HP 2686A/D
LASERJET PRINTER
SERVICE MANUAL

Manual Part Number 02686-90920

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SECTION I

PRODUCT INFORMATION

1-1. INTRODUCTION

The HP 2686A/D printer provides high quality low volume output. The printer is extremely quiet and reliable, and is ideally suited for today's office or workstation environment. The HP 2686A/D provides the following features:

A. This is a non-impact (low noise) printer based on electrophotographic, electronic, and laser technologies.

B. This printer produces high-quality prints with plain paper.

C. This printer is compact and easy to carry. This allows the printer to be placed near the customer.

D. This printer combines a photosensitive drum, toner hopper, developing cylinder and drum cleaner in a single assembly called an "EP cartridge." This allows maintenance servicing and periodic replacement of parts and consumables simply by replacing the EP cartridge. The customer can do this, saving time and the cost of the serviceman.

E. This printer body can be opened/closed with a simple one-handed action, which allows easy clearing of paper jams.

F. This printer has been designed with full provision made for laser safety. It has been certified by the U.S. Bureau of Radiological Health (BRH) as conforming with their standards for laser safety.

G. This printer employs a semiconductor laser which is much more compact than an ordinary gas laser, and which is driven directly by control signals.

H. This printer can be used as an on-line or off-line output unit for office computers, word processors, graphic displays, facsimiles, and other systems.

1-2. IDENTIFICATION

Each printer has an identification plate which lists the model and a serial number attached to the printer left-hand side, adjacent to the I/O connector. The model number is an alphanumeric (such as 2686A).

The serial number consists of a four digit prefix, a letter, and a five digit suffix (0000J00000). The prefix is used to indicate design changes. The letter in the fifth location designates the country in which the printer was manufactured ("J" indicates Japan). The suffix is a sequential number which increments with each printer.

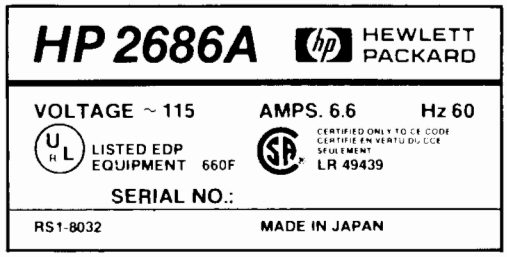


Figure 1-1. HP2686A Printer Identification

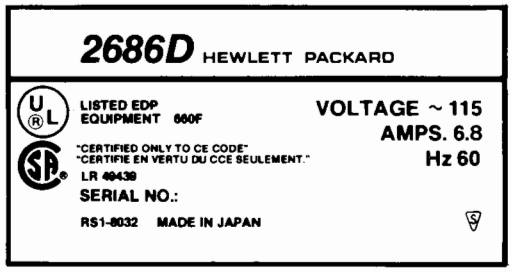


Figure 1-2. HP2686D Printer Identification

NOTE

The illustrations and photographs in this manual are meant to convey either model - (HP 2686A or the HP 2686D) unless specified in the title.

1-3. SPECIFICATIONS

Printer's Physical Dimensions-HP2686A

Width: 47.5 cm. (18.5 inches)
Depth (body only): 41.5 cm. (16.2 inches)
Depth (with trays): 72.3 cm. (28.2 inches)
Height: 29.3 cm. (11.4 inches)
Weight: 32 Kg. (71 pounds)

Printer's Physical Dimensions-HP2686D

Width: 47.5 cm (18.5 inches)
Depth (body only): 49.5 cm (19.5 inches)
Depth (with trays): 90.2 cm (35.5 inches)
Height: 46.0 cm (18.1 inches)
Weight: 45 Kg (100 lbs) (Includes cartridge, cassettes, manual feed guide, and print tray)

Electrical

Voltage/Frequencies
120V +/-10%: 60 Hz +/- 2 Hz
220V +/-10%: 50 Hz +/- 2 Hz
240V +/-10%: 50 Hz +/- 2 Hz

Power Consumption at 115 Vac
850 Watts (printing maximum)
170 Watts (standby)

Environmental

Temperature (Printer and EP Cartridge)

Operating: 10 to 32.5 degrees Celsius (50 to 91 degrees F.)

Storage: 0 to 35 degrees Celsius (32 to 95 degrees F.)

Humidity

Operating: 20 to 80% Relative Humidity (RH)
Non-Operating: 10 to 80% RH

Altitude

Operating: 0 to 2,500 metres (0 to 8,200 feet)

Non-Operating: 0 to 15,000 metres (0 to 49,200 feet)

* Audible Noise

Printing: <55 dBA

Standby: <45 dBA

* Average sound pressure measured at one metre according to ISO/DP 7779.

1-4. RELATED MANUALS

The following manuals provide additional information on the HP 2686A/D printer:

LaserJet Printer Operator's Reference Manual	P/N 02686-90914
LaserJet Printer Family Technical Reference Manual	P/N 02686-90912
LaserJet 500+ Operator's Reference Manual	P/N 02686-90911

1-5. SAFETY INFORMATION

The HP 2686A/D printer is certified as a Class 1 laser product under the U.S. Department of Health and Human Services (DHHS) Radiation Performance Standard according to the Radiation Control for Health and Safety Act of 1968. This means that the printer does not produce hazardous laser radiation.

Since laser light emitted inside the printer is completely confined within protective housings and external covers, the laser beam cannot escape from the machine during any phase of user operation.

The Bureau of Radiological Health (BRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States. The label shown on the back of the printer indicates compliance with the BRH regulations and must be attached to laser products marketed in the United States.

Federal Communications Commission
Radio Frequency Interference Statement *

Warning: This printer generates and uses radio frequency energy and may cause interference to radio and television reception. Your printer complies within the specifications in Subpart J of Part 15 of the Federal Communications Commission rules for a Class B computing device. These specifications provide reasonable protection against such interference in a residential installation.

The Federal Communications Commission has prepared a booklet entitled "How to Identify and Resolve Radio - TV Interference Problems" which may be helpful to you. This booklet (stock #004-000-00345-4) may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

* Use of a shielded interface cable is required to comply with the Class B limits in Subpart J of Part 15 of FCC rules.

Additional Information

When servicing or adjusting the optical system of the printer, be careful not to place screwdrivers or other shiny objects in the path of the laser beam. Also, accessories such as watches and rings should be removed before working on the printer. The reflected beam, though invisible, can permanently damage your eyes.

Since the beam is invisible, the following label is attached to the insides of covers where there is danger of exposure to laser radiation:

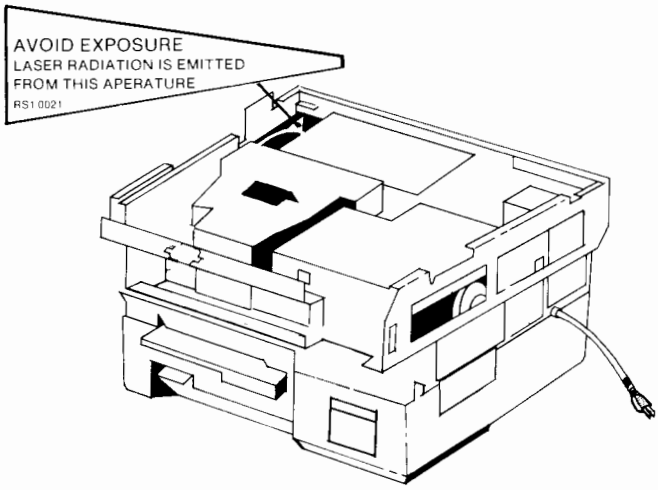
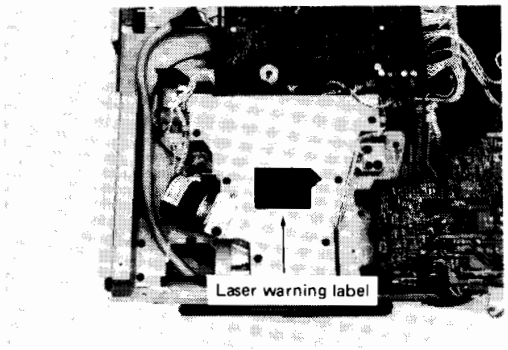


Figure 1-3. Laser Safety Label

Warning labels are affixed to the printer wherever special service attention is needed. Obey the instructions on the labels. For details on label locations, refer to figure 1-3 through 1-8.

According to West German standard VDE0836 (VDE-Bestimmung fur die elektrische Sicherheit von Lasergeraten und anlagen), printer servicing requires at least two servicemen.



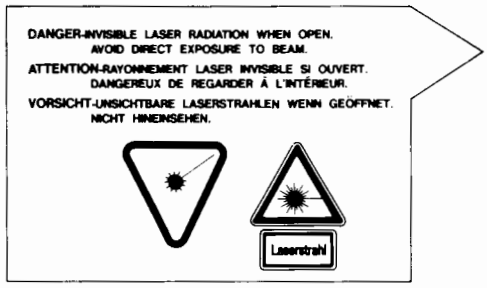
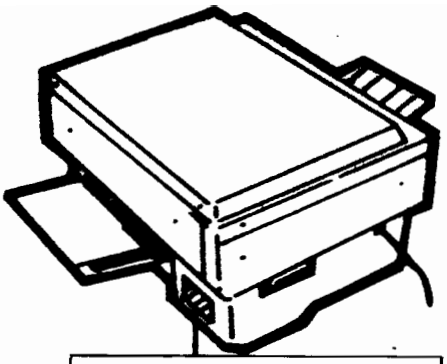


Figure 1-4. Laser Warning Label



HP 2686A

MANUFACTURED ON:

HEWLETT-PACKARD CO.
BOISE DIVISION
11311 CHINDEN BLVD.
BOISE, IDAHO 83714 U.S.A.

This product conforms with NCDRH radiation performance standard. 21 CFR chapter 1 subchapter J.

FCC ID: AZD9MA HP 2686A
HEWLETT PACKARD MADE IN JAPAN

Certified to comply with the limits for a Class B computing device pursuant to subpart J of part 15 of FCC Rules. See instructions if interference to radio reception is suspected.

RS1-8037

Figure 1-5. HP 2686A FCC Compliance Label

HP 2686D

MANUFACTURED ON:

HEWLETT-PACKARD CO.
BOISE DIVISION
11311 CHINDEN BLVD.
BOISE, IDAHO 83714 U.S.A.

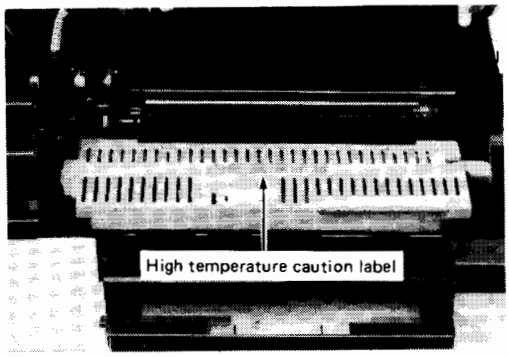
This product conforms with NCDRH radiation performance standard. 21 CFR chapter 1 subchapter J.

FCC ID: AZD9MA HP 2686D
HEWLETT PACKARD MADE IN JAPAN

Certified to comply with the limits for a Class B computing device pursuant to subpart J of part 15 of FCC Rules. See instructions if interference to radio reception is suspected.

RS1-8037

Figure 1-6. HP 2686D FCC Compliance Label

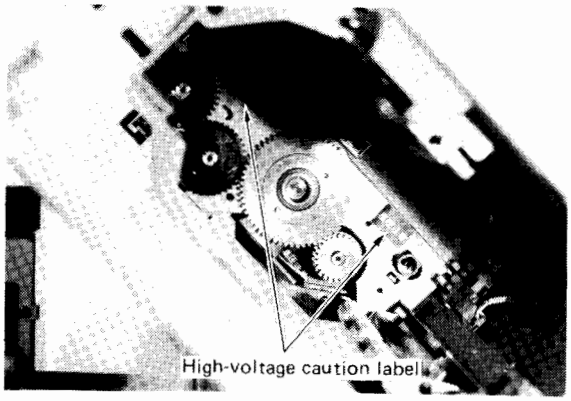


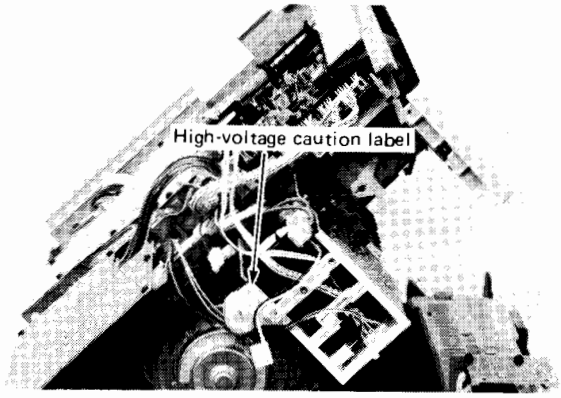
ATTENTION TEMPÉRATURE ÉLEVÉE | WARNING HIGH TEMPERATURE | ACHTUNG! HEISS

Figure 1-7. High Temperature Caution Label

1-6. SERVICE APPROACH

The basis for repair of the printer centers around the modular level replacement of printed circuit assemblies and electro-mechanical subassemblies. The printer's diagnostics serve as an aid in isolating problem areas of the printer. Once the problem is located, the assembly should be replaced without further attempts to identify component failures within the assembly.





220 V/240 V, 50 Hz only

115 V, 60 Hz only

Figure 1-8. High Voltage Caution Label

SECTION II

INSTALLATION

2-1. INTRODUCTION

Each printer is carefully adjusted and strictly inspected before it is shipped. Correct installation of the printer is extremely important to maintain its performance at the level set at the factory. The Service Representative should fully understand the functions of the printer and ensure it is installed properly in a suitable location.

2-2. SITE REQUIREMENTS

The printer is designed for operation in a clean, traffic free environment, preferably in an area not subject to excessive shocks, vibrations, or a wide range of temperature variations. Air conditioning is not required to ensure reliable operation, but the environmental specification listed in section 1-3 should not be exceeded. The following suggestions should be taken into consideration prior to the installation of the printer.

The printer should not be installed near water faucets, humidifiers, refrigerators, etc., and should not be put in a location where the temperature changes abruptly, such as near air conditioners.

The printer should not be exposed to open flames, dust, ammonia fumes, or direct sunlight. (A heavy curtain can be installed to protect the printer if it must be placed in a sunny location.)

The room should be well ventilated.

The printer should be installed on a sturdy, level surface.

The printer should be located at least 17.5 cm (7") from the rear wall. There should be sufficient space to permit unimpeded operation. (See Figure 2-1.)

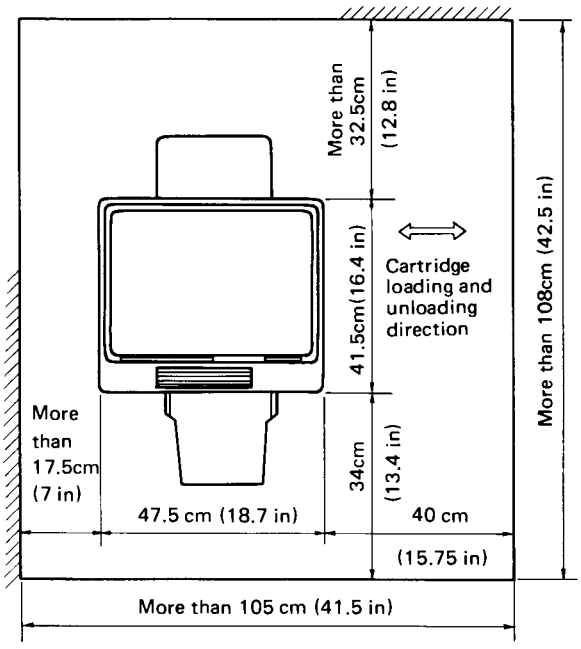


Figure 2-1. HP 2686A Installation Requirements

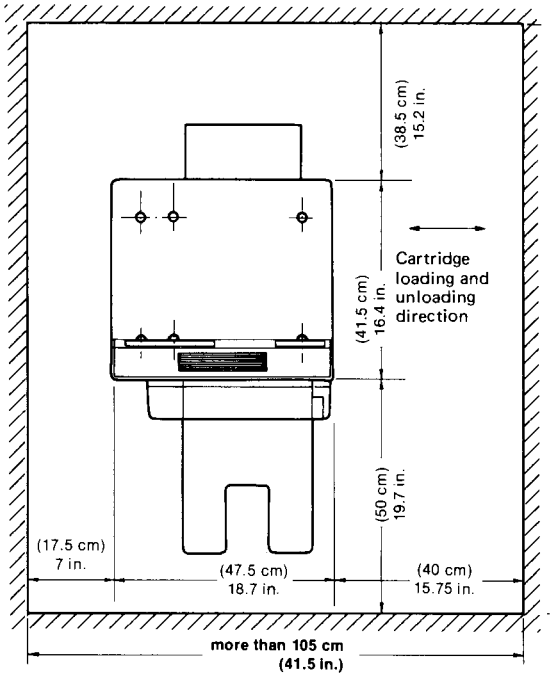


Figure 2-2. HP 2686D Installation Requirements

2-3. UNPACKING and INSTALLATION

Table 2-1 instructs the Service Representative in the proper way of unpacking the HP 2686A/D printer. Refer to the most current edition of the Operator's Manual for detailed unpacking and installation instructions. Prior to unpacking the printer, examine the shipping container for any signs of physical damage (holes in the container, etc). If damage to the shipping container is evident, request that the carrier's agent be present when the printer is unpacked. The EP cartridge is NOT packed with the printer but shipped in a separate package. Ensure the EP cartridge is at the site when installing the printer.

WARNING

The HP 2686A weighs approximately 71 pounds. The HP 2686D weighs approximately 100 pounds. Two people may be required to lift the printer.

Table 2-1.

PROCEDURE	CHECKPOINT	REMARKS
1. Open the cardboard box.		Figure 2-3.
2. Remove the parts and literature from the depressions in the foam packing sheet.	Check that the following are present: (1) Print Tray, (2) Manual Feed Tray, (3) Cassette, (4) Operator's Manual	
3. Lift off the foam packing and remove the printer in its sealed bag.		
4. Remove the bag from around the printer. Remove the tape securing components.	Check for damage to the exterior during transportation.	
5. Lift release lever and raise upper half of the printer.	Check that the inside is not dirty. If dirty, clean it with a damp cloth.	
6. Lift the top (insulating) cover (upper assembly) of the fusing assembly and remove the two spacers.		Figure 2-4.
7. Remove the fuser cleaning pad from the EP cartridge package. Insert the cleaning pad into the groove in the top part of the fusing assembly. Then lower the top of the fusing assembly into position again.	If a cleaner pad is already installed, discard it and replace with a new one.	
8. Peel off the tape securing the wire cleaner to the right side of printer.	Locate the cleaner on its locating pins.	Figure 2-5.

Table 2-1 continued.

PROCEDURE	CHECKPOINT	REMARKS
9. Open the right door.		
10. Remove the cartridge (in the sealed aluminum bag) from the package that held the cleaning pad. Remove the aluminum bag. Hold the cartridge horizontally and rock it 45 degrees slowly back and forth about five times to distribute the toner evenly, then install the cartridge into the printer.		Figure 2-7.
11. Flex the black tab on the side of the EP cartridge until it breaks loose. Pull tab out completely to remove the attached sealing tape. Close upper right door. Close upper half.		
12. Install the print tray, manual feed tray and cassette.		
13. If the printer is configured for 220/240 volts (50 Hz), proceed through all of the remaining steps; if not proceed to step 15. Check to make sure that the setting of the voltage selector (the selector is under the power interlock cover on the side of the power interlock securing screw) matches the power supply voltage (either 220 or 240 V). See Figure 2-8 for proper setting.		
14. If the voltage setting is not correct, remove the screw securing the selector, and rotate the selector 90 degrees to match the setting with the power supply voltage. If the printer is to be set for 240 V, replace the 220 V rating plate with the 240 V rating plate that is inside the power switch cover plate. Resecure the selector, and replace the cover.		Figure 2-8.
15. Plug in the power cord and switch on the power.	* Check that the READY indicator flashes. * Check whether the print density adjustment dial is correctly set with its dot at the top.	
16. Clean outside of printer and surrounding area.		

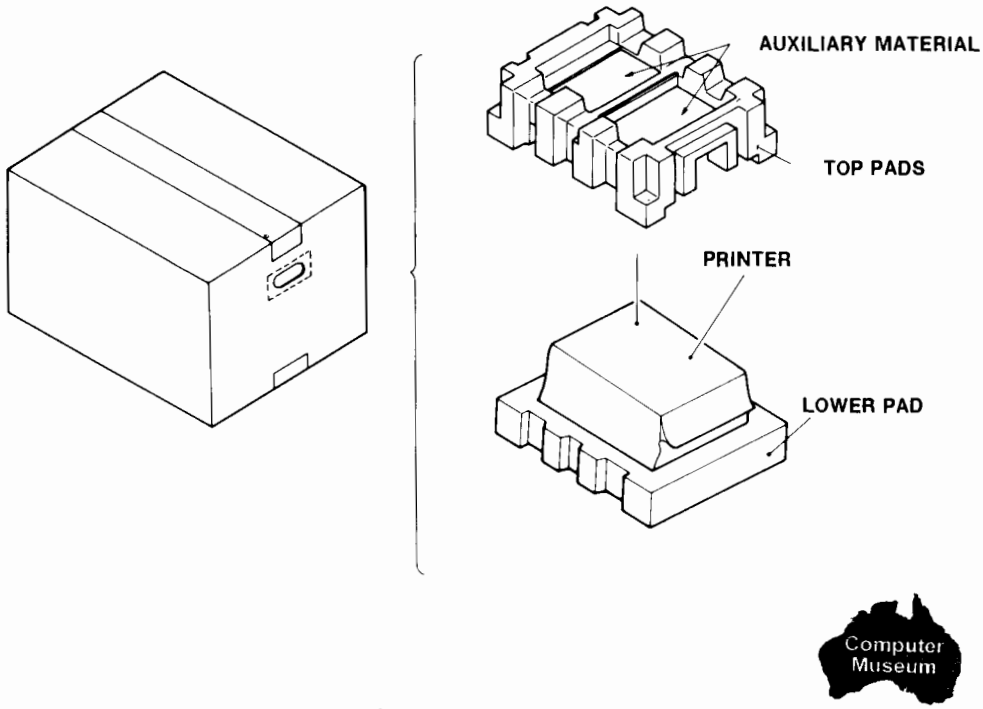


Figure 2-3. Packing

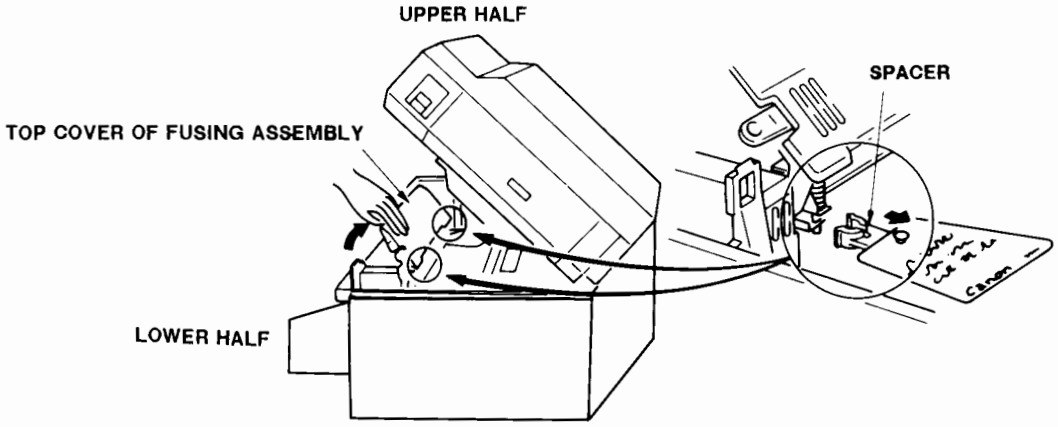


Figure 2-4. Fusing Assembly Spacers

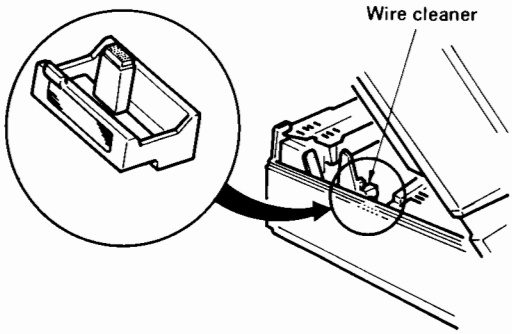


Figure 2-5. Corona Wire Cleaner

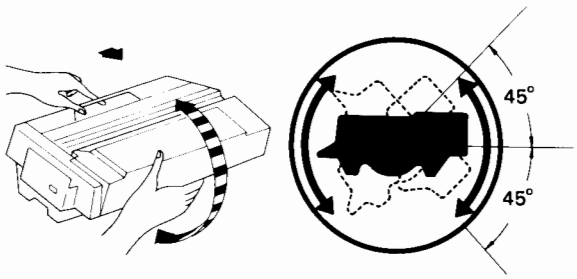


Figure 2-6. Distributing toner inside EP cartridge

2-4. CONFIGURATION

The HP 2686A/D may be configured to either RS232, RS422 or Centronics (parallel) configuration. Consult Table 2-2 for the models and interface options available. The printer comes from the factory configured for RS232 operation with the baud rate set at 9600. If any of the default configurations need changing, perform the following procedures.

HP2686 models	RS232	RS422	Centronics
A	*	*	n/a
A option 200	*	*	n/a
A option 210	n/a	n/a	*
A option 300	*	*	*
D	*	*	*

Table 2-2. Interface Options

For more information on configuring the printer to a host system, refer to the Operator's Manual or the Technical Reference manual appropriate to your model of printer.

Changing the I/O Configuration

To switch interfaces from an RS-232C to an RS-422 (or vice versa), perform the following steps:

A. Switch the power to the OFF (0) position and remove the font cartridge (if installed).

B. Remove the rear panel of the printer by removing the four screws as shown below.

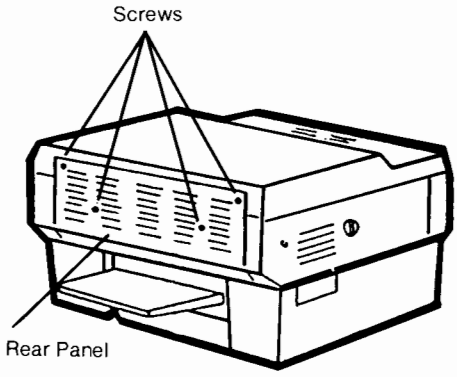


Figure 2-7. Removing the printer rear panel

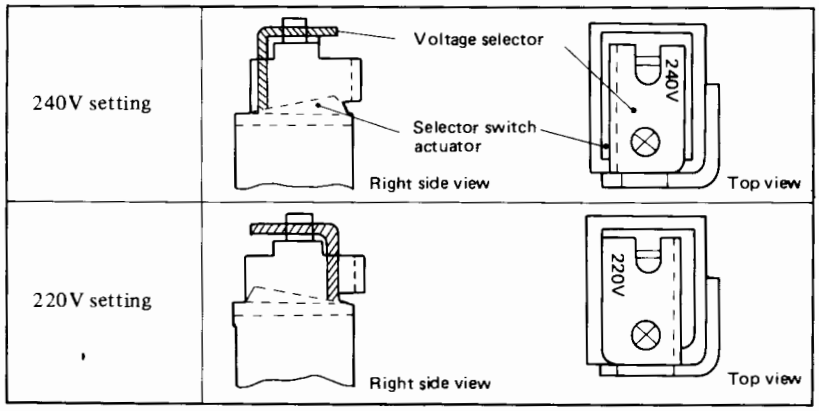


Figure 2-8. Voltage selection

CAUTION

POWER OFF the printer before disconnecting the interface cable from the printer or before selecting another interface via a switch-box.

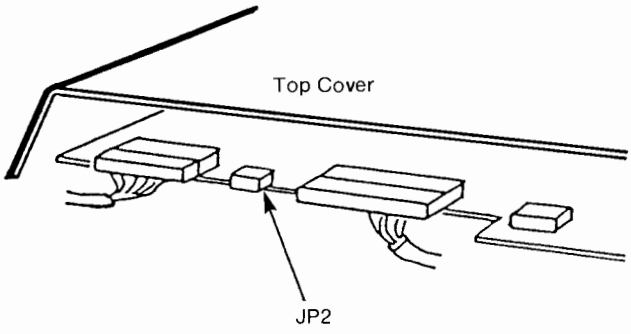


Figure 2-9. Configuration Jumper

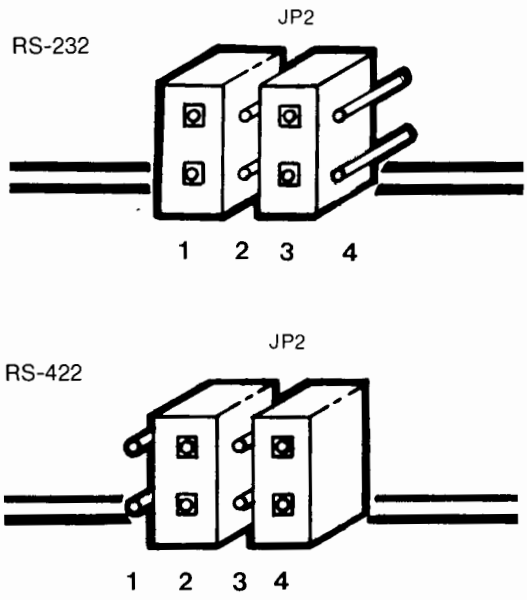


Figure 2-10. RS232 and RS422 Configurations

C. For Serial configuration, set the jumper sockets of JP2 (Figure 2-9) to the positions shown in Figure 2-10. For Centronics (parallel) configuration, set position 1 of SW1 (Figure 2-12) to ON.

D. Replace the rear panel with the four screws removed in step B.

E. Switch the power to the ON (1) position. The printer should be ready for use.

Changing the Baud Rate

NOTE

When using the Centronics I/O configuration, only position 1 of SW1 is active and should be set ON.

The printer's baud rate when shipped is set at 9600. To change the baud rate, perform the following steps:

A. Switch the power to the OFF (0) position and remove the font cartridge (if installed).

B. Remove the rear panel by removing the four screws (see Figure 2-7).

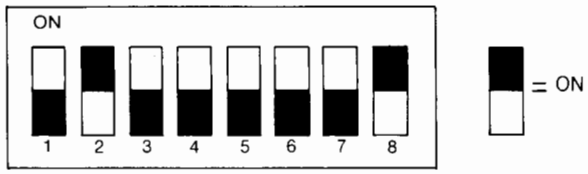
C. Set the SW1 switches to the desired baud rate by consulting the following Table:

Switch number			
2	3	4	Baud Rate
OFF	OFF	OFF	300
OFF	OFF	ON	600
OFF	ON	OFF	1200
OFF	ON	ON	2400
ON	OFF	OFF	4800
ON	OFF	ON	9600
ON	ON	OFF	19200

Figure 2-11. Baud Rate Switch (SW1)

D. Replace the rear panel with the four screws removed in step B.

E. Switch the power ON (1) and resume operation. Remember that the computer system and the printer must be set at the same baud rate for proper operation.



SW1

SWITCH #	USE	ON	OFF
1 *	I/O TYPE	parallel	serial RS-232C/422
2-4 @	BAUD RATE	see fig. 2-10a	see fig. 2-10a
5 *	AUTO-CONTINUE	continue on print and data errors after flashing 10 times	flash error until operator presses the continue key
6 *	ROBUST X-ON	X-ONs repeated every 1 sec when printer is waiting for data	only 1 X-ON sent when printer needs more data
7 &	AUTO-SELECT MODE	powers-up in auto-select mode	powers-up with auto select off
8 @	DTR POLARITY	DTR pin 20 high when printer ready	DTR pin 20 low when printer ready

*=refers to HP2686A+ and HP2686D models
@=refers to all models of HP2686 printers
&=refers to HP2686D models only

Figure 2-12. Setting Switch 1 (SW1)

2-5. STORING and HANDLING EP CARTRIDGES

The EP cartridge can be affected by the environment whether the seal is intact or has been removed. When the cartridge is installed in the printer, it can be similarly affected regardless of whether it is being used or not.

The effects of time can have a significant impact on cartridge life, depending on how the cartridge is stored. Pay careful attention to the following points for storing and handling cartridges.

Storage with the packing seal intact

When storing the EP cartridge in a warehouse or workshop, be sure that the storage place meets the conditions in Table 2-3.

Pay attention to the following points:

1. Keep the EP cartridge out of direct sunlight.
2. Keep the EP cartridge on a secure, level surface where it is not likely to be bumped.

Temperature	Normal conditions (total storage period x 9/10) (160 days)		0° to 35°C
	Severe conditions (total storage period x 1/10) (15 days)	high temp.	35° to 40°C
		low temp.	−20° to 0°C
Temperature variation (within about 3 min.)			40°→15°C −20°→25°C
Relative humidity	Normal conditions (total storage period x 9/10)		35 to 85% RH
	Severe conditions (total storage period x 1/10)	high humidity	85 to 95% RH
		low humidity	10 to 35% RH
Air pressure			460 to 760 mm Hg (0.6 to 1 atm)
Maximum storage time (OPEN SEAL)			6 mo.

Table 2-3. Storage conditions

Storage after the packing seal has been removed

The photosensitive drum in the EP cartridge uses an organic photosensitive coating which deteriorates when exposed to strong light. The toner in the EP cartridge can also be affected by the environment. For these reasons, the customer must be fully informed about the correct method for storing and handling the cartridge.

Storage conditions

1) Do not place cartridges in direct sunlight or near a window. Also, do not leave them inside an automobile for a long period of time in warm weather because the interior can become very hot. (Even if it is still in its storage box, do not place a cartridge in direct sunlight nor leave it in an automobile for long periods of time.)

2) In addition to avoiding areas with high or low temperatures or high or low relative humidity (as listed in Table 2-3), avoid any place that has abrupt changes in either temperature or humidity, such as close to an air conditioner, etc.

3) Do not place cartridges in dusty locations and avoid places where they might be exposed to ammonia gas or organic solvent vapors.

4) Store the EP cartridge below 40 degrees C (104 F).

NOTE

The expiration date of the cartridge is specified on the cartridge box. This date is 2 1/2 years (normal storage period) after the date of manufacture. If the cartridge's aluminum storage bag is broken, the maximum storage life of the cartridge is six months.

Handling Suggestions

1) When installing a cartridge, hold the cartridge horizontally and rock it 45 degrees slowly back and forth about five times to distribute the toner evenly (See Figure 2-6.)

2) If white areas are produced on prints due to lack of toner, hold the cartridge horizontally and rock it 45 degrees slowly back and forth about five times to distribute the toner evenly. (See Figure 2-6.)

NOTE

Be sure to distribute toner inside the EP cartridge as instructed. Hold the EP cartridge by the handle and the rear to distribute toner. Do not hold it by the main cartridge body (on the handle side). If the cartridge is not turned in this way, toner may leak from the developing assembly and from the cleaning assembly.

3) As shown in Figure 2-13, do not stand the cartridge upright, invert it, nor handle it roughly.

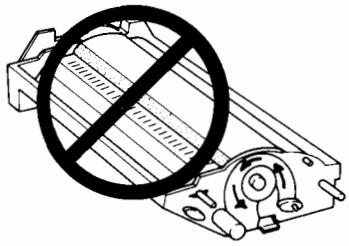
4) Do not touch the surface of the drum when opening the drum's protective shield on the bottom of the EP cartridge. If the surface of the drum becomes dirty, wipe it clean with a piece of soft cloth that has been liberally sprinkled with toner. Do not wipe with a dry cloth and do not use solvent.

5) Do not try to disassemble the EP cartridge.

6) Do not expose a cartridge to unnecessary vibration or shocks.

7) An EP cartridge has light-blocking shutters because the photosensitive drum is sensitive to strong light. Despite these, however, if the cartridge is left in strong light for a long period of time, white blanks or white stripes will appear on prints. If this happens, stop the printer at once and wait a few minutes. This should eliminate the defective images.

8) If it becomes necessary to rotate the drum, always turn it in the direction that it turns while making prints (see Figure 2-13). If it is turned backwards, the spring-loaded contact that applies the developing bias to the inside rim of the developing cylinder may be bent backwards so that it no longer contacts the cylinder, thus preventing proper development.



Do not invert.

Do not stand on end.

Figure 2-13. Storing a cartridge

NOTE

Normal room light, measured a few meters from a window on an average day is about 1,500 lux. Do not expose the photosensitive drum to light of this intensity for more than 5 min.; if the drum is placed under these conditions accidentally, the EP cartridge can be stored in a dark place to "recuperate," although an image may be retained on the drum for some time. Direct sunlight is 10,000-30,000 lux. A drum exposed to direct sunlight may be permanently damaged.

SECTION III

THEORY of OPERATION

3-1. INTRODUCTION

This section of the manual provides a generalized functional understanding of the HP 2686A/D printer and is designed to provide the Service Representative with an understanding of the processes which occur during printing. A generalized block diagram of the printer is shown in Figure 3-1. The following generalized printer blocks will be discussed in detail in this section of the manual:

- Electrophotographic (EP) Process
- Paper Path
- Optics
- Main Drive
- Power Supplies
- Machine Control System
- Interface

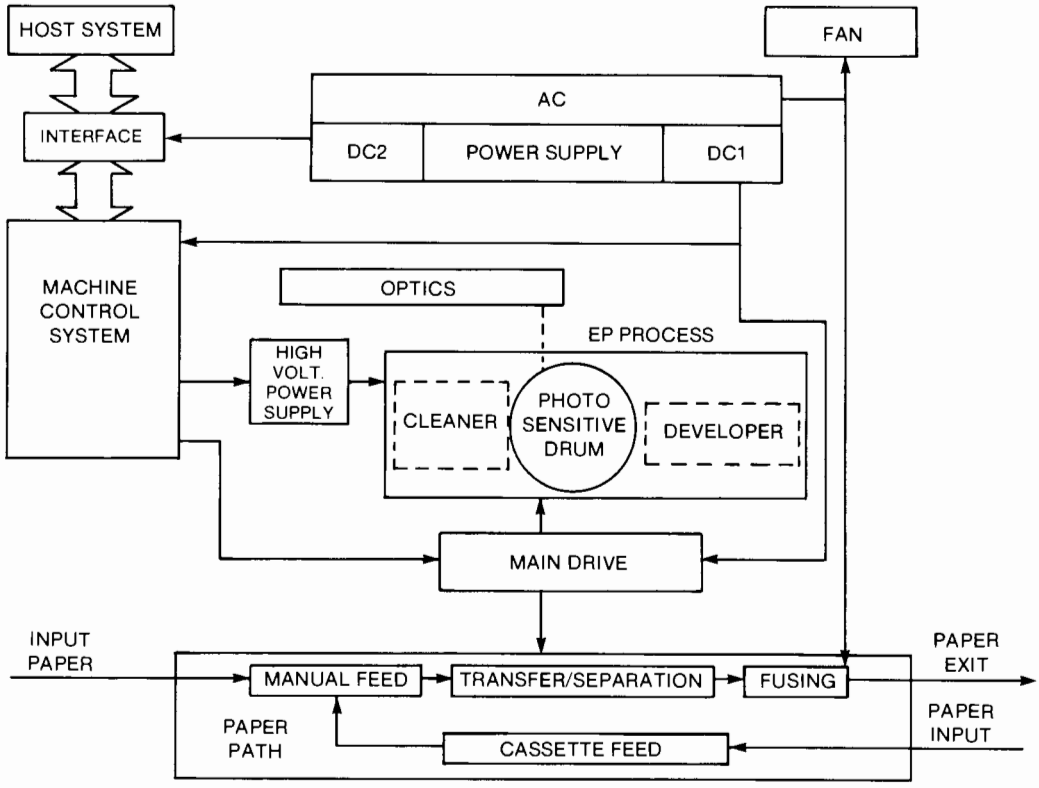


Figure 3-1. HP 2686A/D Printer (functional block diagram)

All material printed in italics is reference information. This information is helpful in understanding printer theory but is not necessary for printer repair.

3-2. LASER PRINTING OVERVIEW

Printing on a laser printer requires the interaction of several different technologies (electronics, optics, electrophotographics, etc.) to provide a page of printed output. Each process functions independently and must be coordinated with all other printer processes. The print process in the HP 2686A/D consists of six stages: cleaning, conditioning, writing, developing, transferring, and fusing.

Laser printing in the HP 2686A/D centers around the printer's drum which is housed in a replaceable cartridge. The drum used in the HP 2686A/D consists of an aluminum cylinder covered with a photosensitive material. The printing process begins as the drum rotates and passes under the cleaning station.

The cleaning station physically and electrostatically prepares the drum to receive a printed image. The station consists of an erase lamp assembly and a cleaning station assembly. The erase lamps illuminate the photosensitive material of the drum to neutralize any electrical charges which may have previously been on the drum. A photosensitive material is any material which exhibits a high electrical resistance in dark light but a low electrical resistance in bright light (i.e., laser light). The cleaning station assembly scrapes the surface of the drum to remove any debris which may be on the drum.

The second step in preparing the drum to receive an image occurs at the primary corona station. Here, a uniform electrostatic charge is applied to the surface of the photosensitive material. This occurs as a result of a corona discharge generated by the printer's corona assembly. The corona discharge occurs when a high voltage is applied to thin wire and results in the ionization of the air around the wire. Because the air around the wire is ionized, it no longer functions as an insulator but allows the charge to move from the wire through the air. In laser printing, the photosensitive material is always placed in close proximity to the corona wire so that it can take on the charge of the wire.

As the drum rotates, it passes the write station where print information is written on its surface. As it passes through this stage, a laser beam scans along the horizontal axis of the drum. The laser beam is focused to a concise spot of light and is turned on/off creating a raster image of "dots" and "no dots" line by line. Wherever the laser light is allowed to strike the drum the static charge on the drum's surface is dissipated (due to the conductivity of the photosensitive material in light). The signal used to modulate the laser beam corresponds to data generated in the printer's Interface PCA.

The drum next rotates past the developing station with the electrostatic image on its surface. In the developing stage, the drum encounters a cloud of toner created by a rotating magnetic cylinder. Toner is a dry powdery black ink used for printing. In most cases, toner is composed of a black plastic resin mixed with iron. The electrostatic charge of the toner is such that it is attracted to the areas of the drum which were discharged when struck by the light of the laser (opposite charges attract). The surface of the drum which was not struck by the laser light repels the toner (like charges repel one another). After leaving the developing station, a visible toner image of the data to be printed is present on the surface of the drum.

It is at the transfer stage where the toner image of the data is placed on paper. At this station, a second corona assembly in the printer is positioned behind the paper. This corona generates a charge on the paper of the opposite charge to that of the toner image on the drum. Since opposite charges attract, the toner image on the drum is pulled onto the surface of the paper. From the transfer station the paper and drum are separated. The drum rotates back to the cleaning station to be prepared for printing the next page and the paper proceeds to the fusing assembly.

At the fusing station the paper passes through a fusing assembly. A high intensity lamp provides the necessary heat (approximately 170-180 degrees centigrade) to physically melt the toner onto the paper. From the fuser, the paper is moved into the output paper tray where the printed output is immediately available for the user.

The entire printing operation is controlled by the Machine Control System. This system coordinates all activities within the print engine portion of the printer. The interface portion of the printer is responsible for

communicating with the host system and for manipulating data into dot image data which can be used by the Machine Control System for writing on the photosensitive drum. The interface also communicates with the Operator through the Control panel. The main drive motor provides for all mechanical movement throughout the printer (through a series of drive gears). The two DC power supplies (print engine and interface) provide the necessary DC power for the printer. A high voltage power supply provides the voltages for the EP processes.

3-3. ELECTROPHOTOGRAPHIC (EP) PROCESS

The EP process consists of five individual processes which revolve around the photosensitive drum. These processes are:

- Cleaning
- Conditioning
- Writing
- Developing
- Transferring

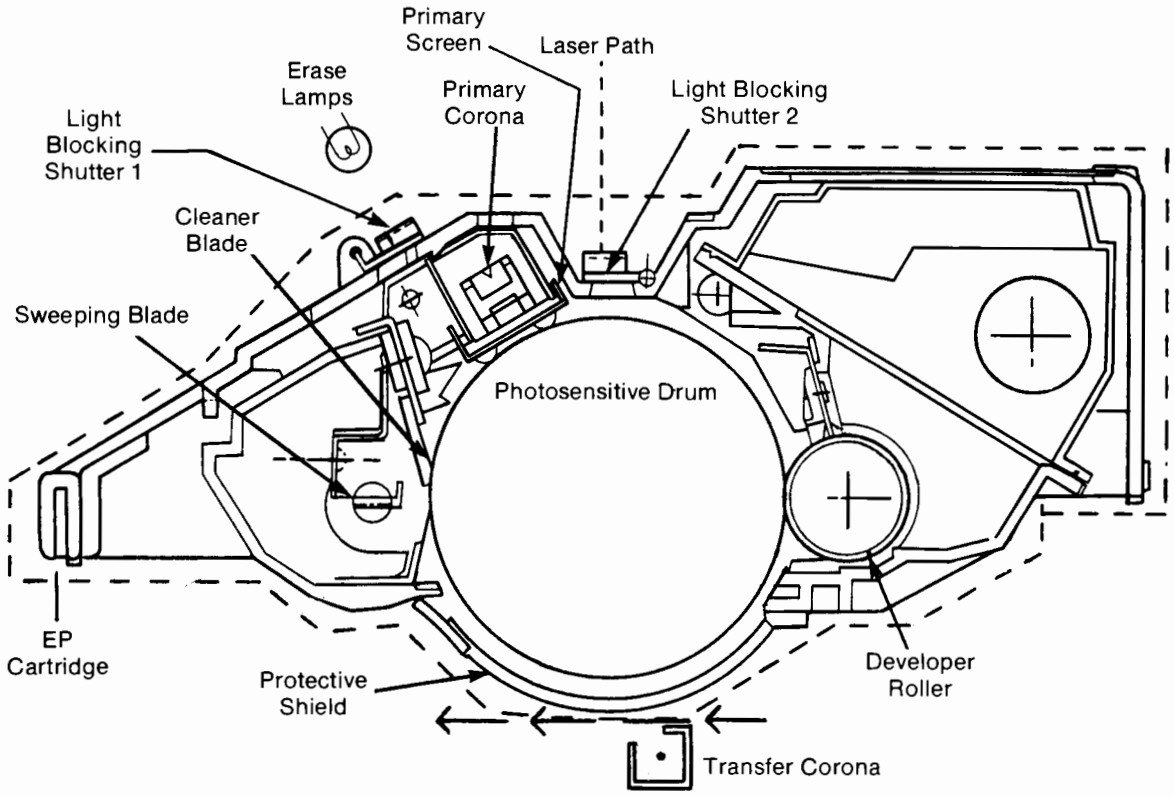


Figure 3-2. HP 2686A/D Electrophotographic Processes

A major portion of the EP process (photosensitive drum, primary corona, developing unit, toner hopper, and drum cleaner station) is contained in a consumable EP cartridge assembly. This cartridge may be replaced by the operator thus preventing a service call. A cross-sectional view of the EP cartridge is illustrated in Figure 3-2.

Photosensitive Drum

The "heart" of the EP process is the photosensitive drum. The properties of the drum are such that it is highly conductive (electrically) when exposed to light but acts as an insulator in a dark or non-light environment. The EP cartridge drum is seamless and manufactured from an organic photoconductor (OPC) material. A cross-sectional view of the drum is illustrated in Figure 3-3.

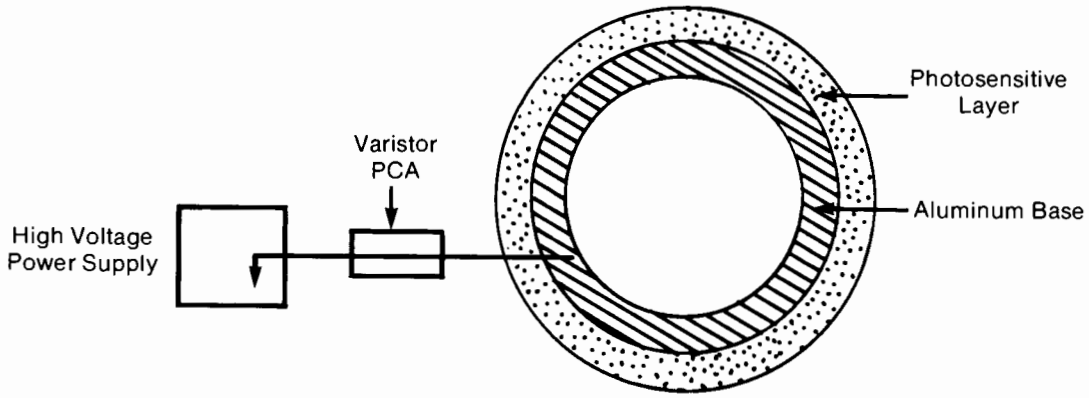


Figure 3-3. Photosensitive Drum

WARNING

Do not expose the drum to direct sunlight or any other bright light sources; permanent damage could occur.

The drum consists of a thin layer of photosensitive material on an aluminum base. The aluminum base of the drum is at a zero volt potential and tied to the High Voltage Power Supply Assembly's ground potential through the Varistor PCA.

Not all photoconductive drums are uniformly sensitive to light. Because of this, each drum is tested during manufacturing and assigned a sensitivity level. The sensitivity level of the drum is identified by tabs on the notched cut-outs on the left-rear corner of the EP cartridge. When the EP cartridge is installed in the printer the tabs on the cartridge activate (or do not activate) two micro-switches at the rear EP cartridge cavity in the printer. The enabling of these micro-switches (MS3 and MS4) informs the printer's Machine Control System of the drum sensitivity level.

Table 3-1 lists the drum sensitivity levels as decoded by the micro-switches.

A third micro-switch (top switch) is also located in the printer's EP cartridge cavity. This micro-switch indicates to the Machine Control System whether or not the EP cartridge is installed.

Signals / Drum Sensitivity	(MS3) $\overline{\text{CSENS1}}$	(MS4) $\overline{\text{CSENS2}}$
LOW	H	H
MID	L	H
HIGH	L	L

Low = Switch Closed
High = Switch Open

Table 3-1. Drum Sensitivity Levels

Cleaning

Cleaner Blade

Before printing (writing on the photoconductive drum) begins, the drum must be physically and electrostatically clean. The drum is physically cleaned by a rubber cleaning blade which rides on the surface of the drum scraping it clean (see Figure 3-4).

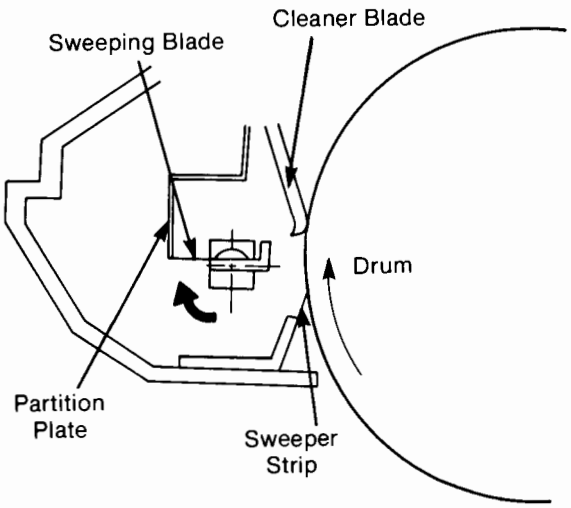


Figure 3-4. Photoconductive Drum Cleaning Station

The residual toner scraped from the drum by the cleaning blade is collected in the sweeper strip. A rotating sweeper blade within the EP cartridge collects the residual toner and dumps it in a debris cavity. The drum is now physically clean.

Erase Lamp Assembly

The erase lamps are responsible for electrostatically cleaning the drum of any previous residual electrostatic charges. The erase lamp assembly consists of five small lamps located in the upper main body of the printer. The illumination of these lamps is controlled by the Machine Control System. When the EP cartridge is installed, light-blocking shutter 1 (see Figure 3-2) is opened. A red filter is positioned between the lamps and the drum to prevent too much light from striking the drum's surface. Since the photoconductive layer of the drum is conductive when exposed to light, the effect of the erase lamps is to neutralize (place the surface of the drum at zero potential) the drum's surface by providing an electrical path through the OPC material for any charge to dissipate.

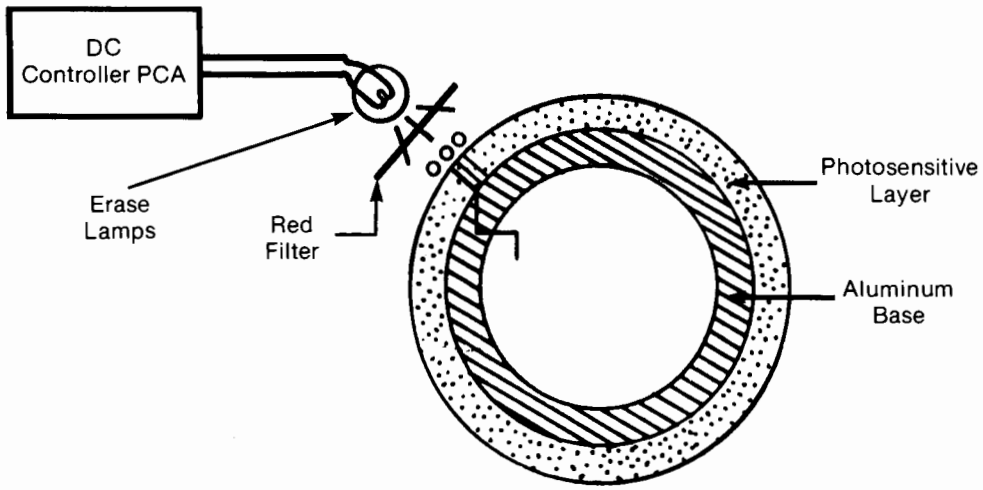


Figure 3-5. Erase Lamp Effect

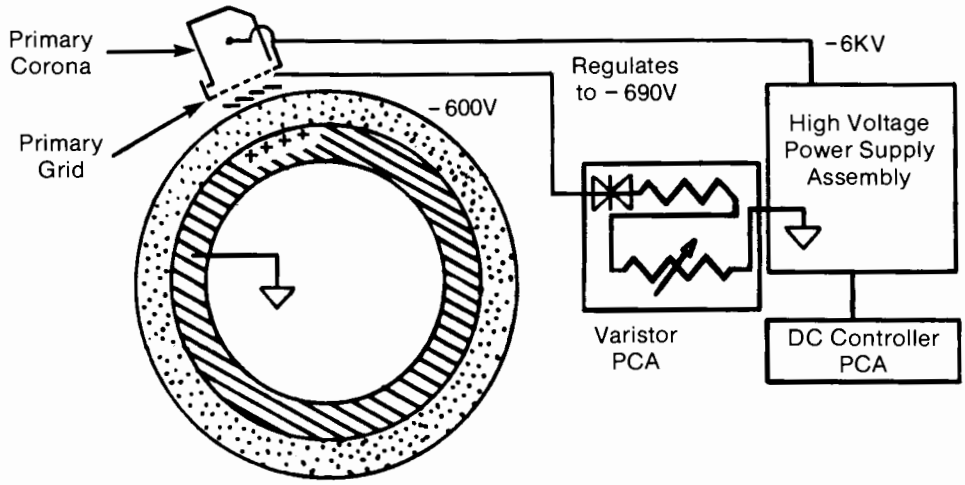


Figure 3-6. Primary Corona Assembly

Conditioning

After the drum has been physically and electrically cleaned, the drum must be conditioned for the print process to continue. The conditioning process consists of the application of a uniform negative charge on the surface of the drum. This charge is applied to the drum by the primary corona assembly.

The High Voltage Power Supply, controlled by the Machine Control System, applies a -6 Kv charge to the primary corona wire. Due to the "corona effect", the air surrounding the wire no longer acts as an insulator and the negative potential from the wire migrates to the surface of the drum. The primary corona grid (see Figure 3-6) is positioned between the corona wire and the drum, and regulates the voltage applied to the drum's surface. The primary corona grid regulates the voltage such that a uniform -600 Volt charge is deposited on the drum's surface. The corona grid returns any excess corona voltage to High Voltage Supply ground via the Varistor PCA.

REFERENCE

A varistor is a semiconductor device whose resistance varies as voltage is applied to it. In this situation, as more voltage is generated by the corona wire (more than desired on the drum's surface), the resistance of the varistor decreases and more voltage is returned to ground.

Writing

Now that the surface of the drum has a uniform charge (fully conditioned), data may now be written on the drum. This is accomplished at the write station. To write on the drum, a modulated laser beam scans horizontally across the drums surface (see Figure 3-7).

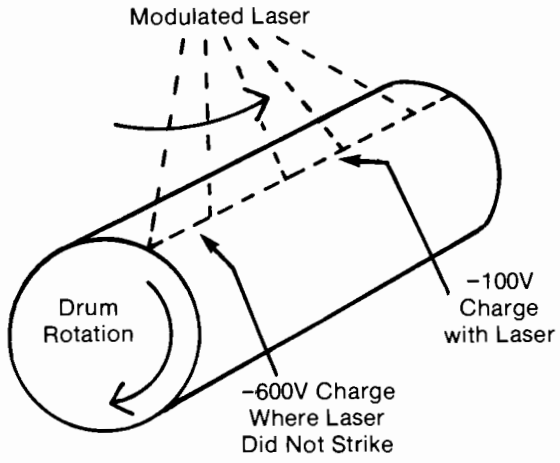


Figure 3-7. Writing on the Drum's Surface

The laser beam passes through an opening in the EP cartridge concealed by light blocking shutter 2 (see Figure 3-2). When the cartridge is installed in the printer the shutter is forced open.

Wherever the laser strikes the photoconductive surface of the drum, the charge at that point (-600 V) is dissipated to approximately -100V. The surface areas of the drum not struck by the laser remain at -600 V potential.

After passing through this station an electrostatic image of what is to be printed is now on the surface of the drum.

Developing

At the development station, the electrostatic image of the print information is transformed into a visible image of what is to be printed. A cross-sectional view of the development station is illustrated in Figure 3-8. As shown in this Figure, the development station consists of a development cylinder with a fixed magnet and a toner regulating blade. The developer toner, or "dry ink", is a single component type made of a color pigment, iron and a resin binder.

As the developer cylinder rotates, toner is attracted to the magnet inside the cylinder. As the developer roll rotates, a toner regulating blade regulates the toner such that only a uniform layer of toner is built-up on the cylinder and allowed to rotate past the drum's surface.

A variable negative DC Bias is applied to the developer cylinder via the High Voltage Power Supply Assembly. This bias may be adjusted by the Print Density Adjustment Dial located on the left side of the printer. When the dial is adjusted, the DC bias is changed, and the attraction between the photosensitive drum and the toner particles on the development roll is changed.

As the laser exposed areas of the drum (which are sitting at a -100 V potential) approach the developer roll, the toner particles are attracted to the drum's surface due to the opposite voltage potentials of the toner and the laser exposed surface of the drum.

In the non-exposed areas of the drum (which are at approximately -600 V potential) the electrostatic force between the toner and the drum's surface is much less and the toner remains adhered to the developer cylinder.

A 1600 VAC (point to point) bias is also applied to the developer cylinder. This AC bias ensures that toner is projected smoothly, thus preventing sharp contrasts in the print image. For more detailed information, read the following reference information.

REFERENCE: TONER PROJECTION DEVELOPMENT

Actually, both the laser exposed and unexposed areas on the drum surface have a negative potential. To simplify explanation, the potential is represented as positive when it is higher than developing cylinder potential and negative when it is lower than developing cylinder potential.

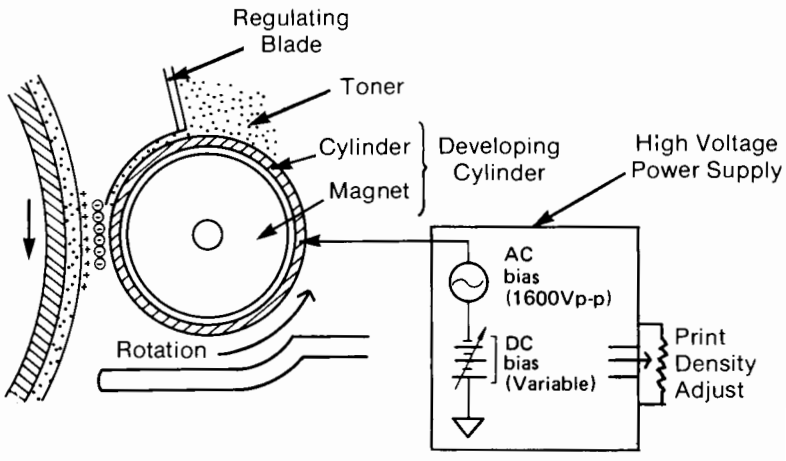


Figure 3-8. Development Station

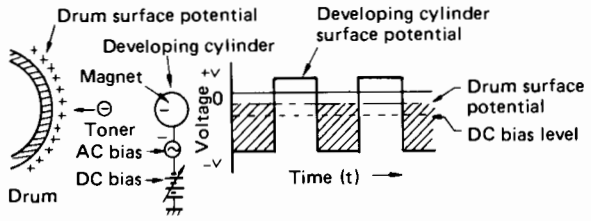
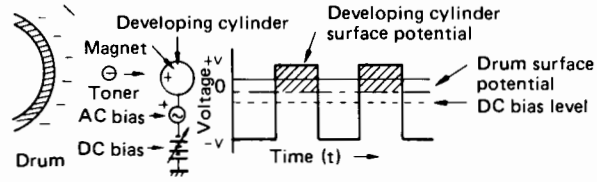
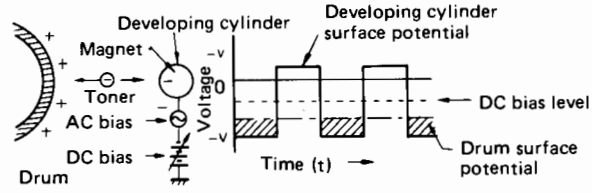
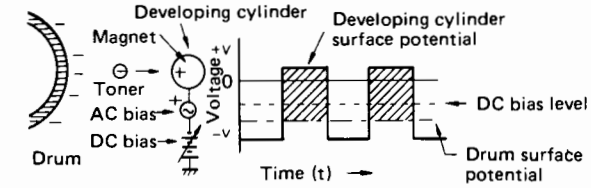
Latent image	Developing bias	Toner movement electric potentials	Description
Exposed areas	Negative bias		When the attraction of the drum surface charges, combined with repulsion due to the negative potential (bias voltage) applied to the developing cylinder, is sufficient to overcome the attraction of the internal magnet (in the cylinder) on the toner particles, toner is projected toward the drum from the developing cylinder.
	Positive bias		When the bias voltage rises and becomes strongly positive, there is no electrical force to repel toner particles from the cylinder in opposition to the attraction of the internal magnet. Therefore, it is difficult for toner particles to be projected from the cylinder. Instead, toner is attracted back from areas of the drum where an excess of toner was applied to the drum during a negative cycle of the cylinder bias. This improves contrast of the finished print.
Unexposed areas	Negative bias		Little toner is projected toward the drum because the surface potential of the drum is very low, and because the magnet in the cylinder continues to attract toner.
	Positive bias		In this case both the cylinder bias and the magnet are attracting and holding toner to the cylinder. Excess toner in unexposed areas is attracted back to the cylinder. This prevents fogging.

Table 3-2. Toner Projection Development

Transferring

Until now, the physical image of what is to be printed is only on the drum's surface: at the transfer station the image is transfered from the drum to paper. Figure 3-9 illustrates the transfer process.

The transfer corona is not part of the EP cartridge (see Figure 3-2) but is located in the lower main body of the printer directly beneath the EP cartridge. It is at the transfer corona where the paper and the photosensitive drum come into contact. Voltage, supplied by the High Voltage Power Supply (approximately +5 KV), is applied to the transfer corona wire. Because of the corona effect, a high positive potential is placed on the back of the paper as it moves past the corona wire. This positive charge on the paper attracts the negatively charged toner image from the photosensitive drum to the paper, thus completing the EP process. The drum continues onto the cleaning station to repeat the EP process. A nylon string is strung across the opening of the transfer corona assembly and prevents the paper from accidently jamming in the assembly.

Static Elimination

Because of the high static properties of paper, a good grounding method is necessary to ensure print quality and prevent printer malfunctions. The grounding methods used at the transfer corona assembly are illustrated in Figure 3-9 (part 2 of 2).

On the paper input side of the transfer corona assembly, the upper and lower transfer guides are tied to the same ground potential: these in turn are connected in series with a 16 Megaohm resistor to the transfer corona assembly housing. The corona housing is also grounded to the High Voltage Power Supply ground via a 1 Kohm resistor on the Varistor PCA.

On the output side of the transfer corona assembly a comb-like brush grounds any static charge from the paper as it is advanced past the corona assembly.

Ozone Filter

One of the by-products of a corona discharge is the generation of ozone. Ozone is a form of oxygen which sometimes generates a pungent odor. To remove the ozone generated by the corona assemblies, the printer uses a charcoal absorption filter. The filter is located directly above the EP cartridge cavity.

3-4. PAPER PATH

Introduction

The HP 2686A/D has two paper paths: cassette feed and manual feed.
These paths are illustrated in Figure 3-10.

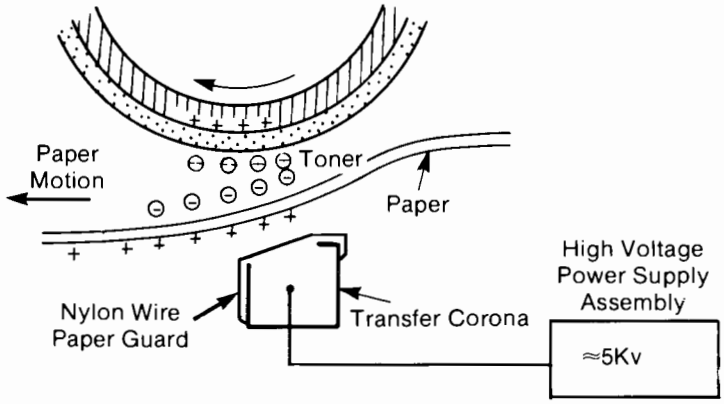


Figure 3-9. Transfer Process (1 of 2)

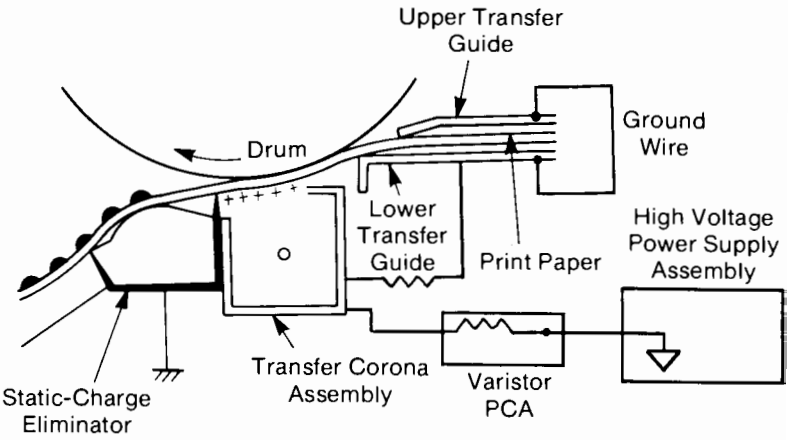


Figure 3-9. Transfer Process (2 of 2)

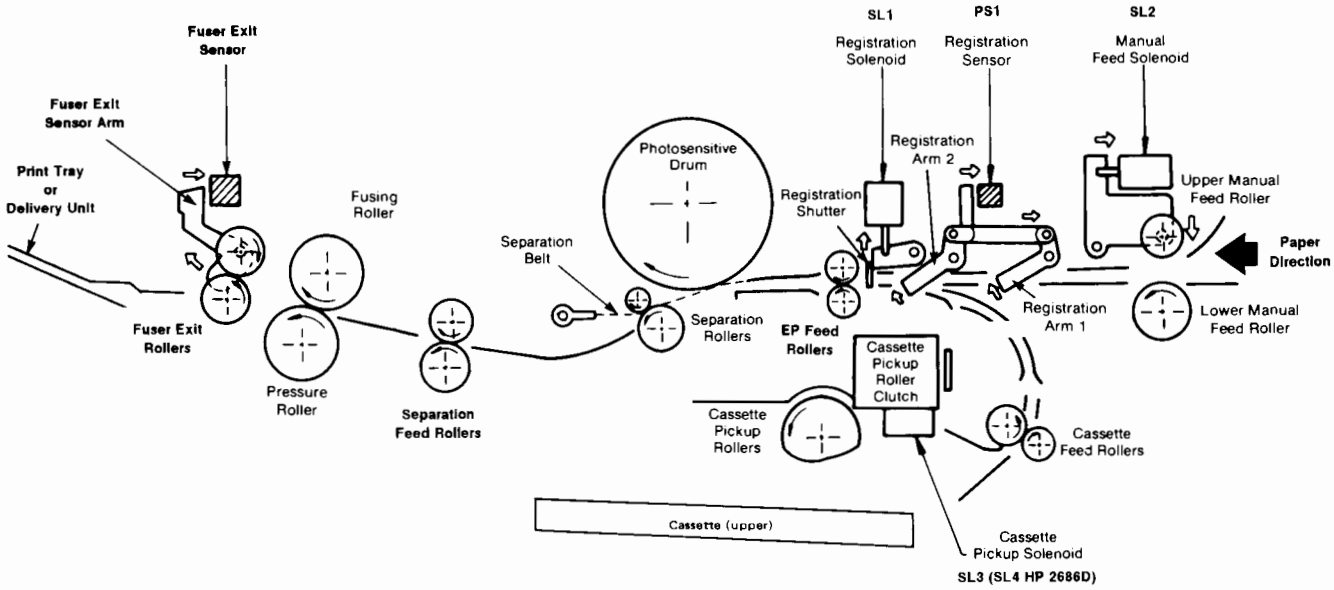


Figure 3-10. HP 2686A/D Paper Feed Path(s)

The cassette feed paper path begins as the cassette pickup solenoid is activated by the Machine Control System. The activation of this solenoid causes the cassette pickup rollers to rotate and pick a sheet of paper out of the paper cassette. Paper is fed from the paper cassette to the cassette feed rollers. The feed rollers advance the paper along the path to the registration shutter. Prior to the paper reaching the shutter, paper registration sensor arm 2 detects the presence of paper. The sensing of paper informs the Machine Control System that paper is present, and the Machine Control System will begin to synchronize the Optical System, and EP drum, with the Paper Transport System. The Machine Control System also uses the detection of paper as a reference point for monitoring paper jams.

During manual feed operations (the printer must be in manual feed mode) the presence of paper in the manual feed tray is detected by registration arm 1. When the Machine Control System senses this, the manual feed solenoid is activated causing the upper pickup roller to lower and paper is advanced to the registration shutter. At this point the two paper paths merge.

When the Machine Control System has ensured that the three major systems are synchronized, the registration solenoid is activated and the registration shutter is raised. The EP area feed rollers (see Figure 3-10) move the paper to the transfer station to accept the print image from the photosensitive drum.

After the print image information has been transferred to paper, the paper is advanced past the separation belt assembly. The separation belt assembly separates the paper from the photosensitive drum. The fusing assembly feed rollers advance the paper to the fusing assembly. In the fusing assembly toner is physically bonded, by heat, to the paper. The exit rollers assist in removing the paper from the fusing assembly and stack the paper in the output paper tray. A paper exit flag is activated as the paper exits past the exit rollers. The flag's movement is detected by a photo-interrupter. The Machine Control System monitors the photo-interrupter to ensure that the printed page, which was first detected at the registration shutter, has successfully moved through the printer (no paper jams have occurred).

Paper Cassette

Four different paper cassettes may be used with the HP 2686A/D printer: letter size, legal size, A4, and B5. An individual paper cassette may NOT be modified to work with any other paper than what it was originally designed for. The HP 2686A trays hold approximately 100 sheets of paper and the HP 2686D trays hold approximately 250 sheets. The trays are not interchangeable between the two models.

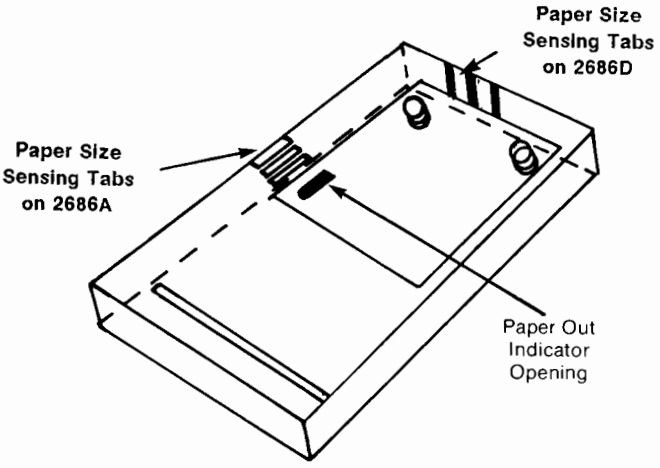


Figure 3-11. Paper Cassette

The HP 2686A paper cassette is uniquely identified by three tabs (protrusions) on its left side. These tabs activate micro-switches MS5, MS6, and MS7 when the cassette is installed in the printer. The HP 2686D paper cassettes are identified by tabs (protrusions) in front of the tray. These tabs activate MS5, MS6 and MS7 (upper tray) and MS10, MS11 and MS12 (lower tray). These switches output a three-bit code to the Machine Control System indicating the cassette size which is installed. Table 3-3 identifies the micro-switch code sent to the Machine Control System: the micro-switch is a TTL low when active (pushed in).

A cassette which is not assembled correctly or damaged (bent tabs or broken fence) may cause paper pickup problems (i.e., paper jams).

Paper Out Sensor

A Paper Out Error (status code "11") may be the result of either of two conditions: the paper cassette is not installed or no paper is present in the cassette. If the cassette is installed, a sensor flag and a photo-interrupter switch is used to detect paper out conditions. Under normal conditions, the paper out sensor arm rests on paper in the cassette. When the arm is in this position, a sensor flag (located on the arm assembly) is away from the photo-interrupter. When no paper is present in the cassette, the sensor arm swings through an opening in the bottom of the cassette and the sensor flag swings down to block a photo-interrupter. The Machine Control System detects that the photo-interrupter is blocked and displays a Paper Out status code.

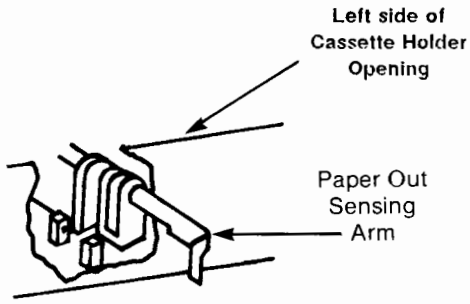


Figure 3-12. Paper Out Sensor Arm

HP 2686A

Signals / Cassette	(MS5) $\overline{\text{PSIZE1}}$	(MS6) $\overline{\text{PSIZE2}}$	(MS7) $\overline{\text{PSIZE3}}$
A4	L	H	L
B5	H	L	L
LEGAL	L	L	H
LETTER	L	L	L
No cassette	H	H	H

HP 2686D Upper

Signal / Cassette	(MS5) $\overline{\text{PSIZEU1}}$	(MS6) $\overline{\text{PSIZEU2}}$	(MS7) $\overline{\text{PSIZEU3}}$
Legal	H	H	L
Letter	H	H	H
A4	H	L	H
B5	L	H	H
No cassette	L	H	L
	H	L	L
	L	L	L

HP 2686D Lower

Signal / Cassette	(MS10) $\overline{\text{PSIZED1}}$	(MS11) $\overline{\text{PSIZED2}}$	(MS12) $\overline{\text{PSIZED3}}$
Legal	H	H	L
Letter	H	H	H
A4	H	L	H
B5	L	H	H
No cassette	L	H	L
	H	L	L
	L	L	L

Table 3-3. Paper Cassette Micro-Switch Codes

Cassette Pickup Assembly

Clutch Operation

The pickup roller is driven by the main motor through a gear-train and a spring clutch. A driving drum projects through the side of the pickup roller gear. A second drum, the driven drum, is in line with the end of the driving drum, and is attached solidly to the shaft of the pickup roller. A clutch spring is wound around the two drums. The clutch spring is securely fastened to the driven drum at one end and to the control ring at the other end. The control ring fits loosely over the spring. (See Figure 3-13).

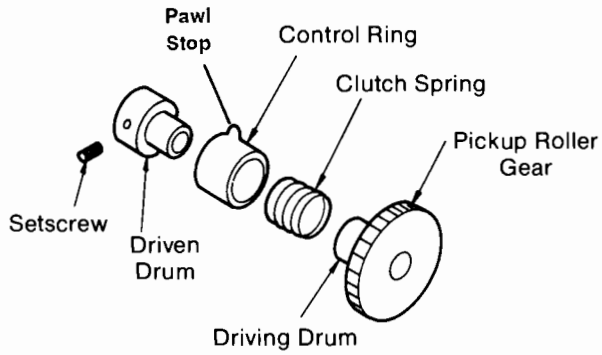


Figure 3-13. Cassette Pickup Assembly

Clutch (Disengaged)

When the pickup solenoid is de-energized, the control ring pawl holds the control ring stationary. The pawl holds the end of the spring back so the spring is loose and the driving drum rotates freely inside the spring with only slight friction. No drive is transferred to the driven drum. (See Figure 3-14).

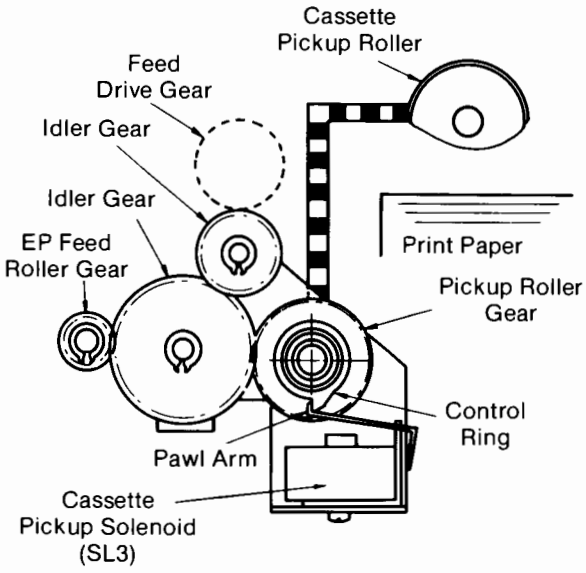


Figure 3-14. Cassette Pickup Assembly HP 2686A (Disengaged)

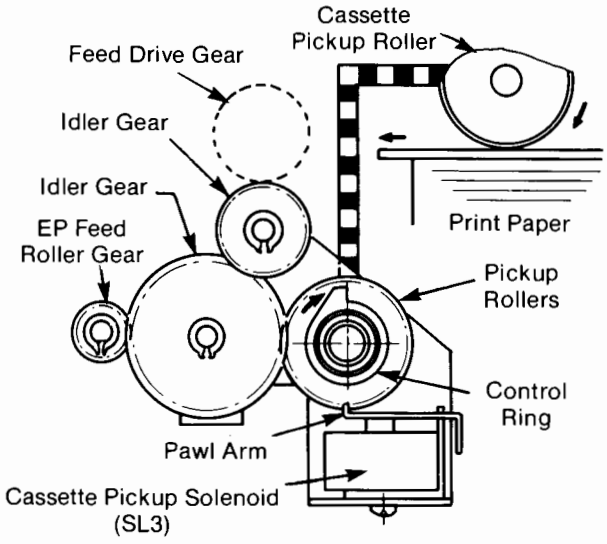


Figure 3-15. Cassette Pickup Assembly HP 2686A (Engaged)

Clutch (Engaged)

When the paper pickup solenoid is energized (for approximately 0.9 seconds) the control ring pawl is pulled away from the control ring allowing the spring to pull the control ring around with it. The diameter of the spring decreases and the spring tightens first onto the driving drum, then onto the driven drum. This turns the pickup roller so it draws a piece of paper out of the cassette. (See Figure 3-15).

The control ring makes only a single turn because the solenoid is de-energized very quickly after being energized; the pawl returns to the normal position and stops the control ring when the control ring pawl completes its turn. When the control ring stops, the end of the spring unwinds from the driving drum so the drum can slip within the spring (disengaged state).

From the paper cassette, paper is advanced to the cassette feed rollers into the paper path.

Cassette Pickup Rollers-HP 2686D

Outline of Operation

When the upper or lower pickup roller clutch solenoid (SL3 or SL4) is actuated, the upper or lower pickup roller rotates. Drive from the main motor is transmitted via pickup drive sprockets 1 and 2 to the drive gears of the upper and lower pickup rollers. The drive gears of the upper and lower pickup rollers do not have the same number of teeth, and the lower pickup roller rotates faster than the upper pickup roller so that paper travels to the registration shutter in the same amount of time for both lower and upper cassette feed.

Description of Operation

As shown in Figure 3-16, drive from the main motor is transferred to pickup drive sprocket 2 via pickup drive sprocket 1 and the timing belt.

Pickup drive sprocket 2 drives the pickup roller drive gears which drive the pickup rollers when SL3 or SL4 is ON. When the pickup roller clutch solenoid (SL3 or SL4) is OFF, the pawl stops rotation of the control ring and the pickup rollers do not rotate.

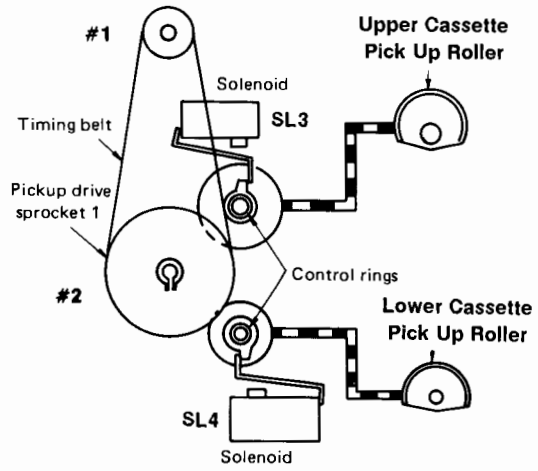


Figure 3-16. Cassette Pickup Rollers HP 2686D (Disengaged)

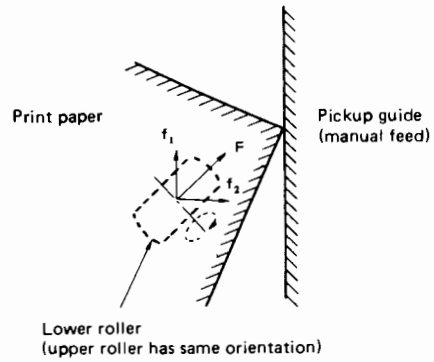


Figure 3-18. Paper Alignment System

Manual Paper Feed

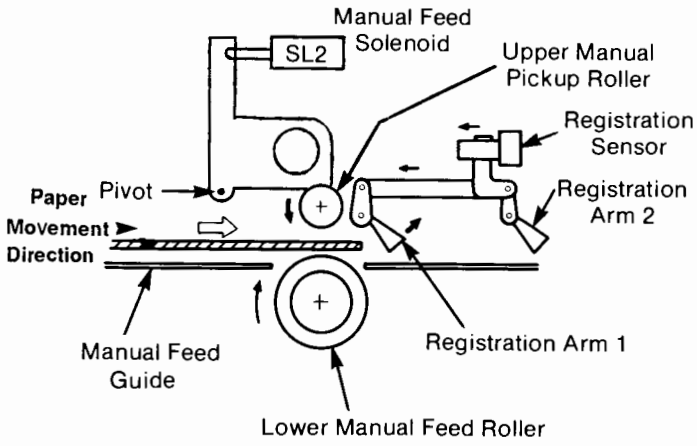


Figure 3-17. Manual Paper Feed System

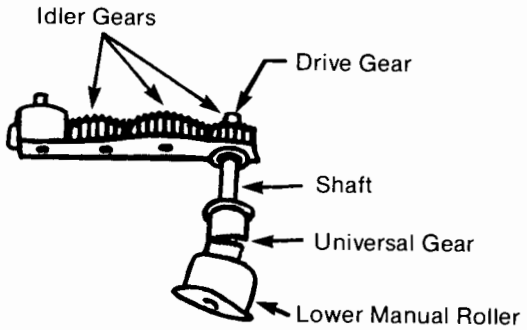


Figure 3-19. Paper Feed Roller

During a manual feed operation, the presence of paper is indicated by registration arm 1 (shown in Figure 3-17). When registration arm 1 is moved, a sensor flag blocks the registration sensor (a photo-interrupter) thus indicating to the Machine Control System the presence of paper. The activation of the manual feed solenoid causes the upper pickup roller assembly to pivot down and pinch the paper between the upper and lower rollers. The paper is then advanced to the registration shutter. The lower manual feed roller is offset at an angle (see Figures 3-18 and 3-19). Because of this offset, paper is aligned to the right hand side of the paper guide (as viewed from the rear of the printer) thus eliminating any paper skew. It should be noted that an excessively worn lower manual feed roller could result in manual feed problems.

Registration

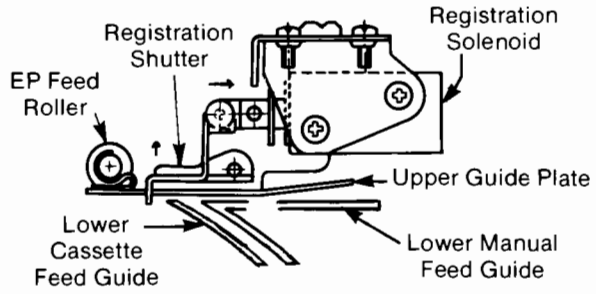


Figure 3-20. Paper Registration Assembly

Paper is delivered to the registration shutter either from the manual paper path or from the cassette feed paper path. When all systems are synchronized, the Machine Control System energizes the registration solenoid, which inturn raises the registration shutter, and paper is fed into the EP area feed rollers.

Transfer Station

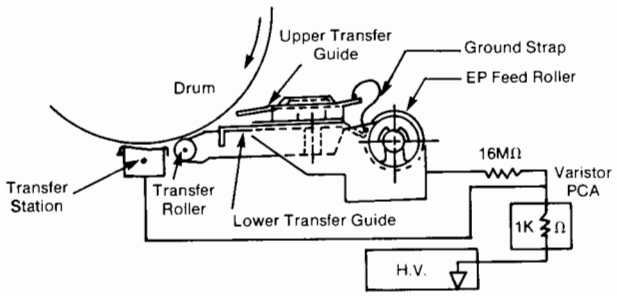


Figure 3-21. Transfer Station

The EP area feed rollers (see Figure 3-21) transport paper through the upper and lower transfer guides to the transfer roller, and on past the transfer corona. At the transfer corona the image is transferred from the photoconductive drum to the paper (refer to paragraph 3-3). The transfer assembly must be correctly grounded to maintain print quality see Figure 3-9.

Separation Unit

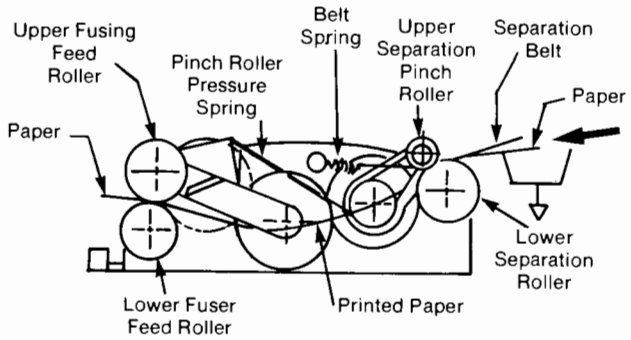


Figure 3-22. Separation Unit

As paper exits the transfer station, the toner image is statically held to the paper (the print is not permanently fused to the paper). So as not to disturb the print image, only the left edge of the paper passes through the separation assembly (this is the left edge of the page when viewing the finished printed page). Because of this, text cannot be printed to the extreme edge of the page. To ensure that the paper does not statically adhere to the drum a separation belt (see Figure 3-23) is used. The separation belt (which is customer installable) peels the paper from the drum's surface.

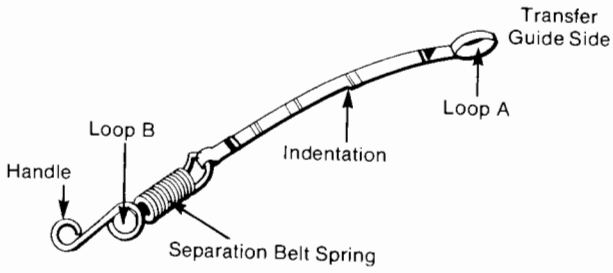


Figure 3-23. Separation Belt

Once the paper is separated from the drum, the fusing feed rollers (see Figure 3-22) feed the paper to the fusing system. It should be noted that the upper fusing feed roller and the separation rollers are spring loaded and assist in pinching the paper (securing the paper to the feeder guide) while the paper is being moved through the unit.

Fusing Assembly

The fusing assembly permanently bonds the toner image to the paper. Paper is fed from the fusing feed rollers (on the separation unit) to the pressure and fusing rollers in the fusing assembly (see Figure 3-24). The pressure roller is manufactured from a soft material and pushes the paper (from the backside) against the fusing roller.

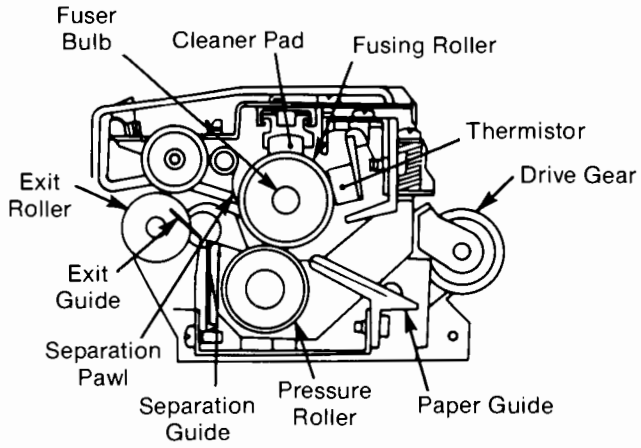
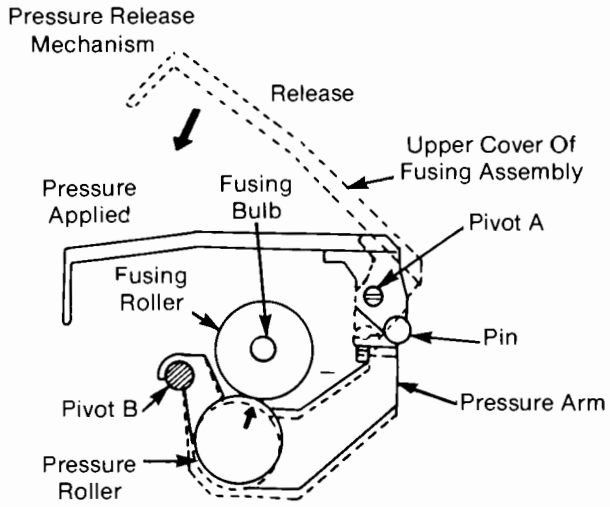


Figure 3-24. Fuser Assembly (cross-sectional view)



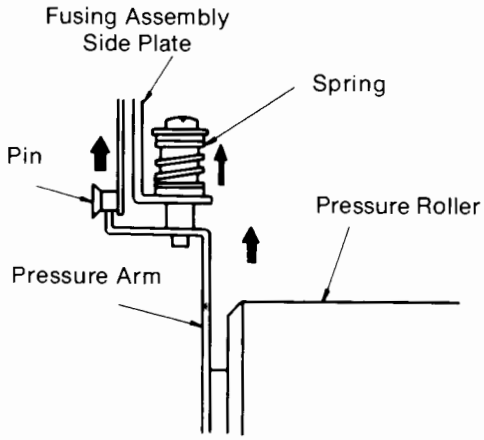


Figure 3-25. Fuser Unit Top Cover

As shown in Figure 3-25, opening the fusing unit cover releases pressure from the upper fusing roller (the cover pivots around pivot A). When the pressure is released, paper jams may be more easily removed from the fusing assembly. When the cover is closed, the correct amount of pressure is applied to the upper fuser roller. If the top cover springs become abnormally worn, improper fusing or more frequent paper jams may occur.

The hollow fuser roller is coated with a non-stick Teflon coating. The fuser bulb (see Figure 3-26) is located inside the fuser roller. The fuser bulb temperature is monitored by the Machine Control System via a thermistor sensing arrangement. The Machine Control System maintains a temperature of 160 degrees C during standby mode, 170 degrees C during cassette feed operation, and 180 degrees C during the manual feed mode of operation. The temperature is higher during the manual feed mode of operation to ensure that thicker papers (i.e. envelopes, letterhead pages, etc) are fused completely.

