 LCIT

❶	Alignment pins	Mesh with holes in the base of the printer and provide precise alignment.
❷	Oblique rollers	Move the sheet through the internal cassette into the paper feed unit.
❸	Paper feed roller	Moves a sheet off the stack into the nip of the oblique rollers.
❹	Extender plate	Fits on the rear of the LCIT to cover the tail of the longer cassettes.
❺	Control board	Operates as a peripheral device to the paper feed controller board. See Sections 2.1, 6.17.1, and 9.10 for more information.
❻	Interface connector	A 4-pin connector that connects the LCIT controller board to the feed unit controller.
❼	Size sensing switches	Three size sensing switches read the configuration of the keys on the side of the installed cassette. Table 1–6 shows and describes the size sensing keys. This information is compared to the selected size by the firmware. A mismatch causes an error to appear. There are two sets of size sensing switches: one in the optional LCIT cassette slot and one in the internal cassette slot.
❽	LCIT cassette slot	Accepts a fixed or universal 500-sheet LCIT cassette. The 500 sheet LCIT cassettes are twice as deep as the 250 sheet internal cassettes.

1.4 Optional Feeders

Figure 1–8 shows the DEClaser 5100 optional envelope feeder and Table 1–8 identifies the components.

The envelope feeder is a field replaceable unit.

Figure 1–8 Envelope Feeder

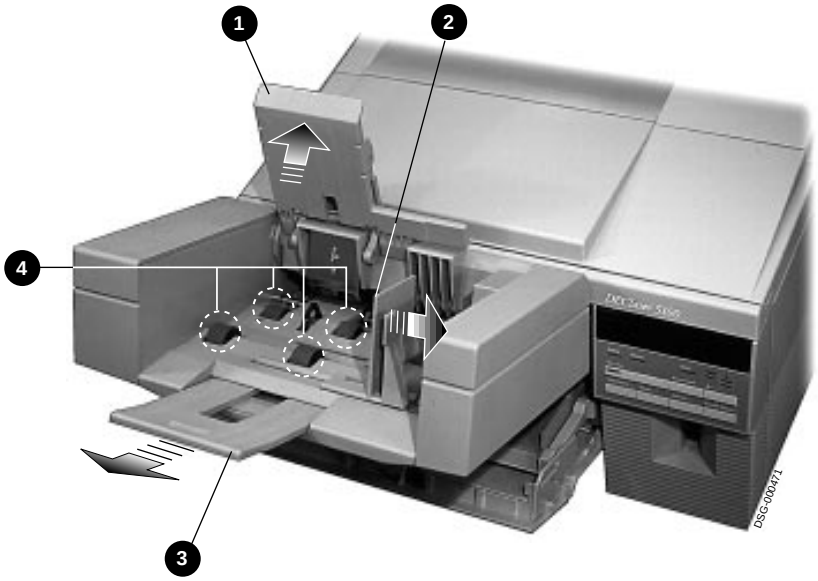


Table 1–8 Envelope Feeder

❶	Stack compressor	Presses the stack down into the envelope feed rollers.
❷	Adjustable guide	Adjusts to hold the envelope stack against the left side of the envelope feeder.
❸	Support tray	Provides support for long envelopes.
❹	Envelope feed rollers	Feeds envelopes from the bottom of the stack into the printer.

1.5 Memory Options

Font memory is an area of printer memory that stores downline-loaded fonts. Once stored in font memory, the font stays until the printer is powered down. Print jobs that downline-load many fonts expand the size of font memory until memory overflow errors occur.

To deal with memory overflow errors, customers can increase font memory by installing single in-line memory modules (SIMMs) or an optional hard disk assembly.

1.5.1 Optional Hard Disk

The optional hard disk expands font memory by 127 non-volatile MB. The downline-loaded fonts remain in the printer through power cycles. Storing fonts on the disk leaves the RAM free for other needs.

The disk is customer installable and the disk formatting procedure is automatic and interactive. See the following locations for additional information:

- Section 4.11 contains the formatting procedure.
- Section 6.11 contains the hard disk display messages and FIP.
- Section 9.6 contains the hard disk assembly removal and replacement procedure.

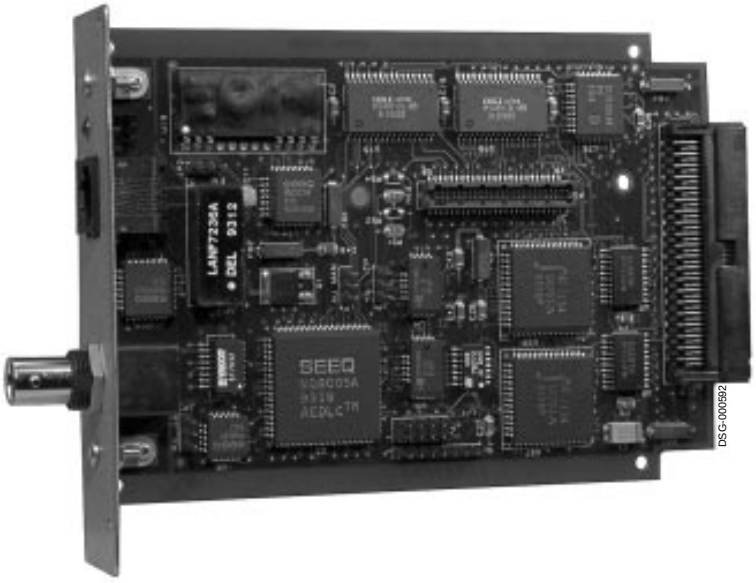
1.5.2 Expansion Memory

The video controller board has two expansion memory (SIMM) slots. Each slot can hold a 4-, 16-, or 32-MB SIMM. The additional RAM increases the available RAM to the video controller board. See the removal/replacement procedure in Section 9.14 to install a SIMM.

1.6 Ethernet Network Board

An optional Ethernet network board slides into the rear of the printer and provides a ThinWire or twisted-pair connection.

Figure 1–9 Ethernet Network Board



1.7 Font (PCMCIA) Cartridges

Figure 1–10 shows a font cartridge being installed into the font cartridge slot. The notch ❶ must be facing up for the cartridge to install correctly. The PCMCIA compliant font cards can be inserted in while the printer is on.

Figure 1–10 Font Cartridge Installation

1.8 Resolution/Graphics Enhancements Option Board

The optional Resolution/Graphics Enhancements (RGE) board is installed in a connector on the video controller board. The connector socket is located above the two SIMM sockets.

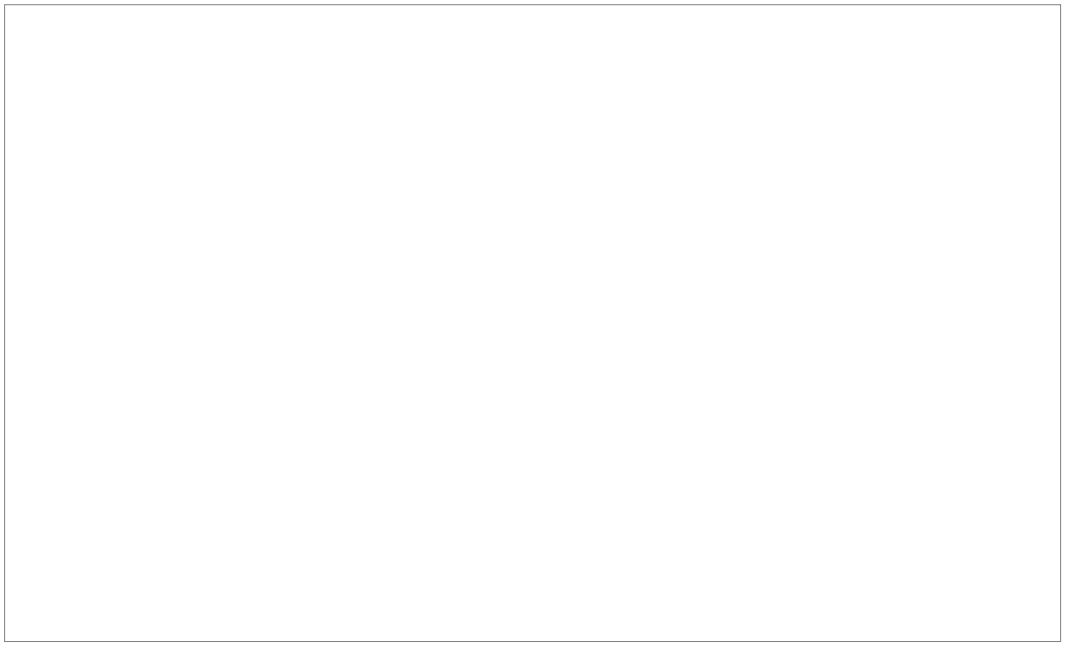
RGE image enhancement differs from DECimage enhancement. RGE creates a 1200 x 1200 bit map in the video controller board memory; DECimage uses a 600 x 600 dpi bitmap. This memory usage might cause memory overflow or print overrun errors (described in Section 6.8) when printing complex images or using many downline loaded fonts.

The RGE enhances the appearance of all PostScript and PCL images. Low resolution image enhancement begins as soon as the RGE board is plugged in and power is turned on. It cannot be enabled or disabled. Two high-resolution features are available:

- 1200 x 600 dpi
- 1200 x 1200 dpi

1.8 Resolution/Graphics Enhancements Option Board

Notes:



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2
Technical Description

This chapter provides a technical description of the following major sections of the DEClaser 5100 printer:

- Section 2.1 describes the block diagram, operational modes, low-voltage power supply assembly (LVPSA) and interlock systems, and presents board and connector level wiring diagrams.
- Section 2.2 describes the paper feeding system plus paper size sensing and detection.
- Section 2.3 describes the xerographic process.
- Sections 2.4 and 2.5 present a detailed description of the scanner and high-voltage power supply assembly (HVPSA).

See the detailed wiring diagrams in Figures 6–2 through 6–5.

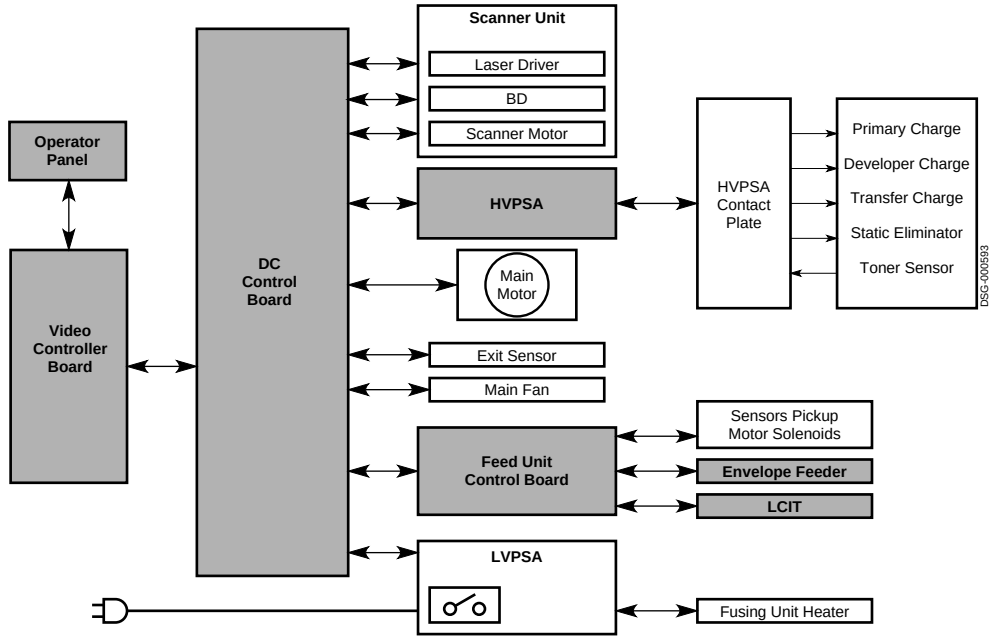
2.1 Print Engine Control

Figure 2–1 shows the overall block diagram of the DEClaser 5100 printer. The shaded blocks indicate microcomputer-controlled devices. All nonshaded components are operated by discrete binary signals.

The DC control board operates all the print engine devices, solenoids, sensors, motors, and so on. The DC control board can operate the printer and print the engine test pattern with no video control board installed.

Section 2.1.1 describes the operation and functioning of the video controller board.

Figure 2–1 Overall Block Diagram



2.1 Print Engine Control

2.1.1 Video Controller Board and SmartPage

Figure 2–2 shows the video controller board mechanically and electronically connecting and interfacing to the following standard and optional devices:

Standard devices:

- The AppleTalk, parallel, and serial interface ports that allow direct simultaneous connections to three different host computers
- The operator panel provides users with control and status
- The DC control board which operates the print engine

Optional devices:

- One or two font cartridge
- Optional hard disk drive
- Optional XLI image enhancement board
- Optional Ethernet network card

The video controller board accepts PostScript level 2 or PCL5E code files from either the host or Ethernet interfaces and creates a bitmap image. The bitmap is fed to the DC controller board as the $\overline{VDO}$ signal that is described in Section 2.4.

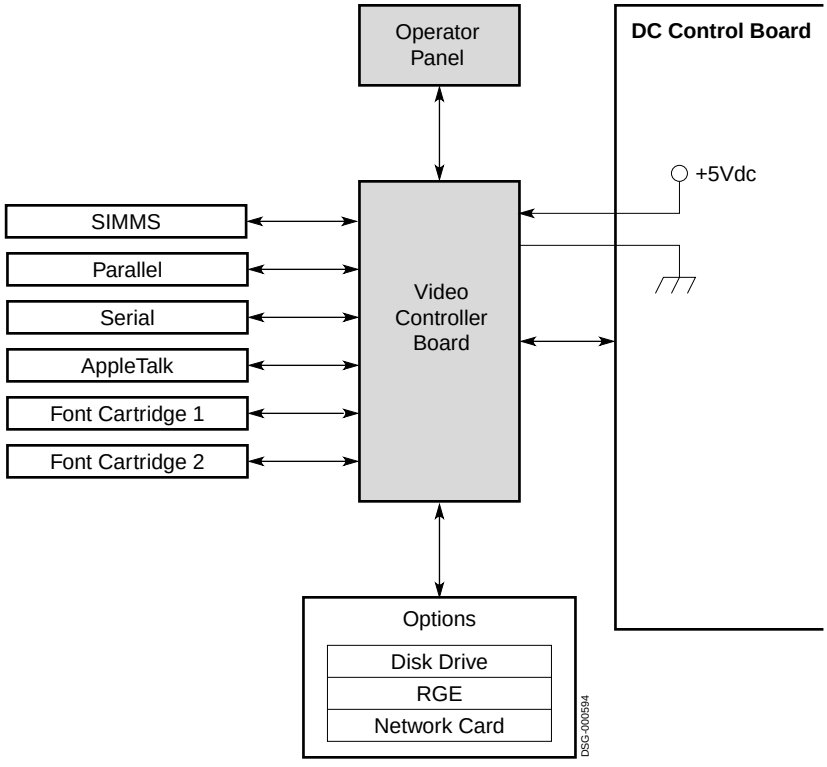
Traditionally, an entire page is bitmapped into RAM before the printer is commanded to feed and print. Such a system requires a considerable amount of RAM memory.

SmartPage is the name of the process that the DEClaser 5100 printer uses to create the printed image. Instead of bitmapping an entire page, this printer bitmaps in bands. When one band is complete, it prints while the next band is bitmapping. The SmartPage process uses about one-sixtieth as much RAM as a full page bitmap requires.

Occasionally, a complex image might exceed the capabilities of the SmartPage process, or memory might overflow due to insufficient memory. When SmarPage fails, the printer:

- Displays a memory overflow or print overrun error message (See Section 6.8
- Fails to print from the point of error to the end of the sheet
- Continues to print until the job is finished

Figure 2–2 Video Controller Block Diagram



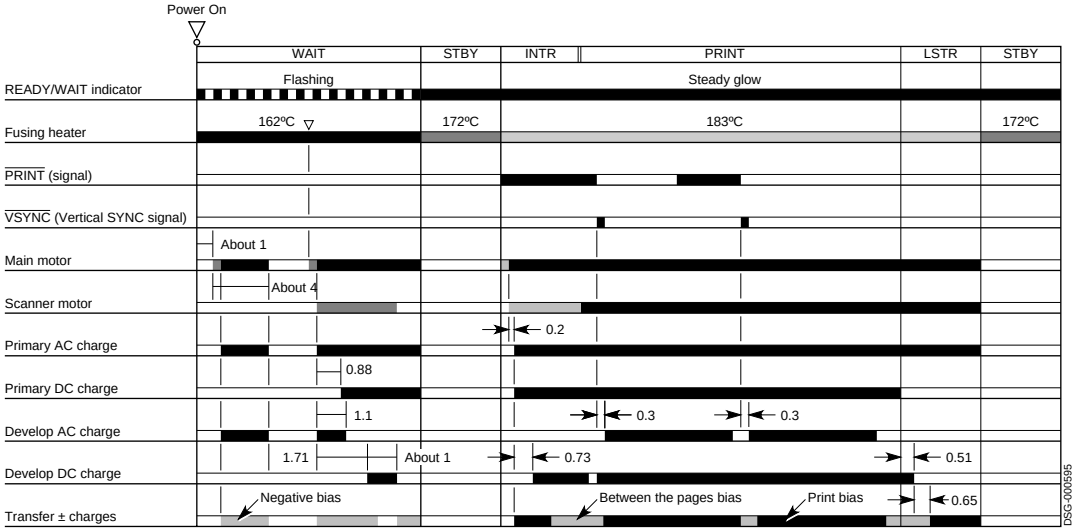
2.1.2 Print Engine Modes

Figure 2–3 shows the activity that occurs during the following DEClaser 5100 operational modes:

1. When the printer is powered on, the printer enters the **wait mode** and:
   - Turns on the fusing heater and monitors the temperature rise.
   - Checks the top door and rear door closed sensors
   - Makes sure the selected feeder is installed and loaded
   - Checks the EP-ED cartridge and toner empty signal
   - Runs the main and scanner motors
   - Turns the high-voltage bias supplies on and off
   - Cleans the transfer roller
2. If all the wait checks pass, the printer enters standby **STBY mode** until a print request is received. During standby, fusing temperature and interlocks are maintained. Standby ends when a print command is received from the video controller or from the test print switch.
3. After a $\overline{PRNT}$ signal is received, the printer enters the initial rotation (**INTR mode**) which lasts approximately six seconds. During this period the fusing temperature is raised, the main and scanner motors come up-to-speed, and the print drum stabilizes.

4. During **print mode**, the fusing temperature is maintained, interlocks are tested, and printing is performed.
5. During the last rotation mode (**LSTR**) the last page of the job is ejected and the transfer roller is cleaned. If a $\overline{PRNT}$ signal is received during this mode, then initial rotation mode immediately begins.

Figure 2–3 Print Engine Modes Timing Diagram



2.1.3 Low-voltage Power Supply Assembly

Figure 2–4 shows the circuits of the low-voltage power supply assembly (LVPSA). If a short circuit or other fault draws excessive current from the +24VA or +5V regulators, the output voltage decreases to a minimal level. To reset the regulator, power the printer off and then on again.

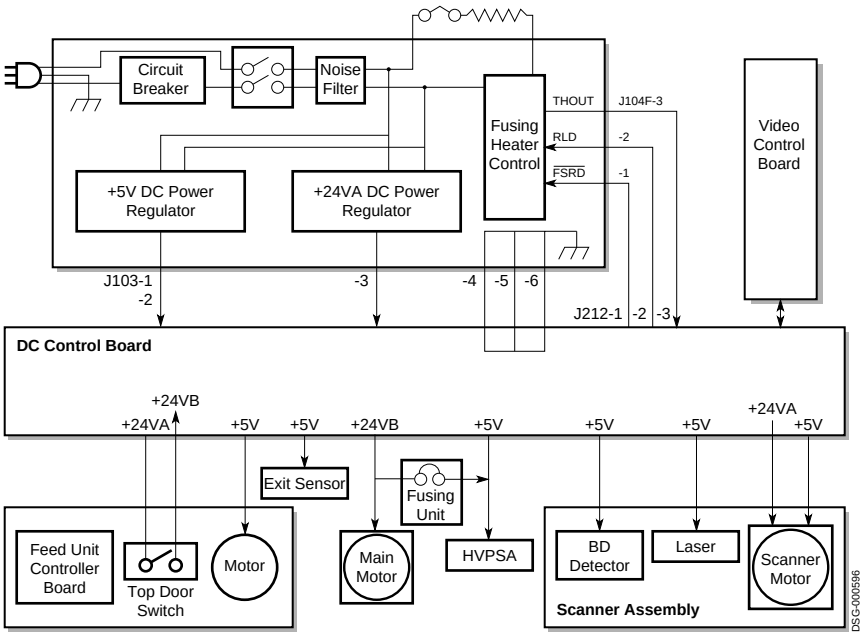
The circuit breaker reset button is accessible through a hole on the side of the LVPSA. The circuit breaker opens when a short circuit occurs in the LVPSA. A shorted power regulator output should not trip the circuit breaker.

Note: *A 6.3 amp fuse is used in place of the circuit breaker of power supplies that carry the Sanken label.*

When the top door is closed, the top door switch provides the +24VB to the motors and high-voltage supplies.

Section 2.1.4 describes the operation of the fusing heater control circuit and the *THOUT*, *RLD*, and $\overline{FSRD}$ signals.

Figure 2–4 LVPSA Diagram



2.1.4 Fusing Heater Control

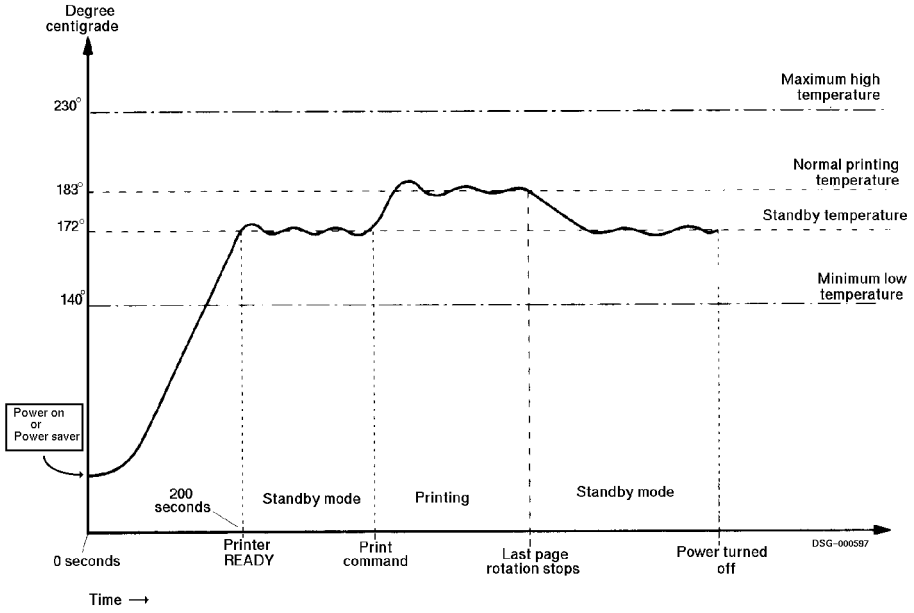
Figure 2–5 shows how the fusing temperature varies after power and during printing and standby operations.

Figure 2–7 shows the circuitry that controls the fusing temperature. The surface temperature of the upper fusing unit roller is measured by thermistor (TH1) and adjusted by the DC control board.

The fusing temperature sets the resistance of TH1, establishing the voltage level for the analog *FSRTH* signal. The resistance of TH1 decreases as the fusing temperature increases. The following TH1 resistance readings are measurable across pins 1 and 2 of the fusing unit connector (J743):

- Room temperature resistance of TH1 is approximately 239K Ω.
- Operating temperature resistance of TH1 is less than 2.0K Ω.

Figure 2–5 Fusing Temperature Chart



2.1.5 Fusing Malfunction

If a fusing malfunction occurs, dynamic and passive safety circuits disable the fusing heater current.

The safety circuit opens RL101 and disconnects the fusing current if the:

- Fusing temperature fails to reach 172°C (341.6°F) within 200 seconds of power on, the DC control board asserts *RLD*.
- Fusing temperature rises above the maximum high temperature
- Fusing temperature falls below the minimum low temperature.
- A short circuit occurs in the fusing heater or leads. The LVPSA senses the increased current and forces the safety circuit to open RL101.

If an uncontrollable temperature rise occurs, the thermoswitch (TP1) opens to permanently disconnect the fusing current.

When a fusing error occurs, C202 is charged to approximately +5 Vdc, which prevents the operation of the fusing circuit. C202 discharges only when the power is turned off. If power is turned on before the charge is completely drained, C202 fully recharges. **The printer must remain off for approximately 10 minutes.**

Caution: *If you do the following, be sure to power off the printer and disconnect the power cord. For service reasons only, C202 can be discharged by touching the + lead of C202 to the metal chassis ground frame. Failure to power off the printer can damage the DC control board.*

Figure 2–6 Discharging C202

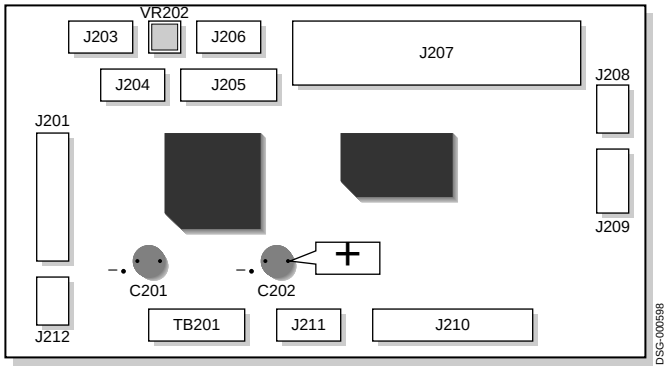
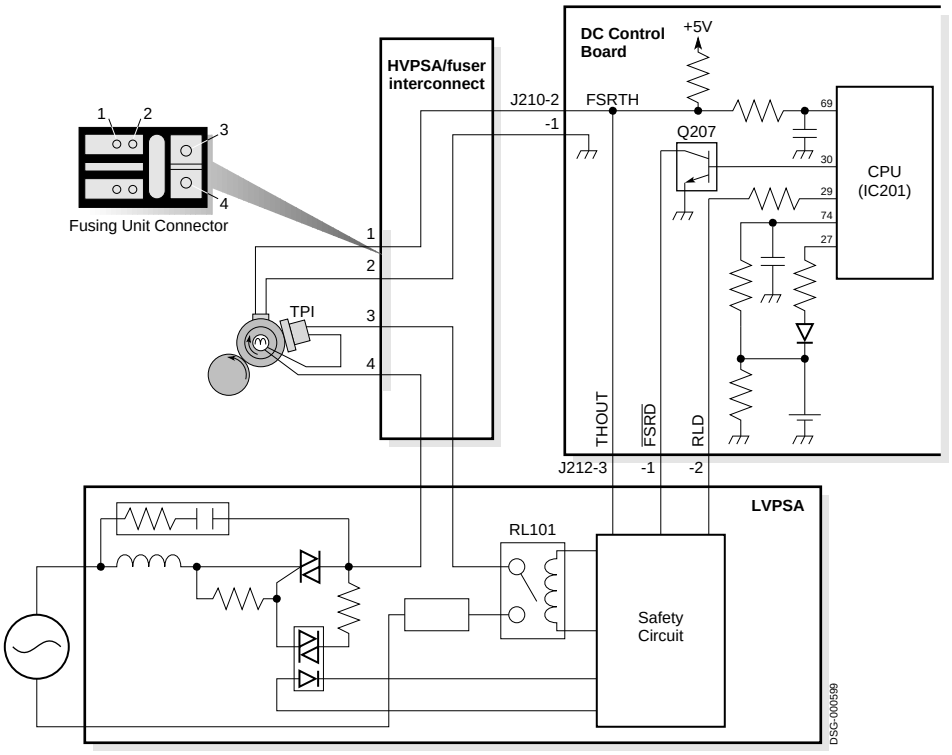


Figure 2–7 Fusing Control Circuits

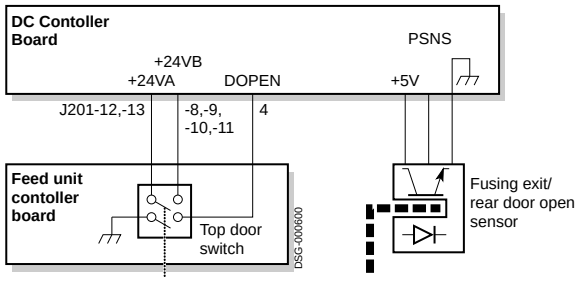


2.1.6 Interlocks

The top door open switch is the only interlock circuit in the DEClaser 5100 printer. Pole 1 disconnects the +24VB; pole 2 asserts *DOPEN* signal.

The rear door opening is sensed by the combined fusing exit/rear door sensor. When the rear door is open, the "Paper Jam" message appears.

Figure 2–8 Interlock Diagram



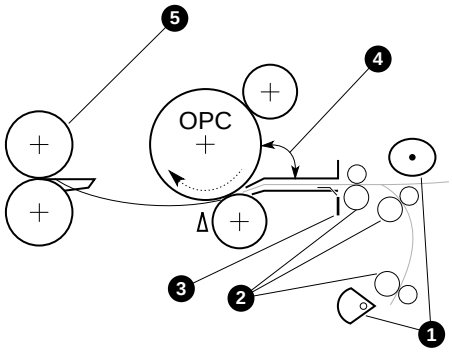
2.2 Paper Feeding System

Paper can feed from the cassette underneath the printer, or from the front tray or envelope feeder at the front of the printer. The paper feed unit mechanically and electrically controls all media feeding.

- The front tray can feed paper, envelopes, labels, and single sheets.
- The envelope feeder holds about 55 envelopes.
- The internal or optional LCIT cassettes feed only standard sized cut sheets, listed in Table 2–1.

2.2 Paper Feeding System

Before the feed process can start, the user must first load and select a feeder. When the print job is received, the video controller sends a $\overline{PRNT}$ signal to the DC control board. If the engine is in standby mode, a short pause occurs while the fusing unit warms up and initial rotation (INTR) occurs. Finally, the feed process can start.



The feed process starts when the pickup motor runs for 0.1 second. Then the paper feed solenoid energizes which turns the paper feed roller ❶ and moves a sheet of paper into the nip of the oblique rollers ❷.

The two oblique rollers drive the sheet forward and sideways into the left side plate and then into the registration sensor ❸. This action deskews the sheet squarely aligning it with the axis of the print drum.

When the paper triggers the registration sensor, the paper feed motor pauses to allow the print drum to rotate into alignment ❹ with the leading edge of the sheet. When these are aligned, the paper feed motor starts and feeds the sheet into the transfer point.

The paper is supported by the oblique rollers which move the sheet through the transfer and static elimination areas and into the nip of the fusing rollers ❺.

2.2 Paper Feeding System

2.2.1 Size Sensing Cassettes

Table 2–1 shows the size sensing switch code. The three size sensing switches are set by keys that are attached to the right side wall of each cassette.

The keys on the fixed cassette are molded into the body of the cassette. The keys on the universal cassette are set by the user.

The size sensing information is compared to the user-requested size. If a mismatch occurs, an operator load tray message appears.

Table 2–1 Size Sensing Switches

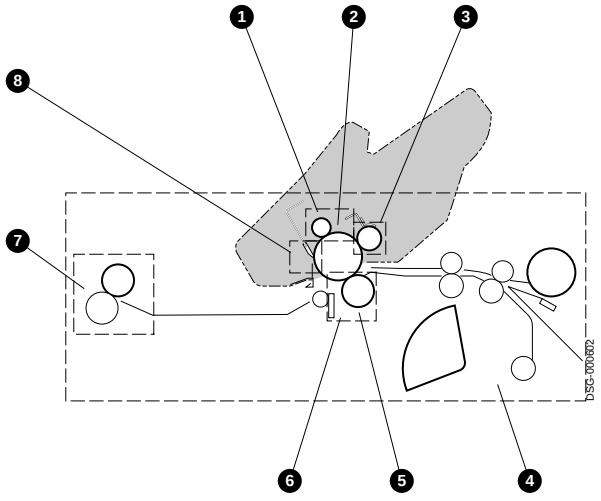
Paper Size	Size Sensing Switches		
	SW603	SW604	SW605
Legal	On	On	Off
Letter	On	Off	On
Executive	Off	On	On
B5	Off	On	Off
A4	Off	Off	On
No cassette	Off	Off	Off

2.3 Xerographic Process

Figure 2–9 shows the xerographic components of the EP-ED cartridge. The components within the shaded area are part of the EP-ED cartridge. In the next table, each item is listed with a reference for more information.

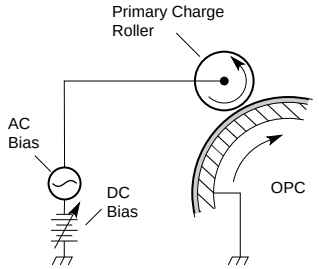
	Process	See Section...
❶	Primary Charging Process	2.3.1
❷	Exposure Process	2.3.2
❸	Development Process	2.3.3
❹	Paper Feeding System	2.2
❺	Transfer Process	2.3.4
❻	Separation Process	2.3.5
❼	Fusing Process	2.3.7
❽	Print Drum Cleaning Process	2.3.6

Figure 2–9 Xerographic Process



2.3 Xerographic Process

2.3.1 Primary Charging Process



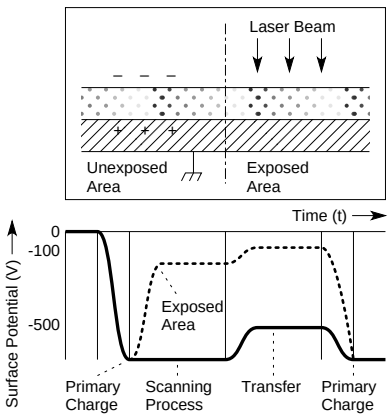
The ac and dc biases on the primary charge roller distributes an even charge across the Organic photoconductor (OPC) drum. The ac bias is applied to keep the primary charge even across the surface of the print drum.

Density can be adjust to obtain a darker print by concurrently changing both the primary and development dc bias. The development dc bias is described in Section 2.3.3.

The primary charging roller is made of a conductive foam rubber-like compound and is part of the EP-ED cartridge. The foam roller charging system requires less high-voltage bias and produces less ozone then corona type charging systems used on other printers.

As the OPC drum turns, the primary charge is subjected to the exposure process.

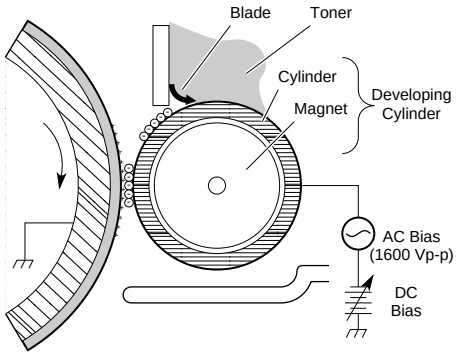
2.3.2 Exposure Process



The data modulated scanning laser beam paints a latent image on the rotating OPC drum. Where the laser exposes the drum, the existing primary charge is neutralized. The primary charge remains in the unexposed areas.

This exposure system is commonly referred to as a **write black system**. The areas exposed to the laser light correspond to the black areas of the printed image. The unexposed areas retain the primary charge, failing to attract toner to the drum during the development process.

2.3.3 Development Process



During the development process, the invisible latent image is painted with toner, producing a visible image on the surface of the OPC drum.

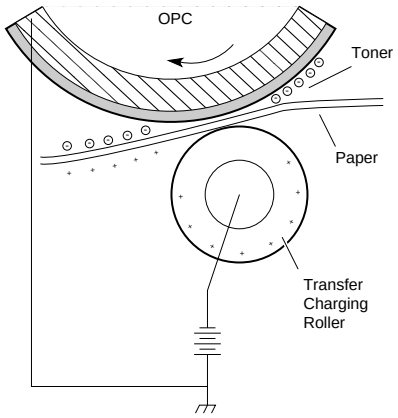
The fixed magnet in the developer roller attracts the magnetite-based toner to the surface of the developer roller. The doctor blade scrapes off the excess toner.

The dc bias on the development roller charges the toner particles, while the ac charge pushes and pulls the charged particles toward the latent image on the surface of the OPC drum.

On the OPC drum, the highly charged unexposed areas repel the toner. The lesser charged, or exposed areas are painted with the toner, thus making the image visible to the naked eye.

The developer dc bias varies from the primary dc bias (see Section 2.3.3).

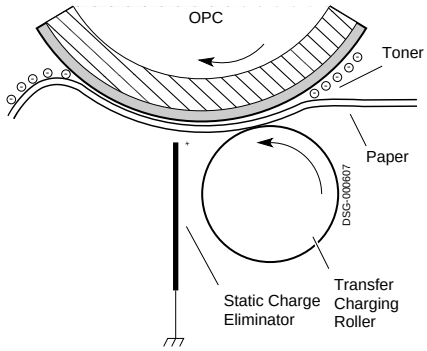
2.3.4 Transfer Process



In the transfer process, the toner image is attracted from the OPC drum to the sheet of paper by the highly charged transfer charging roller. The transfer roller is made of a conductive foam rubber-like compound.

During normal printer operation, the porous surface of the transfer charging roller attracts a small amount of toner, which can degrade the quality of the image. To purge this toner, a reverse polarity is applied during initial rotation (INTR) and between sheets. Frequent jamming and other malfunctions can overwhelm the transfer charging roller purging process and cause image defects.

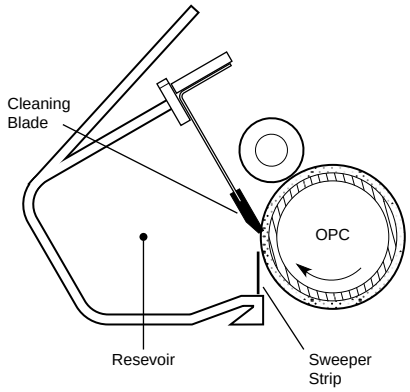
2.3.5 Separation Process



The sheet is separated from the print drum by the stiffness of the printed sheet. This process is also referred to as "curvature separation."

The static eliminator reduces the powerful static charge left on the sheet by the transfer process. Malfunctions of the static eliminator produce the distinctive image defect that is described in Section 8.5.

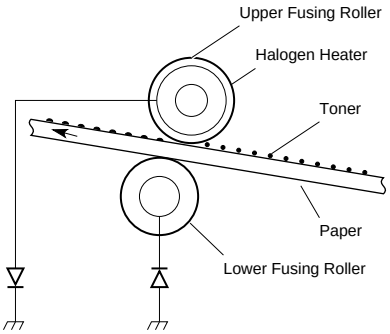
2.3.6 Print Drum Cleaning Process



After the toner image is transferred and the sheet travels to the fusing unit, residual toner is cleaned from the OPC drum surface.

The sweeper strip and cleaning blade scrape any remaining toner off the OPC drum. This toner falls into a reservoir and is not used again; it stays in the reservoir until the EP-ED cartridge is replaced.

2.3.7 Fusing Process



After the transfer process, the toner image is loosely held to the paper sheet by electrostatic and adhesive forces. At this stage, all of the toner could be brushed off the page.

As the sheet passes between the upper and lower fusing rollers, the toner melts and is pressed into the sheet, thus making a permanent image.

The two diodes connect the axial shafts to ground and establish a strong negative cleaning charge on the upper roller. The upper metal fusing roller accumulates the charge from the residual transfer charge that adheres the unfused toner to the sheet. This negative charge repels the like-charged toner particles from the upper roller thus making it difficult for the toner to stick to the fusing rollers.

The nonstick coating on the upper roller also helps prevent toner from sticking.

2.4 Scanner

Figure 2–10 shows the circuits and components within the scanner assembly.

When the printer is powered on, the DC control board generates the scanner clock ($SCNCLK$) signal that regulates the speed of the scanner motor. The scanner motor does not run until a print command is received.

When $\overline{VSYNC}$ is received, the DC control board asserts the following signals to turn on the scanner and laser:

- $\overline{SCANON}$ to run the scanner motor
- $\overline{ENBL}$ to enable the laser diode
- $\overline{LON}$ to force the laser diode on

When the scanner motor is up-to-speed, the scanner ready ($\overline{SCNRDY}$) signal is sent to the DC control board. The following conditions cause a scanner motor error:

- $\overline{SCNRDY}$ fails to assert within 20 seconds of $\overline{SCON}$.
- $\overline{SCNRDY}$ negates (goes high) for longer then 2.5 seconds while the scanner motor is running.

When the scanning beam passes the beam detect (BD) mirror, it reflects the light into the beam detector, creating the $\overline{BDI}$ signal. The DC control board receives $\overline{BDI}$ and sends $\overline{BD}$ to the video controller board.

