

**44689032**

*Rev. F*



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**LINEWRITER 400**  
**MODELS CT301-A/B/C/D**

**SPARED PARTS IDENTIFICATION**  
**FAULT ISOLATION**  
**REPLACEMENT PROCEDURES**  
**ADJUSTMENT PROCEDURES**

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**MAINTENANCE MANUAL**



# REVISION RECORD

REVISION	DESCRIPTION
02 AUG., '83	Pre-release of the CDC Linewriter 400 Maintenance Manual.
A NOV., '83	Release of the CDC Linewriter 400 Maintenance Manual.
B NOV., '83	Updated part numbers in Section I and made miscellaneous corrections.
C JAN., '84	Added 800 LPM information.
D AUGUST, '84	Added new FRU's and the following ECO's: ECO PH19599, ECO PH19907, ECO PH19913, ECO PH19944, ECO PH19949, ECO PH19983, ECO PH19985-1, ECO PH20004, ECO PH20029, ECO PH20060, ECO PH20080, ECO PH20111, ECO PH20236, ECO PH20245
E JAN., '85	Revised to incorporate the following ECO's: ECO PH19599, ECO PH20029, ECO PH20293, ECO PH20369, ECO PH20466, ECO PH20487, ECO PH20542, ECO PH20572
F APRIL '85	Added LW455 and 855 information, Backplane Switch Functions, and the following ECO's: ECO PH20118, ECO PH20230, ECO PH20472, ECO PH20488, ECO PH20583, ECO PH20598, ECO PH20691, ECO PH20692, ECO PH20695, ECO PH20698, ECO PH20699, ECO PH20703

**PUBLICATION NO.**

44689032

**Revision Procedure:**

The revision record page is revised for each revision package to reflect the revision sequence: (Pre-Release) Rev. 01, 02, etc; (Release) Rev. A, Rev. B, Rev. C, etc. The revision record page also provides a brief description of each change. A manual update revision package will be available for manuals after the Release revision of the manual. Each page revised in an update revision package will have the month and year printed in the lower right hand corner. This same date would appear in the revision column above, just below the revision identification. An instruction sheet cover is with each revision package, explaining page removal and insertion and reason for the change. The instruction sheets for revision packages are then to be placed at the back of the manuals as a record of the change.

**IDENTIFICATION NO.**



# MANUAL TO EQUIPMENT LEVEL CORRELATION

This manual reflects the equipment configurations listed below.

EQUIPMENT TYPE	SERIES	TOP LEVEL ASSEMBLY	COMMENTS
CT301-A	2-12	59829800	DATA PRODUCTS COMPATIBLE INTERFACE RS-232 INTERFACE SERIES 1 INTERFACE RS-232 INTERFACE
CT301-B	2-12	59829801	
CT301-C	2-12	59829802	
CT301-D	2-12	59829803	
CT301-E	11,12	59829804	
CT302-A	1-8	59829850	DATA PRODUCTS COMPATIBLE INTERFACE RS-232 INTERFACE SERIES 1 INTERFACE RS-232 INTERFACE
CT302-B	1-8	59829851	
CT302-C	1-8	59829852	
CT302-D	1-8	59829853	
CT302-E	7,8	59829854	



## PREFACE

This manual contains field service maintenance information for the Linewriter printers.

Operator maintenance such as routine cleaning and replacement of consumable items such as ribbons, ribbon rollers and other operator responsibilities are documented in the operator cards, beneath the printer's bonnet in the band cover.

The publications listed below are related publications for these printers.

PUBLICATION	PUBLICATION NUMBER
Set-Up and Reference Manual (With OEM Parallel Interface)	44689053
Set-Up and Reference Manual (With RS-232 Serial Interface)	44689037
Set-Up and Reference Manual (With Series 1 Interface)	44689059
Technical Manual	44689051
Parts Identification Manual	44689062

**WARNING** This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions manual, may cause interference to radio communication. It has been tested and found to comply with the limits for a Class A peripheral computing device pursuant to Subpart J of Part 15 of the 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.

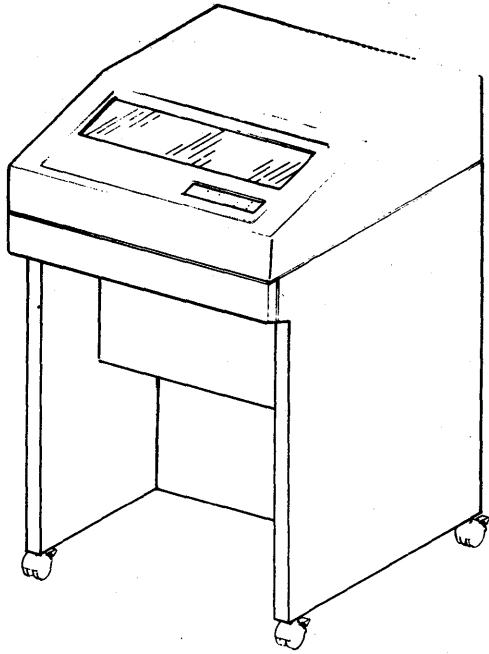
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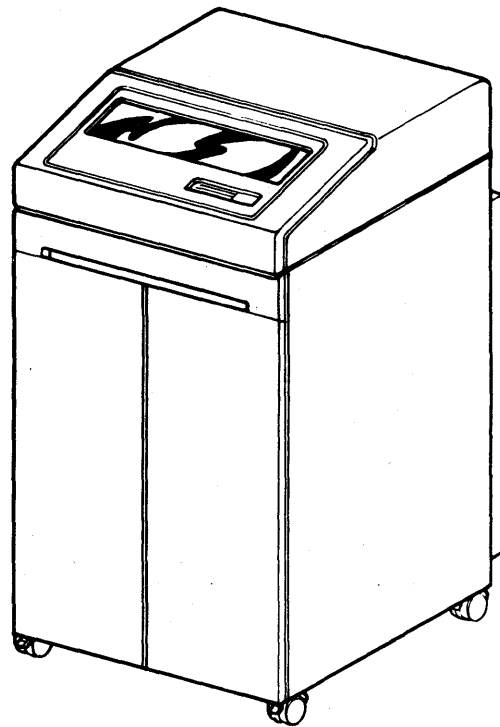


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**LINEWRITER 400/800**



**LINEWRITER 455/855**

# SECTION I

## SPARED PARTS IDENTIFICATION

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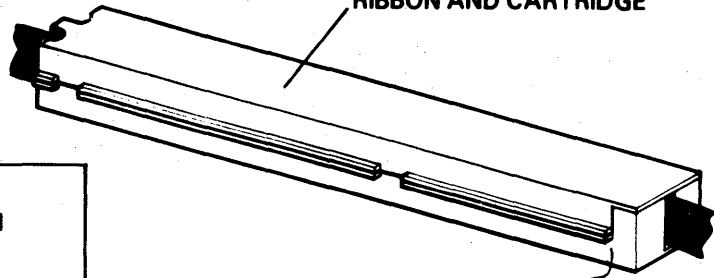
This section provides part number information on parts spared either on site, locally or from regional support centers.

### WHEN ORDERING REPLACEMENT PARTS...

- Include the 8 digit part number and the name of the part.
- Include the area of the printer where the part came from and its function if known.

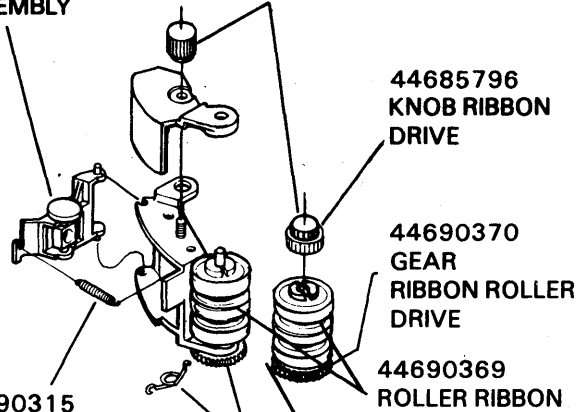
The name of the parts listed in this manual may not be the same as the manufacturer's name of the part. It is suggested that you make note of the part's function and location if possible, in case of name discrepancies between parts.

44688116  
RIBBON AND CARTRIDGE



44688626  
ROTOR AND HOUSING  
ASSEMBLY

44685795  
KNOB ASSEMBLY RIBBON



44685796  
KNOB RIBBON  
DRIVE

44690370  
GEAR  
RIBBON ROLLER  
DRIVE

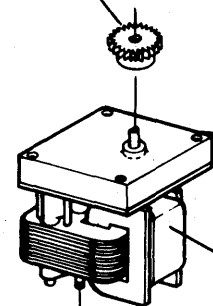
44690369  
ROLLER RIBBON

44690315  
SPRING EXTENSION

44689551  
SPRING PRESSURE  
ROLLER

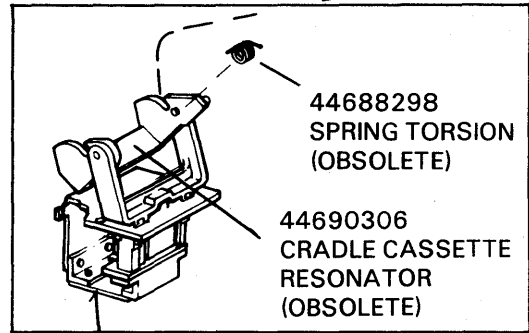
44690385  
GEAR RIBBON  
DRIVE

44681666  
SHAFT ASSEMBLY  
PRESSURE  
ROLLER



44689594  
MOTOR RIBBON  
DRIVE

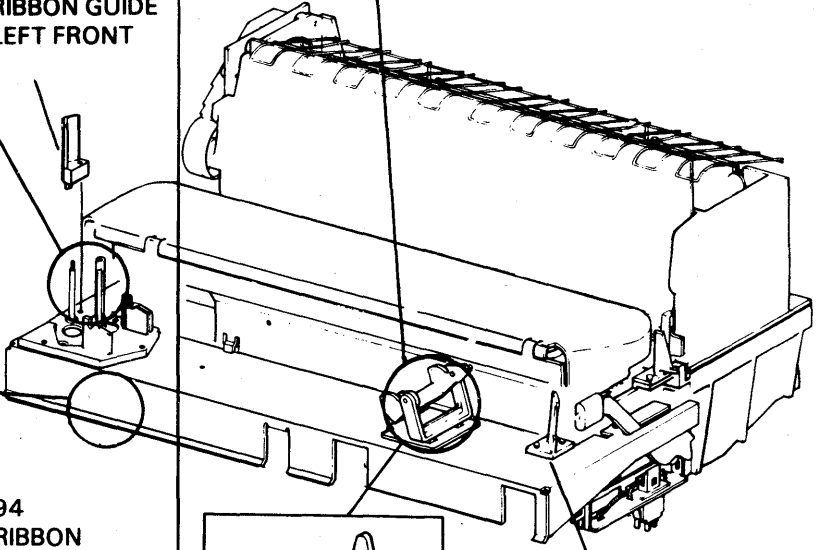
44683741  
FAN RIBBON  
DRIVE MOTOR



44688298  
SPRING TORSION  
(OBSOLETE)


44690306  
CRADLE CASSETTE  
RESONATOR  
(OBSOLETE)


44688299  
RIBBON RESONATOR  
ASSEMBLY




44688659  
RIBBON GUIDE  
LEFT FRONT

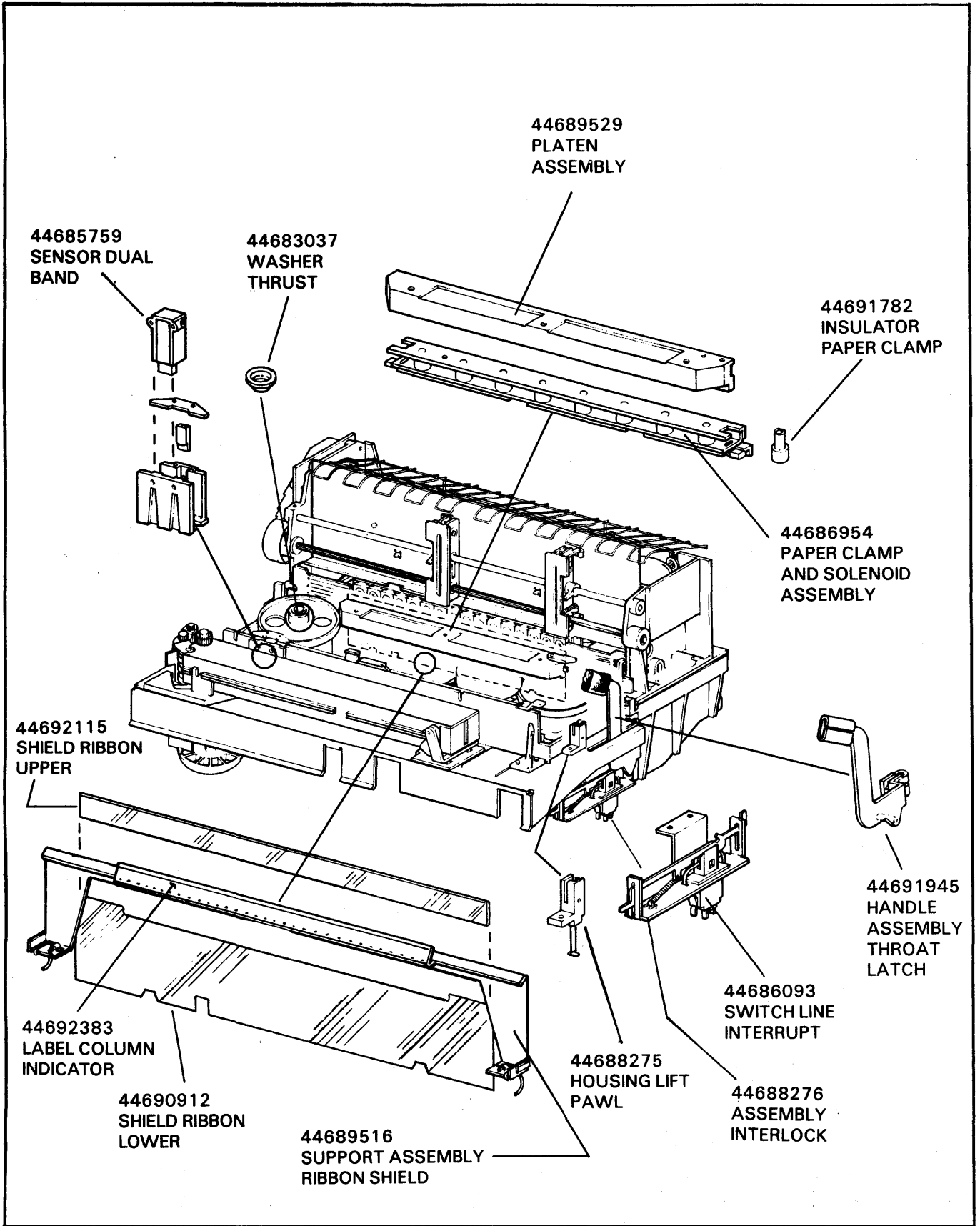
44686916  
RIBBON GUIDE  
RIGHT FRONT

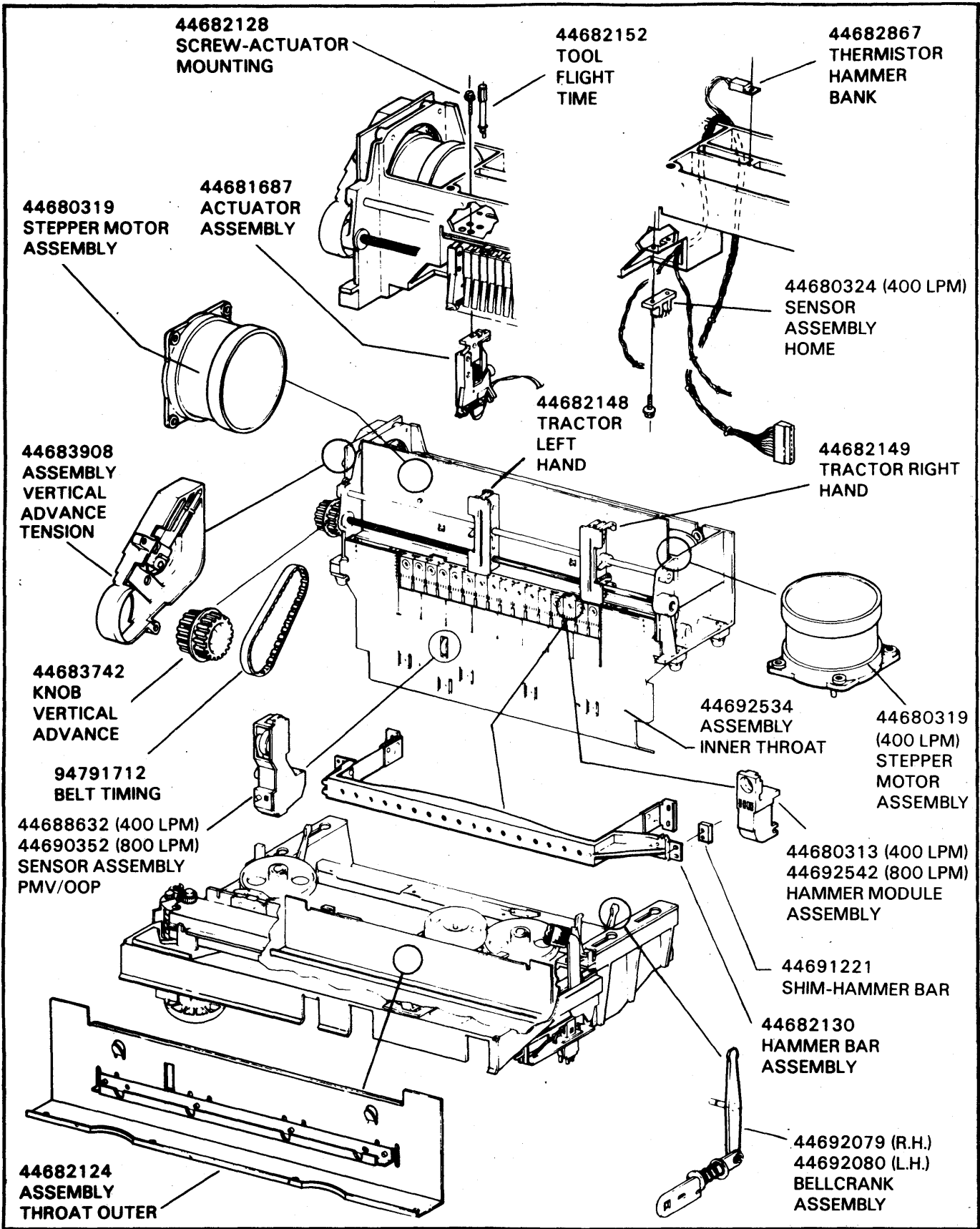
44691767   
RIBBON DRIVE SYSTEM ASSEMBLY

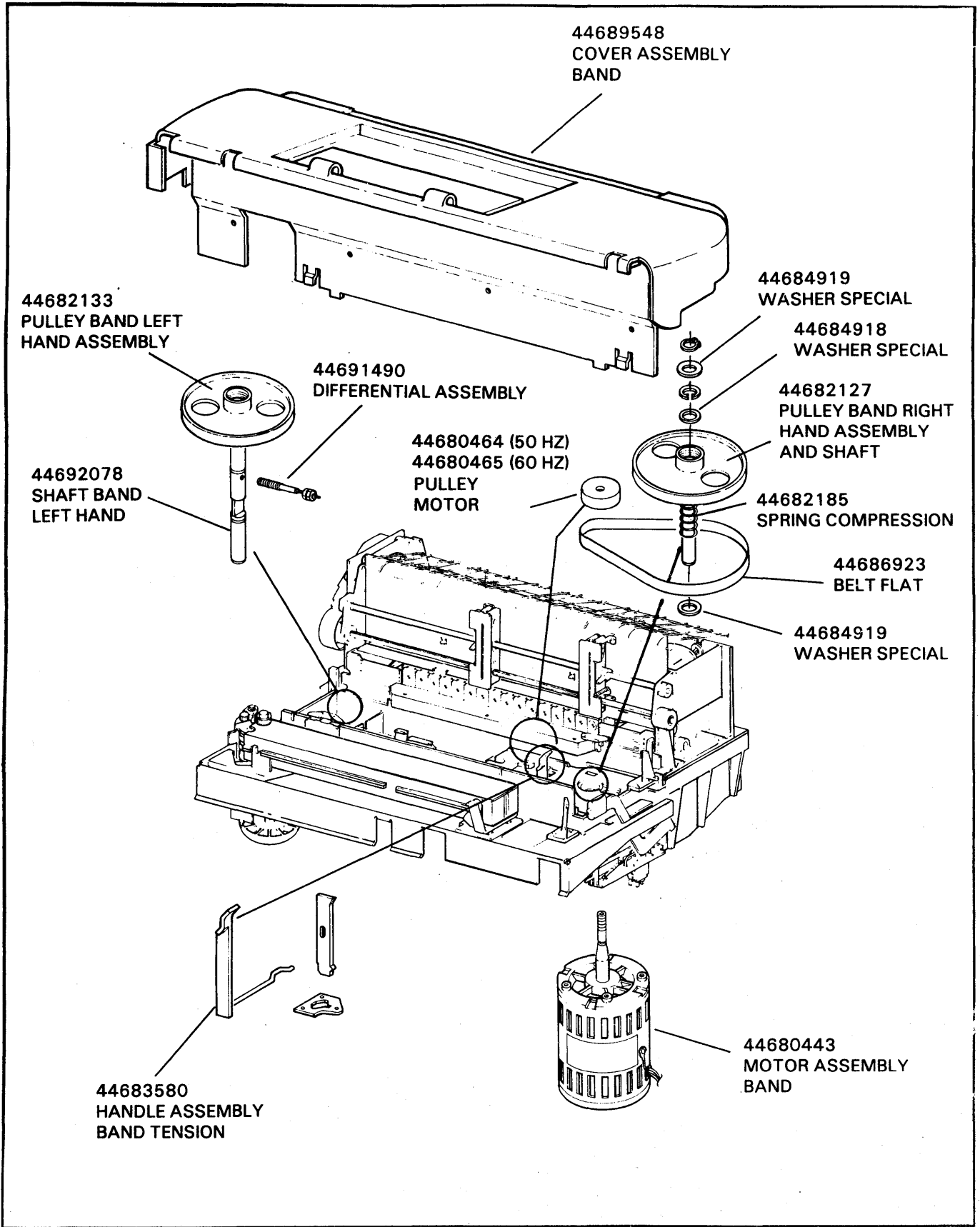
44691776   
RIBBON RESONATOR  
ASSEMBLY

 1 IF PART NUMBERS 44688299 RESONATOR, 44690306 CRADLE AND 44688298 SPRING NEED REPLACEMENT, ORDER 44691776.

 2 LW400 ORDER 44691767 FROM SERIAL NUMBERS 5197 AND GREATER. LW800 ORDER 44691767 FROM SERIAL NUMBERS 1131 AND GREATER. ALL OTHER SERIAL NUMBERS ORDER 44680414.



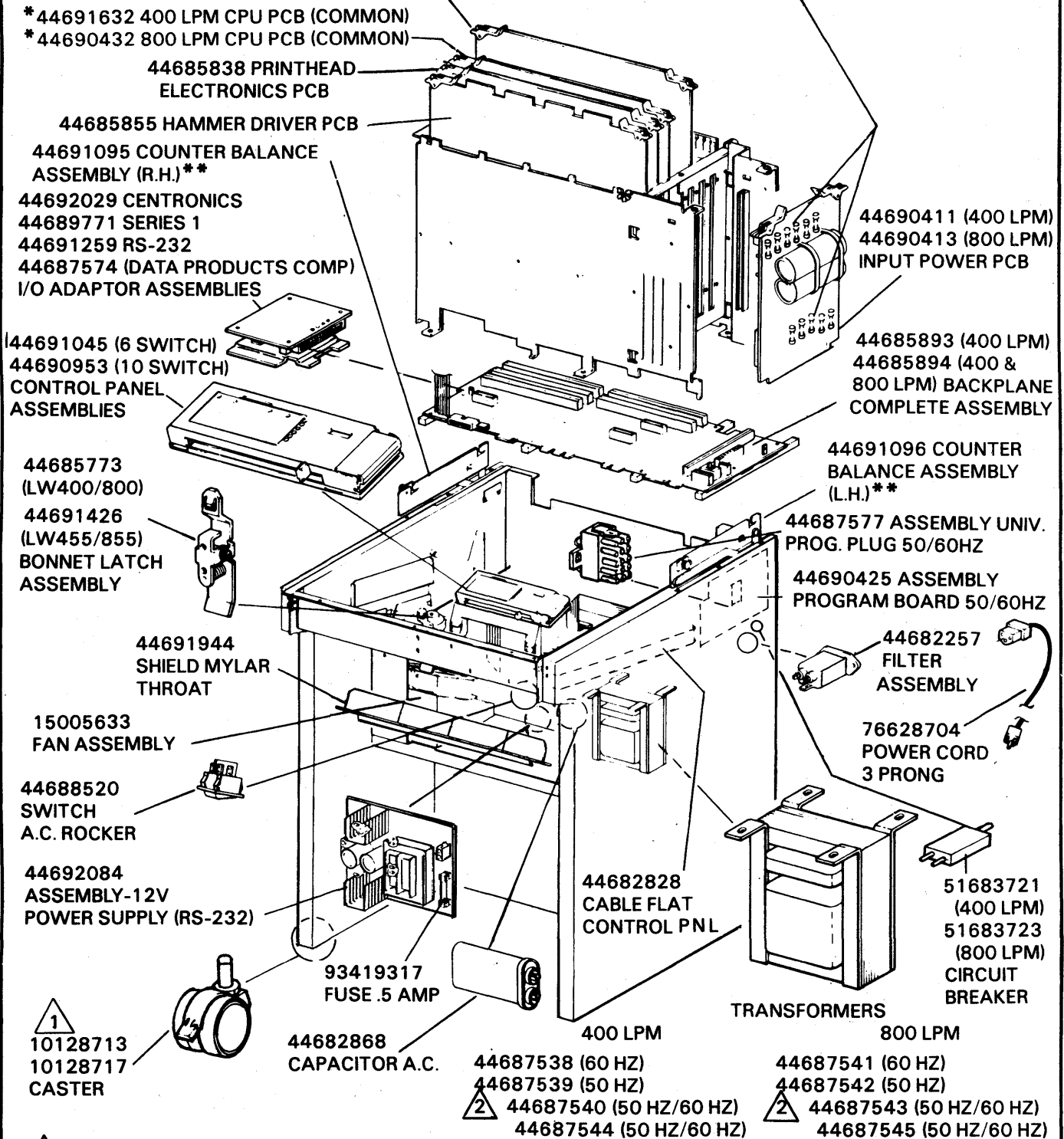




44691027 SERIES 1  
 44692049 (RS-232)  
 \*44682848 (DATA PRODUCTS COMPATIBLE)  
 PERSONALITY MODULE PCB's

FUSES

24521729	4 AMP	LOCATION	F2
24521730	5 AMP	LOCATION	F3,F8,F9
24521732	8 AMP	LOCATION	F1,F4,F6,F7,F10,F11



1 LW400, S/N ≥ 1773 and LW800, S/N ≥ 136 USE 10128717.  
 SERIAL NUMBERS BELOW THESE USE 10128713.

2 LW400, S/N ≥ 7168 USE 44687544, S/N BELOW 7168 USE 44687540.  
 LW800, S/N ≥ 2200 USE 44687545, S/N BELOW 2200 USE 44687543.

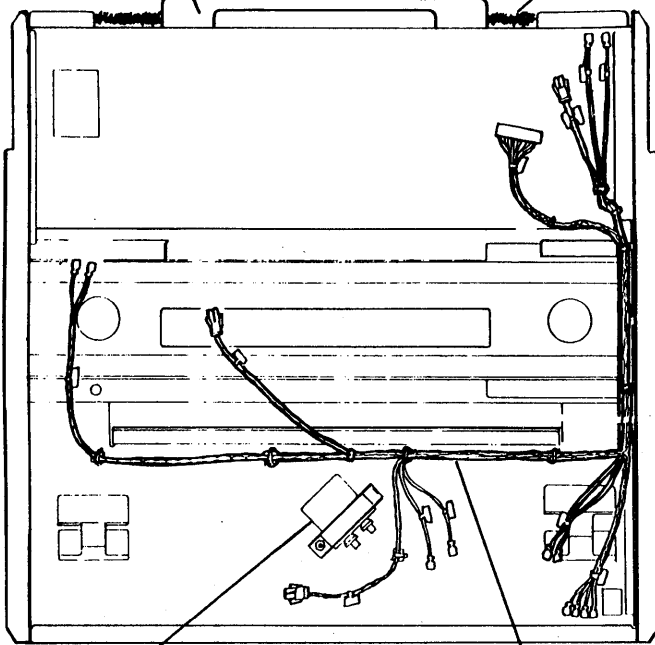
\*SEE SWITCH SETTINGS AT FRONT OF SECTION 2 FOR SWITCH SET-UP

\*\*IT IS RECOMMENDED THAT THESE BE REPLACED IN PAIRS.



44692053  
ASSEMBLY FOLD BREAKER

94788101  
STATIC ELIMINATOR



95359903  
CAPACITOR  
4MFD  
370 VAC

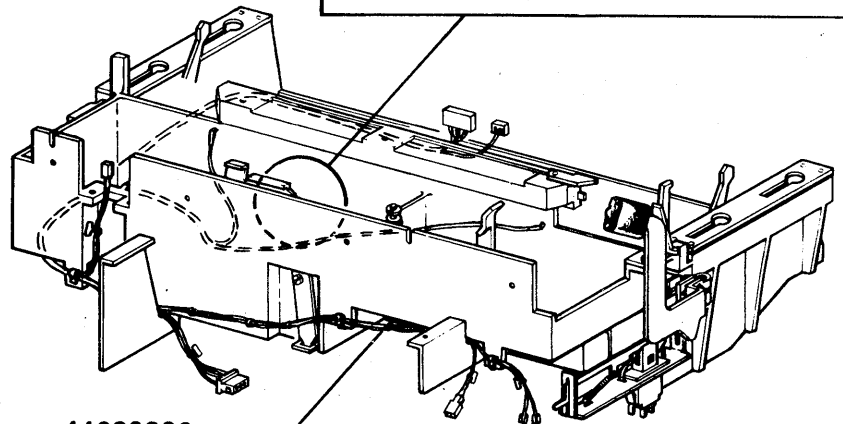
1 44682824 (LW400/800)  
44692447 (LW400/800)  
44691652 (LW455/855)  
44692448 (LW455/855)  
A.C. HARNESS

44689565  
ASSEMBLY EVFU READER

44687561  
SWITCH ROCKER

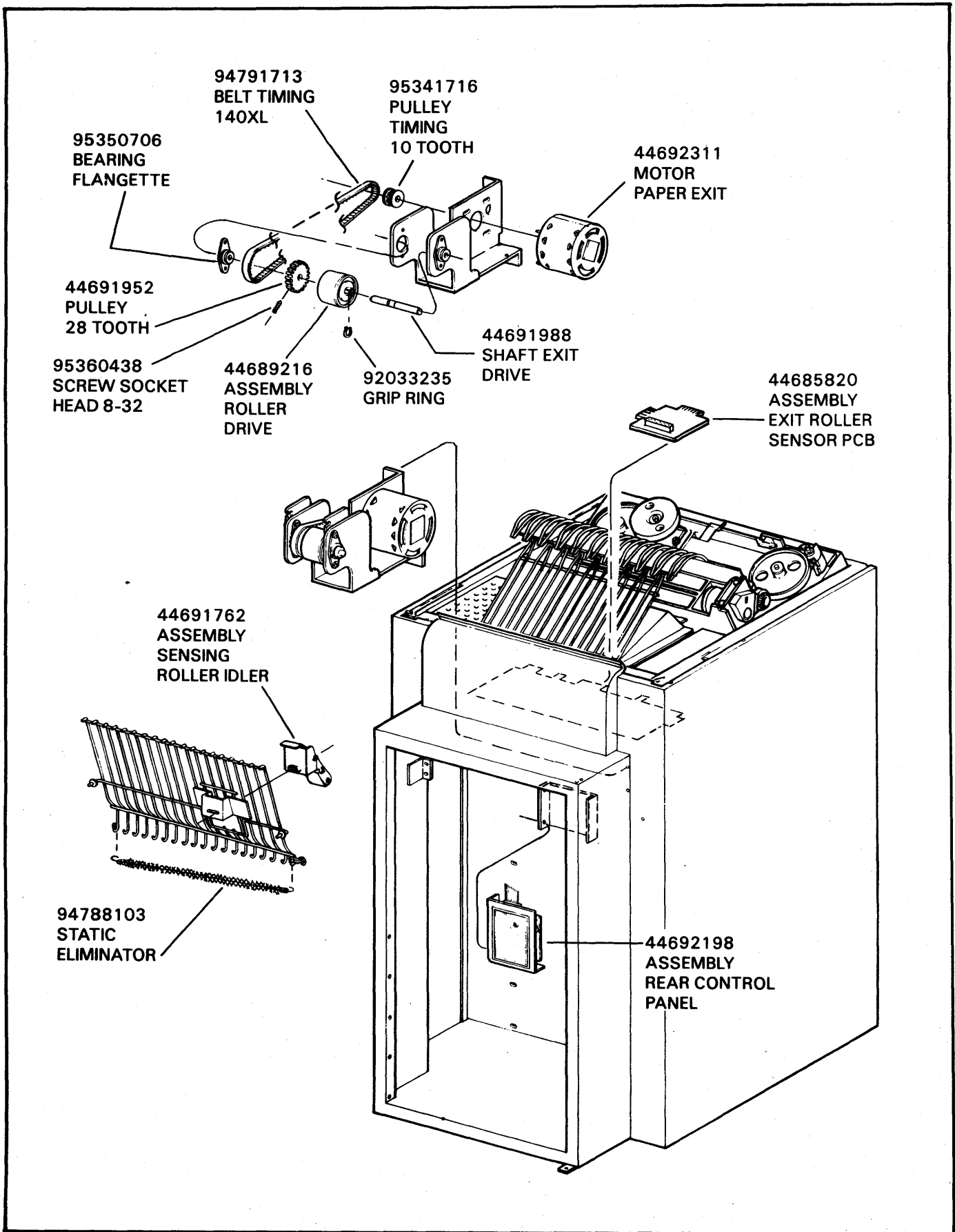
44688580  
ASSEMBLY EVFU PCB

44689566  
ASSEMBLY MOTOR  
AND SHAFT



44682826  
D.C. HARNESS  
LOGIC

1 LW400, S/N  $\geq$  7168 and LW800, S/N  $\geq$  2200 USE 44692447.  
SERIAL NUMBERS BELOW THESE USE 44682824.  
LW455, S/N  $\geq$  7168 and LW855 S/N  $\geq$  2200 USE 44692448.  
SERIAL NUMBERS BELOW THESE USE 44691652.



## **SECTION II FAULT ISOLATION**

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### **INTRODUCTION**

This section contains fault isolation information for the Customer Engineer's use only. Fault isolation should only be performed by Customer Engineers as protective covers which house hazardous voltages and mechanisms must be removed.

This section does not contain normal operator maintenance such as routine cleaning and replacement of ribbons, ribbon rollers, etc. It is the operator's responsibility to perform the maintenance as documented in the operator cards, beneath the printer's bonnet in the band cover.



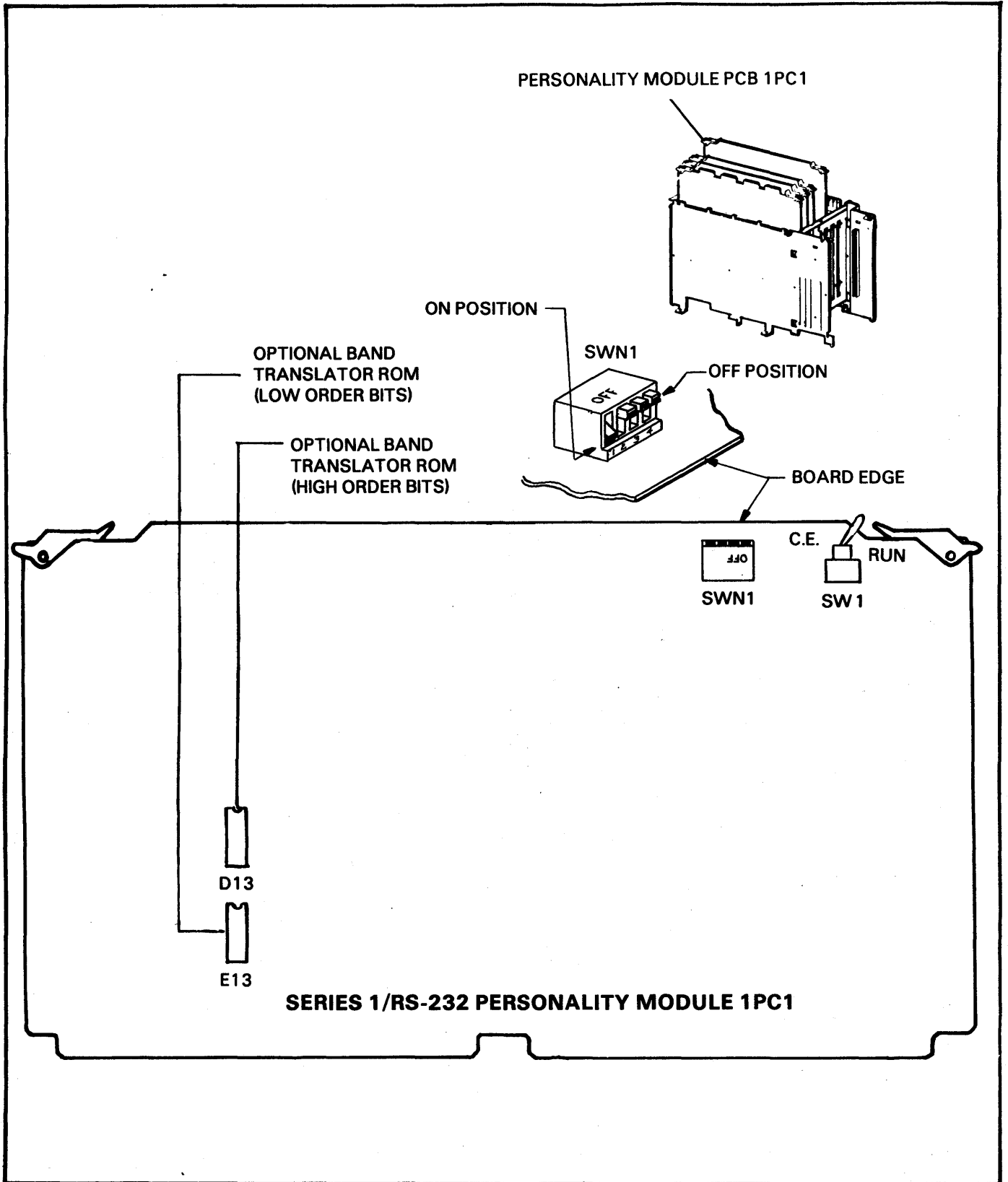


FIGURE 2-1. SERIES1/RS-232 PERSONALITY PCB (1PC1) BAND TRANSLATOR ROM LOCATIONS.