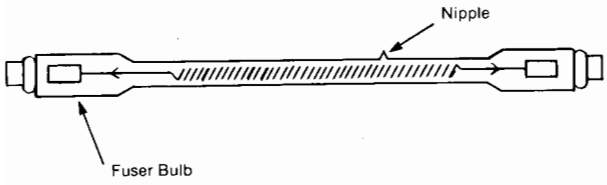


Figure 3-26. Fuser Bulb

A thermoprotector switch is also located in the fusing assembly, adjacent to the thermistor. The thermoprotector shuts down (opens) the fuser when the temperature is in excess of 210 degrees C. If the fuser system is shut down by overheating, allow a ten minute interval to pass so the roller may cool before returning power to the printer.

NOTE

The glass nipple on the fuser bulb (see Figure 3-26) is the hottest portion of the fuser bulb during printer operation. When installing the fuser bulb, ensure that this nipple faces the thermistor.

A replaceable cleaning pad (see Figure 3-24) rides on top of the fuser roller. This pad is to be replaced by the operator each time a new EP cartridge is installed. The pad provides a silicon oil lubricant to the fuser roller and helps clean off any residual toner which may have accumulated on the roller. The application of the silicon oil to the Teflon surface of the fuser roller creates a virtual non-stick surface which prevents the toner from being transferred (offset) to the fuser roller.

Four separation pawls ride along the fuser roller and assist in peeling the paper off the roller. Once the paper is fused, the paper exit rollers (see Figure 3-24) deliver the paper to the output paper tray.

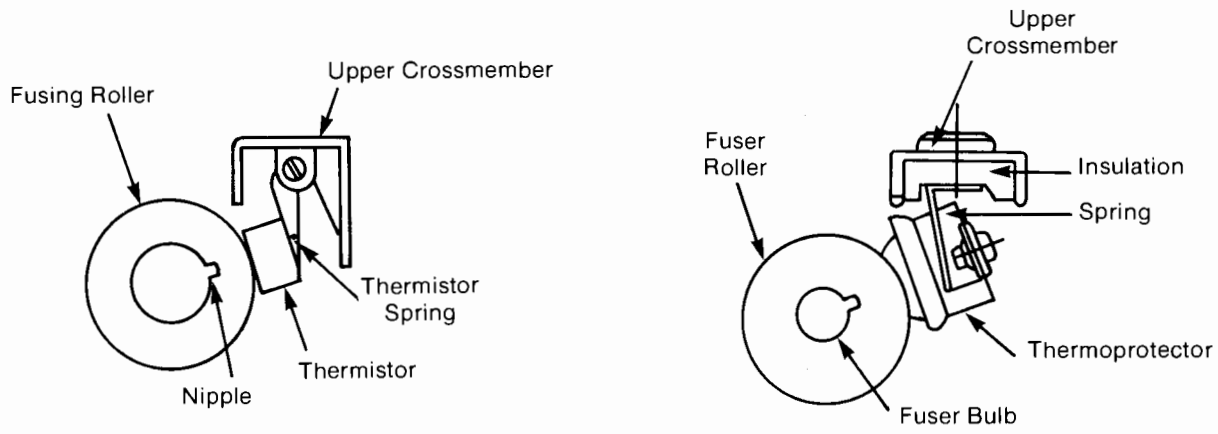


Figure 3-27. Thermistor and Thermoprotector

Delivery Unit-HP 2686D

Overview

The delivery unit receives the printed output page from the fusing system and passes the sheet to the output tray. The output can be placed into the tray in either the FACE-UP mode or the FACE-DOWN mode. Mode selection is done by manually positioning the selection lever (green lever) in the desired position. The selection lever changes the output paper path by deflecting the page into a temporary holding tray and then reversing the direction of the sheet to accomplish a FACE-DOWN operation. In the FACE-UP mode the page passes directly through the delivery unit into the output tray.

When FACE-DOWN mode is selected the Job Offset feature can be operated programatically. Job offset mechanically shifts the page to the right within the holding tray before it is fed into the output tray. By shifting the page on alternate jobs, an operator can easily separate the output for quick distribution to the users.

This unit has a delivery motor (M2) which drives the tray feed-in and feed-out rollers and operates the synchronizing paper delivery rollers via gears, sprockets and timing belts. The delivery motor (M2) also drives the slotted-disk to generate pulses from PS7.

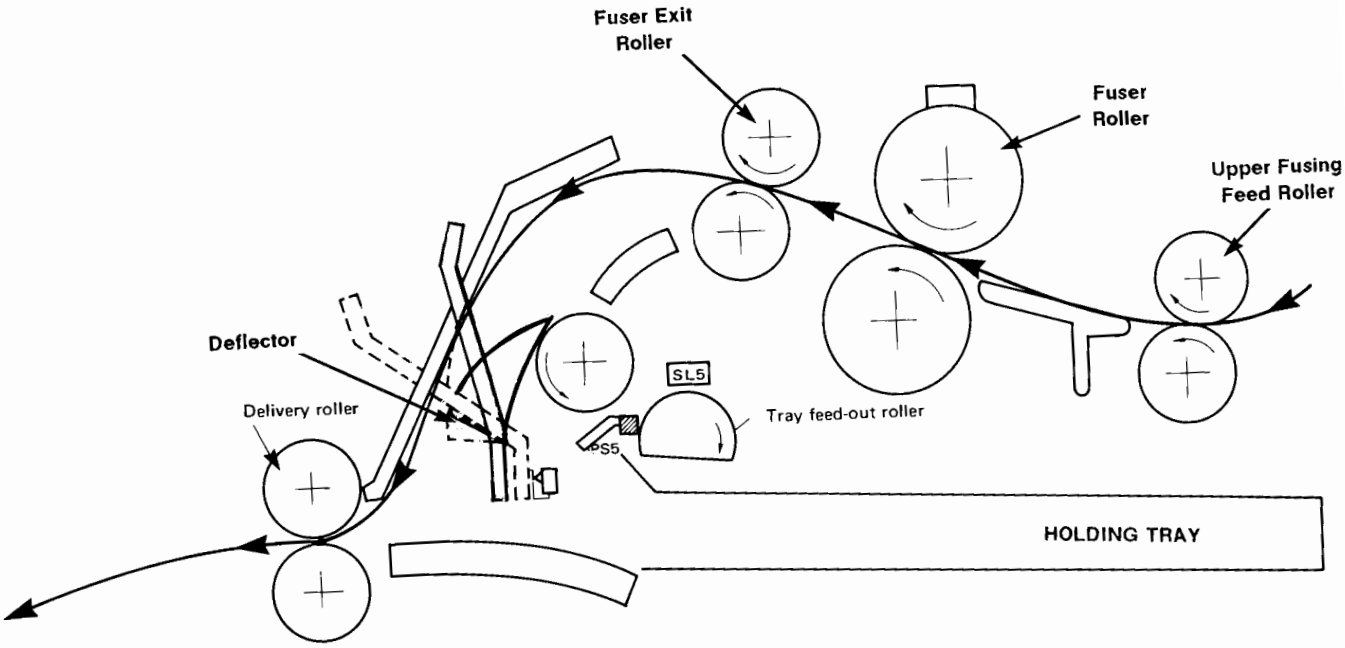


Figure 3-28. Face-up operation

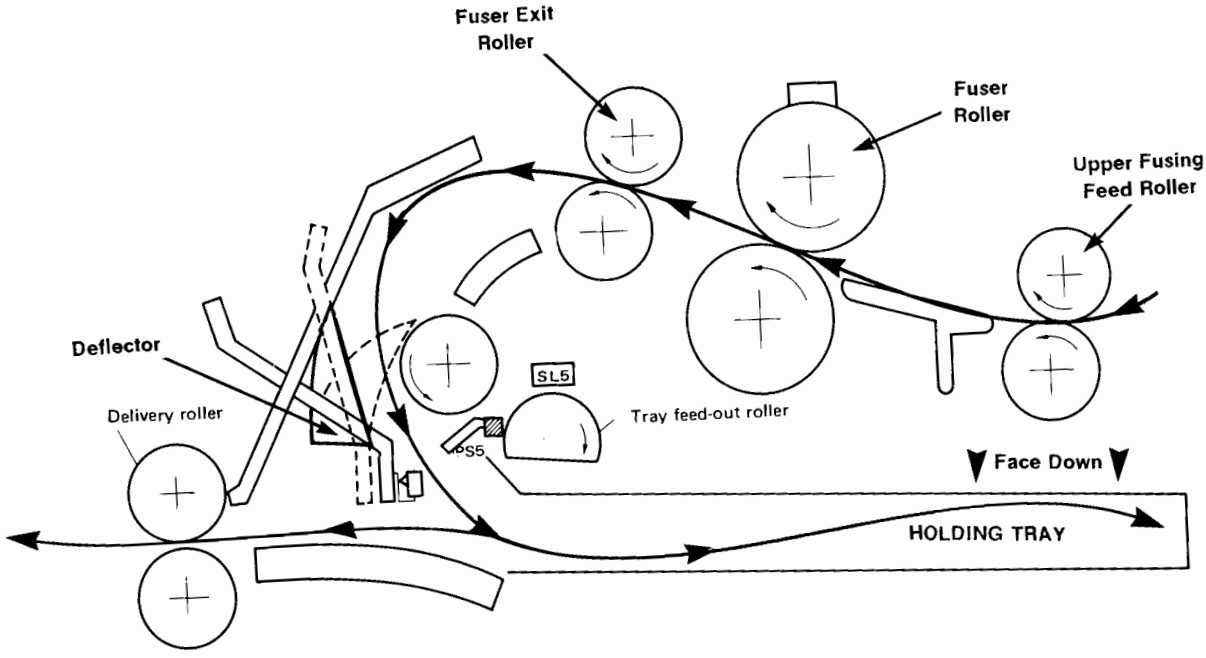


Figure 3-29. Face-down operation.

Face-Up/Face-Down Operation

The selection lever is connected to a deflection shaft which alters the paper path. The selection lever also operates a switch (MS9) to signal the DC Controller PCA of the status of the output mode. When the DC Controller senses the mode it alters the jam detection timings and notifies the program of the status.

The deflection shaft has three spring loaded rollers that force the paper against the tray feed-in roll as the paper moves into the holding tray. Once in the holding tray, the tray inlet sensor (PS5) signals that the paper is clear of the tray feed-in roll and the tray feed out clutch solenoid (SL5) can be energized.

The tray feed-out clutch rollers rotate and feed the paper out of the temporary holding tray. The three tray feed-out rollers ("D" shaped) are similar to the cassette pickup rollers.

The paper is then fed from the tray feed-out rollers to the delivery exit rollers and to the output tray. As the page passes the delivery exit rollers it is sensed by the delivery exit sensor (PS6) and checked for a possible jam condition.

As shown in Figure 3-30, the tension sprocket is driven via the feed-in roller drive sprocket and timing belt.

Drive from the tension sprocket is transmitted to the feed-out roller drive gear. When the tray feed-out clutch solenoid is OFF, the pawl stops the control ring from rotating.

One end of the clutch spring is hooked to the control ring and the other end to the clutch driven drum. When the control ring stops, the clutch spring loosens from the drive gear, preventing the clutch driven drum and the feed-out roller from rotating.

When the solenoid is ON, the pawl is separated from the projection on the control ring. The clutch spring wraps around the drive gear and the control ring starts to rotate. Since the clutch spring is also connected to the clutch driven drum, the drum rotates to drive the feed-out roller to feed paper out of the paper reversing tray to the delivery rollers. (See figures 3-30 and 3-31).

After the control ring rotates one turn, the solenoid turns OFF, and the feed-out roller stops at its original position.

The printer is now ready for the next sheet of paper to enter the paper reversing tray.

Job Offset Assembly

The solenoid which shifts paper to the right side of the tray when energized is SL6. This solenoid is activated by a command from the Interface PCA (program or self test) via the DC Controller and the Paper Control PCA (see Figure 3-32). Job offset can only operate in "Face-down" output mode.

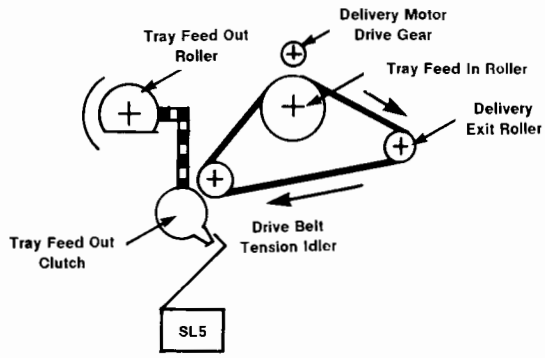


Figure 3-30. Delivery Drive Unit

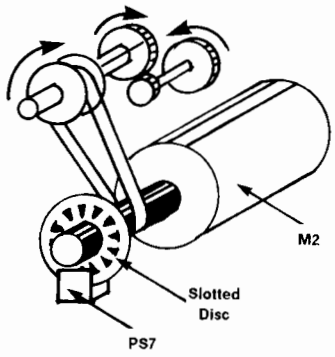


Figure 3-31. Delivery Unit Drive Motor

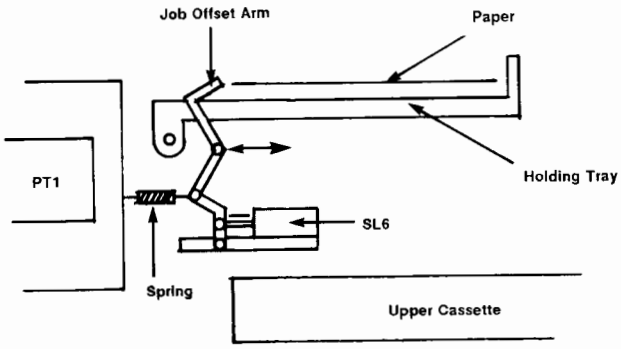


Figure 3-32. Job Offset

Jam Detection

The registration unit, fusing assembly, and delivery unit are provided with sensors (PS1, PS3 and PS6) to check that paper is fed normally. If paper is not fed normally, a paper jam is declared, the JAM status display (13) on the control panel lights, and the main motor and delivery motor stop. There are three types of paper jams:

1. Undetected Jam - jam caused damage to paper; no Status Display (13).
2. False Jam - no paper damage occurred; Status Display (13) occurred.
3. Real Jam - paper damage occurred; Status Display (13) occurred.

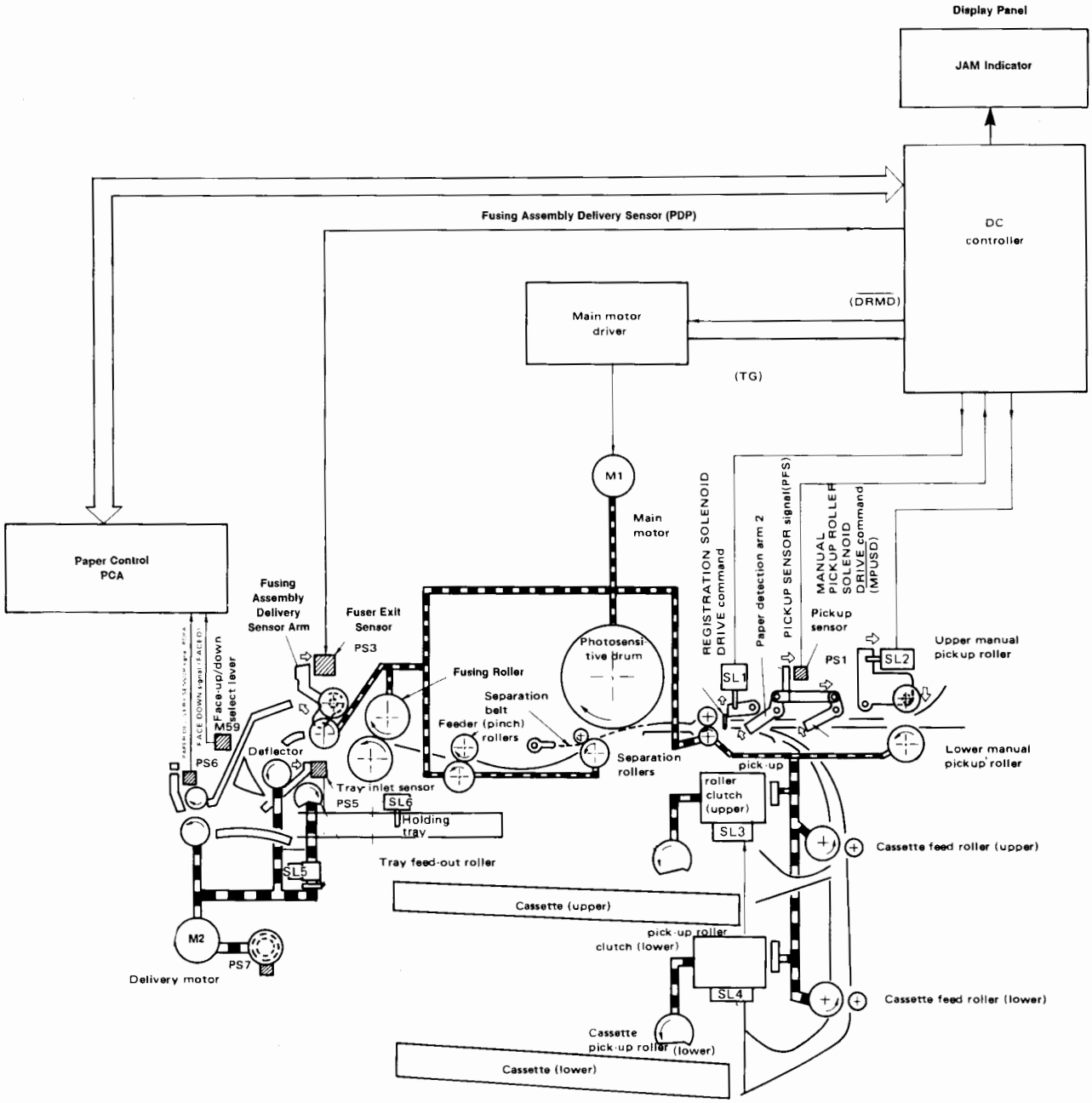


Figure 3-33. Jam Detection

For detecting jams, a photointerrupter senses whether the sheet of paper to be printed has reached or passed through a given point within a specified time. The sensor signal informs the microprocessor on the DC Controller of the presence or absence of paper or a jam. As can be seen in Figure 3-33, there are three paper detection photointerrupters to detect the following five types of jams:

Table 3-4. Paper Jams.

JAM TYPE	CONDITION
Faulty Pickup (Delay)	The paper does not reach the registration sensor (PS1) within the specified time after the DC Controller outputs a TRUE CASSETTE PICKUP ROLLER CLUTCH SOLENOID DRIVE command (See Table 3-5).
Fuser Delay Jam	The paper does not reach the fuser exit sensor (PS3) within the specified time after the DC Controller receives a TRUE VSYNC signal (see Tables 3-6 and 3-7).
Fuser Stationary Jam	The paper does not pass through the fuser exit sensor (PS3) within the specified time after the DC Controller receives a TRUE VSYNC signal (see Tables 3-8 and 3-9).
Delivery Unit Delay Jam (HP 2686D only)	1) When face up mode is selected... The leading edge of the paper does not pass through the paper delivery sensor (PS6) within the specified time after the leading edge of paper has passed through the fuser exit sensor (PS3) (see Tables 3-10 and 3-11). 2) When face down mode is selected... the leading edge of paper does not pass through the paper delivery sensor (PS6) within the specified time after the trailing edge of the paper has passed through the fuser exit sensor (PS3) (see Table 3-12).
Delivery Unit Stationary Jam (HP 2686D only)	1) When face up mode is selected... The trailing edge of the paper does not pass through the paper delivery sensor (PS6) within the specified time after the leading edge of the paper has passed through the fuser exit sensor (PS3) (see Tables 3-13 and 3-14). 2) When face down mode is selected... The trailing edge of the paper does not pass through the paper delivery sensor (PS6) within the specified time after the trailing edge of the paper has passed through the fuser exit sensor (PS3) (see Table 3-15).

NOTE

The times specified on Tables 3-5 through 3-15 are approximate and will vary with different paper lengths.

Faulty Pickup Jam (delay)

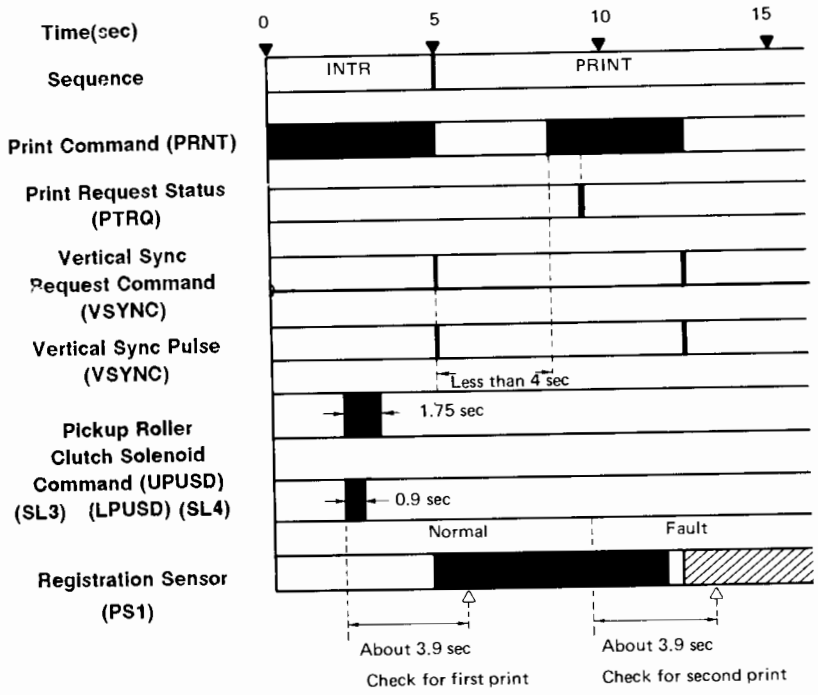


Table 3-5. Timing Chart for Cassette Feed.

NOTE

- If the external device transmits a TRUE PRNT command to the DC Controller within 4 seconds after the leading edge of a TRUE VSYNC signal. the DC Controller does not output PTRQ.
- This timing chart is for an A4 print. Jam detection timing (about 3.9 seconds after SL3 or SL4) is the same for other sizes.
- The upper or lower cassette pickup roller clutch solenoid is selected by a signal from the external device.

*signal names

	HP 2686A	HP 2686D
SL3	CPUSD	UPUSD
SL4	N/A	LPUSD

Fuser Delay Jam

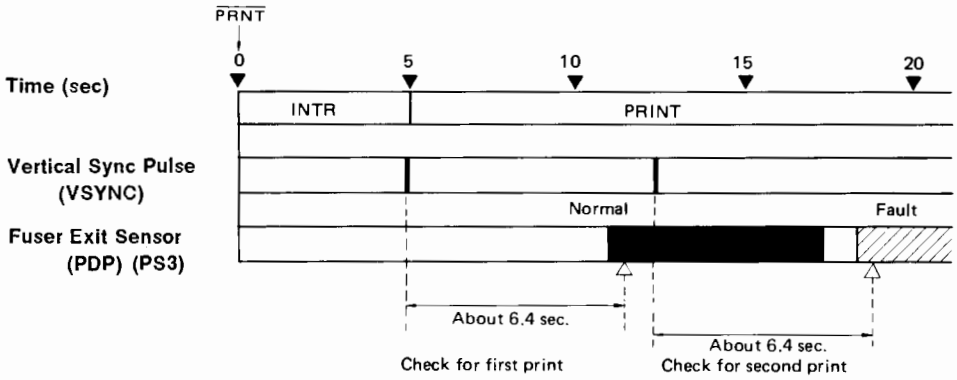


Table 3-6. Fuser Delay Jam for Cassette Feed.

NOTE

The timing chart is for A4 print. Jam detection timing is the same (about 12.9 seconds after a TRUE VSYNC signal) for other sizes.

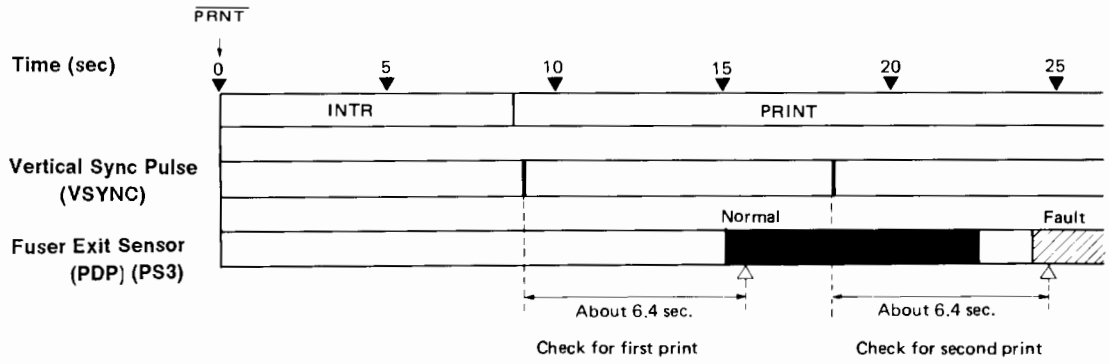


Table 3-7. Fuser Delay Jam for Auxiliary (manual) feed.

NOTE

This timing chart is for legal size paper printed at 5.1 pages/minute throughput. Jam detection timing is the same (about 14.1 seconds after a TRUE VSYNC signal) for other sizes.

Fuser Stationary Jam

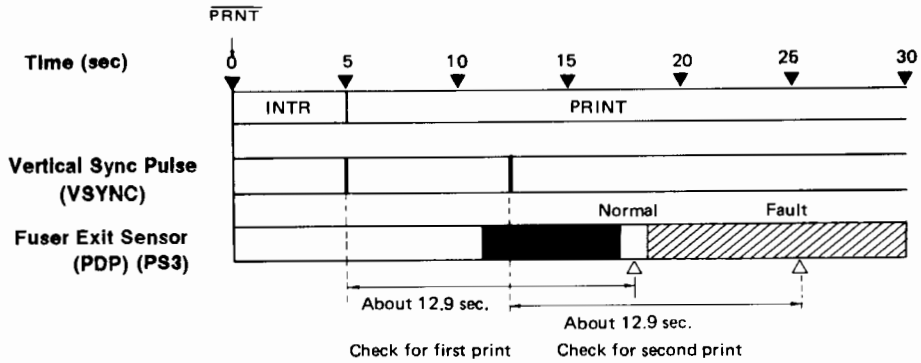


Table 3-8. Fuser Stationary Jam for the Cassette Feed.

NOTE

The timing chart is for an A4 print. Jam detection timing for legal and B4 size paper is 14.1 seconds after a TRUE VSYNC signal. For other sizes, jam detection timing is about 12.9 seconds after a TRUE VSYNC signal.

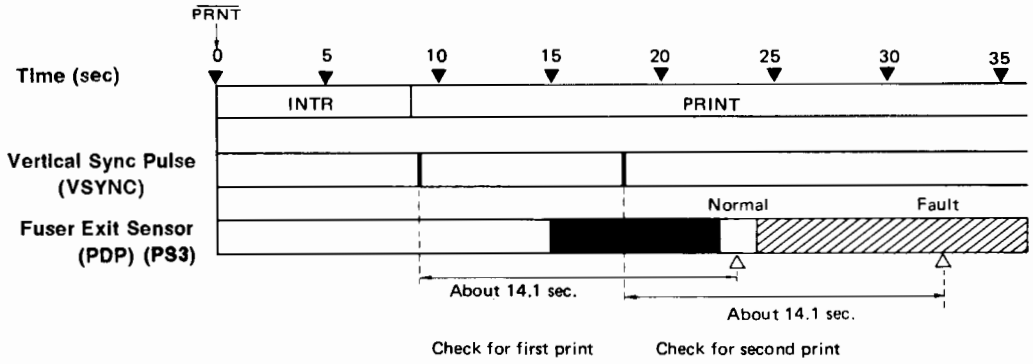


Table 3-9. Fuser Stationary Jam for the Auxiliary (manual) Feed.

NOTE

The timing chart is for legal size paper printed at 5.1 pages/minute throughput. Jam detection timing is the same (about 14.1 seconds after a TRUE VSYNC signal) for other sizes.

Delivery Unit Delay Jam (HP 2686D only)

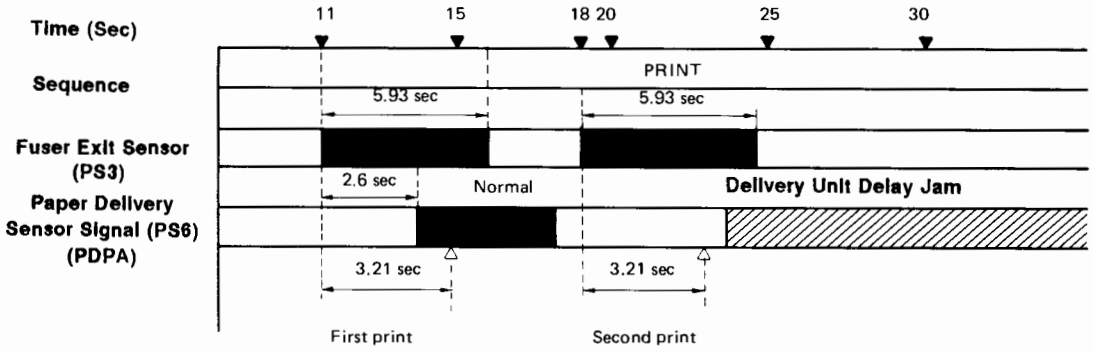


Table 3-10. Timing Chart for Cassette Feed.
(face-up mode and A4 size paper)

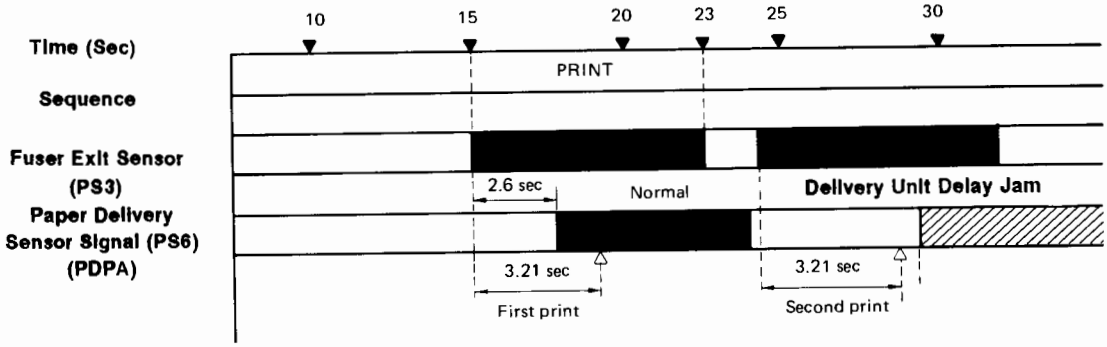


Table 3-11. Timing Chart for Auxiliary (manual) Feed.
(for legal-sized prints at a print speed of 5.1 prints/minute; face-up mode)

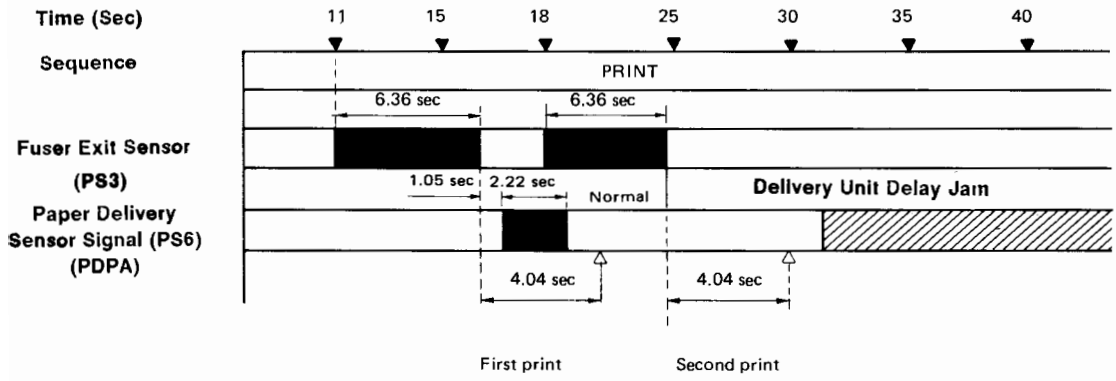


Table 3-12. Timing Chart for Cassette Feed.
(face-down mode and A4 size paper)

Delivery Unit Stationary Jam (HP 2686D only)

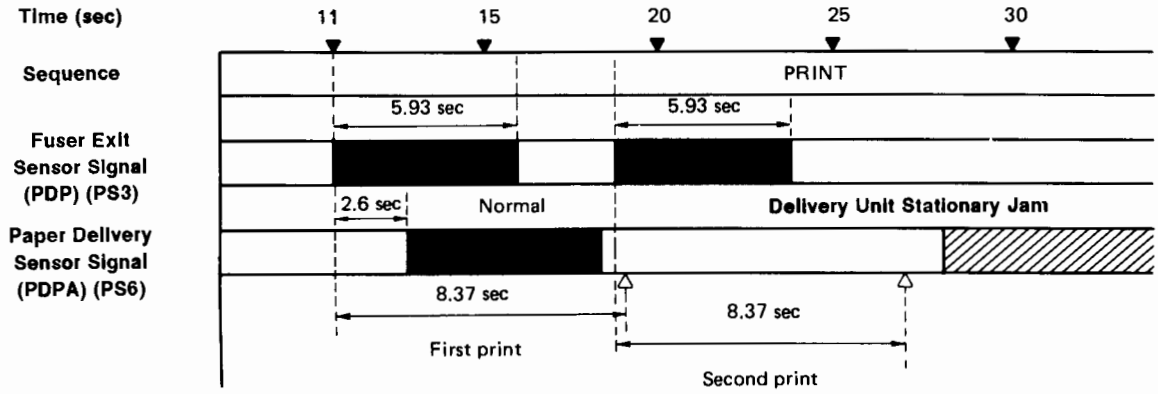


Table 3-13. Timing Chart for Cassette Feed. (face-up mode and A4 size paper)

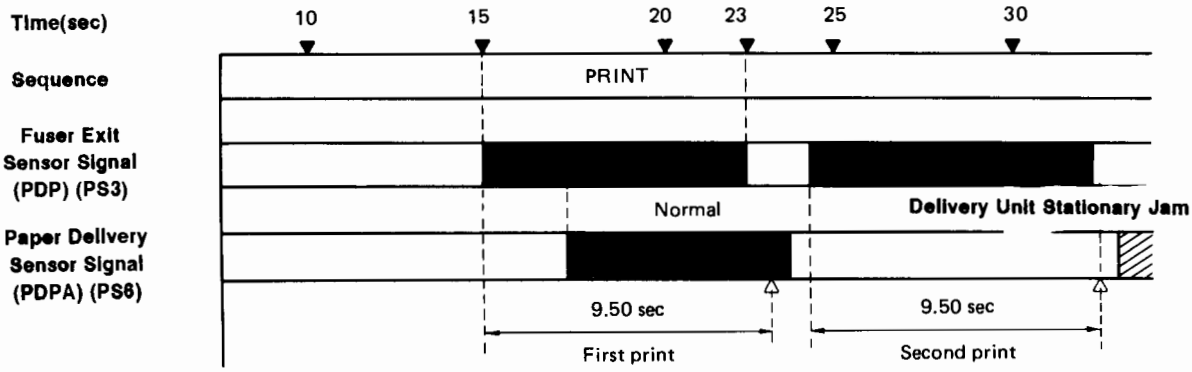


Table 3-14. Timing Chart for Auxiliary (manual) Feed.
(for legal-sized prints at a print speed of 5.1 prints/minute;face-up mode)

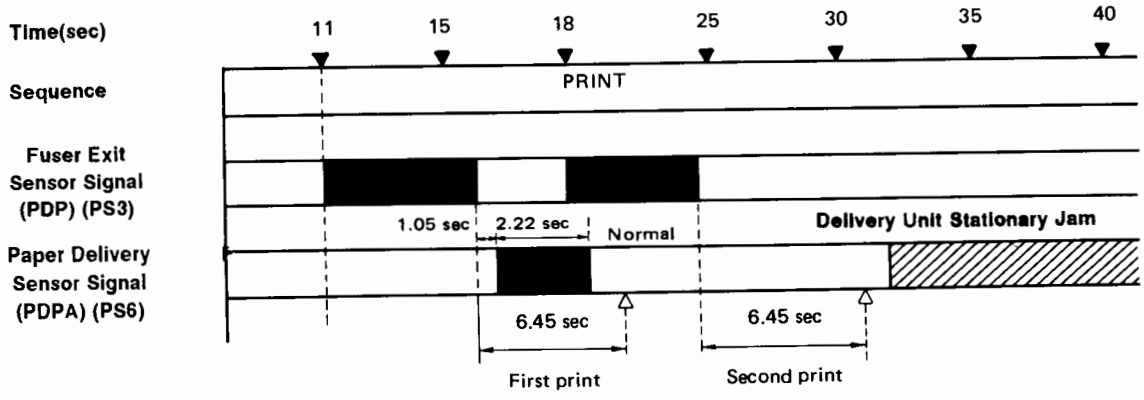


Table 3-15. Timing Chart for Cassette Feed. (face-down mode and A4 size paper)

3-5. OPTICAL SYSTEM

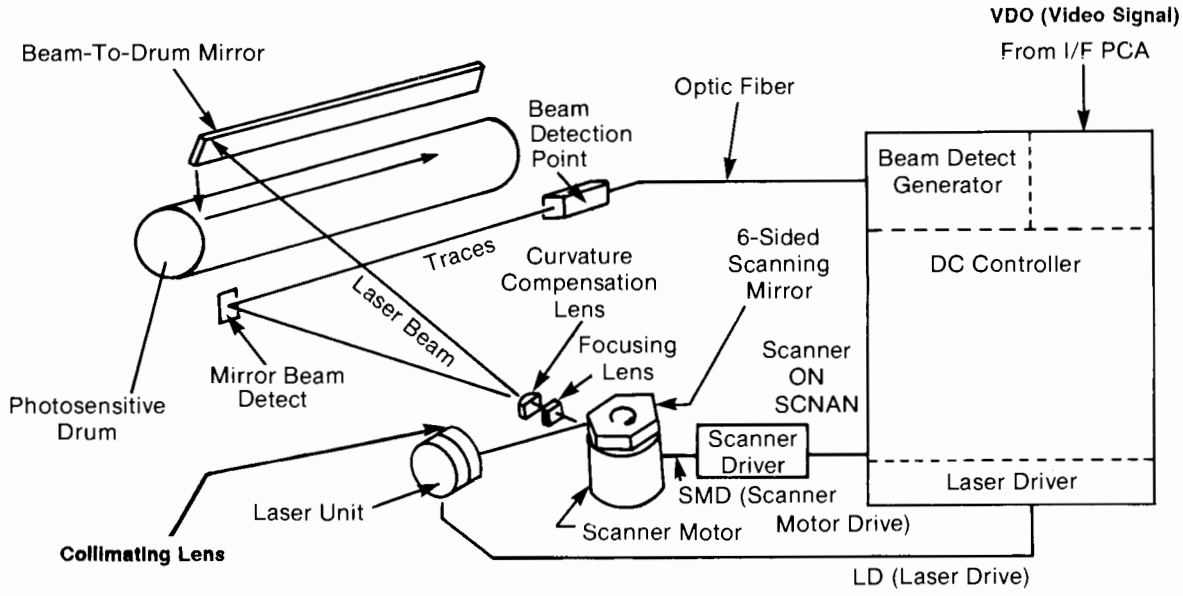


Figure 3-34. Laser/Scanner Unit

The HP 2686A/D printer is a class I laser product, safe for office or data processing use. The laser used in the printer is a solid state, infrared, class III laser.

WARNING

Although the infrared laser beam is invisible, eye damage will occur if direct or indirect (reflected) eye contact with the laser beam should occur. Heed all CAUTIONS and WARNINGS when working with the laser unit.

The laser unit is equipped with a heater unit and its temperature is monitored and regulated by the Machine Control System. Operating the laser unit at a constant temperature ensures a longer laser life and a more consistent laser beam. A collimating lens is incorporated into the laser unit and is used to form a parallel beam of light.

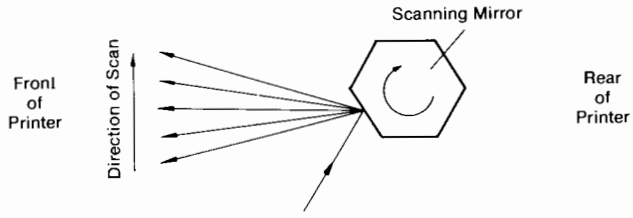


Figure 3-35. Rotating Scanner Mirror

After the laser beam leaves the laser unit the beam strikes a rotating six-sided scanner mirror. Each facet of the scanning mirror represents one scan line of the print image (300 dots/lines per inch). The scanning motor rotates in the clockwise direction (as viewed from the top); therefore the beam scans across the surface of the drum from right to left (as viewed from the front of the printer). After the beam is reflected off the rotating scanner mirror it passes through a focusing lens and a curvature compensation lens. The focusing lens focuses the laser beam to a high resolution spot of light for writing concise-sized dots on the photosensitive drum. The curvature compensation lens compensates for the arc of the laser scan across the drum (i.e. the beam traveling in a horizontal plane must travel further to strike the ends of the drum than to strike the center of the drum). Prior to the beginning of each scan line (at each mirror facet rotation) the beam first strikes a stationary beam detect mirror at the right end of the laser scanner unit. This mirror reflects the beam to a fiber optics cable. The fiber optics cable transmits the laser beam to the DC Controller PCA. This first detection of laser light is called "Beam Detect". The Machine Control System uses beam detect as a reference point (home position) to start printing the horizontal scan line. After encountering the stationary mirror, the beam scans across the beam-to-drum mirror (see Figure 3-34). The beam-to-drum mirror is actually a prism and deflects the beam 90 degrees to scan across the photosensitive drum's surface.

The actual modulation (turning On/Off) of the laser beam occurs on the DC Controller PCA. The information for modulating the beam Video Output (VDO) comes from the Interface PCA. Wherever the laser beam is allowed to strike the drum a dot will eventually be printed. Refer to the paragraph 3-3 for more information on the EP process.

REFERENCE

The following explanation describes how the semiconductor laser chip generates light.

In a semiconductor, the electrons and holes (see Figure 3-36) flow in opposite directions. The two together constitute current flow. A hole is the absence of an electron: a hole has a positive charge.

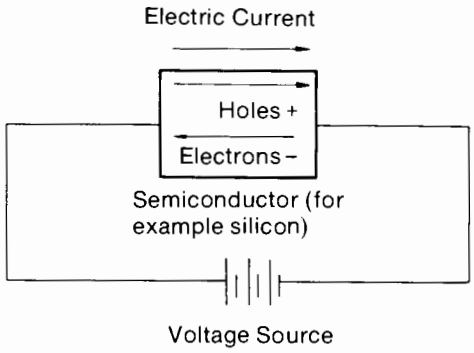
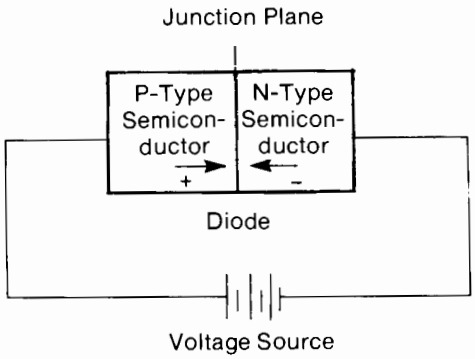


Figure 3-36. Semiconductor

A semiconductor whose mode of conduction is mostly by electrons is called an n-type semiconductor. A semiconductor whose mode of conduction is mostly by holes is called a p-type semiconductor.

A semiconductor laser is a kind of diode combining an n-type semiconductor with a p-type semiconductor. When voltage is applied to the diode as shown in Figure 3-37, holes move to the right and electrons to the left. At the contact face (junction), the electrons and holes combine, producing light.

When voltage is applied to the semiconductor laser as shown in Figure 3-37, the electrons and holes combine emitting light energy in discrete packets. This light is enclosed in the junction, passing back and forth between the two reflective faces.



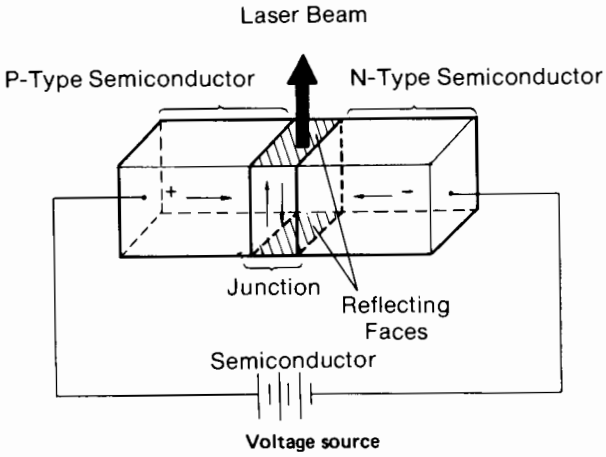


Figure 3-37. Junction plane

As more electrons and holes combine, more light packets continue to be generated. Because of the design and physics of the laser, the light tends to move in phase, somewhat like current in a resonating circuit, and passes through the reflecting faces. When light energy is above a critical level, light is emitted. Every packet of light that escapes from the laser has exactly the same frequency , the light is coherent. The emission from the laser in the printer is the invisible infrared part of the spectrum.

Being coherent, a laser beam can be focused onto a very small point (with the help of a focusing lens). Its high intensity and high resolution are the main requirements for a laser printer.

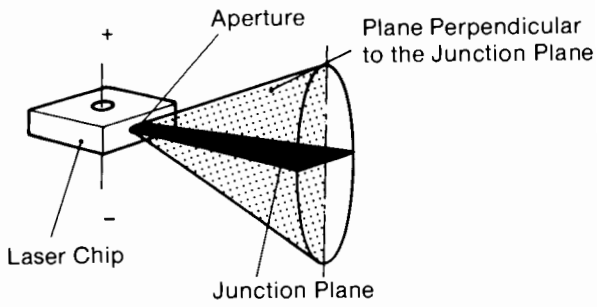


Figure 3-38. Dispersion of laser beam

Figure 3-38 illustrates how light produced by the laser chip would diffuse. For reasons of optics, a small convex lens is mounted immediately outside the beam aperture to make the laser light parallel, drawing it into a thin, tight beam.

3-6. MAIN DRIVE

The main drive motor provides all the drive necessary for printing. The main motor is controlled by the DRUM DRIVE command (DRMD) from the DC Controller PCA. The dashed line in Figure 3-39 represents mechanical linkage (gear driven assemblies) within the printer.

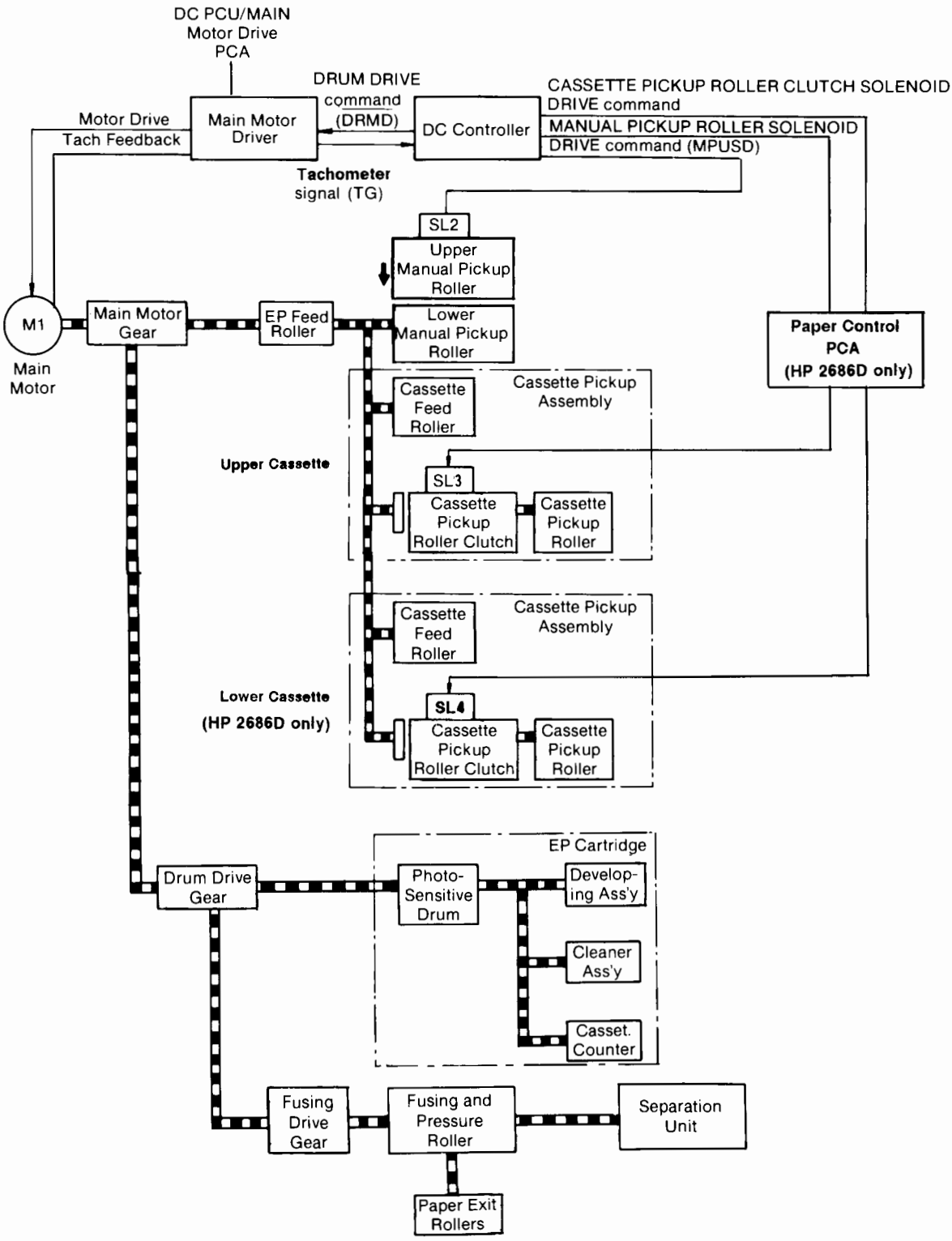


Figure 3-39. Main Drive System

The DRUM DRIVE (DRMD) signal is generated by the Machine Control System on the DC Controller PCA. This signal is input to the DC Power Supply/Main Motor Driver PCA which generates the drive voltage for the drive motor. A tachometer signal is generated by the drive motor (TG) and is used as a feedback signal to regulate motor speed. The tachometer signal also serves as the printers clock for regulating mechanical functions within the printer.

Through a gear reducing transmission, the main drive motor provides direct drive to all mechanical drive gears in the printer (see 3-39). The main drum drive gear has a spring loaded drive pin which protrudes into a slot on the EP cartridge when the cartridge is installed in the printer. As the drive gear rotates, all mechanical functions within the EP cartridge (photoconductive drum, developer roll, cleaner station vane, and EP cartridge usage counter) are rotated.

The drum drive gear transmitts motion through a series of idler gears to drive the fusing assembly gear train.

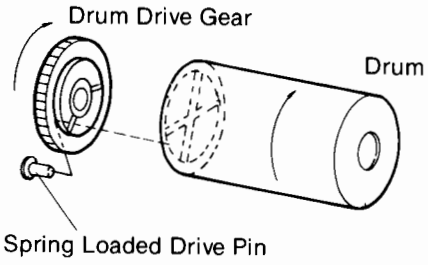


Figure 3-40. EP Cartridge Drum Drive

The main drive motor also provides drive to all feed rollers. It should be understood that drive is present at the paper feed gears (the gears are always rotating). However, these gears will only advance paper when either the manual feed or cassette pickup solenoids are activated.

3-7. POWER SUPPLIES

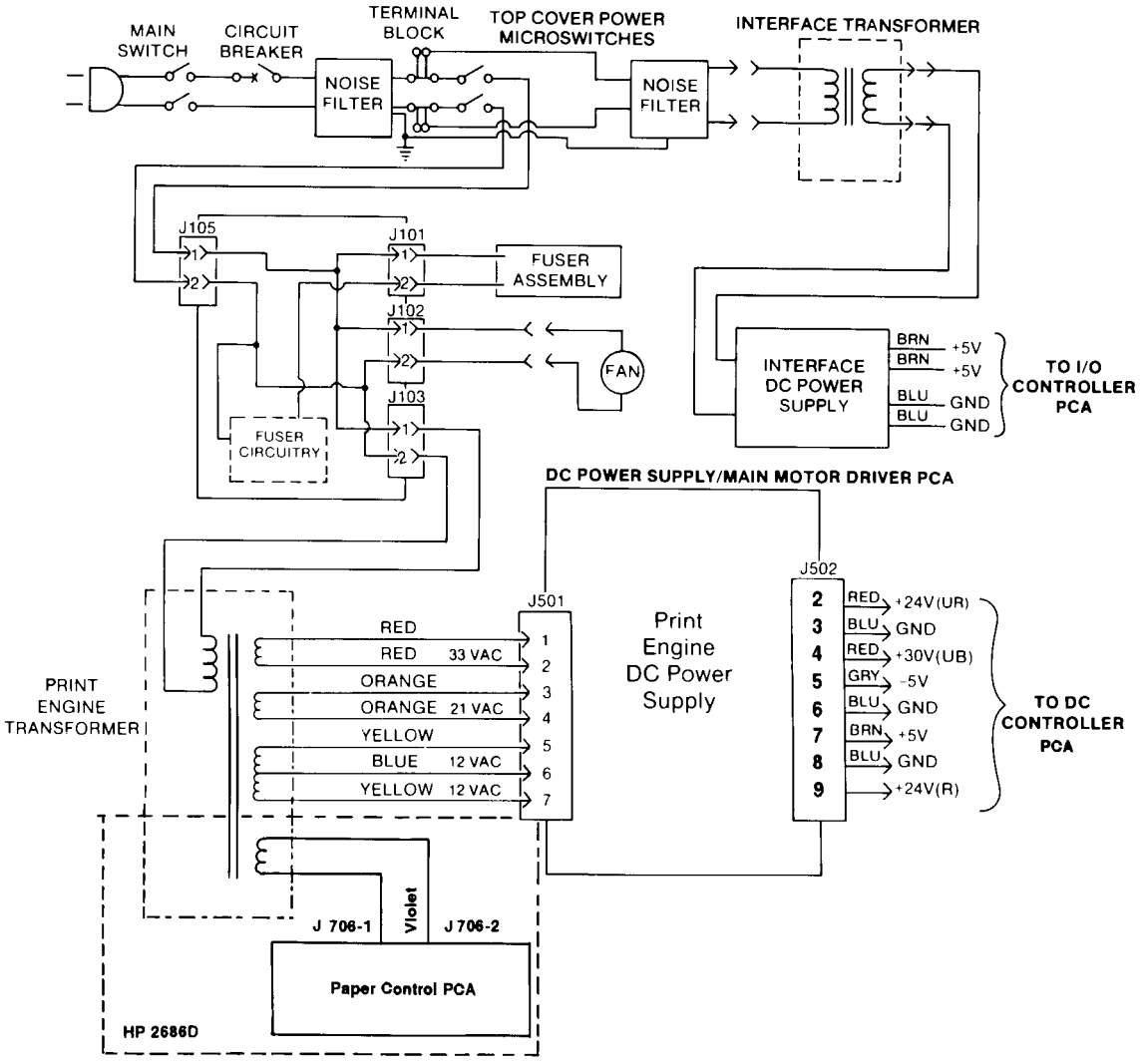


Figure 3-41. Power Supplies

The AC power distribution of the printer is shown in Figure 3-41. AC power enters the printer at the main switch located at the front of the printer. From the main switch, power travels through a circuit breaker, a noise filter, and to the terminal blocks. The AC power at that point is distributed to: 1.) a second noise filter and then on to the Interface transformer (PT-2) and 2.) to the AC Controller PCA where power is distributed to the print engine transformer, cooling fan, and fusing assembly and control circuitry. Power may only be distributed to the latter circuitry when the top cover of the printer is closed (the interlock micro-switches have been closed). The voltages from the secondaries of both transformers are input to the two DC power supplies (print engine power supply and interface power supply).

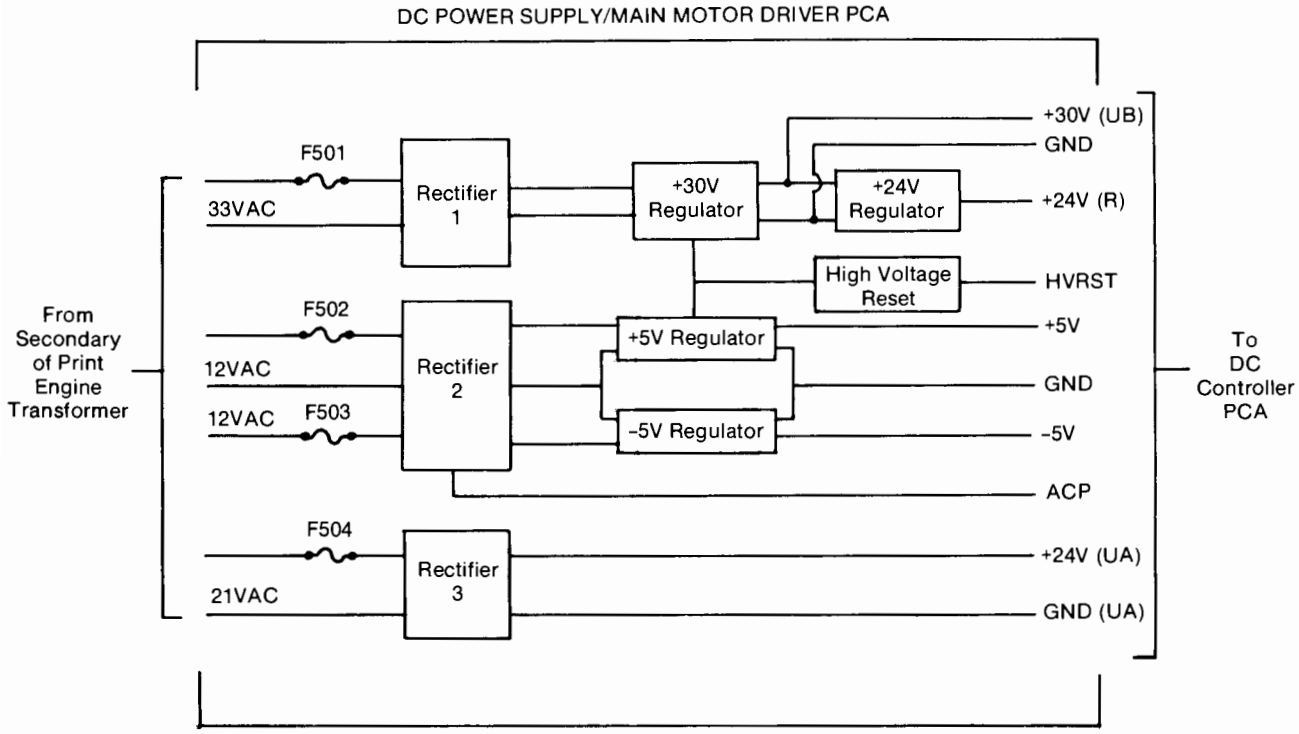


Figure 3-42. Print Engine Power Supply

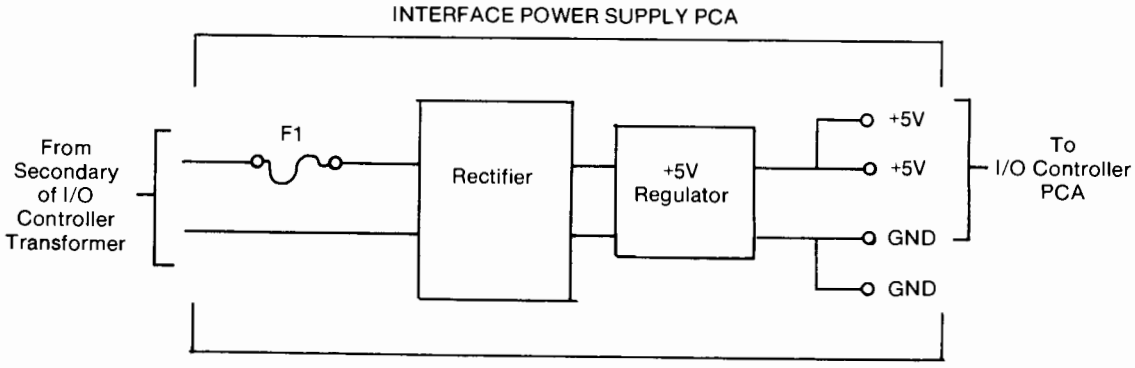


Figure 3-43. Interface Power Supply

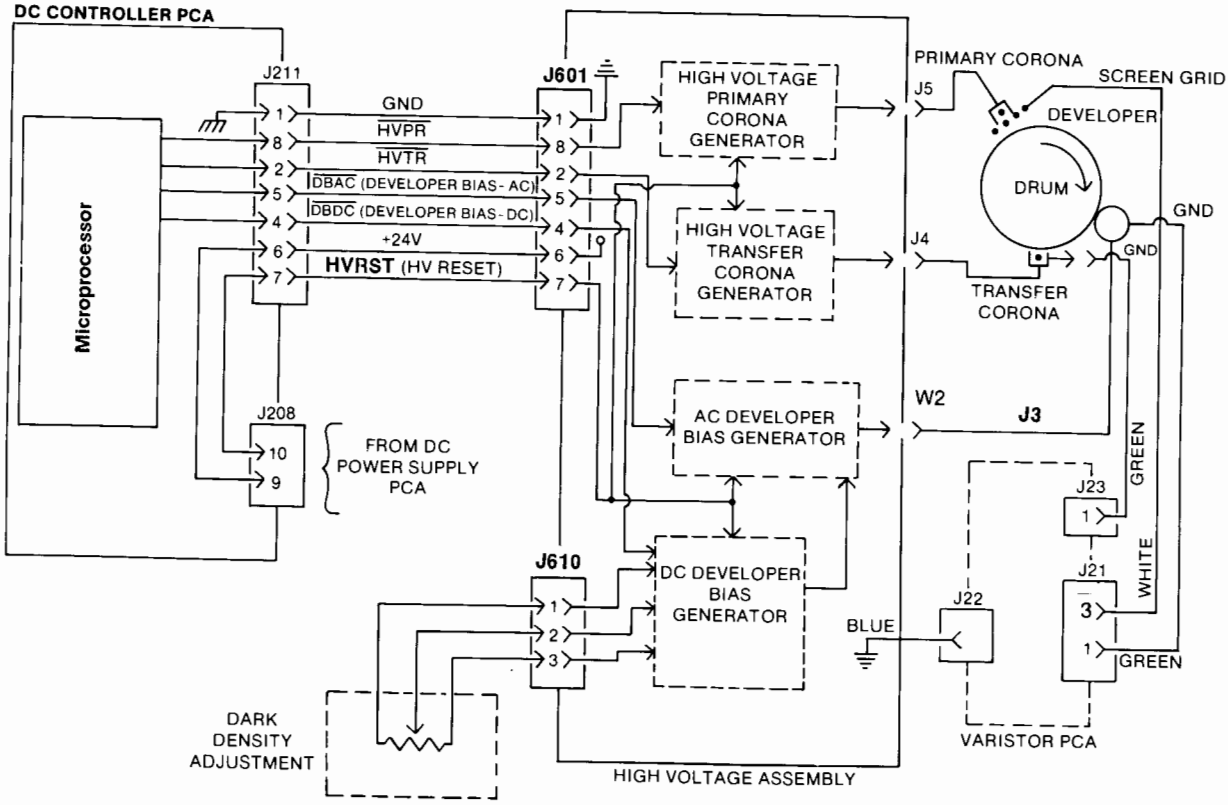


Figure 3-44. High Voltage Power Supply

3-8. MACHINE CONTROL SYSTEM

The Machine Control System consists of the DC Controller PCA's microprocessor and its supporting peripherals and memory. The microprocessor controls the operation of the print engine by monitoring all activities (sensors) and directing all mechanical activities. The Machine Control System processor also communicates with the Interface processor for the exchange of video data and status information. Figure 3-45 provides a block diagram of the Machine Control System. The following is a summary of the operations monitored or controlled by the DC Controller PCA.

Sensors/Switches

Paper Size (HP 2686A)(PSIZEn)*	Indicates whether the cassette is installed
Paper Size (HP 2686D lower tray)(PSIZEDn)*	and indicates the cassette size.
Paper Size (HP 2686D upper tray)(PSIZEUn)*	*n=size number 1,2 or 3
EP Cartridge Installed (CEMP)	Indicates whether the EP cartridge is installed
Drum Sensitivity (CSENS1) (CSENS2)	Indicates drum sensitivity
Paper Out (PEMP) (upper and lower)	Indicates no paper (PS2 & PS4)
Registration Sensor Signal (PFS)	The registration sensor has sensed paper (PS1)
Fuser Exit Signal (PDP)	Indicates that fused print has advanced through the fuser (PS3)
Test Print Command (TSTPT)	Causes a test print to be made
Paper Delivery Unit Sensor (PDPA)	Indicates that paper is delivered to the output tray (PS6)
Tray Inlet Sensor (THRS)	Activates tray feed-out solenoid (PS5)
Slotted Disc Sensor (CLKP)	Delivery Motor (M2) Speed Feedback (PS7)

Solenoids, Erase Lamp, and Laser Heater

Pickup Solenoid (CPUSD) (HP 2686D lower tray)	Energizes the pickup solenoid (SL4)
Pickup Solenoid (CPUSD) (HP 2686D upper tray)	Energizes the pickup solenoid (SL3)
Manual Feed Solenoid (MPUSD)	Energizes the manual feed solenoid (SL2)
Registration Solenoid (RGSD)	Energizes the registration solenoid (SL1)
Erase Lamps (PEXP)	Illuminates the erase lamps
Laser Heater (LSRHD)	Actuates the heater in the laser unit
Job Offset Solenoid (SHTSL)	Energizes the job offset solenoid (SL6)
Tray Feed-Out Clutch (FCDSL)	Energizes the tray feedout clutch solenoid (SL5)

High Voltage Power Supply Signals

Primary Corona (HVPR)	Enables the primary corona
Transfer Corona (HVTR)	Enables the transfer corona
Developer Bias AC (DBAC)	Enables the developer bias AC
Developer Bias DC (DBDC)	Enables the developer bias DC

Enabling Signals

Laser Drive Signal (LD)	Drives the laser output
Scanner Drive (SCNON)	Controls the scanner mirror rotation
Fuser Drive (FSRD)	Actuates the fuser lamp
Drum Drive Command (DRMD)	Actuates the drum drive (main motor)

Feedback Signals

Laser Temperature (LSRTH)	Indicates the temperature of the laser
Fuser Temperature (FSRTH)	Indicates the temperature of the fuser
Scanner Ready Signal (SCNRD)	Indicates the scanning mirror is rotating at the correct speed.
Tachometer Signal (DRMCK)	Generates a pulse proportional to the main motor rotation (PS7)
Print Counter Drive (TM)	Advances the counter that registers total number of prints made
Beam Detect (BD)	Indicates the beginning of a new scanline

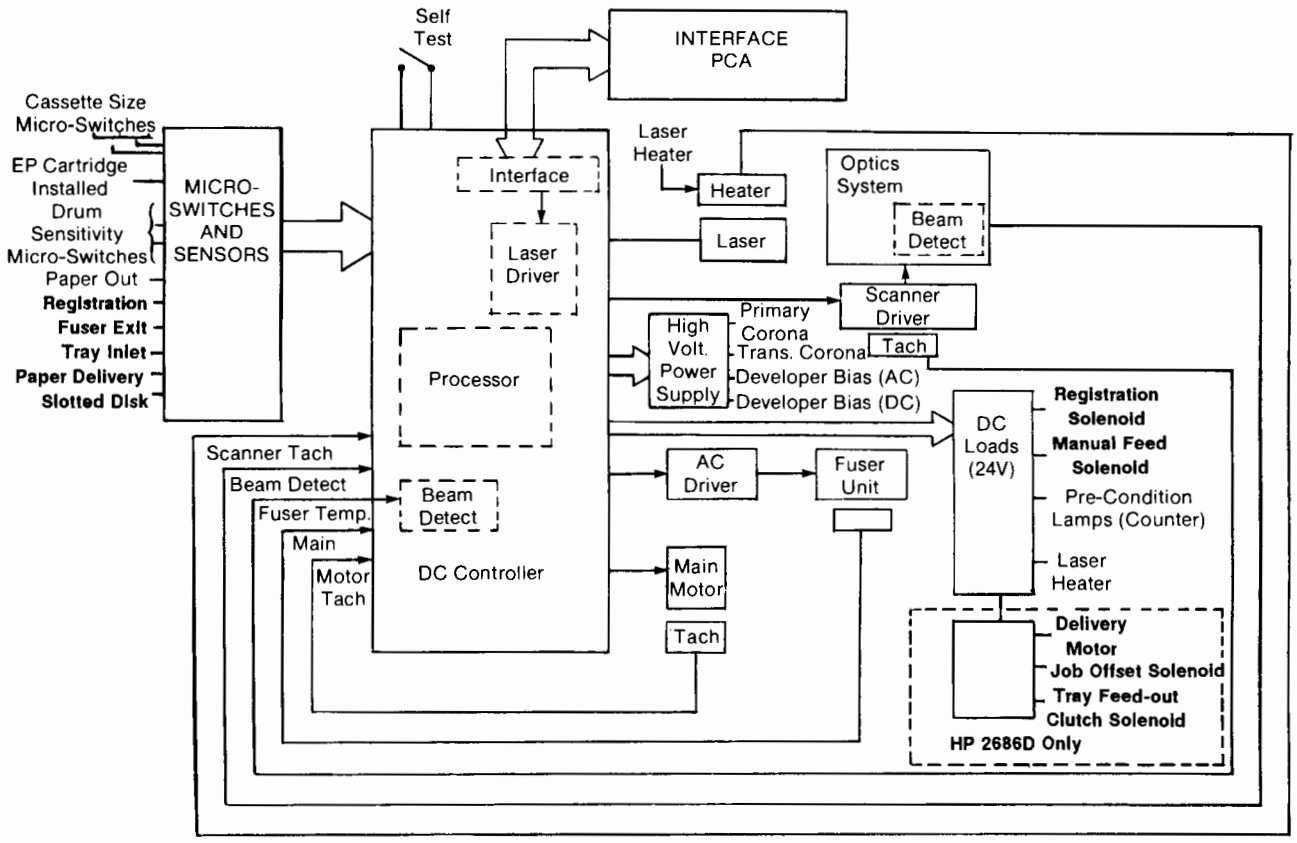


Figure 3-45. Machine Control System Block Diagram

3-9. INTERFACE SYSTEM

The interface control system is comprised of the Interface PCA. The controller interface is responsible for communicating with the host device, the Control panel, and the print engine portion of the printer via the Machine Control System (DC Controller PCA). An optional font cartridge may also be installed in the Interface PCA to provide additional fonts for the printing of text. Figure 3-46 illustrates the relationship of the Interface PCA with the operation of the HP 2686A/D.

A block diagram of the Interface PCA is shown in Figure 3-47; an explanation of each block within the diagram follows:

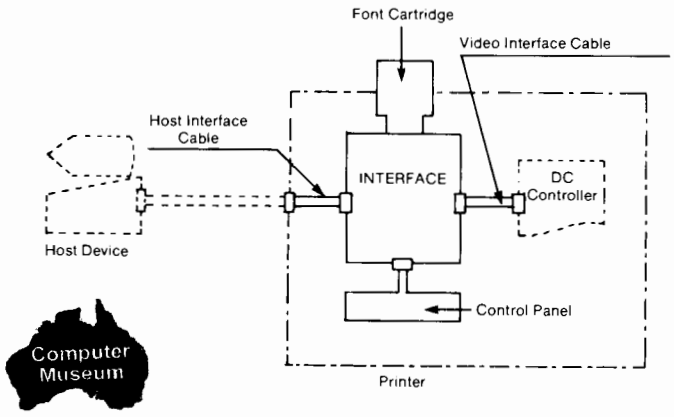


Figure 3-46. Interface Functions

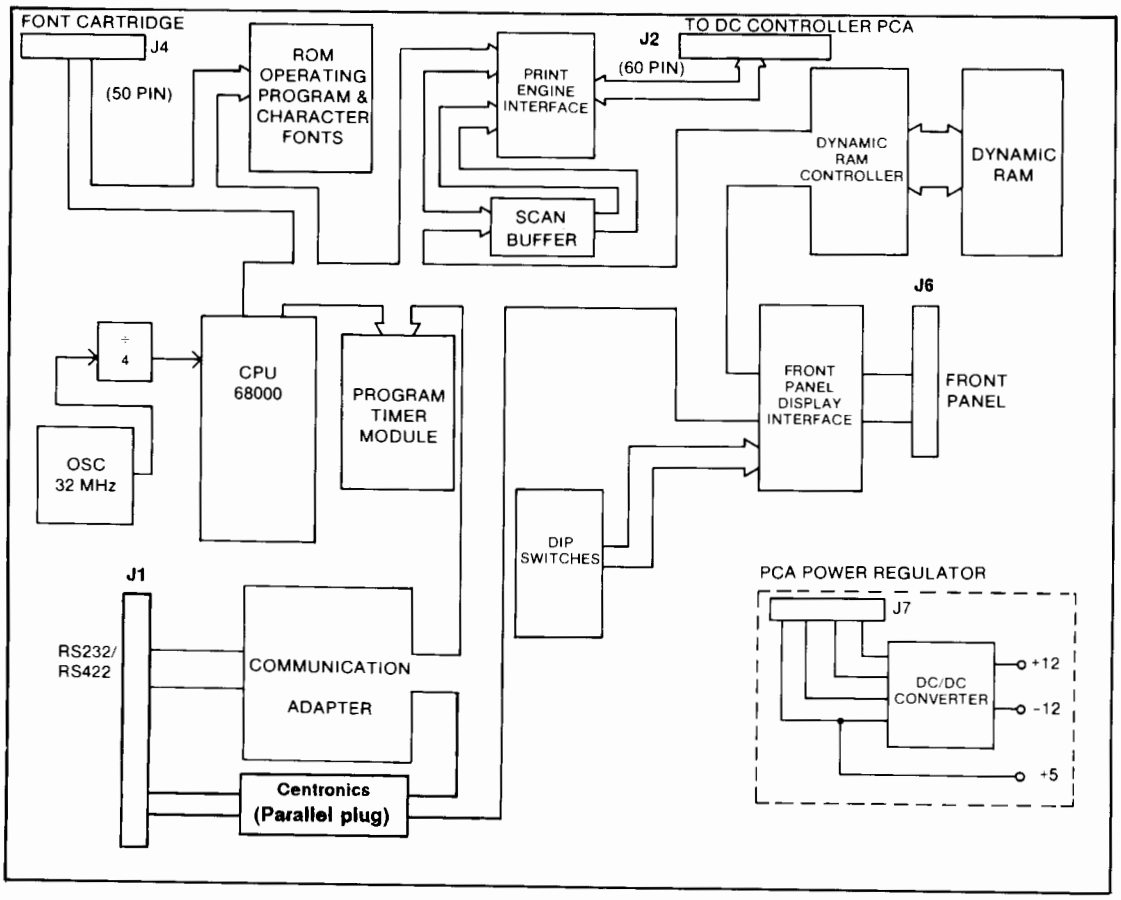


Figure 3-47. Interface Block Diagram

CPU

The 68000 microprocessor and its supporting peripheral circuits are used to regulate all functions on the Interface PCA. All operating instructions are stored in read only memory (ROM) on the PCA.

Communications Adapter

The communications adapter (CA) regulates all interface timing between the host device and the Interface's microprocessor (68000).
The Interface PCA may communicate to a host device either through a RS-232 or RS-422 interface or a Parallel (Centronics) interface.
The HP 2686A option 210 or option 300 comes equipped with a Parallel (Centronics) interface. The HP 2686D and the HP 2686A-Option 300 have dual interface connectors to allow selection of either Serial or Parallel (Centronics) interface operation.

Programmable Timer Module (PTM)

The PTM regulates the Interface's timing. The timer is programmed by the PCA's microprocessor.

Scan Buffer

The scan buffer temporarily stores up to eight scanlines of dots to be printed. These scanlines were generated by microprocessor from the ASCII data received from the host system and from the font patterns stored in memory. The buffer is comprised of four, two Kbyte RAM chips.

Print Engine Interface

The print engine interface converts the dot patterns from the scan buffer into serial video signals and outputs these signals to the print engine's DC Controller PCA. Print Engine status also is exchanged through this interface.

ROM

The Interface's resident Read Only Memory (ROM) contains the microprocessor's operating instructions and the resident character sets. Additional character fonts may be stored in ROM on an optional font cartridge.

Dynamic RAM (DRAM)

The DRAM is used as a buffer for character code data input from the host system and for the font pattern to be printed.

Control Panel Interface

This interface provides for communications between the display panel and the microprocessor.

3-10. PAPER CONTROL PCA

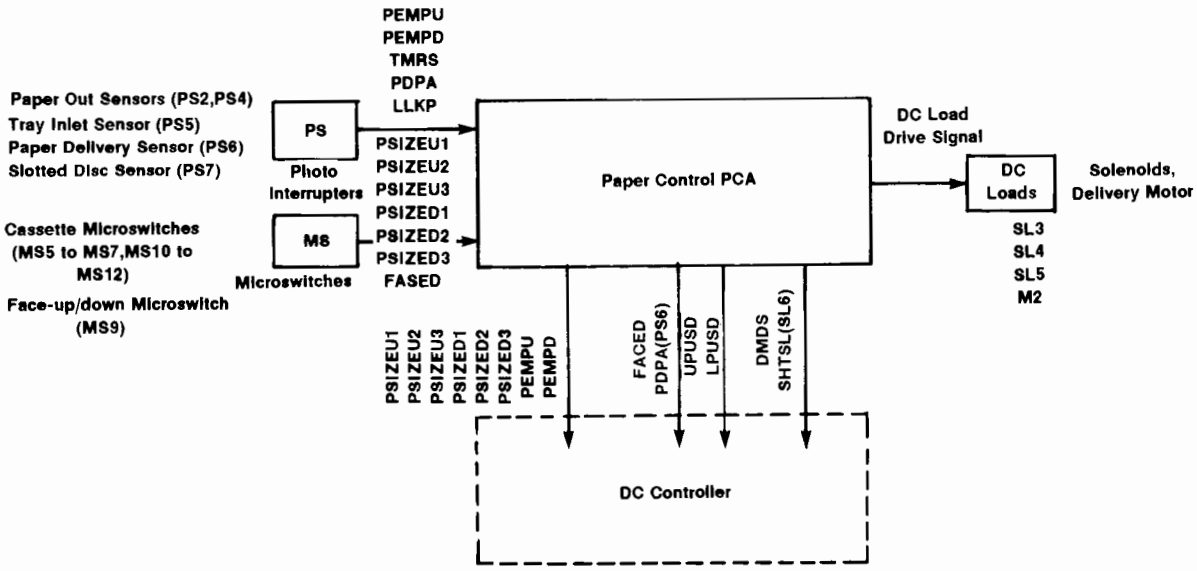


Figure 3-48. Paper Control PCA

Overview

The Paper Control PCA controls the operation of the delivery motor according to instructions from the microprocessor on the DC Controller PCA.

It also controls actuation timing for the job offset solenoid and the tray feed-out clutch solenoid when face down (paper) mode is selected.

The Paper Control PCA feeds the following signals directly to the DC Controller:

1. PAPER SIZE signals
2. PAPER OUT signals
3. Upper PICKUP ROLLER CLUTCH SOLENOID signal
4. Lower PICKUP ROLLER CLUTCH SOLENOID signal
5. DELIVERY SENSOR signal

Paper Reversing and Job Offset

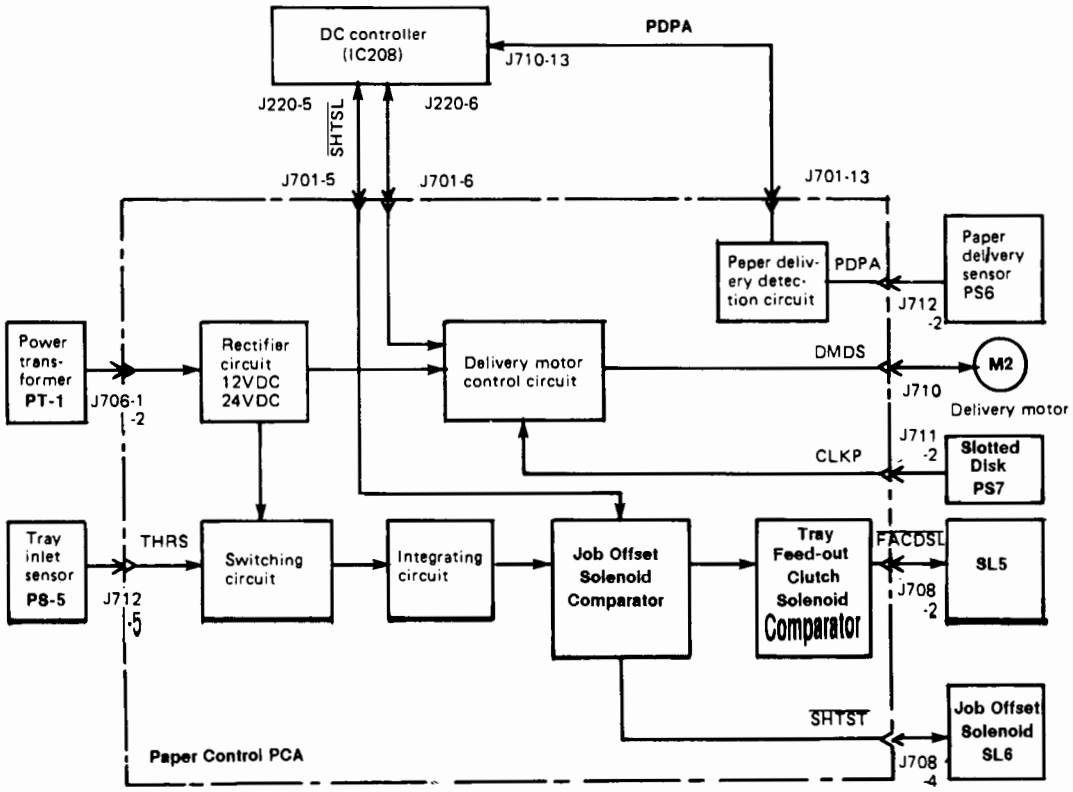


Figure 3-49. Paper Control PCA & Reversing/Job Offset Diagram

Operation

Delivery Motor Drive

After receiving a TRUE PRINT command (PRNT) from the Interface PCA, the microprocessor on the DC Controller PCA outputs a TRUE DELIVERY MOTOR DRIVE command (DMDS) to the delivery motor control circuit on the Paper Control PCA. This causes the delivery motor control circuit to drive the delivery motor (M2).

The clock pulse slotted disk is driven by the delivery motor and causes the slotted disk sensor (PS7) to generate a clock signal (CLKP) with a frequency proportional to delivery motor speed.

The delivery motor control circuit receives the slotted disk sensor signals (PS7). Based on this signal, the delivery motor control circuit determines the speed of the delivery motor, and controls the delivery motor drive voltage so that the motor rotates at a constant speed.

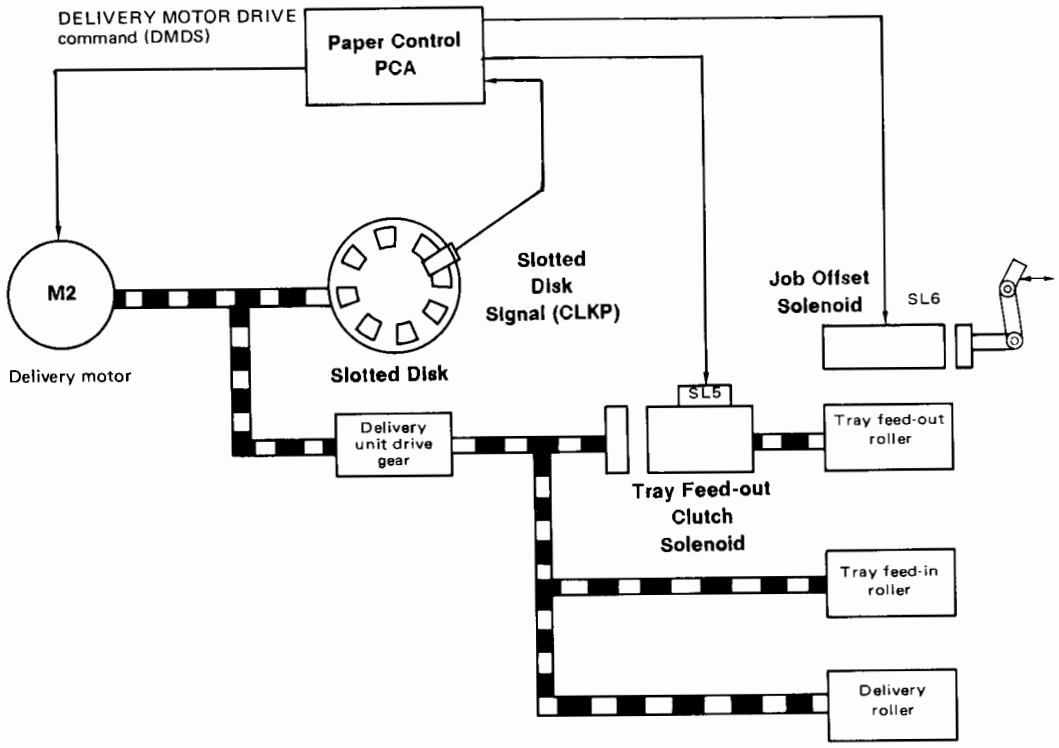


Figure 3-50. Delivery Unit Drive Diagram

The paper stacking lever is used to move the deflector. The lever also actuates a microswitch to notify the external equipment about the mode selected.

If the paper stacking lever is set for face-up delivery, a HIGH FACE-UP/DOWN STATUS signal (FACED) is input to the Paper Control PCA and then sends a HIGH FACED signal to the DC Controller. This causes the DC Controller to notify the external device via an interface line (STATUS COMMAND line: SC) that the printer is in the face-up mode and jam detection timing for the face-up mode is selected by the DC Controller.

If the paper stacking lever is set for face-down delivery, a LOW FACED signal is input to the Paper Control PCA. The Paper Control PCA then sends a LOW FACED signal to the DC controller. This causes the DC controller to notify the external device via the SC line that the printer is in the face-down mode and jam detection timing for the face-down mode is selected by the DC Controller.

As paper is guided by the deflector to the paper reversing tray, the paper moves the tray inlet sensor arm, thus unblocking the optical path in the inlet tray sensor (photointerrupter PS5). This causes a LOW THRS signal to be sent to the Paper Control PCA.

After the trailing edge of the paper passes, the tray inlet sensor falls and blocks the light in PS5. This causes PS5 to send a HIGH THRS signal to the Paper Control PCA.

If a LOW THRS signal followed by a HIGH THRS signal are input to the Paper Control PCA, the Paper Control PCA outputs a LOW FCDSL signal to the tray feed-out clutch solenoid. This allows the tray feed-out roller to rotate and feed the paper to the delivery rollers which deliver the paper to the print tray.

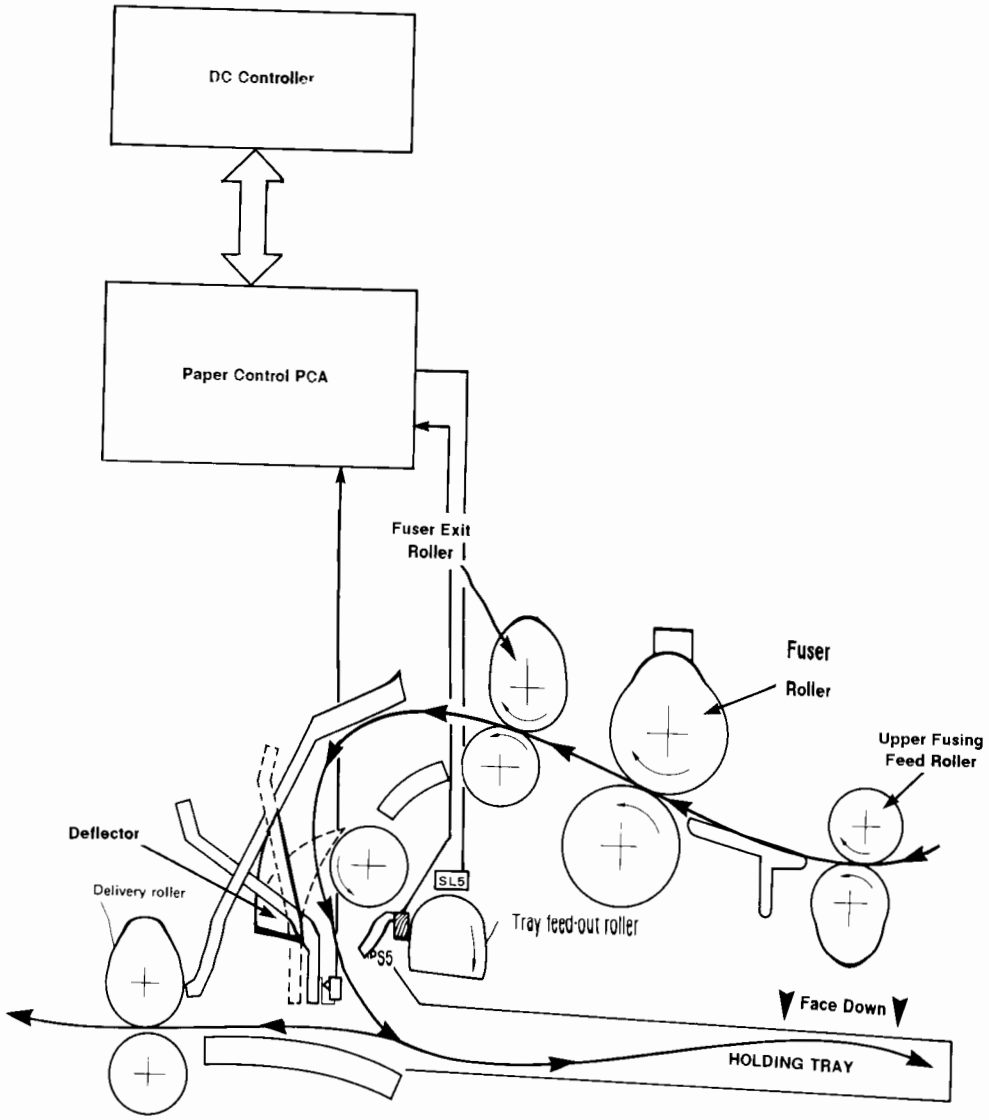


Figure 3-51. Face-Up/Face-Down Operation

Activation timing

If face-down mode is selected and the printer receives a shift request command from the Interface PCA via the status/command line (SC), the DC Controller outputs a TRUE SHIFT SOLENOID DRIVE command (SHTSL) to the job offset solenoid comparator on the Paper Control PCA. If paper is passing the tray inlet sensor (PS5), the switching circuit outputs a LOW signal. When the paper has passed the tray inlet sensor (PS5), the switching circuit output goes HIGH.

When the switching circuit output becomes HIGH, the integrating circuit outputs a transient signal with a fixed time constant to the job offset solenoid comparator and tray feed-out clutch solenoid comparator.

At point "A" in Figure 3-52. the job offset solenoid comparator sends a TRUE JOB OFFSET SOLENOID DRIVE command (SHTSL) to the shift solenoid (SL6) to actuate it. At point "B", the job offset solenoid comparator makes SHTSL FALSE to release SL6.

At point "C", the tray feed-out clutch solenoid comparator sends a TRUE FEED-OUT ROLLER CLUTCH SOLENOID DRIVE command (FCDSL) to the tray feed-out clutch solenoid (SL5) to actuate it. Then. at point "D", the tray feed-out clutch solenoid comparator makes FCDSL FALSE to release the tray feed-out clutch solenoid (SL5). The job offset solenoid comparator and tray feed-out clutch solenoid comparator do not operate when the printer is in face-up mode.

