

PHASER® 2135
COLOR PRINTER
Service Quick Reference Guide



Tektronix
COLOR PRINTERS BY
XEROX

PHASER® 2135
COLOR PRINTER
Service Quick Reference Guide

Warning

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

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COLOR PRINTERS BY
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Users safety summary

Terms in manual:	CAUTION	Conditions that can result in damage to the product.
	WARNING	Conditions that can result in personal injury or loss of life.

Power source: For 110 VAC printers, Do not apply more than 140 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord and connector. For 220 VAC printers, do not apply more than 260 volts RMS between the supply conductors or between either supply conductor and ground. Use only the specified power cord and connector. Refer to a qualified service technician for changes to the cord or connector.

Operation of product: Avoid electric shock by contacting a qualified service technician to replace fuses inside the product. Do not operate without the covers and panels properly installed. Do not operate in an atmosphere of explosive gases.

Safety instructions: Read all installation instructions carefully before you plug the product into a power source.

Terms on product:	CAUTION	A personal injury hazard exists that may not be apparent. For example, a panel may cover the hazardous area. Also applies to a hazard to property including the product itself.
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	DANGER	A personal injury hazard exists in the area where you see the sign.
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Care of product: Disconnect the power plug by pulling the plug, not the cord. Disconnect the power plug if the power cord or plug is frayed or otherwise damaged, if you spill anything into the case, if product is exposed to any excess moisture, if product is dropped or damaged, if you suspect that the product needs servicing or repair, and whenever you clean the product.

Ground the product: Plug the three-wire power cord (with grounding prong) into grounded AC outlets only. If necessary, contact a licensed electrician to install a properly grounded outlet.

Lifting the printer: To avoid injury or damage to the printer, use three people to lift the printer.

Symbols as marked on product:

DANGER high voltage:



Protective ground (earth) terminal:



Use caution. Refer to the manual(s) for information:



WARNING: If the product loses the ground connection, usage of knobs and controls (and other conductive parts) can cause an electrical shock. Electrical product may be hazardous if misused.

Service safety summary

For qualified service personnel only: Refer also to the preceding Users Safety Summary.

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

Use care when servicing with power on: Dangerous voltages may exist at several points in this product. To avoid personal injury, do not touch exposed connections and components while power is on.

Disconnect power before removing the power supply shield, soldering, or replacing components.

Do not wear jewelry: Remove jewelry prior to servicing. Rings, necklaces, and other metallic objects could come into contact with dangerous voltages and currents.

Power source: This product is intended to operate from a power source that will not apply more than 120 or 250 volts AC RMS (depending on printer model) between the supply conductors or between either supply conductor and ground. A protective ground connection by way of the grounding conductor in the power cord is essential for safe operation.

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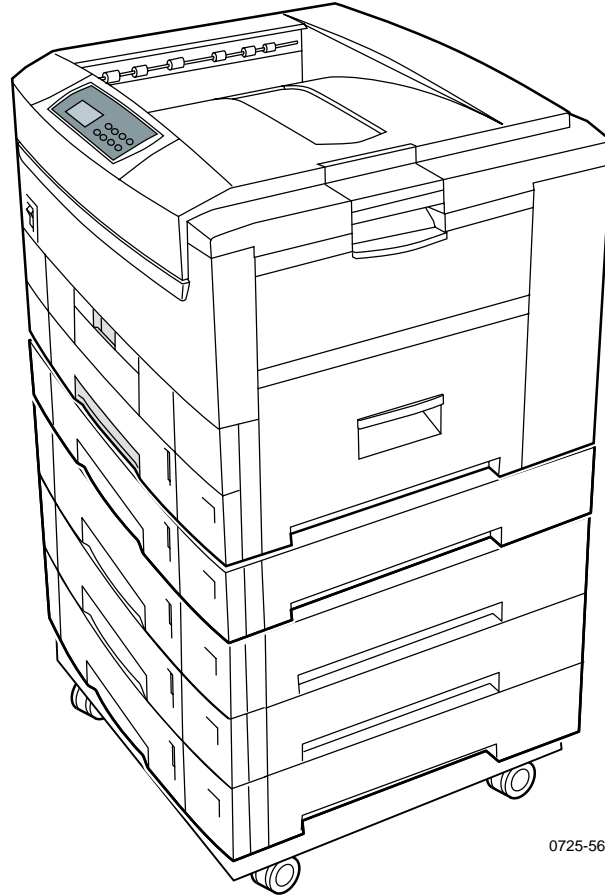
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General Information

This service guide contains information useful for troubleshooting, repairing, adjusting, and maintaining the Xerox Phaser® 2135 Color Printer. This manual includes troubleshooting guides, adjustment procedures and a field replaceable units (FRU) list.

Topics such as printer theory of operation and required service tools are located on the companion *Color Printer Service & Support Resources CD-ROM*.

To ensure a complete understanding of the product, Xerox recommends participation in Phaser 2135 printer service training.



0725-56

The Phaser 2135 Color Printer with lower tray assembly and lower tray deck

The Phaser 2135 Color Printer

The Phaser 2135 Color Printer combines a 4-color, LED-based, tandem-design Tabloid print engine with an EFI image processing controller board supporting Adobe's PostScript Level 3 page description language. The controller features a bi-directional parallel interface and an Ethernet port for host communication. The Ethernet port supports EtherTalk 10/100baseT, Novell and TCP/IP. All printer versions support the color PCL5C printer language.

The printer is available in three configurations:

- The **Phaser 2135N** comes standard with 128 Mbytes of RAM. Additional 64-, 128- and 256-Mbyte RAM DIMMs can be added with a maximum usable capacity is 512 Mbytes. The printer contains 136 standard, built-in fonts. The Phaser 2135N prints at a color resolutions of 600 x 600 dots-per-inch and 600 x 1200 dots-per-inch.
- The **Phaser 2135DT** is the same as the Phaser 2135N except it includes 192 Mbytes of memory, an auto-duplexer, an internal hard drive and a lower feeder tray assembly. With the hard drive the 2135DT supports a print collation mode, a "First Page Preview" mode and a secure print job "password" mode.
- The **Phaser 2135DX** has all the features and capabilities of the Phaser 2135DT printers but includes 256 MBytes of RAM and a three-tray lower tray deck.

The printer supports the following resolutions:

- 600 x 600 dpi (Normal)
- 600 x 1200 dpi (High-quality)

The printer also accepts 300 x 300 dpi files from PCL legacy drivers, PCL bit map fonts, PCL bit map images, although these are imaged at 600 x 600 dpi. The resolution supported is a function of the PDL used and the feature being selected, such as Fax Friendly Black and Draft Mode. Both PostScript and PCL allow full selection of all paper sources, paper sizes, paper types and output trays.

The auto-duplexer unit (optional on the Phaser 2135N) allows the printer to automatically create two-sided prints.

Print speeds depend on the chosen resolution and selected media. For resolutions of 600 x 600 (standard), in color, the printer prints at 21 pages-per-minute (ppm) on paper. Monochrome printing is at 26 ppm on paper. Transparency film printing is always 6.5 ppm. For 600 x 1200 dpi (enhanced) color printing, the printer prints color at the same speeds as standard mode.

The printer support printing on paper sizes such as A-, A4-, Legal-, B-, A3-size and 12 x 18 in. paper and transparency film from an adjustable tray. The printer supports up to 5 trays. The printer also features a built-in multi-sheet bypass feeder from which specialty media, cardstock and envelopes can be fed.



If the printer is equipped with multiple trays loaded with the same-size paper, the printer will switch to an alternate tray as a paper source when a tray runs out of paper.

The printer support these tray combination:

- One lower tray assembly
- Two lower tray assemblies
- One three-tray lower tray-desk
- One lower tray assembly and a three-tray lower tray deck

After being idle for the selected amount of time the printer switches into its Energy Star mode where it consumes less than 45 watts of power. It “awakens” upon receiving data at any of its ports.

Proof Jobs. A proof job is a specific case of a multiple-copy job. With a proof job, the customer assigns a password and copy account at the client workstation before printing. The first set of prints are printed immediately. The original number of requested sets are printed after the customer enters the matching password on the printer’s control panel. The customer has the option of printing the original number of requested sets or deleting the job. Since more than one job may be associated with the same password, the customer can print all the jobs, delete all the jobs or select or delete individual jobs. A proof job that has not been printed is retained on hard disk through power cycles. Proof jobs sent to a printer without the hard disk option are not printed and are discarded.

Secure Jobs. Secure printing allows the customer to defer printing of a job until a matching password is entered from the control panel. The customer assigns the password at the client workstation before printing. The job is stored, and printing is delayed until the password is entered on the printer’s control panel. Since more than one job can have the same password, all secure jobs with the same password are printed. A secure job that has not been printed or released is retained on disk through power cycles. The internal hard drive is required for this function.

TIFF Direct Printing. TIFF files consist of compressed binary images. The TIFF format itself has no capability to select printing options such as orientation, paper size, or duplexing. All TIFF files downloaded to the printer are processed using the default PostScript parameters stored in the printer. Auto sensing of TIFF files are included in the emulation sensing and switching logic when the TIFF option is enabled. TIFF direct printing requires the internal hard drive.

PDF Direct Printing. The printer supports a native PDF image processing. Processing PDF files directly requires a hard disk. PDF printing uses the printer’s currently defined imaging settings. Auto sensing of PDF files are included in the emulation sensing and switching logic when the PDF option is installed. PDF direct printing requires the internal hard drive.



Printer RAM and printer capabilities

The printer features three DIMM connectors which accept 64-, 128-, and 256-Mbytes RAM DIMMs. The printer can use off-the-shelf RAM meeting these specifications:

- 168-pin DIMM
- Synchronous DRAM
- 3.3 volt
- 9 nsec speed
- Valid on-board Serial Presence Detect ROM.

The Startup page and the Configuration Page list the amount of RAM installed in the printer.

If the DIMM does not meet the system controller board's specifications, then the printer reports an "Invalid Memory DIMM Configuration" message and stops the booting process.

If the power-up self-test diagnostics detect a DIMM with defective memory cells the printer declares "Diagnostics Failed - Press Enter to Continue." After the enter key is pressed the boot process continues and the defective RAM DIMM is ignored. Note that a seriously defective RAM DIMMs (with grounded address lines, for example) can keep the system controller board from booting up at all.

With more memory the printer gains the capabilities of printing without having to use image compression (which trades less installed RAM for longer image processing time) and dual frame buffers for printing one image while processing a second image (which gives greater printing throughput).

The printer features three slots each of which can contain a 64-, 128-, or 256-Mbytes SDRAM DIMM. Any slot may be used for any size DIMM. DRAM memory totalling beyond 512 Mbytes will be ignored. **For a capacity of 512 Mbytes, 256-Mbyte DRAM DIMMs cannot be mixed with 128-Mbyte RAM DIMMs.** The image-processing controller board also contains 16-kbytes of non-volatile memory (NVRAM), to store all for the necessary values that can be set on the printer.

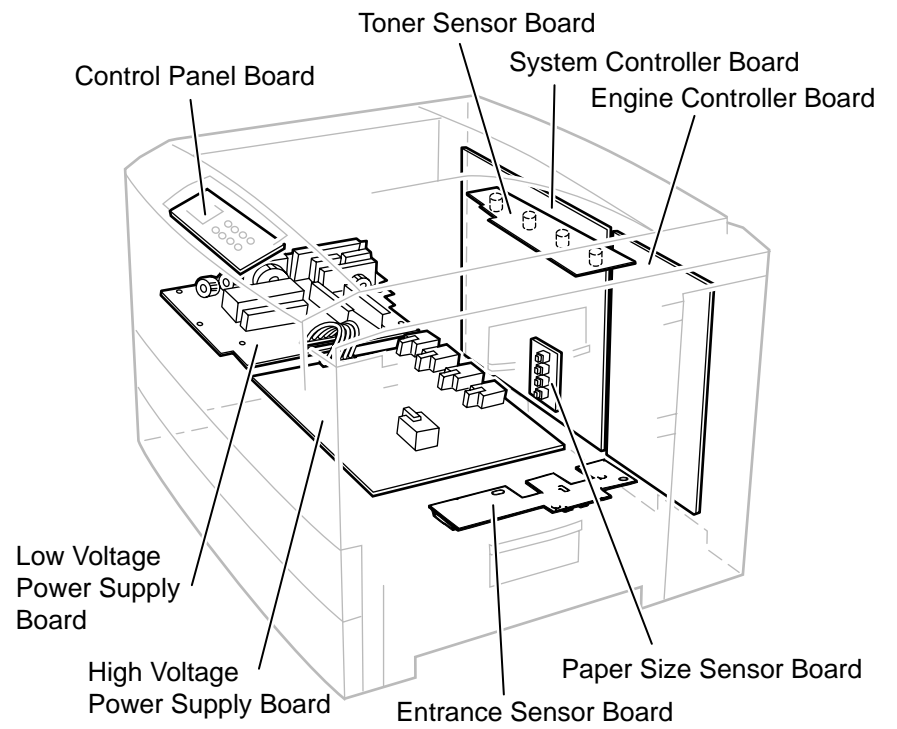
CRC life counter behavior

Internal counters track customer replaceable consumable (CRC) life usage and store the values in NVRAM. The controller monitors these counters in order to display the near end-of-use and end-of-use messages.

The toner states displayed are OK, Low, and Empty, where the engine senses and automatically reports the Low and Empty states. When the empty state is reached for toner, the printer terminates printing at the end of current page and displays the appropriate message on the control panel. No further jobs are accepted from any input port. All printer CRCs wait for the current print job to finish before declaring a Low or Empty state.

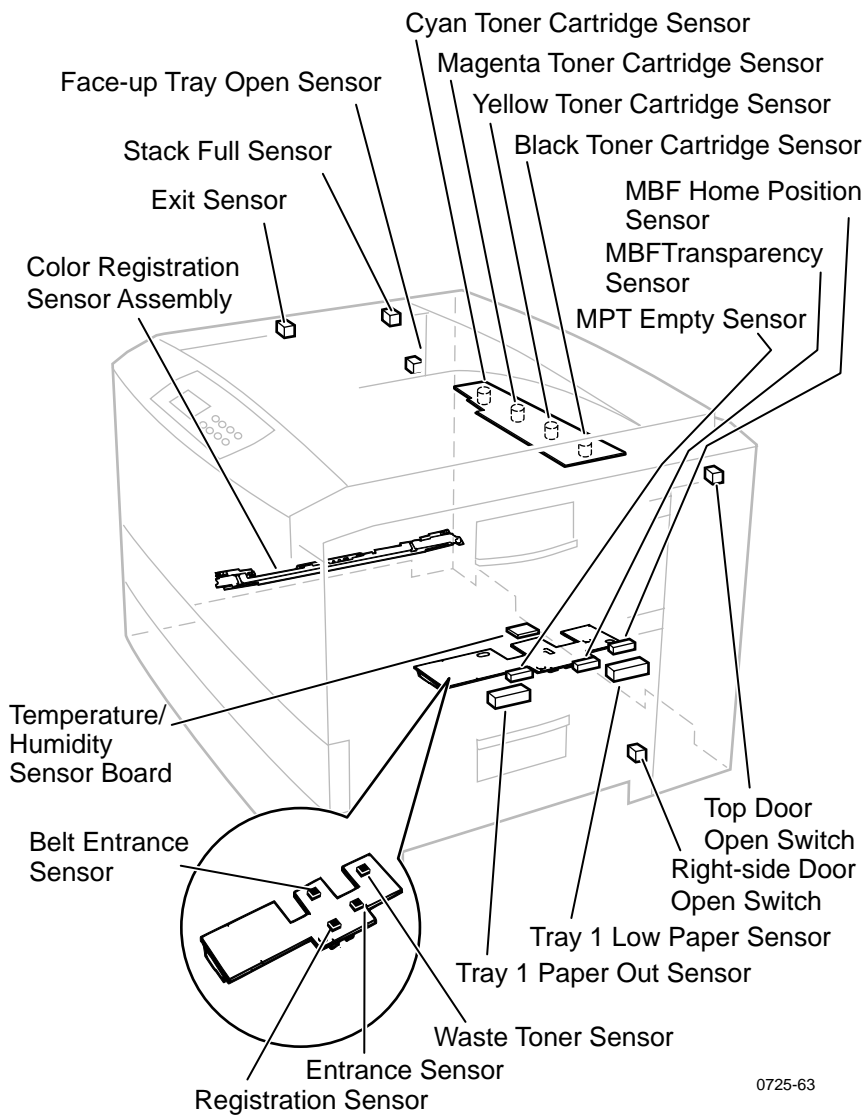


Print engine assemblies



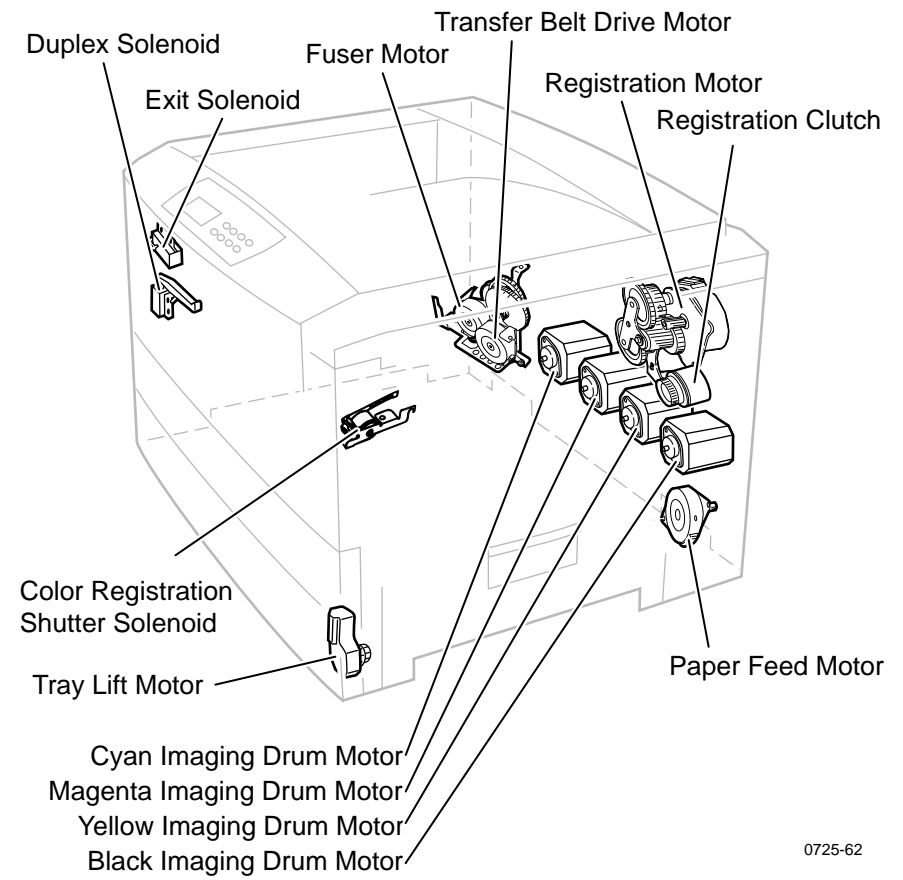
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Print engine circuit boards



Print engine sensor and switch locations

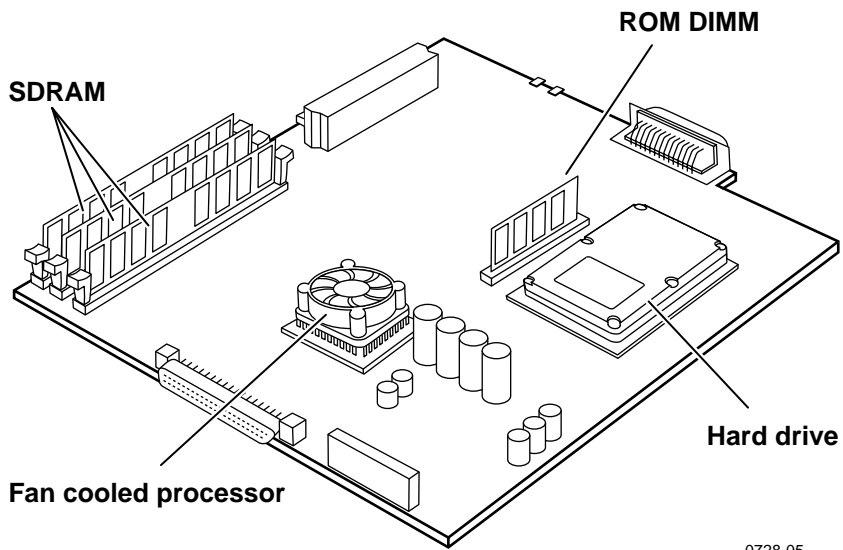




Print engine motors, clutches and solenoids

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The image processor board



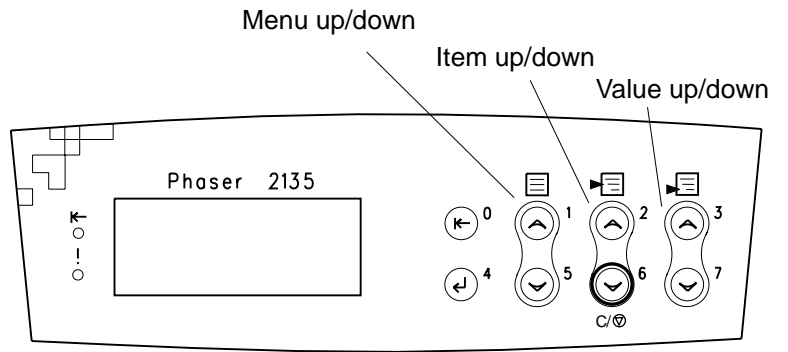
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Features of the controller board



The control panel

The control panel consists of eight labeled keys. These keys navigate the menu system for printer operations. Two LEDs on the display indicate On Line and active faults. The LCD display is two lines by twenty-four characters wide.



The control panel

Key 0 places the printer off-line or on-line. Key 4 is an Enter key. The pairs of keys 1 and 5 are used to scroll through the main menu. Keys 2 and 6 navigate the sub menus, and Keys 3 and 7 scroll sub-menu values. Key 6 cancels print jobs.

On Line LED

Green in color, this LED indicates when the printer is “On Line” and ready to process data. When transitioning from “On Line” to “Off Line”, the LED flashes at a rate of two times per second. When data is being received and processed, the LED flashes at a rate of once per second.

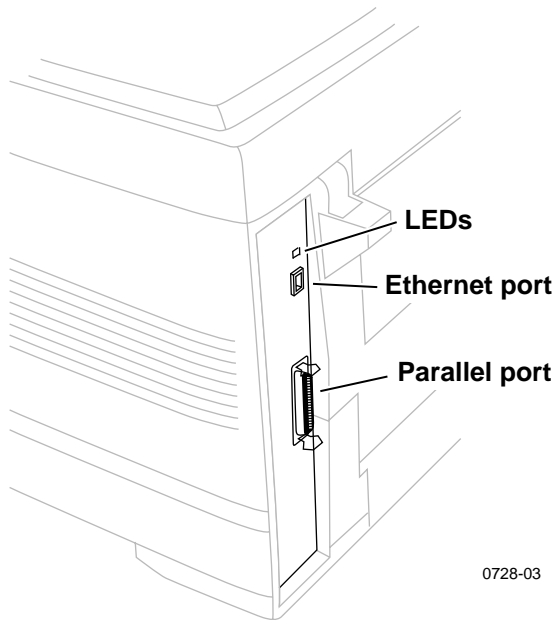
! Fault

Red in color, this LED illuminates whenever operator intervention is required, such as a paper jam in the printer.

Rear panel

The rear panel of the printer features the host interface connectors:

- Bi-directional parallel IEEE 1284-B connector.
- Twisted Pair 10/100baseT Ethernet connector.



0728-03

The printer rear panel

The LED LNK is *off* when the printer is not installed on an Ethernet network, it *blinks* while data is transmitted to the host.

The LED SPD is *off* when the card is set for 4 megabits-per-second (MBPS), *on* when the card is set for 16 MBPS.



Accessing special operating modes

The printer can be placed in diagnostics or other operation modes by simultaneously holding the **Menu Up (1)** and the **Enter (4)** keys as you turn on the printer.

Entering special operating modes

Key Combination	Mode
On Line (0) and Enter (4)	This enables the Reset Menu to become available at the control panel. The Reset Menu is not normally available to the customer, as it contains the ability to format devices and perform a factory reset of all items. The control panel displays Ready when completed. To exit, switch the printer power off, then on.
Menu Up (1) and Menu Down (5)	This forces the Software Update Mode on the parallel port. The Control Panel will display Entering... on the first line and Download Mode on the second line. This indicates that the printer is ready to be have its flash firmware updated. To exit, switch the printer power off, then on.
Menu Up (1) and Enter (4)	Forces the printer into the Engine Diagnostics Mode , bypassing the controller. The control panel displays Diag Mode 1? in the first line. This indicates that the printer is ready to enter diagnostics. To exit, switch the printer power off, then on.
Enter (4) and Value Down (7)	This reinitiates the NVRAM to factory defaults for all values except copy counts and consumable counts. The control panel displays Ready when complete.

System controller board LEDs

A power LED (PWR), when illuminated, indicates +5V is being supplied to the system controller board.

The LED HDD, illuminates to flashes to indicate hard drive read/write activity.

LED GIO2 flashes to indicate proper CPU operation.

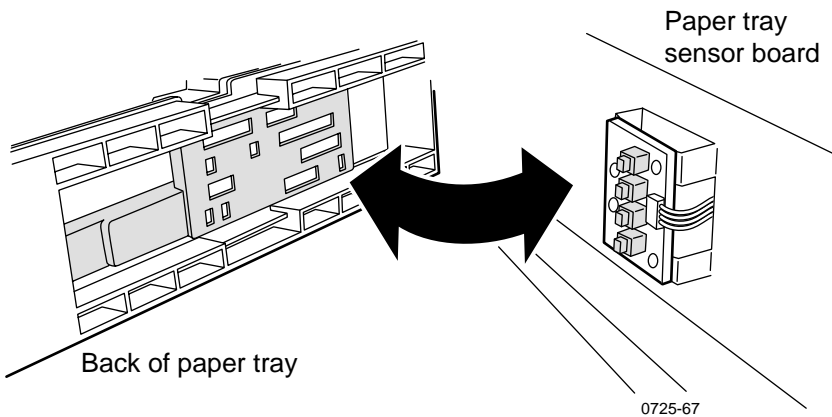
LED GIO3; off indicates 10baseT connection, on indicates 100baseT.

Paper tray size sensing

The position of a multi-slotted plate, at the rear of the paper tray, is set according to the position of the tray's paper guides. Upon insertion of the tray in the printer, the plate's four rows of slots activate four switches. The combinations of the slot positions indicate the size of the paper in the tray.

Paper size detection

State of Microswitch				Paper Size
SW1 (top)	SW2	SW3	SW4 (bottom)	
0	0	0	0	No tray installed
0	0	0	1	B4
0	0	1	0	A4 (landscape)
0	0	1	1	A3-Nobi
0	1	0	0	Legal 13 in.
0	1	0	1	Legal 14 in.
0	1	1	0	A5
0	1	1	1	A6
1	0	0	0	B5 (landscape)
1	0	0	1	A3
1	0	1	0	A/Letter (landscape)
1	0	1	1	B/Tabloid
1	1	0	0	B5 (portrait)
1	1	0	1	Executive
1	1	1	0	A4 (portrait)
1	1	1	1	A/Letter (portrait)



Tray switch sensors and actuators

Specifications

Physical dimensions

Dimensions	Specification
Height:	46.0 cm (18.1 in.) Each additional lower tray adds 12.7 cm (5 ins.) The lower tray deck adds 48 cm (19 ins.)
Width:	66.6 cm (26.2 in.)
Depth:	62.6.0 cm (24.6 in.)
Weight:	About 72 kgs (158 lbs.) Each additional lower tray adds 16.8 kgs (37 lbs.). The lower tray deck weights 57.7 kbs (127 lbs)

Printer clearances

Clearances	Specification
Top:	91.5 cm (36 in.)
Left:	30.5 cm (12 in.)
Right:	30.5 cm (12 in.)
Front:	Unlimited for removal of consumables
Rear:	15.3 cm (6 in.) for connecting computer cable and power cord
Mounting surface flatness:	Maximum deviation of 50 mm (2 in.) from horizontal, side-to-side, with all four feet in contact with the table surface.

Functional specifications

Characteristic	Specification																																																		
Printing process	Electro-photographic, four color (CMYK) tandem transfer printing																																																		
Color medium	Four toner cartridges each contain one of four colors: cyan, magenta, yellow or black. The toner is a nonmagnetic, monocomponent contact medium.																																																		
Addressability	Selectable 600 x 600 and 600 x 1200 dpi, text and graphics																																																		
Printing speed pages per minute (ppm)	<p>Time from paper-load to paper-eject for continuous printing:</p> <p>Single-sided</p> <table> <thead> <tr> <th></th> <th>A-size</th> <th>A4</th> <th>B-size</th> <th>A3</th> </tr> </thead> <tbody> <tr> <td>Four-color:</td> <td>20</td> <td>21</td> <td>11</td> <td>11</td> </tr> <tr> <td>Monochrome:</td> <td>25</td> <td>26</td> <td>14.5</td> <td>14.8</td> </tr> <tr> <td>OHP:</td> <td>6.6</td> <td>6.4</td> <td>na</td> <td>na</td> </tr> <tr> <td>Cover/specialty:</td> <td>10</td> <td>10</td> <td>6</td> <td>5.8</td> </tr> </tbody> </table> <p>Two-sided</p> <table> <thead> <tr> <th></th> <th>A-size</th> <th>A4</th> <th>B-size</th> <th>A3</th> </tr> </thead> <tbody> <tr> <td>Four-color:</td> <td>10</td> <td>10</td> <td>5</td> <td>5</td> </tr> <tr> <td>Monochrome:</td> <td>12</td> <td>12</td> <td>7</td> <td>7</td> </tr> <tr> <td>OHP:</td> <td>na</td> <td>na</td> <td>na</td> <td>na</td> </tr> <tr> <td>Cover/specialty:</td> <td>na</td> <td>na</td> <td>na</td> <td>na</td> </tr> </tbody> </table> <p>Print times do not include image processing time, which can vary depending on image complexity.</p>		A-size	A4	B-size	A3	Four-color:	20	21	11	11	Monochrome:	25	26	14.5	14.8	OHP:	6.6	6.4	na	na	Cover/specialty:	10	10	6	5.8		A-size	A4	B-size	A3	Four-color:	10	10	5	5	Monochrome:	12	12	7	7	OHP:	na	na	na	na	Cover/specialty:	na	na	na	na
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Cover/specialty:	na	na	na	na																																															
Minimum printing margins	All sides 5 mm (0.2 in.),																																																		
Usable paper	<p>Tray: A-size (Letter), Legal, Executive (7.25 x 10.5 in.), A4-size (metric letter), SRA3, 12 x 18 in. B4, 8 x 13 in, A5 Tabloid (11 x 17 in.), A6, JIS B5, US Folio.</p> <p>Use only premium bond laser printer or copier paper, transparency film, card stock and glossy paper in Tray 1</p> <p>Tray feed paper weight: 60 to 163 g/m² (16 to 43 lb.)</p> <p>Minimum paper size: 148 mm x 210 mm (5.83 x 8.27 in.)</p> <p>Multi-sheet bypass feeder: A-size (Letter), Legal, Executive (7.25 x 10.5 in.), 8 x 10 in., 12 x 18 in., A 4-size (metric letter), SRA3, B4, 8 x 13 in, Tabloid (11 x 17 in.), A6, JIS B5, US Folio, A5. SP Folio, Statement,</p> <p>Multi-sheet Bypass Feeder paper weight: 16 lb. to 54 lb. (60g/m² to 203 g/m²)</p> <p>Only Xerox-brand Phaser 35-series A- and A4-size transparency film is supported.</p> <p>Automatic two-sided printing: 75 to 120 g/m² (20 to 32 lb.)</p> <p>A6 paper, transparency film, heavy card stock, and glossy paper are not supported by Trays 2 thru 5</p>																																																		



Functional specifications

Characteristic	Specification
Paper tray capacity	Tray 1: 550 sheets of 20 lb. paper, 250 standard transparencies, 200 premium transparencies. Tray 2 and Tray 5: 550 sheets of paper. Multi-sheet Bypass Feeder: single sheet to 100 sheets of standard paper. Varying number of envelopes and other special stock. The Multi-sheet Bypass Feeder can use media in the 20 to 203 gm ² range.

Electrical specifications

Characteristic	Specification												
Primary line voltages	99 to 140 VAC (115 VAC nominal) 198 to 264 VAC (220 VAC nominal)												
Primary voltage frequency range	50 (48 to 52) or 60 (58 to 62) Hz												
Power consumption	150 Watts during standby state, (1300 Watts max) 1400 Watts during warm-up 550 Watts operation average reference value 42 Watts during Energy Star state												
Primary voltage fusing	110 VAC configuration – 20 Amp 220 VAC configuration – 15 Amp												
Secondary DC voltages	<table border="0"> <tr> <td>Low Voltage Power Supply</td> <td>High Voltage Power Supply</td> </tr> <tr> <td>+3.3 VDC</td> <td>(CH) -900 to -1.4 kV</td> </tr> <tr> <td>+5 V</td> <td>(DB) -10 to 400/+300 V</td> </tr> <tr> <td>+12 V</td> <td>(SB) -100 to -700 V</td> </tr> <tr> <td>+32 V</td> <td>(TB) +1k to +7 kV</td> </tr> <tr> <td>+3.8 V</td> <td>(FIX) 0 to 7 kV</td> </tr> </table>	Low Voltage Power Supply	High Voltage Power Supply	+3.3 VDC	(CH) -900 to -1.4 kV	+5 V	(DB) -10 to 400/+300 V	+12 V	(SB) -100 to -700 V	+32 V	(TB) +1k to +7 kV	+3.8 V	(FIX) 0 to 7 kV
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+12 V	(SB) -100 to -700 V												
+32 V	(TB) +1k to +7 kV												
+3.8 V	(FIX) 0 to 7 kV												
RF emissions	Both 110 and 220 VAC-configured instruments pass these standards: FCC Part 15 Class B VDE Class B EN60555-2 Class A VCCI (CISPR 22:1997) Class B												

Environmental specifications

Characteristic	Specification
Temperature Operating Non-operating Storage	<p>10^o to 32^o C (50^o to 90^o F) 0 to 32 C (32 to 90 F) -10 to 43 C (-14 to 109 F) (with supplies) Media should be acclimated 24 hours before using in the printer.</p>
Humidity Operating Non-operating	<p>10 to 80% relative humidity, non-condensing 10 to 90% relative humidity, non-condensing Media should be acclimated 24 hours before using in the printer.</p>

Environmental specifications

Characteristic	Specification
Altitude	
Operating	0 to 2500 m (8,000 ft.) at 25°C
Non-operating	0 to 6000 m (20,000 ft.)
Vibration/shock	
Operating	May drop any side or corner 50 mm (2 in.) without impairment of subsequent operation.
Non-Operating (vibration)	On five mutually perpendicular axes: 0.5 g, 25-minute sweep, 5 to 200 to 5 Hz, 100 to 200 sec./sweep cycle. No resonant frequencies below 50 Hz.
Non-operating (shock)	15 g, trapezoidal flared pulse, 20 msec each axis.
Acoustic Noise (operating)	Standby: 45 dBa, Running: 54 dBa, Impulse: 57 dBa

Regulatory specifications

The printer is a recognized component in conformance with the following regulatory standards:

- The packaged product meets ASTM D4169-93 and ASTM D4728-91 Transportation Standards.
- Listed UL 1950 Information Processing and Business Equipment.
- Certified CSA C22.2 No. 950 Safety of Information Technology Equipment, Including Electrical Business Equipment.
- GS licensed IEC 950 (1991) Second Edition; EN60950 Information Processing and Business Equipment.
- EN50022 (CISPR 22) Class B
EN61000-3-2
EN61000-3-3
VCCI (CISPR 22) Class B
- FCC Class B (for 115 VAC equipment) pursuant to Sub-part J of Part 15.
ICES 03 Class B



Error Codes and Messages

Error messages

The front panel displays error codes when it encounters certain system failures. These error codes are discussed in the next topic. Except for media jams and other such errors, when an error code first occurs, cycle power on the printer to see if the error re-occurs.

Printer fault messages

Code	Front panel message	Service message
A6	Jam Inside Top Cover, Open Cover, See Labels <ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the feeder. Also ensure the paper is loaded correctly in the feeder.2. Clean the bypass feeder's pick roller.3. Test the main feed motor as described in "Motor and clutch tests" on page 69.4. Replace the main feed motor.5. Replace the engine controller board.	A6-Bypass Feeder Jam
A7	Jam Inside Top Cover, Open Cover, See Labels <ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the duplex unit's rollers.3. Test the duplex motor and clutch as described in "Motor and clutch tests" on page 69.4. Replace the duplex unit.5. Replace the engine controller board.	A7-Duplex Entry Jam
A10	Jam Inside Top Cover, Open Cover, See Labels <ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the exit rollers.3. Ensure the exit rolls rotate freely when the exit roller gear train is rotated.4. At the rear of the printer, inspect the gate which directs the print to the face-up output bin or the face-down output bin.5. Test the fuser motor (which drives the exit gear train) using the test described in "Motor and clutch tests" on page 69.6. Replace the engine controller board.	A10-Paper Output Jam

Printer fault messages

Code	Front panel message	Service message
A11	Jam Inside Top Cover, Open Cover, See Labels	A11-Paper Feed Jam
	<ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the pick and registration rollers.3. Ensure there are no obstructions in the paper path.4. Test the registration motor and clutch as described in "Motor and clutch tests" on page 69. Replace the motor or clutch if necessary.5. Inspect the wiring for the registration clutch and registration motor.6. Replace the engine controller board.	
A22	Jam Inside Top cover, Open Cover, See Labels	A22-Feed Path Jam
	<ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the pick and registration rollers.3. Ensure there are no obstructions in the paper path.4. Test the registration motor and clutch as described in "Motor and clutch tests" on page 69. Replace the motor or clutch if necessary.5. Inspect the wiring for the registration clutch and registration motor.6. Replace the engine controller board.	
B8	Jam Inside Duplex Unit, Open Cover, See Labels	B8-Duplex Jam
	<ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the duplex unit's rollers.3. Test the duplex motor and clutch as described in "Motor and clutch tests" on page 69.4. Replace the duplex unit.5. Replace the engine controller board.	
B13	Jam Inside Duplex Unit, Open Cover, See Labels	B13-Duplex Inverter Jam
	<ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Inspect and clean the eject rollers behind the fuser unit.3. Ensure the paper path leading to the duplex unit and the duplex unit's paper path are both clear of obstructions.4. Inspect the operation of the solenoid activated separator gate the direct the print into the duplex unit. Test the exit solenoid with the "Motor and clutch tests" on page 69.5. Replace the duplex unit.6. Replace the engine controller board.	