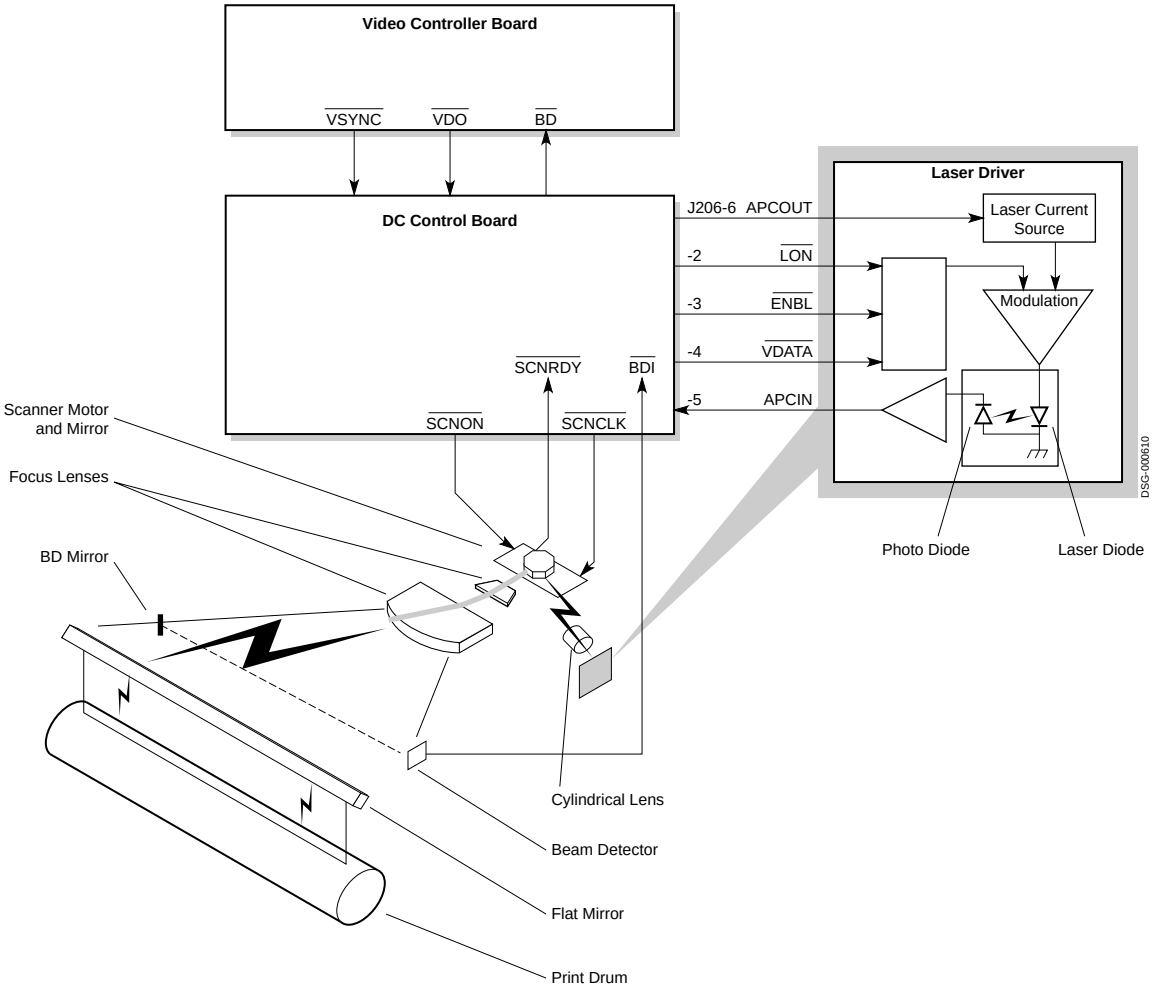
In response to $\overline{BD}$, the video controller transmits the video data out ($\overline{VDO}$) signal to the DC control board, which sends it to the laser driver as the $\overline{VDATA}$ signal.

The automatic power control (APC) regulates controls the intensity of the laser light.

To start the laser the DC control board first asserts the $\overline{LON}$ signal, then incrementally increases the value of the APC output ($APCOUT$) signal. This action slowly turns the laser on.

When the laser is on, a portion of the laser light strikes the adjacent photodiode and creates the APC input ($APCIN$) signal. $APCIN$ feeds back to the DC control board, which uses it to control $APCOUT$ and thus stabilize the intensity of the laser beam.

Figure 2–10 Scanning System Diagram



2.5 HVPSA

Figure 2–11 shows the high-voltage bias circuits that are used by the xerographic processes discussed in Section 2.3. Not shown in Figure 2–11 is the HVPSA/fuser interconnect that makes connection to the DC control board.

Figure 2–12 photographically shows the locations of the high-voltage terminals.

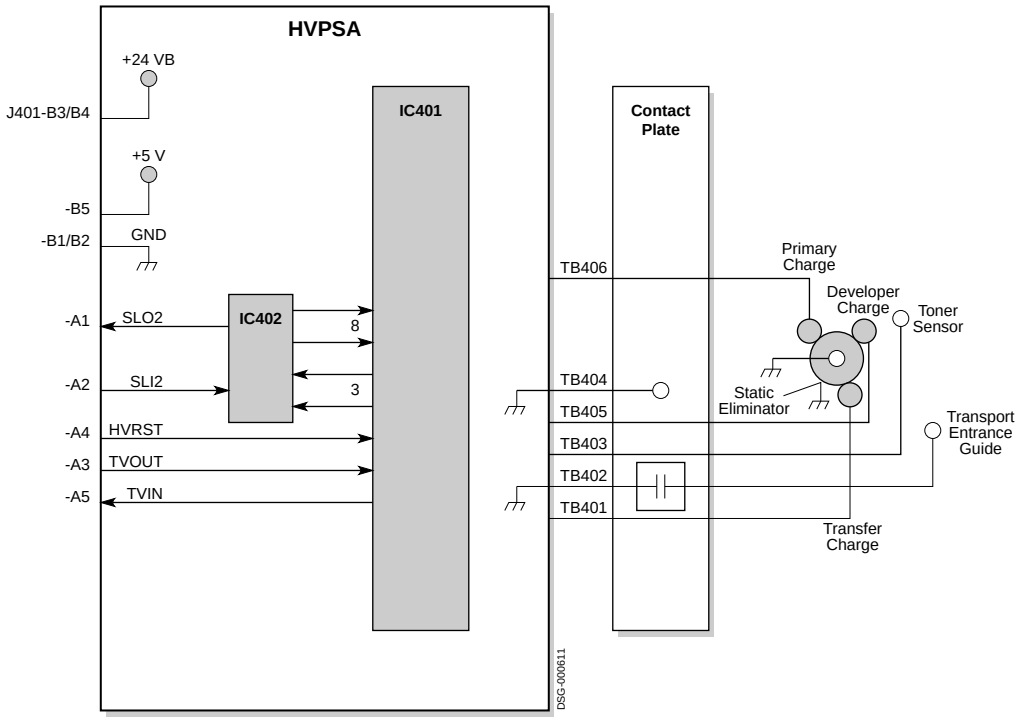
The HVPSA communicates with the DC control board through the serial $SL0$2 and SLI2 signal lines. IC402 is a communication gate array that provides two-channel serial interface to IC202 on the DC control board.

IC401 is a custom integrated circuit that provides the following:

- The ac bias coupled with dc bias used by the primary and development processes. The dc component varies according to laser beam intensity and to the setting of the user assessable density adjustment. The HVPSA couples this dc component to the development bias.
- The transfer bias switches from negative for cleaning and to positive for printing.
- The static eliminator removes the residual transfer charge from the paper sheet.
- TB402 and the contact plate capacitor provide an ac ground path for the transport entrance guide.

The HVPSA contact plate mechanically connects the HVPSA to the EP-ED cartridge and contains the transfer roller and static eliminator. The coil and flat springs of the contact plate press against metal contact pads on the HVPSA circuit boards. The spring holding pressure comes from the screws and clips that are used to mount the HVPSA and contact plate.

Figure 2–11 HVPSA Control Circuit



2.5 HVPSA

2.5.1 EP-ED Cartridge

Figure 2–12 shows the location of the EP-ED electrical connectors. See Section 2.5 for functional description and schematic diagrams.

❶ Primary bias

❷ Developer roller bias

❸ Toner sensor contact

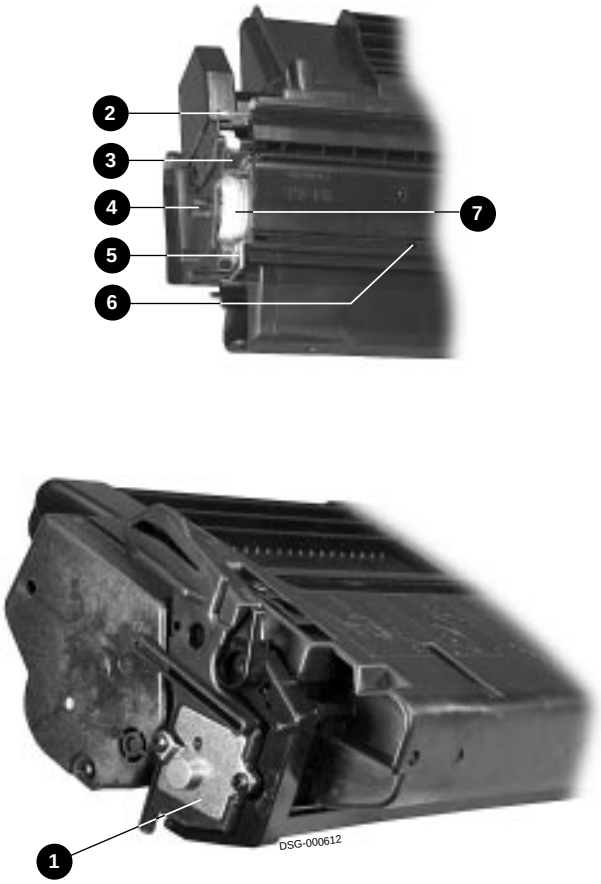
❹ Cartridge ground

❺ Drum shutter

❻ Print drum

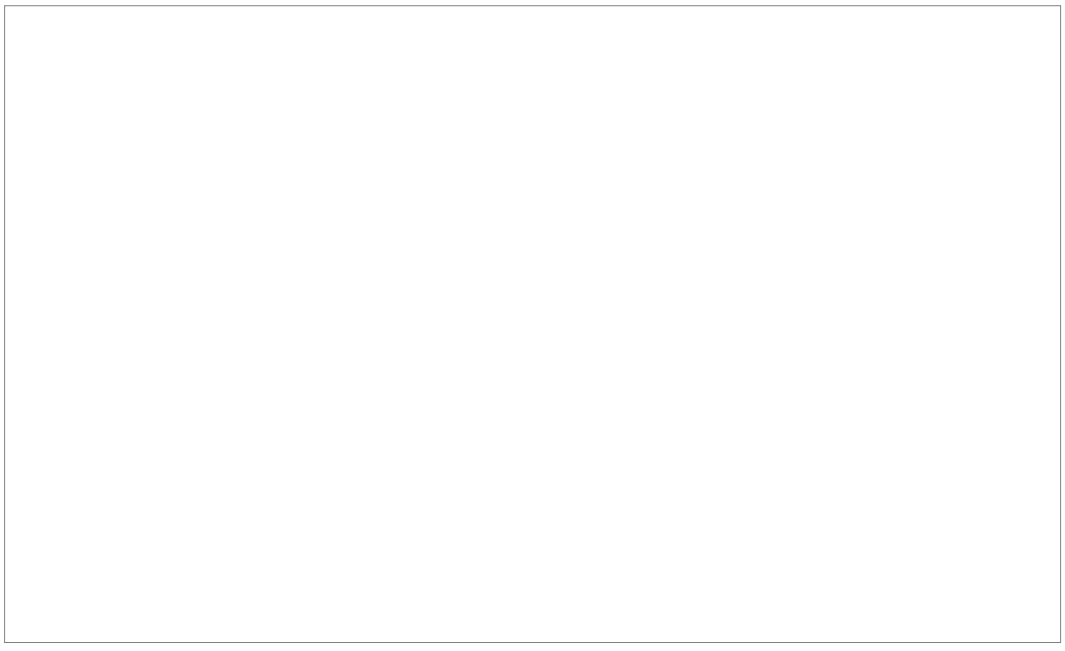
❼ Alignment guides

Figure 2–12 EP-ED Cartridge



2.5 HVPSA

Notes:



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3

Operating the Control Panel

This chapter describes the DEClaser 5100 printer control panel.

- Section 3.1 identifies and describes the control panel, indicators, and keys.
- Section 3.2 explains the control panel operational modes. The print engine operational modes are described Section 2.1.2.
- Section 3.2.2 maps out the structure of the control panel menus. See Appendix A for a definition of each feature and value that appear on the control panel menus.

3.1 Control Panel Description

Figure 3–1 shows the DEClaser 5100 control panel. Tables 3–1 and 3–2 describe the control panel keys, indicators, and displays.

Figure 3–1 Control Panel

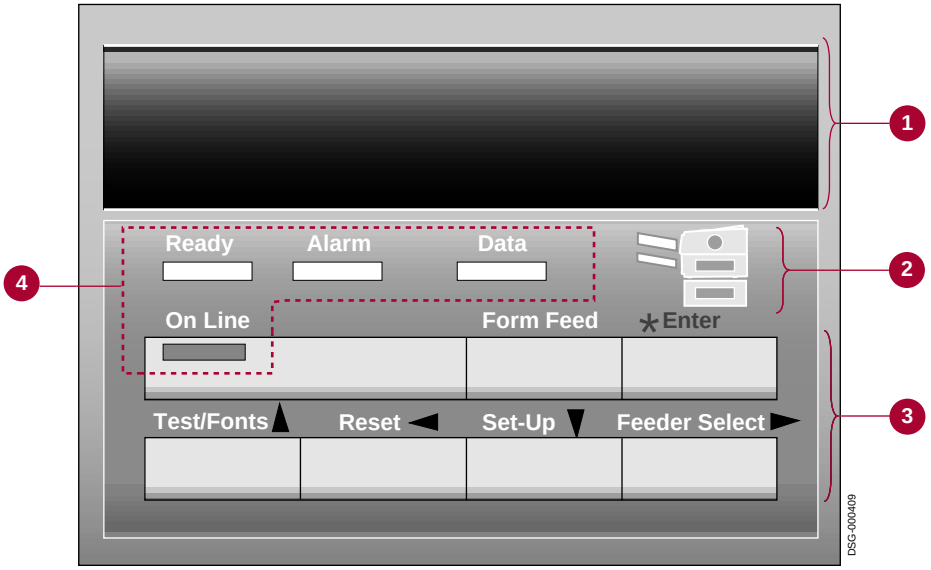


Table 3–1 Control Panel

❶	Message display	The sixteen character alphanumeric, vacuum fluorescent display (VFD) shows error, status, and operator messages.
❷	Graphic display	The display shows jam locations and active and faulted feeders. Green indicates the active feeder and amber indicates a non-fatal error.
❸	Keypad	Table 3–2 describes the seven control panel keys.
❹	Indicators	Table 3–2 describes the four indicators.

Table 3–2 Indicators and Keys

This Key...	When pressed...
On Line	Toggles the printer on and off line.
Form Feed	Appends a form feed character to the data buffer causing it to print.
*	Causes a 2-second display of a nonfatal error message. The key is pressed in response to the error indicator or asterisk display.
Enter	Enters key menu values into the video controller's ROM.
Test/Fonts Reset Set-Up Feeder Select	In paused (offline mode) enters one of the four printer key menus (see Section 3.2.2).
^ < v >	Scrolls through the key menu features (see Section 3.2.2).

This Indicator...	When...
On Line	**On**, the printer is on line and can receive and print a file from the host system. **Flashing**, a job is printing.
Ready	**On**, the printer is powered on and ready to receive and process data. **Flashing**, the printer is resetting or initializing.
Alarm (Amber)	**On**, a fault or error condition exists. **Flashing**, a manual feed operation is under way. See the *DEClaser 5100 Printer Operator's Guide* for manual feed instructions.
Data	**On**, and the display reads "Waiting", press Form Feed to print the remaining contents of the buffer. **Flashing**, data is processing and no action is required.

3.2 Control Panel Operation

The control panel operates in online, paused, and key menu modes. Both the paused and key menu modes are offline operations.

In online mode the printer is either idle, processing a print job, or printing. Press [On Line] to toggle between online and paused modes.

3.2.1 Online and Paused Messages

Table 3–3 explains the messages that appear on the control panel during the online and paused operation.

Table 3–3 Online and Paused Messages

Display	Definition
Ready/Paused, or Paused	The printer is off line. From this state you can enter any of the four key menus, or press [Enter] or [Form Feed]. See Section 3.2.2 for key menu information.
Ready/Idle	The printer is on line, scanning all ports for incoming data. After the port scan detects data, the printer: Locks onto the port Analyzes the data to identify the file type Switches to the appropriate interpreter Receives, interprets, and prints the host data file
PS: Serial PCL: Parallel PS: Network . .	The printer is busy interpreting data and identifies the receiving port.
SER: Waiting LOC: Waiting . . .	Identify the receiving port and indicates that the printer is online and waiting for more data from the host system. If data fails to arrive before the wait timeout period, the job terminates and the printer returns to the Ready/Idle state. See the SER: I/O Timeout entry in the glossary for more information about wait timeout.
PCL: Serial * PS: LOC * .	Indicate a nonfatal type of fault. Printing continues through non-fatal faults. An asterisk prompts you to press the [*] to display the fault message.

(continued on next page)

Table 3–3 (Cont.) Online and Paused Messages

Display	Definition
Paper Jam Printer open 50 ERROR . .	Indicate a fatal error. Printing stops for a fatal error until the operator or service engineer clears the error. A jam or printer open message clears automatically when the door is opened and then closed. The 50 ERROR message requires that you power off the printer for a minimum of 20 minutes.

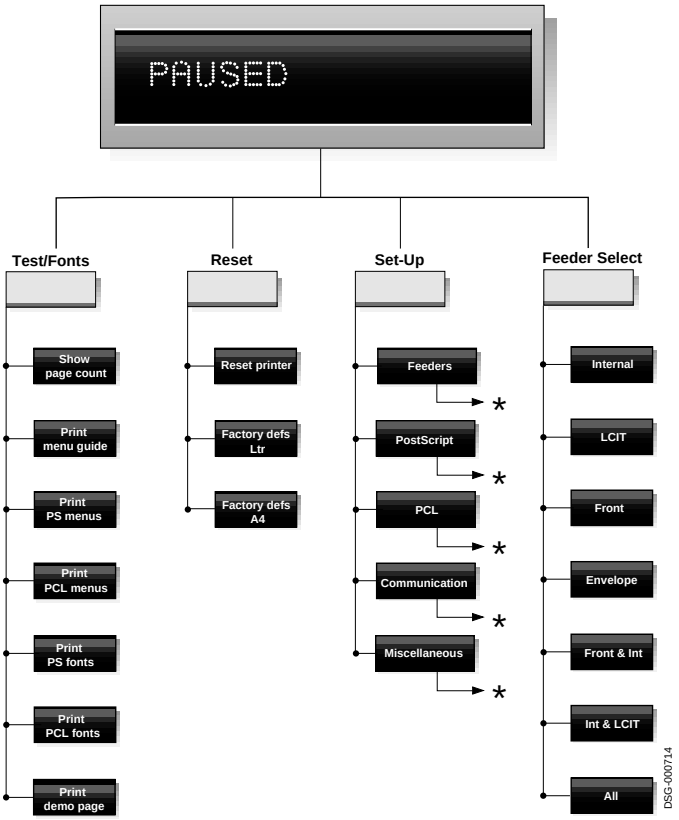
3.2.2 Key Menu Modes

The tree map in Figure 3–2 shows the upper level of the four key menus. A menu is a collection of features and values that you select and enter. The entered value changes the way the printer works. See the detailed map in Figure A–1 for a more in depth view. Appendix A explains all the features and values.

The printer must be paused before you can enter a key menu. Using the map and the four arrow keys, you can scroll around through the two dimensional matrix of the key menus.

The Test/Fonts, Reset, and Feeder Select key menus are one level deep. The complex Set-up key menu extends an additional three levels.

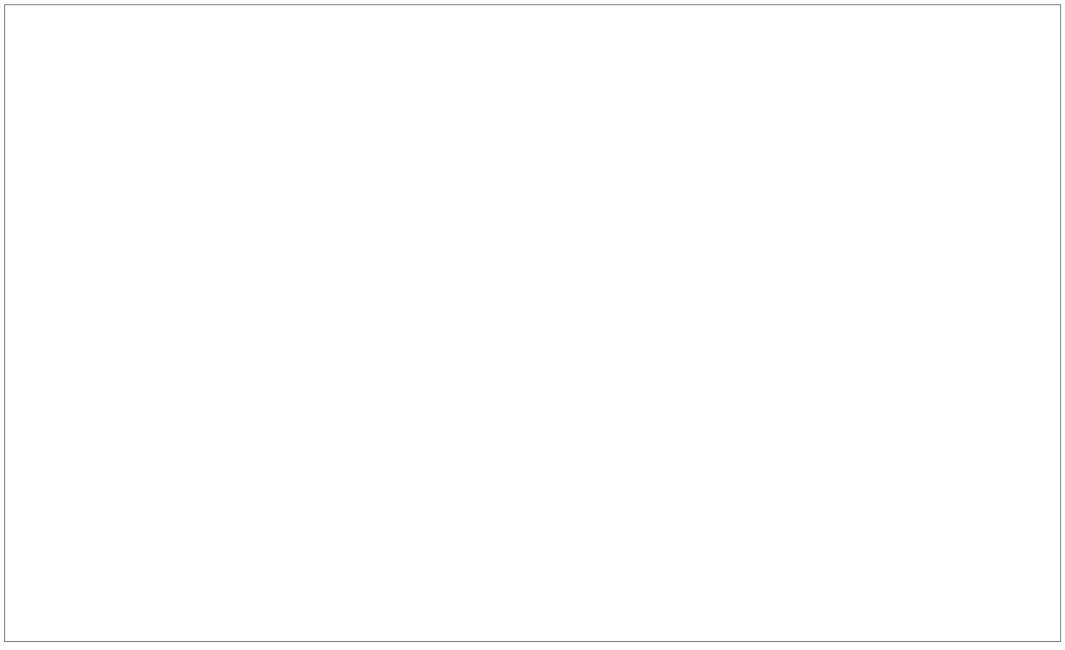
Figure 3–2 Overall Key Menu Map



* See Figure A-1 for more information

3.2 Control Panel Operation

Notes:



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4

Test Patterns and Miscellaneous Procedures

This chapter is about DEClaser 5100 printer printouts and the most commonly used printing procedures.

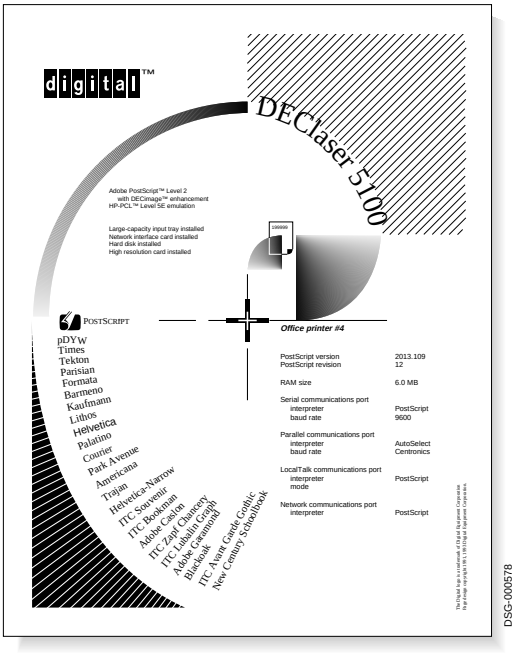
The following printouts are described:

- The seven printouts available from the Test/Fonts key menu (see 4.1 through 4.5).
  - Test page (prints at power up)
  - Menu guide
  - Demo page
  - PostScript and PCL setting pages
  - PostScript and PCL font lists
- PostScript error report (see Section 4.6)
- Engine board test pattern (see Section 4.7)

4.1 About the Test Page

Figure 4–1 shows the test pattern that prints automatically at power up or when you select the test page feature from the Test/Fonts menu.

Figure 4–1 Test (Power Up) Page



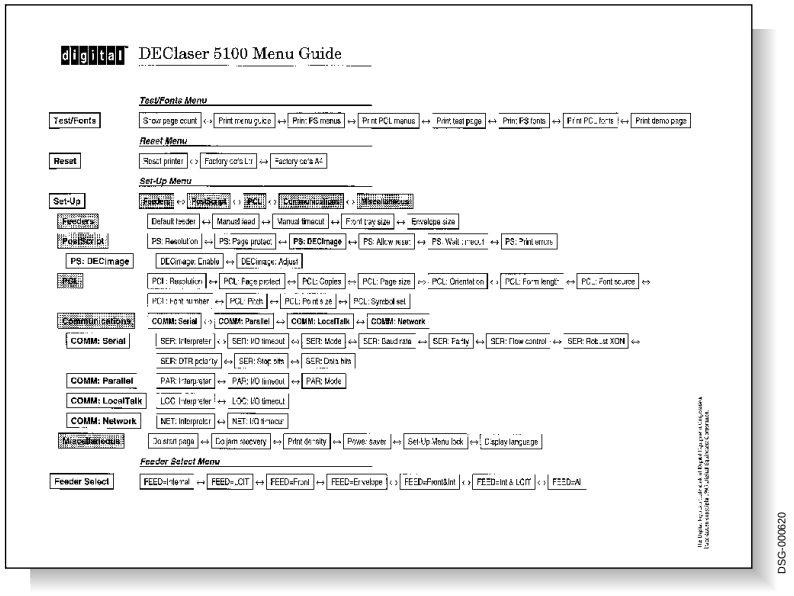
You can disable or enable the automatic printing of the test page at power up as follows:

1. Place the printer off-line and select the Set-Up key menu.
2. Select the Do start page feature from the Miscellaneous submenu.
3. Toggle the values to enable (yes) or disable (no) the test page printing. See the menu maps in Figure A–1 routing information.

4.2 About the Menu Guide

Figure 4–2 shows the menu guide that prints when you select the Print menu guide from the Test/Fonts key menu. Using this map helps to navigate the control panel key menus. The menu guide shows only the features. See Figure A–1 for a full key menu map.

Figure 4–2 Menu Guide



4.3 About the Demo Pages

Figure 4–3 shows the PostScript demonstration page. The demo page is useful for evaluating print quality and for testing all the features of the level 2 PostScript interpreter.

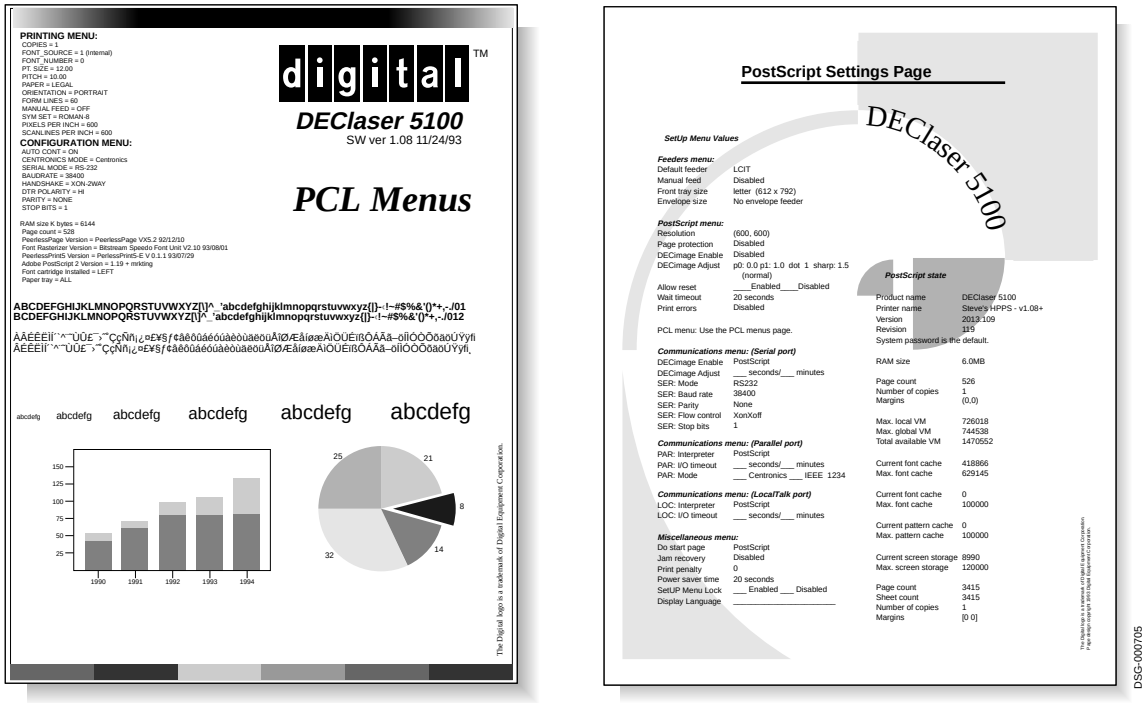
Figure 4–3 Demo Page

4.4 About the Print PS or PCL Menus Pages

Figure 4–4 shows pages that print when the Print PS menus or Print PCL menus selections are entered. Both selections are available from the Test/Fonts key menu.

The pages list all the currently set or entered selections of the PostScript or PCL interpreter.

Figure 4–4 PostScript and PCL Settings Pages



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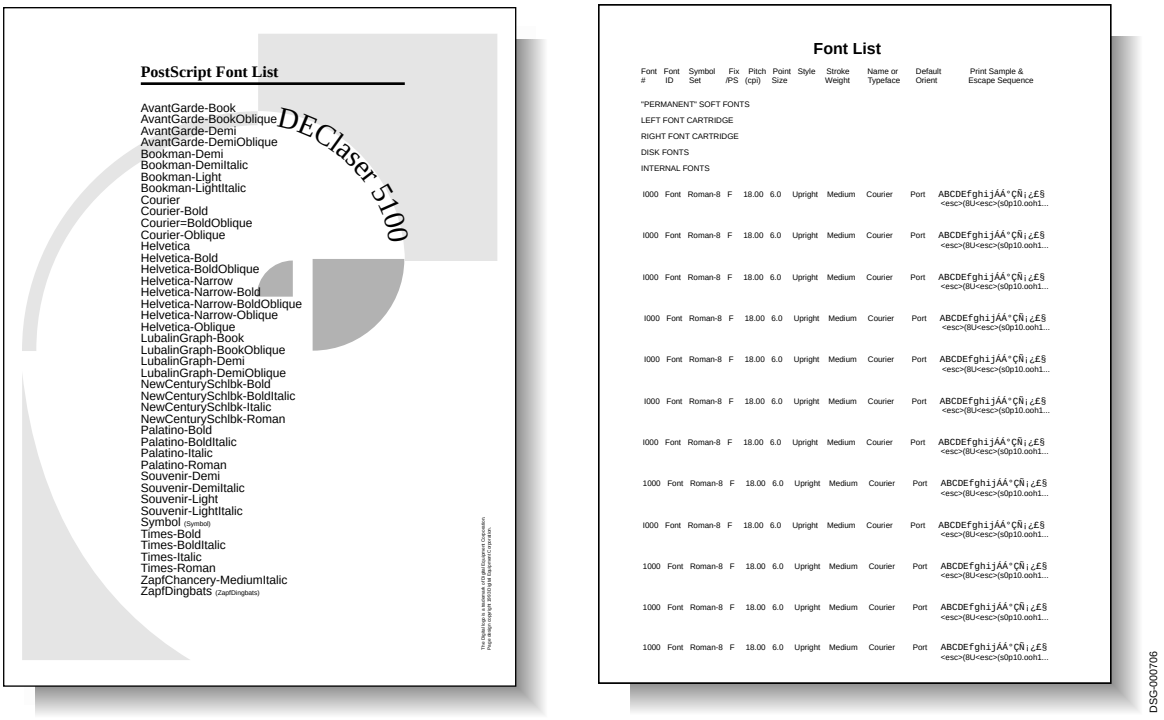
4.5 About the PCL Fonts and PostScript Fonts Lists

Figure 4–5 shows the list of PostScript and PCL fonts. To print either list, select the Print PS fonts or the Print PCL fonts selection from the Test/Fonts key menu.

Figure 4–5 Font Lists



PostScript Font List

DEClaser 5100

AvantGarde-Book
AvantGarde-BookOblique
AvantGarde-Demi
AvantGarde-DemiOblique
Bookman-Demi
Bookman-DemiItalic
Bookman-Light
Bookman-LightItalic
Courier
Courier-Bold
Courier=BoldOblique
Courier-Oblique
Helvetica
Helvetica-Bold
Helvetica-BoldOblique
Helvetica-Narrow
Helvetica-Narrow-Bold
Helvetica-Narrow-BoldOblique
Helvetica-Narrow-Oblique
Helvetica-Oblique
LubalinGraph-Book
LubalinGraph-BookOblique
LubalinGraph-Demi
LubalinGraph-DemiOblique
NewCenturySchlbk-Bold
NewCenturySchlbk-BoldItalic
NewCenturySchlbk-Italic
NewCenturySchlbk-Roman
Palatino-Bold
Palatino-BoldItalic
Palatino-Italic
Palatino-Roman
Souvenir-Demi
Souvenir-DemiItalic
Souvenir-Light
Souvenir-LightItalic
Symbol (Symbol)
Times-Bold
Times-BoldItalic
Times-Italic
Times-Roman
ZapfChancery-MediumItalic
ZapfDingbats (ZapfDingbats)

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Font List

Font #	Font ID	Symbol Set	Fix /PS	Pitch (cpi)	Point Size	Style	Stroke Weight	Name or Typeface	Default Orient	Print Sample & Escape Sequence
"PERMANENT" SOFT FONTS										
LEFT FONT CARTRIDGE										
RIGHT FONT CARTRIDGE										
DISK FONTS										
INTERNAL FONTS										
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
1000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
I000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
1000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
1000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...
1000	Font	Roman-8	F	18.00	6.0	Upright	Medium	Courier	Port	ABCDEfghijÁÄ°ÇÑ¡¿£§ <esc>(8U<esc>(s0p10.ooh1...

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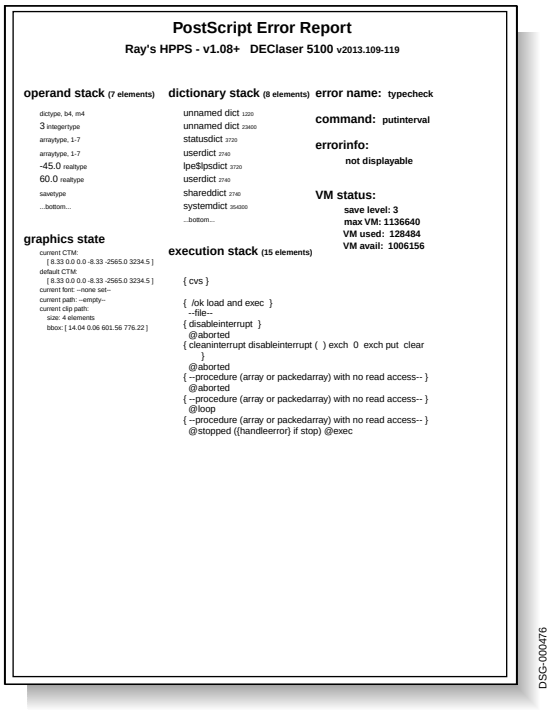
4.6 About the PostScript Error Report

Figure 4–6 is an example of the PostScript error report. To turn on the PostScript error report, enter the Enable value found in the Print error sub menu. (From the Set-Up menu, select the PostScript feature, then the Print errors selection.)

Figure 4–6 PostScript Error Report

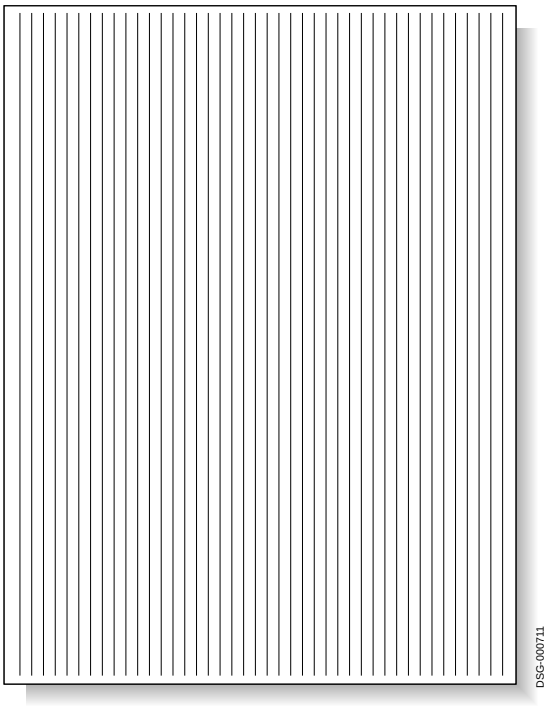


4.7 Engine Board Test Pattern

Figure 4–7 shows the engine board test pattern. The DC controller board feeds paper from the cassette only. The engine board test pattern is resident in the firmware on the DC controller board and can print without a video controller board present in the printer.

To print the engine board test pattern, press the test print switch shown in Table 1–2 with a paper clip or some other suitable tool.

Figure 4–7 Engine Board Test Pattern



4.8 Locking and Unlocking the Set-Up Menu

You can lock the Set-Up menu to keep unauthorized operators from accessing and changing the features and values of the Set-Up menu. If you try to enter a locked Set-Up menu, the printer beeps and the **Set-up locked** message appears.

Lock the Set-Up menu as follows:

1. Press [On Line] to pause the printer.

   The **Paused** message appears.

2. Press [Set-Up] to enter the Set-Up menu.
3. From the Control Panel, use the arrow keys to scroll to
   a. The **Miscellaneous** submenu
   b. The **Set-Up menu lock** feature
   c. The **LOCK=enabled** value
4. Press [Enter] to enter the selection.
5. Press [*] when the message **Press * to lock** message appears.

Temporarily bypass the Set-Up menu lock as follows:

1. Press [On Line] to pause the printer.

   The **Paused** message appears.

2. Press and hold [*].
3. Press and release [Set-Up].
4. Release [*] to display **Set-Up menu** and a level one set up feature. The Set-Up menu lock is released until you leave the Set-Up menu.

   To permanently release the Set-Up key menu lock, select and enter the **LOCK= Disabled** value from the Set-Up menu lock feature submenu.

4.9 Adjusting the Leading Edge Registration

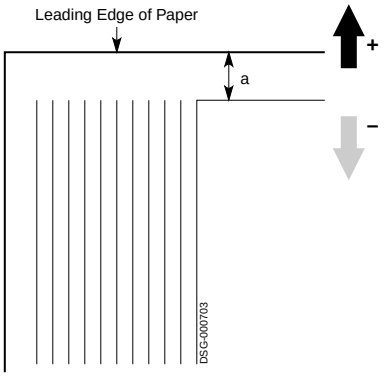
Figure 4–8 shows the location of VR202 on the DC control board. VR202 provides a slight amount of registration adjustment. To access VR202 you must remove the left-side cover and card cage, as shown in Sections 9.19 and 9.16.

The registration adjustment should be checked and adjusted whenever you replace the following FRUs:

- DC control board
- Paper feed assembly
- Paper feed board
- Scanner assembly

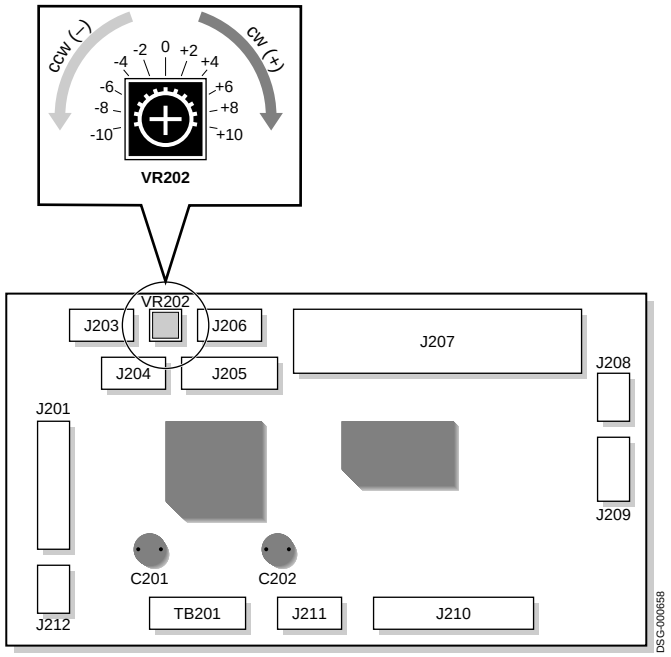
Use the following procedure to adjust the leading edge registration margin:

1. Use a small screwdriver to turn VR202 to the zero (0) position in the center of its adjustment range. Figure 4–8 shows the location of VR202.
2. Before doing the following step, be ready to mark the leading edge of the test print.



3. Use a suitable tool to press the test print switch and print a copy of the engine board test pattern. See Figure 1–2 for the location of the test print switch. Print several copies.
4. Measure the distance (a) between the image and the edge of the paper. Find the average of all measurements.
5. Adjust VR202 until the average measurement is 2 mm (0.079 in).
6. Repeat steps 3 and 4.
7. Readjust VR202 if necessary.

Figure 4–8 VR202 Registration Adjustment



4.10 Reading the Page Count

The 8-pin, nonvolatile random access memory (NVRAM) integrated circuit (IC) is replaced if the "68 SERVICE" message is displayed or it is transferred if the video controller board is replaced. Transferring the NVRAM preserves the page count history. When you replace the NVRAM, record the event and the last known page count number in the site maintenance log.

Use the following procedure to display the page count information:

1. Press [On Line] to pause the printer.

   The **"Paused"** message appears.

2. Press [Test/Fonts] to enter the Test/Fonts key menu.
3. Press [>] and [<] to select the Show page count feature.
4. Press [Enter] to display the current page count number.

4.11 Formatting the Optional Disk

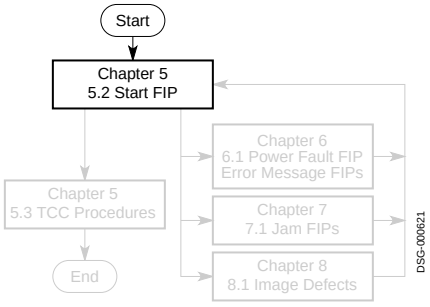
When a new disk is installed and the printer is powered on, the firmware finds the new disk and enters the following interactive formatting procedure:

1. The **Disk Added *** message appears.
   - Press [*] to continue.
2. The *** to format disk** message appears.
   - Press [*] to start formatting or press any other key to not format.
3. The **Formatting disk** message appears while the disk is formatting; this takes about 20 seconds.
4. The **Restart printer** message appears.
   - Power off the printer, then power it on again.

5

Start FIP and Total Call Concept

This chapter contains the start fault isolation procedure (FIP) and the total call concept (TCC) procedures.



The FIPs are a collection of yes/no flow steps, charts, and tables that provide a way to fix or ensure the correct operation of the hardware.

The adjacent flowchart show all the FIP procedures. The darkened area is the overall start FIP. Use the start FIP to test the printer. If a problem exists, use the start FIP to isolate the problem and direct you to the next FIP.

5.1 Preliminary Information

Before using the start FIP, do the following:

- Record the symptoms, then recycle/reboot the printer.
- Do all steps of the start FIP shown in Table 5–1.
- Follow the FIPs in order. The printer is not fixed until you complete the start FIP with no errors.
- After fixing the original malfunction, perform the TCC procedures listed in Section 5.3 to make sure no other problems exist.
- Keep the following in mind when the FIP tells you to check a signal or power supply voltage:
  - Unless otherwise stated, all voltage readings should be within ±5% of the stated value.
  - Voltage level "low" means 0 to +0.5V.
  - Voltage level "high" means 5V ±0.5V.
  - The bar over a signal name $\overline{PRNT}$ shows that that signal, when asserted, is low.

