MANUAL 363
Issue 1, December 1976

TEMPEST MODEL 40 ASR Set

TELETYPE®

INSTALLATION & SERVICING MANUAL

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TELETYPE CORPORATION
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SUPPLEMENT TO TEMPEST M40 MANUAL 363
Issue 1, September 1977

TEMPEST MODEL 40

INSTALLATION AND SERVICE MANUAL

The following information supplements the Tempest M40 Manual 363, Issue 1, December 1976.

PART	
1	GENERAL
2	INSTALLATION
3	OPERATIONAL CHECKOUT
4	TROUBLESHOOTING
5	ADJUSTMENTS
6	COMPONENT ACCESS
7	ROUTINE MAINTENANCE
8	CONVERSIONS

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A. INTRODUCTION

This manual covers the Tempest Model 40 Sets shown on Pages 2-2 through 2-9, A. IDENTIFICATION.

A thorough review of this manual should be completed before installation or servicing of Tempest Model 40 equipment is undertaken.

This manual consists of eight parts. Parts 2 through 8 provide information necessary to install (Part 2), checkout (Part 3), troubleshoot (Part 4), adjust (Part 5), disassemble (Part 6), maintain (Part 7), and convert (Part 8) the Tempest Model 40 Sets. Each part begins with an index, which lists the information contained in that part.

Troubles isolated to outside the output terminal blocks are not analyzed in this manual.

The routine servicing specified for sets with printers and tape cassette drives should be performed at recommended intervals.

WARNING: CARE SHOULD BE EXERCISED IN THE AREA OF THE CRT PICTURE TUBE TO AVOID BREAKAGE WHEN SERVICING THE MONITOR WITH ITS COVER REMOVED.

DANGER: ALL POWER TO THE SET SHOULD BE TURNED OFF WHEN ANY COMPONENTS ARE REPLACED, HOWEVER, WHEN ALIGNMENT ADJUSTMENTS ARE PERFORMED, POWER MUST BE ON. IT IS RECOMMENDED THAT SAFETY GLASSES BE WORN WHENEVER THE MONITOR COVERS ARE REMOVED.

The correction of troubles (PART 4 -- TROUBLESHOOTING) is based on replacement of defective components, therefore, the components shown in this manual, which are applicable to the set, should be readily available. A carrying case (405900), to facilitate storage and transportation of smaller components, is available.

A. INTRODUCTION (Cont)

Card Positions

1-14 -- Circuit Cards (Similar to 410400)

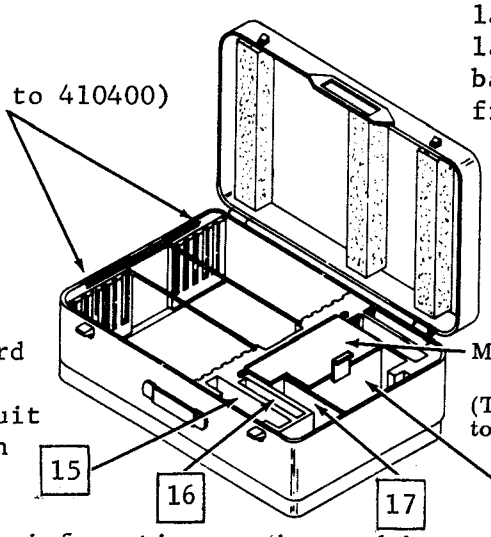
15 -- 410852 Rectifier Card

16 -- 410853 Regulator Card

17 -- 410545 Video Card

18 -- 410546 High Voltage Card

NOTE: All component side of circuit cards to face front except that in position 18 .



PART 4 -- TROUBLESHOOTING provides information on when and how to utilize the test switches and indicators provided in the design of the Tempest Model 40.

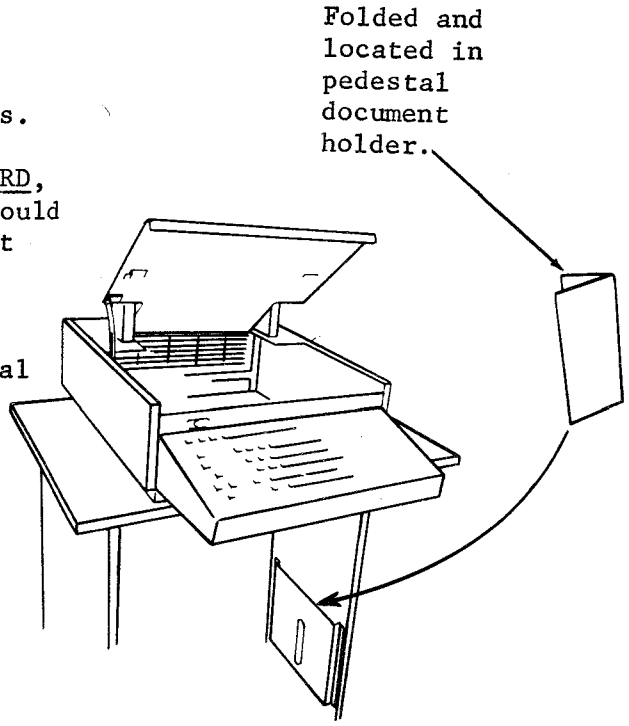
NOTE: When ordering replaceable components, unless otherwise specified, prefix each part number with the letters "TP" (ie, TP410055).

B. FEATURE AND OPTION RECORD

Before proceeding with installation, check-out or servicing, a review of the features and field options or other descriptions and records should be made to determine which options, if any, should be changed from the way they were furnished by the factory, applied at a service location, or altered during earlier service applications.

On Page 2-26a, 4. FEATURE AND OPTION RECORD, a Feature and Option Record for the set should be maintained and attached to the equipment to facilitate checkout or operation.

Conversion information, to change features in the field, is not provided in this manual except to convert replacement components when correcting a trouble by substitution, thereby retaining the original features in the repaired set. For information to add or change the features originally ordered refer to the Teletype Corporation catalog, modification kit specifications, or other instructions and make proper entries on the Feature and Option Record.



C. TECHNICAL DATA

1. POWER SOURCE REQUIREMENTS

115 V ac +10% 50/60 Hz +5% from an unswitched, standard 3-wire system.

NOTE: When operating from a 50 hertz power source, a pulley change is required on the printer and the tape cassette drives.

Depending on set configuration, up to four ac outlets, with ground connector (3-prong), are required. One outlet for the KD set, one outlet for each of the cassette drives and one for the paper winder, if supplied.

DANGER: SETS MUST BE PROPERLY GROUNDED TO PREVENT SHOCK HAZARD.

2. POWER CONSUMPTION AND HEAT DISSIPATION

			Approx Current Draw
KDP	500 Watts	1720 BTU/Hr	4.5 Amps
KD	365 Watts	1250 BTU/Hr	3.35 Amps
CD (each)	105 Watts	367 BTU/Hr	1.0 Amps
R/T (M28)	360 Watts	1225 BTU/Hr	3.85 Amps

3. ENVIRONMENTAL RESTRICTIONS (Operating)

Ambient Temperature	+40°F to +110°F
Relative Humidity	2% to 95% (noncondensing)

4. WEIGHT (Approximate)

	Unpacked
Display Monitor W/Housing	42 lbs
Terminal Logic	50 lbs
Printer and Printer Logic	40 lbs
Housing for Terminal Logic or Printer	15 lbs
Operator Console W/Cover	5 lbs
Pedestal	56 lbs
Cassette Drive	19 lbs

D. SUPPLEMENTARY INFORMATION

Supplementary information can be found in the How to Operate Manual 362 and Section 570-005-800TC, Maintenance Tools.

The following wiring diagram packages (WDP), covering the component, are supplied with the set.

WDP0435 40P Printer
WDP0453 40CAB202/RA, RC Friction Feed Printer Cabinet
WDP0454 40CAB352/RA, RC Tractor Feed Printer Cabinet
WDP0457 40CAB903/RQ, RR Pedestal
WDP0458 40K103/RCE Opcon
WDP0460 40MN202/RA Monitor
WDP0475 4016 AB 001 AB Cassette Drive Set
WDP0476 40C433/ZZZ/000 Controller w/o Cards
WDP0478 40C433/ACS/059 Controller

E. TOOLS AND SUPPLIES

The following tools and supplies may be required for installation or servicing of Tempest Model 40 apparatus. Most of these items should, normally, be present in standard maintenance tool kits.

1. TOOLS

Wrench	3/16" socket	125752
Open-end wrench	3/8"	125765
Open-end wrench	3/16" and 1/4"	129534
Open-end wrench	5/16" and 3/8"	152835
Open-end wrench	3/4"	129537
Nut driver handle		135676
Nut driver	1/4"	89954
Nut driver	5/16"	89955
Nut driver	1/4"	135677
Nut driver	5/16"	135678
Screwdriver	1/8", 2" blade	95368
Screwdriver	1/4", 6" blade	100982
Screwdriver	(blade less than 5/32")	94647
Allen wrench	0.050	104457
Allen wrench	0.078	110271
Tweezers		151392
Spring hook (pull)		142554
Spring hook (pull)		75765
Spring hook (push)		75503
Spring scales (802)		110443
Ruler	6"	95960
Cleaning brush (type face)		151394
Long-nose pliers		108285
Cutting pliers		108286
Terminal extractor		182697
Retaining ring pliers		160396
Terminal extractor		341983
Keyswitch extractor		346257
Keytop extractor		346260
Gauge		402617
Gauge		402868
Terminal extractor		(MOLEX HT2285)
Monitor adjusting tool		405992
Card extender		410499
Static discharge strap		346392

2. SUPPLIES

Grease -- 145867 (4 oz can) or 143484 (one lb can)
Oil -- 88970 (1 qt can)
Ribbon -- 402444 for Model 40 Printer - 7835 for Model 28 Reperforator
Paper (tractor feed)
Degreaser (Freon TF) -- 337449 (6 oz aerosol can)
Tape head cleaner -- 337401 (6 oz aerosol can)

PART 2 -- INSTALLATION

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A. IDENTIFICATION

1. GENERAL

The following chart shows the set configuration covered by Manual 363 and this supplement. This chart supplements the chart in Manual 363, Page 2-2. The supplement chart indicates the maximum number of magnetic tape cassette drives that could be added to any particular set configuration. For conversion information, refer to Part 8 of this supplement.

Optioning of the terminals should be recorded on the Feature and Option Record in either the Manual 363, Pages 2-24a and b or Pages 2-14a and b of this supplement.

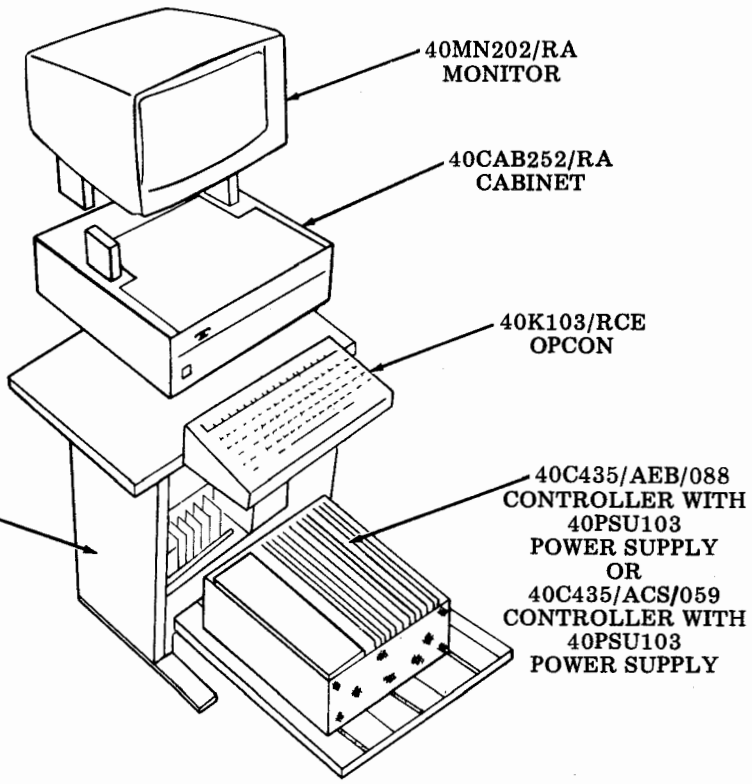
A. IDENTIFICATION

2. SET IDENTIFICATION

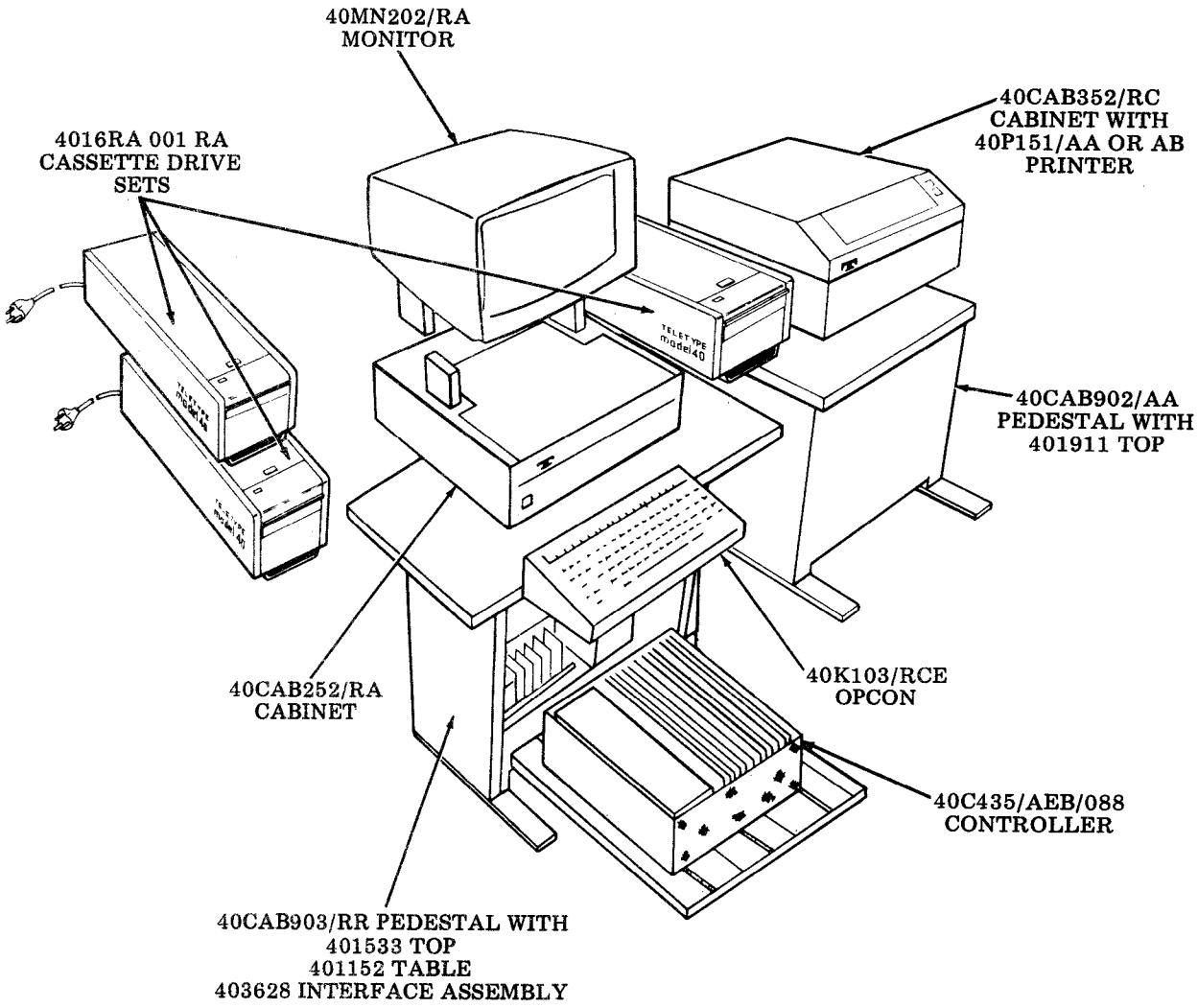
TELETYPE SET CODE	TERMINALS: KD	KDP	KDPM	KDPM2	KDPM3	NO. OF CASSETTES THAT CAN BE ADDED	KD PEDESTAL TOP		SALES CODE
4025RE 001 RD	●					2	24"		4025-8PWEI
4025RE 001 RD	●					3	24"		4025-8PWE
4025RE 001 RE	●					3	34"		4025-8PWF
4030RG 001 RF		●				2	24"		4030-8KWPI
4032RA 001 RA				●			24"		4032-8KWSXI
4035RA 001 RA					●		34"		4033-8KWT

NOTE: For other set configurations, refer to Manual 363, Pages 2-3 and 2-4.

3. KEYBOARD DISPLAY (KD)

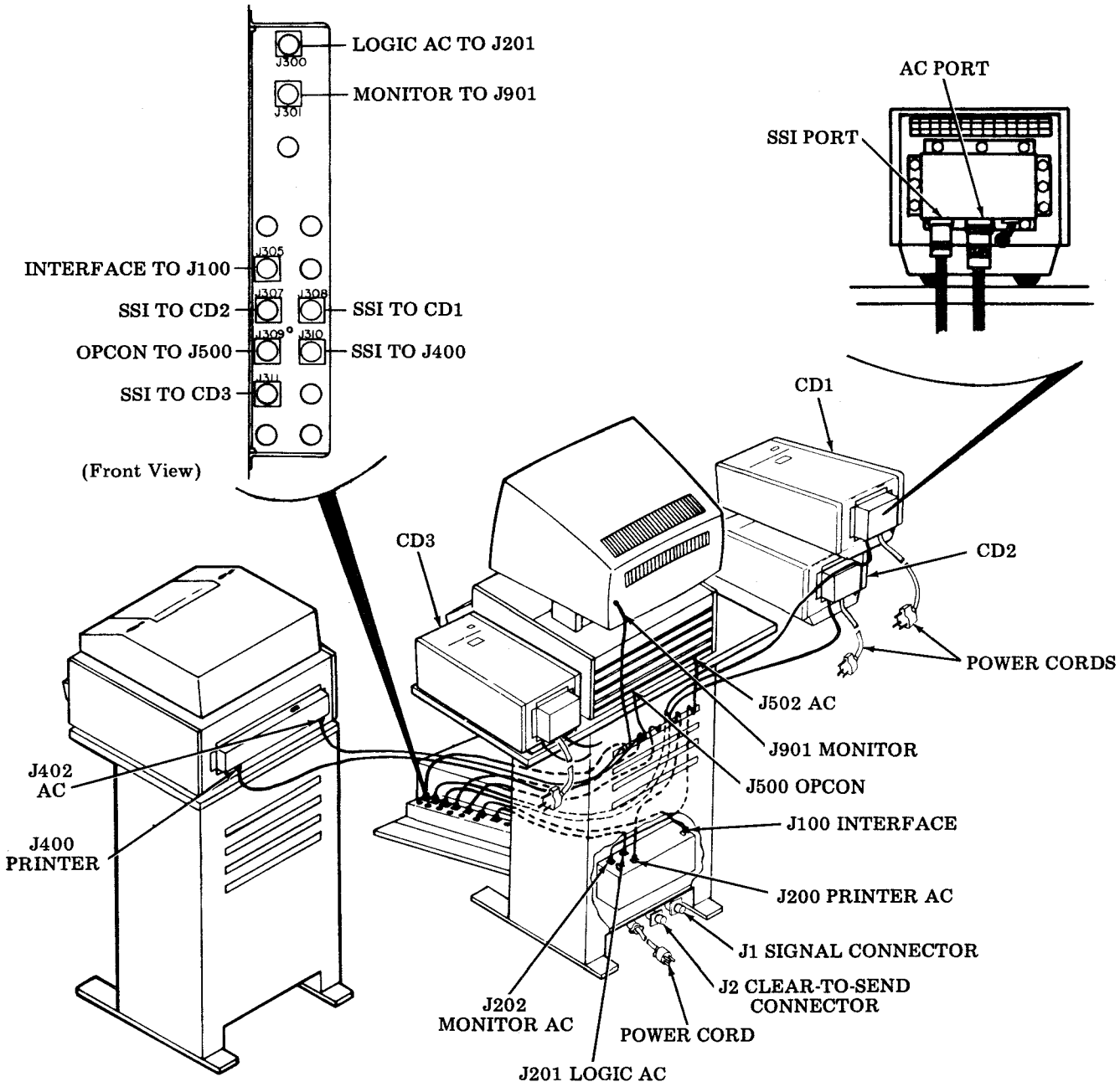


4. KEYBOARD DISPLAY PRINTER W/3 MAGNETIC TAPE CASSETTES (KDPM^3) -- TRACTOR FEED PRINTER



A. IDENTIFICATION (Cont)

5. CABLING FOR KEYBOARD DISPLAY PRINTER CASSETTE (KDPM[3])

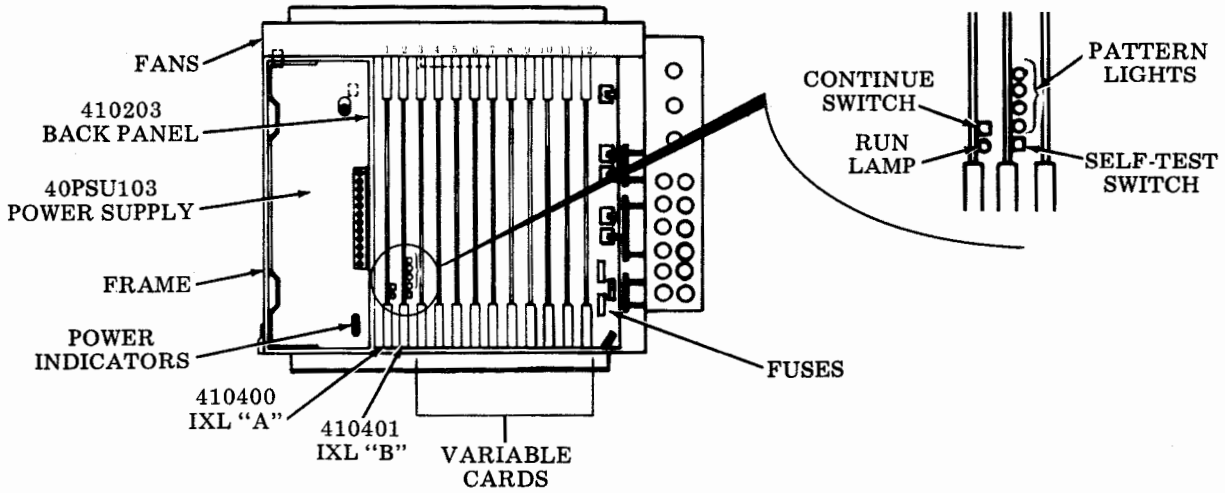


Cables Required

405710 Logic AC
405711 Printer AC
405712 Monitor AC
402236 Monitor
405780 Interface
405782 Opcon
405785 Printer
405785 Cassette (One for Each Cassette)
408600 Cassette AC (One for Each Cassette)

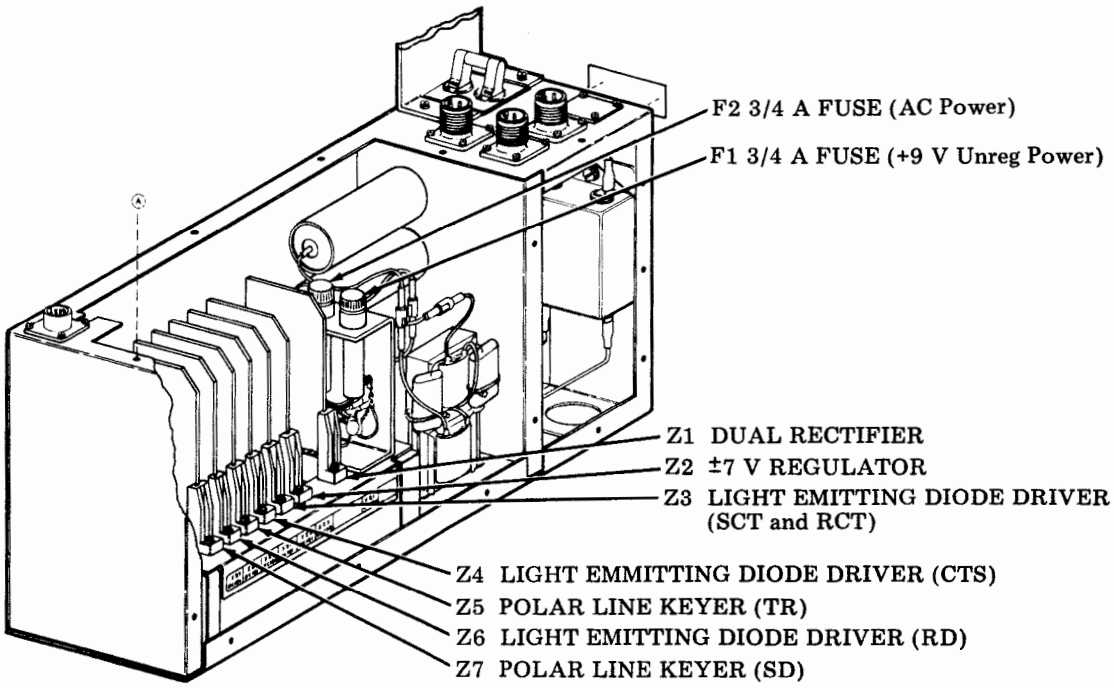
NOTE: For opcon identification, refer to Manual 363, Page 2-6.

6. CONTROLLER



CONTROLLER CODE	CARD SLOT											
	1	2	3	4	5	6	7	8	9	10	11	12
40C435/AEB/088	410400	410401	410437	410406	410406	410411	410461	410461	410912	410913	410811	—
40C435/ACS/059	410400	410401	410437	410406	410411	410461	410461	410912	410913	410811	—	—

7. INTERFACE MODULE

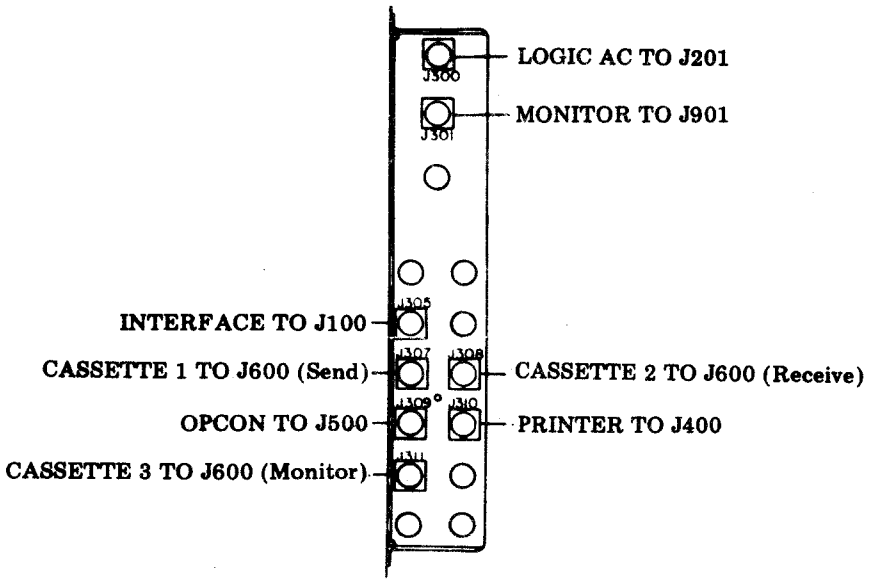


INTERFACE ASSEMBLY PART NO.	CARD SLOT						
	Z1	Z2	Z3	Z4	Z5	Z6	Z7
403628	303169	303168	303181	303181	303180	303181	303180

B. INSTALLATION

1. GENERAL

For installation of the monitor, monitor cabinet, opcon, printer and printer cabinet, refer to Manual 363, Pages 2-8 through 2-16. However, when connecting cables to the 40C435/AEB/088 or the 40C435/ACS/059 Controller, refer to the illustration below.



2. 50 HERTZ PRINTER OPERATION

For 50 hertz printer operation, the motor pully on the printer must be changed.

To change motor pulley on printer for 50 hertz operation:

①Loosen four motor mounting screws. Refer to Manual 363, Page 6-43 for location.

②Slip 400631 impeller shaft belt off motor pulley.

③Remove and retain 153841 screw, 2191 lockwasher and 3598 nut which mount motor pulley to motor shaft.

④Remove 400280 motor pulley (60 Hz) from motor shaft.

⑤Remove 198670 screw which mounts 400282 motor pulley (50 Hz) to its mounting post adjacent motor shaft.

⑥Install 400282 motor pulley (50 Hz) on motor shaft so that mounting flange is away from motor housing.

⑦Mount pulley to motor shaft using mounting hardware retained in Step 3.

⑧Replace 400631 impeller shaft belt over motor pulley.

⑨Place 400280 motor pulley (60 Hz) on storage post and secure with 198670 screw.

⑩Remake Impeller Shaft Drive Belt Tension adjustment (Manual 363, Page 5-25).

3. CASSETTE DRIVE INSTALLATION

①Unpack cassette drives per instructions on outside of carton.

For 50 hertz operation, the motor pulley on the cassette drive must be changed.

The 403305 motor pulley (50 Hz) is tied to the cassette drive casting. It is identified by its black oxide finish and larger diameter driving surface.

To replace motor pulley:

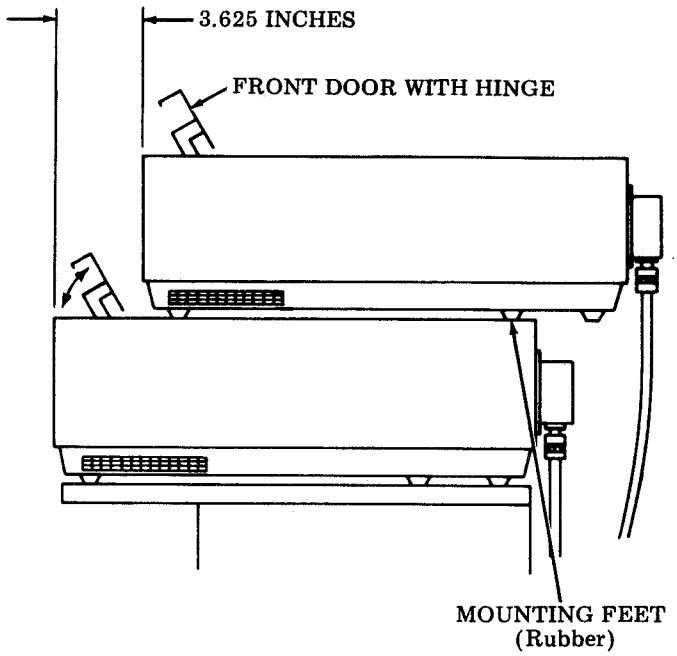
(1) Remove cassette drive cover (Manual 363, Page 6-55).
(2) Remove 403300 drive belt (Manual 363, Page 6-57).
(3) Remove and retain 92115 setscrew from 403299 motor pulley (60 Hz) (Manual 363, Page 6-65, Step 4).
(4) Remove 403299 motor pulley (60 Hz) from motor shaft.
(5) Insert 92115 setscrew into tapped hole in 403305 motor pulley (50 Hz).
(6) Insert 403305 motor pulley (50 Hz) on motor shaft with collar toward motor housing.
(7) Position 92115 setscrew over flat on motor shaft.
(8) Replace 403300 drive belt.
(9) Remake Motor Pulley and Motor Drive Belt adjustments (Manual 363, Page 5-51).

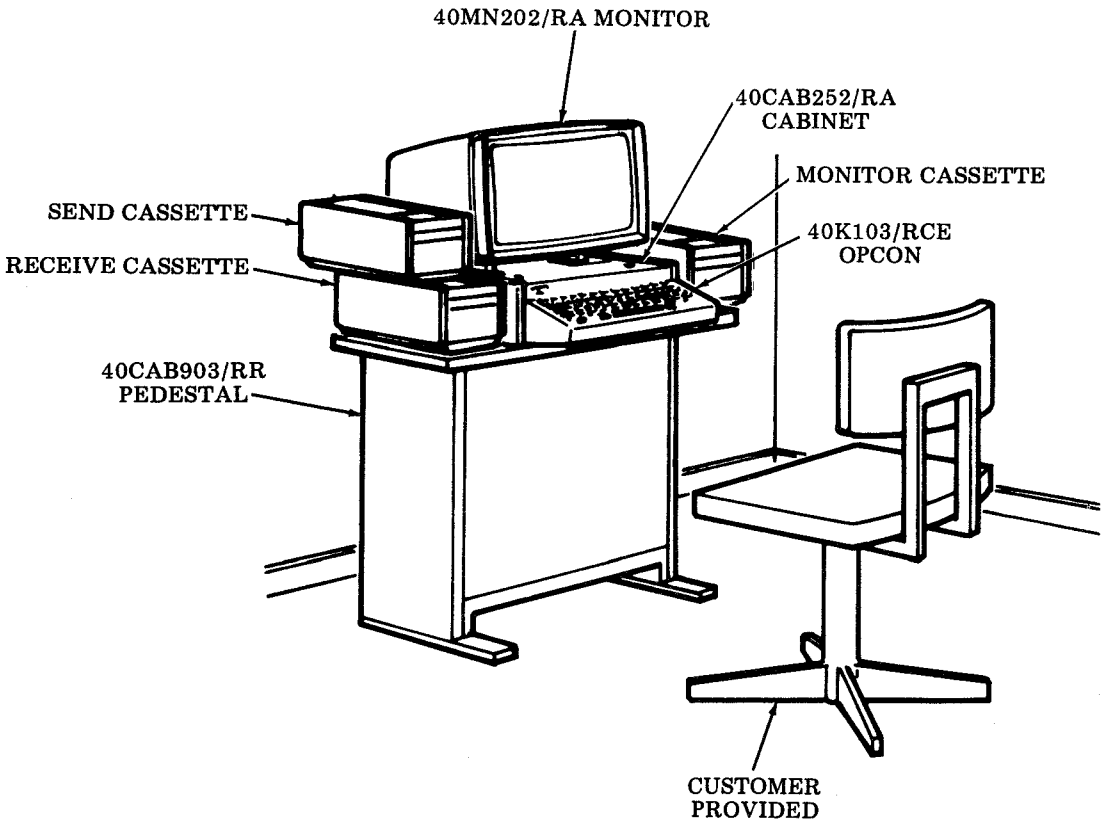
B. INSTALLATION (Cont)

3. CASSETTE DRIVE INSTALLATION (Cont)

②Position first cassette drive on KD pedestal on left side of monitor cabinet.

③Position second cassette drive on top of first cassette drive. Position second cassette drive so that center set of mounting feet are aligned with back edge of first cassette drive cover. This will provide sufficient clearance to fully open lower cassette drive cover.





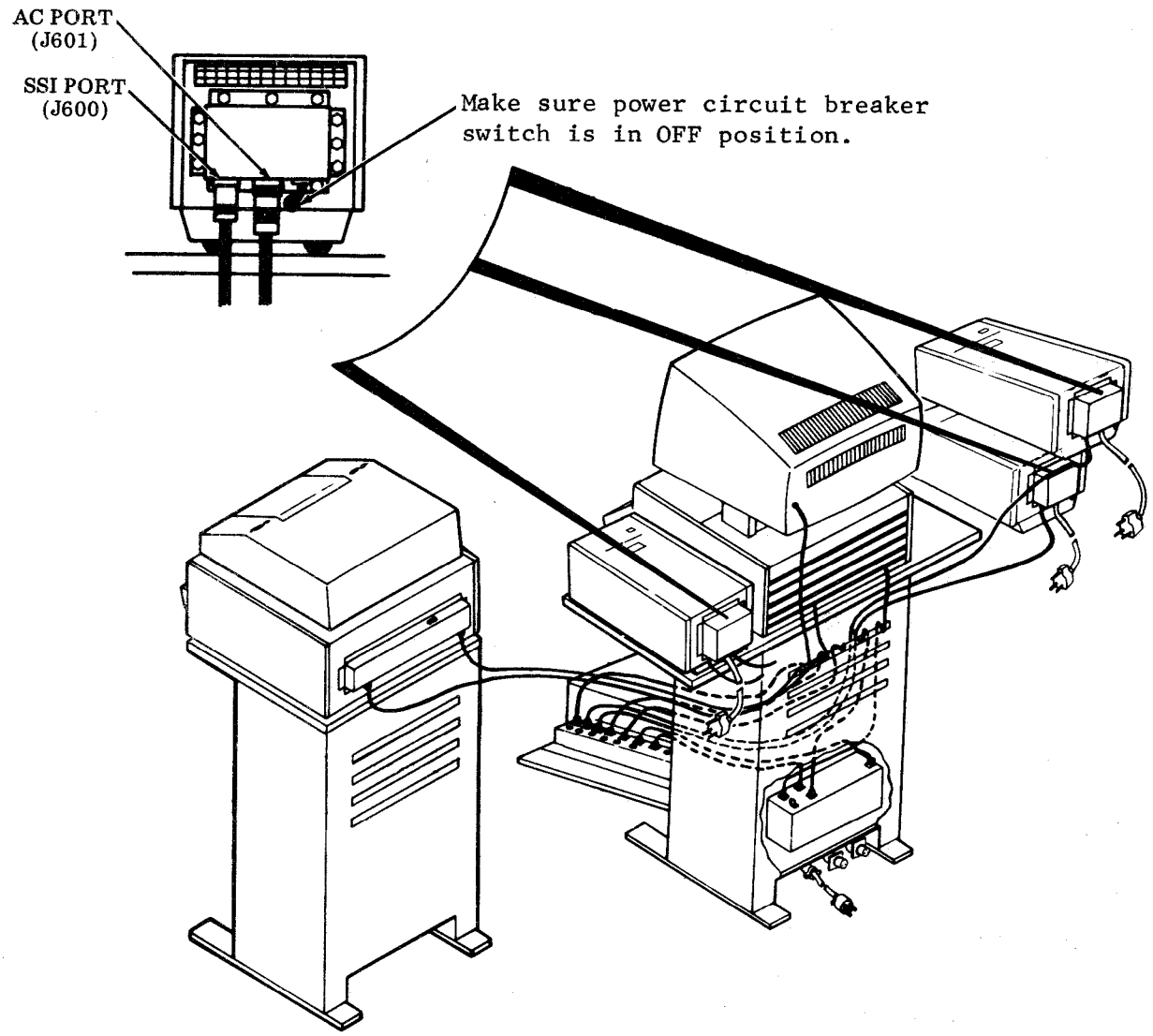
④Position third cassette drive on KD pedestal on right side of monitor cabinet.

⑤Route a 405785 cable assembly from each of the cassette drives to the controller.

⑥Connect one end of 405785 cable assembly into J600 receptacle on cassette drive. Route other end of cable assembly to controller as indicated below. It is recommended that signal cables from the cassette drives be connected in the following manner for uniformity of installations.

a. Connect 405785 cable assembly from the send cassette to J307 receptacle of the controller.
b. Connect 405785 cable assembly from the receive cassette to J308 receptacle of the controller.
c. Connect 405785 cable assembly from the monitor cassette to receptacle J311 of the controller.

⑦Before connecting ac plug to wall receptacle, check for continuity between ground terminal of ac plug and cassette drive frame using a volt-ohm-milliammeter.



C. CONTROLLER OPTIONING

The following is a list of field options which can be implemented at the time of installation. When an option for a unit that is not part of the set configuration being installed is encountered, leave that option in the unselected or off position.

1. FIELD OPTIONS

A. Line printer copies when set is sending
   1. Printer copies data as sent from send line
   2. Printer copies data echoed back on receive line

   } Choose 1

B. Send ETX on premature end of message
   1. Send ETX
   2. Do not send ETX

   } Choose 1

C. Colon is lower case and semicolon is upper case on keyboard
   1. Enabled
   2. Reversed

   } Choose 1 -- refer to keyboard layout

D. Keyboard on-line transmits blind
   1. Keyboard transmit blind
   2. Display monitors keyboard

   } Choose 1

E. Display received escape sequences
   1. Display escape sequences
   2. Do not display escaped sequences

   } Choose 1

F. Printer on-line required to transmit
   1. Printer required to transmit
   2. Printer not required

   } Choose 1

G. Send on-line extended keyboard characters (keyboard in on-line mode)
   1. Send extended keyboard characters as escape sequences
   2. Do not send extended characters

   } Choose 1

H. Monitor tape on required to transmit on-line
   1. Monitor tape required
   2. Monitor tape not required

   } Choose 1

I. Automatic paging on printer (58 lines per page) (see Note 1)
   1. "F_F" sent to printer after 58 lines
   2. No paging

   } Choose 1

J. Printer optioned for double line feed (used with Option I)
   1. Printer optioned for double line feed
   2. Printer optioned for single line feed

   } Choose 1

K. Keep received letter (shift in) and figures (shift out) characters (5-level operation only)
   1. Keep S_O, S_I characters
   2. Discard S_O, S_I characters

   } Choose 1

L. Printer select code (=) also selects receive tape (Poll-Select mode)
   1. Receive tape selected with printer on =
   2. Printer only selected on =

   Choose 1

M. Terminal on-line parity
   1. Odd
   2. Even
   3. No parity

   Choose 1

N. Mode display stays in at end (ETX) of receive message
   1. Display stays in receive
   2. Display goes off

   Choose 1

P. Controller port for send tape
   1. Send tape at J307
   2. Send tape at J308
   3. Send tape at J311
   4. No send tape

   Choose 1 (see Note 2)

Q. Controller port for receive tape
   1. Receive tape at J307
   2. Receive tape at J308
   3. Receive tape at J311
   4. No receive tape

   Choose 1 (see Note 2)

R. Controller port for monitor tape
   1. Monitor tape at J307
   2. Monitor tape at J308
   3. Monitor tape at J311
   4. No monitor tape

   Choose 1 (see Note 2)

S. and T. Two character station identity code
Any two characters from ASCII code chart except communication characters (SOH, ENQ, DC_1, DC_2, DC_3, DC_4, EOT, =, * and Delete)
It is recommended that upper and lower case alpha or numerals be used.

U. Mode display goes to after sending
   1. Display goes to on-line receive
   2. Display goes off

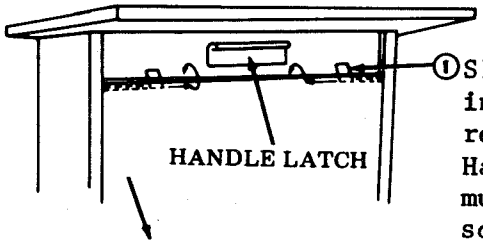
   Choose 1

NOTE 1: When selecting the paging option for the printer, certain related options are affected. When the paging option is selected, the printer Forms switch must be positioned to On. If the printer is optioned for double line feed, Option J must be selected (ON). Also the printer should be optioned for no paper feed out, Option 18a.

NOTE 2: If cassette drives were connected to controller as indicated on Page 2-8 of this supplement, then send tape must be optioned to be at J307, receive tape at J308 and monitor tape at J311.

C. CONTROLLER OPTIONING (Cont)

2. COMPONENT ACCESS IN PEDESTAL

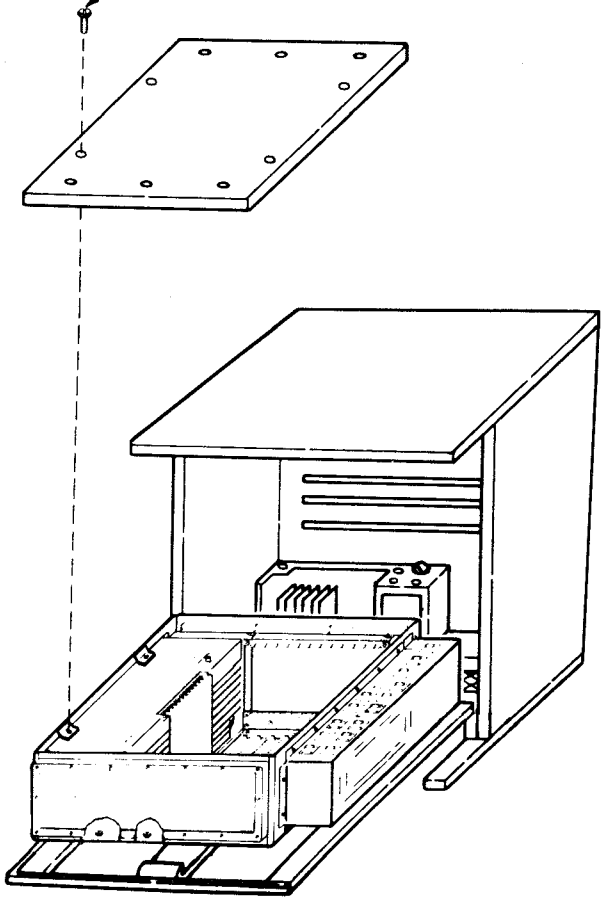


①Slide tabs inward to release panel. Handle latch must be squeezed to open panel.

②CAUTION: GRASP HANDLE FIRMLY WHEN OPENING DOOR SINCE WEIGHT OF ELECTRONICS PACKAGE MOUNTED ON INSIDE BECOMES OVERCENTERED.

NOTE: Tabs can be rotated to become nonfunctional or if desired may be utilized to discourage opening of door by nonservice personnel.

③Remove ten mounting screws. Remove controller cover.



3. GENERAL

Controller option switches are enabled per the service order request and should be checked per the Controller Arrangement Form included with each controller. This form will be placed in the document holder of controller pedestal. See 6. CONTROLLER ARRANGEMENT FORMS, Page 2-18 of this supplement for samples.

The purpose of the Controller Arrangement Form is to provide the following information:

a. Circuit cards required,
b. Placement of circuit cards,
c. Position of switches (on or off) on circuit cards,
d. Controller options selected.

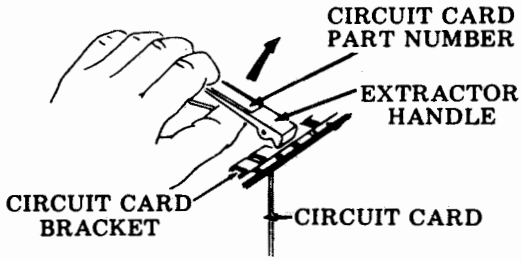
Using the Controller Arrangement Forms, check each controller in the station for the following:

a. Circuit cards are in their proper positions,
b. Switches on circuit cards are on or off (ie, as entered on Controller Arrangement Form).

Extracting circuit cards from controller.

①Lift up on the extractor handles of the circuit card.

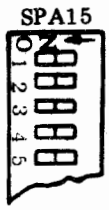
②Lift circuit card straight up.

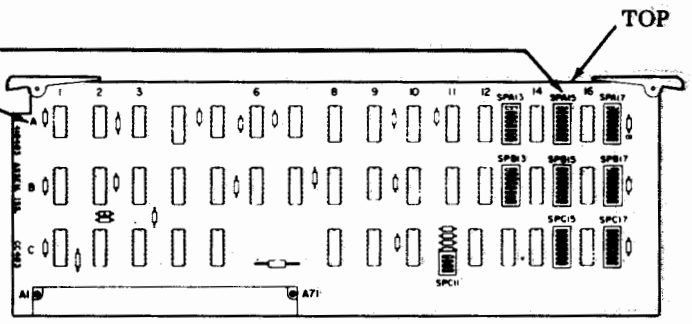


Locating switch packs on circuit cards.

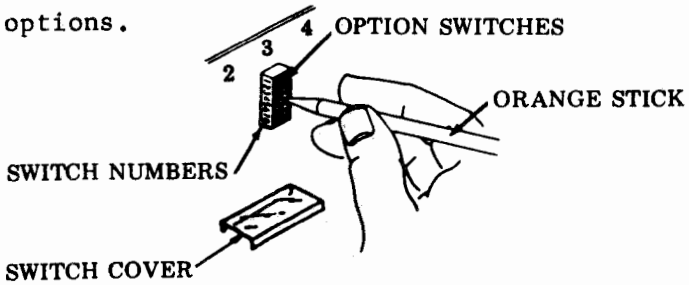
Example: SP [A] [15]

NOTE: "1" is always at the top, and "ON" is always to the left.





Activating options.



Record options set on 4. FEATURE AND OPTION RECORD, 2-14a and b of this supplement and place in document holder.

