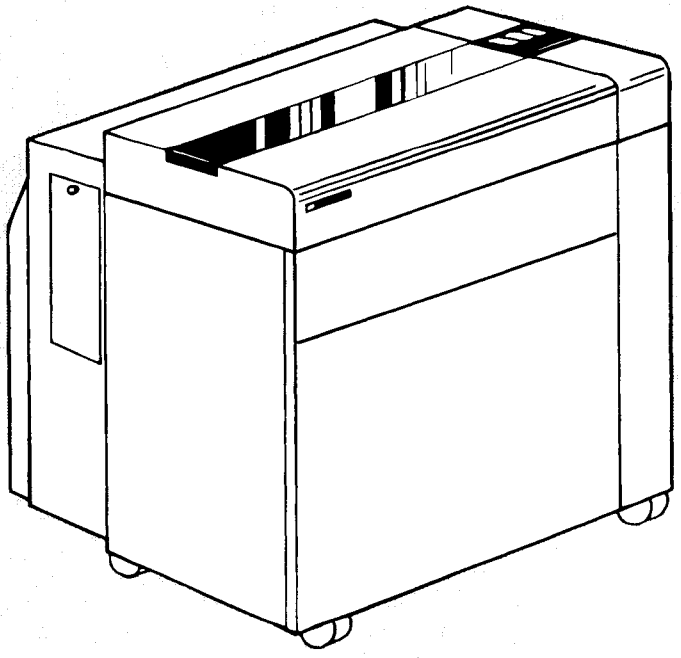
HEWLETT PACKARD

2566B/C 2567B/C
Service Manual

Manual P/N 02566-90993



PUBLICATION HISTORY

Changes in text to document updates subsequent to the initial release are supplied in manual update notices and/or complete revisions to the manual. The history of any changes to this edition of the manual is given below. The last update itemized reflects the machine configuration documented in the manual.

Any changed pages supplied in an update package are identified by a date centered at the bottom of each page.

First Edition, May 1992
Second Edition, June 1994

NOTICE

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The following conventions are used throughtout this manual:

NOTE

Notes contain important information that is set off from the text.

CAUTION

Caution messages appear before procedures which, if not observed, could result in damage to equipement.

WARNING

Warning messages indicate when a specific procedure or practice is not followed correctly, personal injury could occur.

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Chapter 1

Product Information 2566B/C 2567B/C

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1-1. INTRODUCTION

ABOUT THIS MANUAL:

This manual provides installation and servicing information for the HP 2566B/C and HP 2567B/C printers. The following information is included in this manual:

Section I.	Product Information
Section II.	Installation
Section III.	Theory of Operation
Section IV.	Configuration & Diagnostics
Section V.	Adjustments
Section VI.	Removal and Replacement
Section VII.	Parts and Diagrams
Appendices:	Wiring Diagram and Signal Tables, Troubleshooting Guide, Print Quality Problems, ANZAC Support Supplement and Media Specifications.

The HP 2566/67 printers are almost identical except for their rated printing speed (900 lines per minute for the HP 2566B, 1200 lines per minute for the HP 2566C & 2567B, and 1600 lines per minute for the HP 2567C). Unless otherwise identified, the information in this manual applies to both printers, however, in cases where the information differs for the HP 2566B or 2566C as compared to the HP 2567B or 2567C, it is specifically indicated.

ABOUT THIS SECTION:

The following subjects are covered in this section of the manual:

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1-3.	OPTIONS	1 - 4
1-4.	SUPPLIES	1 - 7
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1-2. IDENTIFICATION

Each printer has an identification plate which lists the model and serial number. This plate is attached to the rear panel of the printer next to the power switch. The model number for the 2566B and 2567B is 26066B. The serial number consists of a four digit prefix, a letter, and a five digit suffix (0000A00000). The prefix is used to indicate design changes. The letter in the fifth location designates the country in which the printer was manufactured ("A" indicates the United States, "Y" indicates Mexico). The suffix is a sequential number which increments with each printer.

Another identification plate lists the factory installed options. The option numbers are three digit numbers (such as 015) which, in combination with the model number, indicate the configuration of the unit.

Printed circuit assemblies (PCAs) are identified by a part number and an alphanumeric code consisting of a letter, series code, and a division code stamped or etched on the assembly (for example, A-1949-46). The letter identifies the version of the etched trace pattern on the unloaded printed circuit board. The four digit series code pertains to the electrical characteristics of the loaded PCA. The division code identifies the Hewlett-Packard division that manufactured the PCA.

1-3. OPTIONS

The standard HP 26066B (no option number) is a 900 lines per minute, 132 column printer configured for 120 Vac, 50/60 Hz operation, product number 2566B. Other standard features include raster graphics capabilities, normal and compressed printing, and paper jam detection. Unless otherwise specified, the unit is provided with an HP-IB interface and a power cord for use in the United States. An ASCII symbol set (Standard Roman Extension, compressed and double-size characters), and a 16 channel programmable Vertical Format Control (VFC) are also standard. The 26066B option 120 is the 1200 lpm printer, product number 2567B.

The standard HP 2566C and 2567C printers include a 16 channel Vertical Forms Control (VFC), normal and compressed printing features, raster graphics capabilities, paper jam detection, a Roman-8 symbol set (standard ASCII plus Roman Extension), compressed and double size character, and high speed draft characters. It is configured for 120 Vac, 50/60 Hz operation and comes equipped with a power cord and one ribbon.

Options are stated as three-digit suffixes (001, 002, etc.). The option numbers are marked on an identification tag which is located near the Main Power ON/OFF (1/0) switch on the back of the printer (see Table 1-1 for a list of options).

The following table shows the available options for the HP 2566/67 printers.

Table 1-1. PRINTER OPTIONS

OPTION NO.	OPTION DESCRIPTION
001	Line Draw, Math, and Block symbol sets
002	Katakana-8 symbol set
003 * #	High Density OCR-A and OCR-B symbol sets
004	High Density Roman-8 symbol set
005	High Density italic Roman-8 symbol set
006	High Density Katakana-8 symbol set
008	High Density Bar Codes
009	Adds 12, 13.3 cpi with Roman-8 symbol set
011 #	High-speed Draft Quality 7-bit USASCII symbol set, also includes Line Draw, Math and Block symbol sets.
012	Adds 12, 15 cpi with Roman-8 symbol set
013	Adds 13.3, 15 cpi with Roman-8 symbol set
014 #	High-Speed Draft Quality Roman-8 symbol set, also includes Line Draw and Block character sets
015	220 Vac, 50/60 Hz operation
016	100 Vac, 50/60 Hz operation
017	240 Vac, 50/60 Hz operation
022 * #	Vector-Raster conversion (Graphics) PCA
023 * #	Vector-Raster conversion (Graphics) PCA, High Density
024	HP Label Card PCA
026 %	Cyrillic ECMA 113/86 symbol set
027 %	High Density Cyrillic ECMA 113/86 symbol set

Table 1-1. PRINTER OPTIONS

OPTION NO.	OPTION DESCRIPTION
028 %	Cyrillic ECMA 113/88 symbol set
029 %	High Density Cyrillic ECMA 113/88 symbol set
030	Line Draw, Arabic-8 symbol set
031	High Density Arabic-8 symbol set
032	USASCII, Line Draw, Turkish-8 symbol set
033	High Density USASCII, Turkish-8 symbol set
034	USASCII, Line Draw, Greek-8 symbol set
035	High Density USASCII, Greek-8 symbol set
036	USASCII, Line Draw, Hebrew-8 symbol set
037	High Density USASCII, Hebrew-8 symbol set
038	Line Draw, Hebrew-7 symbol set
039	High Density Hebrew-7 symbol set
043 %	East European ECMA 94/Latin-2 symbol set
044 %	High Density East European ECMA 94/Latin-2 symbol set
046 %	HP-IB Interface
048	US Postal Barcode
049	RS-232C Serial Interface
050	RS-422A Serial Interface
052 * #	Dataproducts Short-Line Interface subsystem
053	Centronics Parallel Interface
054 * #	Dataproducts Long-Lines Interface
060	Deletes the Powered Paper Stacker
115 * #	Passive Paper Stacker
120 @	26066B Option 120 is the 2567B printer
200 *	Configured for Series 200 BASIC/Pascal HP-IB subsystem
210 *	Configured for HP 1000 M, E, and F, HP-IB subsystem

Table 1-1. PRINTER OPTIONS

OPTION NO.	OPTION DESCRIPTION
214 *	Configured for HP 1000 A-Series HP-IB subsystem
290 *	Configured for HP 9000 Series 300/500/800 HP-IB subsystem
337 * #	Configured for HP 3000 Series 37/Micro 3000/Micro 3000XE HP-IB subsystems
340 * #	Configured for HP 3000 39/40/42/52 HP-IB subsystem
344 * #	Configured for HP 3000 Series 44/48/58 subsystems
348 * #	Configured for HP 3000 Series 92X/93X HP-IB subsystem
364 * #	Configured for HP 3000 Series 64/68/70 HPIB subsystem
393 * #	HP 3000 Series 95X HP-IB Subsystem
500 * #	Printer packaged options (004,005,115)
715	Service Documentation
850 *	HP Shared Resource Manager HP-IB subsystem
*	Available on the HP 2566B only
#	Available on the HP 2567B only
@	See Paragraph 1-3 (Options) in Service Manual for more detail
%	HP 2566C and 2567C only

1-4. SUPPLIES

Supplies and accessories recommended for use with your printer, available from Hewlett-Packard, are listed below. Refer to Appendix D for additional information regarding ribbon and paper specifications.

RIBBONS

One replacement ribbon, towel-type (part number 9282-0545).
Same day ship in USA only, order (800) 538-8787
Character yield: 92.25 million.

NOTE

Refer to Appendix E of this manual for complete, detailed paper and ribbon specifications.

PAPER

The HP 2566/67 uses continuous fan-fold, perforated paper varying in width from 3.0 to 18.0 inches (7.6 to 45.7 cm). Although the printer accepts paper as wide as 18.0 inches (45.7 cm), the maximum printing width is 13.2 (33.5 cm) inches. The printer will handle paper weights ranging from 15 to 100 pounds (5.85 to 45 kg).

Multi-part forms up to six parts may be used, with a maximum pack thickness of 0.024 inches. Maximum number for carbonless forms is four parts. Forms should be tried at high humidity (greater than 80%) for satisfactory feeding and handling and at low humidity (less than 25%) to determine if static build-up must be eliminated for proper stacking.

Hewlett Packard neither warrants or recommend the use of a particular print media. Media properties are subject to change by manufacturers and Hewlett Packard has no control over such changes. The customer assumes all responsibilities for the quality and performance of media. Although testing media helps to characterize their performance, a long term satisfaction requires process quality control by manufacturer and proper handling and storage until use.

The following paper types are recommended for use in the HP 2566/67 printers:

Table 1-2. Recommended Printer Paper

Part No.	Description	Quantity
92157A	One-part, white, 9.5 x 11 in 18 lb bond	2400 sheets/box
92157C	One-part, white, 9.5 x 11 in 20 lb #1 bond	2400 sheets/box
9320-1515	One-part, blue bar, 14.9 x 11 in 18 lb, 132 column	2400 sheets/box

NOTE

Due to variations in the manufacturing processes, quality and composition of paper, Hewlett Packard cannot guarantee satisfactory performance with all papers and forms. Special paper, including multi-part forms, card stock, and labels should be tested for satisfactory feeding, registration and print quality prior to purchase.

1-5. RELATED MANUALS

The following manuals provide additional information on the HP 2566/2567 printers:

HP 256X Family Technical Reference Manual	(part no. 02564-90905)
HP Label Card Manual	(part no. 26062-90902)
HP-IB Interface Manual	(part no. 26067-90901)
RS-232C/422A Serial Interface Manual	(part no. 26067-90921)
Centronics Parallel Interface Manual	(part no. 26067-90906)
HP 2566C/2567C Operator's Manual	(part no. 02566-90990)
Powered Paper Stacker Operator's Manual	(part no. 02566-90989)
Powered Paper Stacker Installation Instructions	(part no. 02566-90995)

1-6. SPECIFICATIONS

The specifications for the HP 2566/67 are listed in the following table.

PHYSICAL CHARACTERISTICS

Without Powered Paper Stacker	Including Powered Paper Stacker
Width: 98.3 cm (38.7 inches)	
Depth: 63.5 cm (25 inches)	105.41 cm (41.5 inches)
Height: 110 cm (43.3 inches)	
Weight: 211 kg (465 pounds)	251 kg (552 pounds)

ELECTRICAL CHARACTERISTICS

Input Voltages:	
100 Vac (+5%, -10%);	50/60 Hz +10/-5%
120 Vac (+5%, -10%);	50/60 Hz +10/-5%
220 Vac (+5%, -10%);	50/60 Hz +10/-5%
240 Vac (+5%, -10%);	50/60 Hz +10/-5%

Power Consumption:	2566B	2567B	2566C	2567C
Watts non-printing	180	180	115	150
Watts printing (peak)	592	694	575	700

Power Dissipation:	2566B	2567B	2566C	2567C
BTU/hr non-printing	615	615	393	512
BTU/hr printing (peak)	2021	2369	1961	2387

ENVIRONMENTAL CHARACTERISTICS

Temperature:	
Operating (printer and ribbon)	+10 to +50 C (+50 to +122 F)
Storage (printer)	-40 to +75 C (-40 to +167 F)
Survival (power-on)	-20 to +65 C (-4 to +149 F)
Storage (ribbon)	+10 to +50 C (+50 to +122 F)

Relative Humidity:	
Non-Operating	5% to 95% (non-condensing)
Operating	30% to 80% (recommended)

Audible Noise: *	
Non-Operating	<55 dBa Average Sound Pressure (2566B/2567B)
Operating	65 dBa Average Sound Pressure (2566B/2567B)
Non-Operating	50 dBa Average Sound Pressure (2566C)
Operating	58 dBa Average Sound Pressure (2566C)
Non-Operating	48 dBa Average Sound Pressure (2567C)
Operating	61 dBa Average Sound Pressure (2567C)

* Measured at one meter from source according to ISO/DP 7779.

1-7. SAFETY COMPLIANCE

The HP 2566B/2567B and 2566C/2567C Line Printers are listed by Underwriter's Laboratories, Inc. in the following categories with respective guide designations: Electronic Data Processing Equipment (EMRT) and Office Appliances and Business Equipment (QAOT). These products are designed and tested to comply with IEC380 and IEC435.

The Canadian Standards Association has certified these printers as data processing equipment.

In addition, these printers were designed to meet most European Safety and RFI/EMC standards for Electronic Data Processing Equipment. This also includes Germany's VDE08711 Level B and GS Mark.

FCC RADIO FREQUENCY INTERFERENCE STATEMENT

The Federal Communications Commission (IN 47 CFR 15.818) has specified that the following notice be brought to the attention of users of this product.

NOTE

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC rules which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference. Any questions concerning regulatory agency compliance should be directed to your local Hewlett-Packard Sales Office.

1-8. SERVICE APPROACH

The basis for repair of the printer centers around modular level replacement of printed circuit assemblies and electro-mechanical subassemblies. The self-test and diagnostic features (refer to Section IV) serve as aids in isolating problem areas. Once the problem is located, that assembly should be replaced without further attempts to identify component failures within the assembly.

Chapter 2

Installation
2566B/C 2567B/C

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2-1. QUICK INSTALLATION

If you have previously installed this model of printer, you may not want to read through all the instructions, but would like a quick check list to be sure nothing critical is overlooked. Using the index below as a check list, you can go to any page for the required detail, then return to the list to check it off and proceed to the next step.

Please use this check list as a progress guide.

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2-2. SITE REQUIREMENTS

ENVIRONMENTAL:

The printer is designed for operation in a clean, traffic-free environment, preferably in an area not subject to excessive mechanical shocks, vibrations, or wide ranges of temperature (refer to Chapter 1 for specifications). Moderate humidity (40 - 60%) promotes better paper handling.

NOTE

Make sure the printer sits level. The output paper stack will not stack correctly if the printer does not sit evenly on the floor.
The location of your printer must provide adequate operator access to both the front and rear of the printer. The area around the printer should be kept clean and dust free so that the air used to cool the printer will not contain excessive dust particles.

2-3. UNPACKING AND INSPECTION

Prior to unpacking the printer, examine the shipping container for any signs of damage (broken pallet, 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 following list of tools are required for unpacking the printer:

- Wire cutters or heavy duty scissors
- #1 Pozidrive screwdriver
- 9/16 inch hexhead wrench
- 3/16 inch allen driver
- Safety glasses

UNPACKING INSTRUCTIONS FOR PRINTER

NOTE

The printer should not be unpacked unless a qualified HP service representative is present. Do not destroy or discard the shipping container or any packing materials. These materials will be needed in case of a damage claim requiring reshipment of the printer to the factory or may be requested by the carrier for inspection before granting a claim for damage.

WARNING

Wear protective glasses when cutting strapping bands around the box. These straps are under tension and when cut may spring back, potentially causing serious eye injury.

To unpack the printer, complete the following steps:

a. Move the shipping container as close as possible to the printer's operating location.

b. Cut the shipping straps which surround the container (see "WARNING" notice above and Figure 2-1, step "A").

c. Lift out the packing material located over the top of the printer. (Figure 2-1, step "B").

d. Lift out the box containing the Operator's Manual, cables, and options that may have been ordered

e. Lift the outer container up, off the shipping pallet, and over the printer (requires two people).

f. At the front of the printer, remove the smaller box containing the noise abatement cover. This cover only comes with option #060 orders.

g. At the left side of the printer, remove the three 9/16 inch hex-head bolts securing the wooden end plate to the shipping pallet (see Figure 2-1, step "C").

h. At the rear of the printer, remove the two 9/16 inch hex-head bolts mounting the printer ramp to the pallet. Then, position the ramp as shown in Figure 2-1, step "D", and drop the bolts through the pre-drilled holes to secure the ramp for usage.

WARNING

The printer weighs approximately 465 pounds (211 kg). It is recommended that at least two people assist in rolling down the ramp.

i. Verify that the leveling feet are all the way up, out of the way. With the help of another person, **CAREFULLY** roll the printer off the pallet and down the ramp.

j. Open the printer's front access door and remove the box containing the paper tray. This tray only comes with option #060 orders.

k. Open the printer's top access cover using scissors or a knife. **CAREFULLY** cut trough and remove the nylon shipping strap positioned around the ribbon access cover. (see Figure 2-1, step "E")

CAUTION

The swing gate mechanism can become bound during shipping. DO NOT apply excessive pressure to the swing gate release lever to release the mechanism. To unbind the mechanism, adjust the Paper Thickness Adjustment Lever through its full range of motion, then retry opening the swing gate lever.

NOTE

SAVE the shipping locks for future reshipment.

l. Remove three 3/16 inch Allen screws from each of the two front shipping locks located on the bottom feet of the print mechanism casting, and one screw from each of the two rear shipping locks located behind the print mechanism near the rear panel (see Figure 2-1, steps "E" and "F"). They should be reinstalled prior to a relocation of the printer (refer to "Moving the Printer" in the HP Operator's Manual).

m. Verify that the printer is correctly positioned then run the leveling feet down. The easiest way is to turn all four feet counterclockwise, hand tight against the floor, then add another half turn with the wrench.

CAUTION

Be sure to remove ALL FOUR shipping locks before powering-up the printer. Operating with the locks in place can cause serious damage to the printer.

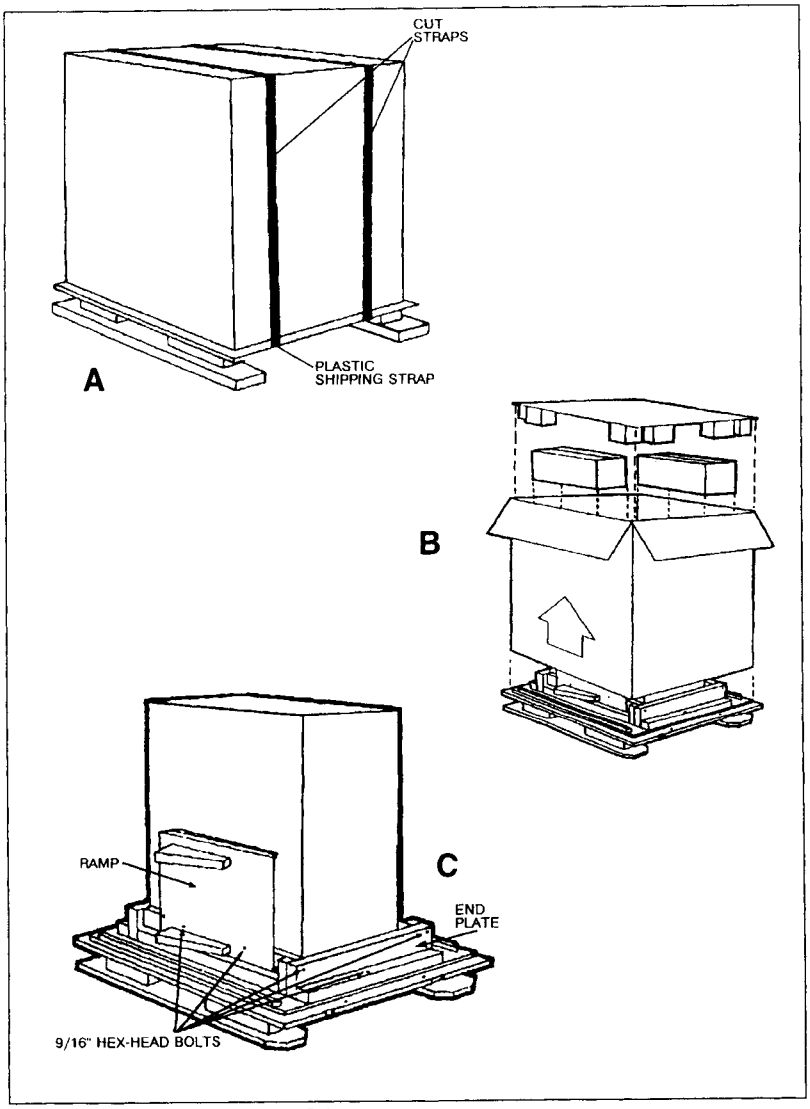

Figure 2-1. Unpacking the Printer

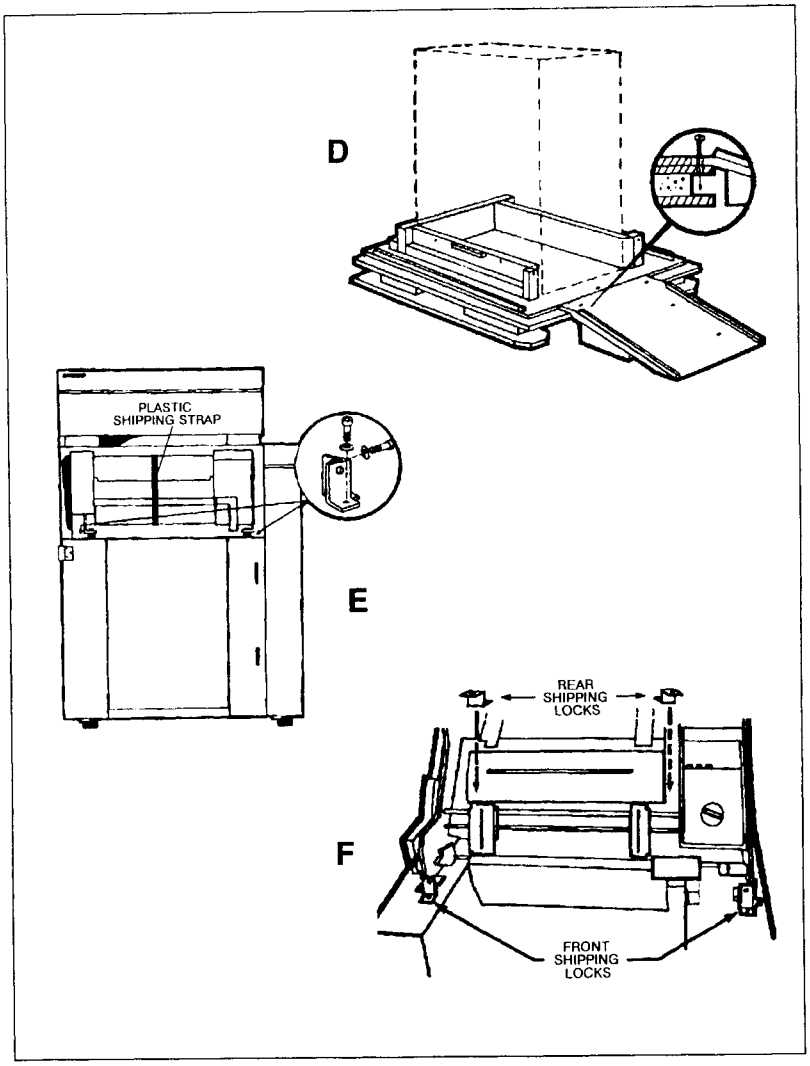

Figure 2-1. Unpacking the Printer (continued)

UNPACKING INSTRUCTIONS FOR THE POWERED PAPER STACKER (PPS)

NOTE

The PPS should not be unpacked unless a qualified HP service representative is present. Do not destroy or discard the shipping container or any packing materials. These materials will be needed in case of a damage claim requiring reshipment of the PPS to the factory or may be requested by the carrier for inspection before granting a claim for damage.

WARNING

Wear protective glasses when cutting strapping bands around the box. These straps are under tension and when cut may spring back, potentially causing serious eye injury.

To unpack the PPS, complete the following steps:

a. Open the box and remove the two foam blocks from the bottom of the PPS.

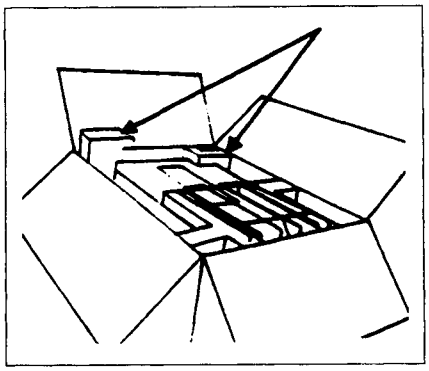

Figure 2-2.

b. Pick up the backstop and take off the foam blocks.

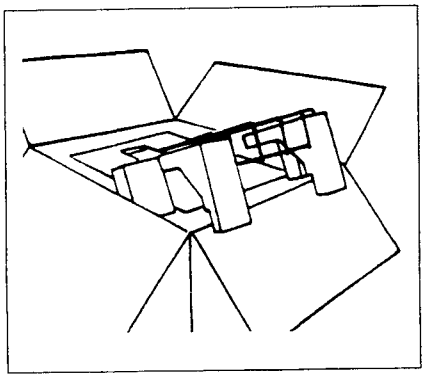

Figure 2-3.

c. Take out the manual, service addendum, and metal paper guide.

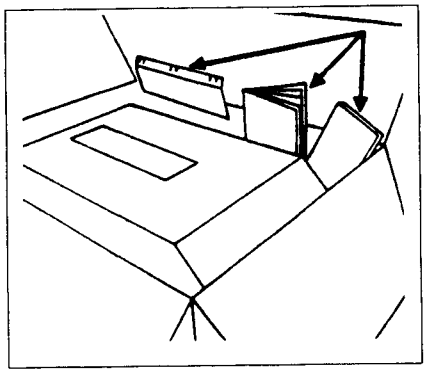

Figure 2-4.

d. Lift off the cardboard surrounding the PPS (may require two people to remove the cardboard).

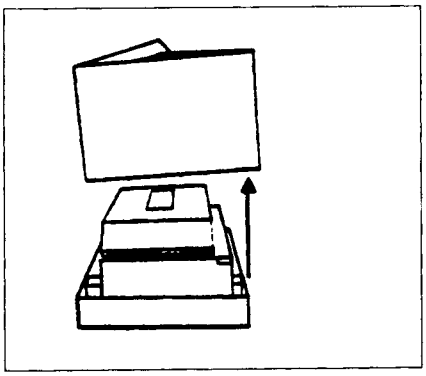

Figure 2-5.

e. Lower each leveler 3 inches.

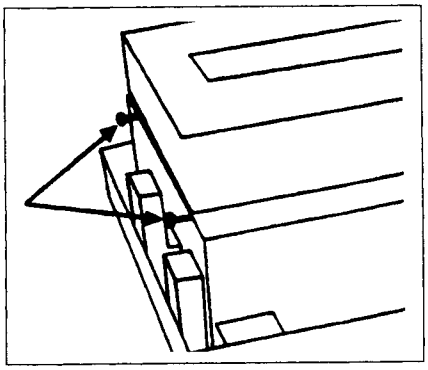

Figure 2-6.

f. Open the PPS door all the way. Remove the foam on the paper tray.

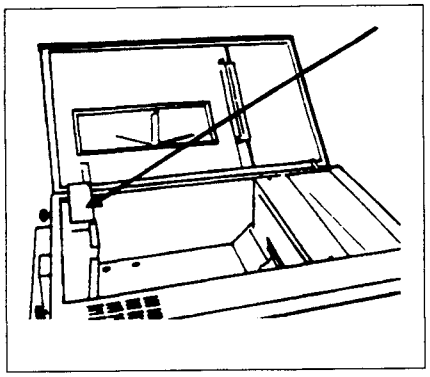

Figure 2-7.

WARNING

The PPS weighs approximately 100 pounds (46 kg). Do not remove it from the box by yourself. Bend your knees when lifting the PPS to avoid personal injury.

7. Close PPS door and lift the entire unit up and away from the cardboard tray. Set the unit upright. It will lean at an angle, so use caution when maneuvering it.

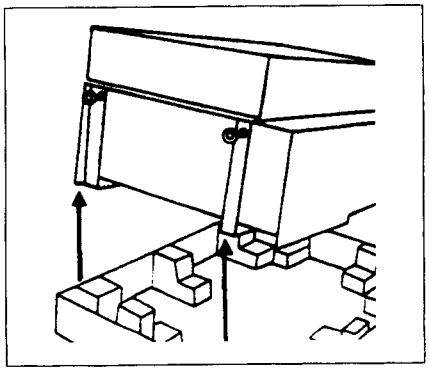

Figure 2-8.

h. Remove the foam block from the back of the PPS.

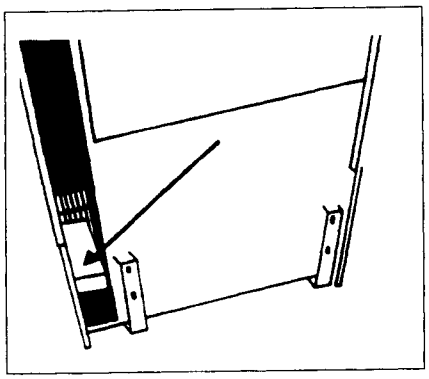

Figure 2-9.

INSTALLING THE PPS

Follow these instructions to attach the powered paper stacker to the printer.

CAUTION

The printer must be stable, with its levelers down, before installing the PPS.

a. Make sure the levelers on the PPS are lowered two inches.

b. Remove the 1/4 turn fastener and take off the access panel on the right side of the PPS.

c. Position the powered paper stacker.
Move the PPS next to the back panel of the printer.

d. Insert the 6-position cable that exits the printer into the top access hole in the stepper motor bulkhead (Figure 2-10).

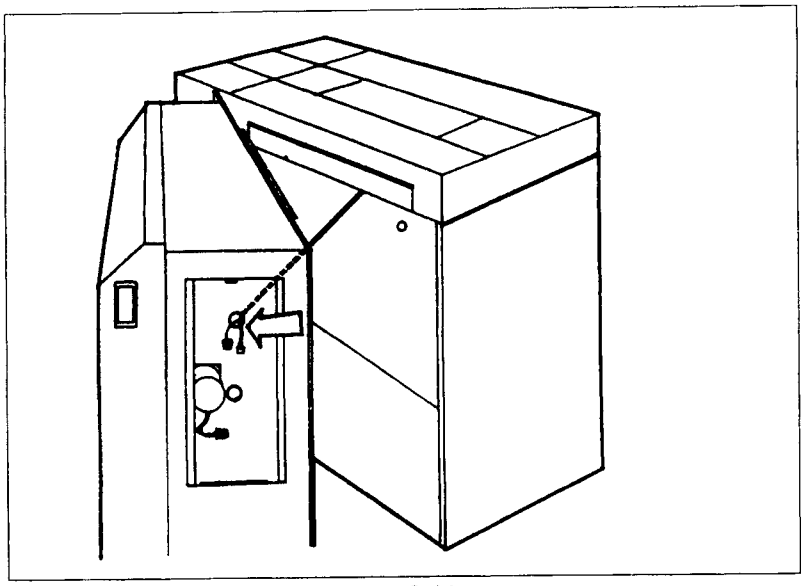

Figure 2-10. Inserting the 6-Position Cable

e. Mate the 6-position cable to the stepper motor on the bulkhead and attach the shield ground lug to the spade lug.

NOTE

Avoid pinching the cable between the PPS and back of the printer.

f. Slide the PPS against the rear of the printer, lining it up with the screw holes in the panel.

g. If the PPS screw holes and locating tabs do not match the rear panel holes, adjust the levelers until they all match.

h. Lift up the PPS and slide the locating tabs into the slots in the rear panel (Figure 2-11).

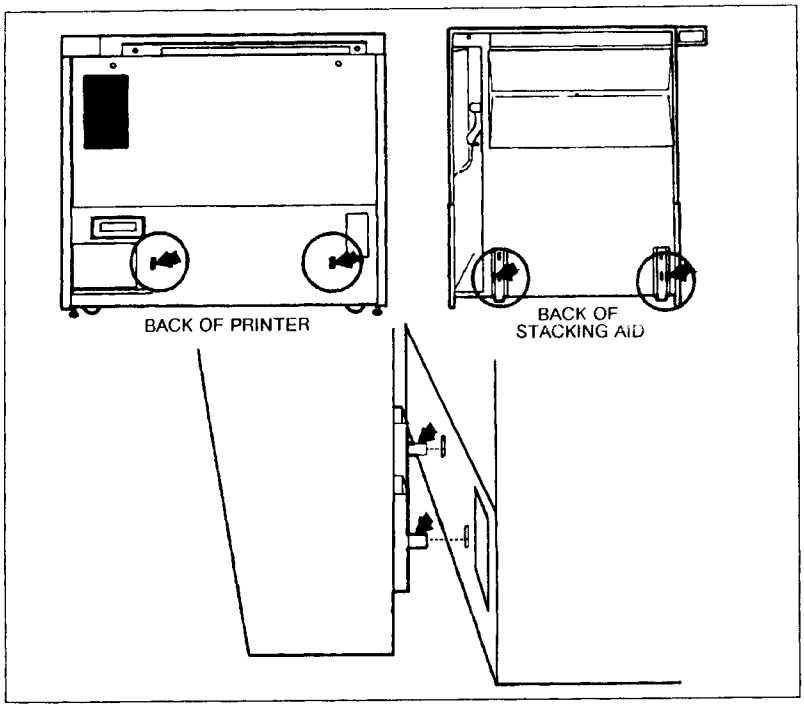

Figure 2-11. Inserting Locating Tabs

NOTE

Use petro wax on the screwdriver when securing the PPS to the printer to avoid dropping the screws.

i. Secure the PPS to the back of the printer with two 1/4 turn screws; one on the mounting tab on the upper left hand corner of the PPS, and one behind the access panel (Figure 2-12, A). Open the PPS door and fasten the PPS to the printer frame with the four flange head screws (Figure 2-12, B).

j. Make sure the levelers fit tightly against the floor.

k. Slide the paper tray toward you. Place the backstop in the "E" position on the paper tray and then stand it up (Figure 2-13). Slide the tray back in.

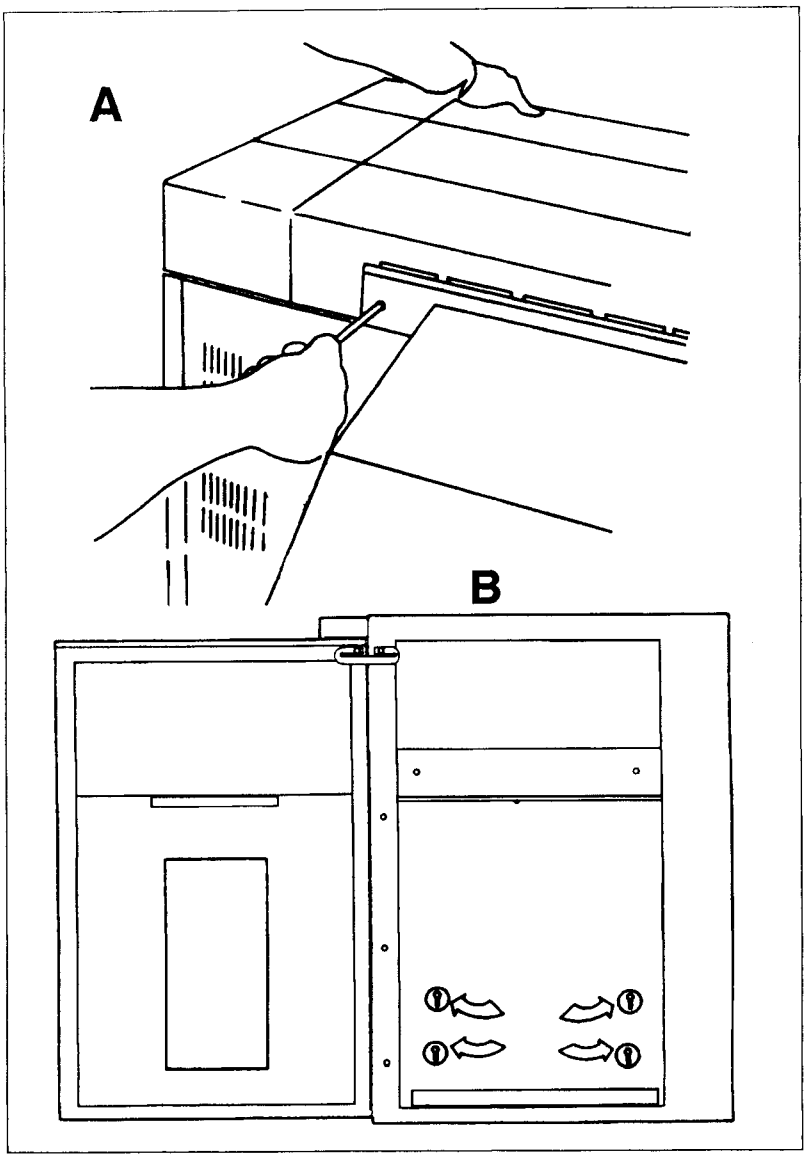

Figure 2-12. Attaching the PPS to the Printer

l. Untape the bag holding the chains on the panel under the static brush. Let the chains hang freely in front of the backstop (Figure 2-14). Make sure all tape is removed in this area.

m. Use a #2 Pozidrive screwdriver to remove the idler cover. Untape the bag containing the door chain assembly (Figure 2-15). Remove all tape in this area and replace the cover.

n. Put the door chains in the middle slot of the door chain bracket; later the customer will position them according to paper size (Figure 2-16). Close the PPS door.

o. Replace the right access panel.

p. Open the printer top cover and slide the paper shield into its mate at the paper discharge frame (Figure 2-17). (The small tabs should be on top.) Push firmly into place.

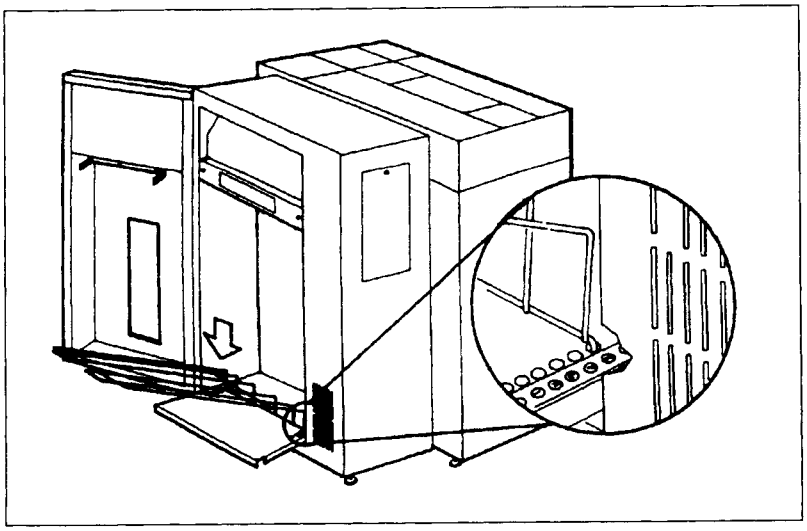

Figure 2-13. Installing the Backstop

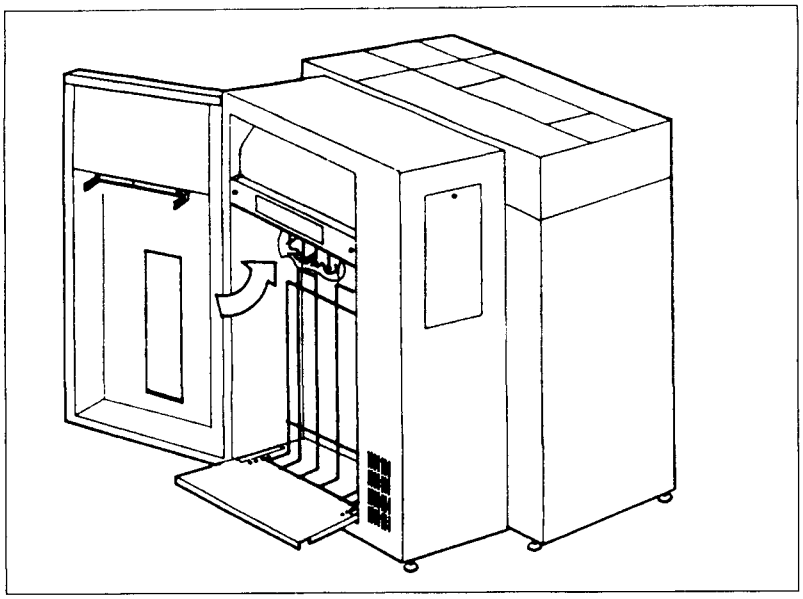

Figure 2-14. Releasing Backstop Chains

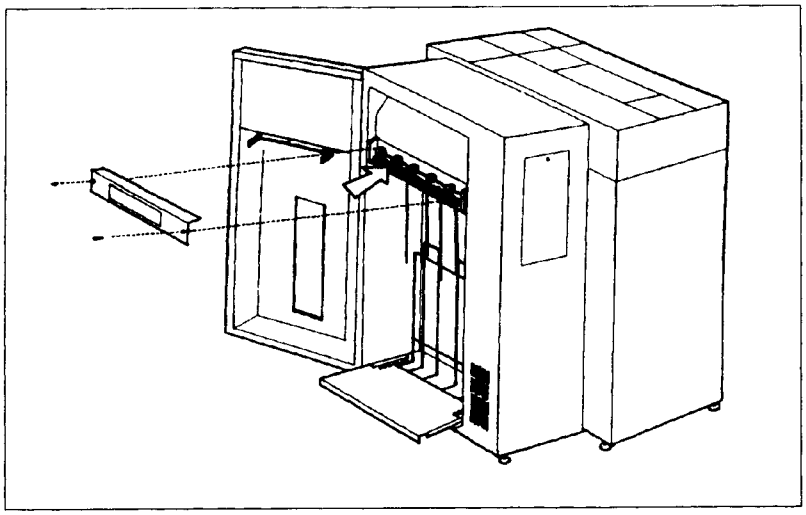

Figure 2-15. Removing the Door Chains

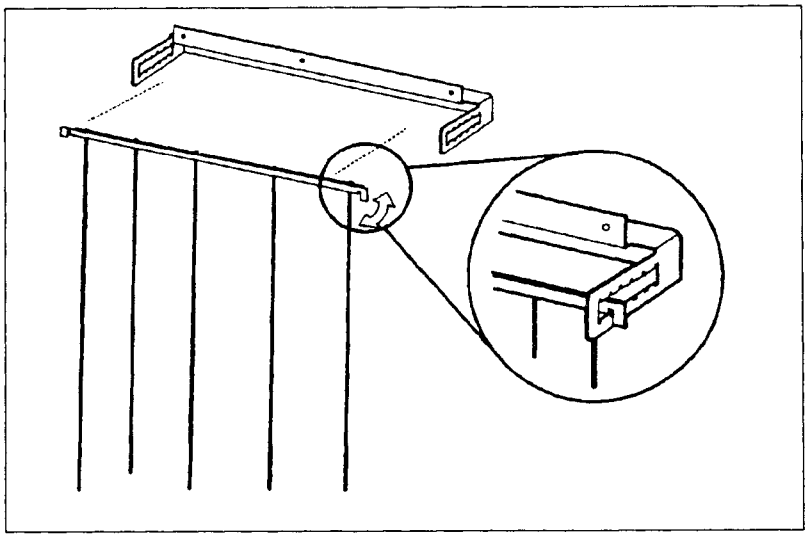

Figure 2-16. Installing Door Chains

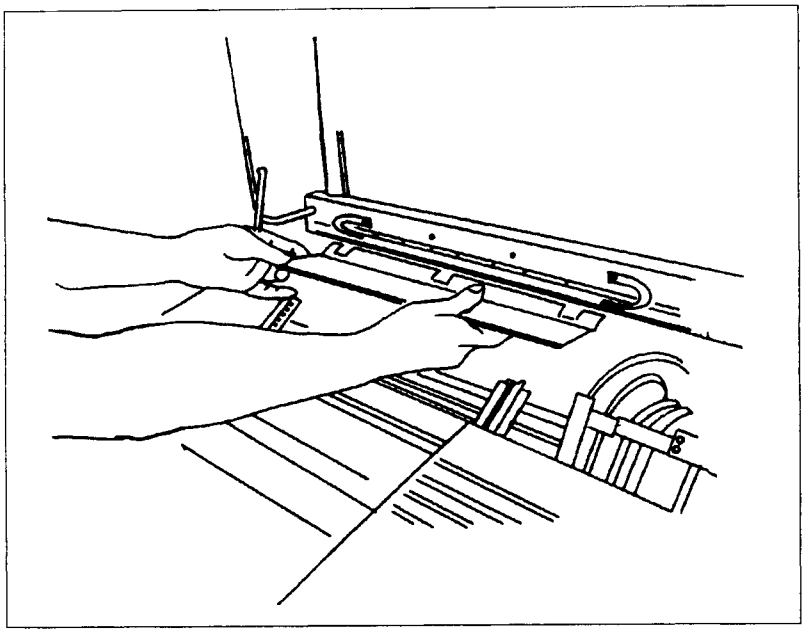

Figure 2-17. Installing the Paper Shield

2-4. POWER CONFIGURATION

The printer must be configured properly to the local power source. Normally, the printer will be configured correctly at the factory as recorded on the option tag located on the printer's back panel.

Standard	120 Vac 50/60 Hz
Option #015	220 Vac 50/60 Hz
Option #016	100 Vac 50/60 Hz
Option #017	240 Vac 50/60 Hz

NOTE

Field re-configuration of the input voltage levels is limited to changes between 100 and 120 or between 220 and 240 only. Re-configuration from either 100 or 120 to 220 or 240 should not be done in the field since this requires a change in the circuit breaker. In some cases the new circuit breaker may not fit into the existing input power assembly panel. The part number for the 100/120 input power assembly is 02566-60185. The part number for the 220/240 input power assembly is 02566-60296.

If it is necessary to change the voltage configuration between 100 and 120 Vac or between 220 and 240 Vac, proceed as follows:

a. Set the printer's ON/OFF switch to the OFF (0) position and disconnect the power supply cable from the printer.

b. Remove the four pozi-drive screws from the four corners of the power input panel surrounding the ON/OFF switch (as viewed from rear of the printer, bottom left).

c. Tilt the panel and assemblies out to gain access to the terminal block mounted on the under-side of the input voltage line filter.

d. Rearrange the wire connectors on the block as shown in Figure 2-18 for the desired input power configuration. (Do NOT change the FAN leads.)

e. Replace the panel and power-up the printer to verify operation.

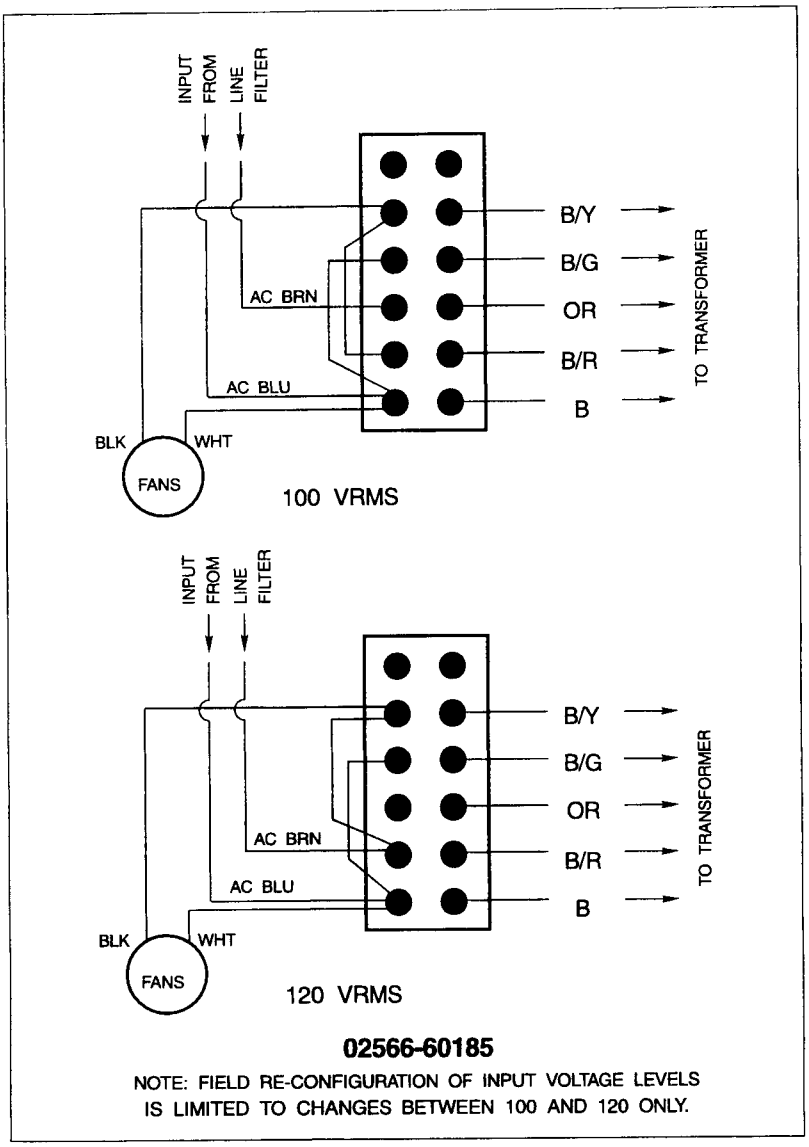

Figure 2-18. Input Power Selection

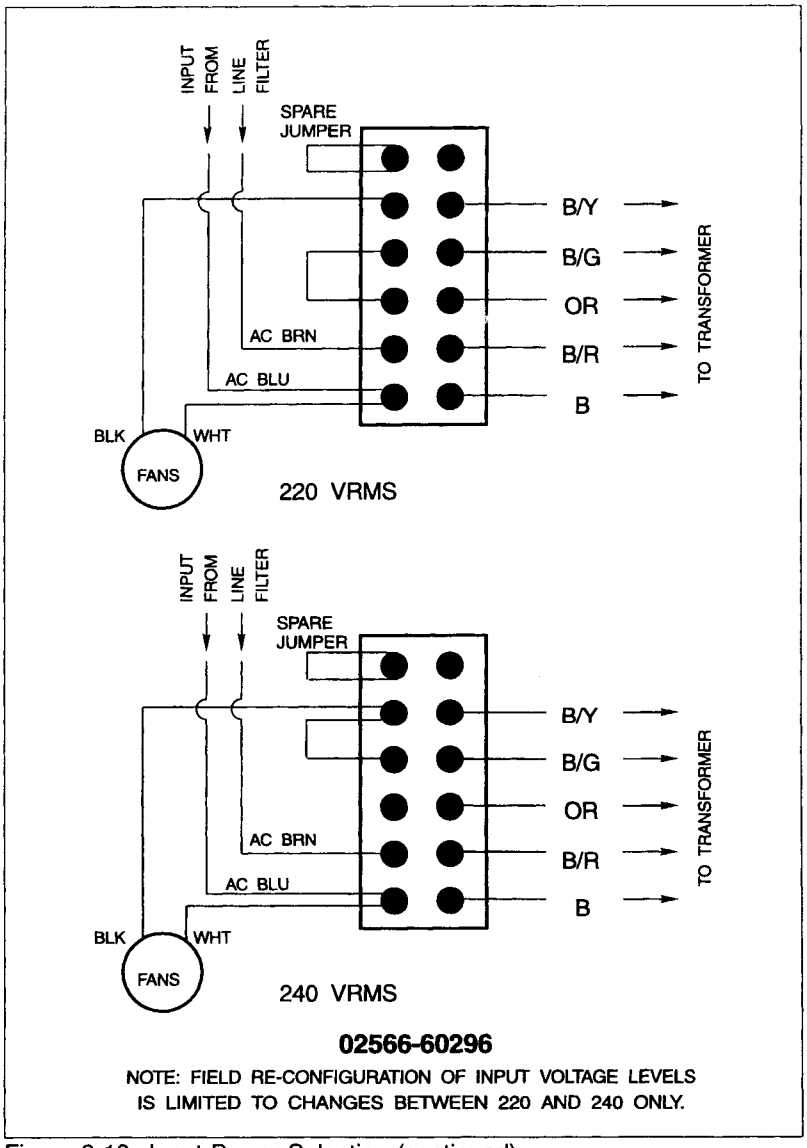

Figure 2-18. Input Power Selection (continued)

2-5. CUSTOMER ASSURANCE

The printer should be ready to be powered up and tested. Turn the main breaker on the back of the printer to ON. Open the swing gate, install a ribbon and single part, full width, paper (refer to the Operator's Manual, Ribbon Replacement and Loading Paper). Run a standard self-test as described in Paragraph 4-3.

CHECK THE PRINT GAP SETTING

With the gap set to "B" for single, check for print quality by running a continuous ripple print. While printing, move the forms thickness lever slowly to thicker (more gap) until the print fades out. If one side fades before the other, perform the platen/printbar gap adjustment (refer to Paragraph 5-6).

CHECK THE TRACTORS

Set the tractor width and forms tension so that the tractor drive teeth slightly deform the holes in the paper. Initiate some form feeds and check for even stretch of the holes and no jams. If you get paper jams or "scrunched" print you will need to adjust the paper feed as described in Paragraph 5-7 to 5-10.

TRAIN THE OPERATOR

Verify other types of customer forms, making sure you address their most difficult forms. Ask the customer to open the Operator's Manual to page 3-10 and follow the procedure taking them through paper loading and adjustments. Show them why certain kinds of forms can be troublesome. This is a good time to help the customer feel confident with their new HP product. After the forms, take the customer through ribbon loading, setting top of form using the front panel and entering configurations.

The following list of operator functions should get the new user off to a good start:

FUNCTION	OPERATOR'S MANUAL Page Number
Printer Status/Modes	6-1
Ribbon Removal and Replacement	3-1
Paper Loading and Adjustment	3-10
Setting paper tension	3-15
Setting paper width	3-17
Top of Form	3-30
Setting form thickness	3-21
Setting form length	3-25
Printer Configuration	5-1
Interface Configuration	5-5
Self-test	5-7
Optimize Print Quality	6-19
Using the PPS	4-1

Remember, if an HP-IB interface is installed, load with appropriate load resistors for cable length and devices. The printer is shipped with no load resistors installed and does have an internal load of "1". Refer to the HP-IB Interface Manual for more information about cable length loading

Refer to the appropriate Interface Manual for further details (refer Paragraph 1-5 for manual part numbers).

2-6. FLIGHT TIME AND TURNAROUND

The last item in the installation is the easiest but potentially the MOST CRITICAL. The printer was fine adjusted at the factory before shipment and the optimum values for flight time and turnaround time were stored in Non-Volatile RAM. If the Formatter PCA is ever replaced, these values will be lost and it is nearly impossible to calculate the values visually. The procedure in this manual can get it close enough to be acceptable but that "brand new" sharpness would be lost. Please, take a minute to write down these numbers in the list on the following page. Then copy this sheet and put it in the System Log or tape it inside the printer. Paragraph 4-2 in the Service Manual shows all these settings and how to display them.

The configuration functions listed on the following page should also be recorded for future reference. The installation values depend upon which interface PCA is used and whether the HP Label Card PCA is installed.

Table 2-1. CONFIGURATION SETTINGS FORM

CONFIG. CODE	CONFIGURATION FUNCTION	INSTALLATION VALUE
20	#	
21	#	
22	#	
23	#	
25	#	
26	#	
27	#	
28	#	
29	#	
40	Flight Time	
41	Turnaround Time *	
42	Graphics Amp. (course)	
43	Graphics Amp. (fine)	
80	@	
81	@	
85	@	
86	@	
87	@	
88	@	
89	@	
Refer to following page for footnote explanations.		

Table 2-1. CONFIGURATION SETTINGS FORM

CONFIG. CODE	CONFIGURATION FUNCTION	INSTALLATION VALUE
* After formatter firmware was changed to date code 2722 this value was no longer adjustable. Prior to date code 2722 a Cold Start must be used to load the default value if unknown. Record other configuration functions before attempting this.		
# Refer to the appropriate interface manual for a description of the Configuration Function numbers.		
@ Refer to HP Label Card Installation/Operator's/Programming Manual (26062-90902) for a description of the Configuration Function numbers.		

NOTE

All configuration values are lost or reset to a default value as the result of a formatter PCA replacement or a cold start of the printer.

Chapter 3

Theory of Operation 2566B/C 2567B/C

OperationOperationOperationOperationOperationOperation OperationOperationOperationOperationOperationO

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3-1. INTRODUCTION

This section of the manual is intended to provide a generalized functional understanding of the HP 2566/67 printer and the processes which occur during the printing operation. A generalized block diagram of the printer is shown in Figure 3-1. Each component (general block) of Figure 3-1 is further diagrammed and explained in this section of the manual. The following topics are discussed:

Paragraph		Page
3-1.	INTRODUCTION	3 - 3
3-2.	FUNCTIONAL OPERATION OVERVIEW	3 - 7
	PRINT MECHANISM	3 - 7
	PAPER PATH	3 - 7
	ELECTRONICS PACKAGE	3 - 7
	DOT PLACEMENT	3 - 8
3-3.	PRINT MECHANISM AND PAPER PATH	3 - 10
	PRINT MECHANISM	3 - 10
	PAPER PATH	3 - 13
3-4.	CONTROL PANEL PCA	3 - 19
	FUNCTION	3 - 19
	KEYPAD	3 - 20
	DISPLAY	3 - 22
3-5.	FORMATTER PCA (PROCESSOR/CONTROL CIRCUITRY)	3 - 23
	FUNCTION	3 - 23
	MEMORY MANAGEMENT	3 - 23
	PROCESSOR COMMUNICATION	3 - 25
	CLOCKING	3 - 26
3-6.	FORMATTER PCA (DOT GENERATION LOGIC)	3 - 26
	FUNCTION	3 - 26
	CHARACTER IDENTIFICATION BYTE DEFINITIONS	3 - 30
	MODES 1, 2 AND 3 BYTE DEFINITIONS	3 - 32
	COMMAND BYTE DEFINITIONS	3 - 33
	STATUS BYTE DEFINITIONS	3 - 34
3-7.	SERVO PCA	3 - 35
	FUNCTION	3 - 35
	CIRCUIT DESCRIPTION	3 - 36
	OPERATION	3 - 41
3-8.	POWER SUPPLY AND BACKPLANE PCA	3 - 41
	BACKPLANE PCA	3 - 41
	POWER STRAPPING AND TRANSFORMER	3 - 42
	POWER SUPPLY PCA	3 - 42
3-9.	MOTOR DRIVER PCA	3 - 45
	FUNCTION	3 - 45
	CIRCUIT DESCRIPTION	3 - 47
3-10.	HAMMER DRIVER PCA	3 - 56
	FUNCTION	3 - 56
	CIRCUIT DESCRIPTION	3 - 57

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2566/67 Block Diagram

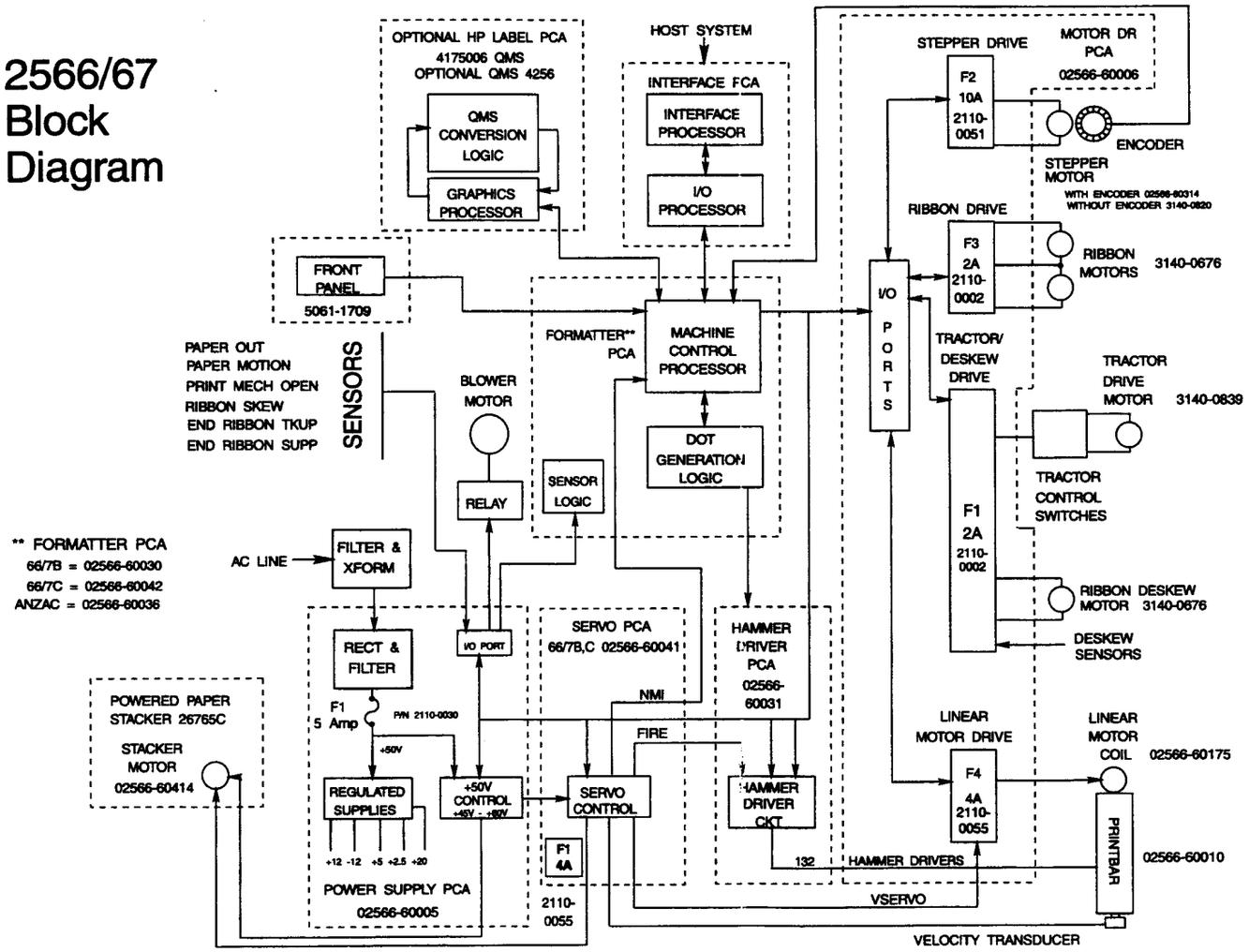


Figure 3-1. Printer Block Diagram

3-2. FUNCTIONAL OPERATION OVERVIEW

In this paragraph, we will briefly discuss each of the three major functional areas of the HP 2566/67 Printer to help provide a general overview of the printing process. After that, we'll go into more detail on each. The three major functional areas are:

THE PRINT MECHANISM:

Consists of two major components, the flexure-mounted printbar (mounted to a casting), and the towel ribbon and its associated drive mechanics. These components are responsible for providing the printbar oscillation and the ribbon drive and deskew mechanics. Details of operation can be found in Paragraph 3-3.

THE PAPER PATH:

Consists of four tractors connected via a drive belt providing a paper mounting medium and a method for accurately moving the paper. Drive for the tractors is provided by a stepper motor. Horizontal positioning is controlled via a cable drive system (also motor driven). A platen provides a surface where the hammers strike the ribbon and paper. For more information on the paper path, see Paragraph 3-3.

THE ELECTRONICS PACKAGE:

The electronics in the printer consists of a Control Panel PCA, Formatter PCA, Servo PCA, Power Supply PCA, Backplane PCA, Motor Driver PCA, Hammer Driver PCA, two Tractor Adjustment Switch PCAs, and an Interface PCA. An optional Graphics PCA is also available.

All the electronics except the Control Panel and Tractor Adjustment Switch PCAs reside in a bay located on the right side of the printer. The power transformer is also located at the rear of the bay. Power strapping access is through a panel in the rear of the printer.

There are several interface configurations available with the printer, including the following:

- HP-IB: This is the standard interface for the 2566B and 2567B. It can be operated in either the intelligent (CIPER), Block or Character

mode. This provides a wider HP system base on which the printer can be used.

- RS-232C & RS-422A: These interfaces allow the printer to be connected to the system via EIA standard voltage levels.

- CENTRONICS COMPATIBLE (PARALLEL): This interface allows the printer to operate with non-HP systems that use Centronics parallel protocol.

Complete information on the various interface PCAs can be found in their respective manuals, listed in Paragraph 1-5, "Related Manuals".

The Vector-to-Raster Graphics PCA's are optional PCAs for the HP 2566B and 2567B. Their function is to convert vector data from the host to raster data that the printer can understand and print. There are two print density options available: High density (140 x 144 DPI) and Normal density (70 x 72 DPI). This on-board conversion frees up the system from calculating the raster data and puts the load on the printer via a Graphics PCA.

The HP Label Card (option #024) adds graphics which enables the printer to print varying sizes of characters, graphics, bar codes, and lines using QMS (R)* Magnum (R)* language. (See the HP Label Card Installation Operation Manual P/N 26062-90902 for more detail).

More information on the other printed circuit assemblies in the HP 2566/67 can be found in Paragraphs 3-4 through 3-10 of this manual.

* QMS and MAGNUM are registered trademarks of QMS, Inc.

DOT PLACEMENT:

The HP 2566/67 can operate in several different print modes: Normal (10 CPI), High Density Normal (10 CPI), Compressed (12, 13.3, 15, or 16.7 CPI), Draft or "sparse" Print (10 CPI), Bar Codes, Raster Graphics and High Density Raster Graphics. When the printer is directed to run in one of these modes by the selection of a symbol set, the formatter processor determines an optimum amplitude for printbar oscillation and an optimum number of passes in which to clock the dot data out to the hammer driver circuitry. The optimum values are those that maximize printed throughput for the specified symbol set.

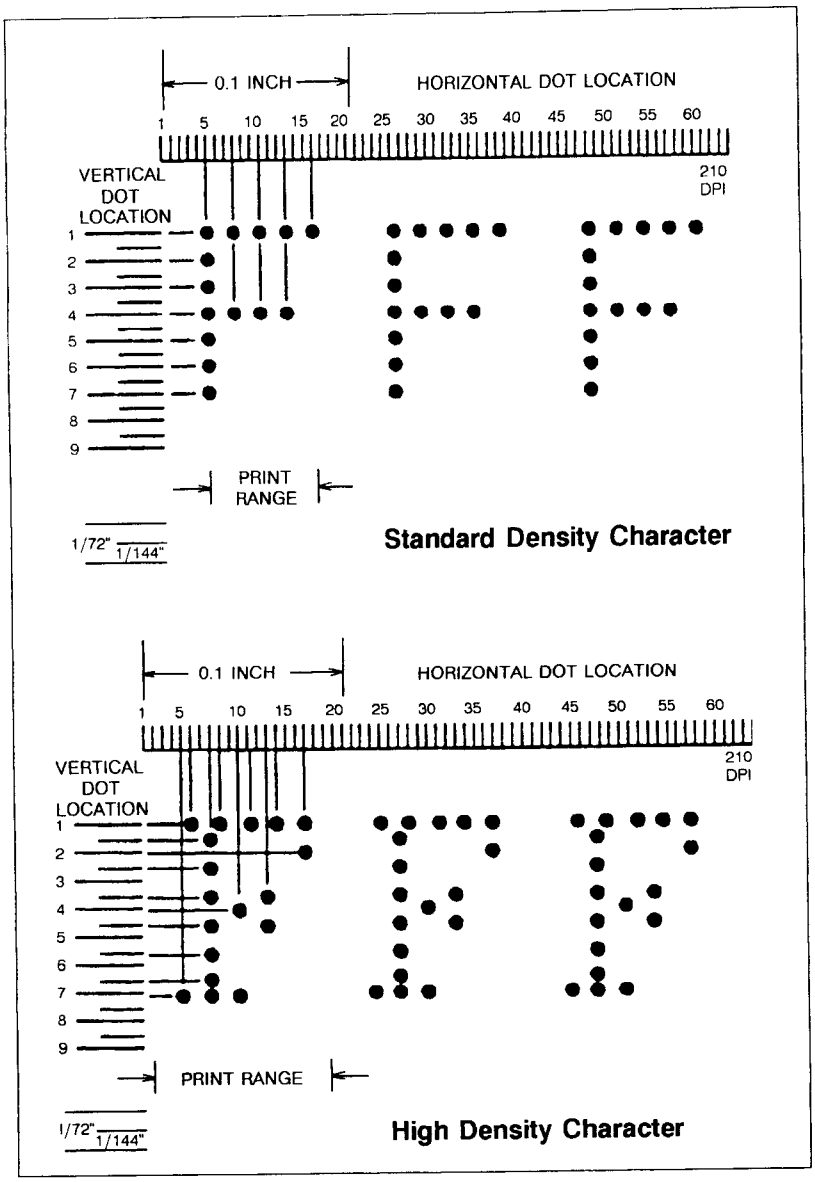


Figure 3-2. Variable Matrix

A variable matrix is used for optimum placement of dots on the printed page. This matrix differs depending on the chosen symbol set and varies from 70 to 210 dots per inch (DPI) or 7 to 21 dots per tine. However, due to a restriction imposed by hammer frequency, only a portion of the addressable dots can be printed on one pass of the printbar. To accomodate this limitation, the character sets have a skip built in. For example, if the skip is set at three, for every dot printed the next two are skipped.

Drive motion, tensioning and slack removal is accomplished by drive next two are skipped.

Since the printbar is moving quite fast, some character sets require multiple passes to print all the necessary dots. The output strategy defines which set of dots are printed for each pass of the printbar.

Samples of typical dot placement for two character sets are shown in Figure 3-2.

3-3. PRINT MECHANISM AND PAPER PATH

The main mechanical parts of the HP 2566/67 are the printbar assembly and ribbon system (the Print Mechanism), and the paper path. Functional descriptions of these components are as follows:

PRINT MECHANISM

Printbar assembly:

The printbar assembly is mounted to a casting using a flexure-type mounting system. The printbar contains 132 spring-steel hammers (1 for each character in the 10 CPI mode). When not printing, all hammers (or tines) are drawn away from the paper by permanent magnets in the printbar assembly. To print a dot, the Hammer Driver PCA sends current to an electromagnet behind a printbar hammer. The electromagnet provides an opposing magnetic field which overcomes the field of the permanent magnet and releases the hammer allowing it to snap forward. A hardened stylus near the tip of the hammer strikes the ribbon against the paper and platen, printing a 0.017 inch dot. Current to the electro-magnet is then cut off, allowing the permanent magnet to recapture the hammer.

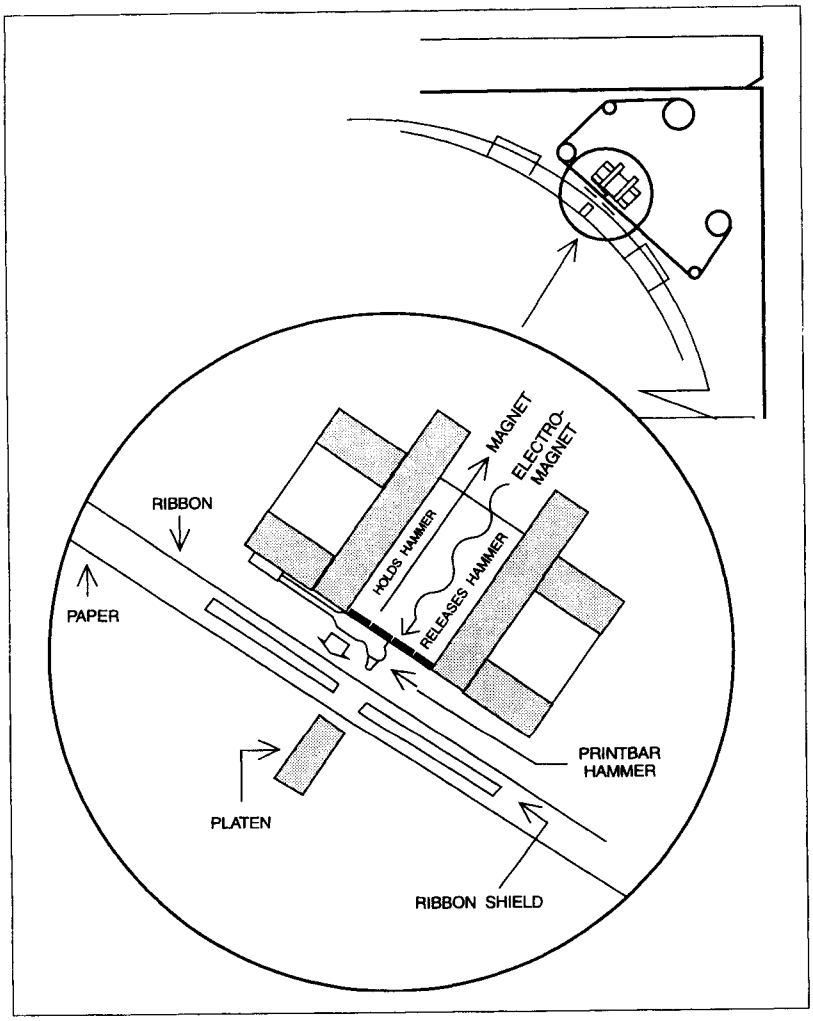


Figure 3-3. The Print Mechanism

To generate a horizontal row of dots (making up each character) the printbar must oscillate back and forth. The lateral motion of the HP 2566/67 printbar is achieved by driving the printbar with a linear motor at the flexure mounted printbar assembly's natural, or resonant frequency.

Printbar speed is controlled by monitoring the motion with a velocity transducer (mounted on the end of the printbar), and then comparing the velocity with a predetermined level and adjusting the motor drive. Print

speed is not determined by the linear motor but by the resonant frequency of the printbar assembly mounted on its flexures. The motor adds energy to the resonant system to counteract any losses.

The maximum number of dot positions per character cell equals 21. This is the total possible number of dot positions which a single hammer can print. Refer to the "Dot Placement" section in Paragraph 3-2 for more information on this subject.

Ribbon drive:

The ribbon system positions the 14.5 inch towel ribbon between the printbar and paper shield while moving the ribbon back and forth to provide even ink utilization. The system also prevents the ribbon from skewing to one side or the other while it is moving. The system consists of three motors (supply reel, take-up reel and deskew) and their associated ribbon drive and deskew mechanics. The system also contains sensors that determine when the ribbon is at the end of its roll, and which direction the ribbon is skewing.

The ribbon skew sensor consists of a sensing arm which "dances" along the left edge of the ribbon. For every revolution of the ribbon drive motor the skew sensor arm is raised over a bar that the ribbon rides on. The sensor is activated when the ribbon allows the arm to drop down. The Formatter determines the ribbon position from this sensor, then drives the deskew mechanics to counteract the ribbon skew.