Printer fault messages

Code	Front panel message	Service message
B21	Jam Inside Right Door A, Open Right Door A	B21-Duplex Area Jam
	<ol style="list-style-type: none"> 1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray. 2. Clean the duplex unit's rollers. 3. Test the duplex motor and clutch as described in "Motor and clutch tests" on page 69. 4. Replace the duplex unit. 5. Replace the engine controller board. 	
C1	Close Tray 1, Tray 1 Not Detected	C1-Check Tray 1
C2	Close Tray 2, Tray 2 Not Detected	C2-Check Tray 2
C3	Close Tray 3, Tray 3 Not Detected	C3-Check Tray 3
C4	Close Tray 4, Tray 4 Not Detected	C3-Check Tray 4
C5	Close Tray 5, Tray 5 Not Detected	C3-Check Tray 5
	<ol style="list-style-type: none"> 1. Ensure the tray is installed correctly. 2. Inspect and test the paper size sensors and the tray's corresponding sensor flags. 3. Replace the paper tray sensor board 4. Replace the paper tray. 5. Replace the engine controller board. 	
E1	Tray 1 Misfeed, Open Rt Door A and Tray 1	E1-Tray 1 Misfeed
E2	Tray 2 Misfeed, Open Rt Door B and Tray 2	E1-Tray 2 Misfeed
E3	Tray 3 Misfeed, Open Rt Door C and Tray 3	E1-Tray 3 Misfeed
E4	Tray 4 Misfeed, Open Rt Door D and Tray 4	E1-Tray 4 Misfeed
E5	Tray 5 Misfeed, Open Rt Door E and Tray 5	E1-Tray 5 Misfeed
	<ol style="list-style-type: none"> 1. Ensure the correct weight and type of paper is loaded in the tray. Also ensure the paper is loaded correctly in the tray. 2. Clean the pick rollers. 3. Test the main feed motor as described in "Motor and clutch tests" on page 69. 4. Replace the main feed motor. 5. Replace the engine controller board. 	
E9	Top Cover Open, Close Top Cover A	E9-Top Cover A Open
	<ol style="list-style-type: none"> 1. Close the cover. 2. Inspect the switch and ensure the switch's actuator is not broken. 3. Test the top cover open switch using the sensor test described in "Switch scan test" on page 63. 4. Inspect the switch's wiring harness. 5. Replace the engine controller board. 	
E12	Top Output Tray Full Remove Output	E12-Output Bin Full, Top
	<ol style="list-style-type: none"> 1. Ensure the output bin full sensor flag operates freely. 2. Test the output bin full sensor using the test described in "Switch scan test" on page 63. 3. Inspect the sensor and its wiring harness. 4. Replace the engine controller board. 	

Printer fault messages

Code	Front panel message	Service message
E14	Close Duplex Unit, Duplex Unit Not Detected	E14-Duplex Unit Not Detected
	<ol style="list-style-type: none">1. Ensure the duplexer is installed correctly.2. Inspect the connector at the rear end of the duplexer unit.3. Inspect the wiring harness leading from the duplexer unit interface connector to the engine controller board.4. Replace the duplexer unit.5. Replace the engine controller board.	
E18	Right Door A Open, Close Right Door A	E18-Right Door A Open
E20	Right Door B Open, Close Right Door B	E20-Right Door B Open
E21	Right Door C Open, Close Right Door C	E21-Right Door C Open
E22	Right Door D Open, Close Right Door D	E22-Right Door D Open
E23	Right Door E Open, Close Right Door E	E23-Right Door E Open
	<ol style="list-style-type: none">1. Ensure the cover's sensor flag operates freely.2. Test the output bin full sensor using the test described in "Switch scan test" on page 63.3. Inspect the sensor and its wiring harness.4. Replace the engine controller board.	
EA	Black Imaging Drum Missing, Reseat Drum	EA-Black Imaging Drum Missing
EB	Cyan Imaging Drum Missing, Reseat Drum	EA-Cyan Imaging Drum Missing
EC	Magenta Imaging Drum Missing, Reseat Drum	EA-Magenta Imaging Drum Missing
ED	Yellow Imaging Drum Missing, Reseat Drum	EA-Yellow Imaging Drum Missing
	<ol style="list-style-type: none">1. Remove and install the drum unit.2. Inspect the spring-loaded drum contact assembly. Ensure they are clean and move up and down freely. Remove the assembly and reseal it, if necessary.3. Replace the engine controller board.4. Replace the printer unit chassis	

Printer fault messages

Code	Front panel message	Service message
EE	Transfer Belt Missing, Reseat Belt	EE-Transfer Belt Unit Missing
	<ol style="list-style-type: none"> 1. Remove and re-install the transfer belt unit. 2. Clean the transfer belt unit's contact on the front-left side of the engine chassis. Clean the corresponding contacts on the transfer belt unit. 3. Install a new transfer belt unit. 4. Replace the engine controller board. 5. Replace the printer unit chassis. 	
EF	Fuser Missing, Reseat Fuser	EF-Fuser Unit Missing
	<ol style="list-style-type: none"> 1. Remove and reinstall the fuser. 2. install a new fuser. 3. Replace the low-voltage power supply. 4. Replace the engine controller board. 	
H1	Disk Read Error, Press Enter to Clear A hard disk error was detected that prevented data from being read from the disk.	H1-Disk Read Error
H2	Disk Write Error, Press Enter to Clear A hard disk error was detected that prevented data from being written to the disk.	H2-Disk Write Error
H3	Disk Full Error, Press Enter to Clear A hard disk full error occurred that prevented data from being written to the disk	H3-Hard Disk Full
	<ol style="list-style-type: none"> 1. Turn the printer off and on again. 2. Ensure the hard drive is properly installed. 3. Re initialize the hard drive. by scrolling to the Reset Menu and selecting the submenu item Disk Init. 4. Replace the hard drive. 5. Replace the system controller board. 	
J3	Replace Fuser	J3-Replace Fuser
	<ol style="list-style-type: none"> 1. Install a new fuser. 2. If a new fuser has been installed but the print engine continues to ask for a new fuser, reset the fuser life count using the topic "Consumable count initialization" on page 73. 3. Replace the engine controller board. 	
J4	Replace Transfer Belt	J4-Replace Transfer Belt
	<ol style="list-style-type: none"> 1. Install a new transfer belt. 2. If a new transfer belt has been installed but the print engine continues to ask for a new transfer belt, reset the transfer belt life count using the topic "Consumable count initialization" on page 73. 3. Replace the engine controller board. 	

Printer fault messages

Code	Front panel message	Service message
J5	Replace Yellow Imaging Drum	J5-Replace Yellow Imaging Drum
J6	Replace Magenta Imaging Drum	J6-Replace Magenta Imaging Drum
J7	Replace Cyan Imaging Drum	J7-Replace Cyan Imaging Drum
J8	Replace Black Imaging Drum	J8-Replace Black Imaging Drum
	<ol style="list-style-type: none">1. Install a new drum unit.2. If a new drum unit has been installed but the print engine continues to ask for a new drum unit, reset the drum unit life count using the topic "Consumable count initialization" on page 73.3. Inspect the spring-loaded drum unit contacts (in a set of three). Ensure they are clean and move up and down freely. Remove and reseal them, if necessary.4. Replace the engine controller board.	
J9	Yellow Toner Empty Replace Yellow Toner	J9-Yellow Toner Empty
J10	Magenta Toner Empty Replace Magenta Toner	J10-Magenta Toner Empty
J11	Cyan Toner Empty Replace Cyan Toner	J11-Cyan Toner Empty
J12	Black Toner Empty Replace Black Toner	J12-Black Toner Empty
	<ol style="list-style-type: none">1. Install a new toner cartridge.2. If a new cartridge has been installed but the print engine continues to ask for a new cartridge, reset the toner cartridge life count using the topic "Consumable count initialization" on page 73.3. Replace the drum unit.4. Replace the engine controller board.	
L0	Load Tray # 1 Size 2 Type 3	Load Tray #, Size Type
	<ol style="list-style-type: none">1. Load the requested size and type of paper in the tray.2. Ensure the tray is installed correctly.3. Inspect and test the paper size sensors and the tray's corresponding sensor flags.4. Replace the paper tray sensor board.5. Replace the paper tray.6. Replace the engine controller board.	

Printer fault messages

Code	Front panel message	Service message
T1	Fuser Upper Error T1 Power Off/On	T1-Fuser Upper Error
T2	Fuser Lower Error T2 Power Off/On	T2-Fuser Lower error
	<ol style="list-style-type: none">1. Remove and install the fuser.2. Test the thermistors inside the fuser using the test described in “Switch scan test” on page 63.3. Replace the fuser.4. Replace the low-voltage power supply.5. Replace the engine controller board.	
T29	Temp Sensor Error T29, Power Off/On	T29-Temp Sensor Error
T30	RH Sensor Error T30, Power Off/On	T30-RH Sensor Error
	<ol style="list-style-type: none">1. Test the temperature sensor or the relative humidity sensor using the sensor test described in “Switch scan test” on page 63.2. Inspect the wiring harness leading to the entrance sensor board.3. Replace the temperature/humidity sensor board.4. Replace the engine controller board.	
T31	Roller Over Temp T31, Power Off/On	T31-Roller Over Error
	<ol style="list-style-type: none">1. Inspect the fuser cooling fan. Ensure it is running correctly and is not blocked.2. Remove and install the fuser.3. Test the thermistor inside the fuser using the test described in “Switch scan test” on page 63.4. Replace the fuser.5. Replace the low-voltage power supply.6. Replace the engine controller board.	
T32	LED Over Temperature T32, Power Off/On	T32-LED Over Temp Error
	<ol style="list-style-type: none">1. Ensure all the chassis cooling fan is operating and is not blocked.2. Ensure the printer is operating in the correct temperature environment; the printer's Service Menu : Print Diag Summary test page lists the ambient temperature sensed by the printer.3. Replace the LED heads.4. Replace the engine controller board.	

Printer fault messages

Code	Front panel message	Service message
U0	Engine ROM Error U0, Power Off/On	U0-Engine ROM Error
U1	Engine RAM Error U1, Power Off/On	U1-Engine RAM Error
U2	Engine EPROM Error U2, Power Off/On	U2-Engine EPROM Error
U3	Engine EPROM Missing U3, Power Off/On	U3-Engine EPROM Missing
U4	Engine SRAM Error U4, Power, Off/On	U4-Engine SRAM Error
U5	Engine Control Error U5, Power, Off/On	U5-Engine Control Error
	<ol style="list-style-type: none">1. Turn the printer off and then on2. Reset the printer NVRAM using the procedure "Resetting NVRAM" on page 85.3. Replace the engine controller board.	
U6	Power Supply Error U6, Power Off/On	U6-Power Supply Error
	<ol style="list-style-type: none">1. Inspect the front and rear power supply fans. Ensure they is running correctly and are not blocked. The front fan blows into the chassis. The rear fan blows out from the chassis.2. Turn the printer off and then on.3. Replace the low-voltage power supply.4. Replace the engine controller board.	
U7	Feeder Home Error U7, Power Off/On	U7-Feeder Home Error
	<ol style="list-style-type: none">1. Test the manual bypass feeder home sensor using the test described in "Switch scan test" on page 63.2. Inspect the sensor and its wiring harness.3. Replace the engine controller board.	
U8	Controller Fan Error U8, Power Off/On	U8-Controller Fan Error
	<ol style="list-style-type: none">1. Inspect the electrical chassis fan to see if it is running and not blocked.2. Inspect the fan's wiring harness.3. Replace the fan.4. Replace the engine controller board.	
U9	Supply Fan Error U9, Power Off/On	U9-Supply Fan Error
	<ol style="list-style-type: none">1. Inspect the main cooling fan to see if it is running and not blocked.2. Inspect the fan's wiring harness.3. Replace the fan.4. Replace the engine controller board.	
U10	Roller Position Error U10, Power Off/On	U10-Roller Position Error
	<ol style="list-style-type: none">1. Ensure the correct weight and type of paper is loaded in the currently used tray. Also ensure the paper is loaded correctly in the tray.2. Clean the pick and registration rollers.3. Ensure there are no obstructions in the paper path.4. Test the registration motor and clutch as described in "Motor and clutch tests" on page 69. Replace the motor or clutch if necessary.5. Inspect the wiring for the registration clutch and registration motor.6. Replace the engine controller board.	

Printer fault messages

Code	Front panel message	Service message
U12	Duplex I/F Error U12, Power Off/On <ol style="list-style-type: none"> 1. Turn the printer off and on. 2. Pull out the duplexer and inspect its connector at the right front corner (the connector faces rearward). Inspect the printer's corresponding connector on the printer chassis (covered by a flexible metal plate). 3. Inspect the wiring harness leading from the engine control board to the duplex unit connector. 4. Replace the duplex unit. 5. Replace the engine controller board. 	U12-Duplex I/F Error
U13	Tray 3 I/F Error U13, Power Off/On	U13-Tray 3 I/F Error
U14	Tray 2 I/F Error U14, Power Off/On	U14-Tray 2 I/F Error
U16	Tray 4 I/F Error U13, Power Off/On	U13-Tray 4 I/F Error
U17	Tray 5 I/F Error U14, Power Off/On <ol style="list-style-type: none"> 1. Turn the printer off and then on. 2. Inspect the interface connector connecting the tray unit to the print engine. Inspect the printer's corresponding connector on the underside of the printer. Inspect the wiring harness leading from the connector to the engine control board. 3. Replace the engine controller board. 	U14-Tray 5 I/F Error
U15	Control Panel Error U15, Power Off/On <ol style="list-style-type: none"> 1. Turn the printer off and then on. 2. Reset the printer NVRAM using the procedure "Resetting NVRAM" on page 85. 3. Replace the engine controller board. 	U15-Control Panel Error
U18	Yellow LED Error U18, Power Off/On	U18-Yellow LED Bar Missing
U19	Magenta LED Error U19, Power Off/On	U19-Magenta LED Bar Missing
U20	Cyan LED Error U20, Power Off/On	U20-Cyan LED Bar Missing
U21	Black LED Error U21, Power Off/On <ol style="list-style-type: none"> 1. Ensure the LED assembly is correctly installed. 2. Inspect the wiring harnesses leading to the LED assembly. 3. Replace the engine controller board. 	U21-Black LED Bar Missing
U22	Yellow Toner Missing, Reseat Toner	U22-Yellow Toner Missing
U23	Magenta Toner Missing, Reseat Toner	U23-Magenta Toner Missing
U24	Cyan Toner Missing, Reseat Toner	U24-Cyan Toner Missing
U25	Black Toner Missing, Reseat Toner <ol style="list-style-type: none"> 1. Inspect the toner cartridge sensor flag. Ensure to moves properly and is not broken. 2. Test the sensor using the test described in "Switch scan test" on page 63. 3. Inspect he toner sensor boards wiring harness. 4. Replace the toner sensor board. 5. Replace the engine control board. 	U25-Black Toner Missing
U26	Yellow Drum Error U26, Power Off/On	U26-Yellow Drum Error

Printer fault messages

Code	Front panel message	Service message
U27	Magenta Drum Error U27, Power Off/On	U27-Magenta Drum Error
U28	Cyan Drum Error U28, Power Off/On	U28-Cyan Drum Error
U29	Black Drum Error U29 Power Off/On	U29-Black Drum Error
	<ol style="list-style-type: none">1. Remove and install the drum unit.2. Inspect the spring-loaded drum unit contacts (in a set of three). Ensure they are clean and move up and down freely. Remove the assembly and reseal it, if necessary.3. Test the drum unit contacts using the Drum contact switch test listed in "Switch scan test" on page 63.4. Install a new drum unit.5. Replace the engine controller board.6. Replace the print unit chassis.	
W16	Fuse Cut Error	W16 - Fuse Cut Error
	<p>For the new Customer Replaceable Consumable (imaging drums, transfer belt or fuser) just installed, the printer did not detect the CRC's "new/used" fuse blow. An internal fuse of a new CRC ordinarily blows a few seconds after the CRC is installed. If the fuse cannot be blown, then the consumable's counter can't be reset and the "consumable expired / replace" messages will not go away.</p> <ol style="list-style-type: none">1. Remove the CRC.2. Cycle the printer's power.3. Install the CRC again. If the error still occurs, try a different CRC.4. If error reoccurs with a different CRC, replace the engine controller board.5. Replace the print unit chassis.	

System controller board diagnostic error codes

Code	Test	Possible Cause
1	Memory	Bad memory DIMMs
2	Memory Speed	Bad DIMMs or system controller board
3	CPU Tick	Bad system controller board
4	System Timer	Bad system controller board
5	BX Host Bridge	Bad system controller board
6	PIIX4 PCI-ISA Bridge	Bad system controller board
7	21152 PCI-ISA Bridge	Bad system controller board
8	PCI-PCI Bridge	Bad system controller board
9	IX	Bad system controller board
10	Parameter Flash R/W	<i>not implemented</i>
11	Strata Flash R/W	<i>not implemented</i>
12	Strata Flash Boot Block Integrity	Bad system controller board
13	Strata Flash File System Integrity	Bad system controller board
14	STE100	Bad system controller board
15	VX2b-0	Bad system controller board
16	VX2b-1	Bad system controller board
17	VX2b-2	Bad system controller board
18	VX2b-3	Bad system controller board
19	Disk Identify	Bad hard disk drive
20	Disk Read/Write	Bad hard disk drive
21	Disk Read Capability	Bad hard disk drive
22	Disk Write Capability	Bad hard disk drive
23	Disk Data Format Check	Bad hard disk drive

These are error codes returned by the system controller board. In the event that one of these errors occurs:

1. Cycle printer power to see if the error reoccurs.
2. Reseat the system controller board.
3. Replace the system controller board.

These errors can also be caused by the board's hard drive or the RAM DIMMs.

System controller board fatal error codes

Code	Description
00	Unknown. Replace the hard drive before replacing the controller board.
04	Video Task
08	Serial Task
10	System Display Task
14	System Status Task
18	Startup, Key Press Processing, Menus Task
1C	Parallel Port Read Buffer Manager
20	Parallel Port Write Buffer Manager
24	NVEE Manager
28	Scheduler
2C	Job Log
30	Print File Task
34	Video Cleanup Task
3C	Collation Task
40	Parallel Port Hear Task
48	PostScript Task 1. Replace the hard drive before replacing the controller board.
4C	PostScript Task 2
50	PostScript_Wrapper Task
54	PCL Task. Replace the hard drive before replacing the controller board.
58	PJL Task
78	Dequeue Task
84	In-menu Print File Task
8C	Alert Recovery Task
90	Sweeper Task
94	SNMP Alert Task
98	SNMP Main Task
9C	SNMP UDP Task
A0	SNMP DDP Task
A4	SNMP IPX Task
A8	Notification Manager
B4	Image Handler
C4	Job Manager
D0	PowerSaver Task
D4	TIFF Task

Troubleshooting

This topic discusses troubleshooting the printer. Troubleshooting is discussed with two approaches:

- A step-by-step verification procedure that systematically confirms that particular components of the printer are properly functioning until a problem is found.
- A symptom/cause scheme that lists particular printer failures or error codes and their possible causes.

Fault History Log

The printer maintains a log file of the last 50 errors that have occurred. The most recent error is displayed first.

To view the log:

1. Turn on the printer.
2. Press the **Menu (5)** key to scroll to the **Support Menu**.
3. Press the **Item(6)** key to scroll to the menu item **Show Fault History**.
4. Press the **Value (7)** key to scroll down the list of errors. The first item is the most recent error. Press the **Value (3)** key to scroll back up the list.

Power on self-diagnostic test

Initial test. The following checks are automatically performed when the printer is powered on:

1. ROM check (loader). Checks ROM by comparing the sum of bits in the received data unit by the number of bits in the transferred data unit.
2. RAM check. Checks RAM by writing a preset data pattern in RAM, reading the contents of RAM, and comparing the data read from RAM by the data written in RAM.
3. EEPROM check. Checks ID numbers stored in the fixed addresses of EEPROM. Checks the content of the menu area by control firmware and the engine area by engine firmware.
4. Flash ROM check. Checks Flash ROM by writing a present data pattern in Flash ROM, reading the contents of Flash ROM, and comparing the data read from Flash ROM by the data written in Flash ROM.
5. Mechanical check.
 - All the engine fans turned on and are checked to ensure they run properly.
 - The fuser heaters activate to heat up the heated rollers.
 - The print engine checks to see that the imaging drums are installed.
 - The engine motors rotate to ensure that their rotation sensors are detected.
 - A sensor check is made to determine if any paper is jammed in the printer.
 - The print engine checks the presence of each toner cartridge.
 - Option unit check. Checks whether the optional units (such as the paper tray 2, paper tray 3, duplex unit) have been installed before entering the operation mode.
 - The print engine performs a color misalignment detection check by laying down patches of toner on the transfer belt and reading their relative positions to each other with the color registration sensor assembly.
 - After the fuser reaches its idle temperature the printer is placed on line in its READY state.

The print engine is initialized. If the startup page feature has not been disabled and no error occurred with the printer, the printer prints a startup page.

Print engine troubleshooting

This topic is a step-by-step procedure for systematically verifying particular aspects of the printer's operation. Following this procedure should lead to the cause of a printer's failure.

Testing the print engine controller board

1. If the printer does not power up, or does not initialize, or the printer initializes but the motors do not run properly, go to the later topic, "Verifying power supply operation" on page 32.
2. Observe that the **Ready** message is displayed on the front panel. If it is not, go to the later topic "Verifying power supply operation" on page 32.
3. To ensure the print engine operates correctly, print one of its internal test pages from its diagnostic menu as explained in the topic "Test printing" on page 71.

If the printer prints a test print, then the printer's print engine is working correctly. Proceed with the next topic, "Verifying printer operation by using its self-test print" on page 32.

If the printer does not make the test print, then a problem exists with the print engine. Proceed with the topic, "Verifying power supply operation" on page 32.

Verifying printer operation by using its self-test print

1. If not already on, turn on the printer. If the printer does not power up, or does not initialize, or the printer initializes but the motors do not run properly, go to the next topic “Verifying power supply operation.”
2. Verify that the system controller board’s health LED is flashing. The health LED is viewable through the rear panel. If the health LED is not flashing, then the system controller board is not working.
3. When the Ready message is displayed, press the **Menu (1, 5)** buttons to enter the menu.
4. Press the **Menu (1, 5)** buttons to navigate to the Print Menu item. Press the **Item (2, 6)** keys to scroll through the list of available test prints. Select any test print.
5. Press **Enter** to print a test prints. The printer should print a test page from the system controller board.

If the printer prints a test pattern, then the print engine controller board and the system controller board are working correctly and the printer’s problem resides with the network or host interface.

Verifying power supply operation

Required tools

- #1 Phillips screwdriver
- Digital multimeter (DMM)

Verifying the power supply involves four steps:

- Measuring the input and output voltages.
- Checking the power supply fuse.
- Checking the safety interlocks.
- Ensuring the +5 VDC loop is complete.
- Testing for a shorted motor which would shut down the power supply or damage the engine controller board.

Measuring power supply voltages

1. Turn off the printer and unplug it from its power outlet.
2. **AC Input:** With the DMM set to measure AC voltages, measure for power being supplied to the printer. It should measure between 87 to 128 VAC (115 VAC nominal) or 174 to 250 VAC (220 VAC nominal).

- 3. Power supply fans:** With the power switch on, are the front and rear power supply fans running? (Access the fans by removing the front and rear covers.) If not, check the fans' wiring harnesses (CN2 and CN5) to the low-voltage power supply board; each fan's voltage should measure 32 to 38VDC (the voltage drops to zero when you disconnect a fan). If the voltage is not correct, replace the low-voltage power supply. Otherwise, replace the non-functioning power supply fan.

DC Output: With the DMM set to measure DC voltages, measure the voltages at the POWER connector on the bottom of the print engine controller board for +3.3VDC, +5 VDC, +12 VDC and +32 VDC. (You must remove the rear cover and rear shield plate to access the engine controller board.)

If the voltages are not correct, inspect the wiring harness connecting the POWER connector of the engine controller board to the CN1 connector of the low-voltage power supply. If the harness is undamaged, replace the power supply.

POWER connector pinout

Pin	Voltage/Signal Level	Pin	Voltage/Signal Level
1	+12 VDC	16	+3.3 VDC
2	No connection	17	+3.3 VDC
3	Ground	18	+3.3 VDC
4	Ground	19	No connection
5	Ground	20	Signal
6	Ground	21	Signal
7	+32 VDC	22	Signal
8	+32 VDC	23	Signal
9	+32 VDC	24	Signal
10	+32 VDC	25	Ground
11	+5 VDC	26	Ground
12	+5 VDC	27	Ground
13	+5 VDC	28	Ground
14	+5 VDC	29	Signal
15	+3.3 VDC	30	Signal

If DC voltages are not being output by the power supply, proceed to the next step, "Inspecting the low-voltage power supply fuse" on page 34.

If the +5 and +32 VDC voltages measure correctly, but the printer does not operate correctly, then proceed to the topic, "Safety interlocks" on page 34.

Inspecting the low-voltage power supply fuse

The 115 VAC power supply features a 20 A fuse. The 220 VAC power supply fuse uses a 15 A fuse.

1. Turn off the printer.
2. Disconnect the power cord from the printer.
3. Remove the front cover as described in “Front cover” on page 90.
4. Remove the AC power switch (1 screw) and the front power supply fan as described in “Front power supply fan” on page 95. The fuse is now accessible.

If the fuse is good, but the printer's power supply does not output DC voltages, replace the low-voltage power supply. Check the +% v loop circuit as described earlier in “Ensuring the +5 VDC loop is complete” on page 35.

Safety interlocks

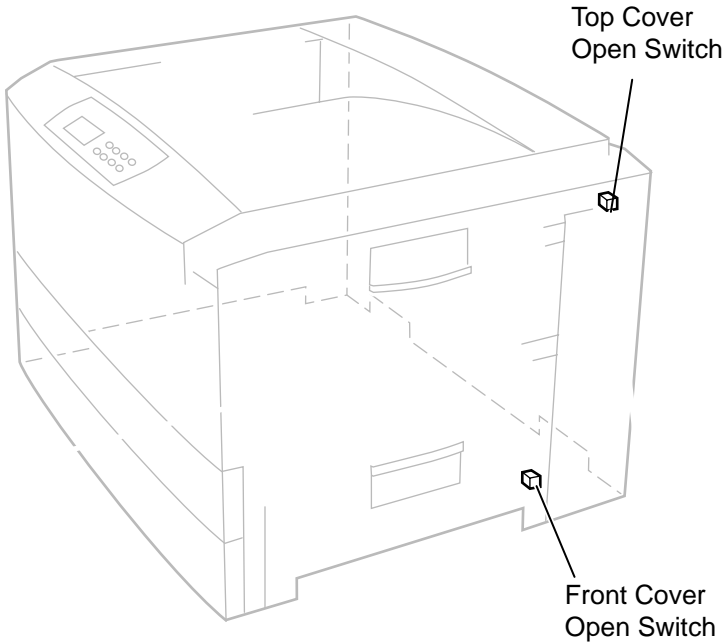
The printer features two safety interlock switches:

- Top door-opened switch.
- Right door-opened switch.

When the top cover switch is opened, the +32 VDC supply to the motors is shut down, as well as the high-voltage power supply and an error message is displayed on the front panel. When the right cover door is opened, the +32 VDC supply to the duplex unit and high-voltage power supply is disabled.

1. Turn off the printer.
2. With a DMM set to measure resistance, test each switch when it is opened and closed.
3. Inspect each switch's wiring harness for pinches, nicks or open connections.

If you find a switch that is defective, replace it. If no motors appear to be at fault, replace the engine controller board.



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Door safety interlock switches

Ensuring the +5 VDC loop is complete

The +5 voltage from low-voltage power supply is routed out of the power supply connector CN1, via a wiring harness, to the POWER connector the engine controller board, through surface-mount fuse F6, out the engine controller board via the ribbon cable OPTN to the toner sensor board. The +5V is then routed back out the toner sensor board through its power supply harness to the low-voltage power supply connector CN 2.

Upon power-up, if the low-voltage power supply does not detect the return of the +5 VDC, then the power supply will immediately shut-down. You may see the CPU fan “bump” or the engine board LED (LED2) flash. To troubleshoot the loop:

1. Test surface-mount fuse F6 for continuity. It is located on the upper-right corner of the engine controller board next to the REG connector. If the fuse is opened, replace the engine controller board.
2. Inspect the two power wiring harnesses and the ribbon cable that carry the +5 VDC loop. Ensure they are properly connected. The wiring harness leading from the toner sensor board to the power supply features an interconnect next to the rear hinge. Ensure it is properly connected.

3. Disconnect the POWER wiring harness (red wire bundle) from the engine controller board. Also, disconnect the power wiring harness interconnect connecting the toner sensor board's white wire harness to the low-voltage power supply board's dark-gray wire harness. The interconnect is located by the rear hinge.

Run a jumper wire from the +5V pins of the first wiring harness (pins 11 - 14, red wire bundle) to the +5V pin (pin 9, dark-gray wire bundle) of the second power wiring harness. (With the jumper wire, you are bypassing the engine controller board, the OPTN ribbon cable and the toner sensor board).

Turn the printer on. If the jumper connection is correct, the low-voltage power supply will start and the power supply fans will run. This indicates the problem lies with the engine controller board or the toner sensor board or their wiring. If the low-voltage power supply does not turn on, it is probably bad. (Ensure your jumper connection is correct.)

Testing for a shorted motor

1. Remove the top and rear covers.
2. Disconnect the motor harnesses and verify motor resistances (see the following topic).
3. Refer to the topic "Wiring Diagram" on page 215 for a diagram that locates each connector.
4. Turn on the printer again to see if it overloads now that the motors are disconnected from the engine driver board.

If the power supply still does not function, replace it.

Motor and fuser roller resistances

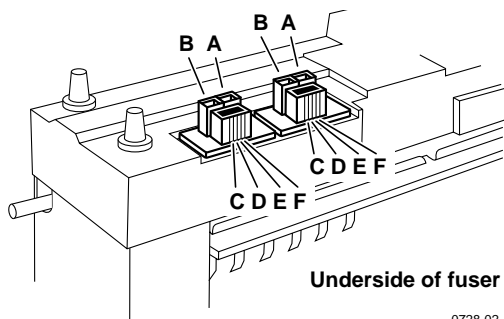
1. Turn off the printer and disconnect the power cord.
2. With a DMM set for measuring resistance, test each motor's windings for correct resistance (disconnected from the printer).

Motor and fuser roller resistances

Motor	Measure between ...	Resistance	
Yellow drum unit motor	Between motor Pins 1 and 2	~3 Ω	
Magenta drum unit motor	Between motor Pins 3 and 4	~3 Ω	
Cyan drum unit motor	All the drum motors connect to connector ID at the top of the engine controller board		
Black drum unit motor			
Black			Pins 1 thru 4
Yellow			Pins 5 thru 8
magenta			Pins 9 thru 12
Cyan	Pins 13 thru 16		
Transfer belt motor	Between motor Pins 1 and 2	~8 Ω	
Registration motor	Between motor Pins 3 and 4	~8 Ω	
Fuser motor	The transfer belt motor connects to connector BELTHET pins 5 thru 8		
Main feed drive motor			
			The feed motor connects to connector HOPFF pins 1 thru 4
	The main motor connects to connector HOPFF pins 5 thru 8		
Tray lift motor	Between motor Pins 1 and 2	~100 Ω	
Fuser unit	Upper Roller		
	Between Pins A and B	2 Ω	
	Between Pins C and D	Open	
	Between Pins E and F	~360 at 25°C	
	Lower Roller		
	Between Pins A and B	3 Ω	
	Between Pins C and D	0 Ω or open	
	Between Pins E and F	(fuse) ~360 at 25°C	

New fuser: The resistance between pins C and D of the lower roller will be 0 Ω, a fuse.

Used fuser: The fuse between pins C and D of the lower roller will be open. The fuse indicates a new fuser and is blown within seconds of being installed to indicate a fuser now in use.



Underside of fuser

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Media jams and the paper path

Required tools

- #1 Phillips screwdriver
- DMM

Jams fall into the following four categories:

- Media-based problems
- Paper-picking errors
- Printing jams
- Paper-ejecting errors

Media-based problems

Media problems

1. Check that the correct type of media is being used. The customer should be using a quality laser printer paper. The printer may have trouble picking slick-finish paper.
2. Inspect the paper for bent, torn or folded corners.
3. Ensure that the correct media is loaded in the paper tray.
4. Only Xerox-brand 35-Series transparency film for this printer should be used from Tray 1 or from the multi-sheet bypass feeder.
5. Refer to the media specifications in the table “Functional specifications,” on page 17.

Multiple-sheet pick

1. Is the paper in good condition and appropriate for a laser printer? Quality office laser printer paper works best.
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer’s condition.
3. Ensure the paper is correctly loaded in the tray.
4. Clean the pick rollers with a clean, dry, lint-free wipe if debris is visible.
5. Replace the paper pick rollers.
6. Check the tray’s retard roller for damage.
7. Replace the paper tray.

The media skews passing through the paper path

1. Make sure that the media is properly installed in the tray.
2. Does the pick-up roller pick up evenly? Is it clean? Clean it with a clean, dry, lint-free cloth if debris is visible.
3. Is the paper tray damaged or obstructed?
4. Are the tray's side paper guides snugly adjusted against the stack of media? The guides should be neither too loose nor too tight.
5. The problem occur when printing from a different tray?
6. Is there an obstacle blocking the paper path?
7. Is the media excessively curled?
8. Is the customer using an appropriate type of media – a type the printer can handle?
9. Ensure the corners or the paper are under the tabs in the corners of the tray.
10. Replace the paper pick rollers.

The paper tray indicates it is empty when it is not

The procedure for troubleshooting this problem applies to the lower tray assembly as well.

1. Does the paper empty flag properly interrupt the paper empty sensor? Remove the paper tray and actuate the paper-empty flag located to the left of the pick rollers.
2. Test the sensor using the service tests described in “Switch scan test” on page 63.
3. Does the tray lift motor raise the loaded paper up to the sensor flag when the tray is installed? Remove most of the paper from the tray, reinsert the tray in the printer and then observe the tray paper level indicator on the front of the tray. The indicator should move from a level full indication (tray lift in lowest position) to a near-empty indication (tray lift in a higher position).

Ensure the tray lift mechanism in the tray moves freely. If you do not hear the tray lift motor operate, test the motor with the motor test in “Motor and clutch tests” on page 69. Replace the tray lift motor, if necessary. If the motor runs but the paper is not raised, replace the main feeder assembly.

4. Replace the engine controller board.

Jams

Wrong media

1. Ensure the correct media type and size is loaded in the correct tray. For the multi-sheet bypass feeder, ensure the loaded media matches the control panel settings.
2. Inspect the paper tray for damage to the tray's paper size sensor actuators.
3. Test the printer's paper size sensors using the service test "Switch scan test" on page 63. If the sensors test ok, then the engine controller board is probably bad.
4. Replace the paper size sensor board's wiring harness.

Paper jams at the paper tray

1. Is the paper in good condition and appropriate for a laser printer?
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's environmental conditions.
3. Are the pick rollers dirty? If so, clean them if debris is visible and try printing again.
4. Remove the paper tray and inspect the paper tray lift levers on the inner-sides of the paper tray cavity. Inspect the tray's paper lift mechanism.
5. Does the paper feed motor run? Check the motor's wiring harness and connection (HOPFF) to the engine controller board.
6. Replace the main feeder assembly (it contains the paper feed motor).
7. Check the gear train for broken teeth and proper installation.
8. Replace the pick rollers.
9. Does the pick clutch work properly? If not, replace it.
10. Replace the engine controller board.

Manual bypass feeder feed jams

1. Is the paper in good condition and appropriate for a laser printer?
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's environmental conditions.
3. Do not overload the manual bypass tray; otherwise jams will occur.
4. If debris is visible, clean the manual bypass feed pick roller. Replace the roller, if necessary.
5. Test the manual bypass feeder sensors using the service test "Switch scan test" on page 63.
6. Inspect the wiring harness from the manual bypass feeder to the engine controller board.
7. Replace the manual bypass feeder assembly.
8. Replace the engine controller board.

Paper jams at the registration rollers

1. Ensure that the pick-up rollers are clean. Clean them with a clean, dry, lint-free cloth if debris is visible.
2. Check the paper path for burrs or foreign obstructions that could block the movement of a sheet of paper.
3. Clean the registration rollers with a clean, dry, lint-free wipe if debris is visible.
4. Test, and if necessary, replace the registration motor. Test the motor using the service test "Motor and clutch tests" on page 69.
5. Does the registration roller electric clutch operate correctly? Operate it with the service test "Motor and clutch tests" on page 69.
6. **Transparency film.** Use only Xerox 35-series transparency film meant for this printer.

Paper jams at the transfer belt

1. Check for a paper scrap in the paper path.
2. Is the transfer belt assembly correctly installed?
3. Test the transfer belt motor using the service test "Motor and clutch tests" on page 69.

Fuser jams

1. Is the paper in good condition and appropriate for a laser printer?
2. Is Xerox Series-35 transparency film being used.
3. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's environmental conditions.
4. Test the fuser motor using the service test "Motor and clutch tests" on page 69.
5. Does the exit sensor flag properly actuate its sensor? Use the service test "Switch scan test" on page 63 to test the sensor.
6. Does the jam occur only during a two-sided print? If so the duplex solenoid may not be operating correctly and the print is jamming in the fuser.
7. Replace the fuser.
8. Replace the engine controller board.

Eject jams

1. Is the paper in good condition and appropriate for a laser printer? Is the paper curling?
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's environmental conditions.
3. Is the jam caused by a heavy, stiff paper being printed to the face-down tray? In such cases, a lighter grade of paper should be used or face-up mode to the side output tray should be used.
4. Is the paper excessively curved after passing through the fuser? Try flipping the paper over in the paper tray. Also, for A-, A4- and B5-sized paper, re-orient the paper in the tray so the short edge feeds into the printer.
5. Clean all the eject rollers with a clean, dry, lint-free wipe if debris is visible.
6. Does the exit sensor flag properly actuate its sensor? Test the sensor using the service test "Switch scan test" on page 63.
7. Replace the engine controller board.

Jams in the duplex unit

1. Is the duplex unit correctly installed?
2. Clean the rollers inside the duplex unit with a clean, dry, lint-free wipe if debris is visible.
3. Inspect the duplex unit for foreign objects such as a scrap of paper.
4. Inspect the duplex unit's electrical connector for damage.
5. Does the duplex unit's sensors operate correctly? Test the sensors using the service test "Switch scan test" on page 63.
6. Test the duplex motor using the service test "Motor and clutch tests" on page 69.
7. Replace the duplex unit.
8. Replace the engine controller board.

No imaging drum installed

1. Ensure that the imaging drums are properly installed.
2. Check the high-voltage terminal connectors for the imaging drum to ensure that they are not damaged.
3. Replace the imaging drum.