C. CONTROLLER OPTIONING (Cont)

4. FEATURE AND OPTION RECORD

Set:		Printer:		Interface:	
KD	☐	40P101AA (Monocase)	☐	Clear to Send +6 V (EC181)	☐
KDP	☐	40P101AB (Up-Low)	☐	Clear to Send -6 V (EC184)	☐
KDPM[2]	☐	40P151AA (Monocase)	☐	Receiver Ready +6 V (EC180)	☐
KDPM[3]	☐	40P151AB (Up-Low)	☐	Receiver Ready -6 V (EC185)	☐

Controller

OPTION	DESCRIPTION	OPTION CONDITION	
A.	Line printer copies when set is sending	1. Printer copies data as sent from send line ☐	2. Printer copies data echoed back on receive line ☐
B.	Send ETX on premature end of message	1. Send ETX ☐	2. Do not send ETX ☐
C.	Colon is lower case and semicolon is upper case	1. Enabled ☐	2. Reversed ☐
D.	Keyboard on-line transmits blind	1. Keyboard transmits blind ☐	2. Display monitors keyboard ☐
E.	Display received escape sequences	1. Display received escape sequences ☐	2. Do not display escape sequences but function is performed ☐
F.	Printer on-line required to transmit	1. Printer required to transmit ☐	2. Printer not required ☐
G.	Send on-line extended keyboard characters (keyboard in on-line mode)	1. Send extended characters as escape sequences ☐	2. Do not send extended characters ☐
H.	Monitor tape on required to transmit	1. Monitor tape on required ☐	2. Monitor tape not required ☐
I.	Automatic paging on printer (58 lines per page)	1. "F_F" sent to printer after 58 lines ☐	2. No paging ☐
J.	Printer optioned for double line feed (used with Option I)	1. Printer optioned for double line feed ☐	2. Printer optioned for single line feed ☐
K.	Keep letters (S_I) and figures (S_O) characters (5-level operation)	1. Keep S_O, S_I characters ☐	2. Discard S_O, S_I characters ☐
L.	Printer select code (=) also selects receive tape (Poll-Select mode)	1. Receive tape selected with printer on = ☐	2. Printer only selected on = ☐
M.	Line parity	1. Odd parity ☐	2. Even parity ☐
		3. No parity ☐	

REMOVE THIS PAGE FROM MANUAL, FILL OUT AND PLACE IN DOCUMENT HOLDER.

Set:		Printer:		Interface:	
KD	☐	40P101AA (Monocase)	☐	Clear to Send +6 V (EC181)	☐
KDP	☐	40P101AB (Up-Low)	☐	Clear to Send -6 V (EC184)	☐
KDPM[2]	☐	40P151AA (Monocase)	☐	Receiver Ready +6 V (EC180)	☐
KDPM[3]	☐	40P151AB (Up-Low)	☐	Receiver Ready -6 V (EC185)	☐

Controller

OPTION	DESCRIPTION	OPTION CONDITION	
A.	Line printer copies when set is sending	1. Printer copies data as sent from send line ☐	2. Printer copies data echoed back on receive line ☐
B.	Send ETX on premature end of message	1. Send ETX ☐	2. Do not send ETX ☐
C.	Colon is lower case and semicolon is upper case	1. Enabled ☐	2. Reversed ☐
D.	Keyboard on-line transmits blind	1. Keyboard transmits blind ☐	2. Display monitors keyboard ☐
E.	Display received escape sequences	1. Display received escape sequences ☐	2. Do not display escape sequences but function is performed ☐
F.	Printer on-line required to transmit	1. Printer required to transmit ☐	2. Printer not required ☐
G.	Send on-line extended keyboard characters (keyboard in on-line mode)	1. Send extended characters as escape sequences ☐	2. Do not send extended characters ☐
H.	Monitor tape on required to transmit	1. Monitor tape on required ☐	2. Monitor tape not required ☐
I.	Automatic paging on printer (58 lines per page)	1. "F_F" sent to printer after 58 lines ☐	2. No paging ☐
J.	Printer optioned for double line feed (used with Option I)	1. Printer optioned for double line feed ☐	2. Printer optioned for single line feed ☐
K.	Keep letters (S_I) and figures (S_O) characters (5-level operation)	1. Keep S_O, S_I characters ☐	2. Discard S_O, S_I characters ☐
L.	Printer select code (=) also selects receive tape (Poll-Select mode)	1. Receive tape selected with printer on = ☐	2. Printer only selected on = ☐
M.	Line parity	1. Odd parity ☐	2. Even parity ☐
		3. No parity ☐	

REMOVE THIS PAGE FROM MANUAL, FILL OUT AND PLACE IN DOCUMENT HOLDER.

OPTION	DESCRIPTION	OPTION CONDITION	
N.	Mode display stay is at end (ETX) of received message	1. Display stays in receive ☐	2. Display switches to off ☐
P.	Controller port for send tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No send tape ☐
Q.	Controller port for receive tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No receive tape ☐
R.	Controller port for monitor tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No monitor tape ☐
S.&T.	Station identity code	1. 1st character ☐	2. 2nd character ☐
U.	Mode display goes to after sending	1. Display go to on-line receive ☐	2. Display goes off ☐

Printer

17.	Printer margin and form length	c. Last character on 80th column ☐	d. Last character on 73rd through 79th column ☐
18.	Printer paper feed out	a. No paper feed out ☐	b. Paper feed out on RM loss ☐
		c. Paper feed out on RM loss or ETX ☐	
19.	Printer errored character symbol	c. Not printed on parity error ☐	d. Printers with 96 character set ☐
		e. Printers with 64 character set ☐	f. Printers with extended ASCII character set ☐
20.	Line feed on printer	a. Single ☐	b. Double ☐
21.	Foldover on up-low printer	a. Upper and lower case print ☐	b. Lower case prints as upper case ☐
22.	Foldover on monocase printer	a. Lower case not folded over ☐	b. Lower case printed as upper case ☐
39.	Forms switch (tractor feed printers only)	a. On ☐	b. Off ☐

DO NOT REMOVE THIS
PAGE FROM MANUAL.

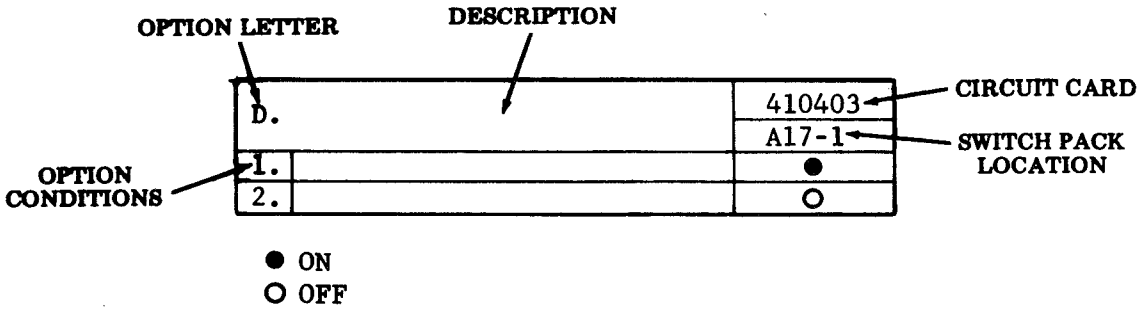
OPTION	DESCRIPTION	OPTION CONDITION	
N.	Mode display stay is at end (ETX) of received message	1. Display stays in receive ☐	2. Display switches to off ☐
P.	Controller port for send tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No send tape ☐
Q.	Controller port for receive tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No receive tape ☐
R.	Controller port for monitor tape	1. J307 ☐	2. J308 ☐
		3. J311 ☐	4. No monitor tape ☐
S.&T.	Station identity code	1. 1st character ☐	2. 2nd character ☐
U.	Mode display goes to after sending	1. Display go to on-line receive ☐	2. Display goes off ☐

Printer

17.	Printer margin and form length	c. Last character on 80th column ☐	d. Last character on 73rd through 79th column ☐
18.	Printer paper feed out	a. No paper feed out ☐	b. Paper feed out on RM loss ☐
		c. Paper feed out on RM loss or ETX ☐	
19.	Printer errored character symbol	c. Not printed on parity error ☐	d. Printers with 96 character set ☐
		e. Printers with 64 character set ☐	f. Printers with extended ASCII character set ☐
20.	Line feed on printer	a. Single ☐	b. Double ☐
21.	Foldover on up-low printer	a. Upper and lower case print ☐	b. Lower case prints as upper case ☐
22.	Foldover on monocase printer	a. Lower case not folded over ☐	b. Lower case printed as upper case ☐
39.	Forms switch (tractor feed printers only)	a. On ☐	b. Off ☐

C. CONTROLLER OPTIONING (Cont)

5. OPTION SWITCH SETTING



A. Line printer copies when set is sending	410411 B1 — 1
1. Printer copies data as sent from send line	●
2. Printer copies data echoed back on received line	○

B. Send ETX on premature end of message	410411 B1 — 5
1. Send ETX	●
2. Do not send ETX	○

C. Colon is lower case and semi-colon is upper case	410411 B1 — 6
1. Enabled	●
2. Reversed	○

D. Keyboard on-line transmits blind	410411 B1 — 7
1. Keyboard transmits blind	●
2. Display monitors keyboard	○

E. Display received escape sequences	410411 B1 — 8
1. Display escape sequences	●
2. Do not display escape sequences but function is performed	○

F. Printer on-line required to transmit	410411 B2 — 1
1. Printer required to transmit	●
2. Printer not required	○

G. Send on-line extended characters from keyboard	410411 B2 — 2
1. Send extended characters as escape sequences	●
2. Do not send extended characters	○

H. Monitor tape on required to transmit	410411 B2 — 3
1. Monitor tape on required	●
2. Monitor tape on not required	○

I. Automatic paging on printer (58 lines per page)	410411 B2 — 5
1. Paging "F_F" sent to printer after 58th line	●
2. No paging	○

J. Printer optioned for double line feed use with Option I	410411 B2 — 6
1. Printer optioned for double line feed	●
2. Printer not optioned for double line feed	○

K. Keep received letters (S_I) and figures (S_O) characters (5-level operation only)		410411 B2 — 8
1.	Keep S_O, S_I characters	●
2.	Discard S_O, S_I characters	○

L. Printer select (=) also selects receive tape		410411 B3 — 2
1.	Receive tape selected with printer on =	●
2.	Printer only selected on =	○

M. Line parity		410411 B3 — 3	410411 B3 — 4
1.	Odd parity	● ●	● ○
2.	Even parity	○	●
3.	No parity	○	○

N. Mode display stay in at end (ETX) of receive message		410411 B3 — 8
1.	Display stays in receive	○
2.	Display switches to off	●

P. Controller port for send tape		410411 B5 — 1	410411 B5 — 2
1.	J307	●	○
2.	J308	○	●
3.	J311	●	●
4.	No send tape	○	○

Q. Controller port for receive tape		410411 B5 — 3	410411 B5 — 4
1.	J307	●	○
2.	J308	○	●
3.	J311	●	●
4.	No receive tape	○	○

R. Controller port for monitor tape		410411 B5 — 5	410411 B5 — 6
1.	J307	●	○
2.	J308	○	●
3.	J311	●	●
4.	No monitor tape	○	○

S.&T. Station identity code (Poll-Select)		410411 Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
	1st character	B7 — 1	B7 — 2	B7 — 3	B7 — 4	B7 — 5	B7 — 6	B7 — 7
	2nd character	B8 — 1	B8 — 2	B8 — 3	B8 — 4	B8 — 5	B8 — 6	B8 — 7

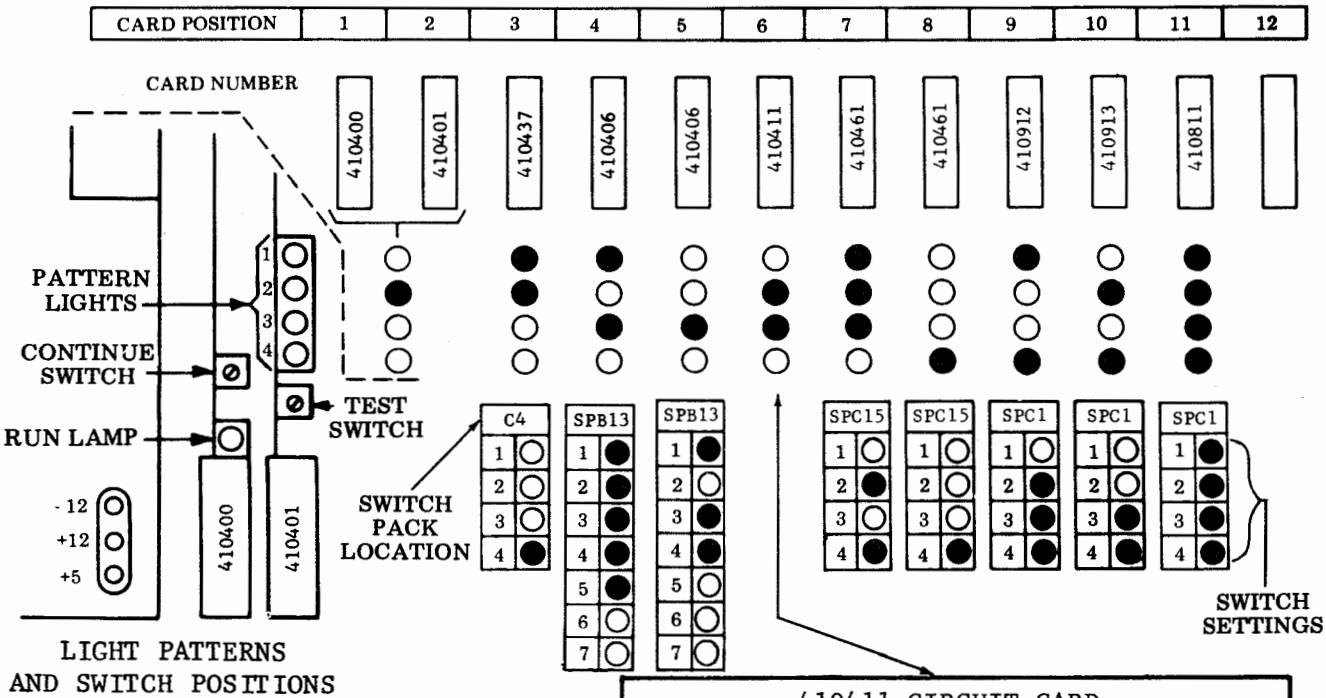
Switch on ● Marking
Switch off ○ Spacing

U. Mode display goes to after sending		410411 B4 — 8
1.	Display goes to on-line receive	●
2.	Display goes off	○

C. CONTROLLER OPTIONING (Cont)

6. CONTROLLER ARRANGEMENT FORMS

CONTROLLER 40C435/AEB/088



LIGHT PATTERNS AND SWITCH POSITIONS

● "ON"
○ "OFF"

"CONTINUE" LIGHT PATTERNS

NONE

410411 CIRCUIT CARD

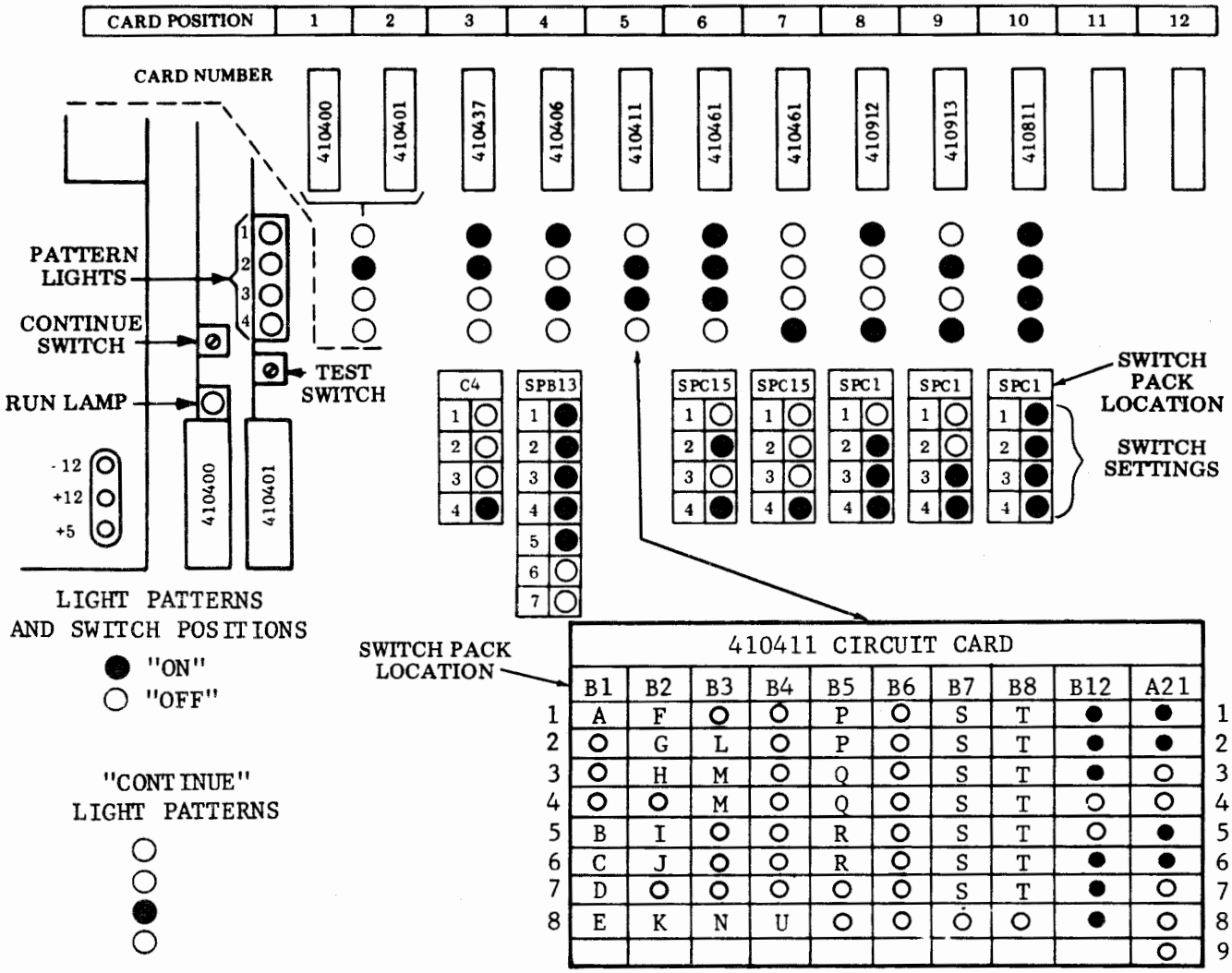
SWITCH PACK LOCATION

	B1	B2	B3	B4	B5	B6	B7	B8	B12	A21	
1	A	F	○	○	P	○	S	T	●	●	1
2	○	G	L	○	P	○	S	T	●	●	2
3	○	H	M	○	Q	○	S	T	●	○	3
4	○	○	M	○	Q	○	S	T	○	○	4
5	B	I	○	○	R	○	S	T	○	●	5
6	C	J	○	○	R	○	S	T	●	●	6
7	D	○	○	○	○	○	S	T	●	○	7
8	E	K	N	U	○	○	○	○	●	○	8
										○	9

OPTIONS:

A. Line monitor by printer on send data
B. ETX on premature end of message
C. Colon lower case, semicolon upper case
D. Keyboard on-line transmits blind
E. Display received escape sequences
F. Printer on-line required to send
G. Send extended characters from keyboard
H. Monitor tape on required to send
I. Automatic paging of printer (58 line/page)
J. Printer optioned for double line feed
K. Keep letter-figures shift characters (S_I, S_O)
L. Printer select also selects receive tape
M. Terminal on-line parity
N. Mode display stays in at end of receive message
P. Controller port for send tape
Q. Controller port for receive tape
R. Controller port for monitor tape
S. 1st station identity character
T. 2nd station identity character
U. Mode display goes to after sending

CONTROLLER 40C435/ACS/059



	B1	B2	B3	B4	B5	B6	B7	B8	B12	A21	
1	A	F	○	○	P	○	S	T	●	●	1
2	○	G	L	○	P	○	S	T	●	●	2
3	○	H	M	○	Q	○	S	T	●	○	3
4	○	○	M	○	Q	○	S	T	○	○	4
5	B	I	○	○	R	○	S	T	○	●	5
6	C	J	○	○	R	○	S	T	●	●	6
7	D	○	○	○	○	○	S	T	●	○	7
8	E	K	N	U	○	○	○	○	●	○	8
										○	9

OPTIONS:

A. Line monitor by printer on send data
B. ETX on premature end of message
C. Colon lower case, semicolon upper case
D. Keyboard on-line transmits blind
E. Display received escape sequences
F. Printer on-line required to send
G. Send extended characters from keyboard
H. Monitor tape on required to send
I. Automatic paging of printer (58 line/page)
J. Printer optioned for double line feed
K. Keep letter-figures shift characters (S_I, S_O)
L. Printer select also selects receive tape
M. Terminal on-line parity
N. Mode display stays in at end of receive message
P. Controller port for send tape
Q. Controller port for receive tape
R. Controller port for monitor tape
S. 1st station identity character
T. 2nd station identity character
U. Mode display goes to after sending

D. INTERFACE EXTERNAL CONNECTION

For interface external connections and connection to tape edit station, refer to Manual 363, Pages 2-33 through 2-35.

L. Printer select code (=) also selects receive tape (Poll-Select mode)
   1. Receive tape selected with printer on =
   2. Printer only selected on =

   } Choose 1

M. Terminal on-line parity
   1. Even
   2. Odd
   3. No parity

   } Choose 1

N. Mode display stays in at end (ETX) of receive message
   1. Display stays in receive
   2. Display goes off

   } Choose 1

P. Controller port for send tape
   1. Send tape at J305
   2. Send tape at J306
   3. No send tape

   } Choose 1

Q. Controller port for receive tape
   1. Receive tape at J305
   2. Receive tape at J306
   3. No receive tape

   } Choose 1

R. Controller port for monitor tape
   1. Monitor tape at J305
   2. Monitor tape at J306
   3. No monitor tape

   } Choose 1

S.&T. Two character station identity code
Any two characters from ASCII code chart except communication characters (SOH, ENQ, DC, DC_2, DC_3, DC_4, EOT, =, * and Delete)
It is recommended that upper and lower case alpha or numerals be used.

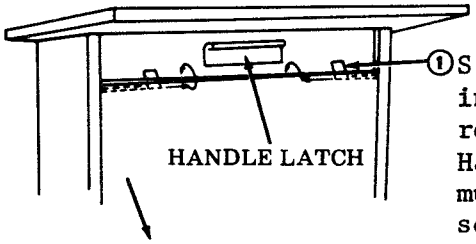
U. Mode display goes to after sending
   1. Display goes to on-line receive
   2. Display goes off

   } Choose 1

NOTE 1: When selecting the paging option for the printer, certain related options are affected. When the paging option is selected, the form switch on the printer must be on. If the printer is optioned for double line feed, option J must be selected (ON). Also the printer should be optioned for no paper feed out, option 18.a.

G. CONTROLLER OPTIONING (Cont)

2. COMPONENT ACCESS IN PEDESTAL

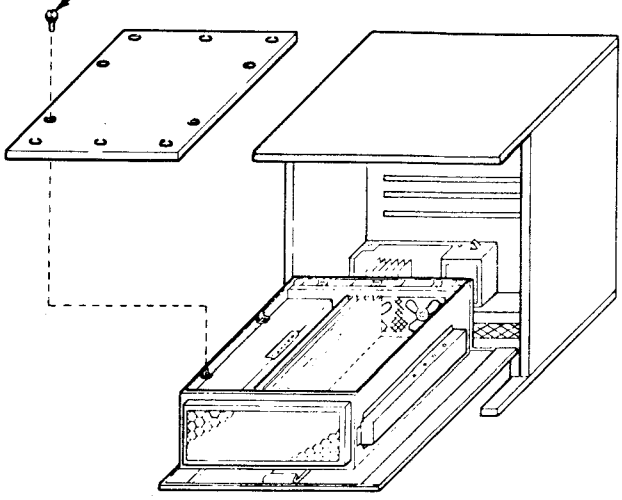


①Slide tabs inward to release panel. Handle latch must be squeezed to open panel.

②CAUTION: GRASP HANDLE FIRMLY WHEN OPENING DOOR SINCE WEIGHT OF ELECTRONICS PACKAGE MOUNTED ON INSIDE BECOMES OVERCENTERED.

NOTE: Tabs can be rotated to become nonfunctional or if desired may be utilized to discourage opening of door by nonservice personnel.

③Remove ten mounting screws. Remove controller cover.



3. GENERAL

Controller option switches are enabled per the service order request and should be checked per the Controller Arrangement Form included with each controller. This form will be placed in the document holder of controller pedestal. See Page 2-28, 6. CONTROLLER ARRANGEMENT FORMS for samples.

The purpose of the Controller Arrangement Form is to provide the following information:

a. Circuit cards required,
b. Placement of circuit cards,
c. Position of switches (on or off) on circuit cards,
d. Controller options selected,

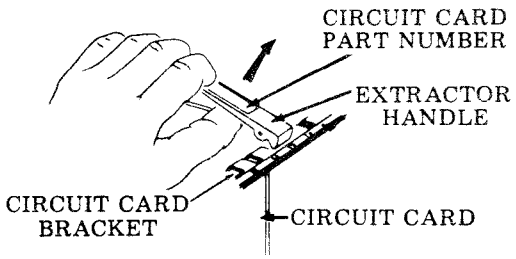
Using the Controller Arrangement Forms, check each controller in the station for the following:

a. Circuit cards are in their proper positions,
b. Switches on circuit cards are on or off (ie, as entered on Controller Arrangement Form).

Extracting circuit cards from controller.

①Lift up on the extractor handles of the circuit card.

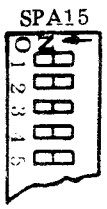
②Lift circuit card straight up.

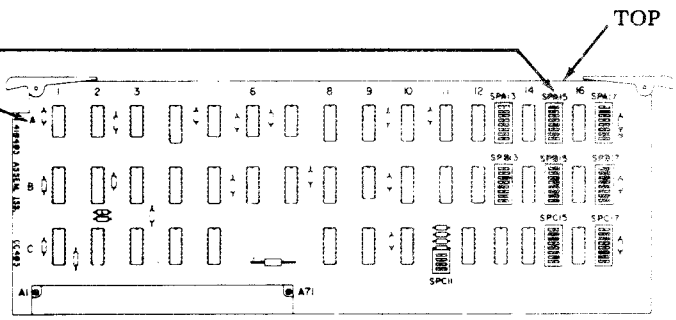


Locating switch packs on circuit cards.

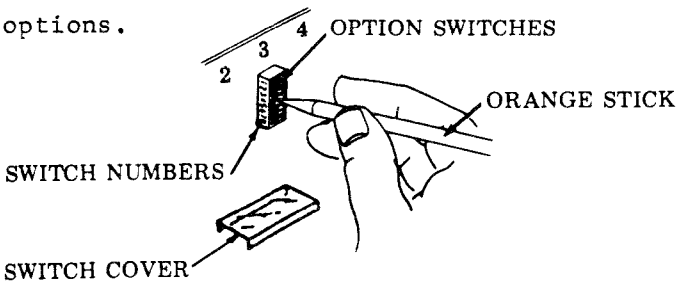
Example: SP [A] [15]

NOTE: "1" is always at the top, and "ON" is always to the left.





Activating options.



Record options set on Page 2-24a, 4. FEATURE AND OPTION RECORD and place in document holder.

Do not remove this page from manual.

G. CONTROLLER OPTIONING (Cont)

4. FEATURE AND OPTION RECORD

Set:
KD ☐
KDP ☐
KDPM^2 ☐

Printer:
40P101AA (Monocase) ☐
40P101AB (Up-Low) ☐
40P151AA (Monocase) ☐
40P151AB (Up-Low) ☐

Interface:
Clear to Send +6 V (EC181) ☐
Clear to Send -6 V (EC184) ☐
Receiver Ready +6 V (EC180) ☐
Receiver Ready -6 V (EC185) ☐

Controller

OPTION	DESCRIPTION	OPTION CONDITION	
A.	Line printer copies when set is sending	1. Printer copies data as sent from send line ☐	2. Printer copies data echoed back on receive line ☐
B.	Send ETX on premature end of message	1. Send ETX ☐	2. Do not send ETX ☐
C.	Colon is lower case and semicolon is upper case	1. Enabled ☐	2. Reversed ☐
D.	Keyboard on-line transmits blind	1. Keyboard transmits blind ☐	2. Display monitors keyboard ☐
E.	Display received escape sequences	1. Display received escape sequences ☐	2. Do not display escape sequences but function is preformed ☐
F.	Printer on-line required to transmit	1. Printer required to transmit ☐	2. Printer not required ☐
G.	Send on-line extended keyboard characters (keyboard in on-line mode)	1. Send extended characters as escape sequences ☐	2. Do not send extended characters ☐
H.	Monitor tape on required to transmit	1. Monitor tape on required ☐	2. Monitor tape not required ☐
I.	Automatic paging on printer (58 lines per page)	1. "F_F" sent to printer after 58 lines ☐	2. No paging ☐
J.	Printer optioned for double line (206) used with Option I	1. Printer optioned for double line feed ☐	2. Printer optioned for single line feed ☐
K.	Keep letters (S_I) and figures (S_O) characters (5 level operation)	1. Keep S_O, S_I characters ☐	2. Discard S_O, S_I characters ☐
L.	Printer select code (=) also selects receive tape (Poll-Select mode)	1. Receive tape selected with printer on = ☐	2. Printer only selected on = ☐
M.	Line parity	1. Odd parity ☐	2. Even parity ☐
		3. No parity ☐	

REMOVE THIS PAGE FROM MANUAL, FILL OUT AND PLACE IN DOCUMENT HOLDER.

Set:
KD ☐
KDP ☐
KDPM[2] ☐

Printer:
40P101AA (Monocase) ☐
40P101AB (Up-Low) ☐
40P151AA (Monocase) ☐
40P151AB (Up-Low) ☐

Interface:
Clear to Send +6 V (EC181) ☐
Clear to Send -6 V (EC184) ☐
Receiver Ready +6 V (EC180) ☐
Receiver Ready -6 V (EC185) ☐

Controller

OPTION	DESCRIPTION	OPTION CONDITION	
A.	Line printer copies when set is sending	1. Printer copies data as sent from send line ☐	2. Printer copies data echoed back on receive line ☐
B.	Send ETX on premature end of message	1. Send ETX ☐	2. Do not send ETX ☐
C.	Colon is lower case and semicolon is upper case	1. Enabled ☐	2. Reversed ☐
D.	Keyboard on-line transmits blind	1. Keyboard transmits blind ☐	2. Display monitors keyboard ☐
E.	Display received escape sequences	1. Display received escape sequences ☐	2. Do not display escape sequences but function is preformed ☐
F.	Printer on-line required to transmit	1. Printer required to transmit ☐	2. Printer not required ☐
G.	Send on-line extended keyboard characters (keyboard in on-line mode)	1. Send extended characters as escape sequences ☐	2. Do not send extended characters ☐
H.	Monitor tape on required to transmit	1. Monitor tape on required ☐	2. Monitor tape not required ☐
I.	Automatic paging on printer (58 lines per page)	1. "F_F" sent to printer after 58 lines ☐	2. No paging ☐
J.	Printer optioned for double line (206) used with Option I	1. Printer optioned for double line feed ☐	2. Printer optioned for single line feed ☐
K.	Keep letters (S_I) and figures (S_O) characters (5 level operation)	1. Keep S_O, S_I characters ☐	2. Discard S_O, S_I characters ☐
L.	Printer select code (=) also selects receive tape (Poll-Select mode)	1. Receive tape selected with printer on = ☐	2. Printer only selected on = ☐
M.	Line parity	1. Odd parity ☐	2. Even parity ☐
		3. No parity ☐	

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OPTION	DESCRIPTION	OPTION CONDITION	
N.	Mode display stay is at end (ETX) of received message	1. Display stays in receive ☐	2. Display switches to off ☐
P.	Controller port for send tape	1. J305 ☐	2. J306 ☐
		3. No send tape ☐	
Q.	Controller port for recieve tape	1. J305 ☐	2. J306 ☐
		3. No receive tape ☐	
R.	Controller port for monitor tape	1. J305 ☐	2. J306 ☐
		3. No monitor tape ☐	
S.&T.	Station identity code	1. 1st character ☐	2. 2nd character ☐
U.	Mode display goes to after sending	1. Display go to on-line receive ☐	2. Display goes off ☐

Printer

17.	Printer margin and form length	c. Last character on 80th column ☐	d. Last character on 73rd through 79th column ☐
18.	Printer paper feed out	a. No paper feed out ☐	b. Paper feed out on RM loss ☐
		c. Paper feed out on RM loss or ETX ☐	
19.	Printer errored character symbol	c. Not printed on parity error ☐	d. Printers with 96 character set ☐
		e. Printers with 64 character set ☐	f. Printers with extended ASCII character set ☐
20.	Line feed on printer	a. Single ☐	b. Double ☐
21.	Foldover on up-low printer	a. Upper and lower case print ☐	b. Lower case prints as upper case ☐
22.	Foldover on monocase printer	a. Lower case not folded over ☐	b. Lower case printed as upper case ☐
39.	Forms switch (tractor feed printers only)	a. On ☐	b. Off ☐

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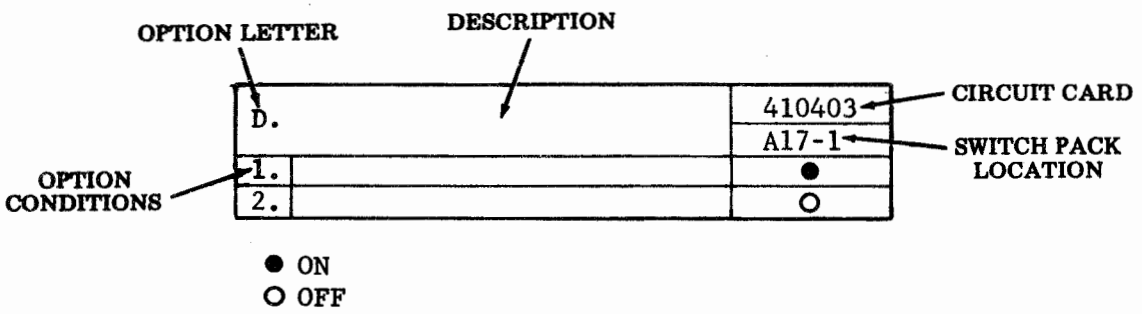
OPTION	DESCRIPTION	OPTION CONDITION	
N.	Mode display stay is at end (ETX) of received message	1. Display stays in receive ☐	2. Display switches to off ☐
P.	Controller port for send tape	1. J305 ☐	2. J306 ☐
		3. No send tape ☐	
Q.	Controller port for recieve tape	1. J305 ☐	2. J306 ☐
		3. No receive tape ☐	
R.	Controller port for monitor tape	1. J305 ☐	2. J306 ☐
		3. No monitor tape ☐	
S.&T.	Station identity code	1. 1st character ☐	2. 2nd character ☐
U.	Mode display goes to after sending	1. Display go to on-line receive ☐	2. Display goes off ☐

Printer

17.	Printer margin and form length	c. Last character on 80th column ☐	d. Last character on 73rd through 79th column ☐
18.	Printer paper feed out	a. No paper feed out ☐	b. Paper feed out on RM loss ☐
		c. Paper feed out on RM loss or ETX ☐	
19.	Printer errored character symbol	c. Not printed on parity error ☐	d. Printers with 96 character set ☐
		e. Printers with 64 character set ☐	f. Printers with extended ASCII character set ☐
20.	Line feed on printer	a. Single ☐	b. Double ☐
21.	Foldover on up-low printer	a. Upper and lower case print ☐	b. Lower case prints as upper case ☐
22.	Foldover on monocase printer	a. Lower case not folded over ☐	b. Lower case printed as upper case ☐
39.	Forms switch (tractor feed printers only)	a. On ☐	b. Off ☐

G. CONTROLLER OPTIONING (Cont)

5. OPTION SWITCH SETTING



A. Line printer copies when set is sending		410411 B1 — 1
1.	Printer copies data as sent from send line	●
2.	Printer copies data echoed back on received line	○

B. Send ETX on premature end of message		410411 B1 — 5
1.	Send ETX	●
2.	Do not send ETX	○

C. Colon is lower case and semi-colon is upper on keyboard		410411 B1 — 6
1.	Enabled	●
2.	Reversed	○

D. Keyboard on-line transmits blind		410411 B1 — 7
1.	Keyboard transmit blinded	●
2.	Display monitors keyboard	○

E. Display received escape sequences		410411 B1 — 8
1.	Display escape sequences	●
2.	Do not display escape sequences but function is preformed	○

F. Printer on-line required to transmit		410411 B2 — 1
1.	Printer required to transmit	●
2.	Printer not required	○

G. Send on-line extended characters from keyboard		410411 B2 — 2
1.	Send extended characters as escape sequences	●
2.	Do not send extended characters	○

H. Monitor tape on required to transmit		410411 B2 — 3
1.	Monitor tape on required	●
2.	Monitor tape on not required	○

I. Automatic paging on printer (58 lines per page)		410411 B2 — 5
1.	Paging "F_F" sent to printer after 58th line	●
2.	No paging	○

J. Printer optioned for double line feed use with Option I		410411 B2 — 6
1.	Printer optioned for double line feed	●
2.	Printer not optioned for double line feed	○

K. Keep received letters (S_I) and figures (S_O) characters (5 level operation only)		410411 B2 — 8
1.	Keep S_O, S_I characters	●
2.	Discard S_O, S_I characters	○

L. Printer select (=) also selects receive tape		410411 B3 — 2
1.	Receive tape selected with printer on =	●
2.	Printer only selected on =	○

M. Line parity		410411 B3 — 3	410411 B3 — 4
1.	Odd parity	● ●	● ○
2.	Even parity	○	●
3.	No parity	○	○

N. Mode display stay in at END (ETX) of receive message		410411 B3 — 8
1.	Display stays in receive	○
2.	Display switches to off	●

P. Controller port for send tape		410411 B5 — 1	410411 B5 — 2
1.	J305	○	●
2.	J306	●	○
3.	No send tape	○	○

Q. Controller port for receive tape		410411 B5 — 3	410411 B5 — 4
1.	J305	○	●
2.	J306	●	○
3.	No receive tape	○	○

R. Controller port for monitor tape		410411 B5 — 5	410411 B5 — 6
1.	J305	○	●
2.	J306	●	○
3.	No monitor tape	○	○

S.&T. Station identity code (Poll-Select)		410411 Bit 1	Bit 2	Bit 3	Bit 4	Bit 5	Bit 6	Bit 7
	1st character	B7 — 1	B7 — 2	B7 — 3	B7 — 4	B7 — 5	B7 — 6	B7 — 7
	2nd character	B8 — 1	B8 — 2	B8 — 3	B8 — 4	B8 — 5	B8 — 6	B8 — 7

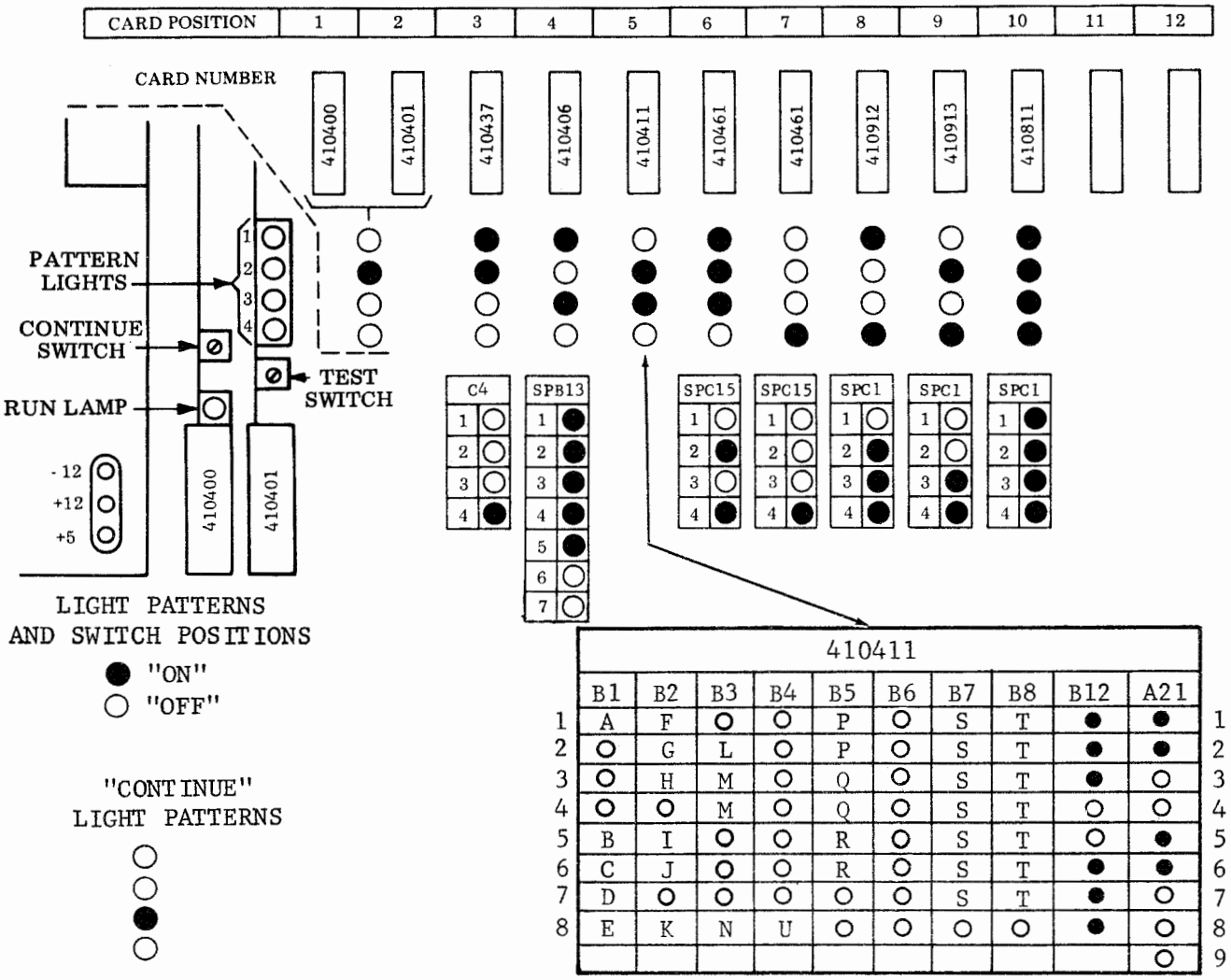
Switch on ● Marking
Switch off ○ Spacing

U. Mode display goes to after sending		410411 B4 — 8
1.	Display goes to on-line receive	●
2.	Display goes off	○

G. CONTROLLER OPTIONING (Cont)

6. CONTROLLER ARRAGEMENT FORMS

CONTROLLER 40C433/ACS/059



410411

	B1	B2	B3	B4	B5	B6	B7	B8	B12	A21	
1	A	F	○	○	P	○	S	T	●	●	1
2	○	G	L	○	P	○	S	T	●	●	2
3	○	H	M	○	Q	○	S	T	●	○	3
4	○	○	M	○	Q	○	S	T	○	○	4
5	B	I	○	○	R	○	S	T	○	●	5
6	C	J	○	○	R	○	S	T	●	●	6
7	D	○	○	○	○	○	S	T	●	○	7
8	E	K	N	U	○	○	○	○	●	○	8
										○	9

OPTIONS:

A. Line monitor by printer on send data
B. ETX on premature end of message
C. Colon lower case, semicolon upper case
D. Keyboard on-line transmits blind
E. Display received escape sequences
F. Printer on-line required to send
G. Send extended characters from keyboard
H. Monitor tape on required to send
I. Automatic paging of printer (58 line/page)
J. Printer optioned for double line feed
K. Keep letter-figures shift characters (S_I, S_O)
L. Printer select also selects receive tape
M. Terminal on-line parity
N. Mode display stays in at end of receive message
P. Controller port for send tape
Q. Controller port for receive tape
R. Controller port for monitor tape
S. 1st station identity character
T. 2nd station identity character
U. Mode display goes to after sending

7. ASCII CODE CHART

BITS				7	0				1			
				6	0		1		0		1	
				5	0	1	0	1	0	1	0	1
4	3	2	1	ROW \ COL	0	1	2	3	4	5	6	7
0	0	0	0	0	NUL	DLE	SP	0	@	P	`	p
			1	1	SOH	DC1	!	1	A	Q	a	q
		1	0	2	STX	DC2	"	2	B	R	b	r
			1	3	ETX	DC3	#	3	C	S	c	s
	1	0	0	4	EOT	DC4	$	4	D	T	d	t
			1	5	ENQ	NAK	%	5	E	U	e	u
		1	0	6	ACK	SYN	&	6	F	V	f	v
			1	7	BEL	ETB	'	7	G	W	g	w
1	0	0	0	8	BS	CAN	(	8	H	X	h	x
			1	9	HT	EM	)	9	I	Y	i	y
		1	0	10	LF	SUB	*	:	J	Z	j	z
			1	11	VT	ESC	+	;	K	[	k	{
	1	0	0	12	FF	FS	,	<	L	\	l	¦
			1	13	CR	GS	-	=	M	]	m	}
		1	0	14	SO	RS	.	>	N	^	n	~
			1	15	SI	US	/	?	O	—	o	DEL

NUL -- Null
SOH -- Start of Heading
STX -- Start of Text
ETX -- End of Text
EOT -- End of Transmission
ENQ -- Enquiry
ACK -- Acknowledge
BEL -- Bell
BS -- Backspace (1)
HT -- Horizontal Tabulation
LF -- Line Feed
VT -- Vertical Tabulation
FF -- Form Feed
CR -- Carriage Return
SO -- Shift Out
SI -- Shift In
DLE -- Data Link Escape
DC1 -- Device Control 1
DC2 -- Device Control 2
DC3 -- Device Control 3
DC4 -- Device Control 4
NAK -- Negative Acknowledge
SYN -- Synchronous Idle
ETB -- End of Transmission Block
CAN -- Cancel
EM -- End of Medium
SUB -- Substitute
ESC -- Escape
FS -- File Separator
GS -- Group Separator
RS -- Record Separator
US -- Unit Separator
SP -- Space
DEL -- Delete

(1) Performs cursor left function on display device.

G. CONTROLLER OPTIONING (Cont)

8. BAUDOT (ITA2) CODE CHART

B_5 B_4 B_3	0 0 0	0 0 1	0 1 0	0 1 1	1 0 0	1 0 1	1 1 0	1 1 1
0 0	BLANK BLANK	SPACE SPACE	CARRIAGE RETURN CARRIAGE RETURN	, N	5 T	# H	9 O	. M
0 1	3 E	BELL S	$ D	! F	" Z	6 Y	? B	/ X
1 0	LINE FEED LINE FEED	8 I	4 R	: C	) L	Ø P	¢ G	; V
1 1	— A	7 U	' J	(K	2 W	1 Q	FIGURES FIGURES	LETTERS LETTERS
B_2 B_1								

Upper character describes upper case code.
Lower character describes lower case code.

