

D640 Cut Sheet Printer Service Manual

Hewlett-Packard Company

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For More Information

For a list of internal and external web sites, see [1-1.2 "Web Sites for More Information,"](#) on page 1-5.

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1 Specifications

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1-1 Introduction

This chapter provides specifications for the D640 cut sheet printer and its optional High Capacity Input (HCI) and High Capacity Output (HCO) paper handlers. This information includes:

- specifications
- safety compliance
- options
- available supplies
- supported printing area
- notes on duplex printing on pre-punched forms

The D640 combines semiconductor laser optical technology and two-component dry development process technology to print on cut-sheet plain paper. [Figure 1-1](#) illustrates an installed printer and the external high-capacity paper handling options.

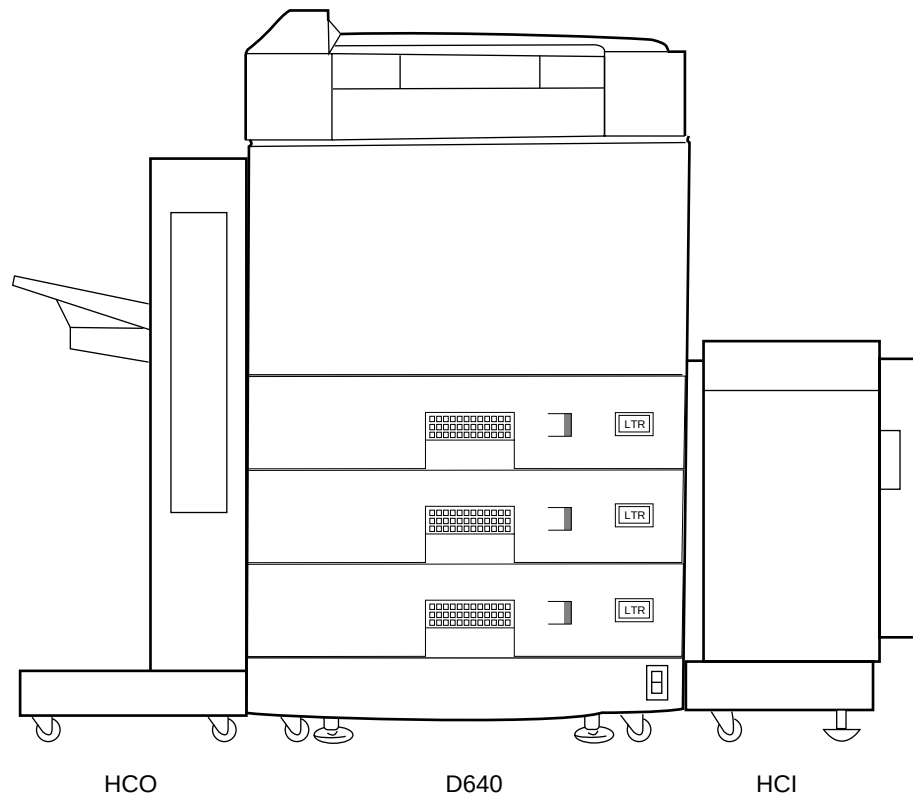


Figure 1-1 D640 Printer With Optional High Capacity Input (HCI) and Output (HCO) Paper Handlers

1-1.1 Related Documents

The following manuals are shipped with each printer and provide additional information on the printer. The information in these manuals is not repeated in this manual.

- *D640 Printer Installation Manual*
- *D640 Printer User Manual*
- *D640 Technical Reference Manual*
- *D640 Enhanced Features Manual*

For more information about the D640 printer, see the following documents. Most of these documents are available on the DLD-Cupertino web site (see [1-1.2 "Web Sites for More Information,"](#) on page 1-5):

- *D640 Printer Installation Manual* (Part # C5620-90015)
Guides you through unpacking, setup, testing, and configuration of your printer.
- *D640 Printer User Manual* (Part # C5620-90024)
Contains the information needed by the customer to operate the D640 printer.
- *D640 Technical Reference Manual* (Part # C5620-90002)
Guide to using fonts and the PCL and PJI emulations on the D640. It also documents additional aspects of printer usage in detail.
- *D640 Paper Specifications Guide* (Part # C5620-90001)
Guide outlines specifications for selecting print media appropriate for use in the D640 printers.
- *3,000-Sheet HCO Installation and User Manual* (Part # C5638-90001)
- *D640 PostScript Emulation Manual* (Part # C5630-90002)
- D640 Training Kit (Part # C5620-60010) contains:
 - Maintenance Video Training Tape - NTSC (Part # C5620-90010)
 - Maintenance Video Training Tape - PAL (Part # C5620-90011)
 - *D640 Workbook* (Part # C5620-90012)
 - Function Code Kit (Part # C5620-60021)
 - *D640 Printer Installation Manual*
 - *D640 Printer User Manual*
 - *D640 Service Manual*
- *Solutions Guide* (Part #5966-7174)
- *Technical Data Sheet* (Part # 5965-7408)
- *D640 Demo CD-ROM* (Part # 5966-4253)

1-1.2 Web Sites for More Information

Web sites are available with updated information, such as updated manuals, alert bulletins, software revisions, and technical support information. Many of the sites are available to only internal HP employees.

Table 1-1. D640 Web Sites

Name	HP Internal/ External	Access
DLD-Cupertino Web Site	HP internal	http://itweb1.cup.hp.com/dld-cupertino/ For updated version of this service manual: 1. Click DLD-Cupertino Document Database 2. Click Service Documents 3. Click HP D640
DLD-Cupertino Customer Web Site	External	http://partners1.americas.hp.com/spo/spodocpu.nsf/WelcomeNavigator?OpenNavigator
German Response Center	HP internal	http://grcad149.grc.hp.com/sys_prn (The information is in German and English).
Global Support Logistics - The Parts Page	HP internal	http://smomvts.rose.hp.com/

1-2 Printer Specifications

This section provides general specifications for the printer, as well as detailed specifications for print speed and the printer's physical, electrical, and environmental requirements. In addition, this chapter includes safety standards applicable to all equipment and an illustration of the printer laser equipment warning label.

1-2.1 Printer General Specifications

[Table 1-2](#) lists general specifications for the D640 printer.

Table 1-2. D640 Printer General Specifications

Item	Specification
Printing technology	Laser diode, Electro-photography
Printing speed	40 ppm (Letter/A4 landscape)
Paper	
Size	A3, A4, A5, Letter, Legal, Ledger, Executive, B4 (JIS), B5 (JIS), custom sizes
Type	Plain paper, label paper, recycle paper, transparency paper, bond paper, pre-punched paper
Resolution	600 x 600 dpi (selectable 100, 300, or 600 dpi)
Paper capacity	• 3 trays: 500 sheets (64 g/m²) standard • High Capacity Input (optional): 3,000 sheets (A4, Letter size only)
Stacker capacity	• Face down tray: 500 sheets each (75 g/m²) • High Capacity Output (optional): 2,000 sheets or 3,000 sheets
Emulation	PCL, HEX, optional PostScript (PS)
Interface	Parallel: IEEE1284C Bitronics/Centronics Serial: RS232C/422A
Warm-up time	Less than 150 seconds
First print time	Less than 18 seconds
Resident RAM	16 MB standard/ 64 MB maximum
Resident font	Bitmap font: 1, Outline fonts: 45

1-2.2 Printer Print Speed Specifications

The print speed specification for the D640 printer is 40 ppm (letter/A4 landscape).

Table 1-3. D640 Printer Print Speed Specifications

Paper Size (direction)	Simplex ^a	Duplex ^a
Letter (landscape)	40	40
Legal (portrait)	25	25
Ledger (portrait)	21	15
Executive (portrait)	40	40
A3 (portrait)	21	15
A4 (landscape)	40	40
A5 (portrait)	40	40
B4 (ISO) (portrait)	21	15
B5 (ISO) (portrait)	40	40
B4 (JIS) (portrait)	24	24
B5 (JIS) (portrait)	34	34
Custom paper width = 120 mm to 297 mm, paper length = 182 mm to 215.9 mm	40	40
Custom paper width = 120 mm to 297 mm paper length = 215.9 mm to 431.8 mm	21	15

- a. Unit of measure: Images Per Minute (IPM). All the speeds have a $\pm 5\%$ tolerance when printing 6000 characters-per-page using outline font of Courier 12 point size. Print speed is measured beginning with the second page in continuous printing mode.

1-2.3 Printer Physical Specifications

Table 1-4 lists the physical specifications of the printer. Figure 1-2 illustrates the physical specifications and dimensions of the printer and Figure 1-3 illustrates the required service area.

Table 1-4. D640 Printer Physical Specifications

Item	Specification
Dimensions	
Width	585 mm (23.0 in)
Depth	640 mm (25.2 in)
Height	1,030 mm (40.6 in)
Weight	Approximately 135 kg (297 lbs)
Service Area	
Front	650 mm (25.6 in)
Back	850 mm (33.5 in)
Left	850 mm (33.5 in)
Right	850 mm (33.5 in)

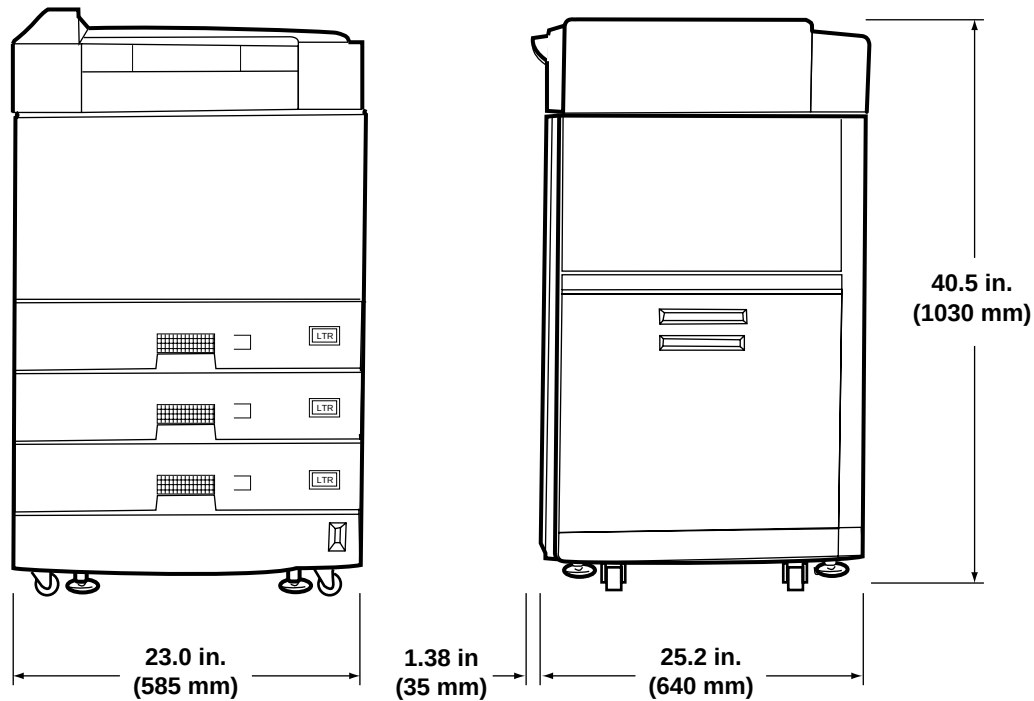


Figure 1-2 Printer Physical Dimensions

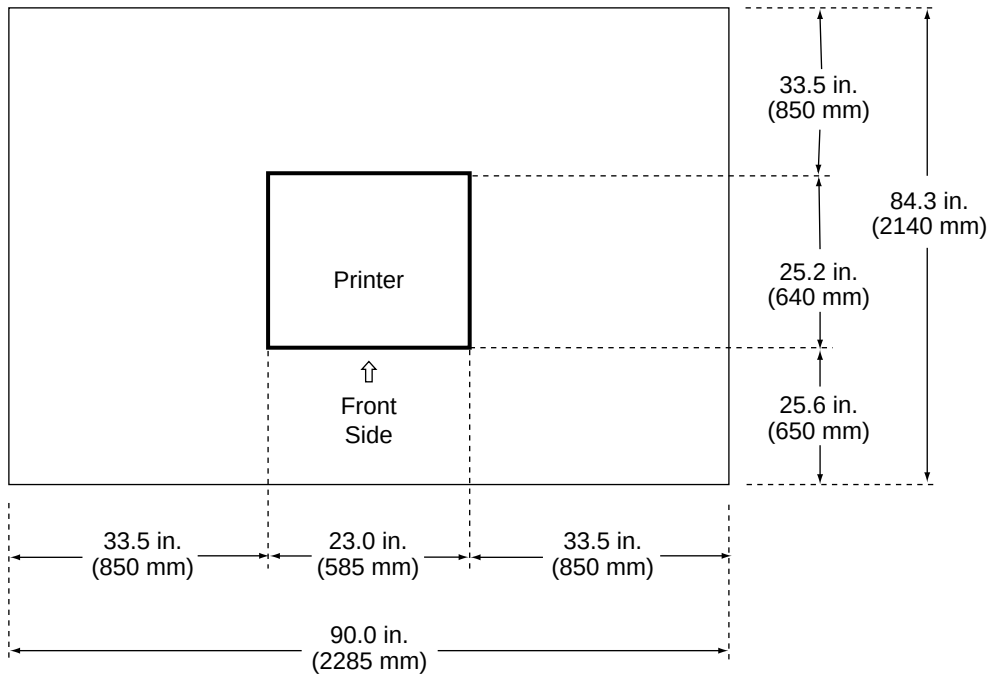


Figure 1-3 Required Service Area

1-2.4 Printer Electrical Specifications

Table 1-5 lists the electrical specifications of the printer.

Table 1-5. D640 Printer Electrical Specifications

Item	Specifications
Input Power	
Voltage	120 to 127 Vac $\pm 10\%$, 12 A 200 to 240 Vac $\pm 10\%$, 7 A
Phase	Single-phase
Frequency	50/60Hz $\pm 5\%$
Power Consumption	1,300 VA or less during operating
Heat capacity	894 kcal per hour

1-2.5 Environmental Specifications For All Equipment

Table 1-6 lists environmental specifications applicable to the printer, High-Capacity Input (HCI), and High-Capacity Output (HCO) units.

Table 1-6. D640 Printer, HCI Option, and HCO Option Environmental Specifications

Item	Specification
Acoustic noise	56 dB(A) or less (printer only)
Ozone emission	0.08 PPM or less: Measured under conditions of typical printer operation and room ventilation
Operating Environment	
Temperature	15° to 35° C
Humidity	20% to 80% RH (no condensation)
Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)
Non-operating Environment	
Temperature	0° to 35° C
Humidity	20% to 80% RH (no condensation)
Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)

1-2.6 Printer Laser Equipment Compliance Label

This product is a Class 1 laser product.

CAUTION

Use of controls or adjustment or performance of procedures other than those specified herein may result in hazardous radiation exposure

Figure 1-4 illustrates the warning label located on the top of the optical unit.

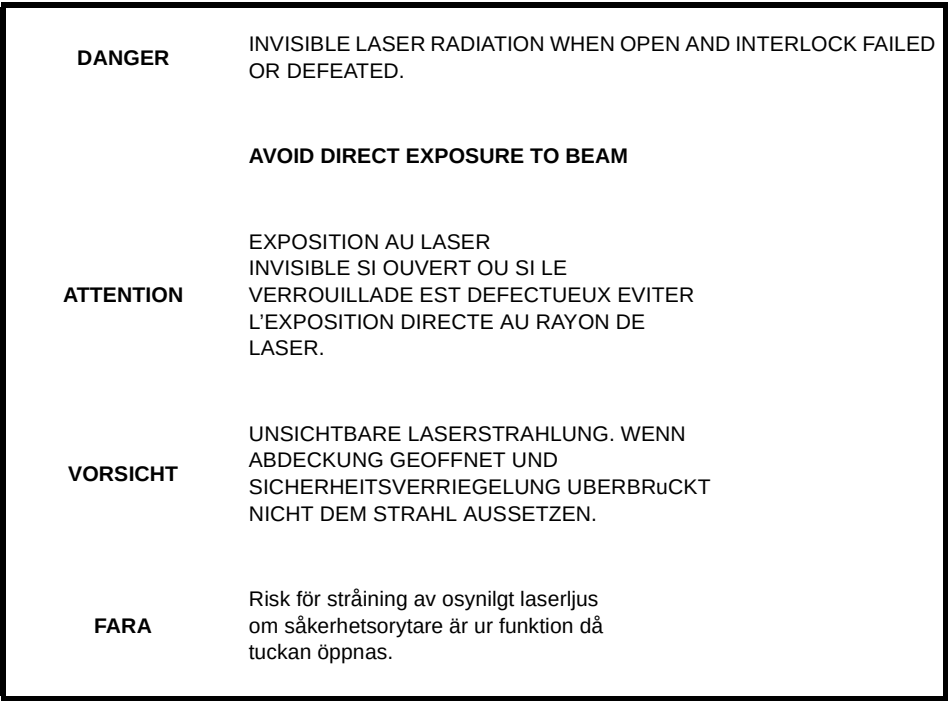


Figure 1-4 Optical Unit Warning Label

1-3 Summary of Optional Features

Table 1-7 lists the options available with the D640 printer along with their associated HP product numbers.

Table 1-7. D640 Printer Available Options

Item	Specification	Model Number
High-Capacity Input (HCI)	3,000 sheets (at 75 g/m ²)	C5621A (Letter) C5622A (A4)
High-Capacity Output (HCO)	2,000 sheets (at 75 g/m ²) 3,000 sheets (at 75 g/m ²)	C5623A (120 VAC) C5624A (240 VAC) C5638A (100-240 VAC)
Custom paper tray	500 sheets (at 75g/m ²) (100 x 182 to 297 x 431.8 mm paper can be used)	C5634A
PostScript upgrade	PostScript Level 2 + 16MB Memory SIMM	C5630A
16 MB Memory Kit	16 MB SIMM (maximum 3 SIMMs)	C5635A

1-4 Printer Custom Paper Tray

The C5634A custom paper tray is an optional, user-installable custom paper tray. The custom paper tray can hold up to 500 sheets of paper (75g/m²). The standard and custom paper trays are interchangeable. If more than one custom tray is installed, all custom sizes must be identical. Paper sizes for the custom tray are selectable within the specifications listed in [Table 1-8](#).

Table 1-8. Custom Paper Sizes

Dimension	Minimum	Maximum
Width	120 mm (4.75 in)	182 mm (11.7 in)
Length	297 mm (7.2 in)	431.8 mm (17 in)

The custom tray also supports all of the standard media sizes.

The print speeds from the custom tray are listed in [Table 1-3](#).

1-5 PostScript Upgrade

The C5630A PostScript upgrade is an optional, user-installable, software upgrade that adds PostScript Level 2 emulation capability to the D640 printer. This option is supplied on a 3.5-inch floppy disk with an additional 16 MB memory SIMM, C5635A. Minimum memory size to run the Postscript option is 32 MB.

1-6 16 MB Memory Kit

The optional C5635A 16 MB Memory Kit contains one 16 MB single-inline memory module (SIMM) for the main controller of the D640 printer. A maximum of three additional SIMMs can be installed. This option is user installable.

1-7 Consumables

Table 1-9 lists the specifications of the consumables used in the D640 printer and optional High Capacity Input. For maximum print quality, ensure that the consumables are replaced at the recommended intervals by monitoring the usage levels printed on the first page of the Maintenance Report.

Table 1-9. Consumables and Replacement Cycle

Carton	Product Number	Contents	Replacement Cycle ^a
Toner Kit 8-Pack	C5626A	Toner 8 bottles/carton	20K images for continuous printing with 4% coverage for each bottle (average 14.4K images) ^b
		Cleaning Roller 4 /ctn.	Every other toner bottle
		Collector Bottle 8 bottles/carton	Every bottle of toner
Developer Kit	C5632B	Developer 2 bottles/carton	1,600 drum counts for each bottle ^c (250K images for continuous printing, average 114K images) ^b
		Ozone Filter 1 unit/carton	Every other bottle of developer
Drum Kit	C5629A	Drum 1 unit/carton	2,500 drum counts ^c (195K images for continuous printing, average 178.5K images)
		Transfer Unit 1 unit/carton	
		Cleaning paper 10 sheets/carton	
Fuser 120-127Vac	C5627A	Fuser 1 unit/carton	300K page length counts ^d
Fuser 200-240Vac	C5628A	Fuser 1 unit/carton	
Printer Pick Roller Kit	C5633A	Pick Roller 1 set/carton	500K page length counts each Three kits required for each printer; one for each tray.
HCI Pick Roller Kit	C5636B	Pick Roller for HCI 1 set/carton	500K page length counts each

- Values for the replacement cycle shown in Table 1-9 are theoretical and based upon printing on letter/A4 size paper. Variations may occur due to improper handling, maintenance, media type, operating environments and other factors related to printer usage.
- The average for printed images is calculated by combining intermittent printing mode and continuous printing mode. The result is 70% of continuous printing.
- The drum counter increments every 150 seconds (this equals 100 images of letter/A4 paper during continuous printing). This counter increments during warm-up and intermittent printing sequences.
- The page length counter increments after 100 simplex letter/A4 images are stacked. During duplex printing, the page length counter is incremented by two after 100 duplex images are stacked. For the Printer Pick Roller Kit and the HCI Pick Roller Kit, this counter always increments as simplex printing. When another size paper is used, the counter increments according to the values listed in Table 1-10.

Table 1-10. Page Length Count

Paper size	Increment by 100 sheets	
	Simplex	Duplex
A5	1	2
A4	1	2
A3	2	4
Letter	1	2
Legal	2	4
Ledger	2	4
Executive	1	2
B4 (JIS)	2	4
B5 (JIS)	1.5	3

1-8 Printable Area

You can print to the paper edge, but print quality is not guaranteed within 5 mm (1/6 inch) of the paper edge. There is a file that can be printed from the printer's hard disk that show the guaranteed print image area for that media. Due to various media factors (such as curl and grain) the guaranteed print image may vary slightly from the specification.

To print a sample of the printable area for a type of media:

Step 1 Place the media in the selected tray

Step 2 Go to the Utilities menu (Test.filesC.MAINT.UTIL).

Step 3 Select **ALL_EDGE.22**.

Step 4 Select **Online**.

Attempting to print outside the printable area can cause the following problems:

- Unacceptable print quality at paper edges
- Paper feed skew (up to ± 2 mm) that may cause missing characters
- Paper transport problems that may cause a paper jam

1-8.1 Printing Position Precision

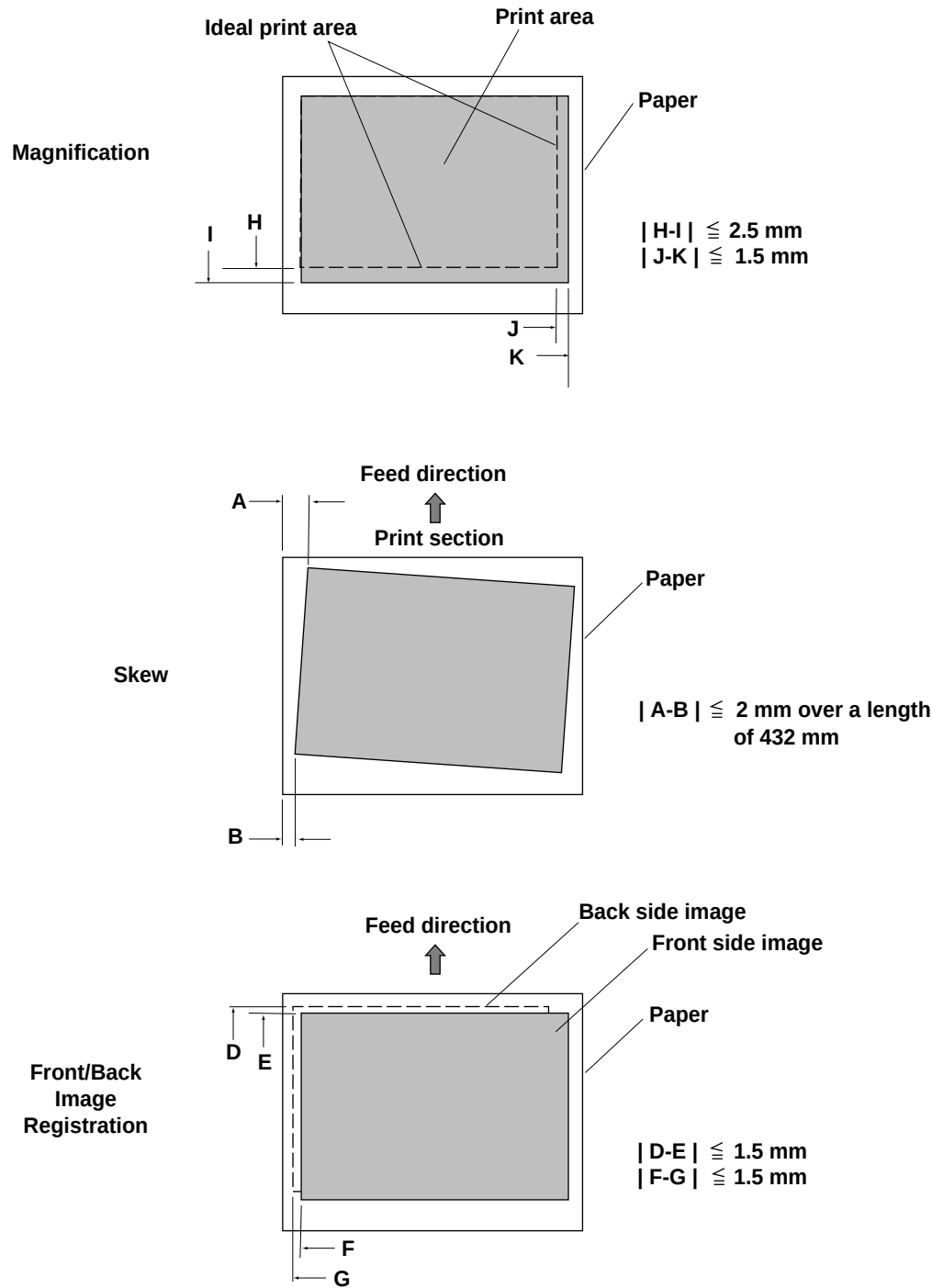


Figure 1-5 Print Positions (page 1)

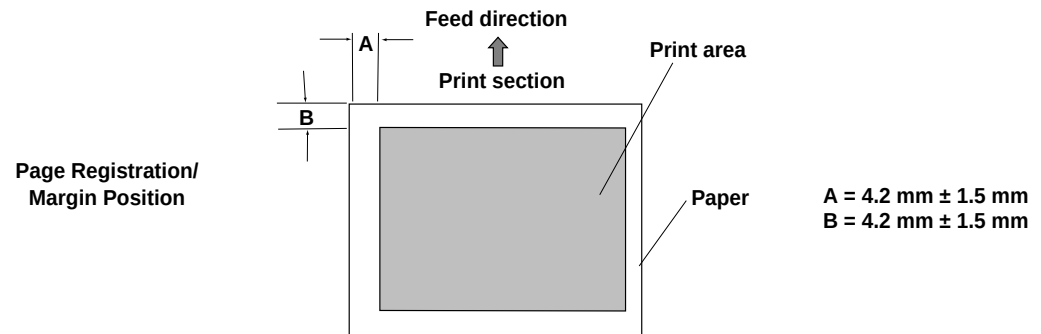


Figure 1-6 Print Positions (page 2)

1-8.2 Simplex and Duplex Printing

The following are important notes on simplex and duplex printing:

- During *simplex* printing, the underside of the paper in the paper tray is the front side. During *duplex* printing, the underside of the paper stacked in the paper tray becomes the back side; the top side of the paper in the paper tray becomes the front side.

The above is reversed when feeding from the High Capacity Input (HCI).

- If punched paper is used for both simplex and duplex printing from the same paper source, the holes and binding margin positions will not match.
- If preprinted forms are used for both simplex and duplex printing from the same paper source, the front and back of the preprinted forms and the printed data is opposite for simplex or duplex paper.
- When using punched paper or preprinted forms (directional paper) for simplex and duplex printing from the *same* paper tray, specify duplex for all printing operations to avoid these problems with punched or preprinted forms.

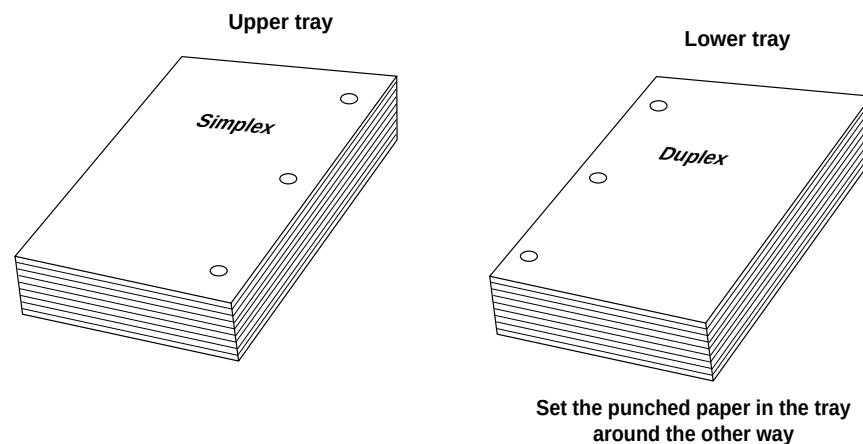


Figure 1-7 Examples of Adding Paper to Paper Trays

2 Functional Overview

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2-1 Introduction

This chapter provides the theory of operation of the D640 including the following:

- Overview of the physical layout of mechanical components
- Detailed descriptions of the following:
 - paper path
 - electrophotographic printing process
 - controllers
 - power supplies
 - toner and developer units

2-2 Physical Layout

This section describes the physical layout of the printer identifying the major components.

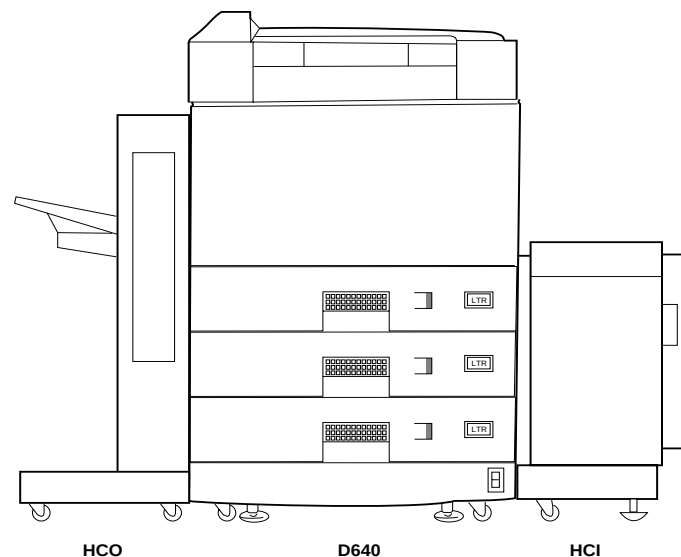


Figure 2-1 HP5000 D640 and Optional High Capacity Input and High Capacity Output

2-2.1 Control Panel and External Front Cover

The control panel contains the following operator controls and display:

- Standby power switch
- Liquid crystal display
- Five buttons that operate menu functions within the display
- Light emitting diode (LED) that indicates that the printer is in the power-save mode.

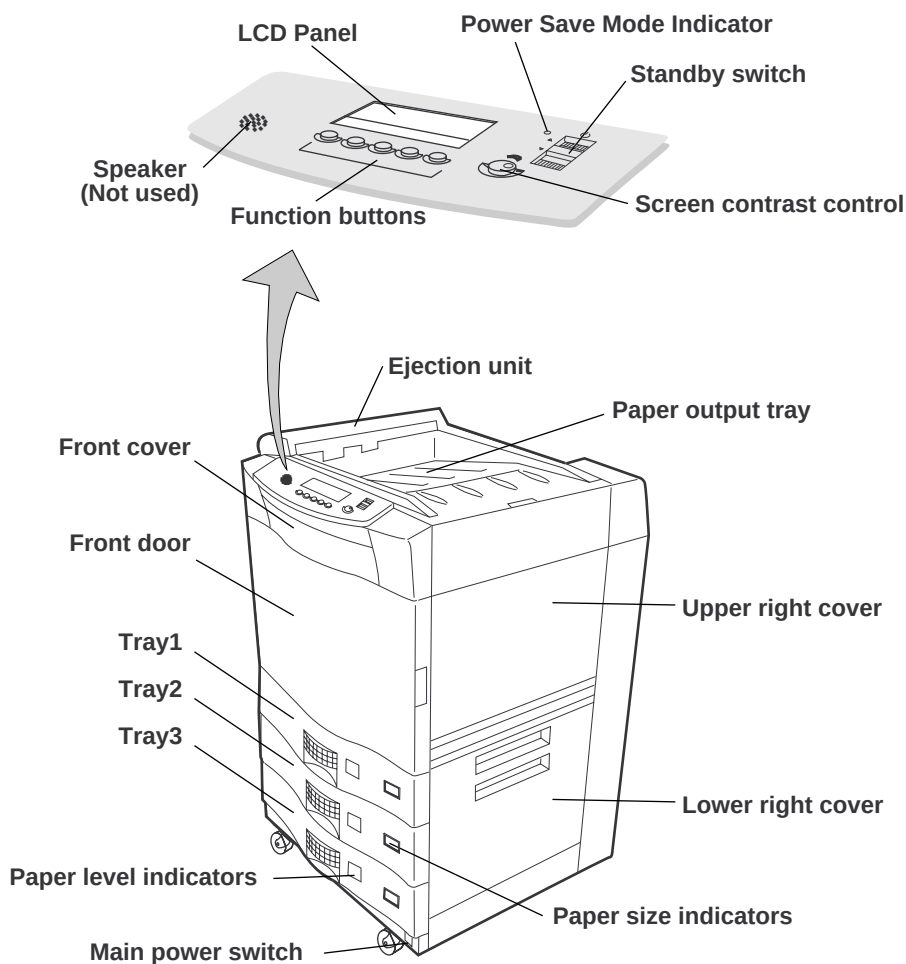


Figure 2-2 Control Panel, Tray, and Cover Location

2-2.2 Slots and Ports Accessible from Top Front Cover

The top front cover allows access to the following slots and port:

- Two PCMCIA slots
- Serial diagnostic port
- Floppy disk drive slot

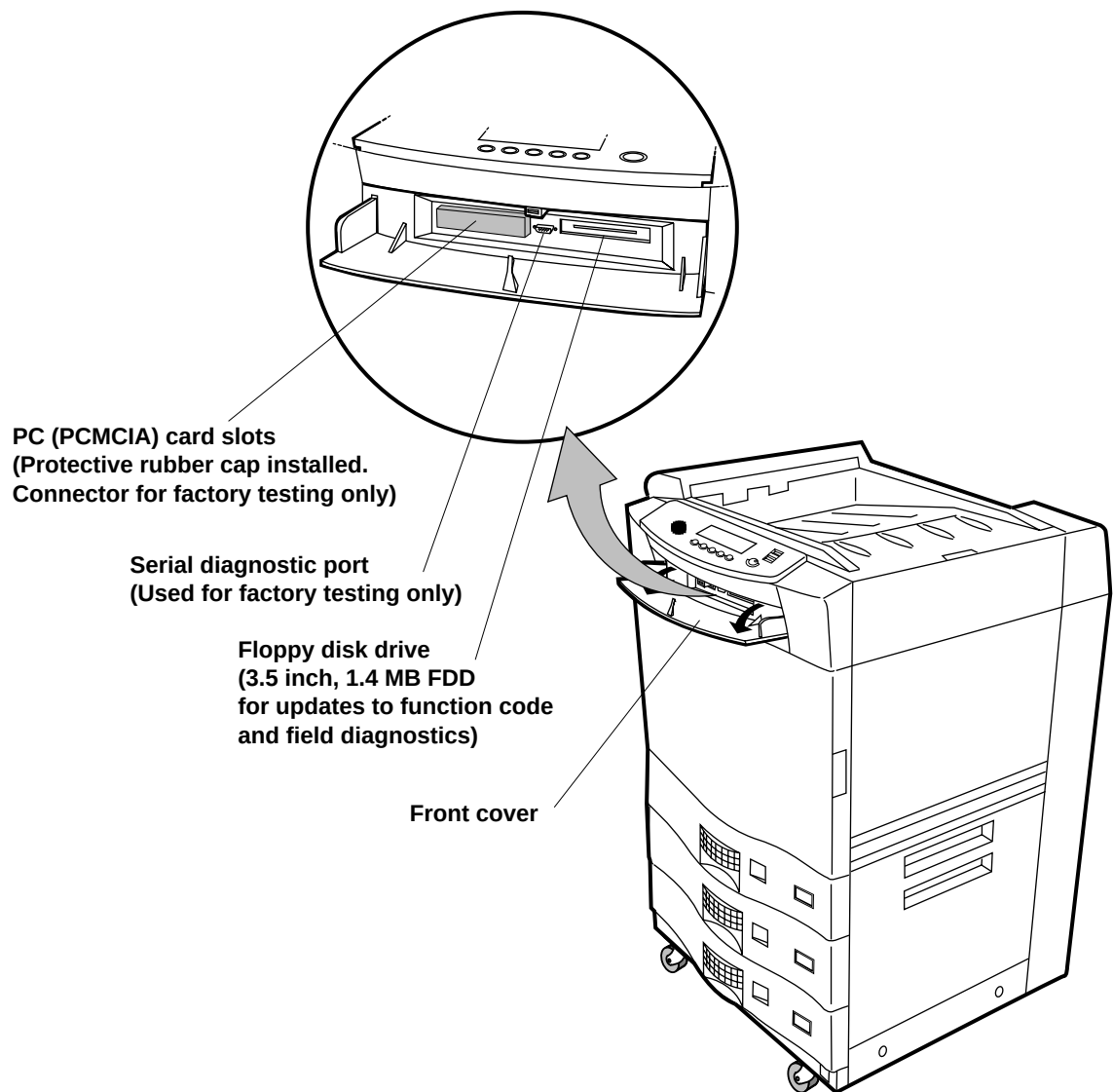


Figure 2-3 Upper Front Cover

2-2.3 Parts Accessible from the Front Door

The front door allows access to the following:

- Various knobs and levers
- Fuser unit
- Drum unit
- Transfer Assembly Guide
- Decurler unit

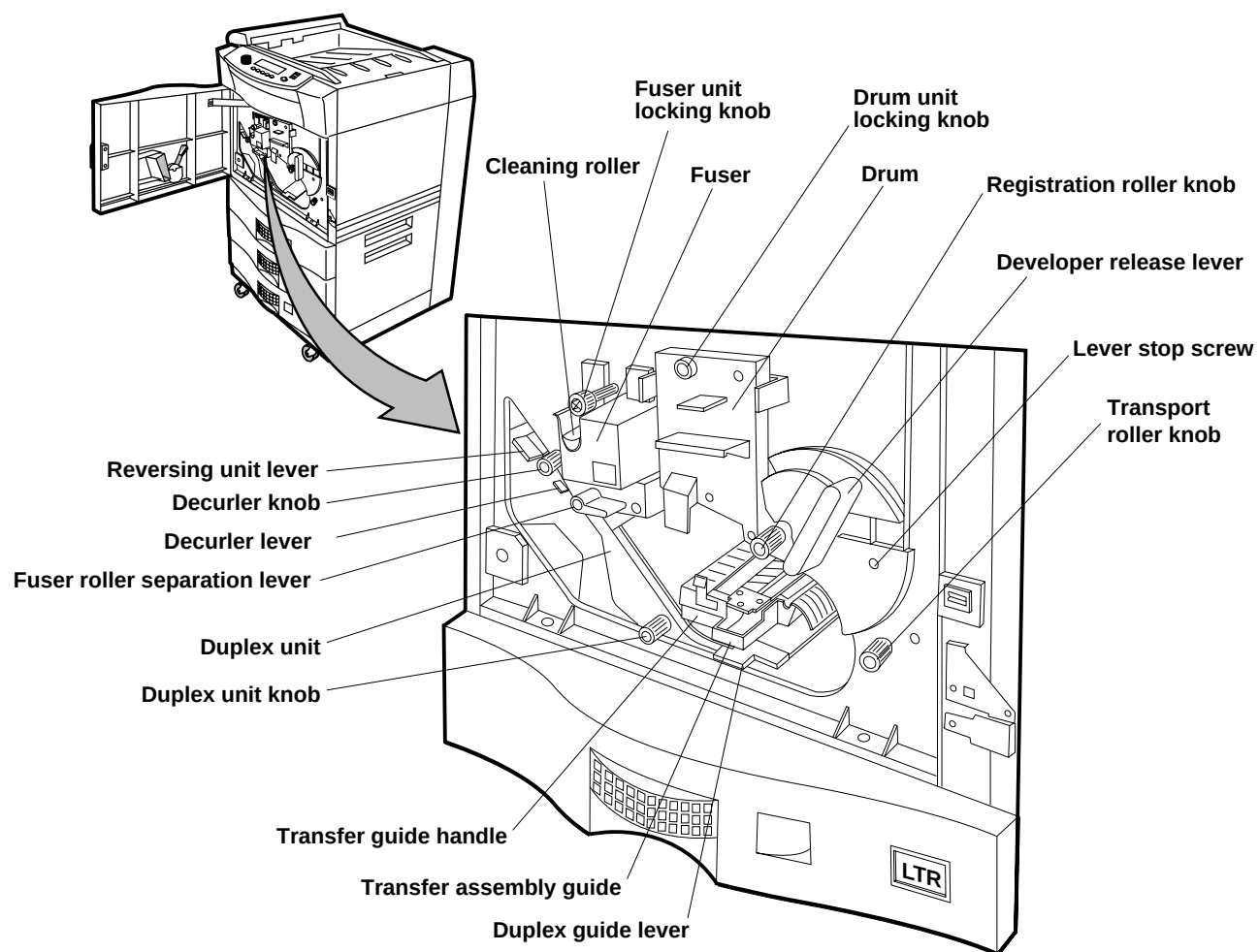


Figure 2-4 Front Inside View

Knobs and Levers

The following knobs and levers are available:

- Developer release lever—Moves the developer unit when replacing the drum. Developer release lever operating position is vertical. When the developer release lever is turned to the stop screw, the developer drive coupling on drive M unit moves away from the developer drive gears, allowing the developer to move away from the drum. When the stop screw is removed, the developer release lever can be turned to the right 90°, allowing the developer unit to be removed or inserted into the printer.
- Transport roller knob—Turns the transport roller (counter-clockwise) advancing media away from PS2.
- Registration roller knob—Turns the registration rollers (clockwise) advancing media away from PS3.
- Decurler roller knob—Rotates the rubber paddle rollers advancing media away from PS4 in the decurling assembly.
- Fuser roller separation lever—Separates the fuser rollers so that media can be removed.
- Reversing unit lever—Spring-loaded upwards to hold media in the reversing unit. Pull down on this lever to gain access to any media that may be contained in the reversing unit.
- Decurler lever—Spring-loaded upwards to hold media in the decurler unit. Pull down on this lever to gain access to any media that may be contained in the decurler unit.
- Duplex unit knob—Advances media through the duplexer and PS5.
- Transfer guide handle—Pull to release the transfer assembly guide.
- Duplex guide lever—Lift to access paper in the duplex unit. The lever is held in place by a magnet located in the base of the duplex unit.

2-2.4 Parts Accessible from the Top Cover and Ejection Cover

The following parts are accessible by opening the ejection cover and removing the top cover:

- Main controller
 - Hard disk drive
 - Floppy drive
 - SIMMs
- Optical unit

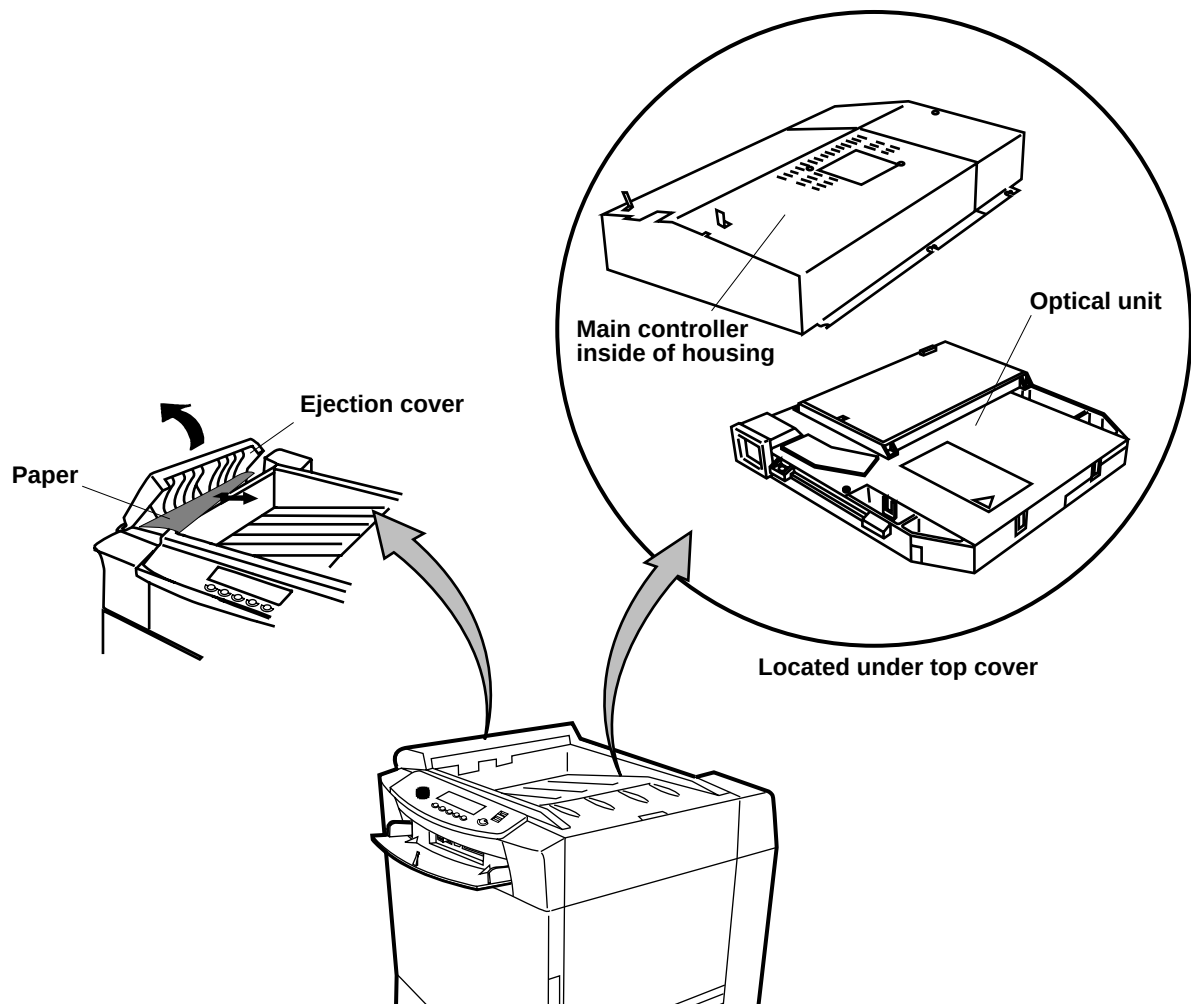


Figure 2-5 Printer Top and Upper-Right Side View

2-2.5 Parts Accessible from the Upper Right Cover

The following parts are accessible by opening upper right cover:

- Developer unit
- Toner hopper

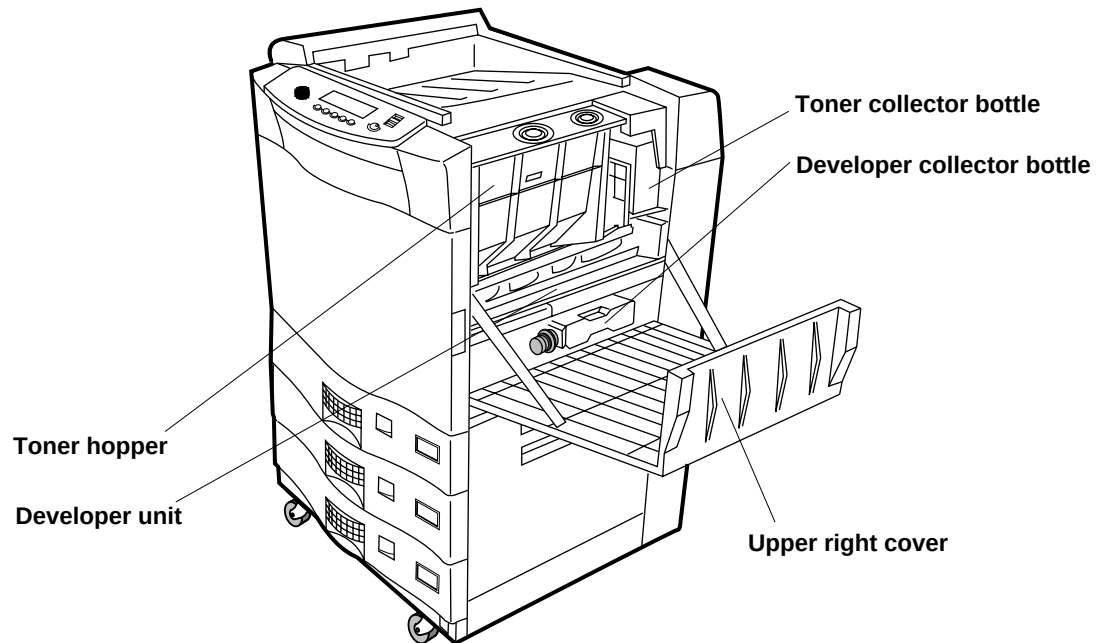


Figure 2-6 Right Cover Access View

2-2.6 Parts Accessible from the Lower Right Cover

The three paper feed units are accessible by opening lower right cover. The paper feed units contain the following for each tray:

- Paper pick rollers
- Separation rollers
- Paper out sensor (EMPSEN)
- Pick roller up sensor (LEVSEN)
- Paper feed sensor (PS1-1/2/3)

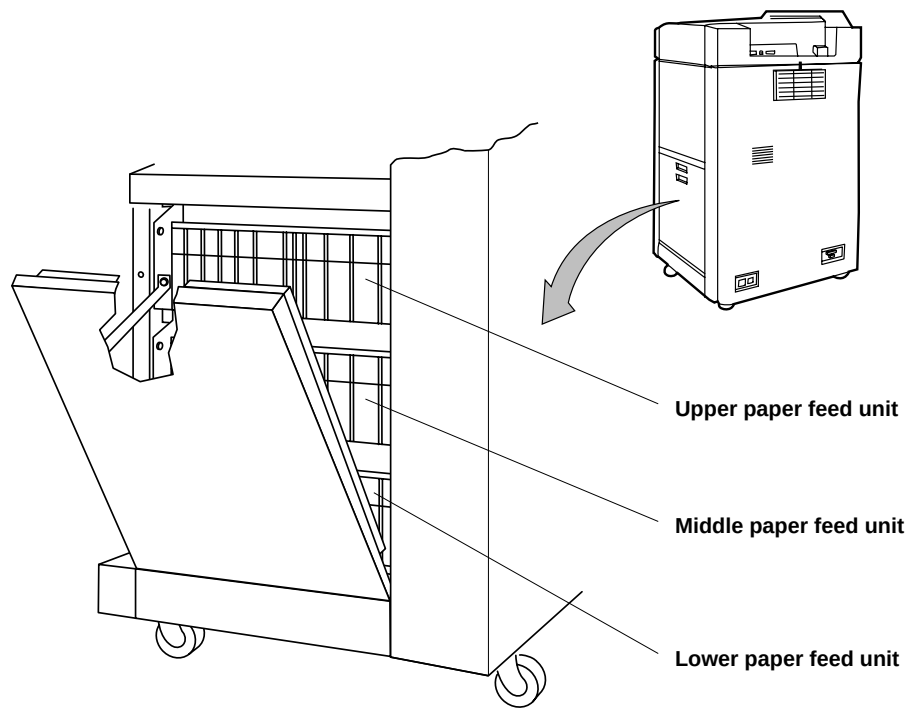


Figure 2-7 Printer Lower-Right Side View

2-2.7 External Parts Accessible from the Rear and Sides

The following parts are accessible from the left side and rear of the printer without removing or opening cover.

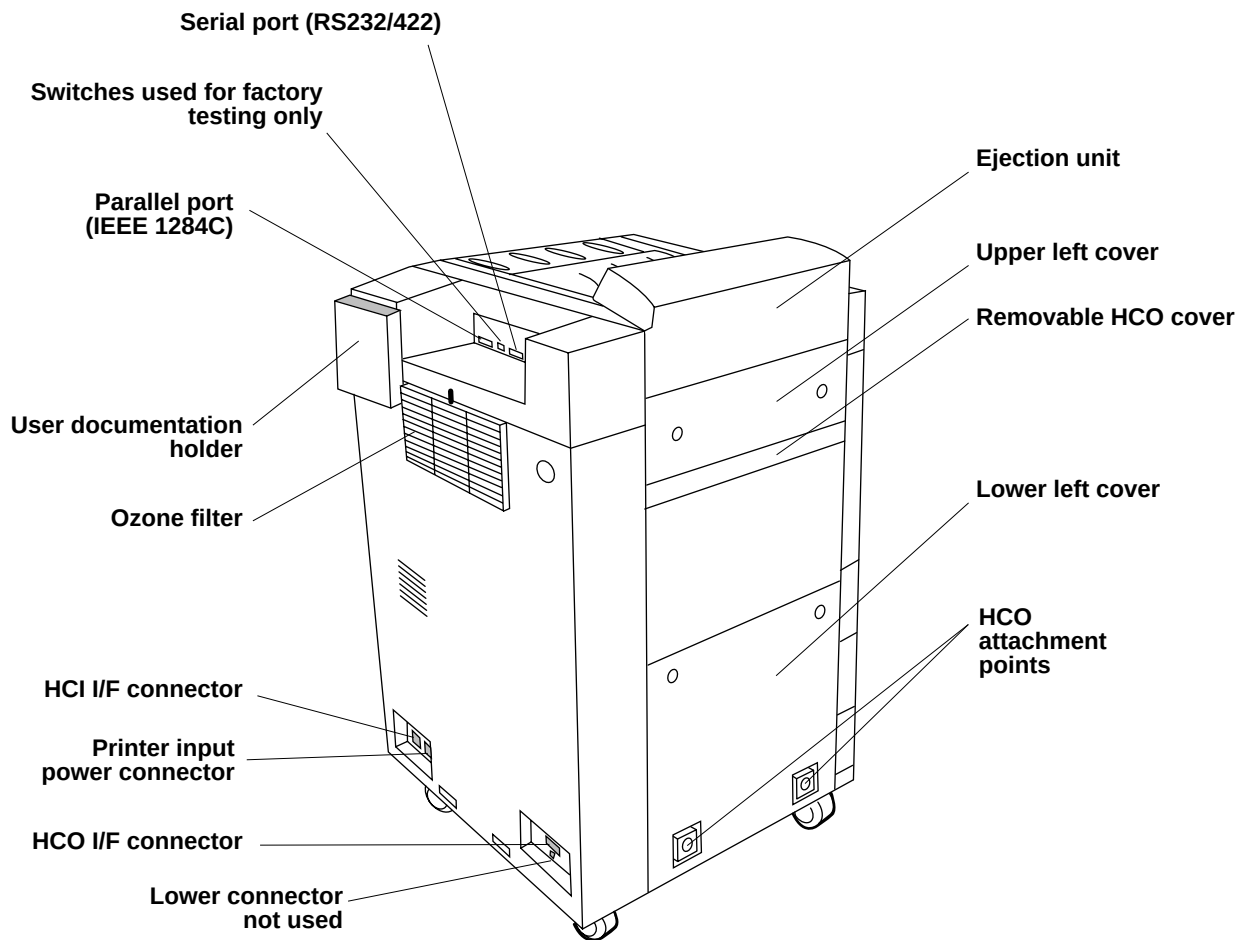


Figure 2-8 Printer Rear and Left-side View

2-2.8 Parts Accessible from the Rear Cover

The following parts are accessible by removing the rear cover.

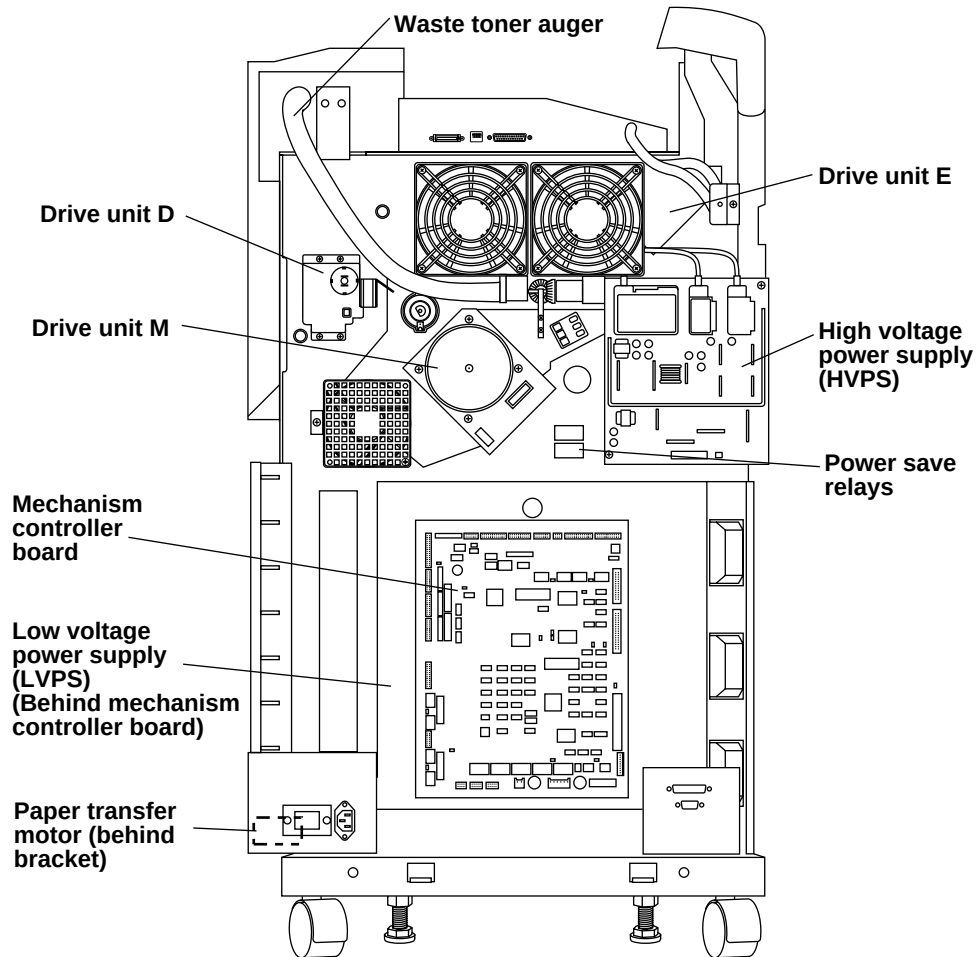


Figure 2-9 Printer Inside Rear View

2-2.9 High Capacity Input

The optional 3000 sheet capacity High Capacity Input is powered directly from the printer. The C5621A supports Letter size paper and the C5622A supports A4 sized paper only. The only difference between these HCI models is the placement of the front and rear paper guides.

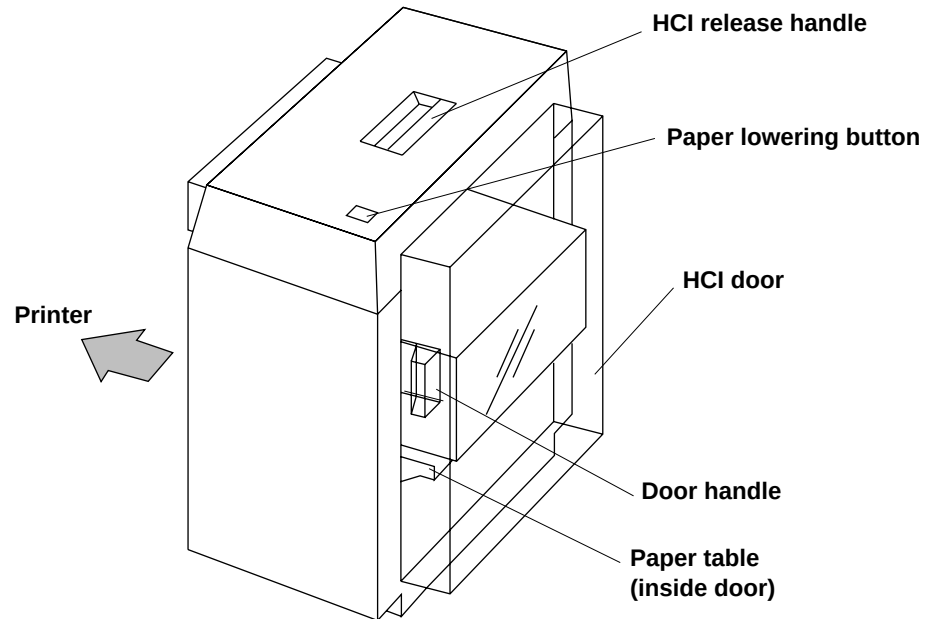


Figure 2-10 High Capacity Input

2-2.10 2,000-sheet High Capacity Output

The 2000 sheet HCO handles all the paper sizes supported by the printer. There are two models to handle two different power requirements, 120-127 VAC and a 200-240 VAC. The only difference is the internal power supply. The HCO has a separate AC power cord.

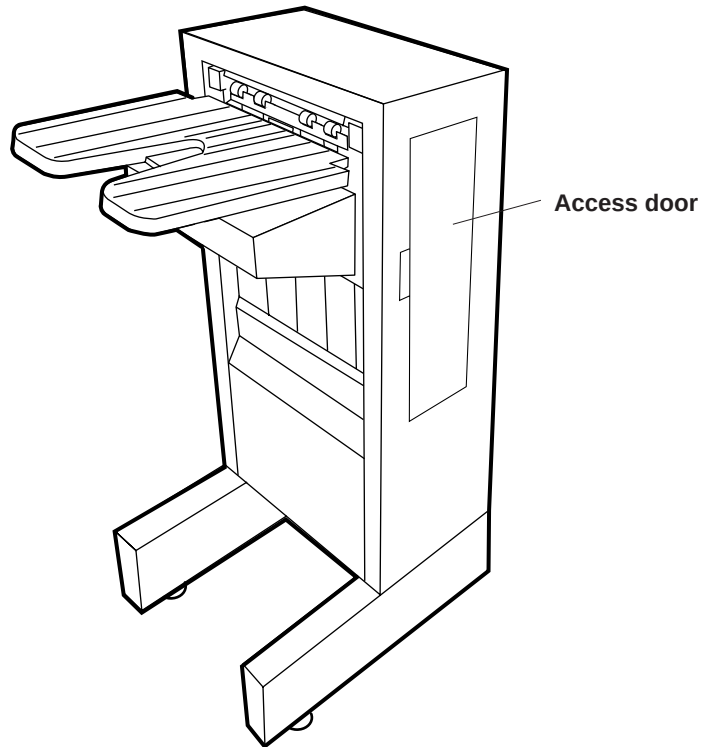


Figure 2-11 2,000 Sheet High Capacity Output

2-2.11 3,000 Sheet High Capacity Output

The 3,000 sheet HCO handles all the paper sizes supported by the printer. There are two models to handle two different power requirements, 120-127 VAC and a 200-240 VAC. The only difference is the internal power supply. The HCO has a separate AC power cord.

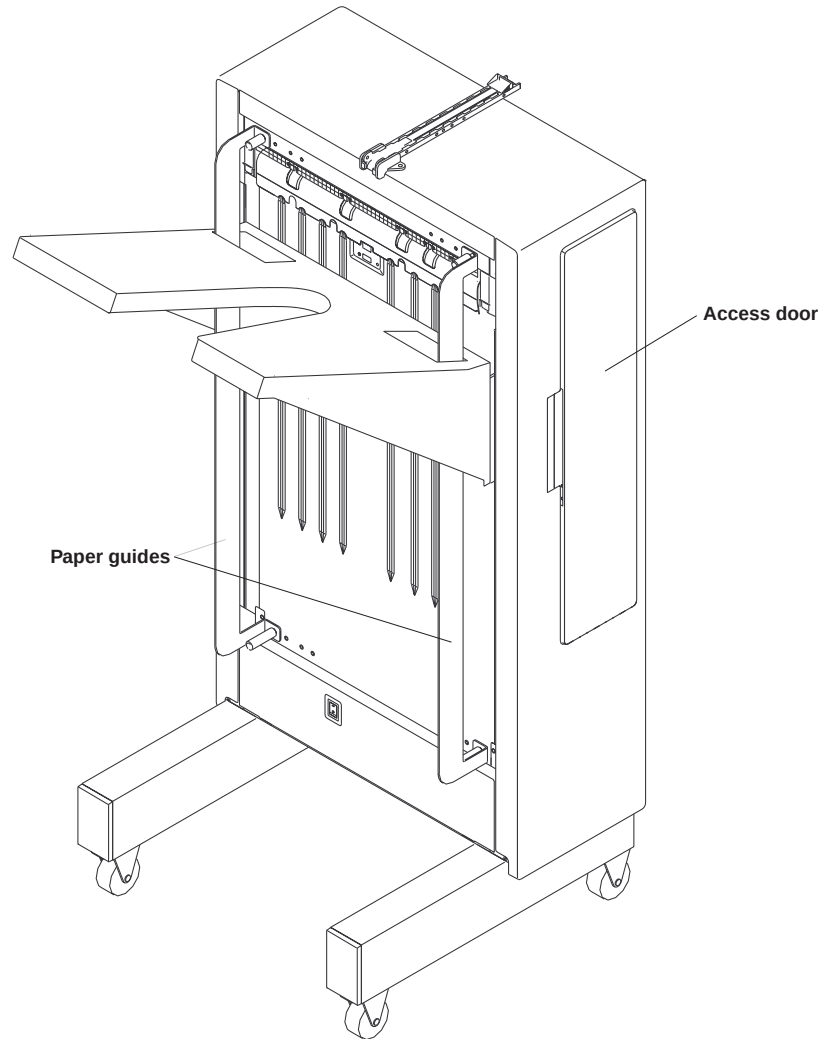


Figure 2-12 3,000 Sheet High Capacity Output

2-3 System Controllers, Control Panel, and Ports

There are two controllers in the printer that control all internal and external functions, the mechanism controller and the main controller. The operator and service engineer communicate with the printer through the control panel and the ports.

2-3.1 Mechanism Controller

The mechanism controller contains the control circuits for all of the motors, optical unit, high-voltage power supply, solenoids, and clutches within the printer.

The master and slave firmware on the mechanism controller contain timing algorithms for every supported paper size. These algorithms dictate when the motors, solenoids, and registration clutch should be turned off or on. The mechanism controller constantly monitors all of the paper sensors in the printer and halts all motors, solenoids, and clutches if a sensor is activated outside of the allowable parameters for the media size being transported. If a sensor is activated outside of the allowable parameters, the mechanism controller sends a status byte to the main controller for interpretation; the main controller then posts the appropriate message on the control panel (for example, Paper Jam).

The mechanism controller sends the Video Request (VR) signal to the main controller when it is ready to print. The optical unit sends the Video Sync (VS) signal to the mechanism controller to start printing.

The mechanism controller has an NVRAM (EEPROM) chip that maintains the total page count, current consumable counts, and electronic paper alignment values when power is off. If the mechanism controller is replaced, this 8-pin socketed integrated circuit must always be transferred to the new mechanism controller to maintain these counts.

The board also contains switches to control settings and run diagnostics. The Test Switch (S3) is located in the top right of the installed board. When the printer is ready, you can press this switch to generate a test printout. This test printout completely bypasses the main controller. The lower-right corner of the board contains three multi-position DIP switches. When you replace the mechanism controller, these switches must be set to match the old board. For a complete description of the switches and their settings, see [5-2.2 "Mechanism Controller Board Switches," on page 5-7](#).

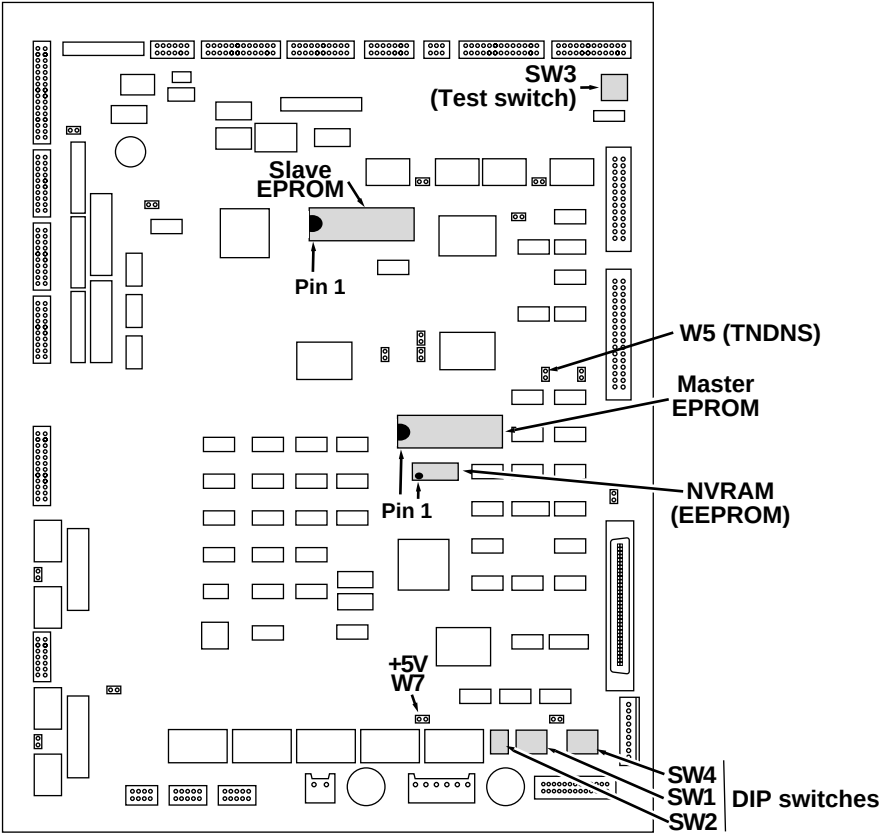


Figure 2-13 Mechanism Controller Chips, Switches, and Test Points

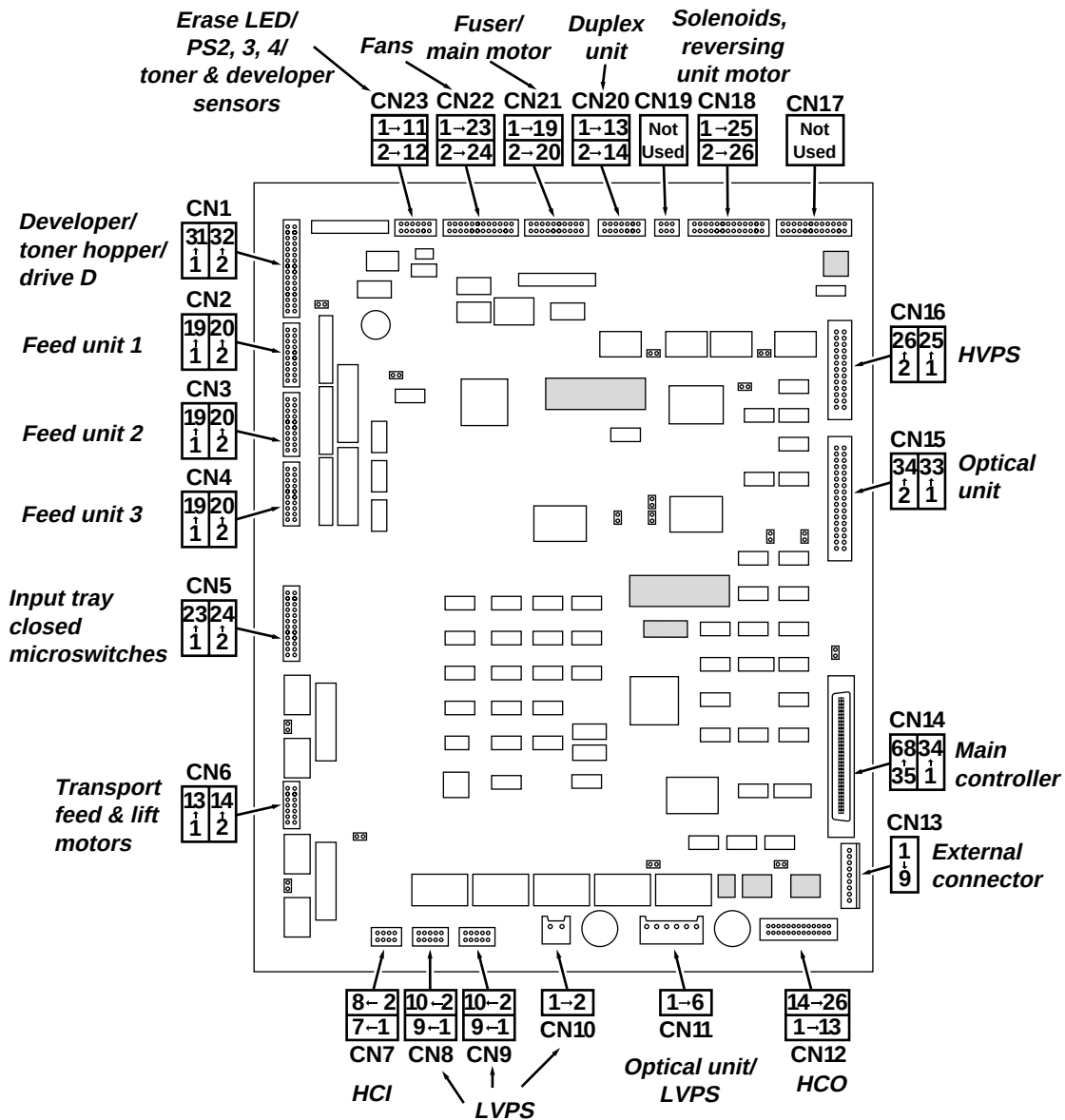


Figure 2-14 Mechanism Controller Connectors

For a list of the connectors and a detailed description, see [Table 5-2. "Mechanical Controller Connectors,"](#) on page 5-53.

2-3.2 Main Controller

The main controller is a printed circuit board with the hard disk and 3.5" floppy disk drive directly mounted onto the board, but separately replaceable.

The main controller contains:

- Motorola 68040 (40 MHz) processor
- Operator control panel interface
- Serial and IEEE1284 parallel interface controllers and connectors
- 16 MB of on-board RAM memory
- Three additional slots for optional 16 MB SIMMs
- Two Type III PCMCIA slots
- Date and time clock with a surface mounted lithium battery (10+ year life)
- 8 KB NVRAM that stores all setup report configuration values and event log
- 2 MB of ROM that contains PCL and Postscript fonts
- 4 MB Flash memory, which holds
 - Bank 0—Printer's function code
 - Bank 1—Postscript (optional) and internal diagnostics (two separate programs)
 - Banks 2 and 3—User downloads, such as fonts and macros

The main controller receives data via the serial or parallel interface ports, the PCMCIA slots, the hard disk, or the floppy disk. The main controller uses the data to format the page and then convert the page into dot rows. When the mechanism controller asserts the VR (Video Request) signal, the main controller sends the dot row data to the optical unit.

The main controller maintains the control panel. The menus are stored in the main controller code and most selections are saved in the main controller NVRAM. The main controller receives error messages from the mechanism controller in Hex format and converts and displays them in alphanumeric format.

The power-on switch (part of the control panel) is simply a ground signal that is routed through the main controller, mechanism controller, and the low-voltage power supply. Powering down from the switch activates a sequence so that the last sheet is fully printed and ejected before the printer power is turned off. This is a firmware-controlled sequence by the main controller and mechanism controller.

The four position DIP switch between the serial and parallel connectors should *always* be set to the UP position so that the printer can boot up by loading the function code from bank 0 of the main controller's flash memory. Changing the settings of this switch will allow the main controller to initialize from alternate locations in flash. For a description of the DIP switch settings, see [5-2.1 "Main Controller Board DIP Switches," on page 5-6](#).

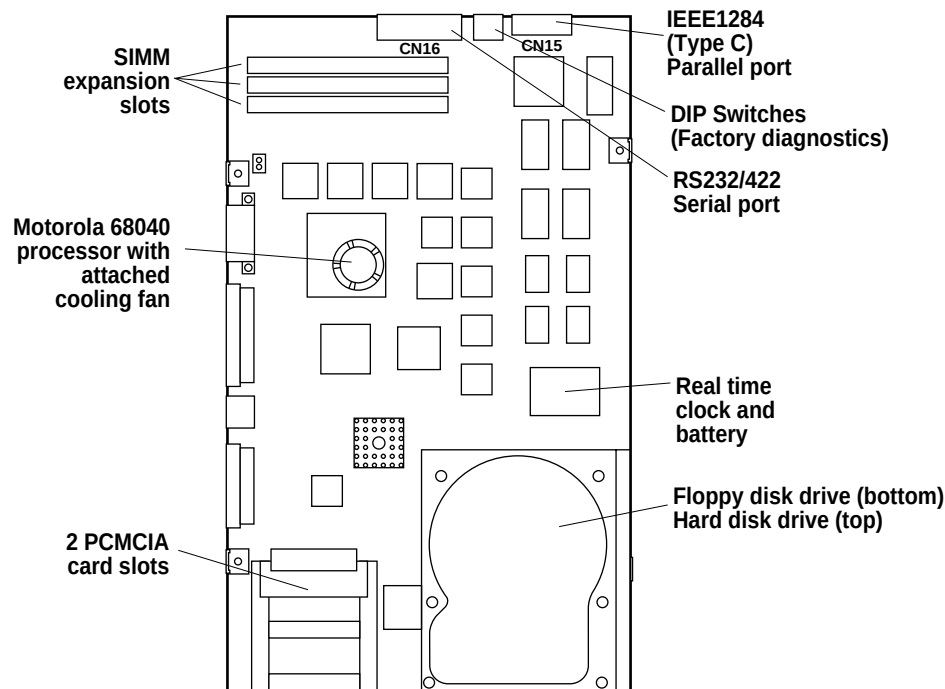


Figure 2-15 Main Controller Board

Hard Disk Drive Organization

The internal hard disk contains several directories and files that can be helpful when servicing the printer. The disk is organized similar to a DOS file system, with a volume label (for example, E01V04), directories, subdirectories, and files.

Some of the directories on the hard disk are the following:

- **USER_ADJ**—Contains the file Alignset.33 that is used to electronically align the print image from the
- **MAINT**—Contains several subdirectories as follows:
 - **CE_PROG** contains the following two subdirectories:

A backup copy of the Printer Diagnostic Program—Selecting the file (for example, CE980131.LE3) and placing the printer on-line copies the Printer Diagnostic Program into the main controller's flash memory (bank 1) where it can be executed. If the diagnostic program is not resident in flash and loading is attempted, the control panel (including the standby power switch) will lockup. In this case, power off the printer at the main power switch on the lower right front, power on the printer, and copy the backup copy of the diagnostic program from the hard disk to the main controller flash (see [3-1.3 "Loading or Upgrading the Printer Diagnostic Program," on page 3-4](#)).

Paper Path Test—Prints 180 sheets from every ready paper source (tray or HCI with paper loaded) to every available output bin (upper bin or HCO). Used to verify entire paper path (see [4-2 "Troubleshooting Overview," on page 4-6](#)).

- FUNCODE contains the following two subdirectories:

MAIN—Contains a backup copy of every function code that has been installed on the printer (for example, 02V01L52.S, where .S is the current version and .OLD is a previous version).

PS—Contains a copy of the printer's optional Postscript code (for example, 961121.S). PS subdirectory will be empty if the Postscript option was not purchased and installed from a floppy disk

- UTIL contains several files:

LASERSET.xx—Used to adjust the laser start position after replacing the optical unit. This file will print a pattern which can then be used to change Switchbank 2 on the mechanism controller to adjust the laser start position (see [5-3.3 "Laser Start Position Alignment," on page 5-10](#)).

ALL_EDGE.xx—Prints an edge-to-edge, front-and-back pattern on the installed media. This pattern will show how close to the media edge printing can be done on any particular media before print quality problems are evident.

FILECHK.PCL—Checks the directory structure of the hard disk and attempts to repair any problems it has found. Similar to the Scandisk utility on a PC, this file will print a report of any problems this utility was unable to fix.

CAPTURE.100mb—Sets a 100-Mbyte limit for capturing files on the printer's hard disk. This is the default for a captured file.

CAPTURE.1_4mb—Sets a 1.4-Mbyte limit for capturing files on the printer's hard disk. This utility is useful for creating small capture files to copy to the printer's floppy disk.

EVENTLOG.C2A (C: to A:)—Performs the following sequence

- prints a Maintenance Report
- updates the EVENTLOG.PCL file on the printer's hard disk
- copies the file to the floppy disk.

Insert a blank, formatted floppy disk before selecting.

REPORTS & EVENTLOG.C2A—A utility that

- prints a Setup and Maintenance Report
- copies a print file of the Setup Report and the Maintenance Report to floppy disk
- copies the eventlog.pcl file to floppy disk.

This utility is useful for sending complete information to support personnel for analysis. Insert a blank, formatted floppy disk before selecting.

- EVENTLOG.PCL—Prints the complete eventlog from the hard disk. On function code L52 or later, whenever the Maintenance Report eventlog is 50% full, it is copied to this file (or appended to this file if already present on the hard disk) so that a complete error history is maintained on the hard disk for the printer. Version L03 or later, the eventlog is copied whenever a Maintenance Report is printed.

Floppy Disk Drive

The 3.5 inch, 1.4 MB floppy disk drive is used to load the optional Postscript emulation code and update the printer's function code. Appropriately formatted files may also be printed directly from a disk, and files can be stored to a floppy disk using the Capture utility (Menu.Maintenance.capture.)

PCMCIA Slots

The two PCMCIA card slots can be used by support personnel and by our customers, but they are officially not supported or documented by HP. The PCMCIA slots can be used for following:

- Factory level diagnostics contained on flash PCMCIA
- Specific linear flash cards (Maxtor, KingMax, and Intel) that are transparent to the user and could be used if a customer wanted to make their non-standard font the default
- Third party developers/OEMs for specific applications, such as TROY Systems, that use the PCMCIA slot for MICR fonts and signatures. This allows the special fonts/signatures to be removed and stored in a more secure environment between usage
- PCMCIA ATA hard disk drives (Maxtor, Integral Peripherals). These PCMCIA hard drives act as drive B (upper PCMCIA slot) or drive D (lower PCMCIA slot).

Serial Diagnostic Port

The RS-232 serial diagnostic port on the front of the printer directly connects a personal computer to the printer. From the computer display, you can dynamically view printer operating system commands and registers. The control panel communications menu allows you to configure the baud rate, parity, start and stop bits for the front serial diagnostic port and the rear 25-pin serial port simultaneously. This port is rarely used except for factory level testing.

Serial and Parallel Ports

The rear serial port supports RS232 or RS422 serial host communication and the IEEE 1284C parallel port supports bidirectional parallel or standard Centronics parallel communication. The printer will automatically switch between the serial and parallel port as data is presented by the host computers (Hot Port Switching).

Data and Memory Processing

The printer main controller is basically a small computer that performs the central communication with the other printer systems, such as the mechanism controller, and optical unit. The communication between the main controller and mechanism controller is bi-directional. The mechanism controller communicates with the optical unit for status and timing synchronization.

PCL, PJP, HP-GL/2, PS, TIFF, and VIP are types of data format that are accepted by the printer. PCL, PJP, HP-GL/2, and PS are printer languages that generate binary data the printer understands. The information about the data types are contained in the beginning section (data stream) of the data file. TIFF (Tagged Image File Format) is data format generally used for graphic images.

VIP (Video Image Printing) is the raster data stream generated by the main controller and sent to the optical unit turning the laser on and off to create the printing image on the drum.

Figure 2-16, Figure 2-17, and Figure 2-18 show the interaction between the main controller, mechanism controller, and the optical unit.

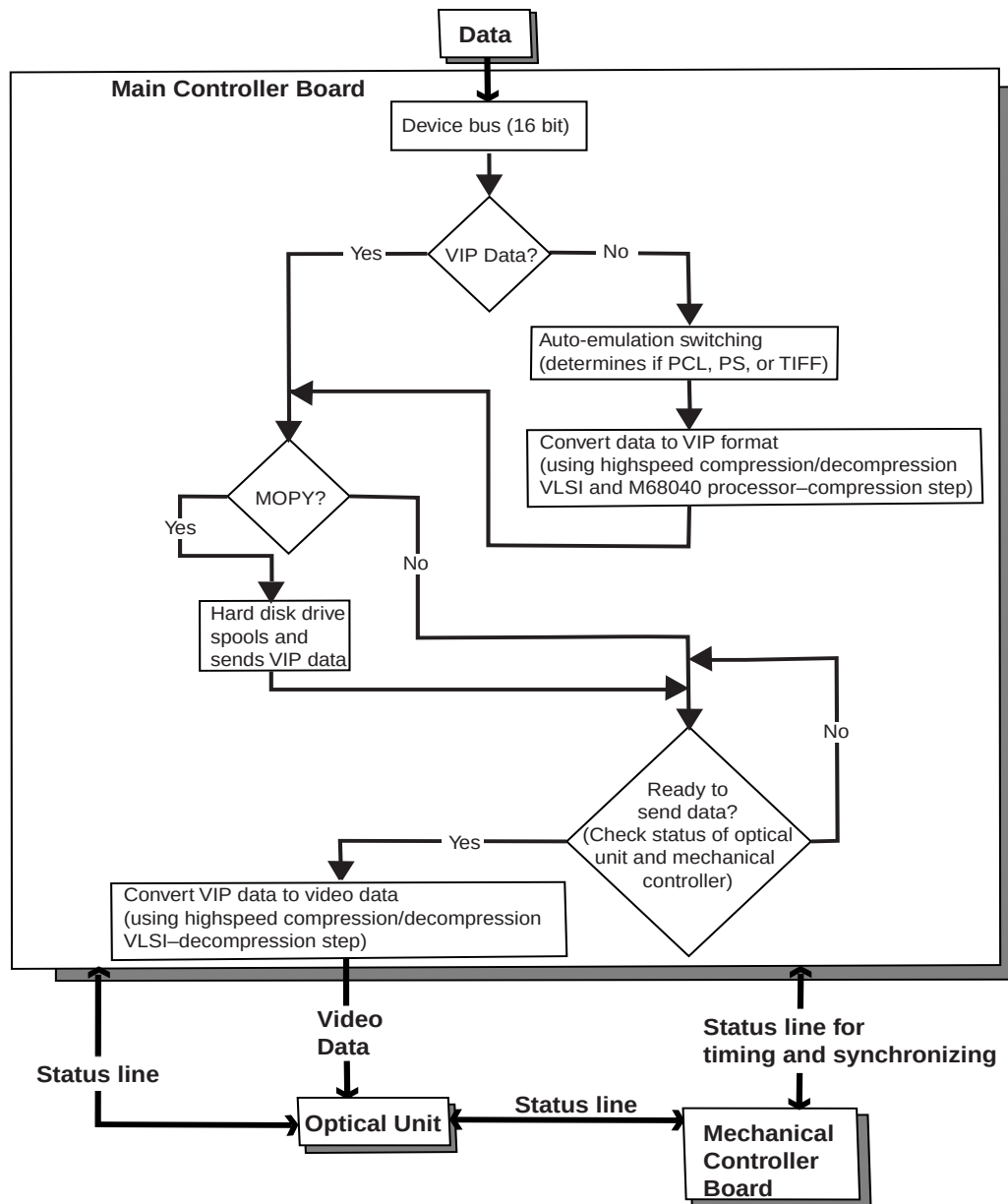


Figure 2-16 Job Processing

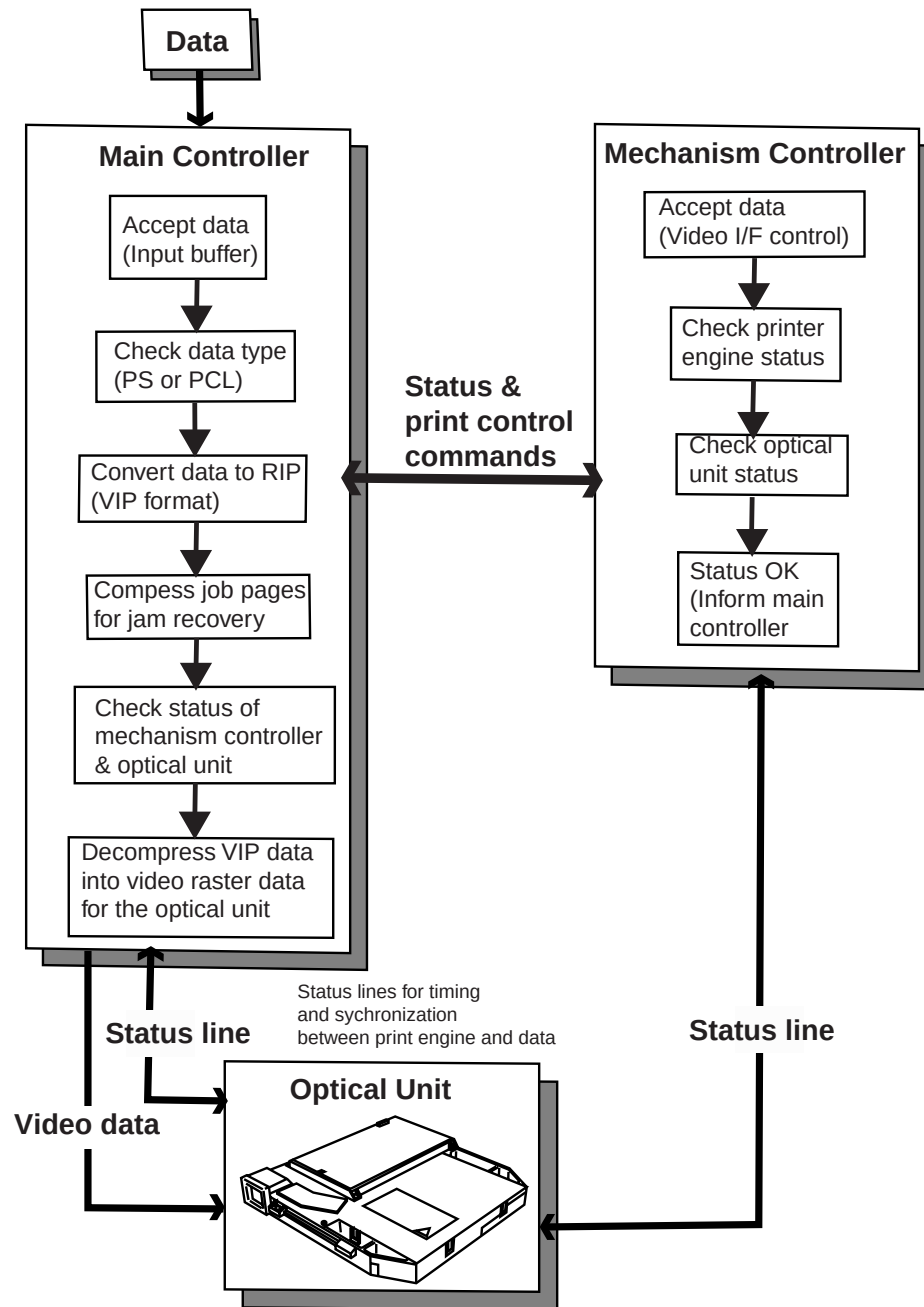
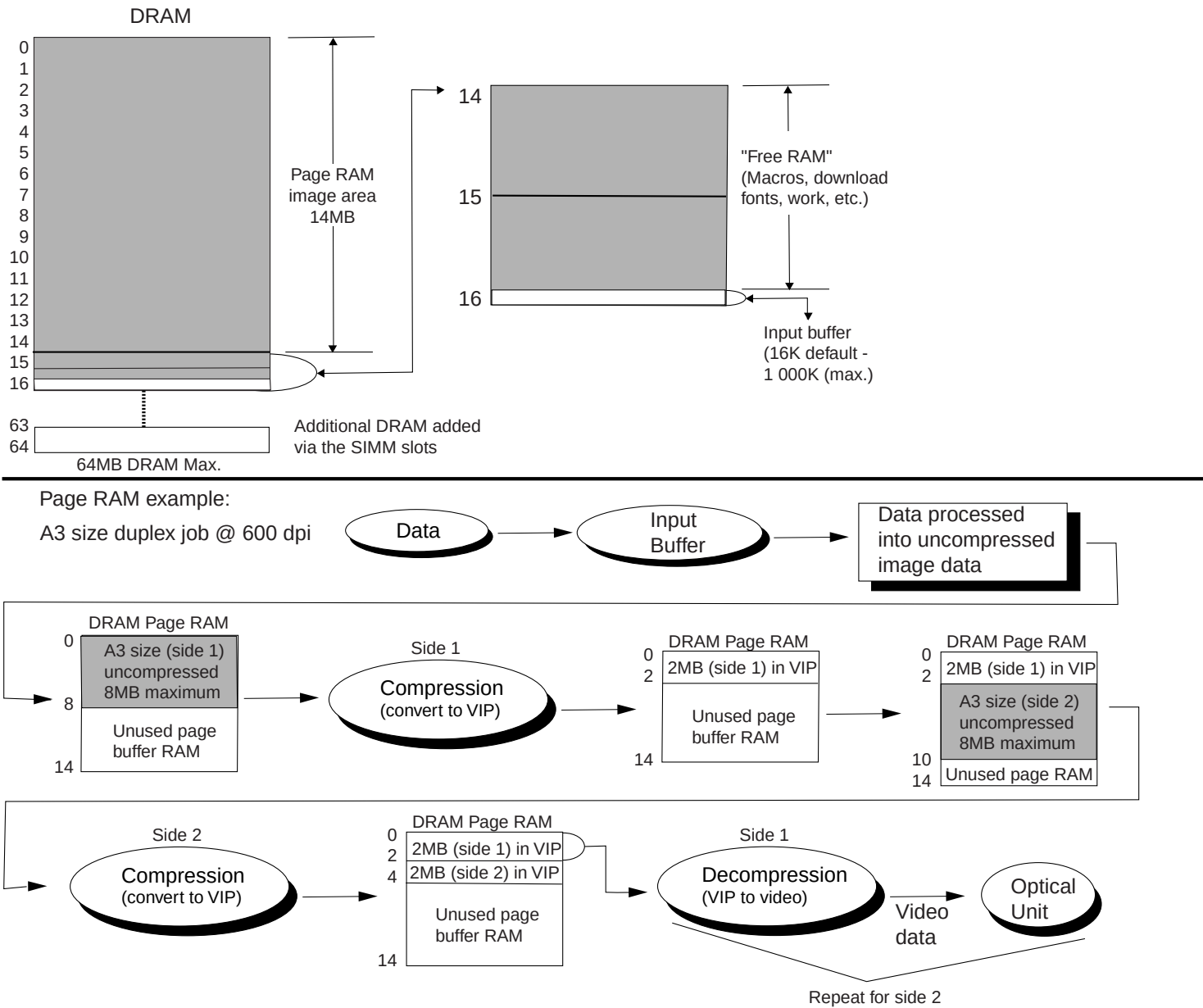


Figure 2-17 Main Controller Data Flow

Figure 2-18 Printer Page Buffer



2-3.3 Control Panel

The control panel contains the following operator controls and display:

- Standby power switch
- Liquid crystal display
- Five buttons that operate menu functions within the display
- Light emitting diode (LED) that indicates that the printer is in the power-save mode.

The LCD panel is always backlit except when in power-save mode. The internal speaker on the control panel is not used. The control panel connects directly to the main controller via the cable in rear of the panel.

The main power switch acts as a circuit breaker controlling the 120/240 VAC power to the printer and is usually left on. To turn operational power on or off, use the standby power switch on the control panel. The standby power switch is a software controlled switch that only powers off the printer after all paper has cleared the paper path.

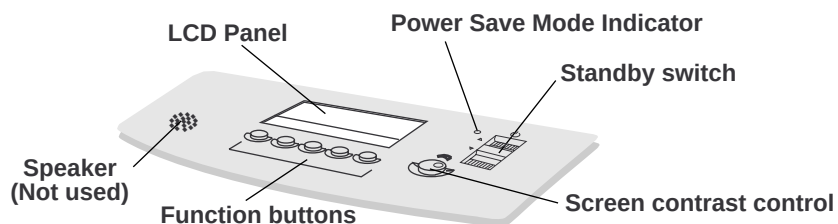


Figure 2-19 Control Panel

2-4 Power Supplies

Printer power is generated from two main power supplies, the low voltage power supply (LVPS) and the high voltage power supply (HVPS). These power supply boards contain the individual power supplies that generate voltage for all the systems on the printer. The power supplies are accessible from the rear of the printer. The LVPS is behind the mechanism controller board.

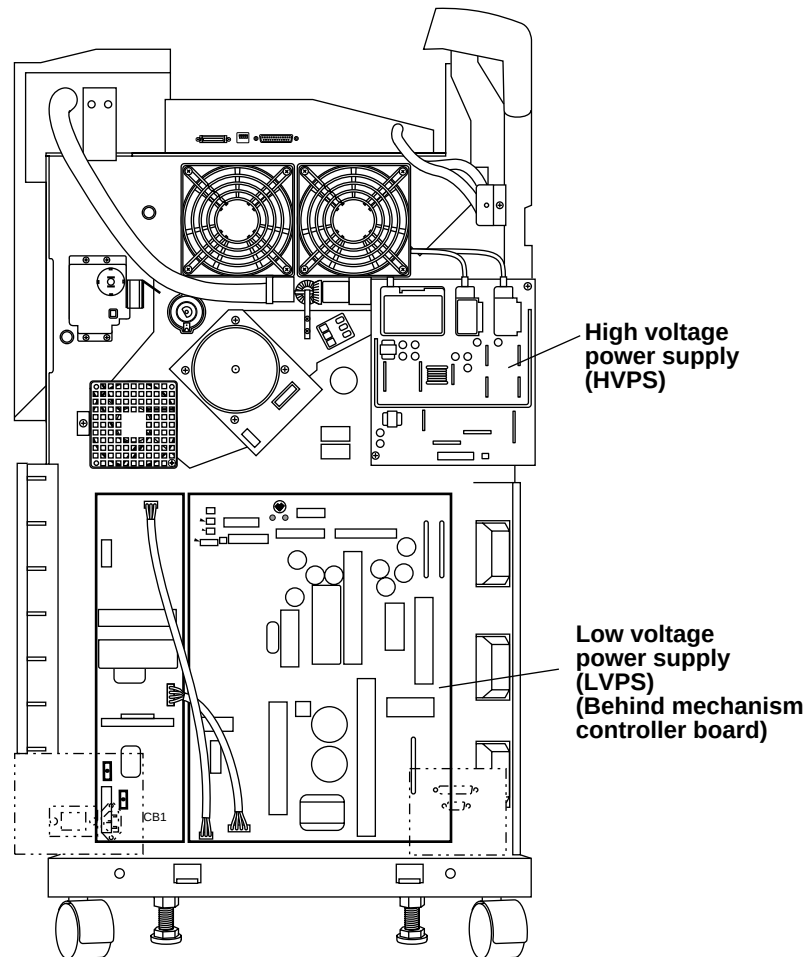


Figure 2-20 Power Supplies Location

The main power switch (circuit breaker) controls the 120/240 Vac power to the printer, and is usually left on. When turned on, the main power switch supplies AC power to the low voltage power supply. The standby power switch operates as a firmware controlled switch that only powers off the printer after the final sheet has cleared the paper path. (For the power on sequence timing diagram, see [A-4 "Power-on Sequence Timing Chart,"](#) on page [A-28.](#))

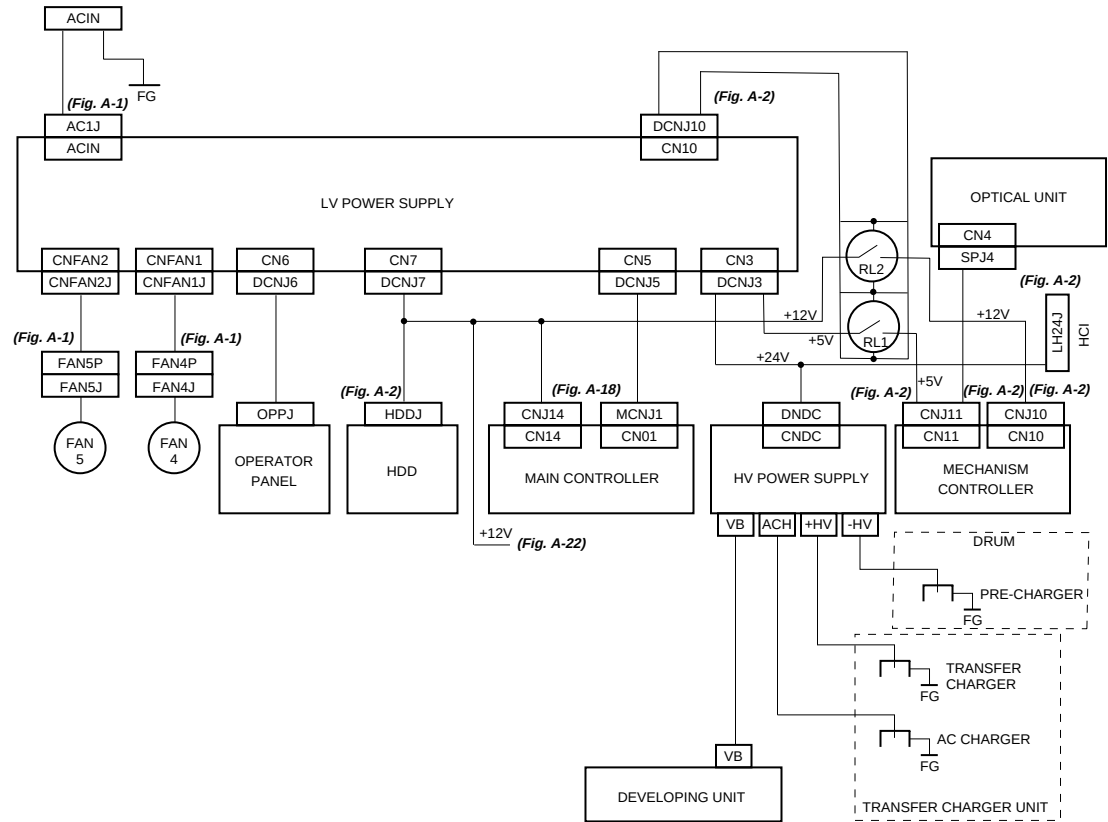


Figure 2-21 Power Distribution

2-4.1 Low Voltage Power Supply

The low voltage power supply (LVPS) supplies +5 (+4.82), +12 and +24 Vdc power to all devices within the printer and the optional high capacity input (HCI). The LVPS has two alarm LEDs visible through a hole in the top center above the mechanism controller:

- Left LED indicates a DC voltage fault labeled POWALM
- Right LED indicates a Fan 4 and/or 5 failure labeled FANALM.

In normal operation, both of these alarm LEDs are off. If either LED is lit, the fault causing the lighted LED must be corrected. To turn off the LED:

- 1 Correct the fault causing the lighted LED
- 2 Unplug the printer from the power source or turn off the main power switch
- 3 Wait until the LED turns off (about 15 seconds)
- 4 Plug in the printer and turn power on.

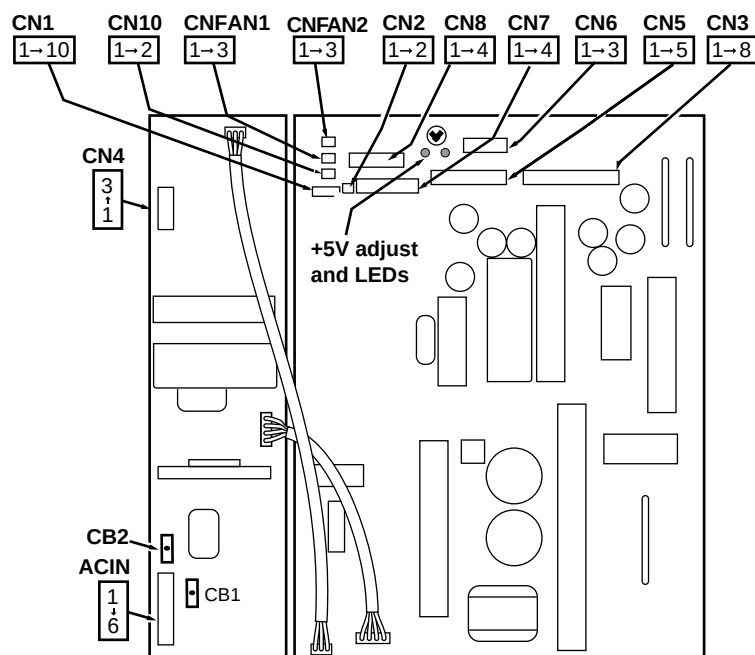


Figure 2-22 Low Voltage Power Supply

The only adjustable LVPS voltage is the +5Vdc, adjusted to 4.82 (± 0.02 Vdc) to comply with the "Energy Star" requirements. The 4.82Vdc is measured at Test Point W7 on the mechanism controller. The +5V adjust is available through an access hole on the mechanism controller bracket (see Figure 2-11). If the +5Vdc is adjusted too low, the printer malfunctions and the control panel is blank, poorly lit, too bright, or has missing characters. If the +5V is adjusted too high, the control panel is blank except for a horizontal white line.

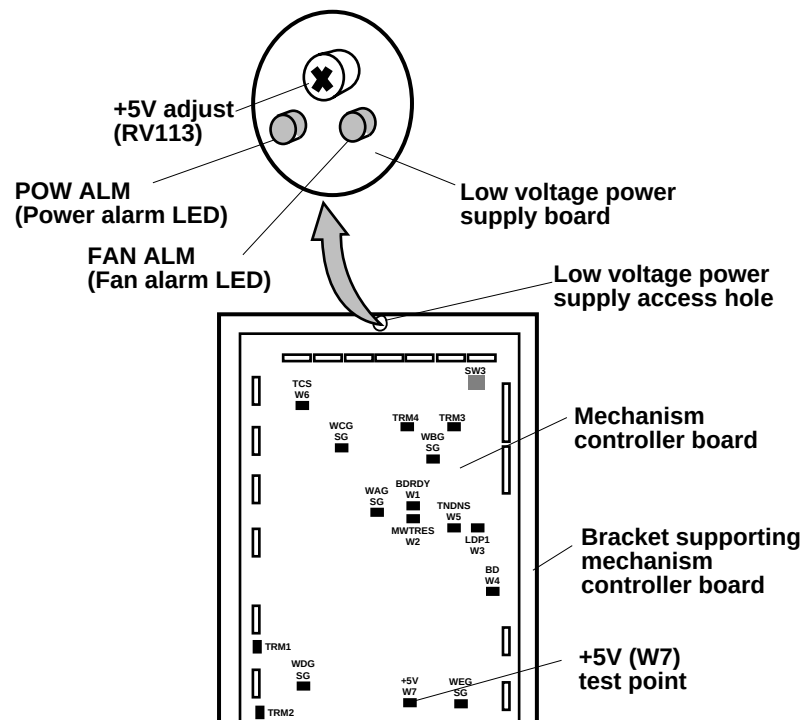


Figure 2-23 LVPS +5V Test Point W7 and +5V Adjustment

The LVPS block diagram (see [Figure A-23 "Low Voltage Power Supply Block Diagram," on page A-24](#)) shows the path the AC power takes to become the DC voltage used by the printer. The following is the sequence:

- 1 The incoming AC power (ACIN) from the main power switch routes through either the two safety circuit breakers (CB1 and CB2) on the low voltage supply. These circuit breakers check for serious problems within the LVPS and if tripped, replace the LVPS.
- 2 AC power routes through noise filters either directly to the fuser or to internal LVPS circuits that detect 120 Vac or 240 Vac and monitor for inadequate voltage, and a power factor correction (PFC) circuit (required for European Standard EN61000-3-2 to reduce harmonic distortion in the neutral return).
- 3 The AC power is rectified into DC power and routed to the +5, +12, and +24 Vdc power supplies.

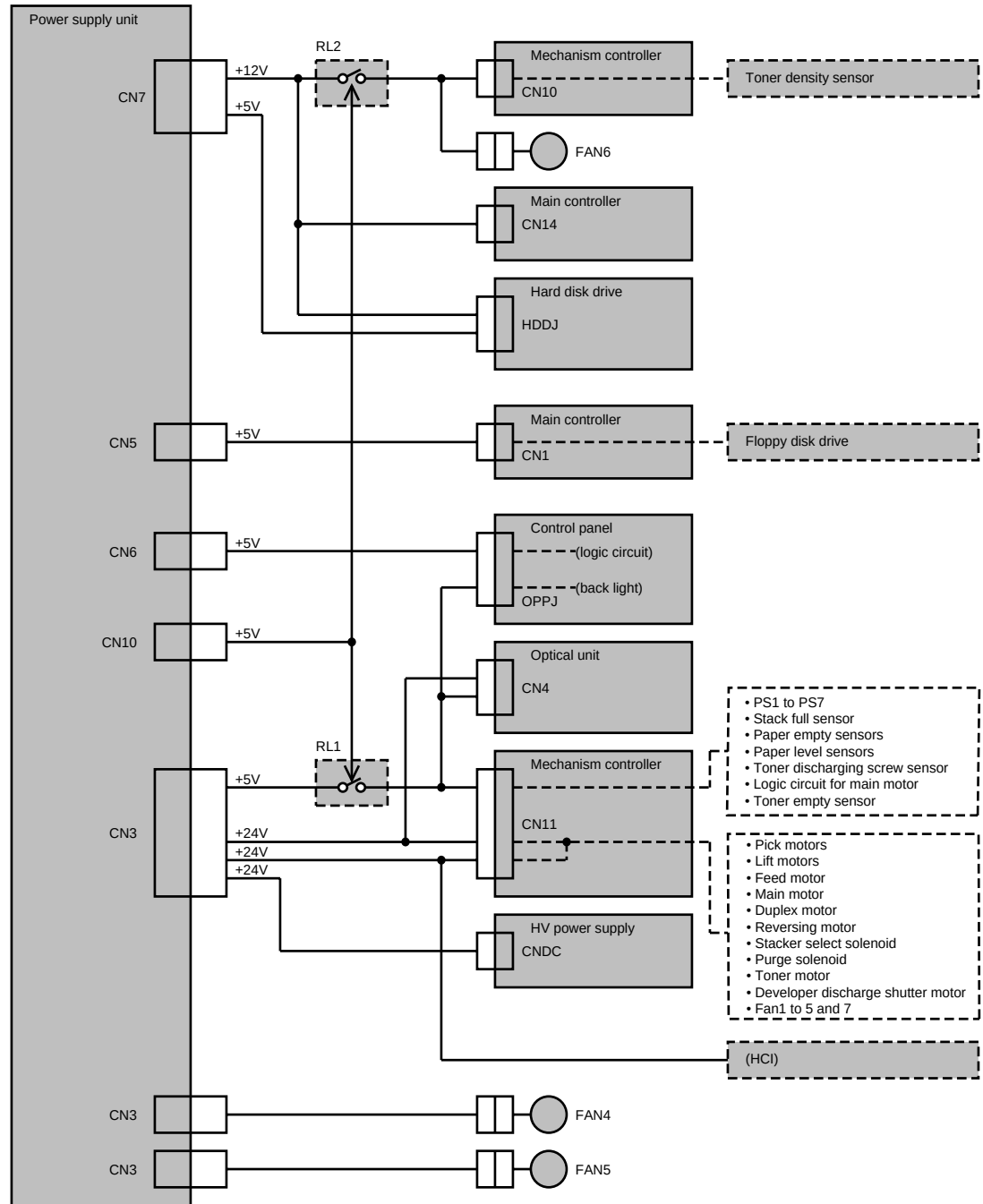


Figure 2-24 LVPS Distribution

The three DC voltages supplied by the LVPS route to the following areas:

- +5 Vdc (+4.82 Vdc)
 - Logic
 - Sensors
 - Mechanism controller logic
- +12 Vdc
 - RL2
 - Fans
 - Mechanism controller
 - Main controller
 - Hard drive
- +24 Vdc
 - Motors
 - Solenoids
 - Fans
 - High voltage power supply
 - HCI
 - Optical unit (via the mechanism controller)

The +5 Vdc picks relays RL1 and RL2 (on the frame; not on the LVPS) and routes to the main controller. RL1 and RL2 are the “power save” relays. When power save mode is active, RL1 cuts off the +5 Vdc to the control panel backlight, the optical unit, and the mechanism controller, and RL2 cuts off the +12 Vdc to the mechanism controller.

If the low voltage power supply detects a speed problem in Fan 4, Fan 5, or any +5, +12 or +24 Vdc loads, the power ready signal drops and the LVPS shuts down. The LVPS has two alarm LEDs visible through a hole in the metal mounting plate at the top center of the mechanism controller. The FANALM LED illuminates if the low voltage power supply detects a problem in Fan 4 or Fan 5. (Fan 4 is the fuser exhaust fan and fan 5 is the low voltage power supply cooling fan located on the rear lower frame.) The POWALM LED illuminates if the mechanism controller detects an over current in the +5, +12, or +24 Vdc loads connected to these power supplies.

2-4.2 High Voltage Power Supply

The high voltage power supply (HVPS) provides high voltages to the following:

- Precharger in the drum (-HV)
- Developer for its developer bias voltage (VB)
- Transfer and separation chargers (+HV)
- Separation voltage for charger (ACH)

The HVPS is firmware controlled by the mechanism controller and powered by 24V from the low voltage power supply. No measurements or adjustments can be made on the board.

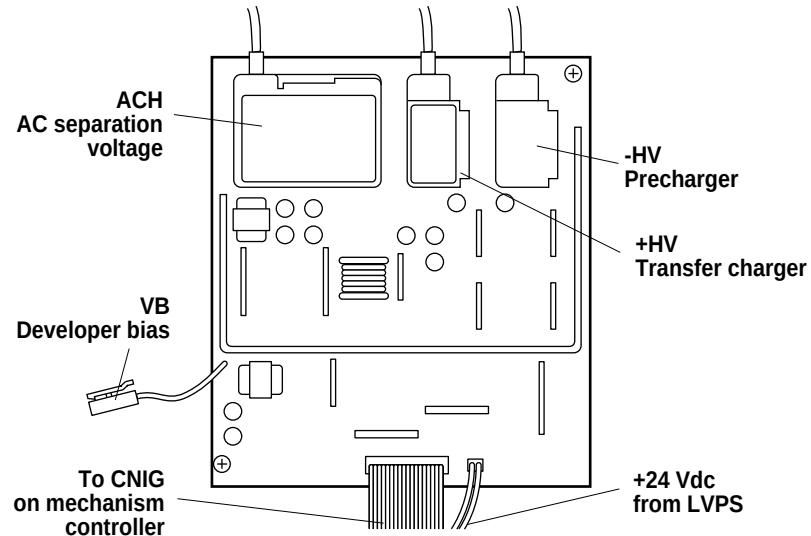


Figure 2-25 High Voltage Power Supply

The high voltage supply uses the +24 Vdc directly from the low voltage supply to generate four separate high voltages used in the electrophotographic printing process. Within the high voltage supply assembly, there are four separate power supplies. For block diagrams for each of the four power supplies, see [A-3 "Printer Power Diagrams,"](#) on page [A-24](#).

- **-HV** —Generates 1.2 KVdc for the precharger in the drum. The -HV cable connects to a lever spring within drive M unit on the rear printer frame. A metal contact at the top rear of the drum contacts this lever spring conducting the -HV voltage to the precharger corona in the drum. After passing through a grid between the precharger and the drum, -600 Vdc is placed onto the drum surface by the precharger corona. When the drum is removed the lever spring is visible on the rear printer frame. A contaminated precharger or a drum that will not accept a charge (end of life) can cause a failure (due to arching) to be detected by the -HV supply error circuitry.
- **-VB** —Generates -350 Vdc for the developer bias voltage applied to the developer mixture. The -VB cable connects the HVPS board to a connector directly to the lower left of the high voltage supply. The connector connects to another cable running to a connector directly below the waste toner bottle, where a cable from the developer unit is inserted to complete the circuit. There is no direct feedback from the developer unit to the high voltage developer bias supply. This cable can be disconnected for troubleshooting purposes, but the white areas of the page will gray.
- **ACH**—Generates high AC voltage for the separation charger. The ACH cable connects to the high voltage supply through a hole in the printer rear frame and connects to the transfer assembly guide. The separation charger utilizes the same ground wire as the transfer charger to complete the circuit.
- **+HV**—Generates high positive voltage to the transfer charger. The +HV cable connects to the high voltage supply through a hole in the printer rear frame to the transfer assembly guide. A green ground wire connects the metal plate on the lower side of the transfer unit assembly to the printer frame to the left of the HVPS to

complete the circuit. The metal plate under the transfer/separation charger must solidly contact the frame of the charger or intermittent transfer or separation problems will be experienced, such as SVC 6F errors.

Each of the four separate supplies has an error detection circuit that reports to the mechanism controller, which sends the appropriate status byte to the main controller. Should an error be detected on one of the internal high voltage supplies, an SVC 6F High Voltage Error (see [4-9.19 "SVC 6F High Voltage Power Alarm," on page 4-52](#)) is posted on the control panel. An open or shorted charger, high voltage supply or ground will be detected as an error.

2-4.3 Fans

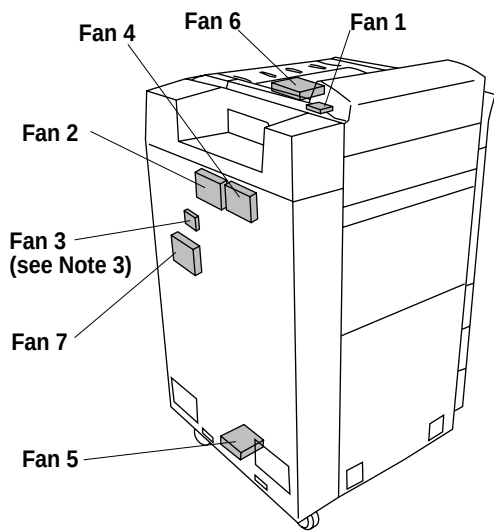
Six fans cool the printer. Fan 3 is not needed and was removed from later printers. Fan 3 error detection is inoperable on the earlier printers when using the current firmware.

Fans 1, 2, and 7 are 24 Vdc. When an interlock opens, all 24 Vdc fans stop. Fans 4, 5, and 6 are 12 Vdc. When an interlock opens, all 12 Vdc fans continue to turn.

Fans 2 and 4 have an ozone filter. The ozone filter is a consumable and is packaged with the developer kit. The ozone filter should be replaced every other time the developer bottle mixture is replaced.

Fans 1, 2, 6, and 7 have sensors that determine if the fan is rotating and can be used for troubleshooting (see [3-13.6 "Fan Sensors Screen \(EngMaint.Sensors.FAN\)," on page 3-26](#)). If these fans are not rotating, a SVC alarm is indicated on the control panel (see [4-9.22 "SVC A0 In-Frame Fan Alarm 1," on page 4-60](#) or [4-9.23 "SVC A1 Fan Alarm 2," on page 4-62](#)).

If fans 4 or 5 stop rotating, the printer power halts and the Fan Alarm LED (FAN ALM) on the LVPS board lights (see [Figure 2-23](#)).



- Notes:
- 1. All 24V fans stop when any interlock switch is opened.
 - 2. All 12V fans continue running regardless if any interlock switch is opened.
 - 3. Fan 3 was removed on later model printers and does not operate with current firmware.
 - 4. Fan assignments are:

Fan	Voltage	Purpose
1	24V	Cool optical unit
2	24V	Cool main frame
3	24V	Cool main motor
4	12V	Cool fuser
5	12V	Cool LVPS
6	12V	Cool main controller board
7	24V	Cool main frame

Figure 2-26 Fan Locations

2-5 Developer and Toner Hopper

The developer unit contains developer mixture and toner used by the printer to write on the surface of the drum and transfer to the paper. Both the developer mixture and toner are consumables that must be periodically replaced or replenished.

2-5.1 Toner Hopper

The toner hopper holds the toner supplied to the developer unit. Toner is added through the toner fill cap on top of the hopper. The hopper holds less than two bottles of toner. *Never fill more than one bottle of toner at a time or toner hopper spillage or clogging can result.* When the first bottle of toner is added in an empty hopper, you need to run about 3,000 pages before the toner low message appears and you can add one more bottle of toner to fill the hopper. If the level is above the sensor, there is not enough room for a complete bottle. Foam on the top of the hopper covers holes that allow air displacement from the hopper during the toner loading process. When an add toner message displays, adding of toner logs an entry in the maintenance log. A bottle of toner typically lasts approximately 18,000 images at 4% coverage.

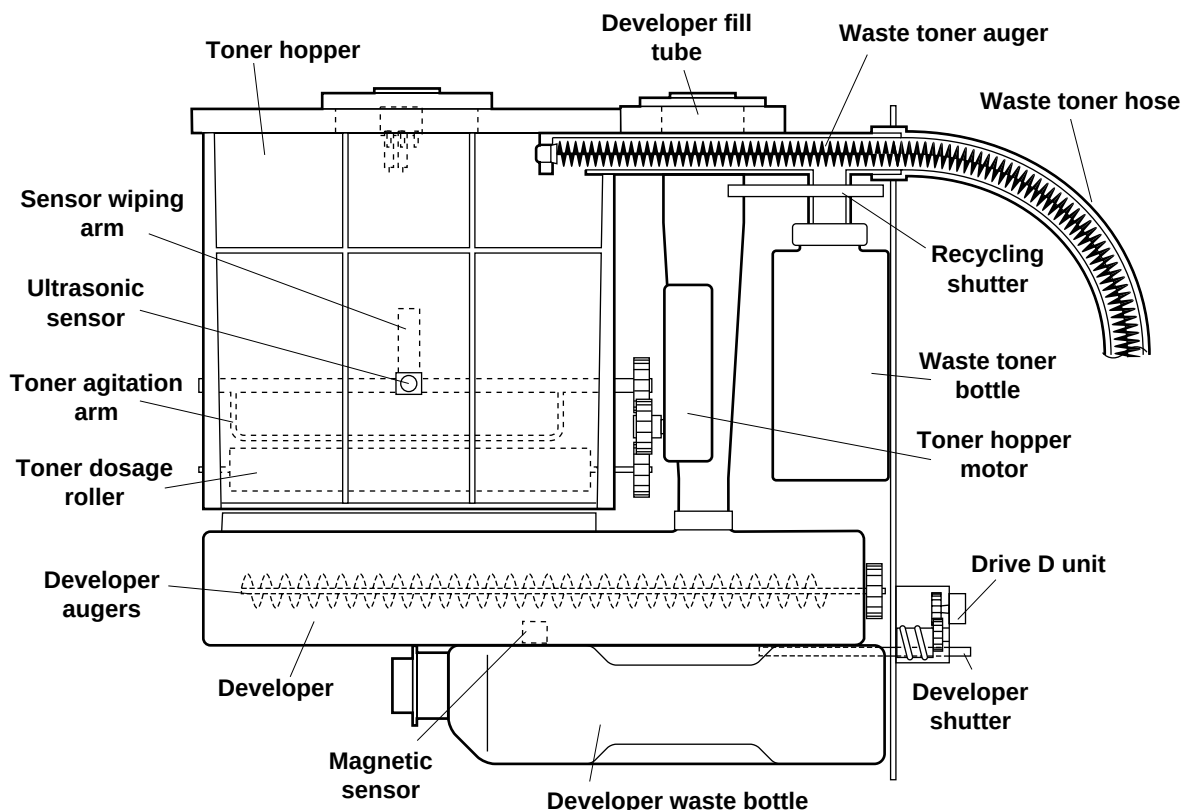


Figure 2-27 Toner/Developer System

An ultrasonic sensor, mounted on the inside of the hopper, detects low toner level. The sensor sends out an ultrasonic signal and monitors the strength of the return signal to determine if the hopper needs toner added.

The toner hopper motor, mounted on the outside of the hopper, turns the toner dosage roller and a shaft with the toner agitation arm and ultrasonic sensor wiping arm. The rotating wiper arm keeps the toner from sticking to the sensor. On the same shaft as the wiper arm, a rotating toner agitation bar stirs the toner to keep the toner free-flowing.

The dosage roller meters toner into the developer. This roller has a pocked surface that measures out a specific amount of toner each revolution. The sensor is checked every 0.5 seconds and the toner motor is activated for 0.5 second intervals when the developer's magnetic sensor indicates that toner is needed in the developer.

2-5.2 Developer Unit

The developer unit holds the developer and toner mixture (see [Figure 2-27](#)).

As part of the developer purge process, developer is poured into the fill cap of the developer tube that connects directly into the developer unit. Developer flows directly into the auger area where augers move in opposite direction to mix the developer and toner metered in from the dosage roller meters. The developer and toner are mixed and agitated during the completion of the developer purge process.

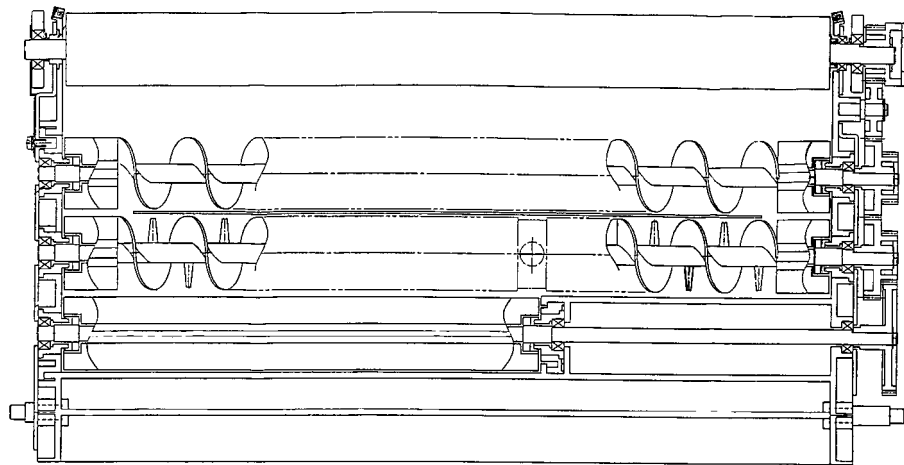


Figure 2-28 Developer Augurs and Rollers

The developer unit contains a magnetic sensor to measure the electrical properties of the developer mixture (3.5% toner and 96.5% carrier). The mechanism controller uses this sensor to compensate for developer mixture aging by altering the toner ratio present in the developer unit. For this reason, *never* use a developer assembly from another printer without first purging and replacing new developer mixture. The developer mixture has a life up to 160,000 drum rotations. The printer will stop at 150% of life span of developer mixture (function code Revision E02L03 or later).

The toner density sensor detects the percentage of toner in the developer by measuring the magnetic flux in the developer/toner mixture. As more toner is added the voltage goes down; as the print process uses toner the voltage increases. The mechanism controller maintains the correct density by monitoring the output of the sensor and adding toner as necessary during the printing process.

At the end of the developer mixture install process the sensor is calibrated by the mechanism controller to measure +2.5 Vdc at TNDNS. This assumes developer was added that 3.5% toner by weight (a new bottle). Over the life of the developer mixture, the mechanism controller gradually increases in steps the voltage to the input of the sensor. As the sensor input voltage increases so does the output voltage. The monitoring circuit sees this increase as reduced toner and adds more to bring the sensor level back down, thus increasing the amount of toner in the mix.

The new developer mixture is 3.5% toner, 96.5% carrier by weight. Over the first 100 pages, the printer adds enough toner to bring the mixture up to 4.5%. Over the life of the developer mixture, the mixture is increased to 5.5%. This increase is necessary as the developer gradually loses its ability to attract toner to the carrier particles. The printer displays a developer replacement message at 160,000 rotations. The printer stops at 240,000 rotations.

Toner is only loaded during the printing process. If power save is disabled, it is possible to deplete the toner from the developer causing a low density error.

2-5.3 Waste Toner

Toner waste hose/auger (see [Figure 2-27](#)) carries waste toner directly from the waste collector of the drum assembly to either the waste toner bottle or recycles it back to the toner hopper. Waste toner includes paper particles and any other material scraped off the drum. The toner kit supplies one empty waste toner bottle for every bottle of toner.

Drive M unit drives the waste toner auger, a long-spring auger that transports waste toner up to the waste toner bottle. The waste toner auger is a separate part and not part of drive M unit.

If the toner recycling shutter is enabled, waste toner goes back into the toner hopper and not into the waste toner bottle. *If toner recycling is turned on, a slight degradation of print quality occurs and is not recommended for optimal print quality.* Toner recycling can be enabled in three ways:

- Sliding the shutter to close the mouth of the waste toner bottle
- Removing the waste toner bottle
- Allowing the waste toner bottle to fill up

Toner recycling adds 15% to 20% to toner life, but decreases quality slightly over a long period of time. If quality decreases below desired level, a developer purge will quickly clear the problem.

The waste toner bottle sensor shown in this picture is no longer installed and is ignored by the firmware if installed.

2-5.4 Drive D Unit

Drive D unit (see [Figure 2-27](#)) drives the developer shutter assembly. The shutter assembly opens during the developer bottle mixture replacement cycle. The shutter opens to allow the old developer mixture to move into the waste developer bottle for disposal.

2-5.5 Toner Messages

The following are some of the toner messages that can occur:

- Toner Low - Toner below the toner sensor.
- Toner Empty - Toner needed by the developer. Voltage at TNDNS rising and no toner at the toner sensor. Stops the printer and is not resetable
- Toner Hopper Alarm - Toner needed by the developer but no toner dropping and a toner present indication by the toner sensor. Possibly caused by a non-rotating dosage roller or tightly-packed toner. Stops the printer but is resetable: press Clear or cycle power.
- Toner Low Density Alarm - The developer density sensor has gone outside its operating range. This alarm can only be recovered from by purging the developer or adding toner to the developer.

2-5.6 D640 Density Level Settings (and Engine Limits)

The VB and Laser Power values that are related to the Density 1-15 values are stored the mechanism controllers Master EPROM. The laser-power value is changed from the Density setting in the Density menu (Menu.Maintenance.Density).

VB (Developer Bias) voltages greater (more positive) than -300 Vdc (-299 and up) the carrier beads will 'bleed' out from the developer unit onto the drum and into the paper path.

"Density" Value	"Developer Bias Value (VB in Volts DC)	Laser Power Value (mW)	
1	-300.78	0.2205	Minimum
10	-351.00	0.3000	Factory Default
15	-451.37	0.8000	Maximum

2-6 Electrophotographic Printing Process

An electrophotographic (EP) printing process is utilized in the D640 printer to formulate and transfer the image to the paper. The electrophotographic process consists of the erase LEDs, drum, optical unit and main controller, developer, and transfer assembly guide.

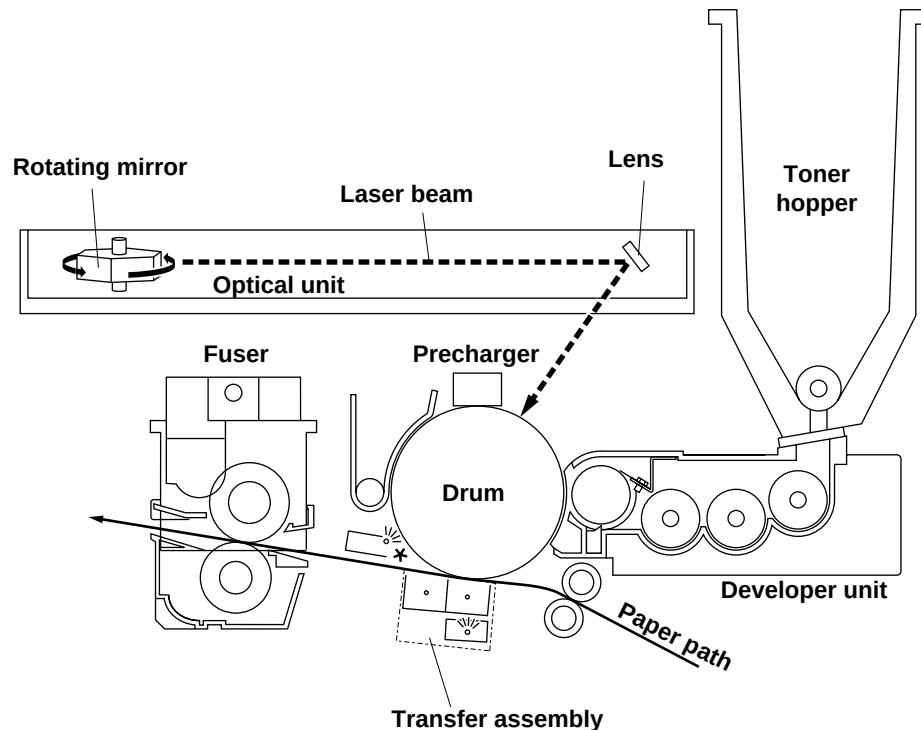


Figure 2-29 Electrophotographic Printing Process

The EP process is controlled by the mechanism controller and is comprised of the following steps:

Step 1 The precharge wires place a -600V charge on the surface of the drum.

The precharger corona is located at the top of the drum. The precharger corona charges the drum surface. Between the drum and the precharge wires is a grid connected to drum ground through a resistor. This grid enables the precharge wires to deposit a uniform charge on the surface of the drum.

The precharger should be cleaned by the operator periodically (at a minimum, every time toner is added) to assure that the charge on the drum is sufficient to inhibit toner transfer to those areas not exposed to the laser. A sufficiently precharged drum surface assures the non-printed areas of the media will be white without any gray background.

Step 2 Send data from main controller to controller in the optical unit.

At the beginning of each print line, the optical unit sends the VS (Video Synch/beam detect) signal to the mechanism controller indicating that it is ready to receive and scan the next dot row of data. When the mechanism controller

receives the VS signal, it sends the Video Ready (VR) signal telling the main controller to send the next dot row of data to the optical unit for scanning onto the drum.

Beam detect from the optical unit is sent to the mechanism controller. The timing for when the optical unit actually starts sending the data (turning the laser on and off) is adjusted by switches on the mechanism controller. The maintenance program, *LaserSet.nn*, enables you to check and change this start position by setting when the data is sent in relation to when the registration rollers begin feeding the paper into the transfer area.

- Step 3** The controller in the optical unit sends alternating scan lines to the two laser diodes.

The optical unit consists of two semiconductor laser diodes and the rotating mirror spindle motor and lens. The laser generator outputs a dual beam from the laser diodes (one beam from each diode).

- Step 4** Each diode sends a modulated beam to the rotating mirror that directs the lines onto the drum surface.

The laser diodes use video signals to convert the laser to a modulated beam. The charged drum surface rotates to the exposure station. The rotating mirror and lens focus and scan the dual modulated laser beams from the optical unit to the drum through a glass covered opening located above and to the right of the drum opening. Both laser diodes use the same facet of the rotating mirror by having one beam lag behind the other beam by 39 μm thus creating two scan lines.

Where the laser strikes the drum surface, the photoconductive drum surface conducts the precharge voltage to the aluminum core of the drum and ground, reducing the electrical charge where the laser has struck to ground potential (-100v or less). At this stage in the electrophotographic process, approximately -600 volts is present on the drum surface except where the drum was exposed to the laser, which is near ground potential. The drum surface now has an invisible electrical image (latent image) of the desired output on its surface.

When the laser is directed to the beam detect mirror in the optical unit at the start of every scan line, the optical unit sends the Video Synch (VS) signal to the mechanism controller. On receipt of the VS signal, the mechanism controller sends the Video Ready (VR) signal to the main controller, signaling the main controller to send the next scan line of data to the optical unit.

The Developer Bias (VB) and Laser Power values are tied to the Density 1-15 values stored in the mechanism controller's Master EPROM. The density adjustment (Menu.Maintenance.Density) changes the laser power and the developer bias setting to darken or lighten the print.

The +24 Vdc spindle motor in the optical unit drives the rotating mirror.

- Step 5** The toner creates the image on the drum.

The drum surface with the scanned lines rotates to the developer unit where the latent image is developed into a visible toner image on the drum surface. The average dot size is 80 μm .

The developer unit contains developer mixture that is a combination of small iron particles and toner charged to approximately -300 Vdc (developer bias

voltage VB). This mixture is attracted to a magnetic roller within the developer located near the drum surface. As the developer roller rotates, a blade scrapes off the top layer of the mixture on the roller so that a uniform height of the mixture is presented to the drum surface. The developer roller is held at a precise distance from the drum surface by a nylon spacer roller on the front and rear of the developer roller.

A magnet within the developer roller switches the charge as the roller nears the drum surface agitating the toner creating a cloud of toner particles. The charged toner is approximately equal to the charge on the areas of the drum not scanned by the laser. The toner is repelled from these charged areas.

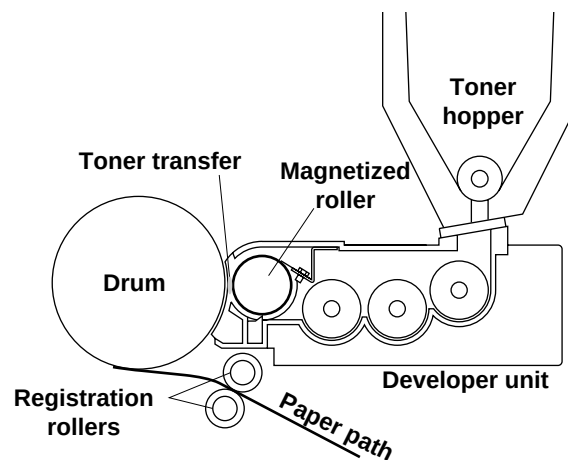


Figure 2-30 Developer Unit

Areas of the drum scanned by the laser are charged to about -100 Vdc. These areas attract the toner. Only the toner attaches to the drum; the developer has a metal carrier component that keeps the developer in the developer assembly by the magnetic attraction of the developer roller.

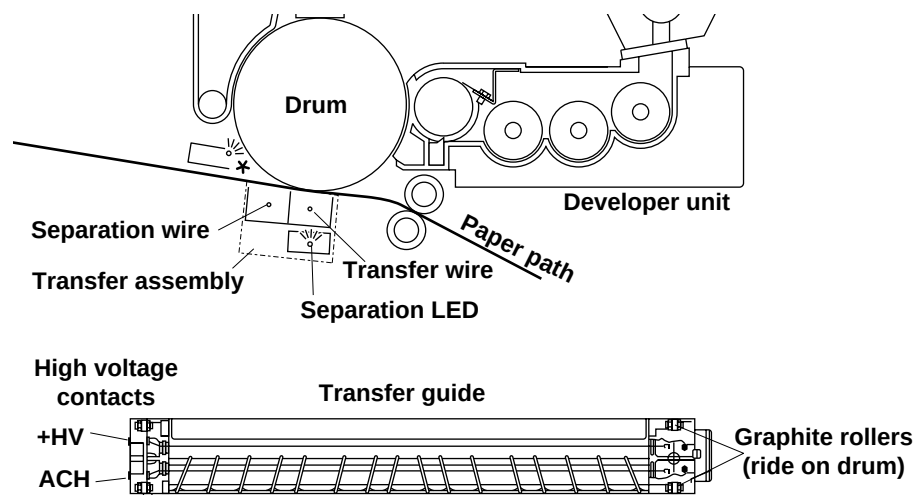


Figure 2-31 Transfer Assembly

Step 6 The image on the drum is transferred to the paper.

The drum rotates down to the transfer area. A high positive charge is placed on the transfer wire behind the paper. This positive charge, applied to the paper, insures that the negatively charged toner particle is attracted to the paper when it comes in contact with the drum.

Step 7 The paper is separated from the drum.

The Separation LED under the transfer wire discharges the drum to assist in the paper separation process for lighter weight paper. At the separation wire a 10K, 500Hz AC charge, biased by a DC voltage, removes any charge from the paper to prevent its being attracted to the drum. The new HVPS is a constant current supply and it will step up the supply to maintain a specific current if needed.

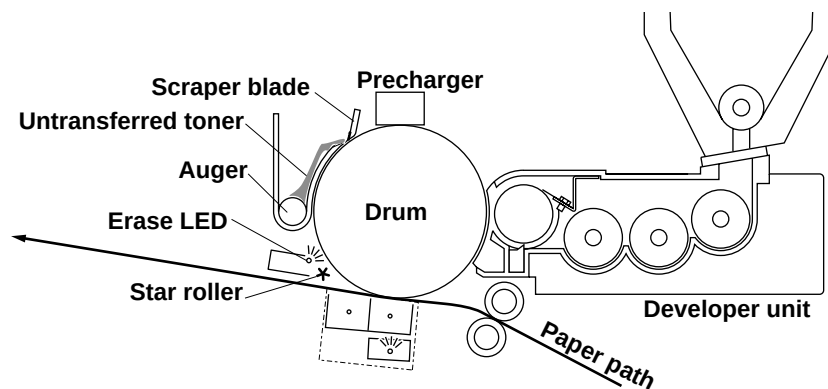


Figure 2-32 Erase LED and Scraper

Step 8 The charge on the drum is erased.

The erase LEDs are attached to the metal fuser mount directly to the left of the drum. These LEDs are turned on by the mechanism controller to expose the drum surface to a uniform light, neutralizing any electrical charge on the drum surface from the previous image and preparing the drum for the next image to be transferred.

Step 9 The drum is scraped clean of toner.

The cleaning unit contained in the drum has a scraper blade that rides on the drum surface to wipe any untransferred toner from the previous image. An auger is located directly below the scraper blade to auger this excess toner out into the waste toner auger unit, which moves the waste toner into the waste toner bottle or back into the toner hopper.

2-6.1 Drum Unit

The drum unit consists of the following:

- Precharger—An electrode which negatively charges the photoconductive drum. The top front of the drum has a flat blue handle which cleans the precharger when pulled out and pushed in. The precharger voltage is called -HV.
- Photoconductive drum—Holds an electrostatic print image for development and transfer onto the media. The electrostatic print image is created on the drum by a dual modulated laser beam directed at the drum.
- Cleaning unit—A scraper blade that collects excess toner remaining on the photoconductive drum after the toner is transferred to the paper. The scraper blade wears down the drum OPC surface and is the main reason for regular drum replacement.

The drum degrades due to physical wear caused by the scraper blade. The drum has an original thickness of approximately 26 microns; when it reaches approximately 14 microns, it can no longer function effectively.

The drum has a life span of up to 250,000 of A4/Letter drum rotations. This equates to an average of 195,000 A4/Letter page sides. The current drum usage percentage is maintained in the NVRAM (EEPROM) of the mechanism controller and can be printed on the maintenance report. When the drum rotation count reaches 250,000, a "Replace Drum" message is posted to the control panel. The drum is a consumable and designed to be replaced by the customer.

The printer does not stop printing when the "Replace Drum" message is displayed. With function code Revision E02L03 or later, printer will stop at 115% of life span of drum. With earlier function code, printing continues indefinitely until the drum is replaced or fails. If the drum is used past its normal life expectancy the following failures may occur:

- The drum develops scratches in the photoconductive surface
- Dark streaks or bands develop on the drum's surface
- Background (light gray) appears across the printed page
- Toner leaks out from the cleaning blade side of the drum. (This toner leakage or "toner dump" problem can also be caused by failure to regularly clean the precharger corona in the drum.)
- In very extreme cases where the drum fails, a "SVC6F High Voltage Alarm" displays. When this happens it is important to note that the drum caused the alarm. The high voltage power supply is OK. As a rule of thumb when an SVC6F occurs, ask the customer if the REPLACE DRUM message appeared on the front panel before the SVC6F occurred.

2-7 Paper Path

The paper path is monitored and controlled by the mechanism controller. The control points of the paper path are the clutches, motors, and solenoids which are turned on and off as needed to assure successful paper transport. The mechanism controller continually monitors the paper sensors to verify the paper being transported arrives and leaves the sensor on time. Master and slave firmware on the mechanism controller contains timing tables specific to each paper size. Printing is halted by the mechanism controller if the sensor detected the paper arrived early or left late.

When a print command is given, paper is pulled from the selected tray and sped through the transport feed mechanism to the registration rollers. When the registration clutch is turned on, the paper slows down to travel through the drum area, the fuser, decurler rollers, and then to the reversing unit.

When paper enters the reversing unit, the mode of printing (duplex or simplex) determines the paper direction. If duplex mode is active, the paper travels down into the duplex unit and then back up to the registration rollers. In simplex mode, the paper proceeds to the HCO or the ejection unit on top of the printer.

The ejection unit stacks the paper face down. If the HCO is attached and selected, the paper enters the HCO and exits straight through if Face Up output is selected. If Face Down output is selected, the switchback diverter directs the paper down into the switchback area. A sensor in the HCO switchback area is activated by the paper, causing the HCO feed rollers to reverse direction and drive the paper up and out of the switchback area to the output tray.

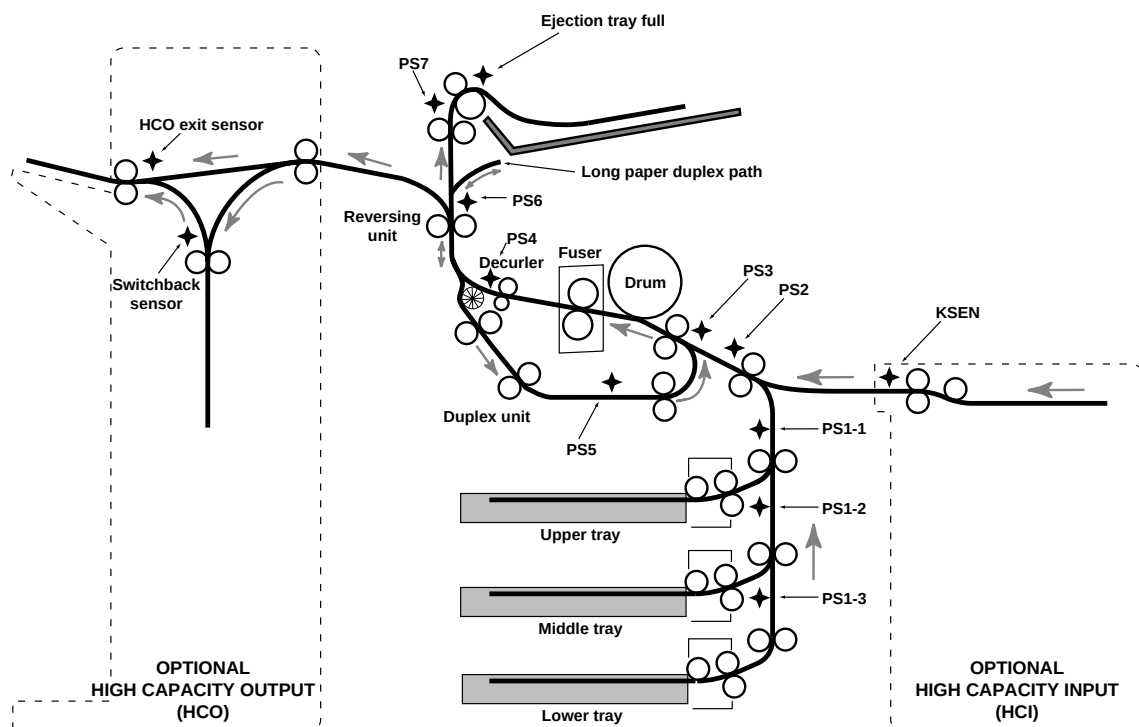


Figure 2-33 Paper Feed Path

2-7.1 D640, HCI, and HCO Paper Feeding Motor Systems

This section describes the paper feeding motor systems and how paper travels from one motor system to another. If a reoccurring feed problem occurs, knowing how the motor system works can be helpful in isolating the problem. Please refer to the following figures for a description of the paper feeding motor locations and feeding speeds.

The D640 has five paper-feed motor systems:

- Pick Motor System
- Transport Motor System
- Main Motor System
- Reversing Motor System
- Duplex Motor System

The HCI has one paper-feed motor system:

- KMOT Motor System

The HCO has two paper-feed motor systems:

- HCO Feed Motor System
- HCO Exit and Switchback Motor System

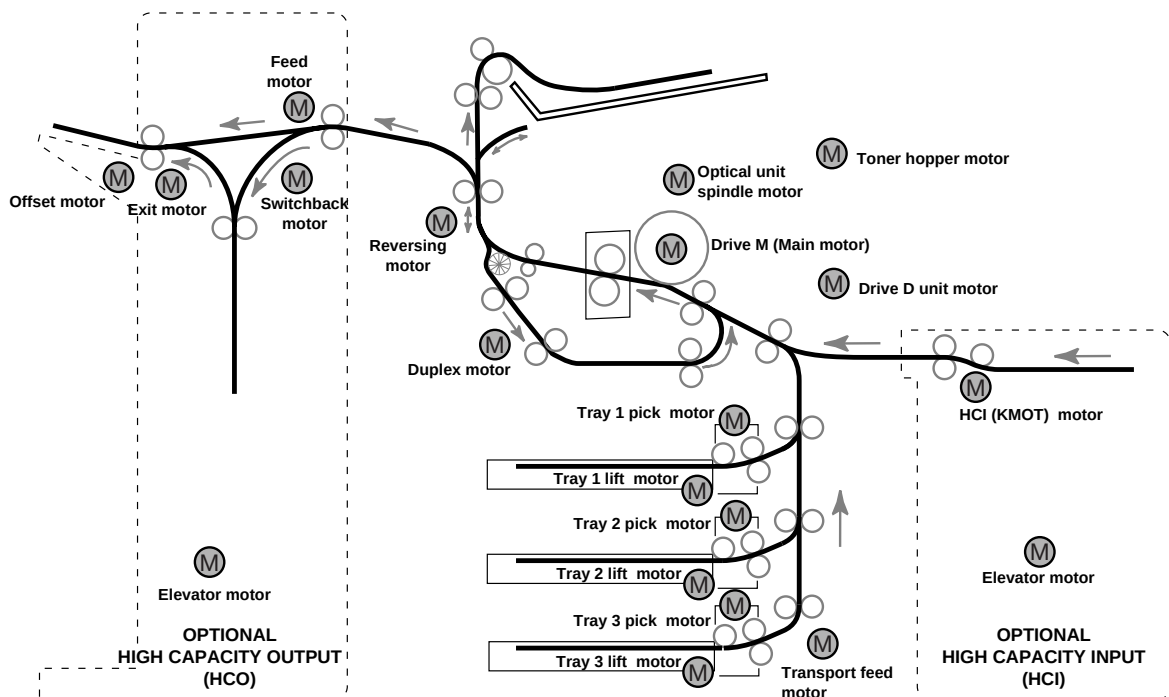


Figure 2-34 Motor Locations

2-7.2 Pick Motor System

The pick motor system contains three independent motor systems, one for each feed unit (see [Figure 2-35](#)). The pick motor system controls picking the sheet from the tray and feeding to the PS1- n ($n = 1, 2$ or 3) sensor. At this point, the pick motor system passes the sheet to the transport motor system. The pick motor system operates at 180 mm/sec.

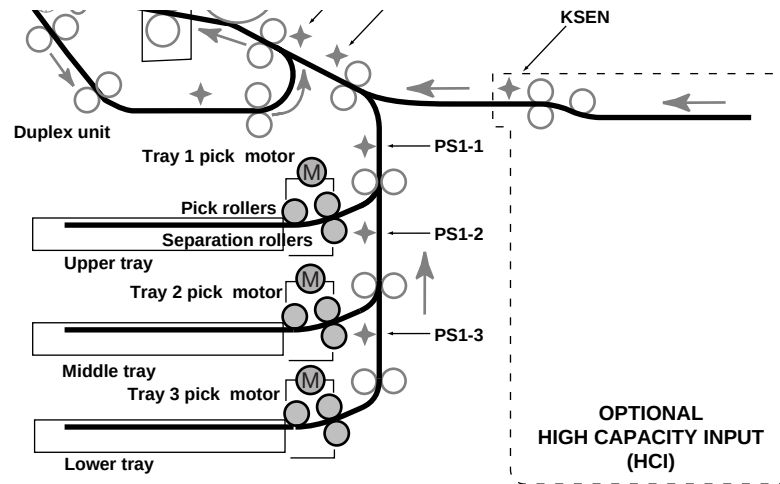


Figure 2-35 Pick Motor System

2-7.3 Transport Motor System

The transport motor system takes the sheet from the pick motor system and feeds the sheet at a much higher speed of 630 mm/sec (see [Figure 2-36](#)). This higher speed can sometimes be heard in the printer as a high pitch sound that occurs after a sheet is picked. The transport motor system passes the sheet to the main motor system at the registration rollers.

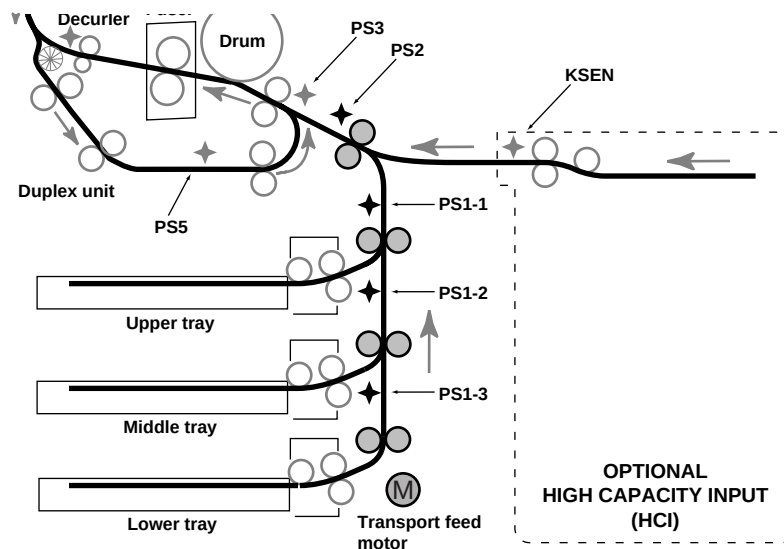


Figure 2-36 Transport Motor System

2-7.4 Main Motor System

The main motor system takes the sheet from the registration rollers at a constant speed of 180mm/sec (see Figure 2-37) and moves it through to the fuser. The fuser links the main motor system to the drive E unit. The drive E unit takes the sheet from the fuser at a constant speed of 180mm/sec and moves it through the whiffle roller to the ejection tray. The reversing rollers have their own motor.

The main motor system also drives both the developer coupling that drives the developer and the waste toner unit that contains a long-spring auger that transports waste toner up to the waste toner bottle.

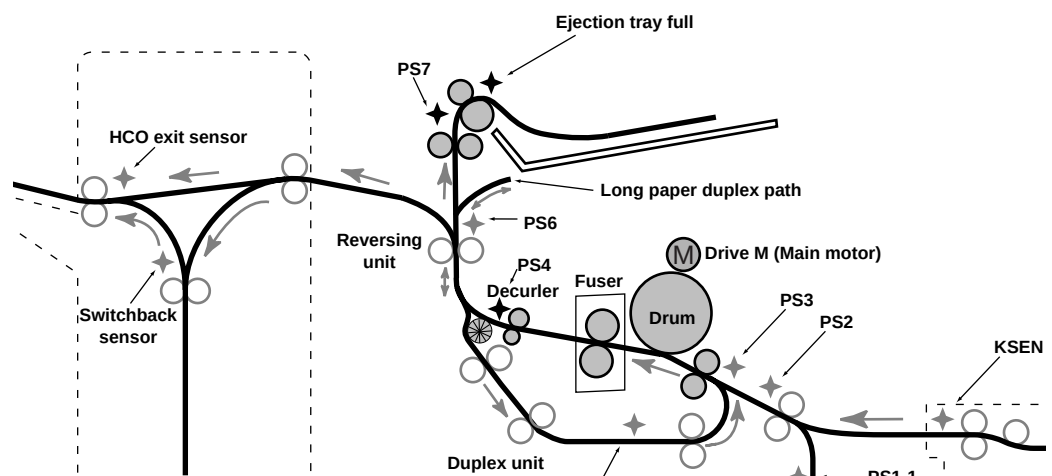


Figure 2-37 Main Motor System

2-7.5 Reversing Motor System

The reversing motor system has three different forward speeds and one reverse speed. This is the only motor in the D640 that can change directions (see [Figure 2-38](#)). The reversing motor system function depends on whether the sheet is in simplex or duplex mode:

- In simplex mode, the reversing motor simply takes the sheet from the main motor system and feeds the paper to the face down tray on top of the printer. The feeding speed when the reversing unit is in simplex mode is a constant 180 mm/sec.
- In duplex mode, the speed slows down to a rate of 133 mm/sec when the sheet reaches the PS4 sensor just after the fuser unit. This slower rate is used to stop the trailing edge of the paper at the top of the rubber paddle roller located on the exit side of the decurler unit. The reversing motor takes the sheet from the main motor system and feeds the sheet *up* at 630 mm/sec. The high speed stops when the sheet clears the upper roller of the duplex unit. At this point the reversing motor *reverses* the sheet's direction and feeds the sheet *down* at 630 mm/sec. The paper is fed downward and passes to the duplex motor system.
- Long size paper duplex path: Paper larger than letter or A4 is routed into a special path located under the ejection tray at 630 mm/sec and reversed into the duplexer at 630 mm/sec.

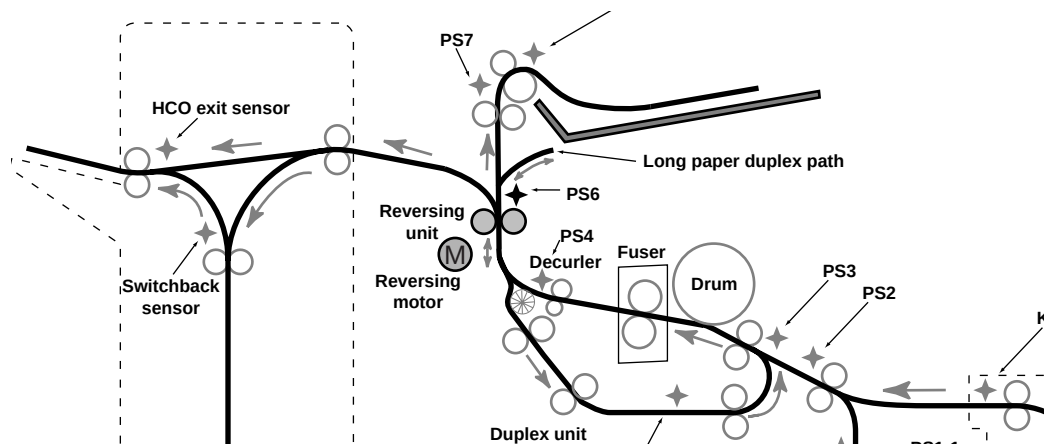


Figure 2-38 Reversing Motor System

2-7.6 Duplex Motor System

The duplex motor system has two speeds:

- The sheet is fed into the duplex unit at a slower speed of 180 mm/sec.
- The sheet is transported back to the registration rollers at a faster speed of 630 mm/sec (see [Figure 2-39](#)).

The main motor system picks up the sheet from the duplex motor system at the registration rollers.

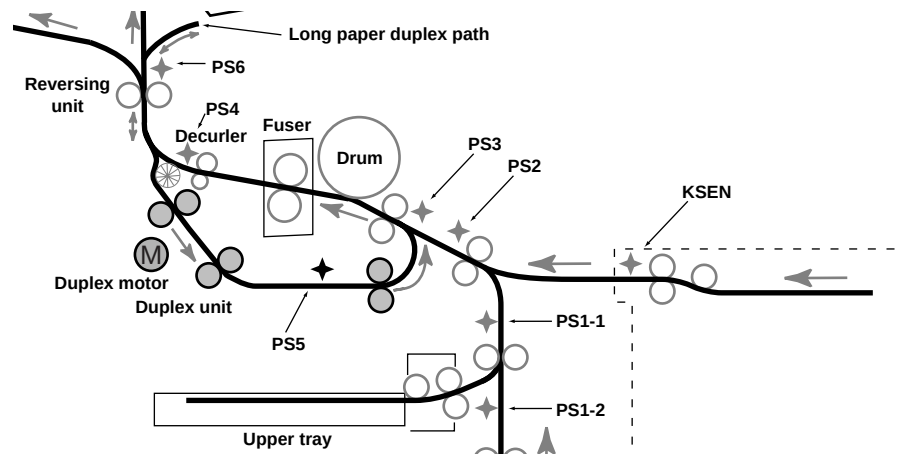


Figure 2-39 Duplex Motor System

2-7.7 KMOT Motor System

The HCI has one paper feeding motor system, the KMOT motor system that picks and transports the sheet at a constant rate of 350mm/sec. The sheet is fed by the KMOT motor system to the printer's transport motor system. Control of the sheet's movement changes from KMOT to the transport motor system immediately after the leading edge of the sheet is through the paper feed rollers, but before the PS2 sensor in the printer. This transfer of control from KMOT to the transport motor system is determined by a fixed time period that starts when the leading edge of the paper triggers the KSEN sensor.

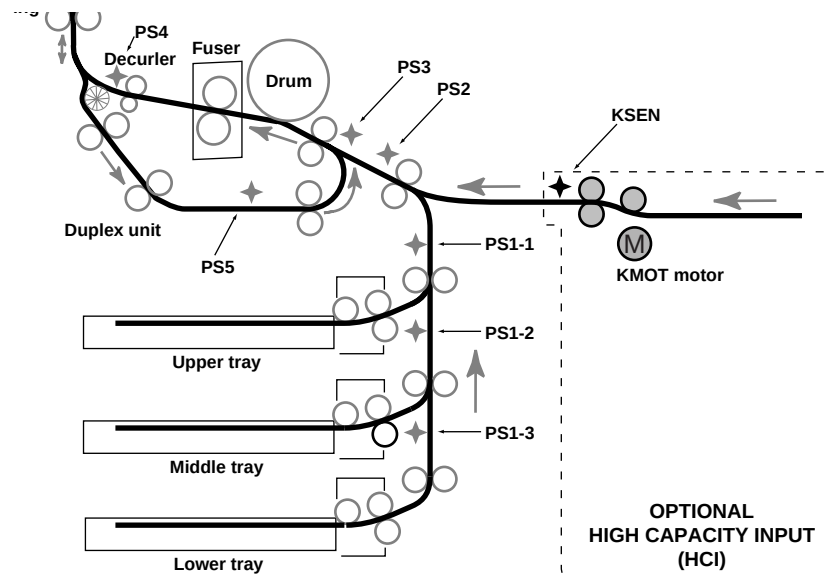


Figure 2-40 KMOT Motor System

2-7.8 HCO Feed Motor System

The HCO (both 2,000 and 3,000 sheet) feed motor system receives the sheet from the D640's main motor system at 180 mm/sec (see [Figure 2-41](#)). The HCO's feed motor feeds at a constant rate of 180 mm/sec. The HCO's feed motor has two possible locations to pass the page depending if the HCO is in Face Up or Face Down mode:

- In face up mode, the HCO feed motor feeds the page straight through the HCO. The feed motor transfers the sheet to the HCO's exit and switchback motor system immediately after the leading edge of the page activates the HCO exit sensor.
- In face down mode, the HCO feed motor feeds the sheet down into the HCO's switchback area where a switchback solenoid is activated to redirect the sheet. The feed motor transfers the sheet to the HCO's exit and switchback motor system immediately after the leading edge of the page activates the switchback sensor in the switchback area.

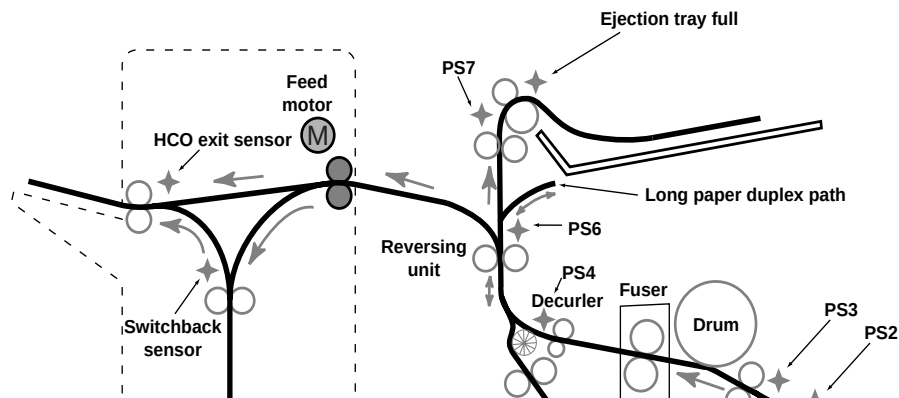


Figure 2-41 HCO Feed Motor System

2-7.9 HCO Exit and Switchback Motor System

The HCO (both 2,000 and 3,000 sheet) exit and switchback motor system (see [Figure 2-42](#)) can receive the sheet from the HCO's feed motor system in two possible locations, depending on whether the HCO is in face up or face down mode:

- Face Up mode—The HCO exit and switchback motor system takes the sheet from the HCO feed motor system immediately after the exit sensor is activated by the leading edge of the sheet. The HCO exit and switchback motor system feeds the sheet a short distance through the exit rollers and out to the exit tray at a constant 151 mm/sec. The slower speed of 151 mm/sec helps the stacking accuracy at the HCO's output tray.
- Face Down mode—The HCO exit and switchback motor system takes the sheet from the HCO feed motor system immediately after the switchback sensor is activated by the leading edge of the page. The HCO exit and switchback motor system transports the sheet *downward* at 885 mm/sec until a short time after the trailing edge of the sheet leaves the switchback sensor. At this point the HCO exit and switchback motor *reverses* direction and feeds the page *upward* at 920 mm/sec until the leading edge of the page activates the exit sensor. The HCO exit and switchback motor slows down to the exit speed of 151 mm/sec and the sheet is ejected out the exit rollers and into the exit tray.

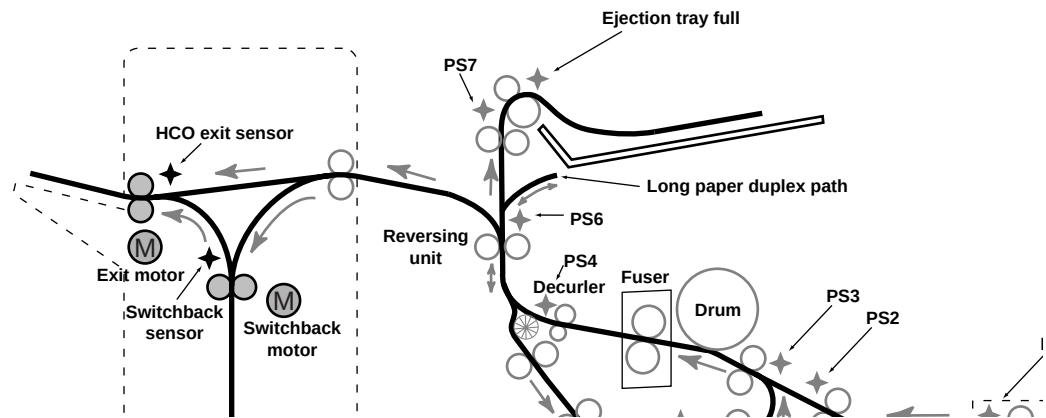


Figure 2-42 HCO Exit and Switchback Motor Systems

2-8 Paper Feed and Transport from Trays and HCI

Paper is fed from one of the three trays or from the High Capacity Input. Each sheet is picked and transported to the registration rollers where it enters the print engine feed path.

The three feed units and the transport roller in the printer are linked by a common belt driven by the transport feed motor located on the printer frame directly to the rear of the lower paper feed unit. Belt tension is maintained by the spring-loaded tensioner mounted on the lower paper feed unit directly above the transport motor. The upper and middle paper feed units are identical; the lower paper feed unit differs because it has the feed belt tensioner mounted to it.

Note	Printers with serial numbers prior to JP20000330 had a second spring-loaded idler assembly located on the printer frame directly below the transport roller.

The pick and separation roller assemblies on each paper feed unit are customer replaceable consumables and should be replaced every 500,000 pages (A4/Letter).

2-8.1 Paper Tray Lift Process - Paper Trays

At power up or reset, the mechanism controller checks the paper tray microswitches for the presence of the three paper trays. When a tray is fully inserted, the paper tray microswitch mounted on the printer rear frame closes and the tray lift motor is activated for that particular tray.

The tray lift motor has a small brass gear connected to the motor shaft and a larger white plastic gear with a series of holes around its perimeter. An actuator on the lift lever shaft is inserted into one of the holes in the white plastic gear. When the tray lift motor turns, the metal tab on the opposite end of the lift lever shaft turns pushing the paper tray up so the front side raises. The lift motor stops when the top edge of the paper stack hits the pick roller assembly which moves a metal flag through the pick roller up sensor.

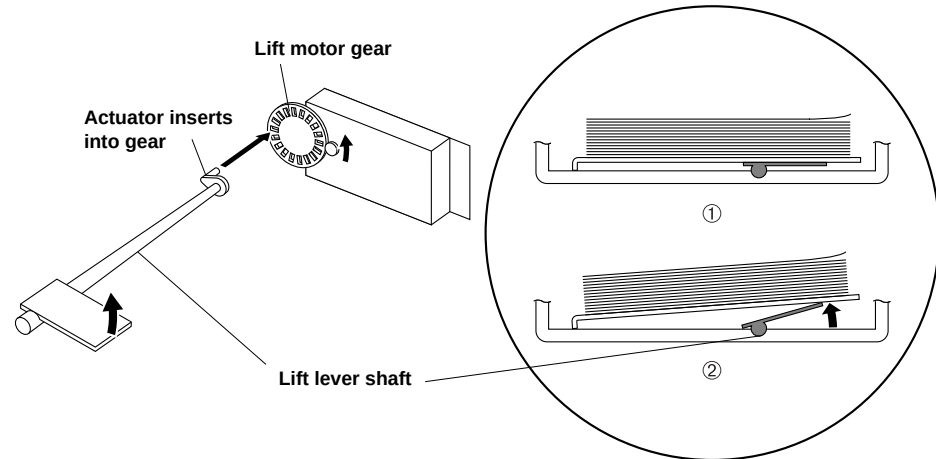


Figure 2-43 Tray Lift Motor

Once the pick roller up sensor is activated, the paper empty sensor is checked. When the tray is empty, the paper empty sensor actuator hangs through the hole in the base of the paper tray and opens the sensor. A message "Tray x Paper Out" (x = 1, 2 or 3) is displayed on the LCD panel.

2-8.2 Paper Tray Lift Process - HCI

The optional 3000-sheet capacity High Capacity Input is powered directly from the printer and is an alternative paper source. The HCI paper table can be moved down with the switch on the top cover when the door is opened. The door open/closed position is sensed by the DSEN sensor. When the door is closed, the paper table lifts until the pick roller up sensor (LEVSEN) is activated and then the paper out sensor (EMPSEN) is checked to verify paper is present on the paper table.

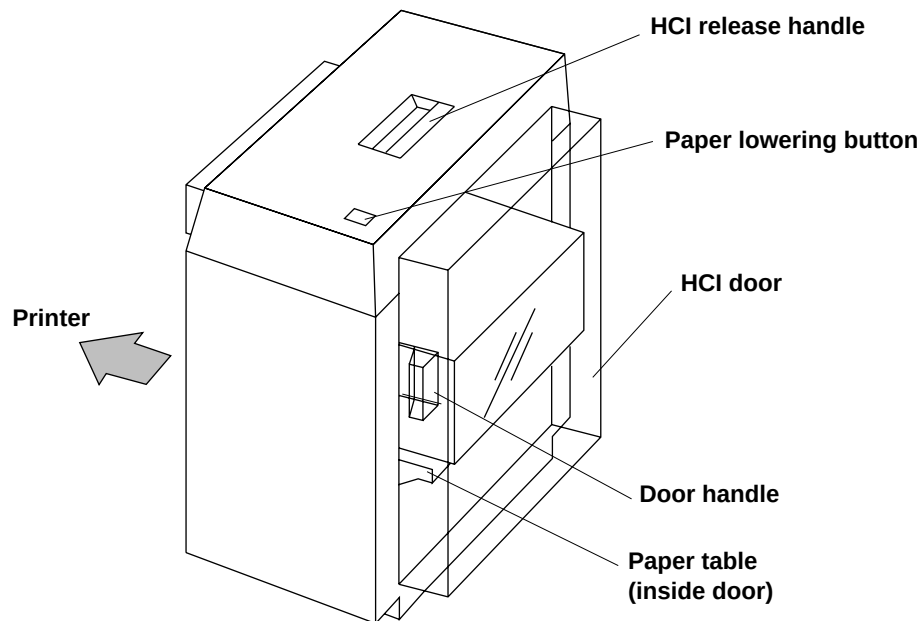


Figure 2-44 High Capacity Input

2-8.3 Paper Pick Process - Paper Trays

Before the paper picking process can start, the mechanism controller must first detect the following sequence:

- 1 Tray is present (tray present microswitch is closed)
- 2 Tray is correctly lifted (pick roller up sensor is closed)
- 3 Paper is in the tray (paper empty sensor is open)

Once the above three micro switches are detected as closed, that paper tray is ready to accept a paper pick command.

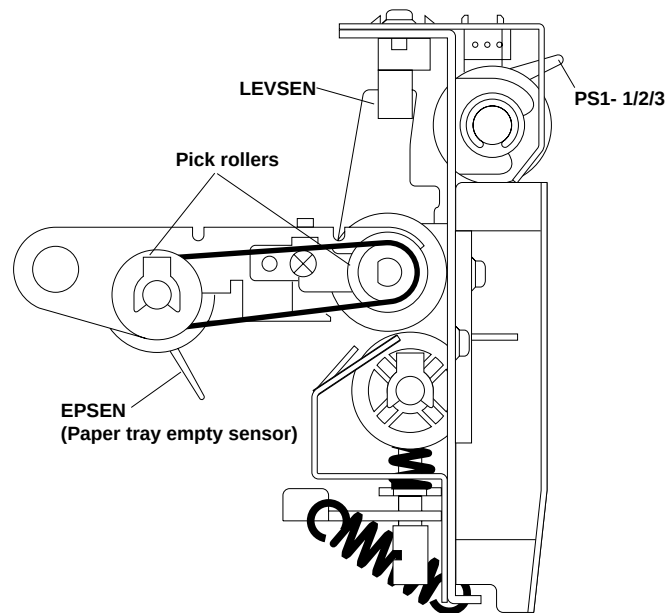


Figure 2-45 Paper Feed Mechanism

When a paper pick command is received, the pick motor is turned on and the feed rollers turn at a 180 mm/s rate to pull the top sheet from the tray. As the pick and feed rollers are turning, the lower separation roller turns in the opposite direction pushing back any other sheets below the picked sheet. This prevents a “multi-pick” condition.

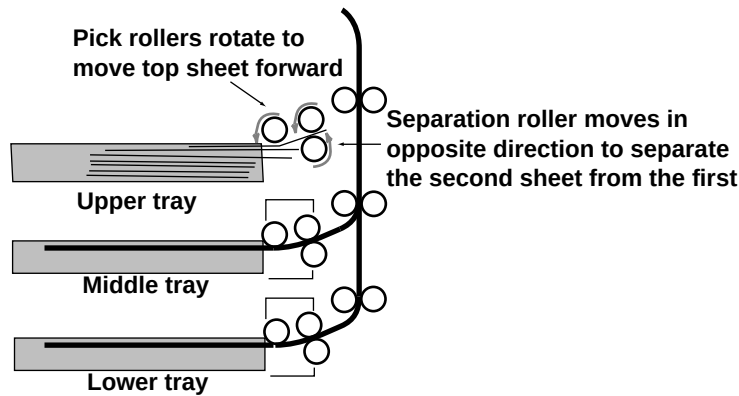


Figure 2-46 Paper Pick and Separation Rollers Rotation

An improper paper pick produces a "Tray n Pick Error" (where $n = 1, 2$ or 3). A Tray Pick error can occur for two reasons:

- The time lapse is less than 310 ms between when the Pick Start command is sent to the pick motor and when the leading edge of the picked sheet arrives at PS1 (-1, -2, or -3). This error is caused by a "multi-pick" condition.
- After three attempts (each 765ms long), the time lapse between when the Pick Start command is sent to the pick motor and when the leading edge of the picked sheet arrives at PS1 is greater than 765ms. This error is caused by a "no pick" condition.

In Error Log, the "Tray n Pick Error" conditions listed do not differentiate between above reasons. This means it is the responsibility of the service technician to determine the actual cause.

2-8.4 Paper Pick Process - HCI

The HCI utilizes a similar process to the paper trays. When a feed command is received, the pick motor roller (KMOT) turns the paper pick, feed, and separation rollers. The pick and feed rollers rotate on the upper paper surface to pick paper off the paper tray and the separation roller rotates in the opposite direction on the lower paper surface to assure only one sheet is picked. A diagnostic indicating the status of the sensors is available from the maintenance menu (see [D-3 "Diagnostics," on page D-6](#)).

A jam sensor at the HCI paper exit (KSEN) verifies successful paper pick as the paper is moved into the print engine where the printers feed roller drives the paper towards the registration rollers. The paper-input guide that directs the paper from the HCI to the printer has a Mylar strip on the printer door to improve paper handling.

An improper HCI paper pick creates the an "HCI jam 1". This error occurs when the time lapse is greater than 300 ms from when the paper is picked to when the leading edge of the page activates the KSEN sensor (see [D-4.2 "JAM51 HCI Pick Error," on page D-12](#)).

The HCI feed roller kit (includes the pick, feed, and separation rollers) is a consumable and expected to be replaced by the customer every 500,000 pages.

When the printer is using the HCI, it not uncommon for the printer to pick paper from a tray containing the same size paper. This is normal operation when the printer needs paper and the HCI is not ready (for example, when the elevator is bringing the paper into position). The printer picks paper from one of the other trays in order to maintain its print speed. If this is not desired, the trays should be locked

2-8.5 Transport Feed Path - Paper Tray and HCI

The transport feed path contains three sets of feed unit rollers (one for each tray) and one set of transport rollers. The feed unit rollers are accessed from the lower-right cover. The transport roller are accessed by removing the black plastic plate below the waste developer bottle. The transport roller can be rotated by turning knob 1 (see [Figure 2-4](#).) All the rollers in the transport feed path are driven by the transport feed motor which is mounted on the lower printer frame directly to the rear of the lowest feed unit.

After paper is successfully picked from a tray and the leading edge of the paper activates PS1- n ($n = 1, 2$ or 3), the paper is then allotted a specified period of time to reach the PS2 sensor. If the time lapse between when the leading edge of the paper activates PS1- n and PS2 is longer the specified time, a "Feed Path Jam n " results. The specified time (PS1- n to PS2) for each tray is as follows:

- Tray 1—If time from PS1-1 to PS2 is longer than 220ms then "Feed Jam 1" occurs
- Tray 2—If time from PS1-2 to PS2 is longer than 420ms then "Feed Jam 2" occurs
- Tray 3—If time from PS1-3 to PS2 is longer than 620ms then "Feed Jam 3" occurs

A "Paper at Tray n " status message occurs if paper is left at the PS1-1, PS1-2 or PS1-3 sensor after a printer reset.

When a page is picked by the HCI, it is possible to get an HCI feed jam 1 or 2. The meaning of an HCI feed jam is as follows:

- "HCI Jam 2" message indicates an "HCI feed jam 1". This HCI feed jam 1 occurs when the time lapse between when the leading edge of the page arrives at the KSEN and the trailing edge leaves KSEN is greater than 655ms. This type of HCI feed jam indicates that a "multi-pick" condition may exist or HCI feed rollers are dirty.
- "Paper at HCI" status message occurs when paper is present at the KSEN sensor after a printer reset. This type of feed jam could be the result of many causes. A printer reset can occur due a customer opening the printer front door, a power failure, a customer doesn't remove all paper after previous jam, etc.