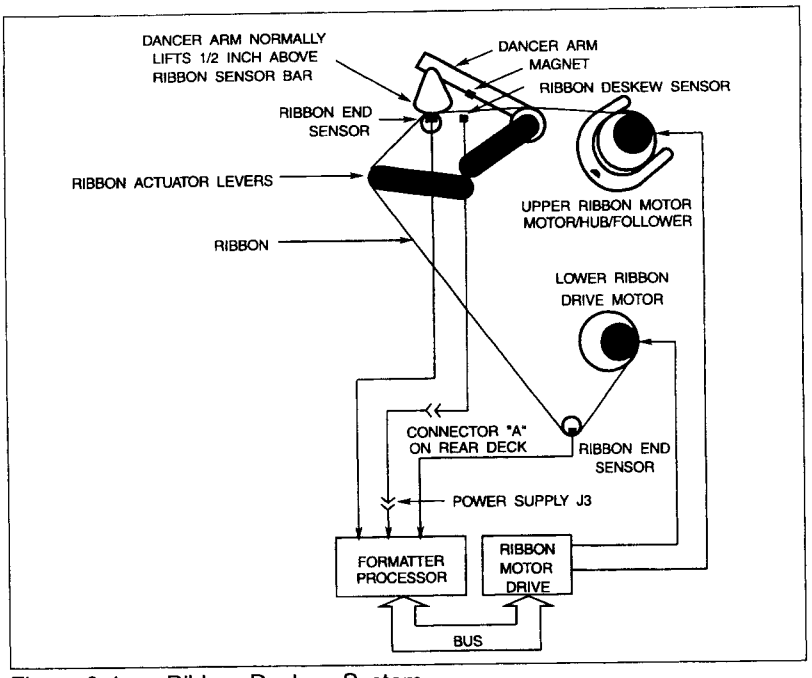


Figure 3-4. a. Ribbon Deskew System

PAPER PATH

The paper path contains the necessary mechanics, motors and sensors to determine if paper is present or moving, to accurately step the paper, and to hold and tension the paper and provide a surface (the platen) for it to rest against while printing. There is also a system that allows the tractors to be positioned horizontally via pushbutton control (power tractors).

Paper stepping is accomplished using a stepper motor controlled by the Motor Driver PCA and the Formatter PCA. Paper motion detection is accomplished by an emitter/sensor encoder assembly mounted to the stepper motor (series code greater than 2743) and a Hall Effect sensor mounted on the upper left tractor. A paper-out switch is located on the lower left tractor to determine if paper is present.

The dual tractor scheme consists of a set of two upper and two lower tractors. The upper tractors are connected to the stepper motor via a splined shaft and then are connected to the lower tractor shaft with a

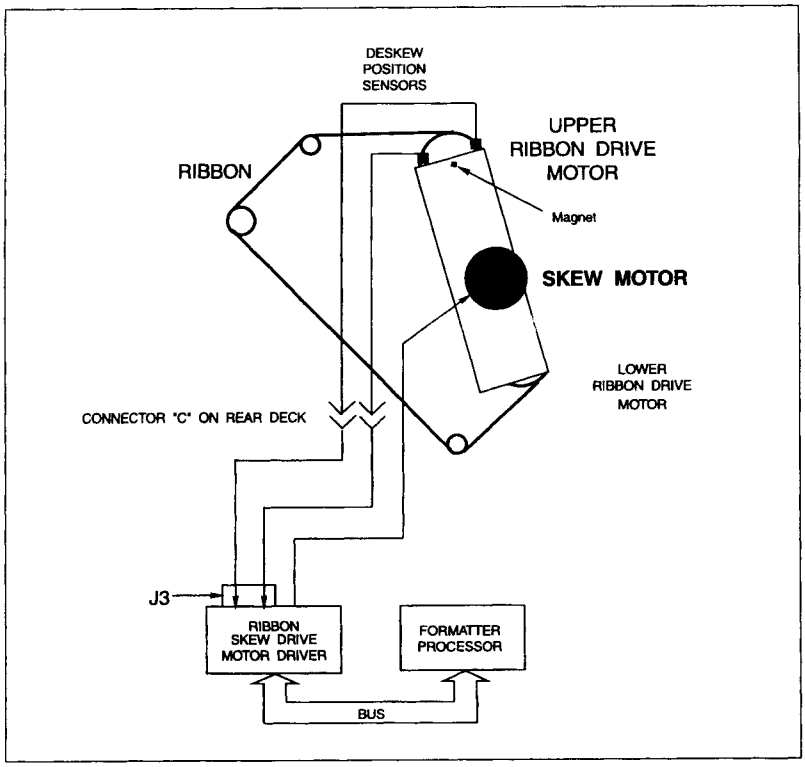


Figure 3-4. b. Ribbon Skew System

drive belt. Paper tension is varied by altering the belt shaft phasing which changes the relative position of the lower tractor paper teeth.

The closed loop paper feed system beginning with series 2743 adds a digital encoder to the paper feed stepper motor and a counter and associated circuitry to the backplane. The counter on the backplane is periodically interrogated by the formatter control program and compared with the required count stored in program memory. If the two count values differ, the control program issues additional command steps to the paper feed stepper motor in an attempt to make the two counts agree. The control program makes several attempts to make the correction. If a discrepancy still exists, the printing is stopped and a paper jam error, 1301, is issued. This differs from the customary paper jam error, 1300, which means that the form is no longer moving over the paper motion roller mounted on the upper left tractor. The counter on the backplane is

interrogated only after a paper slew, that is, a blank line or a form feed at which time the correction will be attempted if a discrepancy exists. This should not be a problem since most paper stalls occur as the perf passes through the print area. The CLOSED LOOP PAPER FEED SYSTEM, is checked during normal Self-test. Error 49 is issued if the system is not working properly. The system may be disabled by disconnecting the ribbon cable that goes from the encoder to the backplane at which time the paper feed system reverts back to the old system without feedback. This can be used as a work around until the system can be repaired.

The tractors are connected through a cabling system that allows power driven horizontal positioning adjustment. The tractors are clamped to a tractor positioning cable when installed. This maintains the parallelism of the upper and lower tractors, regardless of their horizontal positioning.

The Tractor Control Knob must be positioned on the "PRINT" position when printing to maintain accurate tractor alignment.

There is also a tractor vibration dampening system that helps reduce vibration caused by printbar oscillation and provides additional stability to the tractors. The tractors have anti-vibration brackets (AVB's) on their rear surface that extend behind the platen assembly. These AVB's each have a roller that rides on a rail on the rear surface of the platen assembly.

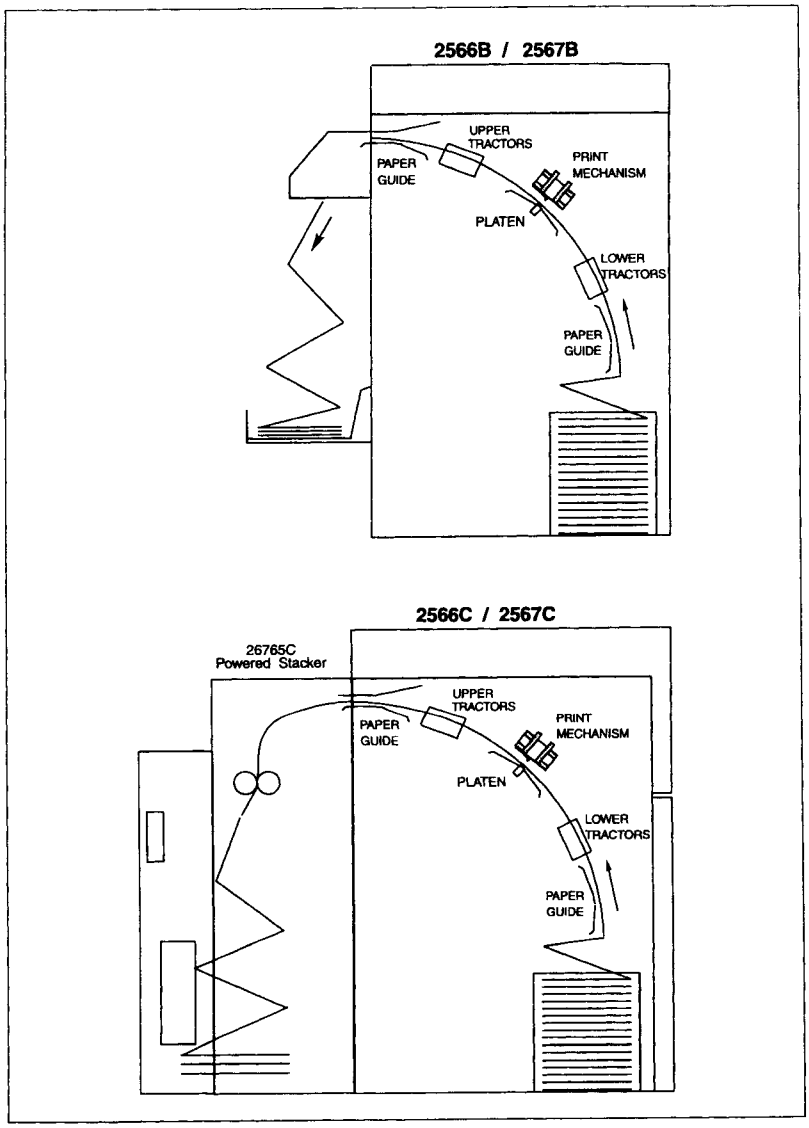


Figure 3-5. The Paper Path

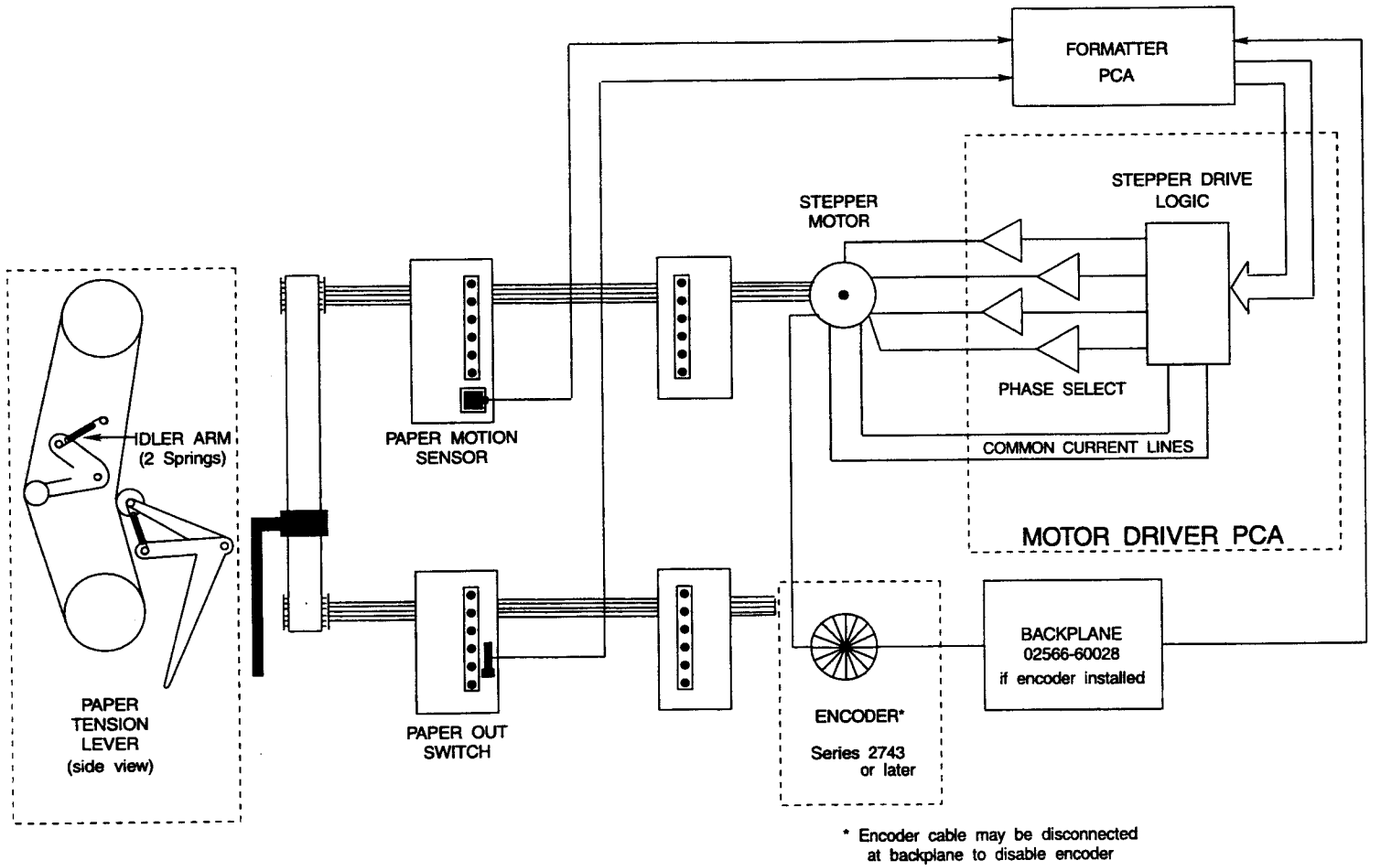


Figure 3-6. Paper Motion System

3-4. CONTROL PANEL PCA

FUNCTION

The Control Panel PCA provides operator interface to the HP 2566/67. The Control Panel consists of 12 keys, an ONLINE LED, and three seven-segment LEDs (two and one-half are utilized), each with an additional single LED (decimal point). A summary of the keyboard functions is provided in Table 3-1. A summary of the display's status and error codes may be found in Section IV of this manual. More detailed information on the Control Panel PCA keys can also be found in the HP 2566/67 Operator's Manual.

All communication between the Control Panel PCA and the Formatter PCA processor occurs over the data bus and four input/output ports (the 26 pin ribbon connector between P1 of the Control Panel PCA and J70 of the Formatter PCA). One input port is used by the control panel to indicate to the Formatter PCA which key has been pressed. The other three are output ports through which the Formatter PCA can write to the seven-segment LEDs.

The Control Panel PCA is checked on power up by the Formatter PCA. If the Control Panel PCA is not connected or defective, the +50V relay, K1, will not close.

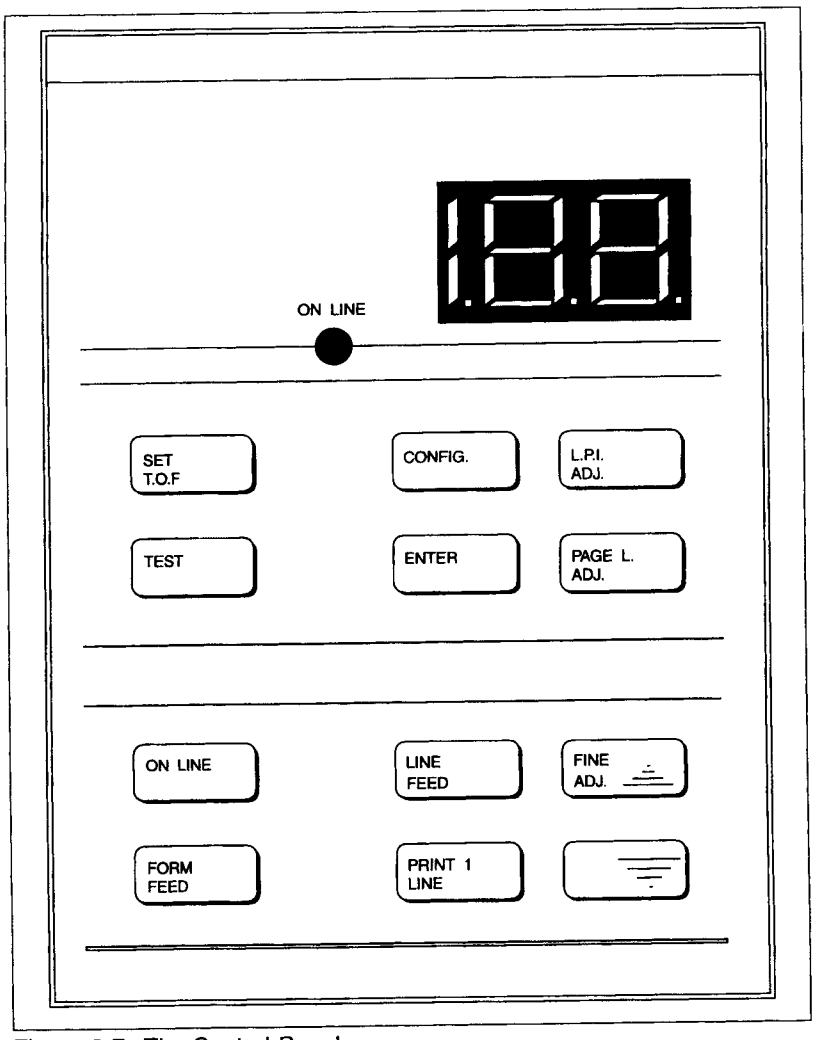


Figure 3-7. The Control Panel

KEYPAD

The keypad is made of silicone rubber with conductive pads (impregnated with carbon) on the back of each key. When the keys are pressed, the conductive pads short across an electrode pattern on the

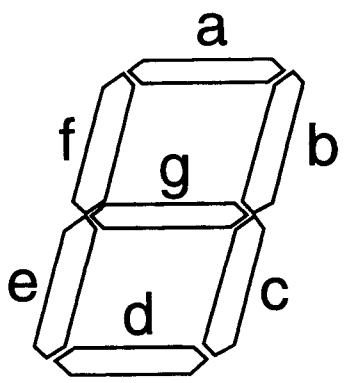
PC board. Pressing these keys does not interrupt the Formatter PCA. The processor is responsible for reading from and writing (polling) the Control Panel PCA at regular intervals.

Table 3-1. KEYBOARD FUNCTIONS

ONLINE	This key places the printer ON/OFFLINE (and aborts SELF-TEST if pressed while SELF-TEST is executing). All other keys are disabled when the printer is ONLINE.
FORM FEED *	Advances the paper to the next top-of-form position.
LINE FEED *	Advances the paper to the next line position.
PRINT 1 LINE *	Causes the printer to go ONLINE, print one line (provided that one line is currently buffered), then return OFFLINE. When pressed in Test mode a special one line test pattern is printed.
FINE ADJ UP/DOWN *	Advances the paper in the direction indicated in small increments (one dot row). This key is also used to advance the display when in TEST, CONFIGURE, LPI ADJ, or PAGE L. ADJ modes.
SET T.O.F.	The pressing of this key followed by the ENTER key establishes the current paper position as Top of Form.Also clears error 11, 12 or 13 when shown in display.
TEST	When pressed before the ENTER key a Self-test is executed. When pressed and held down for five seconds (until the status changes from five to four) and then the ENTER key is pressed, a continuous Self-test is executed. Pressing the TEST key a second time exits either mode. The FINE ADJ keys can be used to select an individual subtest.
CONFIG.	The CONFIGURATION key, used in conjunction with the FINE ADJ keys, allows the operator to select any configurable printer function.
ENTER	When pressed, the parameter selected in Configure Mode is set, or the test selected in Test Mode is executed. lines-per-inch, top-of-form, and page length are also set by using the respective keys along with ENTER key.
L.P.I. ADJ	When pressed, the default lines per inch is displayed. Lines per inch can be set using this key along with the FINE ADJ UP/DOWN and ENTER keys.
PAGE L. ADJ.	When, pressed the physical page length is displayed. Can be adjusted using FINE ADJ UP/DOWN and ENTER keys.
* These keys have auto-repeat capability. # Reset is performed by pressing the FORM FEED and L.P.I. ADJ keys together. When reset, the printer moves paper to the Top of Form, reverts to the power-on parameters, and stays "off-line"	

PORT / DATA BUS	A0	A1	A2	A3 (READ PORT)	
		DS2	DS1	SWITCH CONTROL=1	SWITCH CONTROL=0
BIT 0	SWITCH CONTROL BIT	a	a	LPI ADJUST	LPI ADJUST
BIT 1	ONLINE LED	b	b	FORMFEED	FORMFEED
BIT 2	DS3 c AND b	c	c	ONLINE	ONLINE
BIT 3	DECIMAL POINT	d	d	PAGE LENGTH ADJ	PAGE LENGTH ADJ
BIT 4		e	e	SET TOP OF FORM	TEST
BIT 5		f	f	LINE FEED	PRINT ONE LINE
BIT 6		g	g	CONFIG	ENTER
BIT 7		DECIMAL POINT	DECIMAL POINT	FINE ADJ. UP	FINE ADJ. DOWN

1 = PRESSED
0 = NOT PRESSED



7 SEGMENT DISPLAYS

Figure 3-8. Control Panel Interface

DISPLAY

Three seven-segment LED displays are used to show the printer's current status and configuration. The most significant (leftmost) display uses only two of its seven segments (segments b and c). There are also three single LEDs, making decimal points at the lower right corner of each seven segment LED. These decimal points indicate which mode the printer is in. No decimal points are on when the printer is in the STATUS mode; the right-most decimal point is on when in the TEST mode, the middle and right in CONFIGURATION mode, and all three are on when in the SET

T.O.F. mode. There is also a single ONLINE LED, separate from the others, which is on when the printer is on line.

The printer's displayed status, configuration, and error codes are explained in more detail in Section IV and Appendix B of this manual.

3-5. FORMATTER PCA (PROCESSOR/CONTROL CIRCUITRY)

The Formatter PCA is the "brain" of the printer in that it directs the processes within the HP 2566/67. The PCA consists of two major operational blocks: the Processor/Control circuitry and the Dot Generation Logic (DGL). This paragraph discusses the Processor/Control circuitry. The Dot Generation Logic is discussed in Paragraph 3-6.

FUNCTION

The Processor/Control circuitry consists of an 8086-1 microprocessor, 128 kbytes of ROM (read only memory), 10 kbytes of RAM (random access memory), a Triple Timer Chip, buffers, decoders and a clock generator. The major functions of this circuitry are as follows:

- Manage all memory.
- Coordinate the activity of the other processors (DGL, Interface and Vector Graphics).
- Process the data from the Interface PCA and direct the appropriate sections of the printer.
- Monitor all printer operations such as ribbon control, Control Panel and paper step functions.

The 8086-1 microprocessor is used as the printer's main control processor, executing the printer functions as defined in the firmware (ROM). The 8086-1 also coordinates the activity of the other printer processors and digital subsystems.

MEMORY MANAGEMENT

The printer consists of different processors that are responsible for unique operations (distributed processing). The Formatter PCA's processor communicates with the other processors via shared RAM, and is responsible for all memory management in the HP 2566/67. This responsibility

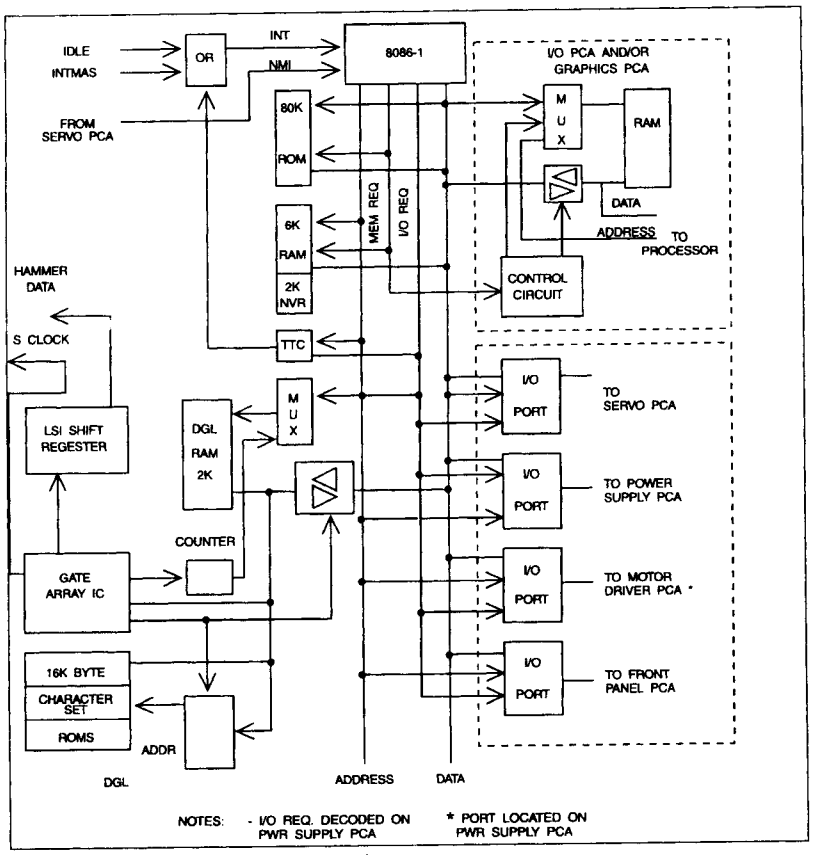


Figure 3-9. Printer Memory Architecture

requires that the formatter processor communicate with the DGL (Dot Generation Logic), the interface, and the Graphics PCA's RAM (if installed).

The formatter processor must access 150 kbytes of memory, which breaks down as follows:

ROM: 128 kbytes, located in four 32 x 8 kbit EPROMs (Erasable Programmable ROMs).

RAM: 8 kbytes, located on the Formatter PCA.
2 kbytes, also on Formatter PCA, but shared DGL RAM.
4 kbytes, located on the Interface PCA.

4 kbytes, on the optional Graphics PCA.
4 kbytes, reserved for future use.

The Formatter's PCA 8 kbytes of RAM are reserved as scratch memory, used by the processor for temporary storage purposes. Of this, 2 kbytes is non-volatile with standby current provided by a lithium battery. This memory is used to store configuration information (on/print meters, interface configuration, primary/secondary languages, lines-per-inch, online/offline state, form length, etc.).

Memory mapped interface ports are used by the Formatter PCA to communicate with the machine control hardware (all analog electronics, the DGL, the Servo PCA, the Control Panel PCA, etc.). These are used in conjunction with the shared RAM.

PROCESSOR COMMUNICATION

The formatter processor functions in conjunction with the other printer processors (Interface, DGL and Graphics), coordinating their activities. Each independent subsystem has RAM that is shared with the formatter processor. The Formatter PCA has the capability of accessing any address within the three shared memories.

Communication between the master (formatter processor) and the slaves (other processors) is handled through these shared memories. Specific locations in the shared memories (except the DGL) are dedicated to the master and to the slave and are reserved for messages. At periodic intervals (or when directed by an interrupt) the master or the slave reads the messages placed in these locations. These messages direct either the master or the slave to a memory packet which provides specific instructions.

There are five possible interrupts to the formatter processor: (1)timer 0, (2)timer 1, (3)timer 2, (4)DGL idle, and (5)backplane. These are all channeled through discrete TTL logic, which serves as an interrupt controller. Interrupt priority is determined by vector addresses in a RAM based interrupt vector table. A triple timer chip with three independent timers allows high resolution, two millisecond, and one hundred millisecond timing capabilities respectively. The high resolution timer is primarily used for stepper motor timing. The formatter processor services interrupts at the completion of its current instruction. In addition, the processor uses a Non Maskable Interrupt (NMI) through which the Servo PCA indicates that a valid dot position has been reached (refer to Paragraph 3-7 for more detail).

CLOCKING

Clocking for the 8086-1 is provided by an 8284A Clock Generator IC which uses a 30 MHz crystal to generate a 10 MHz and a 5 MHz clock. The 10 MHz clock is used by the 8086-1. The 5 MHz clock is used by the Triple Timer Chip (after it has been divided down to 500 kHz). A separate 8 MHz oscillator is divided to 4 MHz and used by the DGL.

3-6. FORMATTER PCA (DOT GENERATION LOGIC)

FUNCTION

The Dot Generation Logic (DGL) is responsible for calculating and buffering dot/bit image data for each row of print. The dot row consists of a cross-sectional segment of each character of the print line. All dot-image data is processed by the DGL during the printbar turnaround period (the time period, during printbar oscillation, when the printbar is changing direction).

The formatter processor, using the turnaround period as an indicator, coordinates the flow of data to the DGL for processing. A scenario of the formatter processor and DGL interaction follows:

The Formatter processor recognizes that data is present on the Interface PCA's 4 kbytes shared RAM. During the start of the next print line period, the formatter processor moves the data from the Interface RAM and puts it in the DGL's shared RAM via character identification bytes (at 2 bytes per printed character).

The first byte input into the DGL's shared RAM defines the ASCII character to be printed and whether or not the character is to be underlined. The second byte determines which character set is to be used (symbol set code) and the character width. All characters associated with a line of print (maximum of 231 bytes in high-density graphics mode) are stored in the DGL RAM; any space remaining after the line data has been loaded is filled with ASCII blanks (20 hex).

As the printbar enters turnaround, the DGL begins generating the next dot row of data. The formatter processor initiates DGL operation by four bytes to the DGL circuitry: Mode One Byte, Mode Two Byte, Mode Three Byte and the Command byte.

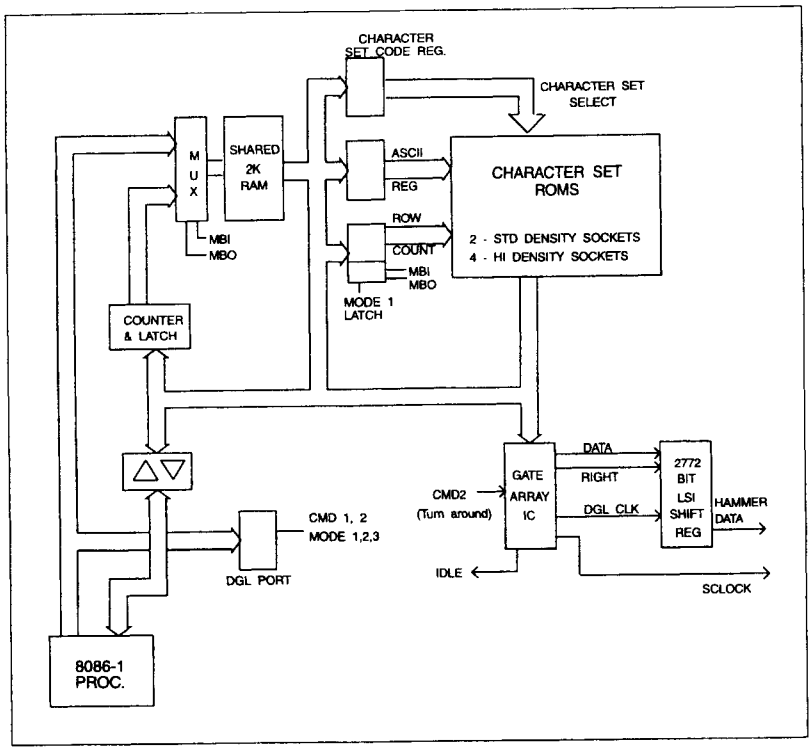


Figure 3-10. Dot Generation Logic

Mode One Byte, bits zero through three, indicate which horizontal dot row is being printed. Bits three and four indicate what block of shared RAM contains the data. Mode Two Byte defines the horizontal grid density at which the dot row of data is to be printed. Mode Three defines the number of characters the DGL should access from the shared RAM buffer (maximum 231). The Command byte specifies how the DGL is to process the data in RAM (e.g. expanded, variable grid, descender scan, alternate row, underline enable, text or graphics, and the printbar direction).

Processing begins as the DGL removes the character identification data from the shared RAM. A gate array addresses the data in the shared RAM and uses it to address the appropriate section of the symbol set ROM bank. This gate array then takes the symbol set output and, in conjunction with the Command byte, serializes the dot/image data and passes it to the 2772 bit LSI (large scale integration) shift register. These

dot/image bits are input in an order representative of each bit's location in the dot matrix character cell. Each character pertaining to a line of print is processed in a similar manner. The end result of the DGL's processing is the inputting of a cross-sectional segment of each character in the next line of print into the 2772 bit shift register. This data represents one horizontal dot row which is to be printed by the printbar.

All data must be processed during printbar turnaround. At the completion of DGL processing, the DGL IDLE line interrupts the formatter processor. It should be understood that the shared 2 kbytes RAM is filled only once for every line of data; however, the DGL processes the data one dot row at a time. The formatter processor must issue a new Mode One, Mode Two and Command byte after each pass of the printbar to update the dot image for the next row.

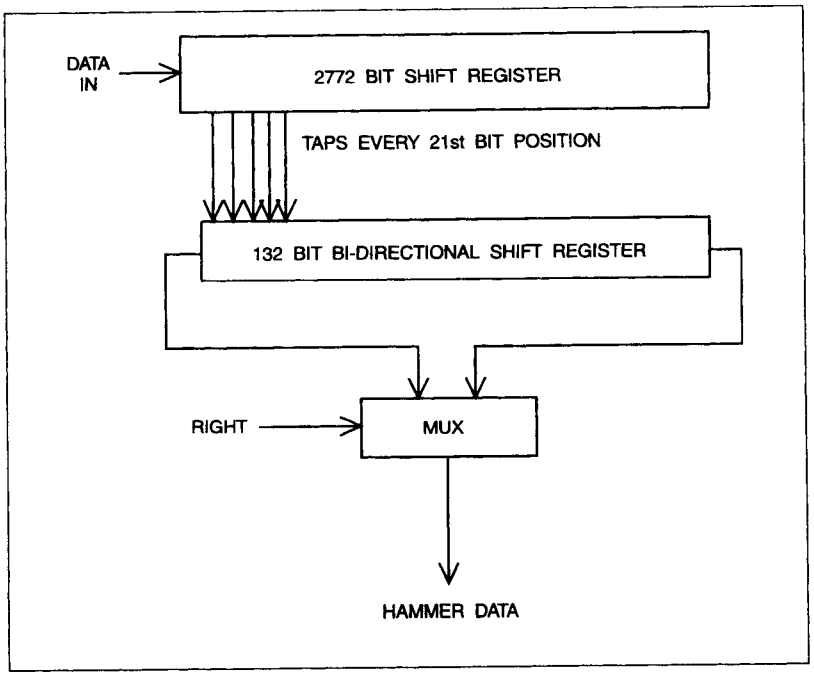


Figure 3-11. LSI Architecture

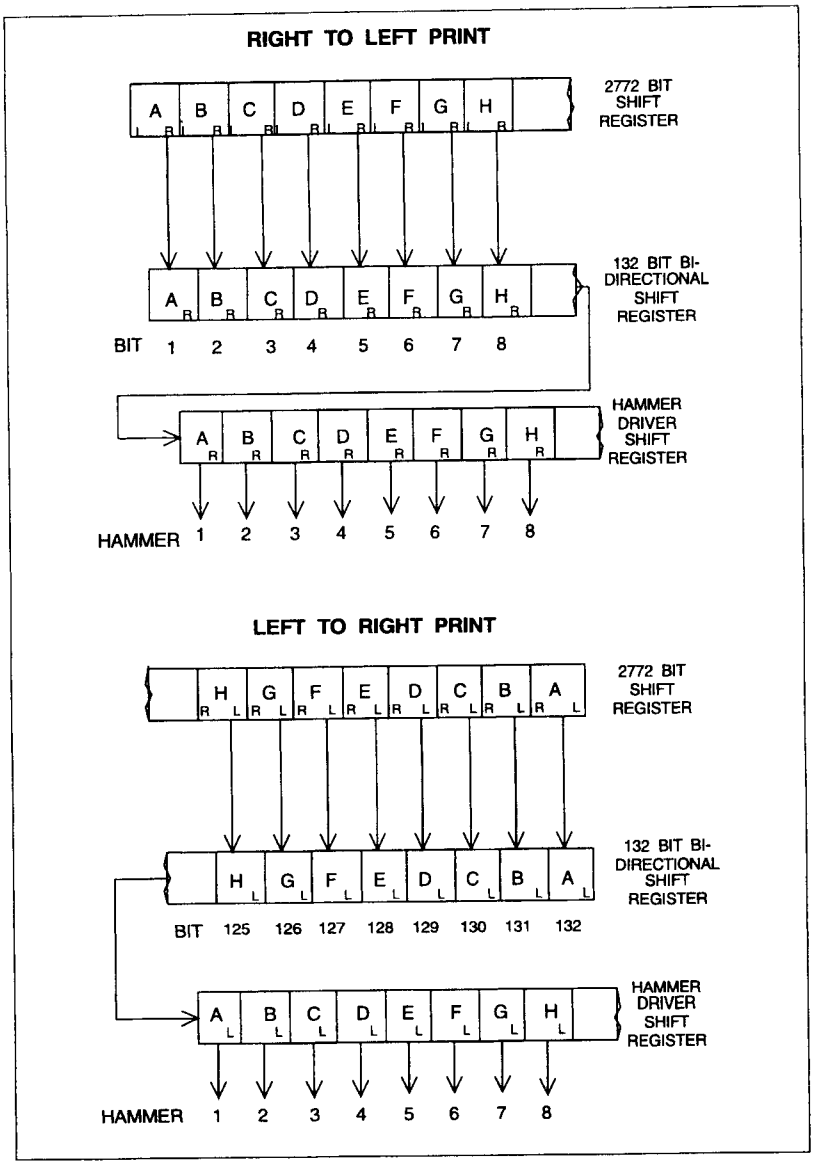


Figure 3-12. Data Output Timing

During one pass of the printbar, the formatter processor strobes the DGL shift and load signal lines. The DGL shift line allows the formatter processor to select the appropriate 132 dot/image bits (one bit for each

hammer) to be sent to the Hammer Driver PCA while the DGL load line actually initiates the sending of the dots. This technique is useful during "multipass" in which one dot row is printed during multiple passes of the printbar, each single pass selecting which dots are to be printed from the 2772 bit shift register. The 2772 bit shift register must be reloaded after every printbar pass.

The formatter processor is interrupted after every hammer fire. After the printbar hammers have fired, this shifting process is repeated. The DGL shift line allows the formatter processor to select the next dot column in the character cell while the DGL load line allows the formatter processor to send this column of 132 dots to the Hammer Driver PCA. During this time, the printbar (and thus the hammers) have also moved to the next dot position. The entire process is repeated until all dot/bit data (maximum of 21) for each printbar hammer has been selected. During the next printbar turnaround, the next dot row is loaded into the 2772-bit shift register.

As mentioned, the processed DGL data is placed into a 2772 bit shift register during printbar turnaround. This register is within a large scale integration (LSI) circuit on the Formatter PCA and contains a dot storage position for every possible dot that could be printed during a single pass of the printbar (maximum 132 characters per line X maximum 21 dots per character). The 2772 bit shift register is designed so that every 21st bit (i.e., 1, 22, 43 ... 2751) may be tapped and loaded in parallel into a 132-bit bi-directional shift register (output register) that is also located within the LSI integrated circuit.

To utilize the data in the Output Register, the data must be shifted from the Output register to the hammer driver shift register in between each occurrence of the hammer fire pulse.

CHARACTER IDENTIFICATION BYTE DEFINITIONS

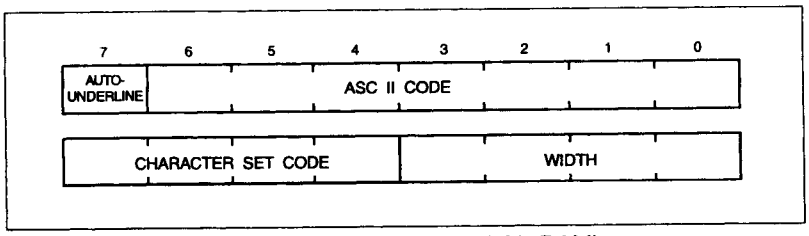


Figure 3-13. Character Identification Bytes (DGL RAM)

BYTE 0:

Auto Underline Bit (AU)
The Auto Underline Bit, when set, indicates to the DGL that the ASCII character corresponding to the bit is to be underlined (provided the Underline Enable Bit (ULE) is set in the Command byte). If ULE and AU are set, the DGL then sets row 9 (16 if high density is selected) to be an underline.

ASCII Code
These bits are the 7 bit ASCII code for the desired character. They are used to address the appropriate section of
the desired symbol set ROM.

In graphics mode (TEXT bit set to 0 in the command port), byte 0 is not used.

BYTE 1:

Symbol Set Code
The HP 2566/67 may contain up to 16 different symbol sets on the Formatter PCA. They are selected when the 8086-1 directs the DGL, through the Symbol Set Code, which symbol set to use. Recall that all 16 symbol sets are contained within the 6 128 kbit EPROMs.

WIDTH
The width bits are used by the DGL to serialize the dot data from the symbol set EPROMs. The width bits correspond to the desired cell density (21, 20, etc.).

In graphics mode, byte 1 contains the raster data for each successive printer dot position. Since there are 1848 possible dots in a raster line, 231 bytes are required to hold the raster data (13.2" x 140 dpi/ 8 dots/ byte = 231 bytes.).

MODE 1, MODE 2 AND MODE 3 BYTE DEFINITIONS

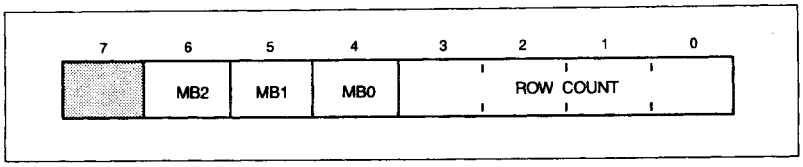


Figure 3-14. Mode One Byte

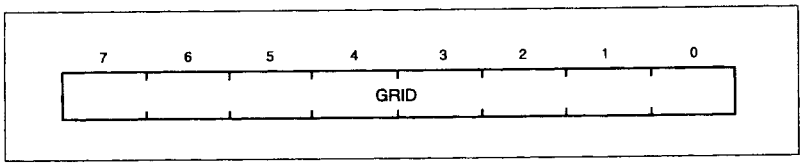


Figure 3-15. Mode Two Byte

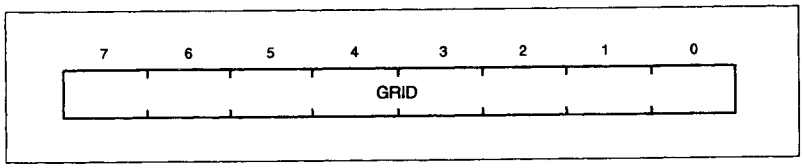


Figure 3-16. Mode Three Byte

MODE 1:

MB0, MB1, MB2
The common DGL RAM is divided into four 512 byte blocks, each contains the 2 character identification bytes for each line of print.

The first 512 bytes contain the first print line, the second 512 contain the overstrike character line for the first line of print. The other two 512 byte blocks contain the same information for the second line of print. MB0, MB1 and MB2 are used by the DGL to identify on which block the character data resides. MB0 and MB1 only are used to access the shared DGL RAM buffers.

ROW
ROW indicates which dot row of the current character code the DGL is processing. The DGL uses ROW to address the correct area of the symbol set ROM.

MODE 2:

Grid Density
When the EGRID bit of the Command byte is set, the DGL reads the Mode 2 byte into the gate array. This byte indicates the grid density at which the line is to be printed. If the grid density is other than 210 dots per inch (DPI), the gate array "pads" the data it inputs to the LSI chip so that the data is then printed correctly. For example, if the grid density is 200 DPI the gate array must pad every twenty-first bit with a zero. If the EGRID bit is not sent, the density is assumed to be 210 DPI.

MODE 3:

Character bytes per line. Value 0 (zero) if left direction in Command byte, Mode 3 value if right direction in Command byte.

COMMAND BYTE DEFINITIONS

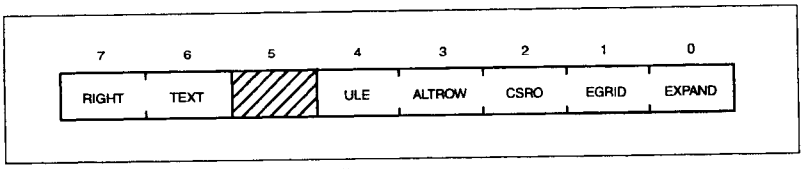


Figure 3-17. Command Mode Byte

RIGHT:
The RIGHT bit indicates which direction the printbar will be moving on the next pass. This information is used by the DGL to put the data in the LSI shift register in the correct orientation. 0=left-to-right direction, 1=right-to-left direction. Note that RIGHT means the printbar is moving toward the left.

TEXT:
The TEXT bit indicates if the data in the DGL RAM is raster data (TEXT=0) or ASCII characters (TEXT=1).

CSR0:
If the CSR0 (0 = zero) bit has been set in conjunction with other bits, it indicates to the gate array one of two activities:

The processor wishes to read a particular address in the symbol set ROM and the address is specified in the first two locations of the shared RAM.

The DGL is to read through the characters specified in the shared RAM and then indicate to the processor if any descenders are in the line and what oscillation amplitude is required.

ULE:
When the formatter processor sets the Auto Underline (AU) bit in Byte 0, this indicates to the DGL that the corresponding character is to be underlined. If the Underline Enable (ULE) is not set, the DGL ignores the AU bit. This method of underlining transfers the burden of underlining from the formatter processor to the DGL.

ALTROW:
The ALTROW (Alternate Row) bit, when set, indicates to the DGL that the current character line is high density and that 18 dot rows per character are to be processed instead of 9. (High density character sets can have twice as much information as normal density. ALTROW is used to select this other information.)

EXPAND:
When double width characters are desired, the EXPAND bit is set. Then, as data is being sent to the 2772 bit shift register, the DGL's gate array state machine switches the output through shift register and logic circuitry. This circuitry duplicates the actual dot/bit image data, and then interleaves the duplicated dot/image data with the original data stream.

EGRID:
When the EGRID bit is set, the DGL is directed to read the Mode 2 byte. If the EGRID bit is not set, the DGL is to use 210 dots per inch as the dot density in its grid circuitry.

STATUS BYTE DEFINITIONS

The DGL Status Byte allows the formatter processor to determine the results of a DGL descender and oscillation amplitude scan.

DOT ROW 8:
0 = No descenders in dot row 8.
1 = Descenders in dot row 8.

DOT ROW 9:
0 = No descenders in dot row 9.
1 = Descenders in dot row 9.

EXCURSION:
0 = Character does not have active dots outside the center 13 in a 21 dot wide cell.
1 = Character does have active dots outside the center 13 in a 21 dot wide cell.

SRO:
When set, shift register output is used for self-test purposes.

3-7. SERVO PCA

FUNCTION

The purpose of the Servo PCA is monitoring the printbar's motion via a velocity transducer. It provides accurate information regarding the position of the printbar relative to the print mechanism casting (and thus the paper). The PPS drive circuitry is also located on the Servo PCA.

The Servo PCA provides the following:

- A FIRE signal that indicates a valid dot position has been reached (and the hammer should be fired).
- A drive signal to the linear voice coil driving circuitry of the Motor Driver PCA.
- A direction signal to the formatter processor (indicates printbar direction.
- A measurement of the linear coil current to the formatter processor.
- Stacker motor drive.

In addition to providing information to the formatter processor, the Servo PCA also receives information from the Formatter PCA. This information directs the Servo PCA to generate a command signal of a certain frequency and amplitude. This command signal is then used to generate the drive signal thereby specifying the printbar oscillating amplitude and frequency.

CIRCUIT DESCRIPTION

The Servo PCA consists of the following functional blocks:

- Formatter Interface
- Clock Generator
- Sine Wave Generator
- Servo Drive Signal Generator
- Motor Current Detect
- Position Generator
- Position Interrupt
- PPS Motor Drive Circuitry

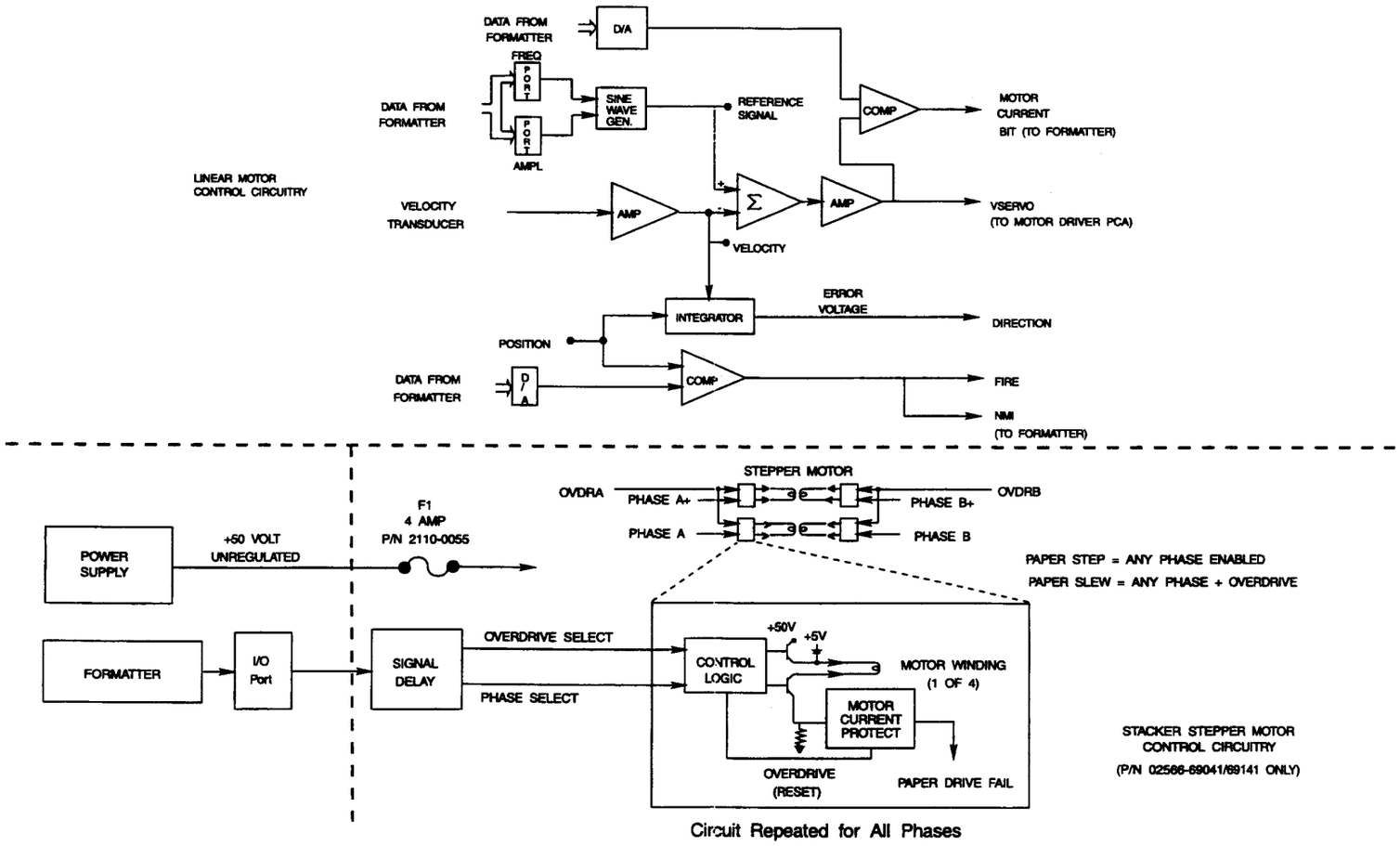


Figure 3-18. Servo PCA Block Diagram

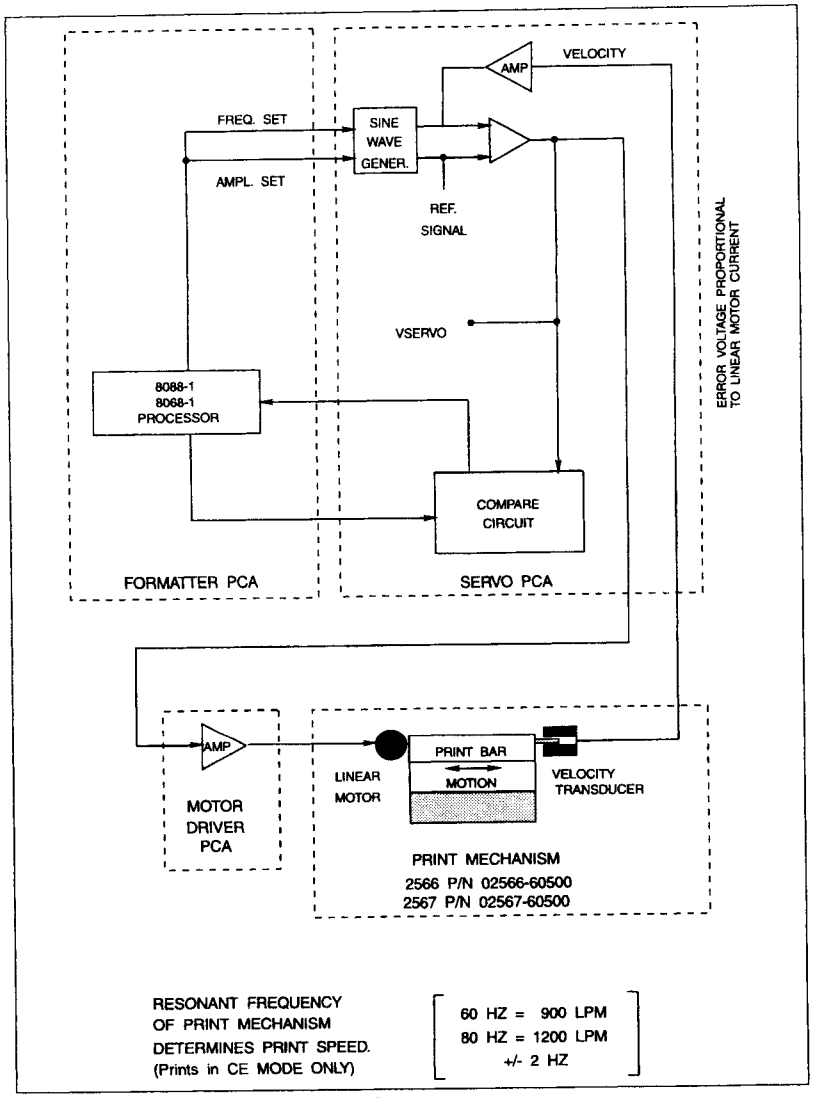


Figure 3-19. Printbar Oscillation System

The formatter interface provides the necessary decoding and routing of information between the Formatter PCA and Servo PCA. Information passed from the formatter processor to the Servo PCA includes frequency and amplitude settings for the sine wave generator and a

position comparison setting used by the position generator. A motor current value and a direction bit are passed from the Servo PCA to the Formatter PCA.

The clock generator provides 16 MHz, 8 MHz and 4 MHz clocks. The 8 MHz clock is passed to the Backplane PCA to be used by other PCAs. The 16 MHz clock is used by the sine wave generator.

The sine wave generator generates a low distortion sine wave at the specified frequency and amplitude. This sine wave specifies the desired printbar motion and is used by the servo drive signal generator.

The servo drive signal generator compares the desired sine wave with the amplified velocity signal from the velocity transducer and produces a drive signal. This drive signal is amplified and passed to the Motor Driver PCA. The drive signal is also passed to the motor current monitor circuitry. Besides generating this drive signal, the servo drive signal generator circuitry supplies the amplified velocity signal to the position generator.

The motor current circuitry takes the peak value of the drive signal (which is proportional to the motor current) and relays it to the Formatter PCA. This value will be at its minimum when the printbar is being driven at resonant frequency. This signal is used during self-test 24, Velocity Transducer Adjustment Test.

The position generation circuitry integrates the velocity signal to derive a position signal which is then combined with a direction signal to produce a position output signal. The direction signal is derived by monitoring the sign of the velocity signal. The position output signal is then fed to the position interrupt circuitry.

The position interrupt circuitry compares the position output signal with the position comparison setting to create the FIRE pulse. The FIRE pulse indicates to the Hammer Driver PCA that the hammers should be fired. The position interrupt circuitry also generates and sends an NMI (non-maskable interrupt) to the Formatter PCA so that it may then update the position comparison setting.

The PPS motor drive circuitry is responsible for driving the PPS stepper motor based on the commands received by the paper stepper motor. For every two steps on the paper stepper motor, the PPS stepper motor steps once. All signals and timings are self generated. There is a fuse (F1) between the drive transistors and +50V to protect the drive motor.

OPERATION:

There are three basic modes of operation for the servo PCA:

- Start Up
- Maintaining Oscillation Frequency
- FIRE Generation

START-UP: At start up, the processor writes a specific amplitude and frequency to the sine wave generator. The Formatter PCA then enables the printbar to mogate. Once the printbar has started mogating the Formatter PCA will measure two passes of the printbar to determine its resonant frequency. This is done to accomodate other flexure frequencies that are used in the 256X family of printers.

MAINTAINING OSCILLATION: Once resonating, the oscillation amplitude is set and the servo drive signal generator provides the drive signal (VSERVO) to the Motor Driver PCA so that printbar oscillation may be maintained at proper frequency.

FIRE GENERATION: To generate the FIRE pulse, the Formatter PCA uses a table in memory (one entry for each dot density) that has all position comparison settings and their corresponding dot column shift values. Upon receipt of a direction change from the position generator, the Formatter PCA sets a pointer to the top of the table and sends the initial value of the position comparison setting to the position interrupt circuitry. The Formatter PCA also shifts the DGL 2772 bit shift register to the proper dot column. When the position output signal exceeds the setting, the FIRE and NMI pulses are generated. Upon receipt of the NMI, the Formatter PCA sends the next comparison setting (dot column value) and updates the pointer.

3-8. POWER SUPPLY AND BACKPLANE PCA

BACKPLANE PCA

The Backplane PCA provides interconnections between the Formatter, Servo, Interface, Graphics and the Power Supply PCAs. It consists of four 60 pin connectors, each connected in a common bus set-up. (Although there is room for six cardcage slots, two connectors and slot tracks are not installed.) There is also a 100 pin edge connector that provides a interconnection to the Power Supply PCA. There is no

restriction (electrically) regarding the location of the other PCAs in the Backplane PCA, however, there is a mechanical restriction that requires the Interface PCA to be placed in the slot marked J16 and some limitations imposed by cable lengths. The 100 pin edge connector that interfaces the Power Supply PCA to Backplane PCA has pins 1 to 60 wired differently than the 60 pin connectors but still maintains the common bus structure. The Backplane PCA also contains support circuitry for the paper encoder of the closed loop paper feed system. The paper stepper encoder is connected to J17 (on 02566-60028 PCA). The Backplane PCA also contains support circuitry for the draft mode options. This is known as a PAL chip (Programable Array Logic) which is located on U1.

POWER STRAPPING AND TRANSFORMER

The power strapping and transformer are located on the bottom rear of the electronics bay. The power strapping can be accessed via a panel located on the back of the printer. The power strapping is factory configured for one of four voltage levels, all of which will operate at 50 Hz or 60 Hz. The levels are 100 VRMS, 120 VRMS, 220 VRMS and 240 VRMS. Re-configuration is accomplished by rewiring the transformer AC line wiring on a barrier block. For detailed power strapping procedures, see Paragraph 2-4, "Power Configuration".

POWER SUPPLY PCA

Function

The Power Supply PCA contains all of the electronics that implement the following functions:

- Line Input Rectification to:
  +50V DC Voltage
- Supplies:
  +12VDC
  -12VDC
  +5VDC
  +20VDC, +2.5VDC (internal on Power Supply PCA)
- Overvoltage Protection
- AC Power Fail Warning/Power On Reset/Power Off Reset
- +50VDC Power Relay System
- Power Supply Interface
- Interrupt System

Circuit description

Figure 3-1 includes a block diagram of the Power Supply PCA. The following is a generalized circuit description of this printer component. The line input rectification takes the transformed line voltage and rectifies it to form +50VDC which is the main power for the printer. This voltage may vary from +40V to +60V depending on loading and line voltage conditions and line voltage. (When printing the Hammer Driver PCA puts a significant load on the +50V.) The +50V is used by the Hammer Driver PCA as the supply for the coils, the Motor Driver PCA as a supply for the motors, and the Power Supply PCA to generate the other voltages. Please note that the Hammer Driver PCA and the Motor Driver PCA are connected to the +50V supply through a power relay system. The +50V connection to the power supply's regulators is fused (F1-5A, SB) so that the crowbar circuitry has a means of disconnecting the regulators from the +50V source.

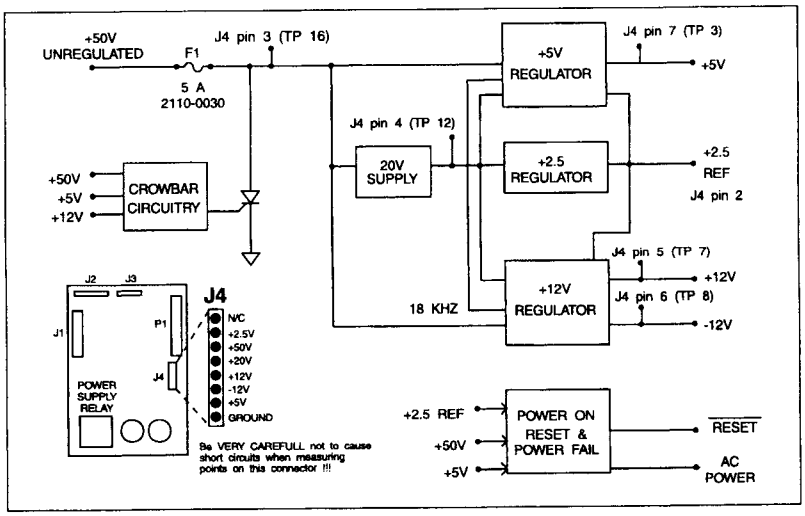


Figure 3-20. Power Supply Regulators

The +50V (unregulated) is used as the source for the +/- 12V,+5V and +20V regulators. The +20V regulator is a simple linear regulator that supplies the +2.5V and other regulator's bias. The +2.5V regulator is a precise reference for the +/-12V and +5V regulators and, consequently, the output voltage of these regulators is directly proportional to the +2.5V reference level. The +5 and +/-12V regulators are switching regulators. The +12V regulator chip supplies an 18kHz square wave signal that is used by the +5V regulator for switching.

Theory of Operation

The loads connected to the +50V, +5V and +/- 12V regulators are protected by a crowbar which shorts the +50V to ground should the regulated voltages exceed a preset level. The short to ground will cause F1 to open, thus shutting off the supplies.

In addition to overvoltage protection there is power fail warning and power on reset circuitry. The power fail warning circuitry senses the amplitude of the AC voltage at the secondary of the transformer. If this voltage drops below +40V for at least 20 milliseconds the circuitry

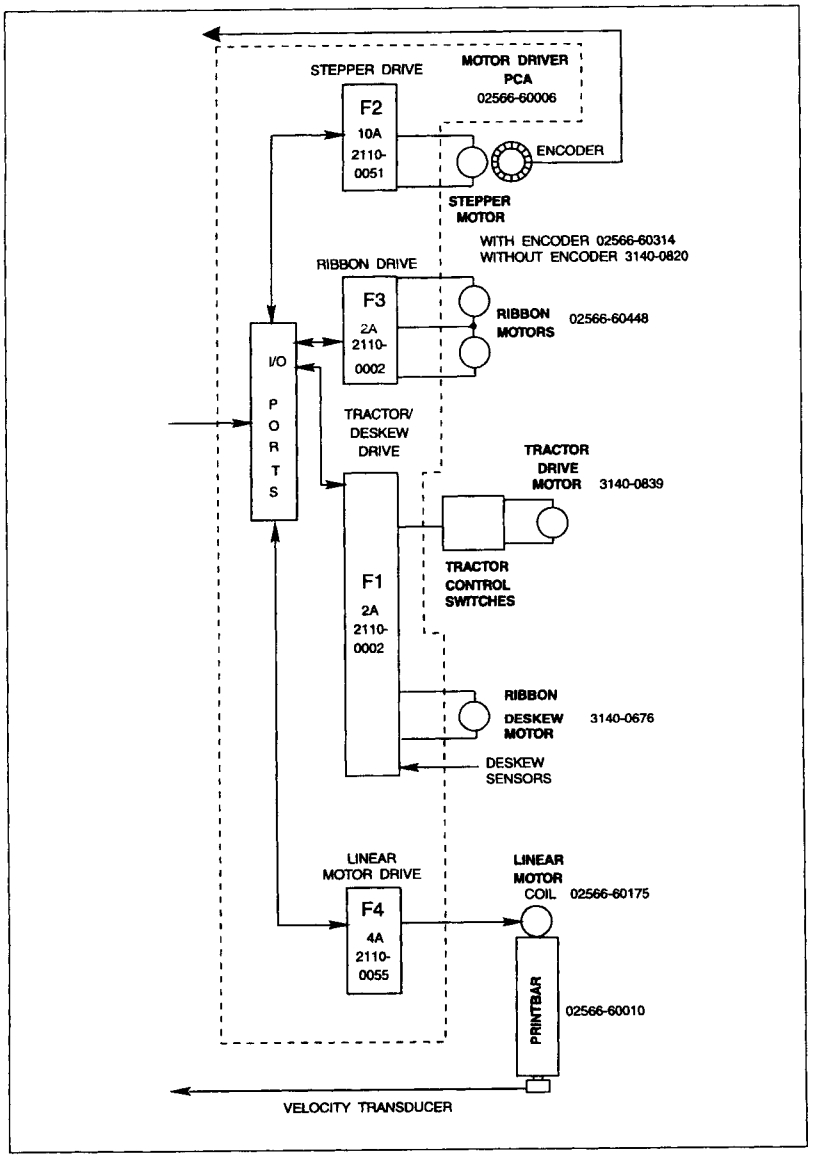


Figure 3-22. Motor Driver PCA

CIRCUIT DESCRIPTION

The Motor Driver PCA consists of the following functional blocks:

- Ribbon Drive and Deskew System
- Linear Motor Drive System
- Paper Stepper Motor Drive System
- Paper Position Encoder System
- Tractor Drive System

Ribbon drive and deskew:

The ribbon drive system supplies the necessary drive to move the ribbon in the appropriate direction, to deskew the ribbon and to provide information to the Formatter PCA of a ribbon fault or stall. The system is also designed to provide ribbon tension and to take up ribbon slack with minimum movement of the ribbon during power up. The ribbon system also applies switching regulator theory to drive the motors. Consequently, there is circuitry to provide the switching pulses to this system.

Drive motion, tensioning and slack removal is accomplished by driving the two ribbon drive motors. When the formatter processor directs the system to move the ribbon from supply reel to take-up reel via the DIRECTION 1 command, transistors QA will be turned on and QD on and off by LONG PULSE while QB and QC are kept off and transistor QE is turned on and off by SHORT PULSE at a shorter duty cycle. This results in the two motors being driven at a slightly different speed, tensioning the ribbon. In moving from take-up reel to supply reel (the DIRECTION 2 bit set), QA and QD are kept off, QB is turned on and off, QC is kept on while QE remains as before. During power up, transistor QA and QC are kept on, QE is switched at SHORT PULSE and QB and QD are kept off. This results in both the motors being driven in opposite directions, thus taking up the slack in the ribbon. Finally, since this is a switching system, transistor QE is driven by SHORT PULSE to insure that the correct amount of current is drawn off for proper tensioning.

In addition to ribbon drive, the system also provides drive to keep the ribbon centered. This is accomplished by turning a deskew motor on to drive the tensioning rod to the correct position, and off to hold at position (braking). The deskew motor is directed to change by the formatter processor via a DESKEW or DIRECTION command. Upon receipt of DESKEW or DIRECTION 1, the deskew system logic determines the current position of the tensioning rod by monitoring the left and right deskew sensors. The logic then commands the motor to move the arm to the opposite position. The circuitry is protected from short conditions via

a fuse that it shares with the tractor drive system. Finally, there is the ability for the formatter processor to turn the deskew system off (and on) via an enable bit should the formatter processor be told of a fault in the deskew block by the fault detection circuitry.

The ribbon drive system has fault detection circuitry that indicates to the formatter processor (via the Power Supply PCA Interrupt system) if there is a ribbon stall or ribbon fault.

A ribbon fault condition occurs if:

- The ribbon drive or Deskew/Tractor drive fuses (F1 or F3) open.
- The current through transistor QE exceeds a preset level

A ribbon stall condition occurs if:

- Current through transistors QB or QD exceeds a preset level.
- Voltage across the driving ribbon motor (DMV) drops below a preset level.
- Voltage to either of the ribbon drive motors (left-side or right-side) exceeds a preset level for an entire LONG PULSE cycle (indicating that motor lead is disconnected or a transistor not working).

Finally, since the ribbon system is a switched system, it contains the circuitry to provide the necessary pulses for switching. The pulses provided are LONG PULSE and SHORT PULSE. LONG PULSE is a 20 kHz signal with a nominal duty cycle of 50%. The duty cycle is dependent on the +50V supply because the motors have +50V switched across them, hence if the +50V is high, the transistors need not be switched on as long to maintain the correct voltage level. LONG PULSE is generated by a voltage controlled oscillator (VCO). SHORT PULSE is used to switch the common transistor (QE) and uses the current level through QE to control the duty cycle so that QE remains on long enough to tension the ribbon. SHORT PULSE frequency is derived from LONG PULSE, but the pulse width of SHORT PULSE is controlled by the current level through transistor QE (higher current = shorter pulse width).

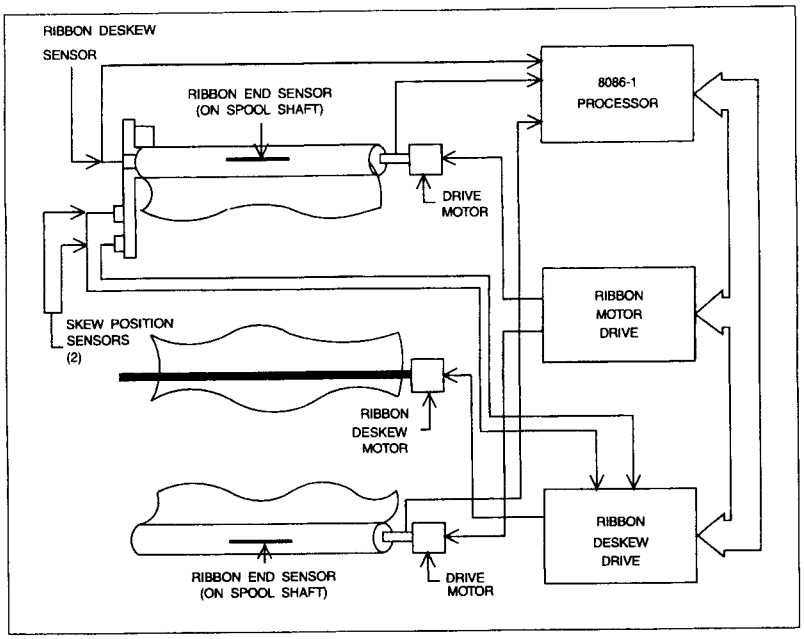


Figure 3-23. Ribbon System

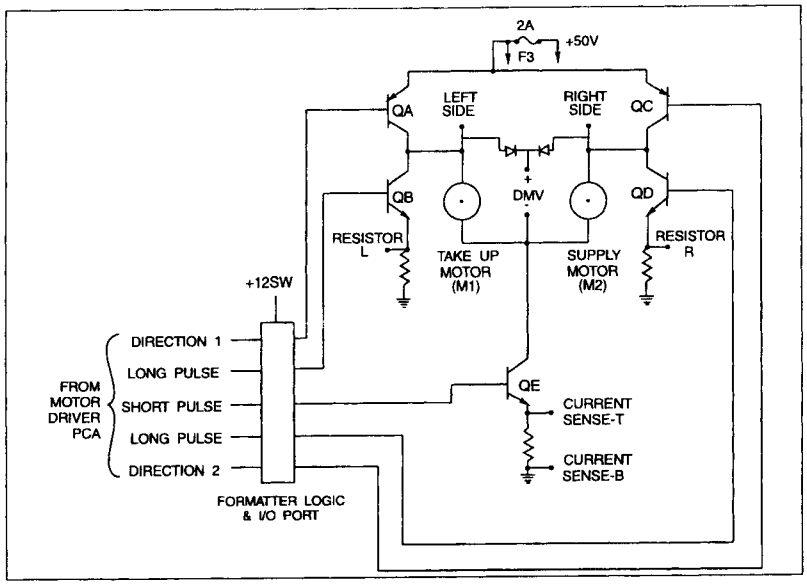


Figure 3-24. Ribbon Drive System

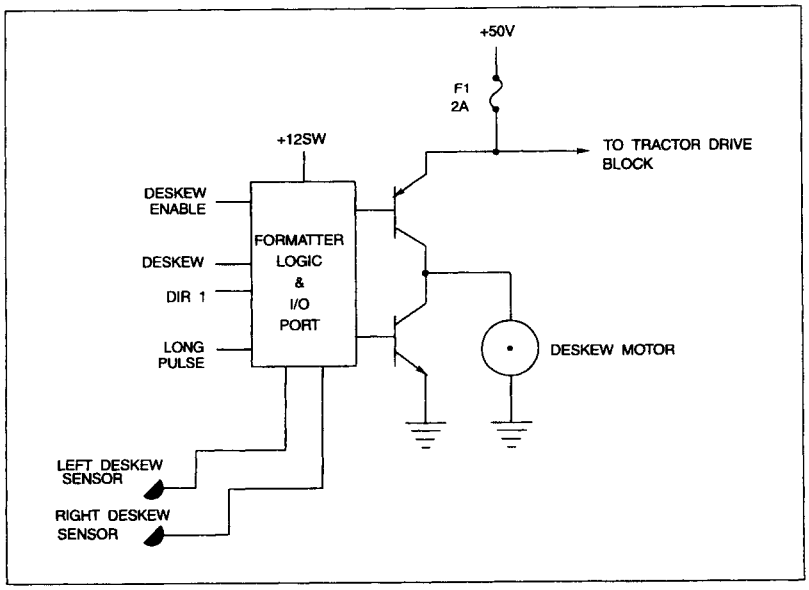


Figure 3-25. Ribbon Deskew Block Diagram

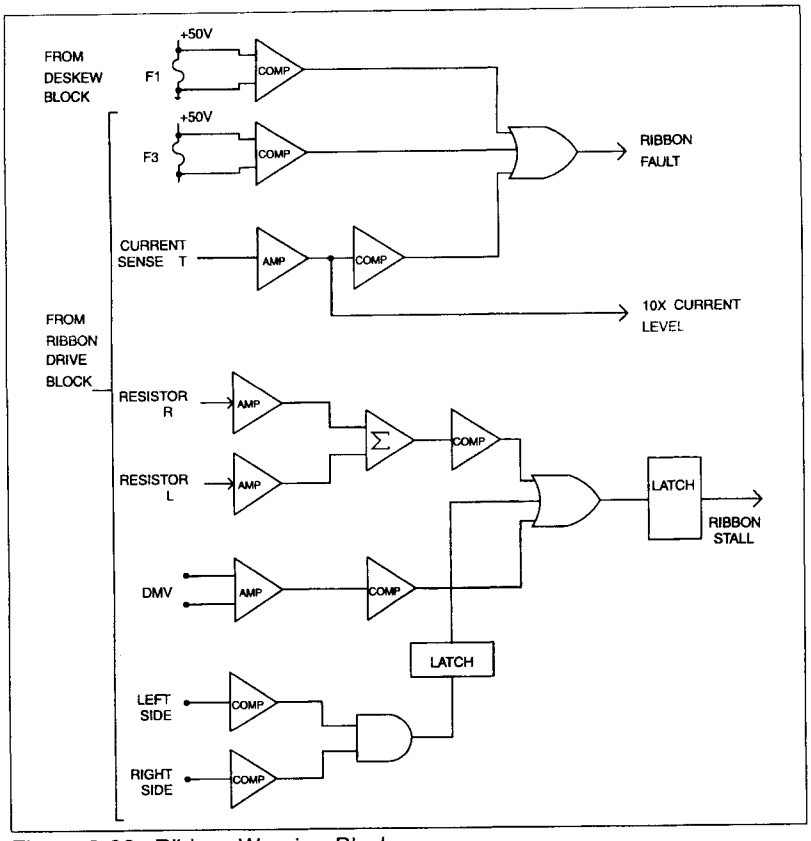


Figure 3-26. Ribbon Warning Block

Linear motor driver:

The linear motor driver is responsible for providing the necessary drive to the linear voice coil motor to oscillate the printbar at resonant frequency. The system also has overcurrent limiting and protection that disables the system if a preset drive current is exceeded. The motor is also protected by a fuse.

The linear motor driver uses VSERVO (drive signal voltage) and compares it against the sum of the current through the coil drive transistors. The circuitry uses this comparison to switch one transistor on and the other off to minimize the difference between VSERVO and the current (negative feedback). The motor current is also monitored. If the motor

current exceeds 5 amperes, the drive is disabled and an overcurrent flag is sent to the formatter processor. This process is called overcurrent limiting and is not a fault condition. However, should the current greatly exceed 5 amperes, a linear motor fault failure flag is sent to the formatter processor indicating a fault condition. The linear motor fault can also occur if the +50V fuse (F1) opens.

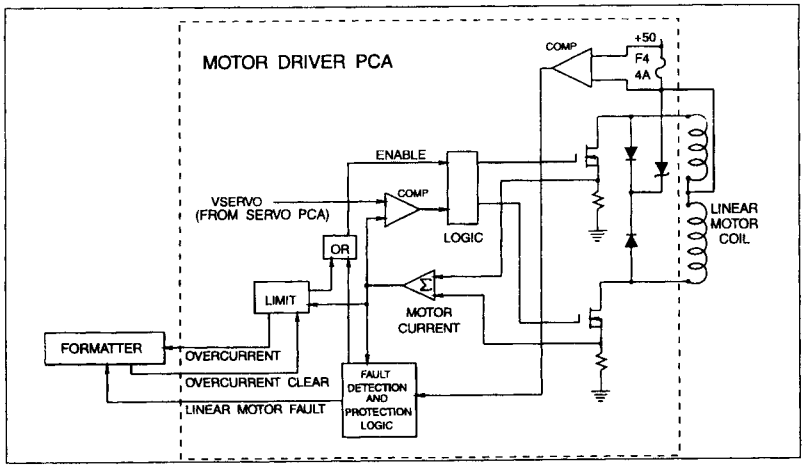


Figure 3-27. Linear Motor Drive

Paper stepper motor drive:

The paper stepper drive is responsible for driving the stepper motor based on commands received from the formatter processor. The motor consists of four phases that can be driven at three different current levels to drive the motor appropriately. There is protection circuitry to prevent an overcurrent condition. However, should a failure occur, the +50V is fused so that the stepper motor is protected.