9. ASCII TO BAUDOT CONVERSION TABLE

ASCII (ITA5) INPUT		CONVERTS TO	BAUDOT (ITA2) OUTPUT	ASCII (ITA5) INPUT		CONVERTS TO	BAUDOT (ITA2) OUTPUT
NUL	*		BLANK	NAK	*		BLANK
SOH	*		BLANK	SYN	*		BLANK
STX	*		BLANK	ETB	*		BLANK
ETX	*		BLANK	CAN	*		BLANK
EOT	*		BLANK	EM	*		BLANK
ENQ	*		BLANK	SS (SUB)	*		BLANK
ACK	*		BLANK	ESC	*		BLANK
BEL			BELL (FIGS. S)	FS	*		BLANK
BS	*		BLANK	GS	*		BLANK
HT	*		BLANK	RS	*		BLANK
LF	*		LINE FEED	US	*		BLANK
VT	*		BLANK	SP	*		SPACE
FF	*		BLANK	!			! (FIGS. F)
CR	*		CARRIAGE RETURN	"			" (FIGS. Z)
SO			FIGURES	#			# (FIGS. H)
SI			LETTERS	$			$ (FIGS. D)
DLE	*		BLANK	%	*		BLANK
DC1	*		BLANK	&			& (FIGS. G)
DC2	*		BLANK	'			' (FIGS. J)
DC3	*		BLANK	(			((FIGS. K)
DC4	*		BLANK	)			) (FIGS. L)

ASCII (ITA5) INPUT	CONVERTS TO	BAUDOT (ITA2) OUTPUT	ASCII (ITA5) INPUT	CONVERTS TO	BAUDOT (ITA2) OUTPUT
*	*	BLANK	H, h		H
+	*	BLANK	I, i		I
,		, (FIGS. N)	J, j		J
-		- (FIGS. A)	K, k		K
.		. (FIGS. M)	L, l		L
/		/ (FIGS. X)	M, m		M
Ø		Ø (FIGS. P)	N, n		N
1		1 (FIGS. Q)	O, o		O
2		2 (FIGS. W)	P, p		P
3		3 (FIGS. E)	Q, q		Q
4		4 (FIGS. R)	R, r		R
5		5 (FIGS. T)	S, s		S
6		6 (FIGS. Y)	T, t		T
7		7 (FIGS. U)	U, u		U
8		8 (FIGS. I)	V, v		V
9		9 (FIGS. O)	W, w		W
:		: (FIGS. C)	X, x		X
;		; (FIGS. V)	Y, y		Y
<	*	BLANK	Z, z		Z
=	*	BLANK	[	*	BLANK
>	*	BLANK	\	*	BLANK
?		? (FIGS. B)	]	*	BLANK
@	*	BLANK	^	*	BLANK
A, a		A	`	*	BLANK
B, b		B	{	*	BLANK
C, c		C	|	*	BLANK
D, d		D	}	*	BLANK
E, e		E	~	*	BLANK
F, f		F	_ (Underscore)		LETTERS
G, g		G	DEL		LETTERS

*Denotes inhibit of LETTERS-FIGURES shifting circuitry.
FIGS. -- FIGURES

D. CONTROLLER OPTIONING (Cont)

9. BAUDOT TO ASCII CONVERSION TABLE

BAUDOT (ITA2) INPUT	CONVERTS TO	ASCII (ITA5) OUTPUT	BAUDOT (ITA2) INPUT	CONVERTS TO	ASCII (ITA5) OUTPUT
A through Z		A through Z (Upper Case)	$ (FIGS. D)		$
			! (FIGS. F)		!
BLANK		NUL	& (FIGS. G)		&
LETTERS		OPTION K1 SI	# (FIGS. H)		#
		OPTION K2 NO	' (FIGS. J)		'
		CHARACTER	((FIGS. K)		(
FIGURES		OPTION R1 SO	) (FIGS. L)		)
		OPTION R2 NO	. (FIGS. M)		.
		CHARACTER	, (FIGS. N)		,
SPACE		SPACE	BELL (FIGS. S)		BEL
CARRIAGE RETURN		CARRIAGE RETURN	; (FIGS. V)		;
LINE FEED		LINE FEED	/ (FIGS. X)		/
- (FIGS. A)		-	" (FIGS. Z)		"
? (FIGS. B)		?	1 through 9		1 through 9
: (FIGS. C)		:			

FIGS. -- FIGURES

H. INTERFACE EXTERNAL CONNECTION

1. SIGNAL AND CONTROL CONNECTION

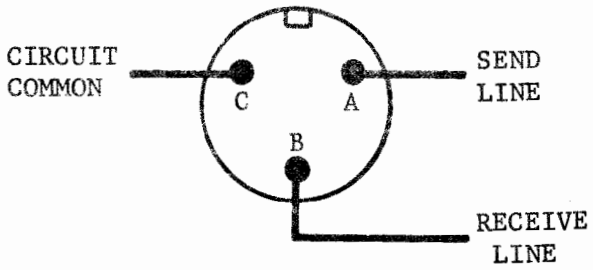
Connections for the signal and control leads to the set are made via military, screw type connectors, located at the lower back of the KD pedestal. The signal lines are terminated in a three pin connector on the left of the cabinet. The control (CTS) is terminated in a three pin connector, located in approximately the center of the pedestal. The following connectors must be supplied by the customer for connection to the set.

Signal connector	MS3106A 14S-7P
Control connector	MS3106A 14S-7SW

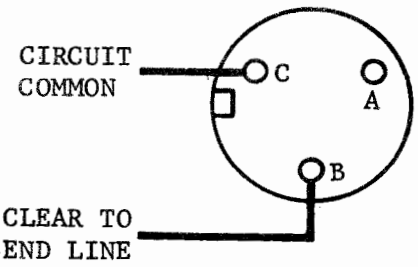
These connectors are available from several connector manufacturers.

The connector should be wired as follows:

SIGNAL
CONNECTOR
(MS3106A 14S-7P)

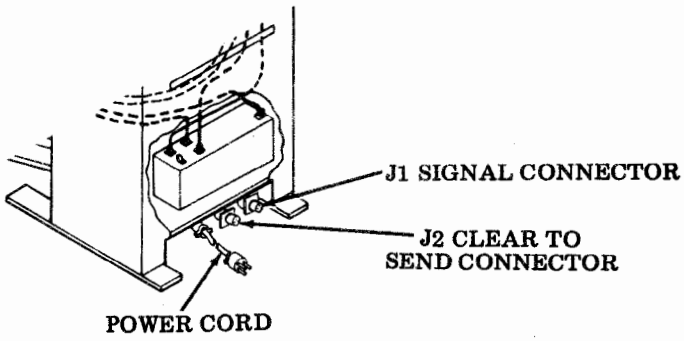


CONTROL
(Clear to Send)
CONNECTOR
(MS3106A 14S-7SW)



2. AC POWER CONNECTIONS

An ac power cord is provided with the set for connection to the ac power source. The power cord is terminated in a standard 3 prong ac plug and is eight feet long. Each cassette drive has a 10 foot power cord. The set and each cassette drive require a 3 wire, single phase, 115 V ac $\pm$ 10% 60 Hz $\pm$ 0.5 Hz power receptacle.



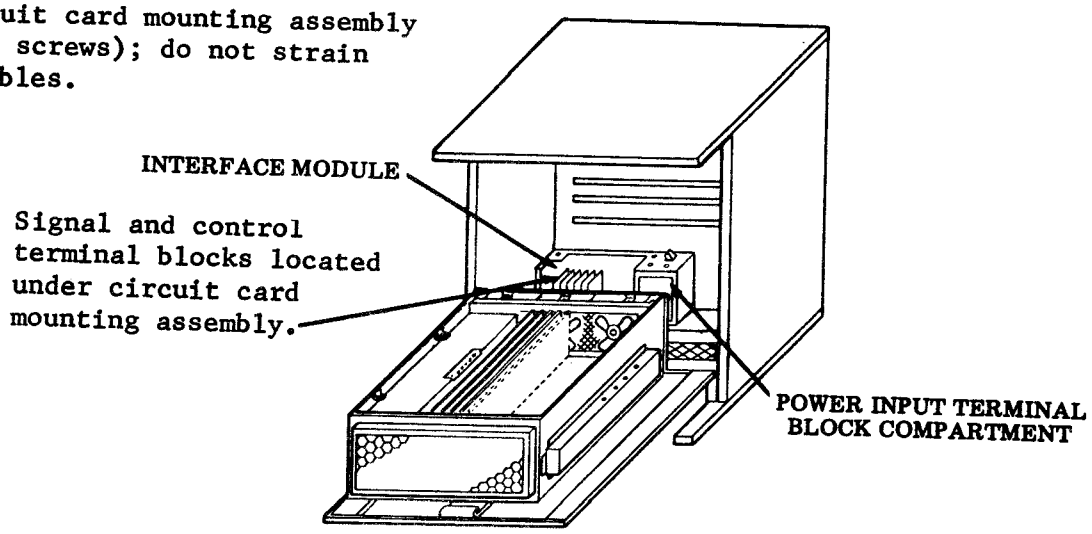
Prior to connecting set and cassete drives to power source, check for continuity between the ground lug of the ac plug and the unit frame using a VOM (Rx1 scale). If 50 Hz power is being used a pulley change is required at the printer and the cassette drivers.

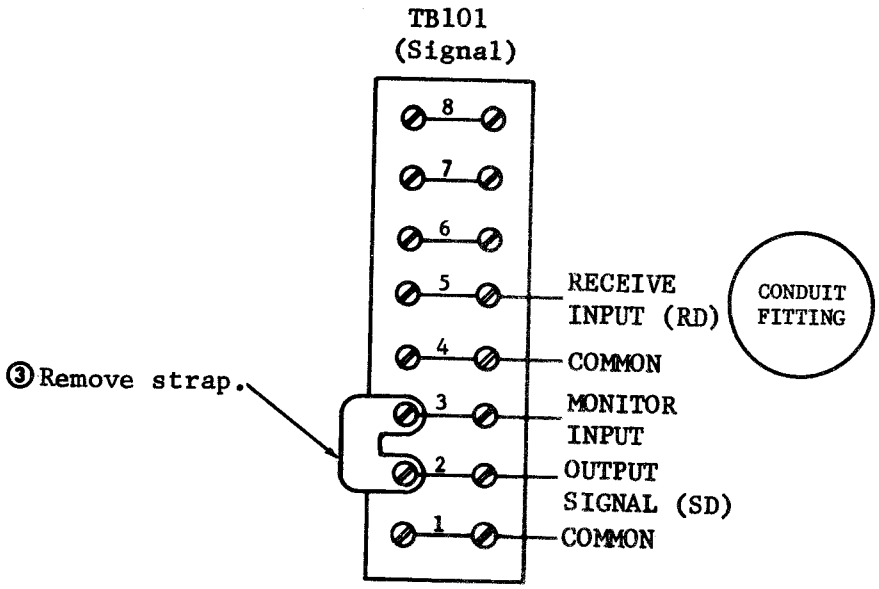
NOTE: If set is being used in system where send data is echoed back to sender, the half duplex strap in the interface assembly will have to be removed.

G. INTERFACE EXTERNAL CONNECTIONS (Cont)

① Remove cover from interface module (18 mounting screws).

② Remove circuit card mounting assembly (3 mounting screws); do not strain attached cables.

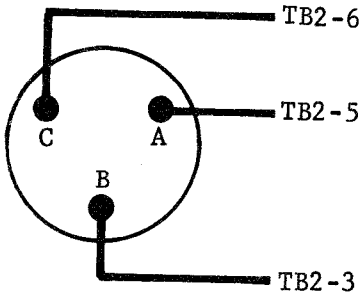




TAPE EDIT STATION CONNECTIONS

J1
MODEL 40 (NOTE 3)

J1 SIGNAL CONNECTOR

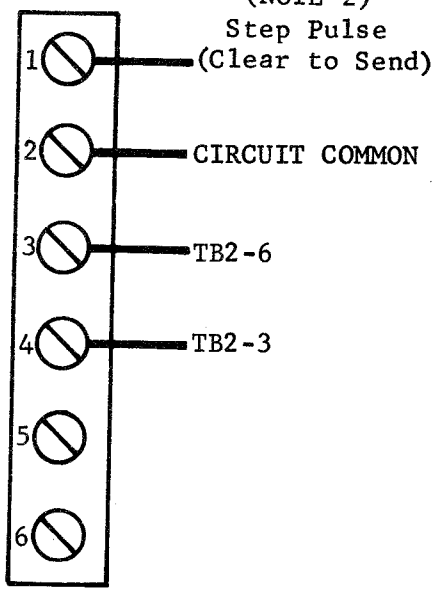


NOTE 1: Customer to provide cabling between Tempest Model 40 Set and Tempest Model 28 Tape Equipment. (Cable construction information from Teletype Corporation on request.)

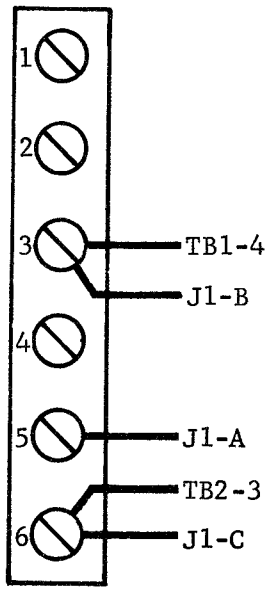
NOTE 2: Model 28 LXD ESA must have step pulse (clear to send) input (+6 V) to send. If step pulse is not available or not to be used, add a strap from TB1-1 to TB1-6.

NOTE 3: When clear to send input to the Tempest Model 40 is not used, remove the 303181 circuit card in slot Z4 of the interface.

TB1
TB TERMINAL BLOCK IN LXD ESA



TB2
TB TERMINAL BLOCK IN LPR ESA



PART 3 -- OPERATIONAL CHECKOUT

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A. GENERAL

The new set configuration shown in Part 2 of this supplement may be checked out using the off-line checkout procedure described in Manual 363, Part 3. The procedure described in Manual 363, Part 3 should be changed to proceed as follows:

Prior to applying ac power to the controller, insure that power is on to the tape cassette drives and the cassette is in the unlatched (cassettes disengaged) position (Manual 363, Page 3-2).

To insure that all tape cassettes are properly formatted, each tape cassette should be placed in the receive tape cassette drive and the erase function performed. The erase function should be performed prior to the off-line checkout of the cassette drive (Manual 363, Page 3-16, Step 69). Refer to How to Operate Manual 362, Page 20 for procedure to erase cassettes.

B. MONITOR TAPE CASSETTE CHECKOUT

The off-line checkout procedure of Manual 363, Part 3 does not check the operation of the monitor tape cassette since the monitor tape cassette has no local mode of operation. To perform an on-line check of the monitor tape cassette drive, two methods are available, depending on system protocal.

1. METHOD 1

If the system provides for on-line testing of terminals, a sample test message may be sent to the Test Center. After the test message has been sent, the monitor tape should be rewound, the cassette removed from the monitor tape cassette drive, placed in the send tape cassette drive and then a local send tape to display (refer to How to Operate Manual 362 for procedure). The message can then be checked to in-

B. MONITOR TAPE CASSETTE CHECKOUT (Cont)

1. METHOD 1 (Cont)

sure the monitor tape correctly copied the sent message. Rewind and erase tape in the receive cassette drive (refer to How to Operate Manual 362 for procedure) and replace tape cassette in monitor cassette drive.

2. METHOD 2

If system protocal does not allow on-line testing, temporarily disconnect the terminal from the line by removing the signal line connector from the rear of the set. Add the half-duplex strap between terminals 2 and 3 of TB101 of interface if it was removed during installation. For this test, the clear-to-send input must be turned on or temporarily remove the 303181 circuit card in slot Z4 of the interface assembly. Now the following procedure may be followed to check out the monitor tape cassette drive. During this test, the set must be in the manual mode of operation (POLL/SEL lamp not lit).

3. CHECKOUT PROCEDURE

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
1	Prepare a test message on display in keyboard-display mode (DISP LINE, DISP LCL and DISP SEND lamps not lit). Start message with S_{O_H}. End message with E_{T_X}. Home cursor.	Message appears on display as typed on keyboard.	
2	Depress PTR LINE. Depress DISP SEND. Depress DISP LINE.	PTR LINE lamp lights. DISP SEND lamp lights. DISP LINE lamp lights. Cursor moves through message and stops at character position after E_{T_X}. Printer motor starts and printer copies message. Display lamps will extinguish or on-line receive depending on how Option U was selected.	
3	Depress DISP LINE if lit. Depress CNTRL MODE.	DISP LINE lamp extinguishes. Control message appears on display.	

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
4	Position cursor over character P in line 3. Type a character R. Position cursor to character position to left of block number in line 5. Type a character R. Depress LINE FEED.	Send and monitor tapes rewind. Indicator light on top of cassette drives extinguish.	
5	Remove tape cassette from monitor tape cassette drive and place it in the send tape cassette drive.		
6	After cassette self-test is complete, enter block number of test message (001 if cassette was not used before) in line 3. Depress LINE FEED.	Send tape cassette positions to test message.	
7	Depress CNTRL MODE. Position cursor to the beginning of the line after original message. Depress DISP LCL. Depress SEND TAPE LCL.	Control message disappears and original test message appears. DISP LCL lamp lights. SEND TAPE LCL lamp lights. Test message appears on display below original message. These messages should be the same, except line feeds (≡) which were sent are stored on monitor tape as ←, ←≡.	
8	Depress CNTRL MODE. Type a character R over the character P in line 3. Type a character R in first character position to left of block number in line 4. Depress LINE FEED.	Test messages disappear; control message appears. Character R overwrites character P. Character R appears. Both send and receive tapes rewind.	

B. MONITOR TAPE CASSETTE CHECKOUT (Cont)

3. CHECKOUT PROCEDURE (Cont)

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
9	Remove tape cassette in send tape cassette drive and place it in receive tape cassette drive. After cassette drive self-test has been completed, type characters XXX in line 9 and depress LINE FEED.	Tape cassette is erased.	
10	Remove tape cassette from receive tape cassette drive and replace it in monitor tape cassette drive. Replace tape cassettes in send and receive tape cassette drives which were removed in Steps 5 and 9.		

Remove the half-duplex strap between terminals 2 and 3 of TB101 of the interface assembly if it was installed for this test. Replace the 303181 circuit card in slot Z4 if it was removed for this test. Reconnect the signal line connector to the signal input jack at the rear of the set.

C. ON-LINE CHECKOUT

To perform an on-line check of the set, two methods are available depending on system protocal.

1. METHOD 1

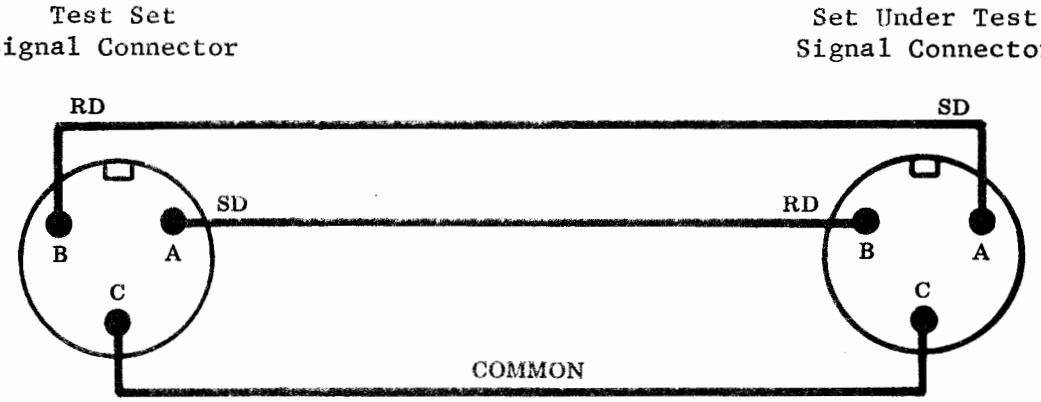
If system protocal allows for on-line testing, a sample test message may be sent to the Test Center in both the manual and poll/select modes. In the poll/select mode, the Test Center must send polling sequences before the set under test can send, and selecting sequences before the set under test can receive.

2. METHOD 2

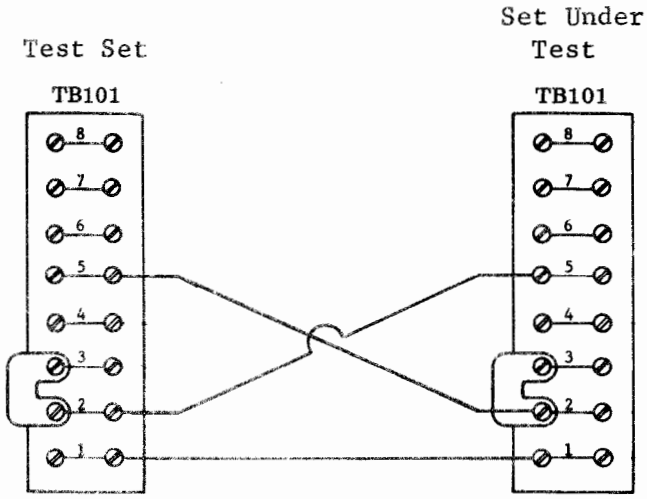
If system protocal does not allow on-line testing or if transmission facilities to the Test Center are not available, an alternate method called back-to-back can be used.

This method requires the use of another functional KD Set (referred to as test set). The test set should be optioned for 8-level ASCII code operation at 150 baud. The test set should be connected as indicated below. If the cable connectors are used, a special back-to-back cable will have to be made locally.

Wiring of Back-to-Back Cable Assembly



Alternate method of connecting using TB101 of interface assembly instead of cable connections shown above. Cabling for this hookup must be supplied locally.



In either arrangement, the clear-to-send input must be turned on (+6 V). If no clear-to-send input is available temporarily remove the 303181 circuit card in slot Z4 of each interface assembly.

C. ON-LINE CHECKOUT (Cont)

3. MANUAL MODE CHECKOUT

The manual mode checkout must be performed with the POLL/SEL lamp not lit and the 5-level communication interface not selected (no character X in line 1 of control mode) in both the test set and the set under test.

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
1	Locally prepare a test message on set under test. Start message with S_{O_H} and end message with E_{T_X}.	Message appears on display.	
2	Condition test set to receive (DISP SEND and POLL/SEL not lit; DISP LINE lamp lit).		
3	Home cursor on set under test. Depress DISP SEND. Depress DISP LINE.	Cursor goes to home position. DISP SEND lamp lights. DISP LINE lamp lights. Cursor moves through message and stops at character position after E_{T_X}. Message is received on display of test set.	
4	Locally copy test message on display on receive tape of the set under test. (Refer to How to Operate Manual 362 for procedure.) Rewind receive tape and place in send tape cassette drive. Position send tape to send test message. Depress SEND TAPE LINE.	Send tape sends test message and test set receives message on display.	

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
5	On set under test enter control mode and place keyboard on-line (type a character X in line 10 and depress LINE FEED). Exit control mode. Type a test message on keyboard.	 Message will be received on test set display. NOTE: If Option D2 was selected, message will be copied on set under test display also.	
6	Locally prepare a test message on test set. Start message with S_{O_H} and end with E_{O_T}. Condition set under test to receive (DISP SEND lamp not lit; DISP LINE, PTR LINE, and REC TAPE LINE lamps lit. Send test message from test set.	 Display, printer and receive tape receive message from test set. NOTE: Set under test will take received E_{O_T}, transform it into an E_{T_X}, display it on display, and record it on receive tape.	
7	To check receive tape: Depress CNTRL MODE. Place an X in line 7 of control message. Depress LINE FEED.	Control message appears. Receive tape listing will be displayed with first 55 characters of test message.	

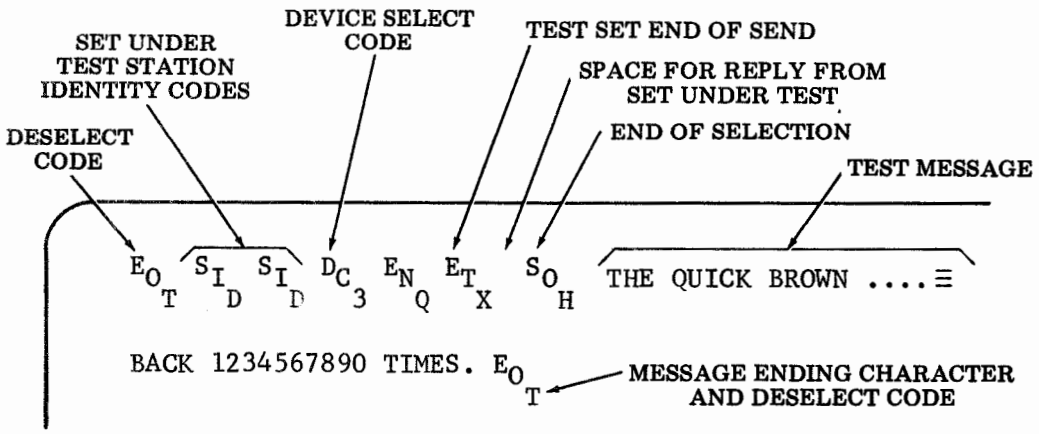
C. ON-LINE CHECKOUT (Cont)

4. POLL/SELECT MODE CHECKOUT

In this checkout procedure, the set under test is in the poll/select mode (lamp lit) and the test set is in the manual mode (POLL/SEL lamp not lit). In this checkout procedure, the test set is functioning as the Central Processing Unit and must therefore generate all the poll and select codes. To perform this, the test set keyboard must be on-line (character X in line 10 of control mode).

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
1	Condition test set display to receive (DISP SEND lamp not lit; DISP LINE lamp lit). With no sending device on set under test being selected to send, send the following poll sequence from test set keyboard. E_{O_T} $S_{I_{D_1}}$ $S_{I_{D_2}}$ D_{C_1} E_{N_Q} $S_{I_{D1}}$ = First station identity character of set under test. $S_{I_{D_2}}$ = Second station identity character of set under test.	Set under test will receive poll sequence and reply with E_{O_T} (no traffic). Reply is displayed on test set monitor.	
2	Locally prepare a test message on set under test display. Start message with S_{O_H} and end message with E_{O_T}. Home cursor. Prepare set under test display to send (DISP SEND and DISP LINE lamps lit). Send poll sequence from test set keyboard. E_{O_T} $S_{I_{D_1}}$ $S_{I_{D_2}}$ D_{C_1} E_{N_Q}	No message transfer will take place until poll sequence is received by set under test. The set under test receives poll sequence and then sends test message to test set which displays message. Any further transmission from test set to set under test	

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
2 (Cont)		will be ignored until set under test receives a valid poll or select code.	
3	In test message on set under test display, change message ending character E_{O_T} to E_{T_X}. Condition display to send on-line as outlined in Step 2. Send poll sequence from test set keyboard as in Step 2.	Test message is received on test set display as in Step 2. However, now the printer only of set under test is conditioned to receive a message. Characters typed on test set keyboard will be printed on set under test printer until it receives an E_{O_T}.	
4	On test set, enter control mode. Delete keyboard on line mode (delete character X in line 10). Depress LINE FEED and exit control mode. Locally prepare following message on test set display.		

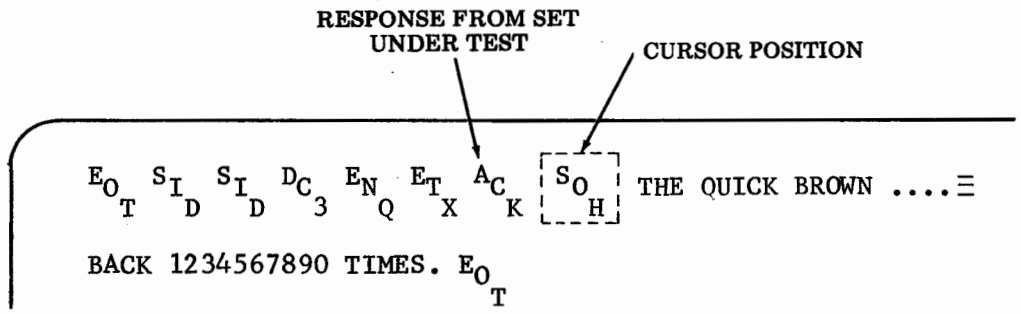


	Home cursor.		

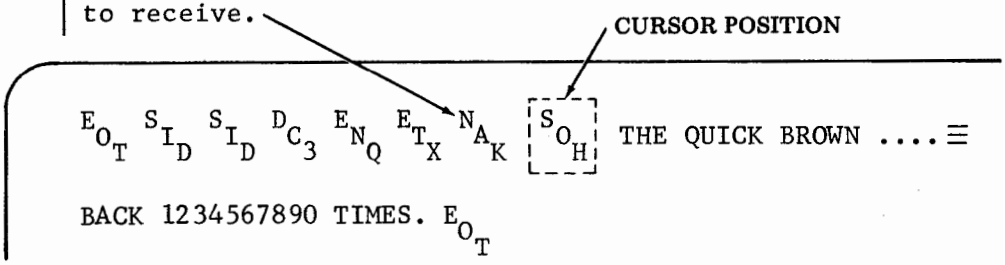
C. ON-LINE CHECKOUT (Cont)

4. POLL/SELECT MODE CHECKOUT (Cont)

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
4 (Cont)	Condition set under test display to receive (DISP SEND lamp not lit; DISP LINE lamp lit).		
	On test set, depress DISP SEND.	DISP SEND lamp lights.	
	Depress DISP LINE.	DISP LINE lamp lights. Test set sends E_{O_T} and switches back to on-line receive (DISP SEND lamp extinguishes).	
	Depress DISP SEND again.	Cursor moves to character position after E_{T_X}. Test set has sent select code sequence for set under test display. Set under test will answer with an A_{C_K} as display is ready to receive.	



	Depress DISP SEND on test set again.	Cursor moves through message and stops at character position after E_{O_T}. Test set has sent test message and message appears on set under test display.	
5	Repeat Step 4 except place set under test display in local (DISP LCL lamp lit).	When set under test receives its select code for the display (D_{C_3}), the display is not	

STEP	PROCEDURE	RESULTS	TROUBLE ANALYSIS
5 (Cont)	Negative acknowledge to select sequence. Device not available or unable to receive.	available to the line to receive data. The set under test will therefore answer select code with a negative acknowledge (N_{A_K}).	
			
		Any further transmission to set under test will be ignored unless it is another select code sequence.	
6	Using procedure outlined in Step 4, the remaining receiving devices may be selected by substituting appropriate select code for D_{C_3}. See below. Select Code — Selects D_{C_2} Printer and receive cassette D_{C_3} Monitor D_{C_4} Receive cassette only = Printer only with option to select printer and receive cassette	When set under test set receives select code for a receiving device, it will answer A_{C_K} if device is available and able to receive. If device is unavailable or unable to receive, set will answer N_{A_K}.	

PART 4 -- TROUBLESHOOTING

INDEX

		PAGE
A.	GENERAL	1
B.	TERMINAL ANALYSIS	2
C.	COMPONENT ANALYSIS	6
	CONTROLLER	6

A. GENERAL

To use the troubleshooting information, always start with Analysis Question 1 of B. TERMINAL ANALYSIS, and follow the indicated procedure to the directive which specifies proceeding to C. COMPONENT ANALYSIS. Then follow the specific component analysis indicated (ie, power supply, display monitor, opcon, etc) starting with Analysis Question 1 to isolate and correct the trouble by replacing the indicated defective component.

If replacement of the part or subcomponent indicated in C. COMPONENT ANALYSIS does not correct the trouble, replace the next higher order of component (ie, fuse, power distribution assembly, display monitor, or entire terminal).

When installing a replacement component, make certain that all options (if present) in this component are implemented for proper set operation.

Where more than one component is specified for replacement, they should be substituted one at a time in the order specified. The original component should be replaced if the trouble is not corrected before making the next indicated substitution.

Once the trouble has been corrected, the terminal should be checked out to be sure that it is performing properly. Refer to PART 3 -- OPERATIONAL CHECKOUT.

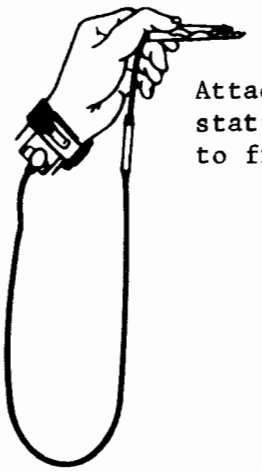
The following caution procedures must be observed when troubleshooting a Model 40 Station or Set.

A. GENERAL (Cont)

CAUTION 1: TURN OFF ALL POWER OR SIGNAL SOURCES BEFORE REMOVING OR REPLACING ANY COMPONENT.

CAUTION 2: TO AVOID POSSIBLE INTERNAL DAMAGE TO CIRCUITRY, WEAR A 346392 STATIC DISCHARGE STRAP CONNECTED TO GROUND TO ALLOW STATIC DISCHARGE BEFORE HANDLING CIRCUIT CARDS FOR REMOVAL OR REPLACEMENT. AVOID TOUCHING CIRCUIT LANDS OR COMPONENTS AS MUCH AS POSSIBLE.

Attach static ground strap tightly to wrist as shown.



Attach clip end of static discharge strap to frame ground.

To locate components, circuit cards, connectors, test switches, indicator lamps and other elements indicated in the troubleshooting information, refer to PART 6 -- COMPONENT ACCESS.

For wire color codes, cable, connector, and other wiring indicated for continuity checks etc, in troubleshooting, refer to wiring diagrams in applicable wiring diagram packages.

The following test equipment is required for troubleshooting the components.

- Volt-Ohm-Milliameter, Triplett Model 630 APL or equivalent
- Oscilloscope, Tektronic Model 7904 e/w:
  2 -- 7A16A Single Trace Amplifiers
  1 -- 7B70 Time Base Unit
  or equivalent

B. TERMINAL ANALYSIS

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Does POLL/SEL lamp on opcon light when power is turned on and approximately 14 seconds later PTR LINE lamp light?	Go to 4.	Go to 2.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
2. Do fans turn when power is turned on?	Go to 3.	Check ac to fan. Refer to wiring diagram. Refer to PART 6 -- COMPONENT ACCESS of this supplement. Power cable connected. Power switch on. AC present at fan assembly connector.
3. Are all three LED indicators in power supply on?	Go to Manual 363, Page 4-16, 3. OPCON. Go to Page 4-6, CONTROLLER of this supplement.	Go to Manual 363, Page 4-5, 1. 40PSU103 POWER SUPPLY.
4. Does raster appear on display with brightness control to full intensity (CCW)?	Go to 10.	Go to 5.
5. Is I5 red DRIVE lamp (in display monitor) on?	Go to 6.	Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR.
6. Is I7 red PILOT lamp (next to fuse on power distribution assembly in display monitor) on?	Go to 7.	Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR.
7. With monitor OFF/ON control switch ON (CCW) and operator brightness control to full intensity (CCW) is raster visible?	Go to 9.	Go to 8.
8. Is I6 HIGH VOLTAGE lamp in display monitor on?	Check Master Brightness adjustment (Manual 363, Page 5-3). Go to 9.	Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR.
9. Is cursor displayed on monitor?	Go to 10.	Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR. Go to Page 4-6, CONTROLLER of this supplement.

B. TERMINAL ANALYSIS (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
10. In keyboard display mode, can data (including editing functions) be entered from the opcon to display monitor on all segments?	Go to 11.	Go to Manual 363, Page 4-16, 3. OPCON. Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR. Go to Page 4-6, CONTROLLER of this supplement.
11. Are characters displayed on display monitor distorted?	Go to Manual 363, Page 4-9, 2. DISPLAY MONITOR. Go to Page 4-6, CONTROLLER of this supplement.	Go to 12.
12. Do characters displayed on display monitor correspond to those generated from opcon?	Go to 13.	Go to Page 4-6, CONTROLLER of this supplement. Go to Manual 363, Page 4-16, 3. OPCON.
13. Does control mode message appear on display when CNTRL Mode key is depressed?	Go to 14.	Go to Manual 363, Page 4-16, 3. OPCON. Go to Page 4-6, CONTROLLER of this supplement.
14. Does set respond correctly to commands entered on the display in the control mode?	Go to 15.	Go to Page 4-6, CONTROLLER of this supplement.
15. Does set have a printer?	Go to 18.	Go to 16.
16. Does set have magnetic tape cassettes?	Go to 22.	Go to 17.
17. Does set perform properly on line?	Place in service.	Go to Page 4-6, CONTROLLER of this supplement.
18. Does printer respond properly when the PTR LCL key is used?	Go to 20.	Go to 19.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
19. Does type carrier symbol (A/A or A/B) print in every column when printer Test switch TS9 is On and printer cover is closed or TS5 interlock switch is in maintenance position?	Go to Page 4-6, CONTROLLER of this supplement.	Go to Manual 363, Page 4-21, 4. PRINTER.
20. Does printer receive on-line properly?	Go to 21.	Go to Page 4-6, CONTROLLER of this supplement.
21. Does set have magnetic tape cassettes?	Go to 22.	Place in service.
22. After a cassette is placed in cassette drives, does run status lamp begin to flash?	Go to Manual 363, Page 4-47, 7. CASSETTE DRIVE.	Go to 23.
23. When in control mode, do block numbers appear in the cassette block number?	Go to 24.	Check wiring to cassette. Cassette power on. Go to Page 4-6, CONTROLLER of this supplement. Go to Manual 363, Page 4-47, 7. CASSETTE DRIVE.
24. Does cassette respond properly in local operation?	Go to 25.	Go to Page 4-6, CONTROLLER of this supplement.
25. Do cassettes send and receive properly on-line?	Place in service.	Go to Page 4-6, CONTROLLER of this supplement.

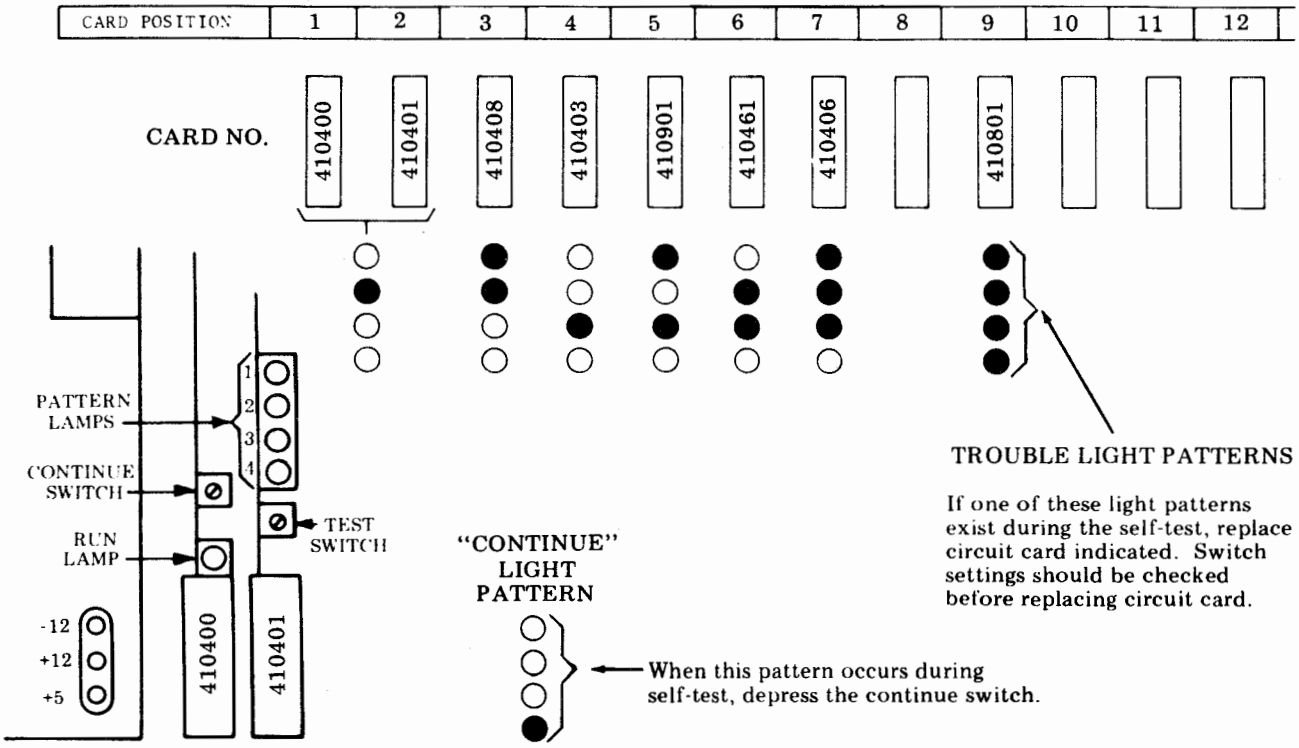
C. COMPONENT ANALYSIS

NOTE: For component analysis of power supply, display monitor, printer, opcon, interface and cassette drive, refer to Manual 363, Part 4.

CONTROLLER

The use of Controller Arrangement Forms is necessary to troubleshoot using self-test. Refer to Page 2-18, 6. CONTROLLER ARRANGEMENT FORMS of this supplement.

Sample Controller Arrangement Form



NOTE: Some arrangements have more than one continue light pattern.

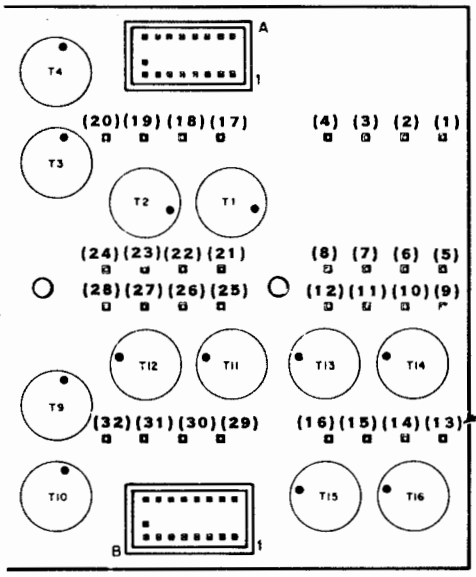
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Do all three voltage indicators light on power supply when power is turned on?	Go to 2.	Go to Manual 363, Page 4-5, 1. 40PSU103 POWER SUPPLY.
2. Depress and hold test switch. Do all pattern lamps and run lamp light?	Go to 4.	Go to 3.
3. Do correct voltages appear at power supply output terminals? Refer to Manual 363, Page 4-5, 1. 40PSU103 POWER SUPPLY for voltages.	Go to 4.	Go to Manual 363, Page 4-5, 1. 40PSU103 POWER SUPPLY.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
4. Replace 410401 circuit card in slot 2 of controller. Depress test switch. Do all pattern lamps and run lamp light?	Go to 7.	Go to 5.
5. Replace 410400 circuit card in slot 1 of controller. Depress test switch. Do all pattern lamps and run lamp light?	Go to 7.	Go to 6.
6. Remove remaining cards one at a time. After each card is removed, push test switch to see if all pattern lamps and run lamp light. Replace defective card and go to 7.	Go to 7.	Go to 7.
7. Release test switch. Controller will automatically run self-test. Does a trouble light pattern appear on pattern lamps?	Go to 8.	Go to 10.
8. Before removing circuit card indicated by trouble light pattern, be sure card is properly seated in card connector. Does trouble light pattern repeat when test is run again?	Go to 9.	Go to 10.
9. Remove circuit card indicated by trouble light pattern. Check setting of address switches on card. Refer to Page 2-18, 6. CONTROLLER ARRANGEMENT FORMS of this supplement for appropriate form. Were switch settings correct?	Replace circuit card.	Correct switch settings and retest.

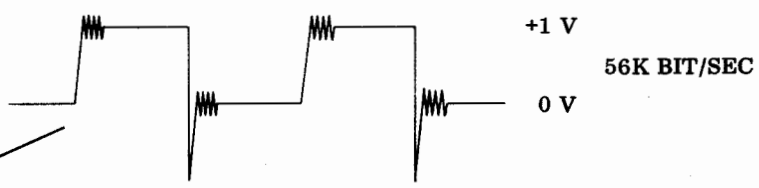
C. COMPONENT ANALYSIS (Cont)

CONTROLLER (Cont)

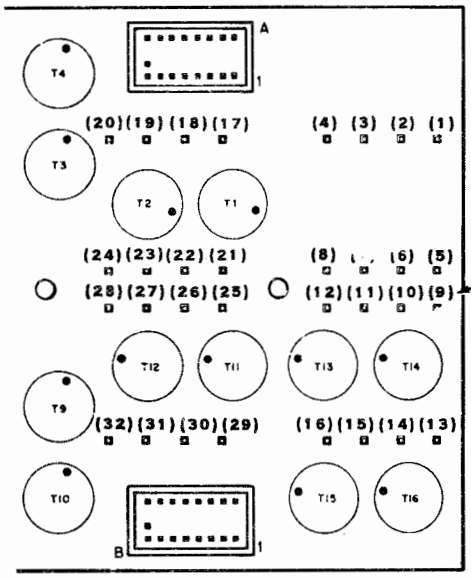
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
10. Does controller arrangement have continue light pattern? Refer to Page 2-18, 6. CONTROLLER ARRANGEMENT FORMS of this supplement. Does continue light pattern appear on pattern lamps?	Push continue switch. Go to 11.	Go to 11.
11. Does set have a display monitor?	Go to 12.	
12. Does display pattern appear on display monitor? Refer to Manual 363, Page 3-2, Step 4 for pattern.	Go to 13.	Go to 31.
13. Does set have a full opcon?	Go to 14.	
14. In keyboard display mode, do characters generated on opcon appear on display?	Go to 16.	Go to 15.
15. Do SSI signals appear at posts 13, 14, 15, and 16 (opcon SSI) of 410157 circuit card on right wall of controller?	Check wiring to opcon. Refer to WDPs supplied with set. (Continuity test) Go to 29.	Replace 410406 circuit card in slot 4. Replace 410157 circuit card.



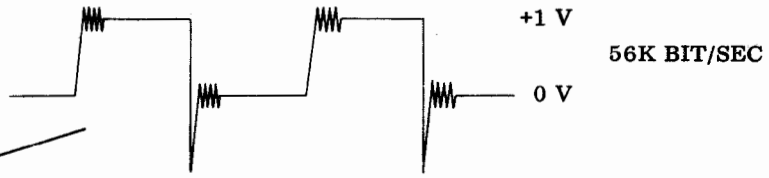
410157 Circuit Card



ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
16. On sets with printers, can information on display be transferred to printer by depressing PTR LCL? (Place ETX at end of message, home cursor, depress PTR LCL, DISP SEND, and DISP LCL.)	Go to 18.	Go to 17.
17. Do SSI signals appear at posts 9, 10, 11, and 12 (printer SSI) of 410157 circuit card on right wall of controller?	Check wiring to printer. Refer to WDPs supplied with set. (Continuity test)	Replace 410406 circuit card in slot 4. Replace 410157 circuit card.
18. On KDPM 2 Sets, when in control mode, do block numbers appear for send, receive and monitor tape block numbers?	Go to 20.	Go to 19.
19. Do SSI signals appear at posts 29, 30, 31 and 32 (send cassette), and 25, 26, 27 and 28 (receive cassette), and 21, 22, 23 and 24 (monitor cassette) of 410157 circuit card mounted on right wall of controller?	Check wiring to each cassette drive (continuity check). Refer to wiring diagrams supplied with set.	Replace 410406 circuit card in slot 4 for send and receive cassettes. Replace 410406 circuit card in slot 5 for monitor cassette. Replace 410157 circuit card.

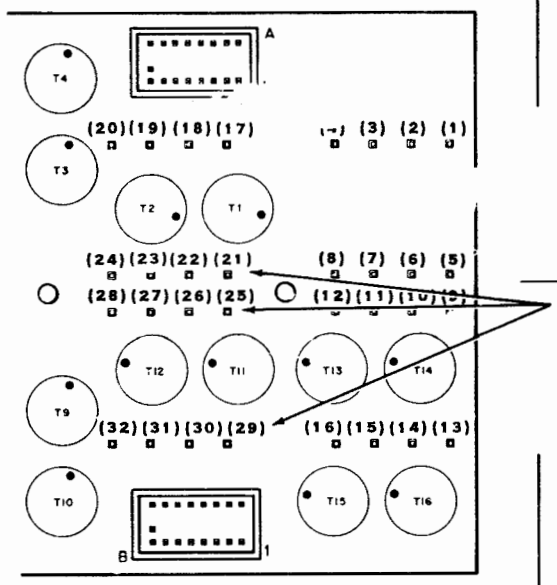
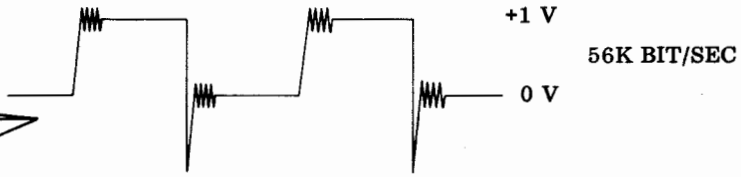


410157 Circuit Card

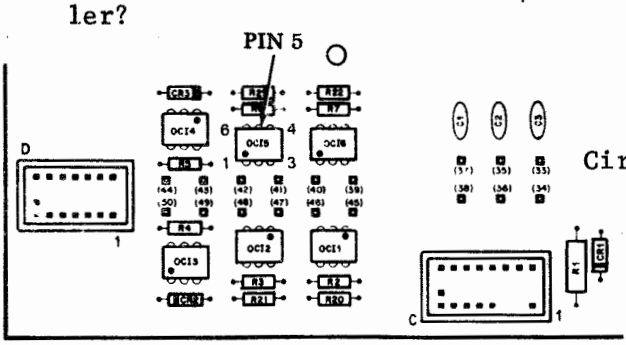


C. COMPONENT ANALYSIS (Cont)

CONTROLLER (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
19. (Cont)  410157 Circuit Card  		
20. Can messages be sent from display to receive tape locally? ①Prepare message ending with ETX. ②Home cursor. ③Depress REC TAPE LCL. ④Depress DISP SEND. ⑤Depress DISP LCL. Check receive tape by listing receive tape heading and checking first 55 characters of message.	Go to 22.	Go to Manual 363, Page 4-47, 7. CASSETTE DRIVE.
21. Can message be transferred from send tape to display locally? ①Position send tape to a recorded block and select single message mode. ②DISP SEND lamp not lit. ③Depress DISP LCL. ④Depress SEND TAPE LCL.	Go to 22.	Go to Manual 363, Page 4-47, 7. CASSETTE DRIVE.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
22. Place set in manual on-line mode (POLL/SEL lamp not lit). If set is full duplex, temporarily add a strap between terminals 2 and 3 of TB101 in interface assembly. For this test, clear-to-send input must be turned on or temporarily remove 303181 circuit card in slot Z4 of interface assembly. ①Select keyboard on-line mode. ② Disp Rec (DISP SEND lamp not lit). ③Depress DISP LINE. ④Depress PTR LINE (if set has printer). ⑤ Depress REC TAPE LINE (if set has cassette drive). Do characters generated on the keyboard appear on display printer and receive tape?	Place in service: ①Remove strap on TB101 if installed. ②Replace 303181 circuit card in slot Z4 of interface assembly if removed.	Go to 23.
23. When sending characters, do the send mark and space lamps on 410411 CIU circuit card flicker?	Go to 26.	Go to 24.
24. Is there approximately a +5 V dc signal at pin 5 of OCI5 on 410157 circuit card on right wall of controller?	Replace 410411 circuit card.	If 303181 circuit card was removed from interface assembly, replace 410157 circuit card. If clear-to-send input to set was turned on, go to 25.