5.2 Start FIP

See Table 5–1 to begin the DEClaser 5100 printer FIP. If the symptoms change or the troubleshooting path is not clear, go back to the beginning of the start FIP.

Table 5–1 Start FIP

		Evaluate the Response	
Step	**Action**	**Normal**	**Malfunction**
1	Turn on the AC power	If the motors run, rollers turn, control panel lights up, fusing unit gets hot, and if it displays the following messages: Warming Up READY/IDLE **Go to Step 2.**	• If you hear abnormal sounds, if the control panel is blank, hung, or garbled, **Go to Section 6.1** • If a display message appears, **See key note**
2	a Press [Test/Fonts] b Select Print test page c Press [Enter] to print	If the paper feeds and prints, **Go to Step 3**.	• If a display message appears, **See key note**. • If a paper jam occurs **Go to Section 7.2**.
3	Inspect the test sheet for print quality and make sure all installed options are listed.	If the print quality is good, **Go to step 4**.	• If the print quality is poor, **Go to Section 8.1**. • If one or more installed options is not listed, **Goto Section 6.2.**
4	Print several test sheets from each input tray	If the printer can print reliably with no errors, jams, or defects, **Go to step 5**.	If you see any: • Control panel faults, **Go to Section 6.1** • Display messages, **See key note** • Paper path jams, **Go to Section 7.2** • Image defects, **Go to Section 8.1**

Key note: All the display message FIPs can be found in Sections 6.3 through 6.16. The messages are listed in the table of contents at the front of this book or you can look for a message by flipping through Chapter 6 reading the section information.

(continued on next page)

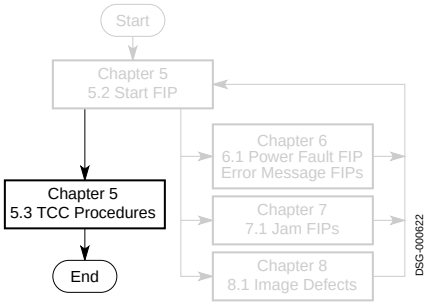
5.2 Start FIP

Table 5–1 (Cont.) Start FIP

		Evaluate the Response	
Step	**Action**	**Normal**	**Malfunction**
5	Perform the TCC procedure in Section 5.3	Printer is OK.	Return to start FIP.

Key note: All the display message FIPs can be found in Sections 6.3 through 6.16. The messages are listed in the table of contents at the front of this book or you can look for a message by flipping through Chapter 6 reading the section information.

5.3 Total Call Concept (TCC) Procedure



This section covers the total call concept (TCC) for the DEClaser 5100. The darkened section of the adjacent map shows that the TCC procedure is the final checkout section of the start FIP.

The TCC procedure involves inspecting for damage and worn out parts and involves cleaning the inside and outside of the printer. Performing the TCC procedure can reduce the number of service calls.

To clean the paper path, use a clean lint-free cloth and the special vacuum cleaner specified in Section D.3. Use a damp sponge to clean the covers and external components.

While cleaning, look for broken plastic or metal components or for any signs of damage. Replace any damaged components.

Before ending a service call, make sure you have done the following:

1. Discuss the operation of the printer with the customer.
2. If more then 200,000 sheets have printed, perform the 200K maintenance procedure (see Section 5.3.1).

   The page count appears when you select the Show page count feature from the Test/fonts key menu. See Figure A–1 for more information.
3. Power on the printer.
4. Either print several test prints or have the customer print a multipage job to exercise the printer for a prolonged time period (5 minutes or more).
5. If intermittent problems or mixed problems occur, note down the type of problem. See Table 5–1 start FIP for a pointer to the specific FIP.
6. Inspect all the paper path rollers for:
   - Surface contamination, uneven wear, dirt, or damage
   - Broken or disconnected pressure springs
   - Defective or unsecured bearings

5.3 Total Call Concept (TCC) Procedure

7. Inspect and clean the following with a vacuum cleaner and a clean, damp, lint-free cloth:
   - Fusing unit transport
   - Static charge eliminator
8. Clean and inspect the following fusing unit items:
   - Fusing entrance and exit guides
   - Fusing separation pawls
9. Clean the delivery exit rollers.
10. Clean the external covers.
11. Repeat the test prints until the printer is performing flawlessly.
12. Power on the printer. Make sure the printer boots and is on-line. **Ready** appears on the display.
13. Enter the following information in the maintenance log:
    - The nature of the original problem and any other malfunctions
    - All parts replaced
    - Any observation that might be helpful to a future service person
    - The current page count

5.3.1 200K Maintenance Procedure

Table 5–2 shows the FRUs that after 200,000 pages should be inspected for wear and if necessary replaced. There is no required or mandatory maintenance procedure, no special visits to the customer's site. Make sure to record the event in the maintenance log.

Table 5–2 200K Maintenance Procedure

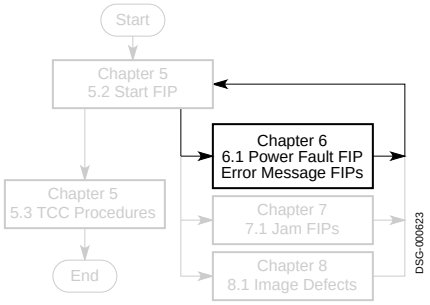
FRU Name	Part Number	R&R Section Number
Fusing unit	FD–41594–01 (115 Vac) FD–41595–01 (220 Vac)	9.25
Pad, front tray separation	FD–41622–01	9.30
Roller, cassette pickup	FD–41629–01	9.32
Roller, front tray pickup (MP tray pickup roller)	FD–41630–01	9.33
Roller, LCIT pickup	FD–41631–01	9.34
Roller transfer	FD–41633–01	9.31

6

Power and Control Panel FIPs

This chapter contains FIPs for troubleshooting power and control panel faults and contains FIPs for error conditions that cause a control panel message display. The engine wiring diagrams are located at the rear of this chapter.

See Chapters 7 and 8 for jam and image defect FIPs.



The adjacent start FIP map shows the position of this chapter in the overall fault isolation procedure.

If a problem exists, use the start FIP to isolate the problem and direct you to the next FIP.

6.1 Bad Power or Control Panel FIPs

Explanation: A power or control panel malfunction can cause a failure of the normal power up activities. Because the control panel is inoperative, there are no error messages.

When the printer is working properly, you can see and hear the following events after the power is turned on:

Sounds	Air wooshing from the exhaust fan, high-pitched whine from the scanner motor, low-pitched rumble from the main motor and gear train.
Control panel	Various indicators light as the self test runs, the "Warming Up" message appears for approximately 200 seconds, and the "READY/IDLE" message appears at the end of the power-up process.
Action	The main motor turns (rounding) the paper path rollers for approximately six seconds. If the covers are removed, you can see the fuser heater glowing.

Review the following two sets of symptoms and choose the one that describes the malfunction:

Symptom 1: The following symptoms indicate a working print engine with a malfunctioning control panel circuit:

- At power up, the rounding cycle completes
- The fusing unit gets warm
- The engine board test pattern prints.
- The control panel message is blank, hung, unreliable, or ambiguous.

Action: Do the following to fix a control panel problem:

1. Make sure that the control panel cable connector is properly plugged into the J131 connector on the video controller board. See Section 9.2 for the connector's location and Section 2.1.1 for a block diagram.
2. Swap the following FRUs:
   - Video controller board
   - Control panel
   - DC control board

6.1 Bad Power or Control Panel FIPs

Symptom 2: The following symptoms indicate a malfunctioning ac power line or low-voltage power supply assembly (LVPSA):

- The printer blows the fuse or circuit breaker that supplies the AC line power.
- No normal power up sounds, rounding, or roller motion
- The control panel display and indicators are blank and never turn on.
- The printer runs for a short time then shuts down or is intermittent.

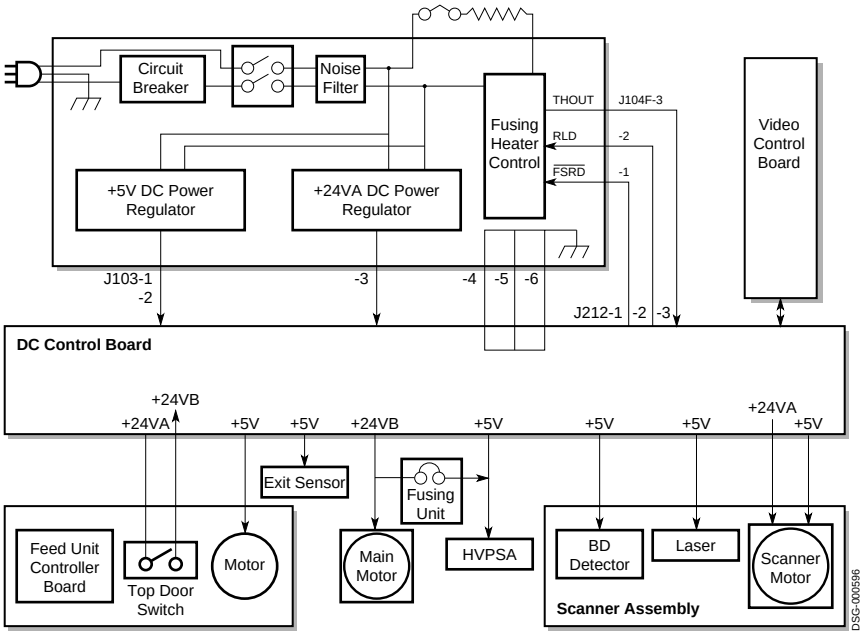
Action: Do the following to fix a power problem:

1. Try another ac line plug and swap the power cord.
2. If the ac wall power is bad, call the site electrician to restore power.
3. Remove the right side panel and metal card cage.

   Refer to Figure 6–1 for connector and pin numbers mentioned in the following steps.
4. Inspect the 6-wire cable that runs from the DC control board to the J103 connector on the LVPSA. Make sure it is properly plugged in and in good condition.
5. Remove the video controller board and all optional equipment.
6. Press the test print switch to see if the printer can print or use a VOM to measure the power supplies from the LVPSA on J103.
7. Skip the following and go to step 8 if the printer fails to print or if the VOM fails to measure +5 and +24 Vdc.
   - Replace the video controller board and removed options one at a time to find the bad FRU.
   - If the power failure is intermittent, inspect the two SIMM memories. The use of nonspecified third-party SIMMs can cause power problems, but only if the printer is fully equipped with all possible optional equipment.
8. Swap the following FRUs:
   a. LVPSA
   b. Fusing unit
   c. DC controller board

6.1 Bad Power or Control Panel FIPs

Figure 6–1 LVPSA Diagram



6.2 Optional Equipment Non-Error FIPs

When the Test (power up) Page builds in memory, the video control board checks for installed options. Each option is listed as installed or not installed on the printed sheet. The sheet also lists the amount of installed memory. See Section 4.1 for information about the Test Page.

If any of the options that you know are installed, fail to list on the Test Page, swap or replace the option or the connecting FRUs to diagnose and repair the problem. The following is a list of the optional equipment:

- The envelope feeder is powered by and communicates with the paper feeder control board. Feed failures and paper jams are typical envelope feeder problems.
- The hard disk is mounted on, powered, and operated by the video controller board. Section 6.11 lists all the hard disk error messages.
- There are two independent SIMM sockets on the video controller board. If only one SIMM is installed, it can mount in either socket. If two SIMMs are installed, they can be of different sizes and installed in any order.

  Memory is available, from Digital Equipment Corporation, in 4-, 16-, or 32-Mb SIMM boards. A customer can purchase and install standard personal computer memory. The SIMMs must comply to the following requirements:

  - 32-bit wide, non-parity, 72-pin SIMMs that conform to JEDEC Standard 21.
  - 36-bit wide, parity, 72-pin SIMMs such as the PC74M-AA/AB/AC
  - The 4-, 8-, and 16-Mb SIMMs are described as single bank, fast-page-mode read/write memory with cas-before-Ras refresh

  The Test Page lists the available RAM. 2-Mb is built in and each installed SIMM adds to this number. For example, if you had installed a 16-Mb and a 4-MB SIMM, you will see 22-Mb of RAM on the Test Page.

  If a SIMM is bad, that entire SIMM's memory will fail to list on the Test Page. For example, if you installed 16-Mb and 4-Mb SIMMs and you saw 6-Mb of RAM on the Test Page, you would know that the 16-Mb SIMM is bad or incorrectly installed.
- The LCIT mounts under the printer. It is powered by and communicates with the feed controller board. Most LCIT malfunctions result in feed failures or jams.

6.2 Optional Equipment Non-Error FIPs

- The Font (PCMCIA) cartridges plug into connectors on the video controller board. Try moving the cartridge to the opposite slot. See the insert or remove FIP in Section 6.3
- The Resolution/Graphics Enhancements (RGE) board is socket mounted on the video controller board. Low resolution image enhancement begins as soon as the RGE board is plugged in and power is turned on. It cannot be enabled or disabled. The two high-resolution features (1200 x 600 and 1200 x 1200 dpi) are enabled from the host system or through the Setup key menu. See Appendix A for more information about the key menus and Section 1.8 for more information about the RGE.
- The Ethernet network board connects to a socket mounted on the video controller board.

  When power is turned on the Ethernet board's self-test runs. If the self-test passes, a status sheet (not shown in this service guide) is printed. On the status sheet you can find the following:

  - The Ethernet address.
  - The setting of the twisted pair/ThinWire jumpers.
  - Information for the various types of networks.

  The rear panel green LED does the following:

If the LED is..	Then..
On steady	The self-test is running or has passed.
Flashes briefly	The self-test passed, the test sheet is being created, and printed.
Flashing slowly continuously	The printer is offline, out of paper, or requires operator attention. Refer to the front panel display.
Flashing rapidly or off	Swap the Ethernet board.

6.3 Insert or Remove Cartridge

Explanation: These message occur whenever a font cartridge is removed or inserted while the print is in the fault state during a print job; for example, if the font cartridge was removed during a paper jam in the middle of a job.

The dc control board cannot recognize the type of installed font cartridge only the presence or absence of a cartridge .

Signal diagram reference: See the block diagram in Figure 2–2.

Action: Do the following if the display cannot be cleared or if the message appears intermittently:

1. Make sure the video controller board is installed correctly and the cartridge connector is undamaged.
2. Swap the cartridge.
3. Swap the video controller board.

6.4 Load Env (*Value*)

Explanation: This message indicates that the envelope feeder is empty or needs a different size envelope loaded. This message should clear when the envelope sensor is depressed.

Signal diagram reference: See Figure 6–6.

Action: Do the following if the message appears intermittently or fails to clear:

1. Remove the envelope feeder and inspect the four pin connector, the pins that align the envelope feeder, and the general area for damage. Replace any damaged FRUs.
2. Swap the following FRUs:
   - The envelope feeder
   - The DC control board
   - The paper feed controller board or the paper feed unit.

6.5 Load Front or Manual Feed

Explanation: Two sensors monitor the front tray paper path. The front tray paper sensor detects paper in the front tray. The front tray paper end sensor detects the end of the sheet as it feeds into the engine.

These messages should clear when the user loads the requested size paper or envelope. All media feeding is performed through the paper feed unit and controlled by the paper feed controller board.

The following control panel menus set the paper size and feed device. See the menu map in Figure A–1 for more information.

- Set the paper size through the **Front Tray Size** feature of the Feeders submenu (from the Set-Up key menu).
- Set the feed device through the **Default feeder** feature of the Feeders submenu (from the Set-Up key menu).

Signal diagram reference: See Figure 6–2 for wiring diagrams.

Action: Do the following if the messages appear intermittently or fail to clear:

1. Inspect the two front tray sensor linkages. If the linkages fail to move freely or bind, replace the paper feed assembly.
2. Swap the following FRUs:
   - DC control board
   - Paper feed controller board
   - Paper feed unit

6.6 Load LCIT (*Value*)

Explanation: This message indicates that the 500-sheet LCIT cassette is empty, is the incorrect size, or is not installed. The three LCIT size sensing switches detect the size of the installed cassette.

Signal diagram reference: Figure 6–7

Action: Do the following if the message appears intermittently or fails to clear:

1. Make sure the 250-sheet internal cassette is fully installed.
2. Remove and inspect the 500-sheet LCIT cassette. Replace the cassette if you find any damage. If the cassette is a universal type cassette, make sure the size sensing cams are set to the correct size.
3. Manually actuate the size sensing switches. Replace the paper feed control board if the switches stick, bind, or fail to operate.
4. Inspect the linkage of the LCIT paper sensor. Replace the LCIT if the linkage sticks, binds or fails to work properly.
5. Swap the following FRUs:
   - LCIT controller board
   - LCIT
   - DC control board
   - Paper feed controller board or paper feed assembly
   - Feed unit and option interconnect

6.7 Load or Install Inter (*Value*)

Explanation: These messages indicate the 250-sheet cassette (internal tray) is empty, is the incorrect size, or is not installed. The three size sensing switches detect the size of the installed cassette. An internal cassette must be installed for the LCIT to work properly.

Signal diagram reference: See Figure 6–2 for wiring diagrams.

Action: Do the following if the message appears intermittently or fails to clear:

1. Remove and inspect the cassette. If damaged replace the cassette. If the cassette is a universal type cassette, make sure the size sensing cams are set to the correct size.
2. Manually actuate the size sensing switches. Replace the paper feed control board if the switches stick, bind, or fail to operate.
3. Swap the following FRUs:
   - DC control board
   - Paper feed controller board or paper feed assembly

6.8 Memory Overflow or Print Overrun

One of the following messages appears when the SmartPage process fails:

Print overrun	The SmartPage coprocessor failed to complete the current band before additional data arrived from the host.
Memory overflow	While building the page, the printer ran out of memory.
limitcheck	A PostScript error that prints on a PostScript error sheet but is not displayed on the control panel.

It is very unlikely that a hardware malfunction could cause these error messages without some other error message. If you suspect the hardware is faulty, swap the video controller board or memory SIMMs.

SmartPage failures occur when the customer prints pages that are too complex for the SmartPage process.

To correct SmartPage errors, advise the customer to:

- Invoke the page protect mode. This forces the printer to build a full page in memory before printing occurs and slows down the completion of the print job.

  Page protect is invoked from the PostScript or PCL Set-Up key menu, as shown in Appendix A.

- Disable the do jam recovery feature. If enabled, jam recovery uses a large amount of memory.
- Reduce print resolution through the host software or through the PostScript or PCL submenu of the Set-Up key menu, as shown in Appendix A.
- Add additional SIMMs to increase the amount of RAM memory.

For additional information see Chapter 7 of the *DEClaser 5100 Printer User's Guide*.

6.9 No Toner Cart or Toner Low

Explanation: The toner sensor circuit detects both the presence of a toner cartridge and quantity of toner that remains.

The ac signal from the developer roller travels through the toner to the toner sensor, which acts like an antenna. The strength of the signal received by the toner sensor varies with the quantity of toner in the EP-ED cartridge.

The HVPSA measures the toner signal and determines the quantity of toner or whether an EP-ED cartridge is installed. Toner is measured during the development portion of the xerographic process. EP-ED cartridge checks are performed during power up, after top door closing, or control panel keying.

Signal diagram reference: See Figures 6–5 and 2–11 for wiring diagrams.

Action: Do the following:

1. The toner might be damp. Remove the EP-ED cartridge and shake it to loosen up the toner.
2. Swap the EP-ED cartridge with a known good unit.
3. Inspect the toner sensor contacts on the EP-ED cartridge and the connector block. Replace any damaged parts.
4. Make sure the HVPSA is correctly installed. Both hold down screws must be tight and the clips must be holding. See Section 9.4 for installation instructions.
5. Remove the HVPSA and inspect the TB403 spring contact.
6. Swap the following FRUs:
   - DC control board
   - HVPSA
   - HVPSA/Fuser Interconnect
   - HVPSA contact plate guide

6.10 Printer Open

Explanation: This message appears when the top door of the printer is open.

When the top door is closed, a tang attached to the door presses down the two-pole door open switch. One pole shorts *DOPEN* to ground. Pole two connects +24VA supply to the +24VB.

The plastic tang on the closed top door depresses the linkage spring, which presses the black plastic stud, which depresses the door open switch. The switch is soldered on the paper feed controller board. The black plastic stud is mounted on the paper feed unit housing. If the top door fails to properly latch, the pressure from the linkage and the switch lever springs is strong enough to hold open the top door.

To clear this error, close the top cover.

Signal diagram reference: See Figures 2–8, 2–4, and 6–2 for wiring diagrams.

Action: Do the following:

1. Make sure the top cover is installed correctly, as shown in Section 9.20.
2. Open and inspect the top cover and tang. If you see any broken or damaged plastic, replace the top cover.
3. Use a small screwdriver to manually depress the spring linkage.
   - If the printer rollers start, inspect the top door, top door, and spring linkage.
   - If the linkage is firmly stuck, inspect the switch and black plastic stud.
4. Inspect the cabling and connectors that run between J201 on the DC control board and J601 on the feed unit controller. Make sure both connectors are securely plugged in and the cable is in good condition.
5. Swap the following FRUs:
   - DC control board
   - Feed unit controller
   - Feed unit and option interconnect

6.11 All Hard Disk Errors

The following messages are associated with the optional hard disk system. The disk is installed and formatted by the customer.

Disk Added * *** to format disk**	These messages are part of the automatic disk formatting procedure. See Section 4.11 for more information.
Disk nn% full	This message appears when the disk is at least 70% full.
Disk full	This message appears when the disk is at least 90% full. The printer stops downline font loading.
Disk Removed *	The printer cannot find a previously installed disk. Press * to continue operation.
Disk write error **Disk read error**	The disk cannot read or write to a previously good area of the disk surface.
Disk error **Disk error nnnn**	An unknown or known disk error has occurred. Where: 1218 = Disk access failure 5033 = Master drive format failure 5034 = Master drive buffer failure 5035 = Master drive ECC failure 5036 = Master drive microprocessor failure 5037 = Master drive interface failure 5038 = Slave drive diagnostics failure 1234 = IDE bus busy and unable to send command 1238 = Event time out 5032 = Bad block 5031 = Uncorrectable data 5030 = Identification not found 1228 = Command aborted 5029 = Track 0 not found 5028 = Data Address mark not found

When problems occur with the disk, you must swap the disk or swap the video controller board. Note any exact error messages in the maintenance log and on the return tag.

6.12 50 ERROR

Explanation: This error message appears when the fusing temperature is too high, low, or fails to warm up fast enough. See Section 2.1.4 for a description of the fusing circuit.

Any malfunction of the fusing control, safety, or temperature regulation circuits can cause this error message.

Signal diagram reference: See figures 2–4 and 2–7 for schematics and Figures 6–2 and 6–5 for wiring diagrams.

Action: A power off time of **more than ten minutes** is required to clear this message. There are no test points for measuring fusing heater voltage. The glow from the fusing lamp can be seen by removing the left-side cover as shown in Section 9.18.

1. Make sure the fusing unit is properly installed.
2. Remove and inspect the fusing unit.
3. If you see any damage, replace the fusing unit.
4. Do the following to measure the resistance of thermistor TH1 and the fusing heater element. Skip this step if you do not have a volt-ohm-milliamp (VOM) meter.
   a. Connect the VOM leads across pins 1 and 2 of the fusing unit connector, shown in Figure 2–7. If the resistance reading is outside of the following parameters, replace the fusing unit:
      - Room temperature resistance is approximately 239KΩ.
      - Operating temperature resistance is less than 2.0KΩ.
   b. Connect the VOM leads across pins 3 and 4 of the fusing unit connector. Normal resistance range for a 115 volt fusing heater is between 2Ω and 3Ω. If the resistance reads open or shorted replace the fusing unit.
   c. Connect a VOM lead to the metal foot of the fusing unit. Touch the other first to pin 3 then to pin 4. If the VOM shows continuity, replace the fusing unit.
5. Make sure connectors C210 and C212 on the DC control board are properly connected.
6. Make sure the fusing unit in the printer is the correct part number for the line voltage.

7. Swap the following FRUs:
    - Fusing unit
    - DC control board
    - LVPSA
    - HVPSA/Fuser interconnect

6.13 51 or 52 ERROR

Explanation: The 51 error indicates that, for a period of two seconds or more, the DC control board failed to detect a beam detect $\overline{BD}$ signal.

The 52 error indicates that the DC control board failed to detect the $\overline{SCNRDY}$ signal from the scanner motor driver board. The $\overline{SCNON}$ signal turns on the scanner motor and the $\overline{SCNCLK}$ signal drives the synchronous scanner motor.

To clear either error, press [*].

Signal diagram reference: See Sections 6–3 and 2–10 for wiring diagrams.

Action: Do the following:

a. If the printer has been moved from a cold to a warm room, the optical lenses might be misted by condensation. Allow about 6 hours for the mist to evaporate.

b. Remove the top cover to inspect the scanner assembly connectors.

c. Make sure the connectors are fully plugged in, refer to Section 9.9 for the location of the scanner connectors.

d. Make sure connectors J206 and J205 are correctly plugged in.

e. Swap the following FRUs:
    - DC control board
    - Scanner assembly
    - Video control board

6.14 57 ERROR

Explanation: This is a main motor error message. The main motor runs on +24VB power derived from the top door interlock switch.

The main motor runs when the DC control board asserts the $\overline{MON}$ signal. When the main motor is up to speed, the $\overline{MRDY}$ signal is asserted by the motor drive board.

To clear this error, power down the printer. Wait about 4 seconds. Then power up the printer.

Signal diagram reference: See Sections 2–4 and 6–5 for wiring diagrams.

Action: Do the following:

1. Make sure the top door is fully closed and the interlock switch is fully depressed.
2. Remove the right-side cover and video controller board.
3. Inspect the connectors and cabling that runs between J211 on the DC control board and J131 on the main motor driver board. Make sure both connectors are correctly plugged in and the cable is in good shape.
4. Make sure the printer power is off.
5. Do the following to test the main motor load:
    a. Manually rotate the main motor for about ten turns.
    b. Swap the following if the motor fails to turn or turn smoothly:
        1. Main motor
        2. Gear assembly
6. Do the following to test the main motor drive power:
    a. Unplug connector J211 from the DC control board.
    b. Turn on the printer.

c. Carefully touch the **+** of the VOM to pin-4 of J211 on the DC control board. Be careful to not short adjacent pins.

d. As you manually actuate the top door switch, VOM should switch between +24 volts and zero volts.

- If this test works go to the step 7.
- If pin-4 fails to go to +24 volts, swap the following FRU:
  - DC control board
  - Feed unit or feed unit controller
  - Feed unit and option interconnect

7. Swap the following FRUs:
   - DC control board
   - Main motor

6.15 58 ERROR

Explanation: This is an exhaust fan error. The single speed exhaust runs when the DC control board asserts the *FAND* signal. If the exhaust fan stalls, the exhaust fan asserts the *FLOCK* signal that is detected by the DC control board.

Signal diagram reference: See section Figure 6–4 for wiring diagrams.

Action: Do the following:

1. Remove the right-side cover and video controller board.
2. Inspect the exhaust fan blades for foreign objects that might stall the fan and produce this error.
3. Inspect the connector and cabling that runs between J209 on the DC control board and the exhaust fan. Make sure the connector is plugged in and the cable is in good shape.
4. Swap the following FRUs:
   - DC control board
   - Exhaust fan

6.16 68 Service

Explanation: The page count memory (NVRAM) is full or is bad:

Action:

1. Swap the page count IC.
2. Replace the video controller board.

6.17 Print Engine Wiring Diagrams

Figures 6-2 through 6-5 are the wiring diagrams for the DEClaser 5100 printer.

The following conventions apply to the wiring diagrams:

– Unless otherwise stated, all voltage readings should be within ±5% of the stated value.

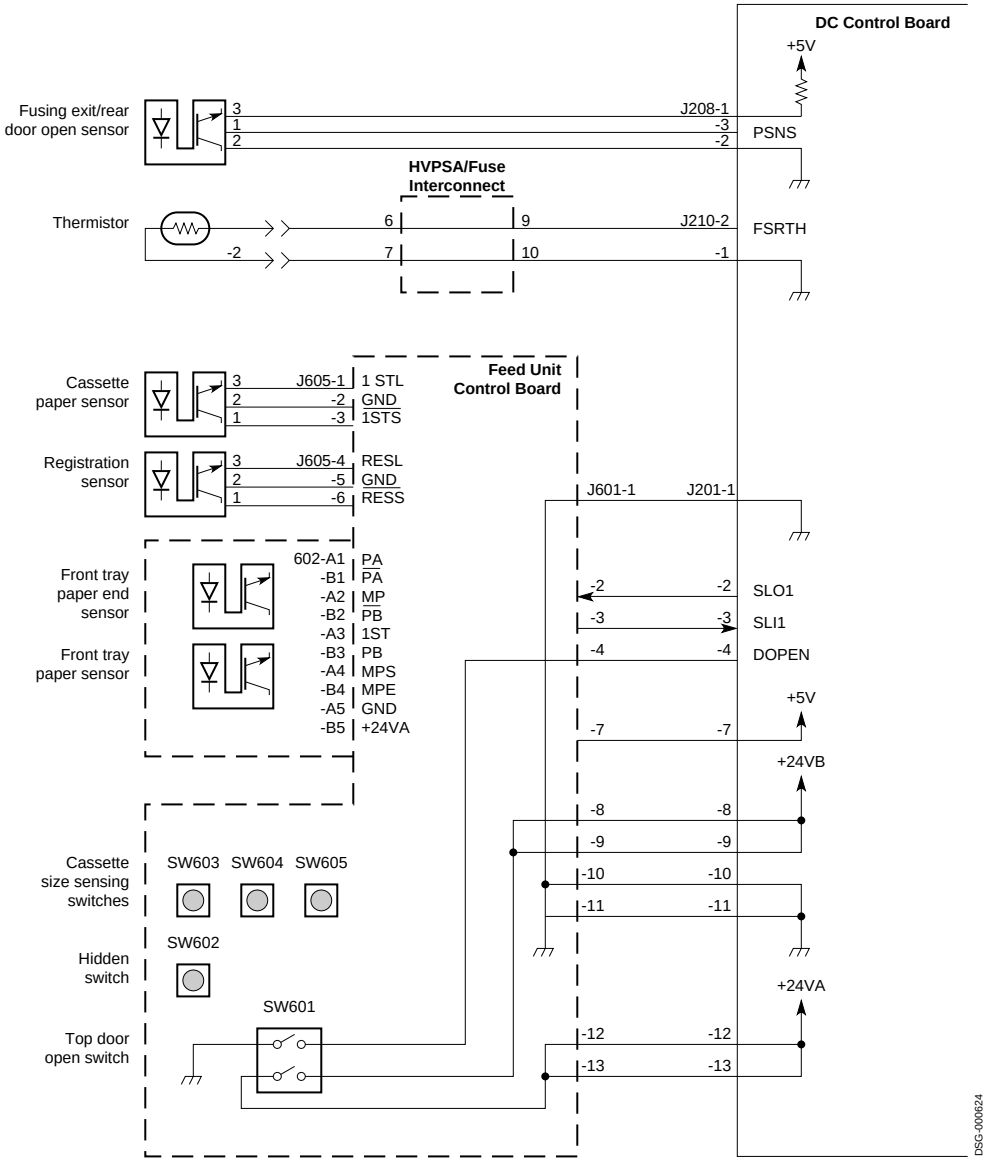
– Voltage level "low" means 0 to +0.5V.

– Voltage level "high" means 5V ±0.5V.

– The bar over a signal name (for example, $\overline{PRNT}$) shows that the signal, when asserted, is low.

Figure 6–6 and Figure 6-7 are the wiring diagrams for the optional envelope feeder and LCIT.

Figure 6–2 Print Engine Wiring Diagram 1



6.17 Print Engine Wiring Diagrams

Figure 6–3 Print Engine Wiring Diagram 2

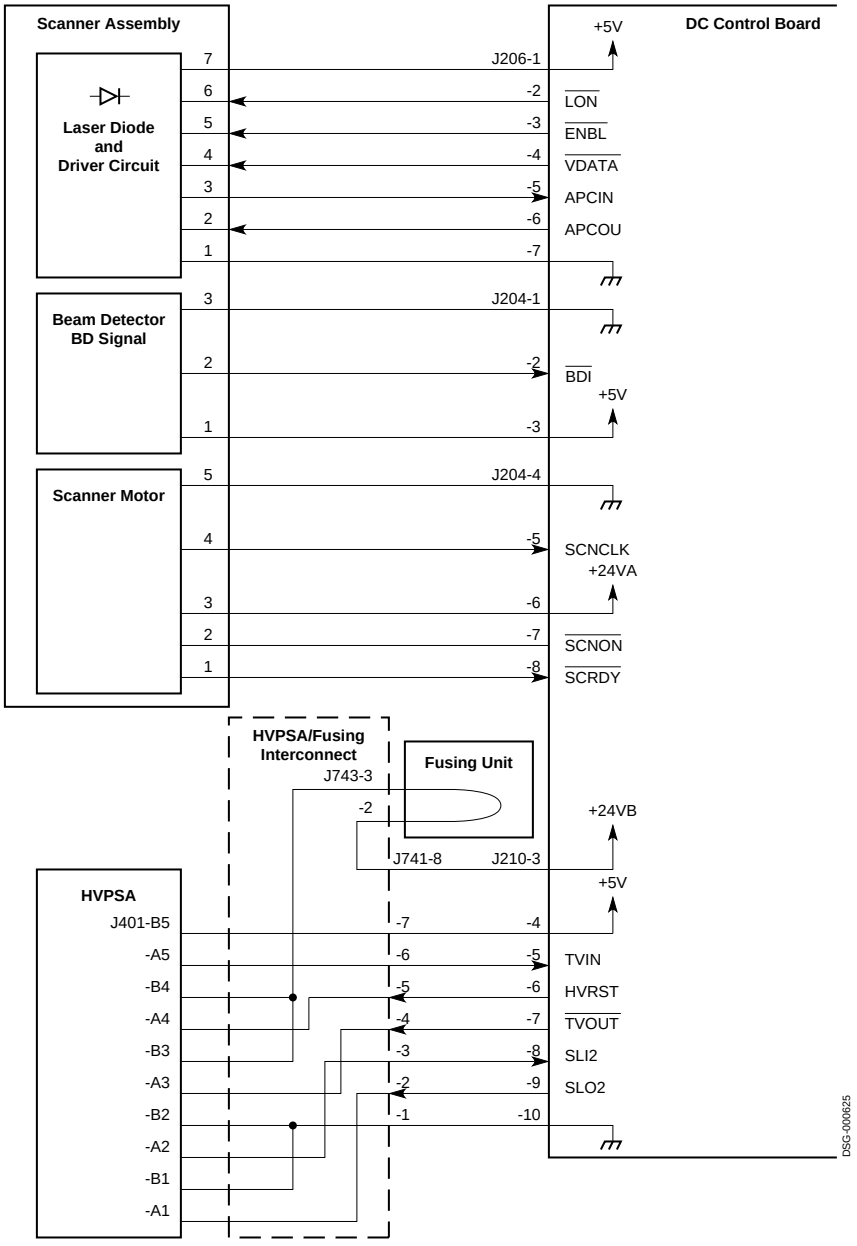
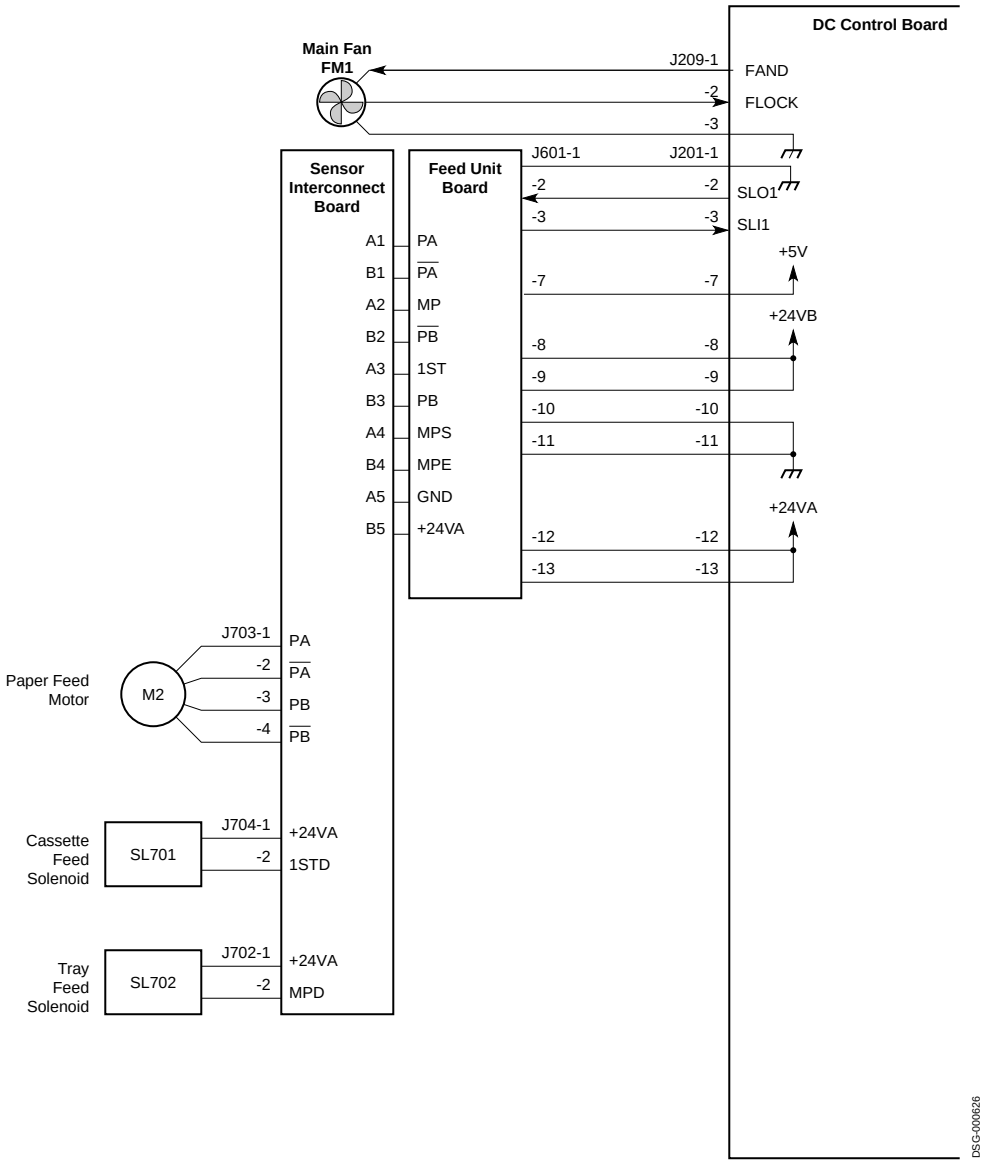
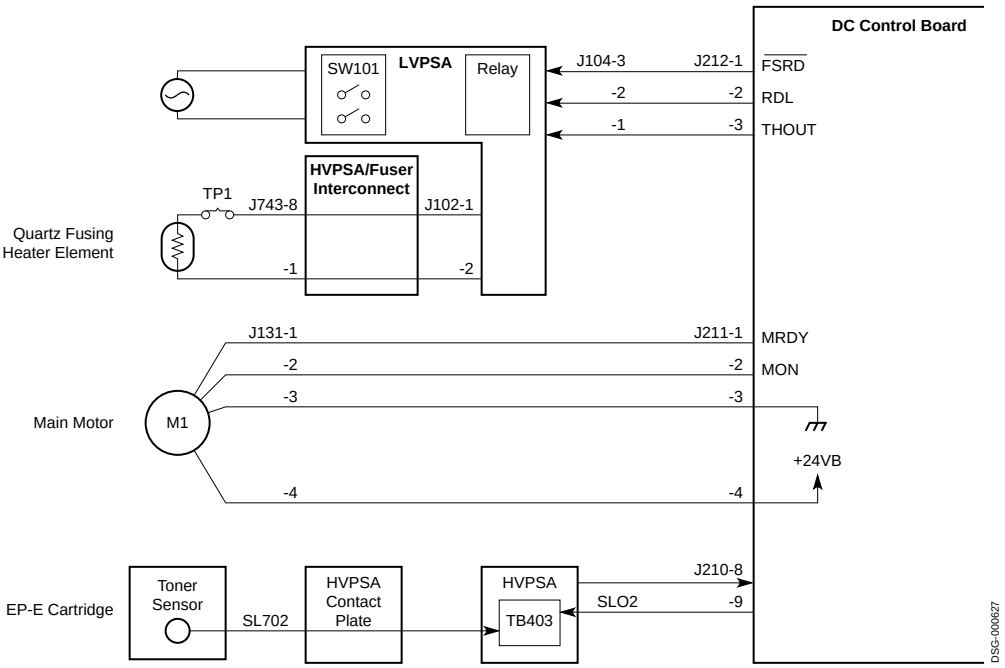


Figure 6–4 Print Engine Wiring Diagram 3



6.17 Print Engine Wiring Diagrams

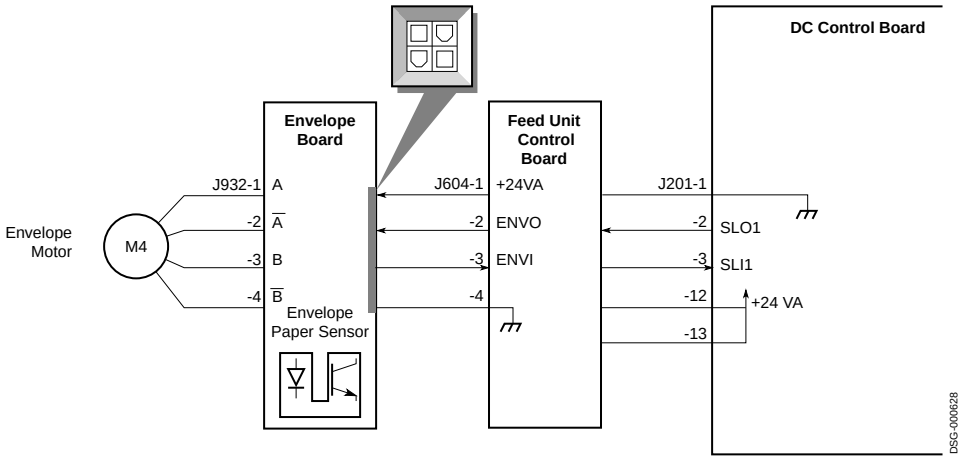
Figure 6–5 Print Engine Wiring Diagram 4



6.17.1 Envelope Feeder and LCIT Wiring diagrams

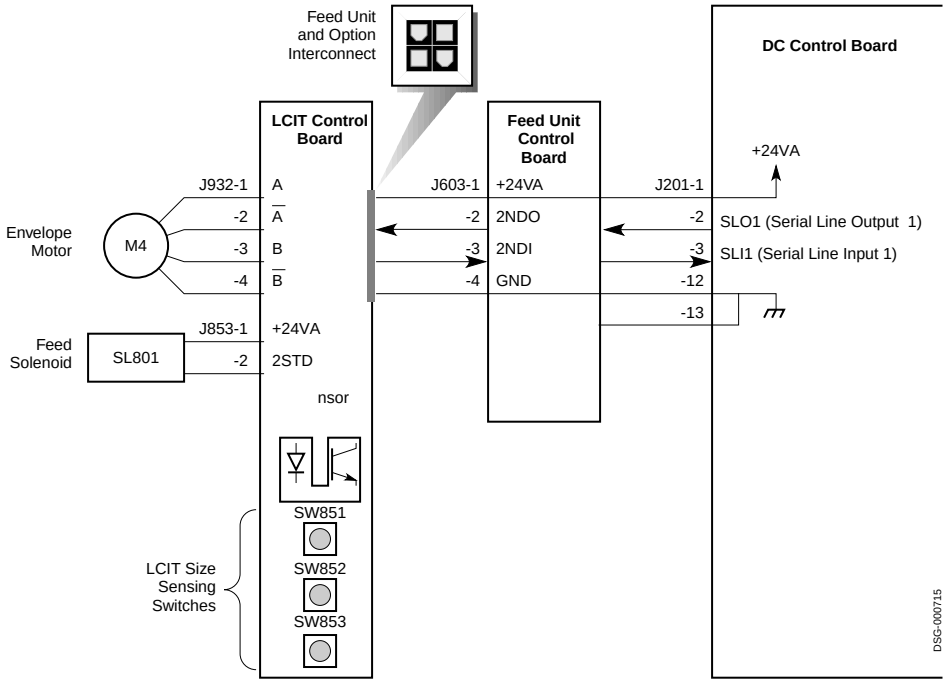
Figure 6–6 and Figure 6–7 are the wiring diagrams for the optional envelope feeder and LCIT.