Imaging drum up/down error

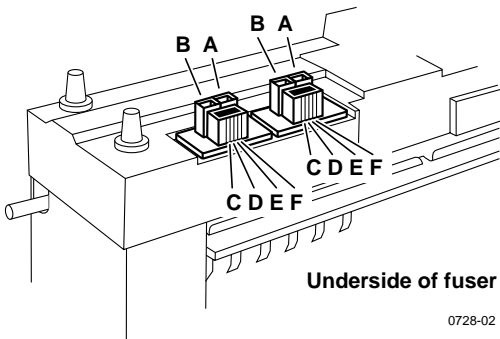
1. Cycle the printer power to see if the problem clears.
2. Ensure that each imaging drum unit is correctly installed and that each unit's drum contact assembly (a set of three spring-loaded pins) is not damaged. Ensure that each contact moves up and down freely and is not contaminated with toner. Remove an assembly from the printer to inspect, if necessary.
3. Open the top cover, defeat the top cover open switch, and observe if the color imaging drum unit are lifted up and down.
4. Test the drum contact assemblies using service test "Switch scan test" on page 63. If a drum contact assembly is damaged, replace it.
5. Does each imaging drum motor rotate. Test them using the service test "Motor and clutch tests" on page 69. Replace the main motor assembly, if indicated.
6. Inspect the gear drive for each imaging drum unit for damage.
7. Replace the engine controller board.

Fan error

1. Is power supplied to pin 1 of the fan? If yes, replace the fan.
2. Inspect the fan's wiring harness for damage.
3. Replace the low-voltage power supply
4. Replace the engine controller board.

Fuser unit error

1. Does the error occur immediately after the printer is turned on? Replace the fuser.
2. Check that AC voltage supplied to the printer is correct.
3. Does the fuser get hot? If not, replace the fuser.
4. If the fuser does warm up, verify that it is reaching the correct temperature by running the service test "Switch scan test" on page 63.
5. **If the fuser does not get warm.** Does AC voltage appear between Pins 1 and 2 of CN 4-1 and CN 4-2 of the fuser connector. These pins connect to Pins A and B of the fuser (illustrated below) when the fuser is installed. Remove the fuser to check. If not, replace the power supply.



Bear in mind that the correct AC voltage may be present at Pins 1 and 2 of CN 4-1 and CN 4-2 even though the drivers ICs feeding these pins are damaged and cannot deliver the current required by the fuser heaters.

6. Replace the engine controller board.
7. Replace the low-voltage power supply.

Other problems

These problems may be indicated as errors on the front panel.

The printer continuously displays “Booting” or “Initializing.”

The most likely cause is that the system controller board has not successfully loaded its EEPROM contents (instructions) into RAM. The health indicator LED (heart beat) usually indicates such an error state by being on or off but not flashing. All print engine operation halts, and will only become ready when the system controller board successfully boots.

1. Re-powering the printer, or perform a NVRAM reset may fix this problem.
2. To verify if the system controller board has failed:
 - a. Power down the printer, and remove the system controller board.
 - b. Power-up the printer. Wait at least 5 minutes while the print engine initializes. If there was a problem with the system controller board, it will now not affect the print engine controller board.
 - c. If the print engine powers up correctly, a traveling “*” moves around the control panel display. If not, then your problem is most likely associated with the print engine controller board, and you will need to replace it. If, however, you see the traveling “*”, then the most likely cause is the system controller board.
 - d. Turn off the printer and reseal the system controller board and turn on the printer to determine if seating was the problem.
 - e. Turn off the printer and systematically remove a RAM DIMM and turn on the printer.
 - f. Replace the system controller board.

False “No toner cartridge installed” message

1. Ensure that the toner cartridge is correctly installed. Reseat the toner cartridge.
2. Replace the toner cartridge.
3. Test the toner cartridge sensor board using the service test “Switch scan test” on page 63.
4. Replace the engine controller board.

False “No fuser unit installed” message

1. Ensure that the fuser unit is correctly installed.
2. Check the condition of fuser units’s connector and their corresponding receptacles on the print engine (under the fuser unit).
3. Replace the fuser unit.
4. Replace the engine controller board.
5. Replace the low-voltage power supply.

Right-side door indicated being open when it is closed

1. Inspect that the front door's interlock for damage.
2. Check the interlock switch for +32 V. Replace the switch if necessary.
3. Check its wiring harness.
4. Replace the engine controller board.
5. Replace the power supply if +32 volts is not present.

High temperature error

1. Check the fans for proper operation.
2. Replace the low-voltage power supply unit.
3. Replace the engine controller board.

Low temperature error

If the fuser is cold,

4. Ensure the fuser unit is properly installed.
5. Check the fuser unit's connection and wiring.
6. Replace the fuser unit.
7. Replace the low-voltage power supply.
8. Replace the engine controller board.

If the fuser is hot,

1. Replace the fuser
2. Replace the engine controller board

Invalid memory DIMM

1. Upon power-up, the system controller board checks each DIMM for information such as data width, clock delay, number of address columns and row, refresh rate and more. If the DIMM does not meet the required specifications the printer displays an "Invalid memory DIMM" error message and then continues the boot-up process.

Printing and print quality problems

Required tools

- #1 Phillips screwdriver
- Volt-ohm-meter (VOM)
- Conductive grease
- Ruler

Light or blurred images

1. Is the correct paper being used in the printer?
2. Are the toner cartridges low?
3. Are any of the imaging drum reaching their end-of-life? Replace them if they are.
4. Do the imaging drum units make good connection to their power terminals?
5. Are the LED heads dirty? Clean each head with a clean, alcohol-soaked, lint-free cloth.
6. Are the LED heads wiring harnesses undamaged and properly seated?
7. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
8. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
9. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
10. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not replace the engine board. (Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.)
11. Inspect the high-voltage wiring harnesses.
12. Replace the high-voltage power supply.



0728-06

Dark, stained background

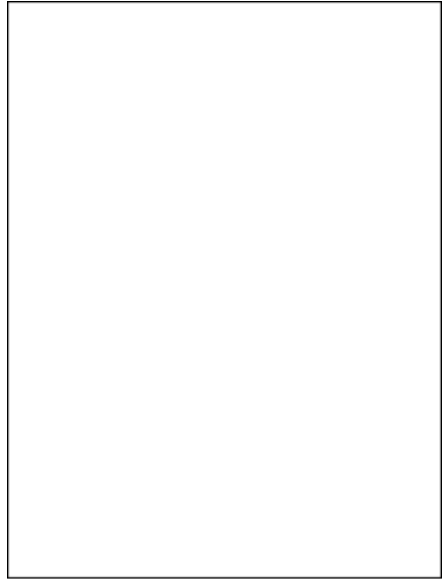
1. Determine if any of the imaging drums were exposed to light for an extended amount of time. If so, replace any unit which was.
2. Examine the fuser rollers for contamination. Replace the fuser if they are.
3. Ensure the media type is correctly set.
4. Are the power supply fans both running? A heat build-up under the imaging units can cause toner to stain the print's background.
5. Do the imaging drum units make good connection to their power terminals?
6. Are the LED heads wiring harnesses undamaged and properly seated?
7. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
8. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
9. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
10. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not, replace the engine board. (Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.)
11. Inspect the high-voltage wiring harnesses.
12. Replace the high voltage power supply.



0728-07

Blank print

1. Do the imaging drum units make good connection to their power terminals?
2. Are the LED heads wiring harnesses undamaged and properly seated?
3. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
4. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
5. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
6. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not, replace the engine board. (Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.)
7. Inspect the high-voltage wiring harnesses.
8. Replace the high voltage power supply.



0728-08

Black stripe in direction of paper travel

Note *A-size prints are normally processed through the printer with the short edge of the print parallel to the direction of the paper path making print artifacts parallel to the short edge of the print.*

B-size prints are processed through the printer with the long edge of the print parallel to the paper path making artifacts parallel to the long axis of the print.

1. Do the imaging drum units make good connection to their power terminals?
2. Are the LED heads wiring harnesses undamaged and properly seated?
3. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
4. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
5. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
6. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not replace the engine board. (Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.)
7. Inspect the high-voltage wiring harnesses.
8. Replace the high voltage power supply.



White stripe in direction of paper travel

Note *A-size prints are normally processed through the printer with the short edge of the print parallel to the direction of the paper path making print artifacts parallel to the short edge of the print.*

B-size prints are processed through the printer with the long edge of the print parallel to the paper path making artifacts parallel to the long axis of the print.

1. Look for dirt or contamination on the LED heads. Clean them with a clean, alcohol-soaked, lint-free wipe.
2. Do the imaging drum units make good connection to their power terminals?
3. Are the LED heads wiring harnesses undamaged and properly seated?
4. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
5. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
6. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
7. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not replace the engine controller board. Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.
8. Inspect the high-voltage wiring harnesses.
9. Replace the high voltage power supply.



0728-10

Poor fusing, toner offsetting

1. Is a supported paper type being used? Try printing on a different brand of paper.
2. Is the fuser unit properly installed and making good electrical contact with the print engine? Inspect its connector.
3. Inspect the fuser. Are its rollers contaminated or damaged?
4. Ensure the media type is correctly set.
5. Does AC voltage appear between Pins 1 and 2 of CN 4-1 and CN 4-2 of the fuser connector. These pins connect to Pins A and B on the fuser's underside when the fuser is installed; remove the fuser to check. If not, replace the power supply.
6. Is the resistance of the fuser's upper roller thermistor (at room temperature) between 190 to 980 Ω ? If not replace the fuser.
7. Is the resistance of the fuser's lower roller thermistor (at room temperature) between 190 to 980 Ω ? If not replace the fuser.
8. Is the fuser temperature correct during printing? Run the maintenance mode fuser test "Test printing" on page 71 and check the temperature displayed on the controller panel.
9. Replace the engine controller board. Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.



0728-11

Offsetting and fuser temperature. Offsetting occurs on specialty paper if the fuser's temperature does not match the paper loaded in the multi-sheet bypass feeder. For cold-offsetting, characterized by toner flaking off the completed print, you want to raise the fuser's temperature. For hot-offsetting, characterized by toner pulled off print as it is fused, you want to lower the fuser's temperature. The chart below lists the specialty paper types and relative fuser temperatures used. To correct offsetting, select the next paper type above or below the current paper type you are using. Removing and reloading paper in the multi-sheet bypass feeder, prompts you for the paper type at the control panel.

Hottest fuser temperature used

- Thick Cardstock
- Glossy
- Thin Cardstock
- Heavy Paper
- Plain Paper
- Light Paper

Coolest fuser temperature used

Repeating defect or voids on print

This can usually be traced to a dent-like defect in the developer roller of the imaging drum unit in question. Measure the spacing between the spots. The distance between the repeating spots indicates the source of the problem.

In some instances, the spots may be dark instead of white. They may also be shaped something other than round.

- If the spots are about 143 mm (5.6 in.) apart, then the problem is a defect on a fusers heat roller. Replace the fuser.
- If the spots are about 113 mm (4.4 in.) apart, then the problem is a defect on a fusers pressure roller. Replace the fuser.
- If the spots are 58 mm (2.3 in.) the problem is with the transfer roller of the transfer belt unit. Replace the transfer belt unit.
- 94 mm (3.7 in.): Imaging drum. Replace the imaging drum unit.
- 50 mm (2.0 in.): Developing roller. Replace the imaging drum unit of the affected color.
- 44 mm (1.7 in.): Charging roller. Replace the imaging drum unit of the affected color.
- 68 mm (2.7 in.): Toner supply roller. Replace the imaging drum unit of the affected color.



0728-12

Missing characters or voids in print

1. Look for dirt or contamination on the LED heads. Clean them with a clean, alcohol-soaked, lint-free wipe.
2. Inspect and clean the imaging drum unit's power terminals. Ensure the spring-loaded pins travel smoothly up and down.
3. Is a low-toner condition occurring?
4. Replace any imaging drum units you suspect are defective.
5. Are the LED heads' ribbon cables undamaged and properly seated?
6. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
7. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
8. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
9. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not replace the engine controller board. Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.
10. Inspect the high-voltage wiring harnesses.
11. Replace the high voltage power supply.



0728-13

Color misalignments

1. Test the registration sensor as described in the topic “Switch scan test” on page 63. Ensure the registration sensors are clean without toner dust on them. Also test the registration solenoid, as described in the topic “Motor and clutch tests” on page 69, to ensure the registration shutter operates smoothly and closes completely, allowing no toner to fall on the sensors.
2. Look for any broken gears in the printer. specifically, inspect the imaging drum gear assembly, the paper feeder assembly and the transfer belt assembly.
3. Inspect and clean the imaging drum unit’s power terminals. Ensure the spring-loaded pins travel smoothly up and down.
4. Replace any imaging drum units you suspect are defective.
5. Are the LED heads’ ribbon cables undamaged and properly seated? Replace any suspect LED head assembly, if necessary
6. Inspect the wiring harnesses of the junction board for damage or improper seating.
7. Inspect the wiring harnesses of the engine controller board for damage or improper seating.
8. Replace the engine controller board. Transfer the old engine controller board’s EEPROM (lower-right corner of board) to the new engine controller board.



0728-14

Unexpected colors

The colors produced by the printer are dramatically different from the color you expected.

1. Look for dirt or contamination on the LED heads. Clean them with a clean, alcohol-soaked, lint-free wipe.
2. If it appears that a single primary color is missing, check that imaging drum's toner cartridge to see if it is empty; the toner sensor board may not be detecting the empty sensor.
3. Inspect and clean the imaging drum unit's power terminals. Ensure the spring-loaded pins travel smoothly up and down.
4. Replace any imaging drum units you suspect are defective.
5. Are the LED heads wiring harnesses undamaged and properly seated?
6. Is +3.8V (red wire) supplied to Pin 3 of each LED head assembly? If yes, replace the LED head assembly.
7. Is +3.8 V supplied to the POWER connector pins 1, 2, 3, 4, 5, 6, 7 and 8 on the junction board or at the 16-pin interconnect near the top cover hinge (under the top shield plate). Inspect the junction board's wiring connectors. If the voltage is not OK, replace the low-voltage power supply.
8. If +32 volts supplied to the POWER connector pins 7, 8, 9 and 10 on the engine controller board? Inspect the wiring harnesses or replace the low-voltage power supply.
9. Is +32V supplied to the HVOLT connector Pin 5 of the engine board. If not replace the engine controller board. Transfer the old engine controller board's EEPROM (lower-right corner of board) to the new engine controller board.
10. Inspect the high-voltage wiring harnesses.
11. Replace the high voltage power supply.



0728-15

Image is skewed on the paper

1. Is the paper in good condition and the recommended type and weight for a laser printer? Does the paper in the multi-sheet bypass feeder match the front panel settings?
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's conditions.
3. Ensure the tray is properly loaded with the tray's paper guides correctly snugged against the stack of paper.
4. Swap the tray from which the skewed print originates.
5. Ensure that paper feed rollers are clean and undamaged. Clean them with a clean, dry, lint-free cloth if debris is visible. Inspect the paper pick roller.
6. Replace the paper pick rollers.
7. Look for obstructions in the paper path.
8. Clean the intermediate and aligning rollers. Clean them with a clean, dry, lint-free cloth if debris is visible.
9. Replace the paper feeder.

Image is not centered on the print

1. Is the paper in good condition and appropriate for a laser printer?
2. Is the printer printing within its environmental specifications? Print the Diagnostic Summary Page to determine the printer's conditions.
3. Ensure that paper feed rollers are clean and undamaged. Clean them with a clean, dry, lint-free cloth if debris is visible. Inspect its paper pick roller. Look for obstructions in the paper path.
4. Clean the feed rollers and the registration rollers with a clean, lint-free wipe.
5. Use the margin adjust function found in the front panel **Support Menu / Margin Adjust**.
6. Replace the engine controller board.

The print is wrinkled

1. Check for an obstruction in the paper path, particularly with the feed rollers and the fuser.
2. Is the paper in good condition and appropriate size, weight, grain and grade for a laser printer? Print the Diagnostic Summary Page to determine the printer's conditions.
3. Is the printer printing within its environmental specifications?
4. If possible, you should feed long-grain paper into the printer. Long-grained paper's grain is parallel to the paper path (the direction the paper travels while it is fed through the printer). Rotate A-, A4- and B5-size paper for short-edge feed to see if it makes a difference.

Macintosh printing problems

Image never prints

The printer indicates it is receiving data, but no print comes out of printer or the printer goes back to Ready to Print mode without printing an image.

1. Make sure that the correct printer icon was selected in the **Chooser**. Try printing the job again. Try printing a different file or from a different application.
2. In the **Chooser**, switch background printing *off*. Try printing the job again. With newer LaserWriter printer drivers, select Foreground Printing in the Print dialog box.
3. Download the *Echo showpage* snippet which produces a blank sheet of paper, to determine if the printer is receiving and processing files.
4. Make sure you are printing with the correct PPD file.
5. Activate *Error Handler* using the front panel Advanced Printer Settings menu. Alternately, download the *Error Handler* utility and try printing the job again. If an error page is printed after printing the job again, call the Customer Support Hotline for further assistance. Please have the error page in hand.
6. If available, try printing to a black-and-white PostScript Level 2 printer (such as an Apple LaserWriter). If the file does not print on the black-and-white PostScript printer, this may mean that the problem is application- or network-related.

Image is rotated 90 degrees

1. In the application's **Page Setup**, make sure that the image is selected to print in Portrait or Landscape orientation, as you expect.

Image prints in black-and-white

1. In the **Chooser**, ensure a color printer icon is displayed next to the Phaser 2135 in the list of available printers. This indicates the printer's PPD has been selected and properly configured.
2. In the Print dialog box, make sure that the **Color/Grayscale** option has been selected.
3. Make sure that the Phaser 2135 printer icon was selected in the **Chooser**. Try printing the job again.
4. Check the version of your LaserWriter driver to ensure that it is version 8.0.x or higher. Earlier versions of the driver do not support color PostScript.
5. The application may require special instructions to print, such as those contained in a PPD file; check in the *Phaser 12135 Printer CD-ROM*.

Printer isn't in the Chooser

1. Ensure that the printer is turned on and the printer is in its READY mode.
2. Check the **Network** or **AppleTalk** control panel to ensure the proper network or zone is selected.
3. Power-cycle the printer.
4. Check to see if the printer has not been renamed or placed in another zone. You can print a Configuration Page, which lists this EtherTalk information as well as other information about the printer.
5. Verify the EtherTalk settings on the printer's Configuration Page.
6. Verify that the printer is correctly cabled to the network and that the Ethernet cable functions properly.
7. Locate and remove any Windows NT shared printers that have captured the AppleTalk queue for the printer.
8. Verify the driver version for the built-in Ethernet port on a Macintosh G3.
9. Reset the printer's NVRAM settings.
10. Disable QuickDraw GX

Windows printing problems

Image never prints

The printer's front panel *Receiving data* message is displayed as if receiving data, but nothing comes out of printer or the printer goes back to *Ready to Print* mode without printing an image.

1. From the printer driver, under the printer's set up options, set **TRANSMISSION RETRY = 850**.

Service Tests and Adjustments

Starting the diagnostics mode

To start the engine maintenance mode:

1. Turn off the printer.
2. Press and hold the **Menu (1)** and **Enter (4)** keys.
3. Turn on the printer.
4. When, DIAGNOSTIC MODE xx.xx.xx is displayed on the control panel (xx.xx.xx is the ROM version), release the control panel keys.
5. Press the **Menu (1)** key to enter the maintenance mode menu.
6. Press the **Item (2) or (6)** keys to scroll through the menu.
7. Press the **Value (3)** key to activate the displayed menu item.
Press the **Value (7)** key to discontinue a test in progress.

Use engine maintenance mode to test the printer sensors, test the media transport system, test the imaging LED banks, and to reset NVRAM.

To exit engine maintenance mode, while DIAGNOSTIC MODE xx.xx is displayed, press **Online (0)**. Alternately, you can turn the power off, wait a few seconds, and then turn power back on.

These are the items of the engine maintenance mode menu.

- Switch Scan Test
- Motor & Clutch Tests
- Test Print
- Consumables count reset
- Consumable Status
- Printer Status

This table details the menu items, their sub-menus, and settings.

Engine maintenance mode menu

Menu - scroll using Menu(1) or Menu(5)	Items - scroll using Item(2) or Item(6)	Settings - scroll using Value(3) or Value(7)	Description
SWITCH SCAN	SCAN00 thru SCAN19	Test start/stop	Select and test printer switches and sensors
MOTOR & CLUTCH TEST	Lists each motor and clutch	Test start/stop Alternation of setting or Test start/stop	Test the printer motors and clutches. A selected motor or clutch is operated for 10 seconds
TEST PRINT	Items set for test print	Select parameters of print such as paper source and print mode. Test start/stop	Test the print engine's ability to print
NV-RAM INITIAL (consumables count reset)	TABLE 1 TABLE 2 TABLE 3	Test start/stop	Table 1 determines the counter values initialized after exchanging the drum belt unit, fuser unit or toner cartridge. The adjusted values for mechanical controls are all cleared to their initial values. Do not use Table 2 or Table 3.
CONSUMABLE STATUS	Displays each consumable item	<i>no settings</i>	The consumption status of each consumables is displayed in turn. Values show are of prints made and percentage of toner consumed.
PRINTER STATUS	Lists print count and impressions made by each imaging unit	<i>no settings</i>	The life status of the selected consumable is displayed.

Switch scan test

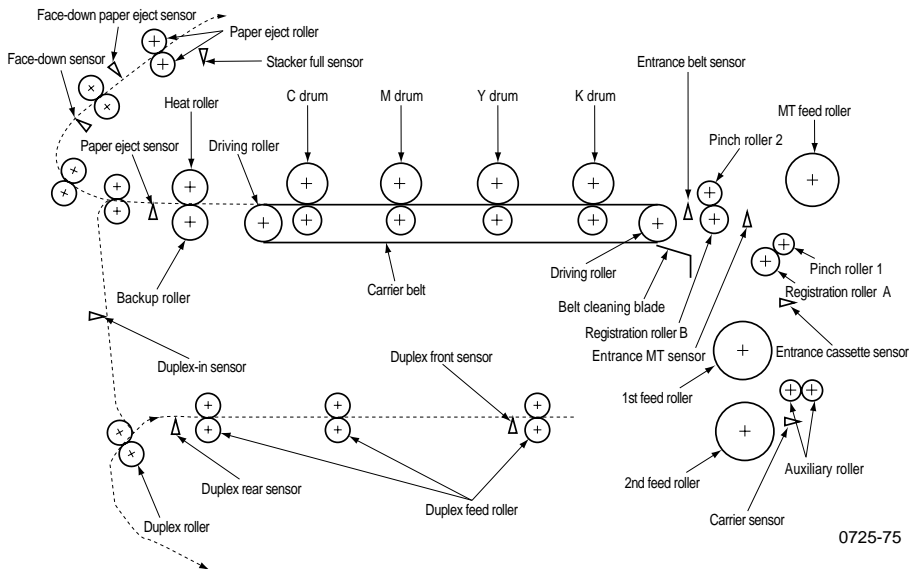
Use this test to check the operation of the printer's switches and sensors.

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until SWITCH SCAN appears on the upper display.
3. Press the **Item (2,6)** keys to scroll through the list of sensor tests, called SWITCH SCAN tests. The table below list the SCAN test items and which sensors and switches and test by that menu item.
4. Pressing the **Value (3)** key activates the currently displayed switch scan test. The SWITCH SCAN number begins to blink, and the corresponding logic state (High or Low) of the particular switches or sensors scanned by the test (listed as 1=, 2=, 3=, and 4=) are displayed.

SWITCH SCAN	00
1=H 2=L 3=H 4=L	

6051

5. With a test active, you can manually actuate the sensors being scanned and look for a change at the control panel.
6. Press **Value (7)** to stop the current test.
7. Repeat steps 2 through 5 as required.
8. To exit the switch scan test mode, press **Enter (4)**.



0725-75

Switch scans and the sensor and switches test

Switch or sensor	Switch scan test	Test result	Details
Tray 1 No Paper Sensor	Switch Scan 00 1=	L - Paper present H - No paper	Pull main tray out to test sensor
Tray 1 Low Paper Sensor	Switch Scan 00 2=	L - Paper level OK H - Low paper	Pull main tray out to test sensor
Cassette Entrance	Switch Scan 00 3=	L - Paper present H - No paper	Open right-side door and toggle sensor flag below the feed rollers
Manual Bypass Feeder Entrance sensor	Switch Scan 00 4=	L - Paper present H - No paper	Open right-side door and push sheet of paper into paper path leading to the transfer unit
Belt Entrance	Switch Scan 01 1=	L - Paper present H - No paper	Open right-side door and push sheet of paper into paper path leading to the transfer unit. Open the top cover and manually rotate the registration roller (use the green thumbwheel on the left end of the roller) to feed the paper to the transfer belt.
Exit Sensor	Switch Scan 01 2=	L - No paper H - Paper present	Toggle sensor flag behind the fuser. Remove the fuser, if necessary
Stack Full Sensor	Switch Scan 01 3=	L - Stack full H - No paper	Toggle the sensor flag at the exit bin
<i>not used</i>	Switch Scan 01 4=		<i>not used</i>
Black Toner Cartridge Present	Switch Scan 02 1=	L - Deactivated H - Unit installed	Open top cover and pull down the sensor flag next to rear of the LED head.
Cyan Toner Cartridge Present	Switch Scan 02 2=	L - Deactivated H - Unit installed	Open top cover and pull down the sensor flag next to rear of the LED head.
Magenta Toner Cartridge Present	Switch Scan 02 3=	L - Deactivated H - Unit installed	Open top cover and pull down the sensor flag next to rear of the LED head.

Switch scans and the sensor and switches test

Switch or sensor	Switch scan test	Test result	Details
Yellow Toner Cartridge Present	Switch Scan 02 4=	L - Deactuated H - Unit installed	Open top cover and pull down the sensor flag next to rear of the LED head.
Top Cover Switch	Switch Scan 03 1=	L - Top closed H - Top opened	Open top cover
Right Cover Switch (Door A)	Switch Scan 03 2=	L - Cover closed H - Cover opened	Open right-side door
Waste Toner Sensor	Switch Scan 03 3=	L - Not full H - Full	Remove the drum units and the transfer belt. Locate the optical sensor in a hole below the registration rollers. Interrupt the sensor by inserting a scrap of paper
<i>not used</i>	Switch Scan 03 4=		<i>not used</i>
<i>not used</i>	Switch Scan 04		<i>not used</i>
<i>not used</i>	Switch Scan 05		<i>not used</i>
Manual Bypass Feeder Home Sensor	Switch Scan 06 1=	L - Roller at home H - Roller not home	Open the top cover and remove the drum units. Manually rotate the manual bypass feed roller by turning the white gear on the right end of the registration roller.
Manual Bypass Feeder Paper Empty Switch	Switch Scan 06 2=	L - Paper loaded H - No Paper	Toggle the switch located at the inner-base of the Manual Bypass Feeder tray next to the pick pad
<i>not used</i>	Switch Scan 06 3=		<i>not used</i>
Manual Bypass Feeder OHP Sensor	Switch Scan 06 4=	L - Transparency H - Paper	Manually feed a sheet of paper thru the feeder by rotating the registration roller. Transparency film causes no change
Tray 1, Size 1 Switch - (Top)	Switch Scan 07 1=	L - Actuated H - Deactuated	Remove the tray and actuate the sensor flags at the rear of the tray cavity
Tray 1, Size 2 Switch	Switch Scan 07 2=	L - Actuated H - Deactuated	
Tray 1, Size 3 Switch	Switch Scan 07 3=	L - Actuated H - Deactuated	
Tray 1, Size 4 Switch - (Bottom)	Switch Scan 07 4=	L - Actuated H - Deactuated	
Color Registration (Front) - 006	Switch Scan 08 1=	Density Value ***H	Color value in hexadecimal format. The default is between 000 to 060 when the sensors are exposed to light. Manually open the registration shutter to expose the sensors to light. If the sensor reading is too high, clean any toner dust off the sensor lens and test again.
Color Registration (Rear) - 00A	Switch Scan 08 2=	Density Value ***H	
<i>not used</i>	Switch Scan 08 3=		<i>not used</i>
<i>not used</i>	Switch Scan 08 4=		<i>not used</i>
Upper Fuser Thermistor - 00D	Switch Scan 09 1=	Encoded fuser roller temperature	Temperature is encoded as a hexadecimal value. The default is between 001 and 0D4.
<i>not used</i>	Switch Scan 09 2=		<i>not used</i>

Switch scans and the sensor and switches test

Switch or sensor	Switch scan test	Test result	Details
Lower Fuser Thermistor - 00F	Switch Scan 09 3=	Encoded fuser roller temperature	Temperature is encoded as a hexadecimal value. The default is between 001 and 0 D4.
<i>not used</i>	Switch Scan 09 4=		<i>not used</i>
Humidity Sensor	Switch Scan 10 1=	Encoded environmental humidity	Ambient environmental humidity is encoded as a hexadecimal value. The default is between 158 and 2A7.
Temperature Sensor	Switch Scan 10 2=	Encoded environmental temperature	Ambient environmental temperature is encoded as a hexadecimal value. The default is between 0E7 and 27C.
<i>not used</i>	Switch Scan 10 3=		<i>not used</i>
<i>not used</i>	Switch Scan 10 4=		<i>not used</i>
Duplex In Sensor	Switch Scan 11 1=	L - Deactuated H - Paper present	Pull out the duplex unit. Lift its cover. Place a sheet of paper inside on the sensor flag. Close the cover. Reinsert the duplex unit in the printer.
Duplex Rear Sensor	Switch Scan 11 2=	L - Deactuated H - Paper present	Pull out the duplex unit. Lift its cover. Place a sheet of paper inside on the sensor flag. Close the cover. Reinsert the duplex unit in the printer.
<i>not used</i>	Switch Scan 11 3=	<i>not used</i>	
Duplex Front Sensor	Switch Scan 11 4=	L - Deactuated H - Paper present	Pull out the duplex unit. Lift its cover. Place a sheet of paper inside on the sensor flag. Close the cover. Reinsert the duplex unit in the printer.
Tray 2, Size 1 Switch - (Top)	Switch Scan 12 1=	L - Actuated H - Deactuated	Remove the tray and actuate the sensor flags at the rear of the tray cavity
Tray 2, Size 2 Switch	Switch Scan 12 2=	L - Actuated H - Deactuated	
Tray 2, Size 3 Switch	Switch Scan 12 3=	L - Actuated H - Deactuated	
Tray 2, Size 4 Switch - (Bottom)	Switch Scan 12 4=	L - Actuated H - Deactuated	
Tray 2 No Paper Sensor	Switch Scan 13 1=	L - Paper present H - No paper	Pull tray out to test sensor
Tray 2 Low Paper Sensor	Switch Scan 13 2=	L - Paper level OK H - Low paper	Pull tray out to test sensor
<i>not used</i>	Switch Scan 13 3=	<i>not used</i>	
<i>not used</i>	Switch Scan 13 4=	<i>not used</i>	
Right Door Tray 2	Switch Scan 14 1=	L - Opened H - Closed	Open door to test sensor
<i>not used</i>	Switch Scan 14 2=	<i>not used</i>	
Tray 2 Feed Sensor	Switch Scan 14 3=	L - Actuated H - Deactuated	Open the Tray 2 right-side door and toggle sensor flag below the feed rollers
<i>not used</i>	Switch Scan 14 4=	<i>not used</i>	

Switch scans and the sensor and switches test

Switch or sensor	Switch scan test	Test result	Details
Tray 3, Size 1 Switch - (Top)	Switch Scan 15 1=	L - Actuated H - Deactuated	Remove the tray and actuate the sensor flags at the rear of the tray cavity
Tray 3, Size 2 Switch	Switch Scan 15 2=	L - Actuated H - Deactuated	
Tray 3, Size 3 Switch	Switch Scan 15 3=	L - Actuated H - Deactuated	
Tray 3, Size 4 Switch - (Bottom)	Switch Scan 15 4=	L - Actuated H - Deactuated	
Tray 3 No Paper Sensor	Switch Scan 16 1=	L - Paper present H - No paper	Pull tray out to test sensor
Tray 3 Low Paper Sensor	Switch Scan 16 2=	L - Paper level OK H - Low paper	Pull tray out to test sensor
<i>not used</i>	Switch Scan 16 3=	<i>not used</i>	
<i>not used</i>	Switch Scan 16 4=	<i>not used</i>	
Right Door Tray 3	Switch Scan 17 1=	L - Opened H - Closed	Open door to test sensor
<i>not used</i>	Switch Scan 17 2=	<i>not used</i>	
Tray 3 Feed Sensor	Switch Scan 17 3=	L - Actuated H - Deactuated	Open the Tray 3 right-side door and toggle sensor flag below the feed rollers
<i>not used</i>	Switch Scan 17 4=	<i>not used</i>	
Tray 4, Size 1 Switch - (Top)	Switch Scan 18 1=	L - Actuated H - Deactuated	Remove the tray and actuate the sensor flags at the rear of the tray cavity
Tray 4, Size 2 Switch	Switch Scan 18 2=	L - Actuated H - Deactuated	
Tray 4, Size 3 Switch	Switch Scan 18 3=	L - Actuated H - Deactuated	
Tray 4, Size 4 Switch - (Bottom)	Switch Scan 18 4=	L - Actuated H - Deactuated	
Tray 4 No Paper Sensor	Switch Scan 19 1=	L - Paper present H - No paper	Pull tray out to test sensor
Tray 4 Low Paper Sensor	Switch Scan 19 2=	L - Paper level OK H - Low paper	Pull tray out to test sensor
<i>not used</i>	Switch Scan 19 3=	<i>not used</i>	
<i>not used</i>	Switch Scan 19 4=	<i>not used</i>	
Right Door Tray 4	Switch Scan 20 1=	L - Opened H - Closed	Open door to test sensor
<i>not used</i>	Switch Scan 20 2=	<i>not used</i>	
Tray 4 Feed Sensor	Switch Scan 20 3=	L - Actuated H - Deactuated	Open the Tray 4 right-side door and toggle sensor flag below the feed rollers
<i>not used</i>	Switch Scan 20 4=	<i>not used</i>	

Switch scans and the sensor and switches test

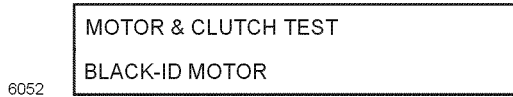
Switch or sensor	Switch scan test	Test result	Details
Tray 5, Size 1 Switch - (Top)	Switch Scan 21 1=	L - Actuated H - Deactuated	Remove the tray and actuate the sensor flags at the rear of the tray cavity
Tray 5, Size 2 Switch	Switch Scan 21 2=	L - Actuated H - Deactuated	
Tray 5, Size 3 Switch	Switch Scan 21 3=	L - Actuated H - Deactuated	
Tray 5, Size 4 Switch - (Bottom)	Switch Scan 21 4=	L - Actuated H - Deactuated	
Tray 5 No Paper Sensor	Switch Scan 22 1=	L - Paper present H - No paper	Pull tray out to test sensor
Tray 5 Low Paper Sensor	Switch Scan 22 2=	L - Paper level OK H - Low paper	Pull tray out to test sensor
<i>not used</i>	Switch Scan 22 3=	<i>not used</i>	
<i>not used</i>	Switch Scan 22 4=	<i>not used</i>	
Right Door Tray 5	Switch Scan 23 1=	L - Opened H - Closed	Open door to test sensor
<i>not used</i>	Switch Scan 23 2=	<i>not used</i>	
<i>not used</i>	Switch Scan 23 3=	<i>not used</i>	
<i>not used</i>	Switch Scan 23 4=	<i>not used</i>	
Black LED Head temperature	Switch Scan 24 1=	Encoded head temperature	Temperature is encoded as a hexadecimal value. The default is between 083 and 316.
Yellow LED Head temperature	Switch Scan 24 2=	Encoded head temperature	
Magenta LED Head temperature	Switch Scan 24 3=	Encoded head temperature	
Cyan LED Head temperature	Switch Scan 24 4=	Encoded head temperature	
Black Imaging Drum Contact	Switch Scan 25 1=	L - Installed H - Missing	Tests the imaging drum up/down sensor. Remove drum unit to test.
Cyan Imaging Drum Contact	Switch Scan 25 2=	L - Installed H - Missing	
Magenta Imaging Drum Contact	Switch Scan 25 3=	L - Installed H - Missing	
Yellow Imaging Drum Contact	Switch Scan 25 4=	L - Installed H - Missing	

Motor and clutch tests

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until MOTOR & CLUTCH TEST appears on the upper display.

Caution *Before running some motor and clutch tests you must remove certain printer consumable items; refer to table below. The front panel also reminds you to remove the necessary item before starting the test.*

3. Press the **Item (2, 6)** keys to scroll through the list of motors and clutches until the desired item is displayed.



4. If indicated, remove the consumable items constraining the test.
5. Press the **Value (3)** key to start the displayed test. The displayed test item blinks, and the selected motor or clutch is driven for 10 seconds.
6. Press the **Value (7)** key to stop the unit.
7. Repeat the Steps 2 to 7 for other motor or clutch tests.
8. Press Enter (4) ends the tests.