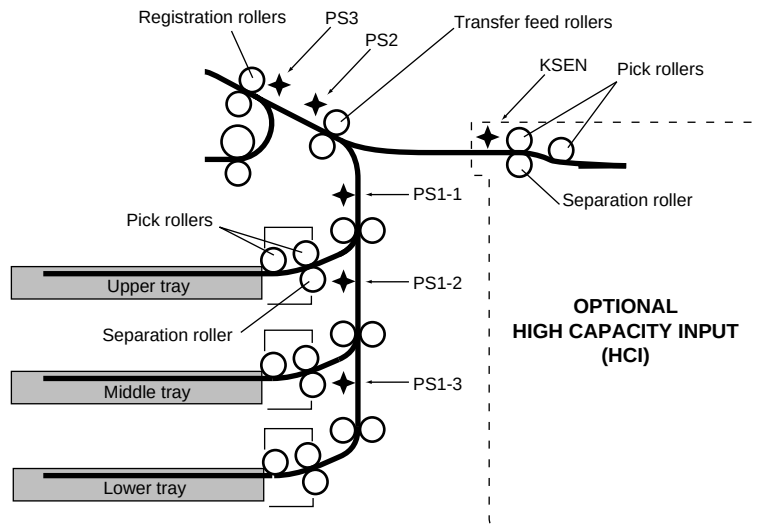


Figure 2-47 Paper Transport Feed Path

When the leading edge of the paper reaches the PS2 sensor, it is still possible to get a "Feed path jam 4" under the following conditions:

- When the time lapse between when the leading edge of the page activates PS2 and PS3 is longer than 150ms. This condition occurs when the page gets stuck under PS2 or when PS2 is not working correctly.
- When a page is detected under PS2 after a printer reset, a "Paper at HCI" status message is displayed. A printer reset can occur when a customer opens the front door, a power failure, a customer doesn't remove all paper after previous jam, etc.

Note	In Error Log, the "Feed Path Jam 4" conditions listed do not differentiate between the above reasons. It is the responsibility of the service technician to determine the actual cause.

2-9 Print Engine Feed Path and the Print Process

2-9.1 Engine Feed Path

The print engine feed path consists of the registration rollers, the fuser assembly, and the decurler assembly rollers, all driven by the main motor.

When the drum is in position to assure proper image placement on the paper, the registration clutch is turned on to enable drive M to rotate the registration rollers. The registration rollers drive the media between the drum and the transfer assembly guide, where the image is transferred from the drum to the media by the transfer charger. The separation charger is then activated to neutralize the transfer charge on the paper, assuring the media will separate from the drum and enter the fuser.

The media is driven into the fuser rollers by the registration rollers, which fuses the toner image onto the paper with heat and pressure. The fuser drives the media through the decurler assembly, which is composed of offset rollers to remove some of the paper curl induced when the media was heated in the fuser. Directly after the decurler rollers is sensor PS4. If paper does not reach PS4 in the allotted time, a "Fusing Unit Jam 1" is posted to the control panel display.

The main motor drives the registration rollers, developer, drum, and fuser (which drives the drive E unit). The developer is driven by the developer coupling. When handle b1 is rotated clockwise from its' vertical position, the developer coupling is pulled from the developer drive gears to allow the developer unit to move to the right, away from the drum. The main motor also drives the waste toner auger that drives a long-spring auger that transports waste toner up to the waste toner bottle or back to the toner hopper. The waste toner auger is a separate part and not part of drive M unit.

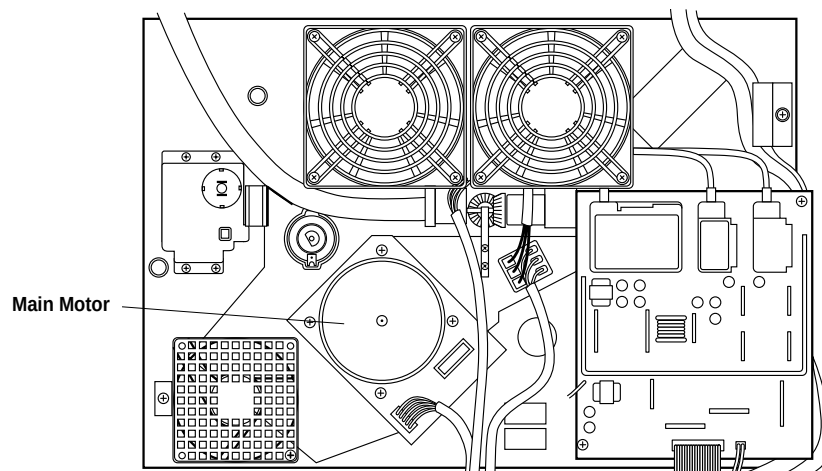


Figure 2-48 Main Motor

2-9.2 Paper De-Skewing Process

When the leading edge of the paper reaches PS3, a timer starts that determines when to shut off the transport feed motor. The timer determines how much feeding is done to create a small bow where the leading edge of the paper is driven into the stationary registration rollers. This bow is critical for automatic de-skewing.

The de-skewing process is as follows:

- 1 The leading edge of the paper fed by the transport feed rollers activates the PS3 sensor and starts the de-skewing timer
- 2 Paper is fed up to the registration rollers, which are stationary (not turning).
- 3 The transport feed rollers continue feeding paper creating a small bow in the paper at the registration rollers. The transport feed rollers continue to feed paper (about 5mm) until the de-skewing timer stops the transport feed rollers.

This process of extra feeding has the effect of de-skewing the paper.

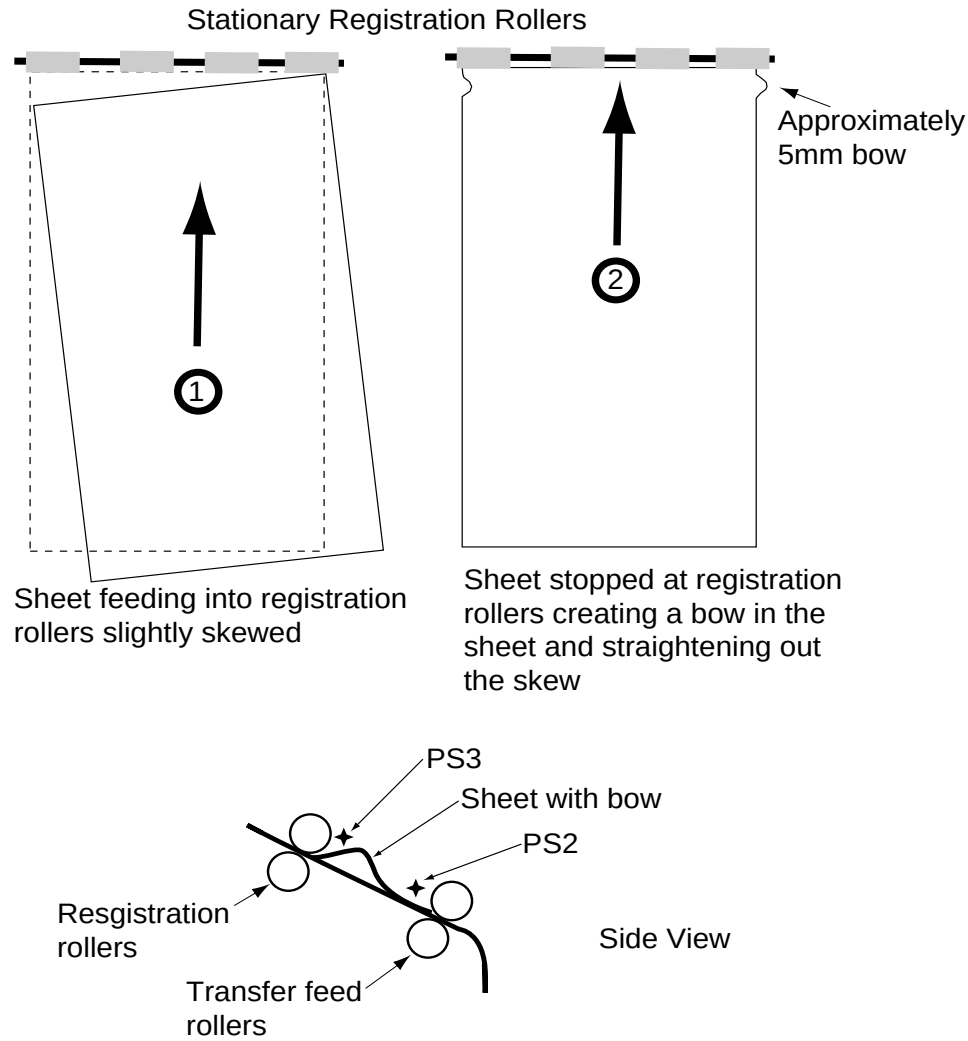


Figure 2-49 Paper De-Skewing

2-9.3 Paper Input Shift

There are six paper input systems: Tray 1, Tray 2, Tray 3, HCI, Duplex-H, and Duplex-V. Paper from each input system has a slightly different horizontal position when it reaches the registration rollers due to skew and paper shift. The printer accommodates each different horizontal position by shifting the print image on the drum to align with the position of the paper. This alignment is made when a Paper Feed System Alignment is done (see [5-3.4 "Paper Feed System Alignment,"](#) on page 5-12 for procedure). The shift is made by delaying or advancing the start and stop of the laser beam.

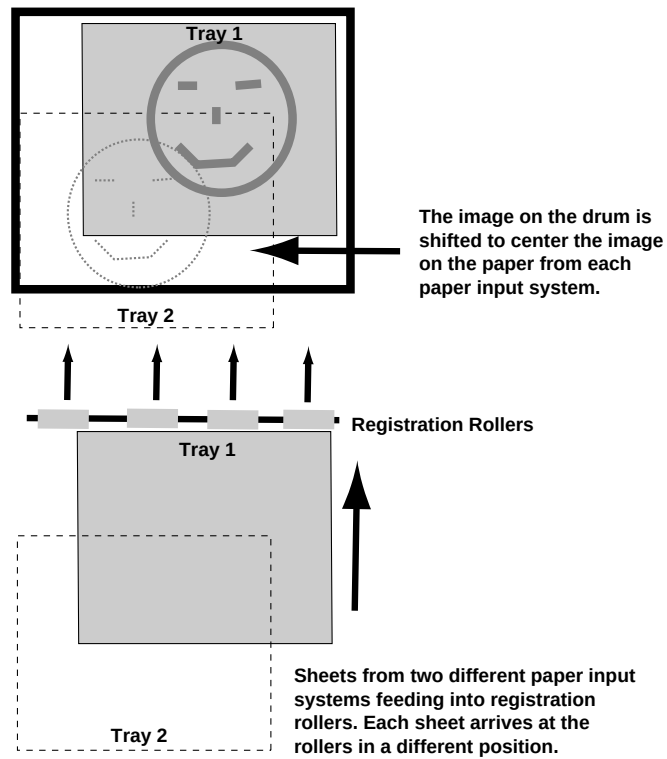


Figure 2-50 Paper Input Image Alignment

2-9.4 Image Transfer and Drum/Paper Separation

As the paper is fed from the registration roller, it passes between the drum and transfer assembly where the image developed on the drum is transferred to the paper. See [2-6 "Electrophotographic Printing Process," on page 2-39](#) for a description of the drum and electrophotographic process.

The transfer assembly guide contains the transfer LEDs and the transfer unit. The transfer unit holds the transfer and separation charge wires. The transfer assembly guide consists of:

- Transfer charge wire—A high voltage DC electrode which transfers the image from the photoconductive drum onto the media. The transfer charge voltage is called +HV.
- Separation charge wire—A high voltage AC electrode (10 KVac 500HZ with a DC offset) that discharges the media to allow it to separate from the drum surface. The AC separation voltage is called ACH.
- Transfer LEDs—Located directly below the transfer charge wires and shine through the transfer charge wires.

The image on the drum is rotated to meet the paper at the transfer assembly guide. The transfer charge wire places a high positive charge behind the paper to attract the image toner from the drum onto the paper. At the same time, the transfer LEDs shine up around the transfer charge wire discharging the drum to assist in toner separation, especially for lighter paper weights (less than 18 lb).

The electrostatic charge on the paper creates an attraction to the drum surface. Immediately after the image is transferred to the paper, the paper passes over the separation wire to completely discharge the paper and remove any attraction of the paper to the drum.

The voltages on the transfer and separation charge wires change as the paper crosses the transfer assembly. They start at a high value and decrease in three stages until the end of the paper has left the area. The values differ for paper coming from the duplexer. The new high voltage power supply changes the way the separation process functions. Instead of supplying a constant voltage to the separation charge wire, the new power supply maintains a constant current.

The transfer unit should be cleaned whenever working on the printer (see [4-6 "Performing Weekly User Maintenance," on page 4-13](#)). The transfer unit is a consumable that comes with the drum kit and replaced with the drum (see [1-7 "Consumables," on page 1-12](#)).

After passing the separation charge wire, the paper moves between the rear of the transfer guide assembly and star roller guide to the fuser area. The star roller guide is part of the clear plastic cover of the erase LEDs. The star roller guide assists paper with a natural curl from raising above the paper path and wrapping around the drum. The star roller guide is important in handling Fusing Jam 1 problems.

2-9.5 Fuser Unit

After the paper has the image transferred to it, it moves to the fuser unit. The fuser unit applies heat and pressure to fuse the toner to the paper. There are two different fusers: 120-127 Vac and 200-240 Vac.

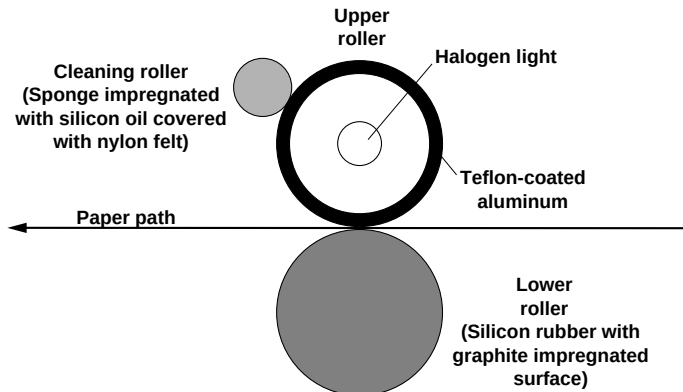
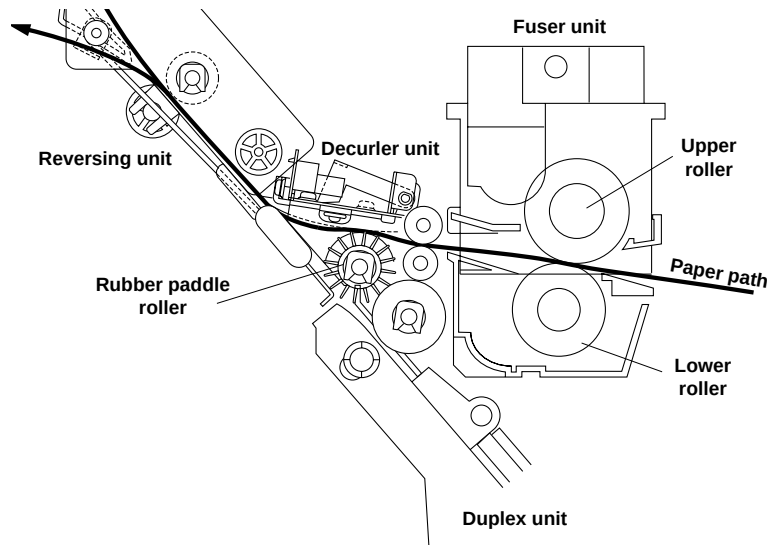


Figure 2-51 Fuser Unit

In the fuser unit, the paper is rolled between an upper hot roller and a lower rubber pressure roller. The upper roller is heated by an AC-powered halogen lamp. The mechanism controller maintains the roller temperature at 180°C by reading the thermal sensor riding on the outside of the roller every 500ms and turning on and off the lamp. To resolve certain fusing or curl problems, the roller temperature can be adjusted between 205°C and 165°C using the control register 1D (see [3-13.29 "Control Info Menu \(EngMaint.Control\),"](#) on page 3-56).

The springs at each end of the lower rubber pressure roller press the roller and the paper against the upper hot roller. With the correct heat and pressure, the toner is fused into the paper surface.

A silicon impregnated cleaning roller rides on the hot roller to clean off any excess toner that may accumulate on the hot roller.

If the mechanism controller detects a low or high temperature condition:

- SVC 27—The fuser did not reach 185°C within 200 seconds after power on or cover closing (see [4-9.6 "SVC 27 Fuser Time-out Alarm," on page 4-26](#))
- SVC 28—the temperature was detected above 225°C twice consecutively (see [4-9.7 "SVC 28 Fuser High-Temperature Alarm," on page 4-28](#))
- SVC 29—The temperature was detected below 155°C twice consecutively (see [4-9.8 "SVC 29 Fuser Low-Temperature Alarm," on page 4-30](#))

If the fuser temperature goes above 260°C, the hardware breaker on the fuser assembly trips. This breaker is resettable.

The fuser is a consumable and is scheduled to be replaced every 300,000 letter/A4 images. The silicon impregnated cleaning roller in the fuser is also a consumable and replaced every other time toner is added. The cleaning roller is part of the toner kit (see [1-7 "Consumables," on page 1-12](#)). The current fuser usage percentage is printed on the Maintenance Report.

The drive gear on the fusing assembly serves as the drive linkage between drive M unit and drive E unit. Removing the fuser disconnects the linkage.

2-9.6 Decurler Unit

The heat and pressure of the fuser's rollers creates an upward curl in the paper. Once the paper has left the fuser, the paper enters the decurler. The decurler routes the paper through a bend to flatten the paper for more reliable feeding, reduced paper jams, and improved paper stacking.

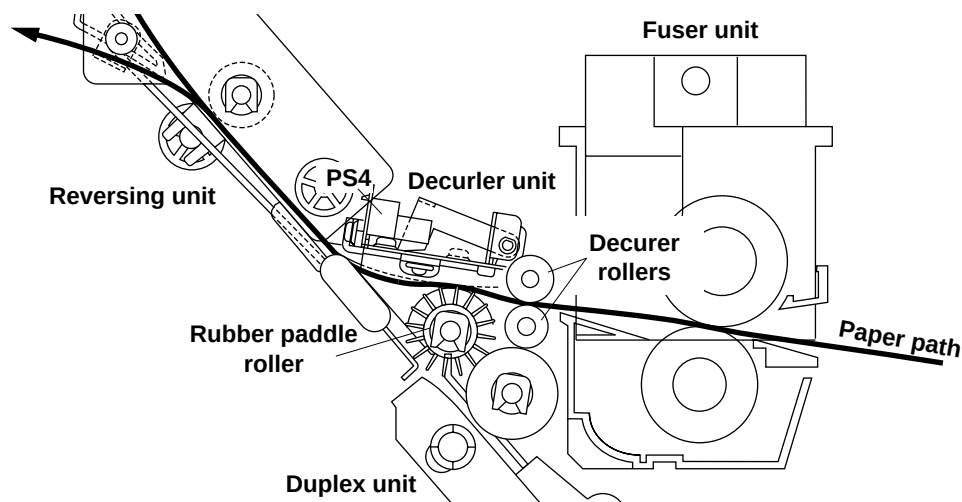


Figure 2-52 Decurler Unit

The paper then moves to the rubber paddle roller at the junction of the decurler, duplex unit, and reversing unit. The rubber paddle roller has teeth that are important for directing the paper. The roller directs the paper from the decurler to the reversing unit.

When a duplex operation has been selected, the paddle roller redirects the paper down into the duplex path. The reversing unit stops the paper with the trailing edge of the paper still in the teeth of the constantly turning roller. As the paper reverses, the teeth redirect the paper into the duplex unit.

The decurler unit has a decurler knob and a decurler lever. The decurler knob rotates the paddle roller (counter-clockwise) which advances the paper away from the fuser unit and PS4. The decurler lever is spring loaded upwards and holds the paper in the decurler unit. By pulling down on the decurler lever, the decurler rollers separate to relieve the pressure on any paper in the decurler unit.

The decurler unit contains the jam sensor PS4 which detects paper coming from the fuser. PS4 is located at the rear of the assembly to keep it away from the heat generated by the fuser. The jam timing is precise enough that the printer takes into consideration that the paper is slightly shorter after having gone through the fuser.

2-9.7 Reversing Unit

The rubber paddle roller directs the paper from the decurler into the reversing unit.

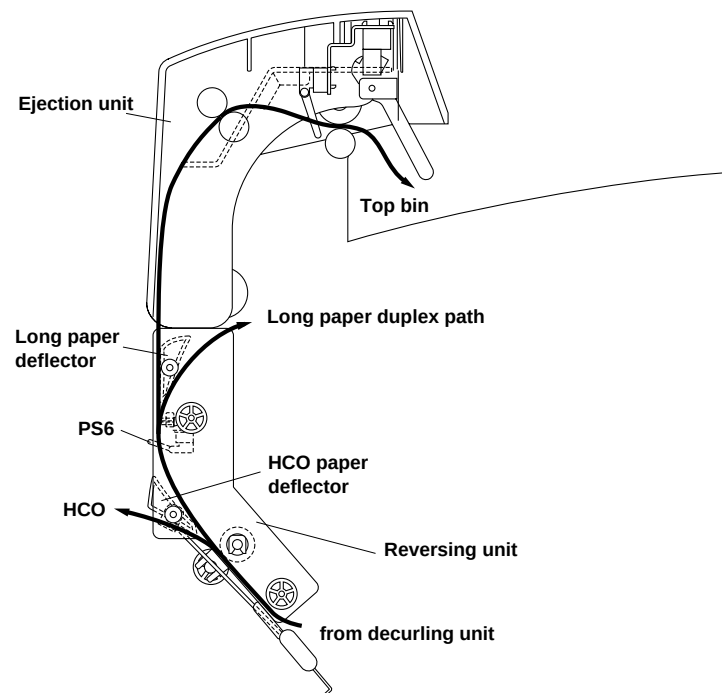


Figure 2-53 Reversing Unit

From the reversing unit, the paper can go into one of four possible routes:

- **Top Output Bin**—If neither of the solenoids is selected to deflect the paper and the paper is not to be sent to the duplexer, the paper goes to the ejection unit where it is ejected into the top output bin.
- **High Capacity Output**—The first junction is the HCO deflector that can deflect the paper into the HCO. The HCO deflector is switched into position by the HCO select solenoid mounted on the rear of the reversing unit. The HCO select solenoid has a

magnet to keep it locked in one position and a spring to keep it locked in the other. When the paper is to be directed to the HCO the solenoid is energized to draw the plunger in. When the current is removed, the solenoid is held in place by a magnet. When the paper is to be directed toward the upper tray, the polarity of the signal is reverse on the mechanism and the solenoid is pushed out. The current is then removed and the plunger is held in this position by a spring.

- Duplex—If the paper is not long enough to need to go into the long paper path, the paper is routed toward the ejection unit until the time value (PS6) for the paper size has been reached. The PS6 sensor in the reversing unit is not used as a paper jam sensor but as a timing sensor for the mechanism controller to determine when the paper can be reversed. The mechanism controller knows the length of the paper and the activation of PS6 starts a timing sequence that the mechanism controller uses to determine when the trailing edge of the paper has reached paddle roller in the decurler unit. This is precisely timed and at the end of the timing sequence, the paper is reversed and the paddle roller directs the paper into the duplexer. The length of this timing sequence will vary for different lengths of paper.
- Duplex Long Paper Path—The second junction in the reversing unit is the Long Paper deflectors. Long paper that is being duplexed is deflected into a cavity beneath the top cover to prevent the top portion of the paper from appearing momentarily out of the upper ejection unit. The upper solenoid is only energized when the paper is to be directed into the cavity below the top cover. The solenoid remains energized until the reversed paper has cleared the area and is routed to the duplexer. When the time value (PS6) for the paper size has been reached, the reversing motor on the reversing unit reverses direction and drives the paper downward into the duplexer.

The reversing rollers are driven by the reversing motor mounted on the rear of the reversing unit. The reversing can run at four different speeds depending on the paper route (see [2-7.5 "Reversing Motor System," on page 2-48](#)).

2-9.8 Duplex Unit

Once the trailing edge of the paper has cleared the decurler unit, the paper is reversed and the paddle roller directs the paper into the duplex unit. The duplex unit directs the paper back to the registration rollers but with the paper reversed so the non-printed side is exposed to the drum. During multiple page duplex jobs, as the paper is traveling through the duplexer, the drum and fuser units are printing another page.

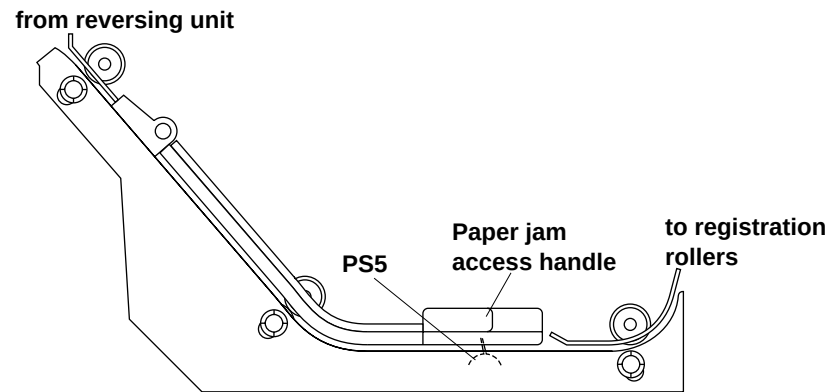


Figure 2-54 Duplex Unit

The duplex motor, located on the rear of the duplex unit, drives three sets of rollers in the duplexer with a cogged belt (see [2-7.6 "Duplex Motor System," on page 2-48](#)). When the media enters the duplexer, it is driven past jam sensor PS5 to the duplex registration rollers. The duplex motor is then switched off momentarily to allow the synchronization of feeding alternate sheets from the paper trays and duplexer by the mechanism controller. The duplex motor is then turned on again to feed the media to the printer registration rollers.

The operation of the registration and fusing areas of the printer are the same as simplex printing, but the timing for PS4 and PS7 changes slightly. When the second side is printed:

For single page duplex jobs, the back side of the page sequence allows for correct face-down stacking.

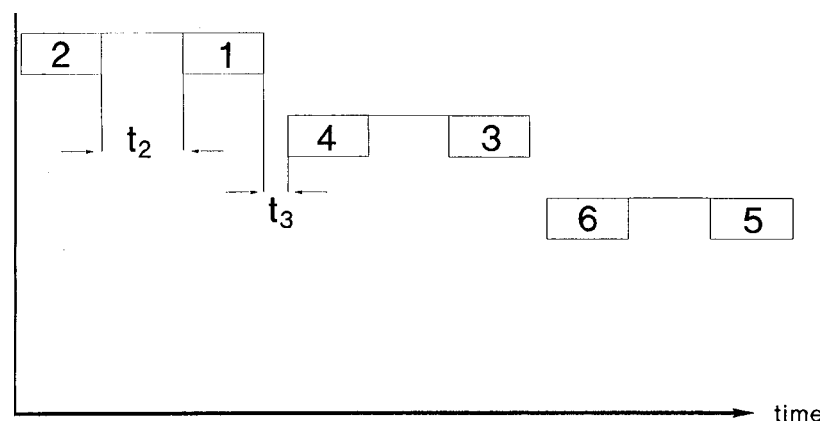


Figure 2-55 Single Page Duplex Printing

For multiple page duplex jobs, the mechanism controller interleaves images, printing image 2 and image 4 from the selected input source, then printing image 1 and image 3 from the duplexer, image 6 from the input source, and then image 5 from the duplexer. This image interleaving continues until the duplex job is completed.

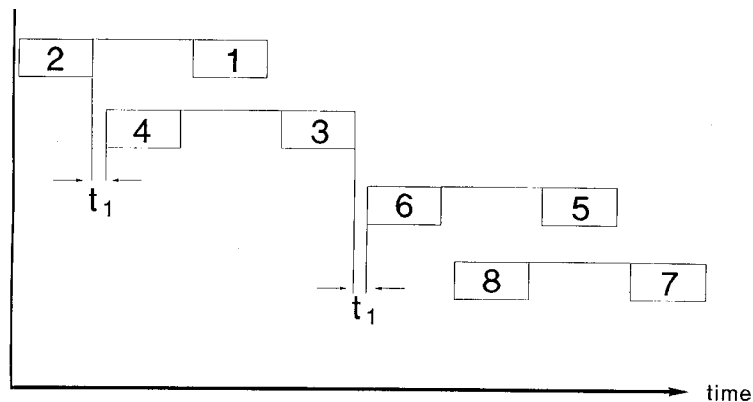


Figure 2-56 Multiple Page Duplex Printing

PS5 jam sensor is responsible for duplexer timing and for the two Duplex Printing Path jams (see [4-10.14 "JAM31 Duplex Printing Path Jam 1,"](#) on page 4-100).

2-10 Ejection Path for Ejection Unit and HCO

The reversing unit is the junction point that determines the direction the paper will go after the decurler unit. If the paper is not sent to the duplex unit, the paper can be either be sent to the High Capacity Output (HCO) or the ejection unit and the top paper bin. There are two versions of the HCO, the 2,000-sheet HCO and the 3,000-sheet HCO.

2-10.1 Ejection Unit and Top Bin

The ejection unit is driven by the drive E unit, a gear and belt assembly that connects to the main motor through the fuser drive gear. The paper is passed to the ejection unit rollers by the reversing unit rollers where it activates sensor PS7 and is presented to the top output tray by a second set of drive rollers. PS7 is a jam sensor that also indicates to the printer that the printed page has successfully reached the output bin and does not need to be reprinted in case of jam.

When the top output tray is full, the stacker full sensor flag moves away from its' sensor and an "Output Stacker Full" message is posted to the operator panel and printing is halted until the output stack is removed.

PS7 sensor is responsible for the two Ejection Unit Jams (see [4-10.12 "JAM29 Ejection Unit Jam 1,"](#) on page 4-96 and [4-10.13 "JAM2B Ejection Unit Jam 2,"](#) on page 4-98).

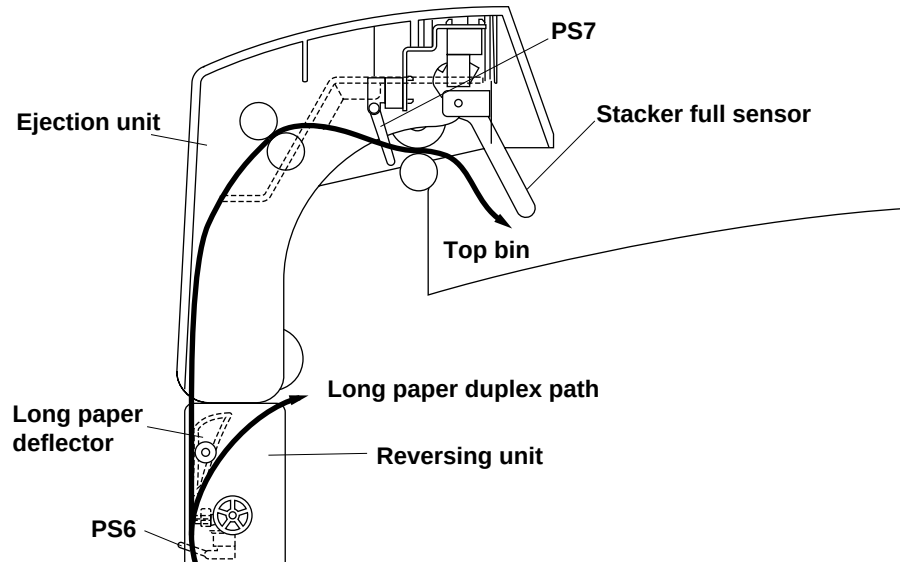


Figure 2-57 Ejection Unit Feed Path

2-10.2 2000-Sheet High Capacity Output

If the paper is directed to the HCO by the HCO select solenoid in the reversing unit, the paper passes from the printer to the optional HCO. In face up operation for the 2,000 - sheet HCO, paper enters the HCO and travels straight through the HCO to the output tray.

In face down operation, media enters the HCO and is deflected into the switchback area by the switchback deflector. The switchback deflector is operated by a solenoid on the front of the HCO. Attached to the switchback deflector, directly above this solenoid, is a photosensor that senses the position of the switchback deflector. On entering the switchback paper path, the media activates the switchback paper path sensor. After activating the switchback sensor and a time period determined by the paper size, the HCO feed rollers are reversed to drive the media up and out of the switchback area.

The printer can offset each printing job by moving the entire output tray forward and backward approximately one inch. Job offset is performed by the offset motor and the offset microswitch located under the stacker output tray. Offset is enabled through the printer's Printing Menu or the customer's printer driver. At power up, the HCO stacker tray rises to the top of travel and the output tray moves forward or backward to check the job offset function.

There are two optical sensors mounted in the center of the HCO frame that are used to detect top of travel for the output stacker tray (lower sensor) and presence of paper (upper sensor.) The upper sensor, when activated by the presence of media, causes the stacker motor to turn on momentarily to lower the output tray until the sensor is cleared.

There is a microswitch mounted on the lower part of the frame that detects a stacker full condition. The door on the front allows access to clear paper jams.

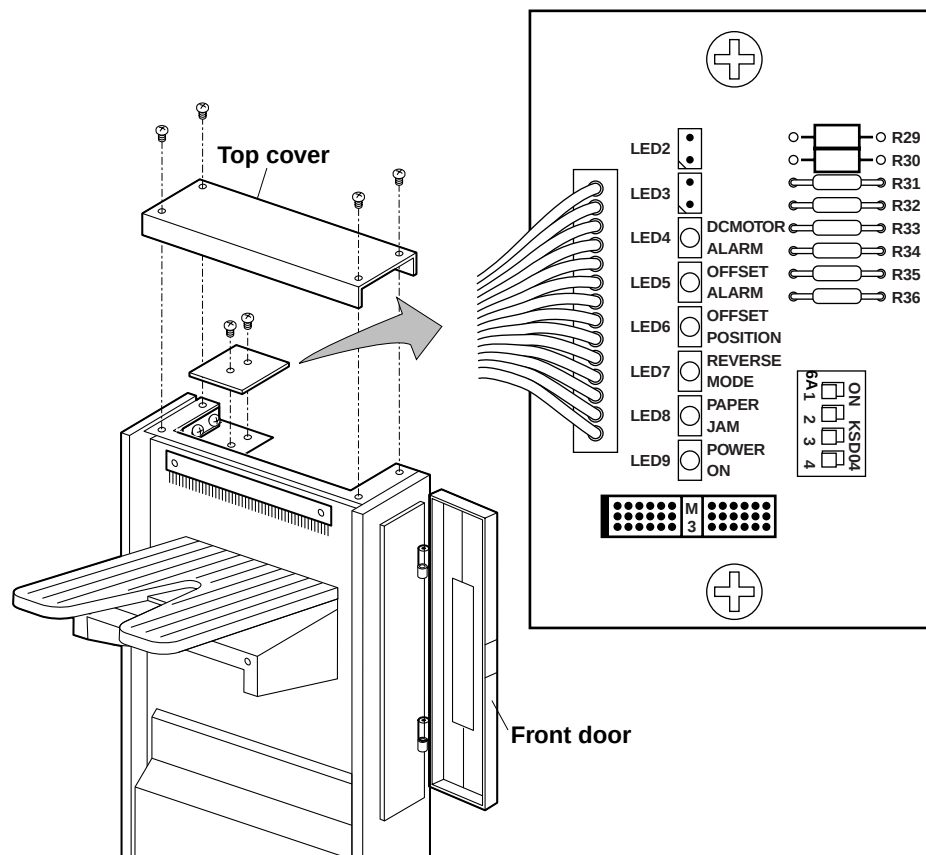


Figure 2-58 2000-Sheet HCO Diagnostic Board

The HCO has a diagnostic board with LEDs and a switchbank located under the top cover. The diagnostic board can be used to test and verify all motors, solenoids, and switches within the HCO. See [C-3 "Diagnostics - Normal Operation \(Connected to Printer\)," on page C-7](#) for more information on running the HCO diagnostics.

2-10.3 3,000-Sheet High Capacity Output

If the paper is directed to the HCO by the HCO select solenoid in the reversing unit, the paper passes from the printer to the optional HCO. In face up operation for the 3,000 - sheet HCO, paper enters the HCO and travels straight through the HCO to the output tray.

In face down operation, media enters the HCO and is deflected into the reverse path by the switchback deflector. The switchback deflector is operated by a solenoid on the front of the HCO. Attached to the switchback deflector, directly above this solenoid, is a photosensor that senses the position of the switchback deflector. On entering the switchback paper path, the media activates the switchback paper path sensor. After activating the switchback sensor and a time period determined by the paper size, the HCO feed rollers are reversed to drive the media up and out of the switchback area.

Page offset is performed by a swiveling output roller not a movable output tray as is used on the 2,000 sheet stacker. Offset is enabled through the printer's Printing Menu or the printer driver. At power up, the HCO stacker tray rises to the top of travel.

The 3,000-sheet HCO has stand-alone diagnostic capability that allows all motors and switches to be tested. It also allows paper to be fed manually to test the unit.

The 3,000 sheet HCO contains the following sensors to track the paper's progress through the HCO.

In addition to sensors SEN2 to SEN7, the HCO contains a Connecting (docking) Switch to verify the HCO to printer connection, a Door Switch for the HCO front door, and a HCO Cutoff Switch to keep the HCO tray from jamming the top of the HCO.

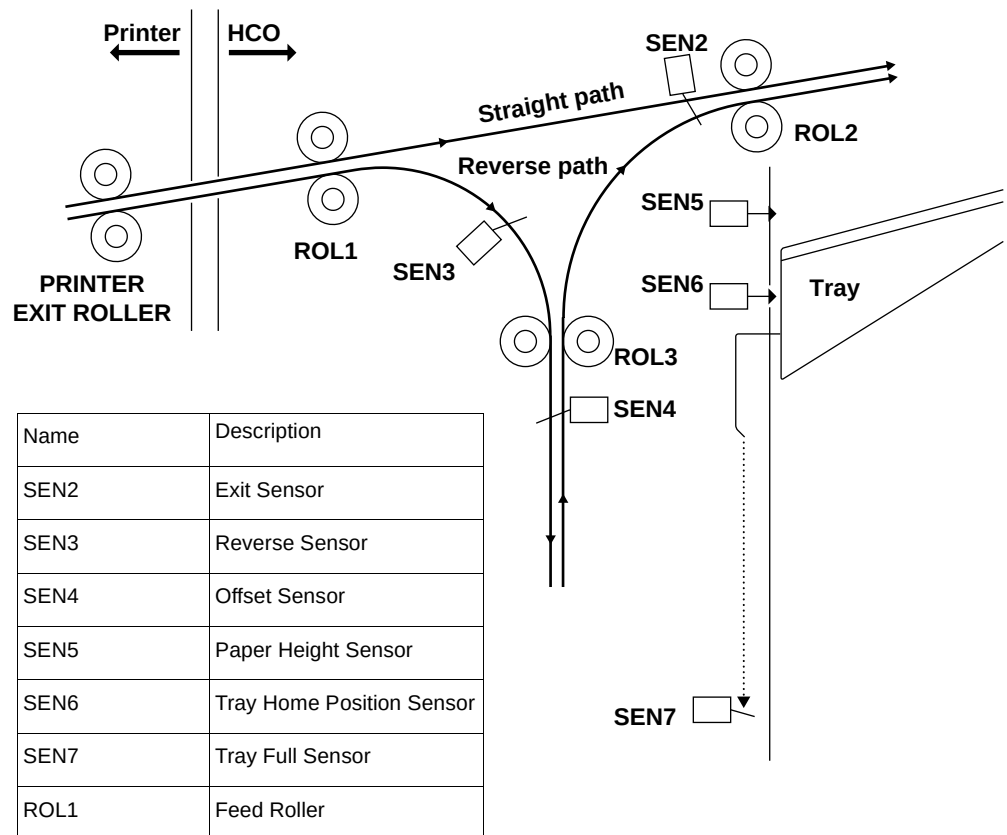


Figure B-59 Location of HCO Sensors SEN2 to SEN7

3 Diagnostics

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3-1 Introduction

This chapter describes the Printer Diagnostic Program – a built-in program of maintenance and diagnostic utilities available within the main controller of HP5000/D640 printer. This program mainly supports inspection and verification of various working attributes of the printer. Field engineers or customers can use these utilities to diagnose or speed up the resolution of a problem.

3-1.1 Printer Diagnostic Program

The Printer Diagnostic Program is resident in the main controller FLASH memory. A copy is resident on the printer's hard disk (C:\maint\ce-prog) for systems with revision level E01V04-980219 and above. The program can be loaded or upgraded through the printer filing system into the controller memory. The revision level of the Printer Maintenance Program is displayed on the Test Selection Menu (see 3-4 "The Test Selection Menu," on page 3-8).

If the printer hangs up when you attempt to enter the Printer Diagnostic Program, it is because the program is not loaded into the main controller FLASH memory. To load the program, you must cycle the power from the main power switch at the bottom-right of the printer, then install the program from a back-up floppy or from the printer's hard disk—C:\maint\ce-prog (see 3-1.3 "Loading or Upgrading the Printer Diagnostic Program," on page 3-4).

3-1.2 Navigating the Printer Diagnostic Program Menus

To navigate the Printer Diagnostic Program menus, use the five push-buttons located below the control panel. The push-buttons are labeled "Key 1" through "Key 5." The values for the keys change for each menu and are shown on the control panel

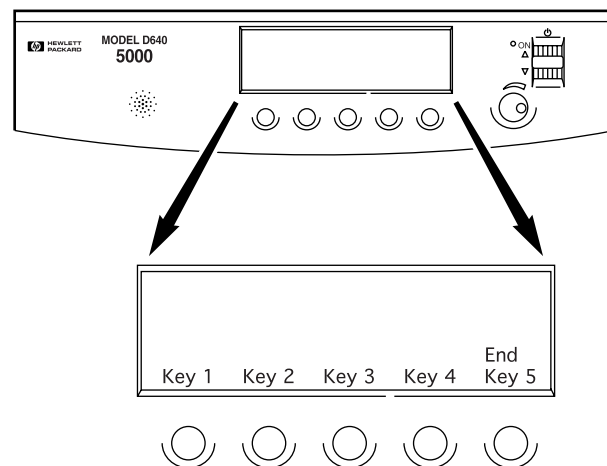


Figure 3-1 Push-Button Key Labels

Many of the menus offer more than five options. To expand the available selection, keys 2 through 5 become columns with multiple rows of options.

Key 1 takes on a role of a shift key, to move the selection marker > cyclically upwards through the rows. Keys 2 through 5 then select the column within the row. When making a selection, you must first use key 1 to select the row, before using the other keys to select the column.

>>>	>>> Key2	>>> Key3	>>> Key4	>>> Key5
>>	>> Key2	>> Key3	>> Key4	>> Key5
>	> Key2	> Key3	> Key4	> Key5
>	Key2	Key3	Key4	Key5

3-1.3 Loading or Upgrading the Printer Diagnostic Program

The program resides in the FLASH memory of the main controller with a copy of the program on the hard disk. If you need to load the current program into FLASH memory, you can copy the program from the hard disk (Test.filesC.Maint) or from a floppy disk. The Printer Diagnostic Program can be upgraded from a floppy disk.

To load or upgrade from a floppy disk:

Step 1 Insert the floppy disk that contains the program into the floppy disk drive.

Step 2 Press **Test**.

Step 3 Highlight **filesA** using the up arrow and down arrows keys and press the **Select** key.

Step 4 Highlight the file **CExxxxxx.LE3** using the up arrow and down arrow keys and press **Select**.

If you select the wrong file or want to quit without upgrading, press **Select** again with the file selected.

Step 5 Press **Online**.

The program on the floppy disk loads into the FLASH memory of the main controller of the printer.

Note

The maintenance program may be supplied with other upgrade files or script files (.LAY). Follow the instructions on the information sheet supplied with the upgrade floppy disk. The maintenance program is available on the SPO web site (see [1-1.2 "Web Sites for More Information," on page 1-5](#)).

To load from the hard disk:

Step 1 Press **Test**.

Step 2 Highlight **filesC** using the up arrow and down arrows keys and press the **Select** key.

Step 3 Highlight the file **CExxxxxx.LE3** using the up arrow and down arrow keys and press **Select**.

If you select the wrong file or want to quit without upgrading, press **Select** again with the file selected.

Step 4 Press **Online**.

The program on the hard disk loads into the FLASH memory of the main controller of the printer.

3-2 Accessing the Printer Diagnostic Program

You can access the Printer Diagnostic Program by performing one of the following:

- Press a prescribed sequence of control panel keys
- Set the DIP switches located on the main controller board
- Press key 5 on the control panel when turning on the printer

Note

If the Printer Diagnostic Program is not present in flash memory and you attempt to access the program, the printer will lock up (including the Standby Power Switch). Turn the printer off, then on, to clear this error condition. The program may have been deleted or a new Main Controller did not have the program loaded. You should reload the program from the hard disk or the floppy disk (see [3-1.3 "Loading or Upgrading the Printer Diagnostic Program,"](#) on page 3-4).

3-2.1 Accessing the Program from the Control Panel

You can access the Printer Diagnostic Program without turning off the printer by pressing a sequence of keys on the control panel.

Perform the following steps:

Step 1 Press and hold keys 1, 3, and 5.

The printer is in a pre-reset state.

Step 2 Release keys 1 and 3; keep holding key 5.

The control panel goes blank.

Step 3 Release key 5 when the moving Display Test Pattern appears (see [Figure 3-2](#)).

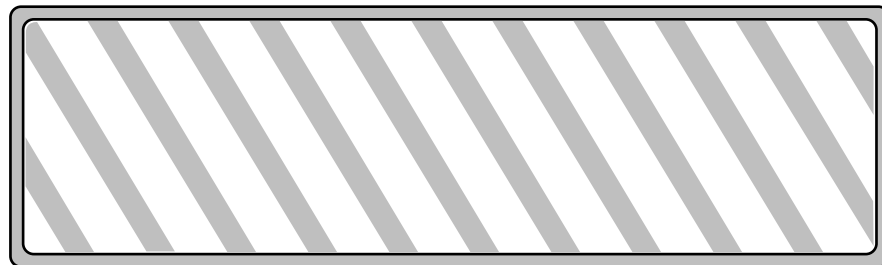


Figure 3-2 Display Test Pattern

You are ready to perform the Display Test (see [3-3 "Display Test and Key Test,"](#) on [page 3-7](#)).

3-2.2 Accessing the Program Using the DIP Switches

You can access the Printer Diagnostic Program when you turn on the printer by setting the DIP switches on the main controller board.

To set the DIP switches:

- Step 1** Turn off the printer.
- Step 2** Remove the rubber cap in between the parallel port and the serial port on the rear side of the printer to access the DIP switch bank.
- Step 3** Set DIP switch 4 to On (down position). Leave all other switches Off (up position). See [Figure 3-3](#). The switches should be set to the following:

1	2	3	4
Off	Off	Off	On

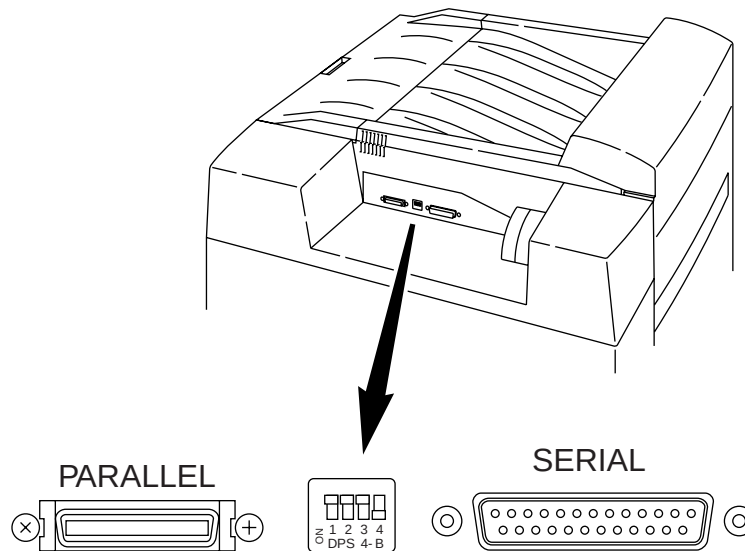


Figure 3-3 Main Controller Board DIP Switches

- Step 4** Turn on the printer.

The the Printer Diagnostic Program starts automatically and the Display Test Pattern appears (see [Figure 3-2](#)).

You are ready to perform the Display Test (see [3-3 "Display Test and Key Test,"](#) on [page 3-7](#)).

Note	After you have finished using the Printer Diagnostic Program, set the DIP switches back to the normal operating position by turning off the printer and setting DIP switch 4 to OFF (up position). All DIP switches should be set to OFF (up position).

3-2.3 Accessing the Program Using Key 5

You can access the Printer Diagnostic Program by pressing Key 5 on the control panel when you turn on the printer.

Perform the following steps:

Step 1 Turn off the printer.

Step 2 Turn on the printer by the stand-by switch while pressing key 5.

The Maintenance Program starts.

Step 3 Release key 5 when the Display Test Pattern appears (see [Figure 3-2](#)).

You are ready to perform the Display Test (see [3-3 "Display Test and Key Test,"](#) on [page 3-7](#)).

3-3 Display Test and Key Test

The control panel shows a moving barber-pole test pattern (see [Figure 3-2](#)) upon entering the Printer Diagnostic Program. This is the Display Test.

Step 1 Adjust the display contrast using the Contrast Control Knob on the control panel so that the dark and light stripes appear to be of equal width.

Step 2 Verify that all of the display area is operating by looking for any pixels that don't light up.

Step 3 Press key 4 to proceed to the Key Test.

The control panel shows the names of the keys. This is the Key Test.

Operator:Press keys from left to right				
Key 1	Key 2	Key 3	Key 4	End Key 5

Step 4 Press all keys on the front panel, starting with key 1 and finishing with key 5. As each key is pressed, the key name disappears.

When all key names have disappeared, the test proceeds automatically to the Test Selection menu.

Pressing and releasing key 5 at any point during the Key Test stops the Key Test and goes to the Test Selection menu.

3-4 The Test Selection Menu

The Test Selection menu is the main menu for accessing the Printer Diagnostic Program.

3-4.1 Accessing the Test Selection Menu

Once you release key 5 in the Key Test, the Printer Diagnostic Program enters the Test Selection menu. Select the appropriate test from the list. [Table 3-1](#) describes each of the menu test options and the submenu test options available under each of the test options. A detailed description for each test is given in the following sections.

The Test Selection Menu also shows the revision level of the Printer Diagnostic Program on the top line. In the following example, the revision level is E01V04 980219.

```
Operator:Select test  E01V04      980219
Customer Access

          TestHDD    TestFDD
          LoopDRAM
          SetDate     SetTime     SetSerNo  ClrMEM
          > EngMaint                                *Exit*
```

If the printer is still initializing after power-up, you may see the message below. Wait until the message is changes before selecting an option.

```
Operator:Select test  E01V04      980219
Please wait : Initializing

          TestHDD    TestFDD
          LoopDRAM
          SetDate     SetTime     SetSerNo  ClrMEM
          > EngMaint                                *Exit*
```

3-4.2 Description of Test Selection Menu Tests

The following table describes each of the Test Selection Menu Tests available through the main menu selections and the sub-menu selections. All of the tests are described in the following sections.

Table 3-1. Printer Diagnostic Program Tests

Menu Selections			Descriptions
Exit			Quit the Maintenance Program and reboot the printer.
TestHDD			Test the printer's internal hard disk.
TestFDD			Test the printer's internal floppy disk drive.
LoopDRAM			Loop test of the DRAM.
SetDate			Verify and set the date.
SetTime			Verify and set the real-time clock.
SetSerNo			Verify and set the printer's serial number stored in the controller.
ClrMEM			Clear the NVRAM of the mechanism controller.
EngMaint	Sensors	DOORS	Check the interlock switches on the doors and covers.
		TRAYS	Check the status of paper input trays, their paper empty sensor, and pick roller position.
		PAPER FEED / PRINT /EJECT	Check the paper sensors on the paper feed units, the paper feeding path (including the duplex unit), and the ejection unit.
		CONSUMER	Check the detection sensors or switches for the consumables and related parts.
		FAN	Verify the cooling fans are rotating.
		SWITCH	Check the status of the DIP switches on the mechanism controller board.
		HCI	Check the status of the HCI sensors.
	SaveRstr	CtrSave	Transfer the contents of the print engine registers of the controller to external storage.
		CtrRstr	Restore the contents of the print engine registers of the mechanism controller from external storage.
	PwrSave		Tests the Power Save function.
	DevErRst		Resets the developer purge sequence bit set during the developer purge cycle.
	EngRegs		Verify the values set in the print engine registers of the controller.
	Counters		Verify the value set in the control counters in the controller. (e.g. consumables life managing counter).
	Control		Change the value set in the print engine registers in the mechanism controller

Table 3-1. Printer Diagnostic Program Tests (Continued)

Menu Selections			Descriptions	
EngMaint (cont)	UnitTest	Input		Test the pick motors and the paper feed motor
		Print	Fuser	Test the fuser unit halogen lamp
			ErLED	Test the LED units
			Main	Test Drive Unit M
			Drive.D	Test the developer discharge shutter motor
			Toner	Test the toner motor
			Charge	Test the HV power supply
			HCO.chg	Test the HCO stacker charge solenoid on the reversing unit
			HCO.sel	Test the HCO select solenoid on the reversing unit
			Clutch	Test the registration roller clutch
		Output		Test the switch back motor on the reversing unit and the duplex motor on the duplex unit
	PrTest		Conduct the printing test	
	ErrMask		Verify and set values for the error masking registers in the mechanism controller	
	NVRAM		Reset the page counter register in the NVRAM of the mechanism controller	

3-5 Quit Printer Diagnostic Program and Reboot (*Exit*)

Selecting *Exit* from the Test Selection menu exits the Printer Diagnostic Program and reboots the printer.

```
Operator:Select test  E01V04      980119
Customer Access

          TestHDD    TestFDD
          LoopDRAM
          SetDate    SetTime    SetSerNo  ClrMEM
          > EngMaint                                *Exit*
```

3-6 Hard Disk Test Menu (TestHDD)

Selecting **TestHDD** from the Test Selection menu opens the Hard Disk Test menu for testing the printer's hard disk. This test checks the status of the connection between the controller hardware and the hard disk drive. No read/write test is conducted in this test.

Hard disk test	
BACK	RUN

BACK Return to the Test Selection menu.

RUN Runs the Hard Disk Test.

To run the Hard Disk Test:

Step 1 Press **RUN**.

The Hard Disk Test issues an IDE-Device-Identify command that reads the ID written in the hard disk drive memory.

Step 2 Observe the display.

If the test is successful, a message similar to the following example displays. This example shows which Quantum hard disk drive is installed in the printer. If the controller cannot recognize the hard disk drive, the message "Not Connected" appears.

Hard disk test	
QUANTUM TRB850A	
Firmware:A40.05	Capacity:830.088Mbytes
BACK	RUN

3-7 Floppy Disk Test Menu (TestFDD)

Selecting **TestFDD** from the Test Selection menu opens the Floppy Disk Test menu for the printer's floppy disk drive. This test writes data to track 0 of the floppy disk which requires a 1.44 MB DOS/V formatted floppy disk be inserted.

Floppy disk test	
Super I/O version:04	
Insert Working FDD which may be written	
Are you sure ?	
BACK	RUN

BACK Return to the Test Selection menu.

RUN Checks for a writable, formatted floppy disk and then starts the Floppy Disk Test.

To run the Floppy Disk Test:

Step 1 Insert a 1.44 MB, DOS/V formatted floppy disk into the floppy disk drive slot, The floppy disk drive slot is located under the front control panel. Verify the disk is not write-protected.

Step 2 Press **RUN**.

The Floppy Disk Test checks for a 1.44 MB, DOS/V formatted floppy disk that is not write-protected. If the floppy disk is found, the Floppy Disk Test starts.

If the floppy disk is not installed, incorrectly formatted, or write-protected, then a message appears indicating how to fix the problem. In the following example, a floppy disk needs to be installed before the test can proceed.

Floppy disk test		
Super I/O version:04		
Install 2HD Floppy Disk		
BACK	RUN	LOOP

BACK Return to the Test Selection menu.

RUN Runs the Floppy Disk Test.

LOOP Continues to rerun the test until the first error is detected. To exit the test loop, press **STOP** that appears while running the test loop.

The floppy disk test performs the following sequence of procedures:

- a. Restore to the outermost track.
- b. Write test pattern on the outermost track, side 1.
- c. Step to the center of disk.
- d. Write test pattern on the innermost track, side 1.

- e. Step outwards half-way.
- f. Write test pattern, side 2.
- g. Step to the outermost track.
- h. Read-verify test pattern on side 1.
- i. Step inwards half-way.
- j. Read-verify test pattern on side 2.
- k. Step to the center of disk.
- l. Read-verify test pattern on side 1.

Step 3 Observe the display for error messages.

If an error occurs during the test, an error message appears on the display. For example:

Floppy disk test	** FAIL **
Super I/O version:04	
Verify:Fail TRC:00 HD:0 SEC:01	
EndofTrc CRC UnderRun NoData MAN (WR)	
WrongTrc ScnNotSatisfied BadTrc	
Seek timeout SuperI/O timeout(R-Data)	
BACK	RUN LOOP

Step 4 Press **BACK** to end the test and return to the Test Selection menu.

If you want to reuse the floppy disk after this test, you need to reformat it on a PC.

3-8 Loop DRAM Test (LoopDRAM)

Selecting **LoopDRAM** from the Test Selection menu runs the Loop DRAM Test. This test checks the on-board DRAM and expansion DRAM modules (SIMMs).

```

Loop DRAM test: DRAM Local
Exit: Press the most left SW          0001
          D31 D27 D23 D19 D15 D11 D07 D03
04000000
05000000
    ABSENT
    ABSENT
  
```

To run the Loop DRAM Test:

Step 1 Select LoopDRAM from the Test Selection menu.

The test automatically begins the loop DRAM test.

The test performs a cyclical read/write to check for the presence of the on-board DRAM and any expansion DRAM modules (SIMMs). The test runs in a loop, where the test returns to the start of the loop upon successful completion, or upon encountering an error.

The number shown in the upper right corner is the current number of loops performed.

Step 2 Observe the control panel for results.

If an error is detected, diagnostic information concerning the error appears. For example:

```

Loop DRAM test: DRAM Local      ** FAIL **
Exit: Press the most left SW          0001
          D31 D27 D23 D19 D15 D11 D07 D03
04006400  ****          +          -
  
```

- + The bit read as 1 when 0 was written.
- The bit read as 0 when 1 was written.
- * The bit has failed both 0 and 1 write/read tests.

Step 3 To exit the loop of the test, press key 1 and the display returns to the Test Selection menu.

3-9 Set Date Menu (SetDate)

Selecting **SetDate** from the Test Selection menu opens the Set Date menu where you can set the printer's calendar date.

Set date				
Sat		97	01	22
WkDay	BACK	Year	Month	Day

WkDay Cycles through the days of the week.

BACK Returns to the Test Selection menu.

Year Cycles through the years.

Month Cycles through the months.

Day Cycles through the days.

To set the date:

Step 1 Use **WkDay**, **Year**, **Month**, and **Day** to set the time.

Step 2 Press **BACK** to return to the Test Selection menu.

3-10 Set Time Menu (SetTime)

Selecting **SetTime** from the Test Selection menu opens the Set Time menu where you can set the printer's clock time.

Set time				
		18	45	30
Stop	BACK	Hour	Minute	Second

Stop	Stops the internal clock of the printer.
BACK	Returns to the Test Selection menu.
Hour	Cycles through the hours.
Minute	Cycles through the minutes.
Second	Cycles through the seconds.

To set the time:

- Step 1** Press **Stop** to stop the internal clock.
- Step 2** Use **Hour**, **Minute**, and **Second** to set the time.
- Step 3** Press **BACK** to restart the internal clock and return to the Test Selection menu.

3-11 Set Serial Number Menu (SetSerNo)

Selecting **SetSerNo** from the Test Selection menu opens the Set Serial Number menu where you can set the serial number of the printer. This menu has two screens as shown below:

Set Serial Number		1/2	
Equip.Serial No : JP20000000			
Next	+	-	>> <<

- Next** Moves to the second screen (labeled 2/2 in upper right corner) to display additional options.
- + and -** Increments or decrements the digit at the cursor (0 to 9, "JP" or "TH").
- >> and <<** Moves the cursor forward or backward within the serial number.

Set Serial Number		2/2	
Equip.Serial No : JP20000000			
Prev	Reset	SET	BACK

- Prev** Moves to the first screen (labeled 1/2 in upper right corner).
- Reset** Resets the serial number to zero.
- SET** Stores the serial number in the NVRAM of the mechanism controller board.
- BACK** Returns to the Test Selection menu.

To set the serial number:

- Step 1** In the first screen, press the >> or << keys to move the cursor and use the + and - keys to incrementally add to or subtract from the number.
- Step 2** Press **Next** to go to the second screen.
- Step 3** Press **SET** to set the new number as the serial number.
- Step 4** Press **BACK** to exit the Set Serial Number menu and return to the Test Selection menu.

3-12 Clear Memory Function Menu (ClrMEM)

Selecting **ClrMEM** from the Test Selection menu opens the Clear Memory Function menu where you can clear all or portions of the battery-backed NVRAM of the main controller.

Clear Memory function : Main Controller			
NVRAM:	ClrALL	ErrLog	ErrMask
	>		BACK

- ClrAll** Clears all of NVRAM.
- ErrLog** Clears the error log portion of the NVRAM.
- ErrMask** Clear the error mask portion of the NVRAM.
- BACK** Returns to the Test Selection menu.

Clearing NVRAM clears all non-volatile settings of the printer, such as:

- Custom menus (CUSTOM1 to CUSTOM4)
- Settings made by emulations, such as the PostScript option
- Setting made by interface drivers

All these settings will be subsequently re-initialized to FACTORY when you reboot the printer for normal operation.

To clear the main controller NVRAM:

Step 1 Press key 1 to move the cursor to select **NVRAM**.

Step 2 Press key to select area of memory.

The following menu appears:

Clear Memory function : Main Controller			
This will erase memory.			
Do you really want to continue it ?			
NVRAM:	ClrAll	ErrLog	ErrMask
	NO/BACK		Yes

- No/BACK** Returns to the Test Selection menu without clearing memory.
- Yes** Clears the selected area of the NVRAM.

Step 3 Press **Yes** to erase the selected memory.

3-13 Engine Test/Maintenance Menu (EngMaint)

Selecting **EngMaint** from the Test Selection menu opens the Engine Test/Maintenance menu where you can choose from a set of tests, settings, and maintenance procedures for the print engine. Each of the menus is described in this section

Engine Test/Maintenance: Select				
	Sensors	SaveRstr	PwrSave	DevErRst
	EngRegs	Counters	Control	ErrMask
>	BACK	UnitTest	PrTest	NVRAM

BACK	Returns to the Test Selection menu
Sensors	Opens the Sensors menu where you can verify the status of the door interlocks, sensors, switches, and fans.
SaveRstr	Opens the Save and Restore menu where you can save the contents of the print engine registers and restore the contents of the print engine registers.
PwrSave	Opens the Power Save menu where you can test the power save mode.
DevErRst	Opens the Developer Error Restore menu where you can reset the developer purge sequence bit.
EngRegs	Opens the Engine Regs Peek/Poke menu where you can verify the value set in the print engine registers.
Counters	Opens the Counters menu where you can verify the value set in the control counters.
Control	Opens the Control Info menu where you can change the print engine registers.
ErrMask	Opens the Error Mask menu where you can verify and set values for the error masking registers.
UnitTest	Opens the Print Unit Test menu where you can test the motors, LEDs, solenoids, and HV power supply.
PrTest	Opens the Printing Test menu where you can run the printing test.
NVRAM	Opens the NVRAMS menu where you can reset the page counter register in the NVRAM.

If the printer is still initializing after power-up, you may see the message below. Wait until the message disappears or return to the Test Selection menu by pressing **BACK**:

Engine Test/Maintenance: Select				
Please wait : Initializing				
	Sensors	SaveRstr	PwrSave	DevErRst
	EngRegs	Counters	Control	ErrMask
>	BACK	UnitTest	PrTest	NVRAM

3-13.1 Monitoring Print Module Sensors Screens (EngMaint.Sensors)

Selecting **Sensors** from the Engine Test/Maintenance menu opens the Sensors menu, which is the first of seven screens where you can observe the status of groups of sensors within the printer. The Sensor menu is made up of seven screens each showing a group of sensors for one of the following areas:

- Doors
- Trays
- Paper Feed/Print/Eject
- Consumer
- Fan
- Switch
- HCI

The screens are accessed sequentially by pressing the - key or the + key to move forward or backward within the series of screens.

3-13.2 Doors Sensors Screen (EngMaint.Sensors.DOORS)

The first screen, DOORS, displays the status of the interlock switches of the doors and covers. The example below shows that the upper right cover is open and all other covers are closed.

```

Engine Test/Maintenance: Sensors
DOORS

    front: Closed
right-upper: Open
right-lower: Closed
    ejection: Closed
        BACK      -      +
  
```

BACK Returns to the Engine Test/Maintenance menu.

+ Goes to next screen, TRAYS.

- Goes to the previous screen, HCI.

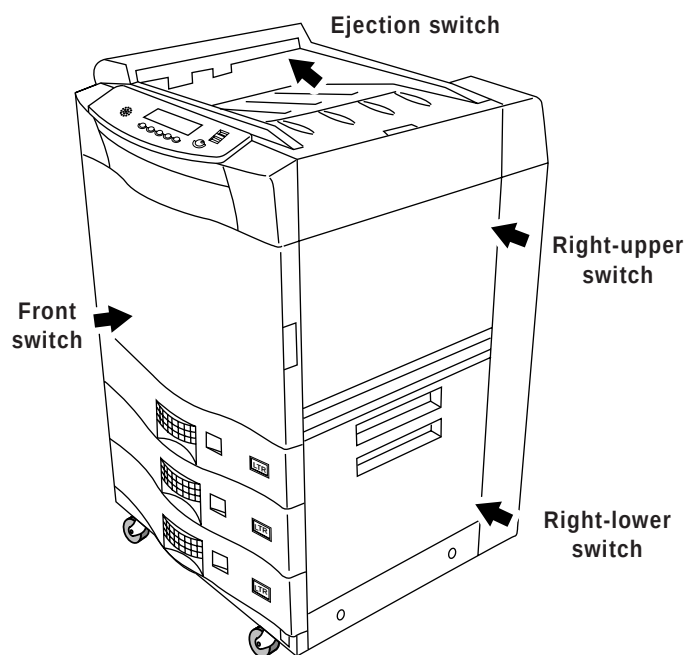


Figure 3-4 Location of Interlock Switches on Doors and Covers

3-13.3 Trays Sensors Screen (EngMaint.Sensors.TRAYS)

The second screen, TRAYS, displays the status of the tray microswitches and sensors of the paper trays. The example below shows that the upper tray is inserted with paper installed and its pick roller is lifted.

Engine Test/Maintenance: Sensors		
TRAYS		
upper: in	full	up
middle: out	empty	up
lower: in	empty	down
BACK	-	+

in/out	The tray is inserted or removed as detected by microswitch on rear printer frame for each paper tray
empty/full	The tray doesn't have paper/has paper as detected by sensor in rear of pick roller assembly
up/down	The location of the pick roller. If the pick roller goes down by extracting the tray during this test, it does not go back to up even the tray is inserted, because the printer cannot lift the pick roller during the test mode as detected by sensor on top of each feed unit.
BACK	Returns to the Engine Test/Maintenance menu
+	Goes to the next screen, PAPER FEED/PRINT/EJECT
-	Goes to the previous screen, DOORS

Note	When an input tray is removed, the sensor displays "out empty down". The lift motor does not operate in diagnostic mode, so if a tray is removed and replaced, the sensor continues to display "out empty down".

3-13.4 Paper Feed /Print /Eject Sensors Screen (EngMaint.Sensors.PAPER FEED /PRINT /EJECT)

The third screen, PAPER FEED /PRINT /EJECT, displays the status of the paper feed, print and eject sensors. The example below shows that the PS2 sensor and the Stack Full Sensor (ESF) are activated (detect paper). See [Figure 3-5 "Location of Paper Feed, Print, and Eject Sensors,"](#) on page 3-24.

Engine Test/Maintenance: Sensors		
PAPER FEED	PRINT	EJECT
FS11	PS2 paper	ES6
FS12	PS3	ES7
FS13	PS4	ESF paper
	DS5	
BACK	-	+

- paper** The sensor is activated by paper.
- BACK** Returns to the Engine Test/Maintenance menu.
- +** Goes to the next screen, CONSUMER.
- Move to the previous screen, TRAYS.

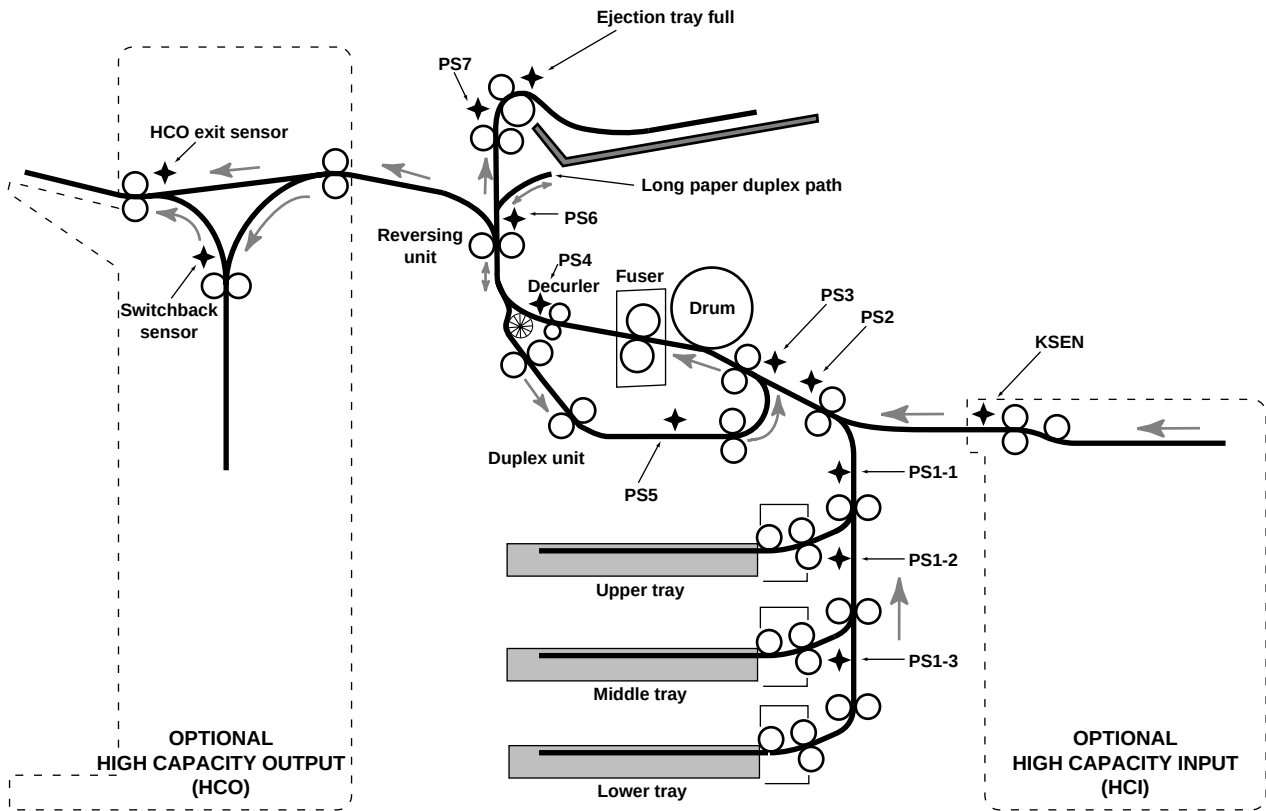


Figure 3-5 Location of Paper Feed, Print, and Eject Sensors

3-13.5 Consumer Sensors Screen (EngMaint.Sensors.CONSUMER)

The fourth screen, CONSUMER, displays the status of the sensors or microswitches for the consumables (user replaceable parts). The example below shows that the toner hopper is empty and the fuser unit is not installed.

Engine Test/Maintenance: Sensors		
CONSUMER		
Toner:empty	Developer:in	
	Dev. bottle:in	
Fuser:out	Dev. shutter:close	
Drum:in		
BACK	-	+

BACK	Returns to the Engine Test/Maintenance menu.
+	Goes to the next screen, FAN.
-	Goes to the previous screen, PAPER FEED /PRINT /EJECT.
Toner	Toner sensor in toner hopper does not detect toner; toner hopper is detected as being empty
Developer	Developer density sensor TNSJ within the developer is connected and operational.
Dev.bottle	Developer collector bottle is detected as being installed by microswitch SWE25.
Fuser	Fuser is detected as being installed by microswitch TINTSW.
Dev. shutter	The developer shutter is detected as being closed by microswitch SWE26 on drive D unit.
Drum	Drum is detected as being installed by microswitch DUSET located on drive M unit.

3-13.6 Fan Sensors Screen (EngMaint.Sensors.FAN)

The fifth screen, FAN, displays the status of the sensors detecting rotation of the cooling fans. For fan locations, see [Figure 3-6](#).

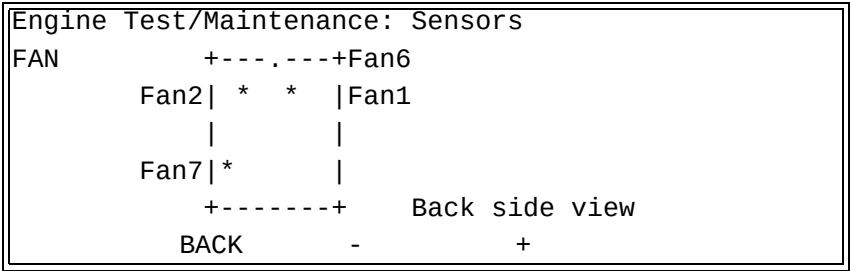
Note

The following fans do not appear:

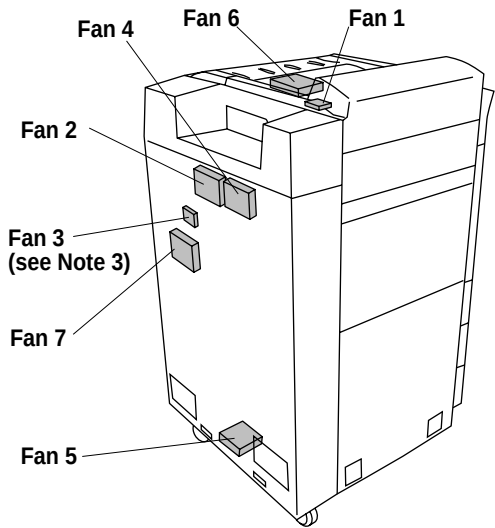
Fan4 and Fan5 are not shown because they are driven directly by the power supply unit. Information on troubleshooting these fans is in the Power Problems section of chapter 4.

Fan3 does not exist in all printers. The fan was removed in newer printers.

The example below shows that the sensor of Fan6 detects no fan rotation.



- . Sensor detects no rotation of the fan.
- * Sensor detects rotation of the fan.
- BACK** Returns to the Engine Test/Maintenance menu.
- +** Goes to the next screen, SWITCH.
- Goes to the previous screen, CONSUMER.



- Notes:
1. All 24V fans stop when any interlock switch is opened.
 2. All 12V fans continue running regardless if any interlock switch is opened.
 3. Fan 3 was removed on later model printers and does not operate with current firmware.
 4. Fan assignments are:

Fan	Voltage	Purpose
1	24V	Cool optical unit
2	24V	Cool main frame
3	24V	Cool main motor
4	12V	Cool fuser
5	12V	Cool LVPS
6	12V	Cool main controller board
7	24V	Cool main frame

Figure 3-6 Location of Fans

3-13.7 Switch Sensors Screen (EngMaint.Sensors.SWITCH)

The sixth screen, SWITCH, displays the status of the DIP switches on the lower right of the mechanism controller board.

Engine Test/Maintenance: Sensors		
SWITCH	current	default
	12345678	12345678
	SW1:011000**	01100000
	SW2:1110	
BACK	-	+

- 1** The switch is on (up).
- 0** The switch is off (down).
- *** The switch is undefined or not installed.
- BACK** Returns to the Engine Test/Maintenance menu.
- +** Goes to the next screen, HCI.
- Goes to the previous screen, FAN.

3-13.8 HCI Sensors Screen (EngMaint.Sensors.HCI)

The seventh screen, HCI, displays the real-time status of the sensors and microswitches mounted on the HCI. To see the status, be sure the front door of the printer is closed. The location of the sensors is shown in [Figure 3-7](#).

Engine Test/Maintenance: Sensors		
HCI	Please close printers covers	
SETSEN: locked	DSEN: closed	
EMPSEN: full	S1B: off	
LEVSEN: on	KSEN: absent	
LOWSEN: off		
BACK	-	+

- BACK** Return to the Sensors Sub-menu.
- +** Goes to the next screen, DOORS.
- Goes to the previous screen, SWITCH.
- SETSEN** Senses HCI is engaged to printer. Values: locked or open.
- EMPSEN** Senses paper is installed in HCI. Values: full or empty.
- LEVSEN** HCI tray at top of travel when on. Values: on or off.
- LOWSEN** HCI tray at lower limit of travel when on. Values: on or off.
- DSEN** HCI door closed sensor. Values: closed or open.
- S1B** Not applicable.
- KSEN** Senses paper as it leaves the HCI. Values: absent or present.

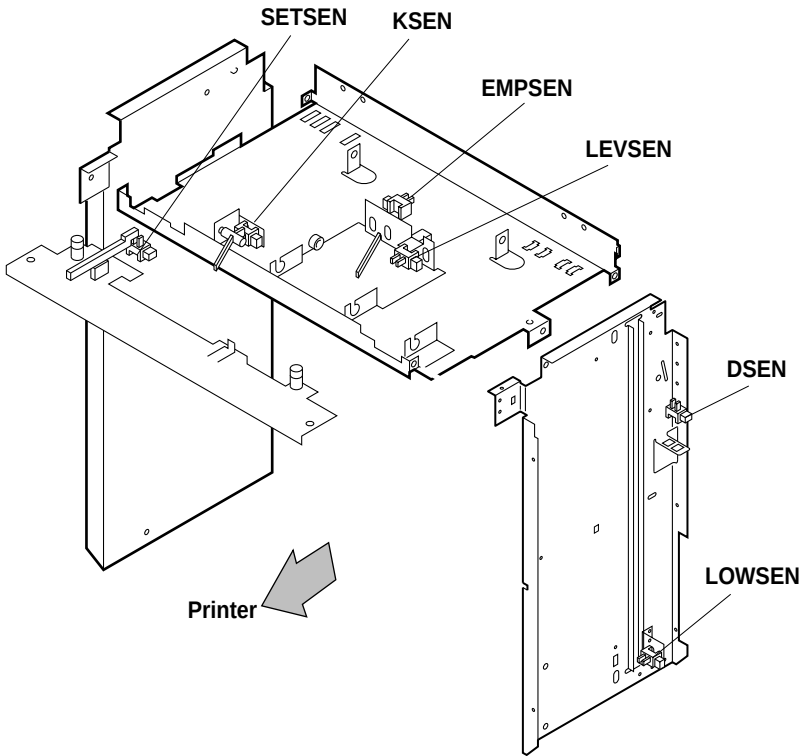


Figure 3-7 Location of HCI Sensors

If HCI is not installed or not recognized by the printer, the sensor and microswitch status is blank as shown in the example below:

```
Engine Test/Maintenance: Sensors
HCI not connected
    SETSEN:           DSEN:
    EMPSEN:           S1B:
    LEVSEN:           KSEN:
    LOWSEN:
    BACK      -      +
```

3-13.9 Save & Restore Menu (EngMaint.SaveRstr)

Selecting **SaveRstr** from the Engine Test/Maintenance menu opens the Save & Restore menu that allows you to save or restore the contents of the print engine registers. The menu provides two separate menus, the Control Info Save menu and the Control Info Restore menu that are described in the following sections.

Engine Test/Maintenance: Save & Restore		
BACK	CtrSave	CtrRst

BACK	Returns to the Engine Test/Maintenance Selection menu.
CtrSave	Opens the Control Info Save menu where you can save the contents of the print engine registers.
CtrRst	Opens the Control Info Restore menu where you can restore the contents of the print engine registers.

3-13.10 Control Info Save Menu (EngMaint.SaveRst.CtrSave)

Selecting **CtrlSave** from the Save & Restore menu opens the Control Info Save menu that allows you to store or transfer the printer control information to one of the following:

- The main controller NVRAM location 0xFFFF6010 to 0xFFFF62A0. The data is saved into every other byte to keep the data compatible with the PCMCIA card.
- A PCMCIA card
- The 9-pin serial port as a text listing of the value at 9600 baud
- The 9-pin serial port as a sequence of ASCII hex pairs. This format can be read by a PC for archiving, printing, or editing. This data transfer is at 9600 baud in 8-data, no-parity, one-stop format. The data is formatted as follows:
 - 2 byte constant header: 16_ABCD
 - 6 byte BCD-coded time/date stamp: hhmmssDDMMYY from controller clock
 - 512 bytes of printer control information (two hex-digits per byte)
 - 128 bytes of printer management counters

```

Engine Test/Maintenance: Control Info
                          Save

Make sure required media is present.

                                CardB-2      OutTxt
                                CardB-1      OutHex
>  BACK                                NVRAM
  
```

BACK	Returns to the Engine/Maintenance Selection menu.
CardB-1	Checks for presence of and ability to write to the PCMCIA card in upper slot B, then saves the control information to the PCMCIA card. If no card is detected or the card can't be written to, an error message is displayed in line 3.
CardB-2	Checks for presence of and ability to write to the PCMCIA card in lower slot B, then saves the control information to the PCMCIA card. If no card is detected or the card can't be written to, an error message is displayed in line 3.
NVRAM	Saves the control information to main controller NVRAM location 0xFFFF6010 to 0xFFFF62A0.
OutTxt	Saves the control information through the serial port as text data.
OutHex	Saves the control information through the serial port as hexadecimal data.

All save operations are confirmed by a short (about three seconds) message sequence, **saving**, followed by **done**, in the third line of the display.

3-13.11 Control Info Restore Menu (EngMaint.SaveRstr.CtrRstr)

Selecting **CtrRstr** from the Save & Restore menu opens the Control Info Restore menu that allows you to load printer control information into the registers of the mechanism controller.

Engine Test/Maintenance: Control Info			
Restore			
Time:18-00-00		Date:98-01-30	
Make sure required media is present.			
CardB-2			
>	BACK	CardB-1	NVRAM InHex

BACK	Returns to the Engine/Maintenance Selection menu.
CardB-1	Loads control information from the PCMCIA card in upper slot B.
CardB-2	Loads control information from the PCMCIA card in lower slot B.
NVRAM	Loads the control information from main controller NVRAM location 0xFFFF62A0 to 0xFFFF6010.
InHex	Loads control information through the serial port as hexadecimal data.

CAUTION	The inter-character timeout for restoring through the serial port is 30 seconds. Therefore, when restoring print module NVRAM data through the printer serial port, you must ensure that data can be delivered by your tool. Otherwise, the test program waits for data a prolonged period of time and appears of be inactive.

All restore operations are confirmed by a short (about 3 seconds) message sequence, **restoring** then **done**, in the third line of the display.

3-13.12 Power Save Menu (EngMaint.PwrSave)

Selecting **PwrSave** from the Engine Test/Maintenance menu opens the Power Save menu that allows you to test the printer's Power Save mode. This test can be run manually or in an automatic loop.

```

Engine Test/Maintenance: Power Save

Printer will enter PowerSave when enter
is pressed. Press button 4(release) to
exit PowerSave.

                                LOOP      Enter      Release      BACK
  
```

- BACK** Returns to the Engine/Maintenance Selection menu.
- LOOP** Runs a continuous cycle of turning on and off Power Save mode.
- Enter** Turns on Power Save mode. The backlight of the operator panel turns off, but the Power Save menu is still functional.
- Release** Turns off Power Save mode and returns to full operation.

To run the Power Save mode Test:

Step 1 Select either **LOOP** or **Enter** from the Power Save Selection menu.

If you pressed **Enter**, the test goes into Power Save mode. The following menu appears with the backlight off:

```

Engine Test/Maintenance: Power Save

Printer will enter PowerSave when enter
is pressed. Press button 4(release) to
exit PowerSave.

                ** POWERSAVE **
>  LOOP      Enter      Release      Back
  
```

If you pressed **LOOP**, the test begins cycling Power Save mode on and off. The number shown in the upper right corner, Loop=nnnn, is the current number of loops performed. The following menu appears:

```

Engine Test/Maintenance: Loop=0001

Printer will enter PowerSave when enter
is pressed. Press button 4(release) to
exit PowerSave.

                ** POWERSAVE **
>  LOOP      Enter      Release      Back
  
```

Step 2 Press **Release** to turn off Power Save mode or end the loop test.

3-13.13 Developer Error Reset Menu (EngMaint.DevErRst)

Selecting **DevErRst** from the Engine Test/Maintenance menu opens the Developer Error Reset menu that allows you to reset the printer's developer purge sequence bit. This is useful when an error occurs during the developer purge sequence and the printer needs to be reset for troubleshooting.

Engine Test/Maintenance: Dev Error Reset	
Print Sequence1(PRSQ1) : 9B	
Please reset discharging developer seq.	
Reset	BACK

BACK Returns to the Engine/Maintenance Selection menu.

Reset Resets the developer purge sequence bit.

To reset the developer purge sequence bit:

Step 1 When a developer purge sequence error occurs, go to the Developer Error Reset menu.

Step 2 Press **Reset**.

The following menu appears:

Engine Test/Maintenance: Dev Error Reset	
Print Sequence1(PRSQ1) : 9B -> 00	
You must now cycle power to continue.	
Reset	BACK

Step 3 Cycle power off then on.

The bit has now been reset and you can begin troubleshooting.

3-13.14 Engine Regs Peek/Poke Menu (EngMaint.EngRegs)

WARNING!

Do not change the values of any registers unless you are directed to by a Support Specialist. Changing a register value incorrectly can severely damage your printer.

Selecting **EngRegs** from the Engine Test/Maintenance menu opens the Engine Regs Peek/Poke menu that provides you with direct access to the print engine command/status interface through 7-bit address and byte-wide read/write operations.

Engine Regs Peek/Poke menu can be used to monitor individual registers or to issue commands to the printer. Issuing commands to the printer can be quite laborious and should be used only when the desired function cannot be achieved through other tests.

When you first display the menu, the **Addr**, **Current** and **New** fields have un-initialized values represented by **##** and **XX**.

Engine Test/Maintenance: Engine Regs.				
Peek / Poke				
Addr: ##				
Current: XX				
> New: XX				
Addr	BACK	-	+	ReSET

- Addr** Press and hold while using the + or - keys to change the address to be accessed.
- BACK** Returns to the Engine/Maintenance Selection menu.
- Press alone to decrement the data. Press while holding the **Addr** key to decrement the address.
- +** Press alone to increment the data. Press while holding the **Addr** key to increment the address.
- ReSET** Sets the input data by momentary (under one second) pressing, or restores the default data by pressing two seconds or more.

To set the access the registers and optionally change the registers:

Step 1 Press and hold the **Addr** key to activate the **Addr** field.

Step 2 While pressing the **Addr** key, use the + key and the - key to select the required register.

Engine Test/Maintenance: Engine Regs.				
Peek / Poke				
>Addr: 59				
Current: XX				
New: XX				
Addr	BACK	-	+	ReSET

Step 3 Release the **Addr** key.

The selected print module register is displayed in the **Current** and **New** data fields.

Pressing and releasing the **Addr** key can be used for repeated inspection of the selected register.

Engine Test/Maintenance: Engine Regs.				
Peek / Poke				
Addr: 59				
Current: B5				
> New: B5				
Addr	BACK	-	+	ReSET

Step 4 If you need to change the value of the register, change the value in **New**. Use the **+** and **-** keys to write the new value into the currently selected print engine register by momentarily pressing the **ReSET** key.

Note	Read-only registers, or registers for which write access had been inhibited, the ReSET key is not present.

3-13.15 Counters Menu (EngMaint.Counters)

Selecting **Counters** from the Engine Test/Maintenance menu opens the Counters menu that allows you to read the contents of individual counters of the printer. To change the values of the counters, see [3-13.29 "Control Info Menu \(EngMaint.Control\)," on page 3-56](#).

Upon first entry to the menu, the **Addr**, **Current** and **New** fields have un-initialized values represented by **##** and **XX**.

Engine Test/Maintenance: Counters			
Addr: ##			
Current: XXXXX			
> New: XXXXX			
Addr	BACK	-	+

Addr Press and hold while using the + or - keys to change the address to be accessed.

BACK Returns to the Engine Test/Maintenance Selection menu.

- Press while holding the **Addr** key to decrement the address.

+ Press while holding the **Addr** key to increment the address.

To set the access the counters:

Step 1 Press and hold the **Addr** key to shift the function to the **Addr** field.

Step 2 While pressing the **Addr** key, use the + Key and the - key to select the counter.

Engine Test/Maintenance: Counters			
>Addr: 18			
Current: XXXXX			
New: XXXXX			
Addr	BACK	-	+

Step 3 Release the **Addr** key.

The selected print engine counter is read-out and displayed in the **Current** and **New** data fields.

Engine Test/Maintenance: Counters			
Addr: 18			
Current: 2328			
> New: 2328			
Addr	BACK	-	+

3-13.16 Print Unit Test Menu (EngMaint.UnitTest)

Selecting **UnitTest** from the Engine Test/Maintenance menu opens the Print Unit Test menu that allows you to test functions for the individual components of the print engine. The tests are divided into three test groups: paper **Input**, **Print** process and paper **Output**. Each group has its own screen that can be accessed from the Print Unit Test menu.

Engine Test/Maintenance: Print Unit Test			
BACK	Input	Print	Output

BACK	Returns to the Engine Test/Maintenance Selection menu.
Input	Opens the Paper Input Test menu where you can access the tests for the pick motor and paper feed motor.
Print	Opens the Print Section menu where you can access the tests for motors, solenoids, fuser, LEDs, and HV power supply.
Output	Opens the Duplex and Output menu where you can access the tests for switch back motor and duplex motor.

Be sure all the covers and doors are closed or interlocks set before starting any test. To verify the results of some tests, you need to actuate the interlock switches of the door or cover by hand. If a door or cover is open when a test is started, a message displays as shown in the following example.

Engine Test/Maintenance: Print Unit Test	
Close all covers and Restart test	
Done	

Done	Issues the reset command to the controller. Press this key after the door or covers are closed.

The Print Unit Test menus use the following key sequences:

- As in all other multi-row menus, **Key1** selects the row of tests and the remaining keys activate tests within their columns
- The second depression of the column key stops the test
- Pressing another column key stops the current test and activates the newly selected test

When a test is selected, the menu item is highlighted as shown in the example below.

Engine Test/Maintenance: Print Unit Test		
Paper Input		
Pick:	Tray1	Tray2 Tray3
Feed: >	180mm/s	627mm/s
		BACK

3-13.17 Paper Input Menu (EngMaint.UnitTest.Input)

Selecting **Input** from the Print Unit Test menu opens the Paper Input menu that tests the individual pick motors and feed motors.

Engine Test/Maintenance: Print Unit Test			
Paper Input			
Pick:	Tray1	Tray2	Tray3
Feed: >	180mm/s	627mm/s	
			BACK

Tray1	Test for the pick motor of the upper tray. Remove Tray1 before testing.
Tray2	Test for the pick motor of the middle tray. Remove Tray2 before testing.
Tray3	Test for the pick motor of the lower tray. Remove Tray3 before testing.
180mm/s	Test for the paper feed motor at speed of 180 mm/sec.
627mm/s	Test for the paper feed motor at speed of 627 mm/sec.
BACK	Return to the UnitTest Selection menu.

To test the pick motors and paper feed motors:

Step 1 Remove the trays so that you can view the pick motor operation.

The trays must be removed or the paper in the tray must be removed before starting the test; otherwise, a paper jam occurs.

Step 2 Choose a test.

Step 3 Observe the pick motor or feed motor is operating correctly.

3-13.18 Print Section Menu (EngMaint.UnitTest.Print)

Selecting **Print** from the Print Unit Test menu opens the Print Section menu that tests the print process.

Engine Test/Maintenance: Print Unit Test				
Print Section: Please Select				
Lamp:	Fuser	EraLED		
Motor:	Main	Drv.D	Toner	Charge
Feed:	HCO.chg	HCO.sel	Clutch	
	>			BACK

Fuser	Tests the halogen lamp in the fuser.
ErLED	Tests the erase LEDs directly to the left of the drum and pre-transfer LEDs in the transfer guide assembly.
Main	Tests drive M unit. Turns on the main motor that drives the developer, drum, and fuser couplings.
Drv.D	Tests the developer discharge shutter motor on drive D unit.
Toner	Tests the toner motor.
Charge	Tests the voltages from the HV power supply.
HCO.chg	Tests the stacker change solenoid on the reversing unit.
HCO.sel	Tests the stacker select solenoid on the reversing unit.
Clutch	Tests the registration roller clutch.
BACK	Returns to the UnitTest Selection menu.

Each test is described in detail in the following sections.

3-13.19 Fuser Lamp Menu (EngMaint.UnitTest.Print.Fuser)

Selecting **Fuser** from the Print Section menu opens the Fuser Lamp menu that tests the halogen lamp in the fuser. The test includes the 10 seconds of cooling time to avoid over-heating of the fuser, since the test is conducted without temperature detection.

To test the fuser lamp:

Step 1 Remove the cleaning roller.

The cleaning roller must be removed to see the fuser lamp.

Engine Test/Maintenance: Print Unit Test Print Section: Fuser lamp Remove Cleaning roller, Defeat door interlock and Press start Start BACK

Start Turn on the fuser lamp.

BACK Return to the Print Section menu.

Step 2 Press the **Start** key.

The fuser lamp will be lit for 3 seconds during which the **BACK** key is extinguished and the **Start** key is highlighted.

Engine Test/Maintenance: Print Unit Test Print Section: Fuser lamp Lighting Start

Step 3 Verify that the fuser light is lit.

After 3 seconds has passed, the halogen lamp turns off. The test enters the 10 seconds of cooling time.

Step 4 Wait 10 seconds for the lamp to cool.

When cooling time is over, the display returns to the initial screen.

Engine Test/Maintenance: Print Unit Test Print Section: Fuser lamp Please Wait : Cooling for 10sec Start

3-13.20 Erase LED Menu (EngMaint.UnitTest.Print.ErLED)

Selecting **EraLED** from the Print Section menu opens the Erase LED menu that tests the erase LEDs and the pre-transfer LEDs.

Engine Test/Maintenance: Print Unit Test	
Print Section: Erase LED	
Start	BACK

Start Turn on the LEDs.

BACK Return to the Print Section menu.

To test the erase LEDs and the pre-transfer LEDs:

Step 1 Remove the drum unit.

The drum unit must be removed to avoid optical fatigue of the photoconductive drum by the excessive exposure of the LEDs.

Step 2 Press the **Start** key.

The LEDs will be lit for 3 seconds. During the time the LEDs are lit, the **BACK** key disappears, and the **Start** key menu item is highlighted.

Engine Test/Maintenance: Print Unit Test	
Print Section: Erase LED	
Lighting	
	Start

Step 3 Verify that the LEDs are lit.

After 3 seconds has passed, the LEDs turn off and the test enters 10 seconds of cooling time.

Step 4 Wait 10 seconds for the LEDs to cool.

When cooling time is over, the display returns to the initial screen.

Engine Test/Maintenance: Print Unit Test	
Print Section: Erase LED	
Please Wait : Cooling for 10sec	
	Start

3-13.21 Main Motor Test Menu (EngMaint.UnitTest.Print.Main)

Selecting **Main** from the Print Section menu opens the Main Motor Test menu that allows you to test drive unit M. The test must be conducted with the drum unit, fuser unit, and developer unit removed.

Cautions: Main motor test	
1.Pull out the units as follows;	
a)Drum unit	b)Fuser unit
c)Developer Unit and its connectors	
2.Defeat cover interlocks and Push START	
Start	BACK

Start Checks for removal of the drum, fuser and developer units and then starts the Main Motor Test.

BACK Returns to the Print Section menu.

To test drive M unit:

Step 1 Remove the drum unit.

Step 2 Remove the fuser unit.

Step 3 Remove the developer unit and its connectors.

Step 4 Set (defeat) the front cover interlock switch.

The front door can't be closed with the drum unit removed.

Step 5 Press **START**.

The following screen displays.

Engine Test/Maintenance: Print Unit Test	
Print Section: Main Motor	
Condition :	
START	BACK

START Turns on the main motor.

BACK Return to the Print Section menu.

Step 6 Press **START**.

The motor will begin to rotate and the following screen will appear.

Engine Test/Maintenance: Print Unit Test	
Print Section: Main Motor	
Condition : Running	
Run	STOP

Run Turns on the motor.

STOP Stops the motor and returns to the previous screen.

Step 7 Press **Stop** to halt the motor.

3-13.22 Drive.D Unit Test Menu (EngMaint.UnitTest.Print.Drv.D)

Selecting **Drv.D** from the Print Section menu opens the Drive.D Unit Test menu that allows you to test whether the developer discharge shutter motor on drive unit D can open and close the shutter. You must remove the developer unit before starting the test.

Cautions: Drive.D unit test	
1.Pull out the Developer Unit completely Defeat interlocks and push START.	
2.Test takes 20sec. Don't open any covers or interlocks during test.	
START	BACK

START Start the Drive.D Unit Test.

BACK Returns to the Print Section menu.

To test the shutter motor:

Step 1 Remove the developer unit.

If you press **Start** without removing the developer unit, a message appears indicating the unit needs to be removed.

Step 2 Press **Start**.

The screen shown below appears.

Engine Test/Maintenance: Print Unit Test	
Print Section: Drive.D unit	
Please do not open the covers at all	
Are you sure?	
Start	BACK

Start Turns on the developer discharge shutter motor.

BACK Returns to the Print Section menu.

Step 3 Press **Start** again.

The asterisk (*) appears to indicate the status of the discharge shutter, as shown below.

Engine Test/Maintenance: Print Unit Test	
Print Section: Drive.D unit	
Please do not open the covers at all	
Opening : **.....	
Start	

```
Engine Test/Maintenance: Print Unit Test
Print Section: Drive.D unit

Please do not open the covers at all
Closing : *****

Start
```

When the test is completed, the message shown below is displayed.

```
Engine Test/Maintenance: Print Unit Test
Print Section: Drive.D unit

This test is completed.
Please confirm the shutter is close.

BACK
```

BACK Return to the Print Section menu.

Step 4 Confirm the shutter is completely closed, then install the developer unit.

3-13.23 Toner Motor Menu (EngMaint.UnitTest.Print.Toner)

Selecting **Toner** from the Print Section menu opens the Toner Motor menu that allows you to test the toner motor on the toner hopper.

CAUTION It is recommended you remove the developer unit prior to the test, since approximately 3 mg of toner drops from the toner hopper per test. If you conduct this test without the developer unit installed, place paper under the toner hopper to catch the toner.

Engine Test/Maintenance: Print Unit Test

Print Section: Toner Motor cnt=00/03

This test dumps toner. Watch toner motor gear carefully when start is pressed to see motor turn. Are you sure?

StartBACK

- cnt** Number of times the test conducted. **This test is limited to three consecutive runs to avoid activating the toner density alarm.**
- Start** Turns on and rotates (approximately 5 degrees) the toner motor.
- BACK** Returns to the Print Section menu.

To test the toner motor:

- Step 1** Remove the developer unit.
- Step 2** Place paper under the toner hopper to catch the 3 mg of toner that drops from the toner hopper per test.
- Step 3** Press **START**.

While the toner motor rotates, **START** is highlighted:

Engine Test/Maintenance: Print Unit Test

Print Section: Toner Motor cnt=01/03

This test dumps toner. Watch toner motor gear carefully when start is pressed to see motor turn. Are you sure?

STARTBACK

If you try to run the test more than three times consecutively, the following message shown appears and no test is conducted.

Engine Test/Maintenance: Print Unit Test

Print Section: Toner Motor cnt=03/03

```
Test only allows three starts.
```

[BACK](#)

3-13.24 Charge Menu (EngMaint.UnitTest.Print.Charge)

Selecting **Charge** from the Print Section menu opens the Charge menu that allows you to test by activating all the units of the print engine without feeding any paper, including the HV power supply.

Engine Test/Maintenance: Print Unit Test			
Print Section: Charge			
Charge:>	FrFront	FrMidd	FrBack
	ReFront	ReMidd	ReBack
			BACK

- Fr** Test with the HV power supply set at the front page.
- Re** Test with the HV power supply set at the rear page.
- Front** Test with the HV power supply set at the leading edge.
- Midd** Test with the HV power supply set at the middle of the page.
- Back** Test with the HV power supply set at the trailing edge.
- BACK** Returns to the Print Section menu.

The settings for the voltage and the current applied to the transfer charger from the HV power supply are different for the leading edge, middle portion, and the trailing edge of the paper. These settings for the front and rear page at duplex printing are also different. These settings are controlled dynamically during the normal printing operation.

To test the print engine:

Step 1 Select one of the HV power supply settings.

The print engine runs until you stop the test.

Step 2 Press the setting key again to stop the test.

3-13.25 HCO Change Solenoid Menu (EngMaint.UnitTest.Print.HCO.chg)

Selecting **HCO.chg** from the Print Section menu opens the HCO Change Solenoid menu that allows you to test the HCO deflection solenoid on the reversing unit.

Engine Test/Maintenance: Print Unit Test	
Print Section: HCO Change Solenoid	
Start	BACK

Start Turn on the HCO deflection solenoid.

BACK Return to the Print Section menu.

To test the HCO deflection solenoid:

Step 1 Press **Start**.

The HCO deflection solenoid turns on and the following screen appears.

Engine Test/Maintenance: Print Unit Test	
Print Section: HCO Change Solenoid	
OPEN	CLOSE

OPEN Indicates the solenoid is turned on.

CLOSE Turn off the solenoid and return to the previous screen.

Step 2 Press **CLOSE**.

The HCO deflection solenoid is turned off and the **CLOSE** menu item is highlighted. After about two seconds, the test returns to the original HCO Change Solenoid menu automatically.

3-13.26 HCO Select Solenoid Menu (EngMaint.UnitTest.Print.HCO.sel)

Selecting **HCO.sel** from the Print Section menu opens the HCO Select Solenoid menu that allows you to test the long-paper deflection solenoid on the reversing unit.

Engine Test/Maintenance: Print Unit Test	
Print Section: HCO Select Solenoid	
Start	BACK

Start Turn on the long-paper deflection solenoid.

BACK Return to the Print Section menu.

To test the stacker select solenoid:

Step 1 Press **Start**.

The long-paper deflection solenoid turns on and the following screen appears.

Engine Test/Maintenance: Print Unit Test	
Print Section: HCO Select Solenoid	
OPEN	CLOSE

OPEN Indicates the solenoid was turned on.

CLOSE Turn off the solenoid and return to the previous screen.

Step 2 Press **CLOSE**.

The long-paper deflection solenoid is turned off and **CLOSE** is highlighted. After about two seconds, the test returns to the original HCO Select Solenoid menu automatically.

3-13.27 Clutch Test with Main Motor Menu (EngMaint.UnitTest.Print.Clutch)

Selecting **Clutch** from the Print Section menu opens the Clutch Test with Main Motor menu that allows you to test the main motor on the drive M unit with the registration roller clutch turned on.

You must remove the drum unit, fuser, and developer unit prior to starting the test.

Cautions: Clutch test with Main Motor		
1.Pull out the units as follows;		
a)Drum unit	b)Fuser unit	
c)Developer unit and it's connectors		
2.Defeat cover interlocks and Push START		
	START	BACK

START Enter the clutch test.

BACK Returns to the Print Section menu.

To test the main motor and clutch:

Step 1 Remove the drum unit.

Step 2 Remove the fuser unit

Step 3 Remove the developer unit and its connectors.

Step 4 Press **START**.

If all specified units are removed, the following screen appears.

Engine Test/Maintenance: Print Unit Test		
Print Section: Clutch test		
Condition : WAIT FOR START		
CluONsta	CluOFFsta	BACK

CluONsta Turns on the main motor and the clutch.

CluOFFsta Turns on the main motor only.

BACK Returns to the Print Section menu.

Step 5 Press **CluONsta** to turn on both the main motor and the clutch.

If you want to turn on only the main motor, press **CluOFFsta**.

The main motor rotates with the clutch turned on or off depending on your selection. When one of these keys is pressed, the other key is extinguished, as shown in the following example.

Engine Test/Maintenance: Print Unit Test	
Print Section: Clutch test	
Condition : Running with clutch	
CluONsta	STOP

STOP Turns off the motor and the clutch, and return to the previous screen.

Step 6 Press **STOP** to stop the motor and turn off the clutch.

3-13.28 Print Unit Test Menu (EngMaint.UnitTest.Output)

Selecting **Output** from the Engine Test/Maintenance Selection menu opens the Print Unit Test menu that allows you to test the reversing (switch-back) motor on the reversing unit and the duplex motor on the duplex unit.

To test the switch-back motor and the duplex motor:

Step 1 Select a speed and direction for one of the motors.

The selected menu item is highlighted during the test, as shown below.

Engine Test/Maintenance: Print Unit Test			
Duplex and Output			
RevUnit:	133mm/s	180mm/s	627mm/s
			-627mm/s
Duplex: >	180mm/s	627mm/s	
			BACK

Step 2 Press the same key again to stop the test.

Press another test key to stop the current test and start the newly selected one.

3-13.29 Control Info Menu (EngMaint.Control)

WARNING!

Do not change the values of any registers unless you are directed to by a Support Specialist. Changing a register value incorrectly can severely damage your printer.

Selecting **Control** from the Engine Test/Maintenance menu opens the Control Info menu that allows you to access the printer control information to verify and change values in NVRAM.

Upon first entry, the **Addr**, **Current** and **New** fields have un-initialized values represented by **##** and **XX**.

Engine Test/Maintenance: Control Info				
Addr: ##				
Current: XX				
> New: XX				
Addr	BACK	-	+	ReSET

- Addr** Press and hold while using the + or - keys to change the address to be accessed.
- BACK** Returns to the Engine/Maintenance Selection menu.
- Press alone to decrement the data. Press while holding the **Addr** key to decrement the address.
- +** Press alone to increment the data. Press while holding the **Addr** key to increment the address.
- ReSET** Sets the input data by momentary pressing, or restores the default data by pressing two seconds or more.

To access the control information and optionally change the values:

Step 1 Press and hold the **Addr** key to shift the function to the **Addr** field.

Step 2 While pressing the **Addr** key use the + key and the - key to select the required register.

Engine Test/Maintenance: Control Info				
>Addr: 59				
Current: XX				
New: XX				
Addr	BACK	-	+	ReSET

Step 3 Release the **Addr** key.

The selected print module register is displayed in the **Current** and **New** data fields.

Pressing and releasing the **Addr** key can be used for repeated inspection of

the selected register.

WARNING!

If there are restrictions for a particular register, only values from the permitted range are shown. For values that are allowed, but which are considered dangerous to the printer or operator, an additional message, ****WARNING****, is displayed.

Engine Test/Maintenance: Control Info				
Addr: ##				
Current: B5				
> New: B5				
Addr	BACK	-	+	ReSET

- Step 4** If you need to change the value of the register, change the value in **New** data field using the **+** and **-** keys. Write the new value into the currently selected print engine register by momentarily pressing **ReSET**.

Note that for read-only registers, or registers for which write access had been inhibited, the **ReSET** key is not present.

3-13.30 Printing Test Menu (EngMaint.PrTest)

Selecting **PrTest** from the Engine Test/Maintenance Selection menu opens the Printing Test menu that allows you to run the built-in pattern printing test. The test uses the built-in test pattern with Run/Stop control and toggle selection of paper path options.

Engine Test/Maintenance: Printing Test				
				Ledger
				Letter
			Tray1	Exec
StdoutD		Simplex	Tray2	A3
StackD	Run	Duplex	Tray3	A4
StackU	StpBCK	Multiplex	HCI	A5

StdoutD	Outputs the paper to the standard output tray, face-down.
StackD	Outputs the paper to the HCO, face-down.
StackU	Outputs the paper to the HCO, face-up.
Run	Starts or stops the printing.
StpBCK	Resets error if pressed momentarily. Returns to Engine Test/Maintenance Selection menu if pressed for two or more seconds.
Simplex	Simplex printing.
Duplex	Duplex printing.
Multiplex	Combination of 1-page-simplex and 1-page-duplex printing.
Input Source	TRAY1, TRAY2, TRAY3 or HCI can be selected.
Paper Size	Ledger, Letter, Exec, A3, A4, or A5 can be selected. Incorrect paper size selection will cause an error.

To run the print engine built-in pattern printing test:

- Step 1** Select an item from the first, third, fourth, and fifth columns.
- Select each menu item using the column key. The paper size available or the status (ready/disconnect) appears when selecting the paper source. The selected option is highlighted.
- Step 2** Press **Run**.
- When the **Run** key is pressed once momentarily, only one page is printed and ejected, then printing is stopped automatically.
- Press the **Run** key for two or more seconds to print continuously.
- Step 3** To stop continuous printing, press the **Run** key again for two or more seconds. If you want to exit this test and return to **EngMaint** menu Selection, press **StpBCK** while it is highlighted for two or more seconds.

If the printer is still initializing after power-up, you may see the message shown below. Wait until the message changes or return to Engine Test/Maintenance Selection menu by pressing the blinking **StpBCK**.

Engine Test/Maintenance: Printing Test				
Please wait : Initializing				Ledger
				Letter
				Tray1 Exec
StdoutD		Simplex	Tray2	A3
StackD	Run	Duplex	Tray3	A4
StackU	StpBCK	Multiplex	HCI	A5

If any error occurs before or during printing, you may see the message shown below. Remove the cause of the error and then reset the command by pressing **StpBCK**.

Engine Test/Maintenance: Printing Test				
Please Remove error!!				Ledger
** EMS1(xx) **				Letter
				Tray1 Exec
StdoutD		Simplex	Tray2	A3
StackD	Run	Duplex	Tray3	A4
StackU	StpBCK	Multiplex	HCI	A5

3-13.31 Error Mask Menu (EngMaint.ErrMask)

Selecting **ErrMask** from the Engine Test/Maintenance menu opens the Error Mask menu that allows you to read and change the contents of the printer error mask table.

An error with its mask bit set to 1 is not reported to the main controller from the mechanism controller enabling you to operate the printer while ignoring the error.

WARNING!

Data loss or sustained damage to the printer may occur when using the printer with some errors masked. For details, see [Table 3-3](#).

Upon the first entry, the **Addr** field has uninitialized values represented by ##.

Engine Test/Maintenance: Error Mask

Addr: ##

.....

Addr BACK - +

- Addr** Press and hold while using the + or - keys to change the address to be accessed.
- BACK** Returns to the Engine/Maintenance Selection menu.
- Press alone to move the error mask bit to the right. Press while holding the **Addr** key to decrement the address.
- + Press alone to move the error mask bit to the left. Press while holding the **Addr** key to decrement the address.

To set an error mask:

Step 1 While pressing the **Addr** key, use the + key and the – key to select the required mask address (see [Table 3-2](#)).

The middle row describes the bit assignment of the currently addressed vector.

Engine Test/Maintenance: Error Mask

Addr: 00 Jam Mask 00

..... jm03 jm02 jm01

0 0 0 0 0 0 0 0

Addr BACK - + ReSET

- ReSET** Momentary pressing toggles the selected bit. Pressing and holding 2 seconds or more restores the default data for the whole vector. An error with its mask bit set to 1 is not reported from the mechanism controller to the main controller.

Step 2 Release the **Addr** key.

Step 3 Use the + key and the – key to select the required error mask bit.

A description of each error mask bit is in [Table 3-2](#).

Step 4 Momentarily press **ReSET** to toggle the bit to 1.

Note	When you mask paper jams, set both the Jam mask bit and the EMSR or OPCAR bit. For example, to mask Jam25 (fuser unit jam 1): • Go to address 04 (Jam Mask 04) and set bit 5 (jm31) to 1 • Go to address 36 (OPCAR1) and set bit 3 (Fusr) to 1

Step 5 Press **BACK**.

When **Back** is pressed with any of mask bits set to 1, the following screen displays:

Engine Test/Maintenance: Error Mask

There are some error masking bits.
Do you use Mainfirm on this condition?

NO/CLR YES/SET

- NO/CLR** The error mask bits are valid until you turn the printer power off. The error mask bits in the NVRAM of the main controller are cleared when you restart the printer.
- YES/SET** The error mask bits are saved into the NVRAM of the main controller. See Warning below.

WARNING!	Any errors that are masked using YES/SET remain masked until you manually clear them. Saved error mask bits are automatically loaded when the printer is powered-on. You must manually clear the error mask bits by using NO/CLR in this menu or by using ErrMask in the ClrMEM menu (see 3-12 "Clear Memory Function Menu (ClrMEM)," on page 3-19).

A message appears on the main menu when an error is masked in NVRAM. Temporary masks set using NO/CLR are not displayed.

Ready -- free		600dpi	
NOV 10 16:05.55			
PCL		LTR	
		LTR	
		LTR	
Online	Error mask on		
Offline	Custom	Menu	Test
		PapSize	

Step 6 To mask the error temporarily, press **NO/CLR** to exit this menu. The mask bits are valid (the errors are masked) until you turn off the printer. For information on errors and their bits, see [Table 3-2](#).

To mask the error until you manually clear it, press **YES/SET** to exit this menu. The mask bits are valid (the errors are masked) even after you turn off and on the printer, because they are saved into the NVRAM of the main controller.

When you turn on the printer, the main controller automatically loads the mask bits from the NVRAM.

WARNING! Data loss or sustained damage of the printer may occur when using the printer with some errors masked. For details, see [Table 3-3](#).

[Table 3-2](#) shows the errors and bits that can be masked within the Error Mask menu.

Table 3-2. Error Masking Table

Address	Message	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
00	Jam mask 00	****	****	****	****	jm03	jm02	jm01	****
		jm01/02/03: Mask bits for Jam 01/02/03 (pick error)							
02	Jam mask 02	****	****	****	****	jm13	jm12	jm11	****
		jm11/12/13: Mask bits for Jam 11/12/13 (feed jam 1)							
03	Jam mask 03	****	****	****	****	****	****	****	jm18
		jm18: Mask bit for Jam 18 (feed jam 2)							
04	Jam mask 04	jm33	jm32	jm31	****	****	****	****	****
		jm31: Mask bit for Jam 25 (fuser unit jam 1) jm32/33: Mask bit for Jam 26/27 (fuser unit jam 2)							
05	Jam mask 05	****	****	****	jm43	jm42	****	jm41	****
		jm41: Mask bit for Jam 29 (ejection unit jam 1) jm42/43: Mask bits for Jam 2B/2C (ejection unit jam 2)							
06	Jam mask 06	****	****	****	****	****	dpl2	dpl1	****
		dpl1: Mask bit for Jam 31 (duplex printing path jam 1) dpl2: Mask bit for Jam 32 (duplex printing path jam 2)							
08	Jam mask 08	****	****	****	****	****	****	stk1	****
		stk1: Mask bit for Jam 41 (HCO stacker jam)							
09	Jam mask 09	****	****	****	mbx5	mbx4	mbx3	mbx2	mbx1
		mbx1/2/3/4/5: (reserved)							
0A	Jam mask 0A	****	****	****	****	hci3	hci2	hci1	****
		hci1: Mask bit for Jam 51 (HCI pick error) hci2: Mask bit for Jam 52 (HCI feed jam 1) hci3: Mask bit for Jam 53 (HCI feed jam 2)							
11	SVC mask 11	0F	0E	0D	****	0B	0A	09	08
		08: Mask bit for SVC08 (upper pick motor alarm) 09: Mask bit for SVC09 (middle pick motor alarm) 0A: Mask bit for SVC0A (lower pick motor alarm) 0B: Mask bit for SVC0B (reversing motor alarm) 0D: Mask bit for SVC0D (feed motor alarm) 0E: Mask bit for SVC0E (stacker select solenoid alarm) 0F: Mask bit for SVC0F (duplex motor alarm)							
14	SVC mask 14	27	****	****	****	****	****	****	****
		27: Mask bit for SVC27 (fuser time-out-alarm)							

Table 3-2. Error Masking Table (Continued)

Address	Message	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
15	SVC Mask 15	****	****	****	****	****	****	29	28
		28: Mask bit for SVC28 (fuser high-temperature alarm) 29: Mask bit for SVC29 (fuser low-temperature alarm)							
1A	SVC mask 1A	57	56	****	****	****	52	51	50
		50: Mask bit for SVC50 (toner motor alarm) 51: Mask bit for SVC51 (toner discharge screw alarm) 52: Mask bit for SVC52 (developer discharge alarm) 56: Mask bit for SVC56 (automatic adjustment alarm) 57: Mask bit for SVC57 (toner high-density alarm) Note: SVC54 (developer discharge shutter alarm) cannot be masked.							
1B	SVC mask 1B	****	****	****	****	5B	5A	59	58
		58: Mask bit for SVC58 (toner low-density alarm) 59: Mask bit for SVC59 (reference voltage too-high alarm) 5A: Mask bit for SVC5A (reference voltage too-low alarm) 5B: Mask bit for SVC5B (toner hopper alarm)							
1D	SVC mask 1D	6F	****	****	****	****	****	69	****
		69: Mask bit for SVC69 (main motor alarm) 6F: Mask bit for SVC6F (high voltage power alarm)							
1F	SVC mask 1F	****	7E	7D	7C	7B	7A	79	****
		79: Mask bit for SVC79 (spindle motor alarm) 7A: Mask bit for SVC7A (BD1 alarm) 7B: Mask bit for SVC7B (BD2 alarm) 7C: Mask bit for SVC7C (beam detection high-speed alarm) 7D: Mask bit for SVC7D (beam detection low-speed alarm) 7E: Mask bit for SVC7E (laser diode alarm)							
24	SVC mask 24	****	A6	A5	****	****	****	A1	A0
		A0: Mask bit for SVCA0 (fan alarm 1) A1: Mask bit for SVCA1 (fan alarm 2) A5: (reserved) A6: (reserved) Note: SVCA3 (fan alarm 5) and SVCA4 (fan alarm 7) cannot be masked.							
25	SVC mask 25	****	****	****	****	****	****	****	A8
		A8: (reserved)							
26	SVC mask 26	B7	B6	B5	B4	B3	****	****	****
		B3: Mask bit for SVCB3 (mechanism controller communication alarm) B4: Mask bit for SVCB4 (EEPROM alarm) B5: Mask bit for SVCB5 (video synchronous alarm) B6: Mask bit for SVCB6 (pre-pick alarm) B7: Mask bit for SVCB7 (video request alarm) Note: SVCB0 (watchdog timer alarm - master) and SVCB1 (watchdog timer alarm - slave) cannot be masked.							
28	SVC mask 28	****	****	C5	C4	C3	C2	C1	C0
		C0: (reserved) C1: (reserved) C2: (reserved) C3: (reserved) C4: Mask bit for SVCC4 (HCI elevator descent alarm) C5: Mask bit for SVCC5 (HCI elevator ascent alarm)							

Table 3-2. Error Masking Table (Continued)

Address	Message	bit 7	bit 6	bit 5	bit 4	bit 3	bit 2	bit 1	bit 0
29	SVC mask 29	****	****	****	****	****	****	****	C8
		C8: (reserved)							
2A	SVC mask 2A	****	****	****	****	****	D2	D1	D0
		D0: (reserved) D1: (reserved) D2: (reserved)							
2B	SVC mask 2B	****	****	****	****	****	****	****	D8
		D8: Mask bit for SVCD8 (HCO stacker alarm)							
30	EMSR1: stop cmd, jams	ESTP	****	****	J4-2	Dplx	Prnt	****	****
		Print: Mask bit for Jam26/27 (fuser unit jam 2) and Jam20 (ejection unit jam 1) Dplx: Mask bit for Jam31 (duplex printing path jam 1) J4-2: Mask bit for Jam 2B (ejection unit jam 2) ESTP: (reserved)							
31	EMSR2: doors open	frnt	rlov	ejec	****	rupr	****	****	****
		rupr: Mask bit for the upper right cover open ejec: Mask bit for the ejection unit cover open rlov: Mask bit for the lower right cover open frnt: Mask bit for the front door open							
32	EMSR3: interlocks	DBtl ⁽³⁾	DBtl ⁽²⁾	DBtl ⁽¹⁾	Dvlv	Fusr	****	Drum	Dvlp
		Dvlp: Mask bit for the developer unit interlock Drum: Mask bit for the drum unit interlock Fusr: Mask bit for the fuser unit interlock Dvlv: (reserved) DBtl ⁽³⁾ : (reserved) DBtl ⁽²⁾ : (reserved) DBtl ⁽¹⁾ : Mask bit for the developer bottle interlock (at developer replacement)							
34	EMSR5: HCI power	****	****	****	****	****	****	****	POff
		POff: (reserved)							
35	EMSR6: HCO errors	Jam1	****	****	****	****	****	****	COpn
		COpn: Mask bit for the HCO door open Jam1: Mask bit for the Jam41 (HCO stacker jam)							
36	OPCAR1: Paper eject jams	****	****	Dplx	HCO	Fusr	Fd2	Fd1	Pick
		Pick: Mask bit for Jam01 and 02 and 03 (pick error) Fd1: Mask bit for Jam 11 and 12 and 13 (feed jam 1) Fd2: Mask bit for Jam 18 (feed jam 2) Fusr: Mask bit for Jam25 (fuser unit jam 1) HCO: Mask bit for Jam2C (ejection unit jam 2) Dplx: Mask bit for Jam32 (duplex printing path jam 2)							
3C	OPCAR7: HCI errors	****	****	****	****	****	fed2	fed1	pick
		pick: Mask bit for Jam51 (HCI pick error) fed1: Mask bit for Jam52 (HCI feed jam 1) fed2: Mask bit for Jam53 (HCI feed jam 2)							
3D	Ejection device jam 2	mb15	****	****	****	****	****	****	****
		mb15: (reserved)							

Table 3-3 shows the risks of using the printer while masking some errors, especially for sustained periods of time.

Table 3-3. Error Masking Risks

Masked Error	Paper Feed	Condition or Risk	Data Loss
jams	No	- Except Jam2B, 2C, 27, if the paper sensor malfunctioned, the printer can't feed paper because the paper feed sequence is based upon the output from the sensor. - If Jam2B, 2C or 27 are masked, the printer can be operated normally.	No
SVC08, 09, 0A (pick motor alarms)	No	If the motor malfunctions, the printer can't feed paper.	No
SVC0B (reversing motor alarm)	No	If the motor malfunctions, the printer can't feed paper.	No
SVC0D (feed motor alarm)	No	If the motor malfunctions, the printer can't feed paper.	No
SVC0E (stacker select solenoid alarm)	No	If the solenoid malfunctions, a jam may occur if the position of the solenoid actuator is low.	No
SVC0F (duplex motor alarm)	No	If the motor malfunctioned, a jam may occur because the printer can't feed paper (only duplex).	No
SVC27 (fuser time-out alarm)	Yes	- The inside of the printer is contaminated by unfused toner caused by poor fusing because the heat roller in the fuser unit is not hot enough. - If the resistor malfunctioned, the fuser unit may overheat and be damaged.	- Data loss from poor print quality may occur. - The print data is erased when the paper is ejected.
SVC28 (fuser high-temperature alarm)	Yes	The fuser unit may overheat and be damaged.	- Data loss from poor print quality may occur. - The print data is erased when the paper is ejected.
SVC29 (fuser low-temperature alarm)	Yes	The inside of the printer is contaminated by unfused toner caused by poor fusing due to the heat roller in the fuser unit not being hot enough.	- Data loss from poor print quality (insufficient fusing) may occur. - The print data is erased when the paper is ejected.
SVC50 (toner motor alarm)	Yes	If the motor malfunctions, the toner density goes low, activating the SVC58 error (toner low-density alarm).	No
SVC51 (toner discharge screw alarm)	Yes	If the toner discharge screw does not rotate, the inside of the printer is contaminated by overflowing toner from the drum unit, because the waste toner can't be discharged.	The print data is erased when the paper is ejected.
SVC52 (developer discharge alarm)	Yes	If the driving screws in the developer unit are damaged, the print data may not be developed.	- Data loss from poor print quality may occur. - The print data is erased when the paper is ejected.
SVC56 (automatic adjustment alarm)	Yes	A malfunctioning toner density control may cause the following: - Contamination of the printer mechanism - Overtone prints - White spots from scattered toner or developer	- Data loss from poor print quality may occur. - The print data is erased when the paper is ejected).
SVC57 (toner high-density alarm)	Yes	Contamination of the printer mechanism from scattered toner due to malfunctioning toner density control.	- Data loss from poor print quality may occur. - The print data is erased when the paper is ejected.

Table 3-3. Error Masking Risks (Continued)

Masked Error	Paper Feed	Condition or Risk	Data Loss
SVC58 (toner low-density alarm)	Yes	Prints with white spots from scattered developer due to malfunctioning toner density control.	• Data loss from poor print quality may occur. • The print data is erased when the paper is ejected.
SVC59 (reference voltage too-high alarm)	Yes	A malfunctioning toner density control may cause the following: • Contamination of the printer mechanism • Overtone prints • White spots from scattered toner or developer	• Data loss from poor print quality may occur. • The print data is erased when the paper is ejected.
SVC5A (reference voltage too-low-alarm)	Yes	A malfunctioning toner density control may cause the following: • Contamination of the printer mechanism • Overtone prints • White spots from scattered toner or developer	• Data loss from poor print quality may occur. • The print data is erased when the paper is ejected.
SVC5B (toner hopper alarm)	Yes	SVC58 (toner low-density alarm) may occur because no toner is fed from the toner hopper to the developer unit.	No
SVC69 (main motor alarm)	No	If main motor malfunctions, the printer can't activate major units, such as the drum unit, in the printer.	No
SVC6F (high voltage power alarm)	No	The following errors or malfunctions may occur: • Prints with white spots or contamination of the printer mechanism from scattered developer • Insufficient toner transfer • Jams caused by insufficient paper separation from the drum, etc.	Data loss by insufficient print quality may occur.
SVC79 (spindle motor alarm)	Yes	Blank prints may occur because no image is made onto the drum.	Data loss by blank prints may occur.
SVC7A (BD1 alarm)	Yes	Possible poor print quality due to a malfunctioning optical unit control.	Data loss by insufficient print quality may occur.
SVC7B (BD2 alarm)	Yes	Possible poor print quality due to a malfunctioning optical unit control.	Data loss by insufficient print quality may occur.
SVC7C (beam detection high-speed alarm)	Yes	Possible poor print quality due to a malfunctioning optical unit control.	Data loss by insufficient print quality may occur.
SVC7D (beam detection low-speed alarm)	Yes	Possible poor print quality due to a malfunctioning optical unit control.	Data loss by insufficient print quality may occur.
SVC7E (laser diode alarm)	Yes	Blank prints may occur because the laser diode in the optical unit may be damaged.	Data loss by blank prints may occur.
SVCA0/A1/A2/A5/A6 (fan alarm 1/2/3/6/7)	Yes	Some units may malfunction or be damaged by overheating, because the fan may not rotate.	Once any malfunction or damage occurred, data loss may occur.
SVCB3 (mechanism controller communication alarm)	No	If mechanism controller malfunctions, the printer mechanism can't be activated.	No
SVCB4 (EEPROM alarm)	No	If mechanism controller malfunctions, the printer mechanism can't be activated.	No
SVCB5 (video synchronous alarm)	No	If mechanism controller malfunctions, the printer mechanism can't be activated.	No
SVCB6 (pre-pick alarm)	No	If mechanism controller malfunctions, the printer mechanism can't be activated.	No

Table 3-3. Error Masking Risks (Continued)

Masked Error	Paper Feed	Condition or Risk	Data Loss
SVCB7 (video request alarm)	No	If mechanism controller malfunctions, the printer mechanism can't be activated.	No
SVCC4 (HCI elevator descent alarm)	No	Printer can't feed paper from HCI. (Paper can be fed from another tray.)	No
SVCC5 (HCI elevator ascent alarm)	No	Printer can't feed paper from HCI. (Paper can be fed from another tray.)	No
SVCD8 (HCO stacker alarm)	Yes	Printer can't eject paper to HCO. (Paper can be ejected to standard output tray.)	No
Covers, doors open	No	Printer can't activate major units in the printer, because +24V power is shut off.	No
developer unit interlock	Yes	Black print may occur because the developer unit is not set. The printer may be contaminated by toner fallen from the toner hopper.	Data loss by blank prints may occur.
drum unit interlock	No	Front door can't be closed when the drum unit is set at an improper position.	No
fuser unit interlock	No	Front door can't be closed when the fuser unit is set at an improper position. If the printer is operated in this condition, an SVC29 (fuser temperature alarm) or SVC27 (fuser time-out alarm) may occur, because the fuser can't connect to the printer electrically and/or mechanically.	No
developer bottle interlock	Yes	• No problem may occur under normal operation. • Developer and toner in the developer unit scatters into the printer mechanism when the developer is discharged without the bottle.	No

3-13.32 NVRAM Menu (EngMaint.NVRAM)

Selecting **NVRAM** from the Engine Test/Maintenance Selection menu opens the NVRAM menu that allows you to reset the counters and clear the registers.

WARNING!

Pressing a selection sets the counter or register to zero on the mechanism controller. This operation cannot be undone.

AllRegs resets the entire mechanism controller to a factory default condition. Perform this action only under the supervision of your printer specialist. This operation cannot be undone.

```

Engine Test/Maintenance: Default NVRAM
This area allows resetting of registers
in the mechanism controller NVRAM.
Proceed with extreme caution.

                                AllRegs
                                PageCnt  CntLogs  Counters
                                BACK
  
```

- BACK** Returns to Engine Test/Maintenance Selection menu.
- PageCnt** Resets the page counter to zero in the NVRAM.
- CntLogs** Resets all control counters to zero in the NVRAM.
- Counters** Resets all consumable counters to zero in NVRAM.
- AllRegs** Resets the entire NVRAM to a factory default condition. **Perform this action only under the supervision of your printer specialist.**

To reset a counter or register

Step 1 Press your selection.

The menu item is highlighted momentarily and the following appears. The menu differs slightly depending on which choice you have made. The following menu is for the choice **Cntlogs**:

```

Engine Test/Maintenance: Default NVRAM
You are about to to reset all control counters
to zero. Do you want to proceed?

                                YES                                NO/BACK
  
```

- NO/BACK** Returns to the NVRAM menu.
- YES** Resets the counters or sets NVRAM to factory default condition, depending on your selection.

Step 2 Press **YES**.

Resets the counters or sets NVRAM to factory default condition, depending on your selection.

4 Troubleshooting

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4-1 Introduction

This chapter gives general maintenance information, such as tools and test equipment required for printer maintenance, helpful hints and tips, and a troubleshooting overview.

4-1.1 Servicing Approach

When servicing the D640 printer, it is important to:

- Understand the specifications of the printer and the associated options described in Chapter 1.
- Understand the component function, location, and theory of operation as described in Chapter 2.
- Use the information about loading and using the printer's internal diagnostic program with the operator panel read-outs as described in Chapter 3.
- Perform troubleshooting using specific alarm or condition specific flow charts provided in Chapter 4.
- Perform failed field replaceable unit (FRU) removal and replacement procedures provided in Chapter 5.
- Refer to the illustrated parts breakdown illustrations and parts listings of the printer provided in Chapter 6 as well as the wiring diagrams provided in Appendix A.

4-2 Troubleshooting Overview

Troubleshooting the D640 printer and its optional high capacity input or output begins by recognizing a fault condition whether reported by the machine, noted in the error logs, or by observation. This chapter provides one location for summaries of information found elsewhere in this manual. There are several procedures that should be performed on every service call to assure all problems are addressed. Each of these procedures is described in the sections of this chapter.

- Step 1** Verify proper installation (see [4-5 "Verifying Proper Installation," on page 4-13](#)).
- Step 2** Print the Setup Report (see [4-3 "Setup Report," on page 4-7](#)).
- Step 3** Print the Maintenance Report to check consumable usage levels and analyze the error logs (see [4-4 "Maintenance Report," on page 4-10](#)).
- Step 4** Fix the errors reported in the maintenance report.
- Step 5** Run the paper path test (Test.filesC.MAINT/.CE_PROG/) to verify repair. This test cycles picking a sheet from all possible input sources and
- Step 6** Verify weekly user maintenance is being performed (see [4-6 "Performing Weekly User Maintenance," on page 4-13](#)).

Most of the service problems exhibited by the D640 can be isolated to one of the following categories. These categories are discussed in this chapter:

- SVCxx error message
- JAMxx Paper Jam error message
- Print quality problem
- Power problems
- Miscellaneous problems, such as blank or garbled control panel

4-3 Setup Report

Whenever the customer makes changes to the parameters listed on the Setup Report, the changes are saved into the current configuration. The current configuration can then be saved into one of the four possible configurations (Power On, Custom 2, Custom 3, or Custom 4) so that it can be restored and made the current configuration when desired. For a complete description of each of these settings, see the *D640 Cut Sheet Printer User Manual*.

The Power On configuration should contain all of the customer's desired default configurations and is the configuration that will be made current at printer power up. The Factory Default Setup Page cannot be modified, but it can be restored into the current configuration and then printed if desired.

4-3.1 Printing a Setup Report

The first step taken on a service call should be to print the Setup Report (Test.SETUPS). The Setup Report lists the current selected parameters for all menus in the printer. An example of a Setup Report is shown in [Figure 4-1](#) and [Figure 4-2](#).

There are five different setup pages that can be printed separately:

- Power On Configuration (Custom.Restore.PwrOnConfig)
- Custom 2 (Custom.Restore.CUSTOM2)
- Custom 3 (Custom.Restore.CUSTOM3)
- Custom 4 (Custom.Restore.CUSTOM4)
- Factory Default (Custom.Restore.FACTORY)

The setup report for each different configuration should be printed and retained in a safe place in case a printer failure requires that the custom configurations be re-entered.

Before loading new function code, print *all* configurations so they can be re-entered after loading the new code. All configurations should be printed because the custom configurations may have been modified by the customer.

See [Figure 4-1](#) and [Figure 4-2](#) for an example of the Factory Default Setup Report.



HP 5000 Model D640 Printer

SETUP REPORT

=PwrOnConfig=FACTORY



**HEWLETT
PACKARD**

Serial No. JP20000127

Menu: Printing <pre> copies = 1 copies = 1 inray = NCI paper = auto outbin = UPPER duplex = OFF binding = LONGEDGE jobseparate = none joboffset = OFF NCI-Alias = NCI emulation = PCL orientation = PORTRAIT lpi = 6.00 error-report = none auto-collate = OFF </pre>	Menu: Configuration <pre> newline = CR+LF traylock.tray1 = UNLOCKED traylock.tray2 = UNLOCKED traylock.tray3 = UNLOCKED traylock.hci = UNLOCKED size = CONFIRM imageshift.top = 0 imageshift.left = 0 customsize.width = 8417 customsize.height = 12240 units = 1/720" dpi = 600dpi clip = ON jamrecovery = ON econmode = OFF powersave = 1 HR language = ENGLISH </pre>	Menu: PCL <pre> font = Courier symbolset = ROMANS 8U pitch = 10.00 pointsize = 12.00 vcartridge1 = none vcartridge2 = none </pre>
Menu: Comm <pre> timeout = 15 databuffer = 32 parallel.speed = FAST parallel.mode = ADVANCED serial.baud = 19200 serial.stobits = 8BIT serial.parity = none serial.flow = XON/XOFF serial.dtr = HI/LO serial.levels = RS232 </pre>	Menu: Maintenance <pre> alignment.tray1 = 10 alignment.tray2 = 8 alignment.tray3 = 8 alignment.hci = 8 alignment.duplex = -5 alignment.duplexv = -1 density = 10 testpages = 30 monitor = OFF capture = OFF </pre>	Menu: PapSize <pre> tray1size = LETTER tray2size = LETTER tray3size = LETTER NCIsize = LETTER </pre>
Printer Information <pre> Total page count = 57717 Paper Width = 8.50"/216mm (5100 pixels) Paper Height = 11.00"/280mm (6600 pixels) Print Width = 8.00"/203mm (4800 pixels) Print Height = 10.00"/254mm (6000 pixels) Total RAM size = 32768 kbytes Page RAM size = 23263 kbytes Free RAM size = 8058 kbytes Permanent softfont = 0 Characters received = 0 Characters lost = 0 Protocol errors = 0 Engine firmware rev. = E01VD01L24 Function Code revision = E02V01L42 Function Code dates = 970904/970904 PowerPage PS version = 2003.002/27g </pre>		

SEP 12 1997 11:57:09

Figure 4-1 Setup Report - page 1

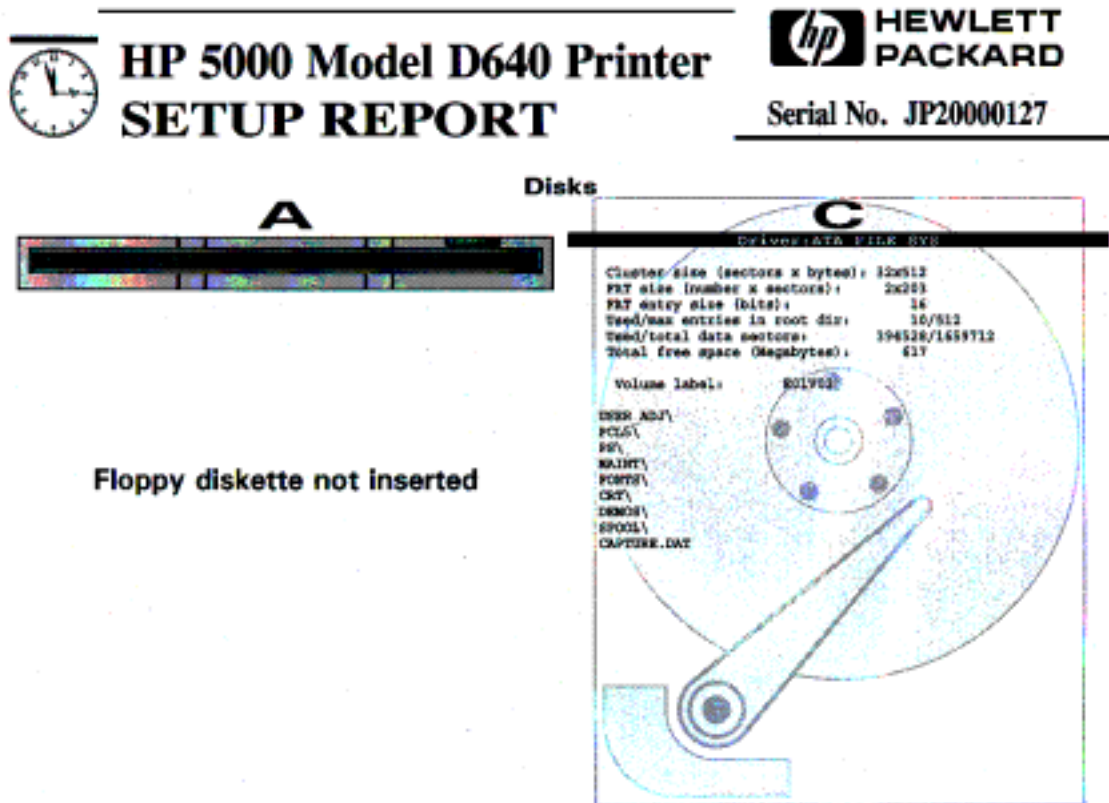


Figure 4-2 Setup Report - page 2

4-3.2 Setup Report Title

Some important items in the Setup Report title are:

- The clock face in the upper left shows the time that the Setup Report was printed. (The date and time are also printed in the lower right corner of the page)
- Directly below the title, the type of setup report printed is identified. In [Figure 4-1](#), the report is identified as FACTORY for Factory Default.
- The printer's serial number is in the upper-right corner.

4-3.3 Maintenance Menu

Under **Menu: Maintenance** in the Setup Report, the electronic alignment values for all installed trays, duplex, and HCI (if installed) are shown. These values can be adjusted to align all the paper inputs so that the print image will print in the same position from any tray. This alignment is run at installation and when a feed unit assembly is removed. See 6-5.3 Paper Feed System Alignment for more information on performing this alignment.

4-3.4 Printer Information

Under **Printer Information** in the Setup Report, the following is given:

- **Total page count**—Total page count printed
- **Total RAM size**—Total memory size; 16,384 KB is standard
- The various revision levels in the printer:
 - **Engine firmware rev**—This is the revision level of the master firmware on the mechanism controller board
 - **Function Code revision**—This is the revision level of the printer's function code loaded into the main controller's flash memory. The function code is easily updated from floppy disk.
 - **Function Code dates**—This is the date associated with the function code revision
 - **PowerPage PS version**—Designates optional Postscript is installed and the revision level

4-4 Maintenance Report

An example of a Maintenance Report (Test.MAINT) is shown in [Figure 4-3](#). The Maintenance Report provides the following information:

- **Engine Status**—These fields are for factory level test and not used for field service.
- **Maintenance Counters**—These counters show the current status of the printer's consumables.
 - **Current, Maximum, and Replace**—The numerical values of these counters are not page counts. The consumable counters are not reset by installing new consumables, but must be reset *manually* from the Replace menu (Menu.Maintenance.replace). See [1-7 "Consumables," on page 1-12](#) for more information on consumables.
 - **Usage**—The percentage used of the consumable. For the developer mixture and drum, usage is calculated based on the number of rotations of drive unit M. For all other consumables, usage is calculated based on the number of A4 or Letter sized images printed.
- **Event Log**—Also called the Error Log. The Event Log lists all errors posted to the printer's Control Panel. The date, time, error code, and a brief error description are logged for each event (error). Consumable replacements are also logged in the Event Log.

4-4.1 Analyzing the Event Log

The Event Log contains useful information if analyzed correctly. For many errors in the Event Log, you will find more than one error logged at the same page count. At a paper jam condition, the printer expects that the operator will remove all paper from the entire paper path before the door is closed to restart the printer. If all the paper is not removed before closing the door, a new error will be logged at the same page count. When multiple errors are seen at the same page count, the first error listed is the only valid error; the other errors at the same page count are the result of not clearing all the paper from the paper path.

The following are some tips to help you use the information to successfully analyze the problem:

- Group all errors that occur at the same page count within the last few days and highlight the first error that occurs within each group. These highlighted errors are the ones you need to troubleshoot and investigate further.
- After each paper jam log entry, a number and letter is shown in parentheses:
 - The number designates the input source when the jam occurred; 1, 2 and 3 correspond to the Input Trays, and 4 designates the HCI.
 - The letter indicates whether (S)implex images or (D)uplex images were being printed at the time of the paper jam.

The following example shows the first error logged is Jam41 HCO Jam 1, and the printer was feeding paper from the HCI in simplex mode at the time of the jam. Jam41 is the only valid error that needs to be investigated. Jam18 and Jam26 are caused by the operator not clearing the paper path completely.

```
05 Sep 97 14:23 25324 Jam41 HCO Jam 1(4S)
05 Sep 97 14:23 25324 Jam18 Feed Path Jam 4(4S)
05 Sep 97 14:23 25324 Jam26 Fusing Unit Jam 2(4S)
```



HP 5000 Model D640 Printer MAINTENANCE REPORT



Serial No. JP20000127

Engine Status

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	00	00	00	40	00	00	00	00	00	01	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00
20	00	00	00	0A	00	00	00	00	00	00	00	00	56	02	00	00
30	02	41	88	87	B0	00	00	00	00	00	00	00	00	00	00	00
40	03	18	00	4C	00	02	02	02	02	02	02	02	02	02	00	06
50	00	00	00	00	00	00	F8	E3	B5	B5	B5	00	00	00	B5	00
60	80	00	00	00	00	61	10	00	00	00	00	18	88	14	00	00
70	00	00	00	00	00	00	00	00	00	00	00	00	00	01	00	80

Maintenance counters: Current Maximum Replace Usage

Developer:	9778	10000	8400	14%
Drum unit:	8523	10000	7500	59%
Fuser:	9383	10000	7000	21%
Tray 1 rollers:	9873	10000	5000	3%
Tray 2 rollers:	9988	10000	5000	0%
Tray 3 rollers:	9998	10000	5000	0%
HCI rollers:	9748	10000	5000	5%

Event Log

Date	Time	Pg	Count	Code	Description
07 APR 97	09:55		2944	JAM 32	Duplex path jam 2 (1D)
07 APR 97	10:08		2944	JAM 2B	Ejection unit jam 2 (1D)
11 APR 97	16:56		6535	CHGE 06	Toner Replacement
14 APR 97	16:10		6589	SVC 79	Spindle motor alarm
29 APR 97	09:06		6809	JAM 2B	Ejection unit jam 2 (1D)
29 APR 97	09:06		6813	JAM 2B	Ejection unit jam 2 (1D)
29 APR 97	09:15		6813	MISP 04	Door open jam
29 APR 97	09:15		6813	JAM 2B	Ejection unit jam 2 (1D)
09 MAY 97	11:51		42	SVC 6F	High-voltage power supply alarm
14 MAY 97	16:50		2206	JAM 01	TRAY1 pick error (1S)
14 MAY 97	16:50		2711	JAM 01	TRAY1 pick error (1S)
18 MAY 97	15:33		9486	JAM 26	Fusing unit jam 2 (1S)
18 MAY 97	15:33		9497	JAM 26	Fusing unit jam 2 (1S)
09 JUN 97	13:28		11108	JAM 25	Fusing unit jam 1 (1D)
09 JUN 97	13:28		11108	JAM 11	Feed path jam 1 (1D)
23 JUN 97	11:42		11140	JAM 52	HCI jam 2 (4D)
23 JUN 97	11:44		11140	JAM 53	HCI jam 3 (4D)
23 JUN 97	11:45		11140	JAM 52	HCI jam 2 (4D)
23 JUN 97	12:59		11189	JAM 11	Feed path jam 1 (1S)
24 JUN 97	08:20		11246	SVC D8	HCO alarm
24 JUN 97	14:00		11244	JAM 53	HCI jam 3 (4D)
25 JUN 97	13:21		11244	JAM 18	Feed path jam 4 (4S)
08 JUL 97	13:52		11544	JAM 18	Feed path jam 4 (4S)
10 JUL 97	10:58		11544	MISP 04	Door open jam
04 AUG 97	13:05		11560	SVC D8	HCO alarm
04 AUG 97	13:05		11544	SVC D8	HCO alarm
13 AUG 97	16:40		11860	MISP 04	Door open jam
13 AUG 97	16:41		11860	JAM 11	Feed path jam 1 (4D)
14 AUG 97	09:24		18866	JAM 25	Fusing unit jam 1 (4D)
14 AUG 97	09:42		18975	JAM 41	HCO jam 1 (4S)
14 AUG 97	09:42		19066	JAM 41	HCO jam 1 (4S)
14 AUG 97	10:01		19066	JAM 18	Feed path jam 4 (3S)
14 AUG 97	10:02		19066	JAM 53	HCI jam 3 (4S)
14 AUG 97	10:04		19066	JAM 41	HCO jam 1 (4S)
14 AUG 97	10:05		19135	JAM 41	HCO jam 1 (4S)
14 AUG 97	10:07		19135	JAM 18	Feed path jam 4 (4S)
14 AUG 97	10:07		19135	JAM 53	HCI jam 3 (4S)
14 AUG 97	10:09		19135	JAM 41	HCO jam 1 (4S)
14 AUG 97	10:09		19183	JAM 41	HCO jam 1 (4S)

SEP 12 1997 11:57:34

Figure 4-3 Maintenance Report Example

4-5 Verifying Proper Installation

The optional High Capacity Input (HCI) and High Capacity Output (HCO) are customer installable. Improper installation can cause paper jams. For complete installation information see the *D640 Cut Sheet Printer Installation Manual* shipped with each printer.

The following steps can help you verify the proper installation by performing the following:

- Step 1** Check that all four printer leveling feet are lowered to the floor and the printer is level.
- Step 2** On the optional 2,000 Sheet High Capacity Output:
- a** Check that the two outermost leveling feet have been lowered to the floor.
 - b.** Check that the leveling feet closest to the printer are *not* lowered to the floor.
 - c.** Check that the vertical gap between the printer and 2000-sheet HCO is parallel and the top center of the HCO is contacting the printer. If the gap is not parallel, lower the two outermost levelers on the HCO until the HCO is parallel and the HCO top is touching the printers upper left cover.
- Step 3** On the optional 2,000 Sheet High Capacity Input:
- a** Check that the two levelers are lowered to the floor and that the chains below HCI Door are just touching the floor. When the HCI levelers' height is properly adjusted the white latches should latch and release easily when the HCI is opened and closed with the release handle.
 - b.** Check that the red line on the top of the HCI lines up with the red line on the printer's input paper deflector. Readjust levelers as necessary to align red lines.

4-6 Performing Weekly User Maintenance

Weekly user maintenance is very important because a dirty machine causes poor print quality and service errors. Check the general cleanliness of the printer and, if necessary, review the maintenance procedure in the *D640 Cut Sheet Printer User Manual* with the operators.

When performing the weekly user maintenance and consumables replacement, note the following:

- The precharger corona in the drum needs to be cleaned every time toner is added. A contaminated precharger corona can cause the developer mixture to be pulled from the developer unit and drop inside the printer.
- Clean the transfer unit guide, removing any toner
- Clean the transfer corona and separation corona
- Clean the LED unit next to the drum

4-7 Data Capture

Note	Data Capture is available from printer with function code E02V01L52 or higher.

Capture (Menu.Maintenance.capture) allows the data being sent to the printer to be captured and saved to a disk file on a floppy disk or the internal hard drive. This is useful when verifying the integrity of the data being received by the printer. If the problem occurs when **capture = A** or **C**, you can reprint the data to verify the data is the problem. Then the file can be analyzed by support personnel to isolate the cause of the problem.

4-8 Loading New Function Code

Before loading new function code, print *all* configurations (see [4-3.1 "Printing a Setup Report," on page 4-7](#)) so they can be re-entered after loading the new code. All configurations should be printed because the custom configurations may have been modified by the customer.

To load new function code:

Step 1 Insert the floppy disk containing the function code into the floppy drive.

Step 2 Go to Test.filesA.

Step 3 Select **UPDATE.LAY**.

Step 4 Press **ONLINE**.

Step 5 Follow any instructions that are displayed on the control panel and on any printouts that are generated by the update process.

After the function code is loaded into the printer, a power-on reset will be performed causing the control panel display to blank out and then return to the ONLINE state. This should take about a minute.

Step 6 Enter any changes the customer made to the Setup Report configurations.

Step 7 Print the Setup Report (Test.SETUPS). Verify all parameters listed are correct and that **SETUP REPORT = PwrOnConfig** is displayed in the title.

4-8.1 Getting the Latest Function Code and Newsletters

The SPO HP D640 web site has a lot of useful information and updates that will help you service the D640 printer. To access this web site and other web sites, both internal and public, see [1-1.2 "Web Sites for More Information," on page 1-5](#).

4-9 SVC xx Error Messages

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4-9.1 SVC 08 Pick Motor Alarm

SVC 09 Pick Motor Alarm

SVC 0A Pick Motor Alarm

Description

The mechanism controller detected an overcurrent of the paper pick motor in the paper feed unit. The error messages correspond to the three paper supply tray pick motors:

- **SVC 08** = upper (Tray1)
- **SVC 09** = middle (Tray2)
- **SVC 0A** = lower (Tray3)

Diagnostics

Paper Input menu (EngMaint.UnitTest.Input.Pick): Test the individual pick motors by observing the pick rollers.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Disconnect the pick motor connectors for the identified pick motor: • Upper (Tray1): PMP1 and PMJ1 • Middle (Tray2): PMP2 and PMJ2 • Lower (Tray3): PMP3 and PMJ3 (See Figure 5-73 on page 5-95.) Activate the pick motor with the Paper Input menu (EngMaint.UnitTest.Input.Pick).	SVC 08/09/0A error appears.	Go to step 2	Replace upper/middle/lower paper feed unit.
2. Check for pinched wires, cables, and damaged connectors between the pick motor and the mechanism controller board connector: • Upper (Tray1): CN2 and Pick motor1 • Middle (Tray2): CN3 and Pick motor2 • Lower (Tray3): CN4 and Pick motor3	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part.	Go to step 3.
3. Reconnect the pick motor connectors that were disconnected in step 1. Activate the motor with the Paper Input menu (EngMaint.UnitTest.Input.Pick).	SVC 08/09/0A error appears.	Replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

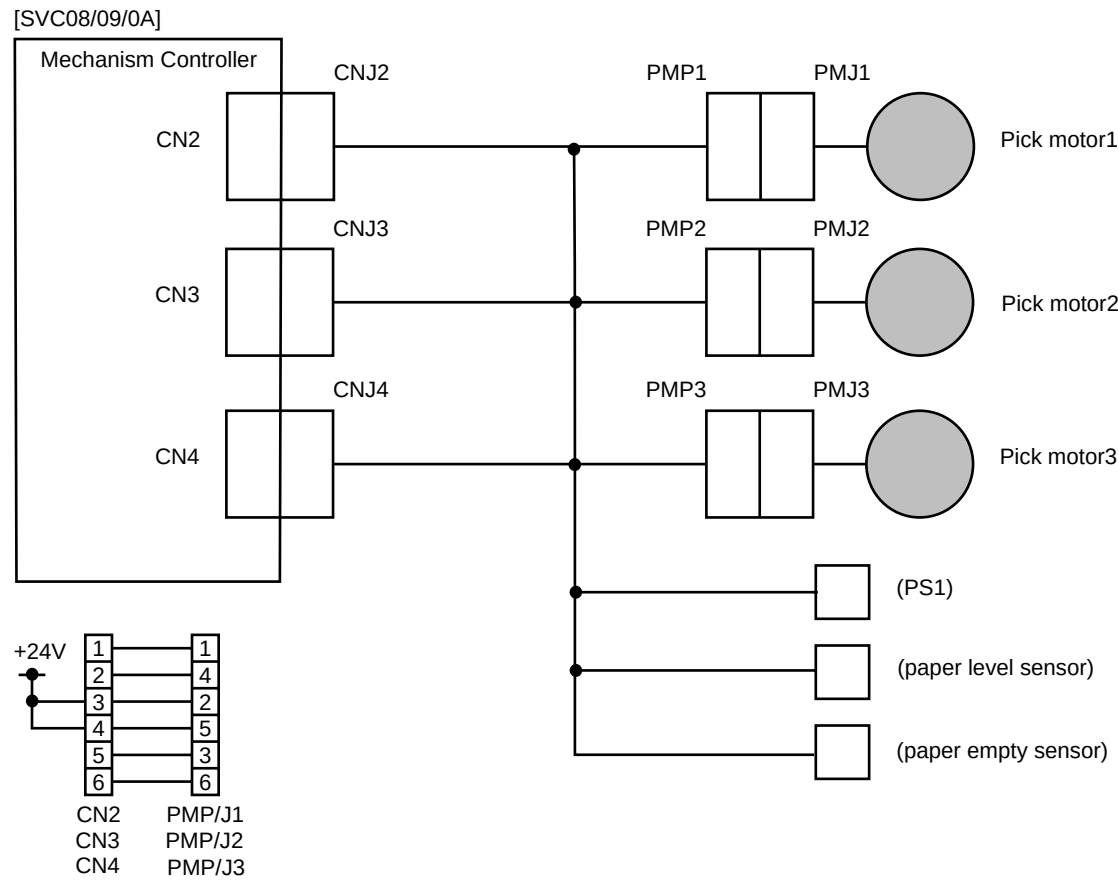


Figure 4-1 Pick Motor Alarm Interconnections Diagram

4-9.2 SVC 0B Reversing Motor Alarm

Description

The mechanism controller detected an overcurrent of the reversing motor (switchback motor) on the reversing unit.

Diagnostics

Print Unit Test menu (EngMaint.UnitTest.Output.SwBack): Test the reversing motor (switchback motor) by observing the reversing unit rollers.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Disconnect reversing motor connectors SBMP and SBMJ (Figure 5-64 on page 5-81). Activate the motor from the Print Unit Test menu (EngMaint.UnitTest.Output.SwBack) at any speed.	SVC 0B error appears.	Go to step 2	Replace reversing unit.
2. Check for pinched wires, cables, and damaged connectors between CN18 on the mechanism controller board and the reversing motor.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part.	Go to step 3.
3. Connect the reversing motor connectors SBMP and SBMJ that were disconnected in step 1. Activate the motor from the Print Unit Test menu (EngMaint.UnitTest.Output.SwBack) at any speed.	SVC 0B error appears.	Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

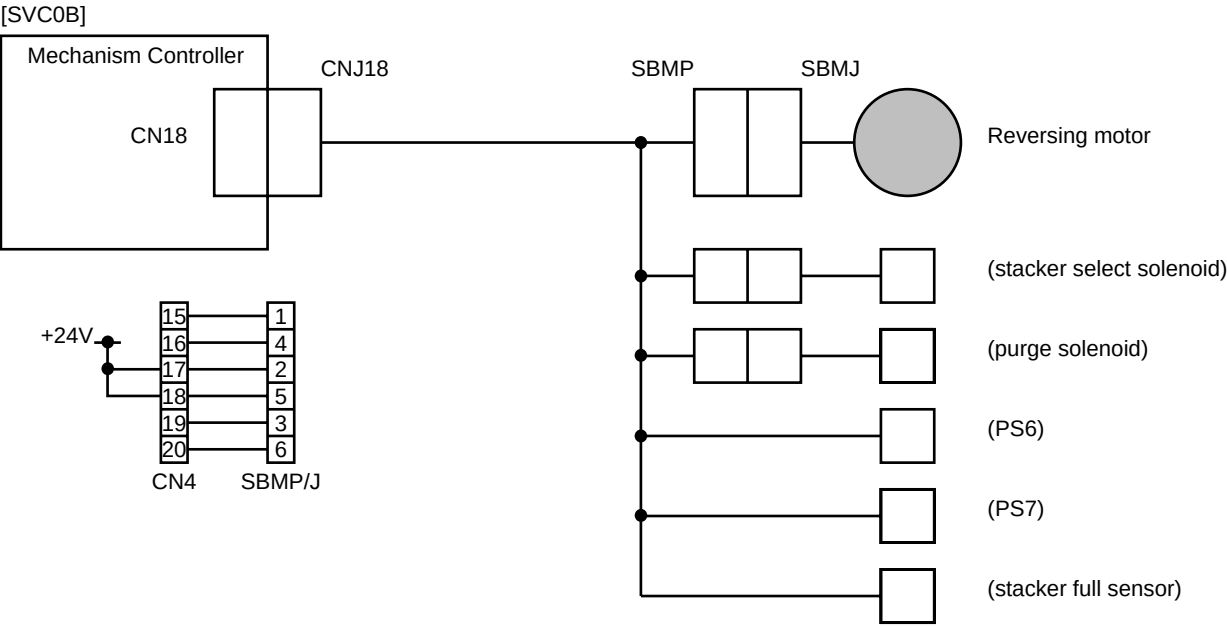


Figure 4-2 Reversing Motor Alarm (SVC 0B) Interconnection Diagram

4-9.3 SVC 0D Feed Motor Alarm

Description

The mechanism controller detected an overcurrent condition of the paper transport feed motor.

Diagnostics

Paper Input menu (EngMaint.UnitTest.Input.Feed): Test the feed motor by observing the feed rollers turning.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Disconnect the feed motor connector FMP (see Figure 5-76 on page 5-99). Activate the motor by using the Paper Input menu (EngMaint.UnitTest.Input.Feed) at any speed.	SVC 0D error appears.	Go to step 2	Replace feed motor. Go to step 3.
2. Check for pinched wires, cables, and damaged connectors between CN6 on the mechanism controller PCB and the feed motor.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Go to step 3.	Go to step 3.
3. Connect feed motor connectors FMP and FMJ that were disconnected in step 1. Activate the feed motor by using the Paper Input menu (EngMaint.UnitTest.Input.Feed) at any speed.	SVC 0D error appears.	Replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

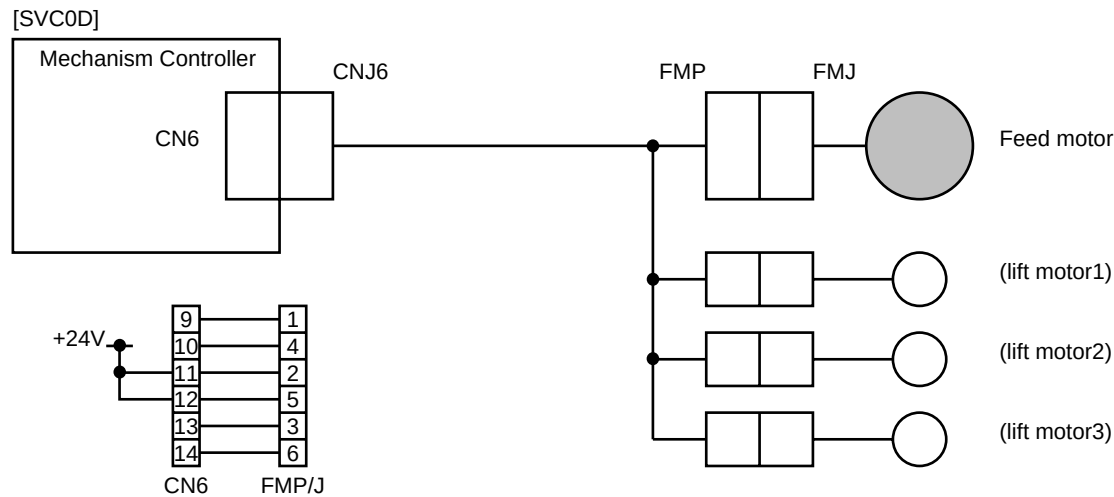


Figure 4-3 Feed Motor Alarm (SVC 0D) Interconnections Diagram

4-9.4 SVC 0E Stacker Select Solenoid Alarm

Description

The mechanism controller detected an overcurrent condition of the stacker select solenoid in the reversing unit.

Diagnostics

HCO Select Solenoid menu (EngMaint.UnitTest.Print.HCO.sel): Test the stacker select solenoid by tuning it on.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Disconnect stacker select solenoid connector STCHP (see Figure 5-62 on page 5-79). Activate the solenoid with the HCO Select Solenoid menu (EngMaint.UnitTest.Print.HCO.sel).	SVC 0E error appears.	Go to step 2.	Replace reversing unit. Go to step 3.
2. Check for pinched wires, cables, and damaged connectors between CN18 on the mechanism controller PCB and the solenoid.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 0E still appears, go to step 3.	Go to step 3.
3. Reconnect solenoid connectors STCHP and STCHJ that were disconnected in step 1. Activate the solenoid with the HCO Select Solenoid menu (EngMaint.UnitTest.Print.HCO.sel).	SVC 0E error appears.	Replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in [section 5-7.3 on page 5-52](#) for details.

Reference Diagrams

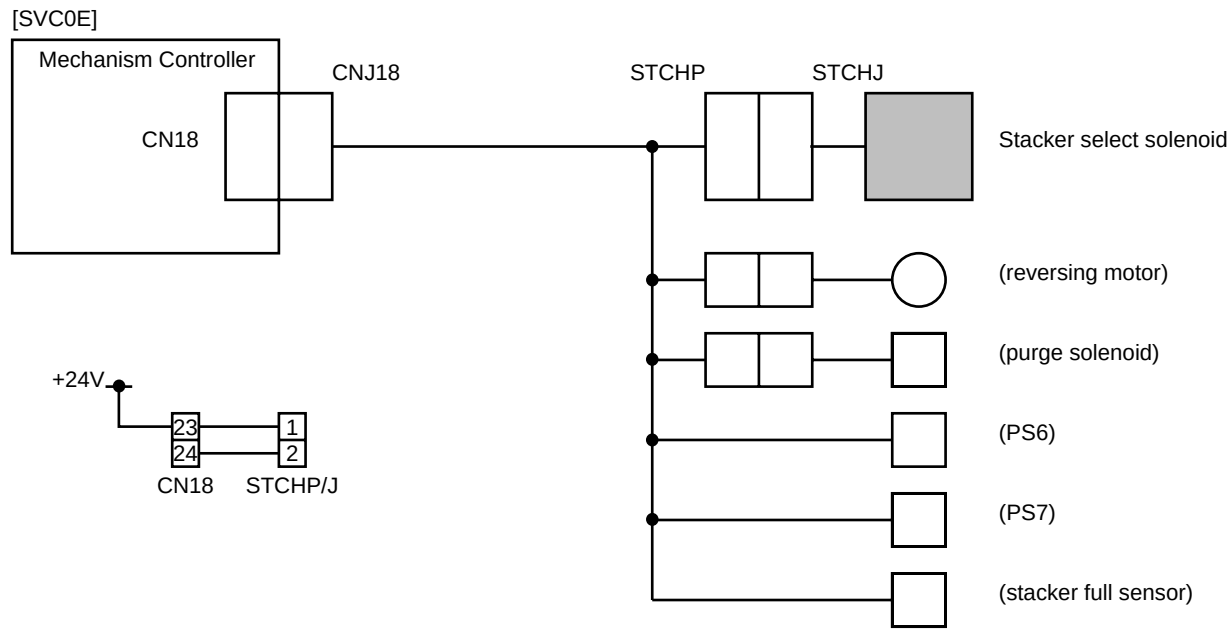


Figure 4-4 Stacker Select Solenoid Alarm (SVC 0E) Interconnections Diagram

4-9.5 SVC 0F Duplex Motor Alarm

Description

The mechanism controller detected an overcurrent condition of the duplex motor in the duplex unit.

Diagnostics

Print Unit Test menu (EngMaint.UnitTest.Output.Duplex): Turn on and observe the duplex unit rollers.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Disconnect duplex motor connectors DMP (see Figure 5-15 on page 5-25). Activate the duplex motor with the Print Unit Test menu (EngMaint.UnitTest.Output.Duplex) at any speed.	SVC 0F error appears.	Go to step 2.	Replace Duplex Unit. Go to step 3.
2. Check for pinched wires, cables, and damaged connectors between CN20 on the mechanism controller PCB and duplex motor.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 0F still appears, go to step 3.	Go to step 3.
3. Connect the duplex motor connectors DMP and DMJ that were disconnected in step 1. Activate the duplex motor with the Print Unit Test menu (EngMaint.UnitTest.Output.Duplex) at any speed.	SVC 0F error appears.	Replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

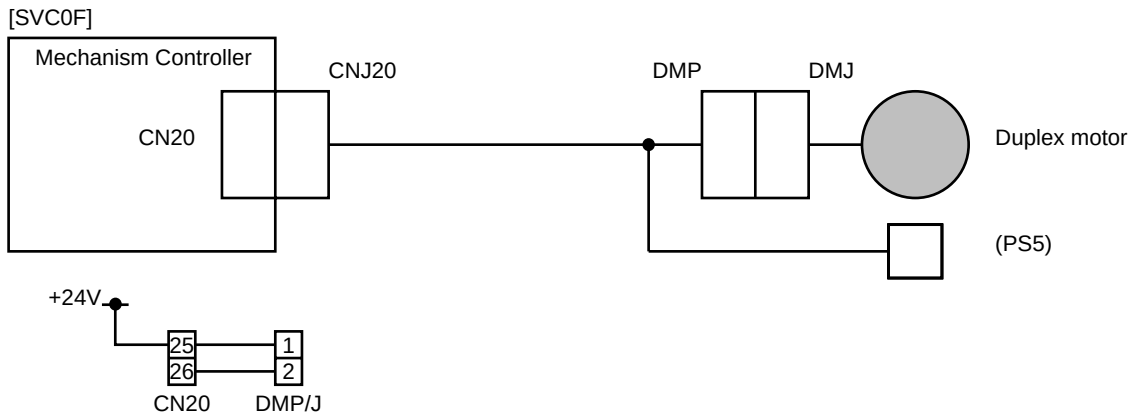


Figure 4-5 Duplex Motor Alarm (SVC 0F) Interconnections Diagram

4-9.6 SVC 27 Fuser Time-out Alarm

Description

The fuser temperature (from the thermistor in the fuser) is checked by the mechanism controller. The fuser unit did not reach the specified temperature (185°C) within 200 seconds after power-on or cover closing.

Diagnostics

Print Unit Test menu (EngMaint.UnitTest.Print.Halogen): Turn on and observe the halogen lamp in the fuser.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the Fuser and verify that the input voltage rating (120V or 200V) located on the side of the fuser matches the printer.	The input voltage rating matches.	Go to step 2.	Replace fuser with a fuser with the correct input voltage rating.
2.Check if the Fuser is mounted correctly with the Consumer Sensors diagnostic screen (EngMaint.Sensors.Consumer).	The screen displays: • Fuser: out • Fuser: in	• Remount fuser. • Replace fuser. Verify repairs. If error SVC 27 still appears, go to step 3.	n/a
3.Turn off the printer and check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller board and CNTJ (fuser connector) on drive unit M.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 27 still appears, go to step 4.	Go to step 4.
4.Check for the rated AC voltage at the LVPS side of the TINTSW switch (see Figure 5-57 on page 5-69). Activate the heater in the fuser for this test using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen). NOTE: The Print Unit Test menu cannot detect the status of the TINTSW switch.	The rated voltage is present: • 120V: between pins 1B and 2B • 200V: between pins 3B and 2B	Go to step 5.	Replace LVPS. Verify repairs. If error SVC 27 appears, go to step 5.
5.Check for the rated AC voltage at the fuser side of the TINTSW switch. Activate the heater in the fuser for this test using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	The rated voltage is present: • 120V: between pins 1A and 2A • 200V: between pins 3A and 2A	Go to step 6.	Replace TINTSW switch. Verify repairs. If error SVC 27 still appears, go to step 6.
6.Turn off the printer and check for pinched wires, cables, and damaged connectors between CN4 on LVPS PCB and the TINTSW switch.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 27 still appears, go to step 7.	Go to step 7.

Instruction	Indication	Yes	No
7. Verify all printer covers are closed, and then check HTON signal while the heater in the fuser is activated using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	Approximately 5V continuous present.	Replace mechanism controller board. ^a	Replace LVPS unit.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

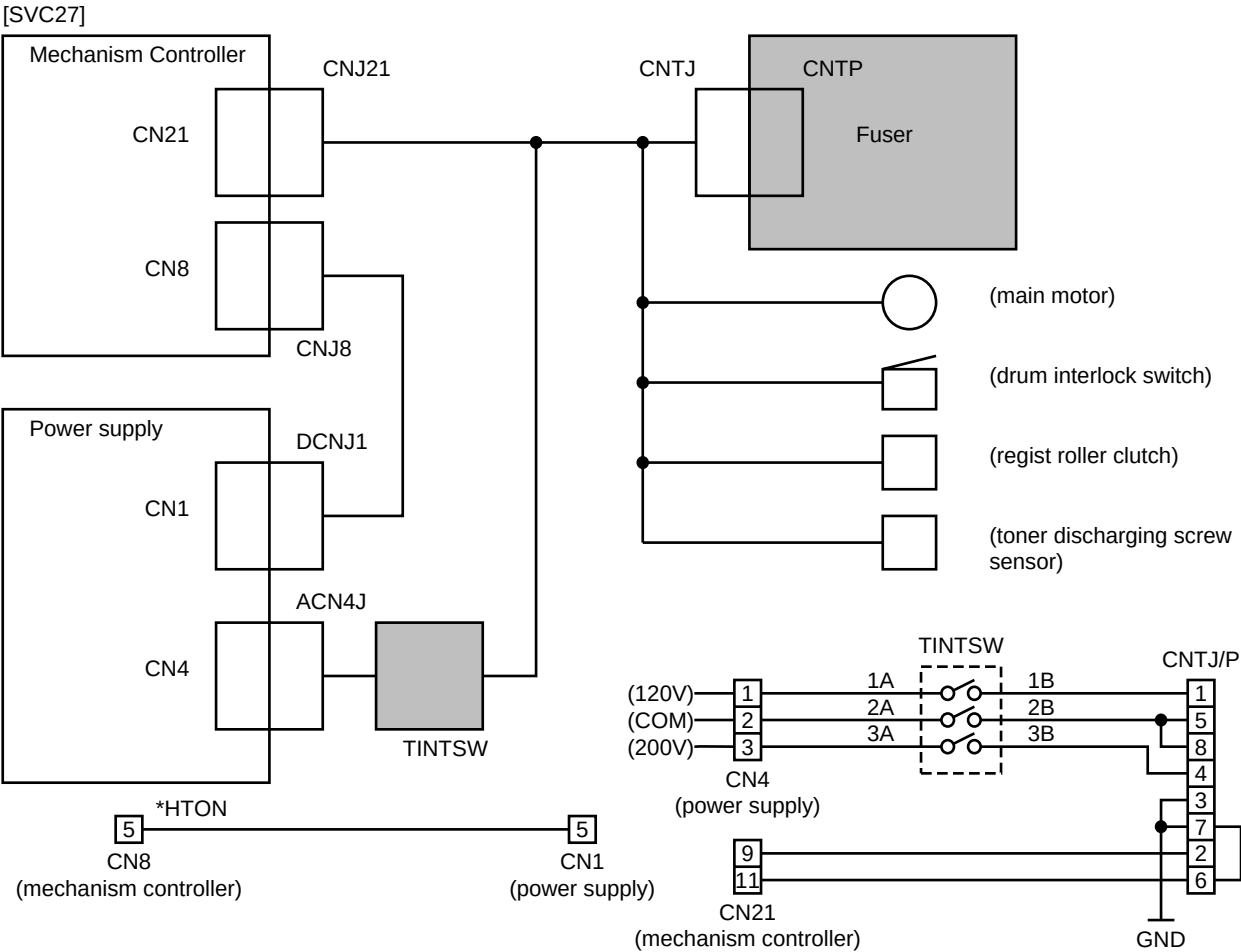


Figure 4-6 Fuser Time-out Alarm (SVC 27) Interconnections Diagram

4-9.7 SVC 28 Fuser High-Temperature Alarm

Description

The fuser temperature (from the thermistor in the fuser) is checked by the mechanism controller every 500 ms. A temperature of 225°C or higher was detected twice consecutively.

Diagnostics Available:

Print Unit Test menu (EngMaint.UnitTest.Print.Halogen): Turn on and observe the halogen lamp in the fuser.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check for the rated AC voltage at the LVPS side of the TINTSW switch (see Figure 5-57 on page 5-69). Activate the heater in the fuser for this test using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	The rated voltage is present • 120V: between pins 1A and 2A • 200V: between pins 3A and 2A	Go to step 2.	Replace LVPS. Verify repairs. If error SVC 28 still appears, go to step 2.
2. Verify all covers are closed and then check HTON signal (CN8 on the mechanism controller) when the heater in the fuser is activated by using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	Approximately 0V continuous is present.	Replace mechanism controller board. ^a Verify all covers are closed. Verify repairs. If error SVC 28 still appears, go to step 3.	Replace fuser (120V or 200V). Verify all covers are closed. Verify repairs. If error SVC 28 still appears, go to step 3.
3. Check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller PCB and the CNTJ (fuser connector) on the drive unit M.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 28 still appears, go to step 4.	Go to step 4.
4. Remove fuser and visually check the connectors on the fuser and driver unit M.	Corroded or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 28 still appears, go to step 5.	Go to step 5.
5. Remove fan4 and fan7. Check the resistance measurements on connector CNTJ (fuser connector on drive unit M) between • pin 3 and FG (frame ground) • pin 7 and FG	The measurements are 10 ohms or more.	Replace fuser. Verify repairs. If resistance is still 10 ohms or more, replace drive unit M. Reinstall fan4 and fan7.	Reinstall fan4 and fan7, turn the printer on, and verify all covers are closed.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

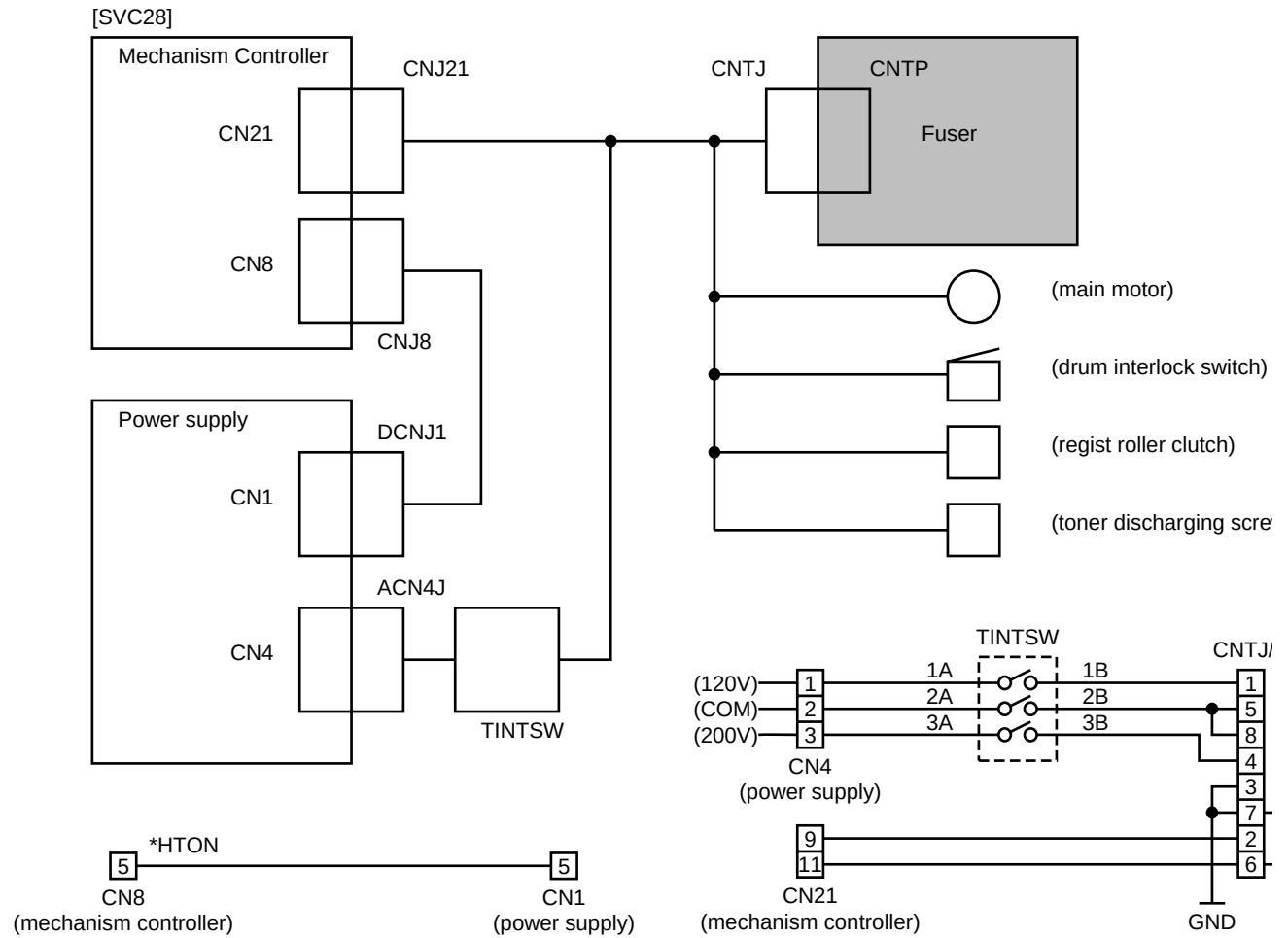


Figure 4-7 Fuser High-Temperature Alarm (SVC 28) Interconnections Diagram

4-9.8 SVC 29 Fuser Low-Temperature Alarm

Description

The fuser temperature (from the thermistor in the fuser) is checked by the mechanism controller every 500 ms. A temperature of 155°C or lower was detected twice consecutively.