Figure 6–6 Optional Envelope Feeder Wiring Diagram



6.17 Print Engine Wiring Diagrams

Figure 6–7 LCIT Wiring Diagram

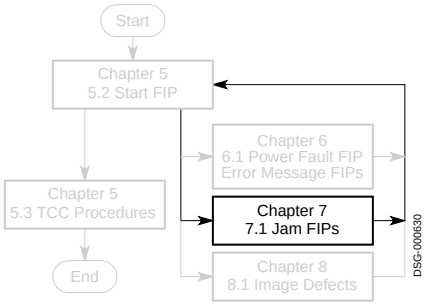


7

FIPs for Fixing Paper Jams

This chapter contains the FIPs for paper path jams and misfeeds.

For power and control panel message FIPs, see Chapter 6. For image defect FIPs, see Chapter 8.



The adjacent start FIP map shows the position of this chapter in the overall fault isolation procedure.

To find the correct paper jam FIP, see Section 7-1 and Section 7-2 to determine the type and location of your jam.

7.1 Types of Jams

The next table describes the various types of paper path jams that can occur in the DEClaser 5100 printer:

Table 7–1 Types of jams

Terms	Definition
Feed Failure	Paper never left the input device or never fed into the paper path.
Shingle jams	Leading edge of the bottom sheet slides under the tailing edge of the front sheet. The pattern resembles roofing shingles.
Stalled paper	Paper stops in the paper path. The removed sheet is undamaged.
Phantom jams	A "Paper Jam" message that occurs for no foreseeable reason. The message can occur spontaneously, intermittently, or continuously. Phantom jams might occur without any paper feeds. These jams are commonly caused by a bad sensor, cabling, or control board.
Wrinkled, Skewed, Notched, Dog-eared, or Shredded	Paper damage caused by a serious paper path malfunction. A common cause might be obstructions, broken paper path guides, rollers, or roller pressure springs.

7.2 Identifying the Location of the Jam

This section describes how to indentify where the the jam has occured.

Before you fix a jam, Before you try to fix a paper jam, you must:

1. Print enough copies of the test page to determine the location, frequency, repeatability, and the type of jam.
2. Using this information, along with Figure 7–1, determine the type and location of the jam.
3. See Table 7–2 to determine which jam FIP to turn to.

Figure 7–1 Jam Areas

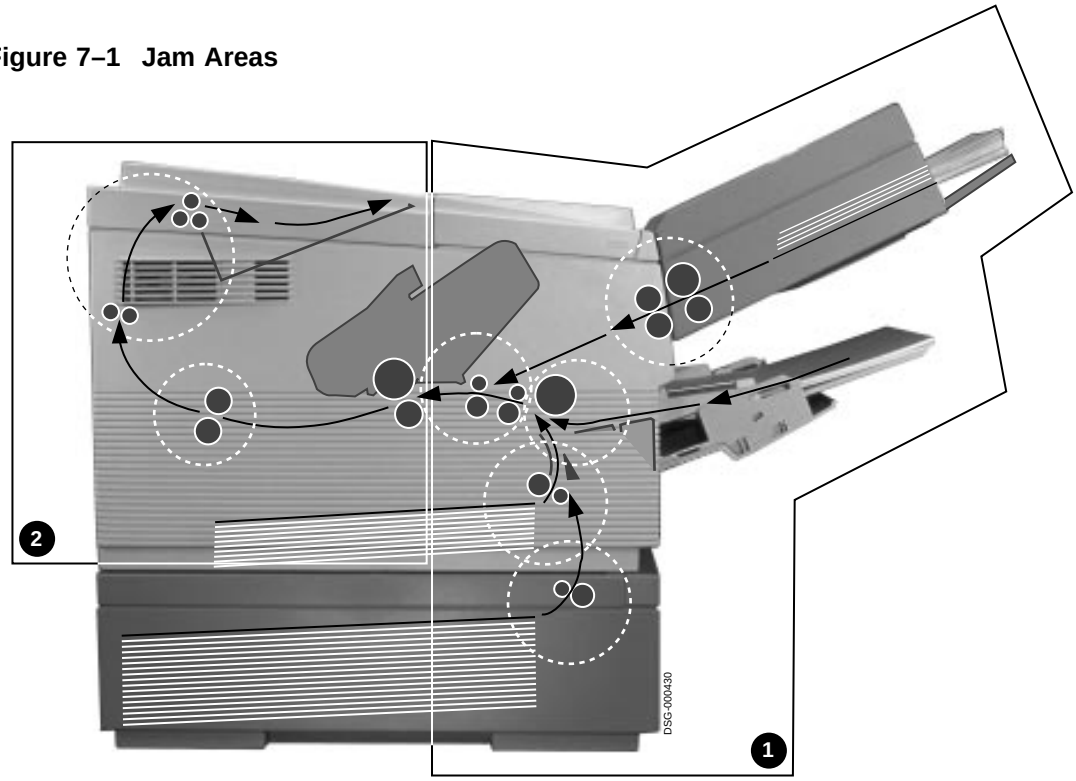


Table 7–2 Jam Areas

If the jams occur . . .	Go to Section . . .
❶ In the **paper feed area**; includes the paper path from the selected input device to the entrance of the fusing unit. See Section 2.2 for a description of the feed path.	7.3
❷ In the **fusing and delivery area**; includes the paper path from the fusing unit to the exit of the delivery rollers.	7.4
❶ and ❷ As a phantom jam	7.5 and see Table 7–1

7.3 Paper Feed Area Jams

This section covers jams, skewing, or feed failure caused by a malfunction in the front or feed area of the DEClaser 5100 printer.

1. If the jamming occurs in the fusing or delivery areas, go to Section 7.4.
2. Try some fresh paper or envelopes of known good quality.
3. Make sure the tray, cassette, or envelope feeder is loaded, but not overloaded, and is adjusted properly.
4. Thoroughly inspect the following for damage or malfunction. If you see any broken or cracked plastic, replace the damaged components.
   - The LCIT and internal cassettes
   - The envelope feeder
   - The EP-ED cartridge
   - The paper path guides, registration sensor linkage, jam plate.
5. Feed paper from all available inputs. **Note the feeder that causes the jam and the type of jam.**.
6. Table 7–3 lists the originating feeder (vertically) and the types of jams (horizontally). Use this table to find the FRU swap list. Swap the FRUs until the jam is fixed.

   Before swapping a FRU, make sure it is installed properly and look for loose connectors or screws.

Table 7–3 Feed Area Swap Lists

	Type of jam		
Originating Feeder	**Skewing, Wrinkling, Stalls**	**Shingle Jams**	**Feed Failure**
All Feeders	Feed assembly EP-ED cartridge DC control board Main motor Gear assembly	Bad paper Feed assembly Feed controller	Feed assembly DC controller Feed assembly interconnect
Front Tray	Paper feed roller Feed assembly	Separation pad Bad paper	Tray feed roller Feed assembly
Internal Cassette	Paper feed roller Feed assembly	Bad paper Incorrect paper loading Internal cassette Feed assembly	Paper feed roller Feed assembly
LCIT	Paper feed roller LCIT controller Feed assembly	Bad paper Incorrect paper loading LCIT cassette LCIT Feed assembly	Paper feed roller LCIT LCIT controller Feed assembly Feed assembly interconnect
Envelope Feeder	Envelope feeder Feed assembly	Bad paper Envelope feeder Feed assembly	Envelope feeder Feed assembly Feed assembly interconnect

Note: *The paper feed assembly controls all paper feeding, registration, and paper path sensing in the paper feed end of the printer.*

7.4 Fusing and Delivery Area Jams

This section covers jams that occur in the fusing or delivery area of the DEClaser 5100 printer. The fusing exit/rear door sensor is the only paper path sensor in the fusing and delivery area.

Note: *When the rear door is open, a "Paper Jam" message appears.*

1. If paper fails to feed or jams before the fusing rollers, refer to Section 7.3.
2. Open the rear door and thoroughly inspect the following:
   - All paper path guides
   - Rear door sensor linkage actuation tang
   - Rear door hinge pins
   - Rear door latch
   - Fusing exit area
   - Fusing assembly levers–in down position
   - Fusing exit sensor linkage–moves freely with no binding.
   - The cabling and connectors that run between J208 on the DC control board and the fusing exit/rear door sensor
3. To fix fusing and delivery area jams, swap the following FRUs in the order shown:
   - Fusing unit
   - Delivery unit
   - Fusing exit/rear door sensor
   - DC control board
   - Main motor
   - Gear assembly

7.5 Phantom Jams

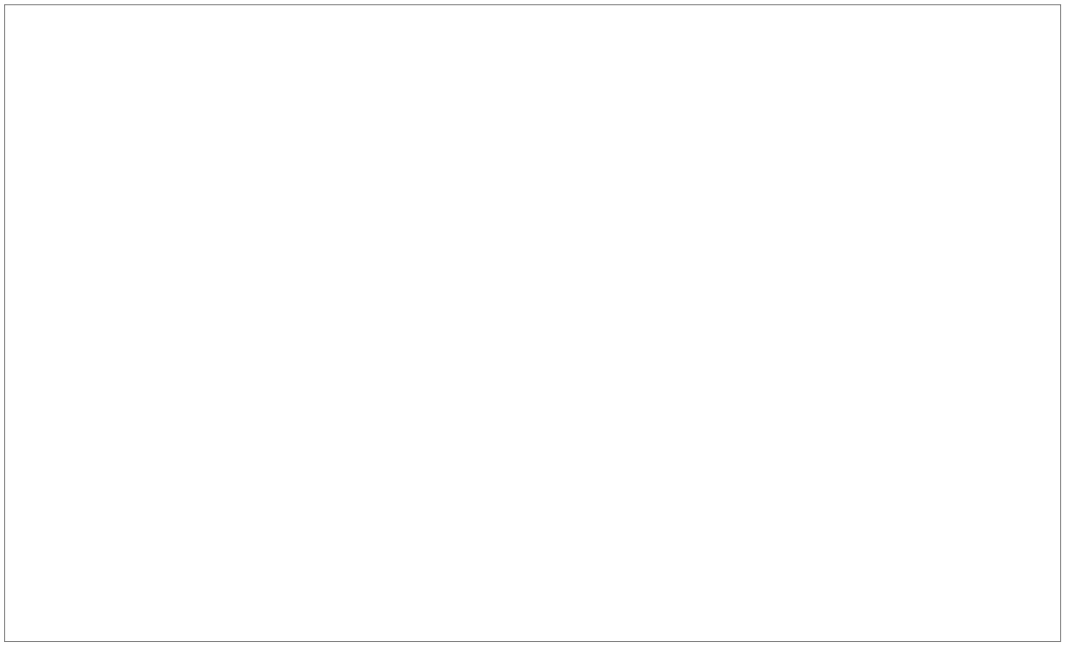
As explained in Table 7–1, phantom jams appear to have no cause that connects to a mechanical problem in the paper path, but are produced by a faulty cable, controller board, or paper path sensor. The DEClaser 5100 printer dual purpose fusing exit/rear door sensor functions as a paper path and interlock sensor.

7.5 Phantom Jams

1. Open the rear door and thoroughly inspect:
   - The rear door hinge pins and latch.
   - The fusing exit/rear door sensor linkages—should move freely with no binding.
2. Open the top door and inspect the registration sensor lever. It should move freely with no binding.
3. Inspect the following:
   - The J208 connector on the DC control board to the fusing exit/rear door sensor
   - The 13-pin connector that plugs into J201 on the DC controller board
4. Swap the following to fix a phantom jam:
   - Fusing exit/rear door sensor
   - DC control board
   - Paper feed assembly

7.5 Phantom Jams

Notes:



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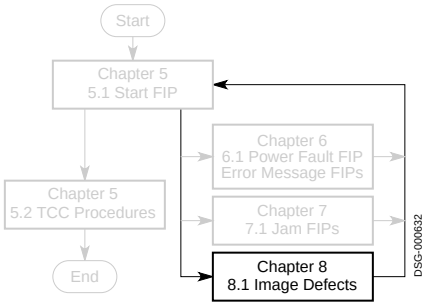
8

FIPs For Fixing Image Defects

This chapter contains the FIPs for fixing image defects.

For power and control panel FIPs, see Chapter 6. For paper jam FIPs, see Chapter 7.



The adjacent map shows the position of this chapter in the overall fault isolation procedure.

To find the type of defect and the most appropriate FIP, see Section 8.1.

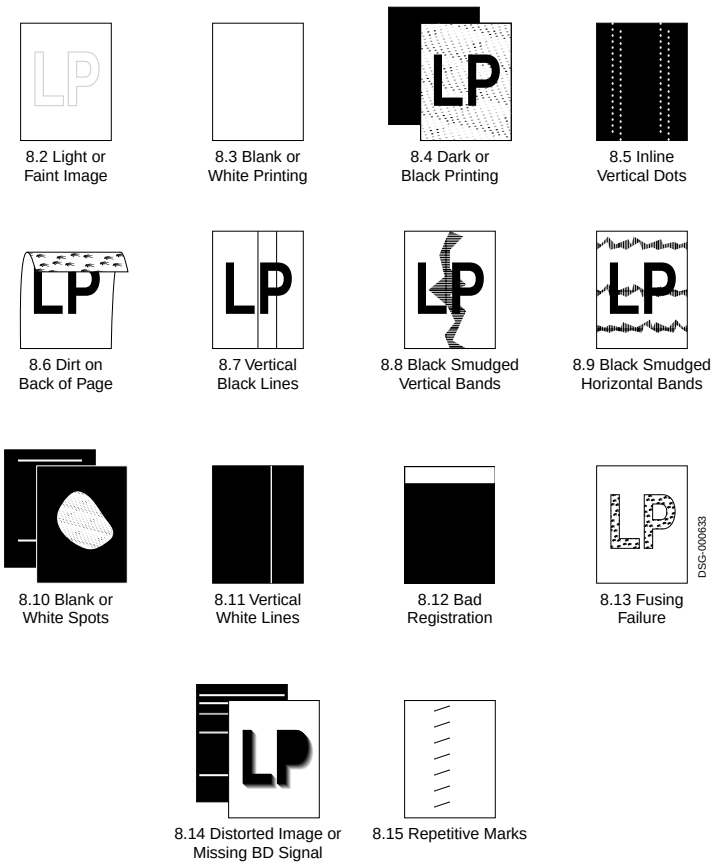
8.1 Image Defects Lookup

To determine image quality, obtain printouts from the customer, and print several copies of the demonstration test page, as described in Chapter 4.

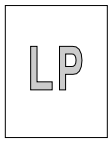
Evaluate the crispness, density, and fusing quality of the printer images. Look for unwanted artifacts and repetitive marks. Match the suspected defects to the examples in Figure 8–1

Turn to the section listed under that example to find the fault isolation procedure (FIP).

Figure 8–1 Image Defects Directory



8.2 Light or Faint Images



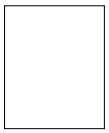
Dark areas look dull and washed out. Text appears gray, not black.

1. The density adjuster must be set to 7. Adjust the density using the Print density and Miscellaneous submenus from the Set-Up Key menu. See Section A.1 key menu map.
2. Try fresh dry paper.
3. Swap the EP-ED cartridge. The toner might be damp or there might not be any toner left in the EP-ED cartridge. Investigate why the toner low error failed to appear.
4. Perform the following print drum test:
   a. Print a test sheet.
   b. Interrupt the test print by opening the top door.
   c. Remove the EP-ED cartridge.
   d. Open the drum shutter (10 seconds maximum), and examine the image on the drum.
   - If there is a **faint image on the drum:**

     Swap the EP-ED cartridge, if you did not do so in step 3.

     Inspect the connectors and wiring between J210 on the DC controller board and J401/J742 on the HVPSA. Make sure J210 pins-9 and -10 are less than 0.76 Vdc.
   - If there is a **dark normal image on the drum,** swap the transfer roller.
5. Swap the following:
   a. HVPSA
   b. DC control board
   c. Scanner assembly
   d. HVPSA/Fuser interconnect
   e. HVPSA contact plate guide

8.3 Blank or White Prints



No printing occurs and the sheet is entirely blank. See Section 2.3.2 for information about the write black xerography.

1. Inspect the operation of the safety shutter, pivot pin, and EP-ED guide. When an EP-ED cartridge is properly installed, the left side guide pushes the pivot pin that opens the shutter.

   To quickly test the shutter, remove the EP-ED cartridge and manually press the pivot pin with a suitable tool. You should hear the shutter open and close with a definite clanking sound.

   The shutter mechanism is shown in Section 9.26.

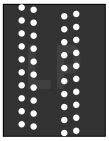
2. Swap the following:
   a. EP-ED (toner) cartridge
   b. HVPSA
   c. DC control board
   d. Scanner assembly
   e. HVPSA/Fuser interconnect
   f. HVPSA contact plate guide

8.4 Black or Too Dark Prints

Either the test print is entirely black or the black areas of the text or graphics appear heavy or smudged because too much toner was deposited. Do the following:

1. The density adjuster must be set to 7. Adjust the density using the Print density and Miscellaneous submenus from the Set-Up Key menu. See Section A.1 key menu map.
2. Swap the EP-ED cartridge
3. Inspect the GND contact of the EP-ED cartridge and connector block. See Figure 2–12. Clean any dirt or replace the damaged component.
4. Inspect the connectors and wiring between J210 on the DC controller board and J401/J742 on the HVPSA.
5. Swap the following:
   a. HVPSA
   b. DC control board
   c. Scanner assembly
   d. HVPSA/Fuser interconnect

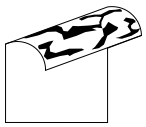
8.5 In-line Vertical Dots



Do the following when rows of white dots appear on a chaotic, muddy, and dark background:

1. Inspect and clean the static charge eliminator for damage, dirt, or loose grounds.
2. The surface of the transfer roller might be contaminated and you need to swap it.
3. Swap the static eliminator, which is integral to the HVPSA contact plate.

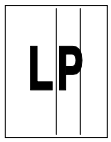
8.6 Dirt on Back of Page



Do the following when toner stains the back of a printed page:

1. Carefully clean the paper guides on the entrance guide, transport fusing unit entrance, and the paper feed unit. Clean the entire paper path.
2. Inspect the EP-ED cartridge for leaking toner. If it leaks, replace the cartridge.
3. Inspect the fusing unit.
   - If the lower roller is dirty, replace it.
   - Make sure the two installation screws (shown in Section 9.25) are tightly secured. If the screws are loose, the fusing unit grounding diodes (shown in Section 9.25) might not work.
4. Swap the following:
   - Transfer roller
   - Fusing unit

8.7 Vertical Black Lines



Do the following if the test print exhibits well defined black lines that run from leading to trailing edge of the sheet. If the artifact is blotchy or smudged, go to Section 8.8. This malfunction is typically caused by mechanical failure of the EP-ED cartridge or the fusing unit.

1. Print a test sheet.
2. Interrupt the test print by powering off the printer.
3. Open the top door. Remove the half-printed sheet.
4. Remove the EP-ED cartridge.
5. Open the drum shutter (10 seconds maximum), and examine the image on the drum.
   - If the offending band appears on the print drum, replace the EP-ED cartridge.
   - If the pattern on the drum is all right, swap the fusing unit.

8.8 Black Smudged Vertical Bands

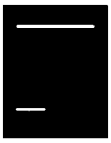
Replace the EP-ED cartridge when the test print has black, smudged, and smeared bands running vertically from the leading to trailing edges of the sheet. If the lines are clearly defined, go to Section 8.7.

8.9 Black Smudged Horizontal Bands

Print several test sheets and line up the sheets from trailing to leading edge.

Replace the EP-ED cartridge if the bands appear at regular intervals. Replace the fusing unit if the bands appear at irregular intervals.

8.10 Blank or White Spots

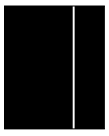


Do the following if bands, stripe, or voids appear in place of text or graphics:

1. Try fresh dry paper. Make sure a correct type and size paper is being used. See *Digital Laser Printers Guide to Paper and Other Media* for paper specifications.

2. Swap the following:
   a. EP-ED cartridge. If this fixes the problem and you suspect that the EP-ED is out of toner, consult the problem history in the site maintenance log. If this problem occurs repeatedly, you can suspect a failure of the toner detection circuit. See Section 6.9 to fix the toner sensor circuit.
   b. Transfer roller
   c. HVPSA
   d. DC control board
   e. HVPSA contact plate guide

8.11 Vertical White Lines



Do the following if well-defined vertical lines of uniform width run through the dark areas of text and graphics of the test print:

1. Remove the EP-ED cartridge and shake it, as shown in the instructions that are embossed on the EP-ED cartridge.
2. Examine the following components in the path of the laser beam. Look for hair, paper shards, dust, or other foreign matter.
   - The inlet shutters of the EP-ED cartridge
   - The outlet slit of the scanner assembly
3. Swap the following:
   a. EP-ED cartridge
   b. Scanner assembly

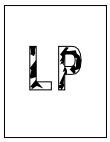
8.12 Registration

The image is out of place between the leading and trailing edges of the sheet. Registration problems are caused by a malfunctioning paper feed process or by a malfunction or maladjustment on the DC control board.

The REGVR potentiometer, on the DC control board, provides approximately 1 cm (0.93 in) of registration adjustment. There are no side-to-side image positioning adjustments.

1. Inspect the cassette or front tray for overloading or mechanical damage.
2. Make sure a correct type and size paper is being used. See *Digital Laser Printers Guide to Paper and Other Media* for paper specifications.
3. Inspect the pickup and oblique rollers for damage, wear, or surface contamination.
4. Make sure the registration sensor lever works without sticking or binding. If the sensor lever fails to work, replace the paper feed unit.
5. Adjusting the REGVR potentiometer to correct for a malfunctioning component is not recommended. Find and replace the malfunctioning part. See Section 4.9 for the registration adjustment.
6. Swap the following parts:
   a. Cassette or front pick up roller
   b. DC control board
   c. Paper feed assembly

8.13 Fusing Failure



Do the following if the toner can be easily brushed off of the printed test sheet:

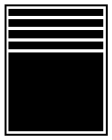
1. Make sure a correct type and size paper is being used. See *Digital Laser Printers Guide to Paper and Other Media* for paper specifications.
2. Open the rear door.

   Make sure the two fusing assembly levers are in the down position. The levers are shown in Section 9.25.
3. Remove the fusing unit and examine the connectors.
4. Swap the following:
   a. Fusing unit
   b. DC control board
   c. HVPSA/Fuser interconnect

8.14 Distorted Image or Missing BD Signal

Image distortion occurs when the paper fails to smoothly move through the transfer process or if a malfunction occurs in the scanning assembly.

If the beam detect (BD) signal is missing, this distinctive pattern prints before an engine fault occurs and the message appears.



1. Inspect the following DC Controller board connectors for damage or missconnection. Replace any FRU that is damaged.

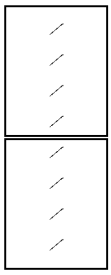
This connector . . .	Should connect to . . .	Comment
J211	Main motor	Plugs into J131 on the motor board.
J201	Paper feed unit	Plugs into feed unit controller.
J205	Scanner assembly	Motor and BD circuit
J206	Scanner assembly	Laser diode

2. **Perform this step only if there is a distorted image.**

   Inspect the condition of the oblique feed rollers and pressure springs. If you see any surface deterioration or rust, replace the paper feed unit. See Section 2.2 for the location of the oblique feed rollers.

3. Swap the following:
   - DC control board
   - Paper feed unit
   - Pickup motor
   - Main motor
   - Scanner assembly

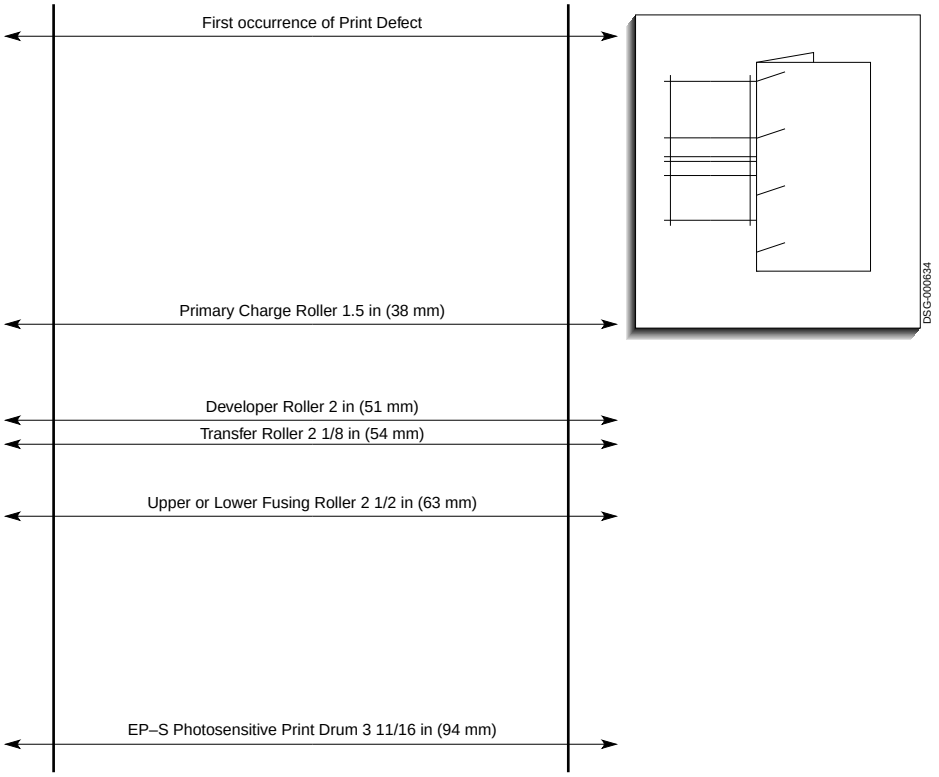
8.15 Repetitive Marks



When surface damage happens to one of the rollers, a repetitive mark is produced on the test page. The color of the marks might be black or white and the shape is a clearly defined spot or hairline.

Use Figure 8–2 to measure the distance between the marks and to identify the defective roller.

Figure 8–2 Roller Defect Ruler



9

Removing and Replacing FRUs

This chapter contains the procedures for removing and replacing field replaceable units (FRU)s from the DEClaser 5100 printer.

9.1 Removing and Replacing FRUs

Unless otherwise noted, you must reverse the removal procedure to replace an FRU.

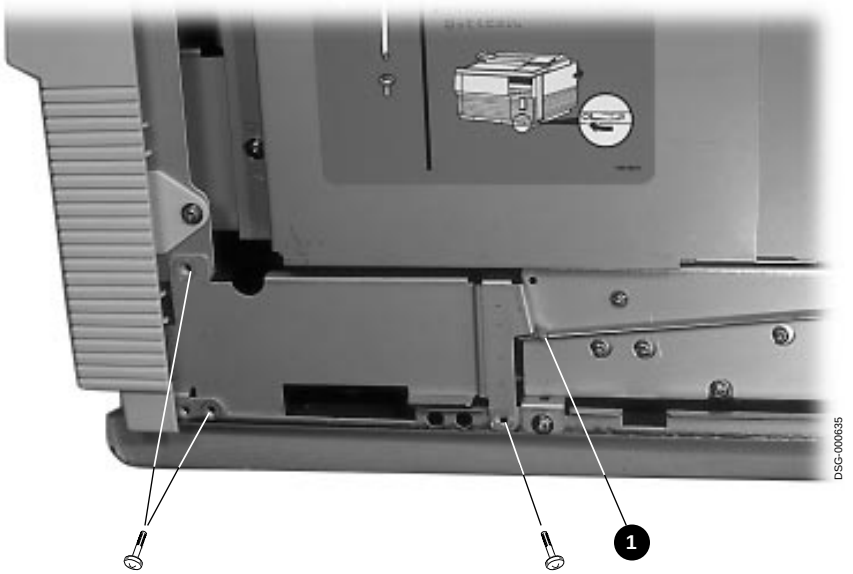
Caution *To protect the FRU and the print engine from static electricity, always use antistatic equipment and procedures. Caution messages are included in the removal and replacement procedures of the most vulnerable FRUs.*

9.2 Assembly, Control panel

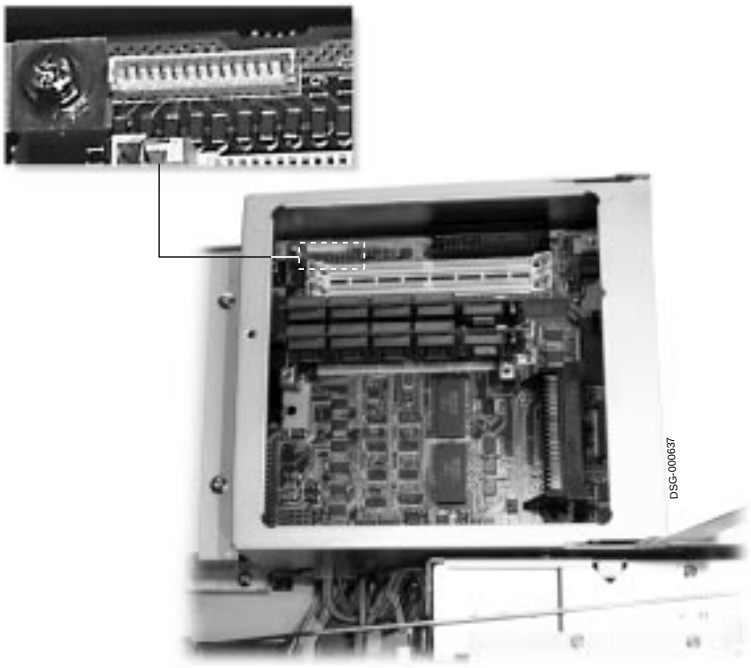
Use the following procedure to remove the control panel Assembly:

1. Remove the paper cassettes.
2. Remove the right-side and top covers, as shown in Section 9.19 and Section 9.20.
3. Remove the three screws that hold the metal panel to the printer.
4. Remove the metal panel.

   When you replace the metal panel and tighten the three screws, make sure the linkage ❶ for the power switch is not pinched and that the action of the power switch is smooth and positive.

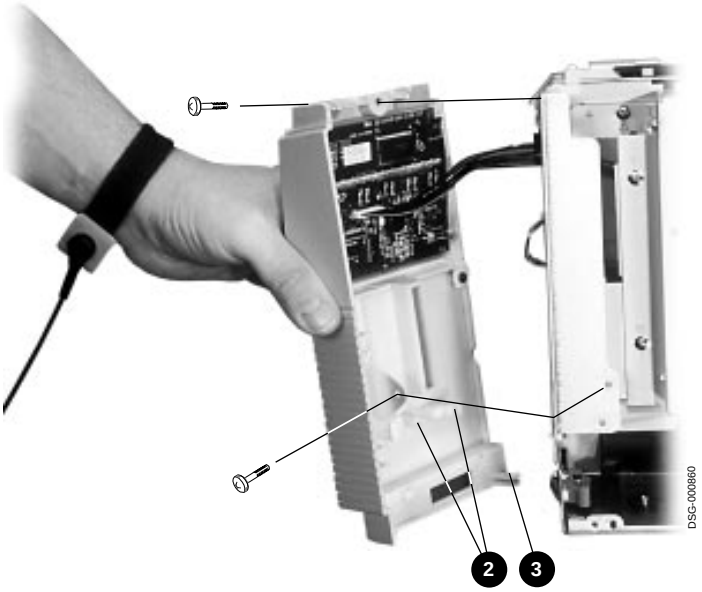


5. Unplug the connector from J131 on the video control board.



9.2 Assembly, Control panel

6. Remove the top and side screws.
7. Release the two clips ❷ that hold the control panel to the metal bulkhead.
8. Release the one remaining clip ❸ and partially withdraw the control panel assembly.



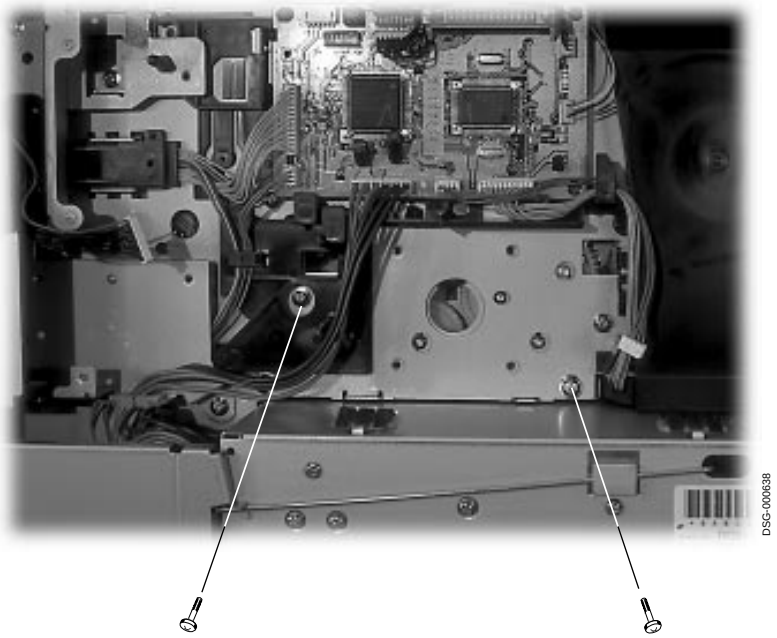
9.3 Assembly, Gear

Use the following procedure to remove the gear assembly:

1. Remove the following parts:

	FRU	See section:
a.	Right-side cover	9.19
b.	Card cage	Section 9.16
c.	Video controller Board	Section 9.15
d.	Fusing unit	Section 9.25
e.	Main motor	Section 9.28

2. Remove the two screws that secure the gear assembly to the printer.



9.3 Assembly, Gear

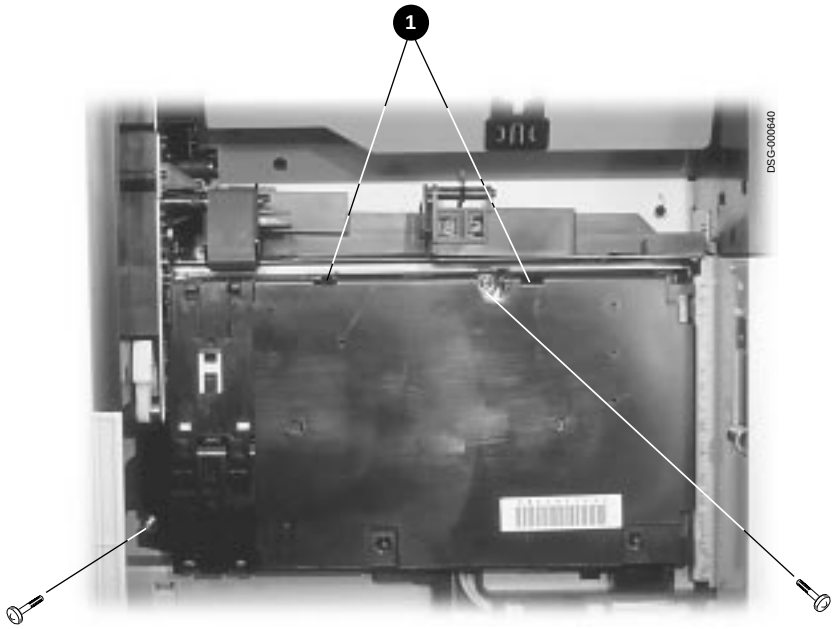
3. Remove the gear assembly through the rear of the printer.

9.4 Assembly, High-Voltage Power Supply (HVPSA)

Use the following procedure to remove the high-voltage power supply assembly (HVPSA):

1. If installed, remove the optional LCIT, as shown in Section 9.10.
2. Remove the EP-ED cartridge, as shown in Section 9.17.
3. Stand the printer up on the right-side cover.
4. Remove the two screws.
5. Release the two clips ❶ while wiggling the HVPSA.
6. Carefully withdraw the HVPSA.

   Caution *Do not damage the contact springs and connectors.*

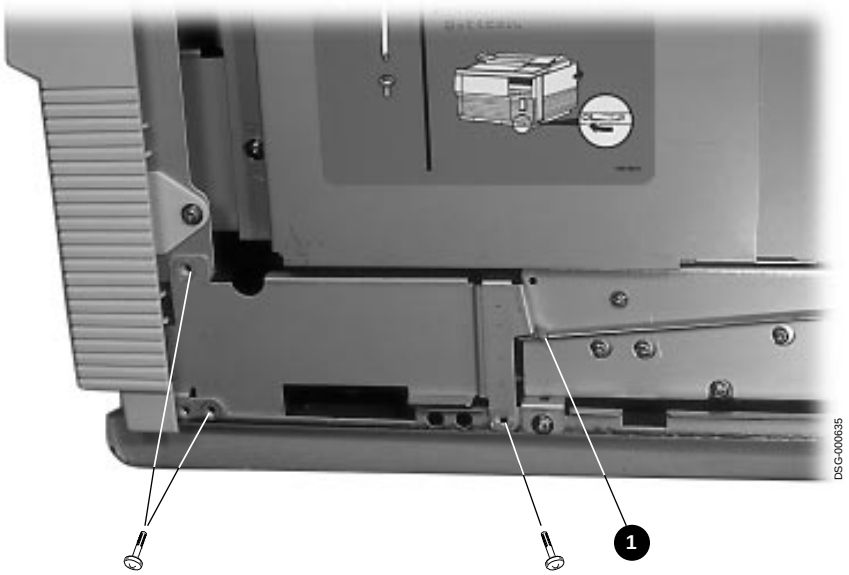


9.5 Assembly, Low-Voltage Power Supply (LVPSA)

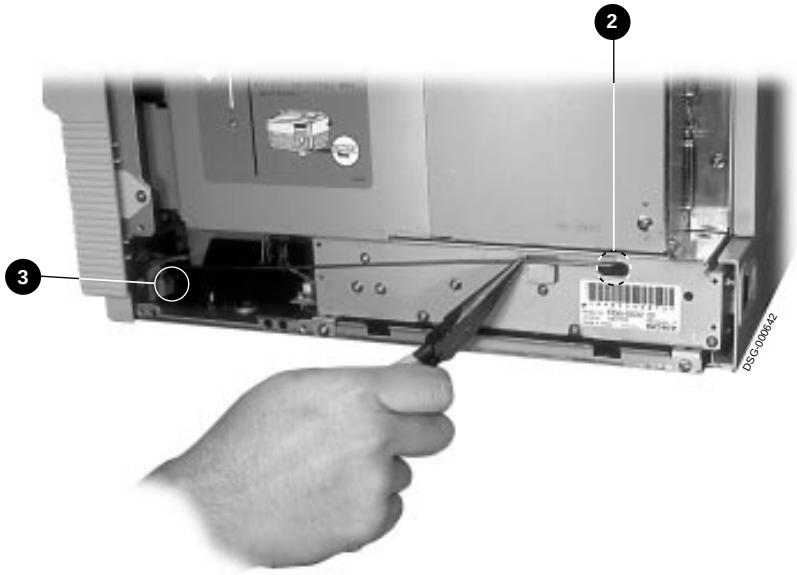
Use the following procedure to remove the low-voltage power supply assembly (LVPSA):

1. Remove the right-side cover, as shown in Section 9.19.
2. Remove the three screws that hold the metal panel to the printer.
3. Remove the metal panel.

   When you replace the metal panel and tighten the three screws, make sure the linkage ❶ for the power switch is not pinched and that the action of the power switch is smooth and positive.



4. Use a large needlenose pliers to flex and remove the switch linkage ❷ from the LVPSA.
5. Flex and remove the switch linkage from the front switch ❸.

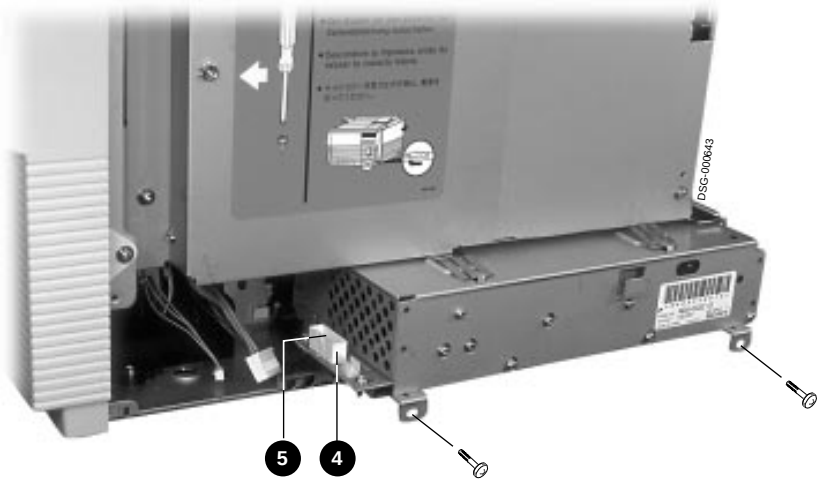


9.5 Assembly, Low-Voltage Power Supply (LVPSA)

6. Disconnect the 3-pin J104 connector ❹.
7. Unplug the 6-pin J103 connector ❺.
8. Remove the two screws that hold the LVPSA to the printer.