The stepper drive can be broken into three functional blocks: phases 1 and 2 drive, phases 3 and 4 drive and fault detection circuitry. The drive circuitry for each of the phases is identical so only phases 1 and 2 will be described.
The phase drive circuitry consists of individual drive transistors for each of the four phases, a field effect transistor (FET) at the common end of the motor windings and control circuitry for the FET. This circuitry works as follows:

The formatter processor selects the desired phase and strobes the stepper select line. The desired phase transistor and the FET turn on. The phase transistor remains on until the formatter processor turns it off. The FET remains on until a preset current level is reached for a predetermined time, at which time it is turned off. The FET is turned back on if the current level drops below the preset level for a specified period of time. The FET is also turned off if a stepper fault occurs. The preset current level is selected by the formatter processor setting a voltage level of a resistor divider. The current levels that can be selected are approximately 2.7 amperes, approximately 4.7 amperes and approximately 7.9 amperes. This current selection gives the formatter processor control of the motor torque. This allows the processor to control the stepping profile and the slew rate of the paper.

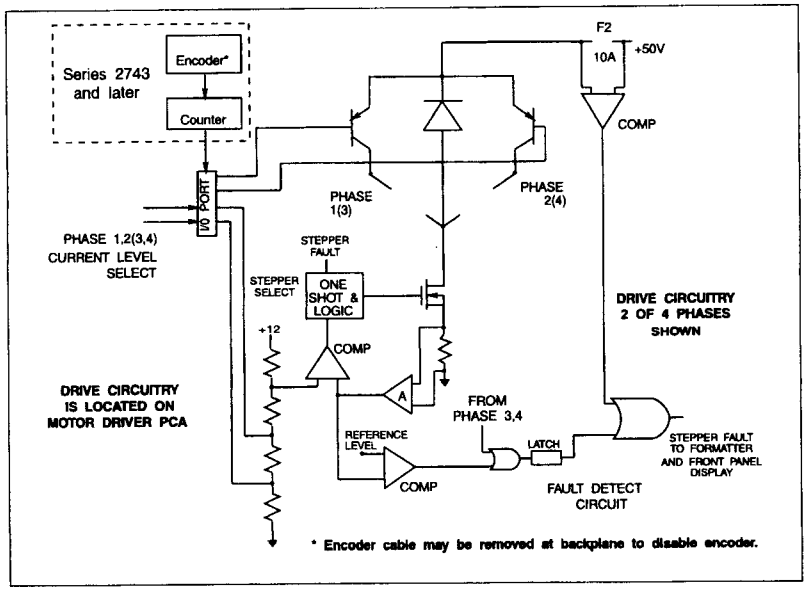


Figure 3-28. Paper Stepper Motor Drive

There is a fuse (F2) between the drive transistors and +50V to protect the drive motor. If the fuse opens the stepper fault bit is set. The stepper fault bit can also be set if the average current in either FET exceeds a preset level.

Paper position encoder system:

The paper position encoder system is implemented on series greater than 2743 by monitoring the shaft of the paper tractor stepper motor using a position encoder. The encoder increments (decrements for negative movement) an encoder counter by one for each eighth step movement detected on the stepper motor shaft. The software can read the encoder counter to keep track of physical paper position.

The paper position encoder hardware is located on the Backplane PCA. The encoder counter is a 12 bit up/down counter. The counter counts up one for every eighth step forward paper motion and counts down one for every eighth step neg ative paper motion. The loop back wire on the encoder cable is decoded as backplane slot 4 I/O. If slot 4 I/O is read by the processor, and one of the bits is low, then the printer is equipped with the paper position encoder hardware. If the processor reads slot 4 I/O and no bits are low, then either the cable is not connected or the paper position encoder hardware does not exist.

Since the software must be backwards compatible to printers without the paper position encoder hardware (series less than 2743), the software initialization routine determines if the printer is equipped with working paper position encoder hardware. The initialization routine moves the paper backwards two half steps, reads the encoder counter, moves the paper forward two half steps, and compares the previously read value to the current encoder counter value. If the encoder hardware is working, the two readings will be different. If the encoder hardware is not working, the readings will be the same. The software uses the paper position encoder hardware if the two readings are different, otherwise the software ignores the encoder hardware.

During the printing operation, the paper position encoder hardware is used to keep track of how many half steps the paper has moved. The software knows how many half steps have been requested, so the two pieces of information can be used to determine if the paper has stalled. A paper stall is defined as no moving paper, no moving tractors. If a stall occurs, the software keeps track of how many half steps need to be requested to get the paper to the correct position.

The printer does not have time to correct the stalled half steps during actual printing since the request would interfere with the process of printing. However, the number of stalled half steps are remembered so they can be issued during the next slew. (A slew is defined as thirteen or more half steps). When a slew is requested, the paper is advanced and the encoder counter is read. If the counter value is off by more than one

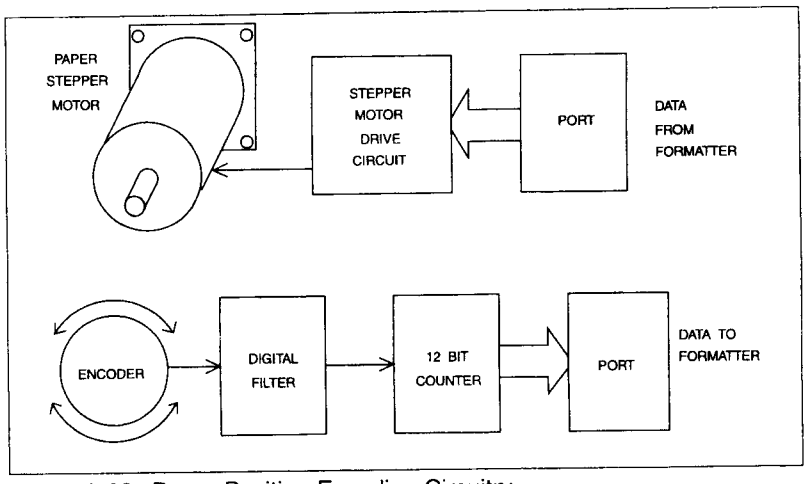


Figure 3-29. Paper Position Encoding Circuitry

half step, the difference is forced to an even number and the paper is again advanced. It is necessary to force the difference to an even number to ensure the stepper motor ends on the correct step; either weak or strong. This process is repeated until the paper finally gets to the requested position (plus or minus one half step) or the total number of attempts exceed ten. If the total number of attempts exceed ten, a 13-01 paper stall error is displayed.

If the encoder is unplugged at the Backplane PCA, the encoder function is disabled and the Formatter PCA ignores the fact that the circuitry exists.

Tractor drive:

The tractor alignment driver system is responsible for reading the operator tractor control switches and then driving the tractor motor in the appropriate direction at one of two speeds.

The tractor motor can be driven at two speeds. Speed is controlled by a voltage controlled oscillator (VCO) that switches the drive transistor on and off. The VCO is controlled by the level of the +50V (for the same reason as LONG PULSE) and the setting of the speed control switch. If the control switch is pressed (high speed position), the duty cycle is increased, thereby increasing the voltage and the motor speed. If the +50V increases, the duty cycle decreases keeping the average motor voltage constant. Rotational direction is controlled by reversing the voltage across the motor through the switches.

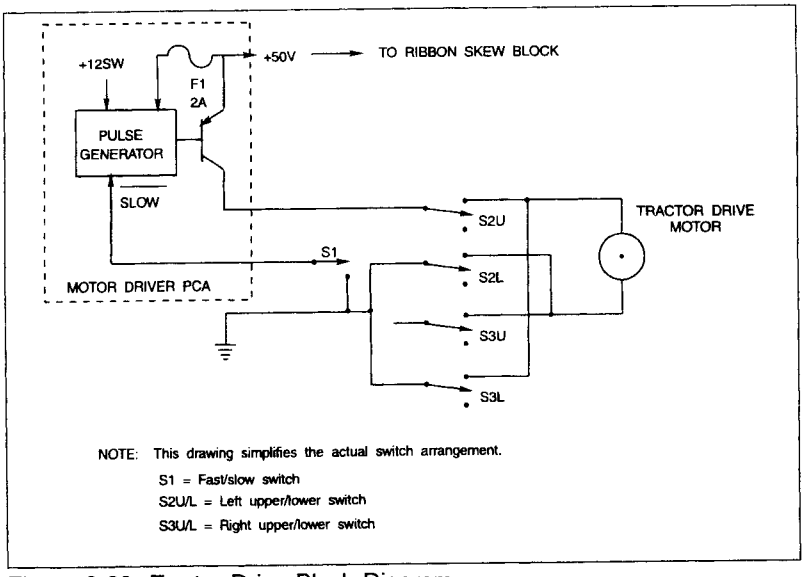


Figure 3-30. Tractor Drive Block Diagram

3-10. HAMMER DRIVER PCA

FUNCTION

The Hammer Driver PCA receives the serial dot data from the DGL, converts the data to parallel form and then energizes the hammer(s). This circuitry also varies the width of the fire pulse to ensure that the hammers are energized for the correct amount of time. There is also power on and off protection circuitry to prevent hammers from firing when the power is turned on or off, and circuitry to detect current flow in the drive transistors to ascertain if there is a fault condition. Finally, there is circuitry to count the number of printed dots sent by the DGL and pass a too many dots (TMD) signal to the formatter processor if the hammer duty cycle is too high.

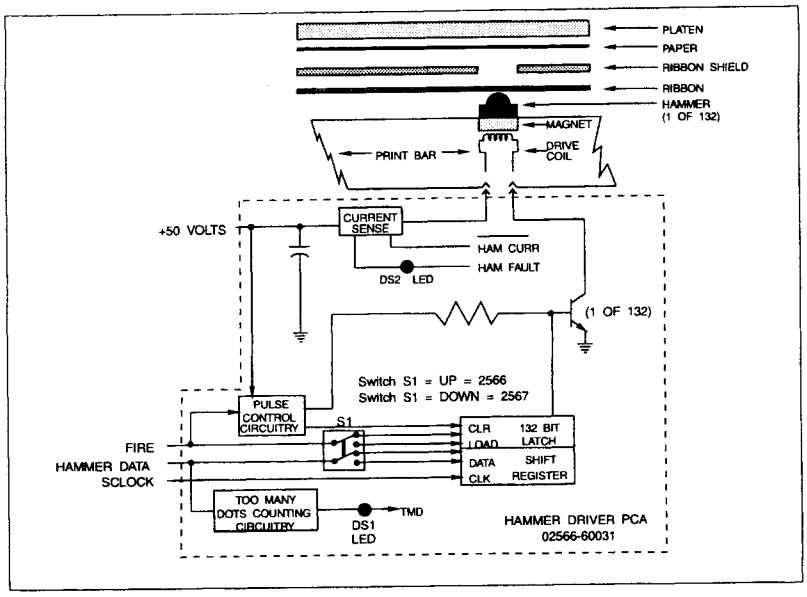


Figure 3-31. Hammer Driver PCA

CIRCUIT DESCRIPTION

The Hammer Driver PCA receives dot data from the 2772 bit shift register of the DGL. The data is shifted into a 132 bit shift register (1 bit per hammer). After 132 bits are loaded, the data is latched and output in a parallel format to the hammer driver transistors. If the bit received by the transistor is a 1, the transistor energizes, causing current to flow through the coil within the printbar. This current flow creates a magnetic field that counteracts the magnetic field of the hammer's permanent magnet, releases the hammer and prints a dot.

A unique feature of the 132 bit shift register is its ability to have new data shifted in while the current data is still latched and firing the hammers. This feature allows the next dot position's data to be shifted into position while the current dot position data is being placed. The clock controlling the input shift register is provided by the DGL and is called SCLOCK. All 132 bits are clocked in between each FIRE pulse.

Once the data is loaded, it is sent to the hammer driver transistors (latched) on the rising edge of the FIRE pulse and the transistors remain on until the fire pulse generation circuitry clears the shift registers latch, thus disabling the transistors.

The fire pulse generation circuitry provides a signal to clear the shift register latch and thus turn all the drive transistors off. This signal is supplied for a predetermined length of time after the receipt of a FIRE pulse. This allows the printing hammers to escape the pull of their permanent magnets. The fire pulse generation circuitry also monitors the +50V supply and varies the hammer fire signal duration based on the voltage level. (If the +50V supply is high the hammers are fired for a shorter time and vice versa.) The dot data supplied by the DGL is also input into the TMD circuitry. This circuitry monitors the dot data and informs the formatter processor when the printed dot rate exceeds a predetermined level. The TMD signal is generated if the dot rate exceeds 30000 dots per second (the rate incurred by printing all pound signs [#] at 1200 lpm). (This rate is calculated over 75 hammers instead of all 132.) The TMD signal becomes active during sub-test 7, DS1 is illuminated whenever the TMD signal is active.

The hammer driver board also has circuitry to monitor current flow from the +50V supply to the hammer coils. A hammer current signal is generated as current flows from the +50V supply. If the average current remains on too long a hammer fault is generated and DS2 is illuminated.

The fire pulse circuitry also enables the drive transistor base resistors, thereby minimizing power dissipation through the resistors. There is circuitry to disable the base resistors if the +50V drops below 36V. This prevents spurious firing of the hammers as power comes up and down.

Chapter 4

Configuration & Diagnostics 2566B/C 2567B/C

DiagnosticsDiagnostics Diagnosticsdiagnosticsdiagnosticsdi

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4-1. INTRODUCTION

The HP 2566/67 printer performs extensive diagnostics to verify the operation of the printer. These diagnostics are performed from the printer's control panel and provide the Service Representative a useful tool for detection of printer problems. All error conditions are displayed on the three digit display at the printer's control panel. The following information is explained in this section of the manual:

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4-2. PRINTER CONFIGURATION AND STATUS INFORMATION

The HP 2566/67 printer are configured entirely from the control panel. Once established, the printer's configuration is stored in the Formatter PCA's non-volatile RAM. The printer configuration should only be altered when a parameter change is necessary to complete a print job (e.g., change in page length) or when the Formatter PCA is replaced. Table 4-1 lists the configurable printer functions and their associated numbers. Each printer function has two or more possible parameters which can be altered as desired. To configure a printer function, perform the following steps:

a. Place the printer offline.

b. Hold down the CONFIG key and press either FINE ADJUST key (the two rightmost decimal points will illuminate) to increment or decrement the display until the desired function number is displayed (see Table 4-1).

c. Release the CONFIG key. The display now shows the current parameter value of the configuration that can be changed.

d. Using the FINE ADJUST keys, increment or decrement the parameter number until the desired number is displayed.

e. Press the ENTER key. The new parameter is entered and the printer will return to the Status mode.

NOTE

If the ENTER key is not pressed, the settings just entered are discarded and the original values will be used.

Table 4-1. CONFIGURATION FUNCTIONS

FUNCTION CODE	DEFAULT FUNCTION	PARAMETER RANGE
01	Select Primary Character Set	0-95
02	Select Secondary Character Set	0-95
07	Select page length representation	0,1
20-29	Interface Configuration	00-FF
40 *	Flight Time Adjust	00-17
41 * #	Turnaround Adjust	30,35
42 *	Graphics Amplitude (coarse)	80-7F
43 *	Graphics Amplitude (fine)	80-7F
50	Disconnect Modem	0,1
51	Difficult forms mode	0,1
52	Dots per Inch (DPI) Resolution	60,70
54	Smart Slew 0=Disable Smart Slew, 1=Enable Smart Slew	0,1
60	Perforation Skip	0,1
61	Display Functions	0,1
62	Line Terminator 0: CR=CR LF=LF FF=FF 1: CR=CR+LF LF=LF FF=FF 2: CR=CR LF=CR+LF FF=CR+FF 3: CR=CR+LF LF=CR+LF FF=CR+FF	0-7
70-72	Print time	00-99
73-75	On time	00-99
80	Enable/Disable Label Card	0,1
81	Printronix P-Series Line Feed Emulation	0,1
85-89	Label Card Configuration	00-FF
90-98	Printer Error Log (90 most recent error)	
99	Clear Error Logs	0,1

* Modified in CE Mode only
\# HP 2566B and 2567B only (Formatter PCA <2722)

OPERATIONAL STATUS CODES

The printer's status code is displayed in either the Online or Offline state and displays the printer's current status. Table 4-2 summarizes the possible printer status.

Table 4-2. PRINTER STATUS

DISPLAY	DESCRIPTION
0	Printer ready
1	Printer ready/modem connected (modem connection is not supported)
2	CIPER Silent Run
4	Continuous Selftest/Subtest Mode
5	Selftest/Subtest Active (single pass)
6	Print One Line (file data)
7	Print One Line (test pattern)

4-3. SELF-TEST AND SELECTABLE SUBTESTS

The diagnostic routines are performed from the printer's control panel and provide the service representative a useful tool for detection of printer problems. The standard test executes a series of subtests which verify the operation of specific sections of the printer hardware.

The standard self-test can be executed or specific subtests can be selected and executed continuously if desired. To perform the standard self-test from the front panel the printer must be offline. If a paper-out, platen, ribbon or hard fault condition exists, none of the printing subtests will execute.

STANDARD SELF-TEST

To perform the standard self-test, press the TEST key and then press the ENTER key. One copy of the self-test printout should be printed. To perform a continuous self-test, press and hold the TEST key for five seconds (until the displayed status, see Table 4-2, changes to a four), and press the ENTER key. Exit the continuous self-test by pressing the TEST key momentarily. The subtest routines listed in Table 4-3 are performed when the standard self-test is run. It should be noted that the right decimal position LED flashes when any diagnostic test is executed.

Table 4-3. STANDARD SELF-TEST

FOLLOWING IS THE NON-PRINTED PORTION OF THE SELF-TEST	
Test	Description
Power On	Verifies +50 V regulated supply.
Digital	A ROM CRC test is performed on all firmware ROM. A nondestructive read/write test is performed on volatile and non-volatile RAM. A DGL (Dot Generation Logic) loopback test is performed to check the DGL logic. A CRC check is performed on all symbol set ROMs installed. A test is also performed on the triple timer chip.
Analog (non-printing)	Tests the ribbon and servo subsystems. The ribbon test verifies the four modes of ribbon operation: off, tension, supply-to-take-up and take-up-to- supply. The servo test, among other things, drives system at measured resonant frequency and high amplitude to measure power dissipation in the linear motor.
Vector Graphics	Tests for hardware, RAM and ROM failures.
Configuration Print Out	This routine provides a printout of the printer's internal configuration.
Raster graphics	A raster graphic print sample (herring bone pattern) is printed.
Print Quality	A sample of vertical and horizontal lines are printed; these may be used to evaluate print quality.
Double Size Ripple Print	A sample of double size print.
Compressed Ripple Print	A sample of compressed print.
Normal Density Ripple Print	A sample of normal density ripple print.
High Density Ripple Print	A sample of high density print. (If high density ROM is installed)
Analog (printing) (CE Mode only)	This portion of the analog test is divided into two parts, a test of too many dots (TMD) circuitry and the open hammer coil test. Descriptions of these two tests follow:
Open hammer coil (CE Mode only)	Checks for current flow through each hammer coil. Each hammer is fired individually while the processor checks for current flow. If an error is detected, the test is repeated until the same hammer fails two times in a row. Only the first hammer coil failure is displayed in the failure code. Fail codes 46-01 through 46-99 correspond to hammers 1 to 99. Fail codes 47-00 through 47-32 correspond to hammers 100 to 132.

Table 4-3. STANDARD SELF-TEST

FOLLOWING IS THE NON-PRINTED PORTION OF THE SELF-TEST	
Too Many Dots (CE Mode only)	Verifies the operation of TMD circuitry on Hammer Driver PCA. Prints a blackout pattern until either TMD goes active or 120 lines have been printed. The test checks the TMD circuit for off before finishing.

SELECTABLE DIAGNOSTIC SUBTESTS

Individual subtests may be executed in the HP 2566/67 Printer to verify the operation of specific functions of the circuitry (see Table 4-4). To perform an individual subtest, press the TEST key momentarily and then use the FINE ADJUST keys to increment or decrement the printer's display to the desired subtest routine. Press the ENTER key to execute the subtest.

Table 4-4. SELECTABLE DIAGNOSTIC SUBTESTS

No.	TEST TITLE	DESCRIPTION
0	Standard Self-test	See Table 4-3.
1	Standard Ripple Print	Prints ASCII characters 0-7F.
2	Double Size Ripple Print	Double size ASCII characters 0-7F.
3	Compressed Ripple Print (16.7 cpi)	Compressed ASCII characters 0-7F.
4	High Density Ripple	If installed, prints High Density ASCII characters 0-7F.
5	Raster Graphics (herring bone)	For visual check of dot placement printer uses 70x72 dot matrix.
6	High Density Raster Graphics (Herring Bone)	High density version of test 5 printer uses 140x144 dot matrix.
7 *	Raster Graphics (black out)	Verifies operation of TMD circuit by printing a blackout pattern until TMD goes active (or 120 lines are printed).
8	Configuration Print-out	Lists internal configuration and available symbol sets.
9	900/1200 LPM Ripple Print (uppercase)	For visual check at normal density.

Table 4-4. SELECTABLE DIAGNOSTIC SUBTESTS

No.	TEST TITLE	DESCRIPTION
10	High Speed Draft Ripple Print (uppercase)	For visual check at normal density (requires sparse symbol set).
11 *	Digital (Formatter PCA)	See Table 4-3.
15	Flight Time/Platen Adj Pattern	Parallel vertical lines followed by parallel horizontal lines. See Section 5 for usage.
16 *	Amplitude Coarse Adj Pattern	Prints groups of vertical lines used in adjusting Servo amplitude (see Section 5).
20 *	Analog Test (non-printing)	See Table 4-3.
21 *	Analog Test (printing)	See Table 4-3.
23 *	Ribbon Test	Runs ribbon drive system to test.
24 *	Velocity Transducer Alignment	Uses display panel to adjust velocity transducer (see Section 5).
27 *	Enable Linear Motor Amp	Allows running motor with external power supply.
30-38	Interface Tests	See appropriate option manual.
40-47	Vector Graphics/Label Card #	See appropriate option manual.
* Available in CE Mode only.		
# If Vector Graphics PCA is installed subtests 40-47 can be performed (refer to the Vector Graphics Service Manuals P/N 26061-90901). If the Label Card PCA is installed, only subtests 40 and 41 can be performed (refer to the Label Card Installation and Operation Manual P/N 26062-90902).		

To execute a continuous subtest routine, press and hold the TEST key for five seconds (until the displayed status changes from a five to a four, see Table 4-2). Use the FINE ADJUST keys to select the desired subtest routine, and then press the ENTER key to execute the routine. Press the TEST key to exit the continuous subtest operation.

4-4. ERROR LISTING

All HP 2566/67 error conditions are displayed on the printer's control panel in the flashing mode. All errors along with an associated fail code, a brief explanation, and a suspect cause of failure are listed in Appendix B. Error are also logged into configuration 90 to 98 with 90 being the most recent error.

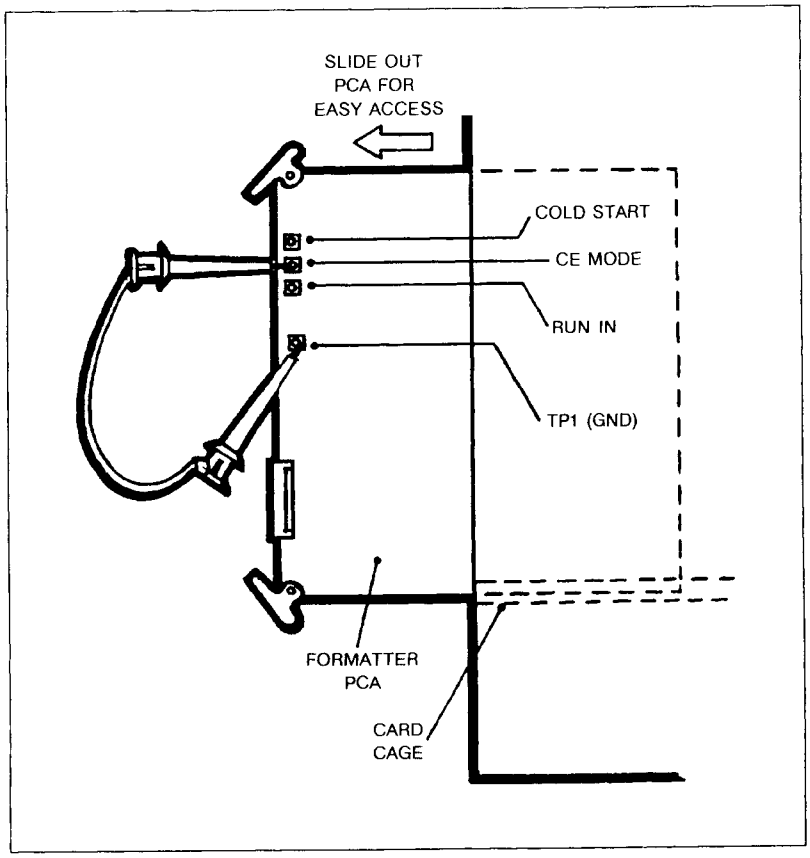

Figure 4-1. CE Mode Jumper Installation

4-5. CE MODE OPERATION

The CE Mode of operation allows the Service Representative to perform several configuration functions, and to perform diagnostic subroutines that are not allowed in the Operator Mode of operation (see Tables 4-1 and 4-4). To place the printer in CE Mode proceed as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF(0) position.

b. Remove the printer's right end panel as described in Paragraph 6-3.

c. On the outside edge of the Formatter PCA, install a jumper from test point CE MODE to GND (see Figure 4-1). The jumper may also be grounded on the cardcage's metal frame.

d. Set the printer's ON/OFF switch to the ON (1) position.

To perform a CE configuration function, hold down the CONFIG key and press either FINE ADJ key. The right-most and middle LEDs should illuminate when in configuration mode. Use the FINE ADJ keys and the ENTER key to select the appropiate configuration.

Use the TEST key to access the CE Subtest Mode (the right-most LED should illuminate). Use the FINE ADJ keys and the ENTER key to perform the appropriate subtest routine. The right-most LED will blink as the test is being executed.

4-6. CLEARING THE ERRORLOG

The printer's errorlog may be cleared to aid in troubleshooting. Clearing the errorlog provides a "fresh start" for the recording of printer errors prior to an actual printer failure. To clear the errorlog, proceed as follows:

a. Place the printer in the CE Mode, refer to Paragraph 4-5.

b. With the printer offline, press and hold the CONFIG key.

c. Use either FINE ADJUST key to either increment or decrement the printer display until the function 99 is displayed and then release the CONFIG key.

d. Use either FINE ADJUST key to either increment or decrement the printer display until a "1" is displayed and then press the ENTER key. The errorlog should now be cleared.

4-7. COLD START

The HP 2566/67 can be "cold started" to initialize all parameters in the printer (see Table 4-1). The cold start procedure functions as a hard reset and is helpful in cases when the printer's self-test will not run or when the Formatter PCA is swapped. To perform the cold start, proceed as follows:

NOTE

Since a cold start clears the configuration values from memory, these values should be written down prior to performing a cold start so they can be re-entered after the cold start. Write down the configuration values for 1, 2, 7, 20 through 29, 40, 42, 43, 51, 52, 60, 61, 70 through 75, 80, 81, and 85 through 89. (Configuration functions 80 through 89 apply to the HP Label Card, if installed.)

a. Switch the printer offline and the ON/OFF switch to OFF (0) position.

b. Remove the printer's right end panel as described in Paragraph 6-3.

c. On the outside edge of the Formatter PCA, install a jumper from test point COLD START to GND (see Figure 4-1). The jumper may also be grounded on the cardcage's metal frame.

d. Set the printer's ON/OFF switch to the ON (1) position. Powering the printer on, performs a hard reset.

e. Reconfigure the Formatter PCA using the values written before and remove the jumper.

4-8. SMART SLEW FUNCTION

The Smart Slew Function is a feature that improves the throughput of printers, by doing paper slew instead of line feed. It is possible to Enable-Disable the Smart Slew Function by configuring funtion code 54; 0=disable, 1=enable (not CE-MODE required).

The Factory Default Setting for the Smart Slew is ENABLED, but some restrictions must be considered for the proper Smart Slew Functionality and Performance:

1) The Smart Slew needs at least, 2 LF between a "Text Sandwich".

2) The Control Panel could be blocked, if the printer is switched OFF-LINE/ON-LINE repeatedly.

3) The Control Panel could be blocked too, if the printer runs out of paper. This problem occurs when:

   a. The T.O.F. has been incorrectly selected.

   b. The Smart Slew is going beyond the limit of one page.

4) For all those cases using the Line Feed beyond the page limit, it is recommended to DISABLE the Smart Slew.

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Chapter 5

Adjustments 2566B/C 2567B/C

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5-1. INTRODUCTION

This section provides the adjustment procedures for the HP 2566/2567 Printer. These adjustments, listed below, are discussed in detail and should be performed in the order listed. Always perform the mechanical adjustments before attempting adjustment of the electronics.

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5-2. REQUIRED TOOLS

The tools required to perform the adjustments described in this section are listed below.

- Metric hexagonal drivers (allen wrenches) 1½, 2, 2½, 3, 4 and 5 mm
- SAE 3/32 inch hexagonal driver (allen wrench)
- Triangular Tractor Alignment Kit (P/N 02566-67934)
- Heavy Duty Spring Puller
- Flat-Blade screwdriver ~SAE 3/16 inch blade
- Long shank 4 mm and 5mm ball drivers -not a necessity, but will save a time.
- Velocity Transducer Centering Tool (P/N 02566-20152)
- Small, portable light (i.e., penlight) -if centering tool is unavailable.
- Small rule (for velocity transducer rough adjust) -if centering tool is not available
- Motor Coil Adjustment Shim (P/N 02608-00217) or three business cards
- 17mm Open-end adjustable wrench capable of 17mm.
- Safety glasses

NOTE

When screw sizes are referenced in this section, they refer to the **WRENCH OR DRIVER SIZE** required to remove the screw.

5-3. PRINTBAR CLEANING PROCEDURE

If it appears that dots are being dropped (the hammers are not printing), this may be due to excessive ink build-up around and between the hammers. This ink build-up prevents the hammers from being captured and released, as required for printing. If this condition appears, the printbar should be cleaned. Before cleaning the printbar, check the Ribbon Shield alignment. If this shield is not square with the hammers, it can cause a similar problem.

CAUTION

Printbars shipped with Series 2837AXXXXX or greater are treated with NYEBAR. NYEBAR is an ink repellent. DO NOT clean a NYEBAR treated printbar routinely; cleaning will remove the NYEBAR treatment. Rebuilt printbars are also being treated with NYEBAR. A rebuilt printbar that has a bar-coded label along the edge identifies a NYEBAR treated printbar. If column drop out is occurring, necessitating either cleaning or changing a NYEBAR treated printbar, attempt to clean the printbar as described in the following procedure.

To clean the printbar, complete the following steps:

a. Switch the printer offline and set the ON/OFF switch to the OFF (0) position.

b. Remove the printer's right and left end panels as described in Paragraphs 6-3 and 6-5.

c. Remove the Ventilation Duct by performing the following steps (this prevents the air duct from blowing the spray into the user's face while cleaning the printbar):

   1. Remove the two Pozi-drive screws holding the upper duct bracket to the edge of the print mechanism casting.

   2. Remove the screws holding each of the two lower duct brackets to the printer's frame.

   3. Lift the duct outward and set it to the side of the printer.

d. Place the printer in Run-In mode by installing the jumper from the RUN-IN test point (located on the edge of the Formatter PCA) to ground (GND test point). [Note, Run-In mode allows the printer to operate (fire its hammers) while ignoring the condition of the ribbon-out, paper motion, and paper-out switches.]

e. Set the printer's ON/OFF switch to the ON (1) position.

f. Remove the upper ribbon spool and place it in the retainer cups.

g. Open the print mechanism swing gate to its fully open position.

h. Remove the ribbon from the printer.

i. Tape the swing gate interlock switch in the down position, otherwise the printer will not operate.

j. Execute a continuous Subtest 1 (Standard Ripple Print). Refer to "Selectable Diagnostic Subtests", Paragraph 4-3, for instructions. The printbar should mogate and the hammers should fire.

k. Using a spray cleaner, spray the hammers. The spray will cause ink to dissolve and drip off the hammers. Keep a paper towel handy to wipe up dripping ink. **USE ONLY THE SPRAY CLEANERS LISTED BELOW:**

WARNING

It is very important that you follow the manufacturer's instructions that accompany these cleaners. It is recommended that maximum 30 second bursts of spray with a minimum of 60 seconds between bursts be used to allow vapor buildup to dissipate from around the printer. Remove soaked towels, rags, etc. from the area after cleaning.

TECH SPRAY Instant Heavy Duty Stripper No. 1644-16S	CONTAINS:	chlorinated and fluorinated hydrocarbon solvents and isopropanol
CHEMTRONICS Flux-Off	CONTAINS:	azeotrope of trichlorotrifloroethane and methylene chloride
CHEMTRONICS Formula III	CONTAINS:	I,I,I-trichloroethane

NOTE

Do not routinely clean any printbar with a bar-coded label along the front edge. This denotes a NYEBAR treated (ink repellant) printbar. Clean a NYEBAR treated printbar only when the printbar fails. Cleaning will remove the NYEBAR treatment.

l. Stop the print test, reinstall the ribbon, and close the swing gate. Run the test again with paper and check for dropped dots. If dots still appear to be dropping, try cleaning the printbar again. Also, check the ribbon shield. If this shield is not square with the hammers, it can cause a similar problem. If a second cleaning or adjustment of the ribbon shield does not correct the dot dropout problem, change the printbar.

m. Remove the RUN-IN jumper and tape from the swing gate switch and reassemble the right and left end panels.

5-4. LINEAR MOTOR COIL

The linear motor coil provides drive to the printbar. It can be adjusted without removing the printbar assembly. Sufficient clearance must be maintained to prevent the coil assembly from rubbing the magnet. The adjustment procedure requires the use of a special plastic adjustment shim (P/N 02608-00217) or three business card cut in 1/2 inch strips.

a. Switch the printer offline and set the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position and lower the ribbon shield.

c. Verify that the two 4 mm hex bolts, which mount the linear motor coil bracket to the printbar, are secure (see Figure 5-1).

d. Slightly loosen the four 3 mm allen screws which secure the coil to the aluminum bracket (see Figure 5-1). Loosen these screws just enough to allow the coil to be moved for the adjustment.

e. Slide the plastic adjustment shim between the coil and the magnet until it wraps around the entire body of the coil or shim in three places equally spaced with three 1/2 inch strips.

f. Retighten the four mounting/adjustment screws. Crosstighten these four screws so that the adjustment does not change when the final tightening is done. First snug the screws in the following order, then return and fully tighten in the same order:

1. Top rear screw
2. Bottom forward screw
3. Top forward screw
4. Bottom rear screw

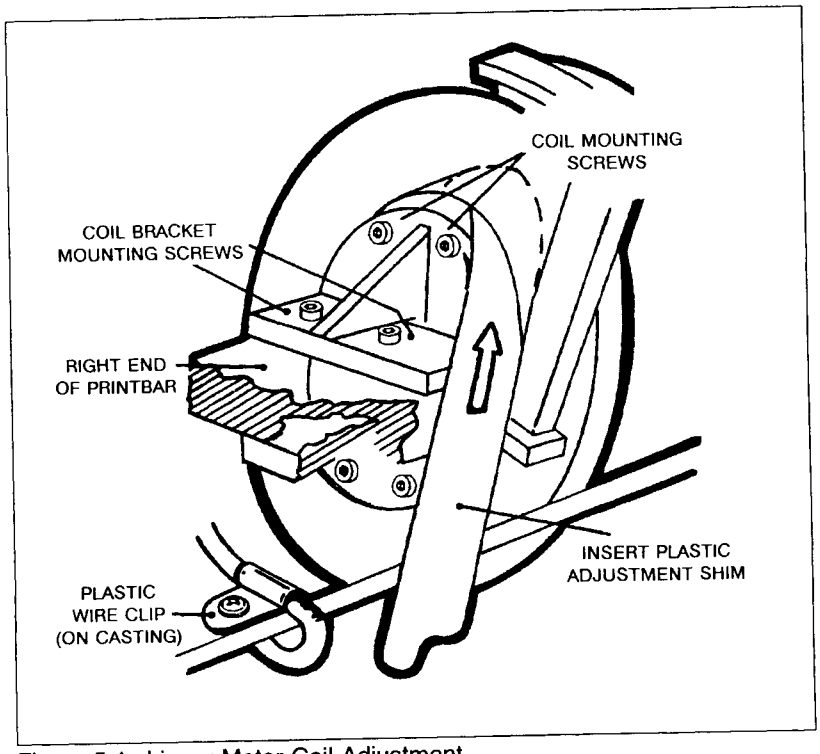

Figure 5-1. Linear Motor Coil Adjustment

g. Remove the adjustment shim.

h. Check for freedom of motion of the linear motor within the magnet: place your left hand on the left end of the printbar and tap the right-hand flexure with a hard object. A ringing vibration should be felt at the left end.

5-5. VELOCITY TRANSDUCER

The Velocity Transducer has two basic adjustments: the magnetic pin depth and the magnetic pin clearance. Both of these adjustments should be performed when the velocity transducer is replaced. These adjustments should also be checked as a troubleshooting measure for poor print quality, excessive linear motor current, and/or settling time errors (fail codes 14-54 or 14-55, Appendix B).

There are two methods available to adjust the pin clearance and pin depth of the velocity transducer. Use Procedure "A" if the Velocity Transducer Centering Tool (CPC P/N 02566-20152) is available; use Procedure "B" if this tool is not available.

It is important that the magnetic velocity pin (attached to the left end of the printbar assembly) does not rub along the inside surface of the transducer. To adjust this clearance, proceed as follows:

PROCEDURE A - Magnetic Pin Clearance with Velocity Transducer Centering Tool 02566-20152.

When centering the transducer magnetic pin (especially in poor light), the Velocity Transducer Centering tool should be used. This tool takes the guesswork out of this step.

a. Switch the printer offline and set the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. From the left end of the print mechanism, slightly loosen the two 3 mm mounting screws located on the transducer mounting clamp base (see Figure 5-2).

CAUTION

Use care when aligning the transducer, the magnetic pin is fragile and can be easily broken.

d. Slide the tool inside the hole in the transducer housing (coil) and over the magnet to center the magnet inside the coil. Tighten the mounting screws.

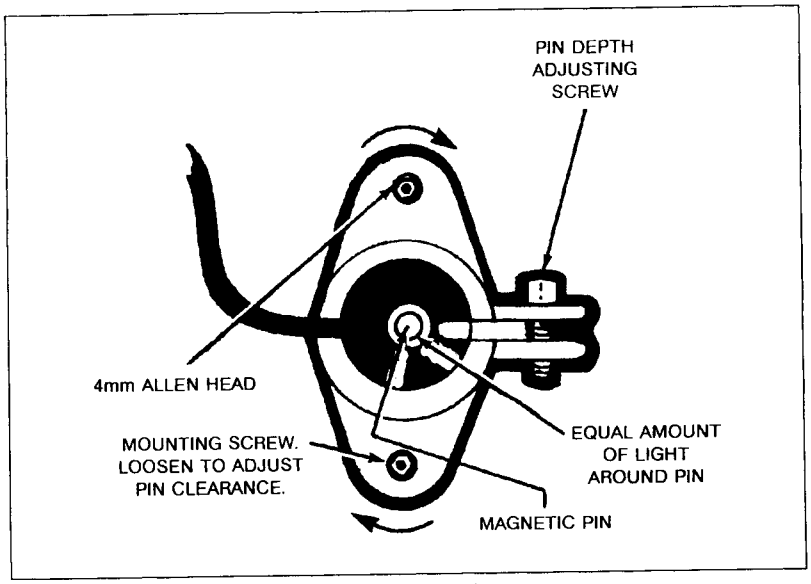

Figure 5-2. Velocity Transducer Adjustment

e. To set the initial pin depth, slightly loosen the Pin Depth Adjustment screw that holds the transducer coil in the mounting clamp. Move the coil to the right (see Figure 5-2). Slide the tool over the magnet to the right until the magnet seats inside the tool. Hold the tool at this position and move the coil to the left until it contacts the tool's black plastic handle.

f. Proceed to the "Pin Depth Fine Adjust" on page 5-9.

PROCEDURE B - Magnetic Pin Clearance without Velocity Transducer Centering Tool.

a. Switch the printer offline and set the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. From the left end of the print mechanism, slightly loosen the two 4 mm mounting screws located on the transducer, mounting clamp, base (see Figure 5-2).

d. Sight through the left end of the transducer while shining a small light (penlight) through the other end. Adjust the transducer so that an equal amount of light can be seen all the way around the magnetic pin.

e. Continue sighting into the end of the transducer while tightening the mounting screws. Tighten each screw a little at a time to keep the transducer clamp from skewing back out of adjustment.

f. Recheck after tightening to ensure clearance all around the pin.

g. To set the initial pin depth, slightly loosen the 3 mm allen screw that holds the transducer coil in the mounting clamp (see Figure 5-2).

h. Using a scale, adjust the distance from the edge of the mounting clamp to the outside (left) end of the transducer to approximately 3/8 inch (9 mm).

i. Proceed to the "Pin Depth Fine Adjust" below.

PIN DEPTH FINE ADJUST:

The depth that the magnetic pin inserts into the transducer body can be rough adjusted mechanically, then fine adjusted using the Main Control Panel in a CE self-test mode, as follows:

a. Place the printer in CE mode as described in Paragraph 4-5 of this manual.

b. Close the print mechanism swing gate and set the printer's ON/OFF switch to the ON (1) position.

c. Execute Subtest 24 (Velocity Transducer Alignment). Refer to "Selectable Diagnostic Subtests" (Paragraph 4-3) for instructions. This should cause the printbar to oscillate.

d. Raise the print mechanism swing gate to the fully open position while test 24 is running.

e. Carefully, slide the transducer body in and out of the mounting clamp while watching the display panel to obtain the lowest possible reading. Some fluttering may occur.

f. Tighten the Pin Depth Adjustment (3 mm) Screw when the display is at its lowest reading. (Do NOT over tighten this screw.)

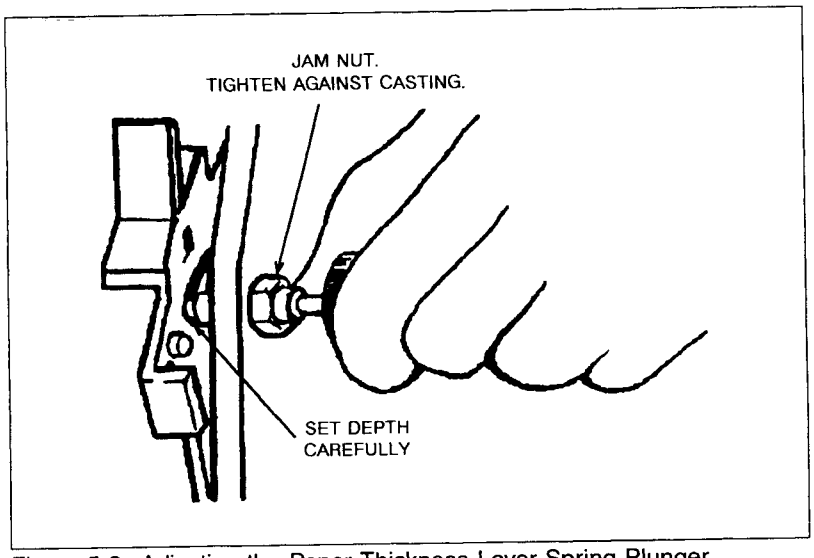

Figure 5-3. Adjusting the Paper Thickness Lever Spring Plunger

5-6. PLATEN/PRINTBAR GAP

Adjustment of the hammer-to-platen gap is necessary whenever the printbar is replaced, the platen is replaced, or the paper thickness adjustment is out of range (i.e. maximum adjustment one way or the other does not produce correct setting). In order to perform this adjustment, there must be no paper loaded and the ribbon must be removed from the printer.

The platen adjustment procedure is performed as follows:

a. Raise the print mechanism swing gate to the fully open position.

b. Check the ribbon shield to ensure that the 6mm wide slot is centered on the hammers. Realign the ribbon shield if necessary.

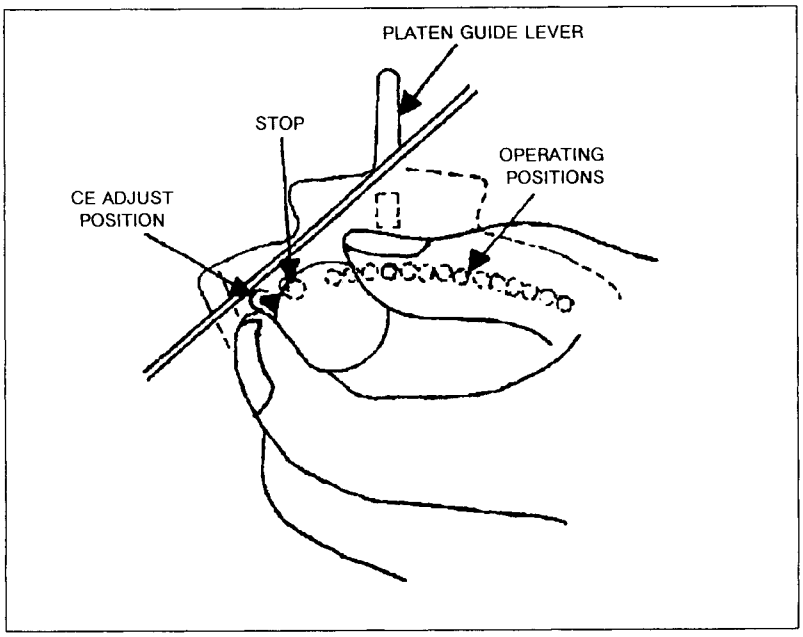

Figure 5-4. Paper Thickness Lever (in "CE" Position)

c. Loosen the jam-nut, located on the right side of the paper thickness adjusting lever (see Figure 5-3), and screw out the Spring Plunger Assembly slightly. This will allow the thickness lever to be moved into the "CE" (adjust) position and engaged with the plunger rod to hold it (see Figure 5-4).

d. Move the tractors to a normal position (left/right) for printing on 132 column paper.

e. Position the AVBs away from the platen. To do this, loosen the two screws in the tractor face plate (these are the AVB screws which secure the AVB), push tractor AVBs away from the platen and into the tractor, and tighten the AVB (faceplate) screws (see Figure 5-5).

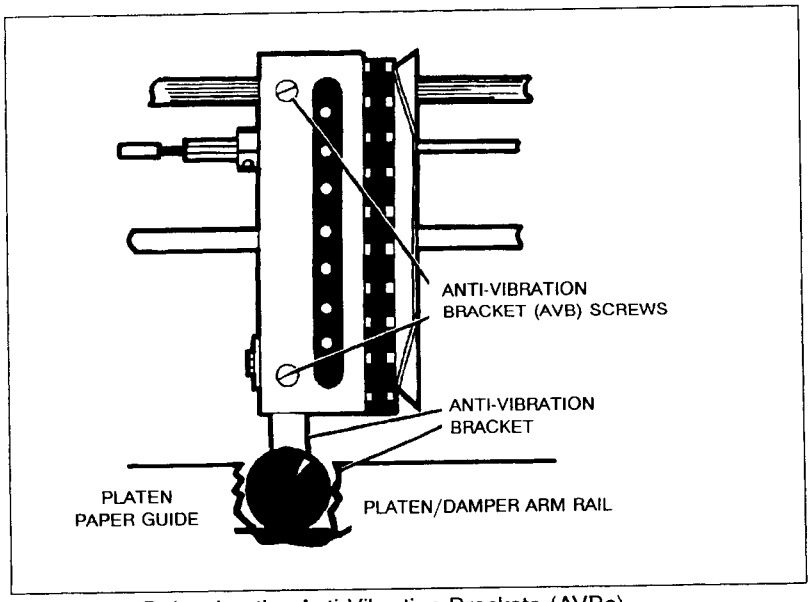

Figure 5-5. Releasing the Anti-Vibration Brackets (AVBs)

f. Lower the swing gate halfway down and loosen the three 4 mm allen screws located on top of the platen assembly directly under the three cutouts in the platen upper tractor guide rail (see Figure 5-6). Loosen these screws just enough to allow the assembly to slide in and out (approximately 3/4 turn counterclockwise). The adjustment springs

should push the assembly out. Press on the face of the platen assembly to verify that it moves in and out freely but not up or down.

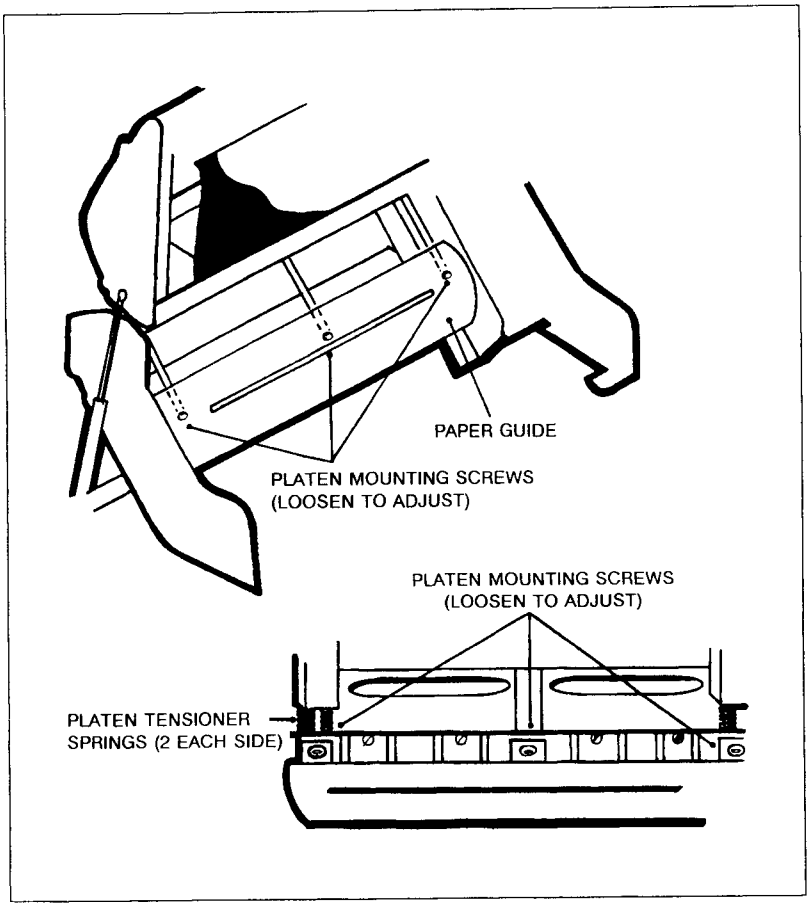

Figure 5-6. Platen Adjusting Screws

g. While watching the platen to verify movement, secure the swing gate into the fully closed position.

CAUTION

The platen must move inward, with the swing gate, as the gate is closed. If the platen binds and does not move in and the swing gate is forced closed, damage to the platen or swing gate could result.

Closing the print mechanism pushes it against the platen which causes the platen to slide back against the tension springs.

h. Snug down the three platen screws in the following sequence, being careful not to skew the platen from its current position:

   1) Snug down the center screw.
   2) Snug down the left screw.
   3) Snug down the right screw.
   4) Go back and tighten in the same sequence.

i. Back out the spring plunger body to allow the Paper Thickness Lever to return to the normal operator position (usually "B" for single part paper).

j. Thread the plunger body in far enough to prevent the Paper Thickness Lever from being moved into the CE adjust position, but not so far in that it causes interference with the movement of the handle. Verify that the handle can be placed in all operator adjust positions, especially the first and last positions.

k. Tighten the jam-nut against the side wall of the casting to prevent movement of the plunger body. (You can turn or hold the plunger body using a 17mm open-end or adjustable-end wrench on the flattened area on the side).

l. Perform the Tractor Anti-Vibration Bracket Adjustment (see Paragraph 5-7).

5-7. TRACTOR ANTI-VIBRATION BRACKETS (AVBs)

The tractors contain a spring tensioned bracket with a plastic roller at the end, referred to as anti-vibration brackets (AVBs). The AVB rollers ride on a rail located at the rear of the platen assembly. These AVB tractors

provide additional support for the paper tractors and help to dampen vibrations caused by printbar oscillations and paper movement.

CAUTION

This adjustment can be performed only when the platen is in its fixed position and properly adjusted (see Paragraph 5-6 for Platen/Printbar Gap Adjustment procedures).

a. Raise the print mechanism swing gate to the fully open position.

b. Use the tractor control keys to move the tractors out as wide as possible (move right tractors to the right and the left tractors to the left).

NOTE

Make sure that the left tractors are positioned all the way to the left and right tractors all the way to the right.

c. Open the tractor doors and slightly loosen the two pozi #1 or slotted faceplate screws, located on the face of each tractor, enough to allow the spring on the bracket to push the roller into the platen rail. Verify that the rollers are fully seated on the rail and retighten the two tractor faceplate screws. (see Figure 5-5).

d. Set the Tractor Control Knob to the FORMS WIDTH position and run the right tractors close to the left tractors (about 2" apart). Run tractors in SLOW and FAST mode when moving.

e. Set the Tractor Control Knob to the PRINT position and run the tractors their full length of travel, left and right, to verify that they do not hang (run in SLOW speed). If the Tractor Drive Motor does not stall in any position, the AVB adjustment is correct. If the motor stalls in any position, check for obstructions: burred or contaminated shaft, etc. Also check the length of the spring holding the right tractor drive cable. A good spring should measure no more than 1 5/8"(16mm). Replace spring (P/N 1460-0648) if found to be stretched.

5-8. TRACTOR DRIVE BELT PHASING

The tractor drive belt serves as the drive mechanism for the lower tractors. The drive originates in a Stepper Motor which is attached to the upper tractor drive shaft. The drive belt adjustment varies the phasing of the paper teeth of the lower tractors with respect to the upper tractors. Poor phasing can cause "character scrunch" or paper jam problems (see Appendix C). There is a limited amount of operator control adjustment available through the Vertical Paper Tension Lever. To determine if adjustment of the tractor drive belt is needed, perform steps a through c, of the adjustment procedure.

WARNING

Wear safety glasses to protect your eyes when removing the Idler Arm Springs.

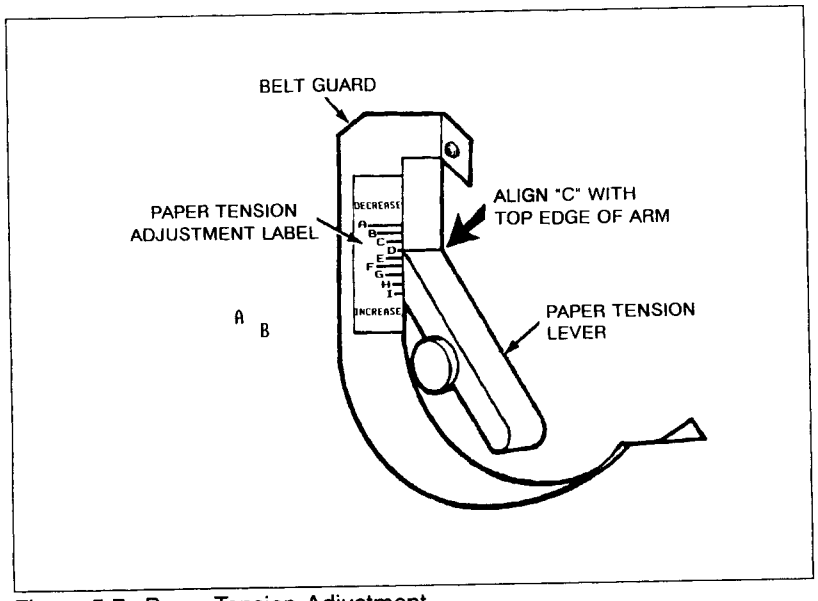

Figure 5-7. Paper Tension Adjustment

a. Set the Paper Tension Lever in the "C" position (the third position down from the top - see Figure 5-7).

b. Place a Mylar Triangle tool (P/N 02566-00261) in the upper-left tractor.

c. Without moving the Paper Tension Lever, check to see if the mylar triangle will fit into the lower-left tractor pins without excess slack or too much tension in the triangle tool. If they do not have excess slack or too much tension, continue on with the following steps:

d. Remove one spring from the idler arm, leaving one spring in place to lower belt tension. This makes the adjustment easier.

WARNING

Wear safety glasses to protect your eyes when removing or installing the Idler Arm Spring.

e. Release the tension on the tractor drive belt (see Figure 5-8) and adjust the belt. This is done by using one hand to pull back on the Drive Belt Idler Arm far enough to release the tension on the belt allowing the Lower Drive Shaft to turn without the belt turning. With your other hand, rotate the Lower Drive Shaft past the cleats on the belt, until the lower-left tractor's drive teeth align with the holes in the Mylar Triangle tool.

f. Verify the alignment of the tractor drive teeth. With the Mylar Triangle Tool placed in the upper-left and lower-left tractor teeth and the paper tension lever set to position "C", the triangle tool should be tight against the platen/paper guide. The paper tension setting may be moved to either one setting more ("D") or one less ("B") and be sufficient. Do not over tension the triangular tools and deform the holes in the mylar tools. If phasing is still incorrect, return to step "e" above.

g. Reinstall the second Idler Arm spring if removed. The second spring is required for proper operation.

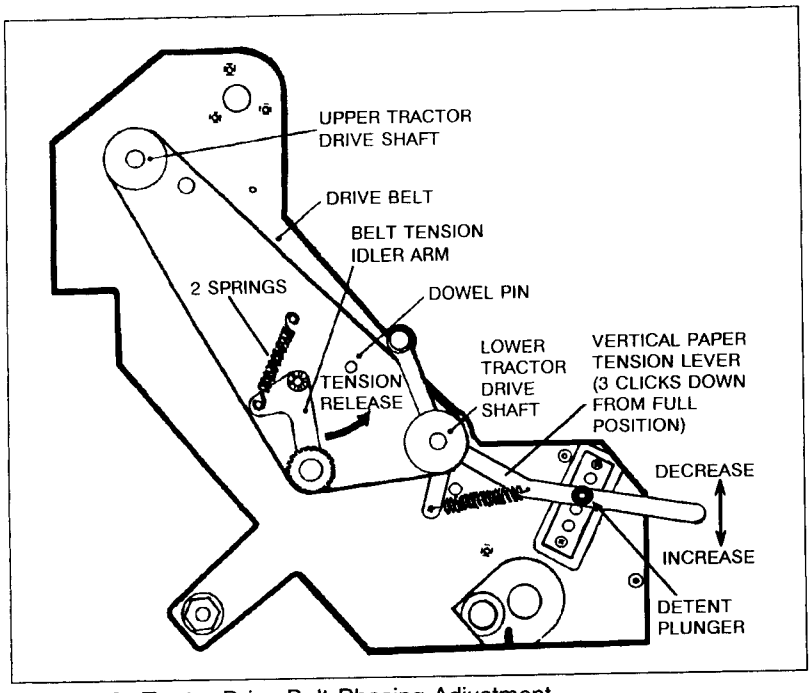

Figure 5-8. Tractor Drive Belt Phasing Adjustment

5-9. VERTICAL TRACTOR ALIGNMENT

The vertical tractor alignment must be performed whenever a tractor or tractor cables are replaced, or, when the printer is experiencing paper jams. The tractors must be aligned so that the upper and lower tractors are in vertical alignment and on a plane that is perpendicular to the platen. The current tractor adjustment procedure is the "Triangle Tool Method". This method uses two mylar triangle tools, P/N 02566-00261.

To align the tractors vertically, perform the following steps:

a. Raise the print mechanism swing gate to the fully open position and remove the paper from the printer.

b. To perform the tractor alignment the platen/printbar gap must be correct. If the platen gap requires adjustment, perform the Platen/ Printbar Gap Adjustment (refer to Paragraph 5-6).

c. To perform the tractor alignment, the anti-vibration brackets (AVBs) must be correctly adjusted. If the AVBs require adjustment, perform the Tractor Anti-Vibration Brackets Adjustment (refer to Paragraph 5-7).

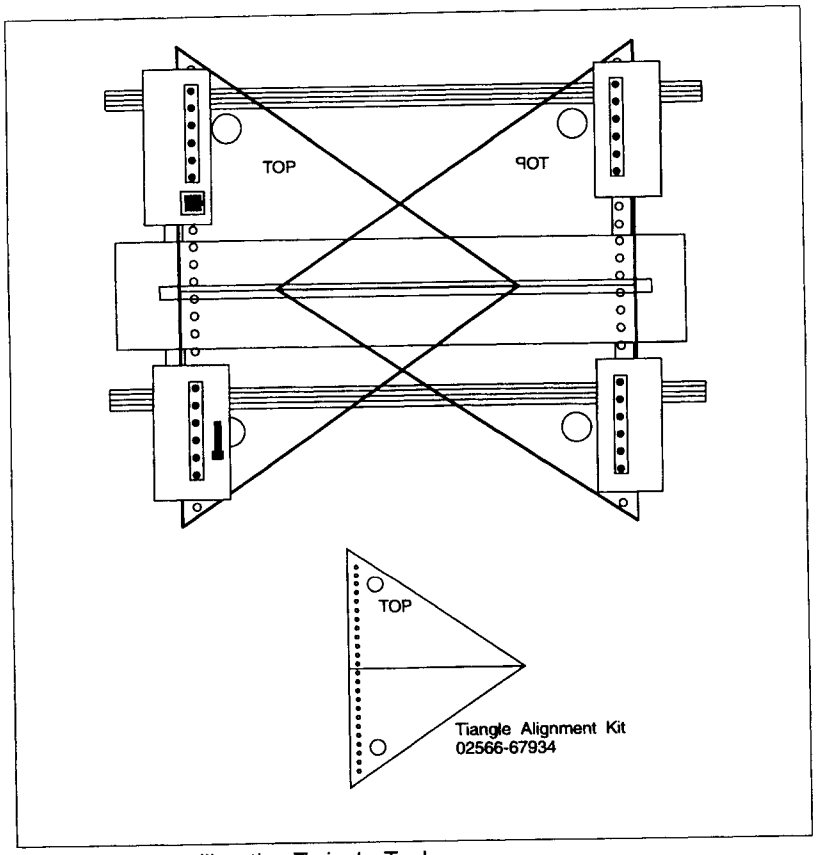

Figure 5-9. Installing the Traingle Tools

d. Place a Mylar Triangle Tool (with "TOP" up) in the left set of tractors (see Figure 5-9) and the other triangle (with "TOP" up) in the right set of tractors.

e. Use the FINE UP/DOWN paper adjust to align the black lines over the middle of the metal insert in the platen/paper guide assembly.

f. Use the paper tension lever to adjust the tension so that the tools are snug against the platen/paper guide. With this tool tensioned properly, the Paper Tension Lever should be in the "B" to "D" range. If not, readjust the Tractor Drive Belt Phasing, Paragraph 5-8, or replace worn mylar triangle tools (look for tractor pin hole distortion).

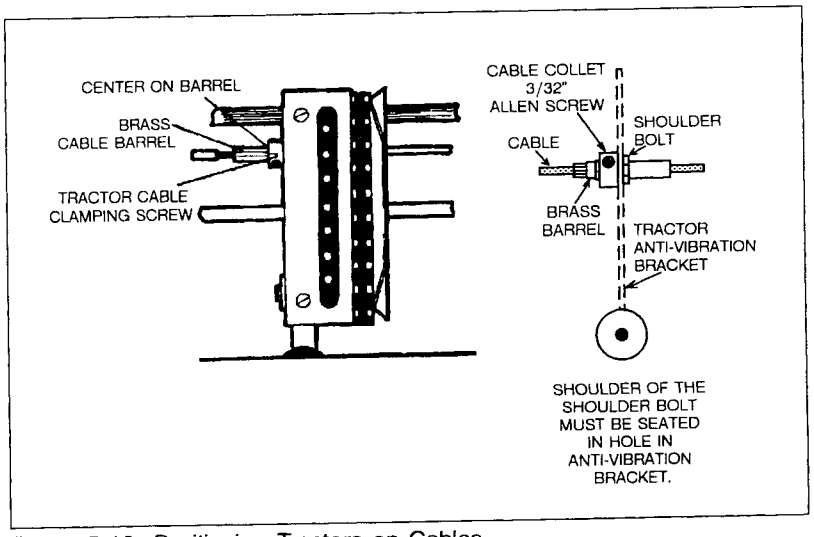

Figure 5-10. Positioning Tractors on Cables

g. Set the Tractor Control Knob to the "PRINT" position, NOT the "FORMS WIDTH" position. With this setup, the black lines on the triangles should overlay each other (or at least be closely parallel). If the lines are NOT parallel, the vertical tractor alignment is out of adjustment, skip to step "i" and continue with the adjustment; if the lines do line up, continue to step "h".

h. With the Tractor Control Knob in the PRINT position, use the control keys to move the tractors left and right while watching the lines on the mylar triangles. The lines will move slightly out of alignment. The movement of the lines should be upward only (see Figure 5-4). If the movement is upward, no adjustment is necessary; however, if the movement is downward, adjustment of the tractors is necessary, continue to step "i".

i. Verify that the lower-right and lower-left tractors are centered on the brass cable barrels; and that the clamping screws on the lower-left and lower-right tractors are facing outward, toward the access holes in the mylar triangle tools adjustment. If they are not, remove the triangles and adjust as necessary then replace the triangles. Tighten the lower-left and lower-right cable clamping screws.

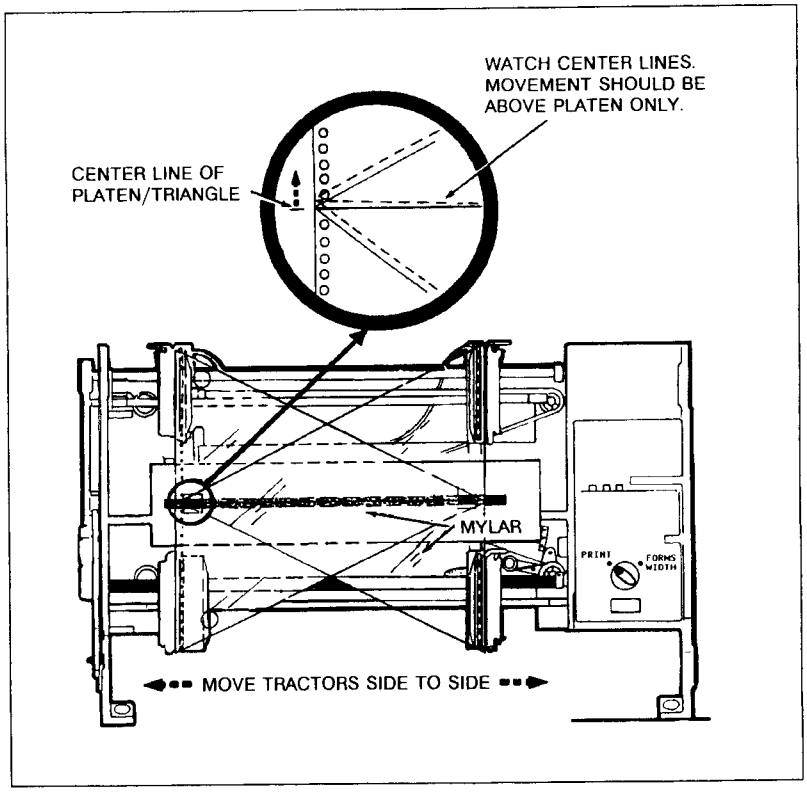

Figure 5-11. Fine Adjusting the Tractor Alignment

j. Slightly loosen the upper-left and upper-right tractor cable clamping screw.

k. Using the mylar triangles, adjust the upper-left and upper-right tractors (by tapping on either side of the tractor) until the center lines on the two triangles are parallel with each other and parallel with the

metal insert in the platen/paper guide assembly (see Figure 5-11). Tighten the upper-left and upper-right cable clamping screws.

l. With the Tractor Control Knob in the PRINT position, use the tractor control keys to move the tractors left and right while watching the center alignment lines on the triangles. The lines will move slightly out of alignment. Adjust the tractors until the movement of the lines is upward from parallel only. This causes the tractors to be adjusted very slightly wider at the top than the bottom.

m. After completing the adjustments, check the alignment by feeding paper through the printer. Examine the tractor holes, looking for elongation or widening of the holes. When the Paper Tension Lever is properly adjusted and the tractors are perfectly aligned vertically, slight evidence of elongation of the paper holes should be present after the paper exits the top set of tractors.

5-10. PAPER PATH SKEW

This adjustment compensates for slight differences in the length of the paper path by moving the right side of the lower tractor drive shaft up or down as necessary.

NOTE

This adjustment is set at the factory and should rarely need to be performed. If it is performed, the Tractor Belt Phasing (Paragraph 5-8) and Vertical Tractor Alignment (Paragraph 5-9) adjustments should be performed first, before attempting this adjustment.

a. Insert the mylar triangle tools into both sets of tractors (see Figure 5-9).

b. Adjust the tractor phasing to properly tension the left tractor tool only with the Paper Tension Lever. The tool is properly tensioned when you can place your index finger in the middle of the platen over the tractor tool and NOT move the tool up and down with your finger.

c. Check the tension on the right side tractors. If the tension on the right tool equals the tension on the left tractor tool no further adjustment is

needed, exit this procedure; however, if the tension is uneven, proceed to step "d".

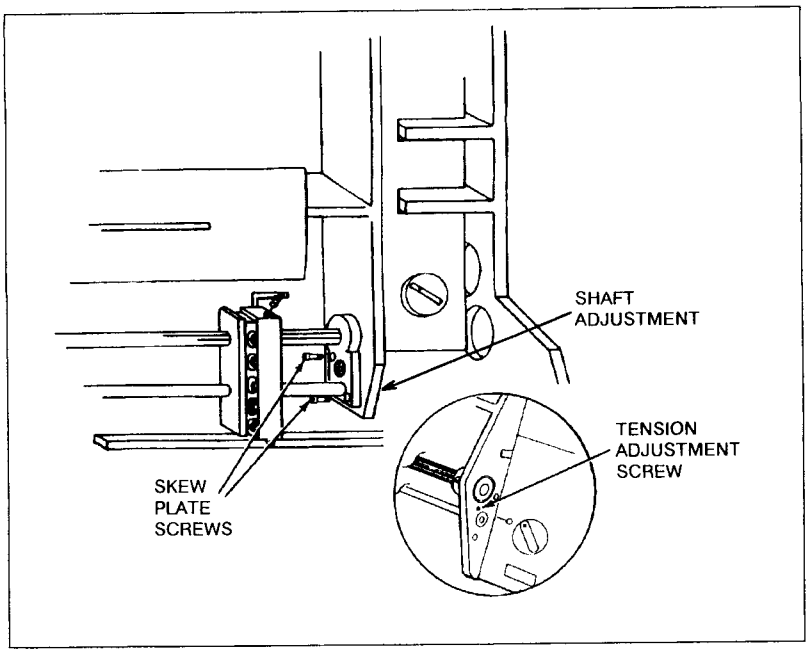

Figure 5-12. Paper Path Skew Adjustment

d. To adjust the right side tension to equal the left side tension, perform the following steps:

   1. Remove the two screws from the protective cover and remove the cover.

   2. Loosen the two screws that hold the Lower Tractor Skew Plate (see Figure 5-12).

   3. With a flat blade screwdriver, adjust the skew plate adjustment screw so that the tension of the right mylar triangle is the same as the left mylar triangle. When the tension is equal, tighten the two skew plate screws and reinstall the protective cover, tightening the other two screws.

e. Remove the mylar triangle tools.

f. Recheck Vertical Tractor Alignment (refer to Paragraph 5-9).

5-11. CONTROL PANEL TIMING ADJUSTMENTS

This section contains procedures for Hammer Flight Time and Amplitude adjustments. In general, these adjustments become necessary if a printbar, linear motor coil, or Formatter PCA has been replaced, or a cold start has been performed.

The Hammer Flight Time and Amplitude Adjustments are described below.

HAMMER FLIGHT TIME:

a. With the printer powered up and set offline, press the SELF-TEST key. The right-most decimal point of the display panel should come on.

b. Set the Paper Thickness Lever in the "B" position, and use single-part paper.

c. Use the FINE ADJ UP key to increment the display to test 15 and press ENTER.

d. If there is some "waviness" in the lines, perform the Hammer Flight Time adjustment. The dots making up the vertical lines should be directly over each other (see Figure 5-13), if they are straight, exit this procedure. If the dots are not straight, proceed to step "e".

e. Place the printer in CE mode (see Paragraph 4-5).

f. Configure the printer to configuration 40, Flight Time Adjustment (see Paragraph 4-2).

g. Increment the display panel readout backward or forward one number (using FINE ADJ UP/DOWN) and press ENTER.

h. Perform the above steps until the vertical lines obtained, in step "d", are straight.

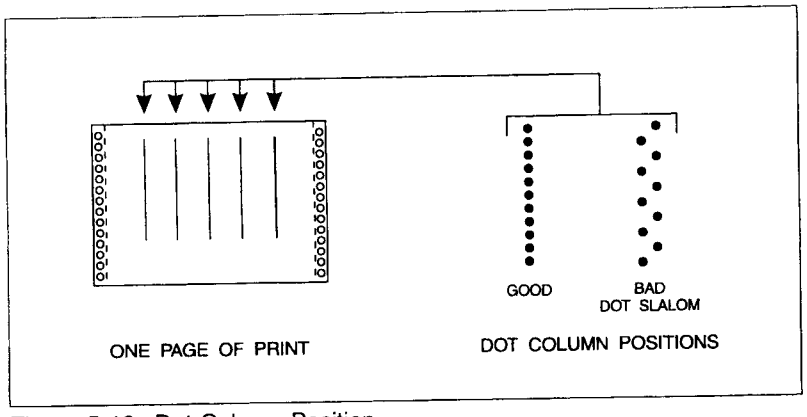

Figure 5-13. Dot Column Position

AMPLITUDE ADJUSTMENTS:

First, check the amplitude adjustment to see if it is adjusted correctly, as described below:

a. With the printer powered up and set offline, press the SELF-TEST key. The right-most decimal point of the display panel should come on.

b. Use the FINE ADJ UP key to increment the display to test 15 and press ENTER.

c. Examine the test print pattern (vertical and horizontal lines). The lines should be straight. If they are straight, continue to step "d". If they are not straight adjust the platen gap (paper thickness lever) and re-run the test until the horizontal lines are as straight as possible before continuing

d. Press SELF-TEST and use the FINE ADJ key to select test 16. You may also use test 2 and/or 5. See figures 5-13 and 5-14.

e. Examine the print pattern. With test 16, pairs of lines are generated. Each line is produced by printing two dots next to each other. If the amplitude is misadjusted, either of two conditions can occur: the dots can be overlapping each other resulting in the line being thinner than normal; or, the dots may be separated too far producing two separate thin lines. To correct either of the above misadjustment conditions, perform the Amplitude, Rough Adjustment and Fine Adjustment described below.

NOTE

Function 42 and 43 performed in the following adjustment are the same, only the adjustment resolution is different.

Amplitude rough adjustment
(Function 42-increments/decrements by 5)

a. Place the printer in CE mode (see Paragraph 4-5).

b. Configure the printer to function 42, Amplitude Adjustment (see Paragraph 4-2). Amplitude is displayed in two's compliment notation.

   00 = Center of Range 7F = Max, 80 = Min

c. Change readout up or down and press ENTER.

d. Repeat steps "d" and "e" of Amplitude Adjustment above, then "b" and "c" of this procedure until the lines are maximum thickness (two dots wide).

Amplitude fine adjustment
(Function 43-increments/decrements by 1)

a. Press SELF-TEST, set the display to 5 with the up arrow key, and press ENTER.

b. Examine the test pattern (herring bone). If the lines are straight (not jagged), exit this procedure; if the lines are still jagged, continue with this fine adjustment procedure (see Figure 5-14).

c. Configure the printer to function 43 (see Paragraph 4-2). Amplitude is displayed in two's compliment notation.

   00 = Center of Range 7F = Max, 80 = Min

d. Change readout up or down and press ENTER.

e. Repeat steps "a", "b", "c" and "d" until the lines are straight.