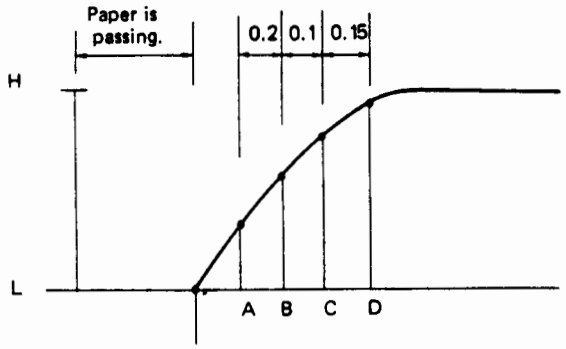


Figure 3-52. Output from the Integrating Circuit

SECTION IV

MAINTENANCE

4-1. LIFE EXPECTANCY of CONSUMABLES

The expected service lives of these parts are as follows:

Table 4-1. Service Life of Consumables

Description	P/N	Qty	Service Life	Remarks
1. EP Cartridge	92285A	1	(no. of prints)	
2. Cleaner Pad *	FG1-2377-000CN	1	with cartridge	
3. Separation Belt *	RG1-0328-000CN	1	50.000	Replace as required.
4. Fusing Assembly	RG1-0197-000CN 115 V RG1-0198-000CN 220/240 V	1	100.000	
5. Pickup Roller	RA1-0666-000CN RA1-2621-000CN RA1-2622-000CN	3 6 2	100.000	HP 2686A HP 2686D HP 2686D

* A Service Kit, HP Part Number 92285T, is available from DMK. The Kit contains 2 Cleaner Pads and 2 Separation Belts.

NOTE

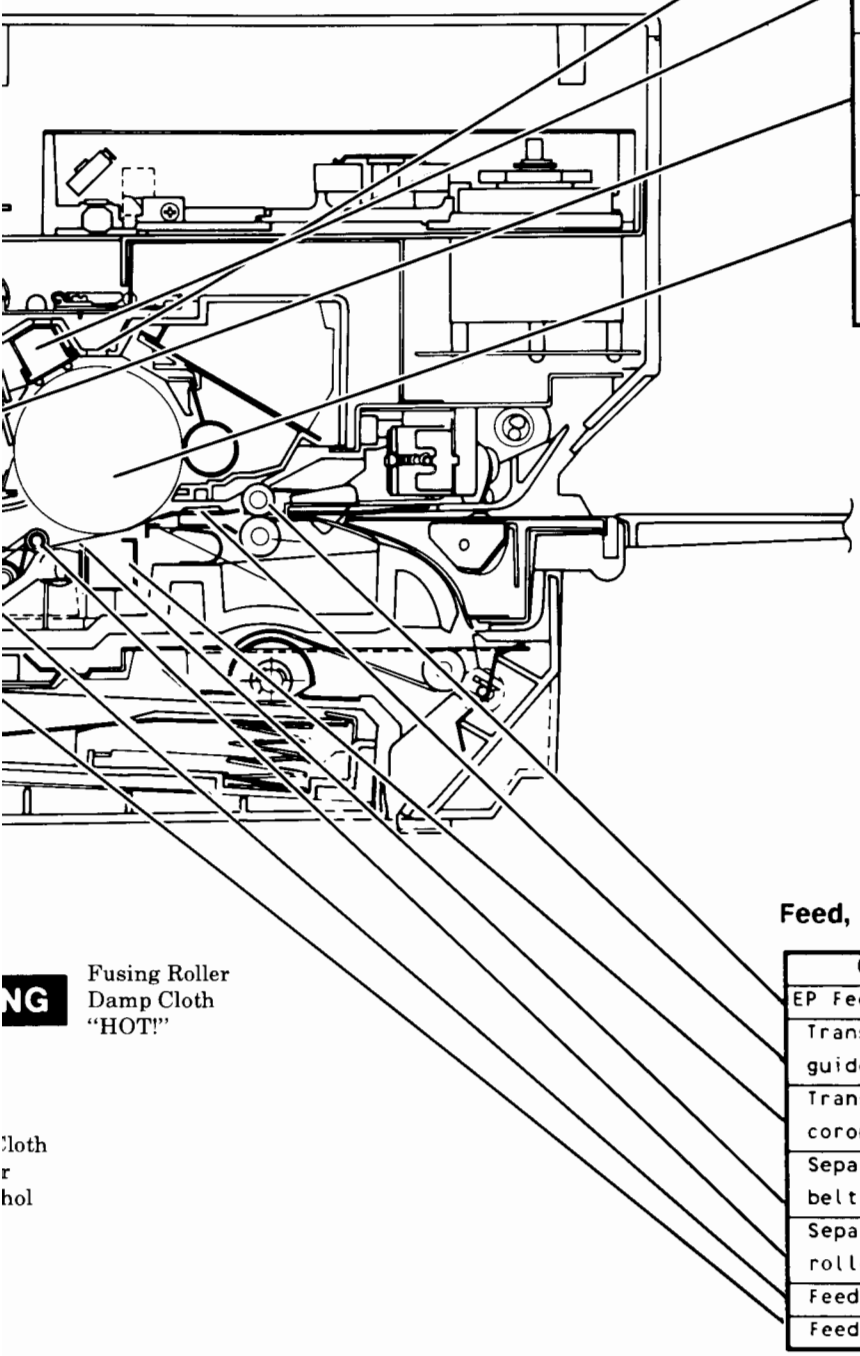
The 100.000 page component list is ONLY AN ESTIMATE. The individual customer's printer (both 2686A and 2686D) may see wear rates greater than or less than the 100.000 page estimate. This estimate is directly related to the type of paper and the performance of the printer. Always inspect these components for wear when servicing the printer and REPLACE IF NECESSARY.

The expected service life estimates are based on A4 or letter size prints with an average of 5% toner image in the effective image area. (The TEST PRINT pattern is approximately a five percent coverage image.)

Items 4 and 5 above should be inspected for excessive wear and replaced if necessary whenever a printer is being serviced. The service lives will vary with different types of forms usage, usage levels and environments.

EP Cartridge

Check	Solvent	Remarks
Light-blocking shutter	-	Always close when removing EP cartridge from printer
Primary corona wire	-	Clean with mechanical cleaner supplied with printer
Protective shield for drum	damp cloth	Image may be dirtied by falling toner. Ensure that foam on shutter edge is not peeling.
Photosensitive drum	toner	Do not clean the drum unless absolutely necessary or expose to sunlight.



NG Fusing Roller
Damp Cloth
"HOT!"

'loth
r
hol

Feed, Separation and Transfer Guides

Check	Solvent	Remarks
EP Feed Rollers	damp cloth	
Transfer guides	damp cloth	
Transfer corona ass'ys	-	lint free tissue paper only
Separation belt	damp cloth	
Separation roller	damp cloth	
Feeder guide	damp cloth	
Feeder roller	damp cloth	

Figure 4-1. Service Checkpoints

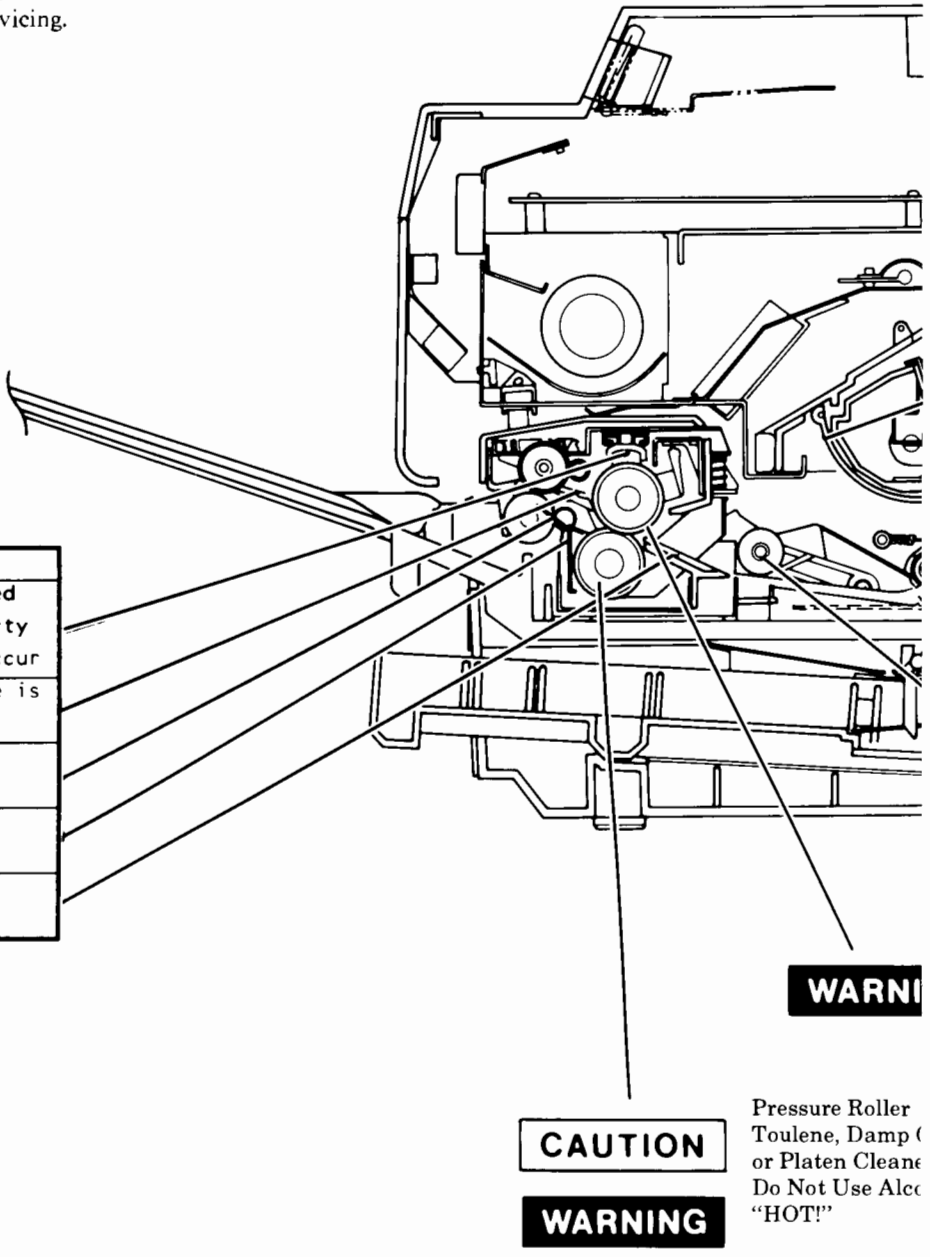
4-2. SERVICE CHECKPOINTS

NOTE

There are no checkpoints unique to the HP 2686D that require servicing.

Fusing Assembly

Check	Solvent	Remarks
Cleaner pad	-	If dirty, printed page will be dirty and jams will occur
Separation pawls	isopropyl alcohol	The leading edge is easily damaged
Lower delivery guide	isopropyl alcohol	
Separation guide	isopropyl alcohol	
Entrance guide	isopropyl alcohol	



CAUTION

WARNING

Pressure Roller
Toulene, Damp
or Platen Cleane
Do Not Use Alc
"HOT!"

4-3. CUSTOMER MAINTENANCE

Service Checks

If one of the following problems occurs. follow the measures listed below.

A. If the PAPER OUT or JAM indicator code on the display panel lights:

If using the cassette. replenish the paper in the cassette when the PAPER OUT indicator lights. If using manual feed. put print paper on the manual feed tray when the PAPER OUT indicator lights. If the JAM indicator lights. open the upper main body and remove the jammed paper. then close the upper main body.

B. If white or light lines or stripes appear on the print:

If the color indicator on the EP cartridge is red. replace the EP cartridge. If the indicator is not yet completely red. shake the EP Cartridge to evenly distribute the toner in the cartridge.

C. If toner stains appear on the print:

The primary corona wire. transfer corona wire. or transfer guide may need cleaning (see cleaning instructions).

D. If the separation belt breaks:

Replace the separation belt.

Replacing the EP Cartridge

The EP Cartridge may be replaced by the customer. During normal printing conditions (an average print density of 5%). the EP cartridge should last approximately 3000 pages. The cartridge should be replaced when white bands (due to lack of toner) start to appear in the print image. If the white bands should occur. advise the customer to remove the cartridge. shake it as illustrated in figure 4-4. reinstall the cartridge in the printer. and run 10 copies of the Self Test. If the white bands in the print image persist. install a new cartridge in the printer.

The fusing cleaning pad. in the fuser assembly. should be replaced and the transfer corona wires should be cleaned with a cotton swab (provided with the EP cartridge) when the EP cartridge is replaced.

A. Lift the release and raise the upper half of the printer.

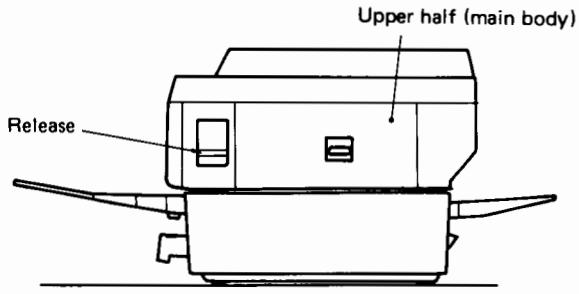


Figure 4-2. Upper Main Body Release Lever

B. Open the right door and pull out the used EP cartridge.

NOTE

The right door can be opened only after the upper main body has been raised.

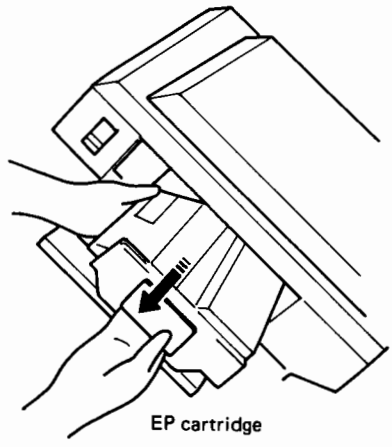


Figure 4-3. Removing the EP Cartridge

C. Hold the new EP cartridge horizontally and rock it 45 degrees slowly back and forth about five times (with the drum as the center of rotation).

NOTE

Hold the EP cartridge by the handle and the rear to distribute toner. Do not hold it by the main cartridge body (on the handle side).

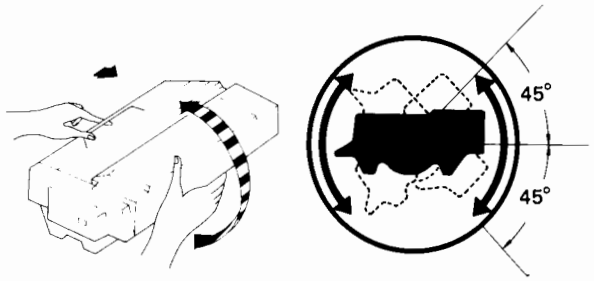


Figure 4-4. Distributing Toner in the EP Cartridge

D. Fully insert the new EP cartridge into the printer.

E. Flex the black tab on the EP cartridge until it breaks loose. (Hold cartridge steady.) Pull the tab out completely to remove the attached sealing tapes.

F. Raise the top of the fusing assembly and replace the fusing roller cleaning pad with a new one. Lower the top of the fusing assembly.

G. Close the upper half of the printer.

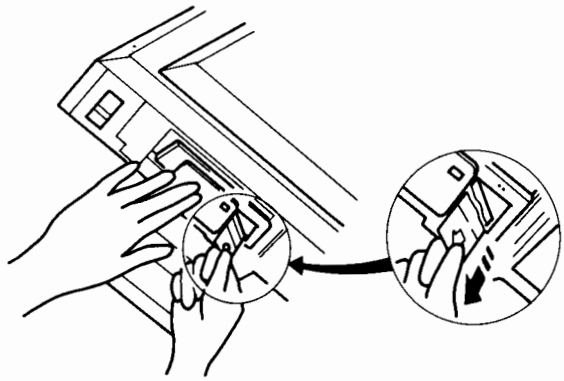


Figure 4-5. Removing the EP Cartridge Shipping Seal

Replacing the Separation Belt

If the separation belt breaks, replace it with the replacement belt provided with the printer (see figure 4-10), as follows:

A. Push the release lever up and open the upper half main body.

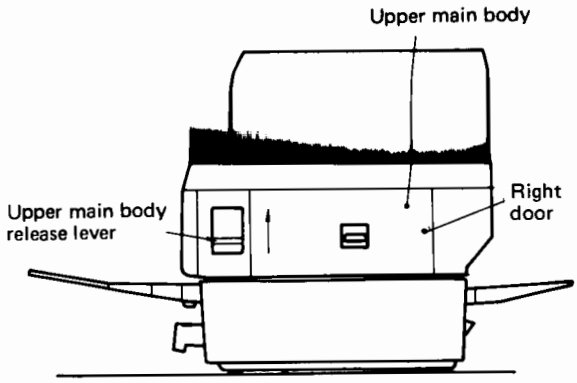


Figure 4-6. Printer Right-Side EP Door

B. Open loop A on the separation belt with a screwdriver.

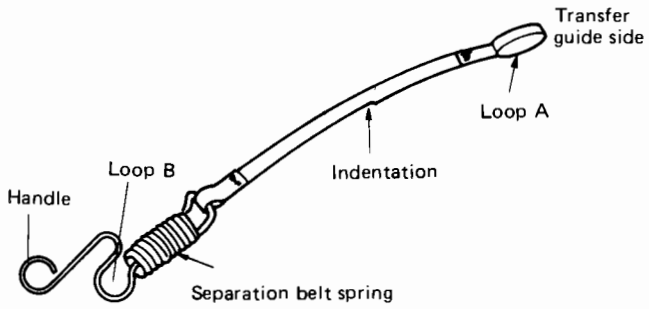


Figure 4-7. Separation Belt

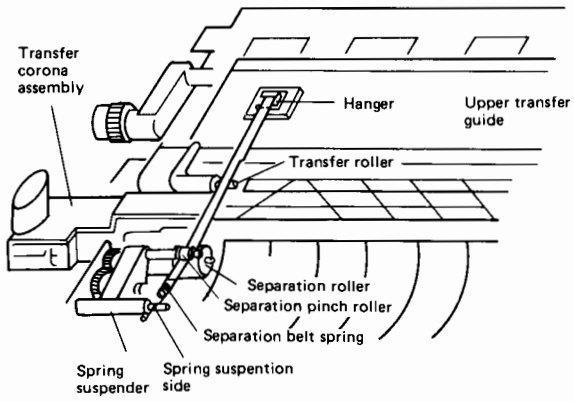


Figure 4-8. Separation Belt Routing

C. Hang loop A of the separation belt on the right side of the upper transfer guide. The indentation on the separation belt belongs on the right side.

D. Pass the separation belt over the transfer roller, and under the separation pinch roller.

E. Hook loop B on the spring suspender.

F. Check the following items after installing the separation belt.

- Is the belt twisted or cut?
- Is the indentation on the right side?
- Is loop A securely hung from the upper transfer guide?
- Does the belt pass over the transfer roller?
- Does the belt pass between the separation roller and the separation pinch roller?
- Is the separation belt spring hooked securely to the spring suspender?

G. Close the upper main body.

4-4. GENERAL CLEANING

If dirty prints are produced, the printer should be cleaned as follows. (These instructions should be given to the customer.)

Primary Corona Wire

Open the printer and pull out the EP cartridge. Insert the wire cleaner into the long slot of the EP cartridge (beside the shutter) and move it back and forth in the slot. (The cleaner displaces the thin protective plastic sheet.) After cleaning, replace the cartridge in the printer, and close the printer.

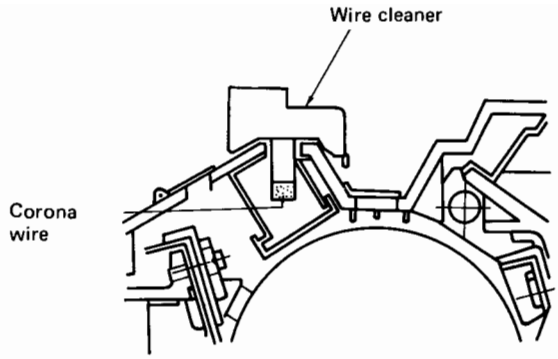


Figure 4-9. Cleaning the Primary Corona Wire

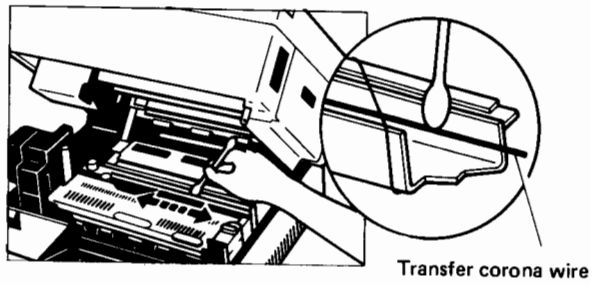


Figure 4-11. Cleaning the Transfer Corona Wire

Transfer Guide

Dampen a cloth. (Don't soak it - it should be moist. not wet.) Clean the transfer guide with the cloth.

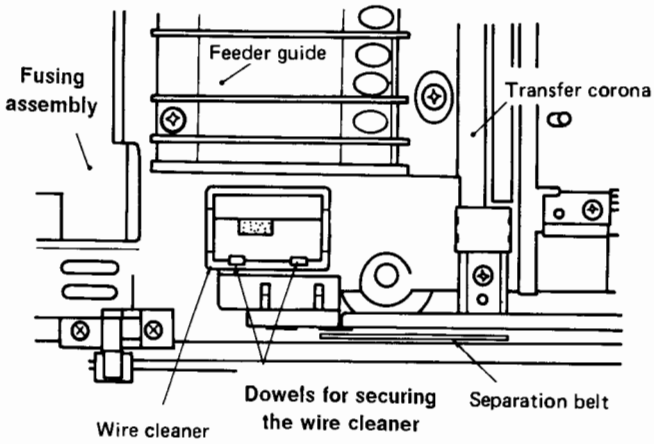


Figure 4-10 Wire cleaner and separation belt location

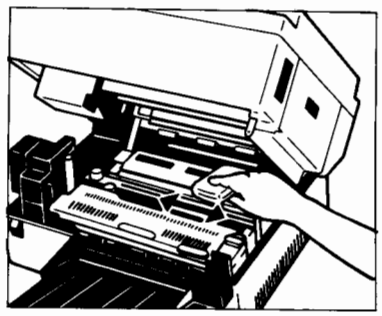


Figure 4-12. Cleaning the Transfer Guide

Transfer Corona Wire

Open the printer. Pull out the EP cartridge. Gently draw the cotton swab (provided with the cartridge) up and down the corona wire. Replace the cartridge in the printer, and close the printer.

4-5. PAGE COUNT VERIFICATION

A page counter (print counter) is located on the preconditioning exposure lamp assembly and provides an approximate count of the number of pages printed. The counter (see figure 4-13) looks similar to a fuse and has a graduated scale ranging from zero to ten. Each division is equal to approximately ten thousand pages (i.e. the maximum count is one hundred thousand pages). The page count is indicated by a mercury bubble which migrates along the graduated scale (to the right).

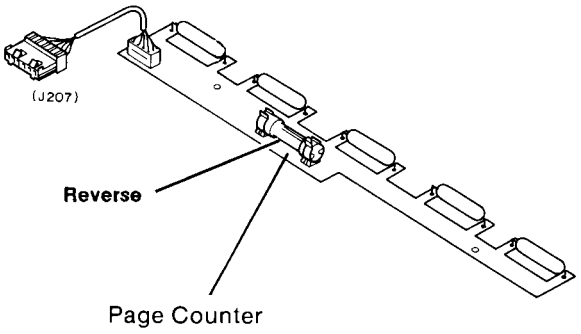


Figure 4-13. Page Counter

To read the page count, proceed as follows:

A. Open the printer (raise the upper half).

B. Remove the ozone filter (refer to paragraph 7-7). The page counter is located on the underneath side of the erase lamp assembly.

C. Verify the position of the bubble along the graduated scale. (Remember each increment indicates ten thousand pages; the count should always be read from the left side of the bubble). If necessary, rotate the page counter within its mounting clip to more easily read the count. After one hundred thousand pages the page counter may be reversed in its holder (as shown in Figure 4-13) or it may be replaced.

4-6. AUXILLIARY PAGE COUNTER

A mechanical page counter that gives a more accurate count of drum rotations is available. It is installed parallel to the registration solenoid as shown in figure 4-14. A section of the rear panel may be removed for viewing of the counter, or the rear panel can be removed periodically to read the counts. Instructions for installing the kit are available under HP part number 02686-90917.

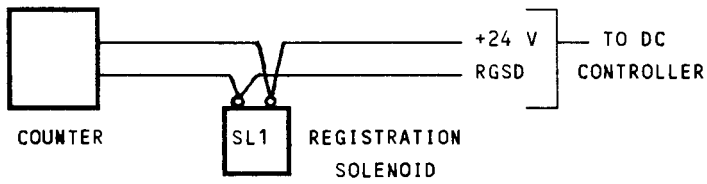


Figure 4-14. Page Counter Circuit Drawing.

SECTION V

ADJUSTMENTS

5-1. INTRODUCTION

This section of the manual provides the adjustment procedures for the HP 2686A/D printer.

Required Tools

The following special tools are required for adjustment on the printer:

Laser Power Checker

Digital Voltmeter (+/- 50 VDC Range)

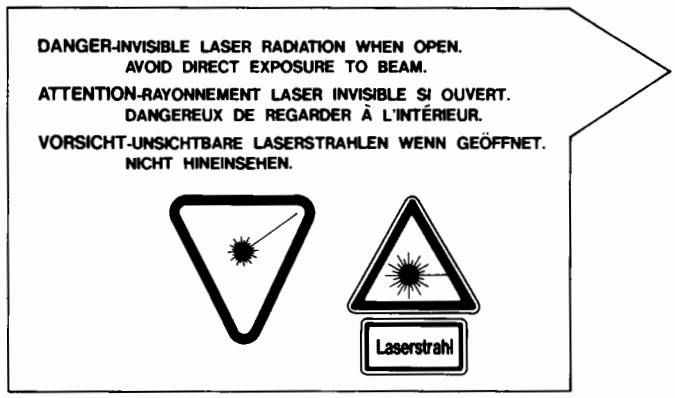


Figure 5-1. Laser Safety Label

5-2. PRINT DENSITY DIAL

The print density dial is located on the left side of the printer. The dial is used to adjust the darkness of the printed output and has a range of 1 through 9. Turning the dial counterclockwise increases the print density, and turning clockwise decreases the print density. Under most conditions, leave the dial in the center position (number 5). Increasing the density causes the printer to use more toner, which in turn, shortens the life of the EP cartridge.

5-3. LASER POWER

Laser power adjustment should be made after replacing the DC Controller PCA, the Laser Unit, or if the following image defects arise: light image or dark image (see image defects I-1 and I-2 in Section VI).

This procedure requires that the laser output power be verified. If the laser output is not within range, the laser driver circuitry output needs to be checked and adjusted if necessary. By performing this procedure the Service Representative can determine if either the laser driver circuitry (DC Controller PCA) or the laser unit is malfunctioning.

Checking/Adjusting the Laser Driver Circuitry Output

A. Switch the printer power to OFF.

B. Heed the Laser safety label shown in figure 5-1 to avoid possible operator injury and possible printer damage.

C. Remove the printer rear panel.

D. Remove the screws which secure the printer top cover, refer to the removal procedure in Section VII. With the top cover screws removed and keeping the three connectors connected, carefully lift off the top cover and position it out of the way. Care should be taken not to put too much stress on the wire harnesses at the back of the top cover.

E. Open the plate over the access hole for the laser power checker on the laser and scanner unit and install the laser power checker tool into the opening (see figure 5-2).

WARNING

Do NOT place anything in the laser/scanner unit access hole other than the Laser Checker Tool. Although the laser beam is invisible, the reflected beam could possibly damage the eye.

F. Connect the leads of the laser power tool to a digital multimeter: set the range to 200 mV.

G. Remove the EP cartridge. Note the position of the EP cartridge sensitivity tabs. Remove the tabs if installed (see table 3-1 for sensitivity tab explanation). Reinstall the EP cartridge.

H. Switch the printer power to ON.

NOTE

When the laser tool is installed in the printer only one page of the Self Test will run before a "51" (Beam Detect Malfunction) error is displayed on the printer's display panel. To clear the error, press the CONT key; a blank page will be printed.

The Laser Power Checker tool must have been calibrated within the last year to be effective.

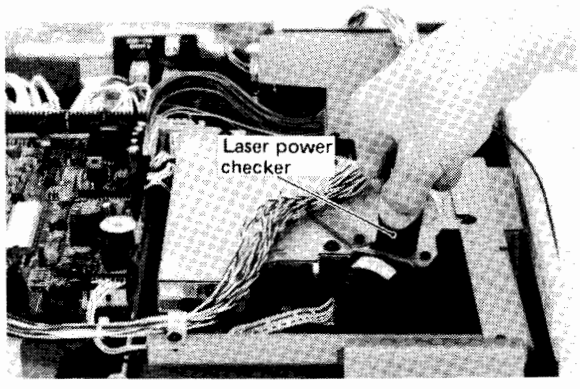


Figure 5-2. Installing Laser Power Checker Tool

I. The laser output should be 45 +/- 1 millivolts while the laser driver output voltage (Check Pin CP 208 on the DC Controller PCA) should be 2.0 +/- 0.3 volts. Both voltages should be measured while the printer is executing Self-Test.

With the laser tool installed and connected to the voltmeter, perform the Self-Test and verify the laser output. If the laser output is not within tolerance (45 +/- 1 millivolts) the laser driver output voltage must be adjusted. Adjust VR202 on the DC Controller PCA until the laser output is within range. Laser output voltage may only be measured while the printer is executing Self Test. Note the result and proceed to step J.

Adjusting/Verifying the Laser Driver Output Voltage

J. Leaving the laser power tool in the access hole, disconnect the tool from the digital multimeter. With the test leads connected to the multimeter, measure the voltage from CP 208 on the DC Controller and frame ground while running Self-Test. The voltage should be 2.0 +/- 0.3 volts. If the voltage is within range, no further adjustment is required: reinstall printer covers and reinstall drum sensitivity tabs.

If the voltage is not within the range, adjust VR202 on the DC Controller PCA until the voltage is within range, and repeat step H to verify the laser output voltage.

If the laser output voltage (45 +/- 1 mv) can NOT be achieved yet CP 208 can be adjusted to its specified range (2.0 +/- 0.3 Vdc), the laser unit is probably weak and should be replaced.

If the laser output voltage is within range, but CP 208 is NOT within range, the laser driver circuitry is malfunctioning and the DC Controller PCA should be replaced.

K. Reinstall the drum sensitivity tabs to their original positions and replace all printer covers.

5-4. Print Skew

There are two major causes of image print skew in the HP 2686A/D printer:

Paper tray misalignment and
Laser/Scanner unit misalignment

Paper Tray Misalignment

Paper tray skew occurs if the paper tray's right fence is misadjusted and therefore the paper is fed into the printer's paper path at a slight angle. Tray misalignment is evident in the printed output if the edges of the print image are not parallel with the edges of the paper. For example, if margin A was different than margin B, or if margin C was different than margin D (as shown in figure 5-3), the print tray is probably misaligned.

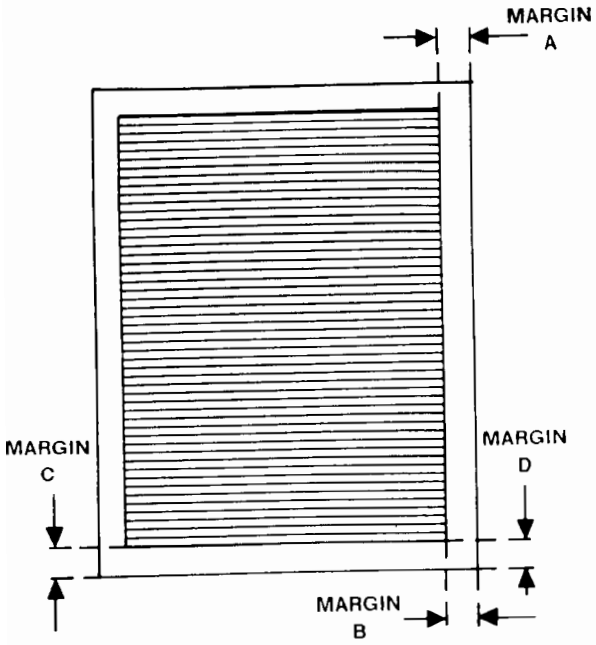


Figure 5-3. Paper tray misalignment

To correct the paper tray skew, proceed as follows:

A. Remove the paper tray from the printer and place the tray upside down on a clean working surface.

B. Loosen the two screws which secure the tray's right side fence.

C. Turn the tray over and install several sheets of paper. Justify the left edge of the paper against the left edge of the tray and then move the tray's right fence over, until the Velcro pad just touches the paper. Tighten the fence screws.

Laser/Scanner Unit Misalignment

Laser/Scanner unit image skew occurs when the Laser/Scanner unit is not squarely aligned to the printer path. Unit misalignment is evident in the printed output if the print image side margins appear to be equal but the actual printed output seems to be running either "uphill" or "downhill", as shown in Figure 5-4.

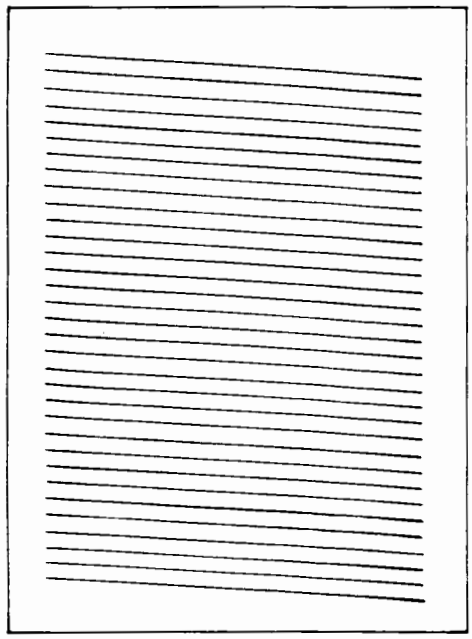


Figure 5-4. Laser/Scanner Unit Misalignment (exaggerated)

To correct Laser/Scanner unit skewing, proceed as follows:

A. Remove the printer's rear cover. (Remove any shielding or cover braces, if present).

B. Remove the screws which secure the top cover and carefully lift and position (fold back) the top cover out of the way, keeping all cables connected. This is necessary so adjustment can be made while executing Self Test.

C. LOOSEN (do not remove) the three (on some machines-4) large screws which secure the Laser/Scanner unit to the upper main body of the printer.

D. Loosen the four glyptolled screws (two on each bracket) which secure the adjustment brackets to each side of the Laser/Scanner unit.

E. Execute a continuous Self Test from the printer's front panel.

WARNING

Do not attempt to lift or remove the Laser/Scanner unit while Self Test is running (note that the securing screws are only loosened and not removed). Laser light could escape if the unit were removed while Self Test was running.

F. While the Self Test is printing out, adjust the unit (right, left, forwards and backwards) until the printed image is parallel (usually the top and bottom margins are parallel, and the left margin of the printed output is three times as wide as the right margin due to the separation belt).

G. When the alignment is complete, carefully tighten the Laser/Scanner unit screws. Care should be taken not to accidentally move the unit before the screws are tightened.

H. Replace all printer covers.

SECTION VI

TROUBLESHOOTING

6-1. INTRODUCTION

This section of the manual provides the Service Representative a means of isolating printer failures. Paragraph 6-2 provides the Service Representative a basic approach to troubleshooting and a summary of printer image problems and malfunctions. Paragraphs 6-3 thru 6-5 provide procedures for isolating the image and hardware errors. Paragraphs 6-6 through 6-9 provide lists of troubleshooting signals, indicator LEDs, and lists of checkpoints.

Preliminary Operating Checks

Before troubleshooting a specific printer problem ensure that the printer meets the following operating conditions:

Environmental Checks

a. Line voltage should not vary more that 10% from the rated value.

b. The printer must be installed on a solid, level surface.

c. Room temperature must be kept between 10 degrees and 32.5 degrees C (50 - 90 F). Relative humidity should be between 20% and 80%.

d. The printer should not be located in hot or humid areas (near water taps, boilers, or humidifiers), nor in a cold place, near open flames, or in a dusty location.

e. Make sure that the printer is never exposed to ammonia gas, which is produced by diazo copiers or office cleaning materials. Stress the importance of this to the customer.

f. The printer should not be exposed to direct sunlight. If it has to be located in a sunny place, the customer must install protective curtains over the window.

g. Install the printer in a well-ventilated area.

Corona Assembly Checks

a. The primary corona assembly in the EP cartridge and the transfer corona assembly must be clean and undamaged. (Replace them if they cannot be cleaned or are damaged.)

b. Check the height of the transfer corona wire (see procedure in Section VII).

c. Make sure the transfer corona assembly is securely seated in its socket.

d. Check that the transfer corona spring is not rusted. (If rusted replace the spring.)

Print Paper Checks

a. Is paper that meets specification being used? If extremely thick paper or thin paper, or paper that tends to curl, is used, paper may jam, transfer may be poor, or the image may be blurred.

b. Has the paper absorbed moisture? (Take paper from a newly opened package, make prints with it, and observe whether print quality improves.)

Consumables

If blank areas occur in the image, toner may have accumulated at one side of the cartridge. Remove the cartridge and rock it side to side to distribute the toner within, then make a sample print and check print quality.

Miscellaneous

a. Make sure that the transfer guide and the feeder guide are clean. If they are dirty, clean them with a damp cloth.

b. Check whether the fusing roller cleaning pad is too dirty to adequately clean the roller anymore.

c. During the winter, if the printer is taken from a cold room into a warm room, condensation will form inside the printer and cause various problems.

Examples:

- Condensation on the optical surfaces (lens, glass, mirrors, etc.) will cause the image to lighten.

- If the drum is cold, the electrical resistance of the photosensitive layer is high, and correct contrast in prints will not be obtained.

- Condensation on the corona assembly will result in corona leakage.

- Moist paper or condensation on the manual feed guide or manual pickup rollers may cause poor paper feed. If condensation is noticed on components, wipe them gently with a clean dry cloth or plug in the printer and leave it ON for 10 - 20 minutes.

- If the aluminum bag protecting the cartridge is opened in a warm room just after being stored in a cold area, moisture will condense inside the cartridge and could cause image trouble. Be sure to instruct the customer to allow the package to come to room temperature before opening it, if it has been stored in the cold. This takes one to two hours.

6-2. BASIC TROUBLESHOOTING APPROACH

BASIC CHECKOUT PROCEDURE

A. Follow the BASIC CHECKOUT PROCEDURE in sequence. Do NOT skip steps. In some cases the answer to a question will not fit the customers exact failure symptom. In these cases, should you fail to locate the cause of the failure, return to the start and reevaluate your answer.

B. Each time you are directed into a troubleshooting chart and have completed the procedure described therein, return to the BASIC CHECKOUT PROCEDURE and start the checkout again. Continue with each failure until it is resolved and you can proceed through the BASIC CHECKOUT PROCEDURE without interruption to the END OF PROCEDURE.

C. If during the BASIC CHECKOUT PROCEDURE, a print image problem is detected, try and locate a similar problem on TABLE 6-1. Proceed as directed to the appropriate troubleshooting chart. Again, if an exact example cannot be located you may need to select one or more procedures that closely resemble your problem.

D. If during the BASIC CHECKOUT PROCEDURE, a status indication is present, refer to TABLE 6-2 for a display panel indicator summary. If the display status (both operational and hardware malfunction) cannot be corrected by the chart, then it is to be considered a HARDWARE FAILURE.

E. Paper path problems should be referred to Section 6.5. This section is IN ADDITION to the BASIC CHECKOUT PROCEDURE. Jams, false errors, undetected errors, solid errors, misfeeds and paper damage should be directed to this section. Any hardware status indicator should be cleared first before proceeding with paper problems.

SET UP

1. Insure that the printer is installed in an environment which is within the specifications detailed in Sections 1-3, and 2-2 of this manual. If not, correct before proceeding.

2. Insure that the AC line voltage is within the specifications detailed in Section 1-2. Insure that the AC line cord and receptical are properly grounded.

3. The printer should have an EP cartridge and 10 to 20 sheets of paper in the cassette(s). The paper MUST be within specification and should have been stored in the proper humidity before troubleshooting paper path problems or print quality problems.

4. Set the PRINT DENSITY DIAL to mid-range (dot to the top). This adjustment can be altered as necessary to achieve good print quality. The age of the EP cartridge will effect this adjustment.

5. When testing an HP 2686D printer set the PAPER SELECTION to AUTO. Set the paper stacking lever to FACE DOWN operation. NOTE: FACE UP can be tested after the checkout procedure is complete.

START CHECKOUT

1. Switch the main line power switch ON (1).

2. QUESTION: After about 1 second are all of the LEDs illuminated and is "05" displayed ?

   YES ↓ NO → POWER MALFUNCTION M-1

3. QUESTION: After about 10 seconds is either "00" or "02" displayed ?

   NOTE: If the "02" display does not change into "00" after 2-3 minutes then this is considered an error.

   YES ↓ NO → Go to Display Status Summary

   WAIT for "00" before proceeding.

4. Press ON LINE once to place the printer in an OFF LINE mode.

5. If testing an HP 2686D, press PAPER SELECT until the AUTO mode is selected. (Proceed to step 6 if testing an HP 2686A)

6. Press the SELF TEST key ONCE only.

7. QUESTION: Does the display indicate "05" for a few seconds, followed by "06" ?

   YES ↓ NO → Go to Display Status Summary

8. QUESTION: Does a single sheet feed completely through the printer to the output tray WITHOUT an error display ? (Print quality problems will be investigated later in this procedure).

YES

NO → Is a Paper Path Problem Indicated?

NO

YES → Go to Paper Problem Troubleshooting Section 6-5

Go to Display Status Summary

9. PRESS and HOLD SELF TEST key (sets continuous mode) until the "05" display flashes, then release the key. An "06" is displayed while the SELF TEST is in progress.

10. Allow the SELF TEST to continue operating until the paper cassette(s) are empty. Only 10-20 sheets should be in each cassette.

11. QUESTION: Does SELF TEST halt with an "11" (out of paper) displayed ?

YES

NO → Go to Paper Out not detected chart T-10(a)

12. Without altering the display OR pressing any keys, reload the paper cassette(s) and reinstall into the printer. The printer SELF TEST operation should continue automatically.

13. QUESTION: Does SELF TEST continue when the cassette is reinstalled ?

YES

NO → Go to Paper Path Problem Troubleshooting. (Section 6-5)

14. After several sheets of paper are printed, check the paper for PRINT QUALITY.

15. QUESTION: Is there any image transfered to the paper ?

YES

NO → Go to Image Troubleshooting I-3

16. QUESTION: Is the image print quality free of all defects ?

YES

NO → Go to Image Defect Summary Table 6-1 and proceed to the appropriate procedure.

17. HALT SELF TEST by pressing the ON LINE key once. When the printer stops it will be in ON LINE mode. Then press the ON LINE key again. This should put the printer into OFF LINE mode.

18. Press the TEST PRINT button on the left side of the printer once. A display of "15" will flash while TEST PRINT is in operation.

19. The lined pattern should be within parallel to the right vertical edge of the paper. In a vertical distance of 25.5 cm (10 inches) the line should not have more than 2.0 mm skew.

20. QUESTION: Is the print pattern within the above specification ?

YES

NO → Go to Section 5-3 Skew Adjustment AND also refer to Image Defect Chart I-13

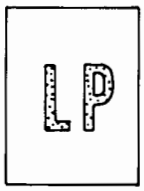
21. END OF PROCEDURE. The BASIC CHECKOUT PROCEDURE is complete. The only areas of the printer which have not been checked are the Font Cartridge plug and the interface cable. These are best tested with the customers programs.

22. If additional testing is required for communication problems, refer to the OPERATOR'S REFERENCE MANUAL (02686-90914) or (02686-90911) May,1985 or later, "Configuring the LaserJet....". Also refer to Appendix C "Communication Verification" in this manual.

23. Return the printer to the customer. If a print image problem should occur, locate the problem in Table 6-1 and proceed to the appropriate troubleshooting procedure in Section 6-3.

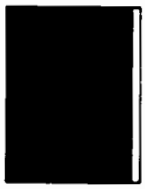
The printer contains extensive internal diagnostics. If a malfunction should occur, a status indication is displayed at the printer's front panel. Table 6-2 provides a summary of all possible printer indications. Listed with the indicator is an explanation and a possible cause of what circuitry could have caused the indicator to be displayed. Section 6-4 contains troubleshooting procedures for the various indications.

Table 6-1. Image Defect Summary

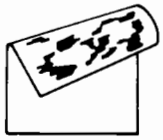

1-2 Light Image


1-2 Dark Image


1-3 Blank Print


1-4 Black Image


1-6 Stained Separation Strip


1-6 Stains on Back of Paper


1-7 Dark Vertical Lines

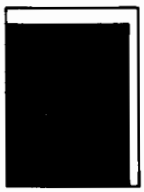

1-8 Sharp Horizontal Black Lines

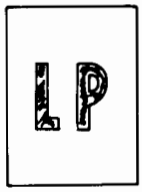

1-9 Vertical Fogged Stripes

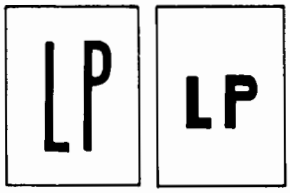

1-10 Horizontal Fogged Stripes

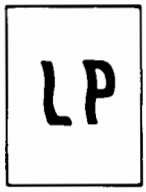

1-11 White Horizontal Lines/ Other Shapes on a Black Print


1-12 Thin Vertical White Lines/Stripes


1-13 Faulty Registration


1-14 Poor Fusing


1-15 Distortion


1-16 Waviness


1-17 Miscellaneous Irregularities

Table 6-2. Display Panel Indicator Summary

DISPLAY	STATUS	EXPLANATION	IF DISPLAY CANNOT BE RESET PROCEED TO ...
00	Ready		
02	Wait		Malfunction M-4
05	Self Test		
06	Test in progress		
07	Reset		
11 (UC)*(LC)*	Out of Paper	Either the paper tray is empty or the cassette is not installed. (*refers to HP 2686D only)	Paper Path Problems T-9
12	Print Engine Power is Off	No power (AC voltage) is being input to the print engine section of the printer but power to the I/F PCA is acceptable. This occurs when the printer's upper main body is opened. It should reset when the printer is closed again.	Malfunction M-1
13	Paper Jam	A paper jam has occurred	Paper Path Problems 6-5.
14	No EP Cartridge	The EP Cartridge is not installed.	
15	Test on the print engine	The self test on the print engine is being executed.	
PC/nn	Paper Cassette replacement request	The current set paper size does not match the requested size from the host.	
PF/nn	Manual Paper feed request	Paper feed request during the Manual Feed mode of operation.	
PE	Envelope Feed Request		
FE	Font Cartridge Removed	Indicates that the font cartridge has been removed during a printer ONLINE operation.	
FC	Font Cartridge Check	The font cartridge has been replaced or removed during the formation of a page.	
20	Memory Overflow	Too much data has been received for a single page of output.	Interface PCA M-7

Table 6-2. Display Panel Indicator Summary (continued)

DISPLAY	STATUS	EXPLANATION	IF DISPLAY CANNOT BE RESET PROCEED TO ...
21	Print Overrun	The Interface cannot format data fast enough for the print engine.	Interface PCA M-7
22	Receiving Buffer Overflow	An overflow condition was indicated in the Interface's receiving buffer during the transmission of data.	Interface PCA M-7
40	Line Error	A data error (parity error, framing error, line overrun error) has occurred during data transmission from the host system (this can be caused if the baud rate is set incorrectly).	Interface PCA M-7
41	Print Check	A temporary error (i.e. unsteady beam detect, or scanner rotation error) has occurred. Note: the page where the error occurred is reprinted.	Malfunction M-6
50	Fusing Unit Malfunction	The print engine has detected a fuser assembly error (no temperature or over temperature indication). To reset- power OFF for $\geq$ 10 minutes.	Malfunction M4
51	Beam Detect Malfunction	The print engine has detected a Beam Detect error.	Malfunction M-6
52	Scanner Malfunction	The print engine has detected a Scanner motor malfunction.	Malfunction M-6
53	Laser Temperature Malfunction	The print engine has detected a laser temperature circuit malfunction.	Malfunction M-6
54	Main Motor Malfunction	The print engine has detected a main motor circuitry error.	Malfunction M2
55	Printer Command Error	Commands (status) could not be exchanged between the print engine (DC Controller PCA) and the Interface PCA.	Interface PCA M-7
60	Bus Error	The Interface has detected an error on its internal data bus.	Interface PCA M-7
61	Program ROM Checksum Error	The Interface has detected a ROM checksum error during its diagnostics.	Interface PCA M-7
62	Font ROM Checksum Error	The Interface has detected a checksum error on the character font ROM located on the PCA.	Interface PCA M-7

Table 6-2. Display Panel Indicator Summary (continued)

DISPLAY	STATUS	EXPLANATION	IF DISPLAY CANNOT BE RESET PROCEED TO ...
63	Dynamic RAM Error	The Interface has detected a read/write error or a parity error in its dynamic random access memory.	Interface PCA M-7
64	Scan Buffer Error	The Interface has detected a read/write error while scanning its random access memory.	Interface PCA M-7
65	Dynamic RAM Controller Error	The Dynamic RAM Controller on the Interface PCA has detected a diagnostic error.	Interface PCA M-7
67	Miscellaneous Hardware Error	A miscellaneous error was detected by the Interface PCA's main processor.	Interface PCA M-7

6-3. IMAGE TROUBLESHOOTING PROCEDURES

I-1. Light Image

DESCRIPTION

* light characters or areas
* voids, overall light print
* non-print areas are free of toner

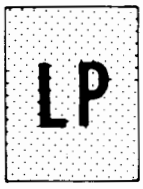
CAUSE	CHECK	RESULT/MEASURE
	1. Switch off the power switch during printing. Raise the upper half of the printer. Is the toner image on drum transferred to paper? (To protect the drum from light, perform this step as quickly as possible.)	YES - If the toner image on drum is very faint, go to step 5.
Transfer corona assembly	2. Is the transfer corona wire broken?	YES - Replace the transfer corona wire.
Moist paper	3. Do prints improve when new paper is used?	YES - Replace the paper with paper that meets paper specifications. Show the customer the correct method for storing paper.
Developing bias	4. Can the problem be corrected by adjusting the print density dial?	YES - Adjust for best print quality. NO - Proceed to next step.
Laser power	5. Is laser output normal? Check laser output by following the adjustment procedure described in Section V.	NO - Adjust laser power.
High Voltage Power Supply, DC Controller PCA	6. Does the voltage between J601-8 (HVPR) and J601-1 (GND) of the high-voltage power supply drop from about +18VDC to about +1VDC as soon as the main motor begins rotating? Does the voltage between J601-2 (HVTR) and J601-1 (GND) of the high-voltage power supply drop from about +20VDC to about 0VDC a few seconds after the main motor starts rotating?	YES - Check J601, J4 and J5 for good contact. If all are good, replace the high-voltage power supply. NO - Check the wiring between J211 on the DC Controller PCA and J601. If it is good, replace the DC Controller PCA.
Grid bias	7. Does the voltage between J21-3 and J21-1(GND) come to about -690V as soon as the main motor begins rotating?	NO - Check J21 and J22 on the Varistor PCA for good contact. If both are good, replace the Varistor PCA.

I-1. Light Image continued.

CAUSE	CHECK	RESULT/MEASURE
Drum sensitivity identification microswitch	8. Does the voltage between J209-1 (CSENS1) and J209-2 (GND) on the DC controller vary from +5VDC to 0VDC when microswitch MS3 (the middle one) is pressed? Does the voltage between J209-3 (CSENS2) and J209-4 (GND) on the DC controller vary from +5VDC to 0VDC when microswitch MS4 (the lower one) is pressed?	NO - Replace the faulty microswitch. If either MS3 and/or MS4 is faulty, the image will become very faint.
Developing bias	9. Does the voltage between J601-4 (DBDC) and J601-1 (GND) on the high-voltage power supply vary from about +20VDC to about 0VDC a few seconds after the main motor starts rotating? Does the voltage between J601-5 (DBAC) and J601-1 (GND) of the high-voltage power supply sometimes vary from about +17VDC to about 0VDC during continuous printing?	YES - Check J601 and J3 on the high-voltage power supply for good contact. If both are good, replace the high-voltage power supply. Is the problem solved? If not, continue with step 9. NO - Check the wiring between J211 on the DC controller and J601. If it is good, replace the DC Controller PCA.

I-2. Dark Image

DESCRIPTION



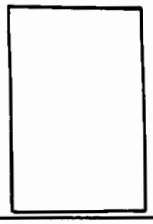
* Background
* Non-print areas contain heavy amounts of toner
* Print area is black
* Print characters may appear thicker than normal

CAUSE	CHECK	RESULT/MEASURE
Developing bias	1. Is the print density adjustment dial set with its dot at the top?	NO - Set the dial correctly.
Grounding spring	2. With an EP cartridge in place, is there continuity between the aluminum base of the drum and the metal frame of the upper main body?	NO - Check whether the grounding spring is in place in the middle of the drum drive gear.
Laser power	3. Is laser output normal? Check laser output by following the adjustment procedure described in Section V.	NO - Adjust laser power.

I-2. Dark Image continued.

CAUSE	CHECK	RESULT/MEASURE
High Voltage Power Supply	4. Turn the developing bias dial to maximum (counter-clockwise). Does the background disappear? Return the dial to its normal position before continuing to the next step.	YES - Replace the High Voltage PCA.
Drum Sensitivity identification microswitch	5. Does the voltage between J209-1 (CSENS1 and J209-2 (GND) on the DC controller vary from +5VDC to 0VDC when microswitch MS3 (the middle one) is pressed? Does the voltage between J209-3 (CSENS2) and J209-4 (GND) on the DC controller vary from +5 VDC to 0VDC when microswitch MS4 (the lower one) is pressed?	NO - Replace the faulty microswitch.
Grid bias	6. Does the voltage between J21-1 and J21-2 (GND) come to about -690V as soon as the main motor begins rotating?	NO - Check J21 and J22 on the Varistor PCA for good contact. If both are good, replace the Varistor PCA.
Erase Lamps	7. Verify correct operation of the erase lamps.	See M-5 procedure.

I-3. Blank Print



DESCRIPTION

* Solid blank page
* May have slight toner background

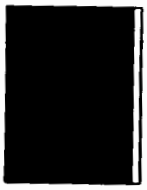
CAUSE	CHECK	RESULT/MEASURE
EP Cartridge	1. Has the EP cartridge been inserted correctly in the printer?	NO - Insert the EP cartridge correctly.
	2. Is the cartridge status indicator red?	YES - Replace the EP cartridge.
	3. Has the sealing tape been removed?	NO - Remove it.
	4. Does the EP cartridge protective shutter and the light-blocking shutter open when an EP cartridge is inserted?	NO - Locate the cause of the trouble and repair. If the cause is in the EP cartridge, replace the cartridge.
	5. Is the transfer corona wire broken?	YES - Replace the transfer corona.

I-3. Blank Print continued.

CAUSE	CHECK	RESULT/MEASURE
High Voltage Power Supply. DC Controller PCA	6. Does the voltage between J601-8 (HVPR) and J601-1 (GND) of the high-voltage power supply vary from about +18VDC to about +1VDC as soon as the main motor begins rotating?	YES - Check J601, J4 and J5 for good contact. If all are good, replace the high-voltage power supply. Is the problem solved? If not, proceed to step 7.
	Does the voltage between J601-2 (HVTR) and J601-1 (GND) of the high-voltage power supply vary from about +20VDC to about 0VDC a few seconds after the main motor begins rotating?	NO - Check the wiring between J211 on the DC Controller PCA and J601. If it is good, replace the DC Controller PCA. Is the problem solved? If not, proceed to step 7.
Developing bias	7. Does the voltage between J601-4 (DBDC) and J601-1 (GND) of the high-voltage power supply vary from about +20VDC to about 0VDC a few seconds after the main motor begins rotating?	YES - Check J601 and J3 on the high-voltage power supply for good contact. If both are good, replace the high-voltage power supply. Is the problem solved? If not, proceed to step 8.
	Does the voltage between J601-5 (DBAC) and J601-1 (GND) of the high-voltage power supply sometimes vary from about +17VDC to about 0VDC during continuous printing?	NO - Check the wiring between J211 on the DC controller and J601. If it is good, replace the DC Controller PCA. Is the problem solved? If not, proceed to step 8.
Laser power	8. Is laser output normal? Check laser output by following the adjustment procedure described in Section V.	NO - Adjust laser power.

NOTE: Upon receiving a print command (PRNT), the printer transmits a vertical sync request command (VSREQ) to the external device. If the external device sets PRNT FALSE before transmitting a TRUE vertical sync signal (VSYNC) to the printer in response to the VSREQ, there is a possibility that a blank page may be output.

I-4. Black Image



DESCRIPTION

* Solid black page
* May not be uniform density print

CAUSE	CHECK	RESULT/MEASURE
EP cartridge	1. Is the primary corona wire broken?	YES - Replace the EP cartridge.
High voltage power supply, DC Controller PCA	2. Does the voltage between J601-8 (HVPR) and J601-1 (GND) of the high-voltage power supply vary from about +18VDC to about +1VDC as soon as the main motor begins rotating?	YES - Check J601 and J5 for good contact. If both are good, replace the high-voltage power supply. NO - Check the wiring between J211 on the DC controller and J601. If it is good, replace the DC Controller PCA.
Laser Power	3. Is Laser output normal? (see Section V)	NO - Adjust Laser power.

I-5. Stained Separation Strip

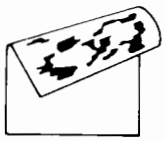
DESCRIPTION

* Toner smear on right side of page

CAUSE	CHECK	RESULT/MEASURE
Separation belt, separation roller, pinch roller, EP cartridge	1. Are the separation belt, separation roller, or pinch roller dirty?	YES - Clean them. NO - Replace the EP cartridge.

I-6. Stains on back of Paper

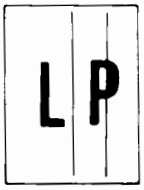
DESCRIPTION



* Irregular spots of toner on the side opposite the printed image

CAUSE	CHECK	RESULT/MEASURE
EP cartridge	1. Is there any toner on the underside of the EP cartridge?	YES - Clean with a damp cloth, then with a dry cloth.
Fusing roll cleaning pad	2. Is the fusing roll cleaning pad dirty?	YES - Replace the fusing roll cleaning pad.
Separation belt, roller and pinch roller.	3. Is there any toner on the belt or rollers?	YES - Clean with a damp cloth, then with a dry cloth.
Transfer guide	4. Is there toner on the transfer guides, or are the guides dirty? 5. Are the transfer guides correctly grounded via 15M ohm resistance?	YES - Clean with a damp cloth, then with a dry cloth. NO - Ground them correctly.
Transfer corona assembly feeder guides.	6. Is there any toner on the assembly or guides.	YES - Clean with a damp cloth, then with a dry cloth.
Manual paper feed guide	7. Is the manual paper feed guide dirty or incorrectly grounded?	YES - Clean it with a damp cloth, then with a dry cloth if it is dirty. Ground it if it is not correctly grounded.
Fusing assembly	8. Is the assembly correctly grounded?	NO - Ground it correctly.

I-7. Dark Vertical Lines (in the paper feed direction)



DESCRIPTION

* Lines in the vertical direction (the direction the paper moves)
* May be thin dark lines

CAUSE	CHECK	RESULT/MEASURE
Fusing roll cleaner	1. Is the fusing roll cleaning pad dirty?	YES - Replace the fusing roller cleaning pad.
EP cartridge	2. Turn the printer off in the middle of printing and open the upper half of the printer. Open the protective shield on the EP cartridge. Can you see a vertical line on the drum? (Make this check as quickly as possible to prevent light from damaging the drum.)	YES - Replace the EP cartridge.

I-8. Sharp Horizontal Lines (cross feed direction)

DESCRIPTION

* Laser scanlines
* Irregular pattern and length

CAUSE	CHECK	RESULT/MEASURE
Laser power/BD signal	1. Check laser power, see Section V. Is laser power correct?	YES - Proceed to M-6 in this Section. NO - Adjust laser power.

I-9. Vertical Fogged Stripes (paper feed direction)

DESCRIPTION

* Irregular line thickness greater than 1 character in width
* May be an appearance of smears on the page

CAUSE	CHECK	RESULT/MEASURE
EP cartridge	1. Does the print image improve after cleaning the primary corona wire?	NO - Replace the EP cartridge.

CAUSE	CHECK	RESULT/MEASURE
Feeder Guide	2. Is the stripe about 1 inch (2.5 cm) to the left of the center of the page?	YES - Replace the feeder guide.
Paper Path Contamination	3. Check all path guides and components.	Clean as necessary.

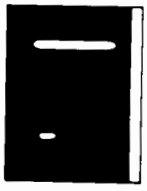
I-10. Horizontal Fogged Stripes (cross feed direction)

DESCRIPTION

* Horizontal areas
* Irregular thickness (height)
* Full horizontal width
* May be repeated every 66 or 188 mm

CAUSE	CHECK	RESULT/MEASURE
EP cartridge	1. Check the distance between stripes to the edge. Is the distance about 188 mm or 66 mm from the edge of print? (The circumference of the drum is 188.5 mm. that of the developing cylinder. 66 mm.)	YES - Replace the EP cartridge.
High Voltage PCA	2. Are the characters clearly formed?	NO - Replace the High Voltage PCA.

I-11. White Horizontal Lines or Other Shapes in black print

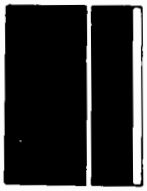


DESCRIPTION

* Faded or very light print in a horizontal direction
* Irregular width/height
* May be in the same location on each page

CAUSE	CHECK	RESULT/MEASURE
Damp paper	1. Is paper that meets specification being used?	NO - Check whether paper is manufacturer-approved. Advise the customer to use paper that meets specification. Explain that poor paper causes poor quality prints.
	2. Is paper damp?	YES - Replace paper. Show the customer the correct method of storing paper.

I-12. Vertical White Lines or Stripes



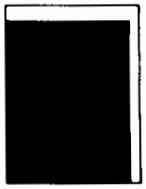
DESCRIPTION

* Irregular width (may be nearly a full page wide)
* Irregular length
* Faded print in a vertical direction
* May be irregular density

CAUSE	CHECK	RESULT/MEASURE
EP cartridge	1. Remove the EP cartridge. Shake vigorously and reinstall into printer. Run a SELF TEST. Did the pattern change?	YES - Replace the EP cartridge.
Fusing roll cleaning pad	2. Is the fusing roll cleaning pad dirty?	YES - Replace the fusing roll cleaning pad.
Transfer corona assembly, EP cartridge	3. Do prints improve after the transfer corona wire is cleaned	YES - Finished NO - Replace the EP cartridge
Laser beam-blocking shutter	4. To check whether the beam porthole is dirty, use the following procedure: (1) Open the printer (raise the upper half). (2) Open the right door. Take the EP cartridge out of the printer. (3) Press the levers toward the laser beam shutter. The shutter opens and the beam porthole can be seen. (4) Check whether there are any obstacles in the area where the beam passes through. Are there any?	YES - Remove the obstacle(s), or clean with a brush.
Dustproofing glass	5. Is the dustproofing glass dirty?	YES - Clean it with lint-free paper.
Varistor PCA	6. Is print on the right hand edge (2-4 mm) near normal?	YES - Replace the Varistor PCA.

I-13. Faulty Registration

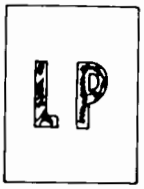
DESCRIPTION



* Does the distance from the top edge of paper to the first line of a TEST PRINT measure 5 mm ± 2 mm?
* Does the distance from the right edge of paper to the first vertical line of a TEST PRINT measure 8 mm ± 2 mm?
* Is print skew of parallel scans < 2 mm per 260 mm (10 inches) of print?

CAUSE	CHECK	RESULT/MEASURE
Feed rollers (registration shutter assembly)	1. Do the white nylon rollers turn freely?	NO - Reseat the rollers and ensure that they spin freely on the shaft.
Paper	2. Is the leading edge of paper curled excessively?	YES - Straighten the edge before using, or change paper.
	3. Is paper that meets specification being used?	NO - Check whether the paper is manufacturer-approved. Advise the customer to use paper that meets specification.
Print Registration	4. Check the vertical registration	Check skew adjustment, Section V.
DC Controller PCA	5. Is the problem solved if the DC Controller PCA is replaced?	YES

I-14. Poor Fusing

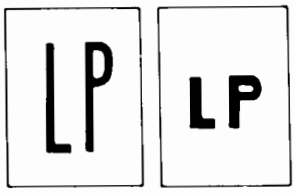


DESCRIPTION

* Print can be easily rubbed off

CAUSE	CHECK	RESULT/MEASURE
Paper	1. Is paper that meets specification used?	NO - Advise the customer to use paper that meets specification.
Fusing assembly	2. Are the upper and lower rollers worn?	YES - Replace the rollers.
	3. Is the cleaning pad properly installed?	NO - Replace the pad.
	4. Is the fuse bulb protrusion pointing toward the thermistor?	NO - Correct the position.

I-15. Distortion

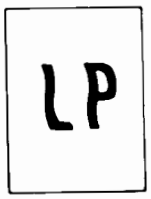


DESCRIPTION

* Tall/short characters
* Wide/narrow characters
* Characters with vertical spaces
* May appear as poorly formed characters

CAUSE	CHECK	RESULT/MEASURE
Drive mechanism. DC Power Supply/Main Motor Driver PCA, main motor.	1. Does LED501 on the DC Power Supply/Main Motor Driver PCA flash or go out?	YES - Perform the following measures until the problem is solved: (1) Check all parts of the drive mechanism. gear train and motor. (2) Replace the DC Power Supply/Main Motor Driver PCA back in the printer and replace the main motor. (3) Put the original DC Power Supply/Main Motor Driver PCA back in the printer and replace the main motor.
High Voltage PCA Font cartridge	2. Are characters are poorly defined with vertical spaces?	YES - 1. Replace the High Voltage PCA. 2. If the problem occurs only when the font cartridge is in. replace the font cartridge.

I-16. Waviness



DESCRIPTION

* Irregular character shapes
* Irregular line margins or spaces

CAUSE	CHECK	RESULT/MEASURE
Font cartridge	1. If the left hand margin is irregular when running the SELF TEST. ensure that a non-proportional font cartridge is used to run the SELF TEST.	Remove and retry.
Scanner driver PCA, scanner motor. DC Controller PCA	2. Does LED401 on the scanner driver PCA (part of the scanner unit) light continuously?	NO - Replace the scanner unit. Is the problem solved? If not. put the original unit back in the printer and replace the DC Controller PCA.

I-17. Miscellaneous Irregularities

DESCRIPTION

* Irregular spots and/or lines
* Any print irregularities that do not fall into the other categories
* Small round spots/dots on page every 188 mm

CAUSE	CHECK	RESULT/MEASURE
Foreign objects in paper path	1. Are there foreign objects in the paper path that could be scratching the drum?	Check the paper path.
Scratched drum	2. Replace the EP cartridge. Is the problem solved?	NO - Retry step 1.
Toner spots on front of page	3. Check that the fuser cleaning pad is installed and is clean.	Replace if necessary
Repeated dots or spots every 188 mm	4. Replace the EP Cartridge	

6-4. DISPLAY STATUS TROUBLESHOOTING PROCEDURES

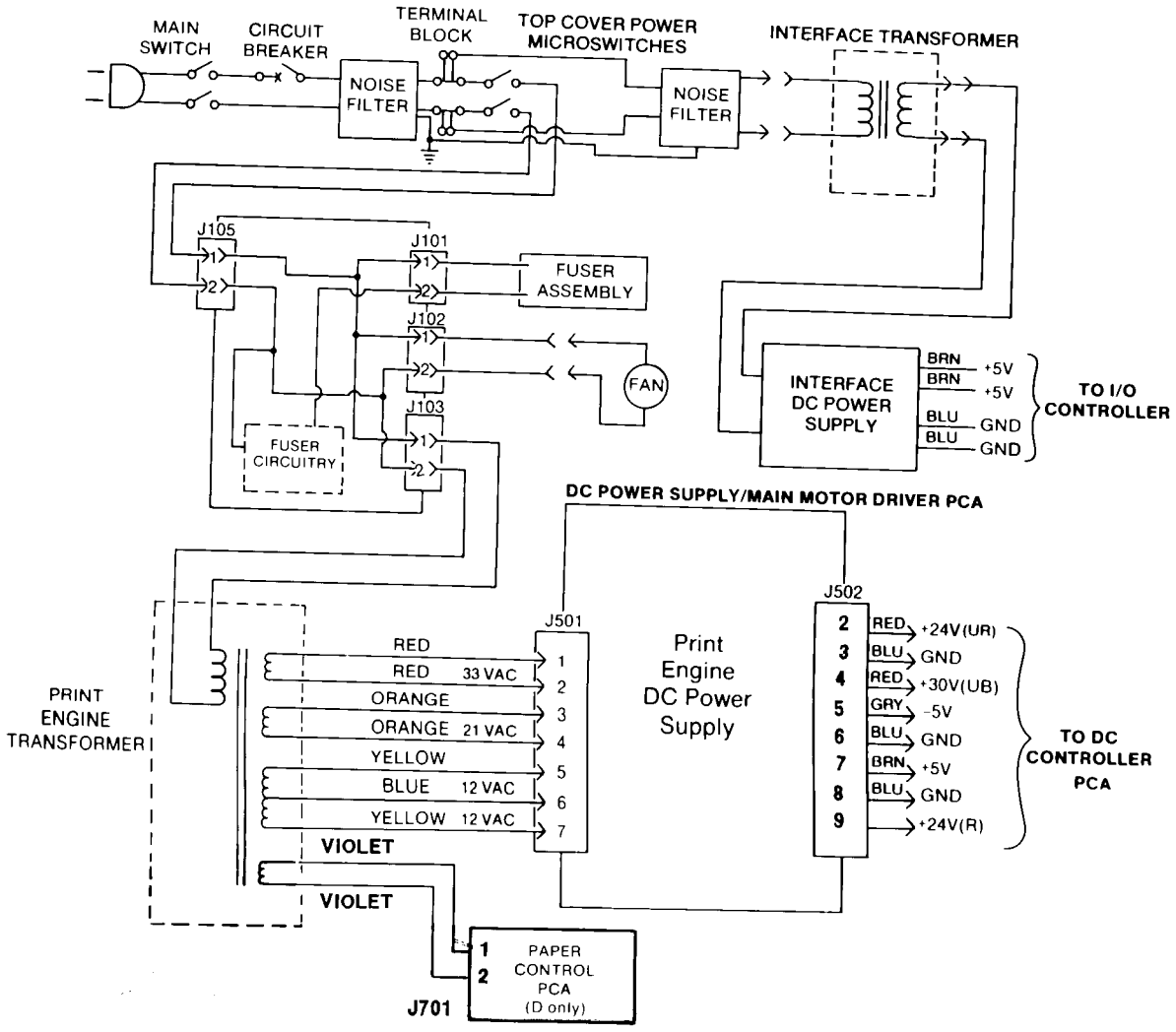


Figure 6-1. AC Power Distribution

M-1. Power Malfunction (AC and DC)

If air is blowing through the louver when power is switched ON, start from step 8.

CAUSE	CHECK	MEASURE
Power Cord	1. Is the printer plugged in?	Plug it in.
Upper main body	2. Is the printer firmly closed?	Close it.
Line voltage	3. Is the required line voltage supplied to the outlet?	If power is supplied at a lower voltage, suggest that the customer install a line-voltage regulator.

M-1. Power Malfunction continued.

CAUSE	CHECK	MEASURE
Circuit breaker	4. Is circuit breaker CB1 open?	Reset the circuit breaker. (If the circuit breaker. breaks its connection as soon as it is reset. excessive current may be flowing. Check the circuit)
	5. Confirm that the power is switched OFF. Unplug the printer. Open the upper half of the printer and remove the AC driver PCA. Confirm circuit breaker CB1 is reset. Is CB1 conducting?	Replace circuit breaker CB1.
Noise filter. main switch. power cord	6. Plug the printer in and turn it ON. Is line voltage supplied between TB1-01-1 and TB1-02-1? (Prior to checking be sure to set the multimeter to the correct AC voltage measuring range.)	Check noise filter NF1. main switch SW1. and the power cord (and plug). Replace as required.
Door switch MS1. MS2	7. Switch the power OFF. Unplug the printer. Reinstall the AC Driver PCA. Plug the printer in and turn the main switch ON. Is AC voltage supplied between J105-1 and J105-2 of the AC Driver when the door switch is actuated with a screwdriver?	Replace MS1 and/or MS2.

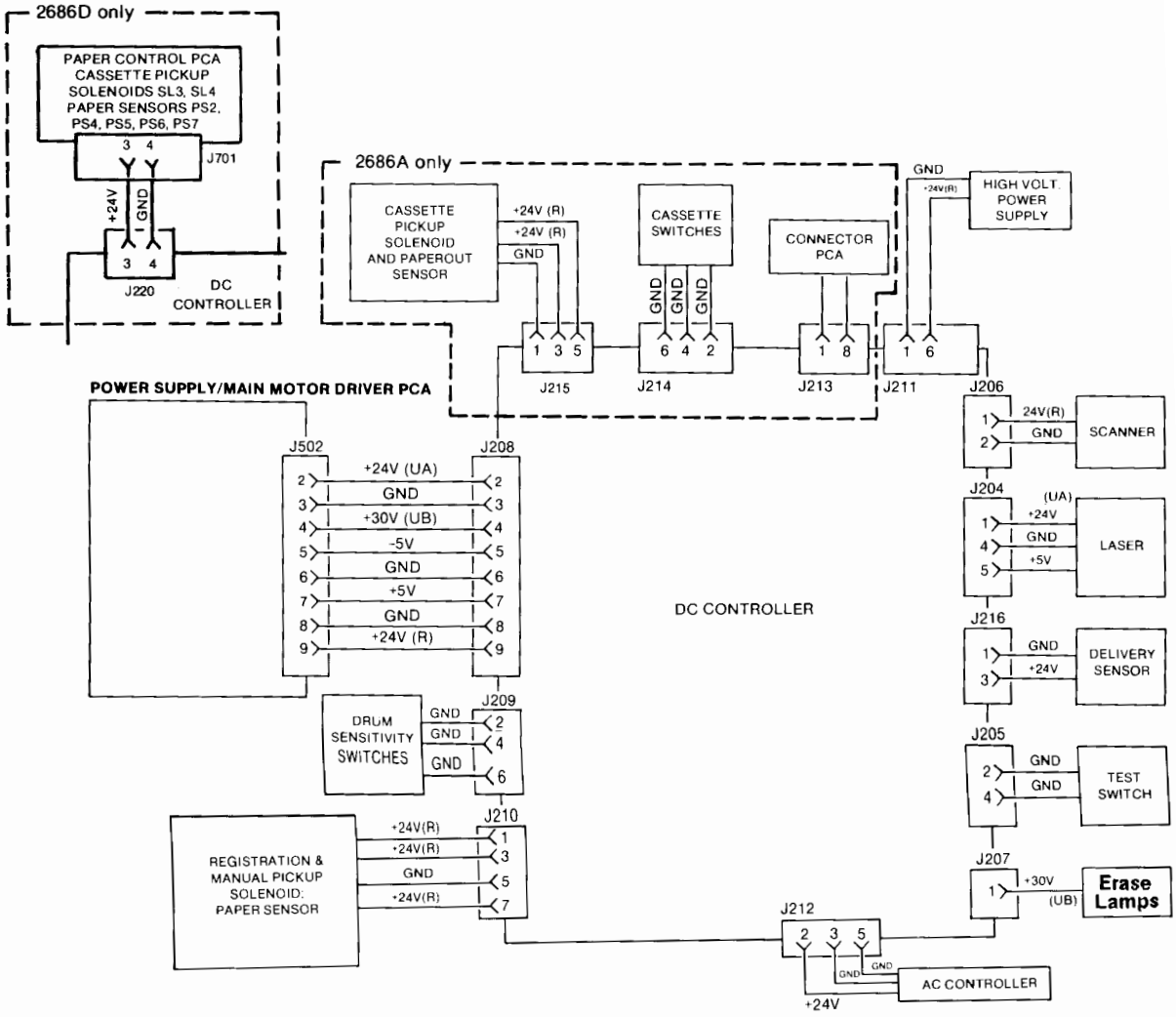


Figure 6-2. DC Power Distribution

M-1. Power Malfunction continued.

CAUSE	CHECK	MEASURE
AC Controller (AC Driver PCA and Fuser Safety PCA)	8. Is AC voltage supplied between J103-1 and J103-2 of the AC Controller when the door switch is actuated with a screwdriver?	Replace the AC Controller PCA. Is the problem solved? If not, replace the Fuser Safety PCA.
DC Power Supply	9. Close the upper half of the printer and remove the top cover. Are the DC voltages supplied between J502 pins on the DC Power Supply/Main Motor Driver PCA as listed below? J502-4 and J502-8 +24-35 J502-9 and J502-8 +24 J502-7 and J502-6 +5 J502-5 and J502-6 -5 J502-2 and J502-3 +20-30	Proceed to step 22
Transformer (print engine)	10. Switch the main switch OFF and disconnect J501 on the DC Power Supply/Main Motor Driver PCA. Switch the printer ON. Are the specified AC voltages supplied between the connector pins as specified in the table below? J501-1 and J501-2 29-37 J501-3 and J501-4 10-14 J501-4 and J501-5 10-14 J501-6 and J501-7 18-24	Replace the print engine transformer PT1.
DC Power Supply/Main Motor Driver PCA	11. Switch the printer OFF. Disconnect J502 on the DC Power Supply/Main Motor Driver PCA, and connect J501. Switch the printer to ON. Is the DC voltage shown in the table in step 9 supplied at J502 on the PCA.	Replace the DC Power Supply/Main Motor Driver PCA.
DC Controller PCA	12. Disconnect all connectors besides J208 on the DC Controller PCA after turning the main switch OFF. Are any of the following J502 pins (cables attached) short circuited? J502-4 and J502-8 J502-9 and J502-8 J502-7 and J502-6 J502-5 and J502-6 J502-2 and J502-3	Check the wiring between J502 and J208 for a short circuit. If there is no short circuit, replace the DC Controller PCA.
Connections	13. Connect all the connectors on the DC Controller PCA. Are any of the following J502 pins (cables attached) short circuited? J502-4 and J502-8 J502-9 and J502-8 J502-7 and J502-6 J502-2 and J502-3	Proceed to step 22.

M-1. Power Malfunction continued.

CAUSE	CHECK	MEASURE
Erase Lamp PCA	14. Were J502-4 and J502-8 shorted?	No - Proceed to step 15. YES - Check the wiring between J207 and TB5 for a short circuit. If there is no short circuit, replace the Erase Lamp PCA.
	15. Were J502-9 and J502-8 shorted?	NO - Proceed to step 18.
DC Controller Loads (HP 2686A)	16. Disconnect connectors J215, J212, J210, J216, J211, J208, and J206 on the DC Controller PCA. Are any of the circuits between the following connectors (cables attached) shorted? J215-3 and J215-1, J215-5 and J215-1 J212-2 and J212-3, J210-1 and J210-5 J210-3 and J210-5, J210-7 and J210-5 J216-3 and J216-1, J213-8 and J213-1 J211-6 and J211-1, J206-1 and J206-2	Check the wires between the shorted connectors and the loads for continuity. If none are shorted, replace the loads (sensors, other components). If a short is found, remove the cause of the short.
DC Controller Loads (HP 2686D)	16a. Disconnect connectors J220, J212, J210, J216, J211, J208, and J206 on the DC Controller PCA. Are any of the circuits between the following connectors (cables attached) shorted? J220-3 and J220-4 J212-2 and J212-3, J210-1 and J210-5 J210-3 and J210-5, J210-7 and J210-5 J216-3 and J216-1, J213-8 and J213-1 J211-6 and J211-1, J206-1 and J206-2	Check the wires between the shorted connectors and the loads for continuity. If none are shorted, replace the loads (sensors, other components). If a short is found, remove the cause of the short. Disconnect the loads from the Paper Control PCA to further identify the failing component.
AC Driver PCA	17. Is J212-2 and J212-3 of the connector (cable attached) shorted?	YES - Check the wiring between J104 and J212 for a short. If it is OK, replace the AC Controller PCA or the Fuser Safety PCA.
	18. Were J502-7 and J502-6 shorted?	NO - Proceed to step 20.
Laser Unit	19. Disconnect J204 on the DC Controller PCA. Are J204-4 and J204-5 shorted?	YES - If the circuit between J204-4 and J204-5 are shorted, check the wiring between J204 and TB3, and between J204 and TB4 for a short. If there are no shorts, replace the laser unit.
	20. Were J502-2 and J502-3 shorted?	NO - Proceed to step 22.

M-1. Power Malfunction continued.

CAUSE	CHECK	MEASURE
Laser Unit	21. Disconnect J204 on the DC Controller PCA. Are J204-1 and J204-4 of the connector (cable attached) shorted?	YES - Check the wiring between J204 and TB3 and TB4 for a short. If there are no shorts, replace the laser unit.
Connections	22. Plug in all the connectors on the DC Power Supply/Main Motor Driver PCA and the DC Controller PCA. Confirm that the circuit breaker has been reset and the upper half of the printer has been closed. Switch the printer ON. Are the specified DC voltages shown below supplied between J208 on the DC Controller PCA? J208-4 and J208-8 +24-35 J208-9 and J208-8 +24 J208-7 and J208-6 +5 J208-5 and J208-6 -5 J208-2 and J208-8 +20-30	YES - Replace the DC Controller PCA. NO - Check the wiring between J502 on the DC power supply and main motor driver PCA and J208 on the DC controller PCA for good contact or scratches on the wire insulation.

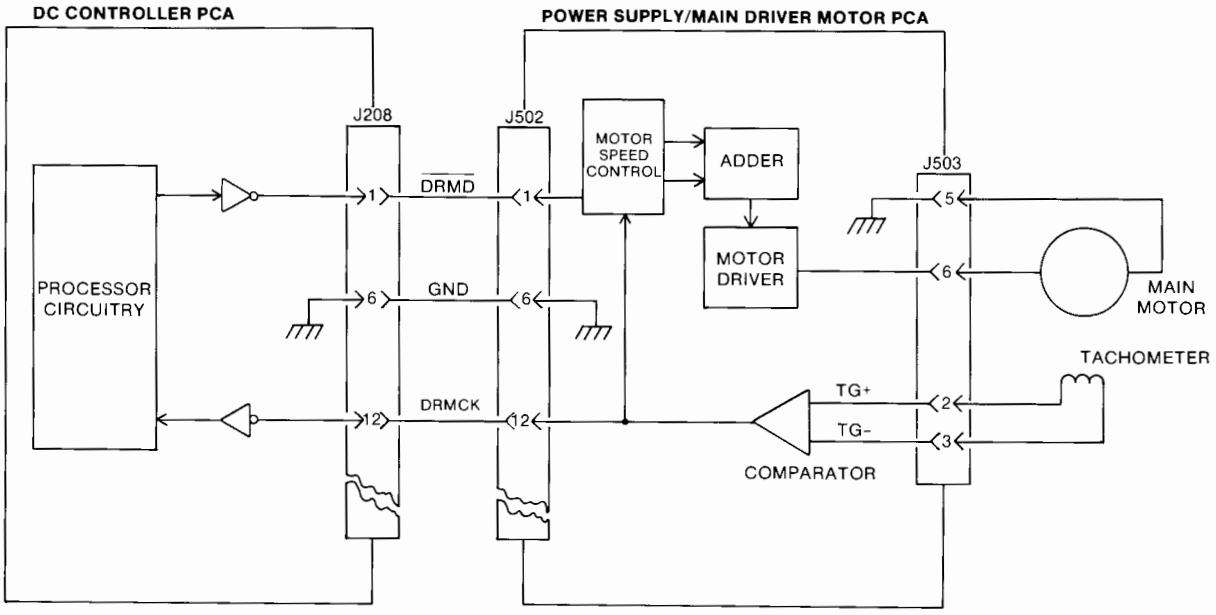


Figure 6-3. Main Motor Driver Circuitry

M-2. Main Motor Malfunction

CAUSE	CHECK	MEASURE
Drive Component	1. Remove the rear panel of the printer. Does the main motor begin rotating as soon as the test switch on the left panel is pressed while the READY indicator lights continuously? (Assume the printer is OFFLINE and READY).	Check that all gears mesh correctly.
Main Motor	2. Does the voltage between J503-6 and J503-5 on the DC Power Supply/Main Motor Driver PCA vary from 0V to about +13 VDC when the same operation as in step 1 is performed?	YES - Replace the Main Motor. NO - Check all connections and wires to the Main Motor. Disconnect J503. Measure the resistance between J503-5 and J503-6. A good motor should measure 13 ohms of resistance. Replace if it is not within that range. Is the problem solved? If not, proceed to step 3.
DC Controller PCA	3. Does the voltage between J208-1 (DRMD) and J208-6 (GND) on the DC Controller PCA vary from about +8 VDC to about 0 VDC when the same operation as in step 1 is conducted?	YES - Check J208 on the DC Controller PCA and J502 on the DC Power Supply/Main Motor Driver PCA for good contact. Repair poor connections. Is the problem solved? If not, proceed to step 5. NO - Replace the DC Controller PCA.
Test Switch. DC Controller PCA	4. Does the voltage between J205-1 (TSTPT) and J205-2 (GND) on the DC Controller PCA vary from +5 VDC to 0 VDC when the test switch is pressed?	YES - Replace the DC Controller PCA. NO - Check J205 and the test switch for correct wiring and good contact. If there is no fault, replace the test switch.
DC Power Supply/Main Motor Driver PCA	5. Does the voltage between J502-1 (DRMD) and J502-6 (GND) on the DC Power Supply/Main Motor Driver PCA vary from about +8 VDC to about 0 VDC when the same operation as in step 1 is performed?	YES - Replace the DC Power Supply/Main Motor Driver PCA.
Paper Cassette	6. Is there too much paper in the paper cassette? Too much paper causes the gears to bind. Paper should be below the arrows on the side of the cassette tray.	Remove some paper from the cassette.

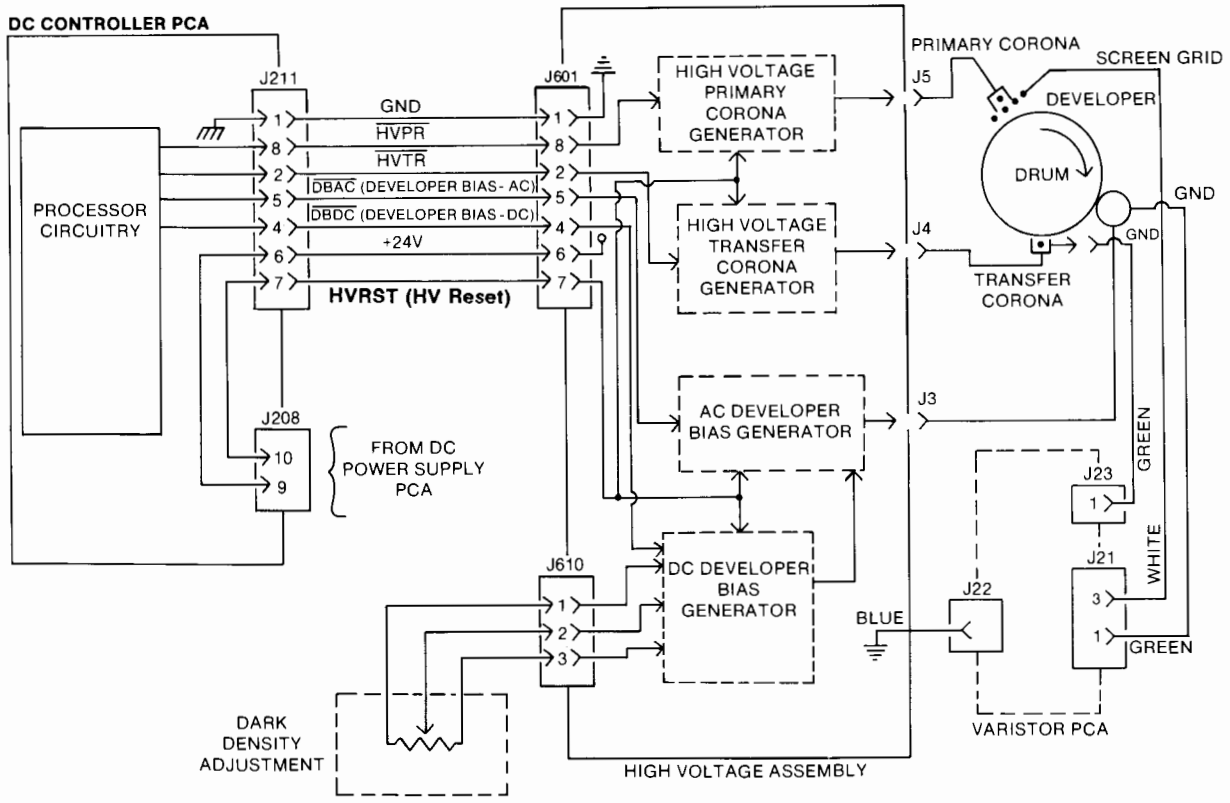


Figure 6-4. High Voltage Power Supply

M-3. High Voltage Power Supply Malfunction

CAUSE	CHECK	MEASURE
Drive Component	1. Remove the rear panel of the printer. Press the test switch on the left panel. Does the main motor begin rotating immediately?	NO - Go to M-2
DC Power Supply/Main Motor Driver PCA	2. Is the voltage between J601-7 (HVRST) and J601-1 (GND) on the high Voltage Power Supply at about 0 VDC when the power is switched ON?	NO - Check the wires between the following connectors for good contact. Repair any problem with poor contact. J211 on the DC Controller PCA and J601 on the High Voltage Power Supply J208 on the DC Controller PCA and J502 on the DC Power Supply/Main Motor Driver PCA Is the problem solved? If not, replace the DC Power Supply/Main Motor Driver PCA.

M-3. High Voltage Power Supply Malfunction continued.

CAUSE	CHECK	MEASURE
High Voltage Power Supply	3. Do the voltages of the J601-1 pins on the High Voltage Power Supply vary as follows when the same operation as in step 1 is executed? - from about +18 VDC to about +1 VDC between J601-8 (HVPR) and J601-1 (GND) immediately after the test switch is pressed - from about +20 VDC to about 0 VDC between J601-2 (HVTR) and J601-1 (GND) and between J601-4 (DBDC) and J601-1 (GND) a few seconds after the test switch is pressed - from about +17 VDC to about 0 VDC between J601-5 (DBAC) and J601-1 (GND) about 6 seconds after the test switch is pressed.	YES - Check J601 and J3, J4, J5 for good contact. Repair any poor contact. Is the problem solved? If not, replace the High Voltage Power Supply.
DC Controller PCA	4. Do the voltages between J211 pins on the DC Controller PCA vary as follows when the same operation as in step 1 is performed? - from about +18 VDC to about +1 VDC between J211-8 (HVPR) and J211-1 (GND) immediately after the test switch is pressed. - from about +20 VDC to about 0 VDC between J211-2 (HVTR) and J211-1 (GND) and between J211-4 (DBDC) and J211-1 (GND) a few seconds after the test switch is pressed - from about +17 VDC to about 0 VDC between J211-5 (DBAC) and J211-1 (GND) about 6 seconds after the test switch is pressed	NO - Replace the DC Controller PCA.