   Caution: *Do not bend the sheet metal. In the next step you might have to flex the bottom of the card cage upward to remove the LVPSA.*

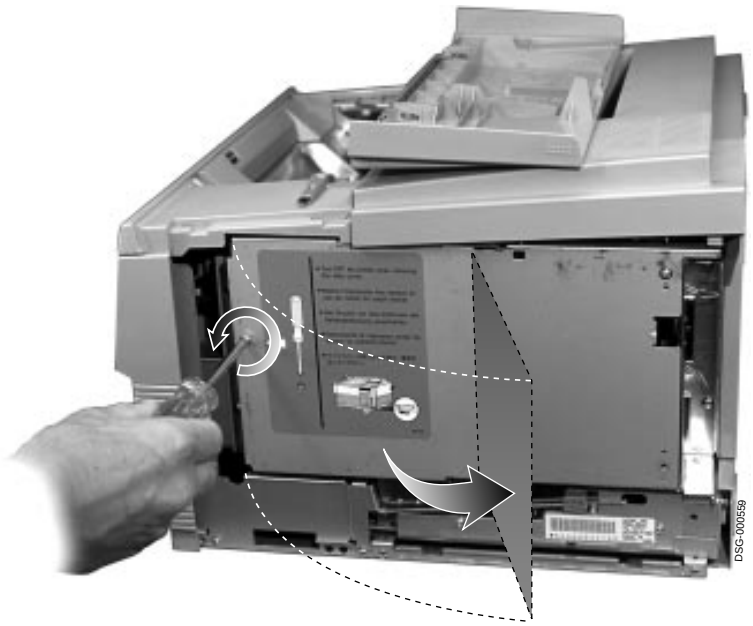
   If the LVPSA cannot be removed, remove the card cage, as shown in Section 9.16.
9. Use a suitable tool to gently pry the LVPSA out of the printer.



9.6 Assembly, Optional Hard Disk Drive

Use the following procedure to remove the optional hard disk drive:

1. Remove the right side cover, as shown in Section 9.19.
2. Remove the screw that latches the card cage cover door.
3. Open the card cage cover door.



9.6 Assembly, Optional Hard Disk Drive

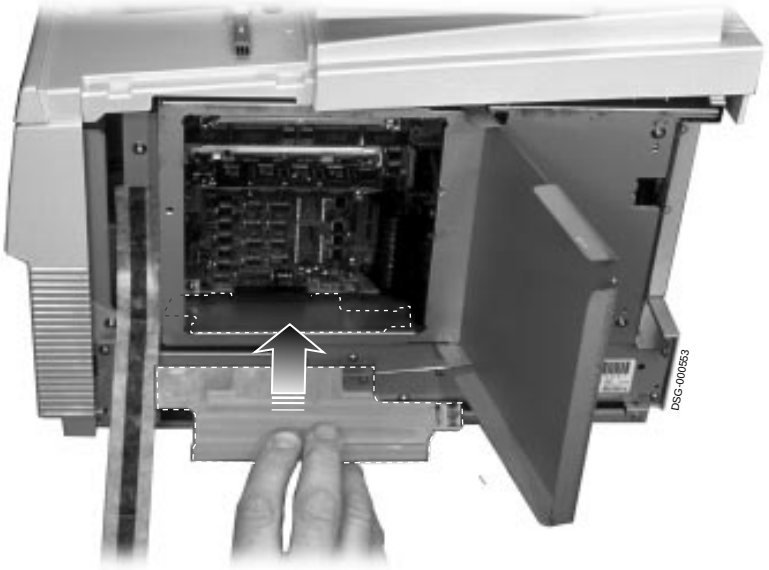
4. Loosen the three screws that hold the disk drive option to the video controller board.

   Caution: *Do not use a magnetic screwdriver to install the disk drive option is risky. The magnetic tip can destroy the disk formatting.*

5. Wiggle the disk drive option to unplug and remove it.

9.6 Assembly, Optional Hard Disk Drive

6. Unsnap and remove the guide plate.



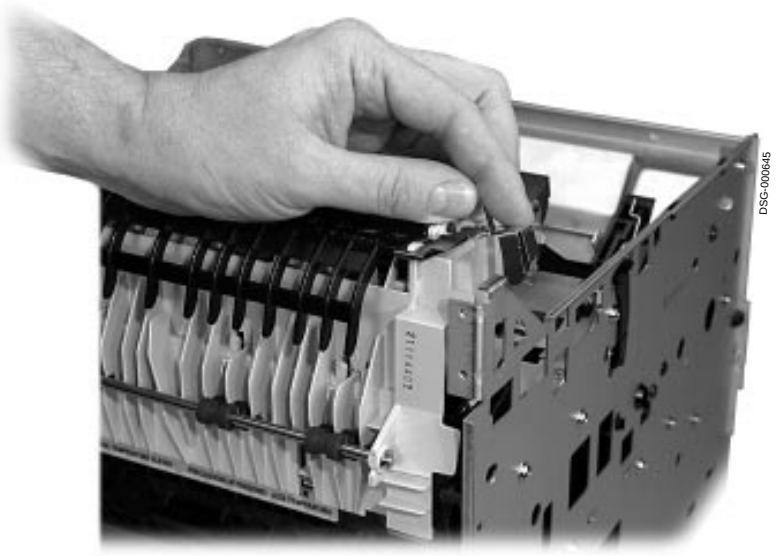
9.7 Assembly, Paper Delivery

Use the following procedure to remove the output assembly:

1. Remove the following parts:

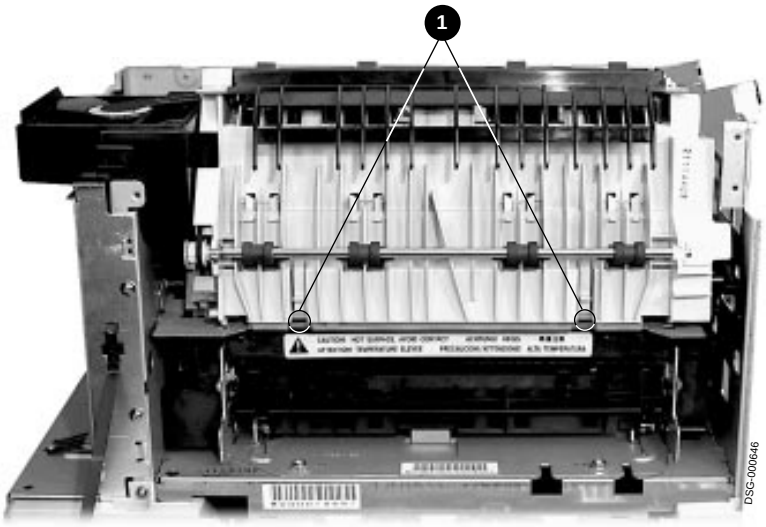
	FRU	As shown in section:
a.	Left-side cover	9.18
b.	Right-side cover	9.19
c.	Top cover	9.20

2. Remove the EMI ground strap the metal frame.



9.7 Assembly, Paper Delivery

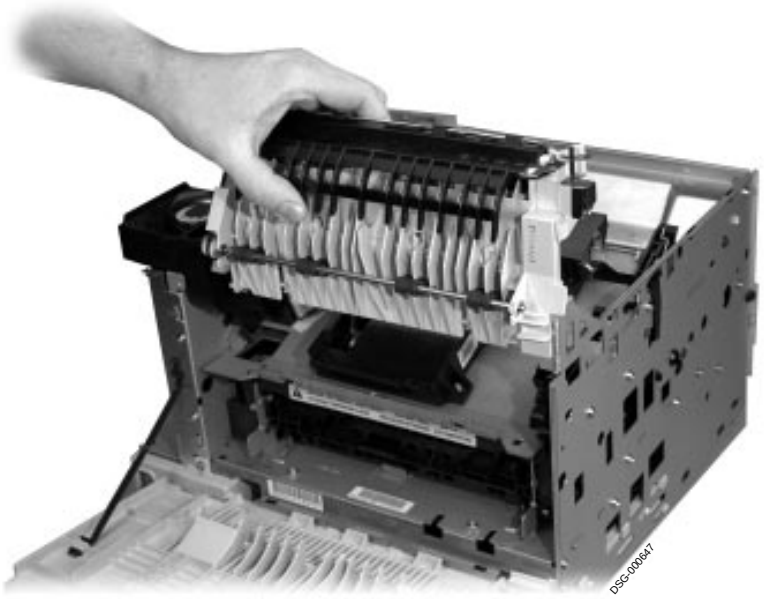
3. Press and release the two clips ❶.



4. Wiggle and rotate the output assembly to disengage the rear clips from the chassis.

   When replacing the output assembly, make sure the clips are fully engaged and the assembly is squarely seated. The assembly's alignment pins must not be damaged and must be centered in the chassis holes.

5. Remove the output assembly.



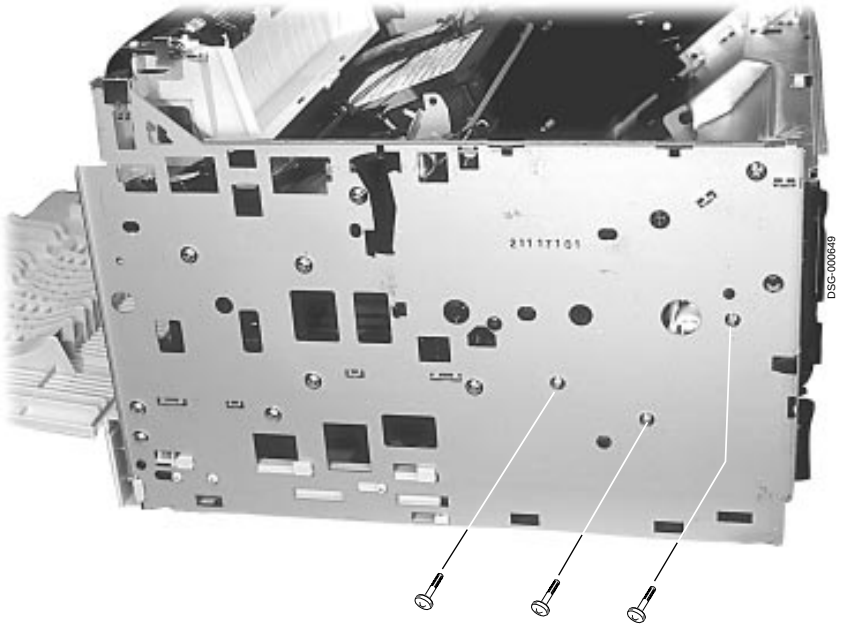
9.8 Assembly, Feed

Use the following procedure to remove the paper feed assembly:

1. Remove the following parts:

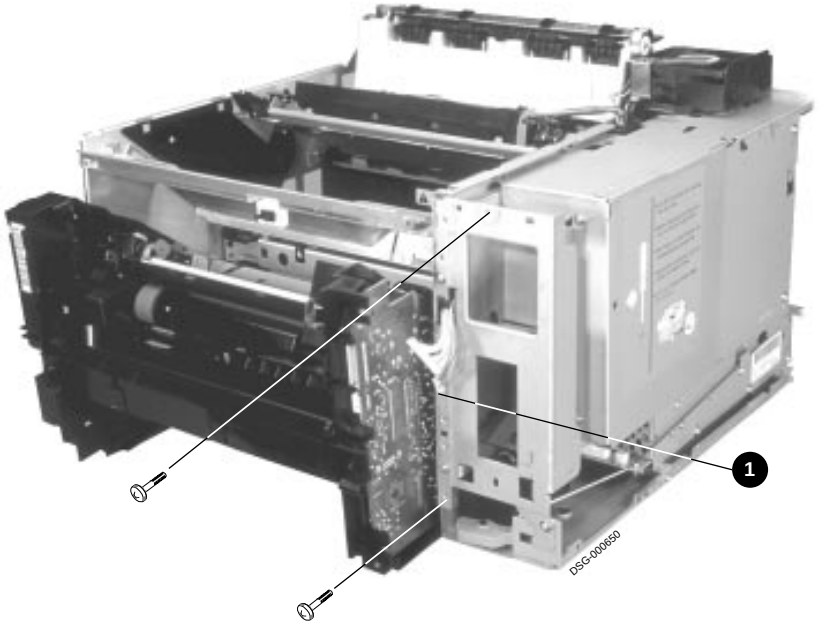
	Part	As shown in section:
a.	Paper cassette	–
b.	Envelope feeder	9.24 (If installed)
c.	Control panel assembly	9.2
d.	Left-side cover	9.18
e.	Right-side cover	9.19
f.	Top cover	9.20
g.	Front door	9.22
h.	Guide plate	9.22.1

2. Remove the three screws that hold the feed assembly to the left side panel.



9.8 Assembly, Feed

3. Unplug the two connectors ❶ from the paper feed controller board.
4. Remove the two screws that hold the feed assembly to the front of the printer.
5. Remove the feed assembly.



9.9 Assembly, Scanner

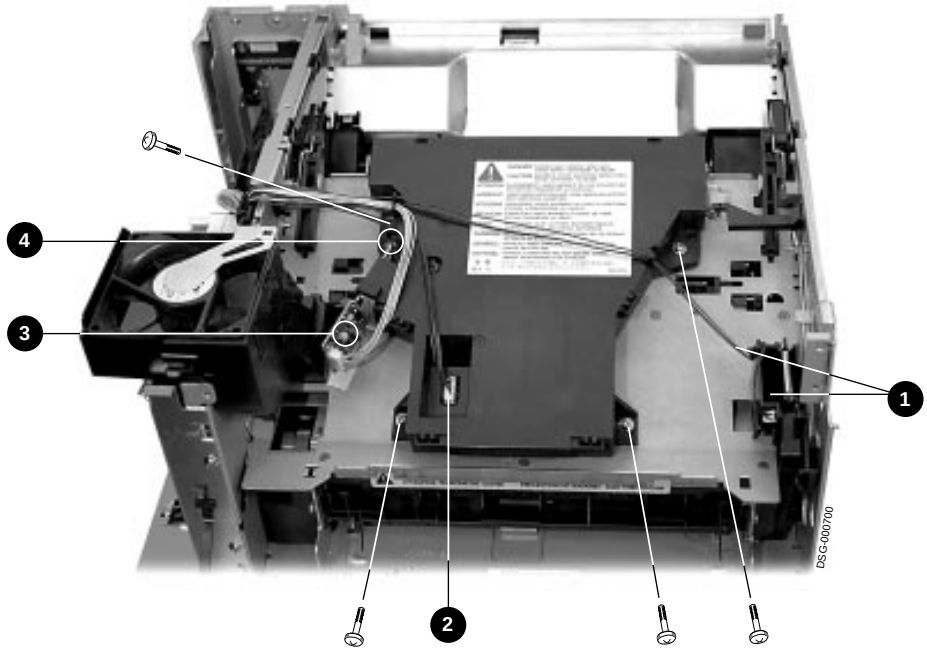
Use the following procedure to remove the scanner assembly:

1. Remove the following parts:

	FRU	As shown in section:
a.	Left-side cover	9.18
b.	Right-side cover	9.19
c.	Top cover	9.20
d.	Output assembly	9.7

9.9 Assembly, Scanner

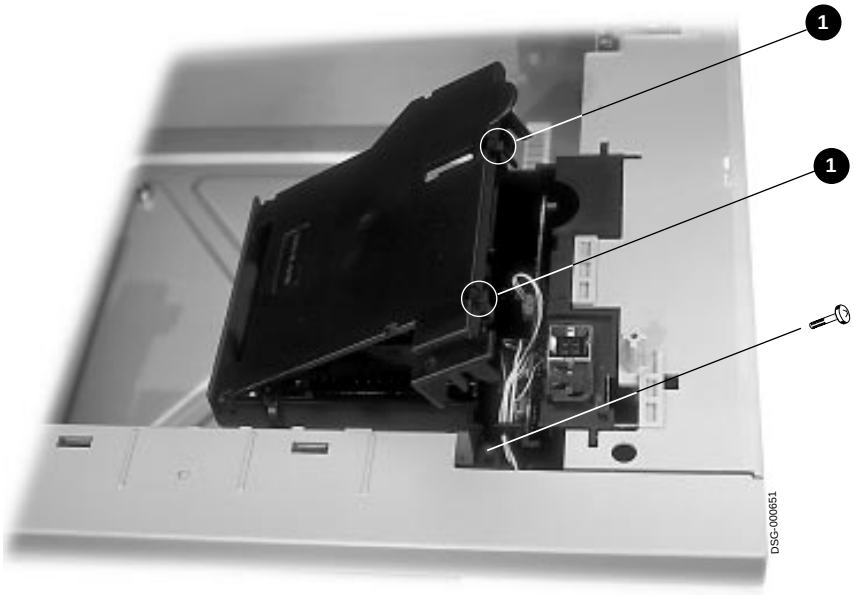
2. Unplug the following connectors and remove the cables from the restraints:
   - ❶ 3-pin fusing exit and rear door sensor
   - ❷ 6-pin scanner motor connector
   - ❸ 7-pin laser diode connector
   - ❹ 4-pin beam detection connector
3. Remove the four screws.
4. Remove the scanner assembly.



9.10 Board, LCIT Controller

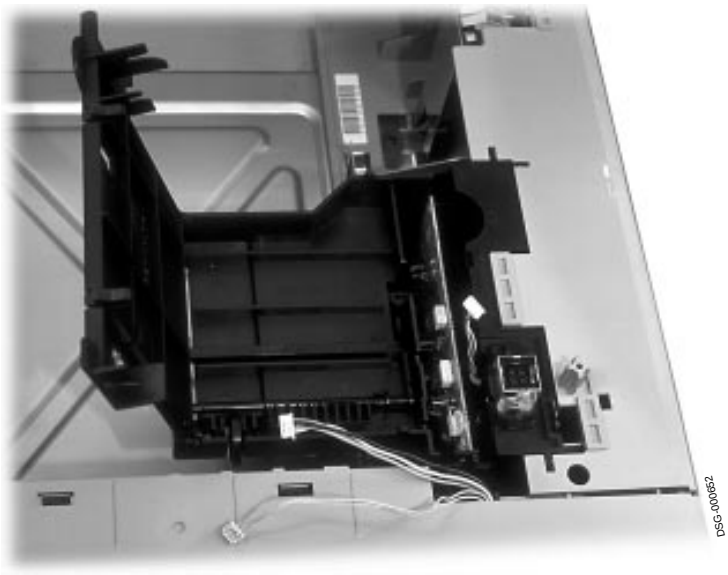
Use the following procedure to remove the LCIT controller board:

1. Remove the screw securing the cover.
2. Press to release the two latches ❶ and open the cover.

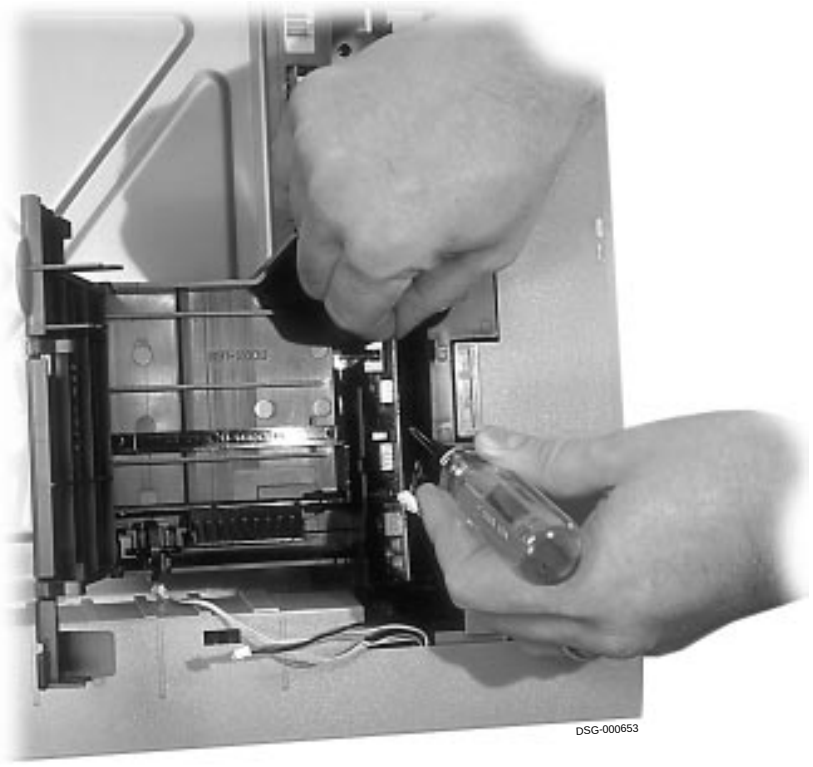


9.10 Board, LCIT Controller

3. Unplug the three connectors from the controller board.
4. Cut and remove the plastic cable tie.

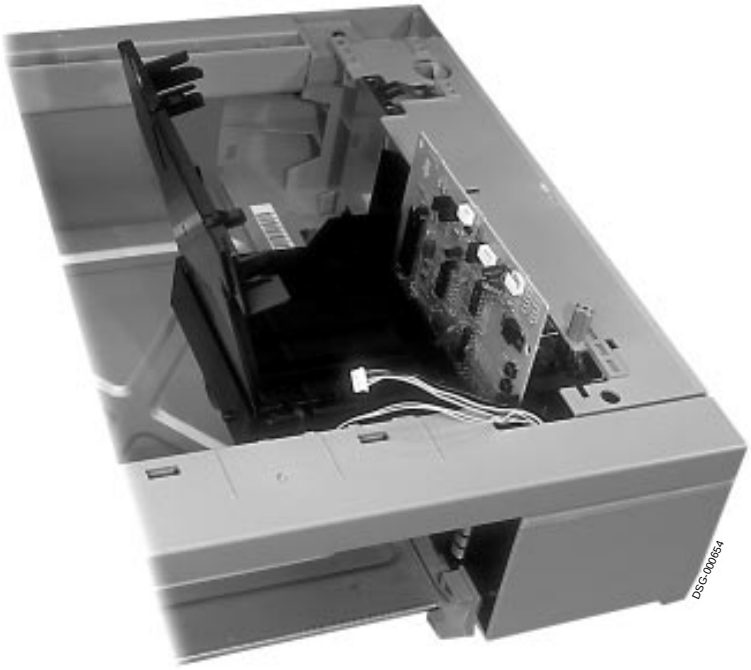


5. Grasp the upper edge of the control board, as shown.
6. Slide a flat blade screwdriver between the plastic tab and the controller board. Disengage the tab from the board.



9.10 Board, LCIT Controller

7. Lift the controller board out of the plastic slides.



9.11 Board, Feed Controller

Use the following procedure to remove the feed controller board:

1. Remove the following parts:

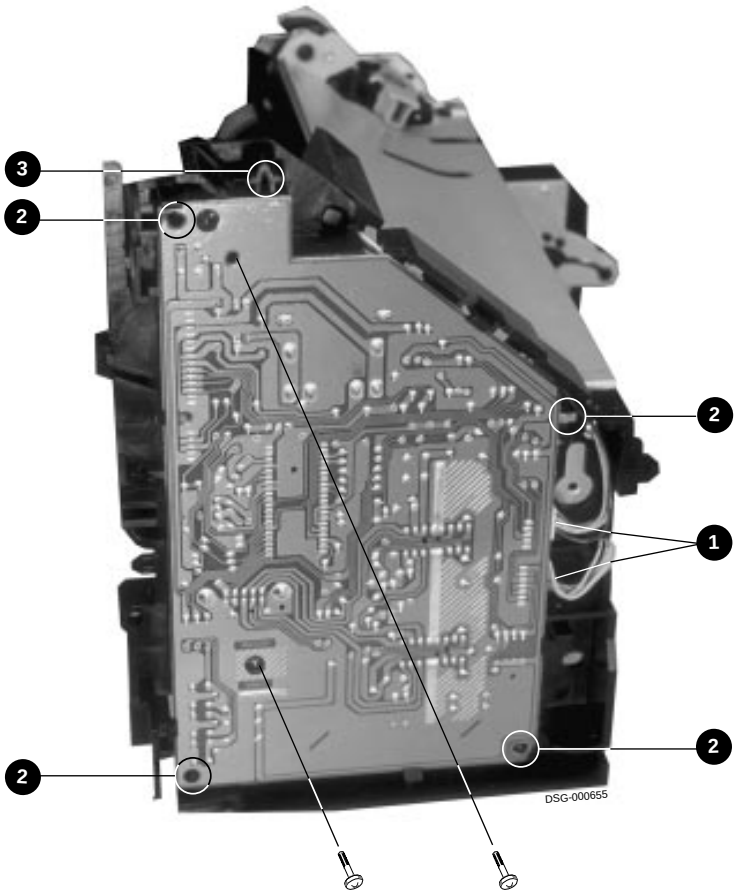
	Part	As shown in section:
a.	Paper cassette	–
b.	Control panel assembly	9.2
c.	Left-side cover	9.18
d.	Right-side cover	9.19
e.	Top cover	9.20
f.	Front door	9.22
g.	Guide plate	9.22.1
h.	Paper feed assembly	9.8

9.11 Board, Feed Controller

2. Unplug the two connectors ❶.
3. Remove the two screws.
4. Release the four clips ❷.

   Caution: *The actuator linkage ❸ for the top door open switch might pop out when you remove the board in the next step.*

5. Remove the feed controller board.



9.12 Board, DC Control

Use the following procedure to remove the DC control board:

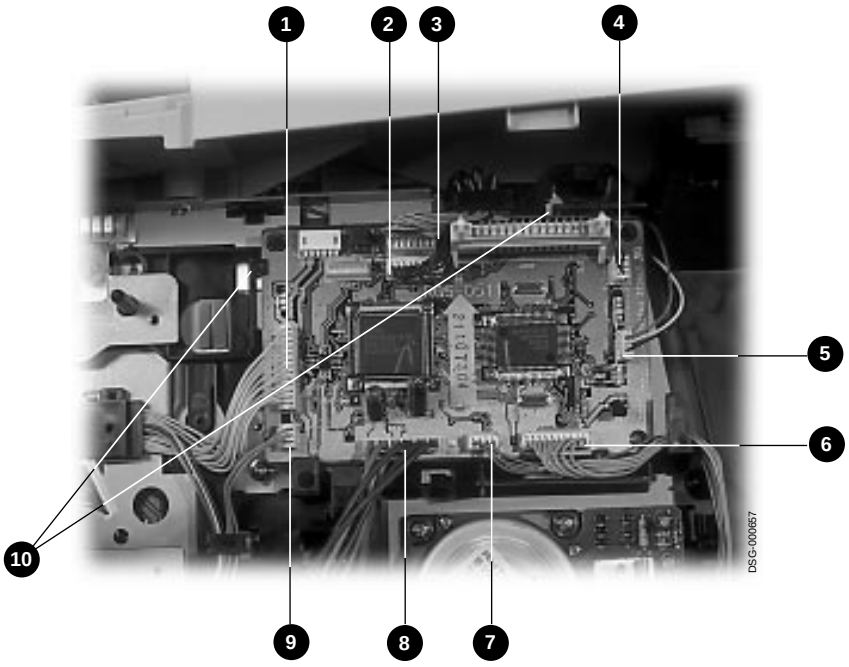
1. Remove the following parts:

	FRU	As shown in section:
a.	Ethernet option board	9.13
b.	Right-side cover	9.19
c.	Card cage	9.16
d.	Video controller board	9.15

9.12 Board, DC Control

2. Unplug the following connectors:
   - ❶ 13-pin J201
   - ❷ 8-pin J205
   - ❸ 7-pin J206
   - ❹ 3-pin J208
   - ❺ 3-pin J209
   - ❻ 10-pin J210
   - ❼ 4-pin J211 that connects to the main motor
   - ❽ 6-pin cable that connects to J103 on the LVPSA
   - ❾ 3-pin J212
3. Press and release the left and right side restraint clips ❿.
4. Wiggle the DC controller board to extract it from the mounting pin.
5. Remove the DC controller board.

9.12 Board, DC Control



9.12 Board, DC Control

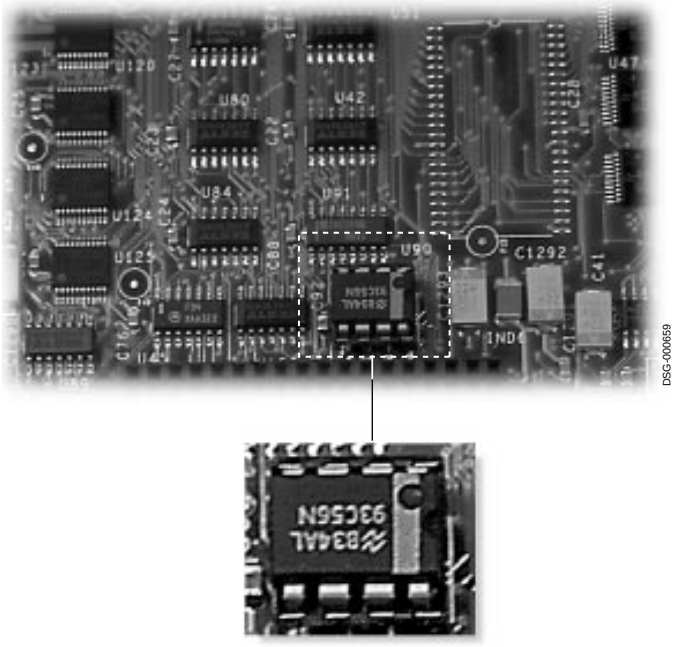
9.12.1 Page Count Memory (NVRAM)

Use the following procedure to remove the video controller board.

Caution: *Use standard antistatic equipment and procedures before you handle this sensitive electronic component.*

1. If installed, remove the hard disk option, as shown in Section 9.6.
2. Remove the video controller board as shown in Section 9.15.
3. Use a suitable tool to gently pry up the 8-pin IC.
4. Remove the IC.

   When replacing the IC, make sure to orientate pin 1 is as shown.



9.13 Board, Ethernet

Caution: *Use standard antistatic equipment and procedures before you handle this sensitive electronic component.*

Use the following procedure to remove the optional Ethernet board:

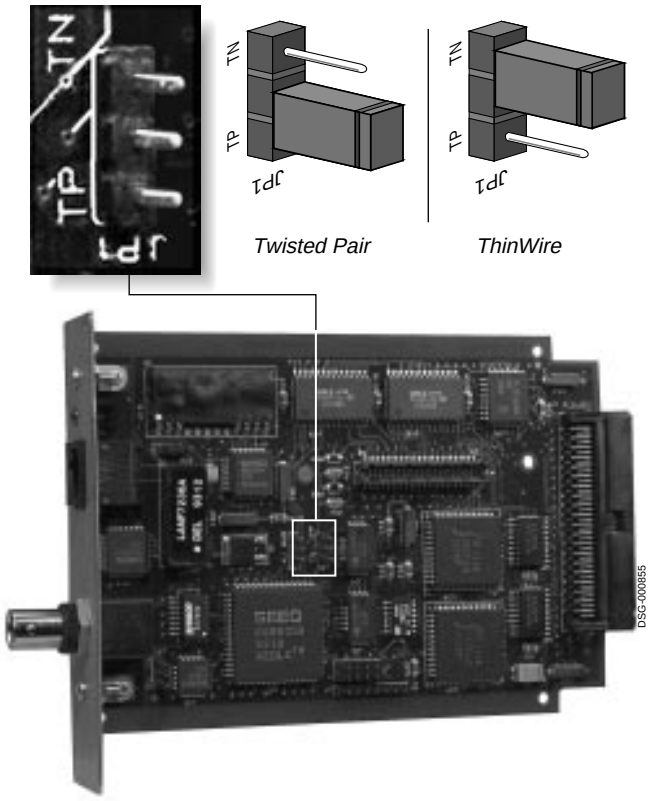
1. Disconnect the ThinWire or twisted-pair connectors from the rear panel.
2. Remove the two screws that hold the mounting plate to the rear connector panel.

   If installing a new Ethernet option, you must remove the blank plate.
3. Pull on the Ethernet board to unplug it from the connector on the video controller board.

9.13 Board, Ethernet

4. Before installing the Ethernet card, make sure to configure the jumper, as shown, for twisted-pair or ThinWire.

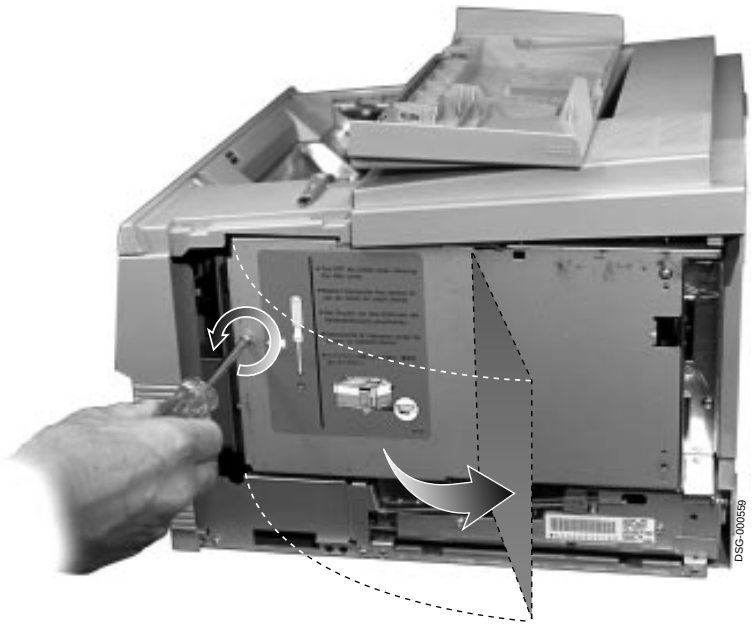
   Note: *When the Ethernet board is installed and the printer is powered on, a network status report prints. This report contains all the information to show that the Ethernet board is working properly and is communicating with the host system. See ??? for troubleshooting information.*



9.14 Board, SIMMs

Use the following procedure to remove the single inline memory module board:

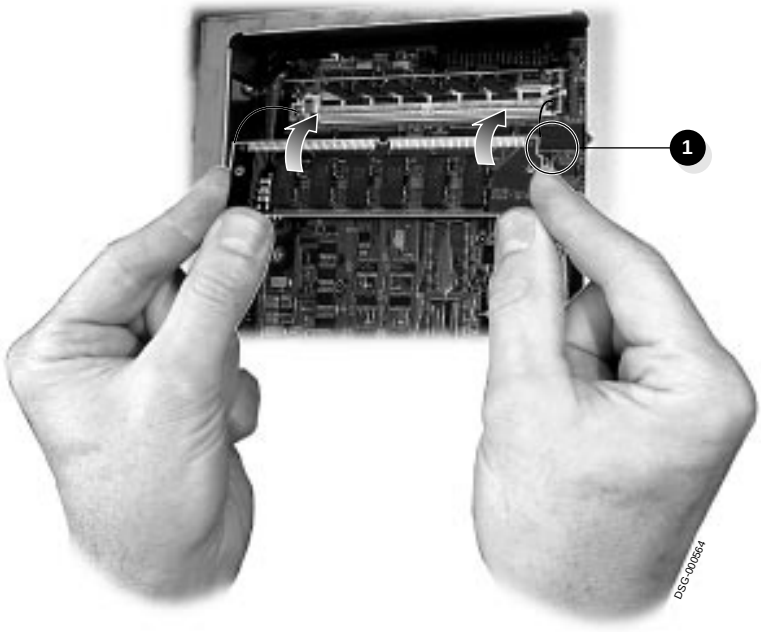
1. Remove the right side cover, as shown in Section 9.19.
2. Remove the screw that latches the card cage cover door.
3. Open the card cage cover door.



9.14 Board, SIMMs

4. Simultaneously release the two clips. The SIMM should move or spring forward in the socket.
5. Remove the SIMM.

   When replacing the SIMM, the notched end ❶ must face left.



9.15 Board, Video Controller

Use the following procedure to remove the video controller board:

1. Remove the following FRUs:

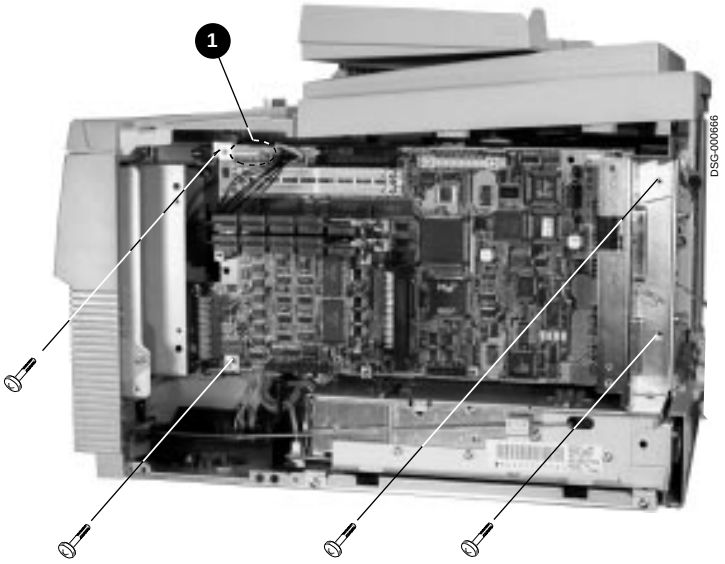
	FRU	See section:
a.	Right-side cover	9.19
b.	Card cage	Section 9.16

2. If installed, remove the following video board options.

	FRU	See section:
a.	Font cartridge	1.7
b.	Ethernet board	9.13
c.	Optional disk	9.6
d.	RAM SIMMs	9.14

9.15 Board, Video Controller

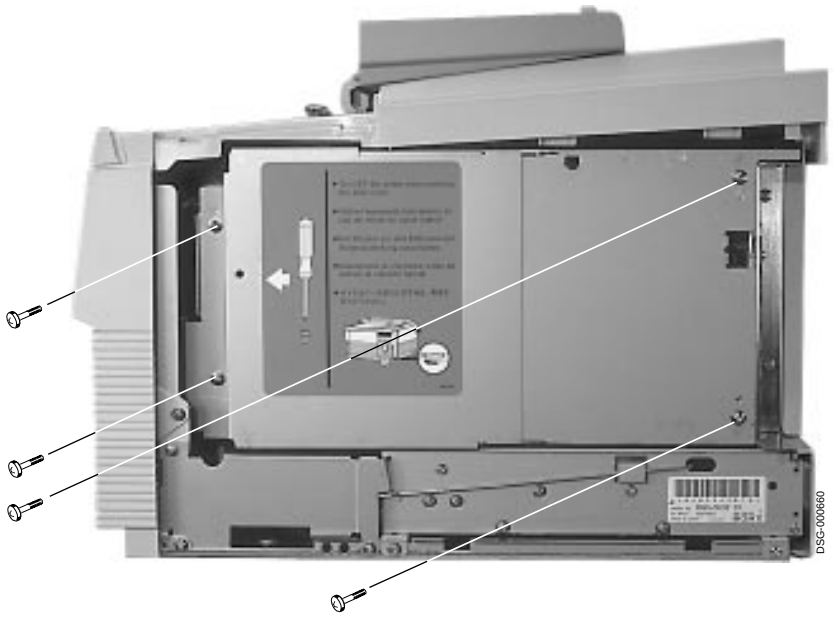
3. Disconnect the connector from J131 ❶ on the video control board.
4. Remove the four screws.
5. Wiggle the board to disconnect the connector.
6. Remove the video control board.



9.16 Cage, Card

Use the following procedure to remove the replace the card cage:

1. Remove the right-side cover, as shown in Section 9.19.
2. Remove the four screws.
3. Wiggle the metal card cage to release and withdraw it.



9.17 Cartridge, EP-ED (toner)

Use the following procedure to remove the EP-ED cartridge:

Caution: *Do not damage the photosensitive drum by overexposing it to ambient light. Place the EP-ED cartridge in the light-proof wrapping bag or in a dark place.*

Do not touch the surface of the OPC drum.

1. Open the top door.
2. Grasp the cartridge and pull on it to remove it.
3. Before you install a new EP-ED cartridge:
   - Remove the plastic shipping strip, as shown on the top of the EP-ED cartridge.
   - Shake the EP-ED cartridge as shown on the top of the cartridge.

9.18 Cover, Left-Side

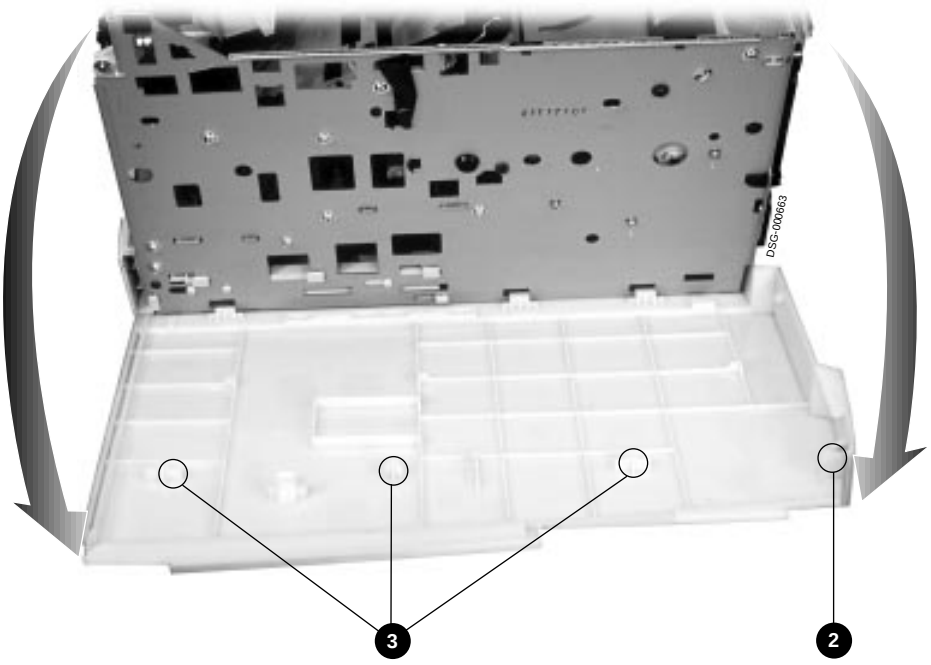
Use the following procedure to remove the left-side cover:

1. Remove the right-side and top covers, as shown in Section 9.19 and Section 9.20.
2. Press down to release the clip ❶ that holds the cover to the left side of the printer.