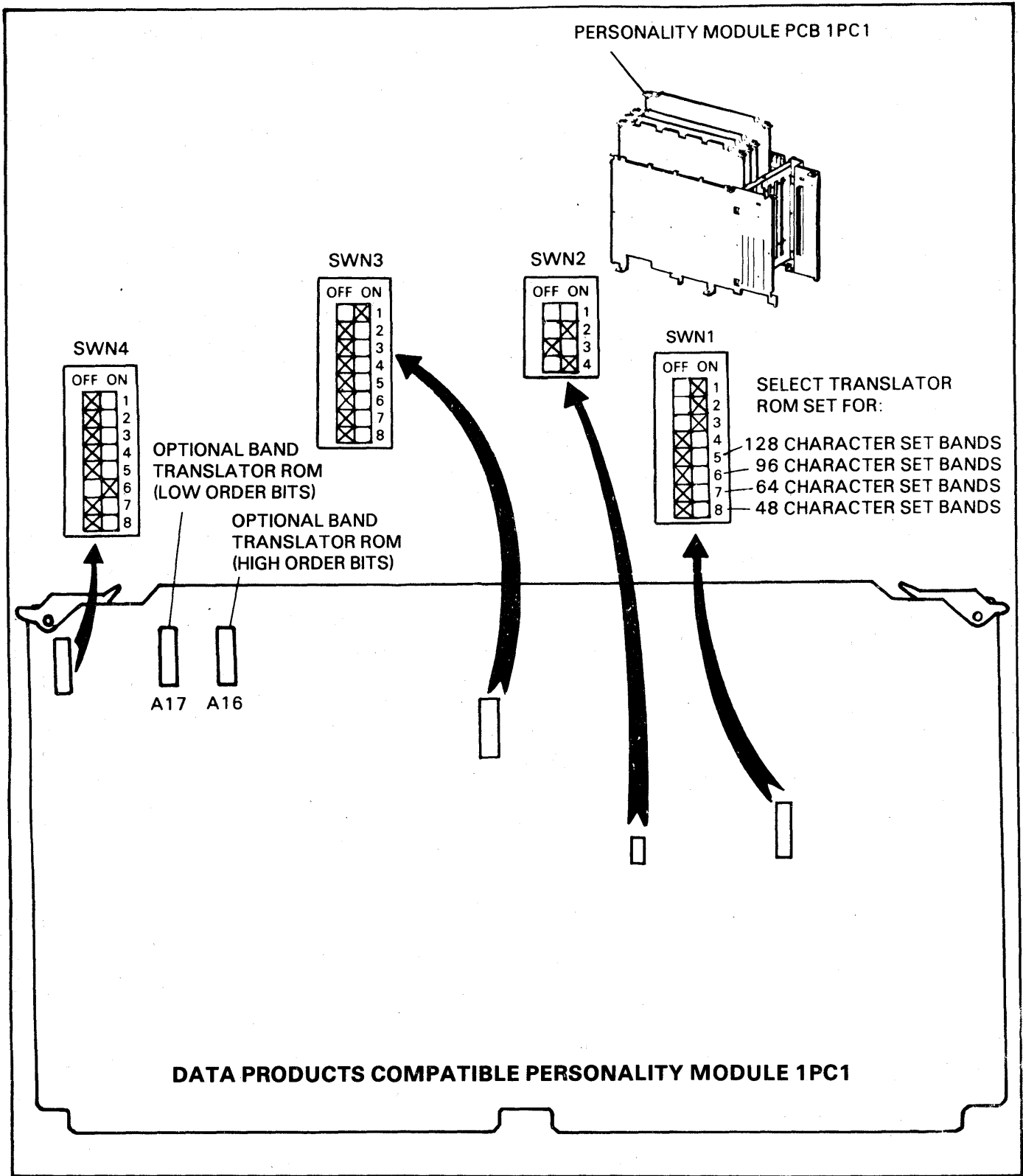


FIGURE 2-2. DATA PRODUCTS COMPATIBLE PERSONALITY PCB (1PC1) FACTORY SWITCH SET-UP AND TRANSLATOR ROM LOCATIONS

TABLE 2-1. DATA PRODUCTS COMPATIBLE PERSONALITY PCB (1PC1) SWITCH FUNCTIONS

DATA PRODUCTS COMPATIBLE PERSONALITY MODULE PCB 1PC1				
SWITCH NETWORK NUMBER	SWITCH NUMBER	POSITION	LOCATION	FUNCTION
SWN1	1 ✓	ON	C5	STANDARD OR FAST VFU RDY SELECT (ON=STD) EVFU INSTALLED DISABLE (ON=INSTALLED) BUFFER CLEAR LOW TRUE ENABLE (OFF=ENABLED) LOW TRUE DISABLE -ON- inverts i'face signals to active low logic levels, -OFF- signifies i'face signals are active high logic levels. SELECT TRANSLATOR ROM SET FOR 128 CHAR SET BANDS SELECT TRANSLATOR ROM SET FOR 96 CHAR SET BANDS SELECT TRANSLATOR ROM SET FOR 64 CHAR SET BANDS SELECT TRANSLATOR ROM SET FOR 48 CHAR SET BANDS
	2	ON		
	3	ON		
	4 ✓	OFF		
	5	OFF		
	6	OFF		
	7	OFF		
	8	OFF		
SWN2	1	ON/OFF	C8	NOT USED 63 LINE COUNT DISABLE (ON=DISABLED) PAPER INSTRUCTION DISABLE (OFF=ENABLED) DATA 8 DISABLE (ON=DISABLED)
	2 ✓	ON		
	3	OFF		
	4 ✓	ON		
SWN3	1 ✓	ON	B11	CONTROL CODE ENABLE (ON=ENABLED) VERTICAL TAB ENABLE (OFF=ENABLED) HALF LINE FEED ENABLE (OFF=DISABLED) PAPER INSTRUCTION PARITY ENABLE (OFF=DISABLED) PARITY ENABLE (OFF=DISABLED) SPACE CODE PARITY ENABLE (OFF=DISABLED) LATCH OR BYTE PARITY SELECT (OFF=BYTE) ODD OR EVEN PARITY SELECT (OFF=EVEN)
	2	OFF		
	3	OFF		
	4	OFF		
	5	OFF		
	6	OFF		
	7	OFF		
	8	OFF		
SWN4	1	OFF	A20	BLANK CODE SELECT BIT 0 BLANK CODE SELECT BIT 1 BLANK CODE SELECT BIT 2 BLANK CODE SELECT BIT 3 BLANK CODE SELECT BIT 4 BLANK CODE SELECT BIT 5  BLANK CODE SELECT BIT 6 BLANK CODE SELECT BIT 7
	2	OFF		
	3	OFF		
	4	OFF		
	5	OFF		
	6 ✓	ON=20 HEX		
	7	OFF		
	8	OFF		

FOR SWITCH FUNCTION SEE SECTION V OF TECHNICAL MANUAL.

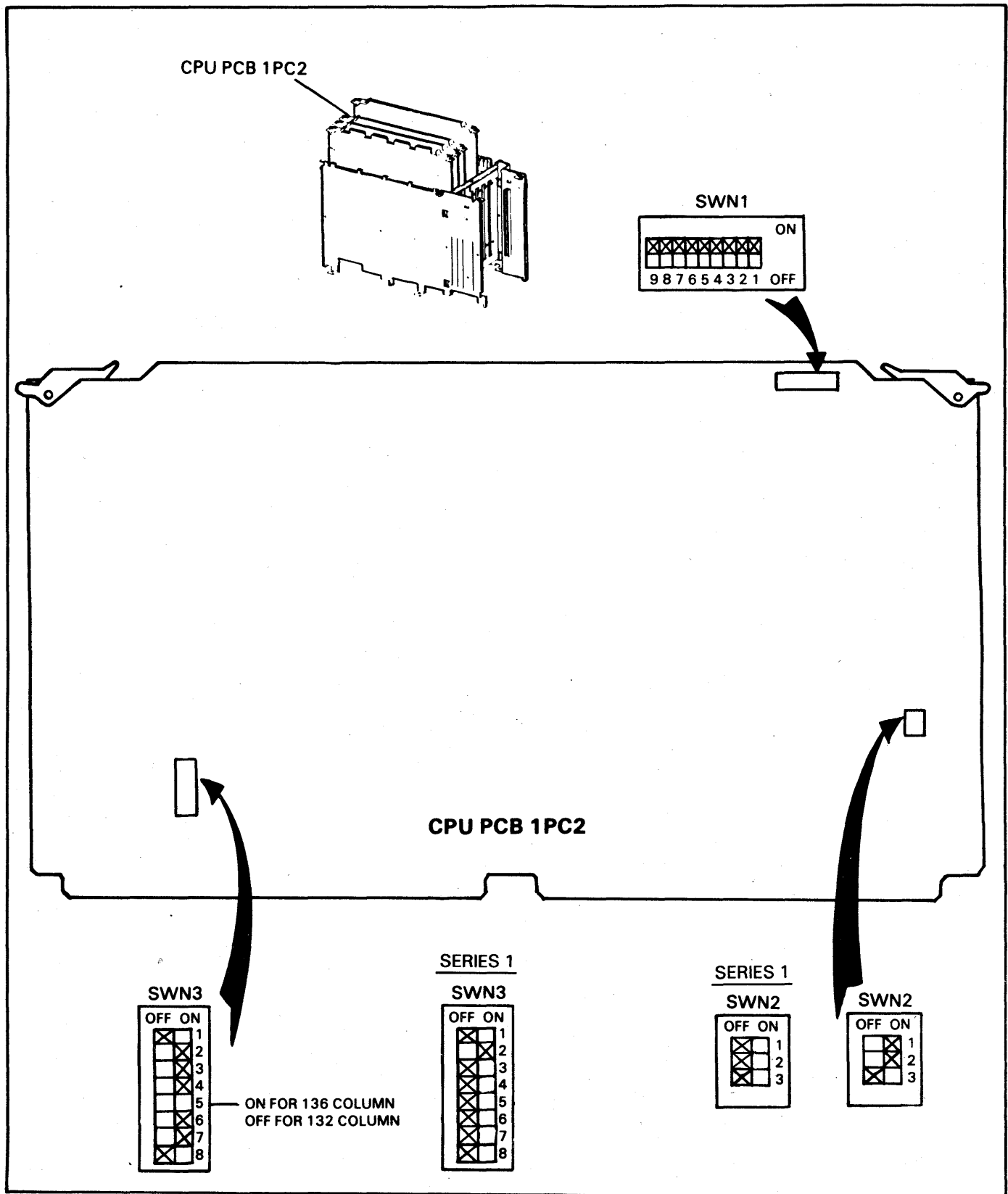


FIGURE 2-3. CPU (1PC2) FACTORY SWITCH SET-UP



TABLE 2-2. CPU PCB (1PC2) SWITCH FUNCTIONS

CPU PCB 1PC2																																																																																																								
SWITCH NETWORK NUMBER	SWITCH NUMBER	POSITION	LOCATION	FUNCTION																																																																																																				
SWN1	1 2 3 4 5 6 7 8 9	POSITIONS VARY - SEE ADJACENT CHART	TOP RIGHT SIDE	<p>SWITCH 1 (CPU PCB)</p> <table border="1"> <tr> <td>9</td><td>8</td><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td> <td>SWITCH NUMBER</td> </tr> <tr> <td>OFF</td><td>C</td><td>H</td><td>A</td><td>R</td><td>-</td><td>S</td><td>E</td><td>L</td> <td>SEE TABLE 2-4 FOLLOWING ASCII "M" CONFIGURATION</td> </tr> <tr> <td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td> <td>SLIDING ALPHA</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>OFF</td> <td>HORIZ MOTION (LW400 ONLY)</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>OFF</td><td>ON</td> <td>HORIZ SET-UP (LW400 ONLY)</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>OFF</td><td>ON</td><td>ON</td> <td>VERT MOTION</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>X</td><td>X</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td> <td>LOAD EVFU</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>X</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td> <td>DISPLAY TEST</td> </tr> <tr> <td>ON</td><td>X</td><td>X</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td> <td>RUN RIBBON &amp; BAND</td> </tr> <tr> <td>ON</td><td>X</td><td>OFF</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td><td>ON</td> <td>EXAM PRINT/EVFU/STATUS MEMORY</td> </tr> </table> <p>X = DON'T CARE ON = LOW LOGIC LEVELS OFF = HIGH LOGIC LEVELS</p>	9	8	7	6	5	4	3	2	1	SWITCH NUMBER	OFF	C	H	A	R	-	S	E	L	SEE TABLE 2-4 FOLLOWING ASCII "M" CONFIGURATION	ON	ON	ON	ON	ON	ON	ON	ON	ON	SLIDING ALPHA	ON	X	X	X	X	X	X	X	OFF	HORIZ MOTION (LW400 ONLY)	ON	X	X	X	X	X	X	OFF	ON	HORIZ SET-UP (LW400 ONLY)	ON	X	X	X	X	X	OFF	ON	ON	VERT MOTION	ON	X	X	X	X	OFF	ON	ON	ON	LOAD EVFU	ON	X	X	X	OFF	ON	ON	ON	ON	DISPLAY TEST	ON	X	X	OFF	ON	ON	ON	ON	ON	RUN RIBBON & BAND	ON	X	OFF	ON	ON	ON	ON	ON	ON	EXAM PRINT/EVFU/STATUS MEMORY
	9			8	7	6	5	4	3	2	1	SWITCH NUMBER																																																																																												
	OFF			C	H	A	R	-	S	E	L	SEE TABLE 2-4 FOLLOWING ASCII "M" CONFIGURATION																																																																																												
	ON			ON	ON	ON	ON	ON	ON	ON	ON	SLIDING ALPHA																																																																																												
	ON			X	X	X	X	X	X	X	OFF	HORIZ MOTION (LW400 ONLY)																																																																																												
	ON			X	X	X	X	X	X	OFF	ON	HORIZ SET-UP (LW400 ONLY)																																																																																												
	ON			X	X	X	X	X	OFF	ON	ON	VERT MOTION																																																																																												
	ON			X	X	X	X	OFF	ON	ON	ON	LOAD EVFU																																																																																												
	ON			X	X	X	OFF	ON	ON	ON	ON	DISPLAY TEST																																																																																												
	ON			X	X	OFF	ON	ON	ON	ON	ON	RUN RIBBON & BAND																																																																																												
ON	X	OFF	ON	ON	ON	ON	ON	ON	EXAM PRINT/EVFU/STATUS MEMORY																																																																																															
SWN2	1 2	ON/OFF ON/OFF	F2	<p>BOTTOM OF FORM SELECT 0 BOTTOM OF FORM SELECT 1</p> <p>SW1 SW2</p> <table border="1"> <tr> <td>ON</td><td>ON</td><td>CHANNEL 2</td> </tr> <tr> <td>OFF</td><td>ON</td><td>CHANNEL 8</td> </tr> <tr> <td>ON</td><td>OFF</td><td>CHANNEL 12</td> </tr> <tr> <td>OFF</td><td>OFF</td><td>NO BOTTOM OF FORM</td> </tr> </table>	ON	ON	CHANNEL 2	OFF	ON	CHANNEL 8	ON	OFF	CHANNEL 12	OFF	OFF	NO BOTTOM OF FORM																																																																																								
	ON	ON		CHANNEL 2																																																																																																				
OFF	ON	CHANNEL 8																																																																																																						
ON	OFF	CHANNEL 12																																																																																																						
OFF	OFF	NO BOTTOM OF FORM																																																																																																						
3	OFF		<p>AUTO LINE FEED SELECT - Option selected when ON.</p>																																																																																																					
SWN3	1 2	OFF/ON ON/OFF	G13	<p>FORMS CONTROL SELECT 0 FORMS CONTROL SELECT 1</p> <p>SW1 SW2</p> <table border="1"> <tr> <td>ON</td><td>ON</td><td>FORMS LENGTH CONTROL (FLC) (CONTROL PANEL SWITCHES)</td> </tr> <tr> <td>OFF</td><td>ON</td><td>I/O VERTICAL FORMAT (IOVFU)</td> </tr> <tr> <td>ON</td><td>OFF</td><td>TAPE LOAD VERTICAL FORMAT (TLVFU)</td> </tr> <tr> <td>OFF</td><td>OFF</td><td>NOT USED</td> </tr> </table>	ON	ON	FORMS LENGTH CONTROL (FLC) (CONTROL PANEL SWITCHES)	OFF	ON	I/O VERTICAL FORMAT (IOVFU)	ON	OFF	TAPE LOAD VERTICAL FORMAT (TLVFU)	OFF	OFF	NOT USED																																																																																								
	ON	ON		FORMS LENGTH CONTROL (FLC) (CONTROL PANEL SWITCHES)																																																																																																				
	OFF	ON		I/O VERTICAL FORMAT (IOVFU)																																																																																																				
	ON	OFF		TAPE LOAD VERTICAL FORMAT (TLVFU)																																																																																																				
	OFF	OFF		NOT USED																																																																																																				
	3 4	ON/OFF ON/OFF			<p>PERF SKIP SELECT 0 PERF SKIP SELECT 1</p> <p>SW3 SW4</p> <table border="1"> <tr> <td>ON</td><td>ON</td><td>3 LINE PERFORATION SKIP</td> </tr> <tr> <td>OFF</td><td>ON</td><td>4 LINE PERFORATION SKIP</td> </tr> <tr> <td>ON</td><td>OFF</td><td>5 LINE PERFORATION SKIP</td> </tr> <tr> <td>OFF</td><td>OFF</td><td>6 LINE PERFORATION SKIP</td> </tr> </table>	ON	ON	3 LINE PERFORATION SKIP	OFF	ON	4 LINE PERFORATION SKIP	ON	OFF	5 LINE PERFORATION SKIP	OFF	OFF	6 LINE PERFORATION SKIP																																																																																							
	ON	ON		3 LINE PERFORATION SKIP																																																																																																				
	OFF	ON		4 LINE PERFORATION SKIP																																																																																																				
ON	OFF	5 LINE PERFORATION SKIP																																																																																																						
OFF	OFF	6 LINE PERFORATION SKIP																																																																																																						
5	ON FOR 136 COL		<p>132/136 COLUMN</p>																																																																																																					
6	ON		<p>LINE CTR CMD'S ON PWR UP-ON-Allows line ctr cmd's as paper motion.</p>																																																																																																					
7	ON/OFF		<p>CH3/CH4 VERT TABE SELECT -ON- Selects chan 3, -OFF-selects chan 4.</p>																																																																																																					
8	OFF/ON		<p>SLEW TO/SLEW THRU TOF (TOP OF FORM) -OFF- slew thru TOF to line count position -ON- slew stops at TOF position.</p>																																																																																																					

FOR SWITCH FUNCTION SEE SECTION VI OF THE TECHNICAL MANUAL.

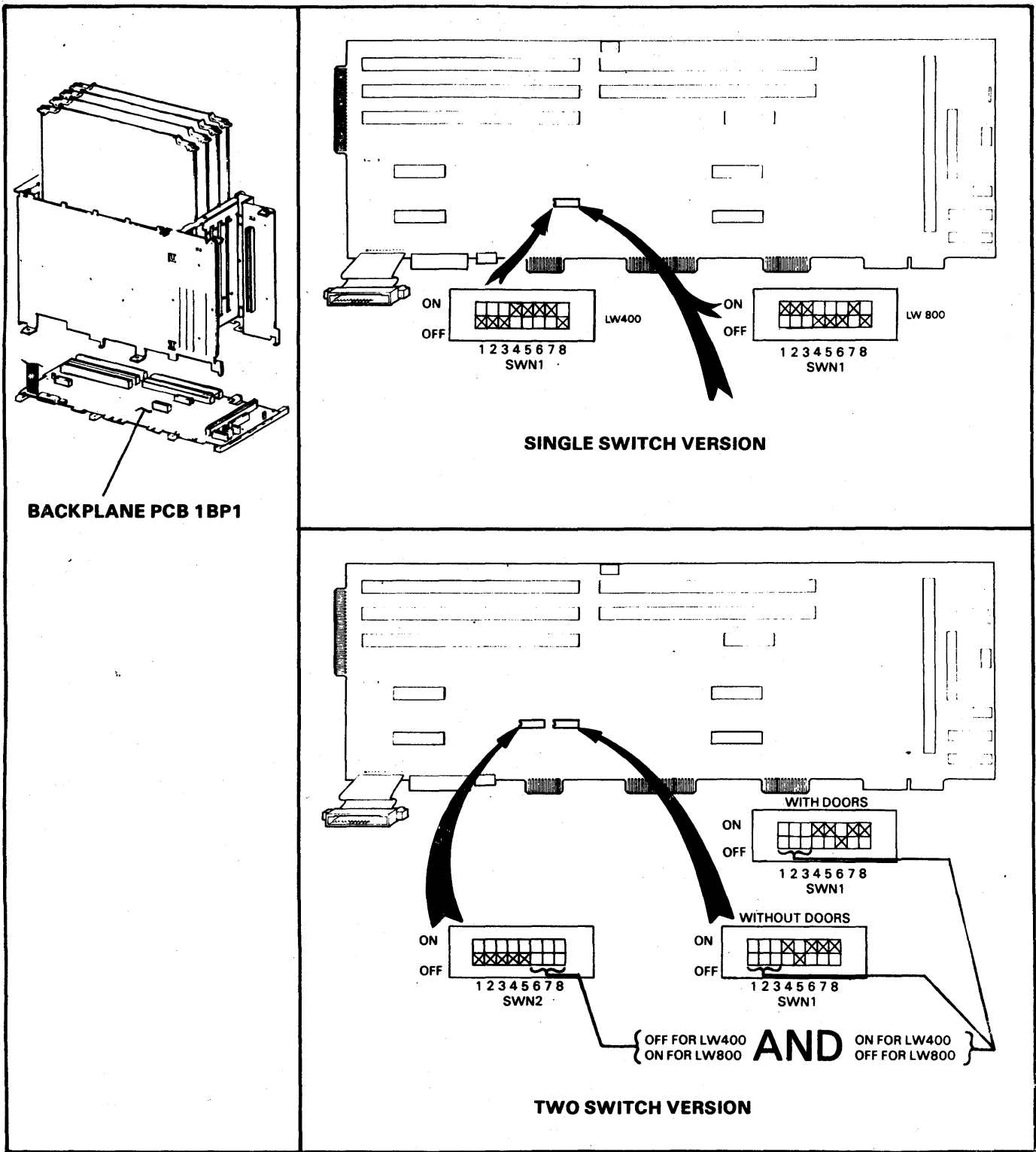


FIGURE 2-4. BACKPLANE (1BP1) FACTORY SWITCH SET-UP

TABLE 2-3. BACKPLANE PCB (1BP1) SWITCH FUNCTIONS

SINGLE SWITCH VERSION BACKPLANE		
SWITCH NETWORK NUMBER	SWITCH NUMBER	FUNCTION
SWN1	1	OFF FOR LW400 (SWITCHES 4, 5, 6 MUST ALSO BE ON) ON FOR LW800 (SWITCHES 4, 5, 6 MUST ALSO BE OFF)  ON FOR LW400 (SWITCHES 1, 2, 3 MUST ALSO BE OFF) OFF FOR LW800 (SWITCHES 4, 5, 6 MUST ALSO BE ON) WHEN OFF, TAPE FORMAT IS CONVERTED BY THE I/O. NOT USED
	2	
	3	
	4	
	5	
	6	
	7	
	8	
TWO SWITCH VERSION BACKPLANE		
SWITCH NETWORK NUMBER	SWITCH NUMBER	FUNCTION
SWN1	1	ON FOR LW400/455 (SWITCHES 6, 7, 8 OF SWN2 MUST ALSO BE OFF) OFF FOR LW800/855 (SWITCHES 6, 7, 8 OF SWN2 MUST ALSO BE ON) WHEN OFF, TAPE FORMAT IS CONVERTED BY THE I/O. WHEN ON, ENABLES EXIT ROLLERS FOR LW455/855 (SWITCH 6 MUST BE OFF). WHEN OFF, ENABLES EXIT ROLLERS FOR LW455/855 (SWITCH 5 MUST BE ON).  WHEN OFF, CONTROL PANEL RECEIVES POWER FROM OPTIONAL 5 VOLT POWER SUPPLY.
	2	
	3	
	4	
	5	
	6	
	7	
	8	
SWN2	1	NOT USED NOT USED NOT USED NOT USED NOT USED  OFF FOR LW400/455 (SWITCHES 6, 7, 8 OF SWN1 MUST ALSO BE ON) ON FOR LW800/855 (SWITCHES 6, 7, 8 OF SWN1 MUST ALSO BE OFF)
	2	
	3	
	4	
	5	
	6	
	7	
	8	

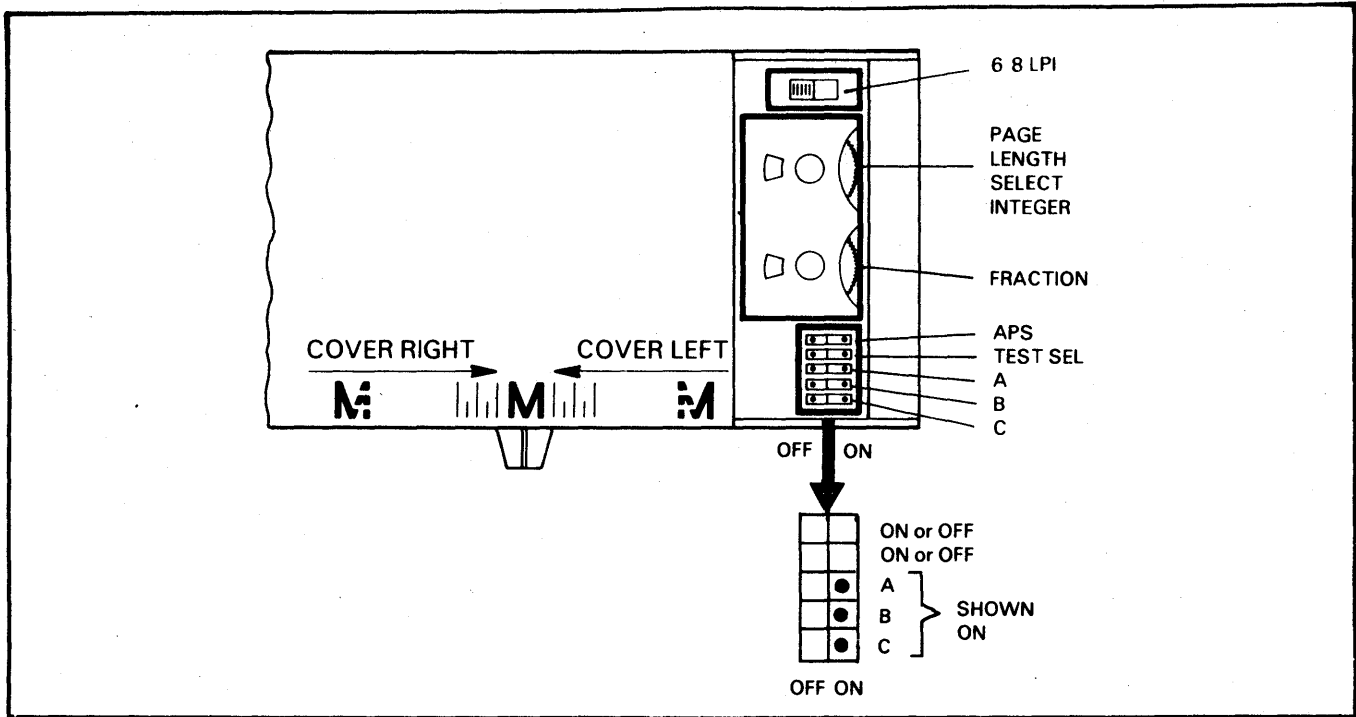


FIGURE 2-5. RS-232 OPTION INSTALLATION-SWITCHES A,B AND C.

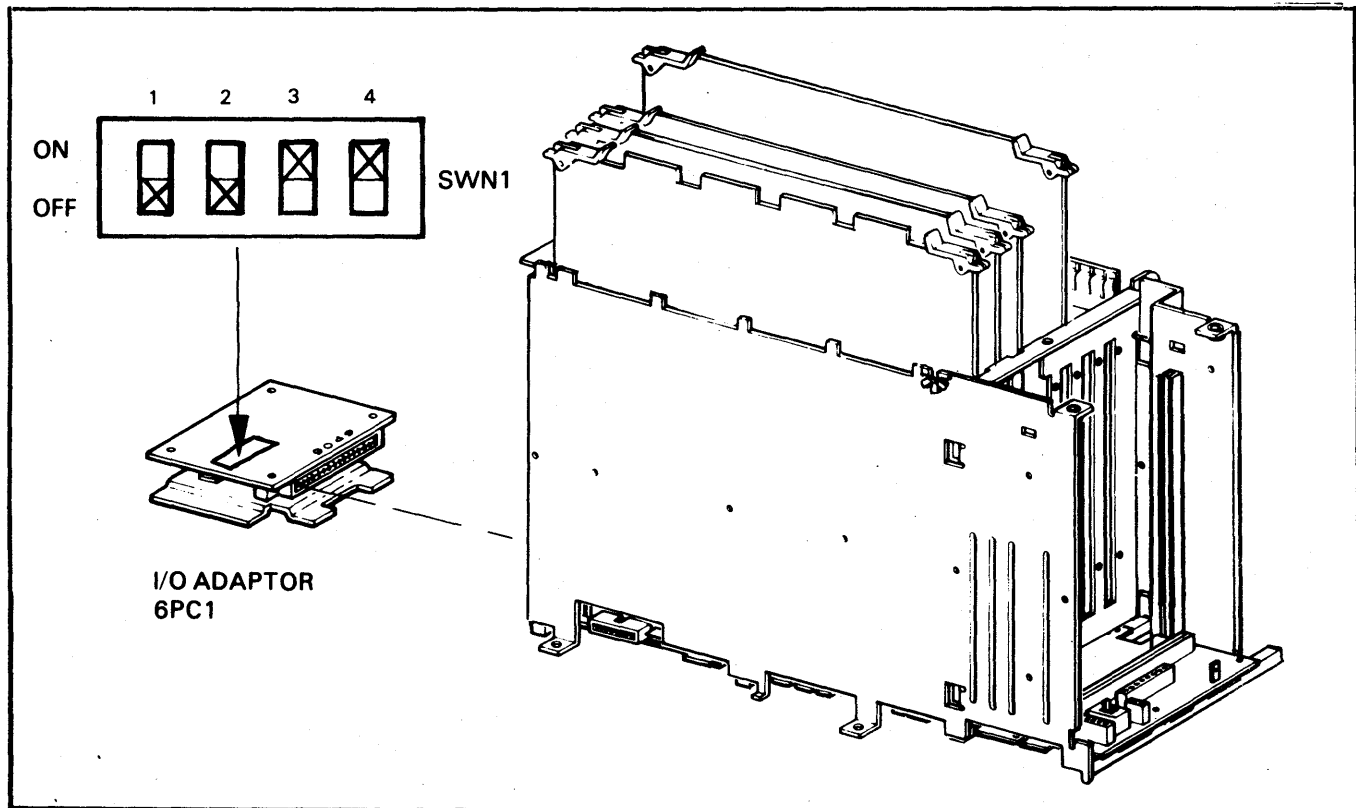
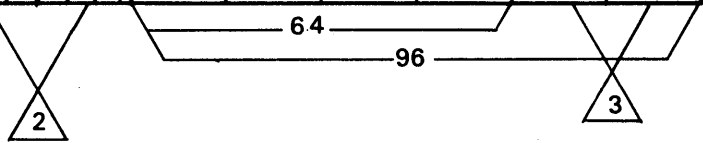


FIGURE 2-6. RS-232 I/O ADAPTOR (6PC1) FACTORY SWITCH SET-UP.

TABLE 2-4. CHARACTER SELECT-ASCII CHARACTER SWITCH POSITIONS

SWITCH POSITION				SW8		SW7		SW6		SW5	
				0	0	0	0	0	0	0	0
SW4	SW3	SW2	SW1	0	0	0	0	0	0	0	0
0	0	0	0			SP	0	@	P	\	P
0	0	0	1			!	1	A	Q	a	q
0	0	1	0			"	2	B	R	b	r
0	0	1	1			#	3	C	S	c	s
0	1	0	0			\$	4	D	T	d	t
0	1	0	1			%	5	E	U	e	u
0	1	1	0			&	6	F	V	f	v
0	1	1	1			'	7	G	W	g	w
1	0	0	0			(	8	H	X	h	x
1	0	0	1			)	9	I	Y	i	y
1	0	1	0	USE IS OPTIONAL	LF	*	:	J	Z	j	z
1	0	1	1		VT	+	;	K	[	k	{
1	1	0	0		FF	.	<	L	\	l	
1	1	0	1		CR	-	=	M	]	m	}
1	1	1	0			.	>	N	^	n	~
1	1	1	1		/	?	O	-	o		Spec Char.

1 = OFF  
 0 = ON  
 SWITCH 1 = LEAST SIGNIFICANT BIT



NOTES:

1 THE ABOVE CHARACTER AND CODE SET IS USED INTERNALLY WHEN THE BAND CODE TRANSLATER ROM'S ARE DISABLED.



ALL UNDEFINED CODES IN THE FIRST TWO CHART COLUMNS WILL BE TREATED AS A SPACE CODE WHEN ASCII CONTROL CODES ARE USED. WHEN ASCII CONTROL CODES ARE NOT USED, CHARACTER CODES FOR 128 CHARACTER BANDS CAN BE ASSIGNED.



ALL CODES IN THE LAST TWO COLUMNS WILL BE TREATED AS SPACE CODES WHEN A 64 CHARACTER BAND IS INSTALLED.



TABLE 2-5. CHARACTER SELECT-SERIES 1 I/O's

SWITCH POSITION				SW8	SW7	SW6	SW5	0	0	0	0	0	0	0	0
SW4	SW3	SW2	SW1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0
						sp	V	R	:		m				
						2	W	-	<	a	n				
						3	X	\$	(	b	o				
						4	Y	*		c	p				
						5	Z	A	!	d	q				
						6	&	B	)	e	r				
						7	,	C	;	f	⊗				
						8	%	D	^	g	⊠				
						9	J	E	\	h	s				
						0	K	F	—	i	t				
						#	L	G	>	[	u				
						@	M	H	?	]	v				
						/	N	I	:	~	w				
						S	O	+	=	j	x				
						T	P	.	"	k	y				
						U	Q	'	`	l	z				

1 = OFF/OPEN (AWAY FROM THE NUMBERS)

## STATUS/FAULT CODES

The following faults and statuses are provided as information on the codes the printer is capable of displaying and their definitions. Because of the printer's software it is possible to receive an endless number of codes on the Status Display. The following list are codes which require either intervention by the operator, the C.E., or are simply status codes which require no intervention.

### Operator Correctable Faults

Display	Definition
BAND	Type of band not detected
BATO	Buss available failed to go active within 1.5 seconds of load complete.
BMSE	Band motor speed error
BSE	Band sync error
CHAN	Channel selected that was not loaded
CHSL	Channel selected and EVFU was not loaded.
CR >5	More than five consecutive carriage returns
DOVF	Data overflow error
DVFU	Error in data format (IOVFU or TLVFU)
FRMS	Paper not moving (paper jam)(while Off Line). Engage Idler Roller at back of printer if installed.
GATE	Gate/band cover interlock open
IINH	Power-up inhibit failed to go active
ILCD	Illegal control code received
ILCH	One of the four illegal EVFU channels selected
INIT	Processor executed an illegal code
IOPE	I/O parity error was detected
IPRG	I/O microprocessor has addressed a wrong location in program memory.
LCSL	Line counter command selected and EVFU was not loaded
LPTO	Load in process remained active
NOLD	Attempt to load TLVFU when diagnostic ROM not installed or attempt to load IOVFU when in Forms Length Control mode
NTOF	A channel 1 (top of form) was selected but was not loaded
NVCM	A control code was detected but it was not considered valid
OOP	Out of paper
OVFL	Maximum memory capacity exceeded
PAGE	A combination of 6 and 8 lines per inch has occurred which was not compatible with selected page length
PJAM	Paper not moving (paper jam)(while On Line)

Corrective action for operator correctable faults are documented in the operator instruction cards in the band cover beneath the bonnet. C.E. correctable faults are documented in Table 2-6. Status codes which appear do not require corrective action as they indicate the normal internal status of the printer.