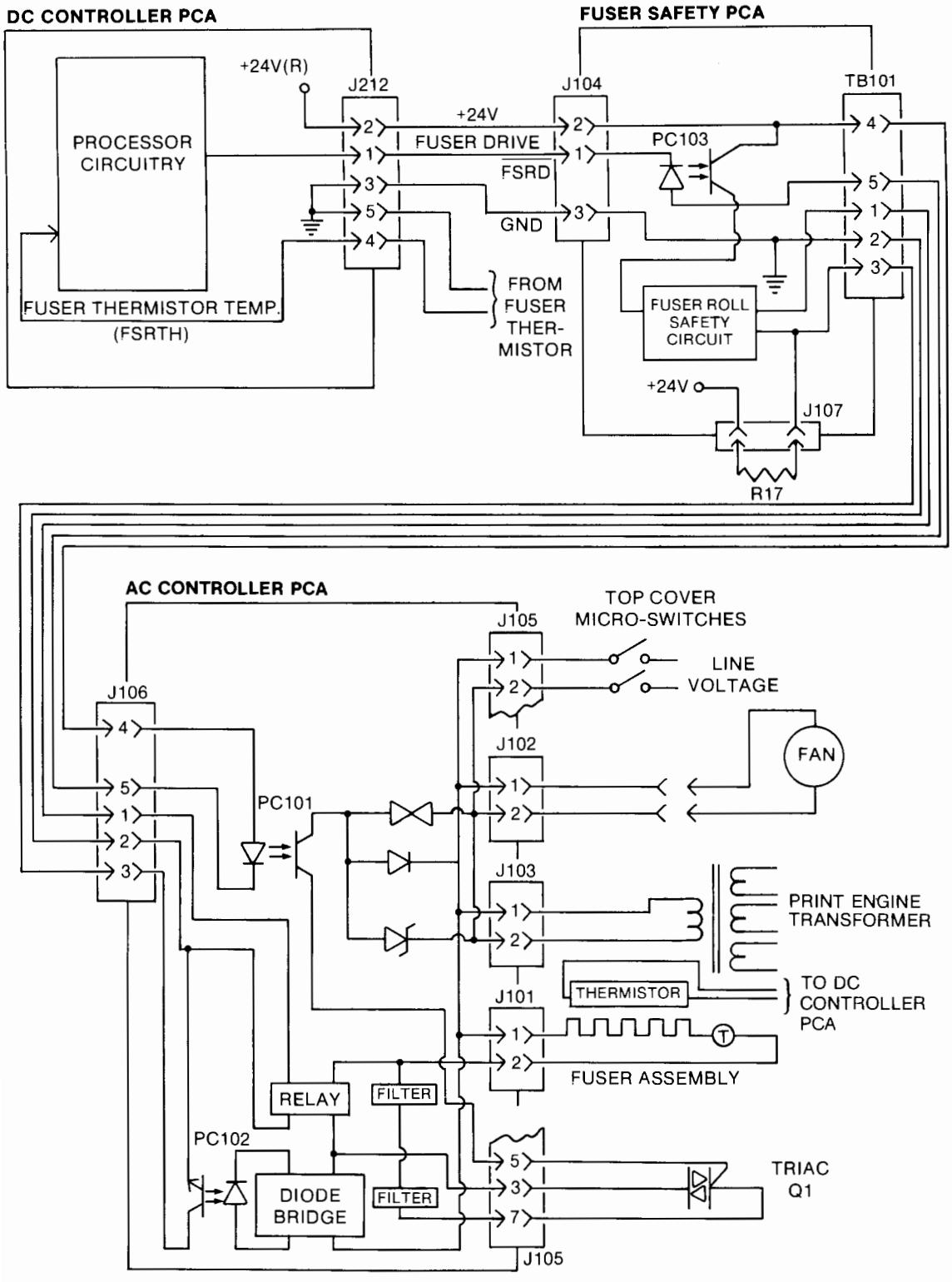


Figure 6-5. Fuser Circuitry

M-4. Fuser Heater Malfunction (see note)

CAUSE	CHECK	MEASURE
Fuser Roll Heater, Thermoprotector	1a. Power OFF the printer and unplug connector J101 on the AC Driver PCA. Check the 47 ohm resistor that sits on connector J107 of the Fuser Safety PCA. Does it measure the correct resistance? NOTE: Low line voltages, power line spikes, or a shorted Triac (Q1) can cause the resistor on J107 to blow.	NO - Replace the resistor and go to step 1b.
	1b. Measure the resistance between J101-1 and J101-2 of the connector (cable attached) to measure the resistance of the fuser roll heater (fuser lamp and thermoprotector). Does it measure 1-5 ohms?	NO - Check whether the lamp is properly seated in its electrical contacts. Ensure that the thermoprotector (fuse) is not "open". If "open", replace the thermoprotector, if not replace the fuser lamp. Do not power-on the printer until the problem is corrected.
Thermistor	2. Unplug J212 on the DC Controller PCA. Measure the thermistor resistance between J212-4 and J212-5 (connector cable attached). Is it 100K to 400K ohms (at room temperature)? NOTE: It will measure 8-11K ohms when hot. After measurement, plug in J212 on the DC Controller PCA.	NO - Check the wiring between the thermistor in the fusing assembly and the DC Controller PCA. If it is normal, replace the thermistor. If the thermistor resistance reaches the specified value, proceed to step 3.
DC Controller PCA	3. Does the voltage between J104-1 (FSRD) and J104-2 (+24 VDC) on the Fuser Safety PCA go from about +24 VDC to about +22 VDC about one second after the power is switched ON?	Check the wiring between J212 on the DC Controller PCA and J104 on the Fuser Safety PCA for good contact. Is the problem solved? If not, replace the DC Controller PCA.
AC Driver PCA (Fuser Safety PCA) (AC Controller PCA)	4. Do the line voltages between the specified connectors on the AC Controller PCA vary as follows about one second after the power is switched ON? - from line voltage to 0 VDC between J105-7 and J105-3 - from 0 VAC to line voltage between J101-1 and J101-2	Replace the AC Controller PCA. Is the problem solved? If not, replace the Fuser Safety PCA. Is the problem solved? If not, reinstall the AC Controller PCA and Fuser Safety PCA, and replace triac Q1.
DC Power Supply/Main Motor Driver PCA	5. Is the voltage between J204-1 and J204-4 (GND) from +20 VDC to +30 VDC, and +5 VDC between J204-5 and J204-4 (GND) in the laser unit?	NO - Check whether the voltage between J208-3 and J208-4 (GND) is from +20 VDC to +30 VDC, and +5 VDC between J208-8 and J208-7 (GND). If not, check the wiring between J502 on the Power Supply/Main Motor Driver PCA and J208 for poor contact. If contact is good, replace the DC Power Supply/Main Motor Driver PCA.

NOTE

The HP 2686A/D has a 10 minute memory of an ERROR 50. The printer must be powered OFF for more than 10 minutes to clear the error. If it is desirable to clear the error before the time has elapsed, jumper the leg of resistor R250 (on the DC Controller PCA) closest to the front of the printer, to ground for 3 seconds.

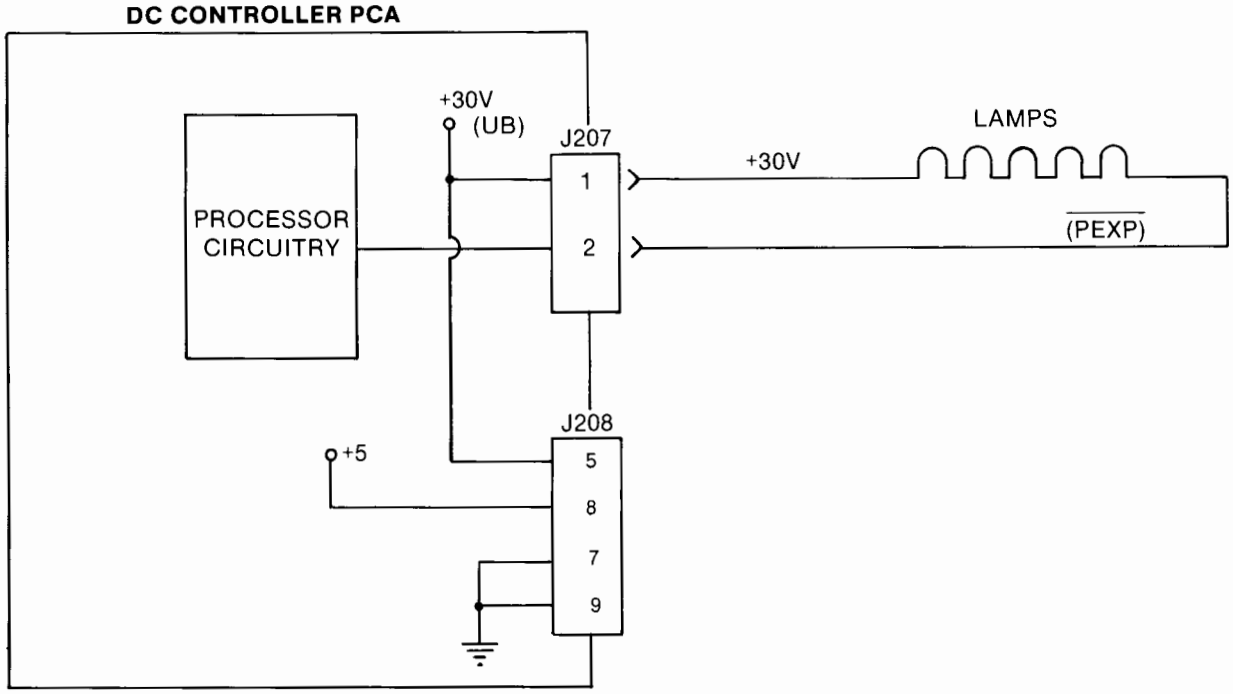


Figure 6-6. Erase Lamp Circuitry

M-5. Erase Lamp Malfunction

CAUSE	CHECK	MEASURE
Erase Lamp/Page Counter PCA	1. Open the upper half of the printer and take out the EP cartridge. Switch the printer to ON. Activate the door switch using a screwdriver. Do the lamps flash momentarily? Is at least one lamp lit?	YES - Replace the Erase Lamp/Page Counter PCA if lamp intensity is low.
DC Controller PCA, DC Power Supply/Main Motor Driver PCA	2. Press the test switch on the left panel. Does the voltage between J207-1 (+24 VDC) and J207-2 (PEXP) on the DC Controller PCA vary from 0 VDC to between +24 VDC and +35 VDC?	YES - Check J207 on the DC Controller PCA for good contact.
	3. Is the voltage between J207-1 and J208-6 (GND) on the DC Controller PCA within the range from +24 VDC to +35 VDC, and between J208-7 and J208-8 (GND) on the DC Controller PCA at +5 VDC?	YES - Replace the DC Controller PCA NO - Check J502 on the DC Power Supply/Main Motor Driver PCA and J208 on the DC Controller PCA for good contact. If OK, replace the DC Power Supply/Main Motor Driver PCA. Is the problem solved? If not, replace the DC Controller PCA.

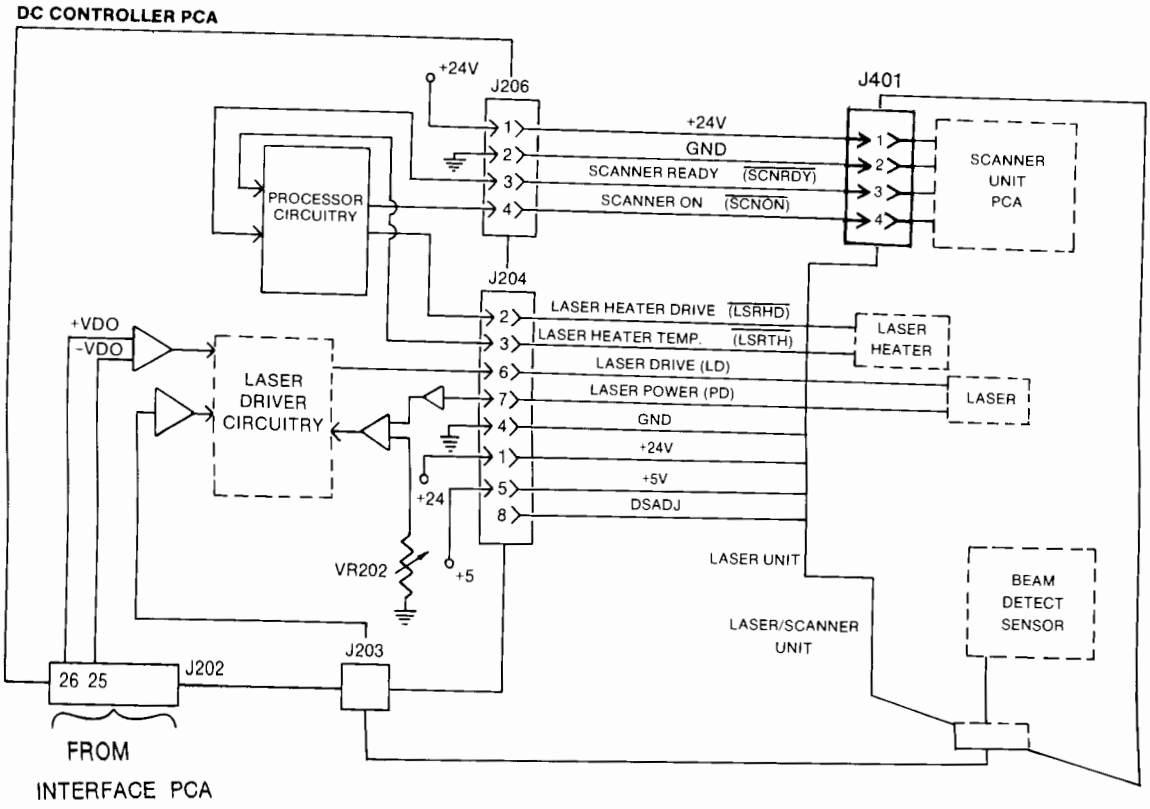


Figure 6-7. Laser/Scanner Circuitry

M-6. Laser/Scanner Malfunction

CAUSE	CHECK	MEASURE
Laser Power	1. Is the laser power at the proper level?	NO - Adjust the laser power to the proper level. (See the laser power adjustment procedure in Section V of this manual.
Scanner Driver PCA	2. Press the test switch on the left panel. Does the scanner motor start, and does LED401 on the Scanner Driver PCA of the Scanner Unit light continuously?	YES - Proceed to step 7.
	3. Is contact good between J401 on the Scanner Driver PCA and J206 on the DC Controller PCA?	NO - Repair any poor contact between J401 and J206.

M-6. Laser/Scanner Malfunction continued.

CAUSE	CHECK	MEASURE
DC Power Supply/Main Motor Driver PCA	4. Is +24 VDC supplied between J401-1 and J401-2 (GND) on the Scanner Driver PCA of the Scanner Unit?	NO - Check whether +24 VDC is supplied between J208-9 and J208-8 (GND) on the DC Controller PCA. If +24 VDC is not supplied there, check J502 on the DC Power Supply/Main Motor Driver PCA and J208 for poor contact. If contact is good, replace the DC Power Supply/Main Motor Driver PCA.
Scanner Driver PCA	5. Does the voltage between J401-4 (SCNON) and J401-2 (GND) in the Scanner Driver PCA of the Scanner Unit vary from about +5 VDC to about 0 VDC when the same procedure as in step 2 is performed?	YES - Replace the Scanner Unit
DC Controller PCA	6. Does the voltage between J206-4 (SCNON) and J206-2 (GND) on the DC Controller PCA vary from about +5 VDC to about 0 VDC when the same procedure as in step 2 is performed?	NO - Replace the DC Controller PCA.
Scanner Driver PCA, DC Controller PCA	7. Does the voltage between J401-3 (SCNRDY) and J401-2 (GND) in the Scanner Driver PCA of the Scanner Unit vary from about +3 VDC to about 0 VDC a few minutes after the same procedure as in step 2 is performed?	YES - Replace the DC Controller PCA. Is the problem solved? If not, put the old PCA back in the printer and replace the Scanner Unit. NO - Replace the Scanner Unit.
Laser Unit	8. Unplug J204 on the DC Controller PCA after switching the printer OFF. Measure the resistance between J204-1 and J204-2 of the connector (cable attached). Is it 40 to 55 ohms?	NO - Replace the Laser Unit.
DC Controller PCA, Laser Unit	9. Measure the resistance between J204-3 and J204-4 on the connector (cable attached). Is it 5K to 15K ohms at normal temperature? After measurement, plug in J204 on the DC Controller PCA.	YES - Replace the DC Controller PCA. NO - Replace the Laser Unit.

M-7. Interface PCA Malfunction

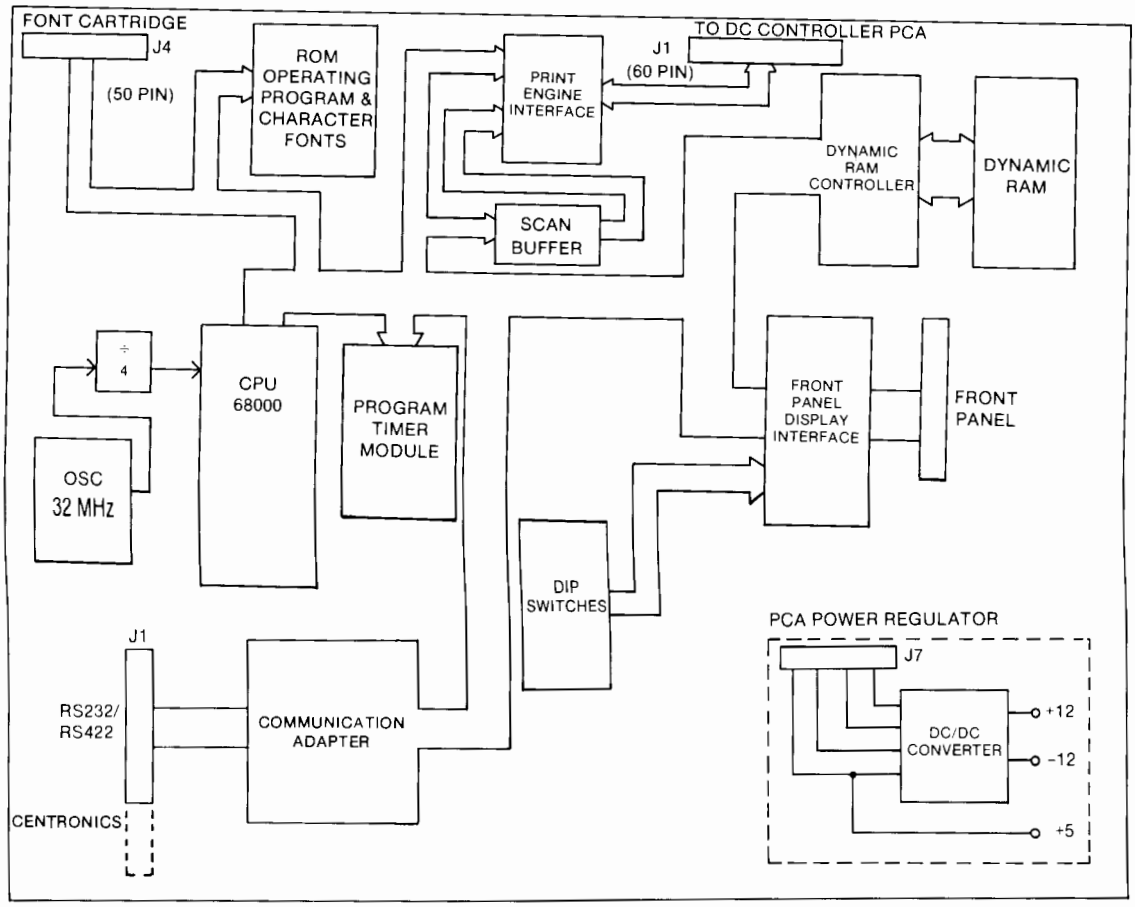


Figure 6-8. Interface PCA

The Interface PCA is a field replaceable assembly. If the status indicator points to this PCA as the source of an error, the Service Representative should perform the following steps:

1. Verify that all connectors are properly seated and that no wires are broken.
2. Ensure that the correct voltages are being input to the PCA (+5 VDC at J7-03 and at J7-04).

If the error persists, the PCA should be replaced without further troubleshooting.

6-5. PAPER PATH (JAMS, real or false) PROBLEM TROUBLESHOOTING

Paper in the printer passes through the four main areas shown below. Jams or paper path problems should be localized to one of the four areas, then proceed to the troubleshooting chart indicated.

Paper Jams

DEFINITION	PAPER DAMAGE	DISPLAY 13	GO TO
Real	yes	yes	see note
False	no	yes	T-7
Undetected	yes	no	T-8

NOTE

Note the position of paper in the printer when a jam occurs. Paper motion will stop with the paper nearest the sensor which detected the error. Figures 6-9 and 6-10 show the main areas where paper jams occur. Refer to those areas and their accompanying sections when troubleshooting paper jams.

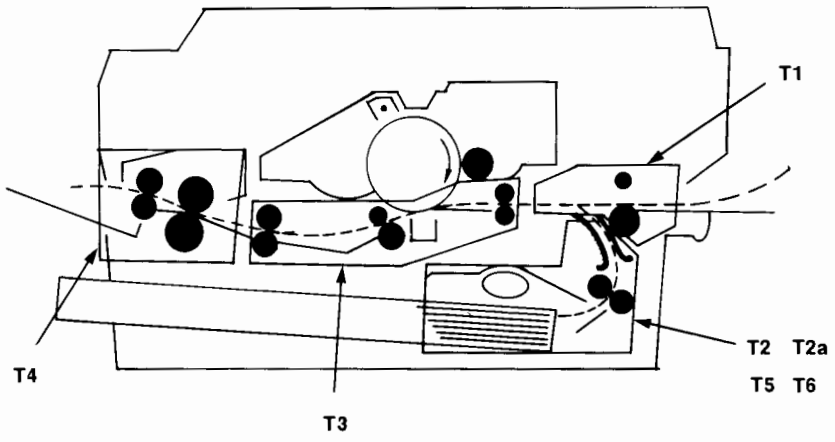


Figure 6-9. HP 2686A Paper Paths

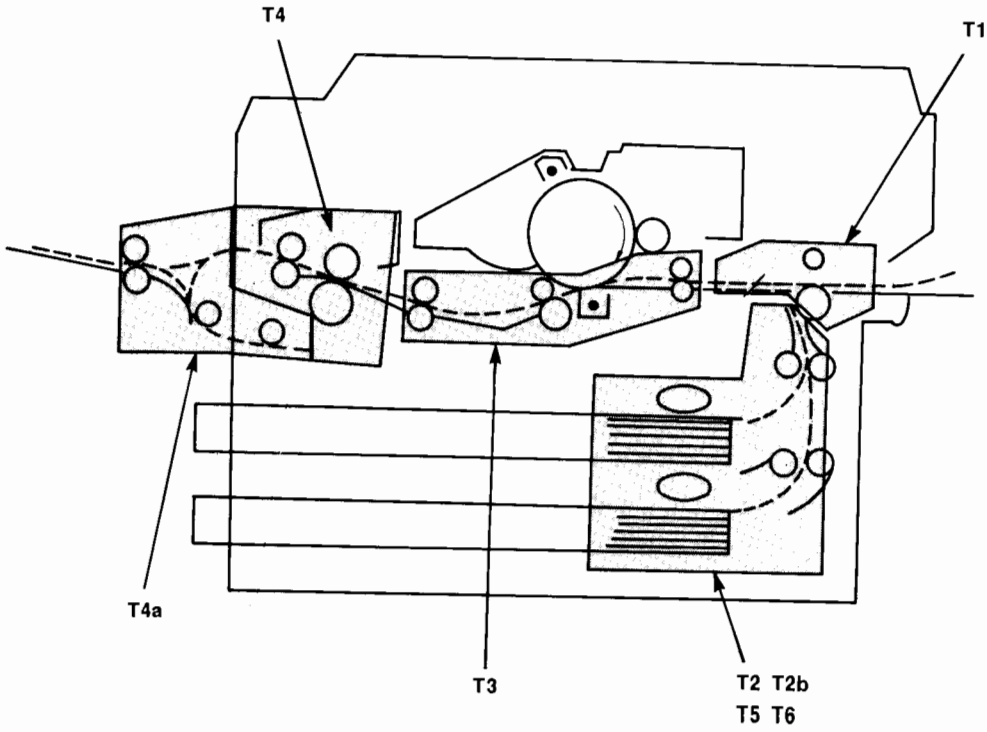


Figure 6-10. HP 2686D Paper Paths

T-1. Manual Paper Feed Area

CAUSE	CHECK	MEASURE
Paper	1. Is the Customer's paper outside of the Paper Specification guidelines? 2. Is the paper wrinkled or curled?	NO - Advise the customer to use paper that meets specification. YES - Replace the paper Inform the customer of the correct method of storing paper.
Paper Detection Arm 1	3. Does the arm move smoothly?	Adjust the arm motion.
Lower Roller	4. Is there deformation due to wear? Is the roller dirty?	YES - Replace the roller if worn. YES - Clean with alcohol.
Guides	5. Are the guides deformed?	YES - Replace deformed guides.

T-1a. Manual Paper Feed Malfunction (see Figure 6-11)

CAUSE	CHECK	MEASURE
Operation Error	1. Has the external device input a manual paper feed command to the printer.	NO - Input a manual paper feed command from the external device to the printer.
DC Power Supply/Main Motor Driver PCA	2. Is a pulse applied between J208-12 (DRMCK) and J208-8 (GND) on the DC Controller PCA?	NO - Check the wiring between J502 on the DC Power Supply/Main Motor Driver PCA and J208. If all are correctly connected, replace the DC Power Supply/Main Motor Driver PCA or the Main Motor (M-1).
Registration Sensor	3. Does the voltage between J210-6 (PFS) and J210-5 (GND) on the DC Controller PCA go from about 0 VDC to +5 VDC when paper is set on the manual feed tray?	NO - Check J4 of the registration sensor and J210 on the DC Controller PCA for poor contact. If it cannot be fixed, replace the registration sensor.
Faulty upper and lower manual pickup rollers	4. Does the upper manual pickup roller descend and feed paper about 8 seconds after the Main Motor begins rotating?	YES - Check the lower roller for wear and proper rotation. Check that the upper roller presses the paper firmly.
DC Controller PCA	5. Does the voltage between J210-4 (MPUSD) on the DC Controller PCA and J210-5 (GND) go from about +24 VDC to about 0 VDC about 8 seconds after the Main Motor begins rotating, and remain at 0 VDC for about 1.5 seconds?	NO - Replace the DC Controller PCA.
Poor contact, manual feed solenoid	6. Unplug J210 on the DC Controller PCA. Check the circuit between J210 and J210-3 (connector with cable attached) using a multimeter. Is their continuity?	NO - Check whether the faston connector for the manual feed solenoid SL2 is firmly attached. Also, check the wire to the DC Controller PCA. Is the problem solved? If not, replace the manual feed solenoid SL2.

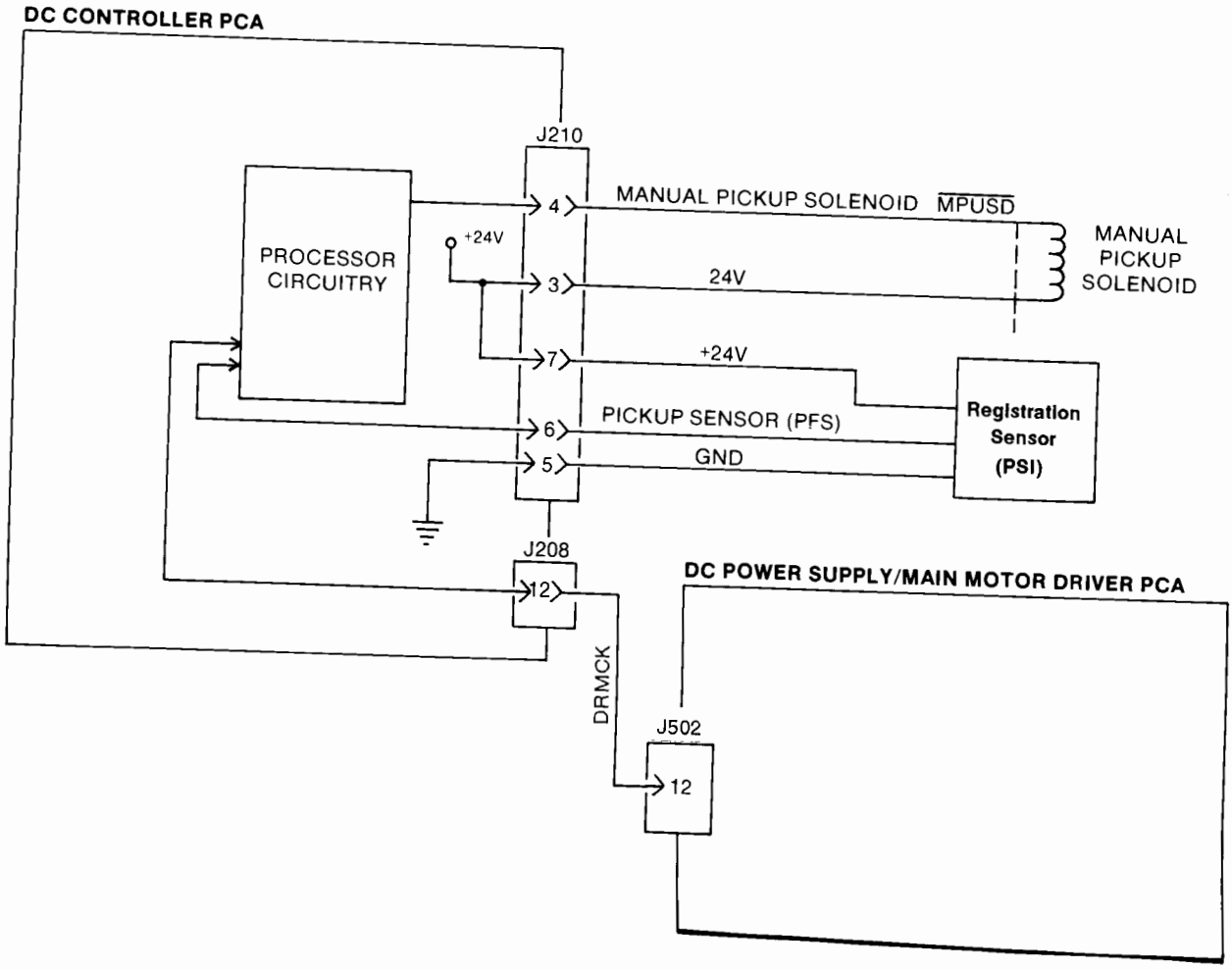


Figure 6-11. Manual Feed Circuitry

T-2. Cassette Pickup Assembly

CAUSE	CHECK	MEASURE
Paper	1. Is paper that meets specification being used?	NO - Advise the customer to use paper that meets specification.
	2. Is the paper wrinkled or curled?	YES - Replace the paper. Show the customer how to store paper.
Cassette position	3. Is the cassette installed properly in the printer?	NO - Show the customer how to insert the cassette.
Cassette Springs	4. Is the cassette spring lifting force adequate?	NO - Check the movement of the cassette plate. Ensure that nothing is hindering plate movement. Replace two springs if movement hindered.

T-2. Cassette Pickup Assembly continued.

CAUSE	CHECK	MEASURE
Cassette hold-down tabs	5. Are either the left or right cassette hold-down tabs deformed?	YES - Replace the hold-down tabs.
Pickup Rollers	6. Are any pickup rollers deformed or worn?	YES - Replace the pickup rollers as required.
Pickup Control Unit	7. Is the clutch spring deformed, rusty or worn?	YES - Replace the clutch spring.
Paper Pickup Guides	8. Does the paper pickup guide close firmly?	NO - Replace the guide springs (front and rear).

T-2a. Cassette Paper Feed Malfunction-HP 2686A (see Figure 6-12).

CAUSE	CHECK	MEASURE
Operation Error	1. Has the external device input a manual paper feed command to the printer?	YES - Input a cassette feed command.
Cassette Feed Roller	2. Does the cassette feed roller begin rotating when the test switch is pressed while the printer is in the READY state?	YES - Check whether the paper pickup guide is firmly closed or whether the cassette feed roller rotates smoothly. If the cassette feed roller is worn out, replace it. NO - Go to M-2. Is the problem solved? If not, proceed to step 3.
DC Controller PCA, Cassette Pickup Roller Clutch Solenoid	3. Does the voltage between J215-4 (CPUSD) and J215 (GND) on the DC Controller PCA drop from +24 VDC to 0 VDC about 2 seconds after the same operation as in step 2 is executed, and remain at 0 VDC for about one second?	YES - Separate the main printer body from the pedestal. Activate the cassette pickup roller clutch solenoid SL3 and rotate the idler gear (both) manually. Does the paper pickup roller clutch function normally and cause the pickup roller to rotate one time? If the pickup roller clutch operates correctly, check the connector of the cassette pickup roller clutch solenoid for good contact. If it has good contact, replace the cassette pickup roller solenoid SL3. If the cassette pickup roller is worn out, replace it.

T-2a. Cassette Paper Feed Malfunction-HP 2688A continued.

CAUSE	CHECK	MEASURE
Cassette size microswitch	4. Unplug J214 on the DC Controller PCA. Do the resistances between the following pins (connector and cable attached) vary from infinite to 0 ohms when microswitches MS5, MS6, and MS7 are pressed? J214-1 and J214-2 J214-3 and J214-4 J214-5 and J214-6 After measurement, plug in J214 on the DC Controller PCA.	NO - Check the wires between the microswitches and the DC Controller PCA for continuity, and all connectors for good contact. If correct operation has been verified, replace the microswitch which has resistance not equal to 0 ohms. YES - Replace the DC Controller PCA.

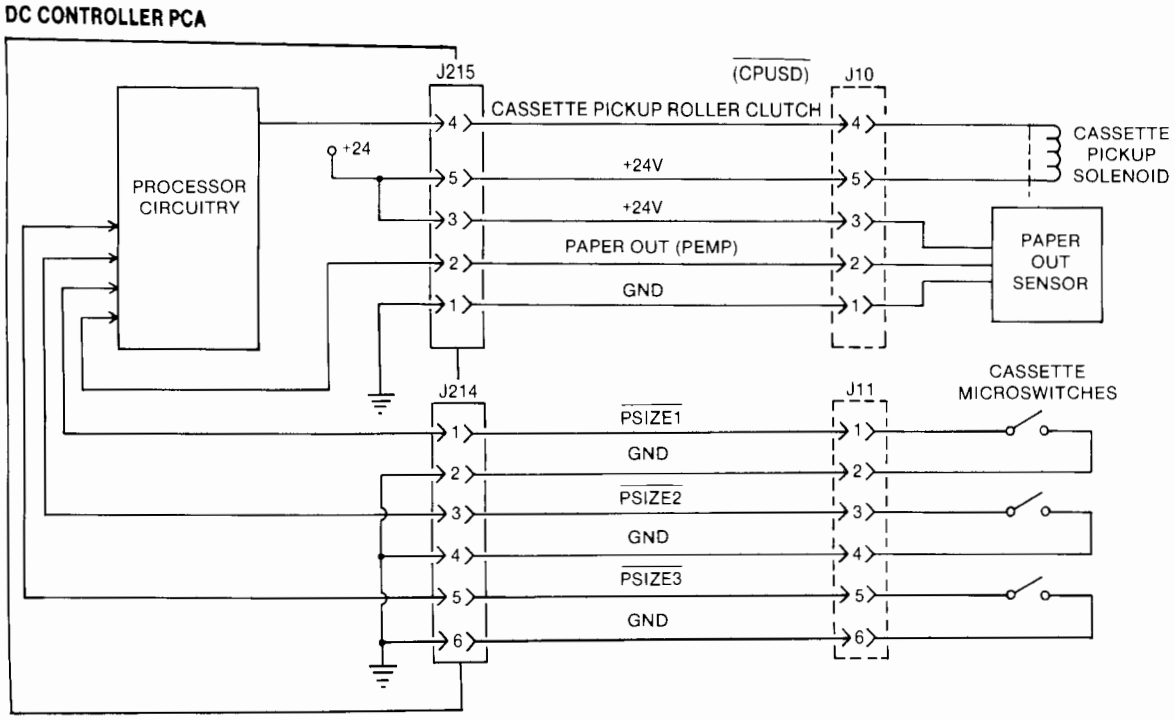


Figure 6-12. Cassette Pickup Circuitry HP 2686A

T-2b. Cassette Paper Feed Malfunction-HP 2686D.

CAUSE	CHECK	RESULT/MEASURE
Operation error	1. Has the external device input a manual paper feed command to the printer?	YES - Input a cassette feed command.
Cassette feed roller	2. Does the cassette feed roller begin rotating when the test switch is pressed while the printer is in a ready state?	YES - Check whether the paper pickup guide is firmly closed or whether the cassette feed roller rotates smoothly. If the cassette feed roller is worn out, replace it. NO - Go to M-2. Is the problem solved? If not proceed to step 3.
DC controller PCA, cassette pickup roller clutch solenoid	3. Does the voltage between J220-1 or J220-2 (UPUSD, LPDSD) and J220-4 (GND) on the DC controller PCA drop from +5 VDC to 0VDC about 2 seconds after the same operation as in step 2 is executed, and remain at 0 VDC for about one second?	YES - Separate the main printer body from the pedestal. Activate cassette pickup roller clutch solenoid SL3 or SL4 and rotate both idler gears manually. Does the paper pickup roller clutch function normally and cause the pickup roller to rotate one time? If the pickup roller clutch operates correctly, check the connector of cassette pickup roller clutch solenoid SL3 for good contact. If it has good contact, replace cassette pickup roller solenoid SL3. If the cassette pickup roller is worn out, replace it.
Cassette size microswitch	4. Unplug J220 on the DC controller PCA. Do the resistances between the following pins (connector and cable attached) vary from infinity to 0 ohms when microswitches MS5, MS6, and MS7 or MS10, MS11 and MS12 are pressed? J220-8 and J220-4 J220-9 and J220-4 J220-10 and J220-4 J220-11 and J220-4 J220-12 and J220-4 J220-13 and J220-4 After measurement, plug in J220 and the DC controller PCA.	NO - Check the wires between the microswitches and the DC controller PCA for continuity, and all connectors for good contact. If correct operation has been verified, replace the microswitch which has resistance not equal to 0 ohms.

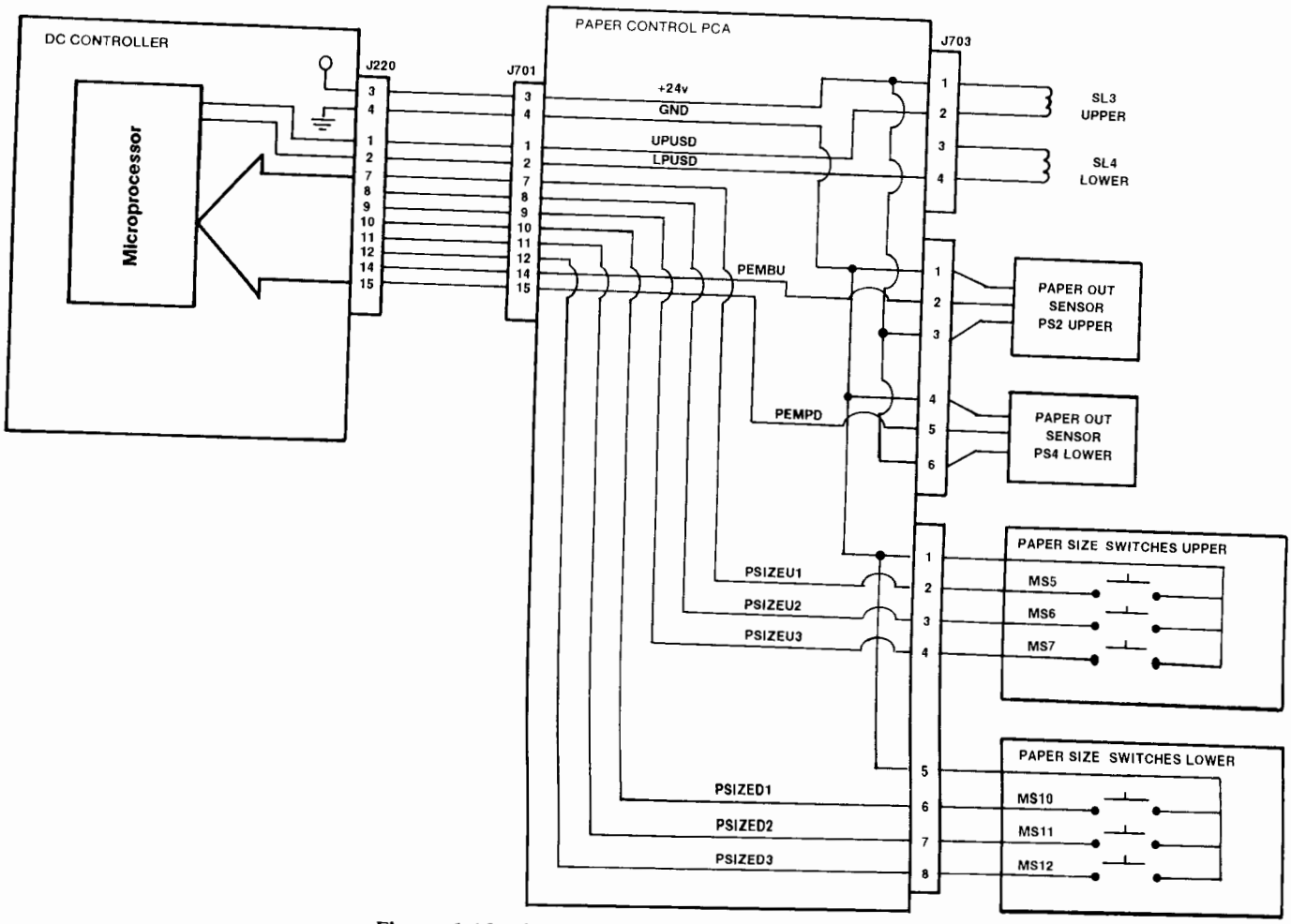


Figure 6-13. Cassette Pickup Circuitry-HP 2686D

T-3. Separation/Feeder Unit

CAUSE	CHECK	RESULT/MEASURE
Separation Belt	1. Is the separation belt damaged or twisted?	YES - Replace the belt.
	2. Is the belt upside down?	YES - Reinstall correctly.
Separation/Feeder Unit	3. Is any roller dirty or worn?	YES - Clean dirty rollers. Replace separation/feeder assembly if rollers are badly worn.
	4. Do pinch rollers press firmly against separation and feeder rollers?	NO - Replace the pinch roller spring.
Feeder rollers	5. Are the feeder rollers dirty or worn?	YES - Clean with alcohol if dirty and replace if worn.
Transfer Guides	6. Are the transfer guides deformed in any way?	YES - Replace the guides.

T-4. Fuser/Fuser Exit Area

CAUSE	CHECK	RESULT/MEASURE
Fusing Roller Cleaner Felt	1. Is the fusing roller cleaning pad dirty?	YES - Replace the fuser cleaning pad.
Entrance Guides	2. Are the entrance guides dirty?	YES - Clean the guides.
Separation Claws	3. Are the separation claws worn or the leading edges damaged?	YES - Replace the claws.
Lower Exit Guides	4. Are the lower exit guides dirty?	YES - Clean the guides.
Upper Exit Guides	5. Are the upper exit guides dirty?	YES - Clean the guides.
Fuser Exit Sensor Arm	6. Does the arm move freely?	NO - Repair to restore free motion.

T-4a. Delivery Unit Area

CAUSE	CHECK	RESULT/MEASURE
Delivery Unit Drive	1. Does the delivery motor run when the main motor is ON? YES - Proceed to step 4.	NO - Check J710 and J709 for good connection. Check the drive gear train and rollers for binds.
Paper Control PCA	2. Measure J710-1 and J710-2. Is +24 V present when the main motor is ON?	NO - Replace the Paper Control PCA or the driver transistor at J709. Also check the cable at J710 for good connection. Replace the delivery unit motor M-2.
AC Power Input	3. Measure the voltage between J706-1 and J706-2. Is 28 VAC present?	NO - Chexk input power and PT-1.
Tray Feed-in and Feed-out rolls and sensor	4. Does paper stay in the holding tray?	YES - Check tray feed-out roller. tray feed-out clutch solenoid (SL5). clutch and tray inlet sensor (PS5). Check connectors J712 and J708. Replace Paper Control PCA if the mechanical assemblies are good.
Deflector shaft and rollers	5. Check that the deflector shaft and miscellaneous rollers are not interfering with paper motion. 6. Proceed to the Jam Charts T-7a and T-8a.	Replace or repair as necessary. Ensure that MS9 is transferred when the deflector shaft lever is moved.

T-5. Incomplete Feed (sheets stuck together)

CAUSE	CHECK	RESULT/MEASURE
Paper	1. Is paper that meets specification being used?	NO - Advise the customer to use paper that meets specification.
Cassette Springs	2. Are the cassette lifting springs being hindered?	NO - Check the action of the lifting plate. If their lifting action is being hindered, replace the cassette.
Cassette Side Plates	3. Are the side plates worn?	YES - Replace the plates.

T-6. Incomplete Feed (wrinkles)

CAUSE	CHECK	RESULT/MEASURE
Paper	1. Is paper that meets specification being used?	NO - Advise customer to use paper that meets specification.
	2. Do wrinkles disappear when new paper is used?	YES - Show customer how to store paper.
Cassette, Pickup Mechanism	3. Is paper fed correctly?	NO - Check the cassette or make prints using a new cassette. Check the pickup roller or make prints using a new roller.
Separation belt and roller	4. Are the belt and roller abnormal?	YES - Clean or replace belt. Check the roller and clean or replace.
Separation/Feeder Unit	5. Do rollers operate smoothly?	NO - If changing the pinch roller spring does not improve the action, replace the unit.
Transfer Guides	6. Is there toner on the transfer guides?	YES - Clean with alcohol.
Fuser Entrance Guide	7. Are the entrance guides dirty?	YES - Clean the entrance guides.
Fuser Upper roller temperature sensor	8. Is the thermistor firmly in contact with the surface of the fusing roller?	NO - Clean and adjust.

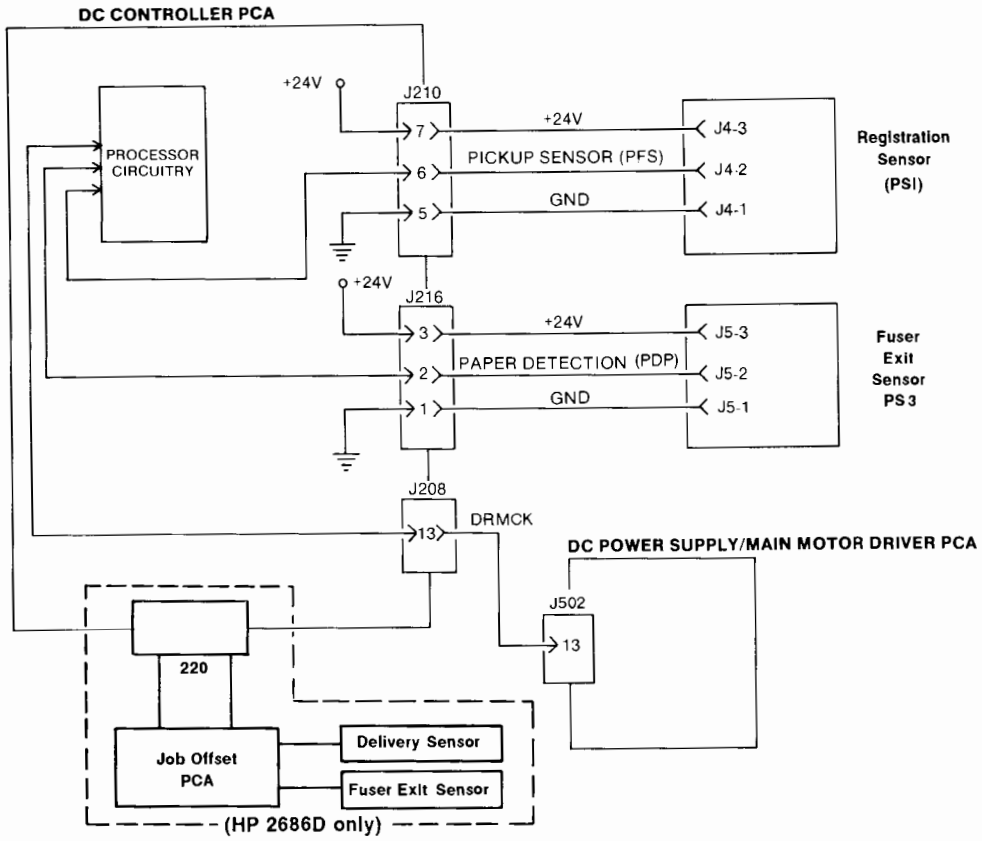


Figure 6-14. Paper Sensor Circuitry

T-7. False Paper Jams-HP 2686A (see Figure 6-14).

CAUSE	CHECK	MEASURE
Paper still in the exit unit	1. Is a paper fragment, etc., caught in the fuser unit?	YES - Remove the obstacle(s)
Registration Sensor	2. Does the voltage between J210-6 (PFS) and J210-5 (GND) on the DC Controller PCA vary from about 0 VDC to about +5 VDC when paper is set on the manual feed tray?	NO - Check J4 on the registration senor (PS1) and J210 on the DC Controller PCA for good contact. Also check that the paper detection arm functions smoothly. If correct operation has been verified replace the registration sensor PS1.
Fuser Exit Sensor	3. Open the upper half of the printer. Activate the door switch with a screwdriver. Shield the light from the fuser exit sensor PS3 with paper. Does the voltage between J216-2 (PDP) and J216-1 (GND) on the DC Controller PCA vary from about 0 VDC to about +5 VDC?	NO - Check J5 on the fuser exit sensor PS3 and J216 on the DC Controller PCA for poor contact. Check also that the paper exit sensor arm moves smoothly. If there is no apparent problem, replace the fuser exit sensor PS3.

T-7a. False Paper Jams-HP 2686D (see Figure 6-14)

CAUSE	CHECK	MEASURE
Paper still in the delivery unit	1. Is a paper fragment, etc., caught in the delivery unit?	YES - Remove the obstacle.
Registration sensor PS1	2. Does the voltage between J210-6 (PFS) and J210-5 (GND) on the DC Controller PCA vary from about 0 volts to about +5 VDC when paper is set on the manual feed tray?	NO - Check J4 on registration sensor PS1 and J210 on the DC Controller PCA for good contact. Also check that paper detection arm 1 (see III B in Section 2) functions smoothly. If correct operation has been verified, replace registration sensor PS1.
Fuser exit sensor PS3	3. Open the upper half of the printer. Activate the door switch with a screwdriver. Shield the light from fuser exit sensor PS3 with paper. Does the voltage between J216-2 (PDP) and J216-1 (GND) on the DC Controller PCA vary from about 0 volts to about +5 VDC?	NO - Check J5 on fuser exit sensor PS3 and J216 on the DC Controller PCA for poor contact. Check also that the fuser exit sensor arm moves smoothly. If there is no apparent problem, replace fuser exit sensor PS3.
Paper delivery Sensor PS6	4. Remove the door and bottom plate of the delivery unit and block the light path in the paper delivery sensor (PS6) with a piece of paper. Does the voltage between J220-13 (PDPA) and J220-4 (GND) on the DC Controller PCA change from about 0 volts to +5 VDC?	NO - Check contact of connector J258 of the paper delivery sensor (PS6) with J712-1, J712-2 and J712-3 on the Paper Control PCA. Also check J220-13 (PDPA from Paper Control PCA) on the DC Controller PCA. Check that the paper delivery sensor arm moves smoothly. If normal, replace paper delivery sensor PS6.

T-8 Paper Jams (not detected)-HP 2686A (see Figure 6-14)

CAUSE	CHECK	MEASURE
Registration Sensor	1. Does the voltage between J210-6 (PFS) and J210-5 (GND) on the DC Controller PCA vary from about 0 VDC to +5 VDC when paper is set on the manual feed tray?	NO - Check J4 on the registration sensor PS1 and J210 on the DC Controller PCA for good contact. Also check that the paper detection arm (1) moves freely. If there is no apparent problem, replace the fuser exit sensor (PS3).
Fuser Exit Sensor	2. Open the upper half of the printer. Activate the door switch with a screwdriver. Shield the light from the exit sensor with paper. Does the voltage between J216-2 (PDP) and J216-1 (GND) on the DC Controller PCA vary from about 0 VDC to about +5 VDC?	NO - Check J5 on the fuser exit sensor PS3 and J216 on the DC Controller PCA for poor contact. Also check that the fuser exit sensor arm moves smoothly. If there is no apparent problem, replace the fuser exit sensor PS3.
DC Power Supply/Main Motor Driver PCA, Main Motor	3. Press the test switch on the left panel while the printer is in the READY mode. Check that a pulse occurs between J208-12 (DRMCK) and J208-6 (GND) on the DC Controller PCA.	NO - Check J502 on the DC Power Supply/Main Motor Driver PCA and J208 for poor contact. If contact is good, replace the DC Power Supply/Main Motor Driver PCA or the Main Motor.

T-8a. Paper Jams (not detected)-HP 2686D (see Figure 6-14)

CAUSE	CHECK	MEASURE
Registration sensor	1. Does the voltage between J210-6 (PFS) and J210-5 (GND) on the DC Controller PCA vary from about 0 volts to +5 VDC when paper is set on the manual feed tray?	NO - Check J4 on registration sensor PS1 and J210 on DC Controller PCA for good contact. Also check that the paper detection arm moves smoothly. If there is no apparent problem, replace registration sensor PS1.
Fuser exit sensor	2. Open the upper half of the printer. Activate the door switch with a screwdriver. Shield the light from fuser exit sensor PS3 with paper. Does the voltage between J216-1 (GND) on the DC Controller PCA vary from about 0 volts to about +5 VDC?	NO - Check J5 on fuser exit sensor PS3 and J216 on the DC Controller PCA for poor contact. Check also that the paper fuser exit sensor arm moves smoothly. If there is no apparent problem, replace fuser exit sensor PS3.
Paper delivery sensor (PS6)	3. Remove the upper and lower covers of the delivery unit, and block the light path in the paper delivery sensor (PS6) with paper. Does the voltage between J220-13 (PDPA) and J220-4 (GND) on the DC Controller change from about 0 volts to +5 VDC?	NO - Check contact of connector J258 of the paper delivery sensor (PS6) with J712-1, J712-2 and J712-3 on the Paper Control PCA. Also check J220-13 (PDPA from Paper Control PCA) on the DC Controller PCA. Check that the delivery detection arm moves smoothly. If normal, replace the paper delivery sensor (PS6).
DC power supply and main motor driver PCA and main motor	4. Execute the test printing while the READY/WAIT indicator on the display unit lights continuously. Check using a voltmeter, measuring between J208-12 (DRMCK) and J208-6 (GND) on the DC Controller PCA. Is the voltage about 3 VDC?	NO - Check J502 on the DC power supply and main motor driver PCA and J208 for poor contact. If contact is good, replace the DC power supply and main motor driver PCA or main motor M-1.

T-9. False Paper-Out Indication-HP 2686A (see Figure 6-12)

CAUSE	CHECK	MEASURE
Operation Error	1. Has the external device input a manual paper feed command to the printer?	YES - For printing with manual feed, put the paper along the manual feed guide. For printing with cassette feed, input a cassette feed command.
Paper-Out Sensor (PS2)	2. Does the voltage between J215-2 (PEMP) and J215-1 (GND) on the DC Controller PCA vary from about +5 VDC to about 0 VDC when the paper detection arm lifts.	NO - Check J5 on the paper-out sensor, J215 on the DC Controller PCA, and the connection (J10) in-between for good contact. Also check that the paper detection arm moves smoothly. If correct operation has been verified, replace the paper-out sensor PS2.
Cassette Size Microswitch	3. Unplug J214 on the DC Controller PCA, do the resistances between the following pins (connector and cable attached) vary from infinite to 0 ohms when microswitches MS5, MS6, and MS7 are pressed? J214-1 and J214-2 J214-3 and J214-4 J214-5 and J214-6 After measurement, plug in J214 on the DC Controller PCA.	NO - Check the wires between the microswitches and the DC Controller PCA for continuity and all connectors for good contact. If they are OK, replace the microswitch which does not have resistance equal to 0 ohms.
DC Controller PCA	4. Does the Paper Out Error (11) go away when a cassette with paper is installed?	NO - Replace the DC Controller PCA.

T-9a. False Paper-Out Indication-HP 2686D (see Figure 6-13)

CAUSE	CHECK	MEASURE
Operation error	1. Has the external device input a manual paper feed command to the printer?	YES - For printing with manual feed, put the paper along the manual feed guide. For printing with cassette feed, input a cassette feed command.
Paper out sensor (PS2 and PS4)	2. When the paper detection arm moves down into the hole of the upper cassette, does the voltage between J220-14 (PEMPU) and J220-4 (GND) on the DC Controller PCA change from about 0 volts to +5 VDC? When the paper detection arm moves down into the hole of the lower cassette, does the voltage between J220-15 (PEMPD) and J220-4 (GND) on the DC Controller PCA change from about 0 volts to +5 VDC?	NO - Check the contact of connector J754 of paper out sensor PS2 with J705-1, J 705-2 and J705-3 on the Paper Control PCA, and check connector J220 of the DC Controller PCA. Also check the contact of connector J755 of paper out sensor PS4 with J705-4, J705-5 and J705-6 on the Paper Control PCA. Also check that the paper detection arm moves smoothly. If normal operation has been verified, replace paper out sensor PS4 or PS5.
Cassette size microswitch	3. Unplug J214 on the DC Controller PCA. Do the resistances between the following pins (connector and cable attached) vary from infinity to 0 ohms when microswitches MS5, MS6 and MS7 or MS10, MS11 and MS12 are pressed? J220-8 and J220-4 J220-9 and J220-4 J220-10 and J220-4 J220-11 and J220-4 J220-12 and J220-4 J220-13 and J220-4 After measurement, plug in J214 on the DC Controller PCA.	NO - Check the wires between the microswitches and DC Controller PCA for continuity and all connectors for good contact. If normal operation is verified, replace the microswitch which does not have resistance equal to 0 ohms.
DC Controller PCA	4. Does the paper-out status code displayed (11) go out when a cassette with paper is installed?	NO - Replace the DC Controller PCA.

T-10. Paper-Out (not detected)-HP 2686A (see Figure 6-12)

CAUSE	CHECK	MEASURE
Operation Error	1. Has the external device input a manual paper feed command to the printer?	YES - Input a cassette feed command.
Paper Out Sensor	2. Does the voltage between J215-2 (PEMP) and J215-1 (GND) on the DC Controller PCA vary from about) VDC to +5 VDC when the paper detection arm descends?	NO - Check J5 on the paper-out sensor, J215 on the DC Controller PCA, and the connection (J10) in-between for good contact. Also check that the paper detection arm moves smoothly. If correct operation has been verified, replace the paper-out sensor PS2.
Cassette Size Microswitches	3. Unplug J214 on the DC Controller PCA. Do the resistances between the following pins (connector and cable attached) vary from infinite to 0 ohms when microswitches MS5, MS6, and MS7 are pressed? J214-1 and J214-2 J214-3 and J214-4 J214-5 and J214-6 After measurement, plug in J214 on the DC Controller PCA.	NO - Check the wires between the microswitches and the DC Controller PCA for continuity, and all connectors for good contact. If correct operation has been verified, replace the microswitch which does not have a resistance equal to 0 ohms.
DC Controller PCA	4. Is the Paper Out Status Code displayed (11) when a cassette with paper is removed from the printer.	NO - Replace the DC Controller PCA.

T-10a. Paper-Out (not detected)-HP 2686D (see Figure 6-13)

CAUSE	CHECK	MEASURE
Operation error	1. Has the external device input a manual paper feed command to the printer?	YES - Input a cassette feed command.
Paper out sensor (PS2 and PS4)	2. When the paper detection arm moves down into the hole of the upper cassette, does the voltage between J220-14 (PEMPU) and J220-4 (GND) on the DC Controller PCA change from about 0 volts to +5 VDC? When the paper detection arm moves down into the hole of the lower cassette, does the voltage between J220-15 (PEMPD) and J220-4 (GND) on the DC Controller PCA change from about 0 volts to +5 VDC?	NO - Check the contact of connector J754 of paper out sensor PS2 with J705-1, J 705-2 and J705-3 on the Paper Control PCA, and check connector J220 of the DC Controller PCA. Also check the contact of connector J755 of paper out sensor PS4 with J705-4, J705-5 and J705-6 on the Paper Control PCA. Also check that the paper detection arm moves smoothly. If normal operation has been verified, replace paper out sensor PS4 or PS5.
Cassette size microswitch	3. Unplug J214 on the DC Controller PCA. Do the resistances between the following pins (connector and cable attached) vary from infinity to 0 ohms when microswitches MS5, MS6 and MS7 or MS10, MS11 and MS12 are pressed? J220-8 and J220-4 J220-9 and J220-4 J220-10 and J220-4 J220-11 and J220-4 J220-12 and J220-4 J220-13 and J220-4 After measurement, plug in J214 on the DC Controller PCA.	NO - Check the wires between the microswitches and DC Controller PCA for continuity and all connectors for good contact. If normal operation is verified, replace the microswitch which does not have resistance equal to 0 ohms.
DC Controller PCA	4. Does the paper-out status code displayed (11) go out when a cassette with paper is installed?	NO - Replace the DC Controller PCA.

6-6. AC CONTROLLER and DC CONTROLLER SIGNAL SUMMARIES

Table 6-3. DC Controller PCA Input/Output Signals

* = HP 2686D only

SIGNAL/COMMAND	CHECKPOINT		APPROX. DC VOLTAGE	
	Red lead	Black lead	True	False
AC pulse signal (ACP)	J208-11	J208-6	Pulse (6-7)	0
Drum sensitivity indication signal (CSENS1)	J209-1	J209-2	0	5
Drum sensitivity indication signal (CSENS2)	J209-3	J209-4	0	5
Fuser roller temperature signal (FSRTH)	J212-4	J212-3	-	-
Laser temperature signal (LSRTH)	J204-3	J204-4	-	-
No cartridge signal (CEMP)	J209-5	J209-6	5	0
Face up/down status signal (FACED)*	J220-16	J220-4	0	5
Paper out signal (PEMP)(HP 2686A)	J215-2	J215-1	5	0
Paper out signal (upper)(PEMPU)*	J220-14	J220.4	5	0
Paper out signal (lower)(PEMPD)*	J220-14	J220-4	5	0
Registration sensor signal (PFS)	J210-6	J210-5	5	0
Fuser Exit signal (PDP)	J216-2	J216-1	5	0
Paper size signal (PSIZE1)(HP 2686A)	J214-1	J214-2	0	5
Paper size signal (PSIZE2)(HP 2686A)	J214-3	J214-4	0	5
Paper size signal (PSIZE3)(HP 2686A)	J214-5	J214-6	0	5
Paper delivery sensor signal (PDPA)*	J220-13	J220-4	5	0
Paper size signal (upper) (PSIZEU1)*	J220-7	J220-4	0	5
Paper size signal (upper) (PSIZEU2)*	J220-8	J220-4	0	5

SIGNAL/COMMAND	CHECKPOINT		APPROX. DC VOLTAGE	
	Red lead	Black lead	True	False
Paper size signal (upper)(PSIZEU3)*	J220-9	J220-4	0	5
Paper size signal (lower) (PSIZED1)*	J220-10	J220-4	0	5
Paper size signal (lower)(PSIZED2)*	J220-11	J220-4	0	5
Paper size signal (lower)(PSIZED3)*	J220-12	J220-4	0	5
Scanner ready signal (SCNRDY)	J206-3	J206-2	0	2.5-3.5
Tachogenerator signal (DRMCK)	J208-12	J208-8	(0-3 peak)	0
Beam detect pulse (BD)	BD: J202-3 BD: J202-4	J208-6	Pulse 0-3.5 peak)	BD: 3.5 BD: 0
Cassette pickup solenoid drive command (CPUSD)(HP 2686A)	J215-4	J215-1	0	24
Upper cassette pickup roller clutch solenoid drive command (UPUSD)*	J220-1	J220-4	0	5
Lower cassette pickup roller clutch solenoid drive command (LPUSD)*	J220-2	J220-4	0	5
Drum drive command (DRMD)	J208-1	J208-3	0	7-8
Developing bias (DC) command (DBDC)	J211-4	J211-1	0	19-21
Developing bias (AC) command (DBAC)	J211-5	J211-1	0	15-18
Fuser Bulb drive command (FSRD)	J212-1	J212-2	Pulse (10-20)	24
High-voltage reset command (HVRST)	J211-7	J211-1	16	0
Primary corona command (HVPR)	J211-8	J211-1	1	17-19
Transfer corona command (HVTR)	J211-2	J211-1	0	19-21

Table 6-3. DC Controller PCA Input/Output Signals (continued)

* = HP 2686D only

SIGNAL/COMMAND	CHECKPOINT		APPROX. DC VOLTAGE	
Laser heater drive command (LSRHD)	J204-2	J204-4	0	15-30
Manual Feed Solenoid drive command (MPUSD)	J210-4	J210-5	0	24
Printer power ready signal (PPRDY)	J202-5	J208-6	5	0
Erase Lamp command (PEXP)	J207-1	J207-2	24-35	0
Ready signal (RDY)	J202-7	J208-6	0	5
Registration solenoid drive command (RGSD)	J210-2	J210-5	0	24
Scanner drive command (SCNON)	J206-4	J206-2	0	5-15
Page counter drive command (TM)	J207-3	J207-4	.1-.15	.04-.06
Vertical sync request command (VSREQ)	J202-9	J208-6	0	5
Delivery motor drive command (DMDS)*	J220-6	J220-4	0	5
Job offset solenoid drive command (SHTSL)*	J220-5	J220-4	0	5

Table 6-4. AC Controller PCA Input/Output Signals

SIGNAL/COMMAND	CHECKPOINT		APPROX. DC VOLTAGE	
	Red lead	Black lead	True	False
Fusing Bulb drive command (FSRD)	J104-2	J104-1	Pulse (10-20)	24
AC power supply for fan (FM1)	J102-1	J102-2	Line voltage	0
Triac Q1 (voltage for both ends)	J105-7	J105-3	0	Line voltage
AC power supply for fuser bulb (H1)	J101-1	J101-2	Line voltage	0
AC power supply for print engine transformer (PT1)	J103-1	J103-2	Line voltage	0

6-7. PRINTED CIRCUIT ASSEMBLY (PCA) LAYOUT

The following section lists the HP 2686A/D PCAs and illustrates the checkpins, connectors, LEDs, fuses, variable resistors, and jumpers on each PCA.

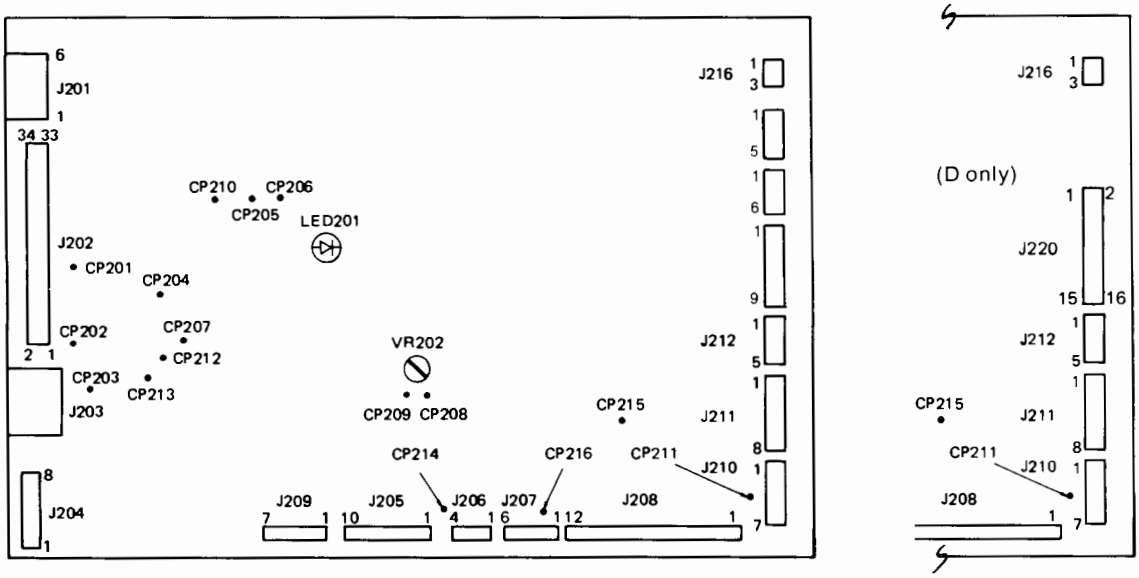


Figure 6-15. DC Controller PCA Layout

Table 6-5. DC Controller PCA Checkpoints, LEDs, Variable Resistors

PCA	Checkpoint	Function
DC Controller PCA	CP201	Output signal from the horizontal sync generator (BEAM DETECT .BD)
	CP202	Synchronous horizontal scanning input signal (output from the beam detection sensor, run through the optical fiber and converted from photoelectric energy).
	CP203	GND
	CP204	Custom IC213 reset signal
	CP205	Horizontal sync pulse (Beam Detect, BD)
	CP206	Custom IC213 clock

	LED201	Lights continuously when the laser beam is turned ON at more than minimum intensity.
	VR202	Adjusts the laser power output.

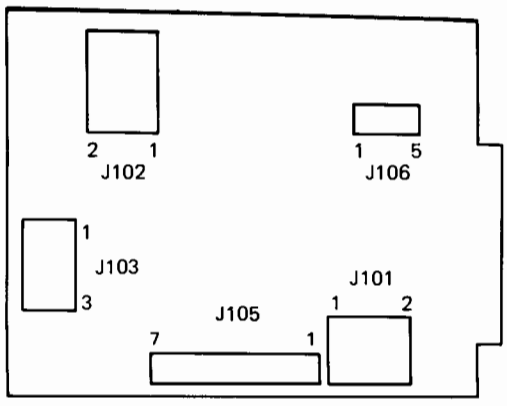


Figure 6-16. AC Controller PCA

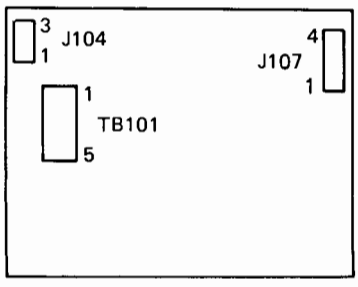


Figure 6-17. Fuser Safety PCA

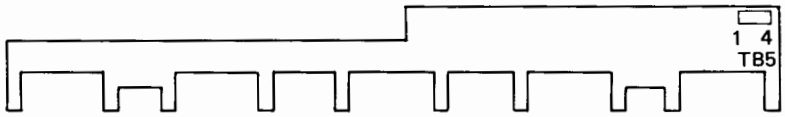


Figure 6-18. Erase Lamp/Page Counter PCA

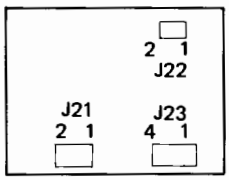


Figure 6-19. Varistor PCA

VR1 - Not field adjustable.

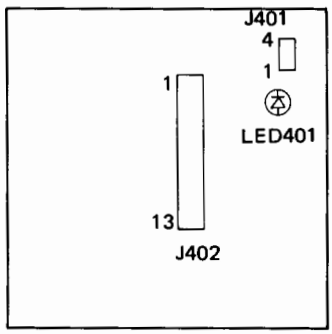


Figure 6-20. Scanner Driver PCA

LED401 on the Scanner Driver PCA illuminates continuously when the scanner motor is rotating above a minimum specified speed.

Table 6-6. DC Power Supply/Main Motor Driver PCA Checkpins

DC Power Supply/Main Motor Driver PCA	CP1	Main motor rotation frequency fluctuation rectification voltage (AFC)
	CP2	Main motor rotation phase fluctuation rectification voltage (APC)
	CP3	Tachometer signal (DRMCK)
	CP4	GND
	LED501	Lights continuously when the main motor is rotating above a minimum specified speed.
Fuses FU501 through FU504 125V/3Amp		

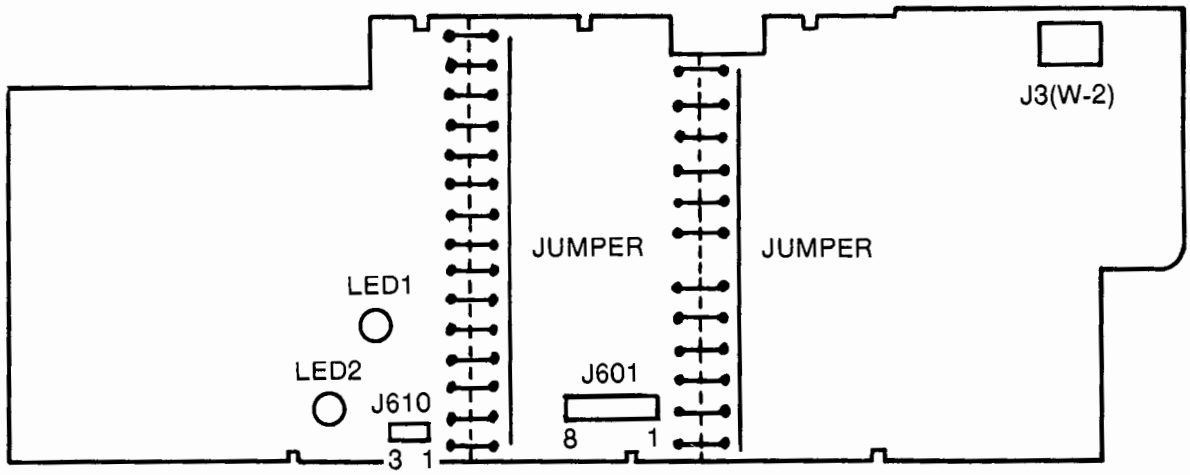
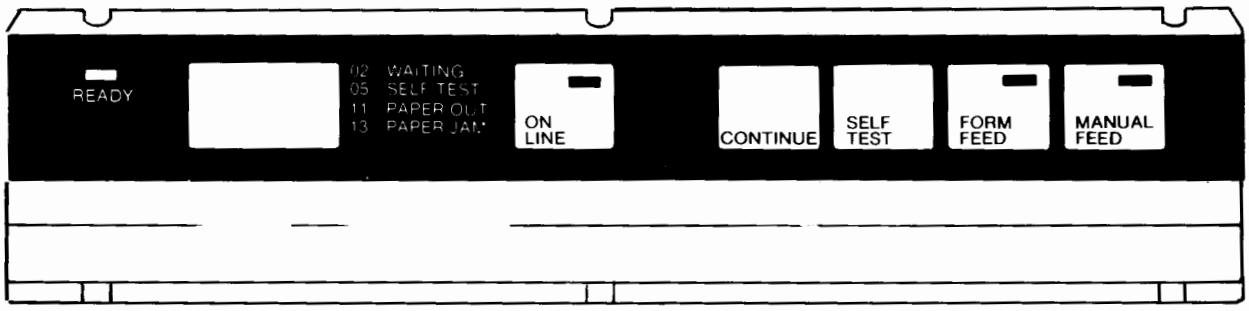
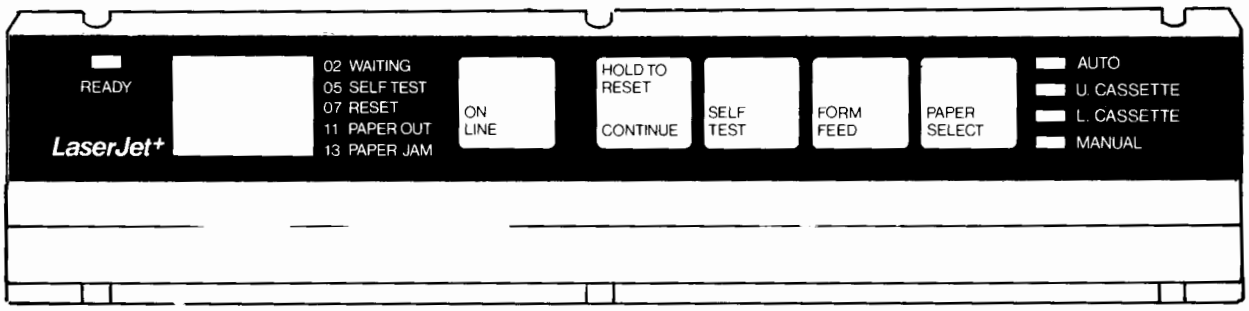


Figure 6-22. High Voltage Power Supply Assembly (removed from housing)



HP2686A



HP2686D

Figure 6-23. Control Panel PCAs

is applied to the printer.)

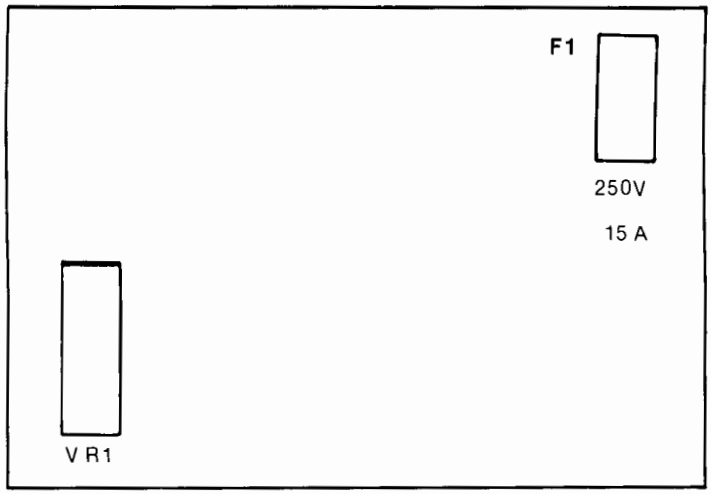


Figure 6-25. Interface Power Supply-HP 2686D

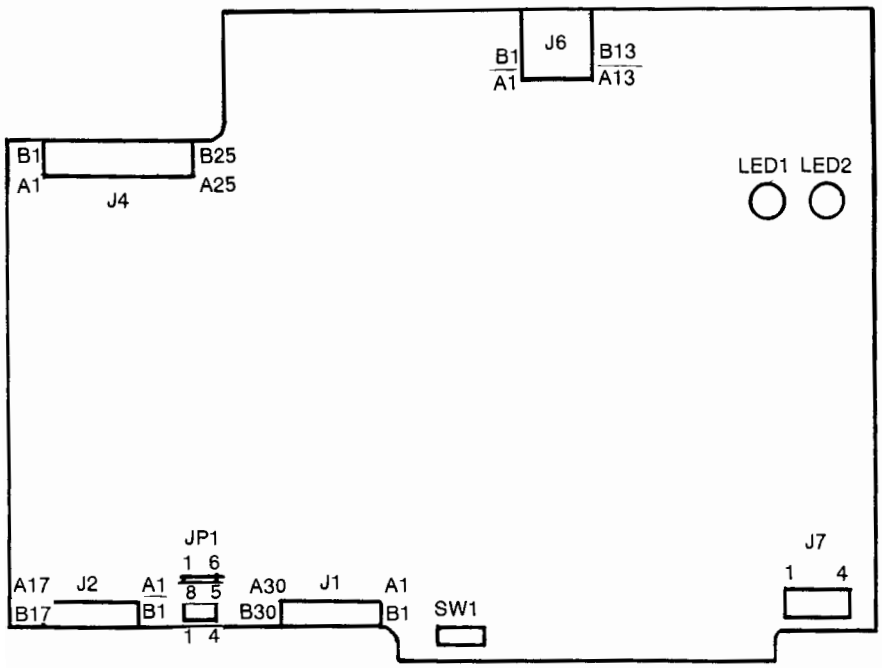


Figure 6-26. Interface PCA HP 2686A/D

	Switch Positions	Function	Setting
SW1	1 *	I/O type	ON - parallel interface OFF - serial interface (RS-232/422)
	2,3,4 @	Baud Rate	(See Figure 2-12) Factory set at 9600 Baud
	5 *	Auto-continue	ON - continue on print and data errors after flashing 10 times OFF - Flashes error until operator presses the continue key
	6 *	Robust X-ON	ON - X-ONs repeated every 1 second when printer is waiting for data OFF - Only 1 X-ON sent when printer needs more data
	7 &	Auto-select mode	ON - Powers-up in auto-select mode OFF - Powers-up with auto-select OFF
	8 @	Data Terminal Ready Polarity	ON - DTR "High", the line goes high when the printer is ready to print. OFF - DTR "Low", the line goes low when the printer is ready to print. Factory set to ON.

* refers to HP 2686A+ and HP 2686D models
@ refers to all models of HP 2686 printers
& refers to HP 2686D models only

Table 6-8. Interface PCA Jumpers

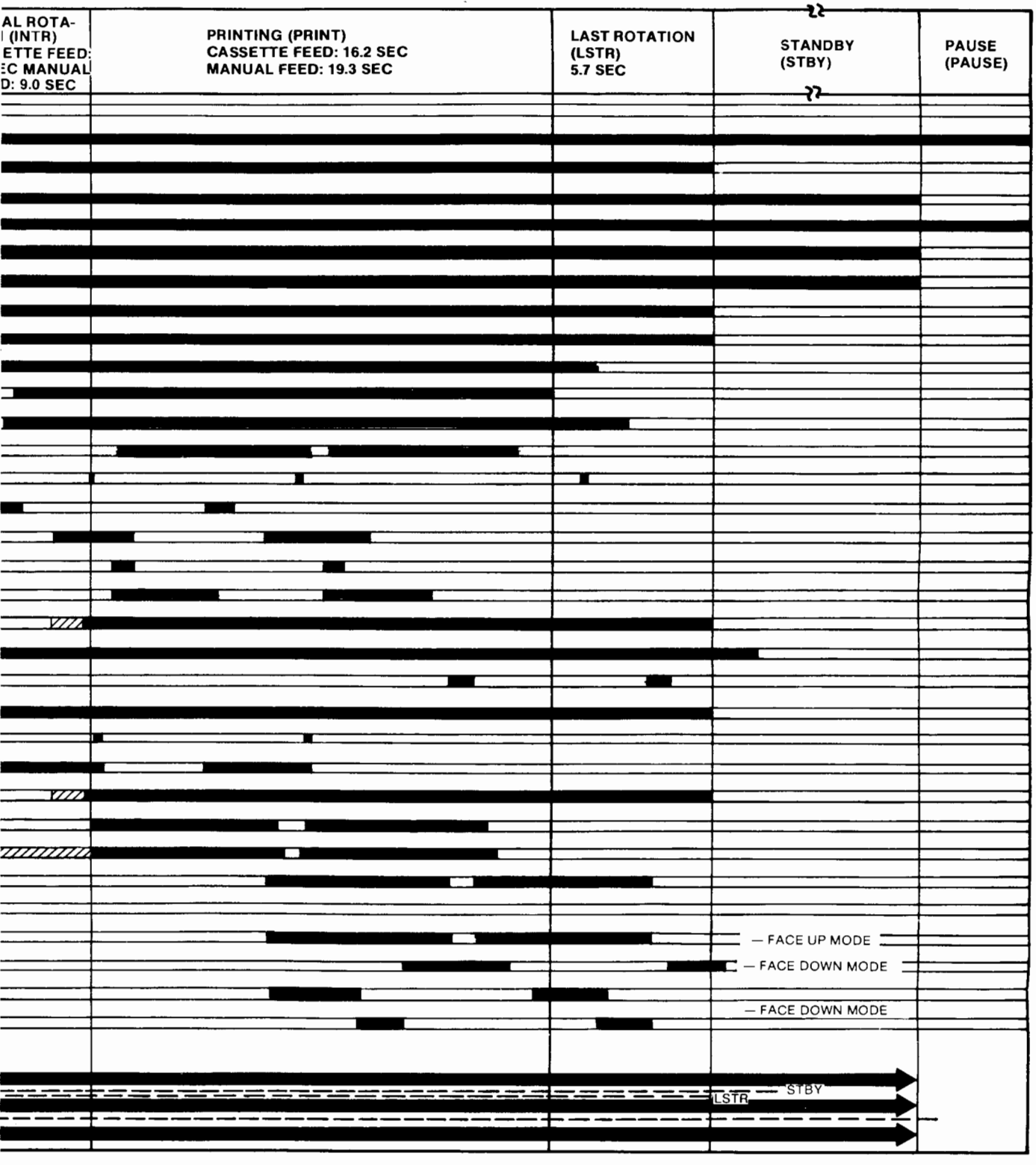
JP2 (Field Adjustable)		1 to 8 3 to 6	For RS-232 Configuration
		2 to 7 4 to 5	For RS-422 Configuration

Table 6-9. Interface PCA LEDs

LED1	Illuminates when the laser beam is horizontally scanning the image area of the drum.	
LED2	Illuminates when the image clock (VDCK) is functioning	

the printer does not start INTR unless paper is placed on the manual feed tray and
he timing of PFS, therefore, differs from that in cassette feed. ▨ indicates
anual feed; ■ indicates timing common to manual and cassette feed.
ary according to temperature detection signals (FSRTH, LSRTH) from
istors.

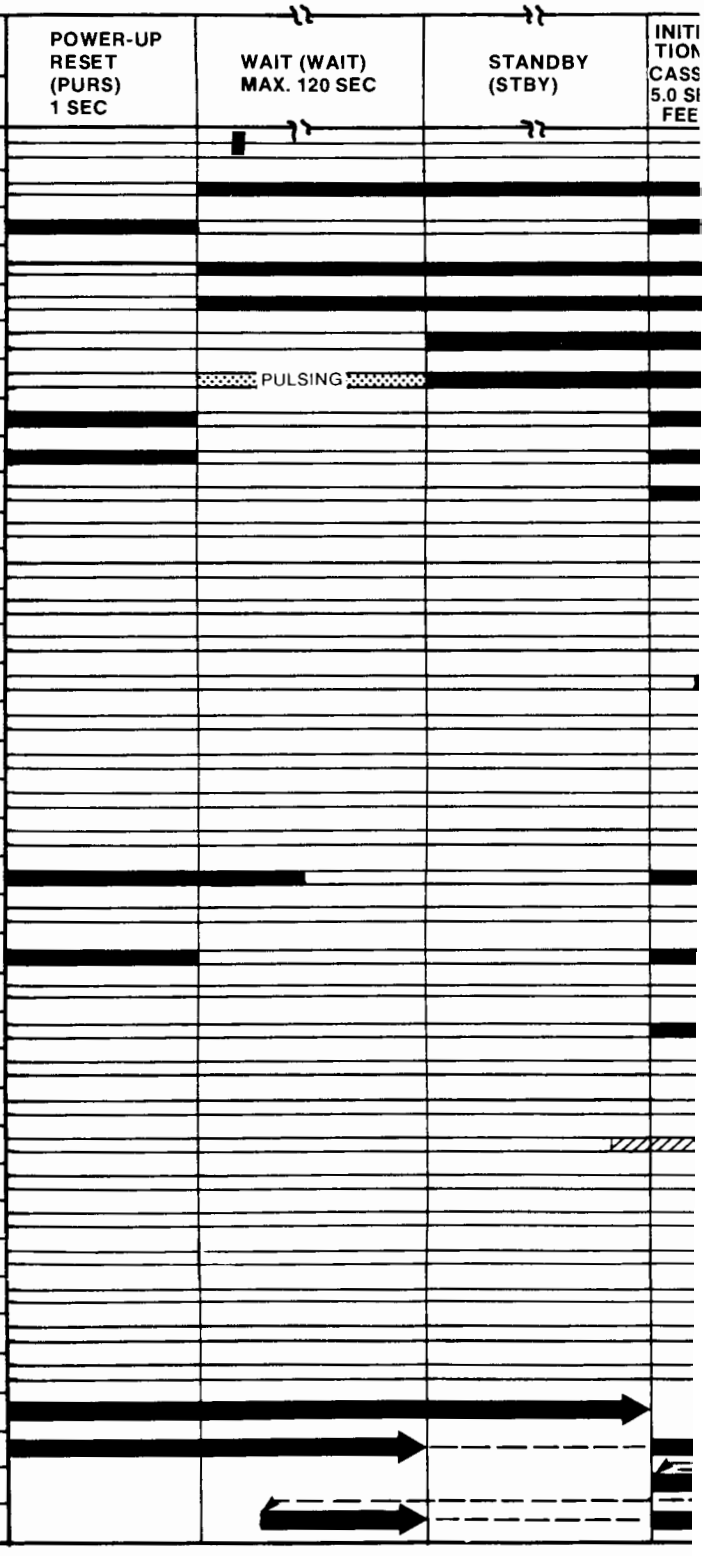
6-8. Timing Diagram (composite HP 2686A/D)



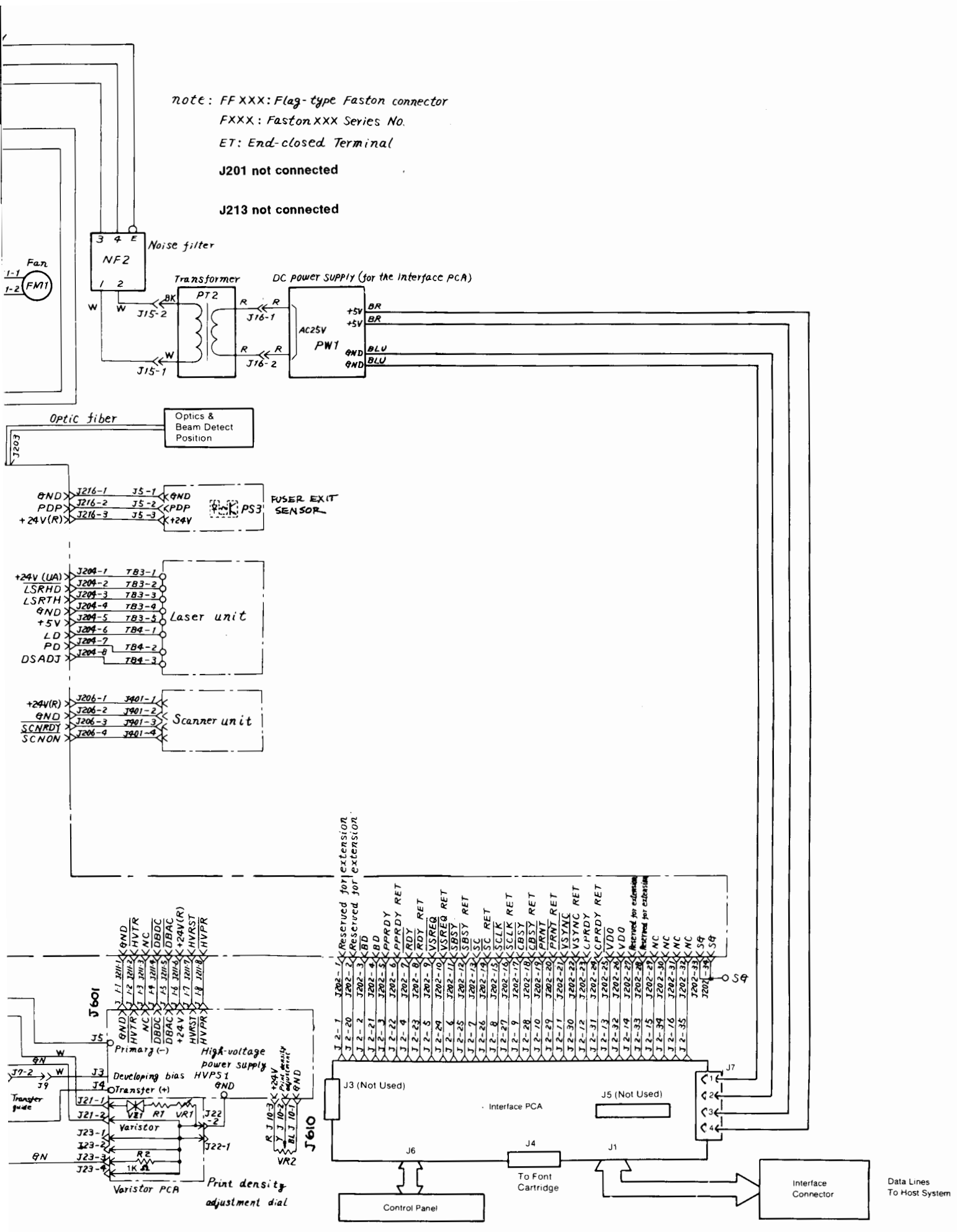
NOTES: — A black bar (▬) on the timing chart indicates when each signal is TRUE.
— One drum rotation equals about four seconds.
— The time SCNRDY becomes TRUE varies within the area marked ▨.
— BD and $\overline{BD}$ (differential signals) become TRUE when SCNRDY becomes TRUE. The timing of the three signals is the same.