9.18 Cover, Left-Side

3. Pull the front of the cover to disengage the clip ❷.
4. Swing down the left-side cover.

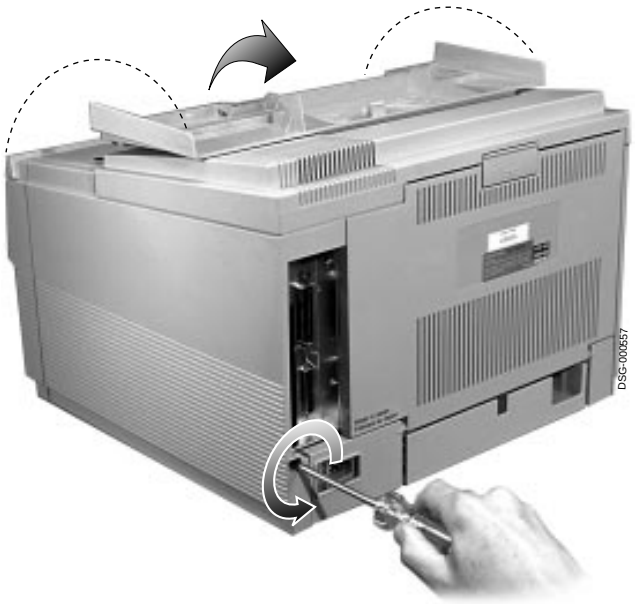
   When you replace the left-side cover, make sure the three plastic alignment pins ❸ fully engage the metal bulkhead holes.
5. Lift the left-side cover to disengage the hinges, and remove the cover.



9.19 Cover, Right-Side

Use the following procedure to remove the right-side cover:

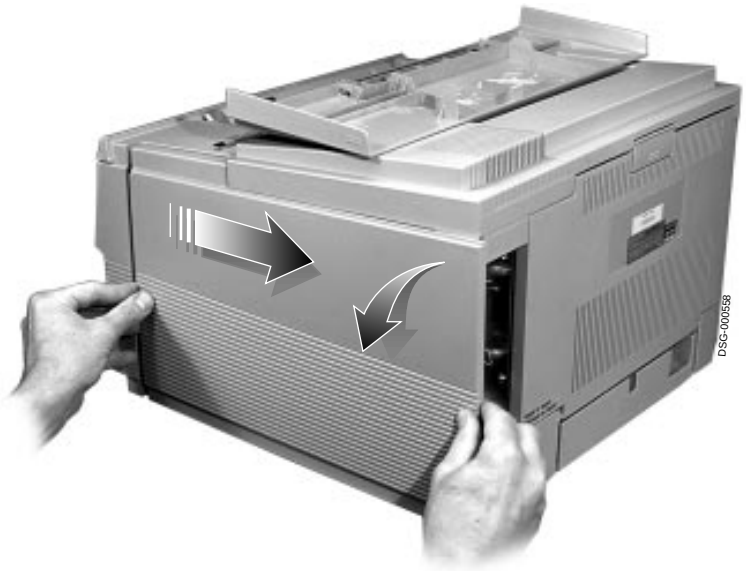
1. Remove the screw that secures the right-side cover to the printer.



9.19 Cover, Right-Side

2. Pull the cover backwards to disengage the top clips.
3. Swing the cover down.

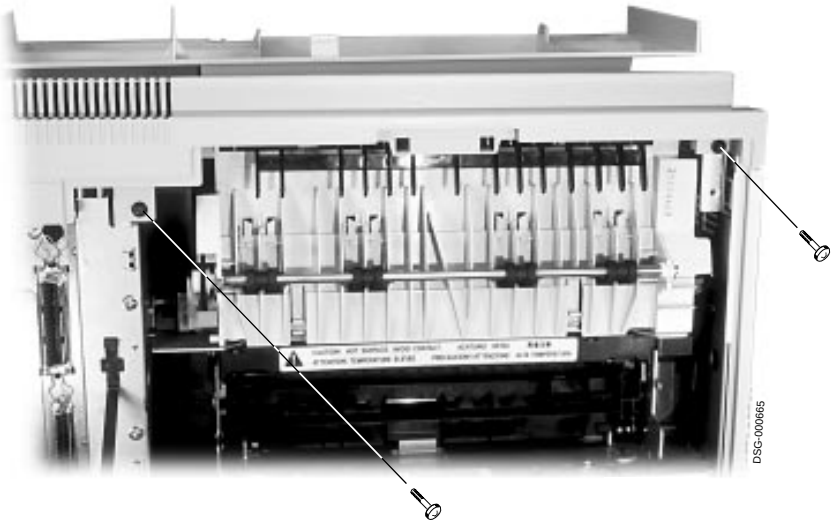
   When you replace the right-side cover, pull the cover backwards (as in step two); otherwise, the hinges bind.
4. Lift the cover to disengage the hinges and remove the right side cover.



9.20 Cover, Top Cover

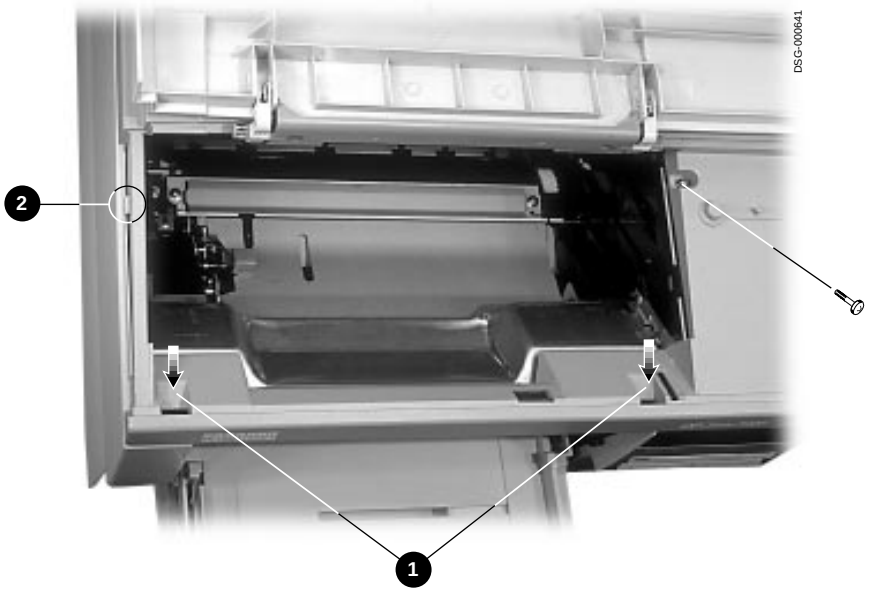
Use the following procedure to remove the top cover:

1. Remove the right-side cover, as shown in Section 9.19.
2. Open the rear door and remove the two screws that hold the top cover to the printer.



9.20 Cover, Top Cover

3. Open the top cover and remove the cleaning brush.
4. Remove the one screw that holds the top cover to the top of the printer.
5. Use a flat blade screwdriver to release the two front clips ❶.
6. Slightly pinch and bend the top cover ❷ to release the left-side clip.
7. Lift and remove the top cover.



9.21 Door, Rear

Use the following procedure to remove the rear door:

1. Remove or partially extend the cassette.
2. Use needlenose pliers to lift and disengage the door support strap.

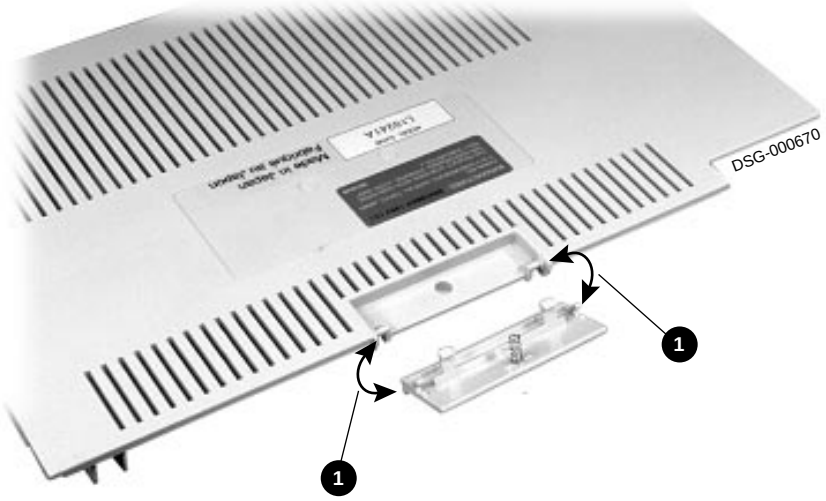
9.21 Door, Rear

3. Flex the bottom of the door to disengage the hinge pins from the plastic bulkhead.

9.21.1 Rear Door Latch

Remove and replace the rear door latch as follows:

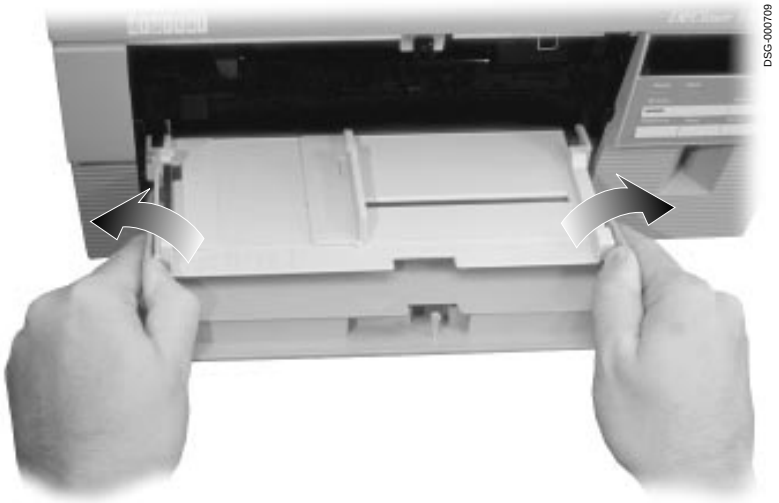
- To remove the latch, use a screwdriver to gently release the hinge clips.
- To replace the latch, first seat the spring then snap the hinges together.



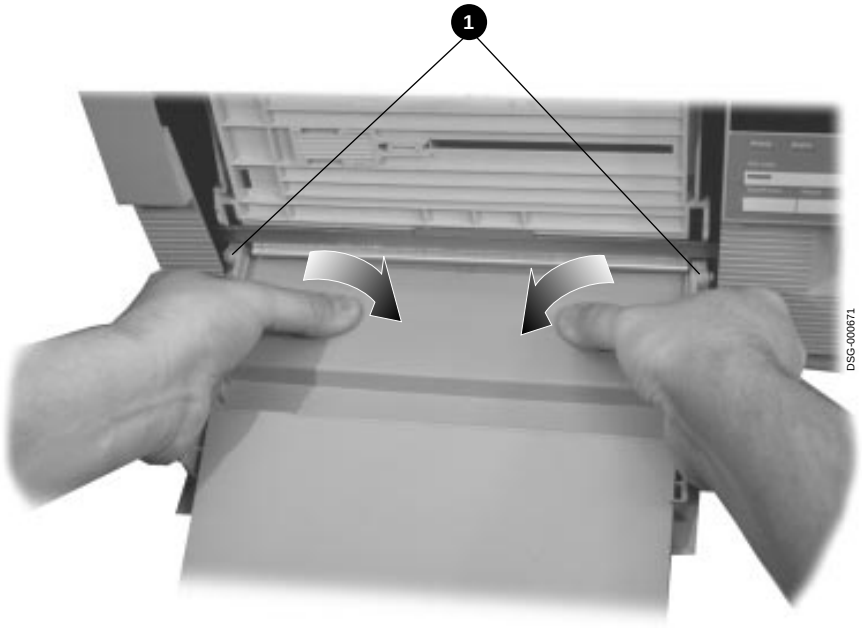
9.22 Door, Front and Guide Plate

Use the following procedure to remove the front door:

1. Remove the cassette.
2. Flex the guide plate to disengage the sliding hinges from the door.



3. Fully extend the paper support plate.
4. Flex the door to disengage the hinge pins ❶.
5. Remove the door.



9.22 Door, Front and Guide Plate

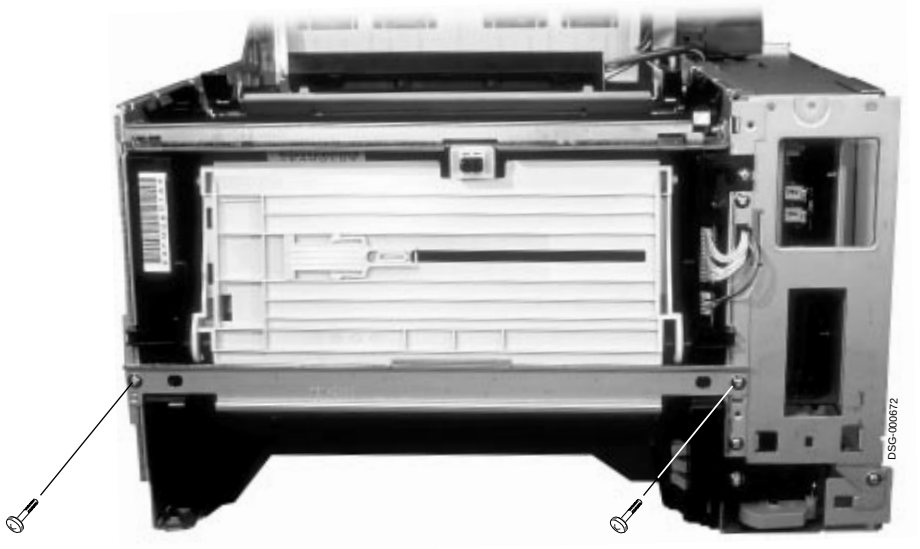
9.22.1 Guide Plate

Use the following procedure to remove the front feeder guide plate:

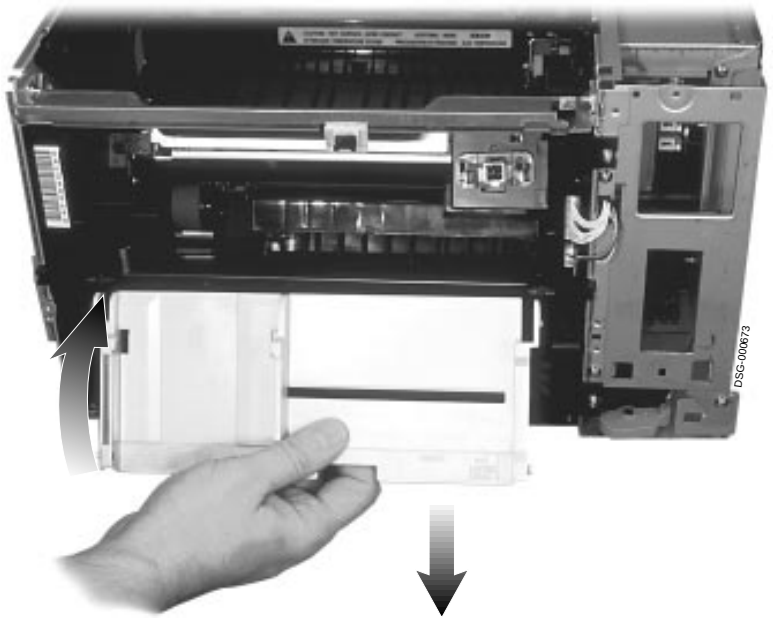
1. Remove the following:

	FRU	As shown in section:
a.	Paper cassette	–
b.	Left-side cover	9.18
c.	Right-side cover	9.19
d.	Top cover	9.20
e.	Front door	9.22
f.	Control panel assembly	9.2

2. Remove the two screws that hold the crossmember bracket to the printer.
3. Remove the crossmember bracket.



4. Swing the guide plate down until the hinges can be pulled apart.



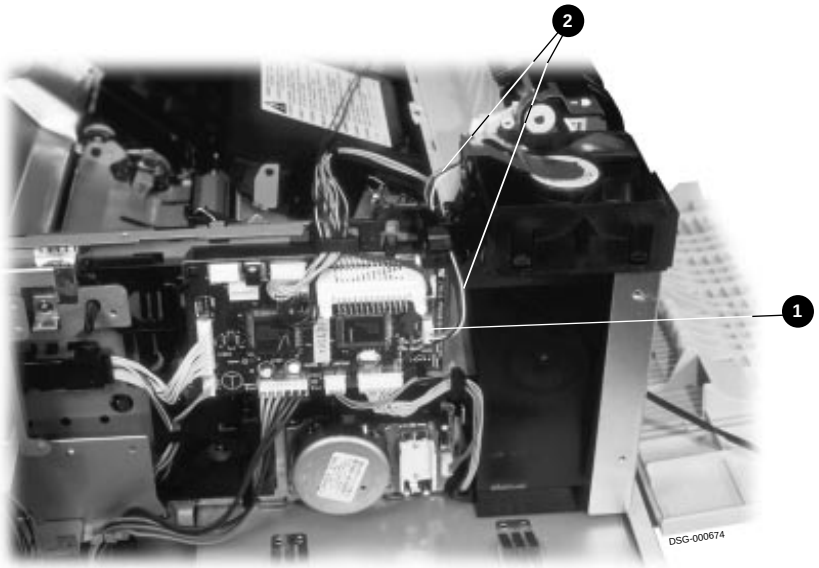
9.23 Fan Exhaust

Use the following procedure to remove the exhaust fan:

1. Remove the following:

	FRU	As shown in section:
a.	Right-side cover	9.19
b.	Card cage	9.16
c.	Video controller board	Section 9.15
d.	Video controller board	9.15

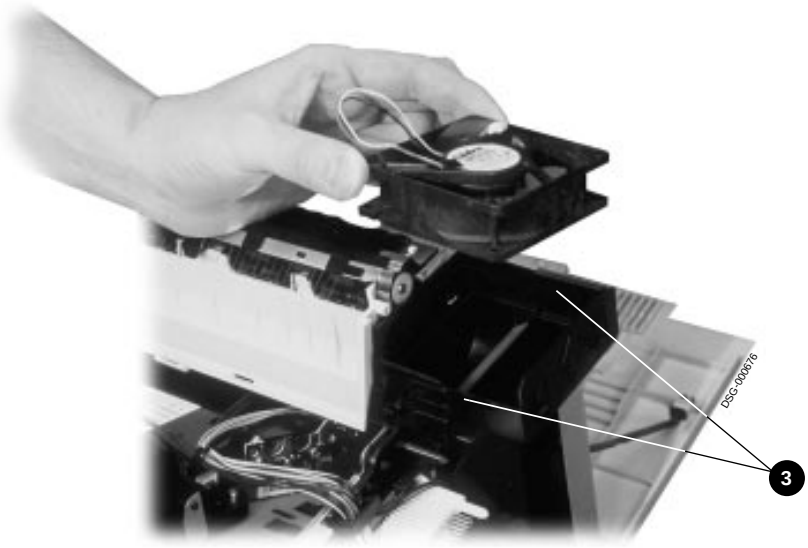
2. Unplug the 3-pin J209 connector ❶ from the DC controller board.
3. Remove the exhaust fan lead-in cable from the wire raceway ❷.



4. Use a small screwdriver to pry loose the two clips and separate the fan shroud.

9.23 Fan Exhaust

5. Pry up to release the four clips and remove the exhaust fan.



9.24 Feeder, Envelope

Use the following procedure to remove the envelope feeder:

1. Open the front door of the printer.
2. Pinch together the two plastic tabs and pull down the blockoff plate.
3. Remove the blockoff plate.

9.24 Feeder, Envelope

4. Insert the nose of the envelope feeder into the print engine.
5. Gently push in the envelope feeder until you feel it securely lock into place.

9.25 Fusing Unit

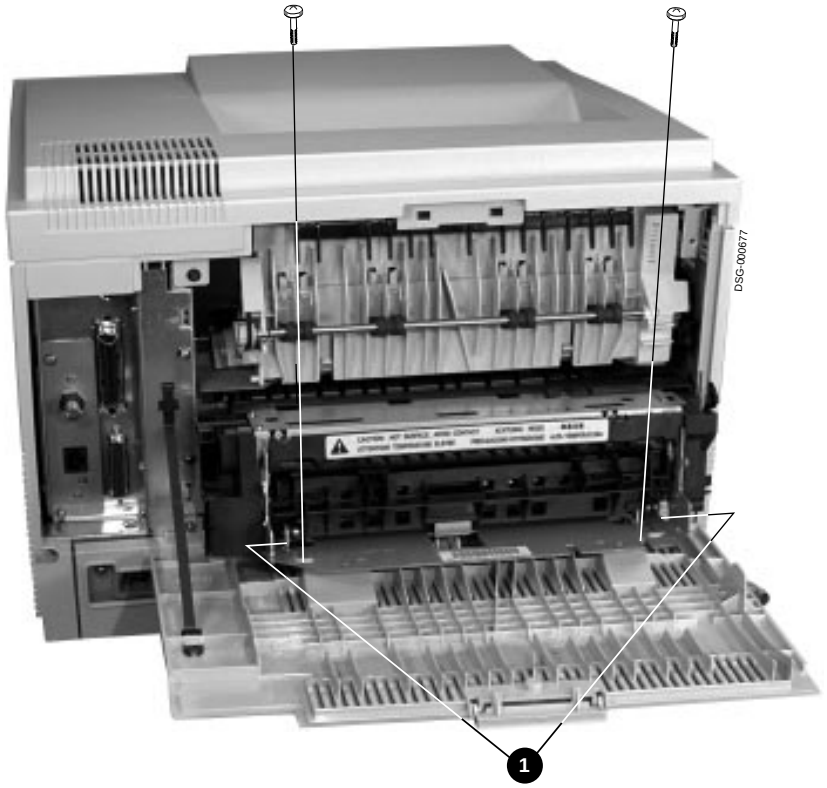
Use the following procedure to remove the fusing unit:

Warning: *Be careful! The fusing unit is hot.*

1. Open the rear door.

   When replacing the fusing unit, make sure the two fusing assembly levers ❶ are in the down position. Fusing failure occurs if the levers are left up.

2. Remove the two screws.
3. Wiggle the fusing unit to release the connector.
4. Remove the fusing unit.



9.26 Guide, HVPSA Contact Plate

Note: *The procedure to remove and replace the HVPSA contact plate is complicated, difficult, and might require several attempts to achieve.* The procedure consists of the following sub-steps:

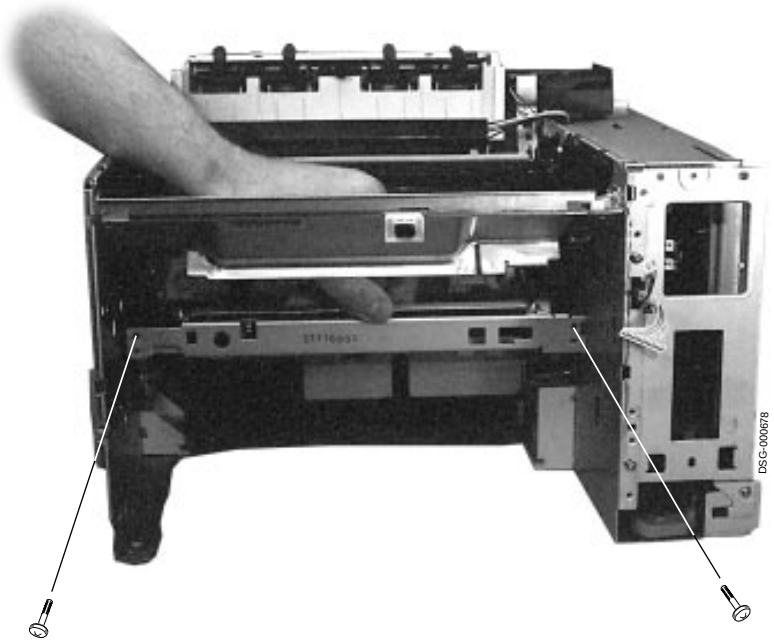
1. Remove all preliminary FRUs
2. Remove the crossmember
3. Remove the transport guide plate
4. Remove the pivot pin that actuates the scanner safety shutter when the EP-ED cartridge is installed
5. Remove the left EP-ED guide plate
6. Remove the HVPSA contact plate

Caution: *The plastic pieces of the parts that required handling can be easily damaged. This might result in deteriorated image quality or intermittent unaccountable faults. If you find a damaged clip or any other damage, replace the part do not attempt to fix it.*

1. **Remove the following preliminary parts:**

	FRU	As shown in section:
a.	Paper cassette	–
b.	Transfer roller	9.31
c.	Front door guide plate	9.22
d.	Control panel assembly	9.2
e.	Left-side cover	9.18
f.	Right-side cover	9.19
g.	Top cover	9.20
h.	Fusing Unit	9.25
i.	High-voltage power supply assembly	9.4

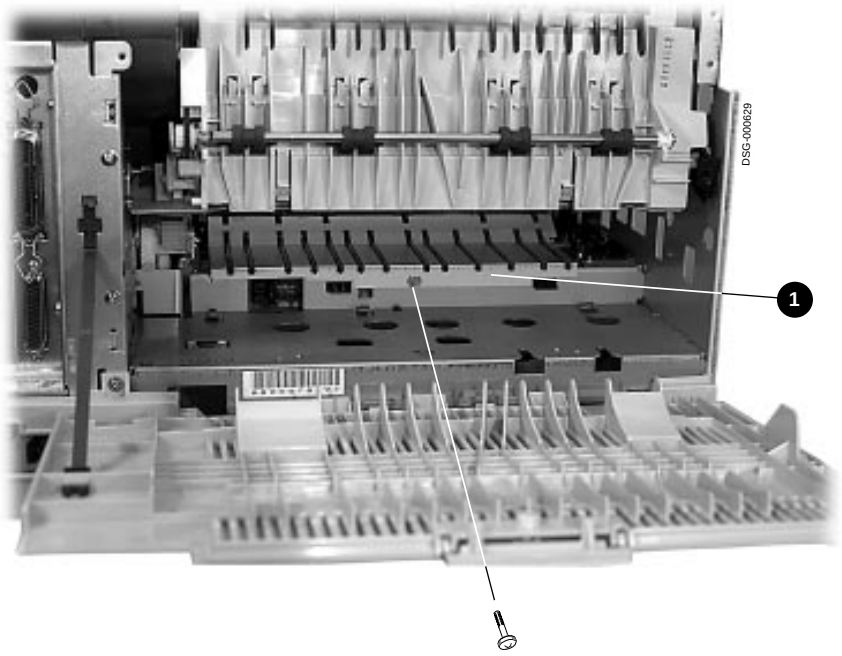
2. **The crossmember:**
   a. Remove the two screws that hold the crossmember.
   b. Remove the crossmember.



9.26 Guide, HVPSA Contact Plate

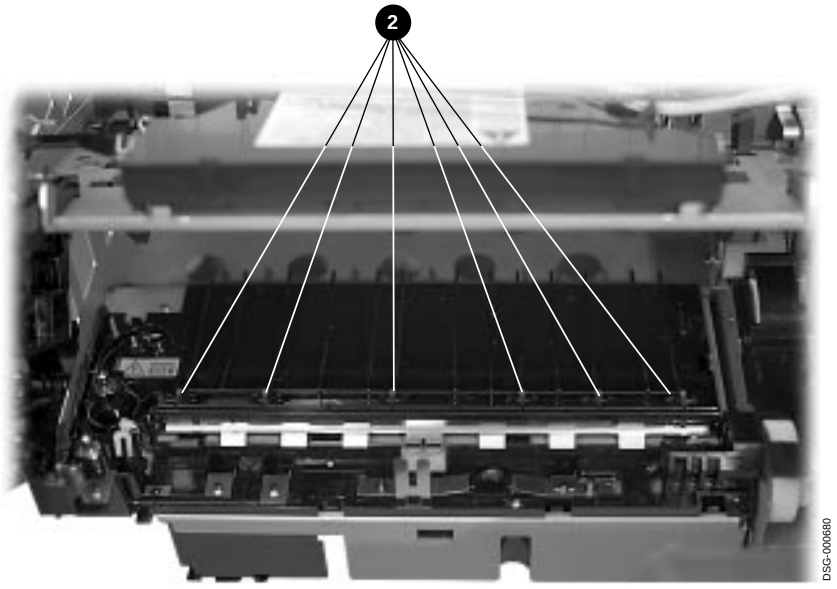
3. **The transport guide plate:**
   a. Remove the screw that holds the rear of the transport guide plate.
   b. Use a suitable tool to pry up the rear ❶ of the transport guide plate to disengage it from the HVPSA contact plate.

      Be careful when you lift the contact guide plate. The six paper rollers might fly about and be lost when the front of the plate is removed.



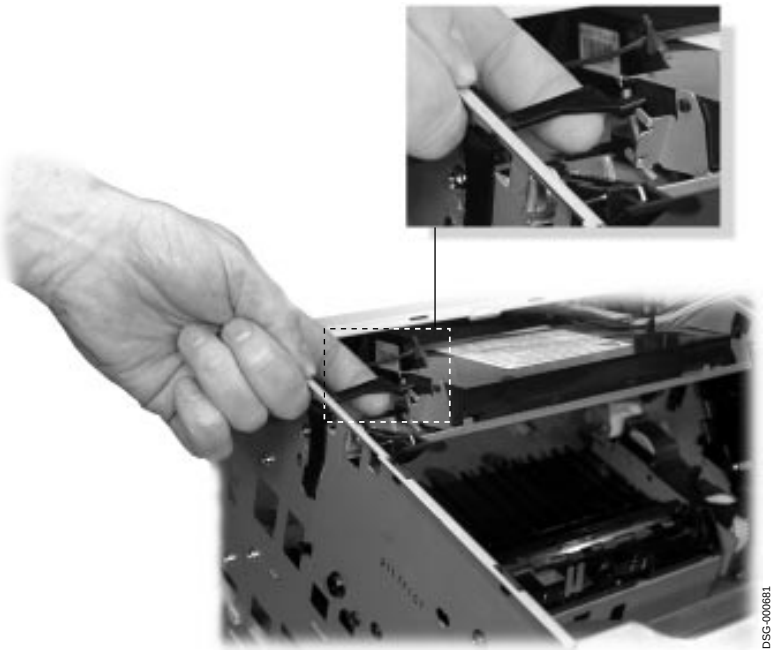
c. Lift and remove the contact plate.

d. Remove each of the six rollers ❷ and store in a safe place.



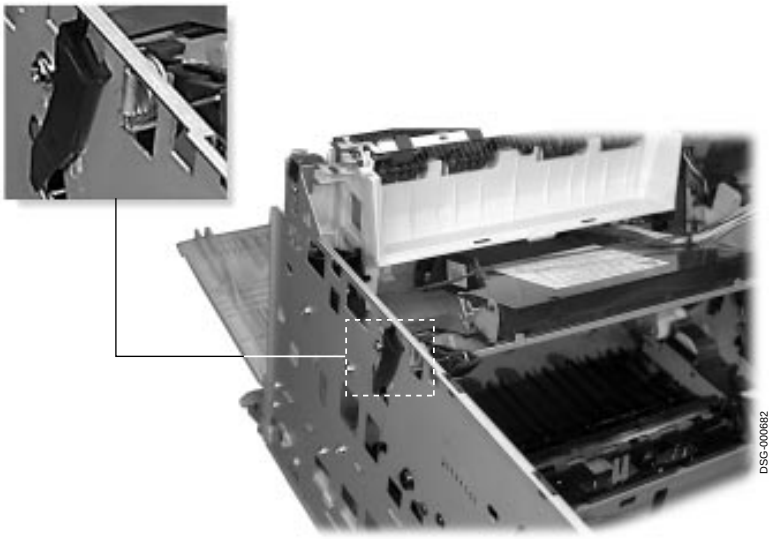
9.26 Guide, HVPSA Contact Plate

4. **The pivot pin:**
   a. Disconnect the spring from the pivot pin arm.
   b. Flex the arm up and over the shutter linkage.



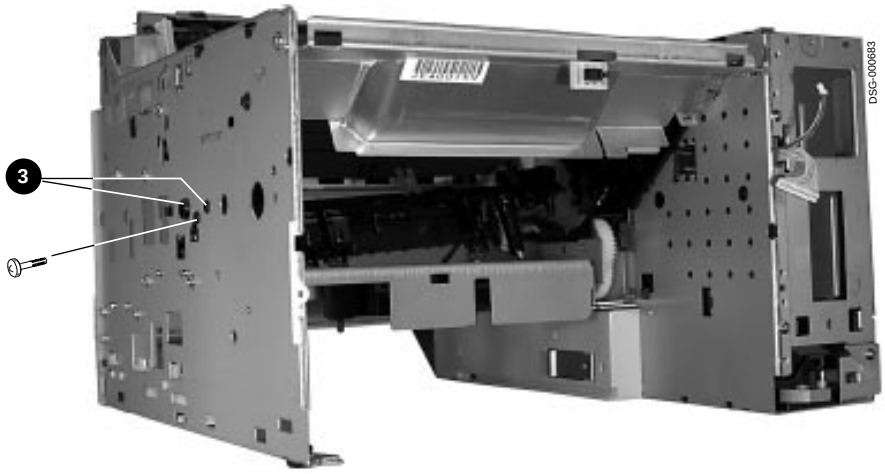
c. Flex the arm clockwise to enable the arm to pass through the chassis hole.

d. Remove the pivot linkage.



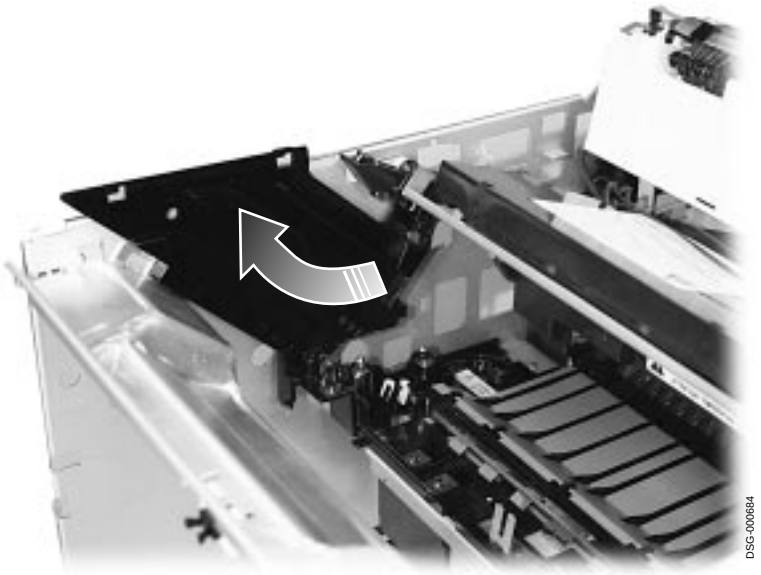
9.26 Guide, HVPSA Contact Plate

5. **The left EP-ED guide plate:**
   a. Remove the self tapping plastic screw.
   b. Note the location of the clip and alignment pins ❸ that secure the EP-ED guide plate.



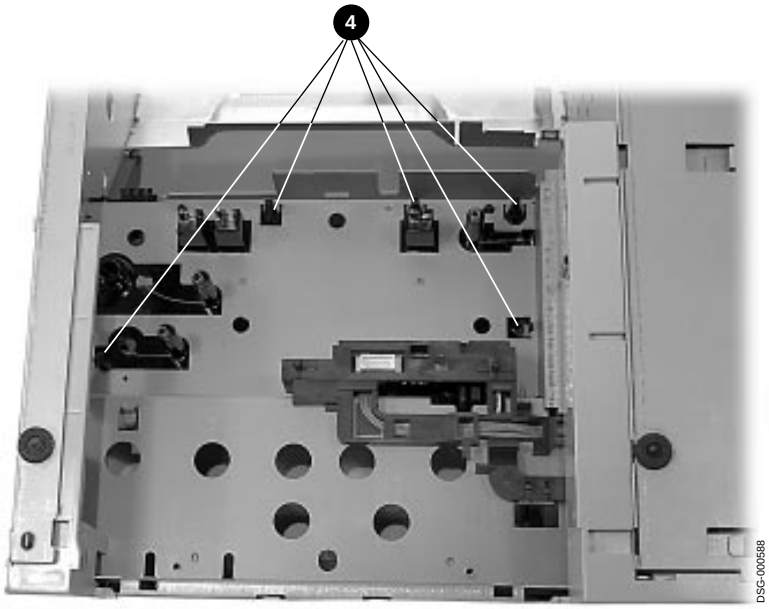
c. Push the clip and alignment pins to disengage the EP-ED guide plate from the left side chassis.

d. Rotate and wiggle the guide plate to remove it. Some flexing of the EP-ED guide plate is necessary.



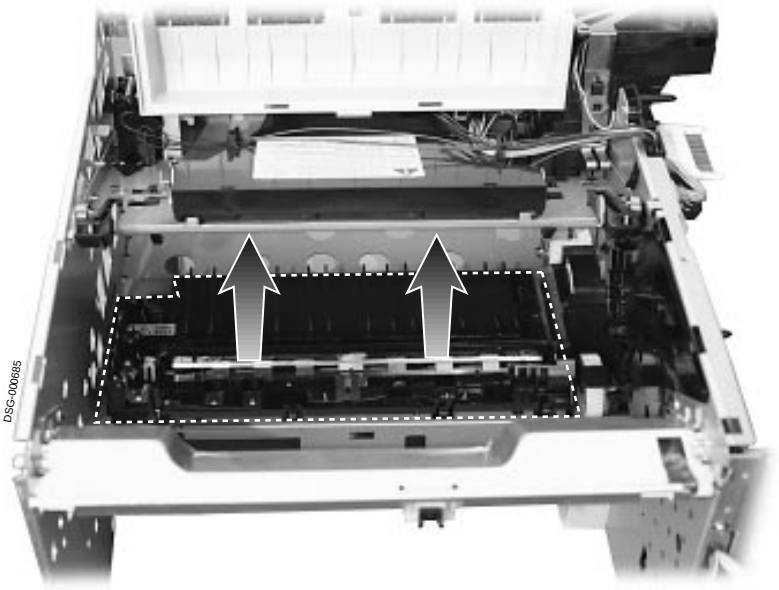
9.26 Guide, HVPSA Contact Plate

6. **The HVPSA contact plate:**
   a. Release the five clips ❹ and lift the HVPSA guide plate up.



9.26 Guide, HVPSA Contact Plate

b. Remove the HVPSA contact plate.



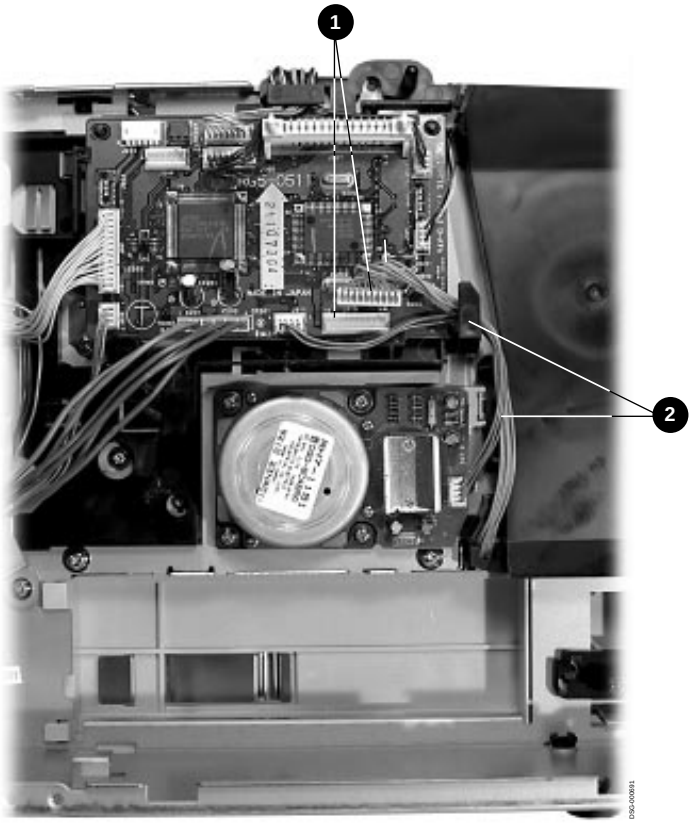
9.27 Interconnect, HVPSA/Fuser

Use the following procedure to remove the interconnect that connects the fusing unit and HVPSA to the DC control board:

1. Remove the following parts:

	FRU	As shown in section:
a.	LCIT (if installed)	9.10
b.	EP-ED cartridge	9.17
c.	Right-side cover	9.19
d.	Card cage	9.16
e.	Video controller board	Section 9.15
f.	LVPSA	9.5
g.	Fusing unit	9.25

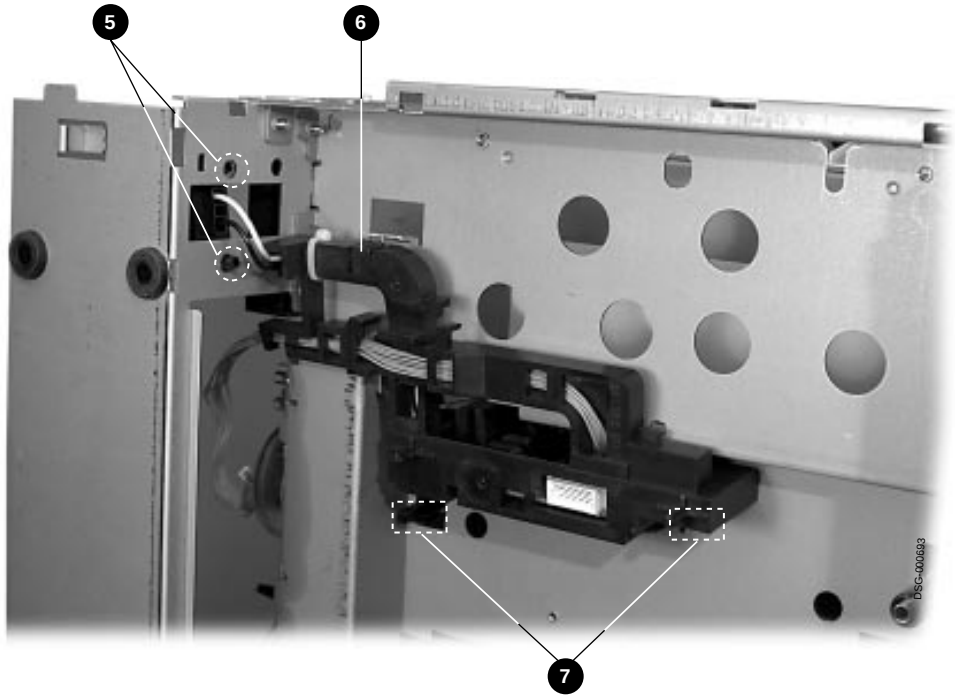
2. Unplug the 10-pin J210 connector ❶ from the DC control board.
3. Unwind the cable from the wire raceway ❷.