C. COMPONENT ANALYSIS (Cont)

CONTROLLER (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
25. Is there a +1.5 V dc signal at post 42 of 410157 circuit card? NOTE: When checking this signal, the scope or meter common should be connected to post 38.	Replace 410157 circuit card.	Check wiring to interface. Refer to 9617WD in WDP supplied with set. Go to Manual 363, Page 4-42, 6. INTERFACE.
26. Is there a 0 to +1.5 V dc inverted data signal at pin 1 of OCI4 on 410157 circuit card?	Go to 27.	Check cable to 410157 circuit card. Replace 410411 circuit card.
27. Is there a 0 to +1 V dc inverted data signal at post 43 of 410157 circuit card? NOTE: When checking this signal, the scope or meter common should be connected to post 38.	Go to 28.	Replace 410157 circuit card.
28. When sending a character, do the receive mark and space lamps on 410411 CIU circuit card flicker?	Replace 410411 circuit card.	Go to 29.
29. Is there a 0 to +1.5 V dc inverted character signal at post 47 of 410157 circuit card?	Go to 30.	Check wiring in interface. Refer to 9619WD in WDP supplied with set. Go to Manual 363, Page 4-42, 6. INTERFACE.
30. Is there a -5 to +5 V dc character signal at pin 4 of OCI2 on 410157 circuit card?	Replace 410411 circuit card.	Replace 410157 circuit card.
31. Is there a +5 V dc signal at post J3 of 410555 circuit card mounted on right side of controller?	Go to 32.	Check wiring to back panel. Check 407548 cable assembly.

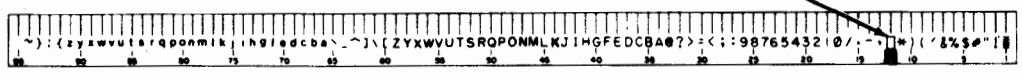
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
30. (Cont)		If no continuity, replace 400579 low paper switch assembly. If above fails to clear trouble, replace printer.
31. Does paper out lamp light when a paper out condition exists (tractor feed printer operating in cabinet)?	Go to 32.	Remove 410640 circuit card. Check continuity from J3 connector, terminal 11 to J114 connector, terminal 1. Continuity when paper is out. If no continuity, replace 402613 paper out switch assembly. Check continuity from J3 connector, terminal 10 to 11. No continuity when paper is out. If continuity is present, replace 402613 paper out switch assembly. If switch above checks good, check continuity of lamp in PAPER switch on cabinet from P114 connector, terminal 1 to 2. If no continuity, check 333588 lamp or 335123 push-button switch.
32. Replace printer in cabinet and connect all cables. Install paper and close cabinet. Turn power on. Depress red PAPER push-button. Does motor run?	Go to 33.	Check for continuity on J3 connector from terminal 5 to 11 when PAPER pushbutton is depressed. If no continuity, replace 400561 switch on friction feed printer or replace 335123 switch (PAPER) on cabinet associated with tractor feed printer. If continuity is present, replace 410640 circuit card.

C. COMPONENT ANALYSIS (Cont)

4. PRINTER (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
33. Generate 20 to 30 lines of printer copy by depressing TEST key on ROP opcon or by sending (PRINT LOCAL) from display monitor in a KDP arrangement. Is copy free of horizontal ink smudges caused by ribbon rubbing against paper?	Go to 34.	Check Left and Right Ribbon Guides (Final) adjustment (Page 5-21). Check Paper Positioning Shaft (Final) adjustment (Page 5-16).
34. Is printer copy free from double print or ghost images?	Go to 35.	Check Left and Right Carrier Sprocket adjustments (Page 5-14). Check that type pallets are seated properly in carrier. Seat pallets to ride against backup bar. Replace type carrier.
35. Is printer copy clear and easily readable?	Go to 36.	Replace 402444 ribbon. Check following adjustments: Backup Bar (Preliminary) (Page 5-13). Left and Right Carrier Sprocket (Page 5-14). Left and Right Ribbon Guides (Final) (Page 5-21).
36. Is printed paper free from embossing (especially noticeable on characters such as hyphen or underline)?	Go to 37.	Check Backup Bar (Preliminary) adjustment (Page 5-13). Replace type carrier.
37. Is print density uniform throughout line without gradual variations?	Go to 38.	Check Backup Bar (Preliminary) and Left and Right Carrier Sprocket adjustments (Pages 5-13 and 5-14).

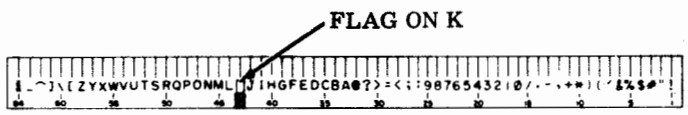
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
38. Is print density uniform throughout line without random variations?	Go to 39.	Check Paper Positioning Shaft (Final) adjustment (Page 5-16). Check Left Carrier Sprocket adjustment (Page 5-14).
39. Are bottoms of characters printed clearly (not light) at both ends of line?	Go to 40.	Check Left and/or Right Carrier Sprocket adjustments (Page 5-14). If printing is light at left end of line, replace 400201 front casting assembly. If printing is light at right end of line, replace 400300 right casting assembly.
40. Are adjacent characters in type carrier printed in place of proper character (ie, T instead of S or B instead of A -- one character delay)?	Check the following: Flag Sensor Gap adjustment (Page 5-16), Impeller Shaft Sensor Gap adjustment (Page 5-28), and type carrier to see that flags are on proper type pallet (flag on K for monocase type carrier and on + for up-low type carrier). Rotate impeller shaft and check to see that flags do not strike right ribbon guide bracket.	Go to 41.



Character Sequence in Up-Low Type Carrier

C. COMPONENT ANALYSIS (Cont)

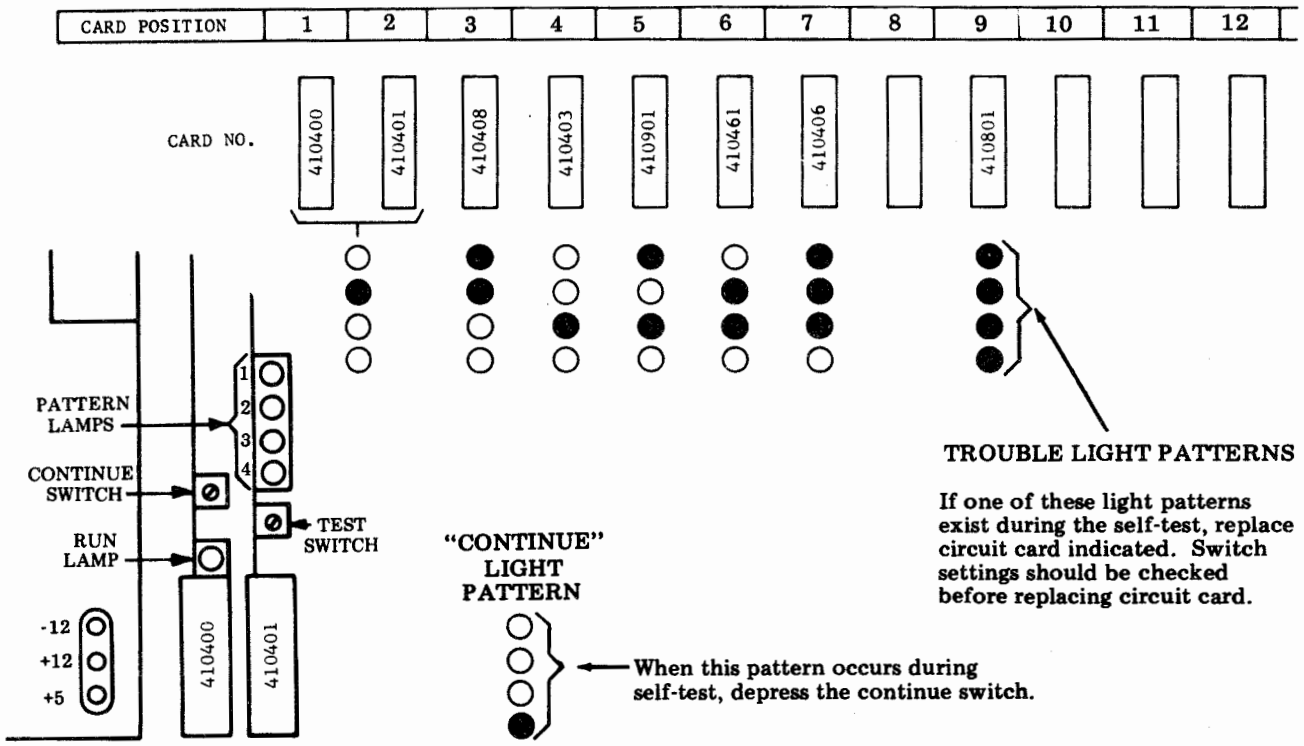
4. PRINTER (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
40. (Cont)  Character Sequence in Monocase Type Carrier		
41. Are all individual characters printed clearly when receiving locally or on-line?	Place printer in service.	Check type carrier for missing, broken, distorted, or dirty type pallets. Replace printer.

5. CONTROLLER

The use of Controller Arrangement Forms is necessary to troubleshoot using self-test. Refer to Page 2-28, 6. CONTROLLER ARRANGEMENT FORMS.

Sample Controller Arrangement Form



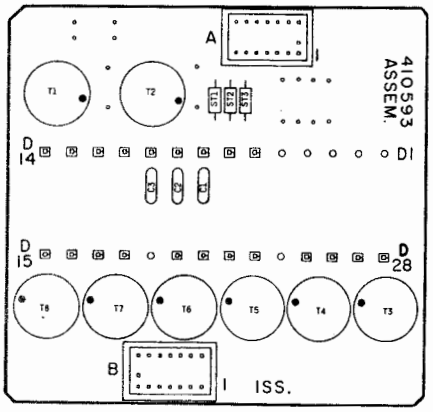
NOTE: Some arrangements have more than one continue light pattern.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Do all three voltage indicators light on power supply when power is turned on?	Go to 2.	Go to Page 4-5, 1. 40PSU103 POWER SUPPLY.
2. Depress and hold test switch. Do all pattern and run lamps light?	Go to 4.	Go to 3.
3. Do correct voltages appear at power supply output terminals? Refer to Page 4-5, 1. 40PSU103 POWER SUPPLY for voltages.	Go to 4.	Go to Page 4-5, 1. 40PSU103 POWER SUPPLY.

C. COMPONENT ANALYSIS (Cont)

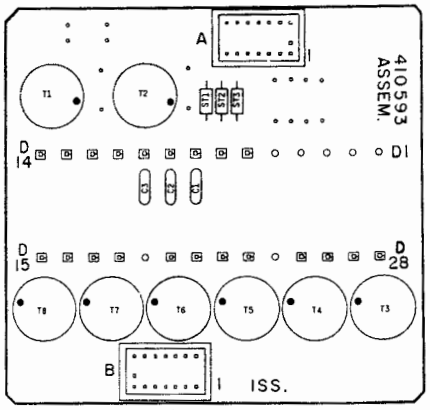
5. CONTROLLER (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
4. Replace 410401 circuit card in slot 2 of controller. Depress test switch. Do all pattern lamps and run lamp light?	Go to 7.	Go to 5.
5. Replace 410400 circuit card in slot 1 of controller. Depress test switch. Do all pattern lamps and run lamp light?	Go to 7.	Go to 6.
6. Remove remaining cards one at a time. After each card is removed, push test switch to see if all pattern lamps and run lamp light. Replace defective card and go to 7.	Go to 7.	Go to 7.
7. Release test switch. Controller will automatically run self-test. Does a trouble light pattern appear on pattern lamps?	Go to 8.	Go to 10.
8. Before removing circuit card indicated by trouble light pattern, be sure card is properly seated in card connector. Does trouble light pattern repeat when test is run again?	Go to 9.	Go to 10.
9. Remove circuit card indicated by trouble light pattern. Check setting of address switches on card. Refer to Page 2-28, 6. CONTROLLER ARRANGEMENT FORMS for appropriate form. Were switch settings correct?	Replace circuit card.	Correct switch settings and retest.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
10. Does controller arrangement have continue light pattern? Refer to Page 2-28, 6. CONTROLLER ARRANGEMENT FORMS. continue light pattern appear on pattern lamps?	Push continue switch. Go to 11.	Go to 11.
11. Does set have a display monitor?	Go to 12.	
12. Does display pattern appear on display monitor? Refer to Page 3-2, Step 4 for pattern.	Go to 13.	Go to 28.
13. Does set have a full opcon?	Go to 14.	
14. In Keyboard Display mode, do characters generated on opcon appear on display?	Go to 17.	Go to 15.
15. Do SSI signals appear at posts D25, 26, 27, and 28 (Printer SSI), and D11, 12, 13, and 14 (Opcon SSI) of 410593 circuit card on right wall of controller?  	Check wiring to opcon. Check wiring to printer. Refer to WDPs supplied with set. (Continuity test) 56K BIT/SEC	Replace 410406 circuit card. Replace 410593 circuit card.

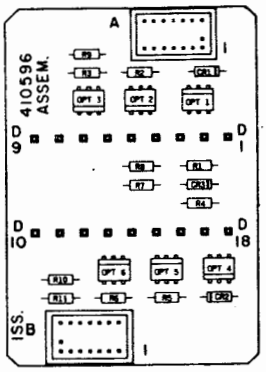
C. COMPONENT ANALYSIS (Cont)

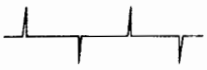
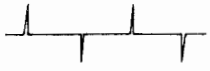
5. CONTROLLER (Cont)

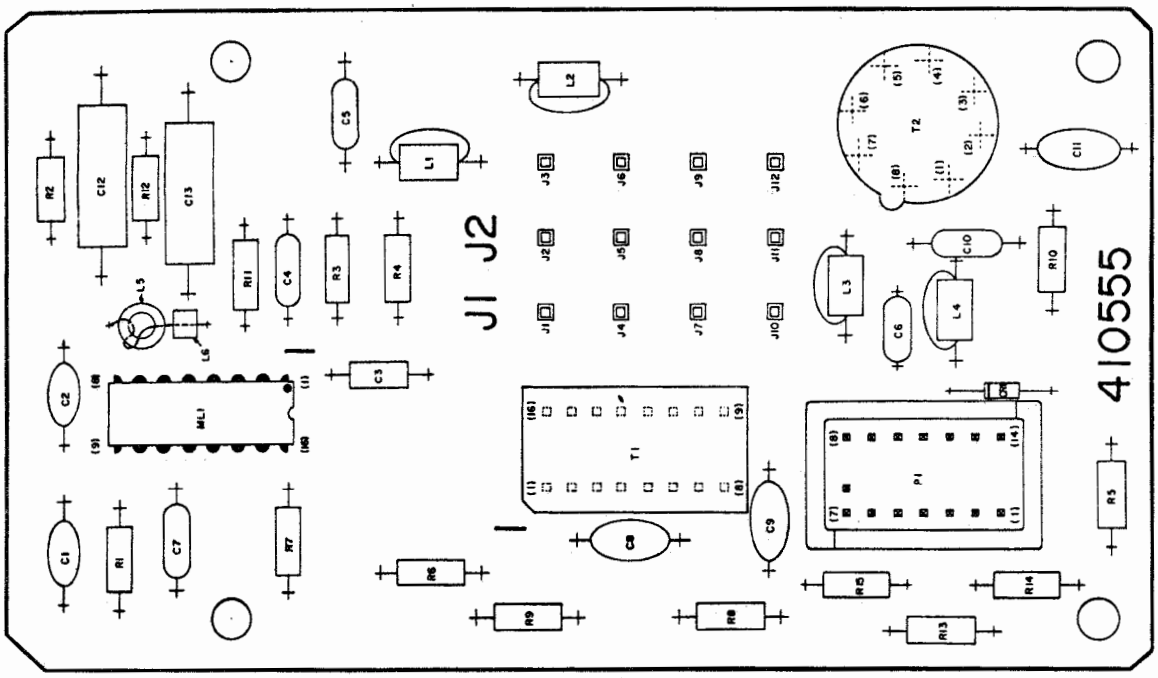
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
16. On KDP Set, can information on display be transferred to printer by depressing PTR LCL? (Place ETX at end of message, home cursor, depress PTR LCL, DISP SEND, DISP LCL.)	Go to 17.	Go to 15.
17. On KDPM2 Sets, when in the control mode, do block numbers appear for the Send and Receive tape block numbers?	Go to 19.	Go to 18.
18. Do SSI signals appear at terminal posts D15, 16, 17, and 18 (SEND CASSETTE) and posts D20, 21, 22, and 23 (Rec. Cassette) of the 410593 circuit card on the right wall of the controller? 	Check wiring to each Cassette Drive (continuity check). Refer to Wiring Diagrams supplied with set.  	Replace 410593 circuit card. Replace 410406 circuit card.
19. Can messages be sent from display to receive tape locally? ①Prepare message ending with ETX. ②Home cursor. ③Depress REC Tape LCL. ④Depress Disp Send. ⑤Depress Disp LCL. Check Rec tape by listing Rec Tape Heading and checking first 55 characters of message.	Go to 21.	Go to Page 4-47, 7. Cassette Drive.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
20. Can messages be transferred from Send tape to display locally? ①Position send tape to a recorded block and select single message mode. ②Display send off. ③Depress Disp LCL. 4Depress Send Tape LCL.	Go to 20.	Go to Page 47, 7. CASSETTE DRIVE
21. Place set in manual on line mode (Poll/Sel lamp off). If set is full duplex temporarily add a strap between terminals 2 and 3 of terminal block 101 in the interface assembly. For this test Clear to Send input must be turned on or temporarily remove circuit card 303181 in slot Z4 of interface assembly. ①Select Keyboard on line mode. ②Disp Rec (Disp Send lamp off). ③Depress Disp Line. ④Depress PTR Line (if set has Printer). ⑤Depress Rec Tape Line (if set has Cassette Drive). Do characters generated on the keyboard appear on the display Printer and and Rec Tape?	Place in service: ①Remove strap on Interface Terminal Block 101 if installed. ②Replace 303181 circuit card in slot Z4 of Interface if removed.	Go to 22.
22. When sending characters do the send mark and space lamps on 410411 CIU circuit card flicker?	Go to 24.	Go to 23.

5. CONTROLLER (Cont) C. COMPONENT ANALYSIS (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
23. Is there approximately a +5 V dc signal at pin 5 of OPT 6 on 410596 circuit card on right wall of controller? 	Replace 410411 circuit card.	If 303181 circuit card was removed from Interface Assembly, replace the 410596 circuit card. If Clear to Send input to set was turned on, go to 24.
24. Is there a +1.5 V dc signal at post D14 of 410596 circuit card? NOTE: When checking this signal, the scope or meter common should be connected to post D6.	Go to Page 4-42, 6. INTERFACE.	Check wiring in interface. Refer to 9575WD in WDP supplied with set. Replace 410596 circuit card.
25. When sending a character, do the receive mark and space lamps flicker on 410411 CIU circuit card?	Replace 410411 circuit card.	Go to 26.
26. Is there a 0 to +1.5 V dc inverted character signal at post d5 of 410596 circuit card?	Go to 27.	Check wiring in interface. Refer to 9575WD in WDP supplied with set. Go to Page 4-42, 6. INTERFACE.
27. Is there a 0 to +5 V dc character signal at pin 4 of OPT 2 on 410596 circuit card?	Replace 410411 circuit card.	Replace 410596 circuit card.
28. Is there a +5 V dc signal at post J3 of 410555 circuit card mounted on right side of controller?	Go to 32.	Check wiring to back panel. Check 405807 cable assembly.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
29. Are the following signals present at posts indicated below? POST J2 VIDEO POST J4 HORIZ  POST J9 VERT	Check wiring in interface. Refer to 9575WD in WDP supplied with set. Check wiring to monitor. Replace 410433 D I/O circuit card.	Go to 33.
30. Remove cable plugged into connector A of 410555 circuit card. Are the following signals present at pins indicated below? PIN 6 VIDEO PIN 1 HORIZ  PIN 13 VERT	Replace 410555 circuit card.	Replace 410433 D I/O circuit card.



C. COMPONENT ANALYSIS (Cont)

6. INTERFACE

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. Is +7 V dc present at pins H and J of card in card connector Z2 with respect to pins N and P (circuit common) of that card connector?	Go to 2.	Go to 4.
2. Is -7 V dc present at pins L and M of card in card connector Z2 with respect to pins N and P (circuit common) of that card connector?	Go to 3.	Go to 4.
3. Is +9 to +11 V dc present at pin A of card in card connector Z6 with respect to circuit common?	Go to 15.	Go to 11.
4. Is +12 to +22 V dc present at pins A and B of card in card connector Z2 with respect to circuit common? Is -12 to -22 V dc present at pins E and F of card in card connector Z2?	Replace 303168 circuit card in card connector Z2.	Go to 5.
5. Are +12 to +22 V dc present at pins M and N and -12 to -22 V dc present at pins P and R of card in card connector Z1 with respect to circuit common?	Check wiring between card connectors Z1 and Z2. Refer to 9559WD in WDP0457.	Go to 6.
6. Is 28 to 42 V ac present between pins H and S of card in card connector Z1?	Replace 303169 circuit card in card connector Z1.	Go to 7.
7. Does F2 fuse check good? (Continuity test)	Go to 8.	Replace 143630 fuse.
8. Is 115 V ac present between connectors J101 and P103? (AC input to filter and transformer assembly)	Check wiring of filter and transformer assembly. Refer to 9559WD in WDP0457.	Go to 9.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
8. (Cont)	Replace 366021 transformer. Replace 334187 inductor.	
9. Is 115 V ac present between terminals 4 and 5 of TB200 terminal block in ac compartment of interface?	Check wiring of FL100 and FL101 filters. Refer to 9559WD in WDP0457. Replace 402085 FL100 filter. Replace 402086 FL101 filter.	Go to 10.
10. Is 115 V ac present between terminals 1 and 2 of TB200 terminal block in ac compartment of interface?	Check wiring of CB1 circuit breaker. Refer to 9559WD in WDP0457. Replace 402026 CB1 circuit breaker.	AC power is not being supplied to set. Check external ac power circuit.
11. Is +9 to +11 V dc present at emitter of Q1 transistor mounted on heat sink of card connector frame?	Check wiring of card connector frame. Refer to 9559WD in WDP0457.	Go to 12.
12. Does F1 fuse check good? (Continuity test)	Go to 13.	Replace 143630 fuse.
13. Is approximately +13 V dc present at pins A and B of card in card connector Z1?	Check wiring to Q1 transistor. Replace 326594 Q1 transistor (2N3764).	Go to 14.
14. Is 13.5 to 18.5 V ac present between pins C and L of card in card connector Z1?	Replace 303169 circuit card in card connector Z1.	Go to 7.

C. COMPONENT ANALYSIS (Cont)

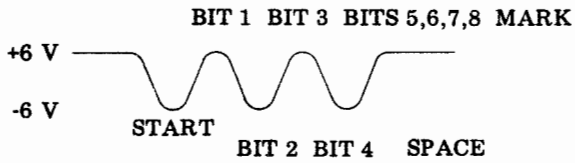
6. INTERFACE (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
15. Is -7 V dc present at: Pin — Card Connector N and K — Z3 N — Z4 F — Z5 F — Z7 Is +7 V dc present at: Pin — Card Connector D — Z5 D — Z7 Is +9 to +11 V dc present at: Pin — Card Connector A — Z3 A — Z4 A — Z6	Go to 17.	Check wiring of card connector frame. Refer to 9559WD in WDP0457.
16. Is interface equipped with 303180 and 303181 circuit cards in card connectors Z3 and Z5?	Go to 17.	Go to 33.
17. Are bit clock signals (+6 V to -6 V shaped waveforms) present on terminals 1 and 3 of TB102 terminal block? Refer to Pages 2-24a and 2-25a, 4. FEATURE AND OPTION RECORD. If Option C.1. (asynchronous transmission mode) is optioned, go to 19.	Go to 18.	External clock is off to set. Check external clock circuit.
18. Does clock signal appear at pins C and L of card in card connector Z3? APPROX 1.5 V 0 V 	Go to 19.	Check wiring to controller for shorts or opens. Refer to 9559WD in WDP0457 and 9575WD in WDP supplied with controller. Replace 303181 circuit card in card connector Z3.
19. Is a 303181 circuit card in card connector Z4?	Go to 20.	Go to 22.

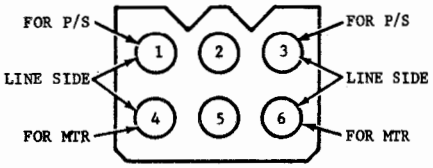
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
20. Is +6 V dc present at terminal 4 of TB102 terminal block in interface?	Go to 21.	Clear-to-send signal is off to set. Check external clear-to-send circuit.
21. Is approximately +1.5 V dc present at pin L of card in card connector Z4?	Go to 22.	Check wiring to controller for shorts or opens. Refer to 9559WD in WDP0457 and 9575WD in WDP supplied with controller. Replace 303181 circuit card in card connector Z4.
22. Is +6 V dc present on terminal 7 of TB102 terminal block when TERM READY lamp on opcon is lit or paper in printer with cover closed, and in REC mode? If opcon does not have terminal ready lamp, go to 26.	Go to 24.	Go to 23.
23. Is voltage at pin M of card in card connector Z5 approximately 1 V dc or more?	Replace 303180 circuit card in card connector Z5.	Go to 24.
24. Depress TERM READY key on opcon or open printer cover. Does voltage on terminal 7 of TB102 terminal block change from +6 V dc to -6 V dc?	Go to 26.	Go to 25.
25. Is voltage at pin M of card in card connector Z5 less than +0.5 V dc?	Replace 303180 circuit card in card connector Z5.	Check wiring to controller.
26. Is +6 V dc present at terminal 5 of TB101 terminal block in interface?	Go to 27.	Receive line off or open. Check external receive line circuit.
27. Is half-duplex strap installed (strap between terminals 2 and 3 of TB101 terminal block) and is +6 V dc present at terminal 3? If no card in card connector Z7, go to 28.	Go to 28.	Remove half-duplex strap. Go to 28.

C. COMPONENT ANALYSIS (Cont)

6. INTERFACE

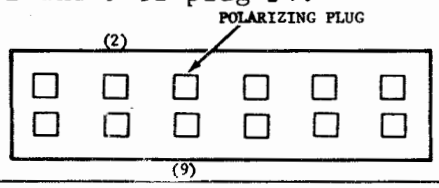
ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
28. Is approximately +1.5 V dc present at pin L of card in card connector Z6?	Go to 29.	Check wiring to controller. Refer to 9559WD in WDP0457 and 9575WD in WDP supplied with controller. Replace 303181 circuit card in card connector Z6. Replace half-duplex strap if removed.
29. Is there a circuit card in card connector Z7?	Go to 30.	Place interface in service.
30. Is +6 V dc present at terminal 2 of TB101 terminal block in interface?	Go to 32.	Go to 31.
31. Is approximately 1 V present at pin M of card in card connector Z7 when set is not sending?	Replace 303180 circuit card in card connector Z7.	Go to 32.
32. When a character is sent from the set, does voltage at terminal 2 of TB101 terminal block switch from +6 V to -6 V for mark to space bit transitions?  	Place interface in service.	Check wiring to controller.

7. CASSETTE DRIVE

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
1. With the Cassette Drive power switch in the "ON" position, does motor run?	Go to 4.	Go to 2.
2. Is 115 volts available at source?	Go to 3.	Repair or replace voltage Repair or
3. With motor connector removed from ac distribution assembly connector, is 115 V present at ac distribution assembly connector? 	(a) Disconnect power supply from motor connector and replace motor. (b) Replace connector.	(a) Replace 405050 ac distribution assembly. (b) Replace connector.
4. With no cassette in the cassette holder and power switch in the "ON" position, is the BOT/EOT lamp lit?	Go to 9.	Go to 5.
5. Is power supply fuse "open"? Check continuity.	Replace fuse, recheck. Recheck if fuse continues to "blow". Recheck power supply.	Go to 6.
6. Is -12 volts present at power supply? Check for -12 V dc between terminals marked common and -12.	(a) Replace Logic Card 410572. (b) Replace Cassette Drive.	Go to 7.
7. Is transformer output voltage present (approx. 31.6 V ac) present between unmarked terminals on power supply circuit card?	(a) Replace power supply circuit board 410043. (b) Replace Power Supply 406101.	Go to 8.
8. Is transformer input voltage present (103 to 127 V ac) between pins 1 and 3 of connector P8?	Replace Transformer 406103.	Replace 405050 ac Distribution Assembly.
9. Is Run (Status) Lamp lit?	Replace Cassette Drive.	Go to 10.

C. COMPONENT ANALYSIS (Cont)

7. CASSETTE DRIVE (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
10. Does Run (Status) lamp light when the "Cassette in Place" switch is manually activated?	Go to 13.	Go to 11.
11. Is +12 V dc present at power supply? Check for +12 V dc between terminals marked common and +12.	Go to 12.	(a) Replace power supply circuit board 410043. (b) Replace power supply 406101.
12. With power removed from the cassette drive, the cassette drive removed from its base, and plug P4 removed from the J4 connector, is there continuity between terminals 2 and 9 of plug P4?  	(a) Replace Logic Card 410572. (b) Replace Cassette Drive.	Replace Cassette Drive.
13. Does left drive shaft (Rewind) hub rotate when "Cassette in Place" switch is manually activated?	Go to 18.	Go to 14.
14. Does left drive shaft (Rewind) rotor rotate?	Go to 15.	Go to 18.
15. Is clutch activated when the "Cassette Drive" switch is actuated?	Replace Cassette Drive.	Go to 16.
16. Is clutch out of adjustment (see Section 5)?	Adjust clutch (see Section 5).	Go to 17.
17. With power removed from Cassette Drive, removed from base and the P4B connector is resistance between terminals 3 and 8 of P4B 32 to 50 ohms?	Replace Logic Card 410572.	Replace Cassette Drive.
18. Does right drive shaft (Forward Drive) rotor rotate?	Go to 19.	Go to 23.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
19. Is O-Ring belt present?	Go to 20.	Assemble O-Ring belt.
20. Are left Drive Shaft (Rewind) Pulley and Idler Pulley present?	Go to 21.	Assemble missing pulley/ pullies.
21. Are left Drive Shaft (Rewind) Pulley set screws (2) tight?	Go to 22.	Tighten set screws.
22. Does left Drive Shaft (Rewind) Pulley bind on casting?	Adjust for end play (see Section 5).	Replace Cassette Drive unit.
23. Is Motor Drive Belt present?	Go to 24.	Assemble Belt.
24. Are right Drive Shaft (Forward Drive) pulley set screws tight?	Go to 25.	Tighten set screws.
25. Are motor pulley set screws tight?	Go to 26.	Tighten set screws.
26. Does right Drive Shaft (Forward Drive) pulley bind on casting?	Adjust for end play (see Section 5).	Replace Cassette Drive unit.
27. With a partially unwound standard cassette placed wrong side out, is the cassette held flat against inside surface of the cassette holder?	Go to 28.	Adjust cassette pressure spring (see Section 5).
28. Is Cassette Holder properly latched (see Section 5)?	Go to 29.	Adjust latch (see Section 5).
29. Does the Left Drive (Rewind) shaft rotate?	Adjust "Cassette in Place Switch".	Go to 30.
30. When removing cassette does latch open too far?	Adjust latch stop screw (see Section 5).	Go to 31.
31. Is cassette holder ejected from drive mechanism?	Go to 32.	Adjust cassette holder Pressure Spring.
32. With the cassette properly assembled to the cassette holder, did the cassette rewind?	Go to 34.	Go to 33.

C. COMPONENT ANALYSIS (Cont)

7. CASSETTE DRIVE (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
33. With the cassette removed from the cassette holder do both reels rotate freely?	Adjust "Cassette in Place" switch height.	Replace cassette.
34. After rewinding, does the tape move forward and rewind?	Go to 36.	(a) Cassette drive not plugged into mating equipment. (b) Go to 35.
35. With power switch in the off position, remove system cable from mating equipment connector and connect it to a known good part. Restore power to cassette drive, does tape move forward and rewind?	Replace or repair mating equipment. Restore Cassette Drive to proper configuration.	(a) Replace system cable. (b) Replace SSI Interface assembly 403587. (c) Replace logic card 410572. (d) Replace cassette drive.
36. Does tape move forward and reverse a second time?	Go to 38.	Go to 37.
37. Does cassette have red tab on left side folded back so that notch is exposed?	Go to 38.	(a) Adjust "Write Inhibit Switch" (see Section 5).
38. Does the Run (Status) lamp turn off or flash when tape is rewound?	Go to 41.	Go to 39.
39. Is the tape between the BOT/EOT sensor tube mechanism transparent?	Go to 40.	(a) Replace cassette. (b) Replace Logic Card 410572. (c) Replace Cassette Drive, Sensing Tube bad.
40. Is the hole in the underside of the sensor tube over the BOT/EOT lamp?	(a) Replace Logic Card 410572. (b) Replace Cassette Drive.	Replace Cassette Drive. Sensing tube out of adjustment.
41. Does the Run (Status) Lamp flash?	Go to 42.	Go to 43.

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
42. Remove cassette and place in known good Cassette Drive. Does Run (Status) Lamp flash after moving forward and reversing when "Write Inhibit" tab is folded back (see Step 37) or after moving forward, reversing, moving forward again and reversing a second time for "Write Inhibit" tab not folded back?	Cassette bad - replace.	Go to 45.
43. With the Cassette Drive connected to a M40 KD or KDP capable of receiving from a Cassette Drive and using a cassette previously recorded on the Cassette Drive, can text be sent to the display?	Go to 44.	Go to 48.
44. Is text garbled?	Go to 45.	Cassette Drive good.
45. Replace the cassette used in Step 43 with a known properly recorded cassette - does garbling still occur?	Go to 46.	(a) Replace Logic Card 410572. (b) Replace Cassette Drive.
46. Is the tape cleaner bobbin indexed as the cassette is inserted and removed?	Go to 47.	(a) Adjust bobbin latch spring. (b) Check bobbin ratchet spring requirement. (c) Check bobbin stepper spring requirement. (d) Replace tape cleaner bobbin.
47. Is "O" Ring Belt frayed?	Replace "O" Ring Belt 403289.	Go to 48.

C. COMPONENT ANALYSIS (Cont)

7. CASSETTE DRIVE (Cont)

ANALYSIS QUESTION	"YES" RESPONSE DIRECTIVE	"NO" RESPONSE DIRECTIVE
48. Is tape cleaner bobbin dirty?	Replace Tape Cleaner Bobbin 403238	(a) Check Drive Belt adjustment. (b) Check "O" Ring Belt adjustment. (c) Clean recording head. (d) Clean clutch faces. (e) Clean brake faces. (f) Adjust clutches. (g) Adjust brakes. (h) Replace Logic Card 410572. (i) Replace cassette drive.
49. Does associated display indicate Block Number *** or 000?	Cassette Drive good - mating equipment at fault.	(a) Replace System Cable. (b) Replace SSI Interference assembly 403587. (c) Replace Logic Card 410572.

PART 5 -- ADJUSTMENTS

INDEX PAGE

A. GENERAL 1

B. CASSETTE DRIVE
1. GENERAL 2
2. ASSEMBLIES 2
3. CASSETTE HOLDER ADJUSTMENTS 5
4. DRIVE MECHANISM ADJUSTMENTS 20
5. 410764 CIRCUIT CARD ADJUSTMENT 24

NOTE: For adjustments of the Display Monitor, Printer and Opcon, refer to Part 5 of Manual 363.

A. GENERAL

Field adjustments of Tempest Model 40 Sets may be required upon installation or on maintenance calls. This supplement includes all adjustments related to the cassette drive that are considered to be "in-the-field" adjustments. No adjustments are required in the controller assembly.

B. CASSETTE DRIVE

1. GENERAL

Adjustments that require major disassembly of the cassette drive are not covered in this manual at this time.

Adjustments are grouped according to the mechanism (cassette holder or drive mechanism), and in the sequence recommended for a comprehensive "in-the-field" adjustment. One electrical adjustment of the 410764 card "Open Line Frequency" is shown.

Identification drawings and tables are included to locate the mechanisms and list the adjustments related to these mechanisms.

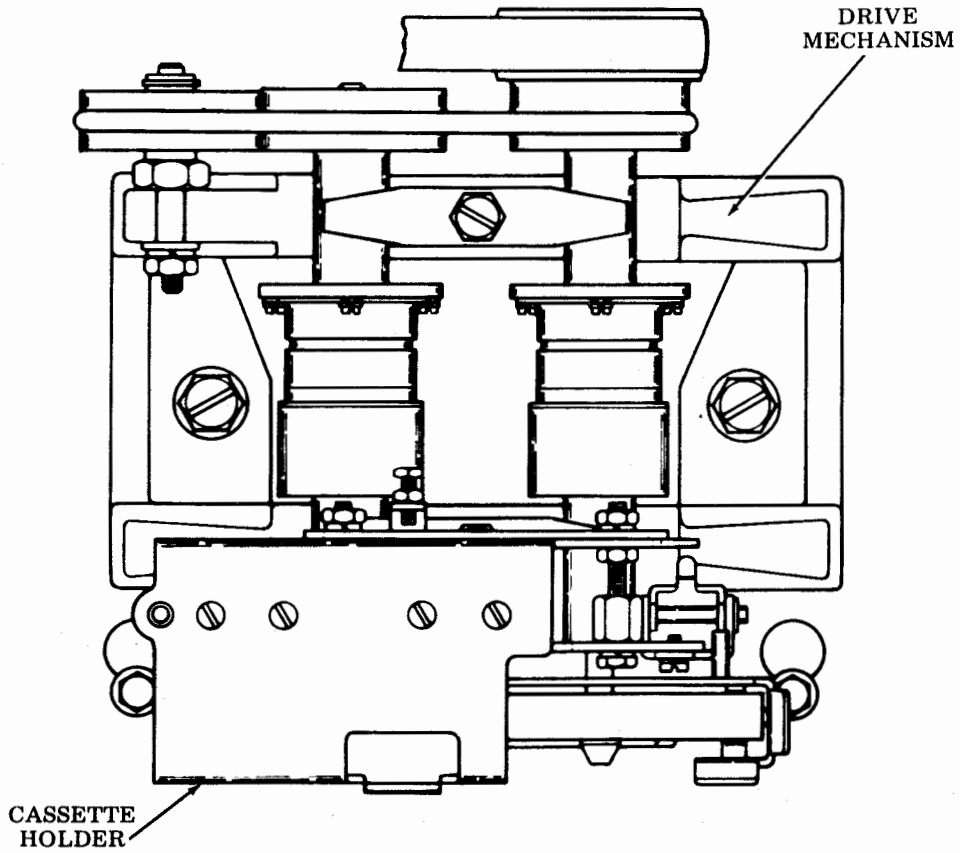
The instruction "friction tight" means to tighten to the point where friction keeps the parts from moving, but they are still loose enough to move for adjustment purposes.

Spring or belt tensions are checked with a spring scale held at the angle shown in the adjustment illustration. Springs that do not meet requirements, and for which no adjustment procedure is given, should be replaced.

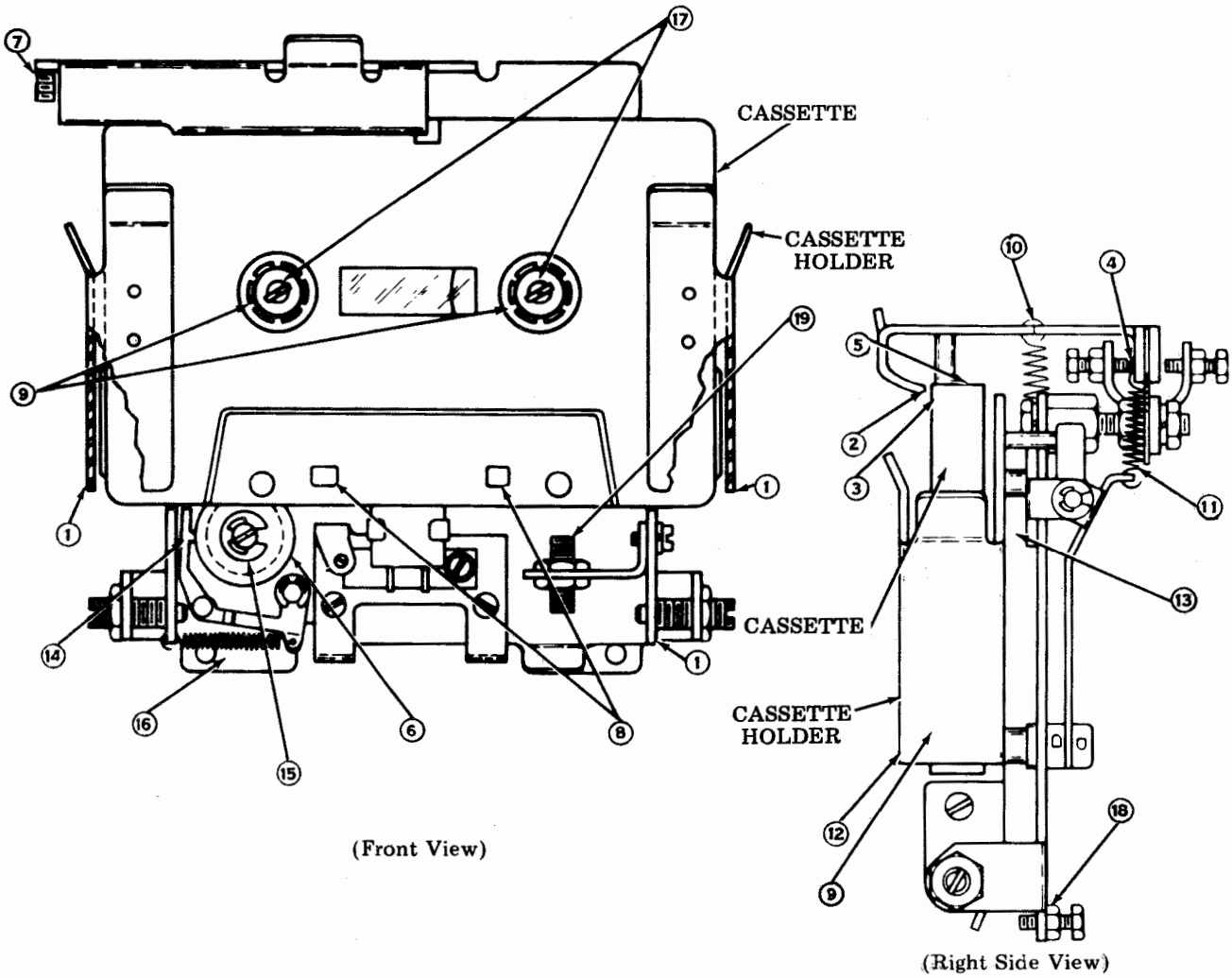
After adjustment is complete, tighten any screws or nuts loosened to make the adjustment.

Tools Required: 406131 Gauge (Brake and Clutch Gap)
406130 Wrench, Driver (402274/402275 Drive Hubs)

2. ASSEMBLIES



Cassette Holder



(Front View)

(Right Side View)

CASSETTE HOLDER ADJUSTMENTS	ADJUSTMENT REFERENCE PAGES
①Cassette Holder	5-5
②Latch (Preliminary and Final)	5-6 & 5-7
③Latch Stop Screw (Rear)	5-8
④Latch Stop Screw (Front)	5-9
⑤Switch Height	5-10
⑥Tape Cleaner	5-11
⑦Run Lamp Mounting	5-11
⑧Head	5-12
⑨Plate with Cassette Holder	5-13
⑩Cassette Latch Spring	5-14
⑪Sensing Bail Spring	5-14
⑫Cassette Pressure Spring	5-15
⑬Cassette Holder Pressure Spring	5-15
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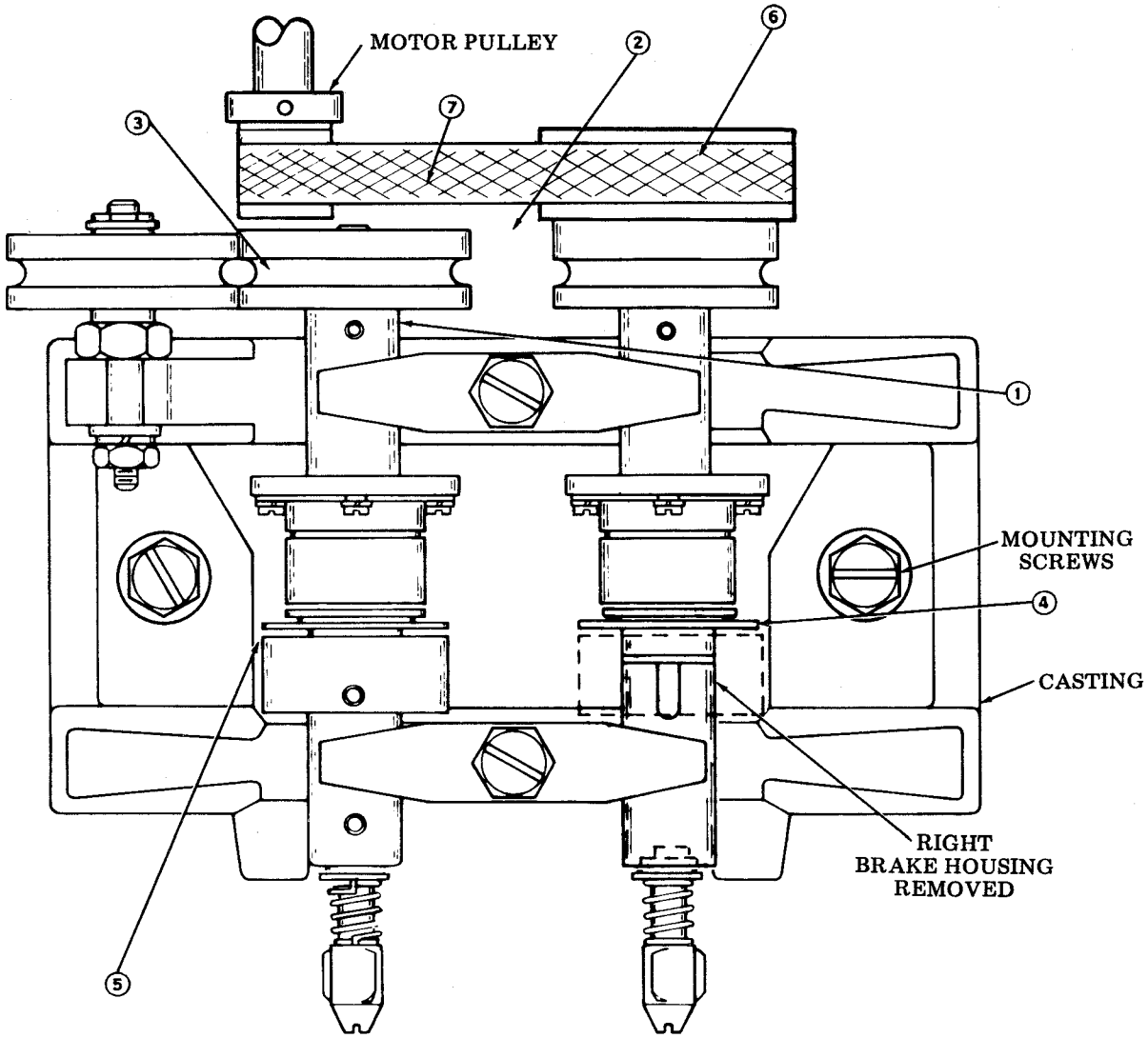
⑱Cassette Holder Stop	5-17
⑲BOT-EOT Lamp Mounting	5-18

B. CASSETTE DRIVE (Cont)

2. ASSEMBLIES (Cont)

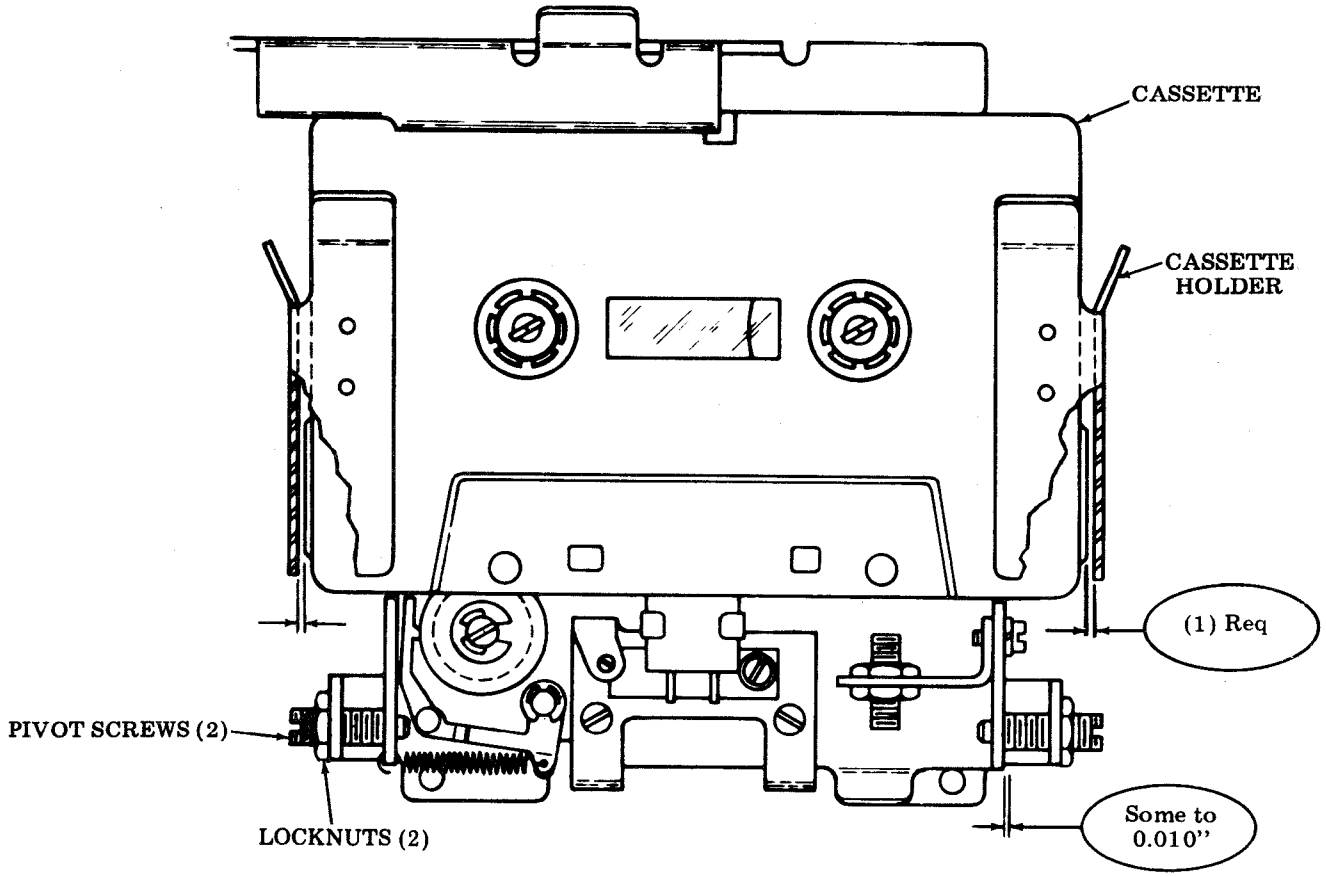
Drive Mechanism



DRIVE MECHANISM ADJUSTMENTS	ADJUSTMENT REFERENCE PAGES
① Pulley and Shaft Endplay	5-20
② Pulley Alignment	5-21
③ Belt ("O" Ring)	5-21
④ Clutch	5-22
⑤ Brake	5-22
⑥ Motor Pulley	5-23
⑦ Motor Drive Belt	5-23

3. CASSETTE HOLDER ADJUSTMENTS

Cassette Holder



(1) Requirement
With a standard cassette latched in position, there should be equal clearance (as gauged by eye) between both sides of the cassette and the cassette holder.