— In manual feed,
PFS is TRUE. T
PFS timing in m
— FSRD, LSRHD
individual therm

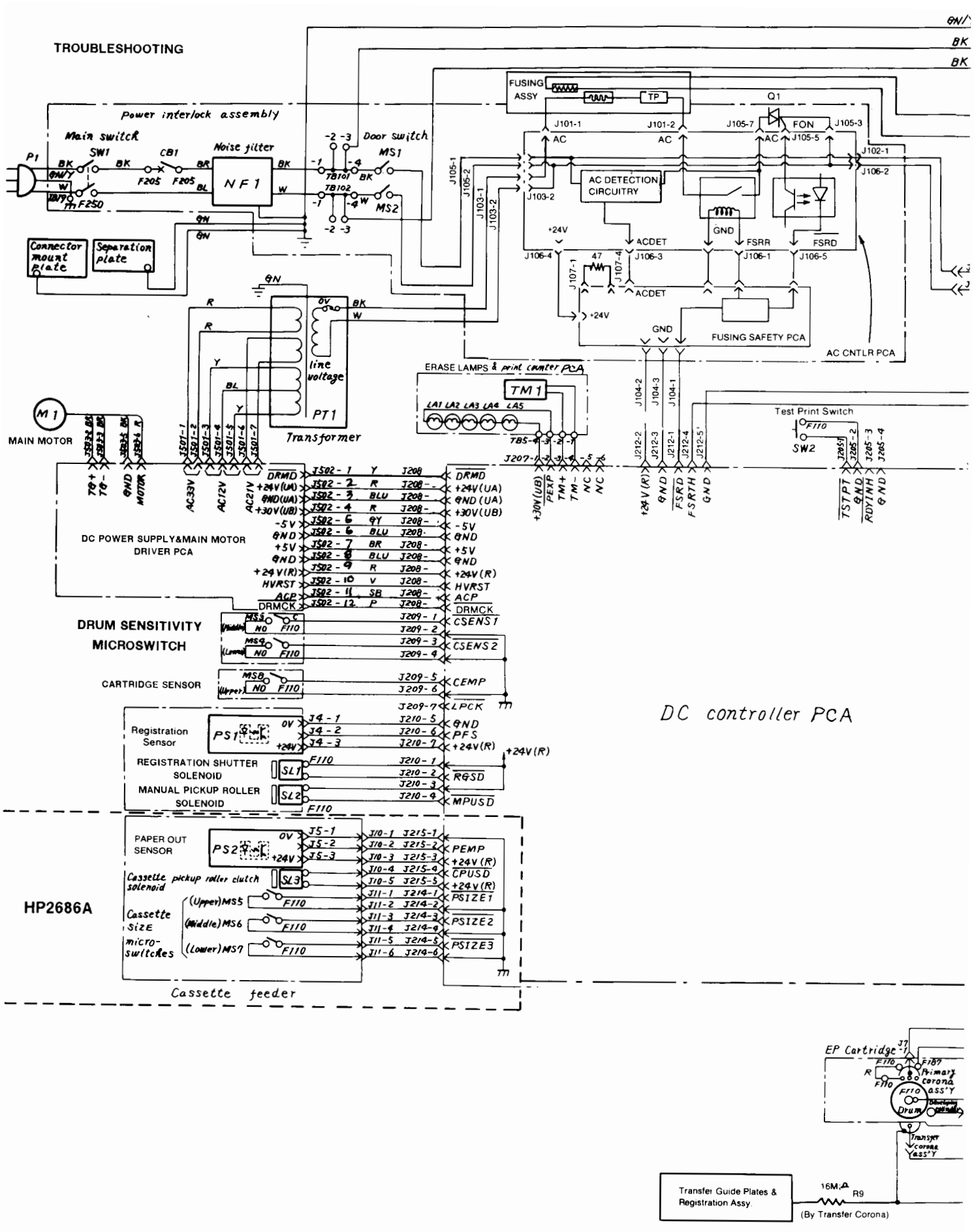
	SIGNAL NAME (LOAD(s))	ABBREVIATION	CHECKPOINTS	
			RED LEAD	BLACK LEAD
DC CONTROLLER OUTPUTS	HIGH-VOLTAGE RESET COMMAND (HVPS1)	HVRST	J211-7	J211-1
	PRINTER POWER READY SIGNAL	PPRDY	J202-5	J208-6
	DRUM DRIVE COMMAND (M1)	$\overline{DRMD}$	J208-1	J208-3
	FUSER DRIVE COMMAND (H1)	$\overline{FSRD}$	J212-1	J212-2
	LASER HEATER DRIVE COMMAND	$\overline{LSRHD}$	J204-2	J204-4
	READY SIGNAL	$\overline{RDY}$	J202-7	J208-6
	READY/WAIT INDICATOR DRIVE COMMAND	$\overline{RDYL}$	J201-2	J208-6
	SCANNER DRIVE COMMAND	$\overline{SCNON}$	J206-4	J206-2
	PRECONDITIONING EXPOSURE COMMAND (LA1-LA5)	$\overline{PEXP}$	J207-1	J207-2
	PRIMARY CORONA COMMAND (HVPS1)	$\overline{HVPR}$	J211-8	J211-1
	TRANSFER CORONA COMMAND (HVPS1)	$\overline{HVTR}$	J211-2	J211-1
	DEVELOPING BIAS (DC) COMMAND	$\overline{DBDC}$	J211-4	J211-1
	DEVELOPING BIAS (AC) COMMAND	$\overline{DBAC}$	J211-5	J211-1
	AUTO POWER CONTROL COMMAND (LASER)	$\overline{APCST}$	INTERNAL SIGNAL OF THE DC CONTROLLER	
	CAS.PICKUP ROLLER CLUTCH SOLENOID DRIVE COMMAND	$\overline{CPUSD}$		
	MANUAL PICKUP ROLLER SOL.DRIVE COMMAND (SL2)	$\overline{MPUSD}$	J210-4	J210-5
	REGISTRATION SHUTTER SOL.DRIVE COMMAND (SL1)	$\overline{RGSD}$	J210-2	J210-5
	TIMER DRIVE COMMAND (TM1)	TM (+), TM (–)	J207-3	J207-4
	BEAM DETECT PULSE (HORIZONTAL SYNC PULSE)	BD, $\overline{BD}$	BD: J202-3 $\overline{BD}$: J202-4	J208-6
	DELIVERY MOTOR DRIVE*	$\overline{DMDS}$	J220-6	J220-4*
	Job offset SOLENOID (SL5)	$\overline{SHTSL}$	J220-5	J220-4
DC CONTROLLER INPUTS	TACHOGENERATOR SIGNAL	$\overline{TG}$	J208-12	J208-3
	VERTICAL SYNC. PULSE	$\overline{VSYNC}$	J202-21	J208-6
	PRINT COMMAND	$\overline{PRNT}$	J202-19	J208-6
	SCANNER READY SIGNAL	$\overline{SCNRDY}$	J206-3	J206-2
	VIDEO SIGNAL	$\overline{VDO}$, VDO	$\overline{VDO}$: J202-25 VDO: J202-26	J208-6
	PICKUP SENSOR SIGNAL (PS1)	PFS	J210-6	J210-5
	FUSER EXIT SENSOR	PDP	J216-2	J216-1
	DELIVERY EXIT SENSOR (PS6)	PDPA*		
	DELIVERY EXIT SENSOR (PS6)	PDPA*		
	TRAY INLET SENSOR (PS5)	THRS		
	TRAY FEEDOUT SOLENOID (SL5)	$\overline{FCDSL}$		
CONDITIONS	1. IF A TRUE PRINT SIGNAL IS NOT RECEIVED AFTER THE POWER IS TURNED ON			
	2. IF NORMAL PRINTING TAKES PLACE AFTER THE POWER IS TURNED ON (TWO A4 PRINTS)			
	3. IF A TRUE PRINT COMMAND IS RECEIVED DURING LSTR OR STBY (TWO A4 PRINTS)			
	4. IF A TRUE PRINT COMMAND IS RECEIVED DURING PAUSE (TWO A4 PRINTS)			

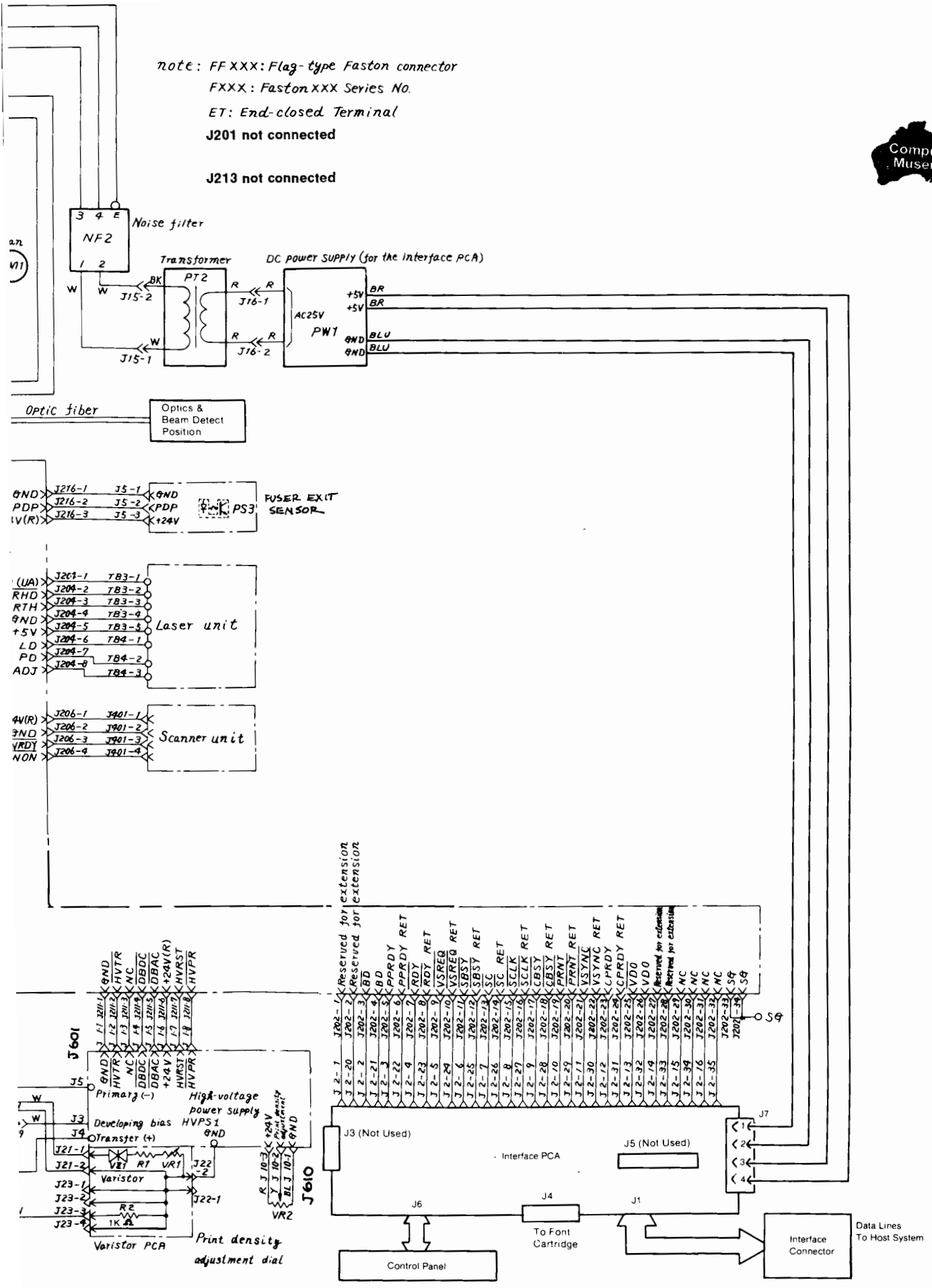


*D ONLY

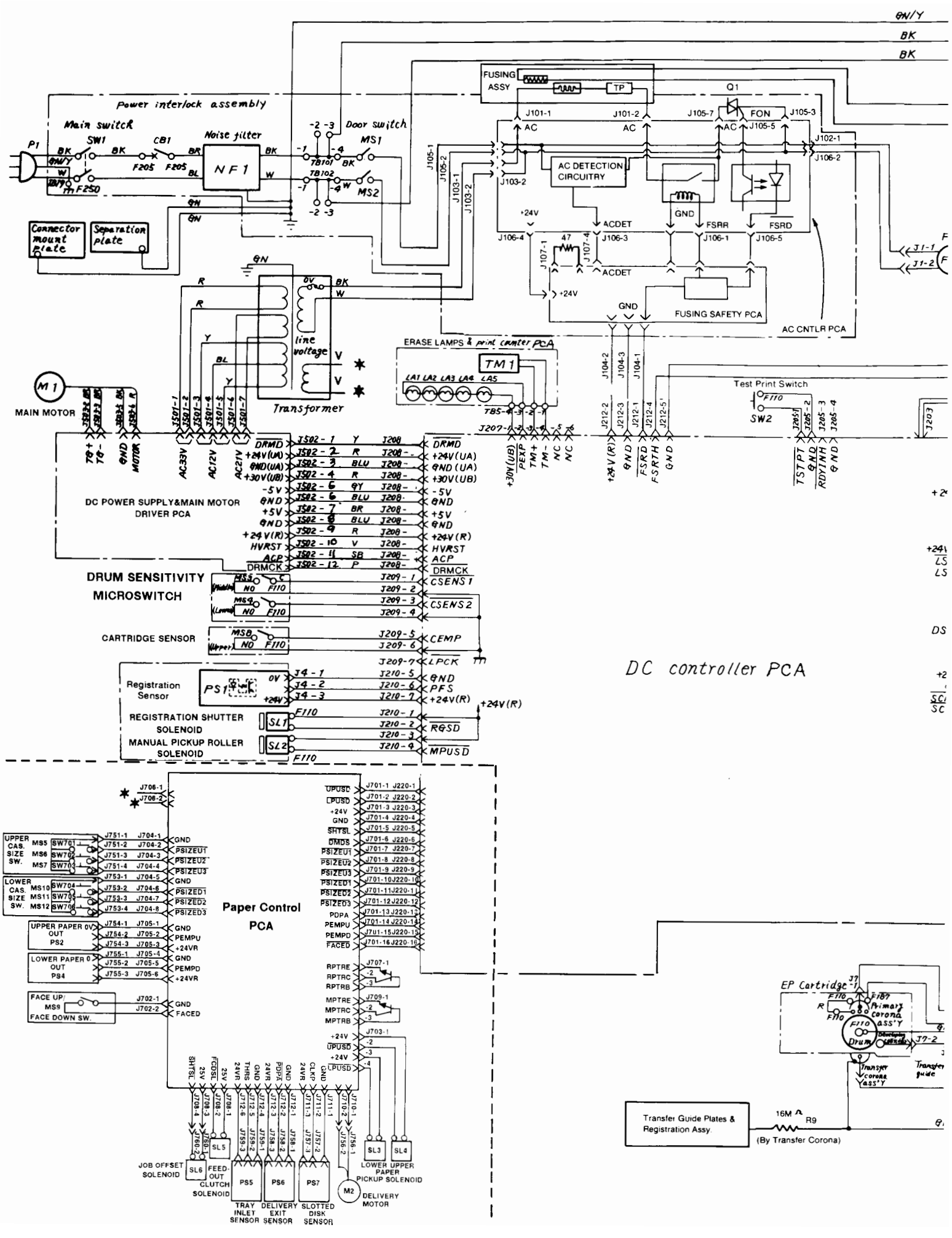


6-9. Wiring Diagram-HP 2686A


Power interlock assembly
Main switch
SW1
CB1
Noise filter
NF1
F250
Door switch
MS1
MS2
Connector mount plate
Separation plate
FUSING ASSY
TP
Q1
FON
AC DETECTION CIRCUITRY
ACDET
FSRR
FSRD
GND
+24V
FUSING SAFETY PCA
AC CNTLR PCA
line voltage
PT1
Transformer
MAIN MOTOR
M1
ERASE LAMPS & print counter PCA
TM1
Test Print Switch
SW2
DC POWER SUPPLY&MAIN MOTOR DRIVER PCA
DRUM SENSITIVITY MICROSWITCH
CARTRIDGE SENSOR
Registration Sensor
PS1
REGISTRATION SHUTTER SOLENOID
SL1
MANUAL PICKUP ROLLER SOLENOID
SL2
PAPER OUT SENSOR
PS2
Cassette pickup roller clutch solenoid
SL3
Cassette size micro-switches
HP2686A
Cassette feeder
DC controller PCA
EP Cartridge
Primary corona ass'y
Drum
Transfer corona ass'y
Transfer Guide Plates & Registration Assy.
16MΩ
R9
(By Transfer Corona)



6-9. Wiring Diagram-HP 2686D


Power interlock assembly
Main switch
SW1
CB1
Noise filter
NF1
Door switch
MS1
MS2
F250
F205
Connector mount plate
Separation plate
FUSING ASSY
TP
Q1
FON
AC DETECTION CIRCUITRY
ACDET
FSRR
FSRD
FUSING SAFETY PCA
AC CNTLR PCA
ERASE LAMPS & print center PCA
TM1
LA1 LA2 LA3 LA4 LA5
Test Print Switch
SW2
MAIN MOTOR
Transformer
line voltage
DC POWER SUPPLY&MAIN MOTOR DRIVER PCA
DRUM SENSITIVITY MICROSWITCH
CARTRIDGE SENSOR
Registration Sensor
REGISTRATION SHUTTER SOLENOID
MANUAL PICKUP ROLLER SOLENOID
DC controller PCA
Paper Control PCA
UPPER CAS. SIZE SW.
LOWER CAS. SIZE SW.
UPPER PAPER OUT PS2
LOWER PAPER OUT PS4
FACE UP/ FACE DOWN SW.
JOB OFFSET SOLENOID
FEED-OUT CLUTCH SOLENOID
TRAY INLET SENSOR
DELIVERY EXIT SENSOR
SLOTTED DISK SENSOR
LOWER UPPER PAPER PICKUP SOLENOID
DELIVERY MOTOR
EP Cartridge
Primary corona ass'y
Drum
Transfer corona ass'y
Transfer guide
Transfer Guide Plates & Registration Assy
16M Ω R9
(By Transfer Corona)

SECTION VII

REMOVAL and REPLACEMENT

7-1. INTRODUCTION

This section of the manual provides removal and replacement procedures for the HP 2686A/D printer. Each procedure should be read thoroughly since some procedures refer to steps from previous procedures, and to specific adjustments in other sections of the manual. Figures 7-1 and 7-2 identify various mechanical and electrical assemblies which will be discussed in this section of the manual. The following is a list of suggestions which should be taken into consideration when performing the various procedures in this section of the manual:

1. If the EP cartridge is removed while dismantling the printer, be sure to close the light-blocking shutters and to keep the cartridge in its original box. Cover it with a cloth, or put it in a dark place to prevent light from affecting the cartridge.

2. Remove the manual feed tray and print tray before disassembling, reassembling, or transporting the printer.

3. Disconnect the printer from the wall outlet before removing or replacing parts.

4. Unless specifically noted, reassembly is the reverse of disassembly and will not be described unless necessary.

5. Do not mix screws (length, diameter), parts or the locations of parts when reassembling the printer.

6. As a rule, the printer should not be operated if any components have been removed.

7. It will be necessary to remove cable tie wraps occasionally when servicing the printer. Replace them in the same position when reinstalling printer assemblies.

CAUTION

POWER OFF the printer before disconnecting the interface cable from the printer or before selecting another interface via a switch-box.

NOTE

Numbers inside parentheses (), refer to the number of parts or assemblies to be removed. When cleaning, inspecting or repairing the interior of the printer, remove the necessary panels as explained. Because the panels are removed and attached just by loosening or removing screws, the procedures are usually not detailed.

Tools Required for Disassembly

The following is a list of tools required to replace the assemblies discussed in this section of the manual.

#2 Phillips Screwdriver (magnetic - minimum 8 inch length shaft)

#2 Phillips Screwdriver (magnetic - maximum 1 inch length shaft or offset screwdriver)

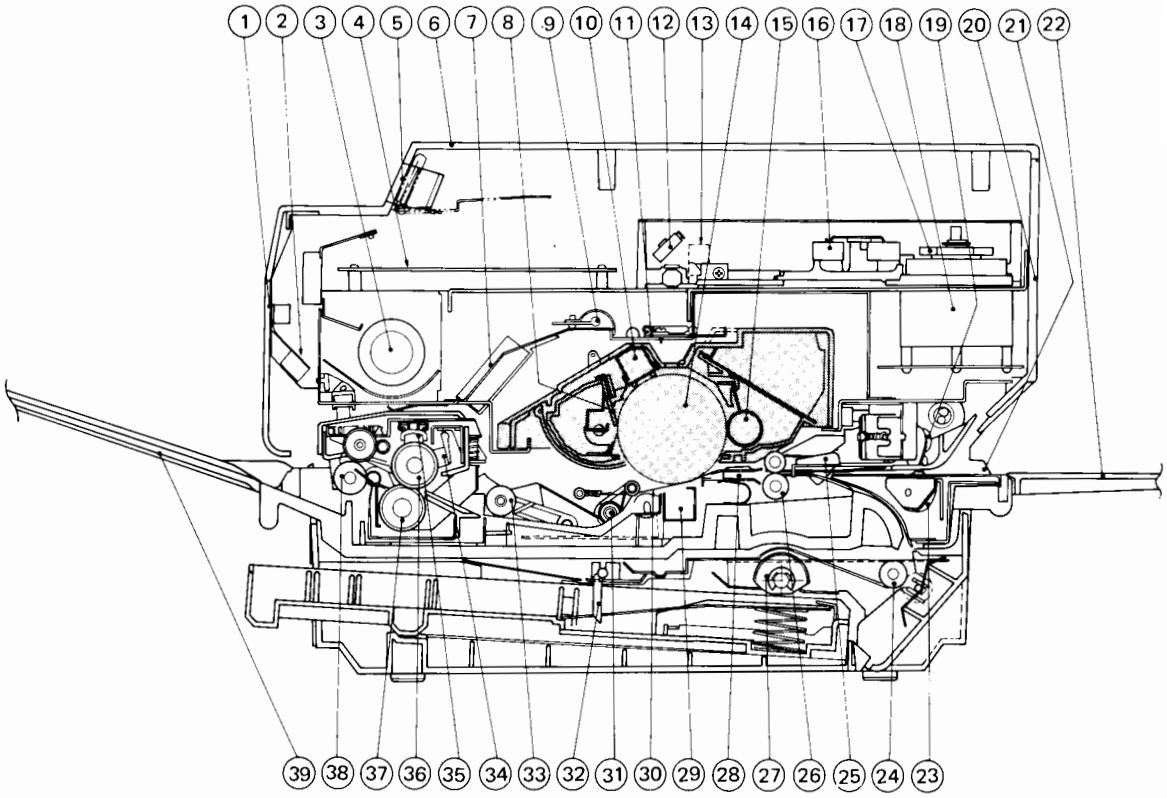
Needle Nose Pliers

Retaining ring pliers - external ("Grip" ring removal)

Allen wrench 2mm and 3mm and 4mm

Small crescent wrench

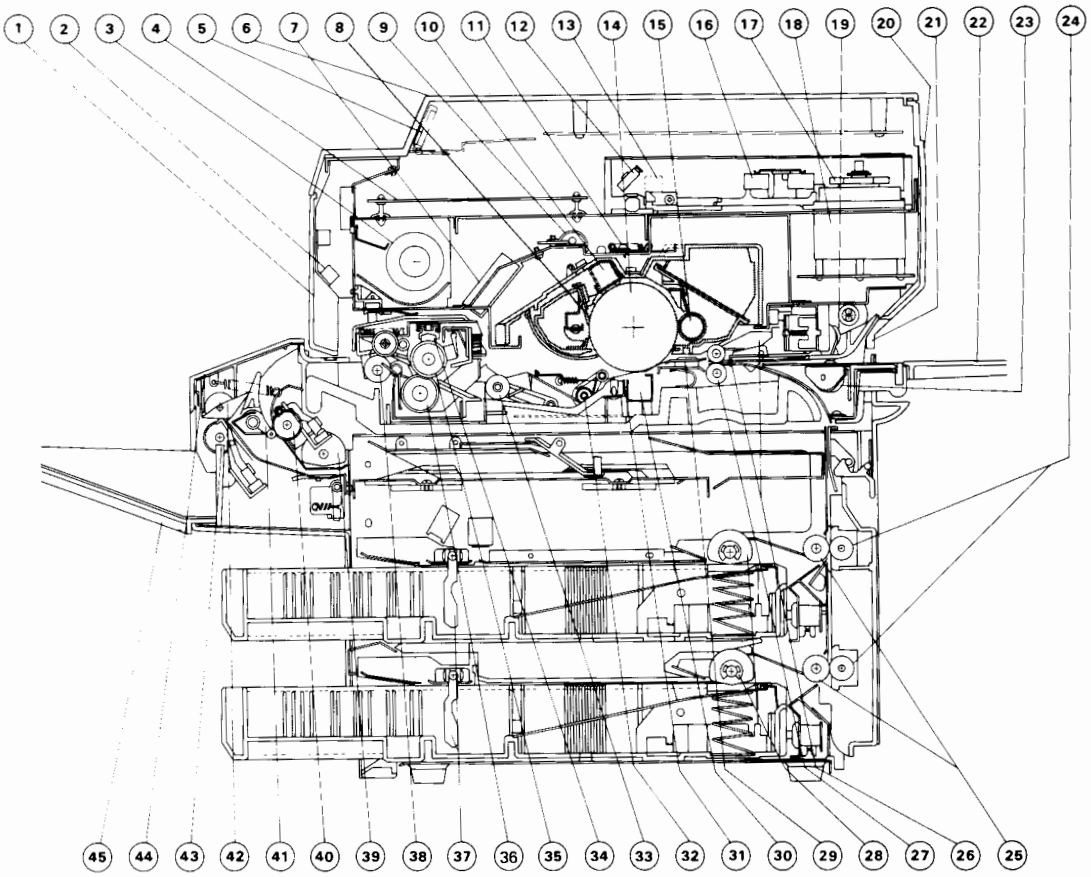
Printer Cross-Sectional Layout HP 2686A



1. Front cover
2. Duct
3. Fan
4. DC Controller PCA
5. Control Panel
6. Top cover
7. Ozone Filter
8. Cleaning blade
9. Erase lamps
10. Primary corona assembly
11. Laser shutter
12. Beam-to-drum mirror
13. Beam detect mirror
14. Photosensitive drum
15. Developer roll
16. Focusing lens
17. Scanning mirror
18. Scanner motor
19. Upper manual feed roller
20. Rear panel
21. Manual feed guide
22. Manual feed tray
23. Lower manual feed roller
24. Cassette feed roller
25. Registration shutter
26. EP Feed rollers
27. Cassette pickup rollers
28. Transfer guide assembly
29. Transfer corona assembly
30. Separation belt
31. Separation/Feeder unit
32. Paper Out sensor arm
33. Fusing Feed rollers
34. Thermistor
35. Cleaning Pad
36. Fusing roller
37. Pressure roller
38. Fuser Exit roller
39. Print tray

Figure 7-1 (1 of 2). HP 2686A Cross-Sectional View

Printer Cross-Sectional Layout HP 2686D



1. Front cover
2. Duct
3. Fan
4. DC Controller PCA
5. Control Panel PCA
6. Top cover
7. Ozone Filter
8. Cleaning blade
9. Erase lamps
10. Primary corona assembly
11. Laser shutter
12. Beam-to-drum mirror
13. Beam detect mirror
14. Photosensitive drum
15. Developer roll
16. Focusing lens
17. Scanning mirror
18. Scanner motor
19. Upper manual feed roller
20. Rear panel
21. Manual feed guide
22. Manual feed tray
23. Lower manual feed roller
24. Cassette feed roller (rear)
25. Cassette feed roller (front)
26. Registration shutter
27. EP Feed rollers
28. Cassette pickup rollers
29. Transfer guide assembly
30. Transfer corona assembly
31. Separation belt
32. Separation/Feeder assembly
33. Pinch roller
34. Fusing roller cleaning pad
35. Upper fusing roller
36. Lower fusing roller
37. Paper out sensor
38. Fuser exit roller
39. Tray feed-out roller
40. Tray feed-in roller
41. Deflector
42. Upper delivery roller
43. Lower delivery roller
44. Delivery unit door
45. Print tray

Figure 7-1 (2 of 2). HP 2686D Cross-Sectional View

Printed Circuit Assembly (PCA) Locations

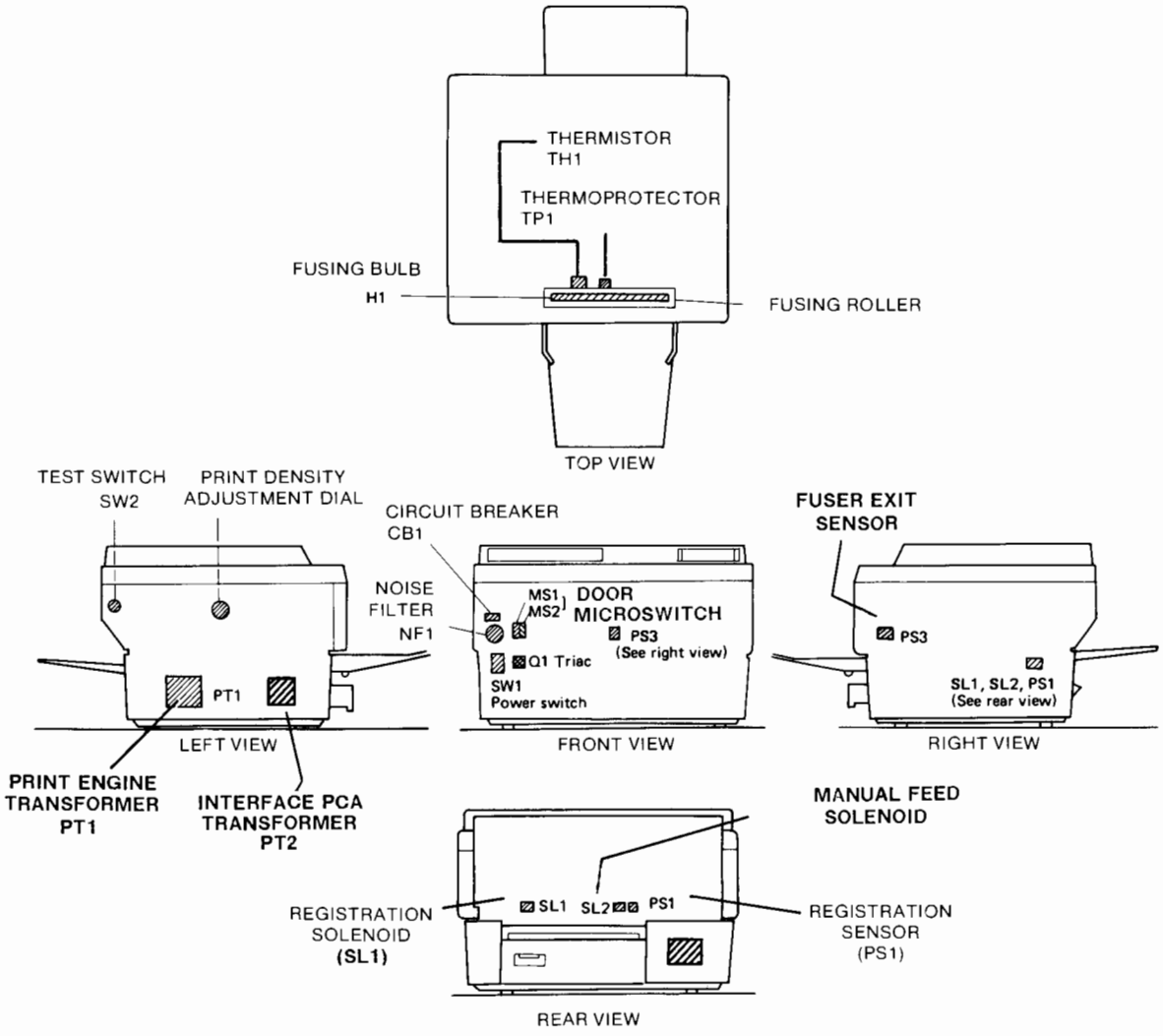


Figure 7-2. Electrical Component Layout HP 2686A (part 1 of 3)

Printed Circuit Assembly (PCA) Locations (continued)

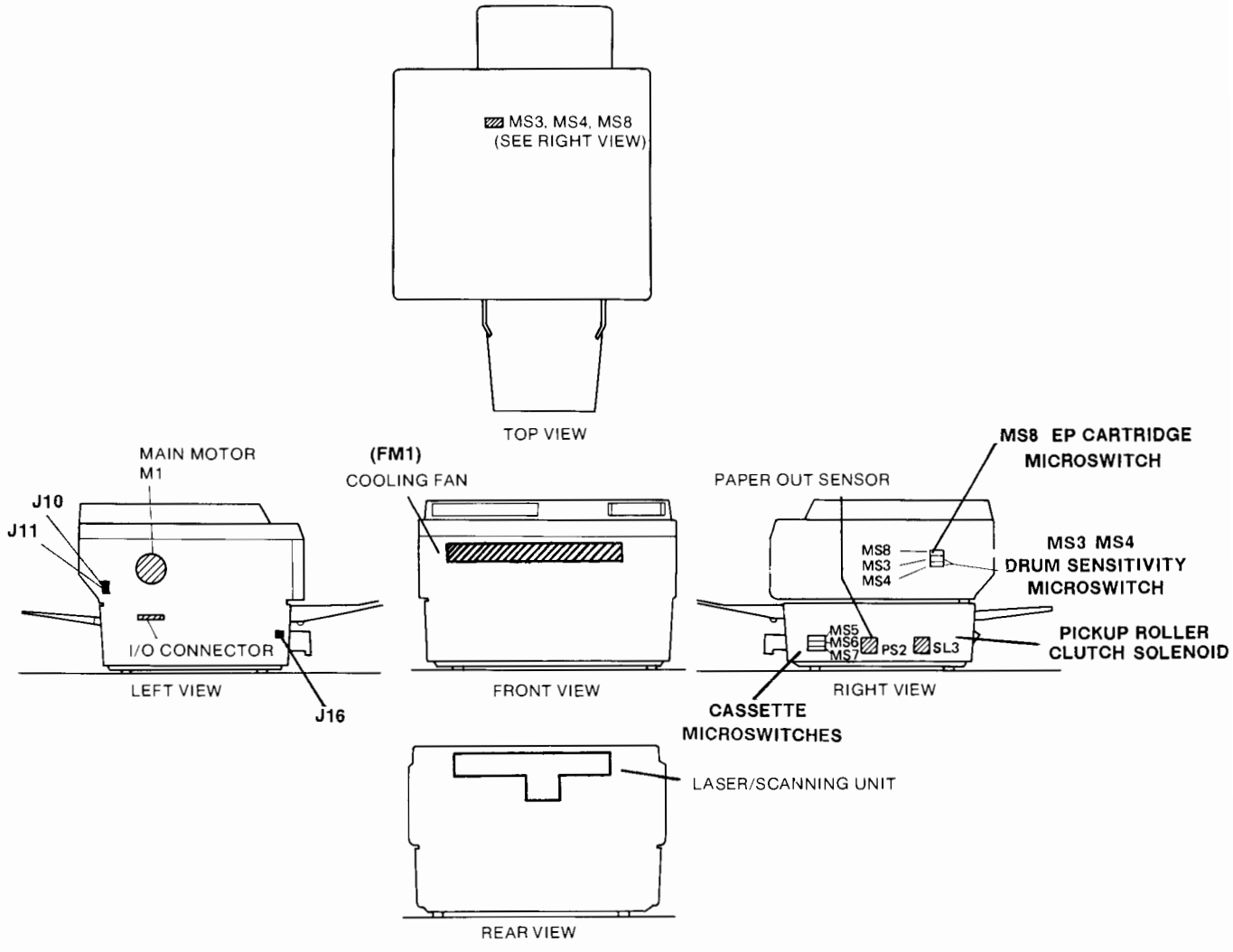


Figure 7-2. Electrical Component Layout HP 2686A (part 2 of 3)

Printed Circuit Assembly (PCA) Locations (continued)

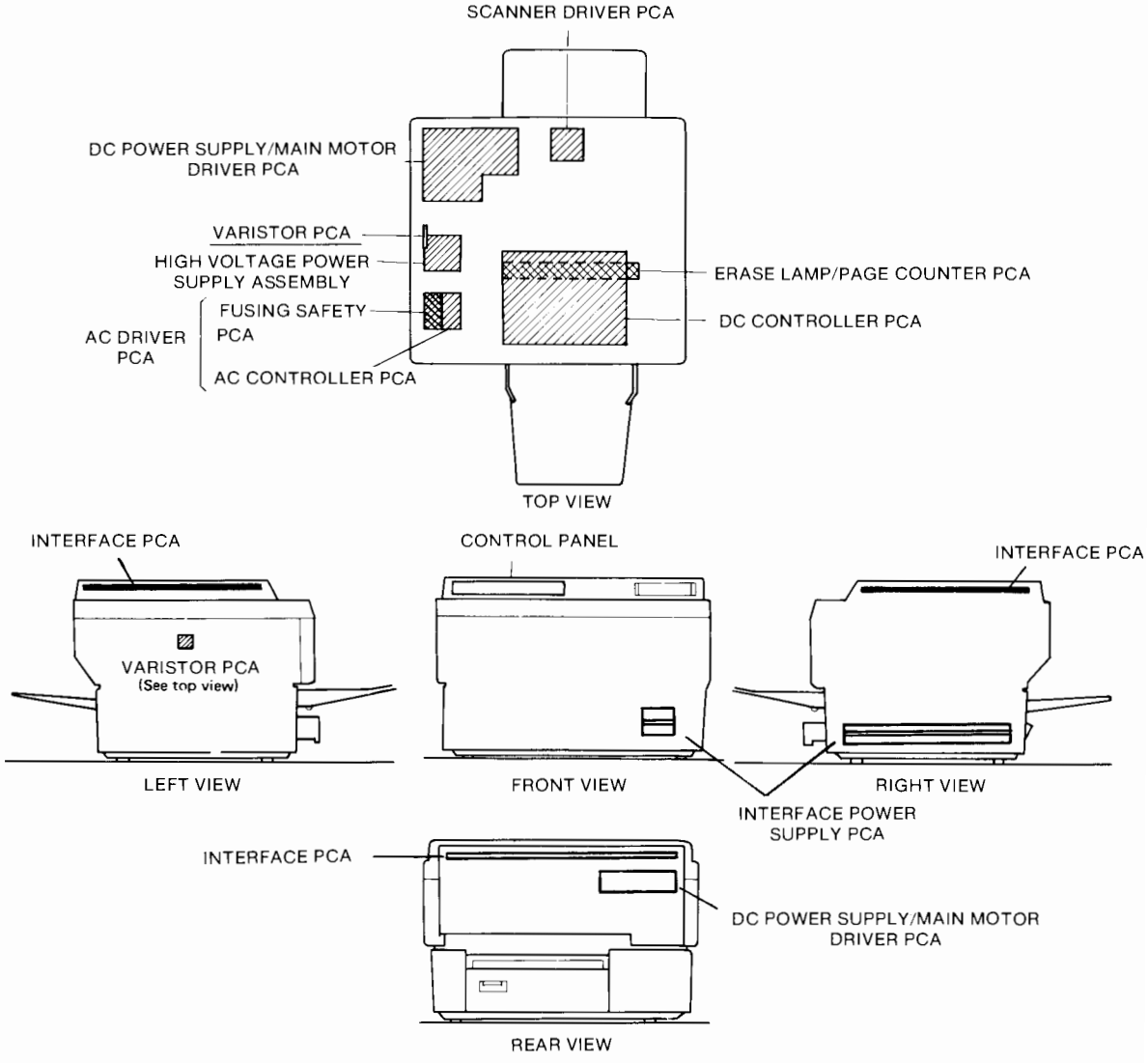


Figure 7-2. Electrical Component Layout HP 2686A (part 3 of 3)

Printed Circuit Assembly (PCA) Locations

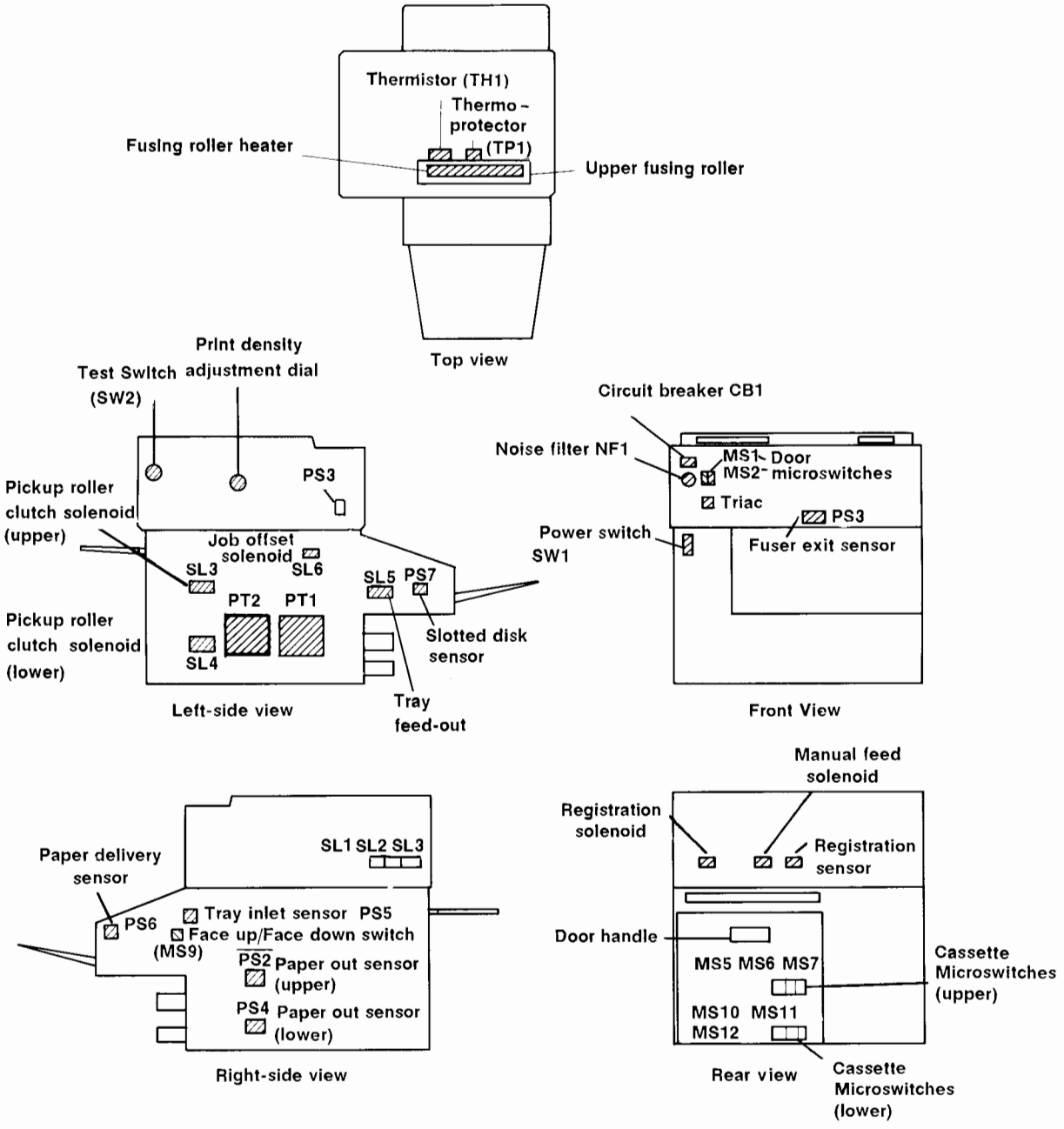


Figure 7-2a. Electrical Component Layout HP 2686D (part 1 of 2)

Printed Circuit Assembly (PCA) Locations (continued)

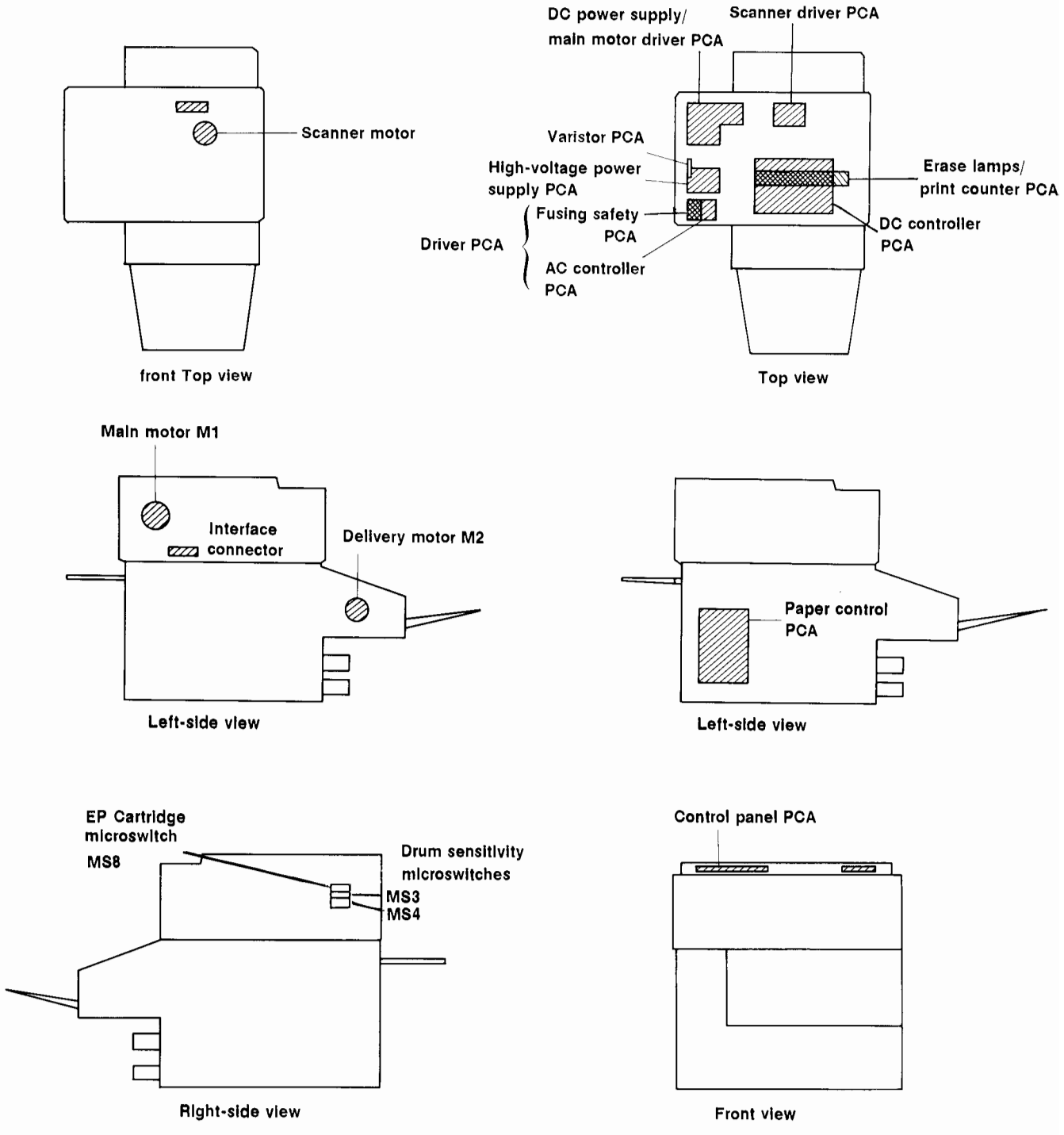


Figure 7-2a. Electrical Component Layout HP 2686D (part 2 of 2)

7-2. COVER and PANELS

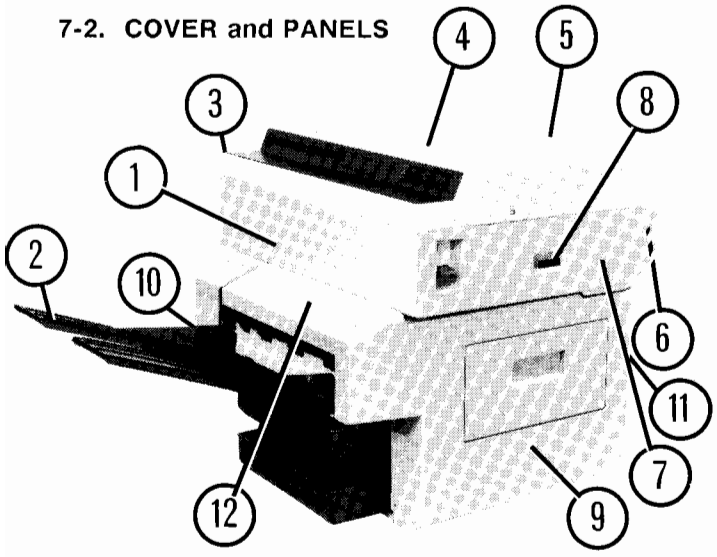


Figure 7-3. Cover and Panels Locations

1. Front panel
2. Output print tray
3. Left panel
4. Top cover
5. Rear panel
6. Manual feed tray
7. Right panel
8. Right door (comes off with right panel)
9. Lower right panel (HP 2686D only)
10. Lower left panel (HP 2686D only)
11. Rear door (HP 2686D only)
12. Delivery unit door (HP 2686D only)

Rear Panel

A. Remove the four screws securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel.

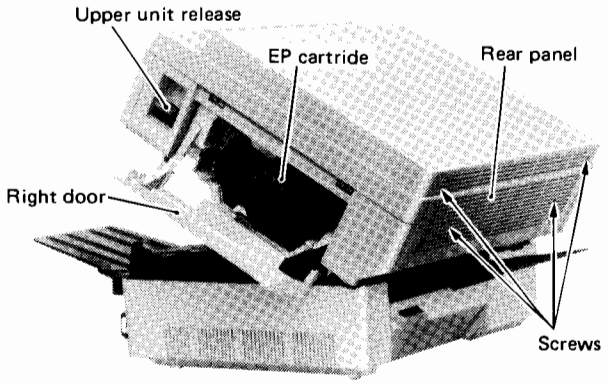


Figure 7-4. Cover and Panels (right rear view)

Top Cover

A. Open the printer (raise the upper half) and open the right door.
B. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel.
C. Remove the four screws securing the top cover (see Figure 7-5).
D. Disconnect the three cables (J1, J2, J7) located on the back edge of the Interface PCA. Carefully lift up on the cover to remove from the printer.

NOTE

It is possible to lift up, and roll over the top cover without disconnecting the three cables from the Interface PCA. This may be necessary if internal access to the printer is required with the power applied.

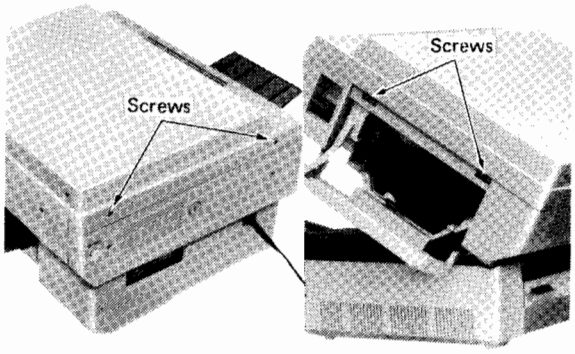


Figure 7-5. Top Cover Screws

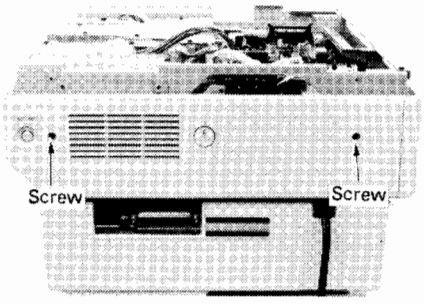


Figure 7-7. Left Panel Screws

Right and Left Panels (HP 2686A/D upper)

A. Open the printer (raise the upper half) and open the right door. Remove the EP cassette.
B. Remove the right panel (4), refer to Figure 7-6.
C. Remove the left panel (2), refer to Figure 7-7.

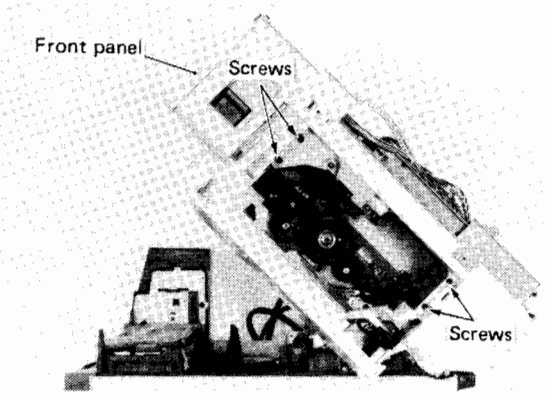


Figure 7-6. Right Panel Screws

Front Panel

A. Open the printer (raise the upper half). Open the right door and take out the EP cartridge.
B. Remove the right panel and the left panel.
C. Take off the front panel (4), refer to Figure 7-8.

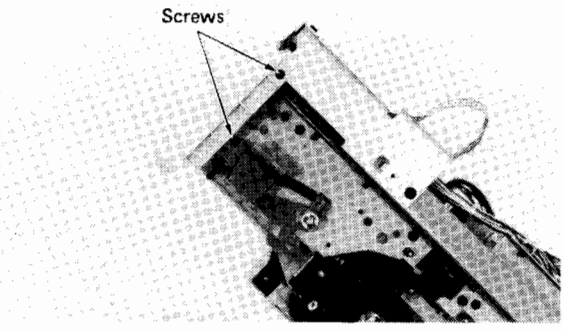


Figure 7-8. Front Panel Screws (right-side)

Manual Feed Tray

A. Raise the manual feed tray.
B. Take off the tray by spreading the hinges in the direction of arrow 2 and pulling it in the direction of arrow 3 (see Figure 7-9).

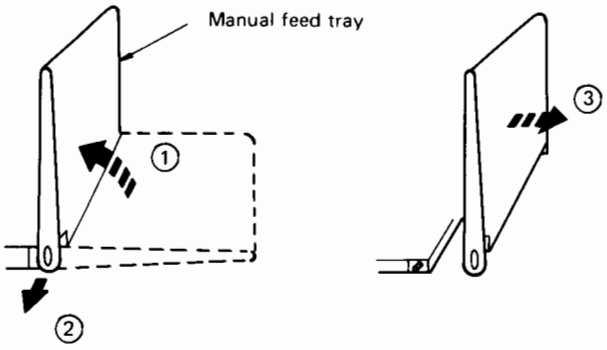


Figure 7-9. Manual Feed Tray Removal

Output Print Tray HP 2686A

A. Raise the print tray.
B. Compress the sides of the tray to release the hinges and remove the tray from the printer (see Figure 7-10).

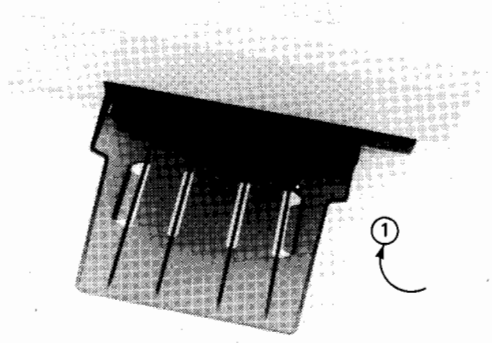


Figure 7-10. Output Tray Removal

Output Print Tray HP 2686D

A. Lift and remove the output print tray from the printer.

Lower Right Panel HP 2686D

A. Open the printer (raise the upper half).
B. Open the lower unit right door and remove the jam release link arm from the door (see Figure 7-11).

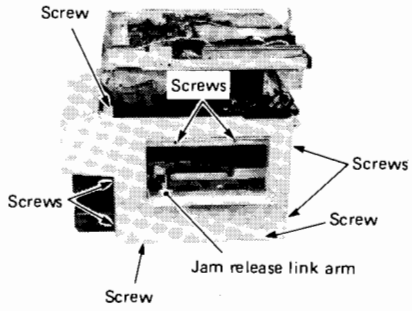


Figure 7-11. Lower Right Panel Removal

C. Remove the screws (9) securing the lower right panel and release the clip on the front side of the panel.
D. Remove the panel from the printer.

NOTE

When reinstalling the panel, ensure that the jam release link arm is protruding through the door opening.

Lower Left Panel HP 2686D

A. Open the printer (raise the upper half).
B. Disconnect the power cord (on some models the power cord is permanently attached to the printer and this step is not possible) and disconnect the interface cables.
C. Remove the lower left panel screws (8).
D. Release the clip on the front side of the panel.
E. Remove the panel from the printer.

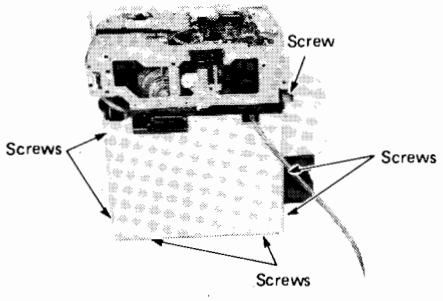


Figure 7-12. Lower Left Panel Removal

Rear Door HP 2686D

A. Remove the lower right panel (see Figure 7-13).
B. Remove the mounting plate (1) on the right side of the door and disconnect the retaining strap (1) on the inside of the door.
C. Remove the door from the printer.

NOTE

To reinstall the door, close the door before tightening the mounting screw. Press the door tightly up against the printer and then tighten the mounting plate screw (1).

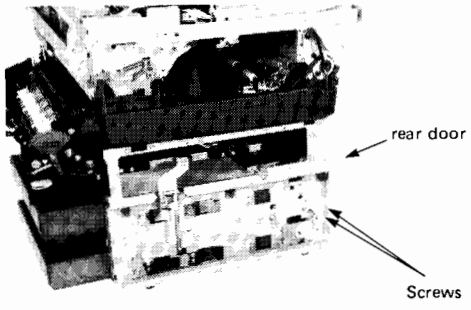


Figure 7-13. Rear Door Removal

Delivery Unit Door HP 2686D

A. Remove the lower right and left panels.

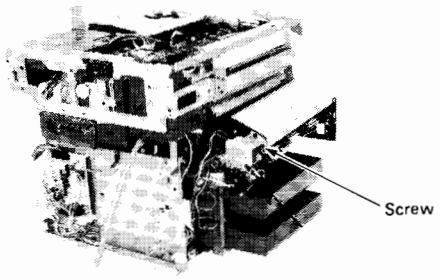


Figure 7-14. Delivery Unit Lower Panel

B. Open the delivery unit door, and remove the two springs.
C. Remove the mounting plate and the ground strap of the delivery unit door which is at the left side of the delivery unit (1).

NOTE

Ensure that the ground strap is reconnected when reinstalling the door.

Delivery Unit Lower Panel HP 2686D

A. Remove the lower right and left panels.
B. Remove the lower panel of the delivery unit (4).

7-3. UPPER MAIN BODY, LOWER MAIN BODY, and PEDESTAL

To provide access to many of the printer components the printer can be separated into three subassemblies: the Upper Main Body, the Lower Main Body, and the

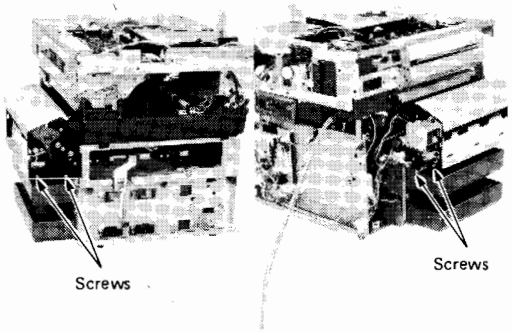


Figure 7-15. Delivery Unit Door

Pedestal. The following procedures describe how to separate the printer into these three sections.

Upper Main Body

Prior to removing the Upper Main Body, the following items should be removed from the printer:

EP Cartridge
Rear Panel
Left and Right Side Panels

Disconnect the following wires/connectors:

A. Disconnect the Faston connector (ground wire) located near the left end of the transfer corona assembly.
B. Remove the fuser wire harness cover (1) shown in Figure 7-19.
C. Remove the AC power interlock cover (1) shown in Figure 7-18.
D. Remove connector J104 from the Fusing Safety PCA.
E. Remove connector J102 from the AC Controller PCA.
F. Disconnect the fuser thermistor cable (J101).
G. Remove the interface cable cover.
H. Disconnect J701 from the Paper Control PCA (HP 2686D only).
I. Disconnect J1 from the Interface PCA and remove the interface cable from the upper main body. Do not disconnect the other end of the cable from the mounting plate.
J. Disconnect the cable clamp (1) at the lower left rear of the printer.
K. Disconnect J7 from the top cover and J501 from the DC power board.
L. Disconnect the registration shutter assembly green ground wire (1).

NOTE

Ensure when reassembling that the green ground wire is not in the way of the paper path.

M. Disconnect the braided ground wire from the left side of the upper main body.
N. While supporting the upper main body, remove the (6) screws (4 screws in older models) securing the upper main body to the lower main body (see Figure 7-16). Carefully lift and separate the two subassemblies.

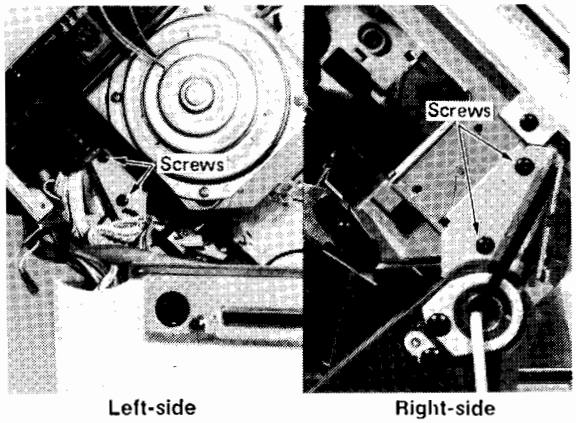


Figure 7-16. Removing the Upper Main Body

NOTE

Ensure that the support bracket hinge notches fit into the upper main body alignment holes when reassembling the printer.

Lower Main Body and Pedestal Separation

The following removal procedure is common for the HP 2686A and the HP 2686D with the exception of the steps noted with an (*), which apply to the A model only.

The Upper Main Body does not have to be removed from the Lower Main Body to perform this removal procedure.

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel.
B. Remove the interface cable from the upper main body.
C. Disconnect the braided ground strap (1).
D. Remove the left panel (2).
E. On the rear of the printer, remove the DC Power Supply main motor shielding screw (1) and slip-out the shielding*. This gives access to J501 (DC power supply main motor connector) and J7 (the Interface PCA connector). Disconnect the connectors.
F. Remove the cable clamp on the rear frame (1).
G. Open the printer (raise the upper main body).
H. Remove the power interlock assembly cover (1) shown in Figure 7-18.
I. Remove the fuser wire harness cover (1) shown in Figure 7-19.
J. Remove the interface cable cover (1).
K. Disconnect the two cables attached to the left rear of the printer, (J10 and J11) and disconnect J16 on the Interface connector PCA bracket.
L. Disconnect the fuser thermistor connector.
M. Disconnect J103 on the AC Controller PCA (Figure 7-20).
N. Disconnect the Faston connectors (2) coming from the line filter which connect the power interlock assembly.
O. Remove the terminal strip screw securing the upper part of the left power interlock support bracket (1).
P. Remove the screws (2) attaching the chrome ground buss to the interface bracket frame and power interlock assembly base.
Q. Remove the large screws (2) which attach the lower body to the pedestal.

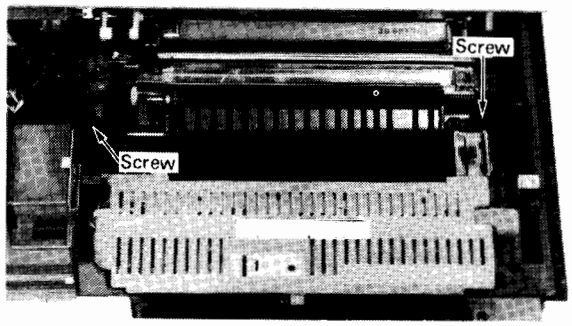


Figure 7-17. Removing the Pedestal Screws

R. Close the printer and carefully lift the upper assembly from the pedestal, using the handles (rear manual feed tray and output tray).

7-4. POWER INTERLOCK ASSEMBLY

A. Open the printer (raise the upper half).
B. Remove the fastening screw on the power interlock assembly cover and remove the cover (see Figure 7-18).

NOTE

Remove the lower left panel if servicing the HP 2686D model. It is not necessary that the panel be removed if servicing the HP 2686A.

C. Remove the Fusing Wire Harness Cover (1), see Figure 7-19.

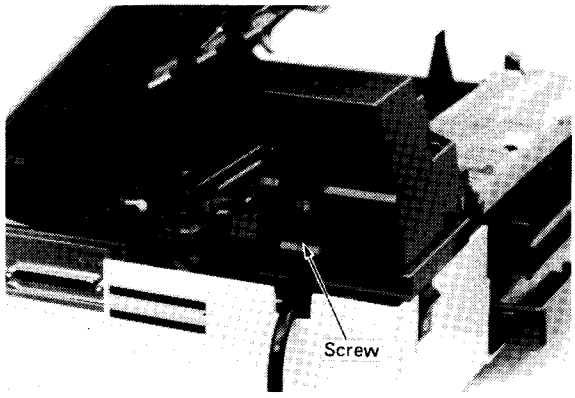


Figure 7-18. Power Interlock Assembly Cover Screw

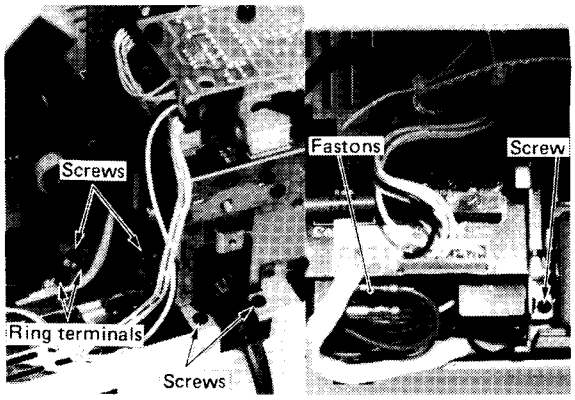


Figure 7-20. Input Power Module

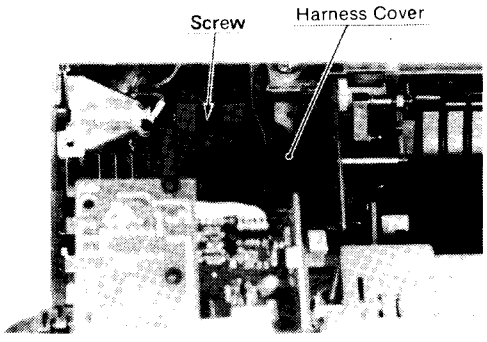


Figure 7-19. Fusing Wire Harness Cover

D. Disconnect J104 on the Fusing Safety PCA.
E. Disconnect J101, J102, J103, and J105 on the AC Controller PCA.
F. Note and mark to identify the wires coming from the line filter to the assembly's terminal block, and then disconnect the Faston connectors (see Figure 7-20).
G. Remove the two ring terminals which secure the two ground wires to the assembly (see Figure 7-20).
H. Remove the five screws which secure the assembly to the base of the printer and then remove the interlock assembly.

Door Microswitch

A. Open the printer (raise the upper half)
B. Remove the fastening screw on the Power Interlock Assembly Cover and remove the cover (see Figure 7-18).
C. Referring to Figure 7-21, remove fastening screws A (2) and take out the door switch together with the switch plate. Pull the four Faston connectors out, remove fastening screws B (2) and take out the door switch.

7-5. TEST PRINT MICROSWITCH

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel.
B. Remove the left panel (2).
C. Note the positions of the faston connectors (see Figure 7-22) and remove the connectors, fastening screw, and test switch.

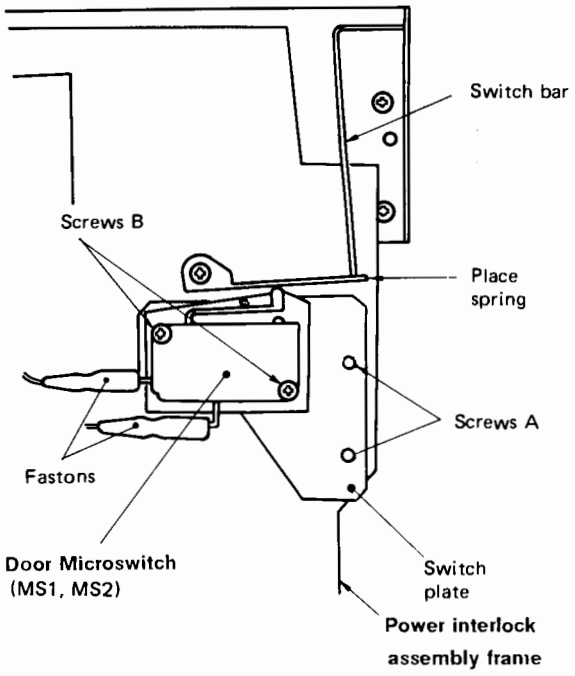


Figure 7-21. Door (Interlock) Switch

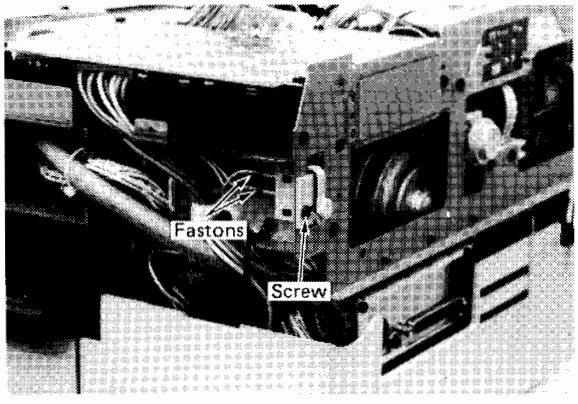


Figure 7-22. Removing Self-Test Microswitch

7-6. PRINT DENSITY ADJUSTMENT DIAL

A. Open the printer (raise the upper half) and open the right door. Remove the EP cartridge.
B. Remove the rear panel, the top cover and the left panel.
C. Disconnect the (3) connectors on the Varistor PCA.
D. Note the positions and disconnect the two Faston connectors on the Feast Print microswitch.
E. Remove the left-side frame (Figure 2-27).
F. Remove the set screw on the print density adjustment dial and pull the dial off the shaft.
G. Remove the high voltage power supply assembly cover (1).
H. Remove the connector and fastening nut and remove the print density adjustment unit.

7-7. FAN

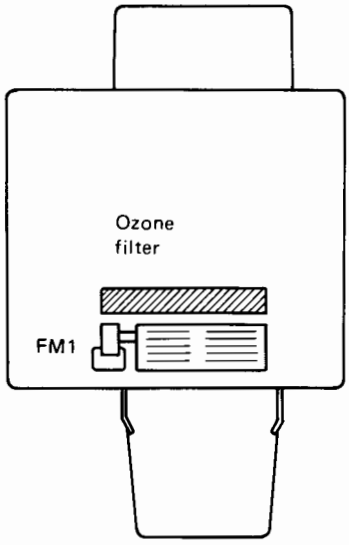


Figure 7-23. Fan Location

A. Open the printer (raise the upper half) and open the right door. Take the EP cartridge out.
B. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4), right panel, left panel and front cover.
C. Take out the fan duct (8), see Figure 7-25.

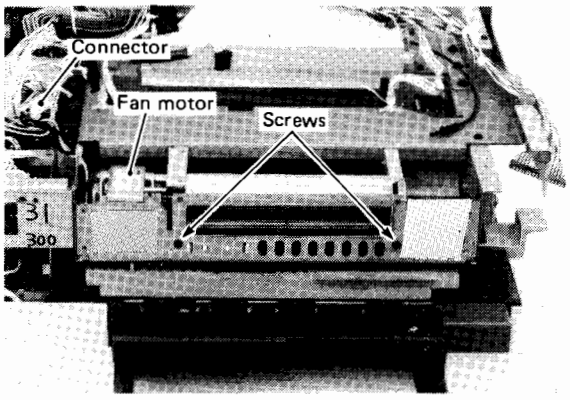


Figure 7-24. Fan Cover Plate

D. Unplug J216 on the DC Controller PCA. Remove the DC Controller from the nylon fasteners (5) and fold back the DC Controller PCA.
E. Remove the fan cover (2). as shown in Figure 7-25.
F. Unplug the fan motor cable connector located at the left side of the printer. Remove the two fastening screws and take out the fan.

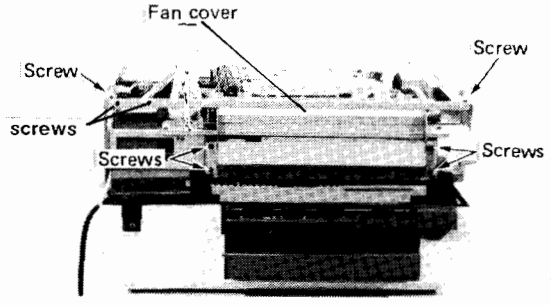


Figure 7-25. Fan Securing Screws

Ozone Filter

A. Open the printer (raise the upper half). Open the right door. Take the EP cartridge out.
B. Remove the fastening screw while supporting the filter and pull out the ozone filter (see Figure 7-26).

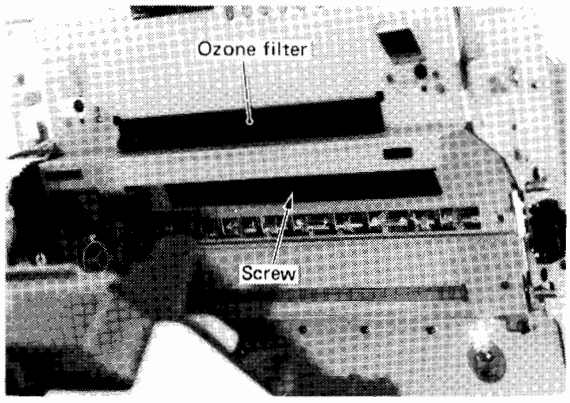


Figure 7-26. Removing the Ozone Filter

7-8. MAIN MOTOR ASSEMBLY

All necessary mechanical drive functions for printing (drum. developing assembly. fusing assembly. delivery unit) are provided by the main motor assembly.

A. Open the printer (raise the upper half). Open the right door and take the EP cartridge out.
B. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields. brackets. and the rear panel. Remove the top cover (4) and the left panel (2).
C. Unplug the three connectors on the Varistor PCA.
D. Note the position and disconnect the two faston connectors on the Test Print microswitch.
E. Remove the printer left-side frame (6) shown in Figure 7-27.

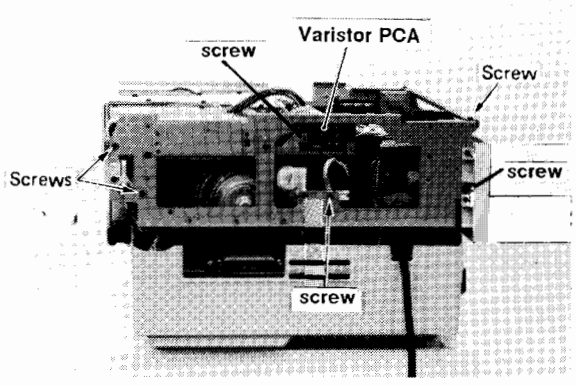


Figure 7-27. Removing the Left-Side Frame

F. Open the printer.
G. Disconnect the High Voltage power supply connectors (3).
H. Remove the (1) screw connecting the power supply to the main motor frame.
I. Remove the cables from the cable harness mounted on the main motor.
J. Disconnect the main motor connector and remove the main motor (4). See Figure 7-28.

NOTE

Take care not to lose the clear plastic bushing which is between the cassette drive gear/shaft and the drive motor mounting/positioning bracket.

CAUTION

Ensure that the Varistor PCA and the High Voltage PCA connectors are connected properly after the main motor has been reinstalled. Severe printer damage could result.

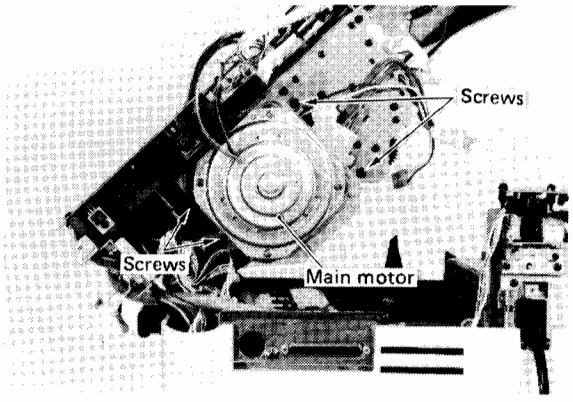


Figure 7-28. Removing the Main Motor

7-9. LOWER MANUAL FEED ROLLER

Remove the lower manual feed roller as follows:

A. Separate the upper Main Body of the printer from the lower Main Body, refer to Section 7-3.

NOTE

If servicing the HP 2686D, skip steps B through F and proceed to step G. If servicing the HP 2686A, proceed through all of the steps listed below.

B. Remove the large screws (2) attaching the lower body to the pedestal.
C. Remove the screw (1) attaching the left power interlock support bracket and the screw (1) attaching the chrome ground bracket.
D. Disconnect the cables (J102 and J103) from the AC Controller PCA and J104 from the Fuser Safety PCA.
E. Remove the (1) screw from the left rear support bracket.

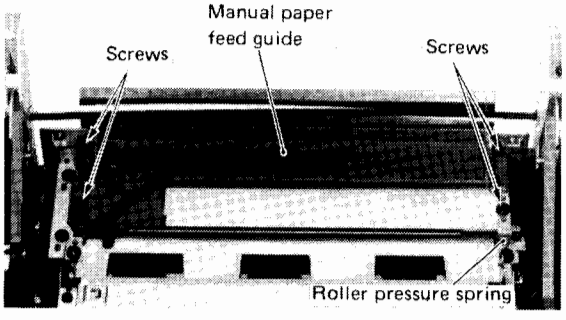


Figure 7-29. Removing the Manual Paper Feed Guide

F. Lift the lower main body off of the pedestal assembly.

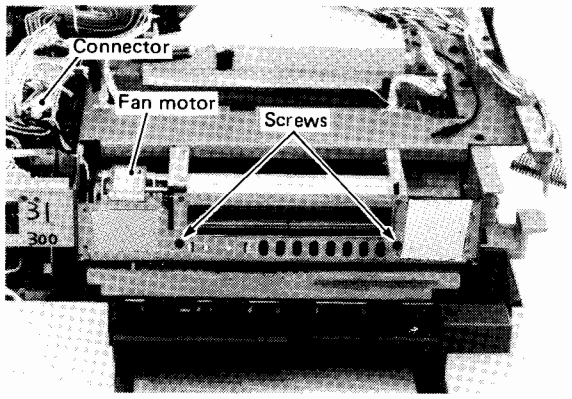


Figure 7-24. Fan Cover Plate

D. Unplug J216 on the DC Controller PCA. Remove the DC Controller from the nylon fasteners (5) and fold back the DC Controller PCA.
E. Remove the fan cover (2), as shown in Figure 7-25.
F. Unplug the fan motor cable connector located at the left side of the printer. Remove the two fastening screws and take out the fan.

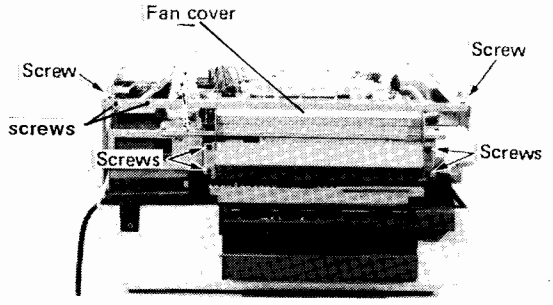


Figure 7-25. Fan Securing Screws

Ozone Filter

A. Open the printer (raise the upper half). Open the right door. Take the EP cartridge out.
B. Remove the fastening screw while supporting the filter and pull out the ozone filter (see Figure 7-26).

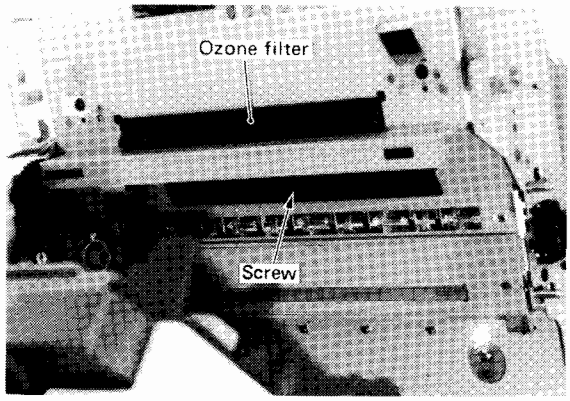


Figure 7-26. Removing the Ozone Filter

7-8. MAIN MOTOR ASSEMBLY

All necessary mechanical drive functions for printing (drum, developing assembly, fusing assembly, delivery unit) are provided by the main motor assembly.

A. Open the printer (raise the upper half). Open the right door and take the EP cartridge out.
B. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4) and the left panel (2).
C. Unplug the three connectors on the Varistor PCA.
D. Note the position and disconnect the two faston connectors on the Test Print microswitch.
E. Remove the printer left-side frame (6) shown in Figure 7-27.

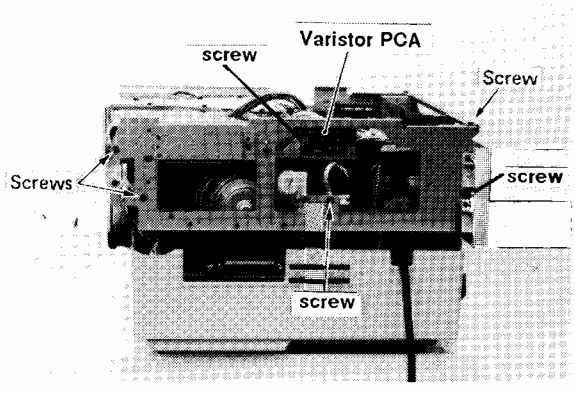


Figure 7-27. Removing the Left-Side Frame

F. Open the printer.
G. Disconnect the High Voltage power supply connectors (3).
H. Remove the (1) screw connecting the power supply to the main motor frame.
I. Remove the cables from the cable harness mounted on the main motor.
J. Disconnect the main motor connector and remove the main motor (4). See Figure 7-28.

NOTE

Take care not to lose the clear plastic bushing which is between the cassette drive gear/shaft and the drive motor mounting/positioning bracket.

CAUTION

Ensure that the Varistor PCA and the High Voltage PCA connectors are connected properly after the main motor has been reinstalled. Severe printer damage could result.

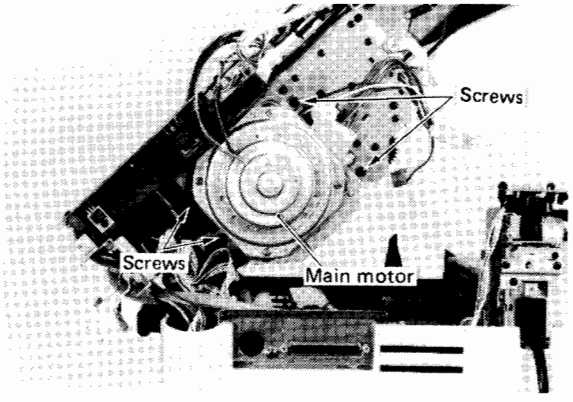


Figure 7-28. Removing the Main Motor

7-9. LOWER MANUAL FEED ROLLER

Remove the lower manual feed roller as follows:

A. Separate the upper Main Body of the printer from the lower Main Body, refer to Section 7-3.

NOTE

If servicing the HP 2686D, skip steps B through F and proceed to step G. If servicing the HP 2686A, proceed through all of the steps listed below.

B. Remove the large screws (2) attaching the lower body to the pedestal.
C. Remove the screw (1) attaching the left power interlock support bracket and the screw (1) attaching the chrome ground bracket.
D. Disconnect the cables (J102 and J103) from the AC Controller PCA and J104 from the Fuser Safety PCA.
E. Remove the (1) screw from the left rear support bracket.

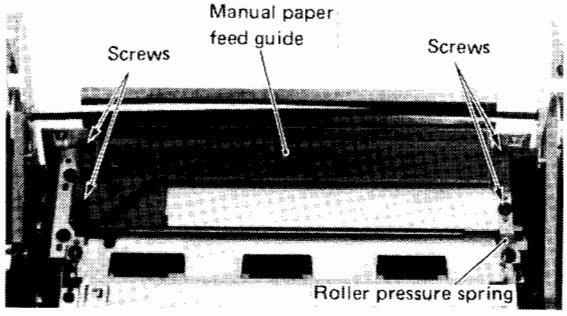


Figure 7-29. Removing the Manual Paper Feed Guide

F. Lift the lower main body off of the pedestal assembly.

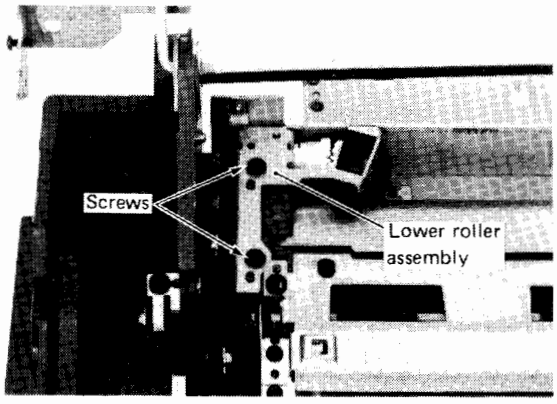


Figure 7-30. Removing the Lower Roller Assembly

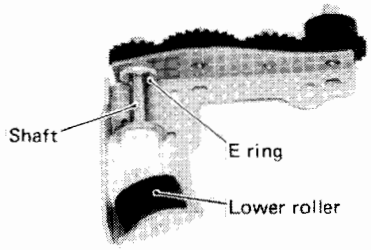


Figure 7-31. Lower Roller Assembly

G. Remove the lower manual feed guide cover (2). (see Figure 7-33).
H. Remove any shielding brackets attached to the manual feed guide assembly.
I. Remove the manual feed guide assembly (3).
J. Remove the screws securing the lower manual feed roller assembly (2).
K. Loosen the left input paper guide screw and slip the lower manual feed roller assembly out.

NOTE

During reassembly, when attaching the green grounding wire to the manual feed guide, position the wire and lug to the right side of the guide plate. Ensure that the wire does not interfere with the upper registration guide assembly. Print registration problems will result if improperly installed.

7-10. REGISTRATION SHUTTER ASSEMBLY

Remove the Registration Shutter as follows:

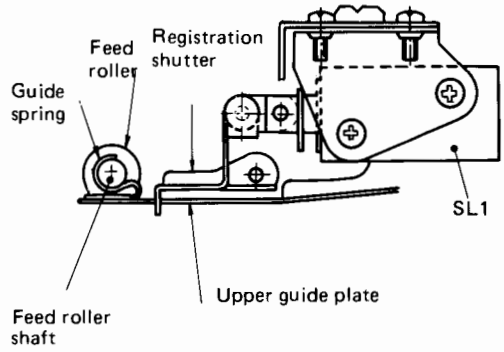


Figure 7-32. Registration Solenoid (mechanical action)

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Take the EP cartridge out. Remove the top cover (4) and left panel.
B. Remove the Laser/Scanner unit, refer to Section 7-16.
C. Remove the DC Power Supply/Main Motor Driver PCA, refer to Section 7-23.
D. Disconnect the PCA connector and the Faston connectors (4) (see Figure 7-33). Open the printer and remove the right ground strap.
E. Open the printer. Disconnect the grounding wire on the right side of the registration assembly.

F. Remove the two screws which attach the registration assembly to the frame (see Figure 7-34).

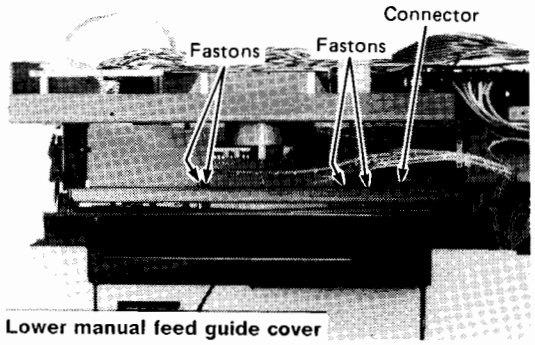


Figure 7-33. Disconnecting Registration Solenoid

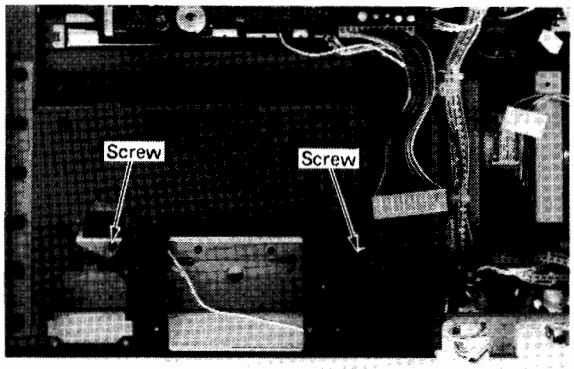


Figure 7-34. Removing the Registration Solenoid

G. Remove the registration shutter.

Installation

A. Place each grip ring (see Figure 7-35) on the shaft so that there is a clearance of 0.2 +/- 0.1 mm between the ring and the lever or arm when each is pressed firmly against its mount.
B. Attach the guide spring (see Figure 7-32).
C. Ensure the EP microswitch arm is positioned between the shutter assembly and the shutter stop.

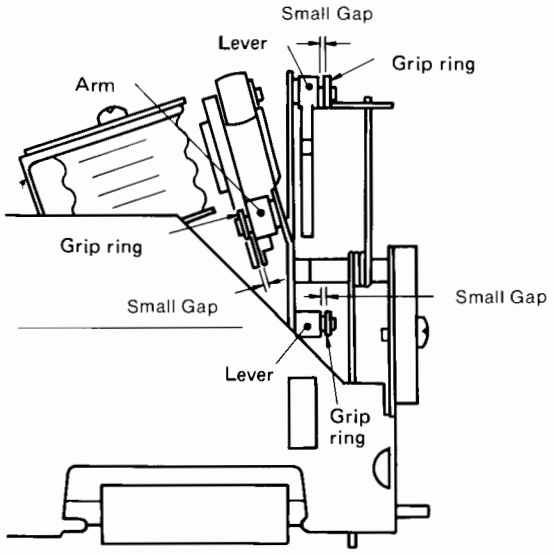


Figure 7-35. Registration Solenoid Positioning

7-11. TRANSFER GUIDE

The transfer guides consist of plates and rollers which guide the paper (manual or cassette feed) to the transfer unit of the photosensitive drum.

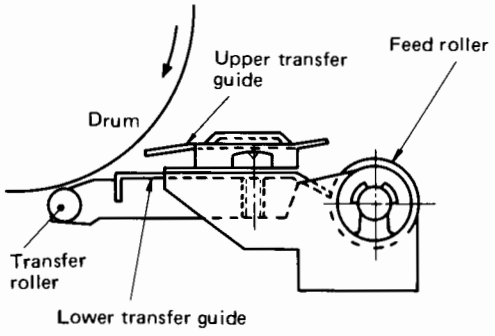


Figure 7-36. Transfer Guide Assembly

A. Open the printer (raise the upper half).
B. Remove the EP cartridge from the printer.
C. Remove the separation belt (see Figure 7-37).

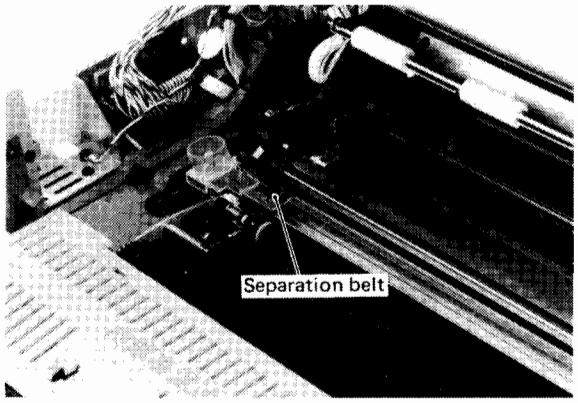


Figure 7-37. Separation Belt Location

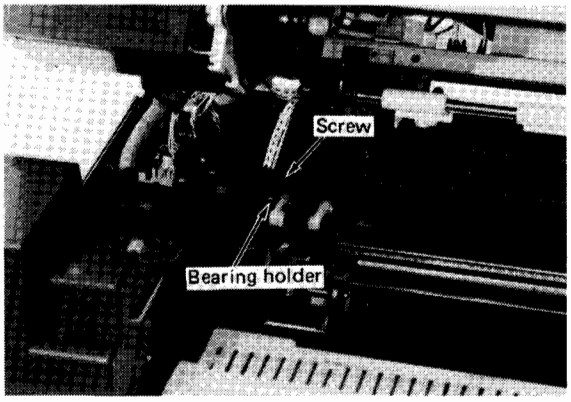


Figure 7-39 Bearing Holder

D. Remove the two screws and the lower guide plate (see Figure 7-39).

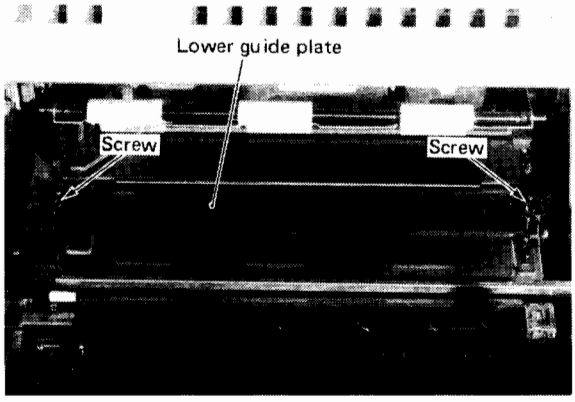


Figure 7-38. Removing the Lower Guide Plate

E. Remove the E-ring on the left side of the roller shaft. Slide the bearing out of the bearing retainer and lift the guide plate out (Figure 7-39).