9.27 Interconnect, HVPSA/Fuser

4. Carefully stand the printer on the front panel.
5. Remove the screw that holds the rear cover to the printer.
6. Pull and wiggle ❸ to release the clip and pry the rear cover away to disengage the hinges.
7. Lift the rear cover off the hinges ❹ and remove the rear cover.

8. Pinch together the release clips ❺ and push the connector through the chassis hole.
9. Press the clip to release it ❻.
10. Swing down the HVPSA/fuser interconnect.
11. Lift the HVPSA/fuser interconnect to disengage the hinges ❼.



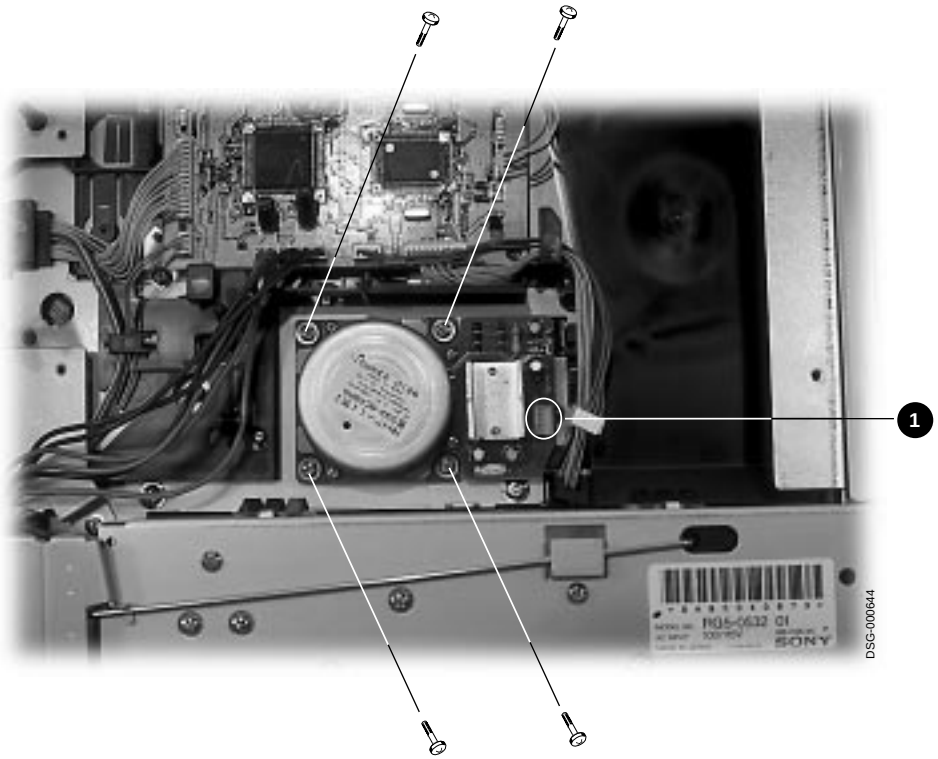
9.28 Motor, Main

Use the following procedure to remove the main motor:

1. Remove the following parts:

	FRU	See section:
a.	Right-side cover	9.19
b.	Card cage	9.16
c.	Video controller board	9.15

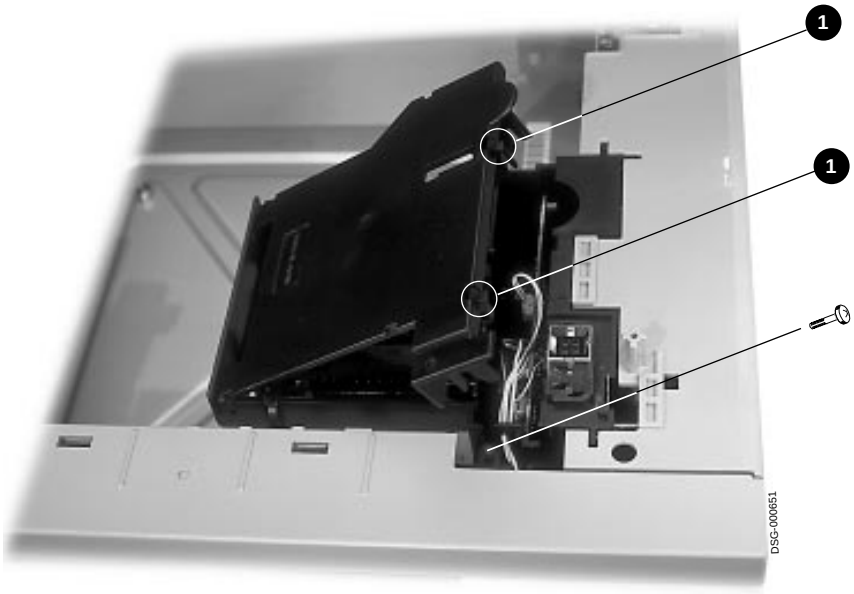
2. Unplug the 4-pin J131 ❶ connector from the main motor board.
3. Remove the four screws that hold the main motor to the printer.
4. Remove the main motor.



9.29 Motor, LCIT Pickup

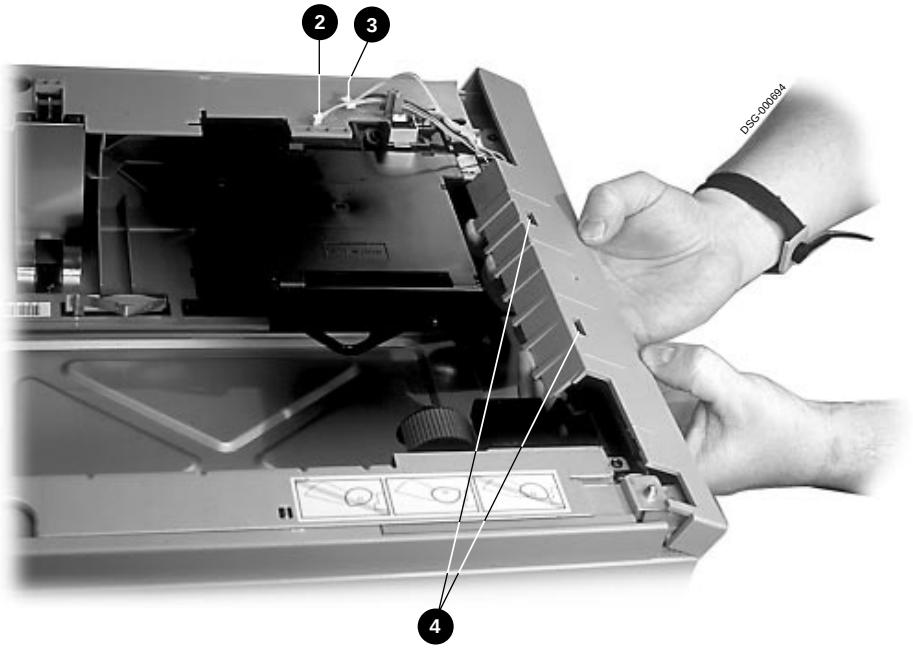
Use the following procedure to remove the LCIT pickup motor:

1. Lift the printer off of the LCIT.
2. Remove the screw that secures the cover.
3. Press the two latches to release them ❶ and open the cover.

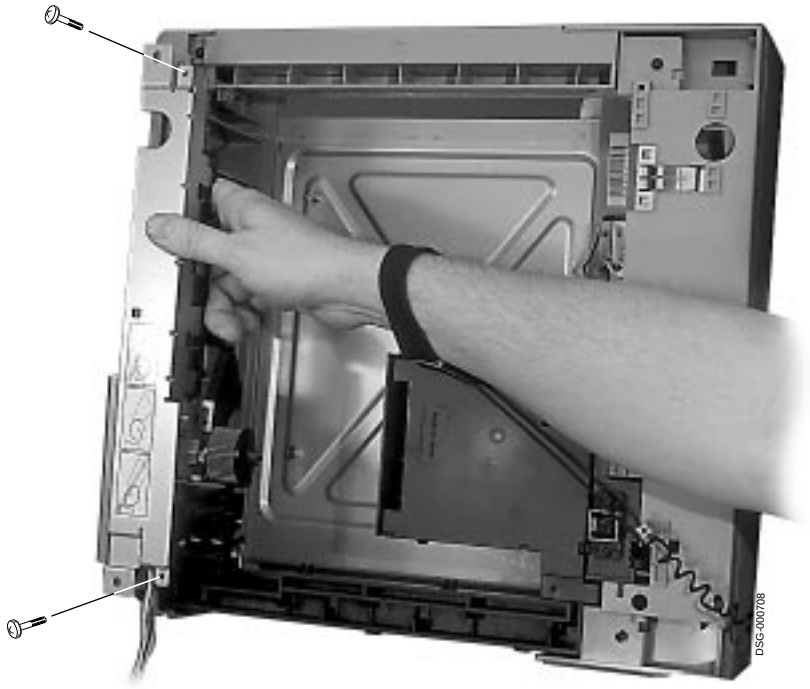


9.29 Motor, LCIT Pickup

4. Unplug the 2-pin connector ❷.
5. Unplug the 4-pin connector ❸.
6. Unsnap the two clips ❹ that hold the cover to the raceway.
7. Remove the cover.



8. Remove the motor cable from the wire raceway.
9. Remove the two screws that hold the motor to the feed unit assembly.
10. Remove the LCIT feed motor.



9.30 Pad, Front Tray Separation

Use the following procedure to remove the front separation pad:

1. Remove the front tray pickup roller, as shown in Section 9.33.
2. Insert a flat bladed screwdriver in the notch underneath the silver strip.
3. Gently pry the pad up and out of the socket.

   When replacing the pad, avoid touching the surface or installing the pad upside down. When the pad is correctly installed, the silver strip is down.

9.31 Roller Transfer

Use the following procedure to remove the transfer roller:

Caution: *The foam surface of the transfer roller is easily damaged by finger oils and perspiration. Contamination can degrade image quality. When handling the transfer roller, touch only the extreme end of the foam roller or the metal shaft.*

1. Remove the EP-ED cartridge, as shown in Section 9.17.
2. Use the end of the cleaning brush to hook onto the left side of the transfer roller shaft.
3. Pull up until the shaft releases from the bearing.
4. Move the roller to the left to disengage the right bearing and remove the transfer roller.

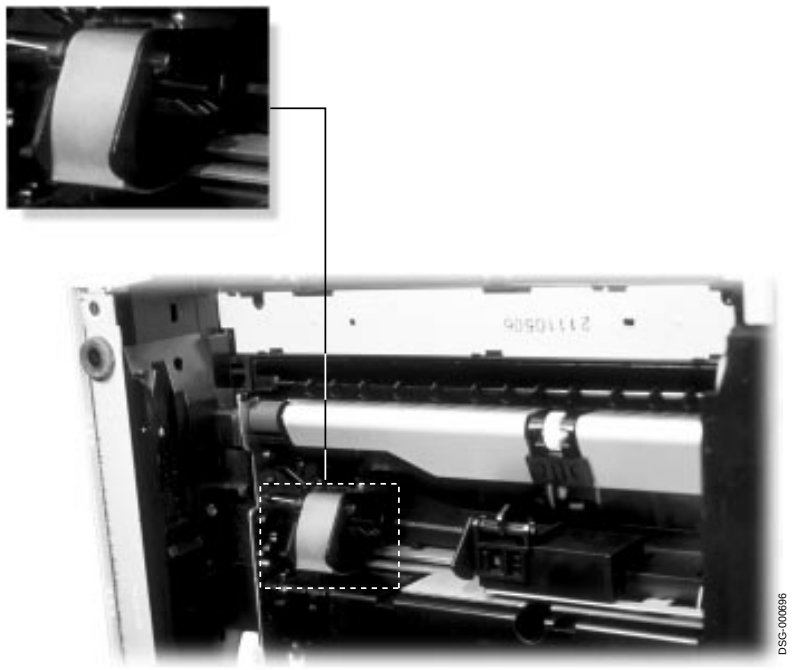
9.32 Roller, Cassette Pickup

Use the following procedure to remove the cassette pickup roller:

1. Remove the EP-ED cartridge.
2. Remove the cassette.
3. Stand the printer on the left-side cover, on top of a soft cloth or paper to prevent scratching the cover.
4. Pinch the clips and lift the roller off the shaft.

   When replacing the roller, make sure the clip firmly holds the roller on the shaft.

   Avoid touching the surface of the pickup roller.



9.33 Roller, Front Tray Pickup

Use the following procedure to remove the front tray pickup roller:

1. Power down the printer.
2. If installed, remove the envelope feeder, as shown in Section 9.24, then go to step 5.
3. Open the front door.
4. Pinch the clips together, pull downwards, and remove the envelope panel.

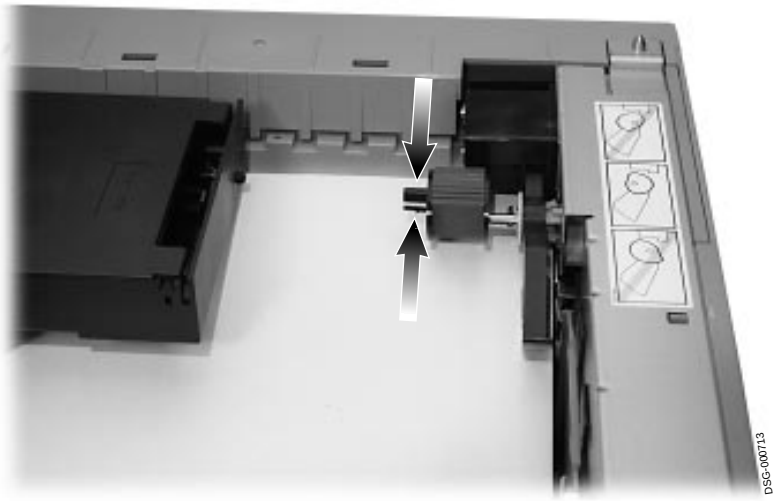
9.33 Roller, Front Tray Pickup

5. Pinch the clips together and remove the pickup roller.

9.34 Roller, LCIT Pickup

Use the following procedure to remove the paper pickup roller from the LCIT:

- Lift the printer off of the LCIT.
- Pinch the restraining clips together and pull the roller off the shaft.



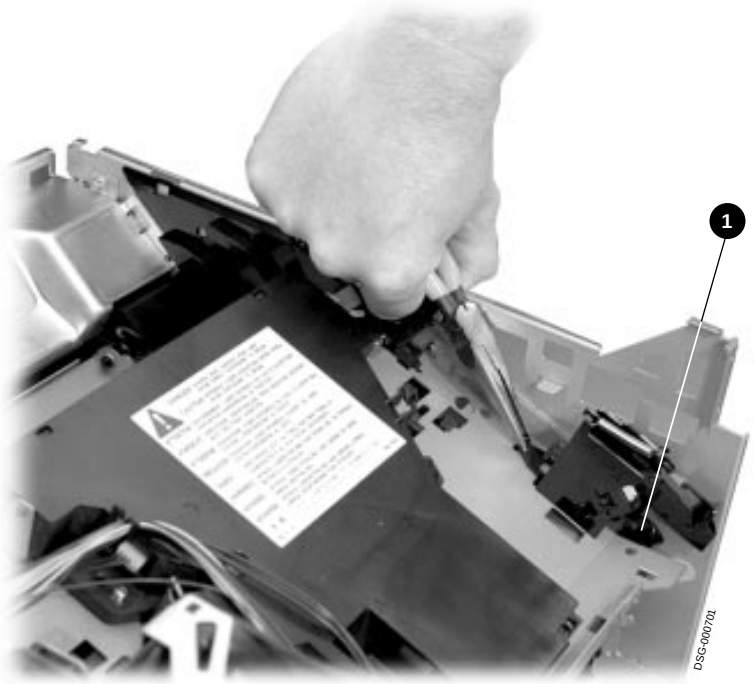
9.35 Sensor, Fusing Exit/Rear Door

Use the following procedure to remove the fusing exit/rear door sensor:

1. Remove the following parts:

	FRU	See section:
a.	Left-side cover	9.18
b.	Right-side cover	9.19
c.	Top cover	9.20
d.	Output assembly	9.7

2. Unplug the 3-pin connector ❶ from the sensor.
3. Grasp the plastic stub with needlenose pliers.
4. Pull up and backwards to release and disengage the sensor assembly.



10

FRU Part Numbers

10.1 Field Replaceable Units

Table 10–1 lists all the field replaceable units (FRU)s by FRU name and the less descriptive order name. The FRU names are in **bold** type while the order names are not. Order names are used on illustrated parts breakdown (IPB) and other logistical documents. Some FRU and order names are the same. The section number for the removal and replacement procedure is listed next to each FRU.

Table 10–1 FRUs

FRU Name Order Name	Part Number	Section Number
Assembly, control panel (Same)	29–31474–01	9.2
Assembly, main drive gear (Main drive gear assy.)	FD–42845–01	9.3
Assembly, high-voltage power supply (HVPSA) (HV power supply)	FD–41616–01	9.4
Assembly, low-voltage power supply (LVPSA) (Power supply)	FD–41614–01 (115Vac) FD–41616–01 (220Vac)	9.5
Assembly, optional hard disk (Hard drive assembly)	LN09X–HD	9.6
Assembly, paper delivery (Same)	29–31521–01	9.7
Assembly, paper feed (Same)	FD–41623–01	9.8

(continued on next page)

10.1 Field Replaceable Units

Table 10–1 (Cont.) FRUs

FRU Name Order Name	Part Number	Section Number
Assembly, scanner (Laser scanner)	FE–HPA15–QR	9.9
Assembly, transfer block (Same)	29–31506–01	9.26
Board, 500 sheet controller (LCIT) (Lower drv cassette PCA cassette)	FD–41598–01	9.10
Board, paper feed control (Paper control PCA)	FD–41611–01	9.11
Board, DC control (DC Controller PCA)	FD–41600–01	9.12
Board, Ethernet Multi-protocol Ethernet card	LN09X–NW	9.13
Board, Resolution/Graphic Enhancement (Same)	LN09X–XL	(None)
Board, SIMMs 32MB (32MB RAM SIMM)	LN09X–MF	9.14
Board, SIMMs 16MB (16MB RAM SIMM)	LN09X–ME	9.14
Board, SIMMs 4MB (4MB ram SIMM)	LN09X–MA	9.14
Board, video controller (Same)	29–31710–01	9.15
Brush, cleaning (Same)	29–31475–01	(None)
Cartridge, EP-ED (toner) (Same)	LNOXX–AA	9.17
Cassette, internal universal (Paper cassette univrsl)	LNOXX–TA	(None)
Cassette, LCIT universal (500 unvrsl lgl cassette)	LNOXX–TC	(None)
Door, rear (Delivery cover)	29–31522–01	9.21

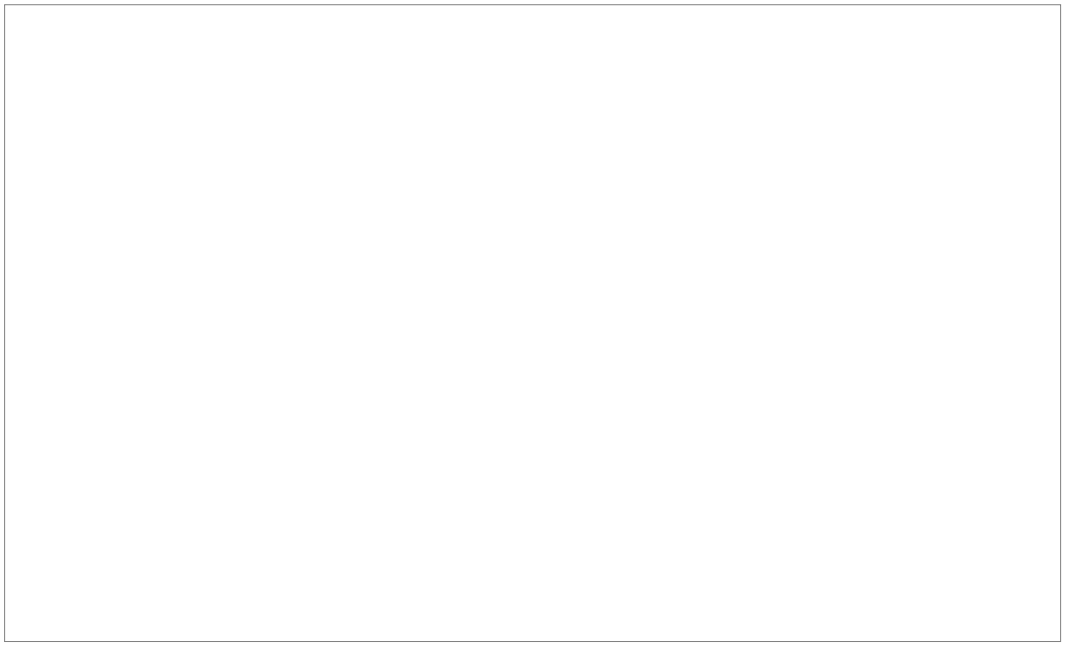
(continued on next page)

Table 10–1 (Cont.) FRUs

FRU Name Order Name	Part Number	Section Number
Door, front (Multipurpose door)	29–31472–01	9.22
Front tray (Multipurpose Tray)	29–31473–01	9.22.1
Fan, exhaust (Fan)	FD–41593–01	9.23
Feeder, 500 sheet LCIT (Paper feeder unit)	LNOXX–TB	(None)
Feeder, envelope (Same)	LNOXX–EF	9.24
Fusing unit (Fusing assembly)	FD–41594–01 (115Vac) FD–41595–01 (220Vac)	9.25
Motor, main (DC 5.8W motor)	FD–41597–01	9.28
Motor, LCIT pickup (DC 3.3W stepping motor)	29–31507–01	9.29
Pad, front tray separation (Separation pad)	FD–41622–01	9.30
Page count memory (2048 bit serial EEPROM)	21–40579–01	9.12.1
Paper exit sensor (Paper out sensor assy)	FD–42843–01	9.35
Roller, cassette pickup (Roller pick-up)	FD–41629–01	9.32
Roller, front tray pickup (MP tray pickup roller)	FD–41630–01	9.33
Roller, LCIT pickup (Pick-up roller)	FD–41631–01	9.34
Roller transfer (Same)	FD–41633–01	9.31

10.1 Field Replaceable Units

Notes:



DSG-000172

A

Key Menu Map, Features, and Values

This appendix contains a diagram of the key menu map, and describes the menu messages you might receive, plus the features and values of the key menus. Control panel operation and modes are described in Chapter 3.

A.1 Key Menu Map

Figure A–1 shows all the key menu features and values. Using the map and the arrow keys, you can scroll through the two dimensional matrix of the key menus.

A.1 Key Menu Map

Figure A–1 Key Menu Map

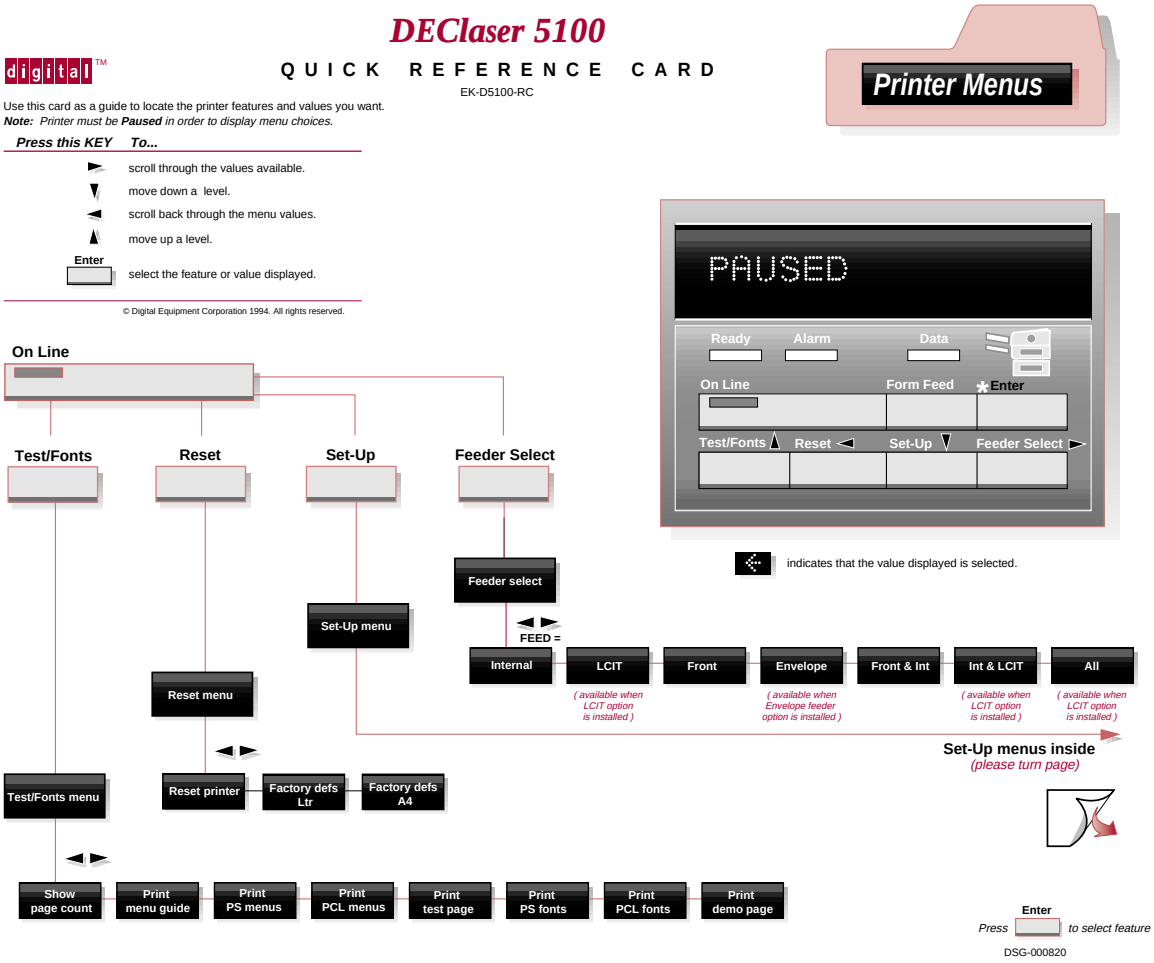


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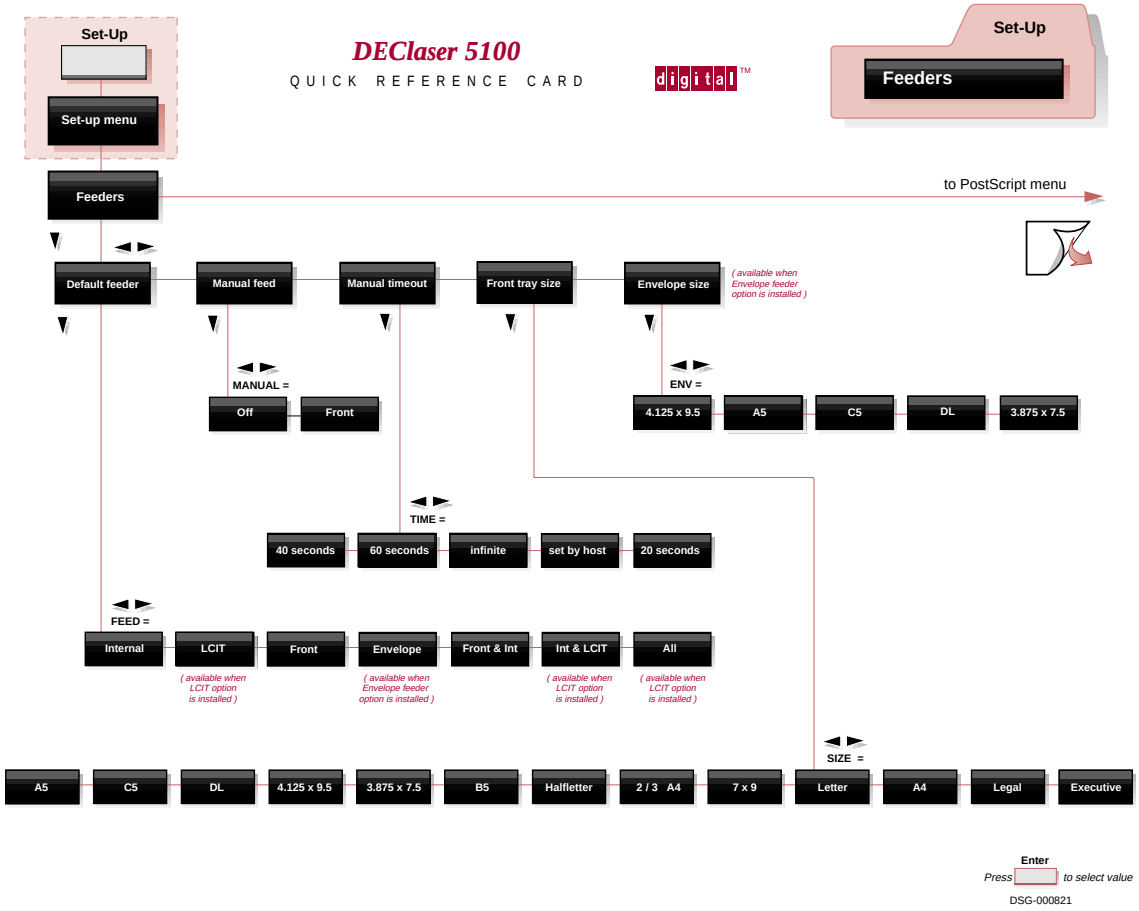
Figure A–1 (Cont.) Key Menu Map



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A.1 Key Menu Map

Figure A–1 (Cont.) Key Menu Map

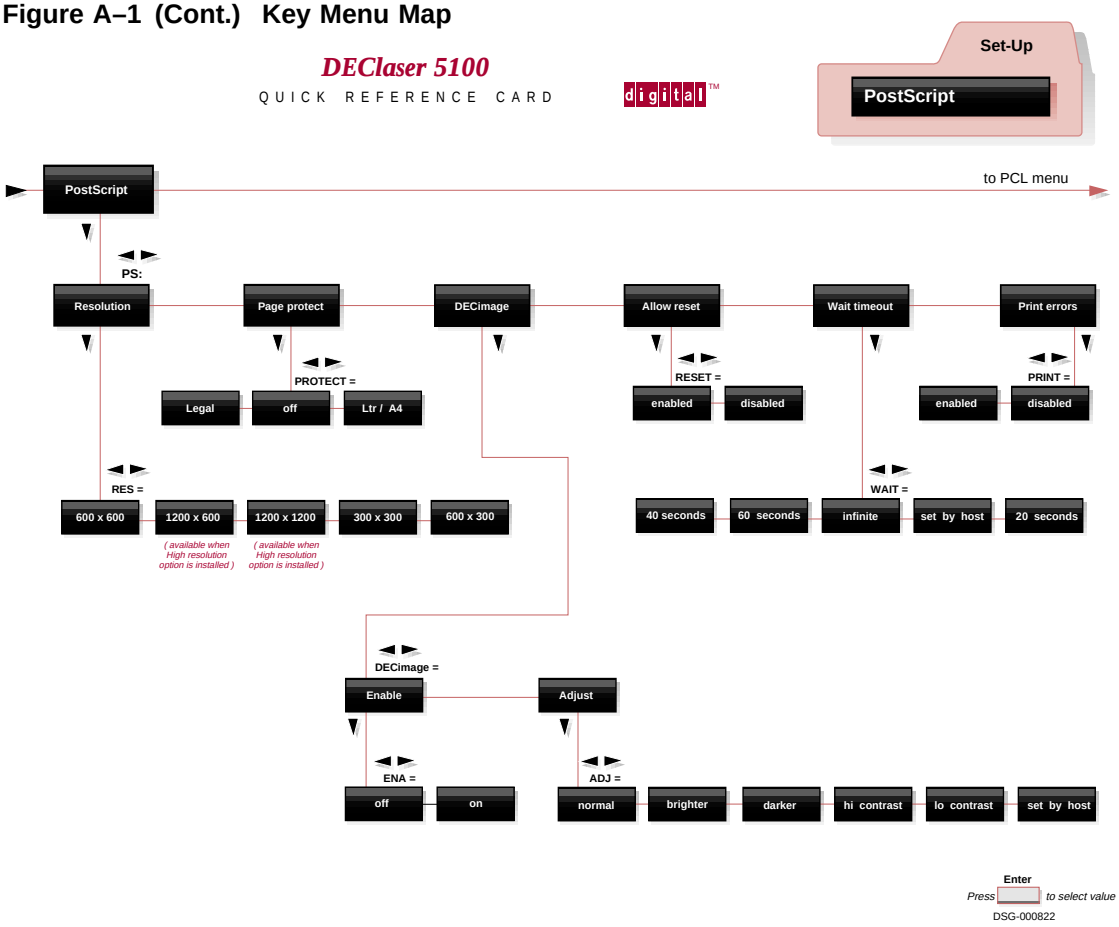

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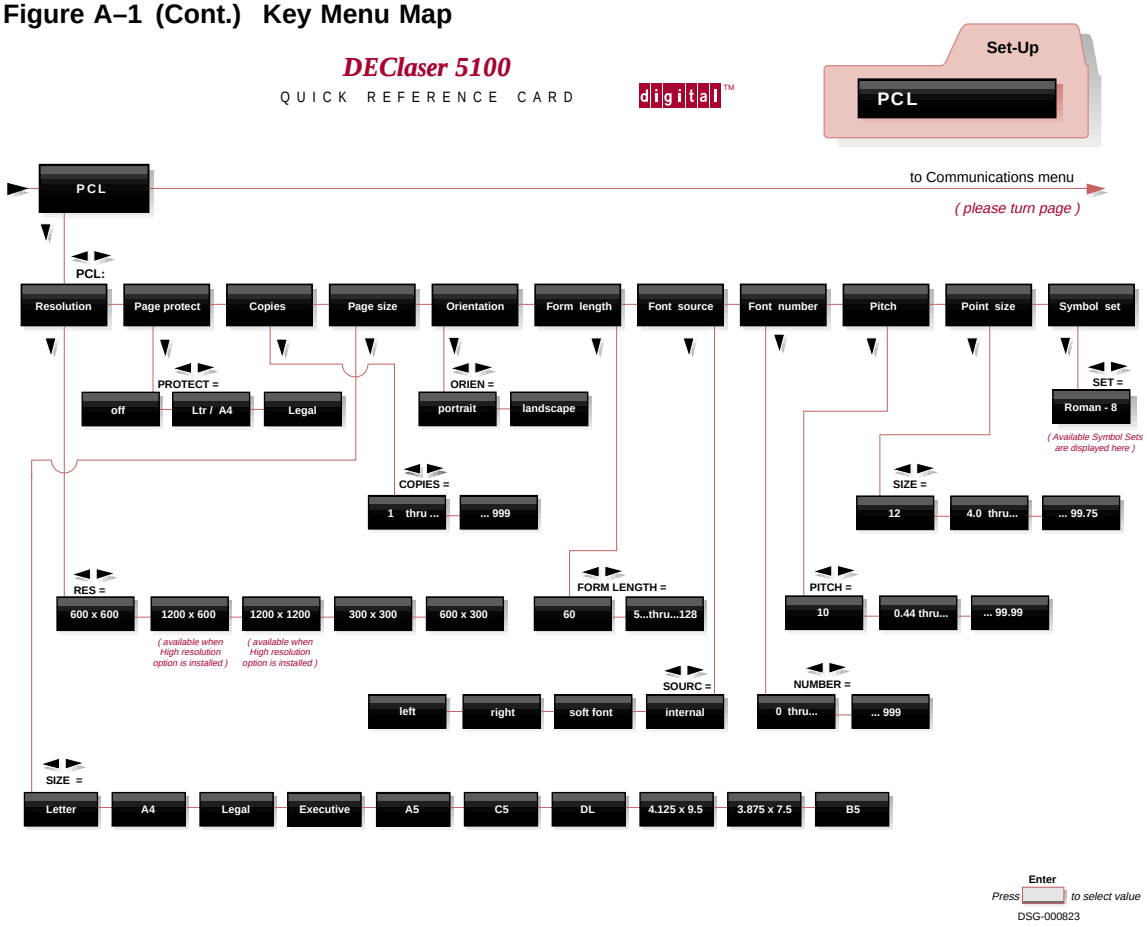
Figure A–1 (Cont.) Key Menu Map



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A.1 Key Menu Map

Figure A–1 (Cont.) Key Menu Map

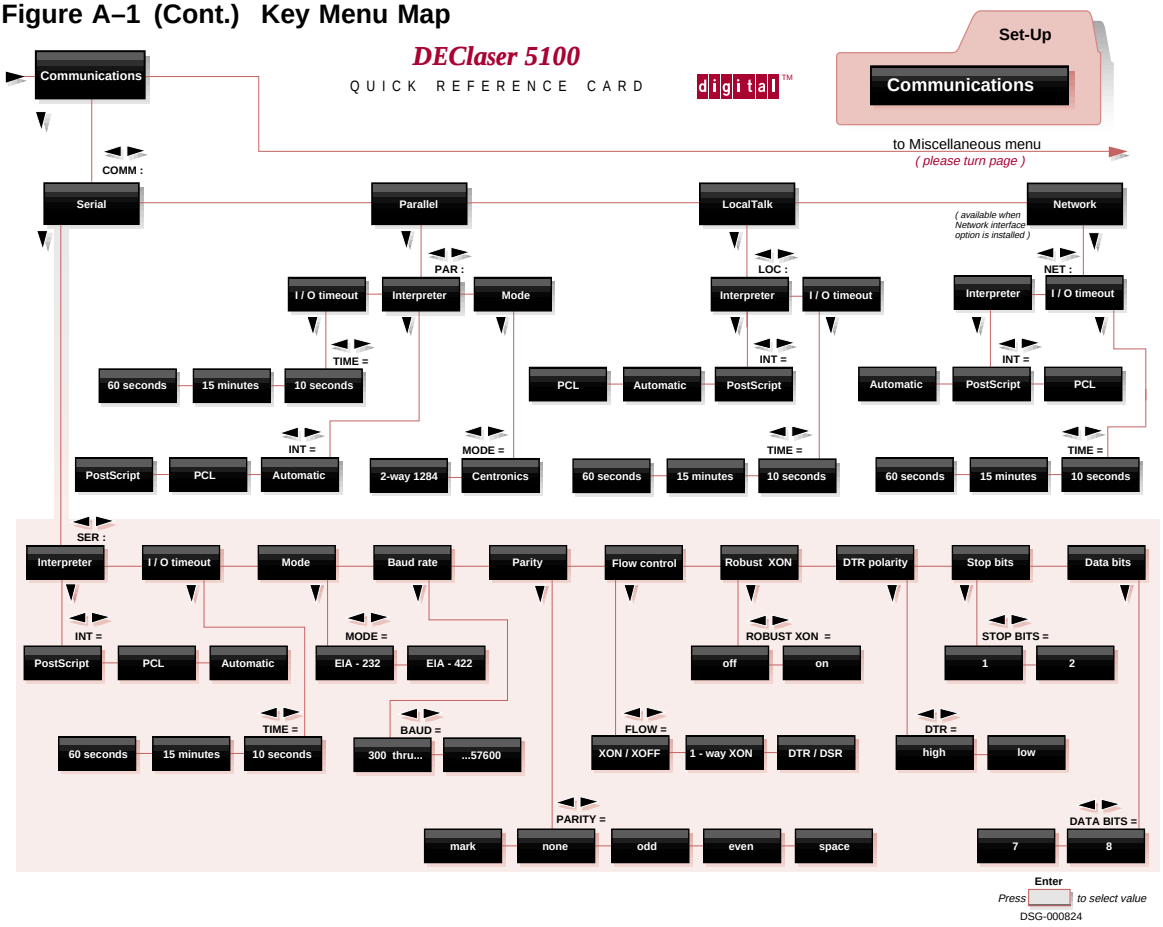

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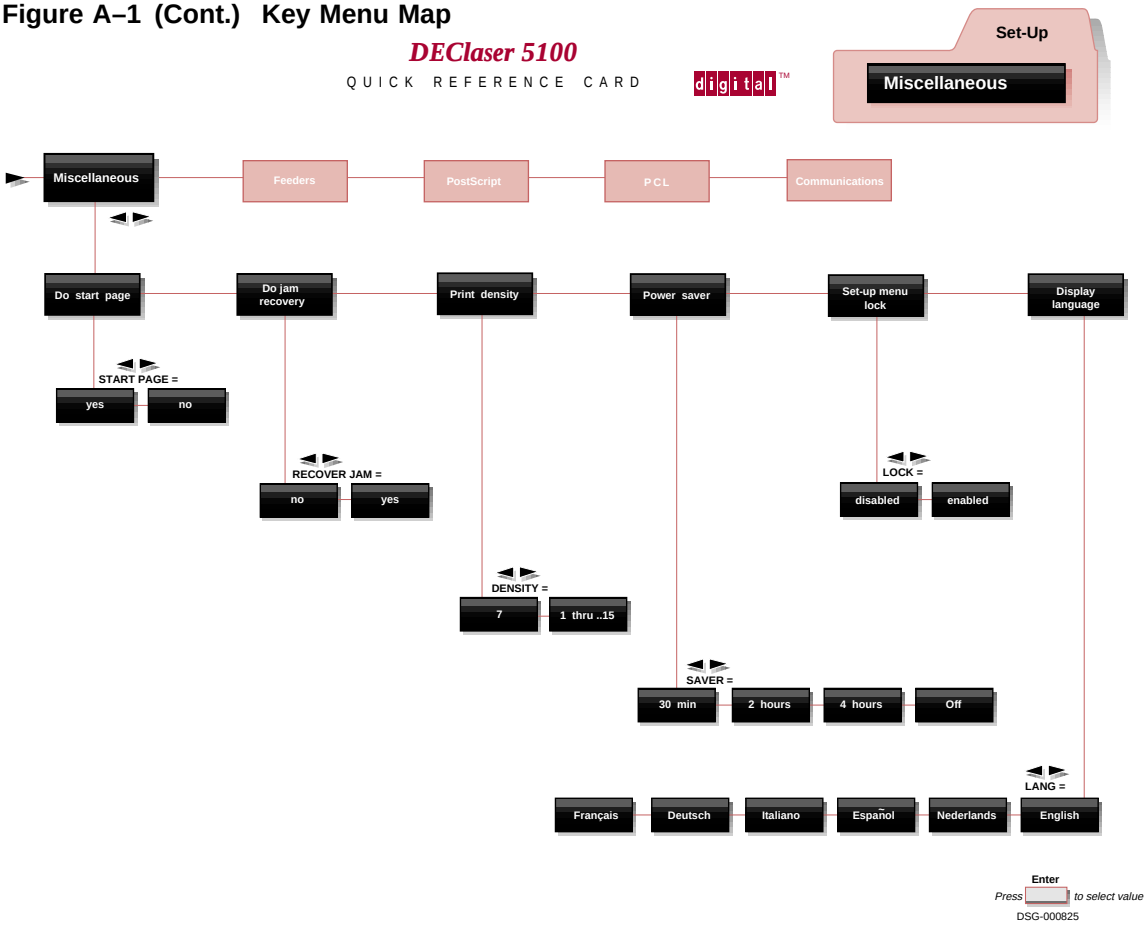
Figure A–1 (Cont.) Key Menu Map



A.2 Key Menu Messages

ADJ= *Value*

These values appear under the DECimage: Adjust submenu. See the PS: DECimage entry.