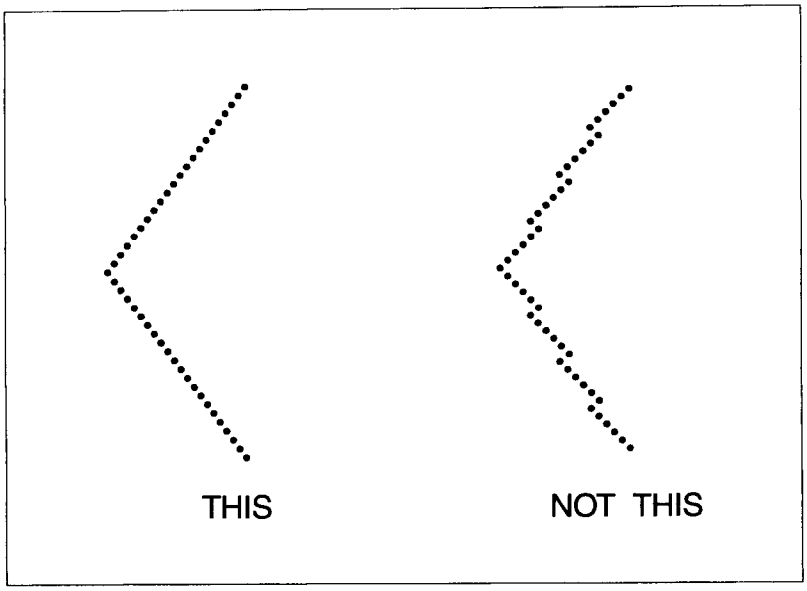

Figure 5-14. Selftest Subtest 5 Herring Bone Pattern

5-12. SPARSE MODE

To optimize the draft print quality, perform the following adjustment:

a. Adjust the vertical tension of the paper as outlined in Page 3-15 of the "HP 2566C/2567C Operator's Manual" (P/N 02566-90990).

b. Verify that the printer will feed paper properly by using the test outlined in Page 3-19 of the "HP 2566C/2567C Operator's Manual".

c. Select the High Speed Draft Ripple Print mode on the printer by performing the following steps:

NOTE

The Sparse Mode Option requires a PAL (Programmable Array Logic) chip to be present on the Backplane PCA. If you are unable to enter the Sparse mode, check for the presence of the PAL chip (see Figure 6-14).

1. Press the TEST key on the front panel, momentarily.

2. Use the FINE ADJUST keys on the front panel to increment or decrement the printer's display to read "10".

3. Press the ENTER key to begin printing one page of ripple print at 1200/1600 lpm, Sparse mode.

NOTE

If the operator desires to print several pages of High Speed Draft Ripple Print at one time, continuous mode can be selected by pressing and holding the TEST key down for 3-5 seconds, until the displayed status changes from "5" to "4". To discontinue printing press the TEST key to exit the subtest.

d. Adjust the paper thickness as outlined in page 3-15 of the "HP 2566C/2567C Operator's Manual" to minimize the horizontal (left-to-right) dot offset. When performing the paper thickness adjustment, pay special attention to characters with a predominate vertical segment such as "L", "I" and "N" to assure that the dots line up in the vertical direction. As a general rule, if they do not line up, the print gap is too large and will need to be decreased. If this occurs, move the Paper Thickness Lever one letter lower (from C to B) and repeat step "c".

e. If the gap between the paper and platen is too small, there may be some smudging of ink on the paper. If this occurs, move the paper thickness lever one letter higher (from B to C) and repeat step 3.

f. Repeat steps 3 and 4 until optimum sparse print quality is obtained.

NOTE

The draft symbol set increases the throughput of the HP 2566C from 900 lpm to 1200 lpm and the HP 2567B/C from 1200 lpm to 1600 lpm. This is achieved by printing characters that are 5 dots high and 4 dots wide in the same space that the standard symbol set prints a character 7 dots high and 5 dots wide. Thus, the dots in the vertical direction will not touch in most cases. This is fundamental to the design, not an indication of improper adjustments.

5-13. TRACTOR CABLE BRAKE PAD ADJUSTMENT

To adjust the Brake Pad, complete the following steps:

a. Place the Tractor Control Knob in the locked (FORMS WIDTH) position.

b. Loosen the two mounting screws in the brake.

c. Remove the rubber pad on the metal post.

d. Hold the brake bracket so that the attached pad is pressed against and centered on the metal post. (Be sure to hold the cable out of the way so it does not interfere with contact of the pad to the post.)

e. Securely tighten the two mounting screws while holding the pad in this position.

f. Reinstall the rubber pad on the metal post.

5-14. LATCH KIT

Adjustment of the swing gate latch kit is necessary when the swing gate latch kit is replaced or the swing gate gas springs are replaced.

The latch kit adjustment procedure is performed as follows:

a. Adjust the hook assembly so the latch kit is aligned with the latch block (see figure 5-15). To do this, lift the swing gate until the latch hook touches the latch block. While holding adjustment, securely tighten the 6mm allen screw and the two 4mm allen screws as shown in figure 5-15.

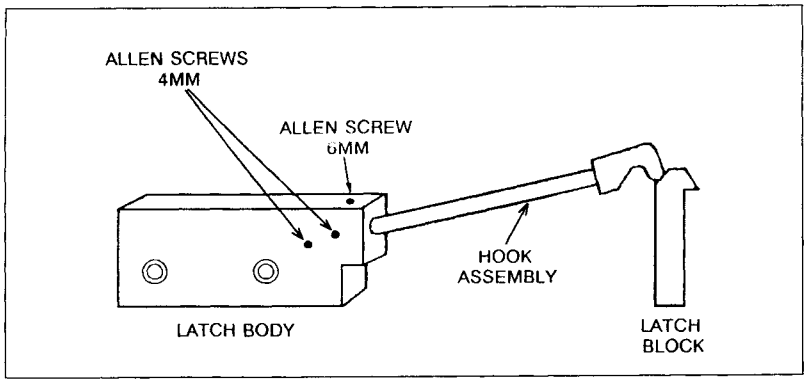

Figure 5-15. Hook Assembly Alignment

b. Loosen the two 6mm allen screws in the latch body. Raise the swing gate until the latch hook contacts the latch block, approximately centered on the angle of the block, as shown in figure 5-16. Hold the swing gate in this position until you securely tighten the 6mm allen screws on the latch body.

c. Close the swing gate and press down the swing gate release arm to release the unit and let it raise to the open position, aided only by the gas springs. Observe how far the lower right edge of the swing gate cover (indicated by the arrow label) rises on the red-yellow-green label.

WARNING

If the --> indicator points to the yellow or red region, the swing gate gas springs must be replaced. **NEVER** let the customer use the printer when the --> indicator points to the red region because the swing gate might fall and cause bodily injury.

d. Check the operation of the latch. Lift the swing gate all the way up until the latch engages. It should hold the swing gate securely. Pull down firmly on the swing gate, the latch should release the swing gate and close.

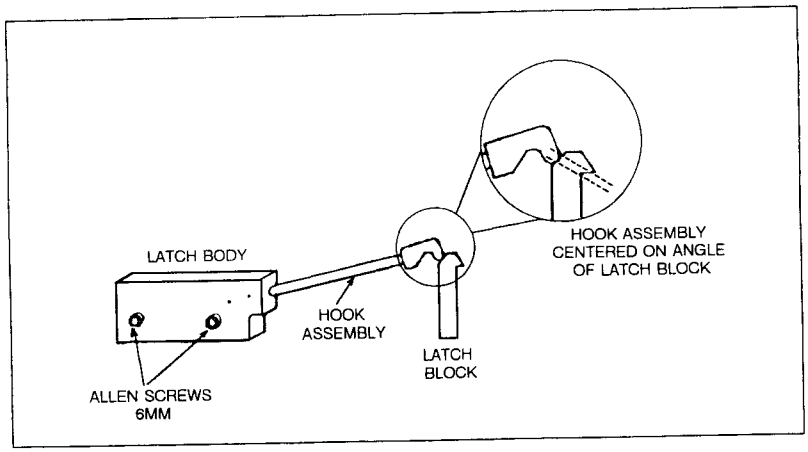

Figure 5-16. Final Adjustment

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Chapter 6

Removal and Replacement 2566B/C 2567B/C

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6-1. INTRODUCTION

This section of the manual details removal and replacement procedures for the HP 2566/67 printers. The procedures should be read carefully as they make some references to other sections of the manual.

In general, it is recommended that the ribbon be removed prior to any work on the print mechanism or in the area of the paper path. This should help prevent accidental dropping and despoooling of the ribbon.

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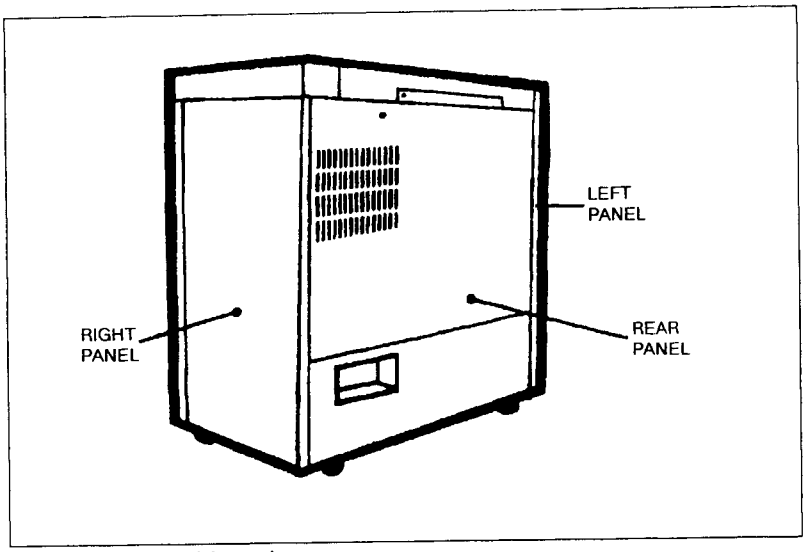

Figure 6-1. Panel Locations

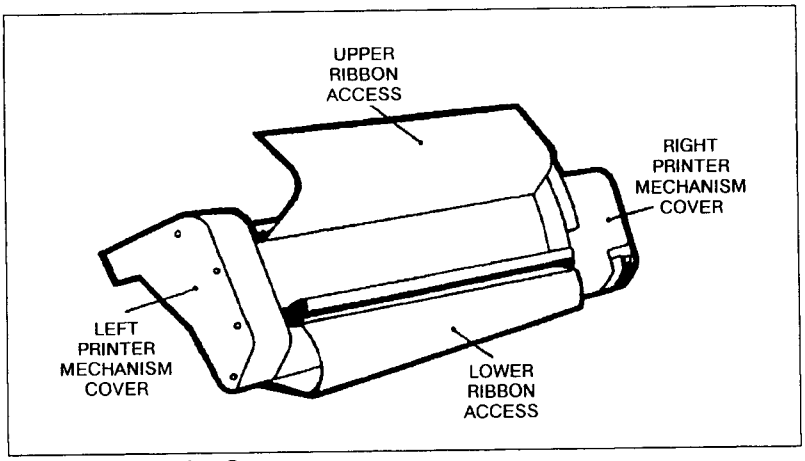

Figure 6-2. Interior Covers

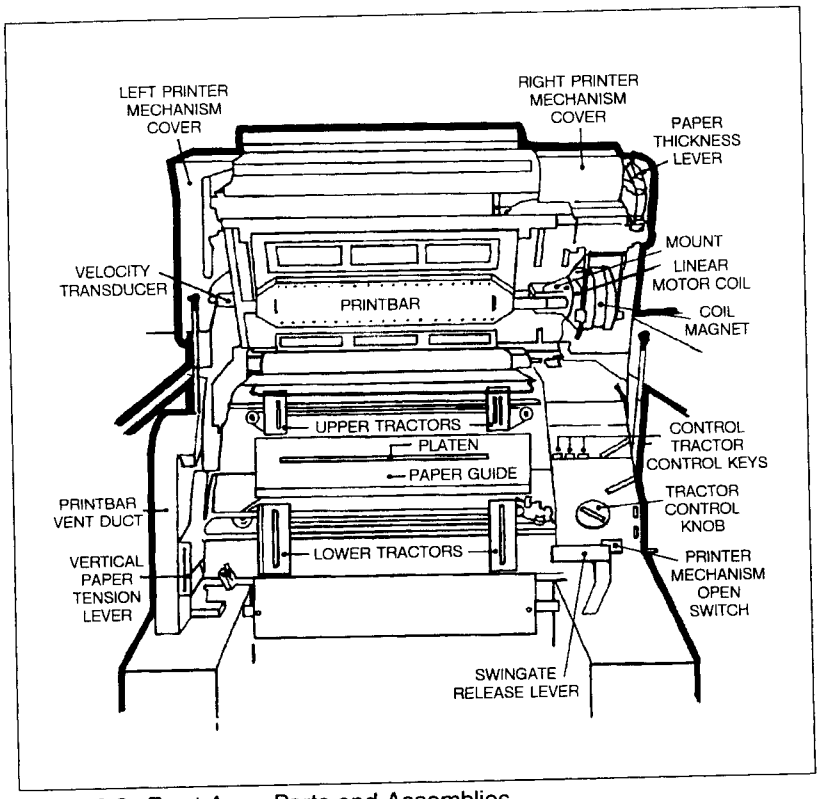

Figure 6-3. Front Area, Parts and Assemblies

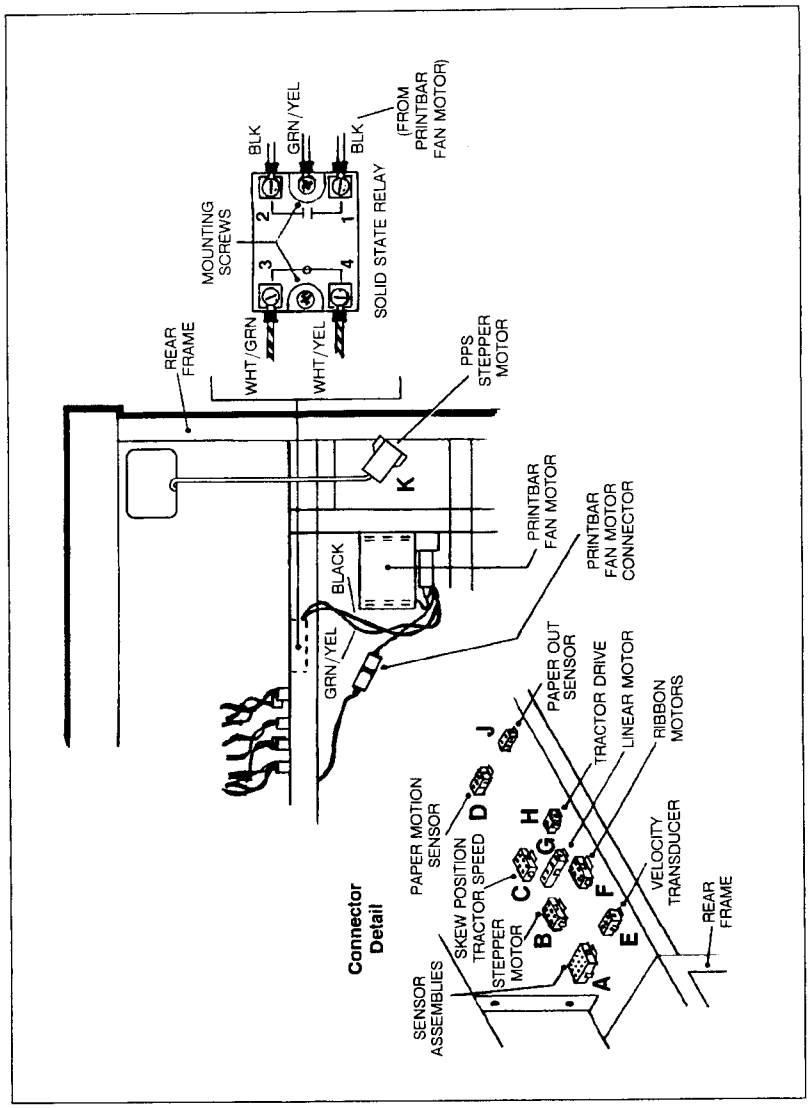

Figure 6-4. Rear Area Electrical Assemblies

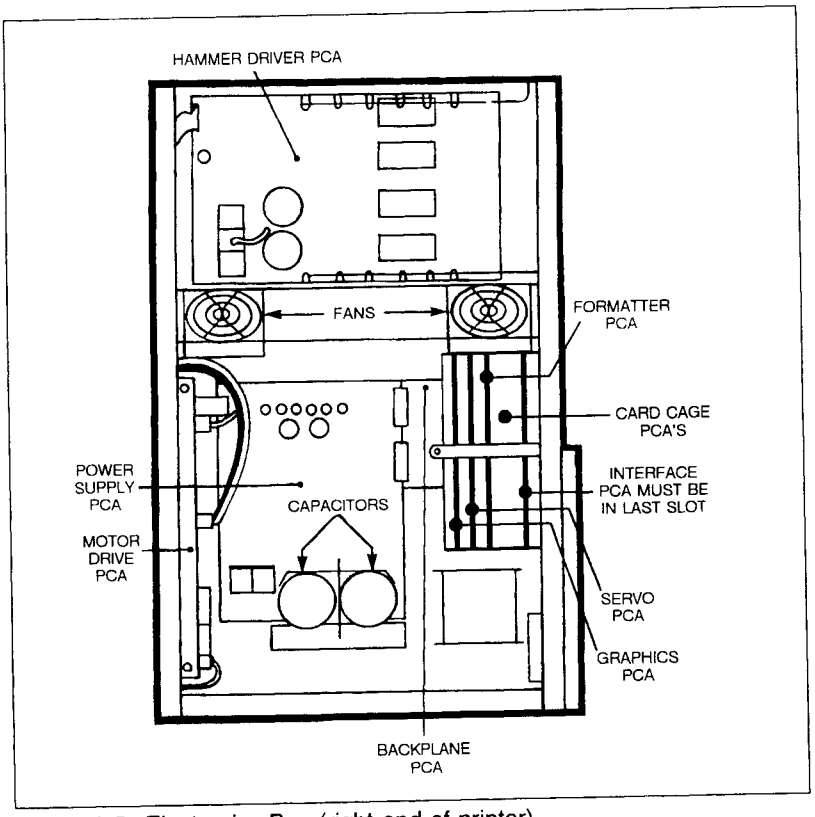

Figure 6-5. Electronics Bay (right end of printer)

6-2. REQUIRED TOOLS

Following is a list of the tools required to replace the parts and assemblies discussed in this section of the manual:

- Pozi-drive screwdrivers (#1 and #2)
- Metric hexagonal drivers (Allen wrenches) 1½, 2, 2½, 3, 4 and 5 mm
- SAE 3/32 inch Allen wrench (tractor cables)
- SAE 5/64 inch Allen wrench (ribbon deskew motor collar)
- Flat blade screwdrivers - small and medium size
- 4 and 5 mm ball drivers are especially useful in many of these procedures (though not a necessity)
- 5.5, 6, 7, and 8 mm sockets, or open-end wrenches

- 1/4 inch open-end wrench
- Medium plastic mallet (see Figure 6-45)
- Heavy duty spring puller

6-3. RIGHT END PANEL

The right end panel, when removed, provides access to the majority of the printer's printed circuit assemblies. Remove the panel as follows:

a. Open the printer's top access cover and the print mechanism swing gate.

b. Insert a long shanked 4 mm Allen-head driver through the access hole located on the inside right wall of the control panel housing under the Operator Control Panel (see Figure 6-6).

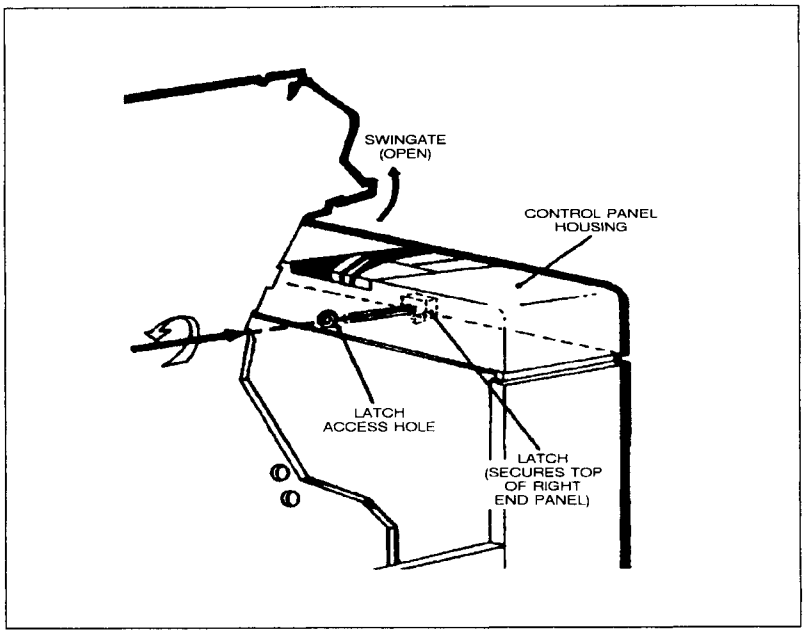

Figure 6-6. Right End Panel Removal using Shim Stock/Credit Card

c. Turn the latch to release the panel.

NOTE

If a long shank 4 mm Allen wrench is not available, a 5/32 inch Allen wrench or small flat blade screwdriver may be used. In a situation where none of these tools are on hand, you can insert a thin plastic card (credit card), between the Operator Control Panel housing and the top of the right end panel, to trip the latch (see Figure 6-6).

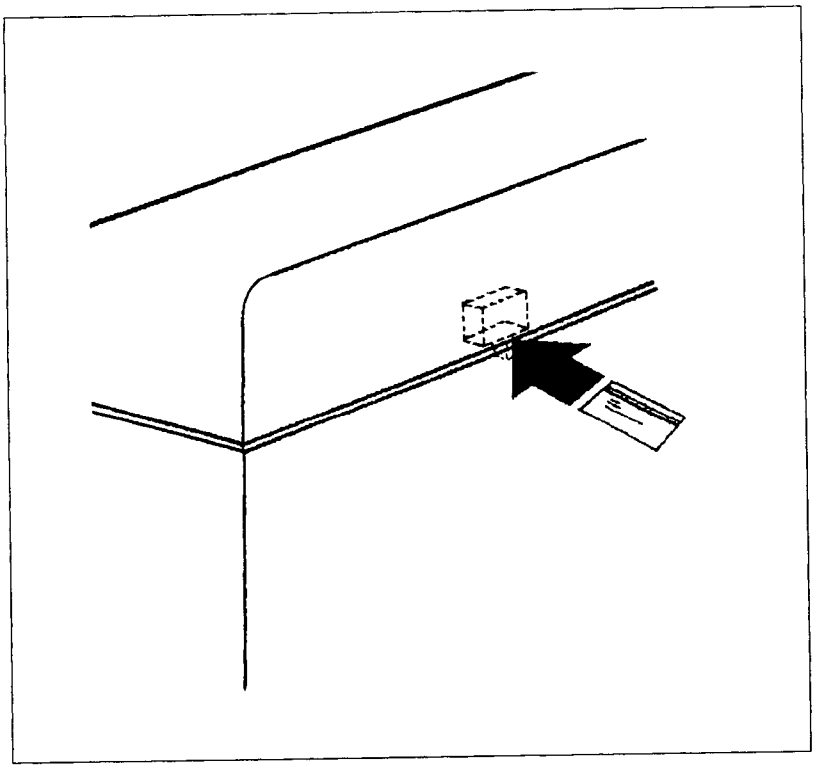

Figure 6-7. Right End Panel Removal

d. Lift the panel up and outward.

To reassemble the right end panel, slide the bottom mounting clips into the holes provided in the printer's cabinet and push the panel to latch it in place.

6-4. REAR ACCESS PANEL

Access to several connectors, a solid state relay, the tractor adjustment motor, the left end panel mounting screws and other parts and assemblies is gained through the rear of the printer. Remove as follows:

To remove the sound shroud:

a. Turn the two 3 mm 1/4 turn Allen or flat-blade screws holding the Sound Shroud to the rear panel. Lift the shroud off.

b. Turn the two 3 mm 1/4 turn Allen screws on the upper portion of the rear panel.

c. Lift the panel upward and away from the printer.

To remove the PPS:

a. Make sure the levelers on the PPS are raised.

b. Remove the 1/4 turn fastener and take off the access panel on the right side of the PPS.

c. Unplug the 6 position cable from the stepper motor.

d. Remove the 6 position cable from the PPS.

e. Turn the two 1/4 turn screws holding the PPS to the rear panel. Open the stacker door and unfasten the four flange head screws that attach the PPS to the printer frame.

f. Lift the PPS upward and away from the printer.

g. Turn the two 3 mm 1/4 turn Allen screws on the upper portion of the rear panel.

h. Lift the panel upward and away from the printer.

Reverse to reassemble.

6-5. LEFT END PANEL

Access for removal of the printbar cooling fan, the tractor drive and support shafts, and other parts and assemblies is gained through the left end of the printer. The printer's rear access panel must be removed prior to removal of the left end panel (see Paragraph 6-4).

Removal of the left end panel is described in the following steps:

a. Remove the three 5 mm Allen screws securing the panel to the printer frame. Two of these screws are accessed from the rear of the printer and the other one from the front (see Figure 6-8).

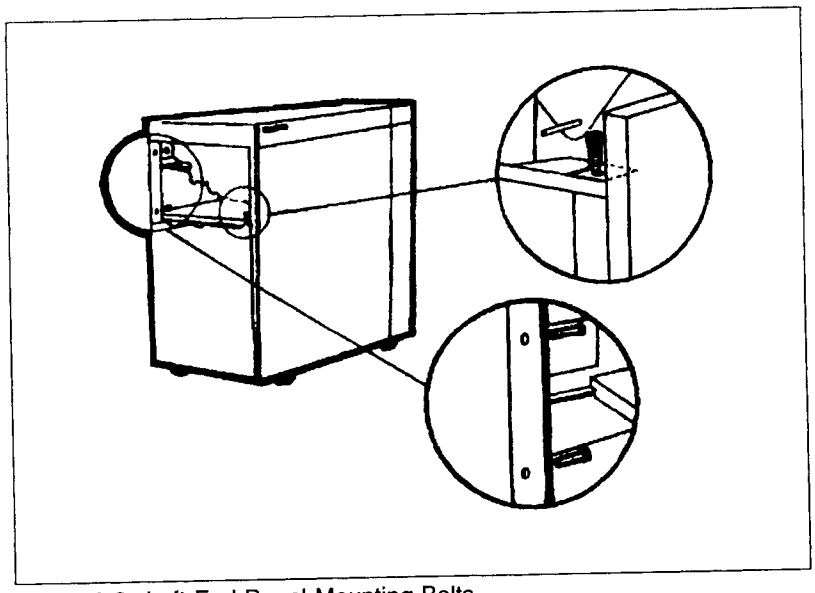

Figure 6-8. Left End Panel Mounting Bolts

b. Lift upward and out to remove the panel.

Reverse the above procedure to reassemble. It is easiest to start the threads on the upper rear screw first, then start the other two before returning to tighten all three.

6-6. UPPER RIGHT PRINT MECHANISM COVER

The upper Tractor Control PCA, the Upper Ribbon Drive and the Ribbon Deskew Motors are located under this cover (see Figure 6-2). Remove as follows:

a. Raise the print mechanism swing gate to the fully open position.

b. Remove the three Pozi-drive mounting screws from the right end of the cover.

c. Remove the two Pozi-drive screws securing the metal portion of the cover to the print mechanism casting.

CAUTION

Do not remove the plastic portion of the right print mechanism cover, leaving the sheet metal portion attached, as closing the swing gate may then damage the sheet metal part.

d. Loosen the jam nut and unscrew the spring plunger assembly on the right end of the upper casting so that the paper thickness lever may be lowered all the way down, out of the way.

e. Lift cover slightly, freeing it from the area of the paper thickness lever and unplug the wiring connector from the Tractor Control PCA (on the under-side of the cover).

f. Remove cover.

CAUTION

Be careful not to lean on the four cover stands-offs. These stand-offs are fragile and may break.

Reverse the above removal procedure to reassemble.

6-7. UPPER LEFT PRINT MECHANISM COVER

A terminal block in the wiring for the ribbon skew and position sensors is located beneath this cover (see Figure 6-2). Remove as follows:

a. Raise the print mechanism swing gate to the fully open position.

b. Remove the 4 Pozi-drive screws on the side of the cover.

CAUTION

Be careful not to lean on the four cover stands-offs. These stand-offs are fragile and may break.

c. Remove cover.

Reverse the above removal procedure to reassemble.

CAUTION

If the connector to the Control PCA is connected with the printer powered-up, fuse F-1 on the Motor Driver PCA may blow.

6-8. FRONT RIBBON ACCESS COVERS

The front ribbon covers, upper and lower, have hinged doors for accessing the ribbon (see Figure 6-2). These doors usually provide sufficient access, but removal of the cover assembly may occasionally be required. The right and left print mechanism covers must be removed prior to the ribbon covers (see Paragraphs 6-6 and 6-7). Remove ribbon covers as follows:

a. Open the upper ribbon access door.

b. Lift the ribbon out of the upper spools and place in retainer cups.

c. Remove the two Pozi-drive screws from the inside of each end of the cover and lift the cover off of the printer.

Reverse the above removal procedure to reassemble.

All of the printer's printed circuit assemblies (except the Operator Control Panel PCA and two Tractor Control PCAs) are located in the electronics bay at the right end of the printer (see Figure 6-5). Access to this area is gained by removal of the printer's right end panel as detailed in Paragraph 6-3.

6-9. MOTOR DRIVER PCA (02566-60006)

The Motor Driver PCA is mounted on the lower left electronics bay against the left bay wall (see Figure 6-5). Remove and replace as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printer's right end panel as described in Paragraph 6-3.

c. Pull out the two black quick fasteners securing the board to the frame.

d. Remove the wire connectors from J1, J2 and J3 (see Figure 6-9).

e. Pull the PCA outward.

To reassemble, reverse the above procedure. Be certain that the connector is firmly seated in the Power Supply PCA. Due to slight differences in board warpage, it may be necessary to grasp the board at the large heat sink to maneuver the connector into place.

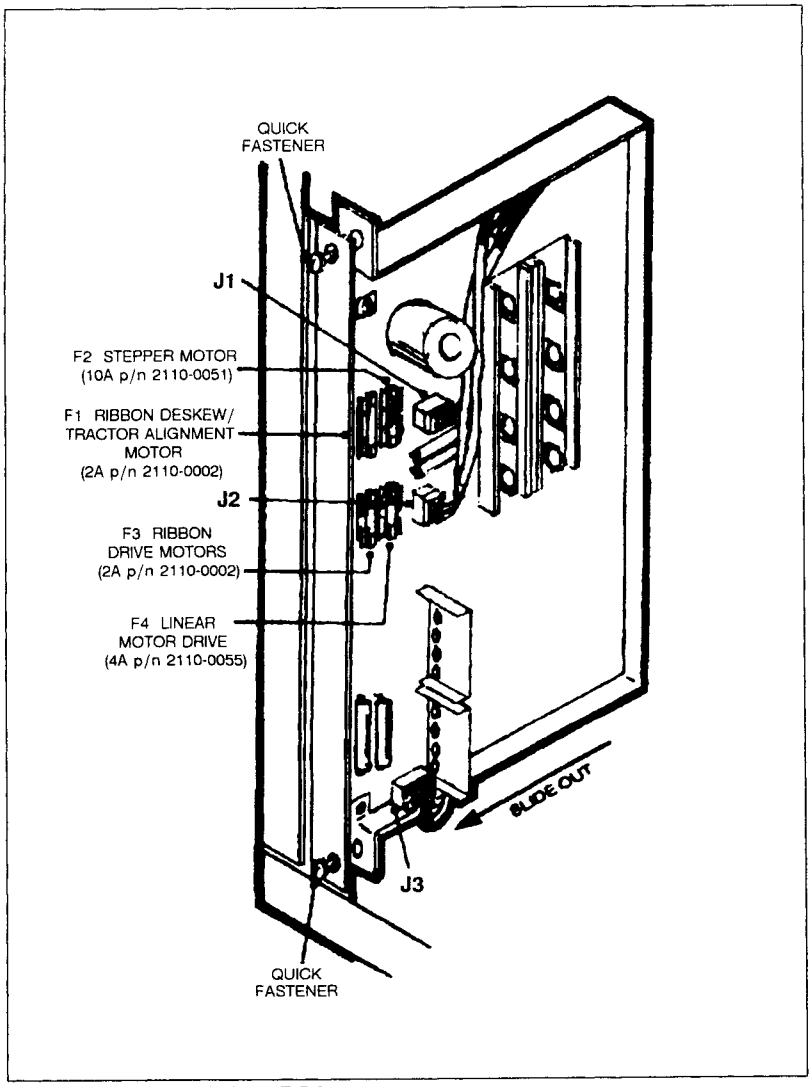

Figure 6-9. Motor Driver PCA

6-10. POWER SUPPLY PCA (02566-60005)

The Power Supply PCA is located adjacent to the Backplane PCA on the back wall of the lower half of the electronics bay (see Figure 6-5). It can be easily identified by the two large capacitors mounted near the bottom of the board. To remove and replace the Power Supply PCA, proceed as follows:

a. Remove the Motor Driver PCA (as described in Paragraph 6-9).

b. On the Power Supply PCA, loosen the wing nut securing the mounting clip for the two large capacitors (see Figure 6-10) and swing the clip downward and out of the way.

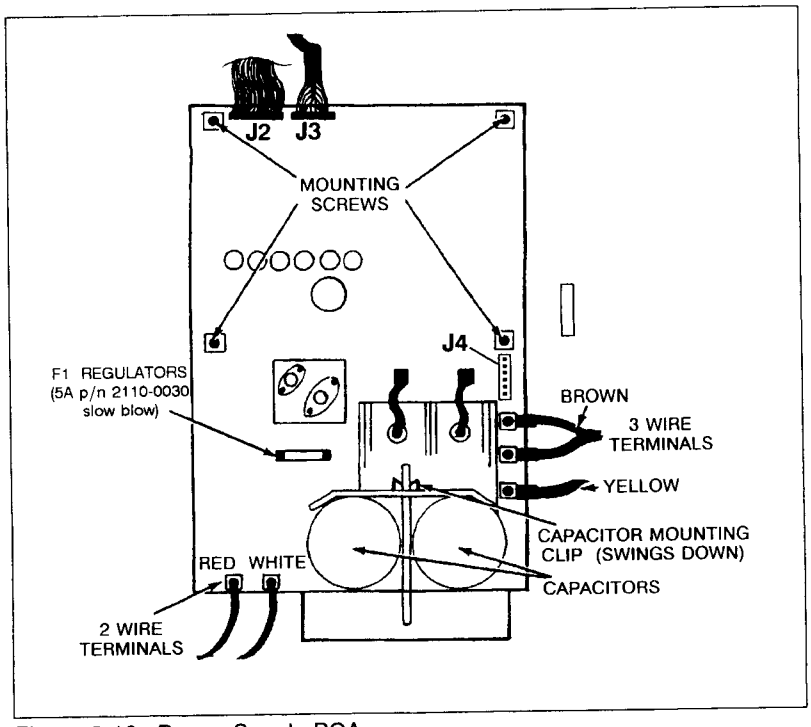

Figure 6-10. Power Supply PCA

c. Remove wire connectors J2 and J3 from the upper left corner of the board.

d. Remove nuts holding wire terminals at five locations, as follows:

LOCATION	WIRE COLOR	WRENCH SIZE
E15	RED	8 mm
E16	WHITE	8 mm
E20	BROWN	7 mm
E21	BROWN	7 mm
E22	YELLOW	7 mm

e. Remove the four screws mounting the board to the rear wall of the electronics bay.

f. Slide the board **CAREFULLY** toward the left to unplug the Power Supply PCA connector from the Backplane PCA, then lift slightly upward and out.

CAUTION

When replacing, **CAREFULLY** slide the Power Supply PCA into the Backplane PCA edge connector to prevent bending the pins. The edges of both PCAs (Power Supply and Backplane) should be tightly butted together. Also install the Motor Driver PCA and then tighten the right mounting screws, remove the Motor Driver PCA and then tighten the left mounting screews.

Reverse the above procedure to reassemble this board. Be sure that the edge of the board rides in the white nylon track.

6-11. HAMMER DRIVER PCA (02566-60031)

The Hammer Driver PCA is mounted in the upper half of the electronics bay. Remove the Hammer Driver PCA as follows: (Reverse this procedure to reassemble).

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printbar ribbon cable connectors from J1 through J12, and the connector at J13 (from Power Supply PCA).

c. Use an 8mm wrench to remove the nuts securing the red wire and the white wire to terminals E1 and E2.

d. Remove the eleven mounting screws (see Figure 6-11).

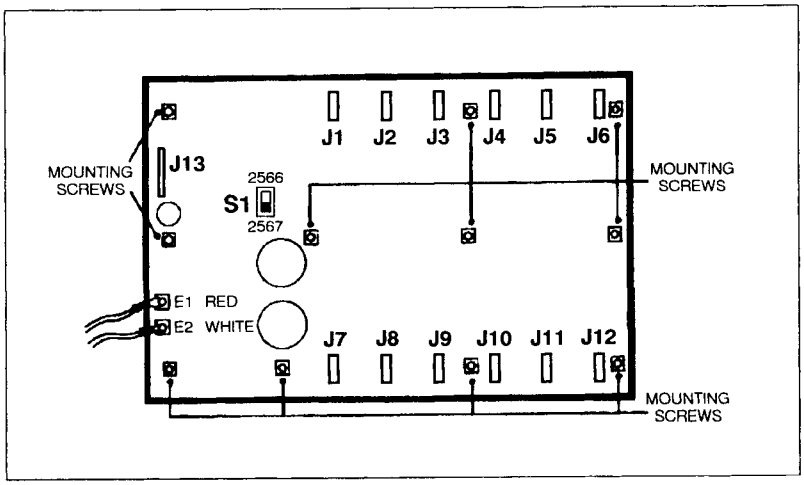

Figure 6-11. Hammer Driver PCA

CAUTION

When replacing, make sure the proper printer is selected through switch S1.

6-12. CARDCAGE AREA PRINTED CIRCUIT ASSEMBLIES

The cardcage, located in the lower half of the electronics bay, allows easy access to certain printed circuit assemblies for removal and replacement. The printer's right end panel must be removed to access the cardcage (see Paragraph 6-3).

There are slots available for four printed circuit assemblies (PCAs) in the cardcage. Three cardcage slots are used for the standard configuration. These three PCAs are the Interface, Formatter, and the Servo. The fourth slot is used by the HP Label Card PCA if the graphics option is installed. There are no electrical restrictions on which slot is used for which PCA. However, the Interface PCA must be installed in the right most slot to allow access to the interface port. Figure 6-5 shows a typical arrangement of the PCAs in the cardcage.

Removal and replacement procedures follow:

INTERFACE PCA:

To remove the interface (listed below), complete the following steps.

HP-IB	5062-0477
Serial (RS232/RS422)	5062-1703
Dataproducts Short Lines *	5061-1714
Dataproducts Long Lines *	5061-1715
Centronics	5061-1708

* HP 2566B and 2567B only

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. From the rear of the printer, remove the two small Pozi-drive screws securing the interface connector to the back of the printer cabinet. (These screws are located inside the depression near the connector.)

c. Pull out on the black quick-fastener holding the PCA retainer bracket to the cardcage and remove the bracket.

d. Grasp the two extractor levers and pull, to slide the board out of its slot.

Reassemble by reversing the above procedure. Be sure the board is properly seated on replacement.

FORMATTER PCA (02566-60030 or 02566-60042):

CAUTION

Before removing the Formatter PCA, write down the configuration values for 1, 2, 7, 20 trough 29, 40, 42, 43, 51, 52, 60, 61, 70 trough 75, 80, 81, and 85 through 89. (Configuration functions 80 through 89 apply to the HP Label Card, if installed).

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the ribbon cable connector (J70) located near the bottom of the Formatter PCA.

c. Remove the cable leading to the edge of the Servo PCA by pulling on the body of the connector.

d. Pull out on the black quick-fastener holding the PCA retainer bracket to the cardcage and remove the bracket.

e. Grasp the two extractor levers and pull, sliding the board out of its slot.

f. Transfer symbol set ROMS to the new Formatter PCA. Assure that the high density (marked "HD") ROMs are placed in high density sockets and that the normal density (marked "ND") ROMs are placed in the normal density sockets (see Figure 6-12).

Reverse the above procedure to reassemble (be sure board seats securely).

g. Cold start the printer (see Paragraph 4-7).

h. Reconfigure the new Formatter PCA using the values written before the old Formatter PCA was removed.

i. Perform the Print Quality Optimization Adjustments (See Paragraph 5-11 and 5-12) if required.

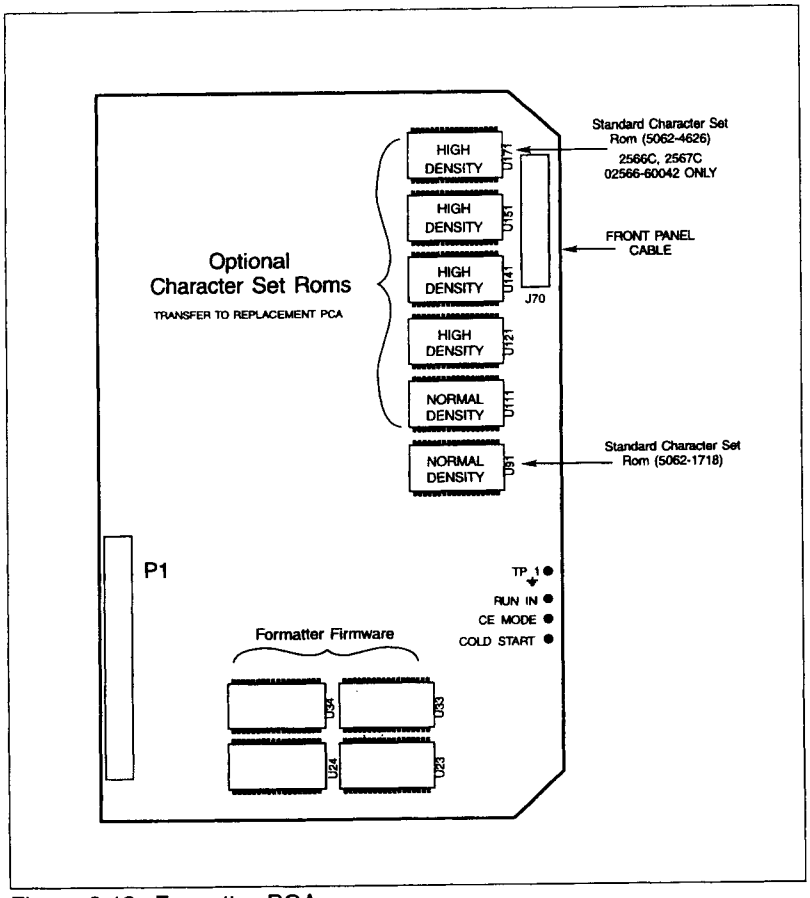

Figure 6-12. Formatter PCA

SERVO PCA (02566-60041):

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the connectors at J1 and J3.

c. Pull out on the black quick-fastener holding the PCA retainer bracket to the cardcage and remove the bracket.

When replacing the PCA, make sure it is securely seated.

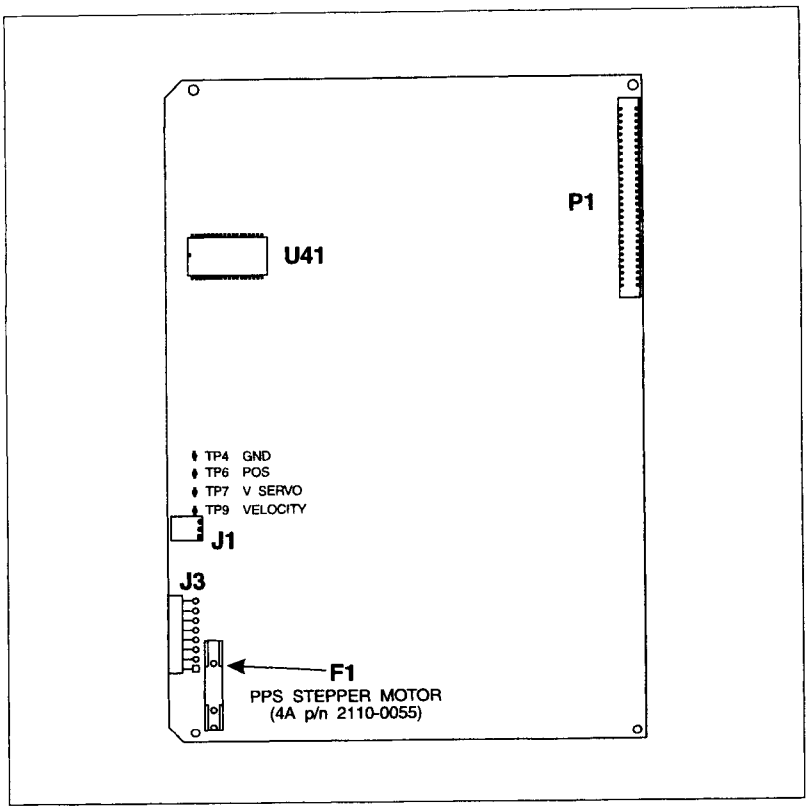

Figure 6-13. Servo PCA

OPTIONAL PCA's:

LABEL CARD PCA (4175006-QMS)

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Pull out on the black quick-fastener holding the PCA retainer bracket to the cardcage and remove the bracket.

c. Grasp the two extractor levers and pull outward. The board will slide out.

When replacing the PCA, make sure it is securely seated.

6-13. BACKPLANE PCA (02566-60028)

a. Remove the Interface, Formatter, Servo, Label PCA's from the cardcage (see Paragraph 6-12 for procedure).

b. Remove the two mounting screws holding the Backplane PCA to the frame.

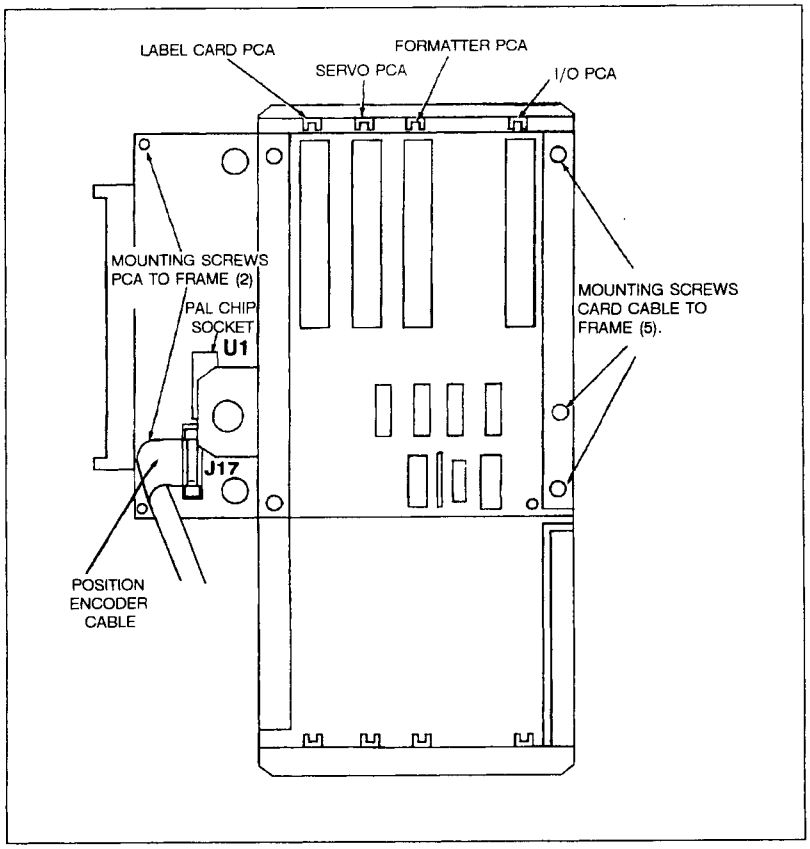

Figure 6-14. Backplane PCA

c. Remove the four mounting screws holding the cardcage to the back of the frame. Remove the cardcage and backplane assemblies from the printer as follows: Rotate the Backplane PCA edge connector out of the mating connector on the Power Supply PCA by simultaneously

moving the Backplane PCA to the right and sliding the right side of the Backplane PCA assembly out and along the rear of the cabinet.

d. Separate the cardcage from the Backplane PCA by removing the four screws on the back of the backplane PCA.

e. Transfer the PAL (Programmable Array Logic) chip (if present) from the old assembly to the new assembly chip socket (U1) on the Backplane PCA. Certain options require the PAL chip to be present on the Backplane PCA to be operational (Sparse Mode/High Speed Graphics).

Reverse the above removal procedure to reassemble. Be careful to replace ground connection to the velocity transducer cable under the lower outside screw attaching the cardcage to the frame.

NOTE

Seat the PCA's into the Backplane PCA before tighten the Backplane PCA mounting screws.

6-14. CONTROL PANEL PCA (5061-1709)

The Control Panel PCA is located directly beneath the Operator Control Panel. The right end panel must be removed prior to removal of the Control Panel PCA (see Paragraph 6-3 for procedure). The PCA is removed as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. At the right end of the printer, loosen the four screws from the underside of the control panel housing (see Figure 6-14).

c. Tilt the panel assembly up and unplug the ribbon cable connector.

d. From the under side of the assembly, loosen the two Pozi-drive screws in one mounting clip, and remove the two Pozi-drive screws from the other clip.

e. Lift the Control Panel and its PCA out of the housing.

Reverse the above removal procedure to reassemble. **BE CAREFUL** that the cable routing does not allow the cables to be damaged.

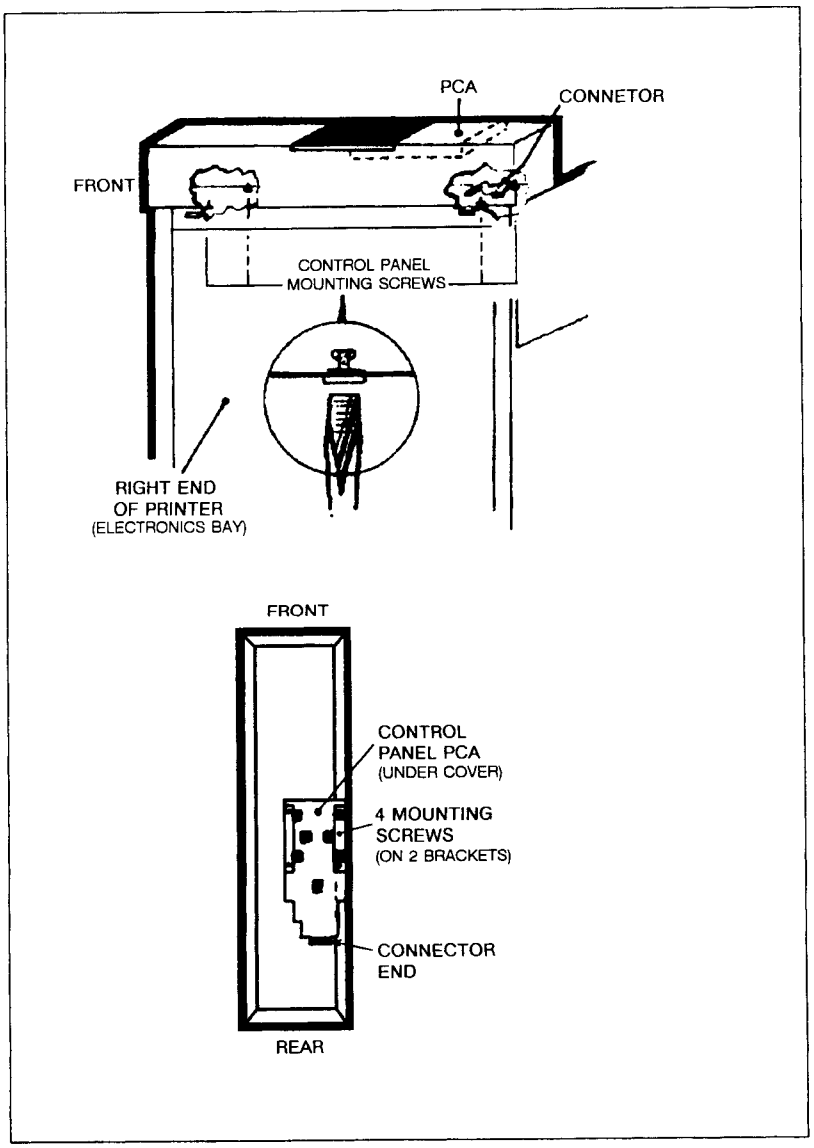

Figure 6-15. Control Panel PCA Removal

6-15. UPPER TRACTOR CONTROL PCA (02566-60021)

The Upper Tractor Control PCA is mounted directly beneath the two auxiliary Tractor Control keys located on the upper right print mechanism cover on the swing gate. Remove as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the upper right print mechanism cover as described in Paragraph 6-6.

c. Raise the cover upward enough to reach underneath and unplug connector J1 from the PCA. Remove the cover from the printer.

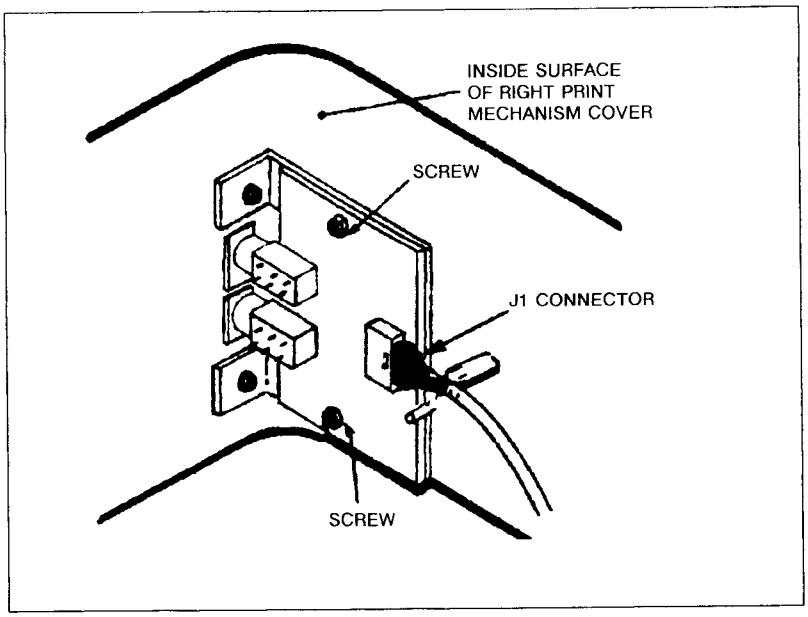

Figure 6-16. Upper Tractor Control PCA

d. From the underside of the cover, use a 6mm wrench to remove the two nuts securing the PCA and the metal mounting bracket to the plastic cover (see Figure 6-16).

Reverse the above removal procedure to reassemble. Be sure to reassemble the PCA and bracket in the same position that it came off (see Figure 6-16). (It is possible to mount the assembly backwards). After replacement, test the keys to verify proper operation.

6-16. LOWER TRACTOR CONTROL PCA (02566-60020)

The Lower Tractor Control PCA is mounted directly beneath the three main tractor control keys located to the right of the tractors (accessible only when the swing gate is opened). Remove as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. Remove the four 2 mm Allen screws from the face of the lower tractor control key panel (see Figure 6-16).

d. Lift the panel part way out.

e. From under the panel, unplug the connector at J1 on the PCA, and the two faston connectors from the print mechanism open sensor switch. Remove the panel from the printer.

f. From the underside of the panel, remove the two 6mm hex nuts securing the PCA to the metal panel.

Reverse the above procedure to reassemble. Be sure to reassemble the two wires to the print-mech open sensor in the proper order: Black connects to the "COMMON" pin, Brown connects to "CLOSED" (no connection to "OPEN" position). Also, when reassembling the panel, make sure that the cable leading to the PCA does not disturb the linkage leading from the tractor control knob to the drive cable idler arm.

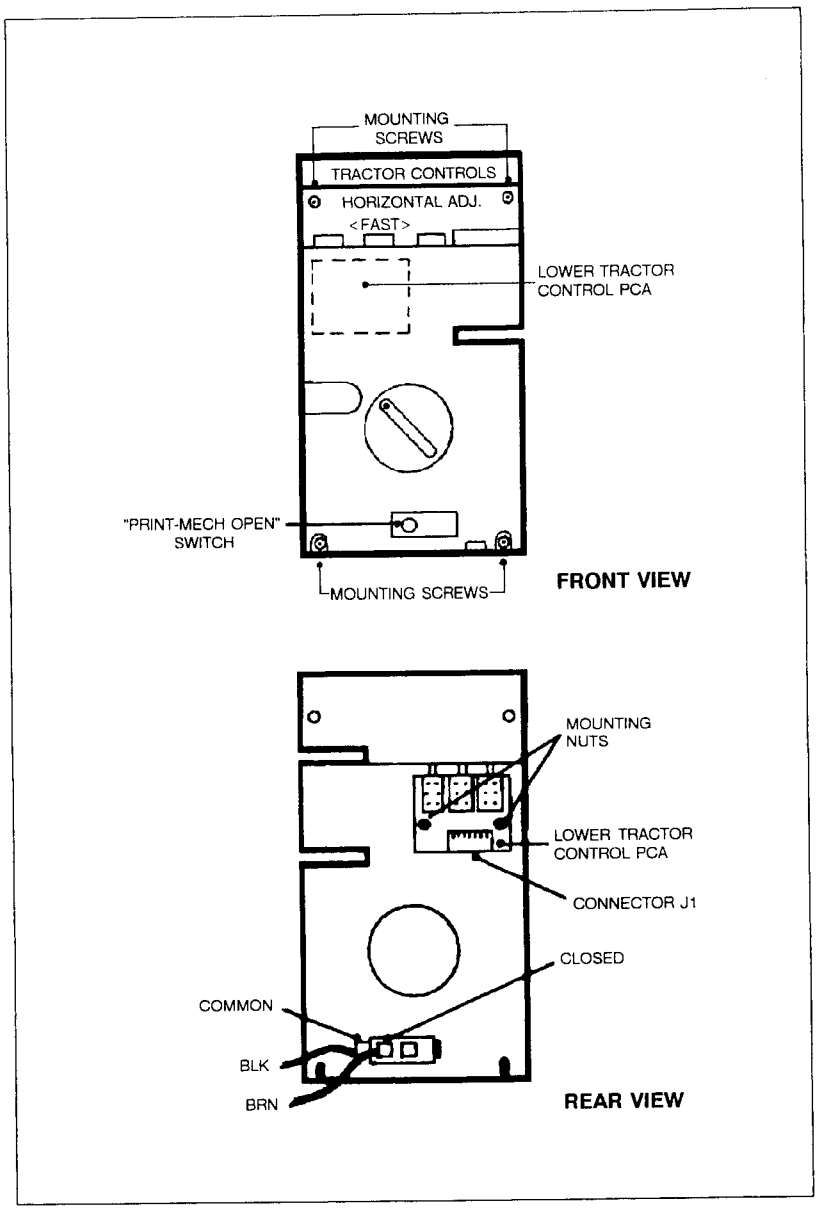

Figure 6-17. Lower Tractor Control PCA

6-17. UPPER RIBBON DRIVE MOTOR

The upper ribbon drive motor is located in the upper right-hand portion of the print mechanism swing gate (Figure 6-17). Removal procedures are as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Open the upper ribbon access door, lift ribbon from upper spools and place in ribbon retainer cups (or remove from printer).

c. Raise the print mechanism swing gate to the fully open position.

d. Remove the upper right print mechanism cover (see Paragraph 6-6).

CAUTION

Before removing the wire leads to the motor, be sure to note their positions (see Figure 6-18). These leads must not be reversed, as this would cause the motor to run backwards.

e. Unplug the two wire terminals on the motor.

f. Unplug Ribbon Motor Grounding wire at the motor end grounding plate.

g. Using a flat bladed screwdriver, **CAREFULLY** pry the plastic ribbon spool holder off the motor shaft (see Figure 6-17).

h. Remove the two Pozi-drive screws holding the motor in place.

i. Remove the grounding plate between the ribbon motor and the right gusset.

j. Slide the motor out toward the right of the printer.

To reassemble, reverse the above procedure. The ribbon spool holder is pressed in place (be sure to align the flat spot on the motor shaft before pressing). The cables should also be secured to the body of the motor (use cable tie, tape, or strong rubber band) to prevent the connectors from vibrating loose from the terminals.

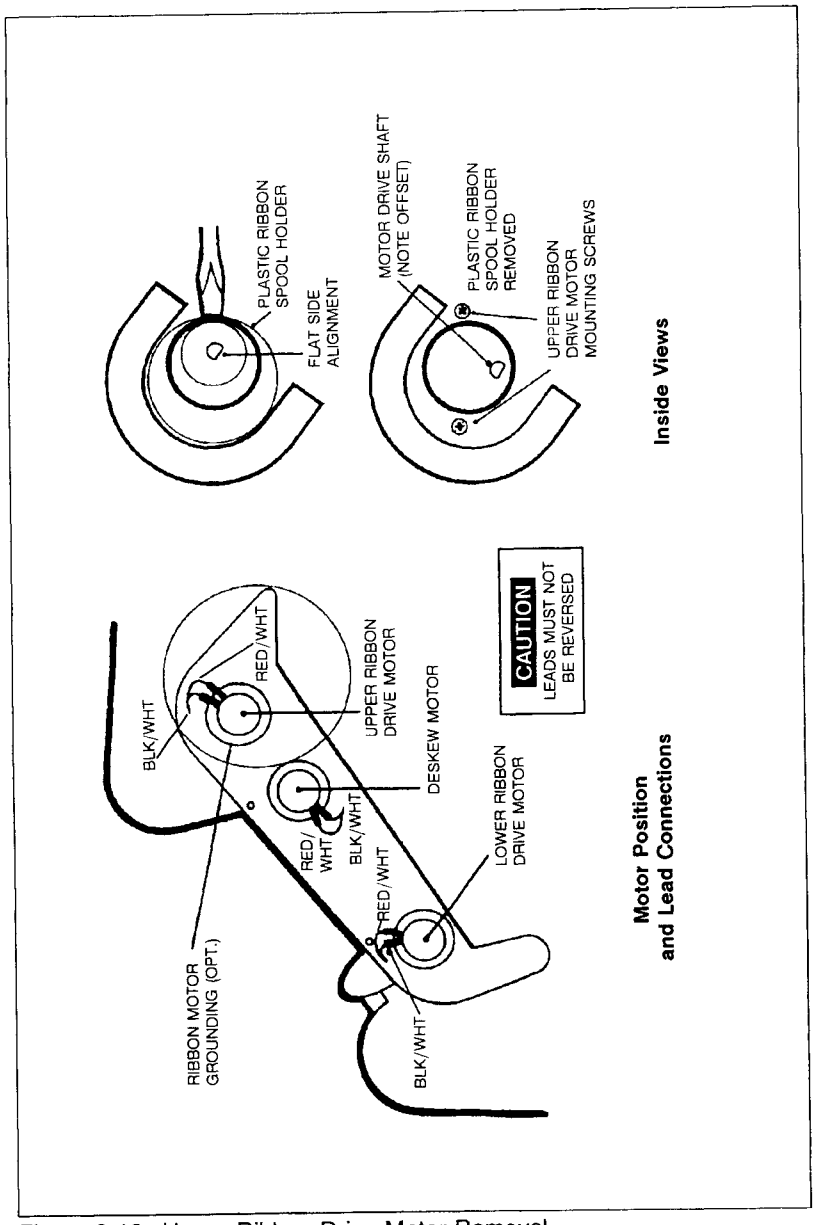

Figure 6-18. Upper Ribbon Drive Motor Removal

CAUTION

Care must be taken to replace the motor in the same position that it was removed (see Figure 6-18). Damage to the ribbon drive mechanism can result from improperly installed motor.

6-18. LOWER RIBBON DRIVE MOTOR

The lower ribbon drive motor is the bottom motor of the group of three identical motors located under the lower right print mechanism cover. Removal and replacement steps follow:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. Remove the right print mechanism cover (see Paragraph 6-6).

CAUTION

Before removing the wire leads to the motor, be sure to note their positions (see Figure 6-19). These leads must not be reversed, as this would cause the motor to run backwards.

d. Unplug the two wire terminals on the motor.

e. Unplug the ribbon motor grounding wire at the motor end grounding plate.

f. Open the lower ribbon access door.

g. Lift the ribbon from lower spools and place in retainer cups (or remove from printer).

h. Using a flat bladed screwdriver, carefully pry the plastic ribbon spool holder off the motor shaft (as shown in Figure 6-19).

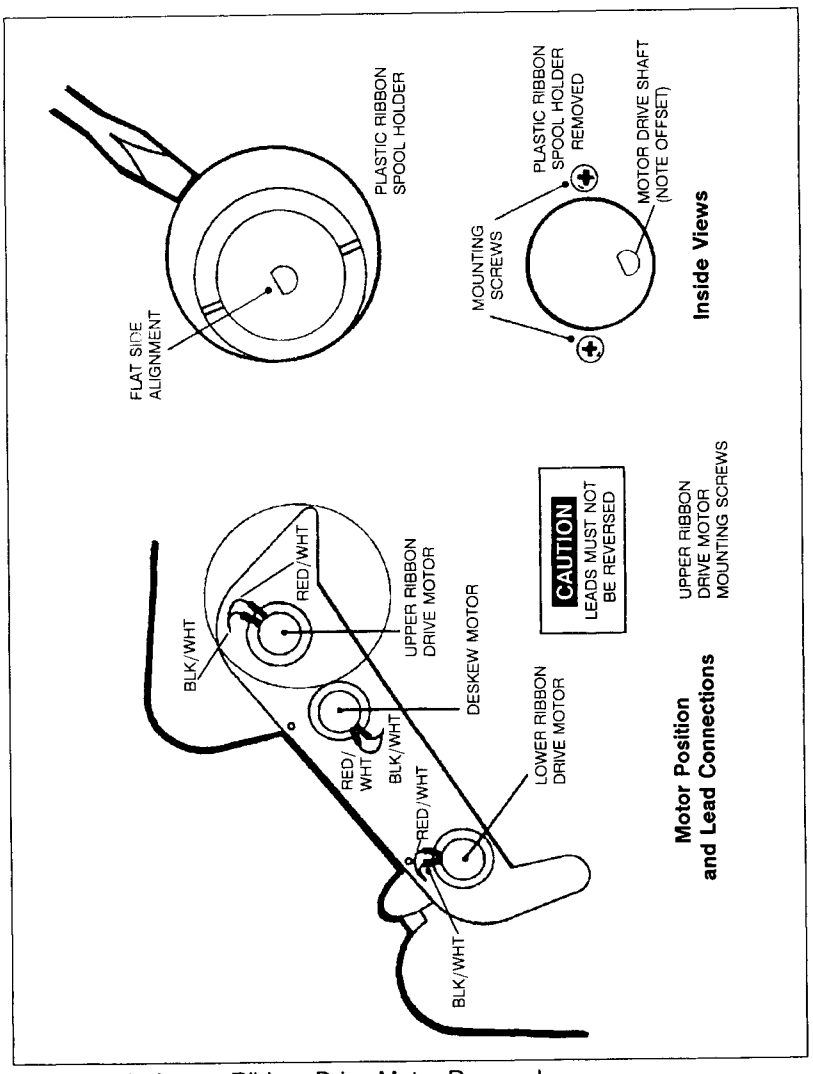

Figure 6-19. Lower Ribbon Drive Motor Removal

i. Remove the two Pozi-drive screws holding the motor in place.

j. Remove the grounding plate between the ribbon motor and the right gusset.

k. Slide the motor out toward the right of the printer.

To reassemble, reverse the above procedure. The ribbon spool holder is pressed in place (be sure to align the flat spot on the motor shaft before pressing). The cables should also be secured to the body of the motor (use cable tie, tape, or strong rubber band) to prevent the connectors from vibrating loose from the terminals.

CAUTION

Care must be taken to replace the motor in the same position that it was removed (see Figure 6-19). Damage to the ribbon drive mechanism can result from improperly installed motor.

6-19. RIBBON DESKEW MOTOR

The ribbon deskew motor is located under the upper right print mechanism cover at the upper right of the printer (between the upper and lower ribbon drive motor). Removal and replacement procedures are as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the right print mechanism cover (see Paragraph 6-6).

c. Lift the ribbon spool from upper spindles and place in ribbon retainer cups.

CAUTION

Before removing the wire leads to the motor, be sure to note their positions (see Figure 6-20). These leads must not be reversed, as this would cause the motor to run backwards.

d. Raise the print mechanism swing gate to the fully open position.

e. Unplug the two wire terminals on the motor.

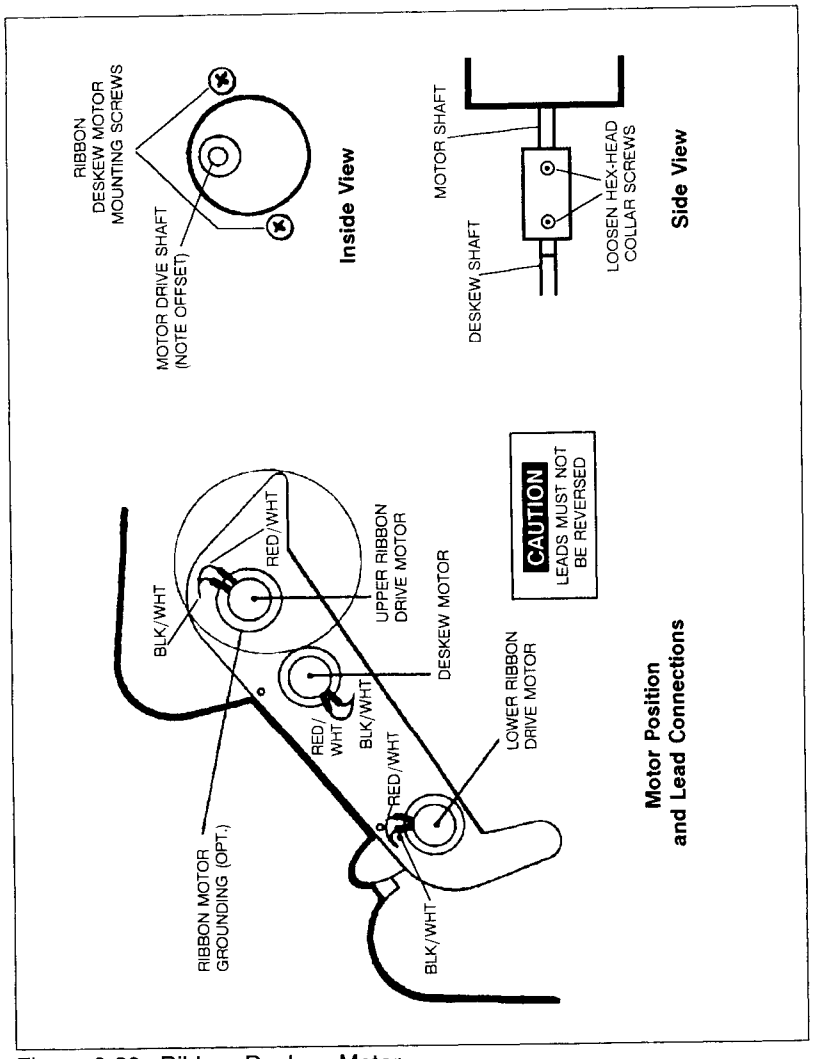

Figure 6-20. Ribbon Deskew Motor

f. Unplug the grounding wire at the motor end.

g. Loosen the four 5/64 inch Allen screw on the collar holding the motor shaft to the deskew shaft.

h. Remove the two Pozi-drive screws holding the motor in place.

i. Remove the grounding plate between the deskew motor and the right gusset.

j. Carefully note the positioning of the motor, perhaps by marking the face of the motor with respect to the face of the gusset. This is to prevent replacing the motor in the wrong position.

k. Lower the print mechanism swing gate part way from the open position.

l. Slide the motor and deskew shaft out towards the right (see Figure 6-20).

CAUTION

Care must be taken to replace the motor in the same position that it was removed (see Figure 6-20). Damage to the deskew mechanism can result from improperly installed motor.

Reverse above removal procedure to reassemble.

6-20. PAPER STEPPER MOTOR

The stepper motor provides drive to the paper tractors. It is located on the top right of the printer toward the rear (see Figure 6-21). Removal procedure is as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printer's rear access panel (see Paragraph 6-4).

c. Unplug the six pin motor lead wire connector at the rear of the printer (connector "B" on Figure 6-22).

d. Unplug paper stepper encoder ribbon cable from the Backplane PCA.

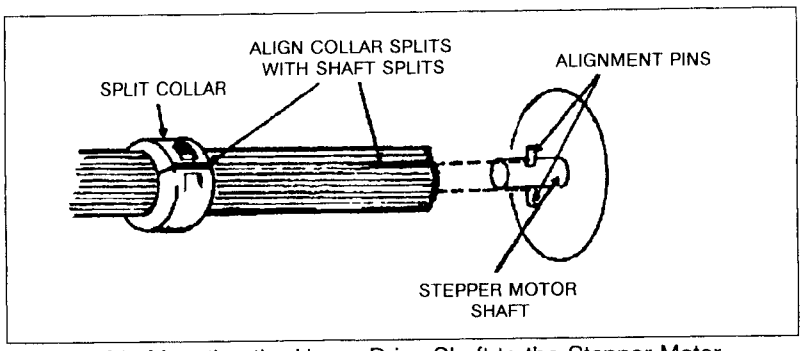

Figure 6-21. Mounting the Upper Drive Shaft to the Stepper Motor

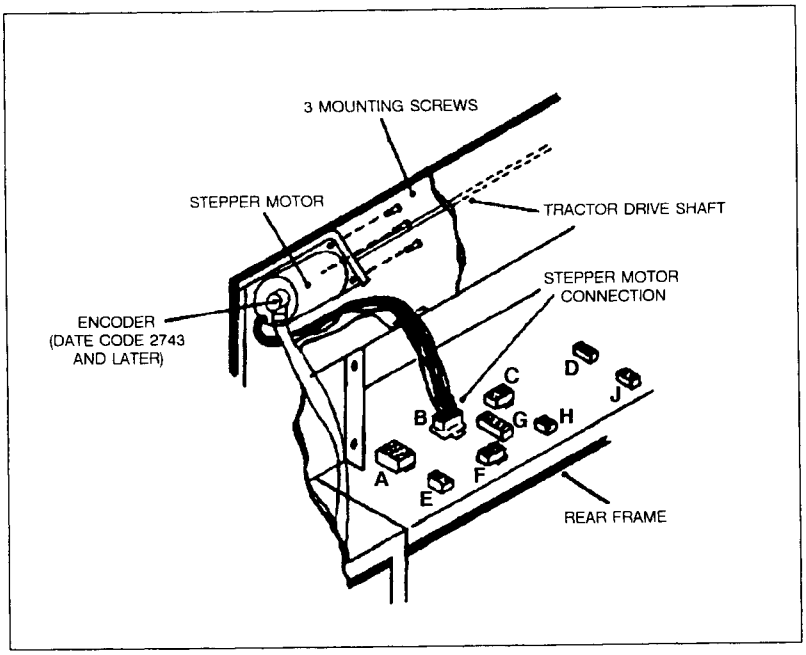

Figure 6-22. Paper Drive (Stepper) Motor

e. From the top of the printer, loosen the 3 mm Allen screw on the split collar located on the tractor drive shaft adjacent to the motor (see Figure 6-21).

f. Note the orientation of the motor (up or down) so that the cabling will be routed in the same direction on replacement.

g. Remove the three 4 mm Allen screws securing the motor to the printer chassis.

h. Slide the motor out towards the right of the printer.

To reassemble, reverse the above procedure. Be sure that the slot in the motor is aligned with the slot in the splined shaft and that the slot in the split collar is aligned with the slot in the upper drive shaft (see Figure 6-21).

6-21. TRACTOR POSITION MOTOR

The motor that drives the tractor alignment cabling system is located at the rear of the printer near the platen. The printer's rear panel must be off the unit (see Paragraph 6-4). Removal and replacement procedures are as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

NOTE

Be careful when sliding this pulley out not to allow the cables to twist or come off the pulley.

c. From the top of the printer, use a large flat bladed screwdriver to pry the cable drive pulley off of the motor shaft (there are no screws to loosen on the pulley).

d. Holding the pulley in the same relative position as it was on the motor, **CAREFULLY** twist it counterclockwise to roll upward along the cables. Roll up until the pulley shaft is aligned with the hole drilled into the casting for use as a temporary holder, and insert the pulley shaft (see Figure 6-23).

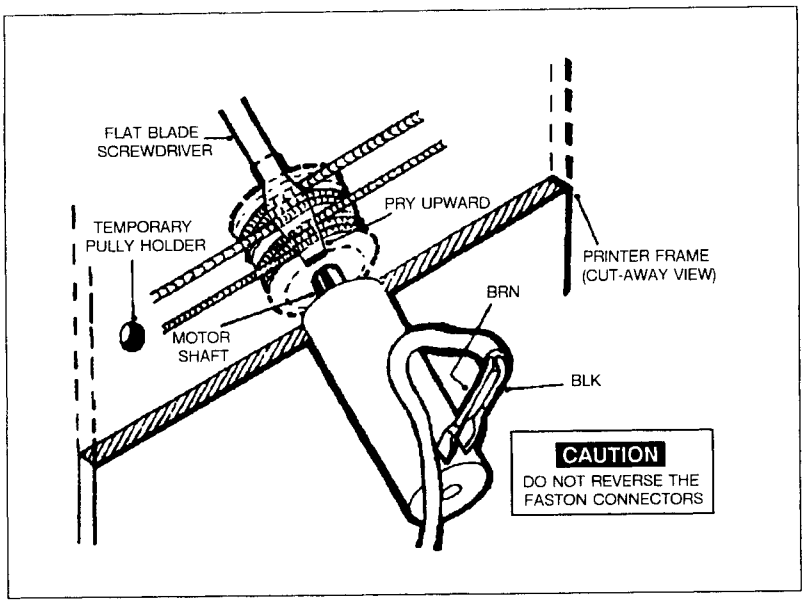

Figure 6-23. Removing Tractor Position Motor

CAUTION

Before removing the wire leads to the motor, be sure to note their positions (see Figure 6-23). These leads must not be reversed, as this would cause the motor to run backwards.

e. From the rear of the printer, unplug the motor's power supply connectors on the body of the motor.

f. From the front of the printer, remove the three SAE 3/32 inch Allen screws mounting the motor to the casting.

g. Slide the motor out towards the rear of the printer, being careful not to lose the bronze bushing that fits around the shaft.