Diagnostics Available:

Print Unit Test menu (EngMaint.UnitTest.Print.Halogen): Turn on and observe the halogen lamp in the fuser.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check if the fuser is mounted correctly with the Consumer Sensors diagnostic screen (EngMaint.Sensors.Consumer).	The screen displays: • Fuser: out • Fuser: in	• Fuser: out - Remount fuser. • Fuser: in - Replace fuser. Verify repairs. If error SVC 29 still appears, go to step 2.	n/a
2. Check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller board and the CNTJ (fuser connector) on the drive unit M.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 29 still appears, go to step 3.	Go to step 3.
3. Check for the rated AC voltage at the LVPS side of the TINTSW switch (Figure 5-30 on page 5-68). Activate the heater in the fuser for this test using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	The rated voltage is present: • 120V: between pins 1B and 2B • 200V: between pins 3B and 2B	Go to step 4.	Replace LVPS. Verify repairs. If SVC 29 still appears, go to step 4.
4. Check for the rated AC voltage at the fuser side of the TINTSW switch. Activate the heater in the fuser for this test using the Print Unit Test menu (EngMaint.UnitTest.Print.Halogen).	The rated voltage is present: • 120V: between pins 1A and 2A • 200V: between pins 3A and 2A	Go to step 6.	Replace TINTSW switch. Verify repairs. If error SVC 29 still appears, go to step 5.
5. Check for pinched wires, cables, and damaged connectors between CN4 on LVPS unit PCB and TINTSW switch.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 29 still appears, go to step 6.	Go to step 6.
6. Check the HTON signal.	Approximately 5V continuous is present.	Replace mechanism controller board. ^a	Replace LVPS unit.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

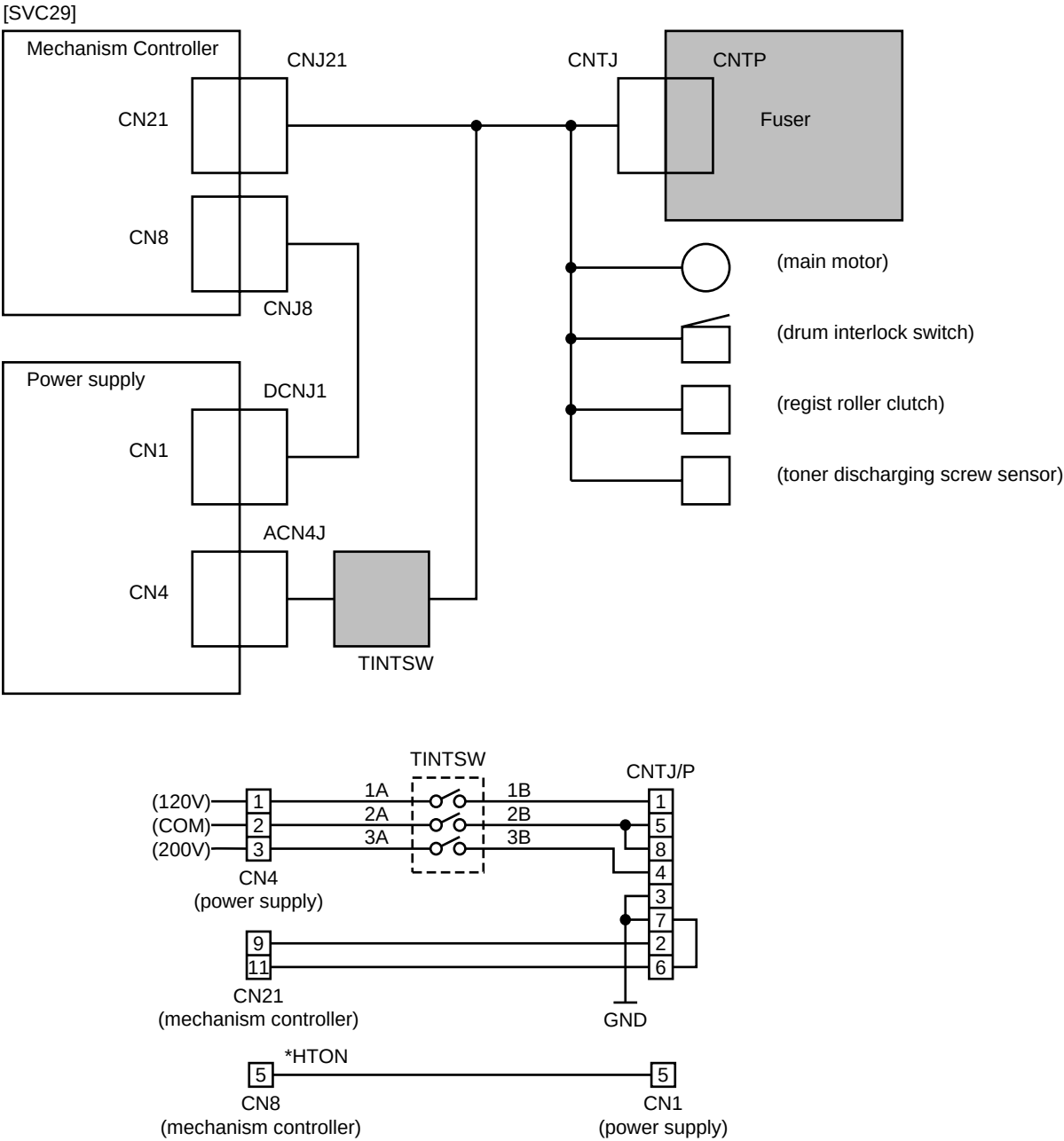


Figure 4-8 Fuser Low-temperature Alarm (SVC 29) Interconnections Diagram

4-9.9 SVC 50 Toner Motor Alarm

Description

The mechanism controller detected an overcurrent condition of the toner motor (DC motor) in the toner hopper.

Diagnostics

Print Section menu (EngMaint.UnitTest.Print.Toner): The toner motor in the toner hopper can be turned on and observed. **The toner motor turns only 1/16 rotation each time it is turned on.** The motor does not turn continuously.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Open the upper right cover and set the actuator of the cover interlock switch. Disconnect toner motor connector TNMJ (see Figure 5-69 on page 5-88). Activate the motor by using the Print Section menu (EngMaint.UnitTest.Print.Toner). The Print Section menu activates the toner motor for only 0.5 sec or less.	SVC 50 error appears.	Go to step 2.	Replace toner hopper. Verify repairs. If error SVC 50 still appears, go to step 2.
2. Check for and repair pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and toner motor.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify all covers are closed. Verify repairs. If error SVC 50 still appears, replace mechanism controller board. ^a	Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

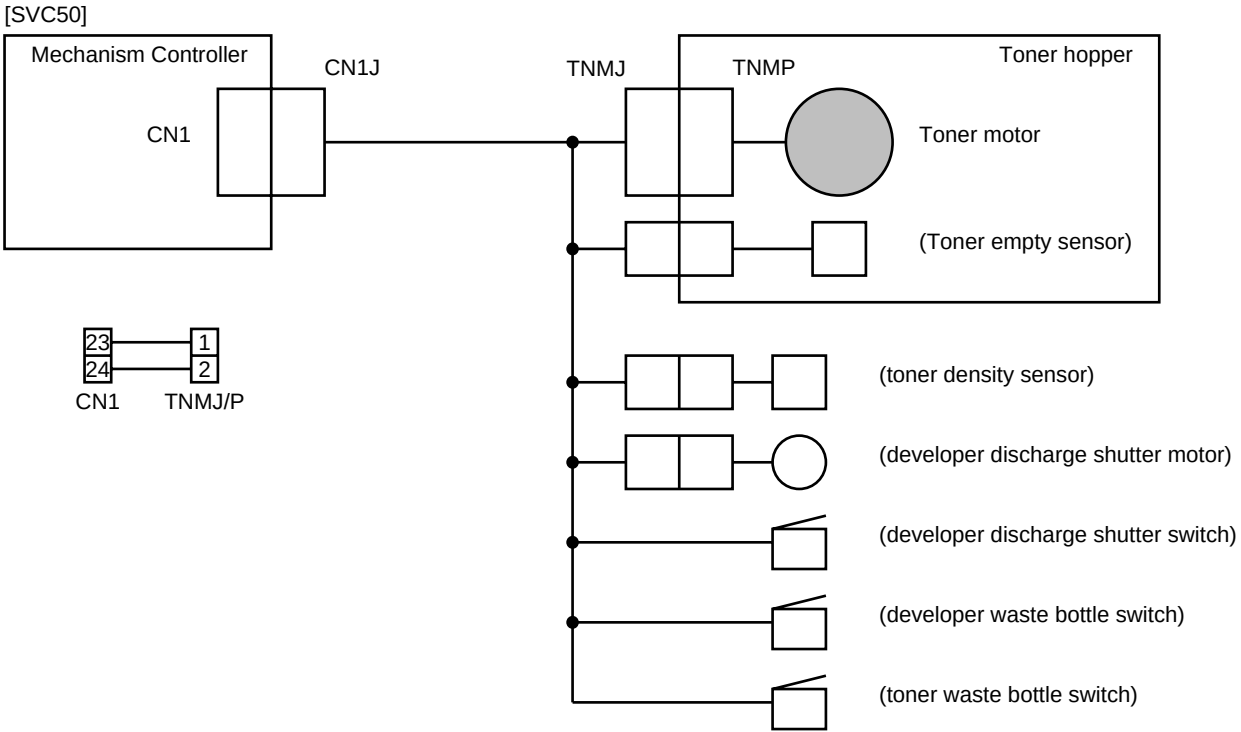


Figure 4-9 Toner Motor Alarm (SVC 50) Interconnections Diagram

4-9.10 SVC 51 Toner Discharge Screw Alarm

Description

The mechanism controller has detected that the toner discharge screw sensor is not changing states as the toner auger rotates when drive unit M is running. The toner discharge screw sensor is mounted on a metal bracket directly to the right of the toner auger drive gear.

Diagnostics Available:

Print Section menu (EngMaint.UnitTest.Print.Main): Drive unit M can be turned on so that you can observe the toner discharge screw and sensor.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check whether the metal shaft (not the gear) of the waste toner screw is rotating when the main motor is turned on using Print Section menu (EngMaint.UnitTest.Print.Main). (See Figure 5-58 on page 5-71.) When you activate the main motor using EngMaint.UnitTest.Print.Motor.Main, remove the drum unit, fuser assembly, and developer unit prior to the test.	- The metal shaft is stopped (not rotating) - The metal shaft is rotating with unusual noise	stopped: Replace drive unit M. unusual noise: Inspect gears. If necessary, replace drive unit M or Toner Auger. Verify repairs. If error SVC 51 still appears, go to step 2	Clean the toner discharging screw sensor on drive unit M. Verify repairs. If error SVC 51 still appears, go to step 2.
2. Check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller PCB and the waste toner discharging screw sensor on the drive unit M.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 51 still appears, go to step 3.	Go to step 3.
3. Turn on the printer. Verify all covers are closed.	SVC 51 error appears.	Replace waste toner discharging screw sensor on drive unit M. Verify repairs. If error SVC 51 still appears, replace the mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

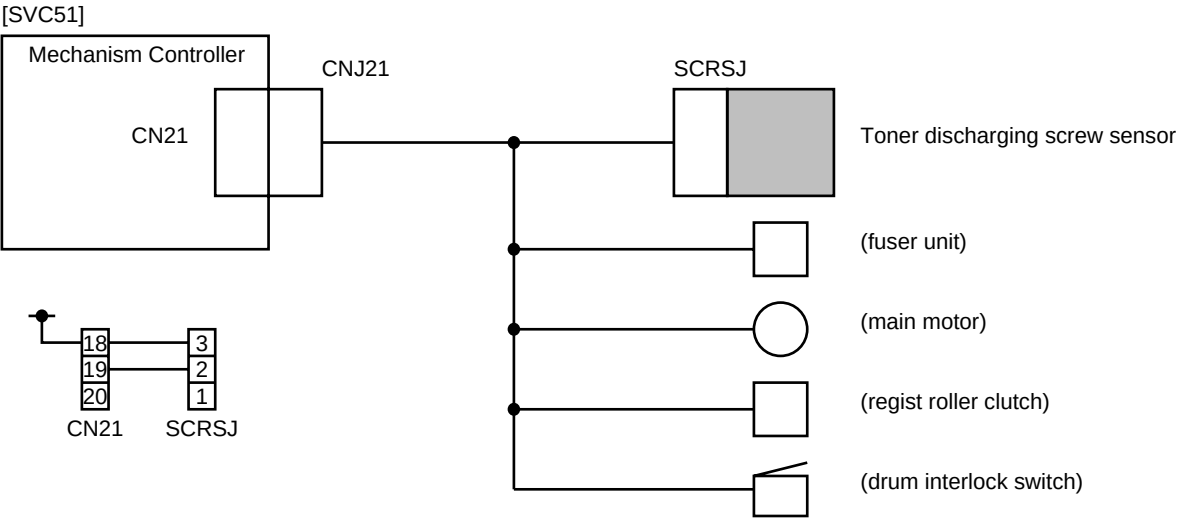


Figure 4-10 Toner Discharge Alarm (SVC 51) Interconnections Diagram

4-9.11 SVC 52 Developer Discharge Alarm

Description

The toner density sensor in the developer unit detected and reported to the mechanism controller that there is developer mixture in the developer unit when it should be empty.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check Developer Collector Bottle.	- Developer Collector Bottle over full. - Developer Mixture completely discharged into bottle.	- Replace Developer Collector Bottle and clean spilled developer under developer unit. Verify repairs. If an SVC 52 error appears, go to step 4. - Go to step 4.	Go to step 2.
2. Open the upper right cover and remove the rear cover and waste developer bottle. Check the developer shutter located on the bottom of the developer assembly.	Does the developer shutter meet with the actuator lever	Go to step 3.	Turn the developer shutter motor by hand to meet the actuator with the developer shutter. You may have to partially remove the developer assembly to get the actuator and shutter to match up. Verify repairs. If error SVC 52 still appears, go to step 3.
3. Remove the developer assembly. Open and close the Developer Release Handle (b1) while observing the developer coupling.	When b1 is open, the developer coupling moves to the rear allowing removal of the developer assembly. When b1 is closed, the developer coupling snaps forward to drive the developer gear.	Go to step 4.	Replace drive unit M. Verify repairs. If error SVC 52 still appears, go to step 4.
4. Check the voltage at TNDNS on the mechanism controller board (see Figure 2-13 on page 2-17).	The voltage reads lower than 1.0 Vdc.	Go to step 5.	Could be a defective toner density sensor. Replace developer assembly. Verify repairs. If error SVC 52 still appears, go to step 5.
5. Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and TNSP connector near the developing unit (see Figure 5-69 on page 5-88).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 52 still appears, go to step 6.	Go to step 6.
6. Turn on the printer. Verify all covers are closed.	SVC 52 error appears.	Replace developer unit. Verify repairs. If error SVC 52 still appears, replace the mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

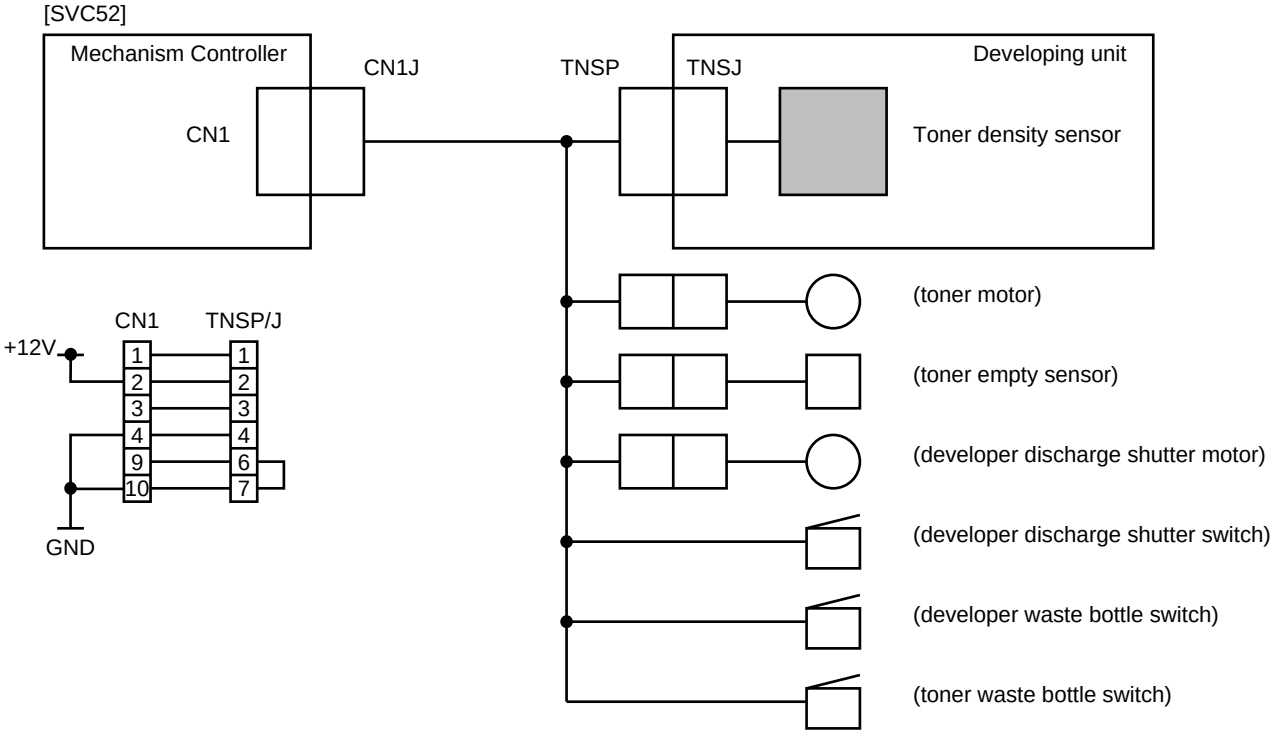


Figure 4-11 Developer Discharge Alarm (SVC 52) Interconnections Diagram

4-9.12 SVC 54 Developer Discharge Shutter Alarm

Description

The developer discharge shutter switch on drive unit D is indicating the developer discharge shutter did not open during the replace developer sequence. The condition was reported to the mechanism controller. It is possible to view the operation of drive unit D when the developer replace routine is entered and to watch the developer discharge shutter (on bottom of developer assembly) being opened.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Open the upper right cover and remove the rear cover and waste developer bottle. Check the developer discharge shutter located on the bottom of the developer assembly.	The shutter is open.	Go to step 2.	Replace drive unit D. Remove the developer unit. Test drive unit D by using the Print Section menu (EngMaint.UnitTest.Print.Drv. D). Verify repairs. If error SVC 52 still appears, go to step 3.
2. Check the developer shutter switch (Dev. shutter) using the Consumer Sensors screen (EngMaint.Sensors.Consumer).	The screen displays Dev.shutter: open .	Go to step 4.	Replace developer shutter switch. Verify repairs. If error SVC 52 still appears, go to step 3.
3. Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board (Figure 5-45 on page 5-52) and the developer discharge shutter switch, and the developer discharge shutter motor on the drive unit D (Figure 5-43 on page 5-50).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 54 still appears, go to step 4.	Go to step 4.
4. Turn on the printer. Verify all covers are closed.	SVC 54 appears.	Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

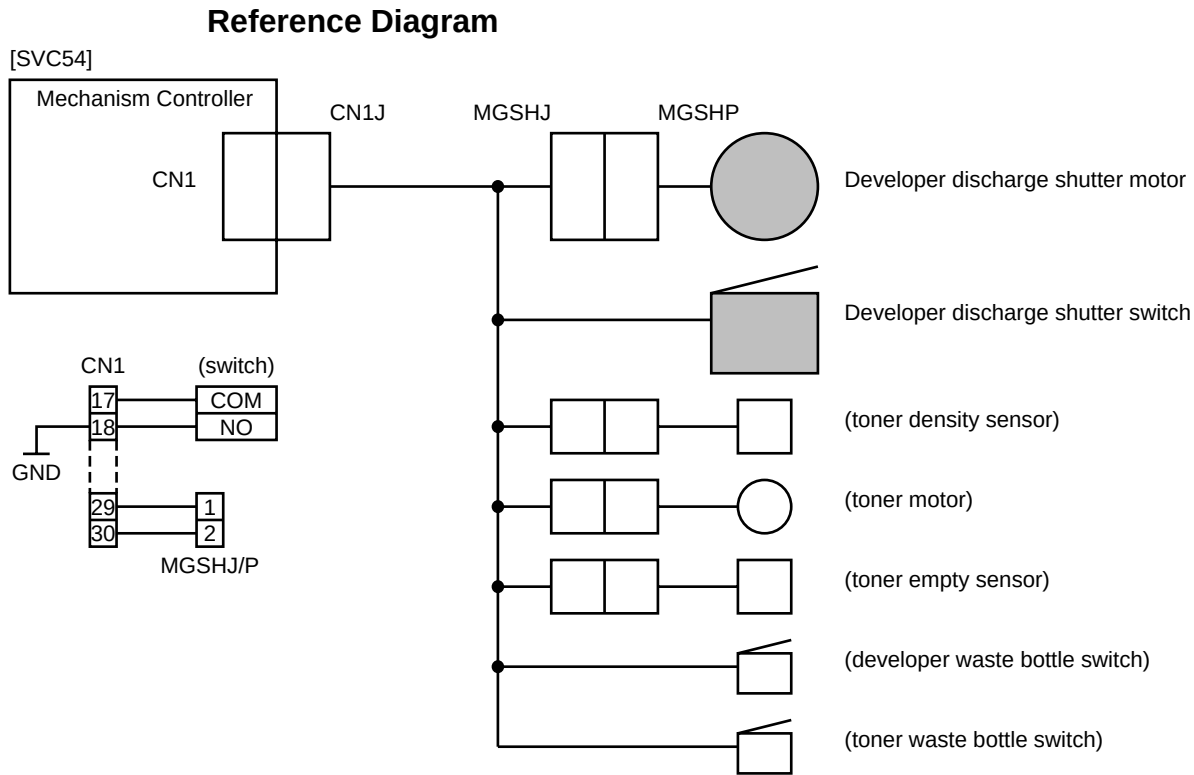


Figure 4-12 Developer Discharge Shutter Alarm (SVC 54) Interconnections Diagram

4-9.13 SVC 56 Automatic Adjustment Alarm

Description

The mechanism controller detected that the toner density sensor output voltage is not $2.5 \pm 0.2V$ at the automatic toner density adjustment after developer replacement. The output of the toner density sensor can be monitored at test point W5 (TNDNS) on the mechanism controller board. The toner density sensor is internal to the developer assembly and not separately replaceable.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the developer assembly. Open and close the Developer Release Handle (b1) while observing the developer coupling.	When b1 is open, the developer coupling moves to the rear allowing removal of the developer assembly. When b1 is closed, the developer coupling snaps forward to drive the developer gear.	Go to step 2.	Replace drive unit M.
2.Check HVPS board connector VB.	Connector VB is properly connected.	Go to step 3.	Connect the connector properly. Verify repairs. If SVC 56 appears, go to step 3.
3.Replace developer mixture. Turn on the printer. Verify all covers are closed.	An error SVC 56 appears.	Go to step 4.	Done.
4.Check voltage at test point TNDNS W5 on the mechanism controller board during the main motor turn-on while printer initializing or printing a Setup Report (see Figure 2-13 on page 2-17).	The voltage is $2.5 \pm 0.2V$.	Replace mechanism controller board. ^a	Go to step 5.
5.Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and the TNSP connector near the developer unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 56 still appears, go to step 6.	Go to step 6.
6.Turn on the printer. Verify all covers are closed.	SVC 56 appears.	Replace developer unit. Verify repairs. If error SVC 56 still appears, replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

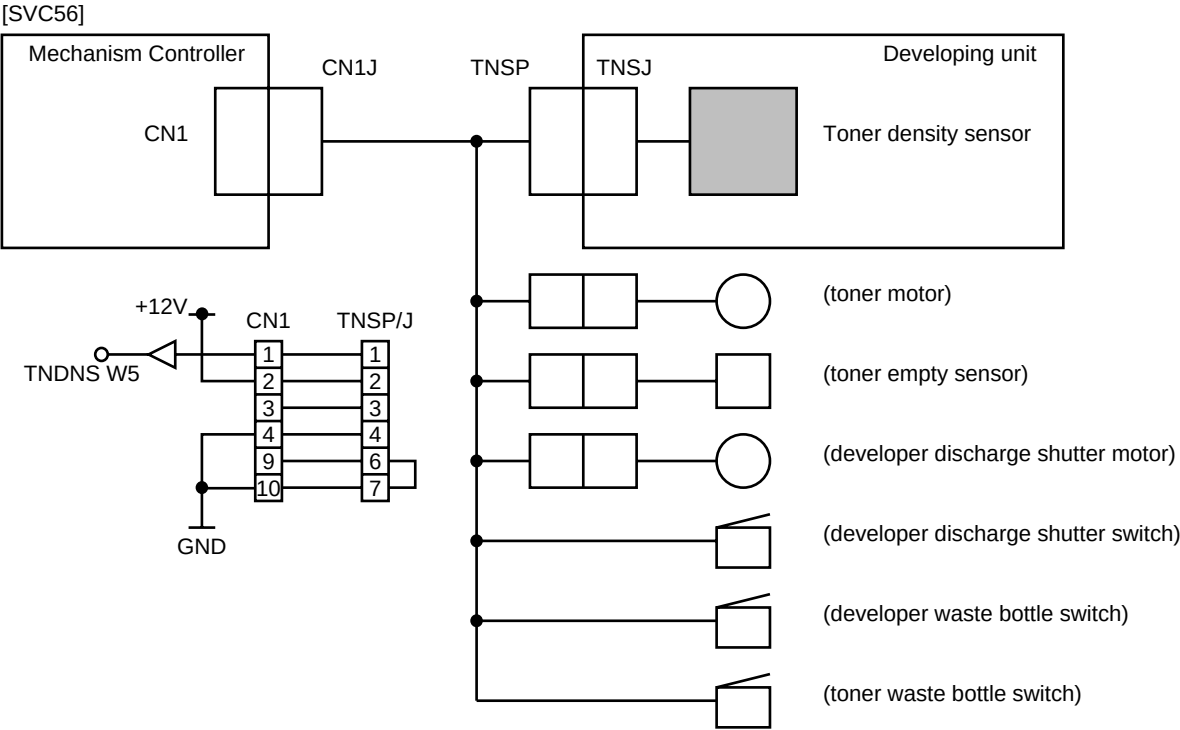


Figure 4-13 Automatic Adjustment Alarm (SVC 56) Interconnections Diagram

4-9.14 SVC 57 Toner High-density Alarm

Description

Too much toner was detected in the developer assembly. The mechanism controller checks the toner density sensor every 0.5 seconds. SVC 57 occurs when an abnormal toner density sensor output voltage (0.98V or lower) is detected four times consecutively.

The toner density sensor output voltage can be monitored at the test point W5 (TNDNS) on the mechanism controller. The toner density sensor is an internal part of the developer assembly and not separately replaceable.

Diagnostics

Toner Motor menu (EngMaint. Unit Test. Print. Toner): The toner motor in the toner hopper can be turned on and observed. Before performing the test, be sure to remove the developer assembly and place a piece of paper under the toner hopper to collect approximately 5 grams of toner that should be fed from the toner hopper each time it is turned on.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the developer assembly. Open and close the developer release handle (b1) while observing the developer coupling.	When b1 is open, the developer coupling moves to the rear allowing removal of the developer assembly. When b1 is closed, the developer coupling snaps forward to drive the developer gear.	Go to step 2.	Replace drive unit M.
2.Replace developer mixture. Turn on the printer. Verify all covers are closed. Run a test print (Test.Testprint) for 100 pages.	An error SVC 57 appears.	Go to step 3.	Done.
3.Check test point W5 (TNDNS) on the mechanism controller board (see Figure 2-13 on page 2-17) during the main motor turn-on while printer is initializing or while test printing using Test Print (Test.TestPrint).	The voltage is lower than 0.98V.	Go to step 4.	Replace developer unit. Verify repairs. If error SVC 57 still appears, replace mechanism controller board. ^a Verify repairs. If error SVC 57 still appears, go to step 4.
4.Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and TNSP connector near developer unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 57 still appears, go to step 5.	Go to step 5.

Instruction	Indication	Yes	No
5. Turn on the printer. Verify all covers are closed. Run a test print (Test.TEstprint) for 100 pages.	An error SVC 57 appears.	Replace the following one at a time, running a test print after each step to verify repair: a. Replace toner hopper b. Replace developer unit c. Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

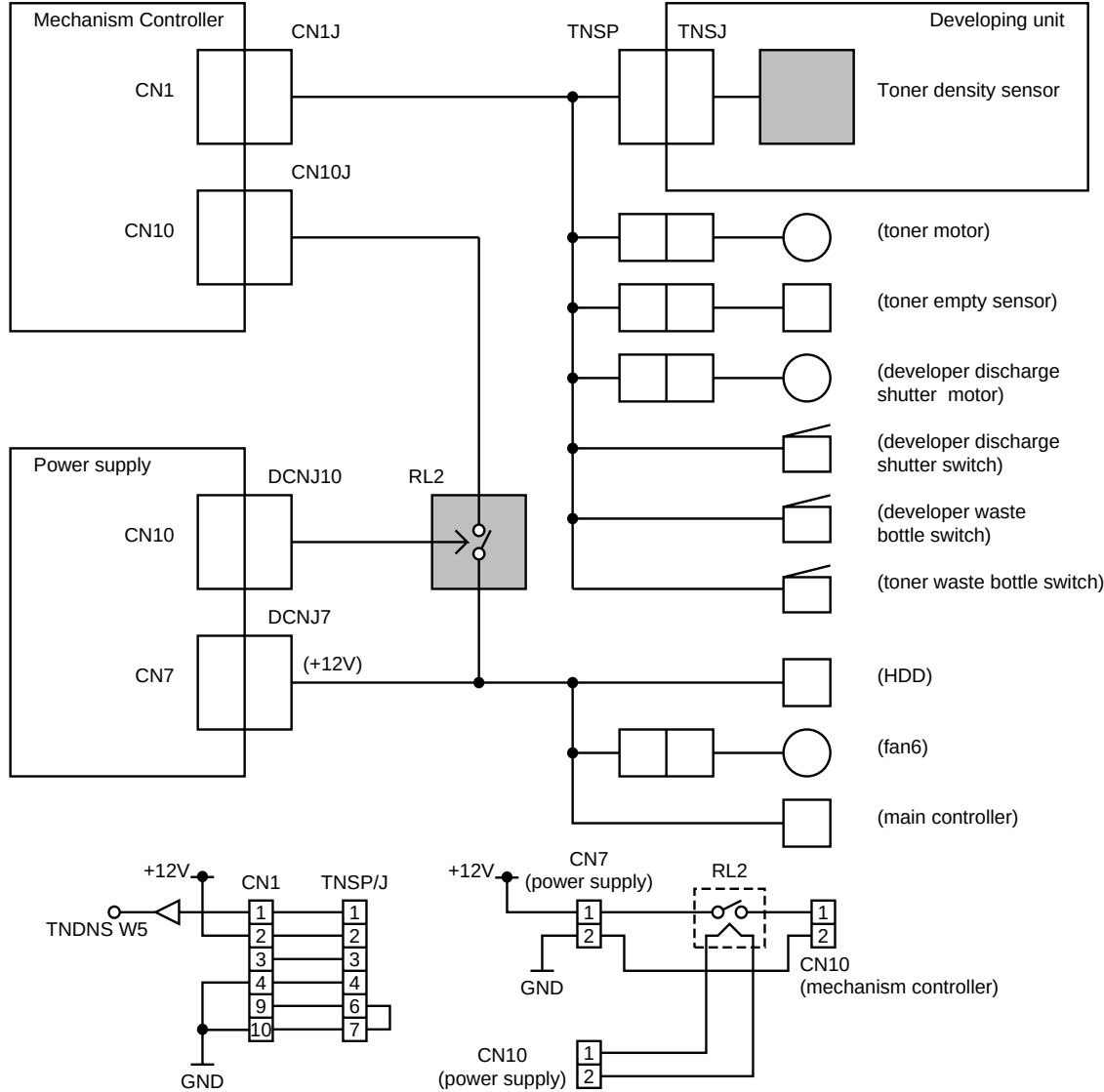


Figure 4-14 Toner High-density Alarm (SVC 57) Interconnection Diagram

4-9.15 SVC 58 Toner Low-Density Alarm

Description

Not enough toner was detected in the developer assembly. The mechanism controller checks the toner density sensor every 0.5 seconds. SVC 58 occurs when an abnormal toner density sensor output voltage (4.04V or higher) is detected four times consecutively.

The toner density sensor output voltage can be monitored at the test point W5 (TNDNS) on the mechanism controller. The toner density sensor is an internal part of the developer assembly and not separately replaceable.

Diagnostics

Print Section menu (EngMaint.UnitTest.Print.Toner): The toner motor in the toner hopper can be turned on and observed. **The toner motor turns only 1/16 rotation each time it is turned on;** the motor does not turn continuously.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the developer assembly. Open and close the Developer Release Handle (b1) while observing the developer coupling.	When b1 is open, the developer coupling moves to the rear allowing removal of the developer assembly. When b1 is closed, the developer coupling snaps forward to drive the developer gear.	Go to step 2.	Replace drive unit M. Verify repairs. If error SVC 58 still appears, go to step 2.
2.Open the upper cover. Check the toner hopper.	Toner hopper is covered with a protective transparent plastic cover.	Release the developer unit and pull out protective cover. Verify repairs. If SVC 58 still appears, go to step 3.	Go to step 3.
3.Go to the Consumer Sensors screen (EngMaint.Sensors.Consumer).	Toner: full indicated.	Go to step 4.	Add new toner and do a test print (Test.TestPrint). Clear any errors until the print density is normal.
4.Replace developer mixture. Turn on the printer. Verify all covers are closed. Run a test print (Test.Testprint) for 100 pages.	An error SVC 58 appears.	Go to step 5.	Done.
5.Check test point W5 (TNDNS) on the mechanism controller board (see Figure 2-13 on page 2-17) during the main motor turn-on while printer is initializing or while test printing using Test Print (Test.TestPrint).	The voltage is higher than 4.04V.	Go to step 6.	Replace developer unit. Verify repairs. If error SVC 58 still appears, replace mechanism controller board. ^a Verify repairs. If error SVC 58 still appears, go to step 6.

Instruction	Indication	Yes	No
6. Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and TNSP connector near developer unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 58 still appears, go to step 7.	Go to step 7.
7. Turn on the printer. Verify all covers are closed and run Test Print (Test.Testprint) for 100 pages.	SVC 58 error appears.	Replace the following one at a time, running a test print after each step to verify repair: a. Replace toner hopper b. Replace developer unit c. Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

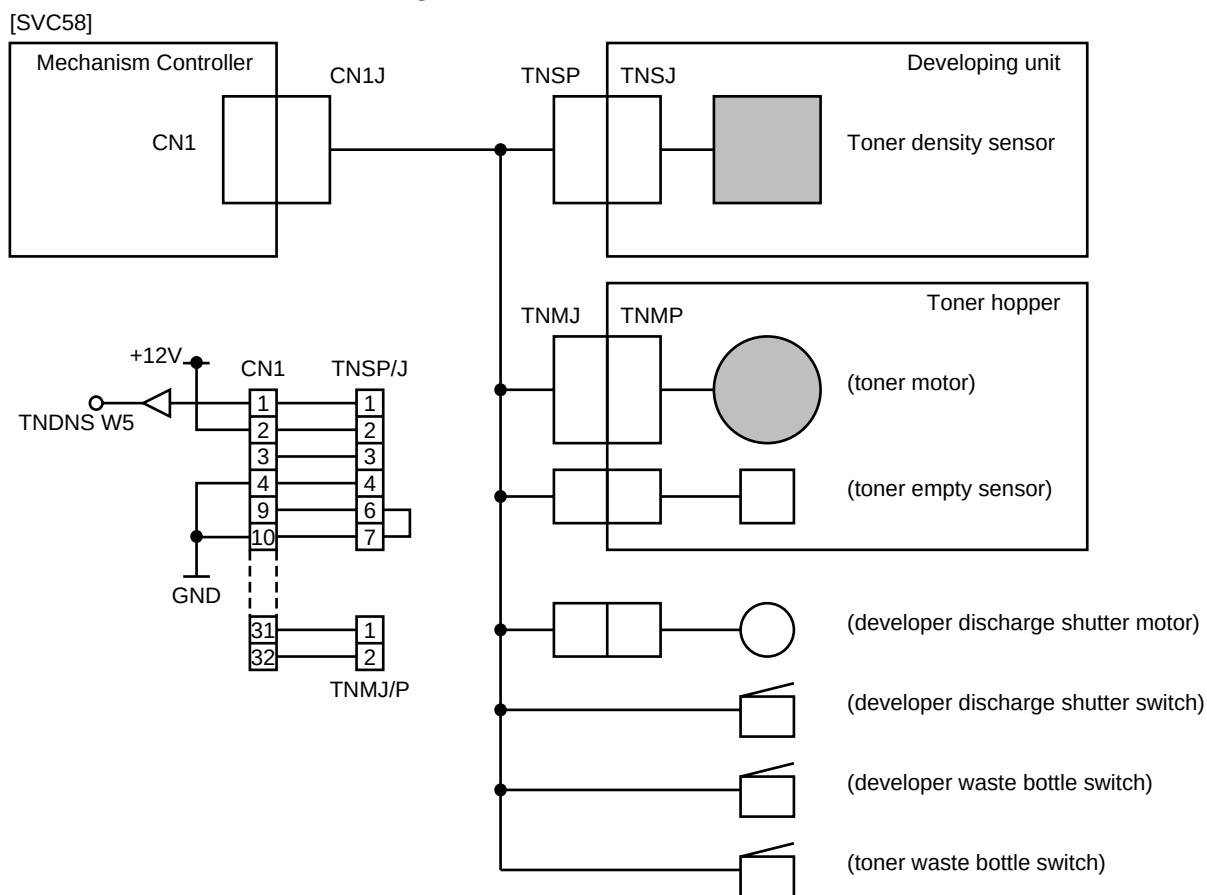


Figure 4-15 Toner Low-density Alarm (SVC 58) Interconnections Diagram

4-9.16 SVC 59 Reference Voltage Too-High Alarm SVC 5A Reference Voltage Too-Low Alarm

Description

SVC 59: Within 0.5 seconds of turning on the printer, the mechanism controller detected that the voltage (TDREF) in the reference voltage generation circuit in the mechanism controller was 1.45V or higher. TDREF cannot be measured directly.

SVC 5A: Within 0.5 seconds of turning the printer on, the mechanism controller detected that the voltage (TDREF) in the reference voltage generation circuit on the mechanism controller was 1.06V or lower. TDREF cannot be measured directly.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check voltage at W6 (TCS) of the mechanism controller board (see Figure 2-13 on page 2-17).	Voltage is 6.65 ±1.0 V.	Replace mechanism controller board. ^a	Go to step 2.
2. Check for pinched wires, cables, and damaged connectors between CN1 on the mechanism controller board and TNSP connector near developer unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 59 still appears, replace mechanism controller board. ^a	Replace developer unit. Verify repairs. If error SVC 58 still appears, replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

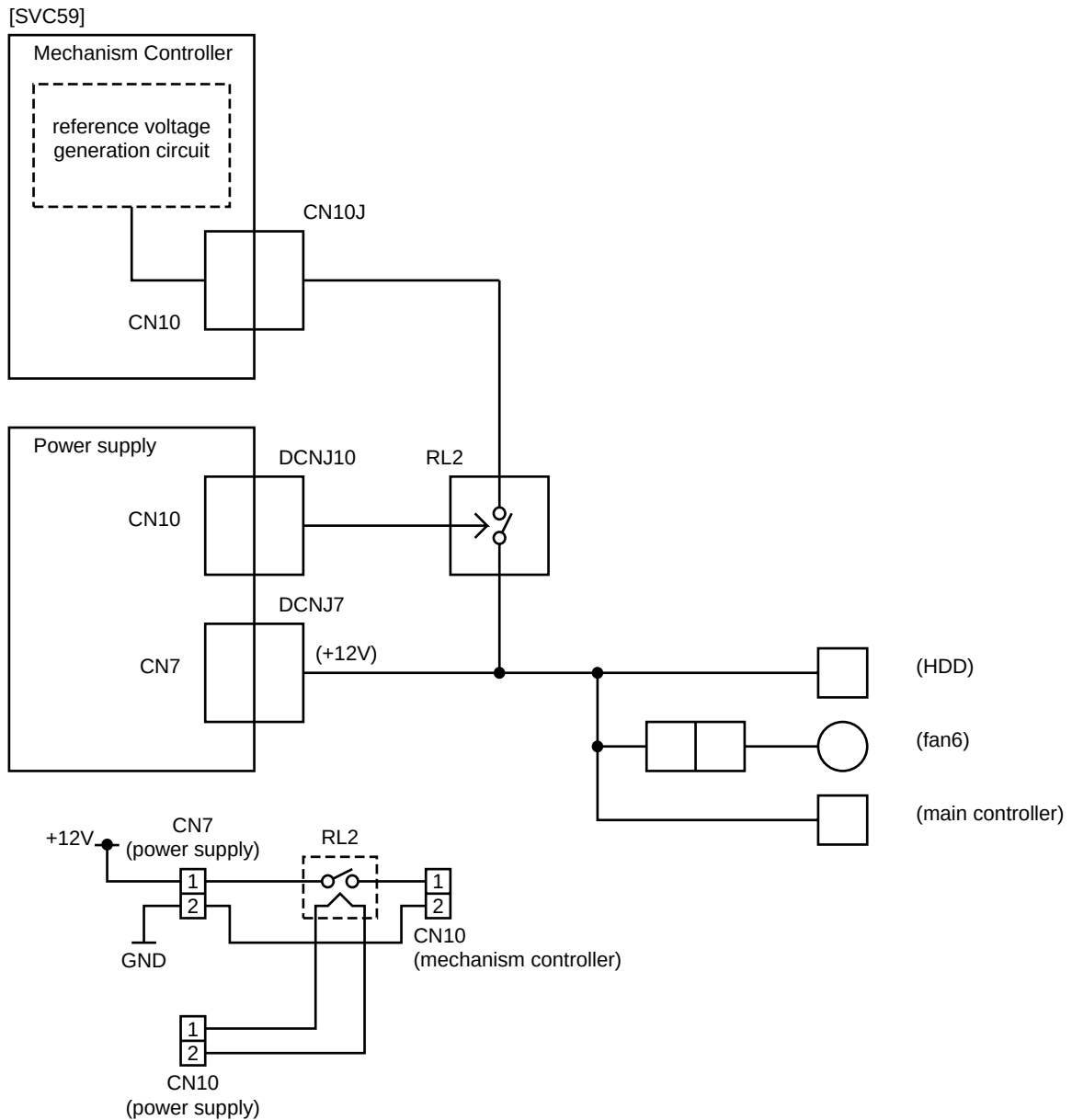


Figure 4-16 Reference Voltage Too-High Alarm (SVC 59)/ Too-Low Alarm (SVC 5A) Interconnections Diagram

4-9.17 SVC 5B Toner Hopper Alarm

Description

Toner density low was detected from the toner density sensor in the developer unit by the mechanism controller when the toner sensor on the toner hopper has toner covering it.

Diagnostics

Print Section menu (EngMaint.UnitTest.Print.Toner): The toner motor in the toner hopper can be turned on and observed. **The toner motor turns only 1/16 rotation each time it is turned on;** the motor does not turn continuously.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the developer assembly. Open and close the Developer Release Handle (b1) while observing the developer coupling.	- When b1 is open, the developer coupling moves to the rear allowing removal of the developer assembly. - When b1 is closed, the developer coupling snaps forward to drive the developer gear.	Go to step 2.	Replace drive unit M. Verify repairs. Go to step 2.
2.Open the upper right cover. Check if the toner hopper is covered with transparent film.	Protective film cover on toner hopper is still installed.	Release developer unit and pull film out. Verify repairs. If error SVC 58 still appears, go to step 3.	Go to step 3.
3.Check for pinched wires, cables, and connectors between CN1 on mechanism controller PCB and TNSP near developer unit (see Figure 2-14 on page 2-18).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 58 still appears, go to step 4.	Go to step 4.
4.Go to the Consumer Sensors screen (EngMaint.Sensors.Consumer.Toner).	"Toner: in" is indicated on Consumer Sensors screen. This indicates there is toner in the toner hopper.	Go to step 5.	Add new toner and run Test Print (Test.Testprint) while clearing any errors till the print density is normal. Verify repairs. If "Toner: Empty" is indicated, replace the toner hopper. Verify repairs using Test Print. If SVC 5B appears, go to step 5.
5.Open the upper right cover and set the actuator of the cover interlock switch. Activate the motor by using the Toner Motor menu (EngMaint.UnitTest.Print.Toner). The Toner Motor menu activates the toner motor for only 0.5 sec or less.	Toner motor runs for 0.5 seconds.	Suspect a toner bridge around the sensor in the toner hopper. Tap the side of the toner hopper to level the toner and clear the bridge. Verify toner is not bridged. If error SVC 5B still appears, replace toner hopper.	Replace toner hopper.

Reference Diagrams

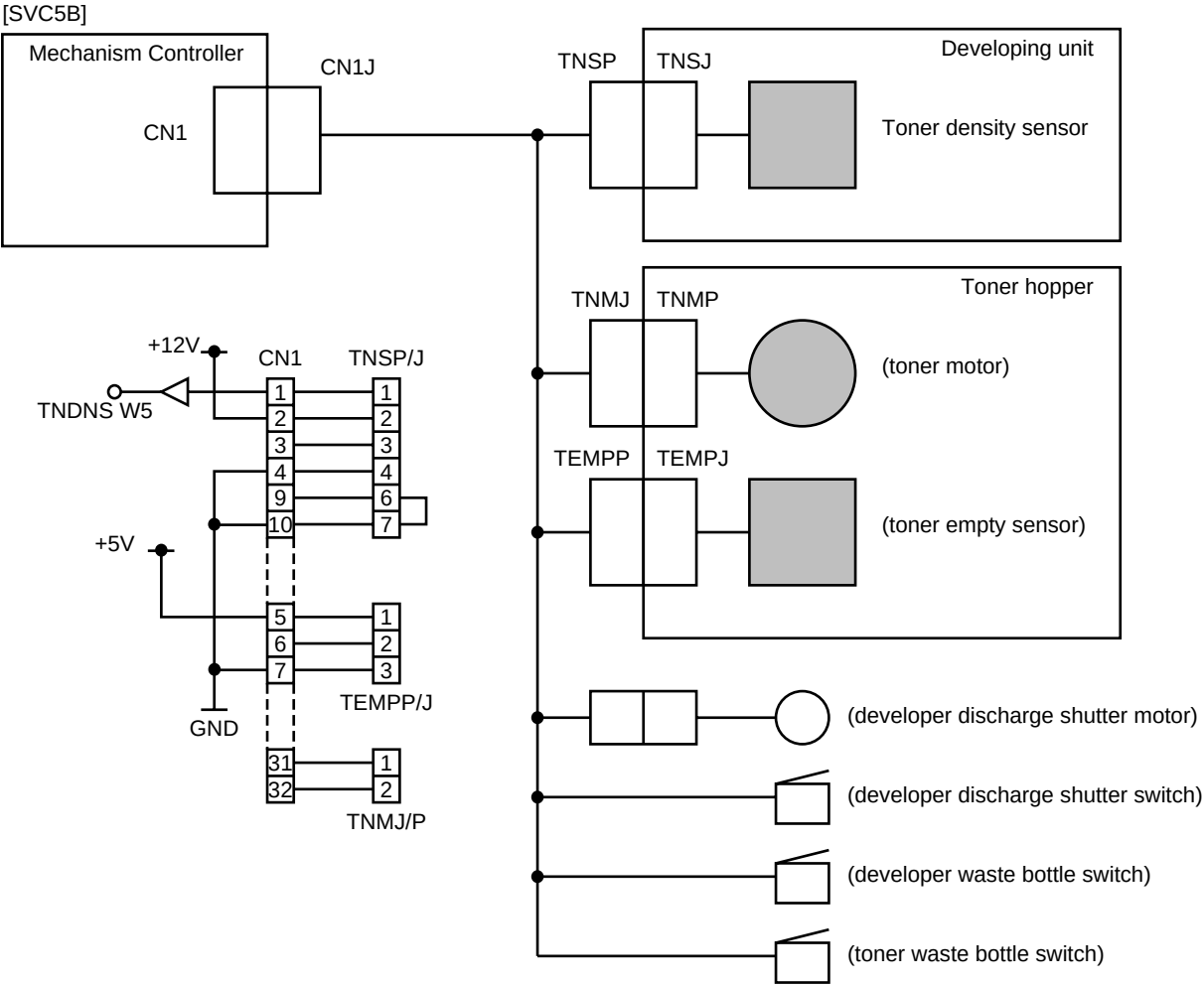


Figure 4-17 Toner Hopper Alarm (SVC 5B) Interconnections Diagram

4-9.18 SVC 69 Main Motor Alarm

Description

Speed of main motor exceeds range by 5%. One second after the main motor is turned on, a check of the main motor is started by the mechanism controller. This check is executed every millisecond until the main motor goes off. The main motor is located in drive M unit and is not separately replaceable.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the drum unit, fuser unit, and developing unit. Activate the main motor from the Main Motor Test menu (EngMaint.UnitTest.Print.Main).	SVC 69 error appears.	Go to step 4.	Go to step 2.
2.Manually turn the drum unit, fuser unit, and developing unit looking for any binding. Visually examine all units for damage or clogging.	Parts are binding or damaged.	Replace damaged parts. Verify repairs. If error SVC 69 still appears, go to step 3.	Go to step 3.
3. Install the units removed in step 1. Do a test printing using Test Print (Test.TestPrint).	SVC 69 error appears.	Perform the following steps one at a time, checking if error SVC 69 still appears after each step: a.Replace drum unit if it was not already replaced in step 2. b.Replace fuser unit (110V or 200V) if it was not already replaced in step 2. c.Replace developer unit if it was not already replaced in step 2. d.Go to step 4.	Done.
4.Check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller board and drive unit M (see Figure 2-14 on page 2-18).	Pinched wires or cables, or damaged connectors.	Perform the following steps one at a time, checking if error SVC 69 still appears after each step: a.Replace damaged parts. b.Replace drive unit M. c.Check for damaged wiring, and verify drive unit M and mechanism controller board are good.	Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

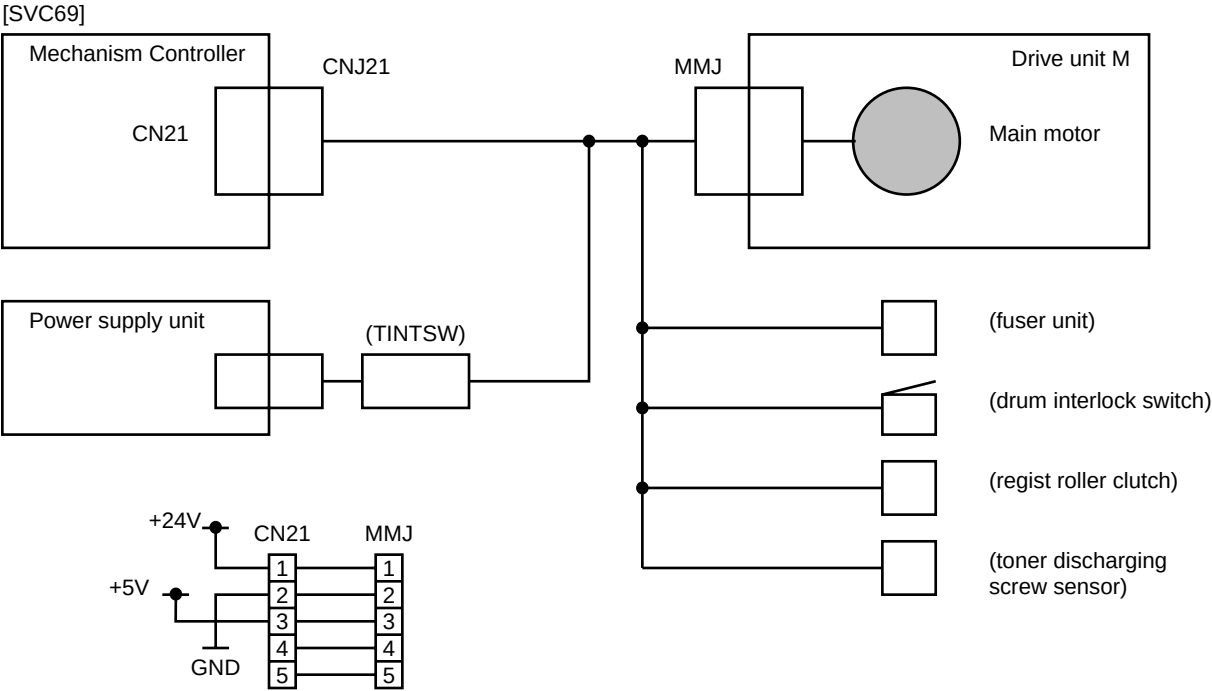


Figure 4-18 Main Motor Alarm (SVC 69) Interconnections Diagram

4-9.19 SVC 6F High Voltage Power Alarm

Description

This alarm indicates that the mechanism controller detected the HVALM (high voltage alarm) signal twice consecutively. When high voltage power is on, every five seconds the following are checked:

- overvoltage or undervoltage
- overcurrent or undercurrent

This error can be caused by a contaminated precharger in the drum unit, defective drum, open transfer guide ground circuit, or a fault in the developer unit.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Clean precharger corona by pulling out and in 10 times. Turn on printer. Verify all covers are closed.	Error SVC 6F appears.	Go to step 2.	Done.
2. Clean the transfer guide assembly and developer area. Turn on printer. Verify all covers are closed.	Error SVC 6F appears.	Go to step 3.	Done.
3. Try installing a new drum without entering the Control Panel replacement procedure as a test.	Error SVC 6F appears.	Reinstall old drum and go to step 4.	Print Maintenance Report. If Drum Unit Usage is over 100%, caution the customer on replacing consumables. Set the Drum usage counter to 0 (Menu.Maintenance.Replace).
4. Try installing a new transfer unit without entering the control panel replacement procedure.	An Error SVC 6F appears.	Reinstall old transfer unit and go to step 5.	Print Maintenance Report. If Drum Unit Usage is over 100%, caution the customer on replacing consumables. Set the Drum usage counter to 0 (Menu.Maintenance.Replace).
5. Check the ground connection below the transfer guide unit.	Ground connection is good.	Go to step 6.	Clean ground connection. Verify repairs. If error SVC 6F still appears, go to step 6.
6. Check that the spring loaded grounding clips are contacting the transfer corona frame.	Grounding clips are contacting the frame.	Go to step 7.	Retension clips. Verify repairs. If error SVC 6F still appears, go to step 7.
7. Remove the drum unit. Check the precharger high voltage contact spring located on the inside rear wall of the printer.	The high voltage contact spring making good contact.	Go to step 8.	Retension the spring. Verify repairs. If error SVC 6F still appears, go to step 8.

Instruction	Indication	Yes	No
8. Check for pinched wires, cables, and damaged connectors on the following: • +HV and ACH to the transfer unit • -HV to the drum unit • VB to the developing unit • between CN3 on LVPS PCB and the CNDC on HVPS PCB • between CN16 on the mechanism controller PCB and CN1 on HVPS PCB See Figure 5-48 on page 5-59.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 6F still appears, go to step 9.	Go to step 9.
9. . Activate the HVPS by from the Charge menu (EngMaint.UnitTest.Print.Charge). Use any of the menu choices.	SVC 6F alarm appears.	Replace HVPS PCB. Verify repairs by activating the HVPS from the Charge menu (EngMaint.UnitTest.Print.Charge). Use any of the menu choices. If error SVC 6F still appears, replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

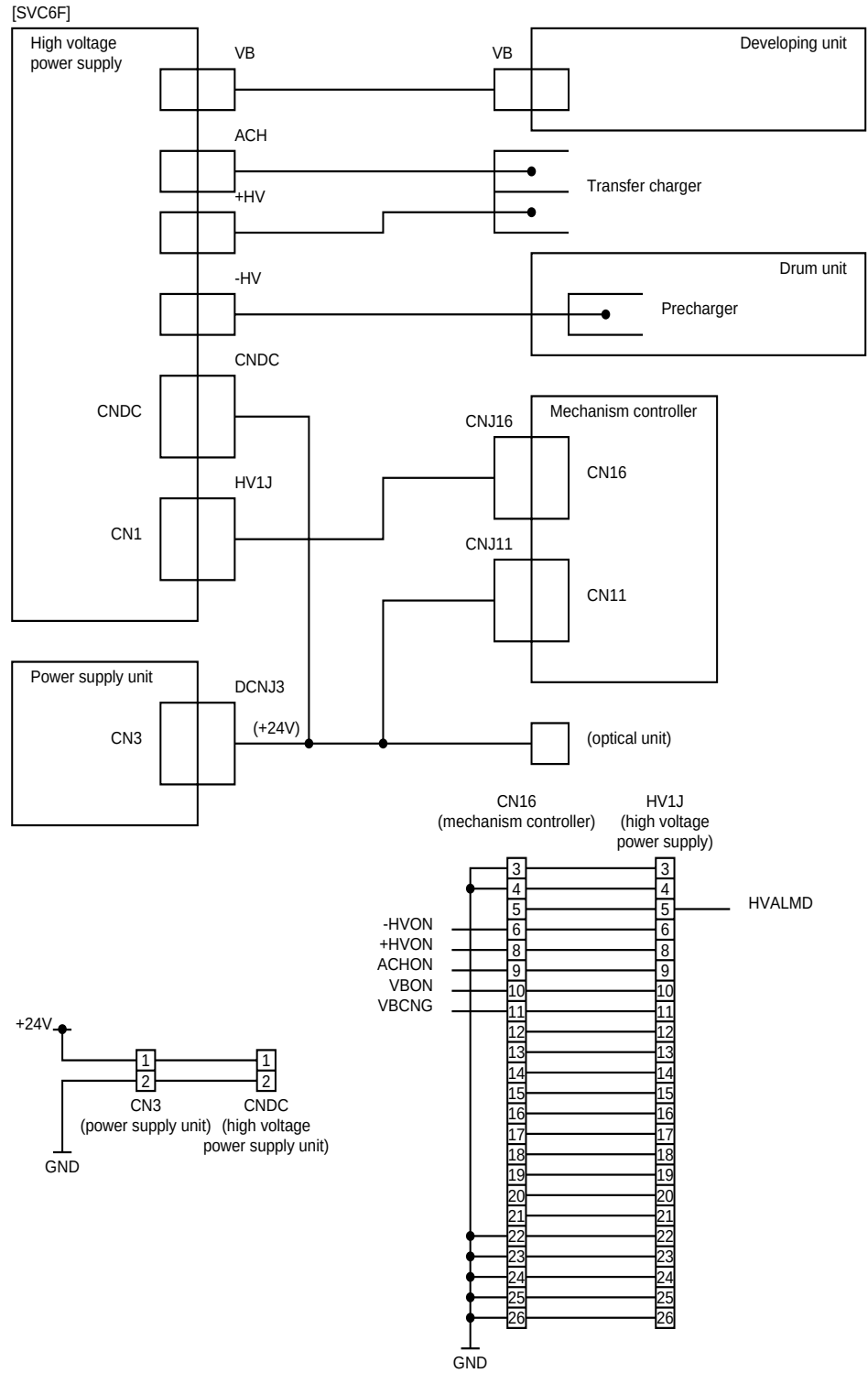


Figure 4-19 High Voltage Power Alarm (SVC 6F) Interconnections Diagram

4-9.20 SVC 79 Spindle Motor Alarm

Explanation

Mechanism controller detected that the spindle motor in the optical unit did not start normally within 8 seconds after the spindle was turned on. The optical unit's spindle motor speed varied from the specification by more than 5%.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the top cover. Turn on the printer. Verify all covers are closed. Check whether the spindle motor is rotating. Listen carefully for a high-pitched sweeping sound from the optical unit at the printer power on.	The spindle motor rotates with a high-pitched sweeping sound.	Go to step 2.	Replace optical unit. Verify repairs. If error SVC 79 still appears, replace mechanism controller board. ^a
2.Turn on the printer. Verify all covers are closed. Note when this alarm occurs.	An error SVC 79 appears three seconds or longer after the main motor started rotating	Go to step 3.	Replace mechanism controller board. ^a
3.Run Test Print (Test.TestPrint).	Just before error SVC 79 appears the printouts are distorted or elongated.	Replace optical unit. Verify repairs. If error SVC 79 still appears, replace mechanism controller board. ^a	Go to step 4.
4.Check for pinched wires, cables, and damaged connectors between: • CN15 on the mechanism controller board and CN2 on the optical unit • between CN11 on the mechanism controller board and CN4 on the optical unit See Figure 5-45 on page 5-52 .	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Go to step 5.	Go to step 5.
5.Run Test Print (Test.TestPrint).	An error SVC 79 appears.	Replace optical unit. Verify repairs. If error SVC 79 still appears, replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

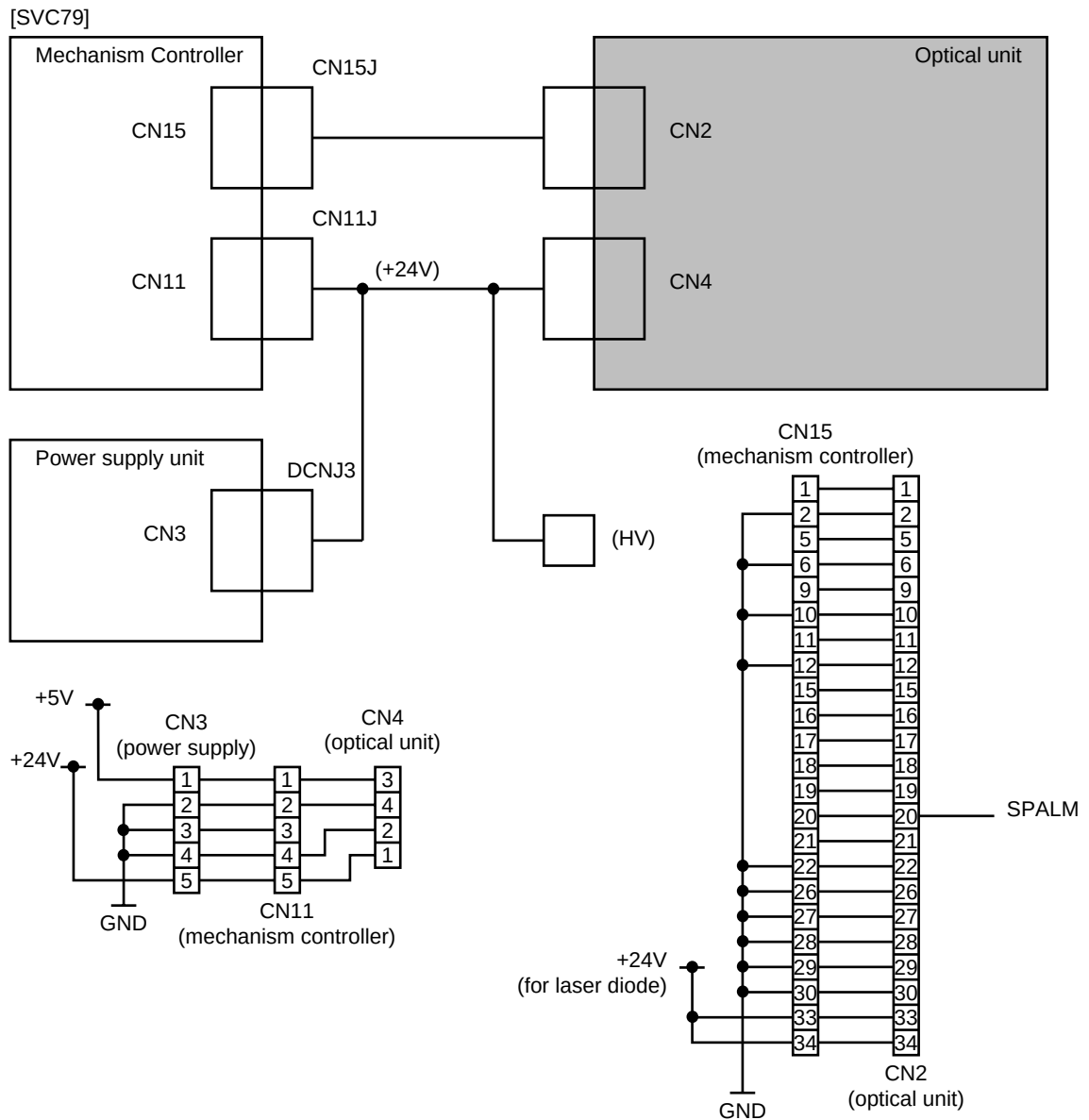


Figure 4-20 Spindle Motor Alarm (SVC 79) Interconnections Diagram

4-9.21 SVC 7A BD1 (Beam Detection) Alarm

SVC 7B BD2 (Beam Detection) Alarm

SVC 7C Beam Detection High-speed Alarm

SVC 7D Beam Detection Low-speed Alarm

SVC 7E Laser Diode (LD) Alarm

Description

- **SVC 7A:** The mechanism controller detected that the BDCAT (BD catch) was not ON 50ms or later after the LDENB (laser diode enable) signal was turned on.
- **SVC 7B:** The mechanism controller detected that beam detection (BD) cycle time varied from the specification by more than 1% over a period of 50 ms within 7 seconds after the LDENB (laser diode enable) signal was turned on.
- **SVC 7C:** The BD cycle time is checked every scan. The mechanism controller detected that the beam detection (BD) cycle time falls below the specified value by 4% or more. This can be caused by arching in any unit driven by the high voltage supply (such as the drum, transfer corona, and developer unit) creating noise on a high voltage line (See Alert Bulletin # 25).
- **SVC 7D:** The BD cycle time is checked every scan. The mechanism controller detected that the BD cycle time is 4% of the specified value or less.
- **SVC 7E:** The BD signal from the second laser diode was not detected by the optical unit and reported to the mechanical controller.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Remove, clean, and examine the drum. Examine for evidence of arching.	Damage due to arching.	Repair or replace damaged part. Verify repairs. If error SVC error still appears, go to step 2.	If error SVC error still appears, go to step 2.
1. Remove the rear cover. Check for pinched wires, cables, and damaged connectors between: • CN11 on the mechanism controller board and CN4 on the optical unit. Especially for the pin 5 (third pin up from bottom right) of the connector CN11 on the mechanism controller. (+24V for the spindle motor) • CN15 on the mechanism controller board and CN2 on the optical unit. Especially for pin 33 and pin 34 (top left and right pin) of the connector CN15 on the mechanism controller. (+24V for the laser diode) See Figure 5-45 on page 5-52 .	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Go to step 3.	Go to step 3.

Instruction	Indication	Yes	No
2.Run Test Print (Test.TestPrint).	The same SVC error appears.	Perform the following steps one at a time, checking if the same SVC xx error appears after each step: a. Clean the transfer charger and the transfer unit guide. (Scattered developer or foreign particles may cause the high voltage leakage at the transfer charger. The mechanism controller may mis-detect the alarm by the electric noise of the leakage). a. Remove, clean, and examine the developer unit. Examine for evidence of arching. b. Replace optical unit. c. Replace mechanism controller board.	Done

Reference Diagrams

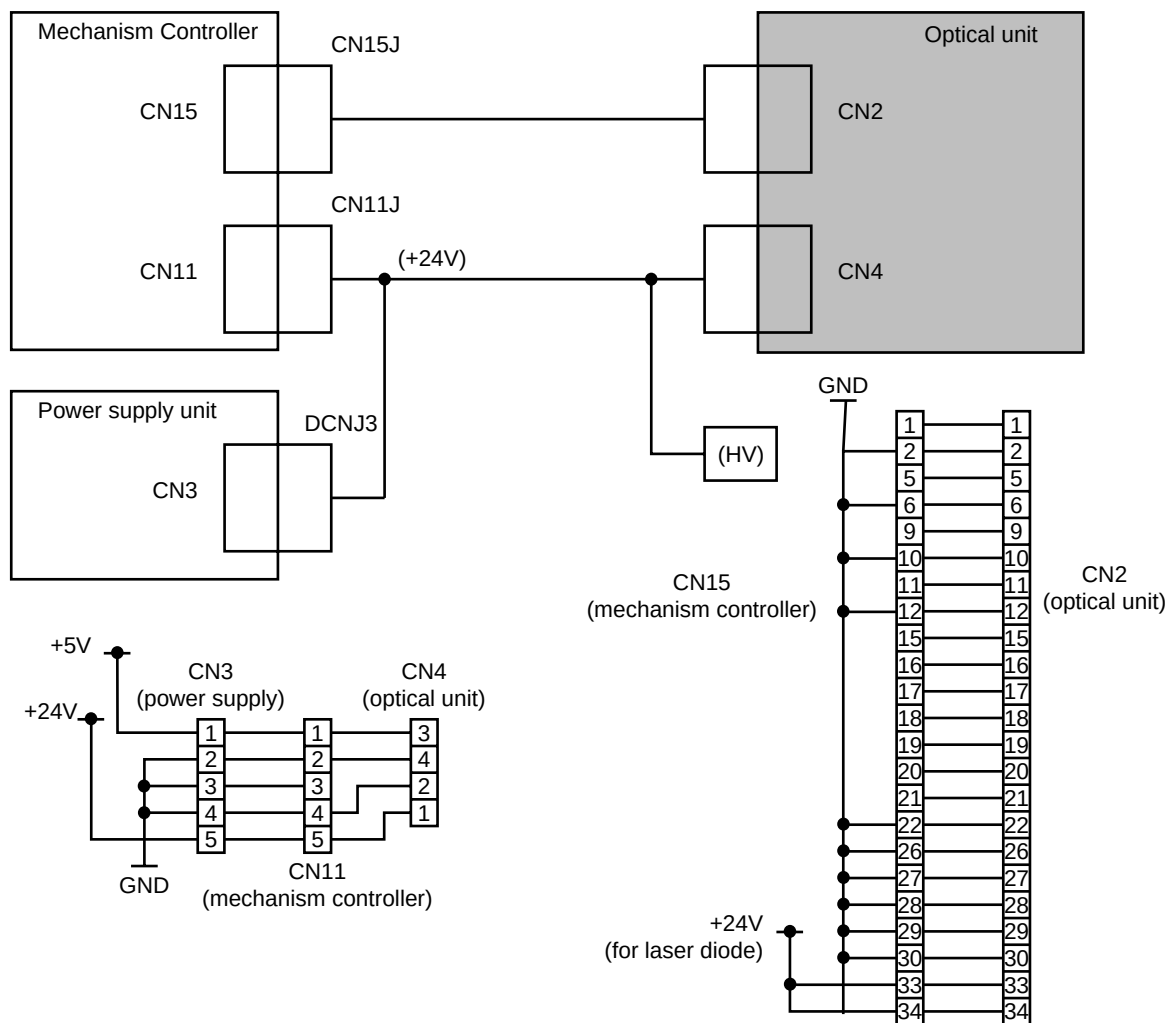


Figure 4-21 SVC 7A/7B/7C/7D/7E Interconnections Diagram

4-9.22 SVC A0 In-Frame Fan Alarm 1

Explanation

The mechanism controller detected that fan 1 is not operating. Fan 1 is the cooling fan in the optical unit, not visible from outside of the unit

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove the rear cover, then check the pin 5 and pin 6 (two pins on right) of the connector CN11 on the mechanism controller board when the printer power is on (before the alarm occurs). See Figure 5-45 on page 5-52 .	The voltage is 24V $\pm 10\%$ for both pins.	Go to step 2.	Replace mechanism controller board. ^a Verify repairs. If SVC A0 appears, replace the power supply unit.
2.Remove the top cover and controller. Check for pinched wires, cables, and damaged connectors between CN22 on the mechanism controller and FAN1P near at the optical unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC A0 still appears, replace the optical unit. (The fan 1 is in the optical unit, and it can not be replaced individually.)	Replace optical unit. (The fan 1 is in the optical unit, and it can not be replaced individually.) Verify repairs. If SVC A0 appears, replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

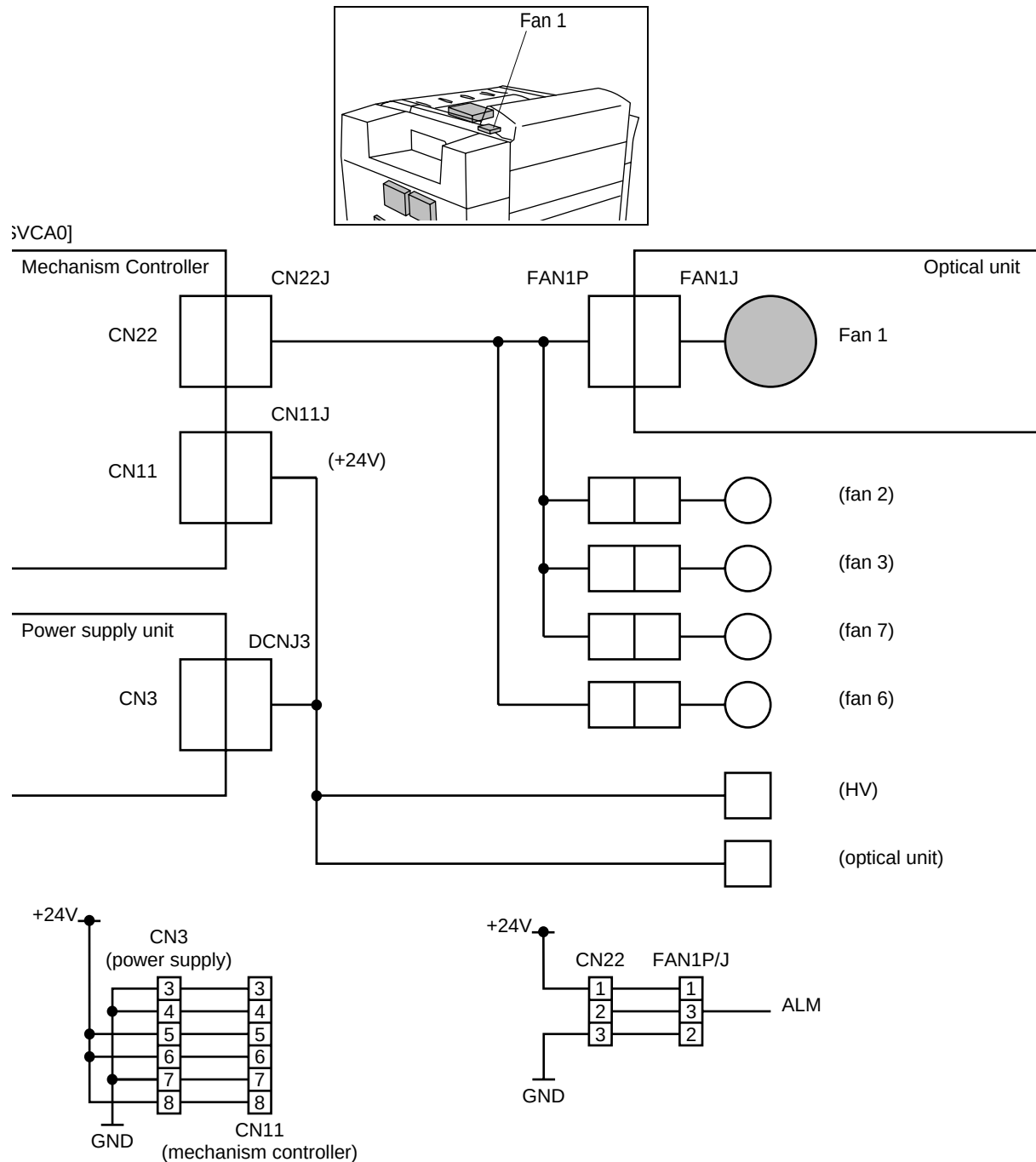


Figure 4-22 Fan Alarm (SVC A0) Interconnections Diagram

4-9.23 SVC A1 Fan Alarm 2

SVC A2 Fan Alarm 3

SVC A5 Fan Alarm 6

SVC A6 Fan Alarm 7

Explanation

- **SVC A1:** The mechanism controller detected that fan 2 is not operating. Fan 2 is the internal cooling fan at upper left of the rear side of the printer.
- **SVC A2:** The mechanism controller detected that fan 3 is not operating. Fan 3 is the small cooling fan for drive M unit at the rear side of the printer. Fan 3 is present in early serial number printers only; it was removed and is not present on later printers.
- **SVC A5:** The mechanism controller detected that fan 6 is not operating. Fan 6 is located on the cover of main controller board.
- **SVC A6:** The mechanism controller has detected that fan 7 is not operating. Fan 7 is the internal cooling fan at lower left of the rear side of the printer.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn on the printer. Verify all covers are closed except rear and top covers.	The fan is rotating.	Go to step 2.	Free the fan from anything preventing rotation. If nothing is preventing the fan from rotating, go to step 3.
2. Check for pinched wires, cables, and damaged connectors between CN22 on the mechanism controller board and FAN2P/3P/6P/7P near at the optical unit. Especially for the pin 3 of the connector FAN2P/3P/6P/7P (alarm signal). See Figure 5-45 on page 5-52 and Figure 3-6 on page 3-26 .	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If the same SVC xx error appears, replace mechanism controller board. ^a	Replace mechanism controller board. ^a Verify repairs. If the same SVC xx error appears, replace problem fan.
3. Check for pinched wires, cables, and damaged connectors between CN22 on the mechanism controller board and FAN2P/3P/6P/7P near the fan. Check the voltage between pin 1 and pin 2 of the connector FAN2P/3P/6P/7P.	Wires, cables, and connectors are good. Voltage is approximately 24V.	Replace FAN2/3/6/7.	Repair or replace damaged part. Verify repairs. If the same SVC xx error appears, replace problem fan.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

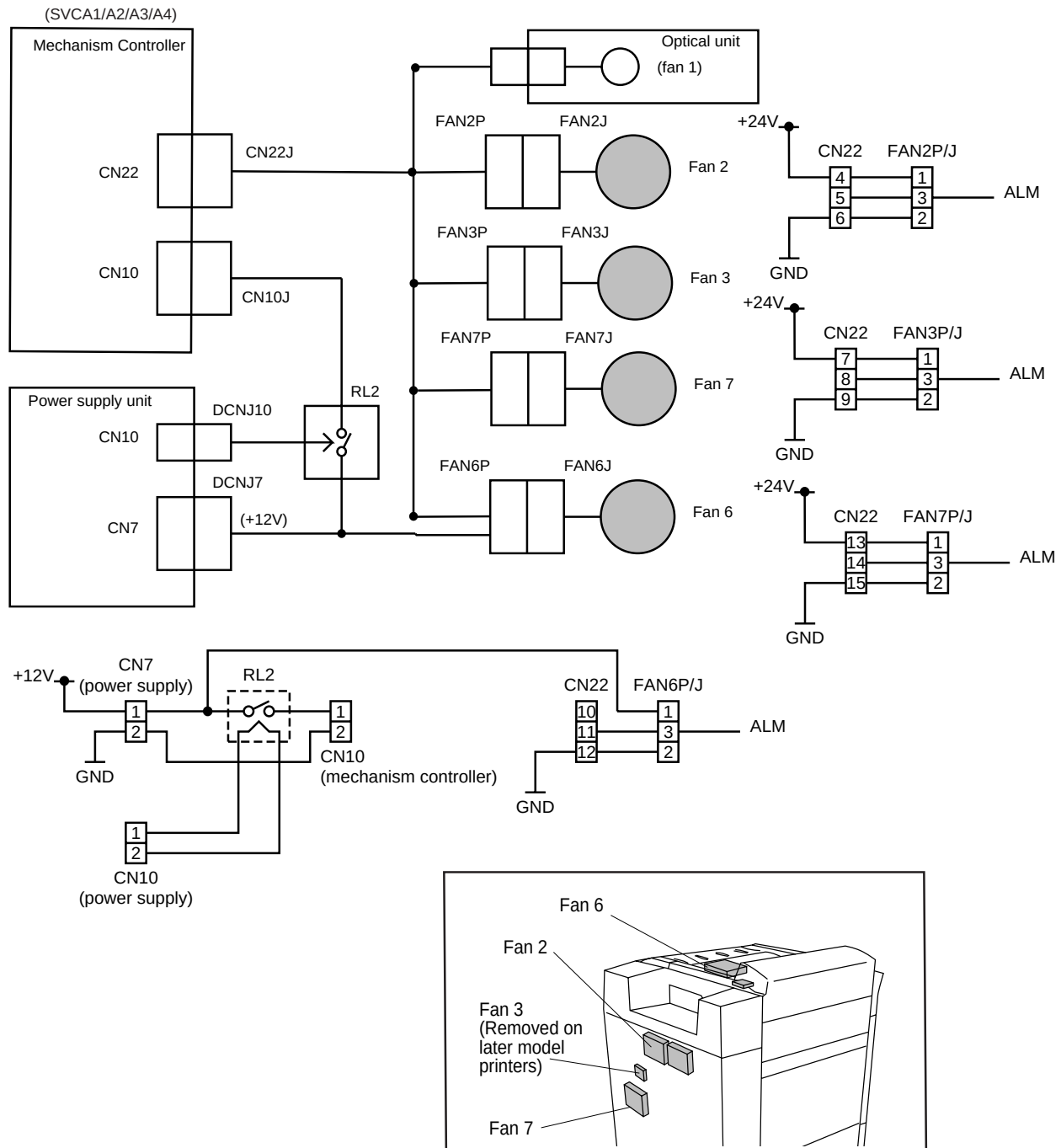


Figure 4-23 Fan Alarm 2/3/6/7 (SVC A1/A2/A5/A6) Interconnections Diagram

4-9.24 SVC B0 Watchdog Timer Alarm

SVC B1 Watchdog Timer Alarm

SVC B3 Mechanism Controller Communication Alarm

Description

- **SVC B0/B1:** The mechanism controller has detected an overrun of its master CPU (SVC B0) or slave CPU (SVC B1). This alarm occurs if the watchdog timer count is not reset from the master CPU within 94.8 ms.
- **SVC B3:** The mechanism controller detected that communication is disabled between its master and the slave CPUs. This alarm can be generated by the serial interface bit check, the mutual hardware check, or the time-out of the master/slave communications on the mechanism controller board.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn off the printer, then turn on the printer. Verify all covers are closed.	An error SVC B0/B1/B3 appears.	Replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

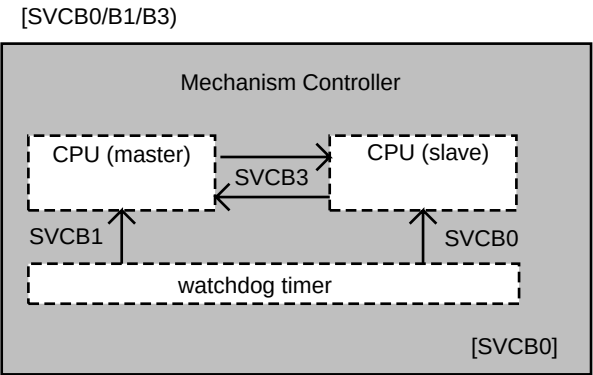


Figure 4-24 SVC B0/SVC B1/SVC B3 Interconnections Diagram

4-9.25 SVC B4 EEPROM Alarm

Description

The mechanism controller detected one of the following:

- an alarm is detected by the NVRAM initialization check at power-on
- data cannot be written to NVRAM (EEPROM) on the mechanism controller
- after data is sent from the master CPU to NVRAM, acknowledgment is not returned

Note: If the NVRAM chip is replaced, the total page count on the printer, the consumable usage count, and the electronic paper alignment values are reset to zero. For this reason, all consumables need to be replaced and the Paper Feed Alignment procedure performed (see [5-3.4 on page 5-12](#)).

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn off printer, then turn on the printer. Verify all covers are closed.	An error SVC B4 appears.	Go to step 2.	Done
2. Turn the printer off. Take the NVRAM from new mechanism controller board and install it on the printer's mechanism controller board. Turn the printer on again. Verify all covers are closed.	An error SVC B4 appears.	Replace mechanism controller board. ^a Replace all the consumables, especially the developer. Perform the Paper Feed Alignment procedure (see 5-3.4 on page 5-12).	Replace all the consumables, especially the developer mixture. Perform the Paper Feed Alignment procedure (see 5-3.4 on page 5-12).

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

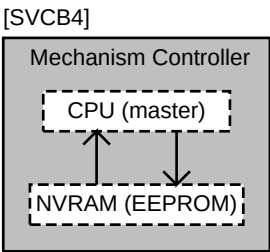


Figure 4-25 EEPROM Alarm (SVC B4) Interconnections Diagram

4-9.26 SVC B5 Video Synchronous (VS) Alarm

Explanation

The mechanism controller detected that the VS (video synchronous) signal from the main controller was not received within 10 seconds after issuing the VR (video request) signal.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn off printer, then turn on the printer. Verify all covers are closed.	An error SVC B5 appears.	Go to step 2.	Done
2. Turn the printer off, Remove the rear cover and the top cover, then check for pinched wires, cables, and damaged connectors between CN14 on the mechanism controller and CN2 on the main controller.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC B5 still appears, go to step 3.	Go to step 3.
3. Replace main controller. Verify that the latest function code and diagnostics are installed in the main controller flash by printing the Setup Report (function code) and going to the diagnostics (see Chapter 3). Note that the printer control panel locks up when attempting to enter the diagnostics when the diagnostics are not loaded.	An error SVC B5 appears.	Replace mechanism controller board. ^a Verify repairs. If error SVC B5/B7 still appears, replace the power supply.	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

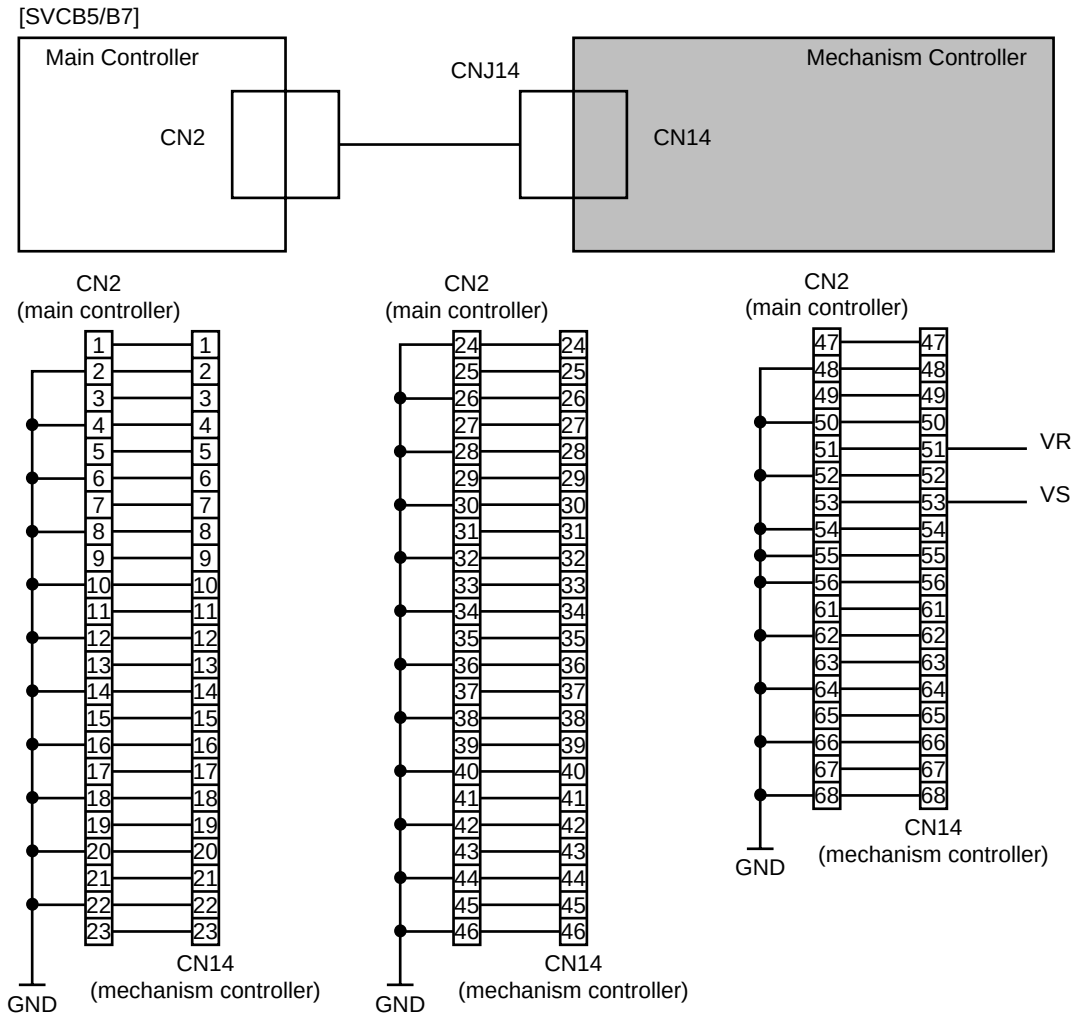


Figure 4-26 SVC B5 Interconnections Diagram

4-9.27 SVC B6 Pre-pick Alarm

Explanation

The mechanism controller failed to receive any of the following commands from the main controller within 20 seconds after receiving the PREPK (prepick) command:

- PSTRT (print start) command I
- TSTRT (test print start) command

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn off printer, then turn on the printer. Verify all covers are closed.	An error SVC B6 appears.	Go to step 2.	Done
2. Replace main controller board. Verify that the latest function code and diagnostics are installed in the main controller flash by printing the Setup Report (function code) and going to the diagnostics (see Chapter 3). The printer control panel locks up when attempting to enter the diagnostics when the diagnostics are not present.	An error SVC B6 appears.	Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

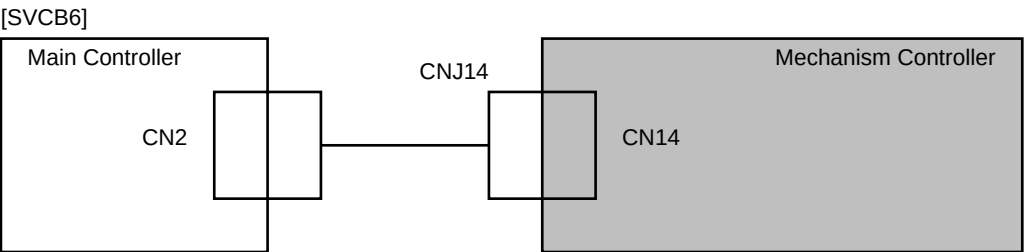


Figure 4-27 Pre-pick Alarm (SVC B6) Interconnections Diagram

4-9.28 SVC B7 Video Request (VR) Alarm

Explanation

The mechanism controller has not issued the VR (video request) signal within 40 seconds of receiving the PSTRT (print start) command or TSTRT (test print start) command. This error may occur if the low voltage power supply is defective.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn off printer, then turn on the printer. Verify all covers are closed.	An error SVC B7 appears.	Go to step 2.	Done
2. Turn the printer off, Remove the rear cover and the top cover, then check for pinched wires, cables, and damaged connectors between CN14 on the mechanism controller and CN2 on the main controller.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC B7 still appears, go to step 3.	Go to step 3.
3. Replace main controller. Verify that the latest function code and diagnostics are installed in the main controller flash by printing the Setup Report (function code) and going to the diagnostics (see Chapter 3). Note that the printer control panel locks up when attempting to enter the diagnostics when the diagnostics are not loaded.	An error SVC B7 appears.	Replace mechanism controller board. ^a Verify repairs. If error SVC B7 still appears, replace the power supply.	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

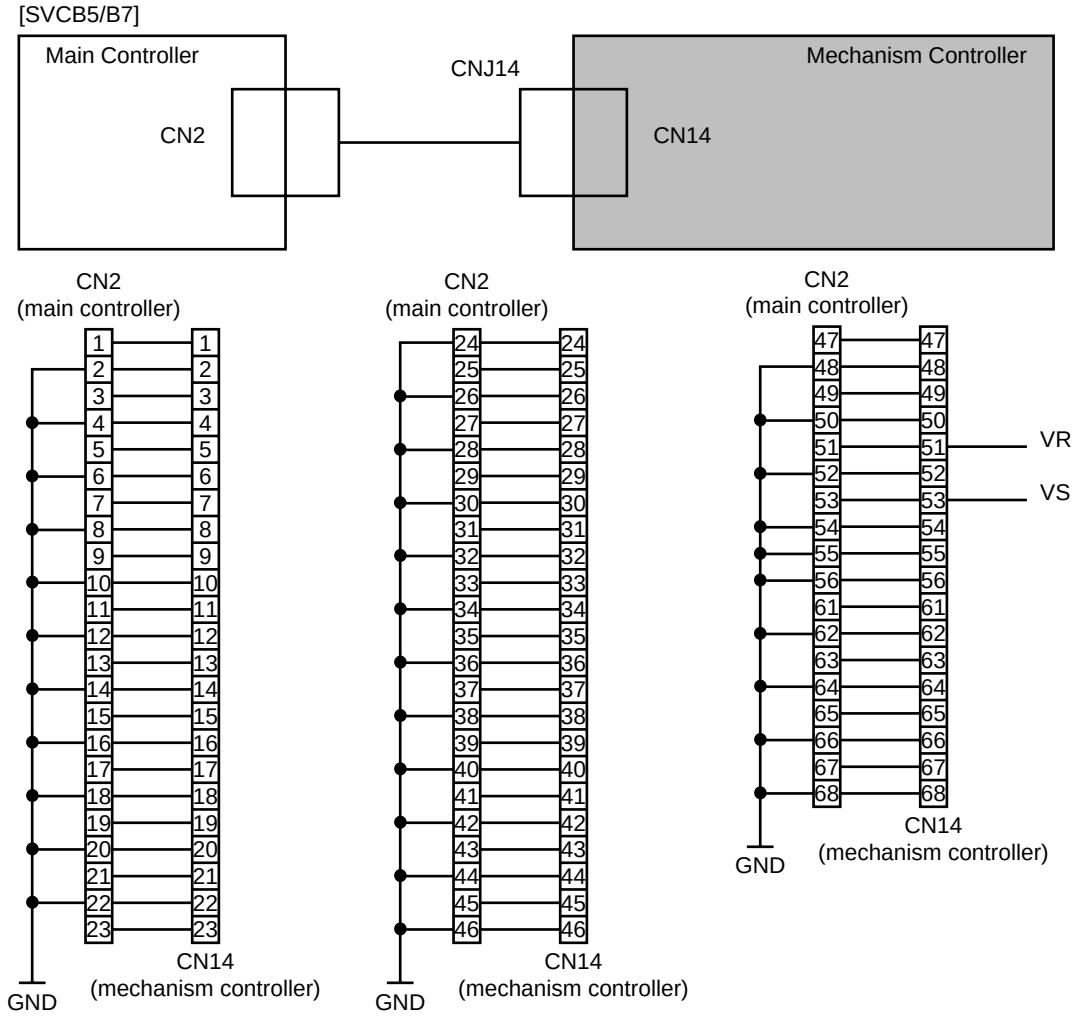


Figure 4-28 SVC B7 Interconnections Diagram

4-9.29 SVC C4 HCI Elevator Descent Alarm SVC C5 HCI Paper Level Check

See [D-4.1 "SVC C4 HCI Elevator Descent Alarm,"](#) on page D-8.

See ["SVC C5 HCI Paper Level Check,"](#) on page D-8.

4-9.30 SVC D8 HCO Stacker Alarm

For 2,000 Sheet HCO, see [C-6.1 "SVC D8 HCO Stacker Alarm,"](#) on page C-19.

For 3,000 Sheet HCO, see [B-4.2 "SVC D8 HCO Stacker Alarm,"](#) on page B-14.

4-10 JAMxx Error Messages

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4-10.1 Introduction

All JAMxx errors are due to sensor timing; either the paper arrived at or left a paper sensor too early or too late. Paper jam timing is based on the size of paper loaded in the paper source. In the D640 printer, there are no sensors to detect the size of paper installed in any paper source. Paper size is specified manually by the operator from the control panel (PapSize). If the paper size specified does not match the size in the paper source, the printer jams due to incorrect sensor timing creating a "Fusing Unit Jam 1" message.

4-10.2 Paper Jam Sensors

There are 12 paper jam sensors

- 9 on the printer
- one on the HCI
- two on the HCO

See [Figure 4-1](#) for paper jam sensor locations.

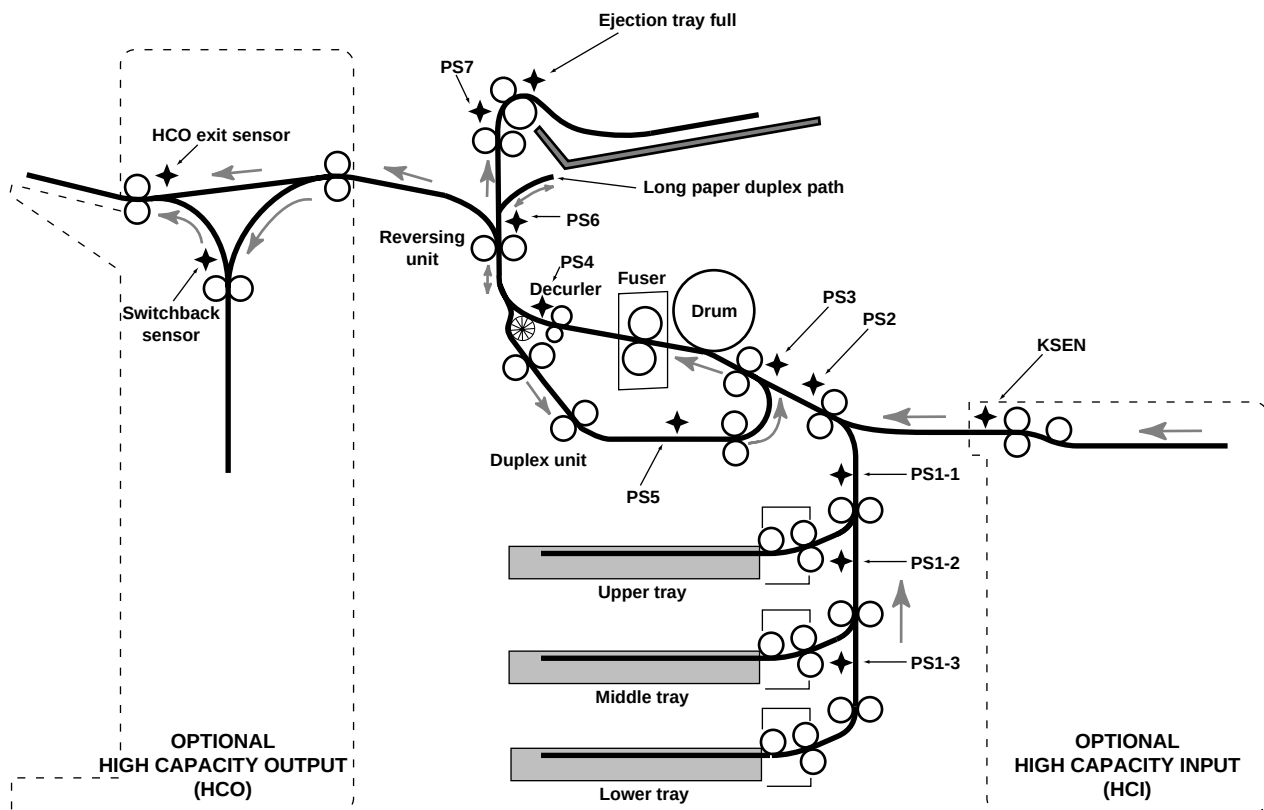


Figure 4-1 Paper Jam Sensor Locations

4-10.3 Paper Jam Analysis

When analyzing paper jams, you can divide them in to two basic types:

- Paper jams that occur at power up or are posted to the operator panel when no paper is present in the printer
- Paper jams that occur intermittently when paper is moving through the printer

To determine which type of jam is occurring, you must first analyze the Maintenance Report Error Logs. See [4-4.1 "Analyzing the Event Log," on page 4-11](#) for a description of the Maintenance Report Error Log and how to isolate the root cause of the paper jam. Once you have isolated the real jam, follow one of the procedures below before going to the detailed paper jam troubleshooting procedures in "5-3 JAMxx Message Problems."

4-10.4 Paper Jam at Power Up

When paper jams occur while powering up the printer, the jam is probably caused by a blocked or defective sensor. To correct these problems, perform the following:

Instruction	Indication	Yes	No
1. Check for paper at the identified paper sensor.	Paper or paper fragments in the area of the sensor.	Remove all paper. Verify repairs. If error still appears, go to step 2.	Go to step 2.
2. Go to the Paper Feed/Print/Eject Sensors Screen (EngMaint.Sensors.PAPER FEED/PRINT/EJECT) and check for a defective sensor.	Sensor indicates paper when no paper is present.	Replace sensor. Verify repairs. If error still appears, go to the specific error in "5-3 JAMxx Message Problems" and follow the troubleshooting procedure.	Go to the specific error in "5-3 JAMxx Message Problems" and follow the troubleshooting procedure.

4-10.5 Intermittent Paper Jams

Intermittent paper jams can be difficult to identify and resolve.

Step 1 Check that the media size displayed on the control panel matches that physically present in the input source. This is especially important If you have Fusing Unit Jam 1 errors.

Paper jam timing is based on the size of paper loaded in the paper source. In the D640 printer, there are no sensors to detect the size of paper installed in any paper source. Paper size is specified manually by the operator from the control panel (PapSize). If the paper size specified does not match the size in the paper source, the printer will jam due to incorrect sensor timing.

Step 2 Print the Maintenance Report and analyze the errors present to determine the type and frequency of the paper jam.

Typically, there are groups of errors that have occurred at the same page count. The first error logged is the cause of the jam; the secondary errors logged at the same page count are attributed to the operator not clearing all the paper from the paper path and closing the door, at which time the printer will log an additional error log entry.

Group all errors that occur at the same page count within the last few days and highlight the first error that occurs within each group.

These highlighted errors are the ones you need to troubleshoot. See [4-4.1 "Analyzing the Event Log," on page 4-11](#) for additional information.

- Step 3** Before attempting to duplicate any paper jam condition:
- a** Configure the desired paper input (Menu.Printing.input) and output (Menu.Printing.output) in the Printing menu.
 - b** Set the number of pages printed when running Test Print (Test.TESTPRINT) from the Maintenance menu (Menu.Maintenance.testpages). The default is 30 pages of a ripple print pattern.
- Step 4** Check for proper printer installation.
- Improper installation causes and contributes to paper jams (see [4-5 "Verifying Proper Installation," on page 4-13](#)).
- Step 5** Verify that the paper meets the printer specifications (see the "Using Paper" appendix in the *HP5000 D640 Cut Sheet Printer User Manual*). If you are unsure about the paper, try different paper. If there are more than one D640 printers on site using the exact same paper and only one is having problems, you can assume it is not a paper problem.
- Step 6** Check whether the environment, both for the printer and the paper itself, meets standards (especially for humidity).
- Step 7** Check that the paper is loaded properly. Paper should be loaded so that the arrow on the ream label (print this side first) is pointing down in all paper trays and up when loaded in the High Capacity Input. Load new paper properly and attempt to duplicate the problem.
- Step 8** If a particular input tray or the HCI is suspected, try to feed from a different paper input source.
- Step 9** If the optional High Capacity Output is suspected:
- a** Try Face Up Output (versus Face Down) to eliminate the Switchback area of the HCO.
 - b** Verify paper can be sent to the top printer output successfully, eliminating the HCO.
- Step 10** Check whether the rollers and the paper guides near the jam are clean (especially for scattered toner or developer, accumulated paper powder, and paper pieces).
- Step 11** Check whether the actuator of the paper sensor regarding the jam can be actuated smoothly, and is not bent or locked.

If these steps don't resolve the problem, go to the troubleshooting procedures.

4-10.6 List of Jam Codes and Definitions

Control Panel Message	Jam Code	Definition
Tray 1 pick error	01	- Leading edge of the media did not reach PS1-1 within 765 ms after pick rollers started (caused by slipping feed rollers). - Leading edge of the media reached PS1-1 faster than 310 ms after pick rollers started (caused by double pick).
Tray 2 pick error	02	- Leading edge of the media did not reach PS1-2 within 765 ms after pick rollers started (caused by slipping feed rollers). - Leading edge of the media reached PS1-2 faster than 310 ms after pick rollers started (caused by double pick).
Tray 3 pick error	03	- Leading edge of the media did not reach PS1-3 within 765 ms after pick rollers started (caused by slipping feed rollers). - Leading edge of the media reached PS1-3 faster than 310 ms after pick rollers started (caused by double pick).
Feed path jam 1	11	Time lapse between the leading edge of the media triggering PS1-1 and PS2 was longer than 220 ms.
Feed path jam 2	12	Time lapse between the leading edge of the media activating PS1-2 and PS2 was longer than 420 ms.
Feed path jam 3	13	Time lapse between the leading edge of the media activating PS1-3 and PS2 was longer than 620 ms.
Feed path jam 4	18	Time lapse between the leading edge of the media activating PS2 and PS3 was longer than 150 ms.
Fusing unit jam 1	21	Time lapse between the registration roller turning on and the trailing edge of the media activating PS2 was too short for expected media size (paper length check).
	22	No media was present when registration roller clutch turned on.
	25	More than 1395 ms elapsed in the time between the registration roller clutch turning on and the leading edge of media activating PS4.
Fusing unit jam 2	26	Time lapse between the leading edge of media activating PS4 and the trailing edge activating PS4 was too long for expected media size.
Ejection unit jam 1	29	Time lapse between the leading edge of media activating PS4 and PS7 was longer than 2030 ms.
Ejection unit jam 2	2B	Time lapse between the leading edge of the media activating PS7 and the trailing edge activating PS7 was too long for expected media size.
Duplex path jam 1	31	Time lapse between the reversing unit motor reversal and the leading edge of the media activating P5 was longer than 480 ms.
Duplex path jam 2	32	- Time lapse between the leading edge of the media activating PS5 and PS3 was longer than 430 ms. - Time lapse between the duplex motor turning on and the leading edge of media activating P3 was longer than 265 ms.
HCO jam 1	41	- When the printer was reset, there was media present at the HCO switchback sensor or exit sensor. - HCO switchback sensor or exit sensor did not see media when expected. Paper jam could be in HCO or in printer.
HCI jam 1	51	Time lapse between HCI pick roller starting and the leading edge of the media activating KSEN was longer than 300 ms.
HCI jam 2	52	KSEN remained activated longer than 655 ms.

4-10.7 Paper Path Status Messages

The following table lists the status messages that appear at the control panel when a jam has not been completely cleared by the operator. These status messages do not appear in the error log because they are not the original cause of the printer problem.

Control Panel Status Message	Definition
Paper at Tray1 area	When the printer was reset, media was present at PS1-1.
Paper at Tray2 area	When the printer was reset, media was present at PS1-2.
Paper at Tray3 area	When the printer was reset, media was present at PS1-3.
Paper at feed path Knob 1	When the printer was reset, media was present at PS2.
Paper at feed path Knob 2	When the printer was reset, media was present at PS3.
Paper at fusing area	When the printer was reset, media was present at PS4.
Paper at ejection area	When the printer was reset, media was present at PS7.
Paper at duplex area	When the printer was reset, media was present at PS5.
Paper at HCI area	When the printer was reset, media was present at KSEN.

4-10.8 JAM01 Tray 1 Pick Error JAM02 Tray 2 Pick Error JAM03 Tray 3 Pick Error

Description

One of the following occurred:

- Leading edge of the media did not reach PS1-1/2/3 within 765 ms after pick rollers started (caused by slipping feed rollers)
- Leading edge of the media reached PS1-1/2/3 faster than 310 ms after pick rollers started (caused by double pick)

where

- JAM01 = PS1-1
- JAM02 = PS1-2
- JAM03 = PS1-3

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM01/02/03 error appears.	Go to step 2.	Done.
2. Check if the lower right cover is completely closed.	Lower right cover is completely closed.	Go to step 3.	Close the cover completely. Verify repairs. If error JAM01/02/03 still appears, go to step 3.
3. Replace tray with known good tray. Perform the Print Test (Test.TESTPRINT).	A JAM01/02/03 error appears.	Go to step 4.	Replace the tray. Verify repairs. If error JAM01/02/03 still appears, go to step 4.
4. Check for the following: • The pick roller is physically damaged. • The pick roller has reached its end-of-life limit. • Blockage at the pick roller unit. • Pick unit coming off. • Drive belt coming off or twisted. • Blockage at the feed unit. • The feed unit is physically damaged.	Damage, blockage or incorrectly mounted part.	Repair or replace part. Verify repairs. If error JAM01/02/03 still appears, go to step 5.	Go to step 5.
5. Remove the tray. Go to the Trays Sensors menu (EngMaint.Sensors.TRAYS). Lift and lower the pick unit while observing screen.	Trays Sensors menu field changes between up and down correctly.	Go to step 6.	Replace the paper level sensor PLS1/PLS2/PLS3. Verify repairs. If error JAM01/02/03 still appears, go to step 6.

Instruction	Indication	Yes	No
6. Open the lower right cover. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/Print/Eject). Insert a piece of paper into the actuator of PS1-1/PS1-2/PS1-3. WARNING: The actuator of these sensors may easily be damaged by touching it from top to bottom or perpendicular to the paper feeding direction.	The PAPER FEED field (FS11/FS12/FS13) changes between paper and blank correctly.	Go to step 7.	Replace the sensor PS1-1 or PS1-2 or PS1-3. Verify repairs. If error JAM01/02/03 still appears, go to step 7.
7. Check for pinched wires, cables and damaged connectors: • JAM01: Check between CN2 on the mechanism controller PCB and the sensor PS1-1 and PLS1 on the upper feed unit. • JAM02: Check between CN3 on the mechanism controller PCB and the sensor PS1-2 and PLS2 on the middle feed unit. • JAM03: Check between CN4 on the mechanism controller PCB and the sensor PS1-3 and PLS3 on the lower feed unit.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error JAM01/02/03 still appears, go to step 8.	Go to step 8.
8. Remove the tray. Go to the Paper Input menu (EngMaint.UnitTest.Input.Pick) and choose the appropriate tray to activate the pick motor. Observe the pick motor.	The pick motor rotates.	Go to step 9.	Replace the feed unit. Verify repairs. If error JAM01/02/03 still appears, go to step 9.
9. Open the lower-right cover and set interlock switch. Go to the Paper Input menu (EngMaint.UnitTest.Input.Feed) and choose any speed to activate the feed motor. Observe the feed motor.	The feed motor rotates.	Replace mechanism controller board. ^a	Replace the feed unit. Verify repairs. If error JAM01/02/03 still appears, replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

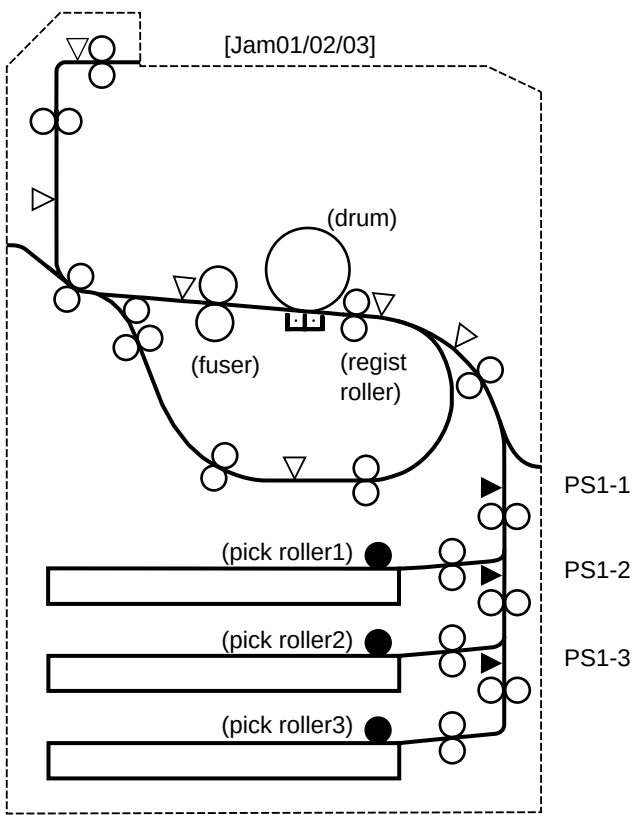


Figure 4-2 Pick Error (JAM01/02/03) Sensor Locations

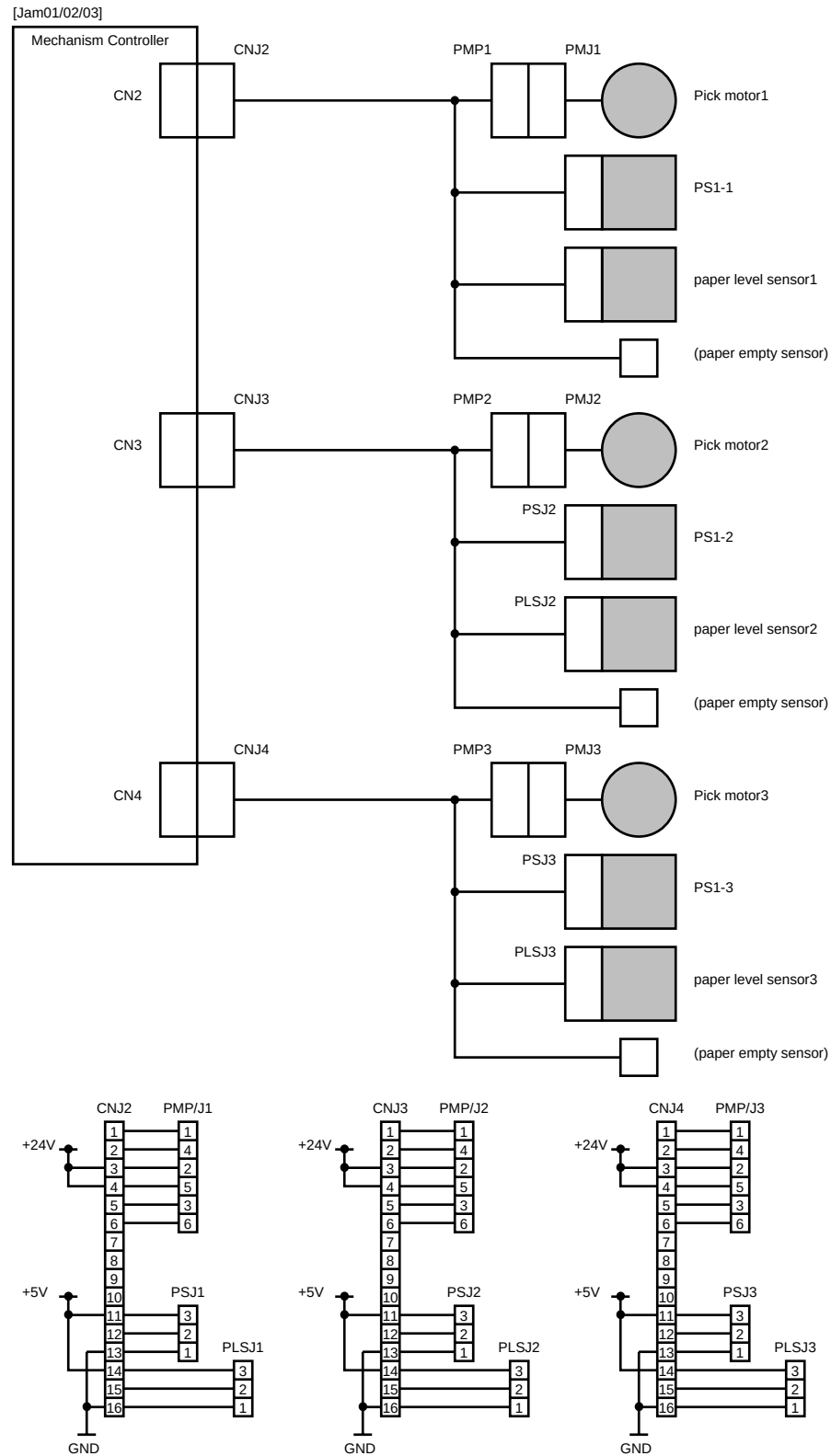


Figure 4-3 Pick Error (JAM01/02/03) Interconnections Diagram

4-10.9 JAM11 Feed Path Jam 1 JAM12 Feed Path Jam 2 JAM13 Feed Path Jam 3

Description

JAM11: One of the following occurred:

- When the printer was reset, media was present at PS1-1
- Time lapse between the leading edge of the media triggering PS1-1 and PS2 was longer than 220 ms

JAM12: One of the following occurred:

- When the printer was reset, media was present at PS1-2
- Time lapse between the leading edge of the media activating PS1-2 and PS2 was longer than 420 ms

JAM13: One of the following occurred:

- When the printer was reset, media was present at PS1-3
- Time lapse between the leading edge of the media activating PS1-3 and PS2 was longer than 620 ms

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM11/12/13 error appears.	Go to step 2.	Done.
2. Open the lower right cover. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS1-1 or PS1-2 or PS1-3. WARNING: The actuator of these sensors may easily be damaged by touching it from top to bottom or perpendicular to the paper feeding direction.	The PAPER FEED field (FS11 or FS12 or FS13) changes between paper and blank correctly.	Go to step 4.	Replace the sensor PS1-1 or PS1-2 or PS1-3. Verify repairs by inserting paper into actuator and observing the menu. If PAPER FEED field not responding correctly, go to step 3.
3. Check for pinched wires, cables and damaged connectors: • JAM01: Check between CN2 on the mechanism controller PCB and the sensor PS1-1 on the upper feed unit • JAM02: Check between CN3 on the mechanism controller PCB and the sensor PS1-2 on the middle feed unit • JAM03: Check between CN4 on the mechanism controller PCB and the sensor PS1-3 on the lower feed unit	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs by inserting paper into actuator and observing the menu. If PAPER FEED field is not responding correctly, replace mechanism controller board. ^a	Replace mechanism controller board. ^a

Instruction	Indication	Yes	No
4. Open the upper right cover. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS2. WARNING: The actuator of this sensor may easily be damaged by touching it from left to right or perpendicular to the paper feeding direction.	The PS2 field changes between paper and blank correctly.	Go to step 6.	Replace the sensor PS2. Verify repairs by inserting paper into actuator and observing the menu. If PS2 field still doesn't respond correctly, go to step 5.
5. Check for pinched wires, cables and damaged connectors between CN23 on the mechanism controller PCB and the sensor PS2.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs by inserting paper into actuator and observing the menu. If PS2 field is not responding correctly, replace mechanism controller board. ^a	Replace mechanism controller board. ^a
6. Open the lower-right cover and set interlock switch. Go to the Paper Input menu (EngMaint.UnitTest.Input.Feed) and choose any speed to activate the feed motor. Observe the feed motor.	The feed motor rotates.	Replace mechanism controller board. ^a	Go to step 7.
7. Remove the lower right cover and the column cover. Loosen the drive belt for feed motor. Activate the feed motor using the Paper Input menu (EngMaint.UnitTest.Input.Feed) Observe the feed motor.	The feed motor rotates.	Perform the following steps one at a time, checking if feed motor rotates after each step: a. Replace the feed unit. b. Check for pinched wires, cables and damaged connectors between CN6 on the mechanism controller PCB and the feed motor. Repair or replace damaged part. c. Replace mechanism controller board. ^a	Go to step 8.
8. Check for the following: • Transport rollers (rollers on the lower right cover) are blocked or damaged • Transport rollers' drive belt is twisted or coming off • Feed unit is blocked • Feed unit is damaged, such as locked, bent, or twisted rollers • Belt of the feed unit is damaged	Damaged, blocked or incorrectly mounted part.	Repair, replace, or unblock part. Verify repairs. If a JAM01/02/03 error appears, replace mechanism controller board. ^a	Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagram

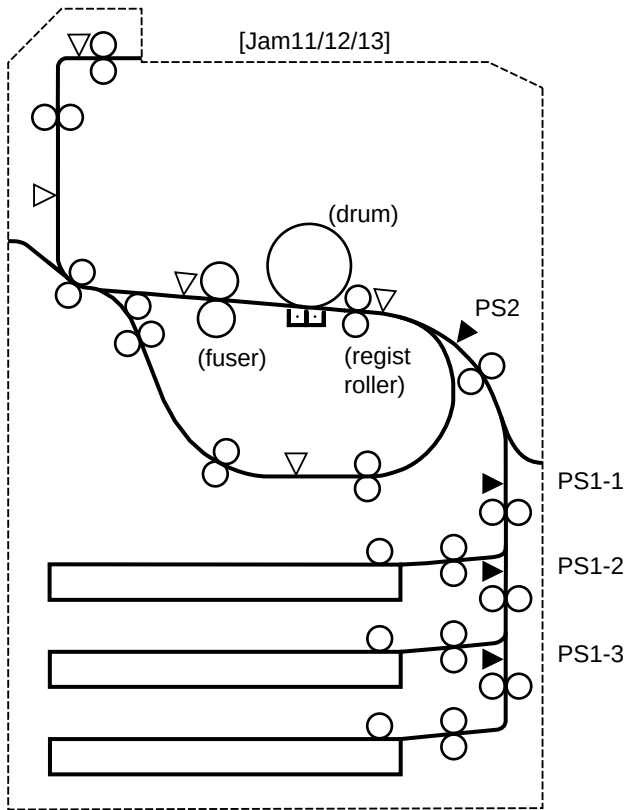


Figure 4-4 Feed Jam 1 (JAM11/12/13) Sensor Locations

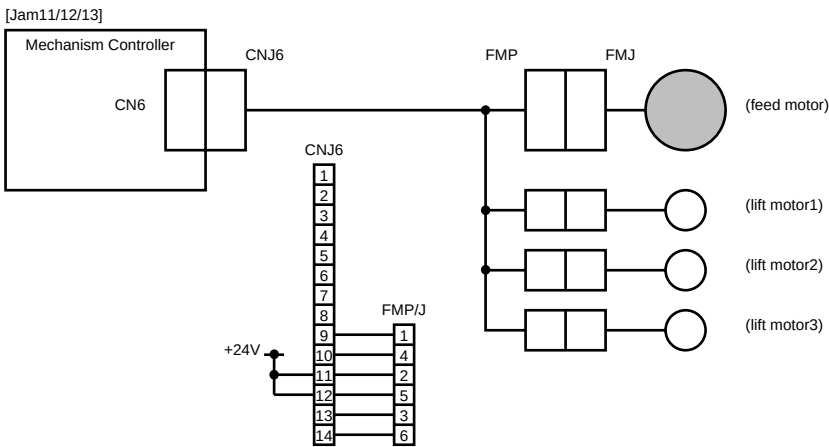


Figure 4-5 Feed Jam 1 (JAM11/12/13) Interconnections Diagram (1 of 2)

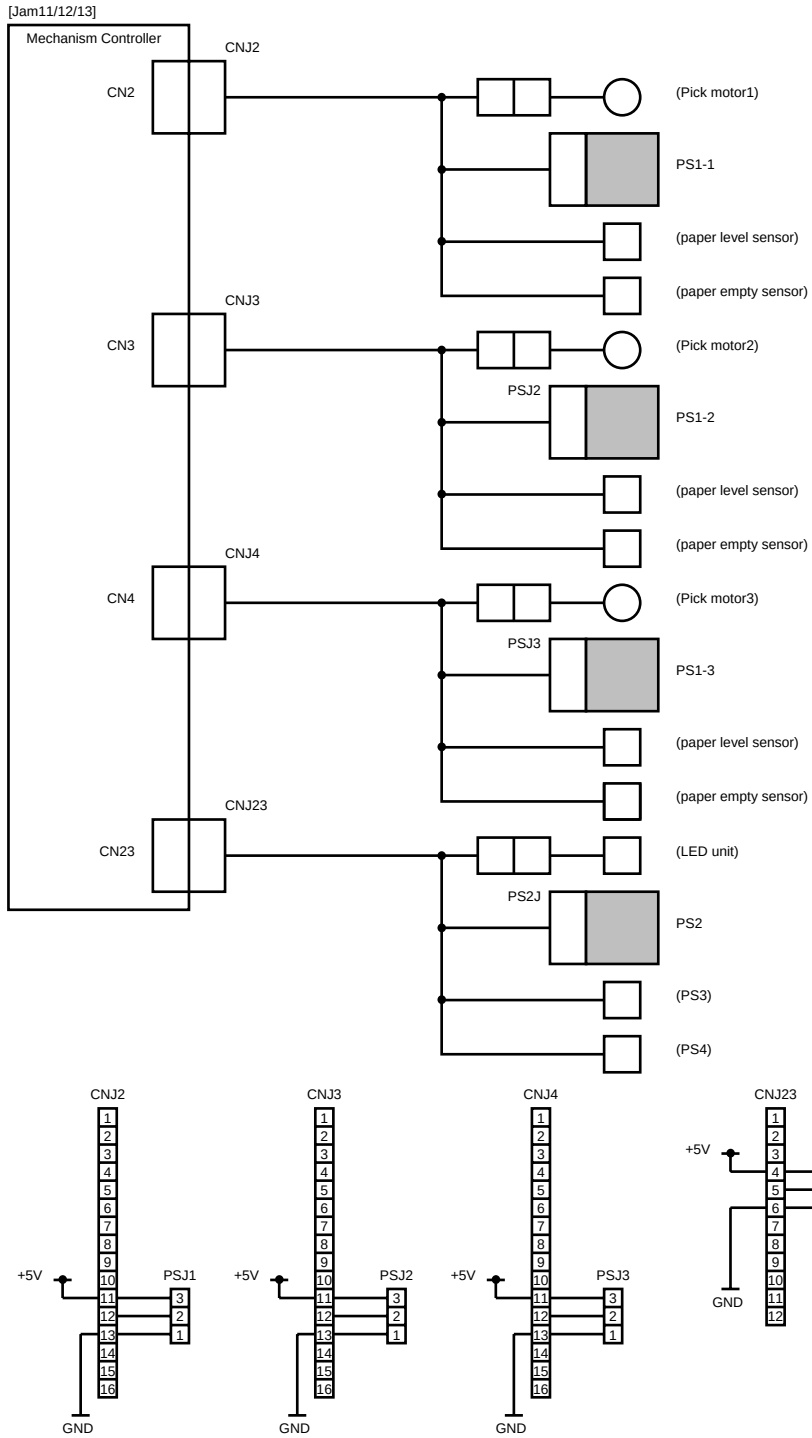


Figure 4-6 Feed Jam 1 (JAM11/12/13) Interconnections Diagram (2 of 2)

4-10.10 JAM18 Feed Jam 4

Description

One of the following occurred:

- When the printer was reset, media was present at PS2
- Time lapse between the leading edge of the media activating PS2 and PS3 was longer than 150 ms

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM18 error appears.	Go to step 2.	Done.
2. Open the upper right cover. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuators of PS2 and PS3. WARNING: The actuator of these sensors may easily be damaged by touching it from left to right or perpendicular to the paper feeding direction.	The PS2 and PS3 fields change between paper and blank correctly.	Go to step 4.	Replace the sensor PS2 or PS3. Verify repairs by inserting paper into actuator and observing the menu. If PS2 or PS3 field still doesn't respond correctly, go to step 5.
3. Check for pinched wires, cables and damaged connectors between CN23 on the mechanism controller PCB and the sensor PS2.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs by inserting paper into actuator and observing the menu. If PS2 or PS3 field is not responding correctly, replace mechanism controller board. ^a	Replace mechanism controller board. ^a
4. Check for the following: • Transfer roller (pre-registration roller) is blocked or damaged, such as locked, bent, or twisted roller. • Transfer roller's drive belt is twisted, coming off, or damaged.	Damaged, blocked or incorrectly mounted part.	Repair, replace, or unblock part. Verify repairs. If a JAM18 error appears, replace mechanism controller board. ^a	Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

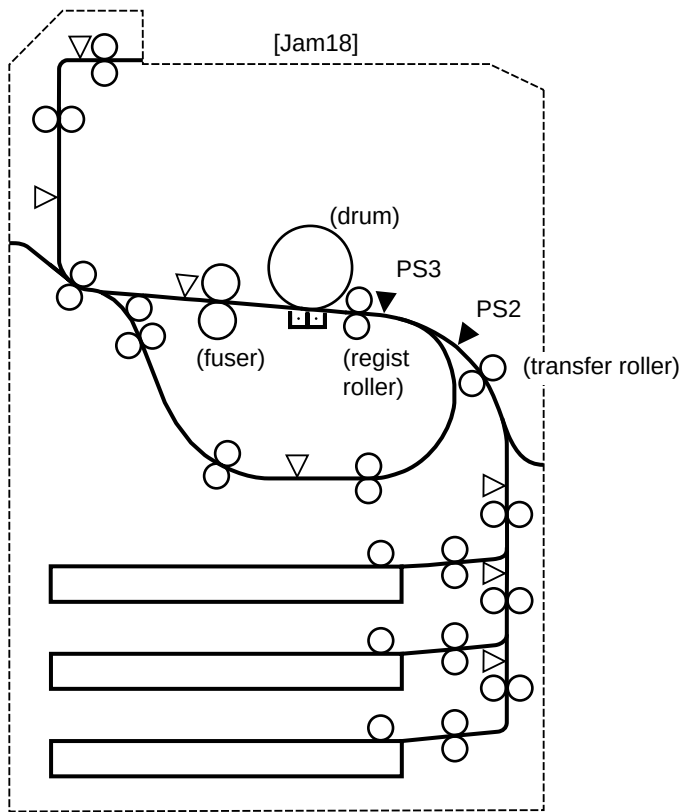


Figure 4-7 Feed Jam 4 (JAM18) Sensor Locations

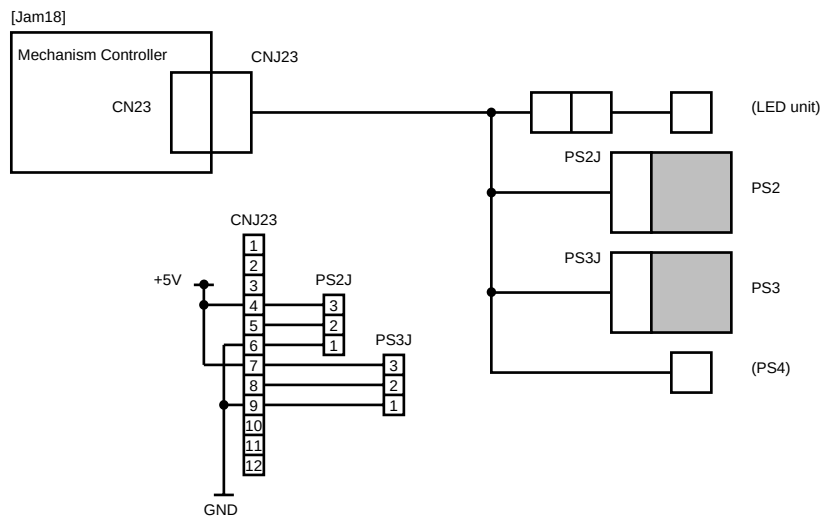


Figure 4-8 Feed Jam 4 (JAM18) Interconnections Diagram

4-10.11 JAM25 Fuser Unit Jam 1 JAM26 Fuser Unit Jam 2

Description

JAM25: One of the following occurred:

- When the printer was reset, media was present at PS3
- No media was present when registration roller clutch turned on
- Time lapse between the registration roller turning on and the trailing edge of the media activating PS2 was too short for expected media size (paper length check)
- More than 1395 ms elapsed in the time between the registration roller clutch turning on and the leading edge of media activating PS4

JAM26: One of the following occurred:

- When the printer was reset, media was present at PS4
- Time lapse between the leading edge of media activating PS4 and the trailing edge activating PS4 was too long for expected media size

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77 . Perform the Print Test (Test.TESTPRINT).	A JAM25/26 error appears.	• If jam occurs before paper is fed, go to step 2. • If the leading edge of the paper stopped just at the registration roller, go to step 3. • If the jammed paper stopped around the transfer unit or is missing or winding around the photoconductive drum, go to step 4. • If the jammed paper stopped around the fuser unit or is missing or winding around the fuser unit, go to step 7. • Other jams, go to step 2.	Done.
2. Open the upper right cover to access PS3 and remove the rear cover to access PS4. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS3 and PS4. WARNING: The actuator of these sensors may easily be damaged by touching it from left to right or perpendicular to the paper feeding direction.	The PS3 and PS4 field changes between paper and blank correctly.	Go to step 3.	Perform the following steps one at a time, checking if PS3 or PS4 field responds correctly by inserting paper into actuator after each step: a. Check if PS3 or PS4 is blocked. If blocked, remove the blockage. b. Replace the sensor PS3 or PS4. c. Check for pinched wires, cables and damaged connectors between CN23 on the mechanism controller board and the sensor PS3 or PS4. Repair or replace damaged part. d. Replace mechanism controller board. ^a

Instruction	Indication	Yes	No
3. Open the front door and set interlock switch. Remove drum unit, fuser unit, and developer unit with its connector. Go to the Clutch Test with Main Motor menu (EngMaint.UnitTest.Print.Clutch) and press Start . Observe knob 2 (connected to the registration roller shaft) as you select CluOnsta and CluOFFsta .	Knob 2 turns when CluONsta is selected, and not turn when CluOFFsta is selected.	Replace mechanism controller board. ^a	Perform the following steps one at a time, checking if knob 2 turns correctly after each step: a. Replace the registration roller clutch. b. Check for pinched wires, cables, and damaged connectors between CN21 on the mechanism controller board and the registration roller clutch RRCL. Replace damaged parts. c. Check for damage (locked or bent) to the registration roller. If damaged, replace the registration roller. d. Replace mechanism controller board. ^a
4. Check for paper jammed around the transfer unit or wound around the drum. Carefully remove paper and check for damaged drum, transfer charger, or transfer guide.	Damaged part.	Replace damaged part. Verify repairs. If JAM25/26 error appears, go to step 5.	Clean transfer charger and transfer unit guide. Be careful not to damage the drum or charger. Verify repairs. If JAM25/26 error appears, go to step 5.
5. Remove the rear cover. Check for damaged or pinched +HV and ACH cables from the high voltage power supply board to the transfer unit.	Pinched or damaged cables.	Replace damaged parts. Verify repairs. If JAM25/26 error appears, replace the high voltage power supply unit. Verify repairs. If JAM25/26 error appears, go to step 6.	Replace the high voltage power supply unit. Verify repairs. If JAM25/26 error appears, go to step 6.
6. Open the front door and set the front door interlock switch. Go to Erase LED menu (EngMaint.UnitTest.Print.ErLED). Observe LED2 at the transfer guide.	LED2 at the transfer guide is lit.	Replace mechanism controller board. ^a	Replace LED2. Verify repairs. Verify repairs. If LED2 is not lit, replace mechanism controller board. ^a
7. Clean the guides and rollers of the fuser and the de-curler unit. Perform the Print Test (Test.TESTPRINT).	A JAM2/26 error appears.	Replace the fuser (120V/220V). Verify repairs. If JAM25/26 error appears, replace mechanism controller board. ^a	Done

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

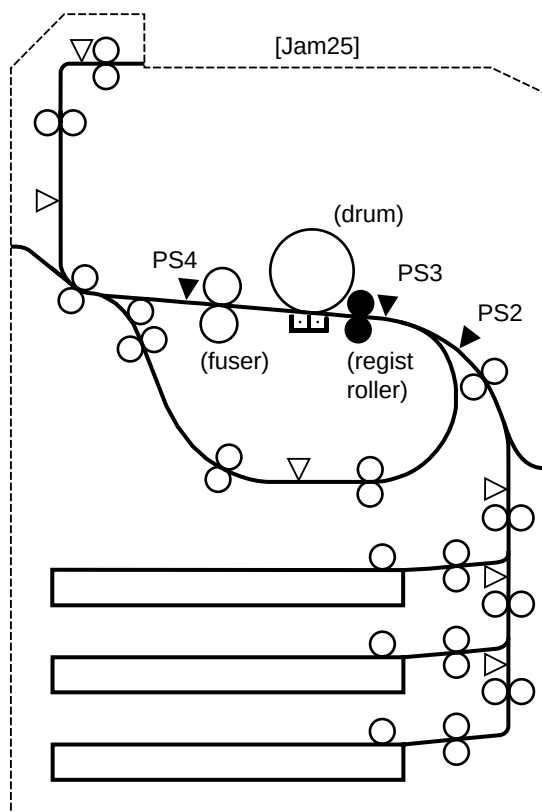


Figure 4-9 Fuser Unit Jam 1/2 (JAM25/26/27) Sensor Locations

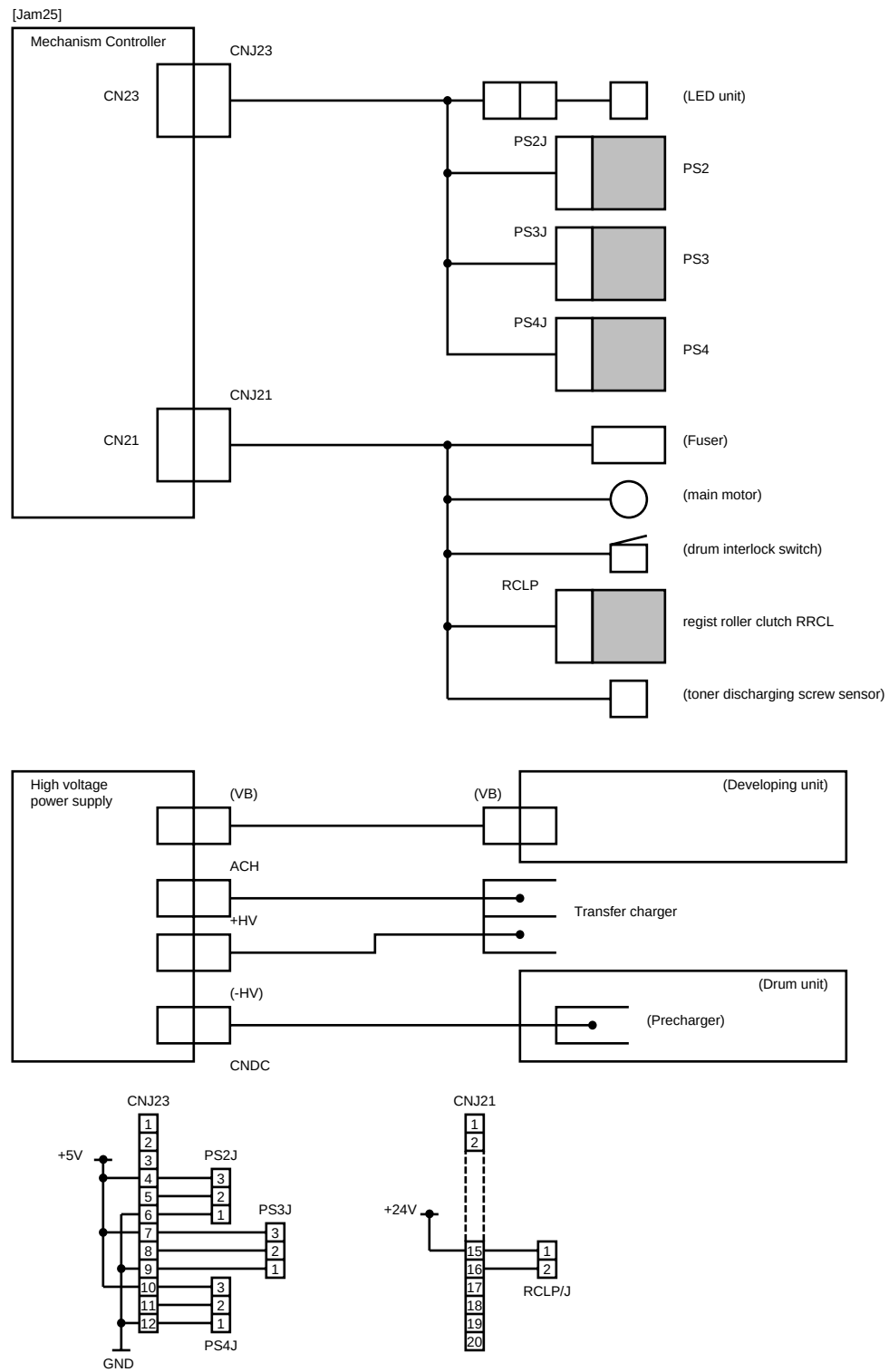


Figure 4-10 Fuser Unit Jam 1/2 (JAM25/26/27) Interconnections Diagram

4-10.12 JAM29 Ejection Unit Jam 1

Description

The time lapse between the leading edge of media activating PS4 and PS7 was longer than 2030 ms.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM29 error appears.	Go to step 2.	Done.
2. Open the front cover and set interlock switch. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS6. WARNING: The actuator of this sensor may easily be damaged by touching it from top to bottom or perpendicular to the paper feeding direction.	The EJECT field ES6 changes between paper and blank correctly.	Go to step 3.	Perform the following steps one at a time, checking if ES6 field responds correctly by inserting paper into actuator after each step: a. Check if PS6 is blocked. If blocked, remove the blockage. b. Replace the sensor PS6. c. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the sensor PS6. Repair or replace damaged part. d. Replace mechanism controller board. ^a
3. Open the front door and set the interlock switch. Go to the Print Section Menu (EngMaint.UnitTest.Print) and select: • HCO.sel to activate the stacker select solenoid • HCO.chg to activate the purge solenoid Observe the solenoids operation.	The solenoids operate correctly.	Go to step 4.	Perform the following steps one at a time, checking if the solenoid operates correctly after each step: a. Replace the reversing unit. b. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the stacker select solenoid/purge solenoid. Repair or replace damaged part. c. Replace mechanism controller board. ^a
4. Keep the front door open and go to the Print Unit Test menu (EngMaint.UnitTest.Output) and select any speed for SwBack to activate the switch back motor on the reverse unit.	The roller of the reverse unit rotates smoothly.	Replace mechanism controller board. ^a	Perform the following steps one at a time, checking if the roller of the reverse unit rotates correctly after each step: a. Remove the upper left cover and check the reverse unit damage, such as blocked or damaged rollers and for a damaged, twisted, or improperly mounted drive belt. Remove blockage, install the belt correctly, replace damaged part, or replace the reversing unit. b. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the switch back motor. Replace damaged parts. c. Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

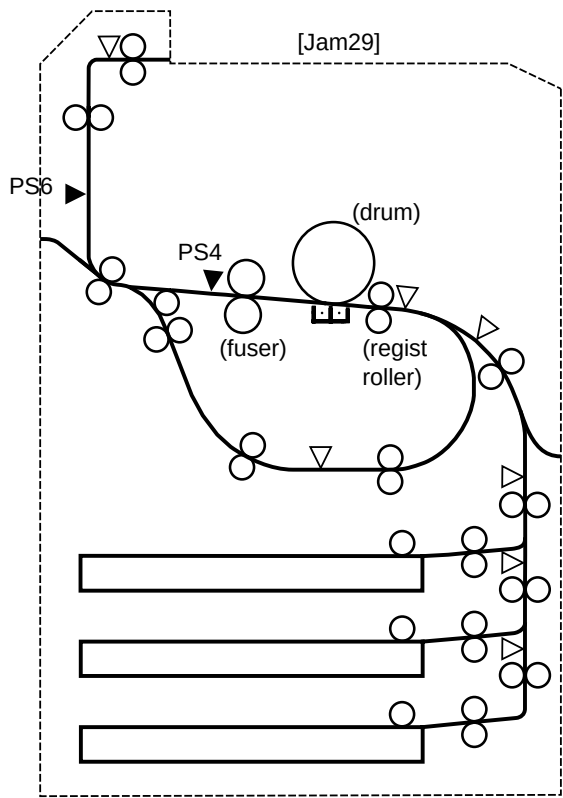


Figure 4-11 Ejection Unit Jam 1 (JAM29) Sensor Locations

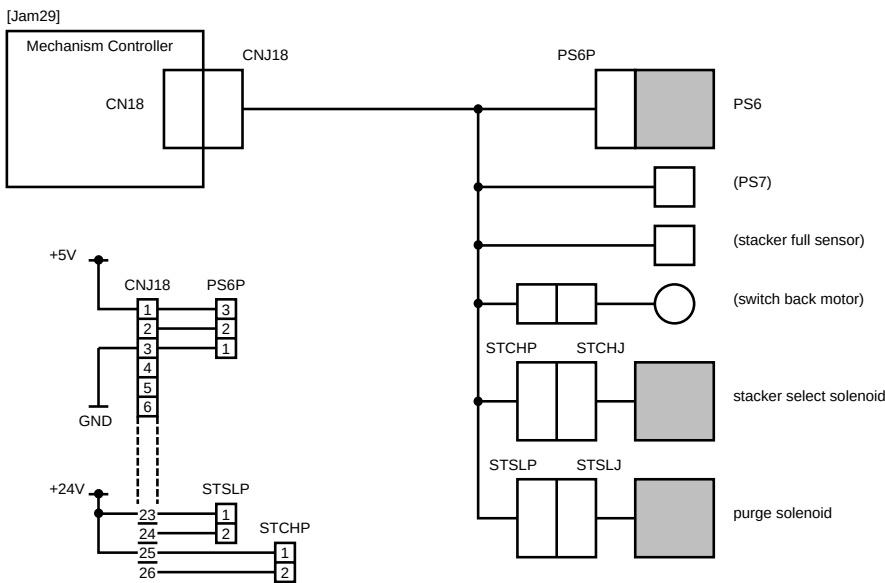


Figure 4-12 Ejection Unit Jam 1 (JAM29) Interconnections Diagram

4-10.13 JAM2B Ejection Unit Jam 2

Description

One of the following occurred:

- When the printer was reset, media was present at PS7, or
- Time lapse between the leading edge of the media activating PS7 and the trailing edge activating PS7 was too long for expected media size.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM2B error appears.	Go to step 2.	Done.
2. Open the front door and the ejection unit cover. Set their interlock switches. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS7. WARNING: The actuator of this sensor may easily be damaged by touching it from top to bottom or perpendicular to the paper feeding direction.	The EJECT field ES7 changes between paper and blank correctly.	Go to step 3.	Perform the following steps one at a time, checking if ES7 field responds correctly by inserting paper into actuator after each step: a. Check if PS7 is blocked. If blocked, remove the blockage. b. Replace the sensor PS7. c. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the sensor PS7. Repair or replace damaged part. d. Replace mechanism controller board. ^a
3. Keep the front door open. Go to the Print Section Menu (EngMaint.UnitTest.Print) and select: • HCO.sel to activate the stacker select solenoid • HCO.chg to activate the purge solenoid Observe the solenoids operation.	The solenoids operate correctly.	Go to step 4.	Perform the following steps one at a time, checking if the solenoid operates correctly after each step: a. Replace the reversing unit. b. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the stacker select solenoid/purge solenoid. Repair or replace damaged part. c. Replace mechanism controller board. ^a
4. Keep the front door open and ejection unit cover off. Remove the drum unit, fuser unit, and developer unit with its connector. Go to the Main Motor Test menu (EngMaint.UnitTest.Prim.Main) and select Start. Observe the ejection unit roller.	The roller of the ejection unit rotates smoothly.	Replace mechanism controller board. ^a	Perform the following steps one at a time, checking if the roller of the reverse unit rotates correctly after each step: a. Remove ejection unit rear cover and check the ejection unit for damage, such as blocked or damaged rollers and for a damaged, twisted, or improperly mounted drive belts. Remove blockage, install the belt correctly, replace damaged part or replace the whole ejection unit. b. Replace the ejection unit. c. Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

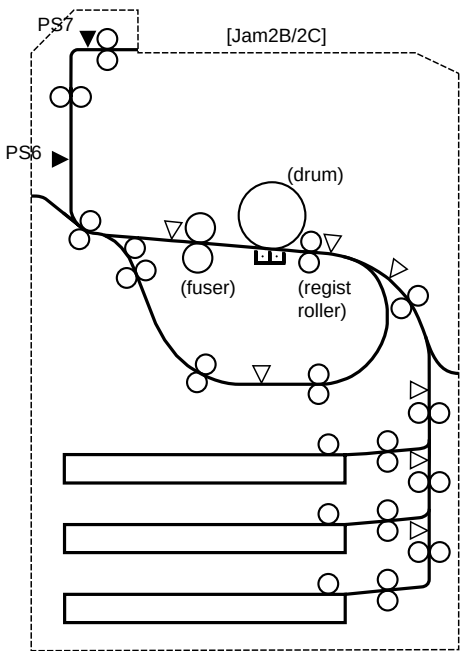


Figure 4-13 Ejection Unit Jam 2 (JAM2B) Sensor Locations

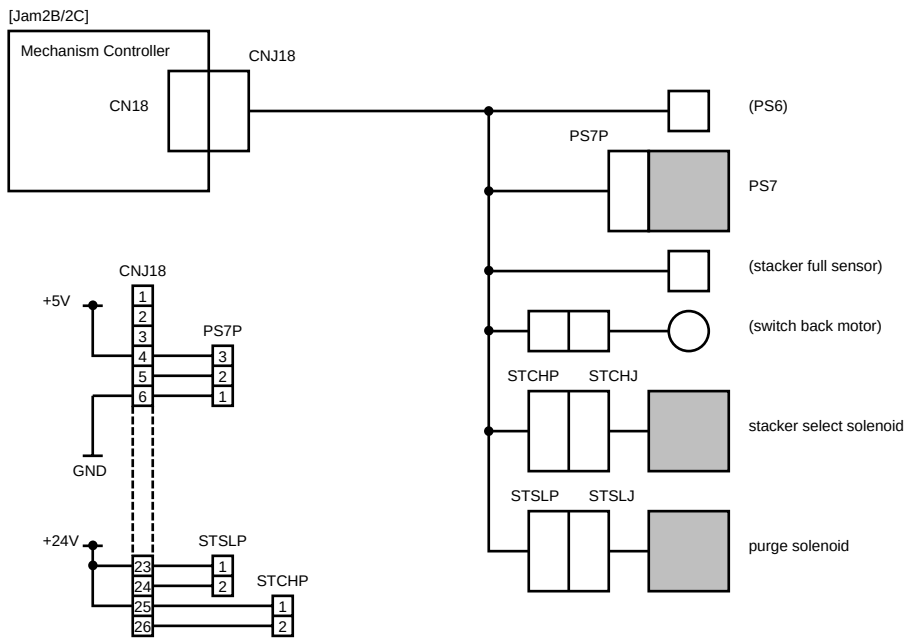


Figure 4-14 Ejection Unit Jam 2 (JAM2B) Interconnections Diagram

4-10.14 JAM31 Duplex Printing Path Jam 1 JAM32 Duplex Printing Path Jam 2

Description

JAM31: Time lapse between the reversing unit motor reversal and the leading edge of the media activating P5 was longer than 480 ms

JAM32: One of the following occurred

- When the printer was reset, media was present at PS5, or
- Time lapse between the leading edge of the media activating PS5 and PS3 was longer than 430 ms, or
- Time lapse between the duplex motor turning on and the leading edge of media activating PS3 was longer than 265 ms

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform initial troubleshooting procedures described in 4-10.3 "Paper Jam Analysis," on page 4-77. Perform the Print Test (Test.TESTPRINT).	A JAM31/32 error appears.	Go to step 2.	Done.
2. Open the front cover and set interlock switch. Go to the Paper Feed/Print/Eject Sensors menu (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Insert a piece of paper into the actuator of PS5. WARNING: The actuator of this sensor may easily be damaged by touching it from right to left or perpendicular to the paper feeding direction.	The EJECT field ES5 changes between paper and blank correctly.	Go to step 3.	Perform the following steps one at a time, checking if ES5 field responds correctly by inserting paper into actuator after each step: a. Check if PS5 is blocked. If blocked, remove the blockage. b. Replace the sensor PS5. c. Check for pinched wires, cables and damaged connectors between CN20 on the mechanism controller board and the sensor PS5. Repair or replace damaged part. d. Replace mechanism controller board. ^a
3. Open the front door and set the interlock switch. Go to the Print Section Menu (EngMaint.UnitTest.Print) and select: • HCO.sel to activate the stacker select solenoid • HCO.chg to activate the purge solenoid Observe the solenoids operation.	The solenoids operate correctly.	Go to step 4.	Perform the following steps one at a time, checking if the solenoid operates correctly after each step: a. Replace the stacker select solenoid/purge solenoid. b. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the stacker select solenoid/purge solenoid. Repair or replace damaged part. c. Replace mechanism controller board. ^a

Instruction	Indication	Yes	No
4. Keep the front door open and go to the Print Unit Test menu (EngMaint.UnitTest.Output) and select any speed for SwBack to activate the switch back motor on the reverse unit.	The roller of the reverse unit rotates smoothly.	Go to step 5.	Perform the following steps one at a time, checking if the roller of the reverse unit rotates correctly after each step: a. Remove the upper left cover and check the reverse unit damage, such as blocked or damaged rollers and for a damaged, twisted, or improperly mounted drive belt. Remove blockage, install the belt correctly, replace damaged part or replace the whole reverse unit. b. Replace the switch back motor. If you want to save time, replace the reverse unit. c. Check for pinched wires, cables and damaged connectors between CN18 on the mechanism controller board and the switch back motor. Replace damaged parts. d. Replace mechanism controller board. ^a
5. Keep the front door open and go to the Print Unit Test menu (EngMaint.UnitTest.Output) and select any speed for Duplex to activate the duplex motor on the reverse unit.	The roller of the duplex unit rotates smoothly.	Replace mechanism controller board. ^a	Check the duplex unit for damage, such as blocked or damaged rollers and for a damaged, twisted, or improperly mounted drive belt. Remove blockage, install the belt correctly, replace damaged part or replace the whole duplex unit. Verify the roller of the duplex unit rotates correctly. If not, go to step 6.
6. Remove the duplex motor from the reverse unit. With the motor still removed from the unit, connect the motor to its power connector. From the Print Unit Test menu (EngMaint.UnitTest.Output), select any speed for Duplex to activate the duplex motor.	The roller of the duplex unit rotates smoothly.	Replace mechanism controller board. ^a	Perform the following steps one at a time, checking if the roller of the reverse unit rotates correctly after each step: a. Replace the duplex motor. If you want to save time, replace the reverse unit. b. Check for pinched wires, cables and damaged connectors between CN20 on the mechanism controller board and the duplex motor. Replace damaged parts. c. Replace mechanism controller board. ^a

a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

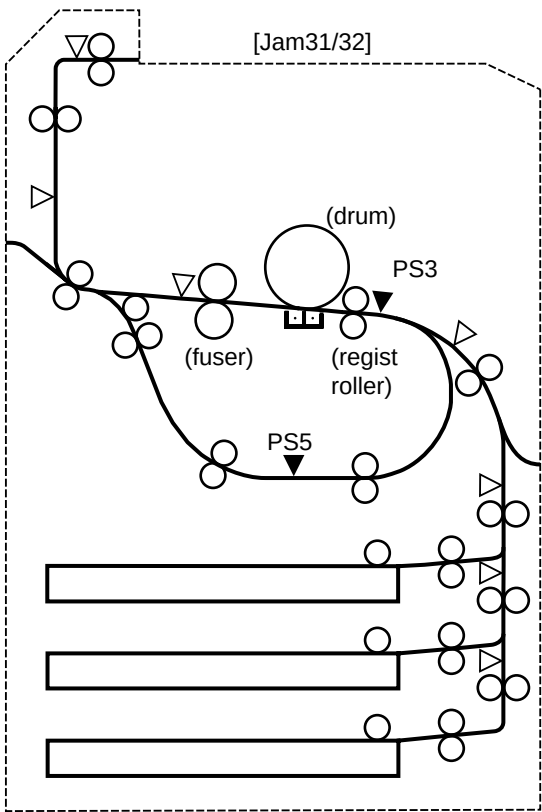


Figure 4-15 Duplex Printing Path Jam 1 (JAM31) Sensor Locations

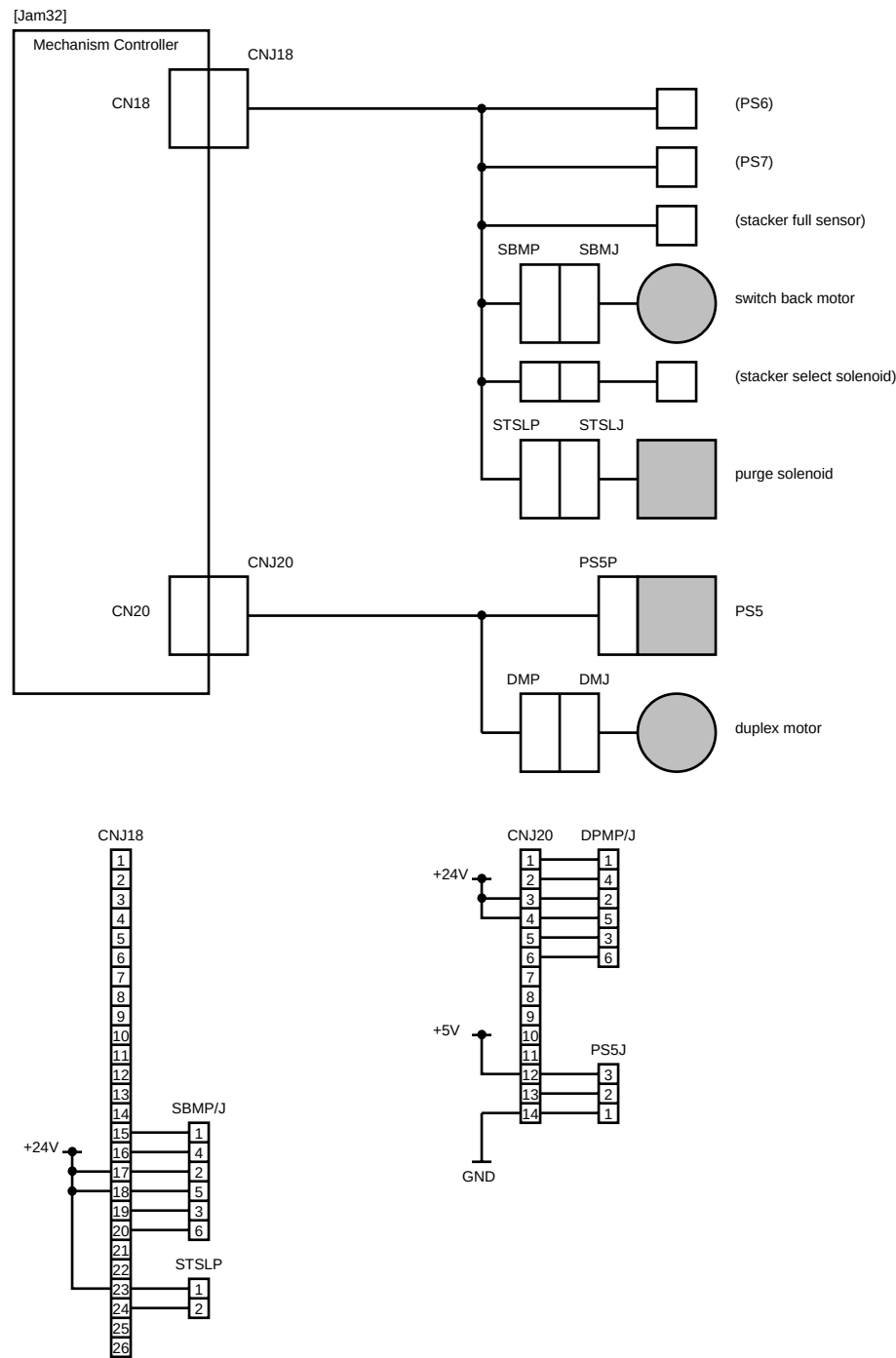


Figure 4-16 Duplex Printing Path Jam 1/2 (JAM31/32) Interconnections Diagram

4-10.15 JAM41 HCO JAM1

For 2,000 Sheet HCO, see [C-6.2 "JAM41 HCO JAM1," on page C-28.](#)

For 3,000 Sheet HCO, see [B-4.3 "HCO Stacker Jams - HCO JAM 1/JAM41," on page B-18.](#)

4-10.16 JAM51 HCI Pick Error JAM52 HCI Feed Jam1

See [D-4.2 "JAM51 HCI Pick Error," on page D-12.](#)

See ["JAM52 HCI Feed Jam1," on page D-12.](#)

4-10.17 JAM53 HCI Feed Jam 2

See [D-4.3 "JAM53 HCI Feed Jam 2," on page D-16.](#)

4-11 Print Quality Problems

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4-11.1 Introduction

This section provides print samples, starting with a good quality print. The rest of the print samples are flawed to show a specific problem, along with recommended corrective actions. The consumable that may be responsible for the flaw is listed below each sample, along with recommended corrective actions.

Note	To establish a good reference for comparison to bad prints, save the test print generated immediately after printer installation.

4-11.2 Initial Print Quality Troubleshooting Procedures

Print quality problems can have many causes. The following are some suggested steps to follow before beginning the specific troubleshooting procedure:

- Step 1** Obtain a page from the customer demonstrating the problem reported.
- Step 2** Question the customer to determine the frequency of occurrence.
- Step 3** Turn on the printer and set the following to their default values:
economode = OFF (Menu.Configuration.economode)
density = 10 (Menu.Maintenance.density)
- Step 4** Verify that the paper meets the printer specifications (see the “Using Paper” appendix in the *HP5000 D640 Cut Sheet Printer User Manual*). If you are unsure about the paper, try different paper. If there are more than one D640 printers on site using the exact same paper and only one is having problems, you can assume it is not a paper problem.
- Step 5** Run the Maintenance Report and verify the consumables (Drum and Developer) have not exceeded their end-of-life. The usage shown on Maintenance Report should be less than 100% and no “REPLACE consumable” message should be displayed on the Operator Panel.

Note	Many print quality problems can be attributed to developer mixture exceeding its end-of-life or used (old) developer being added. When new developer mixture is added, an electrical reading of the mixture's properties is taken by a sensor located within the developer assembly. The developer bias voltage is modified using an algorithm from that original reading as the mixture ages. If used (old) developer is added, this algorithm is not able to compensate properly and print quality problems may result.

- Step 6** Clean the precharger corona in the drum. Pull out and reinsert the flat-blue handle at top of drum several times. It may be necessary to pull out and reinsert the cleaner up to ten times to effectively clean a contaminated precharger corona.
- Step 7** Remove the transfer corona and clean the transfer assembly guide unit. Verify the metal grounding clips on the bottom of the transfer unit guide are clean, secure, and making good contact with the metal frame of the transfer corona. Clean the transfer corona and the pretransfer LED in the transfer guide unit.

Step 8 Compare the sample page to the samples in this section.

You may need to generate more test prints to compare more directly with the prints in this section.

Step 9 Identify a print sample included in this section that has the same flaws as your test print and perform the troubleshooting procedures.

4-11.3 Good Quality Print

Description

This is the ideal print output of the D640 printer.

Reference Diagrams

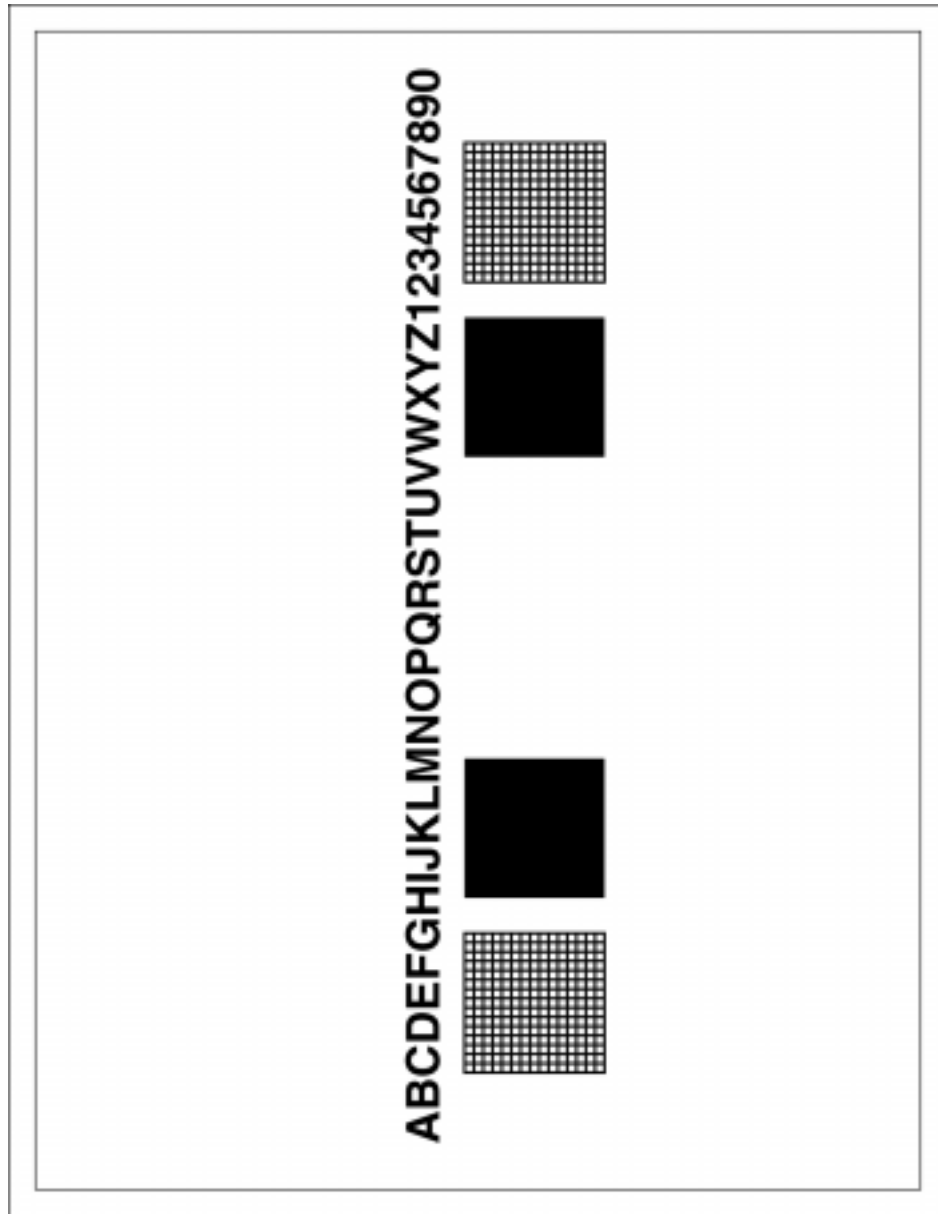


Figure 4-1 Good Quality Print

4-11.4 Background Print

Description

White areas on the test print contains specks in specific patterns.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106. Print a test page.	Background print quality problem still exists.	Go to step 2.	Done.
2.Check the developer bias voltage at the VB connector on the developer unit.	The voltage is 350V $\pm$ 30V.	Go to step 3.	Replace the High Voltage Power Supply Board. Verify repairs. If background print problem still appears, replace mechanism controller board. ^a Verify repairs. If background print problem still appears, go to step 3.
3.Change the density setting darker or lighter (Menu.Maintenance.density). Darker= a higher number. Test print for at least 50 pages.	Background print quality problem still exists.	Replace the following units one at a time, verifying the background print problem still exists after each replacement: a.Developer mixture. Check that the toner recycle mode is set off. b.Developer Unit c.Drum Unit d.High Voltage Power Supply Board.	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

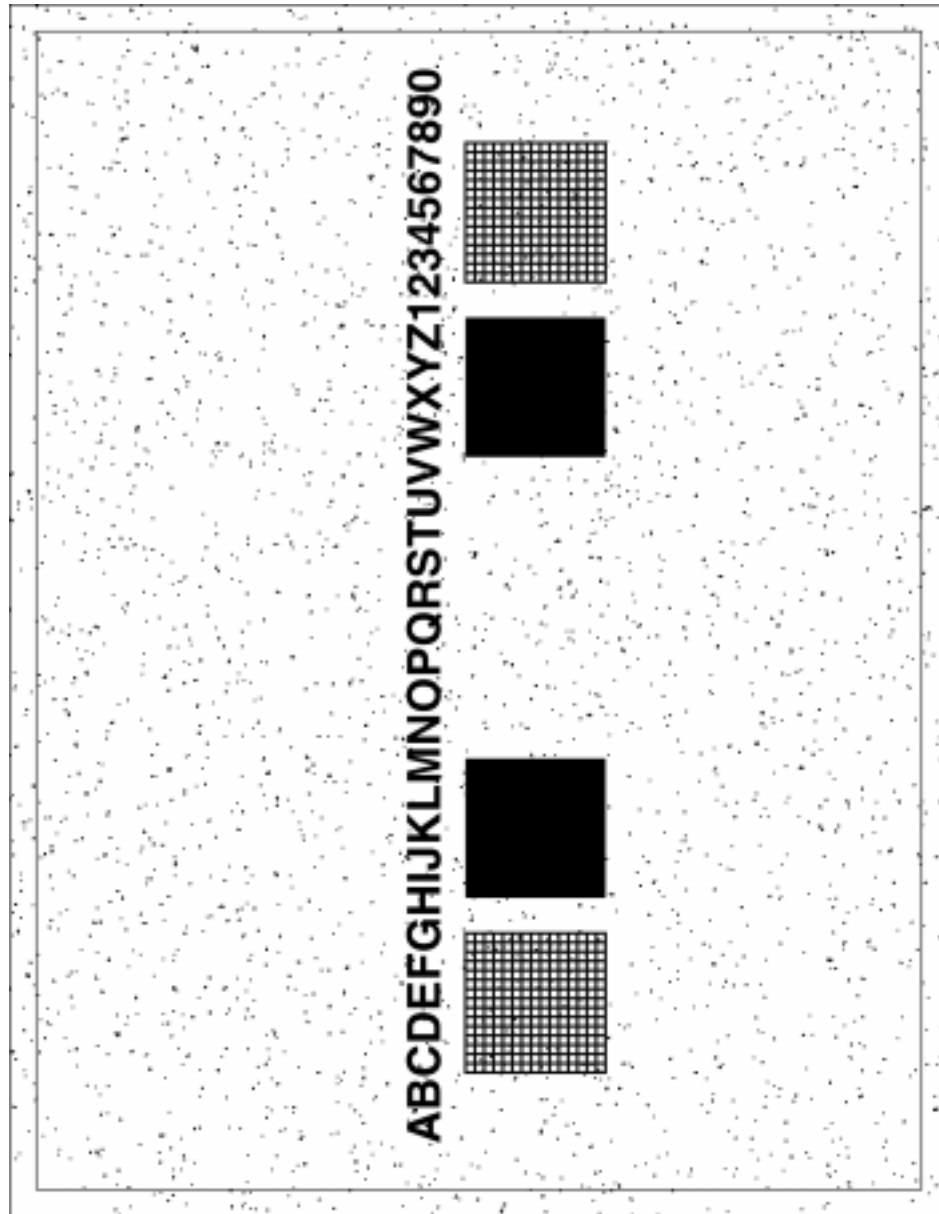


Figure 4-2 Background Print Example

4-11.5 Black or Dark Print

Description

Black or very dark print with no visible images.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Black or dark print problem still exists.	Go to step 2.	Done.
2. Replace the drum unit. Print a test page.	Black or dark print problem still exists.	Replace the following units one at a time, verifying the black or dark print problem still exists after each replacement: • High Voltage Power Supply Board • Optical Unit	Done.

Reference Diagrams

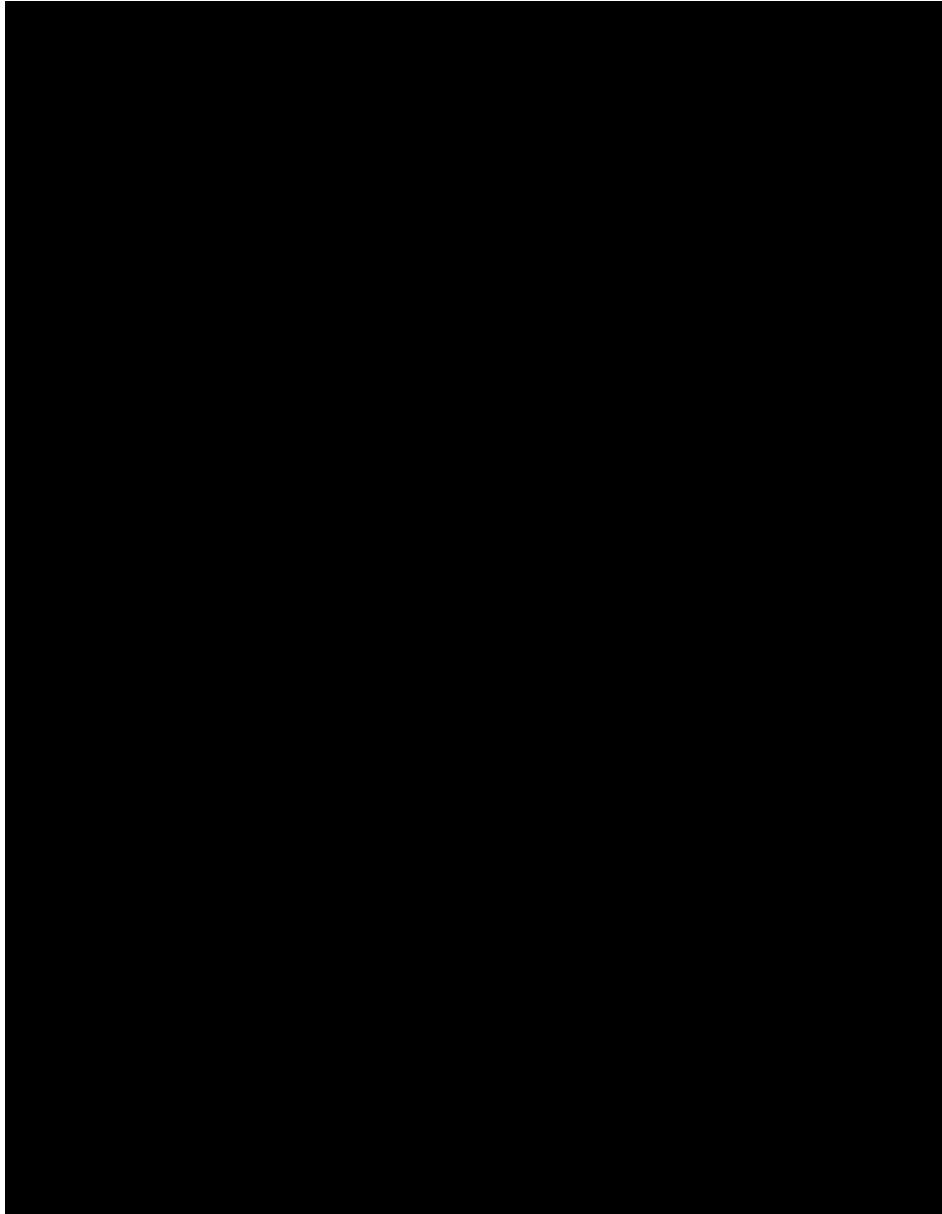


Figure 4-3 Black or Dark Print Example

4-11.6 Blank Print

Description

No image or characters, and the paper is not discolored.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Blank print problem still exists.	Go to step 2.	Done.
2. Check that the developer release handle b1 is closed (vertical).	Developer release handle B1 is closed (vertical).	Go to step 3.	Close handle. Verify repairs. If blank print problem still appears, got to step 3.
3. Verify the developer assembly is turning by removing the drum and wiping your finger across the developer assembly roller. Reinsert the drum and print a Setup Report.	Remove the drum and inspect the developer roller. The mark you made is still visible.	The developer assembly is not being rotated by the developer coupling of drive unit M. Replace drive unit M. Verify repairs. If blank print problem still appears, got to step 4.	Go to step 4.
4. Open the front printer door and set the interlock switch. Print a Setup Report so that as soon as the page reaches the drum, you immediately release the front door interlock to stop the printer.	Remove the drum and inspect it for a developed image. A developed image is on the drum.	Replace transfer charger. Verify repairs. If blank print problem still appears, got to step 5.	Go to step 5.
5. Remove the rear cover, turn the printer on. After the initialization of the printer has ended, tap the switch SW3 on the mechanism controller board (red square key switch on upper right corner of the board). Test printing by the mechanism controller board is started. (Tap the SW3 again, test printing is stopped.)	A fine horizontal line near across the leading edge of the paper is printed.	Check for pinched cables and damaged connectors between the connectors CN2 on the main controller board and CN14 on the mechanism controller board. Verify repairs. If blank print problem still appears, replace the Main Controller Board.	Go to step 6.
6. Clean the window of the optical unit.	Blank print problem still exists.	Replace the following units one at a time, verifying the blank problem still exists after each replacement: a. High voltage power supply board b. Optical unit c. mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

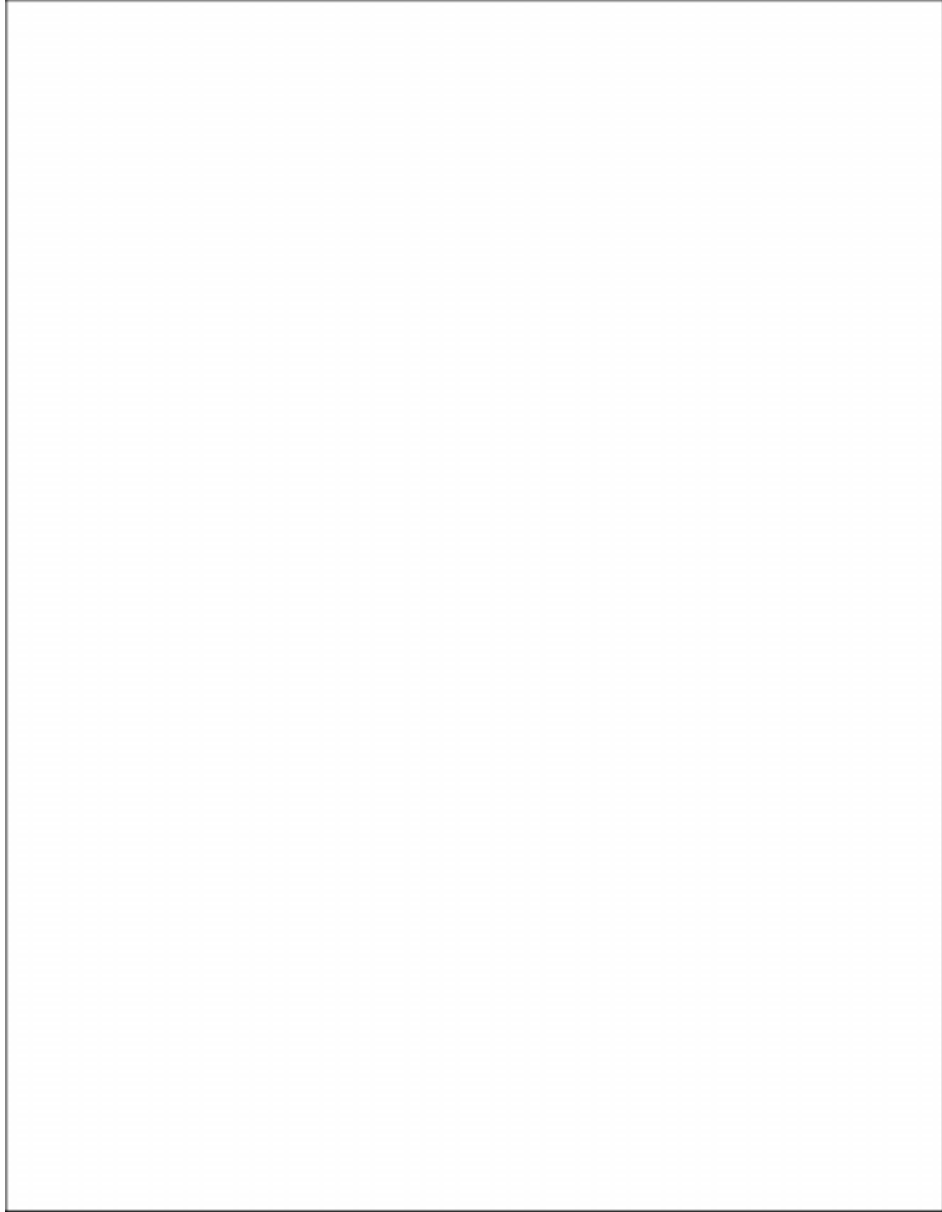


Figure 4-4 Blank Print Example

4-11.7 Blank Vertical Bands Print

Description

One or more vertical blank bands on the page.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Blank vertical bands print problem still exists.	Go to step 2.	Done.
2. Open the front printer door and set the interlock switch. Print a test page so that as soon as the page reaches the drum, you immediately release the front door interlock switch to stop the printer.	Remove the drum and inspect it for blank vertical bands. Blank vertical bands appear on the drum.	Clean the precharger on the drum. Verify repairs. If blank print problem still appears, got to step 3.	Clean transfer charger, transfer guide, and LEDs. Verify repairs. If blank print problem still appears, got to step 3.
3. Clean the window of the optical unit. Print a test page.	Blank vertical bands print problem still exists.	Clean all of the paper feeding path in the printer, around the drum unit and the developer unit. Verify repairs. If blank vertical bands print problem still appears, replace the following units one at a time, verifying the problem still exists after each replacement: a. Developer mixture b. Drum unit c. Developer unit d. Cleaning roller on the fuser unit (packed within the toner kit). e. Fuser unit (120V or 200V)	Done.