Installation

Reassembly is the reverse of disassembly. During reassembly, however, be careful of the following points:

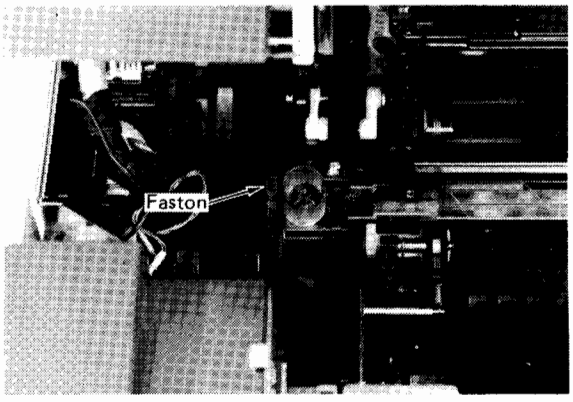


Figure 7-40. Transfer Corona Ground Connector

1. The transfer guide should be grounded.
2. The lower guide plate and the U-guide plate are kept in contact by the roller pressure spring, and therefore are grounded via the transfer guide.

7-12. SEPARATION/FEEDER ASSEMBLY

A. Open the printer and remove the EP cartridge and the separation belt.
B. Remove the ground wire from the separation/feeder assembly (1). (See Figure 7-40).
C. Remove the fusing assembly, refer to Section 7-19.
D. Remove the feed guide (see Figure 7-43).
E. Remove the two separation/feeder assembly screws and remove the separation/feeder assembly (see Figure 7-41).

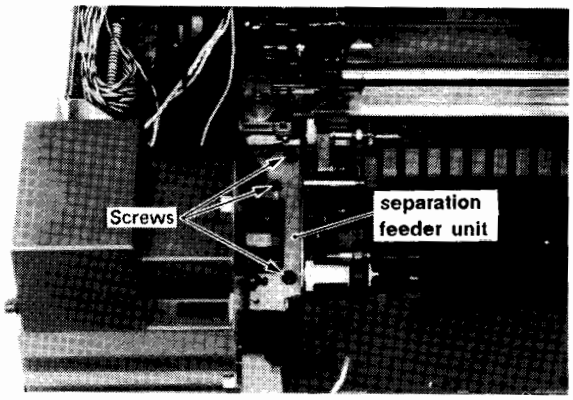


Figure 7-41. Separation/Feeder Assembly

NOTE

During reassembly, be careful not to bend or damage the separation belt.

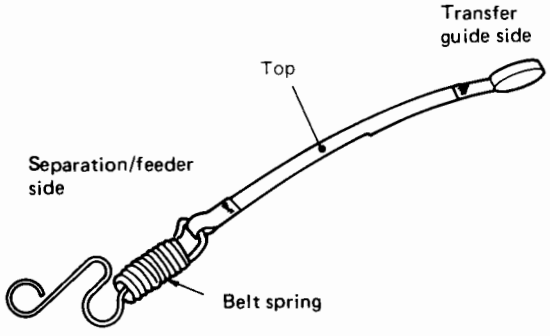


Figure 7-42. Assembled Separation Belt

7-13. FEED GUIDE

The feed guide guides paper to the fusing assembly.

A. Open the printer and remove the EP cartridge.
B. Remove the feed guide (2), see Figure 7-43. (Older models will have 4 screws.)

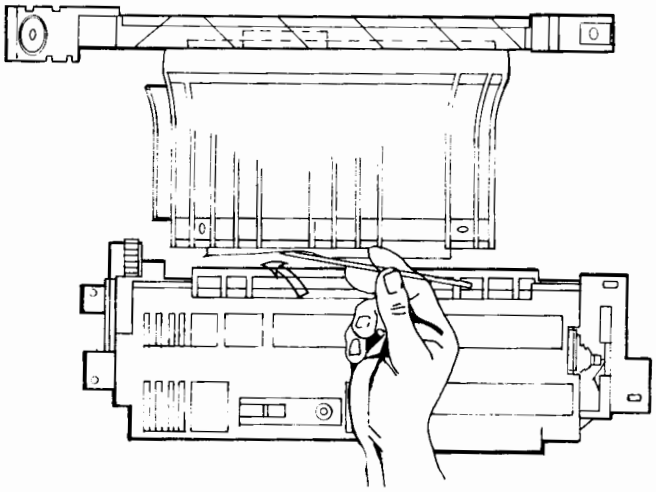


Figure 7-43. Feed Guide Assembly

C. When replacing the feed guide, position the foam covered tab UNDER the transfer corona assembly and seat the feed guide on the four standoffs. Ensure that the guide is positioned properly: it should not protrude above the paper path next to the transfer corona. If not correctly seated, paper jams will result.
D. Replace the (2) screws and ensure that the mylar sheet is positioned under the fuser input path. Hint: run a credit card or similar object between the fuser unit and the feed guide to click the mylar sheet into position.

7-14. CASSETTE PICKUP ASSEMBLY

Cassette Pickup Assembly Removal HP 2686A

Remove the Cassette Pickup Assembly as follows:

A. Separate the upper Main Body of the printer from the Pedestal, refer to Section 7-3.
B. Remove the four screws which secure the grounding strip.
C. Note the positions of the two solenoid lead wires (see Figure 7-44) and then disconnect the wires.
D. Remove the four screws which secure the cassette assembly to the pedestal, and then carefully lift the assembly from the pedestal. It may be necessary to position the AC wires away from the Interface Power Supply to remove the assembly.

Cassette Feed Roll Disassembly HP 2686A

A. Remove the Cassette Pickup Assembly as described in the preceding paragraph.
B. Remove the solenoid lower pickup guide spring.

NOTE

When removing the pickup rollers, note the position of the rollers and the stopping studs (see Figure 7-46).

C. Remove the grip ring, bearing, and then the pickup roller from the pickup roller assembly (see Figure 7-45).
D. Remove the "E" ring(s) and the appropriate roller(s) from the shaft.

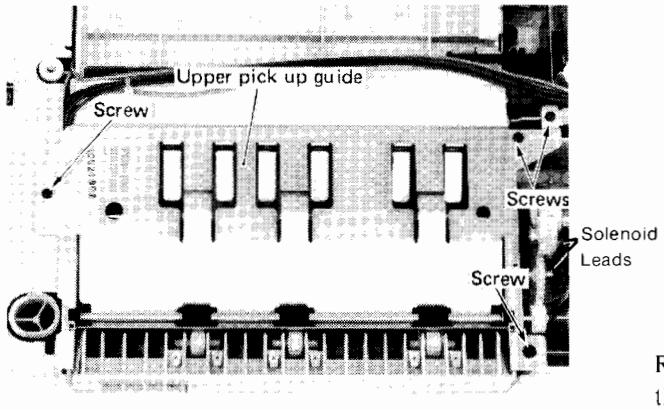


Figure 7-44. Upper Paper Pickup Guide Rollers

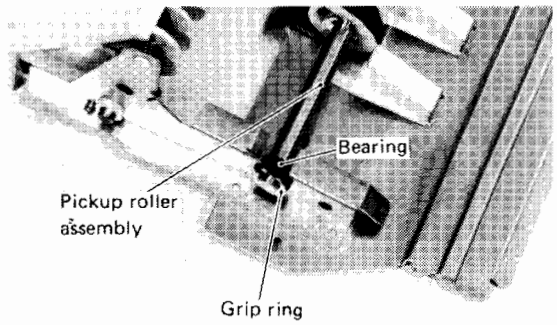


Figure 7-45. Paper Pickup Rollers (retaining bearings)

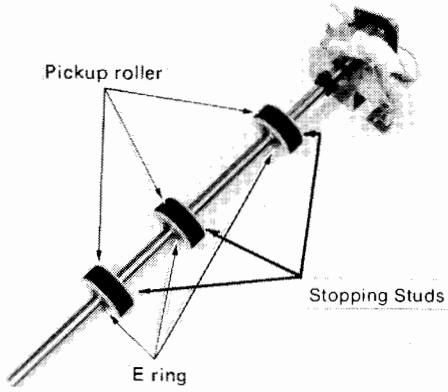


Figure 7-46. Paper Pickup Rollers

Reassembly is the reverse of disassembly. Ensure that the direction of rotation of the pickup rollers is correct (see Figure 7-47).

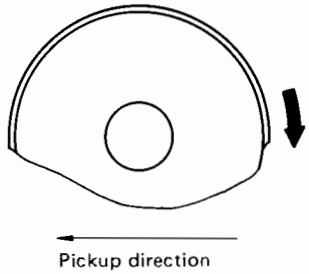


Figure 7-47.
Paper Pickup Rollers (operational direction)

Cassette Clutch Disassembly HP 2686A

Remove the pickup roller unit. E-ring. bushing. and the set-screw; then pull the clutch from the pickup roller shaft.

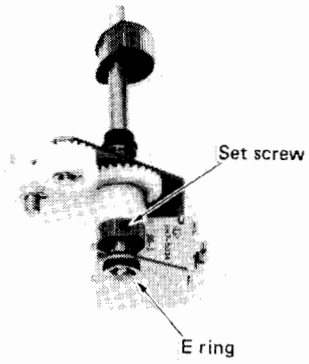


Figure 7-48. Paper Pickup Roller Clutch

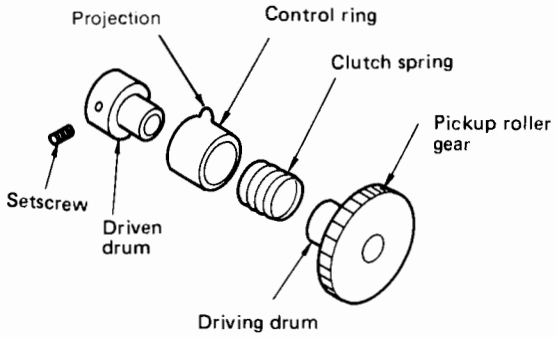


Figure 7-49. Pickup Control Clutch

Reassembly is the reverse of disassembly. With the clutch spring correctly engaging the control ring and the driven drum (see Figure 7-49) position the control ring so that the stop of solenoid SL3 firmly engages the projection on the control ring. Position the pickup roller shaft so that the set screw is aligned with the indentation on the shaft.

Oiling

Both the HP 2686A and the HP 2686D need occasional lubrication. Lubricate the spring of the pickup control clutch with a light oil. Remove the clutch spring. Lubricate the inside of the spring thoroughly.

Cassette Pickup Solenoids (Upper and Lower,SL3 & SL4) HP 2686D

A. Remove the lower left panel.
B. Raise the upper unit.

NOTE

If a short (1 inch). or off-set screwdriver is available. it may not be necessary to remove the transformer mounting plate referred to in step 3.

C. Remove the transformer mounting plate (see note above).
D. Remove the solenoid mounting plates from the lower unit (1 screw each).

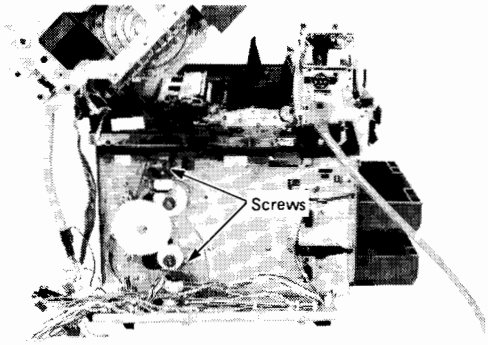


Figure 7-50. Solenoid Mounting Plate Removal

Upper Pickup Rollers HP 2686D

Remove the upper pickup rollers as follows:

A. Remove the lower right and lower left panels.

B. Raise the upper unit.
C. Remove the transformer mounting plate as described in Section 7-25.
D. Remove the upper pickup roller clutch solenoid (SL3).
E. Remove the E-ring from the drive pulley gear, remove the gear and let the drive belt hang.
F. Remove the upper pickup roller cover (2) on the right side of the printer.
G. Remove the E-ring from the right end of the upper pickup roller shaft and remove the bronze bushing.
H. Rotate the pickup roller shaft and remove through the opening in the left pedestal frame.
I. Remove the E-rings and remove the pickup rollers from the pickup roller shaft.

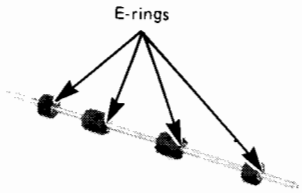


Figure 7-51. Pickup Roller Shaft E-Rings

Lower Pickup Rollers HP 2686D

Remove the lower pickup rollers as follows:

A. Perform steps A-C of the upper pickup roller removal procedure.
B. Remove solenoid SL4.
C. Remove the E-ring from the drive pulley shaft. Remove the drive pulley gear and let the belt hang. Remove the bronze bushing on the right side of the lower pickup roller drive shaft.
D. Rotate the roller shaft and remove through the opening in the right pedestal frame.
E. Remove the E-rings and remove the rollers from the pickup roller shaft.

Upper Cassette Feed Roll Shaft HP 2686D

Remove the upper cassette feed roll shaft as follows:

A. Remove the lower right and lower left panels and the rear door.
B. Raise the upper unit.
C. Remove the transformer mounting plate as described in Section 7-25.
D. Remove the E-ring from the drive pulley gear, remove the gear and let the drive belt hang.
E. Remove the upper pickup guide (2). Remove the screws from the middle pickup guide (4).

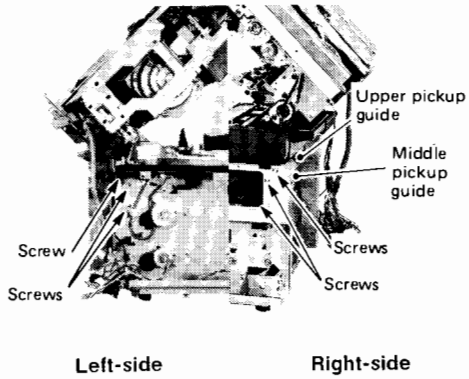


Figure 7-52. Pickup Guide Screws

F. Remove the E-ring and gear from the feed roll shaft, then remove the bushing.

NOTE

Take care not to lose the parallel pin securing the gear on the left end of the shaft, when removing the gear.

G. Slide the middle pickup guide toward the rear and remove the feed roller shaft.

Lower Cassette Feed Roll Shaft-HP 2686D

Remove the lower cassette feed roll shaft as follows:

A. Remove the lower right and lower left panels and the rear door.
B. Remove the E-ring from the drive pulley gear and disconnect the drive belt.

C. Remove the E-rings and bushings on each side of the feed roll shaft.

NOTE

Take care not to lose the parallel pin securing the gear on the left end of the shaft, when removing the gear.

D. Remove the pickup roller cover (2) on the right side of the printer.
E. Loosen the rear upper feed guide plate (4) and move it out of the way of the shaft rolls.
F. Loosen the front upper feed guide plate (4).

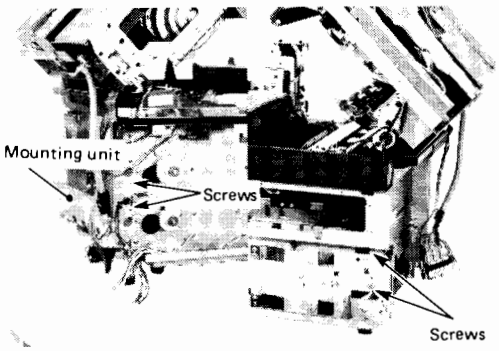


Figure 7-53. Guide Plate Mounting Screws

G. Slide the roll to the left to free the assembly and remove through the right side opening.

Cassette Feed Rollers (Rear) HP 2686D

A. Remove the lower right panel and the rear door.
B. Pry out the six cassette feed rollers (rear) with a flat blade screwdriver.

Cassette Pickup Drive Belt HP 2686D

A. Separate the lower main body from the pedestal (see section 7-3).
B. Remove the E-ring securing the large drive pulley/gear to the shaft, and remove the drive pulley/gear.

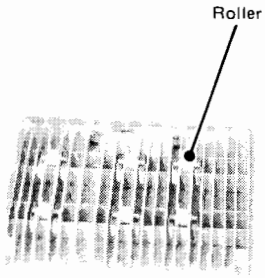


Figure 7-54. Cassette Feed Rollers (Rear)

C. Disconnect the wires (2) attached to the upper cassette clutch solenoid.
D. Disconnect the tension spring attached to the pulley tension plate.
E. Remove the nut (1) securing the drive pulley shaft to the cassette frame.
F. Remove the drive pulley shaft from the pulley and pulley tension plate.
G. Remove the belt from the solenoid area by turning the belt on edge and sliding it between the solenoid armature and the clutch shaft.

7-15. PAPER DETECTION ASSEMBLIES

Paper Out Sensor HP 2686A

A. Separate the Main Body of the printer from the Pedestal, refer to Section 7-3.
B. Remove the paper tray and remove the two screws which secure the paper out sensor and its mounting plate (see Figure 7-55).
C. Rotate the paper out sensor arm 180 degrees from the normal position. Slide the arm out and away until the notches in the shaft align. Slide the arm off the bracket.

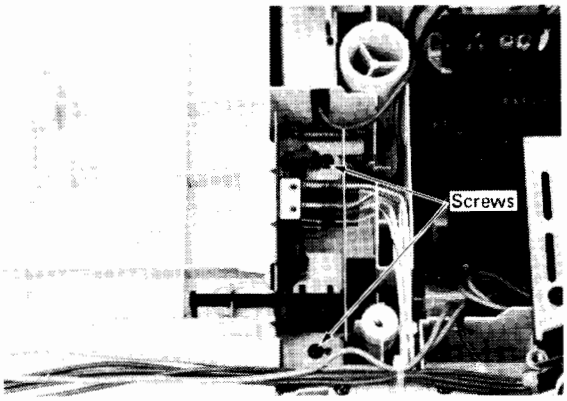


Figure 7-55. Sensor Mounting Bracket

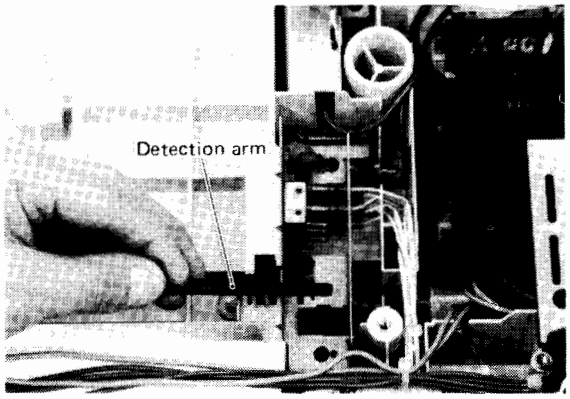


Figure 7-56. Removing the Paper Out Sensor Flag

Paper Out Sensor HP 2686D

A. Remove the lower left panel.
B. Remove the paper out sensors (PS2 and PS4). There are 2 screws for each sensor.
C. Rotate the paper out sensor arm 180 degrees from the normal position. Slide the arm out and away until the notches in the shaft align. Slide the arm off the bracket.

Paper Size Switches HP 2686A

The paper size switches are mounted on the same bracket as the paper out sensor. detailed in 7-15. To access or remove the paper size switches. refer to that procedure.

Lower Cassette Size Detection Switches HP 2686D

A. Remove the lower right and lower left panels and the rear door.
B. Remove the lower detection switch cover (2). Hint: Use the 1 inch screwdriver.
C. Disconnect the connector of the detection switch and remove the detection switch mounting plate (2).

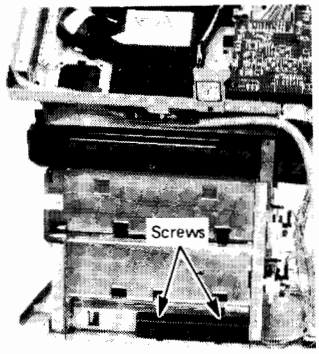


Figure 7-57. Detection Switch Cover

NOTE

When reinstalling the switch mounting plate. ensure that the alignment tabs are properly seated in the slots.

Upper Cassette Size Detection Switches HP 2686D

A. Remove the lower right and lower left panels and remove the rear door.
B. Remove the E-ring from the main clutch drive pulley shaft. Remove the pulley. (It is not necessary that the belt or other rollers be removed).

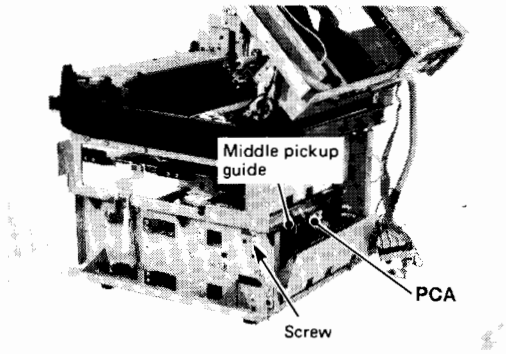


Figure 7-58. Middle Pickup Guide

C. Remove the 4 screws (2 on each side) from the middle pickup guide and slide the guide toward the rear.
D. Disconnect the connector of the detection switch and remove the detection switch mounting plate (2).

NOTE

When reinstalling the switch mounting plate, ensure that the alignment tabs are properly seated in the slots.

7-16. LASER/SCANNING ASSEMBLY

The Laser Scanner Assembly is comprised of the Laser Unit and the Scanner Unit. The Scanner Unit is comprised of the scanner motor, Scanner Driver PCA, scanner mirror and focusing lenses. If the Scanner Driver PCA is defective, the entire Scanner Unit must be replaced. The Laser Unit is composed of the semiconductor laser and its cables and connectors.

NOTE

To prevent damage to the laser from static electricity, exercise all ESD discharge precautions: the laser is highly static sensitive. A new laser unit is shipped with a static shorting connector. Remove this connector before installing a new laser unit.

CAUTION

When servicing the optical system of the printer be careful not to place a screwdriver or other shiny objects in the path of the laser beam. Also accessories such as watches and rings should be removed before working on the printer. The reflected beam, though invisible, can permanently damage your eyes.

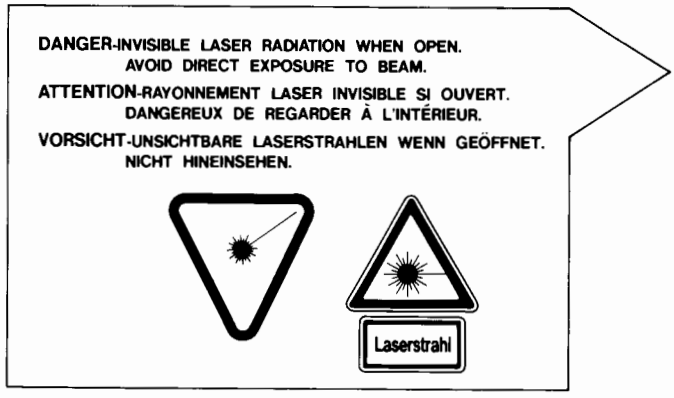


Figure 7-59. Laser Safety Label

Assembly Removal

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4).
B. Unplug connectors J203, J204 and J206.
C. Disconnect the ground strap.
D. Remove the (4) screws (see Figure 7-60) which secure the Laser Scanner assembly and carefully lift the assembly from the printer.

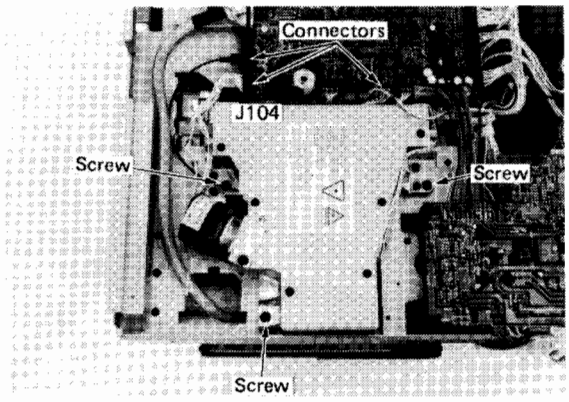


Figure 7-60. Removing the Laser/Scanner Unit

Laser Replacement

A. Take off the rubber cap of the laser and scanner unit. Remove the two Allen screws and remove the laser unit.

NOTE

If the scanner motor or the Scanner Driver PCA is defective, but the laser unit works, remove the old laser unit and install it along with a new scanner unit.

B. Align the laser unit to the locating pinhole. Install the two Allen screws loosely, then tighten them alternately so that the laser and scanner unit fits firmly.

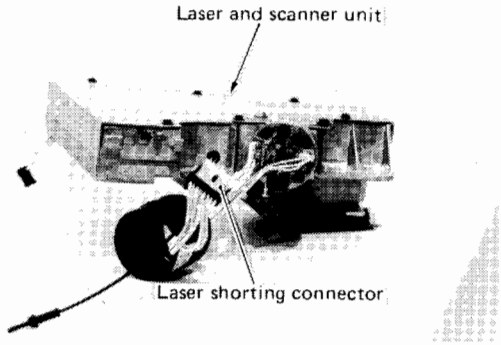


Figure 7-61. Removing the Laser Unit

C. Align the Laser Scanner assembly with the locating pinhole.

NOTE

Clean the mounting face of the Laser Scanner assembly with a clean lint free tissue before installing the unit.

D. Installation is the reverse of removal.

NOTE

When installing and removing the Laser Scanner assembly, be careful not to scratch the Scanner Driver PCA.

Be careful not to leave fingerprints or dust on the window, mirror, lenses, or laser unit mounting plate.

Do not bend the optic fiber cable sharply to prevent damage to the cable.

Laser Beam-Blocking Shutter

A. Remove the Laser Scanner assembly, see the preceding paragraph.
B. Remove the ozone seal plates (2), the tension springs (2), and the fastening screws with the two guide bushings (see Figure 7-62). Remove the shutter.

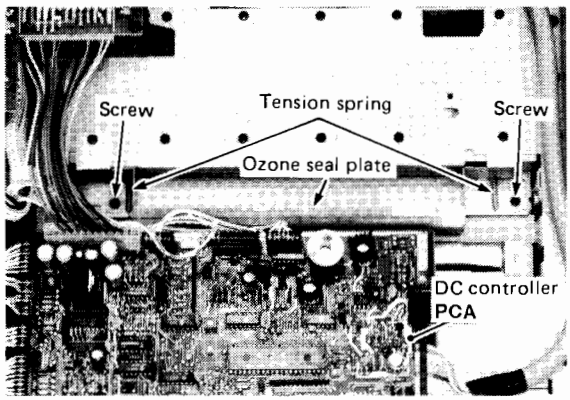


Figure 7-62. Removing the Laser Blocking Shutter

7-17. ERASE LAMPS and PAGE COUNTER

Erase Lamp Assembly

Remove the Erase Lamp/Page Counter assembly as follows:

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4).
B. Loosen or remove the plastic feed plate.
C. Unplug all the connectors on the DC controller PCA. Release the nylon fasteners (5) on the DC Controller PCA and remove the PCA. (See Figure 7-92.)
D. Take out the erase lamp and the page counter PCA assembly. (see Figure 7-63).

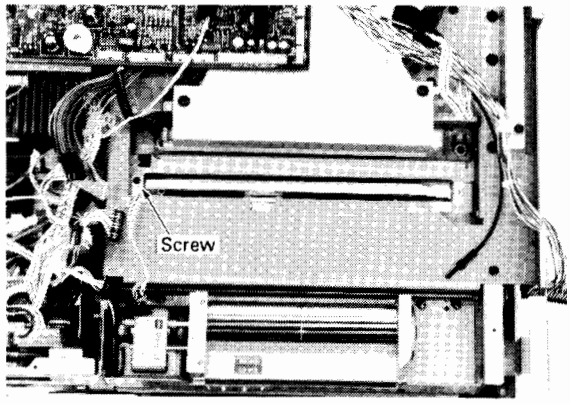


Figure 7-63. Removing the Erase Lamp Assembly

Mechanical Page Counter

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel.
B. Disconnect the three connectors (J1, J2 and J7) from the Interface PCA and remove the top cover (4).
C. Disconnect the registration solenoid and page counter leads from the lug connectors.
D. Remove the screws (2) securing the page counter to the printer frame (see Figure 7-65).

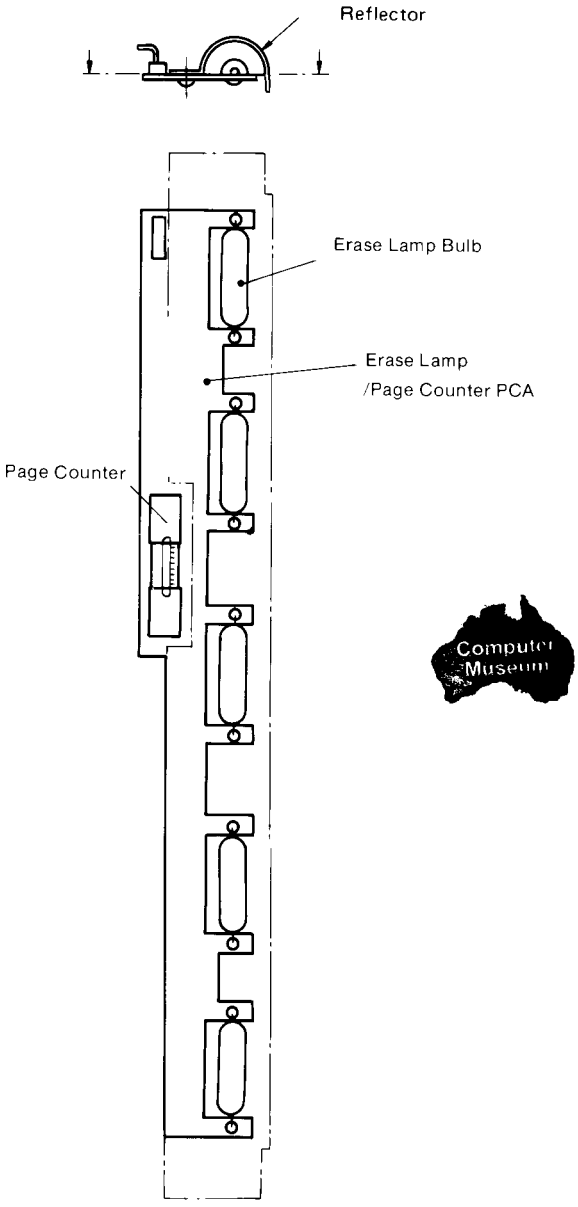


Figure 7-64. Erase Lamps and Page Counter

7-18. TRANSFER CORONA ASSEMBLY

Remove the Transfer Corona assembly as follows:

A. Open the printer (raise the upper half).
B. Remove the EP cartridge.

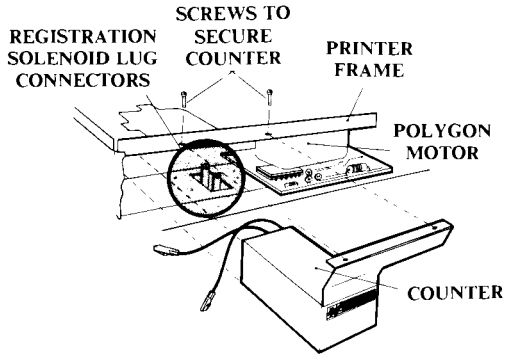


Figure 7-65. Mechanical Page Counter

C. Remove the separation belt.
D. Remove the plastic transfer guide (2).
E. Remove the transfer corona assembly (1).

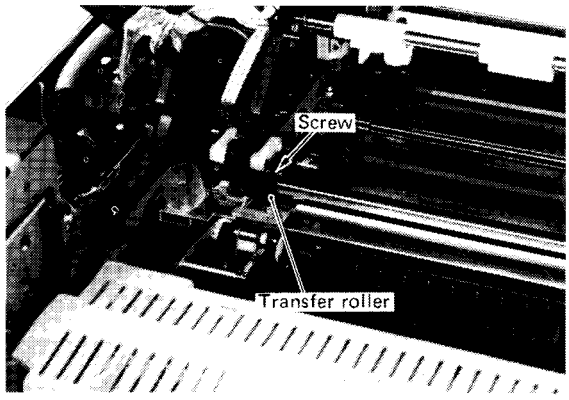


Figure 7-66. Transfer Guide

Stringing the Corona Wire

NOTE

Restringing the corona wire is not a recommended procedure, however if a new assembly is not readily available it is possible to restring the corona to expedite printer operation.

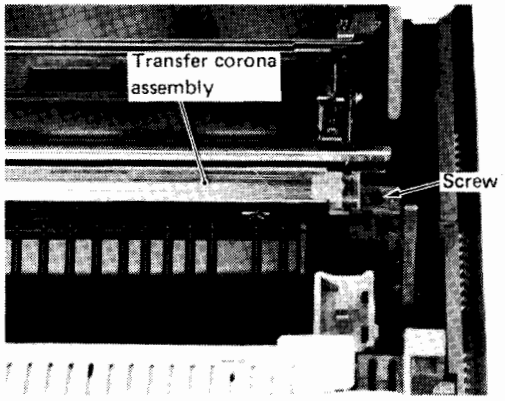


Figure 7-67. Transfer Corona Assembly

A. Remove the transfer corona assembly. Discard the old wire.

NOTE

The corona guide wire does not need to be removed in order to restring the corona.

B. Remove the clear plastic end caps by carefully spreading the plastic holding clamps. Retain the spring for re-use.
C. Cut off about 30 cm of corona wire. Form a 2-mm loop at one end by wrapping the wire around a small Allen wrench and twisting the loop closed. Make a loop of the same size at the other end so that the total length of wire is as shown in Figure 7-68.

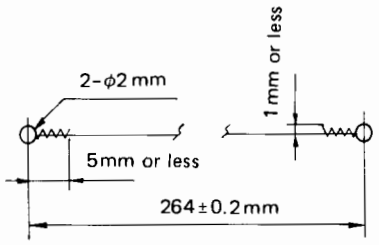


Figure 7-68. Transfer Corona Wire (dimensions)

D. Hook one of the loops over the stud on the right block and pass the wire through the V-groove in the block.
E. Put one end of the spring through the other loop of the wire, then put the other end of the spring over the spring hanger on the left block.

Figure 7-69. Stringing the Transfer Corona

NOTE

The corona wires should not be bent, twisted or kinked. They also should be clean and smooth. Clean the corona wires with a cotton swab (provided with the EP cartridge) dampened with isopropyl alcohol.

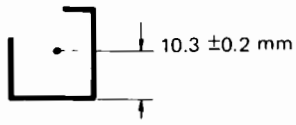


Figure 7-70. Transfer Corona Wire Height

NOTE

The height (position) of the corona wire can be adjusted by turning the screw at the rear of the corona assembly. One turn of the screw changes the wire position about 0.5 mm.

Stringing the Corona Guide Wire

A. Unreel the guide wire from the reel and cut off about 84 cm of wire.
B. Wrap one end of the guide wire around screw 1 (two to three times) as shown in Figure 7-71, and tighten the screw.
C. Wrap the wire around the corona assembly as shown in Figure 7-71.
D. Wrap the end of the grid wire around screw 14 (two to three times) as shown in Figure 7-71. Tighten the screw and clip off the extra wire.
E. The guide wire should be wound tightly. (Tension: 150 +/- 30 g)

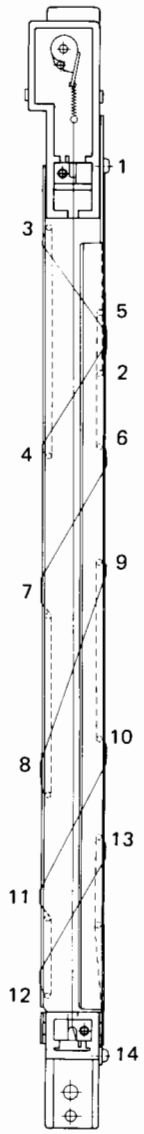


Figure 7-71. Stringing the Corona Guide Wire

7-19. FUSING ASSEMBLY

Fusing Assembly Removal

A. Open the printer (raise the upper half). Open the fusing assembly top cover and remove the fusing cleaning pad.
B. Remove the two screws which secure the fusing right end cover (see Figure 7-72).

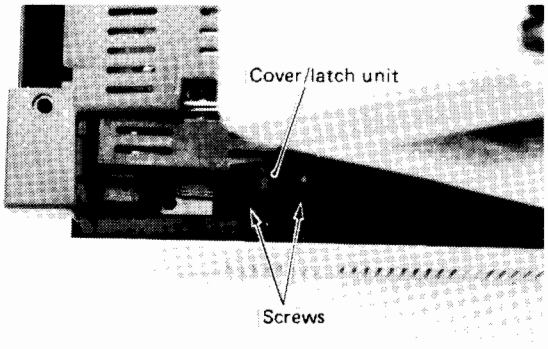


Figure 7-72. Removing Right-End Cover

C. Remove the fusing wire harness cover (1) as shown in Figure 7-19. and disconnect the thermistor connector (see Figure 7-73).

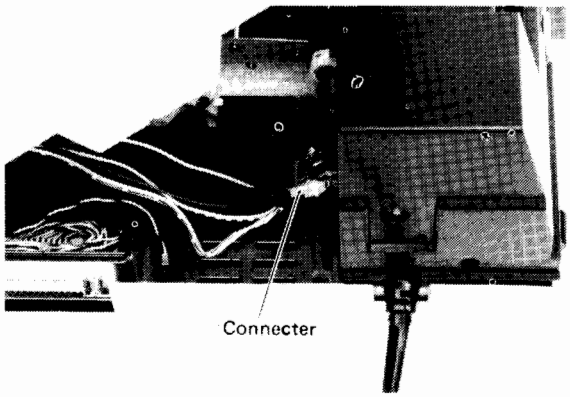


Figure 7-73. Fusing Assembly (thermistor connector)

NOTE

In newer models the left side screws are extended posts to allow for ease of access and removal (Figure 7-74).

D. Remove the four screws which secure the fusing assembly to the lower Main Body of the printer (see Figure 7-74).

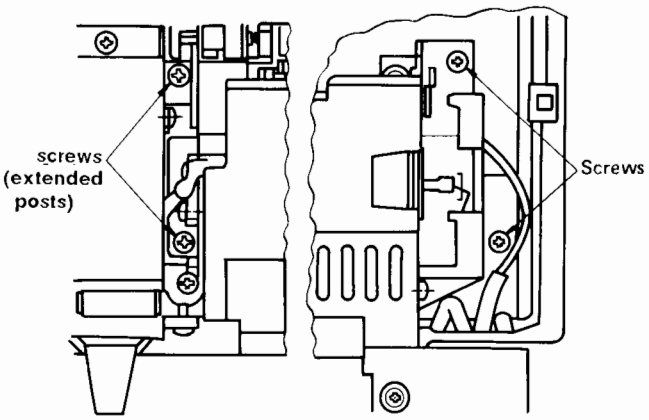


Figure 7-74. Fusing Assembly (securing screws)

E. Lift each end of the fusing assembly enough to remove the faston connectors (one on each end leading to the fuser bulb. see Figure 7-75) then remove the assembly.

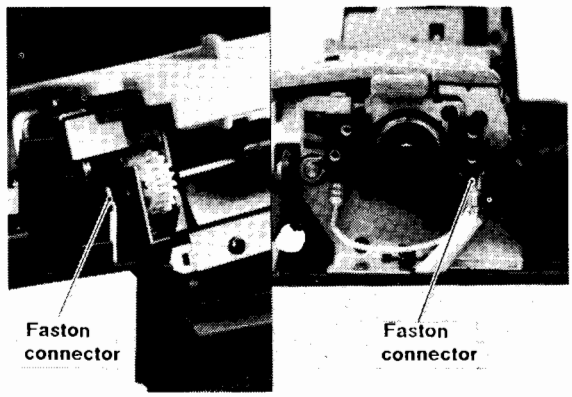


Figure 7-75. Fusing Lamp Connectors

Reassembly is the reverse of disassembly. Be sure the wire harness leading to the fuser bulb is located firmly in the groove in the bottom of the printer.

Fusing Roll/Fusing Bulb Removal

A. Remove the Fusing Assembly, refer to the preceding paragraph.
B. Remove the right electrode holder (2), then the fusing bulb (see Figure 7-76). Proceed onto steps C-G if replacement of the fusing roller is required.

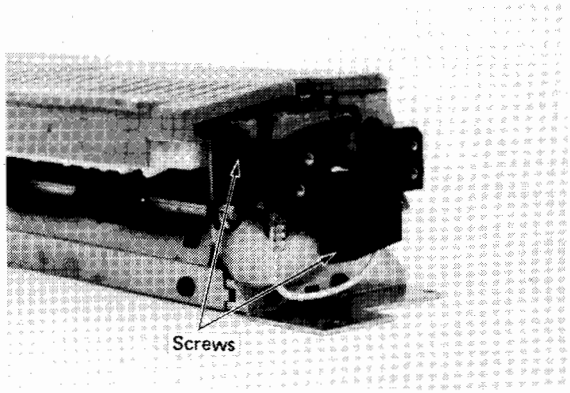


Figure 7-76. Right-End Lamp Connector

C. Remove the (2) screws (one on each side) and remove the fusing assembly's top cover (see Figure 7-77).

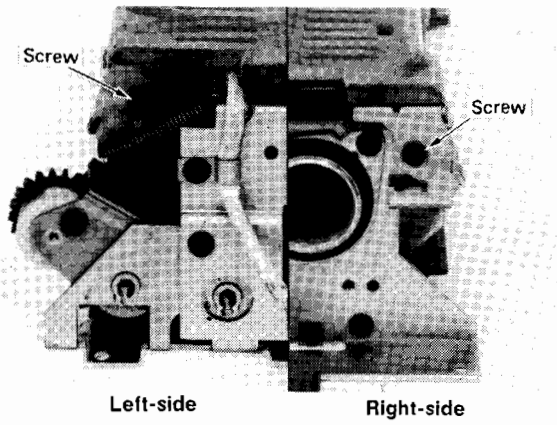


Figure 7-77. Fusing Top Cover

D. Remove the two screws securing the front and rear pressure springs (see Figure 7-78) and remove the springs.

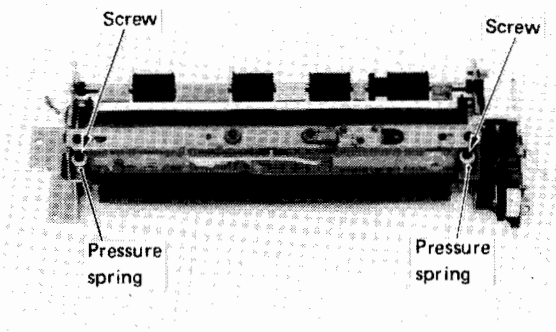


Figure 7-78. Fusing Assembly (rear view)

E. Loosen the cable restraint screw then remove the (2) screws securing the thermistor mounting bracket. Remove the drive gear tension spring, then the lamp terminal mounting plate (2). See Figure 7-79.

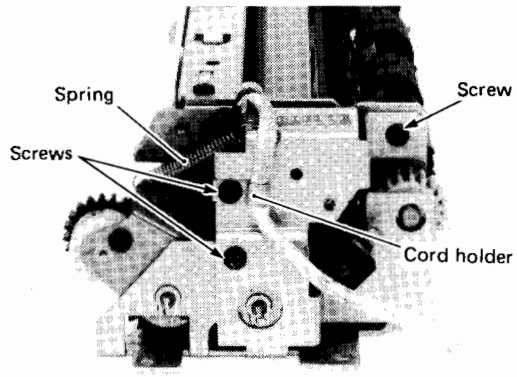


Figure 7-79. Fusing Assembly (left end view)

F. Remove the left retaining ring from the fusing roller, then remove the gear (see Figure 7-80).

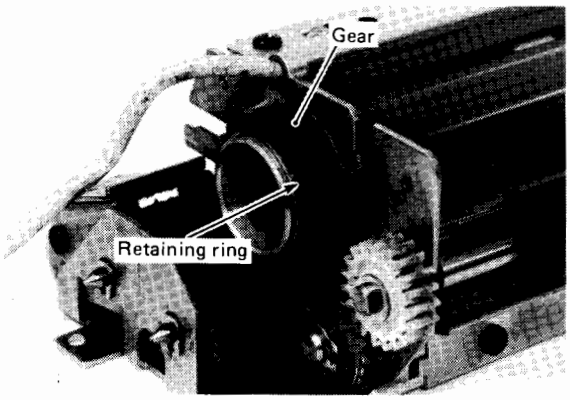


Figure 7-80. Fusing Assembly (left end view)

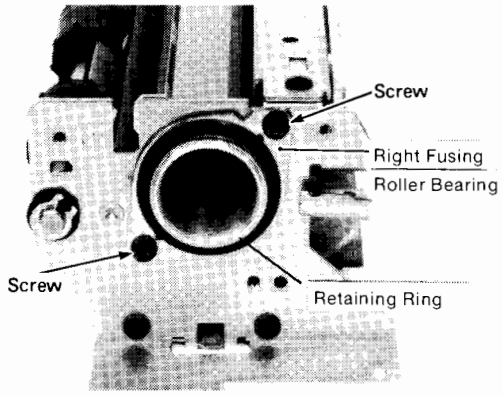


Figure 7-81. Fusing Assembly (bearing)

NOTE

The surface of the fusing roll can be easily scratched. Execute caution when removing or replacing the assembly.

G. Remove the right retaining ring, the right fusing roll bearing (2), (see Figure 7-81) and slide the fusing roll to the right and then pull it out the front of the printer.

Installing the Fusing Roll

Reassembly is the reverse of disassembly. Check that the surface of the thermistor and the thermoprotector contacts the fusing roll evenly (see figures 7-83 and 7-85).

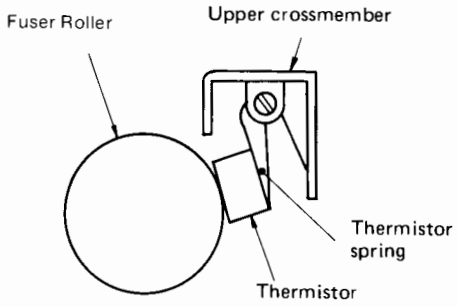


Figure 7-82. Thermistor Positioning

NOTE

It is not necessary to adjust the position of the thermistor and the thermoprotector. If contact is not even, check whether the thermistor's springing action is adequate.

Clean the thermistor with isopropyl alcohol.

When installing the fuser bulb, position the lamp so that the glass protrusion on the lamp points towards the thermistor (see Figure 7-83).

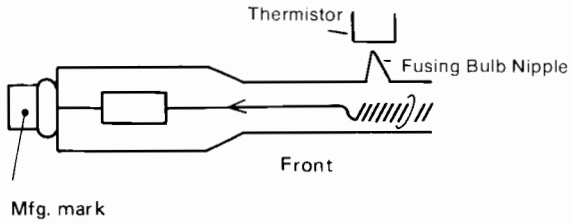


Figure 7-83. Fusing Bulb Positioning

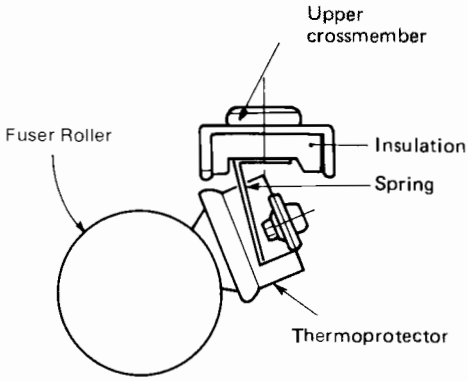


Figure 7-84. Thermoprotector

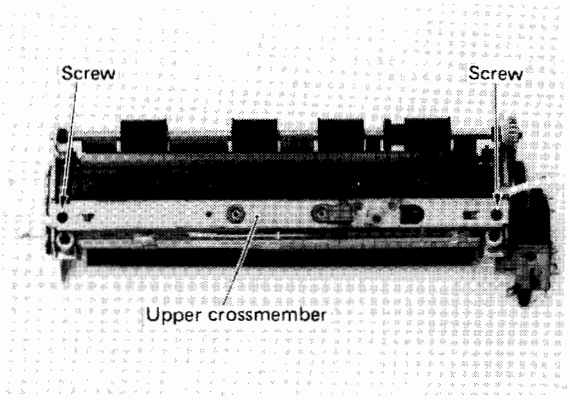


Figure 7-85. Removing Upper Crossmember

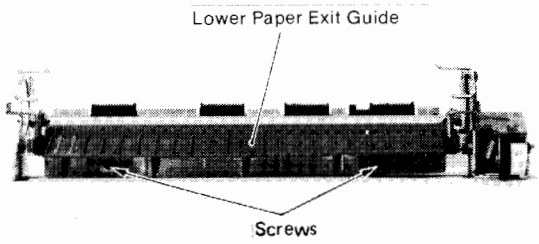


Figure 7-86. Removing the Paper Exit Guide

Pressure Roll Removal

A. Remove the fusing roll, refer to preceding paragraph.
B. Remove the two screws which secure the upper crossmember (see Figure 7-85).
C. Remove the two screws located on the bottom right side edge of the fusing assembly.
D. Remove the two screws which secure the lower paper exit guide (see Figure 7-86).
E. Remove the pressure roll together with the separation guide and the pressure arm (see Figure 7-87).
F. Installation of the pressure roll is the reverse of removal.

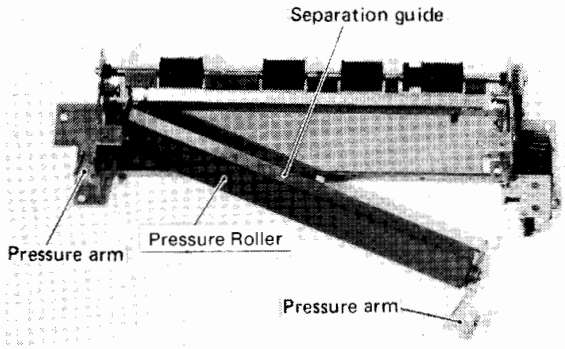


Figure 7-87. Removing the Pressure Arm

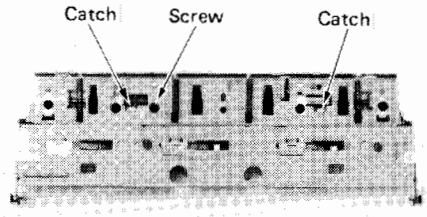


Figure 7-89. Upper Paper Exit Cover

Separation Pawl Removal

A. Remove the fusing cleaning pad.
B. Remove the screw, release the catch (2), then remove the fusing cover of the fusing cover assembly (see Figure 7-88).

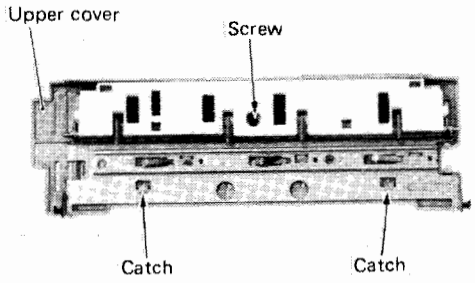


Figure 7-88. Fusing Assembly (upper cover)

C. Remove the screw, release the catch (2), then remove the upper paper exit guide (see Figure 7-89).
D. Remove the four springs (see Figure 7-90).
E. Remove the front or rear E-ring holding the shaft, then remove the separation pawls (see Figure 7-91).

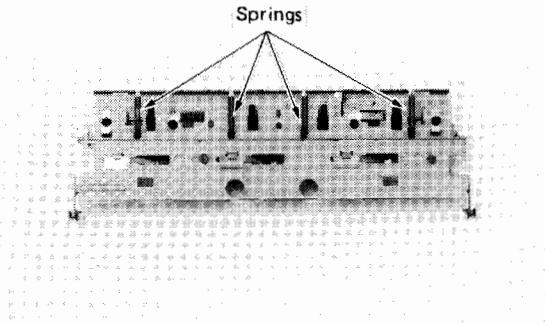


Figure 7-90. Fusing Assembly (spring removal)

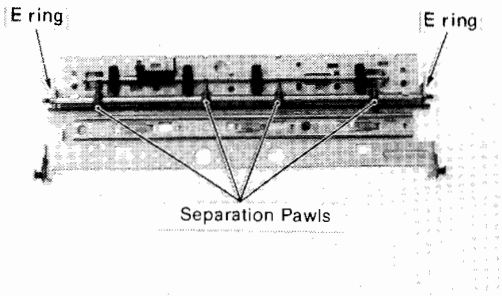


Figure 7-91. Fusing Assembly (separation pawls)

7-20. HIGH VOLTAGE POWER SUPPLY

A. Remove the EP cartridge.
B. Remove the left, right, rear and front panels.
C. Remove the top cover (4).
D. Open the upper body.
E. Disconnect the TEST PRINT switch (2).
F. Disconnect the Varistor PCA (3).
G. Remove the screws (6) securing the left outside upper frame and remove the frame.
H. Remove the High Voltage PCA assembly (1) from the inside upper frame.
I. Disconnect the cables (3) attached to the High Voltage PCA.

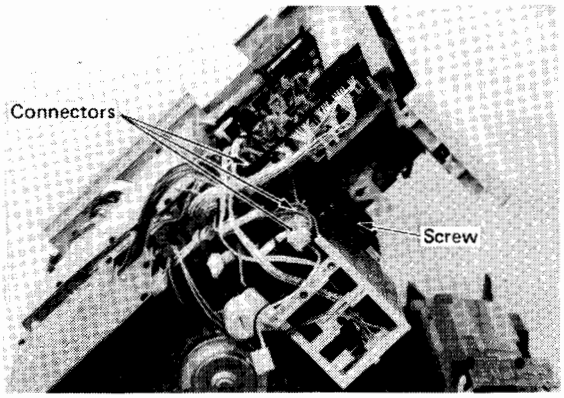


Figure 7-92. High Voltage Power Supply Connectors

7-21. AC DRIVER ASSEMBLY (AC CONTROLLER PCA and FUSING SAFETY PCA)

NOTE

The PCA on the top of the Power Interlock assembly is the Fusing Safety PCA. The bottom PCA is the AC Controller PCA.

A. Open the printer and remove the Power Interlock Assembly Cover (see Figure 7-18).
B. Unplug connector J106 and J104. Remove the two fastening screws and take out the Fusing Safety PCA (see Figure 7-93).
C. Unplug the four connectors. Remove the two fastening screws and take out the AC Controller PCA (see Figure 7-93).

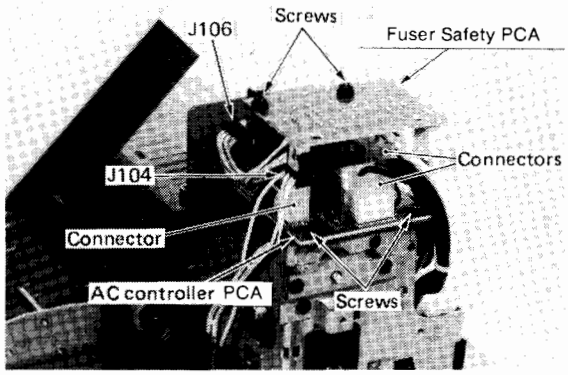


Figure 7-93. AC Controller and Safety PCA

7-22. DC CONTROLLER PCA

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4).
B. Remove the screws securing the plastic air duct (2).
C. Unplug all the connectors on the DC Controller PCA. Remove the (5) Nylon fasteners (see Figure 7-94) and then the DC Controller PCA.

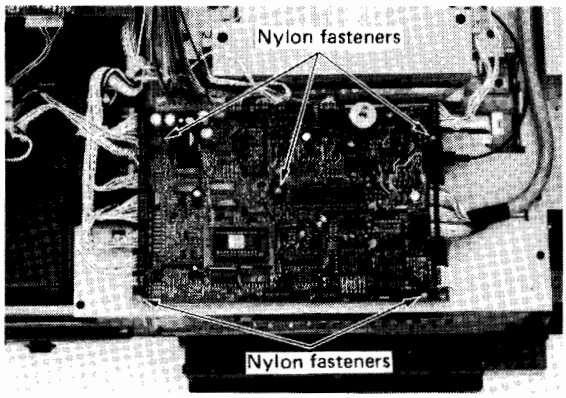


Figure 7-94. DC Controller PCA Removal

7-23. DC POWER SUPPLY/MAIN MOTOR DRIVER PCA

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4) and left panel.
B. Unplug the three connectors on the Main Motor PCA and the three connectors on the Varistor PCA.
C. Remove the DC Power Supply/Main Motor Driver PCA (5), together with the heat sink (see Figure 7-95).
D. On some models it may be necessary to remove the support bracket and ground strap.

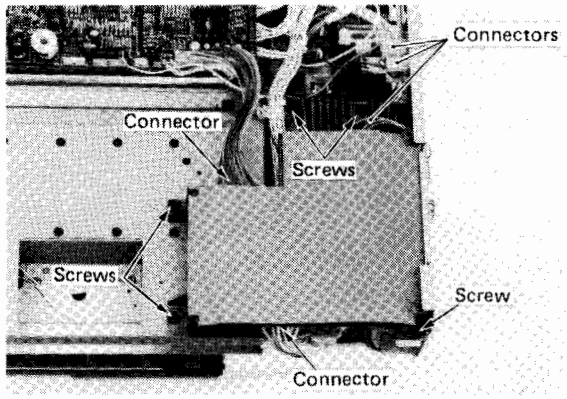


Figure 7-95. DC Power Supply/Main Motor PCA

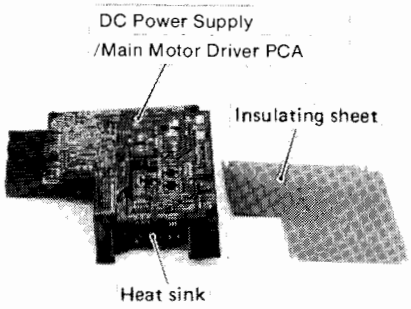


Figure 7-96. Removing DC Power Supply Heat Sink

NOTE

When installing the DC power supply and Main Motor Driver PCA, be sure to attach the insulating sheet if the new assembly has not come with one.

7-24. DC POWER SUPPLY/MAIN MOTOR DRIVER PCA FUSE

NOTE

If the soldered fuses on the PCA are open, replace the power supply as a unit and do not attempt to replace the individual fuse.

Only one fuse (FU504) is replaceable on the PCA. The soldered fuses (FU501, FU502, and FU503) ARE NOT. Follow the procedure in Section 7-23 to replace the PCA.

7-25. TRANSFORMER (PRINT ENGINE-PT1)

Transformer (PT1) HP 2686A

A. Separate the Main Body (upper and lower) from the pedestal, refer to Section 7-3.
B. Remove the transformer cover (4).

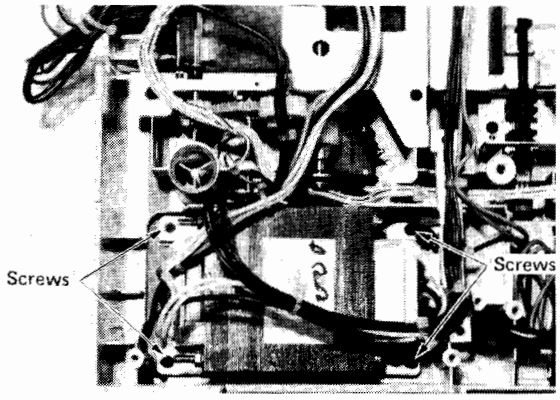


Figure 7-97. Removing Print Engine Transformer

C. Remove the four transformer screws (see Figure 7-97) and disconnect any cables attached to the transformer.

Transformer Mounting Plate Removal HP 2686D

The transformer transforms the AC voltage supplied from the AC Controller PCA to approximately 12VAC, 21VAC, 24VAC and 33VAC which are supplied to the DC Power Supply PCA and the Paper Control PCA.

A. Remove the lower left panel, the rear panel and any shielding that may be present. Disconnect J7 and J501 from the Interface PCA and the DC Power Supply/Main Motor PCA.
B. Raise the upper unit.

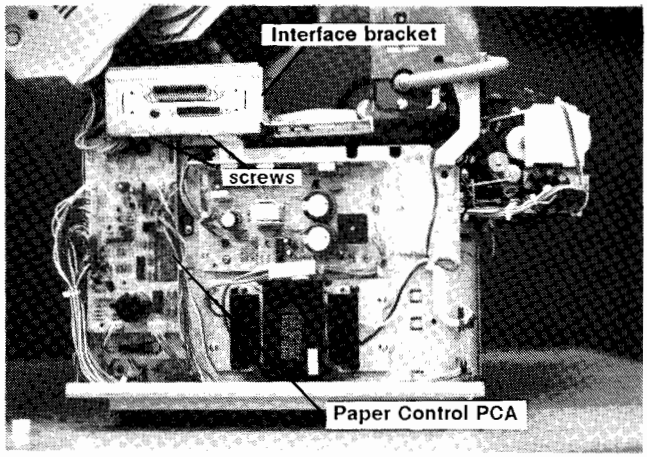


Figure 7-98. Interface Unit

C. Remove the power interlock cover (1).
D. Remove the (2) Faston connectors at the AC Controller PCA (coming from the line filter).
E. Remove the top power interlock support bracket screw (1) and the interface cable cover (1).
F. Remove the ground screw securing the chrome ground buss (1).
G. Disconnect J701 connector (at the Paper Control PCA).
H. Remove the cable clamp (1) attached to the rear of the printer.

CAUTION

Use care when handling the Paper Control PCA. J707 and J709 can easily be broken.

I. Disconnect all cables (except J701) from the Paper Control PCA and remove the cables from the harness clamps. Remove the Paper Control PCA from the Nylon standoffs.
J. Remove the interface bracket frame (1).
K. Remove the transformer mounting plate (7).

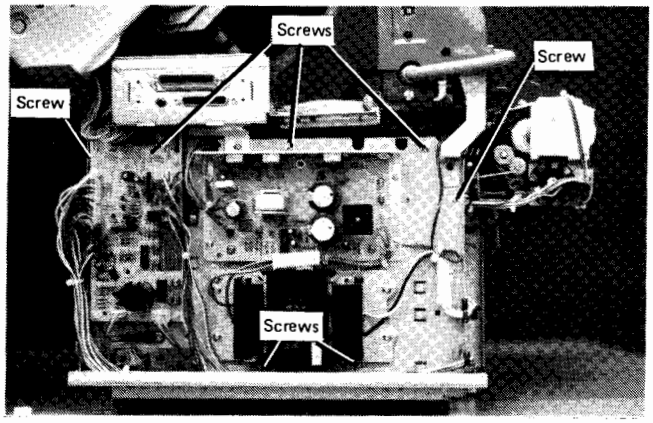


Figure 7-99. Transformer Mounting Plate Removal

Transformer Removal HP 2686D

A. Perform the transformer mounting plate removal procedures detailed above.
B. Remove the transformer (T1) from its mounting plate (4).

NOTE

Ensure that all cables are reinstalled in their harnesses when reassembling the transformer assembly.

7-26. TRANSFORMER (INTERFACE PCA-PT2)

Transformer (PT2) HP 2686A

A. Separate the Main Body (upper and lower) of the printer from the Pedestal, refer to Section 7-3.
B. Remove the four screws which secure the Interface PCA Transformer to the pedestal and disconnect all cables.

Transformer (PT2) HP 2686D

A. Remove the power cord.
B. Remove the lower left side panel.
C. Disconnect the transformer cables (2).
D. Remove the transformer from the mounting plate (4).

7-27. INTERFACE POWER SUPPLY PCA

Interface Power Supply PCA HP 2686A

A. Separate the Main Body (upper and lower) of the printer from the Pedestal, refer to Section 7-3.
B. Remove the two screws which secure the copper grounding strip to the right side of the printer.
C. Remove the two screws (see Figure 8-5, item 14) which secure the Interface Power Supply PCA to the pedestal.
D. Remove the PCA from the printer. Care should be taken when removing the PCA's leads from the taped surface of the pedestal.

Interface Power Supply PCA HP 2686D

A. Remove the lower left panel and the rear cover.
B. Disconnect the red lead connecting the T2 transformer.
C. Disconnect the Paper Control PCA from the Nylon standoffs (7).
D. Remove the interface bracket frame (3).
E. Remove the upper screws (3) on the transformer mounting plate (to allow enough space to slip the cables through the opening).
F. Disconnect J7 from the Interface PCA.
G. Remove the power supply cable from the cable restraints, and pull the cable through the transformer mounting plate cable opening.
H. Remove the power supply from the mounting plate (4).

7-28. INTERFACE PCA

The Interface PCA is located inside the printer top cover. To remove the Interface PCA, proceed as follows:

A. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the left side panels.
B. Disconnect connectors J1, J2, and J7 from the back of the Interface PCA.
C. Remove the printer top cover (4).
D. Remove the screws which secure the holding shield on the back of the Interface PCA, to the top cover (see Figure 7-100), and then remove the PCA.

NOTE

The number of screws securing the Interface PCA may vary from printer to printer. Note the number removed at each step and keep each type and size separate.

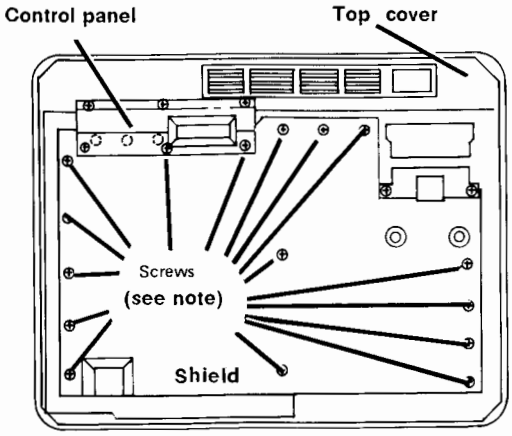


Figure 7-100. Removing the Interface PCA

Control Panel PCA

A. Open the printer (raise the upper half). Open the right door and take the EP cartridge out of the printer.
B. Remove the screws (4) securing the rear panel and the screws securing any RFI shields and support brackets (if present). Remove the shields, brackets, and the rear panel. Remove the top cover (4).
C. Remove the six fastening screws and remove the Control Panel PCA.

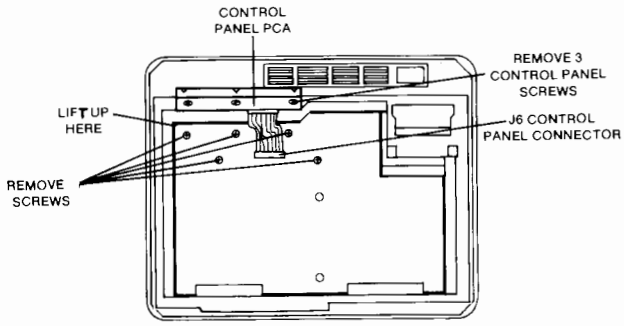


Figure 7-101. Control Panel Removal

7-29. PAPER CONTROL PCA HP 2686D

A. Remove the lower left panel.
B. Disconnect all cables connected to the PCA with the exception of the gray ribbon cable (J701) at the top. (See Figure 7-102)
C. Remove the PCA from the 4 nylon retainers (standoffs).
D. Disconnect cable J701.

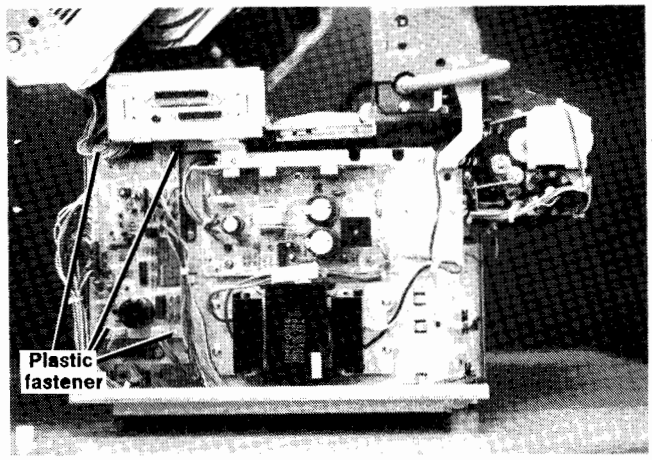


Figure 7-102. Paper Control PCA

7-30. DELIVERY UNIT HP 2686D

Delivery Motor Drive Assembly

This unit has a delivery motor which drives the tray feed-out and feed-in rollers, and operates the synchronizing paper delivery rollers via gears, sprockets and timing chains. The delivery motor also drives the slotted disk to generate clock pulses with frequency proportional to motor speed.

A. Remove the lower left cassette panel.
B. Remove the left front screw attached to the delivery unit lower panel. This attaches the ground buss to the motor. (Figure 7-103)
C. Disconnect PS-7 and any tie wraps.
D. Remove the delivery motor drive assembly frame (3) by sliding the assembly to the left. Use care in handling the motor to ensure that damage to the wires does not occur.

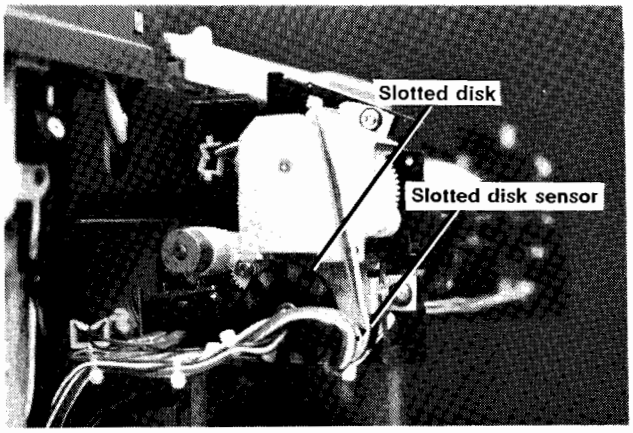


Figure 7-103. Delivery Unit

Motor Drive Belt

Remove the drive belt as follows:

A. Remove the delivery motor drive assembly as detailed above.
B. Remove sensor PS7.
C. Remove both E-rings securing the gear train.
D. Loosen the drive motor (2).
E. Remove the gears and spacers, noting their positions.
F. Slip the belt off the drive pulley and around the slotted disc to free it.

Install the drive belt as follows:

A. Ensure that the drive motor is loose during installation.
B. Place the drive belt on both pulleys.
C. Adjust the motor position to remove all excess belt movement. A loose belt can cause a lot of printer problems. DO NOT OVERTIGHTEN the belt.

Feed-out Drive Belt

A. Remove the delivery motor drive assembly as detailed above.
B. Remove the feed-out clutch assembly from the feed-out shaft (1).
C. Loosen the belt tension bracket (1) and slip the belt off the pulleys.

Feed-out Clutch Assembly

A. Remove the lower left panel.
B. Remove the set screw on the feed-out clutch and pull the clutch off the shaft.
C. Carefully separate the clutch assembly, taking care not to damage the clutch spring. If the spring becomes bent, it must be replaced.
D. When reinstalling the clutch assembly, lightly lubricate it with oil or grease.

Feed-Out Roller Clutch Solenoid (SL5)

A. Remove the lower left panel.
B. Remove the mounting plate of the tray feed-out clutch solenoid (1) as shown in Figure 7-104.

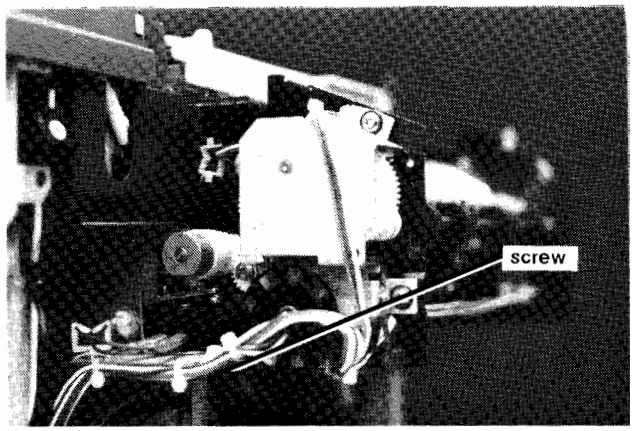


Figure 7-104. Feed-Out Roller Clutch Solenoid

C. Remove the tray feed-out clutch solenoid (1).

Delivery Roll

A. Remove the lower right and lower left panels.
B. Remove the delivery unit door and the lower panel.
C. Remove the motor drive assembly (3).
D. Remove the grip ring, the delivery roller drive sprocket from the delivery roll shaft, and the drive belt and bushing (Figure 7-105).

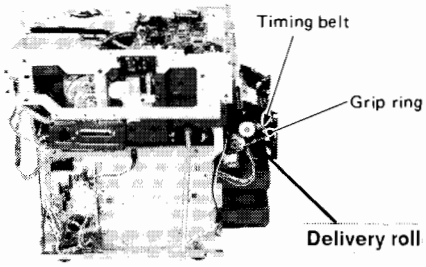


Figure 7-105. Delivery Roll

E. Remove the E-ring and bushing from the right end of the delivery roll shaft and pull out the shaft (Figure 7-106).

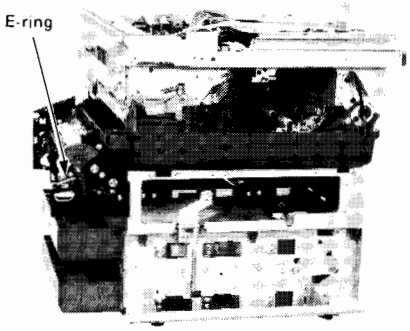


Figure 7-106. Delivery Roll E-Ring Removal

F. Remove the E-rings and dowel pins that hold the four rollers on the shaft and remove the rollers (Figure 7-107).

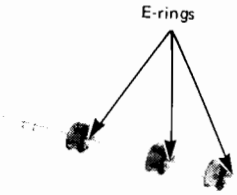


Figure 7-107. Delivery Roll Assembly

Deflector Shaft

The face up/down select lever is attached to the deflector shaft. When face down delivery is selected, paper is diverted by the deflector to the holding tray.

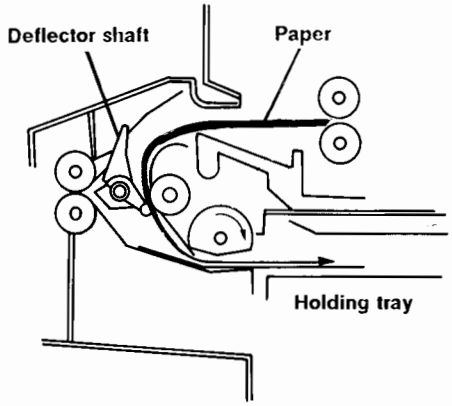


Figure 7-108. Deflector Shaft

A. Remove the lower right and lower left panels.
B. Remove the delivery unit door and lower panel.
C. Remove the motor drive assembly and feed-out roller delivery clutch drive belt.
D. Remove the E-ring and bushing from the left side of the deflector shaft. (Figure 7-110).

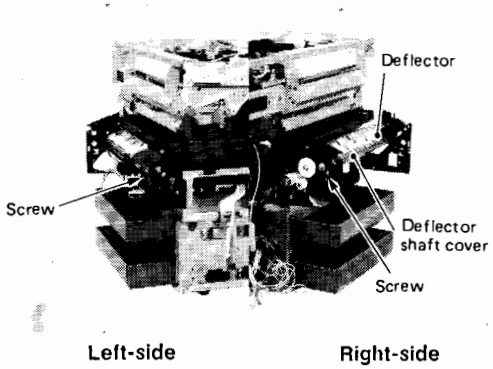


Figure 7-109. Deflector Shaft Cover Removal

E. Remove the right retaining ring selection lever and bushing.
F. Remove the deflector shaft cover (2) shown in Figure 7-109.

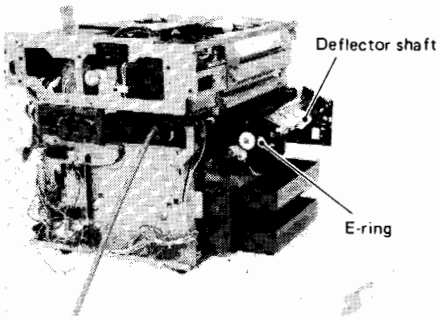


Figure 7-110. Deflector Shaft E-Ring

G. Remove the left end of the deflector shaft from the mounting plate and remove the shaft.

NOTE

The deflector can not be removed from the shaft.

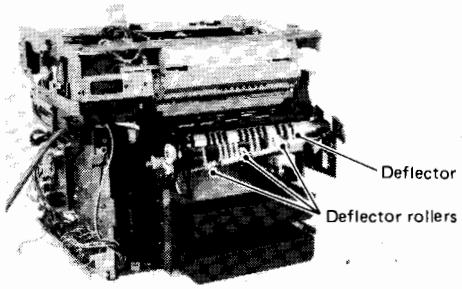


Figure 7-111. Deflector

Deflector Shaft Pressure Roller

NOTE

The rollers are pressed into a holder body, which is pressed onto the deflection shaft. The roller assembly (roll and holder) is spring loaded to provide pressure to the input roll shaft. Care should be taken to not damage the roller assembly or other areas during removal.

A. Open the upper body.
B. Set the deflector shaft to the FACE DOWN position.
C. Remove the delivery unit door.
D. Using a small flat blade screwdriver, pry the center of the roller straight up (Figure 7-112). DO NOT DAMAGE OR BEND THE HOLDER OR DEFLECTOR.
E. During replacement, replace the roller assembly with the deflector in the FACE UP position. After replacement, place the deflector in the FACE DOWN position and reconnect the spring.

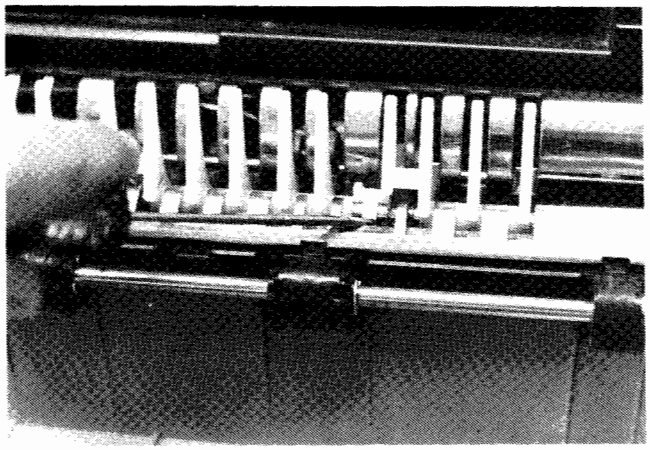


Figure 7-112. Deflector Pressure Roller Removal

Tray Feed-in Roll

A. Remove the lower left and lower right panels.
B. Loosen the feed-out drive belt tension pulley (1).
C. Remove the delivery unit (4).

CAUTION

Remove any cable ties necessary to allow the unit to be laid face down on a flat work surface. Care should be taken not to break any wires or connectors.

D. Disconnect and remove the bracket and sensor PS7 (1). Handle the sensor arm carefully.
E. Rotate the tray feed-in roll so the left retaining ring can be removed.
F. Remove the right E-ring and bushing.
G. Remove the left retainer ring.
H. Remove the drive pulley and parallel pin while sliding the shaft to the right. Lift the shaft out of the printer.

Tray Feed-Out Rollers

A. Remove the lower right and lower left panels.
B. Remove the delivery unit (4).

NOTE

Disconnect all cable ties necessary to remove the assemblies and note their position. Replace them when reinstalling the replacement parts. Use care when handling the cables to prevent damaging them.

C. Remove sensor PS5.
D. Remove the feed-out clutch assembly and the left bushing (1).
E. Remove the right E-ring and bushing.

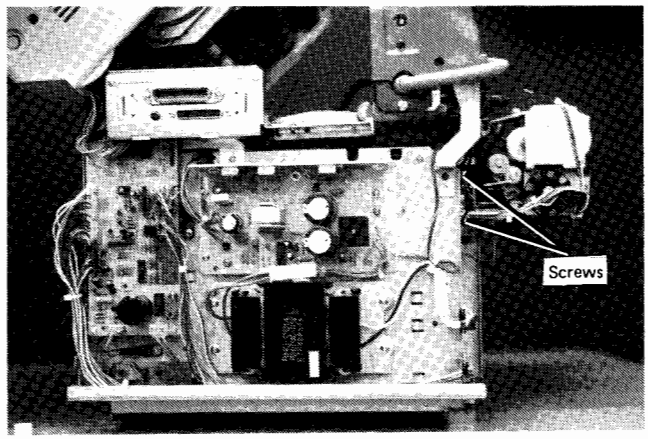


Figure 7-113. Tray Feed Out Roll Assembly

F. Rotate and slide the shaft to the left and lift the assembly out through the right side.
G. Remove the E-rings and parallel pins and rollers from the shaft (3). (Figure 7-114).

NOTE

Installation is the reverse of the removal procedure. Ensure that the rollers are oriented correctly when reinstalling.

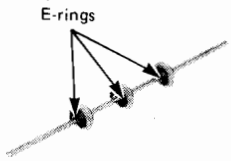


Figure 7-114. Feed Out Rollers

Upper Delivery Rollers

A. Remove the delivery unit door.
B. Carefully pry the four upper delivery rollers (Figure 7-115) out with a small flat screwdriver blade.

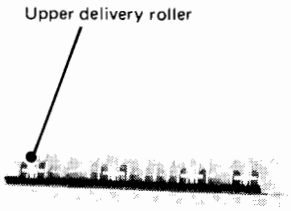


Figure 7-115. Upper Delivery Roller

C. When re-installing, ensure that the tension spring that holds the roller against the drive roll is in place and has not become bent.

Paper Sensors (Delivery Unit)

To remove the delivery sensor (PS6) proceed as follows:

A. Remove the lower left and lower right panels.
B. Remove the delivery unit lower panel.
C. Disconnect the sensor cable.
D. Remove the sensor mounting screw (1).

To remove the tray inlet sensor (PS5) proceed as follows:

A. Remove the lower right and lower left panels.
B. Remove all cable ties (4) connected to the delivery unit and remove the delivery unit.

NOTE

Disconnect all cable ties necessary to remove the assemblies and note their position. Replace them when reinstalling the replacement parts. Use care when handling the cables to prevent damaging them.

C. Disconnect the sensor cable.
D. Remove the sensor mounting screws (1).

7-31. JOB OFFSET ASSEMBLY HP 2686D

A. Remove the lower left and lower right panels.
B. Remove the delivery unit (4).

NOTE

Disconnect all cable ties necessary to remove the assemblies and note their position. Replace them when reinstalling the replacement parts. Use care when handling the cables to prevent damaging them.

C. Disconnect the solenoid cable (1). Remove the solenoid socket from the printer frame using needle-nose pliers (see Figure 7-116).

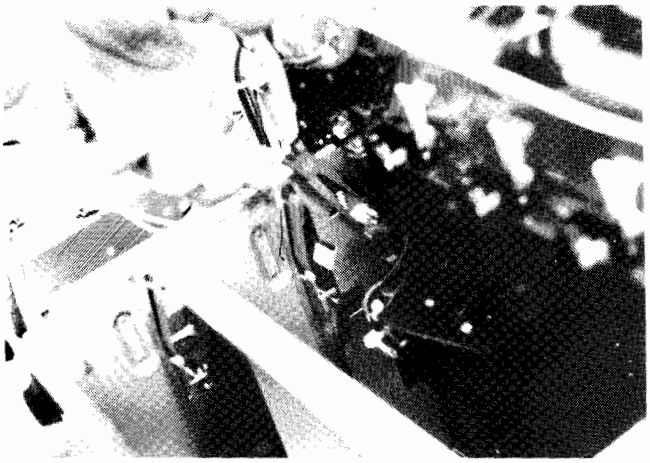


Figure 7-116. Solenoid Cable Disconnection

CAUTION

Damage can occur if excessive force is used to remove the socket.

D. Remove the front mounting screw (1) from the job offset assembly.

E. Remove the assembly by rotating and lowering it as necessary in order to remove it from the front of the machine (Figure 7-117).

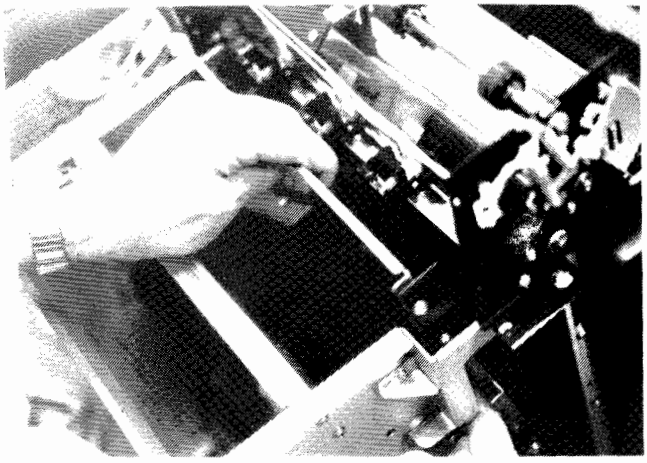


Figure 7-117. Job Offset Removal

SECTION VIII

ILLUSTRATED PARTS BREAKDOWN

8-1. HOW TO USE PARTS LISTS

Figure 8-1, parts 1 through 3, illustrate the major subassemblies in the printer. Each subassembly is further broken down into component parts in the remaining figures in this section of the manual. A table follows each illustrated parts breakdown. The table lists the reference designator (item number) for each part, the associated part number for the item, the quantity, any special notes and the description of that part. While looking for a part number, pay particular attention to the voltage listed in the description column to ensure that the part number selected is for your type of machine.

The symbol "*" in the NOTES column indicates that the item is a special order part. The symbol "@" indicates a non-field replaceable part and an "a" or a "d" in the NOTES column indicates which model printer the part is for. ("a" indicates that the part is for the HP 2686A and "d" indicates that the part is for the HP 2686D).

1 of 3

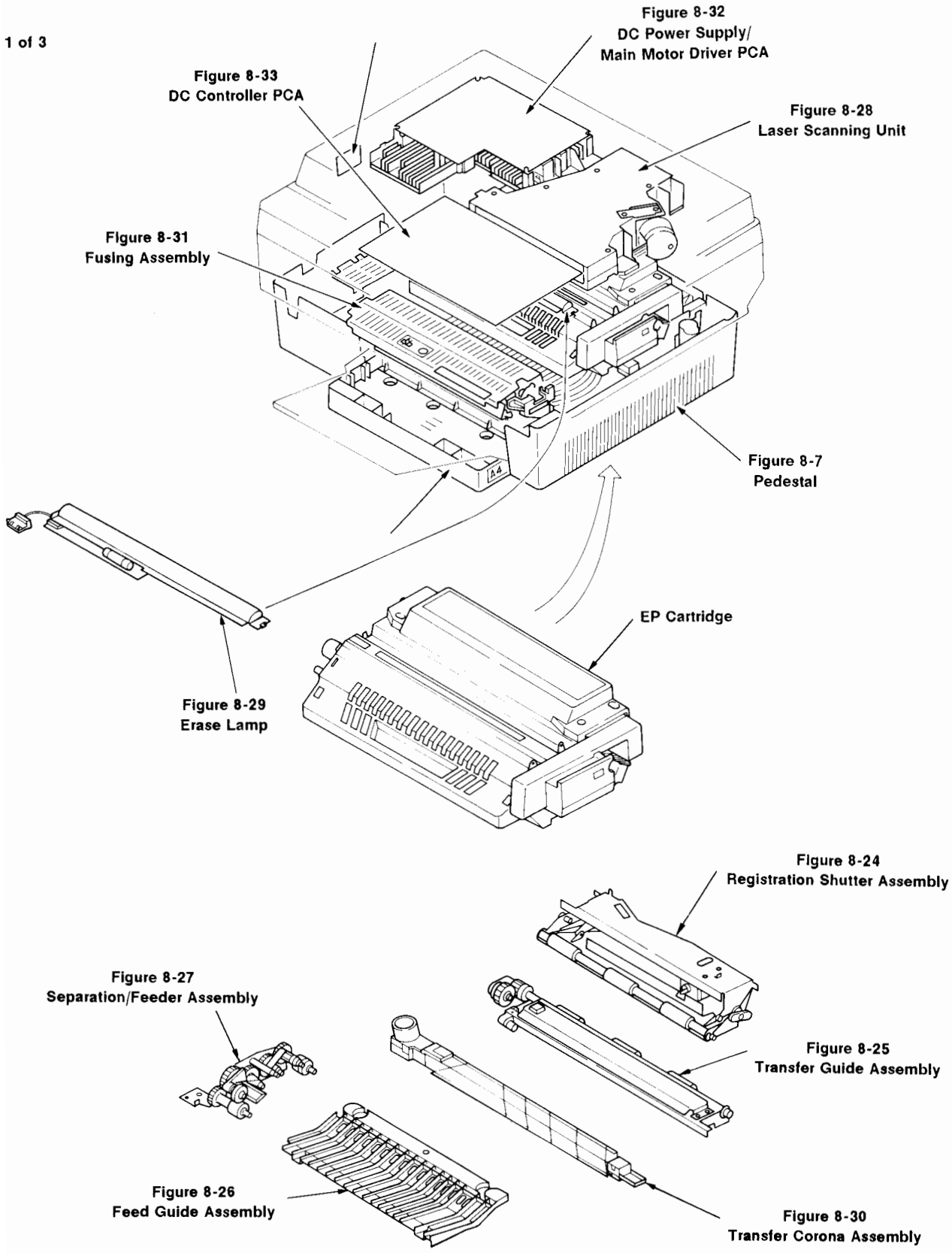


Figure 8-1. Assembly Locations (1 of 3)

2 of 3

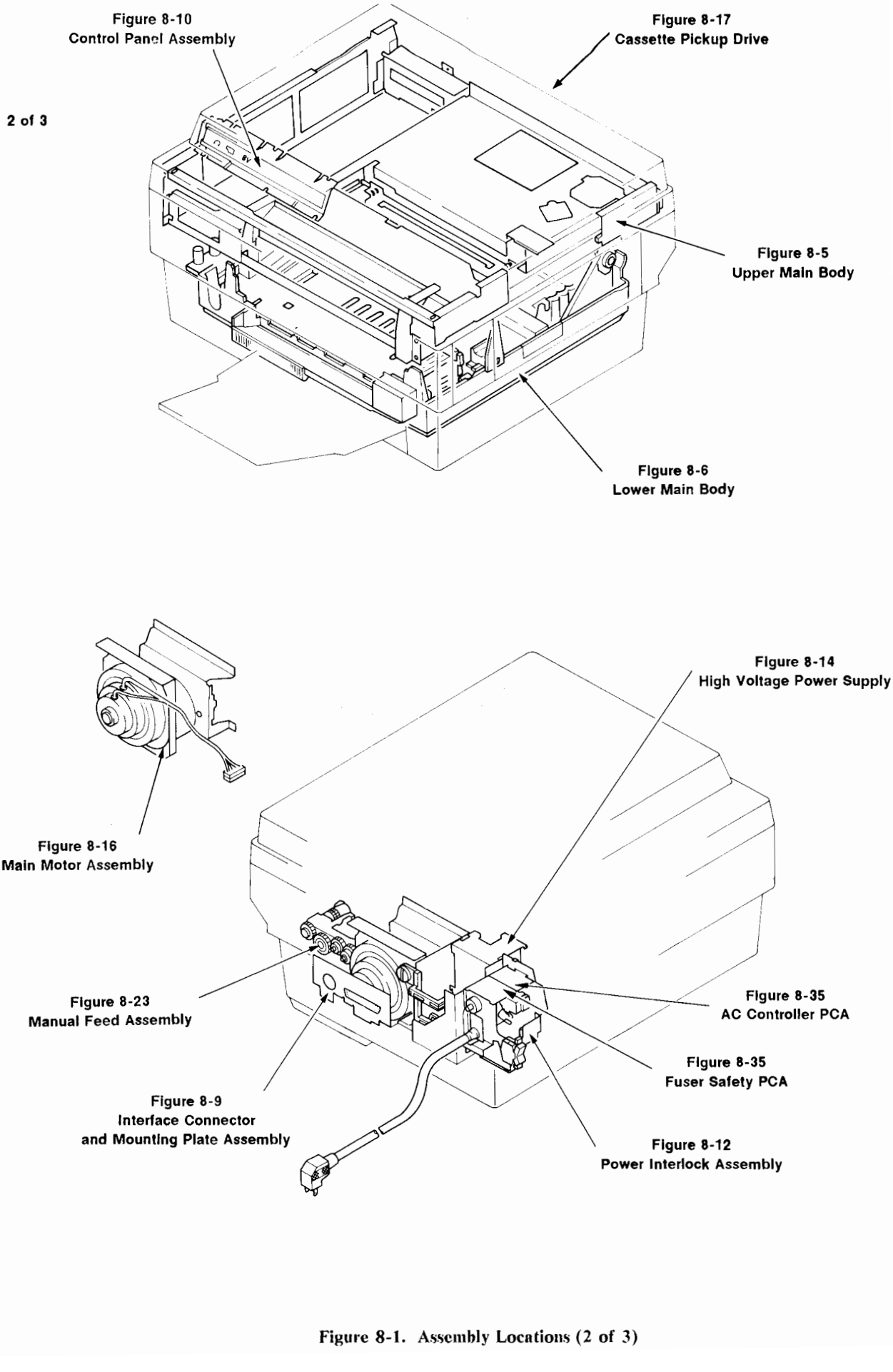


Figure 8-1. Assembly Locations (2 of 3)

3 of 3

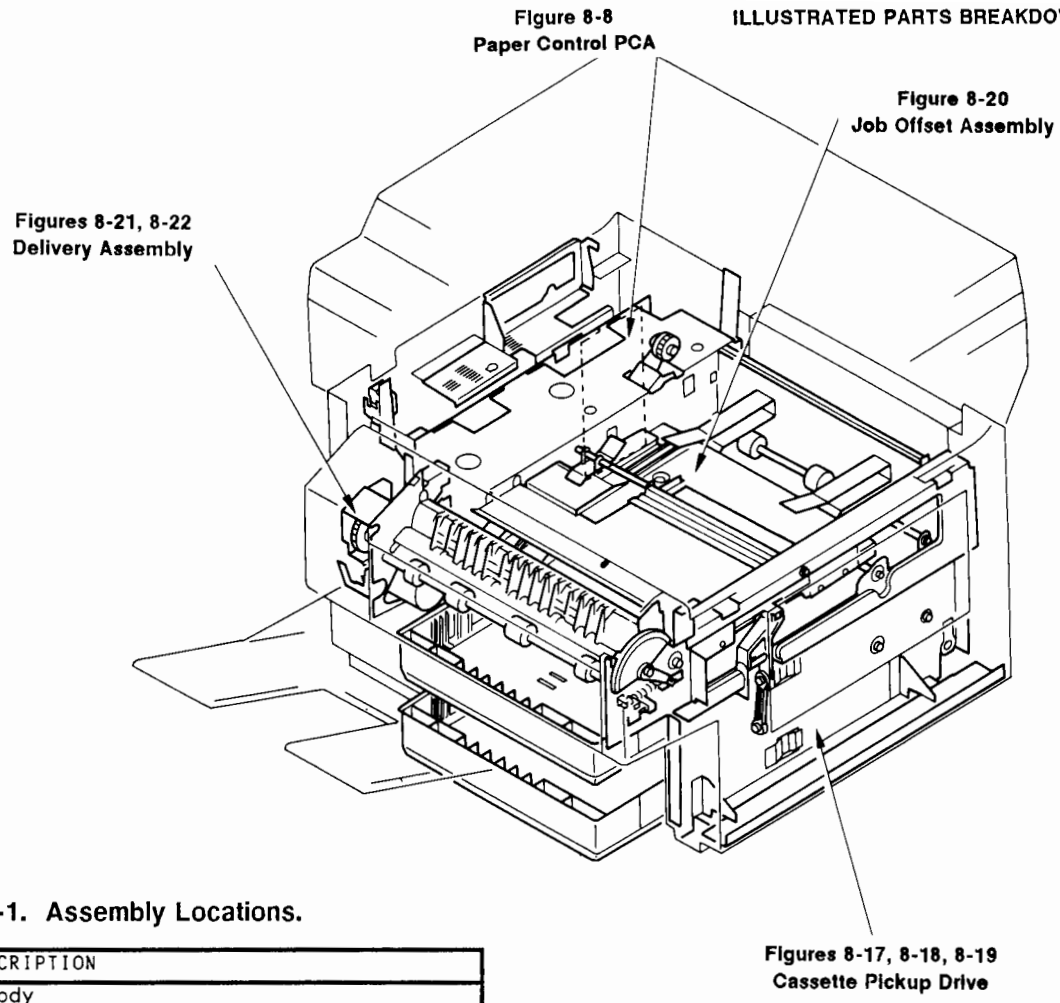


Figure 8-1. Assembly Locations-HP 2686D (3 of 3)

Table 8-1. Assembly Locations.