To reassemble, reverse the above procedure. Be sure to remember to insert the bronze bushing over the motor shaft before reinstallation and align the flat area on the shaft with the flat in the pulley.

6-22. LINEAR MOTOR COIL

The coil for the linear motor that drives the printbar assembly is located at the right end of the printbar, mounted on a machined aluminum bracket. The coil may be replaced without removing the printbar assembly, as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the ribbon from the printer.

c. From the top of the printer, unplug the 3 pin connector in the wire lead from the coil.

d. Raise the print mechanism swing gate to the fully open position.

e. Remove the 3 mm Allen screw securing the plastic wire clip located near the coil (see Figure 6-24).

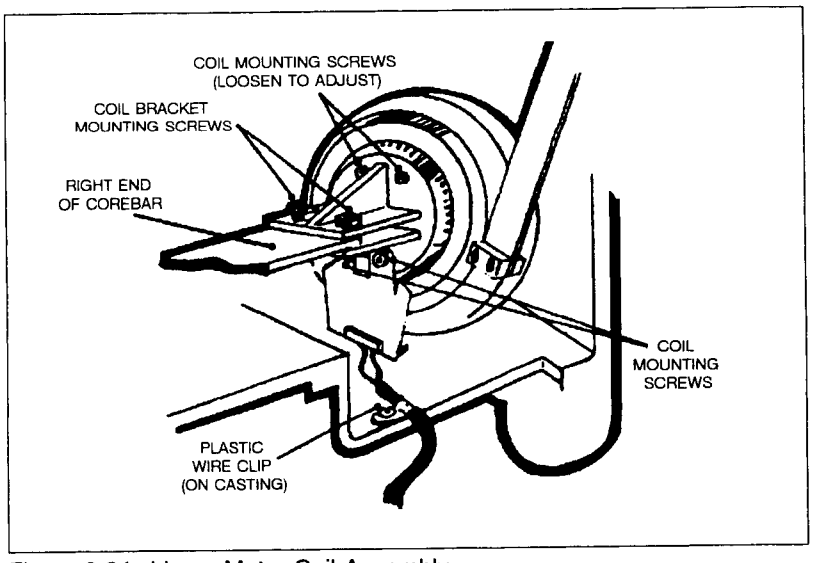

Figure 6-24. Linear Motor Coil Assembly

f. Remove the two 4 mm Allen screws mounting the machined aluminum coil bracket to the end of the printbar (see Figure 6-24).

NOTE

Be careful when removing the coil in step "g", not to scrape the coil wires against the flexure clamping block.

g. Slide the coil assembly out of the magnet (toward the printbar and downward). It may be necessary to wiggle the flexure slightly back and forth while sliding the coil out.

h. Before reinstallation, loosen the four 3 mm screws on the coil's mounting bracket to allow the coil to be adjusted after replacement. Reverse steps "e" through "g" and refer to the adjustment procedure in Paragraph 5-4.

CAUTION

Dress the voice coil leads to ensure that the leads are not touching each other and that none of the leads are touching the casting. The plastic wire clip must be in place and secure (see Figure 6-24).

6-23. FANS

There are three fan assemblies in the printer. Two are located in the cardcage area at the right end of the unit. The other, a "squirrel-cage" type blower which provides cooling for the printbar assembly, is located on the left end of the printer near the floor level. Removal and replacement procedures for these fan assemblies are as follows:

CARDCAGE AREA VENTILATION FANS

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printer's right end panel (see Paragraph 6-3).

c. Unplug the connector on the side of the fan (see Figure 6-25).

d. Remove the four Pozi-drive screws from the top side of the fan housing, as shown in Figure 6-25.

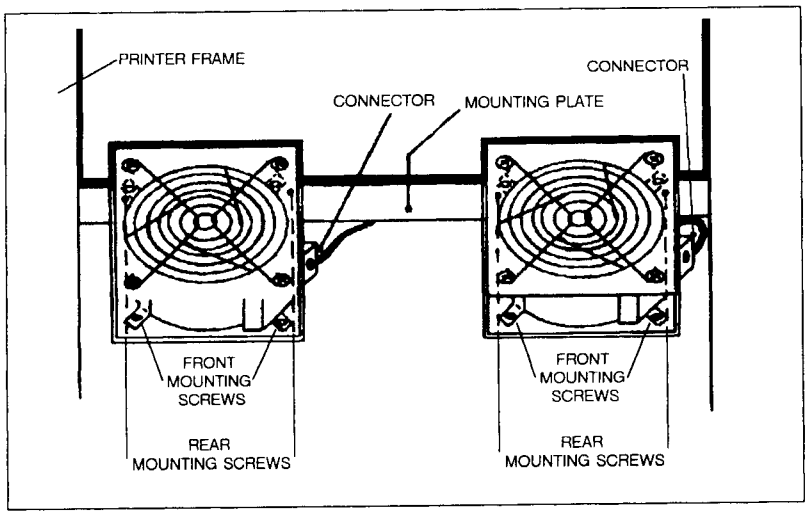

Figure 6-25. PCA Ventillation Fans

FOR THE REAR FAN (right side when facing electronics bay):

1. Remove all cardcage PCAs (see Paragraph 6-12).

2. Remove the four Pozi-drive screws from the bottom side of the fan housing. The inner screws are accessed from inside the PCA cardcage, through the slots in the top of the cardcage.

FOR THE FRONT FAN (left side when facing electronics bay):

1. Remove the Motor Driver PCA (see Paragraph 6-9).

2. Remove the four Pozi-drive screws from the bottom side of the fan housing.

To reassemble, reverse the above procedures. After reinstallation, a running test should be conducted to verify proper performance.

PRINTBAR BLOWER

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printer's left end panel (see Paragraph 6-5).

c. Loosen the large hose clamp securing the flexible duct hose to the blower assembly.

d. Remove the black and green wire terminals from the solid state relay located on the underside of the printer frame. Black is connected to position #2, green to ground (see Figure 6-4).

e. Unplug the in-line connector from the white fan wire.

f. From the left end of the printer, remove the four 3 mm Allen screws that secure the fan to the mounting panel (see Figure 6-26).

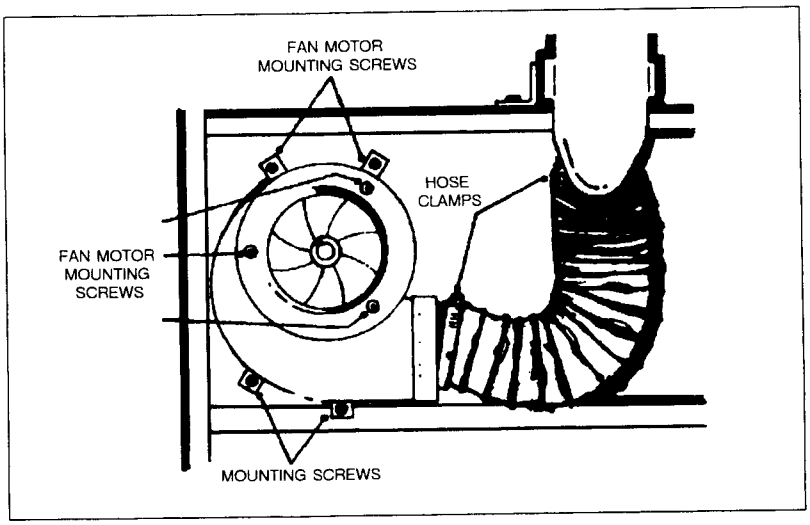

Figure 6-26. Printbar Blower

g. Slide out the left end of the printer rotating the assembly as necessary to remove.

To reassemble, reverse the above procedures.

6-24. VELOCITY TRANSDUCER ASSEMBLY

The velocity transducer consists of two parts: the magnetic pin and the transducer body (coil). The magnetic pin is threaded into the left end of the printbar assembly. The body is mounted on the left side of the upper casting, as shown in Figure 6-27. Removal and replacement procedures follow:

CAUTION

Do not over torque the velocity transducer pin when replacing it. It is fragile and breaks easily.

NOTE

The magnetic velocity pin, which inserts into the body of the transducer, has a hex shaped area at the base, and is easily removed and replaced using a 1/4 inch open end wrench. Do not over torque the velocity pin when replacing. Refer to Paragraph 5-5, for information on the alignment tool (P/N 02566-20152).

TRANSDUCER BODY:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the printer's right and left print mechanism covers as described in Paragraphs 6-6 and 6-7.

c. From the top of the printer, remove the metal plate which covers the wire trough across the top of the print mechanism assembly (see Figure 6-27).

d. Follow the black wire lead from the transducer and open the three cable clips securing the wire to the printer casting.

e. Remove the printer's rear panel as described in Paragraph 6-4.

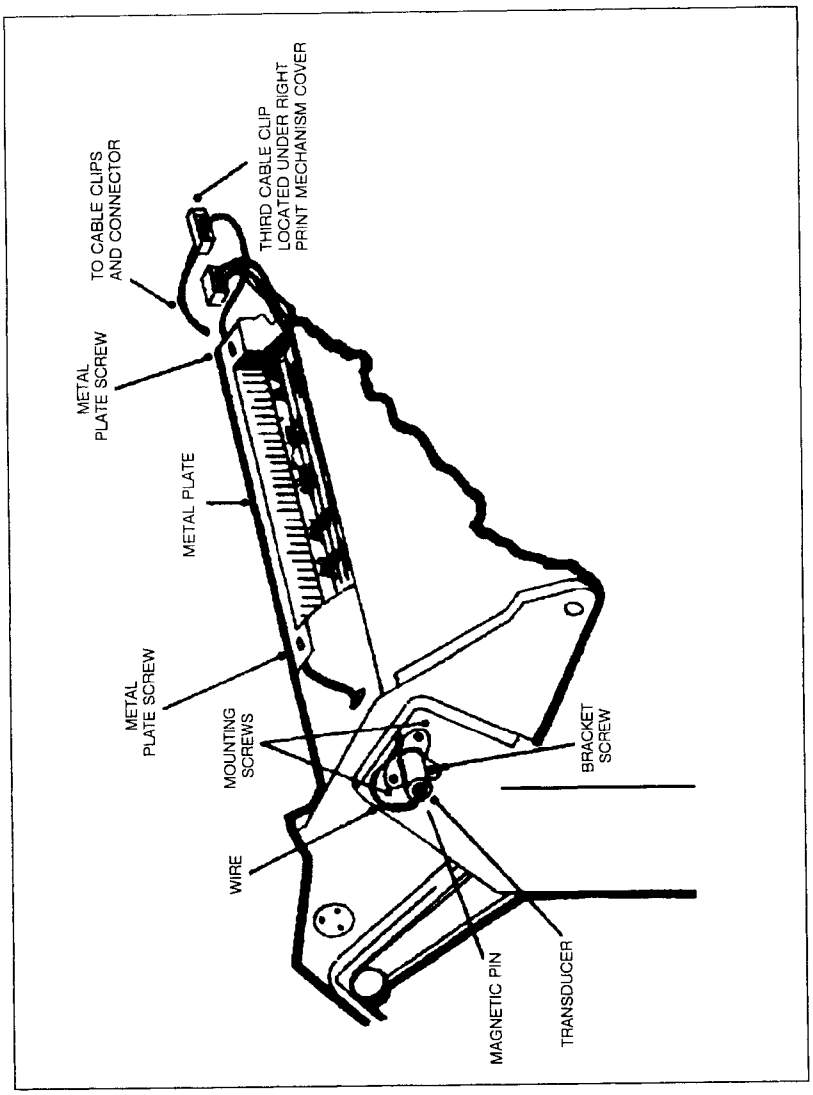

Figure 6-27. Velocity Transducer Removal

f. Unplug the 3 pin transducer lead wire connector at the rear of the printer (connector "E" on Figure 6-4).

g. Raise the print mechanism swing gate to the fully open position.

h. Loosen the 3 mm Allen screw which tightens the clamp to the transducer and slide the transducer body out of the clamp (see Figure 5-2).

i. Gently pull on the cable from the top of the upper print mechanism while guiding the transducer through the large hole in the upper print mechanism body.

To reassemble, reverse the above procedures.

NOTE

Be sure the inside of the transducer is clean before installing. The transducer must be adjusted as described in Paragraph 5-5.

6-25. PRINTBAR ASSEMBLY

The printbar assembly may be removed without removal of the drive coil or velocity transducer assemblies. Procedures are as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Open the upper ribbon cover and remove the ribbon from the printer.

c. Remove the top and bottom cable harness plates from the top and bottom of the printbar (see Figure 6-28). Use a longnose pliers to reach in and pry up on the three plastic fasteners to release the plate.

d. Remove the twelve cable connectors from the top of the printbar assembly (see Figure 6-28). To remove, push the connector body toward the center of the printbar with one hand while gently pulling on the cable with the other hand. This relieves the snap locks located in the connector housing.

e. Remove the four Pozi-drive screws and lock washers securing the metal wire harness assembly to the top of the printbar mechanism (see Figure 6-27). Be careful not to drop the washers.

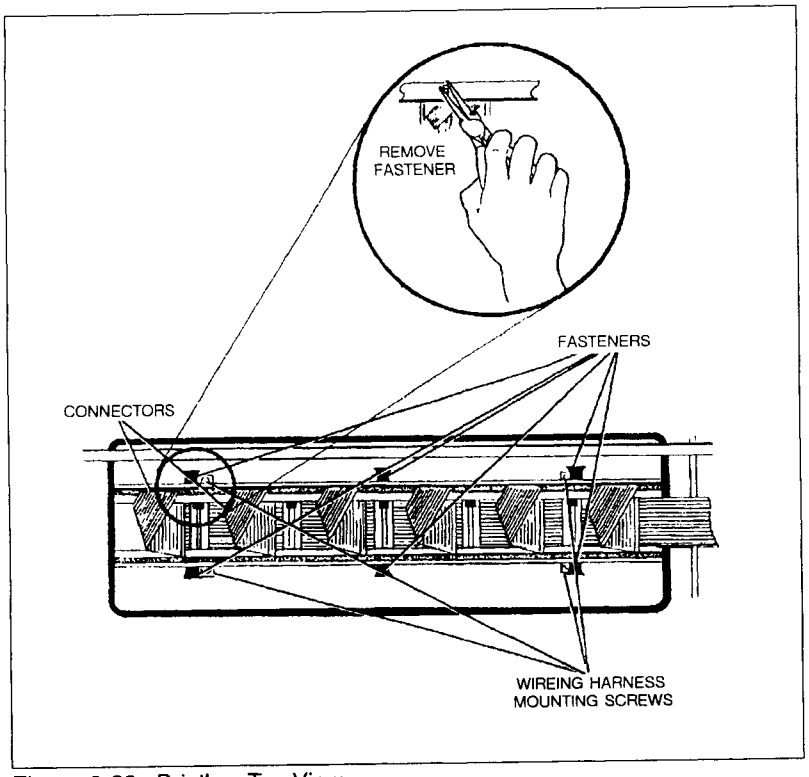

Figure 6-28. Printbar Top View

f. Lift the wiring harness out by pulling up on the right end and swinging it out of the casting.

g. Raise the print mechanism swing gate to the fully open position and lower the ribbon shield.

h. Loosen the three 5 mm Allen screws at the ends of the printbar assembly removing two of the screws (see Figure 6-29). Leave the center screws in to prevent the printbar from sliding out.

i. Grasp the printbar firmly, remove the two remaining screws in the ends of the printbar and slide the assembly toward the front of the printer, to remove.

PRINTBAR REPLACEMENT

Replace the printbar as described in the following steps.

CAUTION

When replacing the printbar, loosen the platen adjusting screws **BEFORE** securing the print mechanism swing gate in the closed position. Failure to do so may result in damage to the printbar.

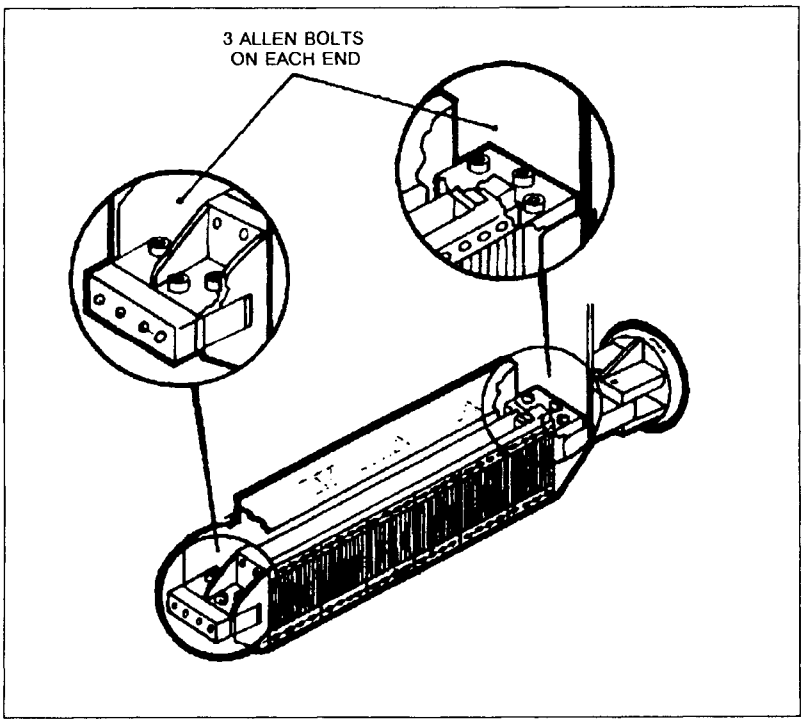

Figure 6-29. Printbar Bottom View

a. With the printbar identification markings toward the left, slide the assembly on to the flexure mounting blocks and insert one of the mounting screws into the center hole on each end.

b. Insert the other four mounting screws and start threads on all.

c. Use a 5 mm ball driver to snug down all six screws, then back off one turn on each.

d. Place the printbar assembly so that there is an approximately equal gap between the printbar and the flexure mounting brackets at each end.

e. Grasp the printbar at the center and pull forward. Snug up the forward-most screw at each end. Release the printbar and snug up the remaining four screws.

f. Using a 90 degree 5 mm Allen wrench, securely tighten the six mounting screws.

g. Verify that the ribbon shield is properly aligned by inspecting the distance between the ribbon shield and the hammers. The hammers should be centered in the 6 mm opening in the shield. Readjust if necessary.

h. Lower the print mechanism swing gate.

i. Install the cable assembly wiring harness by tipping the left end in first, then installing the four Pozi-drive screws and lock washers.

CAUTION

The upper cables may become pinched between the wiring harness bracket and the printbar. Clear them out of the way before securing the wiring harness assembly.

j. Install the twelve connectors. Use a blunt-end tool to aid in pushing connectors into place (see detail, Figure 6-28). Listen for a click to ensure they are latched in.

k. Install the top and bottom harness plates. Position the plastic fasteners in the plate over the fastener holes in the printbar. Using some tool (such as a screwdriver), reach in and press down on the plastic fasteners.

l. Adjust the platen as detailed in Paragraph 5-6.

NOTE

If a new printbar has been installed, the Hammer Flight Time and Graphics Amplitude will probably need readjustment. Refer to Paragraph 5-11 for procedures.

6-26. PLATEN ASSEMBLY

The platen assembly can be removed and replaced as follows:

a. Loosen the two tractor face plate screws and position the AVBs in the up position away from platen rail. (see Paragraph 5-7).

b. From the tighten the face plate screws to hold the AVBs up (off) the platen rail top of the printer (with the swing gate closed), remove the three 4 mm Allen screws securing the platen assembly to the printer chassis (see Figure 6-30).

c. Raise the print mechanism swing gate to the fully open position and remove the platen with its plastic paper guide attached, being careful not to lose the four adjustment springs located behind the platen (see Figure 6-30).

To replace, install the screws while the swing gate is up, but do not tighten. Close the swing gate and install the springs. Refer to Paragraphs 5-6 and 5-7 for platen and tractor vibration dampening arms adjustments.

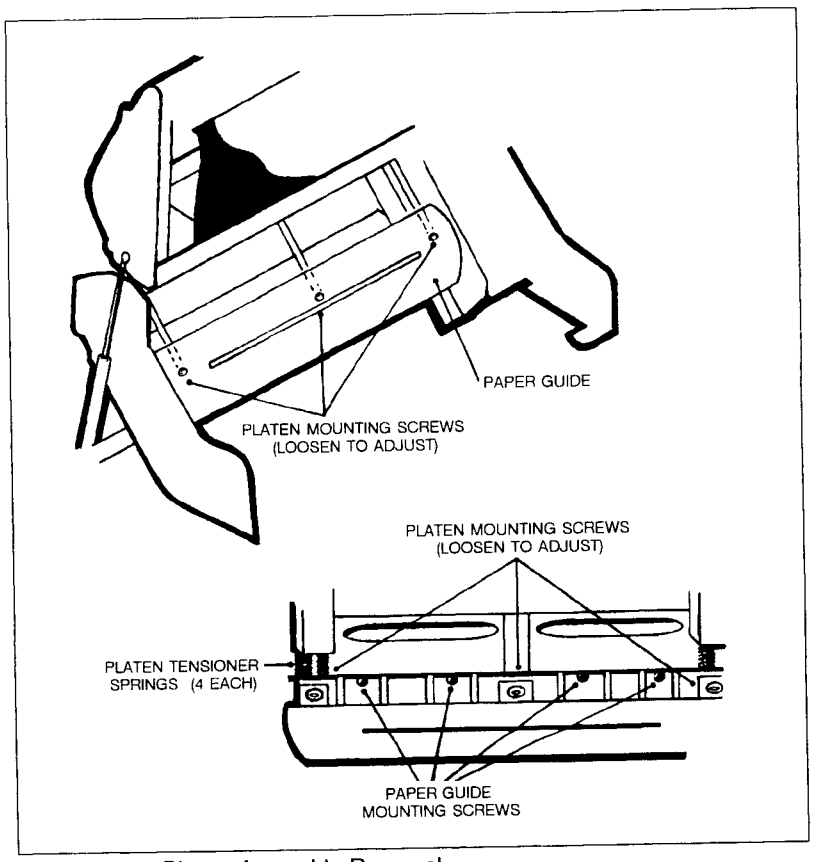

Figure 6-30. Platen Assembly Removal

6-27. PAPER TRACTORS

Prior to tractor removal, the left side panel must be removed, as described in Paragraph 6-5. Procedures for tractor removal are as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (O) position.

b. Raise the print mechanism swing gate to the fully open position.

c. For LOWER TRACTORS ONLY, do the following three steps:

   1. Remove the Pozi-drive screws holding the printbar ventilation duct to the casting. Swing the duct down and out of the way.

   2. Remove the five 2.5 mm Allen screws holding the vertical paper tension lever guard and remove the guard.

   3. For the lower left tractor, unplug the PAPER OUT sensor connector from the rear of the printer (connector "J" on Figure 6-4).

d. For UPPER TRACTORS, perform the following steps:

   1. For the upper left tractor, unplug the three pin PAPER MOTION sensor connector from the rear of the printer (connector "D" on Figure 6-4).

   2. Unplug the ground wires from the spad-lug on the two upper tractors.

e. Using a heavy duty spring puller, remove both springs from the Belt Tension Idler Arm Assembly (see Figure 6-38).

f. Remove the spring from the Tension Arm.

g. Slide the belt off the pulleys and out.

h. At the right end of the tractor drive shaft(s), loosen the 3 mm Allen screw which secures the split collar to the tractor drive shaft.

NOTE

If there is a collar guard on the right end of the lower tractor drive shaft, turn the shaft so that the collar set screw is facing downward. Use a 90 degree Allen wrench to loosen. DO NOT remove the collar guard.

i. Slide both tractor drive shafts toward the left, out of the tractors and out of the printer.

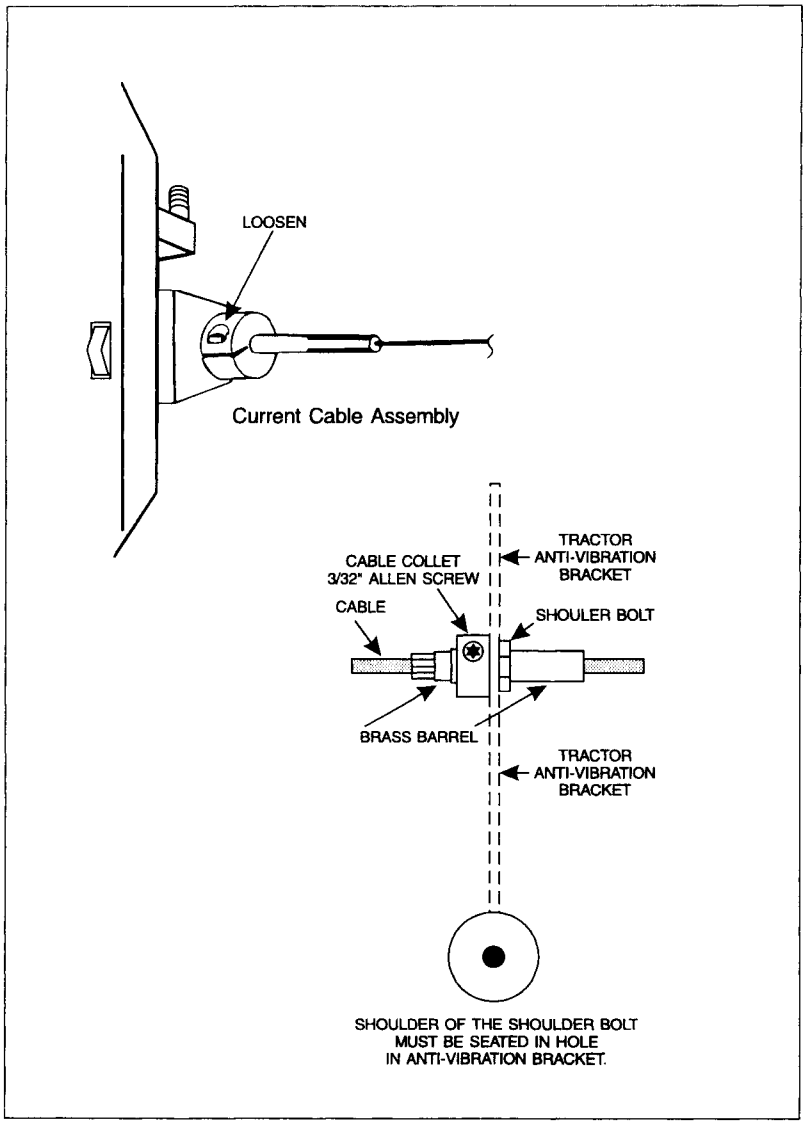

Figure 6-31. Releasing the Tractors from the Cables

j. Remove the flat "e clips" that serve as tractor stops on the tractor support shafts.

k. From the left side of the printer casting, loosen the support shafts using a flat bladed screwdriver. Pull the shaft toward the left and out of the printer.

l. Use a 3/32" driver to loosen the screws in the split collars which secure the tractors to the cables (see Figure 6-31). Turn the collars counterclockwise to remove them from the threaded yokes. (HINT: use a needlenose pliers to hold the back side of the threaded yoke while turning the split collars. Split collars can be loosened by prying the collar slightly open using a small, flat blade screwdriver.)

m. Slide the tractors slightly to the side to free them from the cable.

TRACTOR REPLACEMENT

Replace the paper tractors as described below:

a. Slide the support shaft(s) into the printer from the left side and insert through the support shaft hole in the tractor assembly.

b. Tighten the support shaft(s) in place using finger pressure ONLY. Loosen (backup) the support shaft(s) 1/8 turn.

CAUTION

Excessive tightening of the support shafts may cause them to bow resulting in tractor binding. The support shaft should just be finger tight using Locktite Threadlock 242 to secure them.

NOTE

When installing the splined drive shaft into the tractor assemblies, it is essential that the left and right tractors are in proper alignment to each other, as described in steps "c" through "e", below.

c. Slide the upper drive shaft through the left end of the casting, then through the left tractor and an inch or two beyond.

d. Using a felt tip marker, mark the groove on the drive shaft that passes directly beneath the small protrusion on the tractor's drive hub (see Figure 6-32).

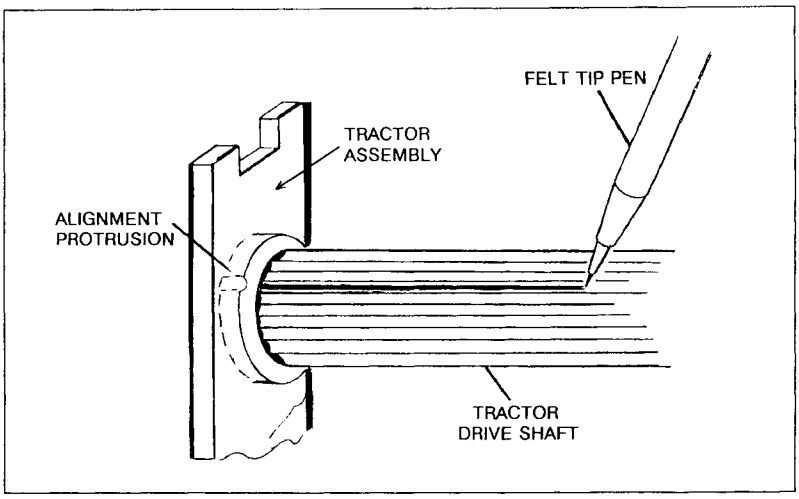

Figure 6-32. Aligning the Drive Groove with Left and Right Tractors

e. Slide the shaft across and through the right tractor with the same drive shaft groove passing directly beneath the protrusion on its hub. This aligns the left and right tractor teeth with each other.

f. Slide the split collar over the shaft.

g. Slide the tractor drive shaft over the stepper motor shaft. Be sure to align the split in the end of the shaft with the alignment pins on the stepper motor shaft.

h. Be sure the shaft is seated all the way toward the right and slide the split collar to within 1 mm from the end of the shaft (but not touching the casting).

i. Check the left end of the shaft to verify that it is seated properly and tighten the 3 mm hex screw in the split collar. Be sure the split in the split collar aligns with the split in the shaft.

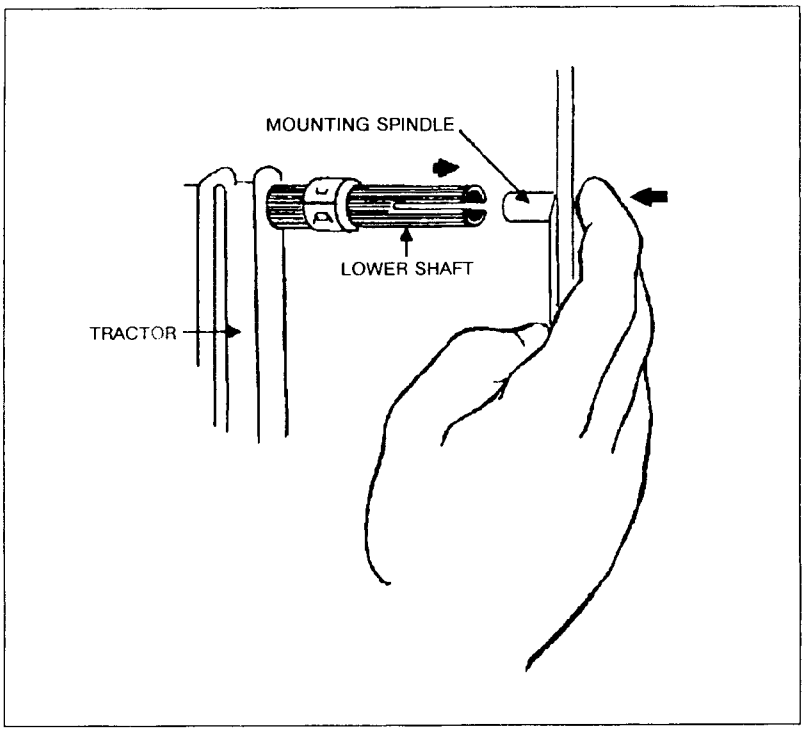

Figure 6-33. Mounting the Lower Tractor Drive Shaft

NOTE

For lower drive shaft, be sure the split in the shaft is seated all the way against the pin in the mounting spindle.

NOTE

On some models, the split collar on the lower drive shaft can bind against a mounting screw on the lower shaft spindle plate (right end of lower drive shaft). This can cause damage to the stepper motor. On these models, be sure to hold the split collar away from the right wall of the printer's casting before tightening.

j. Reassemble the three "e clips" on the support shaft.

k. Reassemble the split nut on the threaded collar to the tractor ensuring that the clamp screw is accessible from the front.

NOTE

Ensure the split nut and split collar assemblies are fully seated against the tractor Anti-Vibration Bracket. There is a slight lip on the split nut that may seat against the AVB; this is not correct. When you view the cable/AVB, there should be no space between the split nut/split collar/AVB. (See Figure 6-31).

l. Reinstall the vertical paper tension lever guard, the ventilation duct, the drive belt and any sensor connectors.

m. Adjust the tractor AVBs as described in Paragraph 5-7.

m. Adjust the Tractor Drive Belt Phasing as described in Paragraph 5-8.

o. Align the tractors as described in Paragraph 5-9.

p. Align the Paper Path Skew Plate, if necessary, as described in Paragraph 5-10.

6-28. TRACTOR ALIGNMENT CABLES

The tractor alignment cabling system provides a means for horizontal positioning and alignment of the paper tractors. There are two separate cables routed along the same path. The longer cable (riding over the larger diameter pulleys) drives the left, upper and lower, tractors. The shorter length cable (riding in the smaller diameter pulleys) drives the two right, upper and lower, tractors. Figure 6-34 shows an overview of the tractor drive cabling system.

The platen must be removed before changing the tractor cables. When removing the cables, the shorter cable (top cable) is removed first, then the longer (bottom cable). The longer cable is installed first, and then the shorter cable.

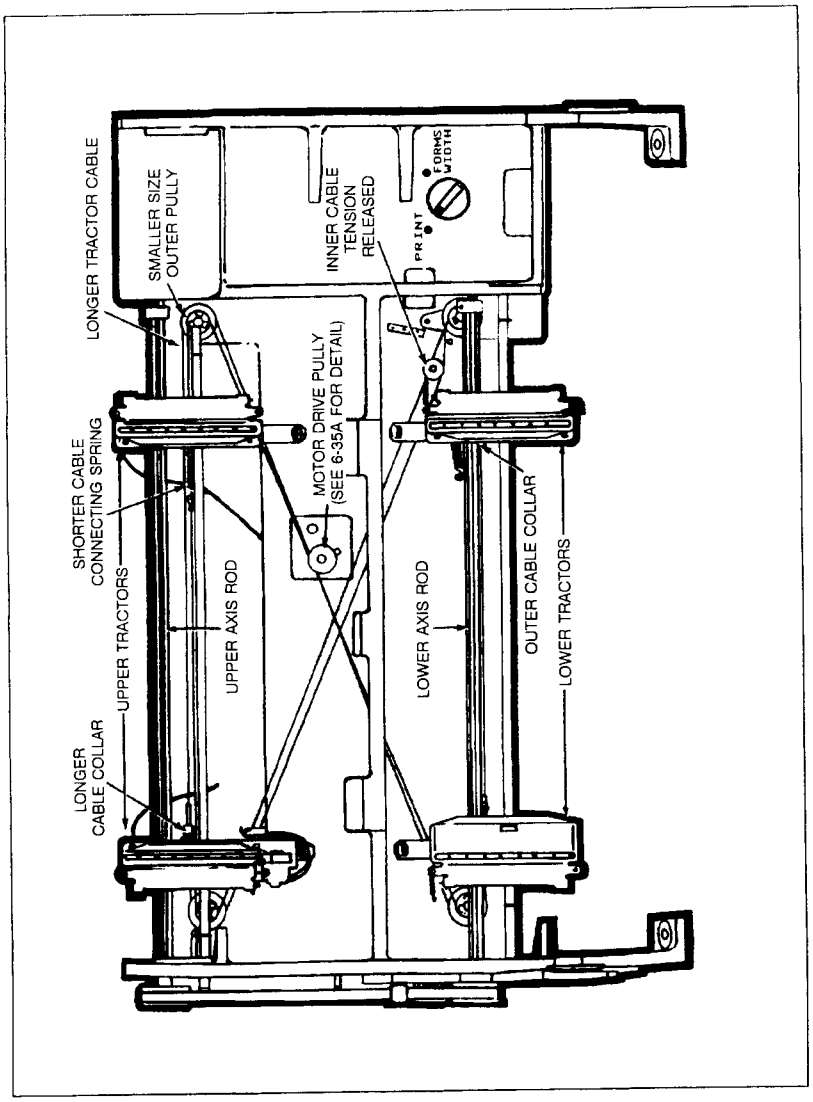

Figure 6-34. Tractor Drive Cabling System

The cable systems can be removed and replaced independently of each other, as follows; but usually are replaced at the same time. A new spring (P/N 1460-0648) is strongly suggested whenever replacing cables.

1. Setup.

Remove the platen assembly as described in paragraph 6-26.

2. Shorter Right Tractor Drive Cable (02566-60315) Removal

The shorter cable of the pair, routed through the smaller diameter pulleys, drives the upper and lower RIGHT tractors. Before removal, study the cable path **CAREFULLY** and, if necessary, make any notes that may help in replacement (Figures 6-34 and 6-35a should help).

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. Loosen the 3/32" Allen screw from the split collars and unscrew the split collar from the split nut on both upper and lower RIGHT tractors (see Figure 6-36, detail D).

d. On both the upper and lower RIGHT tractors, manually move the tractors so that its cable will slide through the notch in the AVB (see Figures 6-35a and 6-35b).

WARNING

Be careful when handling the cable spring as there is a possibility of eye injury if it flies off. Safety glasses are recommended.

e. Remove the spring connecting both cable eyeloops directly to the left of the upper RIGHT tractor (see Figures 6-35a and 6-35b).

f. Unwind the cable from the motor drive and other pulleys.

g. Remove the cable.

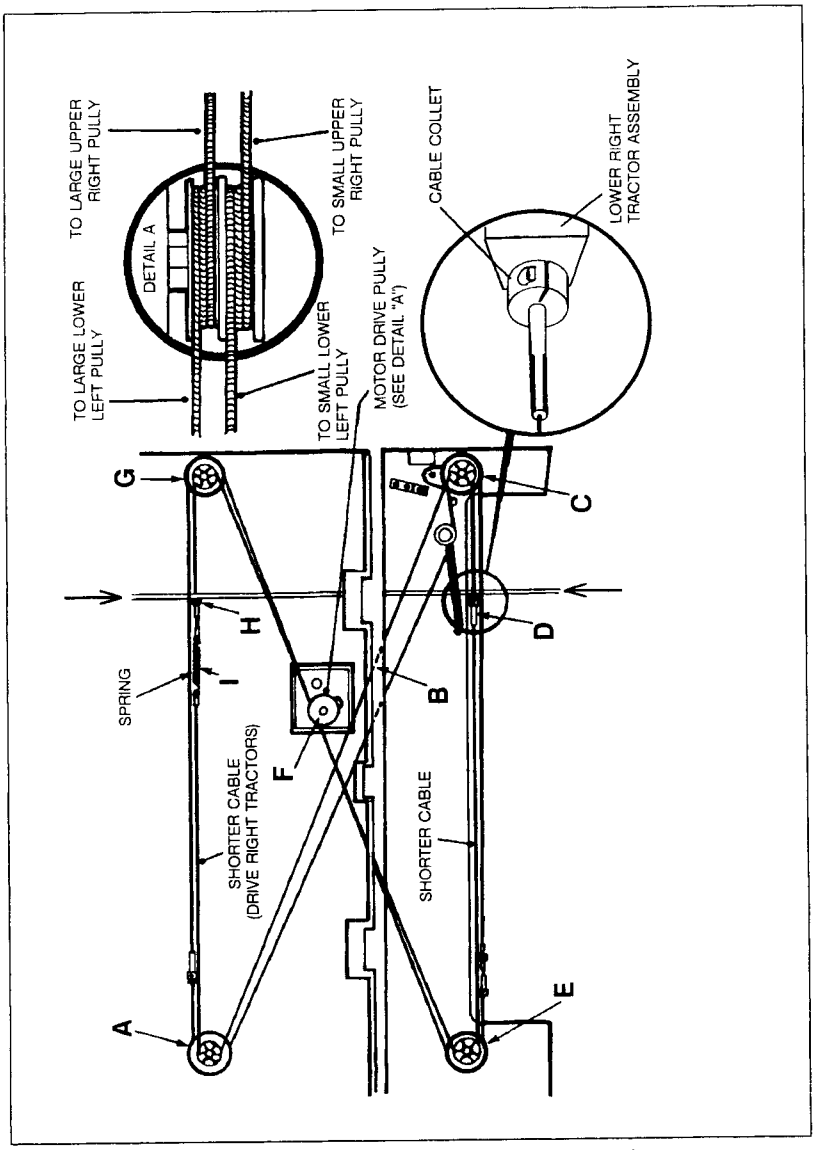

Figure 6-35a. Shorter Right Tractor Drive Cable Removal

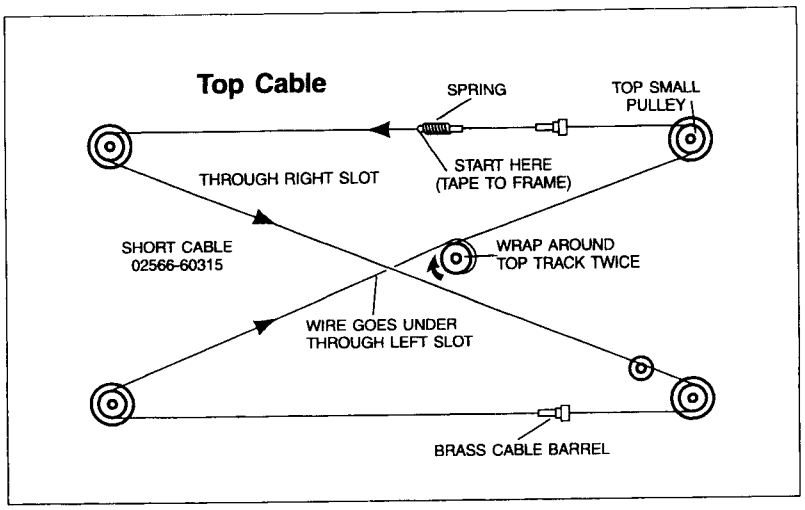

Figure 6-35b. Shorter Right Tractor Drive Cable Removal

3. Longer Left Tractor Drive Cable Removal (02666-60316) Removal.

The longer cable of the pair, routed through the larger diameter pulleys, drives the upper and lower LEFT tractors. Before removal, study the cable path **CAREFULLY** and, if necessary, make any notes that may help in replacement (Figures 6-34, 6-37a and 6-37b should help).

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. Loosen the cable tension by setting the tractor control knob to FORMS WIDTH (right) position.

d. Loosen the 3/32" Allen screw from the split collars and unscrew the split collar from the split nut on both upper and lower LEFT tractors (see Figure 6-36).

e. On both upper and lower LEFT tractors, manually move the tractors so that its cable will slide thorugh the notch in the AVB. (see Figures 6-37a and 6-37b).

f. Unwind the cable from the motor drive and other pulleys.

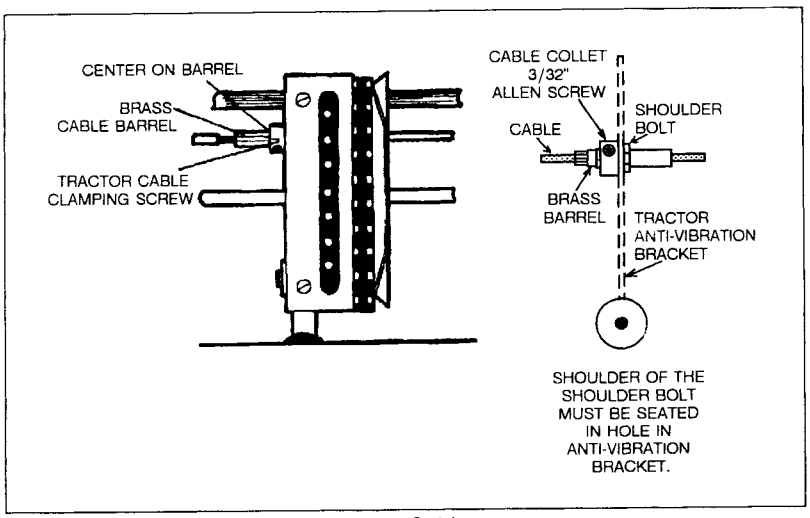

Figure 6-36. Positioning Tractors on Cables

g. Remove the machine screw and nut in the eye ring holding the two cable ends together.

h. Remove the cable.

4. Longer Left Tractor Drive Cable Replacement:

When replacing the cable, be careful to thread it along the same path that it originally followed (refer to Figures 6-37a and 6-37b). Be certain that the new cable follows the correct path and is not crossed with the other cable, hung around other parts, etc. Replace as follows:

a. Move the top left tractor all the way to the left.

b. Secure tempora the end of the cable with the tractor yoke (and eyelet) to the top left tractor using the cable split collar/split nut. Temporary tighten the clamp screw.

c. String the remaining portion of the cable around the larger diameter upper left pulley (Figure 6-37a, "E") and down through the slot in the casting (see Figure 6-37a, "F"), to the lower right pulley.

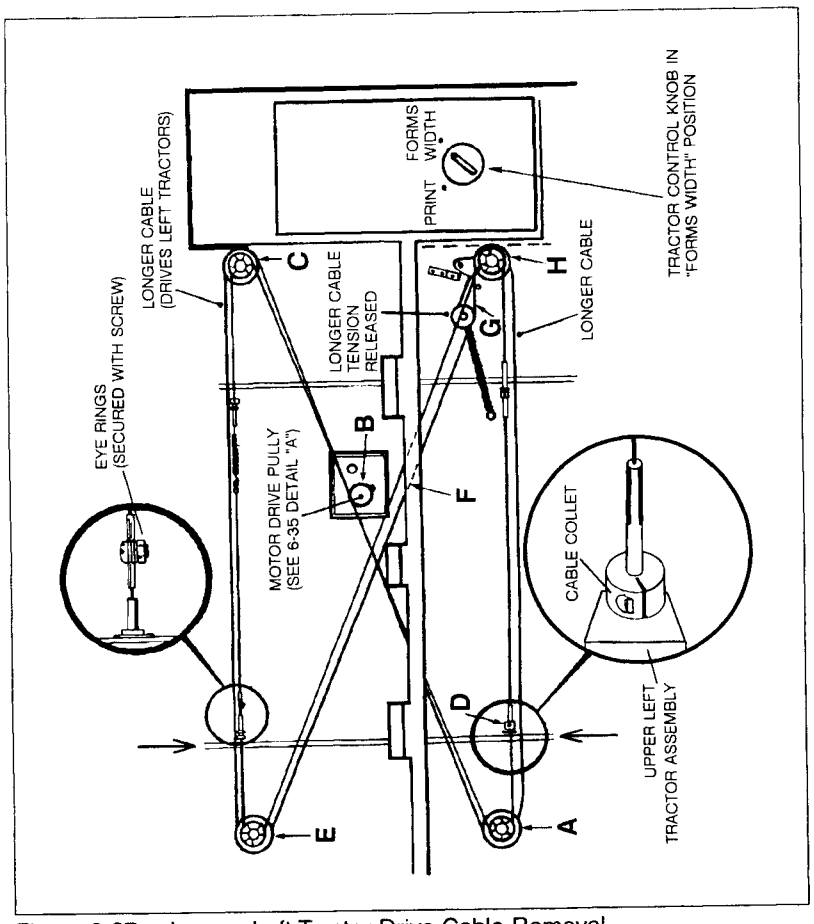

Figure 6-37a. Longer Left Tractor Drive Cable Removal

d. String the cable over (on top of) the tension (idler arm) pulley (see Figure 6-37a, "G"), then over the top of the lower right pulley, around the bottom of the pulley (see Figure 6-37a, "H"), and across to the lower left pulley.

e. Route the cable around the bottom of the lower left pulley (see Figure 6-37a, "A") and up through the slot in the casting to the motor pulley (see Figure 6-37a, "B"). Note, the cable must be strung over itself where it crosses itself (just before the motor pulley), otherwise it will rub.

NOTE

Ensure the split collar/split nut are both located in the area of the brass barrel for the lower left tractor before proceeding.

f. Wrap the cable two times, clockwise, around the lower motor pulley (see Figure 6-35a, "Detail A").

g. From the motor pulley route the cable around the bottom of the upper right pulley (see Figure 6-37a, "C") and then pull the ends of the cable together. The Tractor Control Knob should be set to the FORMS WIDTH position. This raises the tension idler arm off the cable, providing the slack needed to join the cable ends.

h. Attach the two cable eye rings at the ends of the cable together using the machine screw, washer, and nut (see Figure 6-37a, "D").

i. Place the cable under tension (idler arm) pulley (see figure 6-37a, "G").

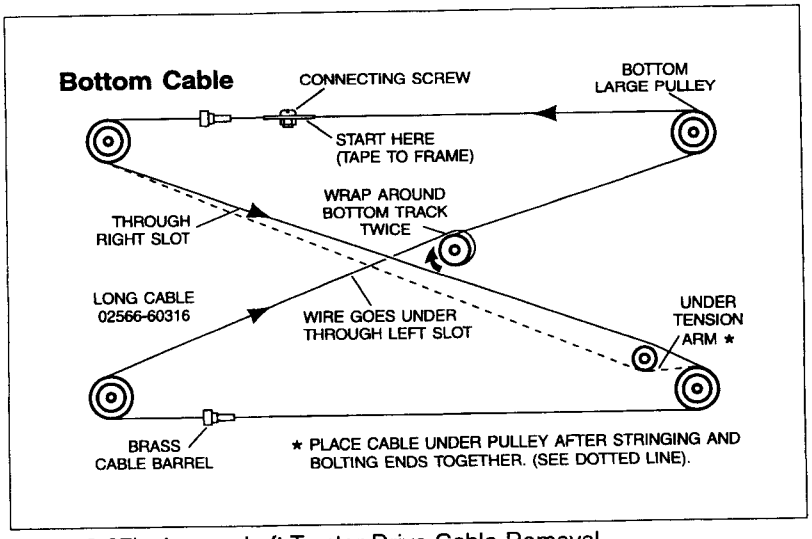

Figure 6-37b. Longer Left Tractor Drive Cable Removal

j. Tighten the cable tension by setting the tractor control knob to the PRINT (left) position.

k. Insert the threaded collar through the left side of the left tractor bracket and secure with the split nut. It should be finger tight with the split nut clamp screw accessible from the front. Center the tractors on the brass yokes, align the two tractors vertically and tighten the clamp screws for the lower left tractor. Leave the 3/32" split collar screw finger tight on the upper left tractor (see Figures 6-35a and 6-35b). If you are replacing both cables skip steps "l" to "q" and proceed to the Right Tractor Drive Cable Replacement following. Otherwise, perform steps "l" to "q".

l. Reinstall the Platen Assembly per Paragraph 6-26 and adjust per Paragraph 5-6.

m. Readjust the tractor AVBs per Paragraph 5-7.

n. Power up the printer and verify freedom of horizontal tractor movement by using the tractor control keys. Move the tractors fully left and right (in SLOW speed) in both FORMS WIDTH and PRINT positions while observing tractor and cable movement. Should any hesitation be noted, investigate and correct.

o. Perform the Vertical Tractor Alignment procedure described in Paragraph 5-9.

p. Test Vertical Tractor Alignment by inserting various customer forms into the printer, closing the swing gate, and doing multiple form feeds to verify all adjustments.

5. Shorter right tractor drive cable replacement.

When replacing the cable, be careful to thread it along the same path that it originally followed (refer to Figures 6-35a and 6-35b). Be certain that the new cable follows the correct path and is not crossed with the other cable, hung around clips, etc. Replace as follows:

a. Start with the end that has a greater length of free cable between the cable end and the brass cable barrel. Tape the cable end to the frame. Route the cable around the smaller diameter upper left pulley (see Figure 6-35a, "A").

b. Route the cable through the slot in the casting located at "B" in Figure 6-35a.

c. Wrap the cable around the top of the smaller diameter lower right pulley (see Figure 6-35a, "C") and across to the lower left pulley. Assure the split nut and split collar are in the general vicinity of the brass cable barrel for the lower right tractor.

d. Wrap around the bottom of the smaller diameter lower left pulley (see Figure 6-35a, "D") and then up through the slot in the casting to the motor pulley. Note, the cable must be strung over itself where it crosses itself (just before the motor pulley), otherwise it will rub.

e. Wind the cable two times, clockwise, around the outer pulley on the motor drive shaft (see Figure 6-35a, details "F" and "A").

f. From the motor pulley route the cable around the bottom of the smaller diameter upper right pulley. (see Figure 6-35a, "G").

g. Slide the split nut and split collar onto the brass cable barrel on the upper right tractor.

WARNING

Be careful when handling the cable spring as there is a possibility of eye injury if it flies off. Safety glasses are recommended.

h. Reinstall the tensioning spring (see Figure 6-35a, "I"). See figure 6-34. When replacing the cables, it is strongly recommended that the spring be replaced. Tractor Cable Spring P/N 1460-0648.

i. Insert the split nut through the right side of the tractor AVB and secure with the split collar. Position the lower right tractor in the center of the brass barrel and tighten the 3/32" Allen screw in the split collar. Leave the upper right tractor split collar loose for the tractor position adjustment (see Figures 6-35a and 6-35b).

j. Reinstall the Platen Assembly per Paragraph 6-26 and adjust per Paragraph 5-6.

k. Readjust the tractor AVB per Paragraph 5-7.

l. Power up the printer and verify freedom of horizontal tractor movement by using the tractor control keys. Move the tractors fully left/right in both PRINT and FORMS WIDTH Tractor Control Knob positions. Verify the tractors move freely the full length of the platen. If not, correct the problem before proceeding.

m. Perform the Vertical Tractor Alignment as described in Paragraph 5-9.

n. Test Vertical Tractor Alignment by inserting various customer forms into the printer, closing the swing gate, and doing multiple form feeds to verify all adjustments.

6-29. TRACTOR DRIVE BELT

The tractor drive belt is located on the left end of the printer, and can be replaced as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Remove the left end panel as detailed in Paragraph 6-5.

WARNING

Exercise caution when removing the belt as there is a slight possibility that the idler arm may snap upwards, causing injury.

c. Remove one spring during adjustment. Loosen the belt tension by carefully pulling the idler arm upwards and allowing the spring(s) to pull it against the dowel pin, which will hold it in this position (see Figure 6-38). (Printers that were produced beginning with series 2742 should have two parallel springs on the idler arm assembly.)

d. Slide the belt off the pulleys and out of the casting.

To reassemble, reverse the above procedures. The belt should then be adjusted as described in Paragraph 5-8.

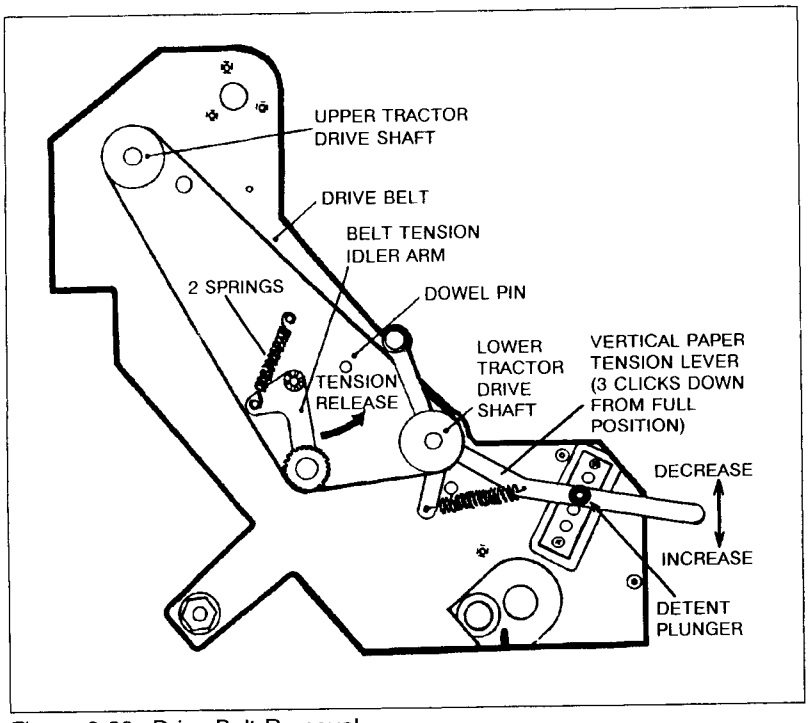

Figure 6-38. Drive Belt Removal

6-30. RIBBON SHIELD

The ribbon shield is located on the lower side of the print mechanism swing gate. Its function is to separate the paper from the ribbon, minimizing ink smearing on the paper. The ribbon shield also serves as the forms alignment guide. Removal procedures follow:

a. Raise the print mechanism swing gate to the fully open position.

b. Lower the ribbon shield.

c. Remove the four Pozi-drive mounting screws from the face of the ribbon shield.

d. Remove the shield.

Reverse the above removal procedure to reassemble. Before tightening the mounting screws, the 6mm slot in the center of the shield must be centered on the printbar hammers.

6-31. MISCELLANEOUS SENSORS

Besides the velocity transducer, there are eight other sensors in the printer, which are all related to the paper and ribbon drive systems. Two of these, the AT END OF TAKEUP and the AT END OF SUPPLY ribbon sensors are split-bar sensors that are activated by a foil strip at each end of the towel ribbon. These sensors are not likely to need replacement and are not included in these procedures. It is possible, however, for the bars to twist into the wrong position. As a quick check, verify that the cable lugs at the end of each bar are facing in-board, that is, they should face approximately opposite of the area where the ribbon comes in contact with these bar sensors.

The remaining six sensors are:

- **PRINT MECH OPEN**
- **RIBBON DESKEW**
- **SKEW POSITION** (2 sensors)
- **PAPER MOTION**
- **PAPER OUT**

PRINT MECH OPEN SWITCH

The Print Mech Open switch detects when the print mechanism swing gate is not in the fully latched position. The error code "10" is displayed on the Operator Control Panel if the printer is powered-up in this condition.

The switch is located on the same panel as the lower tractor control keys, and is accessed only when the swing gate is in the open position. Remove as follows:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Raise the print mechanism swing gate to the fully open position.

c. Remove the four 2mm Allen screws from the face of the lower tractor control key panel (see Figure 6-39)

6-34. RIBBON REVERSING SENSE BAR

There are two ribbon sense bars on the printer, an upper sense bar and a lower sense bar (see Figure 6-46). The upper bar is more difficult to remove since it contains the ribbon deskew dancer foot mechanism.

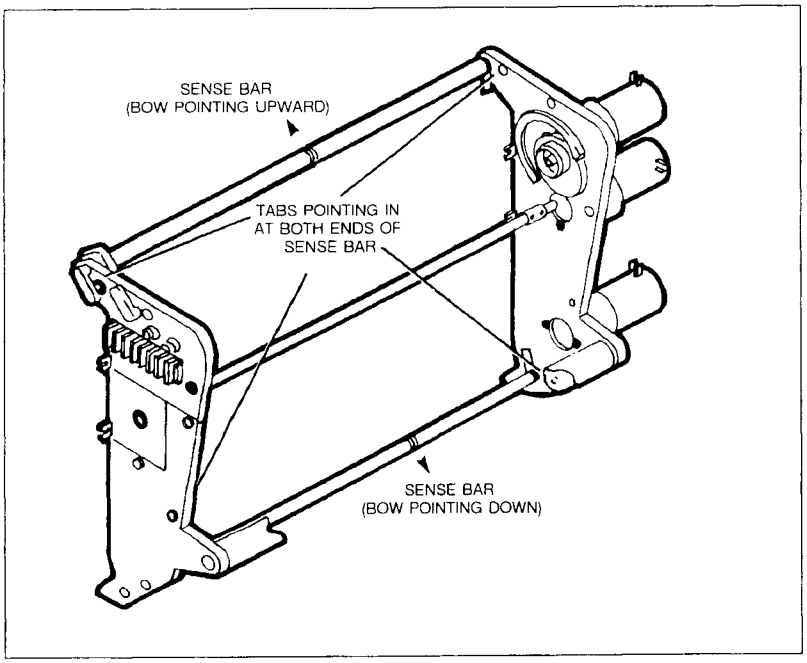

Figure 6-46. Ribbon Reversing Sensor Bars

To remove the bars complete the following steps:

a. Switch the printer offline and the ON/OFF switch to the OFF (0) position.

b. Open the printer top cover.

c. Open the swing gate by pressing down on the swing gate release lever and then lift the gate to the fully upright position.

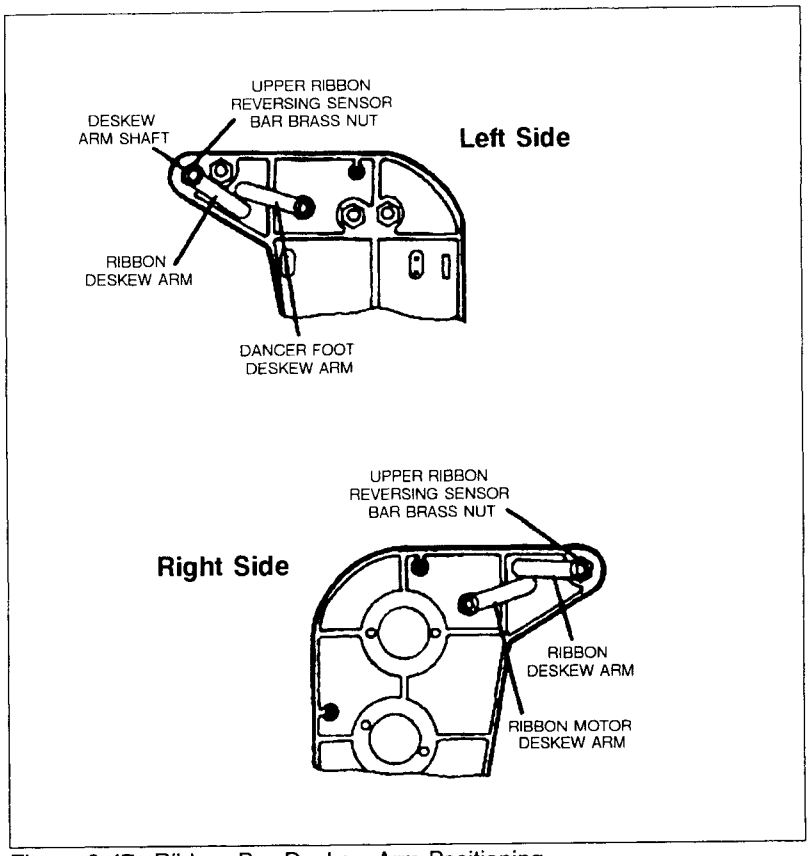

Figure 6-47. Ribbon Bar Deskew Arm Positioning

d. Remove the print mechanism right cover (refer to Paragraph 6-6).

e. Remove the print mechanism left cover (refer to Paragraph 6-7).

f. To remove the upper ribbon reversing sense bar:

Remove the brass nut which secures the ribbon reversing sense bar, from the right side of the printer (see Figure 6-47). Removing this nut also causes the ribbon deskew arm, which is pressed onto a shaft, to be forced off the shaft.

To remove the lower ribbon reversing sense bar, remove the two brass nuts on both sides of the bar (See Figure 6-47) and remove the bar from the printer.

This completes the removal procedure for the lower bar. To complete the removal of the upper sense bar, complete the remaining steps.

g. Pull the left ribbon deskew arm and shaft (which is attached to the arm), from the printer.

h. Remove the brass nut (see Figure 6-47) from the left side of the ribbon reversing sense bar and remove the bar from the printer.

RIBBON REVERSING SENSE BAR REPLACEMENT

The ribbon reversing sense bar consists of two 1/2-length outer bars separated by two plastic insulators, an inner bar and two lug washers (see Figure 6-48).

To replace the ribbon reversing sense bar, complete the following steps:

a. Insert the inner bar through one of the outer bars, then through the two insulators, and then through the other outer bar (see Figure 6-48). Make sure that the inner bar has tape wrapped around both ends. This tape insulates the lug washers, which are installed in the next step, from the inner bar. The insulating tape on each end of the threaded spacer (Figure 6-48) must consist of a **SINGLE** wrap of 3/4 inch electrical tape (P/N 0460-1621) or transparent mending tape, located approximately 1/32 to 1/16 inch from each end. The butt joint of the tape should be located 90 degrees away in either direction from the lug tab to prevent an electrical short between the lug and threaded spacer or the threaded spacer and the guide.

b. Install a lug washer onto the one end of the ribbon reversing sense bar so that the tab is inserted between the tape (on the inner bar) and the outer bar. Install the second lug washer onto the other end of the sense bar in the same way and making sure that the lug is positioned in the same direction as the lug on the other end.

c. Place the sense bar in position and secure it with the two brass nuts (see Figure 6-49). Note, the bars must be installed so that the lugs on the lug washers are pointing toward the other ribbon reversing sense bar. When the bar is installed and tightened, the lug washers cause the bar to bow slightly. This bow is not detectable but must

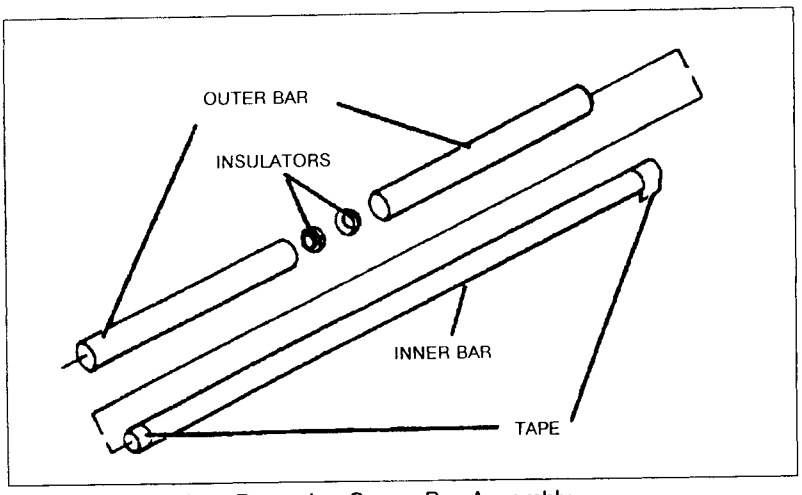

Figure 6-48. Ribbon Reversing Sense Bar Assembly

point outward. The bow will be pointing outward when the lugs are installed pointing inward (toward the other sense bar - see Figure 6-46).

If installing the lower ribbon reversing sense bar this completes the installation; if installing the upper ribbon reversing bar, complete the remaining steps.

d. Insert the deskew arm shaft (with the left ribbon deskew arm attached) into the ribbon reversing sensor bar (through the hole in the left sensor bar brass nut). The deskew arm on the left side should be positioned below the dancer foot deskew arm (see Figure 6-47).

e. Install the right side ribbon deskew arm by pressing it onto the shaft. The deskew arm (on the right side) should be positioned above the ribbon motor deskew arm (see Figure 6-47).

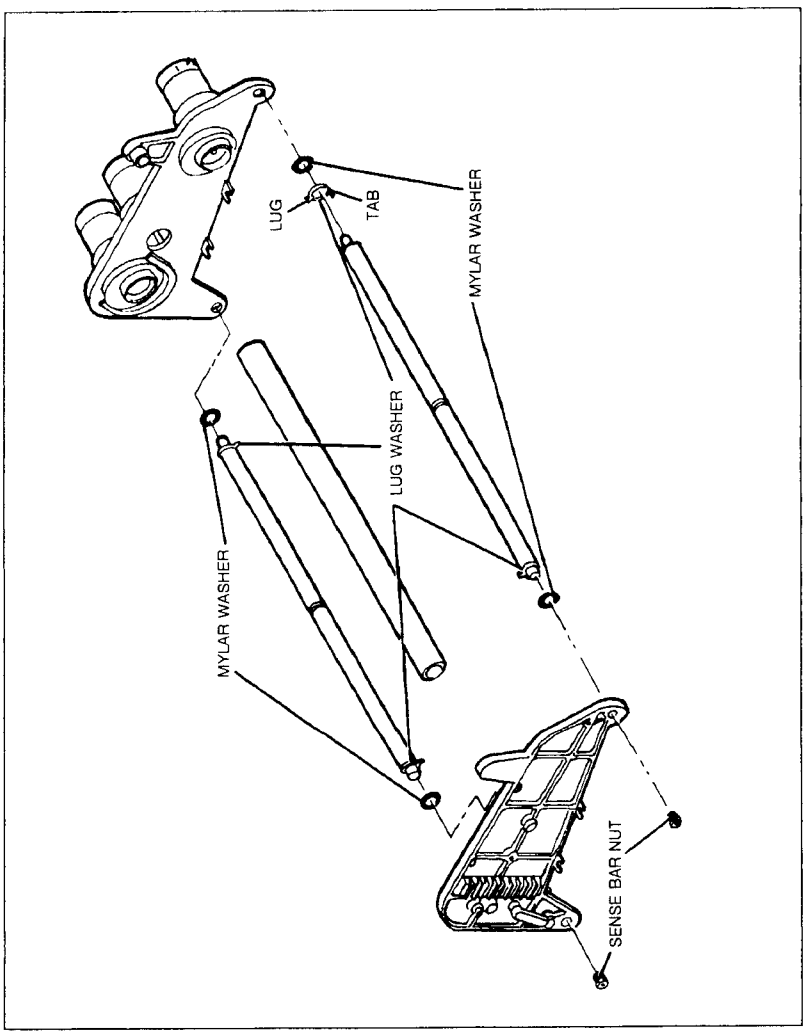

Figure 6-49. Ribbon Reversing Sense Bar Installation

6-35. SWING GATE LATCH KIT

To remove the swing gate latch kit, perform the following steps:

a. Switch the printer off line and the ON/OFF switch to the OFF (0) position.

b. Open the printer's top cover.

c. Remove the latch block by removing the two 4mm allen screws and lock nuts from the swing gate (see figure 6-50).

d. Remove the two allen screws from the face-plate and latch block.

e. Raise open the swing gate.

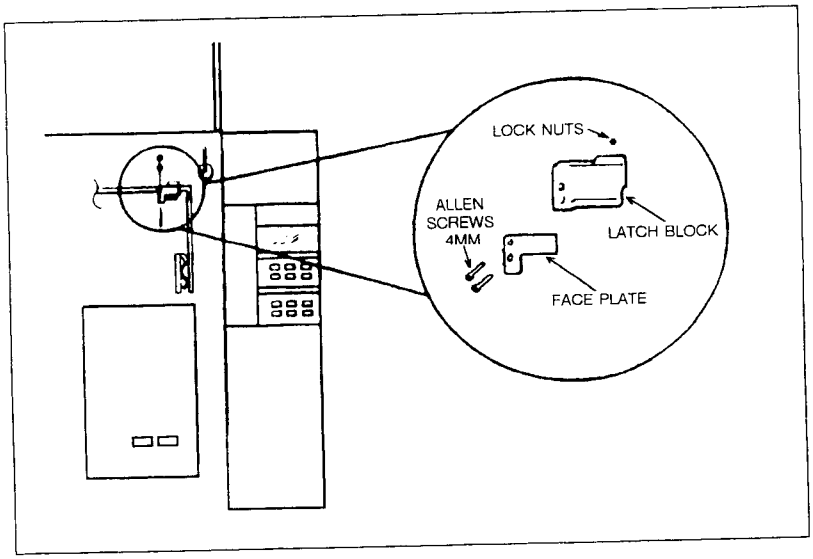

Figure 6-50. Latch Block

WARNING

When the swing gate is released, check the —> indicator in the arrow label. If the —> indicator points to the yellow or red region, the swing gate gas springs must be replaced. **NEVER** let the customer use the printer when the —> indicator points to the red region because the swing gate might fall and cause bodily injury.

f. Lower the swing gate.

g. Remove the hook assembly by loosening the 6mm allen screw and the two 4mm allen screws (see figure 6-51).

To reassemble, reverse the above procedure. The latch kit should be adjusted as described in paragraph 5-14.

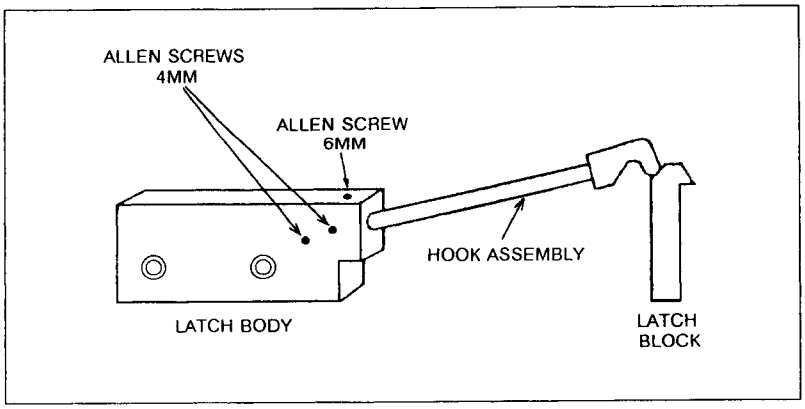

Figure 6-51. Hook Assembly

Chapter 7

Parts & Diagrams 2566B/C 2567B/C

DiagramsDiagramsDiagrams Diagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams DiagramsDiagramsDiagrams

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7-1. INTRODUCTION

This chapter contains illustrated parts breakdowns (IPBs) and replacement parts lists for the HP 2566/67 Line Printers.

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7-2. DESCRIPTION OF PARTS LIST

The columns in the parts lists provide the following information:

a. REFERENCE DESIGNATOR.

This column lists the reference designator which identifies the particular part on the IPB or the parts location diagram.

b. DESCRIPTION

This column gives the name or a brief description of the part.

c. HP PART NUMBER

This column lists the Hewlett-Packard part number for each item.

7-3. PARTS ORDERING PROCEDURE

To order parts from Hewlett-Packard or obtain further information call the nearest Hewlett-Packard Sales and Service Office and provide the following information:

a. Printer model and serial number

b. Hewlett-Packard part number

c. Description of the part

d. The series code for the PCA

7-4. KITS AND OTHER MISCELLANEOUS PARTS

The various kits available for the printer are listed below. Also part numbers for manuals, service supplies and other hard to find parts are provided here.

SPECIAL KITS	PART NUMBER
VELCRO REPAIR KIT	02566-67913
Velcro Hook Fastener	0510-1247 (3 feet)
Velcro Loop Fastener	0510-1248 (3 feet)
Abrasive Cloth	1535-4944 (3 feet)
Left Retainer Clip	02566-40046 (6)
Right Retainer Clip	02566-40047 (6)
Retainer Clip Screw (M4xl2)	0515-0875 (14)
RIBBON GROUNDING KIT	02566-67914
Male Grounding Lug	1251-8350
Grounding Cables	02566-60317 (3)
Grounding Spring	02566-00262 (1)
Grounding Spacers	02566-00263 (3)
CLOSED LOOP PF SYS UPGRADE (2566B/67B)	02566-67917
Backplane PCA	02566-60028 (1)
Stepper Motor/Encoder ASSY	02566-60314 (1)
Firmware (Only if below 2720)	02566-60298 (1)
	02566-60299 (1)
	02566-60300 (1)
	02566-60301 (1)
Cable Clamps	1400-0611 (2)
Installation Instructions	02566-90959 (1)
BELT TENSION IDLER KIT	02566-67919
Belt Idler Pivot Pin	02566-20140 (1)
Belt Tension Idler ASSY	02566-60327 (1)
Belt Idler Spring	1460-2073 (2)
Idler Arm Installation Inst.	02566-90975
PHASE/GAP KIT	02566-67926
Belt Cover II	02566-00327
Drive Pulley Cover	02566-00259
Forms Tension Label II	02566-00328
Screw	0515-0483
Split Washer	2190-0584
Flat Washer	3050-0891
Lwr Tractor Dr Shft/Phase Handle II	02566-60354
Phase Handle Spring	1460-1323
Phase Adjust II Detent	02566-40084
Platen Gap Adjust Handle II	02566-20161
Set Screw	0515-0096
Felt Washer II	3050-1311
Spring Plunger II	02566-60346
Hex Jam Nut II	0535-0047
Forms Thickness Label	02566-00338
Woodruff Key	1500-0674
Operation Manual II	02566-90990
Phase Gap and Paper Tension Installation Instruction	02566-90981
O-Ring 0.081 in.	0905-1153

CAST II TRACTOR KIT	02566-67924
Upper Left Tractor	02566-60348
Lower Left Tractor	02566-60347
Upper Right Tractor	02566-60349
Lower Right Tractor	02566-60350
Tractor Support Shaft	02566-20045
E Clip Retainers	0510-0812
Platen Assy	02566-60245
Platen Screw (w/ captive washer)	0515-1962
Tractor Closing Bar *	02566-00316 *
Closing Bar Clamp	02566-00317
Closing Bar Screw	0515-0875
Petro Wax	0470-1675
Tractor Upgrade Kit Install Inst.	02566-90979

* Before installing lower tractor closing bar, you must first measure the lower ribbon door, from the top of the door, around the bends, to the bottom edge of the door. If the measurement is 12 inches, install the closing door. If the door measures 12 and 7/8 inches, you must first order a new door (02566-00256) before installing the closing bar. If the ribbon door retaining clips have not been installed, you must install them as well. Order: Left Retaining Clip (02566-40046), Right Retaining Clip (02566-40047) and 2 screws (0515-0875).