Reference Diagrams

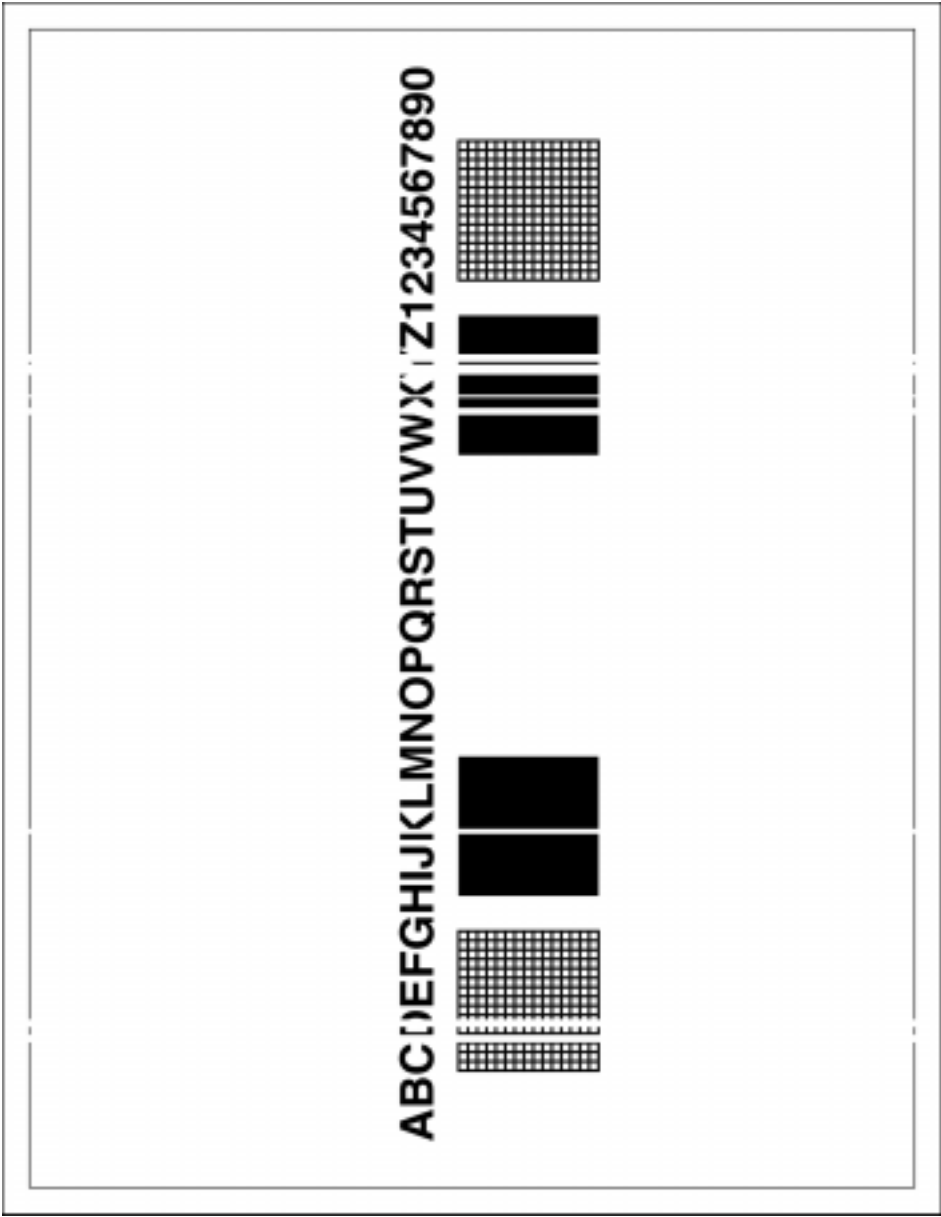


Figure 4-5 Blank Vertical Bands Print

4-11.8 Blurred Images or Blurred Characters Print

Description

The images or characters are not clear. The lower edges of images, characters, or both are extended and possibly smeared.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Blurred image or characters print problem still exists.	Go to step 2.	Done.
2.Check image for partial burring or smearing.	The image blurred or smeared partially.	Clean the window of the optical unit. Verify repairs. If blurred image or characters print problem still appears, clean all of the paper feeding path in the printer, around the drum unit and the developer unit. Verify repairs. If blurred image or characters print problem still appears, go to step 3.	Go to step 3.
3.Replace the developer.	Blurred image or characters print problem still exists.	Replace the following units one at a time, verifying the blurred image or characters print problem still exists after each replacement: a.Developer unit b.Drum unit c.Optical unit d.Mechanism controller board. ^a	Check that toner recycle mode is set to off.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

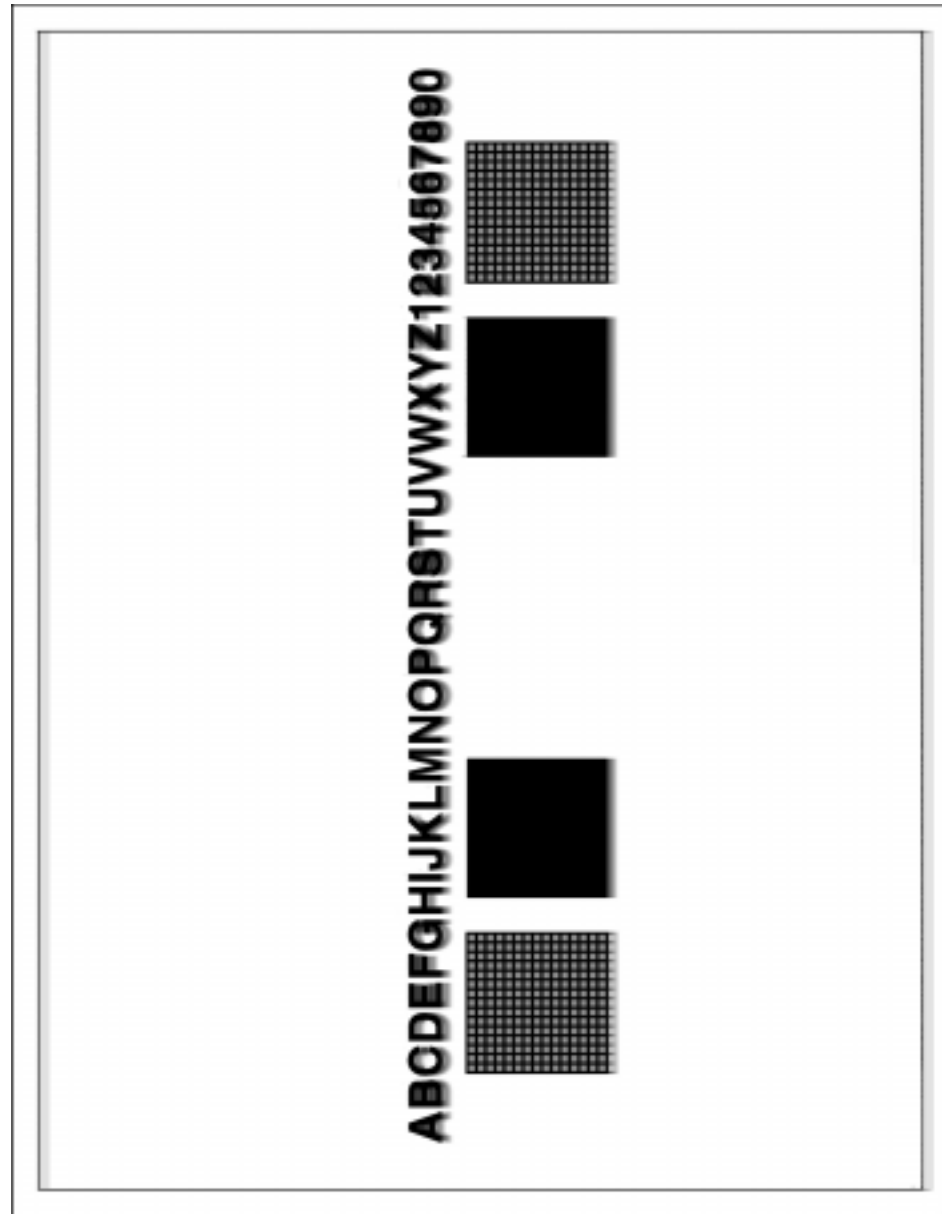


Figure 4-6 Blurred Images or Blurred Characters Print

4-11.9 Dark-Specks, Dark-Lines, or Dark-Areas Print

Description

Dark specks or lines resembling scratches some in the same place on each print.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Dark-specks, dark-lines, or dark-areas print problem still exists.	Go to step 2.	Done.
1. Clean all of the paper feeding path in the printer, around the drum unit and the developer unit.	Dark-specks, dark-lines, or dark-areas print problem still exists.	Replace the following units one at a time, verifying the dark-specks, dark-lines, or dark-areas print problem still exists after each replacement: a. Cleaning roller on the fuser unit (packed within the toner kit) b. Fuser unit (120V or 200V). c. Developer mixture d. Drum unit	Done.

Reference Diagrams

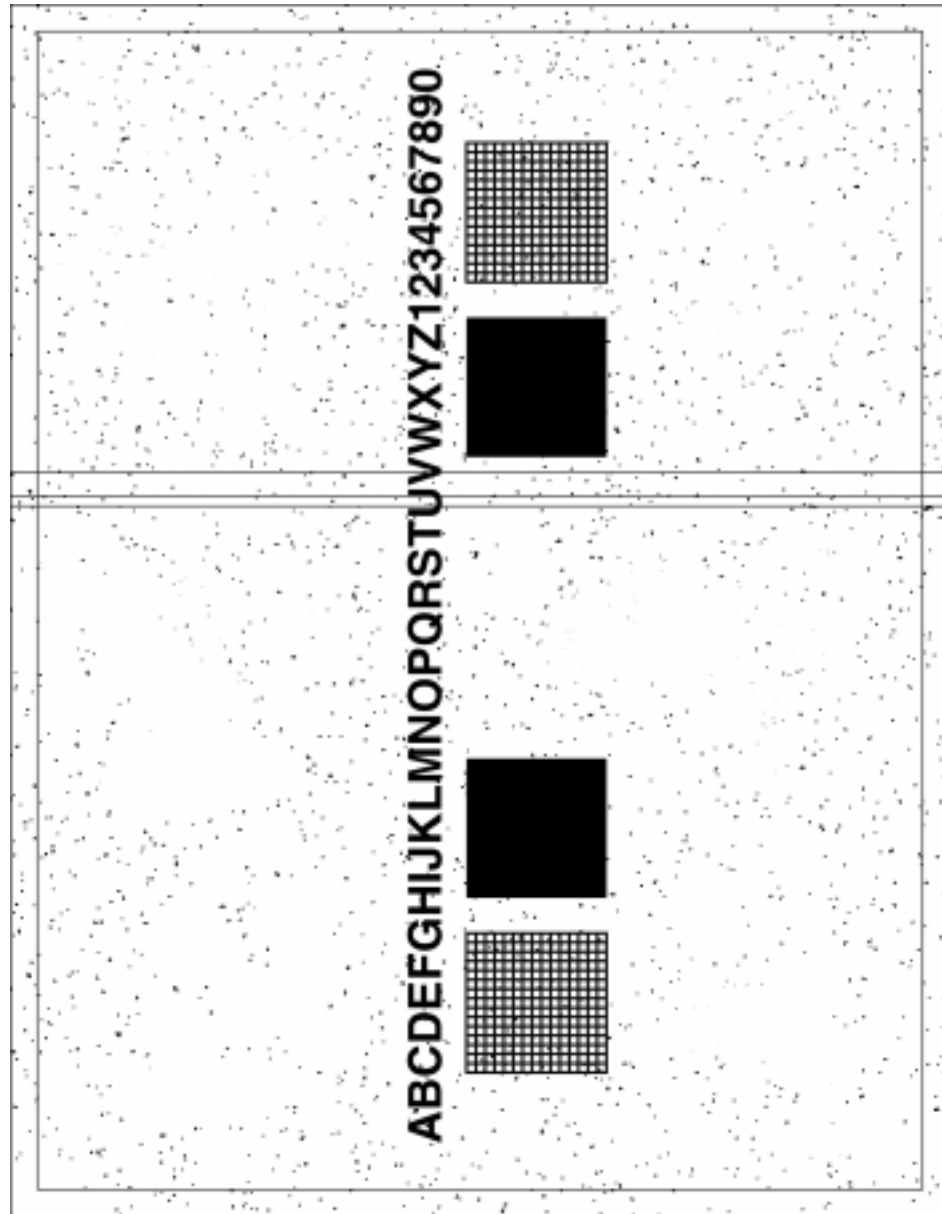


Figure 4-7 Dark-Specks, Dark-Lines, or Dark-Areas Print Example

4-11.10 Dark Vertical Lines Print

Description

One or more dark lines of varying width and density.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Dark vertical lines print problem still exists.	Clean precharger on developer. Verify repairs. If dark vertical lines print problem still exist, go to step 2.	Done.
2. Clean the entire paper feed path in the printer, especially around the drum unit and the developer unit. Print a test page.	Dark vertical lines print problem still exists.	Replace the following units one at a time, verifying the dark vertical lines print problem still exists after each replacement: a. Drum unit b. Developer mixture	Done.

Reference Diagrams

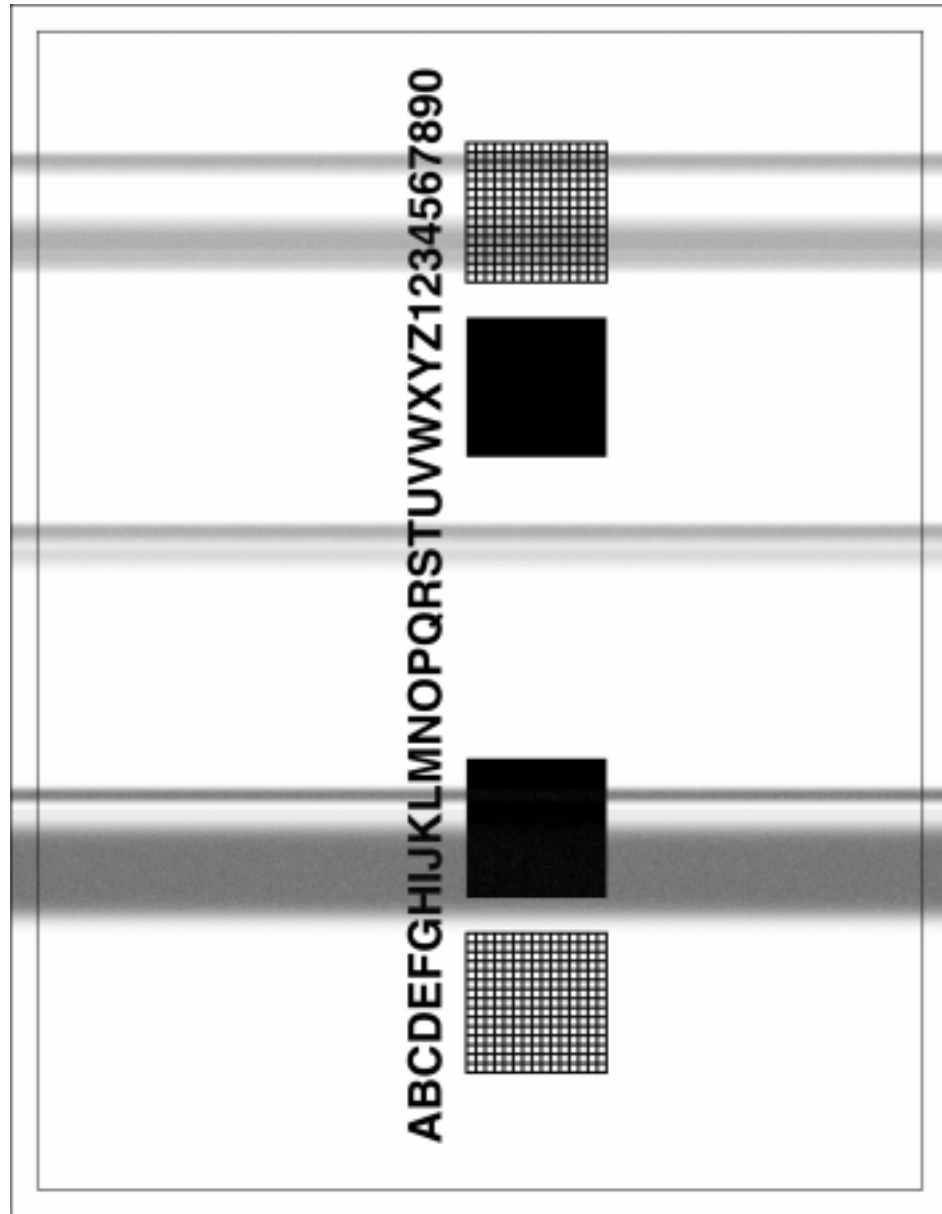


Figure 4-8 Dark Vertical Lines Print Example

4-11.11 Fusing Problems Print

Description

Images or characters rub off the print.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Fusing print problem still exists.	Go to step 2.	Done.
2. Check that the lever on the fuser unit is set in the correct position.	The lever is set in the correct position.	Go to step 3.	Set the lever to the correct position. Verify repairs. If the printer was run with the lever open, toner spots may appear on the paper. If spots appear, clean the fuser rollers. If the spots continue to appear, go to step 3. If the fusing print problem still appears, go to step 3.
3. Replace the fuser Unit.	Fusing print problem still exists.	Replace mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

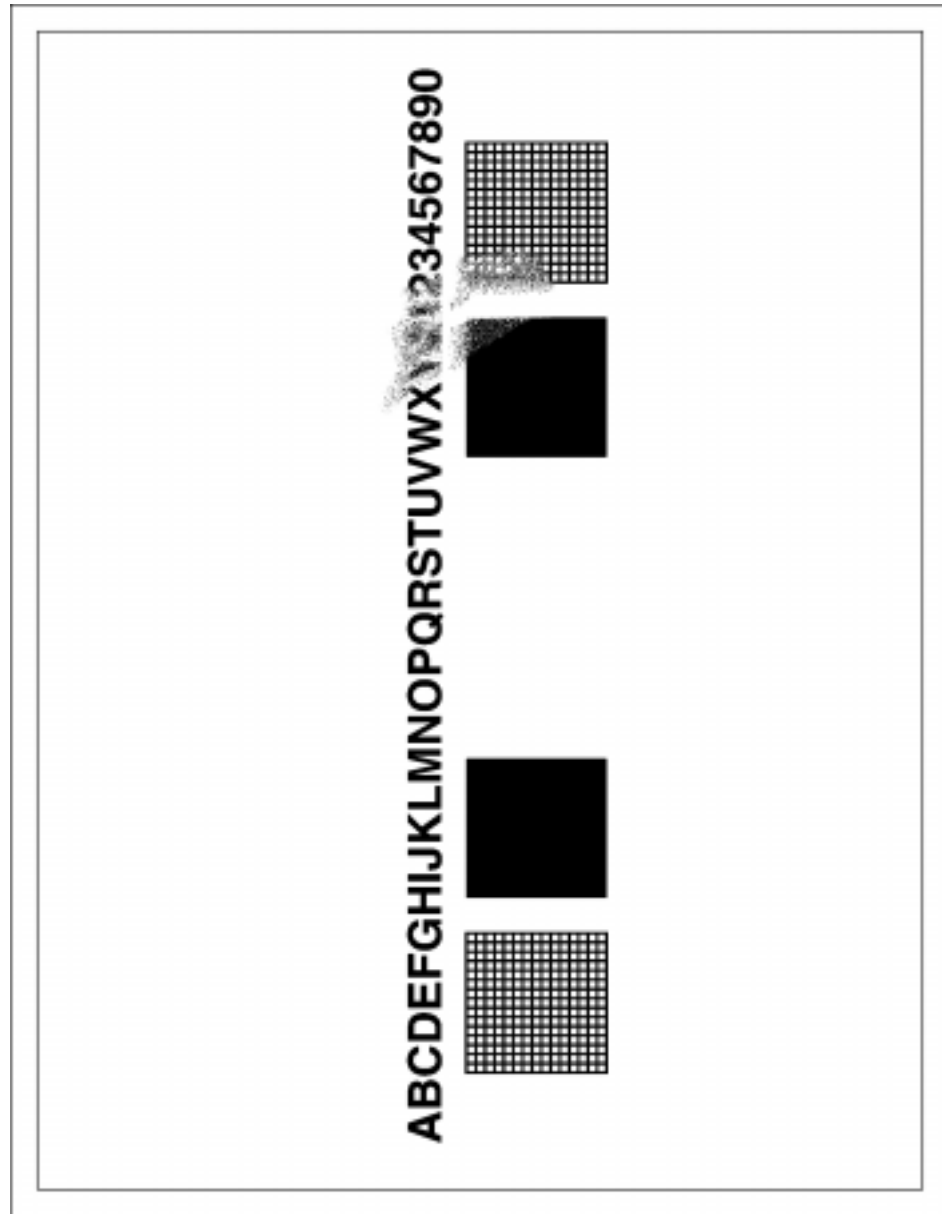


Figure 4-9 Fusing Problems Print Example

4-11.12 Light Print

Description

Images or characters are lighter than normal.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Light print problem still exists.	Go to step 2.	Done.
2. Clean the window of the optical unit.	Light print problem still exists.	Go to step 3.	Done.
3. Check the developer bias voltage at the VB connector on the developer unit.	The developer bias voltage is $-350V \pm 30V$.	Replace the following units one at a time, verifying the light print problem still exists after each replacement: a. Developer mixture b. High voltage power supply board c. Drum unit d. Optical unit e. Developer unit	Replace the developer. Check that toner recycle mode is set to off.

Reference Diagrams

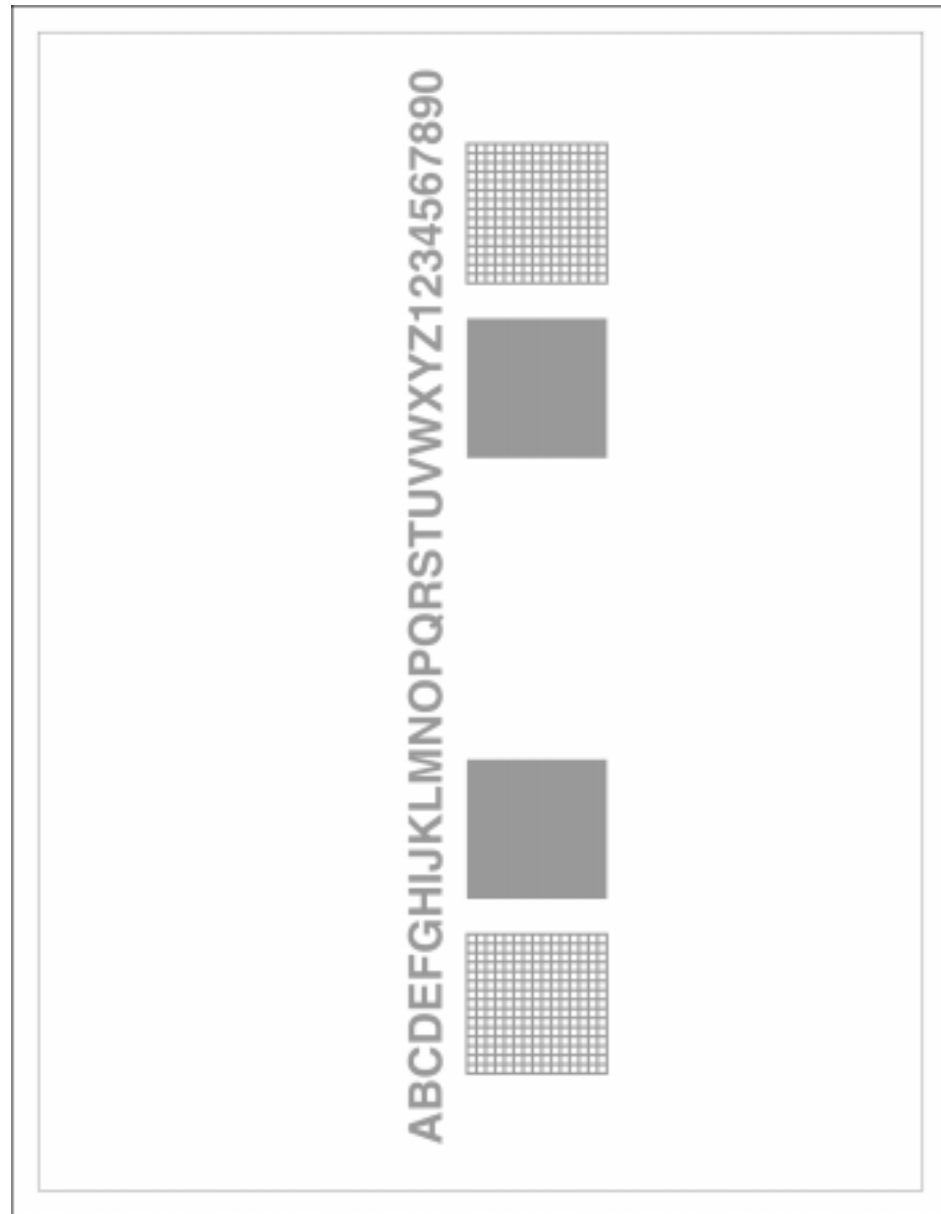


Figure 4-10 Light Print Example

4-11.13 Light Print with Background

Description

Images or characters are lighter than normal. Specks print in the white background.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Light print with background print problem still exists.	Go to step 2.	Done.
2.Check the coupling of the developer unit.	The coupling of drive unit M to the developer unit meets correctly.	Go to step 3.	Remove the developer unit, then mount it again. Replace drive unit M.
3.Check the developer bias voltage at the VB connector on the developer unit.	The developer bias voltage is $-350V \pm 30V$.	Replace the following units one at a time, verifying the light print with background problem still exists after each replacement: a.Developer mixture b.Developer unit c.Drum unit d.High voltage power supply board e.Mechanism controller board ^a	Replace the developer. Check that toner recycle mode is set to off.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

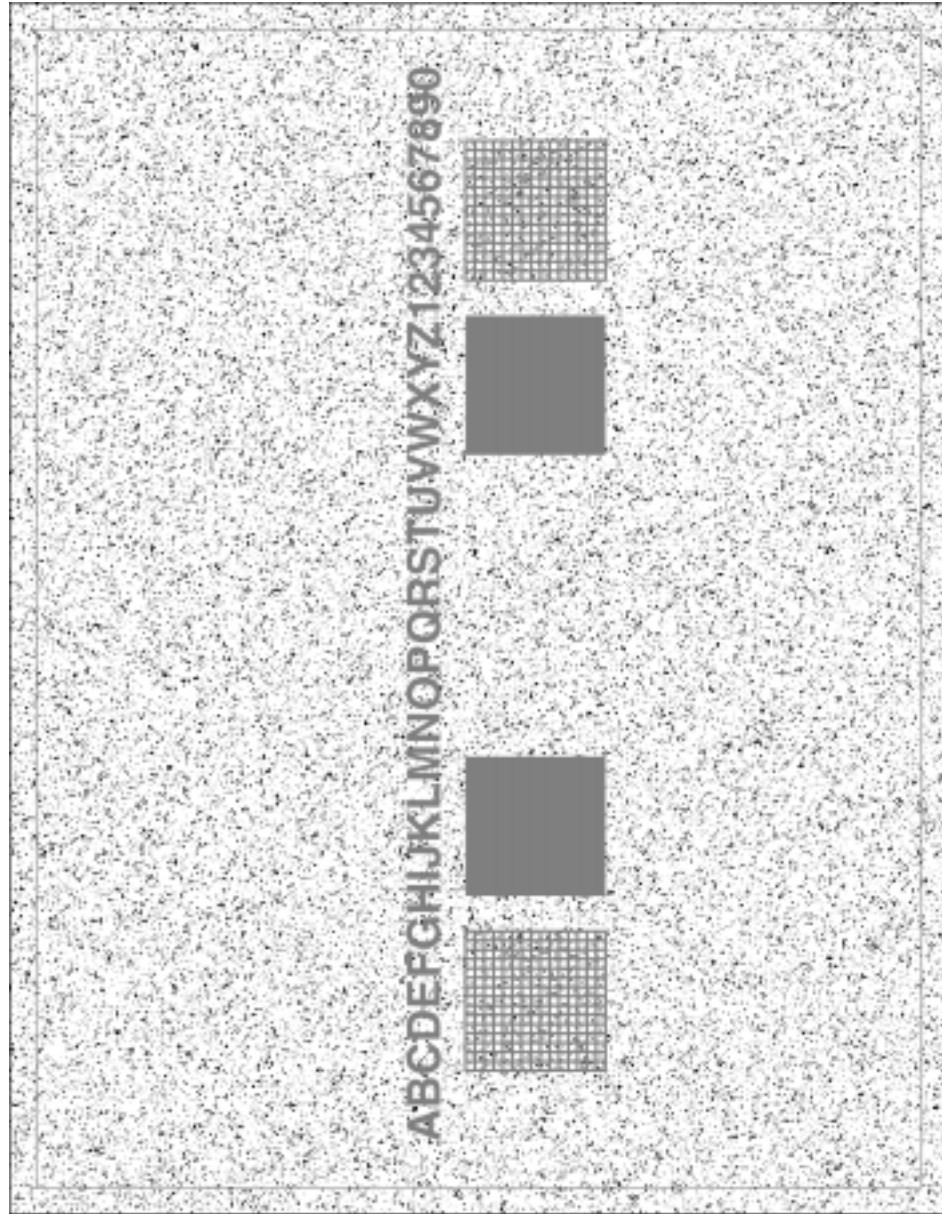


Figure 4-11 Light Print With Background

4-11.14 Light Horizontal Bands Print

Description

One or more horizontal bands.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Light horizontal bands print problem still exists.	Replace the following units one at a time, verifying the light horizontal bands print problem still exists after each replacement: a. Drum unit a. Developer mixture a. Developer unit	Done.

Reference Diagrams

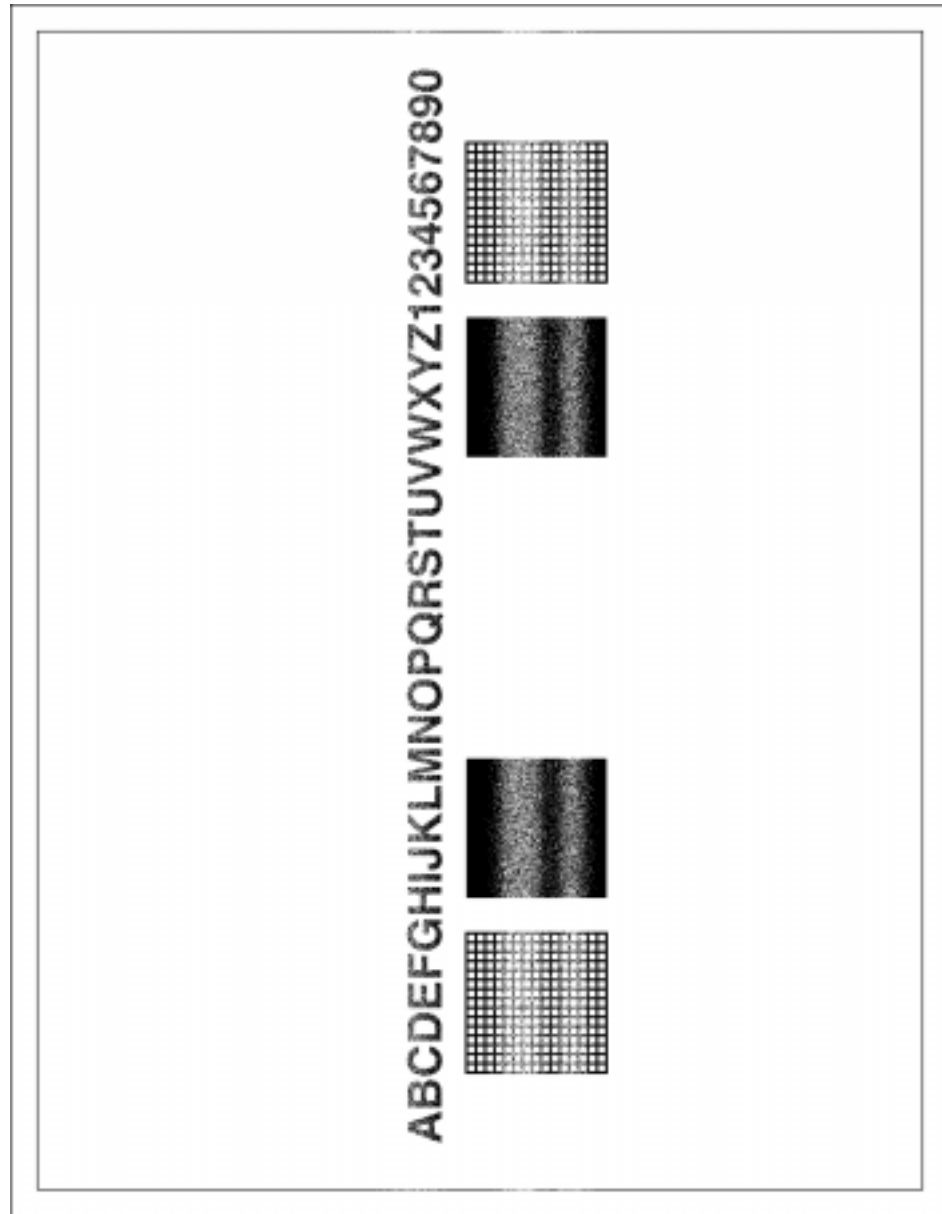


Figure 4-12 Light Horizontal Bands Print

4-11.15 Light Vertical Streaks Print

Description

One or more vertical streaked bands of varying intensity.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Light vertical streaks print problem still exists.	Go to step 2.	Done.
2. Open the front printer door and set the interlock switch. Print a test page so that as soon as the page reaches the drum, you immediately open the interlock to stop the printer.	Remove the drum and inspect the image. Image on drum has vertical streaks problem.	Replace drum. Verify repairs. If blank print problem still appears, go to step 3.	Transfer charger. Verify repairs. If blank print problem still appears, got to step 3.
3. Clean all of the paper feeding path in the printer, around the drum unit and the developer unit.	Light vertical streaks print problem still exists.	Clean the window of the optical unit. Verify repairs. If light vertical streaks print problem still appears, replace the following units one at a time, verifying the problem still exists after each replacement: a. Developer mixture b. Developer unit c. Cleaning roller on the fuser unit (packed within the toner kit) d. Optical unit e. Fuser unit	Done.

Reference Diagrams

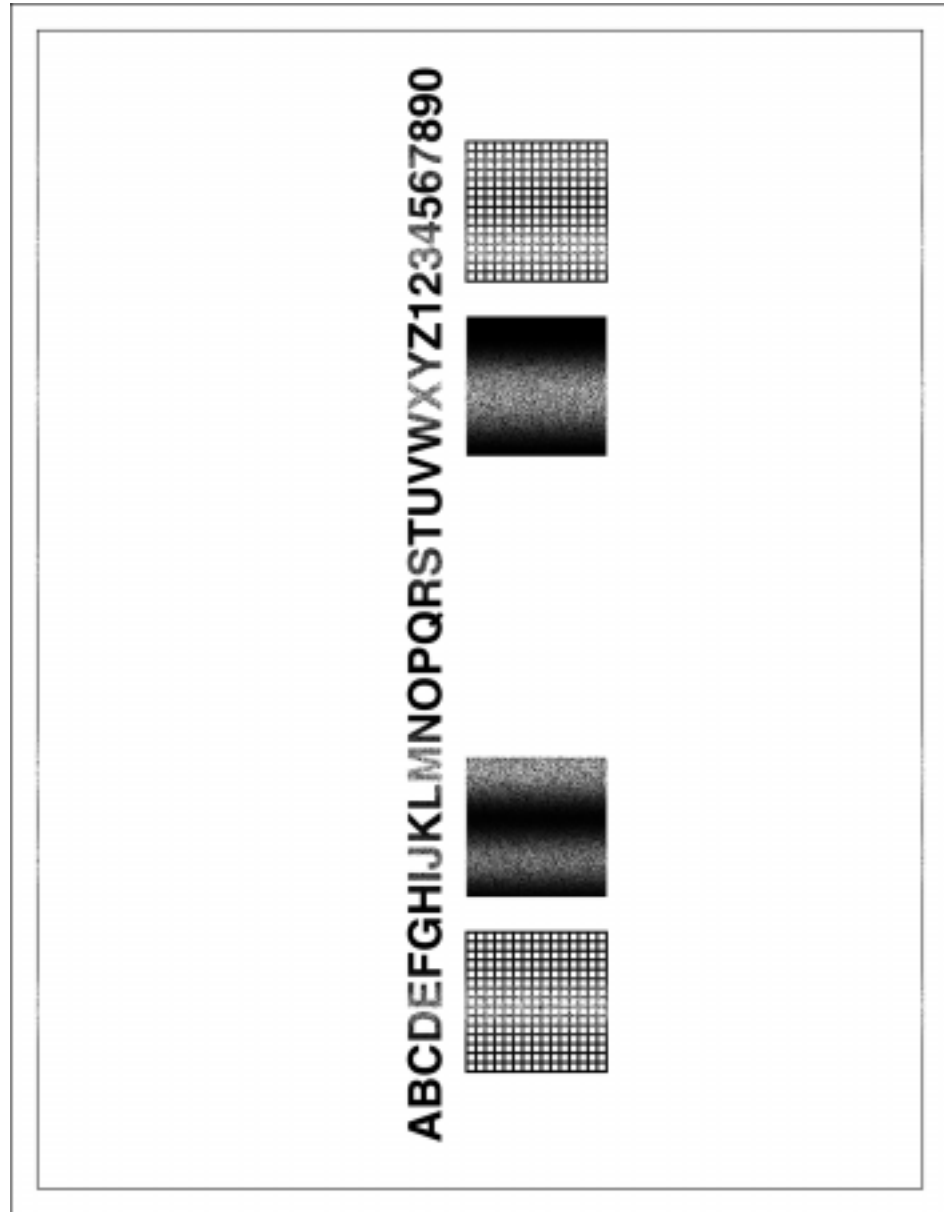


Figure 4-13 Light Vertical Streaks Print Example

4-11.16 Misregistration Print

Description

The entire image is not correctly located on the page. The top or bottom of the image may be missing.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Misregistration print problem still exists.	Go to step 2.	Done.
2.Check the value for imageshift (Menu.Configuration.imageshift).	The values are: imageshift.top = 0 imageshift.left = 0	Go to step 3.	Change the values to 0. Verify repairs. If misregistration print problem still appears, go to step 3.
3.Verify paper tray guides are set to the correct size and are installed securely. Align the papers in the tray or hopper. Print a Setup Report.	Misregistration print problem still exists.	Go to step 4.	Done.
4.Replace the paper in the tray or hopper with newly unpacked paper. Print a test page.	Misregistration print problem still exists.	Go to step 5.	Done.
5.Clean the entire paper feed path in the printer. Print a test page.	Misregistration print problem still exists.	Go to step 6.	Done.
6.Replace the Pick Roller Kit at the tray currently being used. Print a test page.	Misregistration print problem still exists.	Clean the registration roller and its pinch rollers. Verify repairs. If misregistration print problem still appears, replace the following units one at a time, verifying the problem still exists after each replacement: a.Registration roller clutch RRCL b.Registration roller	Done.

Reference Diagrams

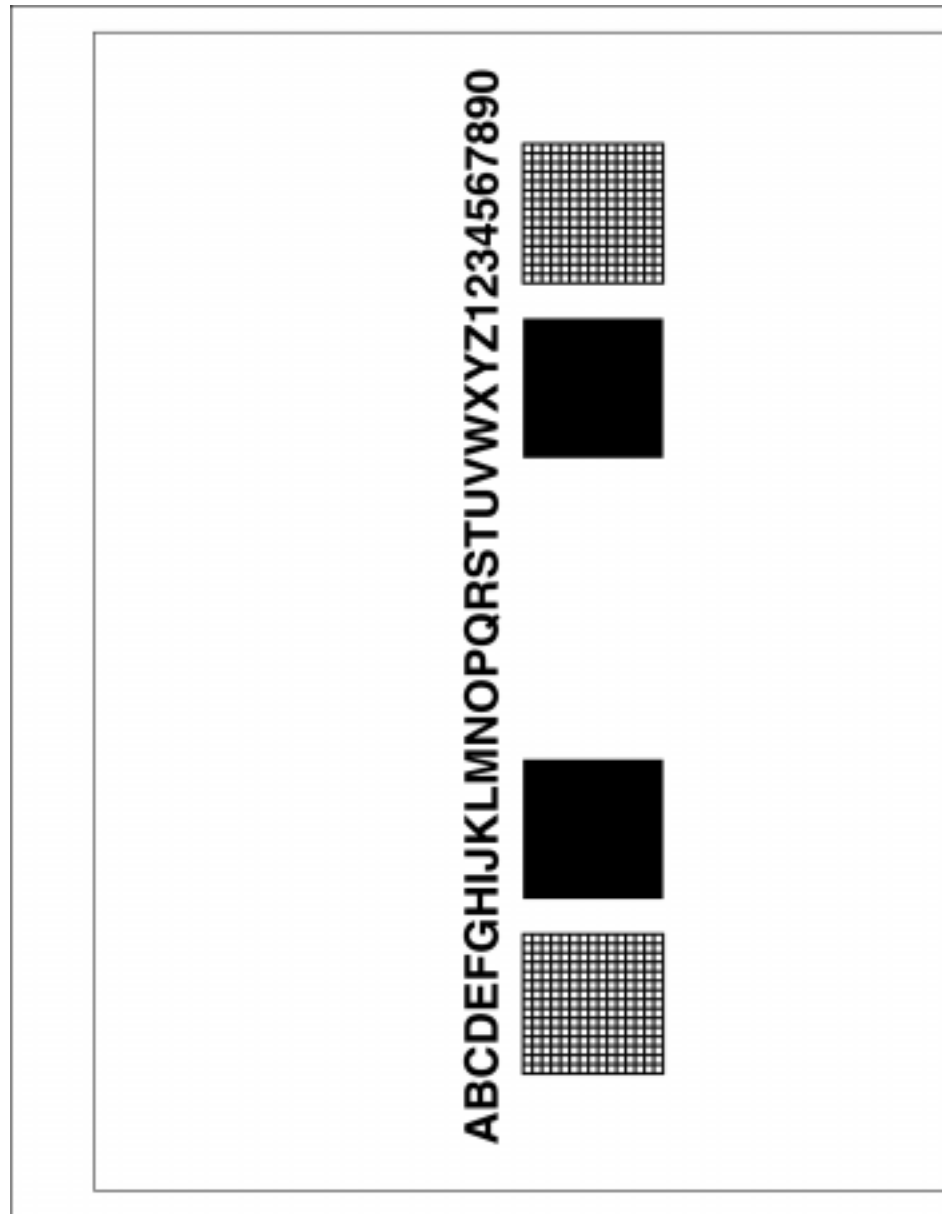


Figure 4-14 Misregistration Print Example

4-11.17 Residual Images Print

Description

Images from a previous print are visible, partially noticeable on pages proceeding test prints, white or shaded areas of the print may contain specks in specific patterns.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Residual images print problem still exists.	Go to step 2.	Done.
2. Clean the LED unit.	Residual images print problem still exists.	Replace the following units one at a time, verifying the residual images print problem still exists after each replacement: a. Cleaning roller on the fuser unit (packed within the toner kit) b. Fuser unit (120V or 200V) c. Drum unit d. Optical unit	Done.

Reference Diagrams

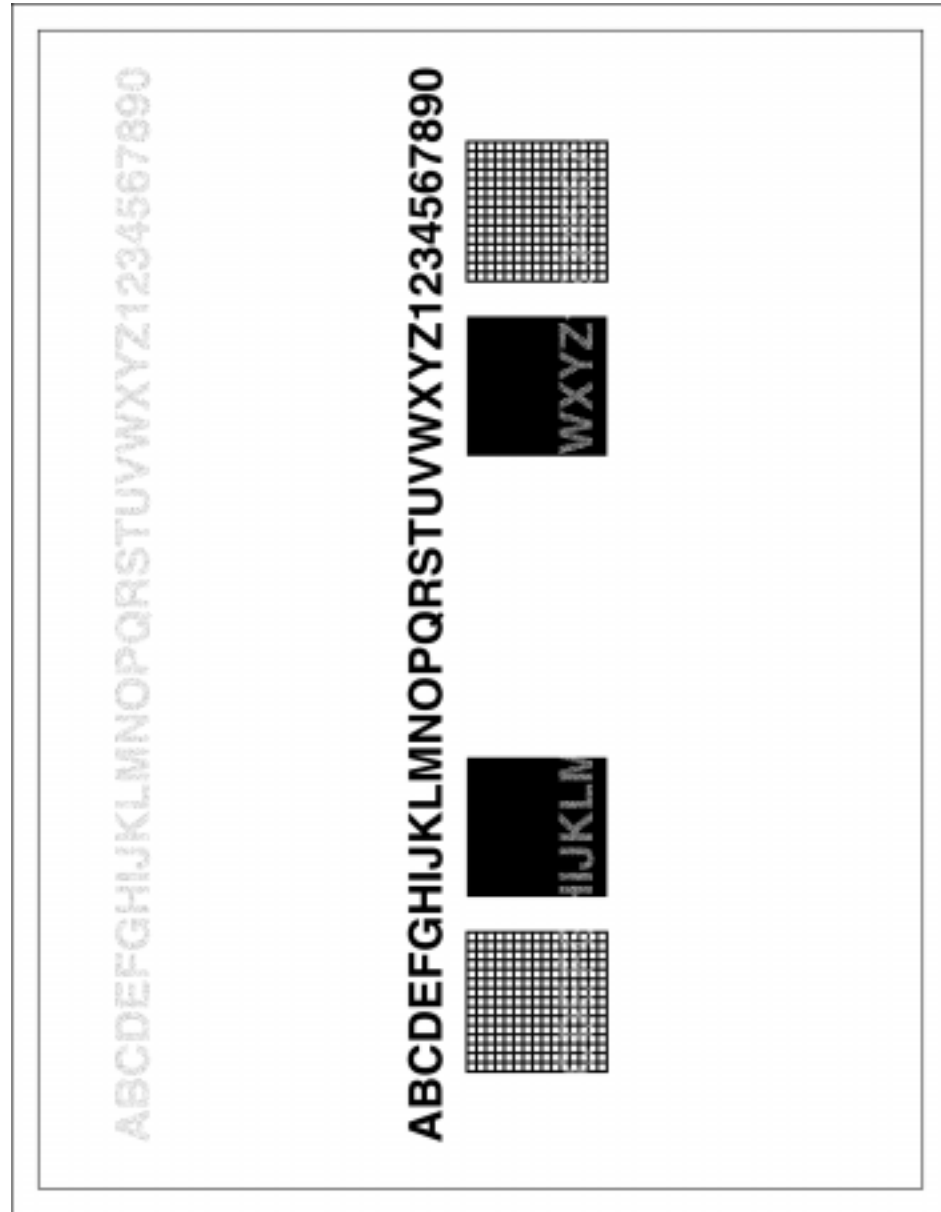


Figure 4-15 Residual Images Print

4-11.18 Skewed Print

Description

The image is not placed squarely on the page.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a Setup Report (Test.SETUPS) from each of the trays.	Skewed print problem still exists.	Skewed print problem • From only one tray, go to step 2 • From all trays, go to step 6	Done.
2.Verify the guides in the paper tray are set correctly set and securely installed. Print a Setup Report from problem tray.	Skewed print problem still exists.	Go to step 3.	Done.
3.Replace the paper in the tray or hopper with newly unpacked paper. Print a Setup Report from problem tray.	Skewed print problem still exists.	Go to step 4.	Done.
4.Clean the entire paper feed path in the printer.Print a Setup Report from problem tray.	Skewed print problem still exists.	Go to step 5.	Done.
5.Replace the pick roller kit. Print a Setup Report from problem tray.	Skewed print problem still exists.	Go to step 6.	Done.
6.Clean the paper feed path and rollers between the pick unit and the registration roller. Verify the guides in all the paper trays are set correctly and securely installed. Print a Setup Report.	Skewed print problem still exists.	Replace the registration roller and the registration roller clutch RrCL.	Done.

Reference Diagrams

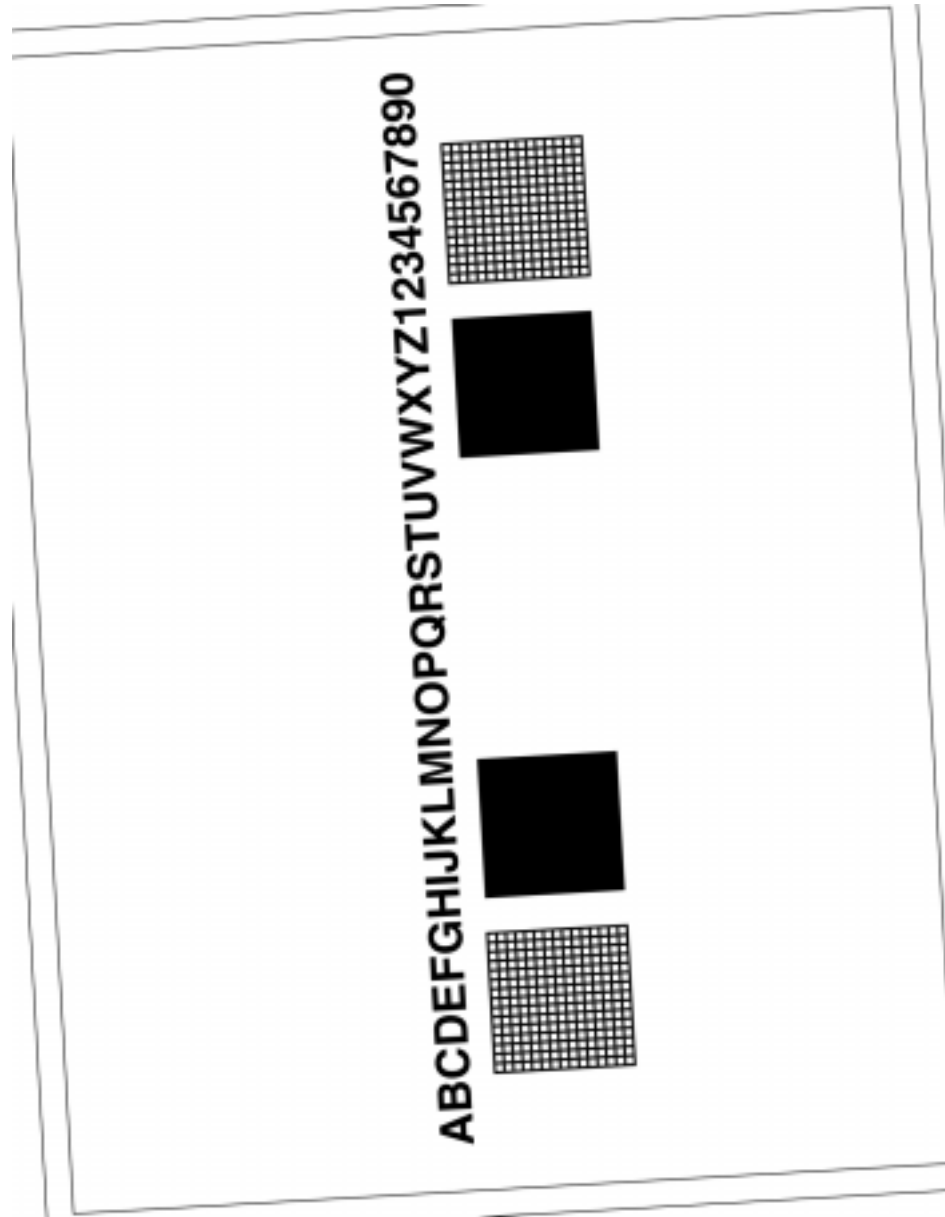


Figure 4-16 Skewed Print Example

4-11.19 Varying Print Density Print

Description

Some areas of the print are lighter or darker than normal, or the letters A, V, and Z have stair-stepped diagonals.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a Setup Report (Test.SETUPS).	Varying print density problem still exists.	Go to step 2.	Done.
2. Clean the window of the optical unit.	Varying print density problem still exists.	Clean the entire paper feed path in the printer, especially around the drum unit and the developer unit. Verify repairs. If varying print density print problem still appears, go to step 3.	Done.
3. Replace the developer mixture.	Varying print density problem still exists.	Replace the following units one at a time, verifying the varying print density problem still exists after each replacement: a. Drum unit b. Developer unit c. High voltage power supply board d. Optical unit	Verify the toner recycle mode is set off. Verify repairs.

Reference Diagrams

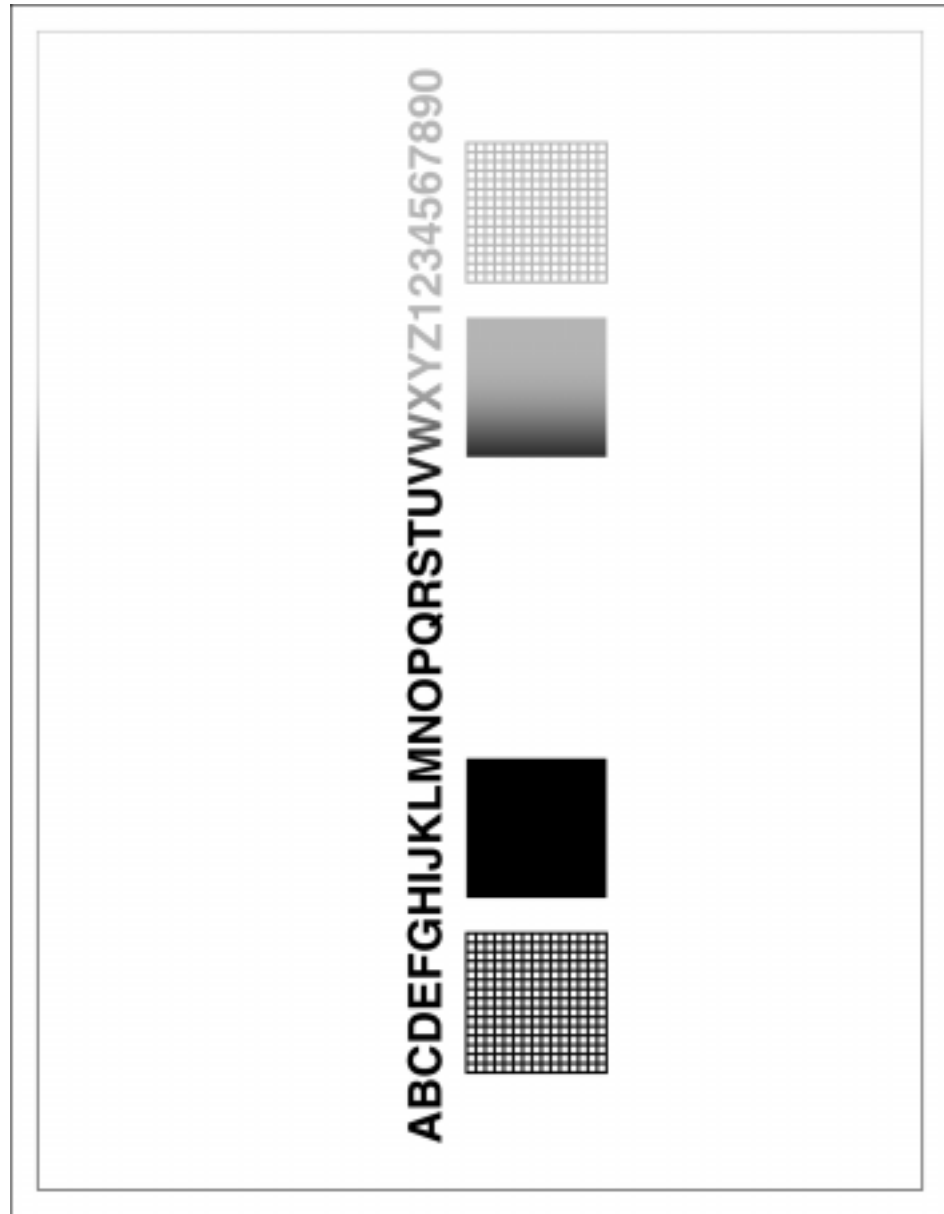


Figure 4-17 Varying Print Density Print Example

4-11.20 Voids or White Spots Print (Print Dropouts)

Description

Various random places on the page are light or missing.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a Setup Report (Test.SETUPS).	Voids or white spots print problem still exists.	Go to step 2.	Done.
2.Could be caused by the transfer assembly creating a crease on skewed paper. Remove transfer assembly and visually inspect the latch tabs for weak spots or breaks. Reinstall the transfer assembly and verify that the transfer guide assembly is latched tightly.	No movement upward on the left side when upward movement is attempted. The right side can be moved upward about 3 mm (1/8 inch); the left side should be tight.	Verify reinstallation. If voids or white spots print problem still exists, go to step 3.	Replace transfer unit. Verify repairs. Voids or white spots print problem still exists, go to step 3.
3.Remove developer bottle under the toner hopper.	Voids or white spots print problem still exists.	Go to step 4.	Upgrade mechanical controller firmware to Rev. 27 or above.
4.Replace the Developer mixture.	Voids or white spots print problem still exists.	Replace the developer unit.	Done.

Reference Diagrams

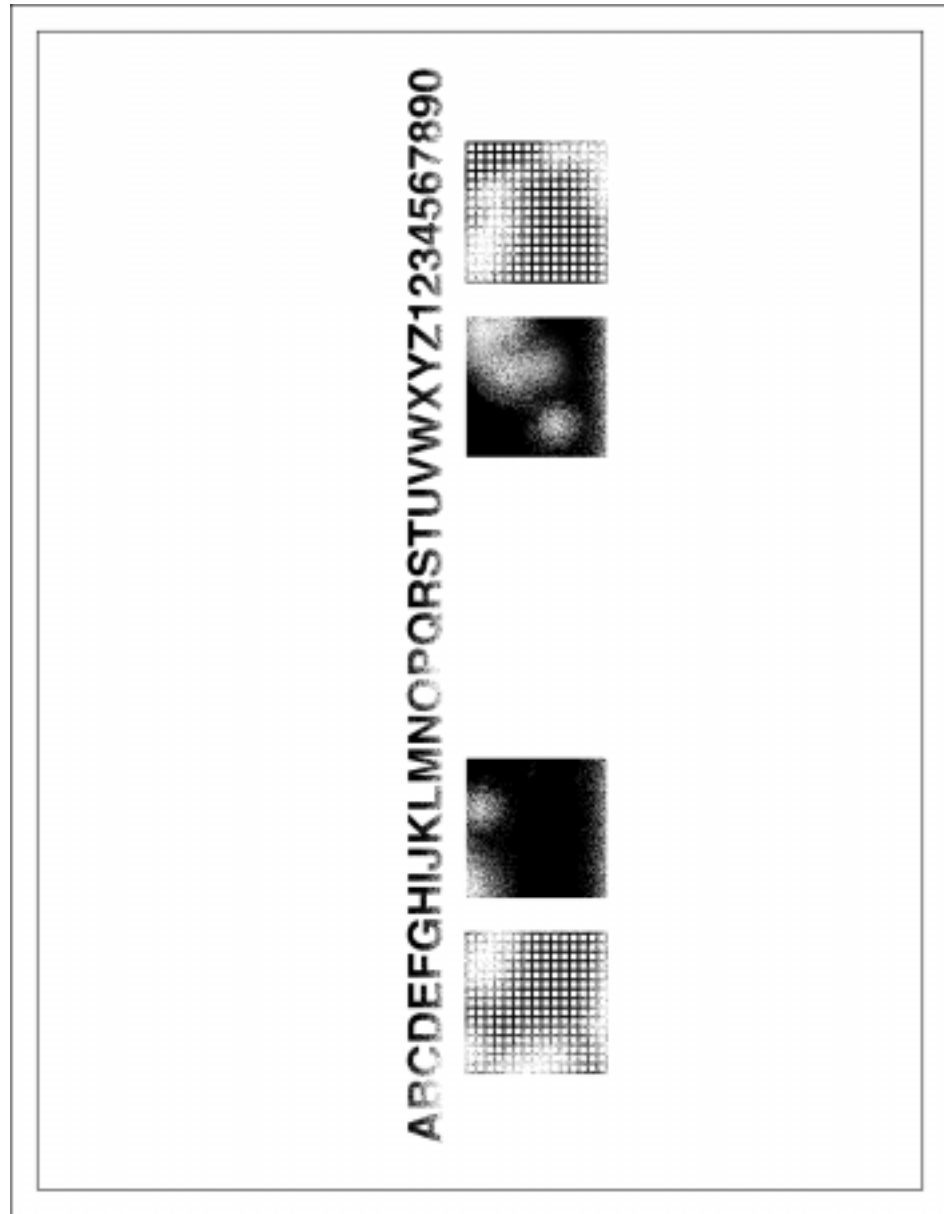


Figure 4-18 Voids or White Spots Print (Print Dropouts) Example

4-11.21 Washed-out Print

Description

One or more washouts in image areas.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Perform the pre-troubleshooting procedures in 4-11.2 "Initial Print Quality Troubleshooting Procedures," on page 4-106 . Print a test page.	Washed-out print problem still exists.	Go to step 2.	Done.
2. Clean the window of the optical unit.	Washed-out print problem still exists.	Go to step 3.	Done.
3. Replace the developer mixture.	Washed-out print problem still exists.	Replace the following units one at a time, verifying the washed-out print problem still exists after each replacement: a. Drum unit b. Developer unit c. High voltage power supply board d. Optical unit	Verify the toner recycle mode is set off.

Reference Diagrams

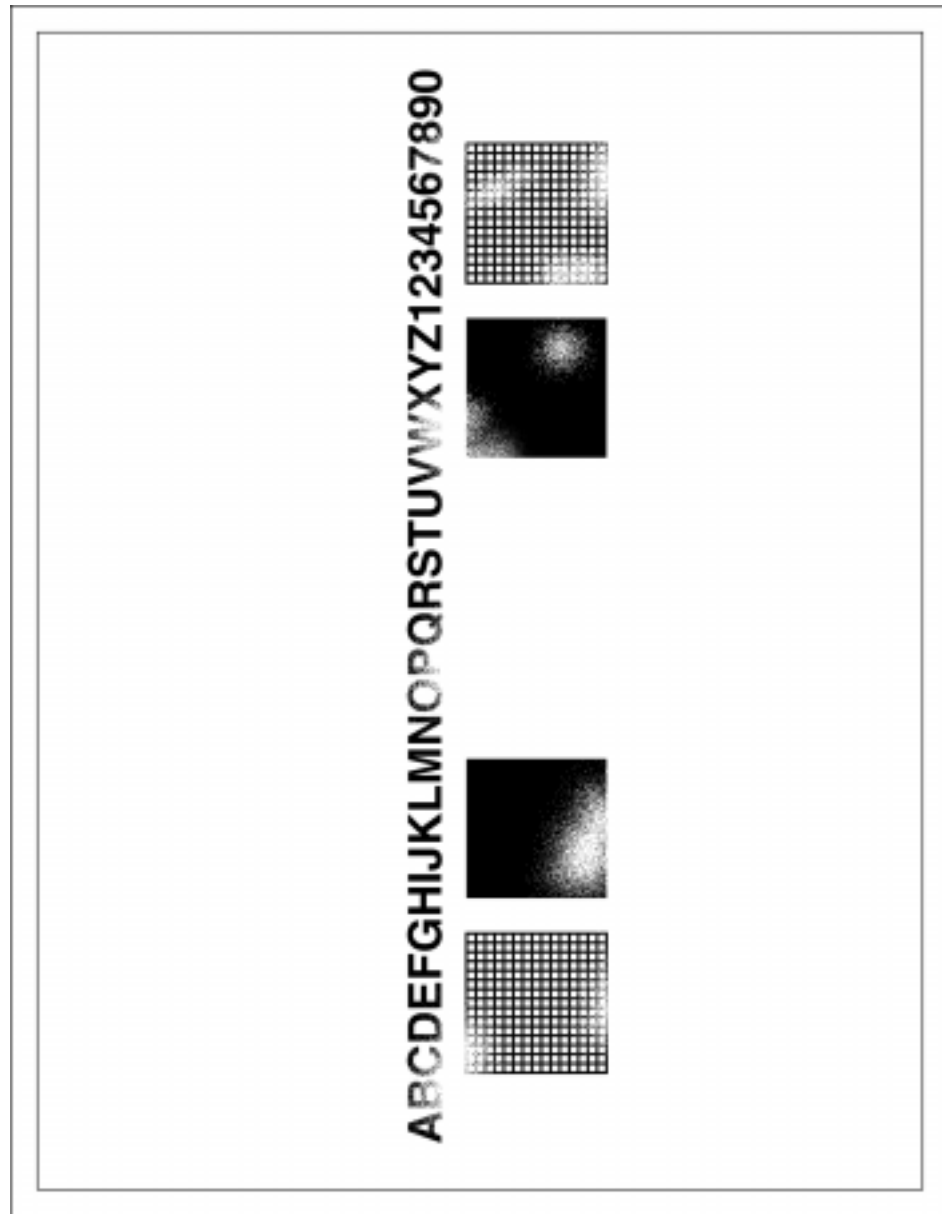


Figure 4-19 Washed-out Print Example

4-12 Power Related Problems

Section 4-12 contents:

- 4-12 Power Related Problems 4-147
 - 4-12.1 Blank Control Panel/Cannot Power Printer On 4-148
 - 4-12.2 Control Panel Powers On But Printer Cannot Power On 4-162
 - 4-12.3 Cannot Power Off Printer With Stand-by Switch. 4-164

4-12.1 Blank Control Panel/Cannot Power Printer On

Description

One of the following occurs:

- The printer can not be turned on
- The back-light of the control panel is not lit up
- The control panel is blank
- Solid white line across front panel

Troubleshooting Procedure

Instruction	Indication	Solution
1. Check the following: • AC power is present at the receptacle • The power cord is connected to the AC power receptacle and to the printer • The lower AC power switch on front of printer is in the 1 position • The control panel standby power switch is in the up position • Make sure the panel intensity knob is set fully clockwise	Power is present and connected and settings are correct.	n/a
2. Check voltage at TP 5V on power supply board (see 5-3.2 "Low Voltage Power Supply (LVPS) +5V Adjustment," on page 5-8).	Voltage is +4.82 $\pm$ 0.02V.	Adjust voltage to +4.82 $\pm$ 0.02V. If the voltage cannot be adjusted to within tolerance, replace power supply board.
3. Remove the rear cover. Check the two LEDs on the power supply board, POWLED and FANALM. Check the relay RL1 on the rear frame of the printer (see Figure 5-49 "Power Sequencing Relays RL1 and RL2," on page 5-61).	FANALM=ON	Fan 4 or Fan 5 may be malfunctioning. Go to Detailed Troubleshooting Procedures: "FANALM On Troubleshooting," on page 4-149 .
	POWLED=ON	An overcurrent on +5V (except the circuits supplied through relay RL1), +12V, or +24V circuits. Go to Detailed Troubleshooting Procedures: "POWLED On Troubleshooting," on page 4-149 .
	POWLED=OFF FANALM=OFF RL1=oscillating like a buzzer	Overcurrent on +5V circuits supplied through the relay RL1 may be occurred. Go to Detailed Troubleshooting Procedures: "RL1 Oscillating Troubleshooting," on page 4-153 .
	POWLED=OFF FANALM=OFF RL1= not oscillating (not buzzing)	Go to Detailed Troubleshooting Procedures: "RL1 Not Oscillating Troubleshooting," on page 4-156 .

Detailed Troubleshooting Procedures

FANALM On Troubleshooting

Instruction	Indication	Yes	No
1. Check fan4 and fan5 just after turning on the printer. (To clear the FANALM, turn the main switch off and wait until the LED goes off.)	Fans rotate.	Go to step 2.	Perform the following steps one at a time, checking if fans are rotating correctly after each step: a. Check the fans for blockage or damage. Free the fan from anything preventing rotation or replace damaged fan. b. Check for pinched wires, cables, and damaged connectors between following connectors, especially for pin1 and pin2 (+24V and GND): • CNFAN1 on the power supply board and FAN4P of fan4 • CNFAN2 on the power supply board and FAN5P of fan5. Repair/replace damaged part. c. Replace fan4 or fan5. d. Replace power supply board.
2. Check for pinched wires, cables, and damaged connectors between following connectors, especially for pin4 (alarm signal): • CNFAN1 on the power supply board and FAN4P of the fan4 • CNFAN2 on the power supply board and FAN5P of the fan5.	Pinched or damaged cables.	Replaced damaged parts. Verify repairs. If FANALM is still lit, replace power supply board.	Replace power supply board.

POWLED On Troubleshooting

Instruction	Indication	Yes	No
1. [+5V, RL1] Remove the mechanism controller board. Pull out the CN3 connector on the power supply board. Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN3 (see Figure 5-46 "Low Voltage Power Supply," on page 5-57).	Resistance is 0.35 ohm or less	Go to step 2.	Go to step 3.
2. Pull out the "13" labeled terminal from the RL1. Check the resistance between the terminal of the relay (not cable) and GND.	Resistance is 0.35 ohm or less	Replace the relay RL1	Check for pinched wires, cables, and damaged connectors between connectors CN3 on the power supply board and "13" labeled terminal of the RL1.
3. [+5V, main controller] Pull out the CN5 connector on the power supply board, then check the resistance between pin1 and pin3, between pin2 and pin3 of the cable side (not board side) of the CN5. Is the.	Resistance is 0.35 ohm or less.	Go to step 4.	Go to step 5.

POWLED On Troubleshooting (Continued)

Instruction	Indication	Yes	No
4. Pull out the CN1 connector on the main controller board, then check the resistance between pin1 and pin3, between pin2 and pin3 of the board side (not cable side).	Resistance 0.35 ohm or less.	Replace the main controller board.	Check for pinched wires, cables, and damaged connectors between connectors CN5 on the power supply board and CN1 on the main controller board.
5. <i>[+5V, hard disk drive unit]</i> Pull out the CN7 connector on the power supply board, then check the resistance between pin4 and pin3 of the cable side (not board side) of the CN7.	Resistance is 0.35 ohm or less.	Go to step 6.	Go to step 7.
6. Pull out the HDDJ connector on the hard disk drive unit, then check the resistance between pin4 and pin3 of the drive side (not cable side).	Resistance is 0.35 ohm or less.	Replace the hard disk drive unit.	Check for pinched wires, cables, and damaged connectors between connectors CN7 on the power supply board and HDDJ on the hard disk drive unit.
7. <i>[+5V, control panel]</i> Pull out the CN6 connector on the power supply board, then check the resistance between pin1 and pin2 of the cable side (not board side) of the CN6.	Resistance is 0.35 ohm or less.	Go to step 8.	Go to step 9.
8. Pull out the OPPJ connector on the control panel board, then check the resistance between pin1 and pin2 of the board side (not cable side).	Resistance is 0.35 ohm or less.	Replace the control panel.	Check for pinched wires, cables, and damaged connectors between connectors CN6 on the power supply board and OPPJ on the control panel board.
9. <i>[+12V, main controller/hard disk drive unit/primary side of RL2]</i> Pull out the CN7 connector on the power supply board, then check the resistance between pin1 and pin2 of the cable side (not board side) of the CN7.	Resistance is 3 ohms or less.	Go to step 19.	Go to step 10.
10. <i>[+12V, secondary side of RL2/fan6]</i> Pull out the CN10 connector on the mechanism controller board, then check the resistance between pin1 and pin2 of the cable side (not board side) of the CN10.	Resistance is 3 ohms or less.	Go to step 22.	Go to step 11.
11. <i>[+12V, toner density sensor]</i> Pull out the CN1 connector on the mechanism controller board, then check the resistance between pin2 and pin10 of the cable side (not board side) of the CN1.	Resistance is 3 ohms or less.	Go to step 12.	Go to step 13.

POWLED On Troubleshooting (Continued)

Instruction	Indication	Yes	No
12. Pull out the TNSP connector near the developing unit, then check the resistance between pin2 and pin10 of the developing unit side (not cable side).	Resistance is 3 ohms or less.	Replace the developing unit.	Check for pinched wires, cables, and damaged connectors between connectors CN1 on the mechanism controller board and TNSP near the developing unit.
13. <i>[+24V, optical unit]</i> Pull out the CN3 connector on the power supply board, then check the resistance between pin5 and pin4 of the cable side (not board side) of the CN3.	Resistance is 2.18 ohms or less.	Check for pinched wires, cables, and damaged connectors between connectors CN3 on the power supply board and CN4 on the optical unit. Repair or replace damaged part. Verify repairs by rechecking resistance on CN3. If resistance is still 2.18 ohm or less, replace the optical unit.	Done.
14. <i>[+24V, HCI]</i> If HCI is installed, pull out the CN3 connector on the power supply board, then check the resistance between pin6 and pin4 of the cable side (not board side) of the CN3.	Resistance is 2.18 ohms or less.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN3 on the power supply board and interface connector for the HCI • Interface connector and PW board-A of the HCI. Verify repairs by rechecking resistance on CN3. If resistance is still 2.18 ohm or less, replace the PW board-A.	Go to step 15.
15. <i>[+24V, high voltage power supply]</i> Pull out the CN3 connector on the mechanism controller board, then check the resistance between pin8 and pin7 of the cable side (not board side) of the CN3.	Resistance is 2.18 ohms or less.	Go to step 16.	Go to step 17.
16. Pull out the CNDC connector on the high voltage power supply board, then check the resistance between pin1 and pin2 of the board side (not cable side).	Resistance is 2.18 ohms or less.	Replace the high voltage power supply.	Check for pinched wires, cables, and damaged connectors between connectors CN3 on the power supply board and CNDC on the high voltage power supply.
17. <i>[+12V, mechanism controller board]</i> Check the resistance between pin1 and pin2 of the board side (not cable side) of the CN10 on the mechanism controller board.	Resistance is 3 ohms or less.	Replace mechanism controller board. ^a	Go to step 18.
18. <i>[+24V, mechanism controller board]</i> Check the resistance between pin5 and pin4, between pin6 and pin4 of the board side (not cable side) of the CN10.	Resistance is 2.18 ohms or less.	Replace mechanism controller board. ^a	Replace power supply board.

POWLED On Troubleshooting (Continued)

Instruction	Indication	Yes	No
19. <i>[+12V, main controller]</i> Pull out the CN14 connector on the main controller board. Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN7 on the power supply board.	Resistance is 3 ohms or less.	Go to step 20.	Replace main controller board.
20. <i>[+12V, hard disk drive unit]</i> Pull out the HDDJ connector of the hard disk drive unit. Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN7 on the power supply board.	Resistance is 3 ohms or less.	Go to step 21.	Replace hard disk drive unit.
21. <i>[+12V, relay RL2]</i> Pull out the “23” labeled terminal from the relay RL2. Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN7 on the power supply board.	Resistance is 3 ohms or less.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN7 on the power supply board and relay RL2 • CN7 on the power supply board and CN14 on the main controller board • CN7 on the power supply board and HDDJ of the hard disk drive unit. Replaced damaged parts.	Replace relay RL2.
22. <i>[+12V, fan6]</i> Pull out the FAN6P connector of the fan6 (main controller cooling fan). Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN10 on the mechanism controller board.	Resistance is 3 ohms or less.	Go to step 24.	Replace the fan6.
23. <i>[+12V, relay RL2]</i> Pull out the “24” labeled terminal from the relay RL2. Check the resistance between pin1 and pin2 of the cable side (not board side) of the CN10 on the mechanism controller board.	Resistance is 3 ohms or less.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN10 on the mechanism controller board and FAN6P of the fan6 above the main controller • CN10 on the mechanism controller board and relay RL2. Replaced damaged parts.	Replace relay RL2.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

RL1 Oscillating Troubleshooting

Instruction	Indication	Yes	No
1. <i>[+5V, toner empty sensor]</i> Pull out the CN11 connector on the mechanism controller board. Turn on printer.	Printer turns on.	Reconnect CN11. Go to step 2.	Go to step 3.
2. Pull out the TEMPP connector near the developing unit. Turn on printer.	Printer turns on.	Replace the developer unit.	Check for pinched wires, cables, and damaged connectors between connectors CN11 on the mechanism controller board and TEMPP connector near the developing unit.
3. <i>[+5V, PS1-1/PLS1/PEMP1]</i> Pull out the CN2 on the mechanism controller board. Turn on printer.	Printer turns on.	Go to step 13.	Go to step 4.
4. <i>[+5V, PS1-2/PLS2/PEMP2]</i> Pull out the CN3 on the mechanism controller board. Turn on printer.	Printer turns on.	Go to step 16.	Go to step 5.
5. <i>[+5V, PS1-3/PLS3/PEMP3]</i> Pull out the CN4 on the mechanism controller board.	Printer turns on.	Go to step 19.	Go to step 6.
6. <i>[+5V, PS2/PS3/PS4]</i> Pull out the CN23 on the mechanism controller board. Turn on printer.	Printer turns on.	Go to step 22.	Go to step 7.
7. <i>[+5V, PS5]</i> Pull out the CN20 connector on the mechanism controller board. Turn on printer.	Printer turns on.	Go to step 8.	Go to step 9.
8. Pull out the PS5J connector at the duplex unit. Turn on printer.	Printer turns on.	Replace PS5 sensor.	Check for pinched wires, cables, and damaged connectors between connectors CN20 on the mechanism controller board and PS5J connector at the duplex unit. Repair or replace damaged parts.
9. <i>[+5V, PS6/PS7/stacker full sensor]</i> Pull out the CN18 on the mechanism controller board.	Printer turns on.	Go to step 25.	Go to step 10.
10. <i>[+5V, main motor/toner waste screw sensor]</i> Pull out the CN21 on the mechanism controller board.	Printer turns on.	Go to step 28.	Go to step 11.

RL1 Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
11. [+5V, HCI] If the HCI installed, pull out the CN7 connector on the mechanism controller board.	Printer turns on.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN7 on the mechanism controller board and the interface connector for the HCI • the interface connector for the HCI and PW board-A of the HCI. Repair or replace any damaged parts.	Go to step 12.
12.[+5V, optical unit] Pull out the CN4 connector on the optical unit.	Printer turns on.	Replace the optical unit.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN11 on the mechanism controller board and relay RL1 • CN11 on the mechanism controller board and CN4 connector on the optical unit Repair or replace damaged parts. Verify repairs. If the printer is still unable to turn on, replace mechanism controller board. ^a
13. [+5V, PS1-1] Pull out the PSJ1 connector on the upper feed unit.	Printer turns on.	Replace PS1-1 sensor.	Go to step 14.
14.[+5V, PEMP1] Pull out the PEMPJ1 connector on the upper feed unit.	Printer turns on.	Replace the paper empty sensor PEMP1.	Go to step 15.
15.[+5V, PLS1] Remove the upper feed unit. Pull out the PLS1 connector on the upper feed unit.	Printer turns on.	Replace paper level sensor PLS1.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN2 on the mechanism controller board and PSJ1 on the upper feed unit • CN2 on the mechanism controller board and PEMPJ1 on the upper feed unit • CN2 on the mechanism controller board and PLS1 on the upper feed unit Repair or replace damaged parts.
16.[+5V, PS1-2] Pull out the PSJ2 connector on the middle feed unit.	Printer turns on.	Replace PS1-2 sensor.	Go to step 17.
17. [+5V, PEMP2] Pull out the PEMPJ2 connector on the middle feed unit.	Printer turns on.	Replace paper empty sensor PEMP2.	Go to step 18.

RL1 Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
18. [+5V, PLS2] Remove the middle feed unit. Pull out the PLSJ2 connector on the middle feed unit.	Printer turns on.	Replace paper level sensor PLS2.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN3 on the mechanism controller board and PSJ2 on the middle feed unit • CN3 on the mechanism controller board and PEMPJ2 on the middle feed unit • CN3 on the mechanism controller board and PLS2 on the middle feed unit Repair or replace damaged part.
19. [+5V, PS1-3] Pull out the PSJ3 connector on the lower feed unit.	Printer turns on.	Replace PS1-3 sensor.	Go to step 20.
20. [+5V, PEMP3] Pull out the PEMPJ3 connector on the lower feed unit.	Printer turns on.	Replace paper empty sensor PEMP3.	Go to step 21.
21. [+5V, PLS3] Remove the lower feed unit. Pull out the PLSJ3 connector on the lower feed unit.	Printer turns on.	Replace paper level sensor PLS3.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN4 on the mechanism controller board and PSJ3 on the lower feed unit • CN4 on the mechanism controller board and PEMPJ3 on the lower feed unit • CN4 on the mechanism controller board and PLS3 on the lower feed unit Repair or replace damaged parts.
22. [+5V, PS2] Pull out the PS2 connector on PS2 sensor.	Printer turns on.	Replace PS2 sensor.	Go to step 23.
23. [+5V, PS3] Pull out the PS3 connector on PS2 sensor.	Printer turns on.	Replace PS3 sensor.	Go to step 24.
24. [+5V, PS4] Pull out the PS4 connector on the decurler assembly.	Printer turns on.	Replace PS4 sensor.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN23 on the mechanism controller board and PS2 • CN23 on the mechanism controller board and PS3 • CN23 on the mechanism controller board and PS4 Repair or replace damaged parts.
25. [+5V, PS6] Pull out the PS6P connector on the reversing unit.	Printer turns on.	Replace PS6 sensor.	Go to step 26.
26. [+5V, PS7] Pull out the PS7P connector on the ejection unit.	Printer turns on.	Replace PS7 sensor.	Go to step 27.
27. [+5V, stack full sensor] Pull out the STFLP connector at the stacker full sensor on the ejection unit.	Printer turns on.	Replace stack full sensor.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN18 on the mechanism controller board and MMJ at the main motor • CN18 on the mechanism controller board and SCRSJ on the toner waste screw sensor • CN18 on the mechanism controller board and SCRSJ on the toner waste screw sensor Repair or replace damaged parts.

RL1 Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
28. <i>[+5V, main motor]</i> Pull out the MMJ connector at the main motor.	Printer turns on.	Replace drive unit M.	Go to step 26.
29. <i>[+5V, toner waste screw sensor]</i> Pull out the SCRSJ connector at the drive unit M.	Printer turns on.	Replace waste toner screw sensor.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN21 on the mechanism controller board and MMJ at the main motor • CN21 on the mechanism controller board and SCRSJ on the toner waste screw sensor Repair or replace damaged parts.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

RL1 Not Oscillating Troubleshooting

Instruction	Indication	Yes	No
1. <i>[+5V, relay RL1]</i> Check the voltage at the RL1, between “14” labeled terminal and GND.	Voltage is +4.82V $\pm 0.02V$.	Go to step 4.	Go to step 2.
2. Check the voltage at the RL1, between “11” labeled terminal and “15” labeled terminal.	Voltage is +4.82V $\pm 0.02V$.	Go to step 3.	Check for pinched wires, cables, and damaged connectors between connectors CN10 on the power supply board and relay RL1. Repair or replace damaged part. Verify repairs. If printer still unable to turn on, replace power supply board.
3. Check the voltage at the RL1, between “13” labeled terminal and GND.	Voltage is +4.82V $\pm 0.02V$.	Replace the relay RL1.	Replace power supply board.
4. <i>[+24V, pick motor1]</i> Pull out the CN2 connector on the mechanism controller board.	Printer turns on.	Go to step 5.	Go to step 6.
5. Pull out the PMP1 connector on the upper feed unit.	Printer turns on.	Replace feed unit.	Check for pinched wires, cables, and damaged connectors following connectors CN2 on the mechanism controller board and PMP1 connector on the upper feed unit.
6. <i>[+24V, pick motor2]</i> Pull out the CN3 connector on the mechanism controller board.	Printer turns on.	Go to step 7.	Go to step 8.
7. Pull out the PMP2 connector on the middle feed unit.	Printer turns on.	Replace feed unit.	Check for pinched wires, cables, and damaged connectors between connectors CN3 on the mechanism controller board and PMP2 connector on the middle feed unit.
8. <i>[+24V, pick motor3]</i> Pull out the CN4 connector on the mechanism controller board.	Printer turns on.	Go to step 9.	Go to step 10.

RL1 Not Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
9. Pull out the PMP3 connector on the lower feed unit.	Printer turns on.	Replace feed unit.	Check for pinched wires, cables, and damaged connectors between connectors CN4 on the mechanism controller board and PMP3 connector on the lower feed unit.
10. [<i>+24V, toner motor/developer shutter motor</i>] Pull out the CN1 connector on the mechanism controller board.	Printer turns on.	Go to step 21.	Go to step 11.
11. [<i>+24V, main motor/registration roller clutch</i>] Pull out the CN21 connector on the mechanism controller board.	Printer turns on.	Go to step 23.	Go to step 12.
12. [<i>+24V, duplex motor</i>] Pull out the CN20 connector on the mechanism controller board.	Printer turns on.	Go to step 13.	Go to step 14.
13. Pull out the DPMP1 connector on the duplex unit.	Printer turns on.	Replace duplex unit.	Check for pinched wires, cables, and damaged connectors between connectors CN20 on the mechanism controller board and DPMP1 connector on the duplex unit.
14. [<i>+24V, reversing motor/solenoids</i>] Pull out the CN18 connector on the mechanism controller board.	Printer turns on.	Go to step 25.	Go to step 15.
15. [<i>+24V, transport feed motor/lift motors</i>] Pull out the CN6 connector on the mechanism controller board.	Printer turns on.	Go to step 28.	Go to step 15.
16. [<i>+24V, fans</i>] Pull out the CN22 connector on the mechanism controller board.	Printer turns on.	Go to step 32.	Go to step 17.
17. [<i>+24V, LED unit</i>] Pull out the CN23 connector on the mechanism controller board.	Printer turns on.	Go to step 18.	Go to step 19.
18. Pull out the CLEDP connector at the LED unit.	Printer turns on.	Replace LED unit.	Check for pinched wires, cables, and damaged connectors between connectors CN23 on the mechanism controller board and CLEDP connector at the LED unit.
19. [<i>+24V, optical unit (LD)</i>] Pull out the CN15 connector on the mechanism controller board.	Printer turns on.	Go to step 20.	Replace power supply board.
20. Pull out the CN2 connector on the optical unit.	Printer turns on.	Replace optical unit.	Check for pinched wires, cables, and damaged connectors between connectors CN15 on the mechanism controller board and CN2 connector on the optical unit.
21. [<i>+24V, developer shutter motor</i>] Pull out the MGSJ connector of the developer shutter motor.	Printer turns on.	Replace drive unit D.	Go to step 22.

RL1 Not Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
22. <i>[+24V, toner motor]</i> Pull out the TNMJ connector of the toner motor.	Printer turns on.	Replace the toner hopper.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN1 on the mechanism controller board and MGSJ connector of the developer shutter motor • CN1 on the mechanism controller board and TNMJ connector of the toner motor
23. <i>[+24V, main motor]</i> Pull out the MMJ connector of the main motor.	Printer turns on.	Replace drive unit M.	Go to step 24.
24. <i>[+24V, registration roller clutch]</i> Pull out the RCLP connector of the registration roller clutch.	Printer turns on.	Replace registration roller clutch.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN21 on the mechanism controller board and MMJ connector of the main motor • CN21 on the mechanism controller board and RCLP connector of the registration roller clutch.
25. <i>[+24V, reversing motor]</i> Pull out the SBMP connector of the reversing motor.	Printer turns on.	Replace reversing unit.	Go to step 26.
26. <i>[+24V, stacker select solenoid]</i> Pull out the STSLP connector of the stacker select solenoid.	Printer turns on.	Replace reversing unit.	Go to step 27.
27. <i>[+24V, purge solenoid]</i> Pull out the STCHP connector of the offset solenoid.	Printer turns on.	Replace reversing unit.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN18 on the mechanism controller board and SBMP connector of the reversing motor • CN18 on the mechanism controller board and STSLP connector of the stacker select solenoid • CN18 on the mechanism controller board and STCHP connector of the offset solenoid.
28. <i>[+24V, feed motor]</i> Pull out the FMP connector of the transport feed motor.	Printer turns on.	Replace transport feed motor.	Go to step 29.
29. <i>[+24V, upper lift motor]</i> Pull out the CLM1J connector of the upper lift motor.	Printer turns on.	Replace upper lift motor.	Go to step 30.
30. <i>[+24V, middle lift motor]</i> Pull out the CLM2J connector of the middle lift motor.	Printer turns on.	Replace middle lift motor.	Go to step 31.

RL1 Not Oscillating Troubleshooting (Continued)

Instruction	Indication	Yes	No
31. [+24V, lower lift motor] Pull out the CLM3J connector of the lower lift motor.	Printer turns on.	Replace lower lift motor.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN6 on the mechanism controller board and FMP connector of the feed motor • CN6 on the mechanism controller board and CLM1J connector of the upper lift motor • CN6 on the mechanism controller board and CLM2J connector of the middle lift motor • CN6 on the mechanism controller board and CLM3J connector of the lower lift motor.
32. [+24V, fan1] Pull out the FAN1P connector near at the optical unit.	Printer turns on.	Replace optical unit. Fan1 in the optical unit can not be replaced individually.	Go to step 33.
33. [+24V, fan2] Pull out the FAN2P connector of the fan2 (internal cooling fan at upper left of the rear side of the printer).	Printer turns on.	Replace fan2.	Go to step 34.
34. [+24V, fan3] Pull out the FAN3P connector of the fan3 (small cooling fan for the toner discharging screw at the rear side of the printer).	Printer turns on.	Replace fan3.	Go to step 35.
35. [+24V, fan7] Pull out the FAN7P connector of the fan7 (internal cooling fan at lower left of the rear side of the printer).	Printer turns on.	Replace fan7.	Check for pinched wires, cables, and damaged connectors between following connectors: • CN22 on the mechanism controller board and FAN1P connector of fan1 • CN22 on the mechanism controller board and FAN2P connector of fan2 • CN22 on the mechanism controller board and FAN3P connector of fan3 • CN22 on the mechanism controller board and FAN7P connector of fan7

Reference Diagrams

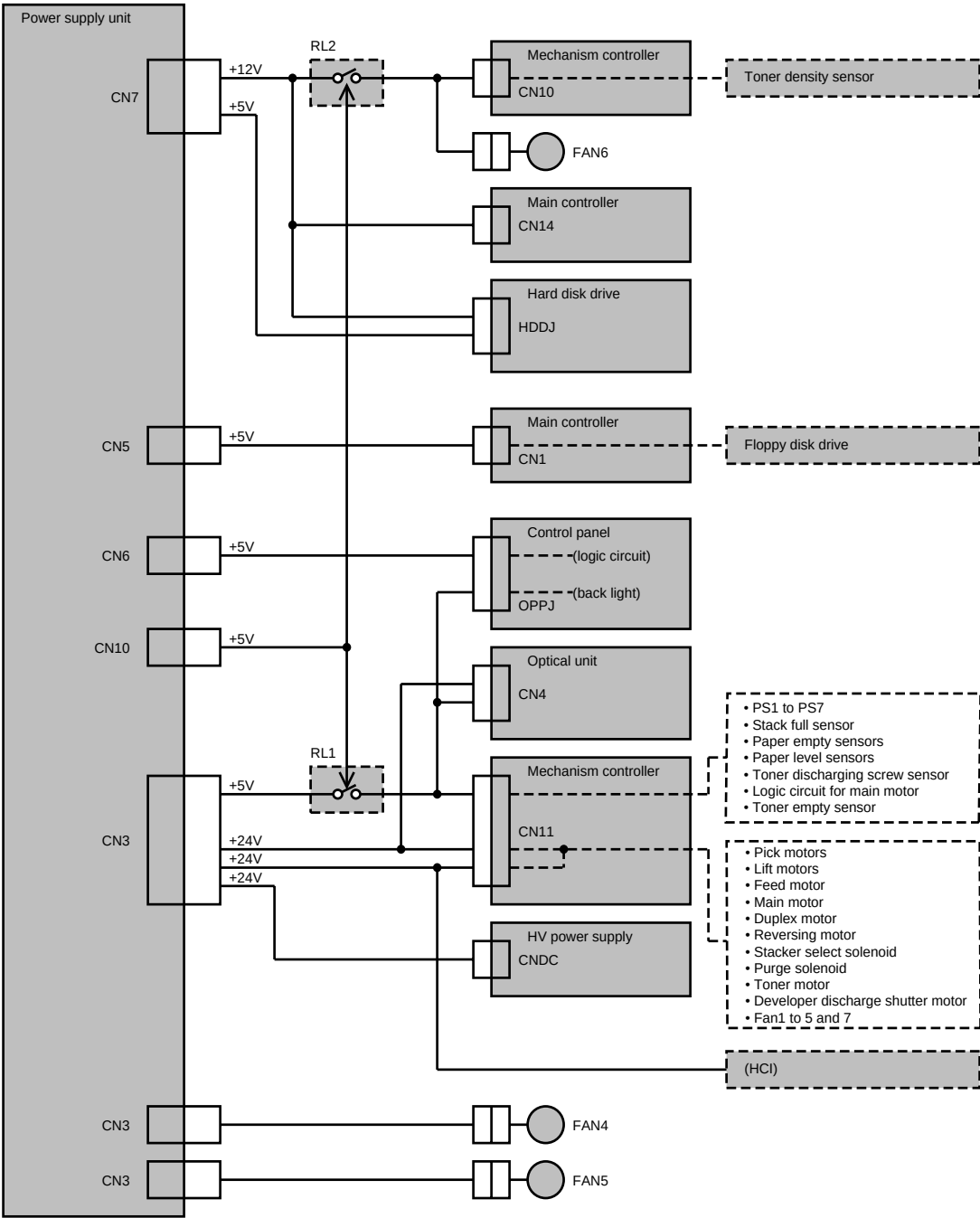


Figure 4-1 Power Control 1 Interconnections Diagram (1 of 2)

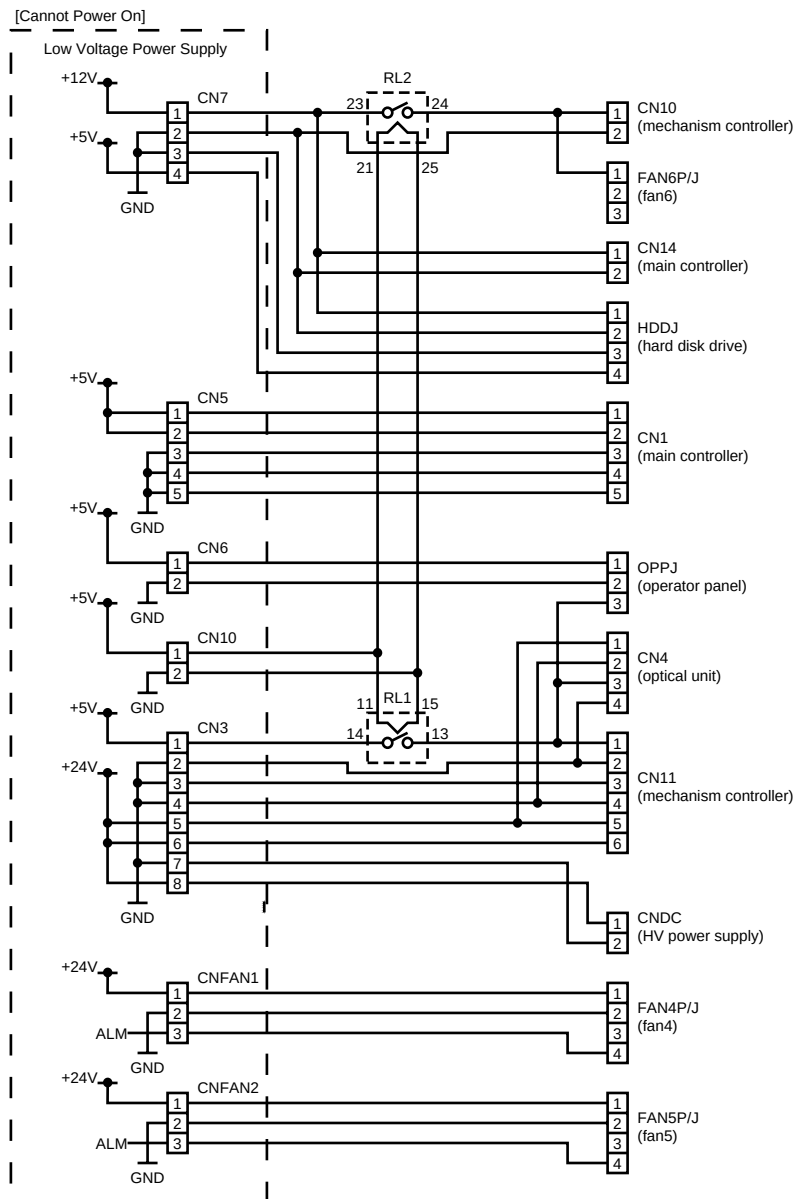


Figure 4-2 Power Control 1 Interconnections Diagram (2 of 2)

4-12.2 Control Panel Powers On But Printer Cannot Power On

Description

The printer can not be turned on, but the back-light of the control panel is lit up.

Troubleshooting Procedure

Instruction	Indication	Solution
1.Remove the rear cover. Check the relay RL1 on the rear frame of the printer.	RL1=oscillating like a buzzer	Overcurrent on +5V circuits supplied through the relay RL1 may be occurred. Go to Detailed Troubleshooting Procedures: " RL1 Oscillating Troubleshooting ," on page 4-153.
	RL1= not oscillating (not buzzing)	Overcurrent in the relay RL1 or on the +24V circuits may have occurred. Go to Detailed Troubleshooting Procedures: " RL1 Not Oscillating Troubleshooting ," on page 4-156.

Reference Diagrams

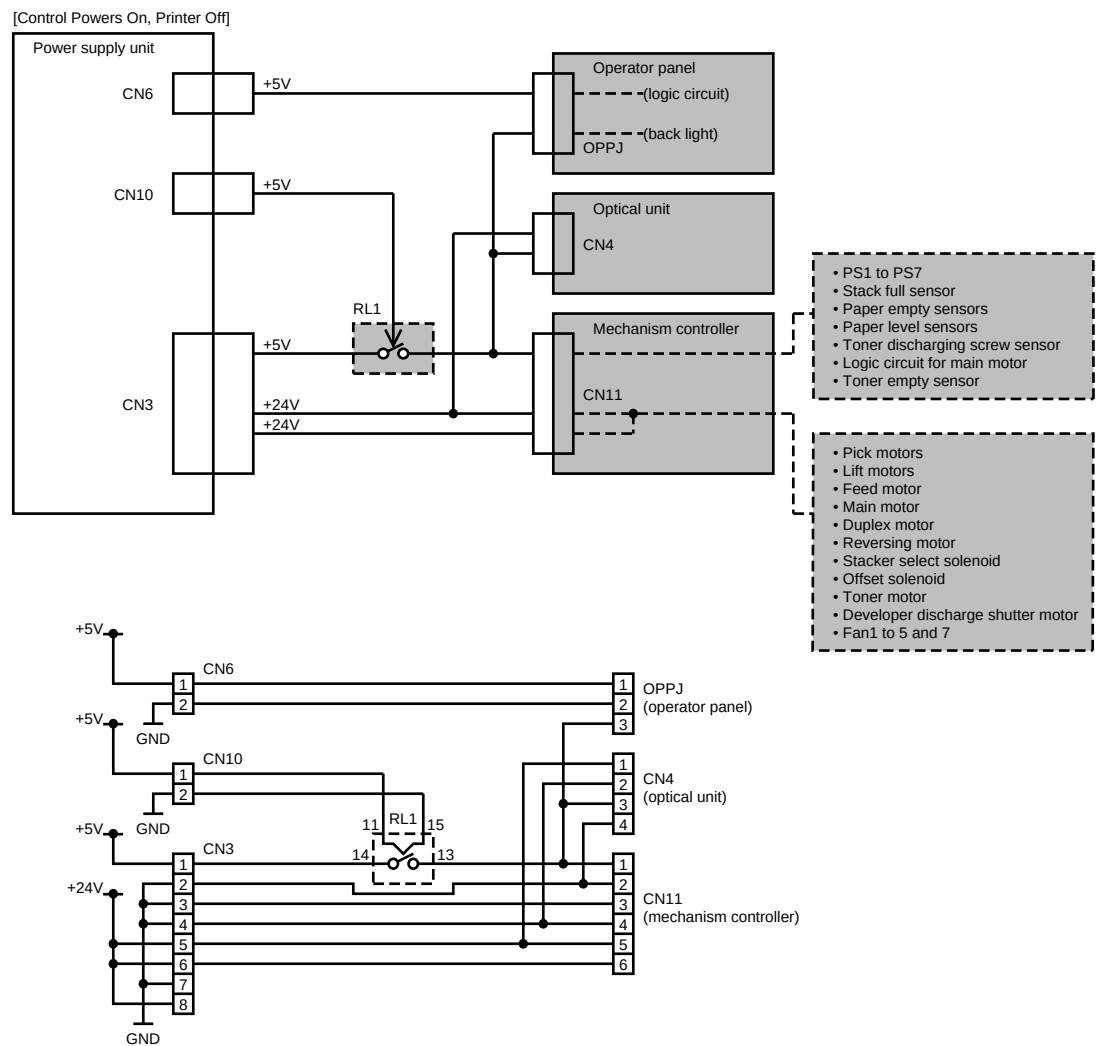


Figure 4-3 Control Powers On, Printer Off Problem Interconnections Diagram

4-12.3 Cannot Power Off Printer With Stand-by Switch

Description

The printer can not be turned off by the stand-by switch.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Turn the main switch off, then turn on the printer again. Turn off the printer by the stand-by switch.	The printer turns off from the stand-by switch.	The printer attempted to load a program (such as the internal diagnostics) from flash memory. The program was not found which caused the control panel to lockup. Reload the missing program.	Go step 2.
2. Remove the top cover. Check the stand-by switch.	Switch is damaged or malfunctioning.	Replace the stand-by switch. Verify repairs. If the printer can not be turned off by the stand-by switch, go to step 3.	Go to step 3.
3. Remove the rear cover, then check for pinched cables and damaged connectors between the following connectors: • CN1 on the power supply board and CN8 on the mechanism controller board • CN2 on the main controller board and CN14 on the mechanism controller board • CN3 on the main controller board and signal connector J4 on the control panel • Stand-by switch and connector J3 on the control panel	Pinched or damaged cables.	Replaced damaged parts. Verify repairs. If the printer can not be turned off by the stand-by switch, go to step 4.	Go to step 4.
4. Turn the printer on, then ground pin3 of the CN8 on the mechanism controller board.	The printer is turned off.	Go to step 5.	Replace the power supply board.
5. Turn the printer on, then connect between pin2 and pin3 of the CN19 connector on the mechanism controller board.	The printer is turned off.	Replace the main controller. Verify repairs. If the printer can not be turned off by the stand-by switch, replace the control panel.	Replace mechanism controller board. ^a

a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

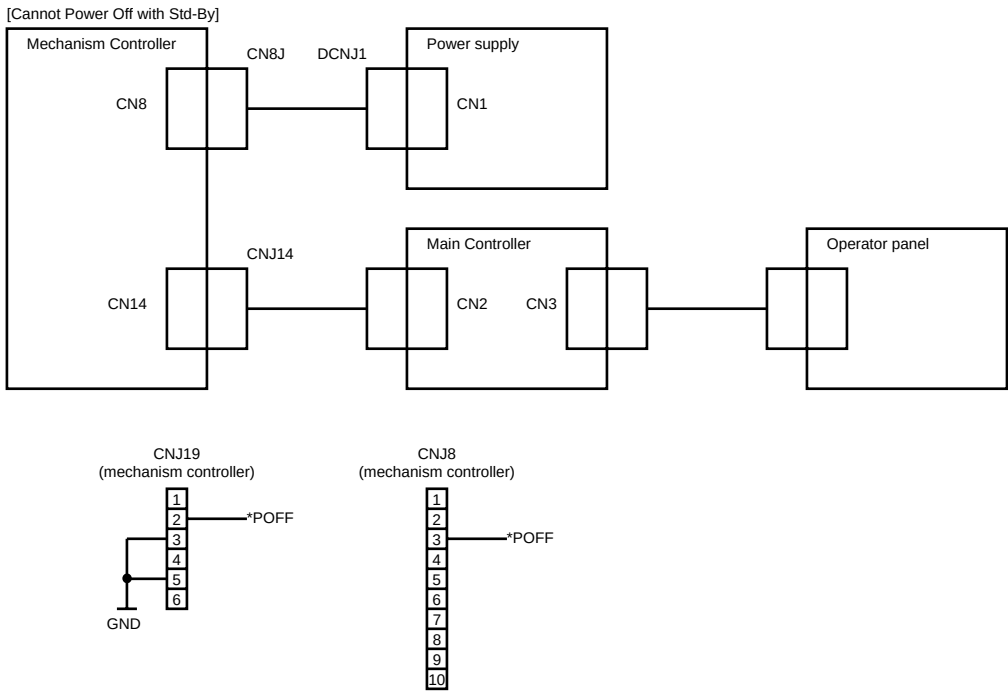


Figure 4-4 Power Control 3 Interconnections Diagram

4-13 Miscellaneous Problems

Section 4-13 contents:

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4-13.1 Cover Open / Interlock

Explanation

One of the following interlocks was detected open:

Problem Interlock	Diagnostic Sensor Screen and Field (EngMaint.Sensors)	Actuator Replacement Part	Switch Replacement Part
Drum unit	CONSUMER: Drum	Drum unit	Drum interlock switch on drive unit M
Fuser unit	CONSUMER: Fuser	Fuser unit	The interlock is a jumper located on the fuser. The printer looks for the jumper at the power connector on drive unit M.
Front door	DOORS: front	Front door	Front door interlock switch on the main frame
Upper-right cover	DOORS: right-upper	Upper right cover	Upper right cover interlock switch on the main frame
Lower-right cover	DOORS: right-lower	Transport cover assembly	Lower right cover interlock switch on the main frame
Ejection unit cover	DOORS: ejection	Ejection unit	Ejection unit cover interlock switch on the ejection unit

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check the following: - Verify the cover or door is completely closed - Actuator of the problem interlock switch for damage	- Door or cover is completely closed - Actuator is good	Go to step 2.	- Close the door or cover completely - Replace the defective actuator (see table in Explanation for part). Verify repairs. If same problem still occurs, go to step 3.
2. Go to the appropriate diagnostic for the problem interlock (see table in Explanation for screen and field). Activate the sensor manually and observe the control panel	Field on control panel changes between in and out or Open and Closed correctly.	Go to step 3.	Replace the defective switch (see table in Explanation for part). Verify repairs. If same problem still occurs, go to step 3.
3. Remove the rear cover. Check for pinched wires and cables or damaged connectors and switches. - Drum unit: check between CN21 on the mechanism controller board and drum set micro-switch on the drive unit M. - Front door, upper-right cover, lower-right cover, or the ejection unit cover: check between CN9 on the mechanism controller board and failing switch. - Fuser: check between CN21 on the mechanism controller board and CNTJ connector on the driving unit M.	Pinched wires or cables, or damaged connectors or switches.	Repair or replace damaged part. Verify repairs. If same problem still occurs, replace mechanism controller board. ^a	Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

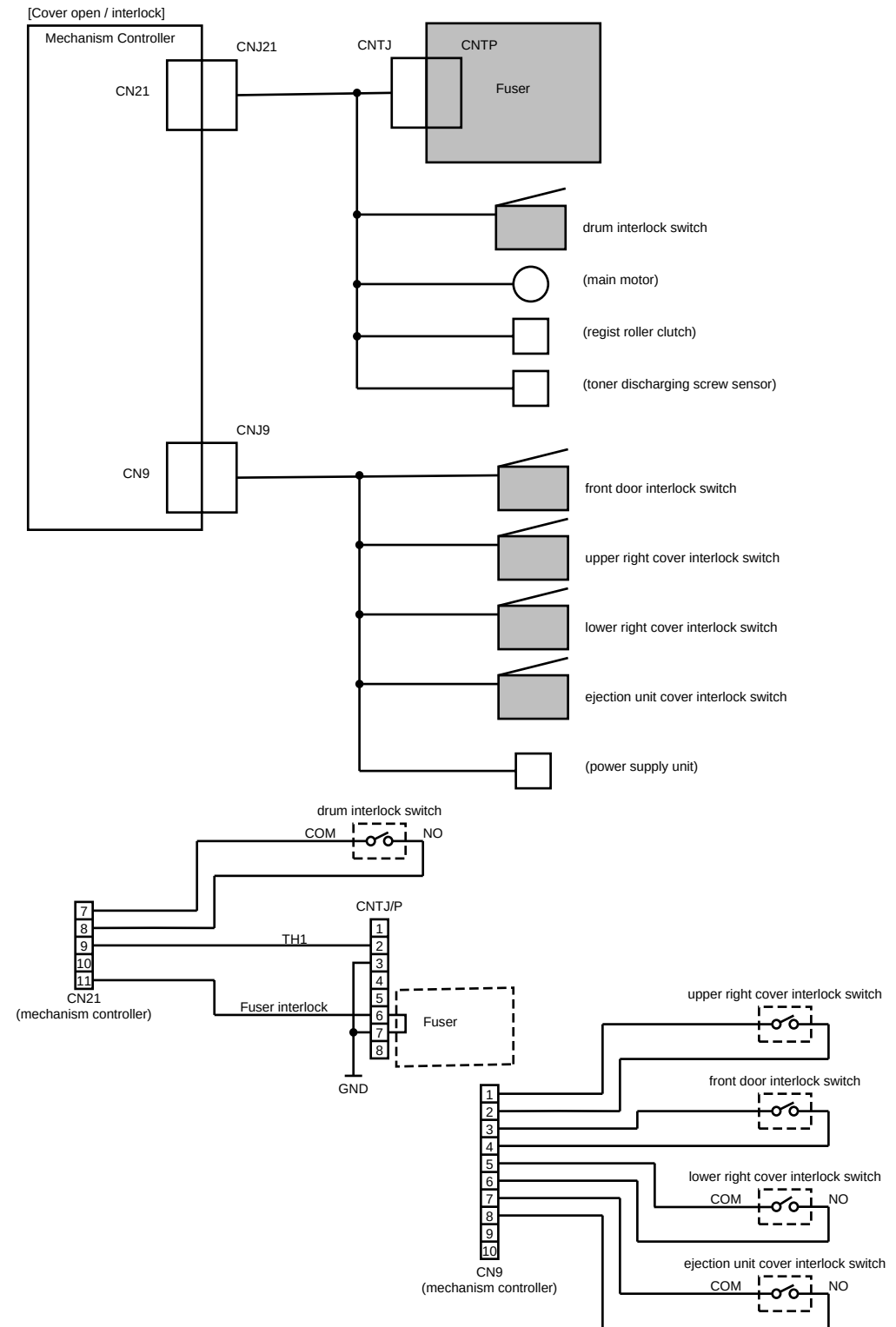


Figure 4-1 Interlock Microswitches Interconnections Diagram

4-13.2 Paper Tray Not Ready

Explanation

A paper supply tray is open or not seated properly or there is a defective sensor.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Verify tray is closed completely until it is locked	Tray is closed completely.	Go to step 2.	Close tray completely. Verify repair. If same problem occurs, go to step 2.
2. Replace the problem tray with another tray.	Same problem occurs.	Put back original tray and go to step 3.	Replace tray. Verify repair. If same problem occurs, go to step 3.
3. Remove tray. Go to Trays Sensors screen (EngMaint.Sensors.TRAYS). Manually actuate the tray detection switch and observe the screen. NOTE: Once you actuate the tray detection switch, the tray lift motor is turned on. To stop the motor, lift the pick rollers by hand or install the tray.	Trays Sensors screen field changes between in and out correctly.	Go to step 4.	Perform the following steps one at a time, checking if Trays Sensors screen field changes correctly after each step: a. Replace tray detection switch. b. Check for pinched wires, cables, and damaged connectors between CN5 on the mechanism controller board and the respective tray detection switch. c. Replace mechanism controller board. ^a
4. When you actuate respective tray detection switch by hand, verify the lift motor rotates by observing the white gear.	The lift motor rotates.	Go to step 5.	Perform the following steps one at a time, checking if the lift motor rotates after each step: a. Replace the lift motor. b. Check for pinched wires, cables, and damaged connectors between CN6 on the mechanism controller board and respective tray lift motor. c. Replace mechanism controller board. ^a
5. Remove tray. Go to Trays Sensors screen (EngMaint.Sensors.TRAYS). Manually lift the pick unit up and down and observe the screen.	Trays Sensors screen field changes between up and down correctly.	Call your printer specialist.	Perform the following steps one at a time, checking if Trays Sensors screen field changes correctly after each step: a. Replace paper level sensor (PLS1, PLS2, or PLS3) and the tray lift motor. NOTE: When paper level sensor malfunctioned, the tray lift motor may already be damaged. b. Check for pinched wires, cables, and damaged connectors between: • Tray 1: CN2 on the mechanism controller board and paper level sensor on the upper feed unit • Tray 2: CN3 on the mechanism controller board and paper level sensor on the middle feed unit • Tray 3: CN4 on the mechanism controller board and paper level sensor on the lower feed unit c. Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

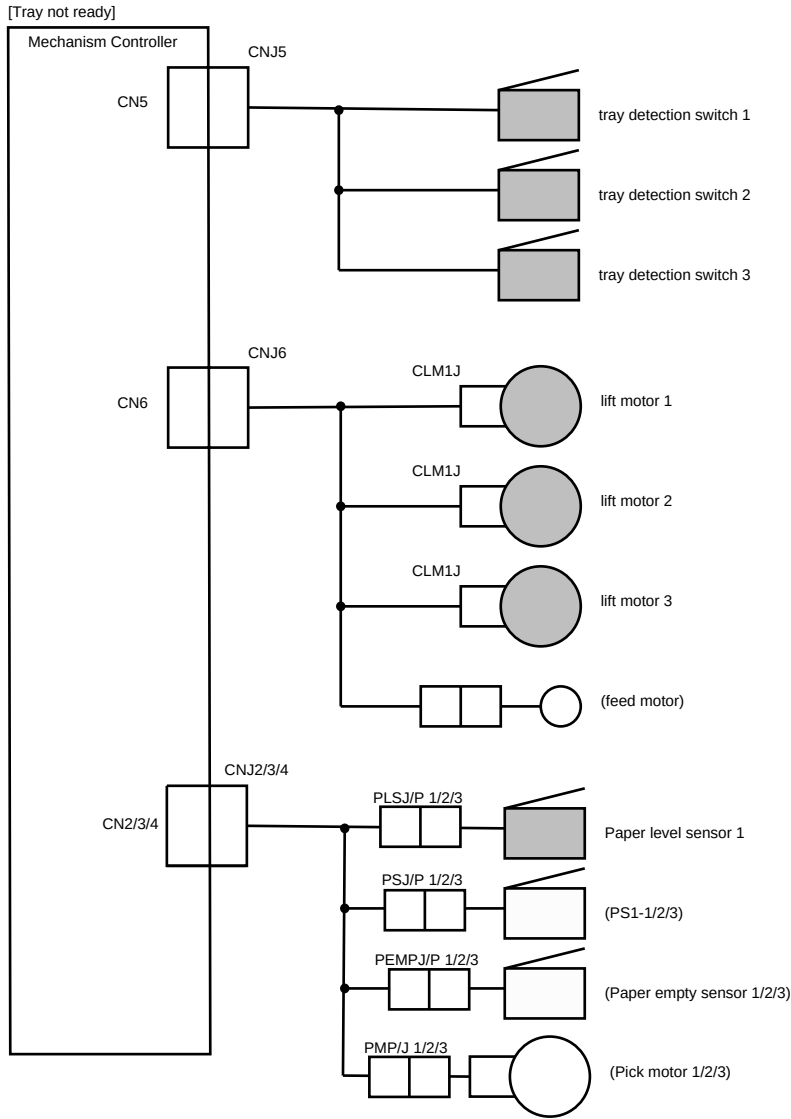


Figure 4-2 Paper Supply Tray Interconnections Diagram

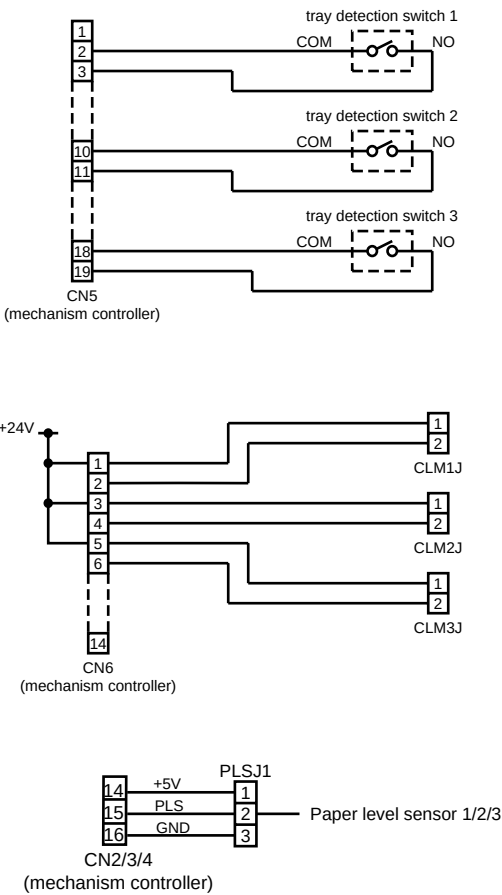


Figure 4-3 Paper Supply Tray Interconnections Diagram

4-13.3 Out of Paper

Explanation

Printer is out of paper or Paper Out Sensor is defective

Paper empty was detected, or After a tray was set, the lift motor went up the paper table within specific time and then the paper level was detected. The absence of paper was detected at that time.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Reload paper in tray and run test page.	Same paper out error occurs.	Go to step 2.	Done
2.Remove tray. Go to Trays Sensors screen (EngMaint.Sensors.TRAYS). Manually actuate the paper empty sensor and observe the screen.	Trays Sensors screen field changes between full and empty correctly.	Call your printer specialist.	Perform the following steps one at a time, checking if Trays Sensors screen field changes correctly after each step: a.Replace paper empty sensor. b.Check for pinched wires, cables, and damaged connectors between: • Tray 1: CN2 on the mechanism controller board and paper empty sensor on the upper feed unit • Tray 2: CN3 on the mechanism controller board and paper empty sensor on the middle feed unit • Tray 3: CN4 on the mechanism controller board and paper empty sensor on the lower feed unit c.Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

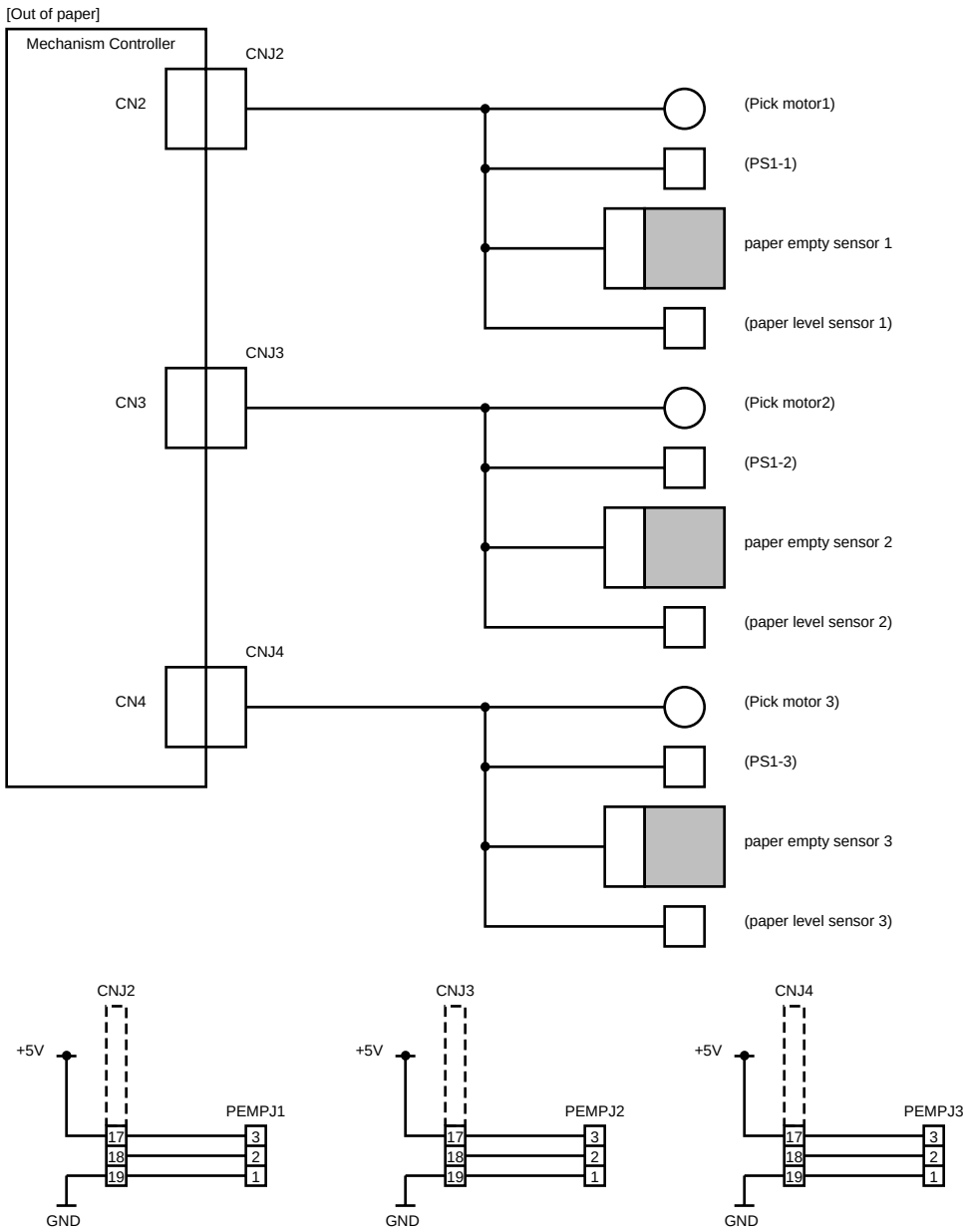


Figure 4-4 Out of Paper Interconnections Diagram

4-13.4 Output Tray Cannot Be Cleared

Explanation

The output tray can not be cleared.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Unload paper from output tray and run test page.	Same output tray error occurs.	Go to step 2.	Done
2. Go to the Paper Feed/Print/Eject Sensors screen (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Manually actuate the stack full sensor and observe the screen.	ESF field changes between paper and blank correctly.	Call your printer specialist.	Perform the following steps one at a time, checking if Trays Sensors screen field changes correctly after each step: a. Replace stacker full sensor. b. Check for pinched wires, cables, and damaged connectors between CN18 on the mechanism controller board and the stack full sensor on the ejection unit. c. Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

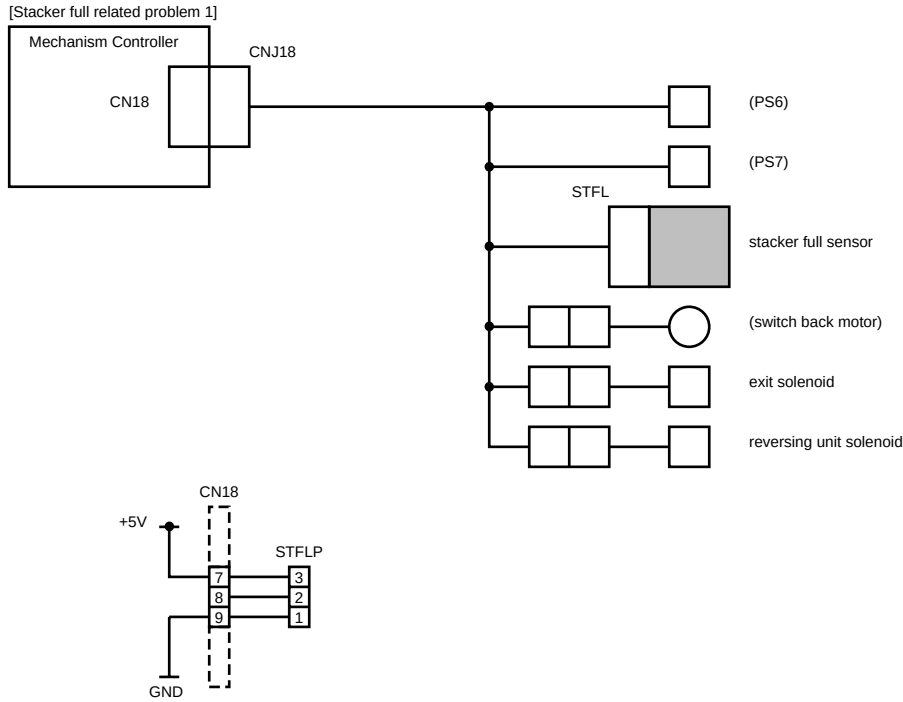


Figure 4-5 Output Tray Cannot Be Cleared Interconnections Diagram

4-13.5 Output Tray Cannot Be Detected

Explanation

The output tray can not be detected.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Go to the Paper Feed/Print/Eject Sensors screen (EngMaint.Sensors.PAPER FEED/PRINT/EJECT). Manually actuate the stack full sensor and observe the screen.	ESF field changes between paper and blank correctly.	Call your printer specialist.	Perform the following steps one at a time, checking if Trays Sensors screen field changes correctly after each step: a. Replace ejection sensor. b. Check for pinched wires, cables, and damaged connectors between CN18 on the mechanism controller board and the stack full sensor on the ejection unit. c. Replace mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

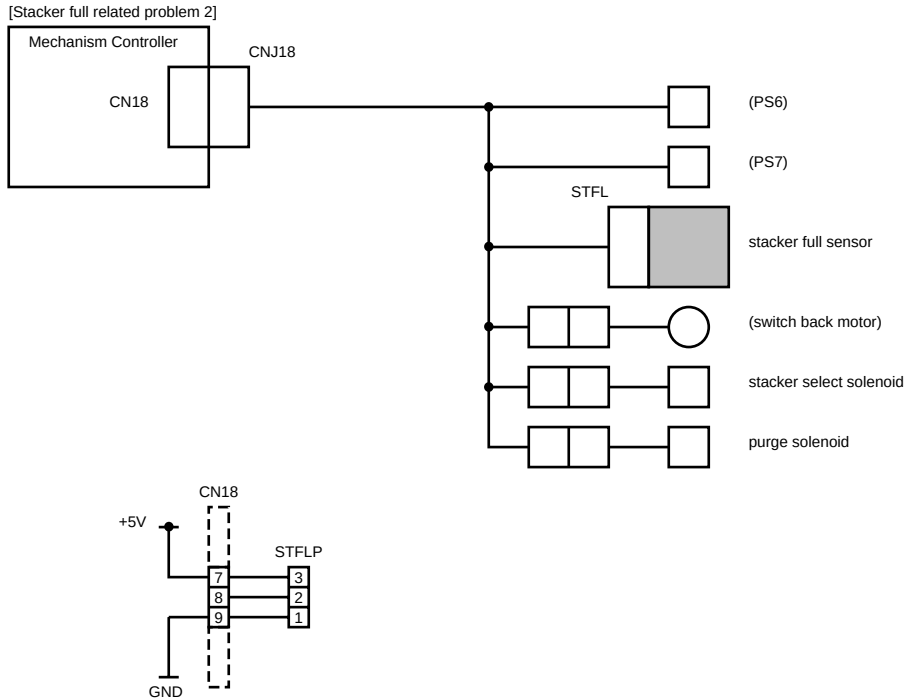


Figure 4-6 Stacker Full Cannot Be Detected Interconnections Diagram

4-13.6 HCI Sensing Problem

See [D-4.4 "HCI Sensing Problem,"](#) on page D-18.

4-13.7 HCO Stacker Full Problems

For 2,000 Sheet HCO, see [C-6.3 "HCO Stacker Full Related Problems,"](#) on page C-36.

For 3,000 Sheet HC, see [B-4.4 "HCO Stacker Full Problems,"](#) on page B-20.

4-13.8 HCO Door Open Related Problems

For 2,000 Sheet HCO, see [C-6.4 "HCO Door Open Related Problems,"](#) on page C-40.

For 3,000 Sheet HCO, see [B-4.5 "HCO Cover \(Door\) Open Problems,"](#) on page B-24.

4-13.9 HCO Stacker Tray Up/Down Movement Problem

For 2,000 Sheet HCO, see [C-6.5 "HCO Stacker Tray Up/Down Movement Problem,"](#) on page C-44.

For 3,000 Sheet HCO, see [B-4.6 "HCO Tray Continuous Up-Down Problems,"](#) on page B-28 and [B-4.7 "HCO Tray Stays Down Problems,"](#) on page B-30.

4-13.10 HCO Not Sensed By Printer

For 2,000 Sheet HCO, see [C-6.6 "HCO Not Sensed By Printer,"](#) on page C-46.

For 3,000 Sheet HCO, see [B-4.8 "HCO Not Recognized By Printer,"](#) on page B-34 and [B-4.9 "HCO Not Installed But Recognized By Printer,"](#) on page B-36.

5 Maintenance

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5-1 Introduction

This chapter describes removal and replacement procedures for field replaceable units (FRUs) in the D640 Cut Sheet Printer. The procedures presented in this chapter assume the service engineer has had training on the D640 Printer and is familiar with replacing printer consumables and accessing the internal mechanisms. For a complete description of the servicing approach and required tools, see [4-1 "Introduction," on page 4-5](#).

The maintenance procedure presented in this service manual are for FRUs that require detailed maintenance instructions. Instructions for removal and replacement of consumable supplies and assemblies are provided in the *HP 5000 D640 Printer User Manual*.

WARNING!	Always power the printer off when beginning FRU maintenance. Detach the power cord plug from the printer base. Where specified, allow at least 30 seconds for the electrical charges to drain before beginning your repair procedure. Servicing the printer with the power on exposes you to moving parts and hazardous voltages and currents capable of causing serious injury or even death.

Chapter 6 provides parts breakdown illustrations and part numbers. Use these illustrations for an in-depth look at the FRU you will be maintaining and/or handling to get at the failed FRU.

Note	The procedures presented in this chapter are mechanical repair procedures. To test the operation of the printer after the printer has been reassembled, return to the "Troubleshooting" chapter for specific instructions.

5-1.1 HCO Maintenance

For 2,000 Sheet HCO, see [C-7 "Maintenance," on page C-48](#).

For 3,000 Sheet HCO, see [B-5 "Maintenance," on page B-37](#).

5-1.2 HCI Maintenance

See [D-5 "Maintenance," on page D-20](#).

5-1.3 Standard Tools and Test Equipment

The following are required tools and test equipment:

- Toner vacuum cleaner with 5 micron filtering (or better) for cleaning spilled toner
- Cleaning sheets for wiping spilled toner
- Multimeter for testing voltages and continuity
- 2 mm L-shape Allen wrench for registration clutch maintenance
- 3 mm Allen wrench for 2000-sheet HCO Front Cover removal
- Phillips #2 magnetized screwdriver set:
 - 2-inch for LED unit/registration roller maintenance
 - 8-inch for general maintenance
 - 12-inch for toner hopper hose/decurler unit maintenance
- Flat head screwdriver (long):
 - 1/8-inch blade to adjust LVPS +5V output
 - 1/4-inch blade for general maintenance
- Small metric-scaled ruler to measure paper registration
- Isopropyl alcohol for cleaning optics lens and other surfaces
- Electrostatic discharge (ESD) Kit:
 - Wrist strap
 - Pad
- Cable ties to re-secure harnesses cut for maintenance
- 3/16" Nut driver
- Needlenose pliers

5-1.4 Hints and Tips

Note

Service Providers: Please send your hints and tips by way of the *Reader Comment Sheet* (found at the end of this manual) or the web site for sharing with others.

The following hints and tips provide some insight into printer design and effective service techniques:

- **Red painted screw heads**—Do not attempt to loosen or remove these screws. They are factory set for optimum performance of the printer.
- **Green painted screw heads**—These screws are used for setting belt tension.
- **Movable-bracket positioning-pins and locating-holes**—[Figure 5-1](#) illustrates proper reinstallation of critical hardware. A bracket misaligned due to careless remounting can cause expensive damage.

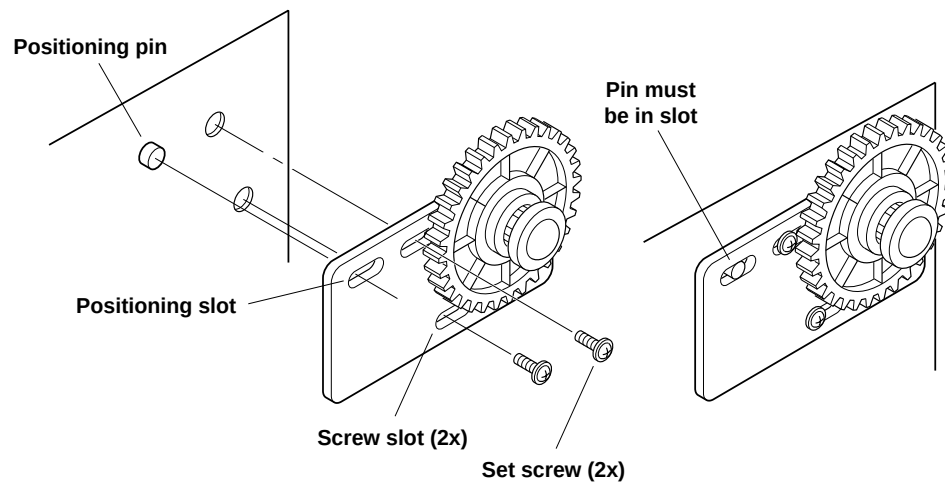


Figure 5-1 Example of Positioning-Pins and Holes On Bracket Assemblies

5-2 Printer Board Switches

5-2.1 Main Controller Board DIP Switches

When the printer powers up, the controller checks the DIP switches on the main controller board. [Table 5-1](#) describes three settings. Other settings are for factory or specialist use.

Table 5-1. Main Controller Board DIP Switches

Setting	Description
	Default Setting - The printer boots from main controller flash bank 0 containing the function code if no control panel keys are pressed.
	Diagnostics : Printer boots from main controller flash bank 1 to access the Printer Diagnostic Program. See section 3-2.2 "Accessing the Program Using the DIP Switches," on page 3-6 for more information.
	Firmware download : Sets the printer into firmware download state, where it will read the new firmware from one of its input ports and install it at the location indicated by the firmware down-load data header.

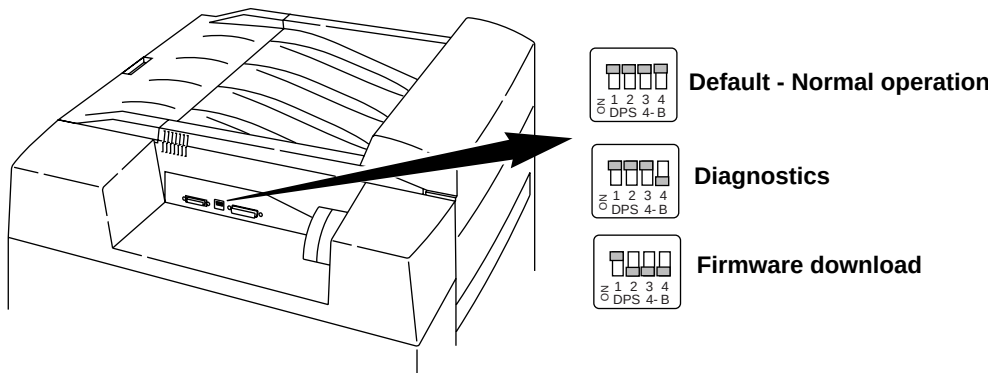


Figure 5-2 Main Controller DIP Switch Settings

5-2.2 Mechanism Controller Board Switches

The mechanism controller board contains a Test switch (S3) located in the top right of the installed board. When the printer is ready, you can press this switch to generate a test printout. This test printout completely bypasses the main controller.

The lower-right corner of the board contains three multi-position DIP switches. When you replace the mechanism controller, these switches must be set to match the old board.

Mechanism Controller Switches

- Switch 1— Default = 01100000
 - Positions 1, 4, 5, 7, and 8 = OFF (Factory use only)
 - Position 2 = ON (VB connector disconnect detection)
 - Position 3 = ON (Lower tray enable - Tray 3)
 - Position 6 = OFF (If a voltage-controlled high voltage power supply is installed.)
= ON (If a current-controlled high voltage power supply is installed.)
- Switch 2 —Laser Start Position Adjustment. See [5-3.3 on page 5-10](#) for procedure.
- Switch 3 —Engine Test Switch (red button.) When printer is initialized:
 - Press once for continuous simplex printing
 - Press twice for continuous duplex printing
 - Press three times for continuous mixed-plex (simplex-duplex)
 - Press four times continuous duplex (2-4-1-6-3-8 sequence)
 - Press once to stop printing
- Switch 4 = not used, all OFF

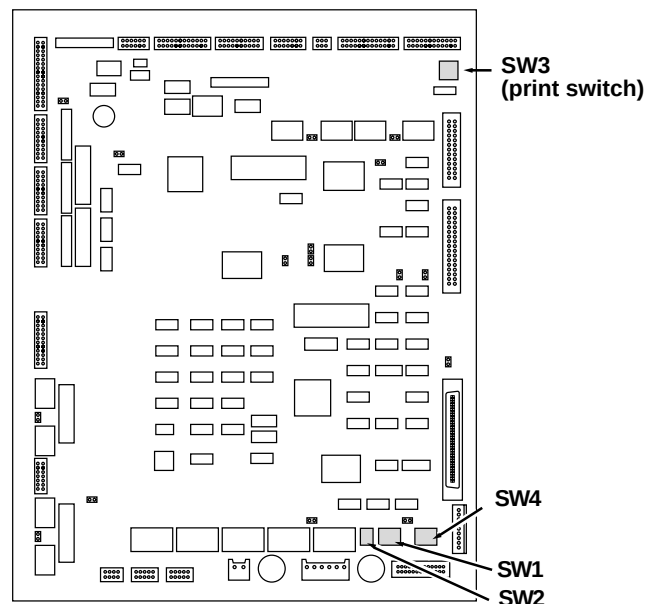


Figure 5-3 Mechanism Controller Board Switches

5-3 Printer Adjustments

Unscheduled adjustments may be required in the D640 printer, HCI, and the HCO. Typically, they become necessary during maintenance to the FRU components but adjustments can be required at any time. The printer adjustments include:

- Low Voltage Power Supply Adjustment
- Laser Start Position Alignment
- Paper Feed System Alignment

5-3.1 2,000 Sheet HCO Adjustments

2,000 Sheet HCO adjustments are not included in this section but can be found in [C-5 "Adjustments," on page C-18.](#)

5-3.2 Low Voltage Power Supply (LVPS) +5V Adjustment

Note	This procedure is not user accessible.

To adjust the +5V (the actual voltage is +4.82V) on the low voltage power supply, follow these steps:

- Step 1** Remove the rear cover.
- Step 2** Use your multimeter to monitor the test point +5 Vdc W7 on the mechanism controller.
- [Figure 5-4](#) illustrates the +5 Vdc (W7) test point location.
- Step 3** Verify the voltage is +4.82 +/-0.02 Vdc (i.e., +4.80 Vdc to +4.84 Vdc).
- Step 4** Use a small, flat-blade screwdriver to adjust potentiometer RV113.
- [Figure 5-4](#) illustrates the access of the +5 Vdc adjustment through the top hole of the mechanism controller support bracket.
- Step 5** If the voltage level cannot be maintained, use the troubleshooting procedures SVC59 and SVC5A to isolate the fault. (See [4-9.16 on page 4-46.](#))
- Step 6** When the low voltage power supply output is set properly, close the rear cover.

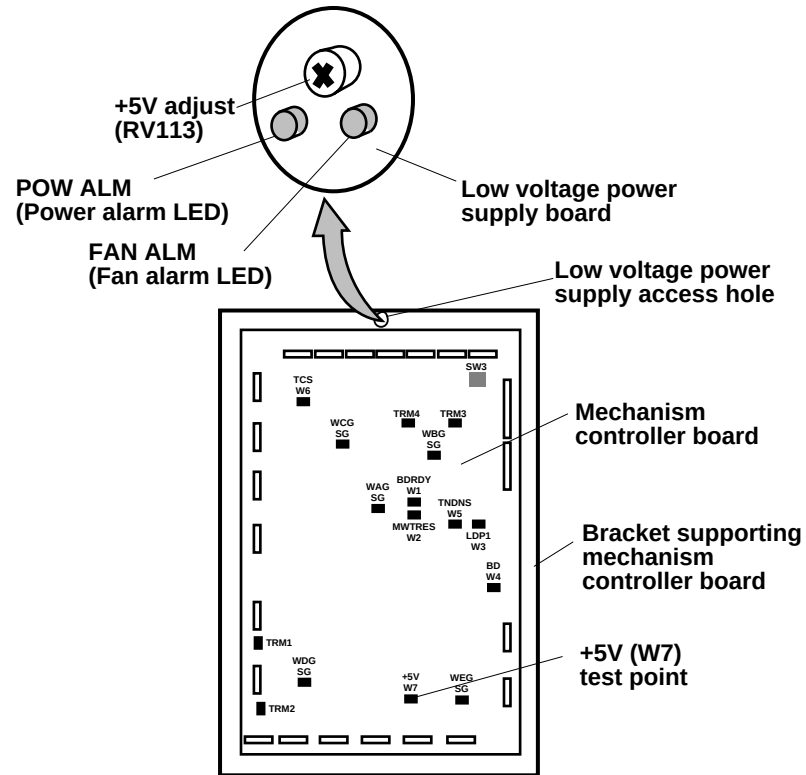


Figure 5-4 LVPS +5V Test Point W7 and +5V Adjustment

5-3.3 Laser Start Position Alignment

Note	This procedure is user accessible.

If the customer has to periodically check paper feed system alignment, you may need to fine tune the laser start position as the printer internal rollers or some other internal components age.

This laser start position alignment procedure establishes the baseline for the leading edge of the printable area.

Test Setup and Analysis

Step 1 Verify that paper is in all trays and the HCI (if installed).

Step 2 Go to the `LASERSET.nn` selection (Test.filesC.MAINT\UTIL\LASERSET.nn) and press **Select**.

The number 1 appears in front of `LASERSET.nn`.

Step 3 Press **Online**.

It takes about 10 seconds for the program to load.

Step 4 The printer outputs alignment test patterns.

Check Alignment

Step 1 Read the test pattern printed instructions that describe SW2 DIP switch settings.

Step 2 Hold the test print up to a strong light so you can see the horizontal bar through the paper.

The ideal test pattern has the horizontal bar exactly through the center under the arrow head. Test patterns within +/-0.5 mm of the ideal pattern are acceptable.

Realign (if necessary)

Step 1 Set SW2 DIP switches S1-S4 to 1 1 1 0 (On On On Off)

Step 2 Reprint `LASERSET.nn` test pattern.

Step 3 Determine the SW2 correction setting.

The horizontal line will touch one of the lines leading to the new SW2 setting.

Step 4 Set SW2 DIP switches S1-S4 to the new setting.

Step 5 Generate a new test pattern.

If the test pattern is within +/-0.5 mm of the ideal pattern, continue with [5-3.4 "Paper Feed System Alignment,"](#) on page 5-12.

Step 6 Reinstall and close all covers.

SW2 DIP Switches Reference

The print outs provide information about setting SW2 DIP switches to adjust test pattern alignment. [Figure 5-5](#) shows the location of the SW2 DIP switches. SW2 switches are numbered 1 to 4 from left to right. To increase spacing above the line, use the + distance settings.

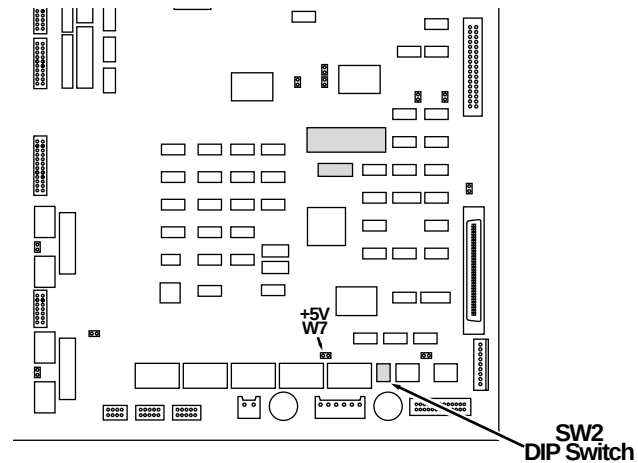


Figure 5-5 Mechanism Controller with SW2 DIP Switch Location

5-3.4 Paper Feed System Alignment

Note	This procedure is user accessible and can be performed by the customer. This alignment is important when for aligning the printer for preprinted forms.

This registration alignment procedure electronically moves the print image to the front or rear of the printer to optimize print output.

To set paper feed system alignment, follow these steps:

Calculate Alignment Values

- Step 1** Verify that paper is in all paper trays and all the fences in the paper trays are set correctly for the size paper in the tray.
- This includes paper trays 1, 2, 3, and the HCI (if installed)
- Step 2** Go to the ALIGNSET.*nn* selection (Test.filesC.USER_ADJ\ALIGNSET.*nn*) and press **Select**.
- The number 1 appears in front of ALIGNSET.*nn*.
- Step 3** Press **Online**.
- It takes about 10 seconds for the program to load, then the alignment test patterns are printed. The following six sheets are printed:
- a** *Simplex feed alignment ruler* - Provides instructions, the simplex reference scale, and a workspace to calculate alignment values and adjustments
 - b** *Feed 1: Upper tray* - Simplex print from top tray 1
 - c** *Feed 2: Middle tray* - Simplex print from middle tray 2
 - d** *Feed 3: Bottom tray* - Simplex print from bottom tray 3
 - e** *Feed 4: High Capacity Input* - If the HCI is installed, simplex print from the HCI. If no HCI is installed, throw away sheet
 - f** *Feed 1: Top tray Second duplex pass* - Duplex print from top tray 1. The back of sheet **f** is labeled *Duplex unit alignment ruler* and provides instructions and the reference scale for duplex alignment.
- Step 4** On sheet **a**, carefully and accurately fold at the "Fold here" line.
- Step 5** Place sheet **a** on sheet **b** so that the folded edge on sheet **a** is on the horizontal line labeled "Measure between these two arrows" on sheet **b**.
- Step 6** Align the left arrow on sheet **a** with the left edge of sheet **b**.
- The line labeled "Feed alignment indicator line" is now crossing the scale marker on sheet **a** at a specific value.
- Step 7** Record the value read from the scale maker on sheet **a** as the "adjustment value" under the "Tray 1 alignment original value"
- Step 8** Perform steps 5 through 7 for sheets **c**, **d**, and **e** and record the values in the appropriate places.

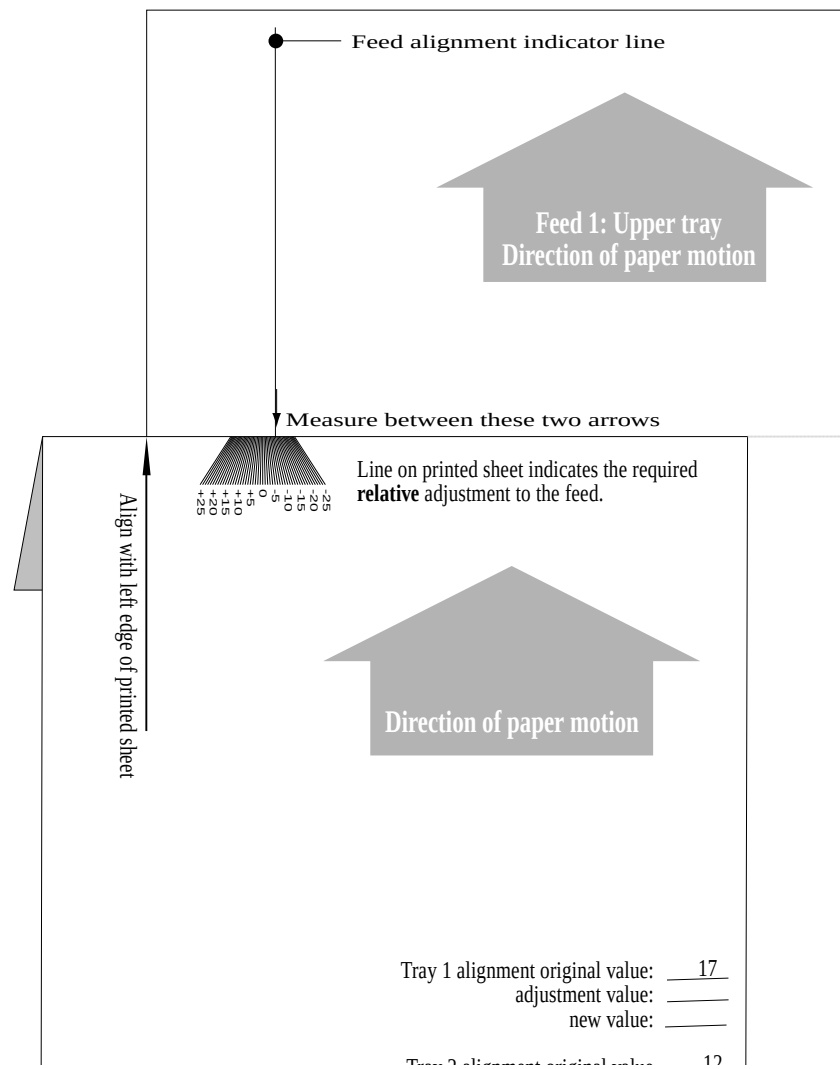


Figure 5-6 Example Feed Alignment Ruler for Skew Adjustment

- Step 9** Turn sheet **f** over to the side labeled “Duplex unit alignment ruler” and hold the sheet up to a strong light.
- Step 10** Note the value indicated on the left scale marker (horizontal) where the line on the reverse side crosses the scale.
- Step 11** Record the value as the “adjustment value” under “Duplex unit (duplex) alignment original value.”
- Step 12** Note the value indicated on the right scale marker (vertical) where the line on the reverse side crosses the scale.
- Step 13** Record the value as the “adjustment value” under “Duplex unit vertical (duplexv) alignment original value.”
- Step 14** Review all the “adjustment values” you recorded.

If the values are consistently high or low, proceed with the next section to set the alignment. If the values seem to be random or erratic, there may be a mechanical problem with the printer.

Setting the Paper Feed System Alignment

- Step 1** Print a Setup Report (Test.SETUPS) and verify that under Menu:Configuration, the imageshift.top and imageshift.left equal 0.
- Step 2** Calculate the new alignment setting by adding the original value and the adjustment value together and write the result in the "new value" line.

For example, if the original value is -2 and the adjustment value is +6, the new value is +4.
- Step 3** Go to the Maintenance.alignment menu (Menu.Maintenance.alignment).
- Step 4** For each tray, use the right arrow to highlight the existing value, then use the up or down arrow to select the new value. The range is -25 to +25.
- Step 5** Press **Select** to set the new value.
- Step 6** Press the left arrow three times to return to the Main Menu.
- Step 7** Verify the new alignment by repeating the Calculate the Alignment Values procedure.

The values should be within 1 mm of center.
- Step 8** If necessary, repeat the alignment procedure until the alignment is correct.

5-4 Printer Microswitch Location Diagrams

5-4.1 Developer Mixture Collector Bottle Detection Microswitch

Part Number

CA02626-E142FJ

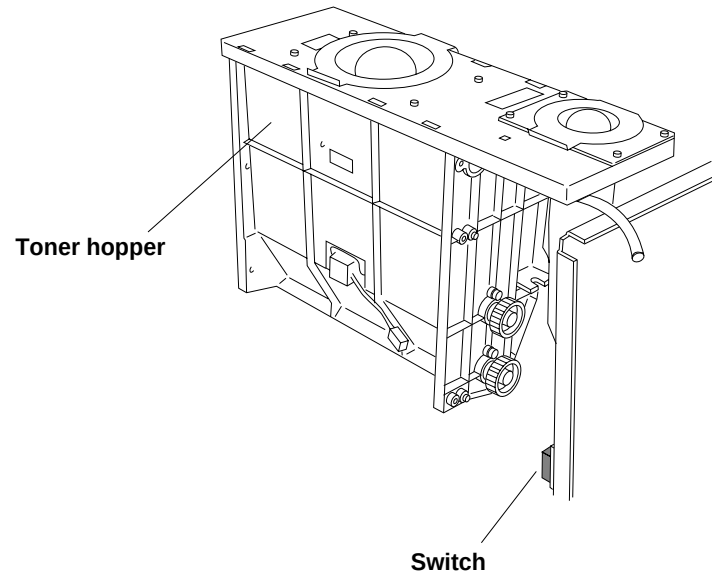


Figure 5-7 Developer Mixture Collector Bottle Detection Microswitch

5-4.2 Developer Unit Shutter Detection Microswitch

Part Number

CA02626-E142FJ (See [6-6.16 on page 6-38.](#))

Included with drive D unit replacement part: CA02626-F600FJ.

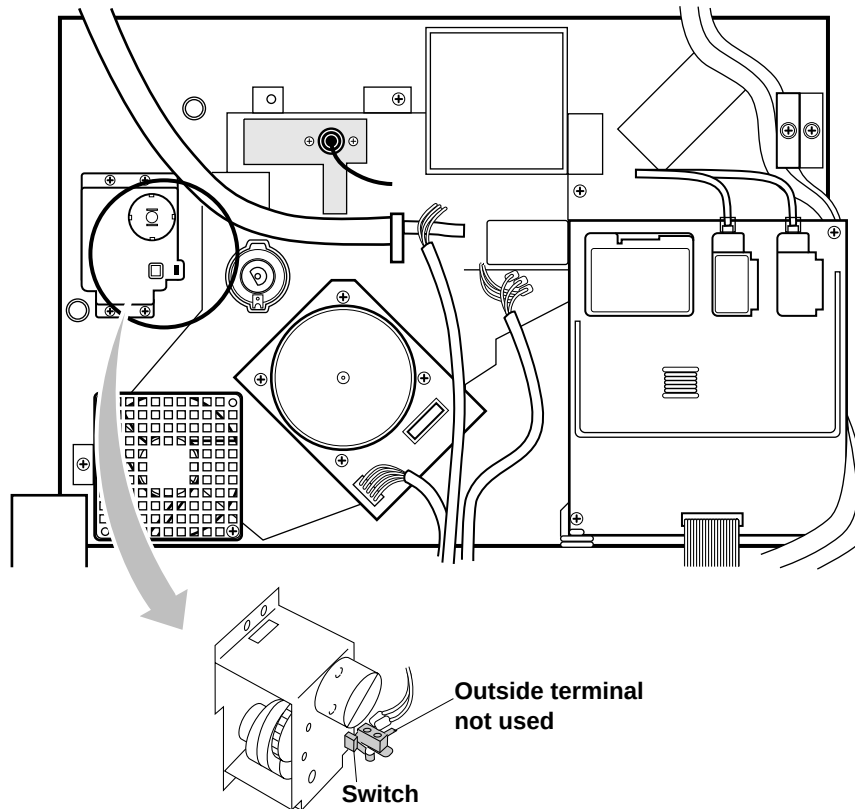


Figure 5-8 Developer Unit Shutter Detection Microswitch

5-4.3 Drum Unit Interlock Microswitch

Part Number

CA02626-E142FJ (See [6-6.14 on page 6-34.](#))

Included with drive M unit replacement part: CA02626-E732FJ.

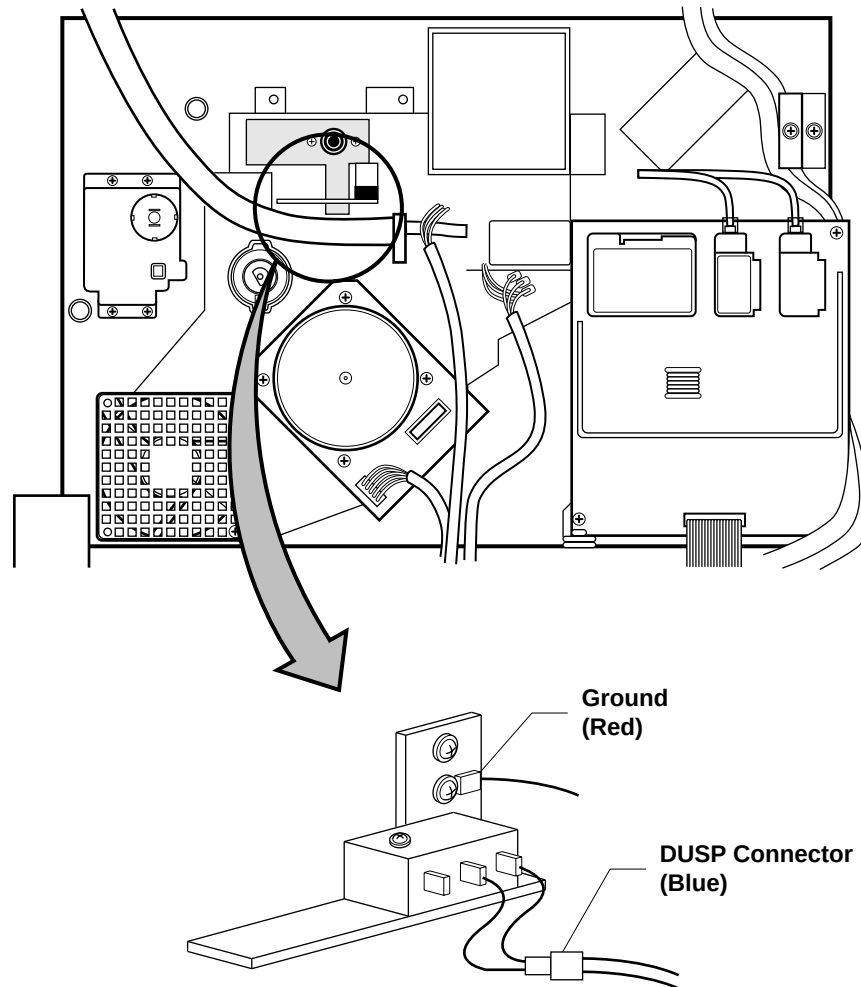


Figure 5-9 Drum Unit Interlock Microswitch

5-4.4 Ejection Unit Cover Interlock Microswitch

Part Number

CA02626-E142FJ (See [6-6.8 on page 6-20.](#))

Included with ejection unit replacement part: CA02626-F900FJ

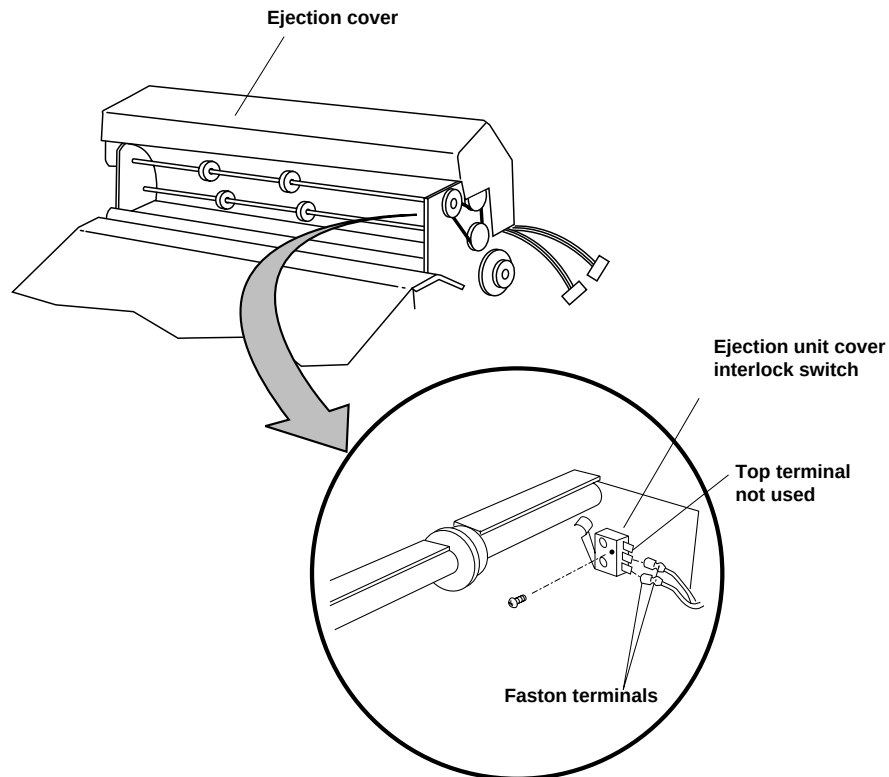


Figure 5-10 Ejection Unit Cover Interlock Microswitch

5-4.5 Front Door Interlock Microswitch

Part Number

CA98001-6946FJ (See [6-6.13](#) on page 6-30.)

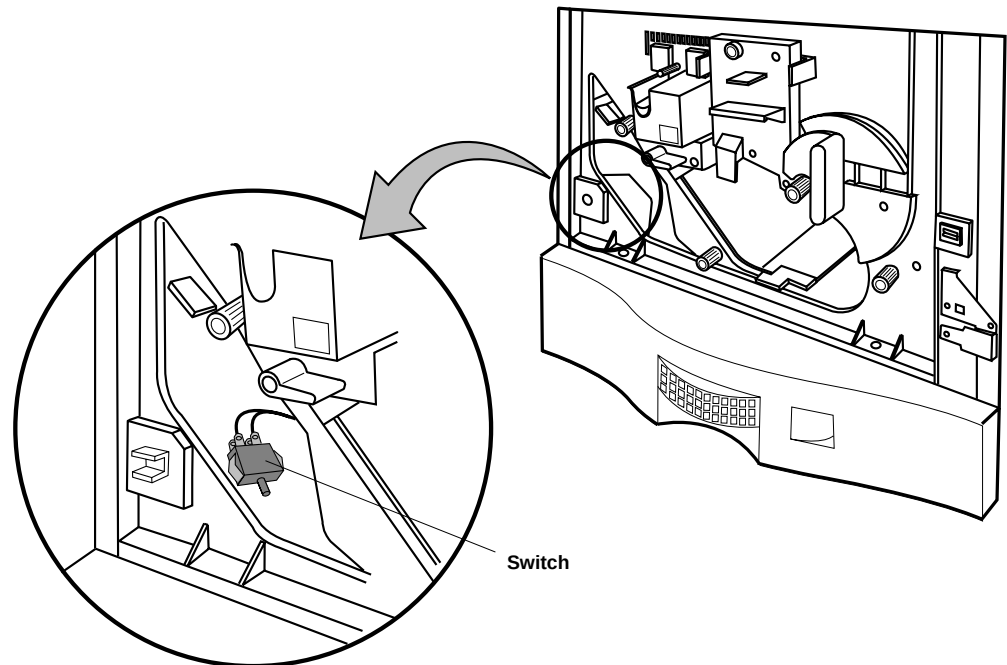


Figure 5-11 Front Door Interlock Microswitch

5-4.6 Paper Tray Detection Microswitch

Part Number

CA02626-E142FJ (See [6-6.6](#) on page 6-16.)

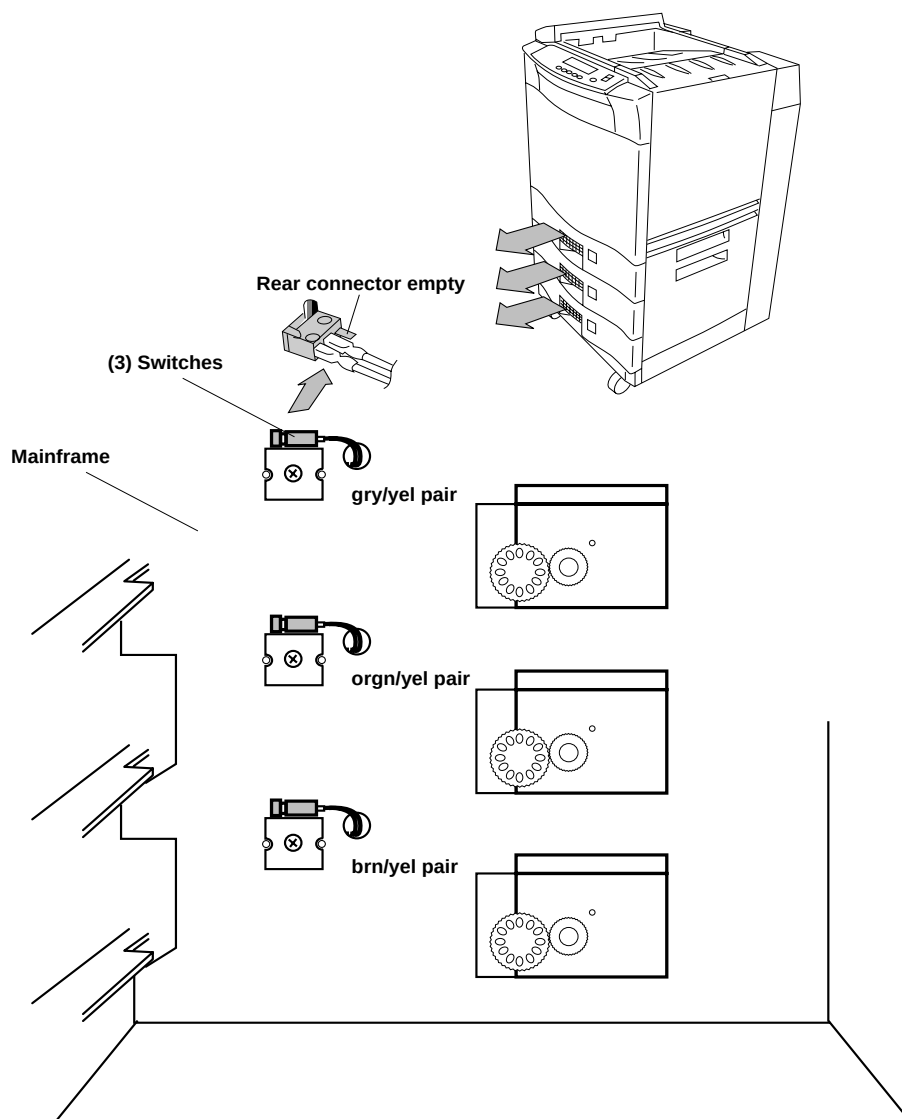


Figure 5-12 Paper Tray Detection Microswitch

5-4.7 Lower-right Cover Interlock Microswitch

Part Number

CA02626-E142FJ (See [6-6.10 on page 6-24.](#))

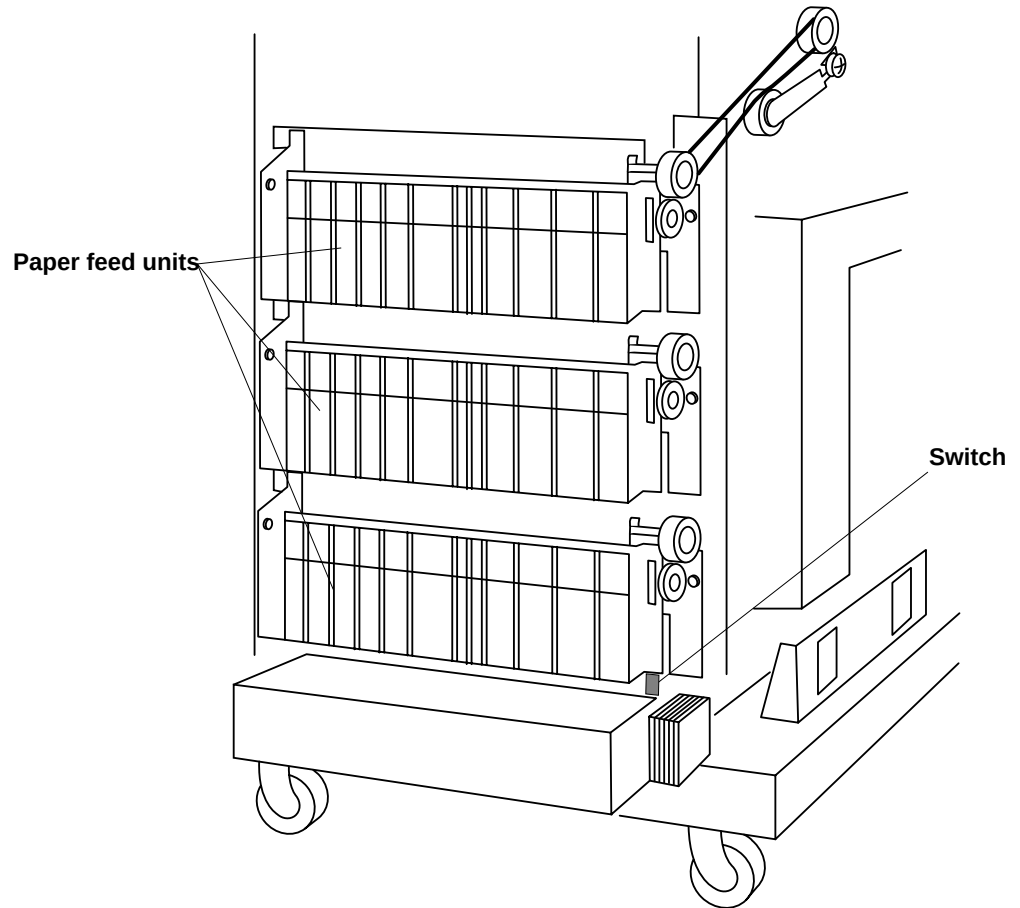


Figure 5-13 Lower-right Cover Interlock Microswitch

5-4.8 Upper-right Cover Interlock Microswitch

Part Number

CA98001-6946FJ (See [6-6.13](#) on page 6-30.)

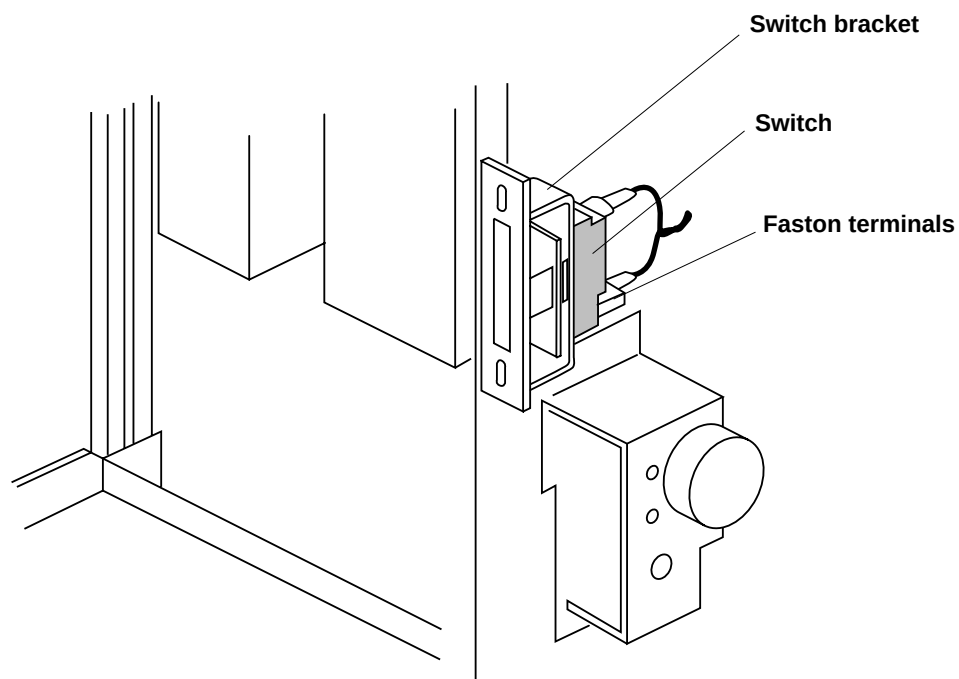


Figure 5-14 Upper-right Cover Interlock Microswitch

5-5 FRUs Accessed from the Front of Printer

5-5.1 Duplex Unit Replacement Procedure

Part Number

CA02626-F840FJ (See [6-6.4 on page 6-12.](#))

Removal and Replacement Procedure

- Step 1** Open the upper right cover and remove the back cover.
- Step 2** On the lower right corner of the high voltage power supply (HVPS), disconnect the CNDC connector.
- Step 3** Disconnect the CN1 connector ribbon cable from the HVPS.
- Step 4** Remove two HVPS bracket screws and swing open the HVPS assembly.
- Step 5** Remove two screws on the rear securing the duplex unit to the frame.
- Step 6** Open the front door.
- Step 7** Remove the fuser.
- Step 8** Disconnect the two duplex unit connectors - PS5 and DMP located on the left side of the duplex unit.
- Step 9** Remove the two screws holding the retaining bracket on the front.
- Step 10** Open Lever 5 and slide the duplex unit to the left to release it from the guide rails and locating pin. Remove the duplex unit.
- Step 11** Slide the new duplex unit onto the guide rails. Note the locating pin on the front left of the duplex unit.
- Step 12** Reassemble in reverse order.

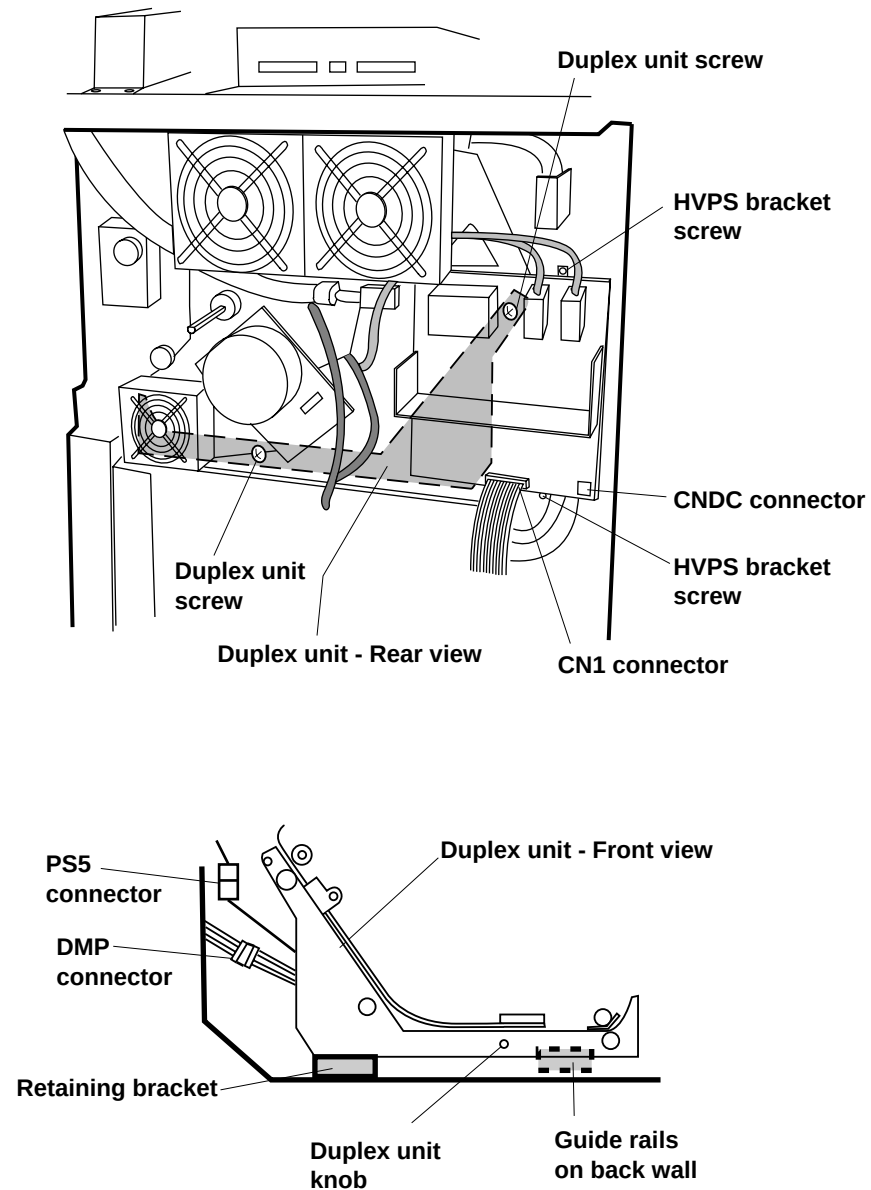


Figure 5-15 Duplex Unit Removal and Replacement

5-5.2 PS5 - Duplex Unit Paper Path Sensor Replacement Procedure

Part Number

CA55002-0337FJ (See [6-6.4](#) on page [6-12](#).)

Removal and Replacement Procedure

- Step 1** Remove the duplex unit. See [5-5.1 "Duplex Unit Replacement Procedure,"](#) on [page 5-24](#).
- Step 2** Disconnect the PS5P sensor connector.
- Step 3** Squeeze the sensor mounting tabs to release the sensor.
- Step 4** Install the new sensor.
- Step 5** Reassemble in reverse order.

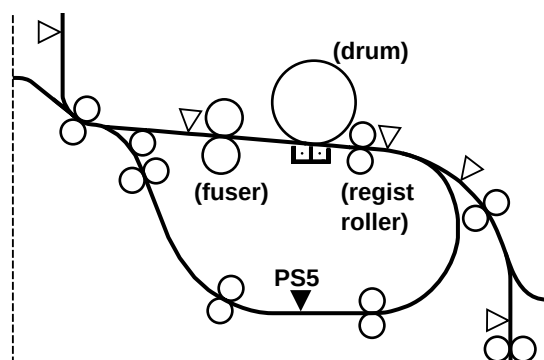


Figure 5-16 PS5 Positioning Overview

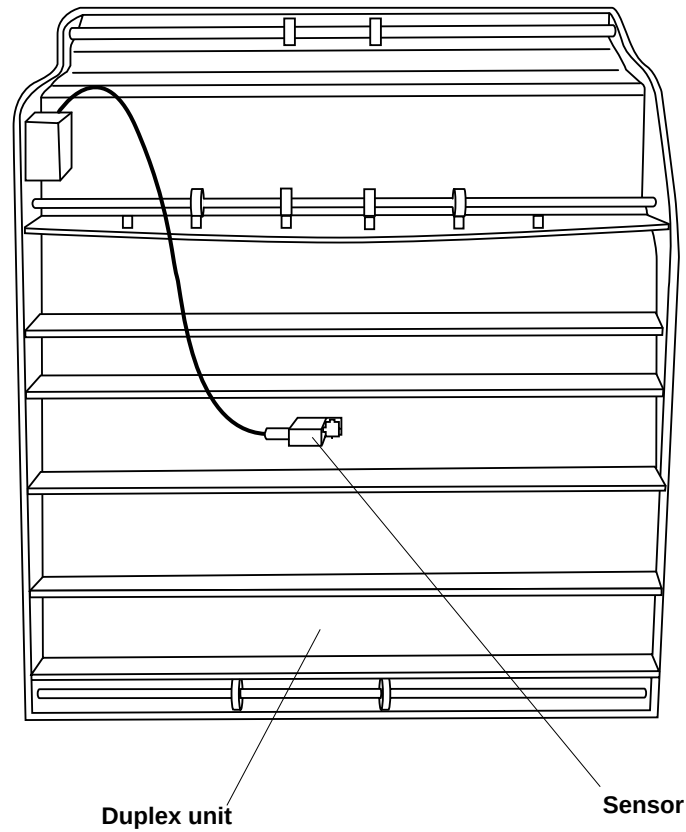


Figure 5-17 Duplex Unit Sensor PS5

5-5.3 LED Erase Unit Replacement Procedure

Part Number

CA02626-E125FJ (See [6-6.13 on page 6-30.](#))

Removal and Replacement Procedure

Step 1 Remove the back cover.