(2) Requirement
Endplay between the cassette holder and the pivot screws
Min Some---Max 0.010 inch.

To Adjust
With the locknuts friction tight, adjust pivot screws until the requirements are met. Tighten locknuts.

B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Latch (Preliminary)

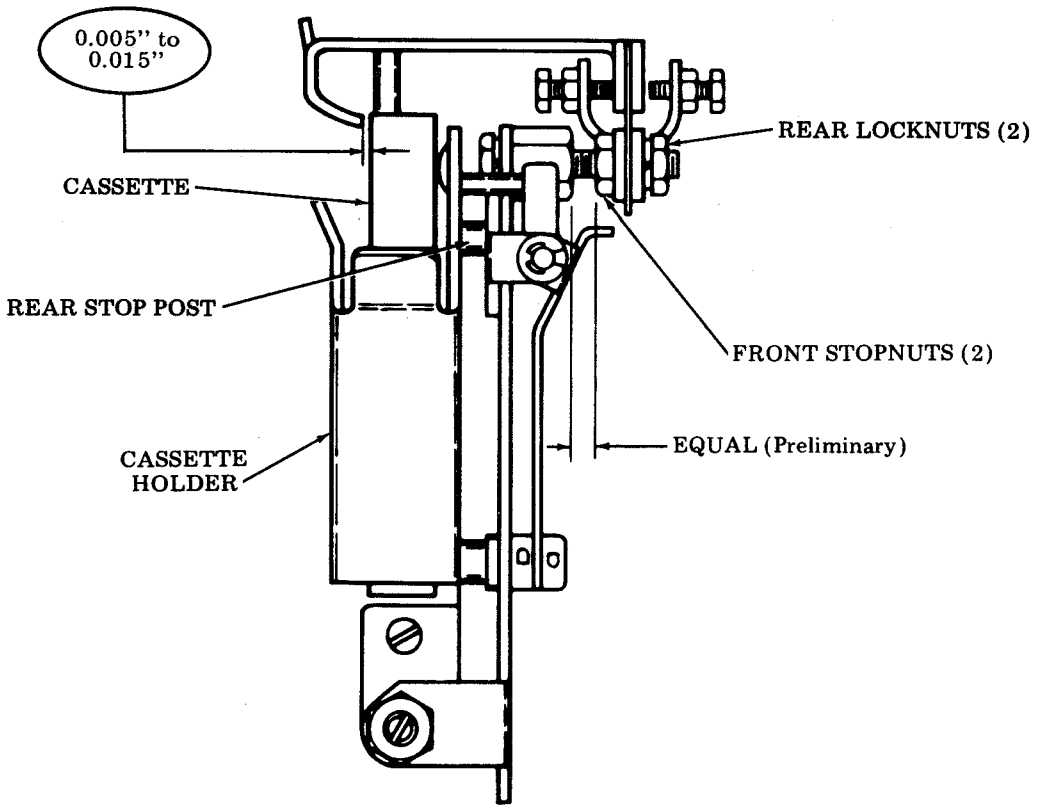
Requirement

With a standard cassette in place and the cassette holder biased rearward against the stop post, the clearance between the cassette and the latch should be

Min 0.005 inch---Max 0.015 inch.

To Adjust

With the rear locknuts loosened, adjust the two front stopnuts equally (Preliminary) until the requirement is met. Tighten locknuts.



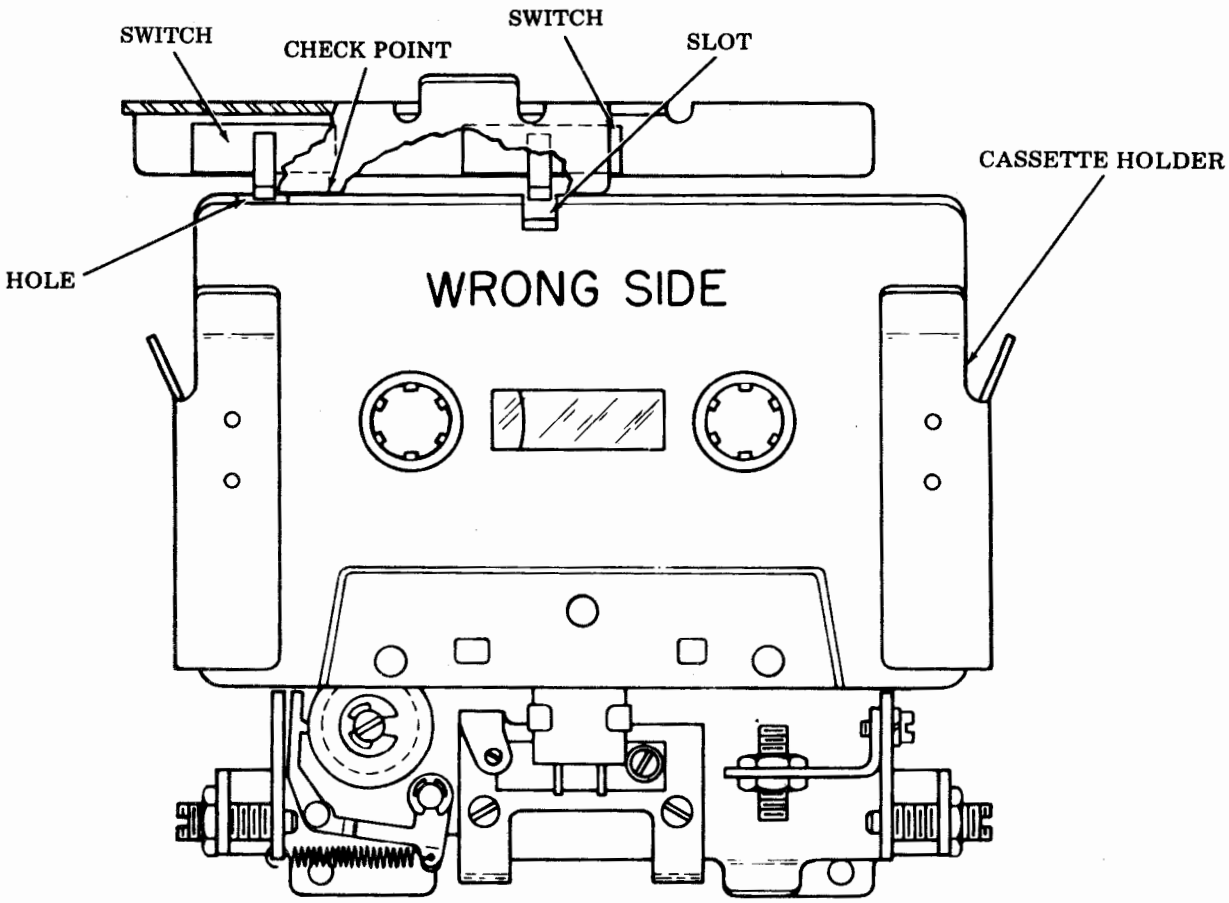
Latch (Final)

(1) Requirement
With a standard cassette placed (wrong side out) in the cassette holder and the cassette holder rotated until the latch is resting on the cassette, clearance between the cassette and either end of the latch should be
Min Some---Max 0.015 inch.

(2) Requirement
The two switch actuators should be centered with their respective hole or slot, as gauged by eye.

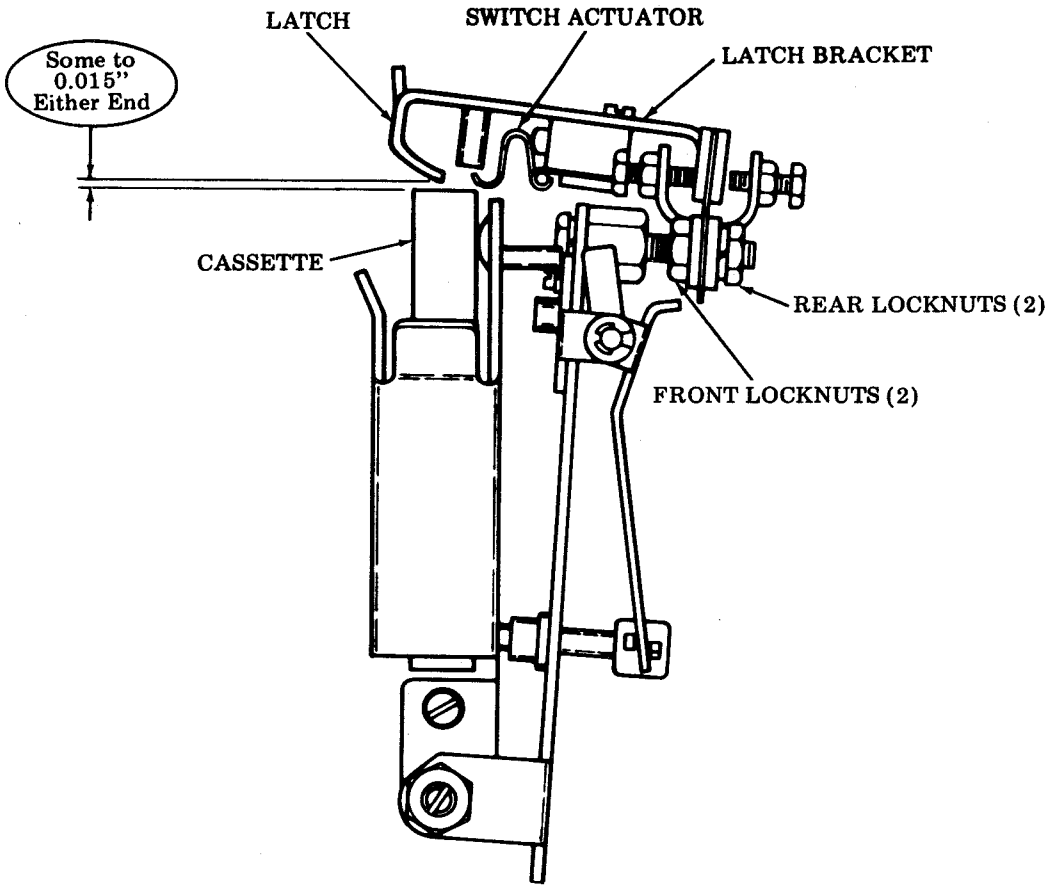
To Adjust
Maintain front locknuts position, loosen the rear locknuts, position the latch and switch to meet the requirements. Tighten locknuts.

Note: Recheck Preliminary Latch adjustment. Refine if necessary.



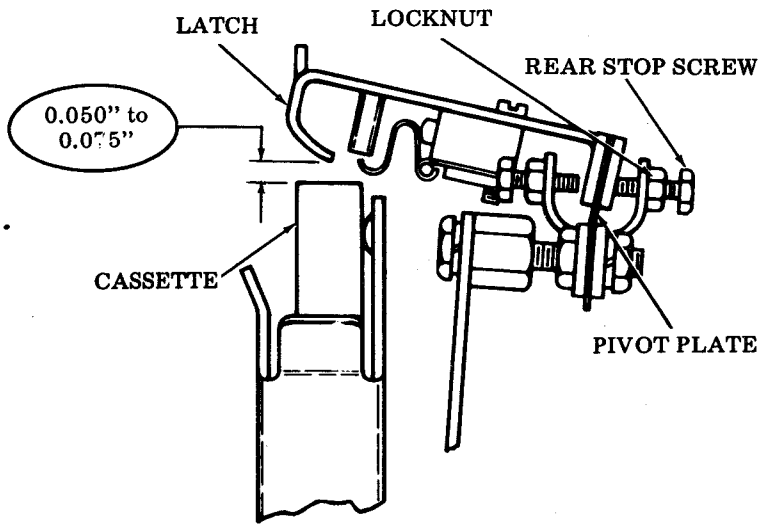
B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS, Latch (Final) (Cont)



Latch Stop Screw (Rear)

Requirement
With the latch raised to its uppermost position there should be clearance between the latch and a standard cassette of
Min 0.050 inch---Max 0.075 inch.



To Adjust
With locknut loose, position rear stop screw until the requirement is met. Tighten locknut.

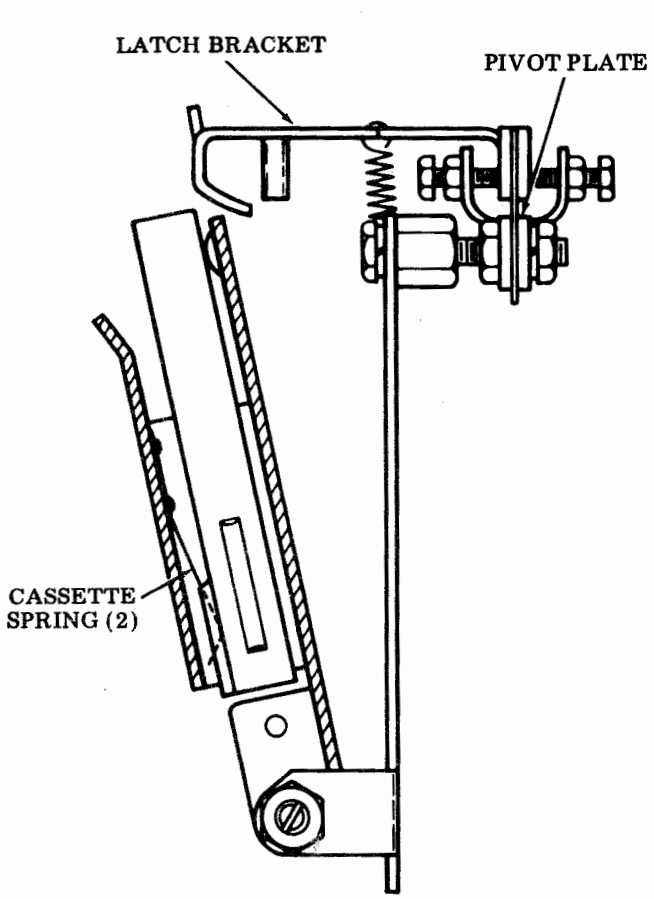
Latch Stop Screw (Front)

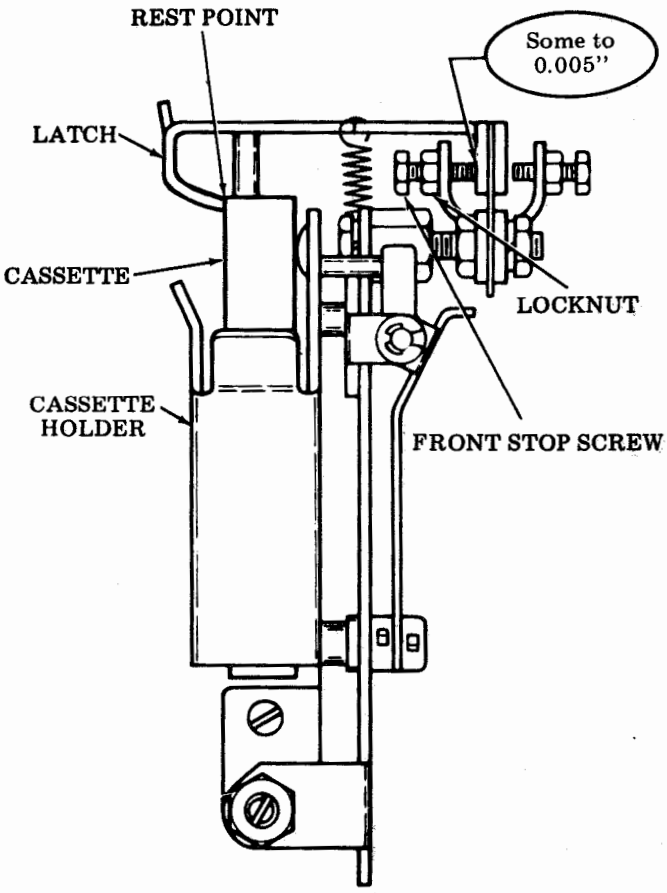
(1) Requirement
As the cassette holder with a standard cassette installed is pivoting toward the latched position, the cassette should strike the latch and cam the latch upward.

(2) Requirement
In the latched position, the latch should rest on the cassette and there should be clearance between the front stop screw and the latch bracket of
Min Some---0.005 inch.

To Adjust
With locknut loose, position the front stop screw until the requirement is met. Tighten locknut.

NOTE: Requirements (1) and (2) have to be checked with cassette spring holding cassette in place against the rear of the cassette holder.

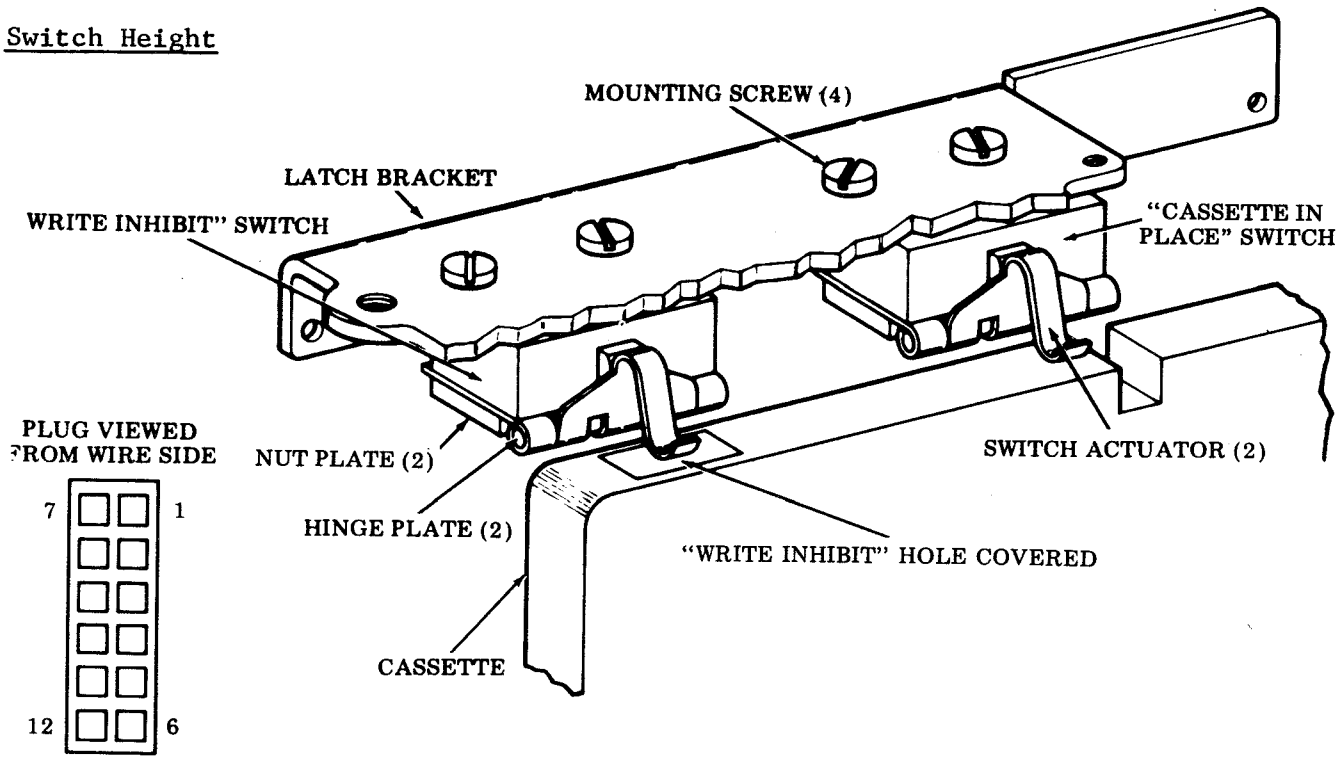




B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENT (Cont)

Switch Height



(1) Requirement

As a standard cassette (right side out) is loaded and unloaded into position, the two switches should operate at approximately the same time (in no case should the "Cassette in Place" switch be actuated before the "Write Inhibit" switch).

To Check

Operation may be determined by the audible "click" of switches or by use of a continuity checking device, on terminals 7 and 8, ("Write Inhibit" switch) and terminals 1 and 2 ("Cassette in Place" switch) to indicate contact closure.

(2) Requirement

There should be some overtravel left on the two switch actuators.

To Check

Check for some clearance between the switch actuator and the cassette, without bottoming the actuator against the switch.

To Adjust

With the switch mounting screws friction tight, position the hinge plate until the requirements are met. Tighten mounting screws.

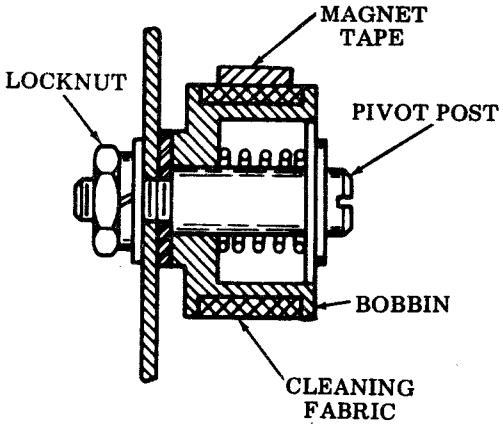
NOTE: Power must be removed from unit when this measurement is taken. Recheck Latch adjustment, refine if necessary.

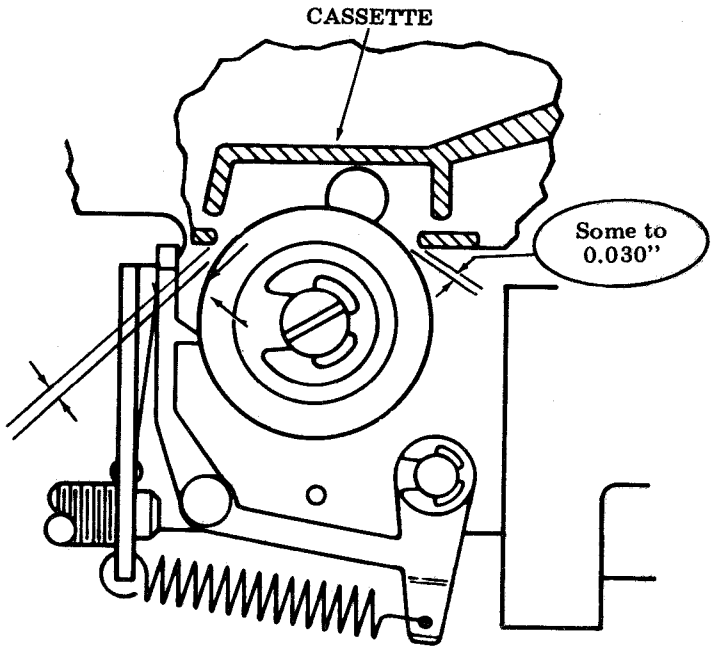
Tape Cleaner

(1) Requirement
With a standard cassette in the loaded position, the magnetic tape should be in contact with the cleaning fabric.

(2) Requirement
There should be
Min Some---Max 0.030 inch
clearance between cassette and bobbin.

To Adjust
With the locknut friction tight, position the bobbin vertically to meet the requirement. Tighten locknut.

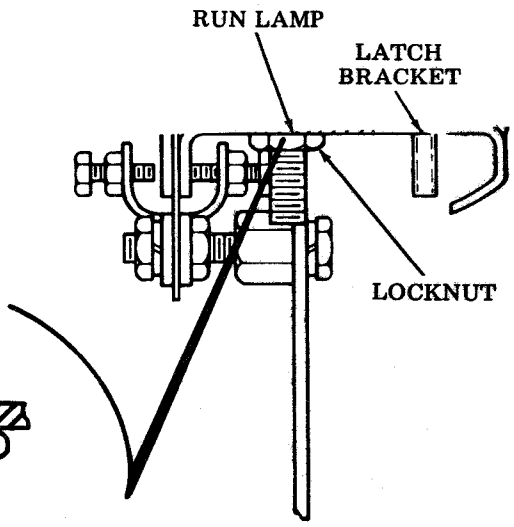


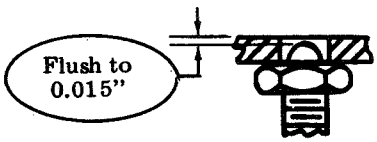


Run Lamp Mounting

Requirement
The tip of the run lamp should be
Min Flush---Max 0.015 inch
underflush with the top
surface of the latch bracket.

To Adjust
With the locknut loose, position the lamp. Tighten the locknut.





B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Head Adjustment

(1) Requirement
With the cassette holder biased rearward against the stop post, recording head assembly should rest on the locating posts and should be centered with equal clearance, as gauged by eye, between the locating posts.

(2) Requirement
The recording head assembly should not bind on the locating pins when cassette holder is pivoted outward. Check that the endplay between the cassette holder and pivot screws is taken up, first to the left and then to the right.

To Adjust
With mounting screws friction tight, slide recording head assembly against locating posts and the clearance on both sides should be equal. Tighten mounting screws.

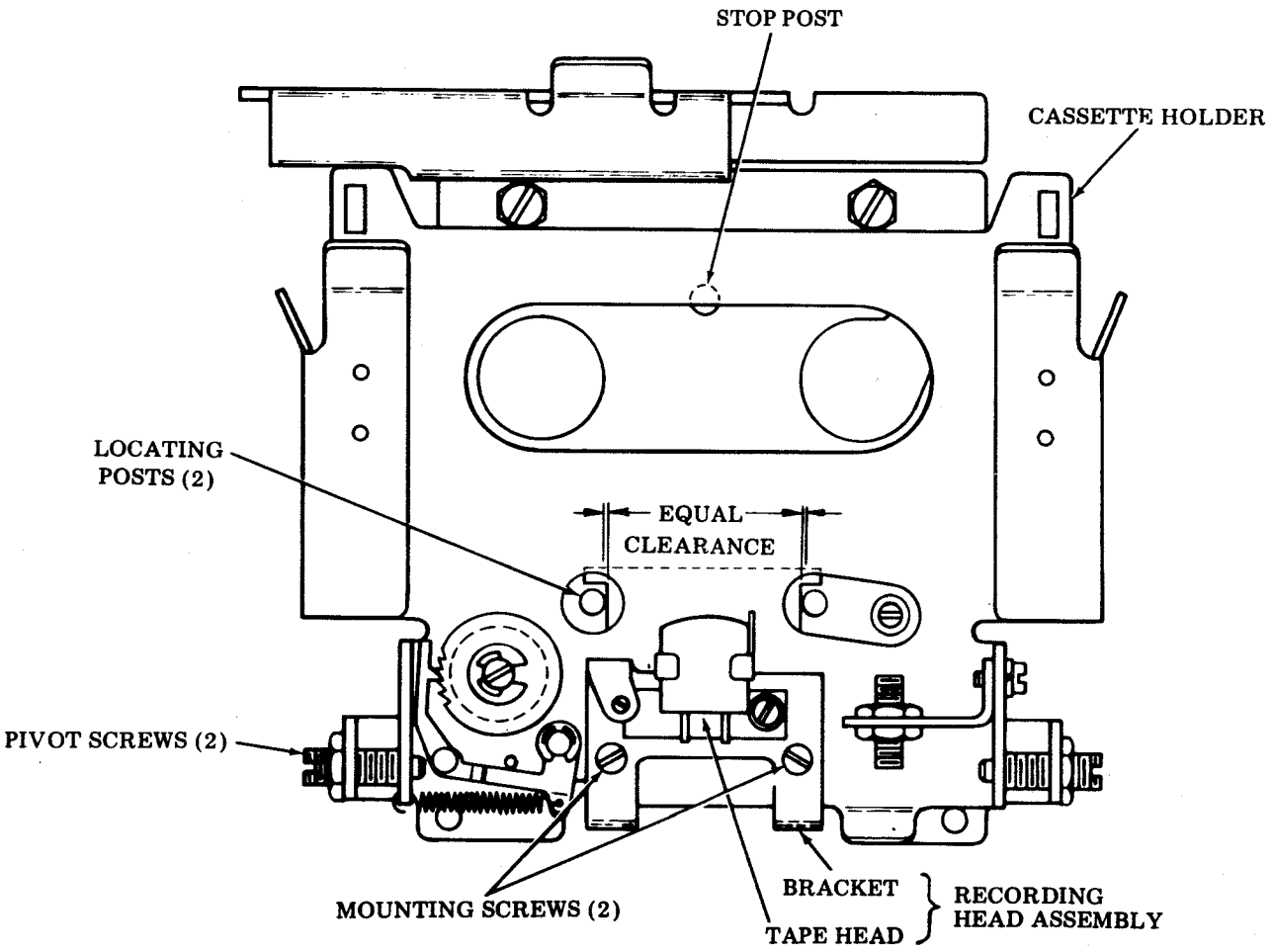
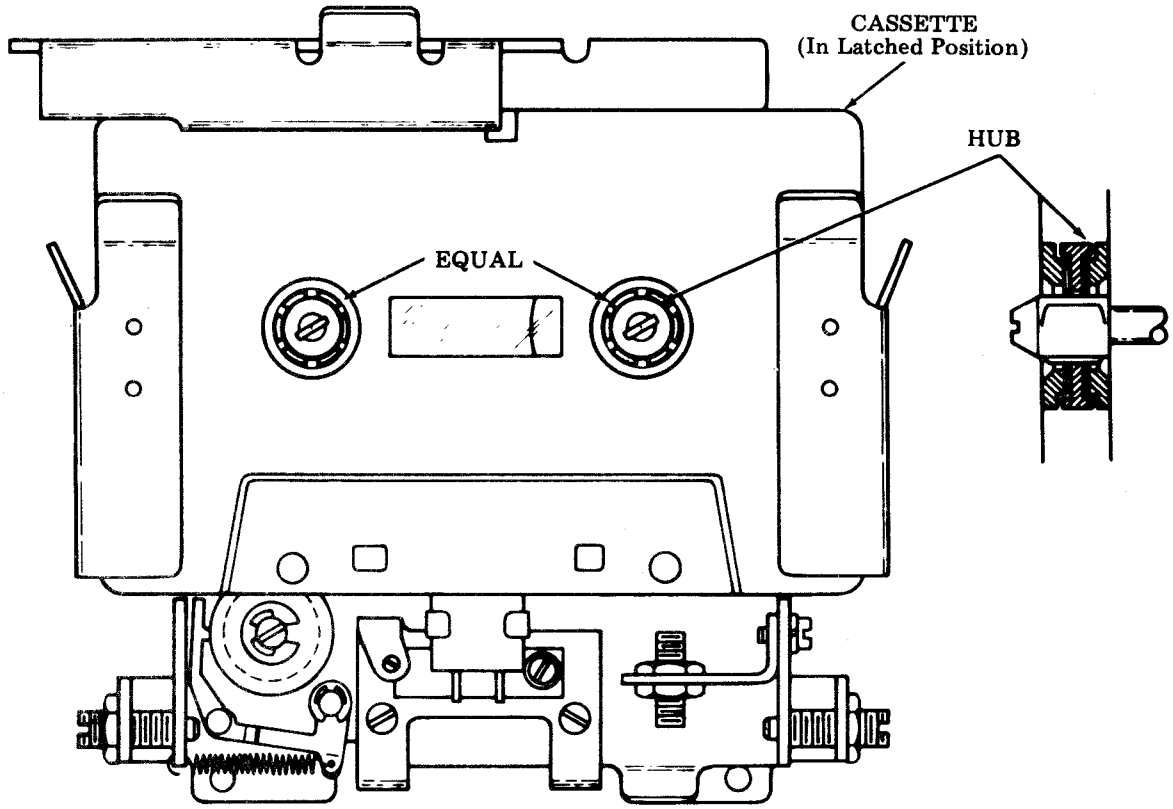


Plate with Cassette Holder



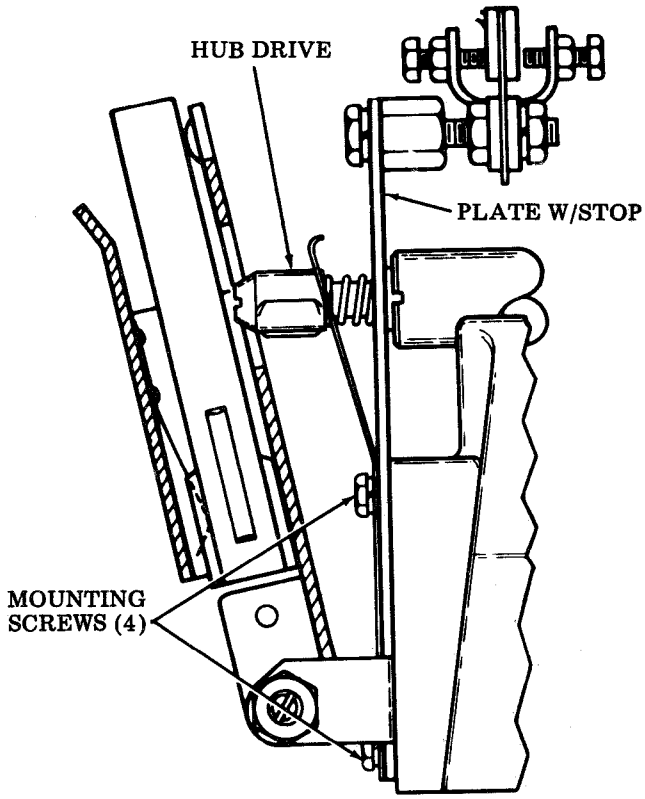
Requirement

With a standard cassette loaded in its latched position, the radial distance between the drive hub (less driving teeth) and the cassette case should be equal, as gauged by eye. Check requirement on both hubs.

To Adjust

With the mounting screws friction tight, position plate with stop to meet this requirement. Tighten mounting screws.

NOTE: The flat portion of the driving teeth of the drive hubs must drive the reel clockwise on the left (rewind) shaft and counterclockwise on the right (wind) shaft.



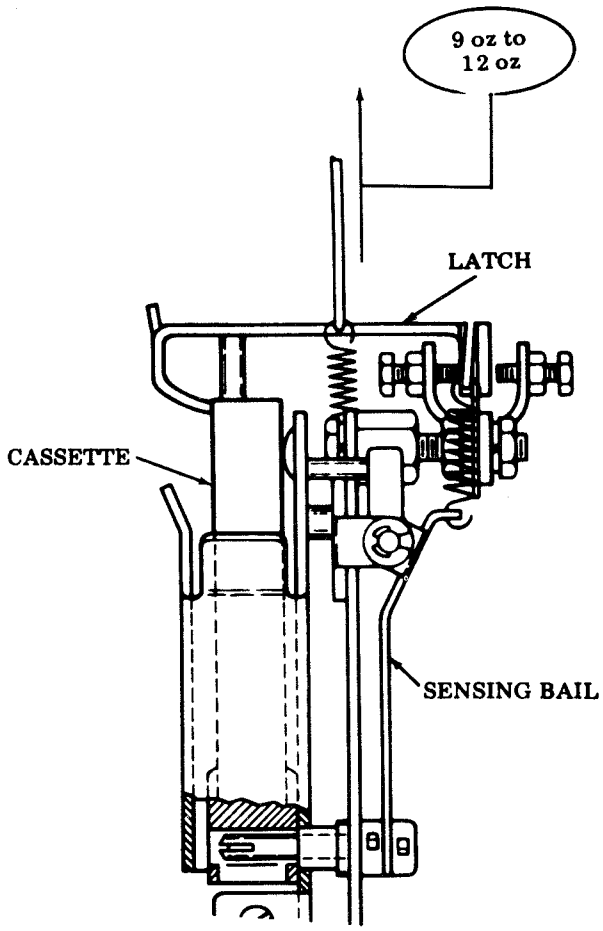
B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Cassette Latch Spring

Requirement
With a standard cassette in the latched position, it should take
Min 9 ounces---Max 12 ounces
to start spring moving from the installed length.

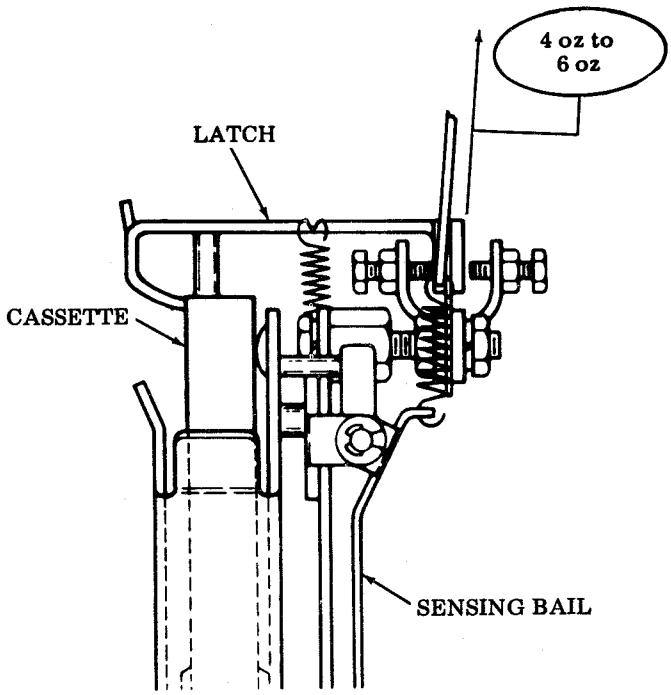
NOTE: If spring does not meet requirement, it should be replaced.



Sensing Bail Spring

Requirement
With a standard cassette in the latched position, it should take
Min 4 ounces---Max 6 ounces
to start spring moving from the installed length.

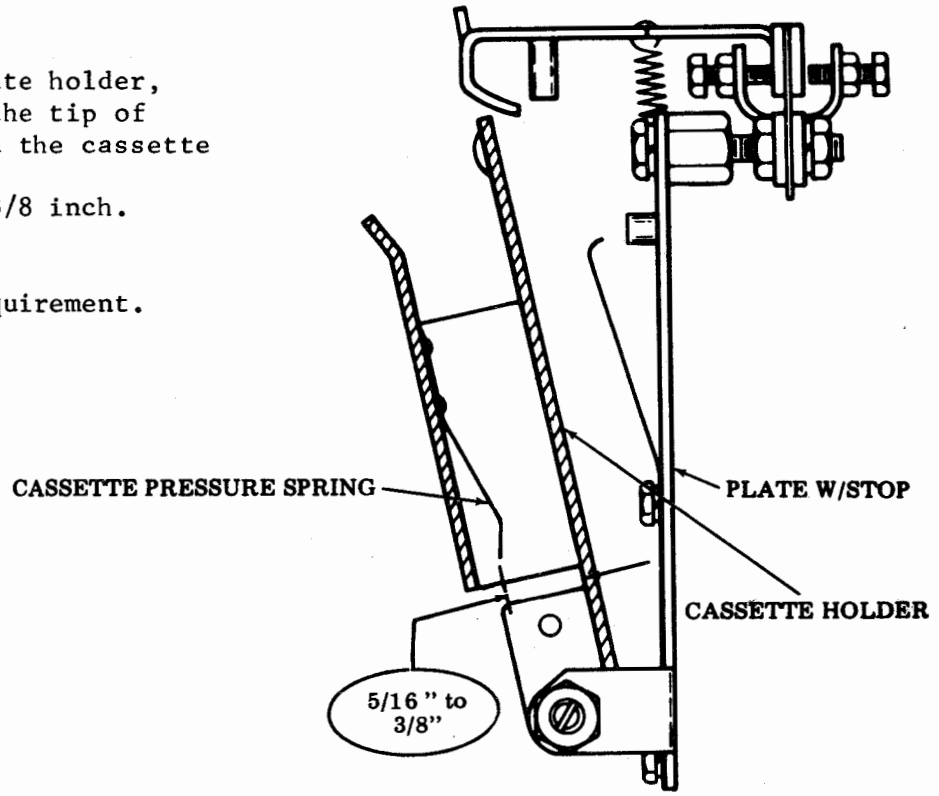
NOTE: If spring does not meet requirement, it should be replaced.



Cassette Pressure Spring

Requirement
With an unloaded cassette holder, the clearance between the tip of the pressure spring and the cassette holder should be
Min 5/16 inch---Max 3/8 inch.

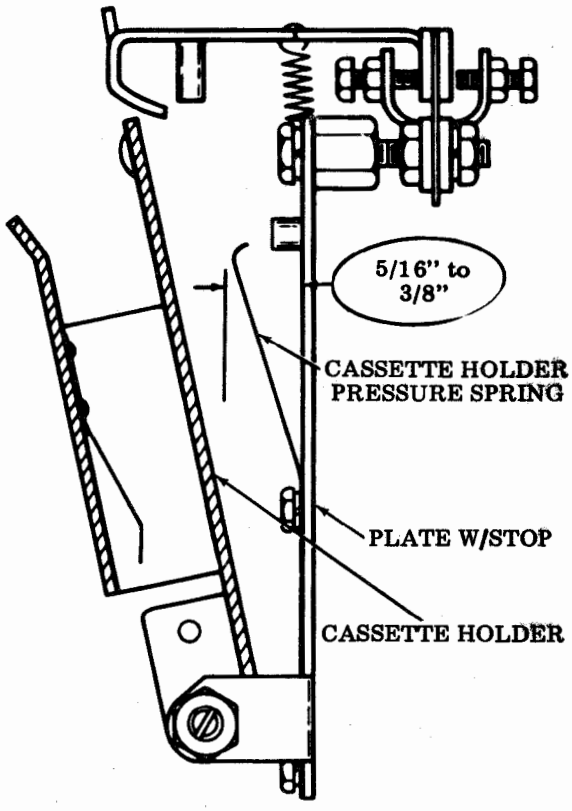
To Adjust
Bend spring to meet requirement.



Cassette Holder Pressure Spring

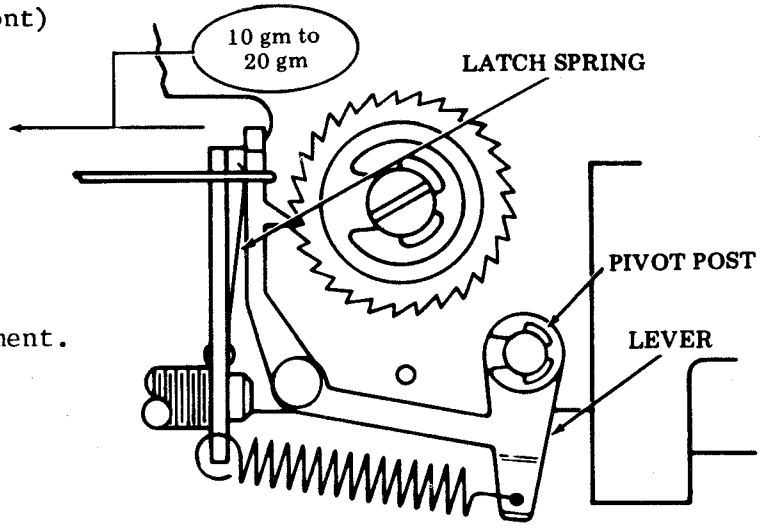
Requirement
With the cassette holder in the unlatched position the distance between the outside edge of the upper form of the spring and the plate with stop should be
Min 5/16 inch---Max 3/8 inch.

To Adjust
Bend spring to meet this requirement.



B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

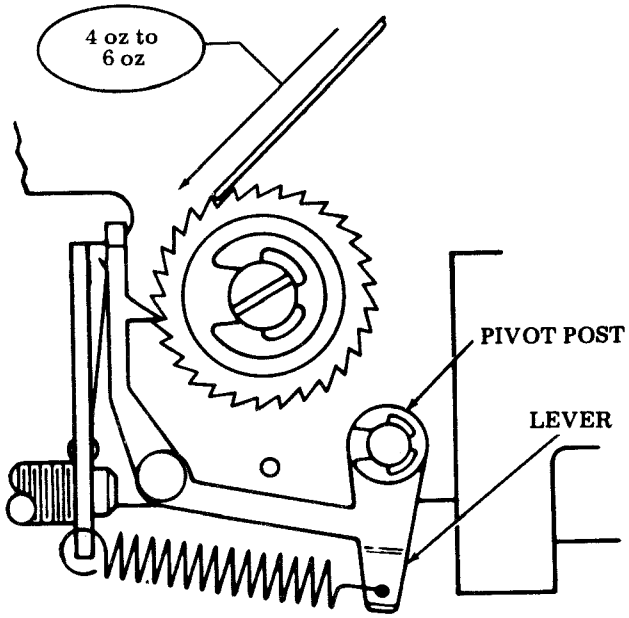


Bobbin Latch Spring

Requirement
It should take
Min 10 grams---Max 20 grams
to start latch moving.

To Adjust
Bend spring to meet this requirement.

NOTE: While checking, hand rotate ratchet wheel 1/2 tooth travel.