Motor and clutch test constraints

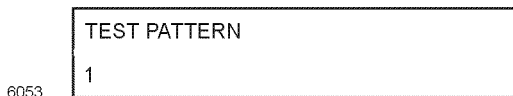
Motor or clutch displayed on control panel	Constraints displayed on control panel	Details
BLACK-ID MOTOR	REMOVE ID	Run test with the drum units removed. Observe the imaging drum drive gear rotate
YELLOW-ID MOTOR	REMOVE ID	Run test with the drum units removed. Observe the imaging drum drive gear rotate
MAGENTA-ID MOTOR	REMOVE ID	Run test with the drum units removed. Observe the imaging drum drive gear rotate
CYAN-ID MOTOR	REMOVE ID	Run test with the drum units removed. Observe the imaging drum drive gear rotate
TRANSFER BELT MOTOR	REMOVE ID	Run test with the drum units removed.
FUSER MOTOR	<i>none</i>	Remove the fuser and observe the fuser drive gears turn.
REGISTRATION MOTOR	Remove media from the multi-sheet bypass feeder	Remove the imaging drums and observe the registration roller B rotate
REGISTRATION CLUTCH	<i>none</i>	Open the front cover and observe registration roller A turning
FRONT MOTOR (REGISTRATION MOTOR)	Remove media from the multi-sheet bypass feeder	Open the multi-sheet bypass feeder and observe the paper position plate cycle up and down
REGISTRATION SHUTTER	<i>none</i>	Remove the imaging drums and the transfer belt to watch the shutter open and close smoothly and completely.
EXIT SOLENOID	<i>none</i>	Open the top cover and observe the exit gate move up and down
FACEDOWN SOLENOID	<i>none</i>	Open the face-up tray and observe the facedown gate move up and down
DUPLEX MOTOR	<i>none</i>	Listen for the motor turning for about 5 seconds
DUPLEX REAR CLUTCH	<i>none</i>	Listen for the clutch activating
DUPLEX FRONT CLUTCH	<i>none</i>	Listen for the clutch activating
TRAY 1 MOTOR (FEED MOTOR)	EXIT TRAY1 CASSETTE	Run the test with Tray 1 removed. Observe the pick roller rotate as the motor runs
TRAY 2 MOTOR (FEED MOTOR)	EXIT TRAY2 CASSETTE	Run the test with Tray 2 removed. Observe the pick roller rotate as the motor runs

Motor and clutch test constraints

Motor or clutch displayed on control panel	Constraints displayed on control panel	Details
TRAY 3 MOTOR (FEED MOTOR)	EXIT TRAY3 CASSETTE	Run the test with Tray 3 removed. Observe the pick roller rotate as the motor runs
TRAY 4 MOTOR (FEED MOTOR)	EXIT TRAY4 CASSETTE	Run the test with Tray 4 removed. Observe the pick roller rotate as the motor runs
TRAY 5 MOTOR (FEED MOTOR)	EXIT TRAY5 CASSETTE	Run the test with Tray 5 removed. Observe the pick roller rotate
TRAY 1 HOPPING CLUTCH	<i>none</i>	Remove Tray 1 and listen for the clutch
TRAY 2 HOPPING CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 2 and listen for the clutch
TRAY 3 HOPPING CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 3 and listen for the clutch
TRAY 4 HOPPING CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 4 and listen for the clutch
TRAY 5 HOPPING CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 5 and listen for the clutch
FEED ROLLER 1 CLUTCH	<i>none</i>	Remove Tray 1 and listen for the clutch
FEED ROLLER 2 CLUTCH (OPTIONAL) -	<i>none</i>	Remove Tray 2 and listen for the clutch
FEED ROLLER 3 CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 3 and listen for the clutch
FEED ROLLER 4 CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 4 and listen for the clutch
FEED ROLLER 5 CLUTCH (OPTIONAL)	<i>none</i>	Remove Tray 5 and listen for the clutch
ID UP/DOWN		Raises and lowers the imaging drum units
FAN1 TEST		Chassis fan, runs for 10 seconds
FAN2 TEST		Fuser fan, runs for 10 seconds

Test printing

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until TEST PRINT appears on the upper display.
3. Press the **Item (2, 6)** keys to scroll through the list of test print items until the desired print option is displayed.
4. With a test print menu item displayed, press the **Value (3, 7)** keys to scroll through the printing options of that item, such as which tray to print from and to print in blank-and-white or color.



Test Print menu

Display	Set Value	Function
PRINT EXECUTE	-	Press Value (3) to start printing. Press Value (7) to stop printing.
TEST PATTERN	<u>1</u>	Selection of Printing Patterns
	<u>2</u>	1: LED Head Drive Pattern
	<u>3</u>	2: Color Registration Adjust Pattern
	<u>4</u>	3: <i>Reserved</i>
	<u>5</u>	4: Gray pattern
	<u>6</u>	5: Thin lines
	<u>7 - 14</u>	6: Colored stripes
		7 thru 14: <i>Do not use</i>
CASSETTE	<u>TRAY1</u>	Lets you select the source of paper for the test print.
	<u>TRAY2</u>	
	<u>TRAY3</u>	
	<u>FF</u>	
	<u>NONE</u>	
PAGE	XXXX	Set number of print you wish the printer to print, 0000 mean continuous printing.
COLOR	<u>ON</u>	Lets you select between color or monochrome printing
	<u>OFF</u>	
DUPLEX	<u>ON</u>	Lets you select between single-sided or double-sided printing.
	<u>OFF</u>	

5. Press the **Item (2, 6)** keys to scroll to the menu item PRINT EXECUTE. Press **Value (3)** to starts printing.
6. Press **Value (7)** to stop printing.

The following messages are showing at warm-up and during printing.

```
6054 P=*** T=*** U=*** [###]  
H=***% L=***[###]
```

P: Number of sheets printed for test (in units of sheets)

U: Upper fuser heater temperature measurement (in degrees Celsius)

L: Lower fuser heater temperature measurement (in degrees Celsius)

T: Environmental temperature measurement (in degrees Celsius)

H: Environmental humidity measurement (in units of%). The key **Value (3)** changes the display.

```
6055 KTR=*. **KV YTR=*. **KV  
MTR=*. **KV CTR=*. **KV
```

```
6056 KR=*. **KV YR=*. **KV  
MR=*. **KV CR=*. **KV
```

7. Press **Enter (4)** to end the test.

Consumable count initialization

This test menu item allows you to initialize the print engine's consumable counts and registration set points.

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until NV-RAM INITIAL appears on the upper display.
3. Press the **Item (2, 6)** keys to select Table 1. The table indicates which NVRAM items will be initialized. Refer to the table printed below.



4. Press and hold Value (3) for 10 seconds to initialize the items of the selected table. The front panel display NV-RAM INITIAL blinks eight times.
5. Press Enter (4) to exit the test mode.

Table 1: Initialization items - consumables

Initialization Item	Detail
Drum Counter Black Yellow Magenta Cyan	Initializes the drum counter's count after the replacement of a drum.
Belt Unit Counter	Initializes the print count after the replacement of a transfer belt unit.
Fuser Unit Counter	Initializes the fuser's print count after the replacement of a fuser unit.
Toner Counter Black Yellow Magenta Cyan	Initializes the toner use count after a toner cartridge is replaced

Consumable counter display

This test indicate the status of each consumable supply.

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until CONSUMABLE STATUS appears on the upper display.
3. Press the **Item (2, 6)** keys to scroll through the list of consumable supply items. The consumption value is displayed with the item. The table below lists the menu items.
4. Press **Enter (4)** to end the test.

Consumable counter menu items

Upper Display	Lower Display	Detail
FUSER UNIT	*****IMAGES	Shows the number of sheets printed since installation of a new fuser unit.
TR BELT UNIT	*****IMAGES	Shows the number of images printed since installation of a new transfer belt unit.
BLACK ID UNIT	*****IMAGES	Indicates the number of images processed by each imaging drum unit since it was installed.
YELLOW ID UNIT	*****IMAGES	
MAGENTA ID UNIT	*****IMAGES	
CYAN ID UNIT	*****IMAGES	
BLACK TONER	***%	Shows the amount of toner consumed from each toner cartridge.
YELLOW TONER	***%	
MAGENTA TONER	***%	
CYAN TONER	***%	

Consumable continuation counter display

The self-diagnosis is carried out to indicate the consumption status of each consumable supply.

1. Enter the diagnosis mode by pressing and holding the **Menu (1)** and **Enter (4)** keys as you turn on the printer.
2. Press the **Menu (1, 5)** keys to scroll through the list of test until PRINTER STATUS appears on the upper display.
3. Press the **Item (2, 6)** keys to scroll through the list of supply items. The life-cycle consumption value is displayed with the item. The table below lists the menu items.

1. Press **Enter (4)** to end the test.

Consumable life-cycle counts

Upper Display	Lower Display	Unit	Detail
TOTAL SHEETS FED	***** PRINTS	Prints	Indicates the total number of sheets fed including blank paper
BLACK IMPRESSIONS	***** IMAGES	Image	Displays the number of images printed by each imaging drum
YELLOW IMPRESSIONS	***** IMAGES	Image	
MAGENTA IMPRESSIONS	***** IMAGES	Image	
CYAN IMPRESSIONS	***** IMAGES	Image	

Adjusting color density and balance

Over the life of the printer, colors may change. For example, reds may begin to take on a purple cast, or blues may take on a green cast. This happens during the normal use of a color printer and can be easily remedied by using the color adjustment procedure described in this section

This front panel procedure involves printing a test page and adjusting the densities and colors based on the appearance of the test page. You may need to repeat this procedure and test your adjustments until you achieve the desired effect.

Note *At any time, you can reset the printer to the factory defaults by selecting Color Defaults from the Color Adjust Menu.*

Printing a Test Page

1. Press the **Menu (1, 5)** keys until you see Color Adjust.
2. Press **Item (2, 6)** keys and the printer prints the Color Balance test print.

Interpreting the Color Balance test print


The Color Balance test print contains numbered images and disks that indicate possible adjustments that can be made. You can choose to make an adjustment to the Black Density, the Color Balance, or the Color Density.

- The Black Density Images, numbered -3K...0...+3K, show a lightness/darkness range using black only.
- The Color Balance Images, numbered 0,1,2,...12, show variations of three-color gray. Each of these circles contains gray with tints of other colors.
- The Color Density Images, numbered -3CMY...0...+3CMY, show a lightness/darkness range using three colors (cyan, magenta, yellow).

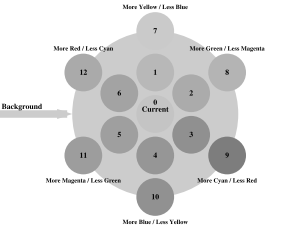
Color And Density Adjustment Test Page

Procedure: Adjust the Black Density, Color Balance, and Color Density on the front panel.
Caution: When you make a density or color balance adjustment, it automatically changes the 'Current' setting. The test page with the new settings will reprint.


Step 1: Black Density - Locate the square where the bar and background patterns blend together. Enter the square number in the Black Density menu. For example, if the bar pattern blends with the background in the "-2K" square, select "-2K". Repeat this step until the two patterns in the "Current" square blend together.



Step 2: Color Balance - Locate the numbered circle that most closely matches the gray of the background. Enter the circle number in the Color Balance menu. Repeat this step until the "Current" circle closely matches the gray background.



Step 3: Color Density - Locate the square where the bar and background patterns blend together. Enter the square number in the Color Density menu. Repeat this step until the two patterns in the "Current" square blend together.



Step 4: Repeat Step 2 and Step 3 as needed.

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What to look for

There are three things to look for in examining the test print.

- The correct Black Density is determined by selecting the image in which the foreground and background grays most closely match.
- The correct Color Balance is determined by matching the “Current” disk in the center with the gray background. The background is produced using black only and the circles are produced using a combination of cyan, magenta, and yellow.
- The correct Color Density is determined by selecting the image in which the foreground and background gray patterns most closely match.

Making adjustments

Use the following procedures to make adjustments to the color density and balance:

Black density adjustment

1. Press **Item (2, 6)** keys until you see Color Adjust Menu: Black Density.
2. Press **Value (3, 7)** keys until you see Black Density = *New Value*.
Values are: -3K, -2K, -1K, 0, +1K, +2K, +3K.
3. Press **Enter**. The Color Adjust Page prints and the front panel displays Color Adjust Menu: Black Density.
Repeat Steps 2 and 3 above until you are satisfied with the results.

Color density adjustment

1. Press **Item (2, 6)** keys until you see Color Adjust Menu: Color Density.
2. Press **Value (3, 7)** keys until you see Color Density = *New Value*.
Values are: -3CMY, -2CMY, -1CMY, 0, +1CMY, +2CMY, +3CMY.
3. Press **Enter**. The Color Adjust Page prints and the front panel displays Color Adjust Menu: Color Density.
Repeat Steps 2 and 3 above until you are satisfied with the results.

Color balance adjustment

1. Press **Menu (1, 5)** keys until you see Color Adjust Menu.
2. Press **Item (2, 6)** keys until you see Color Adjust Menu: Color Balance.
3. Press **Value (3, 7)** keys until you see Color Density = *New Value*.
Values are: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13.
4. Press **Enter**. The Color Adjust Page prints and the front panel displays Color Adjust Menu: Color Balance.

Repeat Steps 2 and 3 above until you are satisfied with the results.

Adjustment recovery

While in the color adjustment routine you can choose to return the values to the factory default values by using the Color Adjust menu's Color Defaults item.

The printer will be restored to the default values.

Cleaning and Maintenance

Service preventive maintenance procedure

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

The frequency of use and the type of paper a customer prints on determines how critical cleaning the machine is. Users of ordinary laser Bond paper (copier paper) should have very few problems since this paper is smooth and relatively dust-free. You should thoroughly inspect and clean these printers.

Recommended tools

- Toner vacuum cleaner
- Suction bulb (air blower)
- Cleaning water
- Lint-free wipes
- Cotton swabs
- Imaging unit cover
- Isopropyl alcohol (greater than 90% pure)

Periodically replaced parts

Periodically replaced parts

Part name	Display or Warning Condition	Recommended condition for replacement	Adjustment after replacement
Toner Cartridge	When the message is displayed	When 15,000 (hi-cap cartridge) or 7,500 (standard cartridge) pages are printed (5% print density).	No adjustment required after replacing toner cartridge
Drum Units	When the message is displayed	When 35,000 pages are printed out (for 3 Page/Job printing of Letter paper).	The printer's imaging drum unit counters are automatically reset due to a fuse being blown in the unit a few seconds after a unit is installed
Fuser Unit	When the message is displayed	When 80,000 pages are printed out.	The printer's fuser unit counter is automatically reset due to a fuse being blown in the unit a few seconds after it is installed
Transfer Belt Unit	When the message is displayed	When 80,000 pages are printed out.	The printer's transfer belt unit counter is automatically reset due to a fuse being blown in the unit a few seconds after it is installed

Cleaning

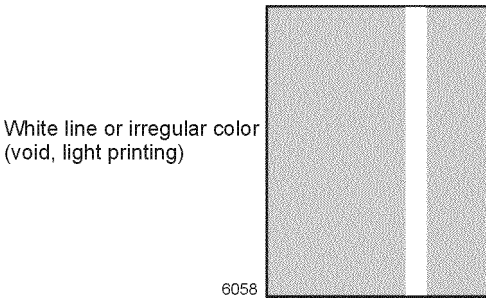
Periodically clean the inside and outside of the printer with a soft cloth and small vacuum cleaner when necessary.

Caution *Do not touch the terminals of the image drums, the LED bar, and the LED head connector block. Clean with alcohol wipe, if necessary.*

Cleaning the LED bar

The LED lens array must be cleaned when the printed paper has white lines or irregular colors (such as a void or light printing) running vertically down of the paper. Clean the lens with an alcohol wipe to clean the LED bar. (An alcohol wipe always comes with the toner cartridge.)

Print the 100% Color Stripe Pattern. If a light or white stripe appears in any primary color or a secondary color has an irregular color streak, clean the LED lens of the affected color.



Print problem caused by dirty LED lens

Cleaning the pickup roller

When mispicks occur, clean the pickup roller.

Note *The roller should be cleaned with a clean, dry, lint-free cloth if debris is visible so the surface is not scratched.*

Resetting NVRAM

Resetting NVRAM returns all the image processor's NVRAM-stored parameters, including the network card, to their factory defaults except the print counts and the Adobe firmware serial number. This procedure reset all values, including language and color balance, to the factory default values. Event logs cannot be cleared.

1. Turn off the printer.
2. Press and hold-down the **On Line (0)** key and the **Enter (4)** keys.
3. Turn on the printer. When the message **Ready** will be displayed use the the **Menu (1, 4)** keys to scroll through the list of menu items to the menu item **Reset Menu**. Press **Enter (4)**.
4. Use the **Menu (1, 4)** keys to scroll through the list of reset options:
 - **Factory Defaults.** (print engine settings)
Use the **Item (2, 6)** keys to activate the **Confirm Action Yes/No** menu. Press **Enter** to confirm your selection.
 - **Network Defaults.** (network settings)
Use the **Item (2, 6)** keys to activate the **Confirm Action Yes/No** menu. Press **Enter** to confirm your selection.
 - **Demo Mode.**
Use the **Item (2, 6)** keys to activate the **Confirm Action Yes/No** menu. Press **Enter** to confirm your selection.
 - **CRU Reset.** (consumable print counts)
Use the **Item (2, 6)** keys to scroll through the list of consumable items. Use the **Value (2, 6)** keys to activate the **Confirm Action Yes/No** menu for the consumable item displayed. Press **Enter** to confirm your selection.

Alternately, refer to the service test procedure “Consumable count initialization” on page 73 to reset the print engine’s NVRAM-stored consumable counts or the registration set points parameters.

A customer-accessible NVRAM reset is available through the front panel menu item **Support Menu**. This reset returns the printer to its factory-default settings but does not clear copy counts nor consumable counts.

FRU Disassembly

This topic illustrates how to remove and replace printer Field Replaceable Units (FRUs). Refer to the later topic “FRU List” on page 187 for a list of the printer’s FRUs. The printer does not contain any mechanical field adjustable components. Default settings and soft switch settings are covered in “Service Tests and Adjustments” on page 61.

About screw colors

Black screws are coarse-thread screws used to join plastic to plastic. In the illustrations the black screws are marked with a **B**.

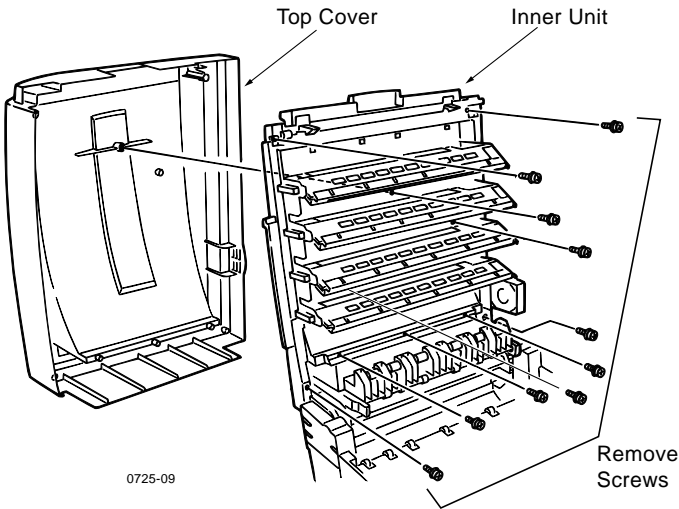
Gold-colored screws are fine-thread screws used to join metal to metal or to mount plastic to metal. In the illustrations the gold-colored screws are marked with a **G**.

Cabinet panels

Top cover

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the rear cover as explained in “Rear cover” on page 89
3. Remove the 10 screws securing the top cover to the top cover inner unit.
4. Remove the top cover.



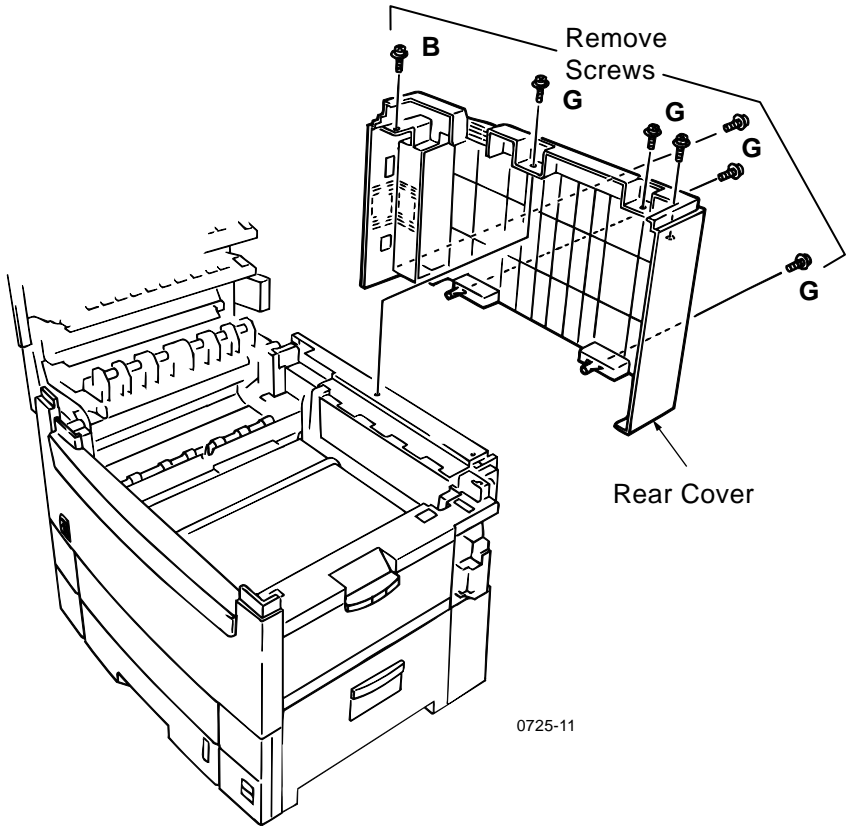
Removing the top cover

To reinstall the top cover, reverse the removal order.

Rear cover

Warning Switch off the power and disconnect the power cord.

1. Remove the system controller board as explained in “System controller board” on page 105.
2. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
3. Remove the seven screws securing the rear cover to the printer.
Remove the rear cover.



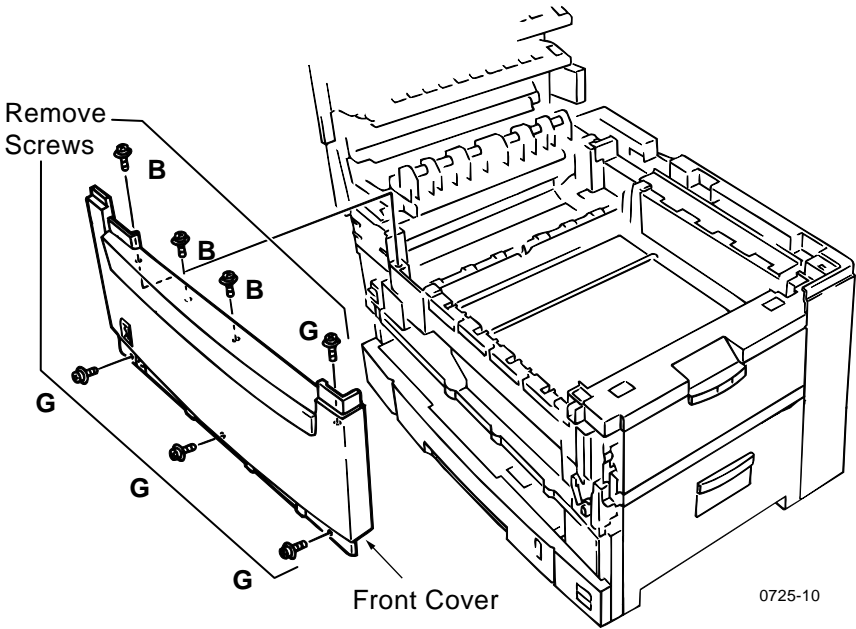
Removing the rear cover

Reverse the removal steps to install the rear cover.

Front cover

Warning Switch off the power and disconnect the power cord.

1. Open the top cover.
2. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
3. Remove the duplex unit/paper tray.
4. Remove the seven screws securing the cover to the printer frame. Remove the cover by lifting it straight up.



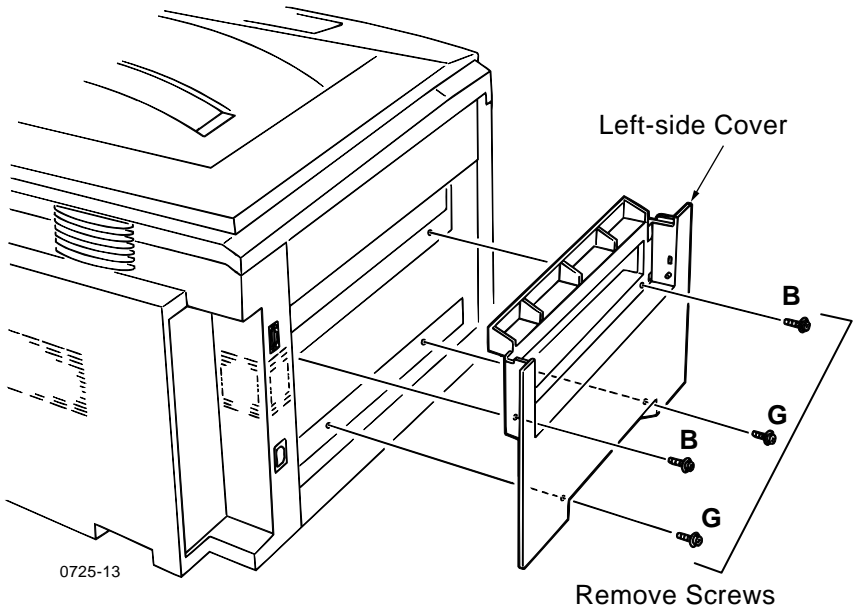
Removing the front cover

Reverse these steps to install the front cover. Lower the front cover into the gap created by the chassis and the fully-open top cover.

Left-side cover

Warning Switch off the power and disconnect the power cord.

1. Open the top cover.
2. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
3. Remove the front cover as described in “Front cover” on page 90.
4. Remove the rear cover as described in “Rear cover” on page 89.
5. Lift the face-up tray to access and remove the two screws underneath.
6. Remove the four screws securing the left side cover.
7. Pull the top of the cover out then up to remove.

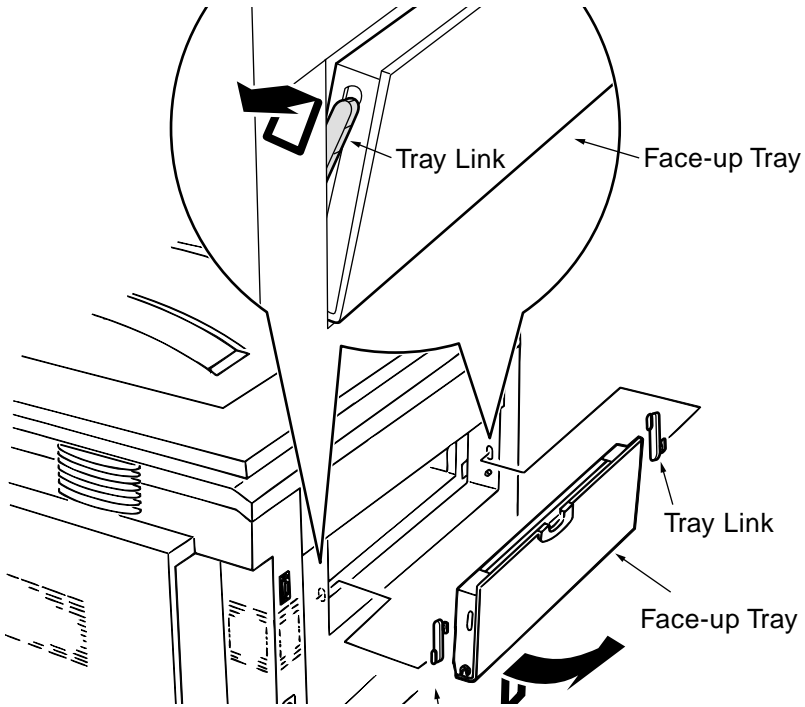


Removing the left-side cover

To reinstall the left-side cover, reverse the removal order.

Face-up tray

1. Open the face-up tray out 25 mm (1 in.).
2. Free the end of the tray links from the sides of the face-up tray.
3. To free the trays links from the printer cabinet, rotate them up so they are parallel with the cabinet face. Remove the keyed ends of the links from the left cabinet cover.

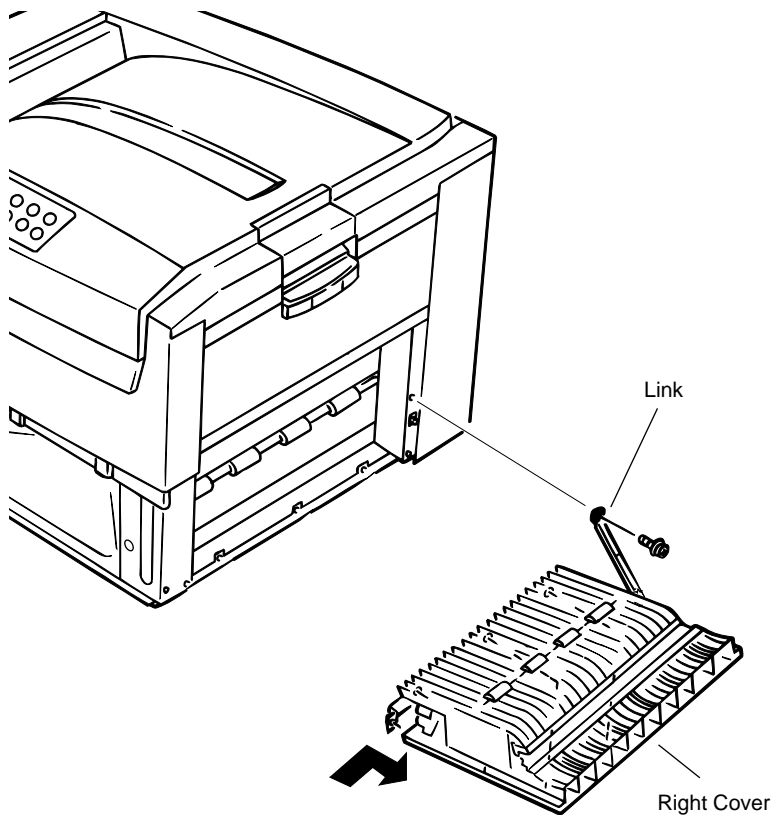


Removing the face-up tray

Reverse these steps to install the face-up tray.

Right door

1. Open the right door.
2. Remove the screw securing the door's link strap to the printer frame.
3. Carefully push the door rearward so the door's front pivot point clears the pin. Once the pin is cleared, remove the door from the printer.



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Removing the right door.

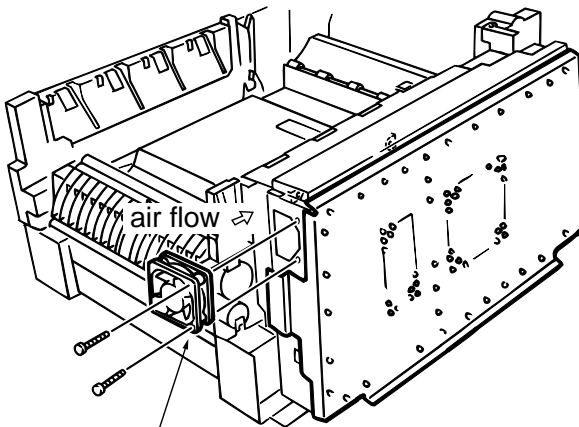
Reverse these steps to install the right door.

Frame components

Electrical card cage cooling fan

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the rear cover as shown on “Rear cover” on page 89.
3. Remove the rear shield plate as described on page 97.
4. Disconnect connector FAN 1 from the print engine controller board.
5. Remove the two screws and spacers securing the fan to the electrical card cage.
6. Remove the electrical card cage cooling fan.



Electrical Chassis
Cooling Fan

0725-16

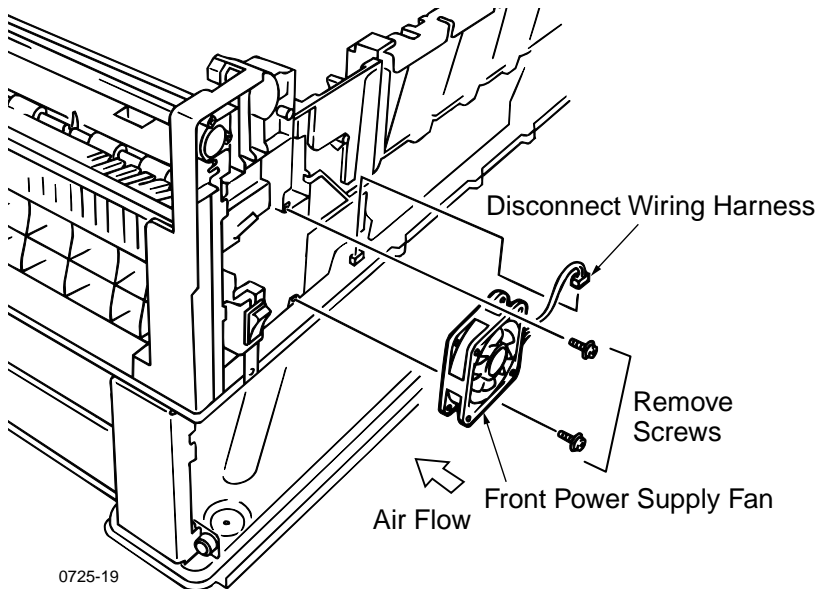
Removing the electrical card cage cooling fan

Reverse these steps to install the electrical card cage cooling fan. Ensure the fan blows into the card cage.

Front power supply fan

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the front cover as described in “Front cover” on page 90.
3. Remove the front shield plate. Pull out the duplex unit/tray 1 to access the shield plates’s lower screws.
4. Disconnect the front power supply fan’s wiring harness from the low voltage power supply board.
5. Remove the two screws securing the fan and slide the front power supply fan out of the printer frame.



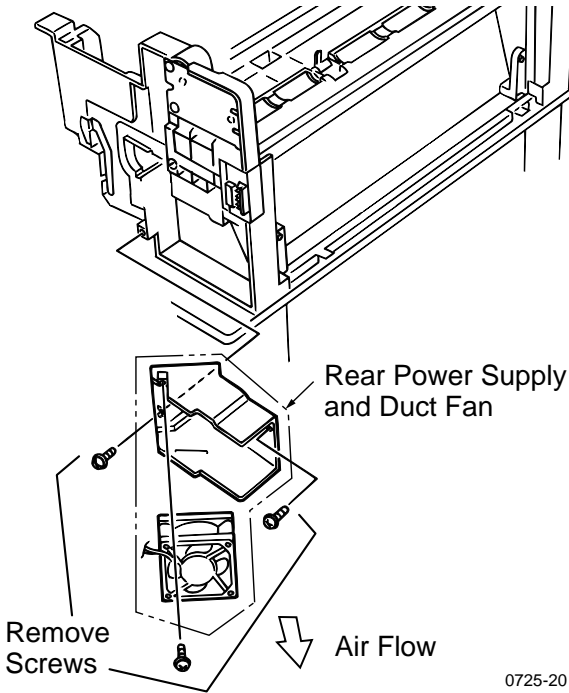
Removing the front power supply fan

Reverse these steps to install the front power supply fan. Ensure the fan blows into the printer unit chassis.

Rear power supply fan

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the electrical card cage as described in “Electrical card cage” on page 98.
3. Remove the left-side cover as described in “Left-side cover” on page 91.
4. Remove the left shield plate.
5. Disconnect the rear power supply fan’s wiring harness from the engine controller board.
6. Remove the screw securing the fan to the fan duct. Slide the rear power supply fan out of the duct. Two screws secure the duct in place.



0725-20

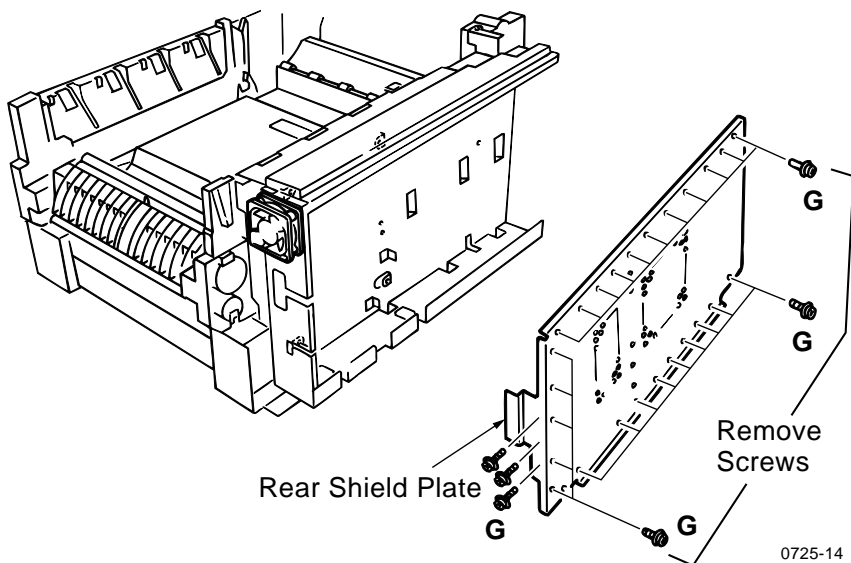
Removing the rear power supply fan

Reverse these steps to install the rear power supply fan. Ensure the fan blows outward from the printer unit chassis.

Rear shield plate

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the rear cover as explained in “Rear cover” on page 89.
3. Remove the screws securing the rear shield plate.
4. Remove the rear shield plate.



Removing the rear shield plate

Reverse these steps to install the rear shield plate.

Electrical card cage

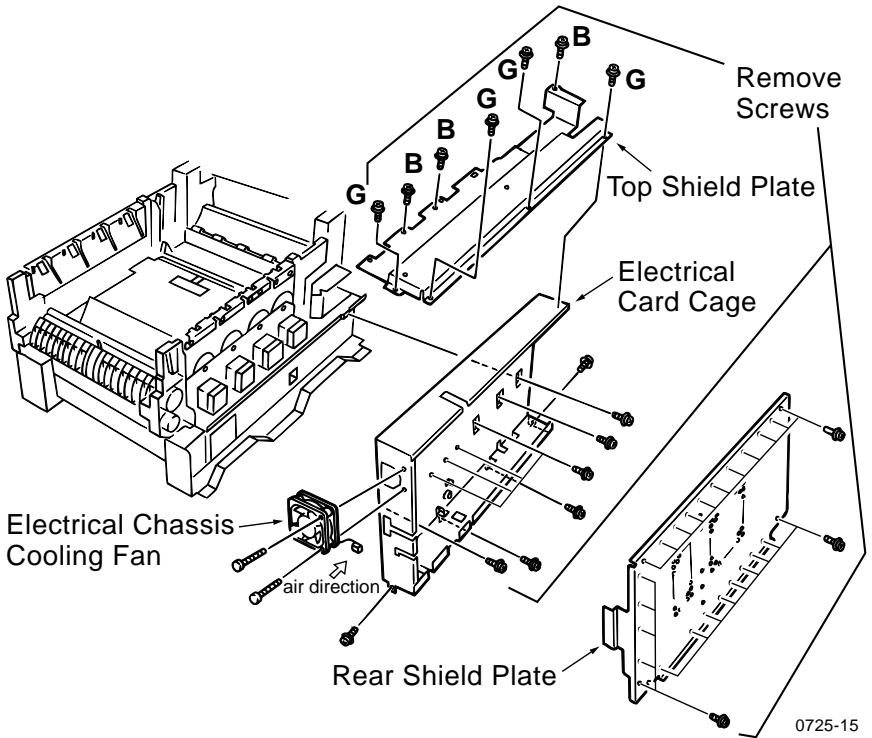
Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the system controller board as shown on page 105.
3. Remove the rear shield plate as explained on page 97.
4. Remove the seven screws securing the top shield plate to the electrical card cage.

Note *To aid in reconnecting the harnesses, label the harnesses as you disconnect them.*

5. Disconnect all the connectors from the print engine controller board. Label the ribbon cables leading to the top cover inner frame to ease re-connection.
6. Pull out the disconnected cable harnesses routed through the top of the chassis.
7. Remove the disconnected cable harnesses from the card cage.
8. Remove screws securing the EMI shield (and the ribbon cables inside) to the top of the electrical card cage. *Note how the power wiring harness is routed under the EMI shield instead of with the other ribbon cables.*
9. Remove the print engine controller board as shown on page 108.
10. Remove harnesses from the front of the electrical card cage.
11. Remove the two screws securing the electrical chassis cooling fan. Remove the fan.
12. Remove the 8 screws securing the electrical card cage to the printer frame.