Step 2 At the back of the printer, disconnect the inline snap connector CLEDP1 and CLEDP2 and pass the connectors through access hole to the front of the printer.

Only one connector is used by the LED erase unit, but the connectors are interchangeable.

Step 3 Open the front door.

WARNING!	The fuser may be hot.

Step 4 Remove the fuser unit.

Step 5 Lower the transfer guide assembly.

Step 6 Remove the drum unit.

Step 7 Using a short Phillips screwdriver, remove the center screw holding the LED erase unit clear plastic cover and remove cover.

Step 8 Remove the LED erase unit mounting screw on the guide plate.

Mounting hooks are used to secure the guide plate.

Step 9 Carefully pull the LED erase unit from the mounting hooks and cable connector free of the printer frame hooks.

Step 10 Reassemble in reverse order.

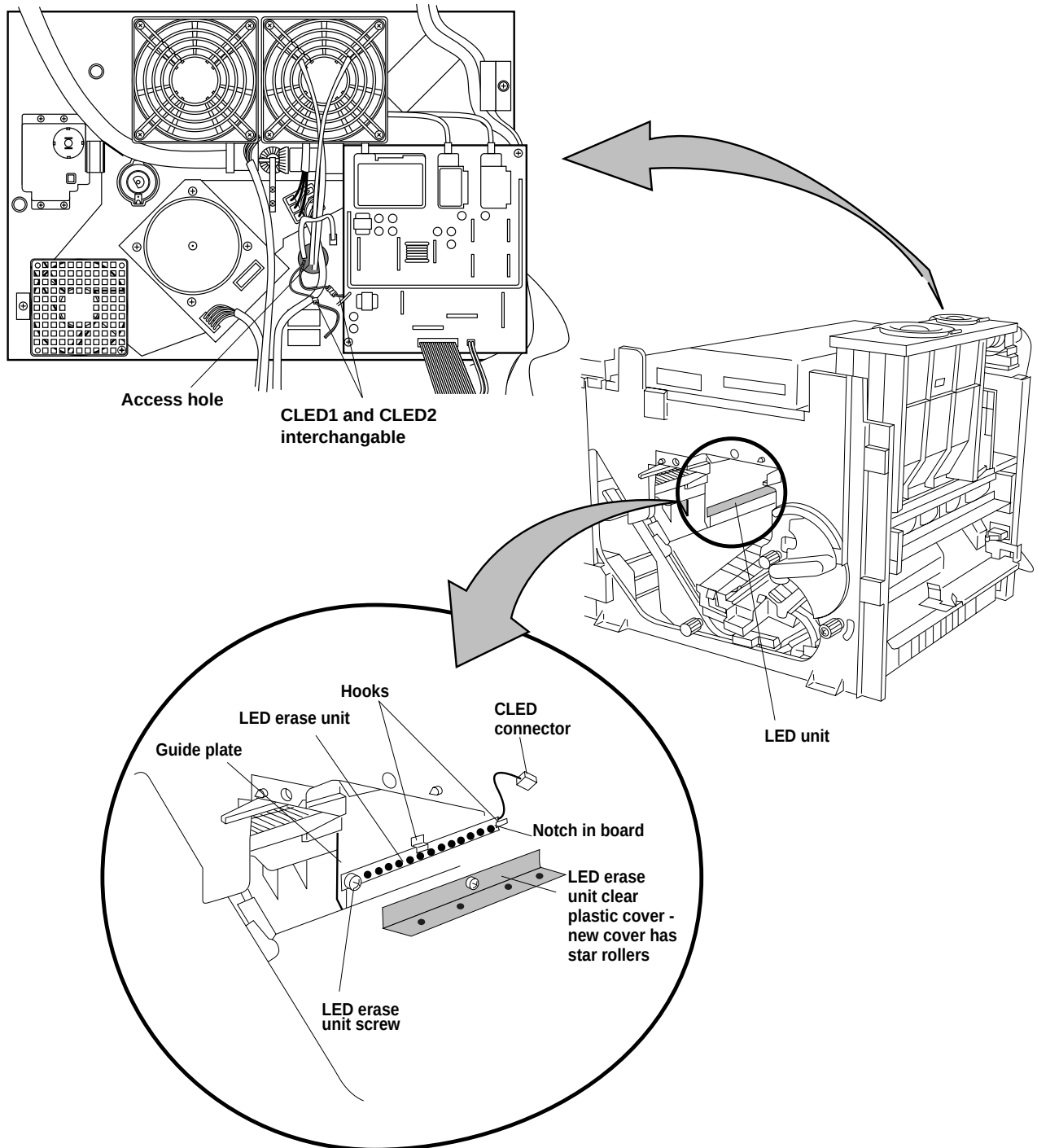


Figure 5-18 LED Erase Unit and Plastic Cover

5-5.4 Transfer Assembly Guide Replacement Procedure

Part Number

CA02626-E501FJ (See [6-6.5](#) on page 6-14.)

Removal Procedure

Step 1 Remove the rear cover.

Step 2 At the rear of the printer, remove the large red cables (+HV and ACH) from the high voltage power supply.

After you remove the cables, remove the tie wraps and lay them flat along the back of the printer. Later, you will feed the cables through the access hole in the printer frame.

Step 3 Remove the green ground cable and connector CLED2 that feed through the same hole as the high voltage cables.

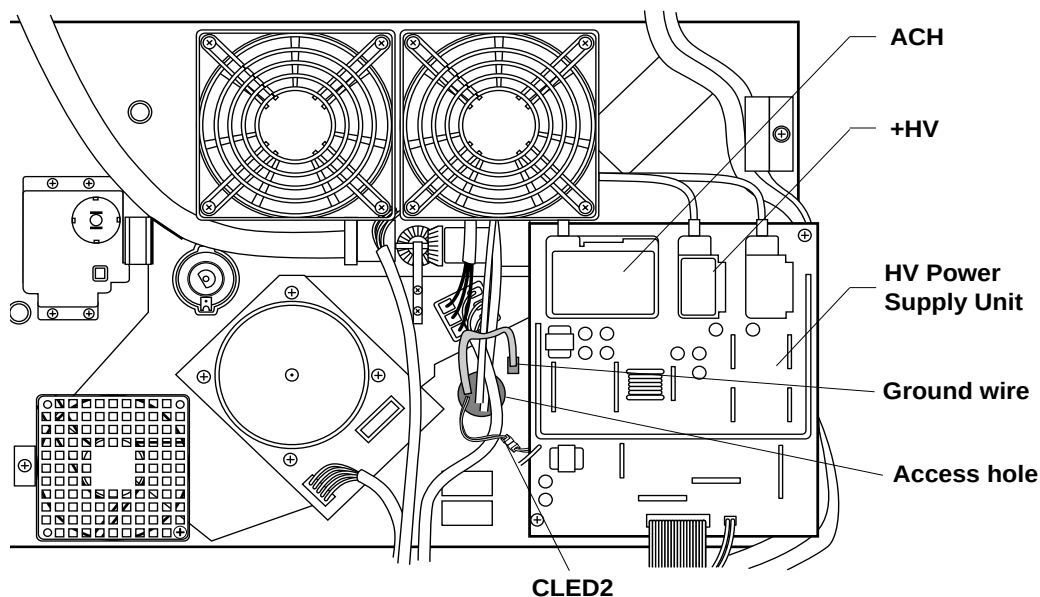


Figure 5-19 High Voltage Connections

WARNING!

The fuser may be HOT!

Step 4 Open the front door and remove the fuser.

Step 5 Remove the drum unit. Cover the drum unit with paper to prevent light shock.

CAUTION

Remember the orientation of the locking blocks as you remove them.

- Step 6** Reach underneath the transfer guide assembly and pull down and remove both white plastic locking clips. Mark the clips. There is a left and right clip; they are not interchangeable. Note clip orientation.
- Step 7** Squeeze the black plastic pivot pins (located directly behind the white locking clips). Pull down, then out the transfer guide assembly while carefully pulling the cables through the access hole.

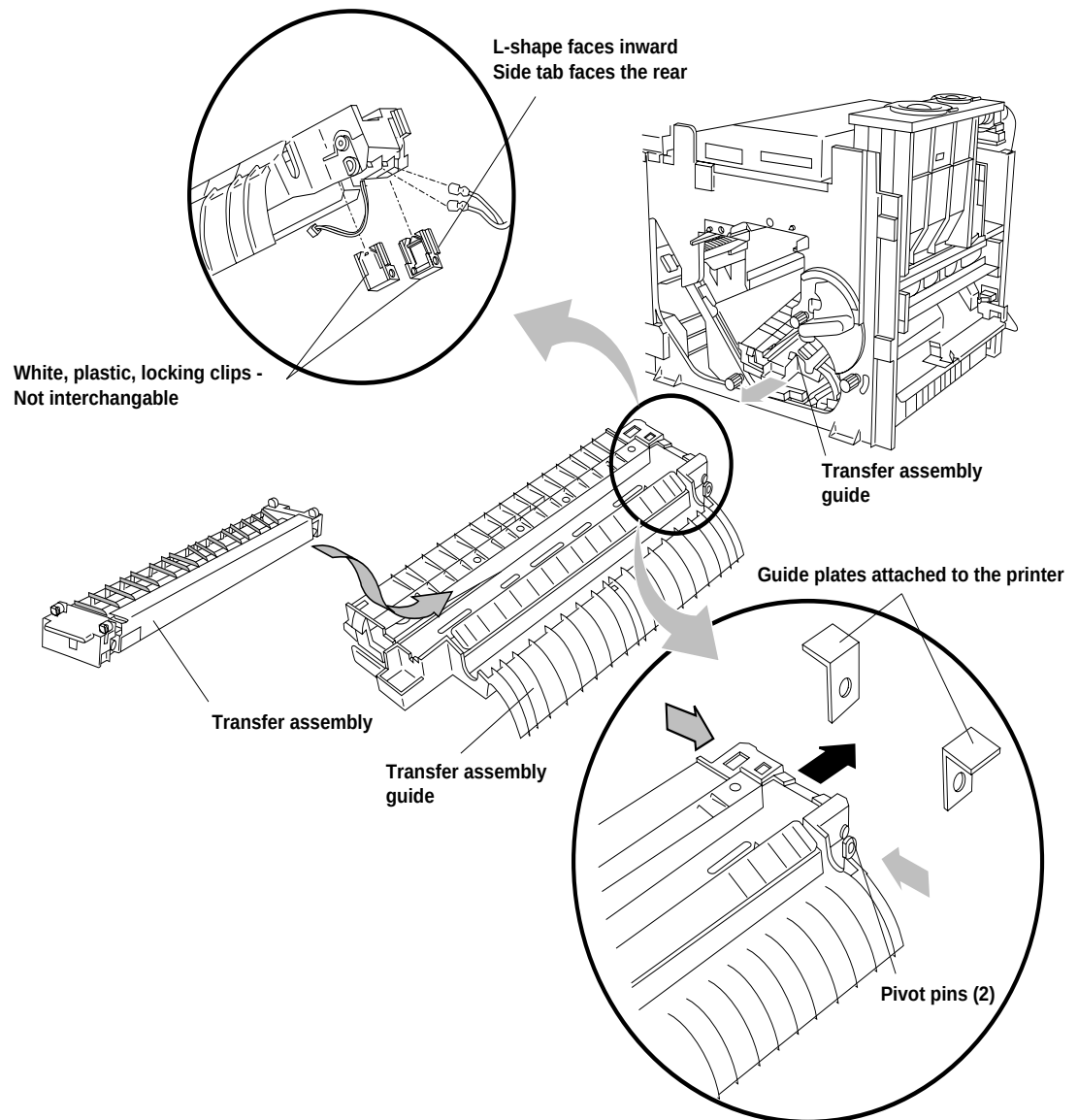


Figure 5-20 Transfer Assembly Guide

WARNING!

Follow the instructions to remove the green ground cable and +HV cable from the transfer guide assembly. If the cables are removed without sliding the connector shield up, the connector could break.

- Step 8** Remove the green ground cable and +HV cable by sliding the connector release up and then pulling the connector off. Place on the new transfer guide using the connector release.

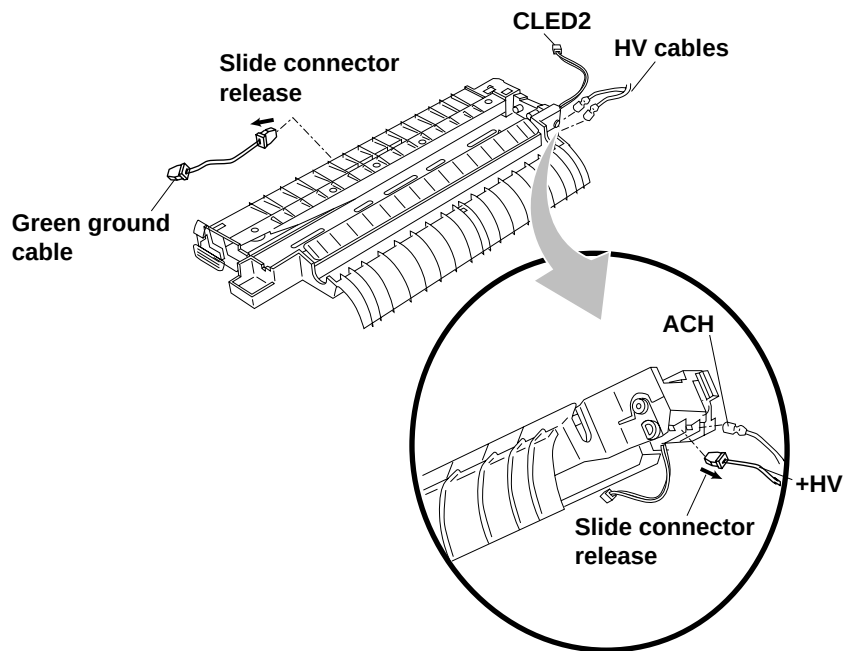


Figure 5-21 Transfer Guide Connectors

- Step 9** Remove the ACH cable from the end of the transfer guide and connect to the new transfer guide.

- Step 10** Remove the transfer unit and place in the new transfer guide.

Replacement Procedure (mounting)

- Step 1** If you haven't already done so, connect the +HV, ACH, and ground cable to the transfer guide assembly and place the transfer unit into the transfer guide.
- Step 2** While squeezing the black pivot pins, insert the transfer guide assembly into the guide plates of the printer.

CAUTION

The black pivot pins must lock in place when transfer guide is inserted. Also, make sure the connections for the two red high voltage wires and the green ground wire are tight.

- Step 3** Insert the two white plastic locking blocks into the rear of the transfer guide.

The open block side faces inward. There is a left and right block; they are not interchangeable.

Step 4 Feed the two red high voltage wires, ground wire, and the CLEDP2 connector through the hole in the printer frame.

Step 5 Reconnect the +HV and ACH red wires to the high voltage power supply, the ground wire to the ground lug, and the CLEDP2 connectors.

There are two identical connectors in this area, CLEDP1 and CLEDP2. They can be interchanged as both LED assemblies are turned on at the same time.

Step 6 Move the transfer unit from the old transfer guide to the new transfer guide.

Step 7 Reinstall the drum and fuser and raise transfer guide into place.

Step 8 Reinstall the rear cover.

5-5.5 Decurler Unit Replacement Procedure

Part Number

CA02626-E122FJ (See [6-6.13](#) on page [6-30](#).)

Removal Procedure

- Step 1** Open the front door.
- Step 2** Remove the fuser unit.
- Step 3** Remove the top cover (three screws).
- Step 4** Remove the rear cover (two screws).
- Step 5** Remove the plastic top shield (three screws).
- Step 6** Disconnect the high voltage power supply (HVPS) connectors CN1 and CNDC (see [Figure 5-22](#)).

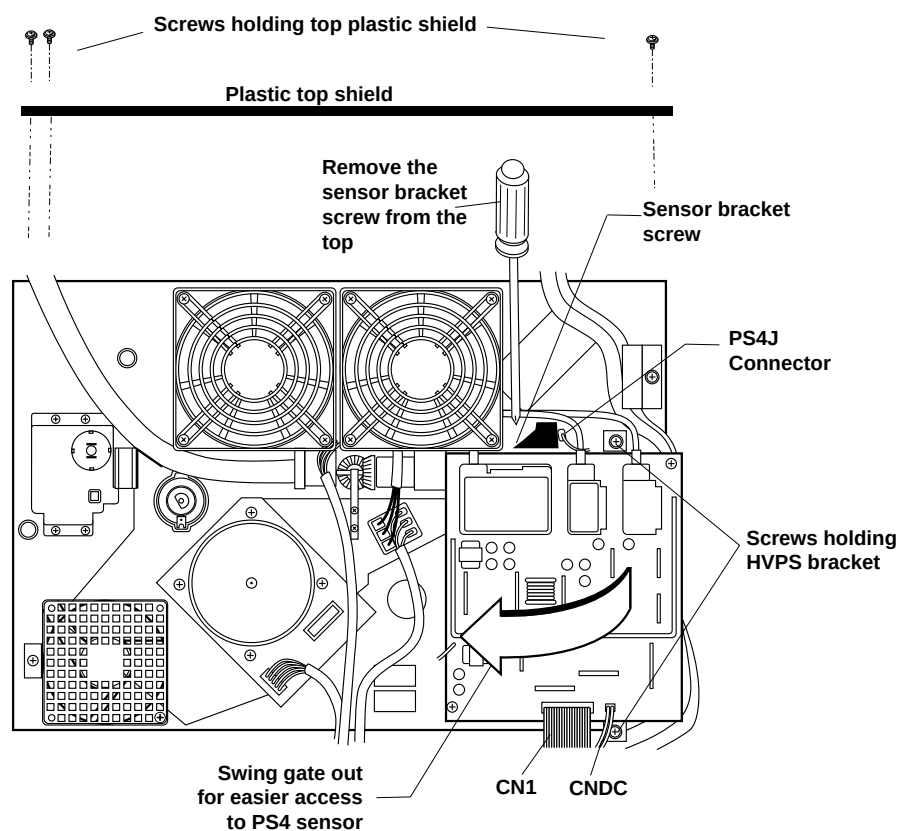


Figure 5-22 Rear Panel

- Step 7** Remove the two screws securing the HVPS bracket. Swing the bracket out.
- Step 8** Disconnect the PS4J connector.

Step 9 Remove the screw holding the PS4 bracket. The screw is accessed from the top using a magnetized, long Phillips #2 screwdriver.

Step 10 Remove the screw holding the knob on the de-curler assembly.

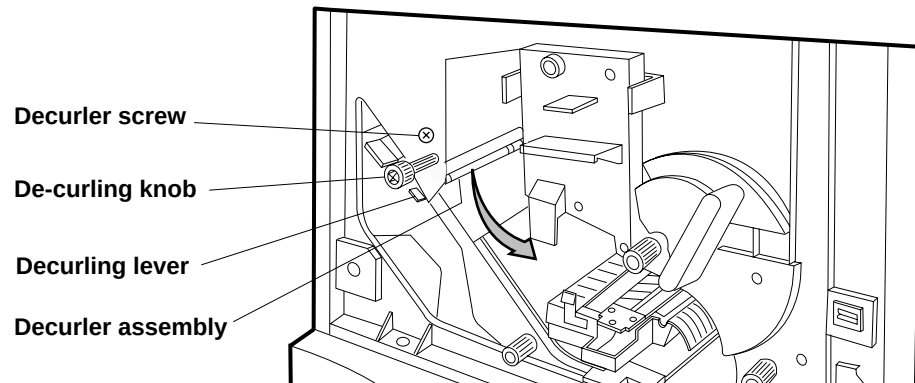


Figure 5-23 Decurler Knob

Step 11 Remove the screw located above the knob shaft and immediately below the laser warning label.

Step 12 Carefully reach in and push the decurler assembly to the rear. Then slightly twist and pull out.

Replacement Procedure

Step 1 Install new decurler assembly.

Step 2 Install the decurler assembly with the positioning pins properly seated.

Step 3 From the top, reinstall the decurler assembly holding screw.

Be sure to verify the placement of the positioning pin.

Step 4 Reconnect the PS4J connector.

Step 5 Close and secure the HVPS bracket.

Step 6 Reconnect the lower HVPS connectors CN1 and CNDC.

Step 7 Reinstall the plastic shield.

Step 8 Reinstall the front screw above the de-curling shaft.

Step 9 Reinstall the de-curling knob.

Step 10 Reinstall the fuser unit.

Step 11 Close all covers.

5-5.6 Paper Tray Lift Motor Replacement Procedure

Part Number

CA02626-E157FJ (See [6-6.6 on page 6-16.](#))

Removal and Replacement Procedure

Step 1 Open the front door.

Step 2 Remove all paper trays.

Identify the top, middle, and bottom trays so that they can be reinstalled in the correct position.

Step 3 Remove the three mounting screws from failed lift motor.

Step 4 Carefully remove the motor from the two hooks and disconnect the power cable from the back of the motor.

Step 5 Reassemble in reverse order.

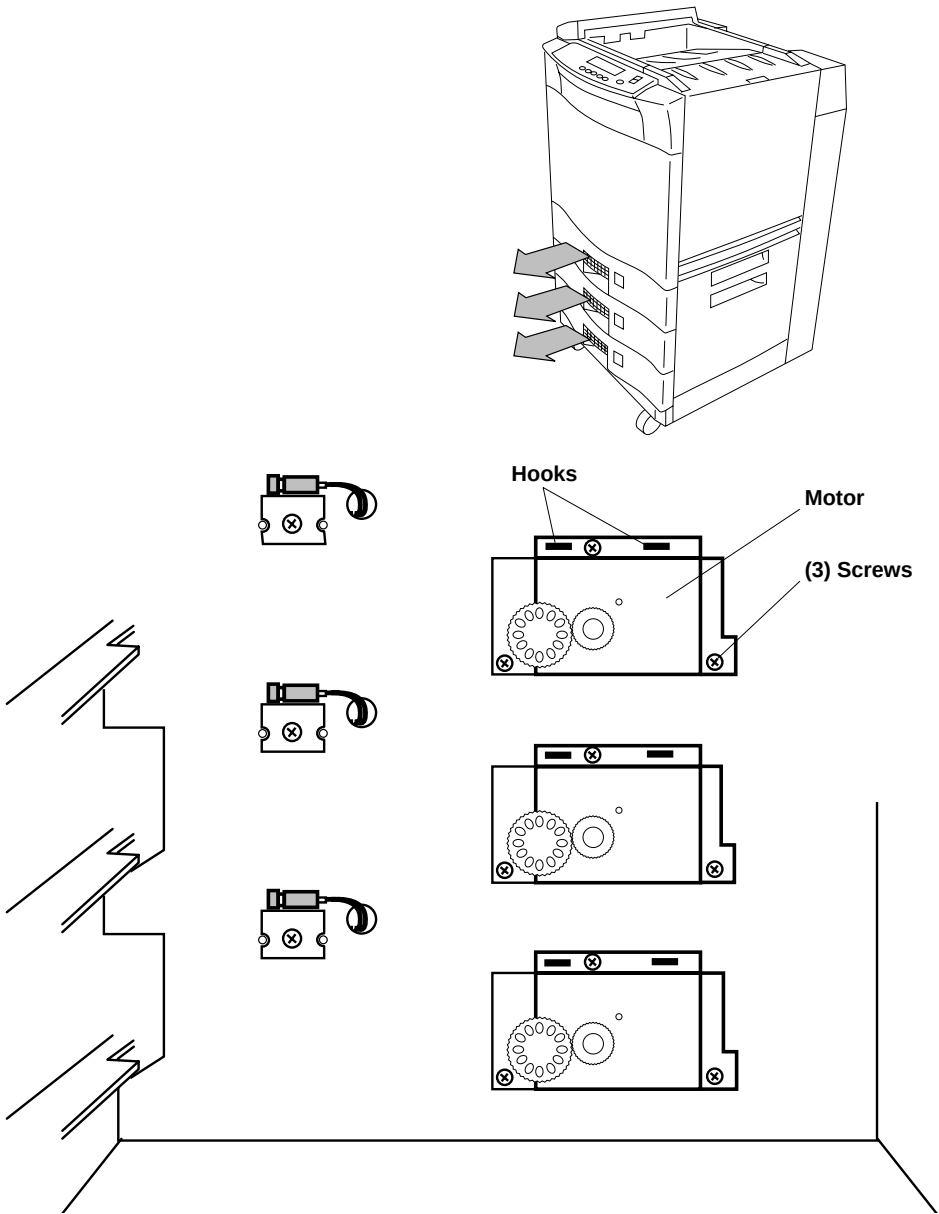


Figure 5-24 Paper Tray Lift Motor

5-5.7 Printer Pick Roller Kit - Tray Pick Rollers Replacement Procedure

Part Number

C5633A (See [6-6.11 on page 6-26.](#))

Removal and Replacement Procedure

Replace the pick rollers whenever the control panel indicates:

Pick Roller At End Life
Replace Pick Roller

or when you get excessive pick errors.

Each tray and the HCI contain pick rollers. The control panel will indicate which one requires replacement. This procedure is applicable to all three printer trays (tray1, tray2, and tray3). For the HCI replacement procedures, see [D-5.2 "HCI Pick Rollers Replacement," on page D-21.](#)

Step 1 Go to the Replace menu (Menu.Maintenance.Maintenance options.replace).

Step 2 Select the set of tray rollers to be replaced.

Step 3 Remove all three trays from the printer to reach the tray pick rollers more easily.

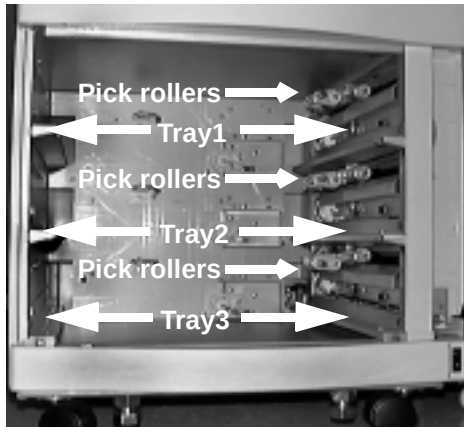


Figure 5-25 Pick Roller Location

Step 4 Unscrew the thumb screw holding the steel plate over the lower tray roller assembly.

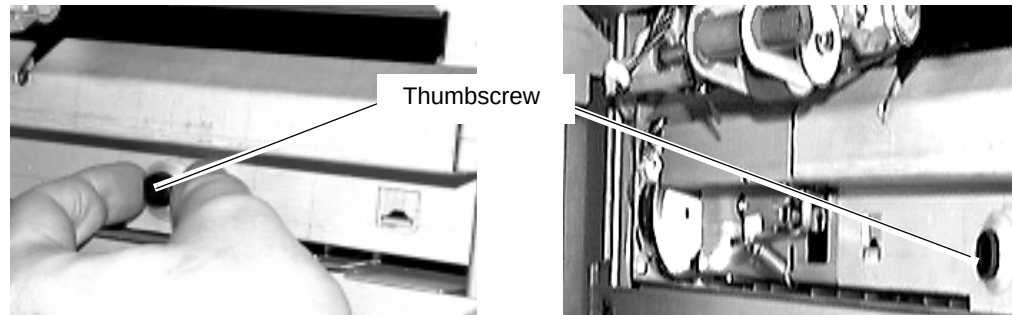


Figure 5-26 Unscrewing Plate

Step 5 Pull off the blue plastic clip holding the lower rollers in place.

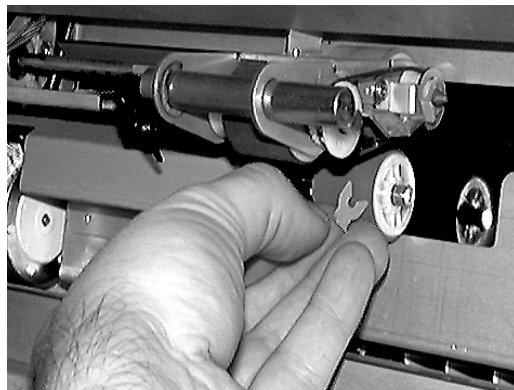


Figure 5-27 Removing Lower Roller Clip

Step 6 Pull the two lower rollers off of the lower shaft now. See Figure 5-14.



Figure 5-28 Removing Lower Rollers from Shaft

Step 7 Pull off the blue plastic clip holding the upper rollers in place.

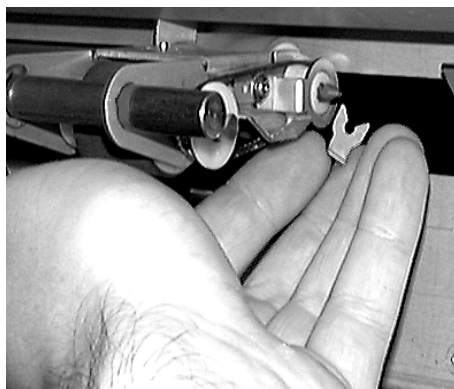


Figure 5-29 Removing Upper Roller Clip

Step 8 Pull the upper roller assembly off of the upper shaft. See Figure 5-16.



Figure 5-30 Removing Upper Roller Assembly

Step 9 Unpack the new printer pick roller kit. See Figure 5-17.

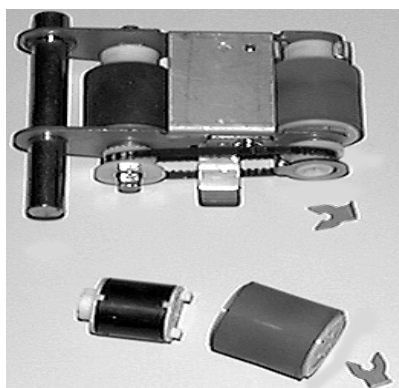
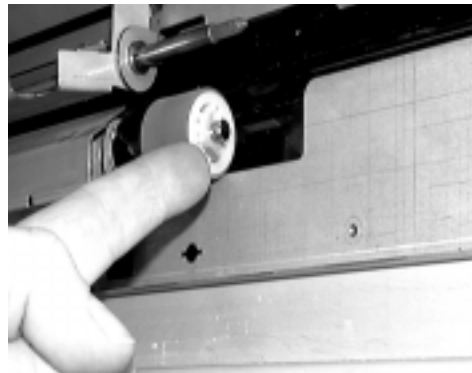


Figure 5-31 Printer Pick Roller Kit

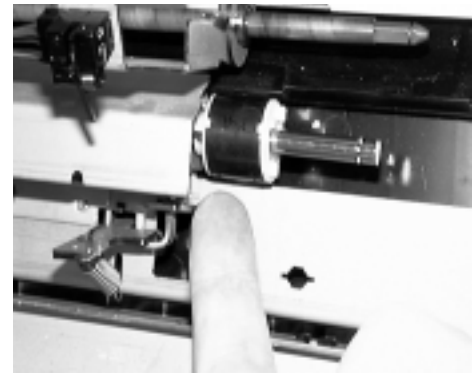
CAUTION

During installation of the lower rollers the torque limiter roller (a smaller lower roller with a black color outside) must go on the lower shaft *first*.

Step 10 Install the smaller lower roller (torque limiter roller) so that the notch in the roller's plastic fits over the metal pegs on the shaft. When this roller is correctly in all the way, the roller is locked and will not rotate.



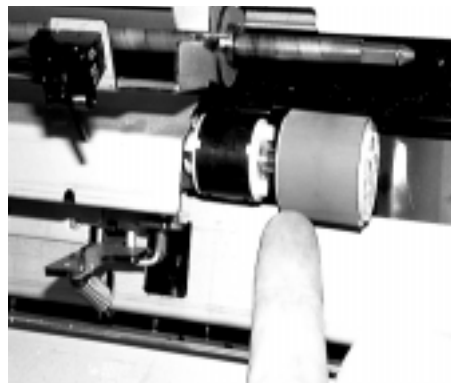
Notch correctly positioned to go over metal peg



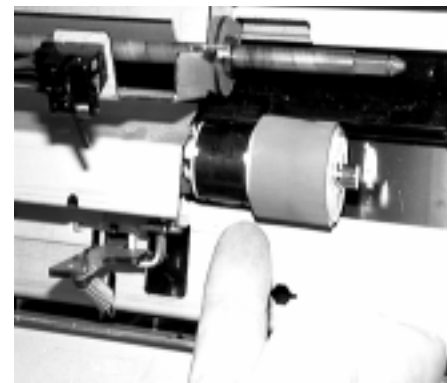
Roller correctly installed all the way, with notch over the metal peg

Figure 5-32 Correct Torque Limiter placement

Step 11 Install the larger lower roller on the same shaft. The larger roller (when correctly positioned) fits onto two small plastic pegs on the smaller lower roller. You may need to rotate the larger roller against the smaller roller until it snaps into place.



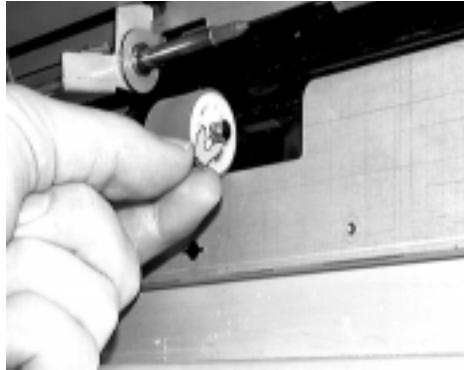
Larger lower roller positioned on the same shaft as the smaller roller



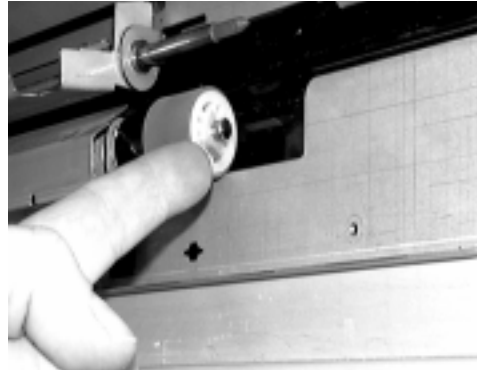
Larger lower roller rotated to engage plastic pegs on smaller

Figure 5-33 Correct Larger Lower Roller placement

Step 12 Snap the blue plastic clip into place. It fits over a groove on the end of the shaft to secure the lower rollers. If you don't see this groove, the rollers may not be completely seated all the way onto the shaft.



Blue clip placed on lower roller shaft



Blue clip snapped into place on lower roller shaft groove

Figure 5-34 Blue Clip Snapped into Place

Step 13 Install the new upper pick roller assembly over the shaft.



When you install the printer's upper pick rollers, the slot on the pick roller assembly must mate with the corresponding mounting tooth on the printer bracket.

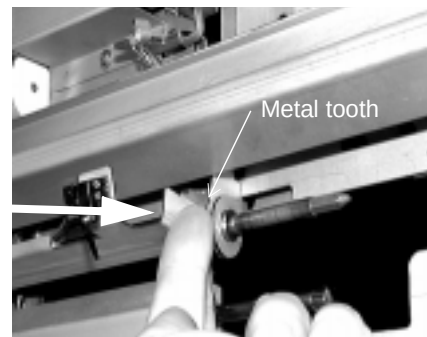
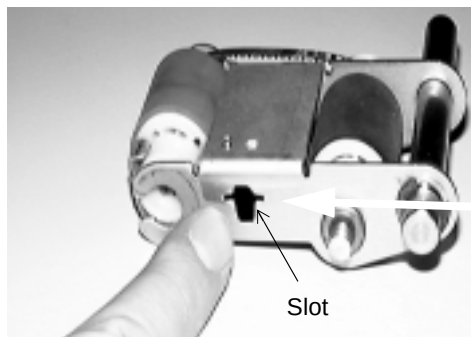


Figure 5-35 Upper Pick Roller Assembly Slot and Mounting Tooth on Printer

Step 14 Push the upper roller assembly all the way onto the shaft. You may have to jiggle the assembly a little as you push it to seat it correctly.

Step 15 Snap the blue plastic clip into place. It fits over a groove on the end of the shaft to secure the upper roller assembly. If you don't see this groove, the assembly may not be completely seated all the way onto the shaft. See [Figure 5-36](#).

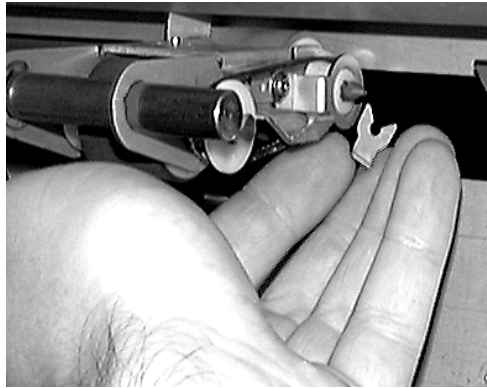


Figure 5-36 Installing Upper Roller Clip

Step 16 Attach the metal plate to the printer frame with the thumbscrew. Turn the thumbscrew clockwise several turns until it is snug. Do not overtighten.

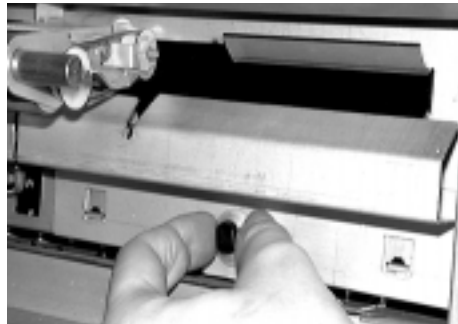


Figure 5-37 Attaching Plate

Step 17 Replace the three paper trays back into the printer.

Step 18 Press **Done** on the control panel.

Step 19 Perform the Paper Path Alignment procedure described in [5-3.4 "Paper Feed System Alignment,"](#) on page [5-12](#).

5-6 FRUs Accessed from the Top of Printer

5-6.1 Control Panel Board Replacement Procedure

Part Number

CA31214-C026FJ (See [6-6.8 on page 6-20.](#))

Removal and Replacement Procedure

- Step 1** Remove the top cover (3 screws).
- Step 2** Open the front control panel and remove the four panel screws.
- Step 3** Disconnect three faston grounding connections from the main controller cover.
- Step 4** Lift the control panel and rotate it upward to disconnect the J4 and J5 connectors.

Connector J4 may have a protective plastic strip securing the squeeze tabs. Rotate the strip to allow removal.
- Step 5** Remove the control panel assembly and place it on a flat working surface.
- Step 6** Disconnect the J3 connector.
- Step 7** Remove the three screws and two ground wires. (The third wire is connected to the switch.)
- Step 8** Remove the control panel board.
- Step 9** Insert the new control panel board.
- Step 10** Reassemble in reverse order.

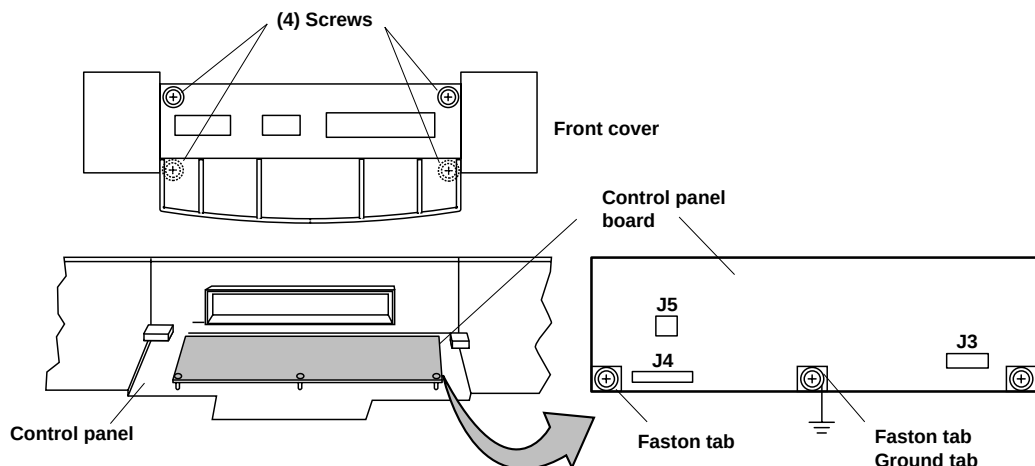


Figure 5-38 Control Panel Board

5-6.2 Main Controller Board Replacement Procedure

Hard Disk Drive (HDD) Replacement Procedure

Floppy Disk Drive (FDD) Replacement Procedure

The main controller takes data from the serial or parallel interface, formats the page, and transfers the data to the print engine as a video signal (one dot row at a time) when the mechanism controller requests new data (beam detect).

The main controller has flash memory which contains the function code and printer internal diagnostics (Bank 0) and, if installed, Postscript code (Bank 1). The flash also contains all of the control panel configurations. The main controller has an internal battery to maintain the data loaded into the flash memory. This battery is not replaceable separate from the main controller.

The replacement main controller should include flash memory that contains pre-installed function code and diagnostics. If the flash memory is empty, the printer control panel will lock up when attempting to use the function code or diagnostics. In this case, you'll need to install the function code and/or diagnostics from a floppy disk or the hard disk.

Controllers may have out-of-date function code. When you replace the main controller, be prepared to reinstall the function code to make sure you have the latest version.

If the customer has PostScript, you'll need to reinstall the PostScript code from a floppy disk or the hard disk when you replace the main controller. The customer should have a Postscript floppy available for re-installation.

Part number

CA31214-C028FJ - Main controller board (See [6-6.7 on page 6-18.](#))

CA02950-1393FJ - Hard disk drive (See [6-6.7 on page 6-18.](#))

CA31214-C016FJ - Floppy disk drive (See [6-6.7 on page 6-18.](#))

Removal Procedure

Always wear an ESD wrist strap properly grounded to the equipment. Always place logic device assemblies on an anti-static mat.

Step 1 Remove the control panel assembly (see [5-6.1 "Control Panel Board Replacement Procedure," on page 5-44.](#))

CAUTION

The main controller metal cover is divided into a smaller, rear section and a larger, front section. The front section is held by five spring-tensioned screws. **Do not remove the five spring-tensioned screws.** Loosen the screws and slide the cover toward the rear of the printer until free of the spring mounted black holding screws, then lift cover to remove.

Step 2 Loosen the screw securing the rear section of the main controller cover. Slide the rear cover toward the back of the printer and lift up to remove.

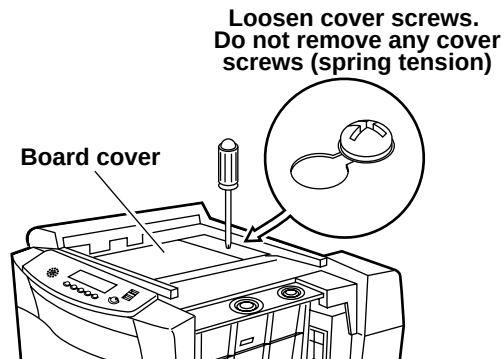


Figure 5-39 Main Controller Board

- Step 3** Loosen, but **do not remove the five black screws** around the edge of the main controller cover (front section).
- Step 4** Carefully slide the cover toward the back of the printer and lift slowly. (The fan wire is attached).
- Step 5** Disconnect the fan connector FAN6P and remove the cover.

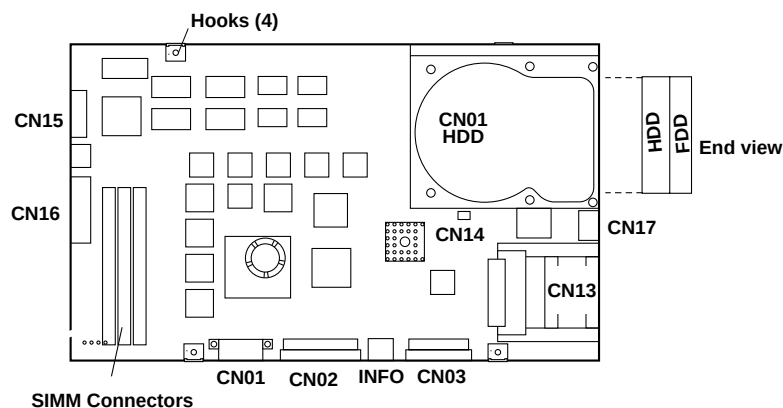


Figure 5-40 Main Controller Connectors

- Step 6** Remove the main controller board connectors CN01, CN02, INFO, CN03, and CN14.

CAUTION Remove the hard disk drive before lifting the main controller out of the printer.

- Step 7** Remove the multi-colored ribbon cable from the HDD connector on the main controller.
- Step 8** Remove the two screws on right side of the hard disk bracket.
- Step 9** Slide the hard drive to the rear, then to the right to free the bushings from the bracket. Lift out the hard drive.
- If you are only replacing the hard disk drive, place new hard disk drive into

bracket and reassemble in reverse order.

If you are replacing the floppy disk drive or main controller board, continue with this procedure.

Step 10 Remove the two control panel cables from the front mounting bracket.

Step 11 On left side, remove the screw and cable clamps securing the CN02 cables. Remove all cables from the rear mounting bracket.

Step 12 Remove a screw from each corner of the front and rear mounting brackets (four screws total).

Step 13 Open the four, board-securing hooks (two on each side), lift the main controller out of the printer (with the mounting brackets and floppy attached), and place on the anti-static mat.

Step 14 Remove the floppy interface cable from the FDD connector on the main controller.

Step 15 Remove the four screws underneath the Controller board that secure the floppy mounting bracket. Remove the floppy mounting bracket and floppy drive.

If you are only replacing the floppy drive, place new floppy drive into bracket and reassemble in reverse order.

If you are replacing the main controller board, continue with this procedure.

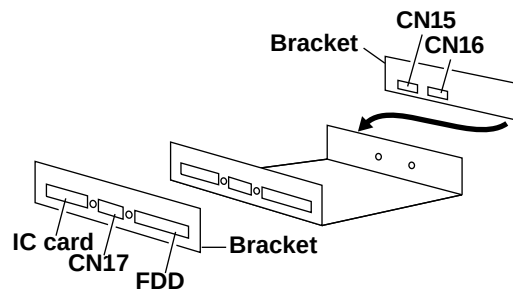


Figure 5-41 Main Controller Brackets

Step 16 Remove the two 3/16" nuts securing the CN17 connector (front serial port) to the front I/O bracket. Remove 2 screws from the top corners of the bracket. Remove the front I/O bracket.

Step 17 Remove two 3/16" nuts securing the CN16 connector (rear serial port) to the rear I/O bracket. Remove two screws securing the CN15 connector (parallel port). Remove the rear I/O bracket.

Step 18 Transfer any optional memory SIMMS on the old main controller board to the new board.

Step 19 Reassemble in reverse order.

- Make sure SW1 on rear of the Controller is set for all positions up (closed).
- Print a Setup Report. Verify the latest version of function code is loaded. If necessary, reload the function code from floppy and install the optional PostScript code.

5-6.3 Optical Unit Replacement Procedure

Part Number

CA02625-D115FJ (See [6-6.7 on page 6-18.](#))

Removal Procedure

Step 1 Remove the control panel assembly and set it aside on a flat surface (see [5-6.1 "Control Panel Board Replacement Procedure," on page 5-44.](#))

Step 2 Remove the main controller (see [5-6.2 "Main Controller Board Replacement Procedure," on page 5-45.](#))

When removing the main controller board, do not remove the hard disk drive, floppy drive or the memory from the board.

CAUTION

Place the controller board on the anti-static mat.

Step 3 Open the two cable clamps on the mounting plate and remove cables.

Step 4 Loosen the three screws in front holding the mounting plate and remove the mounting plate.

Step 5 Remove the three screws that connect the optical unit.

The front screw has a flat spring and a plastic collar that must be removed (see [Figure 5-42](#)).

Step 6 Grasp the optical unit using the hand holds and carefully pull upward only as far as the cables allow.

Do not grasp the edges; your fingers may cover the laser beam glass and deposit grime or body oil.

Step 7 Disconnect the three connectors from the optical unit.

The fan cable has an inline connector, FAN1P.

Step 8 Remove the failed optical unit and set it aside.

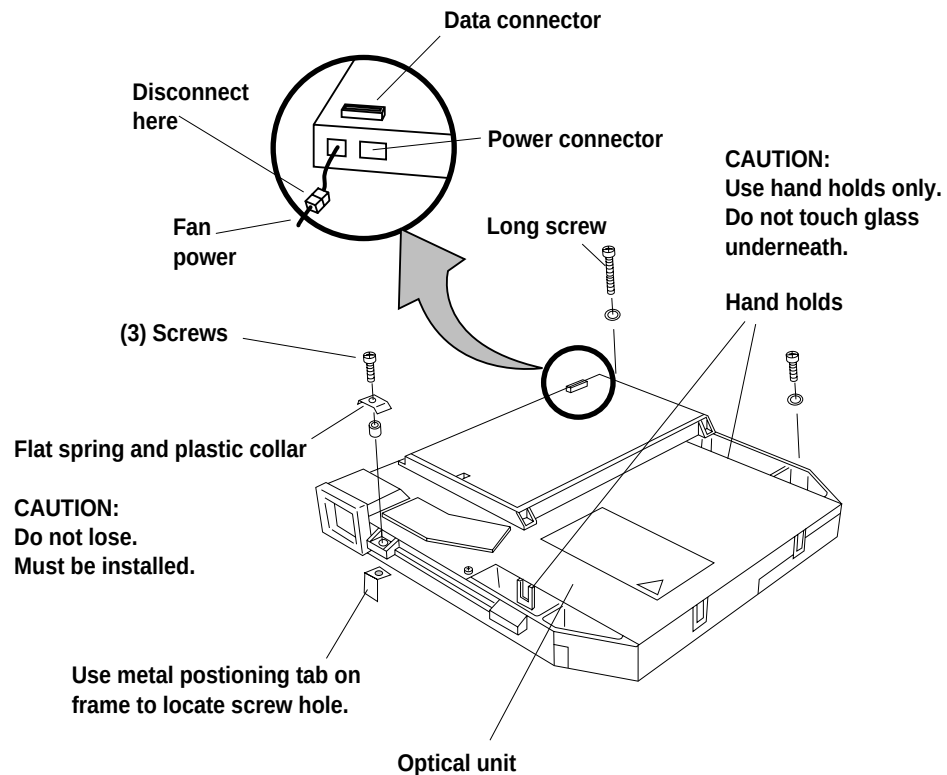


Figure 5-42 Optical Unit

Replacement Procedure

Step 1 Carefully install the new optical unit.

Do not touch the beam glass.

Step 2 Install (do not tighten) the three screws.

The spring and plastic collar must be installed at the front of the unit. Use the metal positioning tab accessed from the front frame to align the screw hole.

The long screw is installed in the rear corner.

Step 3 Tighten all screws.

Step 4 Reinstall the main controller and control panel (see [5-6.2 "Main Controller Board Replacement Procedure,"](#) on page 5-45).

Step 5 Close all covers.

5-7 FRUs Accessed from the Rear of Printer

5-7.1 Drive D Unit Motor Assembly Replacement Procedure

Part Number

CA02626-F600FJ (See [6-6.16](#) on page 6-38.)

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect motor connector MGSJH.
- Step 3** Release the cable bundle on the side of the assembly from the cable clamp.
- Step 4** Disconnect the two faston terminals from the micro-switch.
- Step 5** Remove the two screws that connect the motor assembly bracket. Do not remove the red painted screws.
- Step 6** Remove the two connectors from the microswitch.
- Step 7** Reassemble in reverse order.

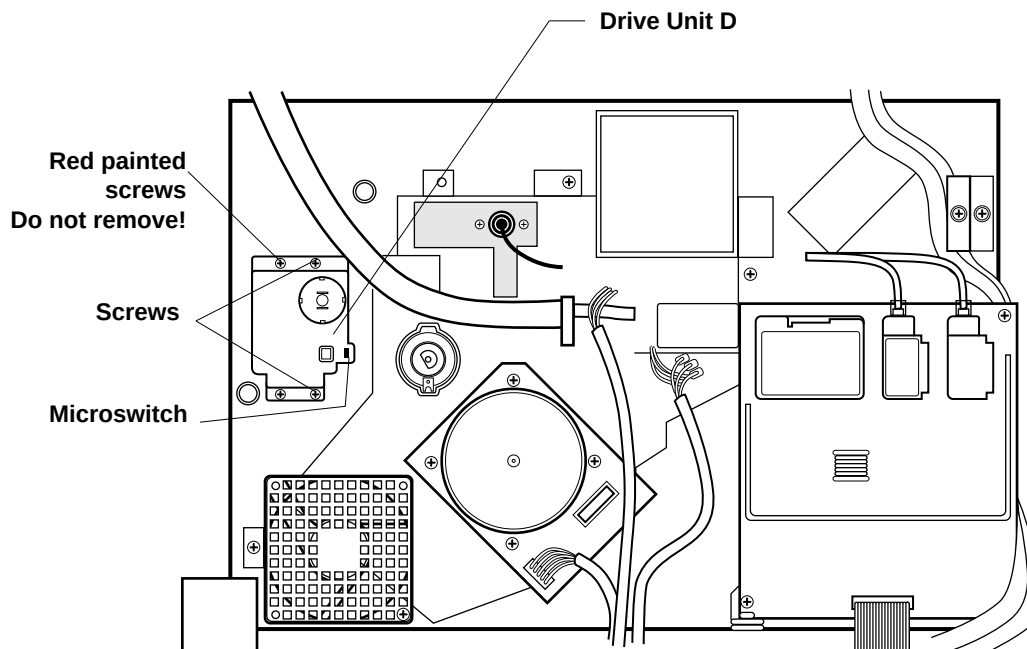


Figure 5-43 Drive Unit D Motor Assembly

5-7.2 Registration Roller Clutch Replacement Procedure

Part Number

B86L24100880AFJ (See [6-6.13](#) on page 6-30.)

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect the inline connector RCLP.
- Step 3** Rotate the shaft to allow the wrench to fit into groove molded into the base plate. The clutch positioning tab fits into lower groove molded into the base plate.
- Step 4** Use a 2-mm, L-shaped Allen wrench to remove the clutch set screw.
The set screw is set into shaft flat side.
- Step 5** Pull the clutch out.
- Step 6** Reassemble in reverse order.

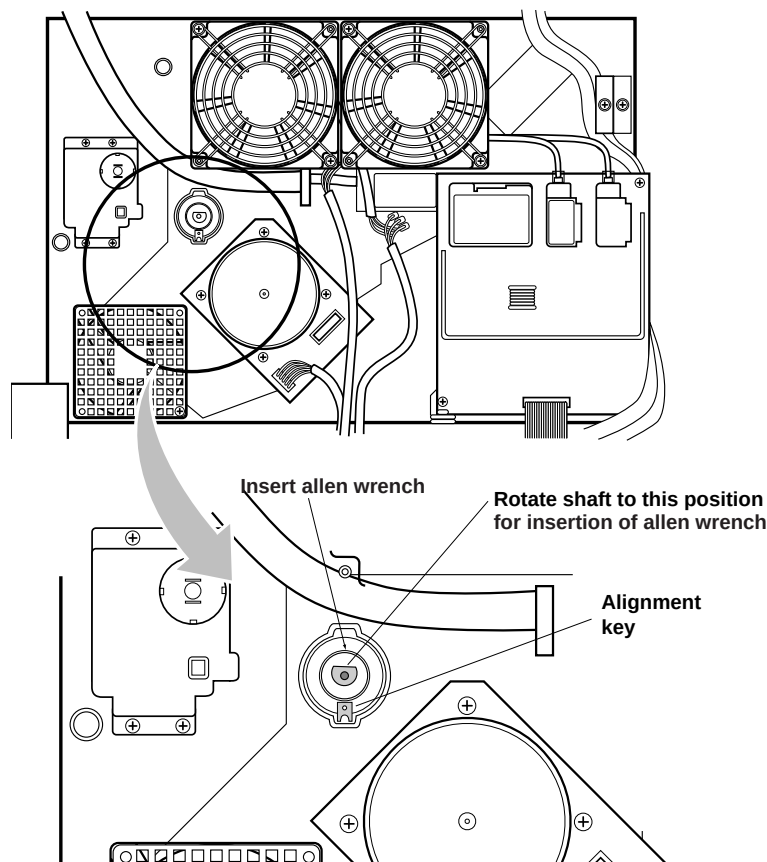


Figure 5-44 Registration Roller Clutch

5-7.3 Mechanism Controller Board Replacement Procedure

The mechanism controller is responsible for controlling all the clutches, motors, solenoids and sensors within the printer. It also provides status to the main controller when a failure occurs. The main controller then posts the appropriate error message on the control panel display.

The mechanism controller has two socketed firmware chips, and an 8-pin socketed, non-volatile RAM (NVR) chip. The NVR chip stores the total page count on the printer, the consumable counters (Developer, drum, fuser, and Rollers), and the electronic tray alignment values. When you install a new mechanism controller, remove the NVR chip from the old controller and install it on the new controller to ensure the counters are accurate.

For a description of the switches and their settings, see [5-2.2 "Mechanism Controller Board Switches,"](#) on page 5-7.

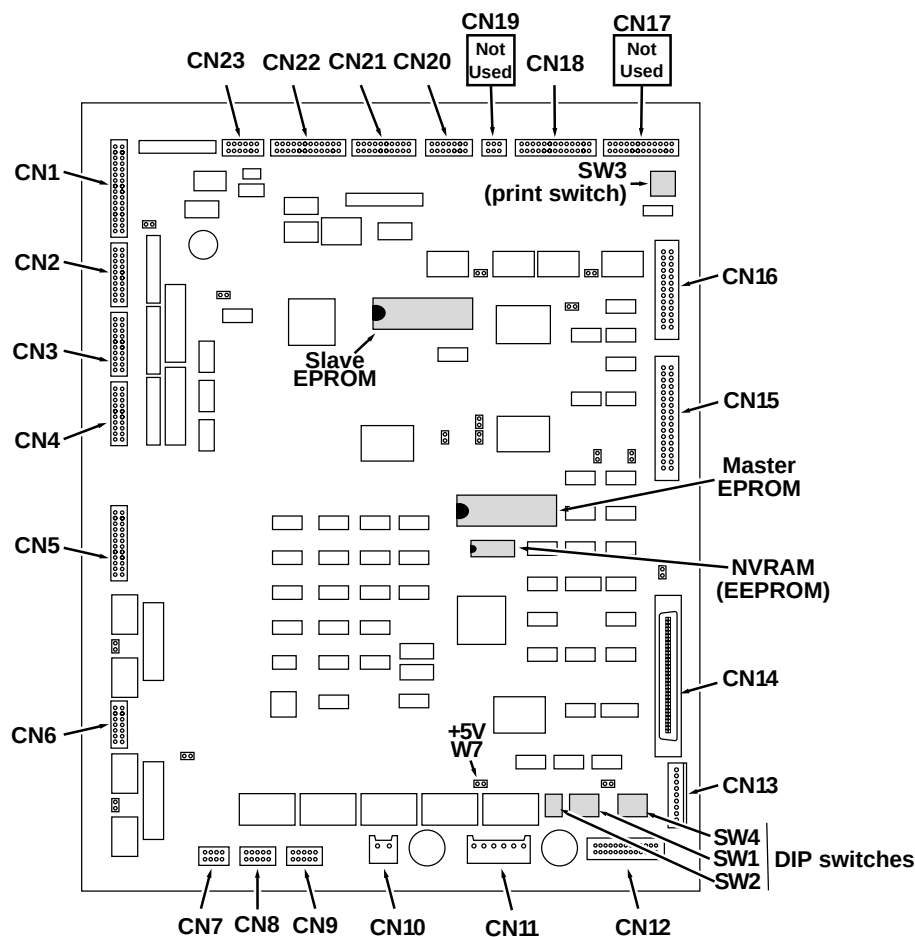


Figure 5-45 Mechanism Controller Board

Table 5-2. Mechanical Controller Connectors

Connector	Connection Description
CN1	Developer/Toner Hopper/Drive D Harness
CN2	Tray 1 feed unit: pick motor, pick roller up sensor, pick sensor, empty sensor
CN3	Tray 2 feed unit: pick motor, pick roller up sensor, pick sensor, empty sensor
CN4	Tray 3 feed unit: pick motor, pick roller up sensor, pick sensor, empty sensor
CN5	Tray empty sensors (Trays 1,2,3)
CN6	Transport feed and lift motors (Trays 1,2,3)
CN7	HCI
CN8	Low voltage power supply
CN9	Low voltage power supply: Door interlocks - front, lower right, upper right, ejection unit
CN10	Low voltage power supply—pin1= 12V, pin2= 0V
CN11	Optical unit/Low voltage power supply—pin1= +5V, pin2= 0V, pin5= +24V, pin6= +24V, pin7= 0V, pin8= 24V
CN12	HCO—25-pin serial
CN13	External port - not used
CN14	Main controller
CN15	Optical unit
CN16	High voltage power supply
CN17	Not used
CN18	HCO deflector solenoid, duplex long-paper solenoid, reversing unit motor (+24V), (ejection unit) top bin full sensor, PS6, PS7
CN19	Not used
CN20	Duplex unit, duplex motor, PS5
CN21	Drive M main motor, registration clutch, toner auger sensor, Fuser—bulb enable, thermistor, thermal switch
CN22	Fans—1, 2, 3, 6, 7
CN23	Erase LED, PS2, PS3, PS4, toner density sensor, toner empty sensor, toner waste bottle sensor (disabled.L39), developer discharge sensor, drive D (+24V), toner motor

Part NumberCA02626-E044FJ (See [6-6.15 on page 6-36.](#))**Special Tools Required**

- IC extractor/insertion tool

Removal Procedure**CAUTION**

Always wear an ESD wrist strap and make sure it is properly grounded to the equipment. Always place circuit boards on the grounded anti-static mat.

Step 1 Remove the rear cover.

- Step 2** On the mechanism controller board, disconnect the following I/O connectors:
- CN1 through CN16
 - CN18
 - CN20 through CN23

To remove CN10 and CN11, squeeze the white tabs. CN17 and CN19 are not used (vacant).

- Step 3** With thumb pressure, release the board mounting hooks (2) at the top of the mechanism controller.

As you raise the board from the bottom supports, tilt the top of the board towards you. Remove the board from the printer and set it on a grounded anti-static mat.

WARNING!

The NVRAM chip must always be transferred to the replacement mechanism controller board. This chip contains the total page count on the printer and the current consumable usage.

If the original NVRAM chip does not remain with the printer, the page count and consumable usage counters revert to zero. This may cause inaccurate consumable counts resulting in damage to the printer.

- Step 4** Transfer the NVRAM chip from the old mechanism controller to the new one.
- The NVRAM is an 8-pin IC located in the M5K socket at the right center of the mechanism controller. See [Figure 5-45](#).
- Step 5** Make sure the latest firmware is installed on the new mechanism controller.
- If the failed mechanism controller has a more-recent revision of the firmware, transfer the firmware to the replacement mechanism controller.
- Step 6** Make sure the 3 DIP switches (SW1, SW2, and SW4) settings on the new mechanism controller match the settings on the old mechanism controller.

Replacement Procedure

- Step 1** Insert the new controller board into the bottom supports and secure the top clips.
- Step 2** Attach all the connectors. CN17 and CN19 are not used (vacant).
- Step 3** Close all covers except the rear cover.
- Step 4** Align the Laser Start Position. See [5-3.3 "Laser Start Position Alignment," on page 5-10](#).
- Step 5** Align the Paper Feed System. See [5-3.4 "Paper Feed System Alignment," on page 5-12](#).

5-7.4 Low Voltage Power Supply (LVPS) Replacement Procedure

Part Number

CA02951-3631FJ (See [6-6.15 on page 6-36.](#))

Special Tools Required

- IC extractor/insertion tool

Removal Procedure

- Step 1** Remove the rear cover.
- Step 2** Remove all I/O connectors on the mechanism controller.
See [Figure 5-45 "Mechanism Controller Board," on page 5-52.](#) Do not remove mechanism controller board.
- Step 3** Remove the faston connector on the main motor ground wire.
- Step 4** Remove all cable clamp restrictions on the bracket.
- Step 5** Remove the two bracket mounting screws (left and right side).
- Step 6** Remove the mounting bracket assembly for the mechanism controller and set it aside.
- Step 7** On the left LVPS boards, disconnect all external connectors.
- Step 8** Remove the two interboard cables and set them aside.
- Step 9** On the left board, remove the two mounting screws, pull the board off the tabs, and set the failed board aside.
- Step 10** On the right board, remove the four mounting screws, pull the board off the tabs, and set the failed board aside.

Replacement Procedure

- Step 1** Install the both boards.
- Step 2** Reinstall the two interboard cables.
- Step 3** Connect all external connectors.
- Step 4** Use the two screws to install the mechanism controller mounting bracket assembly.
- Step 5** Install the cables into the clamps and secure.
- Step 6** Reconnect all I/O connectors on the mechanism controller.
See [Figure 5-45 "Mechanism Controller Board," on page 5-52.](#)
- Step 7** Adjust the +5V output voltage
See [5-3.2 "Low Voltage Power Supply \(LVPS\) +5V Adjustment," on page 5-8.](#)
- Step 8** Close all covers.

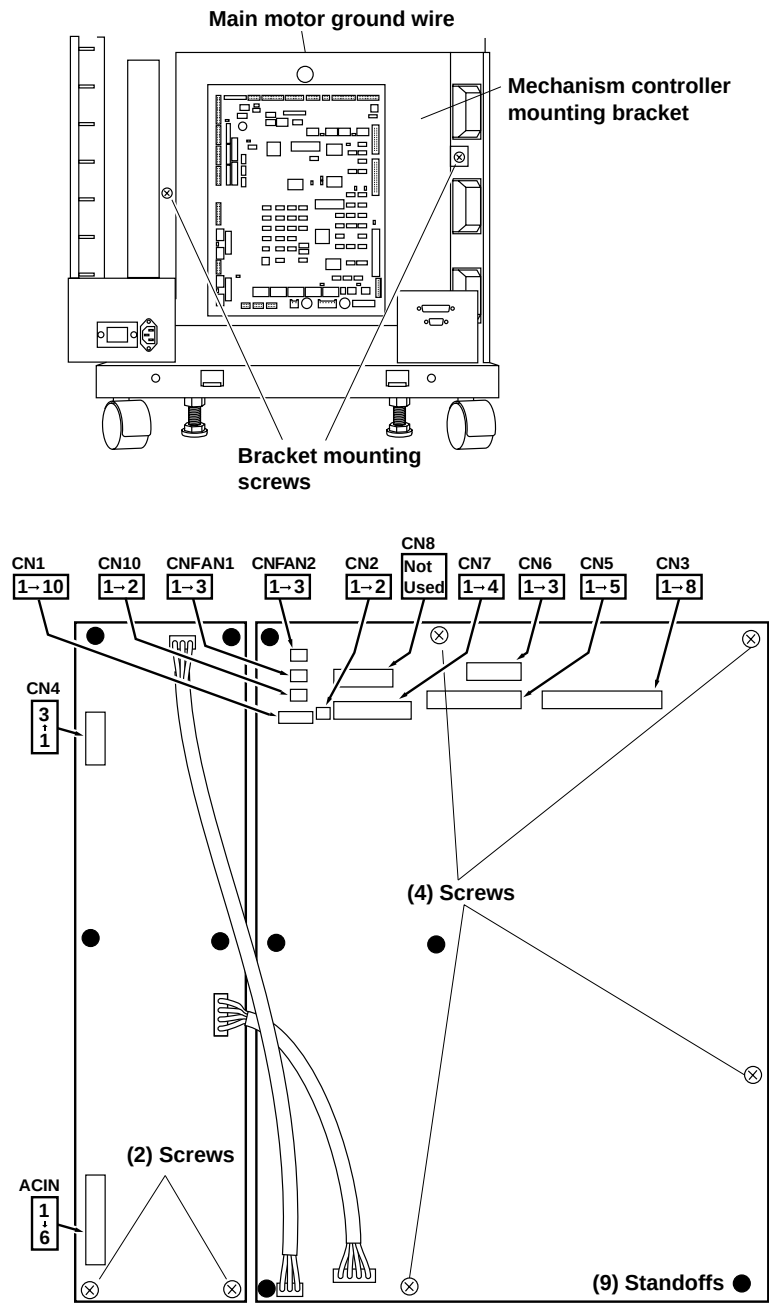


Figure 5-46 Low Voltage Power Supply

5-7.5 Low Voltage Power Supply Fan 5 Replacement Procedure

Part Number

CA02626-E159FJ (See [6-6.15 on page 6-36.](#))

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Remove all I/O connectors on the mechanism controller.
- See [Figure 5-45 "Mechanism Controller Board," on page 5-52.](#) Do not remove mechanism controller board.
- Step 3** Remove the faston connector on the main motor ground wire.
- See [Figure 5-46 "Low Voltage Power Supply," on page 5-57.](#)
- Step 4** Remove all cable clamp restrictions on the bracket.
- Step 5** Remove the two bracket mounting screws (left and right side).
- See [Figure 5-46 "Low Voltage Power Supply," on page 5-57.](#)
- Step 6** Remove the mounting bracket assembly for the mechanism controller and set it aside.
- Step 7** Disconnect the FAN5P connector.
- Step 8** Remove the three fan mounting screws and remove the failed fan and metal finger guard.
- Step 9** Install the new fan with the old metal finger guard.
- Step 10** Reassemble in reverse order.

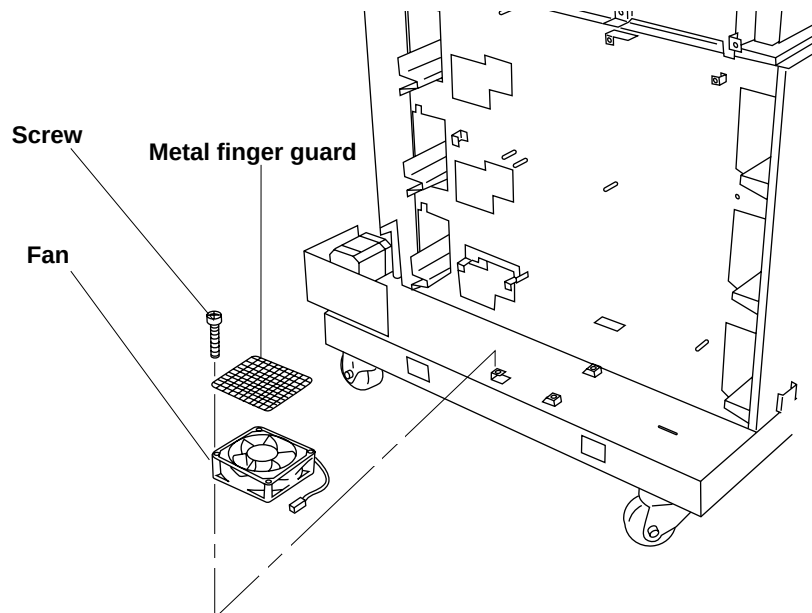


Figure 5-47 Low Voltage Power Supply Fan 5

5-7.6 High Voltage Power Supply Replacement Procedure

Part Number

CA02951-3621FJ (See [6-6.15 on page 6-36.](#))

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect the high voltage power supply (HVPS) connections ACH, +HV, and -HV.
- Step 3** Disconnect the connectors VB, CN1, and CNDC.
- Step 4** Remove the four HVPS mounting screws.
- Step 5** Remove the failed HVPS board.
- Step 6** Install the new HVPS board.
- Step 7** Reassemble in reverse order.

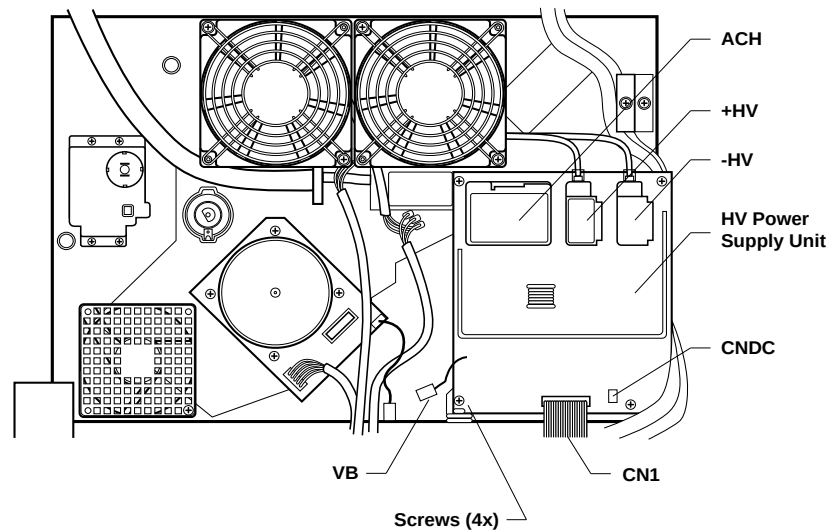


Figure 5-48 High Voltage Power Supply

5-7.7 Power Sequencing Relay Replacement Procedure

Part Number

CA98001-6948FJ (See [6-6.15 on page 6-36.](#))

Removal Procedure

- Step 1** Remove the rear cover.
- Step 2** Remove the two relay mounting screws.
- Step 3** Slide the relay to the left to free the relay from the frame.
- Step 4** While holding the relay, disconnect the faston terminals.

Replacement Procedure

- Step 1** While holding the new relay, reconnect the faston terminals.
The terminals are numbered and wires colored for easy identification (see [Figure 5-49.](#))
- Step 2** Use the two screws to mount and secure the relay.
- Step 3** Close all covers.

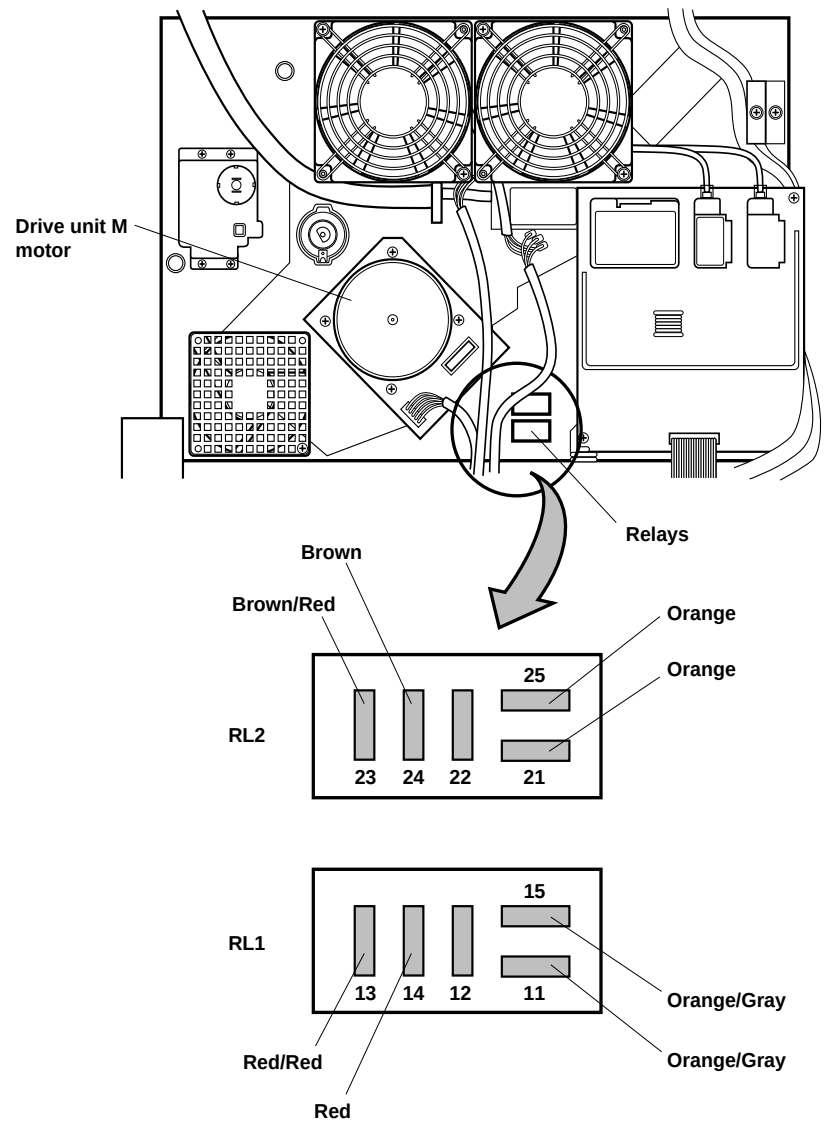


Figure 5-49 Power Sequencing Relays RL1 and RL2

5-7.8 Drive M Unit Lower Fan (Fan7) Replacement Procedure

Part Number

CA02626-E718FJ (6-6.14 on page 6-34.)

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect the FAN7P inline connector.
- Step 3** Remove the two long fan screws.
- Step 4** Remove the fan.
- Step 5** Reassemble in reverse order.

Note Make sure that Mylar deflectors (C and D) are installed in fan air duct. For details, see Alert Bulletin #29 on the DLD-Cupertino web site ([1-1.2 "Web Sites for More Information," on page 1-5](#)).

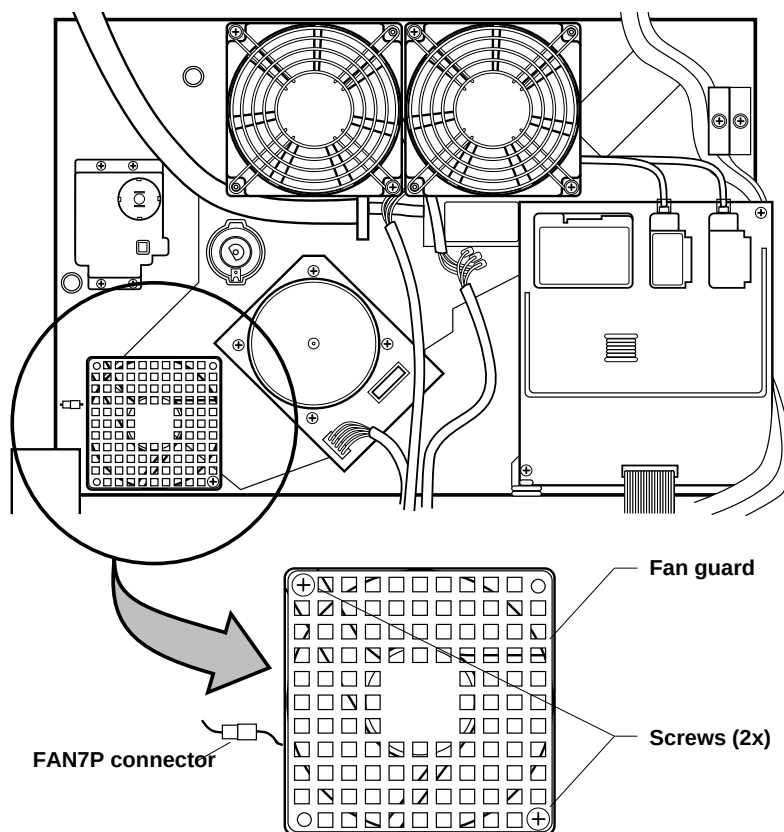


Figure 5-50 Fan 7

5-7.9 Drive M Unit Upper Fans (Fan2 and Fan4) Replacement Procedure

Part Number

Fan2 - CA02626-E715FJ (6-6.14 on page 6-34.)

Fan4 - CA02626-E716FJ (6-6.14 on page 6-34.)

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect the FAN2P and FAN4P inline connectors.
- Step 3** Release FAN2 cables from the cable holder.
- Step 4** Remove the long fan screw.
- Step 5** Remove the support bracket screw.
- Step 6** Remove the fan assembly.
- Step 7** Reassemble in reverse order.

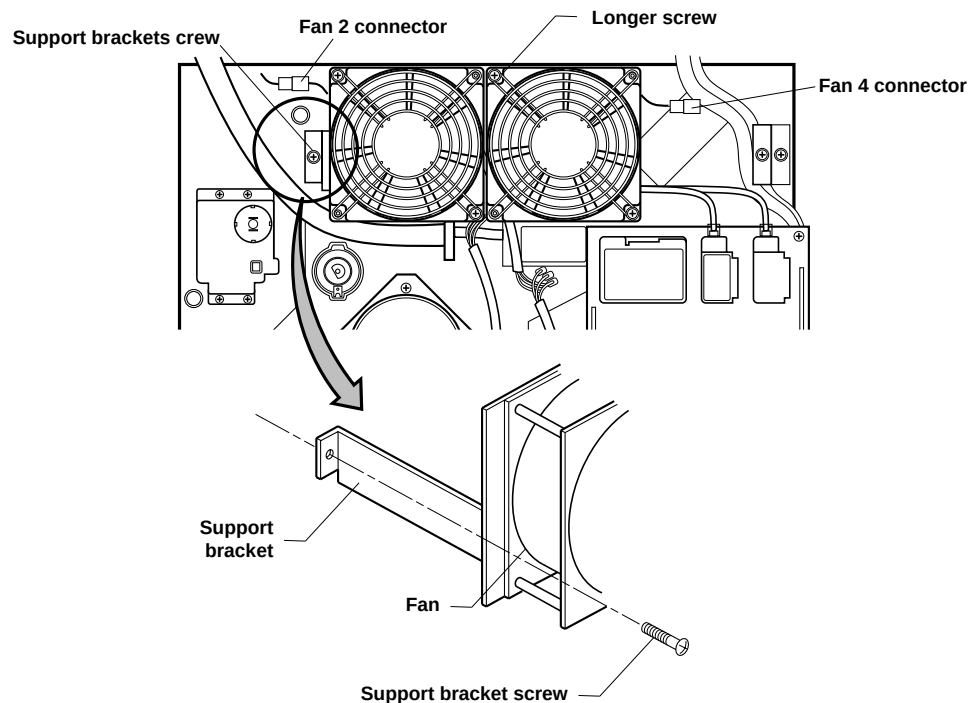


Figure 5-51 Fan2 and Fan4

5-7.10 Drive M Unit Replacement Procedure

Part Number

CA02626-E732FJ (See [6-6.14 on page 6-34.](#))

Removal Procedure

Step 1 Open the front door.

WARNING! The fuser unit may be HOT.

Step 2 Pull the fuser unit out and set it aside in a safe area.

Step 3 Lower the transfer guide assembly and remove the drum unit. Cover the drum unit to protect it from exposure to the light.

Step 4 Remove the top cover.

Step 5 Remove the back cover.

Step 6 Remove the three screws that secure the top plastic shield.

Step 7 Locate and unsnap the three inline fan power connectors FAN2P, FAN4P, and FAN7P. If your printer has a Fan 3, disconnect FAN3P.

[Figure 5-52](#) shows FAN2P and FAN4P. FAN7P connects the lower fan. Some printers have a small Fan 3 and FAN3P connects the fan.

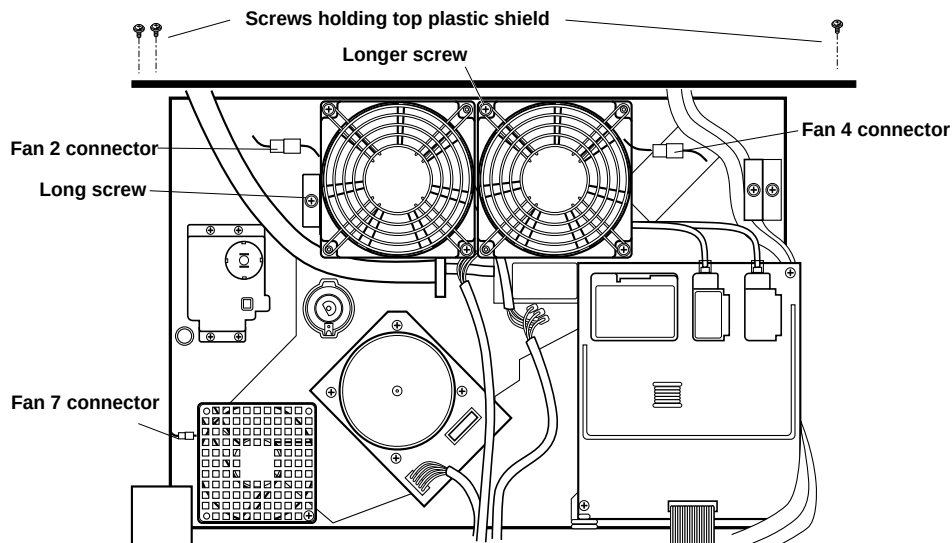


Figure 5-52 Fan Connectors

Step 8 Remove the two screws (labeled long screw and longer screw) securing the upper fan assembly (Fan2 and Fan4) and set the fan assembly aside.

Step 9 Disconnect the -HV faston terminal at the drum.

Step 10 Disconnect the three LVPS fuser interlock faston terminals.

Step 11 Disconnect the registration clutch RCLP faston terminal.

Step 12 On the mechanism controller, disconnect the main motor CNJ21 connector.

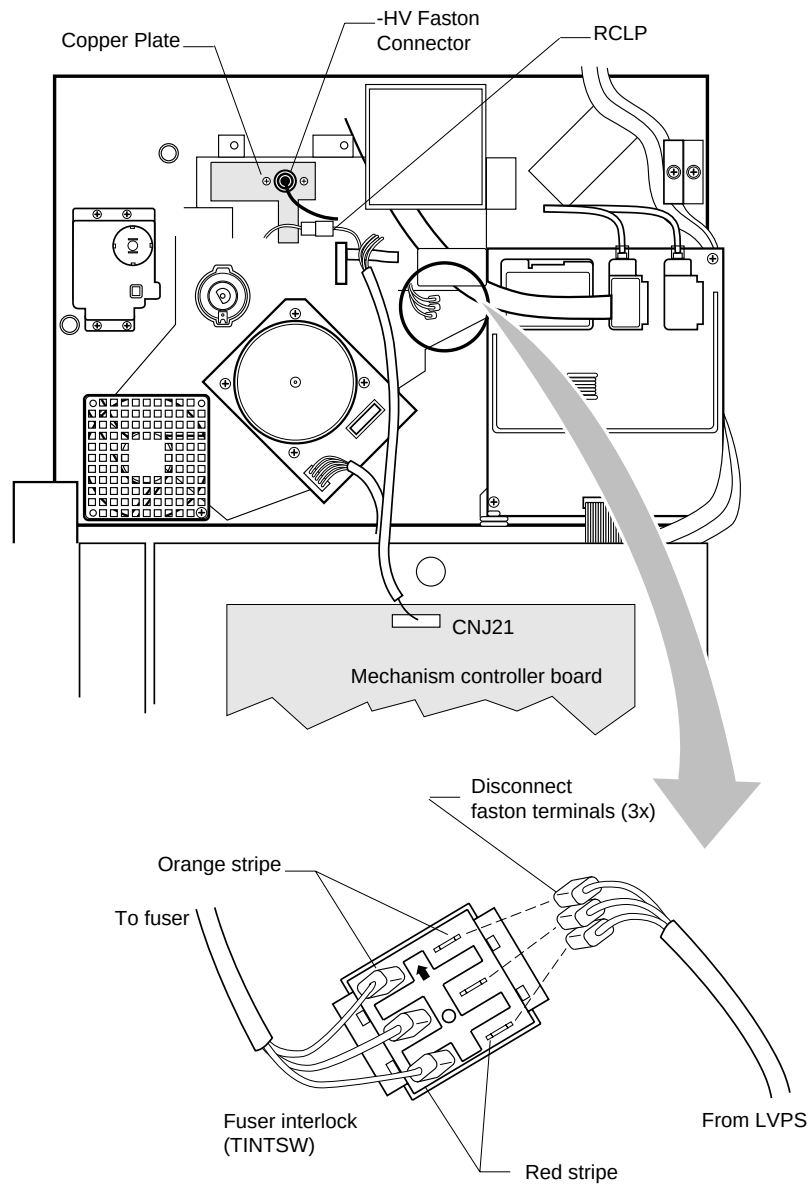


Figure 5-53 Connectors

Step 13 Remove the registration roller clutch (see [5-7.2 "Registration Roller Clutch Replacement Procedure,"](#) on page 5-51).

CAUTION

When the waste toner screw unit is pulled out, toner will spill out.

Step 14 Remove the two screws holding the waste toner screw unit and the one screw holding the waste toner screw sensor.

Step 15 Carefully remove the waste toner unit by unclipping the shaft. You may need to loosen the two screws holding the shaft clip to ease removal.

Step 16 Place the waste toner unit plug over the unit to keep toner from spilling out. (If the plug is missing, wrap material over the unit and secure it.)

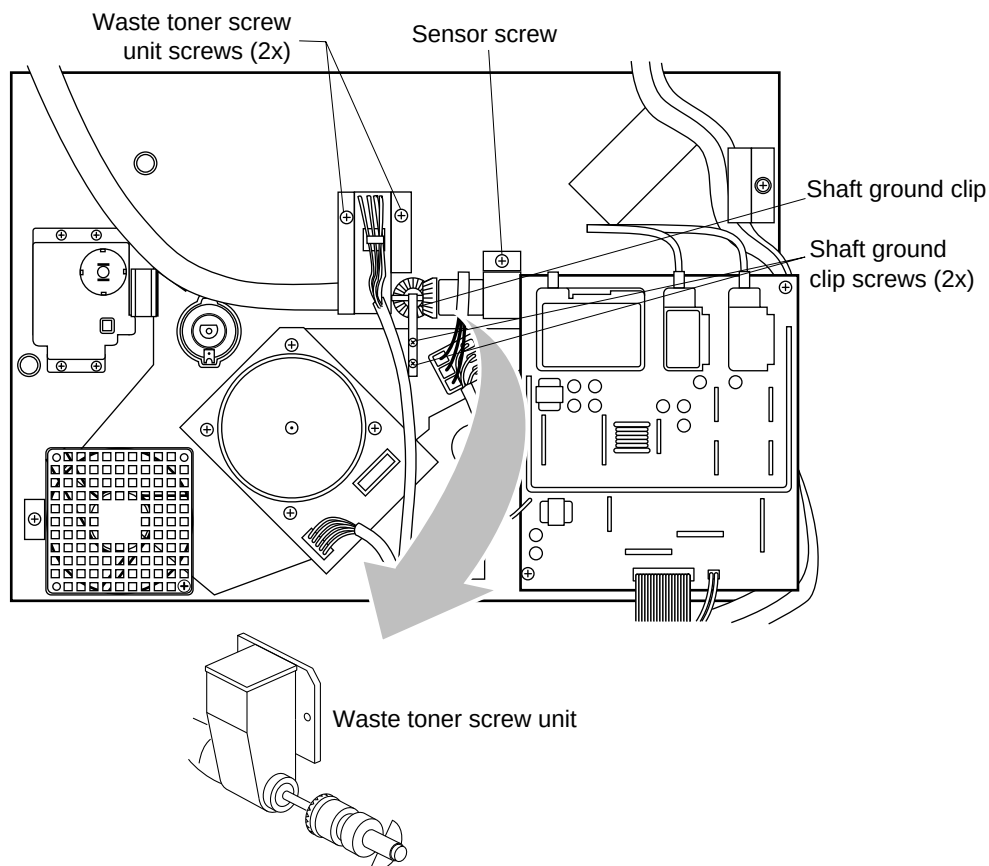


Figure 5-54 Waste Toner Screw Unit and Sensor Removal

Step 17 Release the high voltage cables from the Fan 4 duct cable clamp.

Step 18 Disconnect the cables VB, ACH, and +HV at the high voltage power supply (HVPS).

Step 19 Locate the faston ground wire that connects the motor board to the frame and disconnect it.

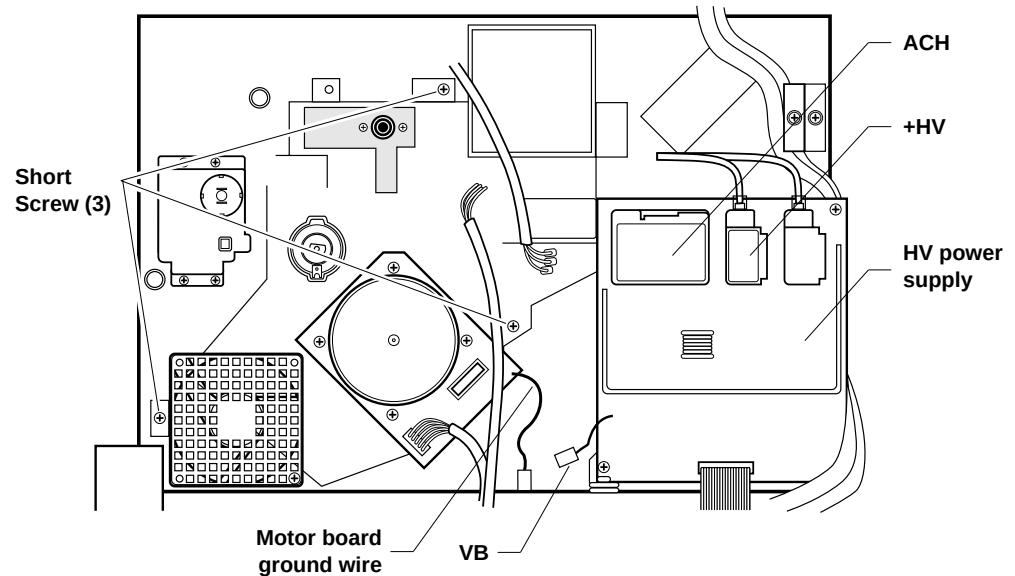


Figure 5-55 High Voltage Power Supply Connectors and Mounting Screws

Step 20 On drive unit M assembly, remove the three mounting screws.

Step 21 Lift the assembly to free it from the holding hooks and remove it.

While carrying the unit, tilt it backward to prevent toner spilling. Lay the unit down with inside of unit facing **UP**.

Step 22 Reassemble in reverse order.

Note Before removing the waste toner screw unit plug, gently tap it with your finger to knock down any toner caught in the plug.

5-7.11 Drive M Unit Fuser Unit Interlock Switch (TINTSW) Replacement Procedure

Part Number

CA98001-6947FJ (See [6-6.14 on page 6-34.](#))

Removal and Replacement Procedure

- Step 1** Remove drive unit M. See [5-7.10 "Drive M Unit Replacement Procedure," on page 5-64.](#)
- Step 2** While standing drive unit M on the bottom edge, press on the switch securing tabs from the outside surface.
- Step 3** When it's free of the housing, remove the switch from inside the drive unit M.
Notice the orientation of the switch spring actuator.
- Step 4** Install the new switch by snapping it into the hole.
The switch markings must show connector tab 1A at the top of the unit
- Step 5** Reassemble in reverse order.

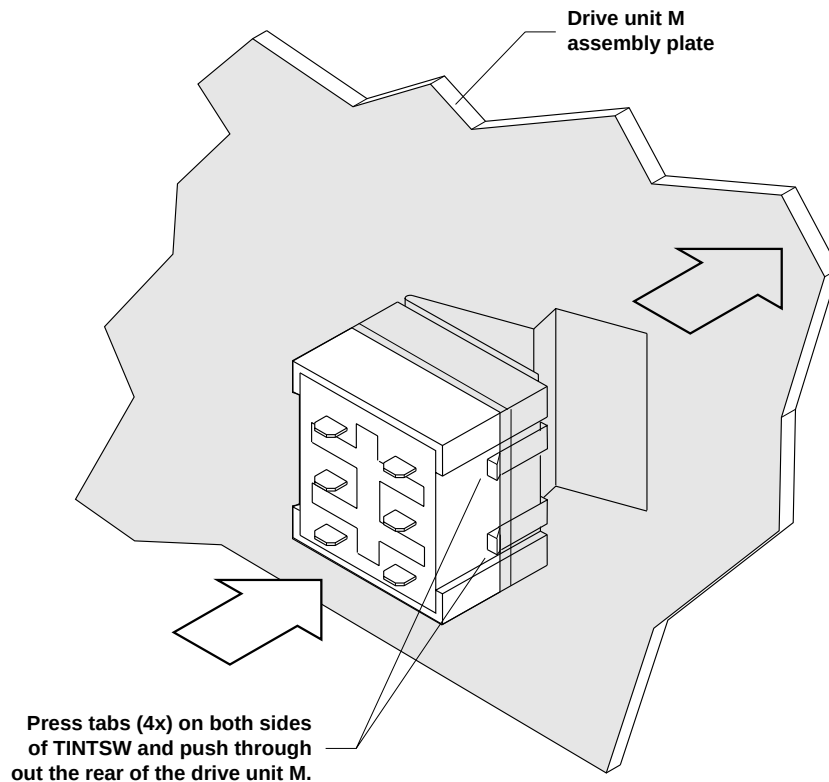


Figure 5-56 Fuser Unit Interlock Switch Removal

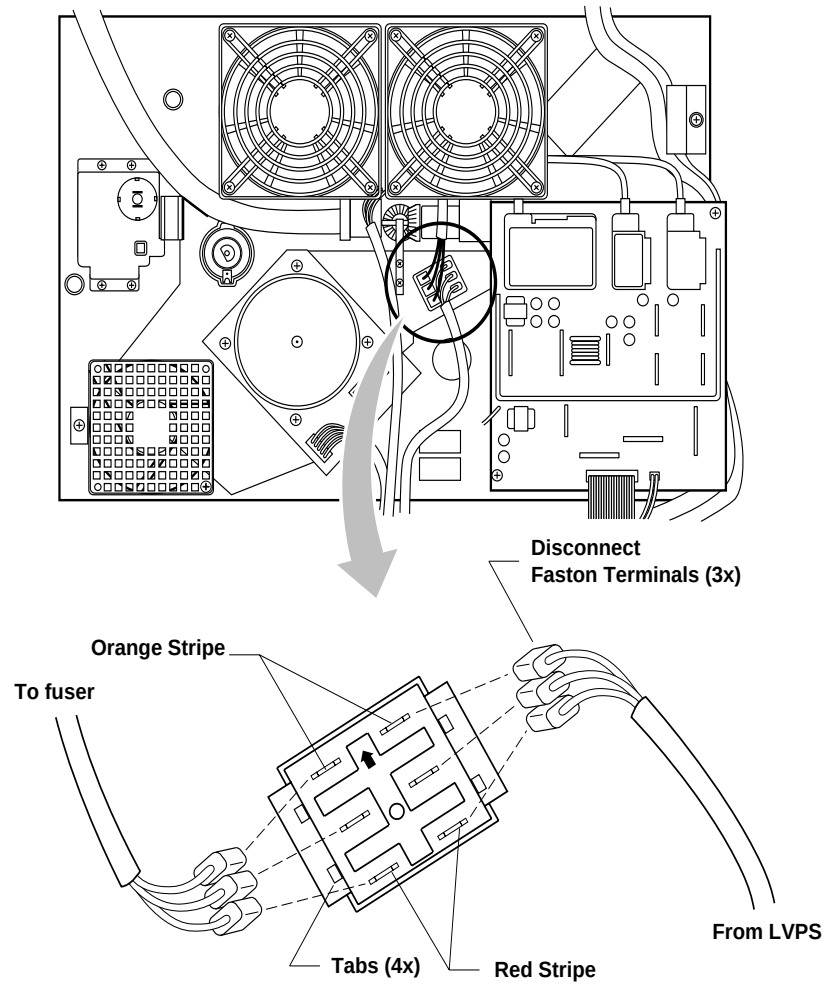


Figure 5-57 Fuser Unit Interlock Switch (TINTSW)

5-7.12 Waste Toner Unit Replacement Procedure

Part Number

CA02626-E734FJ (See [6-6.14 on page 6-34.](#))

Removal Procedure

Step 1 Remove drive unit M upper fans, Fan 2 and Fan 4. See [5-7.9 "Drive M Unit Upper Fans \(Fan2 and Fan4\) Replacement Procedure," on page 5-63](#)

CAUTION

When the waste toner screw unit is pulled out, toner will spill out.

Step 2 Remove the two screws holding the waste toner screw unit and the one screw holding the waste toner screw sensor (for more sensor removal information, see [5-7.13 "Waste Toner Screw Sensor Replacement Procedure," on page 5-74.](#))

Step 3 Remove cables from cable clamp.

Step 4 Carefully remove the waste toner unit by unclipping the shaft. You may need to loosen the two screws holding the shaft ground clip to ease removal.

Step 5 Place the waste toner unit plug over the unit to keep toner from spilling out. (If the plug is missing, wrap material over the unit and secure it.)

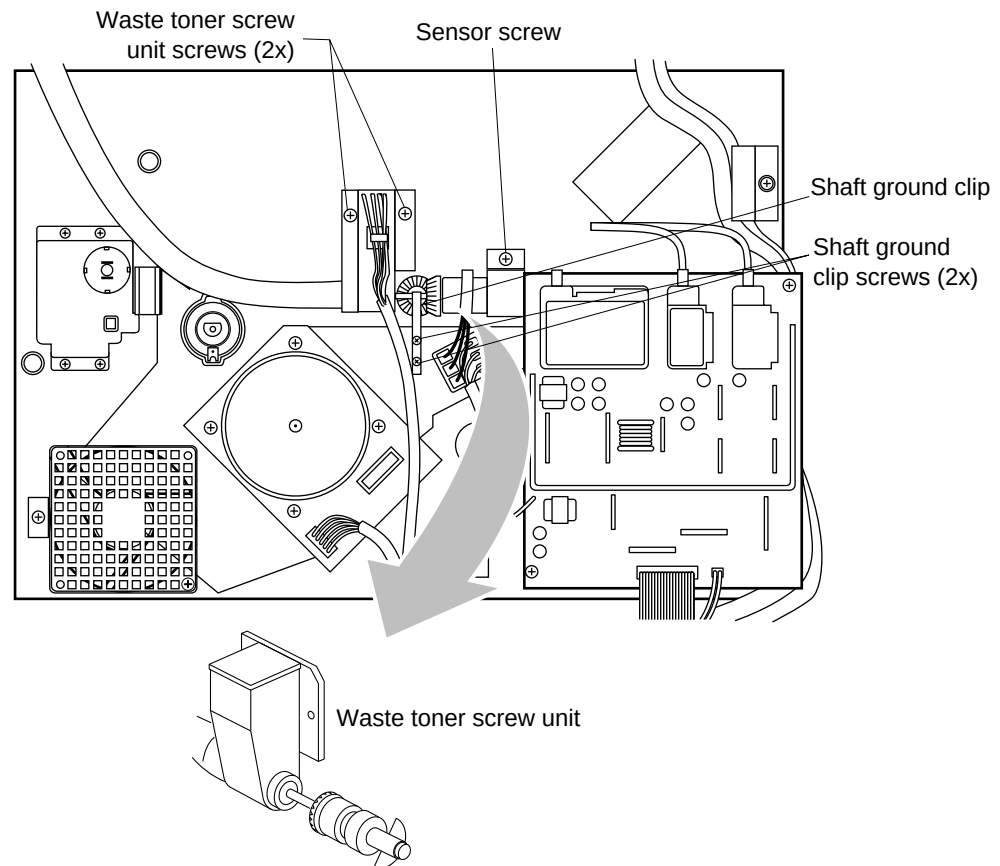


Figure 5-58 Waste Toner Screw Unit Removal

- Step 6** Remove the waste toner collection bottle.
- Step 7** Remove the two screws holding the waste toner unit bracket to the frame.
- Step 8** Using a long Phillips #2 magnetized screwdriver, remove the two screws holding the auger housing to the toner hopper. Use the access hole to remove the inside screw.
- Step 9** Attach the hose plug over the open hose end.

The black rubber plug is attached to the hose near the housing. If the plug is missing, wrap material over the hose and secure it.

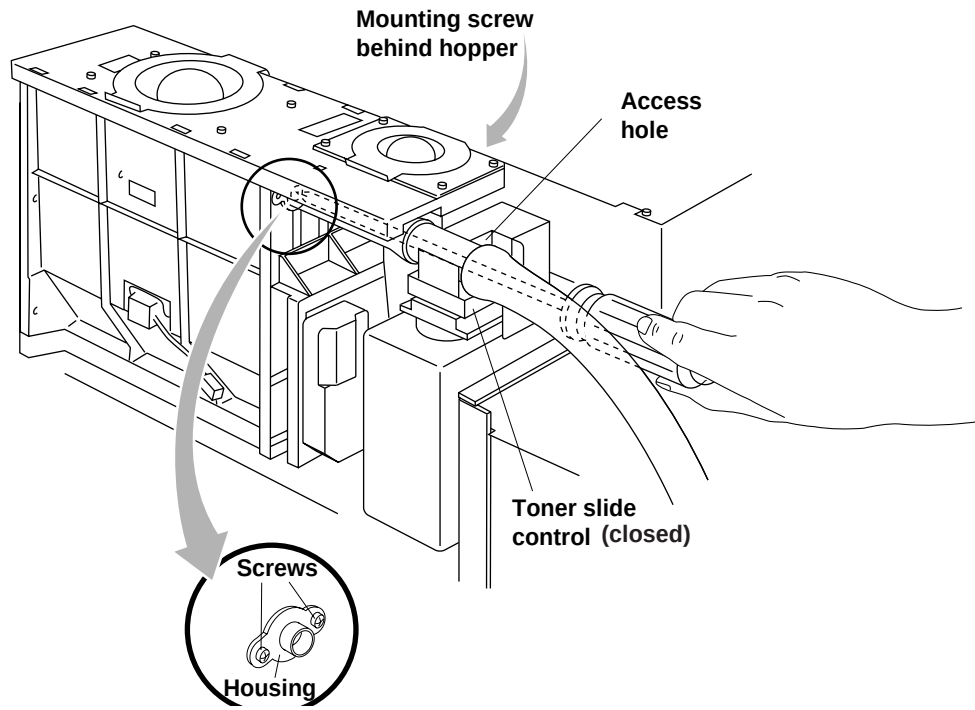


Figure 5-59 Toner Hopper Housing

Step 10 Remove the waste toner unit.

Note	Before removing the waste toner screw unit plug, gently tap it with your finger to knock down any toner caught in the plug.

Step 11 Install new waste toner and reassemble in reverse order.

5-7.13 Waste Toner Screw Sensor Replacement Procedure

Part Number

B86L24100882AFJ (See [6-6.14 on page 6-34.](#))

Removal Procedure

- Step 1** Open the upper-right cover.
- Step 2** Remove the rear cover.
- Step 3** Disconnect connector SCRSJ.
- Step 4** Remove the sensor switch bracket screw.
- Step 5** Grasp the bracket, tilt it away from printer and lift the bracket holding-tab free of panel hole.
The toner feed screw shaft extends through the bracket bearing.

Note	Do not lose the bracket bearing.

- Step 6** When free, move the bracket slightly to right to free the bearing from the shaft.
The shaft worm gear can be lifted free of the drive gear.
- Step 7** Remove the switch from the bracket by squeezing the plastic tabs.

Replacement Procedure

- Step 1** Mount the new sensor switch onto the bracket.
- Step 2** On worm gear shaft, lift the shaft to free the gears and enable you to rotate the high-side lobe of the cam inward.
The high-side lobe activates the switch.
- Step 3** Slip the bearing onto the shaft.
Verify that the bearing flange is installed towards the gear.
- Step 4** Position the bracket so that you can insert the small end of the bearing into the bracket hole while inserting bracket holding tab into the panel hole.
- Step 5** Secure the bracket with the screw.
- Step 6** Reconnect the SCRSJ connector.
- Step 7** Close all covers.

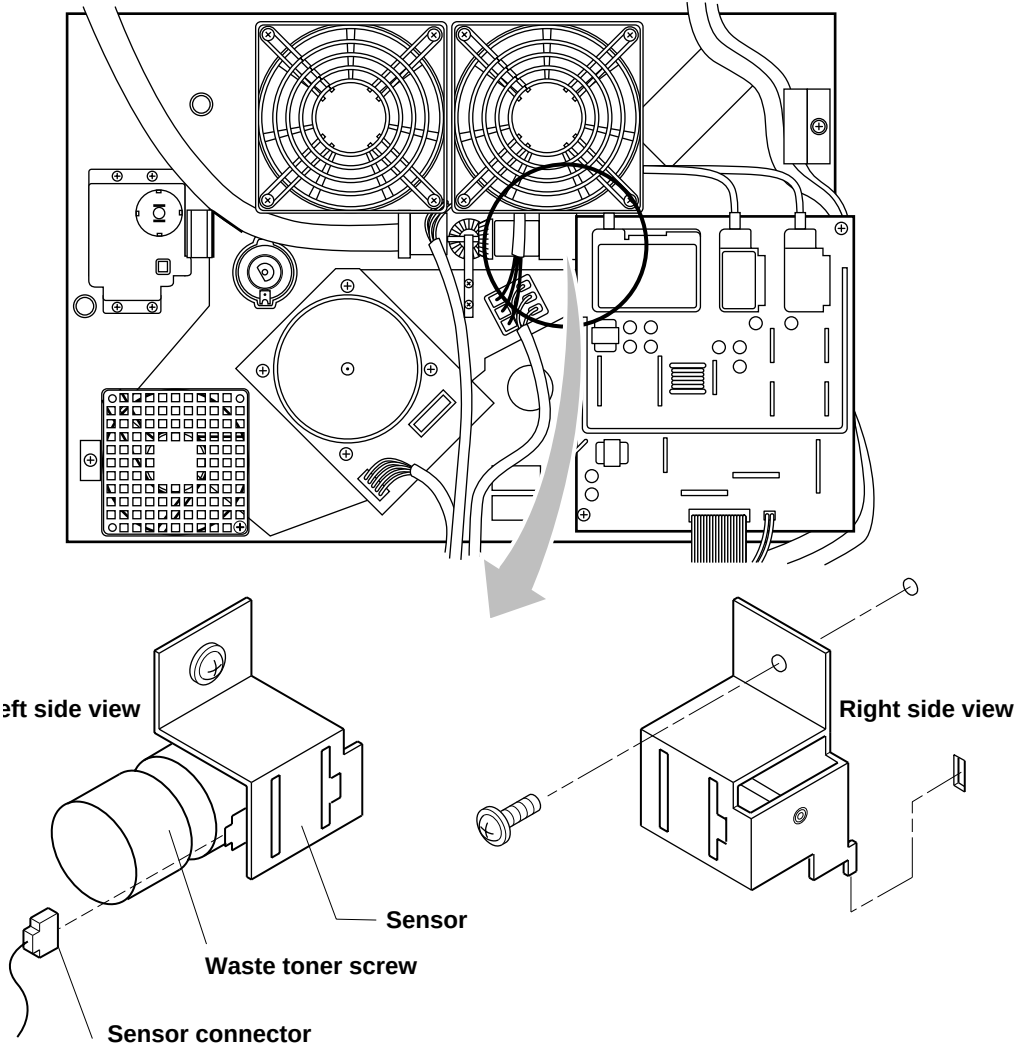


Figure 5-60 Drive Unit M Waste Toner Screw Sensor

5-7.14 Drive E Unit Gear Assembly Replacement Procedure

Drive E Unit to Ejection Unit Belt Replacement Procedure

Part Number

CA02626-E660FJ - Drive E unit gear assembly (See [6-6.16 on page 6-38.](#))

CA98001-6942FJ - Belt (See [6-6.16 on page 6-38.](#))

Removal Procedure

- Step 1** Open the upper-right cover.
- Step 2** Remove the top cover.
- Step 3** Remove the rear cover.
- Step 4** Disconnect the two inline fan power connectors FAN2P and FAN4P located on the sides of the top fan assembly. See [5-7.9 "Drive M Unit Upper Fans \(Fan2 and Fan4\) Replacement Procedure," on page 5-63.](#)
- Step 5** Remove the two screws holding the top fan assembly and remove the assembly.
- Step 6** Disconnect all the connectors to the high voltage power supply (HVPS).
- Step 7** Remove the four HVPS bracket screws and set the HVPS aside (two screws hold the bracket and two screws hold the HVPS hinge).
- Step 8** Remove the two screws on the ejection unit gear bracket.
- The bracket has elongated screw slots to adjust the belt tension. Notice the positioning pin in the third slot.
- Step 9** Lift the belt off top and bottom gears.
- If you are only replacing the belt and not the assembly, install the new belt and reassemble following the replacement procedure.
- If you are replacing the whole assembly, continue with the next step.
- Step 10** Check the belt for wear and replace if necessary.
- Step 11** At the drive unit E gear bracket, then remove the two bracket screws.

Replacement Procedure

- Step 1** Place the new drive unit E gear bracket so that it is flat against the rear wall and install the two bracket screws.
- Step 2** Install the belt on drive unit E and thread it through the belt guard to the ejection unit.
- Step 3** Install the new ejection unit gear bracket assembly so that the position-pin is in the positioning slot and install the two bracket belt-tensioning screws. **Do not tighten.**
- Step 4** Install the belt over the ejection unit gear.

Note Do not overtighten the belt.

- Step 5** Position the tensioning bracket so that the belt is tight but flexes a little when you press down on it.
- Step 6** Tighten the belt tensioning screws.
- Step 7** Reinstall the high voltage power supply (HVPS) bracket with three screws.
- Step 8** Reconnect the HVPS connectors: VB, -HV, +HV, and ACH faston connectors and lower CN1 and CNDC connectors.
- Step 9** Close all covers.

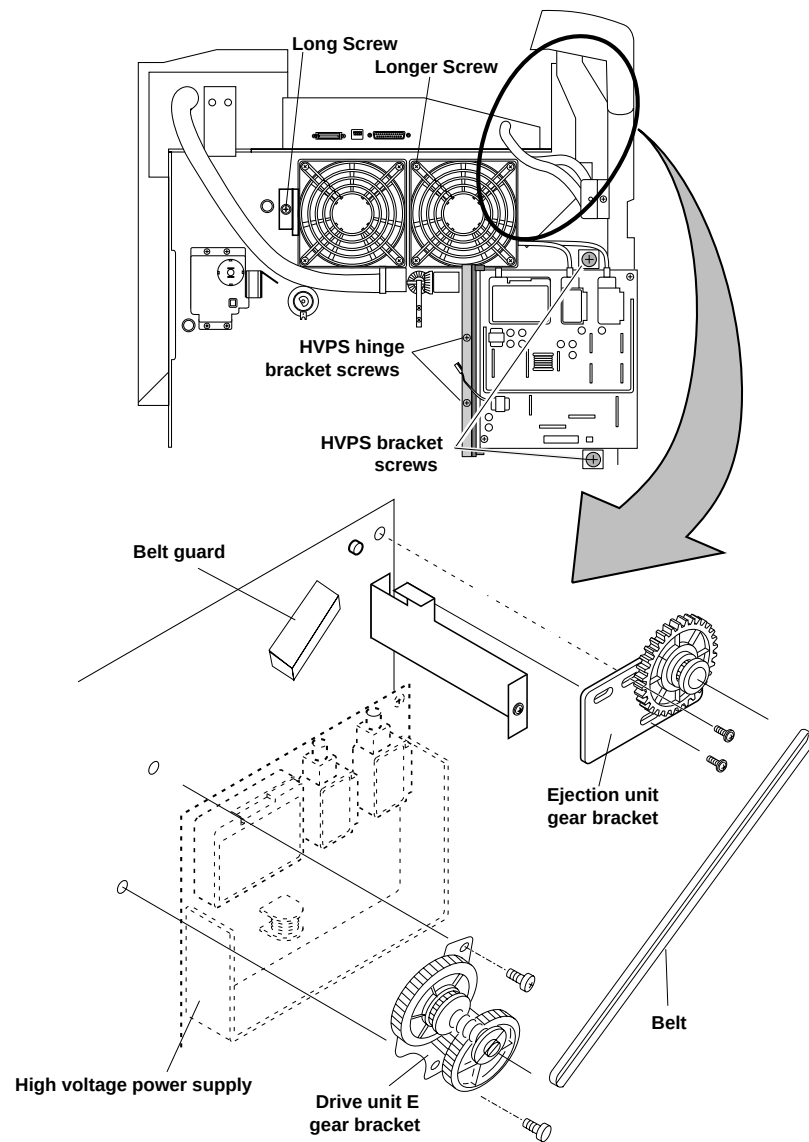


Figure 5-61 Drive Unit E Assembly and Belt

5-8 FRUs Accessed from the Left Side of Printer

5-8.1 Reversing Unit Replacement Procedure

Part Number

CA02626-F800FJ (See [6-6.9 on page 6-22.](#))

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Disconnect the connectors SBM, PS6, STFL, STCH, and STSL from the connector box above the high voltage power supply (HVPS) board.
- Step 3** Remove the upper-left cover.
- Step 4** Remove the one mounting screw for the reversing unit.
These screws are accessed through the left side opening.
- Step 5** Pull the unit to the right while disengaging the positioning pins on the right side of the unit. Carefully pass all cables and connectors through cable hole as you remove the unit.
- Step 6** Insert the new unit into position inserting the right positioning pins into the holes.
Position the cables and connectors carefully.
- Step 7** Reassemble in reverse order.

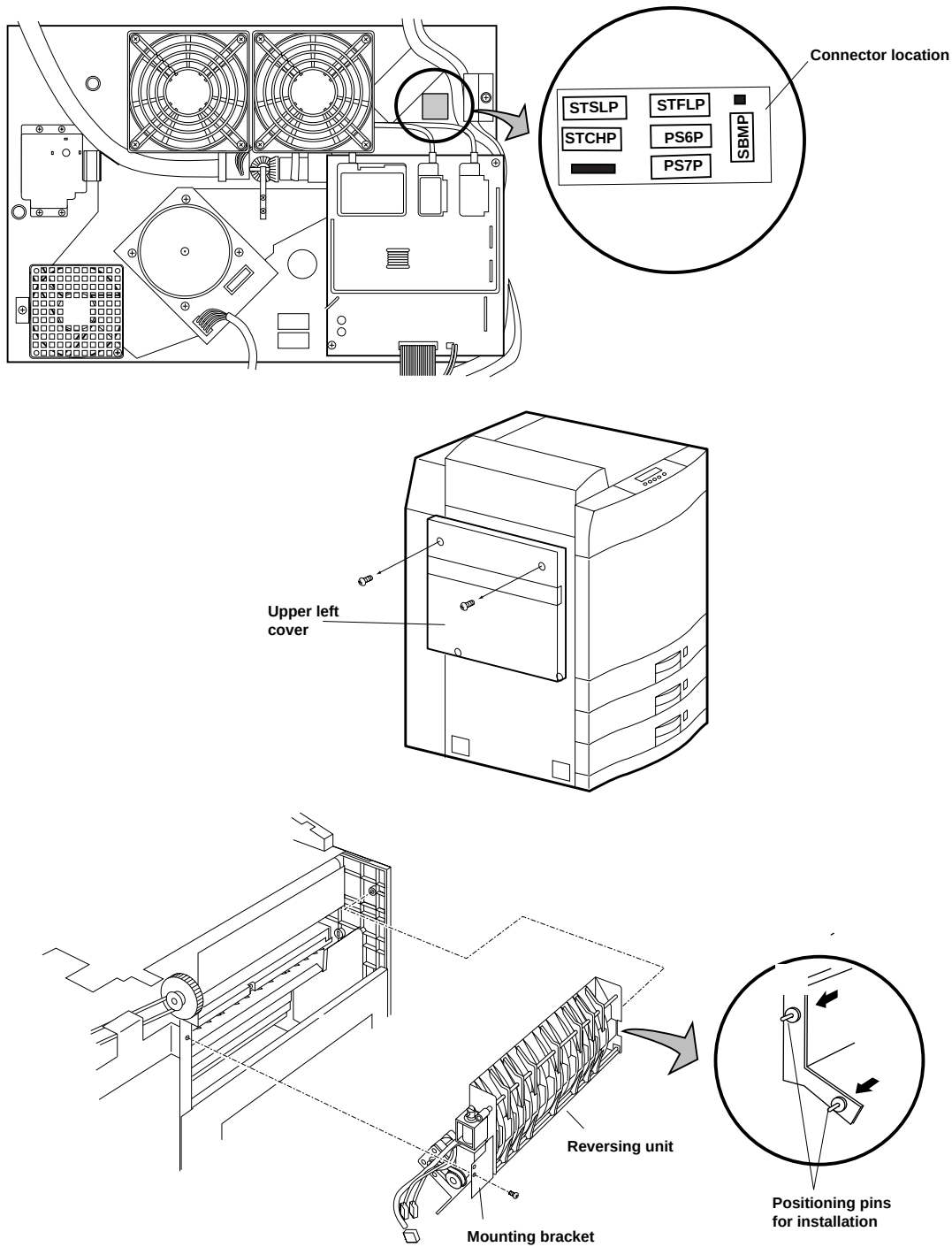


Figure 5-62 Reversing Unit

5-8.2 PS6 - Reversing Unit Paper Path Sensor Replacement Procedure

Part Number

CA55003-1612FJ (See [6-6.9](#) on page 6-22.)

Removal and Replacement Procedure

- Step 1** Remove the reversing unit. See [5-8.1 "Reversing Unit Replacement Procedure,"](#) on page 5-78.
- Step 2** Remove mounting screw for the sensor bracket.
- Step 3** Squeeze the sensor mounting tabs to release the sensor from the bracket.
- Step 4** Remove the mounting screw holding the cable tie and release the sensor cable.
- Step 5** Install the new sensor onto the bracket.
- Step 6** Reassemble in reverse order.

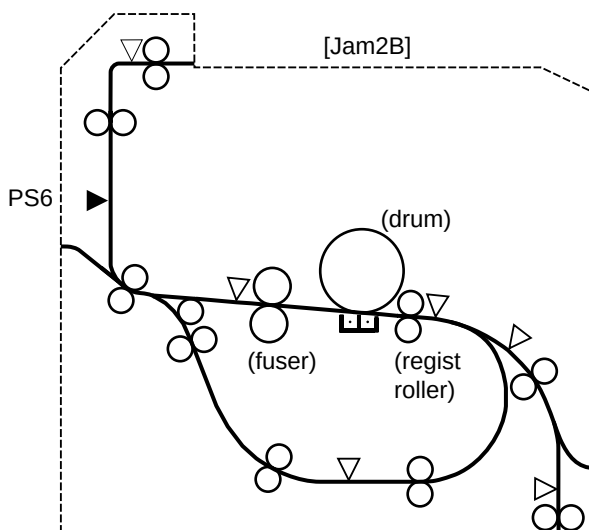


Figure 5-63 PS6 Positioning Overview

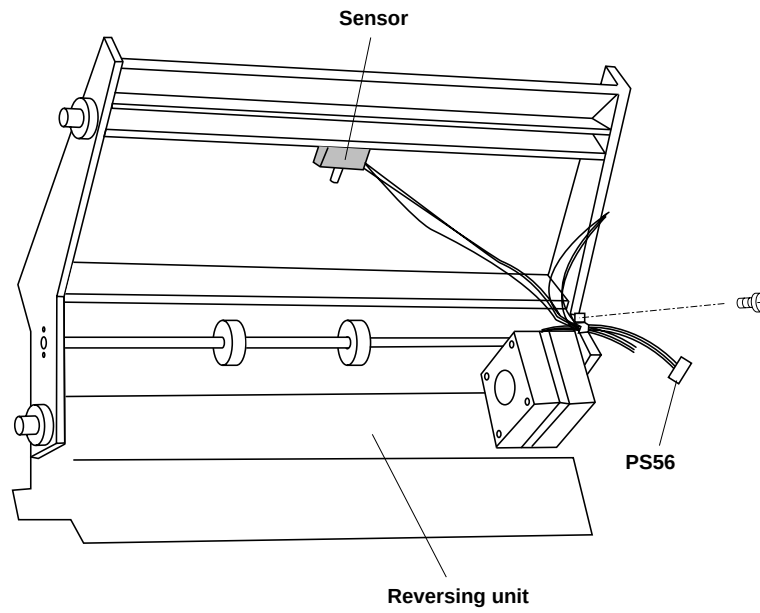


Figure 5-64 Reversing Unit Sensor PS6

5-8.3 Ejection Unit Replacement Procedure

Part Number

CA02626-F900FJ (See [6-6.8 on page 6-20.](#))

Removal and Replacement Procedure

- Step 1** Remove the rear cover.
- Step 2** Remove the top cover.
- Step 3** Remove the upper-left cover.
- Step 4** Remove the reversing unit. See [5-8.1 "Reversing Unit Replacement Procedure," on page 5-78.](#) Disconnect **all** connectors from the connector box above the high voltage power supply (HVPS).
- Step 5** Remove the control panel and set it aside. See [5-6.1 "Control Panel Board Replacement Procedure," on page 5-44.](#)
- Step 6** Remove the three mounting screws from both ends and lift the unit out.
- Step 7** Disconnect the two faston terminals on the ejection unit interlock switch.
- Step 8** Insert the new unit.
- Step 9** Reassemble in reverse order.

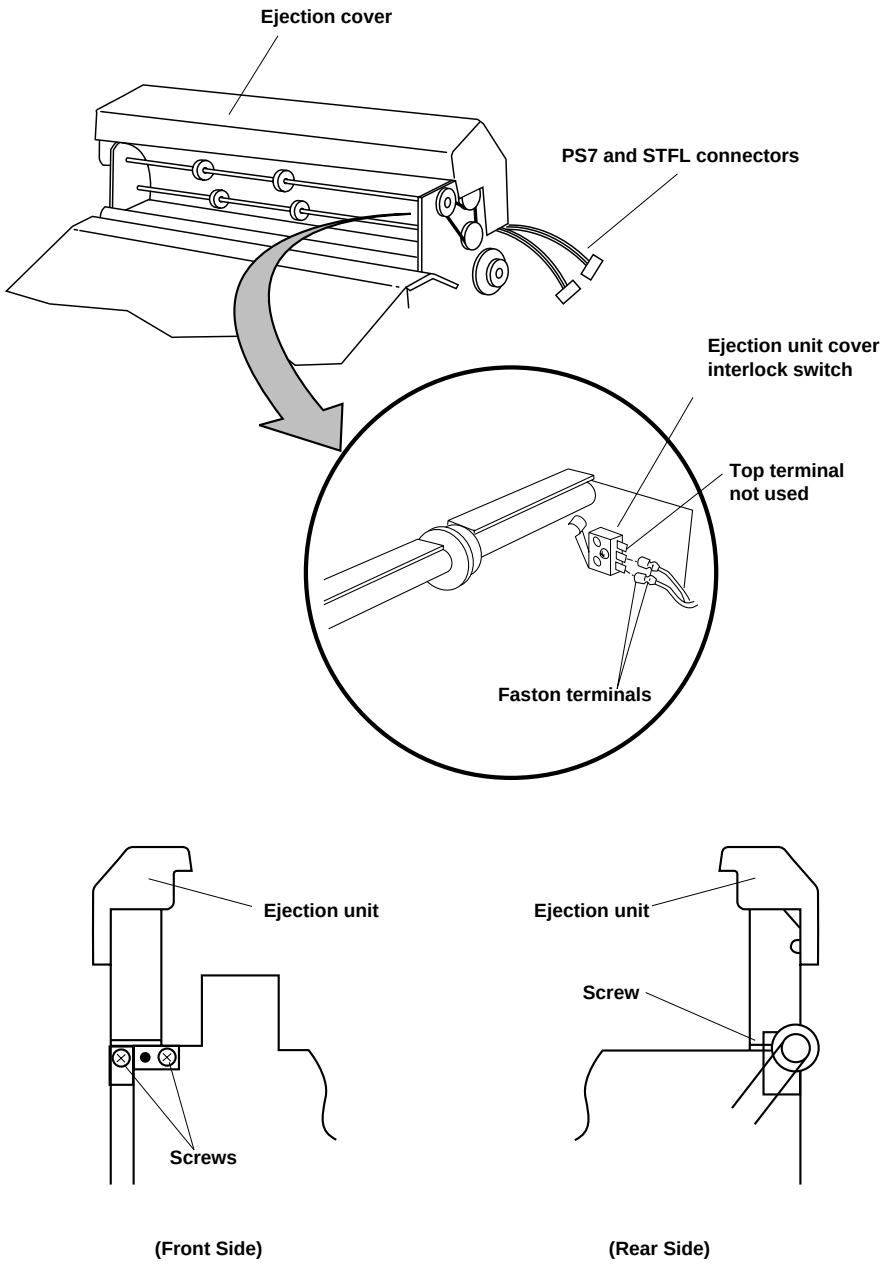


Figure 5-65 Ejection Unit

5-8.4 PS7 - Ejection Unit Paper Path Sensor Replacement Procedure

Ejection Tray - Paper Path Stacker Full Sensor Replacement Procedure

Part Number

CA02951-5074FJ - PS7 sensor (See [6-6.8 on page 6-20.](#))

CA02951-5075FJ - Paper path stacker full sensor (See [6-6.8 on page 6-20.](#))

Removal and Replacement Procedure

- Step 1** Remove the top cover.
- Step 2** Remove the upper-left cover.
- Step 3** Remove the rear cover.
- Step 4** Remove the discharge brush by sliding it out of the tabs.
- Step 5** Free the sensor cable from the cable clamp and disconnect the connector from the connector box above the high voltage power supply board:
 - PS7 sensor - PS7P plug
 - Stacker full sensor - STFLP plug
- Step 6** Remove the sensor bracket mounting screw.
- Step 7** Squeeze the sensor mounting tabs to release the sensor from the bracket.

Note	Do not put any weight on ejection unit cover when it is not held with the strap hinge.

- Step 8** Install the new sensor onto the bracket.
- Step 9** Reassemble in reverse order.

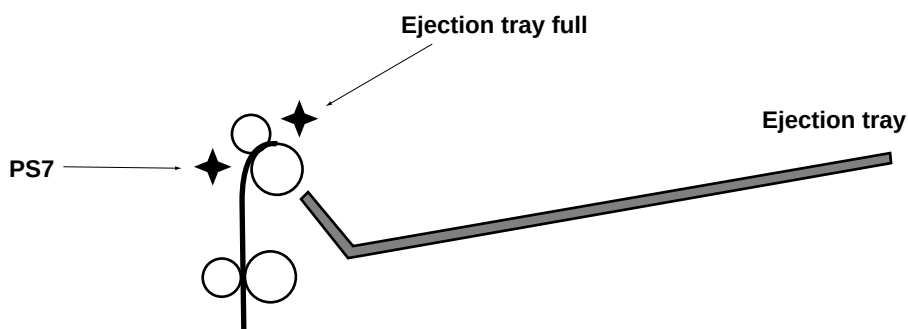


Figure 5-66 PS7 and Stacker Full Sensor Positioning Overview

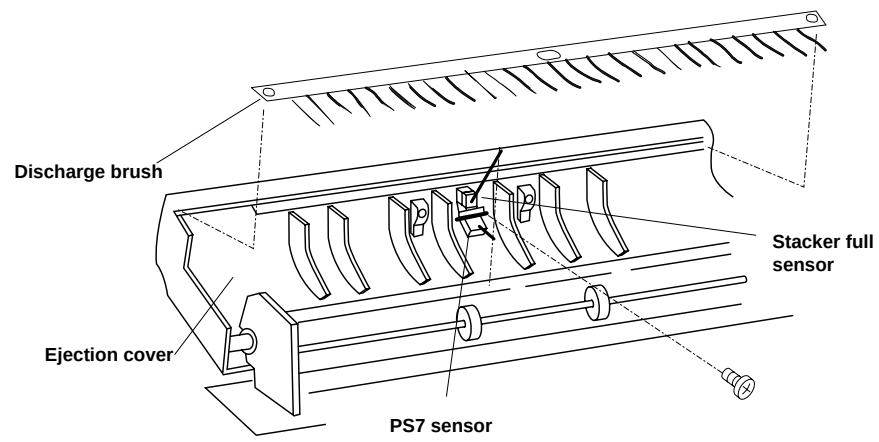
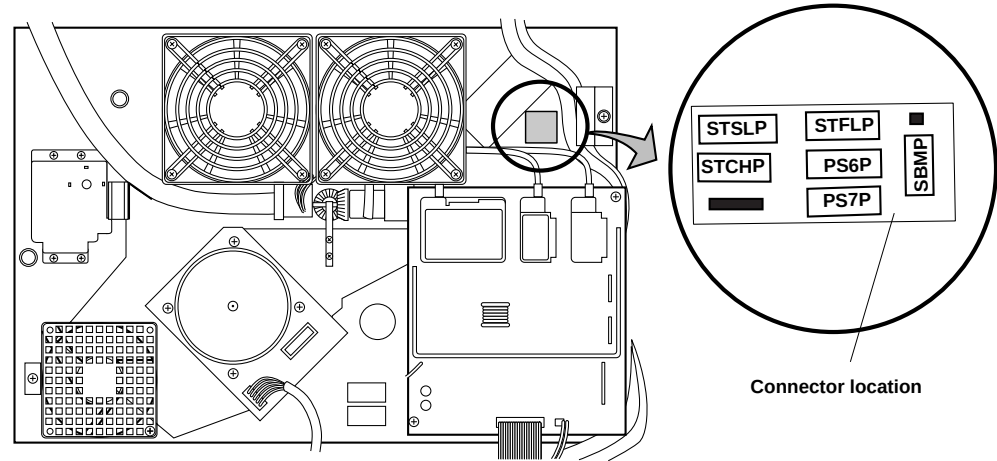


Figure 5-67 Sensor PS7 and Paper Path Stacker Full Sensor

5-9 FRUs Accessed from the Right Side of Printer

5-9.1 Developer Unit Replacement Procedure

Replacing the developer unit consists of the following tasks:

- Purging developer mixture from the developer unit
- Removing and replacing the developer unit.

Each of these tasks is described below.

Note	When you replace the developer unit. You also need a single bottle of developer mixture (P/N CA81218-G063FJ) to replenish the new developer unit.

Before replacing the developer unit, check that the unit is secured properly by the developer retaining plates. When the developer release handle (b1) is closed, the developer unit should not move. If any movement is noted, the developer retaining plates are bent and must also be replaced. See [5-9.2 "Developer Retaining Plate Replacement Procedure," on page 5-89](#).

Part Number

CA02626-E200FJ (See [6-6.12 on page 6-28](#).)

Purging Developer Mixture

This section describes how to purge developer mixture from the developer unit. To purge the mixture, the printer must be powered up and running.

Step 1 Open the top right cover of the printer and place an empty developer collector bottle below the developer unit.

Step 2 On the printer's control panel, select **Replace** from the Maintenance menu.

Step 3 Select **Developer**.

A "Developer Replacement" message appears on the control panel.

Step 4 Prepare new developer mixture and press **Start** to discharge the old developer mixture.

The printer opens the developer shutter and proceeds to purge the developer mixture into the collector bottle. The following message appears:

Developer discharge, please wait

When the printer has completed purging the developer mixture, the following message appears:

Developer discharge completed. Prepare new developer bottle. Open upper right cover. Press Done.

Step 5 Remove the full developer collector bottle and replace the developer unit. See ["Removing and Replacing the Developer Unit," on page 5-87](#).

Step 6 When the developer unit has been replaced, press **Done** on the control panel.

The following message appears on the control panel:

Developer injection. Open rear flap. Insert new Developer bottle. Press Done when empty.

- Step 7** Insert the new developer mixture into the rear opening in the toner hopper and turn it clockwise until it stops.
- Step 8** When the bottle is empty, remove the bottle. Move the cap on the side of the bottle to the holder on the bottle.
- Step 9** Insert the now empty bottle under the developer unit.
- Step 10** Close the top right cover of the printer and press **Done**.

WARNING!

Never reinsert used developer mixture into the developer unit. When you add developer mixture, a sensor in the developer unit automatically resets the developer bias voltage for a new mixture. Because old mixture does not have the same electrical properties as new mixture, print quality problems will result after a few hundred pages.

Removing and Replacing the Developer Unit

- Step 1** Open the upper right cover.
- Step 2** Open the front door.
- Step 3** Remove the developer handle stop screw. See [Figure 5-68](#).
- Step 4** Turn the developer release handle (b1) clockwise to the service position.
- Step 5** Remove the developer collector bottle and set it aside.
- Step 6** Disconnect connectors TNSP and VB (located below the waste toner bottle).
- Step 7** Remove the hinge strap screw on the upper right cover (front side). Remove the metal plate directly under this screw.
- Step 8** Pull out the developer unit and set it aside. Be careful to not tip it over.
- Step 9** Follow this procedure in reverse order to install the new developer unit.

Note

Make sure the developer purge shutter is closed on the new developer unit before you install it. The developer purge shutter is located on the bottom rear of the developer unit.

Step 10

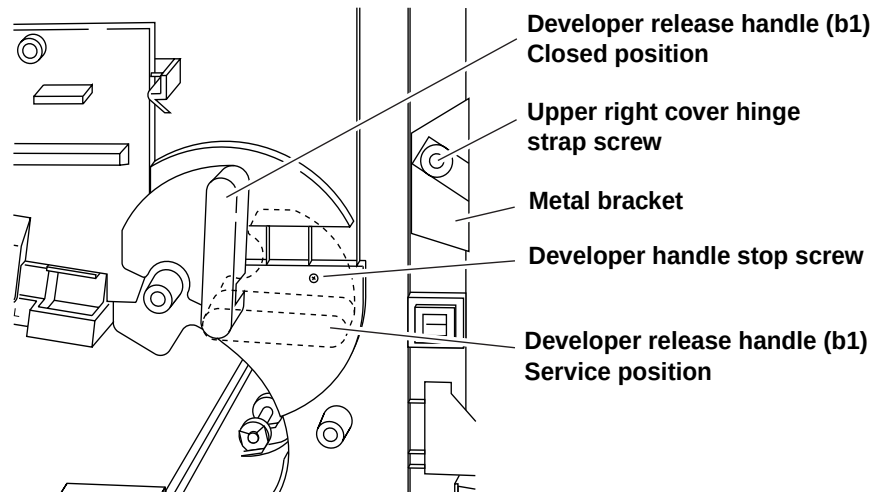


Figure 5-68 Developer Release Handle, Stop Screw, and Metal Bracket

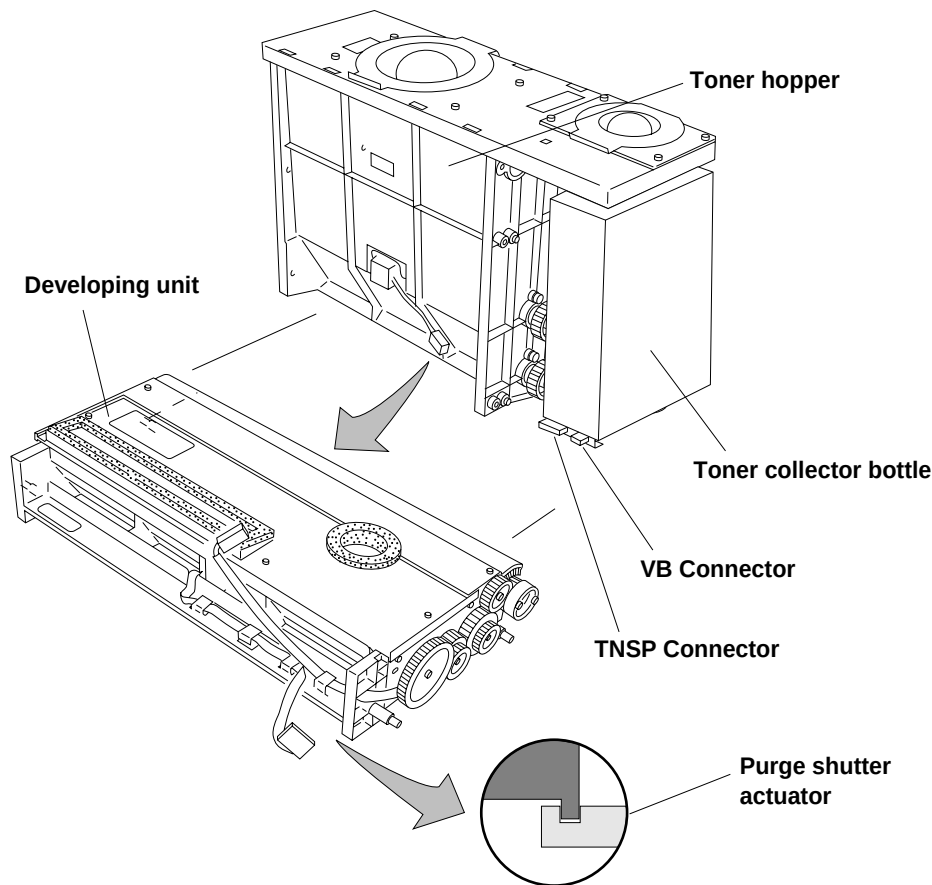


Figure 5-69 Developer Unit

5-9.2 Developer Retaining Plate Replacement Procedure

Part Number

CA04192-E002FJ (See [6-6.12 on page 6-28.](#))

Removal and Replacement Procedure

- Step 1** Remove the developer unit. See [5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 2** Rotate the developer release handle counterclockwise to its closed position.
- Step 3** Remove the screw securing the front developer retaining plate and remove the plate.
- Step 4** Install the new front developer retaining plate. Make sure you engage the coil spring to the hole in the plate. See [Figure 5-70.](#)
- Step 5** Repeat the previous two steps for the rear developer retaining plate.

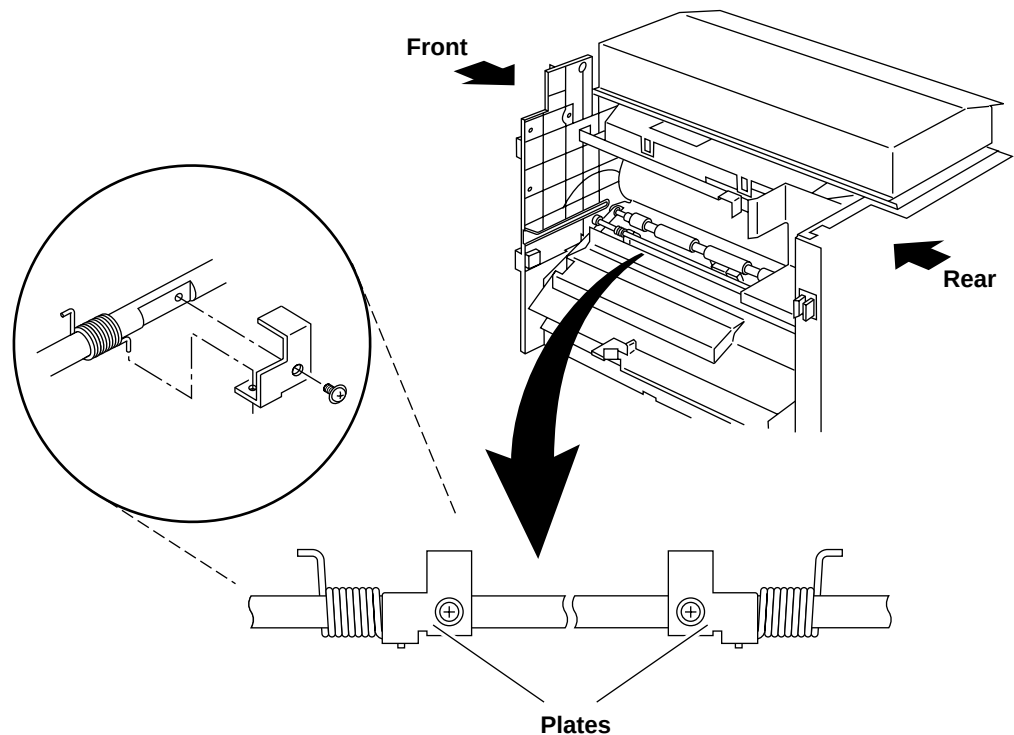


Figure 5-70 Developer Retaining Plates

5-9.3 Toner Hopper Assembly Replacement Procedure

Part Number

CA02626-E250FJ (See [6-6.12 on page 6-28.](#))

Removal Procedure

- Step 1** Open the upper-right cover.
- Step 2** Remove the rear cover.
- Step 3** Open the front door.
- Step 4** Remove the top cover.
- Step 5** Remove the control panel.
[See 5-6.1 "Control Panel Board Replacement Procedure," on page 5-44.](#)
- Step 6** Remove the developer unit.
[See 5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 7** Remove the toner collector bottle and cap.
- Step 8** At toner hopper housing, detach the clamped-on hose plug.
- Step 9** Remove two hose mounting screws where the white hose enters the hopper.
- Step 10** Slide the toner slide control into the closed position (toward the rear).
- Step 11** Remove two bracket screws to free the white hose assembly.
- Step 12** Attach the hose plug over the open hose end.
If the plug is missing, wrap material over the hose and secure it.
- Step 13** Disconnect the inline connector TEMP.
- Step 14** Disconnect the toner motor connector TM.
- Step 15** Remove the four mounting screws on the left-side of the toner hopper
- Step 16** Remove the mounting screw between the hopper and the main controller.
Carefully lift the hopper out.
Be careful not to tip the hopper over.

Replacement Procedure

- Step 1** Install the new hopper and secure with five screws.
- Step 2** Connect the TEMP and TM connectors.
- Step 3** Reinstall the toner hopper hose.
- Step 4** Uncap the toner bottle, secure the cap in the holder, and reinstall.
- Step 5** Reinstall the developer unit.
[See 5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 6** Reinstall the control panel.

Step 7 Close all covers.

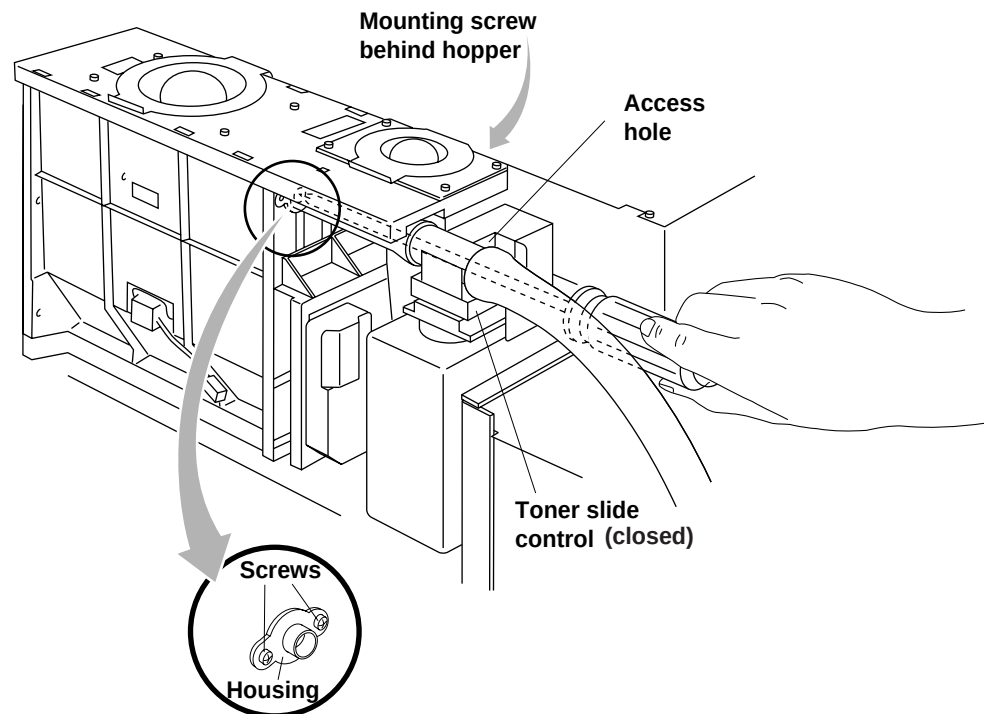


Figure 5-71 Toner Hopper Removal

5-9.4 Main Power Switch Replacement Procedure

Part Number

CA02626-E049FJ (See [6-6.12 on page 6-28.](#))

Removal Procedure

CAUTION

Remove the AC power cord from printer.

- Step 1** Remove the two lower paper supply trays.
Keep track of the middle and bottom tray sequence.
- Step 2** Loosen the two mounting screws at the center of the decorative panel and remove the panel.
- Step 3** Remove the two screws from the bottom-right panel that covers the main power switch.
- Step 4** Disconnect the four faston terminals from the main power switch.
- Step 5** Remove the screws that attaches the breaker mounting bracket.
- Step 6** Squeeze the breaker mounting tabs until the breaker is free from the bracket.

Replacement Procedure

- Step 1** Insert the new main power switch into the bracket.
The ON position must be on top.
- Step 2** Attach the bracket to the frame.
- Step 3** Reattach the following wires:
Inside top - White/white
Inside bottom - White
Outside top - White/red stripe
Outside bottom - Red stripe
- Step 4** Reattach the main power switch cover.
- Step 5** Reattach the lower front cover.
- Step 6** Reinstall the paper supply trays.

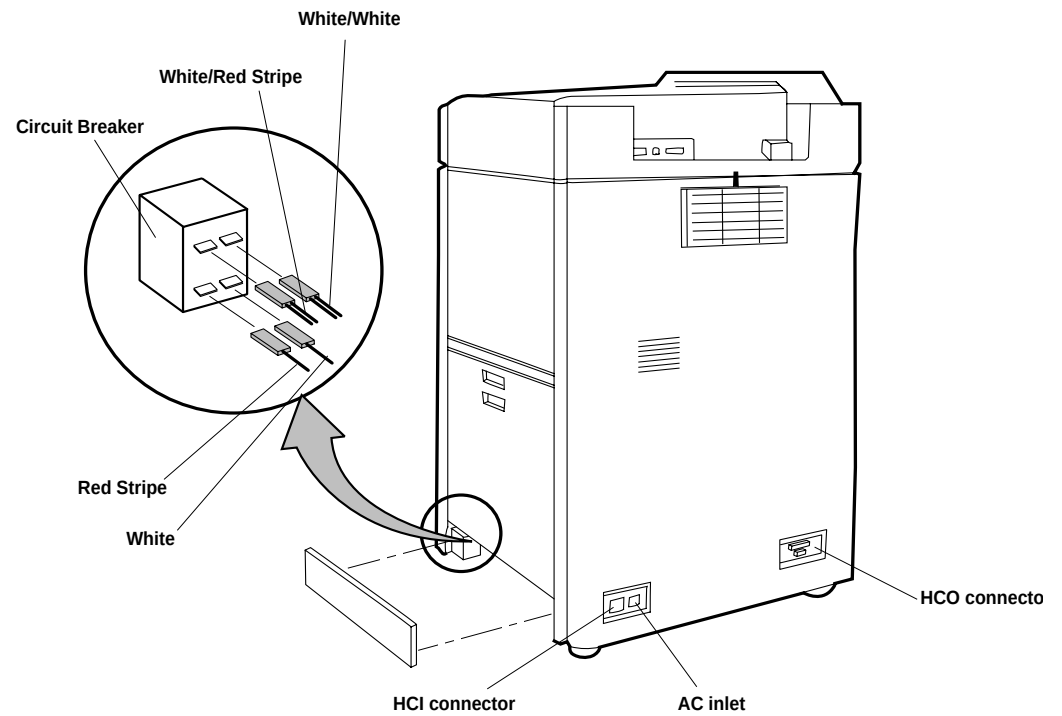


Figure 5-72 Input Power Circuit Breaker

5-9.5 Paper Feed Unit Replacement Procedure

Part Number

CA02626-E330FJ - Upper and middle units (See [6-6.11 on page 6-26.](#))

CA02626-E331FJ - Lower unit (See [6-6.11 on page 6-26.](#))

Removal Procedure

- Step 1** Remove the three paper supply trays.
- Step 2** If the HCI is installed, disconnect it from the printer.
- Step 3** Remove the rear cover.
- Step 4** Remove the two screws holding the cover on the left frame-support column see [Figure 5-73](#)).
- Step 5** Remove the two screws holding the cover on the right frame-support column.
- Step 6** The following step depends on the unit you are removing:
- Upper unit:** Remove the flat, hinge strap screw on the left side and carefully lay the cover down. Do not let the cover drop down.
- Middle unit:** Go to step 6.
- Lower unit:** Remove the flat, hinge strap screw on the left side and carefully lay the cover down. Do not let the cover drop down. Then remove the cover hinge plate screw on the left side of the cover and release the cover from both brackets. Be careful not to lose the hinge-pin washer on the right side.
- Step 7** Disconnect the wire harness going from the failed unit to the mechanism controller board.
- Disconnect the harness from the connector on the mechanism controller board; do not disconnect the inline cable connectors.
- Step 8** Remove the belt from the pulley by performing one of the following:
- Newer models have one belt tensioner—Release the tension on the belt from the bottom tensioner and lift the belt off of the pulley.
- Older models have two belt tensioners—From the rear, loosen the upper tensioner bracket screw. Press on the tensioner spring and lift the belt off the pulley.
- Step 9** Remove the two mounting screws from the failed unit.
- On feed units 1 and 2, remove the cable clamp. To prevent cable pinching, notice the unit cable routing.
- Step 10** Remove the failed unit by carefully lifting off the holding pins.
- Be careful not to damage the belt when removing the unit.
- Step 11** If the top paper feed unit is being replaced, transfer the door catch bar from the failed unit to the replacement unit.
- Step 12** Perform paper feed system alignment procedure (see [5-3.4 "Paper Feed System Alignment," on page 5-12](#)).

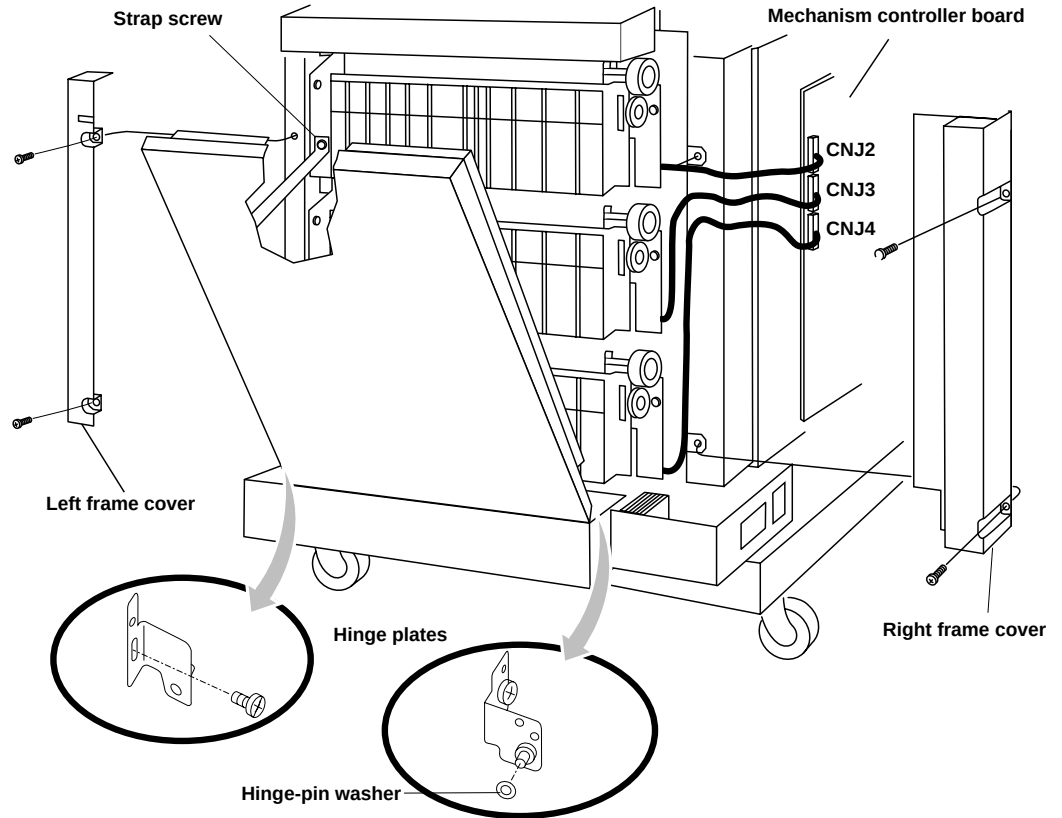


Figure 5-73 Cover Removal

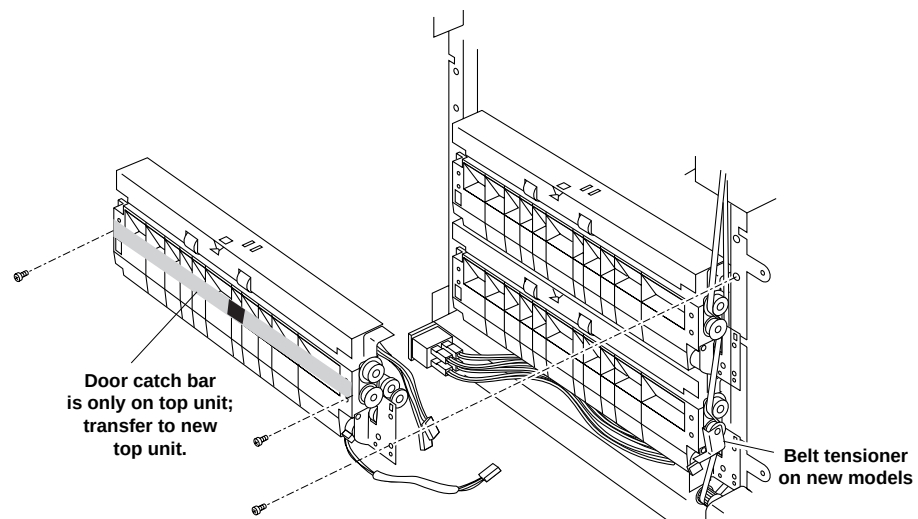


Figure 5-74 Paper Feed Unit Removal

Replacement Procedure

Note	The lower unit is different from the top and middle units. They are not interchangeable.

Step 1 If the top paper feed unit is replaced, transfer the door catch bar from the failed unit to the replacement unit.

Step 2 Install the new unit onto the locating pins.

Be careful not to pinch any wires.

Step 3 Route the cable to the mechanism controller and connect:

Top - CNJ2
 Middle - CNJ3
 Bottom - CNJ4

CAUTION	Do not allow the belt to touch any wires.

Step 4 Reattach the drive belt ([Figure 5-75](#)).

Step 5 Tighten the tensioner bracket.

Step 6 Install the spacer washers on the hinge pins.

Step 7 Insert the hinge pins into the hinge brackets.

Step 8 Install the hinge bracket screw.

Step 9 Install the flat strap with the mounting screw.

Step 10 Install the left and right decorative covers.

Step 11 Install all paper trays in the correct sequence.

Step 12 Align the paper feed system.

See [5-3.4 "Paper Feed System Alignment,"](#) on page 5-12.

Step 13 Close all covers.

Step 14 If applicable, reattach the HCI.

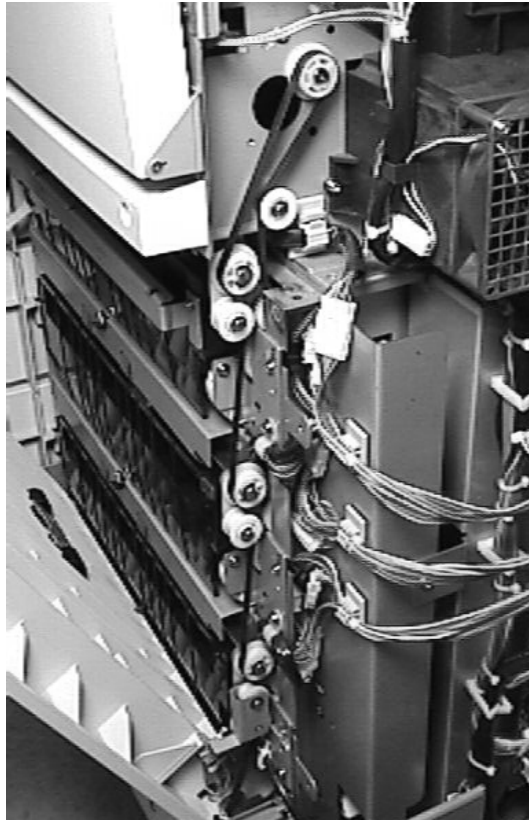


Figure 5-75 Upper Belt Route

5-9.6 Paper Feed Unit Transport Feed Motor Replacement Procedure

Part Number

CA02626-E441FJ (See [6-6.10 on page 6-24.](#))

Removal Procedure

- Step 1** Remove the three paper supply trays.
- Step 2** Remove the two screws holding the bottom base cover and remove cover.
- Step 3** If the HCI is installed, remove the HCI and mounting bracket.
- Step 4** Remove the two screws holding the cover on the left frame-support column (see [Figure 5-73 on page 5-95.](#))
- Step 5** Remove the two screws holding the cover on the right frame-support column.
Do not let the cover drop down.
- Step 6** Remove the flat, hinge strap screw on the left side and carefully lay the cover down.
- Step 7** Remove the cover hinge plate screw on the left side of the cover and release the cover from both brackets.
Be careful not to lose the hinge-pin washer on the right side.
- Step 8** Remove the belt from the pulley by performing one of the following:
Newer models have one belt tensioner—Release the tension on the belt from the bottom tensioner and lift the belt off of the pulley (see [Figure 5-74 on page 5-95.](#))
Older models have two belt tensioners—From the rear, loosen the upper tensioner bracket screw. Press on the tensioner spring and lift the belt off the pulley.
- Step 9** Disconnect the motor cable connector FMP.
- Step 10** Remove the two screws holding the power cord connector mounting bracket and move the bracket to access the screws for the motor mounting bracket.
- Step 11** Remove the two screws holding the motor mounting bracket to the right frame-support column.
- Step 12** Remove the bracket and motor assembly.
- Step 13** Remove the four motor mounting screws holding the motor to the bracket and remove motor.
- Step 14** Install new motor.
- Step 15** Reassemble in reverse order.

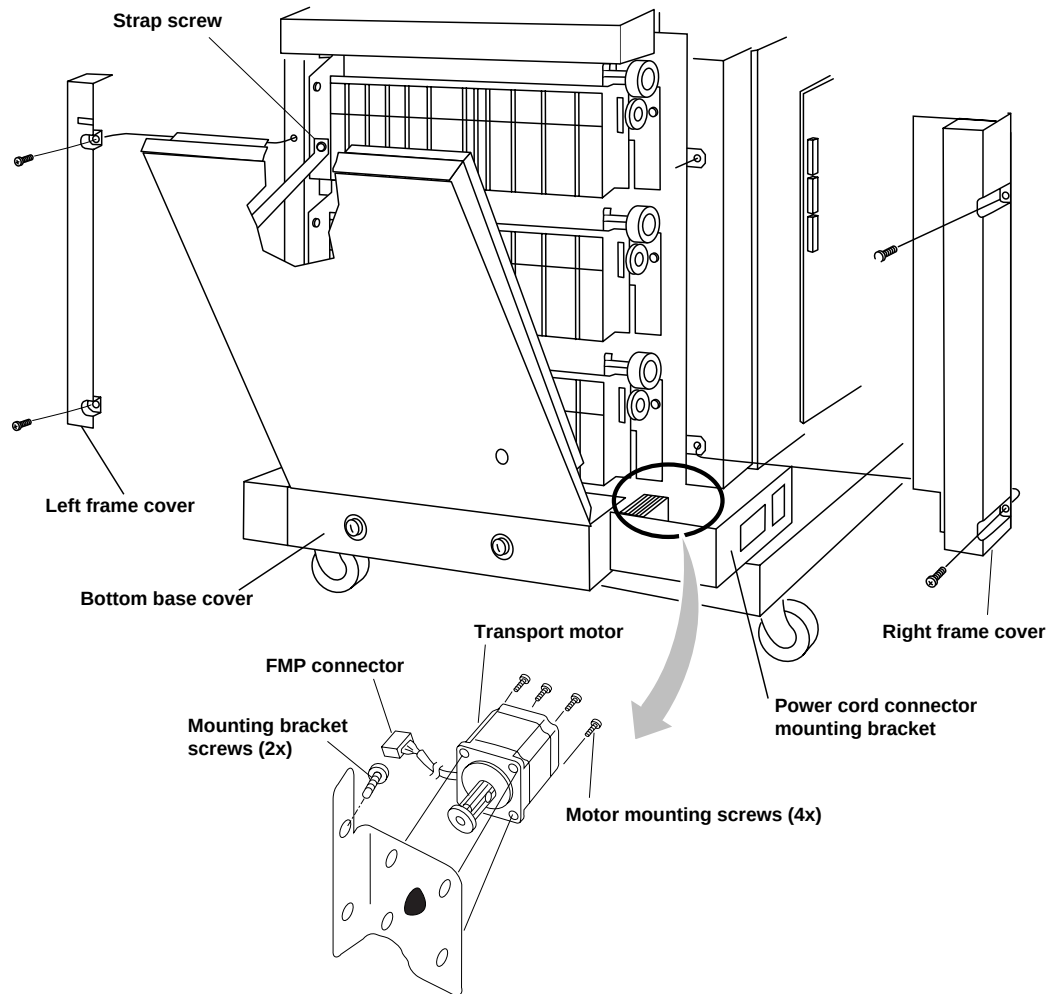


Figure 5-76 Paper Feed Unit Transport Feed Motor

5-9.7 PS1 - Tray Empty Sensors (PS1-1/2/3) Replacement Procedure

Part Number

CA55003-1625FJ (See [6-6.11 on page 6-26.](#))

Removal and Replacement Procedure

Step 1 Remove the paper feed unit.

See [5-9.5 "Paper Feed Unit Replacement Procedure," on page 5-94.](#)

Step 2 On the failed feed unit, remove the two mounting screws and detach the Paper Guide.

Step 3 Disconnect the sensor connector:

PS1-1 Top
PS1-2 Middle
PS1-3 Bottom

Step 4 Squeeze sensor tabs to release the failed sensor.

Step 5 Install the new sensor.

Step 6 Reassemble in reverse order.

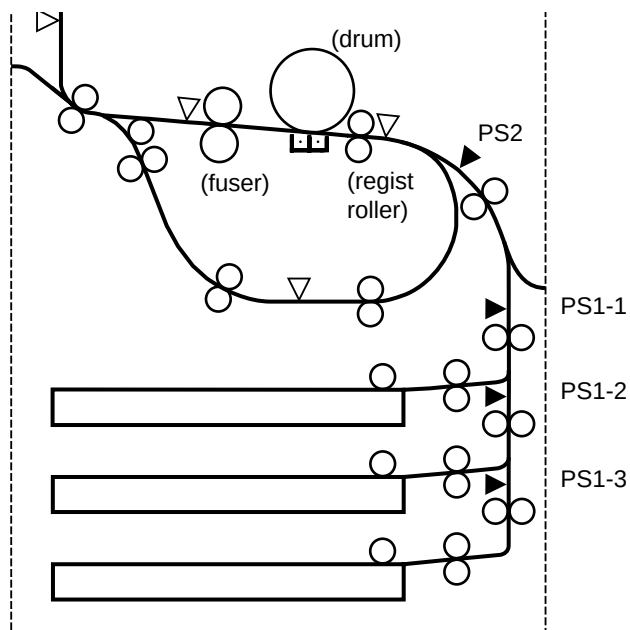


Figure 5-77 PS1 Positioning Overview

5-9.8 PS2 - Paper Path Timing Sensor Replacement Procedure

Part Number

CA55003-1627FJ (See [6-6.13](#) on page 6-30.)

Removal and Replacement Procedure

- Step 1** Remove the developer unit.
See [5-9.1 "Developer Unit Replacement Procedure,"](#) on page 5-86.
- Step 2** Remove the developer collector bottle.
- Step 3** Disconnect the PS2J connector.
- Step 4** Squeeze the sensor mounting tabs to remove the sensor.
- Step 5** Install the sensor.
- Step 6** Reassemble in reverse order.

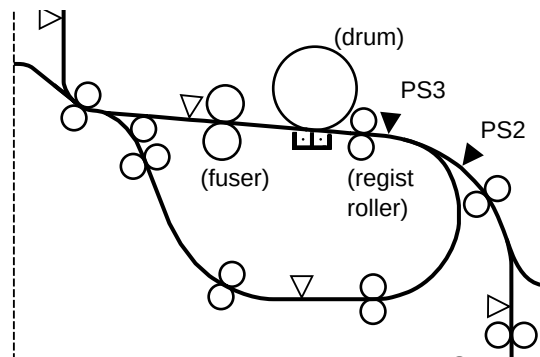


Figure 5-78 PS2 Positioning Overview

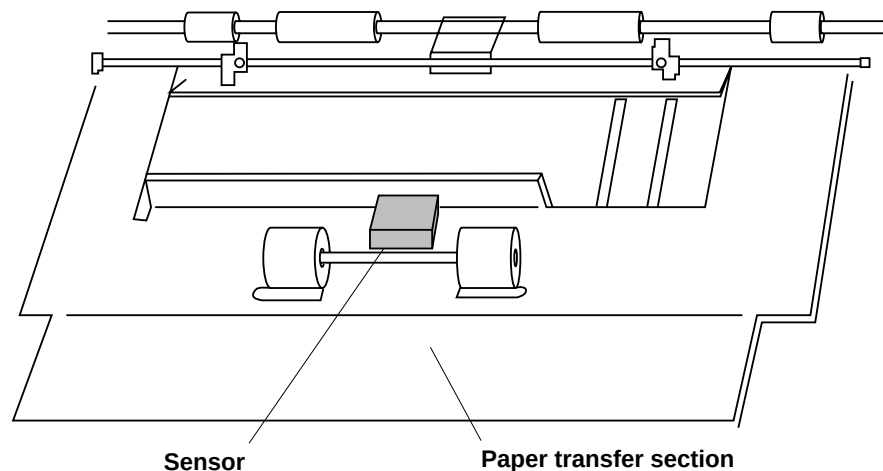


Figure 5-79 Paper Path Timing Sensor PS2

5-9.9 PS3 - Paper Path Registration Sensor Replacement Procedure

Part Number

CA55003-1627FJ (See [6-6.13 on page 6-30.](#))

Removal and Replacement Procedure

Step 1 Remove the developer unit. See [5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)

Step 2 Remove the developer collector bottle.

Step 3 Disconnect the PS3J connector.

Step 4 Squeeze the sensor mounting tabs to remove the sensor.

Step 5 Install the new sensor.

Step 6 Reassemble in reverse order.

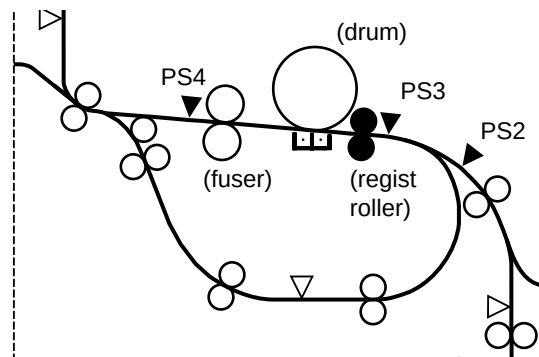


Figure 5-80 PS3 Positioning Overview

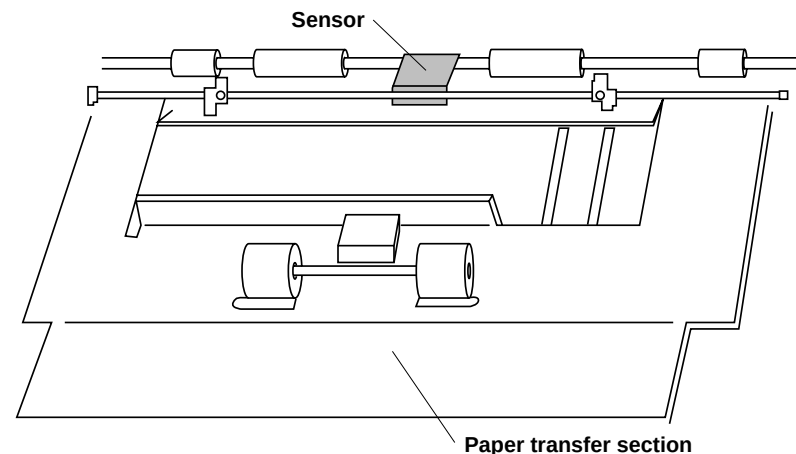


Figure 5-81 Paper Path Registration Sensor PS3

5-9.10 PS4 - Paper Path Decurling Sensor Replacement Procedure

Part Number

B86L24100822AFJ (See [6-6.13 on page 6-30.](#))

Removal Procedure

Step 1 Remove the decurler assembly. See [5-5.5 "Decurler Unit Replacement Procedure," on page 5-34.](#)

Step 2 Squeeze sensor tabs to free from bracket.

Replacement Procedure

Step 1 Install new sensor into bracket.

CAUTION

Observe the bracket and locate the 2 positioning-pin holes. When installed, the positioning pins must be properly seated into the holes.

Step 2 Install the bracket with the positioning pins properly seated.

Step 3 Reinstall the decurler assembly. See [5-5.5 "Decurler Unit Replacement Procedure," on page 5-34.](#)

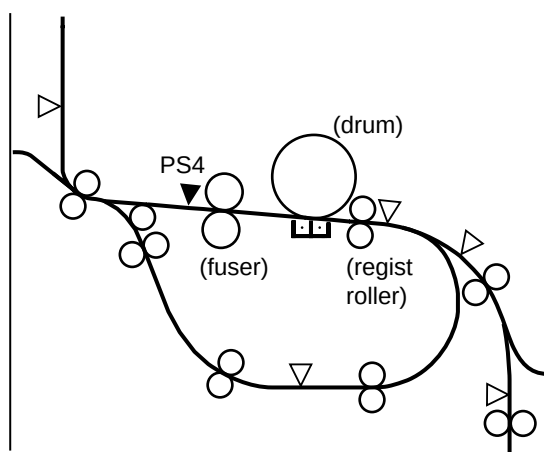


Figure 5-82 PS4 Positioning Overview

5-9.11 HCI Input (Mylar) Guide Replacement Procedure

Part Number

Part of HCI Input Guide Kit - CA04192-E018FJ (See [6-6.10](#) on page [6-24](#).)

Installation Procedure

- Step 1** Open the lower-right cover of your printer.
- Step 2** Remove the paper backing on the guide.
- Step 3** Place the guide on the top edge of the cover with the clear, non-adhesive edge of the guide pointing inward toward the printer.

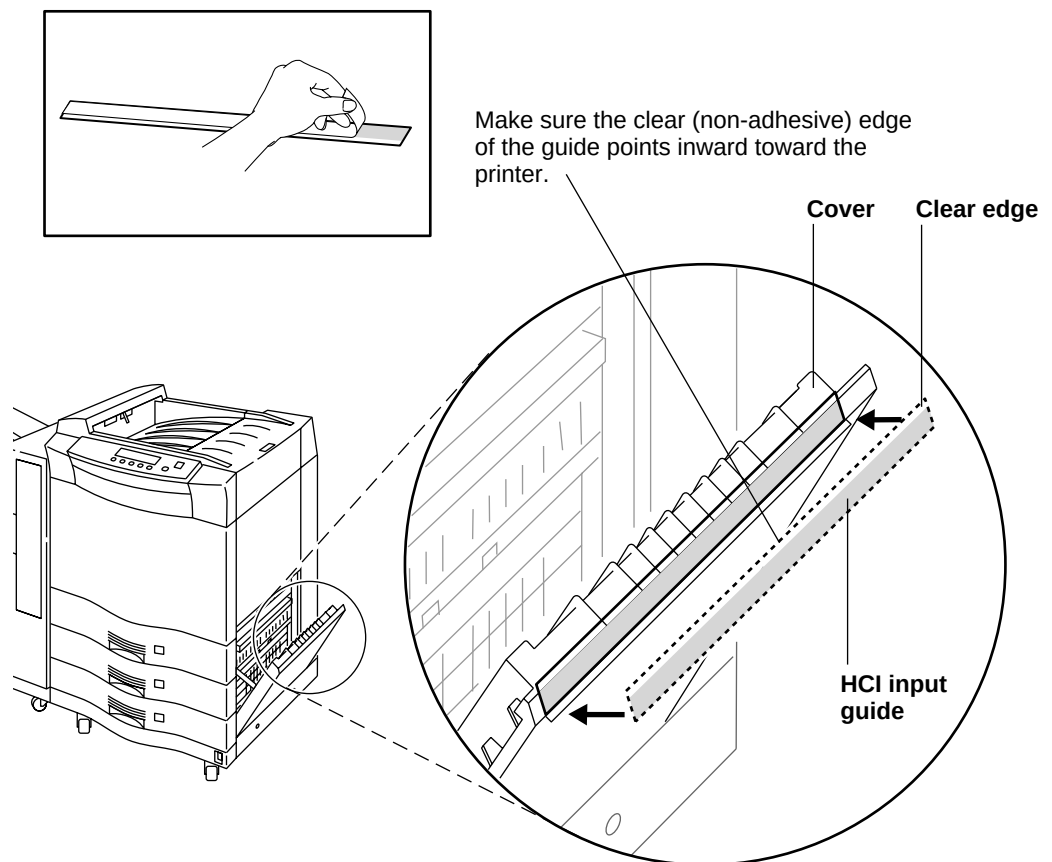


Figure 5-83 HCI Mylar Input Guide

5-9.12 Upper and Lower Transport Rollers Replacement Procedure

Part Number

CA02626-E133FJ (See [6-6.13 on page 6-30.](#))

Removal Procedure

- Step 1** Open the front door.
- Step 2** Open the upper-right cover.
- Step 3** Remove the rear cover.
- Step 4** Remove the developer unit. See [5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 5** Remove the two screws attaching the cover assembly to the printer and remove cover assembly.
- Step 6** *If you are replacing the upper transport rollers, remove the two springs holding the roller to the printer and remove roller. Reinstall in reverse order.*
If you are not replacing the upper transport rollers, without removing the springs, move the upper transfer roller to the other side of the shaft guide to remove the pressure on the lower transport roller.
- Step 7** From front of printer, remove the screw from the transfer roller knob and remove knob.
- Step 8** From the rear of the printer, use the lower belt tensioner to loosen the paper transport belt and remove the belt from the transfer roller pulley.
- Step 9** From the rear of the printer, remove plastic C-clip from transfer roller shaft and remove pulley.
- Step 10** Move the shaft down to the access hole and remove the shaft and front and rear bushings. Note how the front and rear bushings are positioned
- Step 11** Reinstall in reverse order.

Be sure to align the front and rear flat sides on bushings with the flat spots on the frame.