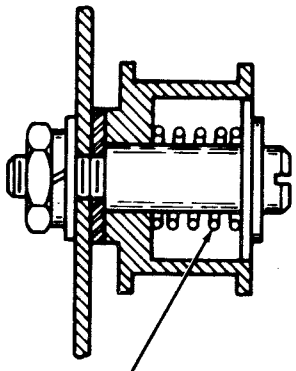


Bobbin Ratchet Spring

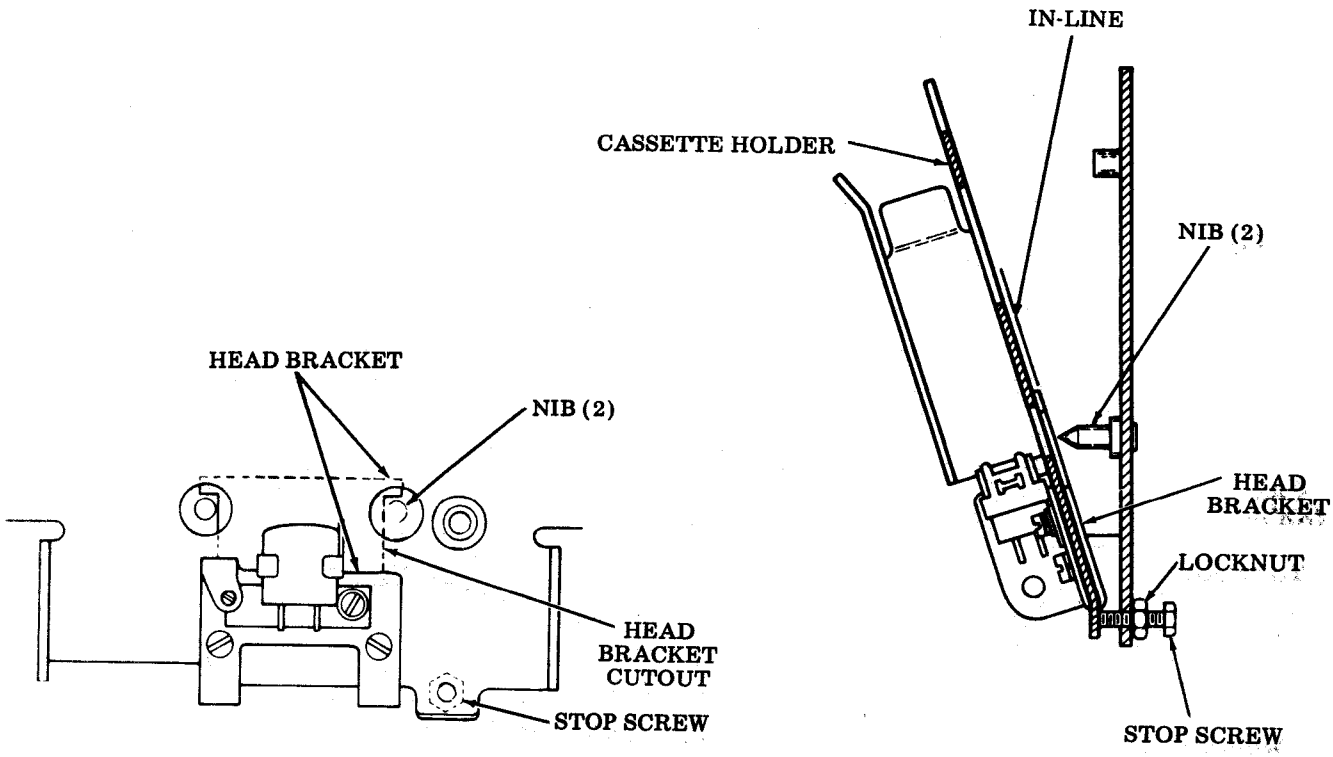
Requirement
It should take
Min 4 ounces---Max 6 ounces
of tangential force to start ratchet moving.

NOTE 1: While checking, hold latch from engaging ratchet wheel.

NOTE 2: If spring does not meet requirement it should be replaced.



Cassette Holder Stop



Requirement

With cassette holder in unlatched (forward) position, rear side of head bracket should be in line with the tip of the NIB (as gauged by eye at cutout of head bracket).

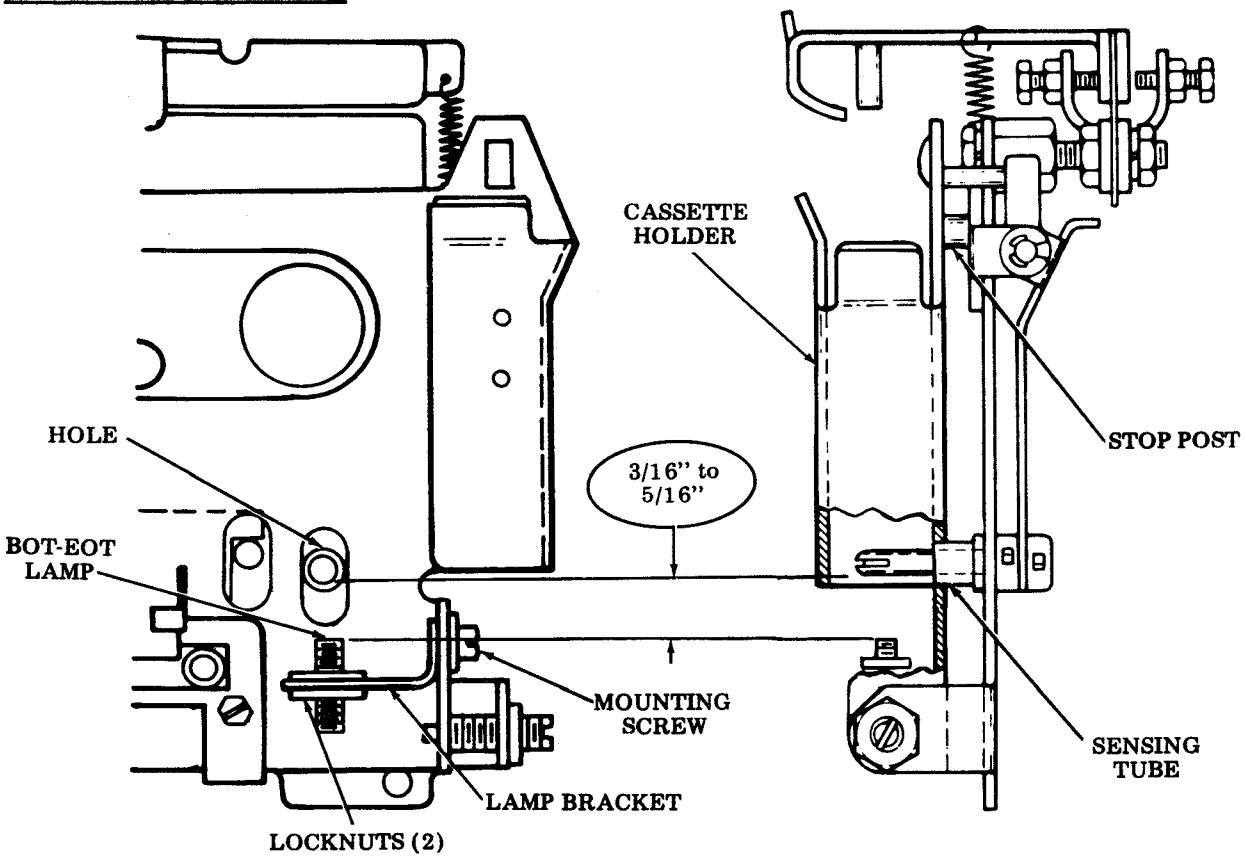
To Adjust

With locknut friction tight, adjust stop screw until requirement is met. Tighten locknut.

B. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

BOT-EOT Lamp Mounting



(1) Requirement

With cassette holder in its rearmost position (against stop post), tip of lamp should be

Min 3/16 inch---Max 5/16 inch

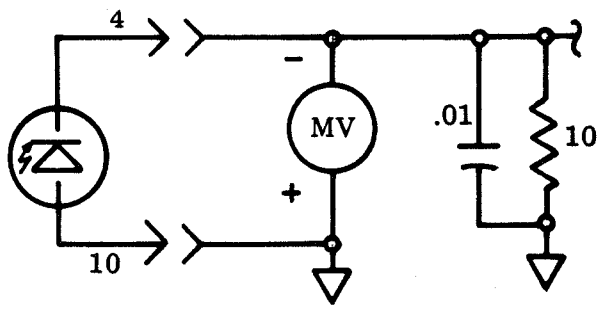
from bottom of sensing tube.

(2) Requirement

Lamp should be in line with hole in underside of sensing tube, as gauged by eye. Lamp should be aimed for peak photo-cell output.

To Adjust

Loosen locknuts and mounting screw which secures lamp bracket to cassette holder. To meet requirement, adjust light source in the following sequence (to produce a minimum output of -200 millivolts between pins 4 and 10 (to 410764 circuit card).



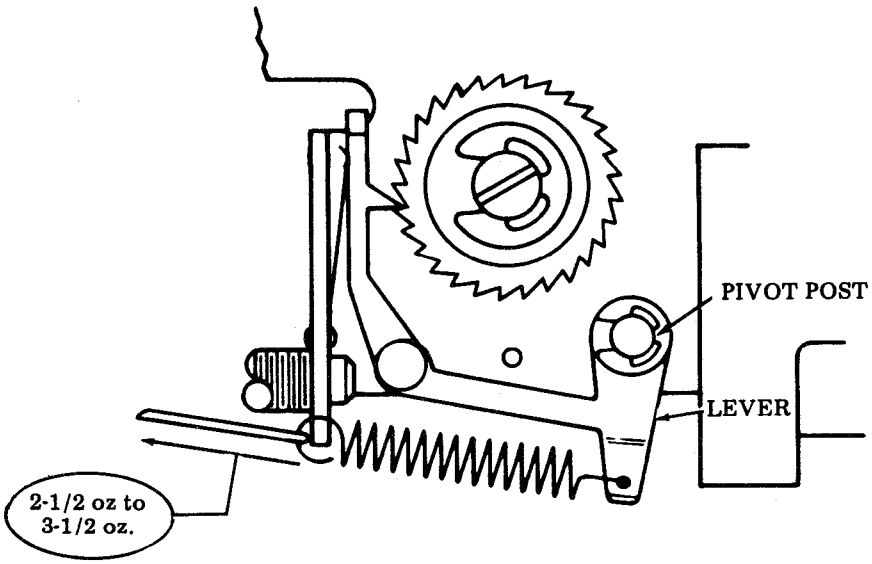
(a) Vertical (up and down)
(b) Vertical Rotation
(c) Horizontal Position (within mounting hole)

Tighten locknuts and mounting screws.

Stepper Spring

Requirement
With the cassette remove, it should take
Min 2-1/2 ounces---Max 3-1/2 ounces
to start spring moving at the installed length.

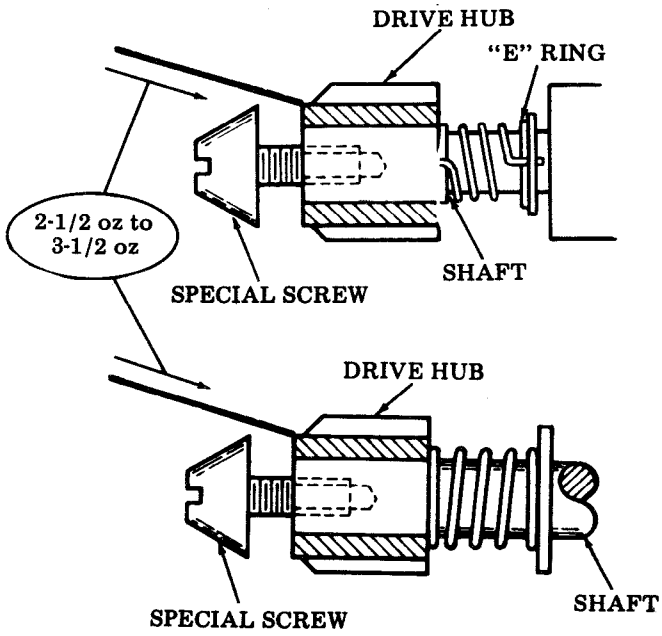
NOTE: If spring does not meet requirement it should be replaced.



Drive Hub Spring

Requirement
With the special screw backed up four threads it should take
Min 2-1/2 ounces---Max 3-1/2 ounces
to push the drive hub flush with the end of the shaft.

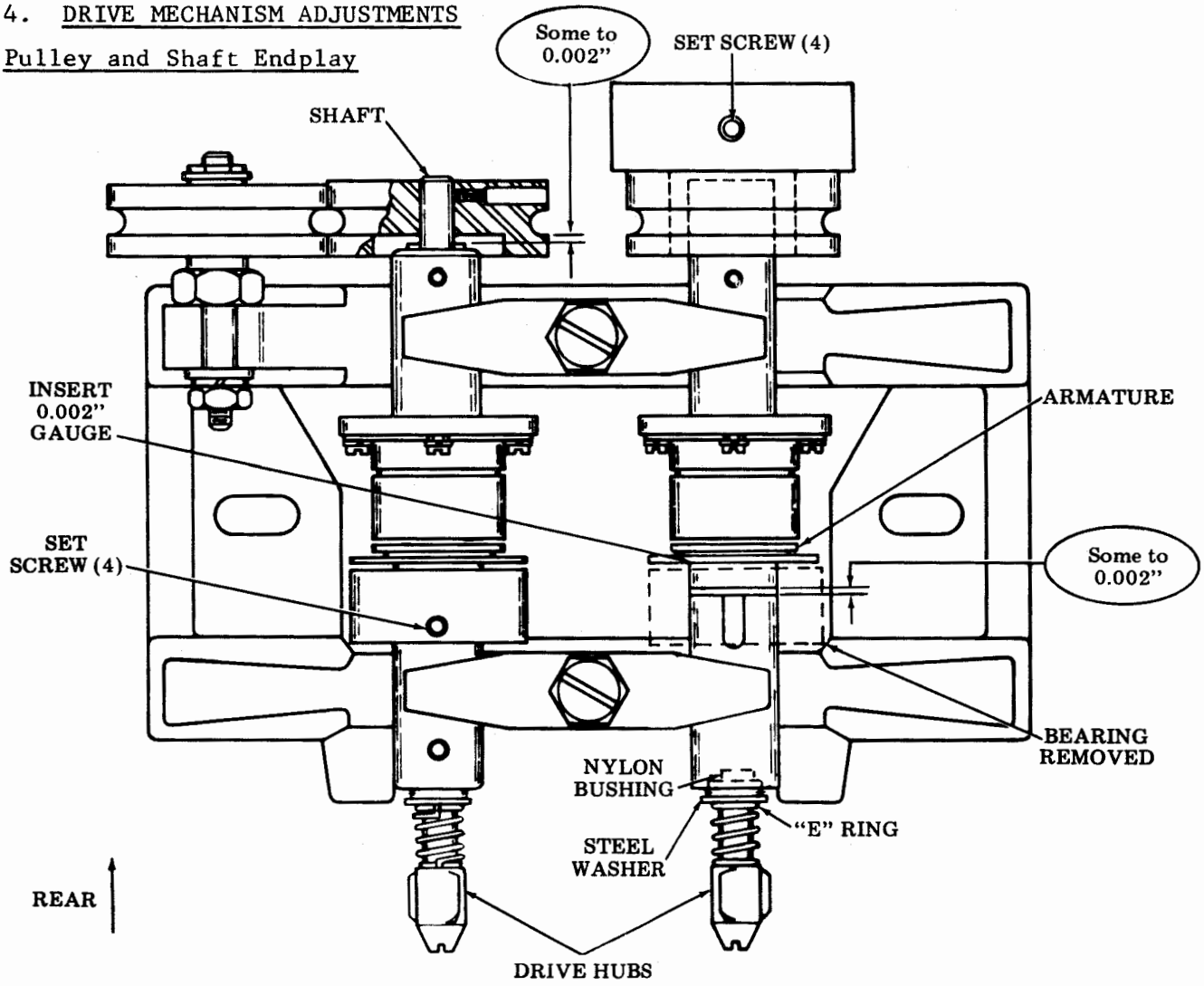
NOTE: If spring does not meet requirement, it should be replaced.



B. CASSETTE DRIVE (Cont)

4. DRIVE MECHANISM ADJUSTMENTS

Pulley and Shaft Endplay



Requirement

There should be

Min Some---Max 0.002 inch

perceptible endplay, as gauged by eye, on each shaft.

To Adjust

(a) Position each armature on its shaft with two set screws loosened.

(b) Insert a 0.002 inch gauge between friction washer and armature.

(c) Apply enough rearward pressure on the drive hubs to force the steel washer into the nylon bushing and overcome any play between the "E" ring and the shaft "E" ring groove.

(d) Tighten (very securely, both set screws for each assembly).

Pulley Alignment

Requirement

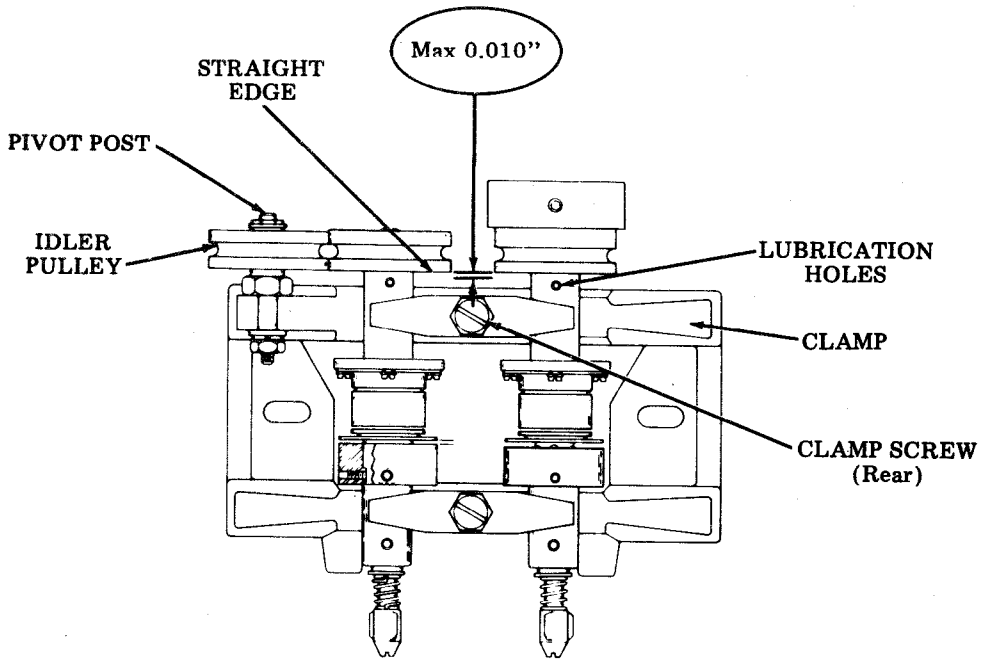
With lubrication holes upward, the front face of all three pulleys should be in line within

Max 0.010 inch

as gauged against a straight edge.

To Adjust

With the rear clamp screw friction tight and the "O" Ring removed, adjust the shafts with pulleys until the requirement is met. Tighten clamp screw.



Belt ("O" Ring)

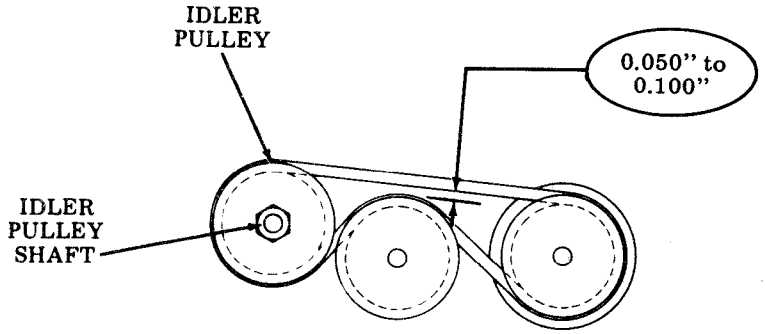
Requirement

The gap in the reversing belt should be

Min 0.050 inch---Max 0.100 inch.

To Adjust

With the idler pulley shaft friction tight, adjust up or down until the requirement is met. Tighten shaft nut.



B. CASSETTE DRIVE (Cont)

4. DRIVE MECHANISM ADJUSTMENTS (Cont)

Clutch

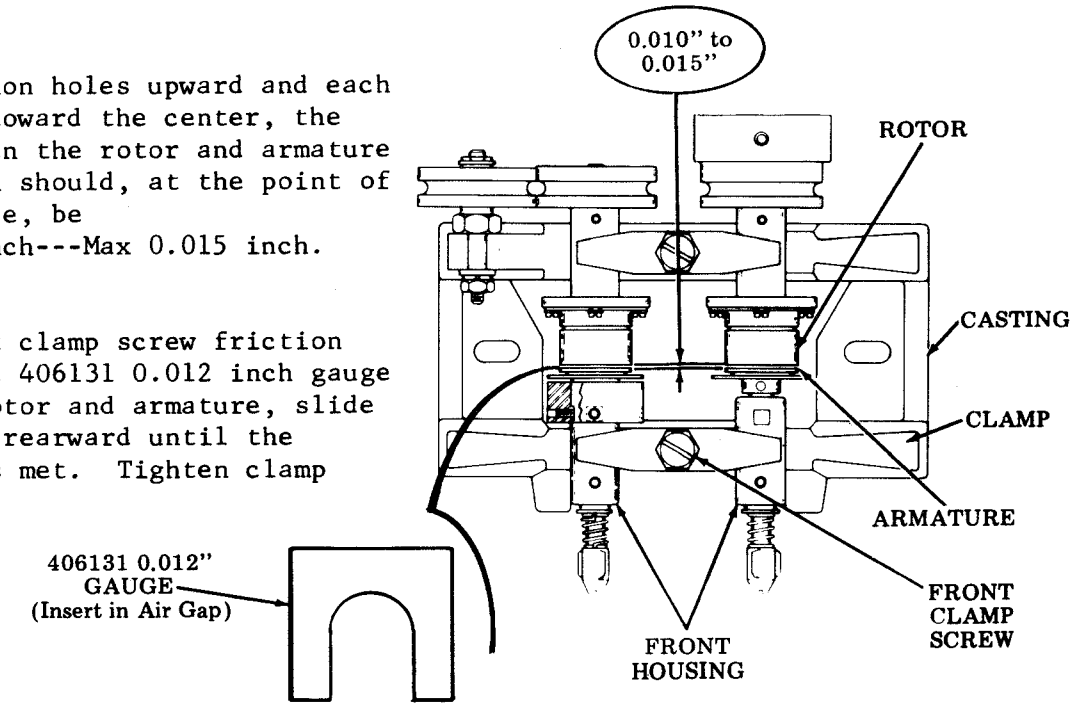
Requirement

With lubrication holes upward and each shaft biased toward the center, the air gap between the rotor and armature of each clutch should, at the point of least clearance, be

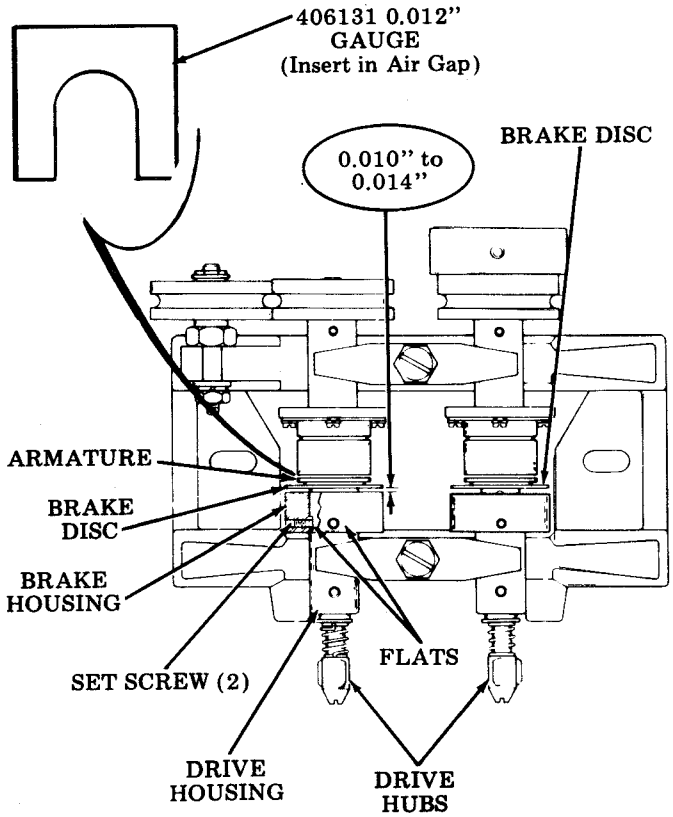
Min 0.010 inch---Max 0.015 inch.

To Adjust

With the front clamp screw friction tight, and the 406131 0.012 inch gauge between the rotor and armature, slide front housing rearward until the requirement is met. Tighten clamp screw.



Brake



Requirement

With the armature biased toward the front (by means of pulling slightly on the drive hub), the air gap between the brake disc and the brake housing should, at the point of least clearance, be

Min 0.010 inch---Max 0.014 inch.

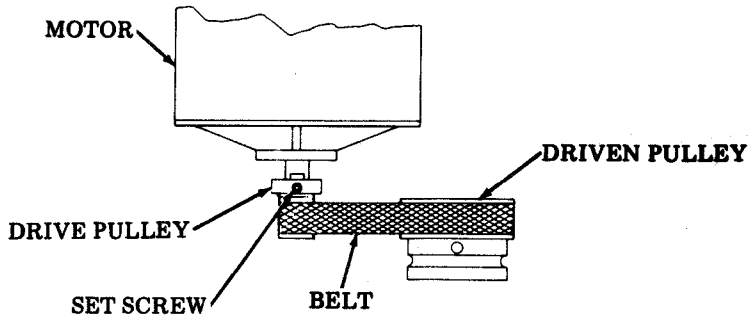
To Adjust

Loosen the two set screws. Insert the 406131 0.012 inch gauge between the brake disc and the brake housing. With the set screws over the mounting flats on the drive housing, slightly tighten the right set screw until friction tight. Adjust brake coil housing until the requirement is met. Tighten two set screws.

Motor Pulley

Requirement
The flat belt should be centered on both the motor drive pulley and driven pulley.

To Adjust
With the set screw loose, position the drive pulley to meet the requirement.

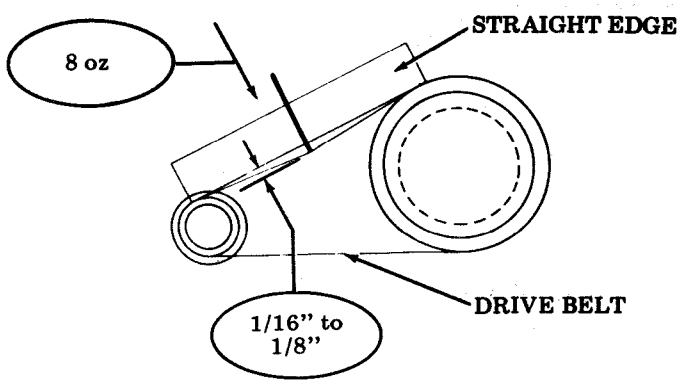


Motor Drive Belt

(1) Requirement
With a force of 8 ounces applied perpendicular to the drive belt, approximately midway along its free length, the belt should deflect
Min 1/16 inch---Max 1/8 inch
from a line tangent to both pulleys.

(2) Requirement
While the belt is motor driven (motor on) the belt should maintain its center position on the large pulley and should not walk to the edge of the pulley.

To Adjust
With the casting mounting screws friction tight, move casting, left or right with a slight pivot, to meet the requirements.



B. CASSETTE DRIVE (Cont)

5. 410764 CIRCUIT CARD ADJUSTMENT

Open Line Frequency

Requirement

The open line frequency of the 405681 TCI chip must be 50 kilohertz ±1 kilohertz. The adjustment must be accurate to within ±.4 microseconds.

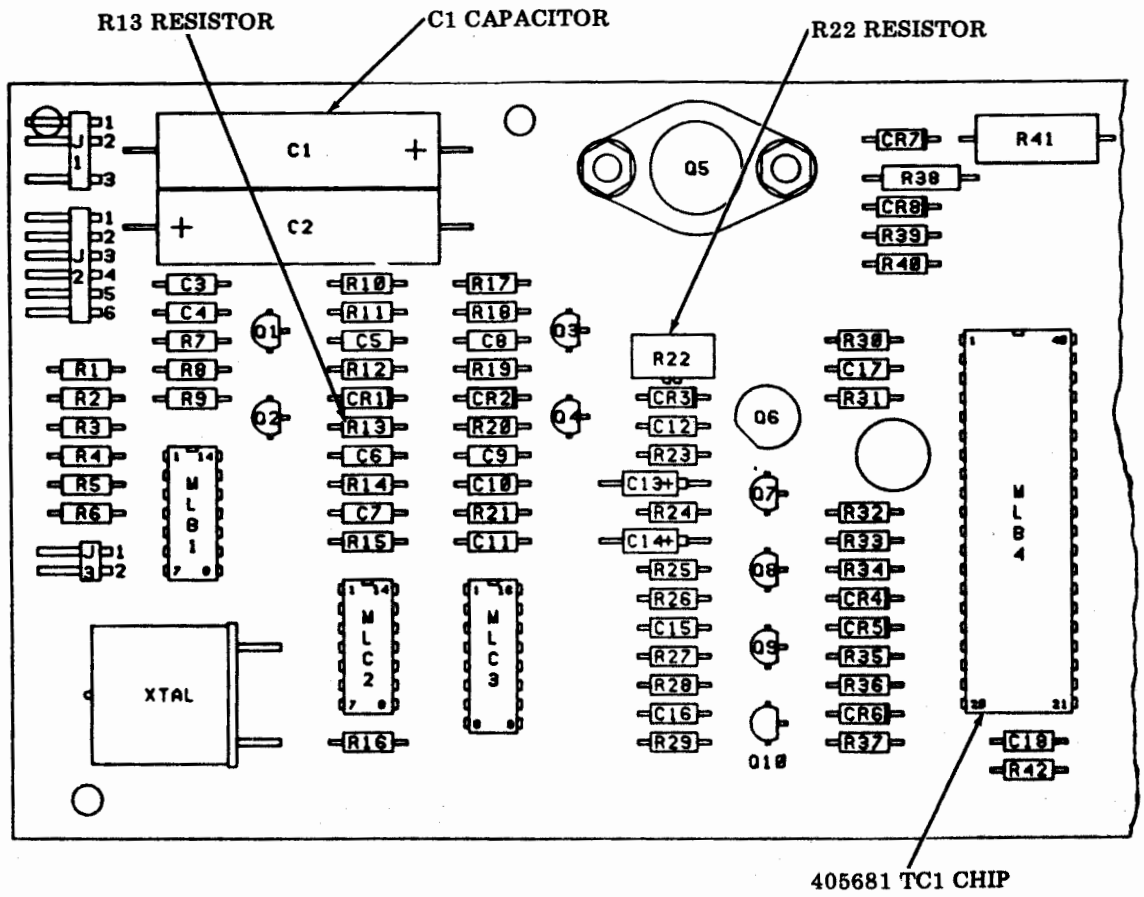
To Adjust

With dc power applied to the 410764 circuit card and the SSI signal line disconnected, adjust R22 to meet the above requirement.

NOTE 1: To adjust variable resistor (R22), connect oscilloscope common to board common (negative end of C1) and oscilloscope probe to the phase 1 clock output (either end of R13).

Set the scope:
X10 probe to 0.5 V per division
2 microseconds per division
Center the truce
Adjust R22 to obtain one complete cycle in 10 divisions.

NOTE 2: With the exception of this adjustment on the 410764 circuit card assembly, all other adjustments are related to the mechanical portion of the 40CD101.



PART 5 -- ADJUSTMENTS

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A. GENERAL

Field adjustments of Tempest Model 40 Sets may be required upon installation or on maintenance calls. This manual includes all adjustments related to the monitor, opcon, and printer adjustments that are considered to be "in-the-field" adjustments. No adjustments are required in the controller assembly.

B. DISPLAY MONITOR

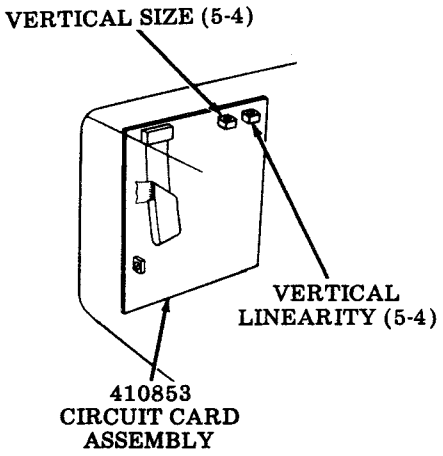
The controls that affect the display on the monitor are shown. These controls are adjusted with the monitor in position, power applied, monitor cover removed, and the heat sink assembly lowered. See PART 6 -- COMPONENT ACCESS.

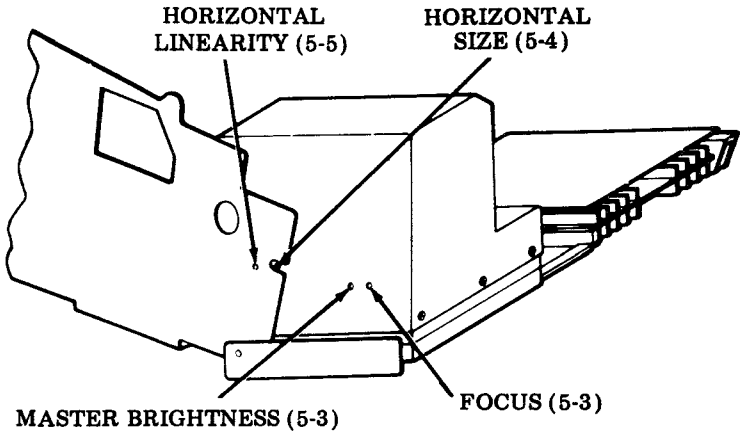
Before making any of the following electrical adjustments allow approximately 10 minutes of warmup time.

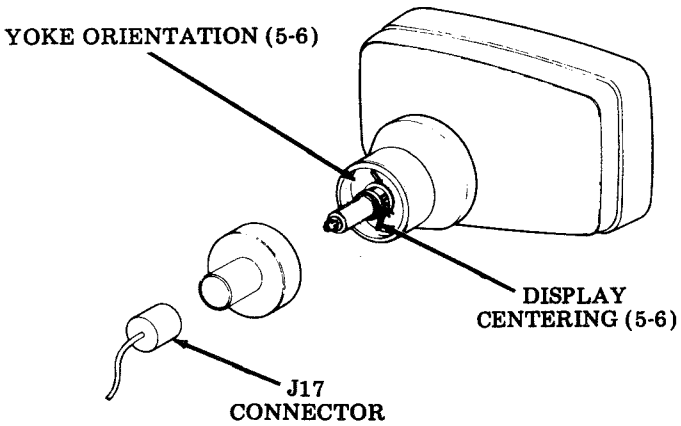
WARNING: OBSERVE ALL PRECAUTIONS TO AVOID ELECTRICAL SHOCK OR BREAKAGE OF THE CATHODE RAY TUBE (CRT). WEAR SAFETY GLASSES WHENEVER THE MONITOR HOUSING IS REMOVED.

B. DISPLAY MONITOR (Cont)

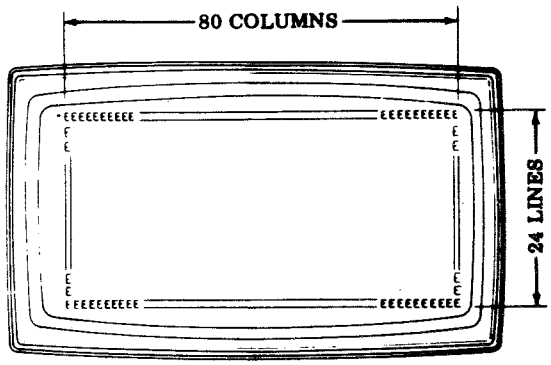
NOTE: The number indicated in parentheses after each adjustment title designates the page covering the adjustment requirements and procedure.







Most of the electrical adjustments require a test pattern on the display tube face consisting of the character "E" (or equivalent) in all positions around the perimeter of the display.

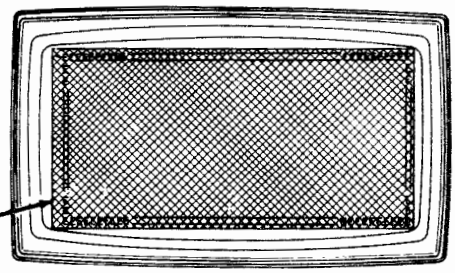


Display Test Pattern

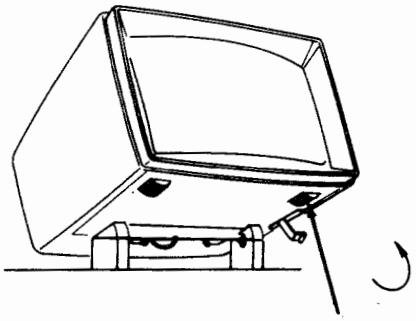
Master Brightness

Requirement: The raster (lighted rectangular background) shall be just visible with operator brightness control turned full counterclockwise to maximum intensity

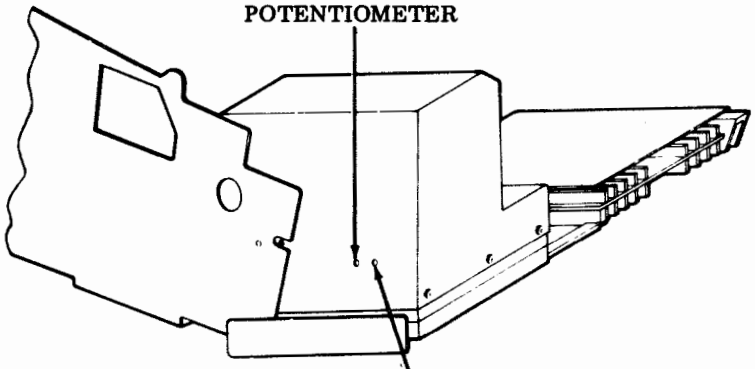
To Adjust: Rotate operator brightness control full counterclockwise for maximum intensity. Rotate master brightness potentiometer clockwise for darker; counter-clockwise for brighter. Adjust for just visible raster.



RASTER (Lighted rectangular background area — shown as crosshatched area)



OPERATOR BRIGHTNESS CONTROL



ACCESS HOLE TO MASTER BRIGHTNESS POTENTIOMETER

(Left Rear View)

ACCESS HOLE TO FOCUS POTENTIOMETER

Focus

Requirement: The display characters shall be well defined.

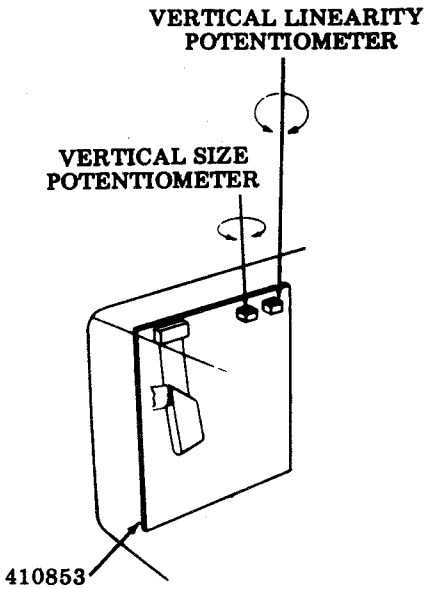
To Adjust: Rotate focus potentiometer to position giving sharpest display characters.

B. DISPLAY MONITOR (Cont)

Vertical Size

Requirement: The height of the 24 lines shall be 5-1/4 inches ±1/8 inch.

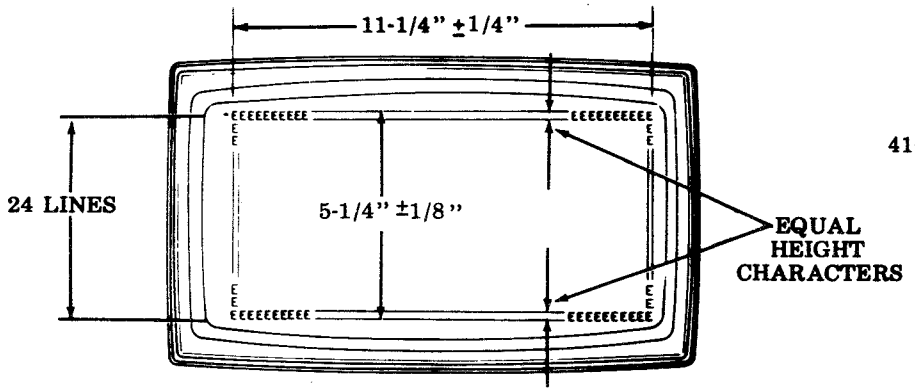
To Adjust: Rotate vertical size potentiometer clockwise to decrease; counterclockwise to increase.



Vertical Linearity

Requirement: Character height shall be uniform throughout the display.

To Adjust: Rotate vertical linearity potentiometer clockwise to decrease top row; counterclockwise to decrease bottom.

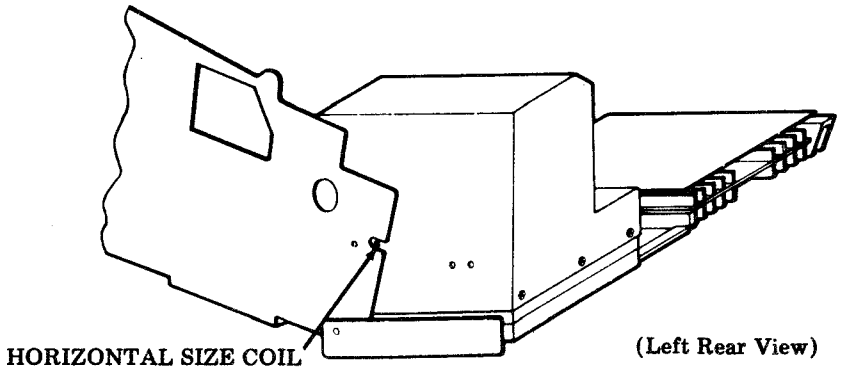


Horizontal Size

NOTE: Use 405993 monitor adjusting tool to perform this adjustment.

Requirement: The width of 80 characters shall be 11-1/4 inches ±1/4 inch.

To Adjust: Rotate horizontal size coil clockwise to decrease width; counterclockwise to increase width.



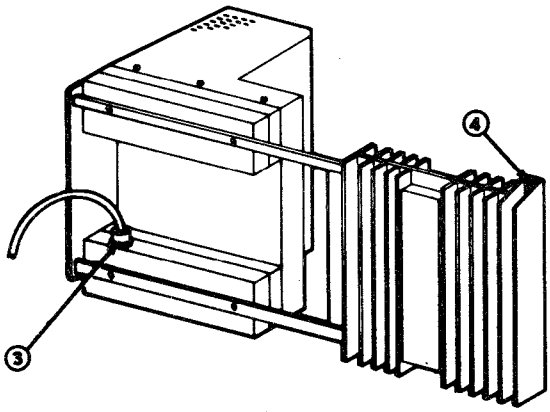
Procedure for Access to Monitor Yoke and Centering Rings

① Turn main power switch off.

② Remove monitor cover.

③ Replace monitor P901 connector.

④ Release 1/4-turn fastener securing heat sink assembly and tilt heat sink assembly rearward.



•To re-install 402112 shield assembly reverse above procedure.

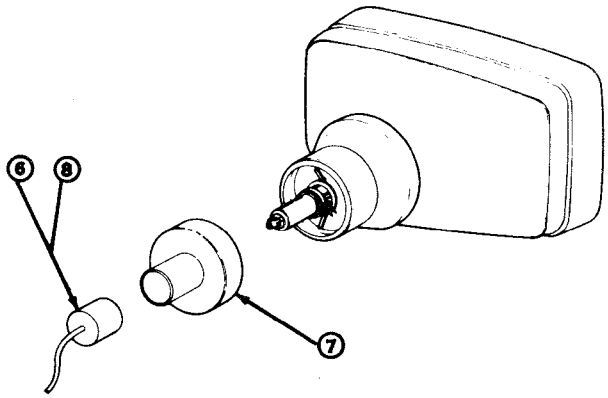
⑤ Using tube tilt mechanism, tilt tube face downward.

⑥ Carefully remove CRT J17 connector.

⑦ Carefully remove 402112 shield assembly.

⑧ Replace CRT J17 connector.

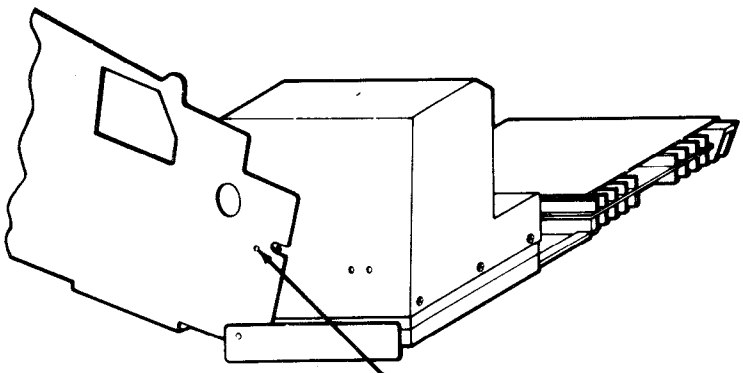
⑨ Turn main power switch on.



Horizontal Linearity

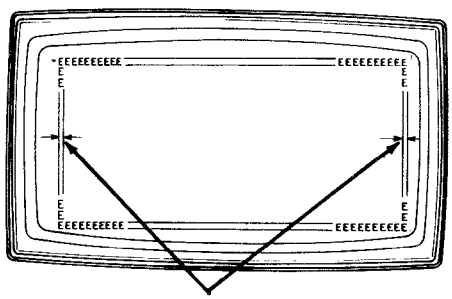
Requirement: Character width shall be uniform throughout the display as gauged by eye.

To Adjust: Rotate horizontal linearity coil for uniform width characters. Check and refine (if necessary) Horizontal Size adjustment.



(Left Rear View)

ACCESS HOLE TO HORIZONTAL LINEARITY COIL (In side frame and high voltage shield)



EQUAL WIDTH CHARACTERS (Gauged by eye)

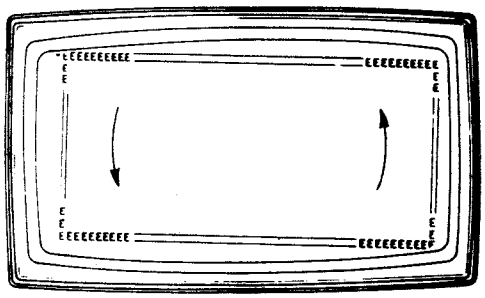
B. DISPLAY MONITOR (Cont)

Yoke Orientation

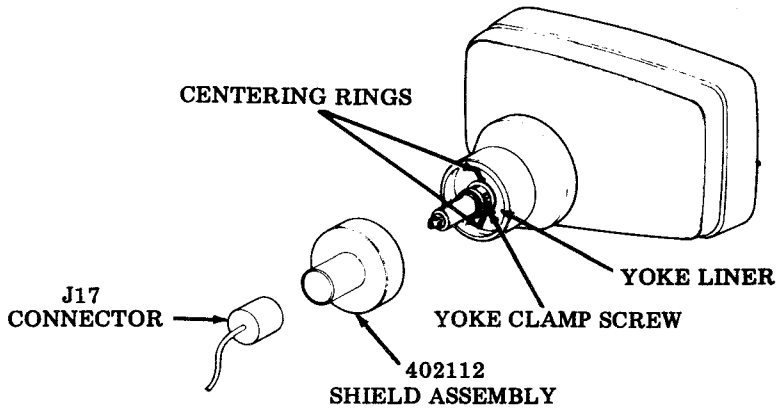
Requirement: The rectangular display area shall be aligned (rotationally) to the CRT face.

CAUTION: HIGH VOLTAGES ARE PRESENT AT YOKE. HANDLE ONLY BY YOKE LINER. THE NECK OF CRT IS FRAGILE. BE CAREFUL NOT TO STRIKE GLASS WITH SCREWDRIVERS, ETC. DO NOT OVER-TIGHTEN YOKE CLAMP SCREW.

To Adjust: Loosen yoke clamp screw. Rotate yoke to align display with CRT face. Do not overtighten yoke clamp screw.



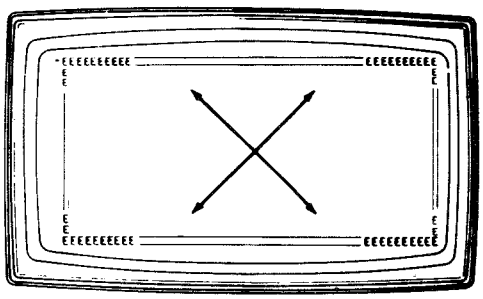
Rotate yoke to align display.



Display Centering

Requirement: The display (80 character by 24 lines) shall be centered on CRT face as gauged by eye.

To Adjust: Rotate two display centering rings by tabs.



Display movement as centering rings are rotated.

C. PRINTER

Adjustments in this section are those which can be performed readily at the operating site. Adjustments that require major disassembly of the printer (more appropriately performed at a Repair Center) are not covered in this manual.