RDR	A tape reader problem
RIB	Ribbon system problem
RNWX	Excessive paper motion when under I/O control
RYON	The controller failed to go not ready
TAPE	Attempt to load TLVFU with no tape
VFER	Vertical format error-the Page Length Select switch setting on right side of Control Panel is in conflict with 6 or 8 line per inch setting.
VRFY	Three reads of tape did not verify
<3"	Forms length of less than three inches selected


### C.E. Correctable Faults

Display	Definition
*BLWR	Blower failure
FUS 2	Clamp fuse blown
*FUS 3	Stepper fuse blown
*FUS 4	Upper Hammer fuse blown
*FUS 5	Lower Hammer fuse blown
HERR	Horizontal position error
*HMR 1	Hammer coil current fault (upper bank)
*HMR 2	Hammer coil current fault (lower bank)
INH	Power on reset hardware fault
IOER	Adaptor card hardware fault
NHOM	Horizontal error on homing attempt
PRT 1	I/O port 1 failure
PRT 2	I/O port 2 failure
PRT 3	I/O port 3 failure
PRT 4	I/O port 4 failure
*PWR 1	Hammer voltage fault (36V)-1PC4
*PWR 2	Hammer voltage fault (36V)-1PC5
RAM1	Buffer RAM failure
RAM2	Buffer RAM failure
ROM1	Program ROM failure
ROM2	Program ROM failure
*STPR	Stepper fault-improper phases active
8048	Band tracking CPU failure
8155	Scratchpad RAM or port 5 failure
8253	Counter timer failure

\*Flashing display- Printer will go Not Ready and will desequence the 36 VDC power supply.






**Status Codes**

<u>Display</u>	<u>Definition</u>
FMFD	Off line form feed active or Form Feed switch is pressed
FRES	Reset switch on Control Panel pressed
HMTN	Horizontal motion cycle in process
HOME	Diagnostic status. Indicates the home position transducer is active
LFSW	Off line Single Space switch is pressed
LIP	I/O data transfer in progress
LVFU	EVFU mode selected and EVFU not loaded
NFLT	Normal printer status. No faults exist.
NHOM	Diagnostic status. Indicates the home position transducer is not active
NOLD	Diagnostic status. Indicates an off line EVFU load routine has been actuated but EVFU mode is not selected
NUTS	Band not up to speed
PHA	Diagnostic status. Indicates phase applied to horizontal stepper motor
PHB	Diagnostic status. Indicates phase applied to horizontal stepper motor
PHC	Diagnostic status. Indicates phase applied to horizontal stepper motor
PHD	Diagnostic status. Indicates phase applied to horizontal stepper motor
PMTN	Paper motion cycle in process
PRNT	Print cycle in process
SREQ	An I/O status request is in process
TLIP	A tape load is in process
TLSW	Tape Load switch is being pressed.
TPSW	Off line Test Print switch is being pressed
	Diagnostic status. Indicates display segment test is in process

**Interface Status Codes (RS-232 Only)**

<u>Display</u>	<u>Definition</u>
ICC	Invalid control code
ICS	Invalid control sequence
IHT	Invalid horizontal tab load
ILBO	I/O line buffer overflow (right margin).
IRAM	I/O RAM error
IROM	I/O ROM error
ITRN	I/O transmission error
IVFU	Invalid EVFU load
NVER	Non volatile option store error. Press "I/O FLT RESET" switch on Control Panel to continue. Option settings may have changed. Check and correct if necessary.

TABLE 2-6. BOARD AND COMPONENT SUBSTITUTION GUIDE

CONTROL PANEL DISPLAY														NO DISPLAY	MOST PROBABLE FIX - POWER OFF FOR 2 SECONDS THEN POWER ON. THEN PROCEED DOWN COLUMN STARTING WITH 1 THEN 2 ETC. UNTIL PROBLEM IS ISOLATED								
8048	8155	8253	BLWR *	FUS2	FUS3 *	HERR	HMR 1 or 2 *	FUS4 or 5 *	INH	IOER	NHOM	PRT1	PRT2			PRT3	PRT4	PWR1 or 2 *	RAM1	RAM2	STPR *	ROM1	ROM2
2	2	2	4	3	2	2			1		2					3			1				REPLACE PRINT HEAD BOARD
																							REPLACE CPU PCB 
								1	2	4						1							REPLACE HAMMER DRIVE PCB 1PC4 or 1PC5
																6							REPLACE POWER TRANSFORMER
																					1		REPLACE IC (B14 ON CPU)
				2																			CHECK CLAMP COIL ASSY AND HARNESS
				1																			REPLACE FUSE 2 ON AC POWER BD
			5																				CHECK/REPLACE BLOWER
			6		3			3								4						7	REPLACE A.C. POWER BOARD
							2																CHECK/REPLACE HAM ACT COIL ASSY
						4					4												CHECK/REPLACE HORIZ STEPPER
																		1					REPLACE RAM 1 (D-14 ON CPU)
																			1				REPLACE RAM 2 (D-15 ON CPU)
												1											REPLACE PORT 1 (F-8 ON CPU)
													1										REPLACE PORT 2 (F-12 ON CPU)
														1									REPLACE PORT 3 (F-11 ON CPU)
															1								REPLACE PORT 4 (F-3 ON CPU)
	1																						REPLACE PORT 5 (C-7 ON CPU)
1																							REPLACE IC (F-6 ON CPU)
							1				1												CHECK/REPLACE HORIZ RDR
											2												ADAPTER PCB MISSING 
									5	1													REPLACE ADAPTER CARD 
		1																					REPLACE IC (B-8 ON CPU)
			2																				BLOWER ON, BLOCKED INLET
									2							2							CHK XFMR AND XFMR CAP CONNECTION
																						1	REPLACE IC (B-13 ON CPU)
							1																REPLACE FUSE 3 ON AC PWR BRD.
								1															REPLACE FUSE 4 OR 5 ON AC PWR BRD.
																						3	CHECK CONTROL PANEL CABLE CONNECTION
																						4	REPLACE PHE BD. IF LED ON BOARD IS LIT.
																						5	REPLACE CPU BD. IF PWR ON LED IS LIT (CONTROL PNL)
																						6	REPLACE FUSE 1 ON AC POWER BOARD
																						8	REPLACE CONTROL PANEL
																						1	CHECK/REPLACE CIRCUIT BREAKER
																						2	SHORTED 5V ON PERSONALITY MODULE
				1																			CLEAR BLOWER INTAKE
				3																			REPLACE ALL COVERS

NOTES:

\* = FLASHING DISPLAY



SEE TABLE 2-1 OR 2-2 FOR SWITCH SET-UP.

2

IF PROBLEM CANNOT BE FOUND IN THIS TABLE, REFER TO SWITCH FUNCTIONS AT THE BEGINNING OF THIS SECTION OR SECTION 6 OF TECHNICAL MANUAL.

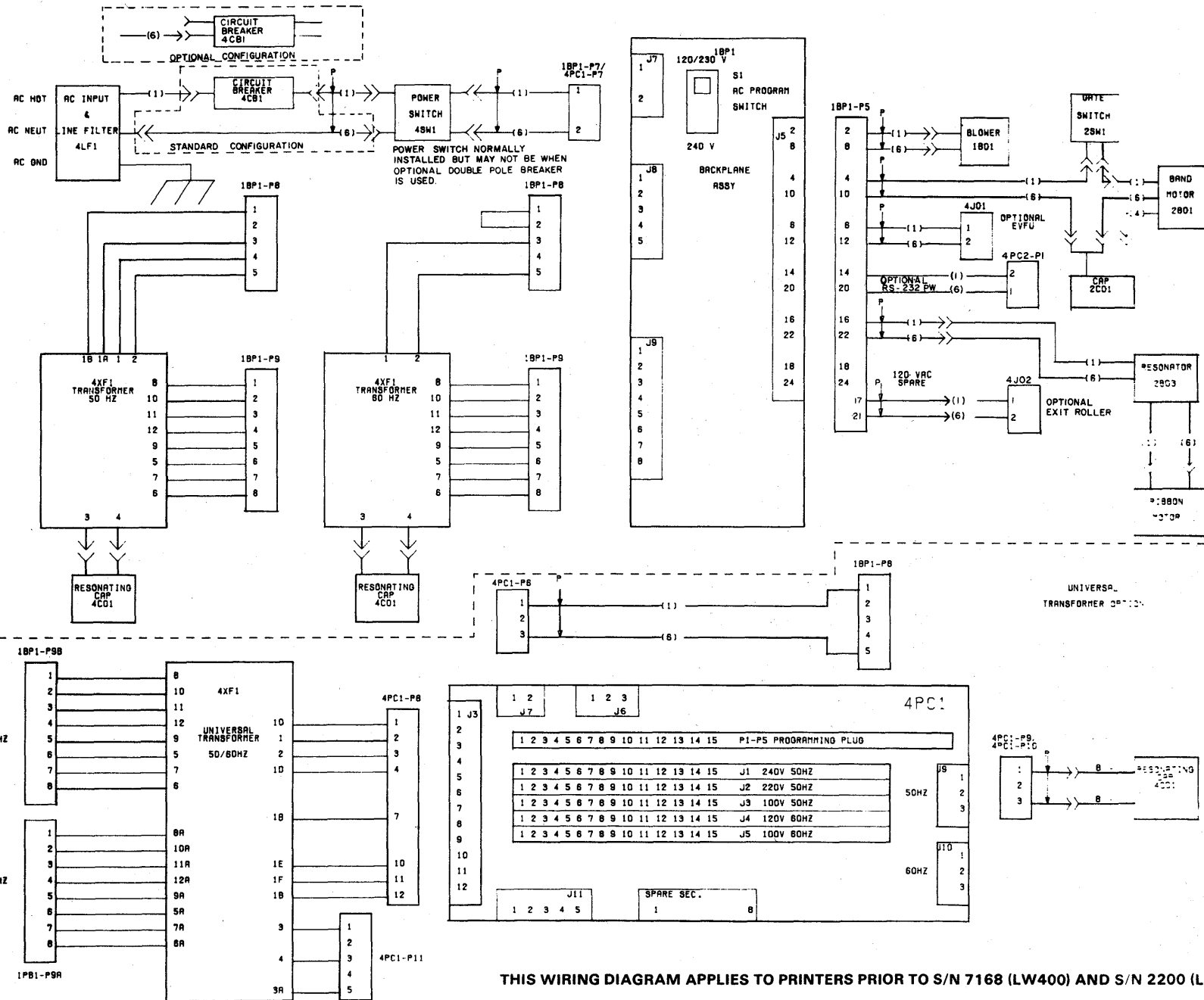
(Continued)

TABLE 2-6. BOARD AND COMPONENT SUBSTITUTION GUIDE (Continued)

CONTROL PANEL DISPLAY	CORRECTIVE ACTIONS (IN SEQUENCE)
BAND	REPLACE CPU PCB (1PC2) REPLACE PHE PCB (1PC3) REPLACE A.C. POWER PCB (1PC6) REPLACE BAND SENSOR TRANSDUCER CHECK/REPLACE BAND SENSOR TRANSDUCER TO BACKPLANE CABLE REPLACE BACKPLANE (1BP1)
ERRONEOUS CODE	REPLACE PERSONALITY MODULE (1PC1) REPLACE CPU PCB (1PC2) CHECK/REPLACE CONTROL PANEL TO LOGIC CABLE REPLACE CONTROL PANEL (5PC1) REPLACE BACKPLANE (1BP1)
FRMS	REPLACE CPU PCB (1PC2) REPLACE HAMMER DRIVER PCB (1PC4) REPLACE PHE PCB (1PC3) REPLACE PMV SENSOR TRANSDUCER CHECK/REPLACE PMV SENSOR TRANSDUCER TO BACKPLANE CABLE REPLACE BACKPLANE (1BP1)
NO DISPLAY	MISSING MULTIPLE COLUMNS (More Than Two): REPLACE HAMMER DRIVER PCB (1PC4) REPLACE CPU PCB (1PC2) REPLACE BACKPLANE (1BP1)
PRNT	REPLACE CPU PCB (1PC2) REPLACE PHE PCB (1PC3) REPLACE A.C. POWER PCB (1PC6) REPLACE BAND SENSOR TRANSDUCER CHECK/REPLACE BAND SENSOR TRANSDUCER TO BACKPLANE CABLE REPLACE BACKPLANE (1BP1)
RIB	RIBBON MOVING: REPLACE PHE PCB (1PC3) REPLACE CPU PCB (1PC2) REPLACE RIBBON MOTION SENSOR CHECK/REPLACE RIBBON MOTION SENSOR TO BACKPLANE CABLE REPLACE BACKPLANE (1BP1) RIBBON NOT MOVING: REPLACE A.C. POWER PCB (1PC6)
SREQ	REPLACE PERSONALITY MODULE (1PC1) REPLACE CPU PCB (1PC2) REPLACE BACKPLANE (1BP1)
START LIGHT FAILS TO COME ON	REPLACE PERSONALITY MODULE (1PC1) REPLACE CPU PCB (1PC2) CHECK/REPLACE CONTROL PANEL TO LOGIC CABLE REPLACE CONTROL PANEL (5PC1) REPLACE BACKPLANE (1BP1)

**NOTE:**

WHENEVER A PRINTED CIRCUIT BOARD IS REPLACED, INSURE THAT ALL SWITCHES IN THE NEW BOARD ARE SET TO THE SAME CONFIGURATION AS THE SWITCHES ON THE OLD BOARD.



THIS WIRING DIAGRAM APPLIES TO PRINTERS PRIOR TO S/N 7168 (LW400) AND S/N 2200 (LW800)

FIGURE 2-7. AC WIRING DIAGRAM (EARLY UNITS)

2-19

APR, 85

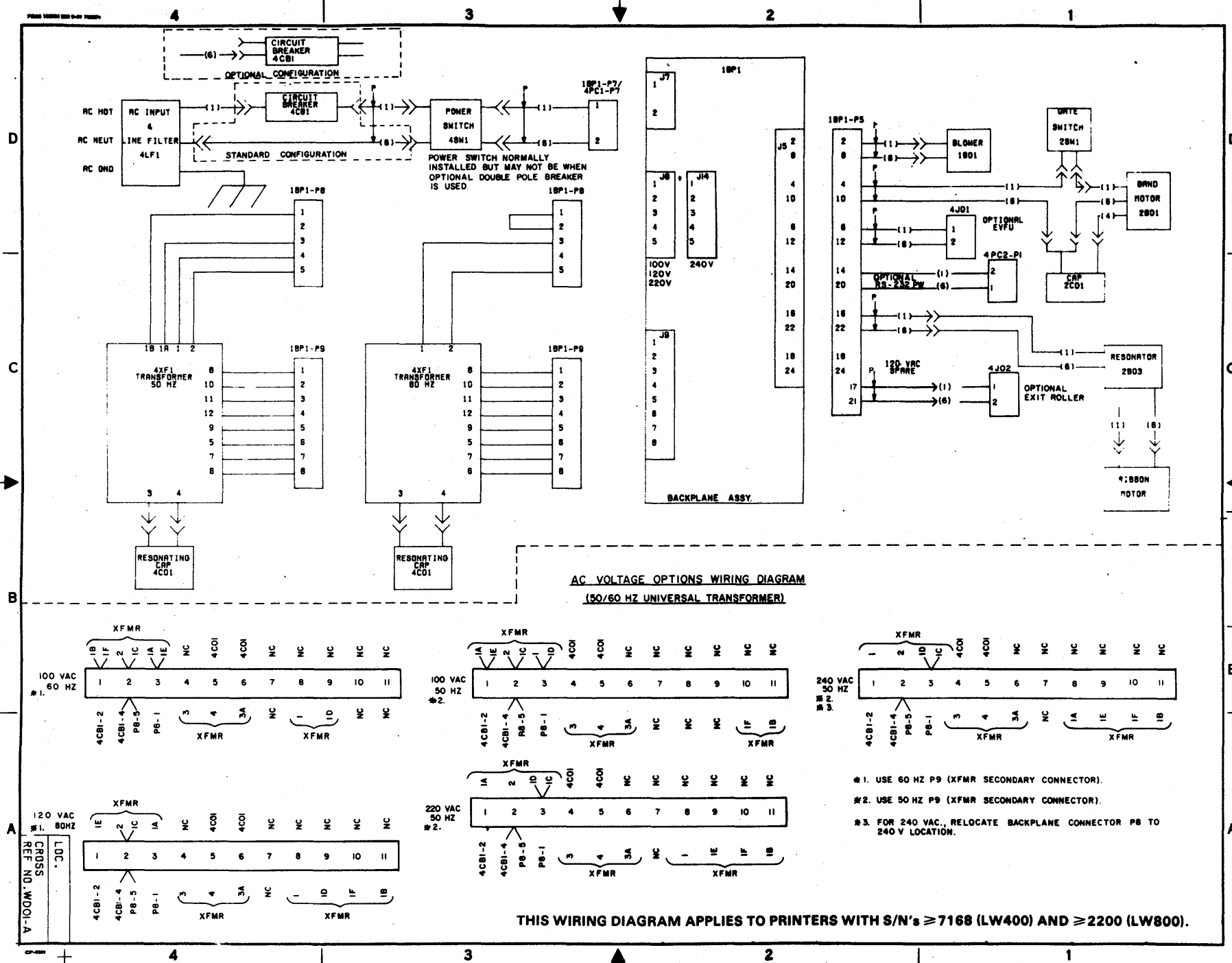


FIGURE 2-8. AC WIRING DIAGRAM

44682272

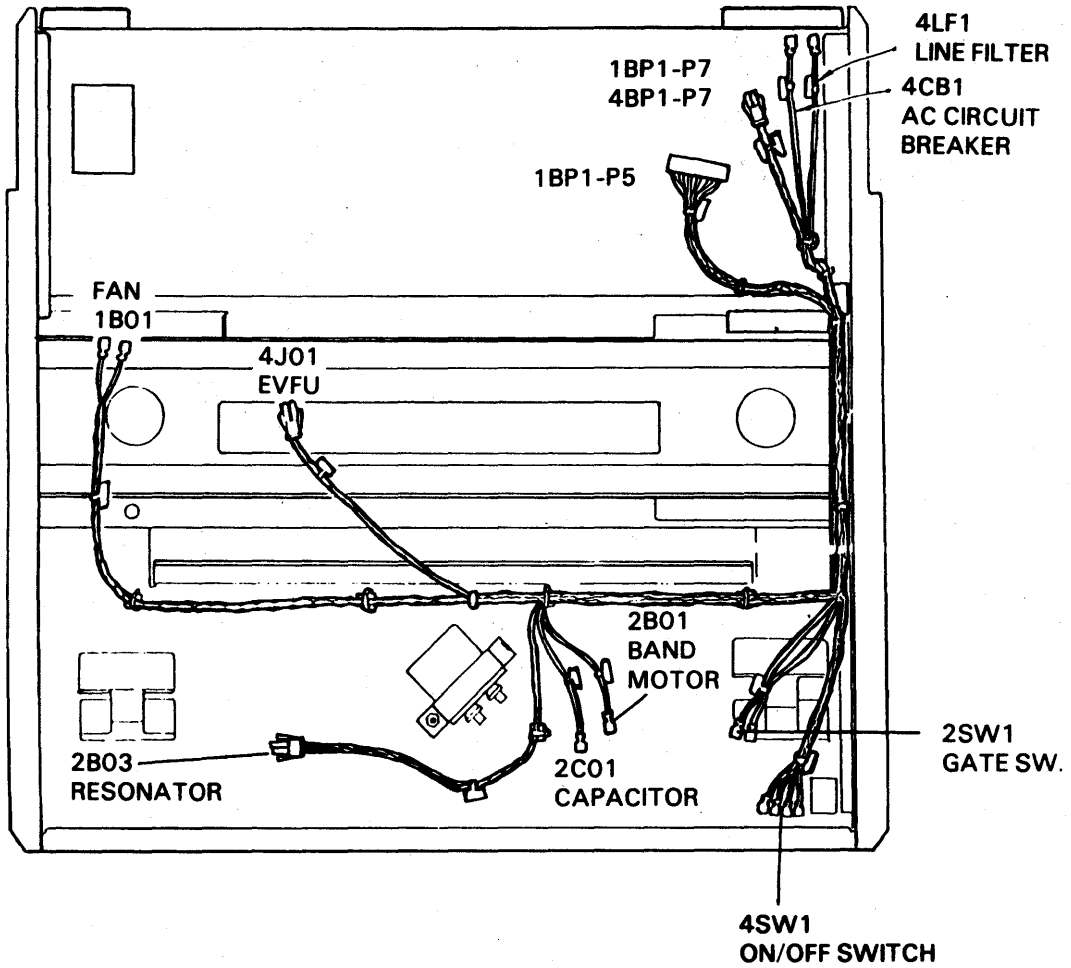


FIGURE 2-9. AC WIRING HARNESS

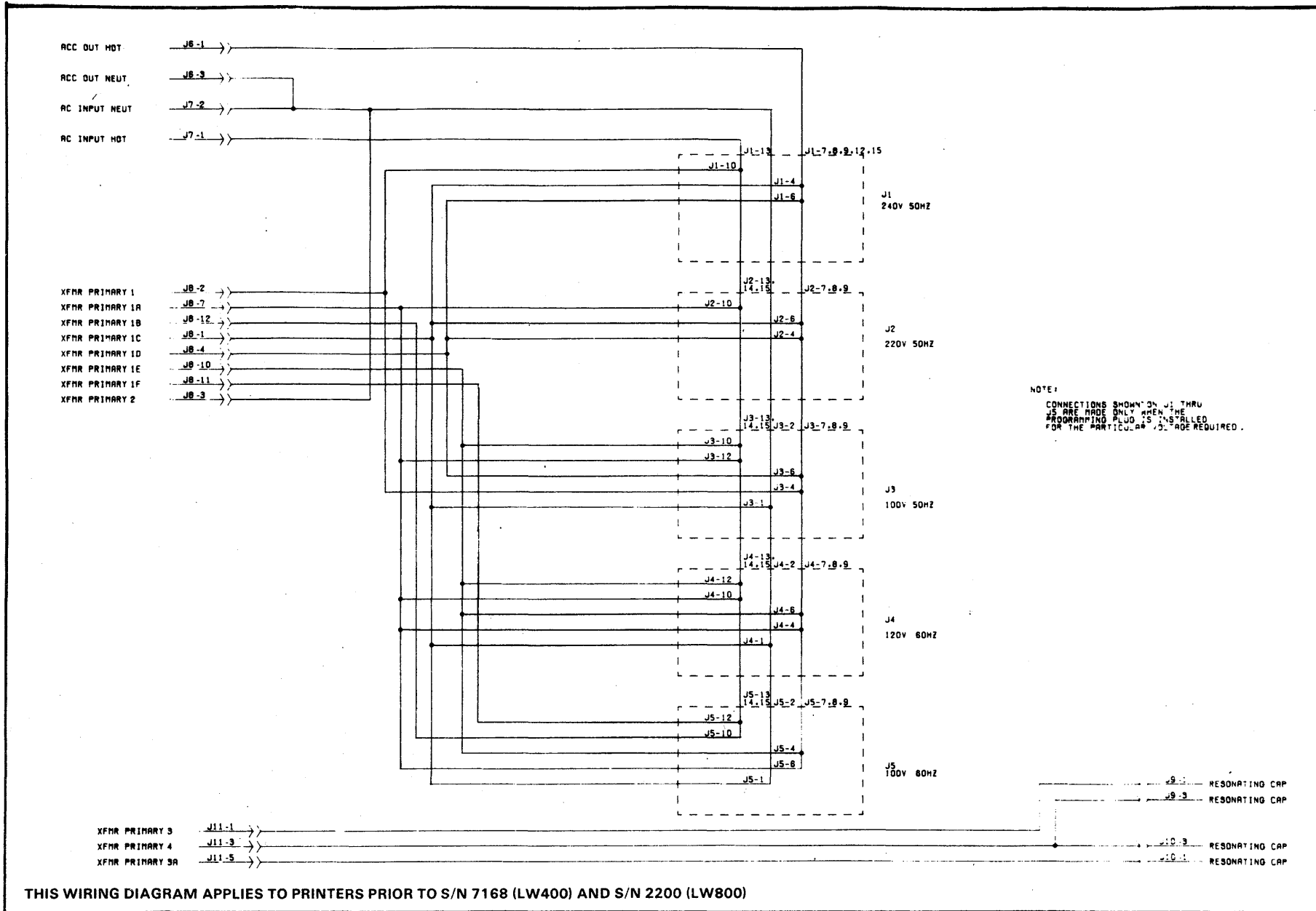


FIGURE 2-10. UNIVERSAL PROGRAMMING BOARD (4PC1) WIRING DIAGRAM (50 HZ/60 HZ UNITS ONLY)