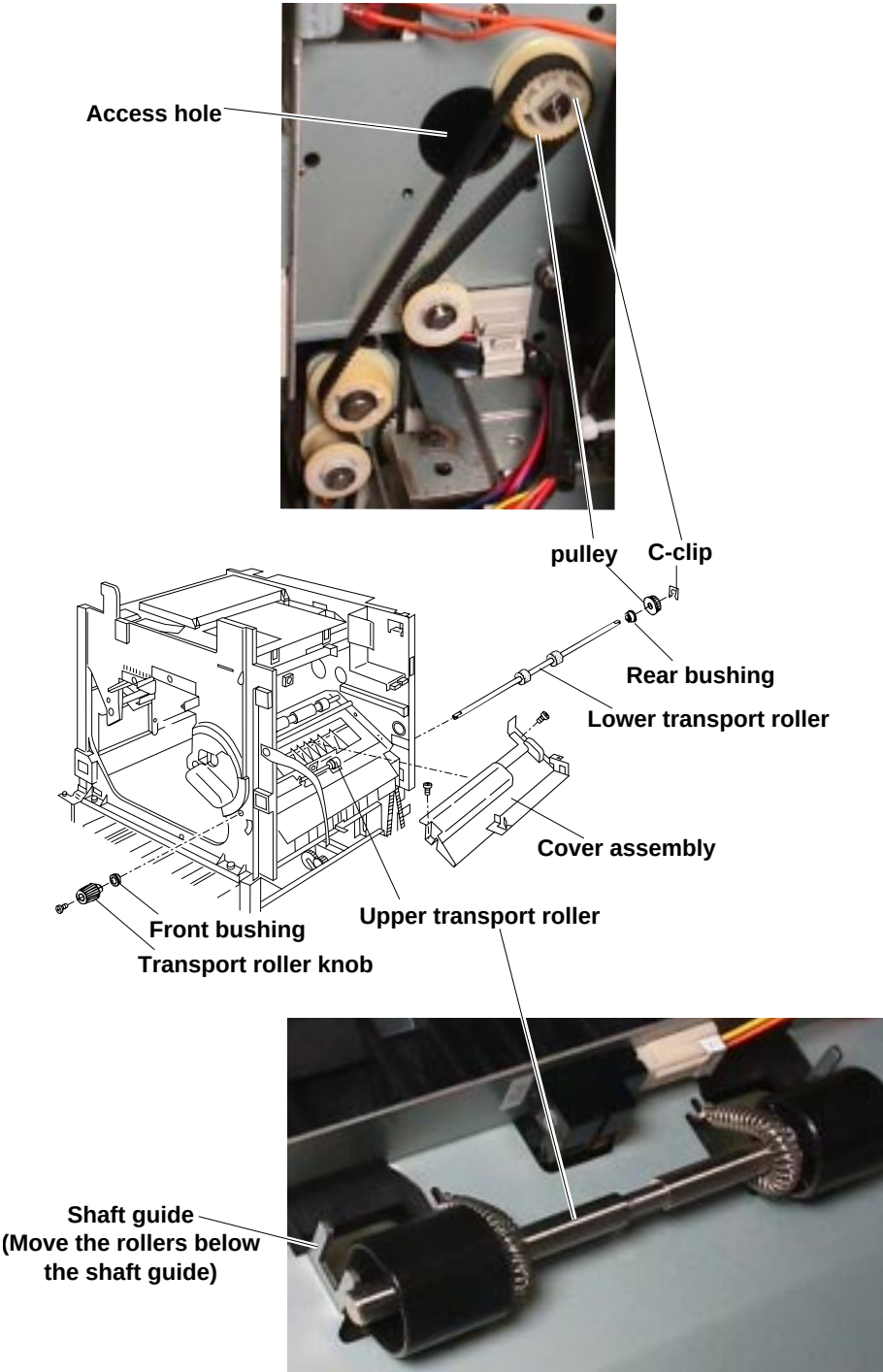


Figure 5-84 Upper and Lower Transport Rollers

5-9.13 Upper Registration Roller Replacement Procedure

Part Number

CA02626-E147FJ (See [6-6.13 on page 6-30.](#))

Removal Procedure

- Step 1** Open the front door.
- Step 2** Open the upper-right cover.
- Step 3** Remove the rear cover.
- Step 4** Remove the drum unit and set it aside.
- Step 5** Remove the registration roller clutch. See [5-7.2 "Registration Roller Clutch Replacement Procedure," on page 5-51.](#)
- Step 6** Remove the developer unit. See [5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 7** From front of printer, remove the screw from the registration roller knob and remove knob.
- Step 8** From inside the printer, use a small, flat-blade screwdriver to push the registration roller shaft **front** brass bushing out the front of the printer.
- Only light pressure is required.
- Step 9** Move the registration roller towards the **rear** of the printer until the front shaft is free and the rear brass bushing is clear of the frame.
- Step 10** Move the front shaft to the left into the drum opening and pull out from front of printer.
- Step 11** Reinstall in reverse order.
- Be sure to align the front and rear flat sides on bushings with the flat spots on the frame.

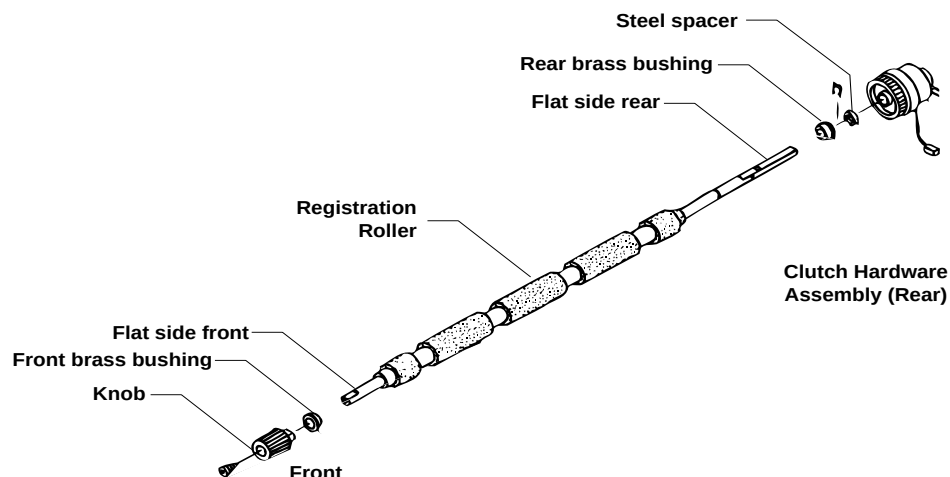


Figure 5-85 Registration Roller Shaft Assembly

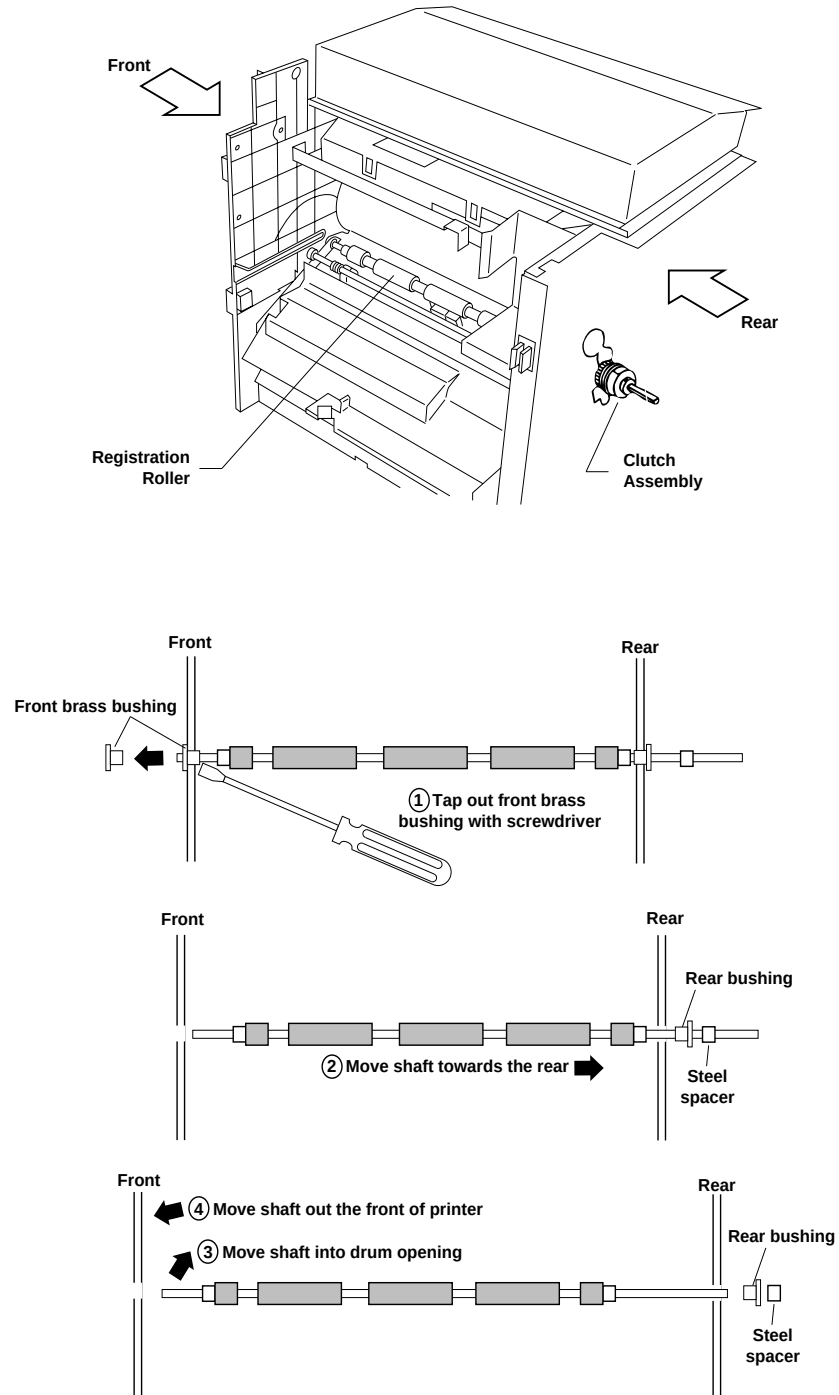


Figure 5-86 Registration Roller Removal

5-9.14 Lower Registration Roller Replacement Procedure

Part Number

CA02626-E118FJ (See [6-6.13 on page 6-30.](#))

Removal Procedure

- Step 1** Open the front door.
- Step 2** Open the upper-right cover.
- Step 3** Remove the rear cover.
- Step 4** Remove the drum unit and set it aside.
- Step 5** Remove the registration roller clutch. See [5-7.2 "Registration Roller Clutch Replacement Procedure," on page 5-51.](#)
- Step 6** Remove the developer unit. See [5-9.1 "Developer Unit Replacement Procedure," on page 5-86.](#)
- Step 7** Remove the upper registration roller. See [5-9.13 "Upper Registration Roller Replacement Procedure," on page 5-108.](#)
- Step 8** Remove the two screws attaching the lower registration roller to the printer and remove the roller out of the front of the printer.
- Step 9** Remove the plastic clip, bushing, and spring from each end of the roller.
- Step 10** Reinstall in reverse order.

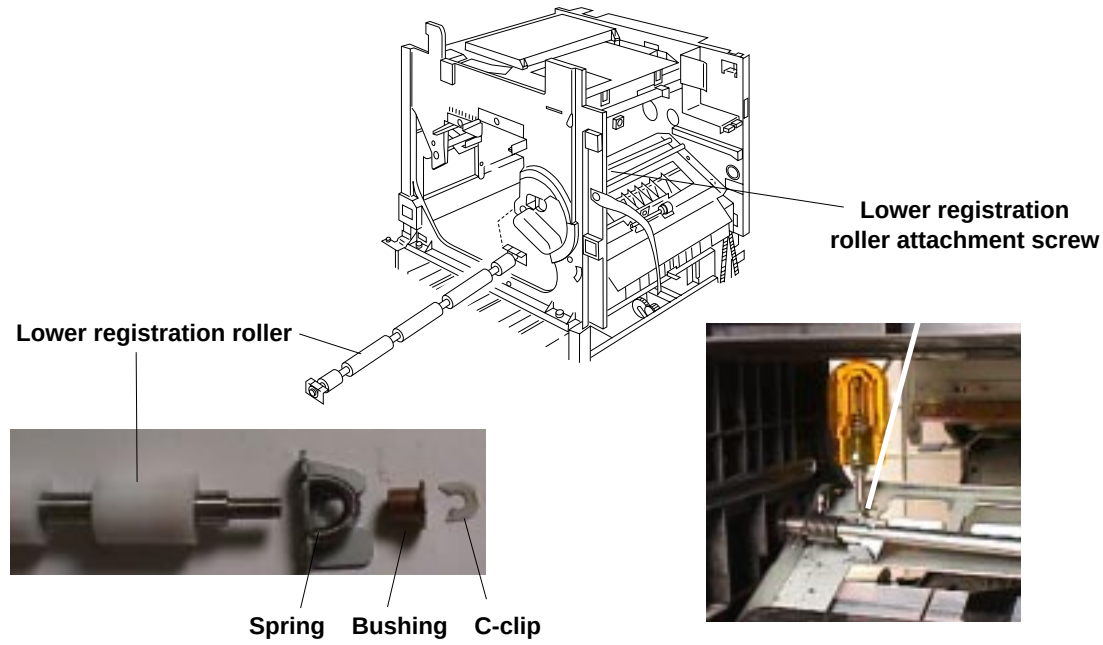


Figure 5-87 Lower Registration Roller Removal

6 Replaceable Parts

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6-1 Introduction

This chapter details the replaceable parts for the D640 printer. Assemblies are illustrated in exploded views. Each part is identified by an index number.

6-2 Conventions

The index numbers listed in the parts tables correspond to a part number in the illustrations. The quantity listed for each part indicates the number of parts needed to complete an assembly or unit.

6-3 HCI Replaceable Parts

See [D-6 "Parts and Diagrams," on page D-28](#).

6-4 HCO Replaceable Parts

For 2,000 Sheet HCO, see [C-8 "Parts and Diagrams," on page C-53](#).

For 3,000 Sheet HCO, see [B-6 "Parts and Diagrams," on page B-54](#).

6-5 Consumables

Note Consumables are the customer's responsibility to replace upon failure.

Parts List for Consumables and Miscellaneous Parts. See [Figure 6-1](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	C5627A	Fuser (120V-127V)	Consumable
1	1	C5628A	Fuser (200V-240V)	Consumable
2	1	C5629A	Drum Kit	Consumable. Includes drum and transfer unit
3		C5632B	Developer Kit	Consumable. Includes 2 bottles of developer mixture and an ozone filter
3	1	CA81218-G063FJ	Developer Mixture	Single bottle of developer mixture for use when the developer unit is replaced.
		C5626A	Toner Kit	Consumable Includes: 8 bottles of toner, waste toner bottle, and cleaning roller
4	1	CA81218-E094FJ	Cleaning roller	Single cleaning roller. The cleaning roller should be replaced every other time toner is added. The cleaning roller is included in the C5626A Toner Kit.
5	1		Waste Toner Bottle	Consumable. Supplied with Toner Kit
		C5633A	Printer Pick Roller Kit	Consumable. Replacement procedure: see 5-5.7 on page 5-38 .
		C5636B	HCI Pick Roller Kit	Consumable. Replacement procedure: see D-5.2 on page D-21 .
	1	CA81218-E091FJ	Ozone Filter	The Ozone Filter is a consumable. It is supplied with the developer mixture.

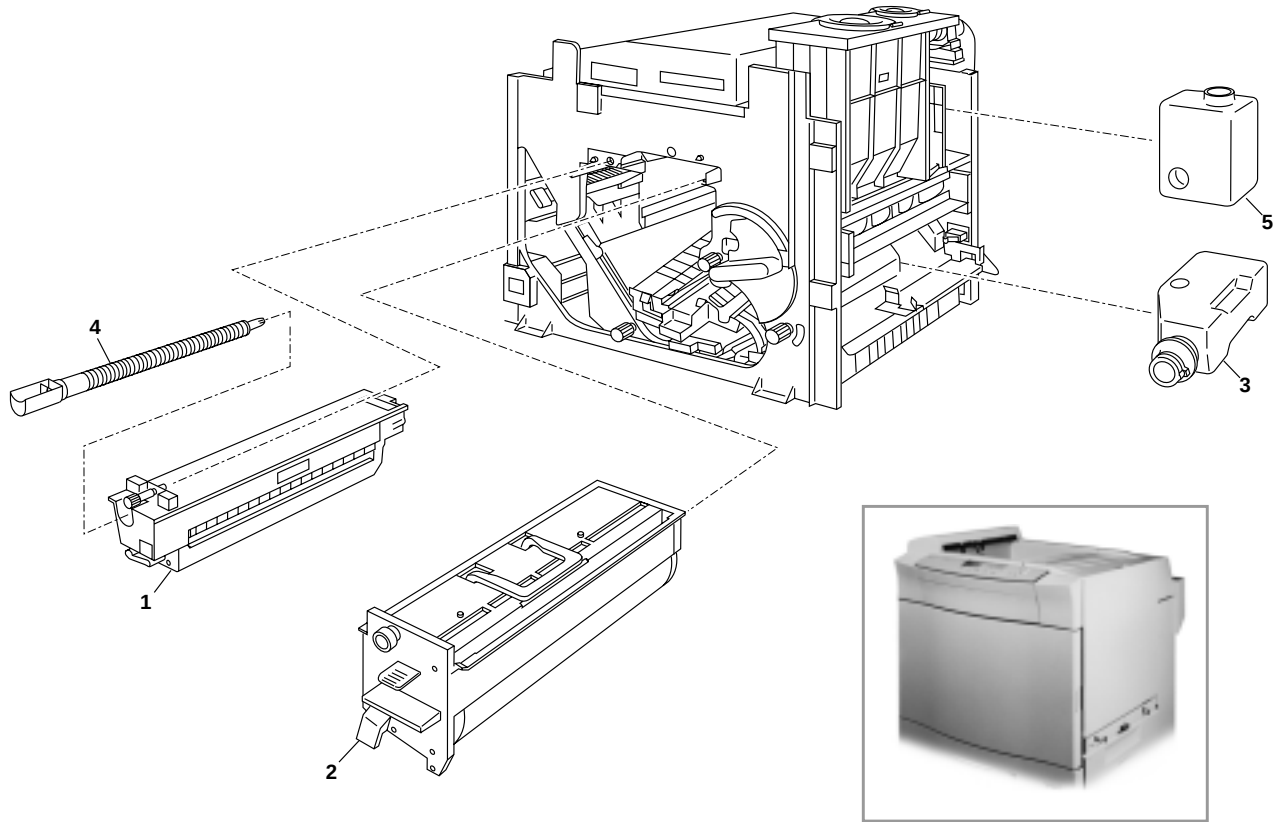


Figure 6-1 Consumables

6-6 Printer Parts and Diagrams

6-6.1 Miscellaneous Parts

Parts List for Miscellaneous Parts.

Index No.	Qty	Part Number	Description	Remarks
	1	CA81218-G063FJ	Developer Mixture	Single bottle of developer mixture for use when the developer unit is replaced.
4	1	CA81218-E094FJ	Cleaning roller	Single cleaning roller. The cleaning roller is included in the C5626A Toner Kit.
		CA81218-E120FJ	Screw Kit	Various screws from the printer
		CA81218-E109FJ	C-Clip Kit	60 C-Clips; three sizes, 20 each
	1	C5620-60023	Enhanced Features Kit	L03 function code and <i>Enhanced Features Manual</i>
	1	C5620-C0013	Driver diskette package	Includes Windows NT driver, Unix 9.0 and Unix 10.0 model script
	1	B96L07200001AFJ	Blower Brush	
	1	CA81218-E091FJ	Ozone Filter	The Ozone Filter is a consumable. It is supplied with the developer mixture.
	1	CA31214-0426FJ	Wrench	Installation wrench
	1	CA04192-E021FJ	Developer spill rework kit	See Alert Bulletin #29 for description of contents and instructions.

6-6.2 Cover Assemblies - Front View

Parts List for Cover Assemblies (front view). See [Figure 6-2](#).

Index No.	Qty	Part Number	Description	Remarks
	1	C5620A, C5620B	HP5000 D640 Printer unit	
1	1	CA31214-0200FJ	Cover, top	
3	1	CA98001-3336FJ	Latch	Male/female plastic latch
4	1	CA31214-0280FJ	Cover, upper right	
5	1		Hinge assembly, L	
6	1	CA04192-E007FJ (part of kit)	Door guide	Part of D640 Hardware Kit that includes door latch and catch (see 6-6.10 on page 6-24).
7	1		Hinge assembly, R	
9	1	CA31214-0418FJ	Strap, upper right cover rear	
11	1	CA31214-0417FJ	Strap, upper right cover front	
13	1	CA31214-0380FJ	Cover, middle right	HCI input cover
	1	CA04192-E018FJ	HCI Input Guide Kit	Not shown. Shipped with HCI. See 6-6.10 on page 6-24 .
15	1		Base cover, rear bottom	
17	1		Base cover, front bottom	
19	1	CA31214-0350FJ	Base cover	
20	2	CA02858-1113FJ	HCI mounting bracket bolt	
21	1	CA31214-0370FJ	Cover	
23	1	CA31214-0270FJ	Front cover	
24	1		Metal fitting	
25	1	CA04192-E019FJ Star Roller Kit	Support, for transfer guide unit.	Part of Star Roller Kit that includes transfer assembly guide support block (see 6-6.2 on page 6-8) and star roller LED cover (see 6-6.13 on page 6-30 .)
26	1	CA31214-0416FJ	Strap	Front door strap
37	1	CA02626-E049FJ	Main power switch	Replacement procedure: see 5-9.4 on page 5-92 .
38	4	CA02626-E164FJ	Caster	One caster

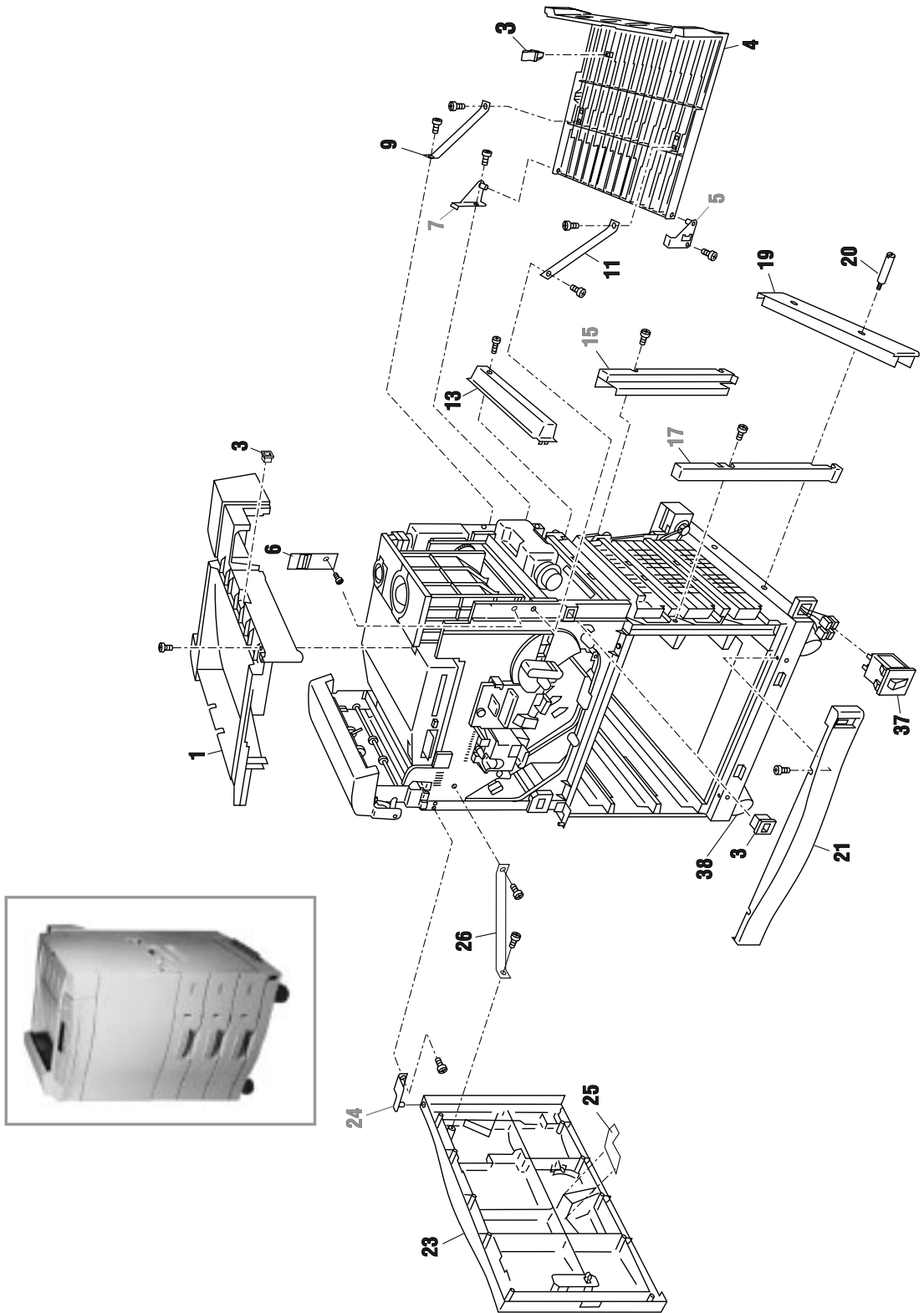


Figure 6-2 Cover Assemblies Diagram (front view)

6-6.3 Cover Assemblies - Back View

Parts list for Cover Assemblies (back view). See [Figure 6-3](#).

Index No.	Qty	Part Number	Description	Remarks
28	1	CA31214-E400FJ	Rear cover	
30	1	CA31214-0300FJ	Left cover	Upper left cover
31	1		Exit guide	Exit guide for HCO. Included with the HCO.
32	1		Exit vent	
33	1	CA31214-0360FJ	Base cover, L	Lower left cover
35	2		L cover	
38	2	CA02626-E165FJ	Mounting bracket	HCO Mounting hardware bracket. Includes two screws
	1	8120-3996 8120-5337 8120-5336 8120-5335 8120-5334 8120-5339 8120-5340 8120-5341	Power cord (Not shown)	PWR 240V North America PWR 120V North America PWR Europe PWR Australia/NZ PWR UK PWR Switzerland PWR Denmark PWR India/SO Africa

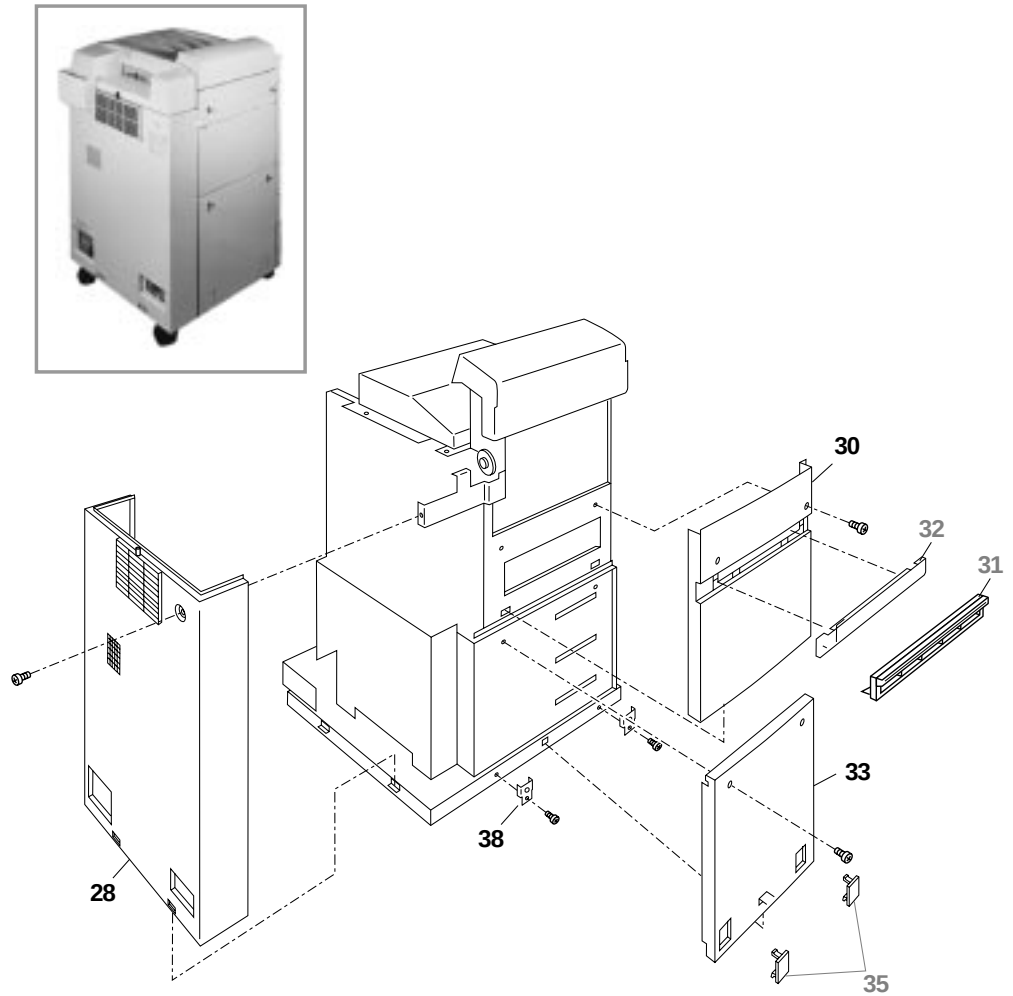


Figure 6-3 Cover Assemblies Diagram (back view)

6-6.4 Duplex Unit

Parts list for Duplex Unit. See [Figure 6-5](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-F840FJ	Duplex unit	Replacement procedure: see 5-5.1 on page 5-24 .
2	1		Roller assembly	
3	4		Bearing	
5	2		Pulley	
8	1		Roller assembly	
9	1		Roller assembly	
10	2		Bearing	
12	1		Pulley	
15	1		Motor	
16	1		Pulley	
17	1		Bushing	
19	1		Belt	
20	1		Belt	
21	1	CA55002-0337FJ	Sensor	PS5 Duplex Sensor. Replacement procedure: see 5-5.2 on page 5-26 .

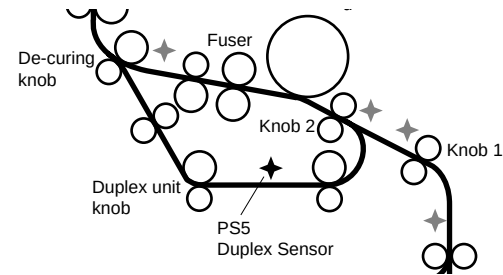


Figure 6-4 PS5 Duplex Sensor Positioning

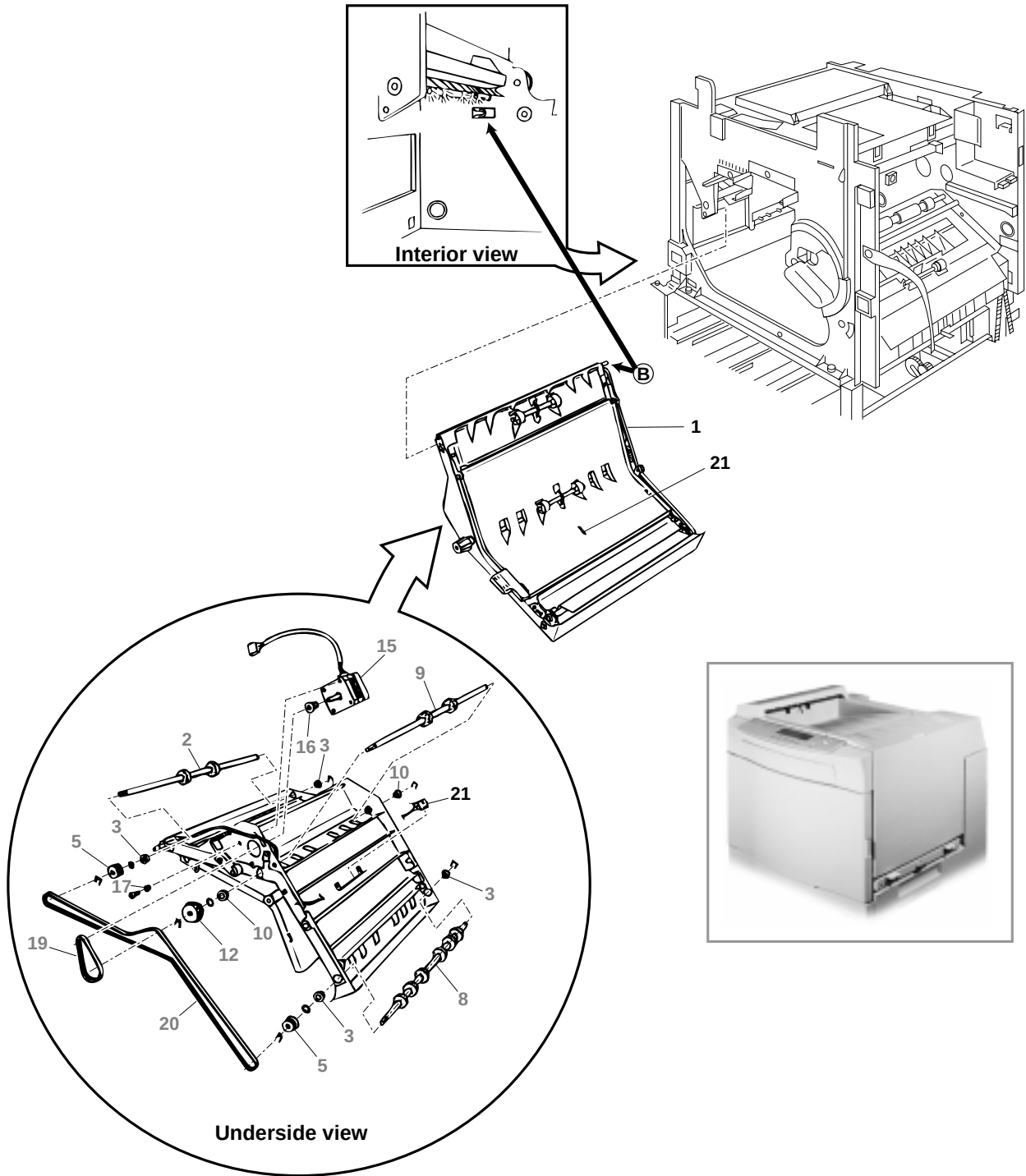


Figure 6-5 Duplex Unit Diagram

6-6.5 Transfer Assembly Guide

Parts List for Transfer Assembly Guide. See [Figure 6-6](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-F501FJ	Transfer assembly guide	Includes LED unit. Replacement procedure: see 5-5.4 on page 5-30 .
2	1	CA81218-E093FJ	Transfer unit	Consumable. The transfer unit is a consumable and is packaged with the drum (C5629A). The customer should replace both at the same time. The part number is used if the transfer unit is required as a service part.
3	2		Clips	White plastic clips
4	1	CA02626-E149FJ	Cable	Transfer guide ground cable
5	1	CA04192-E008FJ	Latch	Transfer guide latch
6	1	CA04192-E019FJ Star Roller Kit	Support block	Support block for transfer assembly guide. Part of Star Roller Kit that includes transfer assembly guide support (see 6-6.2 on page 6-8) and star roller LED cover (see 6-6.13 on page 6-30 .)

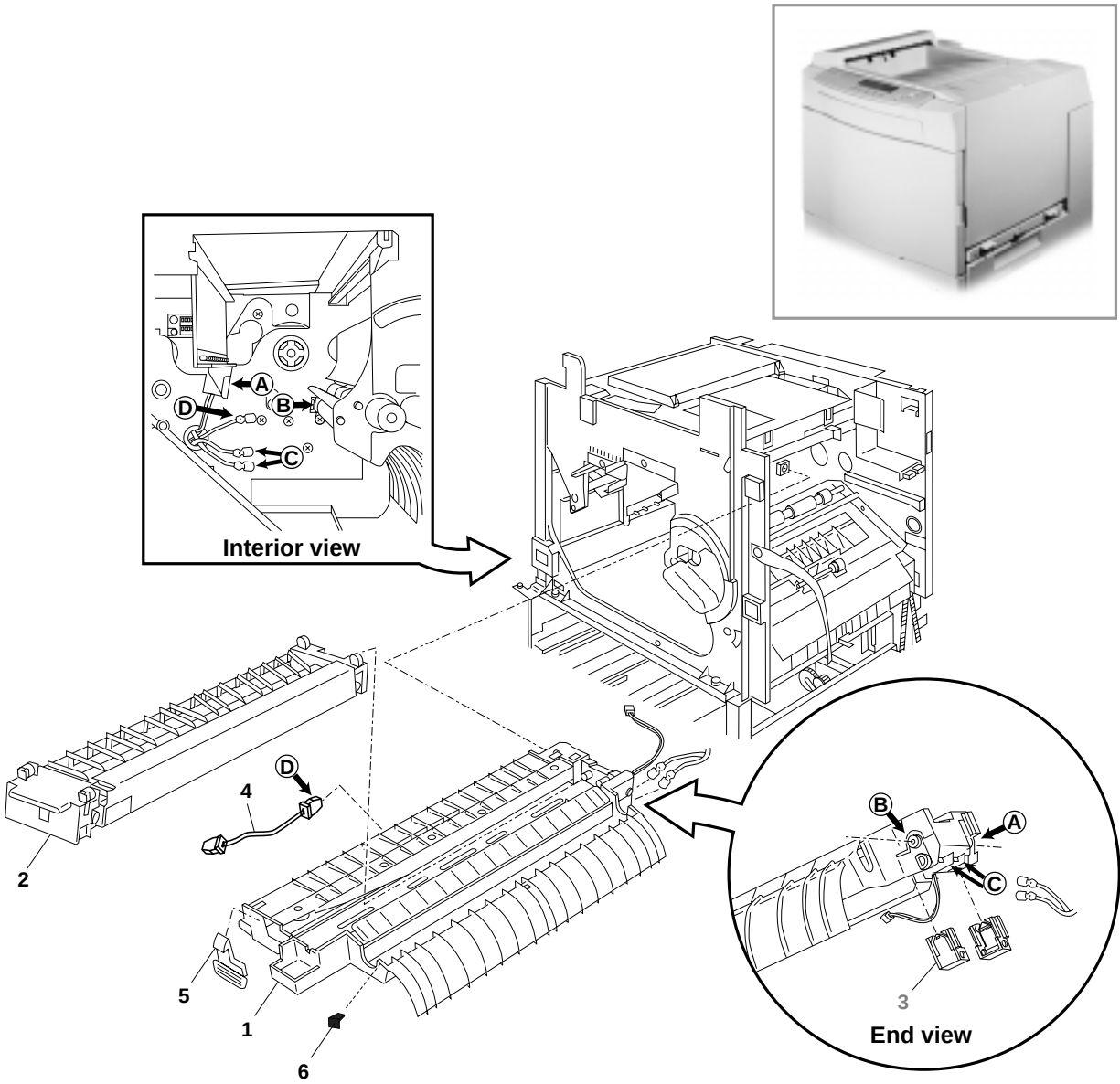


Figure 6-6 Transfer Assembly Guide Diagram

6-6.6 Paper Tray, Paper Lift Motor, and Tray Installed Sensor

Parts list for Paper Tray, Paper Lift Motor, and Tray Installed Sensor. See [Figure 6-7](#).

Index No.	Qty	Part Number	Description	Remarks
	3	C5634-60101 C5634A ^a	Custom tray	Not Shown
1	3	C5625-60101 C5625A ^b	Standard tray	
2	3		Metal fitting	
4	3	CA02626-E142FJ	Switch	Microswitch indicating paper tray is installed. For a description, see 5-4.6 on page 5-20 .
6	1		Metal fitting assembly	
7	1		Motor	
9	1		Spring	
10	1	CA02626-0166FJ	Gear	Tray lift gear
13	1		Pulley	
15	3	CA02626-E157FJ	Lift motor assembly	Paper tray lift motor
16	3		Set of Tray Guides (3 guides/set)	
17	3	CA02626-E388FJ	Cam	Paper tray cam

- a. Product number for customers to purchase an extra Custom Tray.
- b. Product number for customers to purchase an extra Standard Tray.

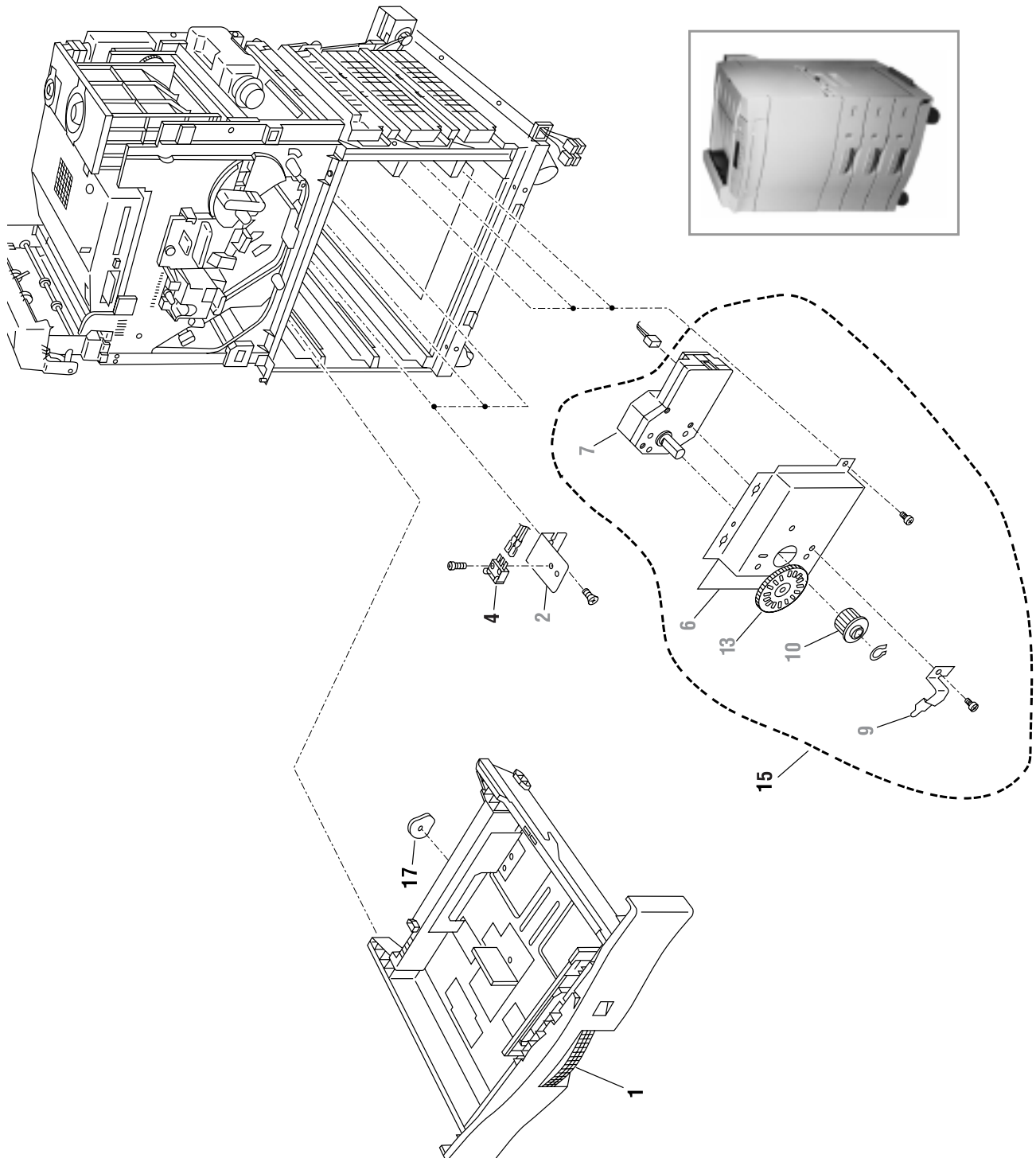


Figure 6-7 Paper Tray, Paper Lift Motor, and Tray Installed Sensor Diagram

6-6.7 Main Controller and Optical Units

Parts list for Main Controller and Optical Units. See [Figure 6-8](#).

Index No.	Qty	Part Number	Description	Remarks
1	1		Plate	
2	1		Plate	
4	1	CA31214-C028FJ	Main controller board	Replacement procedure: see 5-6.2 on page 5-45 .
5	1	CA31214-C030FJ	Mounting brackets	Mounting brackets for hard disk drive Includes plates, screws, and spacers.
8	1	CA31214-C016FJ	Floppy disk drive (FDD)	Replacement procedure: see 5-6.2 on page 5-45 .
9	1	CA02950-1393FJ	Hard disk drive (HDD)	1.2 GB. Replacement procedure: see 5-6.2 on page 5-45 .
12	1		Plate	
15	1	CA71002-1840FJ	Wire harness	Main controller to control panel
16	1	CA71002-1842FJ	Wire harness	Main controller to optics
17	1	CA71002-1841FJ	Wire harness	Main controller to mechanism controller
18	1	CA71002-1891FJ	Wire harness	Main controller to floppy disk
19	1	CA71002-1843FJ	Wire harness	Main controller to hard disk
20	1	CA02626-E159FJ	Fan	Fan 6
21	1		Finger guard	
25	1	CA02625-D115FJ	Optical unit	Replacement procedure: see 5-6.3 on page 5-48 .
28	1	CA02626-E112FJ	Optical unit mounting kit	Includes screws (3), spring, plate, and collar
30	4		SIMM chips	
32	1	CA04192-E013FJ	Optical Unit Heat Shield	Two separate parts to the shield.

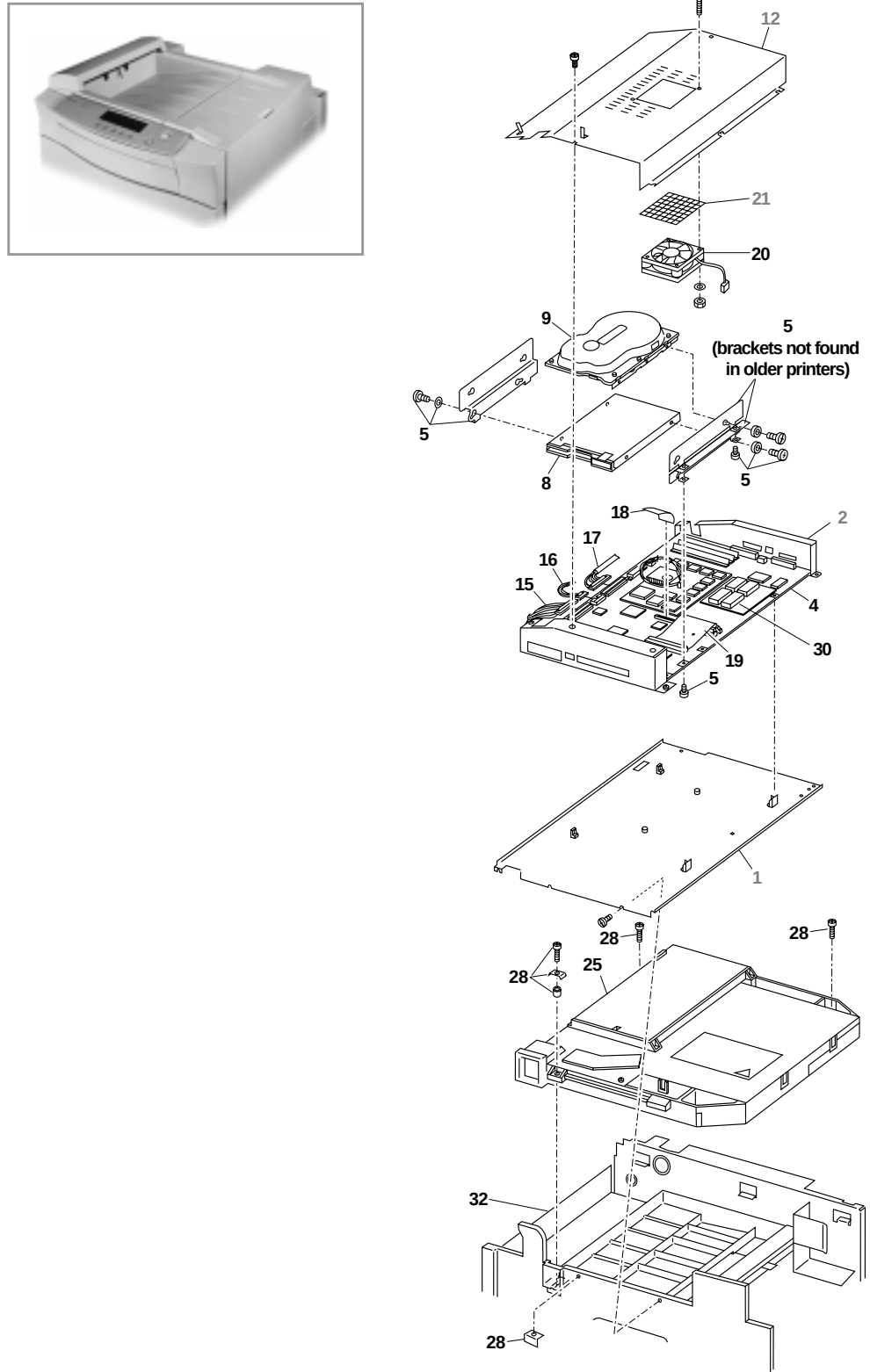


Figure 6-8 Main Controller and Optical Units Diagram

6-6.8 Ejection Unit and Control Panel

Parts list for Ejection Unit and Control Panel. See [Figure 6-9](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA31214-0210FJ	Cover, control panel	
3	1	CA31214-0260FJ	Door	Floppy cover
4	1	CA31214-C014FJ	Cover, control bezel	
5	1		Metal fitting	
7	1	B86L2410V424AFJ	Switch	Standby switch
8	1	CA31214-C026FJ	Control panel	Replacement procedure: see 5-6.1 on page 5-44 .
10	1	CA02626-F900FJ	Ejection unit	Includes ejection unit cover interlock microswitch.
11	1		Metal fitting	
13	1	CA02951-5075FJ	Sensor	Ejection tray full sensor. Replacement procedure: see 5-8.4 on page 5-84 .
14	1	CA02951-5074FJ	Sensor	PS7. Replacement procedure: see 5-6.2 on page 5-45 .
15	1	CA02626-0922FJ	Discharge brush	
18	1		Roller assembly	
19	1		Pulley	
21	1		Roller assembly	
22	1		Pulley	
23	1		Belt	
24	1	CA02626-E142FJ	Switch	Ejection unit cover interlock microswitch (ejection unit closed). For a description, see 5-4.4 on page 5-18 .

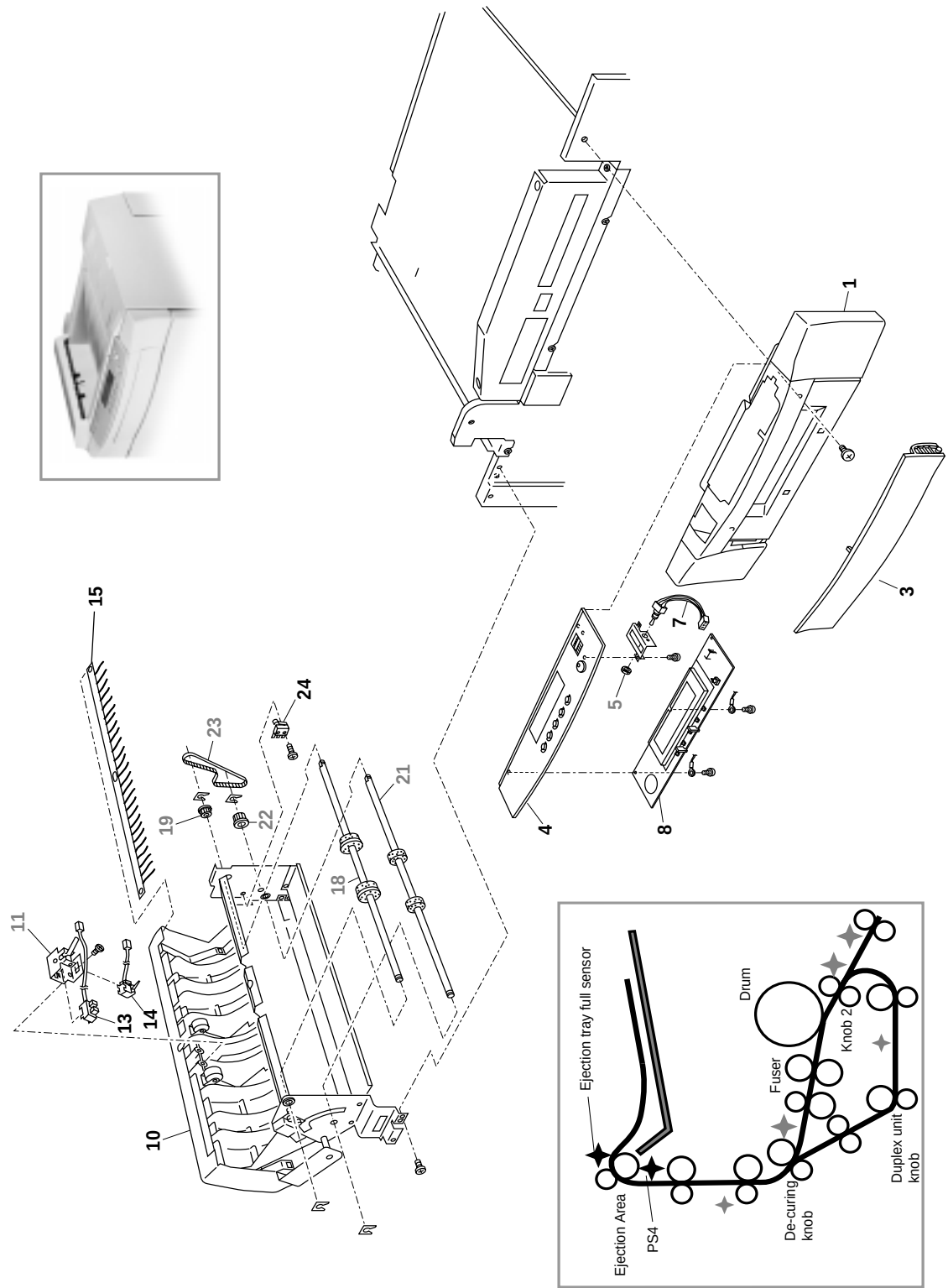


Figure 6-9 Ejection Unit and Operator Panel Diagram

6-6.9 Reversing Unit

Parts List for Reversing Unit. See [Figure 6-10](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-G800FJ	Reversing unit	Replacement procedure: see 5-8.1 on page 5-78 .
2	1	CA02626-E808FJ	Rubber roller assembly	Assembly includes rubber roller, two bushings, one pulley, and 2 E-rings.
6	1		Belt	
7	1		Motor	
8	1		Pulley	
9	1		Bushing	
11	1	CA04267-E820FJ	Solenoid	Duplex long paper deflection solenoid
13	1		Plate	
15	1	CA55003-1612FJ	Sensor	PS6. Replacement procedure: see 5-8.2 on page 5-80 .
17	1	CA82002-0613FJ	Solenoid	HCO exit solenoid

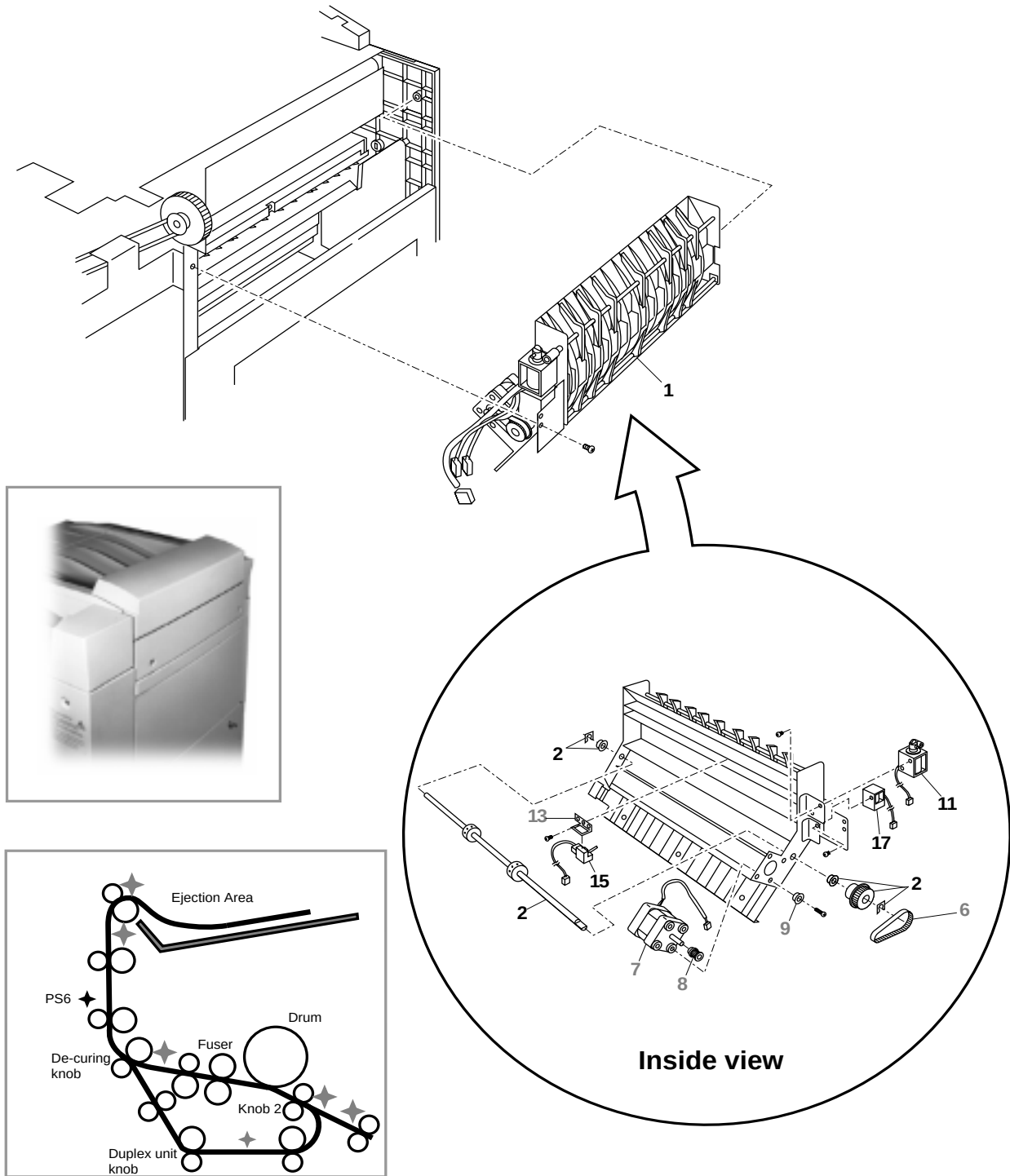


Figure 6-10 Reversing Unit Diagram

6-6.10 Paper Path Transport Assembly

Parts list for Paper Path Transport Assembly. See [Figure 6-11](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-E401FJ	Transport cover assembly	
2	1		Metal fitting (L)	
4	1		Spacer	
5	1		Metal fitting (R)	
7	1	CA02626-E142FJ	Switch	Lower right cover interlock switch. For a description, see 5-4.7 on page 5-21 .
9	1	CA04192-E007FJ part of kit	Door latch	Part of D640 Hardware Kit that includes door latch catch (item 21 below) and front door guide (see 6-6.2 on page 6-8).
11	3	CA02626-E406FJ	Roller, transport cover	
13	1	CA02626-0416FJ	Strap, transport cover	
15	1	CA02626-E441FJ	Motor assembly, feed rollers	Paper feed unit transport feed motor. Replacement procedure: see 5-9.6 on page 5-98 .
16	1		Motor pulley	
17	1		Pulley setscrew	
19	1		Pulley	
20	1	CA98001-6943FJ	Belt, paper transport	
21	1	CA04192-E007FJ part of kit	Door latch catch	Part of D640 Hardware Kit that includes door latch (item 9 above) and front door guide (see 6-6.2 on page 6-8).
22	1	CA04192-E018FJ	HCI Input Guide Kit	Includes guide assembly and mylar guide. Replacement procedure: see 5-9.11 on page 5-105 .

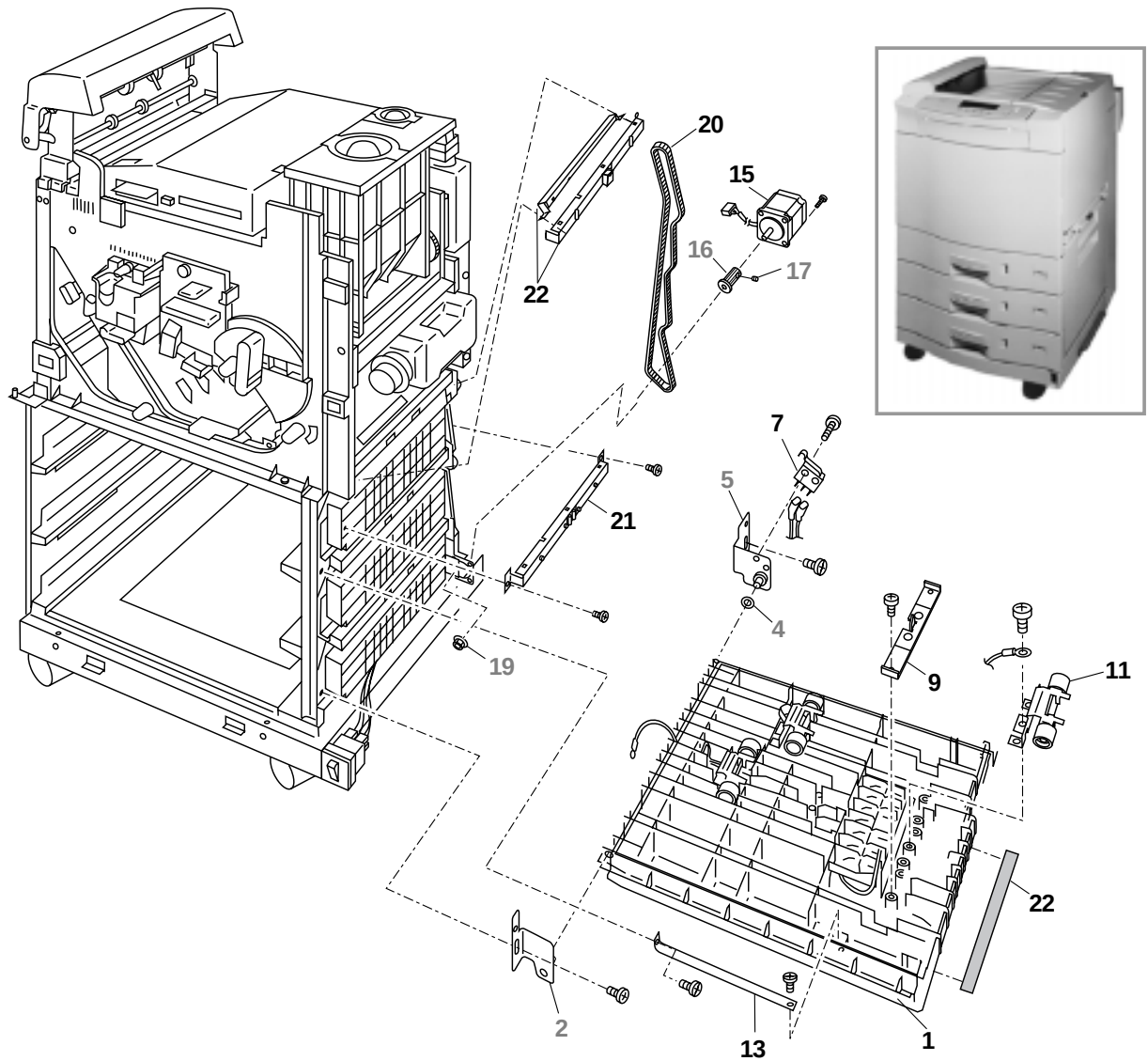


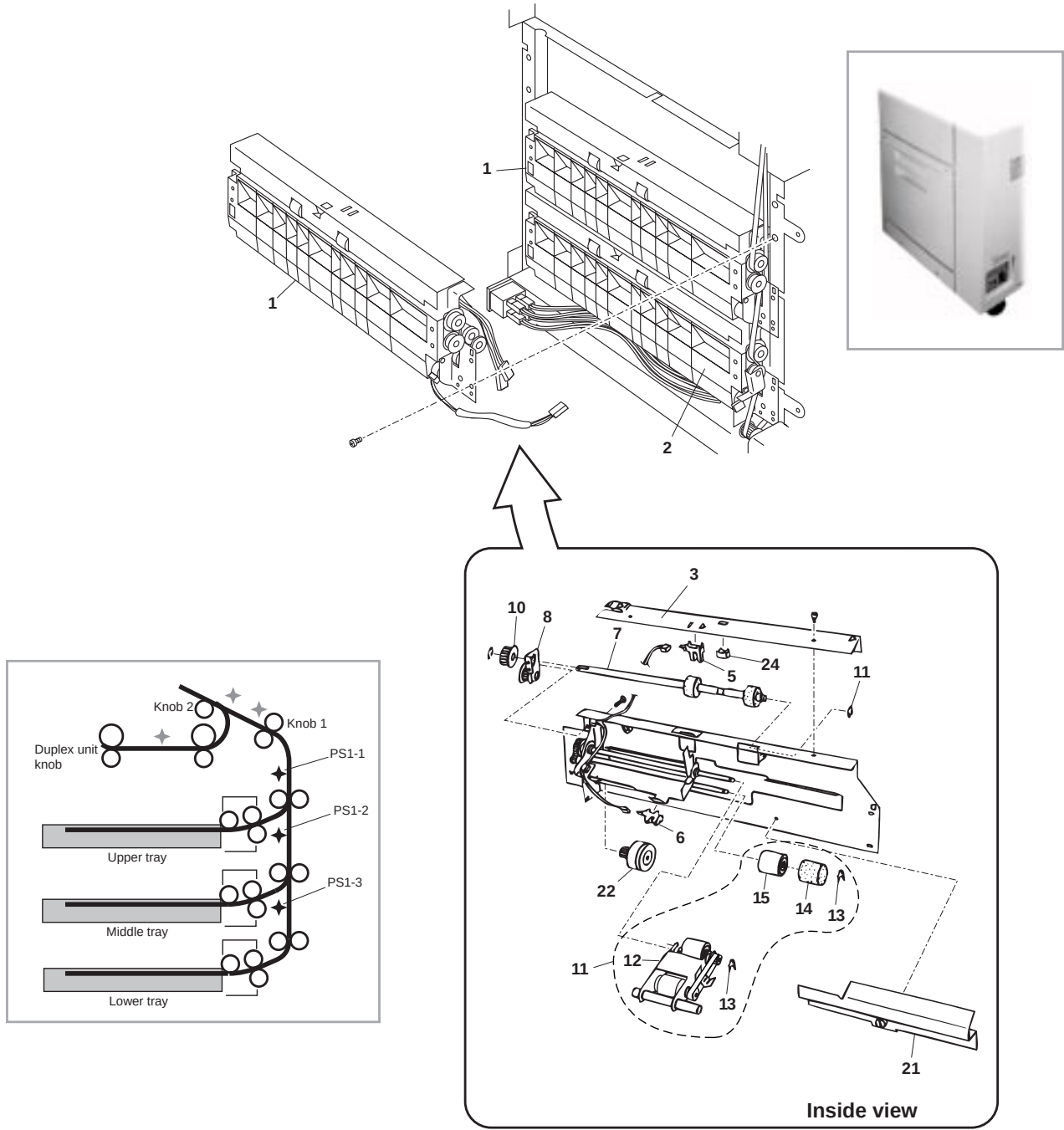
Figure 6-11 Paper Path Transport Assembly Diagram

6-6.11 Paper Feed Unit

Parts list for Paper Feed Unit. See [Figure 6-12](#).

Index No.	Qty	Part Number	Description	Remarks
1	2	CA02626-E330FJ	Paper feed unit 1 & 2	Upper/middle:E330. Replacement procedure: see 5-9.5 on page 5-94 .
2	1	CA02626-E331FJ	Paper feed unit 3	Lower:E331. Replacement procedure: see 5-9.5 on page 5-94 .
3	1		Guide	
5	1	B86L24100822AFJ	Sensor	Pick roller up
6	2	CA55003-1625FJ	Sensor, Paper Feed	Paper tray empty sensor. Replacement procedure: see 5-9.7 on page 5-100 .
7	1	CA02626-E312FJ	Roller assembly	
8	1		Plate H assembly	
10	1		Pulley H	
11	1	C5633A	Printer Pick Roller Kit	Consumable ^a . Includes the upper pick rollers, 4 plastic clips, and two lower pick rollers. Replacement procedure: see 5-5.7 on page 5-38 .
12	1		Upper pick rollers	Consumable ^a . Included in Printer Pick Roller Kit - C5633A
13	2		Plastic clip	Consumable ^a . Four plastic clips included in Printer Pick Roller Kit - C5633A
14	1		Lower pick roller	Consumable ^a .Included in Printer Pick Roller Kit - C5633A
15	1		Lower pick roller	Consumable ^a .Included in Printer Pick Roller Kit - C5633A
21	1		Plate	
22	1	CA55003-1620FJ	Motor	
24	1	CA55003-1625FJ	Sensor	PS1-1, PS1-2, PS1-3. Replacement procedure: see 5-9.7 on page 5-100 .

a. Printer pick rollers are consumables; they should be replaced by the customer upon failure.



6-6.12 Toner Hopper and Developer Units

Parts list for Toner Hopper and Developer Unit. See [Figure 6-13](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-E250FJ	Toner hopper	Replacement procedure: see 5-9.3 on page 5-90 .
2	1		Rack	
3	1		Motor	Toner hopper motor
4	1	CA55002-0338FJ	Sensor	Toner level sensor (ultrasonic)
5	1	CA02626-E210FJ	Sensor	Toner density sensor (magnetic)
6	1		Gear	
10	1	CA02626-E200FJ	Developer unit	Also order CA81218-G063FJ, single bottle of developer mixture. Replacement procedure: see 5-9.1 on page 5-86 .
11	1	CA04192-E002FJ	Developer Plate Kit	Includes front and rear developer plates, and mounting and stopper screws. Replacement procedure: see 5-9.2 on page 5-89 .

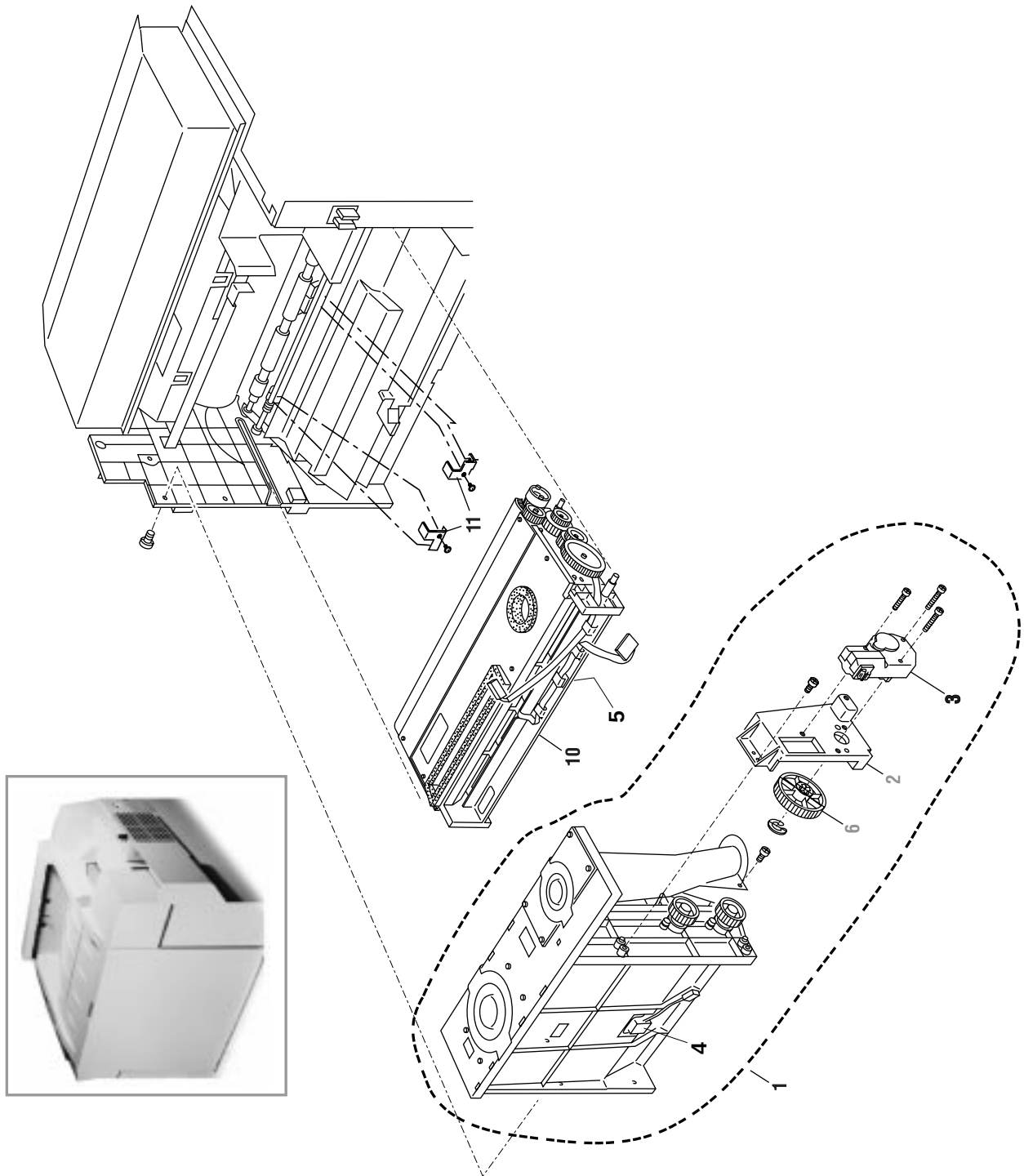


Figure 6-13 Toner Hopper and Developer Unit Diagram

6-6.13 Main Frame Assembly, Decurler, and Registration Rollers

Parts list for Main Frame Assembly. See [Figure 6-14](#) and [Figure 6-15](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-E122FJ	Decurler assembly	Replacement procedure: see 5-5.5 on page 5-34 .
2	1	B86L24100822AFJ	Sensor	PS4. Replacement procedure: see 5-9.10 on page 5-104 .
4	1	CA98001-6946FJ	Switch	Front door interlock switch. For a description, see 5-4.5 on page 5-19 .
5	1	CA02626-E125FJ	LED erase unit	Replacement procedure: see 5-5.3 on page 5-28 .
6	1	CA04192-E019FJ Star Roller Kit	Star roller LED cover	Clear plastic cover for LED erase unit containing star rollers. Part of Star Roller Kit that includes transfer assembly guide support (see 6-6.2 on page 6-8) and support block (see 6-6.5 on page 6-14 .)
7	1		Roller	
8	2		Bearing	
9	1		Gear	
11	1	CA02626-E142FJ	Switch	Not present in later serial number printers
13	1	CA98001-6946FJ	Switch	Upper right cover interlock switch. For a description, see 5-4.8 on page 5-22 .
14	1	CA02626-E147FJ	Upper Registration roller assembly	Black rollers. Replacement procedure: see 5-9.13 on page 5-108 .
15	3		Brass bearing	
16	2		Knob	
20	1	B86L24100880AFJ	Clutch	Registration roller standby clutch. Replacement procedure: see 5-7.2 on page 5-51 .
21	1	CA02626-E133FJ	Lower transport roller	Replacement procedure: see 5-9.12 on page 5-106 .
22	1		Bearing	
23	1		Pulley H	
24	1		Upper transport roller	Replacement procedure: see 5-9.12 on page 5-106 .

Parts list for Main Frame Assembly. See [Figure 6-14](#) and [Figure 6-15](#).

Index No.	Qty	Part Number	Description	Remarks
25	2		Springs	Mounting springs for upper transport roller
27	2	CA55003-1627FJ	Sensor	PS2, PS3. Replacement procedure: see 5-9.8 on page 5-102 or 5-9.9 on page 5-103 .
28	1		Cover assembly	
	1	CA02626-E142FJ	Switch	Not shown. Microswitch indicating developer bottle in place. For a description, see 5-4.1 on page 5-15 .
32	1		Plate	
33	1		Plate spring	
35	1		Bearing	
36	1	CA02626-E118FJ	Lower registration roller	White roller and brackets. Replacement procedure: see 5-9.14 on page 5-110 .

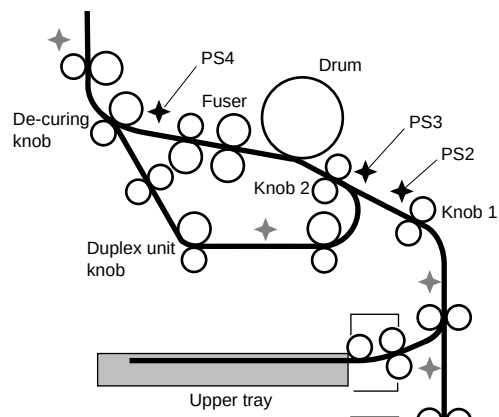


Figure 6-14 PS2, PS3, and PS4 Positioning

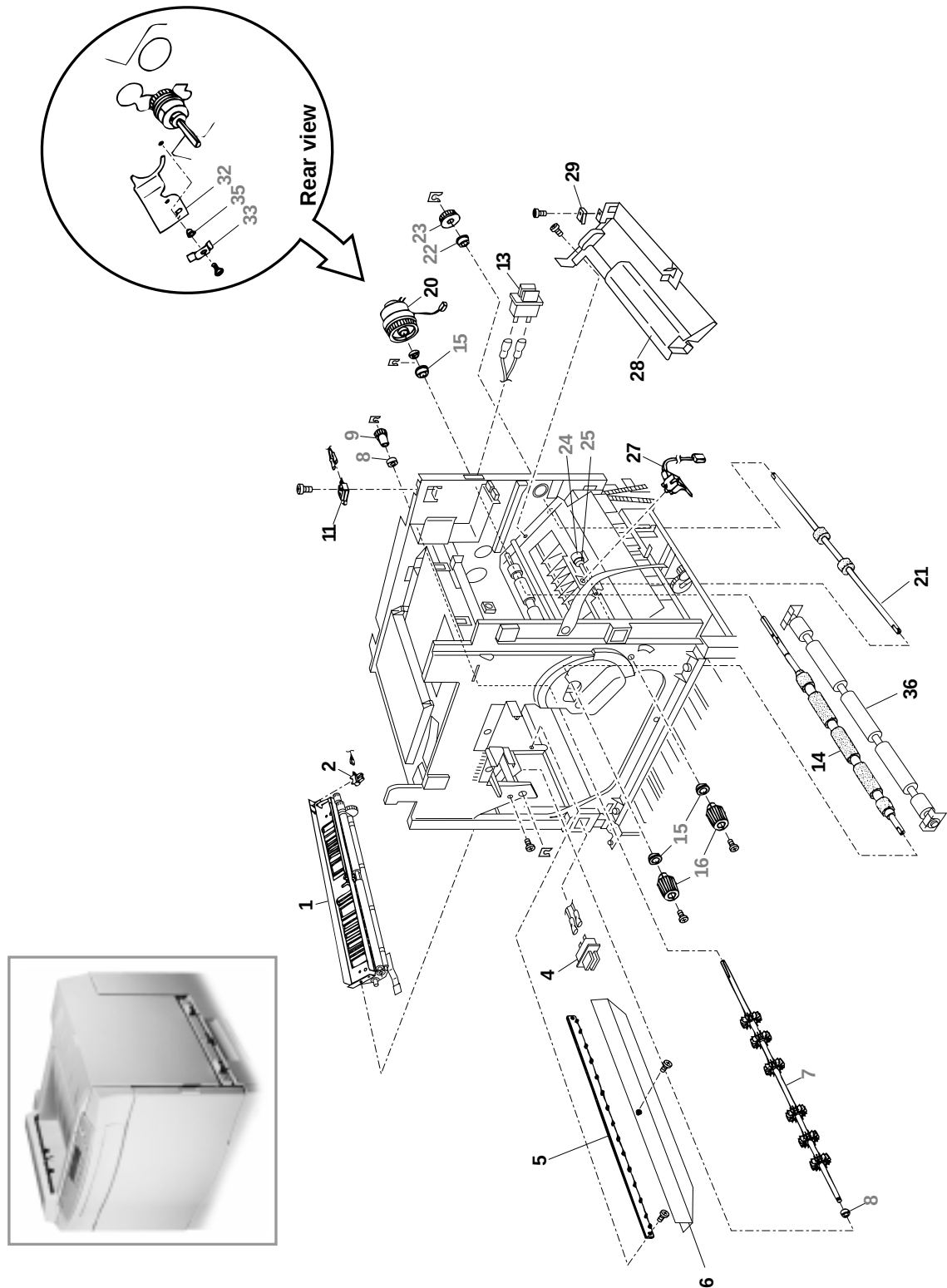


Figure 6-15 Main Frame Assembly Diagram

6-6.14 Drive M Unit and Waste Toner Unit

Parts list for Drive M Unit. See [Figure 6-16](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-E732FJ	Drive M unit sub assembly	Does not include waste toner unit. Includes drum installed microswitch. Replacement procedure: see 5-7.10 on page 5-64
4	1	CA02626-E715FJ	Fan	Fan 2. Replacement procedure: see 5-7.9 on page 5-63 .
5	1	CA02626-E716FJ	Fan	Fan 4. Replacement procedure: see 5-7.9 on page 5-63 .
6	1	CA02626-E142FJ	Switch	Drum Installed microswitch. For a description, see 5-4.3 on page 5-17 .
8	1	CA02626-E718FJ	Fan	Fan 7. Replacement procedure: see 5-7.8 on page 5-62 .
9	1		Finger guard	
13	1	B86L24100822AFJ	Sensor	Waste toner screw sensor. Replacement procedure: see 5-7.13 on page 5-74 .
16	1		Spring	
17	1	CA98001-6947FJ	Switch	Fuser Installed switch
25	1	CA02626-E734FJ	Waste toner unit	Replacement procedure: see 5-7.12 on page 5-70 .

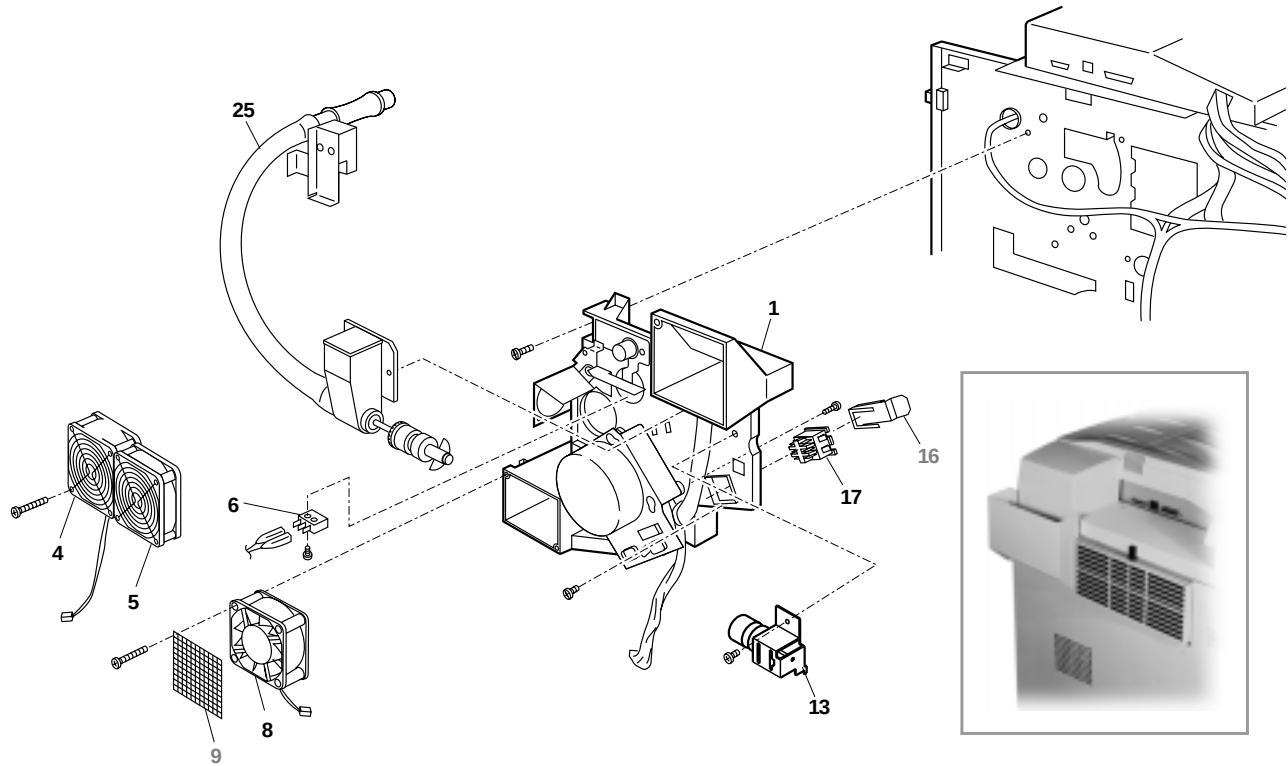


Figure 6-16 Drive M Unit Diagram

6-6.15 Mechanism Controller, Power Supplies, and Fans

Parts list for Mechanism Controller, High Voltage Power Supply (HVPS), Low Voltage Power Supply (LVPS), and LVPS Fan. See [Figure 6-17](#).

Index No.	Qty	Part Number	Description	Remarks
			Wire harness	Wire harnesses are described separately: • 6-6.17 "Mechanism Controller Wire Harnesses," on page 6-40 • 6-6.18 "Main Controller Wire Harnesses," on page 6-42 • 6-6.19 "High Voltage PS and Low Voltage PS Wire Harnesses," on page 6-44
1	1		Metal fitting	
2	1	CA02626-E044FJ	Mechanism controller board	Replacement procedure: see 5-7.3 on page 5-52 .
3	1	CA02626-E035FJ	EPROM	Master firmware - L43 version
4	1	CA02626-E038FJ	EPROM	Slave Firmware Kit
5	1	CA02626-E045FJ	EEPROM	NVRAM
10	1	CA04192-E034FJ	High voltage power supply (Upgrade Kit)	Includes current-controlled HVPS, +HV cable, -HV cable, and ACH cable.. Replacement procedure: see 5-7.6 on page 5-59 . Includes firmware and instructions. See Alert Bulletin #30.
12	1	CA02951-3631FJ	Low voltage power supply unit	Replacement procedure: see 5-7.4 on page 5-56 .
14	1	CA02626-E159FJ	Fan	Fan 5. Replacement procedure: see 5-7.5 on page 5-58 .
15	1		Finger guard	
17	2	CA98001-6948FJ	Relay	

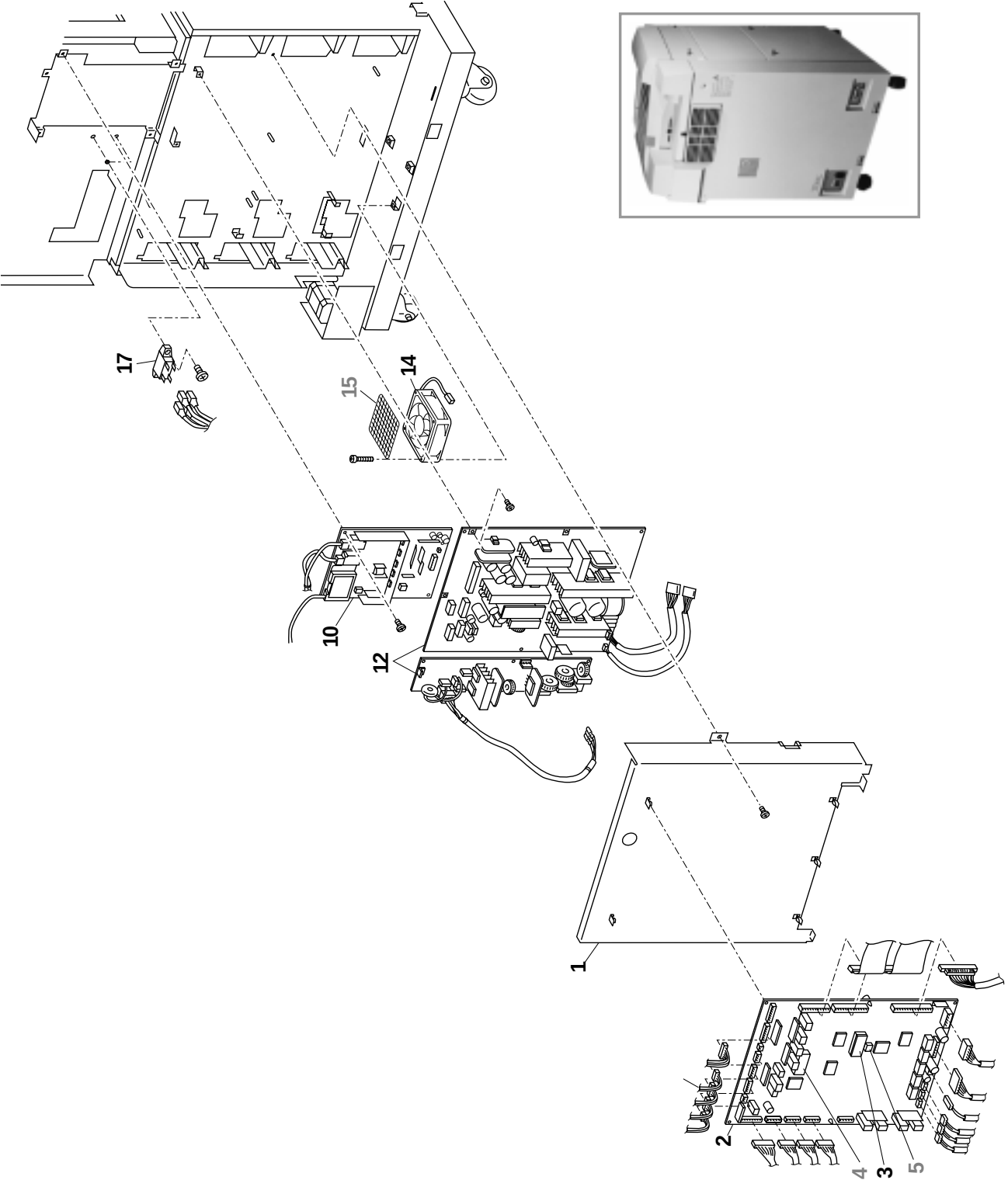


Figure 6-17 Mechanism Controller, Power Supplies, and Fans Diagram

6-6.16 Drive D Unit Motor, Drive E Unit, Drive E Unit Belt

Parts list for Drive D Unit Motor, Drive E Unit, and Drive Unit E Belt.
See [Figure 6-18](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02626-E660FJ	Drive E unit	Replacement procedure: see 5-7.14 on page 5-76 .
2	1	CA98001-6942FJ	Belt	Drive E belt
4	1	CA02626-F600FJ	Drive D unit	Replacement procedure: see 5-7.1 on page 5-50 . Includes developer shutter closed microswitch
7	1	CA02626-E142FJ	Switch	Developer shutter closed microswitch. For a description, see 5-4.2 on page 5-16 .

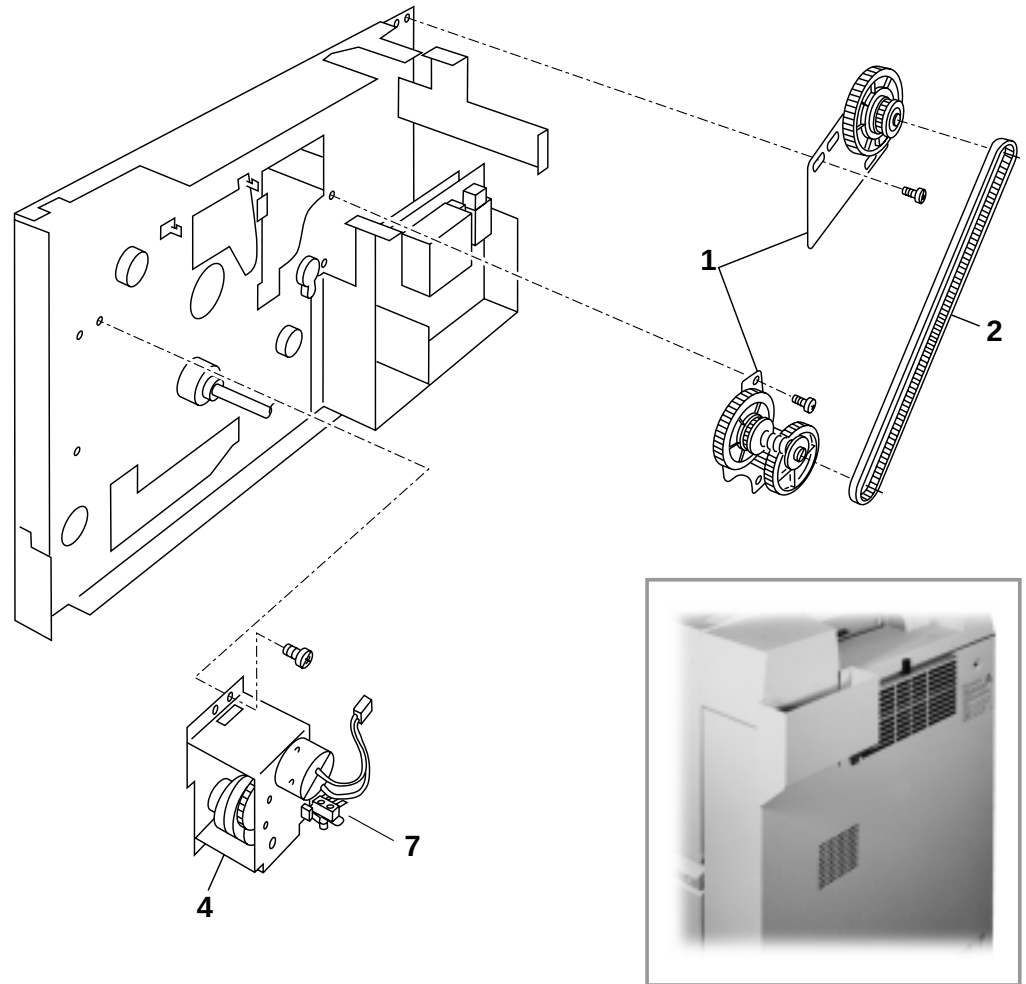


Figure 6-18 Drive D Unit Motor, Drive E Unit, and Belt Diagram

6-6.17 Mechanism Controller Wire Harnesses

Parts list for Mechanism Controller Wire Harnesses. See [Figure 6-19](#).

Connector	Part Number	Description	Remarks
CN1	CA02626-E320FJ	Wire harness	Developer/Toner Hopper/Drive D Harness
CN2	CA02626-E322FJ	Wire harness	Tray 1 feed unit harness: Pick motor, pick roller up sensor, pick sensor, empty sensor
CN3	CA02626-E322FJ	Wire harness	Tray 2 feed unit harness: Pick motor, pick roller up sensor, pick sensor, empty sensor
CN4	CA02626-E322FJ	Wire harness	Tray 3 feed unit harness: Pick motor, pick roller up sensor, pick sensor, empty sensor
CN5		Wire harness	Tray detection sensors
CN6	CA71001-2685FJ	Cable	Feed/Lift motors
CN7		Wire harness	HCI
CN8		Wire harness	Low voltage power supply
CN9		Wire harness	Low voltage power supply
CN10		Wire harness	Low voltage power supply
CN11		Wire harness	Optical unit/Low voltage power supply
CN12	CA71001-2859FJ	Cable	HCO
CN13		Wire harness	External port - for future use
CN14	CA71002-1841FJ	Wire harness	Main controller
CN15	CA71001-2655FJ	Wire harness	Optical unit
CN16	CA71001-2654FJ	Wire harness	High voltage power supply
CN17	n/a	n/a	Not used
CN18		Wire harness	HCO sensors/Switch-back motor
CN19	n/a	n/a	Not used
CN20	CA02626-E850FJ	Wire harness	Duplex
CN21		Wire harness	Fuser/drive M unit - main motor
CN22		Wire harness	Fans
CN23		Wire harness	Discharge LED/PS2, 3, 4

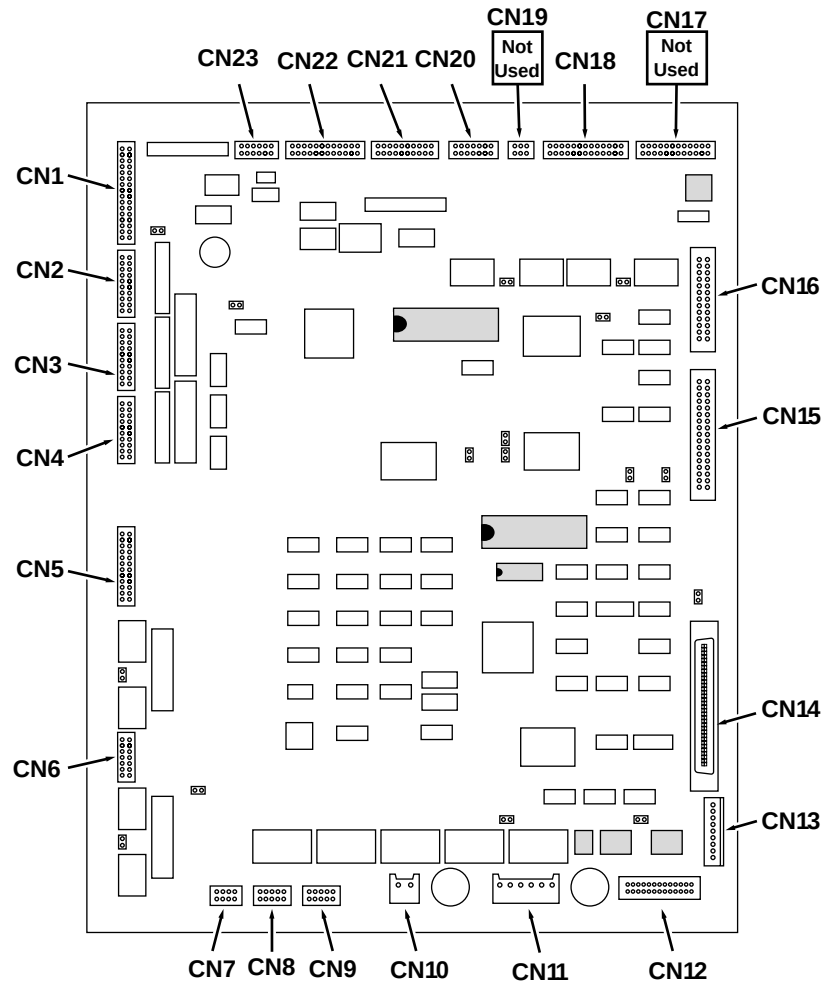


Figure 6-19 Mechanism Controller Connectors Diagram

6-6.18 Main Controller Wire Harnesses

Parts list for Main Controller Wire Harnesses. See [Figure 6-20](#).

Connector	Part Number	Description	Remarks
CN01			Low voltage power supply
CN02	CA71002-1841FJ	Wire harness	Mechanism controller
INFO			Optical unit
CNO3			Control panel
CN14			Low voltage power supply
FDD			Floppy drive
HDD			Hard disk

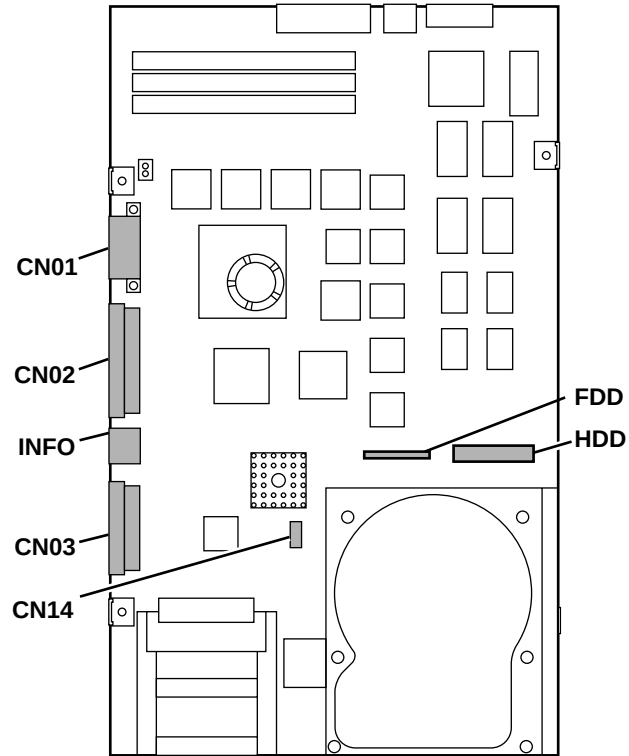


Figure 6-20 Main Controller Connectors Diagram

6-6.19 High Voltage PS and Low Voltage PS Wire Harnesses

Parts list for High Voltage Power Supply and Low Voltage Power Supply Wire Harnesses. See [Figure 6-21](#) and [Figure 6-22](#).

Connector	Part Number	Description	Remarks
Low Voltage Power Supply			
CN1		Wire harness	Mechanism controller
CN2		Wire harness	Mechanism controller
CN3		Wire harness	HCI/Mechanism controller
CN4		Wire harness	Fuser unit
CN5		Wire harness	Main controller
CN6		Wire harness	Control panel
CN7		Wire harness	+12V
CN8		Wire harness	
CN10		Wire harness	RL1 and RL2
CNFAN1		Wire harness	Fan 4
CNFAN2		Wire harness	Fan 5
CB1		Wire harness	
CB2		Wire harness	
ACIN		Wire harness	AC power switch
High Voltage Power Supply			
ACH		Cable	Transfer charger. Included in HV Calbe Kit - CA02626-E061FJ. Included with high voltage power supply - CA02951-3621
+HV		Cable	Transfer charger. Included in HV Calbe Kit - CA02626-E061FJ. Included with high voltage power supply - CA02951-3621
	CA02626-E061FJ	HV Cable Kit	Includes ACH and +HV cables
-HV		Cable	Precharger. Included with high voltage power supply - CA02951-3621
VB		Cable	Developer unit
CN1	CA71001-2654FJ	Wire harness	Mechanism controller
CNDC		Wire harness	Low voltage power supply

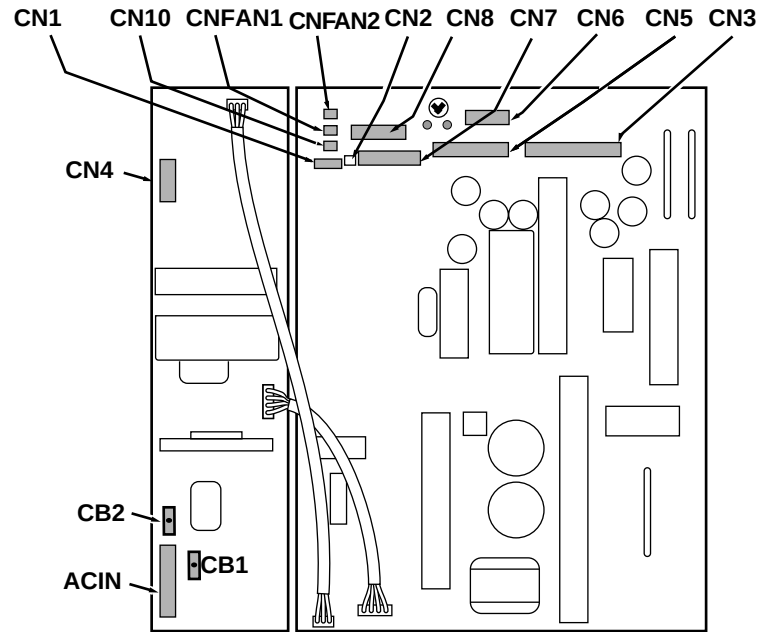


Figure 6-21 LVPS Connectors Diagram

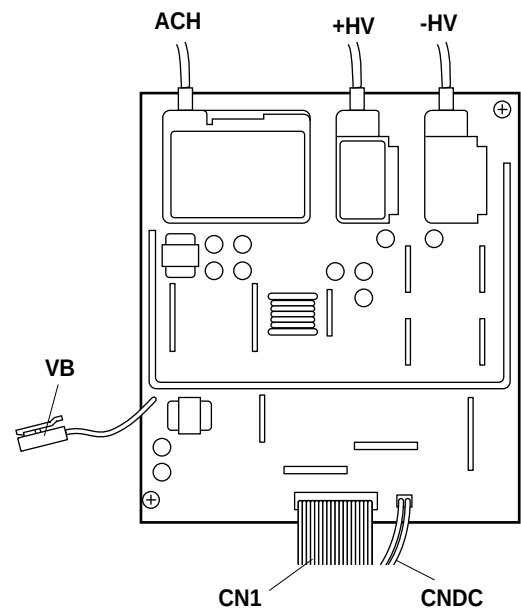


Figure 6-22 HVPS Connectors Diagram

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Reference Diagrams

Appendix A contains:

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A-2 Printer Component Block Diagram A-20
A-3 Printer Power Diagrams A-24
A-4 Power-on Sequence Timing Chart A-28

A-1 Printer Wiring Diagrams

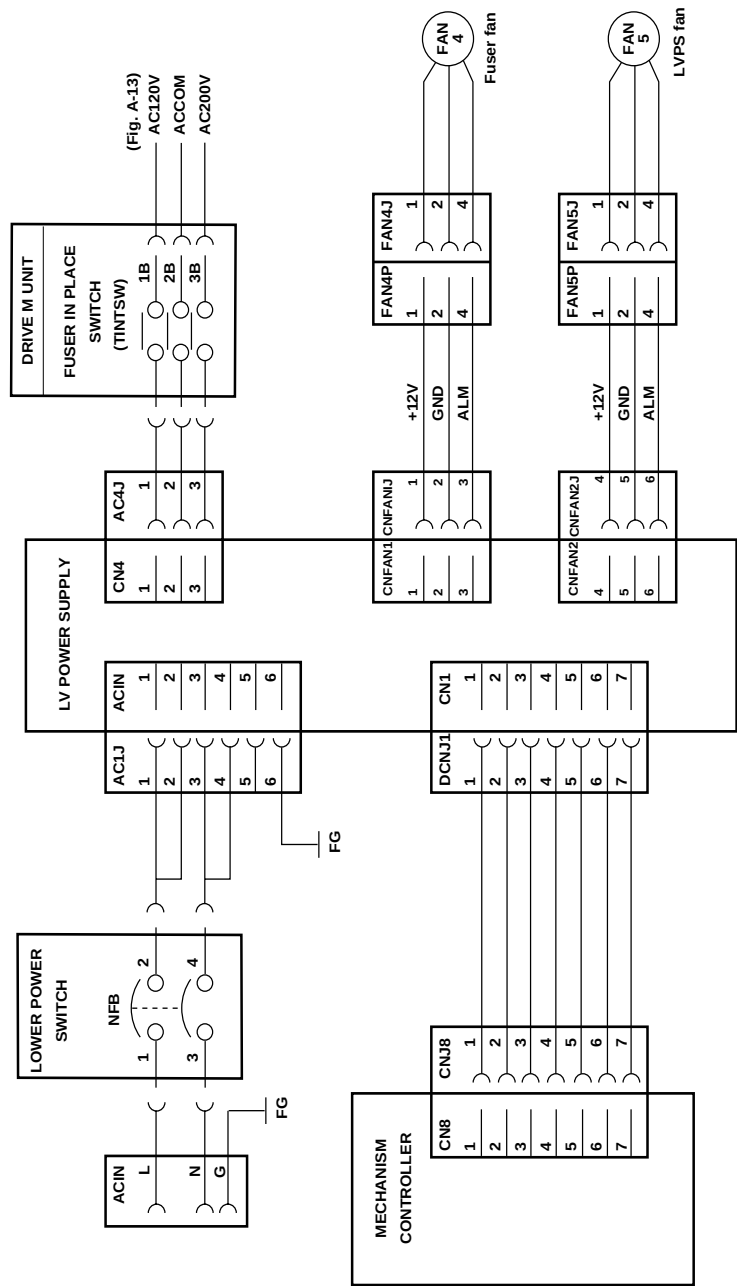


Figure A-1 Printer Wiring Diagram (1 of 18)

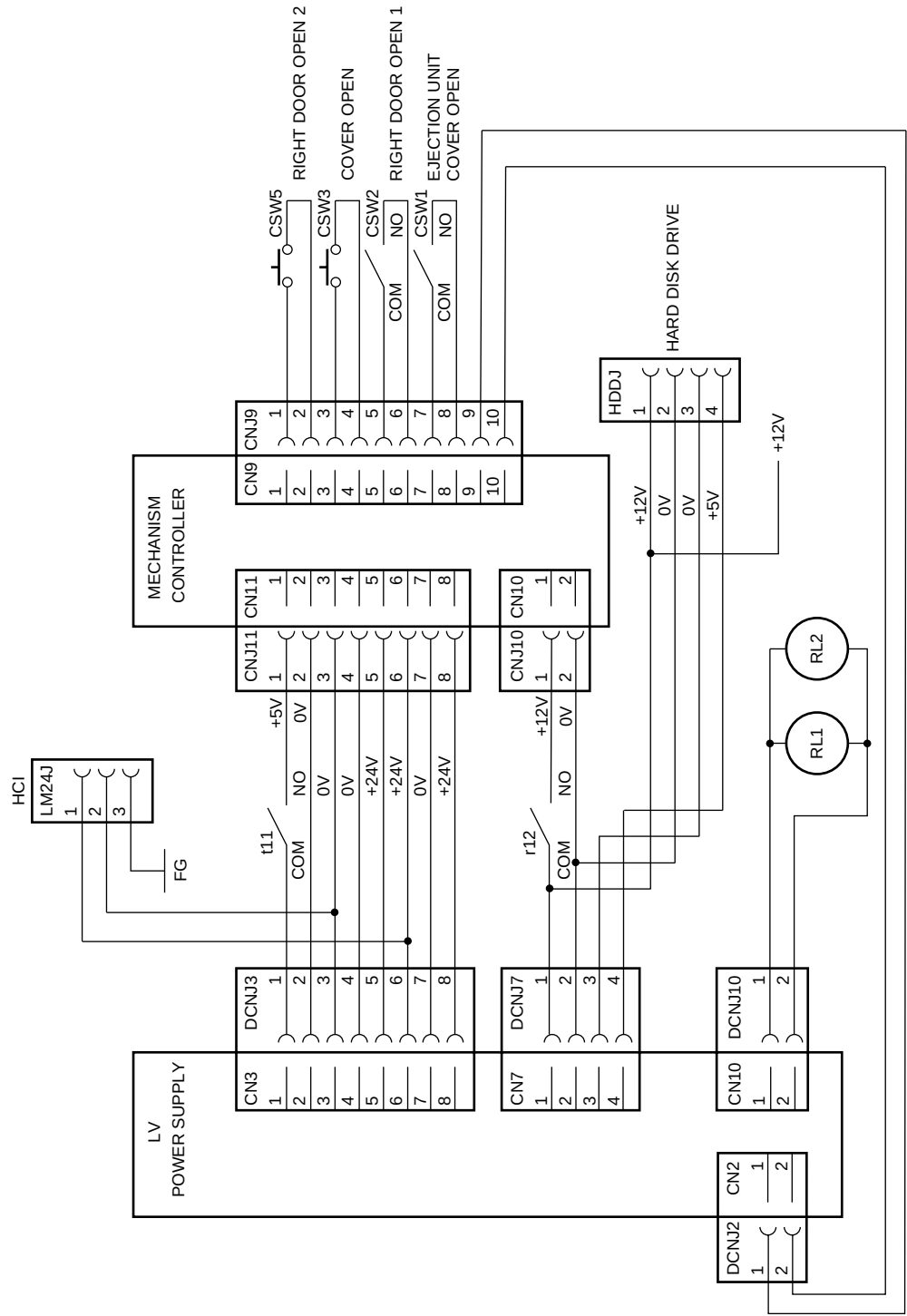


Figure A-2 Printer Wiring Diagram (2 of 18)

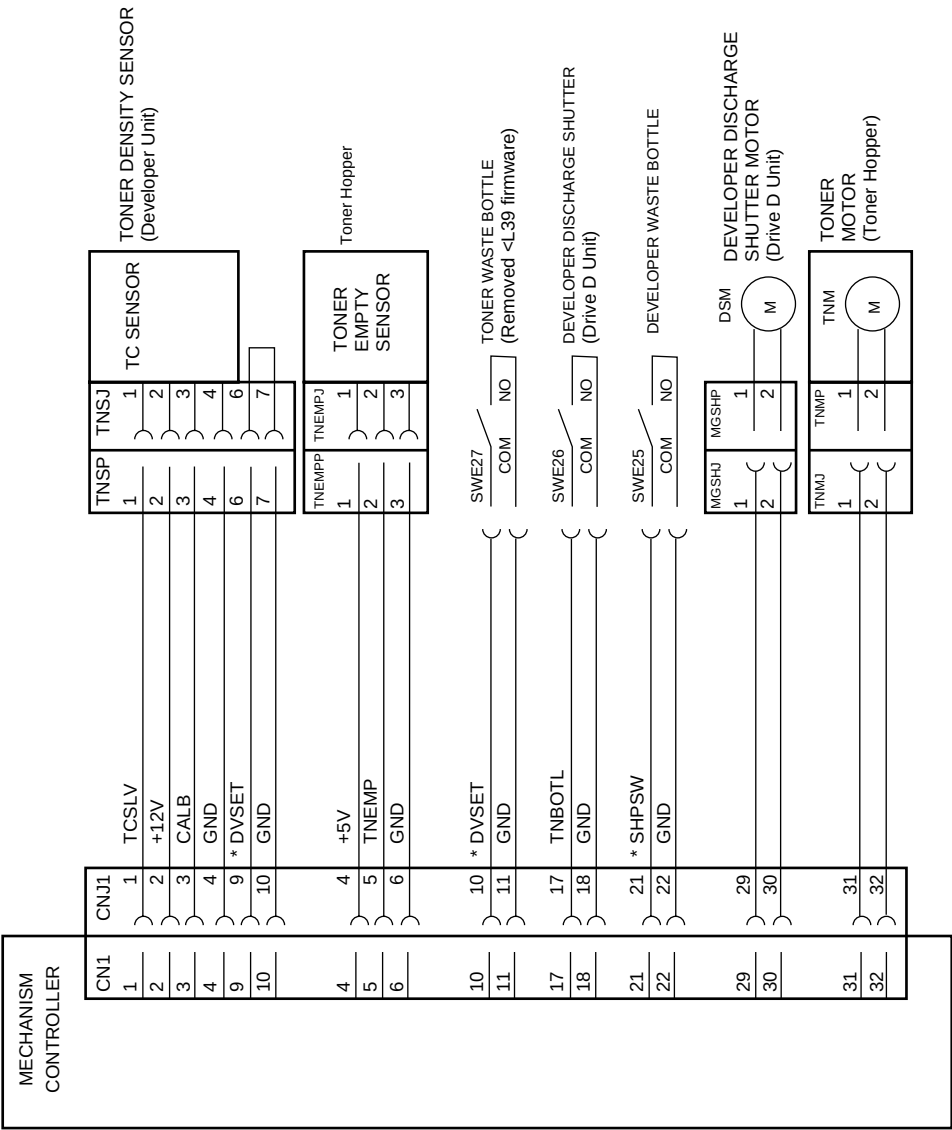


Figure A-3 Printer Wiring Diagram (3 of 18)

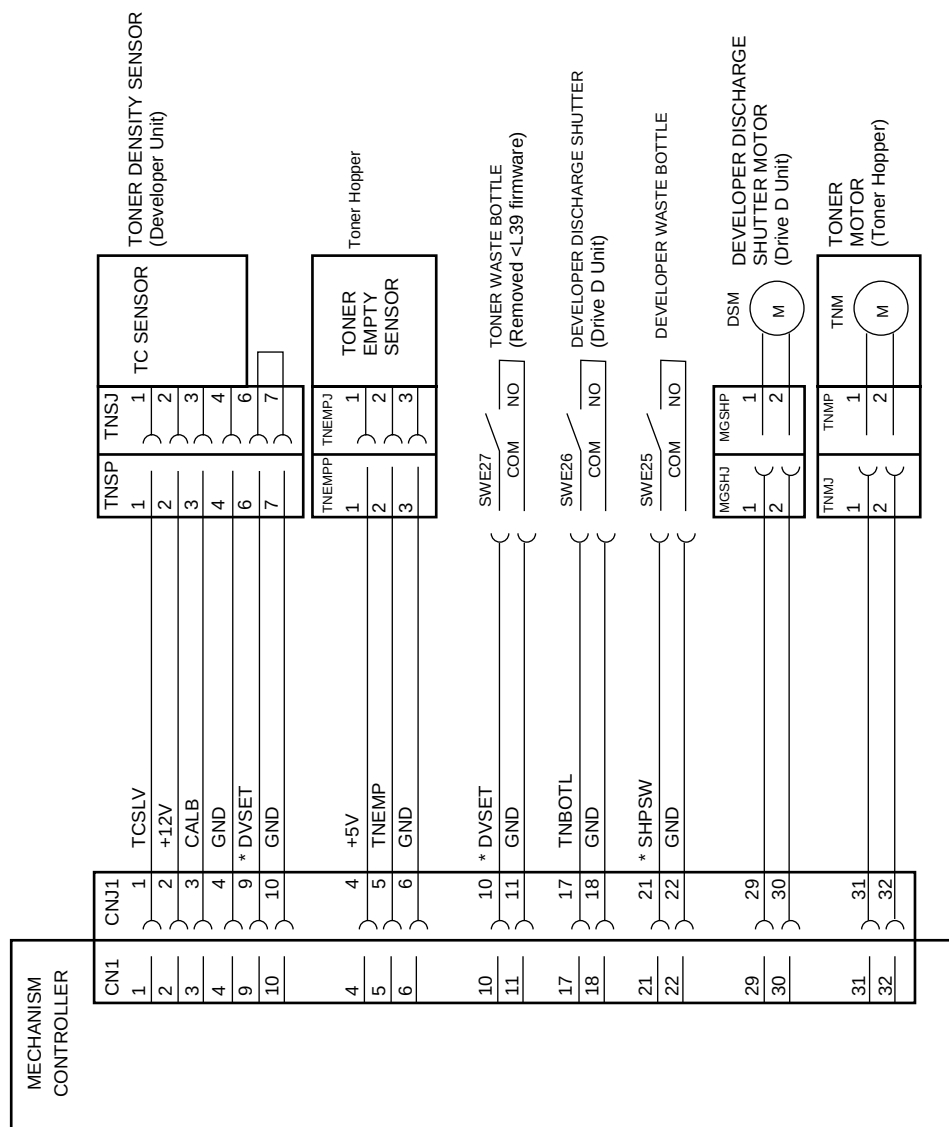


Figure A-4 Printer Wiring Diagram (4 of 18)

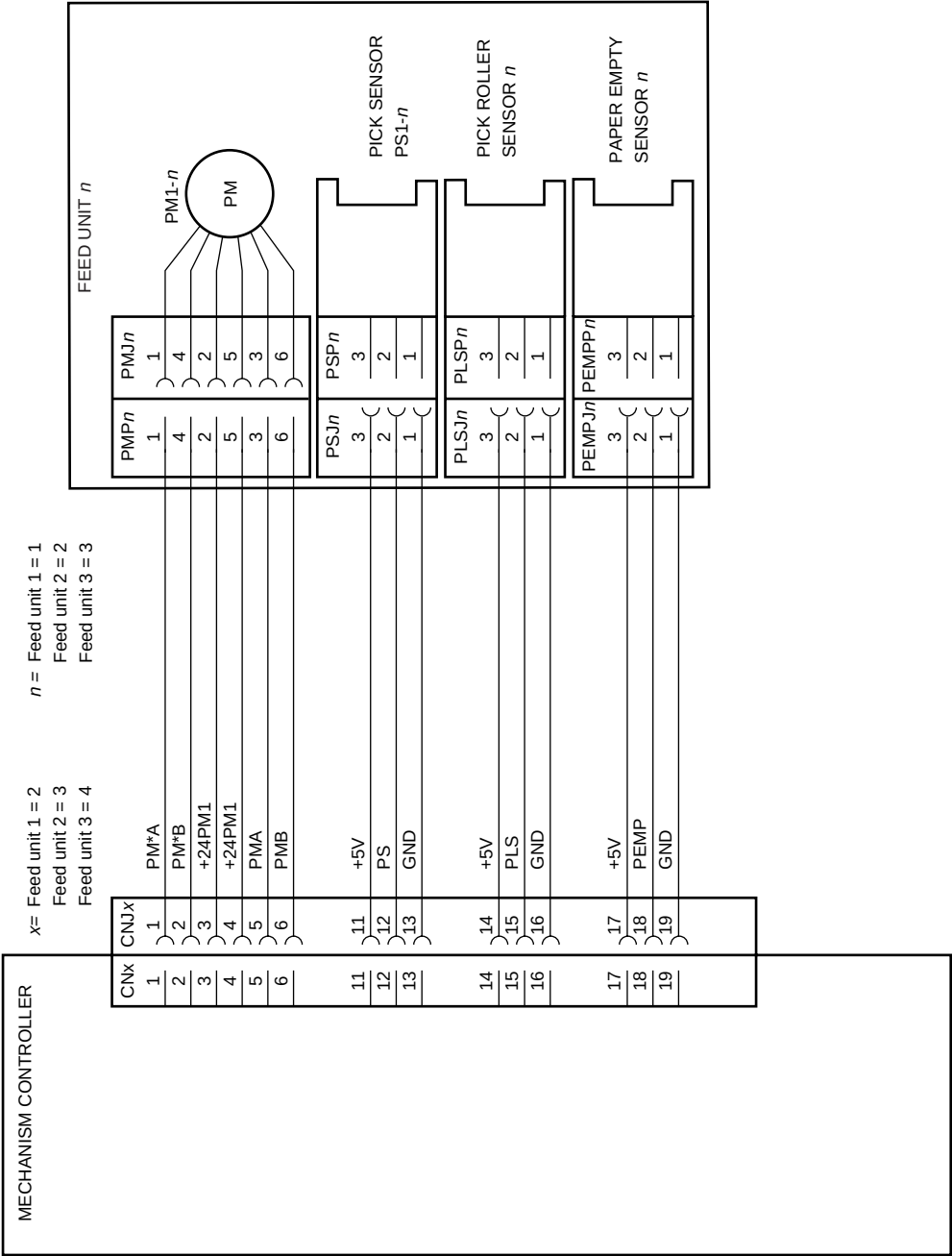


Figure A-5 Printer Wiring Diagram (5 of 18)

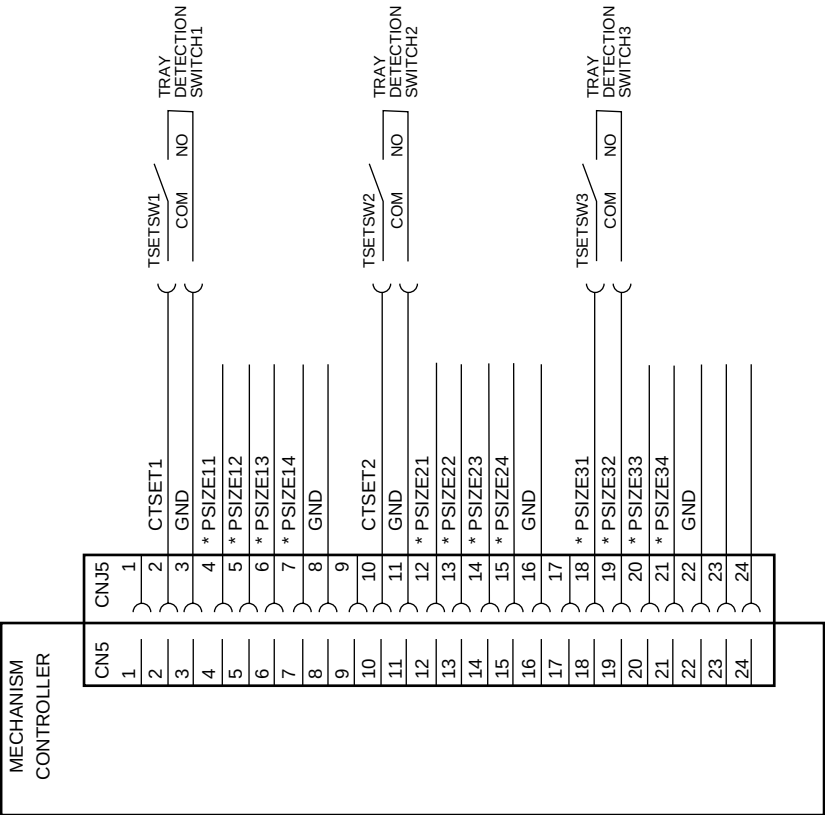


Figure A-6 Printer Wiring Diagram (6 of 18)

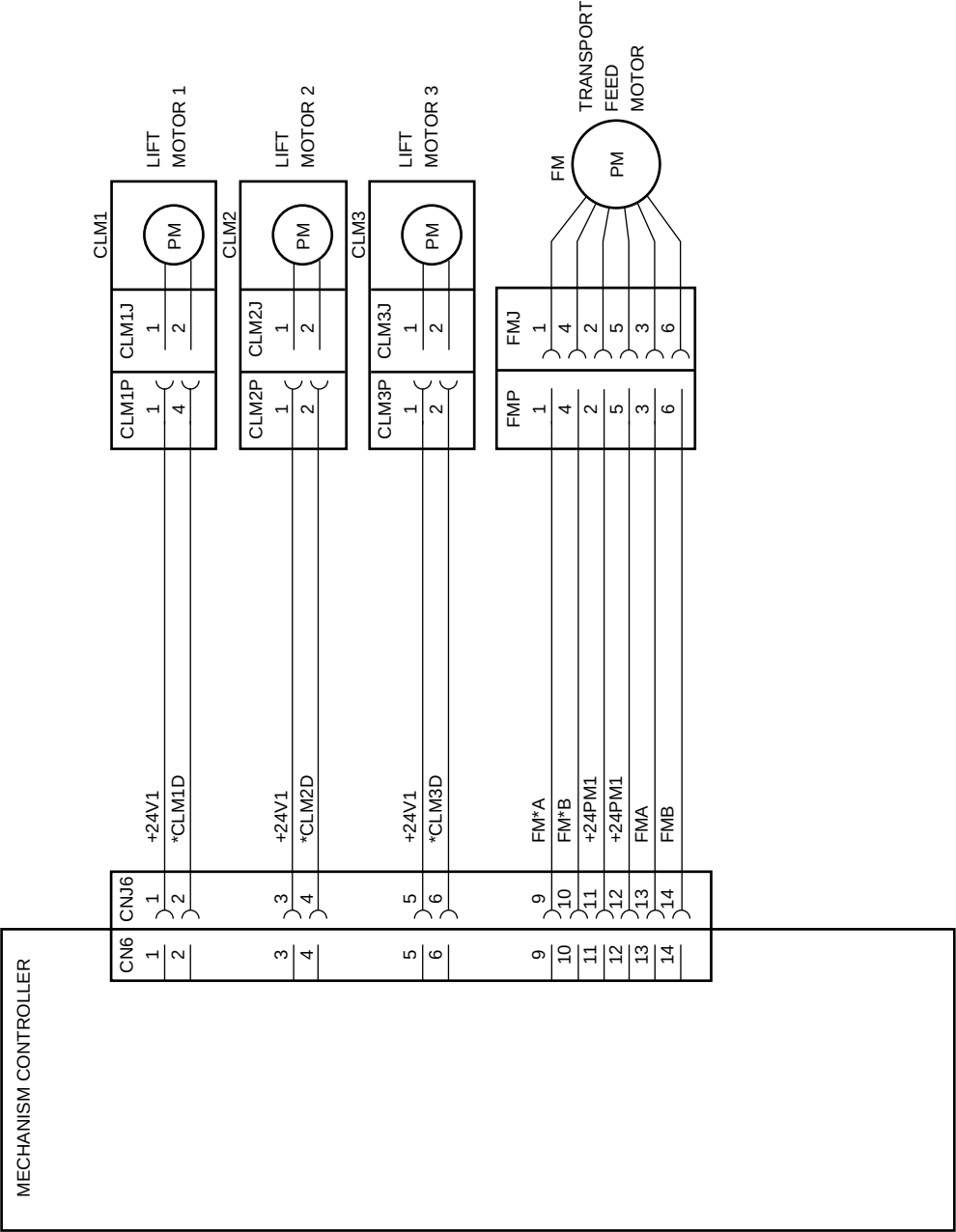


Figure A-7 Printer Wiring Diagram (7 of 18)

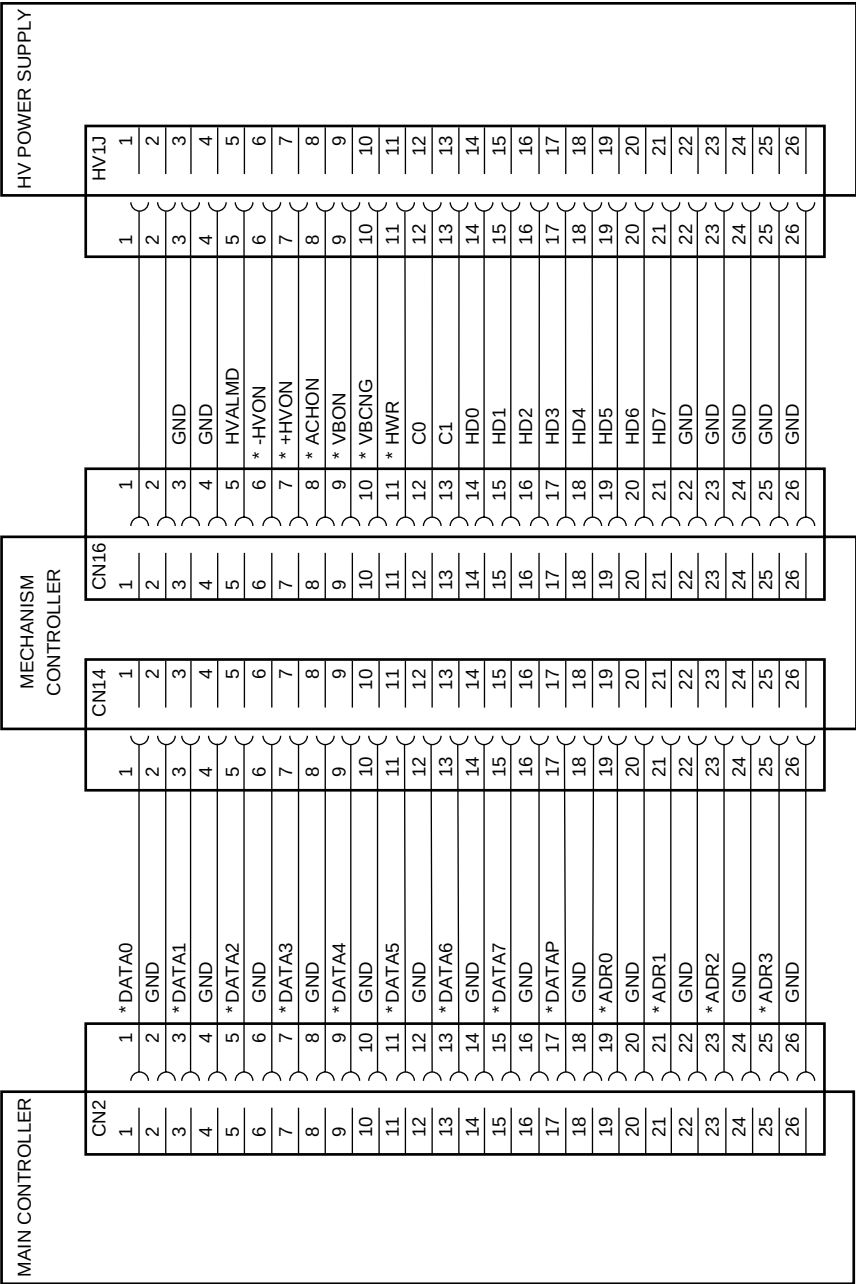


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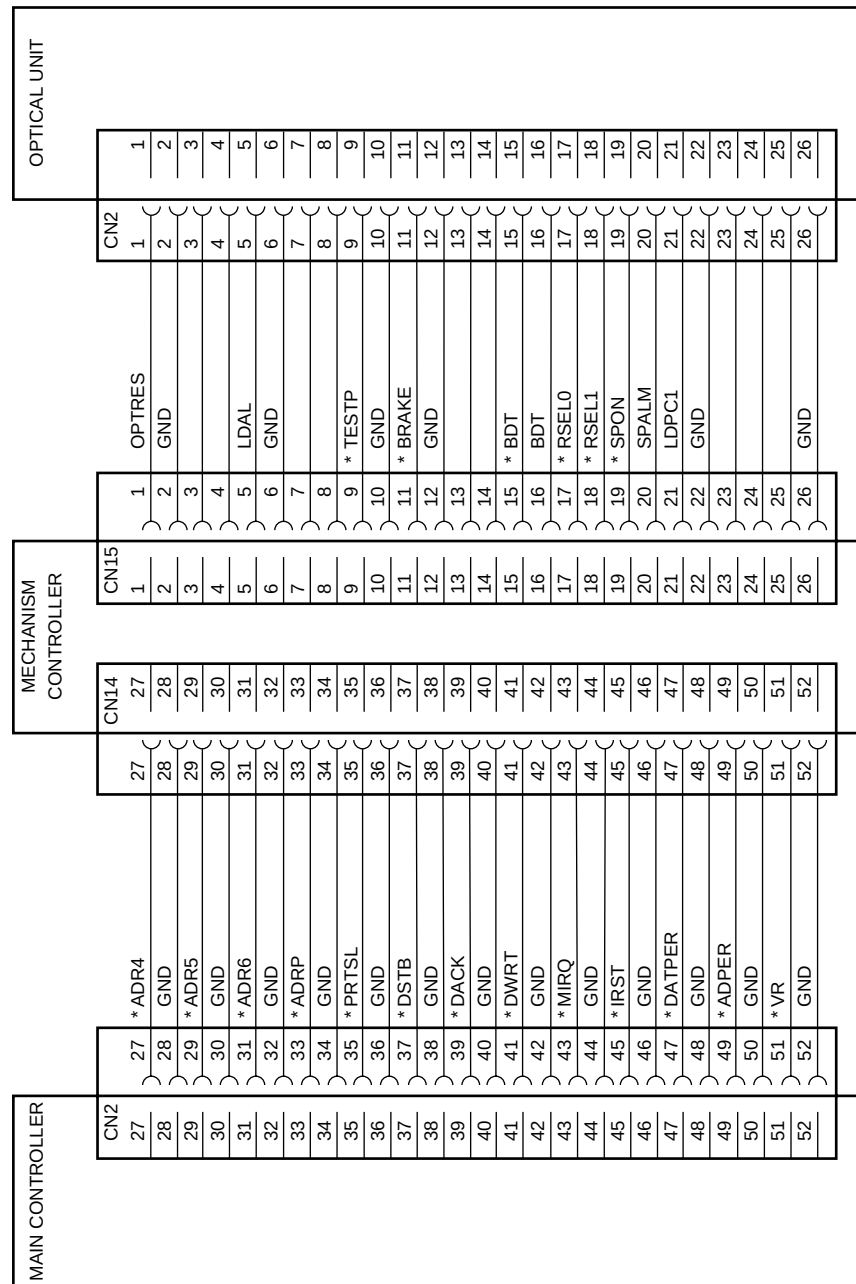


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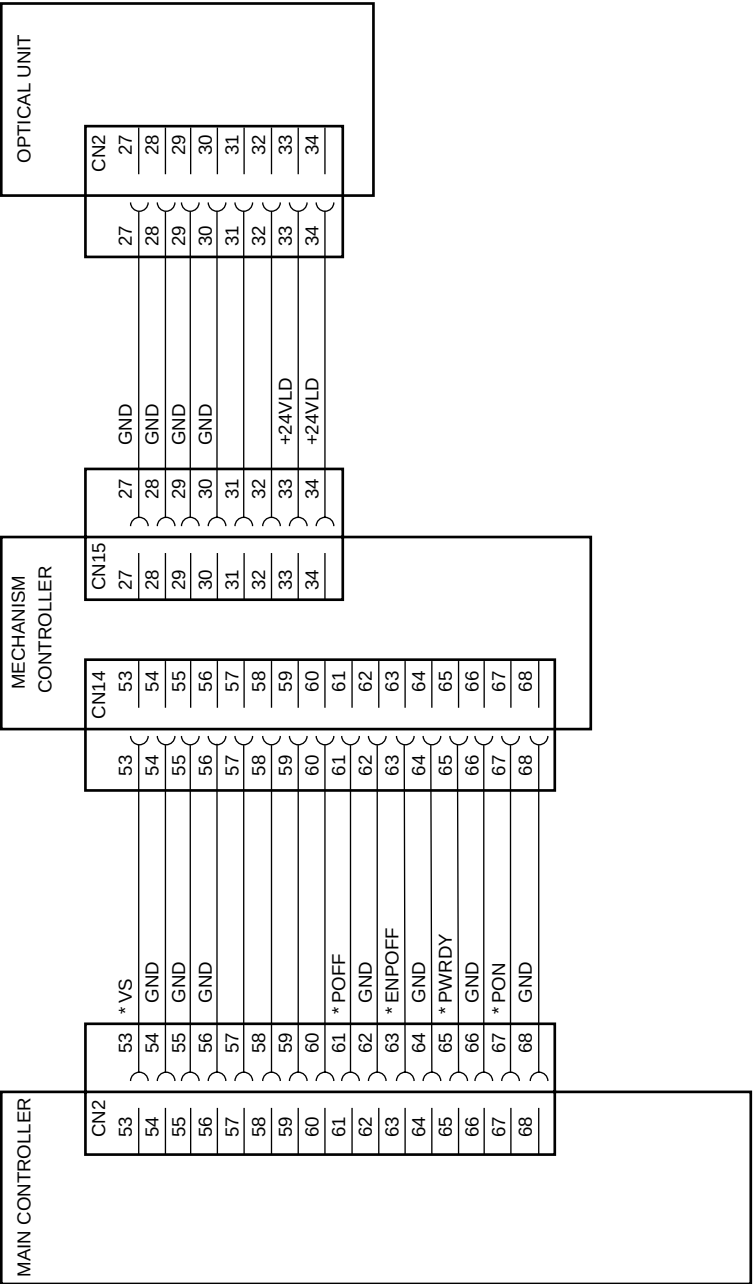


Figure A-10 Printer Wiring Diagram (10 of 18)

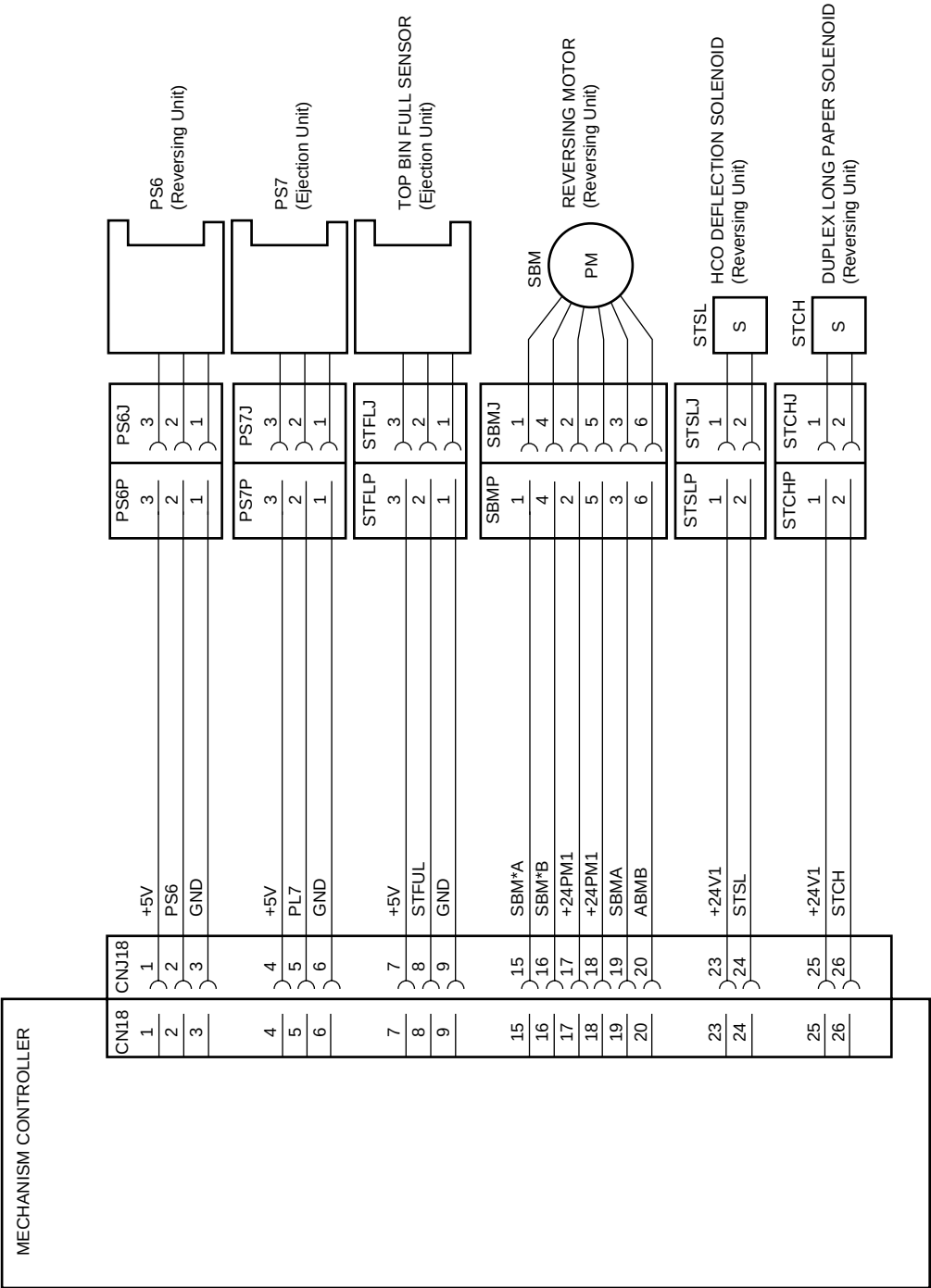


Figure A-11 Printer Wiring Diagram (11 of 18)

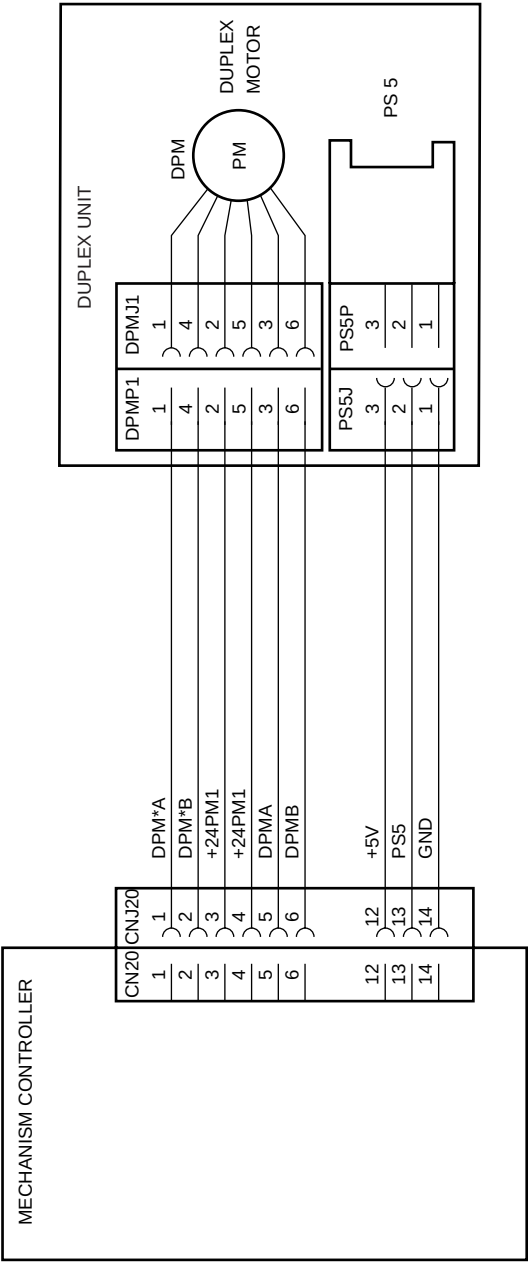


Figure A-12 Printer Wiring Diagram (12 of 18)

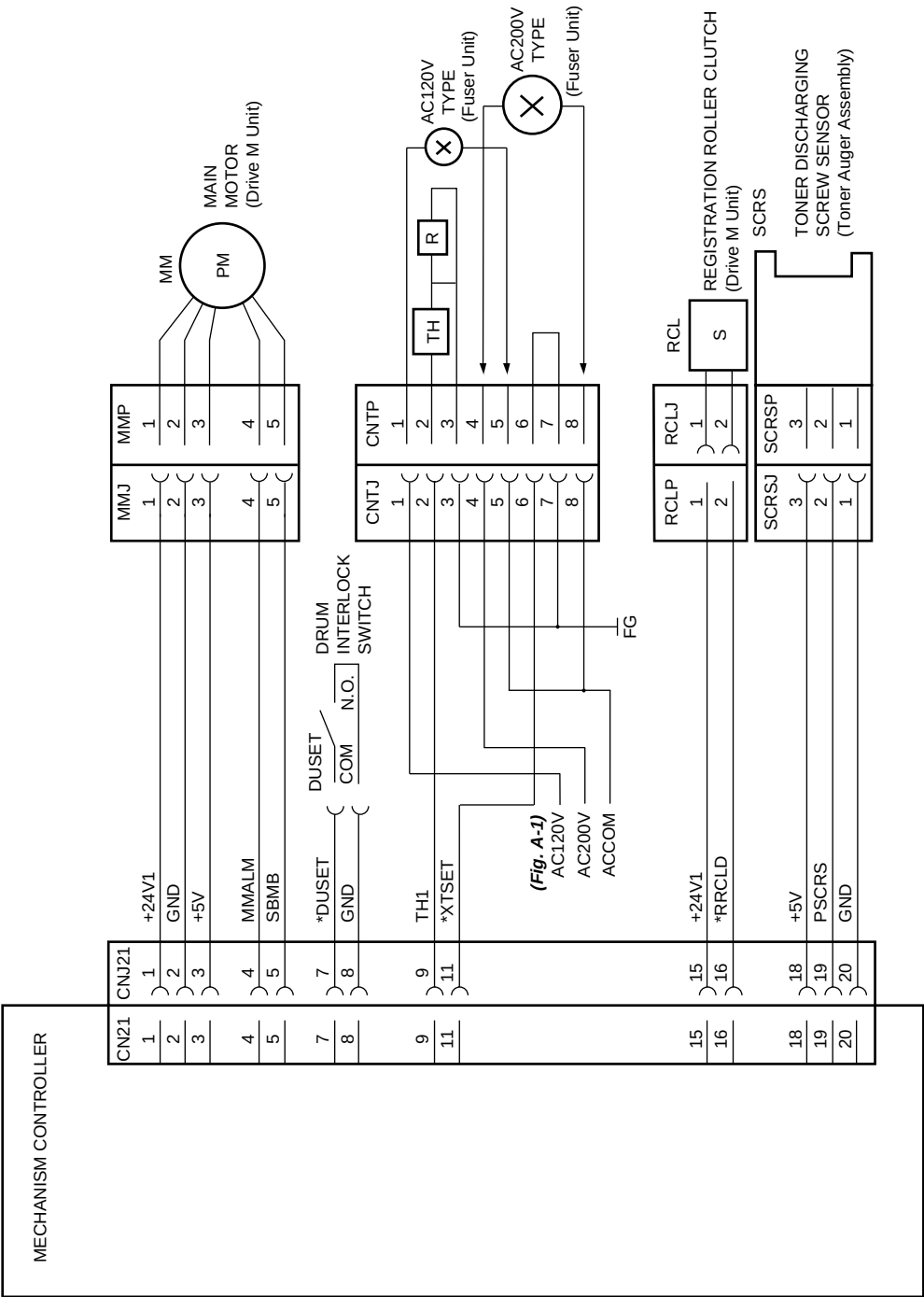


Figure A-13 Printer Wiring Diagram (13 of 18)

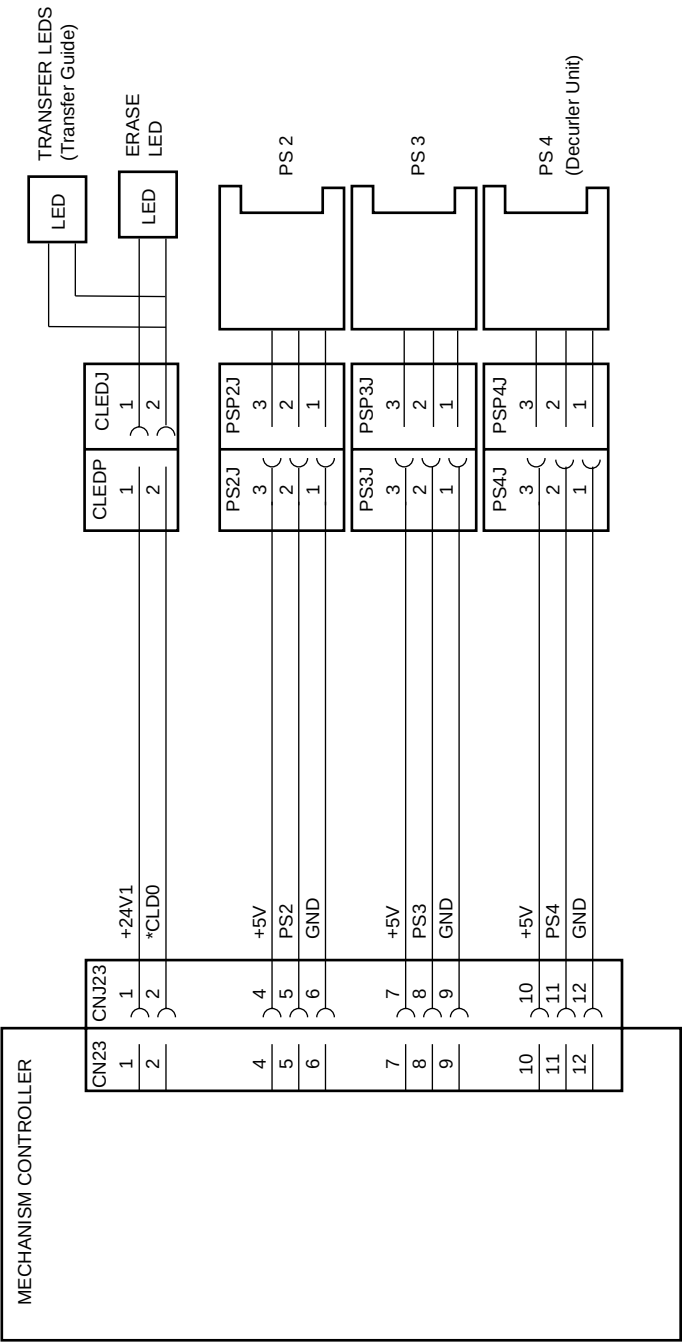


Figure A-14 Printer Wiring Diagram (14 of 18)

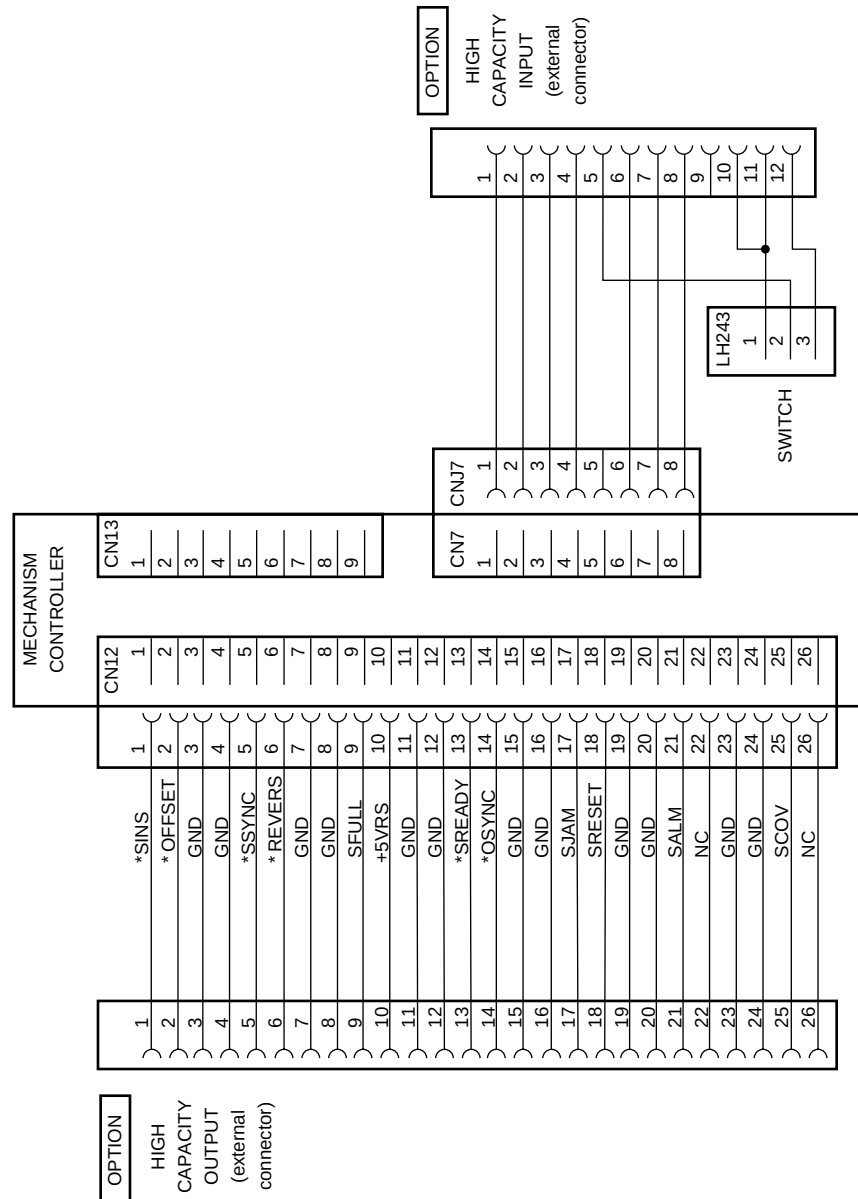


Figure A-15 Printer Wiring Diagram (15 of 18)

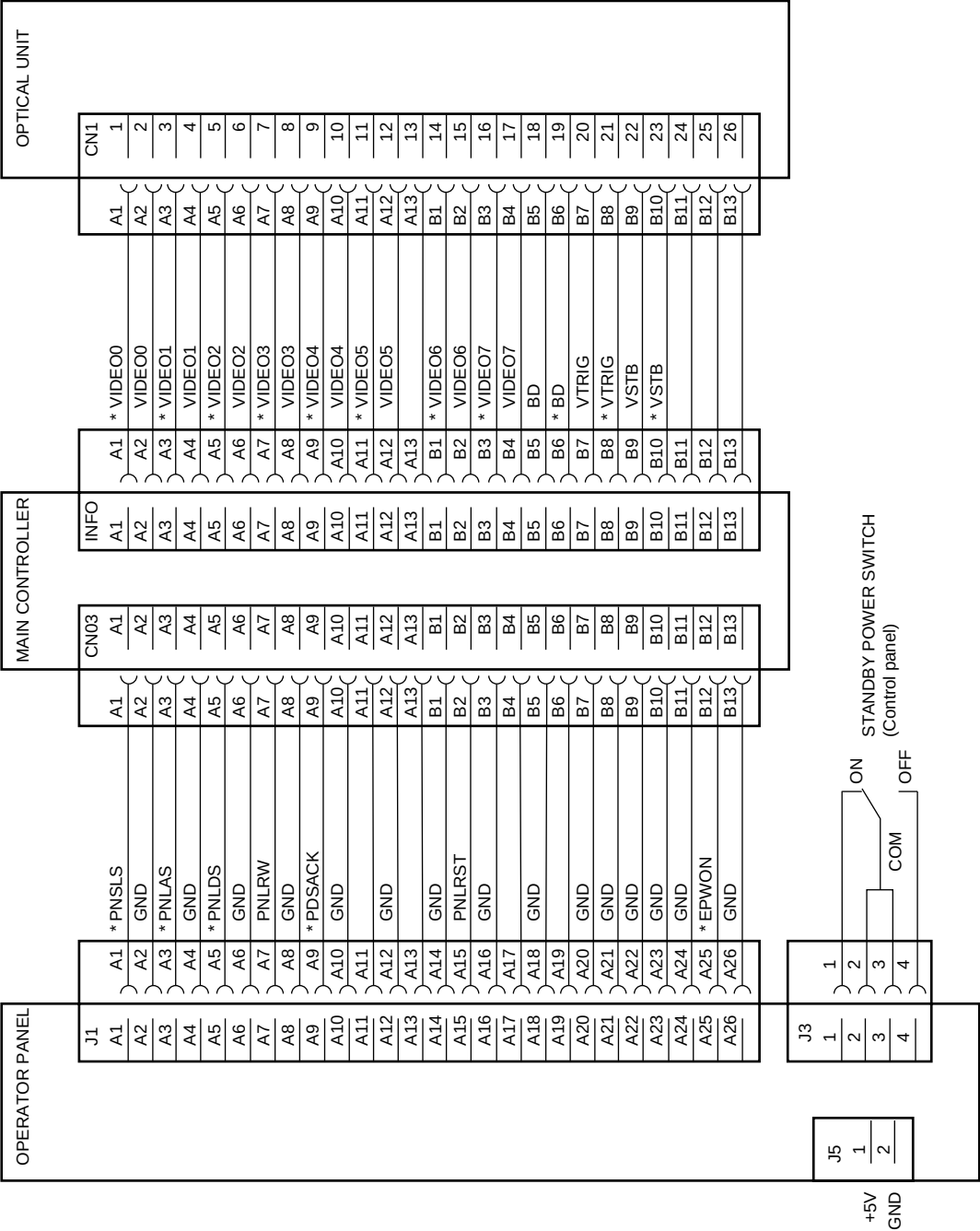


Figure A-16 Printer Wiring Diagram (16 of 18)

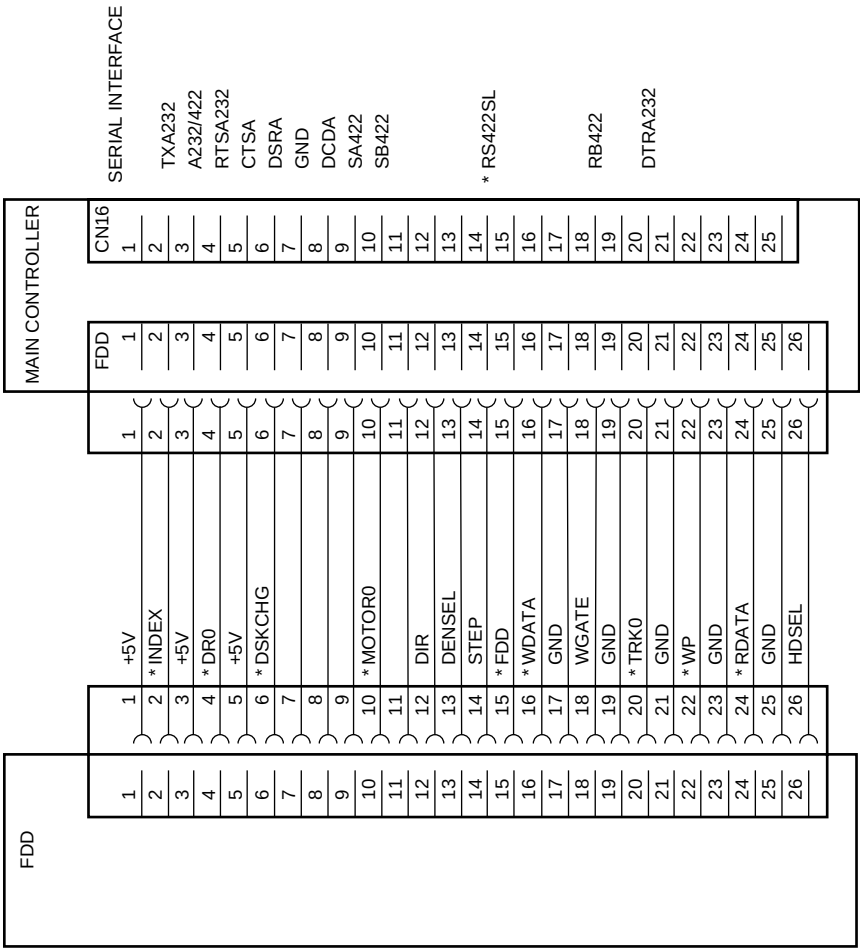


Figure A-17 Printer Wiring Diagram (17 of 18)

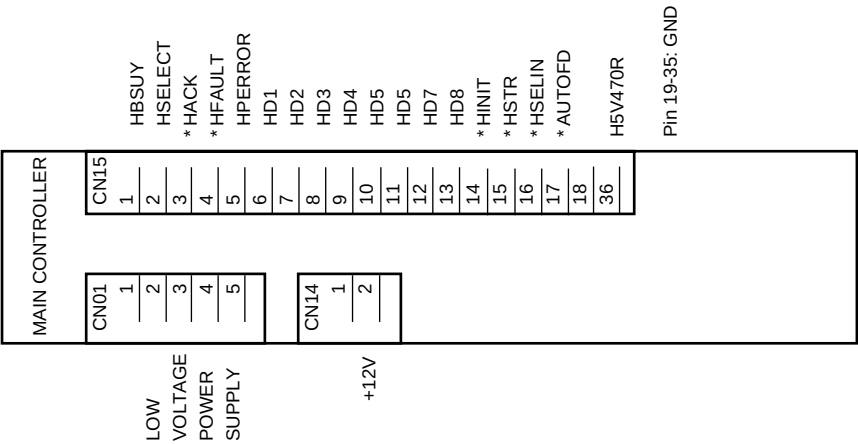


Figure A-18 Printer Wiring Diagram (18 of 18)

A-2 Printer Component Block Diagram

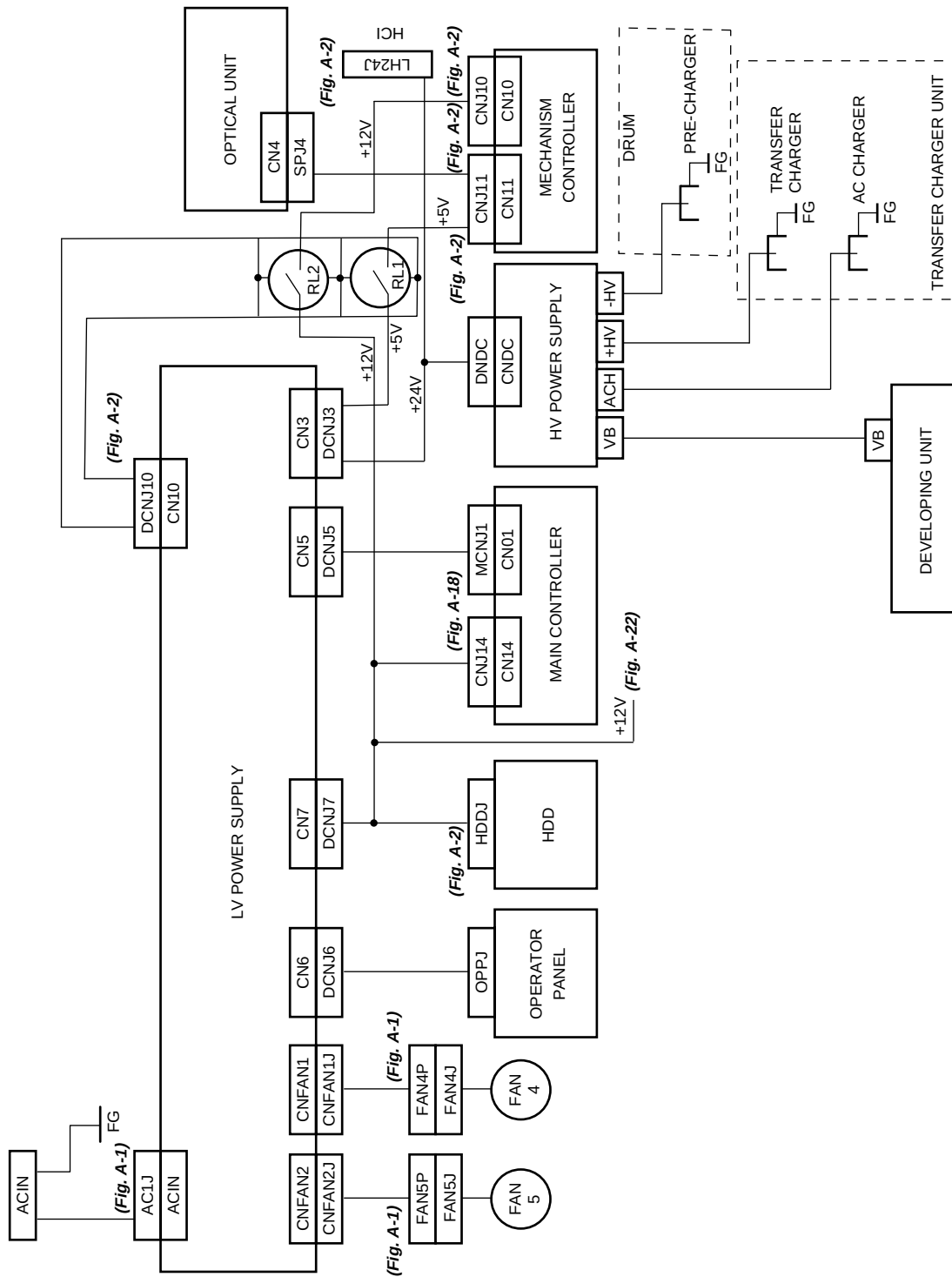


Figure A-19 Printer Component Block Diagram (1 of 4)

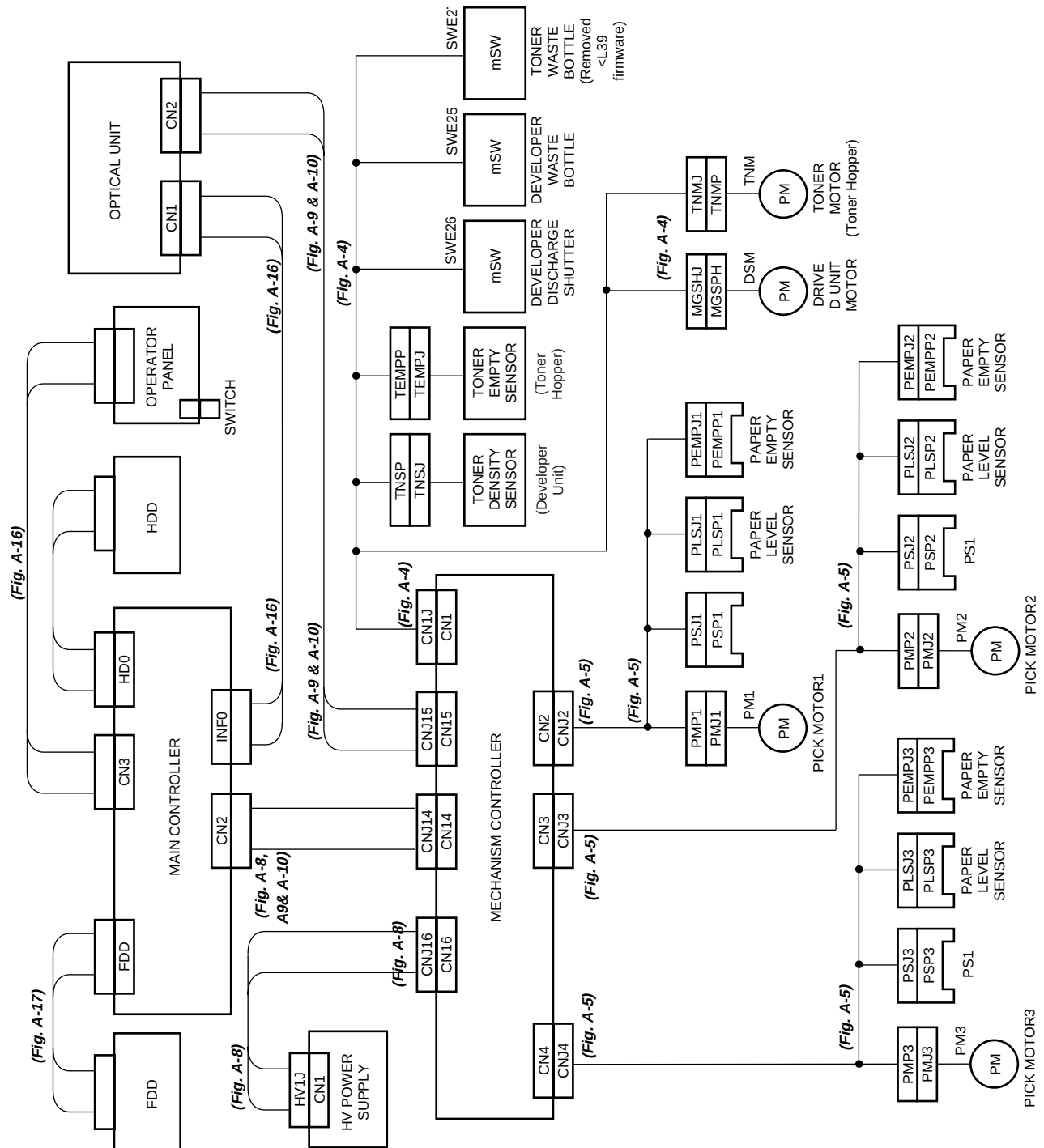


Figure A-20 Printer Component Block Diagram (2 of 4)

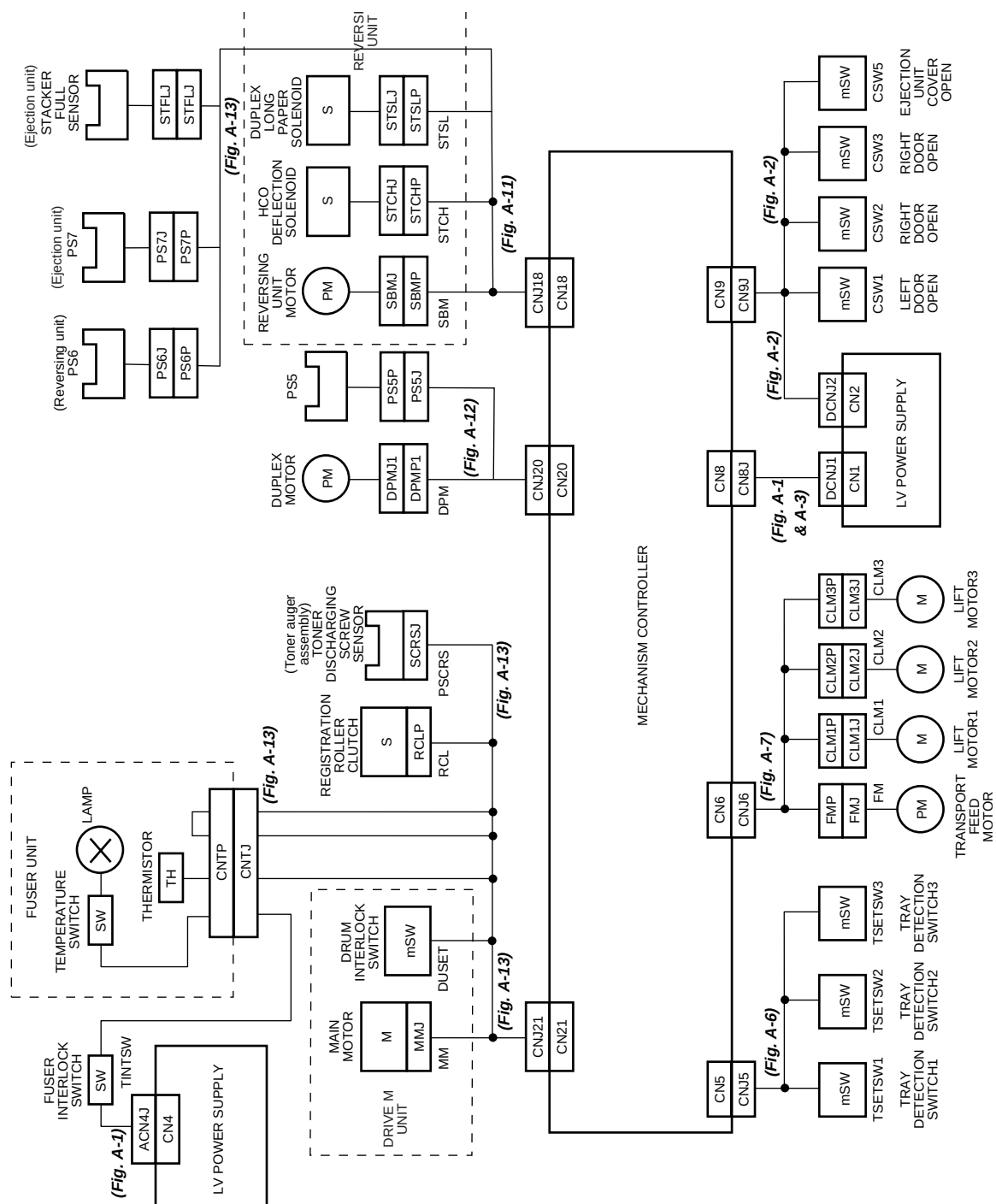


Figure A-21 Printer Component Block Diagram (3 of 4)

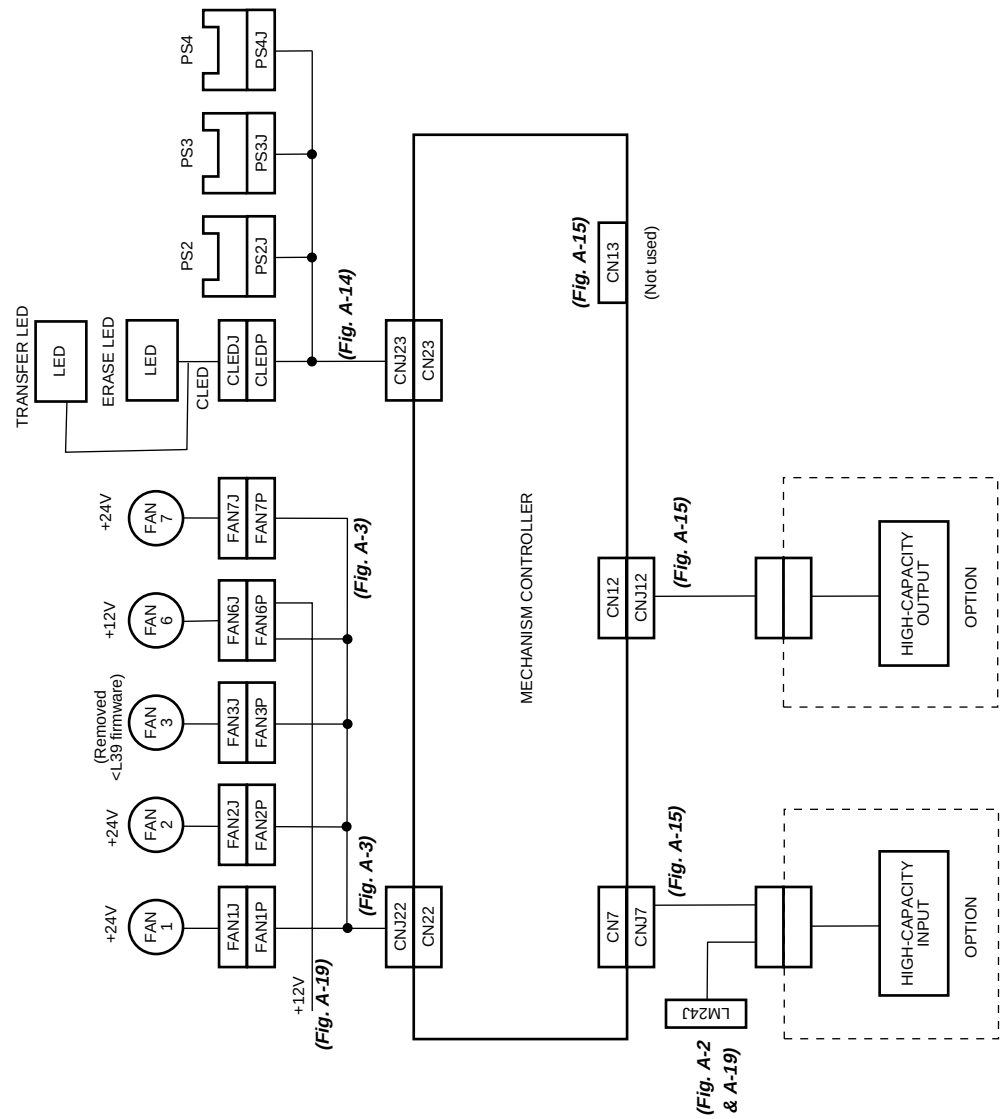


Figure A-22 Printer Component Block Diagram (4 of 4)

A-3 Printer Power Diagrams

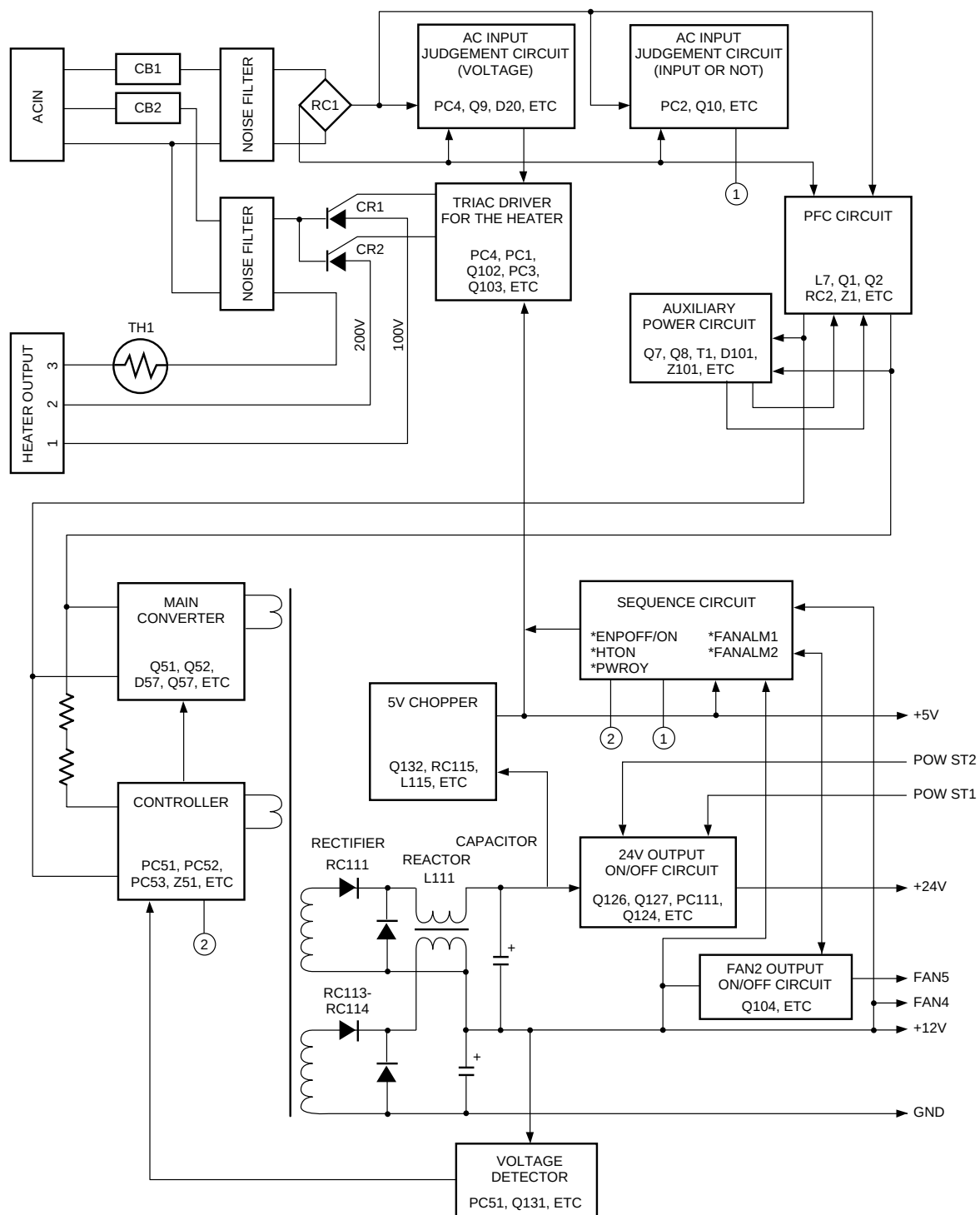


Figure A-23 Low Voltage Power Supply Block Diagram

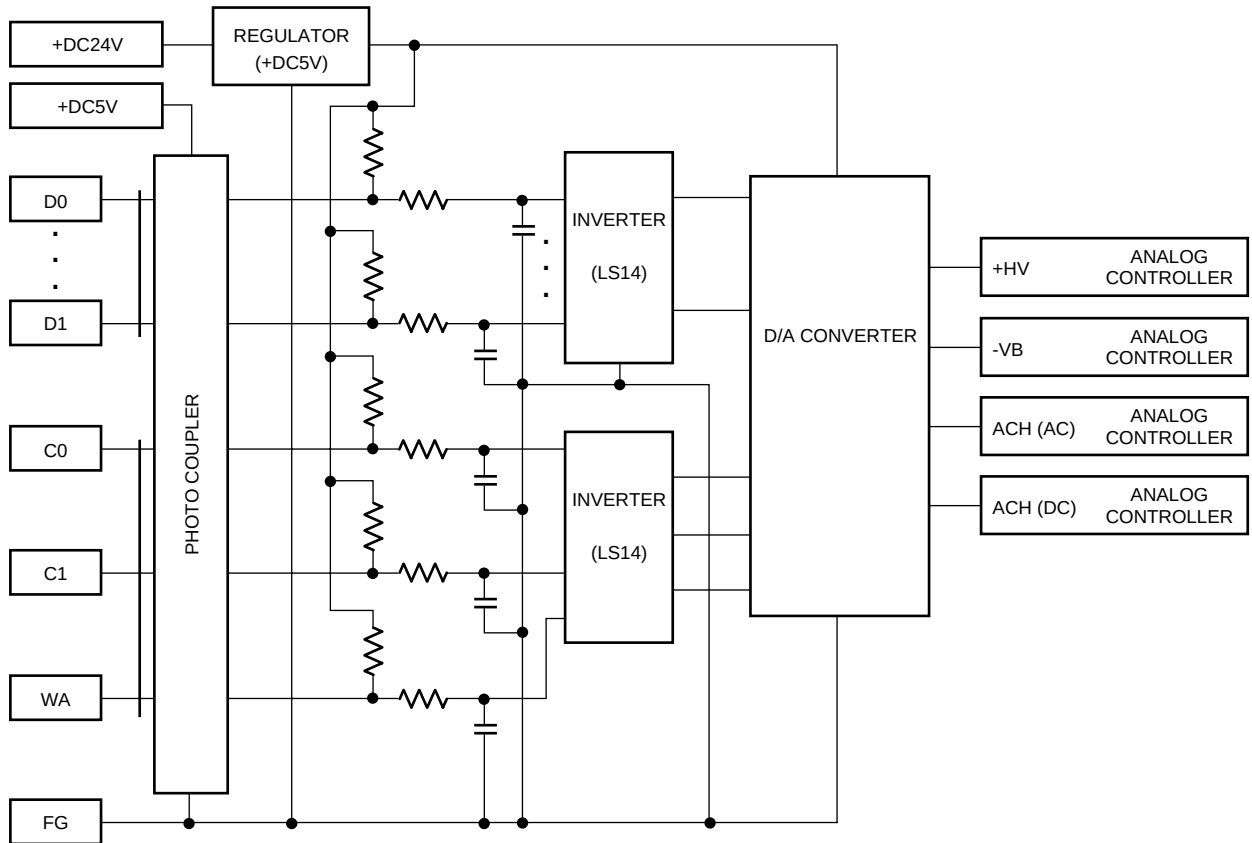


Figure A-24 High Voltage Power Supply D/A Converter Block Diagram

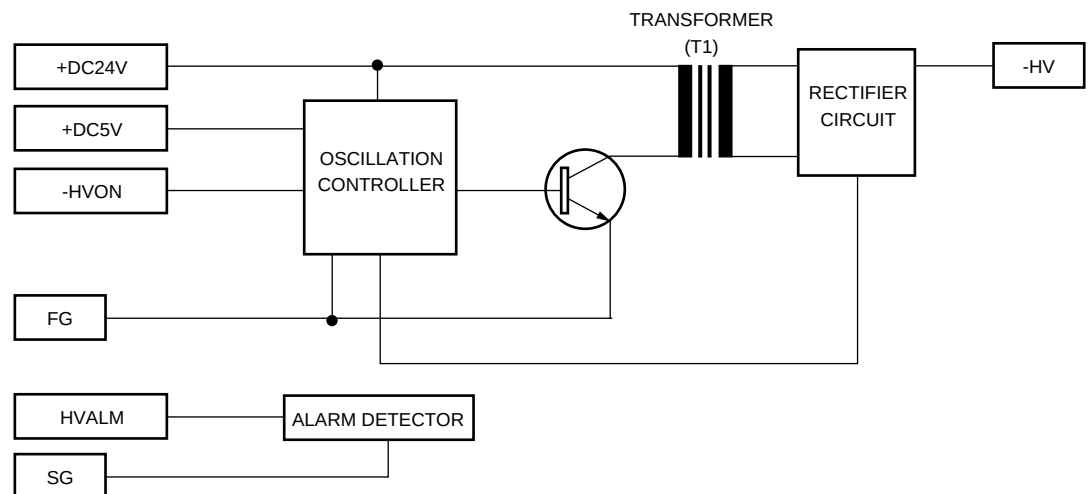


Figure A-25 High Voltage Power Supply -HV Block Diagram

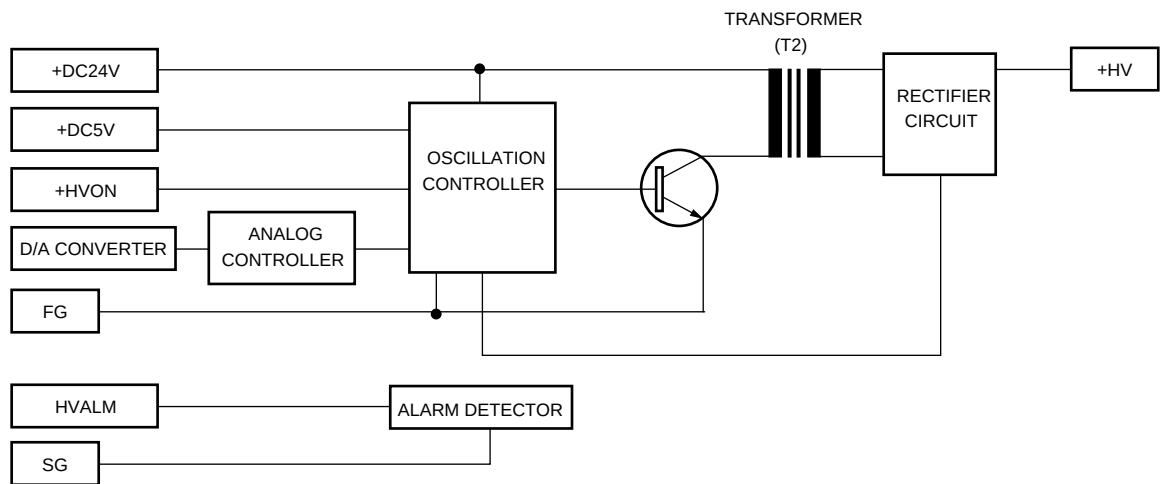


Figure A-26 High Voltage Power Supply +HV Block Diagram

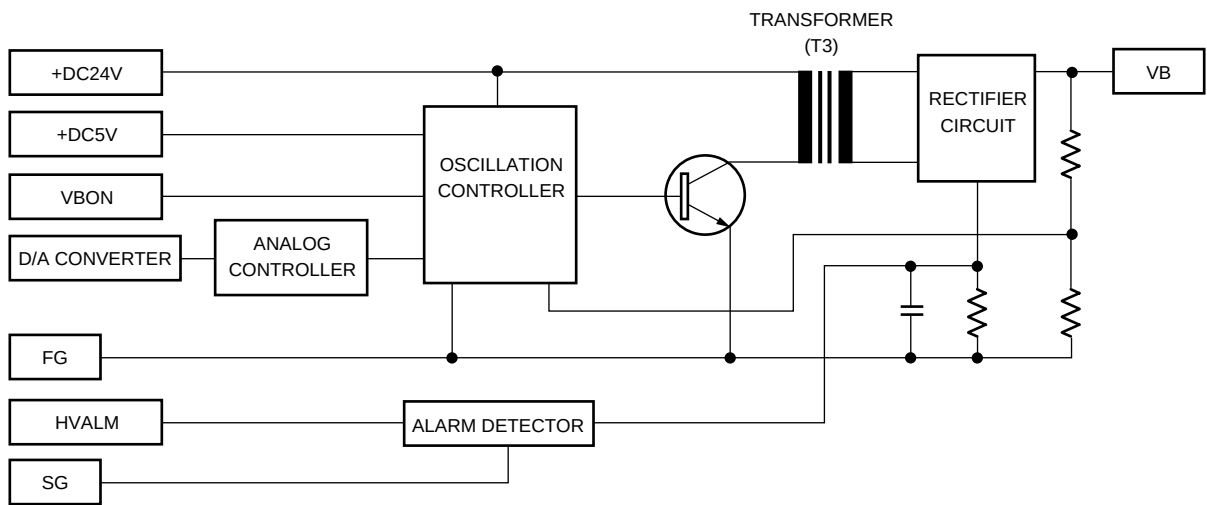


Figure A-27 High Voltage Power Supply VB Block Diagram

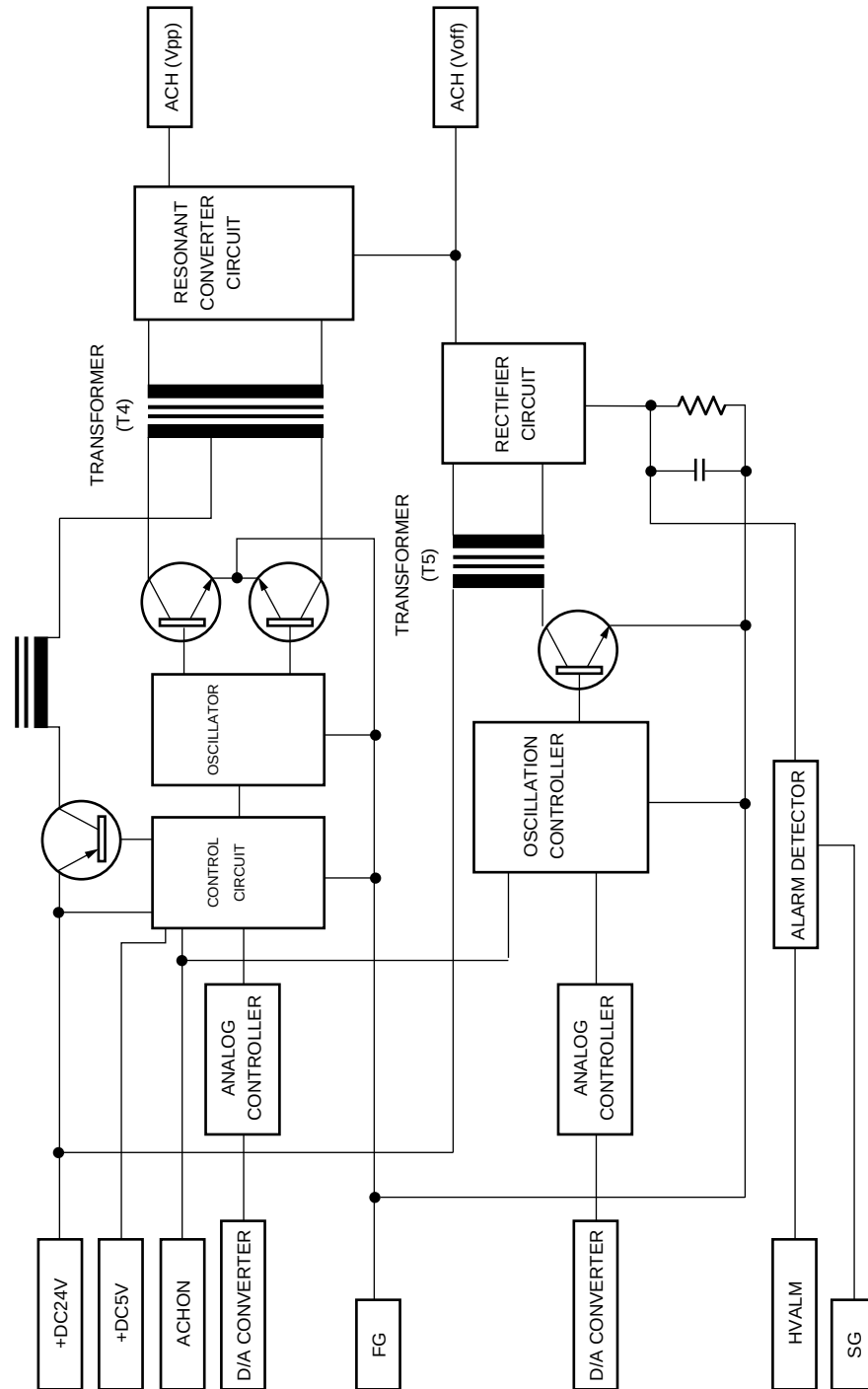


Figure A-28 High Voltage Power Supply ACH Block Diagram

A-4 Power-on Sequence Timing Chart

"*" means the active-low signal.