Adjustments are grouped according to the location of the mechanism (front, left side, or right side), and in the sequence recommended for a comprehensive "in-the-field" adjustment.

Adjustments are provided for both friction feed and tractor feed printers. Adjustments that apply to only one type of printer are so indicated. All other adjustments apply to both friction feed and tractor feed units.

Identification drawings and tables are included to locate the various mechanisms and list the adjustments related to these mechanisms. (Some parts are noted for identification purpose only, and have no adjustments.) The number indicated in parentheses after each adjustment title designates the page covering the adjustment requirements and procedure.

The instruction "friction tight" means to tighten to the point where friction keeps the parts from moving, but they are still loose enough to move for adjustment purposes.

Spring or belt tensions are checked with a spring scale held at the angle shown in the adjustment illustration. Springs that do not meet requirements, and for which no adjustment procedure is given, should be replaced.

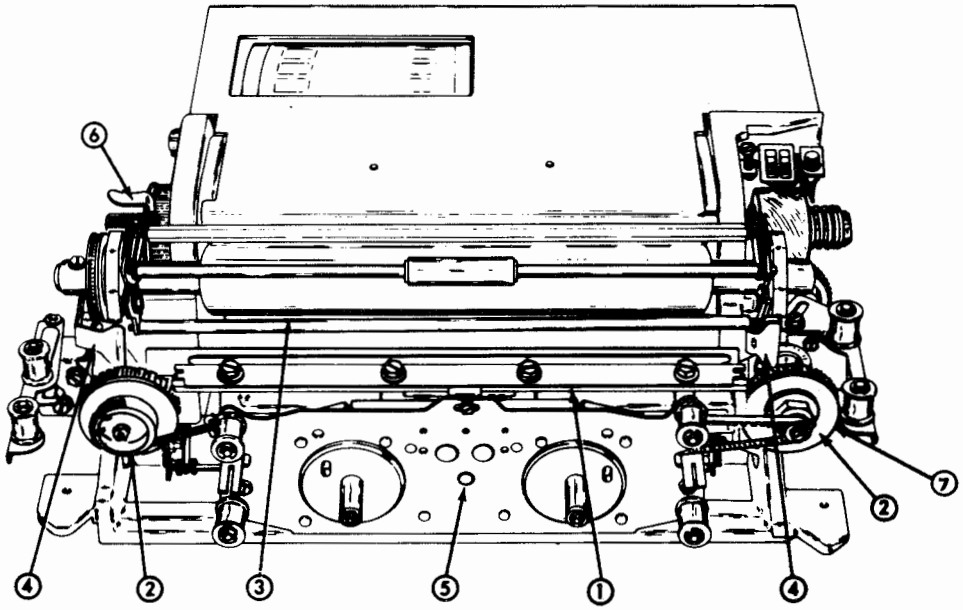
After adjustment is complete, tighten any screws or nuts loosened to make the adjustment.

WARNING: WITH COVER INTERLOCK SWITCH IN MAINTENANCE POSITION OR BYPASSED BY A JUMPER, AS REQUIRED FOR RUNNING ADJUSTMENTS, PRINTER MOTOR MAY START ACCIDENTALLY. WHENEVER PERFORMING ANY NONRUNNING ADJUSTMENTS, BE SURE AC POWER IS REMOVED (TURN PRIMARY AC POWER SWITCH OFF OR UNPLUG POWER CORD FROM AC OUTLET).

C. PRINTER (Cont)

1. FRONT ASSEMBLIES

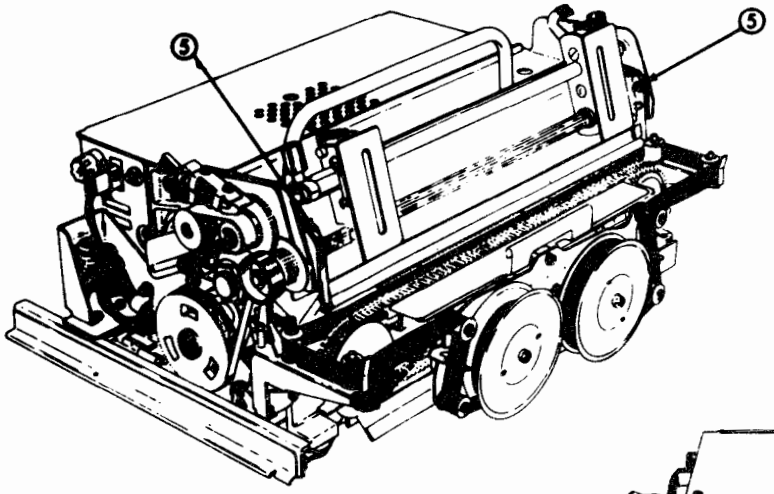
Identification -- Friction Feed Printer



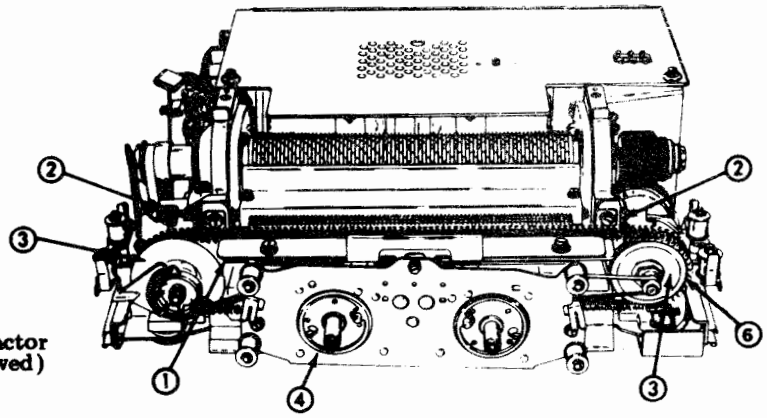
(Front View)

ASSEMBLY	ADJUSTMENTS (If Any)
① Backup Bar	Preadjustment Preparation (5-11) Backup Bar (Preliminary) (5-13) Backup Bar Adjustment (Final) (5-19)
② Carrier Sprockets	Preadjustment Preparation (5-11) Left Carrier Sprocket (5-14) Right Carrier Sprocket (5-14)
③ Paper Positioning Shaft	Preadjustment Preparation (5-11) Paper Positioning Shaft (Final) (5-16)
④ Ribbon Guides	Preadjustment Preparation (5-11) Ribbon Guide (Preliminary) (5-15) Left and Right Ribbon Guides (Final) (5-21)
⑤ Ribbon Feed Assembly	Ribbon Feed Drive Belt Tension (5-17) Ribbon Mechanism Drag (5-22)
⑥ Paper Release Lever	
⑦ Flag Sensor	Flag Sensor Gap (5-16) Flag Sensor (Final) (5-17)

Identification -- Tractor Feed Printer



(Left Front View)



(Front View — Tractor Mechanism Removed)

ASSEMBLY	ADJUSTMENTS (If Any)
① Backup Bar	Preadjustment Preparation (5-11) Backup Bar (Preliminary) (5-13) Backup Bar Adjustment (Final) (5-19)
② Ribbon Guides	Preadjustment Preparation (5-11) Ribbon Guide (Preliminary) (5-15) Left and Right Ribbon Guides (Final) (5-21)
③ Carrier Sprockets	Preadjustment Preparation (5-11) Left Carrier Sprocket (5-14) Right Carrier Sprocket (5-14)
④ Ribbon Feed Assembly	Ribbon Feed Drive Belt Tension (5-17) Ribbon Mechanism Drag (5-18)
⑤ Paper Positioner	Paper Positioning Shaft (Final) (5-16)
⑥ Flag Sensor	Flag Sensor Gap (5-16) Flag Sensor (Final) (5-17)

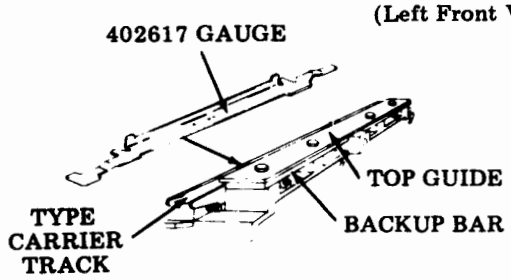
C. PRINTER (Cont)

1. FRONT ASSEMBLIES (Cont)

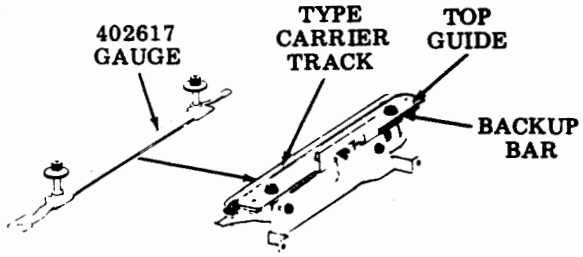
Installation of 402617 Adjusting Gauge

- With ac power off, remove paper and ribbon.
- Remove type carrier per instructions on printer cover.
- Insert 402617 adjusting gauge on type carrier track with front edge against backup bar, under top guide. Position gauge so protrusions at rear line up with no. 1 and no. 80 print hammers.

(Left Front Views)



Friction Feed Printer

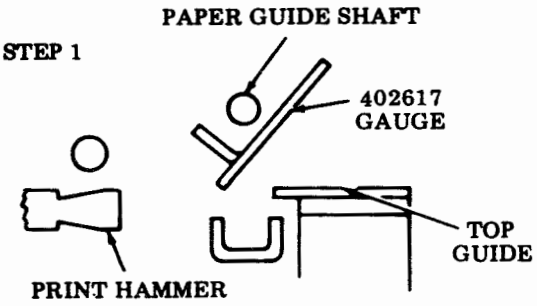


Tractor Feed Printer

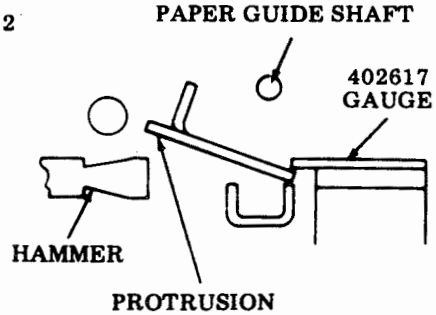
NOTE: To insert gauge: release pressure roller, rotate gauge under paper guide shaft, insert front edge under top guide, and return pressure roller to run position.

- If gauge does not fit freely, or if requirements cannot be met in the following adjustments, perform the Preadjustment Preparation.

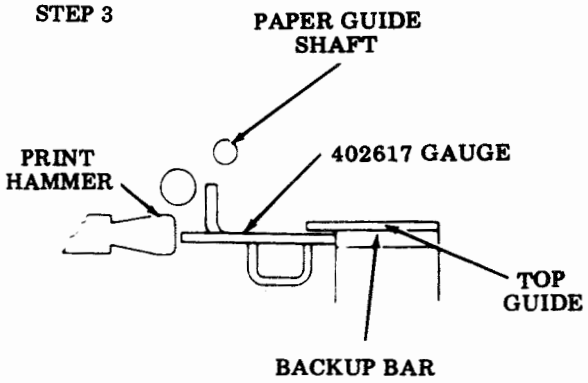
STEP 1



STEP 2



STEP 3

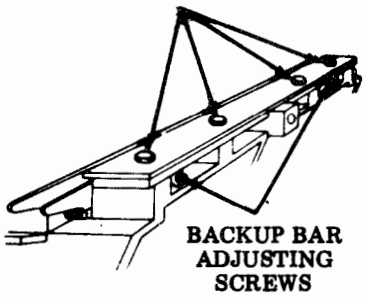


NOTE: Remove posts on 402617 gauge before inserting gauge into friction feed printer.

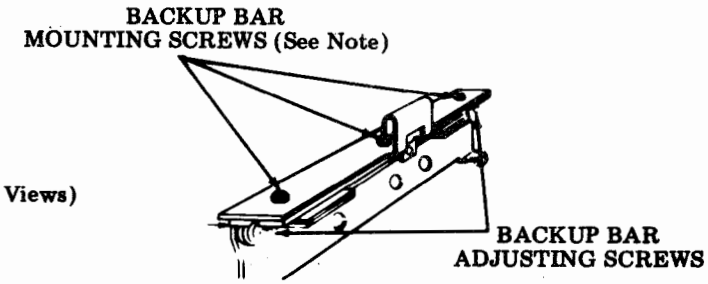
Preadjustment Preparation

The following steps may be used to "back off" the parts that make up the front assemblies, providing a starting point for a complete readjustment of these assemblies. These preadjustment steps are necessary only if there is difficulty in inserting the adjusting gauge into the printer, if requirements cannot be met for the various adjustments, or if there is any reason to suspect that the assemblies are misaligned to the point where a complete readjustment must be performed.

(1) With ribbon and paper removed, and with type carrier removed from track, loosen the backup bar mounting screws. Tighten the outer mounting screws friction tight and leave the inner mounting screw(s) loose. Move backup bar to its forward limit by turning the two backup bar adjusting screws counterclockwise.



(Left Front Views)



NOTE: Some printers are designed with four mounting screws as in the friction feed unit.

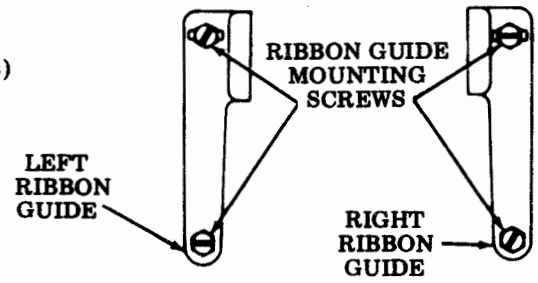
Friction Feed Printer

Tractor Feed Printer

(2) Loosen left and right ribbon guide mounting screws friction tight and position guides by hand to their rear limits.

Friction Feed Printer

(Side Views)

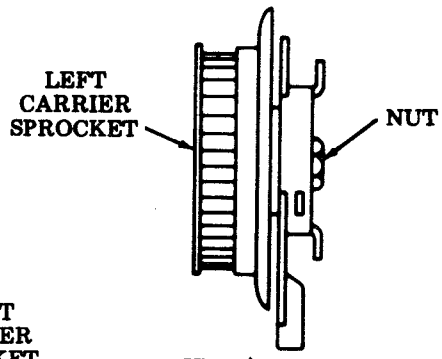


Tractor Feed Printer

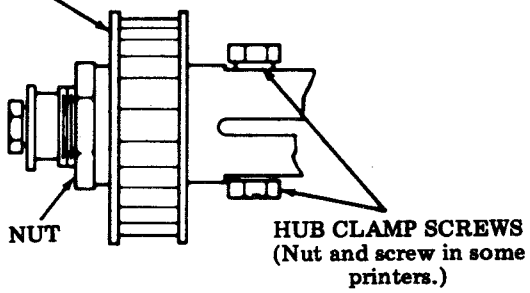
C. PRINTER (Cont)

1. FRONT ASSEMBLIES, Preadjustment Preparation (Cont)

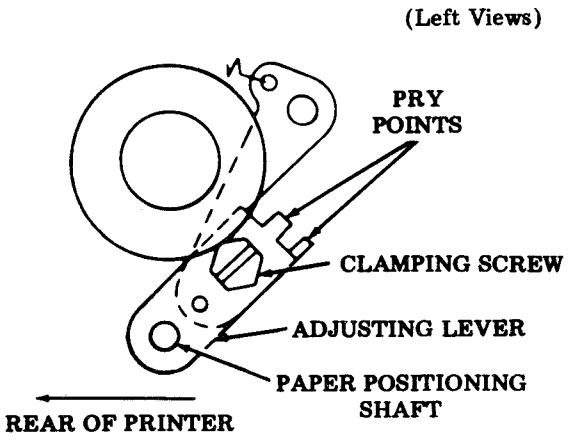
(3) Back off left carrier sprocket by turning nut at front of sprocket counterclockwise until nut is almost flush with end of shaft. While turning nut, hold shaft by using an Allen wrench in the socket at the end of the shaft.



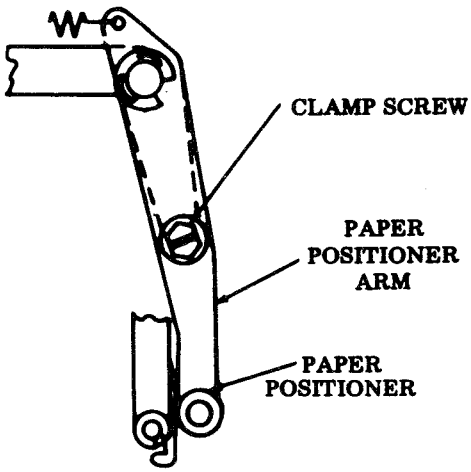
(4) Back off right carrier sprocket by loosening two hub clamp screws (one screw and one nut on some printers) one turn each, then turning nut at front of sprocket counterclockwise until nut clears face of sprocket. Leave hub clamp screws (or nut and screw) loosened at this time.



(5) Back off paper positioning shaft as follows: Loosen clamp screws friction tight. Position shaft to its rear limit. Do not tighten clamp screws.



Friction Feed Printer



Tractor Feed Printer

(6) Install 402617 adjusting gauge and proceed with the Backup Bar (Preliminary), Ribbon Guide (Preliminary), Left and Right Carrier Sprockets, and Paper Positioning Shaft (Final) adjustments.

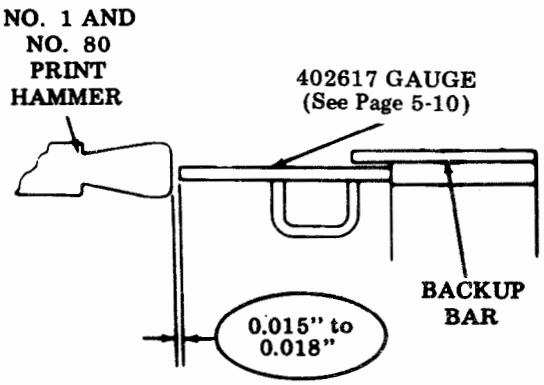
2. FRONT ASSEMBLY ADJUSTMENTS

Backup Bar (Preliminary)

Requirement: 0.015 inch to 0.018 inch clearance between the gauge and the front surface of the print hammers at the right and left sides.

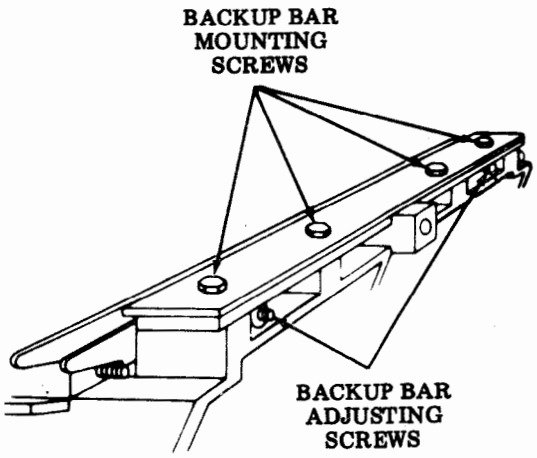
To Adjust: With center backup bar mounting screw(s) loosened and two outer screws friction tight, adjust the two backup bar adjusting screws to meet requirement. Tighten mounting screws.

CAUTION: ADJUSTMENT OF BACKUP BAR TO LESS THAN 0.015 INCH CLEARANCE WILL SEVERELY REDUCE RIBBON LIFE.

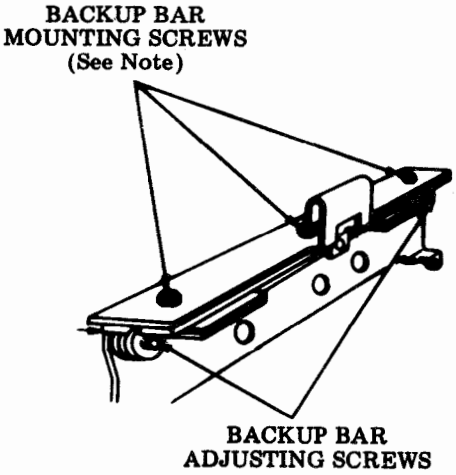


(Left View)

(Left Front Views)



Friction Feed Printer



NOTE: Some printers are designed with four mounting screws as in the friction feed unit.

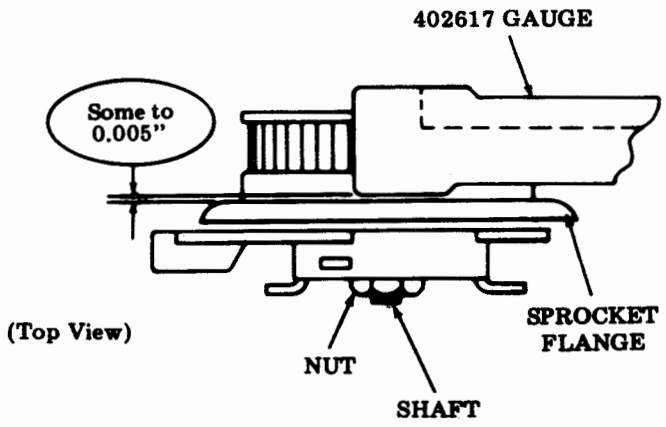
Tractor Feed Printer

C. PRINTER (Cont)

2. FRONT ASSEMBLY ADJUSTMENTS (Cont)

Left Carrier Sprocket

Requirement: Some to 0.005 inch between the gauge and the flat portion of the rear face of the front sprocket flange. The carrier release lever should be rotated clockwise until the rear rim of the sprocket just touches the bottom side of the gauge. Play in the sprocket assembly should be taken up evenly toward the rear of the printer.



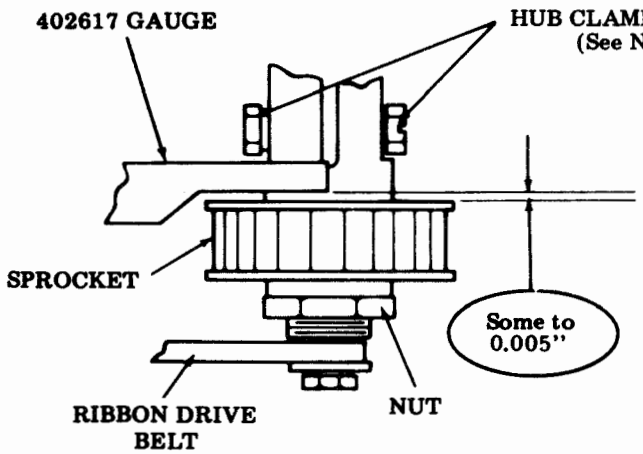
(Top View)

To Adjust (Friction Feed): Position sprocket by turning nut at front of sprocket to meet requirement while holding shaft with an Allen wrench.

To Adjust (Tractor Feed): Position the sprocket by turning nut at front of sprocket to meet requirement.

Right Carrier Sprocket

Requirement: Some to 0.005 inch between the gauge and the rear surface of the right carrier sprocket.



(Top View)

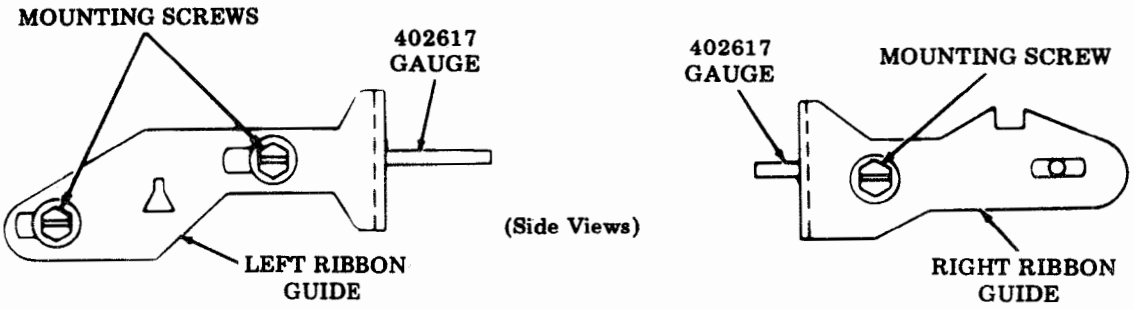
To Adjust: Loosen two hub clamp screws (or one screw and one nut if so equipped). Turn nut at front of sprocket to meet requirement. Tighten hub clamp screws (or screw and nut).

NOTE: Some printers have one screw and one nut instead of two hub clamp screws.

Ribbon Guide (Preliminary)

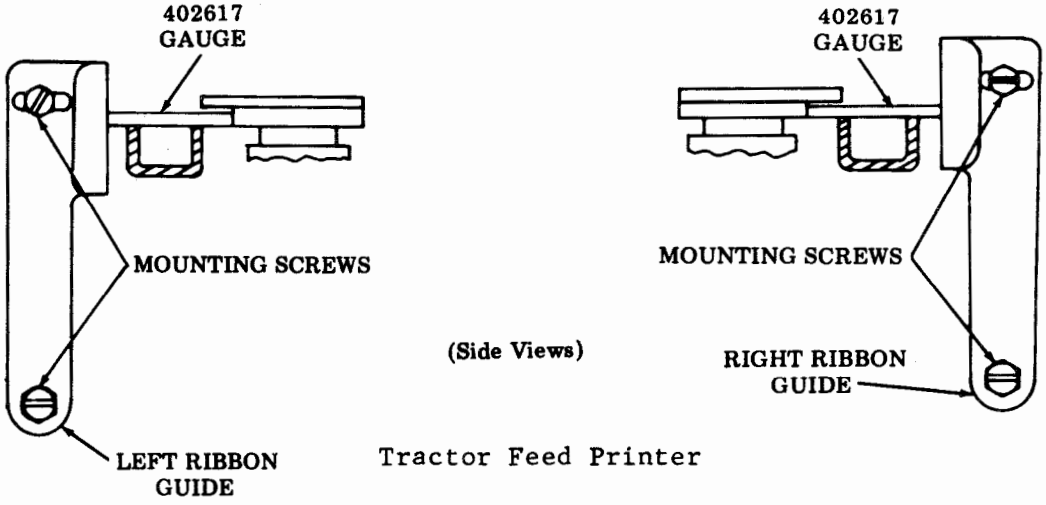
Requirement: The right and left ribbon guides should just touch the gauge.

To Adjust (Friction Feed): Loosen the left and right ribbon guide mounting screws friction tight. With the 402617 gauge held by hand against the backup bar, push the right and left ribbon guides by hand into contact with the guides. Tighten the mounting screws.



Friction Feed Printer

To Adjust (Tractor Feed): Loosen left and right ribbon guide mounting screws friction tight. With 402617 gauge held by hand against the backup bar, push the right and left ribbon guides by hand into contact with the guides. Tighten mounting screws.



Tractor Feed Printer

NOTE: At this point, remove 402617 gauge from printer. Reverse procedure used to install tool.

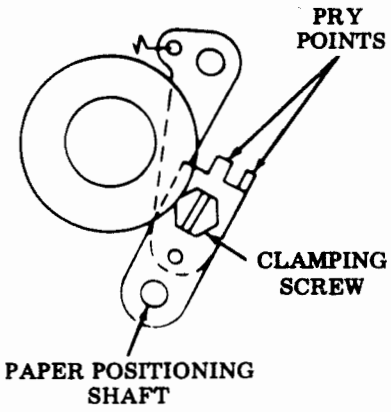
C. PRINTER (Cont)

2. FRONT ASSEMBLY ADJUSTMENTS (Cont)

Paper Positioning Shaft (Final)

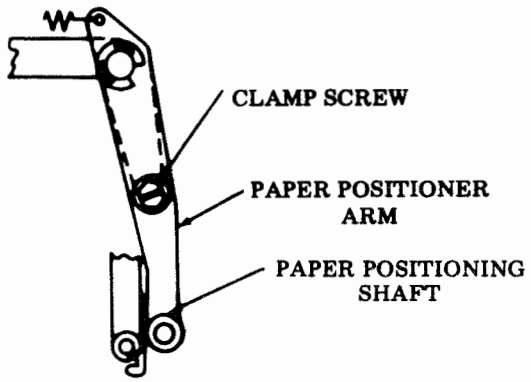
Requirement: No marks should be made on the paper by the ribbon when the printer is running idle. (In tractor feed printer, marking may occur if ribbon is running over a fold of fanfold paper.)

To Adjust: Loosen clamp screws on left and right paper positioner arms and adjust arms to just eliminate marking on either side of paper. Paper should remain as close as possible to ribbon without marking to minimize impact noise and vertical misalignment. Tighten clamp screws.



Friction Feed Printer

(Left Views)



Tractor Feed Printer

To Check: Connect ac power. Loosen the flag sensor locking screw. Adjust gap between flag and sensor pole piece to approximately 0.080 inch. Operate printer TS9 test switch to ON.

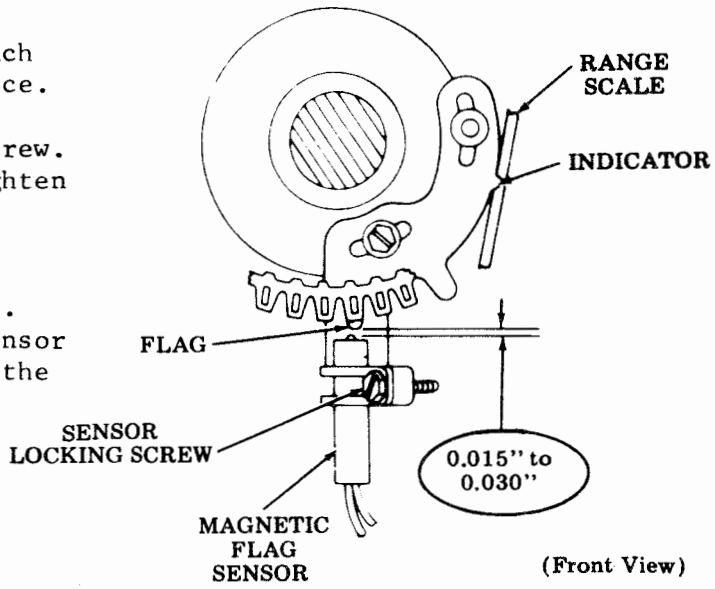
NOTE: After adjustment check, remake Flag Sensor Gap adjustment.

Flag Sensor Gap

Requirement: 0.015 inch to 0.030 inch between the flag and sensor pole piece.

To Adjust: Loosen sensor locking screw. Adjust gap to meet requirement. Tighten locking screw.

NOTE: It is preferable to use non-magnetic gauges to check requirement. Steel gauges are attracted by the sensor magnet making it difficult to gauge the adjustment.



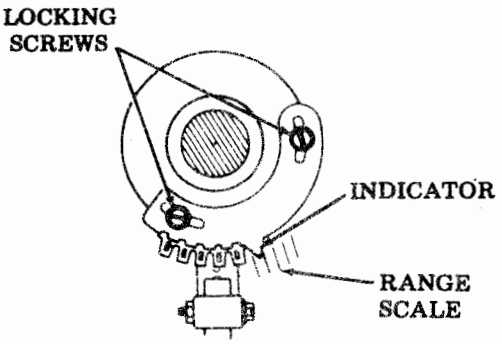
(Front View)

Flag Sensor (Final)*

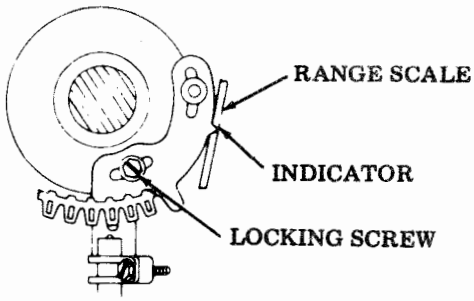
Requirement: The flag sensor must be in approximately the midpoint between failure points of its range.

To Check: Print some font identification characters using the test switch.

To Adjust: Loosen locking screw(s) friction tight. While printing font identification symbol, move indicator counterclockwise to point where printing stops or errors occur. (Note reading on range scale.) Move indicator clockwise to point where printing again stops or errors occur. (Note reading on range scale.) Set indicator midway between these points as gauged by eye. Tighten locking screw(s).



(Front Views) Tractor Feed Printer

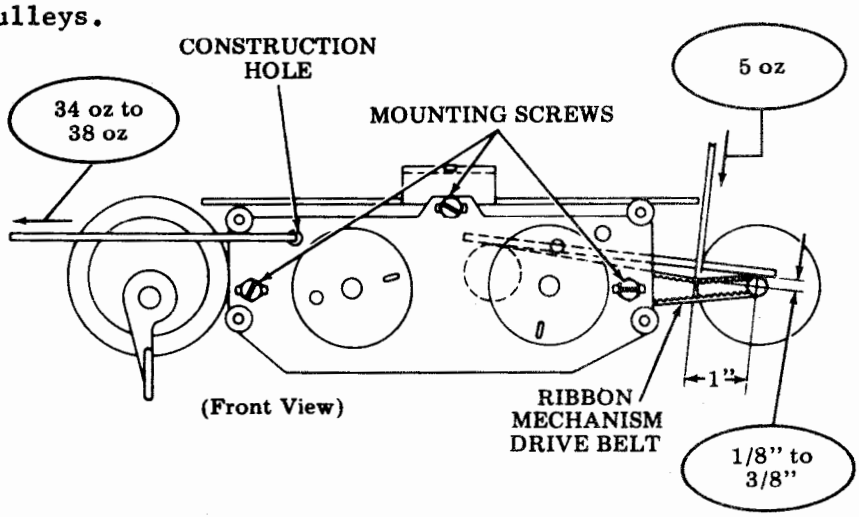


Friction Feed Printer

Ribbon Feed Drive Belt Tension

Requirement: With a force of 5 ounces applied perpendicular to the drive belt approximately 1 inch from right pulley, belt should deflect 1/8 inch to 3/8 inch from a line tangent to both pulleys.

To Adjust: Loosen mounting screws to allow mechanism to move freely to right or left. Pull against construction hole to left with a force of 34 ounces to 38 ounces. Tighten mounting screws with tension applied.



(Front View)

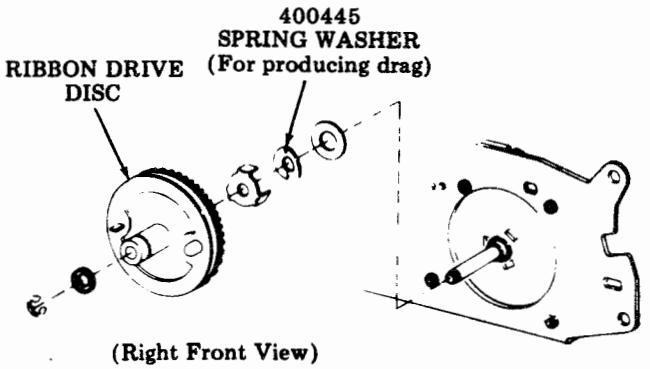
*Under power.

C. PRINTER (Cont)

2. FRONT ASSEMBLY ADJUSTMENTS (Cont)

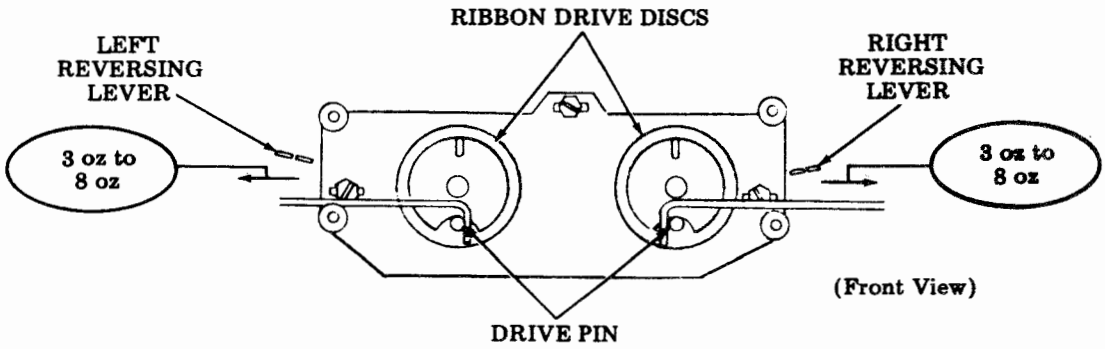
Ribbon Mechanism Drag

Requirement: It should take 3 ounces to 8 ounces to start free wheeling ribbon drive disc moving when pulling tangentially on its drive pin. To check other ribbon drive disc, reverse ribbon mechanism by pulling up on reversing lever adjacent to free wheeling drive disc and manually rotating impeller shaft clockwise as viewed from right side of printer until reversal occurs. The other ribbon drive disc is now the free wheeling disc and may be checked.



(Right Front View)

To Adjust: Remove ribbon drive disc assembly as shown and replace spring washer. Reassemble and recheck requirement.



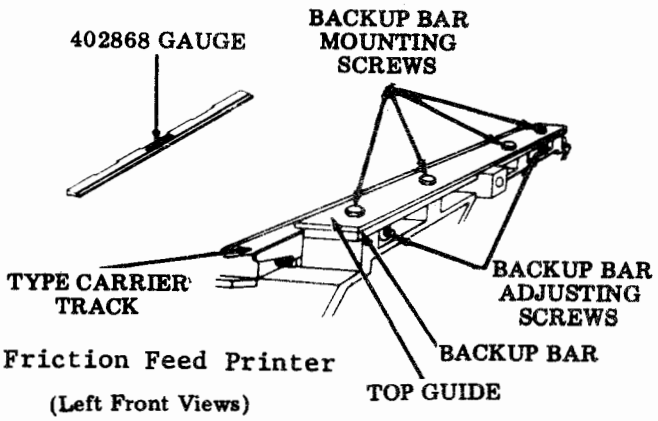
(Front View)

Installation of 402868 Adjusting Gauge for Backup Bar Adjustment (Final)

NOTE: For optimum print quality and maximum ribbon life, the unit should be adjusted after being at room ambient of 65 degrees to 85 degrees Fahrenheit for at least three hours.

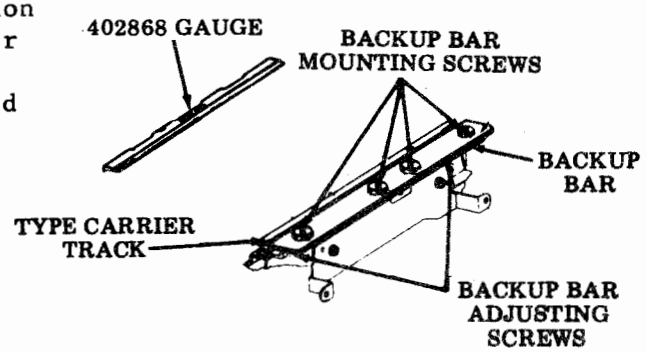
- With ac power off, remove ribbon.
- Install single ply paper.
- Remove type carrier.
- Install new ribbon.
- Insert 402868 adjusting gauge (friction feed and tractor feed) on type carrier track with front edge against backup bar. Position gauge so it is centered in relation with no. 1 and no. 80 print hammers.

NOTE: On tractor feed printers, the top guide with ribbon guides must be removed to install 402868 gauge.



Friction Feed Printer

(Left Front Views)



Tractor Feed Printer

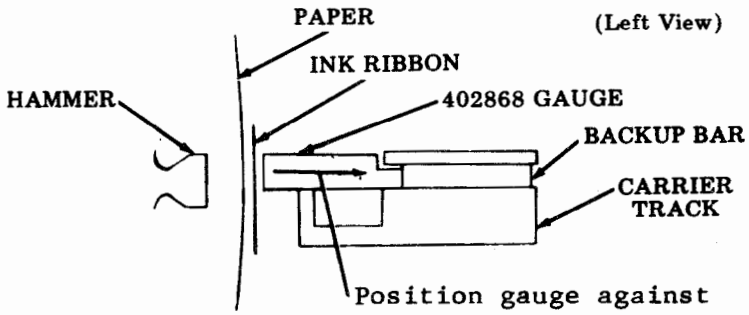
Backup Bar Adjustment (Final) (Using 402868 Gauge)

Requirement: While printing internal test message, Areas 3 and 5 (shown below) should be just visible. Areas 2, 4, and 6 should not be visible. Print density in Areas 1 and 7 should be approximately equal on a properly aligned and adjusted machine.

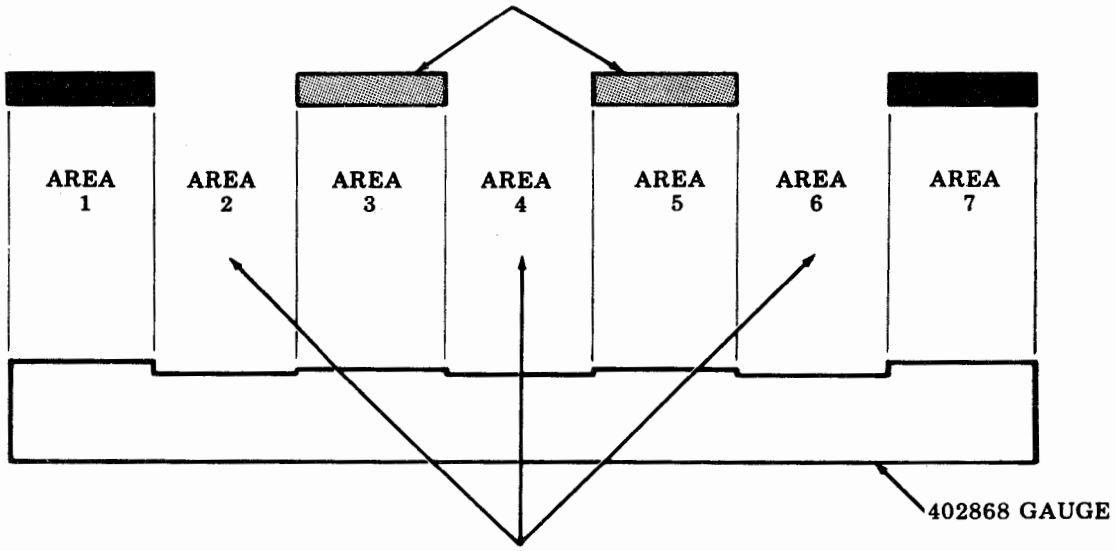
To Adjust: With unit turned on, hold 402868 gauge firmly against backup bar. Place printer test switch in the on position and pass a steel object over the flag sensor to initiate hammer firing. The bar gauge should be approximately centered with hammer bank.

Loosen four backup bar mounting screws friction tight and turn two adjusting screws to print only Areas 1 and 7. From this point, turn both left and right adjusting screws clockwise until Areas 3 and 5 meet requirement.

Tighten four backup bar mounting screws and check requirement.



Just visible printing in Areas 3 and 5.



No visible printing in Areas 2, 4, and 6.

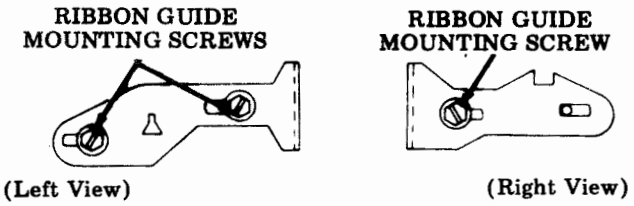
C. PRINTER (Cont)

2. FRONT ASSEMBLY ADJUSTMENTS (Cont)

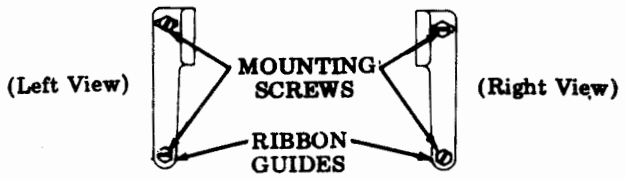
CAUTION: AFTER MAKING THE BACKUP BAR ADJUSTMENT USING 402868 GAUGE, THE FOLLOWING PROCEDURE MUST BE FOLLOWED.

Installation of 402617 Adjusting Gauge

(1) Loosen left and right ribbon guide mounting screws friction tight and position guides by hand to their rear limits.



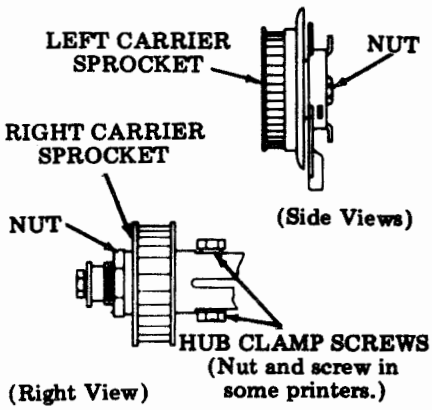
Friction Feed Printer



Tractor Feed Printer

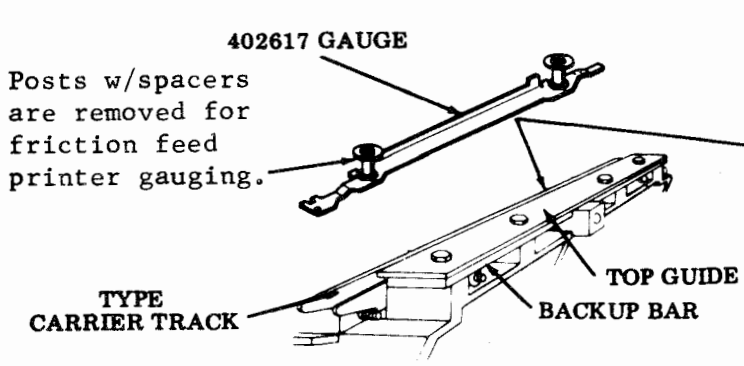
(2) Back off left carrier sprocket by turning nut at front of sprocket counterclockwise until nut is almost flush with end of shaft. While turning nut, hold shaft by using an Allen wrench in the socket at the end of shaft.

(3) Back off right carrier sprocket by loosening two hub clamp screws (one screw and one nut on some printers) one turn each, then turning nut at front of sprocket counterclockwise until nut clears face of sprocket. Leave clamp screws (or nut and screw) loosened at this time.

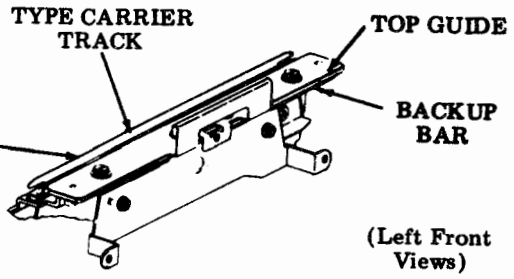


(4) Install 402617 gauge and perform Ribbon Guide (Preliminary), Left Carrier Sprocket, and Right Carrier Sprocket adjustments. Check the Left and Right Ribbon Guides (Final) adjustment.

- With ac power off, remove paper and ribbon.
- With type carrier removed, insert 402617 gauge on type carrier track with front edge against backup bar, under top guide. Position gauge so protrusions at rear line up with no. 1 and no. 80 print hammers.



Friction Feed Printer



Tractor Feed Printer

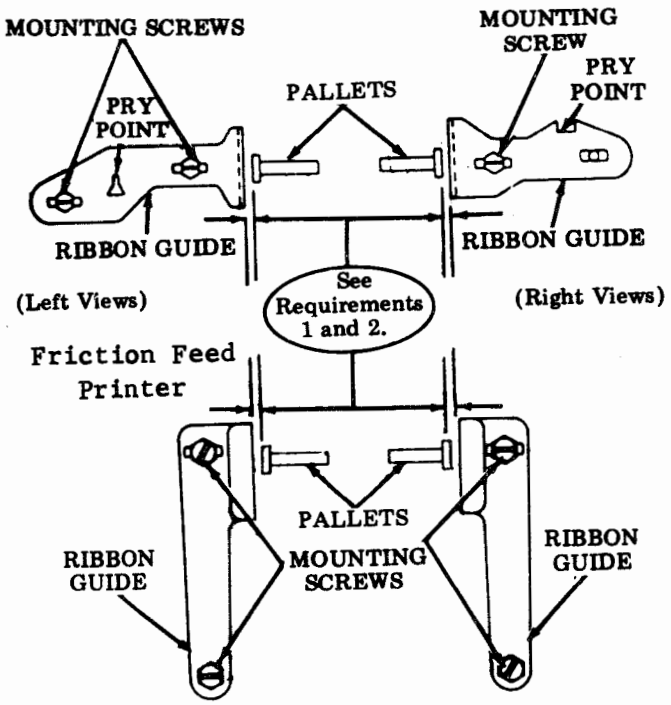
Left and Right Ribbon Guides (Final)

Requirement 1: There should be a minimum of 0.010 inch clearance between ribbon guides and face of a flag pallet on carriers having three fonts and face of a font identification pallet on carriers having two fonts.

To Adjust: Loosen ribbon guide mounting screws friction tight. Position guide to meet requirement. Tighten mounting screws. Repeat procedure with other ribbon guide.

Requirement 2: There should be a minimum of 0.006 inch clearance between ribbon guides and all pallet faces.

To Adjust: Seat pallets against rear surface of front flange of left sprocket.