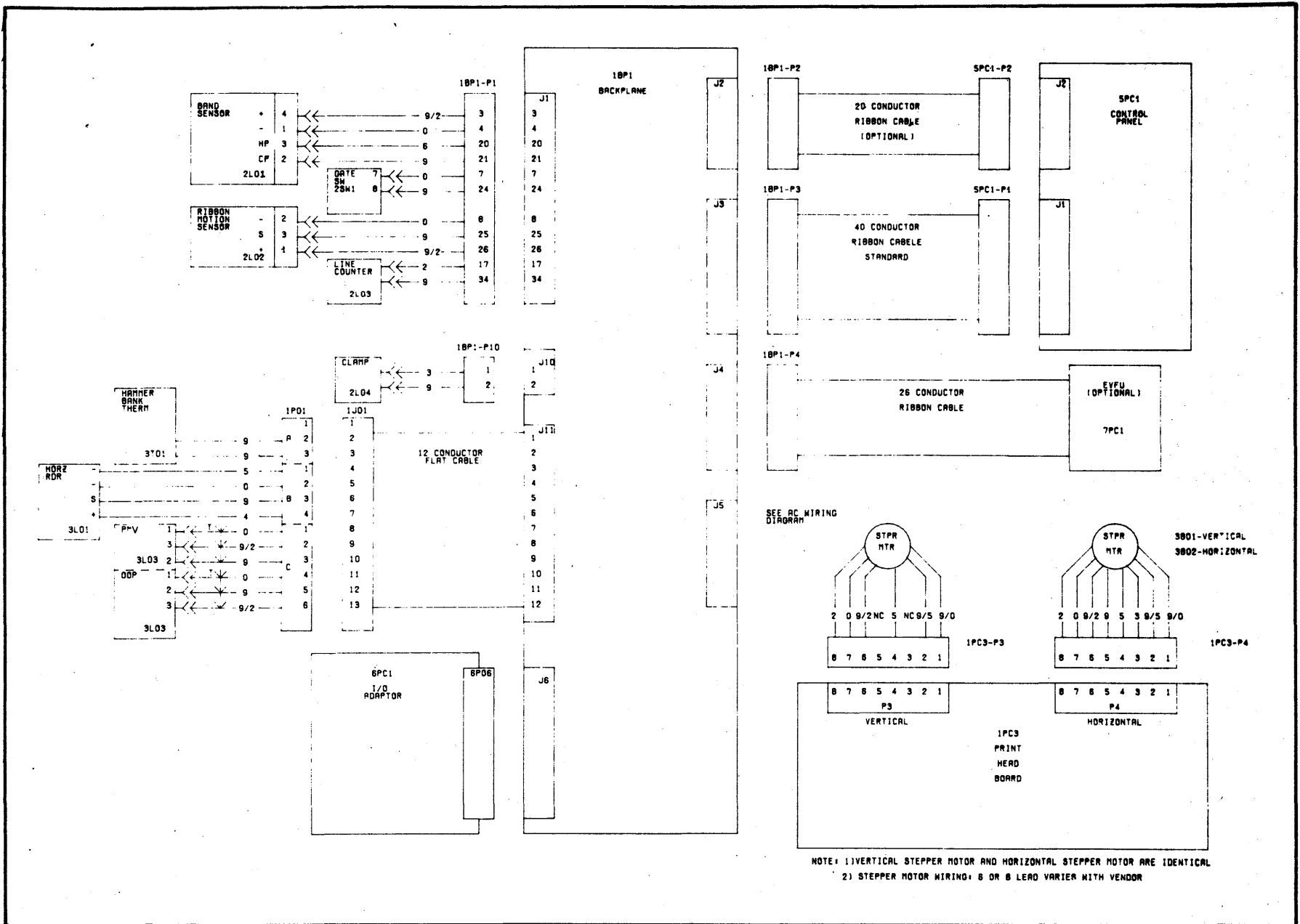


FIGURE 2-11. DC WIRING DIAGRAM



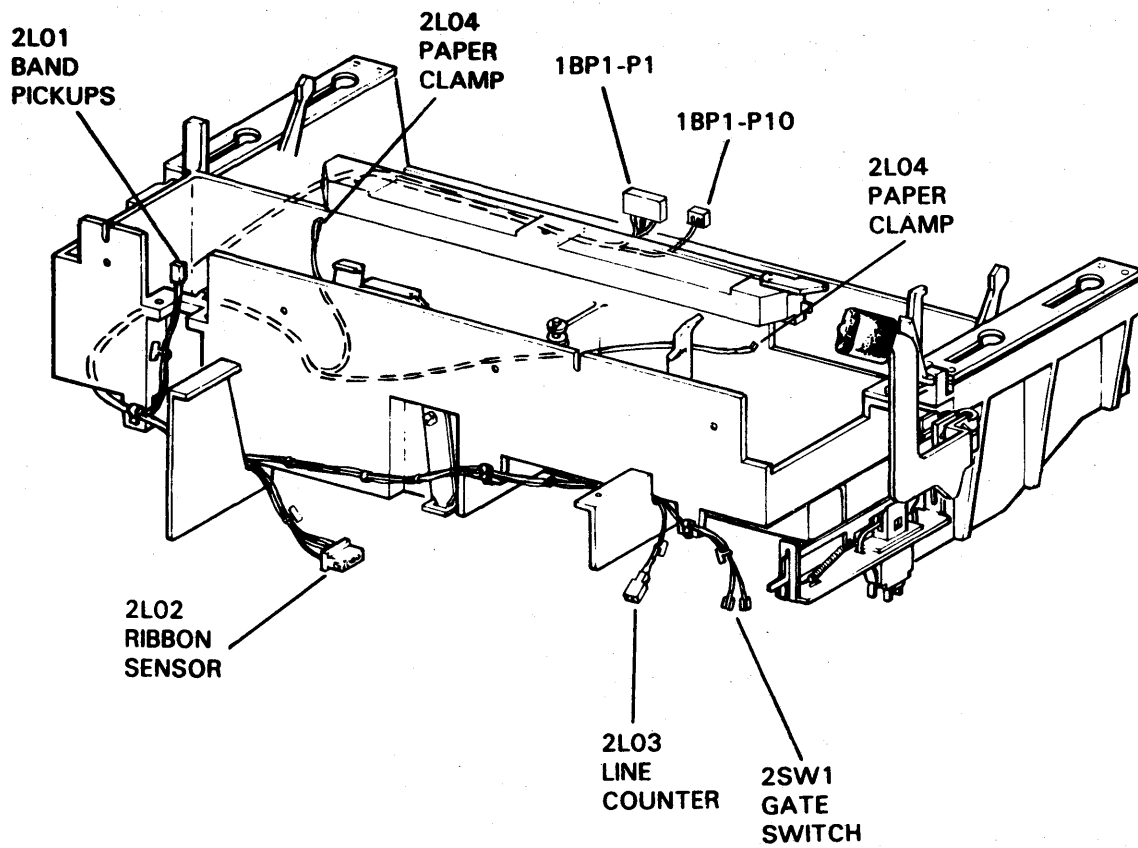


FIGURE 2-12. DC WIRING HARNESS

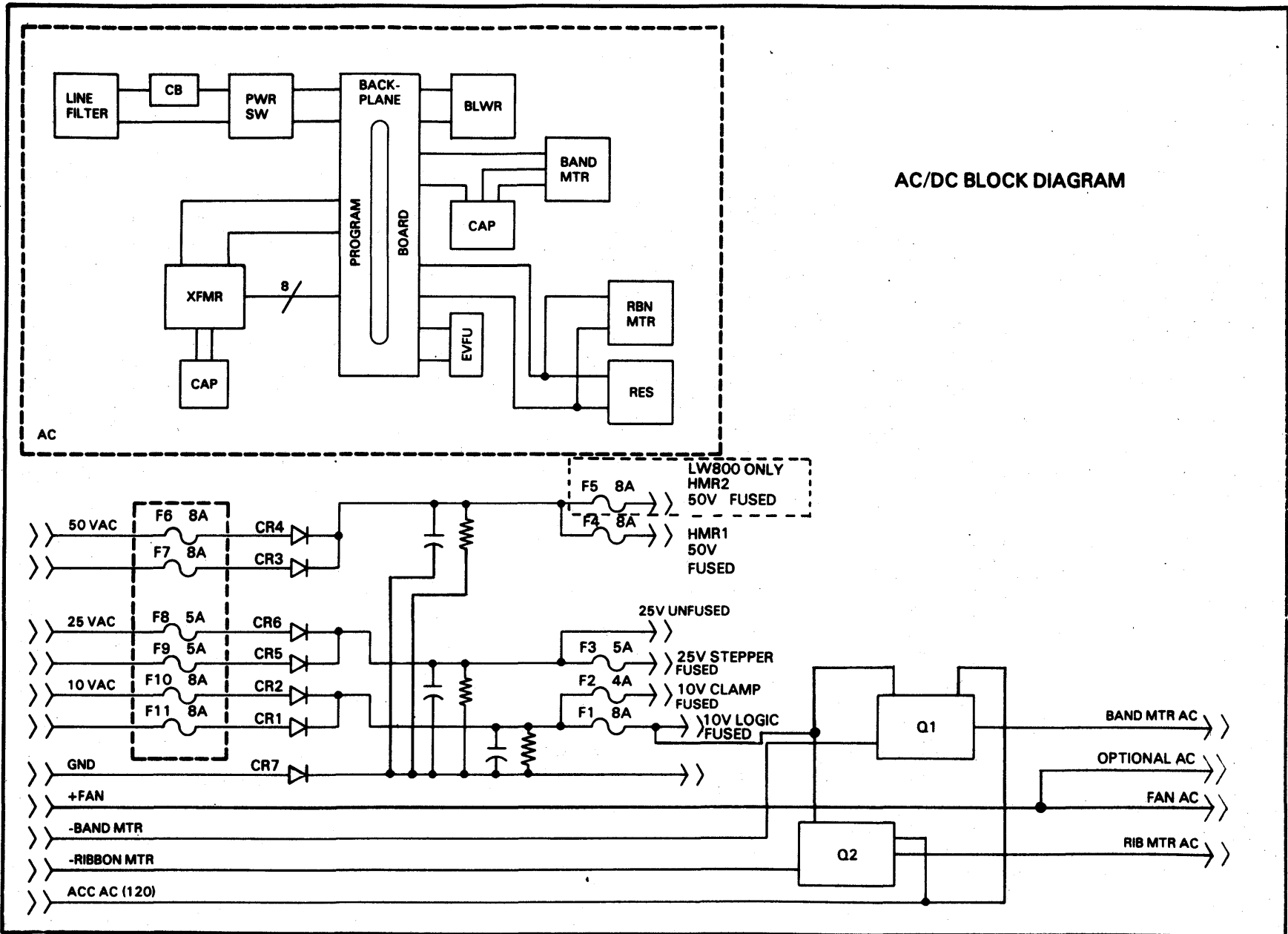


FIGURE 2-13. AC/DC BLOCK DIAGRAM

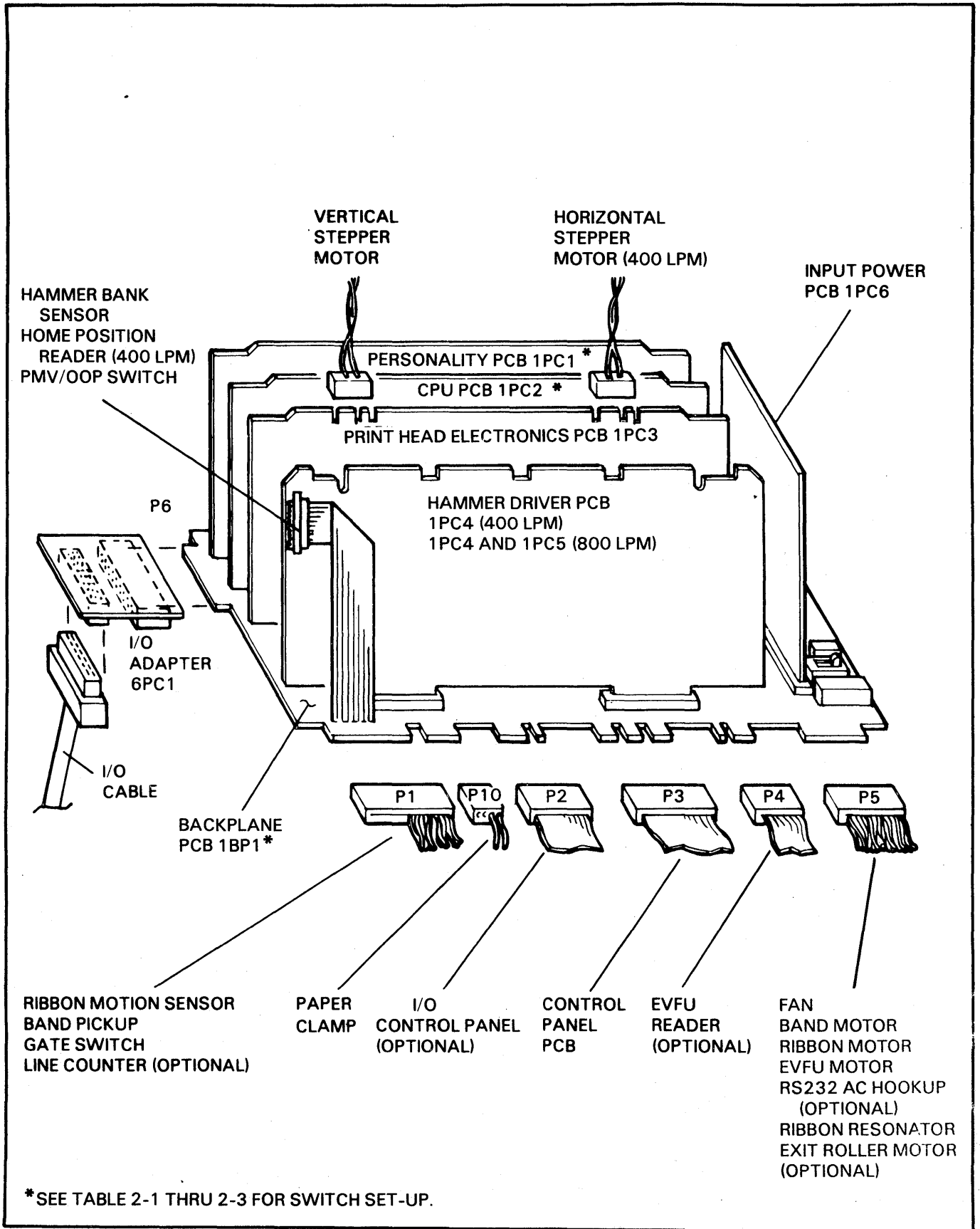


FIGURE 2-14. CONNECTOR IDENTIFICATION

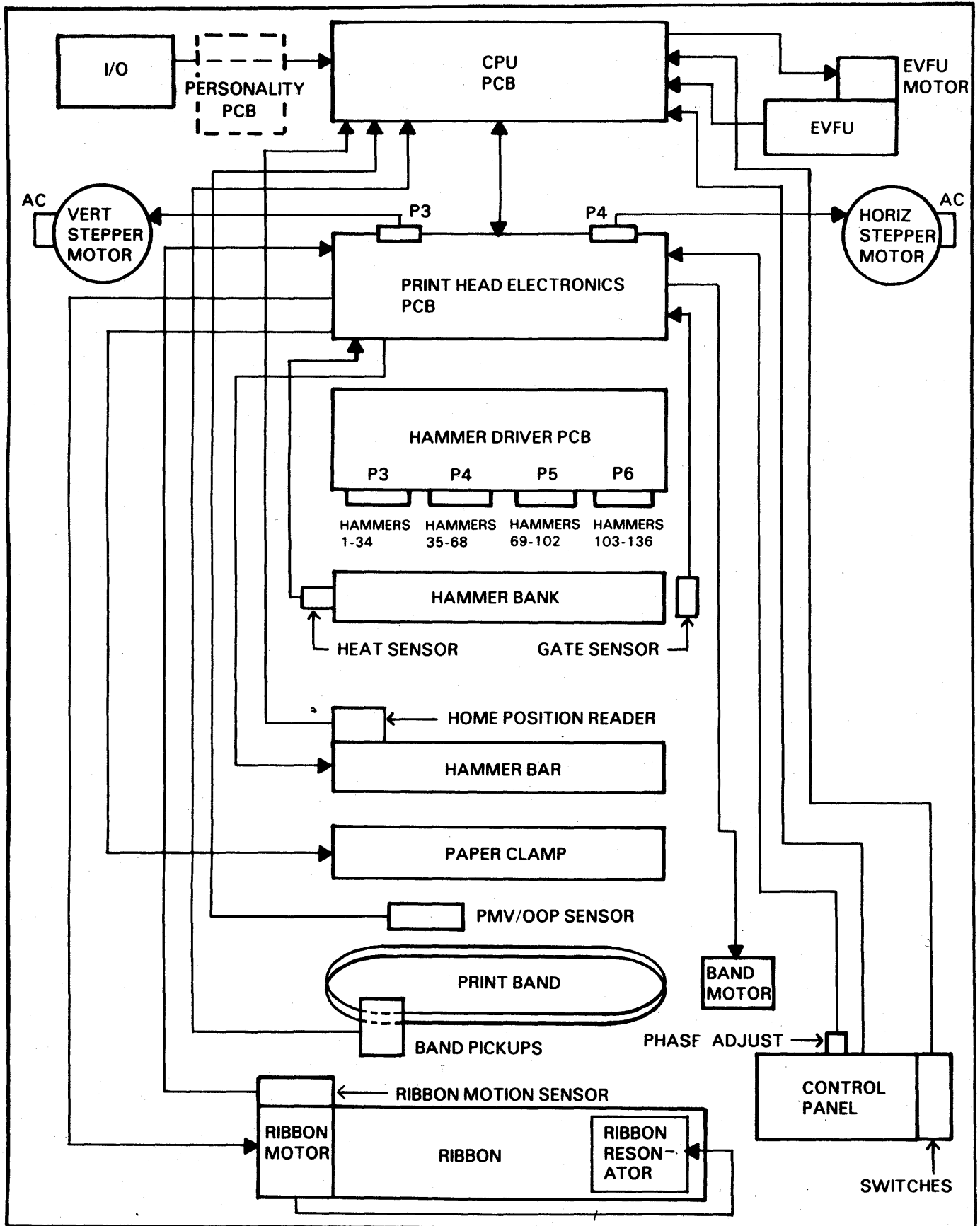


FIGURE 2-15. INTERCONNECTION BLOCK DIAGRAM

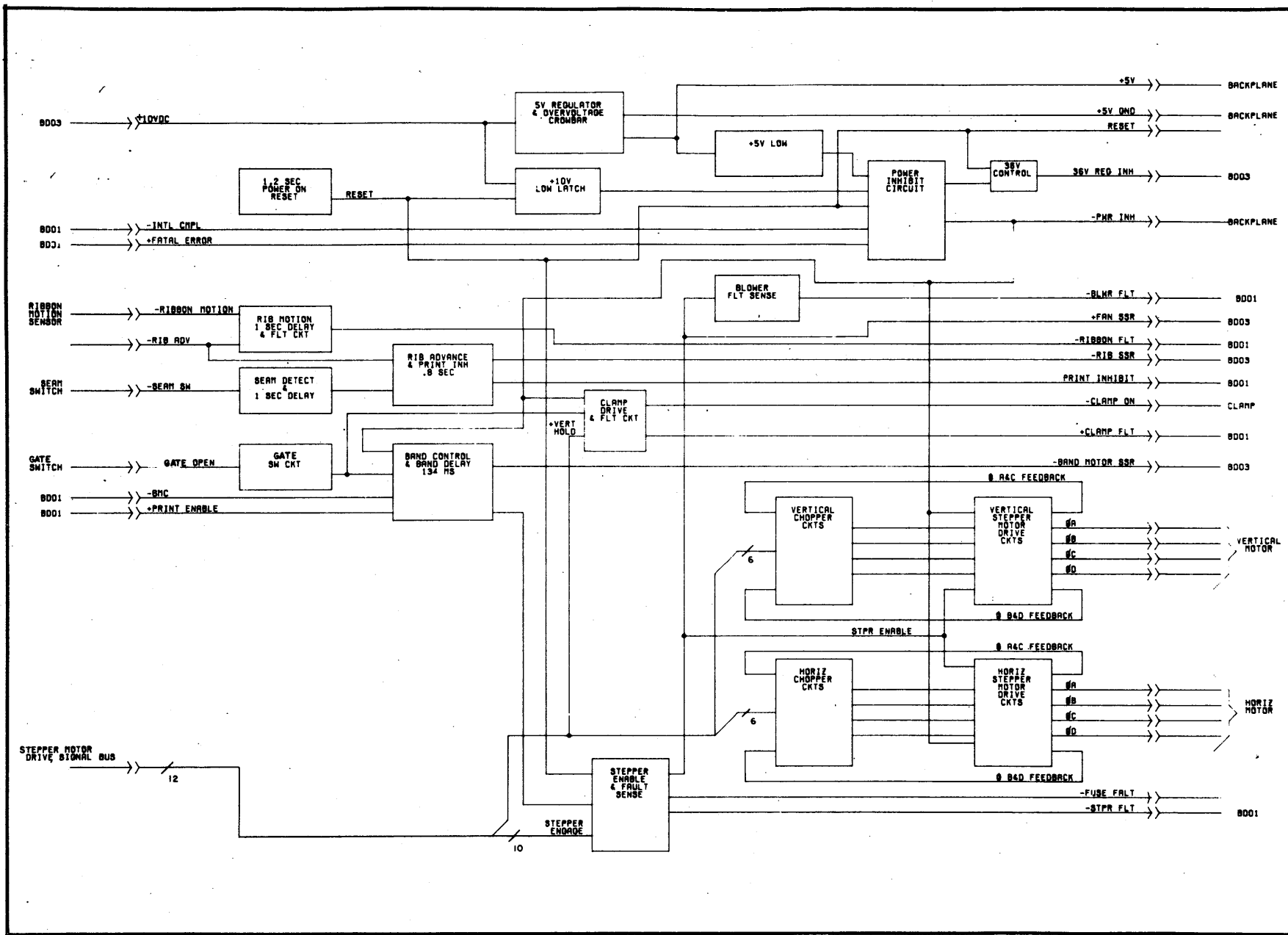


FIGURE 2-16. PRINT HEAD BOARD (1PC3) BLOCK DIAGRAM

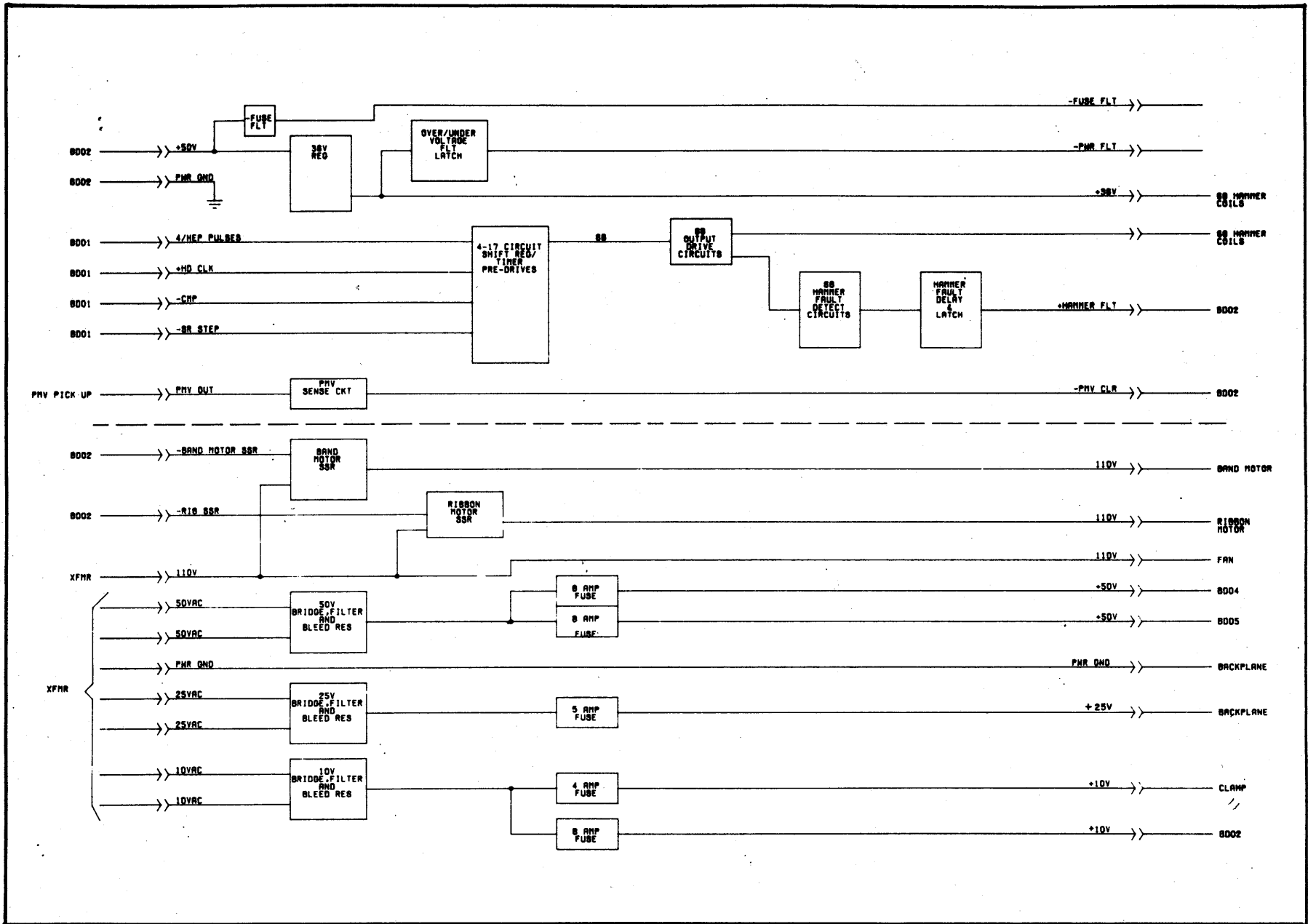


FIGURE 2-17. HAMMER DRIVER BOARD (1PC4)/ INPUT POWER BOARD (1PC6) BLOCK DIAGRAM

2-29/2-30

APR, 85

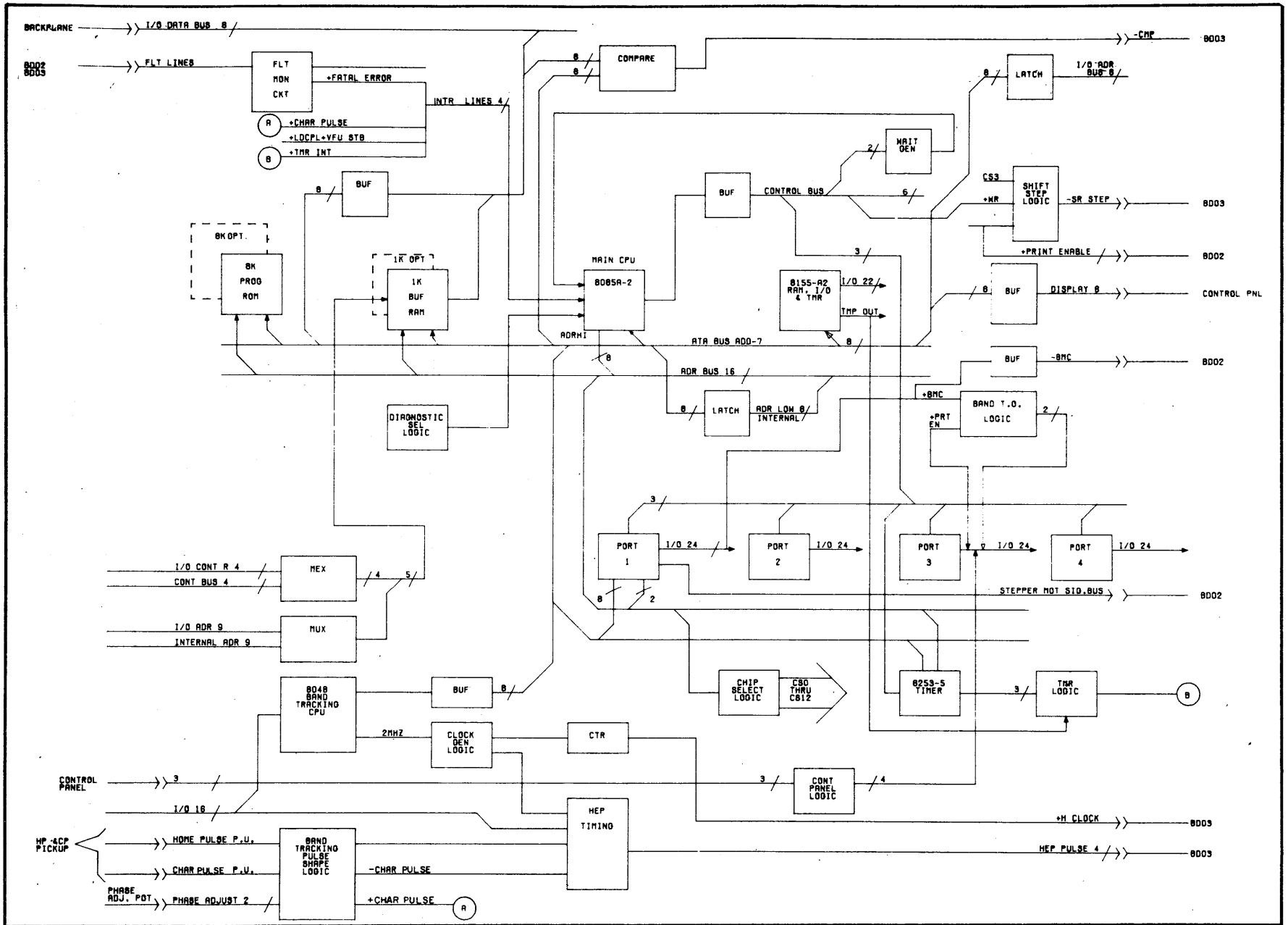


FIGURE 2-18. CPU BOARD (1PC2) BLOCK DIAGRAM





## SECTION III REPLACEMENT PROCEDURES

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#### WHEN ORDERING REPLACEMENT PARTS...

- Include the part number and the name of the part.
- Include the area of the printer where the part came from and its function if known.

The name of the parts listed in this manual may not be the same as the manufacturer's name of the part. It is suggested that you make note of the part's function and location if possible, in case of name discrepancies between parts.

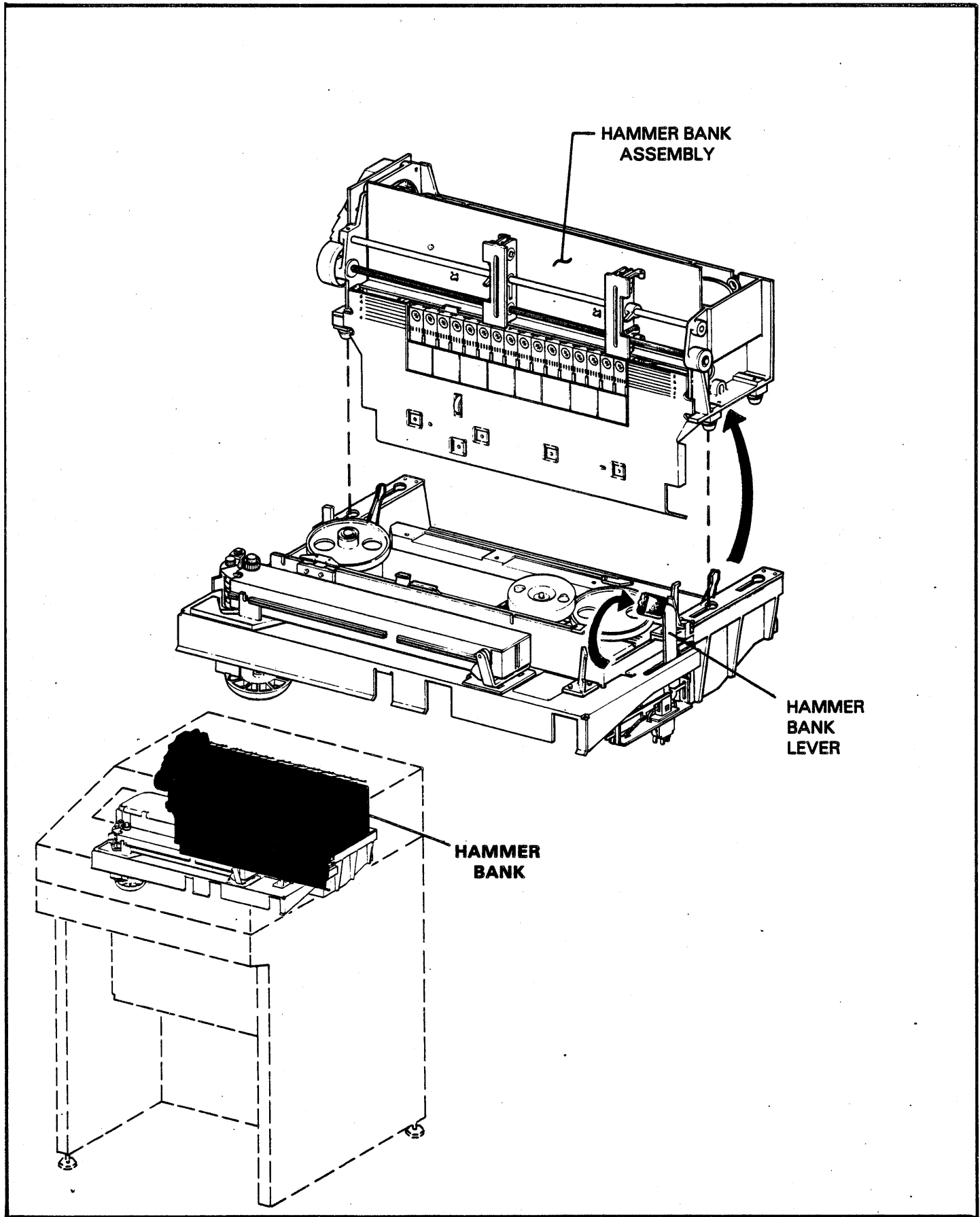


FIGURE 3-1. HAMMER BANK REMOVAL AND REPLACEMENT

## **HAMMER BANK REMOVAL AND REPLACEMENT**

- a. Open paper bail and card rack cover.
- b. Move hammer bank to its rear position by lifting the hammer bank lever behind control panel and close the tractor flaps.
- c. Unplug all seven of the hammer bank's connectors.
- d. Lift hammer bank out of printer, rotate 90 degrees backwards and place on work surface.
- e. Install hammer bank in reverse order of above steps. Be sure the wires are draped down in front of the plastic comb down along the front of the card rack then back up to the hammer bank. (This can be accomplished by tucking the wires down with the edge of your hand).

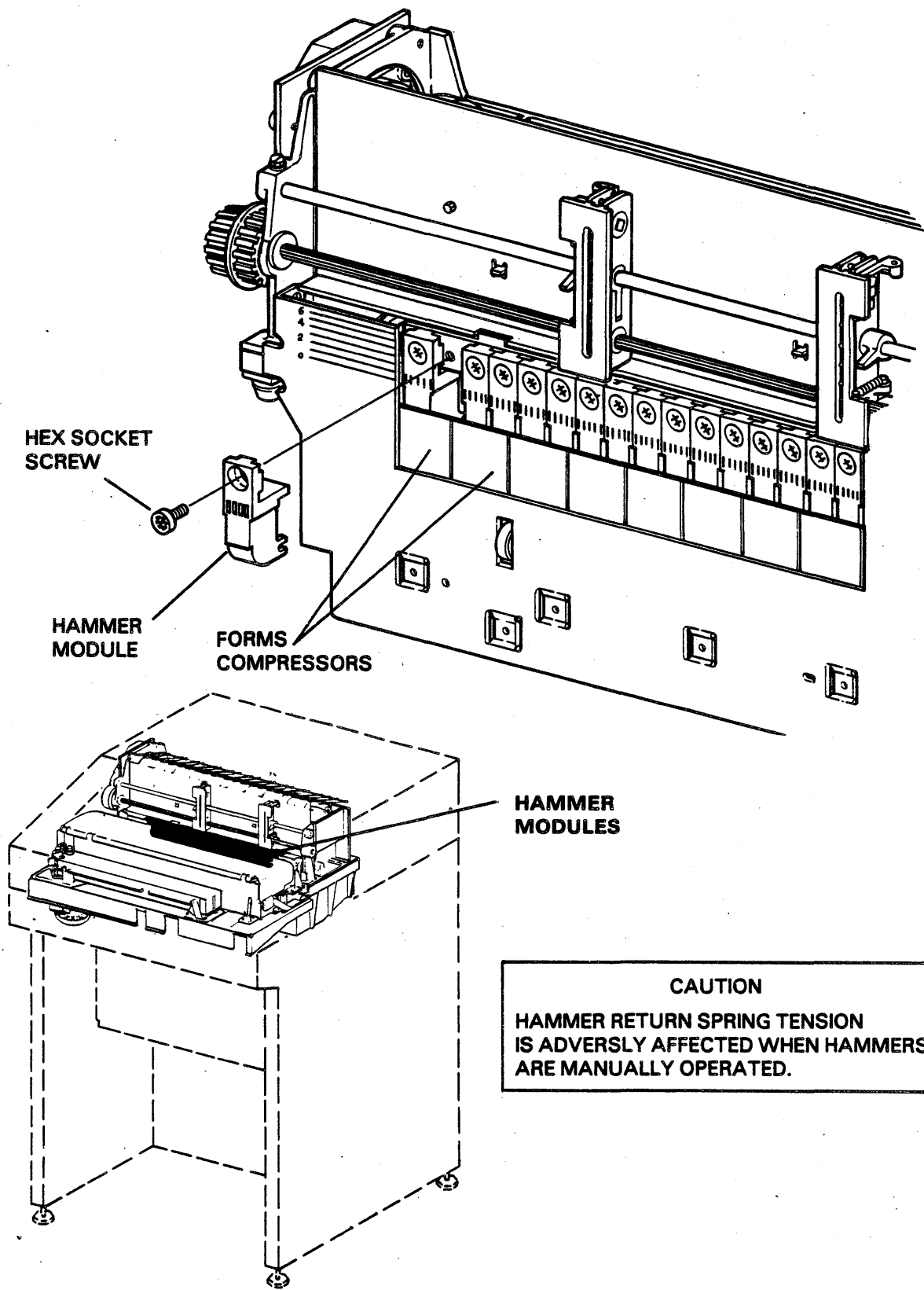


FIGURE 3-2. HAMMER MODULE REPLACEMENT

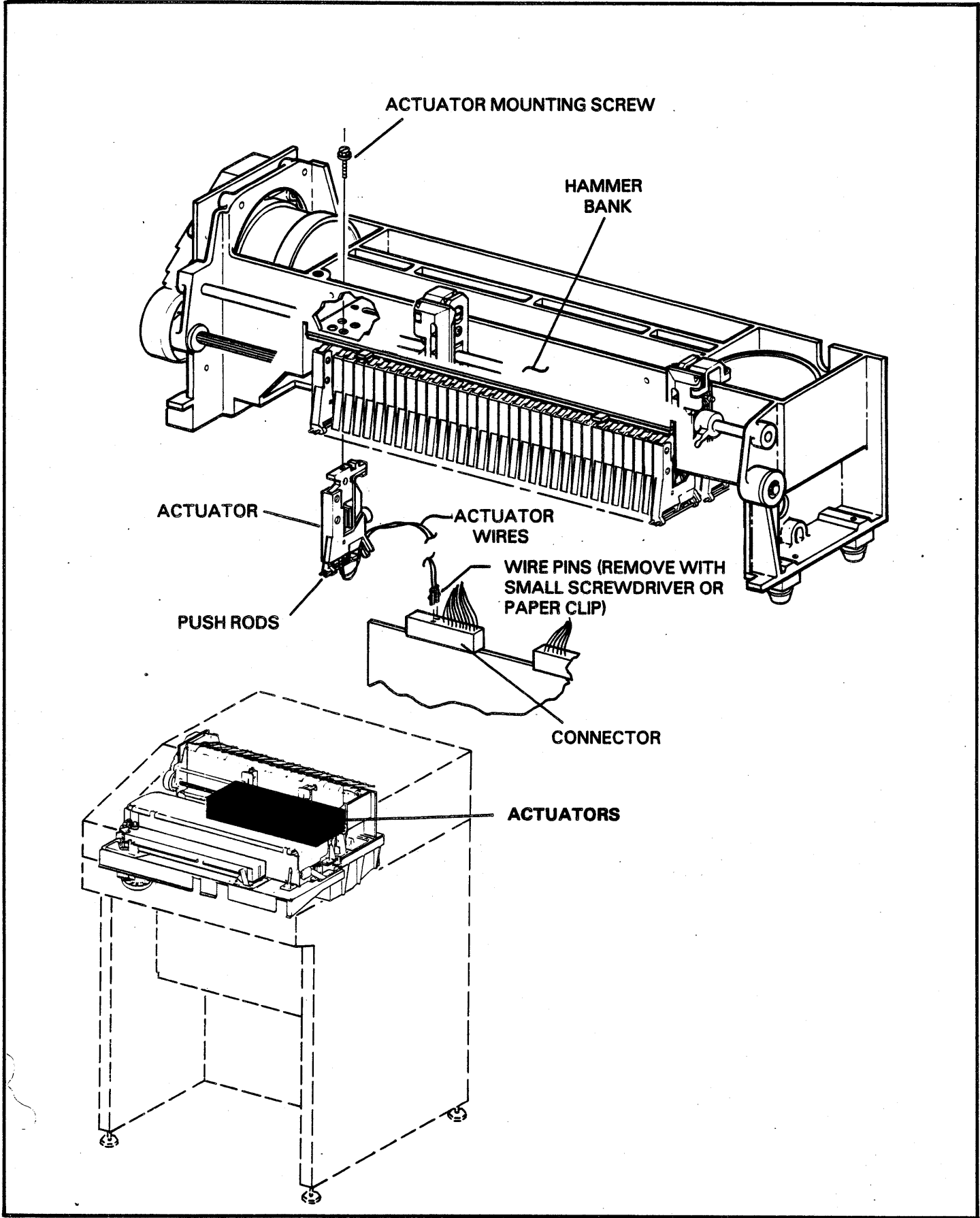
## HAMMER MODULE REPLACEMENT

### CAUTION

HAMMER RETURN SPRING TENSION IS ADVERSLY AFFECTED WHEN HAMMERS ARE MANUALLY OPERATED.

Once accomplished, perform Flight Time Adjustment procedure (next section).

- a. Remove hex socket screw on front of module and pivot the module up and out being careful not to extend the forms compressors too far. Save screw.
- b. Install new module by pivoting it behind the forms compressors and into position. Replace the hex socket screw.
- c. Perform Flight Time Adjustment procedure of both actuators affecting that module if required.



• FIGURE 3-3. ACTUATOR REPLACEMENT

## **ACTUATOR REPLACEMENT**

Once accomplished, perform Flight Time Adjustment procedure (next section).

- a. Remove the hammer bank (see procedure) and remove the 1/4 -inch hex head actuator mounting screw on top of hammer bank which holds actuator in place.

### **CAUTION**

**DO NOT TURN OR REMOVE BRASS SLOTTED HEAD SCREW ON ACTUATOR. IF GLYPTOL CEMENT IS BROKEN, ACTUATOR MUST BE REPLACED.**

- b. Release actuator wires from plastic wire comb and carefully work actuator out of hammer bank slot. For front actuators it is recommended to first remove hammer module. This allows room for finger access to actuators.
- c. Use a small flat blade, jewelers screw-driver or a small paper clip to remove the wires from the connector.
- d. Work new actuator into slot and start 1/4-inch hex head mounting screw in top of actuator. Check alignment of push rods with hammers and tighten screw slightly.
- e. Install the wire pins in connector. Place wires in plastic comb. Resnap wires back into hammer module.
- f. Perform Flight Time Adjustment procedure and tighten hex head screw securely.

MOTOR DRIVE BELT  
TENSION ASSEMBLY COVER

SPRING AND  
ROLLER  
ASSEMBLY

MOTOR DRIVE  
BELT COVER  
SCREW

MOTOR  
BELT

MOTOR  
MOUNTING  
SCREW

MOTOR MOUNTING  
BRACKET

MOTOR PULLEY  
SET SCREW

MOTOR  
PULLEY

PAPER  
POSITIONING  
KNOB

MOTOR MOUNTING  
BRACKET SCREW

VERTICAL  
STEPPING  
MOTOR

PAPER BAIL

VERTICAL  
STEPPING  
MOTOR

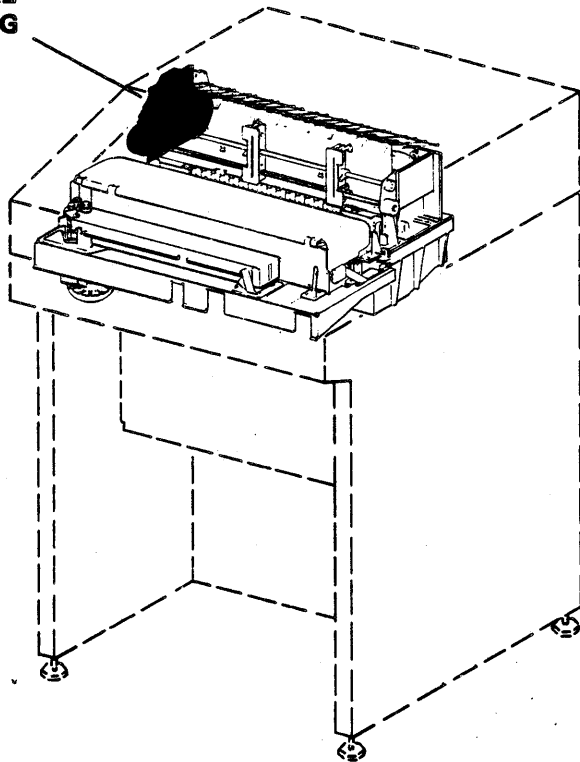
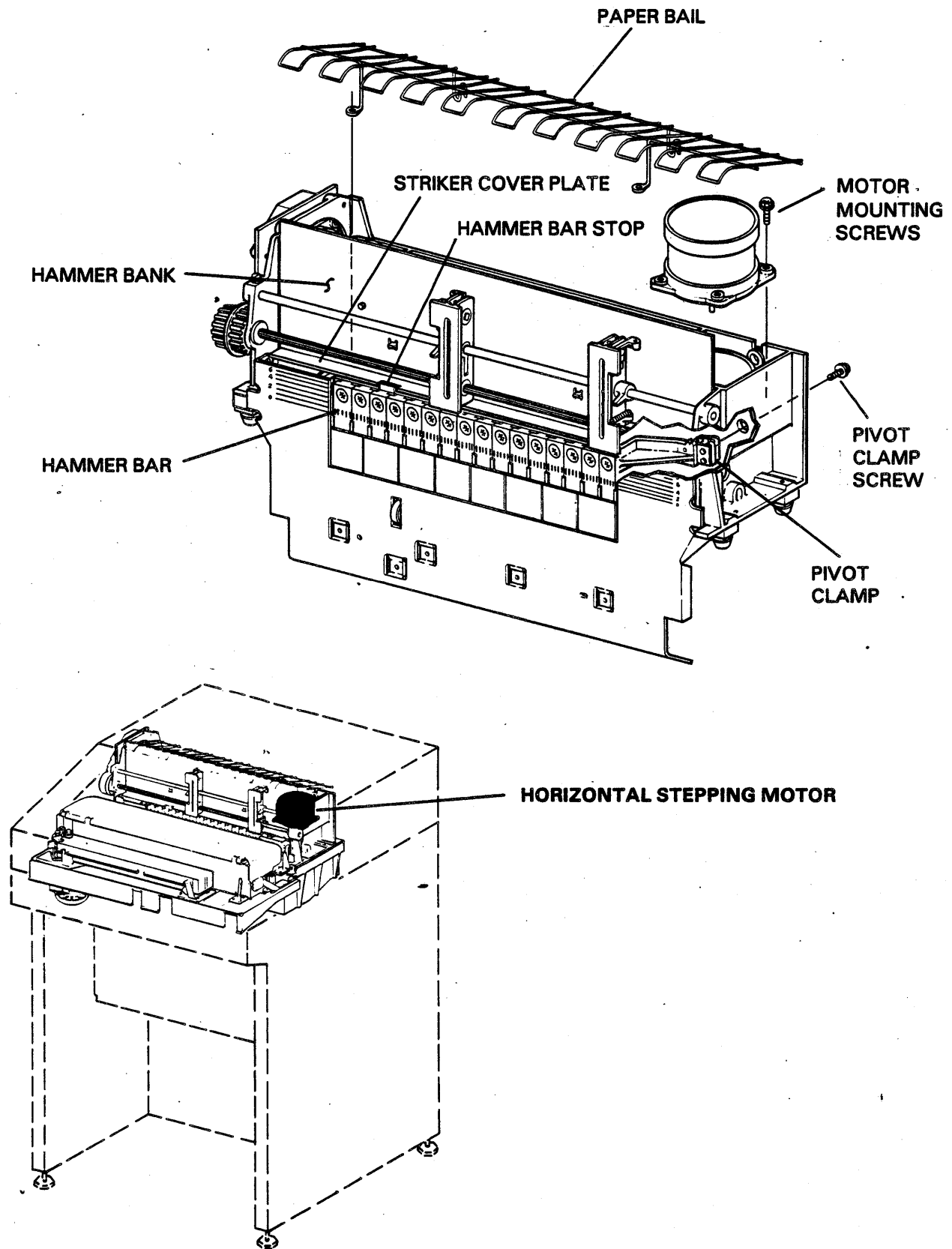


FIGURE 3-4. VERTICAL STEPPING MOTOR REPLACEMENT



## **VERTICAL STEPPING MOTOR REPLACEMENT**

- a. Power the printer OFF and remove the paper bail from hammer bank (two quarter-turn fasteners)
- b. Remove two screws to remove motor drive belt tension assembly cover. Hold cover in place while removing screws since the spring and belt tension roller assembly will fly apart when cover is removed. Remove cover slowly while trying to retain spring and roller in cupped hands.
- c. Remove motor belt.
- d. Remove motor pulley by loosening the set screw.
- e. Cut tie wrap on motor wires.
- f. Remove three screws which hold motor mounting bracket to casting and remove motor assembly from printer.
- g. Remove four screws to remove bracket from motor.
- h. Mount bracket on new motor.
- i. Route wires through casting and install motor assembly on casting with three screws.
- j. Install the motor pulley, the belt and tighten pulley set screw.
- k. Load spring and roller assembly into belt cover. Push roller assembly against the spring until the assembly latches into slot on belt cover.
- l. With spring and roller held in cover under tension, carefully position cover in line with mounting holes in casting and attach. Insert a thin-blade screwdriver through the round hole in cover to hold belt slightly depressed while installing cover in place.
- m. Release roller assembly tension by pushing the assembly out of slot in belt cover.
- n. Check to be sure belt rotates freely by turning paper positioning knob.
- o. Replace paper bail.