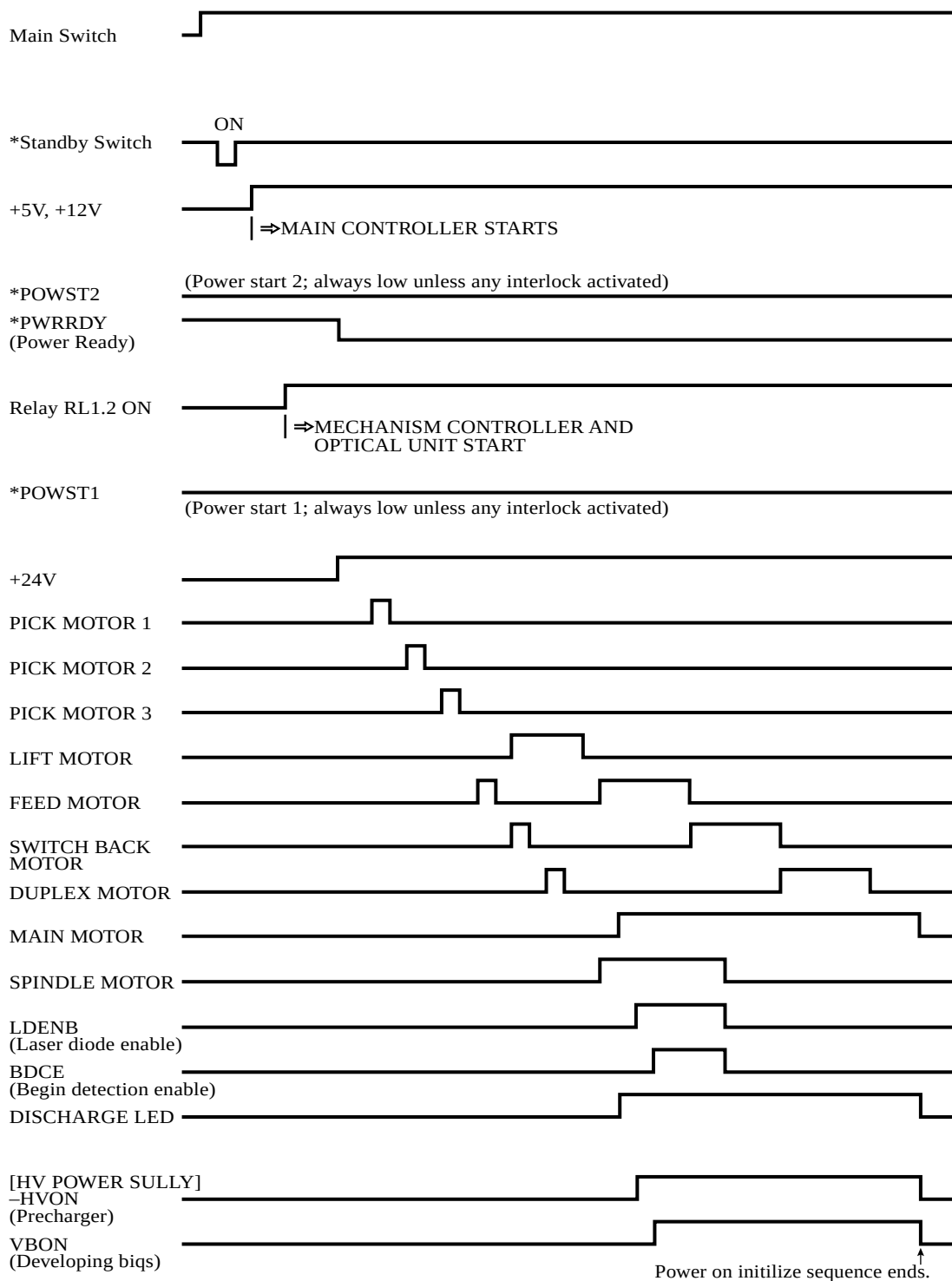


Figure A-29 Power-on Sequence Timing Chart

B

3,000-Sheet High-Capacity Output

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B-1 Overview

This appendix provides service information on the 3,000-sheet High Capacity Output (HCO), an optional accessory for the HP5000 D640 Printer. The HCO supports a variety of paper sizes and can handle up to 40 pages per minute.

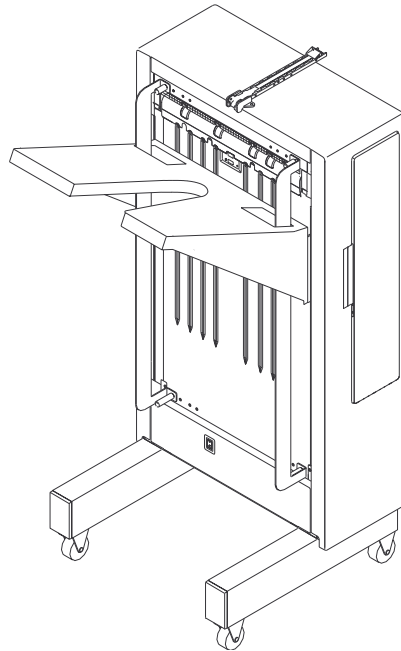


Figure B-1 3,000-Sheet HCO

B-1.1 Related Documents

This appendix is a supplement to the *D640 Service Manual*. It describes service information specific to the 3,000-sheet HCO.

For more information about installing and using the 3,000-sheet HCO, see the *3,000-Sheet HCO Installation and User Manual* (see [1-1.1 "Related Documents," on page 1-4](#)).

B-2 Specifications

This section provides specifications for the 3,000-sheet HCO. Specifications include:

- Paper handling specifications
- Physical specifications
- Electrical specifications
- Environmental specifications

Note Specifications are subject to change without notice.

B-2.1 Paper Handling Specifications

Item		Specifications
Processing Speed		40 ppm
Paper	Size	Letter, Legal, Ledger, Executive, A3, A4, A5, B4(JIS), B5(ISO)
	Type	Plain paper, Label paper, Transparency, Bond paper, Pre-punched paper, 64 to 90g/m ²
Paper capacity		3,000 sheets (75g/m ²)

B-2.2 Physical Specifications

Item		Specifications
Dimensions	Width	16.1 inches (408 mm)
	Depth	17.4 inches (446 mm)
	Height	36.0 inches (913 mm)
Service area	Front	25.6 inches (650 mm)
	Back	33.5 inches (850 mm)
	Right	33.5 inches (850 mm)
Weight		66 pounds (30 kilograms)

B-2.3 Electrical Specifications

Item		Specifications
Input power	Voltage	100 to 120 VAC $\pm$ 10% 200 to 240 VAC $\pm$ 10%
	Phase	Single-phase
	Frequency	50/60 Hz

Item	Specifications
Power consumption	180 VA or less than during operation
Heat production	95 kcal per hour (380 BTU/hr)

B-2.4 Environmental Specifications

Ambient condition	Operating	Non-operating
Temperature	15 to 35 °C	-40 to +70 °C
Humidity	20 to 80% RH (no condensation) 40 to 60% RH optimal	20 to 80% RH (no condensation) 40 to 60% RH optimal
Temperature and humidity gradients	15 °C per hour or less and 30% RH per day or less (no condensation)	

B-3 Diagnostics

To aid troubleshooting, the 3,000-sheet HCO includes a set of DIP switches and LEDs you can use to run HCO diagnostics. Use these diagnostics to make sure:

- No jam or alarm conditions exit
- Sensors are working properly
- Motors are working properly
- The paper feed unit is working properly

The DIP switches and LEDs are located on the HCO controller board.

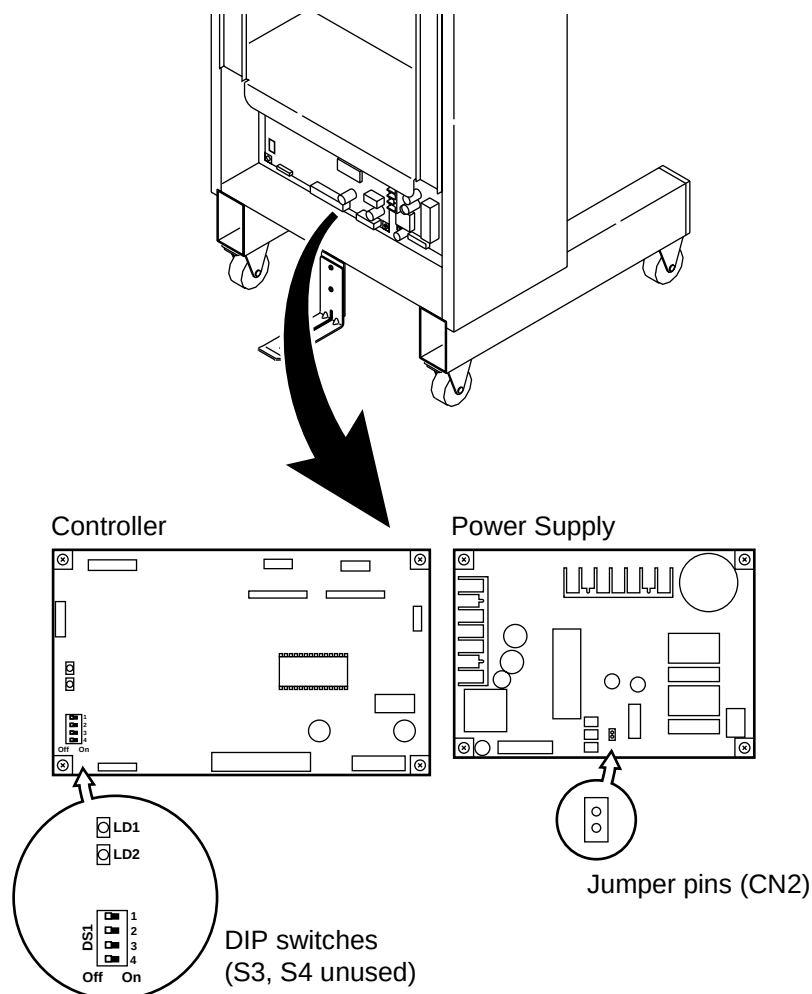


Figure B-2 Location of DIP Switches and Jumper Pins

The DS1 component on the controller board contains the DIP switches. Use the S1 and S2 switches for diagnostics. The S3 and S4 switches are unused. The LED's (LD1 and LD2) are located above the DS1 component.

B-3.1 Running a Test

To run a test:

- Step 1** Remove all paper from the HCO tray.
- Step 2** Power off and unplug the HCO.
- Step 3** Remove the four screws that attach the top cover and set the cover aside.
- Step 4** Loosen the two captive screws that attach the right cover and set the cover aside.
- Step 5** Locate the controller and power supply (See [Figure B-2](#)).

WARNING!

The following step requires you to install a jumper and connect live-line voltage. Make sure the HCO is powered-off and unplugged before you install the jumper.

- Step 6** Place a jumper between the two pins marked CN2 near the bottom of the power supply. (See [Figure B-2](#).)
- Step 7** Plug the HCO into a standard wall outlet.
- Step 8** Run each test as desired. (See details below.)

WARNING!

Never touch the power supply when the HCO is plugged in. This could result in serious personal injury from electric shock.

B-3.2 Normal Settings

In standard operation, the S1 and S2 switches are Off and the LEDs are Off, unless an HCO error or jam has occurred. (See [Table 2-1](#).)

Table 2-1. Normal settings

DIP Switch Settings	LED Display	Description
S1 = Off (not lit) S2 = Off	LD1 = Off LD2 = Off	Normal condition. No error is present.
	LD1 = On LD2 = Off	An HCO alarm has occurred.
	LD1 = Off LD2 = On	An HCO jam has occurred.

B-3.3 Sensor and Switch Test

Use this test to make sure HCO sensors and switches are working properly. The 3,000 sheet HCO contains the following sensors to track the paper's progress through the HCO.

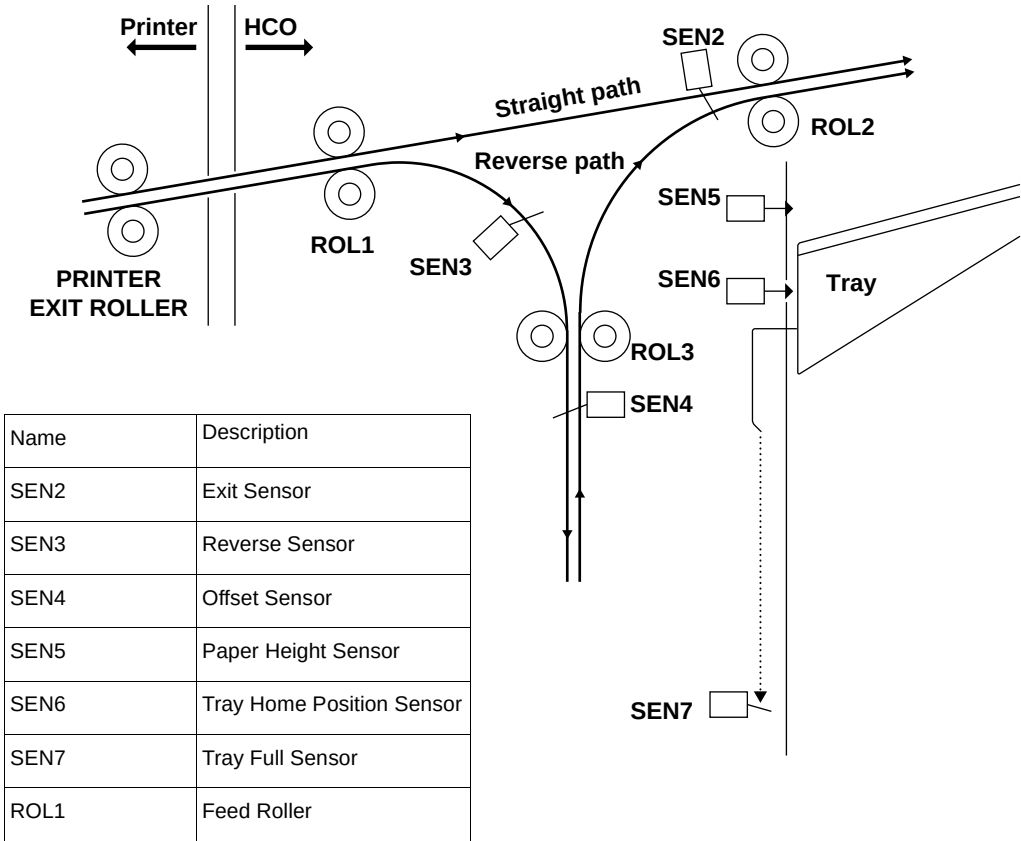


Figure B-3 Location of HCO Sensors SEN2 to SEN7

Note For a detailed view of the HCO, see [B-6 "Parts and Diagrams,"](#) on page [B-54](#).

In addition to sensors SEN2 to SEN7, the HCO contains a Connecting (docking) Switch to verify the HCO to printer connection, a Door Switch for the HCO front door, and a HCO Cutoff Switch to keep the HCO tray from jamming the top of the HCO.

For an illustration of these sensors, see [B-6 "Parts and Diagrams," on page B-54](#).

Table B-2. Sensors and switch test

DIP Switch settings	LED display	Description
S1 = On S2 = Off	LD1 = On/ Off LD2 = Off	Test mode for sensors SEN2 to SEN7. LD1 = Toggles On and Off when the sensor is blocked/unblocked.
	LD1 = Off LD2 = On/ Off	Test mode for door, connecting, and cutoff switch. LD2 = Toggles On and Off when the sensor is activated/deactivated.

Note	LD1 turns On/Off for each sensor (SEN2 to SEN7) you test. LD2 turns On/Off for each switch you test.

To test the sensors and switches:

Step 1 Follow steps [1](#) to [7](#) in the [B-3.1 "Running a Test," on page B-7](#).

Step 2 Engage the Door and Connecting Switches. The sensor test will not work if these switches are engaged.

Step 3 Make sure the tray isn't blocking SEN5, SEN6, or SEN 7.

If necessary, use the tray motor test to reposition the tray. See [B-3.4 "Motors and Solenoid Test," on page B-10](#).

Step 4 Set the DIP switches as shown in [Table B-2](#).

Step 5 To test the SEN2 to SEN7 sensors, use a piece of paper (or other object) to successively block and unblock each sensor.

Step 6 To test the door, connecting, and HCO cutoff switches, successively activate and deactivate each switch.

B-3.4 Motors and Solenoid Test

Use the motors and solenoid test to check the following on the HCO: feed motor, exit motor, tray motor, path solenoid, and offset solenoid.

For an illustration of these parts, see [B-6 "Parts and Diagrams,"](#) on page [B-54](#).

Table B-3. Motors and solenoid test

DIP Switch settings	LED display	Description
S1 = Off S2 = On	LD1 = Off LD2 = Off	Motors and solenoids are tested. For safety reasons, there is a 3-second delay before the motors start. • Feed Motor runs continuously making the rollers turn in the paper-feed direction. • The Exit Motor runs continuously. • The Tray Motor moves the tray up and down. • The Path and Offset Solenoids turn on and off. The lever flaps move up and down and the offset rollers move from side to side. Motors stop when a jam or alarm occurs.
	LD1 = On LD2 = Off	LD = On. An alarm has occurred. Reset by turning power off.
	LD1 = Off LD2 = On	LD = On. An jam has occurred. Reset by cycling power on/off.

To test motors and solenoids:

Step 1 Follow steps [1](#) to [7](#) in the [B-3.1 "Running a Test,"](#) on page [B-7](#).

Step 2 Engage the door and connecting switches. The motors will not start unless these switches are engaged.

Step 3 Set the DIP switches as shown in [Table B-3](#).

Step 4 Verify that the feed, exit and tray motors are running and LD1 and LD2 remain off.

If LD1 is On, reset the HCO by turning power off.

If LD2 is On, check the HCO for paper jams. Then, reset the HCO by cycling power on/off.

B-3.5 Feeding Test

Use the feeding test to make sure paper is feeding properly. This test reverses the paper path and offsets each 10 sheets of paper.

Table B-4. Feeding test

DIP Switch settings	LED display	Description
S1 = On S2 = On	LD1 = Off LD2 = Off	Paper feeding is tested. Feed paper into the HCO by hand. • The paper path is reversed. • Each 10 sheets of paper is offset. Paper feeding stops when a jam or alarm occurs.
	LD1 = On LD2 = Off	LD = On. An alarm has occurred. Reset by turning power off.
	LD1 = Off LD2 = On	LD = On. An jam has occurred. Reset by removing jammed paper and closing the HCO door.

To test paper feeding:

- Step 1** Follow steps [1](#) to [7](#) in the [B-3.1 "Running a Test,"](#) on page [B-7](#).
- Step 2** Engage the door and connecting switches. The paper feeding test will not start unless these switches are engaged.
- Step 3** Set the DIP switches as shown in [Table B-4](#).
- Step 4** Feed paper into the HCO by hand.
- Step 5** Verify that the paper is feeding properly and LD1 and LD2 remain off.

When the paper is feeding properly, the paper path is reversed and each 10 sheets of paper is offset.

If LD1 is On, reset the HCO by turning power off.

If LD2 is On, open the HCO door and remove any jammed paper. Then, close the HCO door.

B-4 Troubleshooting

B-4.1 General Troubleshooting Information

Possible HCO alarms and jams include:

Error	Result	Remedy
HCO jam1 HCO jam 2	Printing stops until the jam is cleared.	Refer to "Clearing an HCO paper jam" in the <i>HCO Installation and User Manual</i> . If the problem persists, see B-4.3 "HCO Stacker Jams - HCO JAM 1/JAM41," on page B-18.
HCO cover open	Printing stops until the error is cleared.	Make sure the HCO door (cover) is closed, the HCO power switch is on, and the HCO is connected to the printer. If the problem persists, see B-4.5 "HCO Cover (Door) Open Problems," on page B-24. Note: This message also appears when the HCO Cutoff Switch is engaged. Make sure the cutoff plate located at the top of the HCO (above the tray) is not activated.
Stack fault – Call engineer	This alarm may appear, when the HCO is disconnected from the printer.	1. Verify the following: - the HCO door is closed. - the HCO power switch is on - the HCO interface cable is connected to the printer and the HCO power cable is plugged into an AC outlet. 2. Restart the printer and the HCO. If the problem persists, see B-4.8 "HCO Not Recognized By Printer," on page B-34.
SVC D8 HCO stacker alarm	Stops the printer and takes it offline.	1. Verify the following: - the HCO interface cable is connected to the printer. - the HCO's power cable is plugged into a working power outlet. - The HCO's power switch is on. 2. Press clear. If the error code returns, see "HCO Stacker Alarms." 3. To continue printing without the HCO, disconnect the HCO interface cable and power cycle the printer.
HCO not ready	Stops the printer and takes it offline.	1. Verify the following: - the HCO interface cable is connected to the printer. - the HCO's power cable is plugged into a working power outlet. - The HCO's power switch is on. 2. Press clear. If the error message returns, cycle power on the printer and HCO. The HCO takes a few seconds to perform power-up diagnostics. 3. If the error message returns, see B-4.8 "HCO Not Recognized By Printer," on page B-34.

B-4.2 SVC D8 HCO Stacker Alarm

Description

A fatal error was detected in the HCO, such as the following:

- The stacker ready signal (SREADY) was not detected by the mechanism controller within a time limit after the printer was powered up.
- The stacker signal alarm (SALM) was activated. Possible causes include:
 - The Paper Exit Sensor indicates the paper guide is not in the correct position.
 - The Offset Sensor indicates the paper tray is not in the correct offset position.
 - The Tray Full Sensor indicates the paper tray is not in the correct up/down position.

Troubleshooting Procedure

Instruction	Indication	Yes	No
Part A: Printer reset and cable check			
1.Remove all paper from the HCO paper tray. Power cycle the HCO and printer.	"SVC D8 HCO Stacker Alarm" message reappears.	Go to step 2.	Return HCO to normal operation.
2.Make sure the HCO to printer interface cable is connected properly and the power switch is working.	Cable is not connected or power switch is broken.	Connect the cable and reset the printer and HCO. If necessary, replace the power switch.	Go to step 3.
Part B: Sensor and switch check			
3.Run HCO DIP switch diagnostics and check the following sensors: • Exit sensor • Offset sensor • Paper height sensor • Tray home position sensor • Tray full sensor See B-3 "Diagnostics," on page B-6 for more information on HCO diagnostics.	Sensor fails diagnostics.	Go to step 4.	Go to step 5

Instruction	Indication	Yes	No
4. Check for damaged signal cables or connectors between the HCO controller and the failed sensor. - Exit Sensor: CN6 on the HCO controller and CN22 on the sensor harness. CN22 on the harness and SEN2. - Offset Sensor: CN6 on the HCO controller and CN24 on the sensor harness. CN24 on the harness and SEN4. - Paper Height Sensor: CN5 on the HCO controller and CN16 on the sensor harness. CN16 on the harness and SEN5. - Tray Home Position Sensor: CN5 on the HCO controller and CN17 on the sensor harness. CN17 on the harness and SEN6. - Tray Full Sensor: CN5 on the HCO controller and CN18 on the sensor harness. CN18 on the harness and SEN7.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the sensor.
Part C: Motor and solenoid check			
5. Run the HCO DIP switch diagnostics and check the following motors and solenoids: - Feed motor - Tray motor - Exit motor - Offset solenoid - Path solenoid	Motor/solenoid fails the diagnostic.	Go to step 6.	Go to step 7.
6. Check for pinched wires, cables, and damaged connectors between the HCO controller and the failed motor/solenoid. - Feed Motor: CN8 on the HCO controller and CN11 on the harness and motor. - Tray Motor: CN7 on the HCO controller and DCM on the motor. - Exit Motor: CN9 on the HCO controller and CN12 on the harness and motor. - Offset Solenoid: CN10 on the HCO controller and CN14 on the harness and solenoid. - Path Solenoid: CN10 on the HCO controller and CN15 on the harness and solenoid.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Go to step 8.
7. Check the following belts: - Exit timing belt - Timing belt - Tray belts See B-6 on page B-54 for the location of these belts.	Belt is loose or worn.	Tighten or replace the damaged belt.	Go to step 8.

Instruction	Indication	Yes	No
Part D: Voltage check			
8. Check the fuse on the HCO controller.	The fuse is blown.	Replace the fuse. If the fuse blows again, go to step 9.	Go to step 10.
9. Check for the correct voltage on the following signals: - HCO controller to feed motor: CN8 Signal 1 = +24V - HCO controller to exit motor: CN9 Signal 1 = +24V - HCO controller to offset solenoid: CN14 Signal 1 = +24V - HCO controller to path solenoid: CN10 Signal 3 = +24V	Voltage is exceeded.	Replace the fuse on the HCO. If necessary, replace the motor/ solenoid.	Go to step 10.
Part E: Power Supply Check			
10. Check the power supply.	Fuse is blown.	Replace the fuse. If the fuse blows again, go to step 12.	Go to step 11.
11. Check for pinched wires, cables, and damaged connectors between the power supply and the HCO controller.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Go to step 12.
12. Check for the correct voltage on between the power supply and the HCO controller. - CN1 Signal 1 = +5V - CN1 Signal 5 = +24V - CN1 Signal 6 = +24V	Voltage is exceeded.	Replace the power supply.	Go to step 13.
Part F: HCO Controller Check			
13. Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagram

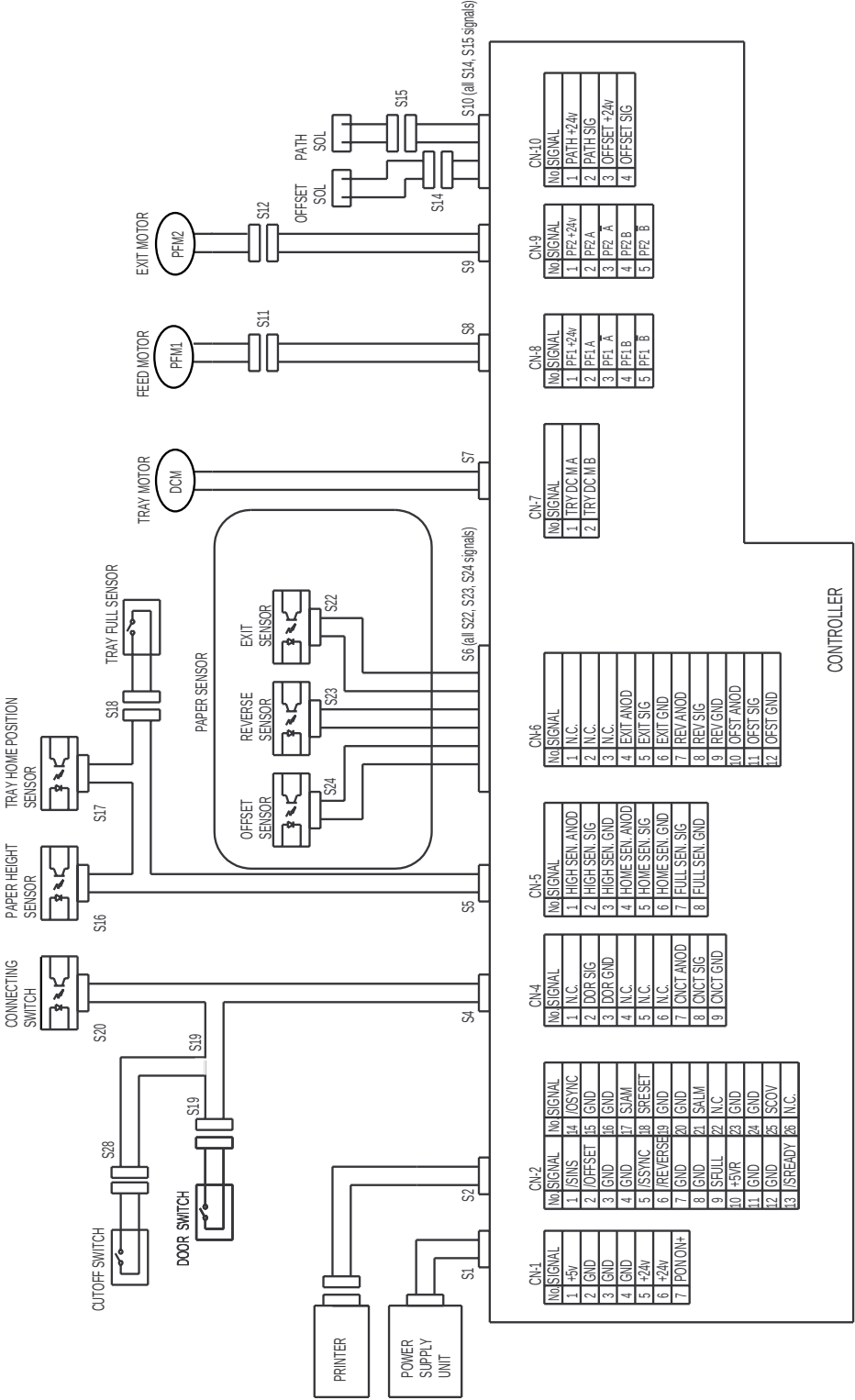


Figure B-4 HCO Wiring Diagram

B-4.3 HCO Stacker Jams - HCO JAM 1/JAM41

Description

When this error occurs, the printer's control panel displays HCO JAM1 and the Maintenance Report shows a JAM41.

When the printer is reset, one of the following has occurred:

- There is paper blocking one of the HCO paper sensors (feed sensor, exit sensor, reverse sensor).
- One of the sensors in the HCO is signalling a paper jam.

Troubleshooting Procedure

Instruction	Indication	Yes	No
Part A: Paper and cable check			
1. Open the front door of the HCO and remove all jammed paper. Power cycle the HCO and printer.	Paper jam message still appears.	Go to step 2.	Return HCO to normal operation. If paper continues to jam, go to step 2.
2. Check the interface cable that connects the HCO to the printer.	Cable is disconnected.	Connect the cable. Power cycle the HCO and printer.	Go to step 3.
Part B: Sensors check			
3. Run HCO DIP switch diagnostics and check the following sensors: • Exit sensor • Reverse sensor • Offset sensor • Paper height sensor • Tray full sensor See B-3 "Diagnostics," on page B-6 for more information on HCO diagnostics.	Sensor fails diagnostics.	Go to step 4.	Go to step 5.
4. Check for damaged signal cables or connectors between the HCO controller and the failed sensor. • Exit Sensor: CN6 on the HCO controller and CN22 on the sensor harness. CN22 on the harness and SEN2. • Reverse Sensor: CN6 on the HCO controller and CN23 on the sensor harness. CN24 on the harness and SEN3. • Offset Sensor: CN6 on the HCO controller and CN24 on the sensor harness. CN24 on the harness and SEN4. • Paper Height Sensor: CN5 on the HCO controller and CN16 on the sensor harness. CN16 on the harness and SEN5. • Tray Full Sensor: CN5 on the HCO controller and CN18 on the sensor harness. CN18 on the harness and SEN7.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Go to step 5.

Instruction	Indication	Yes	No
Part C: Motors check			
5.Run HCO DIP switch diagnostics and check the following motors: • Feed motor • Exit motor • Tray motor	Motor test fails.	Go to step 6.	Go to step 7.
6.Check the motor system that failed. Items to check include the following. (See the “Replaceable Parts” chapter for illustrations of these parts). • Feed Motor system: Feed motor, feed motor gear, feed roller, feed roller gear, feed idlers • Tray Motor system: Tray motor, tray belts • Exit Motor system: Exit motor, exit roller, exit motor pulley, exit belt, exit idlers • Reverse roller system: Reverse roller, Reverse roller pulley, reverse idlers Also check for damaged wires and connectors.	Motor system has a failed or worn part.	Replace the failed or worn part.	Go to step 7.
Part D: Paper Feed Check			
7.Use HCO DIP switch diagnostics to run the Paper Feed test.	Feed test doesn't behave as described, or paper jams during feed test.	Check the Paper Feed Unit for damage. Replace if necessary.	Go to step 8.
Part E: HCO Controller and Signal Check			
8.Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer. (In particular, check pin 17. This pin carries the SJAM signal.)	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagram

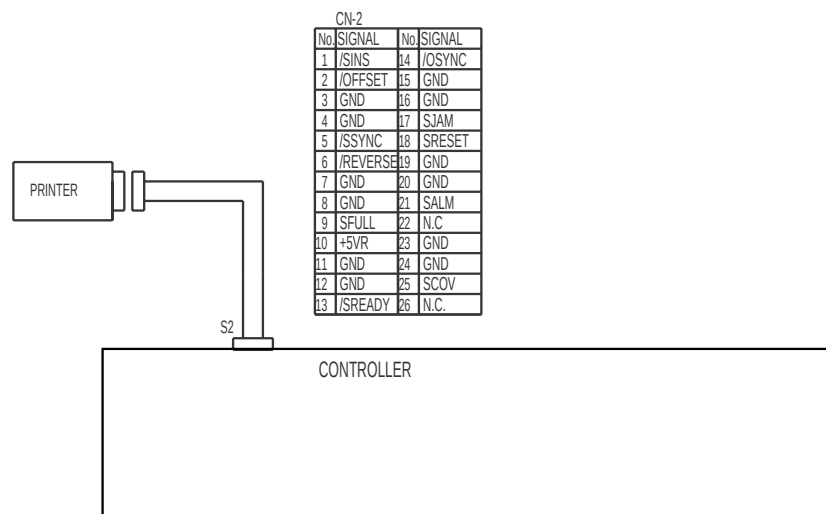


Figure B-5 Wiring Diagram for Controller

B-4.4 HCO Stacker Full Problems

Description

The HCO stacker full message cannot be cleared. "Stacker Full" is detected by SEN7.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1.Remove all paper from the HCO paper tray. Power cycle the HCO and printer.	"HCO stacker full" message reappears.	Go to step 2 .	Return HCO to normal operation.
2.Remove or turn off any external lights that might be activating the Paper Height Sensor.	"HCO stacker full" message reappears.	Go to step 3 .	Return HCO to normal operation.
3.Run HCO DIP switch diagnostics and check the following sensors and switches: • Paper height sensor • Tray home position sensor • Tray full sensor See B-3 "Diagnostics," on page B-6 for more information on HCO diagnostics.	Sensor/switch fails diagnostics.	Go to step 4 .	Go to step 5 .
4.Check for damaged signal cables or connectors between the HCO controller and the failed sensor. • Paper Height Sensor: CN5 on the HCO controller and CN16 on the sensor harness. CN16 on the harness and SEN5. • Tray Home Position Sensor: CN5 on the HCO controller and CN17 on the sensor harness. CN17 on the harness and SEN6. • Tray Full Sensor: CN5 on the HCO controller and CN18 on the sensor harness. CN18 on the harness and SEN7.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the sensor.
5.Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagrams

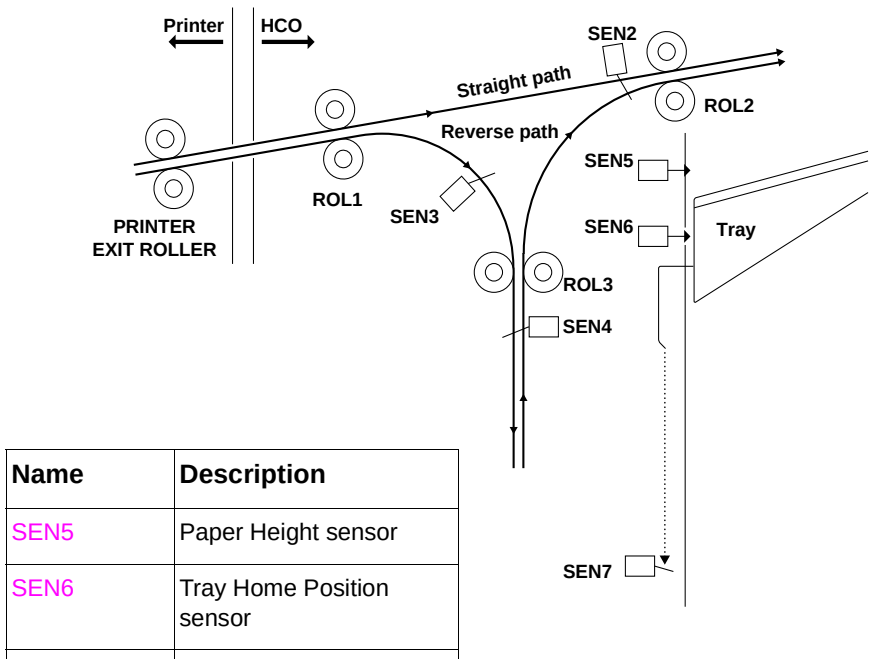


Figure B-6 HCO Tray Sensors

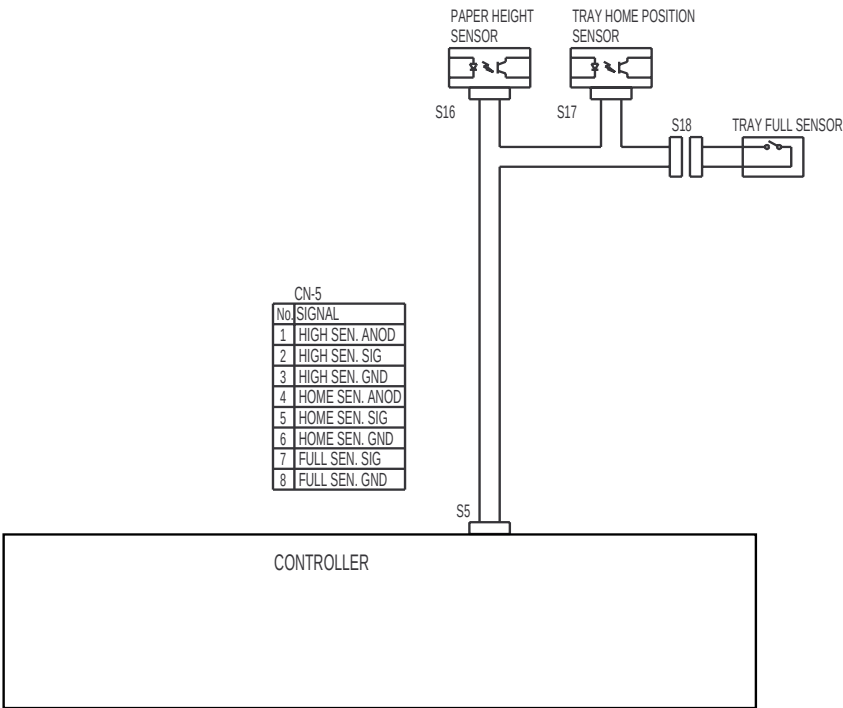


Figure B-7 Wiring Diagram for Tray Sensors

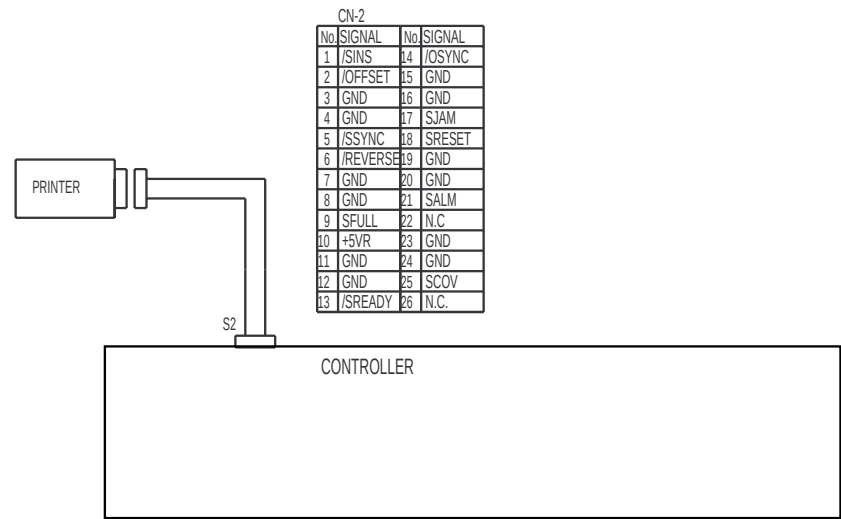


Figure B-8 Wiring Diagram for HCO Controller to Printer Interface

B-4.5 HCO Cover (Door) Open Problems

Description

Possible causes include:

- The HCO door switch indicates the HCO door is open. The door switch is located at the bottom of the HCO front door.
- The HCO cutoff switch is activated. The HCO cutoff switch is located at the top rear of the HCO, below the cutoff plate.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Make sure the HCO front door is closing properly and activating the door switch. • Make sure the screws on the door hinges are tight, holding the door closed. • Make sure the four screws connecting the front cover to the HCO frame are tight. • Make sure the plastic tab on the bottom of the door is not bent or broken. This tab activates the door switch when the door is closed. If the tab is damaged, replace the front door.	"HCO Cover Open" message reappears.	Go to step 3.	Return HCO to normal operation.
2. Check the HCO cutoff plate. • Make sure the plate is not bent or damaged. If so, replace the plate. • Make sure the plate moves up and down freely and is not stuck in the up position.	"HCO Cover Open" message reappears.	Go to step 3.	Return HCO to normal operation.
3. Run HCO DIP switch diagnostics and check the following switches: • Door switch • HCO cutoff switch See B-3 "Diagnostics," on page B-6 for more information on HCO diagnostics.	Switch fails diagnostics.	Go to step 4.	Go to step 5.
4. Check for damaged signal cables or connectors between the HCO controller and the failed switch. • Door Switch: CN4 on the HCO controller and CN19 on the switch harness. CN19 on the harness and the Door Switch. • HCO Cutoff Switch: CN4 on the HCO controller and CN28 on the switch harness. CN28 on the harness and the HCO Cutoff Switch.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the switch.
5. Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagrams

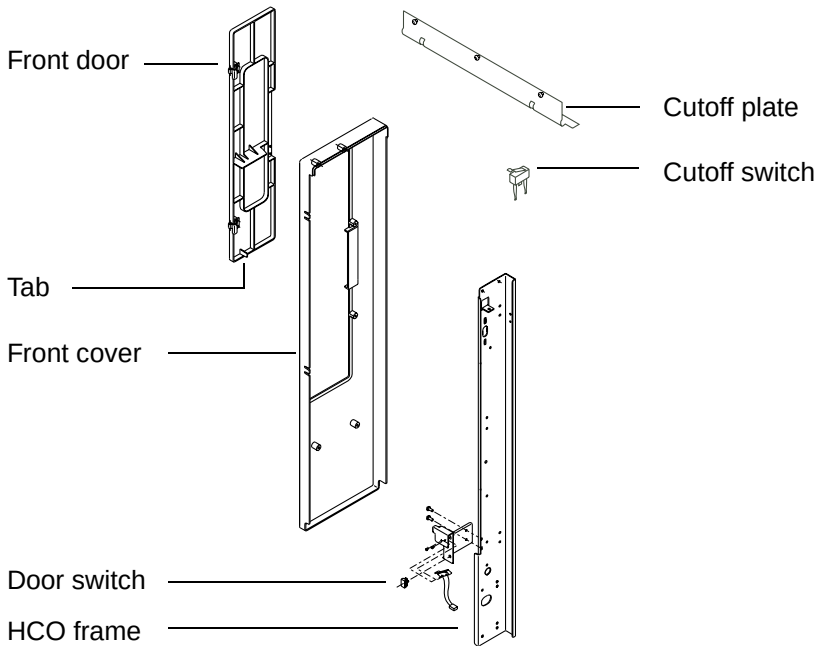


Figure B-9 HCO Door Switch

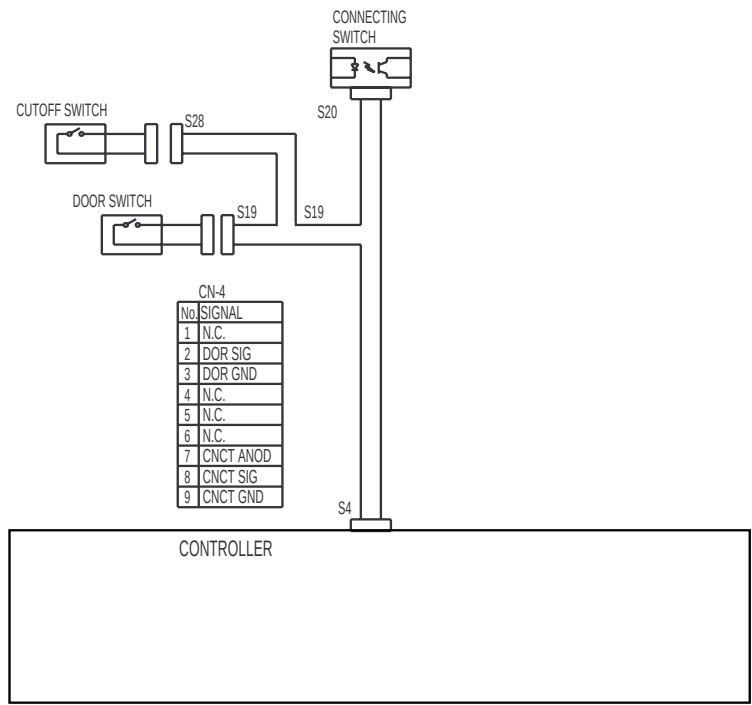


Figure B-10 Wiring Diagram for Door Switch and HCO Cutoff Switch

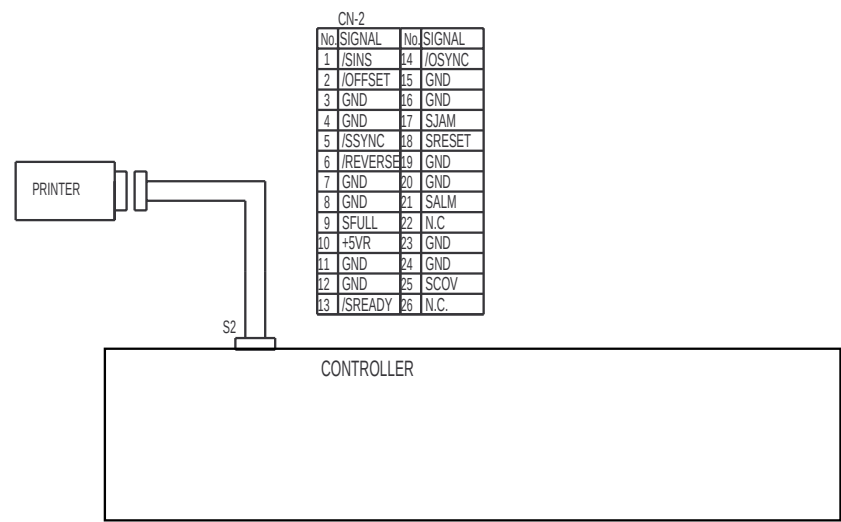


Figure B-11 Wiring Diagram for HCO Controller to Printer Interface

B-4.6 HCO Tray Continuous Up-Down Problems

Description

The HCO is executing an internal test by moving the paper tray up and down repeatedly.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Make sure the HCO DIP switches are set to OFF and power cycle the HCO. See B-3 "Diagnostics," on page B-6 for more information.	HCO Tray continues to move up and down.	Go to step 2 .	Return HCO to normal operation.
2. Run HCO DIP switch diagnostics and check the following sensors. - Paper height sensor - Tray home position sensor	Sensor fails diagnostics.	Go to step 3 .	Go to step 4 .
3. Check for damaged signal cables or connectors between the HCO controller and the following sensors: - Paper Height Sensor: CN5 on the HCO controller and CN16 on the switch harness. CN16 on the harness and the Paper Height Sensor. - Tray home position sensor: CN5 on the HCO controller and CN17 on the switch harness. CN17 on the harness and the tray home position sensor.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the sensor.
4. Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagrams

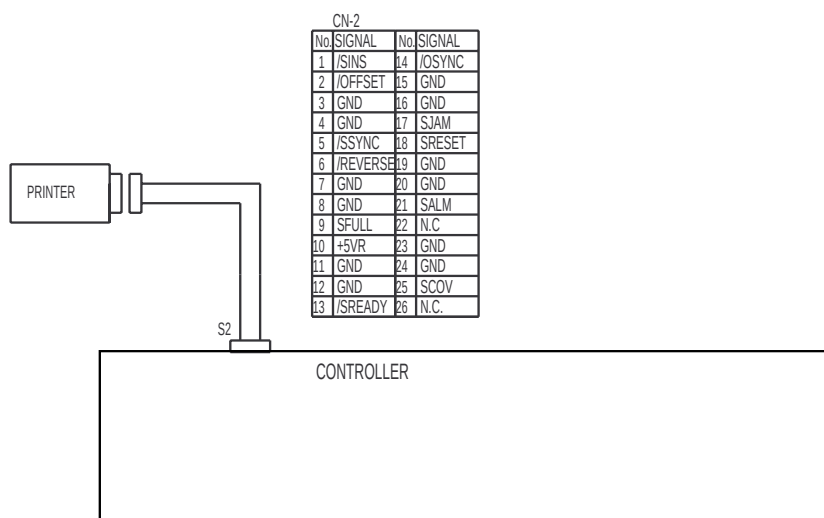


Figure B-12 Wiring Diagram for HCO Controller to Printer Interface

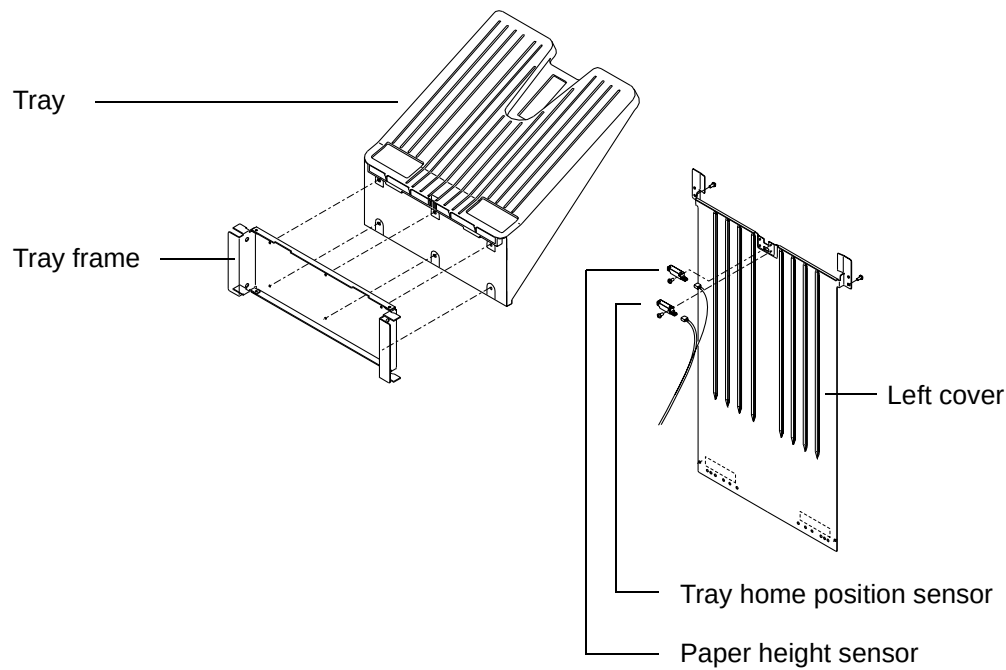


Figure B-13 HCO Paper Tray and Sensors

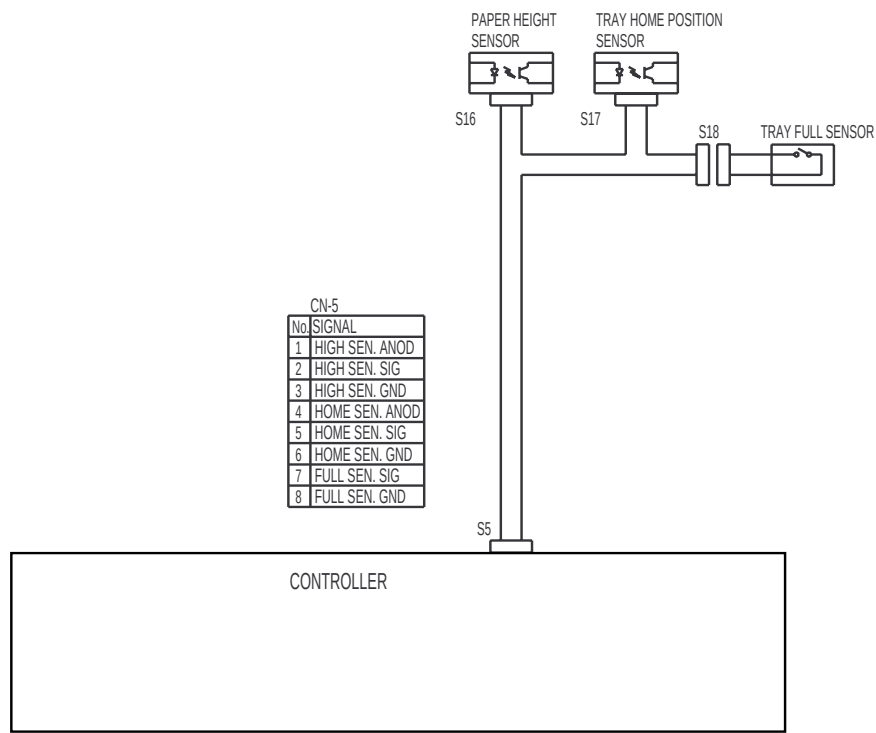


Figure B-14 Wiring Diagram for HCO Paper Height and Tray Home Position Sensors

B-4.7 HCO Tray Stays Down Problems

Description

The paper tray does not move up after the stacked paper is removed. Possible causes include:

- The Tray Full Sensor indicates the tray is full.
- Tray Belts are damaged or slipping.
- The Tray Motor is not working.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Use the HCO DIP switch diagnostics to run the Motors Test. See B-3 "Diagnostics," on page B-6 for more information.	Tray motor fails diagnostics.	Go to step 4.	Go to step 2.
2. Run HCO DIP switch diagnostics and check the Tray Full Sensor.	Sensor fails diagnostics.	Go to step 3.	Go to step 6.
3. Check for damaged signal cables or connectors between the HCO controller and the sensor. • Tray Full Sensor: CN5 on the HCO controller and CN16 on the switch harness. CN17 on the harness and the Tray Full Sensor.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the sensor.
4. Check the Tray Belts and belt tension. • Check the Tray Belts and pulleys for damage. Replace any damaged parts. • Make sure the belt tension is tight and both the left and right belts have the same tension. If necessary, adjust the screws on the upper tension brackets.	Tray remains down.	Go to step 5.	Return HCO to normal operation.
5. Check for damaged signal cables or connectors between the tray motor and the HCO controller. • Check CN7 on the HCO controller and DCM on the tray motor.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the tray motor.
6. Check for pinched wires, cables, and damaged connectors between the HCO controller and the printer.	Connector or signal cable is damaged.	Replace the damaged wire or connector.	Replace the HCO controller board.

Reference Diagrams

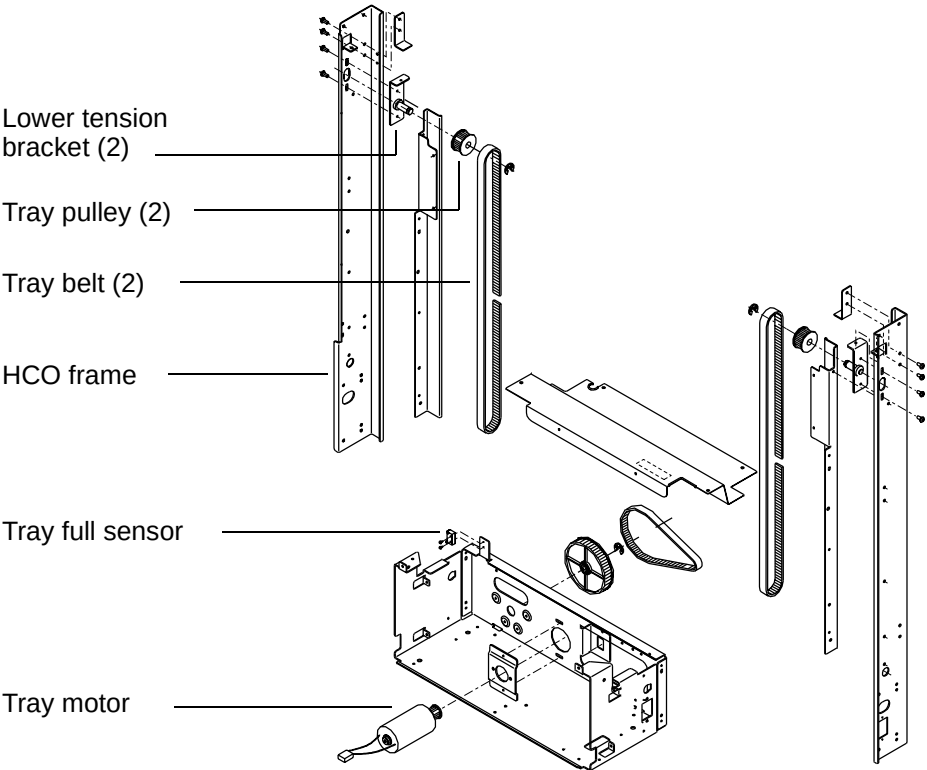


Figure B-15 Tray Motor, Belts, and Tray Full Sensor

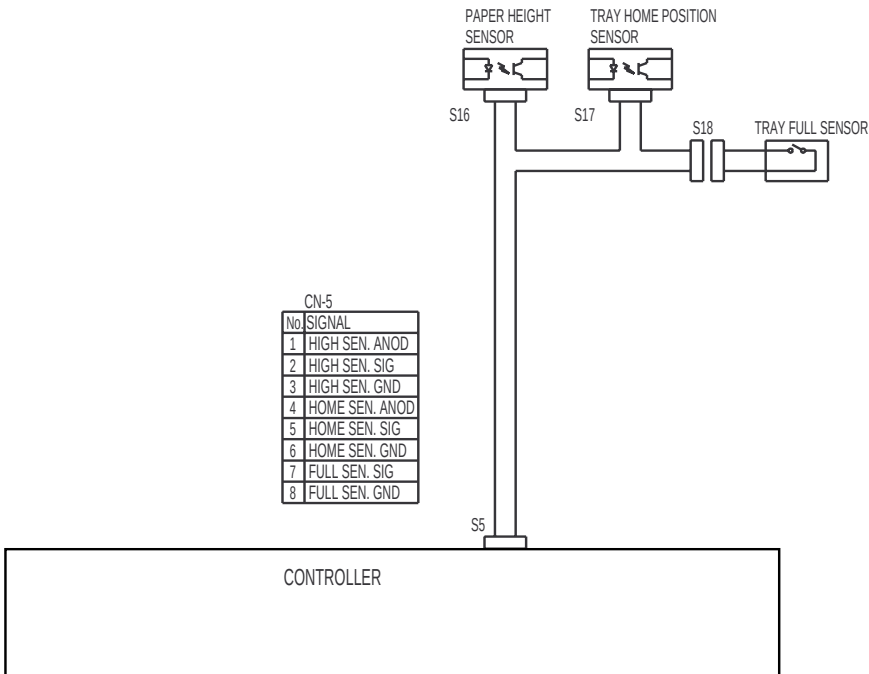


Figure B-16 Wiring Diagram for Tray Full Sensor

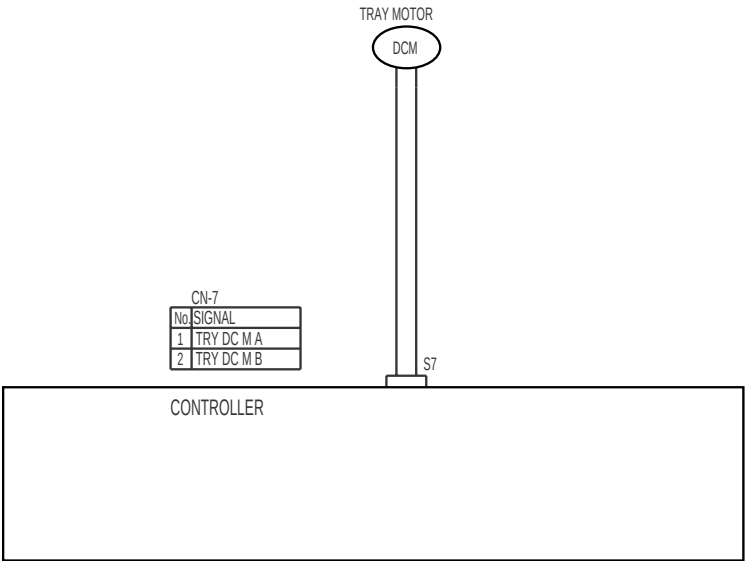


Figure B-17 Wiring Diagram for Tray Motor

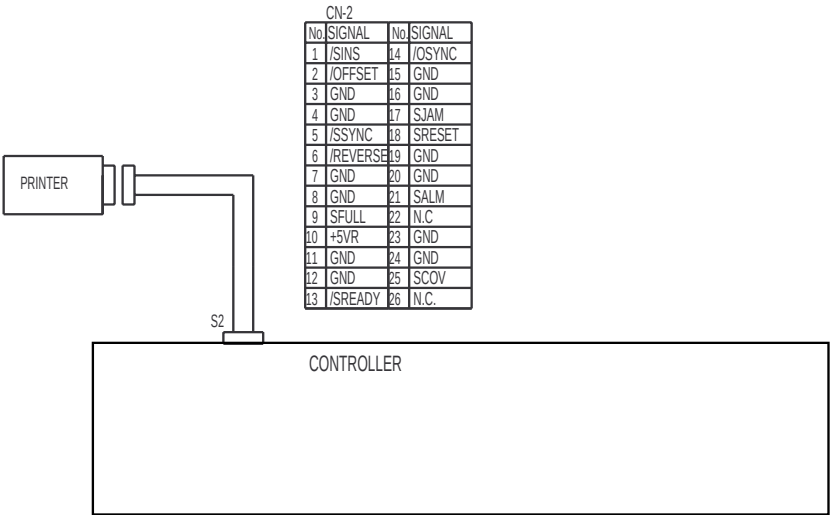
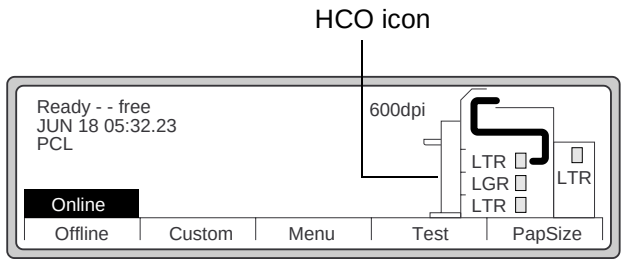


Figure B-18 Wiring Diagram for HCO Controller to Printer Interface

B-4.8 HCO Not Recognized By Printer

Description

The printer does not recognize the HCO although it is installed. The HCO symbol **does not** appear on the printer's control panel.



Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Make sure the interface cable is connected to the printer. Power cycle the HCO and the printer.	HCO still not recognized.	Go to step 2.	Return HCO to normal operation.
2. Check for pinched wires, cables, or damaged connectors between the following: • CN2 on the HCO controller and the HCO interface cable. • CN12 on the printer's mechanism controller and the HCO interface cable.	Connector or cable is damaged.	Replace the damaged cable or connector.	Replace the HCO controller.

Reference Diagram

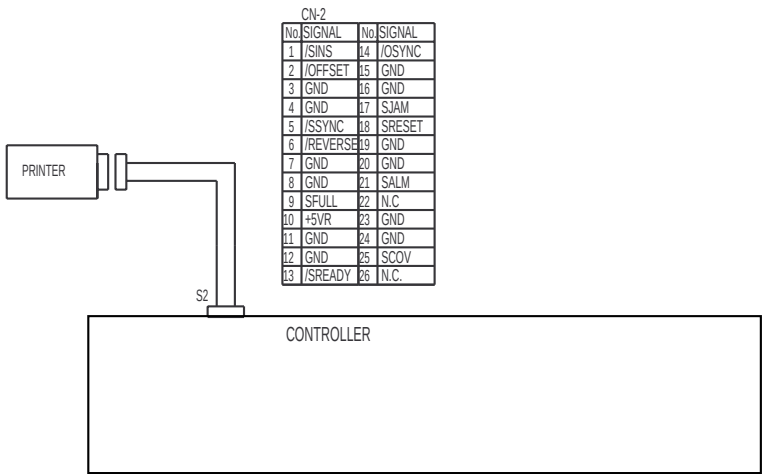
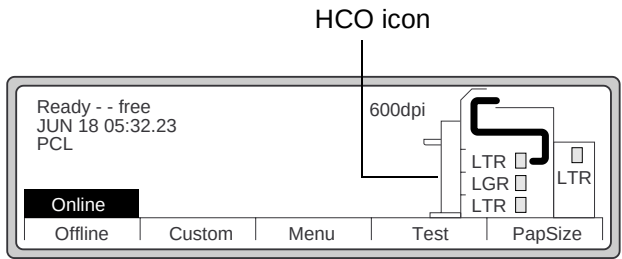


Figure B-19 Wiring Diagram for HCO Controller to Printer Interface

B-4.9 HCO Not Installed But Recognized By Printer

Description

The printer incorrectly detects the HCO when the HCO is not installed. The HCO symbol appears on the printer's control panel when it should not.



Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Make sure the HCO is detached from the printer and the interface cable is disconnected. Power cycle the printer.	HCO is still recognized.	Go to step 2.	Return printer to normal operation.
2. Check for pinched wires, cables, or damaged connectors between the following: • CN12 on the printer's mechanism controller and the HCO interface cable.	Connector or cable is damaged.	Replace the damaged cable or connector.	Replace the printer's mechanism controller board ^a .

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

B-5 Maintenance

This section describes how to replace parts on the 3,000-sheet HCO.

In this section location references are described with respect to the front of the HCO. The front has the HCO access door.

CAUTION

When you replace a part in the HCO, make sure you don't pinch or damage wires near or around the part. If you need to unclamp wires to replace a part, make sure you replace the wires when you reassemble the HCO.

B-5.1 Top Cover Removal

See item 5 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the four screws securing the top cover.
- Step 4** Remove the top cover.

B-5.2 Right Cover (between HCO and printer) Removal

See item 4 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)).
- Step 4** Remove two screws from the top corners of the right cover.
- Step 5** Remove two screws near the bottom of the cover. (These screws are next to the slots in the cover.)
- Step 6** Remove the right cover.

B-5.3 Rear Cover Removal

See item 7 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).

Step 4 Remove the four screws that attach the rear cover to the HCO.

Step 5 Remove the rear cover.

To completely remove the cover, disconnect the ground wire. Then, disconnect the interface cable from the back of the printer and push the cable through the rubber dust pad on the rear cover.

B-5.4 Front Cover Removal

See item 6 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), and rear cover ([B-5.3](#)).

Step 4 Remove the two screws (through the frame) that attach the bottom inside of the front cover.

Step 5 Remove one screw (through the frame) that attaches the middle inside of the front cover.

Step 6 Remove two screws (through the frame) that attach the top inside of the front cover.

Step 7 Remove the front cover.

B-5.5 Left Cover Removal

See item 9 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the two paper guides (items 2 and 3 in [Figure B-27](#)).

Step 4 Remove the six screws that attach the paper tray to the HCO (item 15 in [Figure B-27](#)). Unhook the paper tray and set it aside.

Step 5 Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).

Step 6 Remove the four screws that attach the top cover frame (item 31 in [Figure B-27](#)). Unclip the cables from inside the top cover frame and set it aside.

Step 7 Remove the two screws on top of the pulley cover (item 8 in [Figure B-27](#), just below the left cover) and remove the pulley cover.

Step 8 Remove the two screws near the top corners of the left cover.

Step 9 Remove the paper feed unit (B-5.17).

Step 10 Remove the following connectors.

C16 = Paper Height Sensor

C17 = Tray Home Position Solenoid

Step 11 Lift up the left cover to remove it.

B-5.6 Power Supply Replacement

See item 16 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

Step 1 Power off the HCO and detach the power cord from the rear of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover (B-5.1) and right cover (B-5.2). The main controller board is located above the HCO leg, next to the power supply.

Step 4 Remove the screw securing the green ground wire to the HCO frame.

Step 5 Remove the CN1 connector from the left side of the controller.

Step 6 Remove CN1 DC Input from the lower right of the power supply.

Step 7 Remove four screws from each corner of the power supply.

Step 8 Remove and replace the power supply.

Step 9 Reassemble in reverse order.

B-5.7 Main Controller Board Replacement

See item 17 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover (B-5.1) and right cover (B-5.2). The main controller board is located above the HCO leg, next to the power supply.

Step 4 Remove all connectors from the main controller board (CN1, CN2, CN4, CN5, CN6, CN7, CN8, CN9, CN10,).

Step 5 Remove four screws, one from each corner of the main controller board.

Step 6 Remove and replace the main controller board.

Step 7 Reassemble in reverse order.

B-5.8 Tray Sensors Replacement (Paper Height Sensor, Tray Home Position Sensor)

See item 28 in [Figure B-27 "Top Assembly Drawing," on page B-56](#) and [Figure B-37 "Parts Diagram for Tray Sensors Kit," on page B-71](#).

Step 1 Follow steps 1 through 10 in [B-5.5 "Left Cover Removal," on page B-38](#). You do not need to remove the left cover.

- Step 2** For each of the two sensors, remove the screw that attaches the sensor to the left cover.
- Step 3** Remove the tray sensors (paper height sensor, tray home position sensor).
- Step 4** Inspect the sensor harnesses for pinched wires or damaged connectors.
- Step 5** Replace the tray sensors.
- Step 6** If damaged, replace the harnesses.
- Step 7** Reassemble in reverse order.

B-5.9 Tray Belt and Tray Belt Pulley Replacement

Note To keep the belt tension even, make sure you replace both tray belts at the same time.

Figure B-36 "Parts Diagram for Tray Belt Kit.," on page B-70. Items 27 and 25 in Figure B-27 "Top Assembly Drawing," on page B-56.

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover (B-5.1), right cover (B-5.2), rear cover (B-5.3), and front cover (B-5.4).
- Step 4** Remove the two screws on top of the pulley cover (item 8 in Figure B-27), just below the left cover) and remove the pulley cover.
- Step 5** Turn the tray pulley (item 38 in Figure B-27) to lower the tray to its lowest position.
- Step 6** Remove the four screws that attach the power cage top (item 37 in Figure B-27) and remove the power cage top.
- Step 7** For the left belt, remove the lower tension bracket (item K9-E in Figure B-36) that keeps the tray belt tight.
- Step 8** Remove the E-ring and the tray belt pulley. Replace the pulley.
- Step 9** Remove the four screws that attach the belt connector plate to the tray frame.
- Step 10** Remove the tray belt.
- Step 11** Repeat steps 6 to 11 for the right belt.
- Step 12** Replace both tray belts.

CAUTION When you replace the belts, make sure the belt position on the connector plate is the same for both belts. Otherwise, the notches on the inside of the belt won't align properly and the belt may slip. (See Figure B-20.)

- Step 13** Reassemble in reverse order.

Note

When you reconnect the lower tension brackets to the HCO frame, make sure the tension is the same for both tray belts. Turn the screws on each bracket the same number of times.

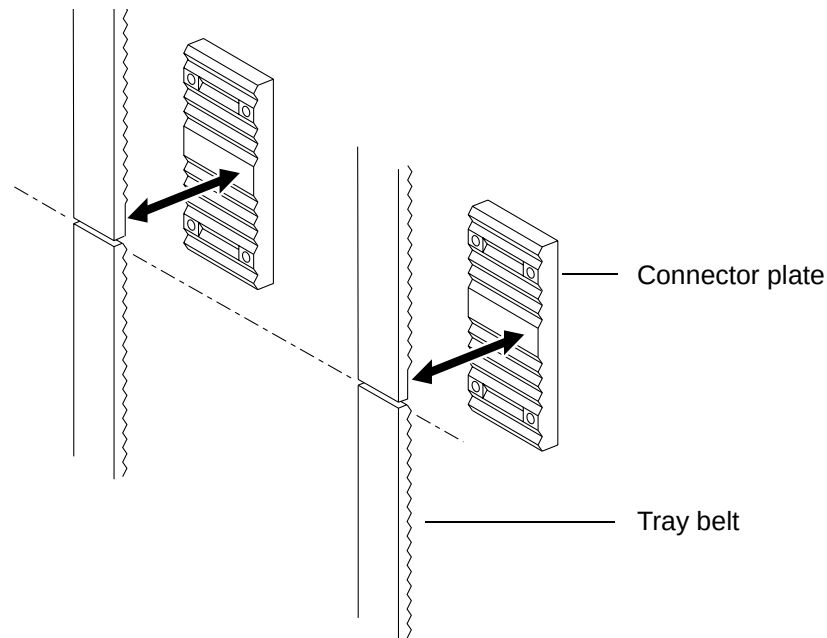


Figure B-20 Tray Belt Replacement

B-5.10 Connecting (Docking) Sensor Replacement

See item 30 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 4** Disconnect the C20 connector.
- Step 5** Remove the screw that connects the connecting sensor bracket to the HCO reinforcement bracket.
- Step 6** Remove the two screws that attach the connecting sensor to the bracket.
- Step 7** Replace the connecting sensor.
- Step 8** Inspect the sensor harness for pinched wires or damaged connectors.
- Step 9** If damaged, replace the sensor harness.
- Step 10** Reassemble in reverse order.

B-5.11 Door Switch Replacement

See item 24 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 4** Remove the two screws that attach the door switch bracket to the HCO frame (located behind the tray belt).
- Step 5** Disconnect the C19 connector.
- Step 6** Remove the two screws that attach the door switch to the assembly.
- Step 7** Replace the door switch.
- Step 8** Inspect the sensor harness for pinched wires or damaged connectors.
- Step 9** If damaged, replace the sensor harness.
- Step 10** Reassemble in reverse order.

B-5.12 Tray Full Sensor Replacement

See item 29 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 4** Remove the four screws that attach the top of the power cage top (item 37 in [Figure B-27](#)) and remove top.
- Step 5** Disconnect the C18 connector.
- Step 6** Remove the two screws that attach the tray full sensor to the frame.
- Step 7** Replace the tray full sensor.
- Step 8** Inspect the sensor harness for pinched wires or damaged connectors.
- Step 9** If damaged, replace the sensor harness.
- Step 10** Reassemble in reverse order.

B-5.13 HCO Cutoff Switch Replacement

See item 77 in [Figure B-28 "Paper Feed Unit Diagram," on page B-60](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the four screws that attach the top cover frame (item 31 in [Figure B-27](#)). Unclip the cables from inside the top cover frame and set it aside.

Step 5 Disconnect the C19 connector.

Note	There are two C19 connectors in the HCO: one for the HCO cutoff switch and one for the door switch. The C19 connector for the HCO Cutoff Switch is near the top of the HCO (underneath the top cover frame).

Step 6 Remove the two screws that attach the cutoff sensor to the HCO frame.

Step 7 Replace the cutoff switch.

Step 8 Inspect the switch harness for pinched wires or damaged connectors.

Step 9 If damaged, replace the harness.

Step 10 Reassemble in reverse order.

B-5.14 Feed Roller Replacement

See [Figure B-29 "Parts Diagram for Feed Roller Kit," on page B-62](#) and item 70 in [Figure B-28 "Paper Feed Unit Diagram," on page B-60](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover ([B-5.1](#)), the right cover ([B-5.2](#)), the rear cover ([B-5.3](#)), and the front cover ([B-5.4](#)).

Step 4 Remove the top cover frame (item 31 in [Figure B-28](#)).

Step 5 Remove the blue knob, E-ring, and bearing on the left side of the feed roller.

Step 6 Loosen the left screw and remove the right screw attaching the feed motor gear bracket to the paper feed unit (item 62 in [Figure B-28](#)). Remove the feed motor gear bracket.

Step 7 Remove the E-ring, and drive gear on the right side of the feed roller, then remove the E-ring and bearing.

Step 8 Lift the Lever.

Step 9 Loosen the idler roller frame (item 56 in [Figure B-28](#)), rotate it forward, and lift it up.

Step 10 Remove and replace the feed roller, drive gear, and bearing.

Step 11 Reassemble in reverse order.

B-5.15 Feed Motor Kit Replacement

See [Figure B-32 "Parts Diagram for Feed Motor Kit," on page B-66](#) and item 62 in [Figure B-28 "Paper Feed Unit Diagram," on page B-60](#).

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).

- Step 4** Remove the feed motor cables from the cable clip and disconnect the C11 connector.
- Step 5** Remove the two screws that attach the feed motor to the feed motor gear bracket (item K5-2 in [Figure B-32](#)).
- Step 6** Loosen the left screw and remove the right screw attaching the feed motor gear bracket to the paper feed unit. Remove and replace the feed motor gear bracket.
- Step 7** Replace the feed motor and harness.
- Step 8** Reassemble in reverse order.

B-5.16 Paper Path Solenoid Replacement

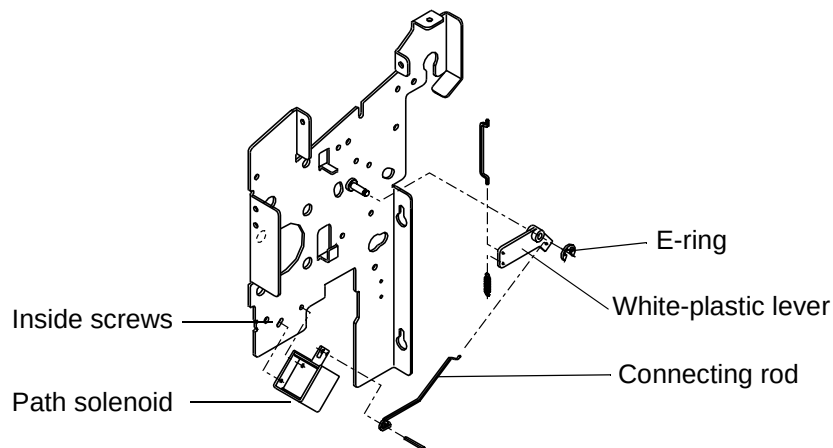


Figure B-21 Paper Path Solenoid Replacement

See item 54 in [Figure B-28 "Paper Feed Unit Diagram,"](#) on page B-60.

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), and rear cover ([B-5.3](#)).
- Step 4** Disconnect the C15 connector and remove wires from cable clip.
- Step 5** Remove E-ring holding the white-plastic lever to the shaft.
- Step 6** Remove the two inside screws that attach the paper path solenoid.
- Step 7** Disengage the solenoid connecting rod from the white-plastic lever.
- Step 8** Remove and replace the paper path solenoid.
- Step 9** Reassemble in reverse order.

B-5.17 Paper Feed Unit Replacement

See [Figure B-28 "Paper Feed Unit Diagram,"](#) on page B-60.

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the four screws that attach the top cover frame (item 31 in [Figure B-27](#)). Unclip the cables from inside the top cover frame and set it aside.
- Step 5** Remove the cutoff switch ([B-5.13](#)).
- Step 6** Disconnect the following connectors:
 - C22 = Exit Switch (top of feed unit)
 - C11 = Feed Motor (rear of stacker, below feed motor and paper offset solenoid)
 - C15 = Path Solenoid (rear of stacker, below feed motor and paper offset solenoid)
 - C12 = Exit Motor (rear of stacker, below feed motor and paper offset solenoid)
 - C23 = Reversing Sensor (mounted on reverse frame)
- Step 7** Remove the screw that connects the paper feed unit grounding wire to the reinforcement bracket on the right-rear of the HCO. (The other end of the grounding wire is connected to the exit motor mounting bracket.)
- Step 8** Remove the screw that attaches the paper feed unit to the reinforcement bracket on the right-front of the HCO.
- Step 9** Loosen the four screws that attach the paper feed unit to the front and rear of the HCO frame.
- Step 10** Lift up the unit and unclip the wires for the paper height sensor and tray home sensor. Remove the following connectors.
 - C24 = Offset Sensor
 - C14 = Offset Solenoid
- Step 11** Remove and replace the paper feed unit.
- Step 12** Reassemble in reverse order.

B-5.18 Paper Offset Solenoid and Harness Replacement

See [Figure B-38 "Parts Diagram for Offset Solenoid Kit.," on page B-72](#) and item 71 in [Figure B-28 "Paper Feed Unit Diagram," on page B-60](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the paper feed unit ([B-5.17](#)).
- Step 5** Remove the exit rollers ([B-5.20](#)). Inspect the exit rollers, pulley, guides, bearings. If worn or damaged, replace with the Exit Kit (Kit 4).
- Step 6** Remove the four screws attaching the offset assembly (item 73 in [Figure B-28](#)) to the paper feed unit.
- Step 7** Remove the two screws that attach the offset solenoid.
- Step 8** Disconnect the C14 connector.
- Step 9** Remove and replace the offset solenoid.
- Step 10** Inspect the offset solenoid harness for pinched wires or damaged connectors.

This harness connects the C14 connector on the offset solenoid to the C10 connector on the HCO controller. It also connects the C15 connector on the path solenoid to the C10 connector on the HCO controller.
- Step 11** If damaged, replace the solenoid harness.
- Step 12** Reassemble in reverse order.

B-5.19 Exit Motor Kit Replacement

See [Figure B-33 "Parts Diagram for Exit Motor Kit.," on page B-67](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), and rear cover ([B-5.3](#)).
- Step 4** Disconnect the C12 connector.
- Step 5** Remove the four screws that attach the exit motor to the paper feed unit and remove the motor.
- Step 6** Remove and replace the four grommets (item K6-3 in [Figure B-33](#)) attached to the paper feed unit.
- Step 7** Replace the exit motor, pulley, and wire harness.
- Step 8** Inspect the motor harness for pinched wires or damaged connectors.

If damaged, replace the motor harness. This harness connects the C12 connector on the exit motor to the C9 connector on the HCO controller.
- Step 9** Reassemble in reverse order.

B-5.20 Exit Kit Replacement

See [Figure B-31 "Parts Diagram for Exit Kit.," on page B-65.](#)

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the paper feed unit ([B-5.17](#)).
- Step 5** Remove the two screws that attach the exit idler roller (item K4-2 in [Figure B-31](#)) remove exit idler roller.
- Step 6** Loosen the adjustment screw for the exit timing belt bracket (item K4-B in [Figure B-31](#)).
- Step 7** Remove and inspect the exit timing belt (item K4-6 in [Figure B-31](#)). If damaged, replace the belt.
- Step 8** Remove the E-ring on the exit timing belt idler roller (item K4-5 in [Figure B-31](#)) on the exit timing belt bracket. Remove and replace the exit timing belt idler roller.
- Step 9** Remove the two E-rings on both sides of the exit roller shaft (item K4-7 in [Figure B-31](#)).
- Step 10** Remove the bearing (item K4-6 in [Figure B-31](#)) on the left side of the exit roller shaft.
- Step 11** Remove the exit roller shaft.
- Step 12** Remove the E-ring, bearing, and pulley (item K4-3 in [Figure B-31](#)) on the right side of the exit roller shaft.
- Step 13** Remove and replace the exit rollers (item K4-1 in [Figure B-31](#)) and roller guides (item K4-4 in [Figure B-31](#)).

Replace all parts included in the Exit Kit.

Make sure the exit rollers are positioned correctly in the roller slots.
- Step 14** Reassemble in reverse order.

When you reassemble the exit roller pulley, make sure the flat side of the pulley (not the gear side) faces away from the rollers.

B-5.21 Reverse Roller Replacement

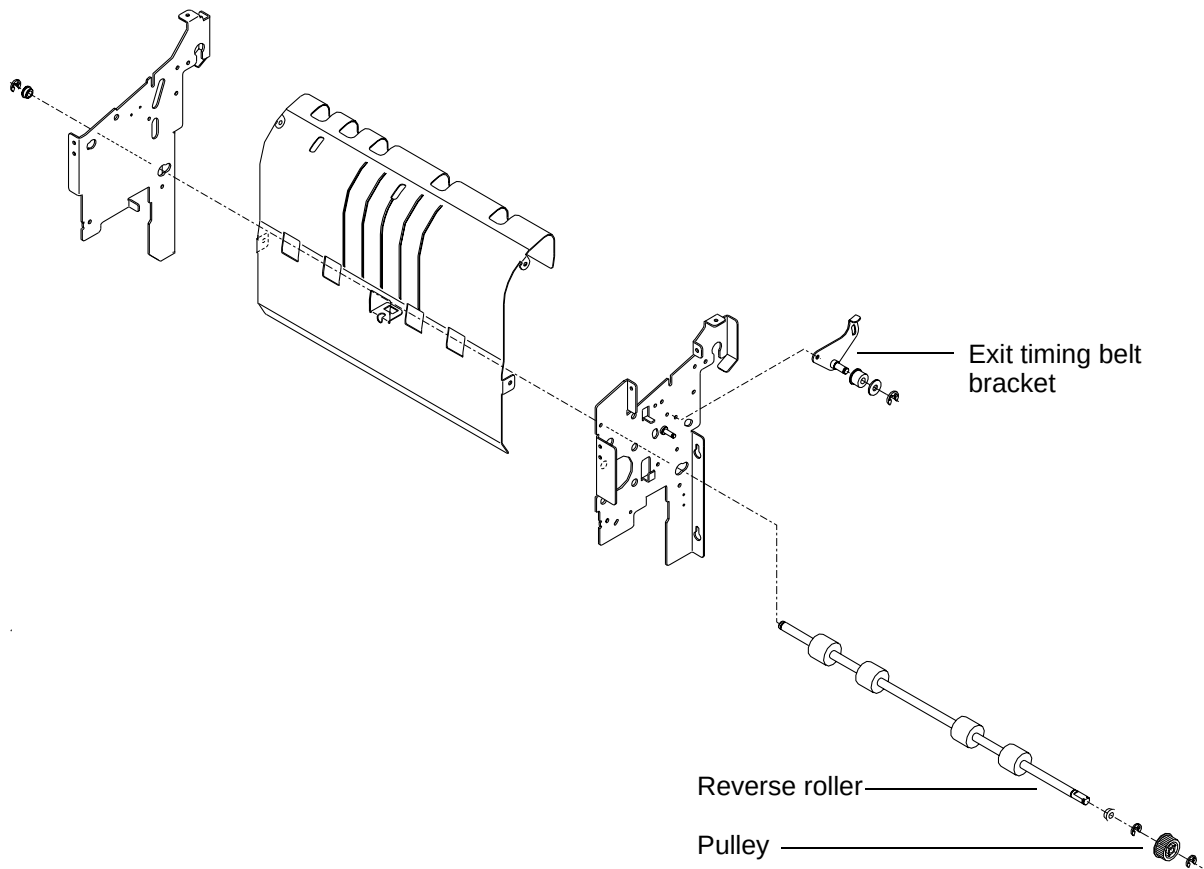


Figure B-22 Reverse Roller Replacement

See item 68 in [Figure B-28 "Paper Feed Unit Diagram," on page B-60.](#)

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the paper feed unit ([B-5.17](#)).
- Step 5** Loosen the adjustment screw for the exit timing belt bracket and disengage the belt from the reverse roller pulley.
- Step 6** Remove the E-ring and reverse roller pulley on the right side of the reverse roller.
- Step 7** Remove the second E-ring and bearing on both sides of the reverse roller.
- Step 8** Remove and replace the reverse roller.
- Step 9** Reassemble in reverse order.

B-5.22 Power Switch Replacement

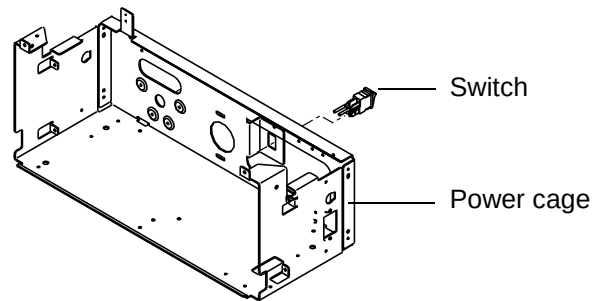


Figure B-23 Power Switch Replacement

See item 18 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the pulley cover (item 8 in [Figure B-27](#)).
- Step 4** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 5** Disconnect the C1 connector on the power supply (item 16 in [Figure B-27](#)).
- Step 6** Disconnect the 2A and 1A connectors on the switch.
- Step 7** Snap out and replace the switch.
- Step 8** Reassemble in reverse order.

B-5.23 Tray Motor Replacement

See item 23 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the pulley cover (item 8 in [Figure B-27](#)).
- Step 4** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 5** Remove the power cage top (item 37 in [Figure B-27](#)).
- Step 6** Disconnect the C7 connector from the HCO controller.
- Step 7** Remove the power supply shield (includes power supply and controller).
There are five screws that attach the shield (one in each corner of the shield and one in the middle near the bottom).
- Step 8** Remove the two screws that attach the tray motor to the tray motor bracket.
- Step 9** Remove and replace the tray motor.
- Step 10** Reassemble in reverse order.

B-5.24 Timing Belt Kit and Tray Pulley Kit Replacement

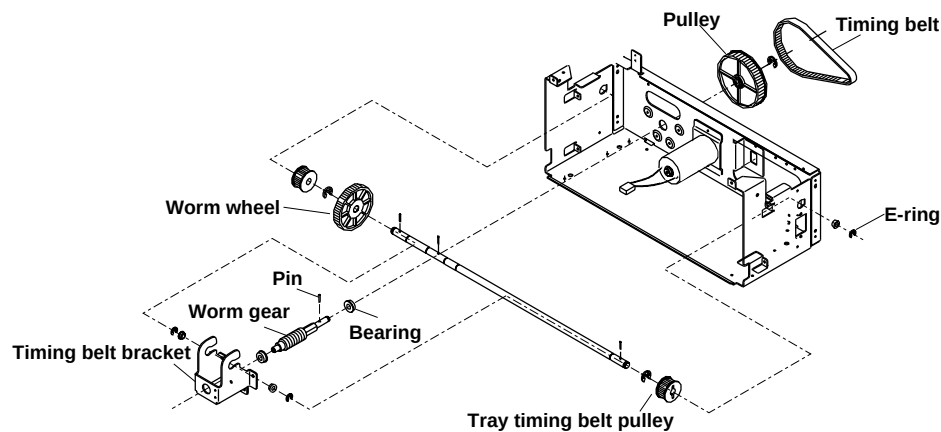


Figure B-24 Timing Belt Kit and Tray Pulley Kit Replacement

See [B-6.9 "Tray Pulley Kit \(Kit 7\)," on page B-68](#) and [B-6.10 "Timing Belt Kit \(Kit 8\)," on page B-69](#). See items 38, 39, 40, and 41 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the pulley cover (item 8 in [Figure B-27](#)).
- Step 4** Loosen the two tray motor screws and remove the timing belt.
- Step 5** Remove the E-ring that holds the timing belt pulley. remove the pulley and pulley pin.
- Step 6** Remove the top cover ([B-5.1](#)) and right cover ([B-5.2](#)).
- Step 7** Remove the power supply ([B-5.6](#)).
- Step 8** Remove the power supply shield (item 36 in [Figure B-27](#)). There are five screws that attach the shield (one in each corner of the shield and one in the middle near the bottom).
- Step 9** Release the tension on both tray belts by loosening the screws in the upper and lower tension brackets. (See items K9-D and K9-E in [B-6.11 "Tray Belt Kit \(Kit 9\)," on page B-70](#).)
- Step 10** Remove the four screws that connect the timing belt bracket.
- Step 11** Remove the E-rings and bearings (both sides) that connect the timing belt shaft to the power cage.
- Step 12** Remove the bearings and worm gear that connect the timing belt and pulley to the power cage.
- Step 13** Remove the pin and E-ring from the left side of the timing belt shaft.

Step 14 Remove the timing belt shaft.

Replace the timing belt, pulleys, and timing belt shaft. Check the bearings, worm gears, and pins for wear. Replace as necessary.

Step 15 Reassemble in reverse order.

B-5.25 Upper Guide Assembly Replacement

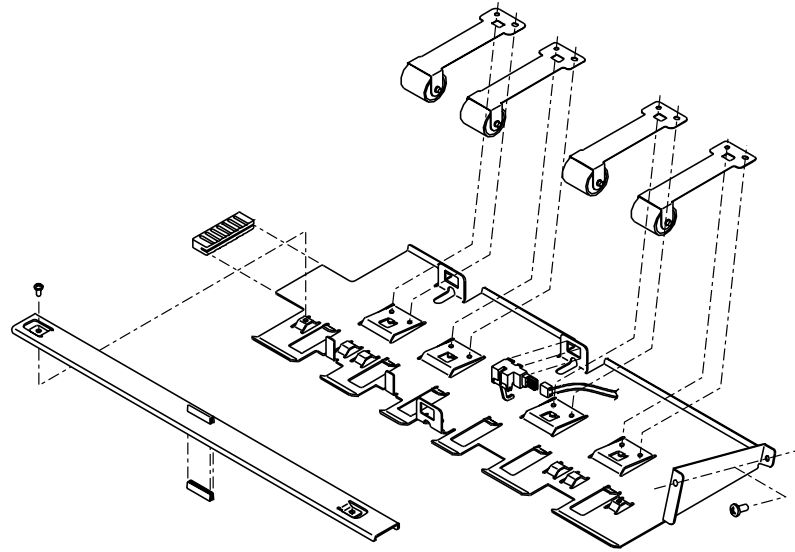


Figure B-25 Upper Guide Replacement

See item 50 in [Figure B-27 "Top Assembly Drawing,"](#) on page B-56.

Step 1 Power off the HCO and detach the power cord from the back of the HCO.

Step 2 Disconnect the HCO from the printer.

Step 3 Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).

Step 4 Remove the paper feed unit ([B-5.17](#)).

Step 5 Remove the two screws that attach the upper guide to the paper feed unit.

Step 6 Remove and replace the upper guide assembly.

Step 7 Reassemble in reverse order.

B-5.26 Lever Replacement

See [Figure B-30 "Parts Diagram for Lever Kit," on page B-63](#). See item 67 in [Figure B-27 "Top Assembly Drawing," on page B-56](#).

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), front cover ([B-5.4](#)), rear cover ([B-5.3](#)), and right cover ([B-5.2](#)).
- Step 4** Remove the top cover frame.
- Step 5** Remove the feed motor ([B-5.15](#)).
- Step 6** Remove the E-ring on the right side of the lever.
- Step 7** Remove the E-ring and bearing on the left side of the lever.
- Step 8** Remove the lever flipper, E-ring and bearing on the right side of the lever.
- Step 9** Remove and replace the lever assembly.
- Step 10** Examine the bearings for wear and replace if necessary.
- Step 11** Reassemble in reverse order.

B-5.27 Reverse Guide Assembly Replacement

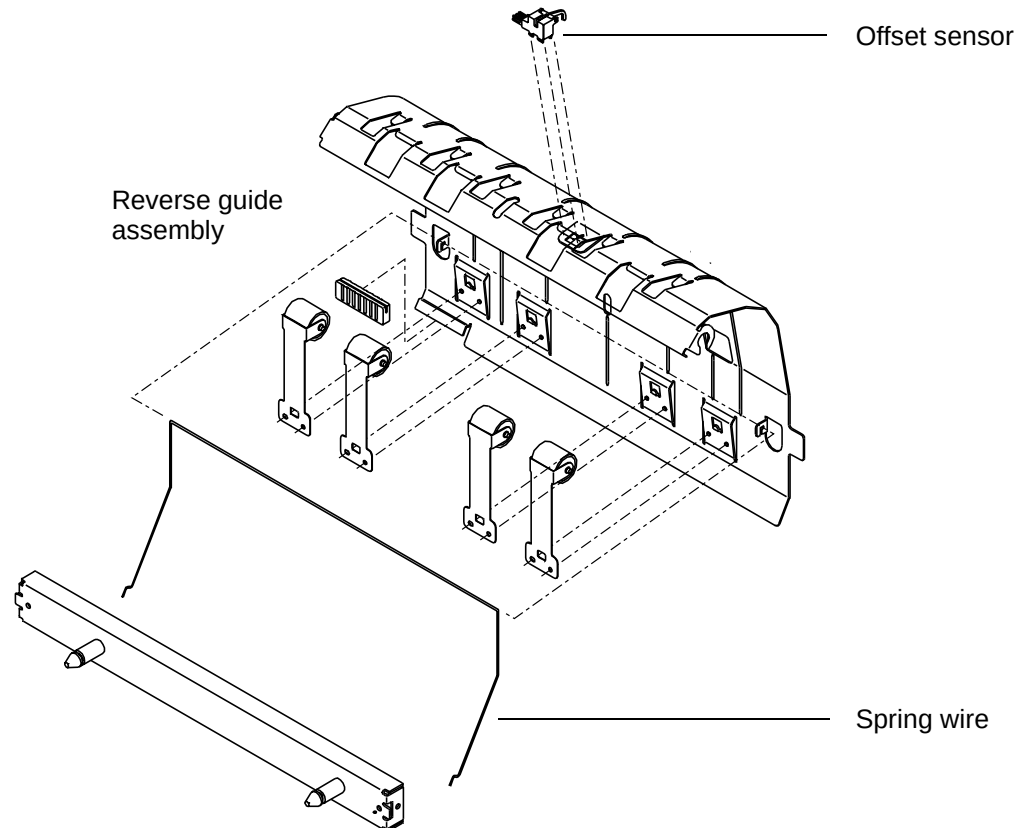


Figure B-26 Reverse Guide Assembly Replacement

See item 51 in [Figure B-28 "Paper Feed Unit Diagram,"](#) on page B-60.

- Step 1** Power off the HCO and detach the power cord from the back of the HCO.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the top cover ([B-5.1](#)), right cover ([B-5.2](#)), rear cover ([B-5.3](#)), and front cover ([B-5.4](#)).
- Step 4** Remove the paper feed unit ([B-5.17](#)).
- Step 5** Remove the feed roller ([B-5.14](#)).
- Step 6** Lift up and remove the spring wires.
- Step 7** Remove and replace the reverse guide assembly.

CAUTION

When you remove the assembly, make sure you don't damage the offset sensor or disconnect the sensor clip.

- Step 8** Reassemble in reverse order.

B-6 Parts and Diagrams

This section shows exploded diagrams of the HCO assembly and sub assemblies. Each drawing also has a list of replaceable parts.

Only replaceable parts are assigned part numbers. If a part or assembly is damaged and does not have a part number, contact your factory representative.

B-6.1 Top Assembly Parts

This section lists parts for the top assembly of the HCO. Additional parts and part kits are described in the following sections.

Parts List for Top Assembly. See [Figure B-27](#).

Index No.	Qty	Part number	Description	Remarks
1	1	A061138-1GR	Front door	
2	1	A061153-0GR	Paper guide, right	
3	1	A061154-0GR	Paper guide, left	
4	1	A060133-1GR	Right cover	
5	1	A061155-0GR	Top cover	
6	1	A050156-1GR	Front cover	
7	1	A061149-0GR	Rear cover	
8	1	A060126-0GR	Pulley cover	
9	1	A061108-1GR	Left Cover	
10	2	A060619-1GR	Leg	
15	1	A061308-1GR	Tray	
16	1	A061500-0GR	Power supply (universal)	
17	1	A061516-0GR	Main controller board	
		A061546-04GR	Main controller firmware kit	Not shown
18	1	A061563-2GR	Power switch	
19	1	A061578-0GR	Interface cable	
20	1	See Kit 14, page B-74	Stacking upgrade kit	
21	4	A062609-0GR	Caster	
22	1	A061708-1GR	Paper stopper	
23	1	A061114-0GR	Tray motor	
24	1	CA02542-0131FJ	Door switch	Same part for 2K HCO.
25	2	A062105-0GR	Tray belt	

Parts List for Top Assembly. See [Figure B-27](#).

Index No.	Qty	Part number	Description	Remarks
26	2	A062106-0GR	Tray belt pulley (Drive side)	
27	2	A062111-0GR	Tray belt pulley (Idler side)	
28	2	A061739-1GR	Tray sensor	Paper height & tray home position switch.
29	1	A061112-0GR	Tray full switch	
30	1	A061115-0GR	Docking (Connecting) sensor	
31	1	None	Top cover frame	
32	1	None	Tray frame	
33	2	None	Reinforcement brackets	
34	1	A061615-0GR	HCO stopper	SA, Guide stopper
35	1	None	Power cage	
36	1	None	Power supply shield	
37	1	None	Power cage top	
38	1	See Kit 8, page B-69	Pulley	
39	1	See Kit 8, page B-69	Timing belt	
40	1	See Kit 7, page B-68	Tray pulley shaft	
41	1	See Kit 7, page B-68	Worm wheel	
42	1	A060625-0GR	Stopper	
43	1	See Kit 14, page B-74	Mounting hardware	
44	1	A062615-0GR	Static brush	This part is compatible with units having serial number JP38A00819 and higher.
45	2	A063100-0GR	Plastic guide, Clip	This part is compatible with units having serial number JP38A00819 and higher.
46	1		Exit guide	Attached to printer

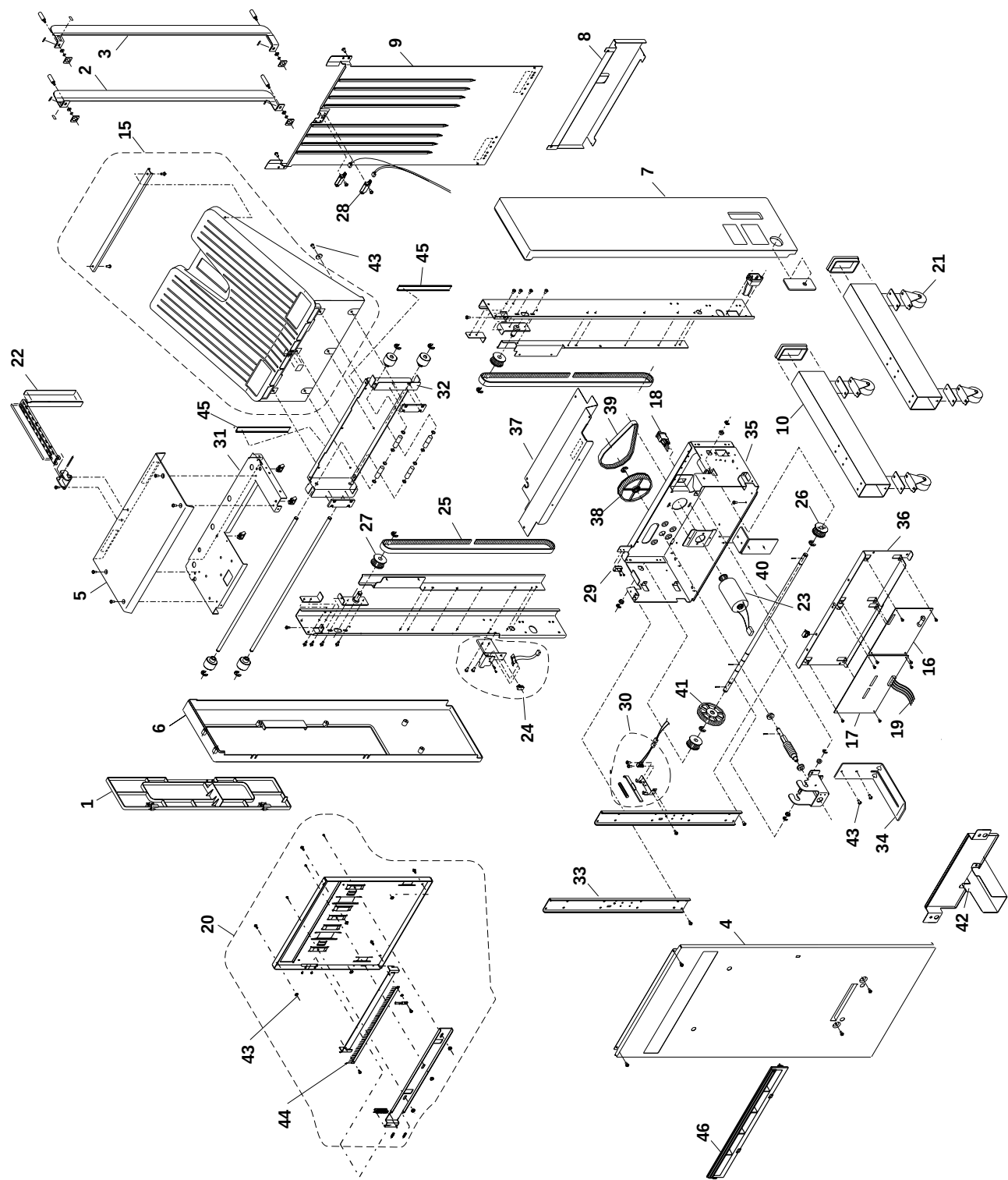


Figure B-27 Top Assembly Drawing

For a detailed view of HCO parts, see the kit descriptions later in this section.

B-6.2 Paper Feed Unit

This section lists parts for the Paper Feed Unit (part number A061243-0GR) of the HCO. This unit is included in the top assembly for the HCO.

Parts List for Paper Feed Unit. See [Figure B-28](#).

Index No.	Qty	Part number	Description	Remarks
50	1	A061242-0GR	Upper Guide Assembly	
51	1	A061244-0GR	Reverse Guide Assembly	
52	1	A061241-0GR	Nose (Paper Input Guide)	
53	8	A061216-0GR	Feed Idler Roller	
54	1	A061231-0GR	Paper Path Solenoid	
55	5	A061213-0GR	Exit Roller	
56	1	A061221-0GR	Exit Idler Roller	
57	1	A062201-0GR	Exit Timing Belt	
58	1	See Kit 1, page B-61	Brush	
59	4	A062206-0GR	Paper Exit Sensor	
60	1	CA02542-0152FJ	Reversing Sensor	Same part for 2K HCO.
61	1	See Kit 1, page B-61	Offset Sensor (in Offset Assembly)	
62	1	See Kit 5, page B-66	Feed Motor	
63	1	See Kit 6, page B-67	Exit Motor	
64	1	None	Exit Timing Belt Bracket	
65	1	See Kit 4, page B-64	Exit Roller Shaft	
66	1	See Kit 4, page B-64	Exit Roller Pulley	
67	1	See Kit 3, page B-63	Lever Assembly	
68	1	A061212-0GR	Reverse Roller	
69	1	A020225-0GR	Reverse Roller Pulley	
70	1	See Kit 2, page B-62	Feed Roller	
71	1	See Kit 12, page B-72	Offset Solenoid	
72	5	See Kit 4, page B-64	Roller Guide	

Parts List for Paper Feed Unit. See [Figure B-28](#).

Index No.	Qty	Part number	Description	Remarks
73	1	See Kit 1, page B-61	Offset assembly	This part is compatible with units having serial number JP38A00818 or lower.
		A061233-1GR	SA, Offset module	This part is compatible with units having serial number JP38A00819 and higher.
74	1	A060235-2GR	Spring wire (reverse guide)	This part is compatible with units having serial number JP38A00819 and higher.
75	1	None	Reverse guide frame	
76	1	A061253-1GR	Safety lever assembly	
77	1	A062161-1GR	Safety plate	Includes cutoff plate and cutoff switch (see B-5.13 on page B-42.)
78	1	A061210-1GR	Inner guide	This part is compatible with units having serial number JP38A00819 and higher.
79	1	A061243-0GR	Paper feed unit	This part is compatible with units having serial number JP38A00818 or lower.
		A061243-1GR	Paper feed unit	This part is compatible with units having serial number JP38A00819 and higher. Replacement procedure: see B-5.17 on page B-45.

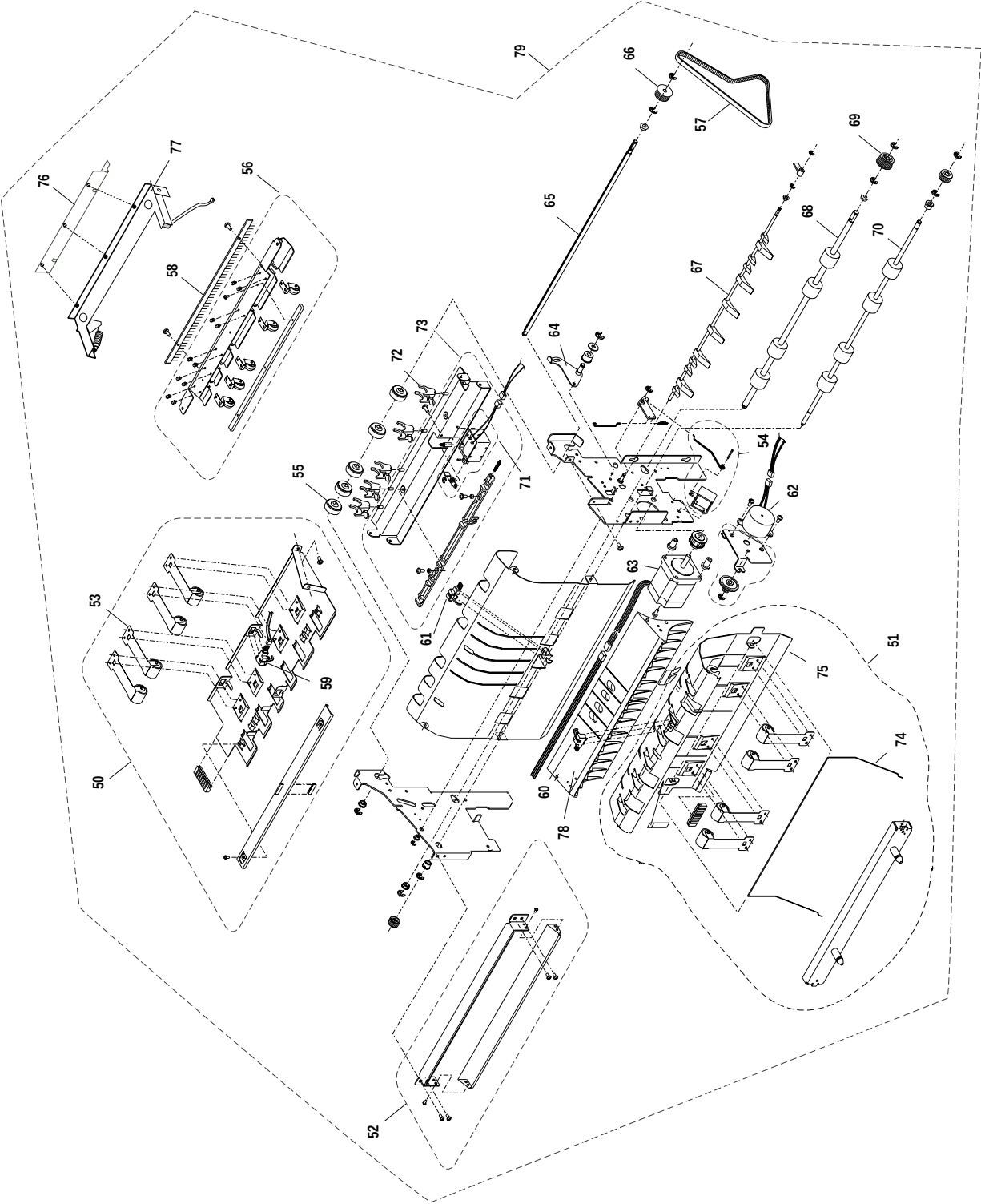


Figure B-28 Paper Feed Unit Diagram

B-6.3 General Maintenance Kit (Kit 1)

This section shows the parts list for the General Maintenance Kit. This kit includes a set of commonly-replaceable parts for the 3,000-sheet HCO. Hewlett-Packard recommends you keep this kit handy if you provide support and maintenance for the HCO.

Parts List for General Maintenance Kit (Part number = A06KIT01-GR)

Index No.	Qty	Reference number ^a	Description	Remarks
K1-1	2	A062107-0GR	Tray sensor	Also in Kit 10 (K10-1)
K1-2	5	A061213-0GR	Exit roller	Also in Kit 4 (K4-1)
K1-3	1	A061221-0GR	Exit idler roller	Also in Kit 4 (K4-2)
K1-4	1	A061211-0GR	Feed roller	Also in Kit 2 (K2-1)
K1-5	1	A061223-0GR	Exit motor	Also in Kit 6 (K6-2).
K1-6	1	A062201-0GR	Exit timing belt	
K1-7	4	A062206-0GR	Paper exit sensor	
K1-8	1	A062210-1GR	Brush, static eliminator	
K1-9	5	A060217-0GR	Roller guide	Also in Kit 4 (K4-4)
K1-10	2	A060202-0GR	Bearing	
K1-11	1	A061233-0GR	FBM, Offset assembly	Offset module
K1-12	1	A061212-0GR	Reverse roller	
K1-13	2	A022220-0GR	Bearing-8	
K1-14	2	A062205-0GR	Bearing	Also in Kit 6 (K6-6)
K1-15	1	A060266-1GR	Shaft	Also in Kit 4 (K4-7)

a. For reference information only. Not sold as a separate HP part.

B-6.4 Feed Roller Kit (Kit 2)

Parts List for Feed Roller Kit (Part number = A06KIT02-GR).

Index No.	Qty	Reference Number ^a	Description	Remarks
K2-1	1	A061211-0GR	Feed roller	Also in Kit 1 (K1-4)
K2-2	1	A0611219-0GR	Feed roller drive gear	
K2-3	2	A060202-0GR	Bearing	
K2-A	NA	Ref	E-ring	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

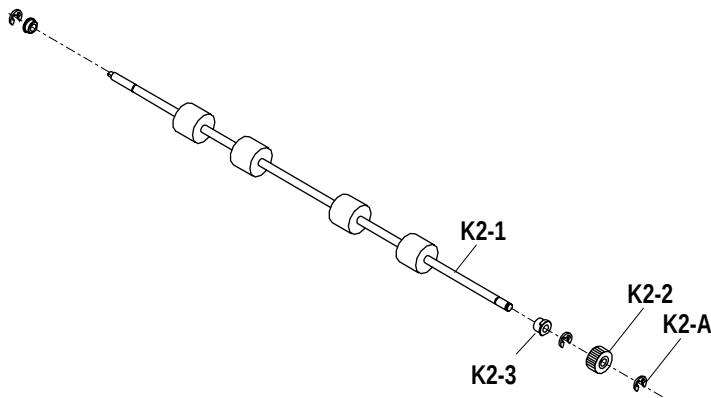


Figure B-29 Parts Diagram for Feed Roller Kit.

B-6.5 Lever Kit (Kit 3)

Parts List for Lever Kit (Part number = A06KIT03-GR).

Index No.	Qty	Reference Number ^a	Description	Remarks
K3-1	2	A012202-0GR	Bearing-4	
K3-2	1	A061215-0GR	Lever	
K3-A	NA	Ref	E-ring	For reference only. Not included in kit.
K3-B	NA	Ref	Lever flipper	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

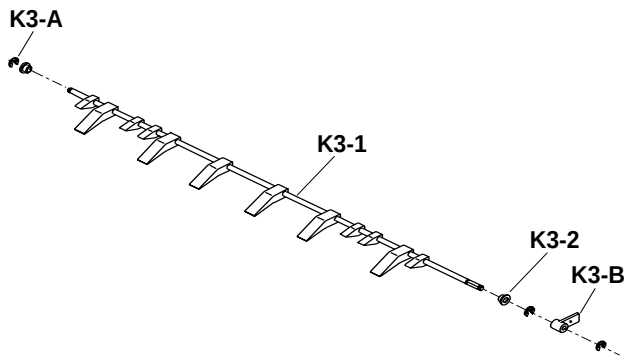


Figure B-30 Parts Diagram for Lever Kit

B-6.6 Exit Kit (Kit 4)

Parts List for Exit Kit (Part number = A06KIT04-GR). See [Figure B-31](#).

Index No.	Qty	Reference number ^a	Description	Remarks
K4-1	5	A061213-0GR	Exit roller	Also in Kit 1 (K1-2)
K4-2	1	A061221-0GR	Exit idler roller	Also in Kit 1 (K1-3)
K4-3	1	A060283-0GR	Exit roller pulley	
K4-4	5	A060217-0GR	Roller guide	Also in Kit 1 (K1-9)
K4-5	1	A021233-0GR	Exit timing belt idler roller	
K4-6	2	A062205-0GR	Bearing	Also in Kit 1 (K1-14)
K4-7	1	A060266-1GR	Shaft	Also in Kit 1 (K1-15)
K1-6	NA	See Kit 1, page B-61	Exit timing belt	For reference only. Not included in kit.
K4-A	NA	Ref	E-ring	For reference only. Not included in kit.
K4-B	NA	Ref	Bracket	For reference only. Not included in kit.
K4-C	NA	Ref	HCO frame	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

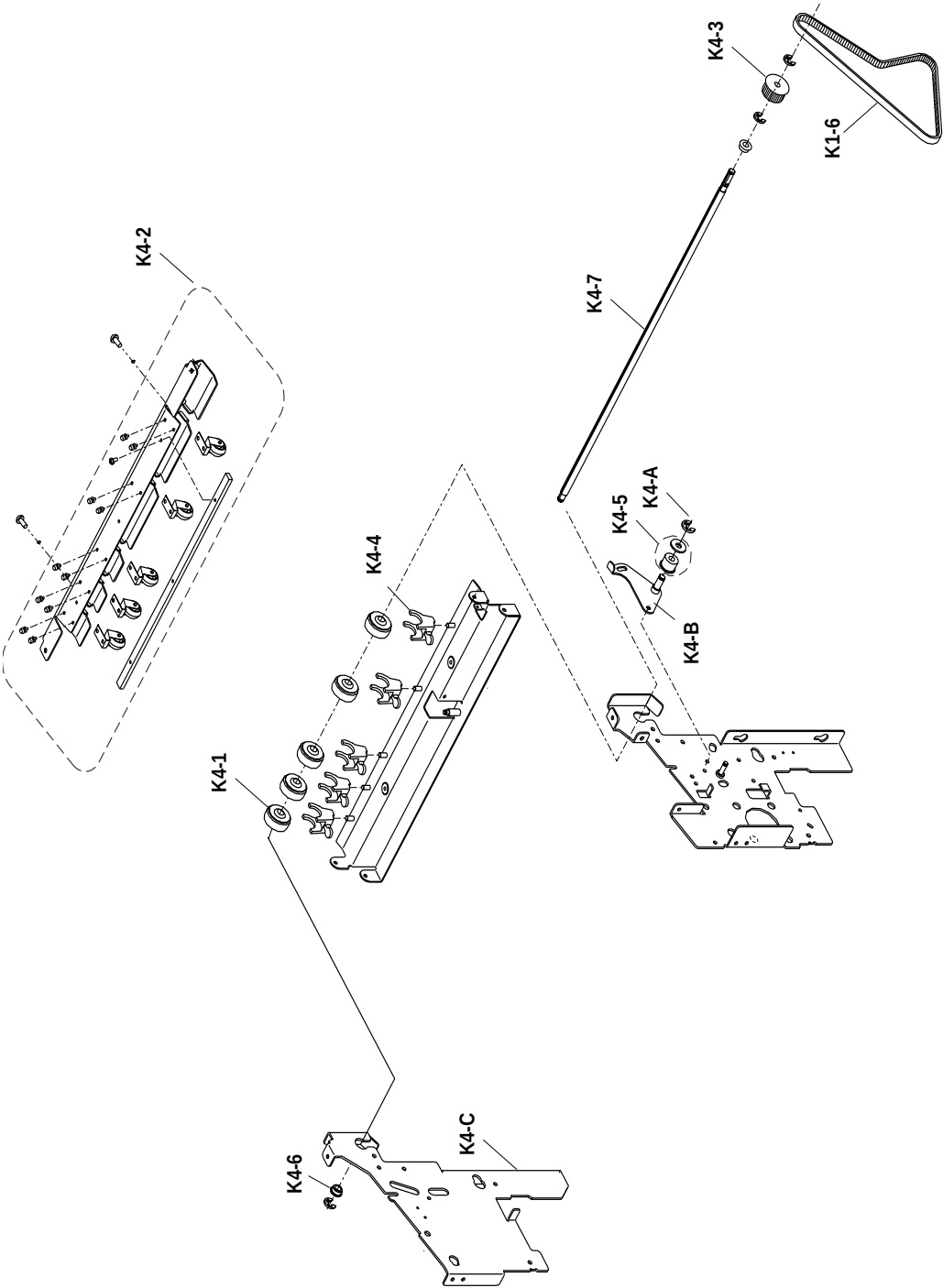


Figure B-31 Parts Diagram for Exit Kit.

B-6.7 Feed Motor Kit (Kit 5)

Parts List for Feed Motor kit (Part number = A06KIT05-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K5-1	1	A011222-0GR	Feed motor	
K5-2	1	A061220-0GR	Feed motor gear	
K5-3	1	A061556-0GR	PFM1 harness	
K5-A	NA	Ref	Screw	For reference only. Not Included in kit.
K5-B	NA	Ref	C19 connector	For reference only. Not Included in kit.

a. For reference information only. Not sold as a separate HP part.

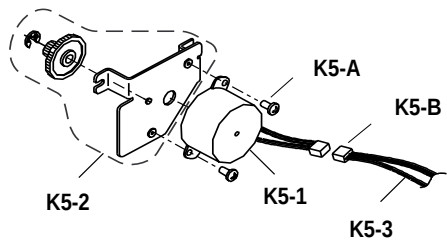


Figure B-32 Parts Diagram for Feed Motor Kit.

B-6.8 Exit Motor Kit (Kit 6)

Parts List for Exit Motor Kit (Part number = A06KIT06-GR).

Index No.	Qty	Reference Number ^a	Description	Remarks
K6-1	1	A020224-1GR	Exit motor pulley	
K6-2	1	A021223-0GR	Exit motor	Also in Kit 1 (K1-5).
K6-3	4	A022215-0GR	Grommet (C-440L)	
K6-4	1	A061557-0GR	Motor harness	
K6-A	NA	Ref	C12 connector	For reference only. Not included in kit.
K6-B	NA	Ref	Bolt	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

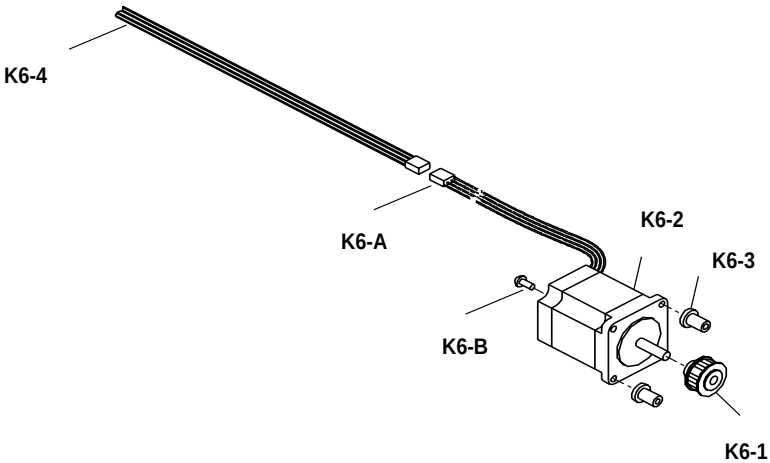


Figure B-33 Parts Diagram for Exit Motor Kit.

B-6.9 Tray Pulley Kit (Kit 7)

Parts List for Tray Pulley Kit (Part number = A06KIT07-GR).

Index No.	Qty	Reference Number ^a	Description	Remarks
K7-1	2	A062106-0GR	Tray timing belt pulley	
K7-2	1	A010119-0GR	Worm wheel	
K7-3	4	A010117-0GR	Bearing	
K7-4	1	A060118-0GR	Shaft (Timing Belt)	
K7-5	3	E70130-16GR	Pin (diam 3x16)	
K7-6	1	E70130-22GR	Pin (diam 3x22)	
K7-A	NA	Ref	E-ring	For reference only. Not included in kit.
K7-B	NA	See Top Assembly, page B-54	Tray Full Switch	For reference only. Not included in kit.
K7-C	NA	Ref	Power cage	For reference only. Not included in kit.
K7-D	NA	Ref	Tray motor bracket	For reference only. Not included in kit.
K7-E	NA	See Top Assembly, page B-54 .	Tray motor	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

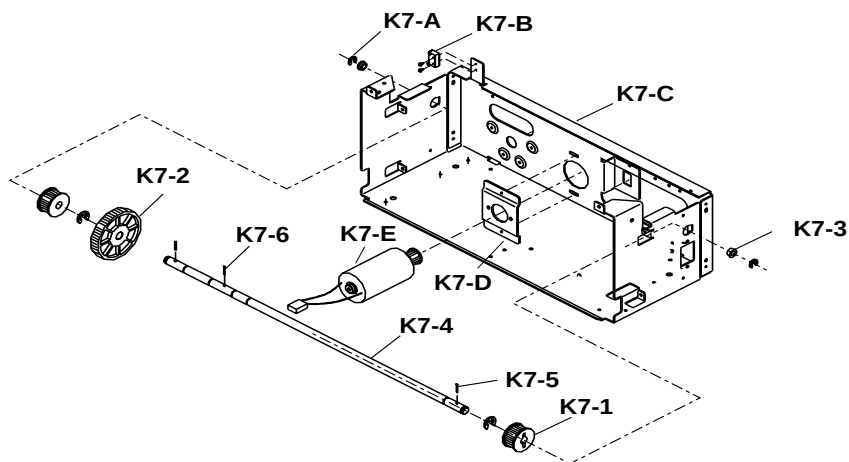


Figure B-34 Parts Diagram for Tray Pulley Kit.

B-6.10 Timing Belt Kit (Kit 8)

Parts List for Timing Belt Kit (Part number = A06KIT08-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K8-1	1	A010136-1GR	Pulley	
K8-2	1	A012111-0GR	Timing belt	
K8-3	1	A060120-0GR	Worm gear	
K8-4	1	A060121-0GR	Bracket (Timing Belt)	
K8-5	3	E70130-16GR	Pin (diam 3x16)	
K8-6	2	A022109-0GR	Bearing	
K8-A	NA	Ref	E-ring	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

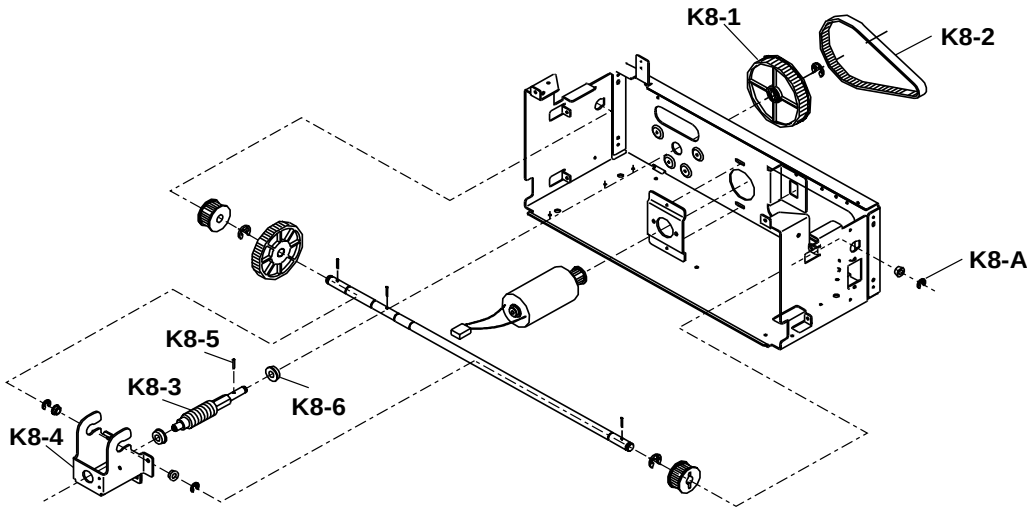


Figure B-35 Parts Diagram for Timing Belt Kit.

B-6.11 Tray Belt Kit (Kit 9)

Parts List for Tray Belt Kit (Part number = A06KIT09-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K9-1	2	A062105-0GR	Tray belt	
K9-2	2	A062111-0GR	Tray belt pulley	
K9-A	NA	Ref	E-ring	For reference only. Not included in kit.
K9-B	NA	Ref	Belt connector plate	For reference only. Not included in kit.
K9-C	NA	Ref	Tray frame	For reference only. Not included in kit.
K9-D	NA	Ref	Upper tension bracket	For reference only. Not included in kit.
K9-E	NA	Ref	Lower tension bracket	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

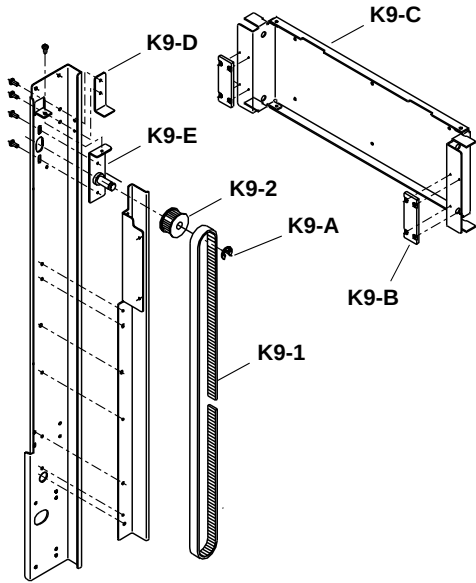


Figure B-36 Parts Diagram for Tray Belt Kit.

B-6.12 Tray Sensors Kit (Kit 10)

Parts List for Tray Sensors Kit (Part number =A06KIT10-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K10-1	2	A061739-1GR	Tray sensor (Paper Height & Tray Home)	
K10-2	1	A061558-2GR	Tray sensors harness	

a. For reference information only. Not sold as a separate HP part.

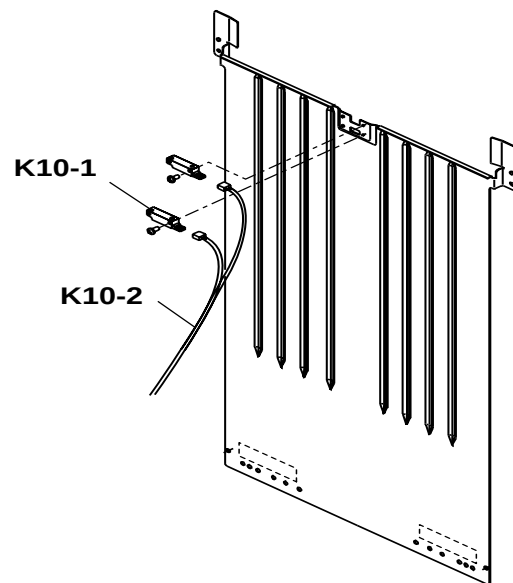


Figure B-37 Parts Diagram for Tray Sensors Kit.

B-6.13 Offset Solenoid Kit (Kit 12)

Parts List for Offset Solenoid Kit (Part number = A06KIT12-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K12-1	1	A061231-0GR	Paper offset solenoid	
K12-2	1	A061553-2GR	Solenoid module harness	
K12-A	NA	See Kit 4, page B-64	Roller guide	For reference only. Not included in kit.
K12-B	NA	See Kit 1, page B-61 .	Offset assembly	For reference only. Not included in kit.
K12-C	NA	Ref	C14 connector	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

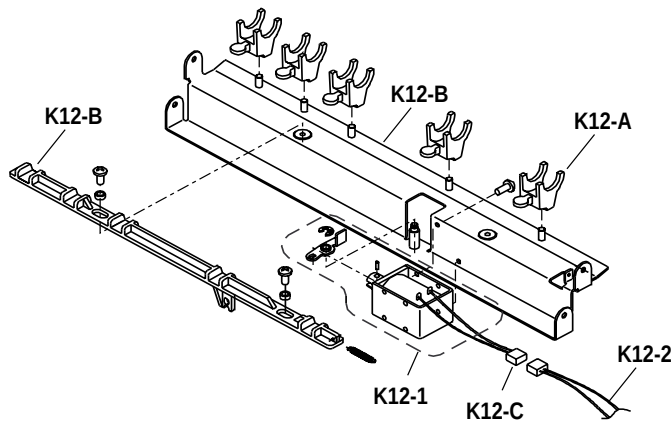


Figure B-38 Parts Diagram for Offset Solenoid Kit.

B-6.14 Mounting Hardware Kit (Kit 13)

Parts List for Mounting Hardware Kit (Part number =A06KIT13-GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K13-1	6		Screws (M4x12) and washers	Secures HCO paper tray
K13-2	2		Screws (M4x6)	Secures stopper to HCO
K13-3	4		Spacer bolts	Secures joining frame
K13-A	NA	See B-6.1 on page B-54.	Mounter plate	For reference only. Not included in kit.
K13-B	NA	See B-6.1 on page B-54.	Stopper	For reference only. Not included in kit.
K13-C	NA	See B-6.1 on page B-54.	Tray	For reference only. Not included in kit.
K13-C	NA	See B-6.1 on page B-54.	Tray frame	For reference only. Not included in kit.

a. For reference information only. Not sold as a separate HP part.

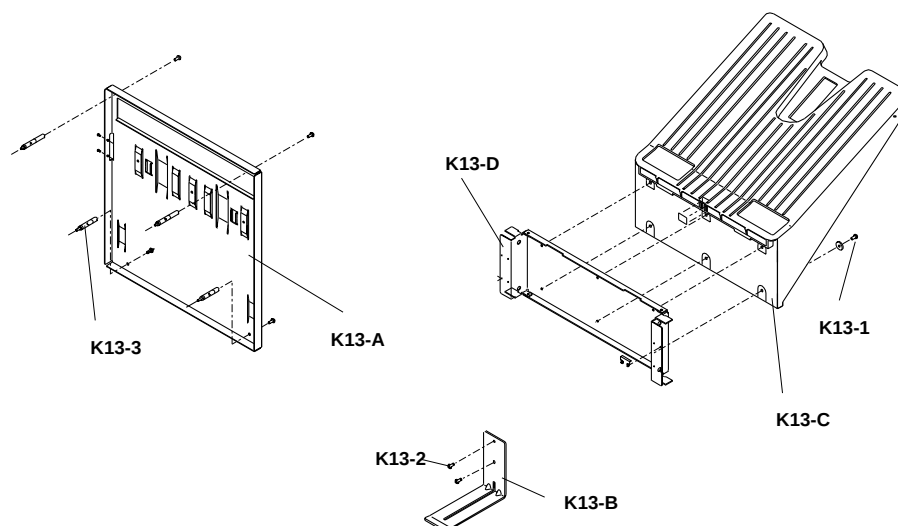


Figure B-39 Parts Diagram for Mounting Hardware Kit.

B-6.15 Stacking Upgrade Kit (Kit 14)

Parts List for Stacking Upgrade Kit (Part number A06DKPT-0GR).

Index No.	Qty	Reference number ^a	Description	Remarks
K14-1	1	A060663-20GR	Joining Frame	
K14-2	1	A060667-02GR	Slide Knob	
K14-3	3	A060668-01GR	Stud	
K14-4	2	A060670-00GR	Spring, Slide Knob	
K14-5	1	A060669-10GR	Knob	
K14-6	1	A062615-0GR	Static Brush	Can be ordered separately. This part is compatible with units having serial number JP38A00819 and higher.
K14-7	1	A060674-10GR	Brush Holder	
K14-8	1	A061599-00GR	Cable, Ground	
K14-9	6	E00540-06GR	Screw	
K14-10	1	E50630-00GR	Washer	
K14-11	2	E00530-06GR	Screw	
K14-12	4	A062612-00GR	Washer	
	1	A061546-05GR	ROM Chip	Not shown

a. For reference information only. Not sold as a separate HP part, except A062615-00GR.

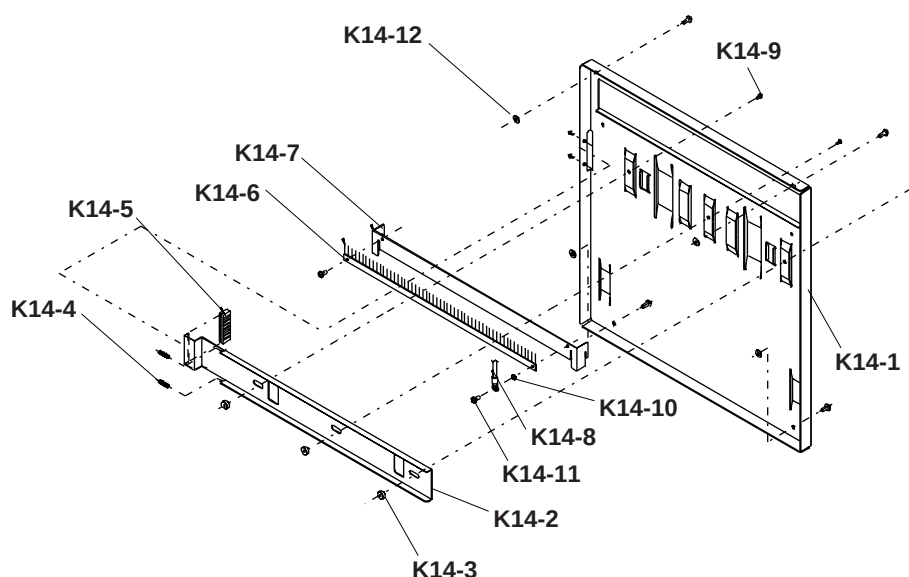


Figure B-40 Parts Diagram for Stacking Upgrade Kit.

B-7 Wiring Diagrams

This section shows the overall wiring diagram for the 3,000-sheet HCO and the major sub-blocks within the HCO.

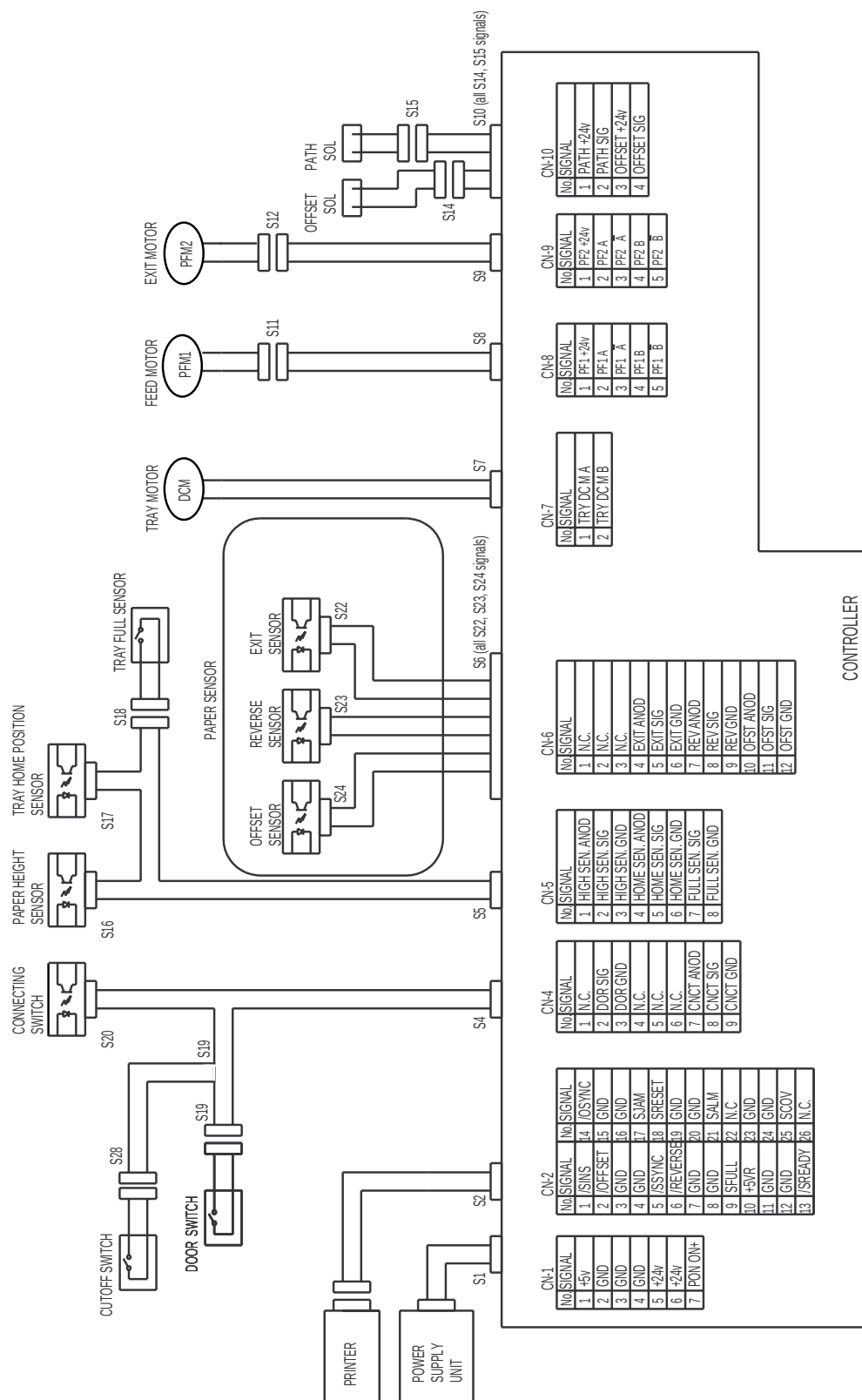


Figure B-41 HCO Wiring Diagram

B-7.1 Power Supply Interface

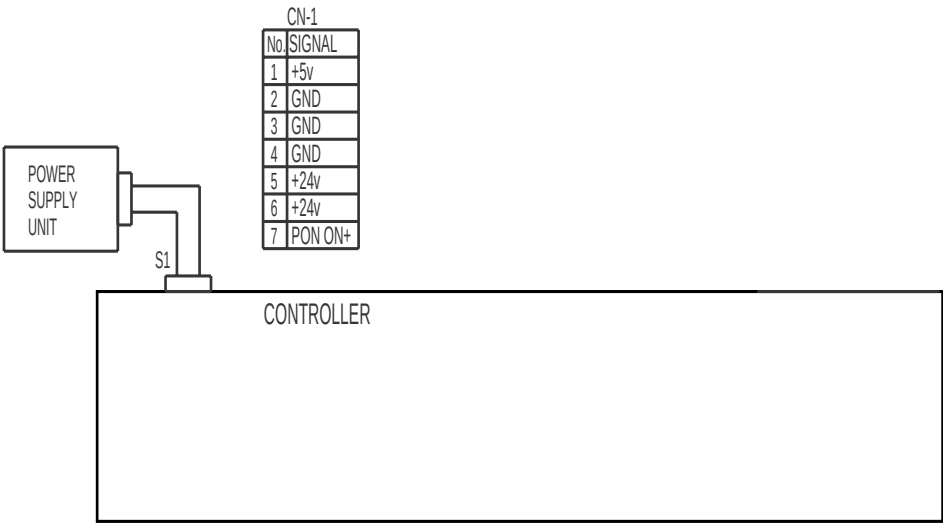


Figure B-42 Power Supply Interface

B-7.2 Printer to HCO Interface

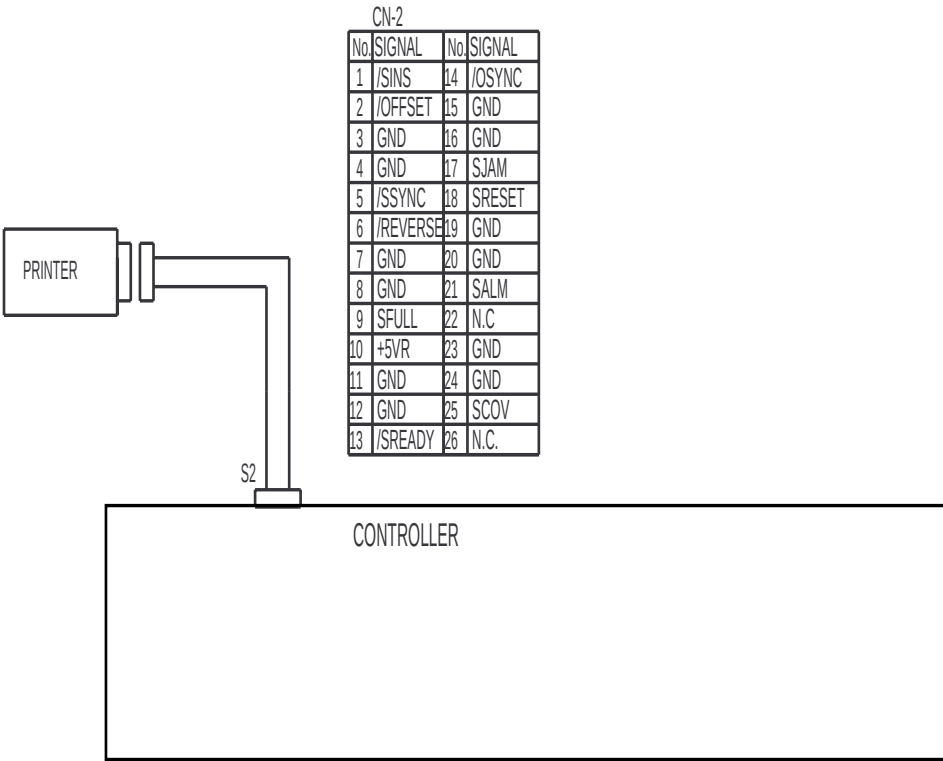


Figure B-43 Printer to HCO Interface

B-7.3 Door Switch and Connecting Switch Interface

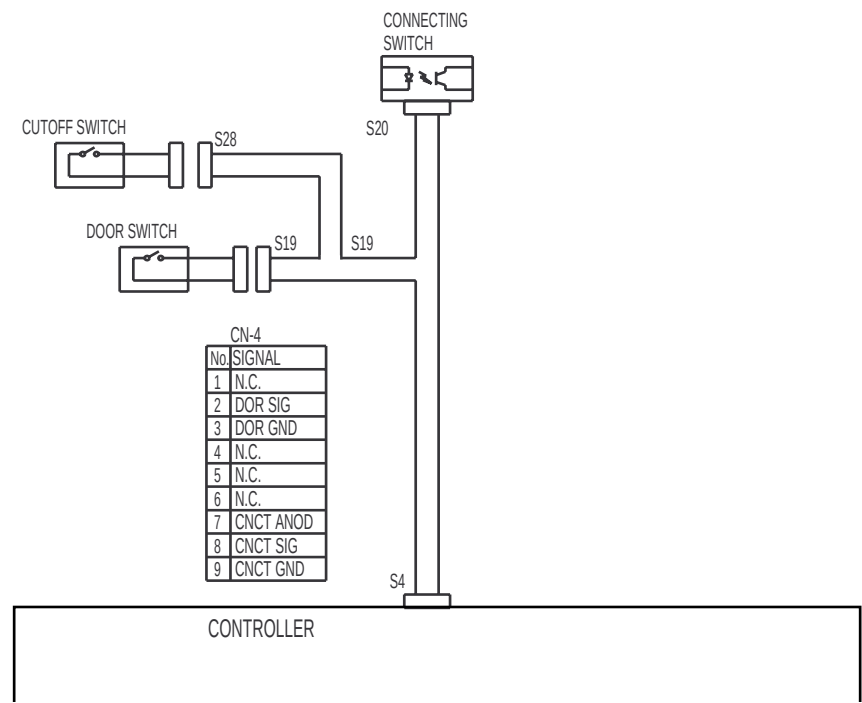


Figure B-44 Door Switch and Connecting Switch Interface

B-7.4 Paper Height Sensor and Tray Home Position Sensor Interface

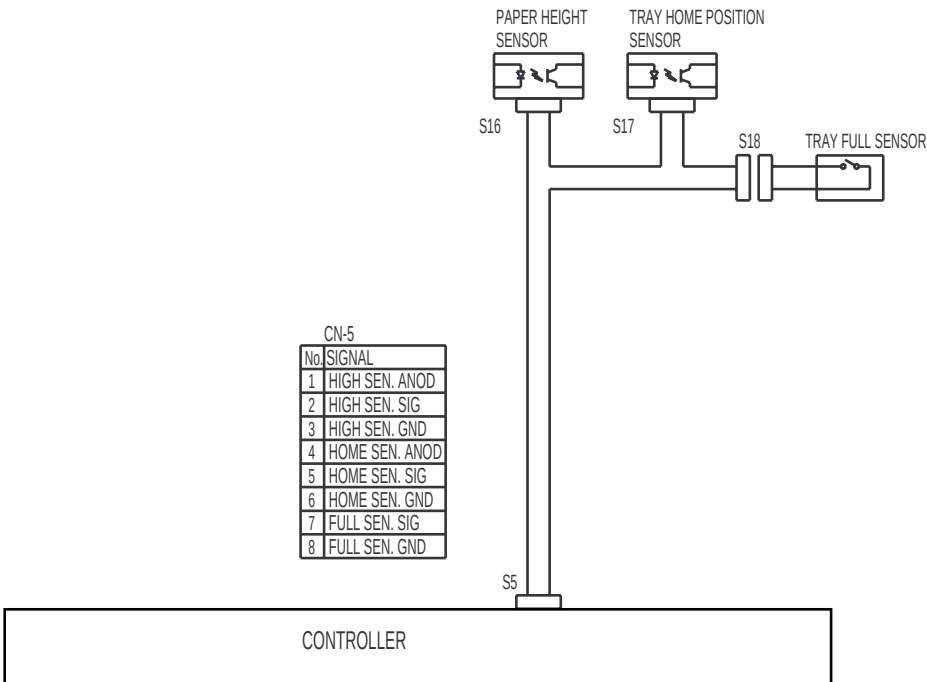


Figure B-45 Paper Height Sensor and Tray Home Position Sensor Interface

B-7.5 Paper Sensors Interface

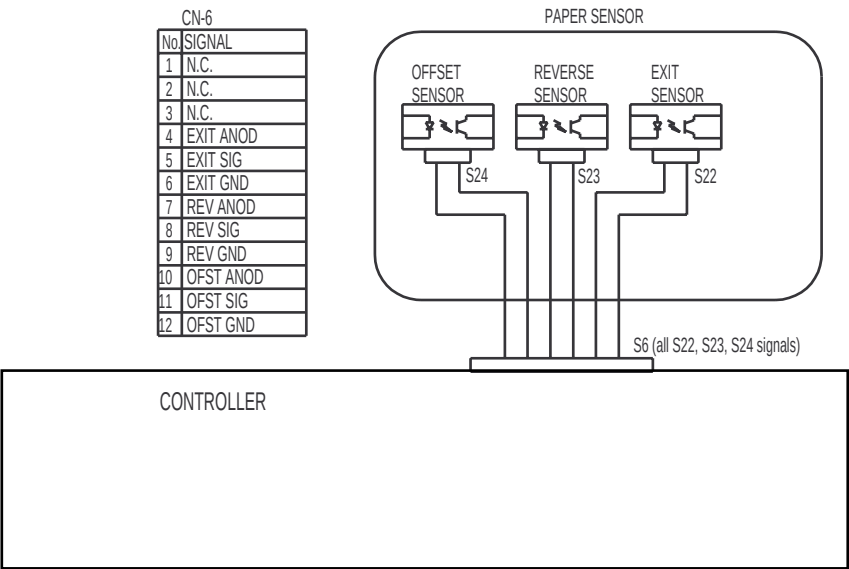


Figure B-46 Paper Sensors Interface

B-7.6 Tray Motor Interface

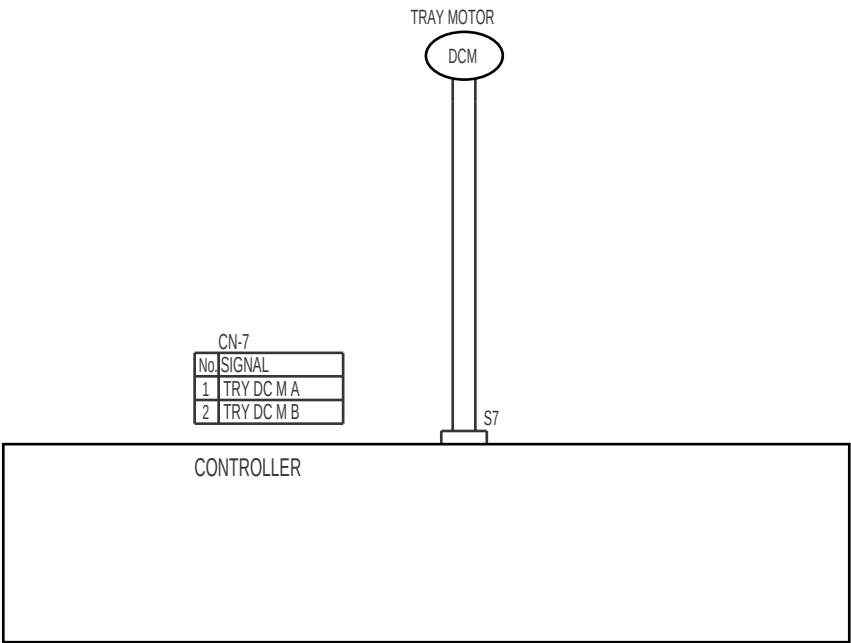


Figure B-47 Tray Motor Interface

B-7.7 Feed Motor Interface

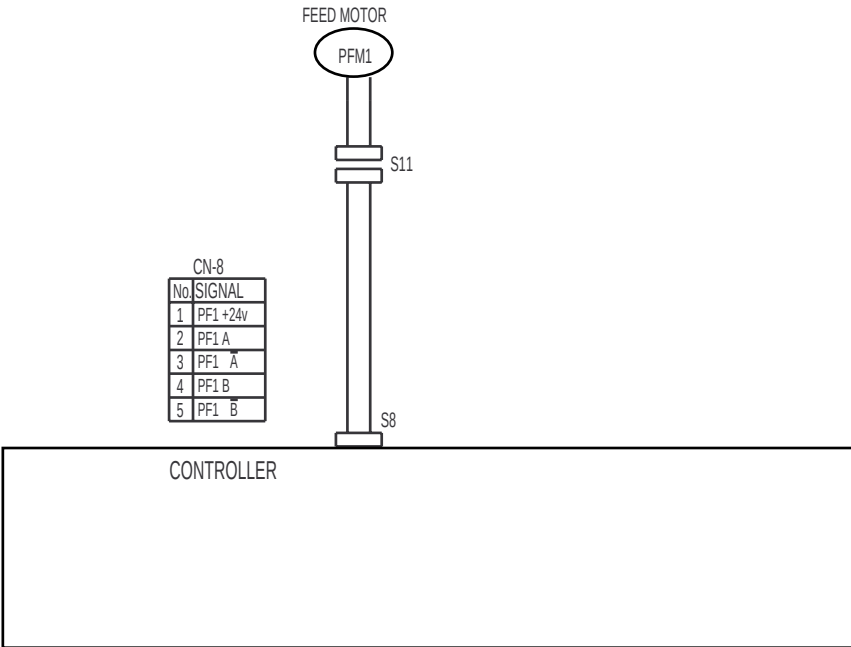


Figure B-48 Feed Motor Interface

B-7.8 Exit Motor Interface

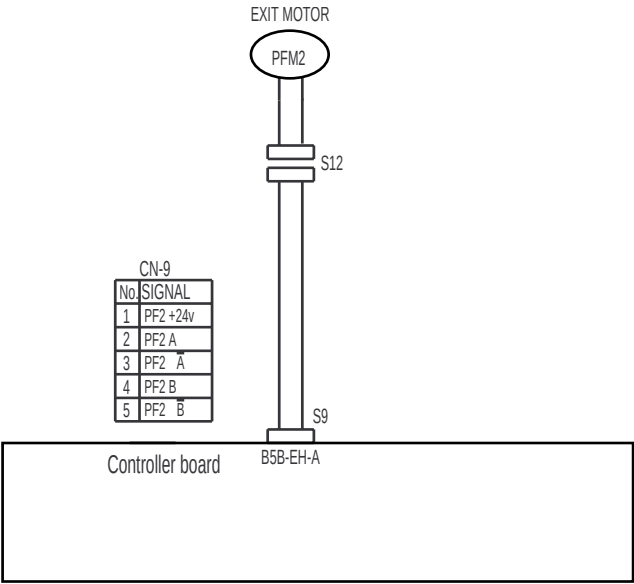


Figure B-49 Exit Motor Interface

B-7.9 Path Solenoid and Offset Solenoid Interface

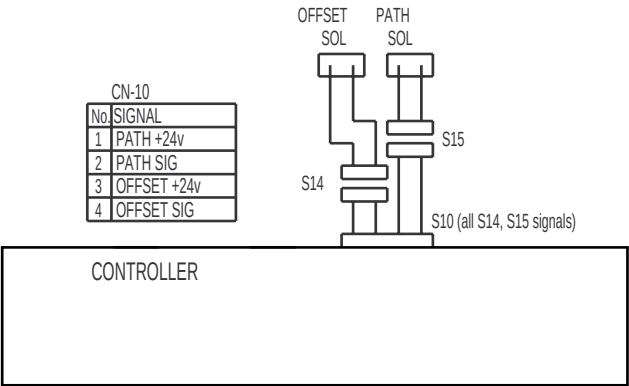


Figure B-50 Path Solenoid and Offset Solenoid



2,000-Sheet High-Capacity Output

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C-1 Overview

This appendix provides service information on the 2,000-sheet High Capacity Output (HCO), an optional accessory for the HP5000 D640 Printer. The HCO supports a variety of paper sizes and can handle up to 40 pages per minute.

Note	This appendix describes the 2,000-sheet HCO. For information on the 3,000-sheet HCO, see Appendix B, "3,000-Sheet High Capacity Output."

Figure C-1 shows the optional user-installable high capacity output (C5623A and C5624A) paper handler that connects to the left side of the printer. The C5623A is for 120V, and the C5624A is for 240V. The HCO can stack up to 2000 sheets of paper (75g/m²).

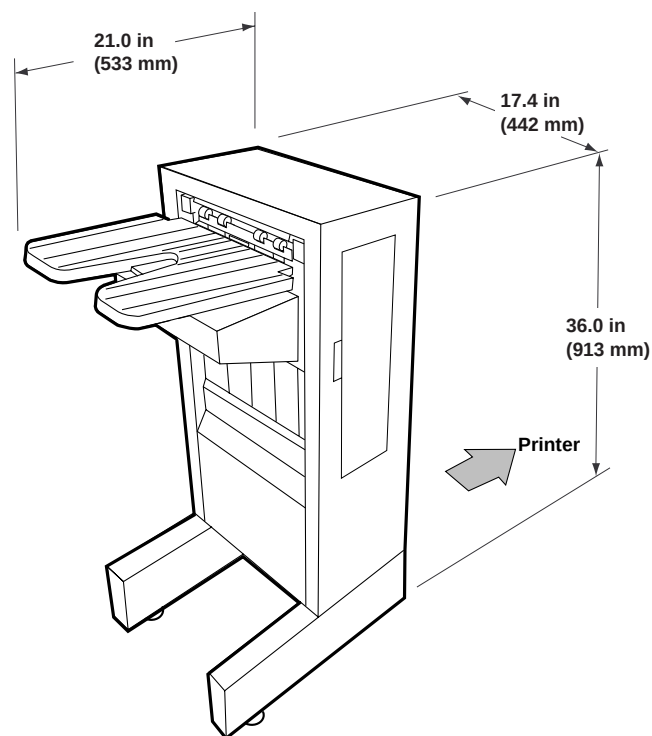


Figure C-1 2,000-Sheet HCO Physical Dimensions

C-1.1 Related Documents

This appendix is a supplement to the *D640 Service Manual*. It describes service information specific to the 2,000-sheet HCO.

For more information about installing and using the 2,000-sheet HCO, see the *2,000-Sheet HCO Installation and User Manual* (see [1-1.1 "Related Documents," on page 1-4](#)).

C-2 Specifications

This section provides specifications for the 2,000-sheet HCO. Specifications include:

- Paper handling specifications
- Physical specifications
- Electrical specifications
- Environmental specifications

Note	Specifications are subject to change without notice.

C-2.1 Paper Handling Specifications

[Table C-1](#) lists the paper handling specifications of the HCO.

Table C-1. HCO Paper Handling Specifications

Item	Specifications
Processing speed	40 ppm
Paper size	A3, A4, A5, Letter, Legal, Ledger, Executive B4 (JIS) (ISO), B5 (JIS) (ISO)
Paper type	Plain, Label, Transparency, Bond, Pre-punched 64 to 90g/m2
Paper capacity	2,000 sheets (75g/ m2)

C-2.2 Physical Specifications

Table C-2 lists the physical dimensions and weight of the HCO and also provides the required service access area dimensions. These specifications are illustrated in Figure 1-5.

Table C-2. HCO Physical Specifications

Item	Specification
Dimensions	
Width	533 mm (21.0 in)
Depth	442 mm (17.4 in)
Height	913 mm (36.0 in)
Weight	32 kg
Service Area	
Front	650 mm (25.6 in)
Back	850 mm (33.5 in)
Left	850 mm (33.5 in)

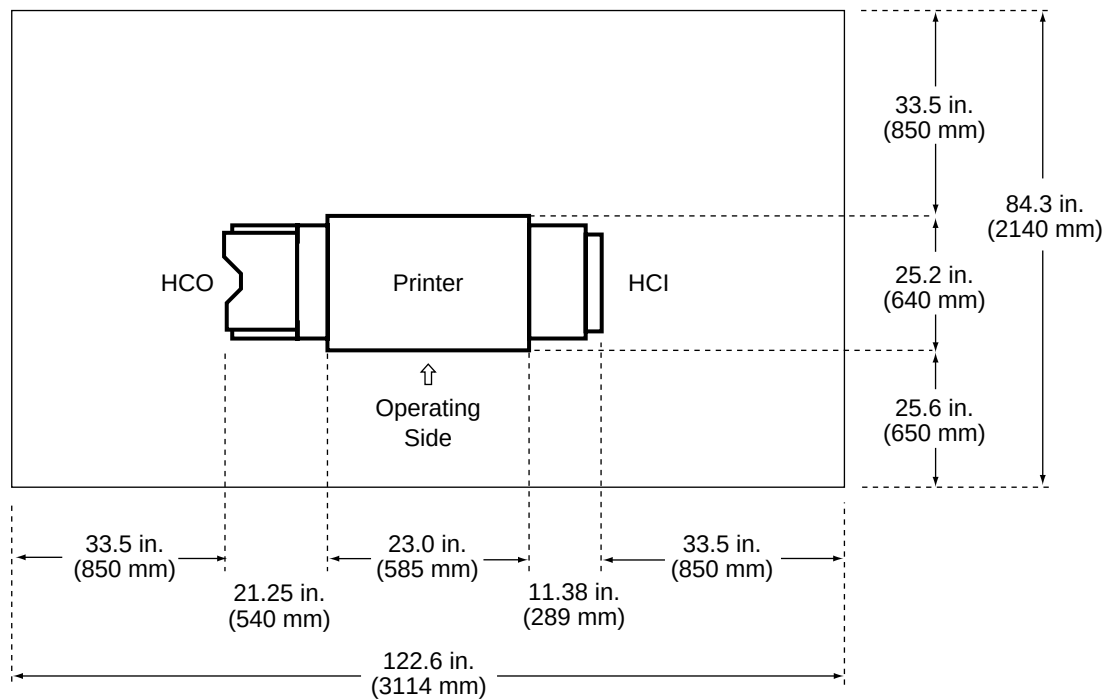


Figure C-2 HCO (Left), D640 Printer (Center), and HCI (Right) Required Service Area Dimensions

C-2.3 Electrical Specifications

Table C-3 lists the electrical specifications of the HCO.

Table C-3. HCO Electrical Specifications

Item	Specification
Input Power	

Table C-3. HCO Electrical Specifications

Phase	Single-phase
Frequency	50/60 Hz $\pm 5\%$
Voltage	C5623A: 100 to 127 VAC $\pm 10\%$ C5624A: 200 to 240 VAC $\pm 10\%$
Power Consumption	120 VA or less during operating
Heat capacity	83 kcal per hour

C-2.4 Environmental Specifications

Table C-4 lists environmental specifications applicable to the printer, High-Capacity Input (HCI), and High-Capacity Output (HCO) units.

Table C-4. D640 Printer, HCI Option, and HCO Option Environmental Specifications

Item	Specification
Acoustic noise	56 dB(A) or less (printer only)
Ozone emission	0.08 PPM or less: Measured under conditions of typical printer operation and room ventilation
Operating Environment	
Temperature	15° to 35° C
Humidity	20% to 80% RH (no condensation)
Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)
Non-operating Environment	
Temperature	0° to 35° C
Humidity	20% to 80% RH (no condensation)
Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)

C-3 Diagnostics - Normal Operation (Connected to Printer)

The 2000-sheet High Capacity Output (models C5623A and C5624A) has a diagnostics board with a DIP switch and LEDs that can be used as a troubleshooting tools. The LEDs on the diagnostics board indicate the status of the HCO.

The diagnostics can be used with the HCO connected to printer (normal operation) or disconnected from the printer (stand-alone operation). The following section describes the diagnostic procedure with the HCO connected to the printer. If the HCO is disconnected from the printer, you will need to perform a preliminary procedure (see [C-4 "Diagnostics - Stand-Alone Operation \(Disconnected from Printer\),"](#) on page [C-16](#)) before running the HCO diagnostics.

During normal operation the HCO is connected by the interface cable to a powered-on D640 printer.

C-3.1 Normal Operation HCO Diagnostic

For normal operation, the DIP switches on the board must be set to "0000" (all OFF) and the covers must all be closed. You must cycle the power off then on to reset the DIP switches. [Figure C-3](#) shows how to access the diagnostics board and the location of the DIP switch and LEDs. [Table C-5](#) describes the LEDs function during normal operation.

Note	When you exit the troubleshooting procedure, verify the DIP switches on the diagnostic board are set to "0000" (all off).

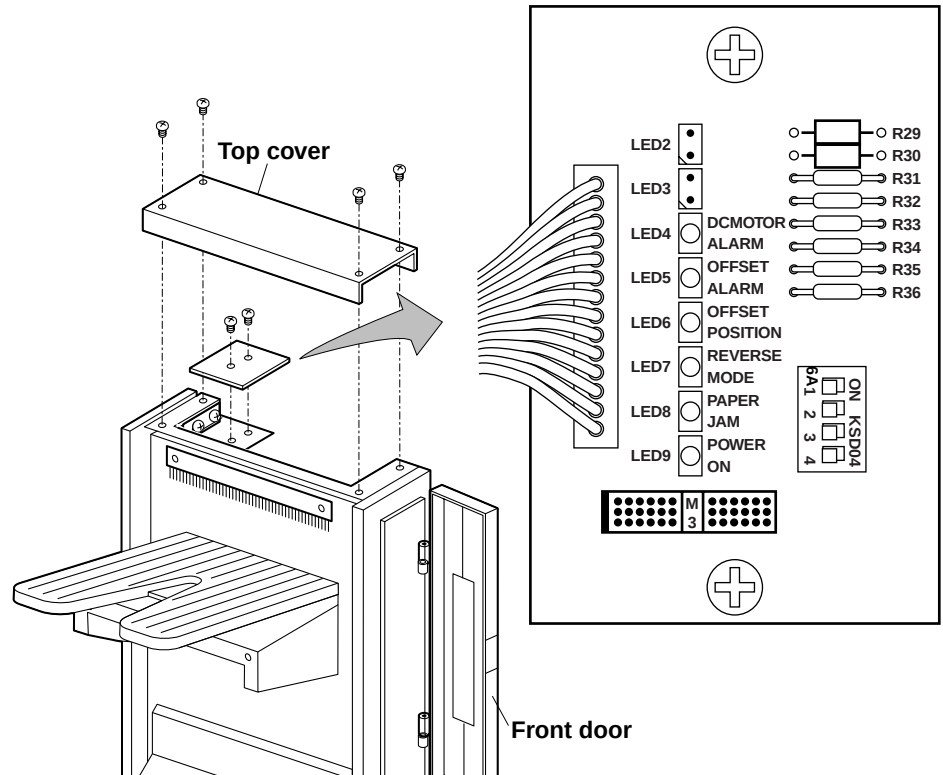


Figure C-3 HCO Diagnostic Board DIP Switch and LED Location

Table C-5. Normal Operation LED Description

Number	Color	Name	Description
LED2	Not present		
LED3	Not present		
LED4	Red	DC Motor (tray motor) Alarm	A paper tray ascending or descending malfunction is detected.
LED5	Green	Offset Alarm	Tray should be at the offset position, but the tray has not been detected.
LED6	Amber	Offset Position	Tray is in the horizontal offset position.
LED7	Red	Reverse mode	Reversing solenoid is active.
LED8	Green	Paper Jam	A paper jam in the HCO.
LED9	Amber	Power On	The HCO power is on. LED7 and LED9 are normally on after successful power up.