LATCH KIT	02566-67929
Face Plate	02566-00387
Label: Arrow	02566-00923
Label: Red-Green	02566-00924
Label: Notice	02566-00925
Label: Latch Oper.	02566-00926
Nut: Latch	02566-20177 (2)
Body: Latch	02566-20180
Latch Nut: Large	02566-20181
Latch: Block	02566-40086
Hook: Assembly	02566-60395
Latch: Installation Instuctions	02566-90150

MANUALS

HP 256X Technical Reference Manual	02564-90905
HP 256X Printer Family Pocket Guide	02564-90907
HP 2566B/2567B Operator's Manual	02566-90914
HP 2566B/2567B Service Manual	02566-90915
HP 2566B/2567B CE Handbook	02566-90986
HP 26765C Powered Paper Stacker Operator's Manual	02566-90989
HP 2566C/2567C Operator's Manual	02566-90990
HP 2566C/2567C Service Manual	02566-90993
HP 26765C Powered Paper Stacker Installation Manual	02566-90995
HP Label Card Manual	26062-90902
HP-IB Interface Manual	26067-90901
RS-232C/422A Serial Interface Manual	26067-90903
Super Centronics Interface Manual	26067-90906
Centronics Parallel Interface Manual	26067-90906
Datataproducts Parallel Interface Manual	26067-90957

SPECIAL TOOLS AND OTHER SUPPLIES

Triangle Tool for Adjusting Tractors	02566-00261
1.5 mm Hex Wrench	8710-0909
Velocity Transducer Centering Tool	02566-20152
Trichloroethane Spray for cleaning Printbar	8500-4663
Dancer Arm Lubricating Oil	6040-0650
Lexan Tape (SIN # 2566B-16-s) (127 ft. roll)	0460-1799
Loctite #416 (for installing belt idler pin)	0470-1146
Loctite #242 (used on Platen Handle set screw)	0470-0231
Petro Wax (for platen installation, etc.)	0470-1675
Molycote G(for lubricating swing gate latches)	6040-0521
COAX Cable to go between HPIB Extenders (100M)	92179G
BNC Connector for COAX above	92226A

SHIPPING SUPPLIES FOR THE 2565B/66C/66B/67C

Front Shipping Bracket	02566-00231 (2)
Rear Shipping Bracket	02566-00236 (2)
Base	02566-00900 (1)
Shipping Box	02566-00904 (1)
Top Pad	02566-00905 (1)
Top Pad	02566-00942 (2)
Shipping Bracket Bolt	3020-0004 (4)
Shipping Bracket Washer	3020-0025 (4)

7-5. ILLUSTRATED PARTS BREAKDOWNS

The illustrated parts breakdowns are provided on the following pages.

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TABLE 1. TOP LEVEL, PRINTER

INDEX NO.	DESCRIPTION	HP PART NO.
1	GAS SPRING	1530-2185
2	SPRING CLIP	1460-1679
5	DOOR, FRONT DOOR, FRONT, NL	02566-60136 02566-60436
6*	PANEL, LEFT SIDE PANEL, LEFT SIDE, NL	02566-60137 02566-60437
7	SCREW, M6 X 12 LG	0515-0501
8	WASHER, FLAT	3050-1013
9	WASHER, STAR	2190-0013
10	PANEL, RIGHT SIDE PANEL, RIGHT SIDE, NL	02566-60140 02566-60440
11	PANEL, RIGHT FRONT PANEL, RIGHT FRONT, NL	02566-00082 02566-00445
12	PANEL, REAR PANEL, REAR, NL	02566-60138 02566-60438
	FASTENER, PANEL, 1/4 TURN FASTENER, BLACK PLASTIC RETAINER, SPLIT RING FASTENER, 1/4 TURN FASTENER, rivited on printer's frame	1390-0091 1390-0071 1390-0088 1390-0841 1390-0085
13	SOUND SHROUD	02566-60199
14	PAPER TRAY	02566-00093
15	WASHER, SPLIT LOCK	2190-0587

* Use items 7, 8, and 9 for the two rear screw locations on the Left Side Panel and items 7, 15, and 9 for the front screw location.
NL: NEW LOOK

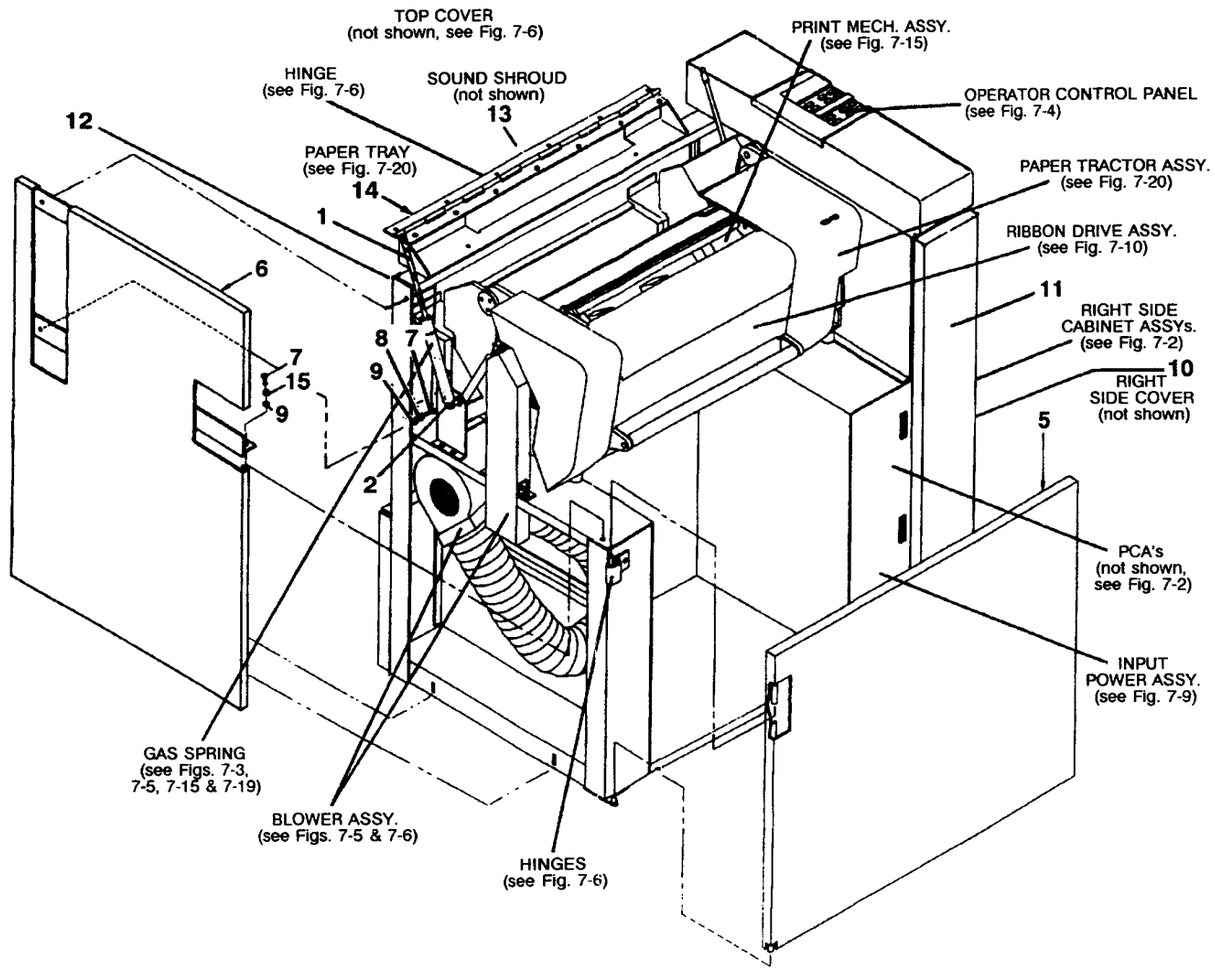


Figure 7-1. Top Level, Printer

TABLE 2. TOP LEVEL, RIGHT SIDE

INDEX NO.	DESCRIPTION	HP PART NO.
1	PCA: POWER SUPPL FUSE 5A 250V	02566-60005 (1) 2110-0030
4	SCR: SKT M4 X 12	0515-0875
5	NUT: M4 HEX	0515-0076
6	PCA: MOTOR DRIVE FUSE 2A 250V FUSE 4A 250V FUSE 10A 250V	02566-60006 (2) 2110-0002 2110--0055 2110-0051
7	PCA: SERVO CNTRL FUSE 4A 250V	02566-60041 (3) 2110-0055
8	PCA: EDP FORMATTER 2566B/67B 2566C/67C ANZAC FORMATTER	 02566-60030 (4) 02566-30042 (5) 02566-60046
9	PCA: I/O	*
10	PCA: HAMMER DRVR	02566-60031 (6)
11	CLAMP: CAPACITOR	02566-00136
12	RETAINER: CAP	02566-00184
13	NUT-WING M4	0535-0060
15	NUT: M5 HEX	0535-0077
16	WSHR-LK INTL 5M	2190-0632
17	SCR-MCH M5 X 12 L	0515-0904
18	SCR-MCH M4 X 12 L	0515-0875
19	SNAP ON PCB EJC	0403-0481
21	COVER, I/O SCREW, MACH M4 X 10 WASHER, M4 STAR	02566-00453 0515-0926 2190-0599
22	PCA: HP LABEL CARD	4175006-QMS(7)
23	I/O SCREW	0515-0803

* Interface PCA P/N's:
5062-0477 = HPIB (Exchange P/N 26067-69102)
5061-1708 = Parallel/Centronics (Exchange P/N 5062-0478)
5062-1703 = RS232C/RS422A (Exchange P/N 26067-69083)
5062-1754 = Super Centronics (Exchange P/N 26067-69081)
5061-1714 = Dataproducts Short Line
5061-1715 = Dataproducts Long Line
C2356-30101= Multiple I/O
(1) Exchange P/N: 02566-69505
(2) Exchange P/N: 02566-69106
(3) Exchange P/N: (02566-69141)
(4) Exchange P/N: 02566-69030
(5) Exchange P/N: 02566-69042
(6) Exchange P/N: 02566-69131
(7) Exchange P/N: 26062-69101

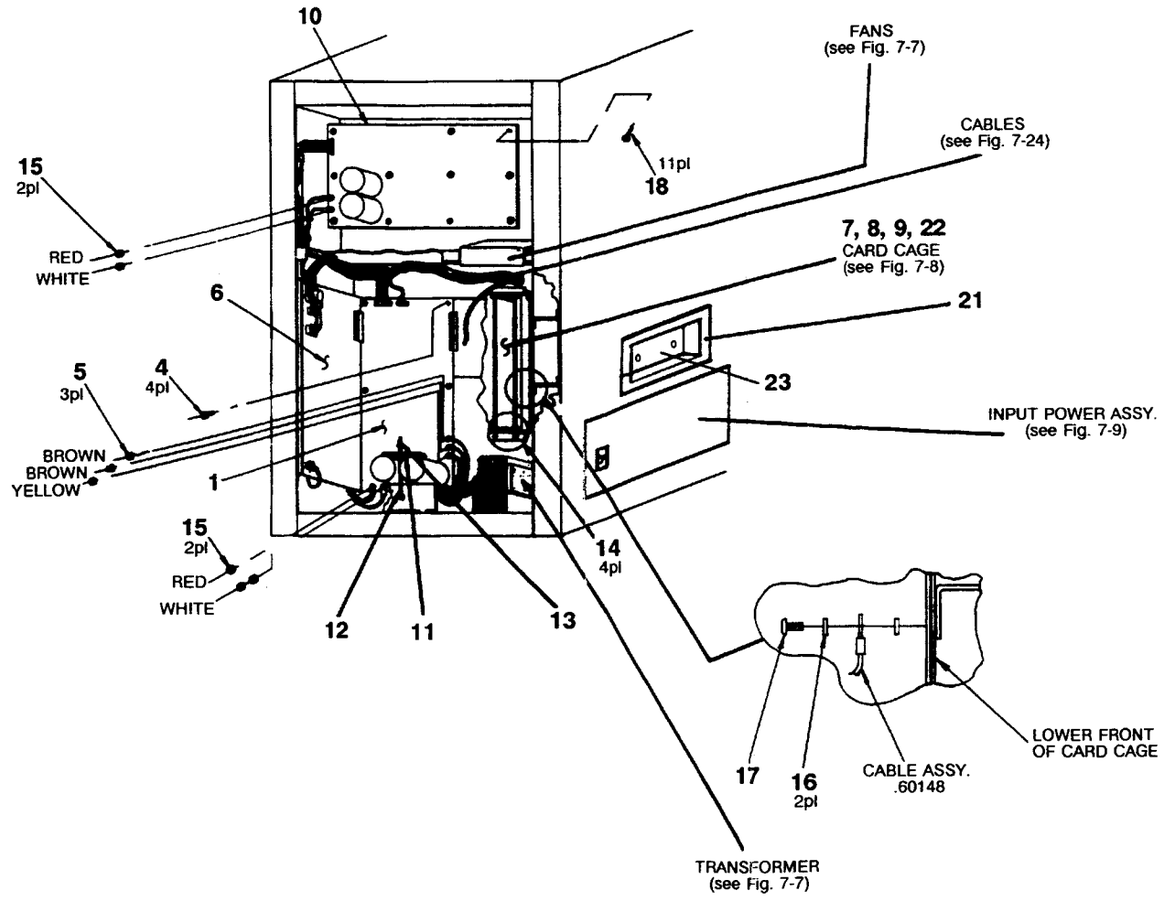
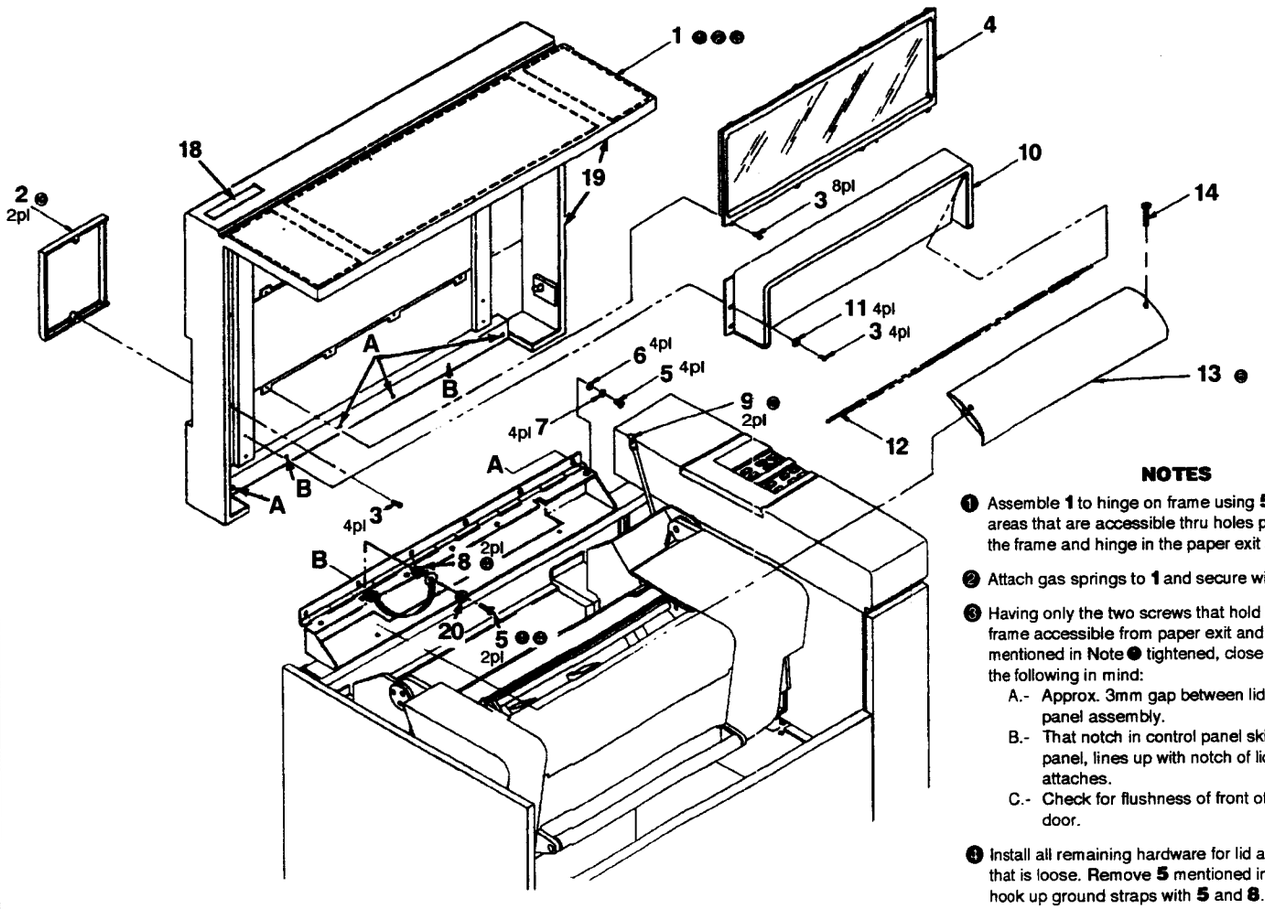


Figure 7-2. Top Level, Right Side

TABLE 3. TOP COVER

INDEX NO.	DESCRIPTION	HP PART NO.
1	ASSY: WLD TOP COVER COVER FOAM, TOP	02566-60115 02566-00127
1	ASSY: WLD TOP COVER, NL	02566-60439
2	ENDCAP: TOP COVER	02566-40029
2	ENDCAP: TOP COVER, NL	02566-40094
3	SCR: TDG 6-20	0624-0667
4	WINDOW ACCESS CV	02566-40033
4	WINDOW ACCESS CV, NL	02566-40095
5	SCR M5 X 10 LG	0515-1438
6	WSHR: M5 FLAT	2190-0402
7	WSHR: M5 SPL LOCK	2190-0587
8	WSHR-LK INTL 5MM	2190-0565
9	SPRING-CLIP	1460-1679
10	SHROUD: INNER	02566-00195
10	SHROUD: INNER, NL	02566-00449
11	WSHR-LK EXT 3MM	2190-0414
12	ASSY: TINSEL	0960-0585
13	GUIDE: PAPER	02566-40032
14	SCR: MCH M4 X 16 PZ	0515-1064
18	NAME PLATE 2566B	02566-00245
	NAME PLATE 2567B	02567-00001
	NAME PLATE 2566C	02566-00393
	NAME PLATE 2567C	02567-00018
19	GASKET TOP ASSY	0330-0393
20	WASHER, FLAT MS	2190-0402
* 21	TOF LABEL	02566-00223

* Not shown NL: NEW LOOK



NOTES

1. Assemble **1** to hinge on frame using **5** in two areas that are accessible thru holes provided in the frame and hinge in the paper exit area.
2. Attach gas springs to **1** and secure with **9**.
3. Having only the two screws that hold hinge to frame accessible from paper exit and the two mentioned in Note ❶ tightened, close the lid with the following in mind:
   - A.- Approx. 3mm gap between lid and control panel assembly.
   - B.- That notch in control panel skin for switch panel, lines up with notch of lid where **2** attaches.
   - C.- Check for flushness of front of lid with front door.
4. Install all remaining hardware for lid and tighten all that is loose. Remove **5** mentioned in Note ❶ and hook up ground straps with **5** and **8**.

Figure 7-3. Top Cover

TABLE 4. OPERATOR CONTROL PANEL

INDEX NO.	DESCRIPTION	HP PART NO.
1*	BEZEL: KEYBOARD BEZEL: KEYBOARD, NL	02566-20117 02566-20187
2	KEYPAD: SIL RBR KEYPAD: SIL RBR, NL	5040-9002 5041-6907
3	PCA: FRONT PANEL	5061-1709
4	SCR: POZ 4-20 X .375	0624-0314
5	ASSY: CONT CVR WL ASSY: CONT CVR WL, NL	02566-60311 02566-60441
6	WSHR: STAR	2190-0597
7	WINDOW: BEZEL WINDOW: BEZEL, NL	5040-9003 5041-6908
8	CABLE, OPER CNTL	02566-60238
15	GROM-SNAP INSULATOR	0340-0554

* Item 7 must also be ordered. NL: NEW LOOK

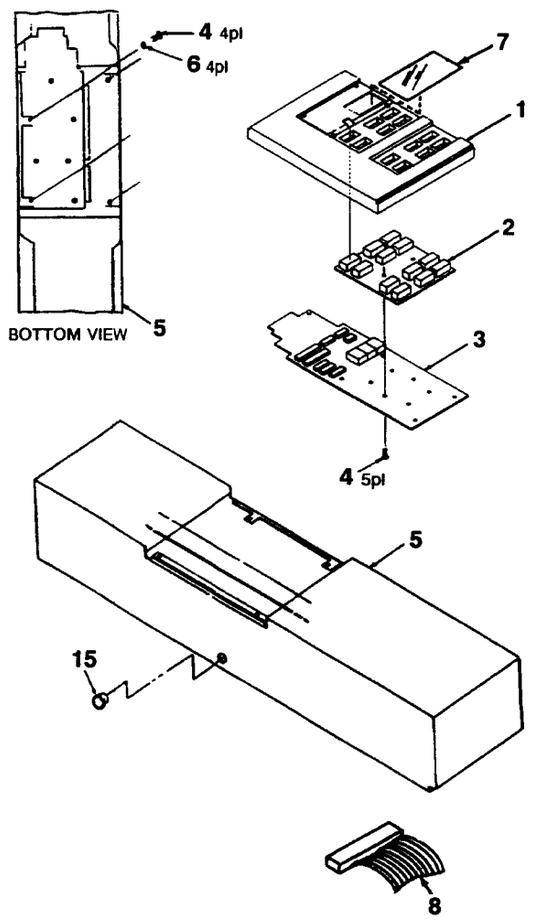


Figure 7-4. Operator Control Panel

TABLE 5. BLOWER ASSEMBLY AND PAPER GUIDE

INDEX NO.	DESCRIPTION	HP PART NO.
1	GUIDE: PAPER	02566-40032
4	SCR-MACH M4 X O.7	0515-1064
5	AIRDUCT: PRINTBAR	02566-40035
6	TUB-FLEX R2 X 460MM	0890-1531
7	C - HOSE	1400-0566
8	BRKT: AIR DUCT	02566-00198
9	WSHR: FL#10 .5"D	3050-0659
10	SCR-MACH M4 X 12	0515-0875
11	BRKT: DUCT MNTG	02566-00155
12	BRKT: GAS SPRG MT	02566-00161
13	WSHR: M5 FLAT	3050-0894
14	WSHR: M5 SPL LOCK	2190-0587
15	SCR-MACH M5 X 1O LG	0515-0927
16	WSHR: LK HLCL 5/16	2190-0433
17	FSTNR-SNP-IN	0570-0628

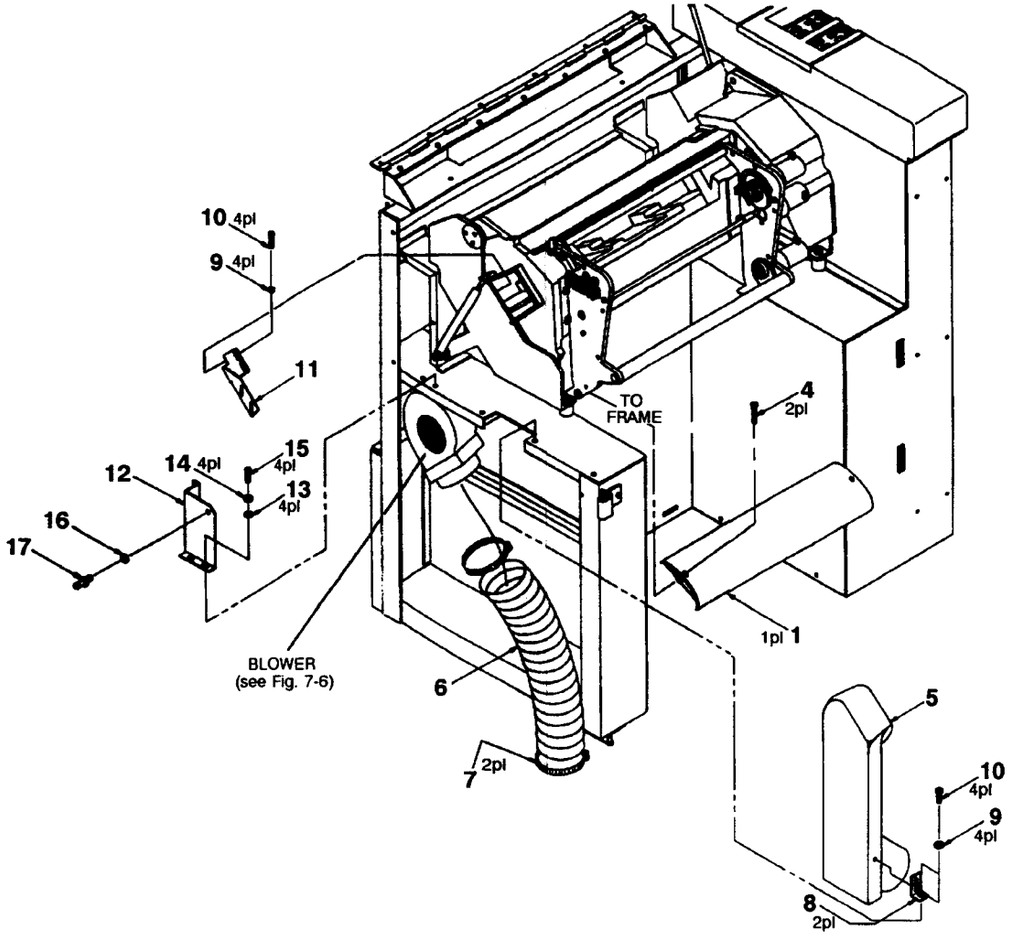


Figure 7-5. Blower Assembly and Paper Guide

TABLE 6. BLOWER/DOOR AND COVER HINGES

INDEX NO.	DESCRIPTION	HP PART NO.
1	FSTNR-CATCH MAG	1390-0265
2	HINGE: LOWER	02566-00324
3	SCR-CAP M4 X O.7	0515-1834
7	HINGE: TOP	02566-00325
9	BLOWER ASSEMBLY	3160-0511 (1)
11	SOLID STATE REL	0490-1373
13	WSHR: M4 STAR LC	2190-0599
14	HINGE: COVER BLACK	02566-00343
15	SCR-MACH M5 X 1OL	0515-1438
16	WSHR: M5 SPL LOC	2190-0587
17	WSHR: M4 FLAT	2190-0402
18	STRAP: GROUNDING	02566-00219
19	WSHR-LK 5M EXT.	2190-0647
20	STDF-HEX .75 IN	0380-0720
21	STDOFF-HEX HEAD	0380-1616
22	COVER SCREEN	02682-20435
23	LABEL WARNING	7120-4626
30	CASTER, SWIVL	1492-0096
31	NUT: M4 HEX	0535-0076
33	LEVELER FOOT	0403-0290
34	LEVELER NUT	2950-0133
35	REAR SHIPPING BRACKET	02566-00231
36	FRONT SHIPPING BRACKET	02566-00236
37	SCREW: 1/4 - 20 X 3/4	3020-0004
38	WASHER, LOCK 0.50 OD	2190-0023

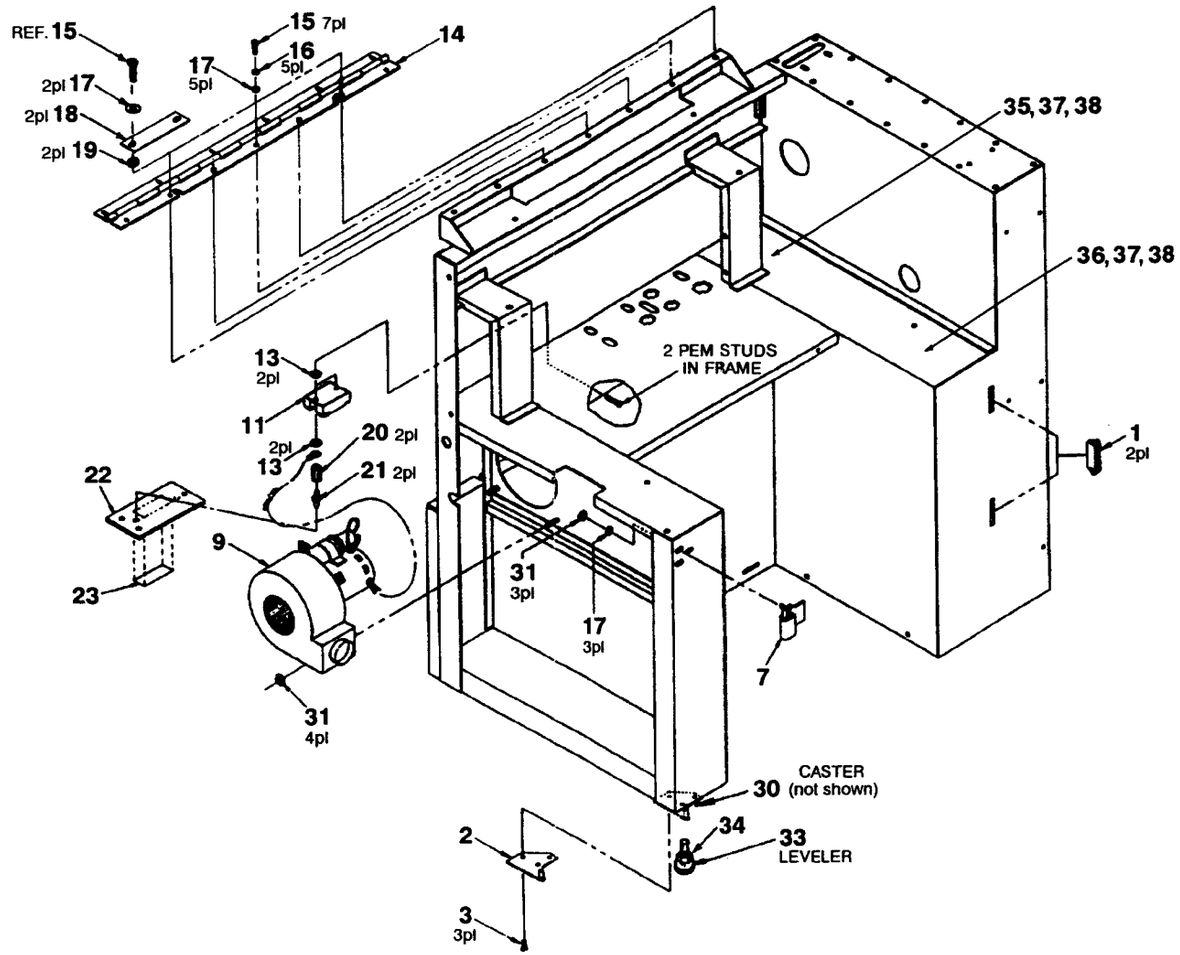


Figure 7-6. Blower Door and Cover Hinges

TABLE 7. FANS/TRANSFORMER/RIGHT SIDE BRACKETS

INDEX NO.	DESCRIPTION	HP PART NO.
1	TRANSFORMER: PWR	9100-4604
2	SCR: M6 X 16 SHCS	0515-0193
3	WSHR: M6 SPL LOC	2190-0592
4	WSHR: FLAT	3050-1013
5	WSHR: M6 STAR LC	2190-0013
6	FAN: TBAX 120-FM	3160-0513
7	FS CLIP	3160-0329
8	FINGER GUARD	3160-0422
9	SCR: 6-32 X .625PA	2360-0205
10	WSHR: FL#6 .147"	3050-0010
11	WSHR: LOCK HEL #6	2190-0851
12	ASSY: MRT DR CC	02566-00291
13	GUIDE: PC BD.07-	0403-0271
14	BRK MTR DRV CC	02566-00221
15	SCR-MACH M5 X 1OL	0515-0927
16	WSHR: M5 SPL LOC	2190-0587
17	WSHR: FL#10 .5"D	2190-0402
18	FSTNR: 1/4 TURN	1390-0716
19	SCR-MACH M4 X 12L	0515-0875
22	CAP PLUG-PROT	1401-0201
24	CABLE: OPER PANEL	02566-60238
25	BRKT: SPPRT CAP	02566-00292

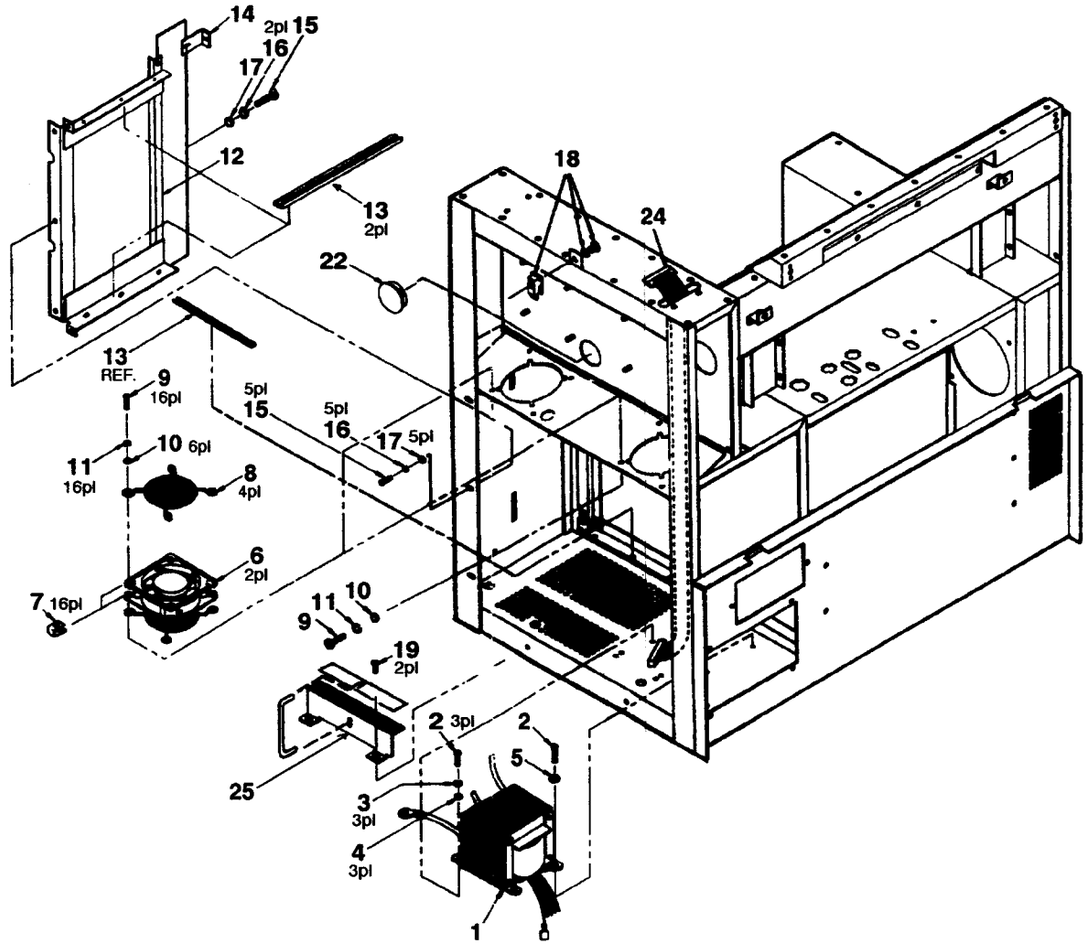


Figure 7-7. Fans/Transformer/Right Side Brackets

TABLE 8. INPUT POWER ASSEMBLY/CARDCAGE/1-0 COVER

INDEX NO.	DESCRIPTION	HP PART NO.
1	INPUT POWER ASSY	
	110/120 Volt	02566-60185
	220/240 Volt	02566-60296
5	SCR-M5 X 10L	0515-0927
6	WSHR: M5 SPL LOC	2190-0587
7	WSHR: M5 FLAT	3050-0894
12	SCR-MACH M4 X 12	0515-0875
13	WSHR: M4 STAR LCK	2190-0632
14	NUT: M5 X 10L	0515-0927
21	ASSY: CARD CAGE	02566-60162
22	GUIDE: PC BD.07-	0403-0271
24	PCA: BACKPLANE	02566-60028

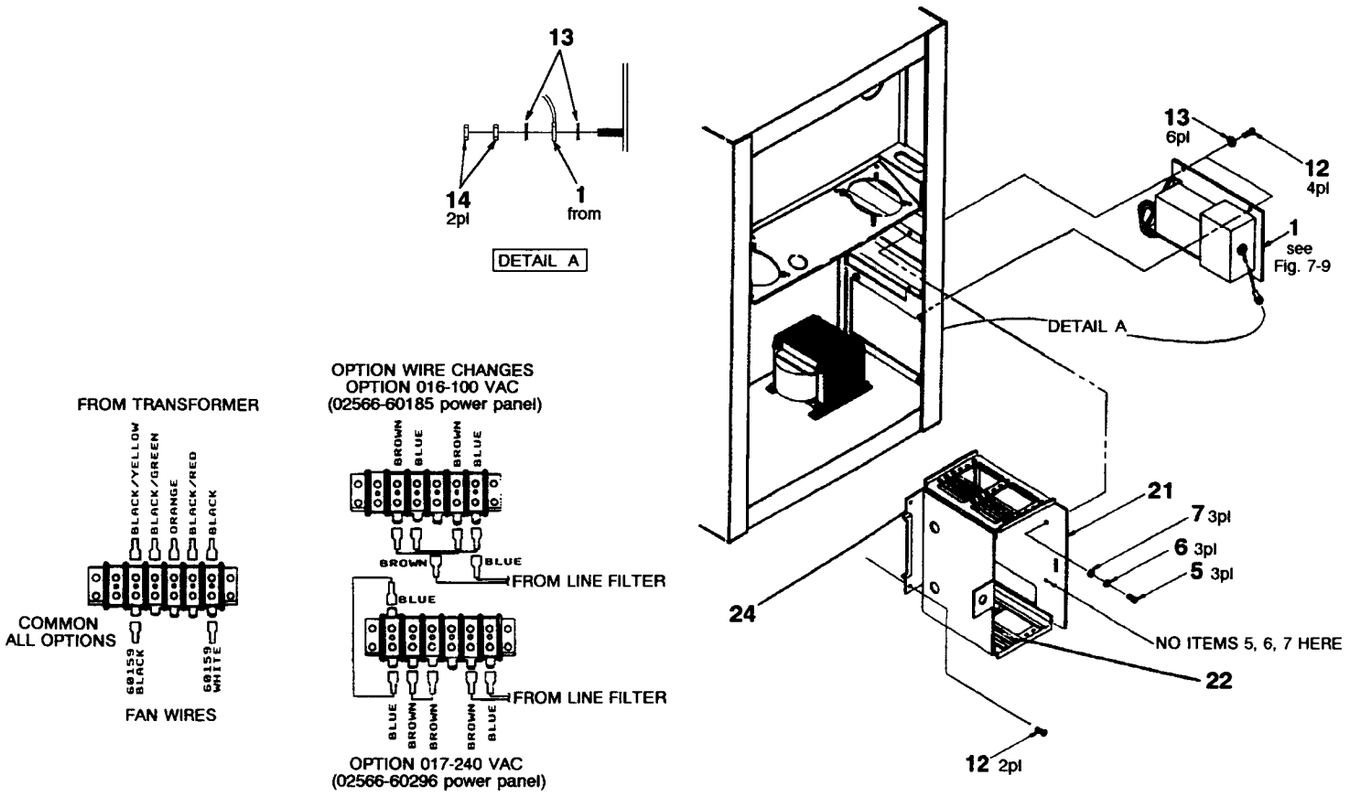


Figure 7-8. Input Power Assembly/Cardcage/1/0 Cover

TABLE 9. INPUT POWER ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
1	BRKT: FILTER MTG	02566-00158
2	GROM-CHN .085GRV	0400-0244
3	ASSY: INPUT PWR CONN	
	110/120 Volt	02566-60190
	220/240 Volt	02566-60294
4	NUT: M4 HEX	0535-0076
7	BRR-BLK= 6 POS	0360-2228
8	ASSY: LINE FILTER	9135-0322
9	SCR: M4 X 10PAN POZ	0515-1064
10	CBL AY: STRAP BRN	02566-60171
11	CBL AY: STRAP BLU	02566-60172
12	FUSE C-B (250v)	
	110/120 12.5A	3105-0144
	220/240 6.25A	3105-0223
13	CBL STRAP	02566-60170
14	WSHR: M4 STAR LCK	2190-0599
15	SHIELD: FILTER	02566-00157
18	GROMMET SNAP	0400-0271
19	SCR: M4 X 10 LG	0515-0926
20	SCR: M4 X 12	0515-0875

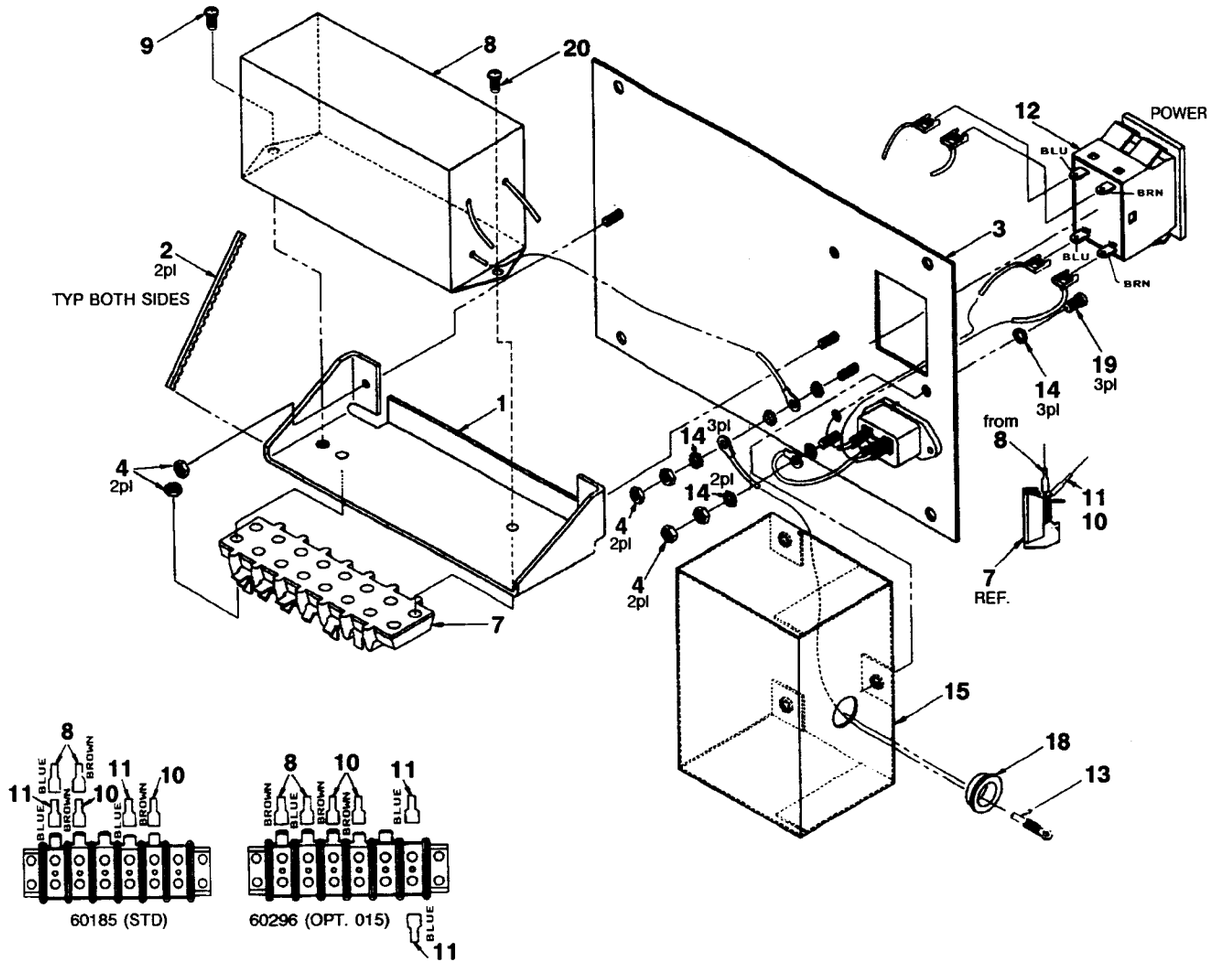


Figure 7-9. Input Power Assembly

TABLE 10. RIBBON DRIVE ASSEMBLY TO CASTING/RIBBON-PAPER SHIELD

INDEX NO.	DESCRIPTION	HP PART NO.
2	SCR: M4 X 16	0515-1064
6	SCR: M5 X 16 SHCS	0515-0496
7	WSHR: M5 SPL LOC	2190-0587
8	WSHR: M5 FLAT	3050-0894
9	LID: DEFLECTOR	02566-00190
10	BRKT: LOADER	02566-40019
11	SCR-TPG 8-16	0624-0397
12	SCR: SHOULDER	3030-0969
14	WSHR: FL#10 .5"D	3050-0659
15	LINK: LOADER	02566-00054
16	SPNG-FXT 1IN LG	1460-1207
17	LATCH BLOCK	02566-40086
18	CBL ASSY: GROUND	02566-60212
19	CBL ASSY: GROUND	02566-60213
21	SPRING, GNDING	02566-00262

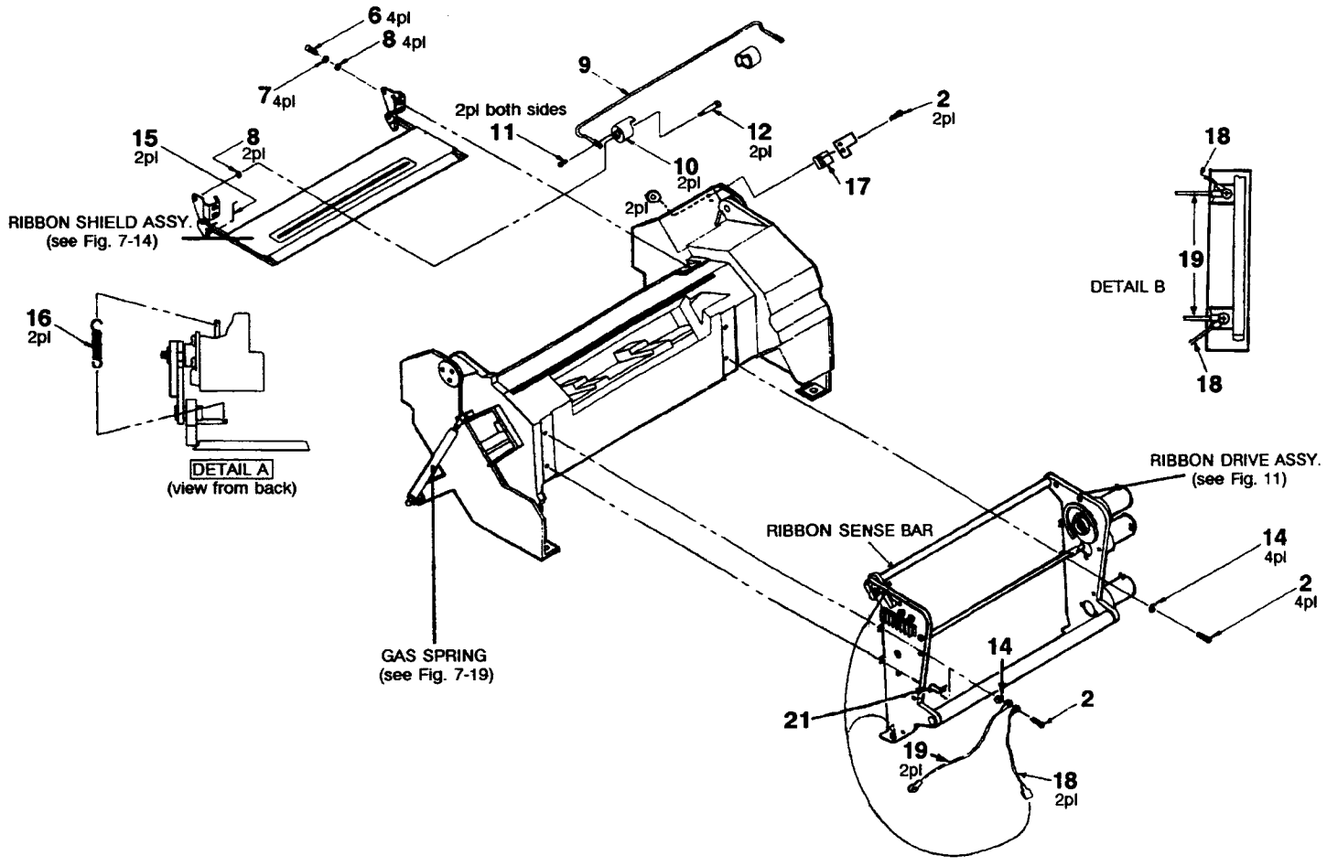
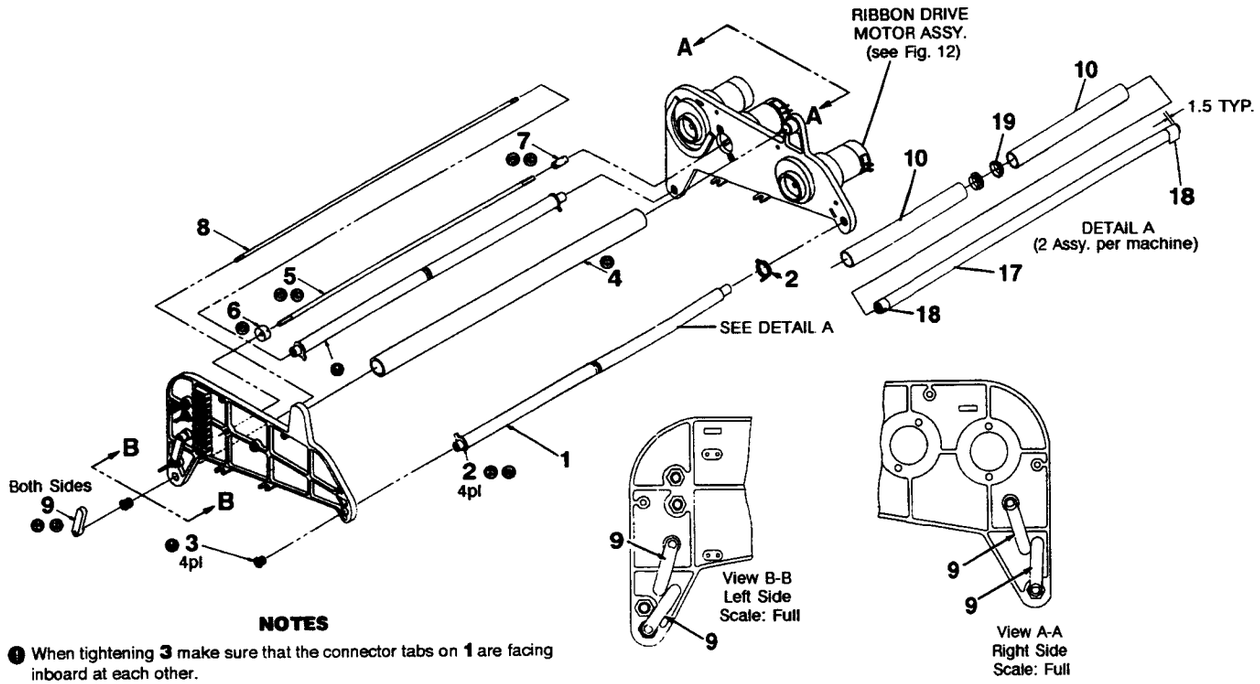


Figure 7-10. Ribbon Drive Assy. to Casting Ribbon Paper Shield

TABLE 11. RIBBON DRIVE ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
2	LUG: CONNECTOR	02566-20113
3	BSHG-PNL .265ID	1410-0721
4	HANDLE	02566-20054
5	SHAFT: DSKW DR	02566-20057
6	CAM: DESKEW	02566-20076
7	COUP: SHFT RIGID	1500-0664
8	SHAFT: DSKW SENS	02566-20056
9	LEVER: ACTUATOR ASSY.	02566-40065
10	SLEEVE, GUIDE	02566-20111
17	SPACER, THREADED	02566-20051
18	TAPE-ELEC .75 IN	0460-1621
19	WASHER, SHOULDER	02566-20112

3140-0676-1



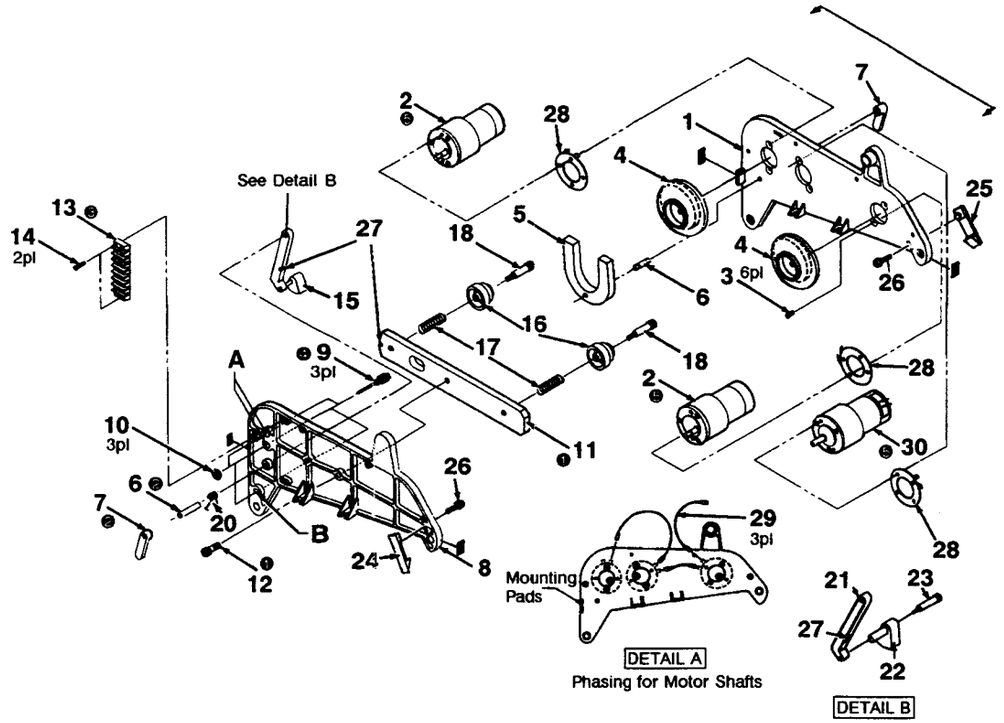
NOTES

1. When tightening **3** make sure that the connector tabs on **1** are facing inboard at each other.
2. To install **5**, **6**, and **7**, first adjust the set screws in **7** just enough to get the threads started. Slip **6** and **7** on to **5** making sure **6** is pushed on until it stops on shaft. Slide end of **5** into designated hole while fitting **6** into oval hole of deskew arm. Align flat of motor shaft to flat of **5** and slide **7** onto motor shaft just enough to cover all of flat of motor shaft and tighten 2 (set screws) on **7** onto motor shaft making sure that one screw tightens onto flat.
3. With **5** all the way to the left and flat of shaft and flat of motorshaft still aligned, pull **7** to left to take up play in motor shaft and tighten other 2 (set screws) on **7** to **5** in the same manner as note 2.
4. Note view A-A and B-B showing **9** on this sheet phasing with **8** of sheet 8.
5. Note **8** and **9** must be free to rotate.
6. Slide **2** onto **1** with tang facing inward, being careful not to cut thru tape.
7. Tabs on item **2** oriented as shown.
8. To install **4**, pull apart gussets and slip into place.

Figure 7-11. Ribbon Drive Assembly

TABLE 12. RIBBON DRIVE MOTOR ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
1	GUSSET: RBN DR R	02566-40012
2	RIBBON DRIVE MOTOR	02566-60448
3	SCR: 10-32 .375FL	2680-0116
4	HUB: RIBBON RIGHT	02566-40014
5	LEVER: FOLLOWER	02566-40007
6	SHAFT: SH FLATTED	02566-20077
7	LEVER: ACTUATOR	02566-40065
8	GUSSET: RBN DR LFT	02566-40013
9	ASSY: HALL EFFECT	02566-60197
10	NUT: HEX M8 X 1.2	0535-0045
11	RBBN: DSK ARM	02566-60225
12	SCR: SH10-24 X .37	3030-0231
13	BARR BLK: 7 POS	0360-1777
14	SCR-TPG 6-19 X .563	0624-0404
15	See Detail B, Figure 7-12	
16	HUB: RIBBON LEFT	02566-40006
17	SPNG CPRN 29MML	1460-2003
18	SCR: SHOULDER	3030-0969
20	SPRING: TORSION	02566-00244
21	DANCER ARM ASSY	02566-60240
22	PAWL: RBN DESKEW	02566-20083
23	SCR: SHLDR 10-24	3030-0949
24	LEFT COVER CLIP	02566-40046
25	RIGHT COVER CLIP	02566-40047
26	SCREW	0515-0875
27	MAGNET: DANCER ARM	9164-0204
28	SPACER, GROUND	02566-00263
29	CABLE ASSY, GROUND	02566-60317
30	RIBBON DESKEW MOTOR	3140-0676



NOTES

1. When tightening **12** to **11**, magnet should face gusset. Check for free movement of **11** so no binding occurs.
2. When installing **6**, **7**, and **15**, make sure **15** is between stop and bottom sensor **9**. The stop is part of moulding.
3. After installation of **13**, wire up **9** using detail **B**.
4. Top two sensors should face center of gusset. Bottom sensor faces toward edge with stop.
5. Orient **2** so that the shaft is at the bottom of the cutout of **1** when used as a drive motor (as viewed with print mech. closed), and at the top of the cutout when used as a skew motor.

Figure 7-12. Ribbon Drive Motor Assembly

TABLE 13. RIBBON DRIVE/PRINT MECH COVER

INDEX NO.	DESCRIPTION	HP PART NO.
1	CVR: RBN DR LWR	02566-00256
1a	CLOSER CLAMP	02566-00317
1b *	CLOSING BAR	02566-00316 **
1c	SCREWS	0515-0875
* CAUTION: Mounting the door closer bar backwards will result in sever damage to the lower left tractor drive shaft! Be sure to mount the larger radius loop toward the right as shown in detail (also, see note on page 7-6). ** NOTE: Before installing lower tractor closing bar, you must first measure the lower ribbon door, from the top of the door, around the bends, to the bottom edge of the door. If the measurement is 12 inches, install the closing door. If the door measures 12 and 7/8 inches, you must first order a new door (02566-00256) before installing the closing bar. If the ribbon door retaining clips have not been installed, you must install them as well. Order: Left Retaining Clip (02566-40046), Right Retaining Clip (02566-40047) and 2 screws (0515-0875). Figure 7-13 shows mounting of the closing bar.		
2	ASSY: RBBN CNTR	02566-60284
3	SCR: MCH M4 X 16 PZ	0515-1064
5	SPCR-RD 85MM LG	0380-1640
6	SPCR-RD 127MM LG	0380-1641
7	CVR: RBN DR UPR	02566-00255
8	LINK: HNG RB CVR	02566-00209
9	SPCR-RD 177MM LG	0380-1642
10	SCR-MCH M4 X 16 LG	0515-1014
11	CVR: L PRNT MECH	02566-40027
12	SCR: MCH M4 X 12 POZ	0515-0875
15	PCA: UPP TRCT CNT	02566-60021
16	CVR: R PRNT MECH	02566-40026
19	NUT: MS HEX	0535-0031
20	SCREW: M4 X 10 L	0515-0926
21	LATCH COVER	02566-00215
23	VELCRO KIT	02566-67913
24	LUG: HNDL GRND	02566-00226
25	SCR: ASSY M4	0515-1064
26	CBL AY: GROUND	02566-60213
27	CBL AY: GROUND	02566-60216
28	WSHR-LK EXT 3MM	2190-0597
30	PLATE: ROD SUPPORT	02566-00241
31	TAPE INDUSTRIAL RL	0460-1315
32	PLATE: ESD	02566-00229
33	USER LABEL	02566-00211
34	WSHR: M4 STAR LCK	2190-0599
35	TERM: QDISC-MALE	1251-8350
36	GAS SPRING 38LB	1530-2185
37	PAPER LOAD LABEL	02566-00194

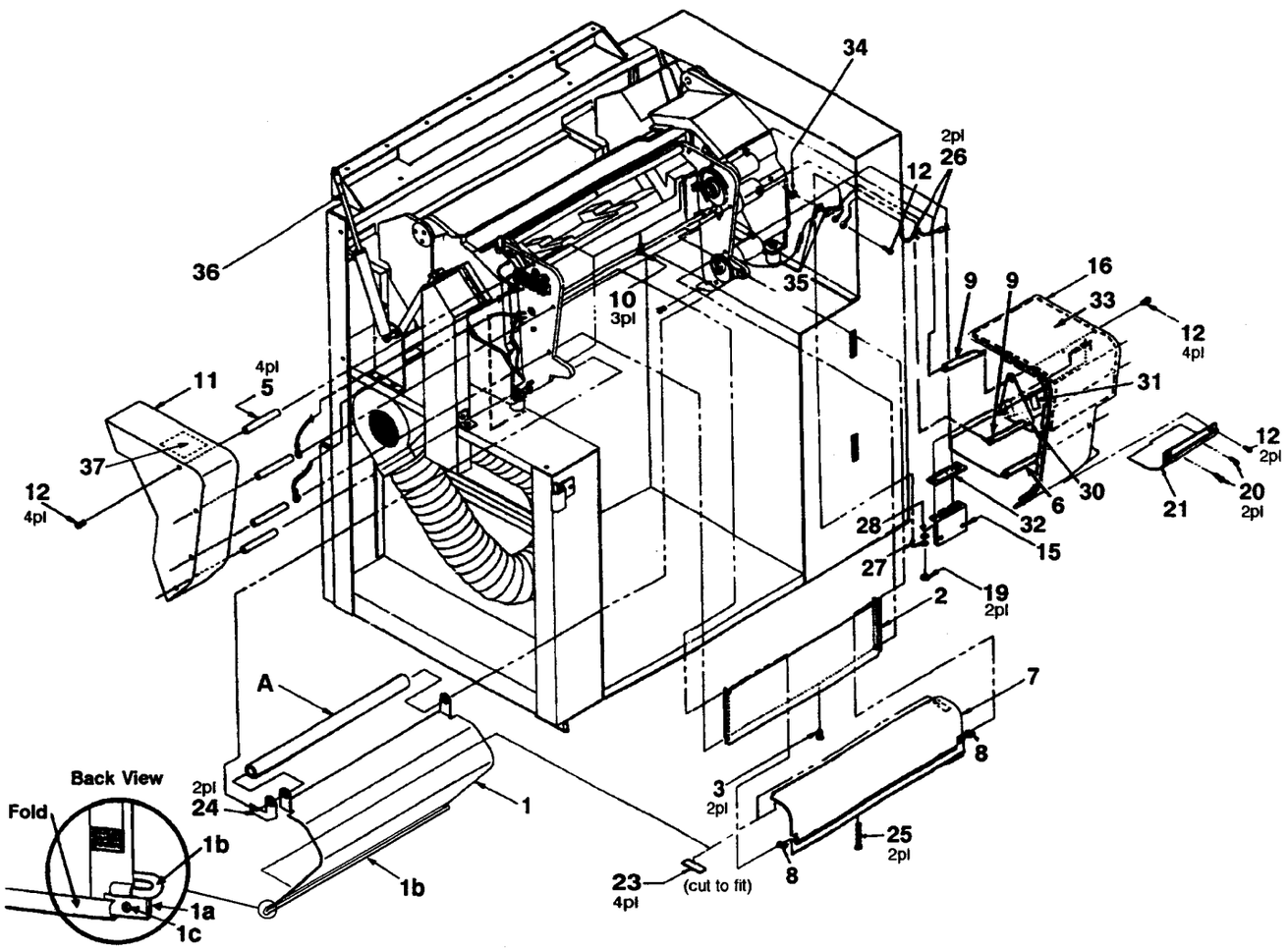


Figure 7-13. Ribbon Drive/Print Mech. Cover

TABLE 14. RIBBON SHIELD

INDEX NO.	DESCRIPTION	HP PART NO.
1	ASSY: SHIELD	02566-60318
2	SCR-MACH M2.5	0515-0922
3	WSHR: FL2.5 X 2.78	3050-0890
4	WSHR: LK HLCL 2.	2190-0583
5	PAPER SHIELD ARM ASSY	02566-60224
6	LEFT MOUNT BRACKET	02566-00106
7	BRACKET: RIBBON MOTOR	02566-00107
8	SCR: M5 X 16 SHCS	0515-0496
9	WSHR: M5 SPL LOC	2190-0587
10	WSHR: M5 FLAT	3050-0894
16	SPNG FXT 1IN LG	1460-1207

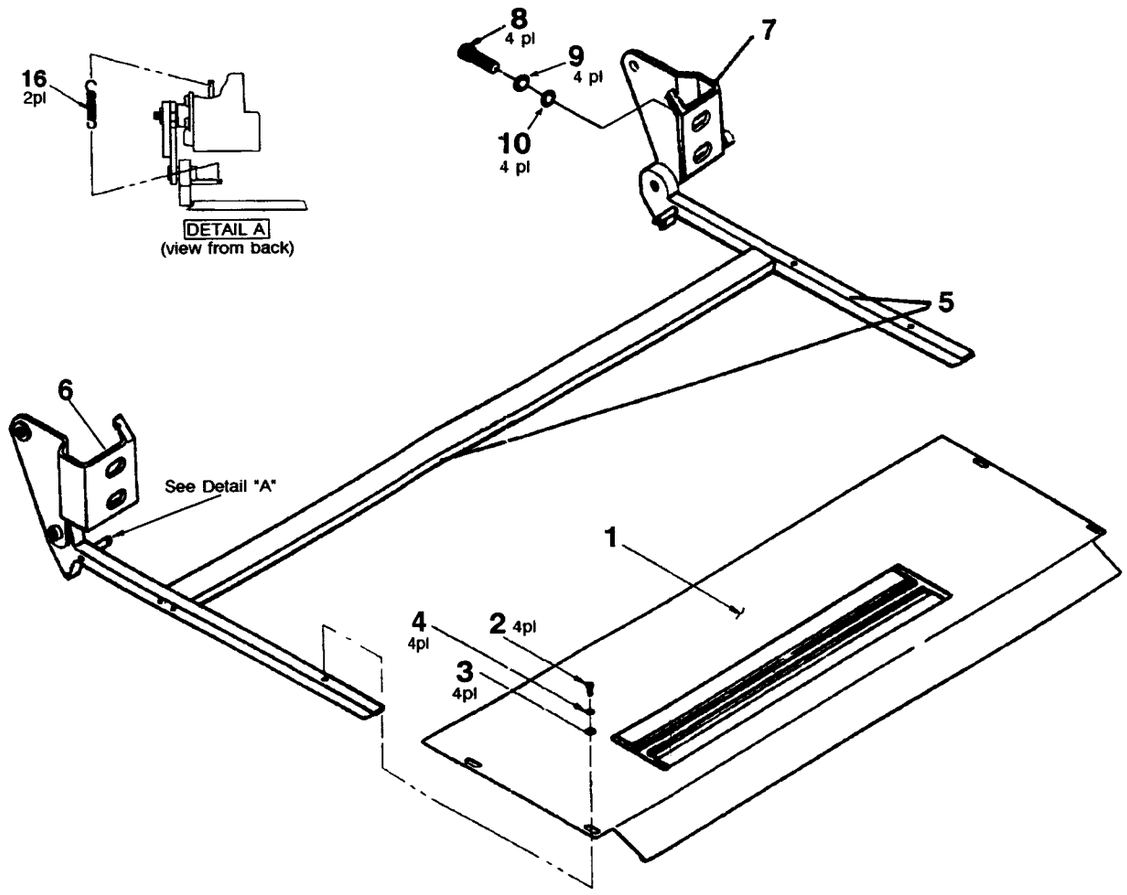


Figure 7-14. Ribbon Shield

TABLE 15. PRINT MECH ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
2	ASSY: PRT BR MECH	02566-60010 (2)
3	SCR: M6 X 25 SHCS	0515-1744
4	SCR: M6.O X 60MM LG	0515-1284
5	SCR: M6 X 1.O X 45MM	0515-1283
5.5	SCR: M6 X 25 SHCS	0515-1281
6	CLP-CA .188-DIA	1400-0291
7	SCR: M4 X 12 SHCS	0515-1834
9	WSHR: M4 FLAT	3050-0659
10	ASSY: VELOCITY/W 10A	02566-60335 (1)
12	VEL XDUCER CLAMP	02566-20021
17	KEY-WOODRUFF	1500-0674
18	HNDL: PLT GAP ADJ	02566-20161
19	RTNR-R BSC EXT	0510-0511
20	SCR: SET M4 X 6 HEX	0515-0096
25	ROD: PLATEN ADJUST	02566-20131
26	PLUNGER: SPRING II	02566-60346
27	PLUNGER NUT	0535-0047
28	WASHER: FELT II	3050-1311
29	LABEL: FORM THICKNESS	02566-00338
* 30	TOF LABEL	02566-00223

(1) Complete Assembly. Velocity Transducer Coil & Magnet
(2) Exchange P/N: 02566-69010
* Not shown

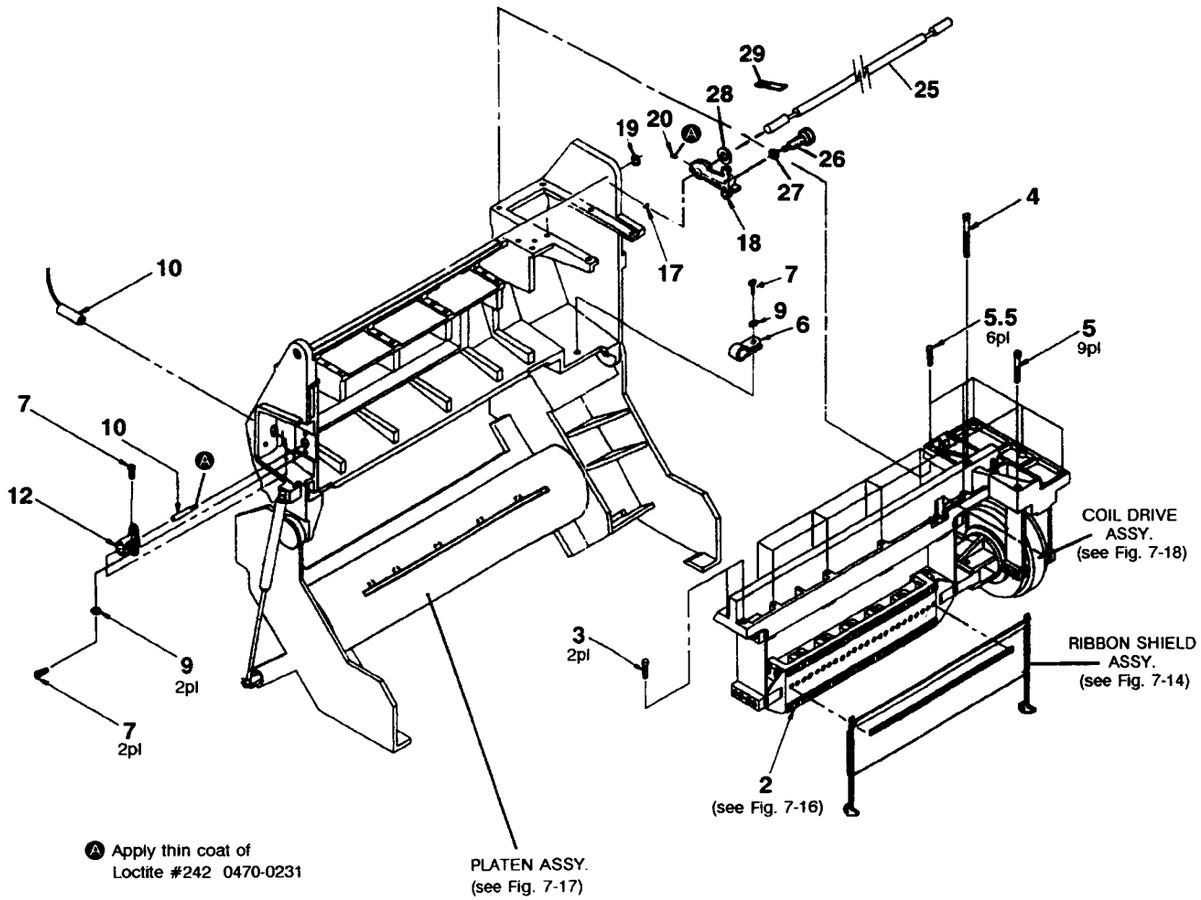


Figure 7-15. Print Mech. Assembly

TABLE 16. PRINT MECH PRINTBAR AND DRIVE COIL

INDEX NO.	DESCRIPTION	HP PART NO.
4	SCR: M6 X 25 SHCS	0515-1281
10	ASSY: PRINT BAR	02566-60010 (1)
15	SCR: SHLDR M6	0515-1100
16	END CAP RISER	02566-40043
17	SCR: MACH M4 X 0.7	0515-1138
(1) Exchange P/N: 02566-69010		

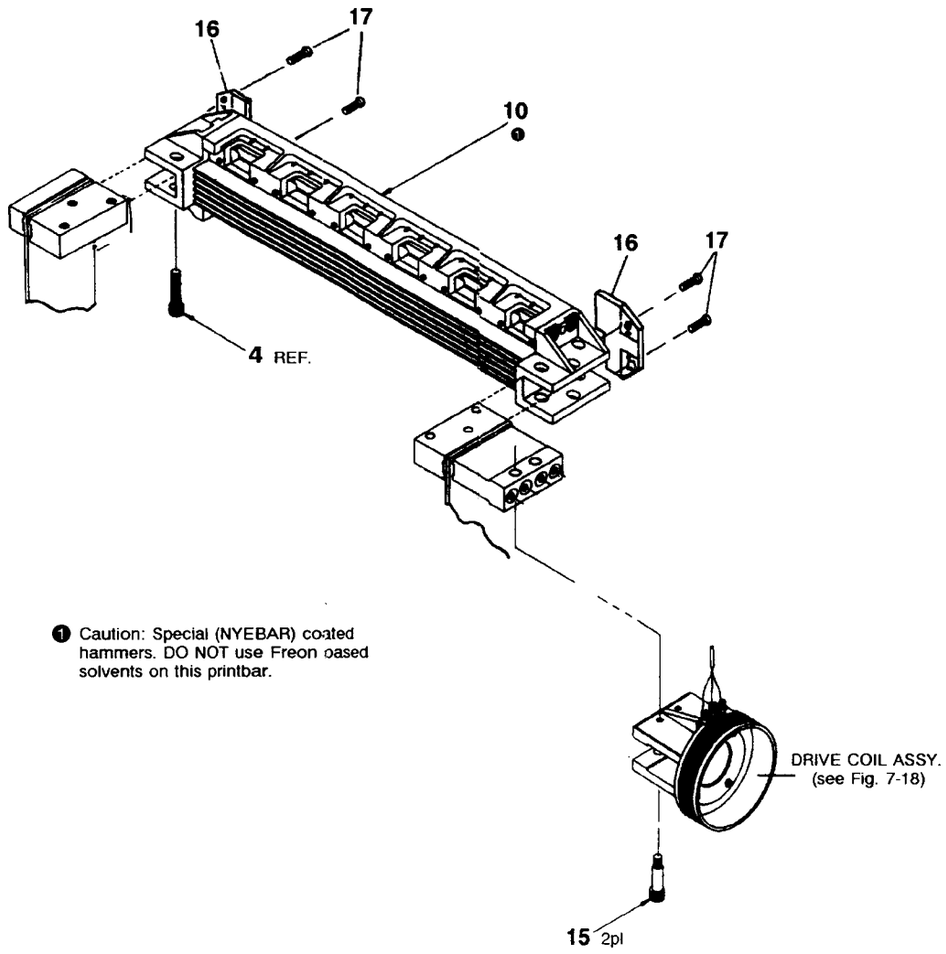


Figure 7-16. Print Mech. Printbar and Drive Coil

TABLE 17. PLATEN ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
1	PLATEN/GUIDE ASSY	02566-60245
9	SCR: M5 X 16 SHCS	0515-1962
10	SPRNG-CPRSN .75"	1460-1748