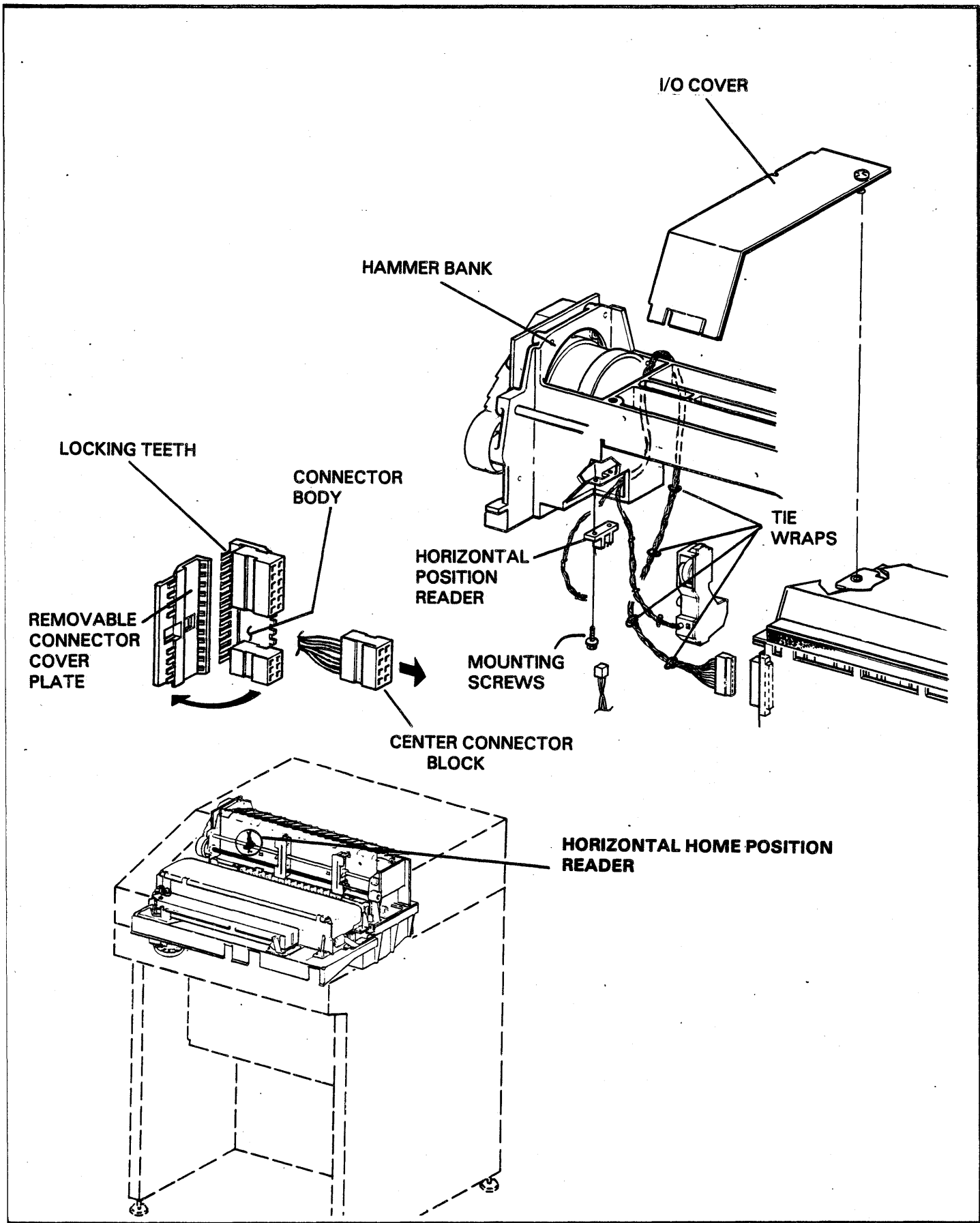


**FIGURE 3-5. HORIZONTAL STEPPING MOTOR REPLACEMENT**

## **HORIZONTAL STEPPING MOTOR REPLACEMENT**

Once accomplished, perform Hammer Bar Home Position Adjustment procedure (next section).

- a. Power the printer OFF.
- b. Remove paper bail from hammer bank (two quarter-turn fasteners).
- c. Remove hammer bank from printer (See procedure).
- d. Turn hammer bank over and loosen pivot clamp screw on motor shaft.
- e. Remove the four motor mounting screws from top of casting to release motor.
- f. Install new motor by passing motor shaft through the pivot clamp and securing in place with four screws. Do not tighten pivot clamp screw yet.
- g. Install hammer bank in printer.
- h. Leave the paper throat open.
- i. Make note of the current switch settings then set the DIP switches on the top edge of the CPU board, 1PC2, such that No. 2 switch is OFF and the rest of the switches are ON.
- j. Power the printer ON.
- k. Slip a 0.010-inch feeler gauge between the left end of the hammer bar stop and the cut-out in the striker cover plate. See Hammer Bar Home Position Adjustment procedure.
- l. Hold the hammer bar stop against the shim and press TEST PRINT switch on the Control Panel. The status display should be alternately flashing between "HOME" and "PHA".
- m. Insert a 5/16-inch "spin-tite" socket wrench into hole in casting behind the motor and tighten clamp screw.
- n. Reset DIP switches on CPU board to the normal operating positions.
- o. Install paper bail.



**FIGURE 3-6. HORIZONTAL HOME POSITION READER REPLACEMENT**

## **HORIZONTAL HOME POSITION READER REPLACEMENT**

- a. Power the printer OFF and remove the hammer bank (See procedure) and I/O cover.
- b. Remove tie wraps on the horizontal position reader connector wires.
- c. Make note of wire color sequence in connector (mounted vertically on the upper left side of the card cage). With removable connector cover plate facing out make note of cable routing.
- d. Hold down the small locking teeth between wires starting at left end of connector as the cover plate is pulled free of locks. Remove cover plate.
- e. Remove center connector block by sliding it up and out of connector body.
- f. Note wire color positions on reader.
- g. Remove the two screws which mount reader.
- h. Install new reader and connect wires in connector block in same position as old reader.
- i. Slide connector block in position in connector body. Seat the wires between locking teeth.
- j. Replace connector cover plate by pressing evenly along the center of the plate while sliding bottom of plate up into the locking teeth. Handle connector carefully.
- k. Reharness the wires using tie wraps.
- l. If when powered ON and a fault code of NHOM is displayed on the Control Panel the reader will have to be turned 180 degrees.

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CLARITY OF ILLUSTRATION

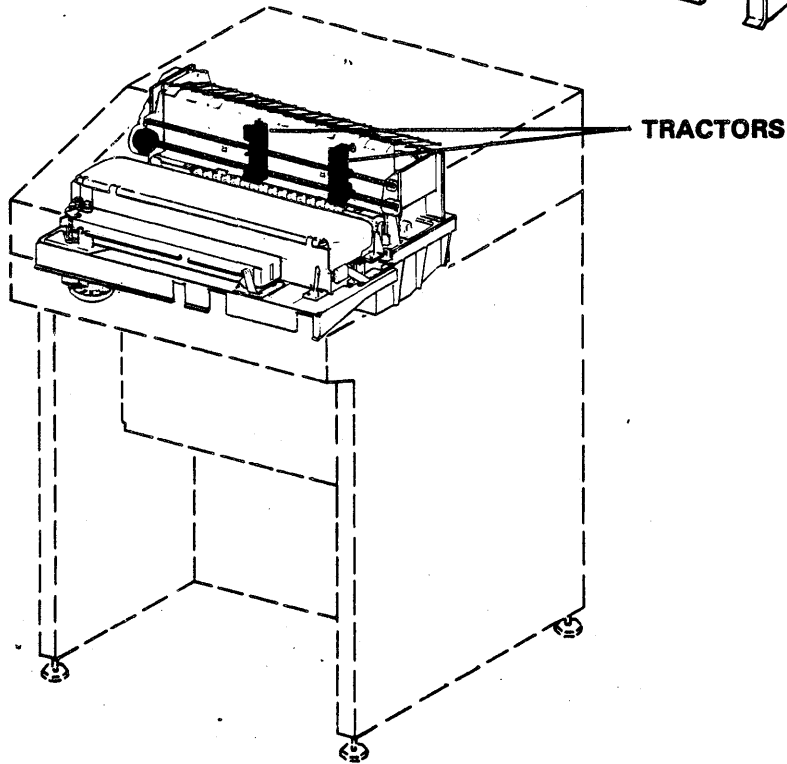
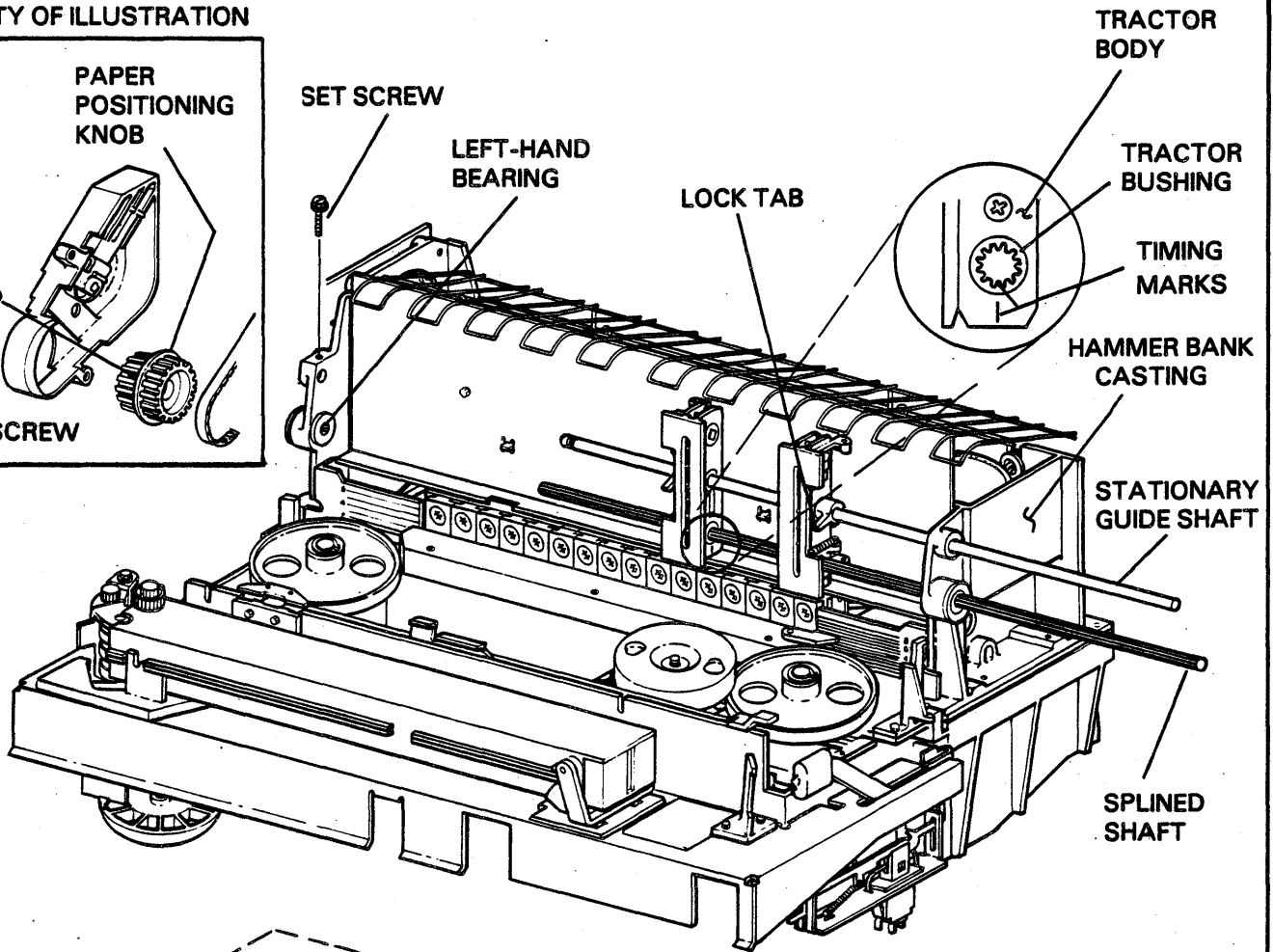
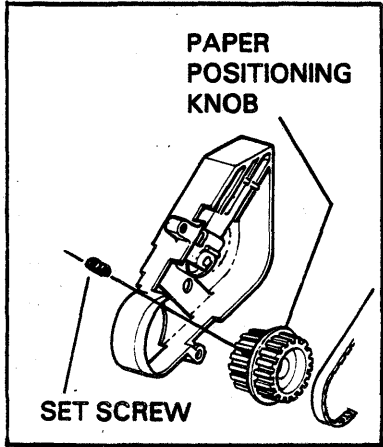


FIGURE 3-7. TRACTOR REPLACEMENT

## TRACTOR REPLACEMENT

Once accomplished, perform Left Hand Tractor Drive Bearing Adjustment procedure (next section).

- a. Loosen two set screws in paper positioning knob.
- b. Loosen the set screw on left end of tractor stationary guide shaft.
- c. Slide both guide shaft and splined shaft about 8 inches to the right through the hammer bank casting. Hold the left-hand bearing in the casting bushing while removing splined shaft.
- d. Unlock tractors and remove from the left ends of the shafts. **Do not force lock tabs up too far; they may break.**
- e. On the new tractors, align the timing marks on the tractor bushings with the marks on the tractor bodies.
- f. Slide both tractors onto the splined shaft R.H. tractor first, making sure the timing marks are still aligned and that timing marks on both tractors are in line with the same tooth on the splined shaft.
- g. Insert splined shaft into left hand bearing so that the end of the spline is flush with the outside end of the bearing.
- h. Slide the stationary guide shaft through tractors and into casting hole until shaft is flush with outside of casting. Tighten set screw .
- i. Place a 0.015-inch shim between spline shaft bushing and bearing flange.
- j. While holding the bearing against bushing (with shim in place) and the paper positioning knob held tightly against casting, tighten the two knob set screws. The clearance between bearing and bushing should be  $0.010 \pm .005$  inches at the closest point during shaft rotation.

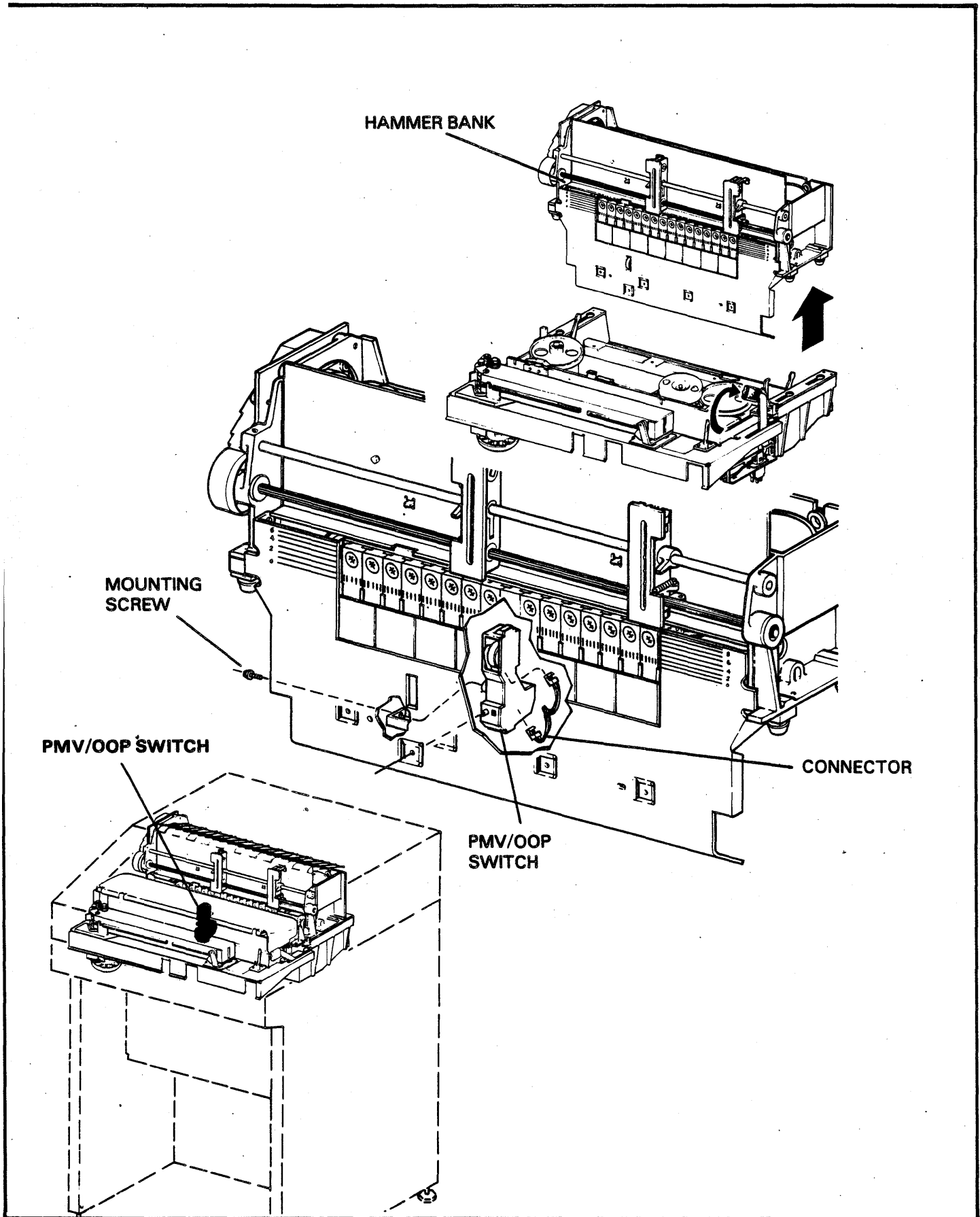
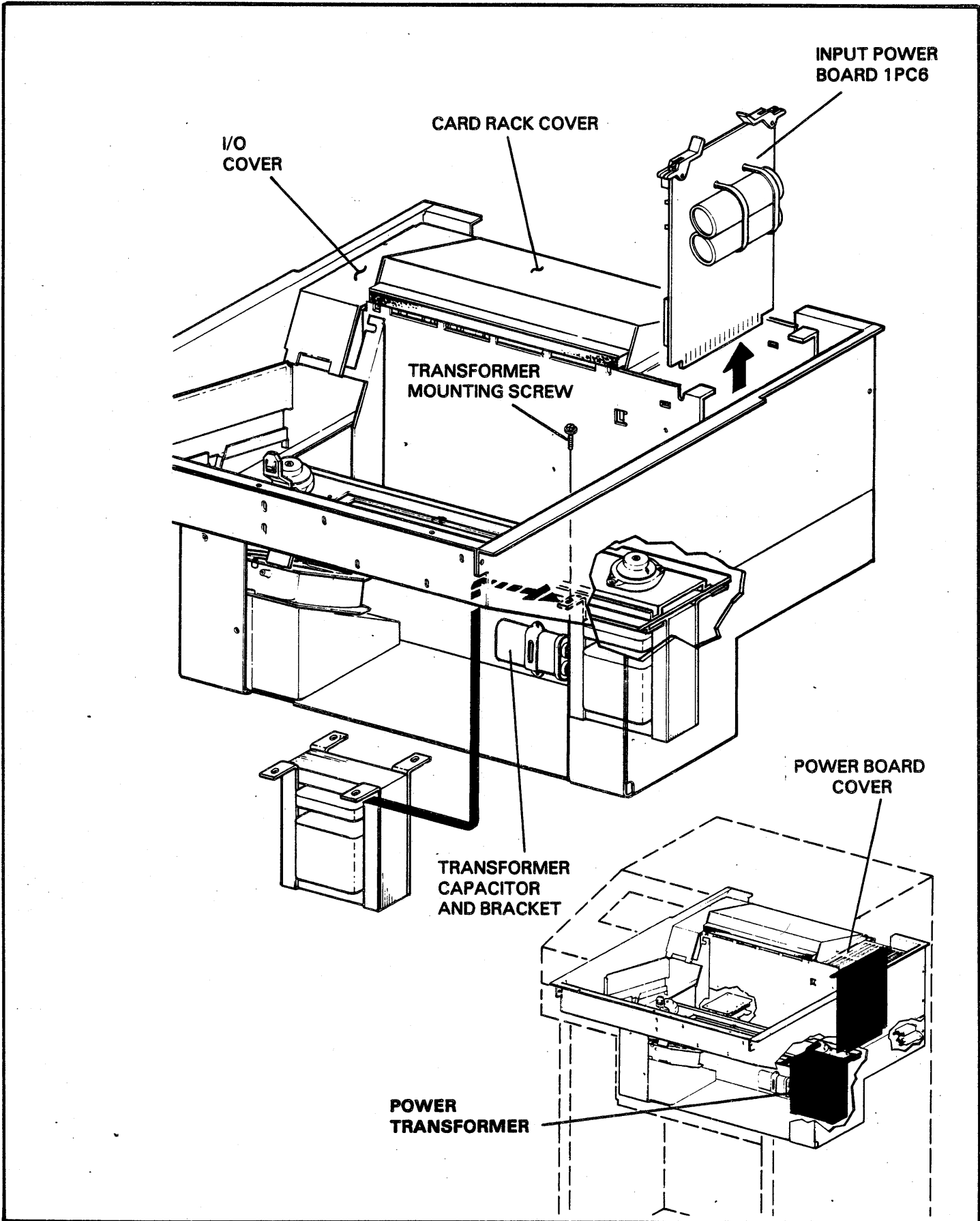


FIGURE 3-8. PAPER MOTION VERIFICATION/OUT OF PAPER (PMV/OOP) SWITCH REPLACEMENT



**PAPER MOTION VERIFICATION/OUT OF  
PAPER (PMV/OOP) SWITCH REPLACEMENT**

- a. Perform Hammer Bank Removal procedure.
- b. Unplug the connector from the switch.
- c. Remove the mounting screw which holds the switch.
- d. Install new switch and reconnect the connector.
- e. Reinstall the hammer bank in the printer.



**FIGURE 3-9. POWER TRANSFORMER REPLACEMENT**

## **POWER TRANSFORMER REPLACEMENT**

- a. Unplug the printer from its ac source.
- b. Open the paper bail and card rack cover.
- c. Unplug the four connectors from the hammer bank.
- d. Remove the I/O cover and unplug the hammer bank sensor 1J01.
- e. Remove the power board cover and the input power board 1PC6.
- f. Open the hammer bank and remove the hammer bank to gain access to transformer mounting screws.
- g. Remove the lower front access panel.
- h. Disconnect all connectors from the transformer and the wires from the transformer capacitor. For ease of accessibility remove the transformer capacitor and its bracket.
- i. Remove the transformer mounting screws, slide the transformer to the left and remove through the front access opening.
- j. Reverse the procedure for installation.

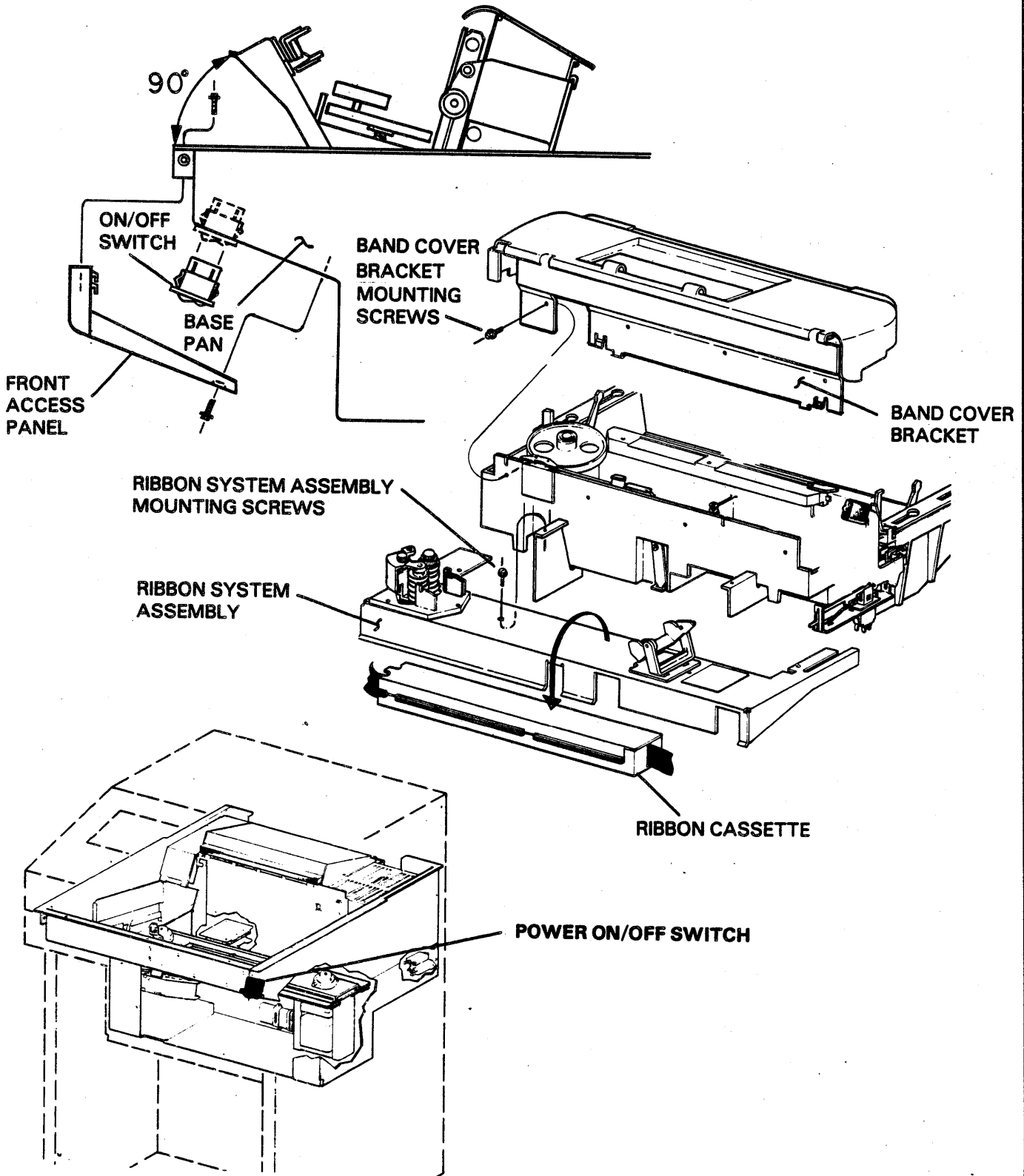


FIGURE 3-10. POWER ON/OFF SWITCH REPLACEMENT

## **POWER ON/OFF SWITCH REPLACEMENT**

- a. Unplug the printer from its ac source.
- b. Remove the ribbon cassette.
- c. Remove the band cover bracket by removing its mounting screws.
- d. Remove four ribbon system assembly mounting screws from the ribbon system assembly and pivot the assembly 90 degrees toward the back of the printer.
- e. Remove the front access panel.
- f. Reach inside the printer, squeeze the switch and push it down through the base pan.
- g. Disconnect the wires from the old switch and install on the new switch.
- h. Push the new switch up into the base pan until it snaps into place.
- i. Reverse the procedure for reassembly.

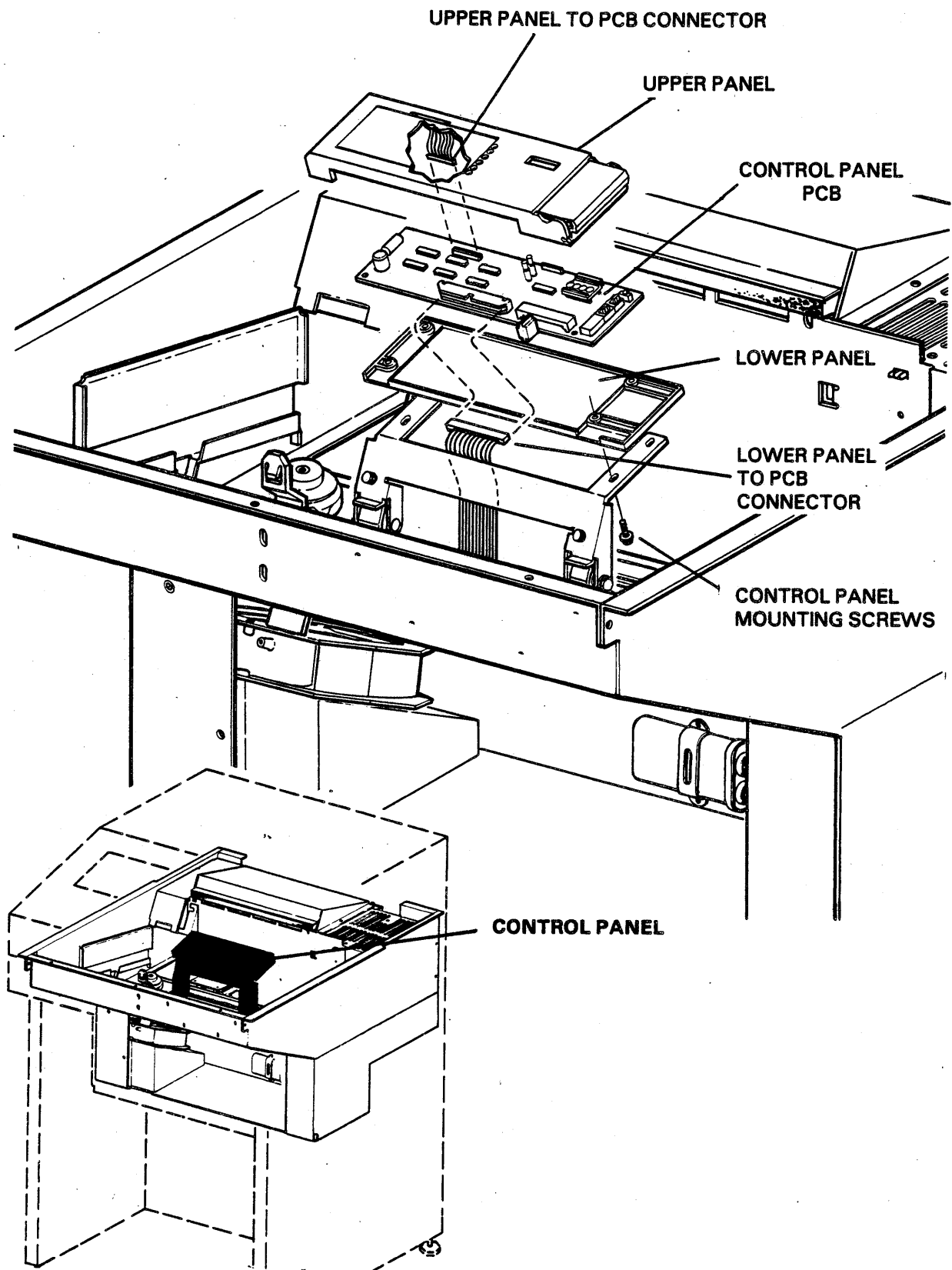


FIGURE 3-11. CONTROL PANEL/PCB REPLACEMENT

## **CONTROL PANEL/PCB REPLACEMENT**

- a. Power the printer OFF.
- b. Wrap one hand around Control Panel assembly to hold it together while removing four Control Panel mounting screws from bottom of Control Panel.
- c. Separate both halves of the assembly.
- d. If upper panel is being replaced, remove upper panel-to-PCB connector from PCB.
- e. If Control Panel PCB is being replaced, remove both connectors from PCB.
- f. To reassemble Control Panel assembly first install both connectors, then place PCB in position between both halves of the assembly and secure with four screws removed in step b.

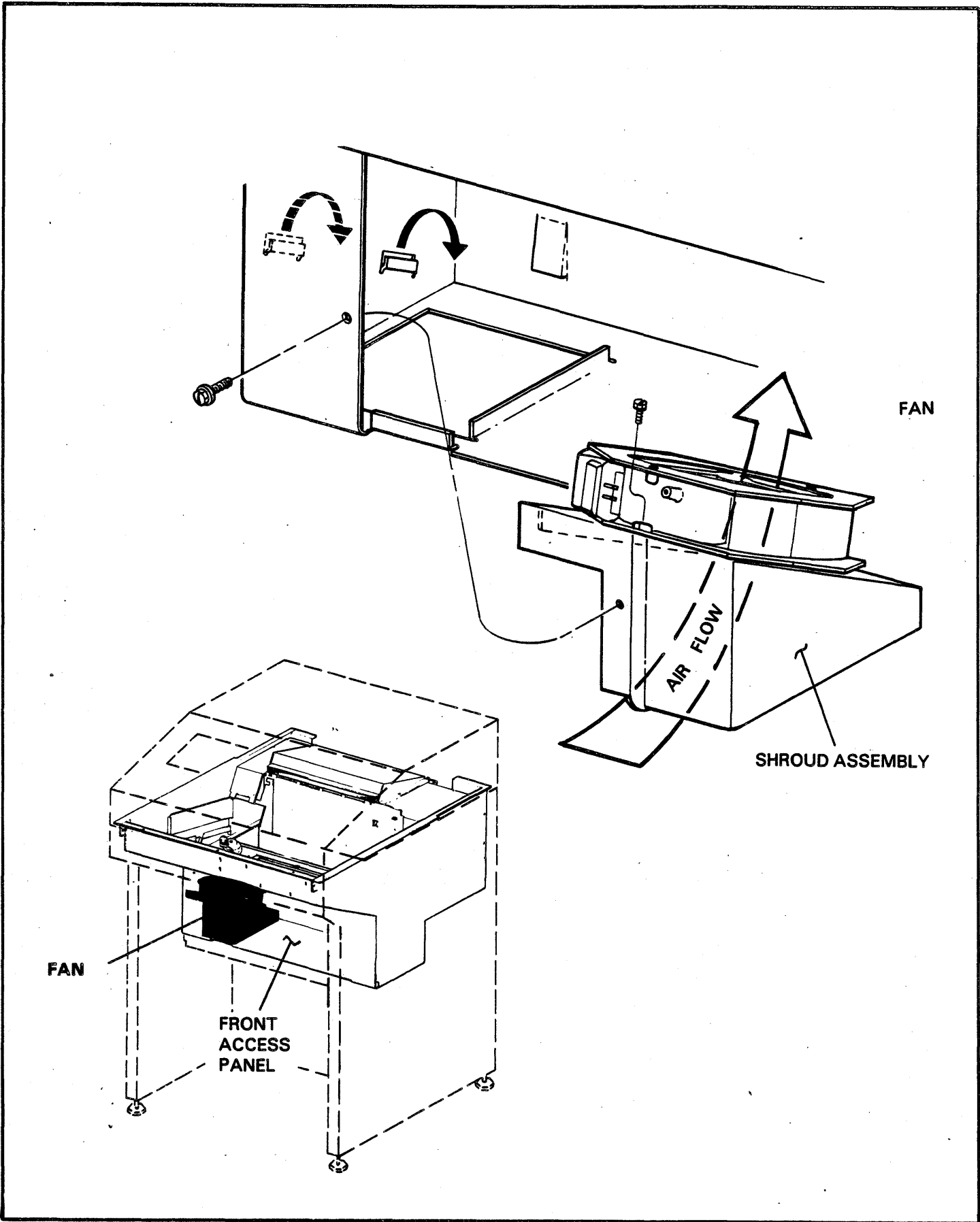


FIGURE 3-12. FAN REPLACEMENT



## **FAN REPLACEMENT**

- . Power the printer OFF.
- . Remove the lower front access panel.
- . If the unit is equipped with a  $\pm 12$  V power supply next to the fan assembly, remove the power supply before removing the fan.
- . Remove one screw from the fan shroud assembly lift and slide the assembly to the right and disconnect the wire harness.
- . Remove the fan from the shroud, replace fan and reconnect the ac connector.
- . Reverse the procedure for installation.