13. Guide the bottom harnesses as you carefully remove the electrical card cage.



Removing the electrical card cage

Reverse these steps to install the electrical card cage.

Note

Attached to the back of the electrical card cage is a grounding tab. As you reinstall the chassis, ensure that the tab is not deformed and is positioned on the end of the paper feed shaft.

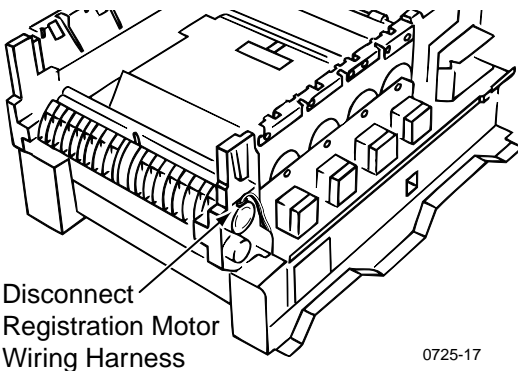
Printer unit chassis

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the front cover as described in “Front cover” on page 90.
3. Unlatch and remove the fuser unit.
4. Lift and remove the transfer belt assembly.
5. Remove the rear cover as described in the topic “Rear cover” on page 89.
6. Remove the left-side cover as described in the topic “Left-side cover” on page 91.
7. Remove the left-side shield plate.
8. Remove the electrical card cage as described in the topic “Electrical card cage” on page 98.
9. Remove the top cover as described in the topic “Top cover” on page 88.
10. Remove the top cover inner frame as described in the topic page 102.

Note *Make note of the harness routing before removing harnesses.*

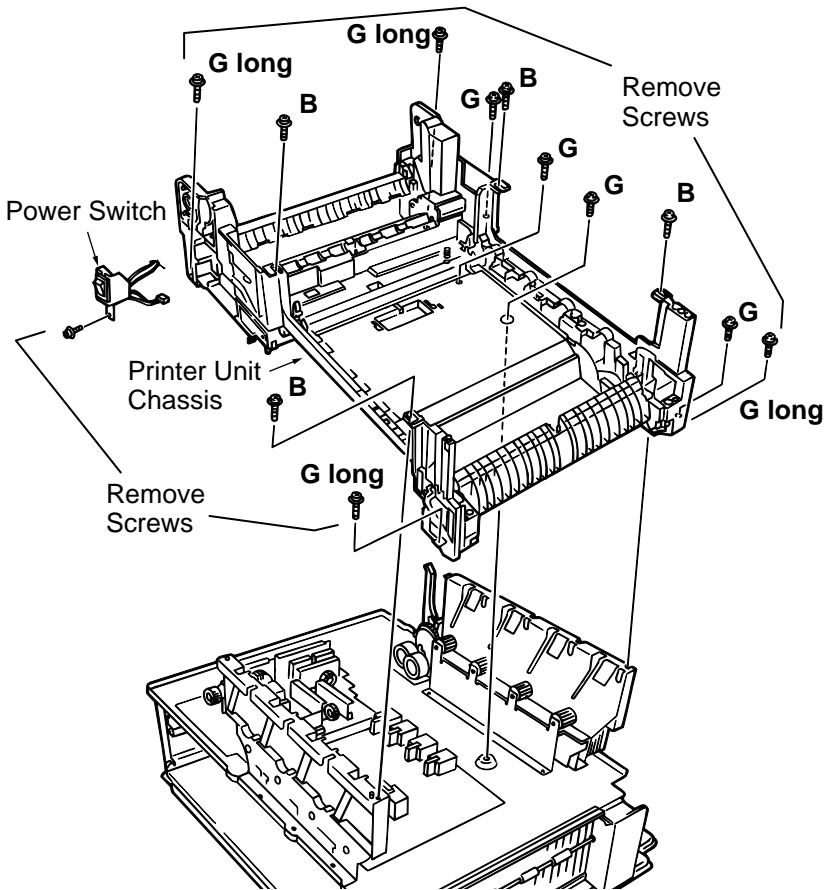
11. Remove the multi-sheet bypass feeder assembly as described on page 119.
12. Disconnect the wiring harness connecting to the serial port at the left-rear of the printer unit chassis.
13. Disconnect the face-up tray open sensor’s harness from the sensor.
14. Disconnect the wiring harness from the registration motor.



0725-17

Disconnecting the registration motor in-line connector (HOPFF)

15. Remove the rear shield plate and the front shield plate. Remove the duplex unit/tray 1 to access the front shield plates lower screws.
16. Free the wiring harnesses attached to the rear power supply fan duct. Then remove the rear fan and duct as described "Rear power supply fan" on page 96.
17. Remove the screw securing the AC power switch to the printer frame. Free the power switch from the printer unit chassis and lay it aside.
18. Disconnect the front power supply fan, the chassis fan, and the duplex solenoid connectors from the front of the low-voltage power supply.
19. Remove the 12 screws securing the printer unit chassis to the frame.
20. Carefully lift the printer unit chassis from the printer frame. Rest the chassis upside-down on a table.



Removing the printer unit chassis

Reverse these steps to install the printer unit chassis. Ensure the front shield plate rests behind the lower lip of the bottom frame.

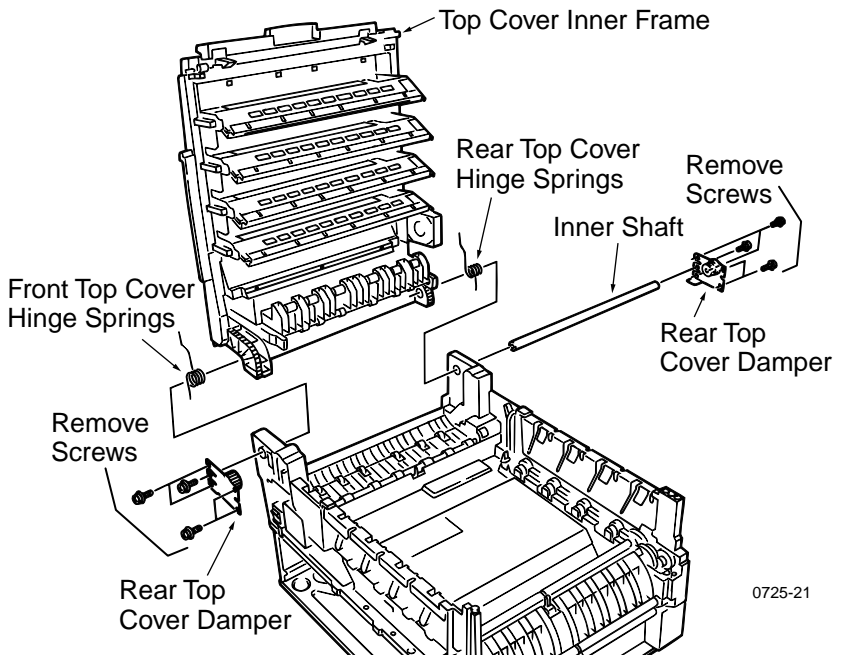
Top cover inner frame and front/rear top cover spring assembly

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the left-side cover as detailed on page 91.
3. Remove the front cover as shown in “Front cover” on page 90.
4. Remove the front shield plate (five gold screws and 3 black screws).
5. Remove the rear shield plate as shown on page 97.
6. Remove the four screws securing the top shield plate to the electrical card cage.
7. Remove the top shield plate.
8. Disconnect the nine LED flat wiring harnesses from the print engine controller board.
9. Remove the four screws securing the cable shield to the top of the electrical card cage. Free the flat wiring harnesses from the card cage.
10. Disconnect the top cover inner frame’s wiring harness interconnects located next to the rear hinge.
11. Remove the five screws securing the rear top cover damper. Tilt the top cover forward slightly and remove the damper.
12. Remove the five screws securing the front top cover damper. Tilt the top cover forward slightly and remove the damper.
13. Supporting the weight of the top cover inner frame, gently lower the inner frame into its closed position.
14. Carefully slide the inner shaft sideways to free it from the printer. The two top cover hinge springs will be freed as the shaft is removed.
15. Remove the top cover inner frame.

Caution *Set up-side down on a flat surface to protect the LED assemblies from damage.*

Caution Do not set the top cover inner frame face down as the LED assemblies or the LED mounting brackets can be damaged.



0725-21

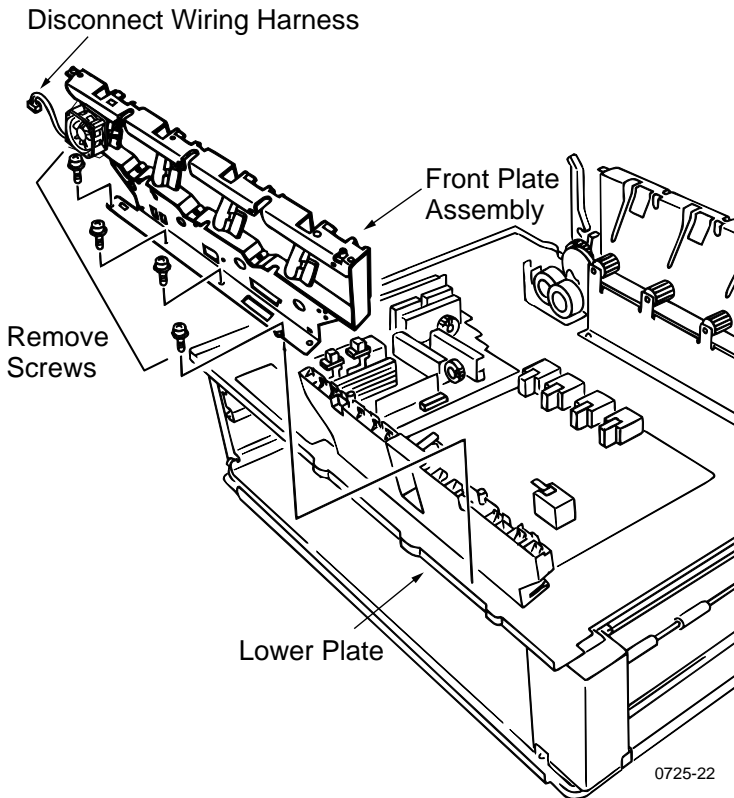
Removing the top shield plate

Reverse these steps to install the top cover inner frame.

Front plate assembly

Warning Switch off the power and disconnect the power cord.

1. Remove printer unit chassis as shown on page 100.
2. Remove the two screws from the front power supply fan. Let the fan rest on the front of the lower plate.
3. Disconnect the chassis fan from the front of the low-voltage power supply.
4. Remove the four screws securing the left plate assembly to the lower plate.
5. Remove the assembly.



Removing the left plate assembly

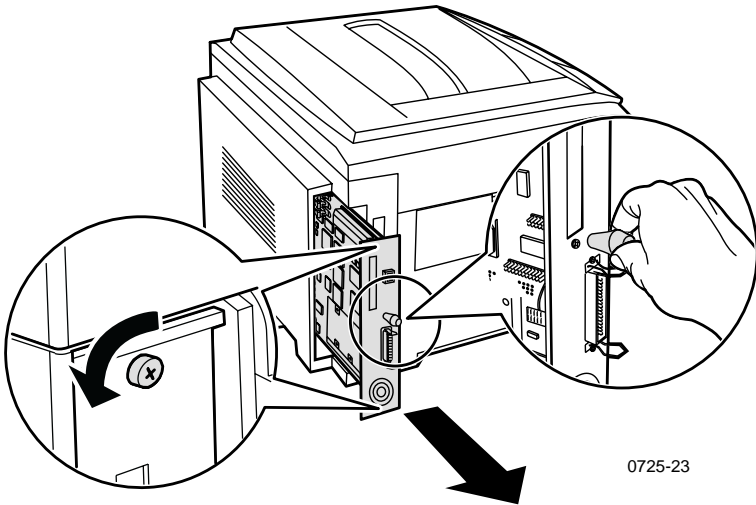
Reverse these steps to install the front plate assembly.

Electronic boards

System controller board

Warning *Switch off the power and disconnect the power cord.*

1. Disconnect all cables connected to the rear of the system controller board.
2. Remove the two screws securing the system controller board to the printer.
3. Slide the system controller board out to the rear of the printer.



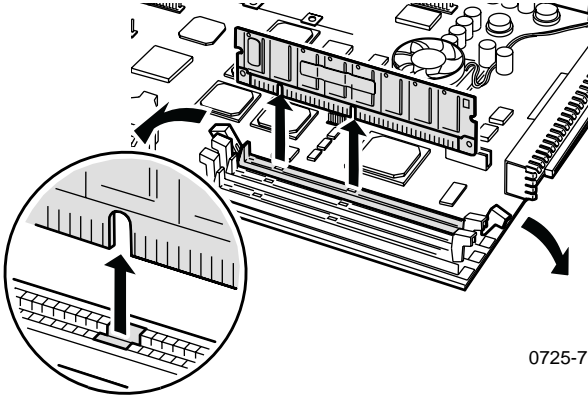
Removing the system controller board

Reverse these steps to install the system controller board. Transfer the RAM DIMMs and the hard drive from the old board to the new board.

RAM DIMMs

Warning *Switch off the power and disconnect the power cord.*

1. Remove the system controller board as described in the procedure “System controller board” on page 105.
2. Spread apart the latches securing each end of the RAM DIMM connector.
3. Lift the DIMM out of the connector.



Removing the RAM DIMMs

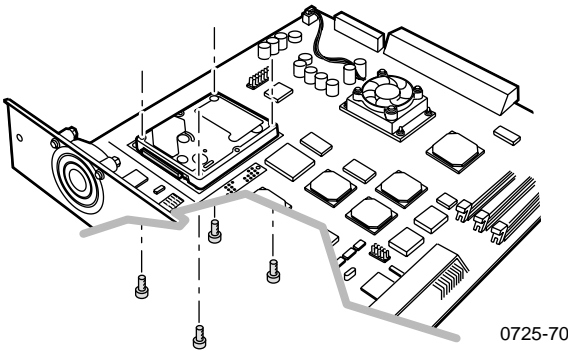
Reverse these steps to install the RAM DIMMs

Note *Do not mix 256 Mbyte RAM DIMMs with small -size RAM DIMM.*

Hard drive

Warning *Switch off the power and disconnect the power cord.*

1. Remove the system controller board as described in the procedure “System controller board” on page 105.
2. Remove the four screws securing the hard drive to the board.
3. Slide the slightly to disconnect the hard drive from its connector and free it from the system controller board.

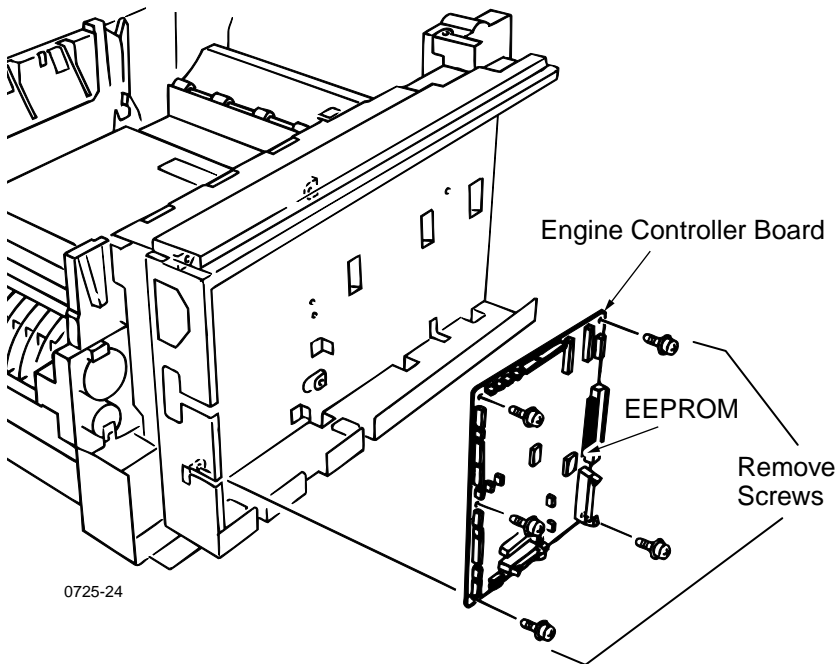


Removing the hard drive

Print engine controller board

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Open the front cover.
3. Remove the rear shield plate as shown on page 97.
4. Remove the system controller board as shown on page 105.
5. Disconnect all connectors connected to the print engine controller board. Remove the EMI suppressor coils and cable ties as necessary.
6. Remove the five screws securing the print engine controller board.
7. Remove the engine controller board.



Removing the print engine controller

Reverse these steps to install the print engine controller. **When replacing the engine board, transfer the socketed, 8-pin EEPROM from the old board to the new board.**

Toner sensor board

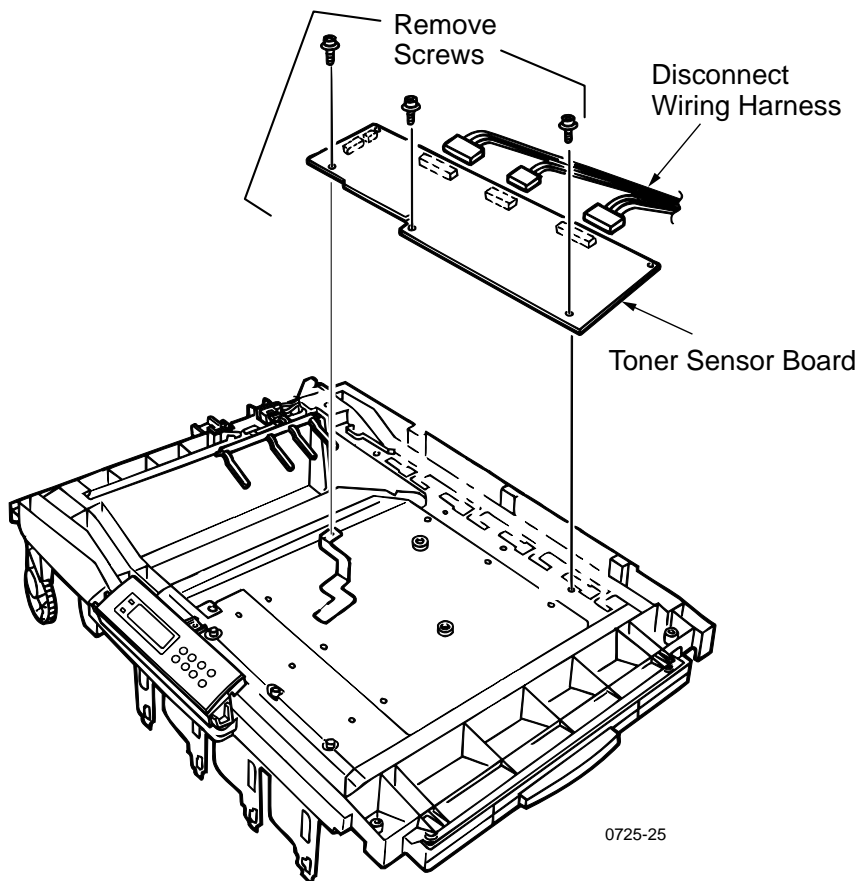
Warning *Switch off the power and disconnect the power cord.*

1. Remove the top cover as detailed on “Top cover” on page 88.
2. From the underside of the top cover inner frame, disconnect the four LED power harnesses from the toner sensor board.
3. Close the top cover inner unit.
4. Remove the three screws securing the toner sensor board.
5. Rotate the board up to expose the component side of the board.

Note *Note for reassembly how the ribbon cables are routed under the sensor board in the next step.*

6. Disconnect the six harnesses from the toner sensor board.

7. Remove the board.



Removing the toner sensor board

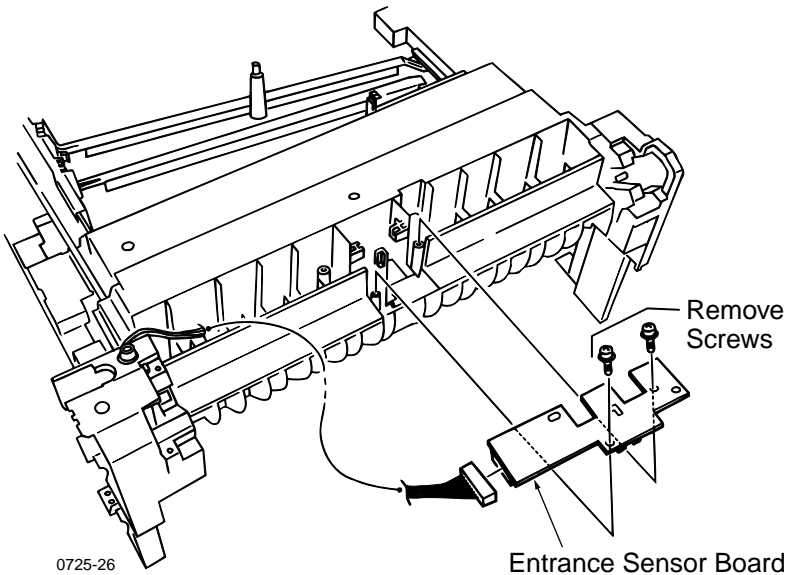
Reverse these steps to install the toner sensor board. Ensure that all harnesses are in the cable channel.

Caution *Ensure the ribbon cables are properly routed and dressed. Do not crunch or fold the ribbon cables while installing the toner sensor board.*

Entrance sensor board

Warning Switch off the power and disconnect the power cord.

1. Remove the multi-sheet bypass feeder as described in the topic on page 119.
2. Remove the printer unit chassis as detailed on page 100.
3. Turning the printer unit chassis upside-down, remove registration roller assembly B as shown on page 129.
4. Remove the spring-loaded tray 1 entrance sensor actuator as explained on page 121. Note the orientation of the actuator's spring for reassembly.
5. Remove the two screws securing the entrance sensor board.
6. Remove the board and disconnect the wiring harness from FSNS.



Removing the entrance sensor board

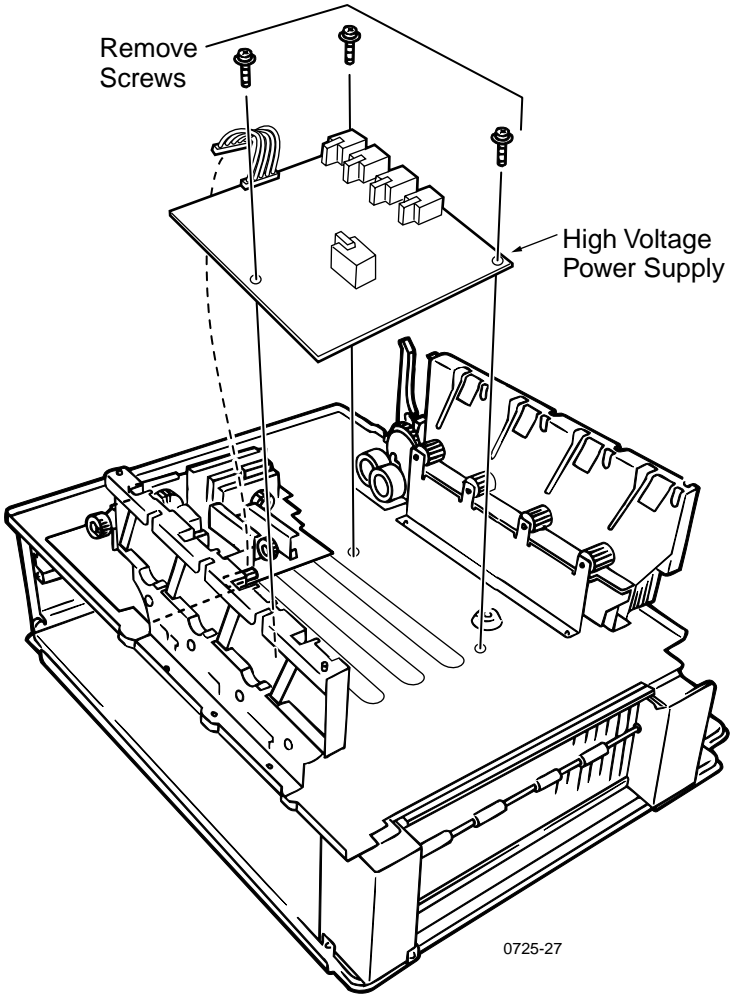
Reverse these steps to install the entrance sensor board.

High voltage power supply

Warning *Switch off the power and disconnect the power cord.*

1. Remove the printer unit chassis as detailed in the topic “Printer unit chassis” on page 100.
2. Disconnect CN1 from the high voltage power supply.
3. Disconnect CN3 from the low voltage power supply.
4. Remove the three screws securing the high voltage power supply to the chassis.
5. Lift the high voltage power supply and the contact assembly and remove.

6. Remove the contact assembly from the high voltage power supply.



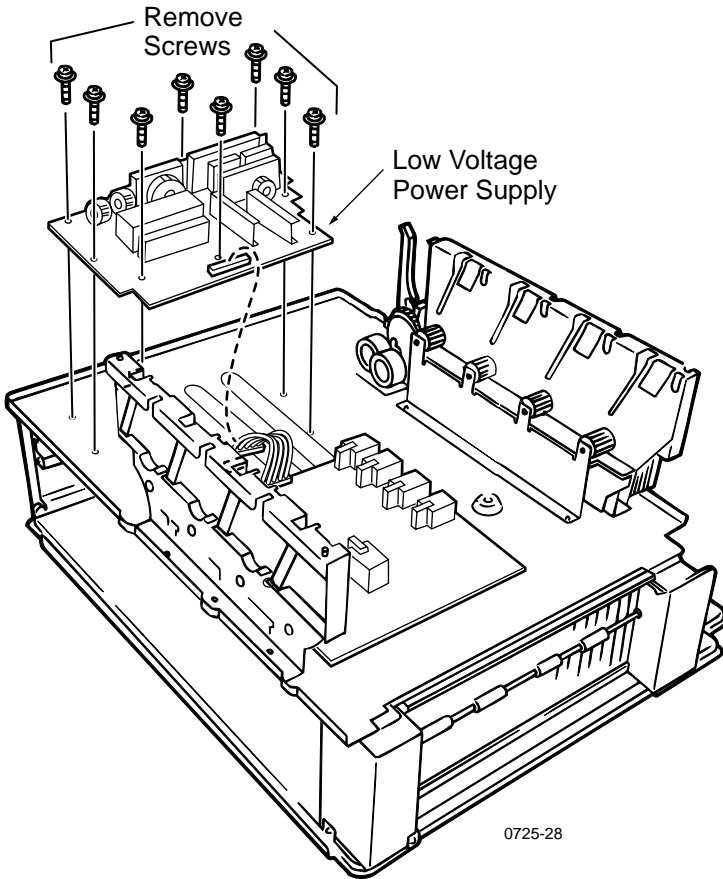
Removing the high voltage power supply

Reverse these steps to install the high voltage power supply. Ensure the plastic insulator plate is positioned correctly under the power supply.

Low voltage power supply

Warning *Switch off the power and disconnect the power cord.*

1. Remove the printer unit chassis as shown on page 100.
2. Disconnect CN1, CN2, CN3, CN5 and CN9 from the low voltage power supply.
3. Disconnect the AC power switch wiring harness interconnect.
4. Remove the eight screws securing the low voltage power supply to the printer.
5. Remove the low voltage power supply to remove.



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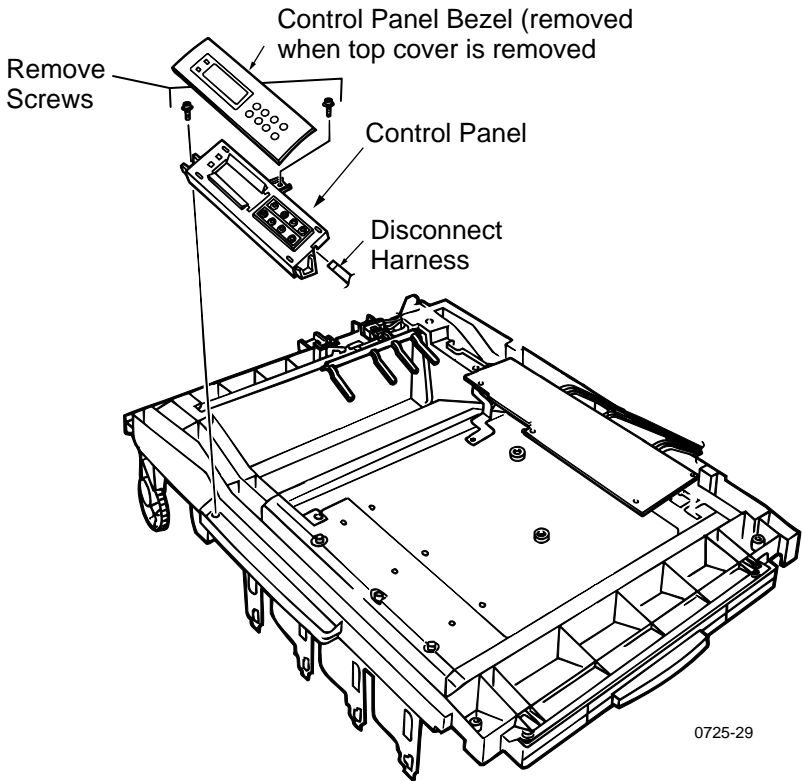
Removing the low voltage power supply

Reverse these steps to install the low voltage power supply.

Control panel

Warning Switch off the power and disconnect the power cord.

1. Remove the top cover as detailed in “Top cover” on page 88.
2. Remove the screw securing the left side of the control panel.
3. Lift the control panel and disconnect CN1 from the back of the panel.
4. Remove the control panel.



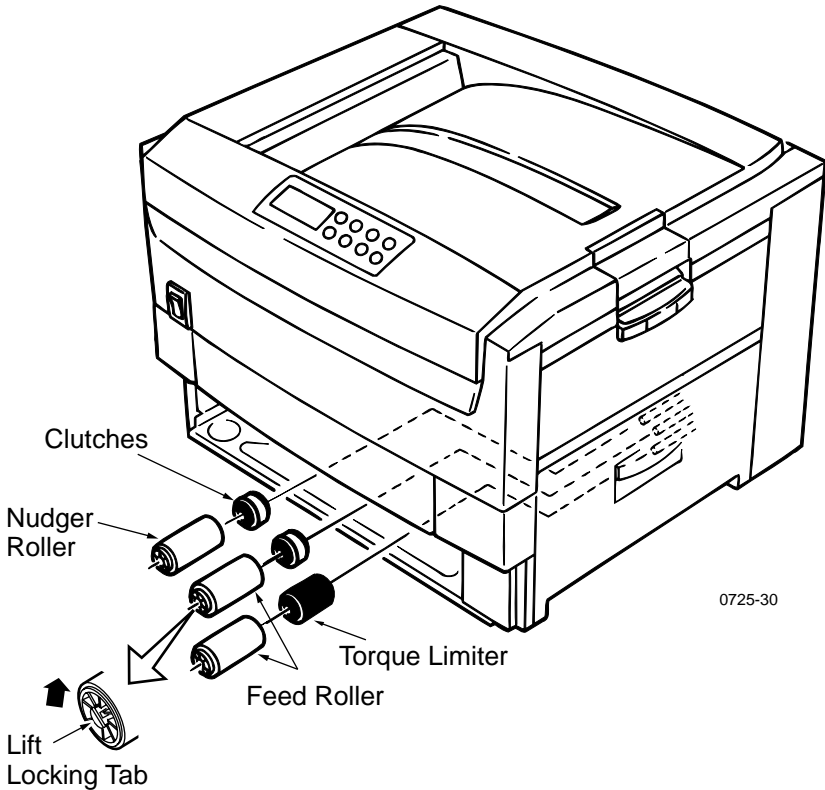
Removing the control panel

Reverse these steps to install the control panel.

Paper feed components

Tray 1 feed roller and nudger roller

1. Remove Tray 1.
2. Release the locking tab on the left end of the feed rollers.
3. Slide the feed rollers to the left and remove. Note the clutch on the shaft behind the upper roller. Note the torque limiter on the shaft behind the lower feed roller.
4. Release the locking tab on the left end of the nudger roller.
5. Slide the nudger roller to the left and remove. Note the clutch on the shaft behind the roller.



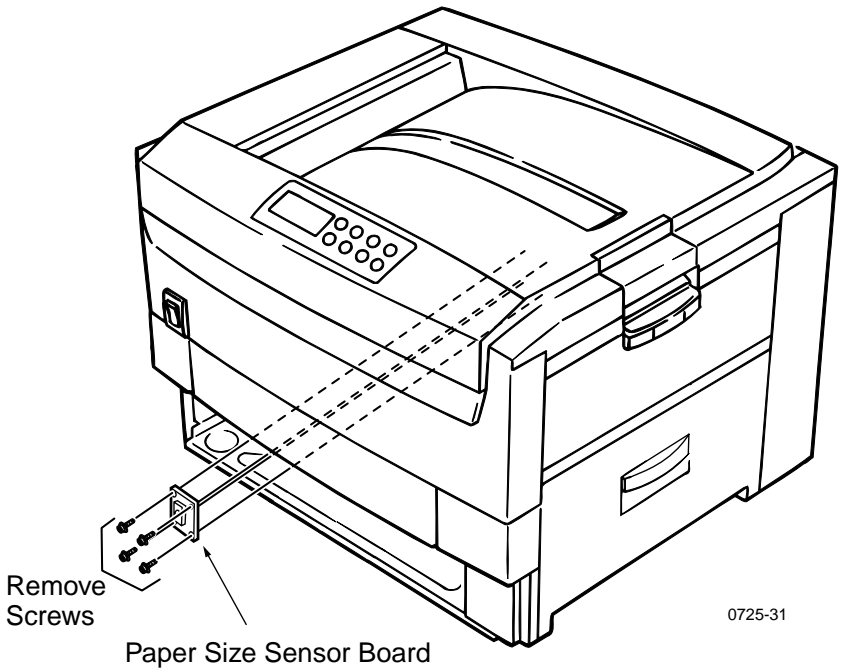
Removing the feed rollers and nudger roller

Reverse these steps to install the feed rollers and nudger roller.

Paper-size sensing board

Warning Switch off the power and disconnect the power cord.

1. Remove paper tray 1.
2. Reaching in through the cavity left by paper tray 1, disconnect the ribbon cable attached to the paper size sensing board.
3. Again reaching in through the cavity left by paper tray 1, remove the four screws securing the paper-size sensing board.



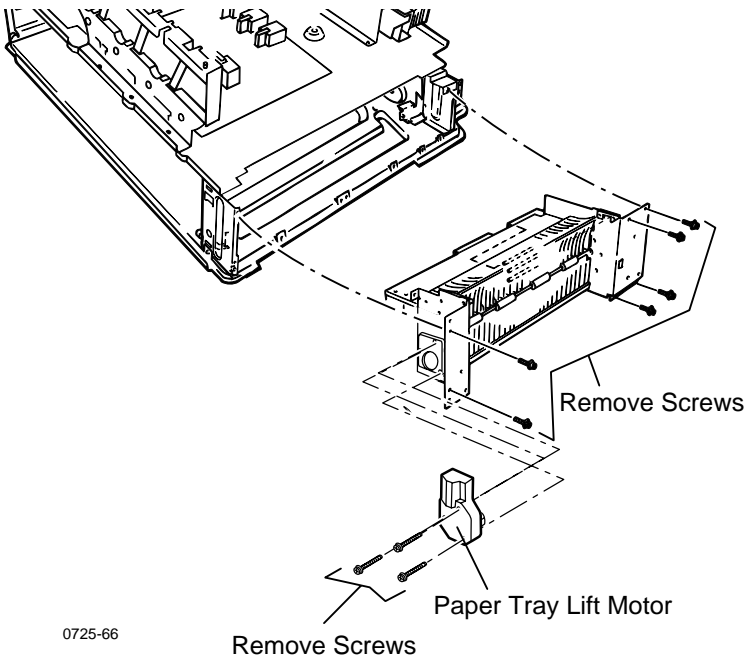
Removing the feed roller and nudger roller

Reverse these steps to install the paper-size sensing board.

Main feeder assembly

Warning *Switch off the power and disconnect the power cord.*

1. Remove the front cover as described on page 90. Also remove the right-front cover.
2. Remove the rear cover as described on page 89.
3. Remove the rear shield plate as described on page 97.
4. Disconnect the seven wiring harnesses leading to the main feeder assembly.
5. Remove the main feeder cross brace; it is held in place with five screws.
6. Remove the six screws securing the main feeder assembly. Pull out the assembly.



Removing the main feeder assembly

Paper tray lift motor

1. With the main feeder assembly removed, disconnect the wiring harness from the paper tray lift motor.
2. Remove the three screws securing the lift motor to the assembly.

Multi-sheet bypass feeder components

Multi-sheet bypass feeder

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Open the front cover.
3. Remove the left-side cover as described in the topic “Left-side cover” on page 91.
4. Remove the rear shield plate “Rear shield plate” on page 97.
5. Remove the upper and lower EMI suppressors on the print engine controller harnesses. (Use a small screwdriver to release the latch on each suppressor). Cut cable ties as necessary.
6. Disconnect the wiring harnesses REG and COVOPN from the print engine controller board.
7. Remove the four black screws securing the multi-sheet bypass feeder top cover. Remove the cover.
8. Open the multi-sheet bypass feeder tray.
9. Remove the two black screws securing the multi-sheet bypass feeder to the printer.
10. Lift and remove the multi-sheet bypass feeder.