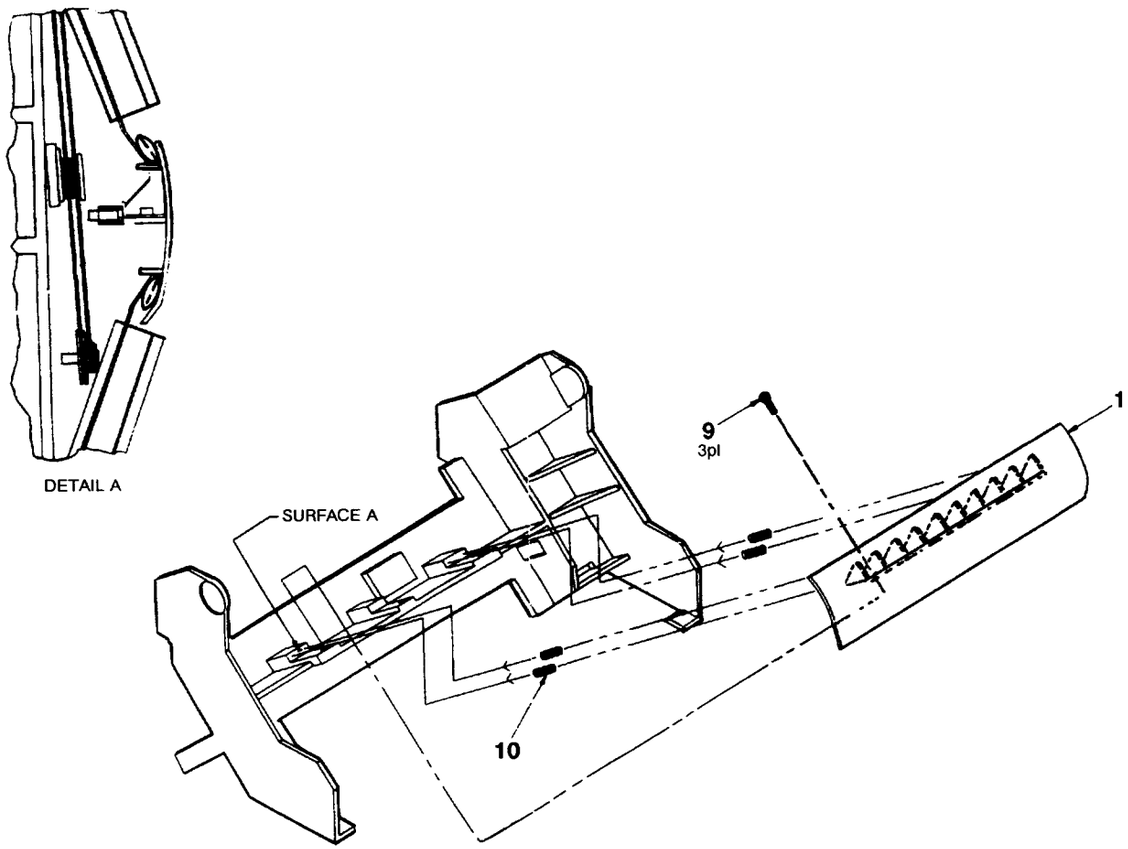


Figure 7-17. Platen Assembly

TABLE 20. PAPER TRACTOR ASSEMBLY (continued)

INDEX NO.	DESCRIPTION	HP PART NO.
1	MOTOR: STEPPER ASSY	02566-60314
2	WSHR: M5 SPL LOC	2190-0587
3	SCR: M5 X 16 SHCS	0515-0497
12	ASSY: SHFT JRNL AND BEARING	02566-60219
13A 13B 13C 13D	GUARD: COLLAR (> 2714) PHASING ADJUST PLATE (> 2714) CAM: ADJUSTER (> 2714) SCREW M4 X 12	02566-00336 02567-20017 02567-20018 0515-0119
33	BRACKET: BRAKE	02566-00175
40	CAST II BRAKE BLOCK	02566-20159
41 41A 41B	ROD RELEASE SPRING RETURN SCREW M3 X 10 SHCS	02566-20123 02566-00003 0515-0483
42	SPRING TORSION R	02566-00242
43	SPRING TORSION L	02566-00243
44	LATCH	02566-40075
45 45A 45B 45C 45D 45E 45F 45G	RELEASE ARM RELEASE ARM STOP NUT M5 HEX SCREW M4 X 0.7 NUT M4 HEX SCREW M5 X 0.8 WASHER WASHER	02566-20125 02566-20090 0535-0077 0515-0246 0535-0006 0515-0495 2190-0587 3050-0894
46 46A 46B	HANDLE RELEASE SCREW M5 X 0.8 WASHER M5 SPL LOC	02566-20124 0515-0496 2190-0587
47	RING, RETAINING	0510-0080

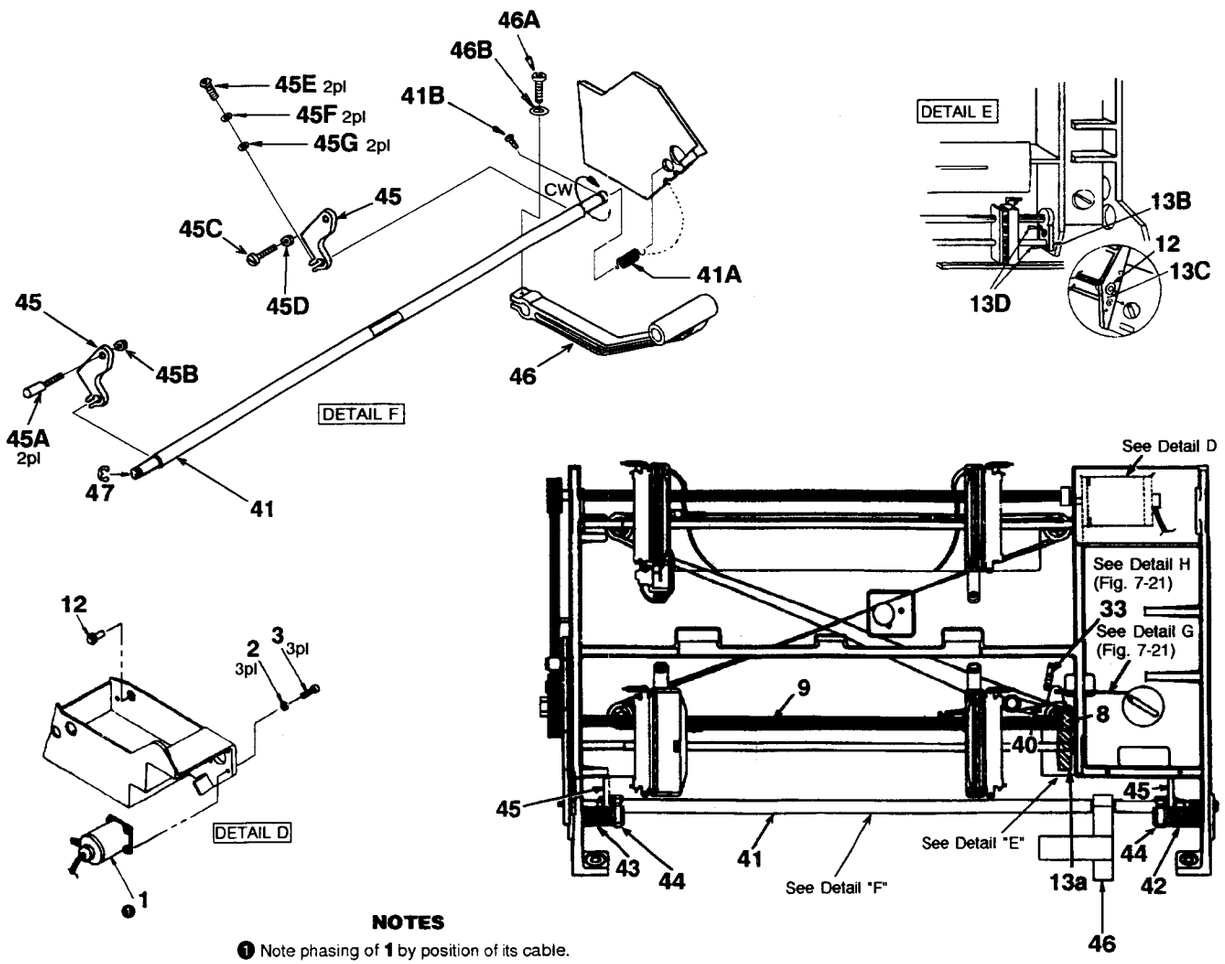


Figure 7-20. Paper Tractor Assembly (continued)

TABLE 21. PAPER TRACTORS, PAPER MOTION AND PAPER OUT SENSORS, AND LOWER TRACTOR CONTROL ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
1	COVER: SWITCH	02566-00011
2	PCA: LWR TRCT CNT	02566-60020
5	NUT: M3 HEX	0535-0031
6	ASSY: TOP LF TRCT	02566-60348
7	ASSY: PAPER OUT SW	02566-60361
8	ASSY: PAPER MOTION	02566-60351
9	SW: INT LK SPDT	3101-2650
10	ASSY LWR LF TRCT	02566-60347
11	SCR-SKT-BTN-CAP	0515-0320
12	KNOB: SELECT	02566-40024
13	LINKAGE: KNOB	02566-00100
14	CAST II BRAKE BLOCK	02566-20159
15	SCREW, POZ 4-20 X .25"	0624-0333
16	BRACKET, BRAKE	02566-00175
17	PAD, BRAKE	02566-40039
18	SCREW	0515-1009

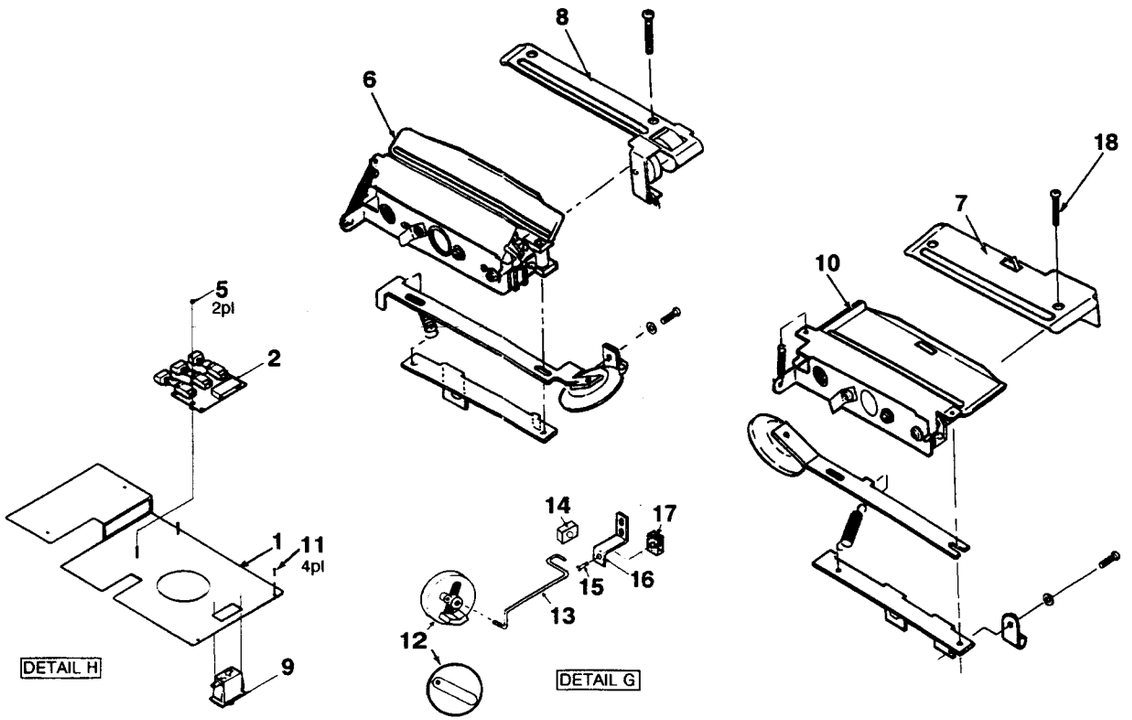
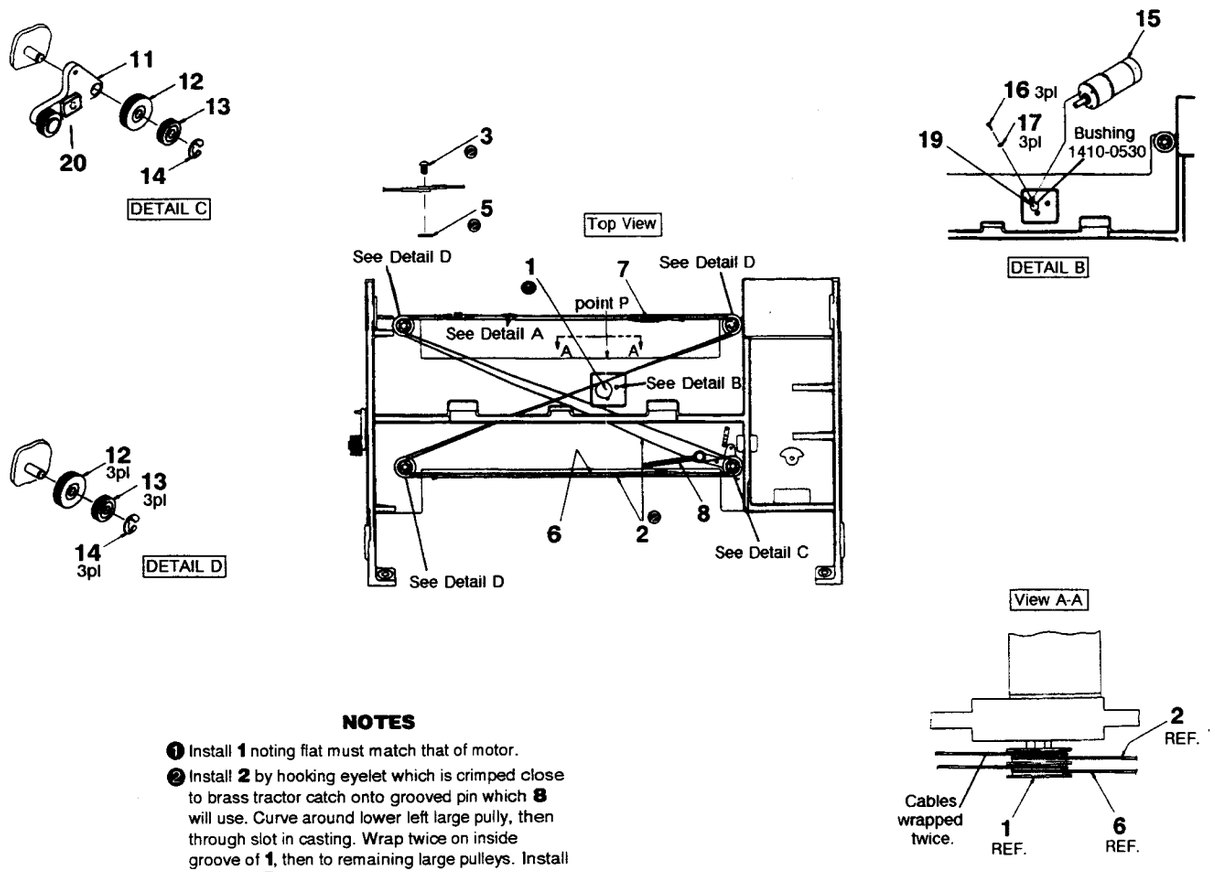


Figure 7-21. Tractors, Paper Motion and Paper Out Sensors and Tractor Control Assembly

TABLE 22. PAPER TRACTOR CABLE, IDLER ARMS, AND PULLEYS

INDEX NO.	DESCRIPTION	HP PART NO.
1	PULLEY: DRIVER	02566-20037
2	CBL ASSY: LONG	02566-60316
3	SCR-MACH M4 X 0.7	0515-0915
5	NUT: M4 HEX	0535-0076
6	CBL ASSY: SHORT	02566-60315
7	SPRING-EXT .75 LG	1460-0648
8	SPNG-EXT 2-IN-L	1460-1323
11	ASSY: IDLER	02566-60220
12	ASSY: LRG PULLEY	02566-60218
13	ASSY: SM/PULLEY	02566-60217
14	RTNR-R E-R EXT	0510-0235
15	MOTOR: DC GEAR	3140-0839
16	SHDCSCR 4-40 X .7	3030-0721
17	WSHR-LK HLCL #4	2190-0003
19	BEARING SLEEVE	1410-0530
20	CAST II BRAKE BLOCK	02566-20159



NOTES

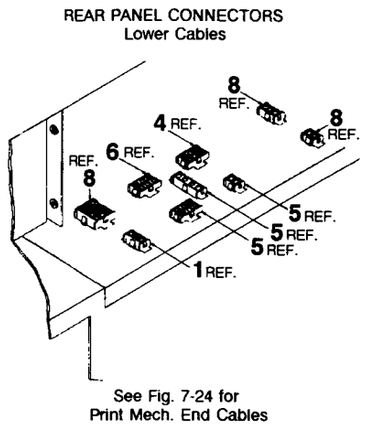
❶ Install **1** noting flat must match that of motor.

❷ Install **2** by hooking eyelet which is crimped close to brass tractor catch onto grooved pin which **8** will use. Curve around lower left large pully, then through slot in casting. Wrap twice on inside groove of **1**, then to remaining large pulleys. Install **3**, **4** and **5** to join eyelets together. Slide cable to left so catch is 3 inches from pulley.

Figure 7-22. Paper Tractor Cable, Idler Arms and Pulleys

TABLE 23. CABINET CABLING

INDEX NO.	DESCRIPTION	HP PART NO.
1	CBL. SERVO XDUCER	02566-60148
2	CBL: FAN	02566-60297
3	CBL: HMR DRVR PW	02566-60160
4	CBL: MTR DRVR, SKEW POSITION	02566-60151
5	CBL: MTR DRVR, RIBBON SENSE	02566-60149
6	CBL: MTR DRVR, STEPPER MOTOR	02566-60150
7	CBL: HMR DRVR RIBBON	02566-60287
8	CBL: POWER SUPPLY SENSORS	02566-60155
9	CLIP: CABLE	1400-0611
10	CBL: PPS STEPPER MOTOR	02566-60400



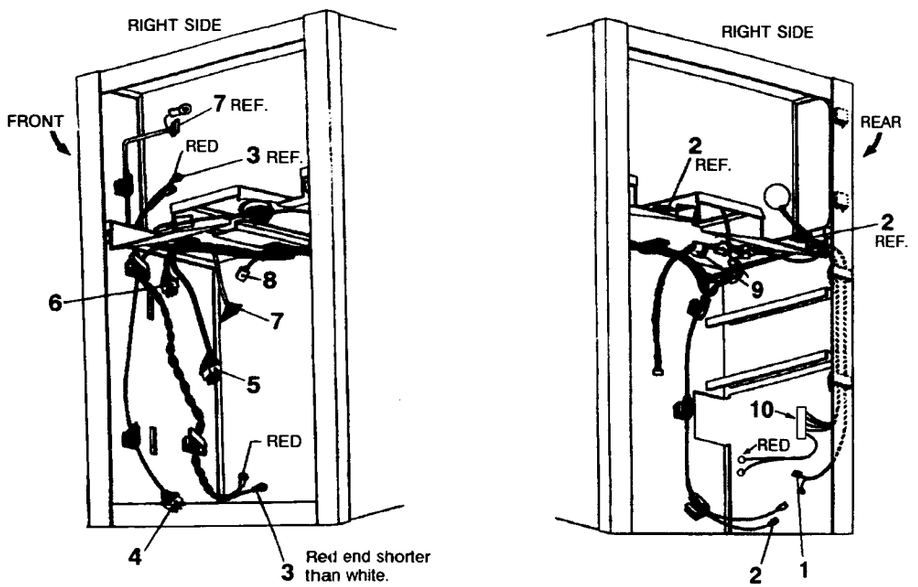


Figure 7-23. Cabinet Cabling

TABLE 24. CABINET CABLING, REAR PANEL

INDEX NO.	DESCRIPTION	HP PART NO.
1	CABLE ASSY: RBN DRV	02566-60112
2	CABLE: ASSY LINEAR MT	02566-60119
3	WSHR: M4 STAR LCK	2190-0599
4	NUT: M4 HEX	0535-0076
5	CABLE: SKEW POSITION	02566-60153
6	CABLE: RIBBON SENSE	02566-60156
7	CABLE CLIP 1.25 X .5	1400-1235
11	TAPE: POLYU FOAM	0460-1315
12	CABLE: PPS STEPPER MOTOR	02566-60400

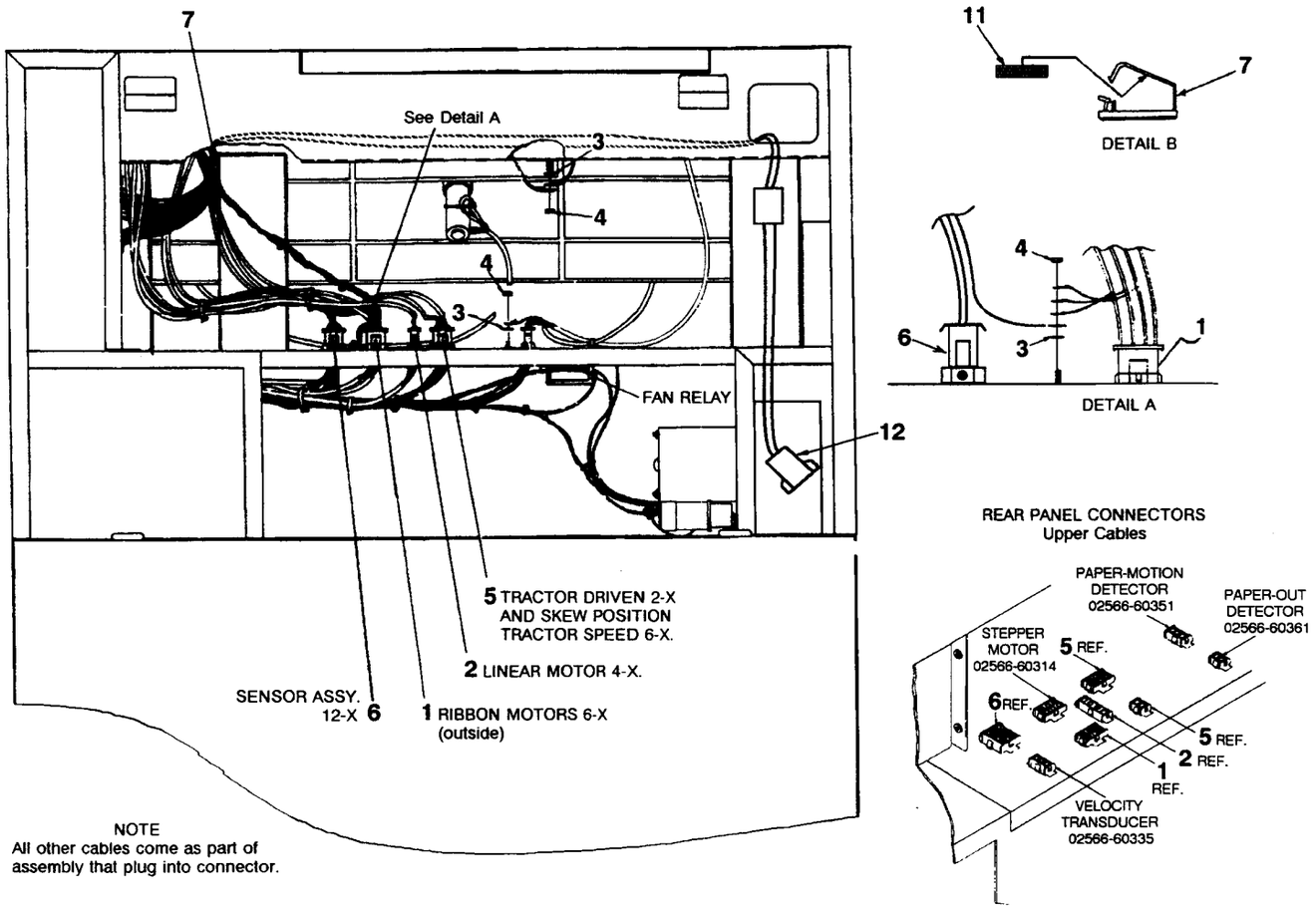


Figure 7-24. Cabinet Cabling, Rear Panel

TABLE 25. PRINTBAR CABLING

INDEX NO.	DESCRIPTION	HP PART NO.
1 1A 1B 1C	CBL: PRINTBAR PRINTBAR RETAINER BRACKET GOURMNET FASTENER PLUNGER	02566-60280 02566-00253 1390-0104 1390-0281
2	SCR-MACH M4 X 1O LG	0515-0926
4	BRKT: RMP CBL MTG	02566-00210
5	SCR: SKT M4 X 1O SHC	0515-1834
7	CBL CLIP 1.25 X .5	1400-1235
8	TAPE: POLYU FOAM	0460-1315
9	BRACKET: CBL RET	02566-00225

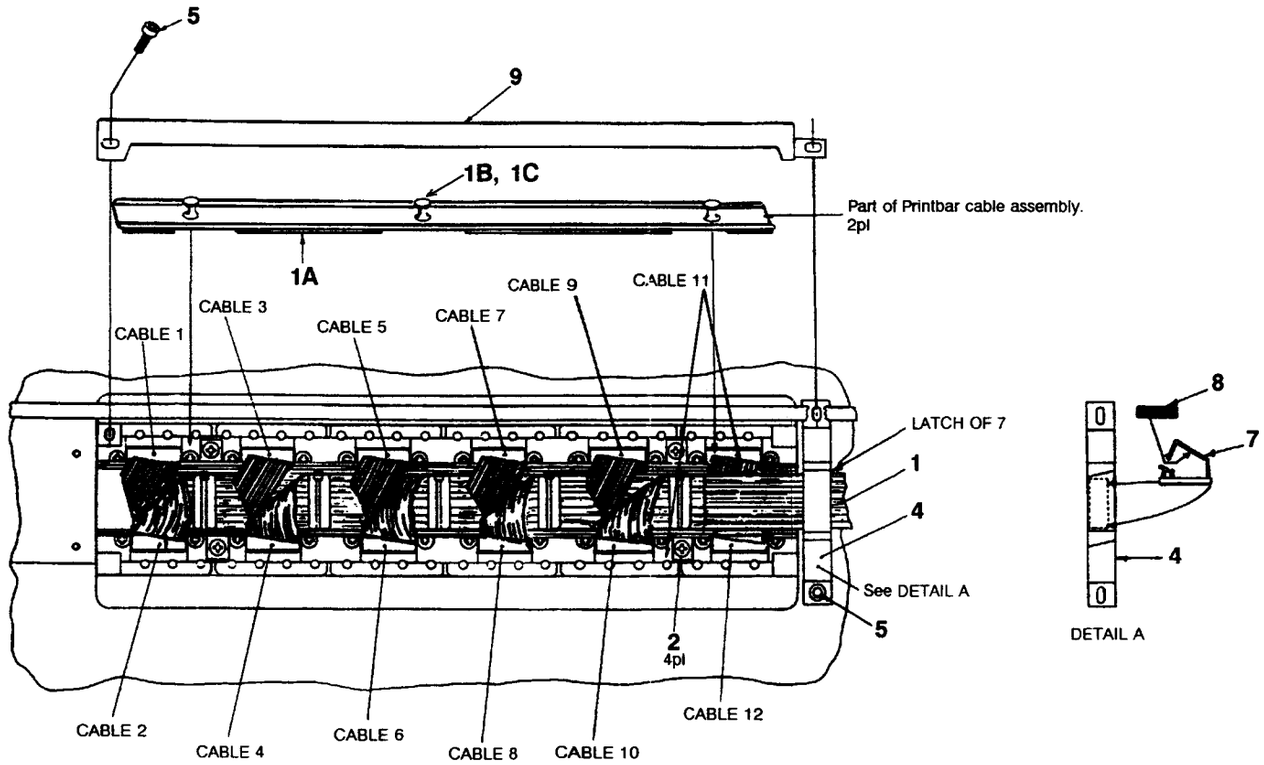


Figure 7-25. Printbar Cabling

TABLE 26. SOUND SHROUD AND PAPER STACKER

INDEX NO.	DESCRIPTION	HP PART NO.
1	SHROUD, SOUND	02566-60199
2	UPPER ASSY	02566-60196
3	PANEL, BASE SUPPORT	02566-00183
4	SUPPORT, BASE	02566-00014
5	BASE ASSEMBLY	02608-60233
6	PIVOT	02608-40067
7	SCREW, PIVOT	2360-0193
8	PAPER TRAY	02566-00093

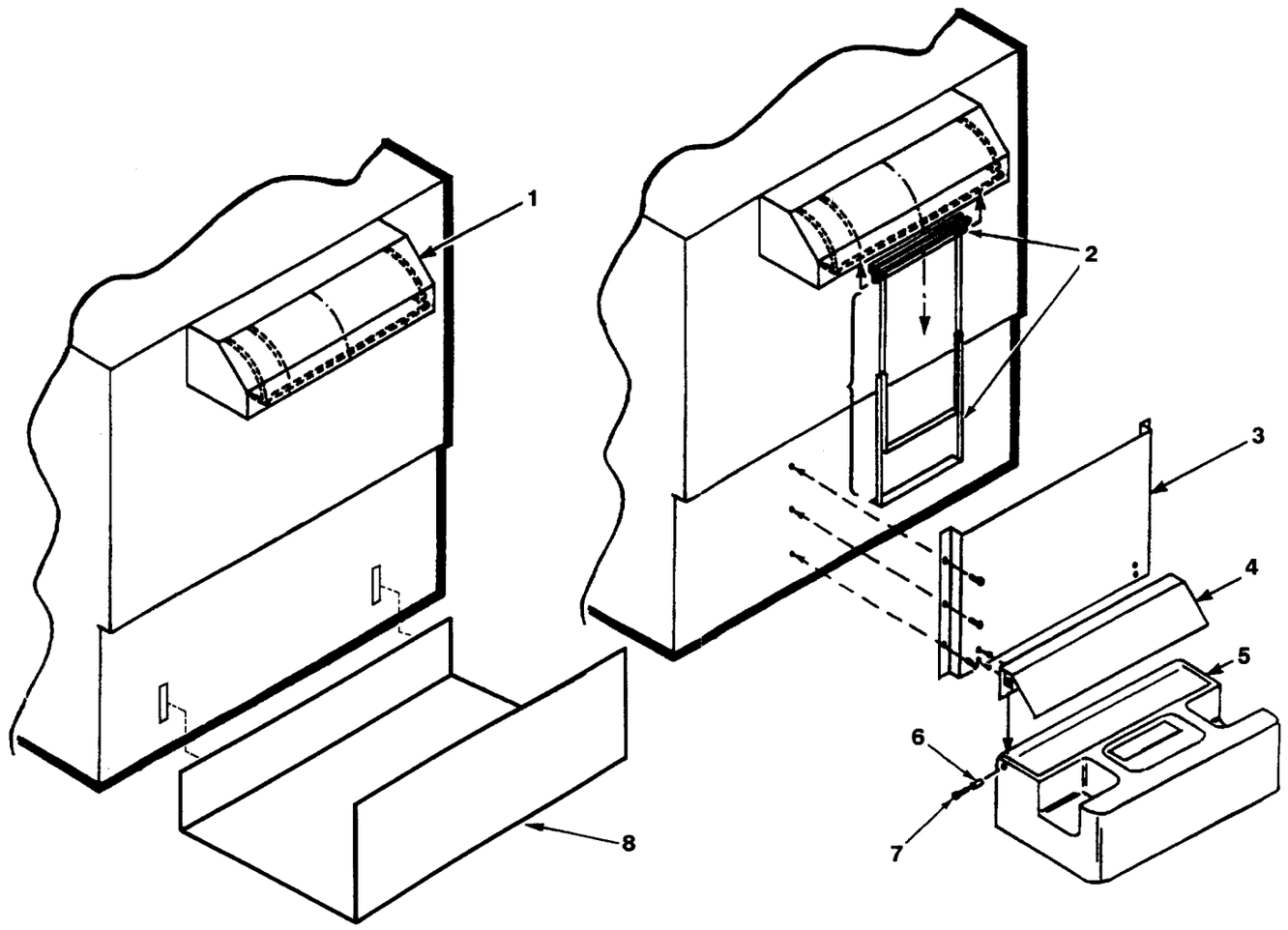


Figure 7-26. Sound Shroud and Paper Stacker

TABLE 27. POWERED PAPER STACKER MAIN ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
10	BACKSTOP, WIREFORM	02566-00381
11	GUIDE, LEAD	02566-00388
24	SCREW, MACH M4 X LG	0515-0910

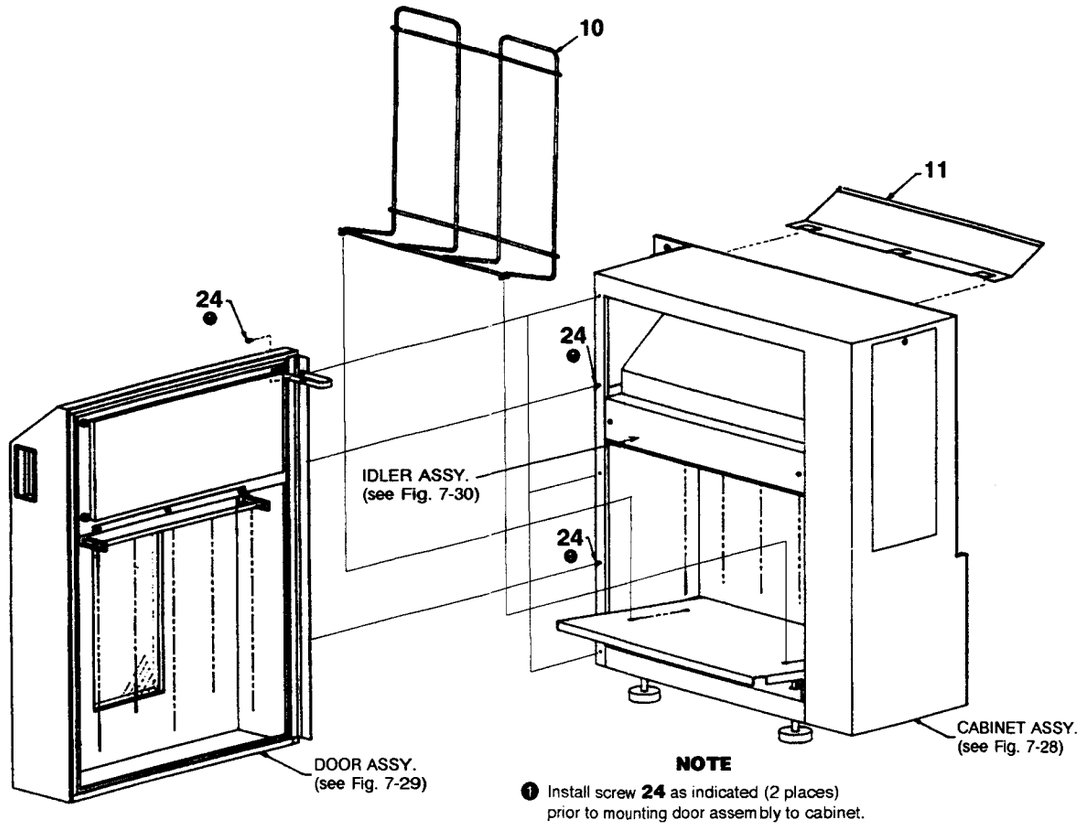


Figure 7-27. Powered Paper Stacker Main Assembly

TABLE 28. POWERED PAPER STACKER CABINET ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
3	IDLER COVER ASSY	02566-60419
4	PULLER SHAFT ASSY	02566-60399
5	MOTOR ASSY	02566-60414
14	COLLAR SPLIT	0510-0611
15	BEARING	1410-0170
16	LEVELER FOOT	0403-0290
17	LEVELER NUT	2950-0133
18	GROMMET, TRACK	0400-0018
19	NUT 1/4 TURN	1390-0091
21	WEAR WASHER 1/4 TURN	1390-0071
22	RETAINER, 1/4 TURN	1390-0088
23	SLIDE, CHASSIS	1494-0085
24	SCREW, MACH M4 X 8 LG	0515-0910
25	SCREW, SEMS M4 X 12 LG	0515-0875
26	SCREW, SKT HD FL M5X	0515-1962
28	NUT. HEX M5	0535-0077
29	WASHER FLAT	3050-0659
35	BUMPER	0403-0061
36	NUT, HEX W/L WASHER M4	0535-0076
38	SCREW, MACH M4 X 12 LG	0515-0909

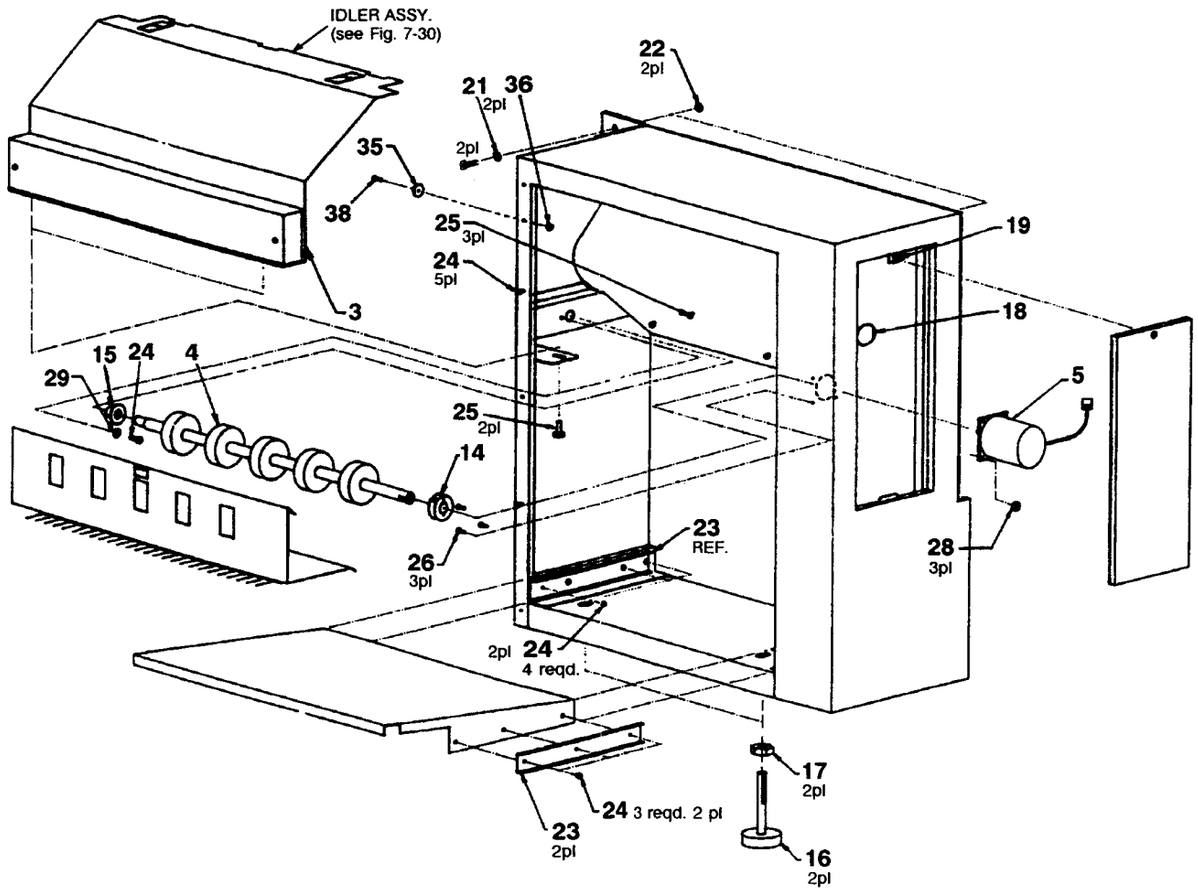


Figure 7-28. Powered Paper Stacker Cabinet Assembly

TABLE 29. POWERED PAPER STACKER DOOR ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
2	DOOR ASSEMBLY	02566-60423
2	DOOR ASSEMBLY, NL	02566-60443
12	BRACKET, CHAIN ADJ	02566-00389
13	BRACKET, CHAIN MTG	02566-00390
27	SCREW, SELF TAP 6-20	0624-0667
30	WASHER, LOCK M3	2190-0414
31	BALL, CHAIN	1530-0070
	BEAD CHAIN REPLACEMENT KIT	02564-60236
NL: NEW LOOK		

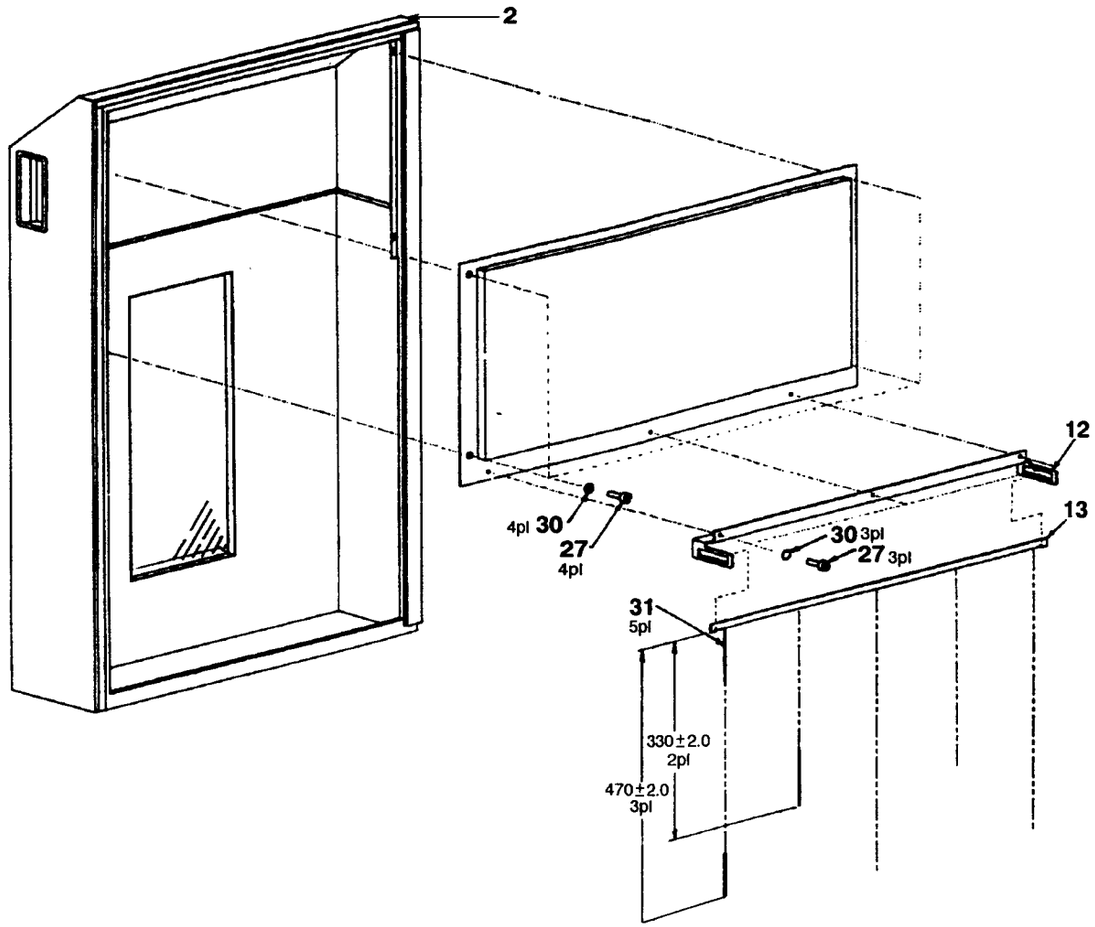


Figure 7-29. Powered Paper Stacker Door Assembly

TABLE 30. IDLER ASSEMBLY

INDEX NO.	DESCRIPTION	HP PART NO.
3	ROLLER, IDLE	02566-40089
	RETAINING RING	0510-0080
4	STATIC BRUSH	02566-00362
5	CLAMP, STAT BRUSH	02566-00366
6	BEARING SLEEVE	1410-1037
7	RETAINING RING	0510-0235
8	SPRING, EXT	1460-2270
9	SCREW M4 X 12 LG	0515-0875
10	SCREW, SELF TAP 6-20	0624-0667
11	WASHER, EXT	2190-0414

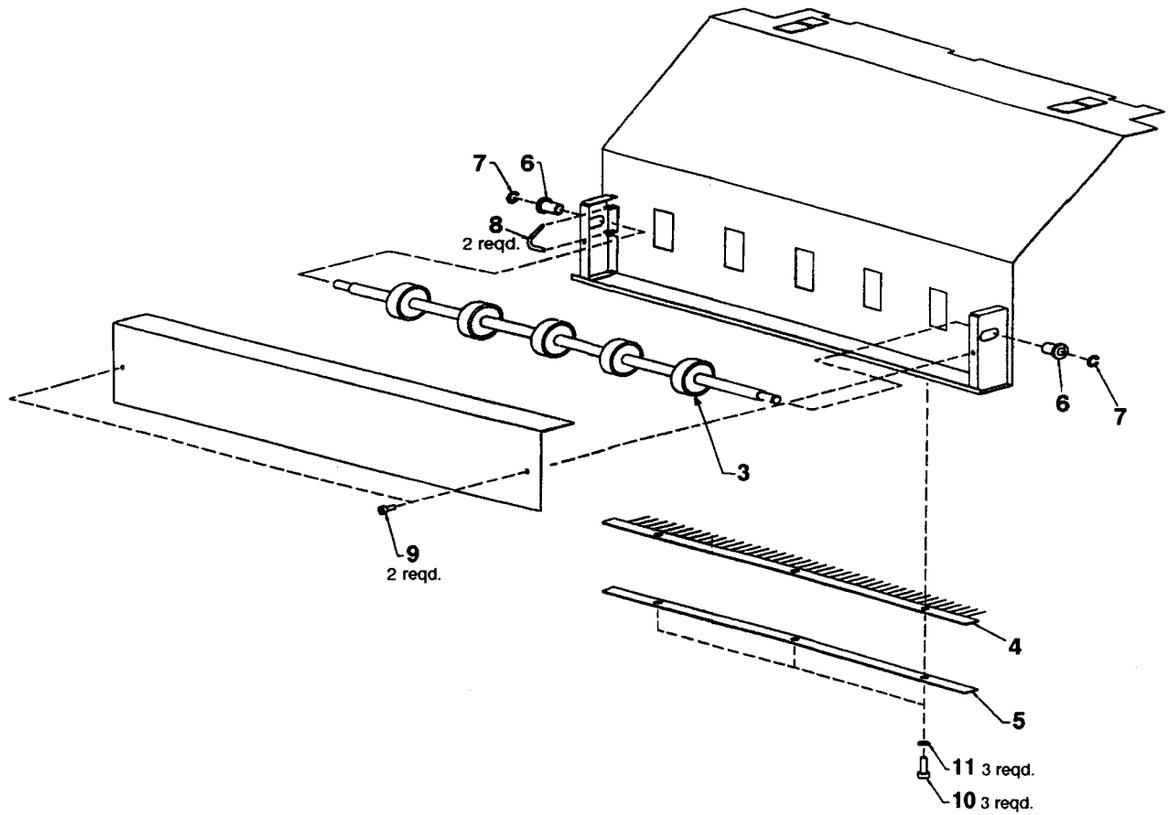


Figure 7-30. Idler Assembly

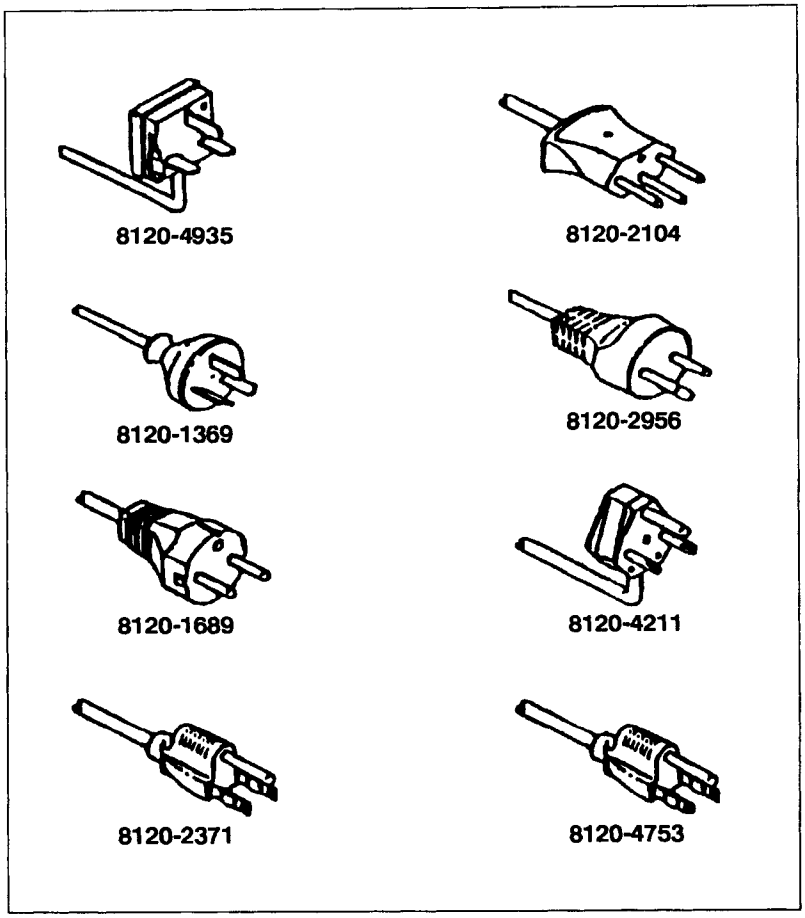


Figure 7-31. Power Cables

Appendix A

Wiring Diagram and Signal Tables 2566B/C 2567B/C

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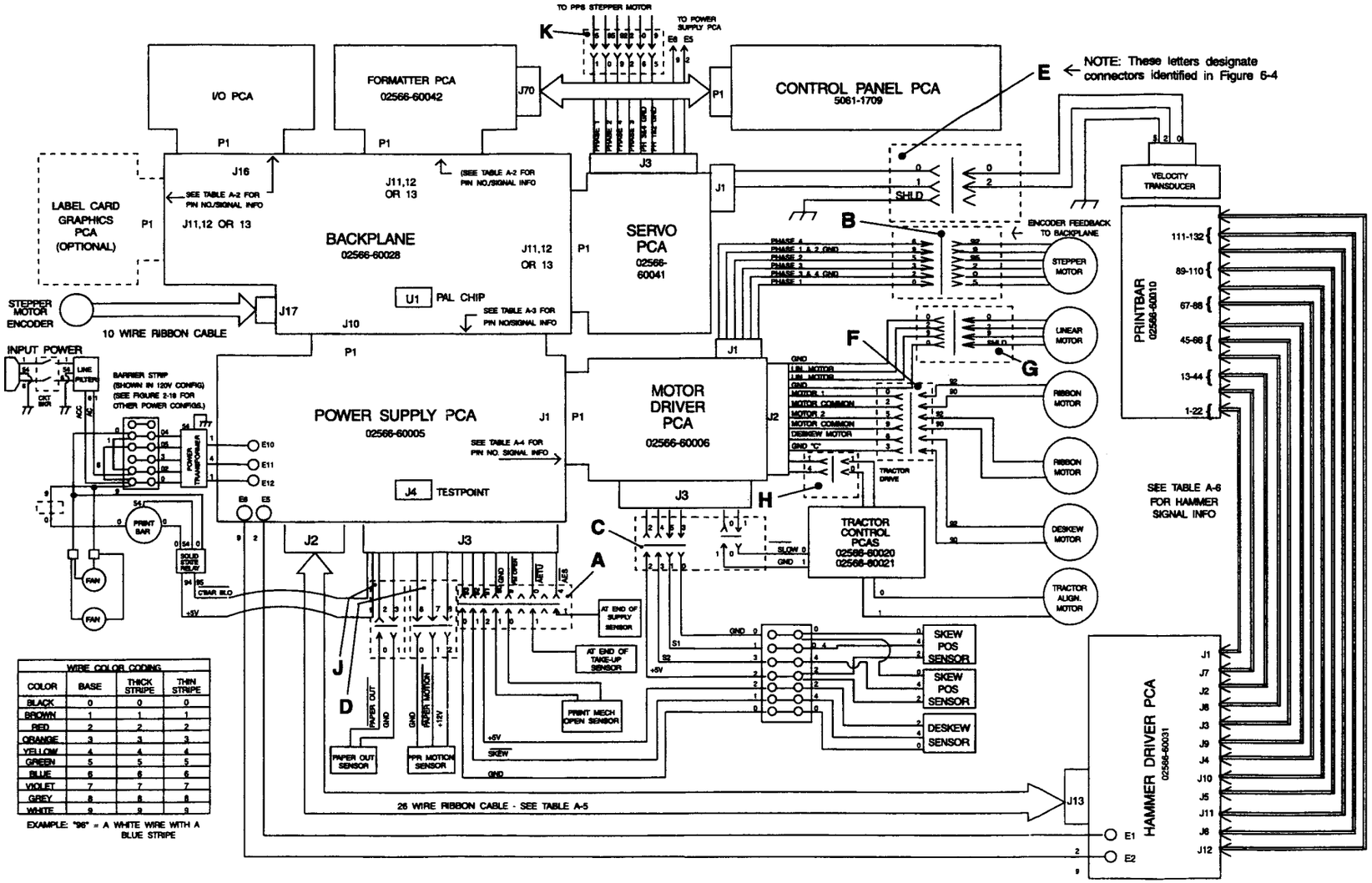

COLOR	BASE	THICK STRIPE	THIN STRIPE
BLACK	0	0	0
BROWN	1	1	1
RED	2	2	2
ORANGE	3	3	3
YELLOW	4	4	4
GREEN	5	5	5
BLUE	6	6	6
VIOLET	7	7	7
GREY	8	8	8
WHITE	9	9	9

Figure A-1. Service Wiring Diagram

WIRING DIAGRAM AND SIGNAL TABLES

This section contains a wiring diagram for usage in diagnostics and troubleshooting of the HP 2566B/2567B. The diagram shows all the PCAs, sensors and motors as well as some other major components of the printer. Where space allows, the diagram also shows what signal is carried by each wire, along with the wire color (in numerical code). Signal information for ribbon cables and multiple pin connectors is contained in the signal tables immediately following the diagram, and those tables are referenced on the diagram where applicable.

CONTENTS

Description	Page
Figure A-1 - Printer Service Wiring Diagram	A-3
Table A-1 - Signal Info: Formatter PCA to Control Panel	A-6
Table A-2 - Signal Info: Backplane to Formatter PCA	A-7
Table A-3 - Signal Info: Backplane PCA to Power Supply PCA	A-8
Table A-4 - Signal Info: Power Supply PCA to Motor Driver PCA	A-10
Table A-5 - Signal Info: Power Supply PCA to Hammer Driver PCA	A-11
Table A-6 - Signal Info: Hammer Driver PCA to Printbar	A-12

Table A-1. FORMATTER PCA, J70 TO CONTROL PANEL PCA, P19

PIN	SIGNAL	PIN	SIGNAL
01	+5V	14	FD1
02	-FPW0	15	+5V
03	GND	16	FD2
04	-FPW1	17	GND
05	+5V	18	FD3
06	-FPW2	19	+5V
07	GND	20	FD4
08	-FPR0	21	GND
09	+5V	22	FD5
10	GND	23	GND
11	+5V	24	FD6
12	FD0	25	RESETF
13	GND	26	FD7

Table A-2 BACKPLANE PCA, J-13 TO FORMATTER PCA, P-19

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
01	+5V	21	-IOREQS	41	A12
02	+5V	22	-MEMREQS	42	A13
03	+5V	23	-RESET	43	A14
04	+5V	24	-INTMAS	44	A15
05	-PAPER ADV	25	CLOCK	45	S0
06	VSERVO	26	-WAIT	46	S1
07	+12V	27	-RD	47	S2
08	+12V	28	-WR	48	S3
09	-12V	29	A0	49	D0
10	-12V	30	A1	50	D1
11	GND	31	A2	51	D2
12	GND	32	A3	52	D3
13	GND	33	A4	53	D4
14	GND	34	A5	54	D5
15	SCLOCK	35	A6	55	D6
16	SPARE	36	A7	56	D7
17	-FIRE	37	A8	57	-INTACK
18	-NMI	38	A9	58	-POLACK
19	HR DATA	39	A10	59	-IOREQX
20	-LOAD	40	A11	60	-MEMRQX

Table A-3. BACKPLANE PCA, J10 TO POWER SUPPLY PCA, P19

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
01	VSERVO	21	A5	41	D5
02	TCLOCK	22	A6	42	D6
03	SPARE	23	A7	43	D7
04	-FIRE	24	A8	44	-INTACK
05	-NMI	25	A9	45	-POLACK
06	HR DATA	26	A10	46	-MEMREQ1
07	SPARE	27	A11	47	-MEMREQ2
08	-IOREQ	28	A12	48	-MEMREQ3
09	-MEMREQ	29	A13	49	-MEMREQ4
10	-RESET	30	A14	50	-MEMREQ5
11	-INTMAS	31	A15	51	-MEMREQ6
12	CLOCK	32	S0	52	SPARE
13	-WAIT	33	S1	53	-IOREQ1
14	-RD	34	S2	54	-IOREQ2
15	-WR	35	S3	55	-IOREQ3
16	A0	36	D0	56	-IOREQ4
17	A1	37	D1	57	-IOREQ5
18	A2	38	D2	58	-IOREQ6
19	A3	39	D3	59	SPARE
20	A4	40	D4	60	SPARE

Table A-3. BACKPLANE PCA, J10 TO POWER SUPPLY PCA, P19 (continued)

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
61	+12V	76	GND	90	+5V
62	+12V	77	GND	91	+5V
63	+12V	78	GND	92	+5V
64	+12V	79	GND	93	+5V
65	-12V	80	GND	94	+5V
66	-12V	81	GND	95	+5V
67	-12V	82	GND	96	+5V
68	-12V	83	GND	97	+5V
69	GND	84	GND	98	+5V
70	GND	85	GND	99	+5V
71	GND	86	GND	100	+5V
72	GND	87	+5V		
73	GND	88	+5V		
74	GND	89	+5V		

Table A-4. POWER SUPPLY PCA, J1 TO MOTOR DRIVER PCA, P19

PIN	SIGNAL	PIN	SIGNAL	PIN	SIGNAL
01	+50V	21	GND	41	GND
02	+50V	22	B D0	42	-RESET
03	+50V	23	GND	43	GND
04	+50V	24	B D1	44	-LIN MTR FAULT
05	+50V	25	GND	45	GND
06	+50V	26	B D2	46	-STPR MTR FAULT
07	+50V	27	GND	47	B A4
08	+50V	28	B D3	48	-12V
09	SPARE	29	GND	49	-BIOREQ0
10	SPARE	30	B D4	50	-12V
11	GND	31	GND	51	-B WR
12	GND	32	B D5	52	+12V
13	GND	33	GND	53	B A3
14	GND	34	B D6	54	+12V
15	GND	35	GND	55	B A2
16	GND	36	B D7	56	B A1
17	GND	37	GND	57	RIBBON STALL
18	GND	38	-B RD	58	+5V
19	GND	39	GND	59	RIBBON FAULT
20	OVERCURRENT	40	VSERVO	60	+5V

Table A-5. POWER SUPPLY PCA, J-2 TO HAMMER DRIVER PCA, J-139

PIN	SIGNAL	PIN	SIGNAL
01	GND	14	-FIRE
02	-HMR FAULT	15	+5V
03	GND	16	HR DATA
04	-HMR CURRENT	17	+5V
05	GND	18	HD CLEAR
06	HD FAULT	19	+5V
07	GND	20	-12V
08	SPARE	21	+5V
09	GND	22	GND SEN
10	-TCLOCK	23	+12V
11	GND	24	TOO MANY DOTS
12	-RESET	25	+12V
13	+5V	26	+12V

Table A-6. HAMMER DRIVER PCA, J1-12 TO PRINTBAR
(H=Hammer Fire Signal—followed by hammer number)9

PIN No.	CONNECTOR NUMBER											
	J1	J7	J2	J8	J3	J9	J4	J10	J5	J11	J6	J12
1	H-116	H-127	H-94	H-105	H-72	H-83	H-50	H-61	H-28	H-39	H-6	H-17
2	H-18	H-125	H-96	H-103	H-74	H-81	H-52	H-59	H-30	H-37	H-8	H-15
3	H-114	H-129	H-92	H-107	H-70	H-85	H-48	H-63	H-26	H-41	H-4	H-19
4	H-120	H-123	H-98	H-101	H-76	H-79	H-54	H-57	H-32	H-35	H-10	H-13
5	H-112	H-131	H-90	H-109	H-68	H-87	H-46	H-65	H-24	H-43	H-2	H-21
6	H-122	H-121	H-100	H-99	H-78	H-77	H-56	H-55	H-34	H-33	H-12	H-11
7	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V
8	H-124	H-119	H-102	H-97	H-80	H-75	H-58	H-53	H-36	H-31	H-14	H-9
9	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V
10	H-126	H-117	H-104	H-95	H-82	H-73	H-60	H-57	H-38	H-29	H-16	H-7
11	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V
12	H-128	H-115	H-106	H-93	H-84	H-71	H-62	H-49	H-40	H-27	H-18	H-5
13	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V
14	H-130	H-113	H-108	H-91	H-86	H-69	H-64	H-47	H-42	H-25	H-20	H-3
15	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V	+50V
16	H-132	H-111	H-110	H-89	H-88	H-67	H-66	H-45	H-44	H-23	H-22	H-1

Appendix B

Troubleshooting Guide 2566B/C 2567B/C

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TROUBLESHOOTING GUIDE

The information in this appendix is intended to provide general guidelines for use in diagnosing causes of error code conditions in the printer. All the printer failure codes are briefly described. The suspected cause of the problems are listed from most likely to least likely. When two causes are equally suspect, the least expensive or simplest repair is listed first. If there is a test procedure shown, it should be performed before undertaking any major repair. The tests are included to help pinpoint the problem when there are multiple suspects.

NOTE

This part of the appendix deals with problems that cause error codes to appear on the Operator Control Panel. Appendix C contains guidelines for dealing with print quality and paper path problems that will not necessarily cause error code conditions.

NO DISPLAY

Implications: For no display problems you must first check if the fans located on the electronics bay are working.

IF THE FANS ARE NOT WORKING, then try to test a known good device from the same outlet as the printer. Otherwise check the power panel assembly.

IF THE FANS ARE WORKING:

Suspects: 1) Check the cable going from the Formatter PCA to the Front Panel PCA
2) Front Panel PCA.
3) Formatter PCA.
4) Power Supply PCA.

PROTOCOL ERRORS

Protocol errors are communication errors between the printer and the host system. The problem is as likely to be in the host as in the printer. These errors are very hard to repair and are, fortunately, rare.

Suspects: 1) Formatter PCA
2) Interface PCA
Tests: 1) Formatter PCA self-test (self-test 11)
2) Interface PCA self-test (self-test 30-38 depending on Interface)

C6 Data Overrun
C7 Transport service error
C8 Illegal block label
CA Illegal device dependent format number
CB Undefined data type
CC Undefined record code
CD Illegal host/peripheral field
CE Incorrect host to peripheral record number
CF Illegal record header length

FIRMWARE TRAPS

The firmware traps were put in to catch catastrophic system errors during firmware development. They were not really designed to aid in debugging the machine and should rarely be seen. Some of the failure codes can be caused by the system. These are noted in the failure code list below.

Suspects: (Unless otherwise noted)
1) Formatter PCA
2) Machine control firmware
Tests: Formatter PCA self-test (self-test 11)

C0 Unrecognized protocol error
D1 Negative slew count
D2 Formatter Mask too small-The host system and Interface board are also suspect. Try Interface self-test (30-38)
D3 Left over data in control mask- The host system and the Interface are also suspect. Try Interface self-test
F0 Spurious interrupt decode-
F1 Illegal Interrupt
F8 Negative Paper Length
F9 Selftest Abort
FC Paper Motion Fail on Power Up
FF Illegal Jump to RAM
Suspects: 1) Interface PCA
2) Formatter PCA
Tests: 1) Interface self-test (30-38)

10 SWING GATE OPEN

Implications: A switch mounted on the lower casting senses when the Swing Gate, housing the Printbar, is not latched into place. The printer is taken offline and printing is disabled when the swing gate is open.

Suspects: 1) Swing Gate not latched
2) Swing Gate Switch/Cabling
3) Power Supply PCA

11 PAPER OUT

Implications: A microswitch mounted on the lower left tractor checks for a paper out condition each time the machine begins printing. Paper out during printing should cause the machine to finish the current page and stop at Top-of-Form.

Suspects: 1) No paper
2) Paper Out Switch/Cabling
3) Power Supply PCA

12 RIBBON JAM

Implications: The ribbon is expected to tension during power up. If it does not, (NO RIBBON INSTALLED) will cause this error code. Also, any unexpected stall after power up will result in this error. (End of reel change in direction is an expected stall.)

Suspects: 1) Ribbon motor wiring reversed
2) Ribbon motors/Cabling
3) Motor Driver PCA
4) Reference Service Notes 2566B-8, 2566B-12

13 PAPER MOVEMENT PROBLEMS

1300 Paper Jam

Implications: The two asynchronous processes, paper stepping and paper motion detection, have gotten too far out of sync. Paper motion is detected by a foam wheel in the upper left tractor, which produces an interrupt about every 43 half steps of paper motion. A paper jam is indicated if no interrupts were detected within the last 127 steps. A paper jam is defined as moving tractors, no moving paper.

Suspects: 1) Paper Motion Sensor/Cabling
2) Power Supply PCA

1301 Paper Stall

Implications: The paper position encoder used to monitor actual tractor motion indicates the tractors did not move as far as requested. After retrying ten times, the printer was unable to move the tractors to the requested position. A paper stall is defined as no moving tractors, no moving paper.

Suspects: 1) The perforations in the forms being used in the printer are catching on the printbar hammers.
2) Backplane PCA
3) Paper Stepper Motor Assembly

Tests: Disconnect Stepper Motor Encoder Cable from Backplane. If no further errors are encountered, replace Stepper Motor.

14 PRINT MECHANISM PROBLEMS

1450 Linear Motor Fault From the Motor Driver

Implications: The motor driver has detected a short in the driver section of the servo control loop. This error can be accompanied by a blown fuse on the Motor Driver PCA.

Suspects: 1) Motor Driver PCA
2) Linear Motor
3) Wiring from Motor Driver PCA to Linear Motor
4) Transducer bad or misadjusted.
5) Broken Flexures. Call Response Center/SSE for verification.

Tests: Inspect linear motor for scorch marks, then ohm out the motor from the motor driver end of the connecting cables (2½ ohms from either end to the center and 5 ohms between ends). Also ohm out all three wires to the magnet and check for shorts.

1451 Servo Communications Error

Implications: The Formatter processor has queried the Servo PCA for an ID and found it missing.

Suspects: 1) Servo PCA
2) Power Supply PCA
3) Formatter PCA

Test: Try reseating the Formatter PCA.

1452 Servo Clock Failure

Implications: The clock generated by the Servo PCA isn't toggling. As this clock is used by some of the Interfaces, this error could

be accompanied by Interface failures (service LED not blinking or 16XX errors).

Suspects: 1) Servo PCA
2) Backplane PCA

1453 Period Measurement Failure

Implications: The Formatter PCA was unable to measure the servo system resonant frequency. This failure indicates that the servo system is not operating in a closed loop.

Suspects: 1) Platen Gap Too Small (binding)
2) Velocity Transducer is:
   a) Disconnected from Servo PCA
   b) Open or Shorted
   c) Rubbing
3) The Linear Motor is:
   a) Disconnected from the Motor Driver PCA
   b) Open or Shorted
   c) Rubbing
4) Servo PCA
5) Motor Driver PCA
6) Power Supply PCA

1454 Excessive Linear Motor Power

Implications: The Formatter PCA was unable to measure motor power at measured resonant servo frequency.

Suspects: 1) Servo PCA
2) Motor Driver PCA
3) Velocity Transducer Misaligned
4) Broken Flexures. Call Response Center/SSE for verification.

1455 Settling Time Error

Implications: The servo system required more than 300 msec for transition from one steady state to another. This failure indicates a damping problem with the printbar or the "Q" of the system out of range. A damping problem will probably be caused by rubbing parts while a "Q" problem is a result of a misadjusted velocity transducer, loose flexures or an unbalanced system.

Suspects: 1) Platen Gap Too Small
2) Linear Motor Rubbing
3) Velocity Transducer Rubbing
4) Loose Flexure Mounting
5) Velocity Transducer Misaligned
6) Motor Driver PCA
7) Broken Flexures. Call Response Center/SSE for verification.

1459 Illegal Error Code

Implications: An undefined servo error was reported to the error handling firmware.

Suspects: 1) Formatter PCA

1461 Ribbon Fault

Implications: The Motor Driver PCA has detected a hardware failure in the ribbon drive system. This error can be accompanied by a blown fuse on the Motor Driver PCA.

Suspects: 1) Ribbon mounted incorrectly by operator
2) Motor Driver PCA/F3 on Motor Driver PCA
3) Ribbon Motors
4) Wiring from Ribbon Motors to Motor Driver PCA

Tests: Check ribbon motors for shorted or open windings and inspect the connections between motors for scorch marks and looseness.

1471 Hammer Driver Malfunction

Implications: A hammer or hammer driver has shorted while printing. A hardware interlock opens the relay when this condition occurs.

Suspects: 1) Hammer Driver PCA
2) Printbar
3) Check the cable coming from the Power Supply PCA to the Hammer Driver PCA.

Tests: Power the machine off and then back on to close the relay and test for shorted hammers. See Table A-6 for hammer cable location.

1480 Stepper Malfunction

Implications: The Stepper motor has drawn current in excess of 4.7 amps for an extended period of time. This indicates excessive power dissipation in the stepper motor, possibly due to a blown FET accompanied by a blown fuse on the Motor Driver PCA.

Suspects: 1) Motor Driver PCA
2) Stepper Motor
3) Ribbon motors not grounded (see Service Note 2566B8)

1490 High Relay Voltage

Implications: The voltage across the relay has remained high, indicating that there is something preventing the Hammer Driver/ Motor Driver capacitors from charging.

Suspects: 1) Shorted Printbar Hammer coil
2) Shorted motor coil/transistor
3) Motor Driver PCA
4) Hammer Driver PCA
5) Power Supply PCA

15 GRAPHICS PCA RUN TIME FAIL *

RUN TIME FAIL
These errors may be present when either Label Card PCA or the Vector Graphics PCA are installed in the printer.

Any reference to the "Graphics PCA" or "Graphics board" applies to the Vector Graphics PCA, the Label Card, or any future PCA.

1500 Unrecognized Nonpacket Request or Response *
Implications: The graphics board has sent a communication pattern that the Formatter processor can not recognize.
Suspects: 1) Graphics PCA
2) Formatter PCA
Tests: 1) Run standard selftest
2) Run graphics board selftest

1501 Return Status Indicates Failure from the Graphics Board *
Implications: The graphics board detected a failure while attempting to execute a particular function.
Suspects: 1) Graphics PCA
2) Formatter PCA
Tests: 1) Run standard selftest
2) Run graphics selftest

1502 Undefined Return Statement *
Implications: There was a communication protocol error while the processor was attempting to communicate with the graphics board.
Suspects: 1) Graphics PCA
2) Formatter PCA
Tests: 1) Run standard selftest
2) Run graphics selftest

1503 Undefined or Unexpected Graphics Command

Implications: There was a communication protocol error while the processor was attempting to communicate with the graphics board.

Suspects: 1) Graphics PCA
2) Formatter PCA

Tests: 1) Run standard selftest
2) Run graphics selttest

1505 Undefined Buffer Type *

Implications: There was a communication protocol error while the Formatter processor was attempting to communicate with the graphics board.

Suspects: 1) Graphics PCA
2) Formatter PCA

Tests: 1) Run standard selftest
2) Run graphics selftest

1507 Reset Response Timeout *

Implications: The Graphics board is installed but failed to communicate within a given time window.

Suspects: 1) Graphics PCA
2) Formatter PCA

Tests: 1) Run graphics digital selftest
2) Run standard selftest

NOTE

Any reference to the "Graphics PCA" or "Graphics board" applies to the Vector Graphics PCA, the Label Card, or any future installable PCA.

1508 Failure to Delink Packet *

Implications: The Graphics board is not communicating properly with the control PCA.

Suspects: 1) Graphics PCA
2) Formatter PCA

Tests: 1) Run graphics digital selftest
2) Run standard selftest

1509 Failure Reported by Graphics PCA *
Implications: The Graphics PCA has experienced a hardware failure.
Suspects: 1) Graphics PCA
2) Formatter PCA
Tests: 1) Run graphics digital selftest

1510 Graphics PCA Dead *
Implications: The Graphics PCA failed to communicate with the control PCA.
Suspects: 1) Graphics PCA
Tests: 1) Reseat Graphics PCA and run digital graphics selftest.

1511 Graphics Buffer Error
Implications: Software Problem - RESET command is embedded in Magnum Code for Label PCA.

16 INTERFACE RUN TIME FAILURE

1600 Unrecognized Nonpacket Request or Response
Implications: Communication protocol error between the Formatter processor and the Interface.
Suspects: 1) Interface PCA
2) Formatter PCA

1601 Return Status Indicates Failure From Interface
Implications: Interface detected a failure while attempting to execute a particular function.
Suspects: 1) Interface PCA
2) Formatter PCA

1602 Undefined Return Status
Implications: There was a communication protocol error while the Formatter processor was attempting to communicate with the Interface board.
Suspects: 1) Interface PCA
2) Formatter PCA

1603 Undefined or Unexpected Interface Command
Implications: Communication protocol error
Suspects: 1) Interface PCA
2) Formatter PCA

1604 Unexpected Data Packet
Implications: Communication protocol error
Suspects: 1) Interface PCA
2) Formatter PCA

1605 Undefined Buffer Type
Implications: Communication protocol error
Suspects: 1) Interface PCA
2) Formatter PCA

1606 Power on Self Test Failure
Implications: The Interface board fails its power on self test when power first comes up or after a reset.
Suspects: 1) Interface PCA
2) Formatter PCA

1607 Reset Response Timeout
Implications: The Interface board is installed but failed to initiate communication with Formatter processor within a specified time limit.
Suspects: 1) Interface PCA
2) Formatter PCA

17 PRINTER TIMED OUT

1701 Error location is in Data Processor
1702 Error location is in QPRINT
1703 Print one line external timeout
1704 Self test timeout during initialization
1705,06 Print one line internal timeout
Implications: Printing timeout printing has not been completed 15 seconds after a print command was initiated to the machine control (i.e. physical machine) or slewing has not been completed 15 seconds after a slew command was initiated to the physical machine.
Suspects: 1) Print Mechanism
a) Servo PCA
b) Velocity transducer is:
1) Disconnected at Servo PCA
2) Open or shorted
3) Rubbing
4) Formatter PCA
5) Motor Driver PCA

19 ATTEMPT TO GO ONLINE IN CE MODE

Implications: The CE Mode line is low when attempting to put the printer On Line.

Suspects: 1) Jumper between CE mode test point and ground on the Formatter PCA.

Tests: 1) Be sure the CE Mode strap is removed from the Formatter PCA before attempting to put the printer online.

29 CONFIGURATION PRINTOUT

2901 Printer Timeout

Implications: The printing of configuration parameters has not been started within 5 seconds.