REF	DESCRIPTION
8-5.	Upper Main Body
8-6.	Lower Main Body
8-7.	Pedestal-HP 2686A
8-8.	Pedestal-HP 2686D
8-9.	Interface Connector & Mounting Plate Assembly
8-10.	Control Panel Assembly-HP 2686A
8-11.	Control Panel Assembly-HP 2686D
8-12.	Power Interlock Assembly-115 V
8-13.	Power Interlock Assembly-220/240 V
8-14.	High Voltage Power Supply
8-16.	Main Motor Assembly
8-17.	Cassette Pickup Drive-HP 2686A
8-18.	Cassette Pickup Drive-HP 2686D
8-20.	Job Offset Assembly-HP 2686D
8-21	Delivery Assembly - HP 2686D
8-22.	Delivery Assembly-HP 2686D
8-23.	Manual Feed Assembly
8-24.	Registration Shutter Assembly
8-25.	Transfer Guide Assembly
8-26.	Feed Guide Assembly
8-27.	Separation/Feeder Assembly
8-28.	Laser Scanning Unit
8-29.	Erase Lamp Assembly
8-30.	Transfer Corona Assembly
8-31.	Fusing Assembly
8-32.	DC Power Supply/Main Motor Driver PCA
8-33.	DC Controller PCA
8-34.	Varistor PCA
8-35.	AC Driver PCA-Fuser Safety PCA & AC Controller PCA
8-36.	I/F Controller PCA

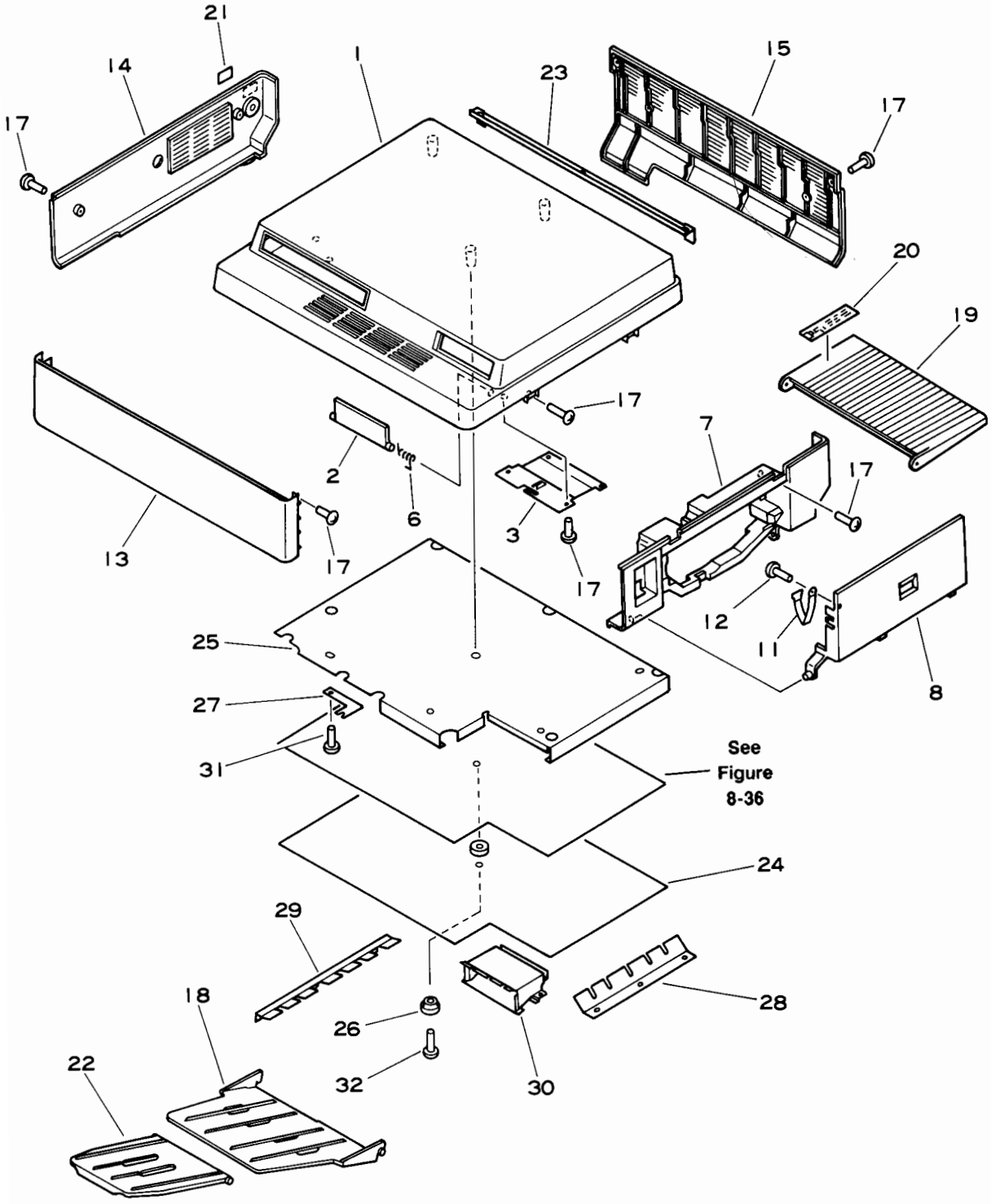


Figure 8-2. External Panels and Covers-HP 2686A

Table 8-2. External Panels and Covers-HP 2686A.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RF1-0214-000CN	1		COVER, TOP
2	RA1-0924-000CN	1		DOOR, FONT CARTRIDGE
3	RA1-0765-000CN	1	*	MOUNT, FONT CARTRIDGE
6	RS1-2009-000CN	1	*	SPRING, TORSION
7	RA1-0918-000CN	1		PANEL, RIGHT
8	RA1-0919-000CN	1		DOOR, RIGHT
11	FA2-6003-000CN	1	*	STRAP
12	XB1-2300-809CN	1	*	SCREW, MACH., TRUSS HEAD M3X8
13	RA1-0920-000CN	1		PANEL, FRONT
14	RA1-0921-000CN	1		PANEL, LEFT
15	RF1-0215-000CN	1		PANEL, REAR (60 HZ)
15	RA1-0922-000CN	1		PANEL, REAR (50 HZ)
17	XB1-2300-609CN	12	*	SCREW, MACH., TRUSS HEAD M3X6
18	FA2-5995-000CN	1		TRAY, OUTPUT
19	FA2-6099-020CN	1		TRAY, MANUAL PAPER FEED
20	RA1-1014-000CN	1	*	LABEL, MANUAL PAPER FEED
21	RS1-8003-000CN	1	*	LABEL, TEST PRINT
22	RA1-0955-000CN	1		TRAY, AUXILIARY OUTPUT
23	RA1-0763-000CN	1	*	CROSSBAR, TOP REAR
24	RA1-0961-000CN	1	*	PLATE, I/F PCA
25	RA1-0963-000CN	1	*	FRAME, I/F PCA (60 HZ)
25	RA1-1094-000CN	1	*	FRAME, I/F PCA (50 HZ)
26	RA1-0969-000CN	3	*	BUSHING, I/F PCA
27	RA1-0959-000CN	1	*	GND PLATE, I/F PCA
28	RA1-1030-000CN	1	*	GND PLATE, TOP COVER RIGHT
29	RA1-1031-000CN	1	*	GND PLATE, TOP COVER LEFT
30	RA1-1032-000CN	1	*	PLATE, FONT CARTRIDGE
31	XB6-7400-609CN	1	*	SCREW, MACHINE, M4X6
32	XB6-7401-209CN	3	*	SCREW, MACHINE, M4X12

*=special order part

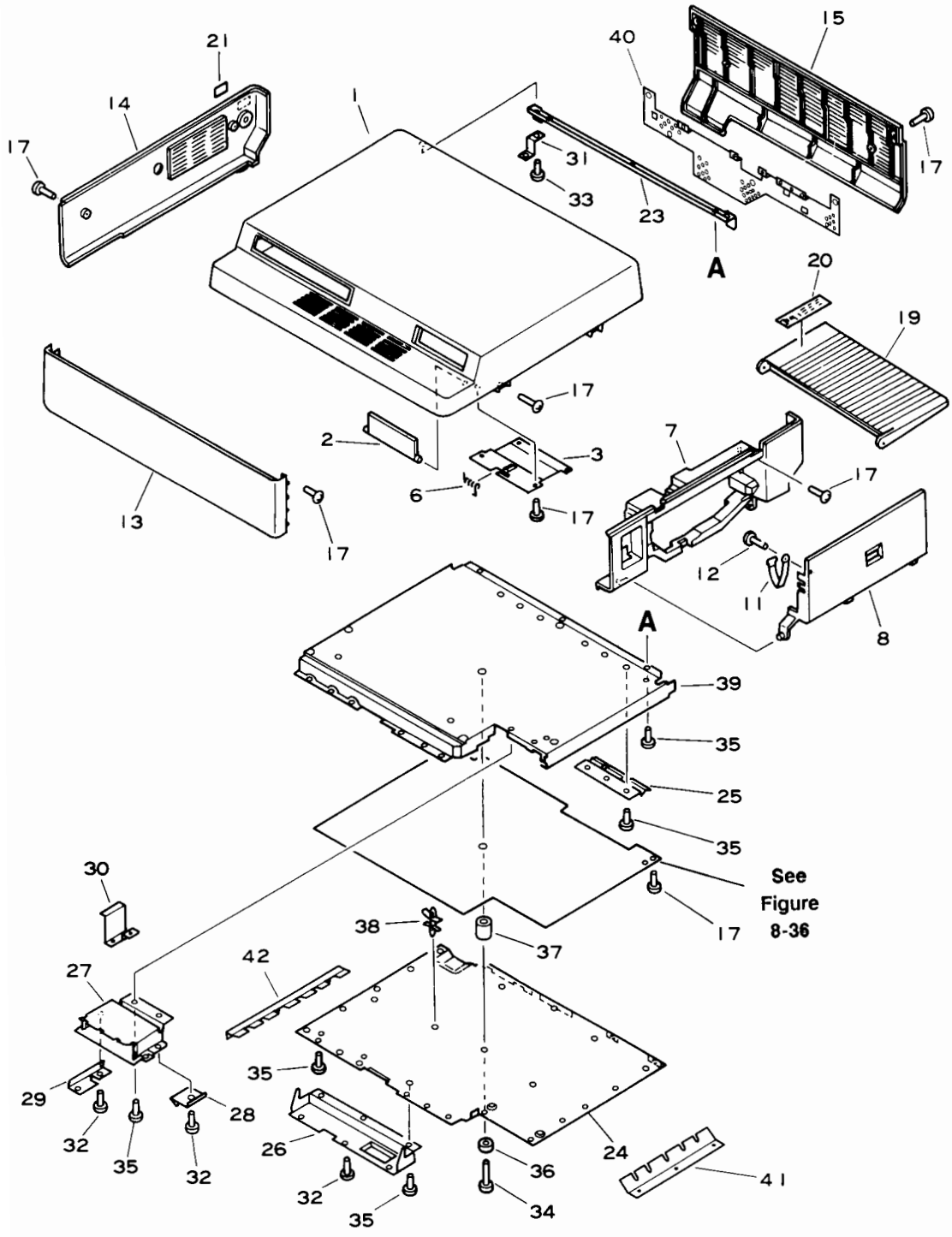


Figure 8-3. Upper External Panels and Covers-HP 2686D

Table 8-3. Upper External Panels and Covers-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RF1-0501-000CN	1	*	COVER, TOP
2	RA1-2100-000CN	1	*	DOOR, FONT CARTRIDGE
3	RA1-0765-000CN	1	*	MOUNT, FONT CARTRIDGE
6	RS1-2009-000CN	1	*	SPRING, TORSION
7	RA1-0918-000CN	1		PANEL, RIGHT
8	RA1-0919-000CN	1		DOOR, RIGHT
11	FA2-6003-000CN	1	*	STRAP
12	XB1-2300-809CN	1	*	SCREW, MACH, TRUSS HEAD M3X8
13	RA1-0720-000CN	1		PANEL, FRONT
14	RA1-0921-000CN	1		PANEL, LEFT
15	RA1-2101-000CN	1		PANEL, REAR
17	XB1-2300-609CN	45	*	SCREW, MACH, TRUSS HEAD M3X6
19	FA2-6099-020CN	1		TRAY, MANUAL PAPER FEED
20	RA1-1014-000CN	1	*	LABEL, MANUAL PAPER FEED
21	RS1-8003-000CN	1	*	LABEL, TEST PRINT
22	RA1-0955-000CN	1	*	TRAY, PRINT AUXILLIARY
23	RA1-2023-000CN	1	*	CROSSMEMBER, TOP COVER
24	RA1-1095-000CN	1	*	PLATE, RFI SHIELD
25	RA1-1098-000CN	2	*	SPRING, LEAF
26	RA1--1097-000CN	1	*	PLATE, CONTROL PANEL RFI SHIELD
27	RA1-1124-000CN	1	*	BOX, RFI SHIELD
28	RA1-1130-000CN	1	*	PLATE (A), GROUNDING
29	RA1-1131-000CN	1	*	PLATE (B), GROUNDING
30	RA1-1135-000CN	1	*	PLATE (D), GROUNDING
31	RA1-1140-000CN	1	*	PLATE, GROUNDING
32	XB3-2300-809CN	13	*	SCREW, TAPPING, TRUSS HEAD M3X8
33	XB3-2300-609CN	4	*	SCREW, TAPPING, TRUSS HEAD M3X6
34	XB1-2301-609CN	2	*	SCREW, MACH, TRUSS HEAD M3X16
35	XB1-2300-406CN	28	*	SCREW, MACH, TRUSS HEAD M3X4
36	WT2-0218-000CN	2	*	BUSHING
37	WT2-0217-000CN	2	*	COLLAR
38	RA1-1030-000CN	1	*	PLATE, GROUNDING, RIGHT
39	RA1-1031-000CN	1	*	PLATE, GROUNDING, LEFT
40	WT2-0217-000CN	2	*	SPACER
41	RF1-0263-000CN	1	*	FRAME, RFI SHIELD
42	RA1-2089-000CN	1	*	PLATE, GROUNDING

*=special order part

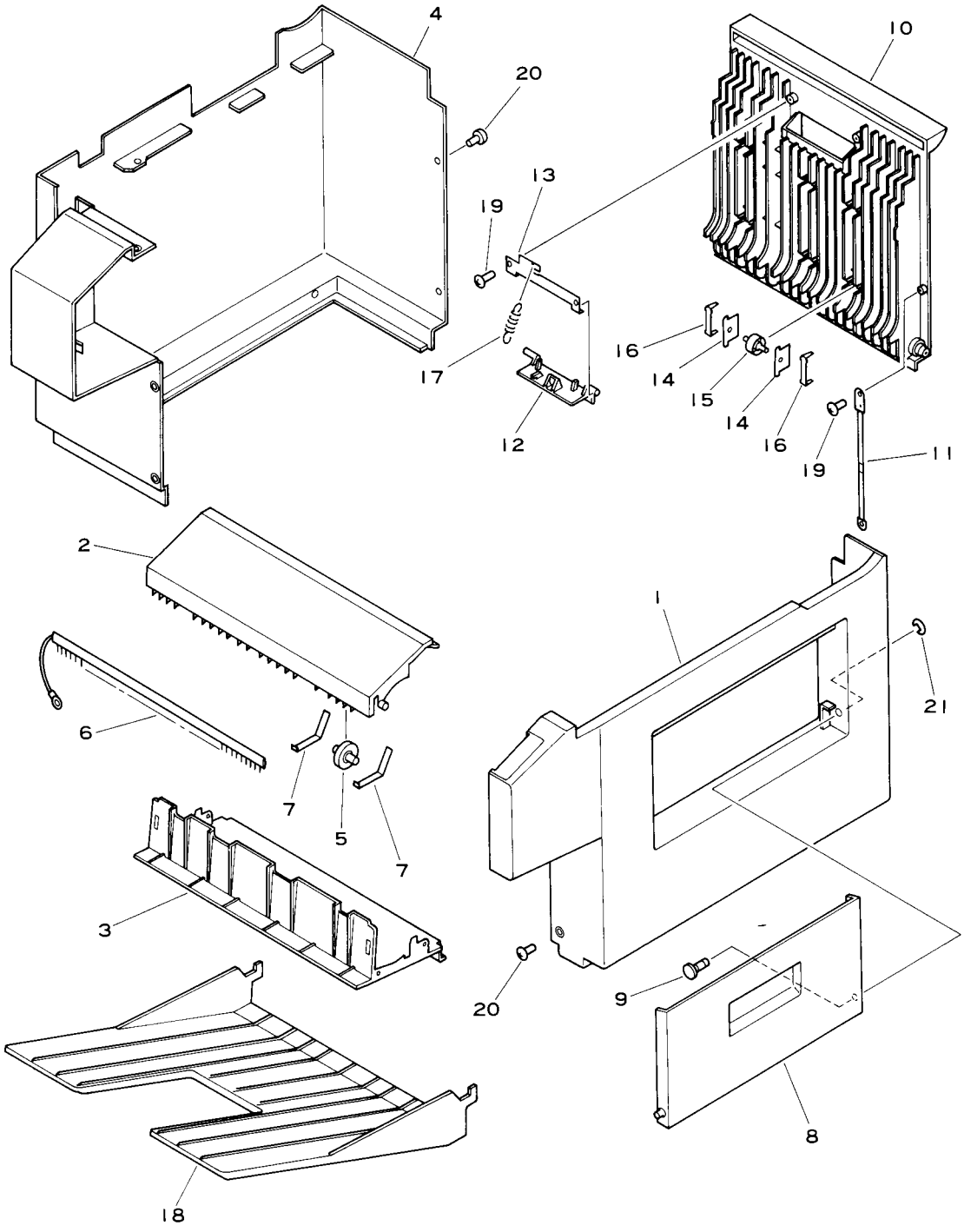


Figure 8-4. Lower External Panels and Covers-HP 2686D

Table 8-4. Lower External Panels and Covers-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-1877-000CN	1		PANEL, RIGHT
2	RF1-0482-000CN	1		PANEL, FRONT
3	RA1-1881-000CN	1		BASE PLATE, FRONT
4	RA1-1878-000CN	1		PANEL, LEFT
5	RA1-1964-000CN	4		ROLLER, DELIVERY
6	RA1-1965-000CN	1	*	ELIMINATOR, STATIC CHARGE
7	RA1-1976-000CN	8		SPRING, LEAF
8	RA1-1879-000CN	1	*	PANEL
9	RS1-5025-000CN	1	*	SHAFT, PANEL
10	RA1-1882-000CN	1		COVER, PAPER PICK-UP
11	RA1-1884-000CN	1		BAND, COVER
12	RA1-1918-000CN	1		KNOB
13	RA1-1919-000CN	1	*	HOLDER, KNOB
14	RA1-0667-000CN	12	*	PLATE
15	FA2-5612-000CN	6		ROLLER
16	FA2-5613-000CN	12		SPRING, LEAF
17	RS1-2042-000CN	1		SPRING, TENSION
18	RA1-2027-000CN	1		TRAY, COPY
19	XB1-2300-507CN	3	*	SCREW
20	XB1-2300-606CN	10	*	SCREW, MACH, TRUSS HEAD, M3X6
21	XD2-1100-502CN	1	*	SCREW

*=special order part

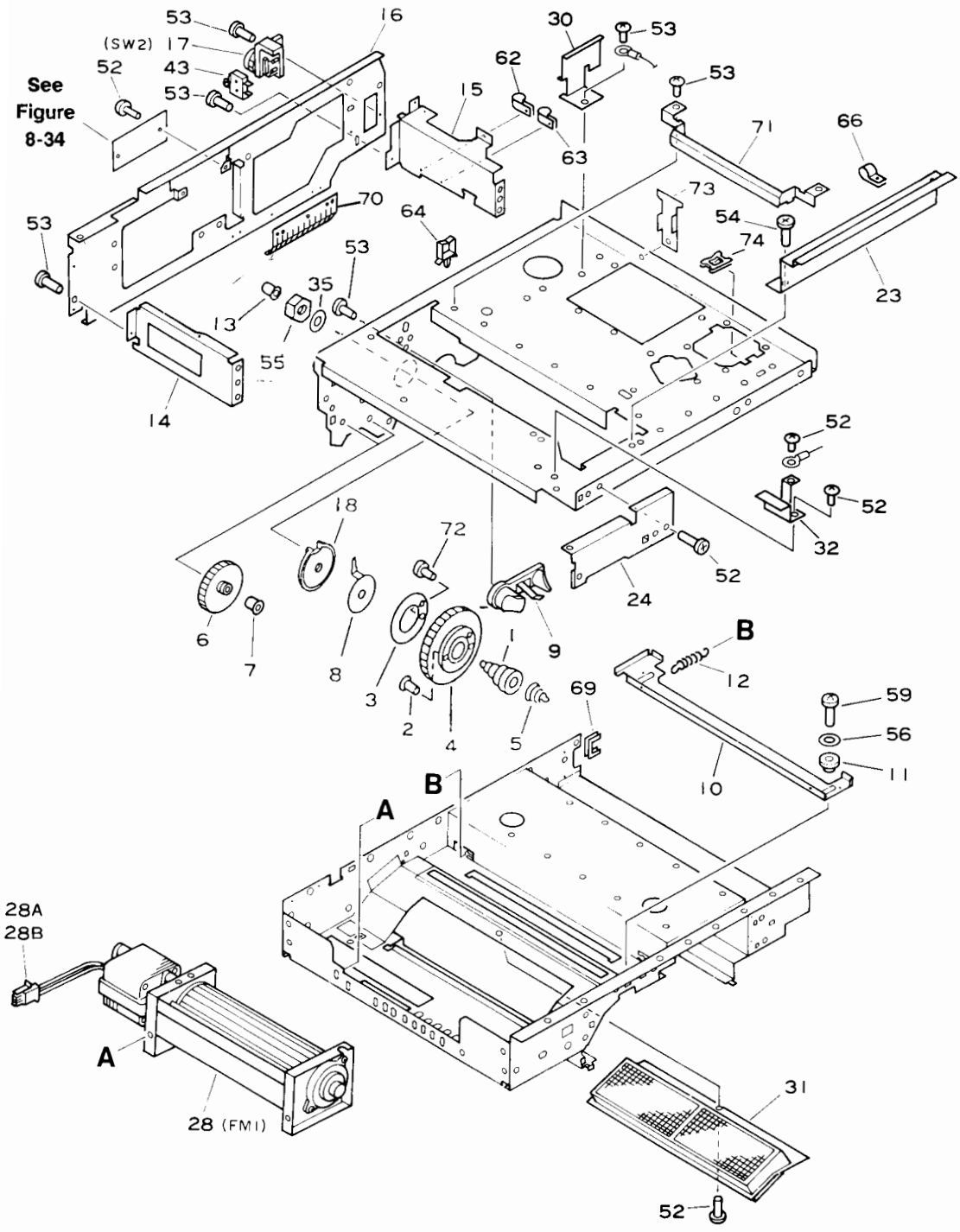


Figure 8-5. Upper Main Body (1 of 2)

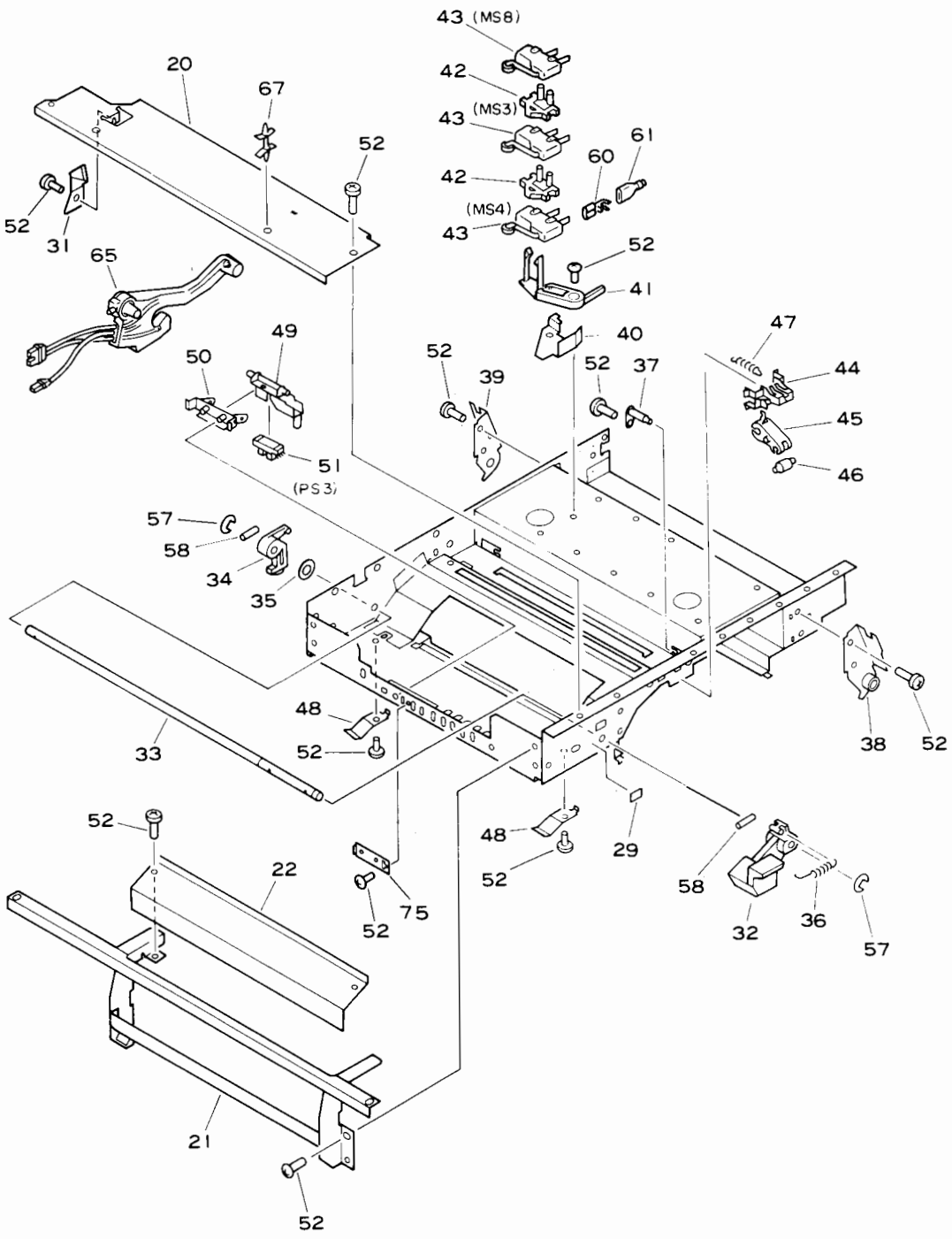


Figure 8-5. Upper Main Body (2 of 2)

Table 8-5. Upper Main Body.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-0972-000CN	1		HOLDER, DRUM
2	FA2-5690-000CN	1	*	PIN, DRUM DRIVE
3	FA2-5691-000CN	1		SPRING WASHER, DRUM
4	RS1-0011-000CN	1		GEAR, DRUM DRIVE
5	FS1-2670-000CN	1		SPRING, DRUM GROUND
6	FS1-0729-020CN	2		GEAR, MAIN DR IDLER
7	FA2-5706-000CN	2		BUSHING
8	RA1-0720-000CN	1		TERMINAL, DRUM GND
9	RF1-0138-000CN	1		CART SHUTTER/PRI SCR CONTACT
10	RA1-0716-000CN	1	*	SHUTTER, LASER
11	RA1-0717-000CN	2	*	BUSHING
12	RS1-2008-000CN	2		SPRING, LASER SHUTTER
13	RA1-0722-000CN	1	*	BUSHING
14	RA1-0727-000CN	1	*	FRAME, LEFT, FRONT
15	RA1-0728-000CN	1	*	FRAME, LEFT, REAR
16	RA1-0821-000CN	1	*	FRAME, LEFT SIDE
17	RA1-0926-000CN	1	*	BUTTON, TEST PRINT
18	RA1-0721-000CN	1		PLATE, DRUM GEAR MOUNT
20	RA1-0818-000CN	1	*	PLATE, FAN COVER
21	RA1-0819-000CN	1	*	DUCT, FAN
22	RA1-0820-000CN	1	*	COVER, FAN DUCT
23	RA1-0719-000CN	1	*	BRACKET, VIDEO CABLE
24	RA1-0725-000CN	1	*	FRAME, RIGHT FRONT
28	RH7-1006-000CN	1		FAN, 115V (60 HZ)
28	RH7-1007-000CN	1		FAN, 220/240V (50 HZ)
28A	VS4-0001-002CN	1	*	CONNECTOR, 2P, MALE
28B	WS4-0219-000CN	2	*	PIN, CONTACT 18-22AWG
29	FA1-0193-000CN	4	*	LABEL, "WARNING HIGH VOLTAGE"
29	FA1-1269-000CN	4	*	LABEL, "WARNING HIGH VOLTAGE"
31	FA2-5664-020CN	1		FILTER, OZONE
32	RA1-0729-000CN	1		RELEASE, UPPER UNIT
33	FA2-5674-000CN	1	*	SHAFT, UPPER UNIT RELEASE
34	FA2-5678-000CN	1		HOOK, LEFT UPPER UNIT
35	RA1-0730-000CN	2	*	WASHER
36	FS1-2677-000CN	2		SPRING, UPPER UNIT RELEASE
37	RF1-0140-000CN	2	*	STUD, CASSETTE HOLDER
38	RF1-0141-000CN	1	*	HINGE PLATE, RIGHT
39	RF1-0142-000CN	1	*	HINGE PLATE, LEFT
40	RA1-0718-000CN	1	*	MOUNT, CASSETTE SWITCH
41	RA1-0738-000CN	1	*	HOLDER, CASSETTE MICROSWITCH
42	RA1-0739-000CN	1	*	SPACER, CASSETTE MICROSWITCH

Table 8-5. Upper Main Body (continued)

43	WC4-0084-000CN	4		MICROSW. CASSETTE, TEST PRINT
44	FA2-5693-000CN	1		MOUNT, CASSETTE LATCH
45	FA2-5694-000CN	1		ARM, CASSETTE LATCH
46	FA2-5695-000CN	1		ROLLER, CASSETTE LATCH
47	FS1-2671-000CN	1		SPRING, CASSETTE LATCH
48	FA2-5698-000CN	2		LEAF SPRING, FUSER COVER
49	FA2-5696-000CN	1		HOLDER, PAPER EXIT SENSOR
50	FA2-5697-000CN	1		MOUNT, PAPER EXIT SENSOR
51	FH7-7023-000CN	1		PAPER EXIT SENSOR
52	XB1-2300-809CN	25	*	SCREW, MACH., TRUSS HEAD M4X8
53	XB6-7300-609CN	15	*	SCREW, TP, M3X6
54	XB6-7400-809CN	6	*	SCREW, TP, M4X6
55	XB7-2100-609CN	1	*	NUT, HEX, M6
56	XD1-1106-225CN	2	*	SHIM WASHER
57	XD2-1100-502CN	4	*	E-RING
58	XD3-2200-122CN	2	*	PIN
59	FA2-5970-000CN	1	*	SCREW, M3
60	X62-5370-000CN	1	*	SOCKET, FASTON 110, 20-24AWG
61	X62-6847-000CN	6	*	SLEEVE, FASTON 110
62	X62-6809-000CN	1	*	CLAMP, CABLE, 3N
63	X62-6863-000CN	2	*	CLAMP, CABLE, 5N
64	WT2-0133-000CN	1	*	CLIP, CABLE, 1NS
65	RH2-9001-000CN	1		CONNECTOR, HIGH VOLTAGE
66	X62-6859-000CN	1	*	CLAMP, 7N
67	VT2-0001-004CN	5	*	STAND OFF
69	WT2-0136-000CN	3	*	CLIP, CABLE
70	RA1-0834-000CN	1	*	GND PLATE, LEFT REAR
71	RA1-0957-000CN	1	*	BRACKET, OZONE SEAL
72	XB3-2300-505CN	1	*	SCREW, TAP,TRUSS HEAD, M3X5
73	RA1-1011-000CN	1		BRACE, TOP COVER
74	WT2-0136-000CN	1	*	CLIP, CABLE
75	RA1-1126-000CN	1	*	PLATE, SENSOR
76	RA1-1133-000CN	1	*	PLATE, GROUNDING

*=special order part

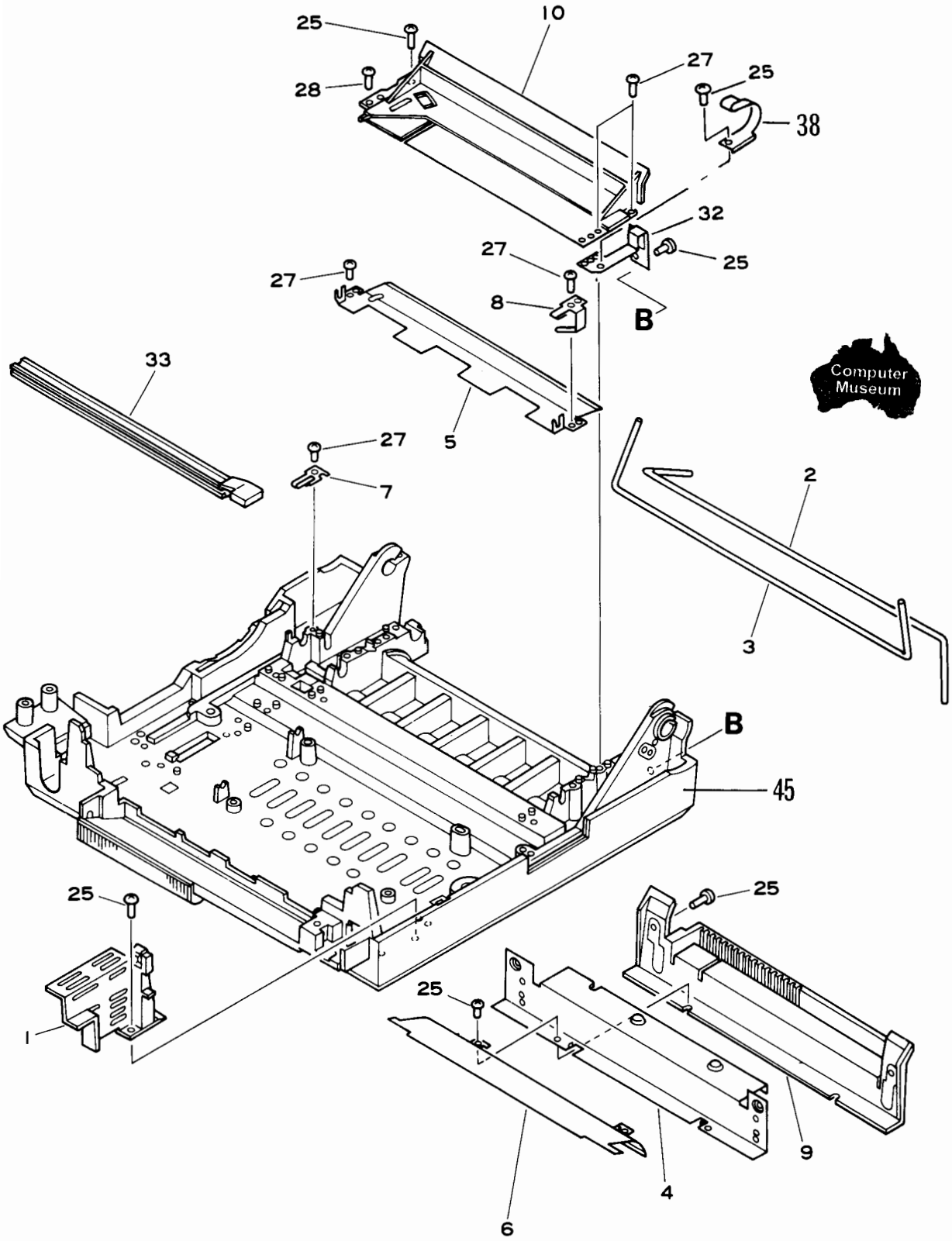


Figure 8-6. Lower Main Body (1 of 2)

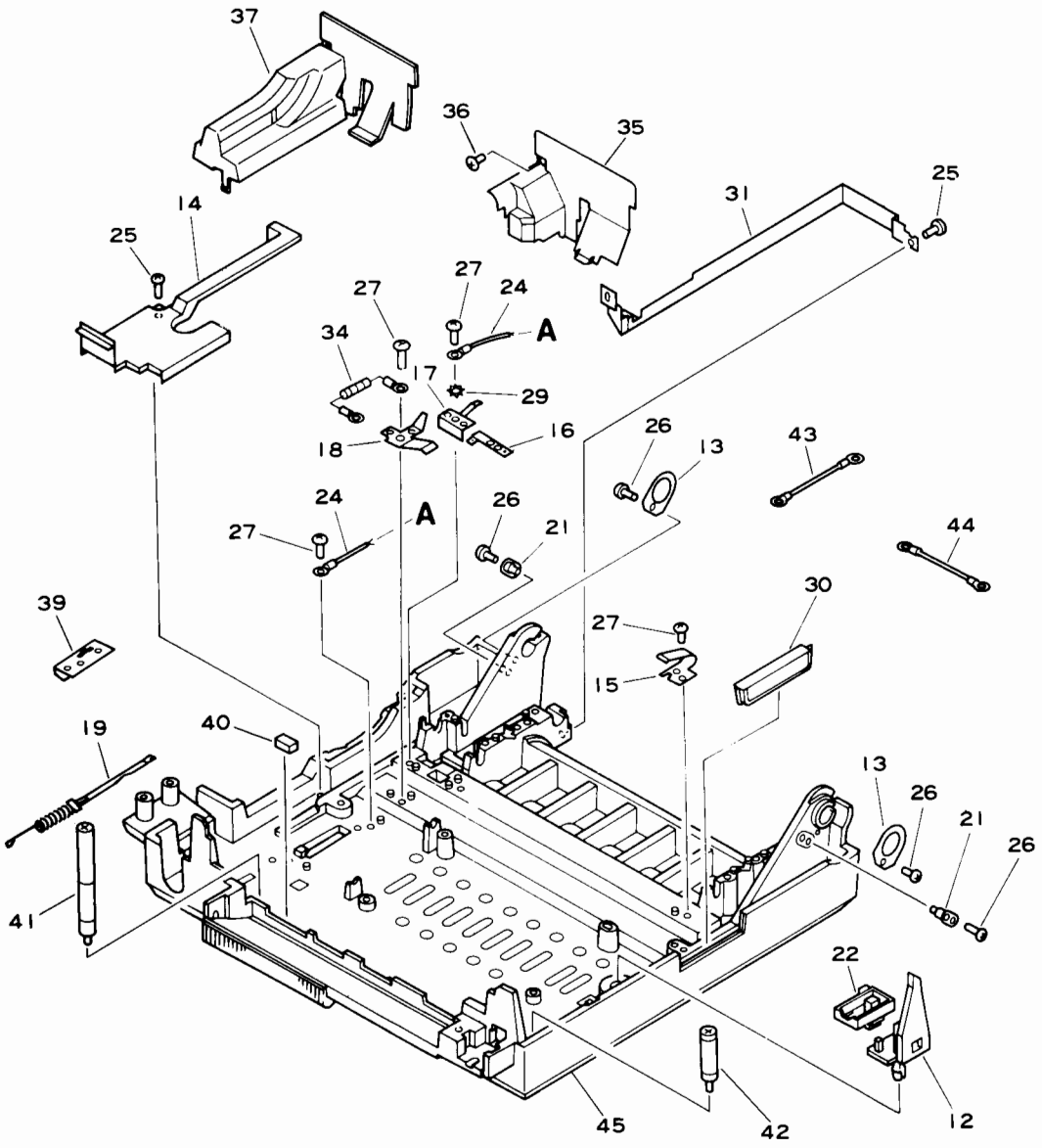


Figure 8-6. Lower Main Body (2 of 2)

Table 8-6. Lower Main Body.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	FA2-5682-000CN	1	*	COVER, RIGHT FUSING ASSY
2	RA1-0831-000CN	1	*	TORSION BAR, FRONT
3	RA1-0832-000CN	1	*	TORSION BAR, REAR
4	FA2-5721-000CN	1	*	BRACE, CASSETTE PICK-UP
5	FA2-5724-000CN	1	*	PLATE, LOWER PAPER GUIDE
6	FA2-5725-030CN	1	*	PLATE, MIDDLE PAPER GUIDE
7	FA2-5726-000CN	1	*	RETAINER, LEFT BUSHING
8	RA1-0837-000CN	1	*	RETAINER, RIGHT BUSHING
9	FA2-6255-030CN	1		PANEL, LOWER REAR
10	RF1-0213-000CN	1	*	PLATE, MANUAL PAPER FEED GUIDE
11	RA1-0681-000CN	1	*	COVER, RIGHT FRONT
12	FA2-5683-000CN	1	*	ACTUATOR, CARTRIDGE SHIELD
13	FA2-5709-000CN	2	*	SHIM, TORSION BAR
14	FA2-5719-000CN	1		COVER, FUSING WIRE HARNESS
15	FA2-5728-000CN	2		LEAF SPR, RIGHT XFER GUIDE
16	RA1-0680-000CN	1	*	LEAF SPR, XFER CONNECTOR
17	FA2-5729-000CN	1		LEAF SPR, REAR GEAR TRAIN
18	FA2-5730-000CN	1	*	LEAF SPR, XFER CONTACT
19	RG1-0328-000CN	1		BELT, SEPARATION
21	FF1-3557-000CN	2	*	STUD, UPPER BODY CATCH
22	RF1-0239-000CN	1		CORONA CLEANING BRUSH
24	RF1-0161-000CN	1	*	WIRE, GROUNDING
25	XB1-2300-809CN	1	*	SCREW, MACH., TRUSS HEAD M3X8
26	XB3-2401-009CN	4	*	SCREW, TAP., TRUSS HEAD M4X10
27	XB3-2401-209CN	11	*	SCREW, TAP., TRUSS HEAD M4X12
28	XB3-2401-609CN	1	*	SCREW, TAP., TRUSS HEAD M4X16
29	XD1-4200-302CN	2	*	WASHER, TOOTHED LOCK
30	FA2-5734-000CN	1	*	PLUG, LOWER RIGHT
31	RA1-0835-000CN	1	*	BRACKET, LOWER BODY GND
32	RA1-0836-000CN	1	*	CLIP, REAR GROUNDING
33	FG1-2377-020CN	1		CLEANER PAD
34	RF1-0191-000CN	1		RESISTOR, PAPER PATH BLEEDER
35	RA1-0975-000CN	1	*	BLANKING PLATE
36	XB1-2300-809CN	1	*	SCREW, M3X8
37	RA1-1775-000CN	1	*	COVER
38	RA1-1148-000CN	1	*	PLATE, GROUNDING
39	RA1-1685-000CN	1	*	PLATE
40	FA2-7054-000CN	1	*	SHIM
41	RF1-0510-000CN	1		SCREW, FUSING
42	RF1-0511-000CN	1		SCREW, FUSING
43	RF1-0192-000CN	1	*	WIRE, GROUNDING (A)
44	RF1-0246-000CN	1	*	WIRE, GROUNDING (B)
45	FA2-5671-000CN	1	*	BASE PLATE

*=special order part

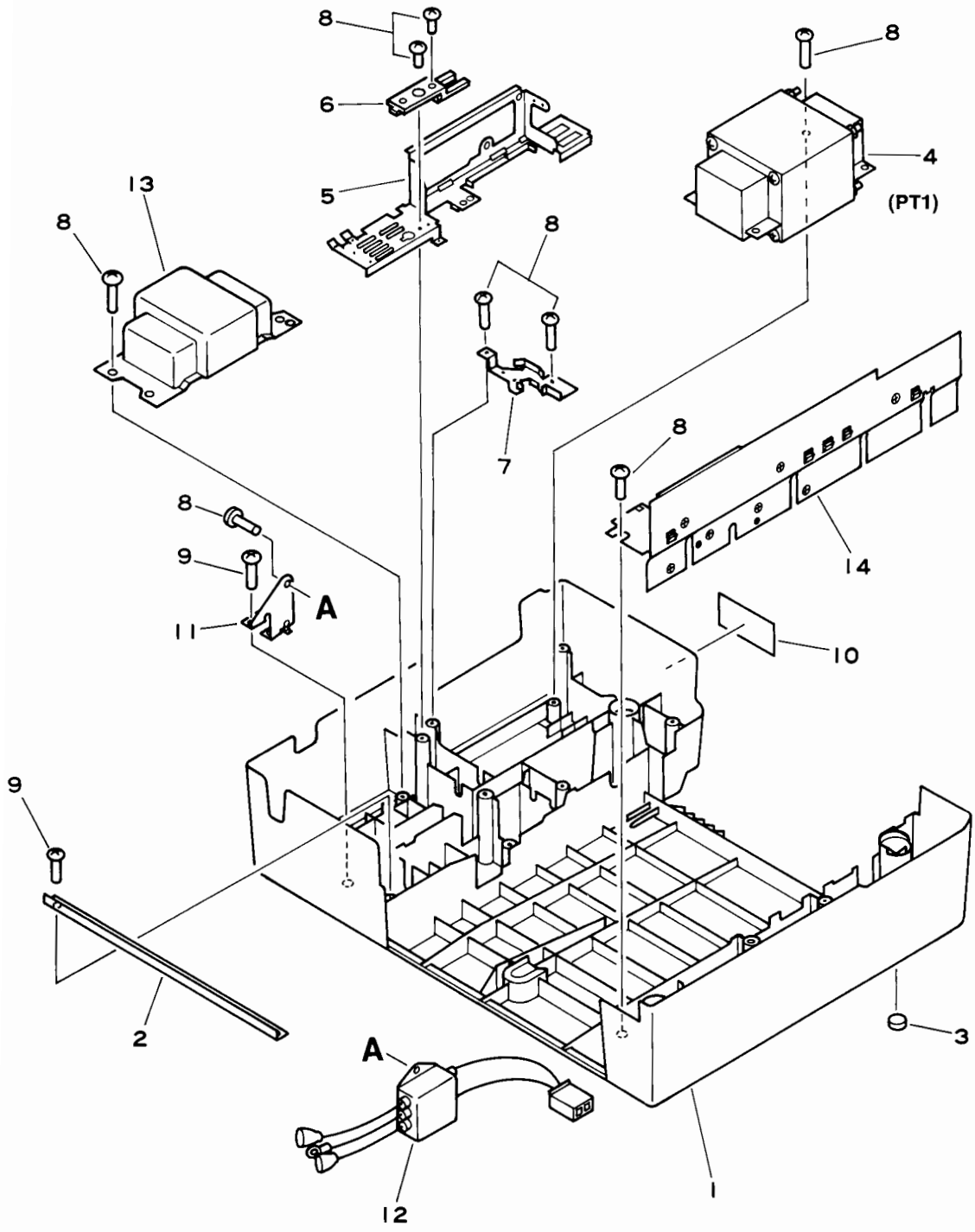


Figure 8-7 Pedestal-HP 2686A

Table 8-7. Pedestal-HP 2686A.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-0661-000CN	1	*	BODY, PEDESTAL
2	RA1-0664-000CN	1	*	SUPPORT, FRONT PEDESTAL
3	RA1-0663-000CN	4	*	FOOT, RUBBER
4	RH3-0011-000CN	1		XFORMER, PRINT ENGINE, 60 HZ
4	RH3-0022-000CN	1		XFORMER, PRINT ENGINE, 50 HZ
5	RA1-0791-000CN	1	*	PLATE, I/F CONNECTOR MOUNTING
6	RA1-0794-000CN	1	*	TERMINAL, SG
7	RA1-0795-000CN	1	*	GUIDE, WIRE
8	XB1-2300-809CN	8	*	SCREW, MACH., TRUSS HEAD M3X8
9	XB3-1400-609CN	2	*	SCREW, TAPPING, PAN HEAD M4X4
10	RS1-8013-000CN	1	*	LABEL, BRH
11	RA1-0796-000CN	1	*	MOUNT, I/F LINE FILTER
12	RF1-0190-000CN	1		LINE FILTER, I/F (60 HZ)
12	RF1-0197-000CN	1		LINE FILTER, I/F (50 HZ)
13	RH3-0014-000CN	1		TRANSFORMER, I/F (60 HZ)
13	RH3-0025-000CN	1		TRANSFORMER, I/F (50 HZ)
14	RH3-2004-000CN	1		POWER SUPPLY, I/F (60 HZ)
14	RH3-2007-000CN	1		POWER SUPPLY, I/F (50 HZ)

*=special order part

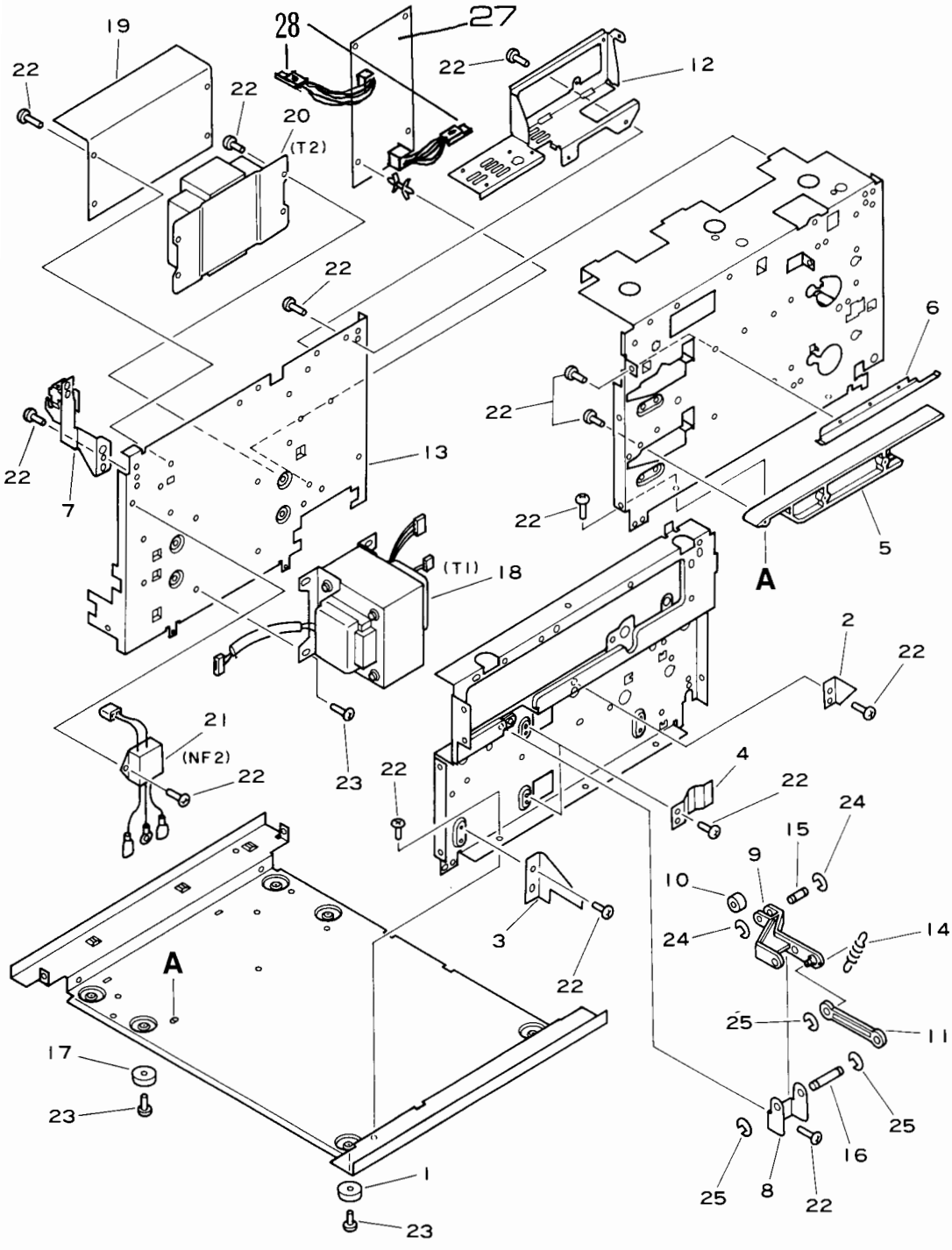


Figure 8-8 Pedestal-HP 2686D

Table 8-8. Pedestal-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-1886-000CN	4	*	PAD, RUBBER
2	RA1-1888-000CN	3	*	PLATE, S
3	RA1-1889-000CN	3	*	PLATE, L
4	RA1-1890-000CN	2	*	SPRING, LEAF
5	RA1-1891-000CN	2	*	GUIDE, CASSETTE
6	RA1-1893-000CN	1	*	GUIDE, CASSETTE B
7	RA1-1894-000CN	1	*	PLATE, F
8	RA1-1912-000CN	1	*	MOUNT, ARM
9	RA1-1913-000CN	1		LEVER, RELEASE JAM
10	RA1-1914-000CN	1		ROLLER
11	RA1-1915-000CN	1		LINK, RELEASE JAM
12	RA1-1931-000CN	1	*	PLATE, COVER
13	RA1-1974-000CN	1	*	MOUNT
14	RS1-2041-000CN	1		SPRING, TENSION
15	RS1-5017-000CN	1	*	SHAFT, RELEASE JAM 2
16	RS1-5018-000CN	1	*	SHEFT, RELEASE JAM 1
17	XH9-0001-000CN	2	*	FOOT, RUBBER
18	RH3-0042-000CN	1		TRANSFORMER, 115 V
18A	RH3-0043-000CN	1		TRANSFORMER, 220/240 V
19	RH3-2011-000CN	1		REGULATOR, INTERFACE, 115 V
19A	RH3-2012-000CN	1		REGULATOR, INTERFACE, 220/240 V
20	RH3-0014-000CN	1		TRANSFORMER, INTERFACE, 115 V
20A	RH3-0025-000CN	1		TRANSFORMER, INTERFACE, 220/240V
21	RF1-0190-000CN	1		FILTER, NOISE, 115 V, 60 HZ
21A	RF1-0197-000CN	1		FILTER, NOISE, 220/240 V, 50 HZ
22	XB6-7300-609CN	28	*	SCREW, TAPPING, M3X6
23	XB6-7400-609CN	10	*	SCREW
24	XD2-1100-322CN	2	*	E-RING
25	XD2-1100-502CN	3	*	SCREW
26	RA1-1979-000CN	1	*	J-CLIP
27	RG1-0599-000CN	1		PAPER CONTROL PCA
28	RG1-0600-000CN	2		DRIVER TRANSISTOR ASSEMBLY

*=special order part

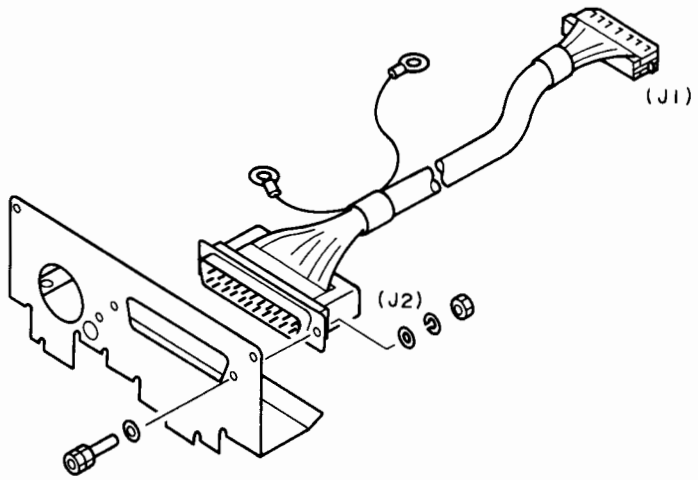


Figure 8-9. Interface Connector and Mounting Plate Assembly

Table 8-9. Interface Connector and Mounting Plate Assembly

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	SG4-6106-000CN	1		RS CABLE ASSEMBLY, HP 2686A OPT 200 & HP 2686A/D STANDARD
	SG4-6107-040CN	1		CENTRONICS CABLE ASSEMBLY HP 2686A OPTION 210
	SG4-6124-000CN	1		DUAL I/O CABLE ASSEMBLY, RS AND CENTRONICS HP 2686A/D OPTION 300

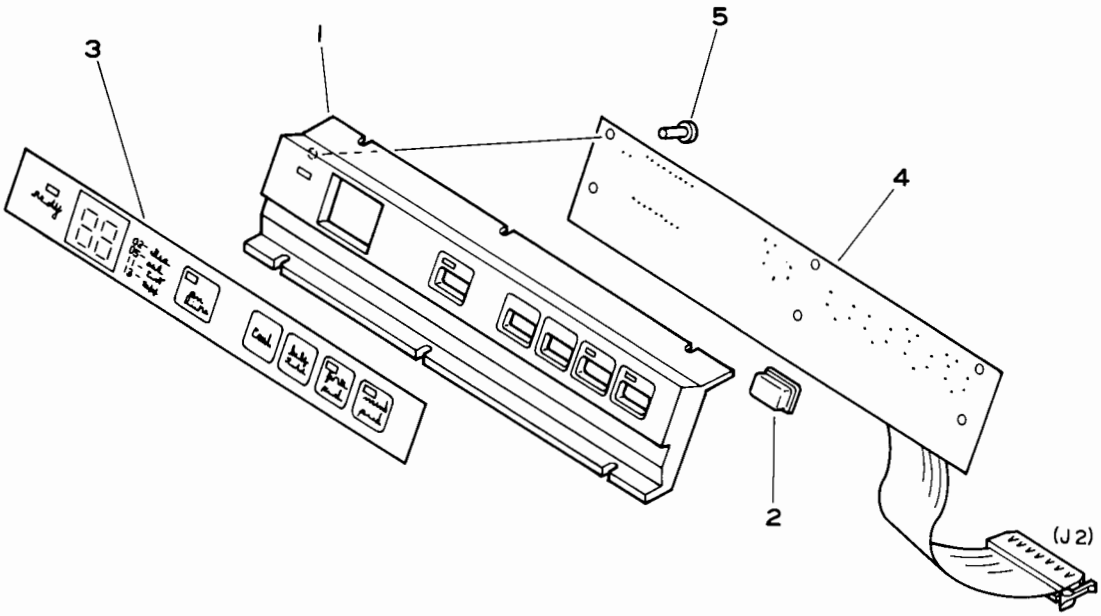


Figure 8-10. Control Panel Assembly-HP 2686A

Table 8-10. Control Panel Assembly-HP 2686A.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	SG4-6104-000CN	1		CONTROL PANEL ASSEMBLY
1		1	@	MOUNT, CONTROL PANEL
2		1	@	KEY, CONTROL PANEL
3	SA4-6004-000CN			CONTROL PANEL OVRLY, HP 2686A
3A	SA4-6056-000CN	1		CNTRL PNL OVRLY, HP 2686A OPT 200, 210 & 300
4		1	@	PCA: CONTROL PANEL
5		1	@	SCREW: TAP. PAN 3X6

@=non field-replaceable part

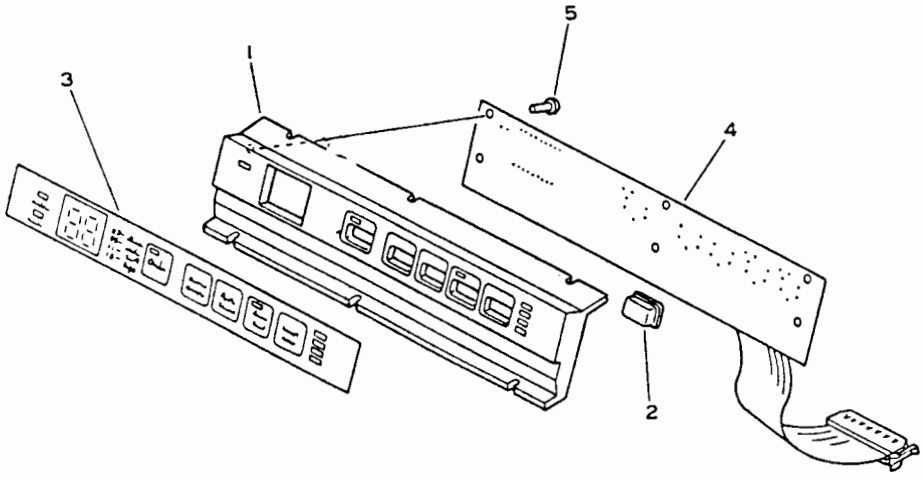


Figure 8-11. Control Panel Assembly-HP 2686D

Table 8-11. Control Panel Assembly-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	SG4-6123-000CN	1		CONTROL PANEL ASSEMBLY
1		1	@	MOUNT
2		1	@	KEY, CONTROL PANEL
3	SA4-6059-000CN	1		OVERLAY, CONTROL PANEL
3A	SA4-6060-000CN	1		OVERLAY, CONTROL PANEL OPT 300
4		1	@	PCB, CONTROL PANEL
5		6	@	SCREW, TAPPING, PAN HEAD, M3X8

@=non field-replaceable part

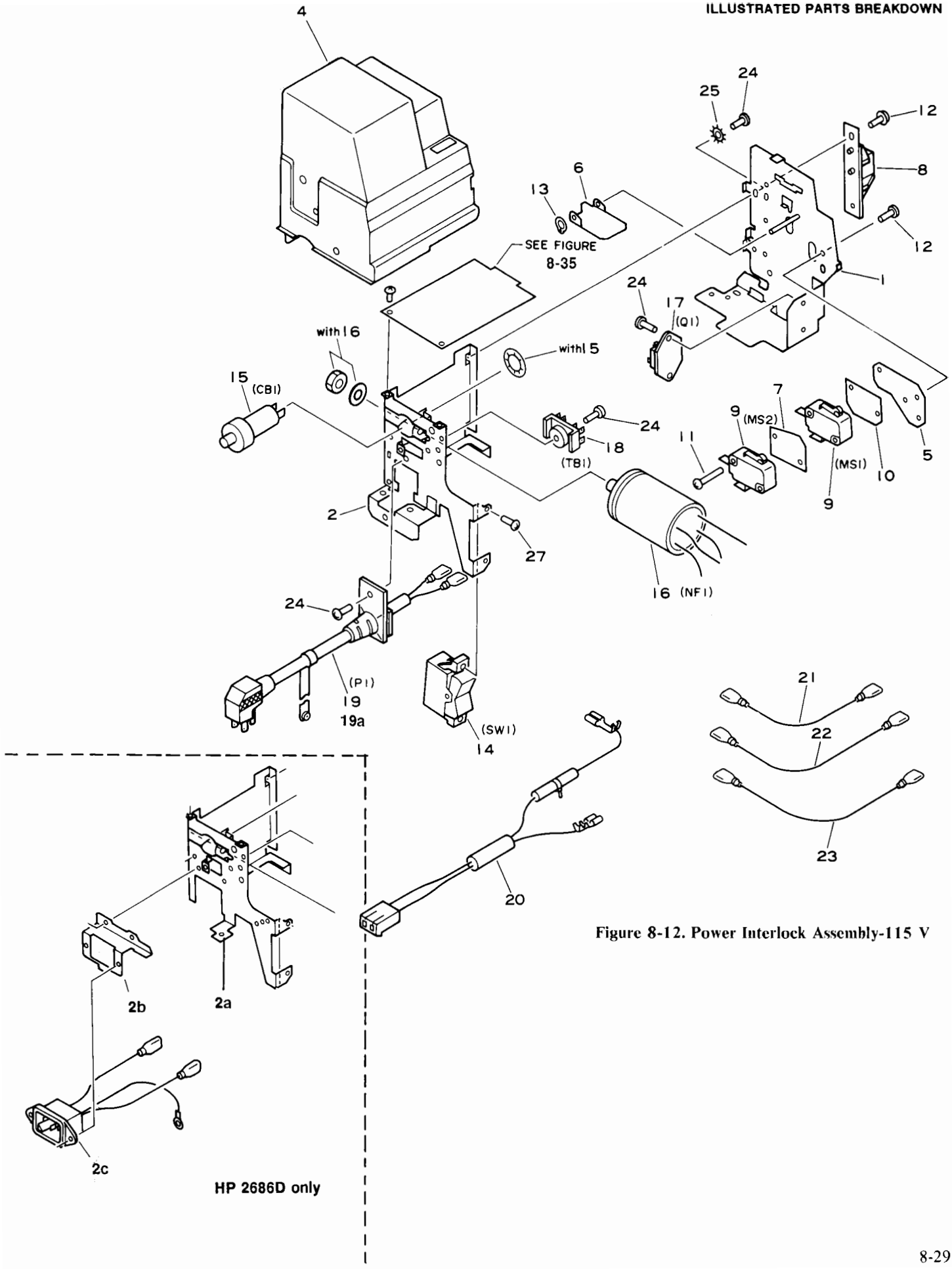


Figure 8-12. Power Interlock Assembly-115 V

Table 8-12. Power Interlock Assembly-115 V.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RF1-0145-000CN	1	*	MOUNT, POWER INTERLOCK
2	RA1-0701-000CN	1	a	MOUNT, POWER CORD
2A	RA1-1683-000CN	1	d	MOUNT,CORD
2B	RA1-1684-000CN	1	d	MOUNT SOCKET
2C	RF1-0357-000CN	1	d	CONNECTOR, POWER SUPPLY
4	RA1-0704-040CN	1		COVER, POWER INTERLOCK
5	FA2-6023-000CN	1	*	PLATE, MICROSWITCH
6	FA2-6024-000CN	1	*	ACTUATOR, MICROSWITCH
7	FA2-6025-000CN	1	*	PLATE, ACTUATOR TRAVEL LIMITER
8	FA2-6026-000CN	1		LATCH, LEFT UPPER MAIN BODY
9	WC4-0091-000CN	2		MCRSW, POWER INTRLCK (60 HZ)
10	FA1-9517-000CN	1	*	INSULATOR, MICROSWITCH
11	XB1-2303-009CN	2	*	SCREW, MACH., TRUSS HEAD M3X30
12	XB6-7301-009CN	5	*	SCREW, TP, M3X10
13	XD2-2100-402CN	1	*	GRIP RING
14	RH7-6001-000CN	1		POWER SWITCH, 250V 20A
15	WD3-0063-000CN	1		CIRCUIT BREAKER, (60 HZ)
16	RH7-9002-000CN	1		LN FILTER, PRNT ENG (60 HZ)
17	WA5-0045-000CN	1		TRIAC, FUSER BULB (60 HZ)
18	WT1-0118-000CN	1	*	CONNECTOR BLOCK
19	RH2-5013-000CN	1	a	115V POWER CORD (FIXED)
19A	RH2-5022-000CN	1	d	POWER CORD, 115V, REMOVABLE
20	RF1-0160-000CN	1		CORD, FUSING ASSY
21	RF1-0176-000CN	1	*	CORD, A
22	RF1-0177-000CN	1	*	CORD, B
23	RF1-0179-000CN	1	*	CORD, C2
24	XB1-2300-809CN	8	*	SCREW, MACH., TRUSS HEAD M3X8
25	XD1-4200-502CN	1	*	WASHER, TOOTHED LOCK
26	XB1-2500-804CN	1	*	SCREW, MACH., TRUSS HEAD M5X8
27	XB1-3300-809CN	2	*	SCREW, MACH., C.S. HEAD M3X8

*=special order part
@=non field-replaceable part
a=HP 2686A models only
d=HP 2686D models only

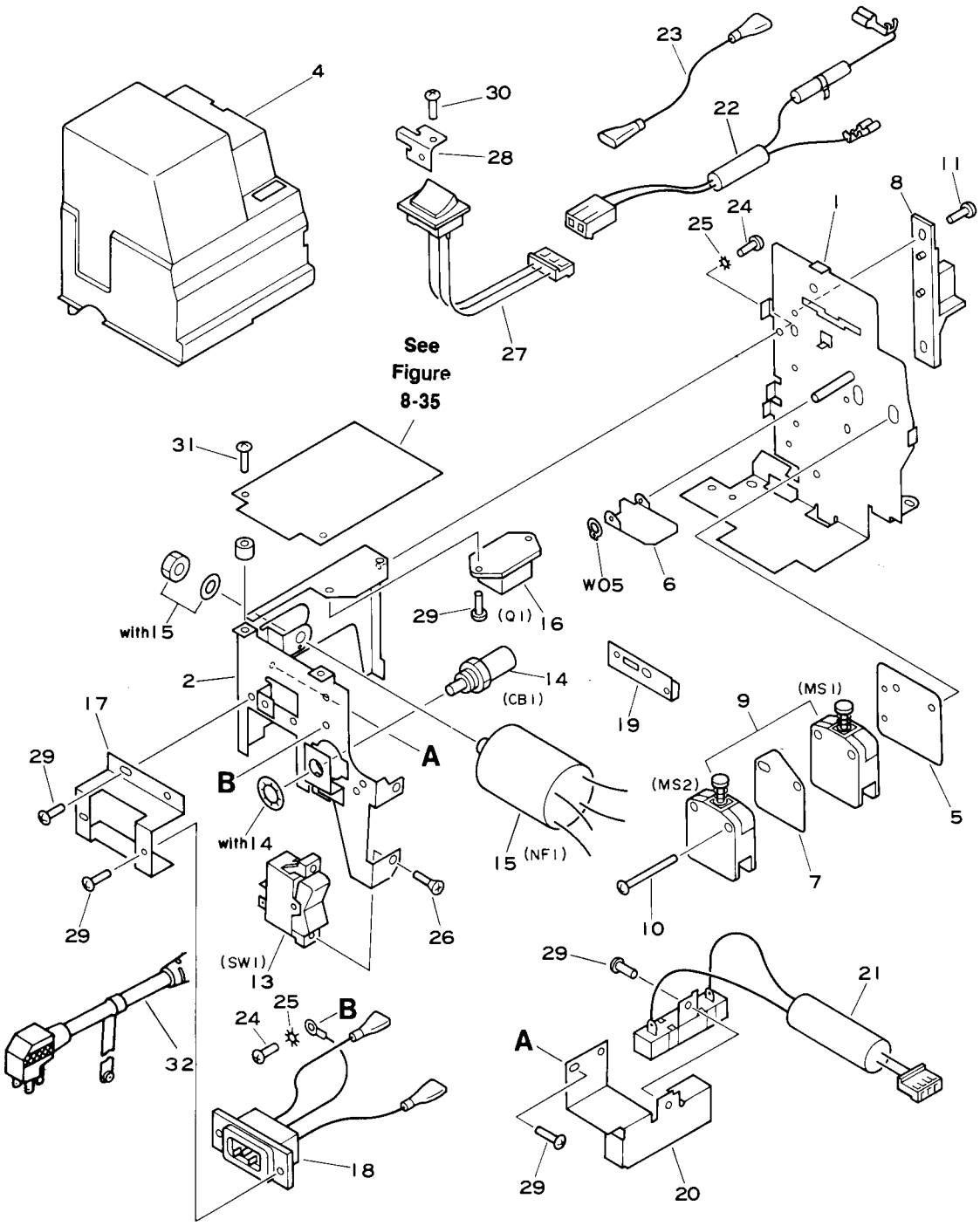


Figure 8-13. Power Interlock Assembly-220/240 V

Table 8-13. Power Interlock Assembly-220/240 V.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RF1-0318-000CN	1	*	MOUNT
2	RA1-1022-000CN	1	*	MOUNT, CORD
3	RA1-1820-000CN	1		COVER, POWER SWITCH
5	RA1-1023-000CN	1	*	PLATE, SWITCH
6	FA2-6024-000CN	1	*	ACTUATOR, MICROSWITCH
7	FA2-6033-000CN	1	*	PLATE, ACTUATOR TRAVEL LIMITER
8	FA2-6026-000CN	1		LATCH, REAR
9	WC4-0072-000CN	2		SWITCH, MICRO
10	XB1-2403-009CN	2	*	SCREW, MACH, TRUSS HEAD, M4X30
11	XB6-7301-009CN	4	*	SCREW, TAPPING, M3X10
12	XD2-2100-402CN	1	*	RING, GRIP
13	RH7-6001-000CN	1		SWITCH, ROCKER, 250 V, 20 A
14	WD3-0085-000CN	1		CIRCUIT BREAKER, AC250 V, 50 HZ
15	RF1-0247-000CN	1		FILTER, NOISE, AC250 V, 15 A
16	WA5-0040-000CN	1		TRIAC, (FUSER BULB) 50 HZ
17	RA1-1020-000CN	1	*	MOUNT, CONNECTOR, POWER SUPPLY
18	RF1-0200-000CN	1	*	CONNECTOR, POWER SUPPLY
19	RA1-1018-000CN	1	*	CLAMP, POWER CORD
20	RA1-1019-000CN	1	*	PLATE, MOUNTING RESISTOR
21	RF1-0199-000CN	1		RESISTOR, 10 KOHM, 10 W
22	RF1-0160-000CN	1		CORD, FUSING ASSEMBLY
23	RF1-0179-000CN	1	*	CORD, C2
24	XB1-2400-609CN	1	*	SCREW, MACH., TRUSS HEAD M4X6
25	XD1-4200-402CN	1	*	WASHER, TOOTHED LOCK
26	XB1-3300-809CN	2	*	SCREW, MACH., C.S. HEAD, M3X8
27	RF1-0196-000CN	1	d	SWITCH, ROCKER, AC250 V, 6 A
28	RA1-1028-000CN	1	*	CLAMP, SWITCH
29	XB1-2300-409CN	12	*	SCREW, MACH, TRUSS HEAD, M3X4
30	XB1-2300-609CN	4	*	SCREW, MACH, TRUSS HEAD, M3X6
31	XB1-2301-609CN	2	*	SCREW, MACH, TRUSS HEAD, M3X16
32	RH2-5014-000CN	1		CORD, POWER, DETACHABLE, 220 V
32A	RH2-5030-000CN	1		CORD, POWER, DETACHABLE, 240 V

*=special order part
a=HP 2686A models only
d=HP 2686D models only

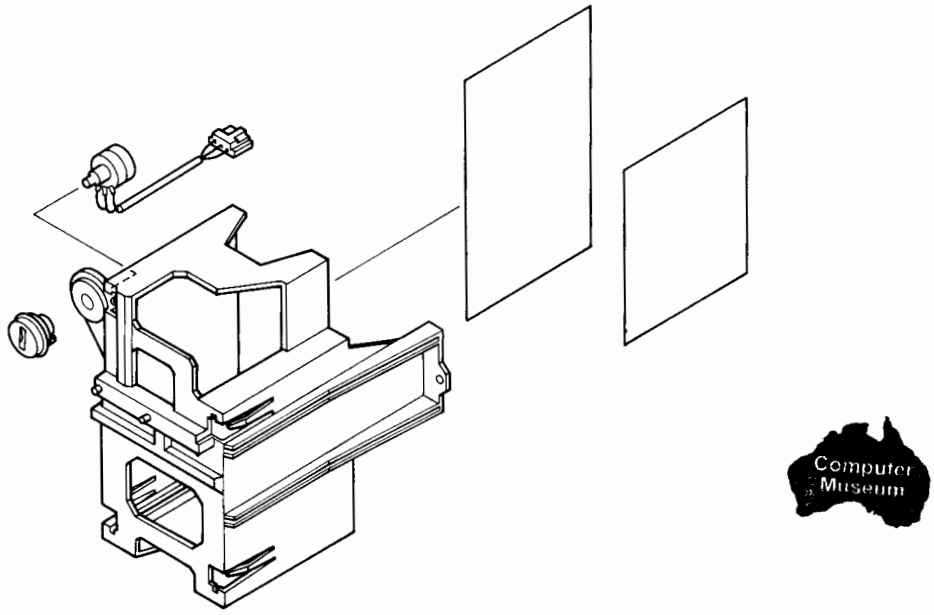


Figure 8-14. High Voltage Power Supply

Table 8-14. High Voltage Power Supply.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0649-000CN	1		HIGH VOLTAGE POWER SUPPLY
1		1	@	DIAL, PRINT DENSITY
2		1	@	VARIABLE RESISTOR, PRINT DENSITY
3		1	@	COVER, HIGH VOLTAGE
4		1	@	SCREW, MACH., TRUSS HEAD M3X8
5		1	@	SETSCREW, M4X5

@=non field-replaceable part

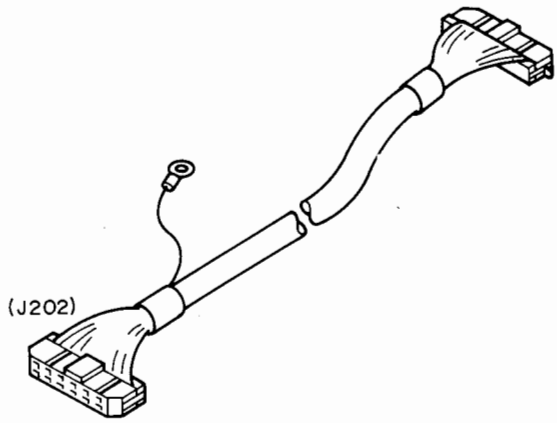


Figure 8-15. Video Cable

Table 8-15. Video Cable.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	SG4-6108-000CN	1		CABLE: VIDEO ASSY

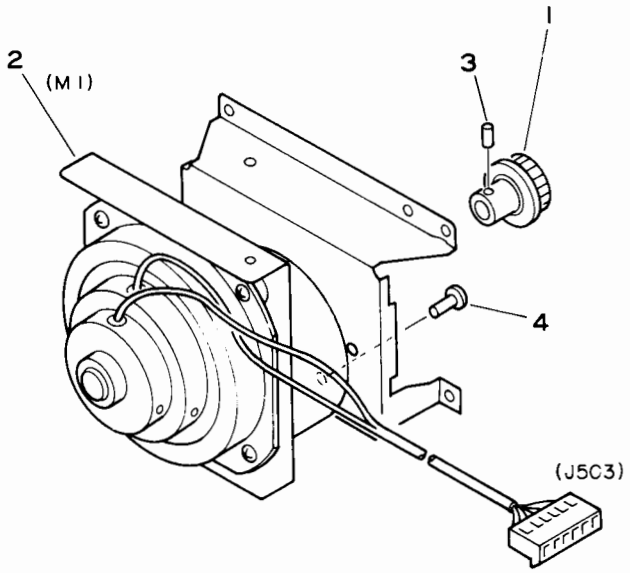


Figure 8-16. Main Motor Assembly

Table 8-16. Main Motor Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RS1-0010-000CN	1		GEAR, MAIN MOTOR DRIVE
2	RG9-0102-000CN	1		MAIN MOTOR
3	XB6-2400-508CN	2		SETSCREW, M4X5
4	XB1-2400-809CN	4		SCREW, MACH., TRUSS HEAD M4X8

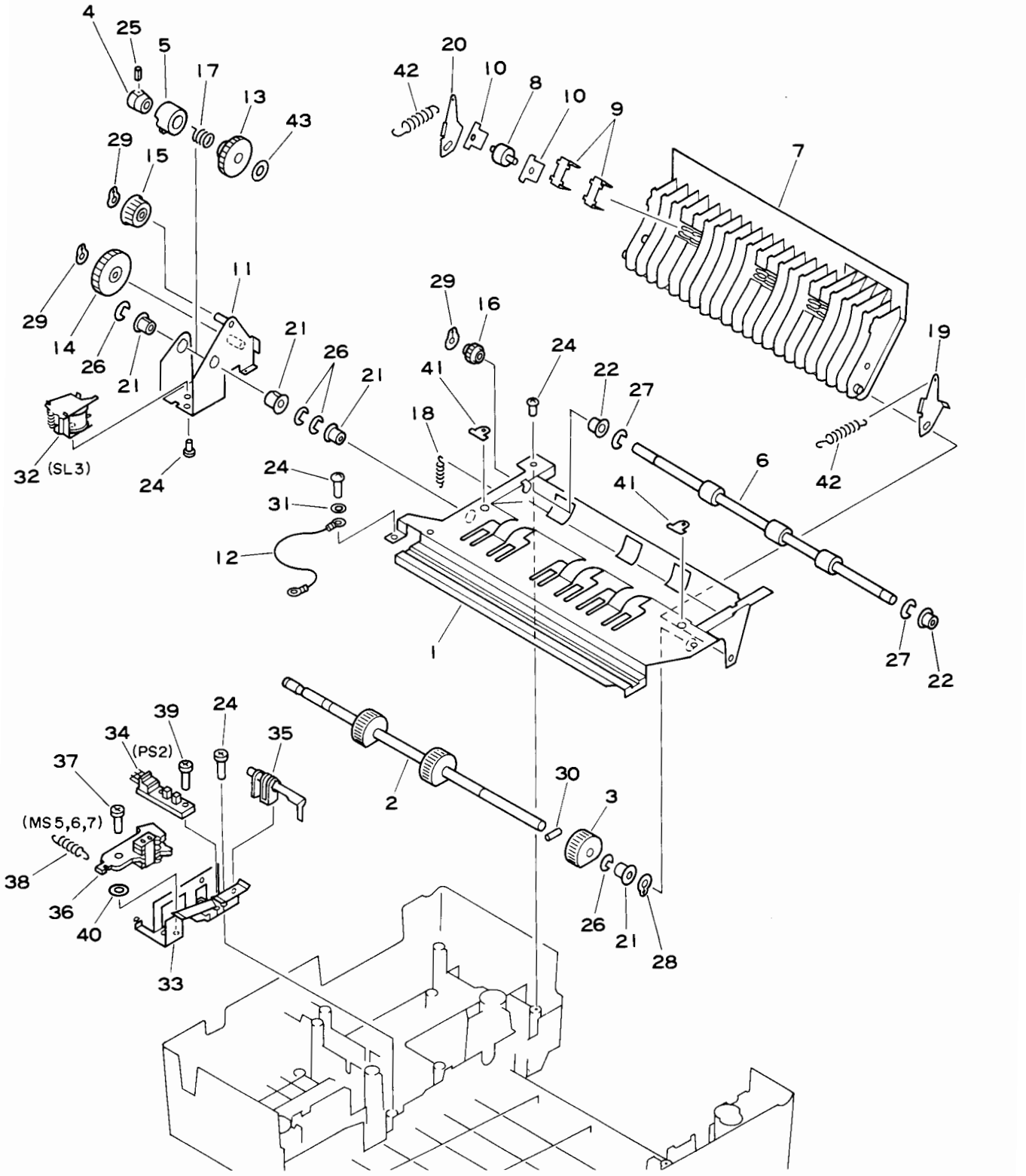


Figure 8-17. Cassette Pickup Drive-HP 2686A

Table 8-17. Cassette Pickup Drive-HP 2686A.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RF1-0204-000CN	1	*	GUIDE, UPPER CASSETTE PICKUP
2	FA2-5603-000CN	1		SHAFT, CASSETTE PICKUP ROLLER
3	RA1-0666-000CN	3		ROLLER, CASSETTE PICKUP
4	FA2-5606-000CN	1		DRUM, CLUTCH DRIVER
5	FA2-5607-000CN	1		RING, PICKUP CLUTCH CONTROL
6	RA1-0977-000CN	1		ROLLER, CASSSETTE FEED
7	FA2-5611-020CN	1		GUIDE, LOWER CASSETTE PICKUP
8	FA2-5612-000CN	3		ROLLER, LOWER CASSETTE GUIDE
9	FA2-5600-000CN	6		LEAF SPR, CASSETTE GUIDE ROLLER
10	RA1-0667-000CN	6	*	PLATE, LOWER CASSETTE GUIDE
11	FF1-3502-000CN	1	*	PLATE, CLUTCH/GEAR MOUNTING
12	FF1-3597-000CN	1	*	WIRE, GROUNDING
13	FS1-0701-000CN	1		GEAR, CLUTCH DRIVE
14	FS1-0702-000CN	1		GEAR, CASSETTE PICKUP DRIVE
15	FS1-0703-000CN	1		GEAR, CLUTCH IDLER
16	FS1-0704-040CN	1		GEAR, CASSETTE FEED ROLLER DRIVE
17	FS1-2651-000CN	1		SPRING, CLUTCH
18	FS1-2652-000CN	1		SPRING, UPPER CASSETTE GUIDE
19	RA1-0929-000CN	1	*	CLIP, RIGHT LOWER GUIDE HINGE
20	RA1-0930-000CN	1	*	CLIP, LEFT LOWER GUIDE HINGE
21	FS1-1046-000CN	4		BUSHING
22	FS1-1190-000CN	2		BUSHING
24	XB6-7300-609CN	5	*	SCREW, TP M3X6
25	XB6-2400-509CN	1	*	SETSCREW, M4X5
26	XD2-1100-642CN	6	*	E-RING
27	XD2-1100-502CN	2	*	E-RING
28	XD2-2100-802CN	1	*	GRIP RING
29	XD2-2100-602CN	3	*	GRIP RING
30	XD3-2200-122CN	3	*	PIN
31	XD1-4100-302CN	1	*	WASHER, TOOTHED LOCK
32	FH7-5034-000CN	1		SOLENOID, CASSETTE PICKUP
33	RA1-0669-000CN	1	*	MOUNT, PAPER OUT SENSOR
34	FH7-7024-000CN	1		PAPER OUT SENSOR
35	RA1-0673-000CN	1		ARM, PAPER OUT SENSOR
36	RF1-0163-000CN	1		MICROSWITCH UNIT, PAPER CASSETTE
37	FA2-5970-000CN	1	*	SCREW, MACH., TRUSS HEAD M3X8
38	RS1-2007-000CN	1		SPRING, MICROSW UNIT
39	XB1-2300-809CN	1	*	SCREW, MACH., TRUSS HEAD M3X8
40	XD1-1103-129CN	1	*	WASHER, 3.1X5.6X1
41	RA1-0928-000CN	2	*	CLIP, LOWER GUIDE SPRING
42	RS1-2011-000CN	2		SPRING, LOWER PICKUP GUIDE
43	XD1-1108-231CN	1	*	SHIM

*=special order part

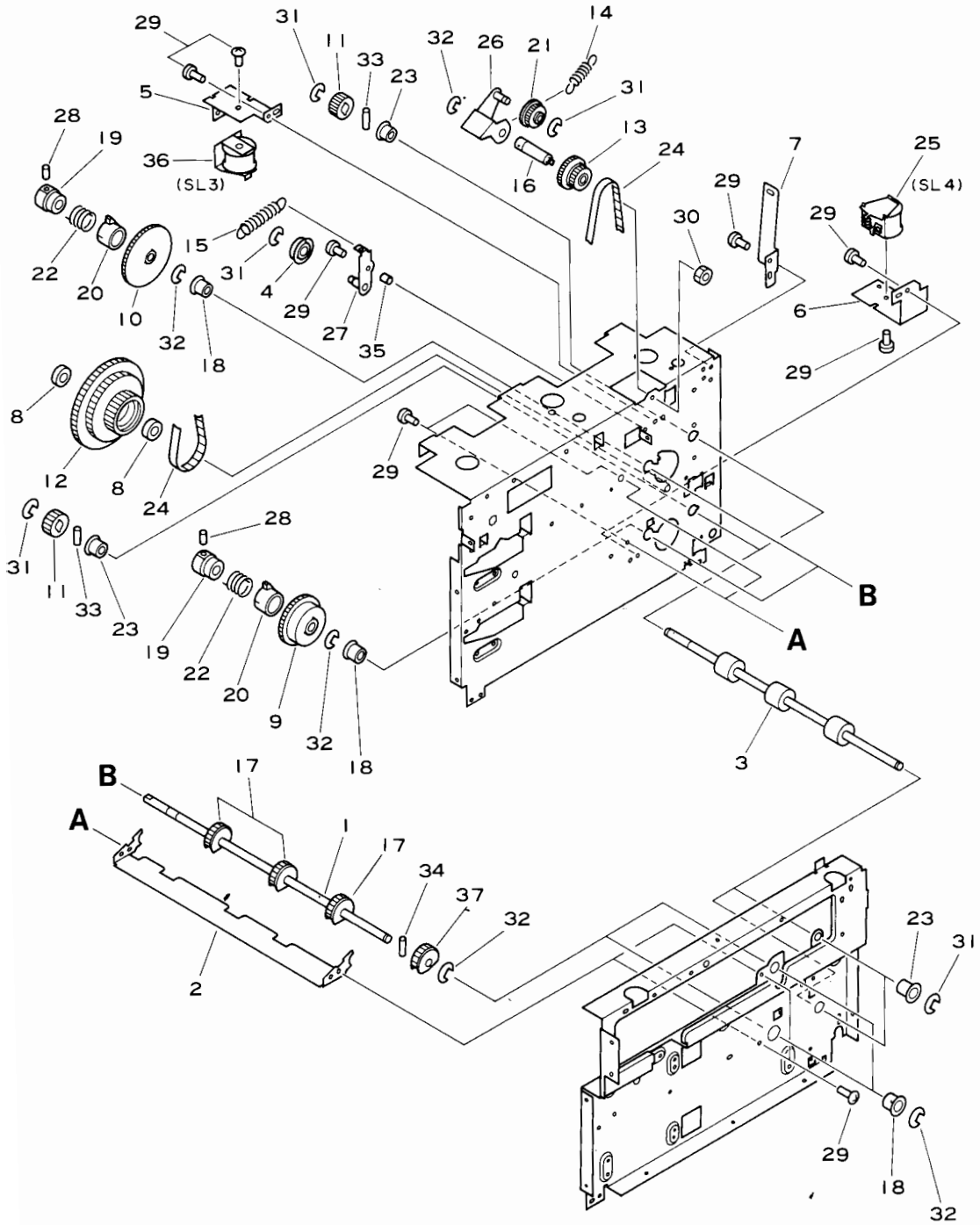


Figure 8-18. Cassette Pickup Drive-HP 2686D

Table 8-18. Cassette Pickup Drive-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-1903-000CN	2		SHAFT, PAPER PICK-UP
2	RA1-1904-000CN	2	*	PLATE, CASSETTE
3	RA1-1905-000CN	2		SHAFT, PAPER FEED
4	RA1-1934-000CN	1		ROLLER, TENSION
5	RA1-1935-000CN	1	*	PLATE, SOLENOID, UPPER
6	RA1-1936-000CN	1	*	PLATE, SOLENOID, LOWER
7	RA1-1975-000CN	1	*	PLATE
8	XG2-8016-505CN	2		BUSHING
9	RS1-0038-000CN	1		GEAR, 34 T
10	RS1-0039-000CN	1		GEAR, 45 T
11	RS1-0040-000CN	2		GEAR, 13 T
12	RS1-0041-000CN	1		GEAR, 77 T 62 T, PULLEY 24 T
13	RS1-0050-000CN	1		GEAR, 28 T, PULLEY 14 T
14	RS1-2043-000CN	1		SPRING, TENSION
15	RS1-2044-000CN	1		SPRING, TENSION
16	RS1-5020-000CN	1		SHAFT, PULLEY
17	RA1-2621-000CN	6		ROLLER, PAPER PICK-UP
18	FA1-3224-000CN	4		BUSHING
19	FA2-5606-000CN	2		DRUM, CLUTCH
20	FA2-5607-000CN	2		RING, CLUTCH ACTION
21	FS1-0703-000CN	1		GEAR, 20 T
22	FS1-2651-000CN	2		SPRING, TORSION
23	FS1-1213-000CN	4		BUSHING
24	XF9-0154-000CN	1		TIMING BELT, 90 T
25	RH7-5003-000CN	1		SOLENOID, LOWER
26	RF1-0477-000CN	1	*	PLATE, SPINDLE
27	RF1-0478-000CN	1		ARM, GEAR SPINDLE
28	XB6-2400-508CN	2	*	SETSCREW, M4X5
29	XB6-7300-609CN	10	*	SCREW, TP, M3X6
30	XB7-2100-409CN	1	*	NUT, HEX, M4
31	XD2-1100-502CN	5	*	SCREW
32	XD2-1100-642CN	7	*	E-RING
33	XD3-2200-082CN	2	*	PIN, PARALLEL
34	XD2-2200-142CN	3	*	PIN, PARALLEL
35	XZ1-1300-025CN	1	*	SPACER
36	FH7-5034-000CN	1		SOLENOID, UPPER
37	RA1-2622-000CN	2		ROLLER, PICKUP