Note *If replacing the multi-sheet bypass feeder drive gear, continue with Step 12.*

Drive gear

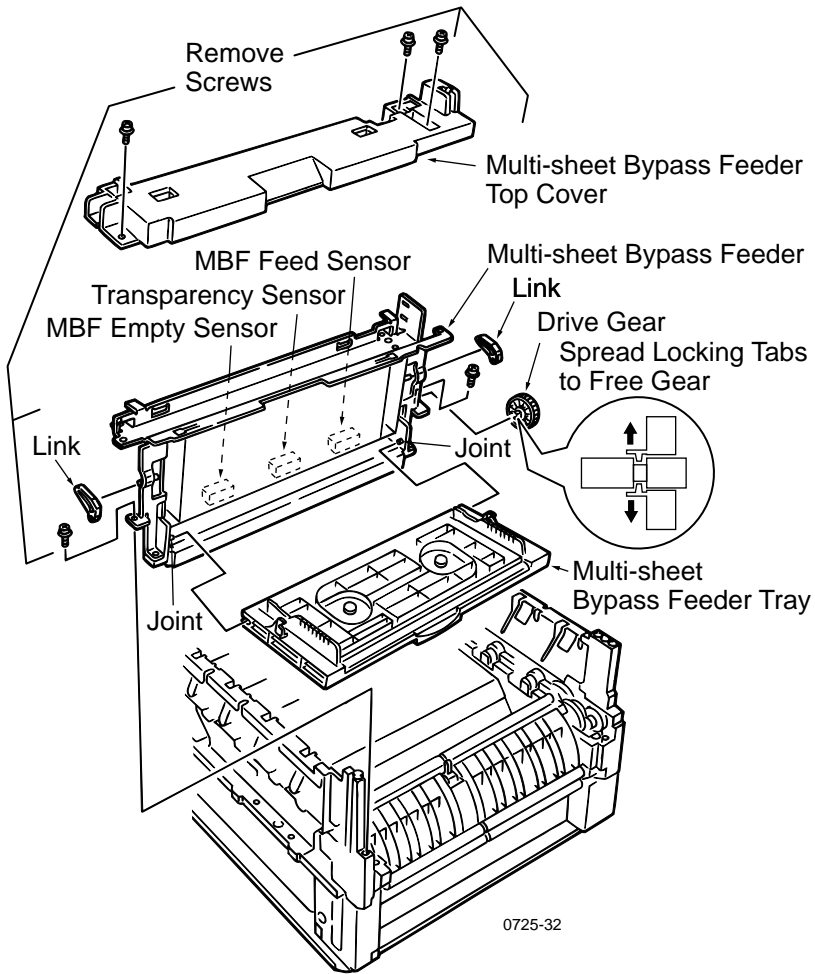
1. Remove the ground strap at the end of the drive gears shaft, it is held in place by one screw.
2. If replacing the drive gear, release the two locking tabs on the inside of the drive gear and remove the gear from the shaft.

Multi-sheet bypass feeder sensors

Disconnect the sensor’s wiring harness from the multi-sheet bypass feeder entrance sensor or the transparency sensor and unclip the sensor from the multi-sheet bypass feeder.

Temperature/humidity sensor board

Disconnect the board’s wiring harness from the board. Remove the screw securing the board in place.



Removing the multi-sheet bypass feeder

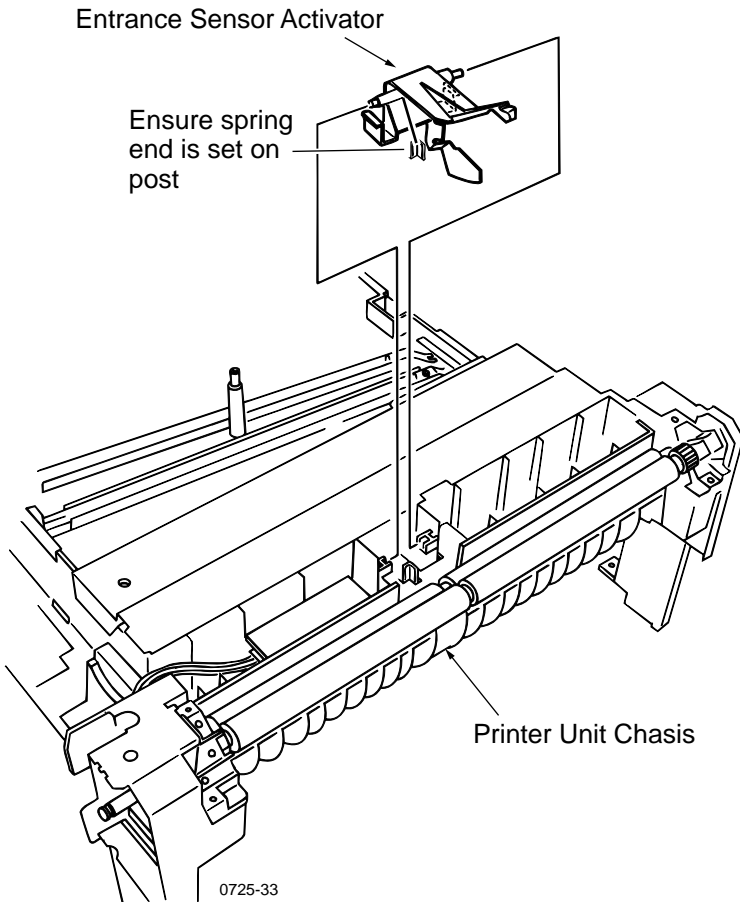
Reverse these steps to install the multi-sheet bypass feeder.

Paper transport components

Tray 1 entrance sensor actuator

Warning *Switch off the power and disconnect the power cord.*

1. Remove the printer unit chassis as detailed in the topic on page 100.
2. Turn the printer unit chassis upside-down and then carefully squeeze the actuator's two locking tabs and remove the sensor.



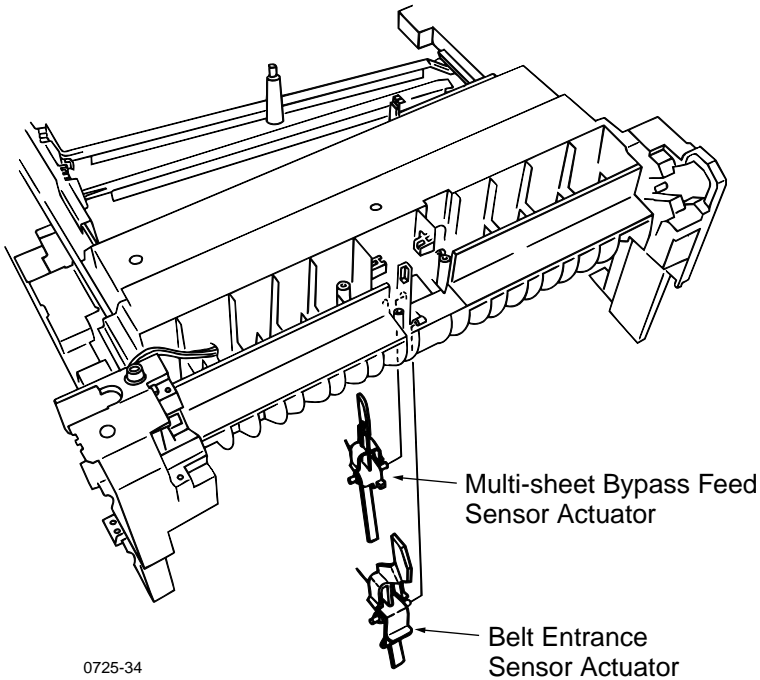
Removing the tray 1 entrance sensor actuator

For reassembly, reinstall the entrance sensor actuator. Ensure the spring arm is on the plastic post. Reverse these steps to install the tray 1 entrance sensor actuator.

Belt entrance and multi-sheet bypass feed sensor actuators

Warning Switch off the power and disconnect the power cord.

1. Remove the printer unit chassis described in the topic “Printer unit chassis” on page 100.
2. Remove the Tray 1 entrance sensor actuator as described in the topic “Tray 1 entrance sensor actuator” on page 121.
3. Remove the entrance sensor board as described in the topic “Entrance sensor board” on page 111.
4. From the bottom, squeeze the two locking tabs securing the belt entrance sensor actuator.
5. Remove the actuator from the top.



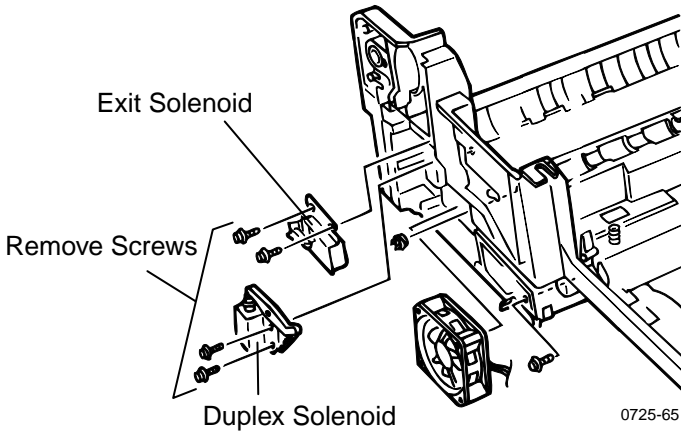
Removing the belt entrance sensor actuator

Reverse these steps to install the actuators. For reassembly, install the sensor actuator and ensure the spring arm is properly located in the notch in the printer unit chassis.

Duplex solenoid and exit solenoid

Warning *Switch off the power and disconnect the power cord.*

1. Remove the front cover as described in “Front cover” on page 90.
2. Remove the front shield plate.
3. Free the front power supply fan.
4. Disconnect the wiring harness of the solenoid you wish to remove.
5. Remove the two screws securing the solenoid you wish to remove.
Remove the solenoid.



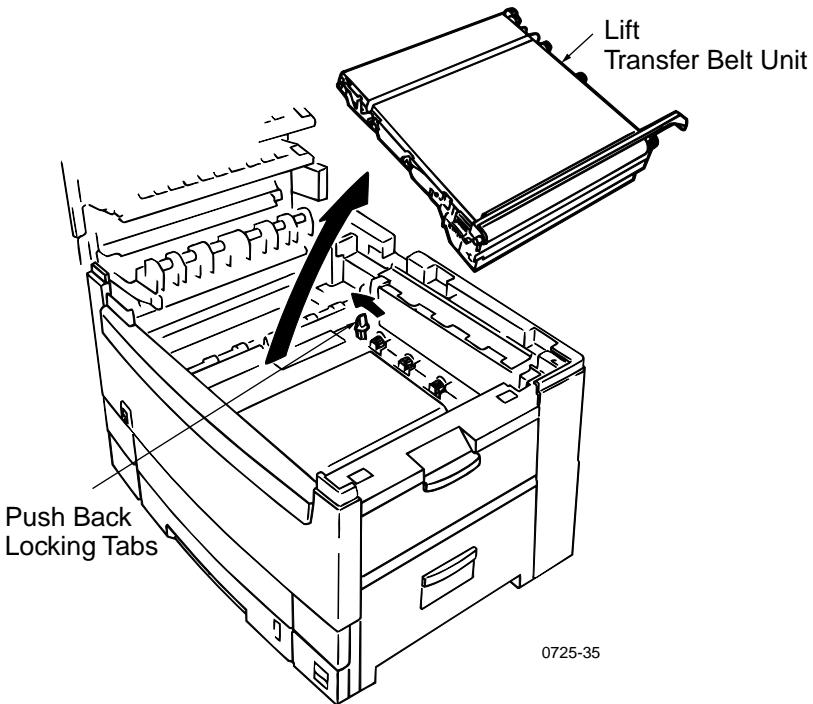
Removing the duplex solenoid and the exit solenoid

Reverse these steps to install the solenoids.

Transfer belt unit

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover.
2. Remove the drum unit caddy. Cover the drum units and store in a safe place.
3. Push the transfer belt unit locking tabs toward the left side of the printer to release the unit.
4. Using the transfer belt unit handle, lift the unit about 1/2 inch (12 mm).
5. Using the handle and the front frame of the transfer belt unit, remove the unit.



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Removing the transfer belt unit

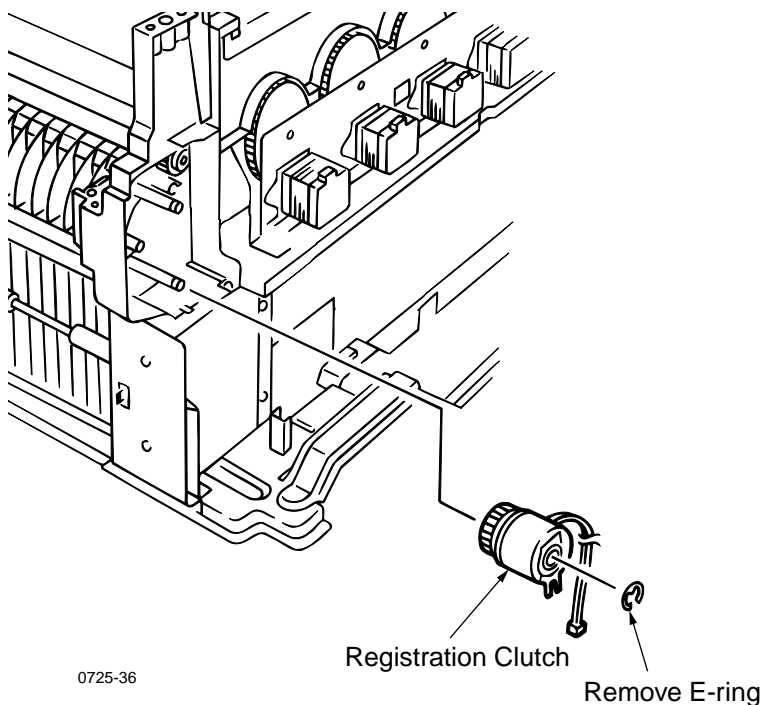
Reverse these steps to install the transfer belt unit. Ensure the transfer belt unit's locking tabs fully engage.

Registration components

Registration clutch

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the rear shield plate as described in the topic “Rear shield plate” on page 97.
3. Disconnect the RCL connector from the printer engine controller board.
4. Remove the screw securing the ground strap to the motor bracket.
5. Remove the E-ring securing the clutch to registration shaft B.
6. Remove the registration clutch.



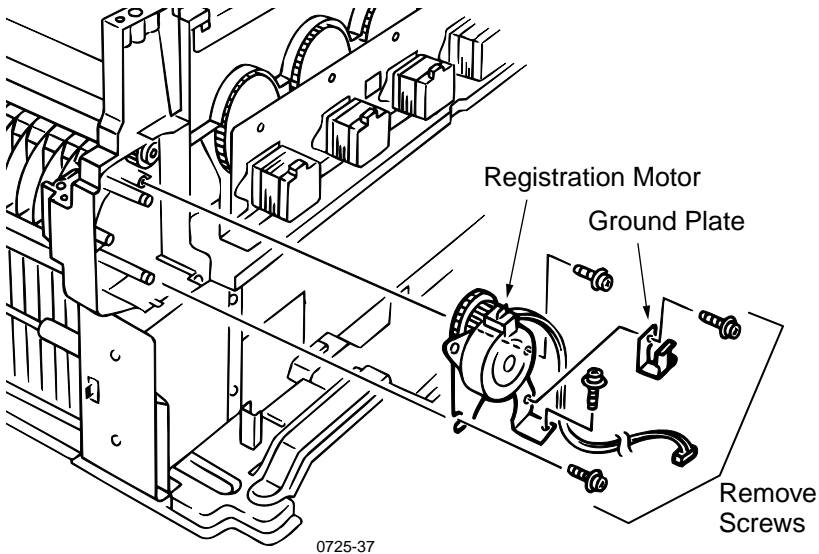
Removing the registration clutch

Reverse these steps to install the registration clutch.

Registration motor assembly

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Open the front cover.
3. Remove the rear shield plate as described in the topic “Rear shield plate” on page 97.
4. Remove the registration clutch as detailed in “Registration clutch” on page 125.
5. Remove the screws securing the motor bracket to the printer.
6. Remove the registration motor assembly.
7. Disconnect the harness from the registration motor.
8. If replacing the motor, remove the two screws securing the motor to the motor bracket.



Removing the registration motor assembly

Reverse these steps to install the registration motor assembly.

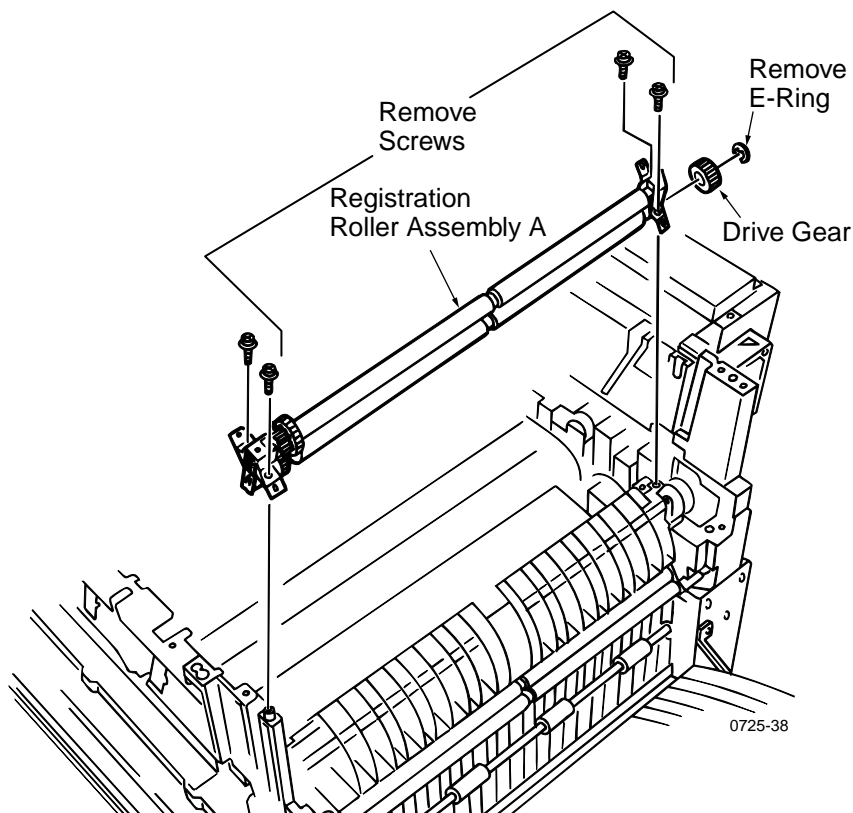
Registration roller assembly A and drive gear

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the transfer belt unit.
3. Remove the rear shield plate as described in the topic “Rear shield plate” on page 97.
4. Remove the multi-sheet bypass feeder as described in the topic “Multi-sheet bypass feeder” on page 119.
5. Remove the four screws securing the registration roller assembly A.
6. Lift the roller assembly and remove.

Note *If replacing the drive gear, continue with Steps 7 and 8.*

7. Remove the E-ring securing the drive gear to the right end of the registration roller shaft.
8. Remove the drive gears.



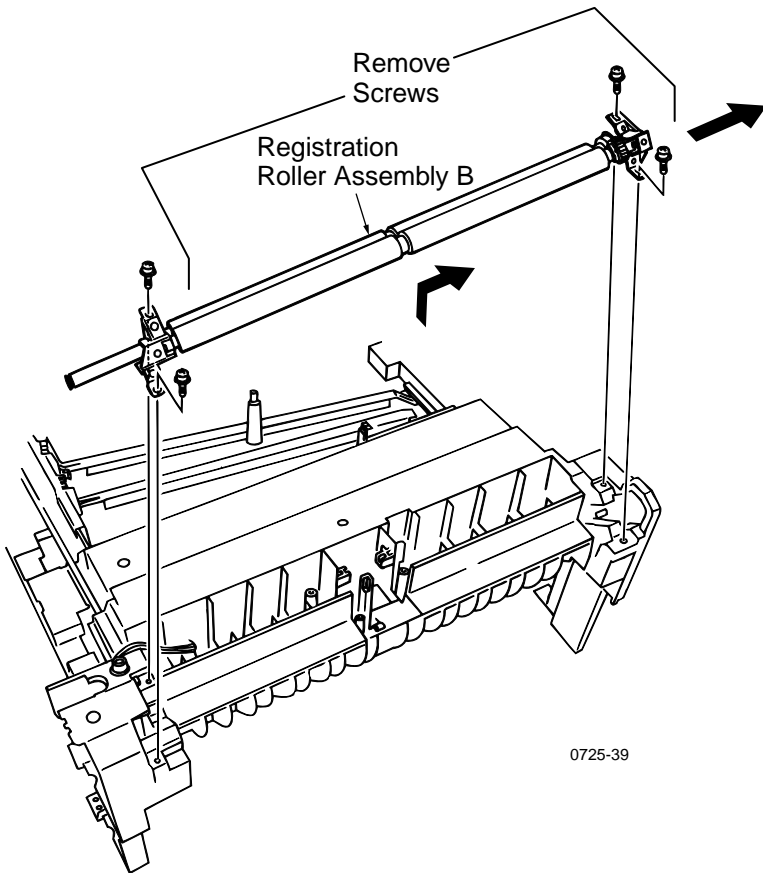
Removing the registration roller assembly A and drive gear

Reverse these steps to install the registration roller assembly A and drive gear. Install the drive gear so that it drives the roller in the direction of paper travel. The blue plastic face should face the outside, next to the E-ring.

Registration roller assembly B

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the printer unit chassis as described in “Printer unit chassis” on page 100.
3. Turn the printer unit chassis upside-down.
4. Remove the four screws securing registration roller assembly B to the underside of the printer unit chassis. Remove the roller.



0725-39

Removing the registration roller assembly B

Reverse these steps to install the registration roller assembly B.

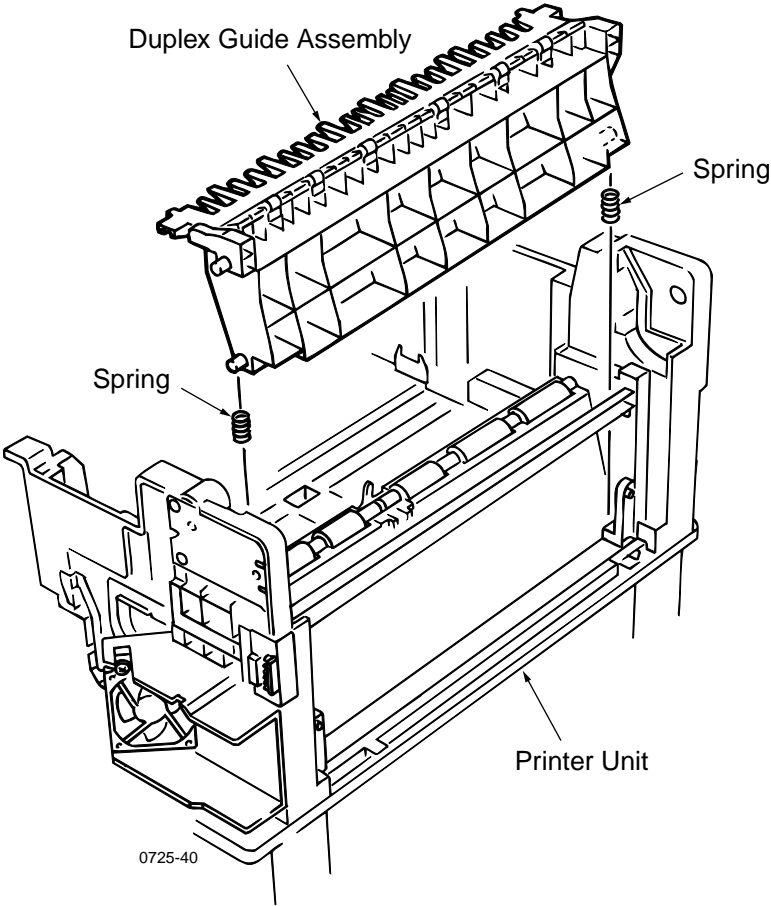
Exit assembly and fuser components

Duplex guide assembly

Warning *Switch off the power and disconnect the power cord.*

1. Remove the top cover. Remove the drum/toner cartridge basket. Cover the basket in a lightproof black bag and store in a safe place.
2. Open the front cover.
3. Remove the left-side cover as described in the topic “Left-side cover” on page 91.
4. Remove the right-side cover as described in the topic “Rear shield plate” on page 97.
5. Remove the right shield plate as described in the topic “Rear shield plate” on page 97.
6. Remove the rear cover, “Rear cover” on page 89.
7. Remove the top cover inner frame as described in the topic “Top cover inner frame and front/rear top cover spring assembly” on page 102.

8. Carefully lift the duplex guide assembly to free it from the printer.



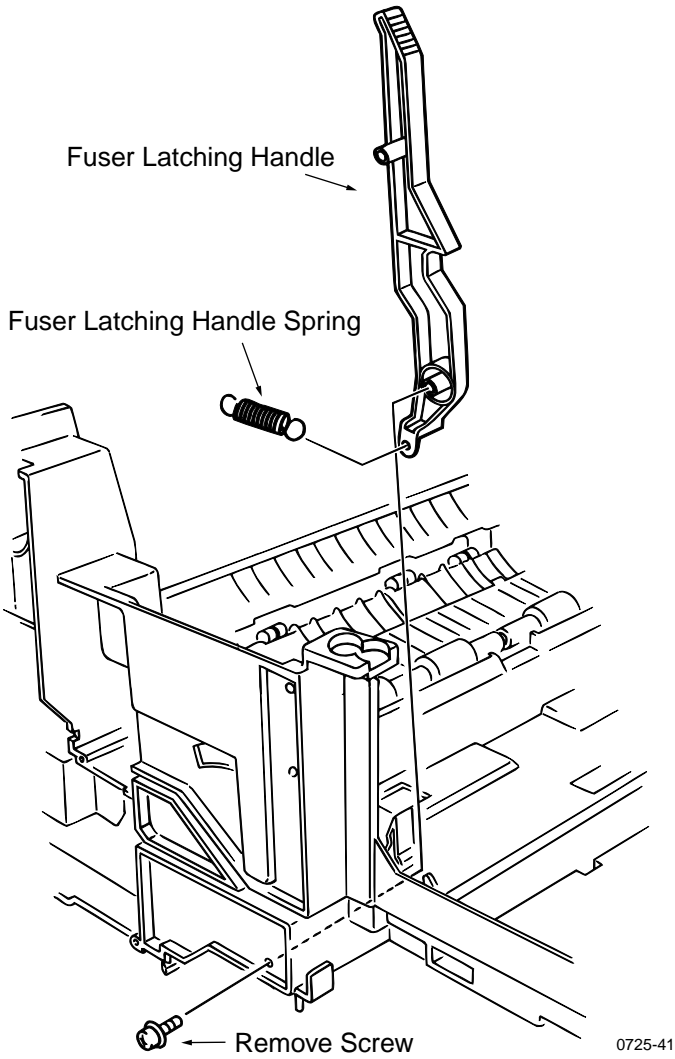
Removing the duplex guide assembly

Fuser latching handle (front)

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the front cover as described in the topic “Front cover” on page 90. Remove the left-side metal shield.
3. Remove the fuser
4. Release the fuser latching handle spring.
5. Remove the screws securing the fuser latching handle to the printer unit chassis.

6. Remove the left fuser latching handle.



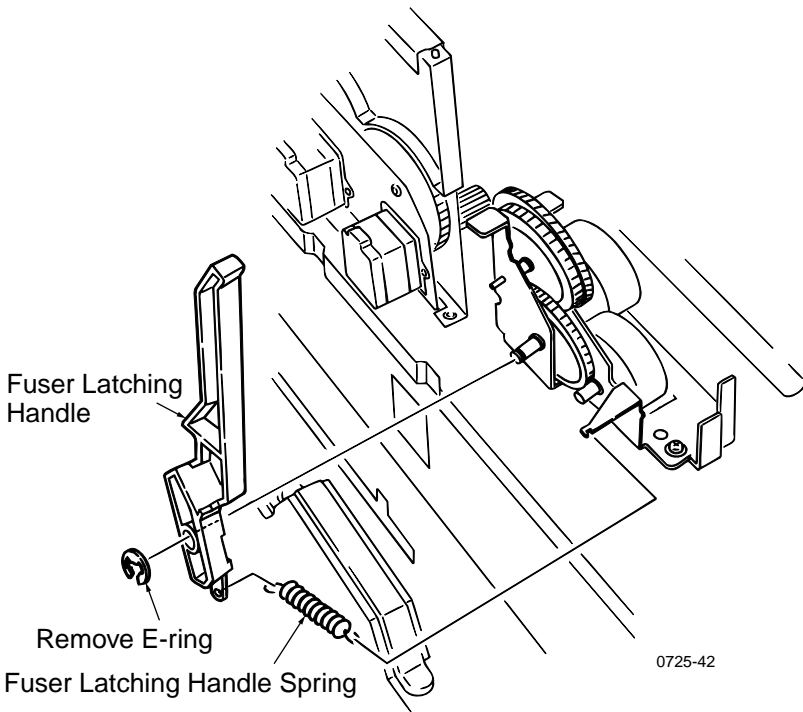
Fuser latching handle (left)

Reverse these steps to install the fuser latching handle (left).

Fuser latching handle (rear)

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the printer unit chassis as described the topic “Printer unit chassis” on page 100.
3. Release the fuser latching handle spring.
4. Remove the E-ring securing the rear fuser latching handle to its shaft.
5. Slide the rear fuser latching handle off of its shaft.
6. Remove the left fuser latching handle.



Fuser latching handle (left)

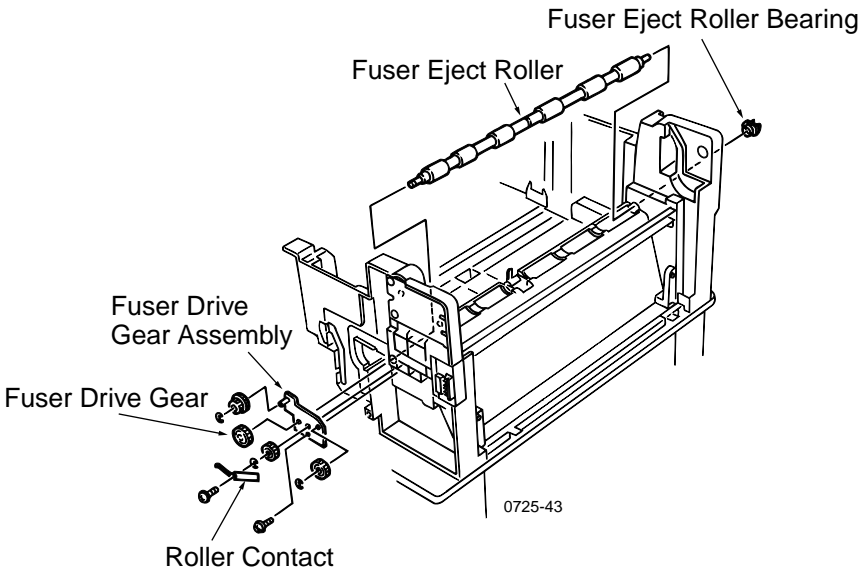
Reverse these steps to install the fuser latching handle (left).

Fuser exit roller

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the front cover as detailed in the topic “Front cover” on page 90.
3. Remove the rear shield plate as described on “Rear shield plate” on page 97.
4. Remove the rear power supply fan and duct as described in the topic “Rear power supply fan” on page 96.
5. Remove the front power supply fan as described in “Front power supply fan” on page 95.
6. Remove the rear shield plate as shown in “Rear shield plate” on page 97.
7. Remove the card cage as detailed in the topic “Electrical card cage” on page 98.
8. Lift and remove the duplex exit gate.
9. At the rear of the fuser exit roller, remove the screw securing the fuser exit roller ground contact.
10. Remove the two screws securing the fuser gear assembly in place. Remove the assembly.
11. Remove the bearing located behind the fuser drive gear.
12. At the front of the fuser exit roller, release the two locking tabs and remove the bearing from the front end of the fuser exit roller shaft.

13. Slide the fuser exit roller to the rear until the front end of the staff is free.



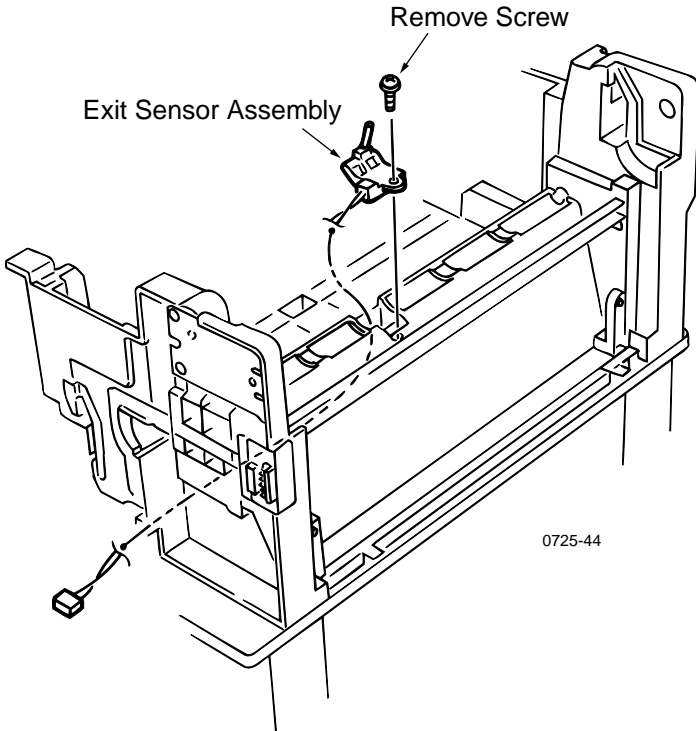
Removing the fuser exit roller

14. Reverse these steps to install the fuser exit roller.

Exit sensor assembly

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the fuser exit roller as detailed on page 135.
3. At the engine controller board, disconnect the connector to the exit sensor assembly (PARTTEMP).
4. Lift and remove the duplex exit gate.
5. Remove the screw securing the exit sensor assembly.
6. Guide the sensor's wiring harness through the chassis as you remove the assembly.



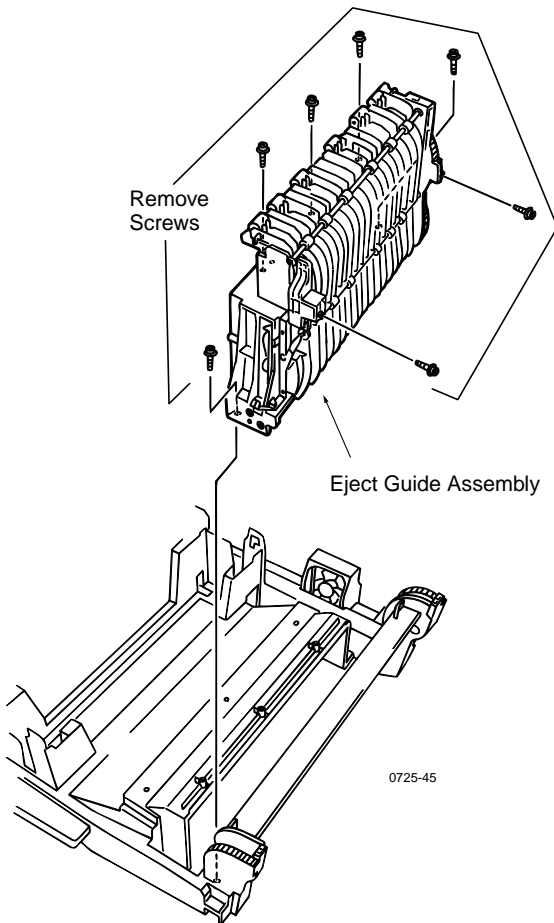
Removing the exit sensor assembly

Reverse these steps to install the exit sensor assembly.

Eject guide assembly

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the top cover inner frame as detailed in “Top cover inner frame and front/rear top cover spring assembly” on page 102.
3. Remove the five screws securing the eject guide assembly to the top cover inner frame.
4. Remove the eject guide assembly.



Removing the eject guide assembly

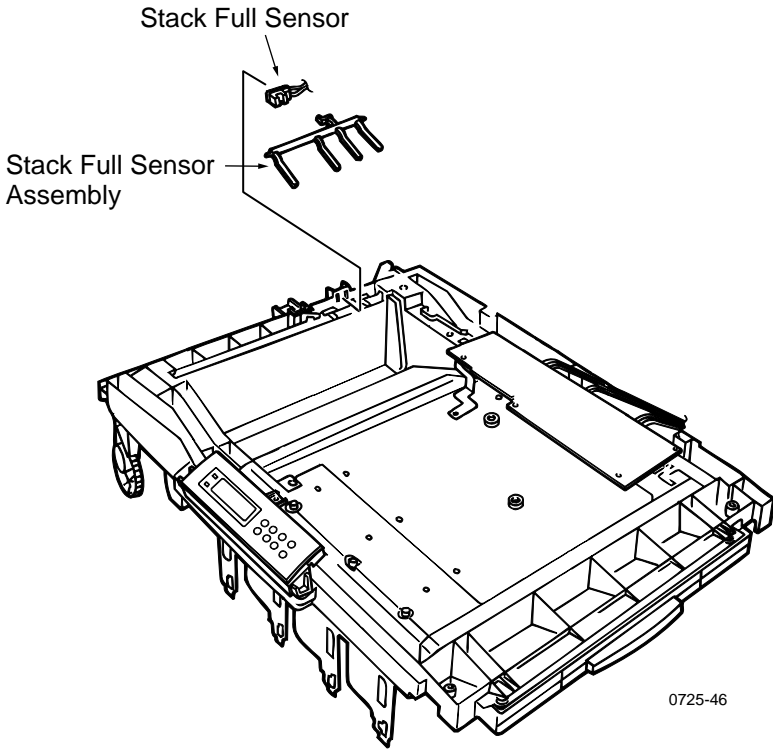
Reverse these steps to install the eject guide assembly.

Stack full sensor

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
1. Remove the top cover.
2. Disconnect the four LED assembly power harnesses from the underside of the toner sensor board.
3. Close the top cover inner unit.
4. Remove the four screws securing the metal shield over the toner cartridge sensor board.
5. Remove the three screws securing the toner sensor board.
6. Rotate the board up to expose the component side of the board.
7. Disconnect the sensor's connector from the toner sensor board.
8. Free the disconnected cable from all cable retainers.
9. Release the four locking tabs securing the stack full sensor, and remove the sensor.

10. Remove the stack full sensor.



Removing the stack full sensor

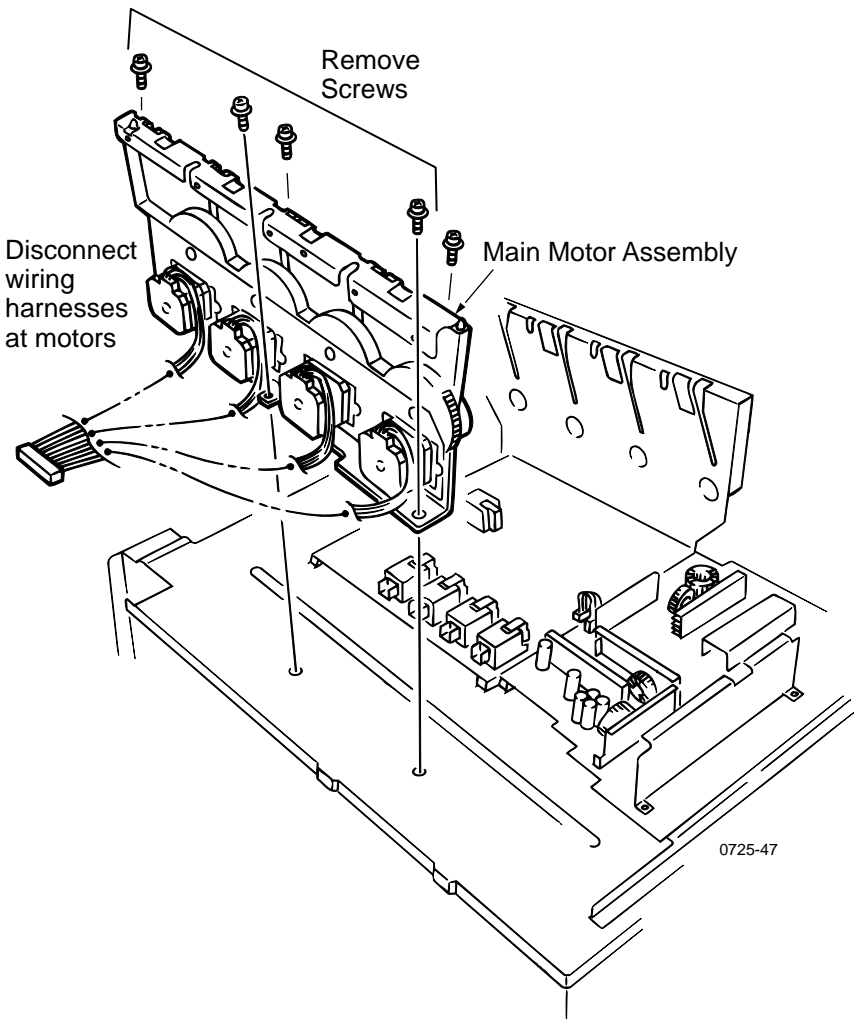
Reverse these steps to install the stack full sensor.