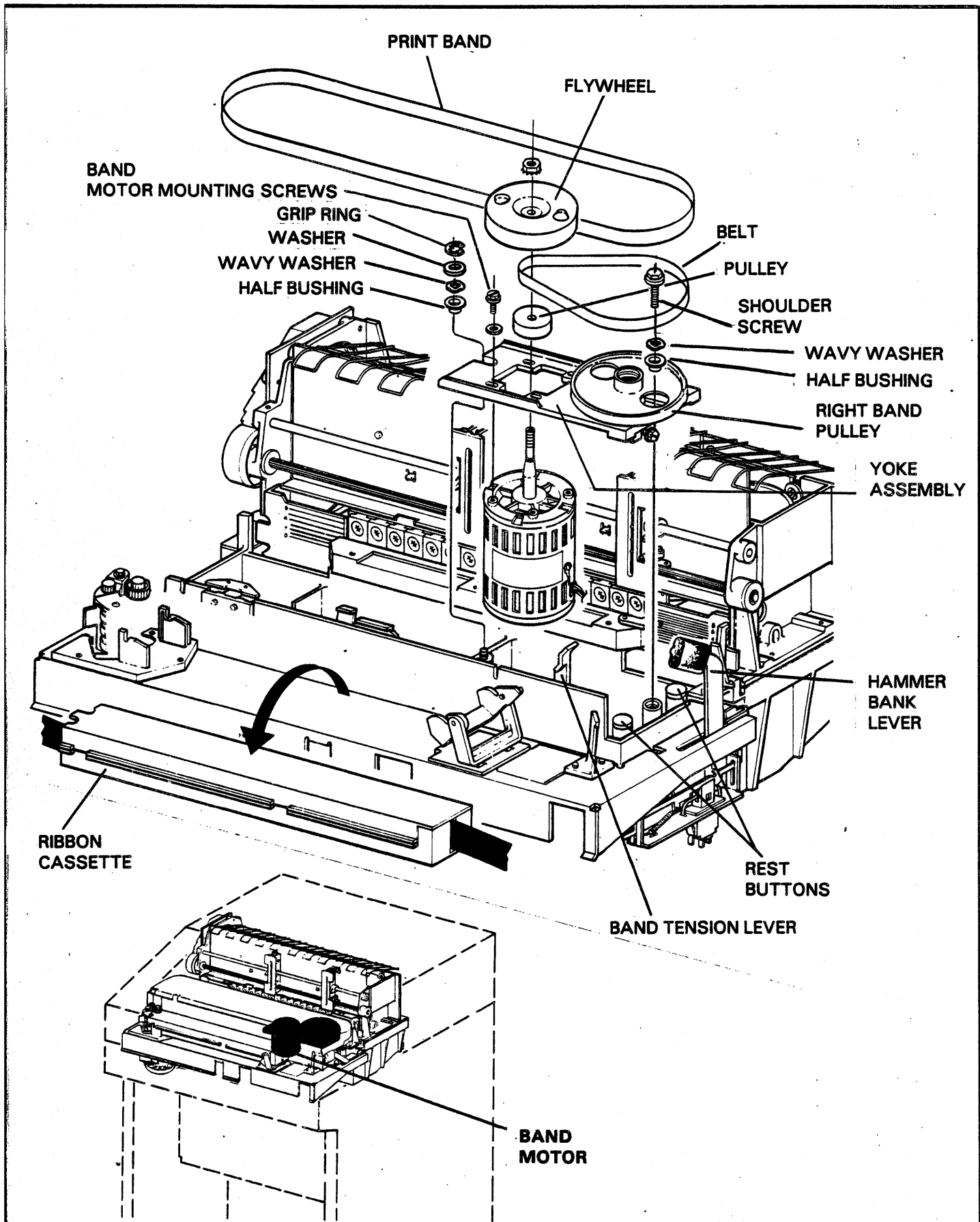


FIGURE 3-13. BAND MOTOR REPLACEMENT

## **BAND MOTOR REPLACEMENT**

Once accomplished, perform Band Drive Belt Adjustment procedure and Band Tracking Adjustment procedure (next section).

- a. Swing open the Control Panel.
- b. Remove the ribbon cassette.
- c. Open the hammer bank by lifting the hammer bank lever and open the ribbon shield support plate.
- d. Open the band cover, release band tension and remove print band.
- e. Remove the grip ring from the left side of the yoke assembly.
- f. Remove the washer, wavy washer and half bushing.
- g. Remove the shoulder screw, wavy washer and half bushing from the right side of the yoke assembly by lining up one of the holes in the right band pulley to gain access to the shoulder screw.

### **NOTE**

**USE CAUTION NOT TO LOSE THE TWO REST BUTTONS WHICH THE YOKE ASSEMBLY RESTS ON (STEP h).**

- h. Partially lift out the yoke assembly, detach the four wires and remove the entire yoke assembly.
- i. Remove the flywheel, pulley and the belt. Remove the pulley by applying lever type pressure to two opposite sides of the pulley and prying upward.
- j. Remove the band motor mounting screws and remove the motor.

### **NOTE**

**THERE MAY BE SHIMS USED FOR MOTOR ALIGNMENT. DO NOT LOSE THESE SHIMS AS IT WILL PROBABLY BE NECESSARY TO SHIM THE NEW MOTOR.**

- k. Install the new motor.
- l. Perform Band Drive Belt Adjustment procedure.
- m. Perform Band Tracking Adjustment procedure.

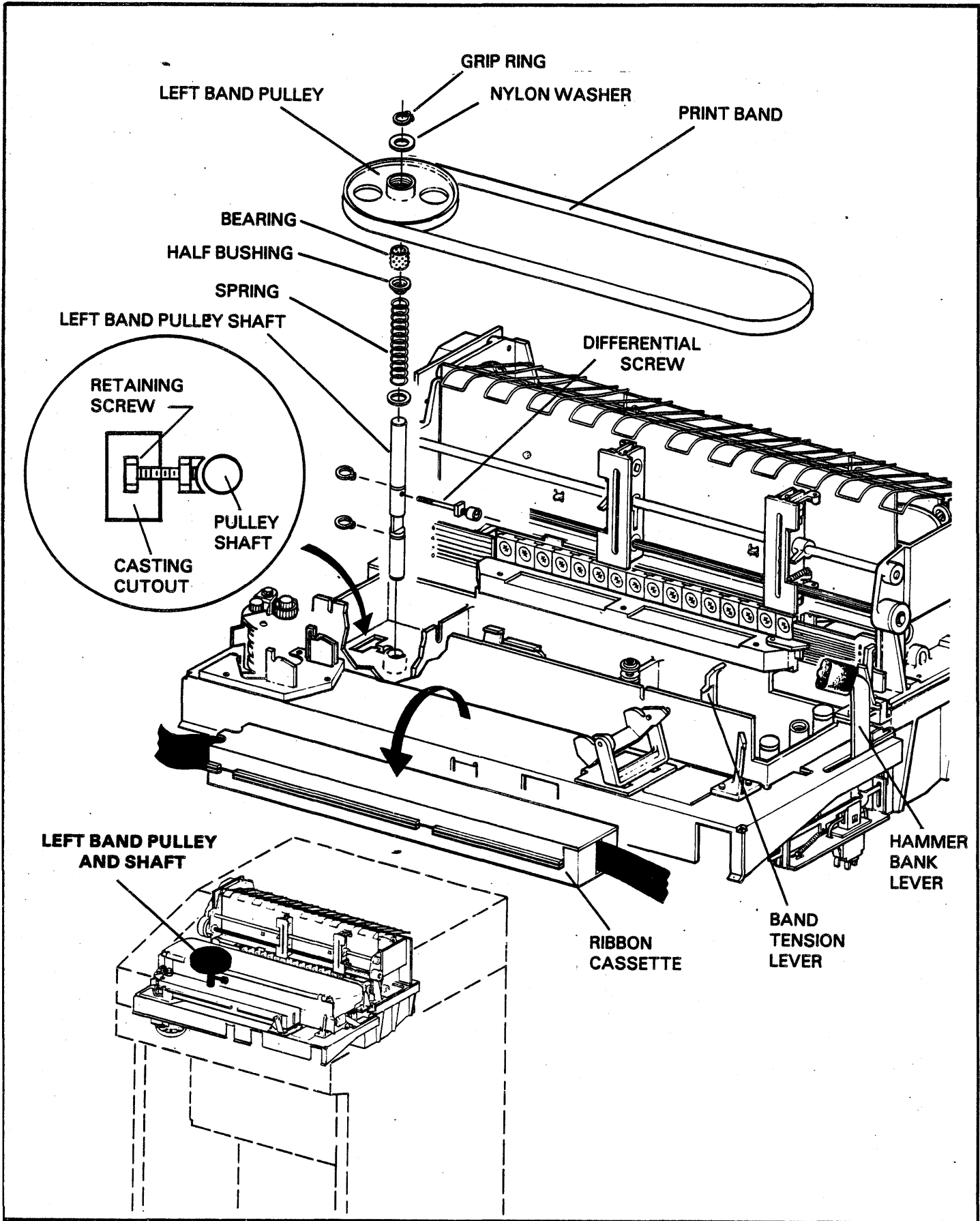


FIGURE 3-14. LEFT BAND PULLEY AND SHAFT REPLACEMENT

## **LEFT BAND PULLEY AND SHAFT REPLACEMENT**

Once accomplished, perform Band Tracking Adjustment procedure (next section).

- a. Swing open the Control Panel.
- b. Remove the ribbon cassette.
- c. Open the hammer bank by lifting the hammer bank lever. Open the ribbon shield support plate and the band cover.
- d. Release band tension and remove the print band.
- e. Remove the grip ring and nylon washer from the shaft. **THIS ASSEMBLY IS SPRING LOADED - USE CAUTION WHEN REMOVING.**
- f. Remove the left band pulley, bearing, half bushing and spring. This exposes the left band pulley shaft, differential screw and retaining rings.
- g. If shaft replacement is necessary loosen the retaining screw (located in a cutout in the gate casting base) and loosen the differential screw to remove tension from the shaft and remove the shaft.
- h. Reverse the procedure for installation.
- i. Perform Band Tracking Adjustment procedure.

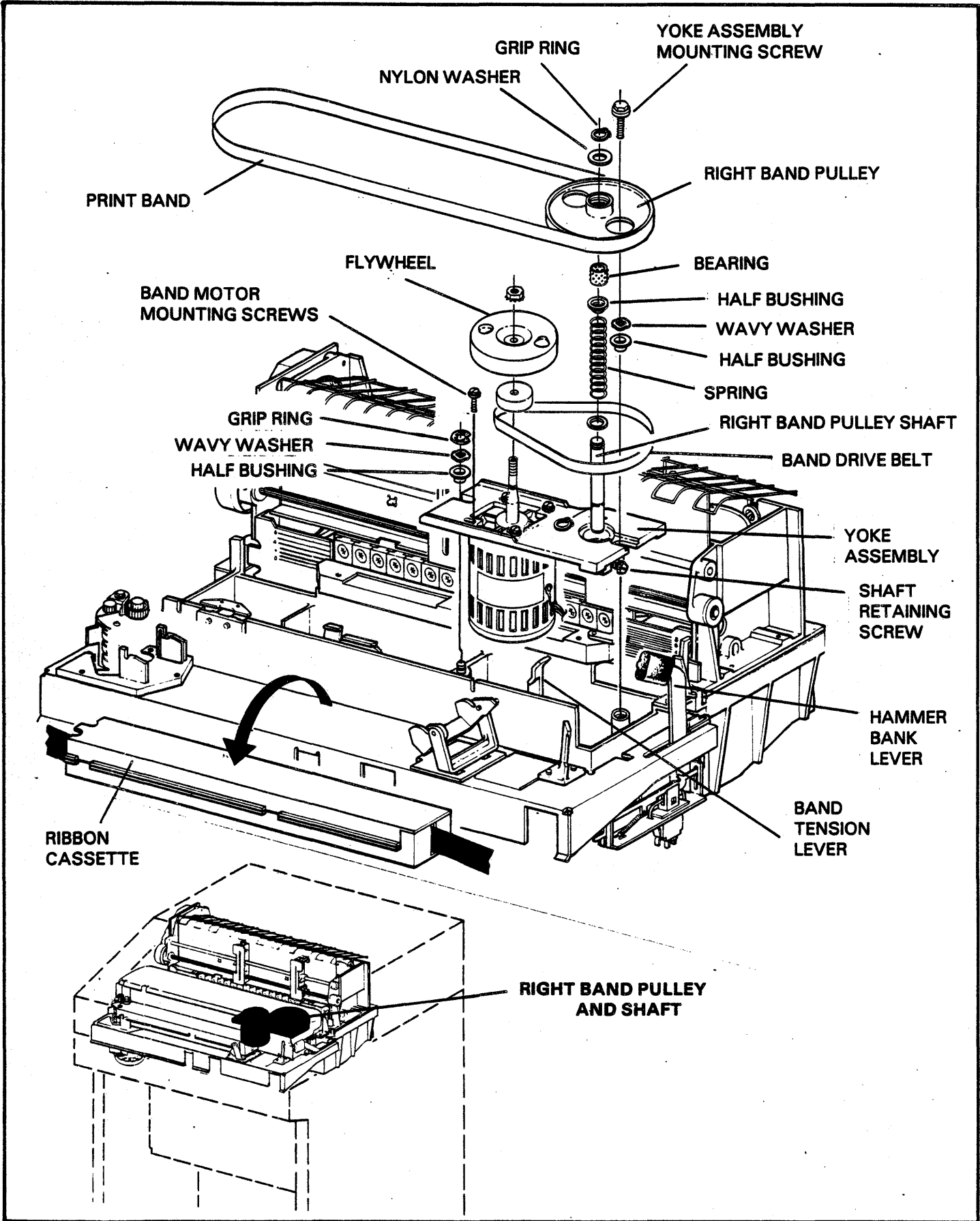


FIGURE 3-15. RIGHT BAND PULLEY AND SHAFT REPLACEMENT

## **RIGHT BAND PULLEY AND SHAFT REPLACEMENT**

Once accomplished, perform Band Drive Belt Adjustment procedure and Band Tracking Adjustment procedure (next section)

- a. Swing open the Control Panel.
- b. Remove the ribbon cassette.
- c. Open the hammer bank by lifting the hammer bank lever, open the ribbon shield support plate and the band cover.
- d. Release band tension and remove the print band.
- e. Remove the flywheel and its band drive belt.
- f. Remove the grip ring and nylon washer from the shaft. **THIS ASSEMBLY IS SPRING LOADED - USE CAUTION WHEN REMOVING.**
- g. Remove the band pulley and bearing.
- h. If pulley shaft replacement is necessary, remove the yoke assembly and loosen the retaining screw (located in a cutout in the gate casting base) and remove the shaft.
- i. Reverse the procedure for installation.
- j. Check band drive belt. It should not be above or below the crowned edges of the band pulley after the band motor has been powered on for a few seconds. If adjustment is necessary perform Band Drive Belt Adjustment procedure.
- k. Check band tracking. The upper edge of the band should be between .120 and .150 inches above the top edge of both pulleys. If adjustment is necessary, perform Band Tracking Adjustment procedure.

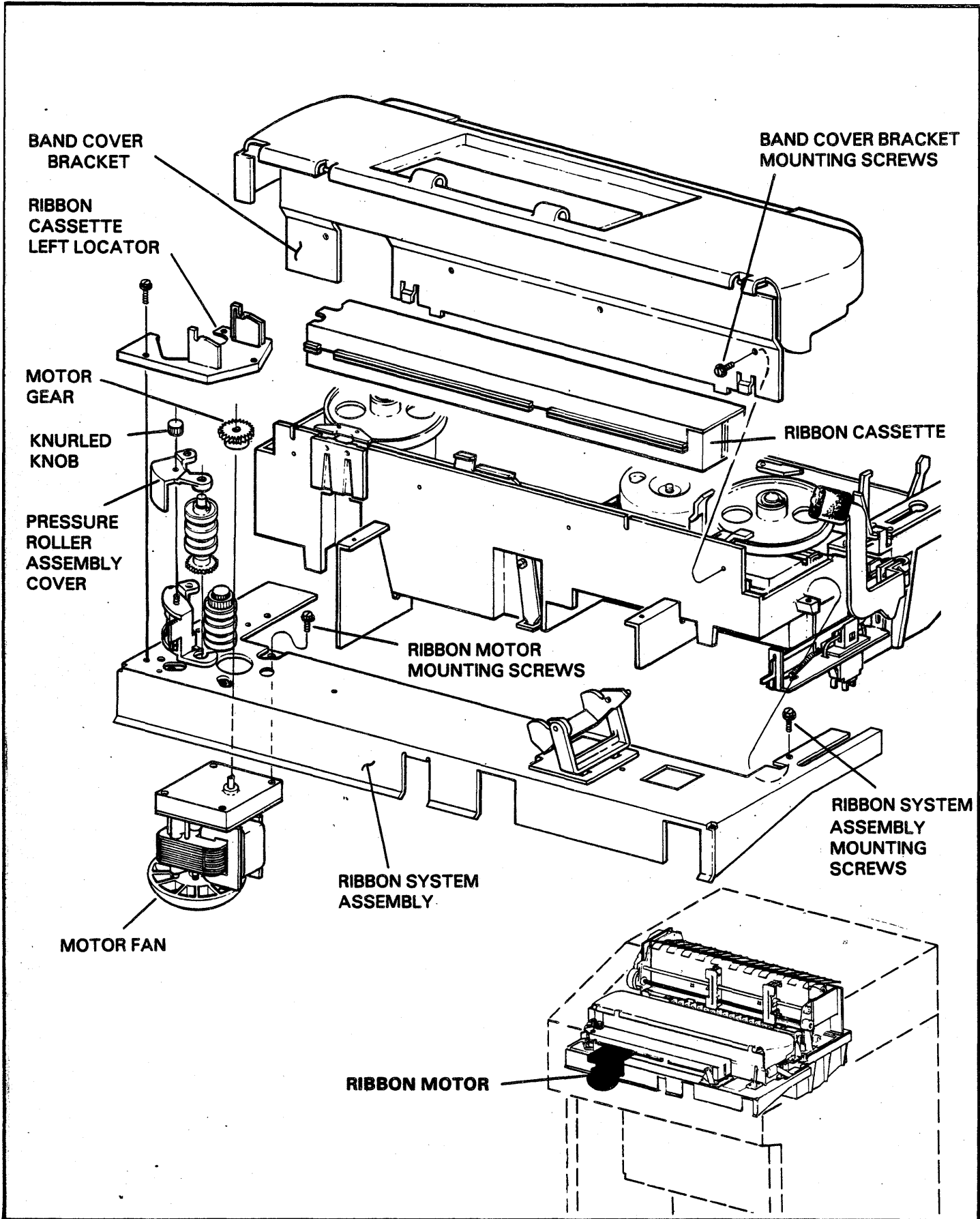


FIGURE 3-16. RIBBON MOTOR REPLACEMENT



## **RIBBON MOTOR REPLACEMENT**

- a. Power the printer OFF.
- b. Remove the ribbon cassette.
- c. Remove the band cover bracket by removing four screws.
- d. Remove the ribbon system assembly by removing four screws.
- e. Pivot the ribbon system assembly 90 degrees toward the back of the printer.
- f. Remove the plugs from underneath the assembly and remove the assembly. Do not set the assembly on its plastic ribbon motor fan.
- g. Remove the ribbon cassette's left locator by removing three screws.
- h. Remove the pressure roller assembly cover by unscrewing the left most knurled knob and lifting out the assembly.
- i. Remove the four ribbon motor mounting screws and remove the motor from the bottom of the assembly.
- j. Unplug the ribbon motor if not already done in step f.
- k. If just replacing the motor, remove the motor fan and the motor gear from the old motor and install on new motor.

### **NOTE**

**WHEN INSTALLING RIBBON SYSTEM ASSEMBLY, BE SURE NOT TO LET ANY WIRE HARNESSES TOUCH THE RIBBON MOTOR FAN.**

- l. Reverse the procedure for installation. Make sure the gears mesh when installing.

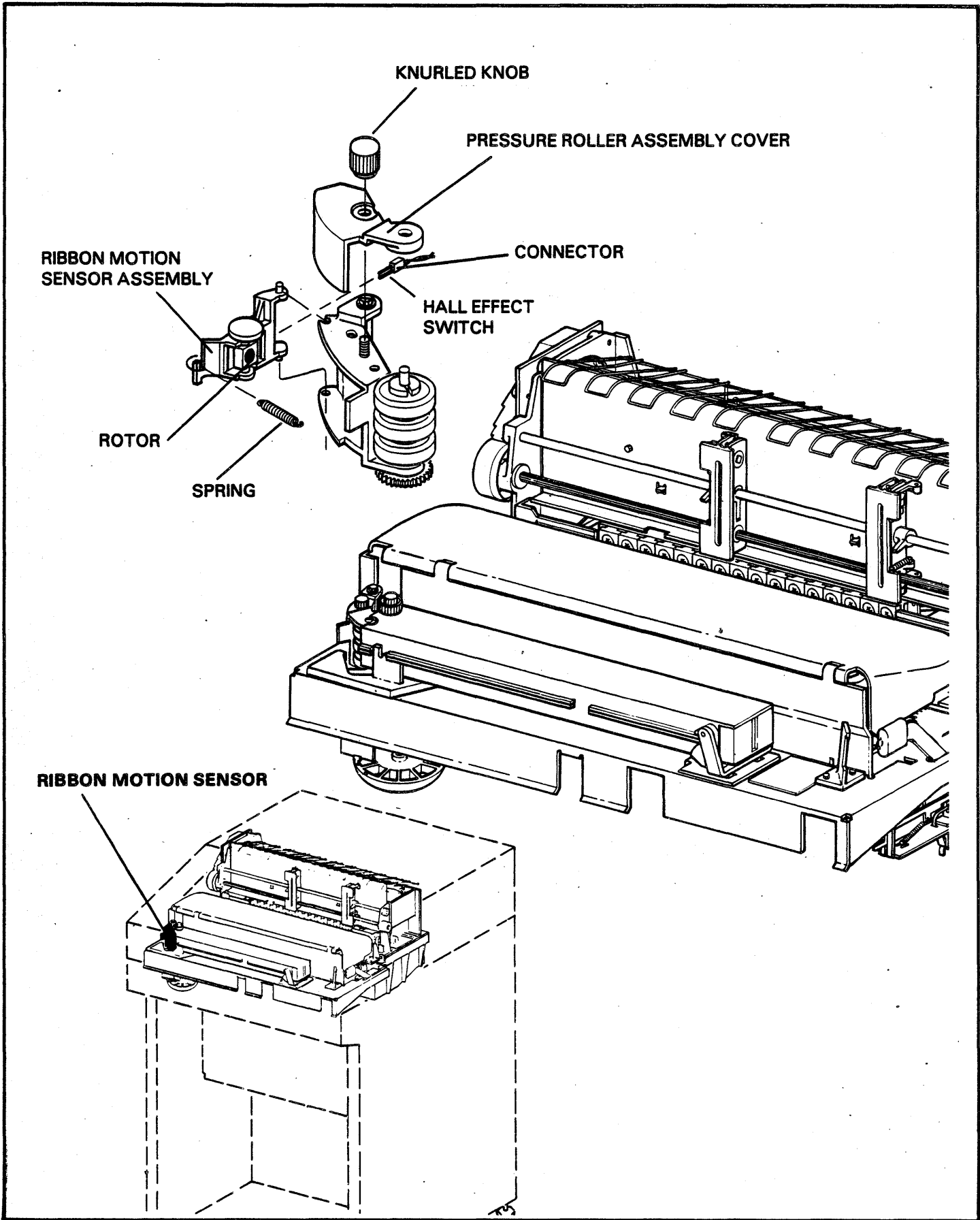


FIGURE 3-17. RIBBON MOTION SENSOR REPLACEMENT

## **RIBBON MOTION SENSOR REPLACEMENT**

- a. Remove the pressure roller assembly cover by unscrewing the left most knurled knob and lifting off the cover.
- b. Release the spring and swing out the ribbon motion sensor assembly.
- c. If just the rotor is defective, unsnap it from the sensor housing and replace.
- d. If just the hall effect switch is defective, unsnap the connector from the housing, remove defective switch, install new switch in the connector and install in housing.
- e. Reverse the procedure for installation.

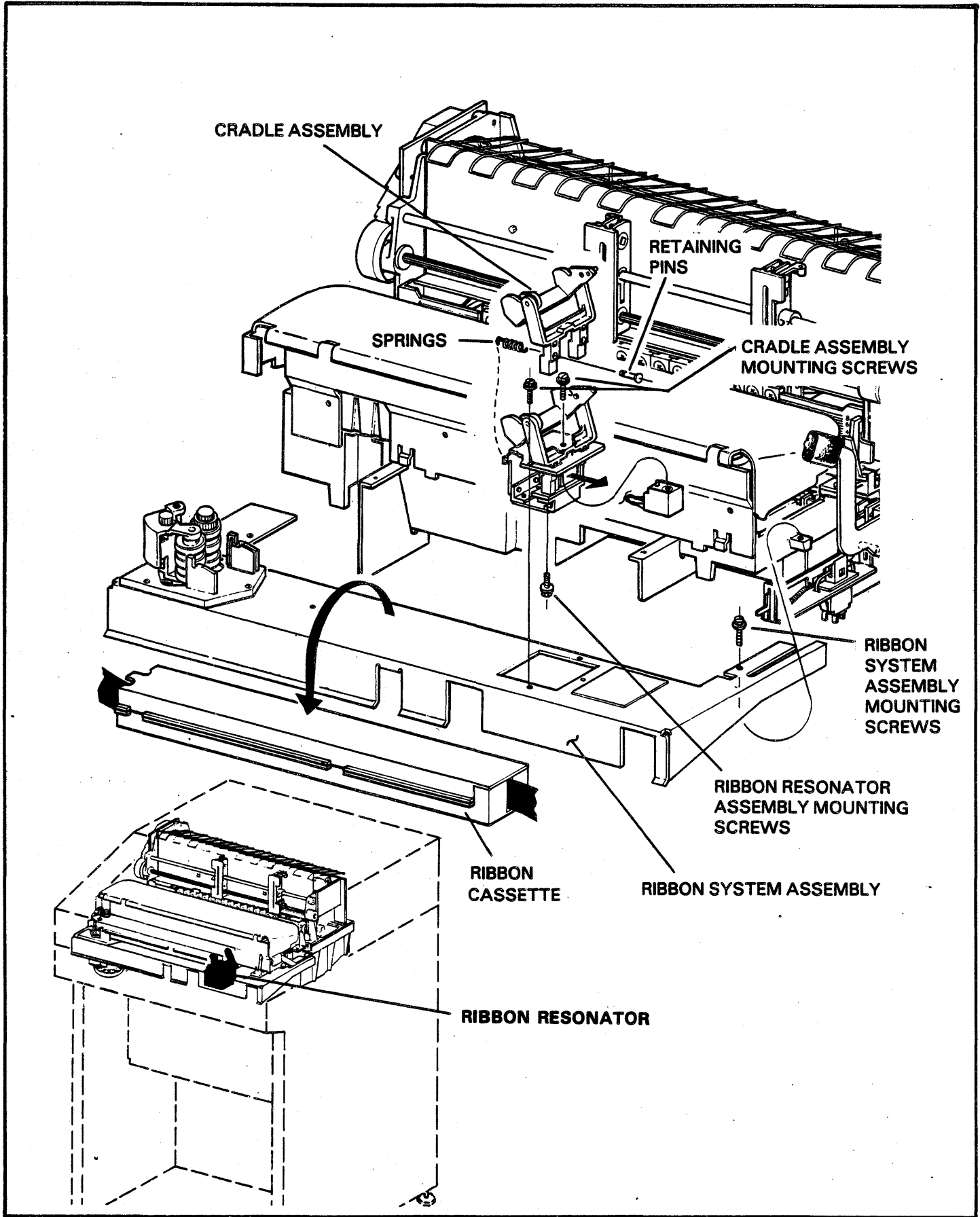


FIGURE 3-18. RIBBON RESONATOR REPLACEMENT

## **RIBBON RESONATOR REPLACEMENT**

- a. Power the printer OFF.
- b. Remove the ribbon cassette.
- c. To replace only the cradle assembly (the upper plastic parts) remove the two screws which attach the resonator assembly to the ribbon system assembly and lift the assembly out.
- d. Remove the two springs and their retaining pins and the two screws from the bottom of the assembly and remove the cradle assembly. Replace with new assembly.
- e. To replace the entire ribbon resonator assembly perform the following steps.
- f. Remove the four screws which attach the ribbon system assembly.
- g. Pivot the assembly up 90 degrees and disconnect the connectors for the ribbon resonator assembly.
- h. Remove the two ribbon resonator assembly mounting screws which attach the ribbon resonator assembly to the ribbon system assembly.
- i. Install the new assembly, plug in the connectors and replace the ribbon system assembly with four screws.

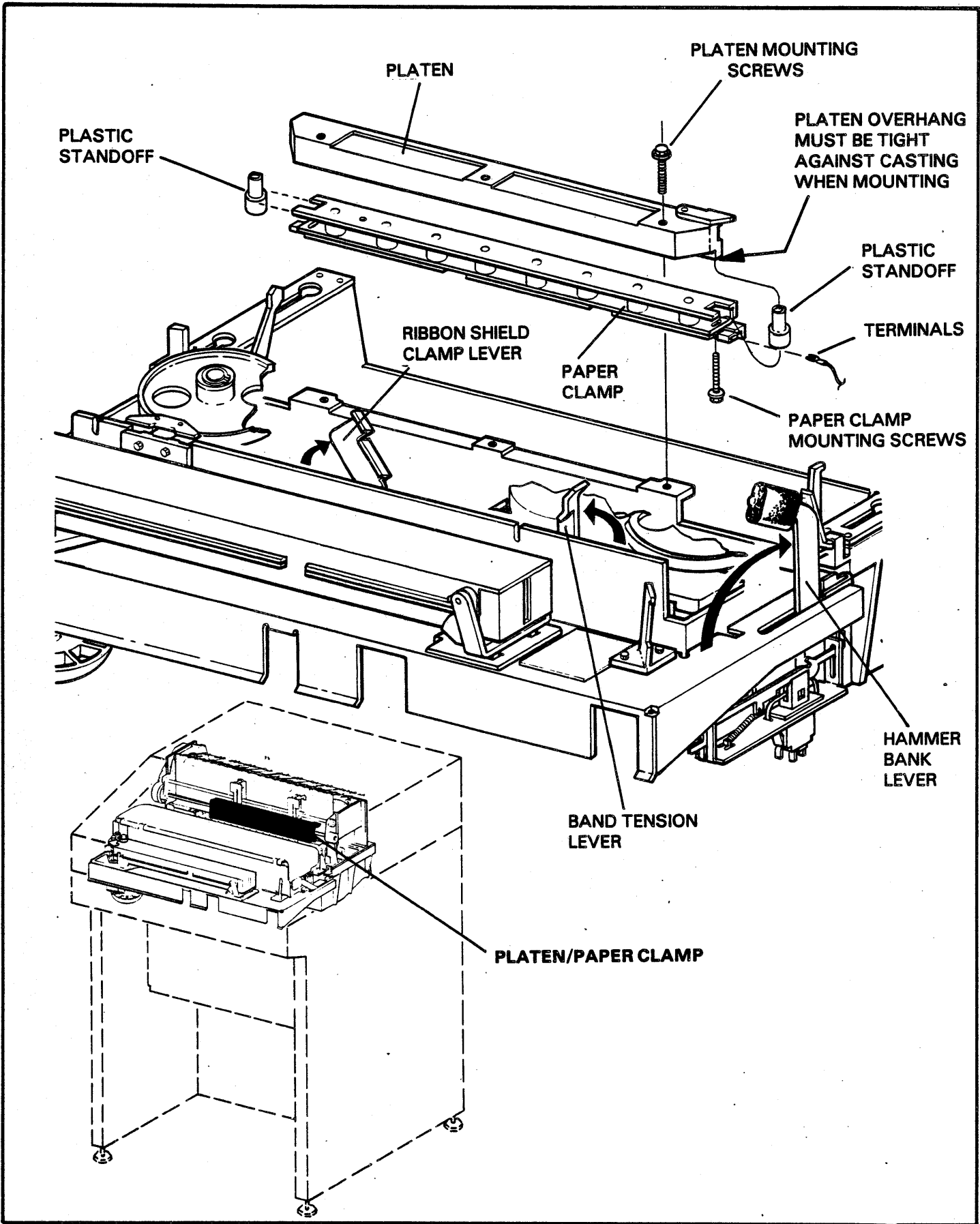


FIGURE 3-19. PLATEN/PAPER CLAMP REPLACEMENT

## **PLATEN/PAPER CLAMP ASSEMBLY REPLACEMENT**

- a. Open the hammer bank with the hammer bank lever and remove the hammer bank. Push the ribbon shield support bracket away from the print gate.
- b. Open the band cover.
- c. Lift the ribbon shield clamp lever in the center of the band compartment to open the ribbon shield clamp at bottom of paper throat.
- d. Remove the ribbon shield.
- e. Release band tension then remove the print band and ribbon from around ribbon guides.
- f. Remove the three platen mounting screws on top of platen. Platen is now detached from casting.
- g. Tip the top of platen toward rear of printer to clear casting during removal.
- h. Raise platen a few inches to allow room for disconnecting a wire on each end of paper clamp. Using caution not to break the terminals, pull on the terminals to disconnect wires. Lift platen/paper clamp assembly out of printer.
- i. Separate paper clamp from platen by removing a screw on the bottom of each end of the paper clamp. Save the two plastic standoffs.
- j. Reassemble platen and paper clamps loosely with the two standoffs and screws removed in previous step. Position the standoffs all the way forward against the ridge on the bottom of the platen, then tighten the screws.
- k. Reconnect paper clamp wire terminals at both ends.
- l. Lower platen/paper clamp assembly into printer at an angle so the paper clamp will go underneath the edge of the outer throat guide. Push the platen overhang tight against the casting and secure platen to casting with three screws previously removed.
- m. Replace ribbon around guides and roll excess ribbon into cartridge.
- n. Replace print band and actuate the band tension lever. Replace the ribbon shield and secure with the ribbon shield clamp lever.
- o. Close the band cover and push down on hammer bank lever to close the hammer bank.

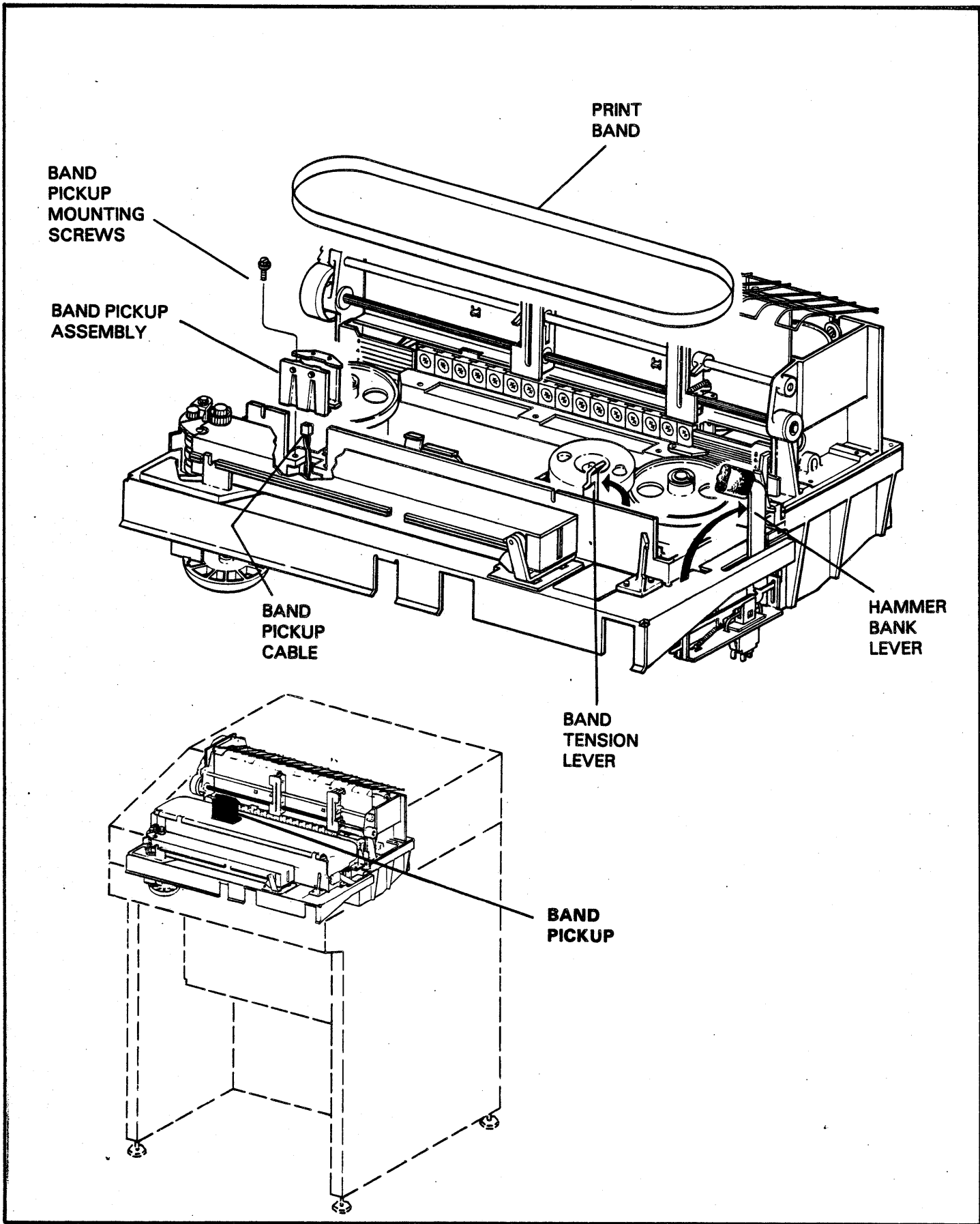


FIGURE 3-20. BAND PICKUP REPLACEMENT



## BAND PICKUP REPLACEMENT

Once accomplished, perform Band Pickup Adjustment procedure (next section).