*=special order part

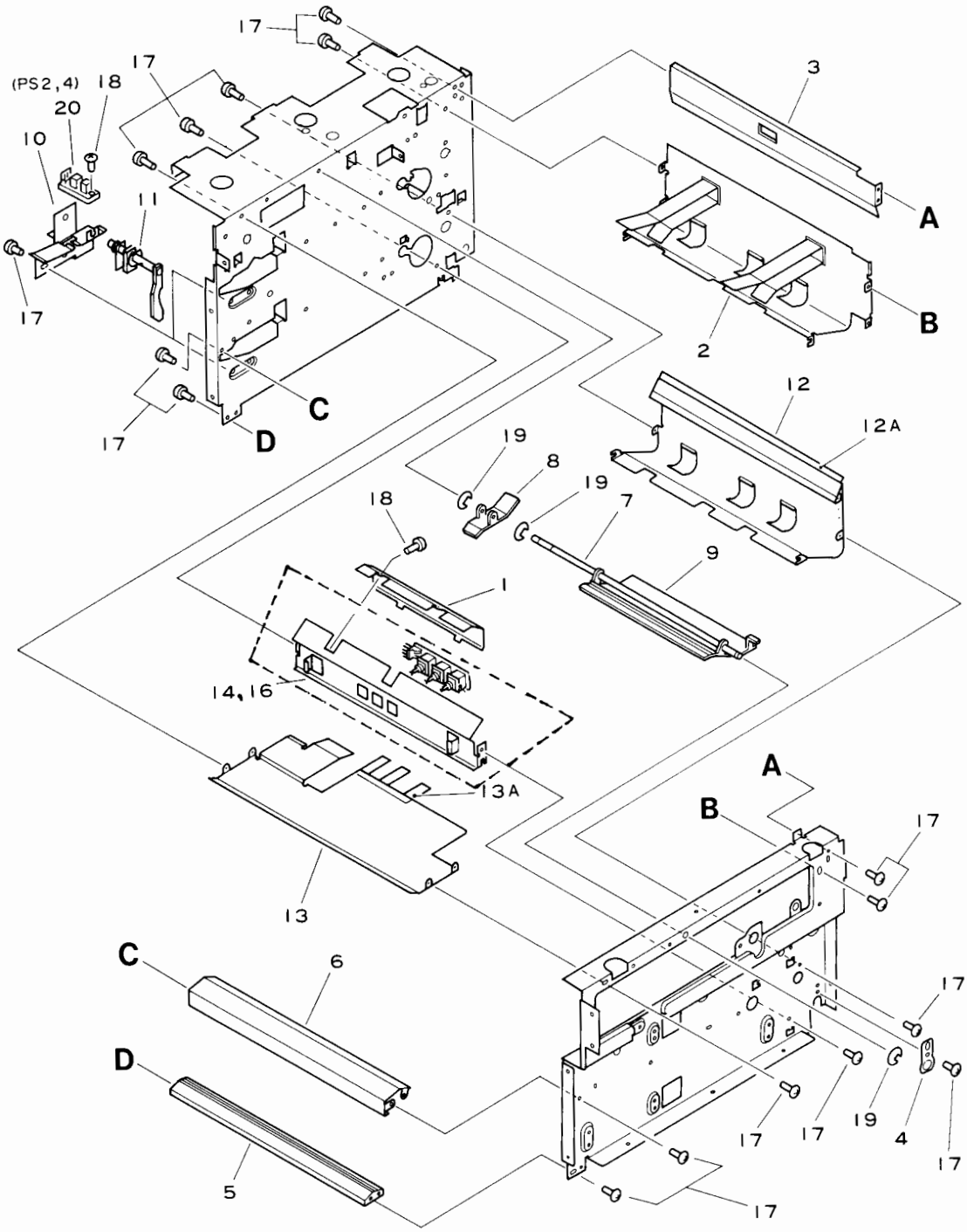


Figure 8-19. Cassette Pickup Sensor-HP 2686D

Table 8-19. Cassette Pickup Sensor-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-1897-000CN	1	*	COVER, SWITCH
2	RA1-1899-000CN	1	*	GUIDE, CASSETTE
3	RA1-1902-000CN	1	*	GUIDE, CASSETTE (3)
4	RA1-1920-000CN	1	*	PLATE, PANEL, RIGHT
5	RA1-1921-000CN	1	*	CROSSMEMBER, CASSETTE, 2
6	RA1-1922-000CN	1	*	CROSSMEMBER, CASSETTE, 1
7	RA1-1925-000CN	1	*	SHAFT
8	RA1-1926-000CN	1	*	WEIGHT (1)
9	RA1-1927-000CN	1	*	WEIGHT (2)
10	RA1-1928-000CN	2	*	MOUNT,PHOTO-INTERRUPTER
11	RA1-1929-000CN	2		ARM
12	RF1-0567-000CN	1	*	GUIDE, CASSETTE
13	RF1-0568-000CN	1	*	GUIDE, JAM
13A	RA1-1924-000CN	1	*	MYLAR, SHIFT
14	RG1-0704-000CN	1	*	UPPER SW PLATE ASSY
16	RG1-0654-000CN	1	*	LOWER SW PLATE ASSY
17	XB6-7300-609CN	25	*	SCREW, TP, M3X6
18	XB1-2300-609CN	2	*	SCREW, MACH, TRUSS HEAD, M3X6
19	XD2-1100-322CN	5	*	E-RING
20	FH7-7052-000CN	2		PHOTO INTERRUPTER UNIT

*=special order part

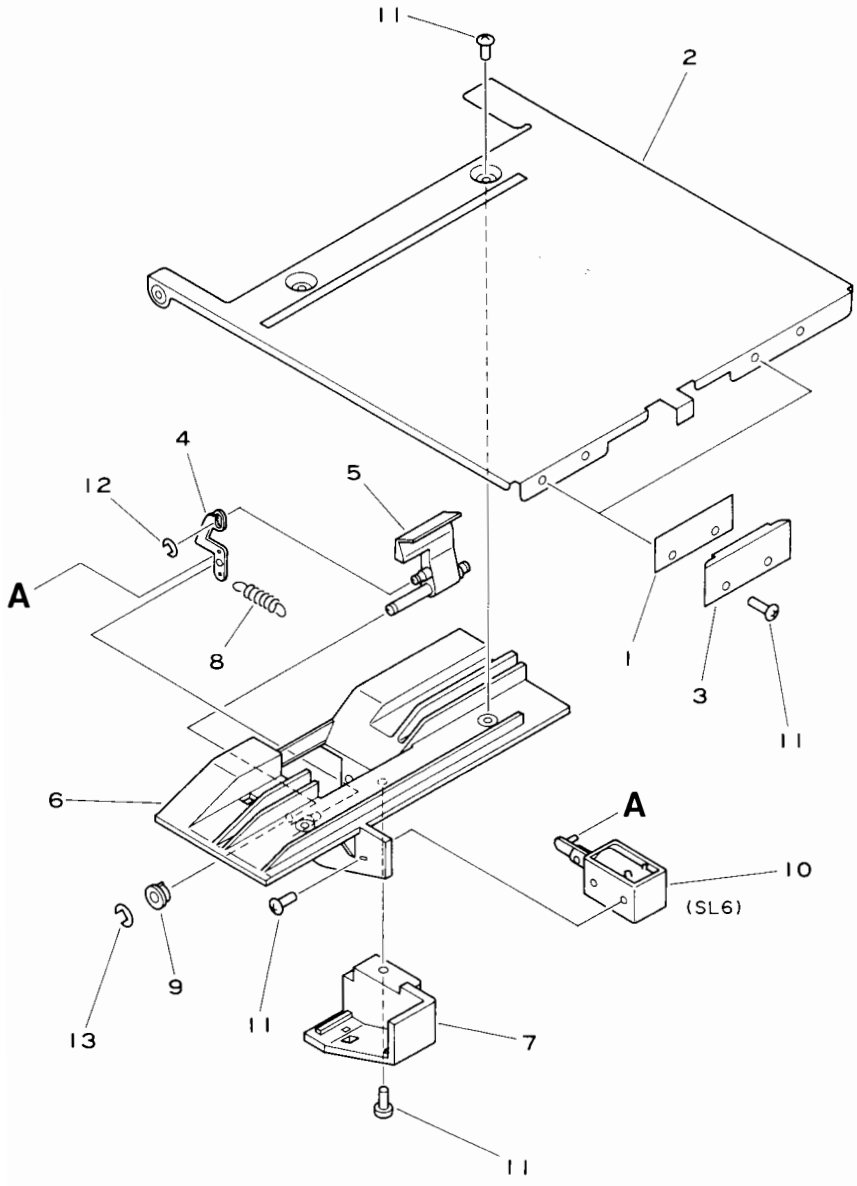


Figure 8-20. Job Offset Assembly-HP 2686D

Table 8-20. Job Offset Assembly-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0655-000CN	1		JOB OFFSET ASSEMBLY
1		2	@	SPACER, STOPPER
2		2	@	PLATE, JOGGING
3		2	@	STOPPER
4		1	@	LINK, SHIFT 2
5		1	@	ARM, SHIFT
6		1	@	MOUNT, SOLENOID
7		1	@	COVER, SOLENOID
8		1	@	SPRING, TENSION
9		1	@	BUSHING
10		1	@	SOLENOID UNIT
11		9	@	SCREW M3X5
12		1	@	E- RING
13		2	@	SCREW

@=non field-replaceable part

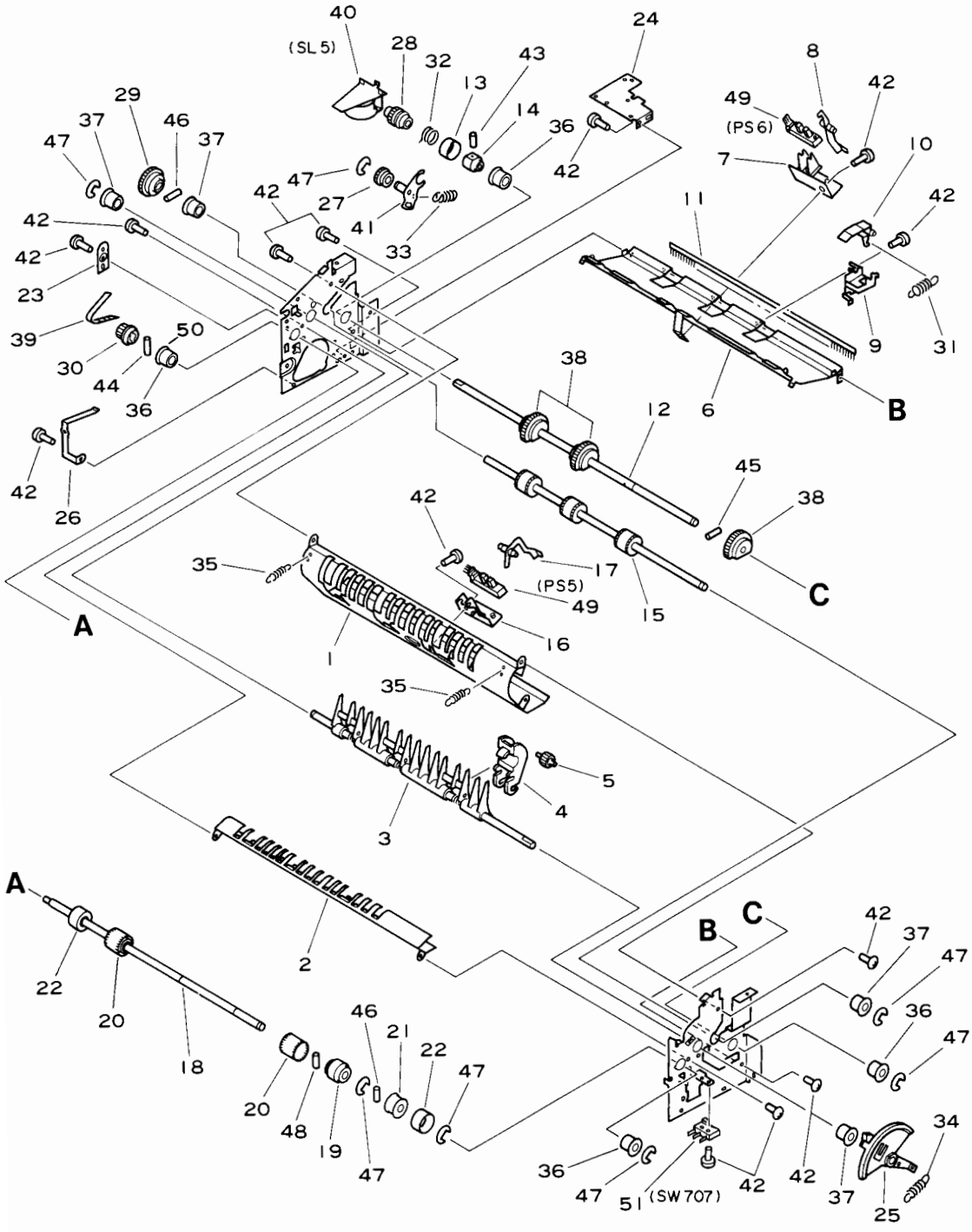


Figure 8-21. Delivery Assembly-HP 2686D

Table 8-21. Delivery Assembly-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RA1-1939-000CN	1	*	GUIDE
2	RA1-1940-000CN	1	*	GUIDE
3	RA1-1941-000CN	1		DEFLECTOR
4	RA1-1942-000CN	3	*	GUIDE, ROLLER
5	RA1-1943-000CN	3		GUIDE, ROLLER, H
6	RA1-1944-000CN	1	*	GUIDE, FRONT (2)
7	RA1-1945-000CN	1		BRACKET, PHOTO-INTERRUPTER
8	RA1-1946-000CN	1		LEVER
9	RA1-1947-000CN	3		BRACKET, BACK-UP
10	RA1-1948-000CN	3		PLATE, BACK-UP
11	RA1-1949-000CN	1		ELIMINATOR, STATIC-CHARGE
12	RA1-1950-000CN	1		SHAFT
13	RA1-1954-000CN	1		RING, CLUTCH ACTION
14	RA1-1955-000CN	1		DRUM, CLUTCH
15	RA1-1956-000CN	1		SHAFT, PAPER-PICKUP
16	RA1-1957-000CN	1		BRACKET, PHOTO-INTERRUPTER
17	RA1-1958-000CN	1		LEVER
18	RA1-1959-000CN	1	*	SHAFT, DELIVERY
19	RA1-1960-000CN	2		ROLLER, DELIVERY
20	RA1-1961-000CN	2		BAND, RUBBER
21	RA1-1962-000CN	2		ROLLER, DELIVERY, 2
22	RA1-1963-000CN	2		BAND, RUBBER
23	RA1-1966-000CN	1	*	MOUNT, FRONT COVER
24	RA1-1972-000CN	1	*	MOUNT, SOLENOID
25	RA1-1973-000CN	1		LEVER, EXCHANGE
26	RA1-1978-000CN	1	*	GROUNDING LEAF SPRING
27	RS1-0042-000CN	1		GEAR 22 T, PULLEY 22 T
28	RS1-0043-000CN	1		GEAR, 24 T
29	RS1-0044-000CN	1		GEAR, 44 T, PULLEY 40 T
30	RS1-0045-000CN	1		PULLEY, 16 T
31	RS1-2045-000CN	3		SPRING, TENSION
32	RS1-2046-000CN	1		SPRING, CLUTCH
33	RS1-2048-000CN	1		SPRING, TENSION
34	RS1-2049-000CN	1		SPRING, TENSION
35	RS1-2050-000CN	2		SPRING, TENSION
36	FS1-1190-000CN	5		BUSHING
37	FS1-1213-000CN	8		BUSHING
38	FA3-4686-000CN	1		ROLLER, PICK-UP
39	XF9-0156-000CN	1		TIMING BELT, 88 T
40	FH7-5033-000CN	1		SOLENOID
41	RF1-0479-000CN	1		ARM, GEAR SPINDLE
42	XB1-2300-609CN	20	*	SCREW, MACH. TRUSS HEAD, M3X6
43	XB6-2400-508CN	1	*	SETSCREW, M4X5
44	XD3-2200-062CN	1	*	PIN, PARALLEL
45	XD3-2200-142CN	3	*	PIN, PARALLEL
46	XD3-2200-122CN	3	*	PIN, PARALLEL
47	XD2-1100-502CN	9	*	E-RING
48	XD3-2200-082CN	2	*	PIN, PARALLEL
49	FH7-7052-000CN	1		PHOTO-INTERRUPTER
50	RA1-1952-000CN	1		SPACER, BELT GUARD
51	WC4-0150-000CN	1		SWITCH, MICRO

*=special order part

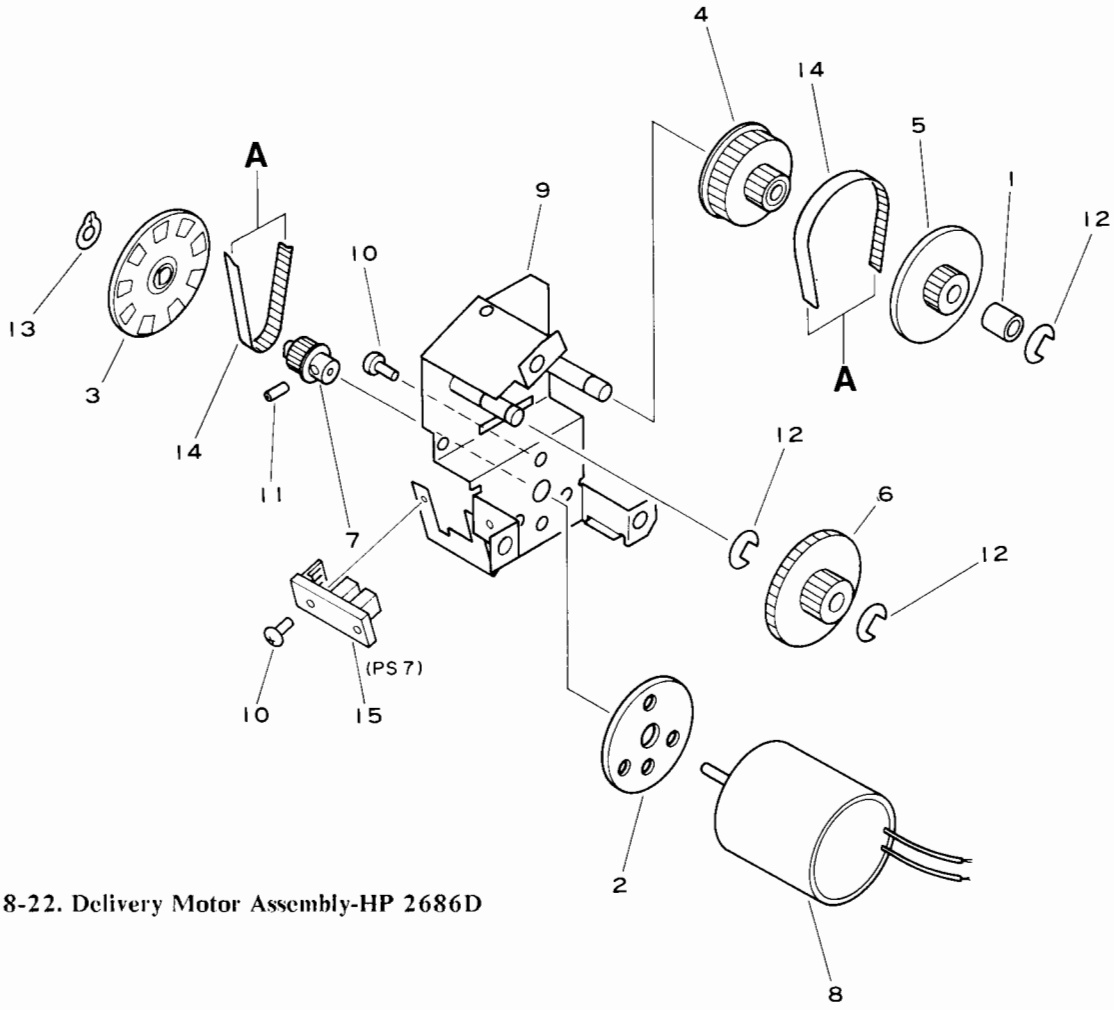


Figure 8-22. Delivery Motor Assembly-HP 2686D

Table 8-22. Delivery Assembly-HP 2686D.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0656-000CN	1		PAPER REVERSE MOTOR ASSEMBLY
1		1	@	COLLAR, SHAFT MOTOR
2		1	@	MOTOR SEAT, RUBBER
3		1	@	DISK, CLOCK
4		1	@	PULLEY, 17 T
5		1	@	GEAR, 51 T, 17 T
6		1	@	GEAR, 51 T, 19 T
7		1	@	PULLEY, 16 T
8	RH7-1025-000CN	1		MOTOR
9		1	@	PLATE, MOTOR MOUNTING
10		2	@	SCREW, M3X8
11		1	@	SETSCREW, M4X4
12		3	@	SCREW
13		1	@	RING, GRIP
14	XF9-0156-000CN	1		TIMING BELT
15	FH7-7038-000CN	1		PHOTO INTERRUPTER

@=non field-replaceable part

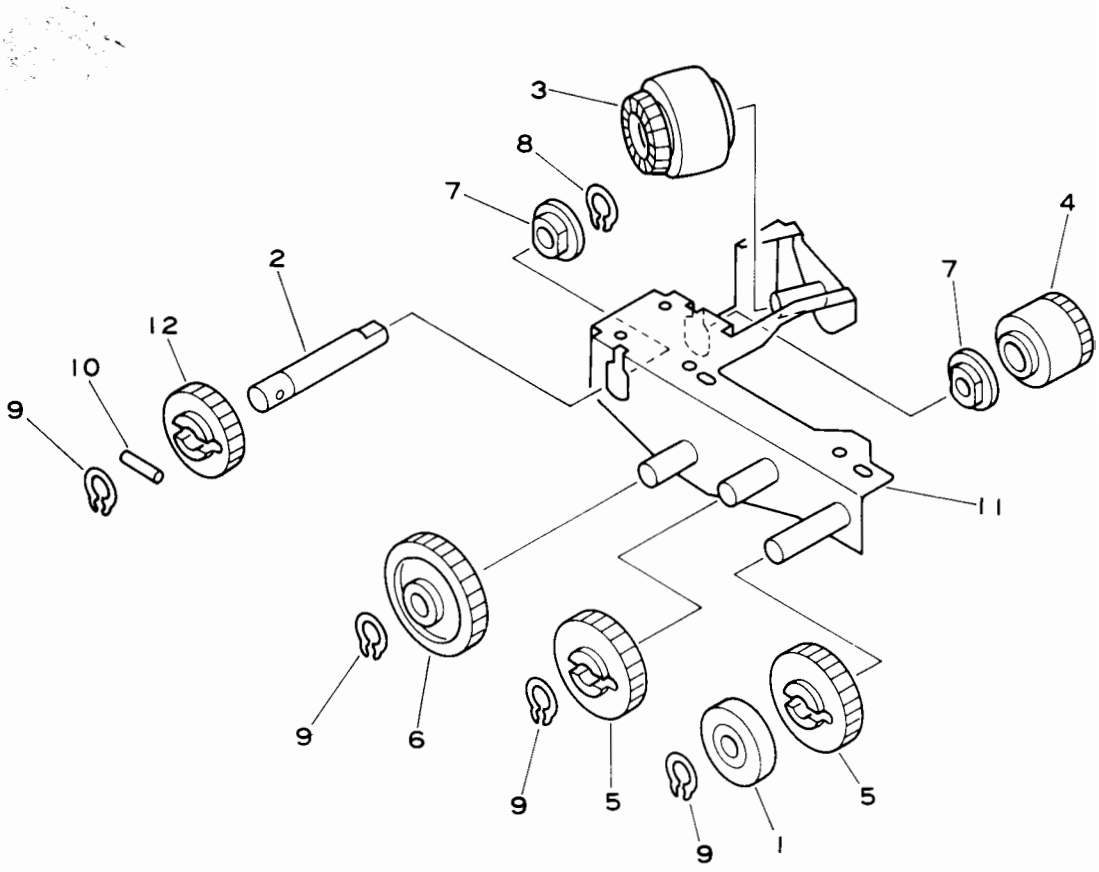


Figure 8-23. Manual Feed Assembly

Table 8-23. Manual Feed Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	FG1-2354-000CN	1		MANUAL FEED ASSEMBLY
1		1	@	SPACER, MANUAL FEED
2		1	@	SHAFT, MANUAL FEED DRIVE
3	FS1-0706-000CN	1		ROLLER, LOWER MANUAL FEED
4		1	@	GEAR, UNIVERSAL MANUAL FEED
5		2	@	GEAR, IDLER A
6		1	@	GEAR, IDLER B
7		2	@	BUSHING
8		1	@	E-RING
9		4	@	GRIP RING
10		1	@	PIN
11		1	@	FRAME, MANUAL FEED
12		1	@	GEAR, MANUAL FEED DRIVE

@=non field-replaceable part

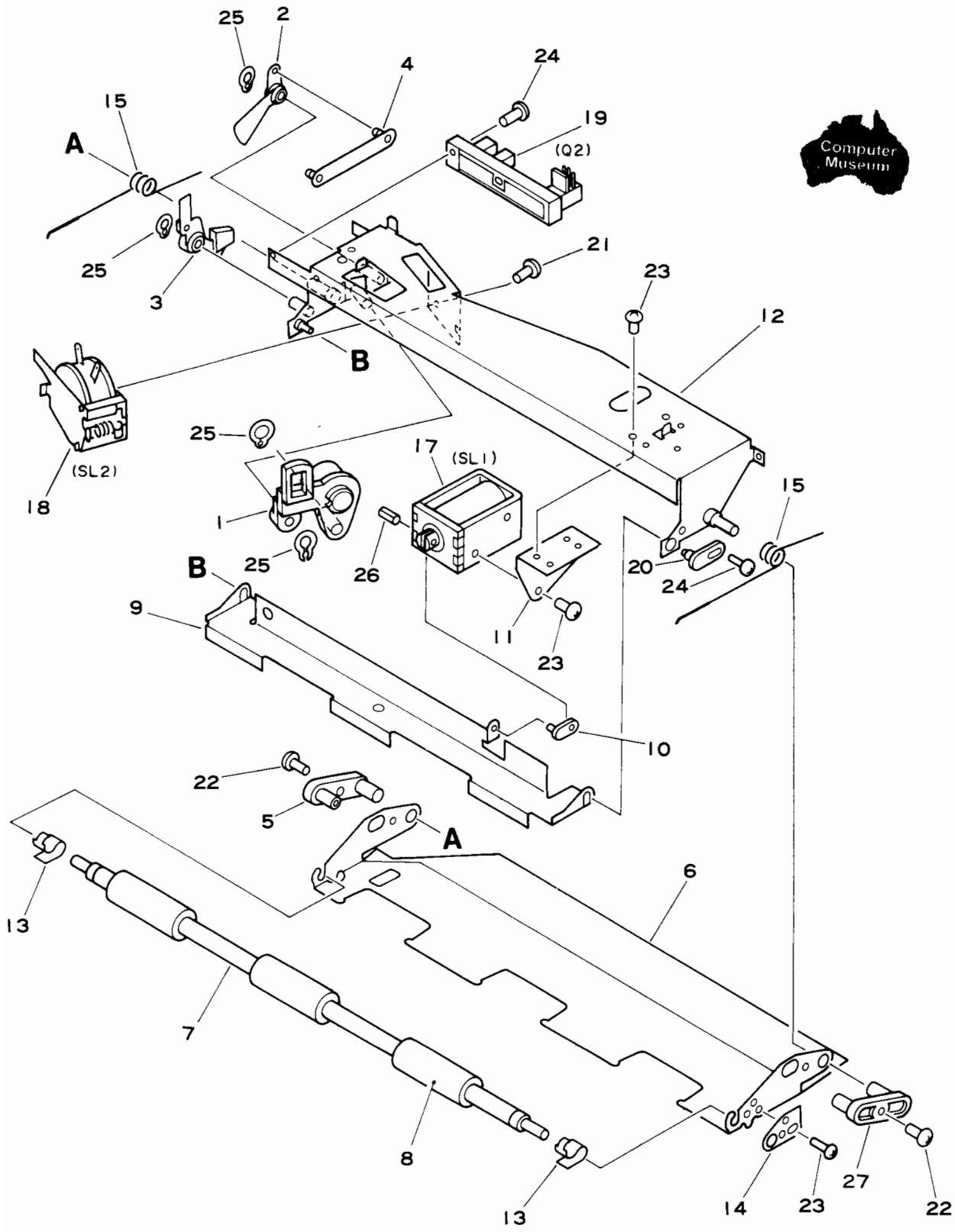


Figure 8-24. Registration Shutter Assembly

Table 8-24. Registration Shutter Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0215-000CN	1		REGISTRATION SHUTTER ASSEMBLY
1		1	@	ROLLER, UPPER MANUAL FEED
2		1	@	ARM, REGISTRATION 1
3		1	@	ARM, REGISTRATION 2
4		1	@	LINK, REGISTRATION
5		1	@	PIVOT, LEFT REG. SHUTTER
6		1	@	FRAME, REG. SHUTTER GUIDE
7		1	@	SHAFT, EP FEED ROLLER
8	FA2-5861-000CN	3		ROLLER, UPPER EP FEED
9		1	@	SHUTTER, REGISTRATION
10		1	@	LINK, REGISTRATION ARM
11		1	@	MOUNT, REGISTRATION SHUTTER
12		1	@	FRAME, UPPER REGISTRATION
13		2	@	CLIP, EP FEED ROLLER
14		1	@	PLATE, EP FEED ROLLER
15		2	@	SPRING, REGISTRATION SHUTTER
17	RH7-5001-000CN	1		SOLENOID, REGISTRATION
18	FH7-5033-020CN	1		SOLENOID, MANUAL FEED
19	FH7-7027-000CN	1		REGISTRATION SENSOR
20		1	@	GUIDE, REGISTRATION SHUTTER
21		1	@	SCREW, MACH., TRUSS HEAD M3X6
22		2	@	SCREW, MACH., TRUSS HEAD M3X8
23		2	@	SCREW, MACH., TRUSS HEAD M3X4
24		9	@	SCREW, MACH., TRUSS HEAD M3X8
25		3	@	GRIP RING
26		1	@	PIN, REG SOLENOID SHAFT
27		1	@	PIVOT, RIGHT REG. SHUTTER

@=non field-replaceable part

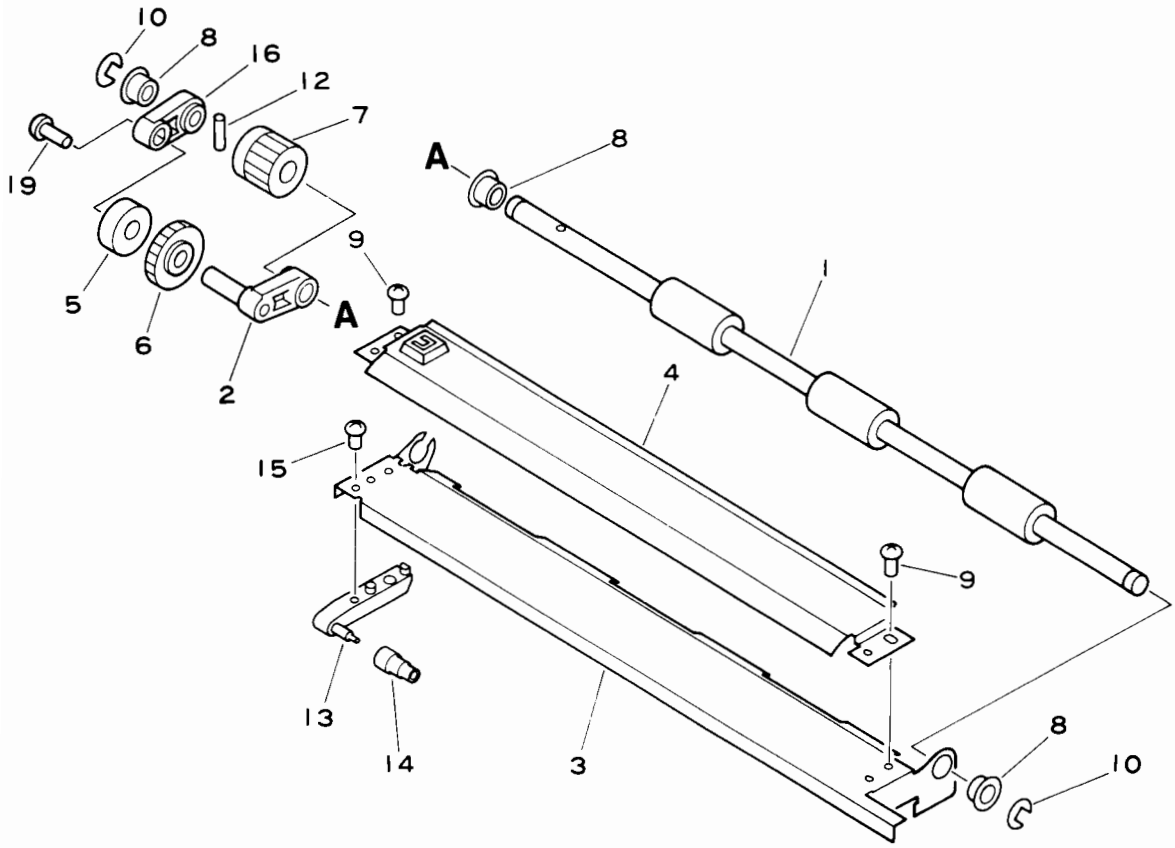


Figure 8-25. Transfer Guide Assembly

Table 8-25. Transfer Guide Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0195-000CN	1		TRANSFER GUIDE ASSEMBLY
1		1	@	ROLLER, LOWER EP FEED
2		1	@	ARM, TRANSFER GUIDE GEAR
3		1	@	GUIDE, LOWER TRANSFER
4		1	@	GUIDE, UPPER TRANSFER
5		1	@	SPACER, TRANSFER GUIDE
6		1	@	GEAR, TRANSFER GUIDE IDLER
7		1	@	GEAR, LOWER EP FEED DRIVE
8		3	@	BUSHING
9		2	@	SCREW, MACH., TRUSS HEAD M3X8
10		2	@	E-RING
12		1	@	PIN
13	FA2-5885-000CN	1		ARM, SEPARATION BELT
14	FA2-5886-000CN	1		ROLLER, SEPARATION BELT
15		1	@	SCREW, TAP., TRUSS HEAD M3X8
16		1	@	ARM, TRANSFER GEAR
19		1	@	SCREW, TP M3X8

@=non field-replaceable part

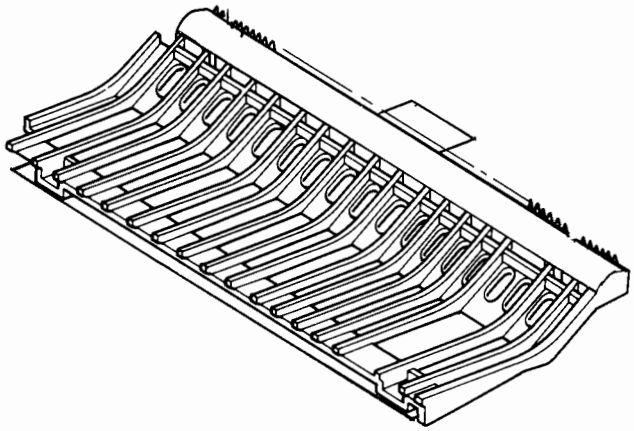


Figure 8-26. Feed Guide Assembly

Table 8-26. Feed Guide Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0192-050CN	1		FEED GUIDE ASSY

@=non field-replaceable part

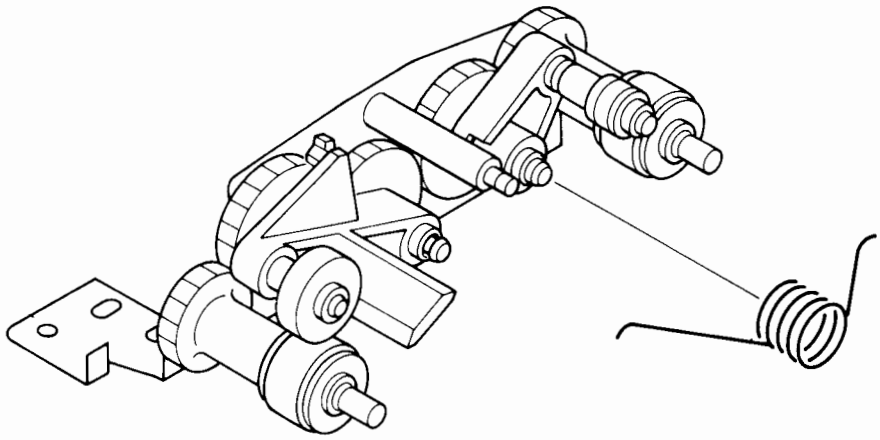


Figure 8-27. Separation/Feeder Assembly

Table 8-27. Separation/Feeder Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0194-000CN	1		SEPARATION/FEEDER ASSEMBLY

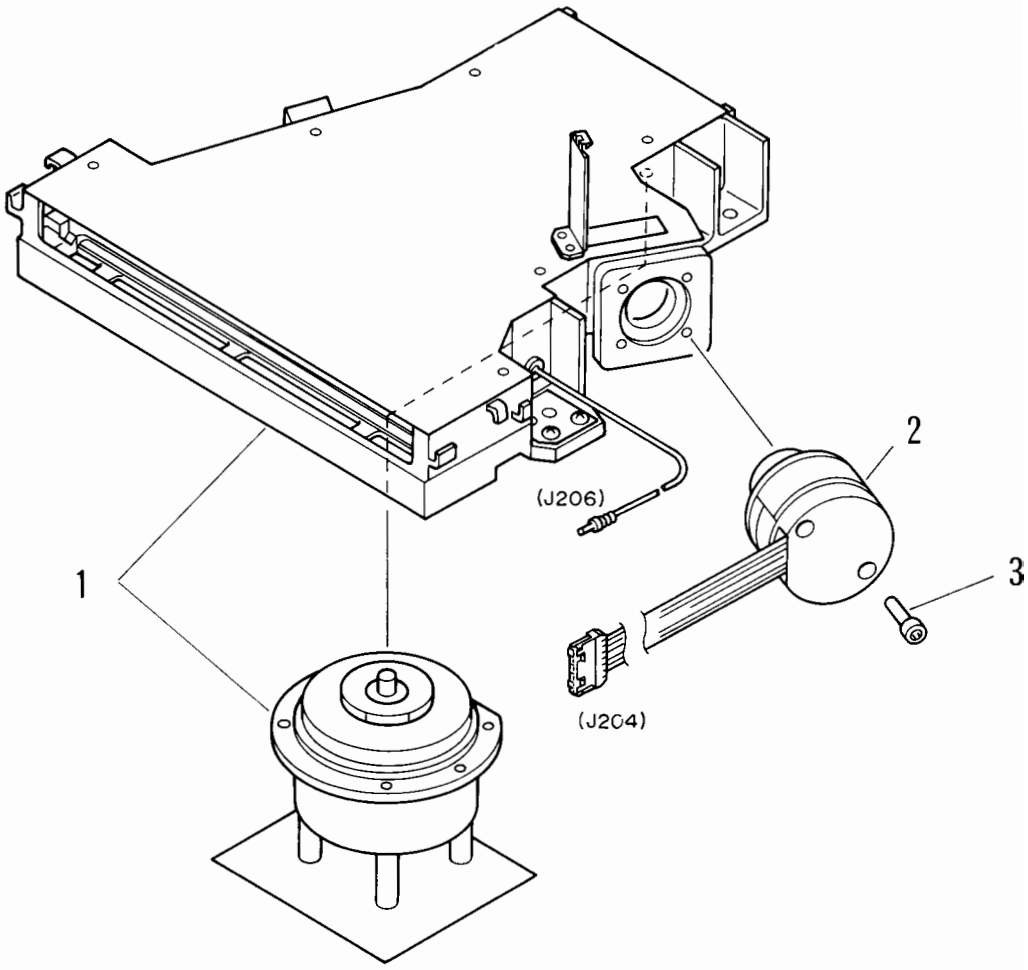


Figure 8-28. Laser Scanning Unit

Table 8-28. Laser Scanner Unit.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RG0-0018-000CN	1		SCANNER UNIT
2	RG0-0009-000CN	1		LASER UNIT
3	XB7-1040-109CN	2	*	SCREW, ALLEN HEAD M4X10

*=special order part

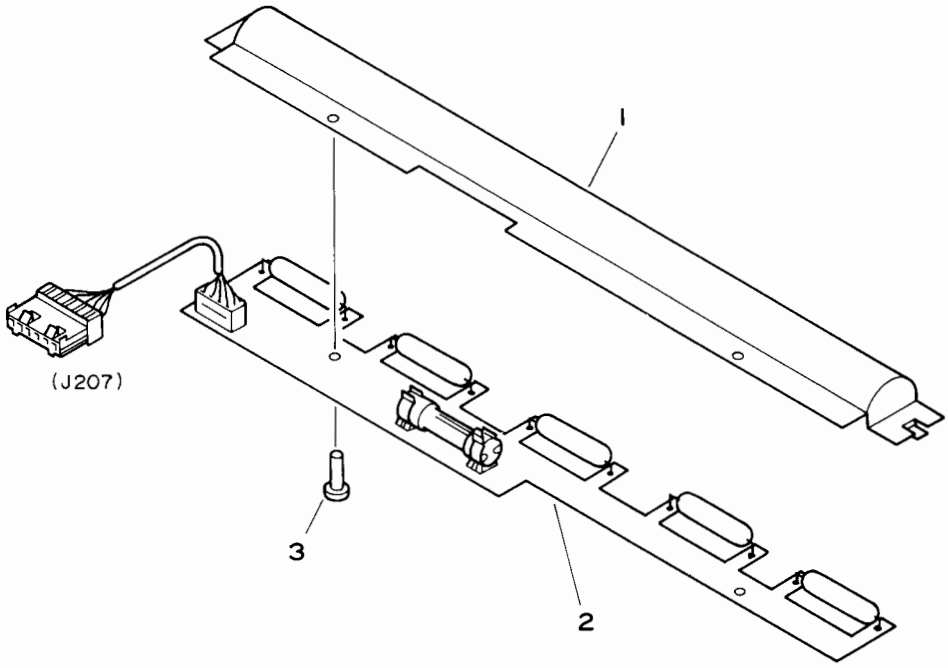


Figure 8-29. Erase Lamp Assembly

Table 8-29. Erase Lamp Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0214-000CN	1		ERASE LAMP ASSY
1		1	@	REFLECTOR
2		1	@	PCA, ERASE LAMP
3		2	@	SCREW, MACH., TRUSS HEAD M3X6

@=non field-replaceable part

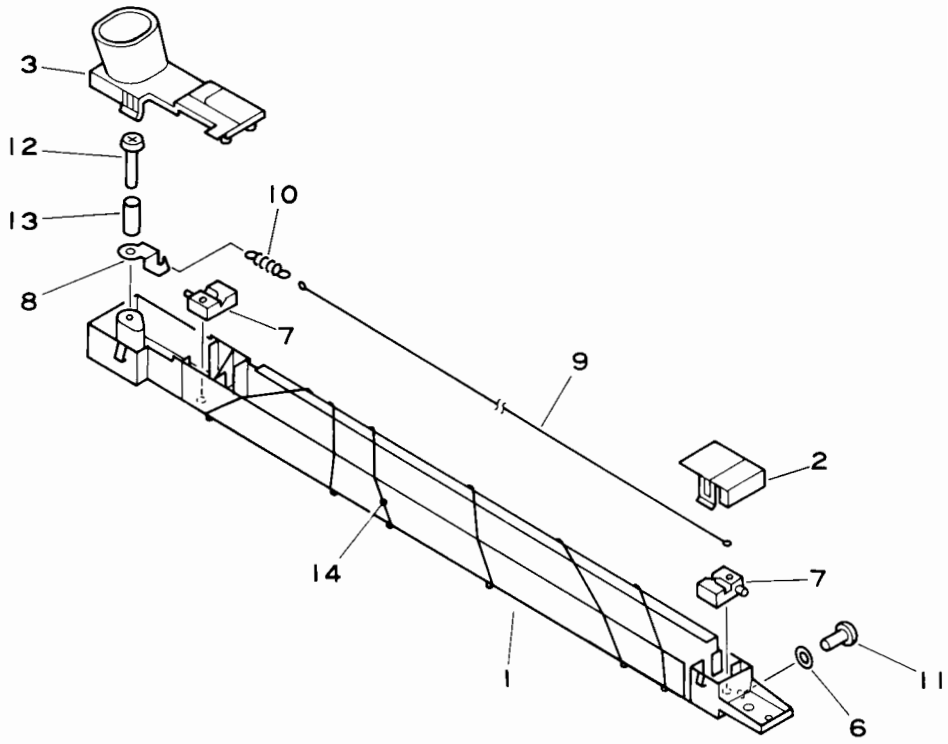


Figure 8-30. Transfer Corona Assembly

Table 8-30. Transfer Corona Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0191-020CN	1		TRANSFER CORONA ASSEMBLY
1		1	@	FRAME, TRANSFER CORONA
2		1	@	COVER, RIGHT TRANSFER CORONA
3		1	@	COVER, LEFT TRANSFER CORONA
6		2	@	SPACER
7		2	@	GUIDE, CORONA WIRE
8		1	@	TERMINAL, CORONA WIRE
9	FY1-0100-000CN	AR	@	WIRE, CORONA 0.08MM 100M/ROLL
10		1	@	SPRING, TRANSFER CORONA
11		2	@	SCREW, MACH., TRUSS HEAD M3X6
12		1	@	SCREW, MACH., TRUSS HEAD M3X16
13		1	@	SPACER, 3X11
14	RY1-1502-000CN	AR	@	GUIDE WIRE, TRAN. CORONA, ROLL

@=non field-replaceable part
AR=as required

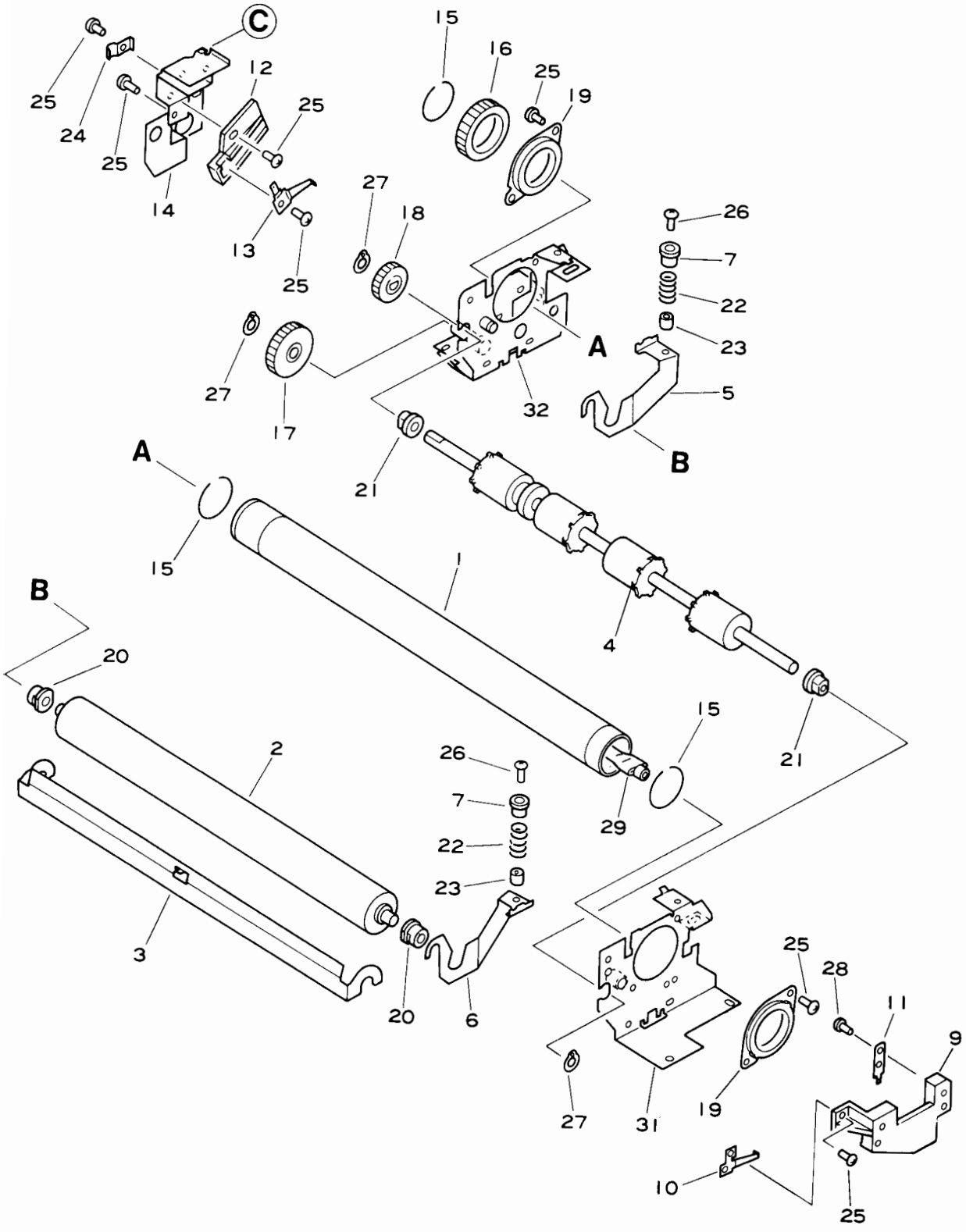


Figure 8-31. Fusing Assembly (1 of 2)

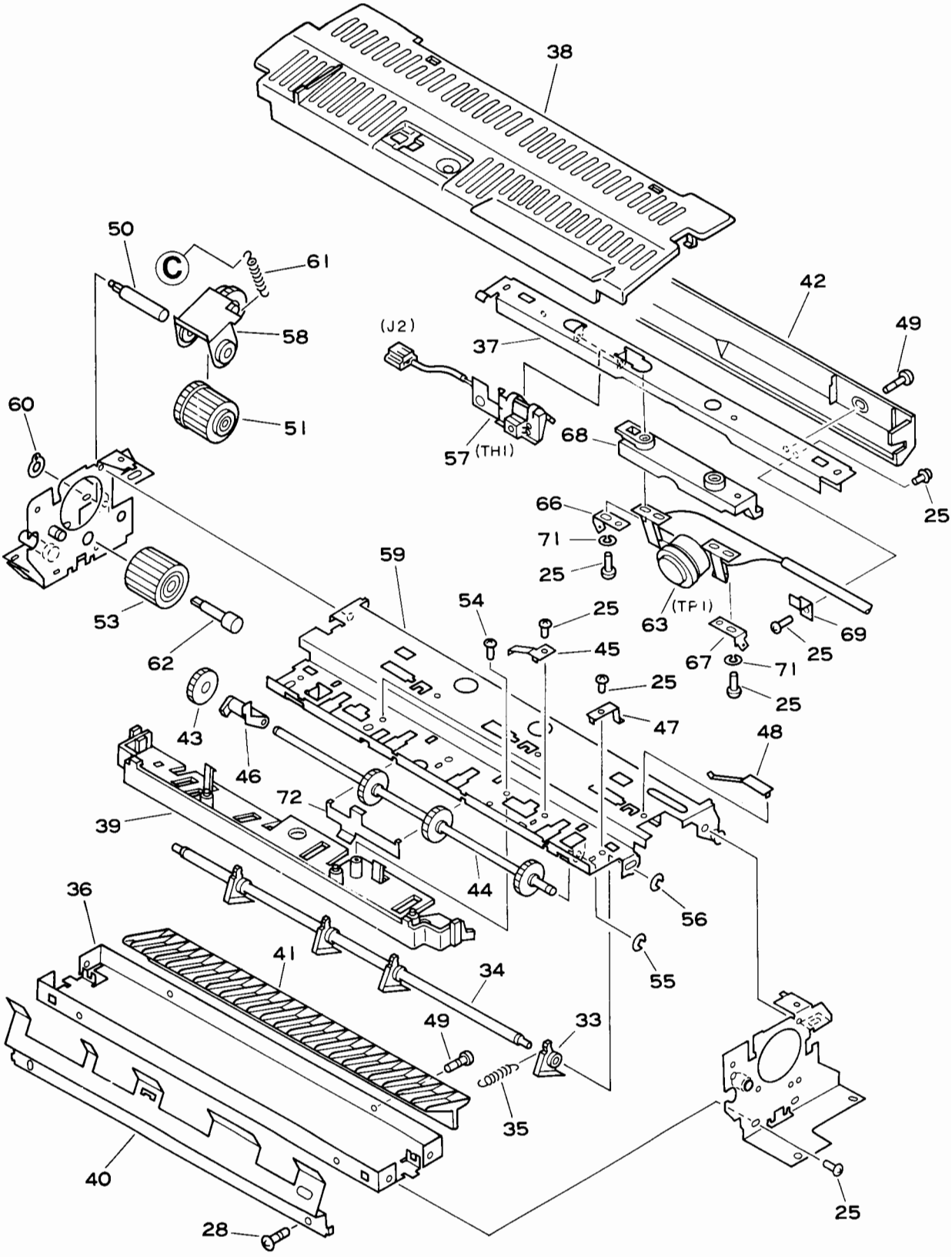


Figure 8-31. Fusing Assembly (2 of 2)

Table 8-31. Fusing Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0198-000CN	1		FUSING ASMBLY (220/240V 50 HZ)
	RG1-0197-000CN	1		FUSING ASSEMBLY (115V 60 HZ)
1		1	@	ROLLER, FUSING
2		1	@	ROLLER, PRESSURE
3		1	@	GUIDE, FUSING SEPARATION
4	FA2-5939-000CN	1		ROLLER, PAPER EXIT
5		1	@	ARM, LEFT PRESSURE ROLLER
6		1	@	ARM, RIGHT PRESSURE ROLLER
7		2	@	BUSHING
9	FA2-5964-000CN	1	*	HOLDER, RIGHT FUSER BULB
10	FA2-9824-000CN	1		CONTACT, RIGHT FUSER BULB
11	FA2-5966-020CN	1		TERMINAL, RIGHT FUSER
12	FA2-5967-000CN	1	*	HOLDER, LEFT FUSER BULB
13	FA2-5968-000CN	1		TERMINAL, LEFT FUSER
14	FA2-5969-000CN	1	*	MOUNT, LEFT FUSER
15	FA2-5971-020CN	3	*	RING, RETAINING
16		1	@	GEAR, FUSER DRIVE
17	FS1-0716-000CN	1		GEAR, FUSER IDLER
18	FS1-0717-000CN	1		GEAR, PAPER EXIT DRIVE
19	FS1-1203-000CN	2		BEARING, FUSER ROLLER
20	FS1-1204-000CN	4		BUSHING
21	FS1-1205-000CN	2		BUSHING
22	FS1-2657-000CN	2		SPRING, PRESSURE ROLLER
23	XZ1-1301-805CN	2	*	SPACER, PRESSURE ROLLER
24	FA2-5981-000CN	1	*	CLAMP, FUSER CORD
25	XB1-2300-609CN	26	*	SCREW, MACH., TRUSS HEAD M3X6
26	XB1-2302-509CN	2	*	SCREW, MACH., TRUSS HEAD M3X25
27	XD2-2100-602CN	3	*	GRIP RING
28	XB6-6300-809CN	2	*	SCREW, W/WASHER, M3X8
29	RH7-4007-000CN	1		FUSER BULB, (60 HZ)
29	RH7-4009-000CN	1		FUSER BULB, (50 HZ)
31		1	@	FRAME, RIGHT FUSER
32		1	@	FRAME, LEFT FUSER
33	FA2-5938-000CN	4		PAWL, SEPARATION
34		1	@	SHAFT, SEPARATION PAWL
35	FS1-2658-000CN	4		SPRING, SEPARATION PAWL
36		1	@	FRAME, FUSER BASE
37		1	@	CROSSMEMBER, UPPER FUSER
38		1	@	TOP COVER, FUSER
39		1	@	GUIDE, UPPER PAPER EXIT
40		1	@	BRACKET, LOWER PAPER EXIT
41		1	@	GUIDE, LOWER PAPER EXIT
42		1	@	COVER, REAR FUSING

Table 8-31. Fusing Assembly (continued)

43	FA2-5957-000CN	4		ROLLER, PAPER EXIT
44		1	@	SHAFT, PAPER EXIT ROLLER
45		2	@	LEAF SPRING, TOP PAWL SHAFT
46	FA2-5960-000CN	1		ARM, PAPER EXIT SENSOR
47		2	@	LEAF SPRING, SIDE PAWL SHAFT
48		3	@	LEAF SPRING, FUSER
49		6	@	SCREW, M3
50		1	@	SHAFT, REAR FUSER IDLER GEAR
51		1	@	GEAR, REAR FUSER IDLER
53		1	@	GEAR, FRONT FUSER IDLER
54		2	@	SCREW, TAP., TRUSS HEAD M3X8
55		2	@	E-RING
56		2	@	E-RING
57	RH7-7002-000CN	1		THERMISTOR
58		1	@	MOUNT, FUSER DRIVE GEAR
59		1		FRAME, UPPER FUSER
60	XD2-2100-402CN	2		GRIP RING
61	FS1-2676-000CN	1		SPRING, FUSER DRIVE
62		1	@	SHAFT, FRONT FUSER IDLER GEAR
63	FH7-7041-000CN	1		THERMO PROTECTOR
66		1	@	TERMINAL, LEFT THERMO PROTECTOR
67		1	@	TERMINAL, RHT THERMO PROTECTOR
68		1	@	MOUNT, THERMO PROTECTOR
69		1	@	GUIDE, FUSER CORD
70		2	@	SCREW, MACH., TRUSS HEAD M3X4
71		4	@	WASHER, SPRING
72		1	@	PLATE, PAPER EXIT

*=special order part

@=non field-replaceable part

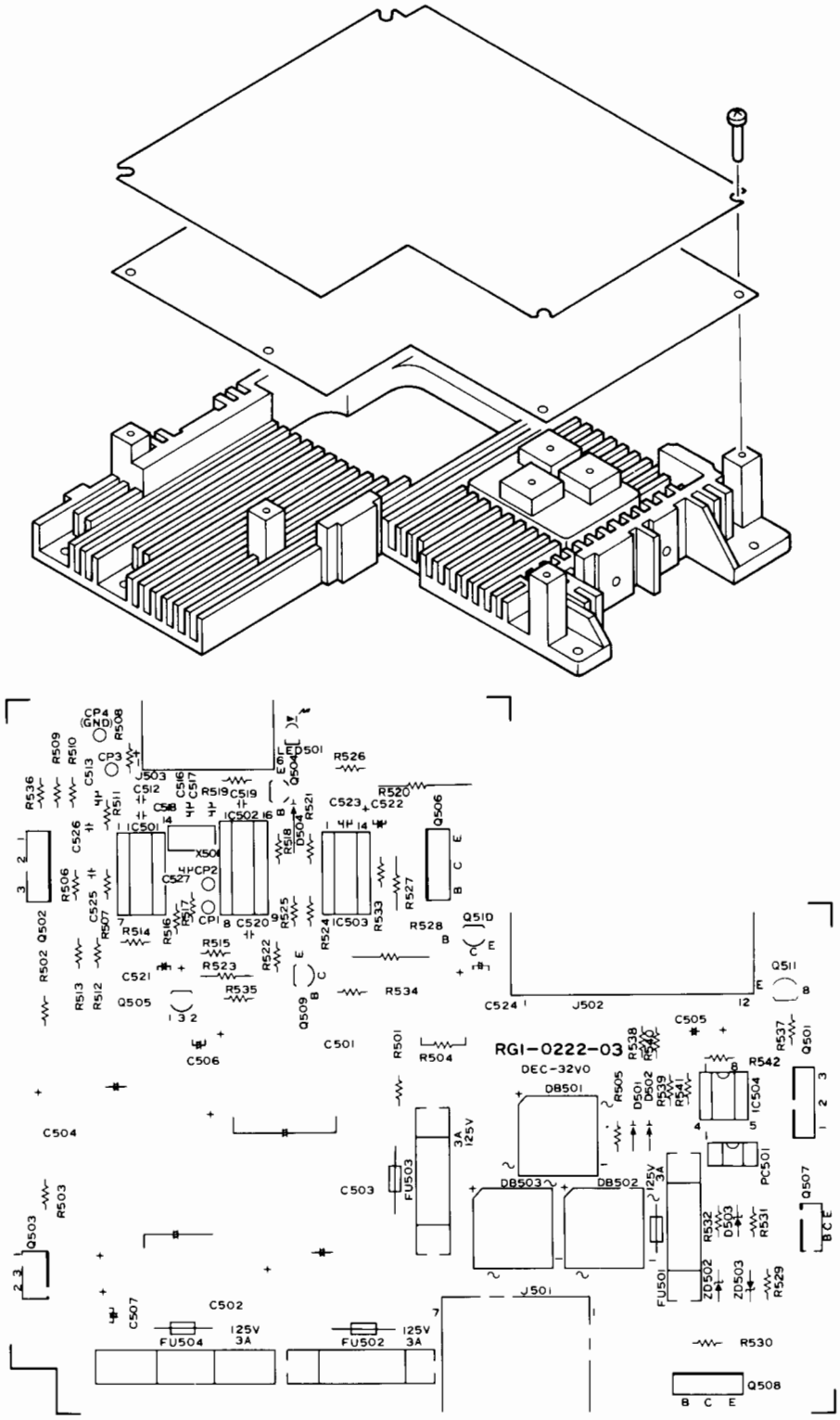
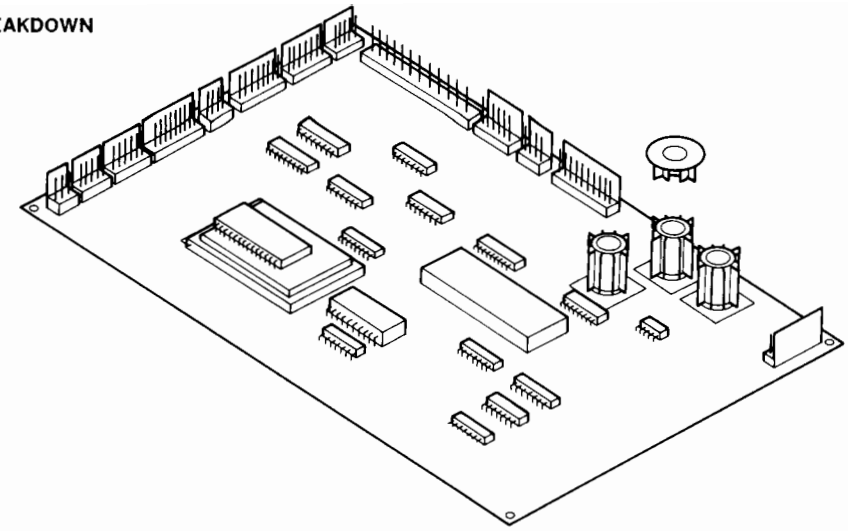


Figure 8-32. DC Power Supply/Main Motor Driver PCA

Table 8-32. DC Power Supply/Main Motor Driver PCA.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0222-000CN	1		DC PSU/MMD PCA (60 HZ) HP 2686A
	RG1-0221-000CN	1		DC PSU/MMD PCA (50 HZ) HP 2686AB/AU
	RG1-0468-000CN	1		DC PSU/MMD PCA (60 HZ) HP 2686D
	RG1-0624-000CN	1		DC PSU/MMD PCA (50 HZ) HP 2686DB/DU



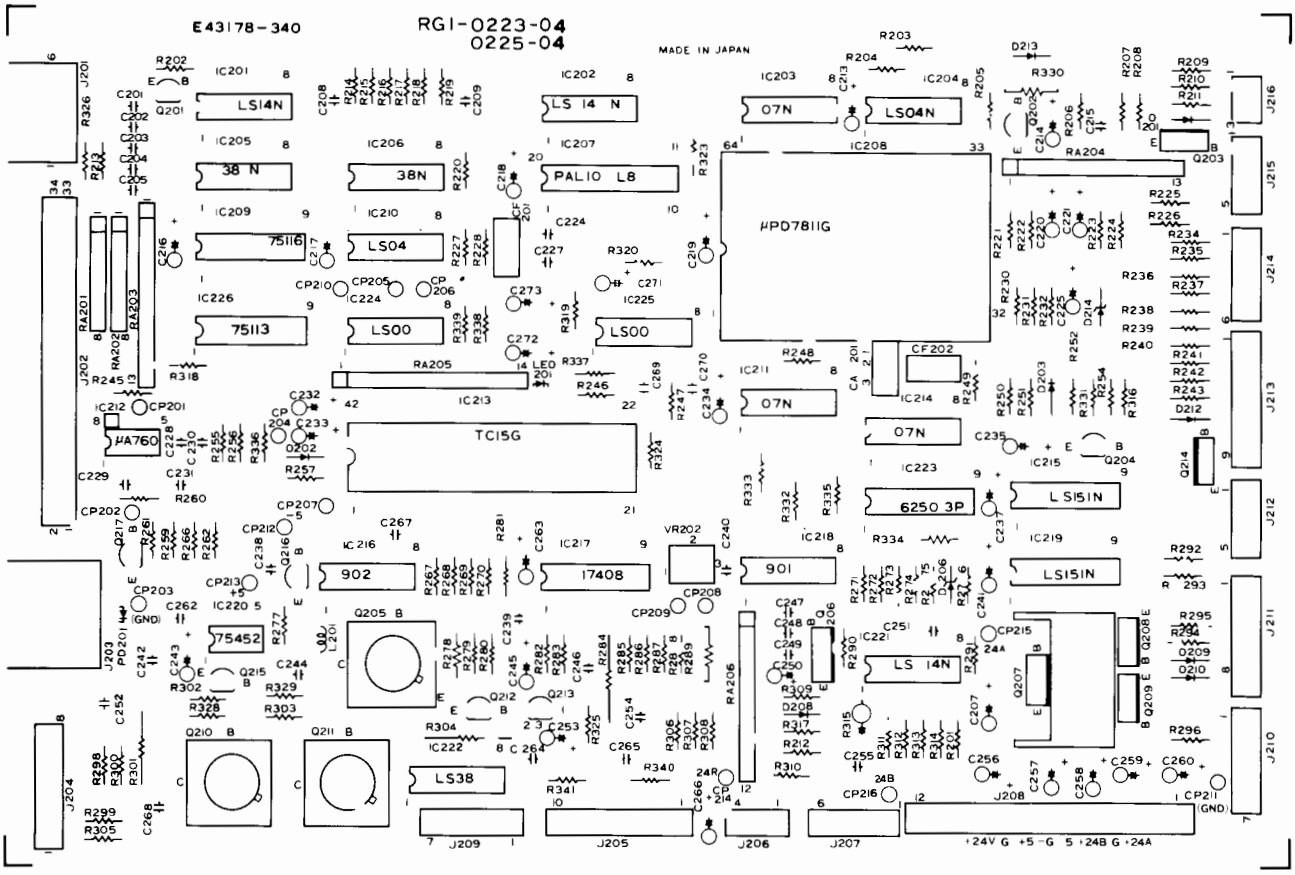


Figure 8-33. DC Controller PCA

Table 8-33. DC Controller PCA.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	RG1-0225-070CN	1	a	DC CONTROLLER PCA (300 DPI)
1	RG1-0560-000CN	1	d	DC CONTROLLER PCA (300 DPI)

a=HP 2686A models only
d=HP 2686D models only

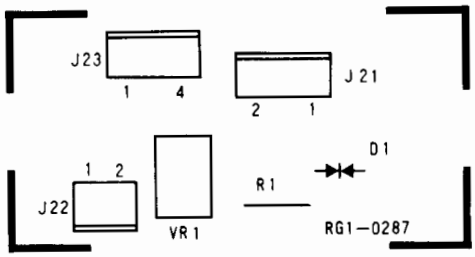
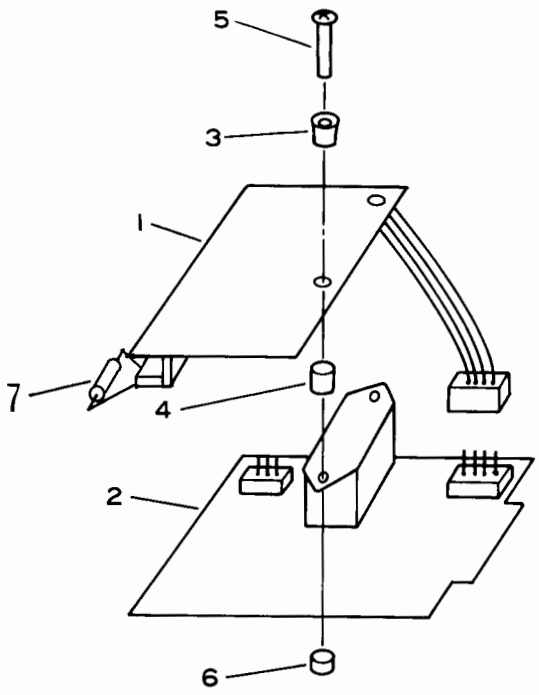
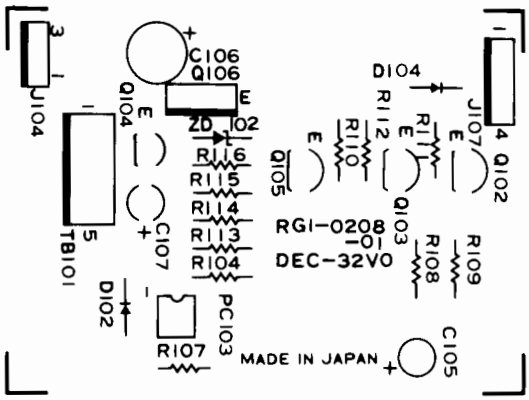


Figure 8-34. Varistor PCA

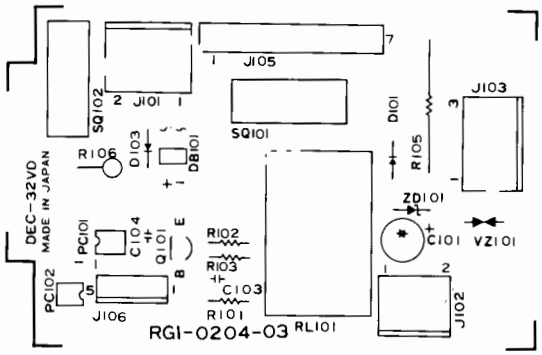
Table 8-34. Varistor PCA.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0287-000CN	1		VARISTOR PCA





Fusing Safety PCA



AC Controller PCA

Figure 8-35. AC Driver PCA (Fuser Safety PCA and AC Controller PCA)

Table 8-35. AC Driver Assembly.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
	RG1-0204-060CN	1		AC DRIVER ASSEMBLY (60 HZ)
	RG1-0205-000CN	1		AC DRIVER ASSEMBLY (50 HZ)
1	RG1-0208-040CN	1		FUSING SAFETY PCA (50/60 HZ)
2	RG1-0209-000CN	1		AC CONTROLLER PCA (60 HZ)
2	RG1-0210-000CN	1		AC CONTROLLER PCA (50 HZ)
3	WT2-0218-000CN	2	*	BUSHING
4	WT2-0220-000CN	2	*	SLEEVE, AC DRIVER
5	XB1-1302-009CN	2	*	SCREW, MACH., PAN HEAD M3X20
6	XB7-2100-309CN	2	*	NUT, HEX, M3
7	FF1-3872-000CN	1		47 OHM, 1/4 W RESISTOR

*=special order part

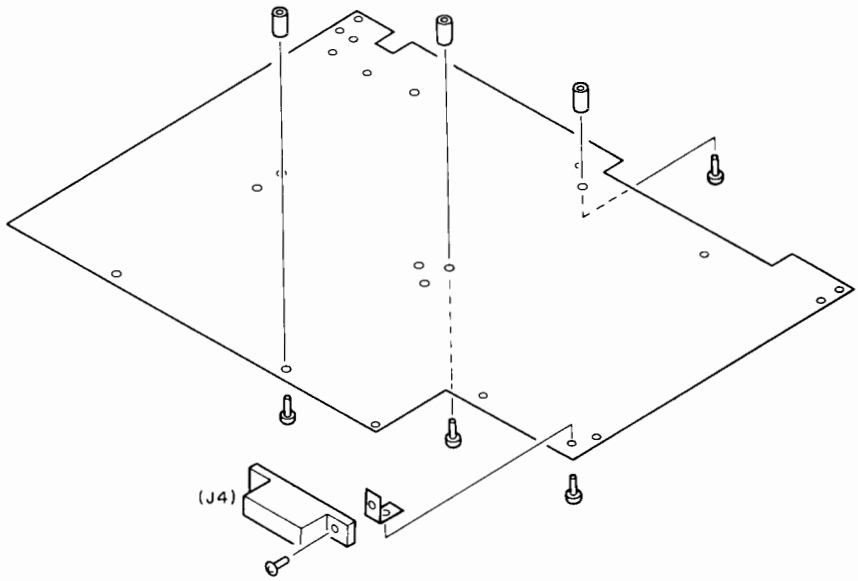


Figure 8-36. Interface Controller PCA

Table 8-36. I/F Controller PCA.

REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	SG4-6014-040CN	1		I/F PCA HP 2686A (60 HZ)
1	SG4-6019-000CN	1		I/F PCA HP 2686A 50 HZ (AB,AU)
1	SG4-6022-000CN	1		I/F PCA HP 2686A (50/60 HZ) OPT 200, 210, 300 AND HP 2686D (50/60 HZ)

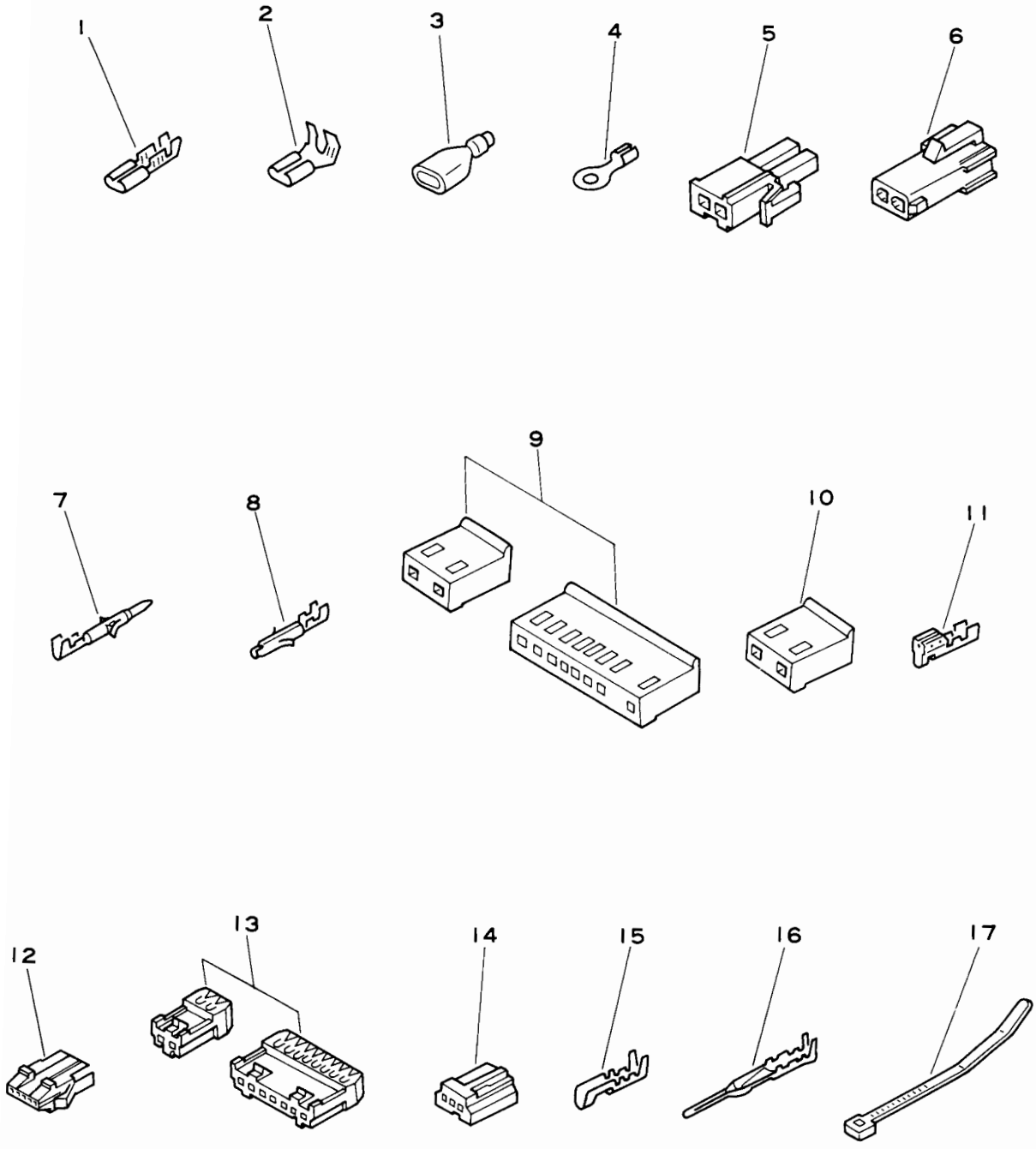


Figure 8-37. Connectors and Terminals

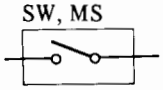
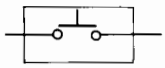
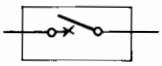
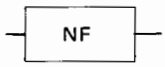
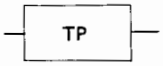
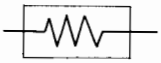
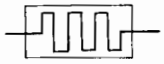
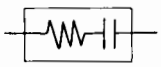
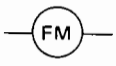
Table 8-37. Connectors and Terminals.

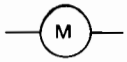
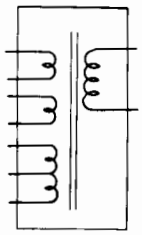
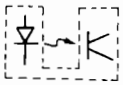
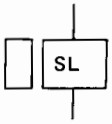
REF	PART NUMBER	QTY	NOTES	DESCRIPTION
1	WS3-1013-000CN	AR	*	SOCKET, FASTON 187, 20-24AWG
1	WS3-1014-000CN	AR	*	SOCKET, FASTON 187, 16-20AWG
1	WT1-0017-000CN	AR	*	SOCKET, FASTON 250, 18-22AWG
1	WT1-0040-000CN	AR	*	SOCKET, FASTON 187, 20-24AWG
1	WT1-0147-000CN	AR	*	SOCKET, FASTON 187, 16-20AWG
1	WT1-0148-000CN	AR	*	SOCKET, FASTON 110, 20-24AWG
1	WT1-0216-000CN	AR	*	SOCKET, FASTON 30, 22-24AWG
1	X62-5334-000CN	AR	*	SOCKET, FASTON 250, 14-18AWG
1	X66-6662-000CN	AR	*	SOCKET, FASTON 187, 20-24AWG
2	WT1-0155-000CN	AR	*	SOCKET, FASTON 187, 16-20AWG
3	WT1-0023-000CN	AR	*	SLEEVE, FASTON 250
3	WT1-0026-000CN	AR	*	SLEEVE, FASTON 110
3	WT1-0029-000CN	AR	*	SLEEVE, FASTON 187
3	WT1-0041-000CN	AR	*	SLEEVE, FASTON 187
4	WT1-0214-000CN	AR	*	TERMINAL, RING
4	WT1-0218-000CN	AR	*	TERMINAL, RING
4	X62-6765-000CN	AR	*	TERMINAL, RING, 4.3MM
5	VS4-0002-002CN	AR	*	CONNECTOR, 2P, FEMALE
6	VS4-0001-002CN	AR	*	CONNECTOR, 2P, MALE
7	WS4-0218-000CN	AR	*	SOCKET, CONTACT, 22-26AWG
8	WS4-0219-000CN	AR	*	PIN, CONTACT, 18-22AWG
9	VS3-0044-002CN	AR	*	CONNECTOR, PCA, 2P, FEMALE
9	VS3-0044-007CN	AR	*	CONNECTOR, PCA, 7P, FEMALE
9	VS3-0044-012CN	AR	*	CONNECTOR, PCA, 12P, FEMALE
10	VS3-0047-002CN	AR	*	CONNECTOR, PCA, 2P, FEMALE
11	WS3-0916-000CN	AR	*	SOCKET, CONTACT, 18-24AWG
12	VS3-0108-005CN	AR	*	CONNECTOR, 5P, FEMALE
12	VS3-0108-006CN	AR	*	CONNECTOR, 6P, FEMALE
13	VS1-0066-002CN	AR	*	CONNECTOR, 2P, FEMALE
13	VS1-0066-003CN	AR	*	CONNECTOR, 3P, FEMALE
13	VS1-0066-004CN	AR	*	CONNECTOR, 4P, FEMALE
13	VS1-0066-005CN	AR	*	CONNECTOR, 5P, FEMALE
13	VS1-0066-006CN	AR	*	CONNECTOR, 6P, FEMALE
13	VS1-0066-007CN	AR	*	CONNECTOR, 7P, FEMALE
13	VS1-0066-008CN	AR	*	CONNECTOR, 8P, FEMALE
13	VS1-0066-009CN	AR	*	CONNECTOR, 9P, FEMALE
13	VS1-0066-010CN	AR	*	CONNECTOR, 10P, FEMALE
13	VS1-0186-003CN	AR	*	CONNECTOR, 3P, FEMALE
14	WS3-0429-000CN	AR	*	CONNECTOR, 3P, FEMALE
14	WS3-0430-000CN	AR	*	CONNECTOR, 4P, FEMALE
15	WS3-0437-000CN	AR	*	SOCKET, CONTACT, 20-30AWG
16	WS3-0885-000CN	AR	*	PIN, CONTACT, 20-30AWG
17	WT2-0030-000CN	AR	*	TIE, CABLE

*=special order part
AR=as required

APPENDIX

Appendix A. Component Symbols and Functions

Symbol	Type	Code	Function
SW, MS 	Switches	SW1	Power switch
		SW2	Test switch
		MS1	Door switches
		MS2	
		MS3	Drum sensitivity detection
		MS4	
		MS5	Cassette size switches
		MS6	
		MS7	
		MS8	NO CARTRIDGE detection
		MS9	Face up/Face down Microswitch
		MS10	Cassette Size Microswitches (Lower)
		MS11	
		MS12	
CB 	Circuit breaker	CB1	Protects all loads
NF 	Noise filter	NF1	Power line noise filter
		NF2	AC Line Noise Filter
TP 	Thermoprotector	TP1	Protects the fuser from excessive temperature (245° C)
TH 	Thermistor	TH1	Senses fuser roller surface temperature
H 	Bulb	H1	Fusing bulb (500W)
Q 	Triac	Q1	Control the fuser
SQ 	Noise suppressor	SQ1	Eliminates electrical noise (voltage spikes) from lines to protect Q1
FM 	Fan	FM1	Cooling fan

Symbol	Type	Code	Function
M 	Motor	M1	Main motor
		M2	Delivery Motor
PT 	Transformer	PT1	For DC power supply
		PT2	Interface Power Supply
TM 	Timer	TM1	Page counter
LA 	Lamps	LA1	Erase lamps
		LA2	
		LA3	
		LA4	
		LA5	
PS 	Photointerrupters	PS1	Pickup detection
		PS2	PAPER OUT detection
		PS3	Paper exit
		PS4	Lower Paper Out Sensor
		PS5	Tray Inlet Sensor
		PS6	Paper Delivery Sensor
		PS7	Slotted Disk Sensor
SL 	Solenoids	SL1	Control of registration shutter
		SL2	Control of manual pickup roller
		SL3	Control of clutch of cassette pickup roller
		SL4	Pickup Roller Clutch Solenoid (Lower)
		SL5	Pickup Roller Clutch Solenoid (Upper)
		SL6	Job Offset Solenoid
LED 	LEDs	LED1	Control Panel
		LED2	
		LED3	
		LED4	
		LED5	
VZ 	Varistor	VZ1	Regulates grid bias voltage of the primary corona ass'y
	Variable resistors	VR1	Control of voltage of grid bias on primary corona
		VR2	Control of print density

Appendix B. Solenoids, Sensors and Microswitches

The following tables refer to the component number found on drawings throughout this manual. the component name and the signal designator.

SENSORS (PS)

SENSOR NUMBER	FUNCTION (signal)
PS1	Registration Sensor (PFS)
PS2	Upper Paper Out Sensor (PEMP)
PS3	Fuser Exit Sensor (PDP)
PS4	Lower Paper Out Sensor (PEMP)
PS5	Tray Inlet Sensor (THRS)
PS6	Paper Delivery Sensor (PDPA)
PS7	Slotted Disk Sensor (CLKP)

SOLENOIDS (SL)

SOLENOID NUMBER	FUNCTION (signal)
SL1	Registration Solenoid (RGSD)
SL2	Manual Feed Solenoid (MPUSD)
SL3	Pickup Roller Clutch Solenoid (Upper) (UPUSD)
SL4	Pickup Roller Clutch Solenoid (Lower-HP 2686D)(LPUSD)
SL5	Tray Feed-out Clutch Solenoid (FCDSL)
SL6	Job Offset Solenoid (SHTSL)

MICROSWITCHES (MS)

MS NUMBER	FUNCTION
MS1	Door Microswitch
MS2	Door Microswitch
MS3	Drum Sensitivity Microswitch
MS4	Drum Sensitivity Microswitch
MS5	HP 2686A Casette MS or HP 2686D Upper Casette MS
MS6	HP 2686A Casette MS or HP 2686D Upper Casette MS
MS7	HP 2686A Casette MS or HP 2686D Upper Casette MS
MS8	EP Cartridge Microswitch
MS9	Face up/Face down Microswitch
MS10	HP 2686D Lower Cassette Microswitch
MS11	HP 2686D Lower Cassette Microswitch
MS12	HP 2686D Lower Cassette Microswitch

Appendix C. Verifying Operation

Communication Verification Using BASIC

The folllowing BASIC 2.1 program verifies that the computer and the printer are communicating properly. Power on the printer and set on-line. Enter the program manually (note that the italic commands are for information only and do not need to be entered for the program to run).

```
A>BASIC
10 LPRINT CHR$(27)+"E"                    'Resets the printer
20 LPRINT "LASERJET COMMUNICATION OK!"
30 LPRINT CHR$(13);                       'Carriage return
40 LPRINT CHR$(12);                       'Form feed
50 END
```

The print-out should look like the following example:

LASERJET COMMUNICATION OK!

Communication Verifiication Using MS-DOS

This exercise verifies that the computer and the printer are communicating properly. To verify the communication link using MS-DOS commands. enter the following:

```
A>COPY CON:LJTEST (return)

LASERJET COMMUNICATION OK! (return)

CTRL Z (press control and Z simultaneously) (return)

    1 file(s) copied

A>PRINT LJTEST PRN: (return)

    Name of print device [PRN]: (return)

A>
```

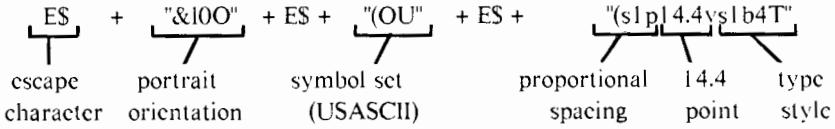
The printout should look like the example shown above.

Font Cartridge Verification

To test an HP 92286B font cartridge for proper operation, enter the following BASIC program. The italic commands are optional and do not need to be entered.

```
100 REM *******Font Cartridge Test*******
110 REM
120 E$=CHR$ (27)
130 LPRINT E$ + "E";                                          ' Resets the printer
140 LPRINT E$ + "&a10L";                                      ' Sets the Left Margin = 10
150 LPRINT
160 LPRINT TAB(24) "ASCII = CHARACTER"                        ' Outputs Title
170 LPRINT
180 LPRINT
190 LPRINT E$ + "&l0O" + E$ + "(0U" + E$ + "(s1p14.4vs1b4T";  ' See note below
200 T = 1
210 FOR N = 32 TO 127
220 LPRINT TAB(T);
230 LPRINT N "= " CHR$(N);                                    ' Prints USASCII character
240 T = T + 11 : IF T = 67 THEN T = 1
250 NEXT
260 LPRINT CHR$(12);                                          ' Form Feed
```

The print sample below was printed with an HP 92286B Font Cartridge. Other samples can be printed by modifying the escape sequence on line 190. NOTE: The purpose of each section of the escape sequence is explained below:



For further information on using escape sequences, consult the Operator's Manual or the Technical Reference Manual.

ASCII = CHARACTER

32 =	33 = !	34 = "	35 = #	36 = $	37 = %
38 = &	39 = '	40 = (	41 =)	42 = *	43 = +
44 = ,	45 = -	46 = .	47 = /	48 = 0	49 = 1
50 = 2	51 = 3	52 = 4	53 = 5	54 = 6	55 = 7
56 = 8	57 = 9	58 = :	59 = ;	60 = <	61 = =
62 = >	63 = ?	64 = @	65 = A	66 = B	67 = C
68 = D	69 = E	70 = F	71 = G	72 = H	73 = I
74 = J	75 = K	76 = L	77 = M	78 = N	79 = O
80 = P	81 = Q	82 = R	83 = S	84 = T	85 = U
86 = V	87 = W	88 = X	89 = Y	90 = Z	91 = [
92 = \	93 =]	94 = ^	95 = _	96 = `	97 = a
98 = b	99 = c	100 = d	101 = e	102 = f	103 = g
104 = h	105 = i	106 = j	107 = k	108 = l	109 = m
110 = n	111 = o	112 = p	113 = q	114 = r	115 = s
116 = t	117 = u	118 = v	119 = w	120 = x	121 = y
122 = z	123 = {	124 = |	125 = }	126 = ~	127 = ▒

INDEX

INDEX

E

F

G

H

P

R

S

T

U

V

W