Drive assembly components

Main motor assembly

Note *Switch off the power and disconnect the power cord.*

1. Remove the electrical card cage as detailed in “Electrical card cage” on page 98.
2. Remove the printer unit chassis as detailed on page 100.
3. Disconnect each wiring harnesses from the four imaging drum motors.
4. Remove the five screws securing the main motor assembly to the frame.
5. Lift the front of the main motor assembly about 2 cm (3/4 in.)
6. Carefully guide the ribbon cable through the assembly as you lift the main motor assembly and remove.



Removing the main motor assembly

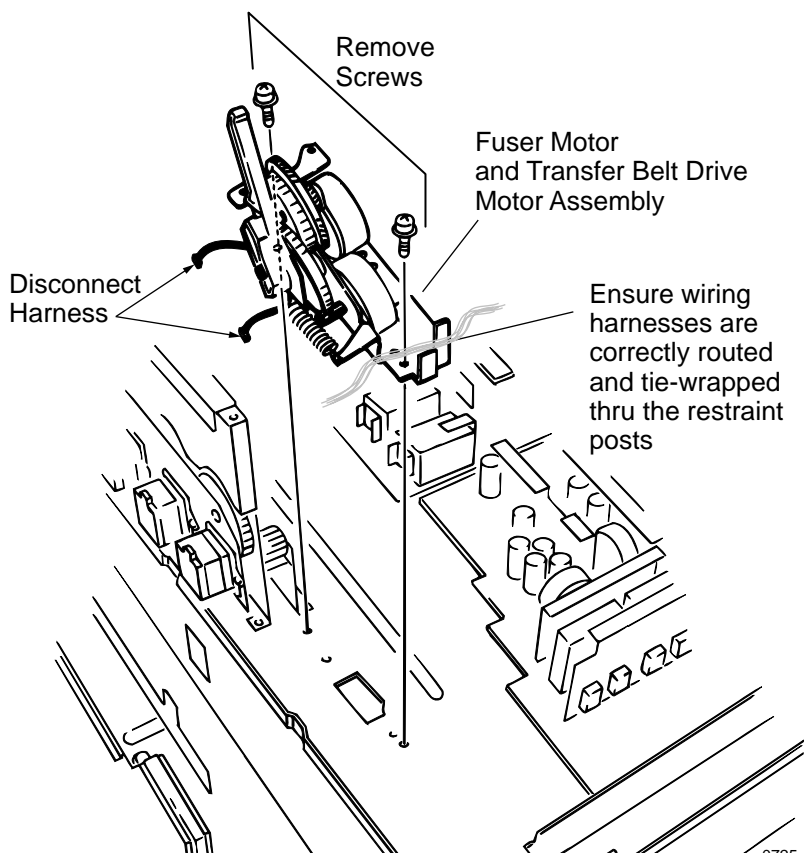
Imaging drum motor

1. Remove the two screws securing the motor to the main motor assembly.
Reverse these steps to install the main motor assembly.

Fuser motor and transfer belt drive motor assembly

Warning Switch off the power and disconnect the power cord.

1. Remove the print unit chassis as detailed in “Printer unit chassis” on page 100.
2. Remove the rear fuser latching handle as described in “Fuser latching handle (rear)” on page 134.
3. Disconnect the two inline connector leading to the fuser motor and belt drive motor assembly.
4. Remove the two screws securing the fuser motor and belt drive motor assembly to the printer frame.
5. Remove the motor assembly.



Removing the fuser motor and transfer belt drive motor assembly

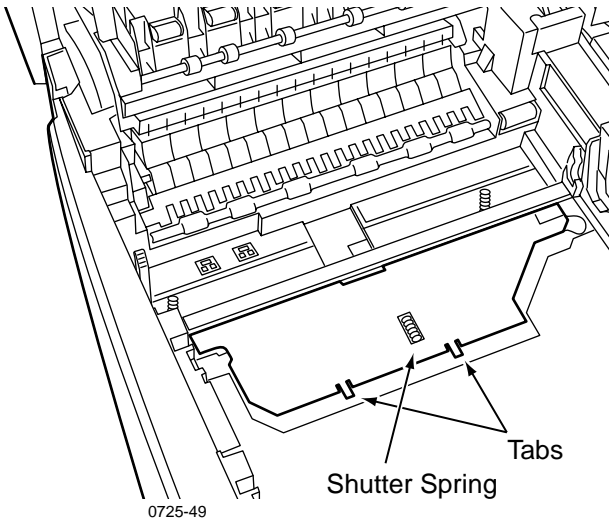
Reverse these steps to install the fuser motor. Ensure the wiring harnesses are correctly routed through the restraints. Refer to “Wiring Diagram” on page 177.

Xerographic components

Shutter plate

Warning Switch off the power and disconnect the power cord.

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the transfer belt unit as explained on page 124.
3. Through the opening in the shutter plate, carefully remove the shutter spring.
4. Open the shutter plate to the full open position.
5. Carefully lift the tabs on the front edge of the shutter plate over the stopper and continue to move it toward the front.
6. Remove the shutter plate.



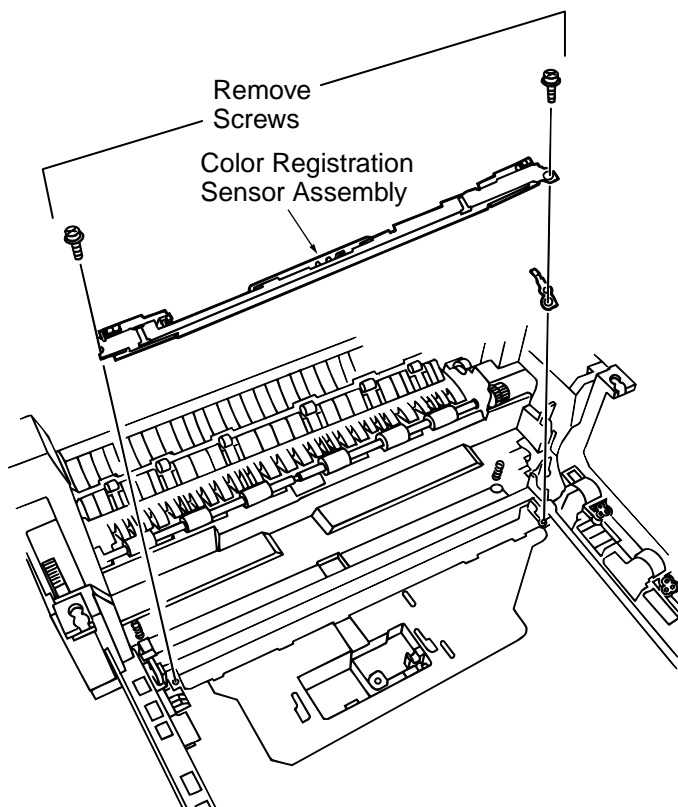
Removing the shutter plate

Reverse these steps to install the shutter plate; ensure all guide pins on the shutter plate are properly aligned when reinstalling. Move the shutter plate to the full closed position to insert the shutter spring.

Color registration sensor assembly

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Remove the transfer belt unit as detailed on page 124.
3. Remove the shutter plate as described in the previous procedure "Shutter plate" on page 144.
4. Remove the two screws securing the color registration sensor assembly.
5. As you lift the assembly, carefully disconnect the two harnesses (RSNS and LSNS) connected to the assembly.
6. Remove the color registration sensor assembly.



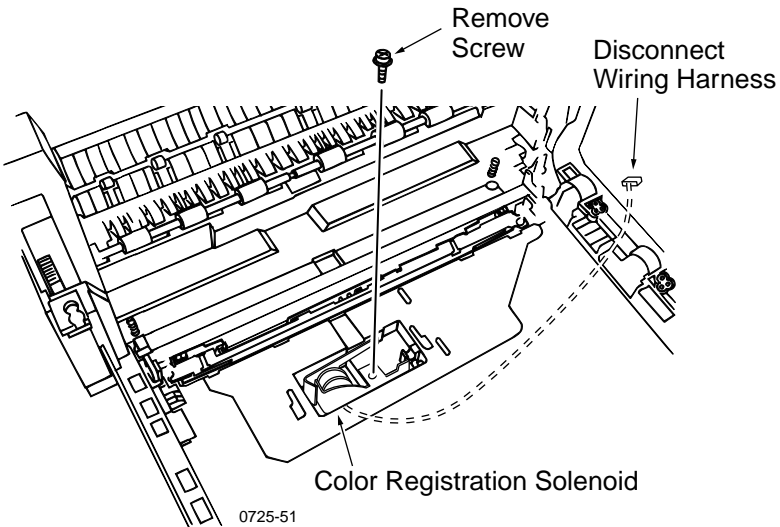
Removing the color registration sensor assembly

Reverse these steps to install the color registration sensor assembly.

Color registration solenoid

Warning *Switch off the power and disconnect the power cord.*

1. Remove the printer unit chassis as shown on page 100.
2. Remove the shutter plate as explained on page 144.
3. Disconnect the shutter solenoid in-line connector.
4. Release the shutter solenoid harness from all cable clamps.
5. Remove the screw securing the shutter solenoid to the printer unit chassis.



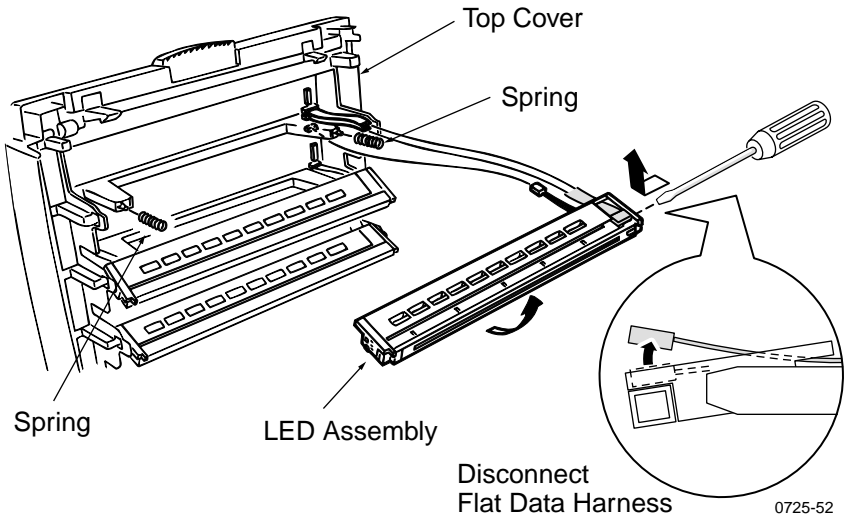
Removing the color registration solenoid

Reverse these steps to install the color registration solenoid.

LED assembly

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Carefully disconnect the flat data harnesses from the LED assembly by inserting a small, flat-blade screwdriver through the hole in the end of the LED assembly and lifting up on the connector. Free the harnesses from the LED assembly.
3. Disconnect the LED assembly's power harness from the toner sensor board.
4. Push the LED assembly against its springs and rotate the LED assembly until its locking tabs align with the slots in the frame.
5. Starting with the front end of the LED assembly, carefully spread the mounting frame outward slightly to free the LED assembly.
6. Remove the LED assembly.



Removing an LED assembly

Reverse these steps to install the LED assembly.

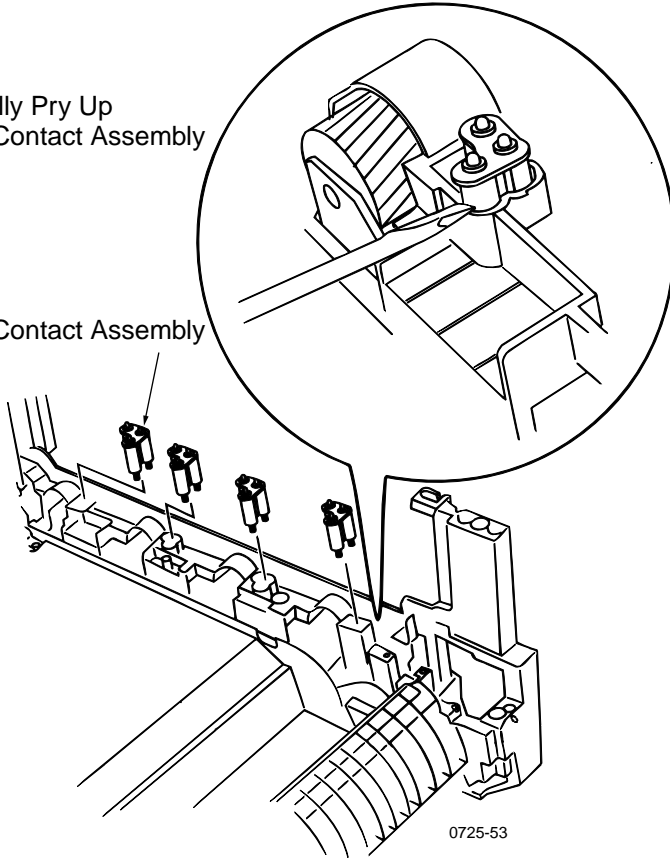
Drum contact assembly

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Use a small screwdriver to carefully pry the drum contact assembly from the printer chassis.

Carefully Pry Up
Drum Contact Assembly

Drum Contact Assembly



Removing the drum contact assembly

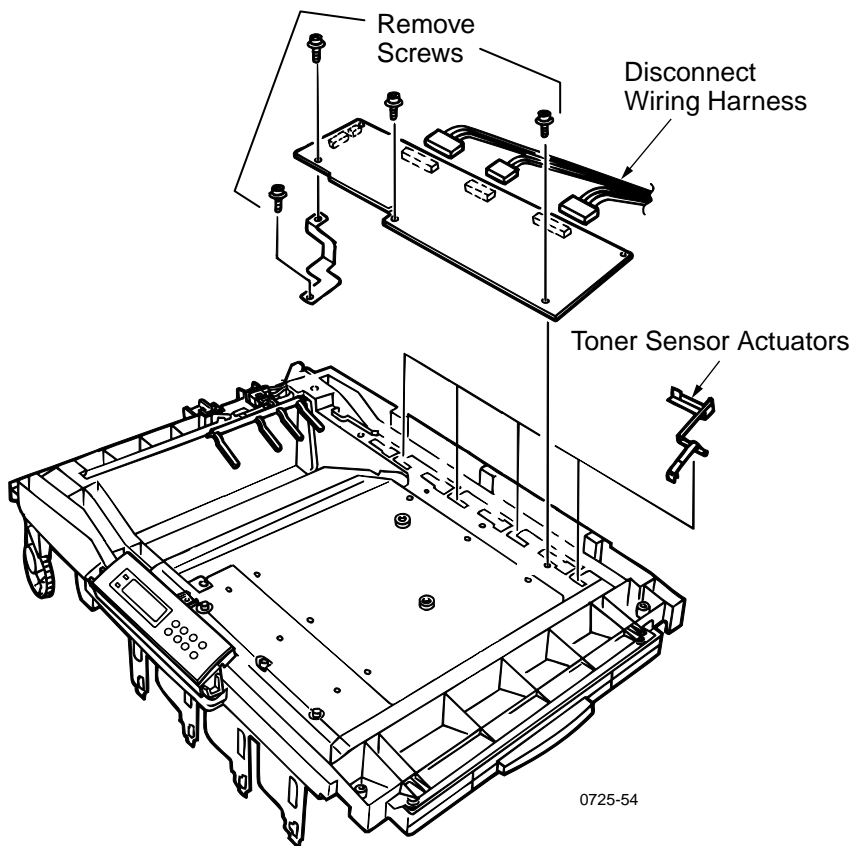
Reverse these steps to install the drum contact assembly.

Toner sensor actuators

Warning *Switch off the power and disconnect the power cord.*

1. Open the top cover. Remove the drum/toner cartridges. Place them in a lightproof black bag to protect the drum units from light and store in a safe place.
2. Disconnect the four LED power harnesses from the bottom of the toner sensor board.
3. Close the top cover inner unit.
4. Remove the three screws securing the toner sensor board and the insulator.
5. Rotate the board up to expose the component side of the board.
6. Open the top cover inner unit.
7. From the underside of the top cover inner unit, use a small screwdriver to carefully push up the arms of the sensor actuator until they are free.

8. Remove the sensor actuator.



Removing the toner sensor actuators

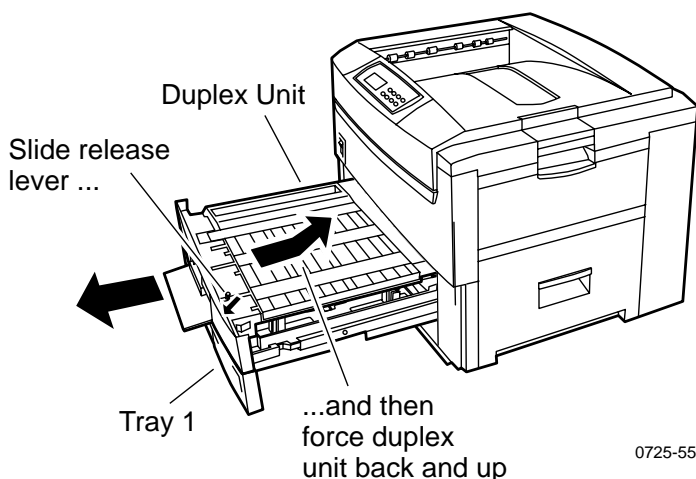
Reverse these steps to install the toner sensor actuators. When replacing the toner sensor board, insure all harnesses are in the cable channels.

Duplex unit

Warning *Switch off the power and disconnect the power cord.*

Note *The duplex unit and Tray 1 are interlocked. The duplex unit cannot be removed without the paper tray.*

1. Open the duplex unit release cover.
2. Pull the duplex unit release handle and pull out the duplex tray and Tray 1 together until they stop.
3. Lift the front of the duplex unit and tray 1 and pull the right side out slightly to free them from the printer.
4. Slide the release lever to raise the two spring-loaded guide pins that align the duplex unit to tray 1. The release lever is located next to the right guide pin on the inside lip near the front of the duplex unit.
5. Holding tray 1 still, force the duplex unit backwards about 5 cms (2 ins.) Lift the duplex unit to separate it from the paper tray.



Removing the duplex unit

Reverse these steps to install the duplex unit.

FRU List

This topic provides a list of field replaceable units for the printer.

Changes to Xerox instruments are made to accommodate improved components as they become available. It is important when ordering parts to include the following information:

- Component's part number.
- Instrument type or number.
- Instrument serial number.
- Modification number, if any.

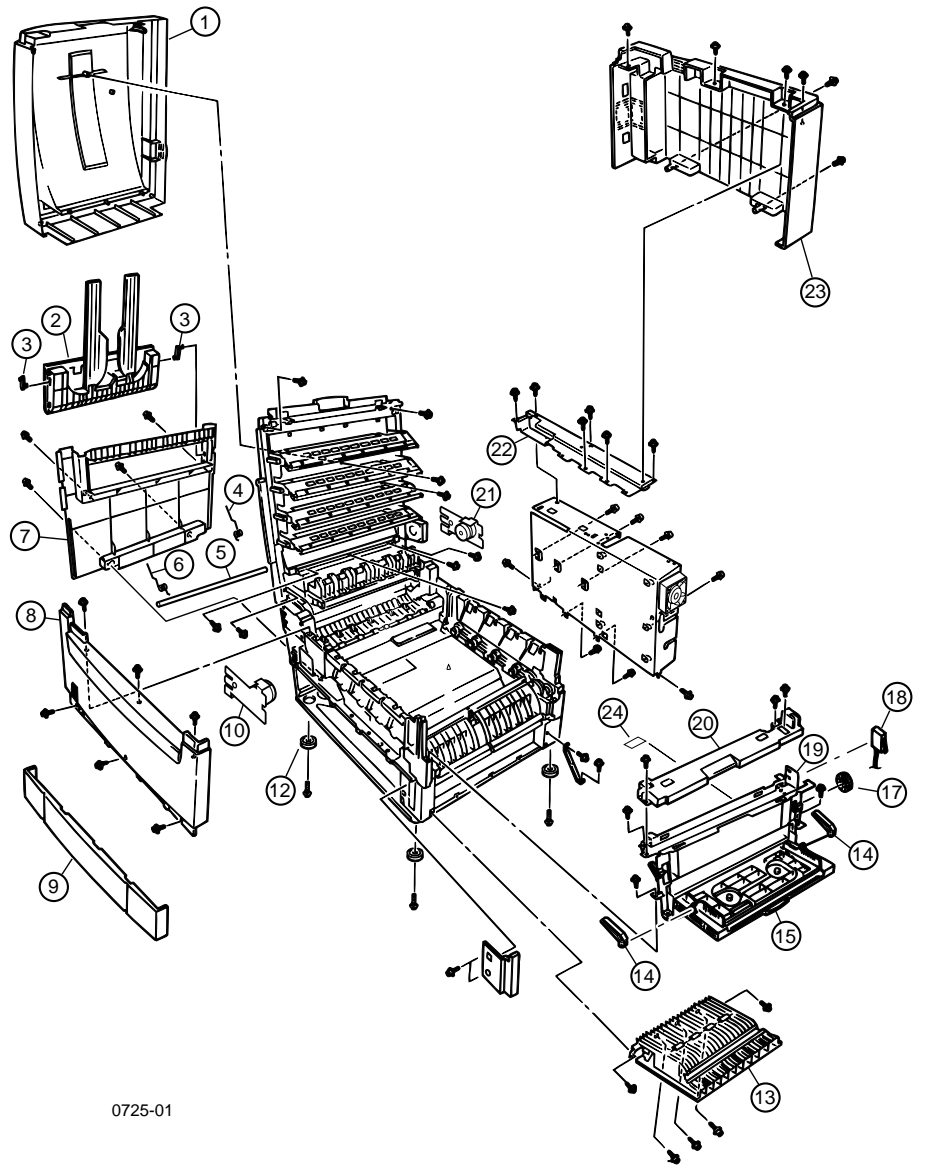
Using the parts list

- The numbers shown in each illustration correspond to the parts list number for that illustration.
- The capital letters “C”, “E”, and “S” shown in an illustration stand for C-ring, E-ring, and Screw, respectively.
- A shaded triangle *t* in an illustration indicates the item is part of an assembly.
- The notation “with X~Y” following an part name indicates an assembly that is made up of components X through Y. For example, “1 (with 2~4)” means part 1 consists of part 2, part 3, and part 4.
- An asterisk * following a part name indicates the page contains a note about this part.
- The notation “J1<>J2 and P2” is attached to a wire harness. It indicates that connector jack 1 is attached to one end of the wire harness and connector jack 2 is attached to the other end that is plugged into plug 2.
- A notation “(part of item 1.1)” indicates that the part is included with item 1.2.1 (PL1.2, line item 1).

Table 1 FRU parts list of the printer cabinet and top cover

Fig 1 parts	Part number	Name and description
1	116-0998-00	Top Cover/Face Down Stack Bin
2	116-1083-00	Side Output Tray/Face Up Stack Tray
3	116-1061-00	Side Output Tray Link
4	116-1052-00	Top Cover Hinge Spring - Rear
5	116-1053-00	Top Cover Hinge Shaft
6	116-1051-00	Top Cover Hinge Spring - Front
7	116-1006-00	Left Side Cover
8	116-1004-00	Front Cover
9	116-1039-00	Duplex Slot Cover
10	116-1055-00	Top Cover Damper - Front
12	116-1008-00	Foot
13	116-1084-00	Right Side Door
14	012E12690	Multi-Sheet Bypass Links (Front & Rear)
15	116-1017-00	Multi-Sheet Bypass Tray
17		Multi-Sheet Bypass Drive Gear (part of 116-1037-00 Gear Kit)
18	116-1025-00	Top Cover Interlock Switch
19	116-1016-00	Multi-Sheet Bypass Pick Assembly
20	116-1018-00	Multi-Sheet Bypass Feeder Top Cover
21	116-1056-00	Top Cover Damper - Rear
22	116-1059-00	Top Cable Shield
23	116-1005-00	Rear Cover
24	5602000P00 01	Temperature/Humidity Sensor Board





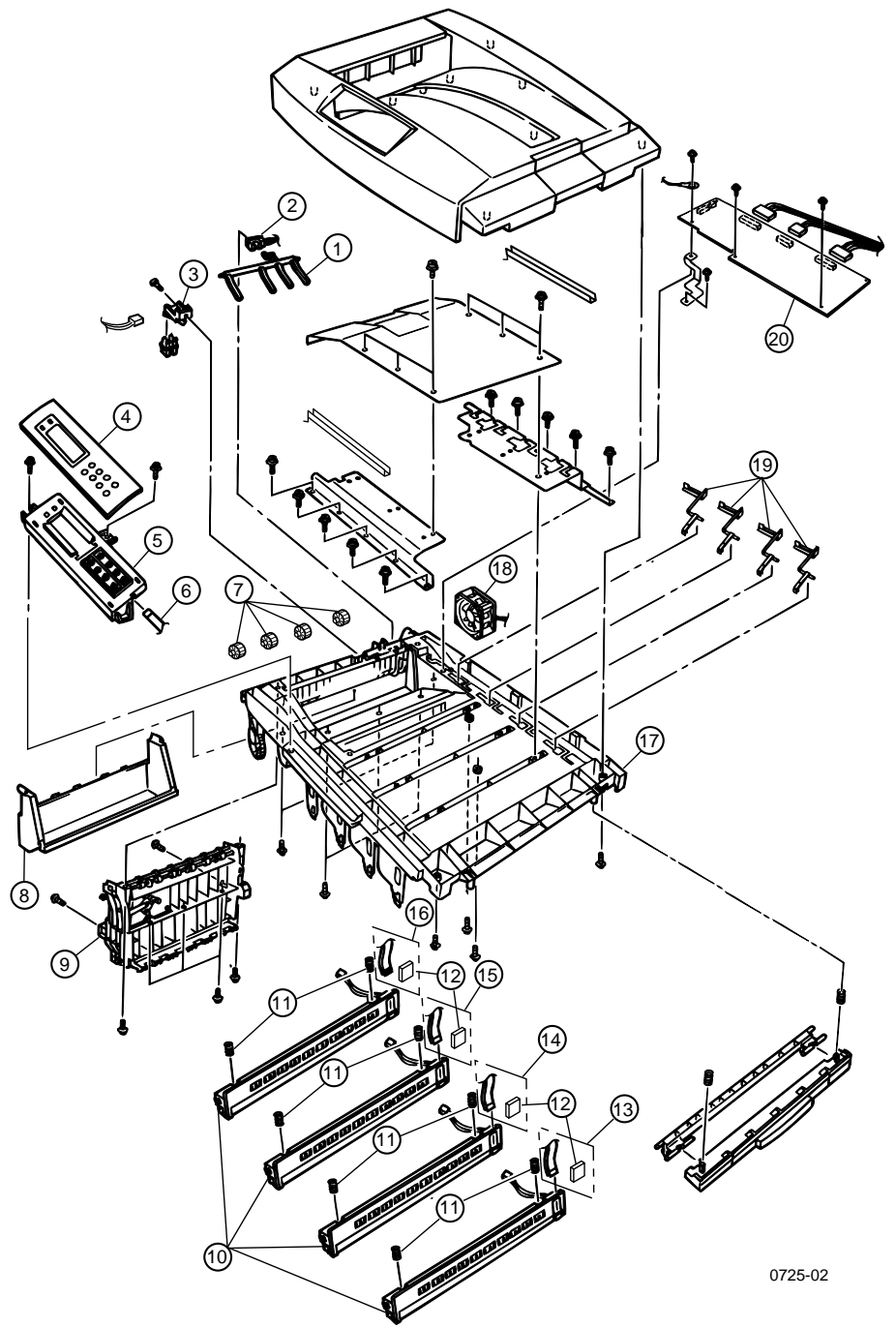
0725-01

Figure 1 Cabinet and top cover FRUs

Table 2 FRU part list of the top cover inner frame

Fig 2 parts	Part number	Name and description
1		Exit/Stack Full Sensor Actuator (part of 116-1036-00 Flag Kit)
2	116-1000-00	Exit/Stack Full Sensor
3	116-1054-00	Top Output (Face-down) Eject Sensor Assembly
4	116-1082-00	Control Panel Bezel
5	116-1003-00	Control Panel Assembly
6		Control Panel Tape Harness (part of 116-1035-00 Harness Kit)
7		Idler Rollers/Face Up Side Tray (part of 116-1038-00 Hardware Kit)
8	116-1057-00	Top Cover/Stack Bin - Inner Cover
9	116-1002-00	Eject Guide Assembly
10	116-0999-00	LED Bar Assembly
11		LED Assembly Spring (part of 116-1038-00 Hardware Kit)
12		26-pin LED Connector (part of 116-1035-00 Harness Kit)
13		Black LED Wiring Harness (part of 116-1035-00 Harness Kit)
14		Yellow LED Wiring Harness (part of 116-1035-00 Harness Kit)
15		Magenta LED Wiring Harness (part of 116-1035-00 Harness Kit)
16		Cyan LED Wiring Harness (part of 116-1035-00 Harness Kit)
17	116-1001-00	Top Cover Inner Frame
18	116-1024-00	Fuser Fan
19		Toner Cartridge Sensor Actuator (part of 116-1036-00 Flag Kit)
20	140E45610	LED/Toner Control Board





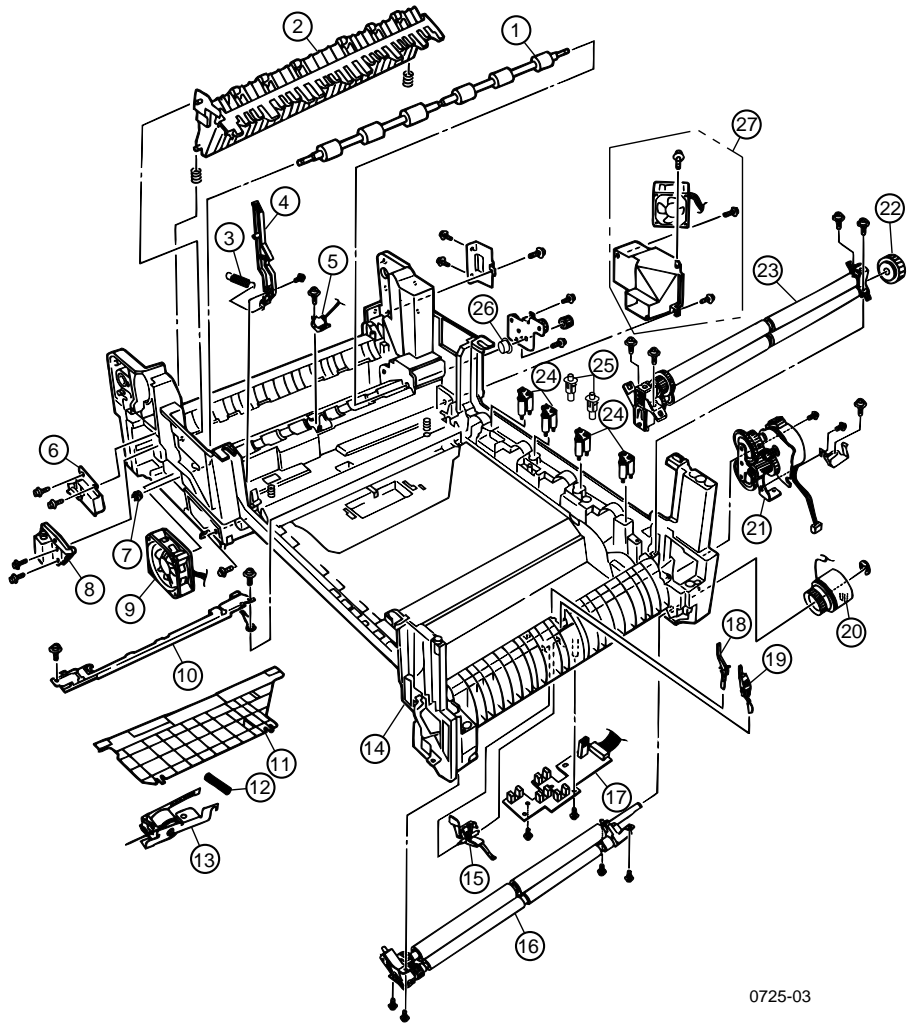
0725-02

Figure 2 Top cover FRUs

Table 3 FRU part list of the printer chassis (1 of 2)

Fig 3 parts	Part number	Name and description
1	116-1022-00	Fuser Exit Roller
2	116-1019-00	Duplex Guide Assembly
3		Fuser Latch Handle Spring (part of 116-1038-00 Hardware Kit)
4	003E55690	Fuser Latching Handle (Front)
5	130K65670	Fuser Exit Sensor Assembly
6	116-1021-00	Top/Side Output Solenoid Assembly
7		Fuser Exit Roller Bushing (Front) (part of 116-1038-00 Hardware Kit)
8	116-1020-00	Duplex Gate Solenoid Assembly
9	116-1066-00	Front Power Supply Fan
10	116-1032-00	Color Registration Sensor Assembly
11	116-1030-00	Color Registration Plate Shutter
12		Registration Shutter Spring (part of 116-1038-00 Hardware Kit)
13	121K26000	Color Registration Shutter Solenoid
14	116-1087-00	Printer Chassis
15		B Registration Entrance Sensor Flag (part of 116-1036-00 Flag Kit)
16	116-1015-00	Registration Roller Assembly (B)
17	160K79190	Entrance Sensor Board
18		A Registration Exit Sensor Actuator (Belt Entrance) (part of 116-1036-00 Flag Kit)
19		A Registration Entrance Sensor Actuator (part of 116-1036-00 Flag Kit)
20	121K25810	Registration Clutch
21	116-1012-00	Registration Motor Assembly
22		Registration Drive Gear A (part of 116-1037-00 Gear Kit)
23	116-1014-00	Registration Roller Assembly (A)
24	115K01970	Drum Contact Assembly
25	116-1068-00	Transfer Contact Assembly
26		Fuser Exit Roller Bushing (Back) (part of 116-1038-00 Hardware Kit)
27	116-1028-00	Rear Power Supply Fan





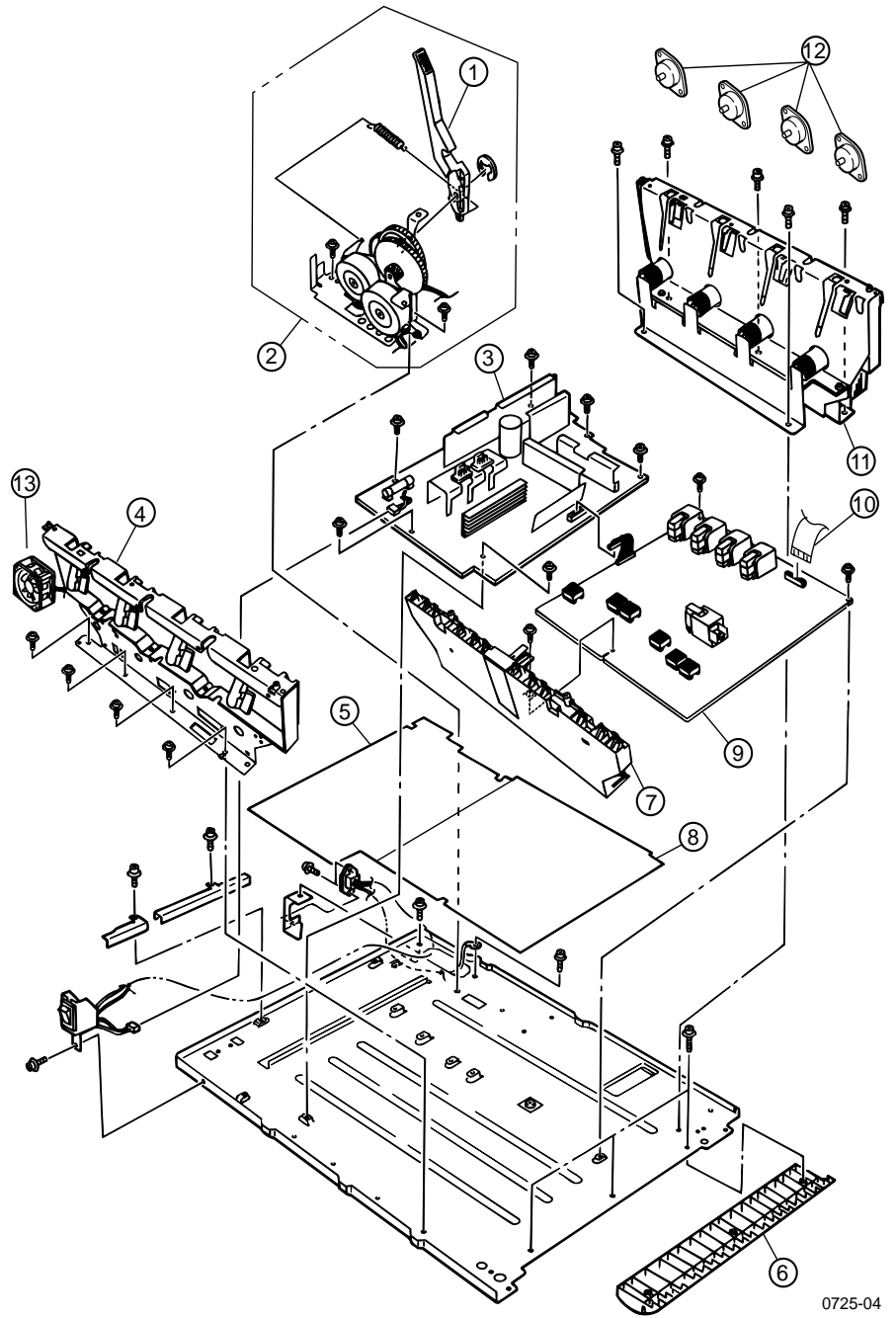
0725-03

Figure 3 Printer chassis FRUs (1 of 2)