Baud= *Value*

For the values associated with this prompt, see the SER: Baud rate entry.

COPIES: *Value*

For the values associated with this prompt, see the PCL: COPIES entry.

DECimage: Enable or Adjust *Value*

For the values associated with this prompt, see the PS: DECimage entry.

DENSITY= *Value*

For the values associated with this prompt, see the Print density entry.

Default feeder *Value*

This feature, which exists under the Set-Up key menu menu, can be confused with the values found under the Feeder Select key menu. Also, the FEED= *Value* does the same thing as this feature.

- When the Set-Up lock feature is enabled, the Default feeder values are unavailable.
- The Feeder Select key menu values are always available to the control panel operator.

The following values select the input feeding device for PostScript, PCL, and LOC interpreters:

FEED= Internal
FEED= LCIT
FEED= Front
FEED= Envelope
FEED= Front & Int
FEED= Int & LCIT
FEED= All

A.2 Key Menu Messages

Display language

When selected, the LANG= prompt allows you to select the language for the control panel display; for example: French, English, Dutch, and so on.

Do jam recovery

The RECOVER= yes or RECOVER= no values control the jam recovery feature. If yes, the printer allocates sufficient memory to recover all the pages lost during a paper jam. Using jam recovery might cause a noticeable speed decrease because the full page bitmap is retained until the printed sheet is ejected from the printer. For additional information about jam recovery, see *DEClaser 5100 Printer User's Guide.*

Do start page

The START PAGE= yes or no values control the automatic printing of the start-up test page.

Envelope size

The following values are available under the Envelope size feature:

ENV= 4.125x9
ENV= 3.87x7.5
ENV= A5
ENV= C5
ENV= DL

Factory def Ltr or A4

Sets all features in the Set-Up and Feeder Select menus to factory default values. Two features are available for letter (Ltr) or A4 size paper. The Resetting menus.... message appears while the printer is resetting.

Feeder Select key menu

Press Feeder Select to enter the Feeder Select menu and display the FEED= *Value* prompt.

The Feeder Select menu values allow you to change the selected input device when the Set-Up lock feature is enabled. Do not confuse the Feeder Select menu with the Set-Up key menu Feeders submenu. See the Default feeder entry for a listing of Feeder Select values.

A.2 Key Menu Messages

Feeders submenu

This menu appears on the first level of the Set-Up key menu. The following features appear under the Feeders Submenu. For information and values see the entry that is associated with that feature.

Default feeder
Manual feed
Front Tray Size
Envelope Size

FEED= *Value*

This value prompt is displayed by both the Default feeder submenu and the Feeder Select key menu. For the values associated with this prompt, see the Default feeder entry.

FLOW= XON/XOFF *Value*

For the values associated with this prompt, see the SER: Flow control entry.

FORM LENGTH= *Value*

For the values associated with this prompt, see the PCL: Form length entry.

Front tray size

This Feeders submenu feature sets the front tray paper size to one of the following values:

FRONT= Letter
FRONT= A4
FRONT= Legal
FRONT= Executive
FRONT= A5
FRONT= C5
FRONT= DL
FRONT= 4.125x9
FRONT= 3.87x7.5
FRONT= B5
FRONT= Halfltr
FRONT= 2/3 A4
FRONT= 7x9

Do not confuse the features of the Feeder submenu and the Feeder Select key menu.

A.2 Key Menu Messages

INT= *Value*

For the values associated with this prompt, see the SER: Interpreter entry.

LANG= *Value*

For the values associated with this prompt, see the Display language entry.

LOC: I/O Timeout

For the values associated with this prompt, see the SER: I/O Timeout entry.

LOC: Interpreter

For the values associated with this prompt, see the SER: Interpreter entry

LOCK= *Value*

For the values associated with this prompt, see the Set-Up menu lock entry.

Manual feed

This is a Feeders submenu feature. The off and front values enable front tray manual feeding. Do not confuse the features of the Feeder submenu and the Feeder Select key menu.

MODE= *Value*

For the values associated with this prompt, see the PAR: Mode entry.

NUMBER= *Value*

For the values associated with this prompt, see the PCL: Font number entry.

ORIEN= landscape or portrait

For the values associated with this prompt, see the PCL: Orientation entry.

PAGES: *Value*

For the values associated with this prompt, see the Show page count entry.

Paper Jam

This message appears when the rear door of the printer is open or when paper is jammed in the fusing unit rollers. Both conditions are detected by the rear door sensor.

PAR: I/O Timeout

For the values associated with this prompt, see the SER: I/O Timeout entry.

A.2 Key Menu Messages

PAR: Interpreter *Value*

For the values associated with this prompt, see the SER: Interpreter entry.

PAR: Mode

The following MODE= *Value* appear under this feature:

- The MODE= Centronics value configures the port to operate as a standard, unidirectional Centronics printer. Centronics is the most commonly selected value.
- The Mode= 2-way 1284 value configures the port to conform to the Institute of Electrical and Electronic Engineering (IEEE) 1284 standard. The IEEE 1284 standard extends the existing personal computer parallel interface by adding bi-directional characteristics.

The value you select must match the description of the host system's parallel port.

PARITY= *Value*

For the values associated with this prompt, see the SER: Parity entry

PCL: Copies *Value*

The value of 1 through 999 that you enter determines how many copies of each page are printed. Press and hold < or > to increase or decrease the number.

PCL: Font number

This feature issues the NUMBER= *Value* prompt that determines which font is used from the selected source. The value changes by ±1 when you press < or > and by ±10 as you hold down the key.

See PCL: Font source, for information about selecting the font source.

PCL: Font source

The following value sets the default font source used by the PCL interpreter. This feature and value work with the PCL: Font number value.

SOU= internal
SOU= cartridge L
SOU= cartridge R
SOU= soft font

PCL: Form length

The value that you enter (5–128) determines the line spacing for the paper in the selected input tray. The default is FORM LENGTH= 60. The value changes by ±1 when you press < or > and by ±10 as you hold down the key.

PCL: Orientation

The ORIEN= landscape or ORIEN= portrait values set the orientation of the image on the sheet.

PCL: Page protect

The PROTECT= off, PROTECT= Ltr/A4, and PROTECT= Legal values reserve bitmap memory for full page bitmapping. The page protect operation competes for memory with font storage, jam recovery, and high resolution values that significantly slow down the printer, depending on the complexity of the printing image. For additional information about the page protect feature see the *DEClaser 5100 Printer User's Guide.*

PCL: Pitch

The value you select establishes the character spacing of the selected monospaced typeface. When selected, the PITCH= 10.00 prompt appears. The character spacing number spans from 00.44 to 99.99 characters per inch (CPI). The default is 10.00. The value changes by ±00.01 when you press < or > and by ±1.00 as you hold down the key.

PCL: Point size

The value you select sets the size of the proportional typeface selected by the font source and number values. When selected, the PCL: Point size= 12.00 prompt appears. Point sizes vary from 4.0 to 999.75. The default point size is 12.0. The value changes by ±0.25 when you press < or > and changes by ±1.0 as you hold down the key.

PCL: Resolution

For the values associated with this prompt, see the PS: Resolution entry.

PCL: Symbol set

The value you select determines the PCL default symbol set and displays the SET= *Value* prompt. The term "symbol set" is also known as a "character set." Consult the *DEClaser 5100 Printer User's Guide* for a list of character sets.

PITCH= *Value*

For the values associated with this prompt, see the PCL: Pitch entry.

A.2 Key Menu Messages

Point size= *Value*

For the values associated with this prompt, see the PCL: Point size entry.

PROTECT= *Value*

For the values associated with this prompt, see the PS: Page protect entry.

PS: Allow reset

The following value selections determine what happens after [On Line] is pressed while printing a PostScript job:

- If RESET= Disabled, printing continues until the end-of-job.
- If RESET= Enabled, the user is prompted to press [*]. The job then stops and the data is lost from memory.

PS: DECimage

The Enable and Adjust values turn on the standard DECimage image enhancements feature and provide for DECimage parameter adjustment. Do not confuse this standard DECimage feature with the optional XLI image enhancement feature.

The following prompts appear when Enable is selected:

ENA= host only
ENA= always
ENA= never

The Adjust value prompts for the following DECimage parameters:

ADJ= normal
ADJ= bright
ADJ= dark
ADJ= hi contrast
ADJ= lo contrast
ADJ= set by host

PS: Page protect

The PROTECT= off, PROTECT= Ltr/A4, and PROTECT= Legal values reserve memory for a full page bitmap of the PostScript page. Page protect operation competes for memory with font storage, jam recovery, and the higher resolution values to significantly slow down the printer, depending on the complexity of the printing image. For additional information about jam recovery, see the *DEClaser 5100 Printer User's Guide*.

PS: Print errors

The PRINT= enabled and PRINT= disabled values control the printing of a PostScript error page after a PostScript error has terminated the print job.

PS: Resolution

This PS: Resolution feature is identical to the PCL: Resolution feature. It sets the resolution to one of the following values.

RES= 300x300
RES= 600x300
RES= 600x600
RES= 1200x600
RES= 1200x1200

When complex images are printing, insufficient memory can cause complex page errors that end the print job. Reducing the resolution value can reduce the likelihood of the complex page errors. For additional information about the resolution feature see the *DEClaser 5100 Printer User's Guide.*

PS: Wait timeout

This feature sets the PostScript wait timeout to one of the following values:

WAIT= 20 seconds
WAIT= 40 seconds
WAIT= 60 seconds
WAIT= infinite
WAIT= set by host

Power saver

The power saver feature turns off the fuser heater after exceeding the selected value. The message **Power Saver On** appears while the fuser heater is turned off. The following values are available:

SAVER= 30 minutes
SAVER= 2 hours
SAVER= 4 hours
SAVER= off

Print PCL fonts

This Test/Fonts key menu feature prints downline loaded, built-in, and cartridge PCL fonts.

A.2 Key Menu Messages

Print PCL menus

This Test/Fonts key menu feature prints all selected values for the Set-Up and Feeder Select menus. If necessary, the printer automatically switches to the appropriate interpreter.

Print PS fonts

This Test/Fonts key menu feature prints all downline loaded, built-in, and cartridge PostScript fonts.

Print PS menus

This Test/Fonts key menu feature prints all selected values, except PCL values, for the Set-Up and Feeder Select menus. If necessary, the printer automatically switches to the appropriate interpreter.

Print demo page

This Test/Fonts key menu feature prints a PostScript demonstration page.

Print density

When this feature is selected, the DENSITY= prompt appears. This feature produces a slightly darker printing. The selected value varies the primary and developer bias (see Sections 2.3.1 and 2.3.3.) The values vary from 1 to 15. The recommended value is 7.

Printer Open

This message appears when the top cover of the printer is open. See the description under Section 2.1.6.

Print menu guide

This Test/Fonts key menu feature prints a menu roadmap.

Print test page

This Test/Fonts key menu feature prints a test page.

PROT= *Value*

For values associated with this prompt, see the PS: Page protect entry.

RECOVER= *Value*

For the values associated with this prompt, see the Do jam recovery entry.

RES= *Value*

For the values associated with this prompt, see the PS: Resolution and PCL: Resolution entries.

Reset key menu

Press Reset to enter the Reset key menu. See the entries for the following features for a description the feature:

Reset Printer
Reset all comm
Factory def A4
Factory def ltr

Reset printer

When this feature is selected, it:

- Displays the **Resetting...** message for about 2 minutes
- Restores all values stored in nonvolatile memory
- Clears the page buffer
- Resets the interpreters
- Clears downline loaded information such as soft fonts
- Clears the active communication buffer

Resetting...

For a description of this message, see the Reset printer entry.

Resetting Menus...

For a description of this message, see the Factory def Ltr or Factory def A4 entry.

SAVER= *Value*

For the values associated with this prompt, see the Power saver entry.

SER: Baud rate

When selected, the Baud= *Value* prompt appears. The baud rate value must match the baud rate of the connected host or modem. The values start at 300 baud, double in value to 38400 baud, and then jump to 57600 baud. The advisable selections are 9600 or 19200 baud.

A.2 Key Menu Messages

SER: DTR polarity

DTR is a standard data communication signal name for the data terminal ready signal. The DTR= high and DTR= low value prompts must match the DTR values of the attached host or modem.

SER: Flow control

The XON/XOFF selection must match that of the attached host or modem. When this feature is selected, the following values appear:

FLOW= XON/XOFF
FLOW= 1-way XON
FLOW= DTR/DSR

SER: I/O Timeout

When the time exceeds the selected value, the printer stops waiting for data, gives up on the job, and searches the other ports for data. This timeout period can compensate for a busy network or host system. The following value are available under this selection:

TIME= 10 seconds
TIME= 30 seconds
TIME= 60 seconds

SER: Interpreter

When this feature is selected, the following values appear. The identical values are shown for the parallel (PAR) and LocalTalk (LOC) interpreters features.

The selection sets either the PostScript or PCL interpreters or allows automatic interpreter detection to select:

PostScript or PCL.
INT= PostScript
INT= PCL
INT= Automatic

SER: Mode

The Mode= EIA-232 or Mode= EIA-422 values set the EIA interconnection standard for the serial port. The selection must match the characteristics of the transmitting host or modem.

SER: Parity

The parity selection must match that of the attached host or modem. When this feature is selected, the following values appear:

PARITY= none
PARITY= odd
PARITY= even
PARITY= space
PARITY= mark

SER: Robust XON

The ROBUST XON= off and ROBUST XON= on values appear only when XON flow control is selected. If the printer's input buffer empties and the ROBUST= on value is selected, the printer attempts to wake up the host or network devices by transmitting one XON character per second through the network to the host. This feature compensates for the loss of an XON character by the host or by a network device. See the SER: Flow control entry.

SER: Stop bits

The STOP BITS= 1 or STOP BITS= 2 value must match those of the attached host or modem. The default is STOP BITS= 1.

SET= *Value*

For the values associated with this prompt, see the PCL: Symbols entry.

SOU= *Value*

For the values associated with this prompt, see the PCL: Font source entry.

START PAGE= *Value*

For the values associated with this prompt, see the Do start page entry.

Set-Up key menu

Press Set-Up to enter the Set-Up key menu. The Set-Up key menu is the most complex key menu, divided into four levels. Selecting any one of the following features calls up the next level of submenus:

Feeders
PostScript
PCL submenu
PostScript
Communication
Miscellaneous

A.2 Key Menu Messages

For a description of each Test/Fonts feature, see the feature's entry.

Set-Up menu lock

The LOCK= disabled or LOCK= enabled values enable a security lock of the Set-Up menu, as described in Section 4.8

Show page count

This feature appears under the Test/Fonts key menu. When selected, the page count message PAGES *Value*: appears for approximately 2 seconds.

The page count also prints on the start up page.

Test/Fonts

Press Test/Fonts to enter the Test/fonts key menu. The following features are available:

Show page count
Print menu guide
Print PS menus
Print PCL menus
Print PS fonts
Print PCL fonts
Print demo page

For a description of each Test/Fonts feature, see the feature's entry.

TIME= *Value*

For the values associated with this prompt, see the SER: I/O timeout entries.

WAIT= *Value*

For the values associated with this prompt, see the PS: Wait timeout entry.

B

General Information

This chapter describes how to connect the DEClaser 5100 printer to the following systems:

- Ethernet Network—see Section B.1
- IBM compatible PC—see Section B.2
- Apple Macintosh—see Section B.3
- OpenVMS VAX or ULTRIX Systems—see Section B.4

B.1 Connecting to an Ethernet Network

Instructions for installing the optional interface card are packaged with the option. See Section 9.13 for removal and replacement procedures.

B.2 Connecting PC or IBM Compatible Systems

The MS–DOS and Windows PC operating system use the parallel and serial ports to communicate with the printer. The parallel port is the system's default. The serial port is used when the parallel port is occupied.

- Use the parallel port if the printer is less than 3 meters (10 feet) from your computer.

  The parallel port supports IEEE 1284 bidirectional and Centronics unidirectional communications.

- The DEClaser 5100 printer serial port supports both the EIA-232 and EIA-422 communication protocols. EIA-323 is universally accepted while EIA-422 is available on most systems.

  – Choose EIA-232 for distances up to 15 meters (50 feet) and baud rates up to 19200. Use lower speeds for longer distances.

  – Choose EIA-422 for high baud rates *and* long distances.

- The default serial communications settings are:

Baud rate	9600 bits per second
Parity	None
Flow control	XON/XOFF (2-way)
Stop bits	1
Mode	EIA-232
XON/XOFF	For AT compatible ports
DTR/DSR	For PC compatible ports

B.2.1 Configuring AUTOEXEC Files

The AUTOEXEC.BAT file directs data to the chosen printer port and configures the nondefault port. Some applications automatically update the AUTOEXEC.BAT file, fully or partially, when they are installed or modified.

If AUTOEXEC.BAT changes have been made, reboot the computer to effect the change.

See the *MS–DOS User's Guide and Reference* documentation for MODE command and AUTOEXEC.bat file editing.

LPT1 Parallel Port: The following example shows the MODE command that sends a "busy" message if the port is busy during a status check.

Table B–1 Parallel Port AUTOEXEC.BAT Modifications

If you are using . . .	Add the following command . . .
MS–DOS Version 4.0 or newer	MODE LPT1:,,B
MS–DOS Version 3.3 or older	MODE LPT1:,,P

COM1 Serial Port: The following examples show one MODE command setting the COM1 communication characteristics. The second MODE commands redirects the data from the default parallel (LPT1) port to the COM1 serial port.

Table B–2 Serial Port AUTOEXEC.BAT Modifications

If you are using . . .	Add the following commands . . .
MS–DOS Version 4.0 or newer	MODE COM1:9600,N,8,1,B[1] MODE LPT1:=COM1:
MS–DOS Version 3.3 or older	MODE COM1:9600,N,8,1,P[1] MODE LPT1:=COM1:

[1]This command assumes you are using the default communications settings of the printer.

B.2 Connecting PC or IBM Compatible Systems

B.2.2 MS–DOS Drivers

MS–DOS applications use internal printer drivers. There are several different PCL and PostScript drivers available. The following examples show PCL and PostScript drivers:

- **PCL drivers**
  - LaserJet 4, LaserJet III, and LaserJet II
  - PCL5 and PCL4
- **PostScript drivers**
  - LaserJet 4M
  - LaserWriter IIg, LaserWriter IIf, LaserWriter Plus, and LaserWriter

Read the MS–DOS application documentation for information about selecting a printer driver.

B.2.3 Windows and Windows NT Drivers

The DEClaser 5100 printer supports Adobe PostScript Level 2 and HP-PCL5E emulation. Read the Windows documentation for information about installing and selecting printer drivers. Make sure the printer port interpreter is set to PostScript or PCL, or to automatic interpreter detection and switching.

PostScript Driver: PostScript printer drivers are supplied with the DEClaser 5100 printer. Other PostScript drivers can be used but might not take advantage of the DEClaser 5100 printer features and performance.

Install the printer driver according to the *Adobe Printer Driver User Guide* (Windows Version) that comes with the diskettes labeled "PostScript." Refer to your MS-Windows documentation for additional information about installing and selecting printer drivers.

PCL Driver: A PCL printer driver is not supplied with the DEClaser 5100 printer. PCL users can use any of the following drivers that come with or are available for Windows 3.1:

- HP LaserJet 4
- HP LaserJet IIIP, III, IIP

B.3 Connecting the Printer to a Macintosh Computer

Figure B–1 shows the typical connections for the AppleTalk network.

The rear panel LocalTalk port ❶ can connect the DEClaser 5100 printer directly to a Macintosh computer or into a AppleTalk network.

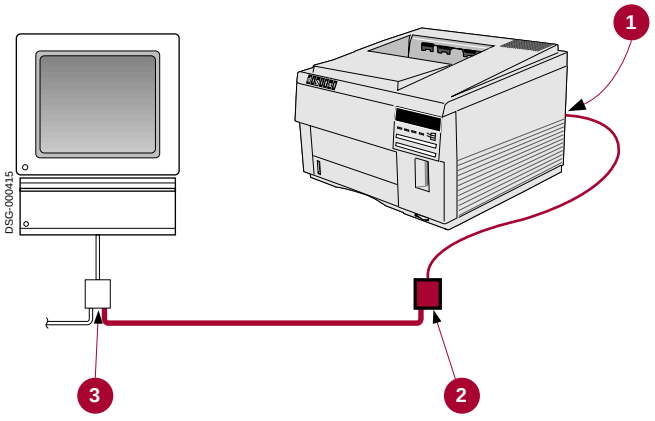
The connector boxes are either terminated ❷ or unterminated ❸. When using an unterminated connector box, you must add a terminating resistor.

Note: *Do not leave the AppleTalk network open or unterminated.*

Always notify the network users before disconnecting the Appletalk network. Installing the DEClaser 5100 printer between devices interrupts network operation until the new connections are made.

See the system manager if you are not sure if your printer is located between devices or is the last device on the network.

Figure B–1 AppleTalk Network Connections



B.3 Connecting the Printer to a Macintosh Computer

B.3.1 Macintosh Printer Driver

A Macintosh printer driver is supplied with the DEClaser 5100 printer. Although other Macintosh drivers may work, the driver supplied with the printer makes the most of the DEClaser 5100 printer features and performance.

Install the printer driver according to the *Adobe Printer Driver User Guide* (Macintosh Version) instructions that comes with the diskettes labeled "Macintosh." Refer to your *Macintosh User's Guide* for additional information about installing and selecting printer drivers.

Install the Macintosh printer driver as follows:

1. Insert the diskettes labeled "Macintosh Printer Driver" into your diskette drive.
2. Click on OK in the title screen.
3. Click on Install in the installation dialog box and follow the instructions on the screen.
4. Open the Chooser and set AppleTalk ON.
5. Select DEClaser 5100.

B.4 Connecting to OpenVMS VAX or ULTRIX Systems

Figure B–2 shows typical cable and adapter configurations for EIA-232 and EIA-422 interfaces, and the typical cable and adapter configurations for the DEClaser 5100 printer.

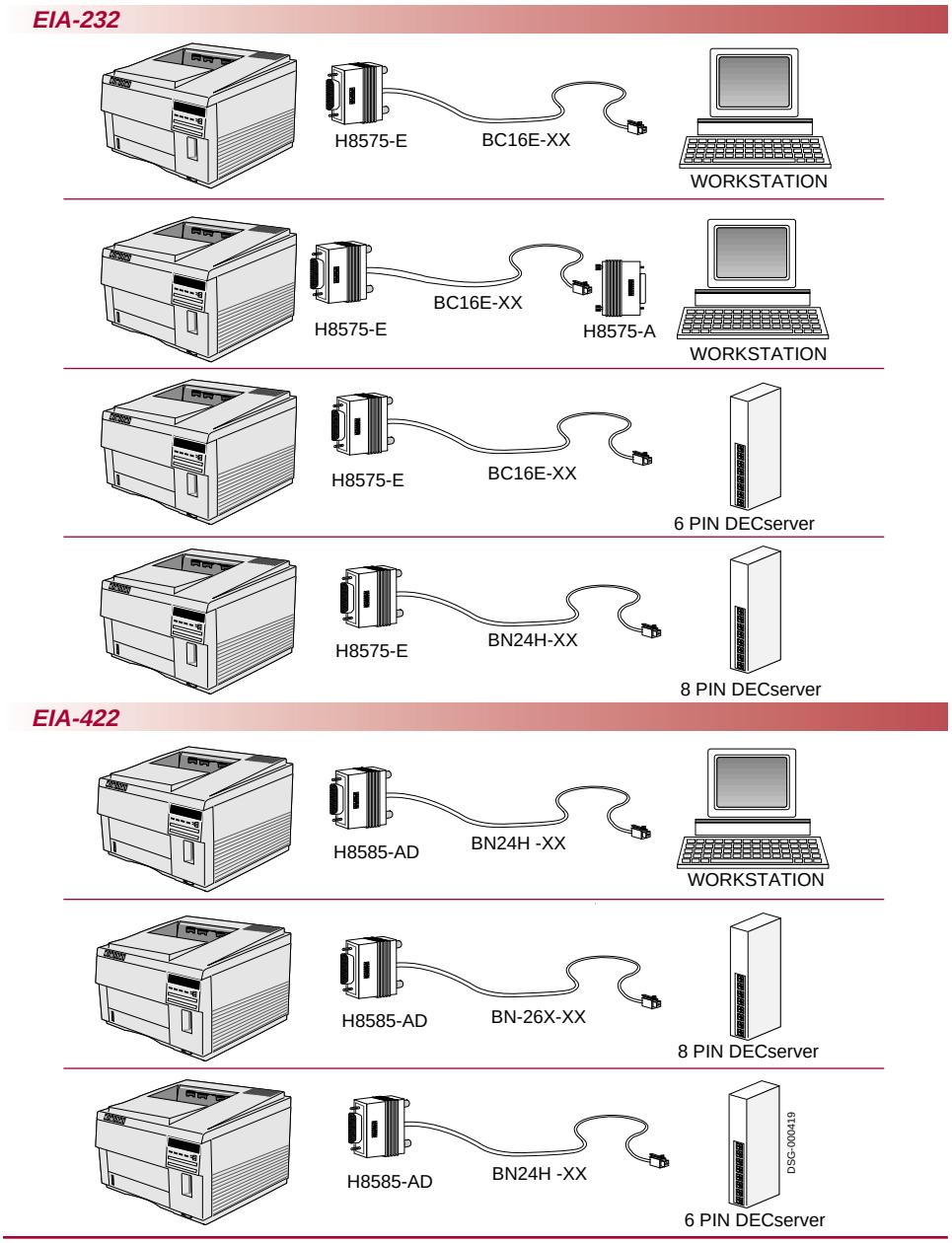
- See Section B.2 for the serial communication default settings protocol selection.
- All Digital host systems and DECservers with a built-in DECconnect interface or built-in OpenDECconnect interface are EIA-422 compatible.

Caution: *Damage to the DEClaser 5100 printer might occur if the H8571 or H8575 adapters are used with the EIA-232 interface protocol.*

Figure B–2 shows the H8575-x adapter for use in some configurations. The older H8571-x adapters can substitute for the H8575-x.

B.4 Connecting to OpenVMS VAX or ULTRIX Systems

Figure B–2 EIA-232 and EIA-422 Cable/Adapter Configurations



(continued on next page)

B.4 Connecting to OpenVMS VAX or ULTRIX Systems

Figure B–2 (Cont.) EIA-232 and EIA-422 Cable/Adapter Configurations

Host System / Server	EIA Interfaces	Host Adapter	Cable	Printer Adapter
VAXstation 3100 DECstation 3100 DECserver 300 DECserver 90L DECserver 90L+ LATprint	EIA-232 or... EIA-422	None None	BC16E-xx [1] BN24H-xx [1]	H8575-E H8585-AD
DECserver 200MC DECserver 700-8	EIA-232	H8575-A	BC16E-xx [1]	H8575-E
DECserver 900 DECserver 700-16 DECserver 90TL DECserver 90M	EIA-422	None	BN26X-xx [1]	H8585-AD

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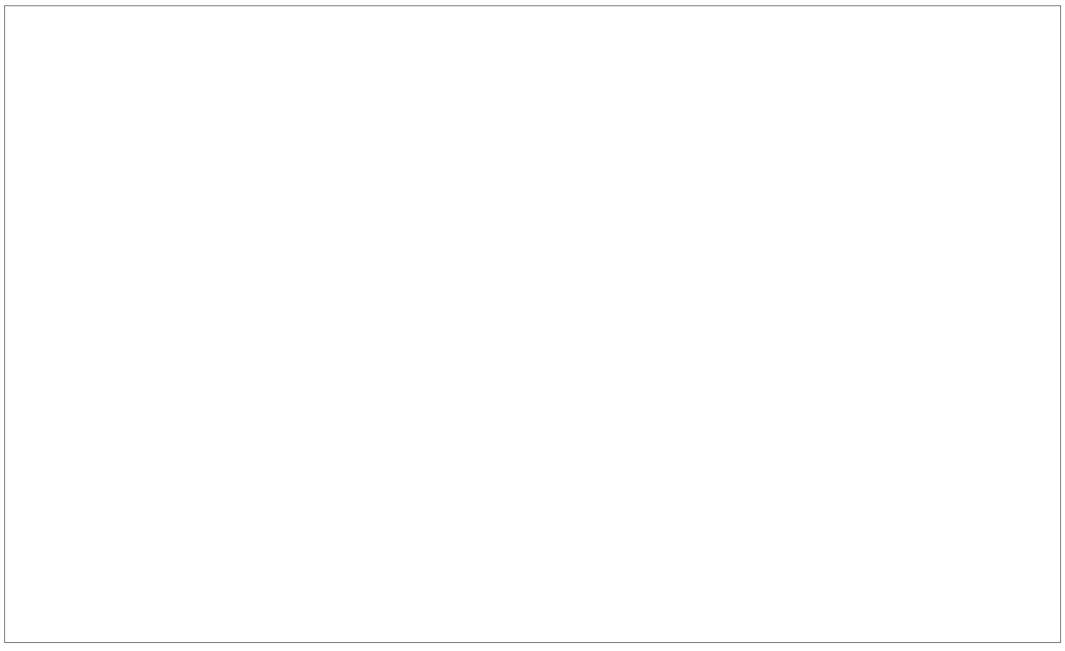
[1] xx refers to the cable length. (BN = meters, BC = feet)

B.4 Connecting to OpenVMS VAX or ULTRIX Systems

Notes:



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C

DEClaser 5100 Specifications

This appendix contains the operating and interface specifications for the DEClaser 5100 printer.

Table C–1 Printer Specifications

Category	Specification
Type	Desktop page printer
Printing Method	Electrophotographic using laser beam scanning
Resolution	300 x 300 dpi 600 x 300 dpi 600 x 600 dpi
Optional Resolution/Graphics Enhancement Board	1200 x 600 dpi 1200 x 1200 dpi
Optional Hard Disk Drive	120 MB disk drive
Optional Font Card Slots	2 slots are available to accept optional PCMCIA font cards for PCL and PostScript fonts.
Printing Speed	8 pages/minute maximum using A4 or Letter-size paper from the internal tray
Warm-Up Time: 100V–115V	60 seconds or less at 20°C (68°F)
Warm-Up Time: 220V–240V	75 seconds or less at 20°C (68°F)

(continued on next page)

Table C–1 (Cont.) Printer Specifications

Category	Specification
Internal Paper Tray	250-sheet capacity Letter (8.5 in x 11 in) A4 (210 mm x 297 mm) Universal (Accommodates Executive, A4, Letter, and Legal-size paper)
Front Tray Feed	100-sheet capacity.
Optional Large Capacity Input Tray	500-sheet capacity.
Optional Envelope Feeder	75-envelope capacity.
Top Output Tray Capacity	250-sheet capacity (facedown stacking)
Paper Weight Range Internal Tray Feed	64 g/m^2 to 90 g/m^2 basis weight (17 lb to 24 lb)
Paper Weight Range Manual Feed	64 g/m^2 to 105 g/m^2 basis weight (17 lb to 28 lb)
Resident Fonts	The DEClaser 5100 printer has 120 resident fonts: 73 PostScript Level 2 fonts 47 HP-PCL5E emulation fonts
Built-in RAM	2 MB
Add-on RAM	Built-in RAM expandable to 66 MB with optional SIMMs
Communication Interfaces	OPENcomm architecture provides simultaneous support for all available interfaces. Serial: EIA-232, EIA-422 (using the H8585-AD printer adapter) DEC-423 MMJ (using the H8575-E printer adapter) Parallel: Supports standard unidirectional Centronics and IEEE 1284 bidirectional (Nibble Mode) LocalTalk: AppleTalk network

(continued on next page)

Table C–1 (Cont.) Printer Specifications

Category	Specification
Optional Interface	DEClaser 5000 Series Ethernet Card
Acoustic Noise	31dB(A) during standby 48dB(A) during printing
Operating Temperature	10°C to 32.5°C (50°F to 90.5°F)
Operating Humidity	20% to 80% relative humidity (noncondensing)
Storage Temperature	0°C to 35°C (32°F to 95°F)
Storage Humidity	10% to 80% relative humidity (noncondensing)
Power Requirements	100–115 Vac, 50/60 Hz (North America and Japan) 220–240 Vac, 50 Hz (Rest of the world)
Power Consumption	Maximum 100–115 Vac: 530W 220–240 Vac: 520W Average (at 20 pages per hour) 100–115 Vac: 90W 220–240 Vac: 90W Power saving mode 100–115 Vac: Less than 30W 220–240 Vac: Less than 30W EPA Energy Star Compliant
Shipping Weight	Approximately 17.0 kg (37.4 lbs)
Dimensions	Width: 416 mm (16.4 in) Depth: 403 mm (15.9 in) Height: 297 mm (11.7 in)

C.1 Operating Requirements

The DEClaser 5100 printer performance can be affected by electrical and environmental conditions surrounding its location. The following sections describe:

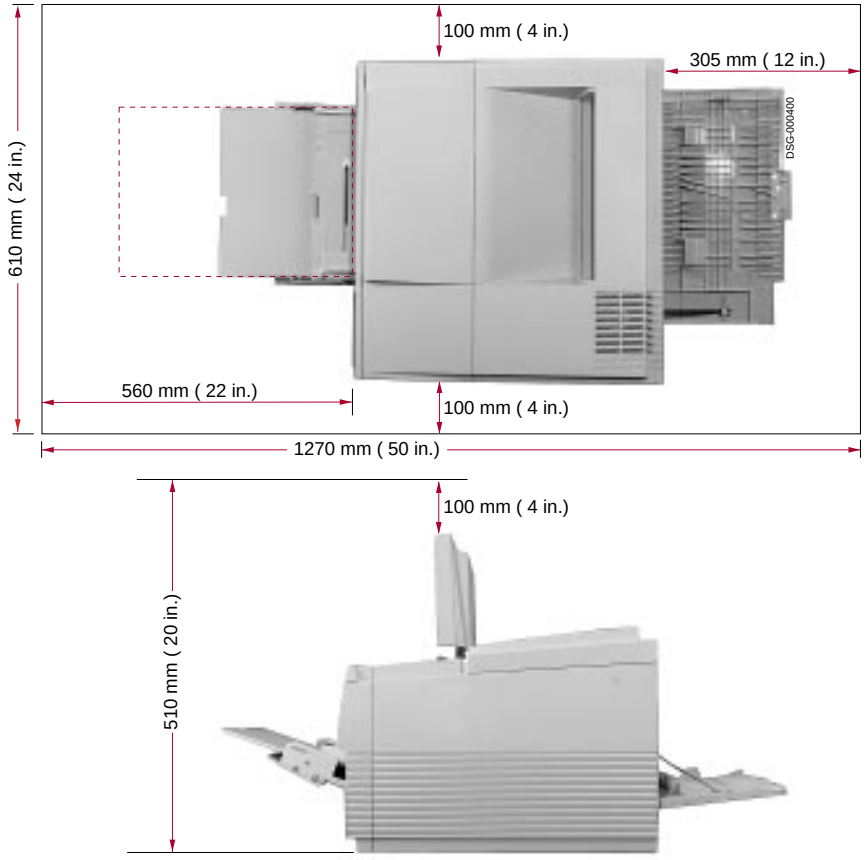
- Space requirements
- Environmental requirements

C.1.1 Space Requirements

Install the DEClaser 5100 printer in an area that meets the following requirements:

- A flat, level surface free from vibrations
- Enough surrounding space to allow ventilation and easy access to the printer to perform daily operations (Figure C–1)

Figure C–1 Operating Space



C.1 Operating Requirements

C.1.2 Environmental Requirements

For the proper operation of the printer, be sure the following environmental conditions are met:

- Ambient temperature of 10°C to 32.5°C (50°F to 90.5°F)
- Relative humidity of 20% to 80% (noncondensing)
- Good ventilation to avoid heat build up
- Dust-free or almost dust free area
- No sudden changes in temperature or high humidity
- No hot or cold drafts from a heating system or air conditioner
- No direct sunlight

D

Training, Documentation and Tools

This appendix contains training, tools, and documentation information.

D.1 Training

Before attempting to use this book and repair the printer, you must attend the specific Digital Education training course and all other prerequisite training courses.

Table D–1 lists the order numbers and information about the courses.

Table D–1 Training

Order Number	Description
EY–H990E	Printer Maintenance Course
United States Training Prerequisite Courses	
EY–7629E–IV	Hardcopy and video specialist core course
EY–5528E–IV	Laser safety and printer concepts course
Europe and GIA Training Prerequisite Courses	
EY–2830E–IV	Data Communication Fundamentals
EY–2239E–IV	Hardcopy Theory
EY–2423E–IV	Laser Printer Concepts
EY–2424E–IV	Laser Concepts and Safety

D.2 Documentation Ordering Information

Table D–2 lists the order numbers for documentation related to the DEClaser 5100 printer you may find useful.

Table D–2 Documentation

Order Number	Title
EK–D5100–UG. A01	DEClaser 5100 Printer DEClaser 5100 Series Ethernet Card User's Guide
EK–LPSML–MG	*DEClaser Maintenance Log*
12–39532–01	Pouch for the Maintenance Log
EK–DL510–UG	*DEClaser 5100 Printer User's Guide*
EK–DL510-AD	*DEClaser 5100 Printer Documentation Addendum*
EK–D5100–DK	*DEClaser 5100 Printer Documentation Kit* (User documentation)
EK–D5100–RC	*DEClaser 5100 Printer User Feature Card*
EK–DL51M–IN	*DEClaser 5100 Printer Memory Upgrade Option Installation*
EK–DL510–IN	*DEClaser 5100 Printer Installation and Setup Guide*
EK–D5100–IN	*DEClaser 5100 Printer Disk Option Installation*
EK–DLPL2–PS	*DEClaser 5100 Printer Level 2 PostScript Programmer's Supplement*
EK–D5100–IP	*DEClaser 5100 Illustrated Parts Breakdown*
EK–LASER–GD	*Digital Laser Printers Guide to Paper and Other Media*

D.3 Tools

Table D–3 lists the ordering number of the tools that are needed to service the DEClaser 5100 printer in the field.

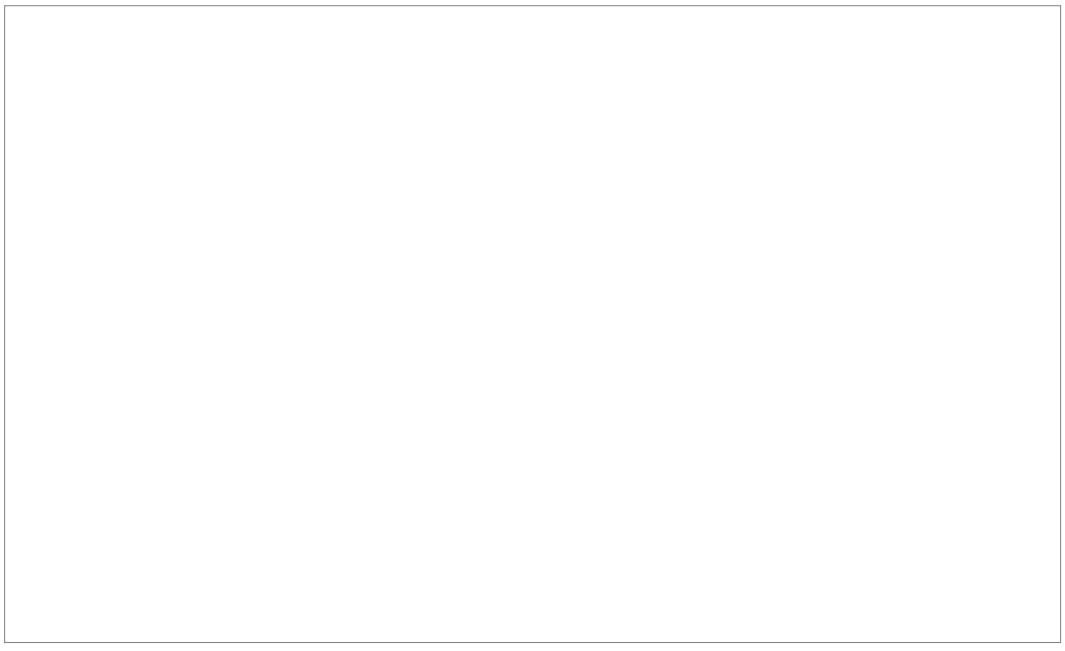
Table D–3 Tools

Order Number	Description
29–26106–00	50-Hz terminal tool kit
29–26109–00	60-Hz terminal tool kit
29–11762–00	Antistatic kit
29–26259–00	Vacuum[1] and attachments, 200 volts
29–25526–00	Vacuum[1] and attachments, 120 volts
29–26017–00	Filter bags and filter shell
29–26234–00	Cleaning kit
29–27340–01	Terminal tool kit

[1]Special vacuum cleaner for toner powder

D.3 Tools

Notes:



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