C-3.2 LED Test

Step 1 Normal mode: Verify HCO interface cable is connected to the printer and the printer is powered on.

Stand-alone mode: Perform the preliminary setup if you haven't already done so (see [C-4.1 "Stand-Alone Preliminary Setup,"](#) on page [C-16](#)).

Step 2 Turn the power switch off.

Step 3 Set DIP switch 1 to on (1000) on the diagnostic board.

Step 4 Turn the power switch on.

The six LEDs on the diagnostic board turn on in sequence starting with LED4 and ending with LED9. This sequence repeats itself until power is turned off.

Step 5 When you exit the troubleshooting procedure, verify the DIP switches on the diagnostic board are set to "0000" (all off).

C-3.3 Photo-Sensor Test

Step 1 Normal mode: Verify HCO interface cable is connected to the printer and the printer is powered on.

Stand-alone mode: Perform the preliminary setup if you haven't already done so (see [C-4.1 "Stand-Alone Preliminary Setup,"](#) on page [C-16](#)).

Step 2 Turn off HCO power switch.

Step 3 Set DIP switch 1 to off and switch 2 to on (0100) on the diagnostic board (see [Figure C-3](#)).

Step 4 Turn the power switch on.

Step 5 Test each of the sensors by blocking and unblocking using a piece of paper (see [Table C-1](#)).

To properly test SEN5 and SEN6 you may need to lower the tray. See footnote b in [Table C-1](#) for procedure.

Step 6 When you exit the troubleshooting procedure, verify the DIP switches on the diagnostic board are set to "0000" (all off).

Table C-1. Photo-Sensor Test Sensors and LEDs

Sensor	LED ^a	Sensor Location	LED Indication When Blocked
SEN1	LED4	Paper Jam sensor mounted on the Feed Idler Roller Guide.	Off
SEN2	LED5	Paper Jam sensor mounted on the HCO reversing assembly.	Off
SEN4	LED9	Reversing Solenoid sensor. Located next to the Reversing Solenoid.	On
SEN5 ^b	LED7	Upper Paper Level sensor. Upper Sensor located on the upper middle of the tray side of the HCO.	Off
SEN 6 ^b	LED8	Paper Tray Up sensor. Lower Sensor located on the upper middle of the tray side of the HCO.	Off

- a. LED6 is always on and LED2 and LED3 are not present.
- b. In order to properly test SEN 5 and SEN 6 you may have to lower the paper tray 2 or 3 inches (even without paper on the tray) to ensure the sensors are not being blocked before starting the test. To do this, power the HCO off and set the DIP switches to "0110" (1=Off, 2=On, 3=On, 4=Off). Then power the HCO back on and let the tray move down 2 to 3 inches before turning the power off. Reset DIP Switches for the Photo-Sensor test and turn the power on.

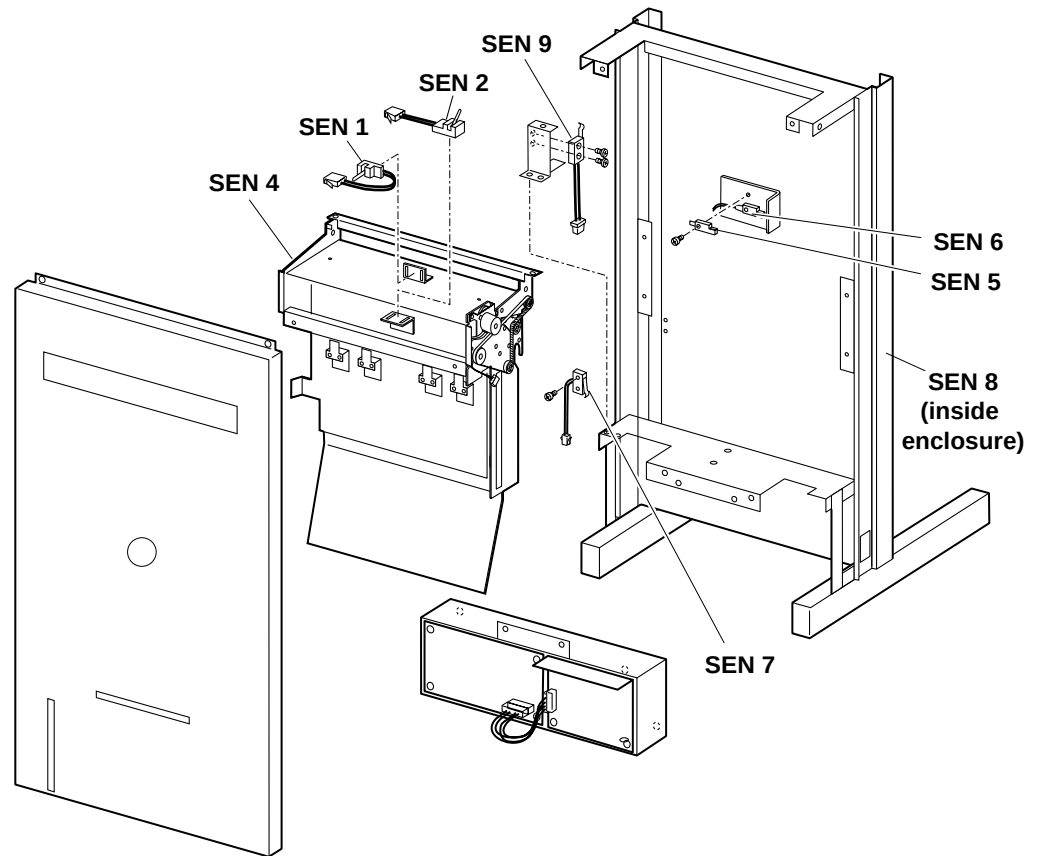


Figure C-1 HCO Sensor and Microswitch Location

C-3.4 Microswitch Test

- Step 1** Normal mode: Verify HCO interface cable is connected to the printer and the printer is powered on.
- Stand-alone mode: Perform the preliminary setup if you haven't already done so (see [C-4.1 "Stand-Alone Preliminary Setup,"](#) on page [C-16](#)).
- Step 2** Turn off HCO power switch.
- Step 3** Set DIP switch 2 to on and all others to off (0100) on the diagnostic board (see [Figure C-3](#)).
- Step 4** Turn the power switch on.
- Step 5** Test the micro-switches (see [Table C-1](#) and [Figure C-1](#)).
- Step 6** When you exit the troubleshooting procedure, verify the DIP switches on the diagnostic board are set to "0000" (all off).

Table C-1. Microswitch Test

Sensor	LED	Sensor Location	LED Indication
SEN7	LED4	Paper Tray Lower Limit switch	LED4 is off when SEN7 microswitch is depressed.
SEN8	LED6	Offset Position switch	LED6 is off when SEN 8 microswitch is depressed.
SEN9	LED5	Front Door switch	When SEN9 microswitch is depressed, LED5 and other LEDs turn on depending on location of Output Tray. ^a

- a. Activating this switch effectively turns this test into the photo-sensor test, because the controller is sensing the Front Door as closed. Other LEDs may turn on depending on whether or not a particular photo-sensor is interrupted at the time.

C-3.5 Motor Test

- Step 1** Normal mode: Verify HCO interface cable is connected to the printer and the printer is powered on.
- Stand-alone mode: Perform the preliminary setup if you haven't already done so (see [C-4.1 "Stand-Alone Preliminary Setup,"](#) on page C-16).
- Step 2** Turn off HCO power switch.
- Step 3** Set DIP switches to the setting for the motor (see [Table C-2](#)) on the diagnostic board (see [Figure C-3](#)).
- Step 4** Turn the power switch on.
- Step 5** When you exit the troubleshooting procedure, verify the DIP switches on the diagnostic board are set to "0000" (all off).

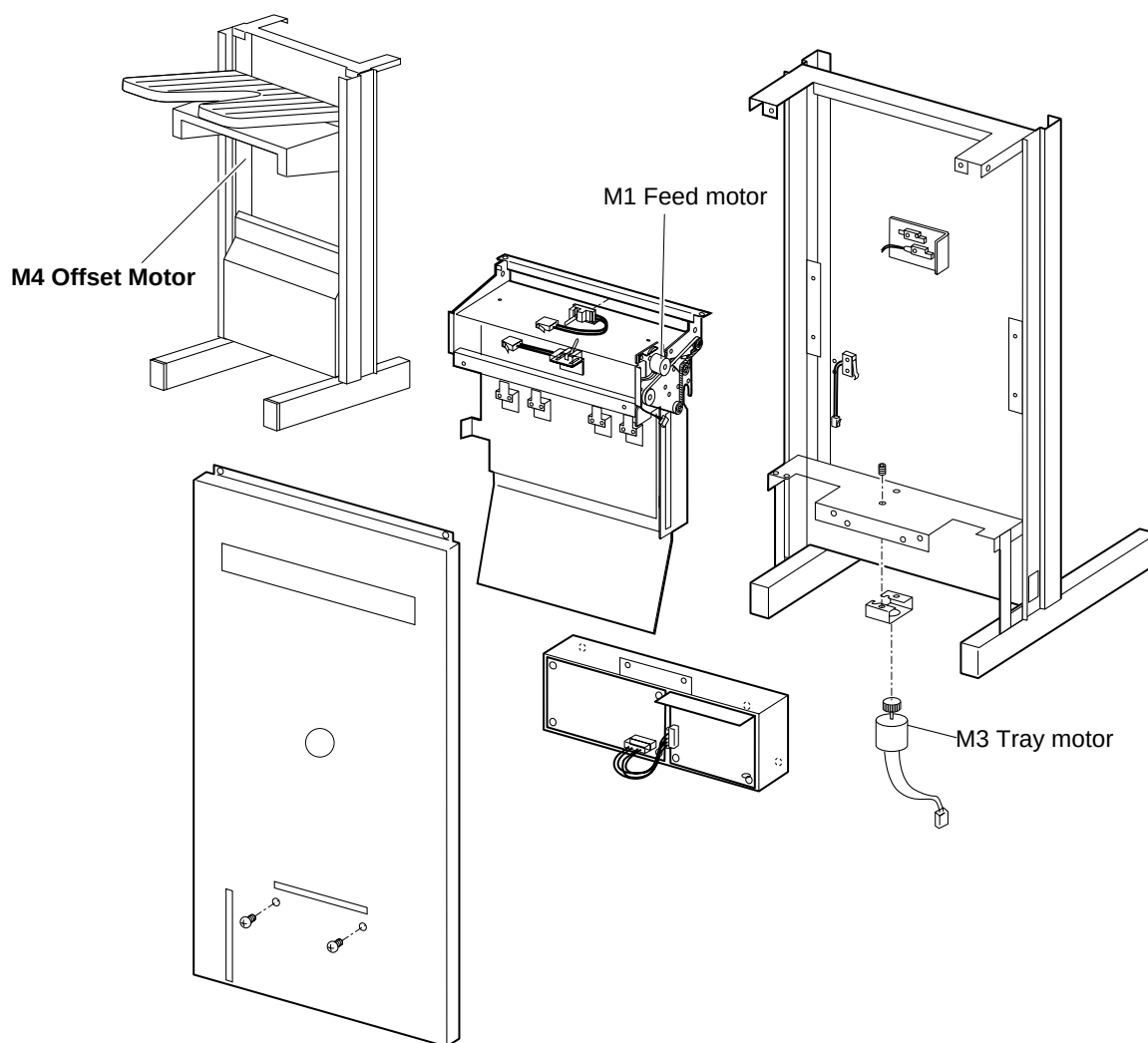


Figure C-1 HCO Motors Location

:

Table C-2. Motor Tests

Motor	DIP Switch Setting	Test	Test Activity
Feed Motor M1	1100	Stepper Motor M1 Test	Feed motor runs continuously making rollers turn in the paper-feed direction. The reversing solenoid is turned on and off in cycles.
Reverse/Exit Motor M2	0010	Stepper Motor M2 Test	The reversing/exit motor runs 10 seconds in the direction to feed paper downward into the switchback at normal speed and then continuously in the feed-paper-upward direction at maximum speed. When switched to maximum speed, exit rollers run at maximum speed.
Offset Motor M4	1010	Stepper Motor M4 Test	Offset motor jogs paper tray back and forth between the "Set" and "Offset" positions. It starts with a short cycle and then continues cycles with 1 second delays at the end positions.
Tray Motor M3	0110	DC Motor M3 Test	Tray motor moves paper tray up and down between SEN 6 and SEN 7 and then down to lowest position; cycle repeats.
All motors	1110	Combined Test	All the motor tests described above are run simultaneously.

C-4 Diagnostics - Stand-Alone Operation (Disconnected from Printer)

For troubleshooting purposes, you can disconnect the HCO from the printer so that all motors, solenoids, and sensors can be exercised to verify proper operation. Before you can run the diagnostic program on a stand-alone HCO, you must first perform the stand-alone preliminary setup described in the following section.

C-4.1 Stand-Alone Preliminary Setup

Before running any HCO diagnostics with the HCO as a stand-alone unit, you must first you must do the following:

- Step 1** Remove all paper from the HCO paper tray.
- Step 2** Turn off the HCO power switch and unplug the HCO power cord.
- Step 3** Disconnect the HCO from the printer.
- Step 4** Remove HCO top and right covers.
- Step 5** Verify the DIP switches on the diagnostic board are set to all off or "0000" (see [Figure C-3](#)).

WARNING!

You will be connecting live-line voltage by installing the jumper in the next step. Verify the HCO is turned off and unplugged before performing step 6.

- Step 6** Place a jumper between the two pins marked as CN2 located near the bottom edge of the HCO Power Supply board (see [Figure C-2](#)).

Power On Sequence

- Step 7** Plug the HCO back in and turn on HCO.

The HCO responds with the following power-on sequence:

- (1) After 0.5 seconds, the power relay mounted on the controller board engages.
 - a.** The gray input feed rollers turn counter-clockwise and the corresponding white spring loaded plastic idler rollers turn clockwise.
 - b.** The gray exit rollers do not turn, but the M1 feed motor and belt are moving.
 - c.** The paper tray is rises up to its "home" position.
 - d.** The tray jogger completes one cycle stopping at the "set" position.
 - e.** The reversing solenoid activates and LED7 on the diagnostic board turns on.
 - f.** Only LEDs 7 (REVERSE MODE) and 9 (POWER ON) should be on at the end of the power-on sequence.

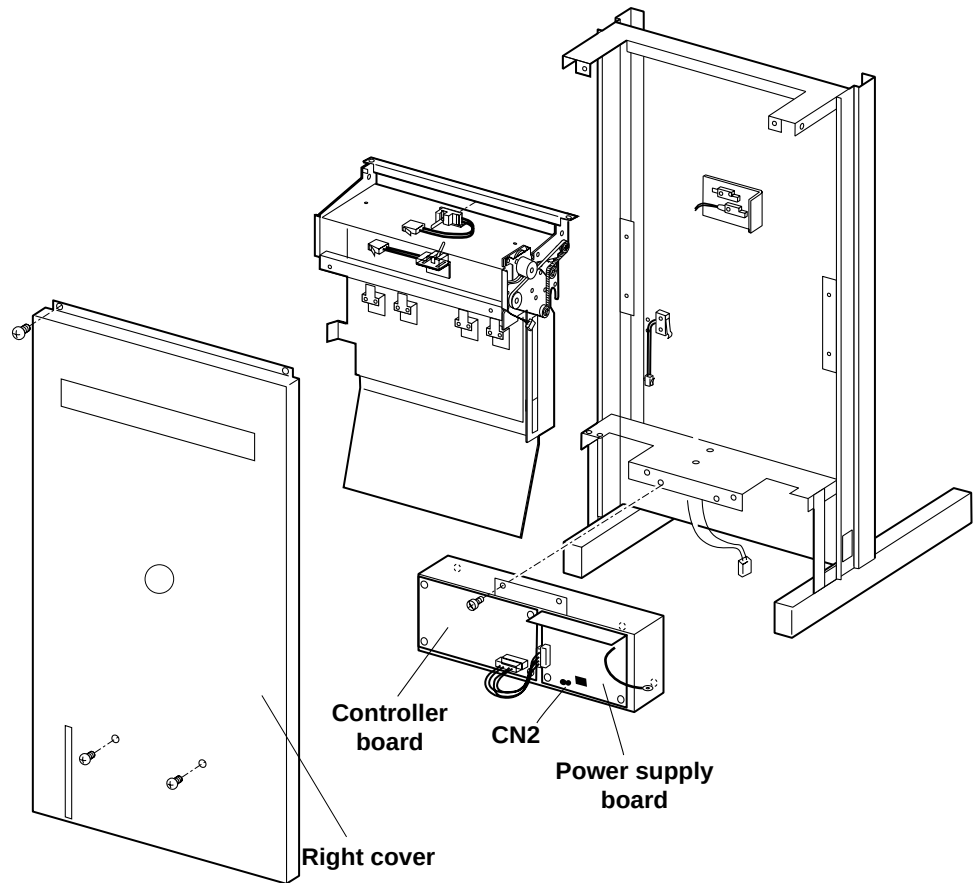


Figure C-2 Stand-Alone Preliminary Setup Part Location

C-5 Adjustments

The HCO output tray should be level front to back. To level the HCO output tray:

Step 1 Power off the HCO and remove the right cover.

Step 2 Disconnect the output tray upper limit sensor, SEN5, at connector CN15.

This sensor is located directly above and to the left of the HCO controller.

WARNING!	Be prepared to power off the HCO within a few seconds after performing the following step.

Step 3 Power up the HCO.

The output tray drives past the disconnected sensor to its mechanical stops. A very loud ratcheting sound will be heard as the higher side reaches the mechanical stop and causes the splined belt to “skip” over a tooth and automatically level the output tray. Power off the HCO within 3-4 seconds!

Step 4 Reconnect the CN15 connector and replace the right cover.

The HCO tray will reposition itself to the proper location.

C-6 Troubleshooting

C-6.1 SVC D8 HCO Stacker Alarm

Description

A fatal error was detected in the HCO, such as the following:

- The stacker ready signal (SREADY) was not detected by the mechanism controller within a the time limit after the printer powered on.
- The mechanism controller detected that the stacker alarm signal (SALM) was activated. The conditions which the SALM is activated are:
 - Guide sensor alarm: It was detected from the guide sensor by the HCO controller that the paper guide was not at right position before specified time passed after the paper guide position was changed.
 - Offset alarm: It was detected from the offset sensor by the HCO controller that the paper tray was not at right position before specified time passed after the paper tray position was offset.
 - DC motor alarm: It was detected from the hi-top sensor by the HCO controller that the tray did not reach the hi-top sensor before specified time passed after the tray reached the top sensor.

Troubleshooting Procedure

Note: When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Instruction	Indication	Yes	No
1. Open the front door of the HCO, and verify the DIP switches on the LED unit board (see Figure C-3) are set to "0000" (all off).	DIP switches are set to "0000."	Go to step 2.	Set DIP switches to "0000." Close doors and cycle power off/on ^a . Verify repairs. If SVC D8 still occurs, go to step 2.
2. Check the HCO AC power cord is attached and the power switch on the lower rear cover is on. Press CLEAR. Observe the HCO Output Tray to assure it moves back and forth during the power up sequence.	The output tray moves in only one direction (not both directions).	Suspect a problem with the HCO offset switch, go to C-6.1 "SVC D8 HCO Stacker Alarm," on page C-19 .	Go to step 3.

Instruction	Indication	Yes	No
3. Open the front door of the HCO, and check the DIP switches on the LED unit board.	An LED is lit.	- If no LED is lit, go to "SVC D8 with No LEDs Lit," on page C-20. - If LED5 (green LED) is lit, go to "SVC D8 Offset Alarm," on page C-21 - If LED4 (red LED) is lit, go to "SVC D8 DC Motor Alarm," on page C-22 - If any other LED is lit, go to "SVC D8 Guide Sensor Alarm," on page C-21	Go to step 27.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

SVC D8 with No LEDs Lit

Instruction	Indication	Yes	No
1. If the problem is intermittent and paper is jamming as it leaves the printer or enters the HCO, check the HCO Controller firmware revision.	HCO controller firmware revision number is later than A050 004 43FC.	Go to step 2.	Upgrade firmware. If SVC D8 still occurs, go to step 2.
2. If no LED is lit, then the problem may be on the primary circuits of the power supply. Check the following: a. The power cable and the AC circuit breaker. b. The locker switch of the HCO functions correctly and is set on. c. The interface cable is connected to the printer correctly. d. Pinched wires, cables, and damaged connectors between the following connectors: - CN12 on the mechanism controller PCB of the printer and the HCO interface connector - HCO interface connector and CN3 on the HCO controller PCB. e. If there is something conductive on the power supply board. f. The fuse on the power supply unit.	Damaged or improperly installed part.	Repair, reinstall correctly, or replace defective part. Verify repairs, if same error still occurs, go to step 28. When replacing the fuse, if the fuse blows again, replace the power supply board.	Go to step 2.
3. Check the voltage at the pin 3 of the connector CN31 on the power supply board. When checking the voltage, turn the printer on.	Voltage is approximately 5.0V.	Go to step 3.	Replace HCO power supply board.
4. Check the voltage between the pin 3 and pin 4 of the connector CN1 on the HCO controller board.	Voltage is approximately 5.0V.	Replace HCO controller board.	Check damages or pinches of wire, cable and connector between the connectors CN31 on the power supply board and CN1 on the HCO controller board.

SVC D8 Guide Sensor Alarm

Instruction	Indication	Yes	No
1. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the guide sensor by sliding a piece of paper over the guide sensor while observing the LED9 (amber LED) on the LED unit board.	LED9 turns on and off correctly.	Go to step 2.	Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN4 at the guide sensor. Repair or place damaged part. Verify repairs. If LED9 still doesn't turn on and off correctly, replace the guide sensor.
2. Set the DIP switch on the LED unit board to "1100". Cycle power off/on ^a . Observe the exit roller.	The feed roller rotates.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the feed roller rotates after each repair: a. Check the feed motor gear b. Check the guide gear c. Check the feed roller d. Check the paper guide e. Replace paper feed unit f. Replace HCO controller board	Check for pinched wires, cables and damaged connectors between the connectors CN7 on the HCO controller board and M1 near the feed motor. Repair or place damaged part. Verify repairs. If the feed roller still doesn't rotate, replace the feed motor.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

SVC D8 Offset Alarm

Instruction	Indication	Yes	No
1. HCO controller board detected the offset alarm. The problem may be in the paper tray offset mechanism. Check the fuse on the HCO controller.	The fuse on the HCO controller is good.	Go to step 2.	Go to step 2.
2. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the offset switch by pressing the actuator of the offset switch by hand while observing the LED6 (amber LED) on the LED unit board.	LED6 turns on and off correctly.	Go to step 3.	Check for pinched wires, cables and damaged connectors between the following connectors • CN6 on the HCO controller board and CN17 on the harness • CN17 on the harness and SEN8 at the offset switch Repair or place damaged part. Verify repairs. If LED6 still doesn't turn off and on correctly, replace the offset switch.

SVC D8 Offset Alarm (Continued)

Instruction	Indication	Yes	No
3. Set the DIP switch on the LED unit board to "1010". Cycle power off/on ^a . Observe the paper tray offset.	The paper tray offsets smoothly.	Replace HCO controller board.	If the paper tray does not offset at all, go to step 4. If the paper tray offsets, but not smoothly, then the driving mechanism may already be deformed or damaged. Replace the whole HCO.
4. Remove the offset motor. Rotate the offset motor by hand.	The offset motor can be rotated by hand.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the feed roller rotates after each repair: a. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN6 on the HCO controller board and CN17 on the harness • CN17 on the harness and M4 at the offset motor. b. Replace offset motor assembly c. Replace HCO controller board	Replace offset motor assembly.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

SVC D8 DC Motor Alarm

Instruction	Indication	Yes	No
1. Check the fuse on the HCO controller.	The fuse on the HCO controller is good.	Go to step 14.	The problem may be an overload on the 24V circuits. Check where the paper tray is stopped and go to the appropriate step. • Paper tray stopped at the top position, go to step 2 • The paper tray stopped at the bottom position and the bottom switch is actuated, go to step 3 • All other positions, go to step 4
2. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the hi-top sensor by sliding a piece of paper over the sensor while observing LED7 (red LED) on the LED unit board.	LED7 turns on and off correctly.	Go to step 15.	Check for pinched wires, cables and damaged connectors between the following connectors: • CN2 on the HCO controller board and CN15 on the harness • CN15 on the harness and SEN5 at the hi-top sensor Repair or place damaged part. Verify repairs. If LED7 still malfunctions, replace the hi-top sensor.

SVC D8 DC Motor Alarm (Continued)

Instruction	Indication	Yes	No
3. Set the DIP switch on the LED unit board to "0100". Cycle power off/on ^a . Check the bottom switch by pressing the actuator of the bottom switch by hand, while observing LED4 (red LED) on the LED unit board.	LED4 turns on and off correctly.	Go to step 15.	Check for pinched wires, cables and damaged connectors between the connectors CN6 on the HCO controller board and SEN7 at the bottom switch. Repair or place damaged part. Verify repairs. If LED4 still malfunctions, replace the bottom switch and the fuse on the HCO controller board (24V, 3A).
4. Try to move the paper tray up or down by turning the tray motor by hand.	The paper tray moves up and down.	Go to step 5.	Go to step 12.
5. Check the resistance between pin 4 of the CN6 on the HCO controller board and FG.	The resistance is approximately 0 ohm.	Go to step 6.	Replace HCO controller board.
6. Disconnect the connector CN6 on the HCO controller board. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Go to step 9.	Go to step 7.
7. Disconnect the connector CN7 on the HCO controller board. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Replace feed motor and the fuse on the HCO controller board (24V, 3A).	Go to step 8.
8. Disconnect the connector M2 near the exit motor. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Replace exit motor and the fuse on the HCO controller board (24V, 3A).	Check for pinched wires, cables and damaged connectors between the following connectors: • CN7 on the HCO controller board and M1 near the feed motor • CN7 on the HCO controller board and M2 near the exit motor. Repair or place damaged part. Replace the fuse on the HCO controller board (24V, 3A).
9. Disconnect the M3 connector near the tray motor. Connect the CN6 on the HCO controller board as it was. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Replace tray motor and the fuse on the HCO controller board (24V, 3A).	Go to step 10.
10. Disconnect the connector SOL1 near the guide solenoid. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Replace guide solenoid and the fuse on the HCO controller board (24V, 3A).	Go to step 11.

SVC D8 DC Motor Alarm (Continued)

Instruction	Indication	Yes	No
11. Disconnect the connector M4 near the offset motor. Check the resistance between pin 4 of the CN6 on the HCO controller board (board side, not harness side) and FG.	The resistance is 50 ohms or more.	Replace offset motor assembly and the fuse on the HCO controller board (24V, 3A).	Check for pinched wires, cables and damaged connectors between the following connectors: • CN6 on the HCO controller board and M3 near the tray motor • CN6 on the HCO controller board and M4 near the offset motor • CN6 on the HCO controller board and SOL1 near the guide solenoid.
12. Check for blockage, twists in the belts and pulleys of the paper tray • one belt at the tray motor • two belts at both sides of the HCO.	The belts and pulleys are not blocked and are installed correctly.	Go to step 13.	Remove any blockage at the pulleys and install the belts correctly.
13. Remove the tray motor. Rotate the tray motor by hand.	The tray motor can be rotated by hand.	The paper tray driving mechanism may already be deformed or damaged. Replace the whole HCO.	Replace tray motor and the fuse on the HCO controller board (24V, 3A).
14. The problem may be at the paper tray driving mechanism. Check for blockage, twists, or damage in the belts and pulleys of the paper tray • one belt at the tray motor • two belts at both sides of the HCO.	The belts and pulleys are not blocked or damaged and are installed correctly.	Go to step 15.	• Remove any blockage at the pulleys and install the belts correctly. • If these belts are coming off or damaged, the paper tray driving mechanism may already be deformed or damaged. Replace the whole HCO.
15. Set the DIP switch on the LED unit board to "0110". Cycle power off/on ^a . Observe the paper tray.	The paper tray moves smoothly.	Replace HCO controller board.	• If the paper tray does not move at all, check for pinched wires, cables, and damaged connectors between the connectors CN6 on the HCO controller board and M3 near the tray motor. Repair or replace damaged part. If paper tray still doesn't move, replace the tray motor. • If the paper tray moves, but not smoothly, then the driving mechanism may already be deformed or damaged. Replace the whole HCO.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Reference Diagrams

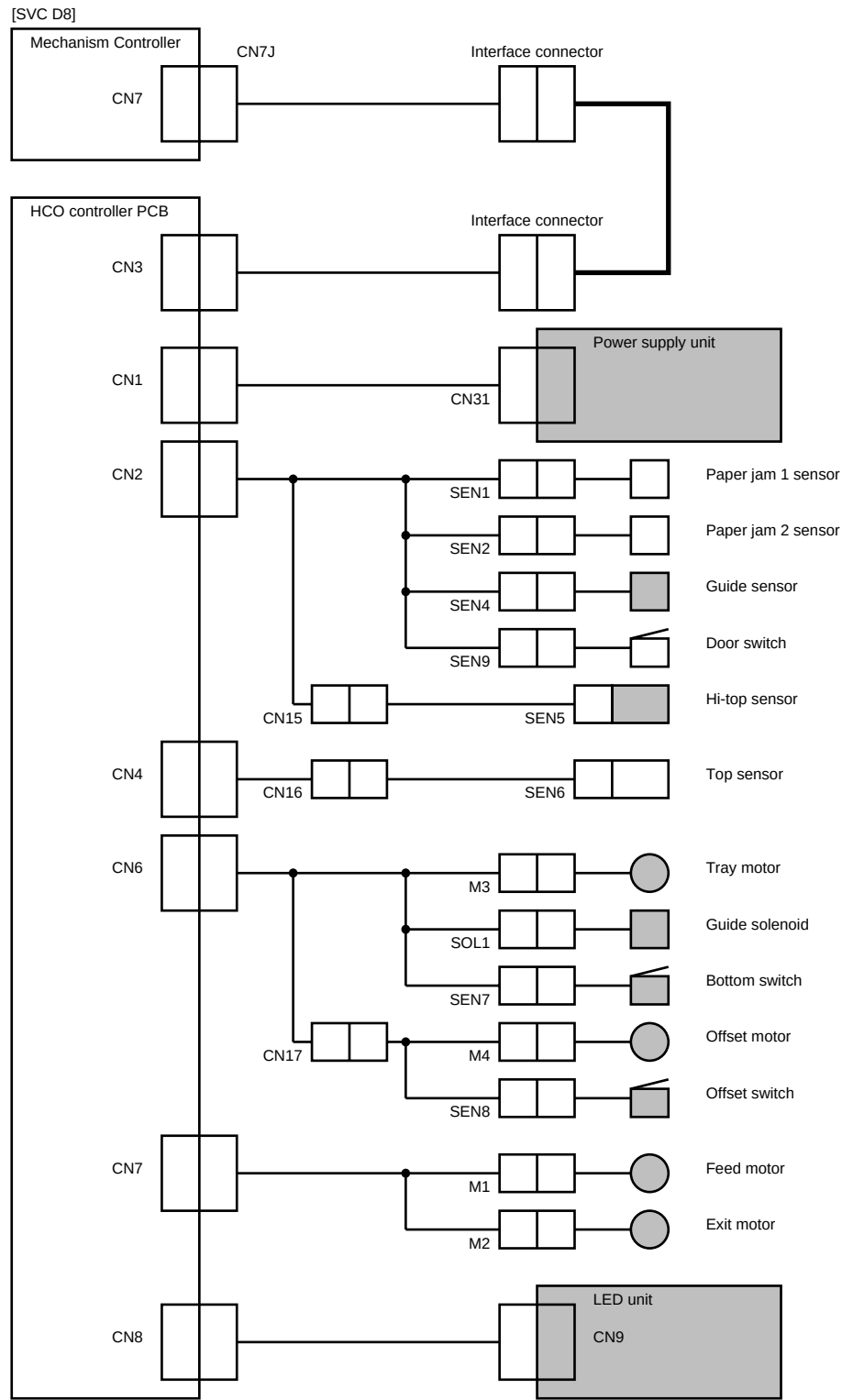


Figure C-3 HCO Stacker Alarm (SVC D8) Interconnections Diagram (1 of 2)

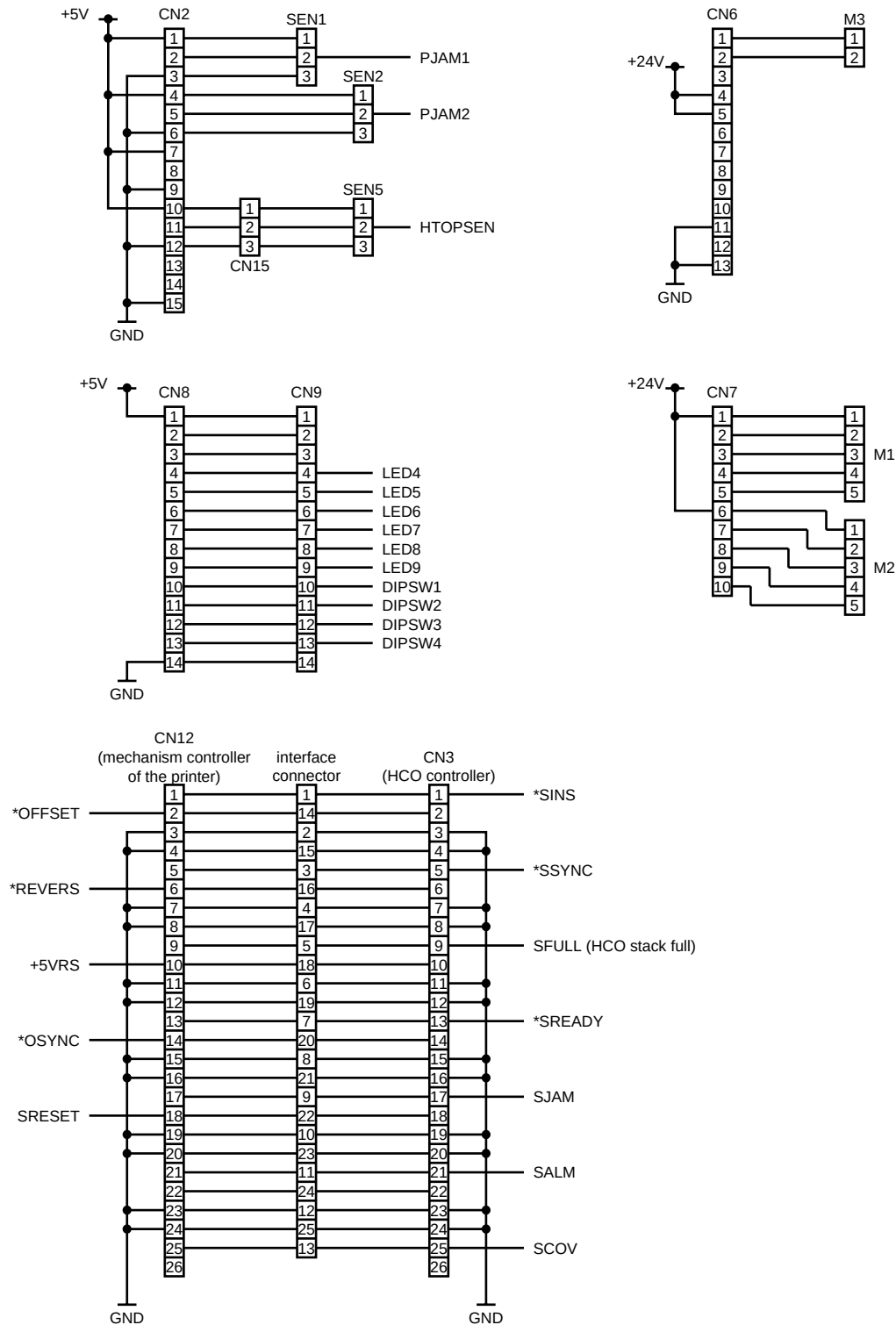


Figure C-4 HCO Stacker Alarm (SVC D8) Interconnections Diagram (2 of 2)

C-6.2 JAM41 HCO JAM1

Description

Note: When this error occurs, the operator panel displays HCO JAM1 and the maintenance report shows a JAM41.

One of the following occurred:

- When the printer was reset, there was media present at the HCO switchback sensor or exit sensor
- The HCO switchback sensor or exit sensor did not see the media when expected

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Verify the HCO Exit Roller has been updated to the hardened roller. On the front side of the Exit Roller shaft, 3.2 mm (1/8 inch) from the front shaft bushing, there is a groove present in the hardened roller shaft. This groove is not present on older Exit Roller Shafts and is visible without disassembling the High Capacity Output.	HCO exit roller is the updated hardened roller.	Go to step 2.	Replace HCO exit roller. Verify repairs. If JAM41 still occurs, go to step 2.
2. Verify the clear mylar shields located below the HCO exit rollers are not touching the higher portions located on the front and back of each exit roller. The metal guide the mylar separation shields are mounted on can be easily bent inward causing the mylar separation shields to contact the exit rollers and hinder their movement. This causes intermittent to continual HCO Jam1 to be displayed on the Operator Panel with the corresponding Jam41 in the Maintenance Report.	The mylar shields are properly installed.	Go to step 3.	Replace the mylar shields or replace paper feed unit. Verify repairs. If Jam41 still occurs, go to step 3.
3. Run a test print and observe when the JAM41 occurs.	A JAM41 error appears.	• If jam occurs at power up when there is no paper in the HCO, go to "JAM41 at Power Up," on page C-29. • If jam occurs approximately every 120 sheets stacked, go to "JAM41 Every 120 Sheets," on page C-30. • All other cases, go to "JAM41 General Procedure," on page C-32.	Done.

JAM41 at Power Up

Instruction	Indication	Yes	No
1. The problem may be on the HCO Exit Sensor (SEN1) or HCO Switchback Sensor (SEN2). Check for blockage at the paper jam 1 and 2 sensors.	Blockage at sensor (paper pieces, etc.)	Remove blockage and clean path. Verify repairs. If JAM41 error still appears, go to step 2.	Go to step 2.
2. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the HCO Exit Sensor (SEN1) by sliding a piece of paper over the sensor while observing LED4 (red LED) on the LED unit board.	LED4 turns on and off correctly.	Go to step 3.	Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN1 at the HCO Exit Sensor (SEN1). Repair or place damaged part. Verify repairs. If LED4 still doesn't turn on and off correctly, replace the HCO Exit Sensor (SEN1).
3. Check the HCO Switchback Sensor (SEN2) by sliding a piece of paper over the HCO Switchback Sensor (SEN2) while observing LED5 (green LED) on the LED unit board.	LED5 turns on and off correctly.	Go to step 4.	Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN2 at the HCO Switchback Sensor (SEN2). Repair or place damaged part. Verify repairs. If LED5 still doesn't turn on and off correctly, replace the HCO Switchback Sensor (SEN2).
4. Check whether the interface cable is connected to the printer correctly. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN12 on the mechanism controller board of the printer and the HCO interface connector • HCO interface connector and CN3 on the HCO controller board.	Pinched or damaged cables.	Perform the following steps one at a time, checking if JAM41 error appears after each step: a. Replace damaged parts. b. Replace the HCO controller board. c. Replace the paper feed unit.	Replace the HCO controller board. Verify repairs. If JAM41 error still appears, replace the paper feed unit.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

JAM41 Every 120 Sheets

Instruction	Indication	Yes	No
1. The problem may be on tray driving system, top of stack sensor, tray up sensor, or an incorrect detection of stacker full. Remove all the paper on the paper tray.	JAM41 still occurs.	Go to step 2.	Done.
2. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the top of stack sensor by sliding a piece of paper over the sensor while observing LED7 (red LED) on the LED unit board.	LED7 turns on and off correctly.	Go to step 3.	Check for pinched wires, cables and damaged connectors between the following connectors: • CN2 on the HCO controller board and CN15 on the harness • CN15 on the harness and SEN5 at the top of stack sensor Repair or place damaged part. Verify repairs. If LED7 still malfunctions, replace the top of stack sensor.
3. Check the tray up sensor by sliding a piece of paper over the sensor while observing LED8 (green LED) on the LED unit board.	LED8 turns on and off correctly.	Go to step 4.	Check for pinched wires, cables and damaged connectors between the following connectors: • CN4 on the HCO controller board and CN16 on the harness • CN16 on the harness and SEN6 at the tray up sensor Repair or place damaged part. Verify repairs. If LED7 still malfunctions, replace the tray up sensor.
4. Check the output tray lower limit microswitch by pressing the activator while observing LED4 (red LED) on the LED unit board.	LED4 turns on and off correctly.	Go to step 5.	Check for pinched wires, cables and damaged connectors between the connectors CN6 on the HCO controller board and SEN7 on the harness. Repair or place damaged part. Verify repairs. If LED4 still malfunctions, replace the down limit switch.
5. Check the belts of the paper tray (one belt at the tray motor, two belts at both sides of the HCO).	Pulleys are blocked, or the belts are twisted, coming off or damaged.	Repair or replace damaged part. Verify repairs. If JAM41 still occurs, go to step 6	Go to step 6.

JAM41 Every 120 Sheets (Continued)

Instruction	Indication	Yes	No
6. Set the DIP switch on the LED unit board to "0110". Cycle power off/on ^a .	Tray moves smoothly up and down.	Replace the mechanism controller board of the printer. ^b	• If the paper tray does not move at all, the driving mechanism may already be deformed or damaged. Replace the whole HCO. • If the paper tray moves in jerks or very rough, check for pinched wires, cables, and damaged connectors between the connectors CN6 on the HCO controller board and M3 near the tray motor. Repair or place damaged part. Verify repairs. If paper tray still moves incorrectly, replace the tray motor.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".
- b. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

JAM41 General Procedure

Instruction	Indication	Yes	No
1. The problem may be on the feed motor system or the input paper guide. Check the paper feeding path, especially near the input paper guide.	The paper feed path is blocked (paper pieces, etc.)	Remove blockage. Verify repairs. If JAM41 still occurs, go to step 2.	Go to step 2.
2. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on ^a . Check the HCO Switchback Sensor (SEN2) by sliding a piece of paper over the sensor while observing LED5 (green LED) on the LED unit board.	LED5 turns on and off correctly.	Go to step 3.	Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN2 at the HCO Switchback Sensor (SEN2). Repair or place damaged part. Verify repairs. If LED5 still doesn't turn on and off correctly, replace the HCO Switchback Sensor (SEN2).
3. Set the DIP switch on the LED unit board to "0100". Cycle power off/on ^a . Check the HCO Exit Sensor (SEN1) by sliding a piece of paper over the sensor while observing LED4 (red LED) on the LED unit board.	LED4 turns on and off correctly.	Go to step 4.	Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN1 at the HCO Exit Sensor (SEN1). Repair or place damaged part. Verify repairs. If LED4 still doesn't turn on and off correctly, replace the HCO Exit Sensor (SEN1).
4. Check for deformation or damage to the paper guide.	Unrepairable deformation or damage.	Reform the input paper guide or replace the paper feed unit.	Go to step 5.
5. Set the DIP switch on the LED unit board to "1100". Cycle power off/on ^a . Check the feed roller.	The feed motor rotates and the switchback deflector operates smoothly.	Perform the following steps one at a time. Replace any damaged parts and check if JAM41 error still occurs after each repair: a. Check the feed motor gear b. Check the feed roller gear c. Check the feed roller d. Check the feed idlers e. Replace the paper feed unit	Check for pinched wires, cables and damaged connectors between the connectors CN7 on the HCO controller board and M1 near the feed motor. Repair or place damaged part. Verify repairs. If feed motor does not rotate, replace the feed motor.

JAM41 General Procedure (Continued)

Instruction	Indication	Yes	No
6. Set the DIP switch on the LED unit board to "0010". Cycle power off/on ^a . Observe the exit roller.	The exit roller rotates.	Perform the following steps one at a time. Repair or replace any damaged parts and check if JAM41 error still occurs after each repair: a. Check the exit belt for clog at the pulleys of the belt, or twisted belts. b. Check if the exit belt is coming off or damaged. c. Check the exit motor pulley. d. Check the exit belt roller. e. Check the reverse roller pulley. f. Check the reverse roller. g. Check the reverse idlers. h. Check the exit roller pulley. i. Check the exit roller. j. Check the exit idlers. k. Check for any other damage on the paper feed unit. l. Replace the paper feed unit.	Go to step 7.
7. Power off HCO. Remove the exit motor and leave its connector connected. Power on the HCO and observe the motor.	The exit motor rotates.	Replace paper feed unit.	Check for pinched wires, cables and damaged connectors between the connectors CN7 on the HCO controller board and M2 near the exit motor. Repair or place damaged part. Verify repairs. If exit motor still doesn't rotate, replace the exit motor.

- a. After changing the DIP switch setting, the power must be cycled off /on to reset. When cycling HCO power, an SVC D8 momentarily occurs and should be ignored. When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Reference Diagrams

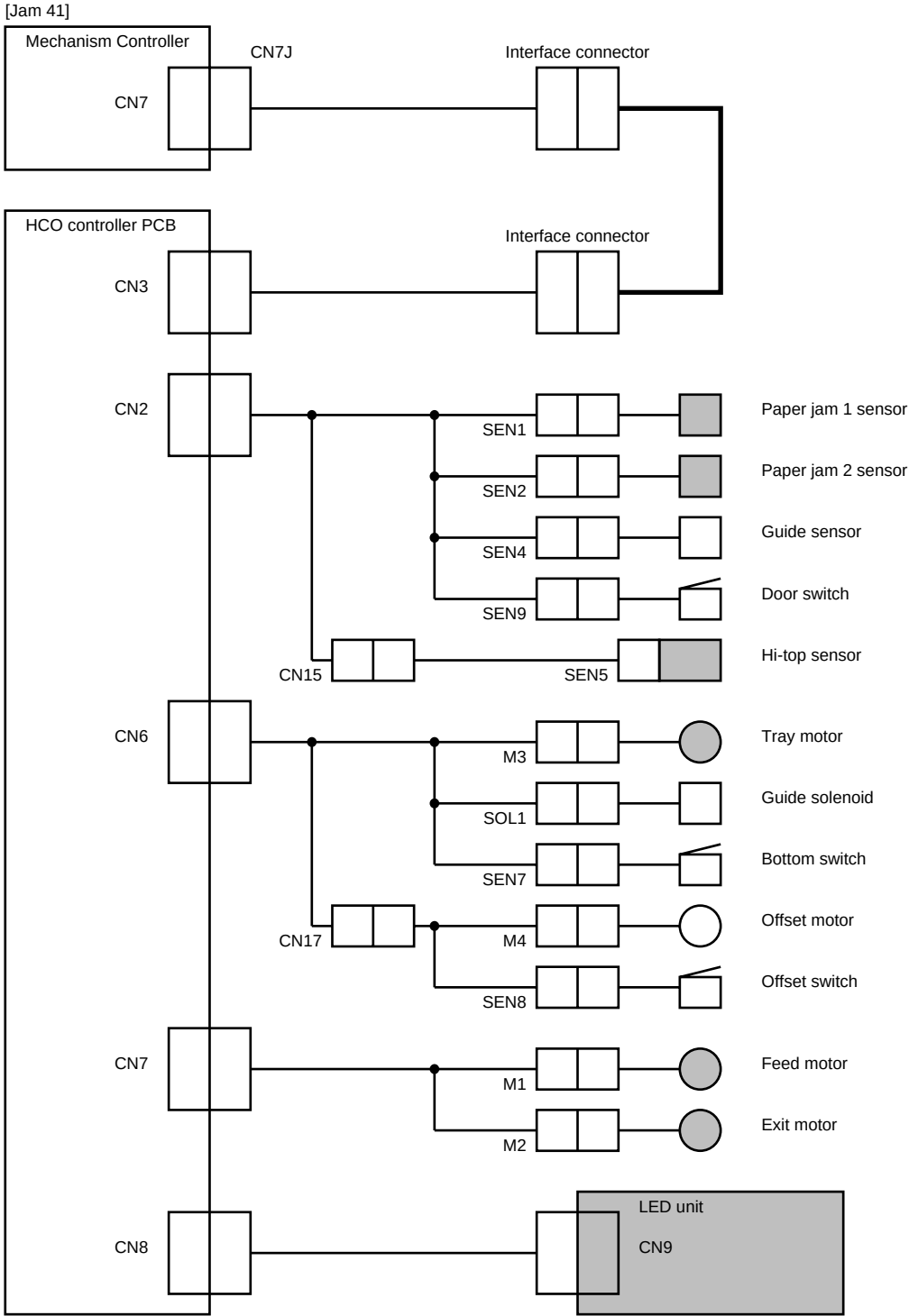


Figure C-5 HCO Stacker Jam (JAM41) Interconnections Diagram (1 of 2)

[Jam41/SVCD8]

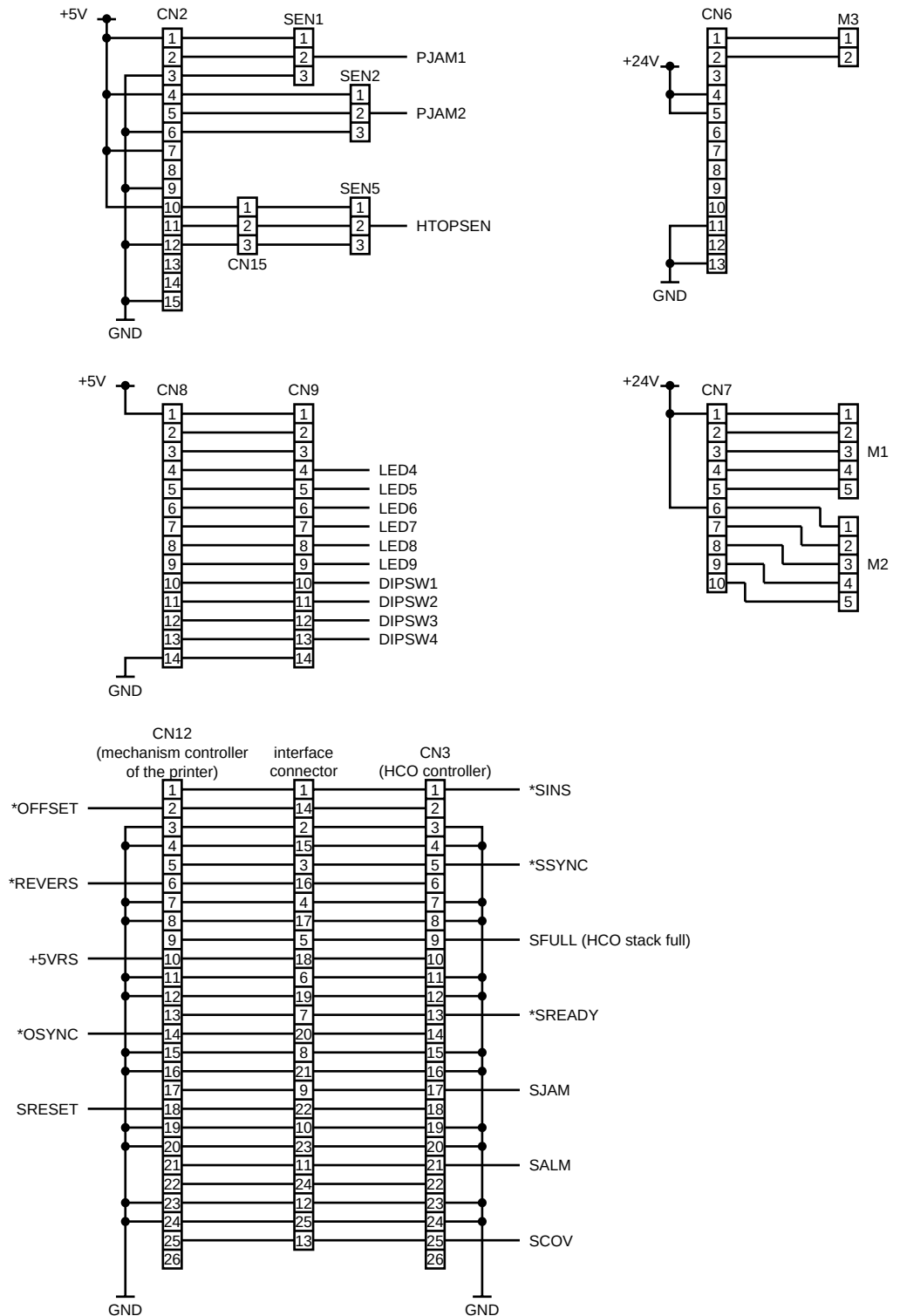


Figure C-6 HCO Stacker Jam (JAM41) Interconnections Diagram (2 of 2)

C-6.3 HCO Stacker Full Related Problems

Description

The stacker full of the HCO can not be cleared.

Troubleshooting Procedure

Note: When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000" (see [Figure C-3](#)).

Instruction	Indication	Yes	No
1. Check for external light shining at the hi-top sensor.	External light shining on sensor.	Remove or turn off the external light. Verify repair. If same problem occurs, go to step 2.	Go to step 2.
2. Turn off HCO power switch and remove top cover. Set the DIP switch on the diagnostic board to "0100" (see Figure C-3). Cycle power off/on. Observe the paper tray.	The paper tray stopped at the bottom position (the bottom switch is actuated).	Go to step 3.	Go to step 4.
3. Check the top sensor by sliding a piece of paper on and off the top sensor while observing LED8 (green LED) on the diagnostic board.	LED8 turns on and off correctly.	Go to step 4.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the LED8 turns on and off correctly after each repair: a. Check for pinched wires, cables and damaged connectors between the following connectors: • CN4 on the HCO controller board and CN16 on the harness • CN16 on the harness and SEN6 at the top sensor b. Replace the top sensor c. Go to step 4.

Instruction	Indication	Yes	No
4. Check the hi-top sensor by sliding a piece of paper on and off the hi-top sensor while observing LED7 (red LED) on the diagnostic board.	LED7 turns on and off correctly.	Go to step 5.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the LED7 turns on and off correctly after each repair: a. Check for pinched wires, cables and damaged connectors between the following connectors: • CN2 on the HCO controller board and CN15 on the harness • CN15 on the harness and SEN5 at the hi-top sensor. b. Replace the hi-top sensor. c. Go to step 5.
5. Check the bottom switch by pressing the actuator of the bottom switch by hand while observing the LED4 (red LED) on the diagnostic board.	LED4 turns on and off correctly.	Go to step 6.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the LED4 turns on and off correctly after each repair: a. Check for pinched wires, cables and damaged connectors between the connectors CN6 on the HCO controller board and SEN7 at the bottom switch. b. Replace the bottom switch c. Go to step 6.
6. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN12 on the mechanism controller board of the printer (especially for the pin9) and the HCO interface connector • HCO interface connector and CN3 on the HCO controller board (especially for the pin9).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If same problem still occurs, replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a	Replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section 5-7.3 on page 5-52 for details.

Reference Diagrams

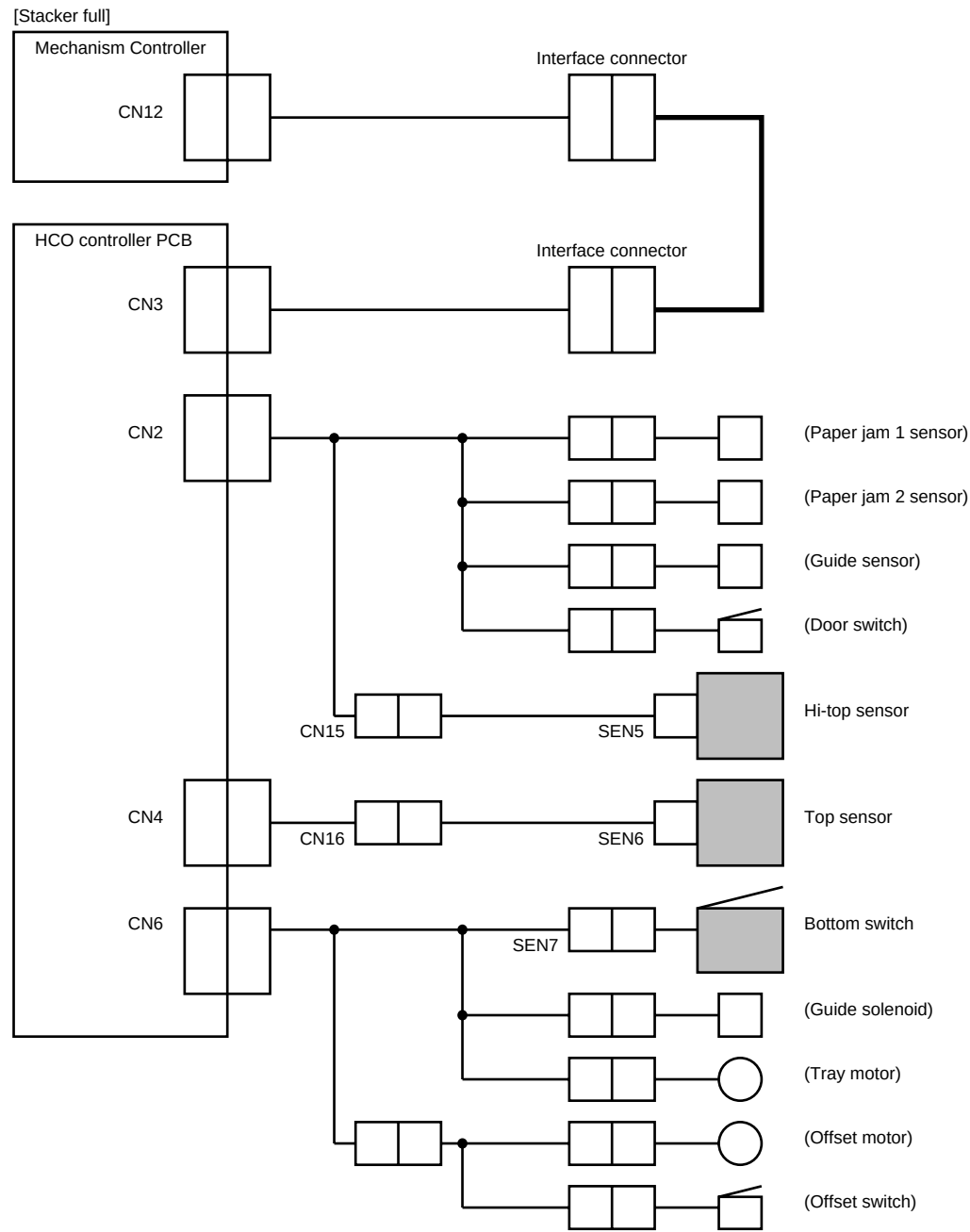
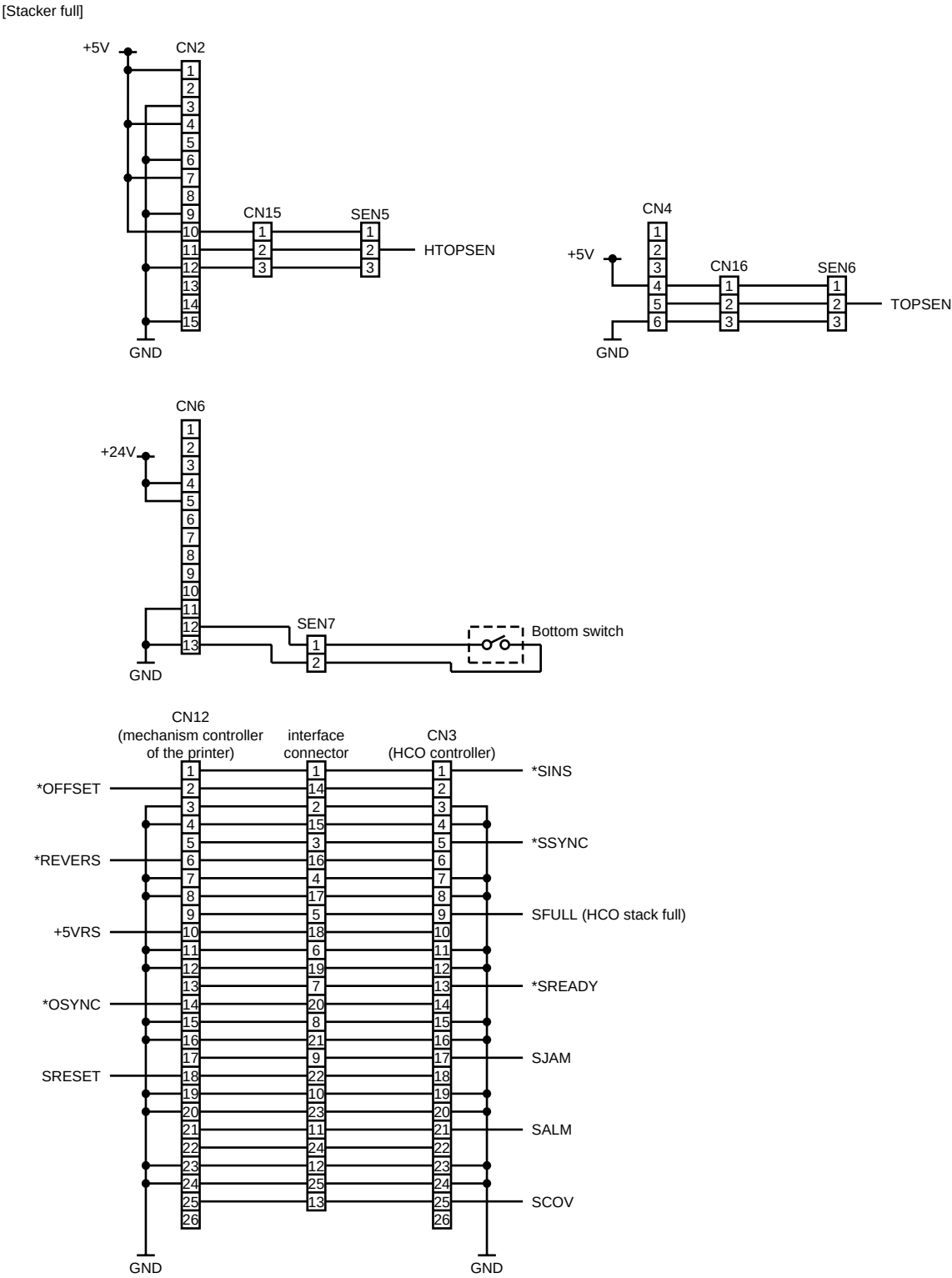


Figure C-7 HCO Stacker Full Related Problems Interconnections Diagram
(1 of 2)



C-6.4 HCO Door Open Related Problems

Description

The HCO door is detected as being open by the Door Open Microswitch present behind the lower portion of the HCO front door.

Troubleshooting Procedure

Note: When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Instruction	Indication	Yes	No
1. Verify that the HCO front door is closing properly and activating the front door switch by checking the following: a. The actuator behind the front door for damage b. The 3mm allen screw behind the left side middle of the HCO front cover is tight, holding the front cover against the HCO frame. c. Check and adjust the HCO front door hinges	One of the following: a. Actuator is deformed or damaged b. The allen screw is loose c. The front door out of adjustment	a. Replace the front door. b. Tighten the allen screw c. Adjust the HCO front door hinges	Go to step 2.
2. Turn off HCO power switch and remove top cover. Set the DIP switch on the diagnostic board to "0100" (see Figure C-3). Cycle power off/on. Check the door switch by pressing the actuator of the door switch by hand, while observing LED5 (green LED) on the diagnostic board.	LED5 turns on and off correctly.	Go to step 3.	Perform the following steps one at a time. Repair or replace any damaged parts and check if the LED5 turns on and off correctly after each repair: a. Check for pinched wires, cables and damaged connectors between the connectors CN2 on the HCO controller board and SEN9 at the door switch. b. Replace the door switch. c. Go to step 3.
3. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN12 on the mechanism controller board of the printer (especially for the pin25) and the HCO interface connector • HCO interface connector and CN3 on the HCO controller board (especially for the pin25).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If same problem still occurs, replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a	Replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

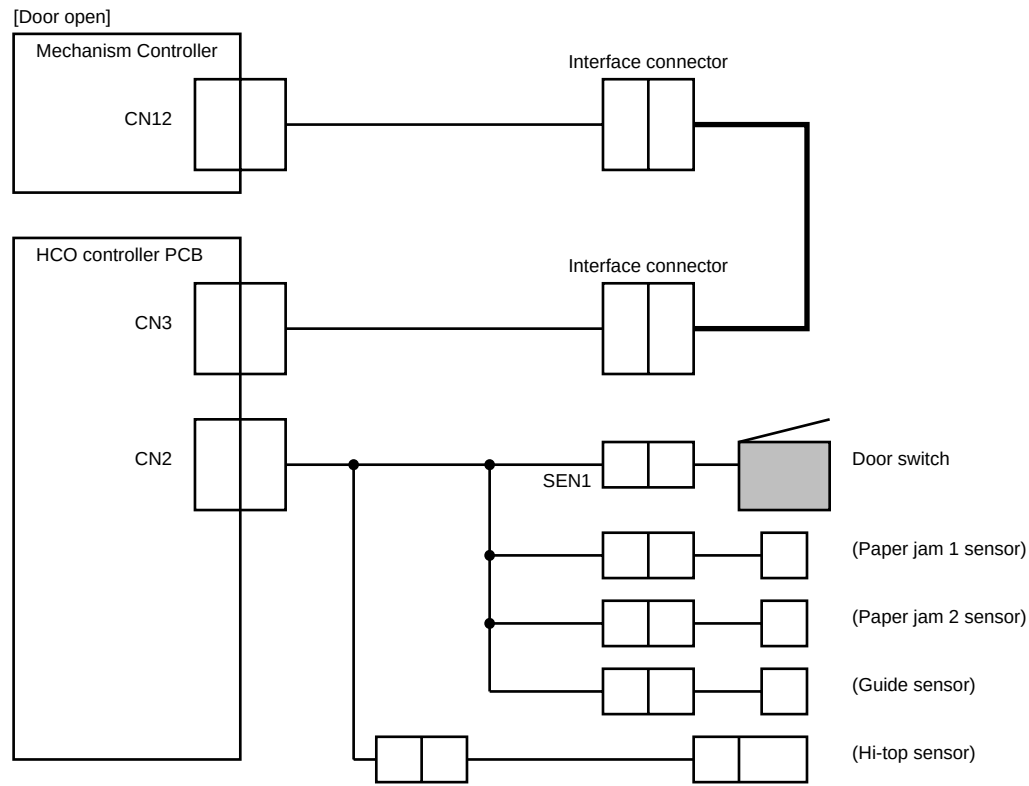


Figure C-9 HCO Door Open Related Problems Interconnections Diagram (1 of 2)

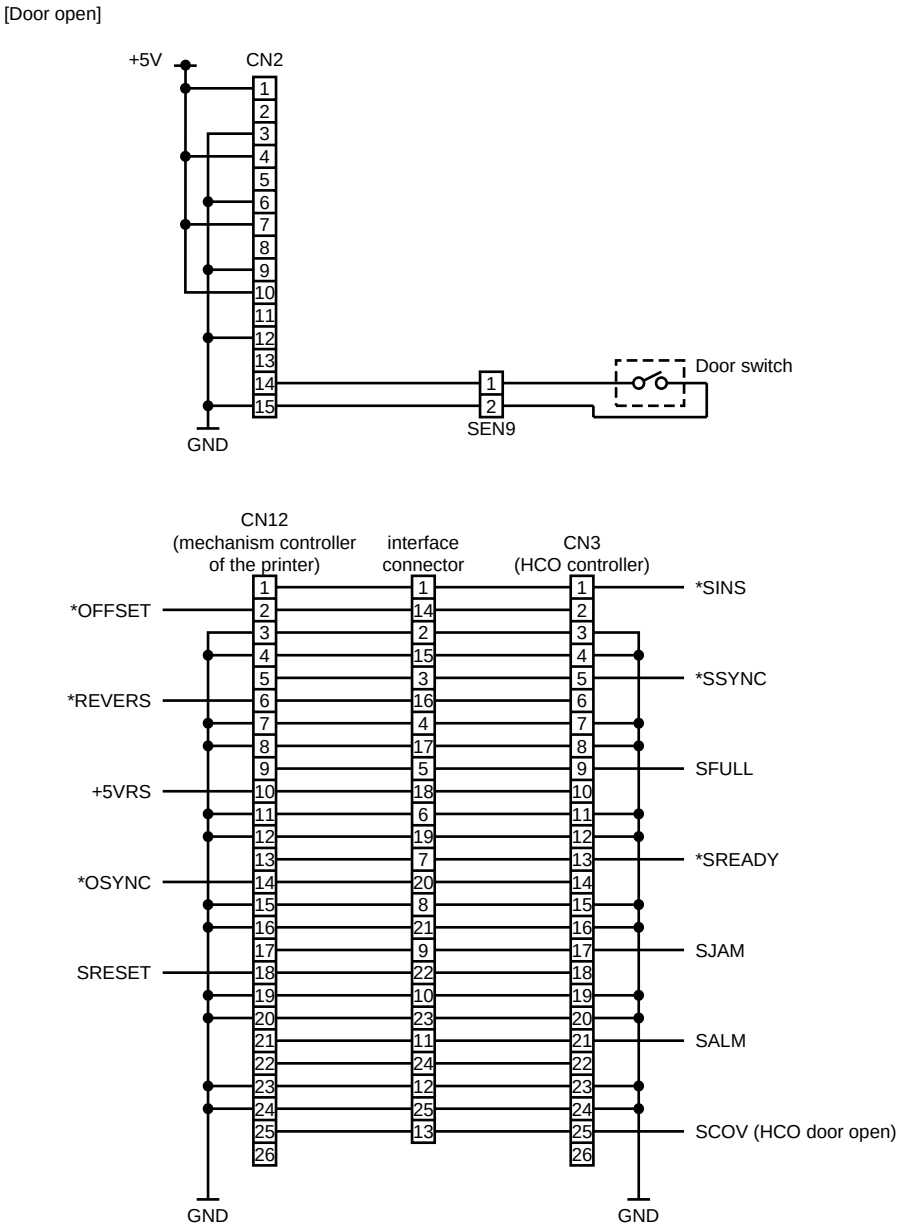


Figure C-10 HCO Door Open Related Problems Interconnections Diagram (2 Of 2)

C-6.5 HCO Stacker Tray Up/Down Movement Problem

Description

One of the following occurs:

- The stacker tray continuously moves up and down
- The stacker tray stays down after the stacked paper was removed.

Troubleshooting Procedure

Note: When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Instruction	Indication	Yes	No
1. An internal test may be operating. Open the front door and check the DIP switches on the diagnostic board.	The switches are set to "0000".	Go to step 2.	Turn off HCO power switch and remove top cover. Set the DIP switch on the diagnostic board to "0000". Cycle power off/on. Verify repairs. If same problem still occurs, go to step 2.
2. Turn off HCO power switch and remove top cover. Set the DIP switch on the LED unit board to "0100" (see Figure C-3). Cycle power off/on. Check the top sensor by sliding a piece of paper facing on and off the top sensor while observing LED8 (green LED) on the LED unit board.	LED5 turns on and off correctly.	Replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a	Go to step 2.
3. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN4 on the HCO controller board and CN16 on the harness • CN16 on the harness and SEN6 at the top sensor	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If same problem still occurs, replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a	Replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3](#) on [page 5-52](#) for details.

Reference Diagrams

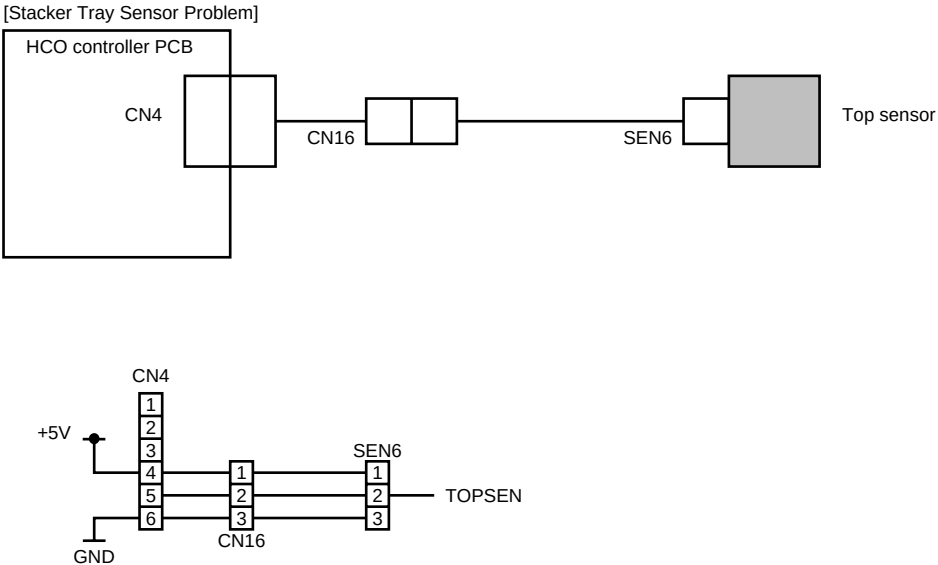


Figure C-11 Stacker Tray Stack Sensor Problem Interconnections Diagram

C-6.6 HCO Not Sensed By Printer

Description

The printer does not sense the HCO although it is installed. The symbol of the HCO is not displayed on the operator panel of the printer.

Troubleshooting Procedure

Note: When you exit the troubleshooting procedure, verify the DIP switches on the LED unit are reset to "0000".

Instruction	Indication	Yes	No
1. Check the interface cable connected to the printer.	Interface cable is connected correctly.	Go to step 2.	Connect the cable correctly.
2. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN12 on the mechanism controller board of the printer (especially for pin1) and the HCO interface connector • HCO interface connector and CN3 on the HCO controller board (especially for pin1).	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If same problem still occurs, replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a	Replace the HCO controller board. Verify repairs. If same problem still occurs, replace the mechanism controller board. ^a

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

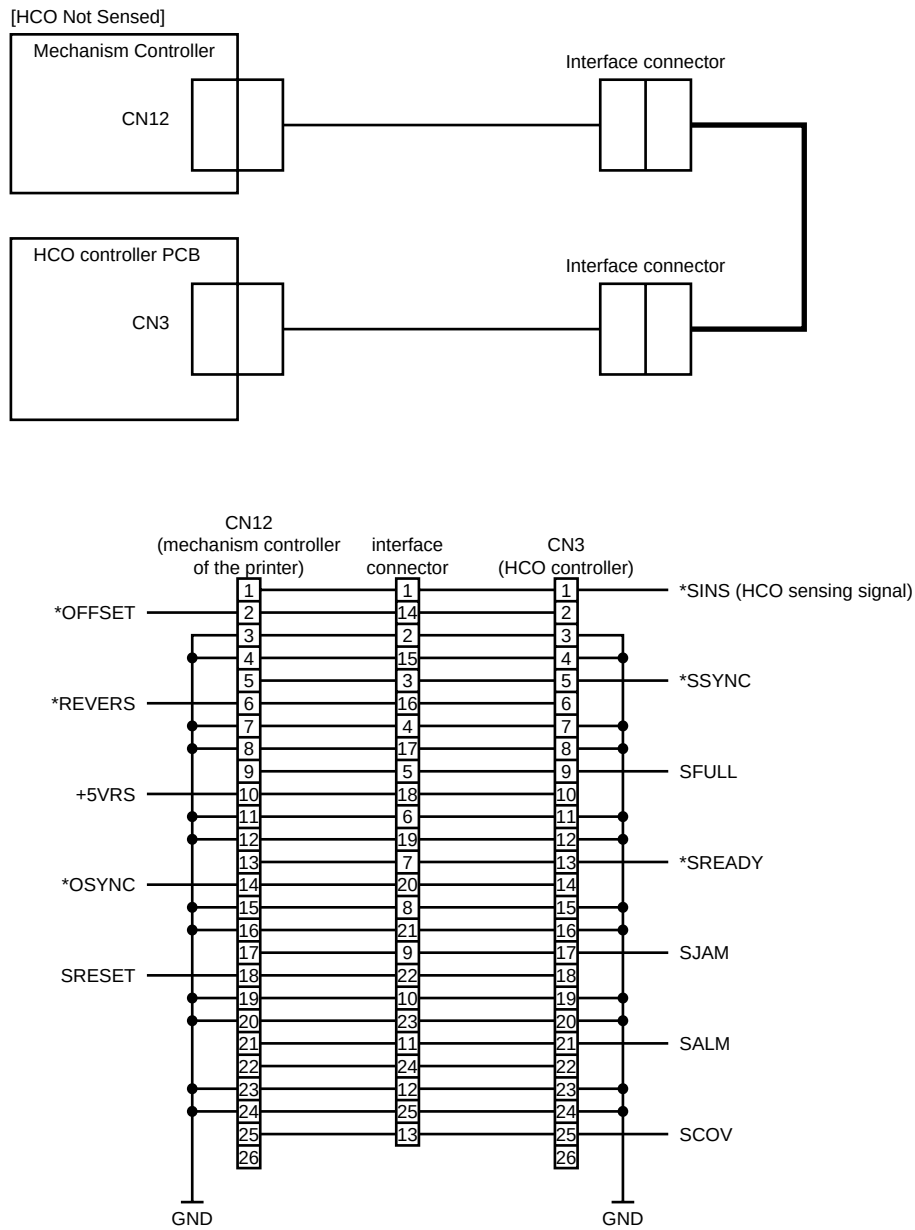


Figure C-12 HCO Not Sensed By Printer Interconnections Diagram

C-7 Maintenance

Note	All location references are from the front of the HCO. The front has the Access Door. For detailed drawings of HCO parts, see C-8 "Parts and Diagrams," on page C-53 .

C-7.1 Top Cover Removal

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the 4 screws securing the top cover and lift off the top cover.

C-7.2 Rear Cover Removal

- Step 1** Power off the HCO and disconnect the power cord.
- Step 1** Disconnect the HCO from the printer.
- Step 1** Remove the HCO top cover.
- Step 1** Remove the two inside screws that secure the diagnostics board.
- Step 1** Remove the two inside screws located above the power supply.
- Step 1** Remove the rear cover.

C-7.3 Front Cover Removal

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the HCO top cover.
- Step 4** Remove the two inside screws that connect the top of the cover.
- Step 5** Remove the two inside screws located above HCO controller.
- Step 6** Remove the inside, 3mm allen screw located two inches below the front cover latch.
- Step 7** Remove the front cover.

C-7.4 Right Cover Removal

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the HCO top cover.
- Step 4** Remove two screws from the top corners of cover.
- Step 5** Remove the two screws just outside the cover slot (12-inches from floor).
- Step 6** Remove the right cover.

C-7.5 Left Cover Removal

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the two screws from the top corners of cover.
- Step 4** Remove the two screws securing the bottom of the cover.
- Step 5** You'll need to lay the HCO on it's front cover to access these two screws.
- Step 6** Remove the left cover.

C-7.6 Power Supply Replacement Procedure

Part Number

CA02542-0160FJ - 100V (See C-8.4 on page C-60.)

CA02542-0162FJ - 200 V (See C-8.4 on page C-60.)

Removal and Replacement Procedure

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Remove the right cover.
- Step 3** Remove the screw securing the green ground wire to the lower frame.
- Step 4** Remove the CN31 connector from the lower left of the power supply.
- Step 5** Remove the AC Input connector (CN1) from the lower right of the power supply.
- Step 6** Remove the two screws securing the lower corners of the power supply and the one screw securing the upper middle of the power supply.
- Step 7** Remove the power supply.
- Step 8** Install new power supply
- Step 9** Reassemble in reverse order.

C-7.7 HCO Controller Replacement Procedure

Part Number

CA02542-0181FJ (See C-8.4 on page C-60.)

Removal and Replacement Procedure

Step 1 Power off the HCO and disconnect the power cord.

Step 1 Remove the right cover.

Step 1 Starting from the top left and moving clockwise around the Controller, remove the following connectors: CN6, CN7, CN1, CN3, CN4, CN2 and CN8.

Step 1 Remove the four screws securing each corner of the controller.

Step 1 Remove the controller.

Step 1 Install the new unit.

Step 1 Reassemble in reverse order.

Note

Inspect the firmware revision of the single-socketed IC chip on the replacement Controller and compare it with the firmware revision on the old Controller. If the firmware on the old Controller is more recent, transfer it to the new Controller.

C-7.8 Paper Feed Unit Replacement Procedure

Part Number

CA02542-0200FJ (See C-8.5 on page C-62.)

Removal and Replacement Procedure

- Step 1** Power off the HCO and disconnect the power cord.
- Step 2** Disconnect the HCO from the printer.
- Step 3** Remove the HCO top cover, rear cover, right cover, and left cover.
- Step 4** On the HCO controller, remove the CN2 connector (lower left).
- Step 5** Directly above the HCO controller, disconnect the black and gray wire interconnect (labeled SEN9) and the yellow, green and black wire interconnect (labeled CN15). Remove this cable harness from the cable securing point on the lower frame.
- Step 6** On the HCO controller, remove the CN6 connector (upper left).
- Step 7** Directly above the HCO Controller, disconnect the black and red interconnect (labeled SEN7), the brown and red interconnect (labeled SEN7), and the six-wire interconnect (labeled CN17). Remove this cable harness from the cable securing point on the lower frame.
- Step 8** On the HCO controller, remove the CN7 connector (upper right). Then, remove this cable harness from the cable securing points along the lower frame.
- Step 9** Remove the two screws from the front vertical frame and two screws from the rear vertical frame.
- Step 10** Open the front cover access door.
- Step 11** Lift the output paper transport assembly up and away from the HCO frame.
- Step 12** Install new unit.
- Step 13** Reassemble in reverse order.

C-7.9 HCO Exit Roller and Exit Pulley Replacement Procedure

Part Number

CA02542-E003FJ (See C-8.5 on page C-62.)

Removal and Replacement Procedure

- Step 1** Remove HCO paper feed unit. See [C-7.8 "Paper Feed Unit Replacement Procedure,"](#) on page C-51.
- Step 2** Place the paper feed unit on a work surface with the HCO exit roller shaft facing up. Locate the roller shaft drive belt and its belt tension idler roller (white roller without splines).
- Step 3** Loosen the screw securing the belt tensioner plate and remove the splined belt.
- Step 4** Remove the C clip securing the exit pulley. Remove the exit pulley and flat spacer washers on each side of the exit pulley.
- Step 5** Inspect the exit roller for wear such as discoloration of the area under the exit pulley and replace the exit roller if wear is noted.

Note	The exit pulley clutch requires NO LUBRICATION and should not be lubricated!

- Step 6** Remove the C clip on each end of the exit roller shaft and a steel bushing on each end of the shaft. remove the exit roller shaft.

Note	When you reinstall the exit pulley, make sure the lip on the exit pulley is toward the outside of the feed unit.

- Step 7** Install new unit.
- Step 8** Reassemble in reverse order.

C-8 Parts and Diagrams

This section shows exploded diagrams of the HCO assembly and sub assemblies. Each drawing also has a list of replaceable parts.

Only replaceable parts are assigned part numbers. If a part or assembly is damaged and does not have a part number, contact your factory representative.

Note This section includes parts for the 2,000-sheet HCO. For information on the 3,000-sheet HCO, see Appendix B, “3,000-Sheet High Output.”

C-8.1 HCO Attachments

Parts list for Attachments. See [Figure C-1](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02542-0189FJ	Interface cable	
		CA02542-0235FJ	HCO Mounting Hardware kit	Includes items 3, 4, 5, and 6, and mounting screws
2	1		Exit guide	
3	1		Bracket A	Included in HCO Mounting Hardware kit
4	1		Bracket B	Included in HCO Mounting Hardware kit
5	1		Connecting pin	Included in HCO Mounting Hardware kit
6	1	CA02858-1112FJ	Thumbscrew	Included in HCO Mounting Hardware kit
7	1	8120-1395 8120-4519 8120-4419 8120-4420 8120-4416 8120-4521 8120-4934	HCO Power cord	PWR 120V North America PWR Europe PWR Australia/NZ PWR UK PWR Switzerland PWR Denmark PWR India/SO Africa
8	2	CA02626-E165FJ	Mounting bracket	HCO Mounting hardware bracket. Includes one screw.
	1	CA02542-0193FJ	HCO Screw kit	Miscellaneous screws for HCO.

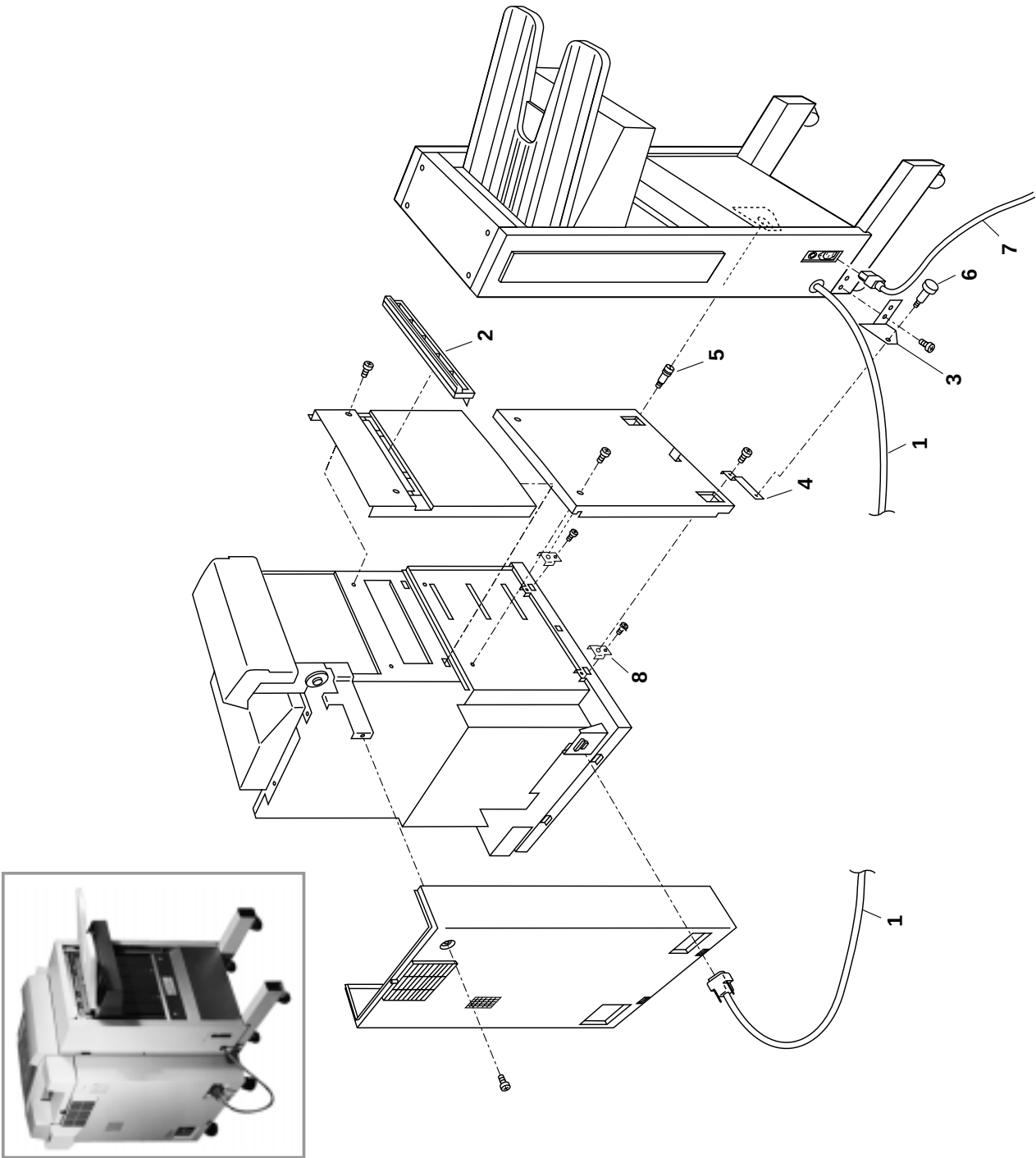


Figure C-1 Attachments Diagram

C-8.2 Stacker Frame Assembly

Table C-1. Parts list for Stacker Frame. See [Figure C-2](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02542-0199FJ	Front door	
2	1	CA02542-0165FJ	LED unit	Diagnostic PCA
3	1	CA02542-0180FJ	Offset motor assembly	
4	1	CA02542-0206FJ	Offset switch	
5	1	CA02542-0154FJ	Brush	
6	1	CA02542-0183FJ	Top cover	
7	1	CA02542-0186FJ	Tray	
8	1		Left side cover	
9	1	CA02542-0190FJ	Diagnostic PCA cable	
10	4	CA02542-0191FJ	Caster	
11	2	CA02542-0192FJ	Hinge	
12	1	CA02542-0203FJ	Film guide	
13	4	CA02542-0234FJ	Mylar tab	One for each exit roller Package of 50 tabs
	2	CA02542-0155FJ	Tray belt	Not shown. Offset belt
	2	CA02542-0156FJ	Tray pulley	Not shown. Offset pulley
	2	CA02542-0166FJ	Tray pulley	Not shown. Offset pulley

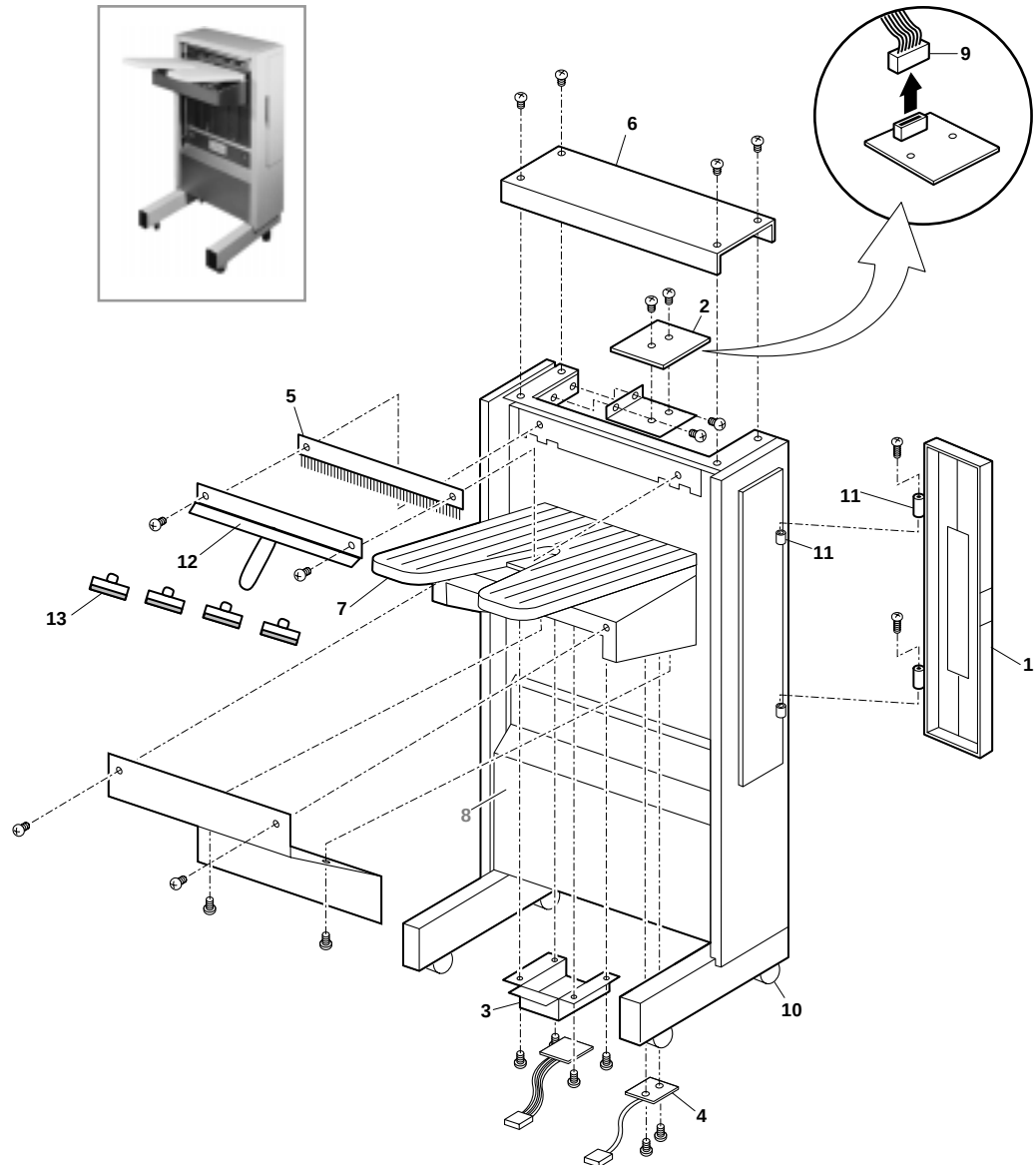


Figure C-2 Stacker Frame Assembly Diagram

C-8.3 Controls and Covers

Parts list for Controls and Covers. See [Figure C-3](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02542-0122FJ	Guide sensor	Switchback Deflector Sensor
2	1	CA02542-0150FJ	Guide solenoid	Switchback Deflector Solenoid
3	1	CA02542-0182FJ	HCO frame assembly	
4	1	CA02542-0184FJ	Front cover	
5	1	CA02542-0185FJ	Rear Cover	

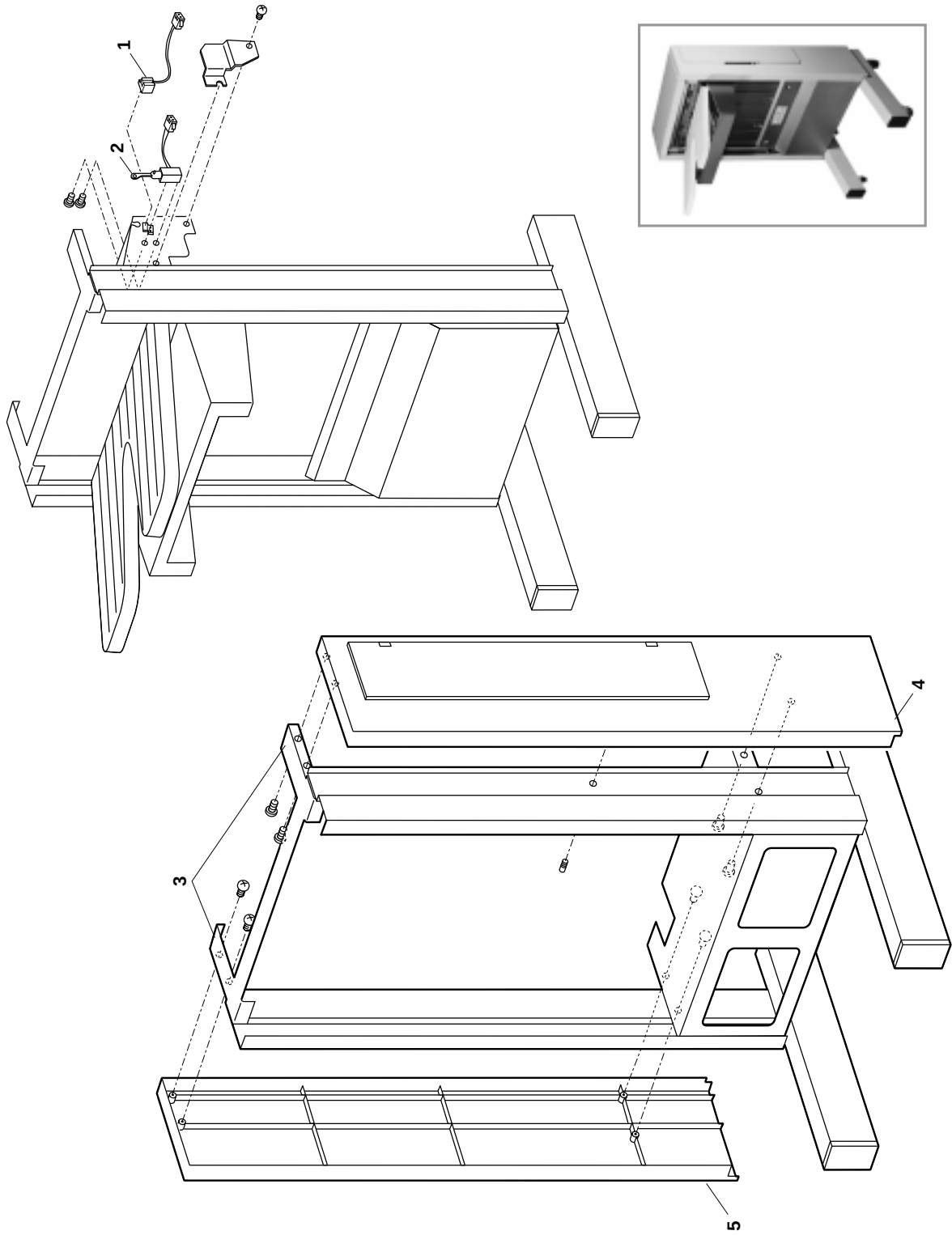


Figure C-3 Controls and Covers Diagram

C-8.4 Input-Paper Transport Assembly

Parts list for Input-Paper Transport Assembly. See [Figure C-4](#) and [Figure C-5](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02542-0152FJ	Jam sensor	Exit sensor
2	1	CA02542-0160FJ	Power supply (100V)	100-127V. Replacement procedure: see C-7.6 on page C-49.
3	1	CA02542-0162FJ	Power supply (200V)	200-240V. Replacement procedure: see C-7.6 on page C-49.
4	1	CA02542-0181FJ	Control PCB	HCO Controller
5	1	CA02542-0206FJ	Door switch	Front door switch
6	1	CA02542-0194FJ	Tray motor	
7	1	CA02542-0138FJ	Switch, Power On	AC Power Switch
8	1	CA02542-0152FJ	Jam sensor	Switchback sensor
9	1	CA02542-0201FJ	Sensor	SEN5 Upper Paper Level Sensor
10	1	CA02542-0201FJ	Sensor	SEN6 Paper Tray Up Sensor
11	1	CA02542-0158FJ	Bottom switch	Tray Full Switch
12	1		Right side cover	

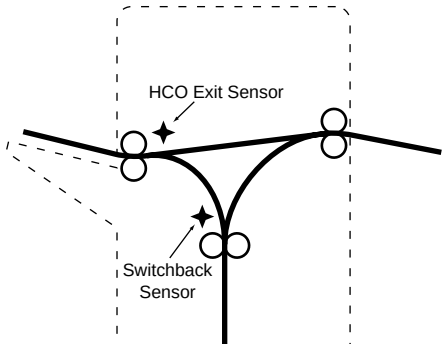


Figure C-4 Jam Sensor Positioning

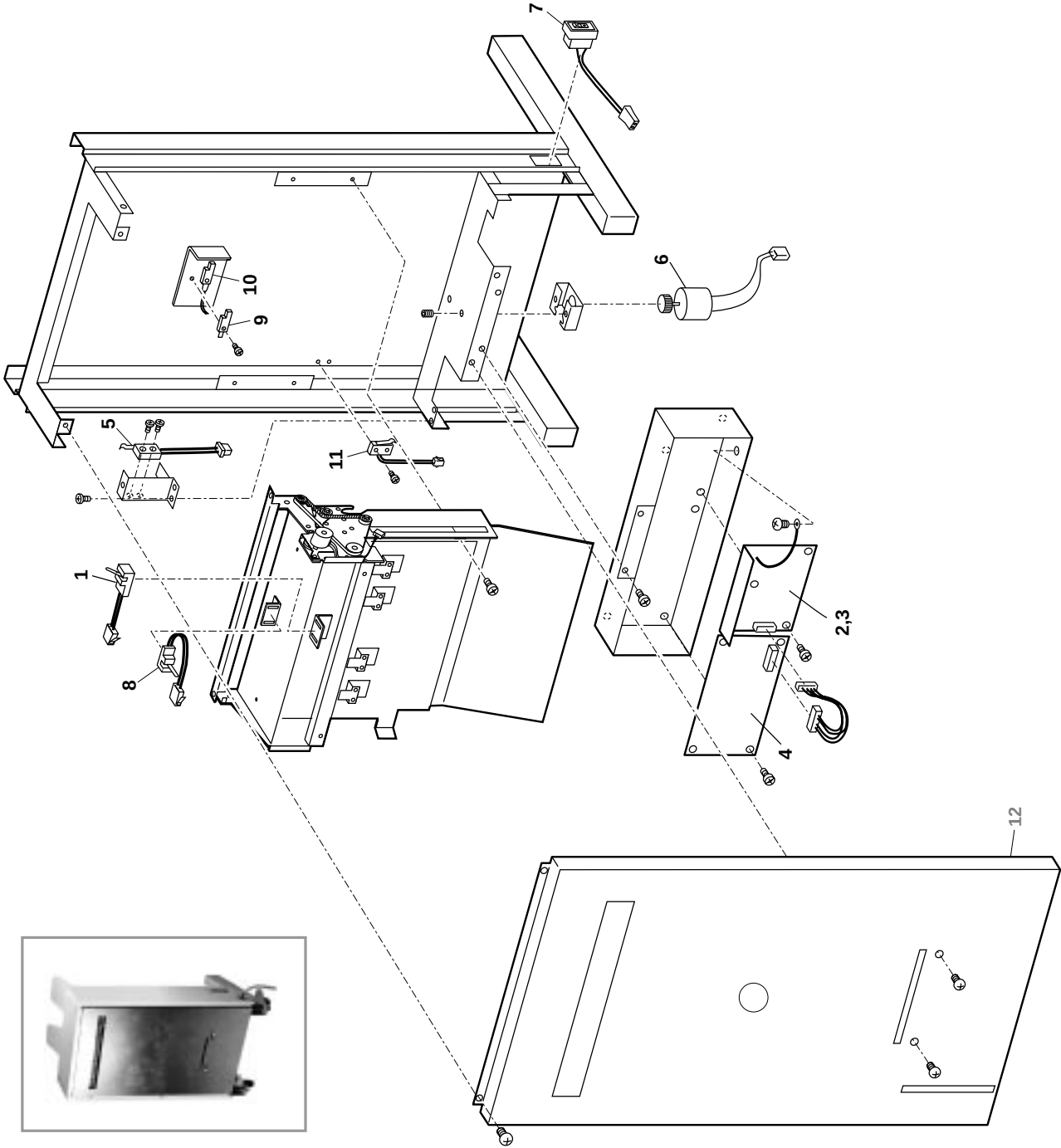


Figure C-5 Input-Paper Transport Assembly Diagram

C-8.5 Output-Paper Transport Assembly

Parts list for Output-Paper Transport Assembly. See [Figure C-6](#).

Index No.	Qty	Part Number	Description	Remarks
1	1	CA02542-0200FJ	Paper feed unit	Replacement procedure: see C-7.8 on page C-51.
2	4	CA02542-0198FJ	Reverse idler	
3	4	CA02542-0197FJ	Feed idler	
4	1	CA02542-0115FJ	Feed motor	
5	1	CA02542-0145FJ	Feed motor gear	
6	1	CA02542-0107FJ	Feed gear	
7	1	CA02542-0109FJ	Guide gear	Included in exit pulley/exit roller kit - P/N CA02542-E003FJ
8	1	CA02542-E003FJ	Exit pulley	Exit pulley/exit roller kit - includes items 7,8, 15, and 16. Replacement procedure: see C-7.9 on page C-52.
9	1	CA02542-0151FJ	Exit belt	
10	1	CA02542-0149FJ	Exit motor	
11	1	CA02542-0146FJ	Exit motor pulley	
12	1	CA02542-0141FJ	Feed roller	
13	4	CA02542-0196FJ	Exit idler	
14	1	CA02542-0147FJ	Reverse pulley	
15	1	CA02542-0204FJ	Exit roller	Included in exit pulley/exit roller kit - P/N CA02542-E003FJ
16	1	CA02542-E003FJ	Exit roller	Exit pulley/exit roller kit - includes items 7,8, 15, and 16.
17	1	CA02542-0140FJ	Reverse roller	
	1	CA02542-0203FJ	Film guide	Not shown. Exit tray mylar
21	6		Bearing	
	4	CA02542-0234FJ	Mylar tab	One for each exit roller. Package of 50 tabs. See item 13 in Figure C-2 .

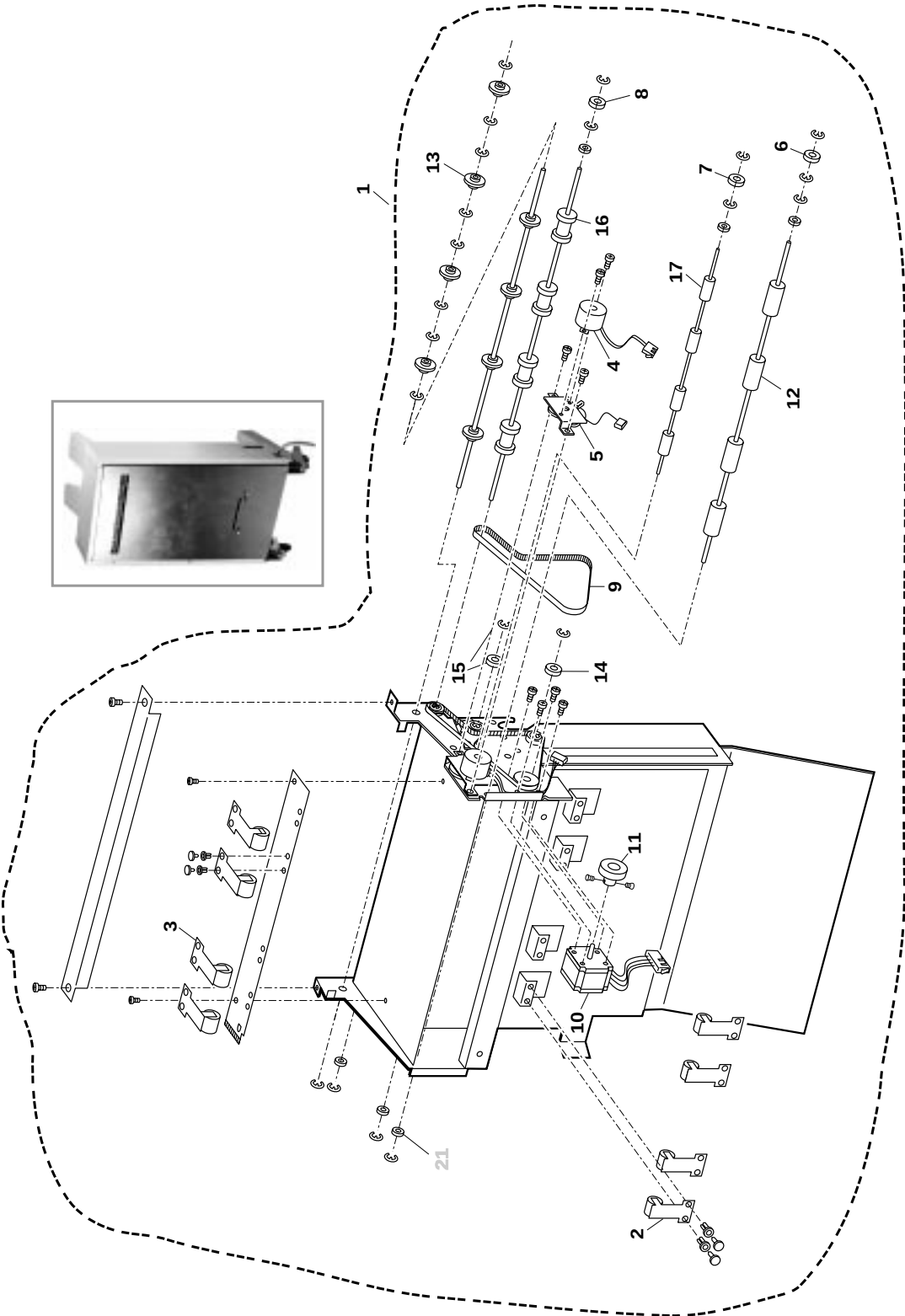


Figure C-6 Output-Paper Transport Assembly Diagram

D

High-Capacity Input

Appendix D contains:

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D-1 Overview

The C5621A and C5622A are optional user-installable high capacity input (HCI) units for the D640 printer which connect to the right side of the printer. The C5621A can feed Letter size paper only, while the C5622A can feed Letter and A4 size paper. Both HCIs can accept up to 3000 sheets of paper (75g/m2).

Figure D-1 illustrates the C5621A/C5622A High Capacity Input.

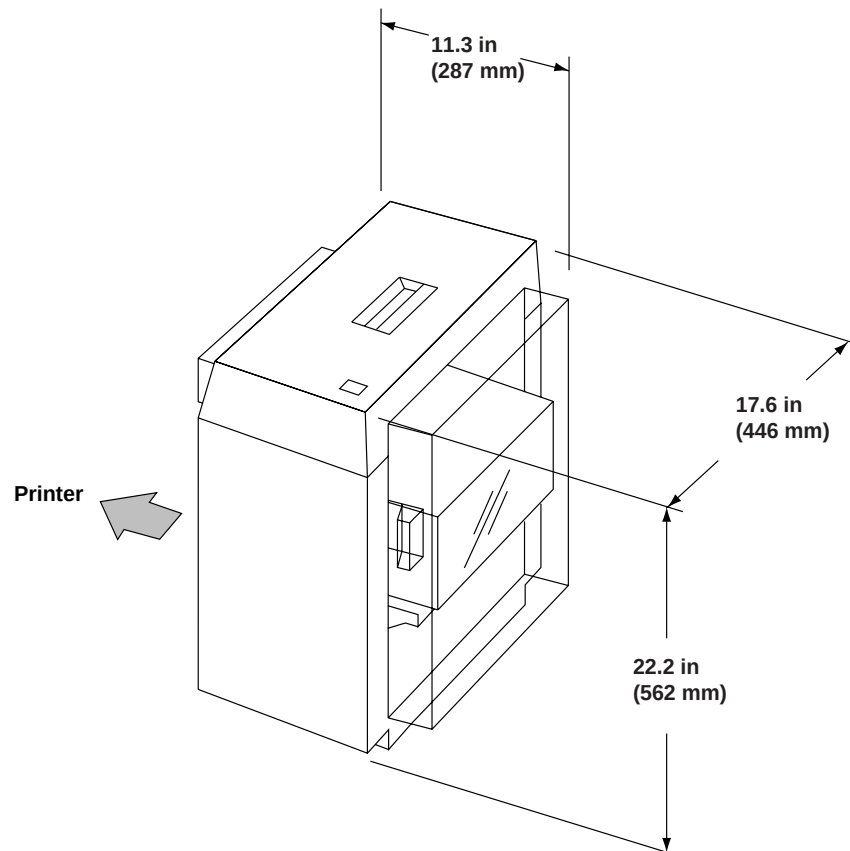


Figure D-1 High Capacity Input Paper Handler Physical Dimensions

D-1.1 Related Documents

This appendix is a supplement to the *D640 Service Manual*. It describes service information specific to the 3,000-sheet HCI.

For more information about installing and using the 2,000-sheet HCO, see the *3,000-Sheet HCI Installation and User Manual* (see [1-1.1 "Related Documents,"](#) on page 1-4).

D-2 Specifications

This section provides specifications for the HCI. Specifications include:

- Paper handling specifications
- Physical specifications
- Electrical specifications
- Environmental specifications

Note	Specifications are subject to change without notice.

D-2.1 Paper Handling Specifications

[Table D-1](#) lists the HCI paper related specifications.

Table D-1. HCI Paper Handling Specifications

Item	Specifications
Paper capacity	3,000 sheets (75g/ m2)
Paper	
Size	C5621A: Letter / C5622A: A4
Type	Plain. Label. Transparency, Bond, Pre-punched 64 to 90g/m2
Processing speed	40 ppm (C5621A: Letter landscape, C5622A: A4 landscape)

D-2.2 Physical Specifications

[Figure D-1](#) illustrates the HCI physical dimensions and [Table D-2](#) lists the physical dimensions and unit weight. Required service area dimensions for the HCI are illustrated in [Figure D-2](#).

Table D-2. HCI Physical Specifications

Item	Specification
Dimensions	
Width	287 mm (11.3 in)
Depth	446 mm (17.6 in)
Height	562 mm (22.2 in)
Weight	About 17 kg
Service area	
Front	650 mm (25.6 in)
Back	850 mm (33.5 in)
Right	850 mm (33.5 in)

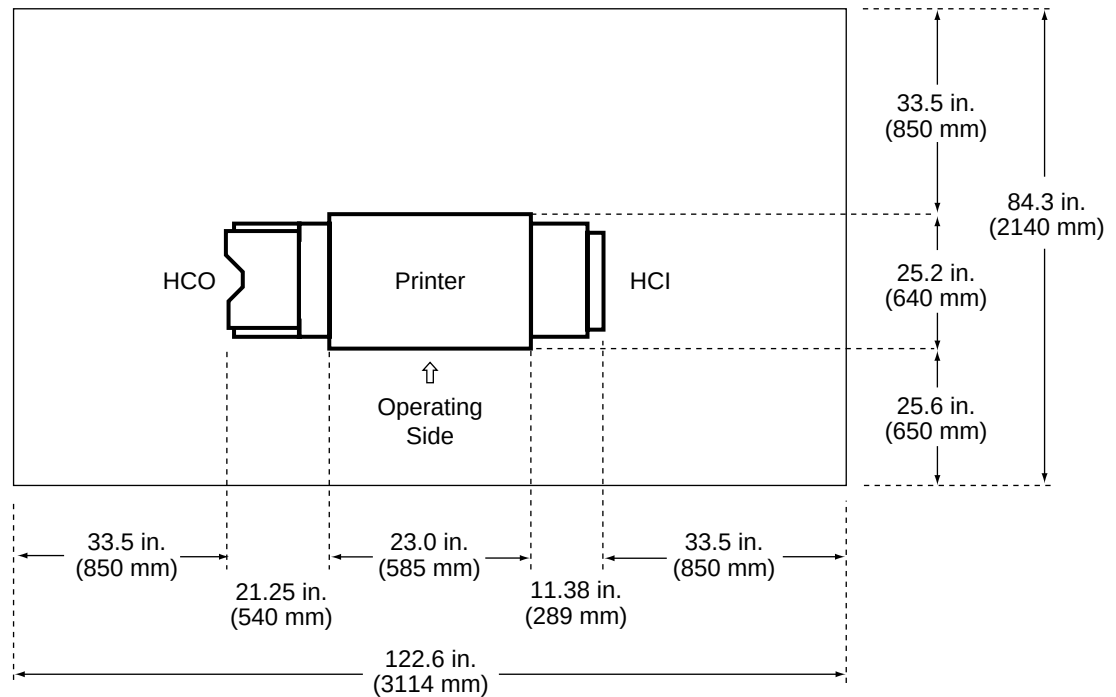


Figure D-2 HCO (Left), D640 Printer (Center), and HCI (Right) Required Service Area Dimensions

D-2.3 HCI Electrical Specifications

Table D-3 lists the electrical specifications of the HCI.

Table D-3. HCI Electrical Specifications

Item	Specification
Input power	24VDC, supplied from D640 printer
Power consumption	30VA or less during operating

D-2.4 Environmental Specifications

Table D-4 lists environmental specifications applicable to the printer, High-Capacity Input (HCI), and High-Capacity Output (HCO) units.

Table D-4. D640 Printer, HCI Option, and HCO Option Environmental Specifications

Item	Specification
Acoustic noise	56 dB(A) or less (printer only)
Ozone emission	0.08 PPM or less: Measured under conditions of typical printer operation and room ventilation
Operating Environment	
Temperature	15° to 35° C
Humidity	20% to 80% RH (no condensation)

Table D-4. D640 Printer, HCI Option, and HCO Option Environmental Specifications

Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)
Non-operating Environment	
Temperature	0° to 35° C
Humidity	20% to 80% RH (no condensation)
Temperature and humidity gradients	15° C per hour or less and 30% RH per day or less (no condensation)

D-3 Diagnostics

HCI Sensors Screen (EngMaint.Sensors.HCI) of the Printer Diagnostic Program displays on the printer control panel the real-time status of the sensors and microswitches mounted on the HCI. (For more information on the Printer Diagnostic Program, see Chapter 3.)

To see the status, be sure the front door of the printer is closed. The location of the sensors is shown in [Figure D-3](#).

Engine Test/Maintenance: Sensors		
HCI	Please close printers covers	
SETSEN:locked	DSEN:closed	
EMPSEN:full	S1B:off	
LEVSEN:on	KSEN:absent	
LOWSEN:off		
BACK	-	+

BACK Return to the Sensors Sub-menu.

+ Goes to the next screen, DOORS.

- Goes to the previous screen, SWITCH.

SETSEN Senses HCI is engaged to printer. Values: locked or open.

EMPSEN Senses paper is installed in HCI. Values: full or empty.

LEVSEN HCI tray at top of travel when on. Values: on or off.

LOWSEN HCI tray at lower limit of travel when on. Values: on or off.

DSEN HCI door closed sensor. Values: closed or open.

S1B Not applicable.

KSEN Senses paper as it leaves the HCI. Values: absent or present.

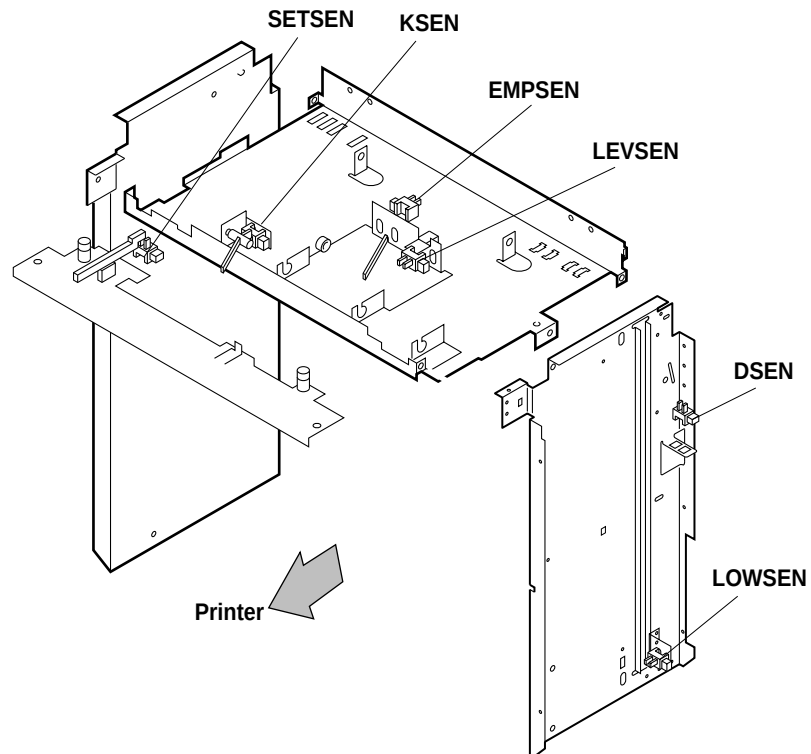


Figure D-3 Location of HCI Sensors

If HCI is not installed or not recognized by the printer, the sensor and microswitch status is blank as shown in the example below:

```

Engine Test/Maintenance: Sensors
HCI not connected
    SETSEN:           DSEN:
    EMPSEN:           S1B:
    LEVSEN:           KSEN:
    LOWSEN:
    BACK      -      +
  
```

D-4 Troubleshooting

D-4.1 SVC C4 HCI Elevator Descent Alarm SVC C5 HCI Paper Level Check

Description

SVC C4: The paper table lowered position sensor (LOWSEN) is not blocked (the sensor output does not go low) 12 seconds after the elevator motor (HMOT) is energized.

SVC C5: The paper raised position sensor (LEVSEN) is not blocked (the sensor output does not go low) 12 seconds after the elevator motor (HMOT) is energized.

Troubleshooting Procedure

Instruction	Indication	Yes	No
SVC C4: Check the actuator and sprocket. SVC C5: Check if the paper table is stopped at the top frame.	SVC C4: The actuator is stuck or frozen in the sprocket. SVC C5: The paper table is stopped at the top frame.	The table driving system may already be unrepairable. Replace the whole HCI.	Go to step 2.
1. Check the sensor for something blocking the sensor. SVC C4: LOWSEN SVC C5: LEVSEN See Figure 3-7 on page 3-29 .	Something is blocking the sensor, such as paper pieces.	Remove blockage. Verify repairs. Confirm the front door of the printer is closed, then open and close the cassette door of the HCI. If error SVC C4/SVC C5 still appears, go to step 3.	Go to step 3.
2. Go to the HCI Sensors screen (EngMaint.Sensors.HCI). SVC C4: Open the HCI door and insert a piece of paper to actuator of the sensor LOWSEN. SVC C5: Lift HCI pick roller by hand to actuate the sensor LEVSEN.	SVC C4: The field LOWSEN changes from on and off as you insert and remove the paper. SVC C5: The field LEVSEN changes from on and off as you lift the HCI pick roller.	Close the front door of the printer. Reset the malfunction and check if opening and closing the cassette door of the HCI causes the paper table to rise. If the paper table rises, replace the PW board-A. If not, go to step 4.	Perform the following steps one at a time, checking if sensor is responding after each step: a. Replace LOWSEN/LEVSEN sensor. b. Check for pinched wires, cables and damaged connectors between CN3 on the PW board-A and the LOWSEN/LEVSEN sensor. Repair any pinched wires or cables, or damaged connectors. c. Replace PW board-A.
3. Go to the HCI Sensors screen (EngMaint.Sensors.HCI). Remove the front cover of HCI and insert a piece of paper to actuator of the DSEN.	The field DSEN changes from DSEN:open and DSEN:closed as you insert and remove the paper.	Go to step 5.	Perform the following steps one at a time, checking if DSEN sensor is responding after each step: a. Replace DSEN sensor. b. Check for pinched wires, cables and damaged connectors between CN3 on the PW board-A and the sensor DSEN. Repair any pinched wires or cables, or damaged connectors. c. Replace PW board-A.

Instruction	Indication	Yes	No
4. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN5 on the PW board-A and the motor HMOT • CN3 on the power supply PCB of the printer and the HCI interface connector • HCI interface connector and CN1 on the PW board-A.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC C4 still appears, go to step 6.	Go to step 6.
5. Check the HMOT motor voltage while opening and closing the cassette door of the HCI. Confirm the front door of the printer is closed.	24 V appears at HMOT motor.	Replace PW board-A.	Go to step 7.
6. Remove the elevator motor HMOT. Open and close the cassette door of HCI while checking if the motor rotates.	The HMOT motor rotates.	Replace HCI.	Replace HMOT motor.

Reference Diagrams

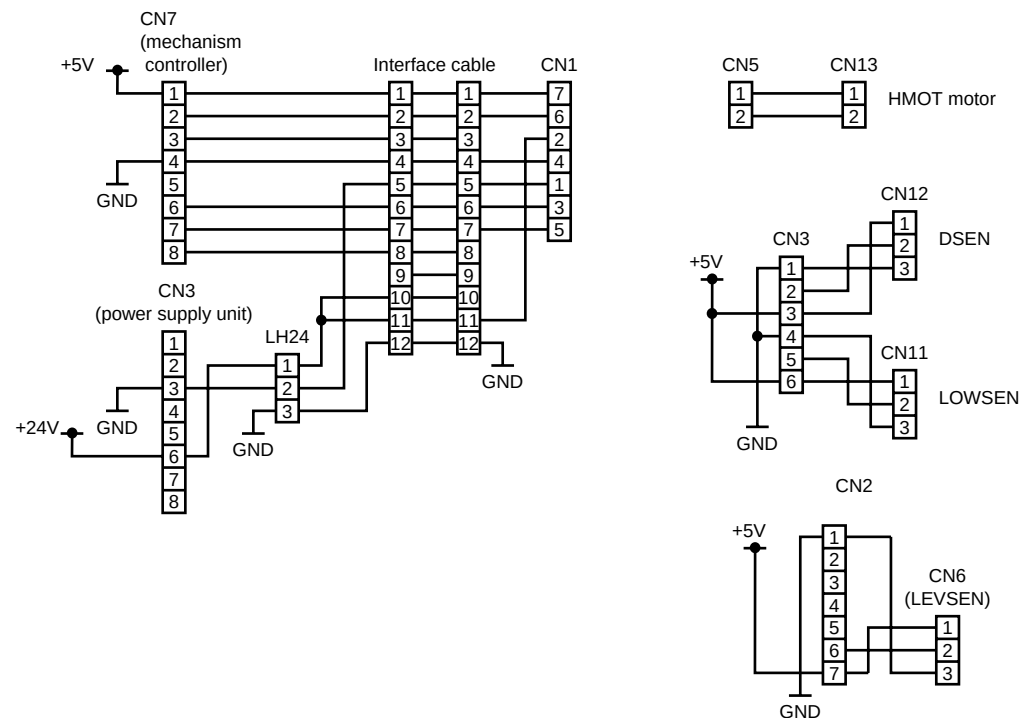


Figure D-4 SVC C4 and SVC C5 Interconnections Diagram (1 of 2)

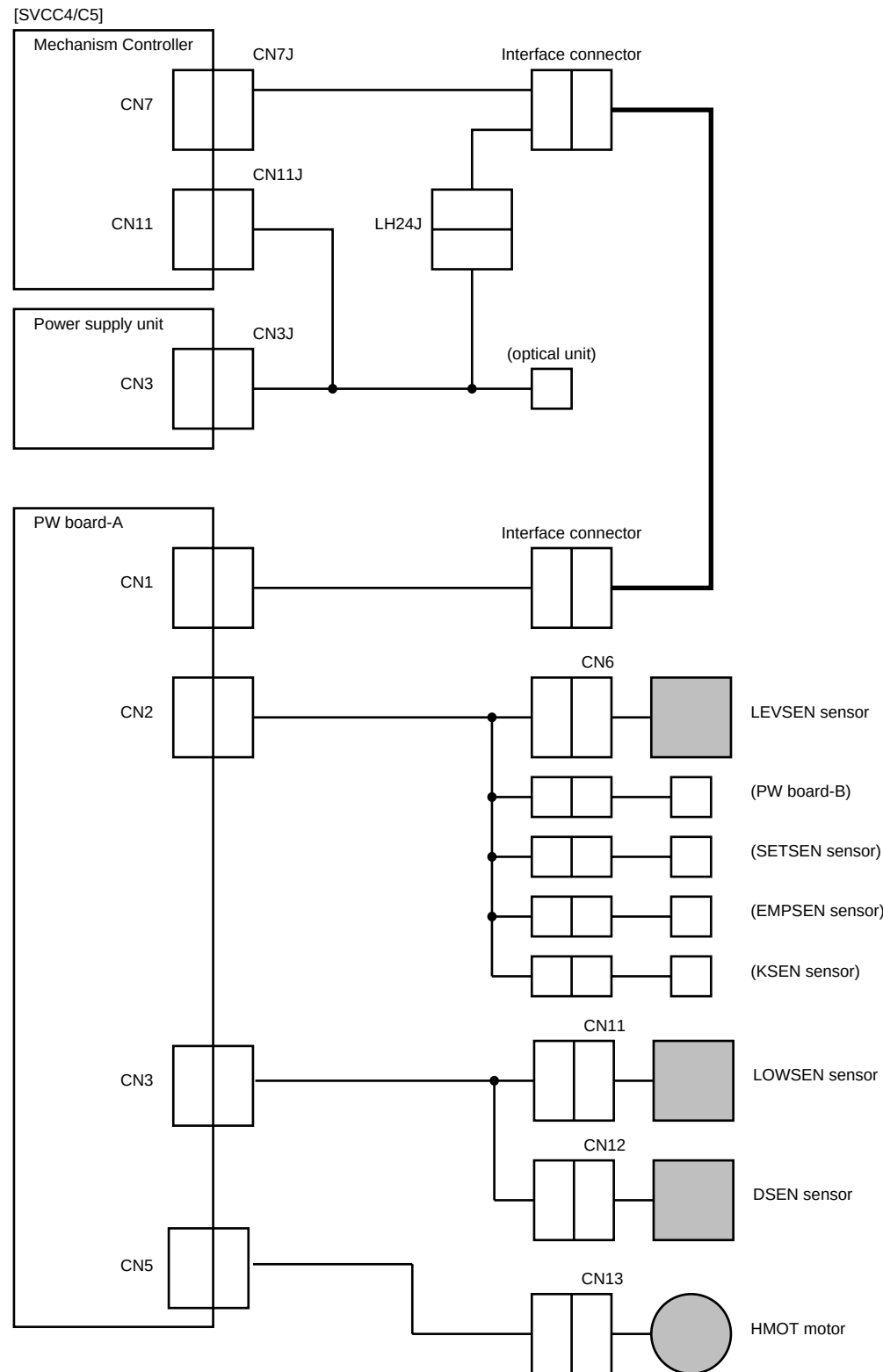


Figure D-5 SVC C4 and SVC C5 Interconnections Diagram (2 of 2)

D-4.2 JAM51 HCI Pick Error JAM52 HCI Feed Jam1

Description

JAM51: Time lapse between HCI pick roller starting and the leading edge of the media activating KSEN was longer than 300 ms.

JAM52: KSEN remained activated longer than 655 ms.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. JAM51: Check if the HCI Paper Out Sensor flag is dislodged. • JAM52: Check if paper gets stuck trying to enter the printer through the mylar guides on the HCI Paper Guide.	• JAM51: The HCI Paper Out Sensor flag is dislodged. • JAM52: The paper gets stuck.	• JAM51: Reinstall the HCI Paper Out Sensor flag. Verify repairs. If JAM51/52 appears, go to step 2. • JAM52: Visually check for the following: • Bent guide • Lower-right door closing properly • Mylar strip on lower-right door and interior are properly placed • HCI is adjusted correctly • Service Note was properly installed	Go to step 2.
2. Check the KSEN sensor.	The paper reaches the KSEN sensor.	Go to step 3.	Clean the rollers and guides on the paper feeding path around the pick roller. Check if the pick roller assembly or separator roller assembly is damaged or has exceeded its life span. If there is damage or the life span has been exceeded, replace the pick roller assembly or the separator roller assembly. Verify repairs. If error JAM51/52 still appears, go to step 3.
3. Inspect the KSEN sensor for something clogging the sensor, such as paper pieces.	Something is clogging the KSEN sensor.	Remove anything clogging the sensor. Verify repairs. If error JAM51/52 still appears, go to step 4.	Go to step 4.
4. Go to the HCI Sensors screen (EngMaint.Sensors.HCI). Open the HCI door and insert a piece of paper to actuator of the KSEN.	The field KSEN changes from present and absent as you insert and remove the paper.	Go to step 5.	Replace the sensor KSEN. Verify repairs. If error JAM51/52 still appears, check for pinched wires, cables and damaged connectors between CN2 on the PW board-A and the sensor KSEN. Repair any pinched wires or cables, or damaged connectors. Verify repairs. If error JAM51/52 still appears, go to step 5.

Instruction	Indication	Yes	No
5. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN4 on the PW board-A and the motor KMOT • CN3 on the power supply PCB of the printer and the HCI interface connector, • HCI interface connector and CN1 on the PW board-A.	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC 0E still appears, go to step 6.	Go to step 6.
6. Remove the paper feed motor KMOT.	• The KMOT motor can be turned by hand. • When you turn the pick roller counter-clockwise by hand, the pulley G1 turns.	Replace the motor KMOT. Verify repairs. If error JAM51/52 still appears, replace the PW board-A.	• Replace the motor KMOT. If error JAM51/52 still appears, replace the PW board-A. • Roller driving system is unrepairable. Replace the pick roller assembly.

Reference Diagrams

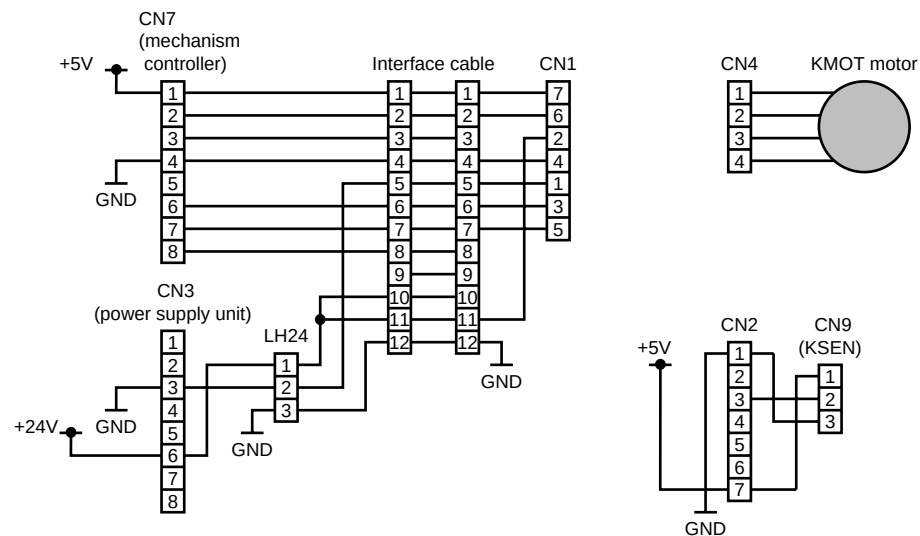


Figure D-6 HCI Pick Error (JAM51) and HCI Feed Jam 1 (JAM52) Interconnections Diagram (1 of 2)

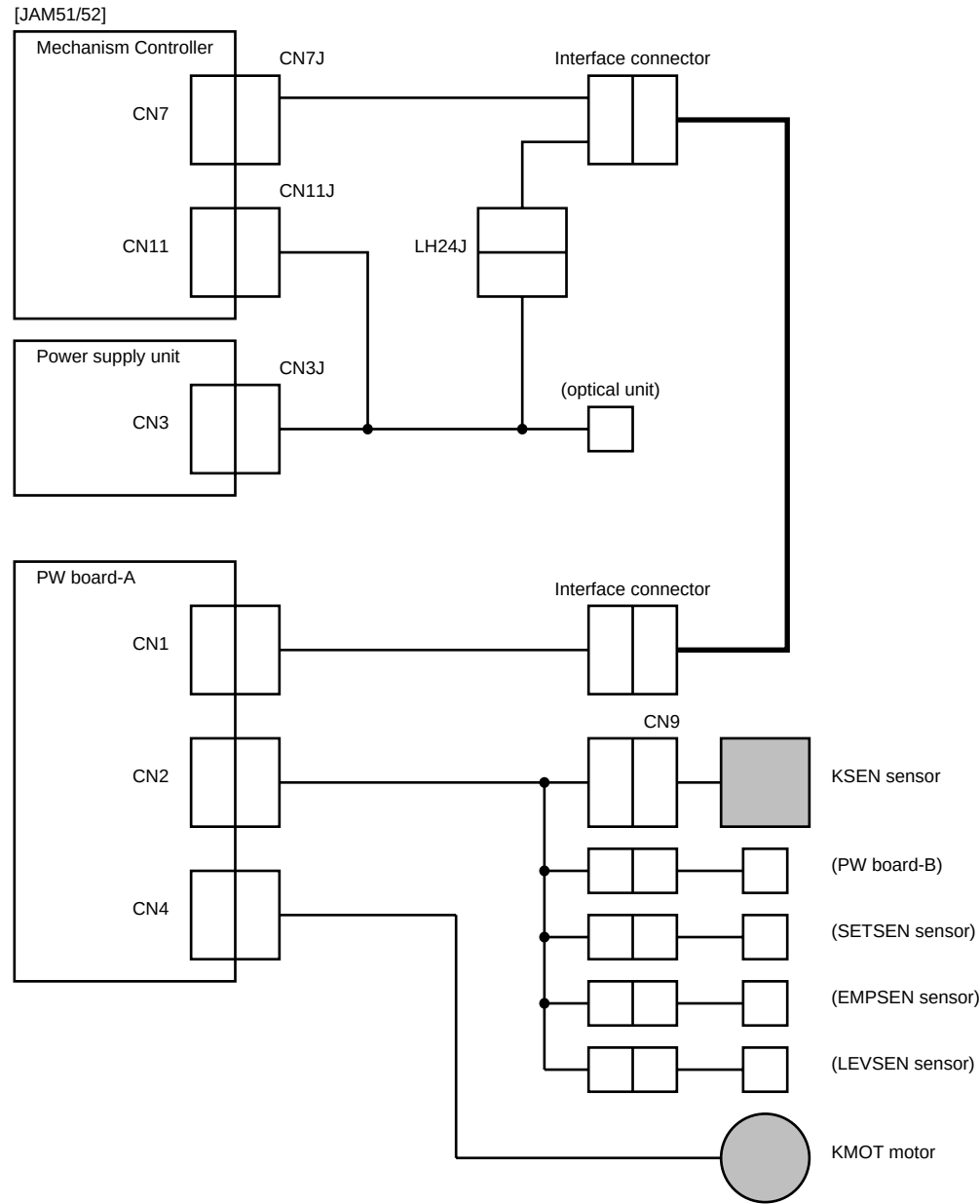


**Figure D-7 HCI Pick Error (JAM51) and HCI Feed Jam 1 (JAM52)
Interconnections Diagram (2 of 2)**

D-4.3 JAM53 HCI Feed Jam 2

Description

When the printer was reset, media was present at KSEN.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Inspect the KSEN sensor for something clogging the sensor, such as paper pieces.	Something is clogging the KSEN sensor.	Remove anything clogging the sensor. Verify repairs. If error JAM53 still appears, go to step 2.	Go to step 2.
2. Go to the HCI Sensors screen (EngMaint.Sensors.HCI). Open the HCI door and insert a piece of paper to actuator of the KSEN.	The field KSEN changes from KSEN:present and KSEN:absent as you insert and remove the paper.	Replace the PW board-A.	Replace the sensor KSEN. Verify repairs. If error JAM53 still appears, check for pinched wires, cables and damaged connectors between CN2 on the PW board-A and the sensor KSEN. Repair any pinched wires or cables, or damaged connectors. Verify repairs. If KSEN sensor still is not responding, replace the PW board-A.

Reference Diagrams

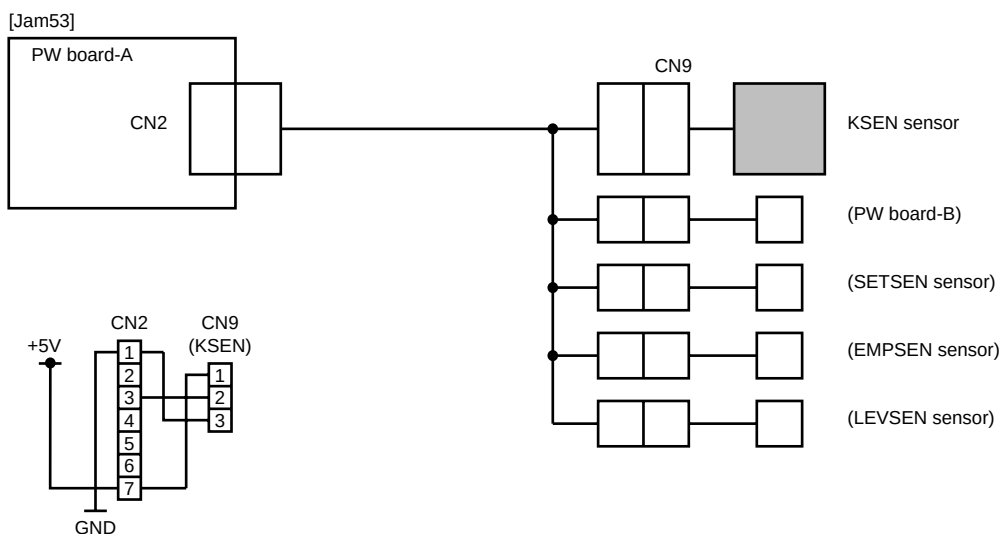


Figure D-8 HCI Feed Jam2 (JAM53) Interconnections Diagram

D-4.4 HCI Sensing Problem

Description

The printer does not sense the HCI is installed. The symbol of the HCI is not displayed on the control panel of the printer.

Troubleshooting Procedure

Instruction	Indication	Yes	No
1. Check that the interface cable is correctly connected to the printer.	Interface cable is correctly connected.	Go to step 2.	Connect interface cable correctly. Cycle power off/on. Verify repairs. If the HCI sensing problem 1 still appears, go to step 2.
2. Check for pinched wires, cables, and damaged connectors between the following connectors: • CN7 on the mechanism controller board and the HCI interface connector • CN3 on the power supply board of the printer and the HCI interface connector, • HCI interface connector and CN1 on the PW board-A	Pinched wires or cables, or damaged connectors.	Repair or replace damaged part. Verify repairs. If error SVC C4 still appears, go to step 3.	Go to step 3.
3. Replace the PW board-A (MCI controller).	HCI sensing problem 1 still appears.	Replace the mechanism controller board. ^a	Done.

- a. Transfer the NVRAM from the failed board to the new board and verify the firmware is the latest revision. See Warning in section [5-7.3 on page 5-52](#) for details.

Reference Diagrams

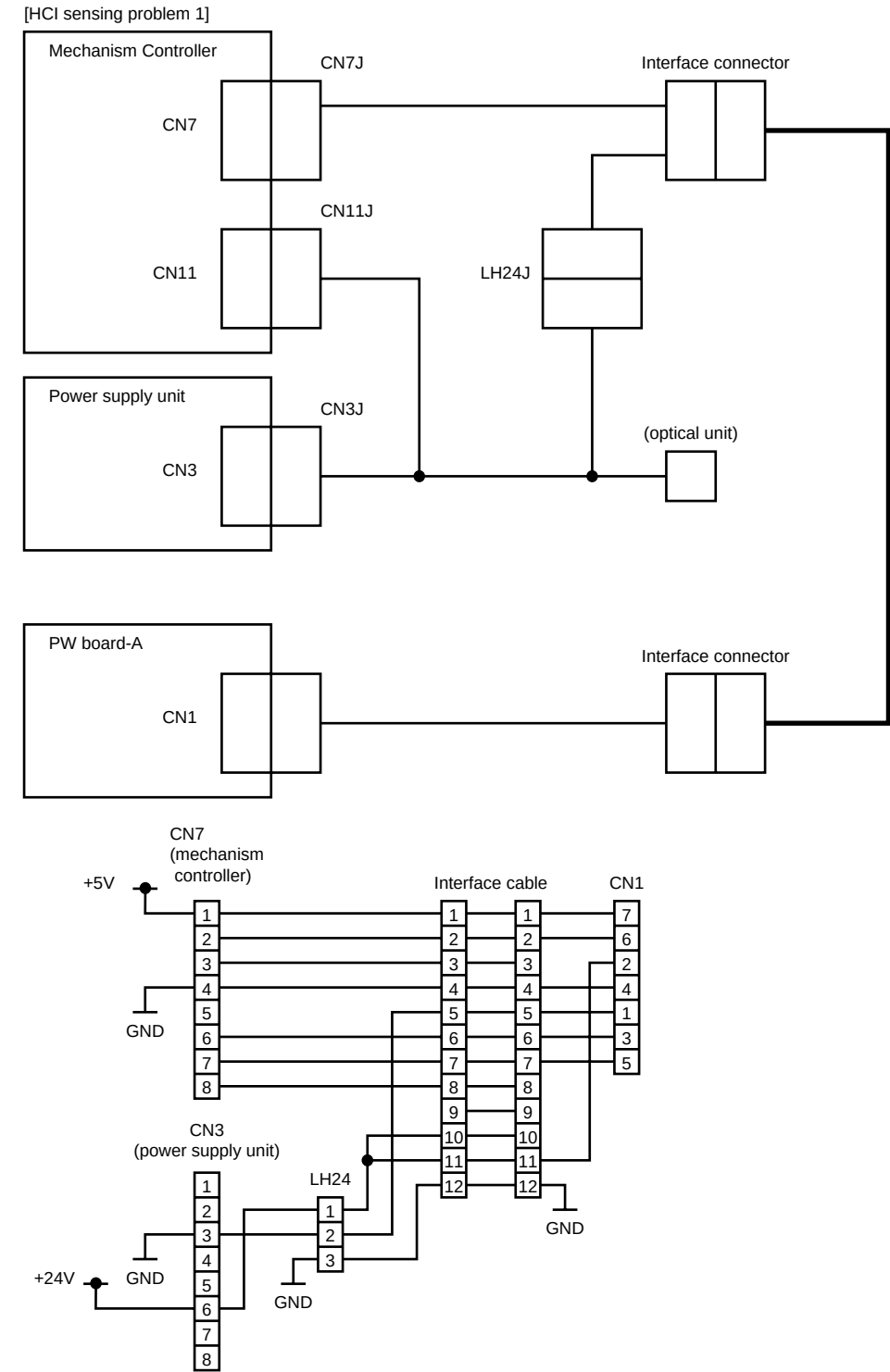


Figure D-9 HCI Sensing Problem Interconnections Diagram

D-5 Maintenance

D-5.1 Sensor Location

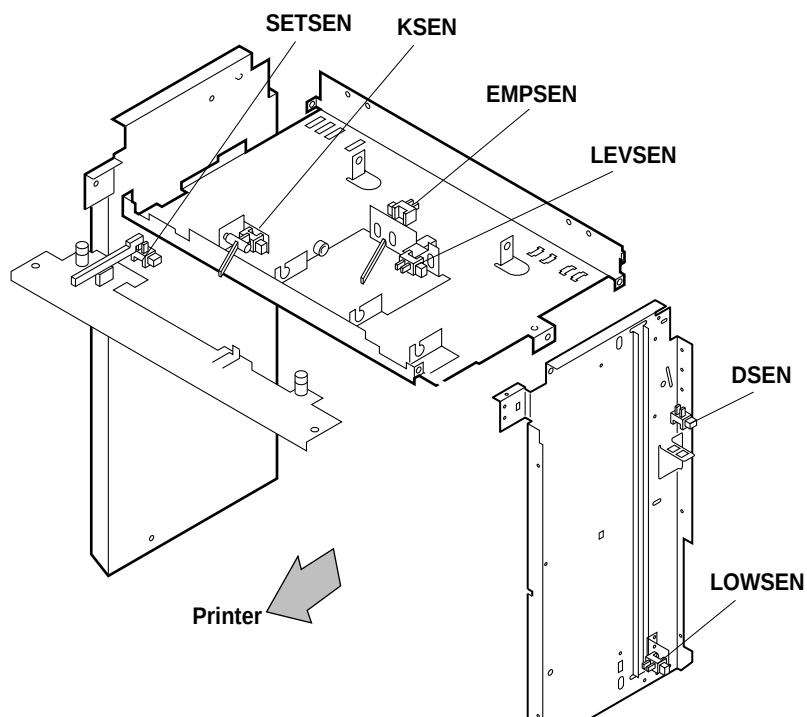


Figure D-10 Location of HCl Sensors

D-5.2 HCI Pick Rollers Replacement

Part Number

C5636 (See [D-5.2](#) on page [D-21](#).)

Removal and Replacement Procedure

This section provides the procedures to remove and replace the HCI pick rollers. When the HCI pick rollers need to be replaced when the control panel indicates:

HCI Pick Roller At End of Life
Replace HCI Pick Roller

or when you get excessive feed errors from the HCI.

We recommend that you use a small flashlight to help you see the inside of the HCI while working in it.

Step 1 Go to the Replace menu (Menu.Maintenance.Maintenance options.replace).

Step 2 Select the HCI tray rollers.

The HCI option only appears if the HCI is installed.

Step 3 Release the HCI from the printer and slide the HCI back on its rails.

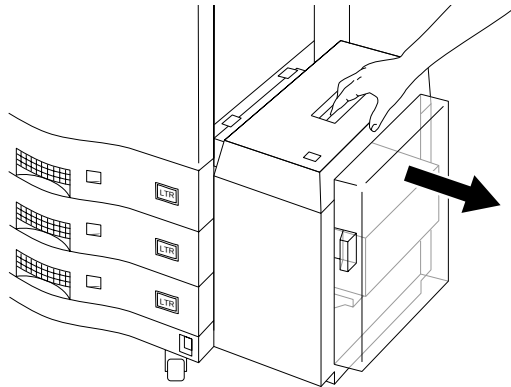


Figure D-1 Sliding HCI Away from Printer

Step 4 Open the HCI door, press the HCI top button to lower the shelf, and then remove any paper. See [Figure D-2](#). The printer must be powered on and the HCI must be connected to the printer for the HCI top button to lower the shelf.

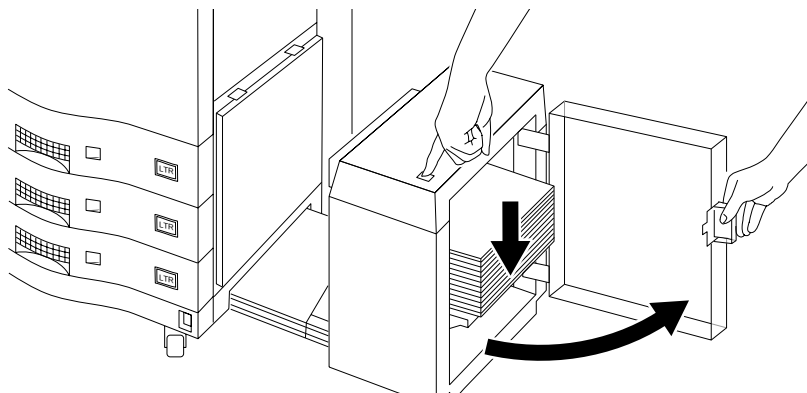


Figure D-2 Opening the HCI

Step 5 From the back of the HCI, carefully remove the retaining springs providing tension to the lower roller assembly. See Figure 5-86. Notice how these springs are attached to the lower roller assembly.

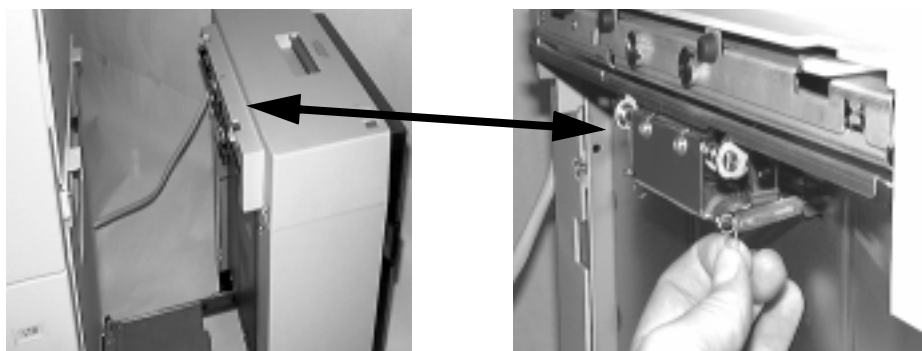


Figure D-3 HCI Rear and Lower Roller Assembly Springs

Step 6 Remove the white plastic clip securing the lower roller shaft at the far end.

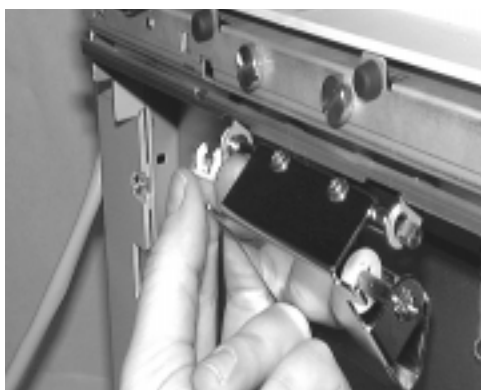


Figure D-4 Removing Clip From Lower Roller Assembly

Step 7 Grasp the lower roller assembly and slide the shaft to the side away from the retaining clip. Once free, lower the assembly and set it aside.



Figure D-5 Remove Lower Roller Assembly

Step 8 Move to the front of the HCI. Locate the upper roller assembly on the top underside of the HCI, as shown in [Figure D-6](#). Hold this assembly up with your hand.

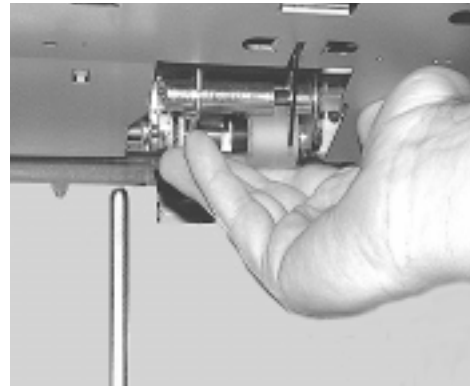


Figure D-6 HCI interior and Upper Roller Assembly location

Step 9 With your other hand, locate the two thumb screws on the back side of the HCI. Remove these two screws and set them aside.



Figure D-7 Remove Thumbscrews

Step 10 From the front of the HCI, gently pull out the upper roller assembly ([Figure D-8](#).) Slide the assembly a little to the right before bringing it out of the HCI.

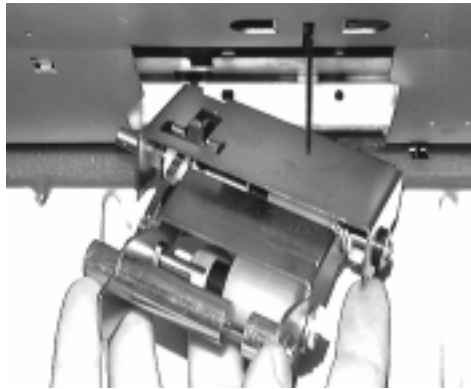


Figure D-8 Remove Upper Roller Assembly

Step 11 Unpack the new HCI pick roller kit ([Figure D-9](#).)

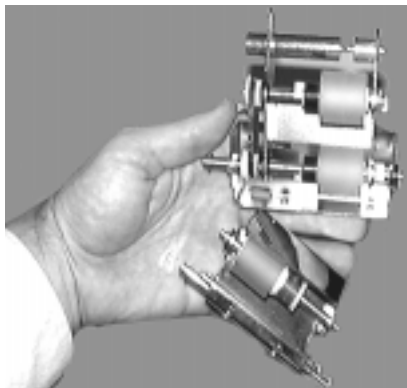


Figure D-9 HCI Roller Kit

Step 12 When you install a new HCI pick roller kit, the shaft on the upper roller assembly (left side) goes into the hole. See Figure 5-93.

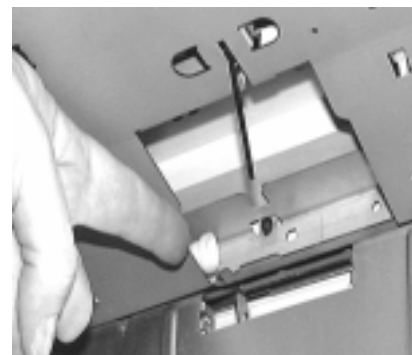
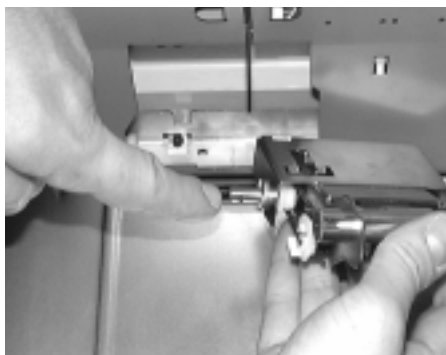


Figure D-10 Shaft and Hole Location for HCI Upper Pick Roller Assembly

Step 13 From the front of the HCI, gently guide the upper roller assembly into place, as shown in [Figure D-11](#).

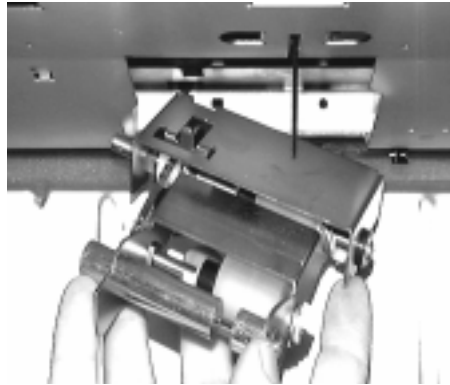


Figure D-11 Installing Upper Roller Assembly

Step 14 Once the upper roller assembly is in place, gently hold it up and push it slightly to the left (to help the screws engage).

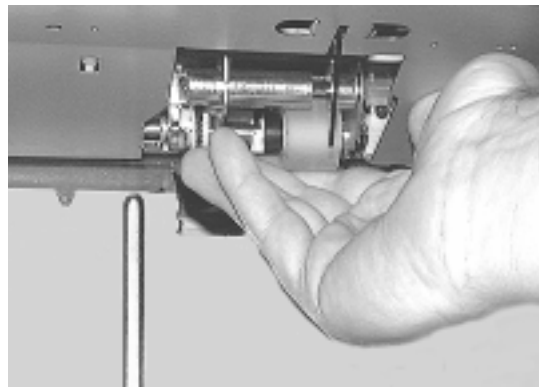


Figure D-12 Holding Upper Roller Assembly in Place

Step 15 With your other hand, place the thumbscrews removed previously into the holes on the back side of the HCI. To get the proper screw engagement, you may need to push the upper roller assembly slightly to the left. If necessary, look through the screw holes to judge if the hole is aligned correctly. Tighten the thumbscrews until they are snug.

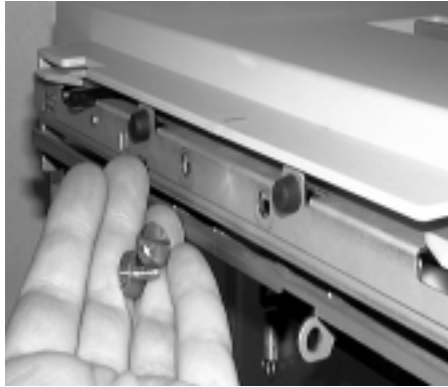


Figure D-13 Installing Thumbscrews



Step 16 Hold the lower roller assembly and slide the front (closest) shaft into the front metal retaining clip. Slide the back shaft into the back retaining clip.



Figure D-14 Installing Lower Roller Assembly

Step 17 Snap the white plastic clip into place. It fits over a groove on the back end of the shaft to secure the lower rollers. If you don't see this groove, the rollers may not be completely seated all the way onto the shaft.



Figure D-15 Installing Clip onto Lower Roller Assembly

Step 18 On the back of the HCI, carefully extend and install each retaining spring to the lower roller assembly. The retaining springs have a “holder” to pull on while extending the spring.



Figure D-16 Installing Retaining Springs

Step 19 Push the HCI against the printer to lock it into place. Add paper to the HCI and close the HCI door.

Step 20 Press **Done** on the control panel.

Step 21 Perform the Paper Path Alignment procedure described in [5-3.4 "Paper Feed System Alignment,"](#) on page 5-12.

D-6 Parts and Diagrams

This section shows exploded diagrams of the HCI assembly and sub assemblies. Each drawing also has a list of replaceable parts.

Only replaceable parts are assigned part numbers. If a part or assembly is damaged and does not have a part number, contact your factory representative.

D-6.1 HCI Base

Parts list for HCI Base. See [Figure D-17](#).

Index No.	Qty	Part Number	Description	Remarks
1	1		Support stand	Part of HCI Mounting Bracket kit-P/N CA02858-F206FJ.
2	2		Leveling chains	Part of HCI Mounting Bracket kit-P/N CA02858-F206FJ.
3	2		Adjusting bolt	Part of HCI Mounting Bracket kit-P/N CA02858-F206FJ.
4	1		Mounting bracket	Part of HCI Mounting Bracket kit-P/N CA02858-F206FJ.
5	1	CA04192-E018FJ (Part of the HCI Input Guide Kit)	Guide Assembly	Attaches to printer. See 6-6.10 "Paper Path Transport Assembly," on page 6-24 for description of complete HCI Input Guide Kit:.
6	4	CA02858-1112FJ	Thumbscrew	Part of HCI Mounting Bracket kit-P/N CA02858-F206FJ.
7	1	CA02858-F206FJ	HCI mounting bracket kit	Includes (1) support stand, (2) leveling chains, (2) adjusting bolts, (1) mounting bracket, and (2) thumbscrews.

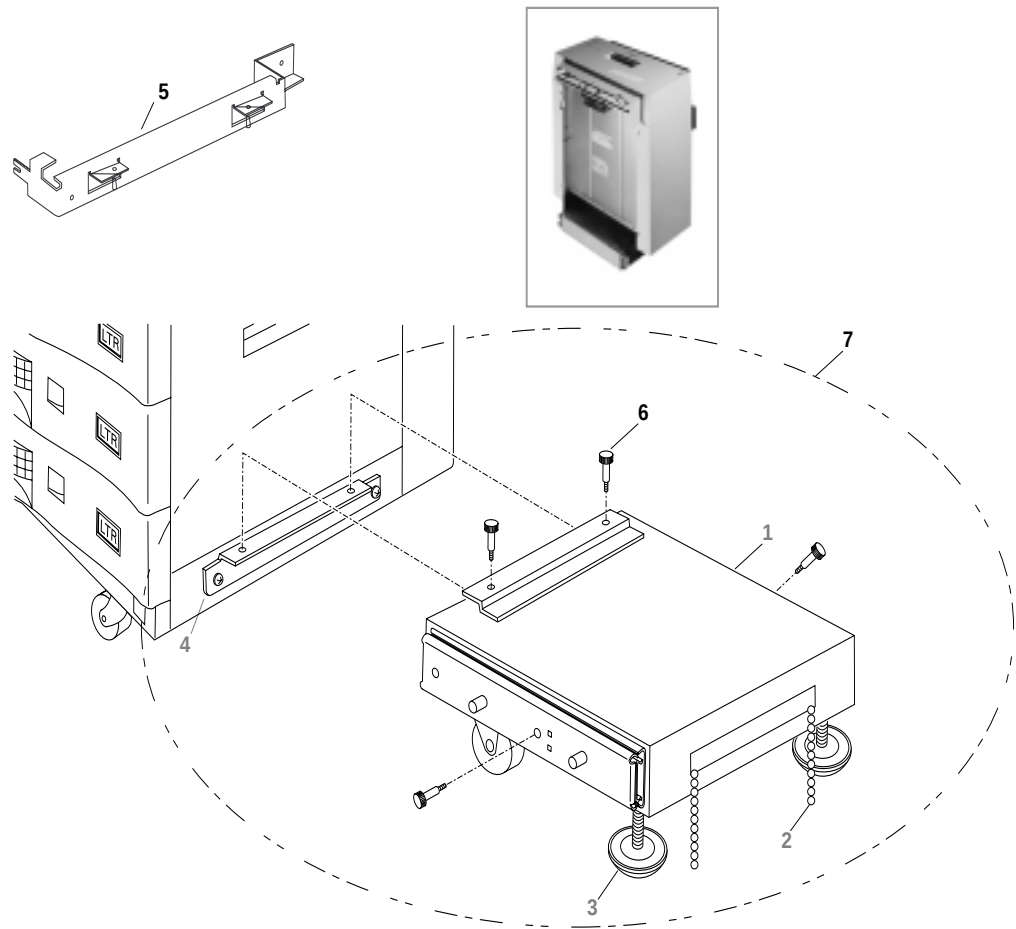


Figure D-17 HCI Base Diagram

D-6.2 HCI Frame

Parts list for HCI Frame. See [Figure D-18](#).

Index No.	Qty	Part Number	Description	Remarks
1	1		Top cover	
3	2	CA81101-1050FJ	Side cover	
4	4		Rail	
8	1	CA81101-1043FJ	Hinge, Lower	
9	1	CA81003-5657FJ	PCA-B	Tray Elevator Switch
10	2	CA81101-1013FJ	Lock release lever	
11	1		Button	
12	1	CA81003-5651FJ	Door	
13	1	CA81101-1042FJ	Hinge, Upper	

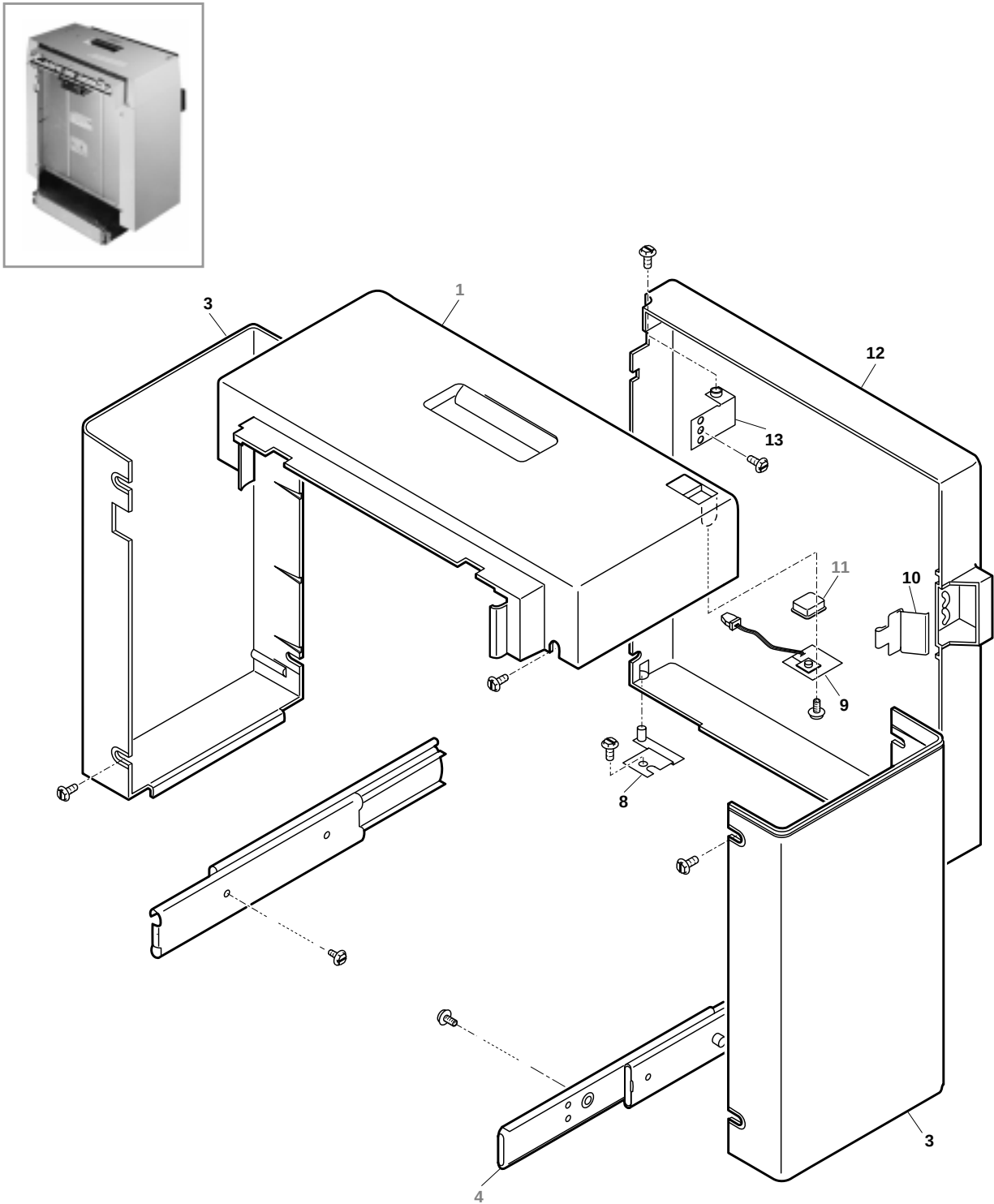


Figure D-18 HCI Frame Diagram

D-6.3 HCI Paper Feed Assembly

Parts list for HCI Paper Feed Assembly. See [Figure D-19](#).

Index No.	Qty	Part Number	Description	Remarks
1	1		Bracket, rear	
2	1		Frame, rear	
3	1	CA81101-1084FJ	Harness	HCI to Printer
4	1		Guide frame	
5	1		Shaft	
6	1		Roller, separator	
8	2		Tension spring	
9	1		Holder, separator	(PCA-B)
10	1		Size plate	
11	1		Ground plate	
12	1		Frame, lower	
13	1		Bracket, front	
14	2	CA81003-5653FJ	Photo interrupter	DSEN, LOWSEN
15	1		Bracket	
16	1	CA81003-5656FJ	PCA-A (with IC)	(PCA-A) HCI Controller PCA
17	1		Bracket	
18	1		Frame, front	
19	1	CA81101-1056FJ	Actuator	Door Open Actuator
20	1	CA81003-5654FJ	Motor	KMOT Pick Roller Motor
21	1		Bracket	
22	1	CA81101-1079FJ	Gear, 52T	
23	4		PWB support, 6.35H	
	1	C5636B	HCI Pick Roller Kit	Consumable ^a . Includes lower pick roller assembly and the upper roller assembly (see index number 64 on page D-35.)
25	1		Lower pick roller assembly	Consumable ^a . Included in HCI Pick Roller Kit - C5636B.

- a. HCI pick and separator rollers are consumables; they should be replaced by the customer upon failure.

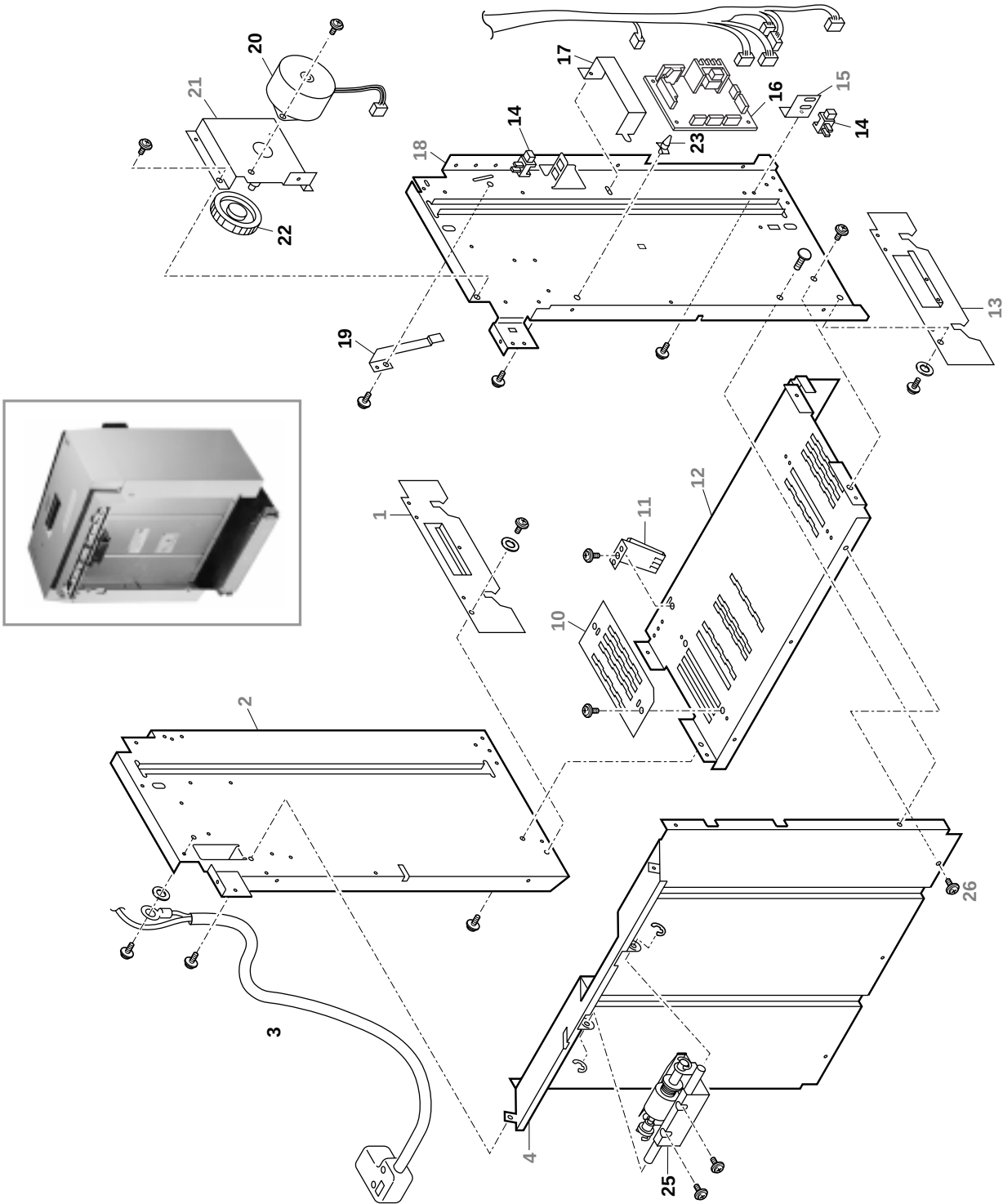


Figure D-19 HCI Paper Feed Assembly Diagram

D-6.4 HCI Paper Transport Assembly

Parts List for HCI Paper Transport Assembly. See [Figure D-20](#).

Index No.	Qty	Part Number	Description	Remarks
		CA02858-F231FJ	HCI latch mechanism	Includes the items 30, 34, 35, 65.
2	1	CA81101-1065FJ	Actuator	Paper out actuator (EMPSEN)
3	1		Size plate	
4	2		Bushing	
5	4	CA81101-1010FJ	Sprocket, 13T	
6	1	CA81101-1019FJ	Gear, 30T	
7	2		Chain, 136LNK	
8	2	CA81101-1046FJ	Mounting plate	Lower chain sprocket
9	4	CA81101-1021FJ	Guide roller	
10	1	CA81101-1020FJ	Gear, 18/50T	
11	1	CA81101-1067FJ	Gear, 28/56T	
12	1		Worm gear	
13	1		Bracket	
14	1		Bracket	
15	1		Bracket	
16	1	CA81003-5655FJ	Motor	HMOT Tray Lift Motor
18	1		Ground plate	
19	1		Regulating plate, front	
20	2		Plate nut	
21	1		Friction sheet	
22	1		Paper plate	
23	1		Actuator	
24	1		Shaft	
25	1		Shoulder screw	
26	1		Bracket	
27	2		Tension spring	
28	2		Rubber cushion	

Parts List for HCI Paper Transport Assembly. See Figure D-20.

Index No.	Qty	Part Number	Description	Remarks
29	1		Wire	
30	2	CA81003-5652FJ	Lock lever	Included with HCI Latch Mechanism - P/N CA02858-F231FJ.
31	4	CA81003-5653FJ	Photo interrupter	SETSEN, EMPSEN, KSEN, LEVSEN
32	2		Collar	
33	1		Pressure spring	
34	1		Actuator	SETSEN Actuator. Included with HCI Latch Mechanism - P/N CA02858-F231FJ.
35	2		Pin	Included with HCI Latch Mechanism - P/N CA02858-F231FJ.
36	1		Frame, top	
37	1		Gear, 30T	
38	1		Bushing	
39	1		Shaft	
53	1	CA81101-1064FJ	Actuator	KSEN Actuator
54	1		Tension spring	
57	1		Regulating plate, rear	
58	4		Cable tie	
59	1		Edge cover	
60	2		Wiring saddle	
	1	C5636B	HCI Pick Roller Kit	Consumable ^a . Includes upper pick roller assembly and the lower roller assembly.
64	1	C5636B	Upper pick roller assembly	Consumable ^a . Included in HCI Pick Roller Kit - C5636B
65	6		E-ring	Type 9150. Included with HCI Latch Mechanism - P/N CA02858-F231FJ.
66	1	C5636B	Lower pick roller assembly	Consumable ^a . Included in HCI Pick Roller Kit - C5636B
69	1		Guide	
70	2	CA81101-1024FJ	Rubber bumpers	Quantity 4

- a. HCI pick and separation rollers are consumables; they should be replaced by the customer upon failure.

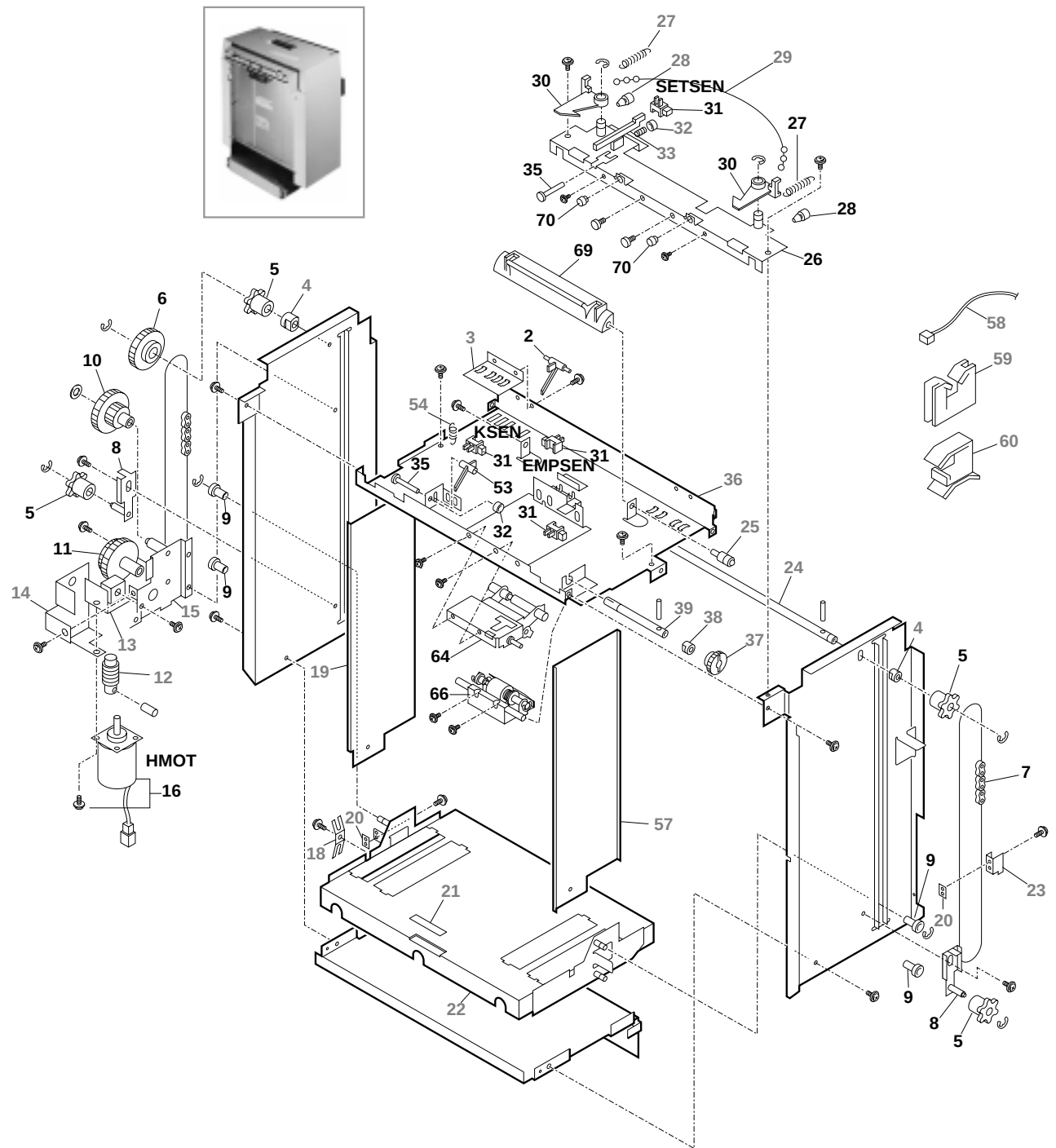


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