Table 4 FRU of the printer chassis (2 of 2)

Fig 4 parts	Part number	Name and description
1	003E55700	Fuser Latching Handle (Rear)
2	116-1011-00	Transfer Belt Motor Assembly
3	116-1026-00 116-1027-00	Low Voltage Power Supply (115 VAC) Low Voltage Power Supply (220 VAC)
4	116-1029-00	Front Plate Assembly
5	116-1034-00	Low Voltage Power Supply Insulator
6	116-1067-00	Duplex Exit Paper Guide
7	115K01960	Rear Contact Assembly
8	116-1033-00	High Voltage Power Supply Insulator
9	105K25120	High Voltage Power Supply
10		High Voltage Tape Harness (part of 116-1035-00 Harness Kit)
11	116-1063-00	Back Plate Assembly w/ Imaging Drum Drive Gears
12	116-1064-00	Imaging Drum Motor
13	41431602	Chassis fan





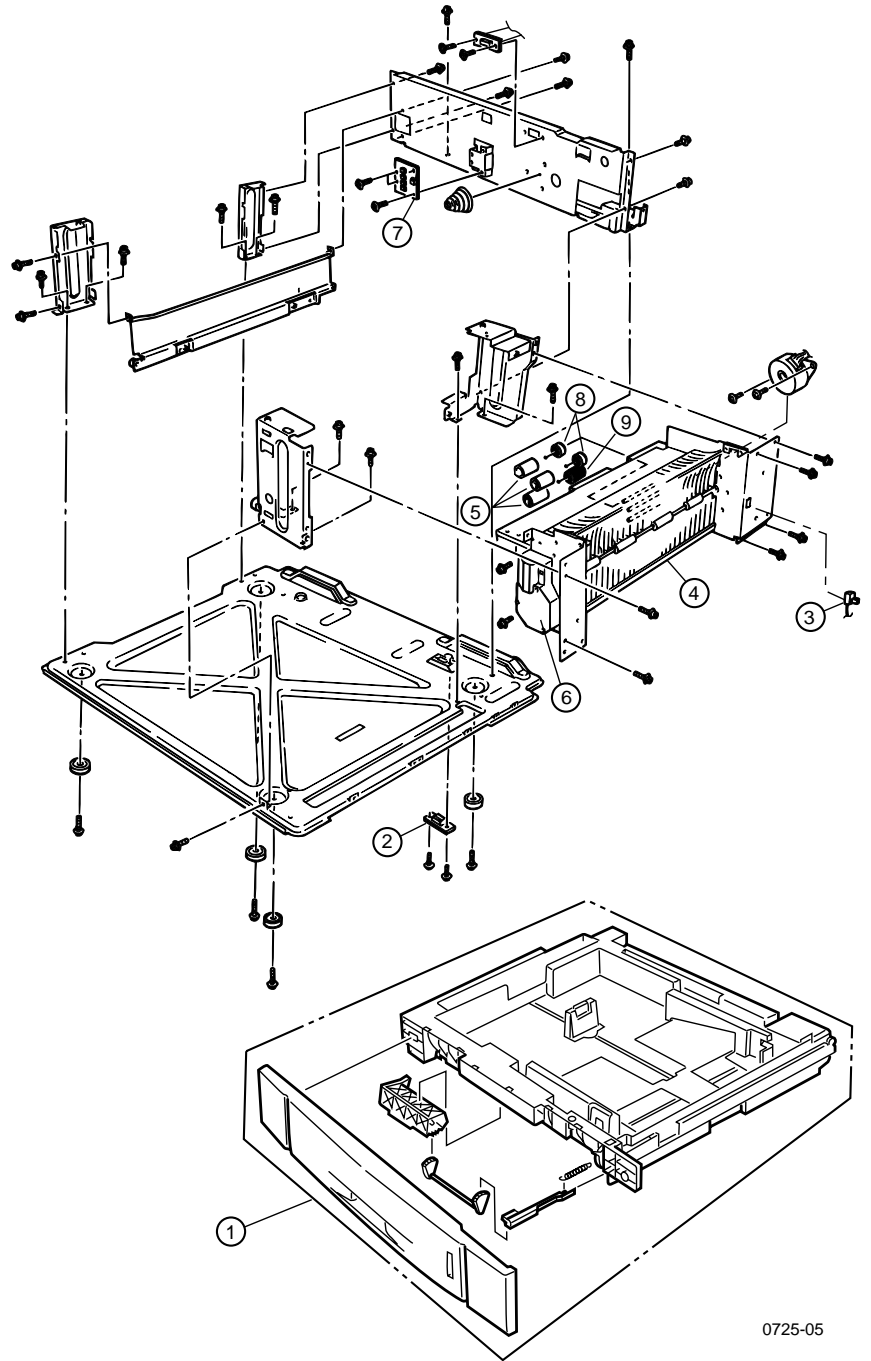
0725-04

Figure 4 Printer chassis FRUs (2 of 2)

Table 5 FRU of the paper tray and paper tray guides

Fig 5 parts	Part number	Name and description
1	116-1009-00	Universal Paper Tray
2	116-1085-00	Connector with Harness
3	116-1065-00	Right Cover Interlock Switch
4	116-1086-00	Main Feeder Assembly
5	116-1062-00	Paper Feed Roller
6	116-1010-00	Media Plate Lift Motor
7	116-1007-00	Paper Size Sensing Board (includes Ribbon Harness)
8	41402901	Roller Clutches (Bearing, One-Way)
9	41406601	Roller Torque Limiter



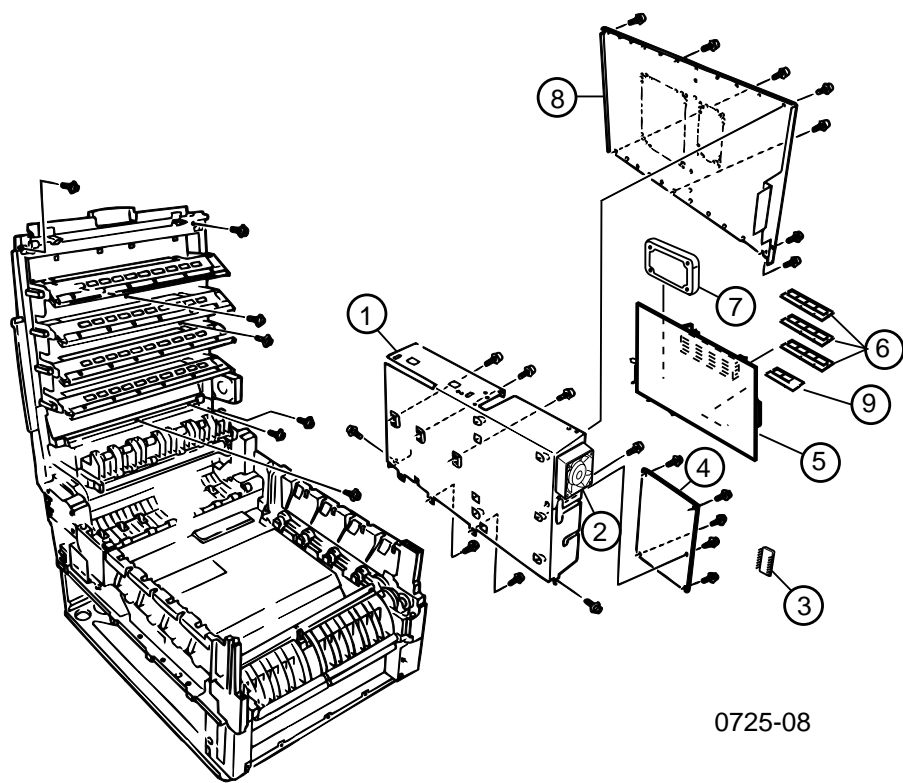


0725-05

Figure 5 Paper tray and paper tray guides FRUs

Table 6 Electrical components FRUs

Fig 8 parts	Part number	Name and description
1	116-1050-00	Electrical Card Cage
2	116-1023-00	Electrical Chassis Cooling Fan
3	537E61970	CRU EEPROM 816A2323M000
4	116-1031-00	Engine Controller Board
5	671-5269-00	System Controller Board (EFI Controller), Image Processor
6	156-4811-10 156-4780-10 156-4839-00	64-Mbyte RAM DIMM 128-Mbyte RAM DIMM 256-Mbyte RAM DIMM
7	650-4209-00	Internal IDE hard drive, programmed
8	160-1060-00	Outer (Rear) Shield Plate
9	674-5282-00	Code ROM DIMM

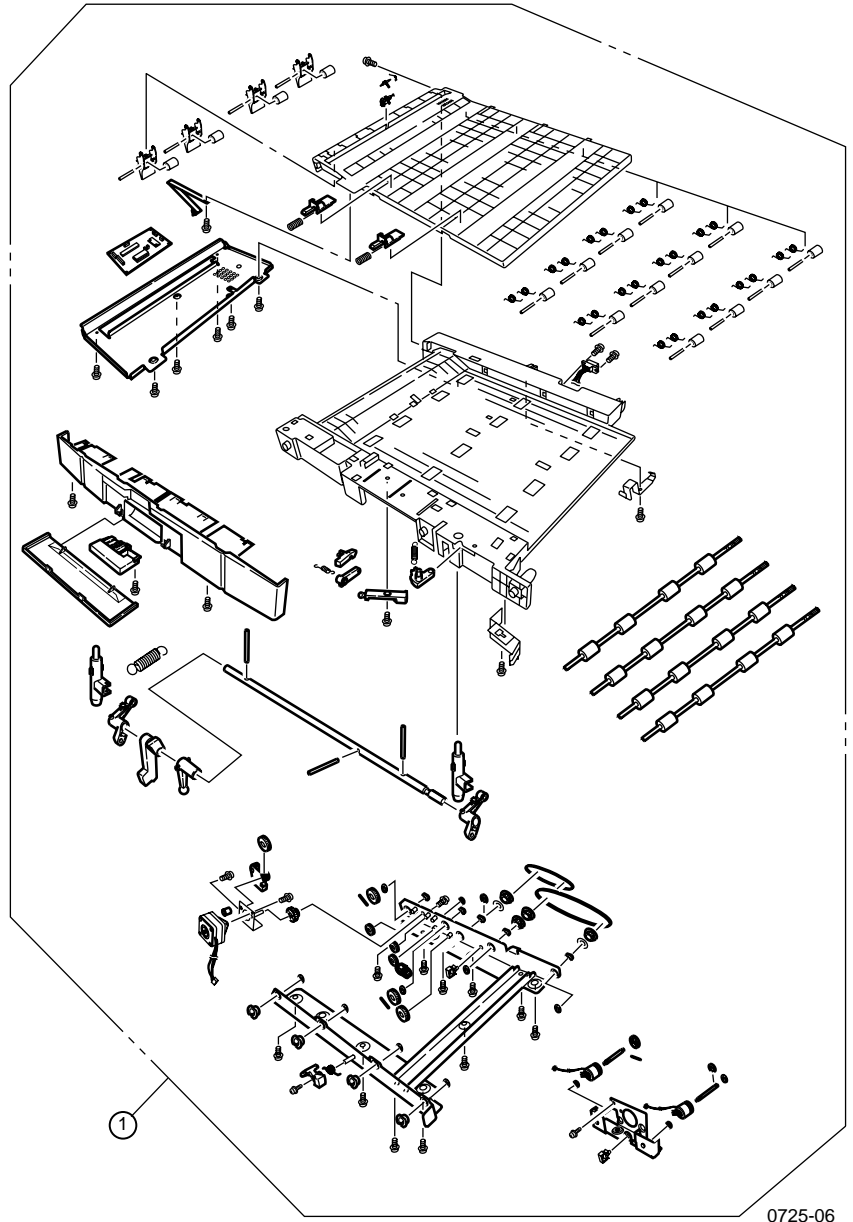


0725-08

Figure 6 Electrical components FRUs

Table 7 FRUs of the duplexer unit

Fig 9 parts	Part number	Name and description
1	116-1088-00	Duplex Transport Assembly



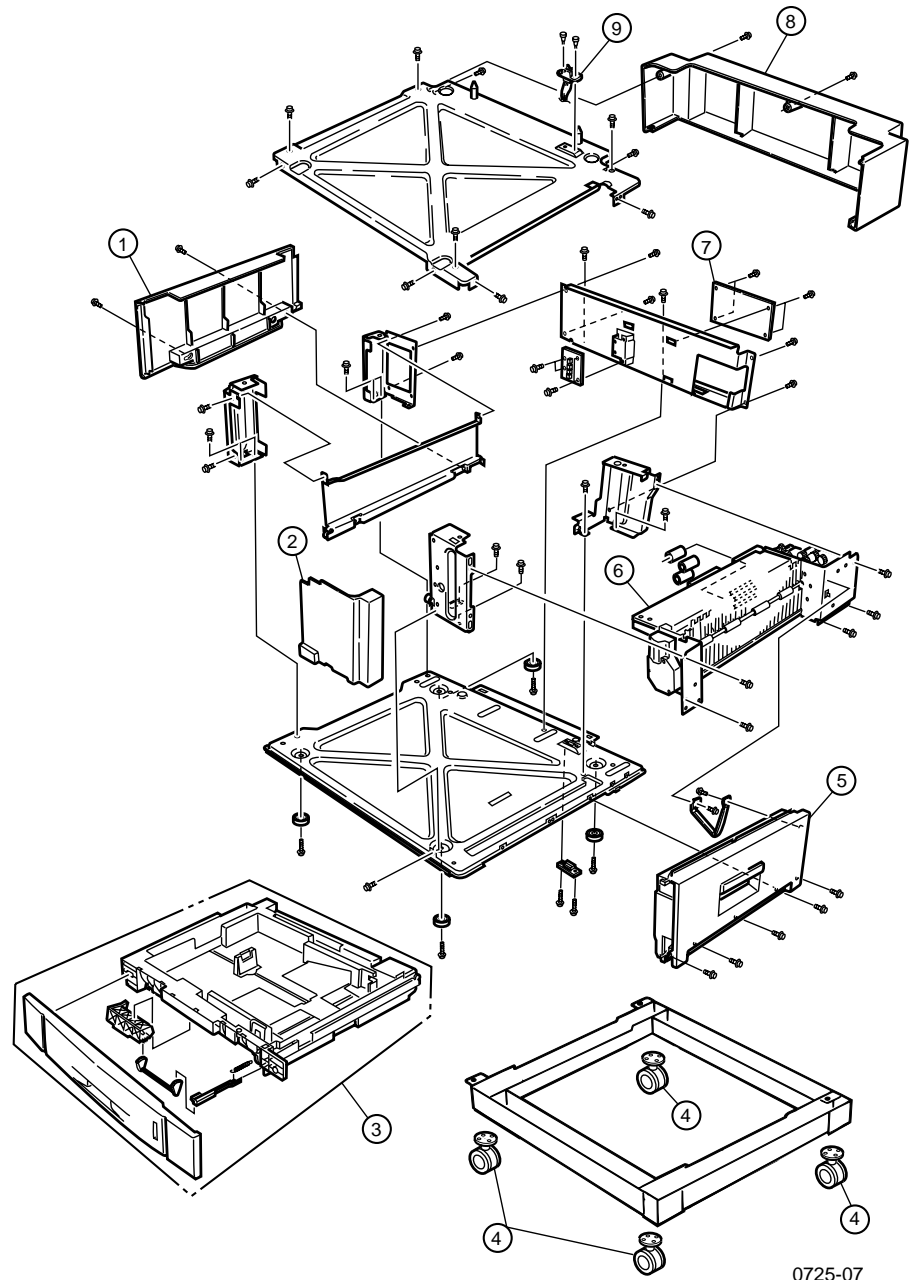
0725-06

Figure 7 Duplexer unit

Table 8 FRUs of the Lower Tray Assembly

Fig 10 parts	Part number	Name and description
	119-6376-00	Lower Tray Assembly (with tray)
	119-6377-00	Lower Tray Deck (with trays)
1	116-1045-00	Lower Tray Assembly Left Cover
2	116-1043-00	Lower Tray Assembly Front Right Cover
3	116-1009-00	Lower Tray Assembly Universal Tray
4	116-1013-00	Castor Wheel
5	116-1046-00	Lower Tray Assembly Right Side Cover (Door)
6	116-1047-00	Lower Tray Assembly Main Feeder Assembly
7	116-1048-00	Lower Tray Assembly Control Board
8	116-1044-00	Lower Tray Assembly Rear Cover
9	116-1040-00	Lower Tray Assembly Top Connector





0725-07

Figure 8 Lower Tray Assembly FRUs

Table 9 Hardware kit

Part number	Name and description
116-1038-00	Hardware Kit
	LED Assembly Spring Kit
	Fuser Exit Roller Bushing (Front)
	Fuser Exit Roller Bushing (Back)
	Registration Shutter Spring
	Fuser Latch Handle Springs
	Screw (T3x8)
	Screw (T3x10)
	Screw (T4x10)
	Screw (M2x8)
	Screw (M3x6)
	Screw (M3x8)
	Screw (M4x8)
	Screw (SP3x10)
	Screw (T4X6)
	Screw (T4X8)
	Plastic Eject Rollers

Table 10 Gear kit

Part number	Name and description
116-1037-00	Gear Kit
	Main Feeder Drive Gear
	Fuser Drive Gear A
	Fuser Drive Gear B
	Fuser Drive Gear C
	Registration Drive Gear A
	Multi-sheet Bypass Feeder Drive Gear
	Imaging Drum Drive Gear



Table 11 Harness kit

Part number	Name and description
116-1035-00	Harness Kit
	LED Harness M
	LED Harness C
	LED Harness Y
	LED Harness K
	26 pin LED connector
	Control Panel Tape Harness
	High Voltage Tape Harness
	For Heat Motor, Belt Motor
	For MBF paper End sensor, Near End sensor, OHP sensor
	For 1stPaperEnd sensor, Near end sensor, 2nd Interface, Temp/Humidity sensor
	For Geared Motor
	For Feed sensor
	For Color Registration sensor
	For Board N71
	For Board R71
	For Board A73
	For Duplexer
	For Power
	For Right side Cover Open, Stacker Cover Open
	For Right side Cover Open-Relay cable
	For C73 Interface (Finisher)
	For Job Offset motor, Fuser Fan-relay cable
	For Image Drum Motor
	For hopping Motor, MBF/Registration Motor
	For pickup clutch, feed roller Clutch
	Temp/Humidity sensor-relay cable
	Paper End sensor-relay, Paper Near End sensor-relay cable
	For Paper Size Detect (board B73)
	For Y71 PWB

Table 12 Sensor flag kit

Part number	Name and description
116-1036-00	Flag Kit
	Stack Full Flag
	Toner Sensor Actuator (qty of 4)
	Intermediate Exit Flag
	B Reg Entrance Sensor Flag
	A Reg Entrance Sensor Flag
	A Reg Exit Sensor Flag
	Tray 1 Media Low Flag
	Tray 1 Media Out Flag

Table 13 Customer supplies and accessories

Part number	Name and description
061-4288-00	Phaser 2135 Manual Pack (English)
061-4289-00	Phaser 2135 Manual Pack (French)
061-4290-00	Phaser 2135 Manual Pack (Italian)
061-4291-00	Phaser 2135 Manual Pack (German)
061-4292-00	Phaser 2135 Manual Pack (Spanish)
061-4293-00	Phaser 2135 Manual Pack, Brazilian/Portuguese
061-4294-00	Phaser 2135 Manual Pack, Simplified Chinese
061-4295-00	Phaser 2135 Manual Pack, Traditional Chinese
061-4296-00	Phaser 2135 Manual Pack, Korean
061-4298-00	Phaser 2135 Manual Pack, Dutch
061-4299-00	Phaser 2135 Manual Pack, Swedish
071-0725-00	Phaser 2135 Service Quick Reference Guide
063-3399-00	CD-ROM, Printer Software, Drivers and Utilities
063-3400-00	CD-ROM, Printer Management
003-1496-00	Toner Vacuum (115 VAC)
003-1497-00	Toner Vacuum (220 VAC)
003-1498-00	Filter for 3M Toner Vacuums
003-0619-00	DIP IC removal tool

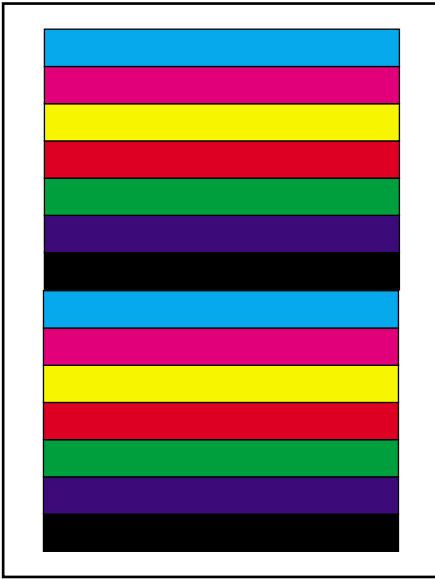


Table 13 Customer supplies and accessories

Part number	Name and description
003-1633-00	PLCC IC removal tool
161-0310-00	Power cord, US, shielded
161-0066-09	Power cord, 220V Euro
161-0066-10	Power cord, U.K.
161-0066-11	Power cord, Australian
161-0154-00	Power cord, Swiss
161-0240-00	Power cord, Danish
006-7998-00	Conductive grease, silicon
065-0598-00	Shipping box, replacement kit
004-5127-00	Shipping Carton

Test Prints

This topic illustrates the test prints produced by the printer. The topic “Printing and print quality problems” on page 48 discusses solutions to problems revealed in the test prints.



0728-16

Interpreting the 100% Color Stripe Pattern

The 100% Color Stripe Pattern consist of two set of bars. Each set of bars is made of of a seven bars, each bar is a 100% solid fill of the primary colors (cyan, magenta, yellow and black) and the secondary colors (red, green and blue).

Look for:

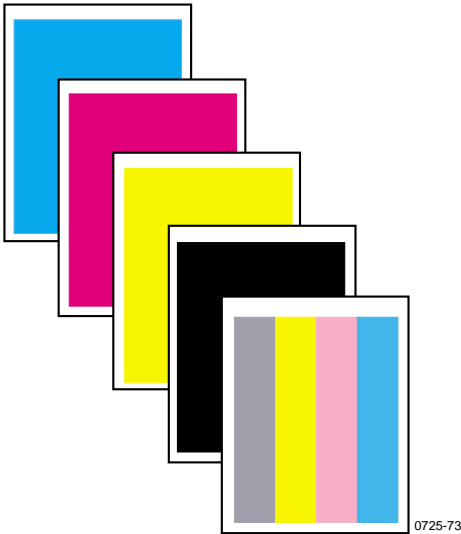
1. Consistent fills in each primary color. Each color should be consistent across the width of the page with no voids.
2. No separation or misconvergence where each bar meets its neighbor. Each bar is separated by a thin black line.

Interpreting the Print Diagnostic Print Quality prints

The print produces five pages, one page of each primary color and one page with 4 primary color fills.

Look for:

1. Consistent fills in each primary color. Each color should be consistent across the width of the page with no voids.
2. No separation or misconvergence where each bar meets its neighbor. Each bar is separated by a thin black line.
3. Look for thin white lines that would indicate a dirty LED lens or a scratched imaging drum
4. Look for dark lines that would indicated a dirty or damaged imaging drum.
5. Look for complete fusing. Cold or hot offset fusing could indicate the incorrect paper weight has been selected



0725-73

Interpreting Test Pattern A

This pattern consists of color blocks and bars. Use this pattern to identify defects such as deletions, banding, color misregistration, side-to-side density problems, and text problems.

Look for:

1. Solid fills in the color blocks.
2. Ensure the small text is legible and not broken.



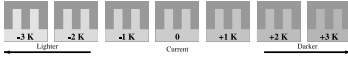
0728-17

Color And Density Adjustment Test Page

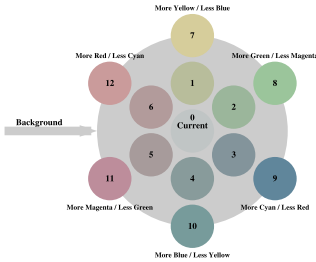
Purpose: Adjust the Black Density, Color Balance, and Color Density on the front panel.

Caution: When you make a density or color balance adjustment, it automatically changes the "Current" setting. The test page with the new settings will reprint.

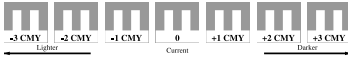
Step 1. Black Density - Locate the square where the bar and background patterns blend together. Enter the square's number in the Black Density menu. For example, if the bar pattern blends with the background in the "+2K" square, select "+2K". Repeat this step until the two patterns in the "Current" square blend together.



Step 2. Color Balance - Locate the numbered circle that most closely matches the gray of the background. Enter the circle's number in the Color Balance menu. Repeat this step until the "Current" circle closely matches the gray background.



Step 3. Color Density - Locate the square where the bar and background patterns blend together. Enter the square's number in the Color Density menu. Repeat this step until the two patterns in the "Current" square blend together.



Step 4. Repeat Step 2 and Step 3 as needed.

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Interpreting the Color Balance and Density Adjustment Page.

You use this print to assess and adjust color balance, color density and black density. Use the 30% halftones to judge the current level and decide on a preference.

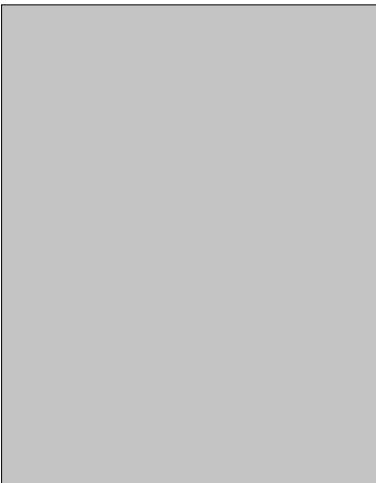
Look for:

The Color Density and Black Density should be at approximately the same level. This is important in order to make the Color Balance adjustment.

To determine the correct Color Balance compare the disk in the center of the Color Balance object marked "CURRENT" with the gray background. The background is produced using black only and the circles are produced using a combination of cyan, magenta, and yellow. The adjustment objective is for the "CURRENT" circle to be the closest gray of any of the circles when compared to the gray background.

Refer to the adjustment "Adjusting color density and balance" on page 77.

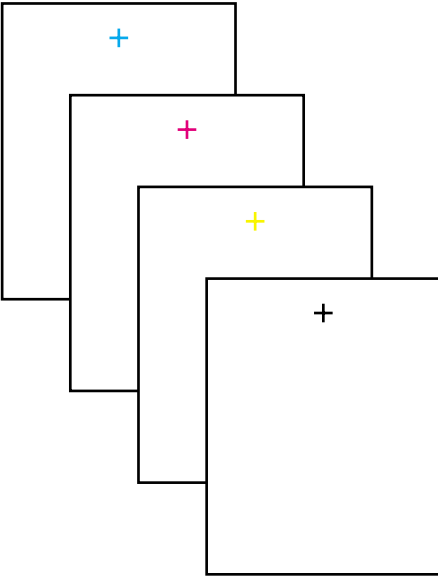
Gray 35% Halftone Test Pattern



Interpreting the Gray 35% Halftone Test Pattern

The Gray 35% Halftone Test Pattern is a full-page, fill made up of a 35% gray tint. It is useful for isolating black imaging and LED head problems.

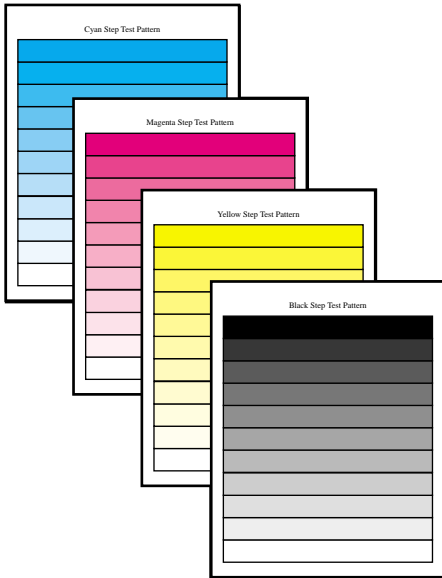
Look for uniform fill with no banding or lines.



0728-20

Interpreting the Blank Print (with crosshatch)

Each print consists of a blank page with a single primary-colored crosshatch printed near the top of the page. Use these pages to identify color on non-printed areas of a print as well as residual offsetting.



0728-21

Interpreting the Step Test Patterns

The Step Test Patterns consist of 11 color bars, starting with a 100% fill of a primary color bar and progressing in 10% steps to a 0% (white) fill bar. Use these pages to isolate primary color imaging or LED head problems.

Look for uniform transitions from dark to light.

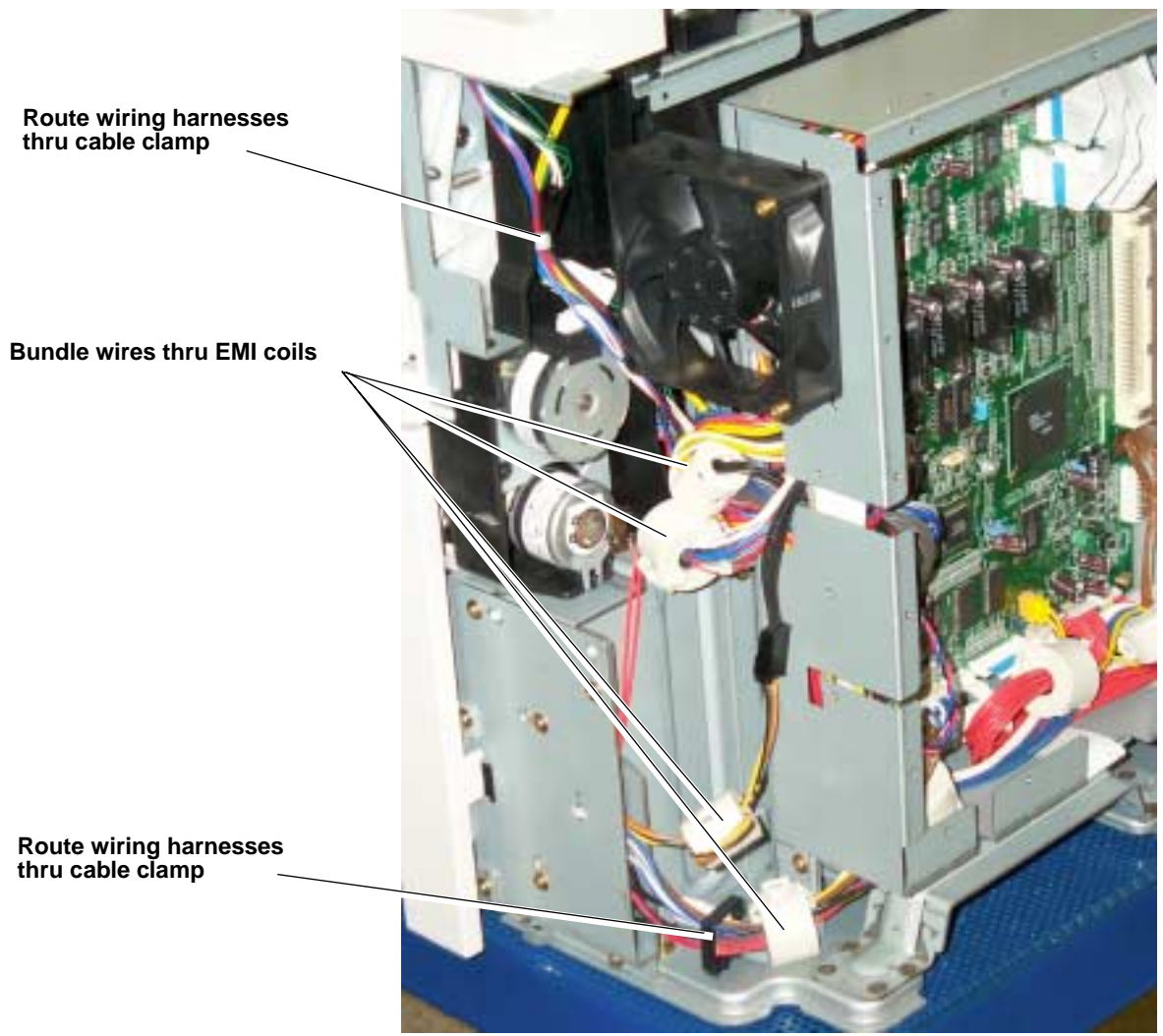


The wiring receptacles are color-coded with their plugs for correct placement

Bundle wires thru EMI coils

Tie wraps

Wire routing at the engine controller board



Details of wiring passthru

Ensure the wiring harnesses are routed inside the wiring shield except the power wiring harness which is routed under the wiring shield



Ensure the power harness inter-connect is dressed behind the flat ribbon cables to ensure it does not disconnect when the top cover is closed

Make sure wiring is not pinched by the top shield plate when it is installed

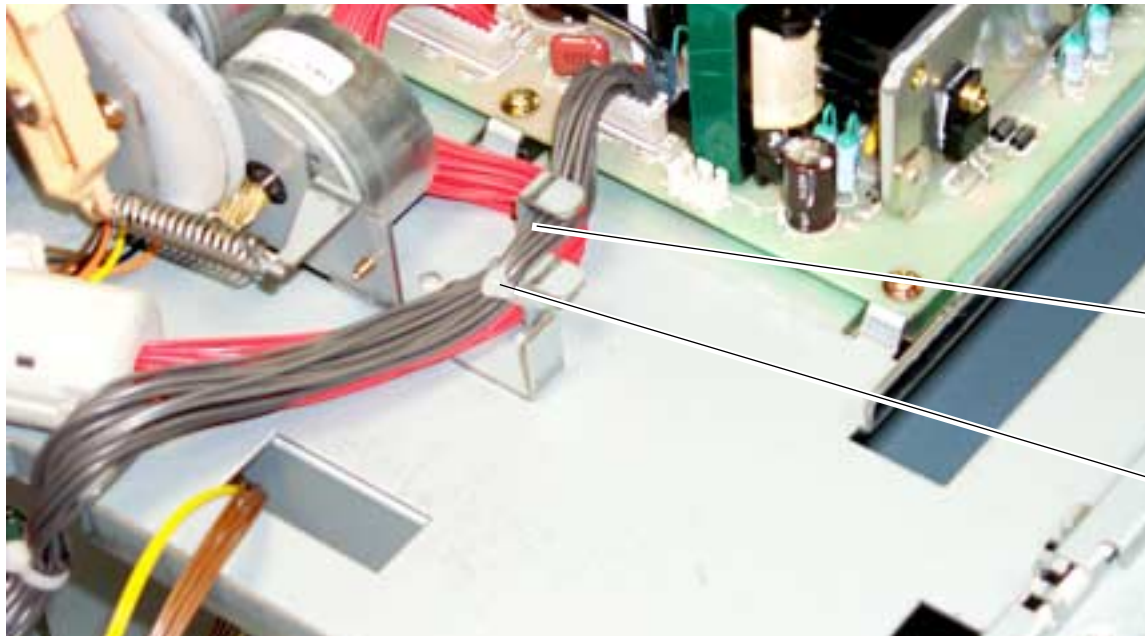
Wiring under the top shield plate



Route wiring harnesses under the imaging drum motors

EMI coils

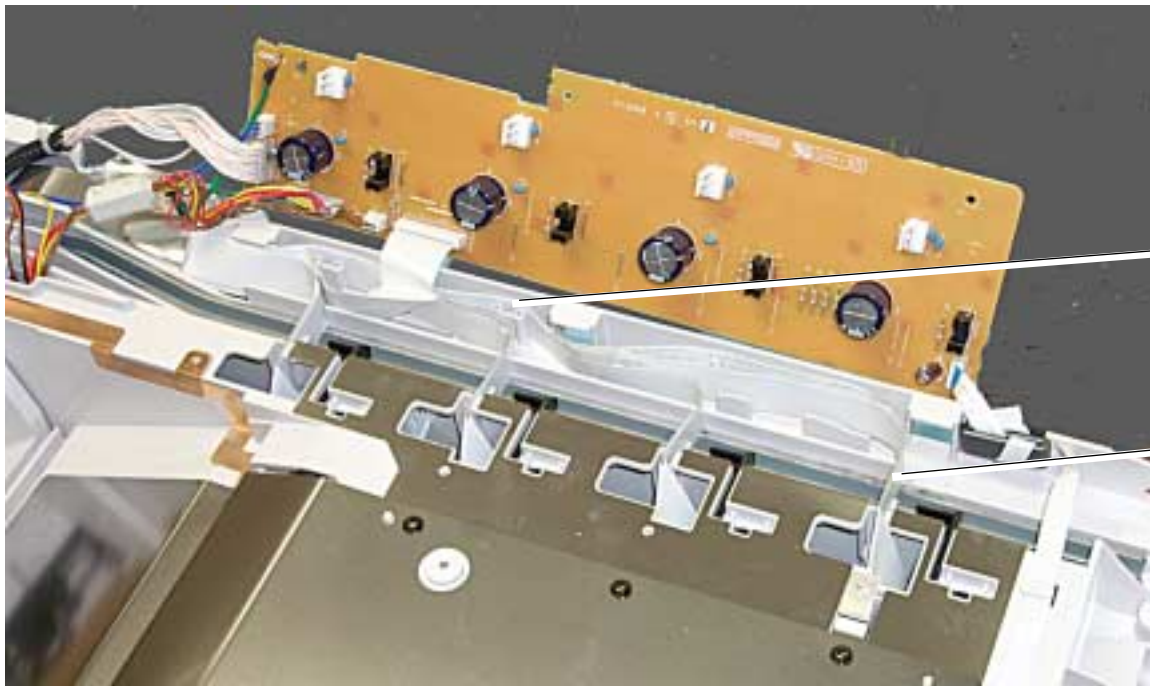
Wiring harnesses route by the imaging drum motors



Route wiring harnesses between first and second restraint posts

Cable tie the wiring harnesses to the center restraint post

Wire routing by the fuser and transfer belt motor unit.



Harnesses route through channel around post

Note how harness route through slot

Ribbon cable routing under the toner sensor board

NOTES

Hexidecimal conversions

To convert hexadecimal to decimal use the following information:

<u>Hex value</u>	<u>Decimal equivalent</u>
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
A	10
B	11
C	12
D	13
E	14
F	15

For example:

The hexadecimal value **13FA**

breaks down into:

1	3	F	A
1 is 1	3 is 3	F is 15	A is 10

For the 4th column multiply 1×16^3	For the 3rd column multiply 3 by 16^2	For the 3rd column multiply 15 by 16^1	For the 3rd column multiply 10 by 16^0
--	--	---	---

(1×16^3) <u>(1×4096)</u> 4096	(3×16^2) <u>(3×256)</u> 768	(15×16^1) <u>(15×16)</u> 240	(10×16^0) <u>(10×1)</u> 10
--	--	---	---

Add the column values together

$$4096 + 768 + 240 + 10 = 5114$$

13FA's decimal equivalent is **5114**