- a. Power the printer OFF.
- b. Lift the hammer bank lever behind control panel to open the hammer bank and push the ribbon shield support plate away from the print gate.
- c. Open band cover, release band tension and remove print band.
- d. Remove two band pickup mounting screws.
- e. Grasp band pickup and gently lift it up and out of mounting bracket until the cable can be unplugged from bottom of pickup.
- f. Connect cable to the new pickup and slide pickup down into mounting bracket.
- g. Secure pickup with two screws.
- h. Perform the Band Pickup Adjustment procedure.
- i. Replace print band, actuate band tension lever and close band cover.
- j. Close hammer bank by lowering the hammer bank lever.

LY MV  
~~1~~ 1 ON  
OFF 2  
3  
4  
5 ON  
6 ON  
7  
OFF 8 ON

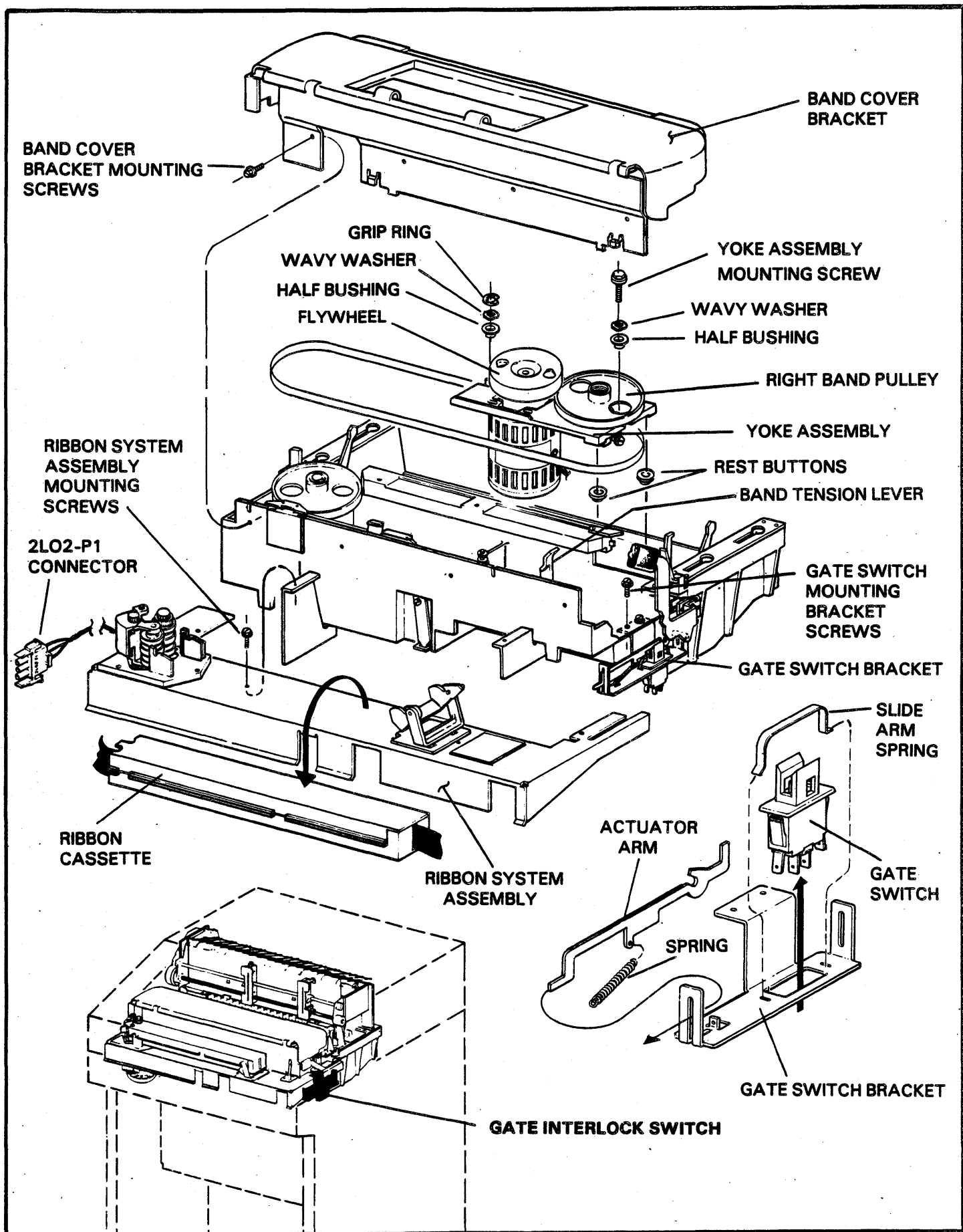


FIGURE 3-21 GATE INTERLOCK SWITCH REPLACEMENT

## GATE INTERLOCK SWITCH REPLACEMENT

- a. Power the printer OFF.
- b. Remove the ribbon cassette.
- c. Remove the band cover bracket by removing four screws.
- d. Release band tension and remove the band.
- e. Remove the ribbon system assembly (four screws).
- f. Remove the right band pulley, flywheel and yoke assembly as a complete unit by removing the yoke assembly mounting screw, wavy washer and half bushing from the right side. On the left side remove the grip ring, wavy washer and half bushing. Be careful not to lose the two rest buttons that the yoke assembly rests on.
- g. Remove the two gate switch bracket mounting screws (beneath the yoke assembly) and remove the bracket.
- h. Make note of the wire routing and terminations and remove the faston connectors from the gate switch.
- i. Detach the spring and remove the actuator arm from the bracket.
- j. Remove the slide arm spring and unsnap the gate switch from the bracket.
- k. Install new switch by pressing on the switch until it snaps into the bracket and reattach the faston connectors.
- l. Reattach the slide arm spring, the actuator arm and the spring.
- m. Reattach the bracket to the gate casting. Make sure the power ON/OFF switch wires are dressed away from the actuator arm.
- n. Reinstall the right band pulley, flywheel and yoke assembly unit. Be sure the rest buttons are installed.
- o. Reinstall the ribbon system assembly and reconnect all connectors. Connector 2LO2-P1 should be dressed to the inside right edge of the ribbon system assembly mounting plate as shown in the illustration.
- p. Reinstall the band cover bracket, the print band, and the ribbon cassette.

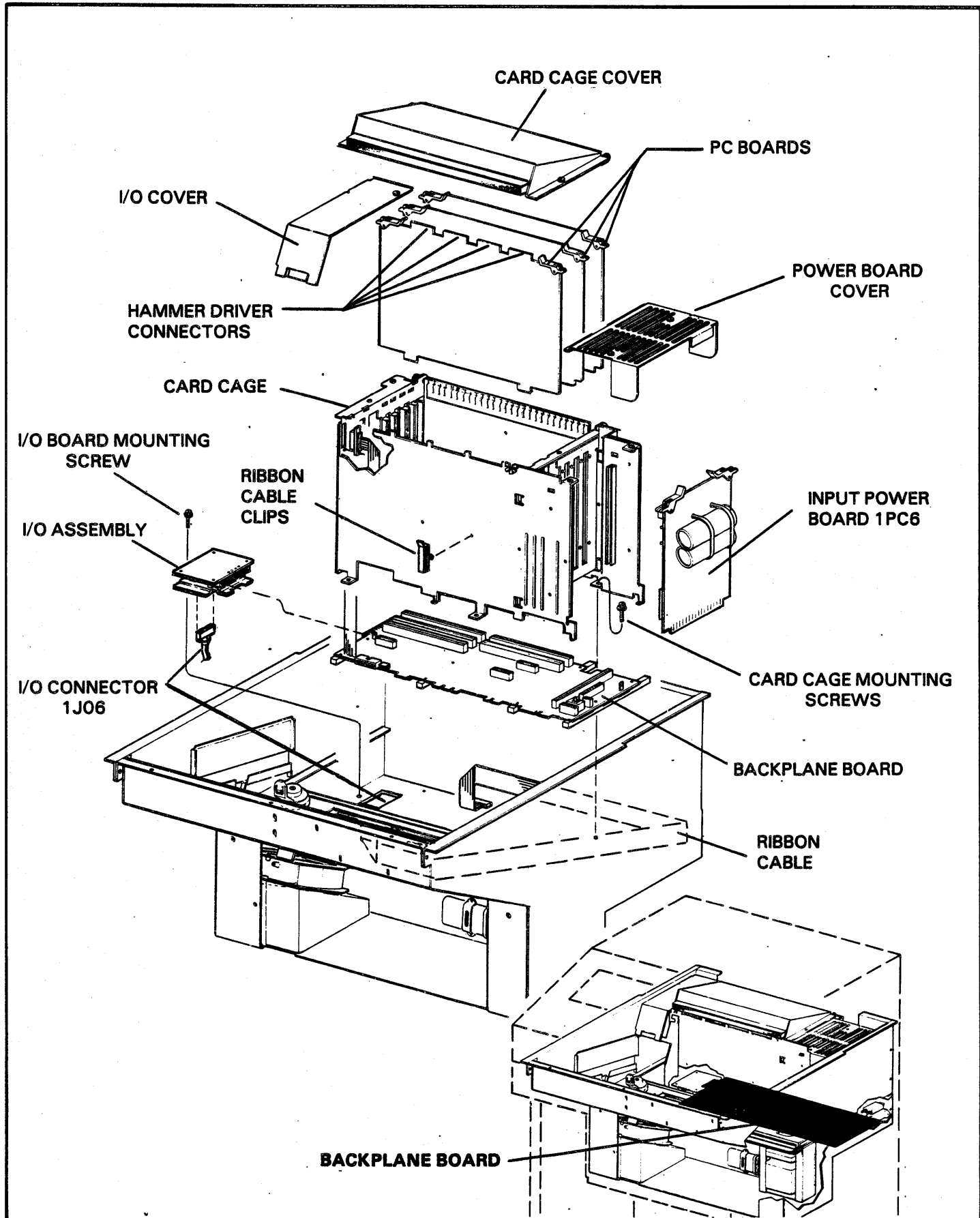
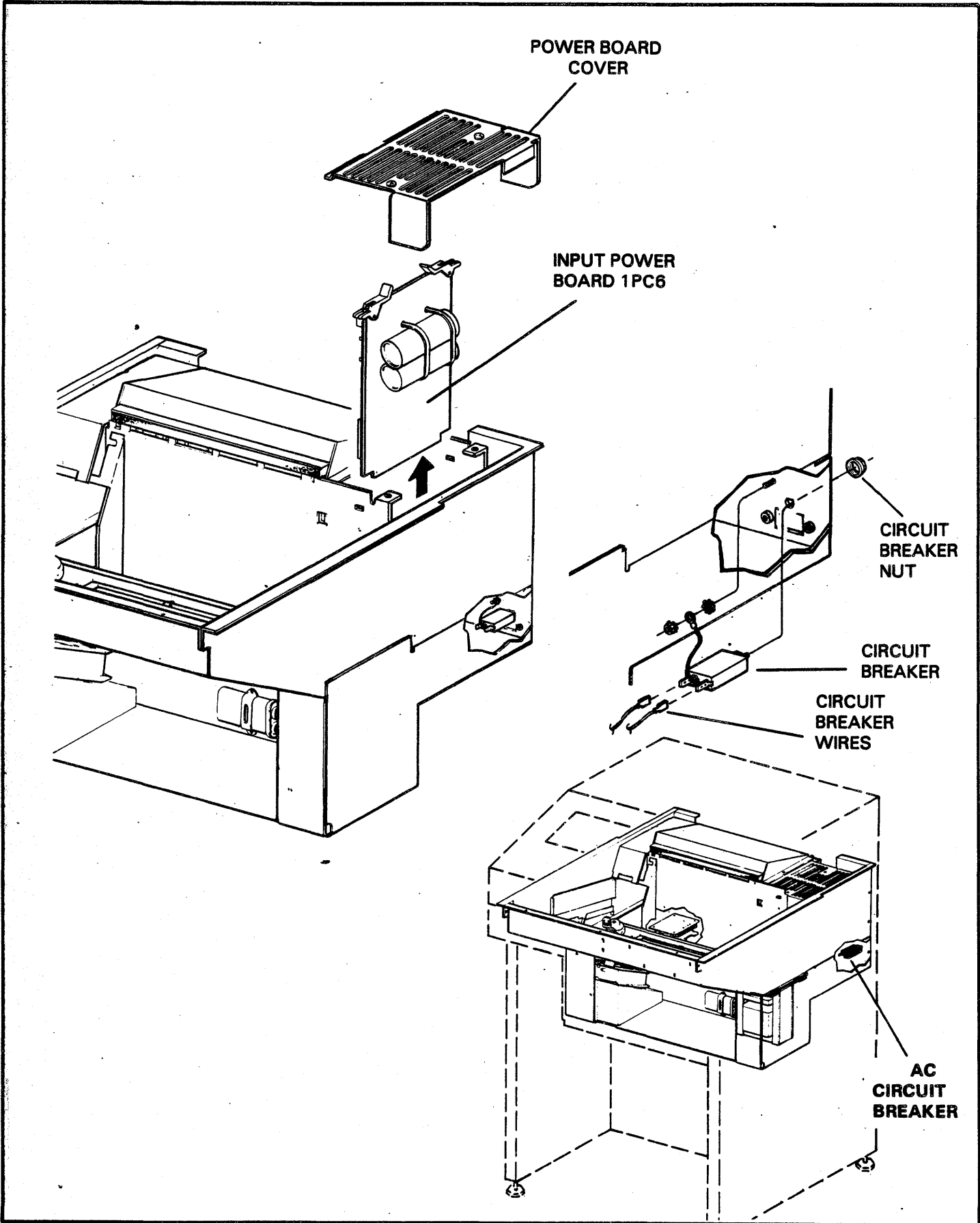


FIGURE 3-22. BACKPLANE BOARD REPLACEMENT

## BACKPLANE BOARD REPLACEMENT

- a. Unplug the printer from its ac source.
- b. Remove the paper bail, card cage cover, power board cover and I/O cover.
- c. Unplug the hammer driver connectors.
- d. Release the ribbon cable clips which drape the ribbon cable across the front of the card cage and free the ribbon cable from the clips.
- e. Unplug the hammer bank sensor connector 1J01 (beneath the I/O cover).
- f. Remove the input power board 1PC6.
- g. Disconnect all connectors from the backplane board.
- h. Disconnect the I/O connector 1J06 from the printer (outside bottom rear).
- i. Remove the screw from the I/O board and pull entire I/O assembly away from the mother board and remove from the printer.
- j. Remove the four screws which secure the card cage to the printer's base and lift the card cage out to a work bench or stable surface.
- k. Remove the remaining P.C. boards.
- l. Unclip the backplane board from the card cage by gently pulling the three clips of the card cage which the backplane board rests on.
- m. Clip the new backplane board into place in the card cage.
- n. Reinsert the P.C. boards (to locate the backplane board in its correct position) removed in step k.
- o. Install the card cage back into the base of the printer with the four screws removed in step j.
- p. Install the I/O board onto the backplane board and install its screw.
- q. Install the I/O connector and all the connectors to the backplane board.
- r. Install the input power board 1PC6.
- s. Install hammer bank sensor connector 1J01.
- t. Install the ribbon cable into the clips located on the front of the card cage.
- u. Install the hammer driver connectors. Drape the wires down in front of the card cage then back up to the hammer bank. This can be accomplished by tucking the wires down with the edge of your hand.
- v. Install the paper bail, card cage cover, power board cover and I/O cover.
- w. Plug in the power cord.



**FIGURE 3-23. AC CIRCUIT BREAKER REPLACEMENT**

## **AC CIRCUIT BREAKER REPLACEMENT**

- a. Power the printer OFF.
- b. Unplug the printer from its ac source.
- c. Open the paper bail.
- d. Remove the power board cover.
- e. Remove the input power board 1PC6.
- f. Disconnect the two wires from the circuit breaker.
- g. Unscrew the circuit breaker nut from the rear of the machine and remove the circuit breaker.
- h. Reverse the procedure for installation.

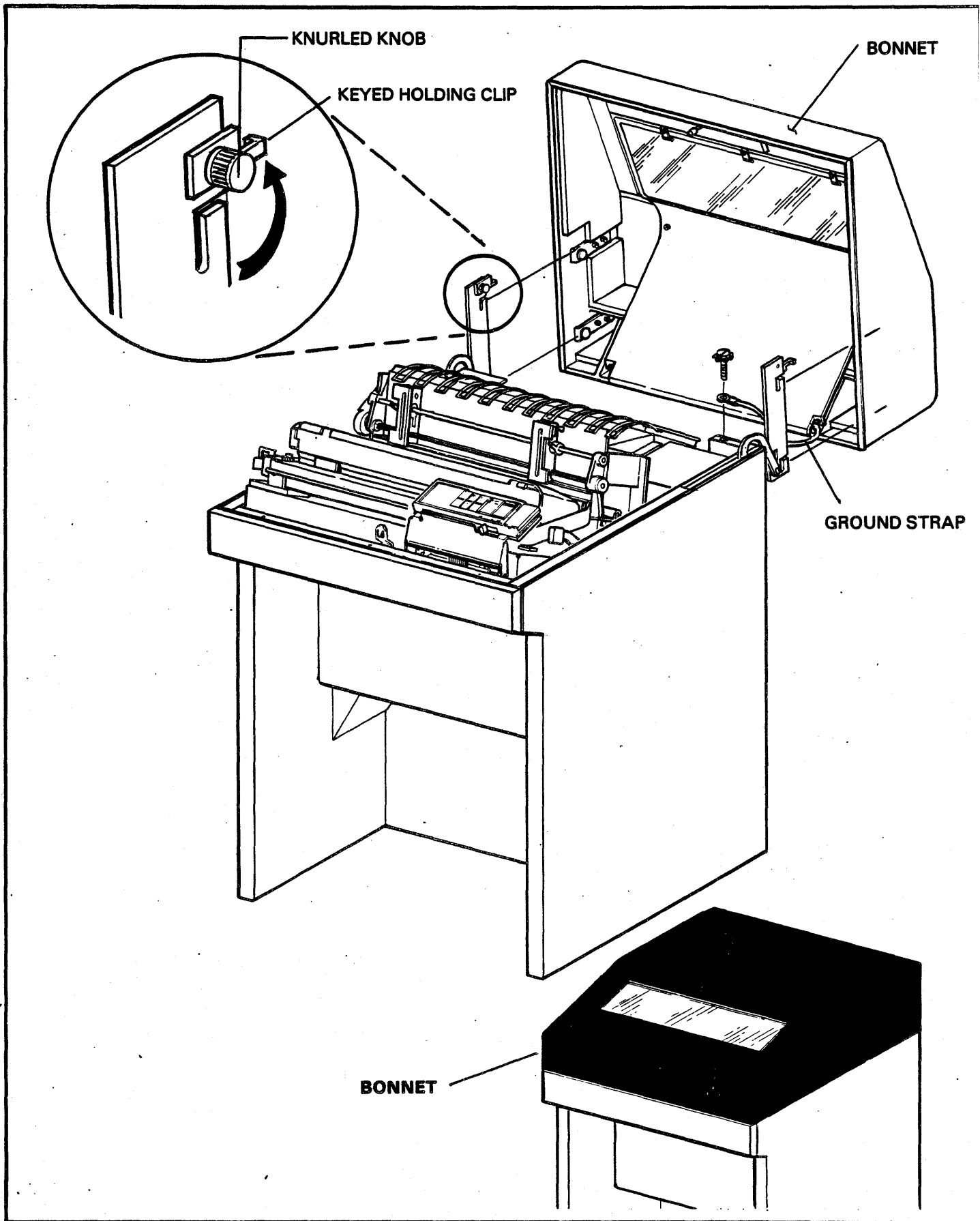


FIGURE3-24. BONNET REPLACEMENT



## **BONNET REPLACEMENT**

- a. Disconnect the ground strap extending between the bonnet and the base pan. Disconnect from the base pan end.
- b. Unscrew the two knurled knobs completely.
- c. Pivot up the two holding clips beneath the knurled knobs.
- d. Pull and lift off bonnet.

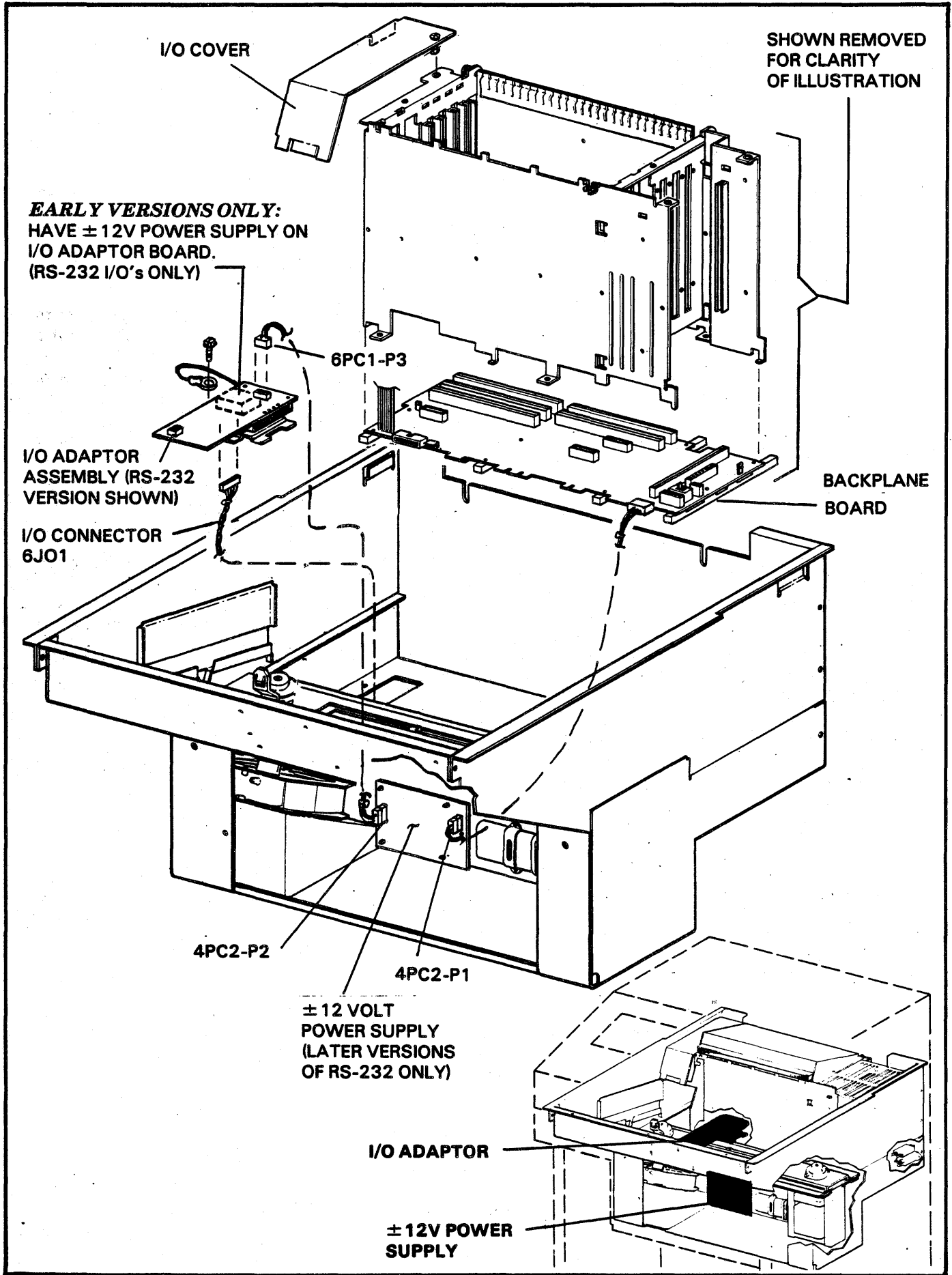


FIGURE 3-25. I/O ADAPTOR AND POWER SUPPLY REPLACEMENT

## ADAPTOR AND POWER SUPPLY PLACEMENT

I/O adaptor boards are located beneath the I/O printer. RS-232 I/O assemblies require a  $\pm 12$  volt power supply in order to function in addition to the adaptor board. This procedure includes the  $\pm 12$  volt power supply replacement. Disregard part of the procedure if the machine being repaired is not equipped with an RS-232 interface.

### NOTE

HERE ARE TWO VERSIONS OF RS-232 I/O ADAPTOR ASSEMBLIES THAT HAVE BEEN MANUFACTURED. THE EARLY VERSION HAS A  $\pm 12$ V POWER SUPPLY INTERNAL TO THE I/O BOARD. THE LATER VERSION HAS THE  $\pm 12$ V POWER SUPPLY EXTERNAL TO THE BOARD. TWO POWER CABLES ARE UTILIZED TO PROVIDE POWER FROM THE BACKPLANE BOARD TO THE POWER SUPPLY AND FROM THE POWER SUPPLY TO THE I/O ADAPTOR BOARD. THE EARLY VERSION IS INSTALLED AND UPON ITS FAILURE SHOULD BE REPLACED WITH THE LATER VERSION.

Disconnect the printer from its ac source.

Remove the I/O cover.

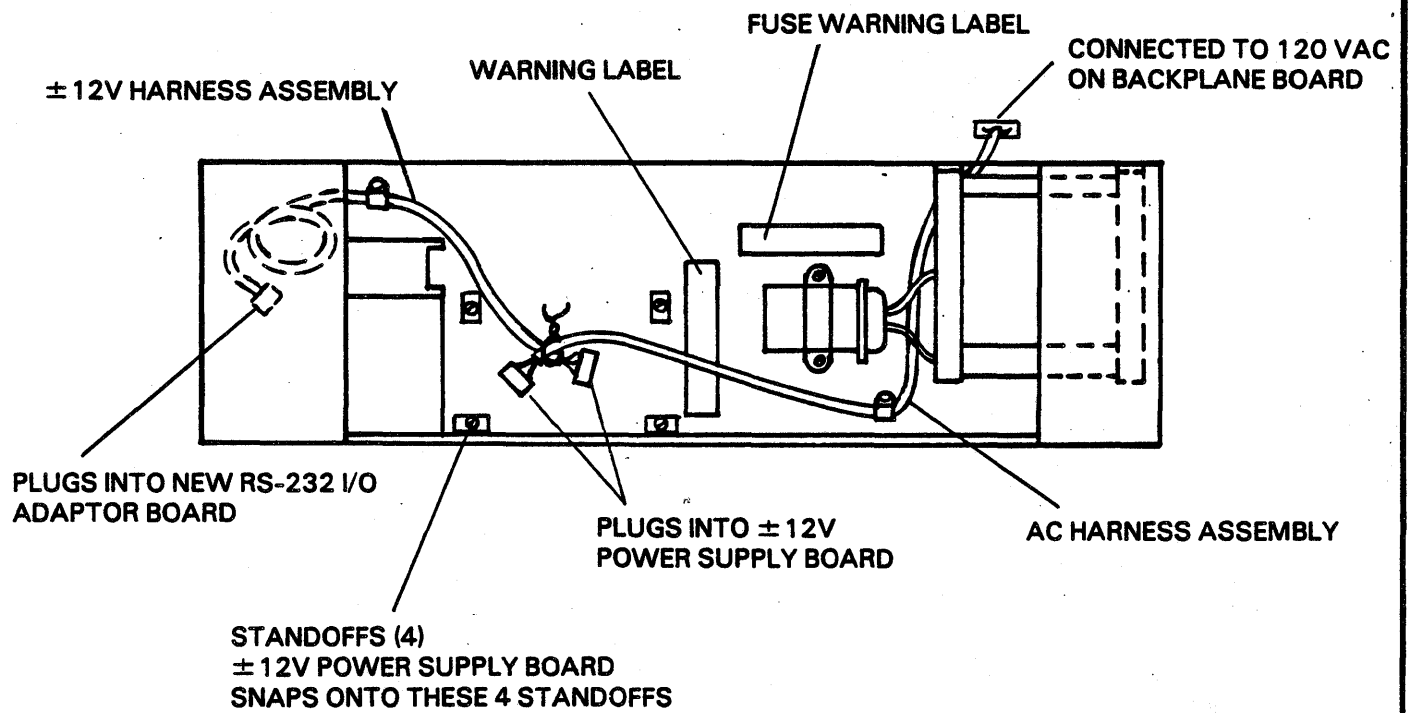
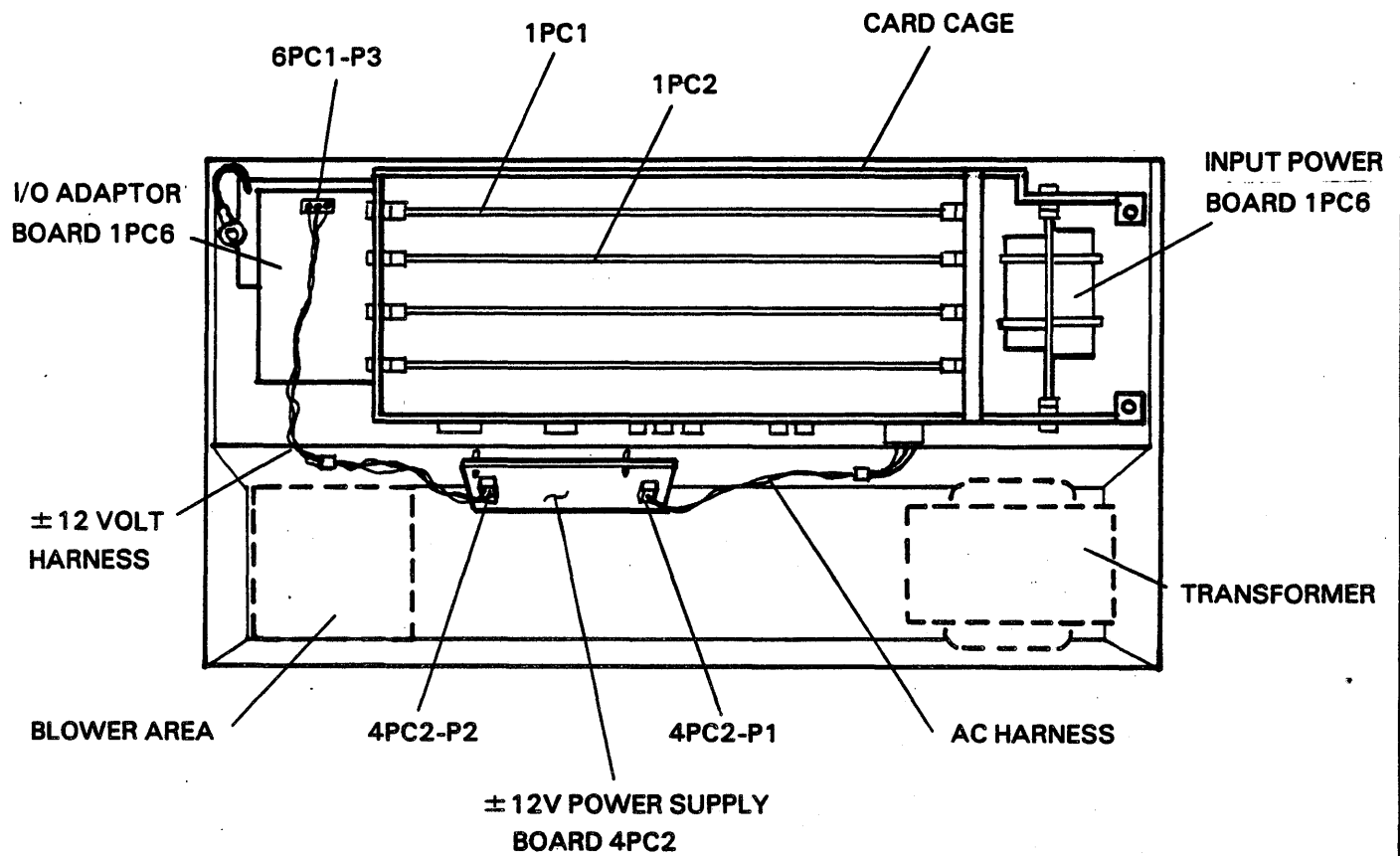
Disconnect the I/O connector 6JO1 from the printer.

- d. Remove the I/O board mounting screw and pull the entire assembly away from the backplane board and remove from the printer.
- e. If the I/O assembly has a two inch square power supply mounted on the board, it is the early version and will have to be replaced with the later version which consists of an I/O adaptor board *and* an external power supply board.
- f. Remove the front access cover.
- g. Attach the  $\pm 12$ V power supply board next to the transformer capacitor on the four standoffs provided. Attach the power harnesses (4PC2-P1 and P2) to the power supply board. See Figure 3-26.
- h. Set the four DIP switches on the new board to match that of the old board then install the new I/O adaptor board by plugging it into the backplane board. Attach the mounting screw and the ground strap.
- i. Attach the left power harness 6JO1-P3 to the I/O adaptor board.
- j. Connect the I/O cable 6JO1 to the I/O adaptor board.
- k. Attach the I/O cable.
- l. Connect the printer to its ac source.

111

111

111



**VIEW OF LOWER CHASSIS AREA WITH FRONT ACCESS PANEL REMOVED**

**FIGURE 3-26. RS-232 I/O ADAPTOR AND POWER SUPPLY INSTALLATION**



# SECTION IV ADJUSTMENT PROCEDURES

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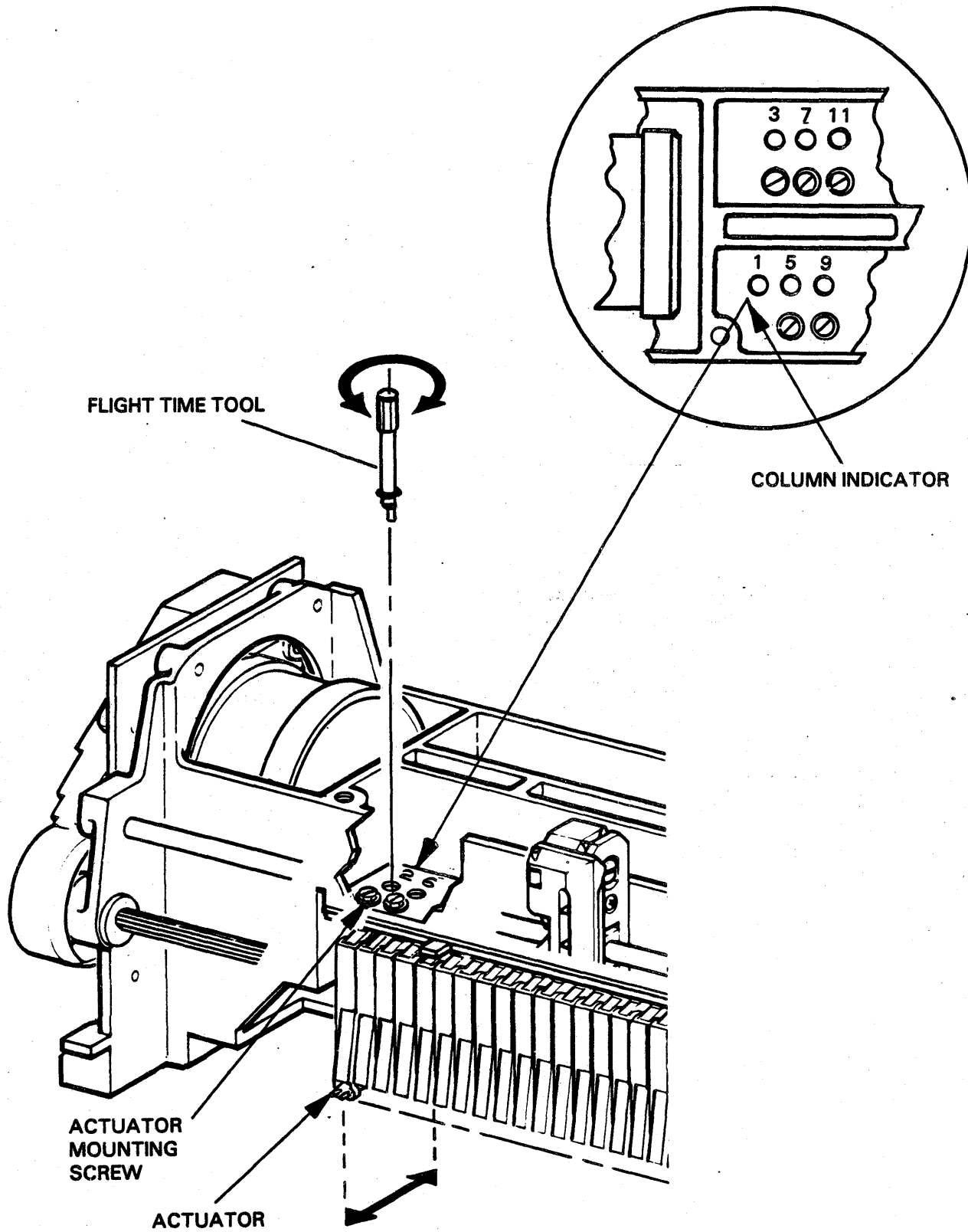
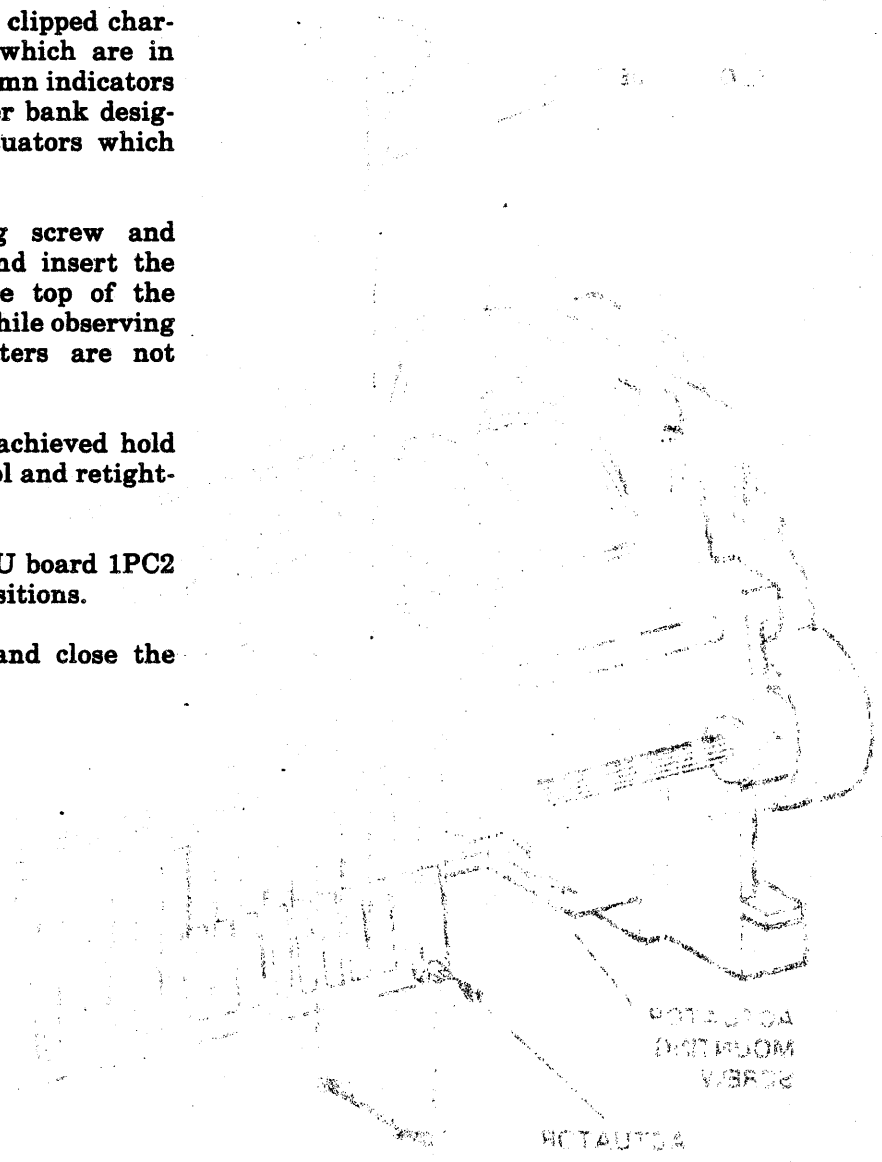


FIGURE 4-1. FLIGHT TIME ADJUSTMENT



## FLIGHT TIME ADJUSTMENT

- a. Install single part paper, ribbon and band.
- b. Open the rear paper bail, remove the front paper bail and close the print gate.
- c. Make note of the DIP switch settings on the top of the CPU board 1PC2, then reset them as follows: For ASCII bands set switches 2, 5, 6 and 8 ON, all other switches OFF. This will provide an all "M" test print pattern. For non-ASCII bands configure the printer such that it does print all "M"s.
- d. Power the printer ON and push the TEST PRINT switch on the Control Panel.
- e. Observe the printout for pairs of clipped characters and locate the columns which are in need of adjustment. The two column indicators located in the top of the hammer bank designate the columns and their actuators which need adjustment.
- f. Loosen the actuator mounting screw and retighten until slightly snug and insert the flight time tool (clipped to the top of the hammer bank). Rotate the tool while observing the printout until the characters are not clipped on either side.
- g. Once the proper adjustment is achieved hold the position of the flight time tool and retighten the actuator mounting screw.
- h. Set the DIP switches on the CPU board 1PC2 back to their normal operating positions.
- i. Reinstall the front paper bail and close the back paper bail.