Suspects: Formatter PCA

2940 Failed to Delink Interface Packet Pointer for Status

Suspects: 1) Interface PCA
2) Formatter PCA

2941 Could Not Send Interface Packet Pointer for Status

Suspects: 1) Interface PCA
2) Formatter PCA

2942 Failed to Delink Interface Pointer for Configuration

Suspects: 1) Interface PCA
2) Formatter PCA

2943 Could Not Send Interface Packet Pointer for Configuration

Suspects: 1) Interface PCA
2) Formatter PCA

2945 Failed to Delink Graphics Packet for Status

Suspects: 1) Graphics PCA
2) Formatter PCA

2946 Could Not Send Graphics Packet for Status

Suspects: 1) Graphics PCA
2) Formatter PCA

2947 Failed to Delink Graphics Packet for Configuration

Suspects: 1) Graphics PCA
2) Formatter PCA

2948 Could Not Send Graphics Packet for Configuration
Suspects: 1) Graphics PCA
2) Formatter PCA

30 THROUGH 39 PRINTING SELFTEST TIMEOUTS

3001 Standard ripple print timeout
3101 Double size ripple print timeout
3201 Compressed ripple print timeout
3301 High density ripple print timeout
3401 Raster graphics print timeout
3601 Graphics blackout timeout
3701 Print quality test timeout
3801 Sparse ripple print timeout
3901 1200 LPM ripple print timeout

Implications: Timeout when print one line is being done with data from host. Printing has not been completed 15 seconds after a print command was initiated to the machine control (i.e. physical machine) or slewing has not been completed 15 seconds after a slew command was initiated to the physical machine.
Suspects: 1) Print Mechanism
a) Servo PCA
b) Velocity transducer is:
1) Disconnected at Servo PCA
2) Open or shorted
3) Rubbing
4) Formatter PCA

40 SYMBOL SET ROM CRC TEST

4000 Symbol set socket 1 failure
Implications: The check code for the ROM in socket 1 is not correct.
Suspects: 1) Symbol set ROM in socket 1
2) Formatter PCA

4002 Symbol set socket 2 failure
Implications: The check code for the ROM in socket 2 is not correct.
Suspects: 1) Symbol set ROM in Socket 2
2) Formatter PCA

4003 Symbol set socket 3 failure
Implications: The check code for the ROM in socket 3 is not correct.
Suspects: 1) Symbol set ROM in Socket 3
2) Formatter PCA

4004 Symbol set socket 4 failure
Implications: The check code for the ROM in socket 4 is not correct.
Suspects: 1) Symbol set ROM in Socket 4
2) Formatter PCA

4005 Symbol set socket 5 failure
Implications: The check code for the ROM in socket 5 is not correct.
Suspects: 1) Symbol set ROM in Socket 5
2) Formatter PCA

4006 Symbol set socket 6 failure
Implications: The check code for the ROM in socket 6 is not correct.
Suspects: 1) Symbol set ROM in Socket 6
2) Formatter PCA

41 RAM TEST

4100 Selftest timeout
Implications: Self test timed out while waiting for the RAM test to complete.
Suspects: Formatter PCA

4101 RAM 1 failure (U54)
Implications: The Formatter processor cannot write and read back data from the RAM at address U54.
Suspects: Formatter PCA

4102 RAM 2 failure (U53)
Implications: The Formatter processor cannot write and read back data from the CMOS RAM.
Suspects: Formatter PCA

4103 RAM 3 failure (nonvolatile U64)
Implications: The Formatter processor cannot write and read back data from the RAM 3 (U64).
Suspects: Formatter PCA

4104 RAM 4 failure (U63)
Implications: The Formatter processor cannot write and read back data from the RAM 4 (U63).
Suspects: Formatter PCA

4105 RAM 5 failure (U81)
Implications: The Formatter processor cannot write and read back data from the shared DGL RAM (U81).
Suspects: Formatter PCA

42 FIRMWARE ROM CRC TEST

4200 Selftest timeout
Implications: Selftest timed out waiting for the ROM test to be completed.
Suspects: Formatter PCA

4201 Firmware ROM failure (U24,U34,U23,U33)
Implications: The CRC calculation has failed indicating that the firmware ROMs may be corrupted.
Suspects: Formatter PCA

43 TIMER TEST

4301 Intel 8253 timer failure (U75)
Implications: The Intel 8253 timer chip has failed.
Suspects: Formatter PCA

44 DOT GENERATION LOGIC (DGL) TEST

4401 No descender scan 'A' failure
4402 Excursion scan 'A' failure
4403 Single descender scan 'A' failure
4404 Excursion scan ',' failure
4405 Double descender scan 'Null' failure
4406 Excursion scan 'Null' failure

Implications: The DGL gate array is not properly extracting the descender/excursion bits from the symbol sets during status readback.
Suspects: Formatter PCA (DGL gate array)

4411 70 dpi left direction graphics failure
4412 70 dpi right direction graphics failure
4413 100 dpi left direction graphics failure
4414 100 dpi right direction graphics failure
4415 140 dpi left direction graphics failure
4416 140 dpi right direction graphics failure

Implications: The DGL gate array is not transferring the graphics image in the DGL RAM buffer to the LSI shift register properly for the indicated dot density and direction.
Suspects: Formatter PCA

4417 210 dpi, 10.0 cpi left direction text failure
4418 210 dpi, 10.0 cpi right direction text failure
4419 180 dpi, 12.0 cpi left direction text failure
4420 180 dpi, 12.0 cpi right direction text failure
4421 180 dpi, 15.0 cpi left direction text failure
4422 180 dpi, 15.0 cpi right direction text failure
4423 200 dpi, 16.7 cpi left direction text failure
4424 200 dpi, 16.7 cpi right direction text failure
4425 170 dpi, 17.0 cpi left direction text failure
4426 170 dpi, 17.0 cpi right direction text failure

Implications: The DGL gate array is not creating the proper dot image in the LSI shift register based on the ASCII text in the DGL RAM buffer. The DGL gate array may be incorrectly accessing the symbol set ROMs.
Suspects: Formatter PCA

45 TOO MANY DOTS (TMD) TEST

4501 TMD selftest timeout

Implications: Timeout when print one line is being done with data from host. Printing has not been completed 15 seconds after a print command was initiated to the machine control (i.e. physical machine) or slewing has not been completed 15 seconds after a slew command was initiated to the physical machine.

Suspects: 1) Print Mechanism
- a) Servo PCA
- b) Velocity transducer is:

1) Disconnected at Servo PCA
2) Open or shorted
3) Rubbing
4) Formatter PCA
5) Hammer Driver PCA

4502 TMD stuck active

Implications: The printer was already in 'slow' mode when the TMD test started.

Suspects: 1) Hammer Driver PCA
2) Power Supply PCA
3) Formatter PCA

4503 TMD stuck inactive

Implications: The TMD did not go active within 120 dot rows of print. This condition can be caused by either a hardware failure or AC power problems. If the printer 'stuttered' while printing, the machine is suffering from lowline voltage. If the pattern printed smoothly, there could be a hardware problem.

Suspects: 1) Verify that the S1 switch of the Hammer Driver PCA is set according to the printer model.
2) Long power cord
3) Hammer Driver PCA
4) Power Supply PCA

Tests: Measure the ac line voltage at the printer.

4504 TMD inactivetoggled active and stuck

Implications: The TMD went active within 120 dot rows of raster blackout, then stayed active for the rest of the print pattern. This generally indicates an ACline problem.

Suspects: 1) Long power cord
2) Power Supply PCA
3) Hammer Driver PCA

46 THRU 47 PRINTBAR COIL TEST

4600 Selftest timeout

Implications: Timeout when print one line is being done with data from host. Printing has not been completed 15 seconds after a print command was initiated to the machine control (i.e. physical machine) or slewing has not been completed 15 seconds after a slew command was initiated to the physical machine.

Suspects: 1) Print Mechanism
a) Servo PCA
b) Velocity transducer is:
1) Disconnected at Servo PCA
2) Open or shorted
3) Rubbing
4) Formatter PCA

4601 thru 99 (for hammers #1 to 99)
4700 thru 32 (for hammers #100 to 132)

Implications: The firmware attempts to fire each hammer #132 to #1 (right to left). If no current is sensed, a failure is indicated. If there are more then two failures, only the lowest number is displayed.

Suspects: 1) Printbar has open coil
2) Printbar to Hammer Driver board ribbon cable

Tests: Swap hammer cables at Hammer Driver board end. If the bad hammer # changes by a factor of 11, then the printbar or cable is at fault, otherwise the problem is the Hammer Driver board.

48 LINEAR MOTOR TEST

4800 Selftest linear motor on timeout

Implications: Timeout when print one line is being done with data from host. Printing has not been completed 15 seconds after a print command was initiated to the machine control (i.e. physical machine) or slewing has not been completed 15 seconds after a slew command was initiated to the physical machine.

Suspects: 1) Print Mechanism
- a) Servo PCA
- b) Velocity transducer is:

1) Disconnected at Servo PCA
2) Open or shorted
3) Rubbing
4) Formatter PCA

49 PAPER POSITION ENCODER TEST

4900 Paper position encoder hardware failure

Implications: The printer is equipped with a complete set of paper position encoder hardware, but the hardware is nonfunctional. The encoder is located on the back of the paper stepper motor. If the encoder has its cable connected to the backplane, the printer determines it is equipped with paper position encoder hardware. If the printer determined the paper position encoder hardware was nonfunctional when the printer was turned on and the encoder cable is connected, error 4900 is displayed, indicating the paper encoder hardware is nonfunctional.

NOTE

Error 4900 can be disabled, as a temporary work around, by disconnecting the encoder cable from the backplane connector J17 and resetting the printer. The printer will not detect a complete set of paper encoder hardware so the error will not be displayed. However, the printer may lose top of form if thick multipart forms are used. This solution is acceptable only for printers which never print on thick multipart forms.

Suspect: 1) Backplane PCA
2) Paper stepper motor assembly
Tests: Disconnect Stepper Motor Encode Cable from backplane.

50 DATAPRODUCTS LONGLINE <OR> SHORTLINE INTERFACE

The following error codes apply only if Dataproducts I/O is installed.

5001 RAM failure
5002 ROM failure
5004 Multiple errors (both of the above)
Suspects: 1) Interface PCA
2) Formatter PCA

50 RS232 SERIAL INTERFACE ERRORS

The following error codes apply only if the serial Interface is installed.

5001 RAM
Implications: The RAM on the Interface PCA can not be written to and read from correctly.
Suspects: 1) Interface PCA
2) Formatter PCA

5002 ROM
Implications: The check code in the Interface ROMs is not correct.
Suspects: 1) Interface PCA
2) Formatter PCA

5003 Serial hardware failure
Suspects: 1) Interface PCA
2) Interface Cable
3) Formatter PCA

5004 Two or more of the above failures
Implications: Multiple failures
Suspects: 1) Interface PCA
2) Interface Cable
3) Formatter PCA

60 THRU 66 SHADE GRAPHICS ERROR CODES

Implications: All these failures imply a defective graphics (Vector Graphics PCA or Label Card PCA) board.

60XX Failed to complete nondestructive test
61XX Failed complete destructive test
62XX Nondestructive ROM test
63XX Nondestructive static RAM test
64XX Destructive graphics controller test
65XX Destructive dynamic RAM test
66XX Failed to create self test image

NOTE

Errors 60XX and 61XX refer to either the Vector Graphics PCA or the HP Label Card, depending on which one is installed. Errors 62XX through 66XX refer to the Vector Graphics PCA, only.

80 SYMBOL SET ERRORS

80X5 Invalid frequency

Implications: The measured printbar frequency did not match the specified symbol set as defined by X". The most common error is 8005 at power-up and references the power-up default symbol set "0". Where:

"X" = 0-4 = Default Symbol Set ROM
4-7 = Optional Normal Density Symbol Set ROM
8,9 = 1st High Density Symbol Set ROM
A,B = 2nd High Density Symbol Set ROM
C,D = 3rd High Density Symbol Set ROM
E,F = 4th High Density Symbol Set ROM

Suspects: 1) Transducer assembly
2) Transducer cable
3) Servo PCA
4) Motor Driver PCA
5) Formatter PCA
6) Symbol Set ROM
7) Loose Hammer Driver Cable hold-down assembly
8) Broken flexure, call Response Center/SSE for verification

800X Symbol Set Error
Implications: An error was detected on a symbol set ROM.
800X-803X = Default Symbol Set ROM
804X-807X = Optional Normal Density Symbol Set ROM
808X-809X = 1st High Density Symbol Set ROM
80AX-80BX = 2nd High Density Symbol Set ROM
80CX-80DX = 3rd High Density Symbol Set ROM
80EX-80FX = 4th High Density Symbol Set ROM
Where X = any number except 5. If X=5 refer to error 80X5, above.
Suspects: 1) If X=5, refer to Invalid Frequency Error, above
2) Symbol Set ROM (incorrect or defective)
3) Formatter PCA

8097 Symbol Set Error
Suspects: 1) A PAL Chip is missing or defective on the Backplane PCA (U1 socket). Call RC or CEC for instructions and replacement information.

81 THROUGH 83 SELF-TEST SELECT ERRORS

81XX Slave selftest select error using up button
Implications: Communication error with the slave when the Formatter processor asks if the selftest number reached by the up button exists.
Suspects: 1) Slave PCA (Interface or Graphics)
2) Formatter PCA
Tests: 1) Run the Interface selftest (CE Mode test 30-38)
2) Run the Graphics selftest (CE Mode test 40-48) if the Graphics PCA is installed.
3) Run the Formatter PCA selftest (CE Mode test 11)

82XX Slave selftest select error using down button
Implications: Same as 81 except the selftest code was reached using the down button on the front panel.
Suspects: 1) Slave PCA (Interface) or Graphics
2) Formatter PCA
Tests: 1) Run the Interface selftest (CE Mode test 30-38)
2) Run the Graphics selftest (CE Mode test 40-48) if the Graphics PCA is installed.
3) Run the Formatter PCA selftest (CE Mode test 11).

NOTE

Any reference to the "Graphics PCA" or "Graphics board" applies to the Vector Graphics PCA, the Label Card, or and future installable PCA.

83XX Internal firmware selftest table problems

Implications: The table used to decode the selftest numbers is not set up properly in the machine control ROMS.

Suspects: 1) Firmware ROMS
2) Formatter PCA

86 MODEM DISCONNECT FUNCTION

8601 Could not delink a packet

Suspects: 1) Interface PCA
2) Formatter PCA

Tests: 1) Try selftest 11 (CE Mode)
2) Try the appropriate Interface selftest

8602 Could not send the packet

Suspects: 1) Interface PCA
2) Formatter PCA

Tests: 1) Try selftest 11 (CE Mode)
2) Try the appropriate Interface selftest

8603 Error encountered on Interface

Implications: The Interface PCA reports an onboard problem

Suspects: 1) Interface PCA
2) Formatter PCA

Tests: 1) Try selftest 11

88 ILLEGAL ERROR

Suspects: 1) Reseat all PCAs and retest.
2) Front Panel PCA
3) Front Panel PCA Cable
4) Formatter
5) Power Supply

90 INTERFACE SLAVE TIMEOUTS

9050 Failed to return selftest description
Suspects: 1) Interface PCA
2) Formatter PCA

9051 Failed to return from a selftest in the prescribed time
Suspects: 1) Interface PCA
2) Formatter PCA

9052 Returned with an incorrect command
Suspects: 1) Interface PCA
2) Formatter PCA

9053 Failed to delink a packet
Suspects: 1) Interface PCA
2) Formatter PCA

91 GRAPHICS SLAVE TIME OUTS

NOTE

Any reference to the "Graphics PCA" or "Graphics board" applies to the Vector Graphics PCA, the Label Card, or and future installable PCA.

9150 Failed to return selftest description
Suspects: 1) Graphics PCA
2) Formatter PCA

9151 Failed to return from a selftest in the prescribed time
Suspects: 1) Graphics PCA
2) Formatter PCA

9152 Returned with an incorrect command
Suspects: 1) Graphics PCA
2) Formatter PCA

9153 Failed to delink a packet
Suspects: 1) Graphics PCA
2) Formatter PCA

MAINTENANCE OF THE POWERED PAPER STACKER

There are three visible problems which may mean a malfunction with the powered paper stacker (PPS): paper jams caused by either paper not moving through the stacker or insufficient movement through the stacker, incorrectly stacked paper, or print quality problems.

PAPER JAMS

Paper jams can be caused by the paper not moving through the PPS for the following reasons:

Puller stepper motor isn't working
Check the following:

1. Bad cable connection
2. Bad cable
3. Defective puller stepper motor
4. Blown fuse on the Servo board
5. Defective Servo board

Paper will sometimes move through the printer and the PPS, but the stacker will be unable to keep up with the printer. Check the following:

The motor drive shaft coupling is loose

Binding of the drive shaft
If this is suspected do the following procedure:

1. Turn off the printer.
2. Using your fingers, apply slight pressure to the drive shaft coupling and turn it to check for uniform resistance besides the magnetic detent.

Insufficient pressure on the idler shaft
Check for the following:

1. Broken, stretched, or missing springs
2. Binding of the idler shaft bushing in the elongated slots (Pull it to check for movement.)
3. The elongated slot is not long enough. There should be 1/8th inch (3 mm) equal clearance on both sides. (Check for damaged or bent mounting brackets.)

NOTE

When the idler shaft is disengaged the puller motor may run erratically.

You should ensure that the upper paper shield is not missing, and is securely attached.

INCORRECTLY STACKED PAPER

The paper may stack incorrectly in the PPS because of the following:

1) Paper isn't starting into the printer so that it will stack the same direction it was in the box.

2) The door isn't closed all the way.

3) The paper tray isn't pushed all the way in.

4) Check the backstop (refer to the Powered Paper Stacker Operator's Manual).

5) Check to make sure the door chains are installed correctly and hanging freely (refer to the Powered Paper Stacker Operator's Manual).

PRINT QUALITY PROBLEMS

Print quality problems are not caused by the PPS alone, but you should check the following:

1) The vertical paper tension setting in the printer

2) Tractor adjustment and alignment

To validate the paper motion of the PPS, you should do standard character set printing and form feeds in both normal mode and in difficult forms mode (Function 51). Check for buckling or billowing of the paper between the upper tractors and the paper puller.

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Appendix C

Print Quality Problems 2566B/C 2567B/C

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QUALITY PROBLEMS

This appendix provide some suggestions to aid in detecting causes of and correcting some print quality problems that may not necessarily cause error codes to appear on the Operator Control Panel's display.

NOTE

The two printer controls that are used to achieve the best print quality are the vertical paper tension lever and the paper thickness adjustment lever. Incorrect adjustment of these operator controls is the primary suspect in print quality problems, and should always be checked first.

If the vertical tension lever and the paper thickness adjustment are correctly adjusted, there are several other print quality problems and solutions are provided in this section.

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Vertical Line Wave (Dot Column Position)	8
Dot Row Gap/Overlap at One Tenth Inch (Hammer Cell) Boundry's	9
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Light or Smeared Print	13
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CHARACTER SCRUNCH

Character "scrunch" causes the printed characters to be squashed down from the top. O's (letter O) and 0's (zeros) are most sensitive. E's appear to have the center crossbar biased to the top of the character (see Figure C-1). In extreme cases, S's start looking like 5's. This problem is most likely to occur with heavy paper (100 lb.), or six part forms.

Two possible causes of character "scrunch" include:

- Vertical paper tension adjusment set too loose.
- Loose (or worn) tractor belts.

Two hints for solving this problem are described below:

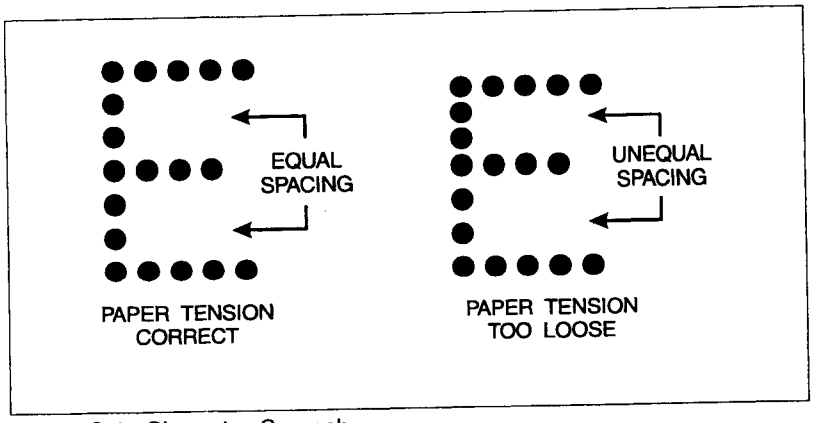


Figure C-1. Character Scrunch

Hint 1: Adjust the vertical paper tension, as follows: With the swing-gate open and paper loaded, move the lever downward until the paper is slightly taut against the platen. Place your hand on the paper in the region of the platen and gently move paper up and down. If the paper has significant freedom to move (about 0.05" or more), the vertical paper tension is still too loose. When the tension is correct you will notice very little vertical looseness.
With the printer off-line, press the FORM FEED key two or three times to ensure that the paper moves freely over the platen. Excessive vertical paper tension will elongate the tractor holes in the paper, and may cause a paper jam. If either

condition occurs, raise the tension lever slightly and use the FORM FEED key to test again.
Initiate a page of ripple print self-test (see Paragraph 4-3; sub-test 9 is best). Examine the print quality for improvement or elimination of the character "scrunch".
If there is insufficient range in the tension adjustment, the tractor drive belt "phasing" (belt tension between upper and lower tractor drive pulleys) must be corrected. Use the procedure detailed in Paragraph 5-8.
If paper jams persist in spite of adjustments to vertical paper tension, the tractor vertical alignment should be checked (detailed in Paragraph 5-9).

Hint 2: If the above steps do not correct the character "scrunch" problem, new tractors must be installed.

TO MEASURE SCRUNCH:

"Scrunch" is defined as the difference between the top and bottom halves of a character. In other words, the vertical symmetry of a character. The following procedure provides a more precise method of measuring "scrunch" and guidelines on acceptable tolerances:

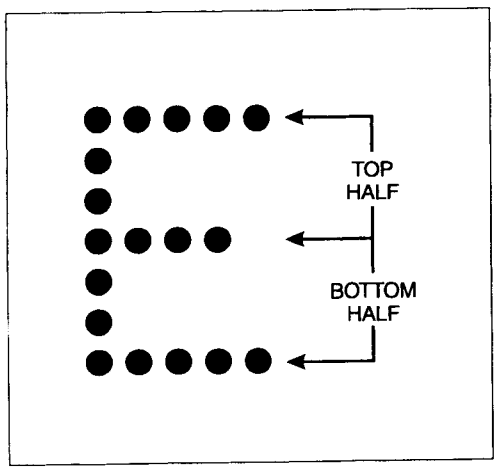
For these measurements, a minimum optical tool is the Bishop Optical Comparitor, model 3500, with a 0.005 inch increment scale reticle (Bishop P/N 3517).

Using the optical comparitor, measure the difference between the top and bottom half of the upper case character "E".

Subtract the two numbers. The result is the value of Character Scrunch. Using this method, the margin for error (best attainable accuracy) is in the range of +/-.003 inch. The acceptable limit for "scrunch" is 0.007 inch. If the value is obviously well under 0.01 inch (using the 0.005 inch increment reticle), the "scrunch" is probably under the limit and is acceptable.

HORIZONTAL LINE "SAWTOOTHS"

Underlines or plain horizontal lines appear to be excessively jagged at 0.2 inch centers or "noisy" at 0.02 to 0.04 inch centers.



Four common causes of horizontal line "sawtooths" include:

- Incorrect platen to printbar gap.
- Improper tractor AVB seating in platen rail.
- Misaligned platen.
- Spline shaft collar loose.

Three hints for solving this problem are described below:

Hint 1: Initiate self-test 15, which is a set of vertical and horizontal lines (see Paragraph 4-3). Examine the horizontal lines. If the length of the raised or lowered sections is 0.2 inch (or two 10 pitch character cells), then the platen/printbar gap is incorrect. When there are 0.2 inch wide sawtooths, adjust the print gap lever (located on the lower right side of the printer) one click at a time. Initiate self-test 15 again and see if there is a change. When the gap is adjusted correctly, the horizontal lines will have superimposed anomalies of 0.001 to 0.002 inch (an acceptable limit). If the adjustment cannot achieve this, then the platen/printbar gap must be adjusted (see Paragraph 5-4), or the printbar replaced (Paragraph 6-25).
Figure C-2 illustrates the relationship of the interleaved hammer tine paths with the printbar/platen gap. If the gap is adjusted either too small or too large, the dots printed by adjacent tines will not be aligned.

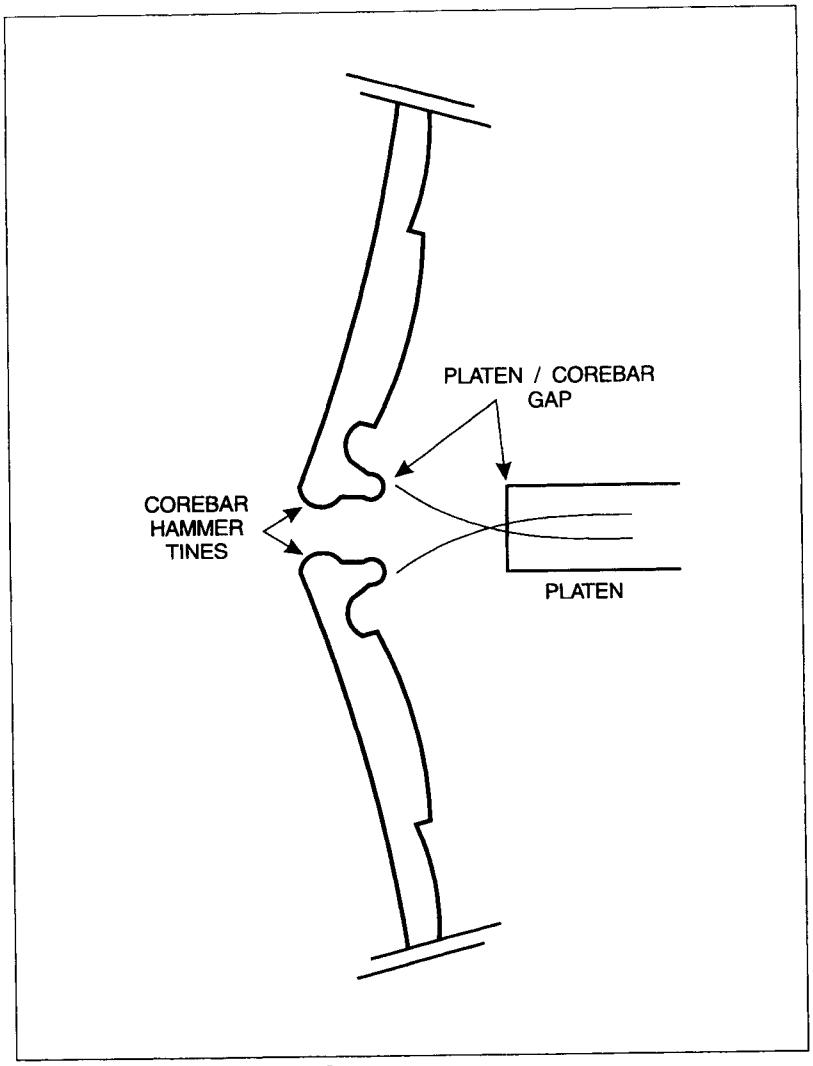


Figure C-2. Platen/Printbar Gap

Hint 2: For higher frequency noise across the horizontal line, the tractor AVBs should be adjusted to damp vibrations on the drive shaft and support shafts (see Paragraph 5-7 for procedure).

NOTE

The platen/printbar gap adjustment must be made prior to flight time adjustment.

Hint 3: The vertical lines are also affected by print gap, since this changes the flight time of the hammer. If the vertical lines have sawtooths on dot row to dot row, the flight time should be readjusted. This is a CE Mode configuration function from the Operator Control Panel, as described in Paragraph 5-10.

VERTICAL LINE WAVE (DOT COLUMN POSITION)

If vertical lines appear "wavy" (dots making up vertical lines should be directly above each other), the hammer flight times may require adjustment.

Figure C-3 shows on the left a print out of diagnostic sub-test 15. The right hand shows a blow-up of the vertical lines produced by sub-test 15. If the "Column Dot Position" requires adjustment, refer to Section 5, Control Panel Timing Adjustments, Hammer Flight Time Adjustment for corrective action.

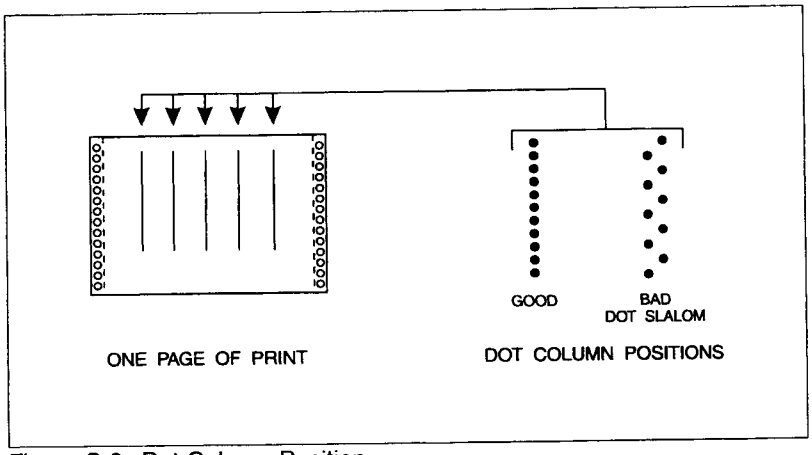


Figure C-3. Dot Column Position

DOT ROW GAP/OVERLAP AT ONE TENTH INCH (HAMMER CELL) BOUNDARIES

With this problem, the customer may complain of trouble reading bar codes; or, when printing graphics and/or compressed characters, at the one tenth inch (hammer cell) boundry a gap or overlap is apparent.

A quick rough check is to run Sub-test 5 (herring bone pattern) as shown in Figure C-4. If the pattern appears similar to the right hand image refer to Section 5, Control Panel Timing Adjustments, Amplitude Adjustments for corrective action.

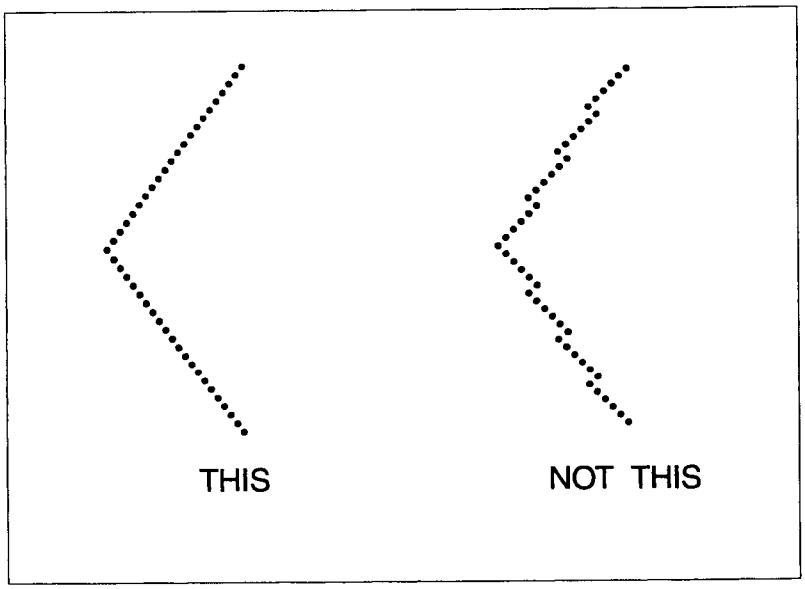


Figure C-4. Self-Test Subtest 5 Herring Bone Pattern

HORIZONTAL CHARACTER SLOPE/DOT ROW SLOPE

If the customer complains of sloping printed lines when compared to preprinted lines on green bar paper, the following actions should take place to identify and evaluate the problem. This phenomenon can also occur on label or other types of preprinted paper. Always ask the customer to demonstrate the problem. Evaluate the paper path and the paper used by the customer, as described below.

a. Evaluate the paper path. Paper path adjustments MUST be verified as correct before attempting to remedy customer problems. Refer to Platen/Printbar Gap, AVBs, Tractor Drive Belt Phasing, Vertical Tractor Alignment, Paper, and the Path Skew adjustments in Section 5.

b. Evaluate the paper used by customer. Verify customer's paper, ideally using single part green bar (15/18 lb.), implement the following procedure:

1. Tear off a single sheet of paper (11x14).

2. Fold the paper in half, tractor hole to tractor hole, taking care that two adjacent corners meet squarely and tractor hole edges of the form are parallel (see Figure C-5).

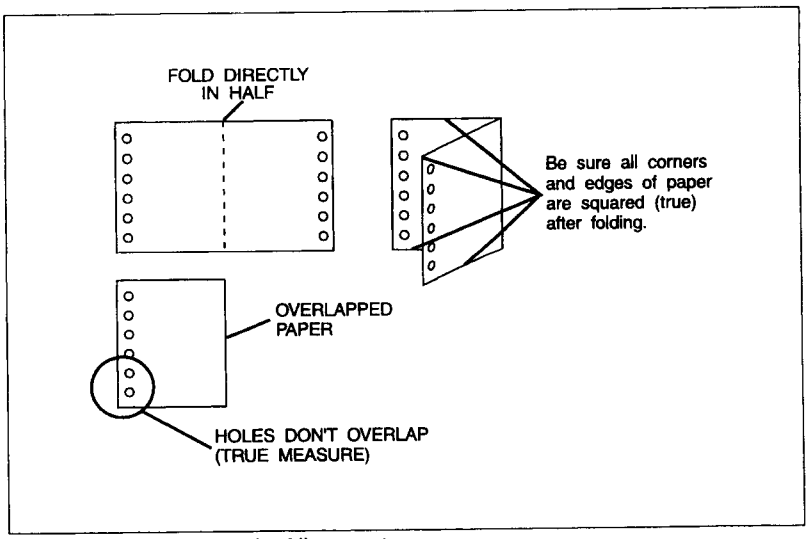


Figure C-5. Tractor Hole Alignment

3. Ideally, all edges should be parallel and the tractor holes should match. If the tractor's holes are greater than 1/2 a hole out, a better quality paper must be used.

4. Now, fold another sheet of paper in half, perforation to perforation, taking great care to square one set of corners and to keep perf edges parallel (see Figure C-6).

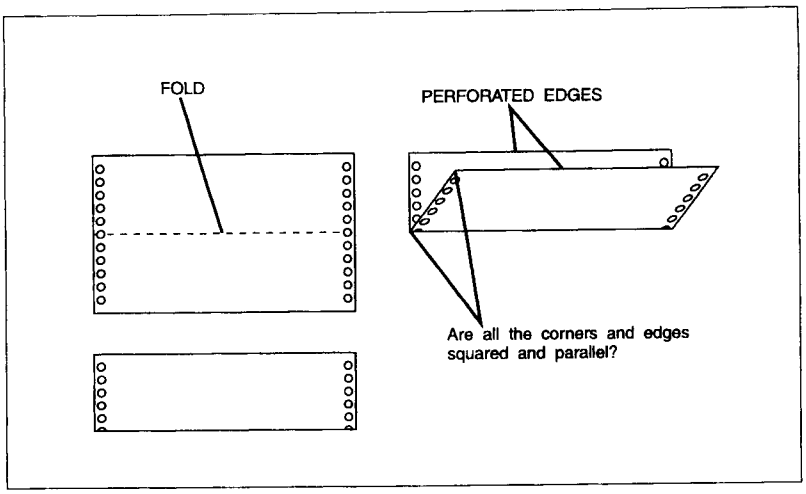


Figure C-6. Perf. Edges Check

5. Ideally, all edges should be parallel and the tractor holes should match. If the tractor holes are greater than 1/2 hole out, a better quality of paper must be used.

6. Now compare either green bar paper line or preprinted line from on one half to other half of the single sheet (see Figure C-6). Ideally they should overlap or be parallel.

7. Any descrepancy will affect the perceived position of the printed line on the paper in relation to the preprinted lines.

NOTE

Careful folding is critical to arrive at this stage with meaningful results.

c. If the paper path and paper have been verified to be within specifications, proceed as follows:

1. Install green bar or preprinted paper exactly in the same manner the customer would.

2. Run Self-Test and position the image so it is centered in the middle (equal space left and right).

3. Position the perf of the paper to align with the top left hand edge of the platen. When this position has been found, use a pencil to mark the position of perf on the black plastic portion of the platen assembly.

4. Make this mark on the left hand side of the platen, this is a useful reference for a later portion of this test precedure.

5. Set T.O.F at this point.

6. With the perf set in this position, observe how the perf aligns with the length of the platen. Ideally the right side of the perf should coincide with the top edge of the platen.

7. Invoke Subtest 15 (Flight Time/Platen Adj Pattern) and optimize platen gap (forms thickness adjustment) for the best print quality. After the gap is adjusted for the best print quality, place the printer in continuous Subtest 15 and print 10 to 20 pages of print.

8. Load the paper, printed on in step 7, into the printer so that the opposite side will be printed on. Ensure that the first page printed in previous step is the first page to be printed on. Align perf with pencel mark on platen.

9. Invoke Subtest 15 (Continuous) to print on reverse side. Press "TEST" button to exit this test.

10. The object of this procedure is to overprint the image on the other side of the paper.

11. Compare horizontal lines of Subtest 15 on each side of paper and measure the difference. (Hint, hold the paper so light will shine through it. A window will provide a good light source.) Use a graduated magnifying glass (graduated in one thousands of an inch/mm) to measure the difference (see Figure C-7).

12. The maximum difference should be no greater than 0.046 of an inch. Measure from top of line on the front of the paper to top of line on the reverse side. The actual error is equal to 1/2 of the actual measurement.

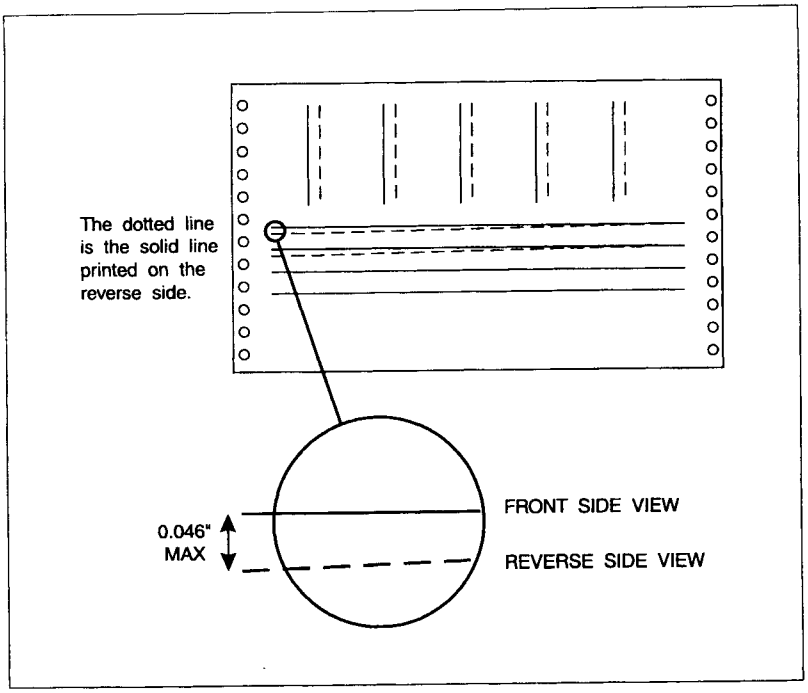


Figure C-7. Horizontal Line Measurements

13. At this point the paper path should be adjusted correctly, the paper has been verified. If the problem has not been identified at this time then escalate.

LIGHT OR SMEARED PRINT

If print appears light on one side of the page, the platen gap should be checked. Refer to Section 5 to perform the Platen/Printbar Gap Adjustment procedure. After completing this procedure, print a Self-Test, then back-off the Paper Thickness Lever until the print fades. The degree of fading should be fairly equal across the page.

Reverse the direction of the Paper Thickness Lever (platen gap becomes smaller). The print should become more legible. As the platen gap becomes smaller the density of print across the page should be even if the platen gap is set correctly; if not, readjust the platen gap.

Multipart (carbon) forms work best for this test. Observe the amount of dent made by the hammer in the bottom forms.

Also, a new ribbon (or an evenly worn ribbon) is required for this test. Older ribbons, not evenly worn, will produce misleading results.

Continue closing the platen gap until the optimum print quality is achieved and observe the caution regarding the NYEBAR coating on the printbar.

DROPPED PRINT COLUMNS

If it appears that dots are being dropped, that is, the hammers are not printing, this may be due to an excessive ink build-up around and between the hammers. This ink build-up prevents the hammers from being captured and then released as required for printing. If this condition appears, the printbar should be cleaned. Before cleaning the printbar, check the Ribbon Shield alignment. If this shield is not square with the hammers, it can cause a similar problem.

To clean the printbar, refer to Paragraph 5-3, Printbar Cleaning Procedure.

Appendix D

Anzac Support Supplement 2566B/C 2567B/C

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ANZAC SUPPORT SUPPLEMENT

Anzac Computer Equipment Corp. is one of Hewlett-Packard strategic partners. They OEM (original equipment manufacture) the Guadalajara family of printers (256X & HP2300) and resell them into the IBM system environment. The Anzac printers are designed to emulate an IBM 4214 model 2 printer or IBM 5225-1 printer and connect to the IBM System AS/400 and IBM systems 34, 36, 38. Anzac changes the HP front panel logo and inserts two IBM twinax boards (interface and backpanel) into the 256X & HP2300 transforming the HP printer into the "Anzac Shuttle Matrix Printer". Anzac also uses the HP Super Centronics PCA not the standard HP Centronics PCA. The Anzac 5080-2 and the Anzac 5011 are being shipped with the Super Centronics PCA or the Multiple I/O depending on the customer's needs.

All Anzac printers come with a 90 day on site warranty from GPR. The response time in a warranty call is next day for travel zones 1, 2 and 3 or more for other zones (see Worldwide Customer Support Travel and Office Directory, P/N 5091-2356E). All warranty is coded 02N and billed back to GPR (DO NOT use 02Y or bill to DIV 5060). The warranty does not cover installation; customers will be charged for this. Technical assistance for printer problems is available through the response centers. Technical assistance for the Anzac/IBM interface is available through the Anzac support desk at 1-800-223-9673, or, if outside the USA, you can dial Anzac direct at (415)475-4600 and ask for the support desk.

NOTE

You must call the Anzac support desk before going on site and you must close the call with the Anzac support desk before leaving the customer's site. Always keep the Anzac support desk informed of the customer's status. Anzac is your customer not the end user. Address all customer issues to the Anzac support desk.

THE ANZAC SUPPORT DESK IS MANNED 0500 hrs to 1700 hrs MONDAY THRU FRIDAY PACIFIC COAST TIME.

For Anzac support issues or Anzac escalations you can contact the Anzac Account Team, for USA accounts only:

Anzac Account Manager: Don Robinson, 510/460-1667, telnet 460-1667
Anzac Escalations: Larry Brasesco, 415/694-2118, telnet 694-2118

Anzac Support Supplement

The Hewlett-Packard/Anzac printer comparison is listed below in table 1.

Table 1. HEWLETT-PACKARD/ANZAC PRINTER COMPARISON LIST

HP PRINTER	ANZAC PRINTER	PRODUCT DESCRIPTION
2562C	ANZ5030	300 LPM
2563B/C	ANZ5040	420 LPM
2564B/C	ANZ5080	840 LPM
2566B/C	ANZ5012	900/1200 LPM
2567B/C	ANZ5016	1200/1600 LPM
C2354A	ANZ5080-2	840LPM
C2356A	ANZ5011	1100LPM

Unique Anzac PCA switch setting and parts are listed in the following sections.

Table 2. ANZAC FORMATTER MASTER FIRMWARE LIST.
All PROMS must be labeled as shown below

5030/5040	5080	5012/5016	5080-2	5011
63-250 U125 3305 8E6D	64-231 U13 2938 EBC7	66-406 U12 2928 7889	33422-67901 U191 3322 E7FB	C3206-67901 U191 3322 E716
63-251 U115 3305 660A	64-232 U33 2938 6CDC	66-407 U11 2938 E322		
63-252 U105 3305 F291	64-233 U63 2938 EFF5	66-408 U32 2938 4231		
63-253 U95 3305 18EA		66-409 U31 2938 3050		

Table 3. UNIQUE ANZAC PARTS BREAKDOWN

ANZAC P/N	DESCRIPTION	MODELS
ANZX0310003	Anzac Twinax I/F PCA	All except 5080-2 / 5011
ANZ-0310003FMK	Firmware for interface. **The Anzac Twinax I/F and the interface firmware must be ordered together**	All except 5080-2 / 5011
ANZX0310042	Anzac Twinax I/F PCA. * No firmware on new interface. IBM printer model number is downloaded from the host.	5080-2 / 5011
ANZ-0300016	5 position power harness for Analog revision 3046 and below. Wires must be soldered to Cap on Analog Board.	5030/5040/5080
ANZ-0300046	5 position power harness for Analog revision 3046 and above. Plug-in connector.	5030/5040/5080
ANZ-0300018	36 pos cable assy	all
ANZ-0300028	Backpanel assy	5012 / 5016
ANZ-0300015	Backpanel assy	5030/5040/5080
ANZX0300059	Backpanel assy	5080-2 / 5011
ANZ-1300010	Mounting plate	5030/5040/5080
ANZ-1300084	Mounting Plate	5080-2 / 5011
ANZ-1200007	3/16" Adj. standoff	all (4)
ANZ-0300023	Power harness	5012 / 5016
ANZ-2400025	Label, Anzac	5040
ANZ-2400026	Label, Anzac	5016
ANZ-2400027	Label, Anzac	5012
ANZ-2400028	Label, Anzac	5080
ANZX2400037-5080-2	Label, Anzac	5080-2
ANZX2400037-5011	Label, Anzac	5011
ANZ-0300019	60 pin assy (QMS opt. only)	5040 /5080

Table 3. UNIQUE ANZAC PARTS BREAKDOWN

ANZAC P/N	DESCRIPTION	MODELS
ANZ-1300064	CKT board spacer 5/8" (x2), QMS	5040 / 5080
ANZ-1300065	Nylon 632 hex nut (x4), QMS only	5040 / 5080
5062-1754	HP Super Centronics (new)	all
26067-69081	HP Super Centronics (rebuilt)	all
C2356-30101	Multiple I/O PCA	5080-2 / 5011
02566-60036	Anzac Formatter PCA. This PCA is loaded with Anzac firmware less character sets.	5012 / 5016
02566-69030	HP Formatter PCA See Table 2 for unique firmware	5012 / 5016 2566/67B
02563-69021	Anzac Formatter PCA. This PCA is loaded with Anzac firmware less character sets.	5030 / 5040
02563-69015	HP Formatter PCA See Table 2 for unique firmware	5030 / 5040 2563B
02564-69021	Anzac Formatter PCA. This PCA is loaded with Anzac firmware less character sets	5080
02564-69012	HP Formatter PCA See Table 2 for unique firmware	5080 / 2564B
4175006-QMS 4382022-QMS 02563-90974 26062-90902	HP Label Card (NEW) HP Label Card II (NEW) Label Card II Handbook Label Card Handbook	all (obsolete) all all all
26062-69101	HP Label Card (rebuilt)	all
33422-60001 C3206-60002	Anzac Formatter Anzac Formatter	5080-2 5011

Table 4. HP LABEL CARD. ANZAC TYPICAL CONFIGURATION

ORIGINAL HP LABEL CARD 256X & HP2300		FUNCTION NUMBER	HP LABEL CARD II 256X only *
JUMPER SETTING	FUNCTION SETTING		FUNCTION SETTING **
JW1 2,3	0 (No HP Label Card Installed)	80	0 (No HP Label Card Installed)
JW2 2,3	1 (HP Label Card installed)	80	1 (HP Label Card installed)
JW3 2,3	1	81	1
JW5 2,3	0	85	0
JW7 1,2	04	86	0
	10	87	0
	13	88	10
	11	89	00 5030/5040 01 5080/5080-2 10 5012 11 5016

* To configure HP Label Card II on the HP2300 refer to the proper manual, P/N 02563-90974. Anzac typical configuration for HP2300 in next edition.

** No jumpers on Label Card II.

Table 5. HP SUPER CENTRONICS 5062-1754 / 26067-69081
Hardware 8 Pin Dip Switch Setting and Front Panel Configuration

DIP SWITCH #	DIP SWITCH SETTING
1	on
2	off
3	off
4	off
5	off
6	off
7	off
8	off

FUNCTION SETTINGS
20 = 0
21 = 0
22 = 0
23 = 0
24 = 0
25 = 0
26 = 11
27 = 0
28 = 0
29 = 0

NOTE: Anzac typical configuration for the Multiple I/O will be included in the next edition.

TROUBLESHOOTING THE ANZAC INTERFACE

Twinax basics:

The Anzac printer is connected to the IBM System via the twinax interface and cable. Anzac printers use two type of cable assembles from the IBM System:

1. Twinax cables daisy chained from the IBM channel through a maximum of seven devices (0 thru 6) not to exceed 5000 ft.

2. Twisted Pair (phone lines), connected from the IBM channel via a balun (transformer) into a .5 foot twinax cable to the back panel of the Anzac printer. The twinset will only support 7 devices (0 thru 6). This configuration may be daisy chained together, but it is usually in a star configuration from a patch panel.

The specific device number is setup through the Anzac back panel switch (0 thru 6). Switch position #7 is used to select the Anzac interface selftest.

CAUTION

It is very easy to bump the back panel device select switch and change the printers configuration. Always check the position of the switch with the printers position on the daisy chain to avoid unnecessary troubleshooting time.

System commands: IBM vs. HEWLETT-PACKARD

In the Hewlett-Packard system environment you can ask the operator to down a particular device (down 6), Or, you can ask the operator to stop the spooler (stopspoolfile 6). In the Anzac / IBM environment you can do the exact same thing by using the IBM terminology (Table 6).

Table 6. SYSTEM COMMANDS

Hewlett-Packard	IBM
Down (#)	Vary Offline (#)
UP (#)	Vary Online (#)
Stopspoolfile (#)	Endwtr (#or discpt)
Startspoolfile (#)	Strprtwtr (#or discpt)

CAUTION

Never disconnect the printer's twinax or twisted pair without making sure the operator has ended the writer and varied the printer offline. Failure to insure that the printer is offline and the writer is stopped will result in taking down the rest of the devices on that channel. The operator will have to up all the devices on the daisy chain, not a pleasant task.

RUNNING PRINTER SELFTEST:

You have available to you two types of selftest:

1. Front Panel Selftest
2. Anzac Back Panel Selftest.

The front panel test is run with the printer in the Offline position. There are several printing and non-printing selftests available. The front panel selftest can be run anytime as long as the printer is in the offline position.

NOTE

Before running the Anzac selftest mark down the present device address and make sure the operator has stopped the IBM system writer (Endwtr).

The Anzac back panel selftest is enabled by turning the printer off, setting the printers back panel device select switch to #7 (refer figure 1) and turning the printer on. This will test 90% of the Anzac interface back into the printer.

The test will also give you the following information:

1. Provide you with a sliding alpha test pattern for print quality issues.
2. Firmware revision

HP41.D = IBM 4214 model 2 emulation
HP51.D = IBM 5225-1 emulation

You can then use this information to make sure the IBM system configuration matches the Anzac printer emulation. The operator or system administrator should have the system configuration.

ANZAC BACKPANEL ASSEMBLY

The Anzac back panel assembly can give you a quick snapshot of what is going on with the IBM system. The Parity, Sync, and the Printer lights (refer figure 1) will help you determine the present state of the printer.

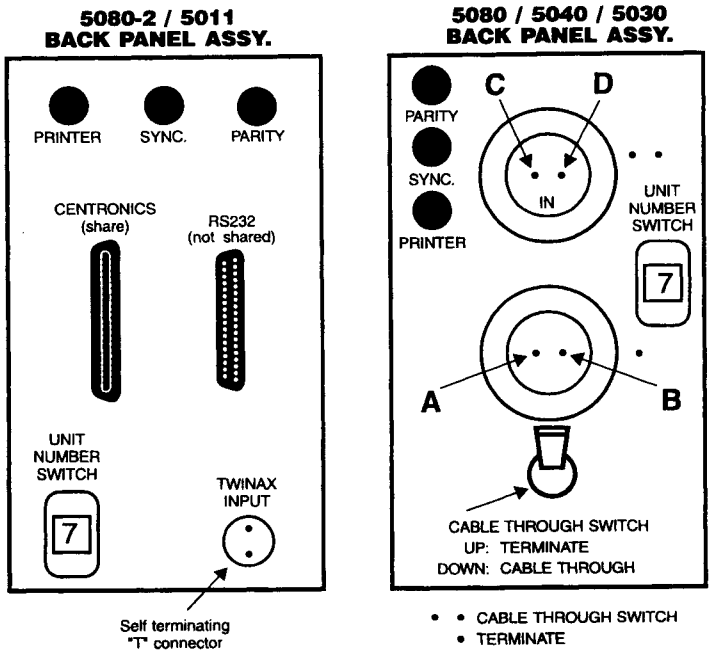
Parity light: Parity light must be off for proper operation. If the parity light is illuminated then the Anzac printer is having trouble seeing the system. If parity light is on look away from the printer back to the system. The printer is receiving or has received an incorrect packet. Possible bad data cable (twinax cable or phone line). Possible poor connection between Anzac backpanel and Anzac interface board in the printer.

Sync light: The sync light must be illuminated for proper printer operation. If the sync light is flashing the Anzac interface has looked for a poll and has not received it. With sync light flashing look for a bad cable connection in the daisy chain path back to the IBM channel or patch panel.

Printer light: The printer light must be off for proper printer operation. The printer light is tied to the printers fault line. The printer light will be lit if the printer is out of paper, or a fault condition exists (error12, 14-50). Correct the printer fault condition.

Cable thru switch — If the Anzac printer is device #6 or the last device on the channel the switch must be up (terminated). If the Anzac printer is not the last device on the channel then the switch must be down (cable thru).

Power on: — On power-on all three back panel lights will illuminate for ~ 1 second. If any of the lights fail to come on within that brief moment you have a defective LED.



CAUTION

It is easy to bump the switch while moving the printer. If you change the switch setting you will down all the devices past yours. Again the operator will have to up all the devices you have downed.

You can check the Anzac back panel assembly for continuity. This test will check out the continuity between the back panel and the Anzac interface board and cable. Figure 1 shows all the test points needed for this final test. Compare the values with table 6 below.

Table 6.

TEST POINTS	TERMINATE	CABLE THROUGH
A - B	OPEN	OPEN
A - GND	OPEN	OPEN
B - GND	OPEN	OPEN
A - C	OPEN	<2 ohms
B - D	OPEN	<2 ohms
C - D	110 ohms	OPEN
C - GND	54.9 ohms	OPEN
D - GND	54.9 ohms	OPEN

DEVICE ADDRESS SEVEN TEST

To enter the Device 7 test, turn the printer off, change the device switch to address 7, and turn the printer on again. The Device 7 test should be used when installing printers for the first time. Successful completion of a Device 7 test indicates that the Anzac Interface PCA is receiving power, and that the board is communicating with rest of the printer. It DOES NOT mean that the printer is receiving data from the computer system(s).

A successful Device 7 test also indicates the following:

1. **The Firmware Revision Number and Checksum.**
   The firmware revision number identifies the type of code on the Anzac Interface PCA. The checksum identifies the code based on numeric characteristics. Unless the code has been write protected, the printer's checksum will change whenever the printer is used.

2. **Config Bytes.**
   The configuration byte settings are used to make changes to the printer's setup. Due to the constant changes in functionality, access to these configuration bytes is limited to programming support. Customers may be given information about the configuration bytes only in very special cases.

3. **Page Count And Line Count.**
   This option is enabled or disabled based on whether or not the Anzac Interface PCA's firmware has been write protected.

4. **The System Emulation.**
   This is the emulation which the minicomputer system uses to identify the printer. System emulations commonly being used are 3812, 5225 and 4214.

5. **Virtual Printer Type And Protocol.**
   This identifies the printer language used by the printer engine. Commonly used printer types are HP Laser and 9/18 pin, which respectively use PCL5 and Epson FX protocol. Advanced programmers may want to access such protocols in order to utilize special printer functions.

6. **The Character Set.**
   A description of the accessed printer character set.

7. **Available Fonts According To GFID.**
   Fonts listed according to their GFID numbers vary according to the amount stored inside the printer. Repetition of font styles is common and often intentional, because many fonts have more than one GFID number assigned to them.

VOYEUR MODE

Printers with the Anzac Interface PCA include a self diagnostic tool called Voyeur mode. It is similar to Hex Dump provided by many printers. However, Voyeur mode allows the user to analyze the data being sent to the printer, instead of the data that has been converted by the Anzac Interface PCA. Voyeur mode prints the exact IBM system commands being used, as well as their Hexadecimal equivalents.

Retrieving a Voyeur Mode Test is often the first step in diagnosing a problem unit. If possible, retrieving a Voyeur along with an equivalent Hex

Dump test will provide Programming Support the clues to determine whether a problem is hardware or firmware related. Whereas entering Hex Dump mode is a different process from printer to printer, entering Voyeur Dump Mode requires the following steps:

1. Turn the printer off and on.

2. Change the device setting switch using one of the switch's buttons until the device switch is again at its original value.

3. The system operator must now send the file or print job which needs to be analyzed.

To exit Voyeur mode, make sure the device switch setting is still set to its original value. Turn the printer off and on.

Appendix E

Media Specifications

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This appendix provides specifications for selecting continuous form paper appropriate for use in the HP 2566/67 Printers. This section also identifies ribbon specifications. These specifications are intended to ensure that the highest quality print and reliability of the printer are maintained and are not intended to recommend a specific brand of paper or ribbon.

PRINTER OVERVIEW

The HP 2566/67 Printers use dot-matrix technology which allows a high degree of printing flexibility. The printing mechanism in this family of printers is a printbar containing 66 hammers; one hammer for each character (at 10 characters per inch). The printbar oscillates horizontally to allow dot placement in any allowable dot positions across the page. Dot-matrix technology provides flexibility to adjust character formation, allowing multiple languages, line draw characters, special characters and graphics images to be printed.

DOT-MATRIX VS. FULL-FONT PRINTERS

A major difference between dot-matrix printers and full-font printers is the print gap, the distance between the print hammer in its retracted position and the platen. While the hammers of full-font printers fire only once to form an entire character, the hammer of a dot-matrix printer fires an average of 13 times per character and as many as 26 times to form a standard-density character. The high-repetition rates that dot-matrix hammers are required to operate at requires a significantly small print gap. Figure D-1 gives a comparison of typical dot-matrix and full-font print gaps.

For most standard paper and multi-part forms, the smaller print gap of dot-matrix printers does not present any problems. However, some specialty forms may cause unacceptable paper jam rates and/or print smearing even though they perform satisfactorily in full font printers. This paper specification guide will help you identify and purchase paper that will perform well in your Hewlett-Packard Printer. This guide will help you work with your forms vendors in designed and or purchasing forms that will give you optimum print quality and stacking in your printer.

NOTE

Always test your paper and forms prior to purchasing a large quantity for proper print quality, feeding and stacking.

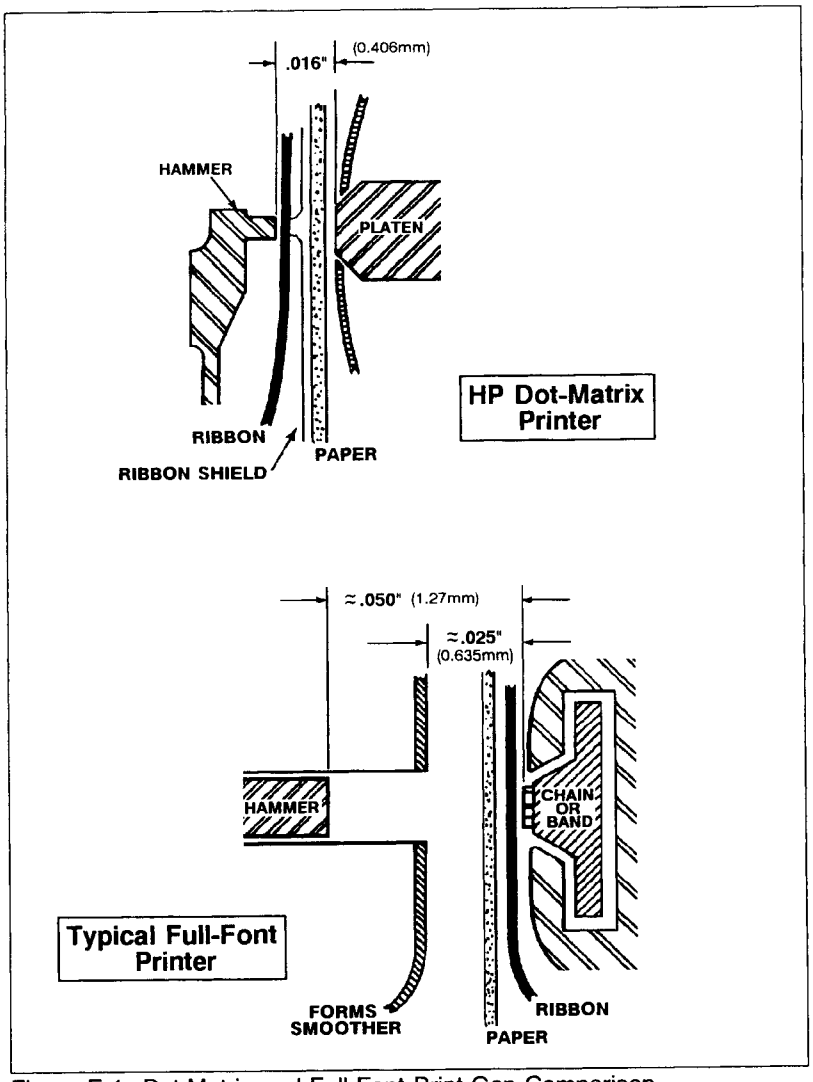

Figure E-1. Dot-Matrix and Full-Font Print Gap Comparison

GENERAL PAPER REQUIREMENTS

The printer uses continuous fan-fold edge-perforated paper varying in width from 3.0 inch (7.62 cm) to 18 inch (45.72 cm). Although the printer accepts paper as wide as 18 inches, the farthest right it can print is 15.2 inch (38.6 cm). It will handle paper weights in the range of 15 to 100 pound (18 - 60 pound optimum). Multi-part forms up to six parts may be used with a maximum overall pack thickness of 0.024 inch (0.61 mm).

If paper is to be used in humidity extremes (greater than 55% or less than 20%) it should first be tested. Paper to be used at high humidity should be tested for satisfactory feeding and handling. Paper to be used at low humidity should be tested to determine if static buildup must be eliminated for proper stacking.

In general, any special application paper, such as multi-part forms, labels, etc. should be tested in the printer prior to purchase.

PAPER SPECIFICATIONS

This section describes the paper specifications which must be met to ensure optimum performance of the printer.

Hewlett-Packard conforms to ANSI standard X3.96-1983, "American National Forms Information Systems for Continuous Business Forms", and ISO Recommendation No. 2784, which cover common form widths and depths, standards for sprocket feed holes and margins, as well as other basic tolerances.

All measurements should be made at 20 to 26 degrees C (68 to 78 degrees F) and 45 to 55 percent relative humidity.

STANDARD FORMS SPECIFICATIONS

The Hewlett-Packard 2566/67 Printers were found to perform adequately with forms that meet the following specifications:

Paper Sizes:

Maximum form width	16.75 in (42.4 cm) edge-to-edge
Minimum form width	5.0 in (7.6 cm) edge-to-edge
Maximum left margin	0 - 1.37 in (3.5 cm)
Maximum right margin	2.0 in (5.0 cm)
Maximum printing width	13.2 in (33.5 cm)
Maximum form length	15.0 in (38.0 cm)
Minimum form length	2.0 in (5.0 cm)

Paper Weights:

- **Single-part:**

Standard	15 to 100 pound	(57 - 380 gm/sq meter)
Optimum print quality	18 to 80 pound	(68 - 304 gm/sq meter)
Optimum paper stacking	20 to 80 pound	(76 - 304 gm/sq meter)

- **Multi-part forms:**

Paper:	12 pound (46 gm/sq meter) up to 6 total pages
Carbons:	8 pound (30 gm/sq meter) up to 6 total pages
Pack Thickness:	Maximum .024 inches (0.61 mm) total
Carbonless:	Up to 4 part forms

Standard line printer paper purchased from Hewlett-Packard meets the above specifications and will perform well in the printer. Many other papers purchased from other sources will also provide satisfactory results. For forms other than single-part or simple carbon-type multi-part forms, refer to the next paragraph, "Specialty Forms Specifications". The forms used in the printer should not vary in thickness across the printable surface. If paper is to be used in humidity extremes (greater than 80% or less than 20%), it should first be tested. Paper to be used at high humidity should be thoroughly tested for satisfactory feeding and handling. Paper to be used at low humidity should be tested to determine is static buildup must be eliminated for proper stacking.

SPECIALTY FORMS SPECIFICATIONS

Due to the variations in manufacturing processes, quality, and composition of forms, Hewlett-Packard cannot guarantee satisfactory performance with all paper and forms. This section of paper specifications is intended to familiarize and alert the user to some of the characteristics of specialty forms which may cause unsatisfactory performance of the printer. This paper specification is NOT intended as a substitute for actual testing.

NOTE

All specialty forms, including special single-part paper, multi-part forms, forms with glue strips, carbonless forms, card stock, and labels should be tested for satisfactory feeding, registration, and print quality prior to purchase.

RECYCLED PAPER

Recycled paper is a combination of **waste paper, pre-consumer waste,** and **post-consumer waste.** Printed waste paper is usually washed to remove most of the inks and other contaminents. A recycled sheet of paper may contain dark specks or appear gray or dirty. You should choose a recycled paper that meets the same specifications as standard paper and that has an appearance suitable for your needs. Hewlett-Packard recommends that recycled paper contain no more than 5% **groundwood.**

FORM THICKNESS UNIFORMITY

Because of the small print gap in dot-matrix printers, they are less tolerant of form thickness variations than are full-font printers. Sometimes these thickness variations can be caused by defects such as bubbles or wrinkles. Other times they are due to varying paper composition or the number of parts within the form.

Nominal differences in thickness and compressibility make it impossible to specify allowable thickness variations exactly. The following cases are intended to serve as a guide, but all forms with thickness variations must be tested for satisfactory performance. (In the following cases, T = maximum thickness.)

Case 1: Form Defect

In order to avoid hammer dragging, the overall thickness of a form plus any defects should be no more than as shown in Figure E-2 (.015+T/2) inch.

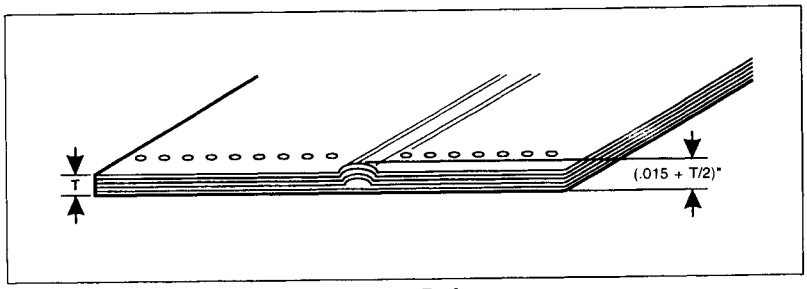

Figure E-2. Maximum Height of Form Defects

Case 2: Varying Thickness Forms: Printing on All Areas.

In order to ensure satisfactory print quality on all areas of the form, the difference in thickness between the thickest and thinnest section of the form should be no more than .008 inch (as shown in Figure E-3). The print gap should be adjusted to optimize print quality on all thicknesses of the form. Since dot-matrix printing is optimized when printing at one gap size, print quality can in some cases be compromised when printing on forms of varying thickness. This is especially true on the copy sheets of multi-part forms. When printing on forms of varying thickness, the maximum depth of depression defects on the thick part of the form is also .008 inch.

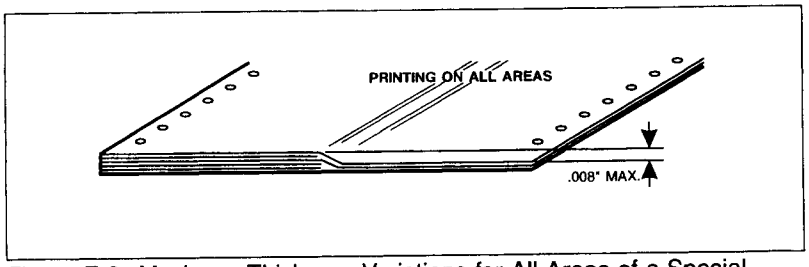

Figure E-3. Maximum Thickness Variations for All Areas of a Special Form

Case 3: Varying Thickness Forms: Printing on Thin Area.

In order to avoid smearing on the thickest area of the form when printing on the thin area only, the difference in thickness between the thinnest area and the thickest should be no more than as shown in Figure E-4 (.015-T/2) inch. For forms with larger variations in thickness, the print gap may be opened beyond the optimum gap to reduce smearing, but print quality on the thinner areas will degrade accordingly.

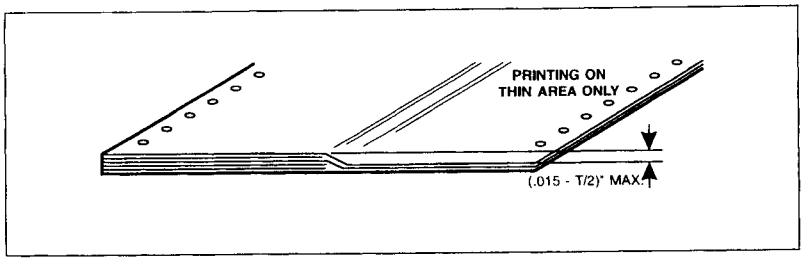

Figure E-4. Maximum Thickness Variations for the Thin Areas of a Special Form

Case 4: Varying Thickness Forms: Printing on Thickest Areas.

In this case, as long as the thickest area of a form does not exceed the specifications listed (see "Paper Weights" page E-4), there is no lower limit to the thickness of the thinnest area as long as it is sufficient to support the form as it is fed through the printer.

PERFORATION PROJECTION

The perforation projection (perforation tent) is measured by laying the form on a flat surface as shown in Figure E-5. Perforation projections exceeding the value shown (.015+T/2 inch) can result in excessive smearing at the perforations and/or an unacceptable jam rate. This is because the perforations may snag on the hammers as the paper slews through the print area. Opening the print gap will reduce smearing or jamming, but may also degrade print quality.

Paper crimps should not come loose and tails should not be showing. If these occur they will catch on the inward fold and cause paper jams.

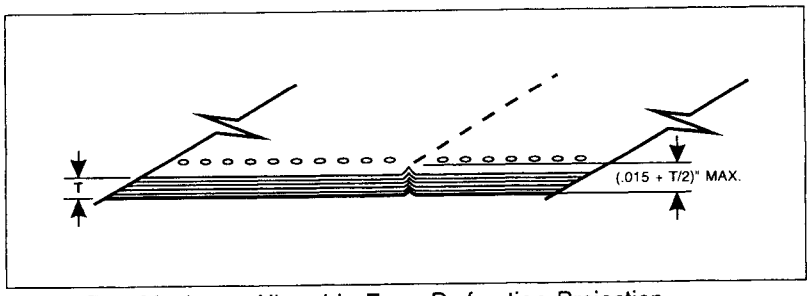

Figure E-5. Maximum Allowable Form Perforation Projection

OTHER SPECIAL FORMS

Forms with windows, cutouts, flaps, or attached cards, and other specialized forms may jam excessively in the printer. The only way to ensure satisfactory performance of these forms is to test them thoroughly before purchase.

LABELS

Most standard labels work well in the printer as long as they meet the specifications outlined in the section "Standard Forms Specifications". However, due to variations in the label products offered, all labels should be tested for satisfactory performance before purchase.

CARBONLESS FORMS

When using carbonless forms, poor print quality can be a result of the forms. The following considerations can result in poor print quality:
If shelf life of the form is past, if the chemical coating on the form is not distributed evenly, and certain chemicals have longer developer times.

CONCLUSION

Since it is impossible to test all possible form types available for use in the printer, Hewlett-Packard recommends that paper conform to the specifications outlined in this document for optimum printer performance.

Table E-1. Recommended Printer Paper

Part No.	Description	Quantity
92157A	One-part, white, 9.5 x 11 in 18 lb bond	2400 sheets/box
92157C	One-part, white, 9.5 x 11 in 20 lb #1 bond	2400 sheets/box
9320-1515	One-part, blue bar, 14.9 x 11 in 18 lb, 132 column	2400 sheets/box

Once again, this paper specification is NOT intended as a substitute for actual testing. ALL SPECIALTY FORMS, INCLUDING SPECIAL SINGLE-PART PAPER, MULTI-PART FORMS, FORMS WITH GLUE STRIPS, CARBONLESS FORMS, CARD STOCK, AND LABELS SHOULD BE TESTED FOR SATISFACTORY FEEDING, AND PRINT QUALITY PRIOR TO PURCHASE. For the best results in selecting standard or specialty forms, consult a forms vendor who can ensure conformance to these specifications and can recommend cost-effective purchases.

PAPER STORAGE AND HANDLING

Since the performance of the printer is dependent on the condition of the paper used, the following recommendation for packaging, handling and storing are included in this document.

PACKAGING

To avoid damage during handling, top and bottom fillers should be used in continuous paper cartons to hold the stack firmly in place. Because the physical condition of the paper affects printer reliability, proper packaging ensures that the paper remains flat and is not damaged along the edges.

Media Specifications

STORAGE

Do not store cartons directly on the floor, and do not stack more than six high. Each carton should be set upright squarely on the one underneath. Placing additional weight on top of the stack of cartons can damage the paper.

ENVIRONMENTAL CONSIDERATIONS

Since performance is affected by environmental conditions, paper should be protected from temperature and humidity extremes (as listed in the next section).

PRECONDITIONING FORMS

Paper should be stored in an environment similar to the printer's controlled environment for 48 hours prior to use. This conditioning allows moisture content in the paper to stabilize. HP 2566/67 Printers are intended for operation in a controlled environment. This environment consists of temperatures 10 to 50 degrees C (50 to 122 degrees F) with a relative humidity of 30% to 80% non-condensing. For best results, however, the cartons should be stored and used at 18 to 24 degrees C (65 to 75 degrees F), with a relative humidity of 40 to 50 percent.

In the event the printer is in an environment subject to extremes of relative humidity or temperature, it may be necessary to store the forms in a controlled environment and withdraw them on an as-needed basis.

SHIPPING

When paper is shipped through different environments, the entire stack of cartons on the pallet should be plastic wrapped. When shipping across bodies of water, individual cartons should be wrapped as well.

RIBBON SPECIFICATIONS

The remainder of this appendix identifies the ribbon specifications which must be met to ensure optimum performance of the printer.

Overall dimensions

Overall Ribbon Length	18.3 +/- .15 meters and full-font (60 +/- 0.5 feet)
Ribbon Width	381 mm (15.0 in)
Core Length	406 mm (16 in)
Core I.D.	31.8 mm (1.25 in)

RIBBON FABRIC

The ribbon should be 0.0914 - 0.1067 mm (.0036 - .0042 inch) thick nylon fabric. Quality ribbon fabric should have 111 to 115 threads per cm^2. (716 to 742 threads per m^2).

Only new ribbon fabrics are recommended for use in the HP 2566/67 Printers. Current methods used for re-inking used ribbons does not ensure complete re-saturation of the ribbon. Excess ink on the surface of the ribbon tends to come off the ribbon in clumps and contributes to corebar contamination. Ink build up on the hammers can cause the hammers not to fire correctly.

Splices or repair patches in the body of the ribbon material between conductive pads should also be avoided.

NOTE

Hewlett-Packard does not recommend the use of re-inked ribbons. If a re-inked ribbon causes a printer failure, Hewlett-Packard will handle this problem on a per-incident basis and a "time and materials" billing may result.

INK

Ink specifications include:

Color	Medium black
Pigmentation size	<5 microns
Solids content	20%
Ribbon ink content	18-20% by weight
Ink base	Vegetable oil

CONTACT PATCH

An aluminum contact patch must be located at both ends of the ribbon, beginning at a distance of 190 +/- 15mm from the point of ribbon attachment to the core. See Figure E-6. The patch must be 76 +/- 4mm square, and it must be centered (152 +/- 4mm from each side).

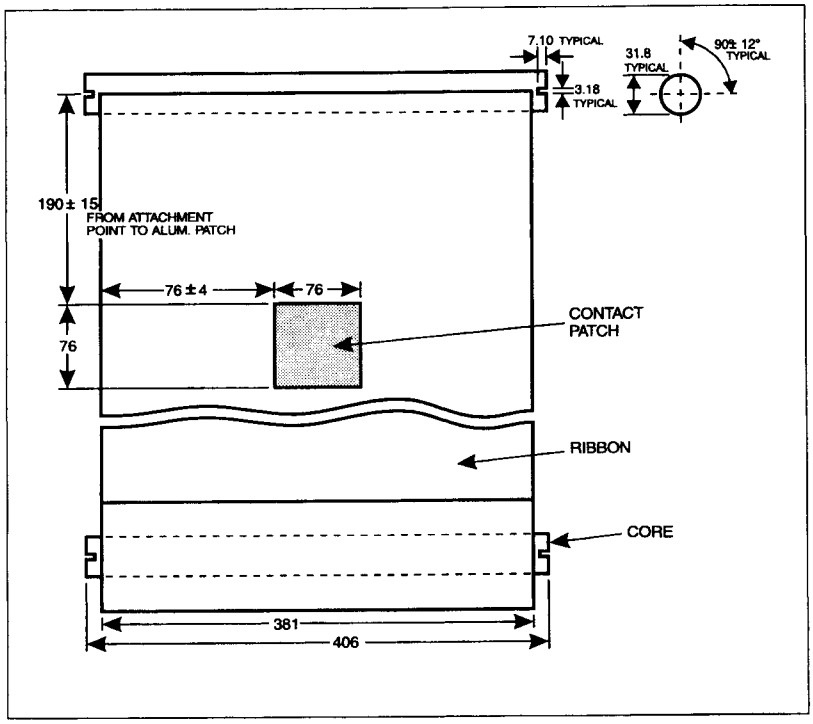

Figure E-6. Aluminum Contact Patch Location

Foil patches of different dimensions and locations have been shown to cause static discharge, resulting in various printer errors.

TESTED RIBBON VENDORS

In addition to the recommended HP ribbon (P/N 9282-0545), ribbons from the following vendors have been tested and found to perform satisfactorily in the 2566/67 printers:

Data Products
P/N 233430-504

Pacific Computer Supply
P/N 807-2230-420

CONCLUSION

Since it is impossible to test all ribbons available for use in the printer, Hewlett-Packard recommends that ribbons conform to the specifications outlined in this document for optimum printer performance.

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Appendix F

Service Notes

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