SLIP .010 SHIM BETWEEN LEFT END OF  
HAMMER BAR STOP AND THE CUT OUT IN  
THE STRIKER COVER PLATE.

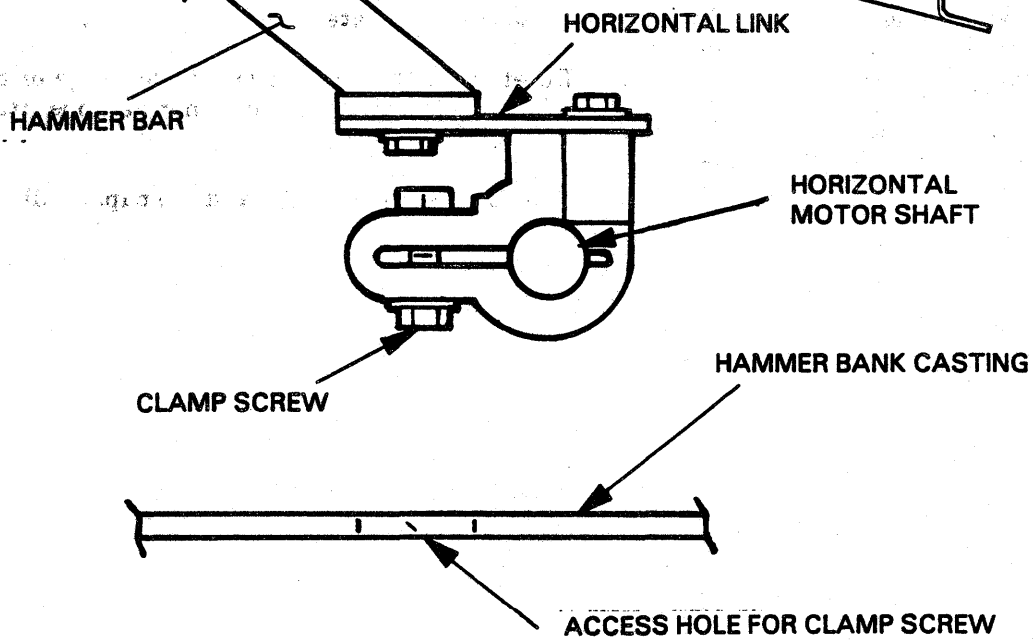
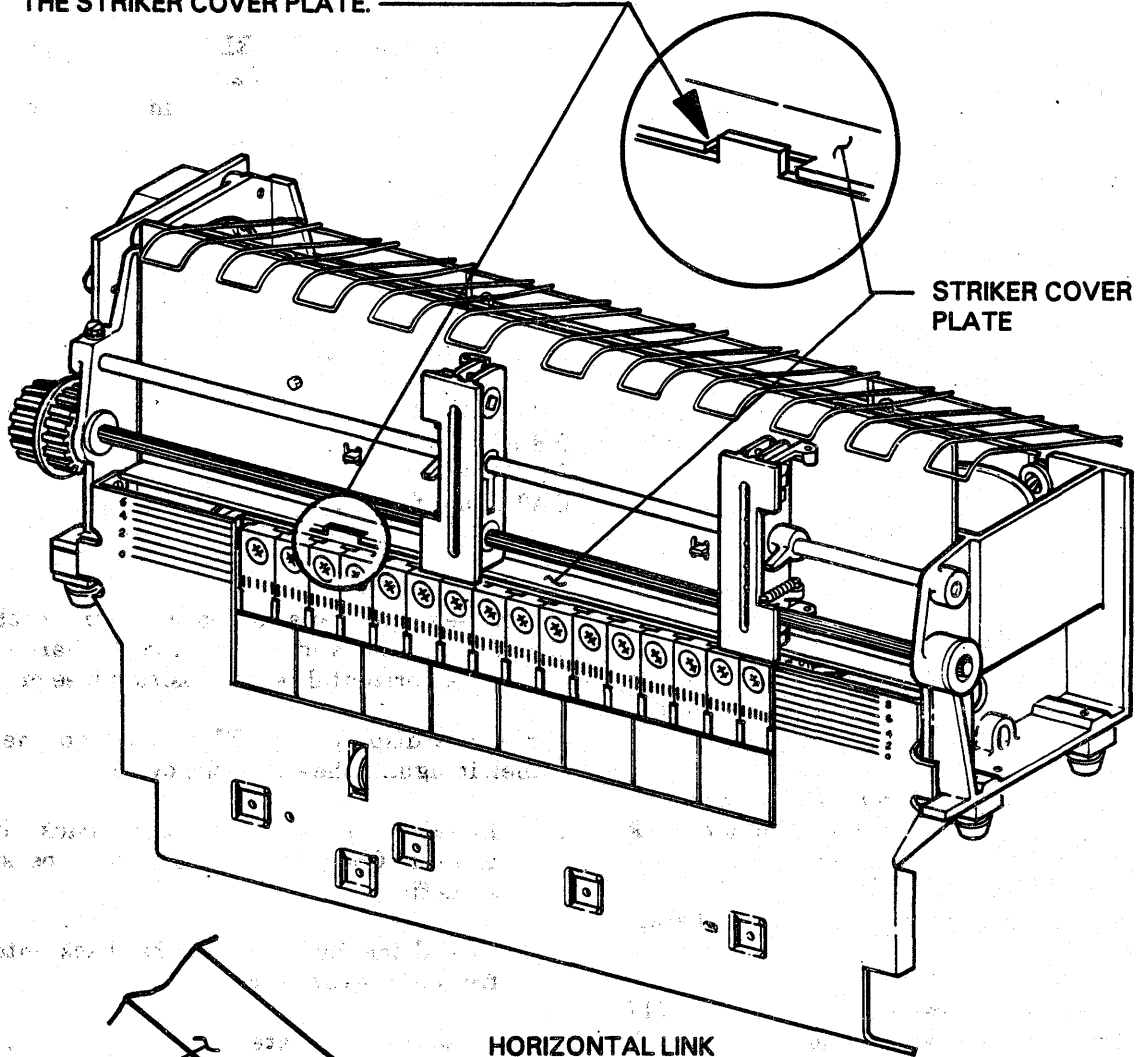


FIGURE 4-2. HAMMER BAR HOME POSITION ADJUSTMENT

## HAMMER BAR HOME POSITION ADJUSTMENT

- a. Power the printer OFF.
- b. Open the paper bail and the card rack cover.
- c. Make a note of the DIP switch settings on the top edge of the CPU board 1PC2, then reset them such that the number 2 switch is OFF and the rest of the switches are ON.
- d. Open the print gate.
- e. Power the printer ON.
- f. Push the TEST PRINT switch once. The Control Panel display should alternate between "PH A" and "HOME".
- g. Check the gap between the hammer bar stop and the cutout (left side) in the striker cover plate. It should be  $.010 \pm .002$  inch. If not, perform the following steps.
- h. Pop off the four "wire combs" from the top front of the card rack which house the hammer driver wires.
- i. Without disconnecting any of the hammer bank's connectors, lift out the hammer bank and rotate it 90 degrees backwards.
- j. Loosen the clamp screw on the horizontal stepper motor shaft.
- k. Cycle the printer by pressing the TEST PRINT switch. The printer will cycle through all phases and will be complete when "GATE" appears on the Control Panel display.
- l. Insert a .010 inch shim between the left side cutout in the striker cover plate and the hammer bar stop. Hold the hammer bar stop against the shim.

- m. Press the TEST PRINT switch once. The Control Panel display should alternate between "PH A" and HOME. Tighten the clamp screw.
- n. Press the TEST PRINT switch again and observe the Control Panel display for a complete cycle. The display should alternately flash each phase listed below.

PH A/HOME  
PH AB/HOME  
PH B/HOME or NHOM  
PH C/HOME or NHOM  
PH D/HOME or NHOM  
PH DA/NHOM  
PH A/NHOM  
PH B/NHOM  
PH C/NHOM  
GATE (not flashing)

If this sequence fails to appear in order, check the horizontal link and its mounting hardware and check the horizontal reader position (see procedure).

When the display "GATE" appears on the Control Panel, it signals the end of the cycle.

- o. Install the hammer bank back into the printer. Check all connectors to be sure of a snug fit.
- p. Install the four "wire combs" back onto the top front of the card rack.
- q. Close the print gate.
- r. Reset the DIP switches on the top edge of the CPU board 1PC2 to their normal operating positions.
- s. Close the card rack cover and the paper bail.

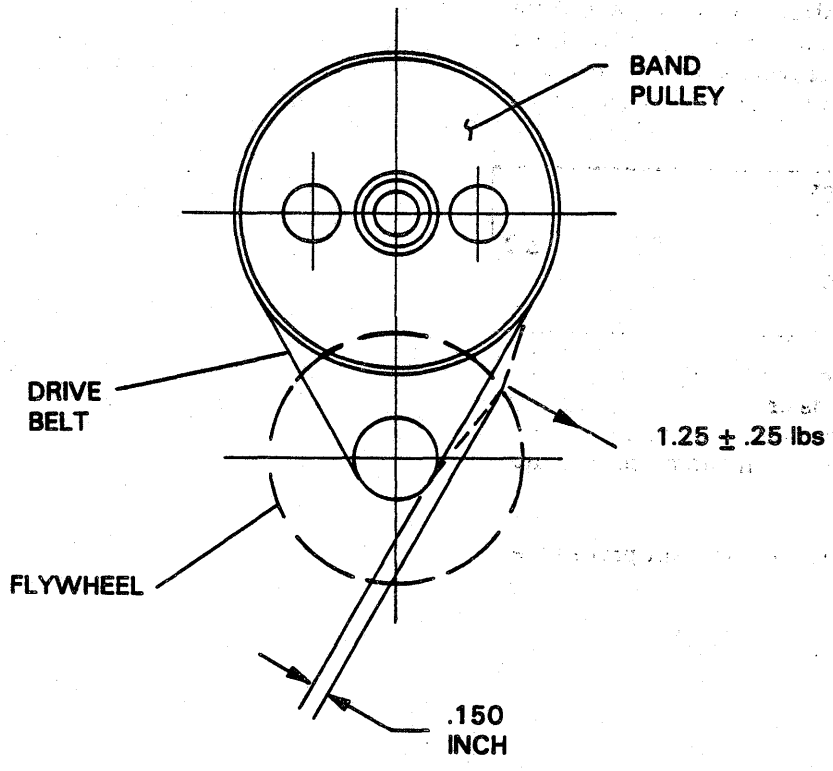
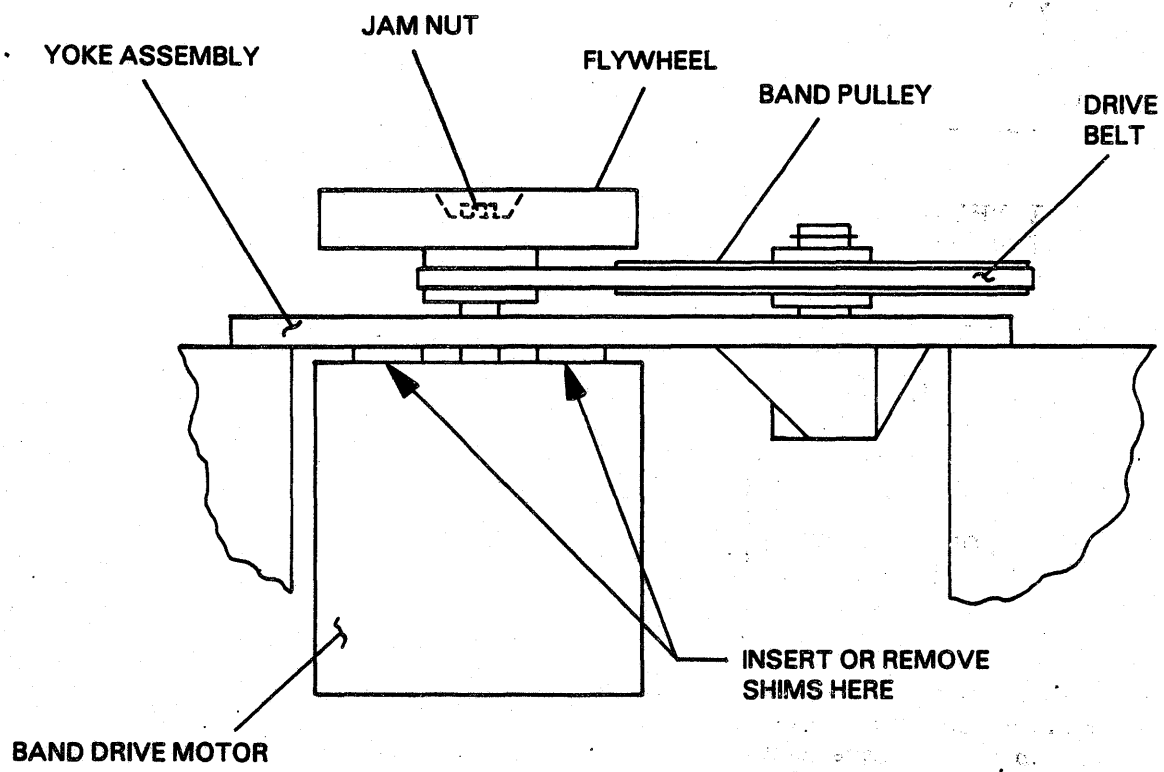


FIGURE 4-3. BAND DRIVE BELT ADJUSTMENT

## BAND DRIVE BELT ADJUSTMENT

This adjustment is necessary whenever the band motor or band drive belt has been replaced or when the band drive belt is tracking over the top or bottom edge of the band pulley.

### NOTE

THE JAM NUT ABOVE THE FLYWHEEL ON THE MOTOR SHAFT MUST BE TIGHTENED BEFORE TRACKING CAN BE CHECKED.

- a. Remove the entire yoke assembly but not its components. (See Band Motor Replacement steps a thru h).

### NOTE

USE CAUTION NOT TO LOSE THE TWO REST BUTTONS WHICH THE YOKE ASSEMBLY RESTS ON.

- b. Loosen the four motor mounting screws (beneath the flywheel), insert or remove shims and retighten screws until the drive belt tracks in the middle of the band pulley. This can be checked by manually turning the flywheel in a clockwise direction for repeated rotations and observing the drive belt's tracking on the pulley. If the belt tracks high or low, add or subtract shims until proper tracking is achieved.

### NOTE

ADDITIONAL SHIMS ARE PROVIDED WITH THE NEW MOTOR

- c. Loosen the four motor mounting screws and move the motor towards or away from the band pulley until the drive belt tension feels firm but not too tight and tighten the motor mounting screws.
- d. Perform Band Tracking Adjustment procedure.

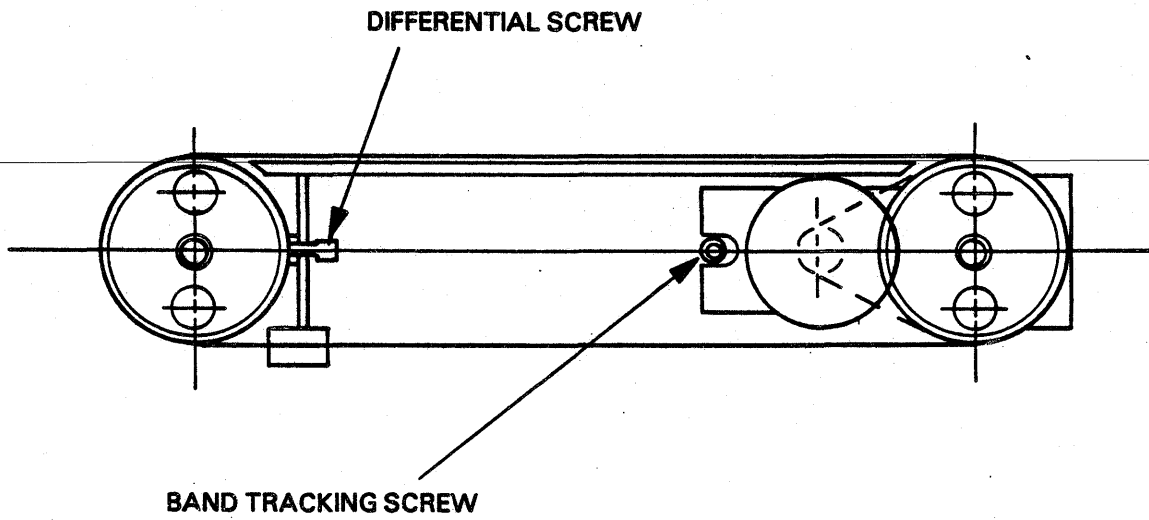
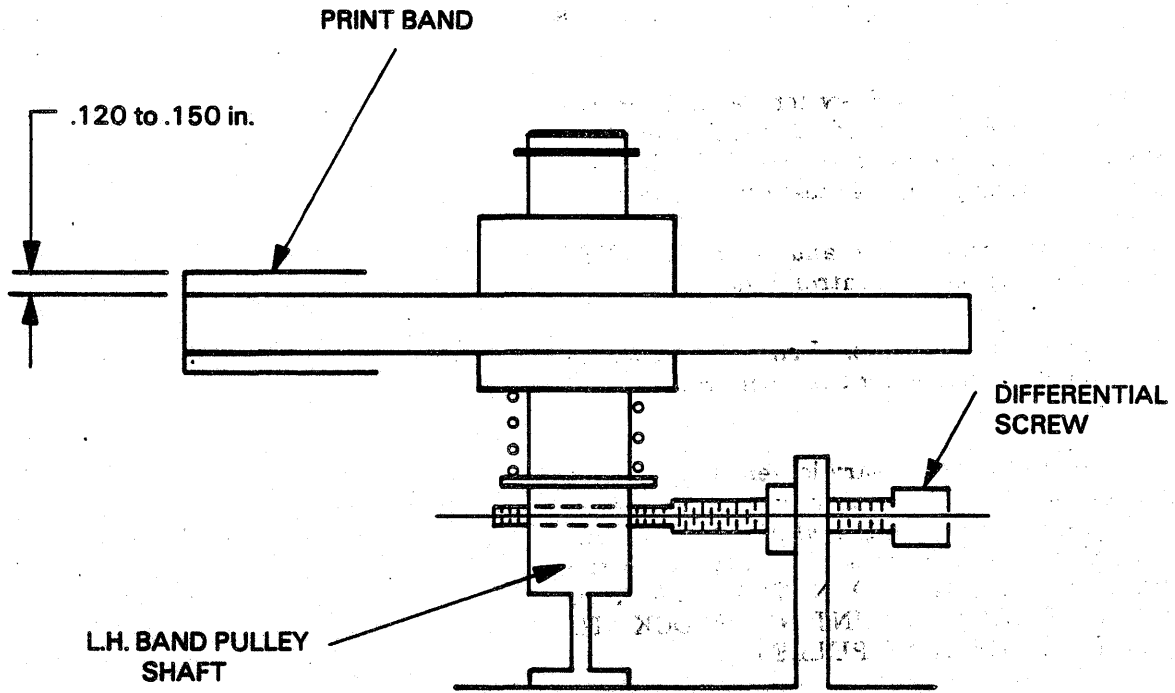
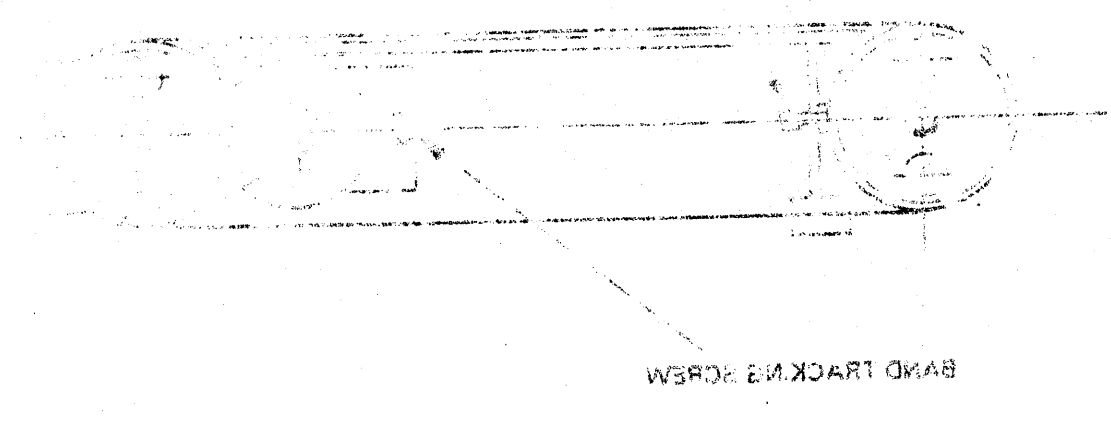
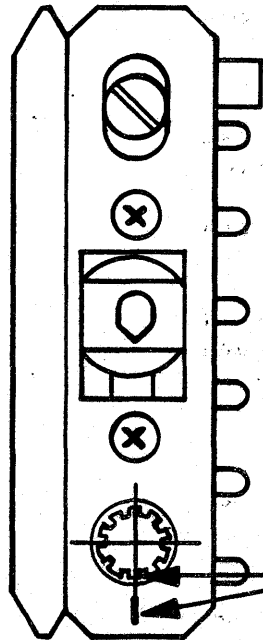


FIGURE 4-4. BAND TRACKING ADJUSTMENT

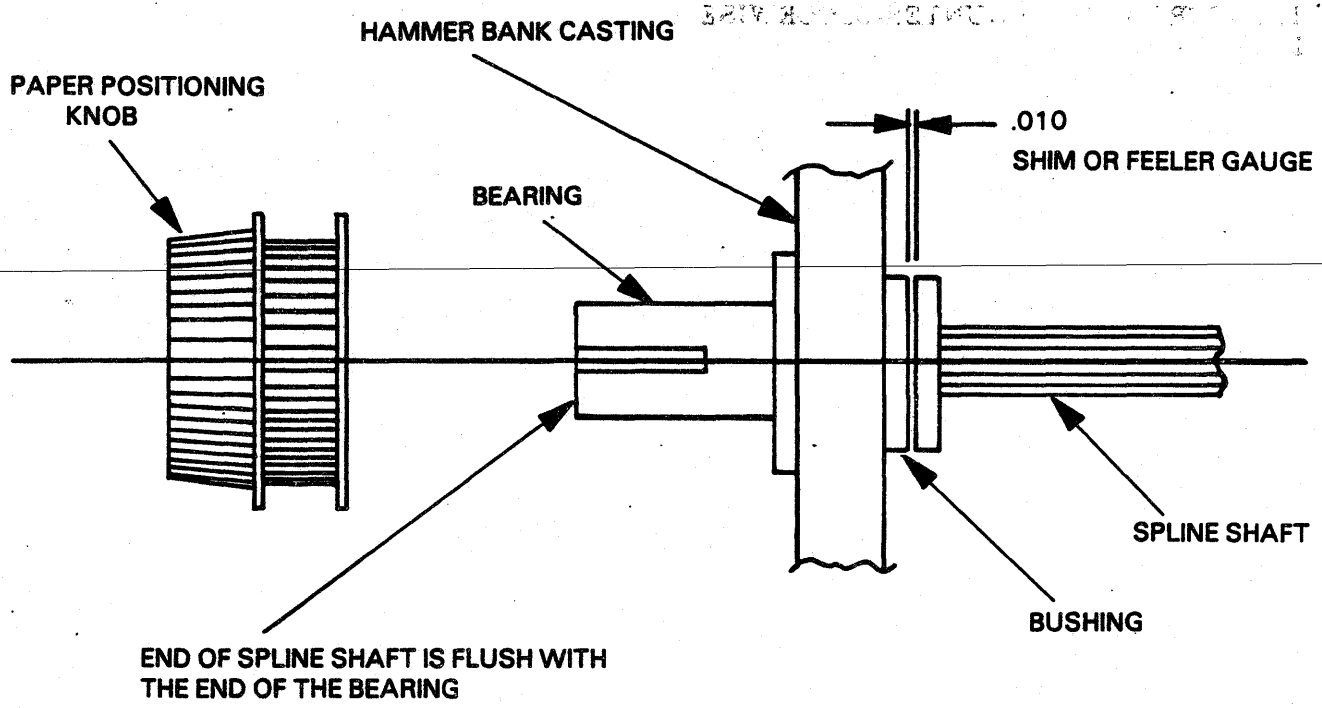
## BAND PICKUP ADJUSTMENT

- a. Install forms, ribbon and band.
- b. Position the character phasing control slide (on the Control Panel) in the center of its travel.
- c. Make note of the DIP switch settings on the top of the CPU board 1PC2, then reset them such that all the switches are ON. This will provide a sliding alphabet test print pattern.
- d. Power the printer ON and push the TEST PRINT switch on the Control Panel.
- e. Examine the printout. Printed characters should not be clipped for the entire range of the forms.
- f. If adjustment is necessary loosen the two band pickup assembly mounting screws and move the assembly left or right while printing until the printed characters are not clipped on the right or left sides. **DO NOT ALLOW THE BAND PICKUP MOUNTING BLOCK TO CONTACT THE BAND PULLEY.**
- g. Tighten the band pickup assembly mounting screws.





**TIMING MARKS ON L.H. & R.H. TRACTOR BEARINGS MUST BE ALIGNED TO THE SAME SPLINE TOOTH.**



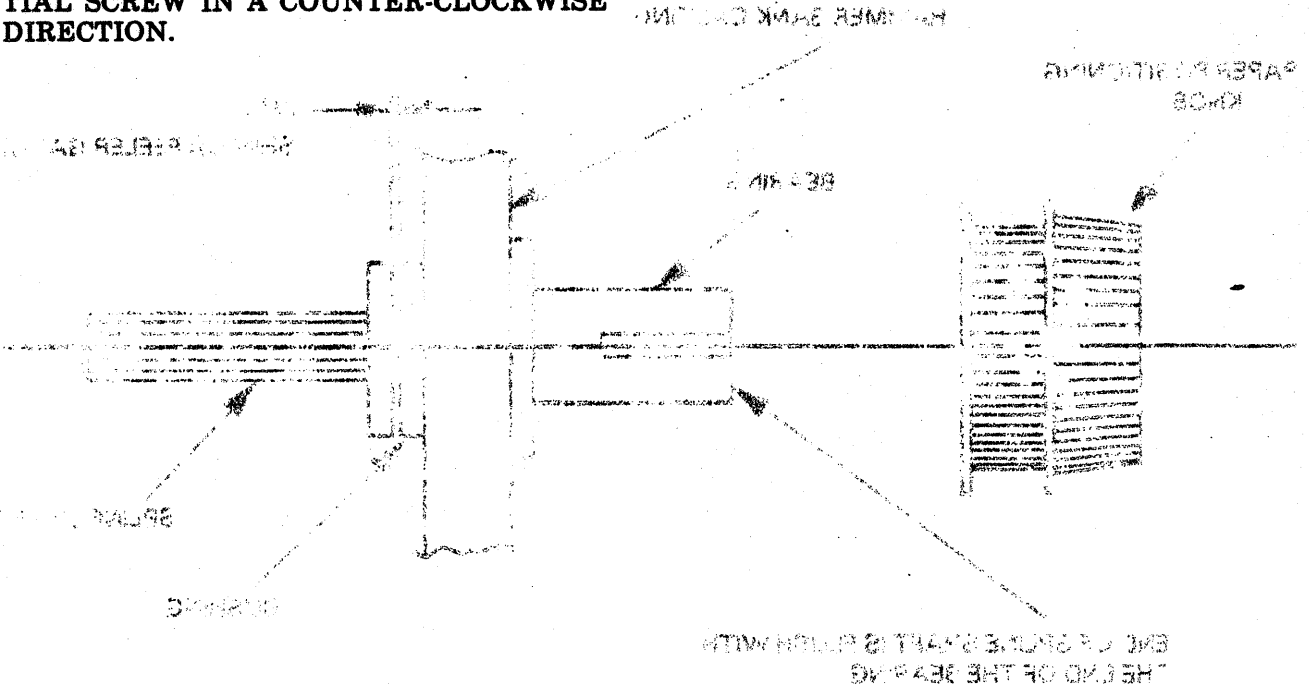
**FIGURE 4-6. LEFT HAND TRACTOR DRIVE BEARING ADJUSTMENT**



## BAND TRACKING ADJUSTMENT

Before performing this procedure check the band drive belt adjustment and perform the Band Drive Belt Adjustment procedure if necessary.

- a. Install a print band, power the printer ON, close the band cover and the paper throat. Allow the band to run for at least five seconds.
- b. Open the paper throat and band cover and allow the band to come to a complete stop.
- c. Measure the distance between the top edge of the band and the top edge of both the left and right band pulleys. The distance should be between .120 and .150 inches.
- d. If adjustment is necessary, perform the following step using a flight time tool (clipped to the top of the hammer bank).
- e. Rotate the band tracking screw to get the measurement close to the proper dimension. Then adjust the differential screw in a counter clockwise direction until the band slowly rides down the pulley. Now turn the same screw in a clockwise direction until the band tracks to the tolerance in step c. Perform steps a thru c until the proper dimension is achieved. THIS ADJUSTMENT MUST ALWAYS BE TERMINATED BY TURNING THE DIFFERENTIAL SCREW IN A COUNTER-CLOCKWISE DIRECTION.



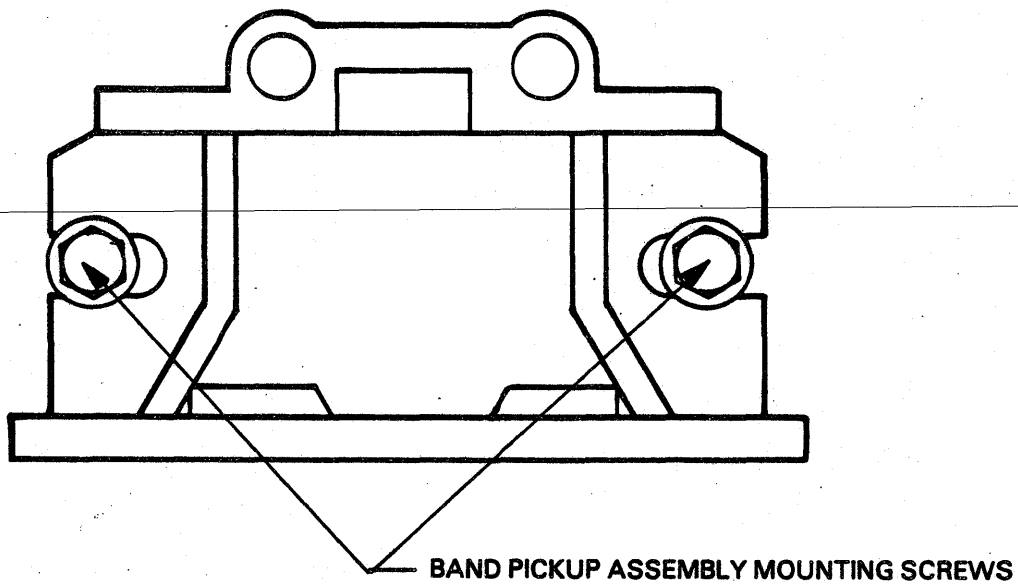
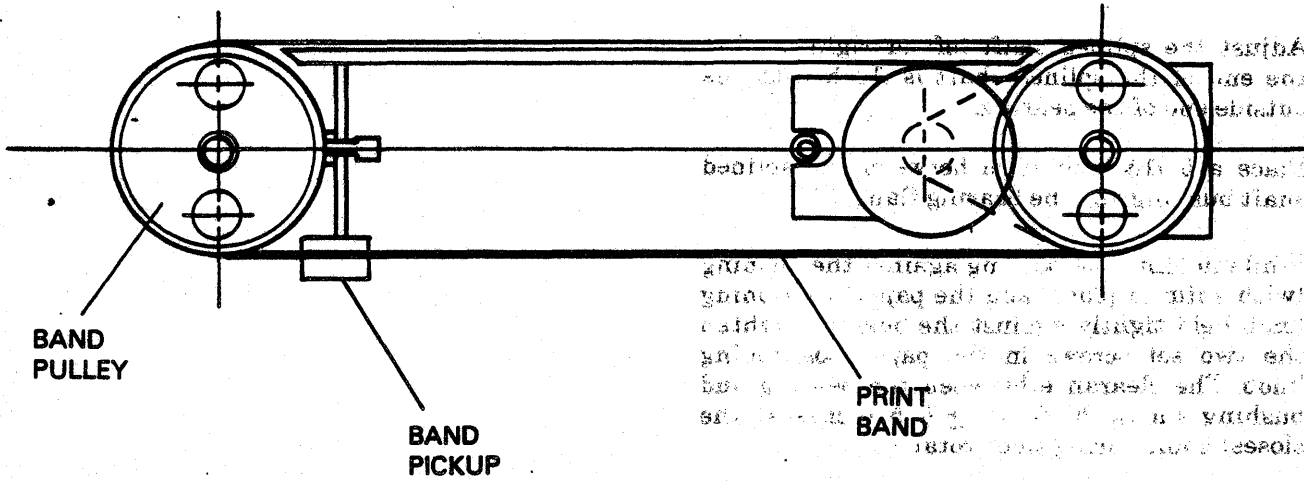


FIGURE 4-5. BAND PICKUP ADJUSTMENT

## LEFT HAND TRACTOR DRIVE BEARING ADJUSTMENT

Before performing this procedure check that the timing marks on the bushings of both the left and right tractors are in line with the same tooth on the splined shaft.

- a. Loosen the two set screws from the paper positioning knob.
- b. Adjust the splined shaft left or right so that the end of the splined shaft is flush with the outside end of the bearing.
- c. Place a 0.015 inch shim between the splined shaft bushing and the bearing flange.
- d. While holding the bearing against the bushing (with shim in place) and the paper positioning knob held tightly against the bushing tighten the two set screws in the paper positioning knob. The clearance between the bearing and bushing should be  $0.010 \pm .005$  inches at the closest point during shaft rotation.