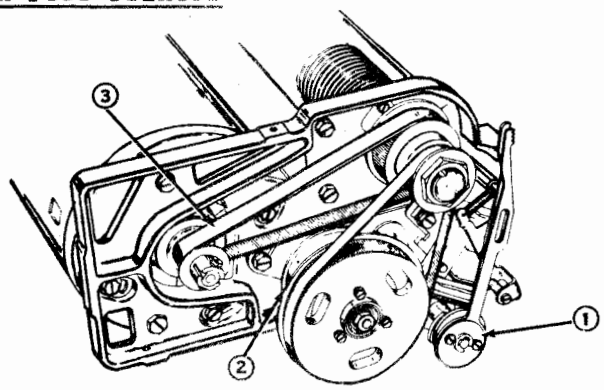


Tractor Feed Printer

C. PRINTER (Cont)

3. LEFT SIDE ASSEMBLIES

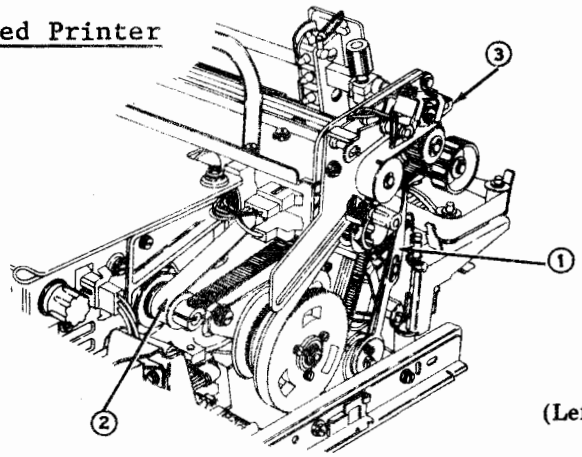
Identification -- Friction Feed Printer



(Left View)

ASSEMBLY	ADJUSTMENTS (If Any)
① Line Feed Assembly	Line Feed Bar Eccentric (5-23) Line Feed Bail Spring (5-23) Feed Bar Drive Belt Tension (5-24)
② Line Feed Clutch Sprocket	Clutch Drive Belt Tension (5-24)
③ Impeller Shaft Drive Belt	Impeller Shaft Drive Belt Tension (5-25)

Identification -- Tractor Feed Printer

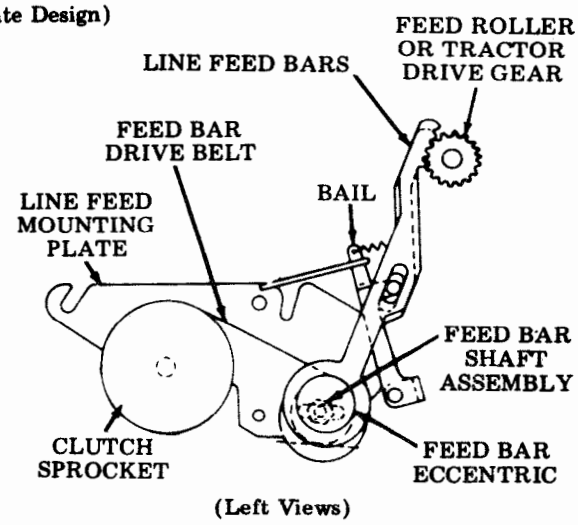


(Left Rear View)

ASSEMBLY	ADJUSTMENTS (If Any)
① Line Feed Mechanism	Line Feed Bar Eccentric (5-23) Line Feed Bail Spring (5-23) Feed Bar Drive Belt Tension (5-24) Clutch Drive Belt Tension (5-24)
② Impeller Shaft Drive Belt	Impeller Shaft Drive Belt Tension (5-25)
③ Form-Out Mechanism	Form-Out Contact Gap (5-25) Form-Out Contact Lateral (5-25) Form-Out Gear Backlash (5-25) Form-Out Contact to Belt Spacing (5-26)

4. LEFT SIDE ASSEMBLY ADJUSTMENTS

(Late Design)



(Left Views)

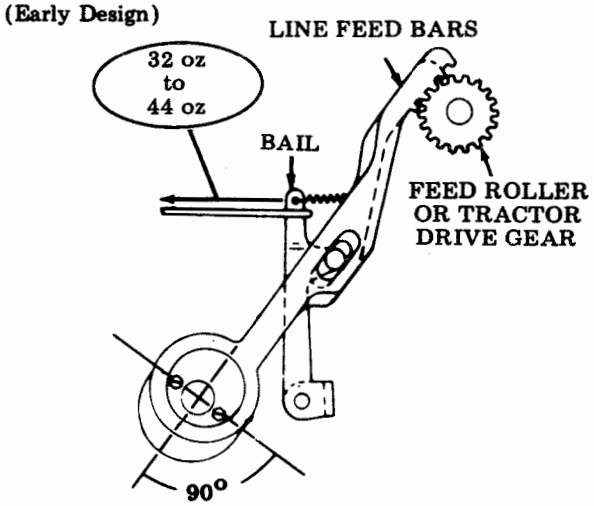
Line Feed Bar Eccentric (Late Design)

To Check: Disengage line feed clutch (latched). Position line feed bars against feed roller drive gear (friction feed) or tractor drive gear (tractor feed).

Requirement: Feed bars should be parallel to each other as gauged by eye.

To Adjust: Remove feed bar drive belt from clutch sprocket. Rotate feed bar eccentric to meet requirement. Replace belt.

(Early Design)



To Check: Disengage line feed clutch (latched). Position line feed bars against feed roller drive gear (friction feed) or tractor drive gear (tractor feed).

Requirement: Feed bar eccentric adjusting screws should be positioned at right angles to line feed bar rear surface as gauged by eye.

To Adjust: Loosen feed bar eccentric adjusting screws. Rotate eccentrics to meet requirement. Tighten adjusting screws.

Line Feed Bail Spring (Late Design)

Requirement: 32 ounces to 44 ounces to start line feed bail moving.

Line Feed Bar Eccentric (Early Design)

To Check: Disengage line feed clutch (latched). Position line feed bars against feed roller drive gear (friction feed) or tractor drive gear (tractor feed).

Requirement: Feed bar eccentric adjusting screws should be positioned at right angles to line feed bar rear surface as gauged by eye.

To Adjust: Loosen feed bar eccentric adjusting screws. Rotate eccentrics to meet requirement. Tighten adjusting screws.

Line Feed Bail Spring (Early Design)

Requirement: 32 ounces to 44 ounces to start line feed bail moving.

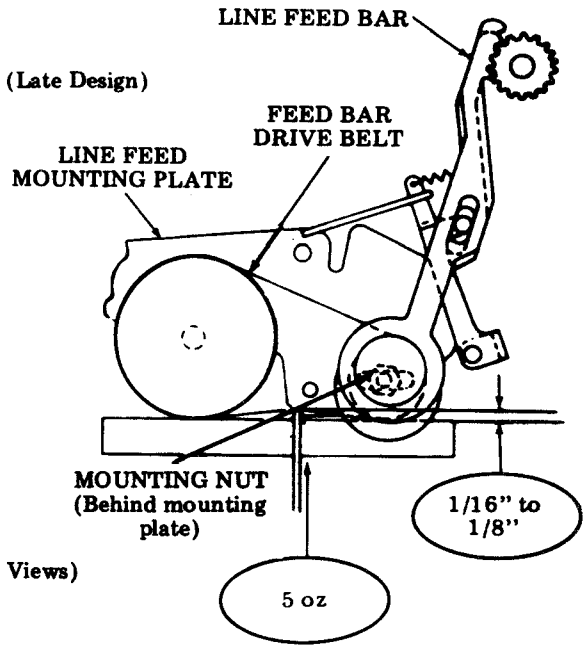
C. PRINTER (Cont)

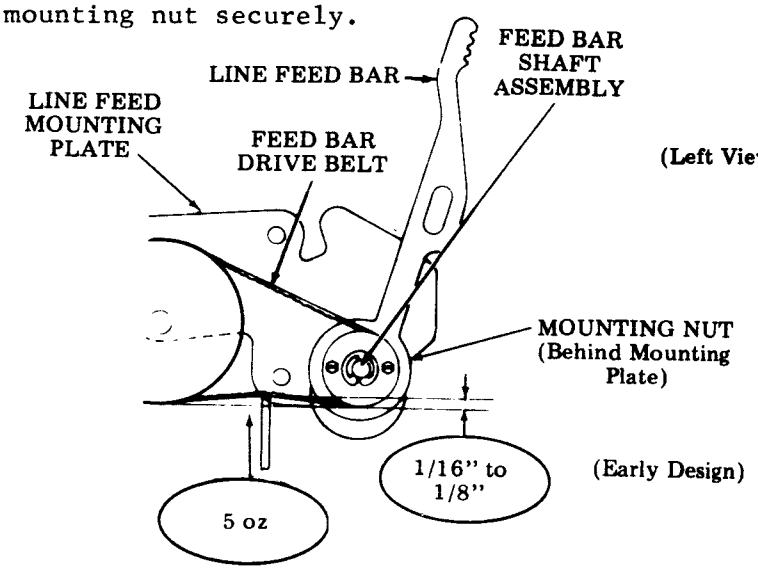
4. LEFT SIDE ASSEMBLY ADJUSTMENTS (Cont)

Feed Bar Drive Belt Tension

Requirement: With a force of 5 ounces applied perpendicular to drive belt approximately midway along its free length, the belt should deflect 1/16 inch to 1/8 inch from a line tangent to both pulleys.

To Adjust (Late Design): Loosen the nut mounting the feed bar shaft assembly to the mounting plate and move the feed bar shaft assembly left or right to meet the requirement. Tighten the mounting nut securely.



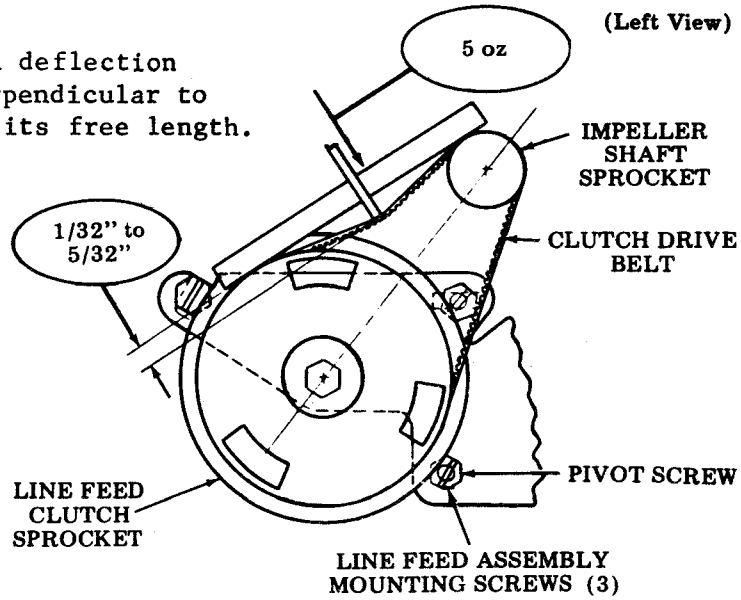


To Adjust (Early Design): Remove circuit card. Loosen mounting nut. Position feed bar shaft assembly to meet requirement. Tighten mounting nut.

Clutch Drive Belt Tension

Requirement: 1/32 inch to 5/32 inch deflection with a force of 5 ounces applied perpendicular to the belt approximately midway along its free length.

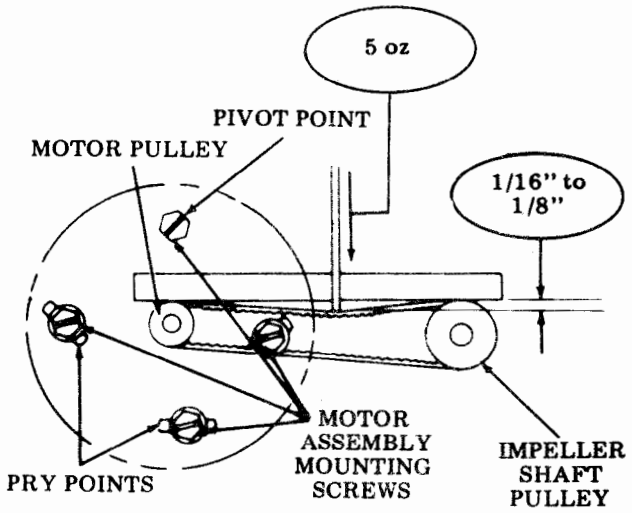
To Adjust: Loosen the three line feed assembly mounting screws sufficiently to allow the line feed assembly to move freely about its pivot. Pull with 48 ounces to 52 ounces against the line feed clutch sprocket in line with a line drawn through the center of the line feed clutch sprocket and the impeller shaft sprocket. Tighten the mounting screws with the tension applied.



Impeller Shaft Drive Belt Tension

Requirement: With a force of 5 ounces applied perpendicular to drive belt approximately midway along its free length, the belt should deflect 1/16 inch to 1/8 inch from a line tangent to both pulleys.

To Adjust: Loosen the four motor assembly mounting screws friction tight. Using a screwdriver, pry the flat washer under one of the mounting screws in the desired direction using the appropriate end of the slot. Tighten the mounting screws.



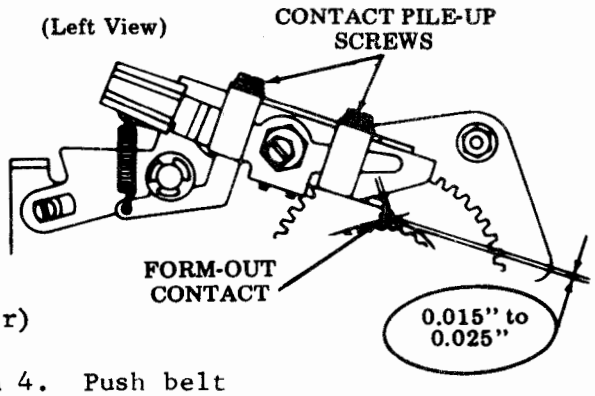
(Left View)

Form-Out Contact Gap (Tractor Feed Printer)

Requirement: With form-out contacts fully open, gap between contacts should be Min 0.015 inch---Max 0.025 inch.

To Adjust: Form contact spring to meet requirement.

NOTE: In adjusting, form the spring that shows signs of deforming.



Form-Out Contact Lateral (Tractor Feed Printer)

To Check: Set form-out mechanism to position 4. Push belt manually toward printer against pulley flanges. Engage form-out contact with one of two short cam lobes on belt.

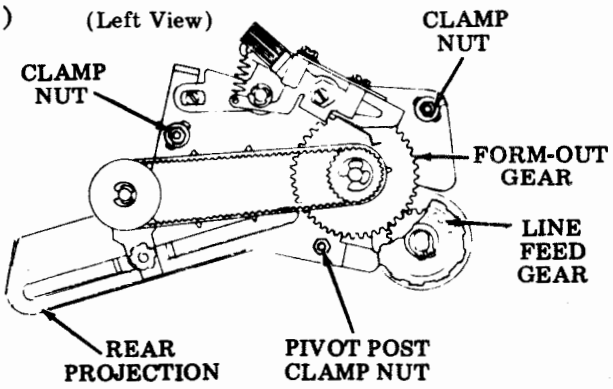
Requirement: Contact should be centered on cam lobe as gauged by eye.

To Adjust: With two contact pile-up screws friction tight, position contact laterally to meet requirement. Tighten screws.

Form-Out Gear Backlash (Tractor Feed Printer)

Requirement: While holding form-out gear stationary, turn manual paper advance knob. There should be a barely perceptible backlash between the form-out gear and line feed gear, checked at three positions of the form-out gear approximately 120° apart.

To Adjust: With clamp nuts friction tight (3 places), move form-out mechanism by its rear projection to meet requirement. Tighten clamp nuts.



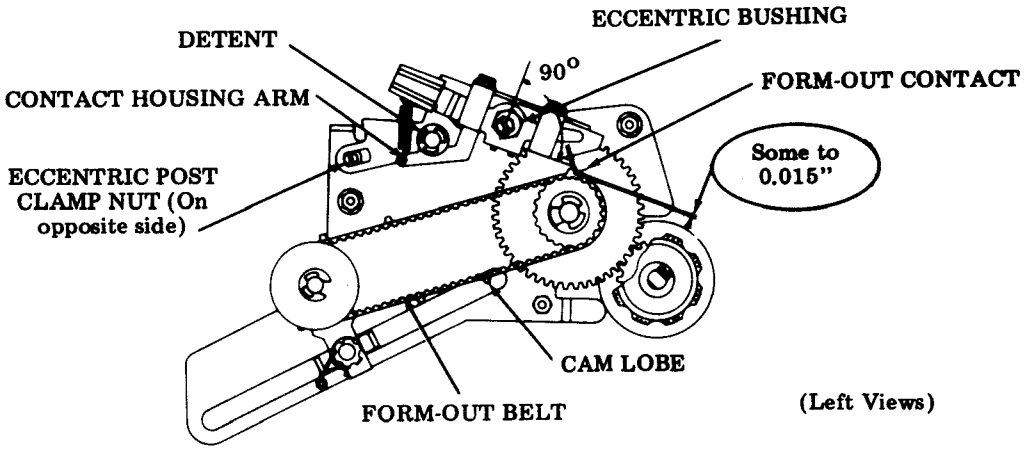
C. PRINTER (Cont)

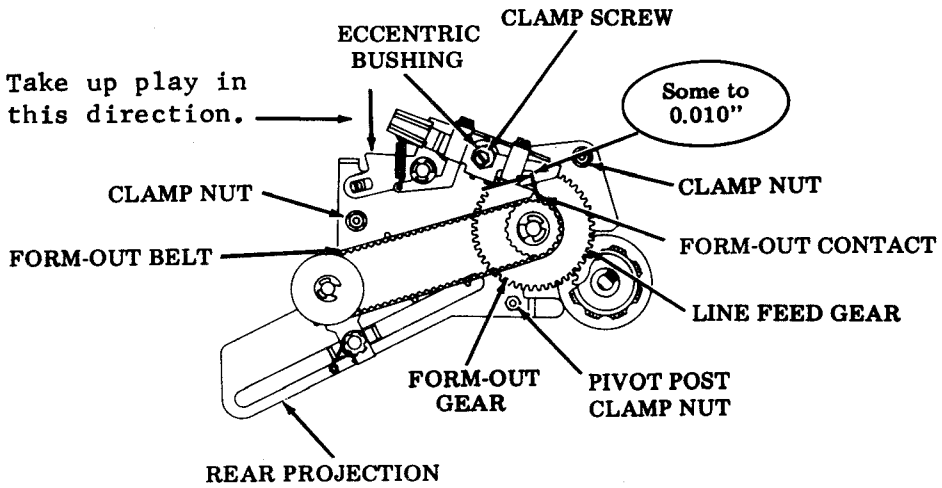
4. LEFT SIDE ASSEMBLY ADJUSTMENTS (Cont)

Form-Out Contact to Belt Spacing (Tractor Feed Printer)

Requirement: With line feed clutch latched in stop position and form-out belt turned to position the form-out contact with a cam lobe as shown, the form-out contact should be some to 0.010 inch from the front face of the cam lobe and the form-out contact should clear the belt by some to 0.015 inch.

To Adjust: With the eccentric bushing clamp screw friction tight, position the form-out contact with the eccentric bushing. Tighten the clamp screw. Check for the some to 0.015 inch clearance between the form-out contact and the belt surface (preliminary adjustment). With eccentric post clamp nut friction tight, use eccentric post to position the contact. These two adjustments, being related, may both need refining.

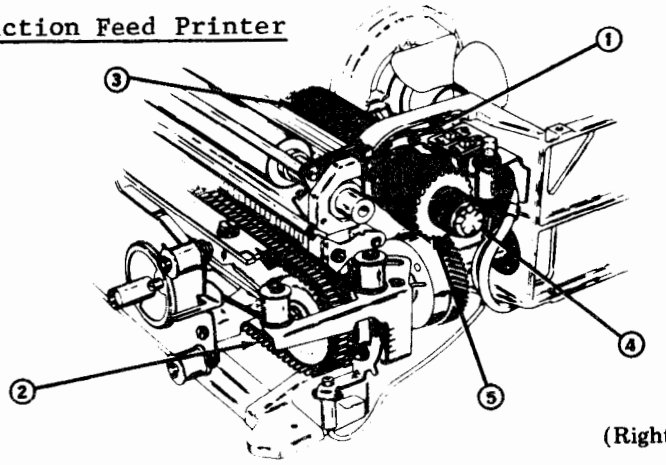




NOTE: If there is not enough adjustment range to meet the requirement, the form-out gear may have to be disengaged and moved one tooth in either direction. If this is done, remake Form-Out Gear Backlash adjustment.

5. RIGHT SIDE ASSEMBLIES

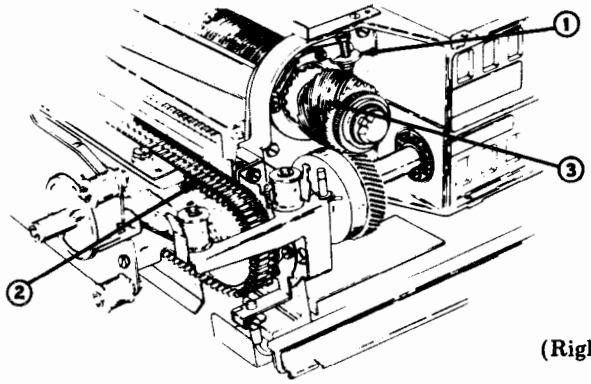
Identification -- Friction Feed Printer



(Right Front View)

ASSEMBLY	ADJUSTMENTS (If Any)
① Impeller Shaft Sensor	Impeller Shaft Sensor Gap (5-28) Impeller Shaft Sensor (Final) (5-29)
② Type Carrier	
③ Impeller	
④ Impeller Shaft	Impeller Shaft to Carrier Phasing (5-28)
⑤ Impeller Shaft Gear	Impeller Shaft to Carrier Phasing (5-28)

Identification -- Tractor Feed Printer



(Right Front View)

ASSEMBLY	ADJUSTMENTS (If Any)
① Impeller Shaft Sensor	Impeller Shaft Sensor Gap (5-28) Impeller Shaft Sensor (Final) (5-29)
② Type Carrier	
③ Impeller Shaft Gear	Impeller Shaft to Carrier Phasing (5-28)

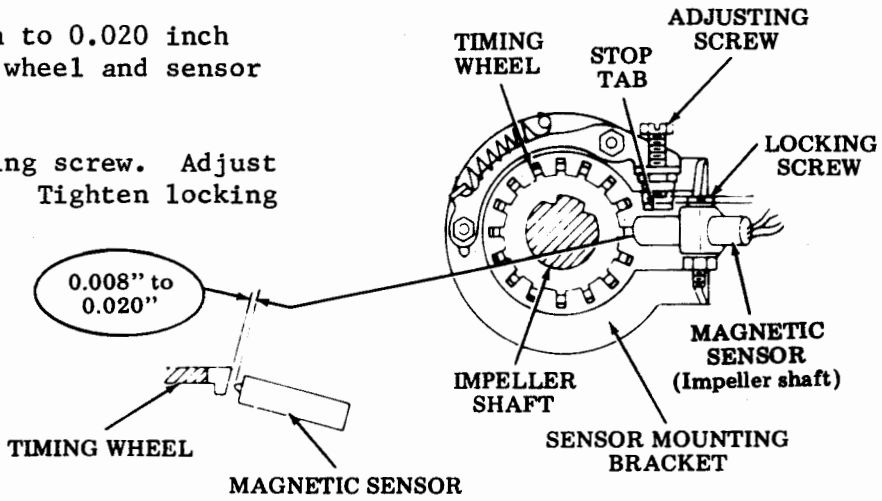
C. PRINTER (Cont)

6. RIGHT SIDE ASSEMBLY ADJUSTMENTS

Impeller Shaft Sensor Gap

Requirement: 0.008 inch to 0.020 inch between teeth of timing wheel and sensor pole piece.

To Adjust: Loosen locking screw. Adjust gap to meet requirement. Tighten locking screw.



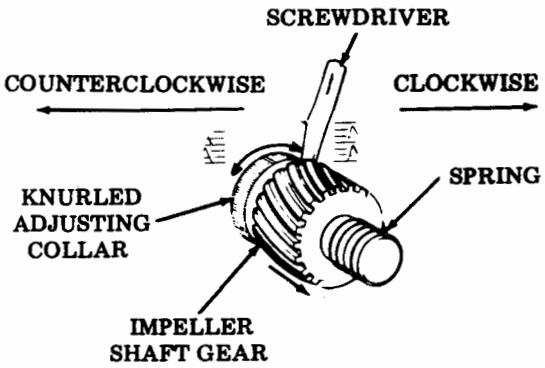
Impeller Shaft to Carrier Phasing*

Requirement: Printed characters should line up with print hammers.

To Adjust: Print some font identification characters using the test switch. Turn printer off, disconnect ac power. If the right portion of the character is missing, turn the knurled adjusting collar clockwise while holding the impeller shaft gear away from the collar.

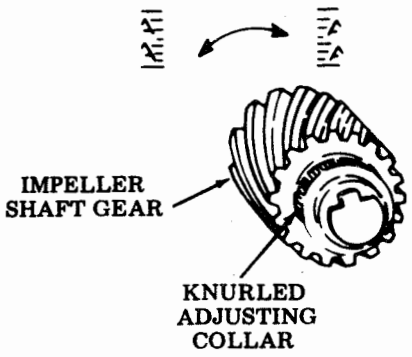
NOTE: Because of the strong spring tension, it may be necessary to pry the gear with a screwdriver (as shown in Friction Feed diagram). Do this carefully so the screwdriver does not slip and damage any parts.

If the left portion of the character is missing, turn the knurled adjusting collar counterclockwise. Turn on ac power and repeat test to make sure requirement is met.



Friction Feed Printer (Early Design)

(Right Front Views)



Tractor Feed and Friction Feed Printers (Late Design)

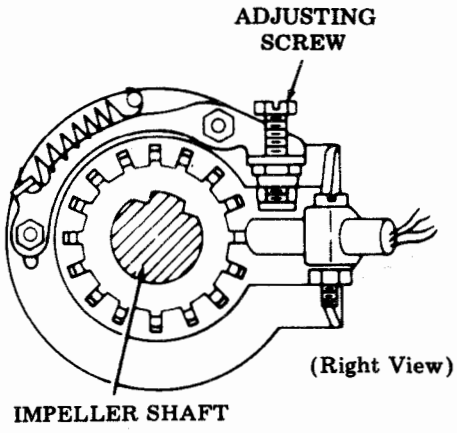
*Under power.

Impeller Shaft Sensor (Final)*

Requirement: All columns must print.

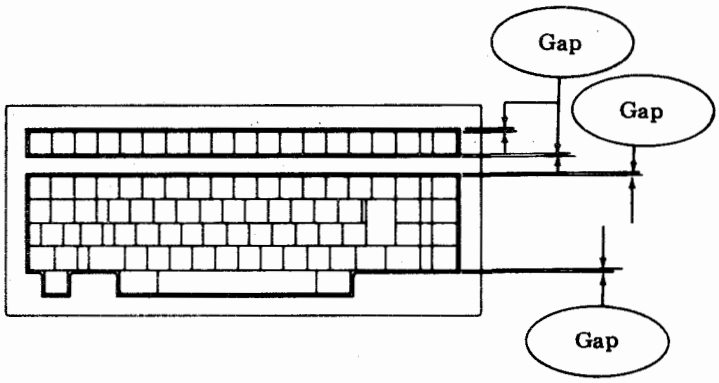
To Adjust: While printing the font identification symbol, turn adjusting screw counterclockwise (with a nut driver) through the range where all columns are printing to the point where columns again begin to drop out. Turn adjusting screw clockwise 2 to 2-1/4 complete turns.

*Under Power



D. OPCON

The clearance between the cover and keytop is the only adjustment provided on the KD-KDP opcon. Normally, readjustment is not necessary unless the cover is replaced or if there is an interference between keytop and the cover.



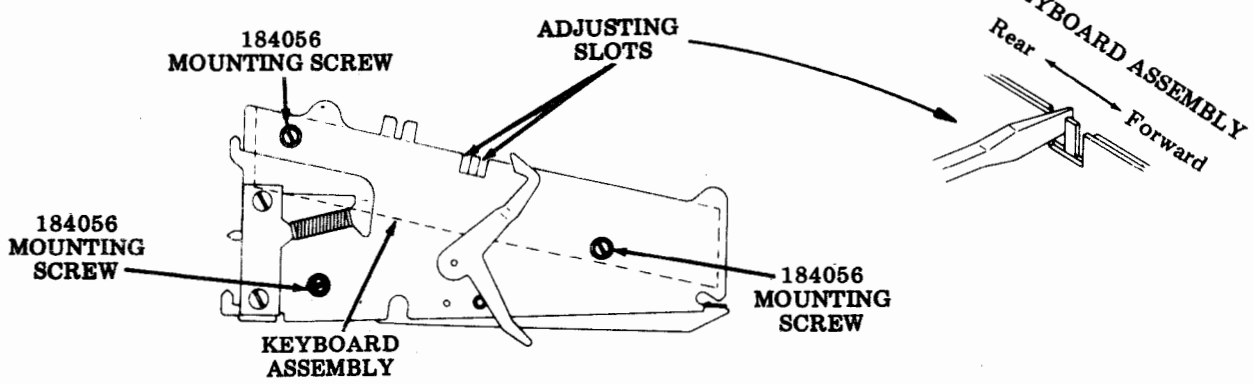
Cover-to-Keytop Adjustment

Requirement: Gap approximately equal in four places shown.

To Adjust: Remove the cover (see Page 6-30, 401100 Cover).
Loosen three mounting screws friction tight on both sides of console.

Insert screwdriver blade into adjusting slot and move keyboard assembly forward or to the rear to gain "gap" clearance.
Tighten screws, replace cover and check gaps.

NOTE: If gaps required are not approximately equal after reassembly, remove cover and repeat adjustment procedures.



E. CASSETTE DRIVE

1. GENERAL

Adjustments that require major disassembly of the cassette drive are not covered in this manual at this time.

Adjustments are grouped according to the mechanism (cassette holder or drive mechanism), and in the sequence recommended for a comprehensive "in-the-field" adjustment.

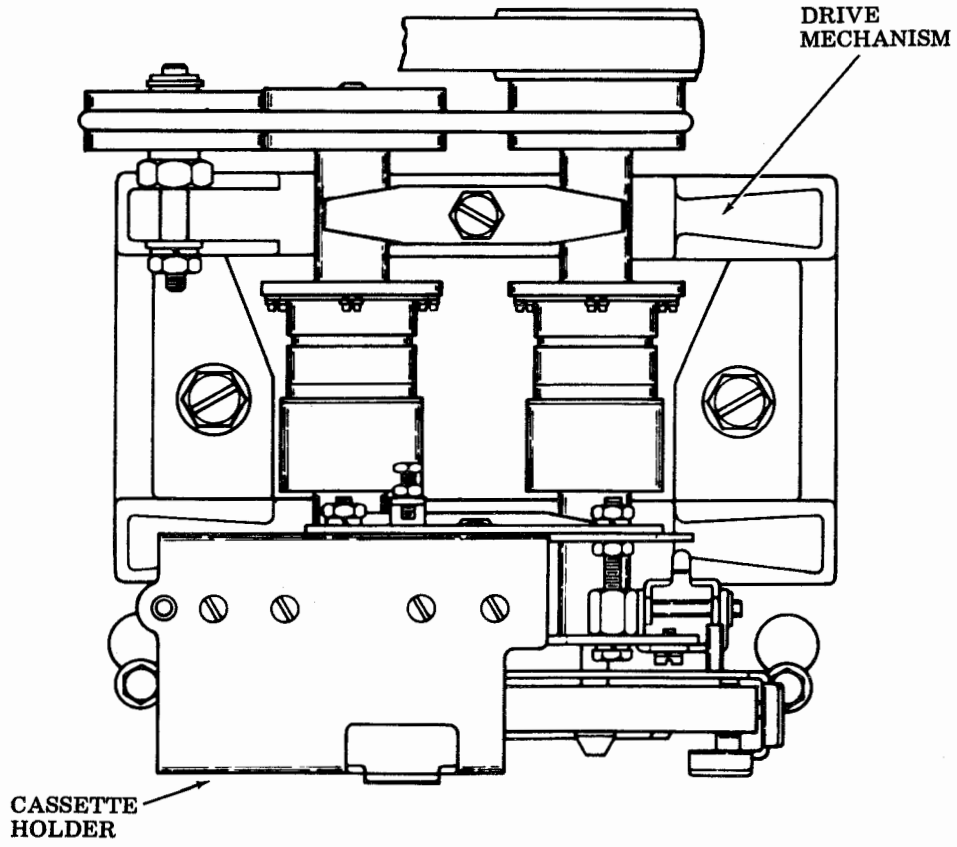
Identification drawings and tables are included to locate the mechanisms and list the adjustments related to these mechanisms.

The instruction "friction tight" means to tighten to the point where friction keeps the parts from moving, but they are still loose enough to move for adjustment purposes.

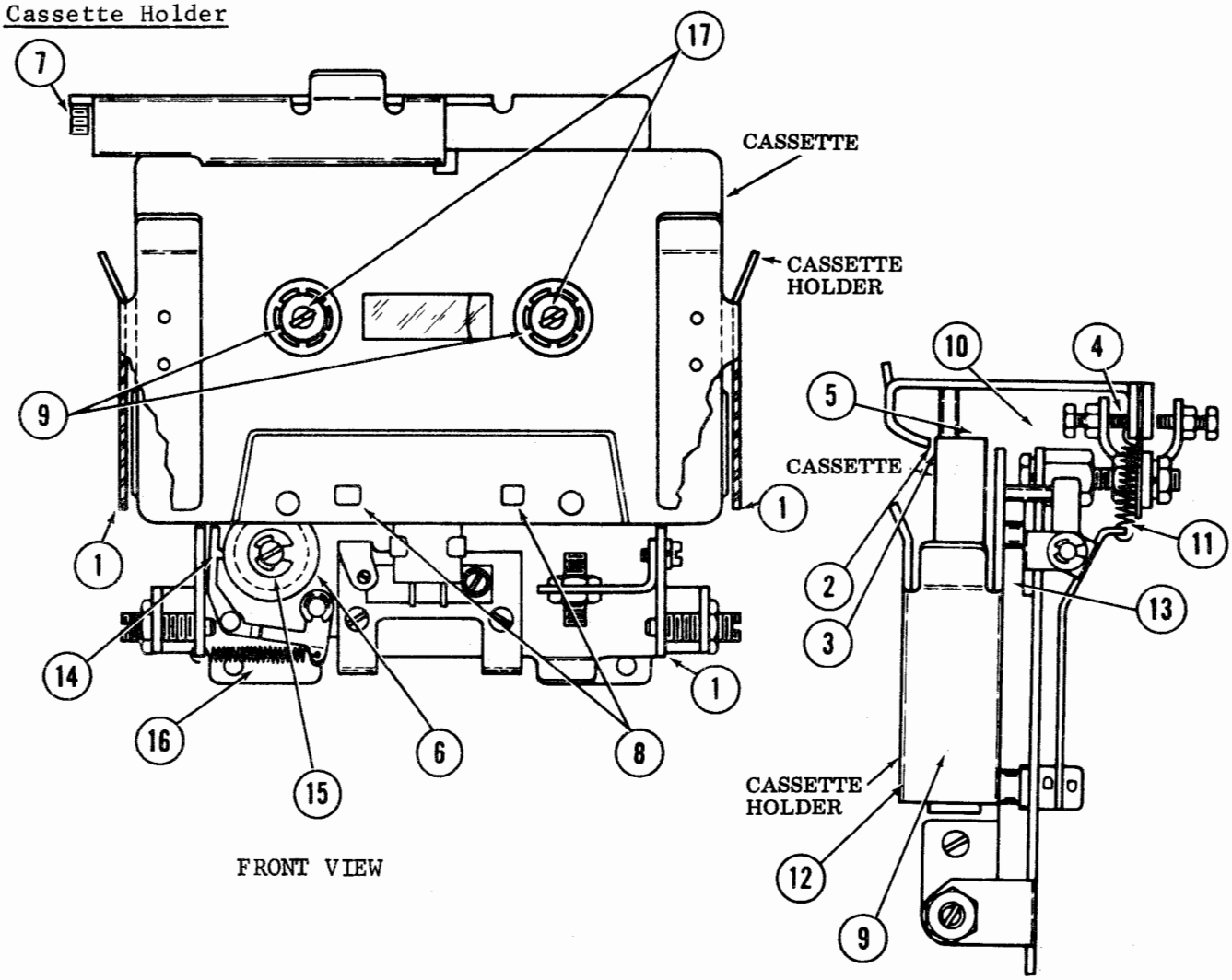
Spring or belt tensions are checked with a spring scale held at the angle shown in the adjustment illustration. Springs that do not meet requirements, and for which no adjustment procedure is given, should be replaced.

After adjustment is complete, tighten any screws or nuts loosened to make the adjustment.

2. ASSEMBLIES



Cassette Holder



FRONT VIEW

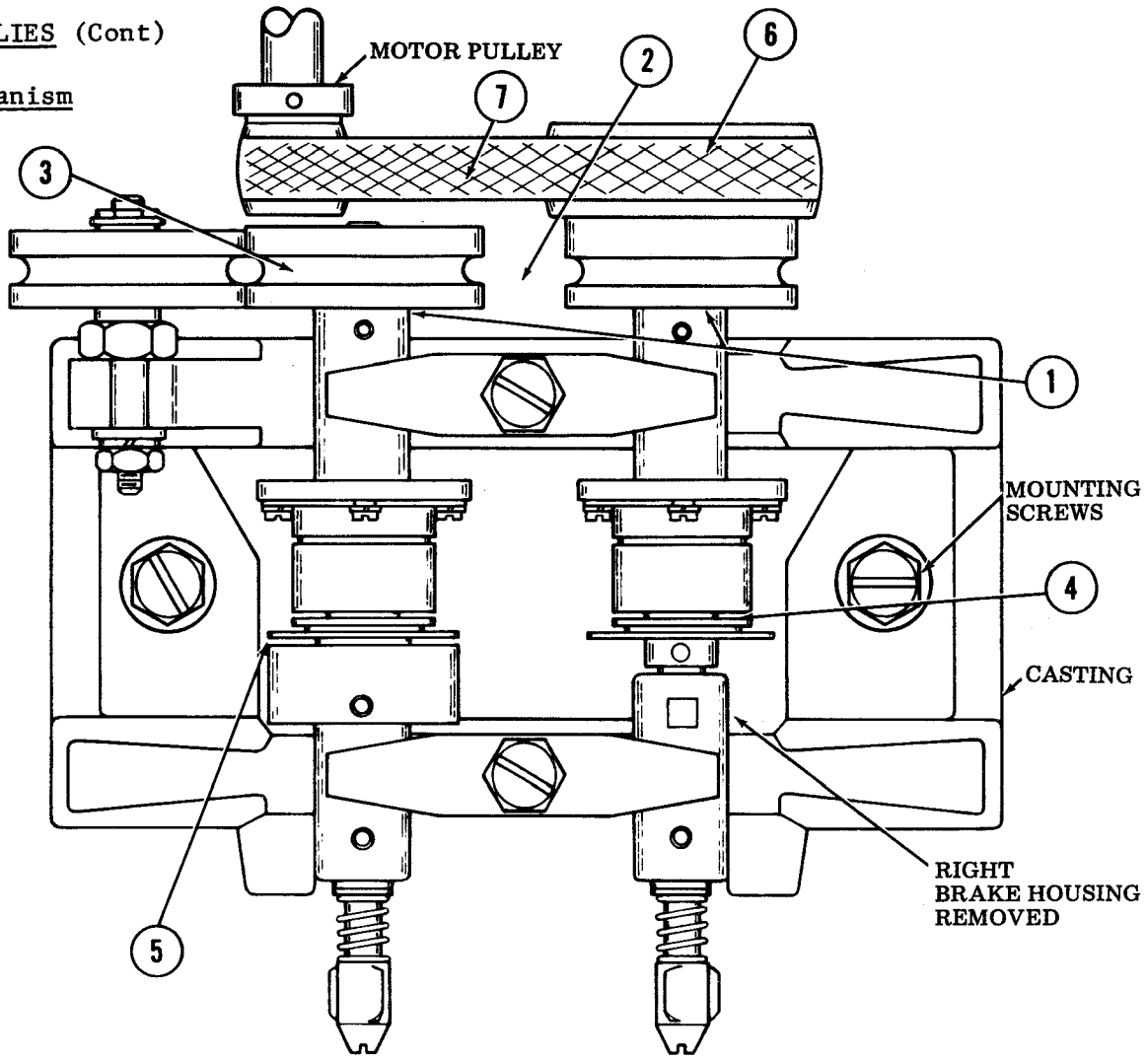
LEFT SIDE VIEW

CASSETTE HOLDER ADJUSTMENT	ADJUSTMENT REFERENCE
① Cassette Holder	
② Latch (Preliminary and Final)	
③ Latch Stop Screw (Rear)	
④ Latch Stop Screw (Front)	
⑤ Switch Height	
⑥ Tape Cleaner Bobbin	
⑦ Run Lamp Mounting	
⑧ Head	
⑨ Plate with Cassette Holder	
⑩ Cassette Latch Spring	
⑪ Sensing Bail Spring	
⑫ Cassette Pressure Spring	
⑬ Cassette Holder Pressure Spring	
⑭ Bobbin Latch Spring	
⑮ Bobin Ratchet Spring	
⑯ Stepper Spring	
⑰ Drive Hub Spring	

E. CASSETTE DRIVE (Cont)

2. ASSEMBLIES (Cont)

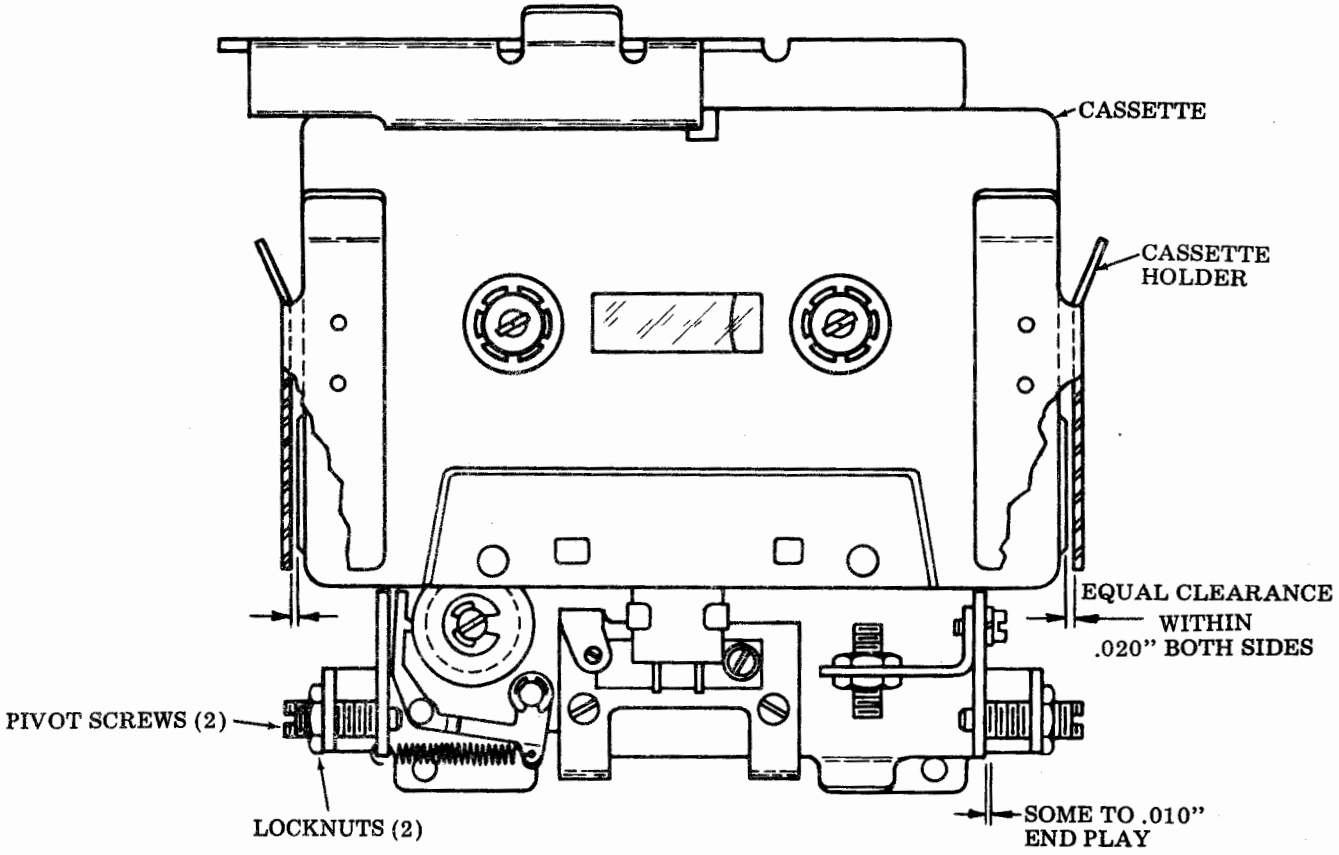
Drive Mechanism



DRIVE MECHANISM ADJUSTMENT	ADJUSTMENT REFERENCE
① Pulley and Shaft Endplay ② Pulley Alignment ③ Belt (O-Ring) ④ Clutch ⑤ Brake ⑥ Motor Pulley ⑦ Motor Drive Belt	

3. CASSETTE HOLDER ADJUSTMENTS

Cassette Holder



Requirement 1: With a standard cassette latched in position, there should be equal clearance (within .020 inch) between both sides of the cassette and the cassette holder.

Requirement 2: Endplay between the cassette holder and the pivot screws
Min some --- Max 0.010 inch

To Adjust: With the locknuts friction tight, adjust pivot screws until the requirements are met. Tighten locknuts.

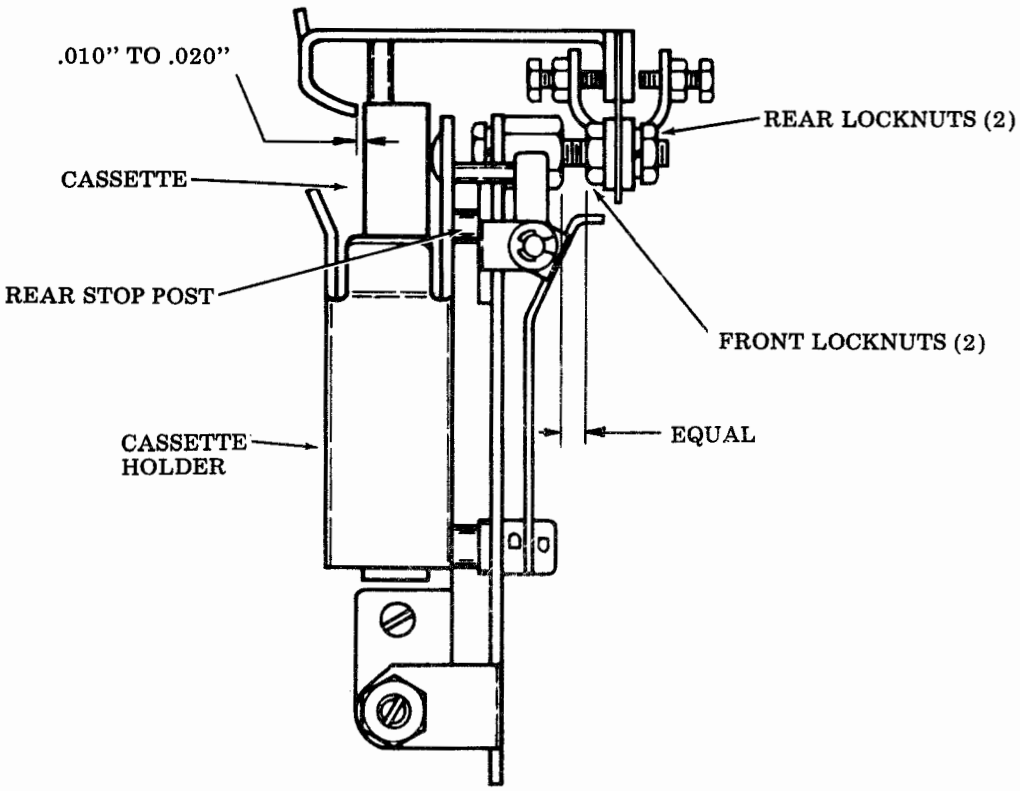
E. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Latch (Preliminary)

Requirement: With a standard cassette in place and the cassette holder biased rearward against the stop post, the clearance between the cassette and the latch shall be
Min 0.010 --- Max 0.020

To Adjust: With the rear locknuts loosened, adjust the two front stop nuts (equal distance) until the requirement is met. Tighten locknuts.



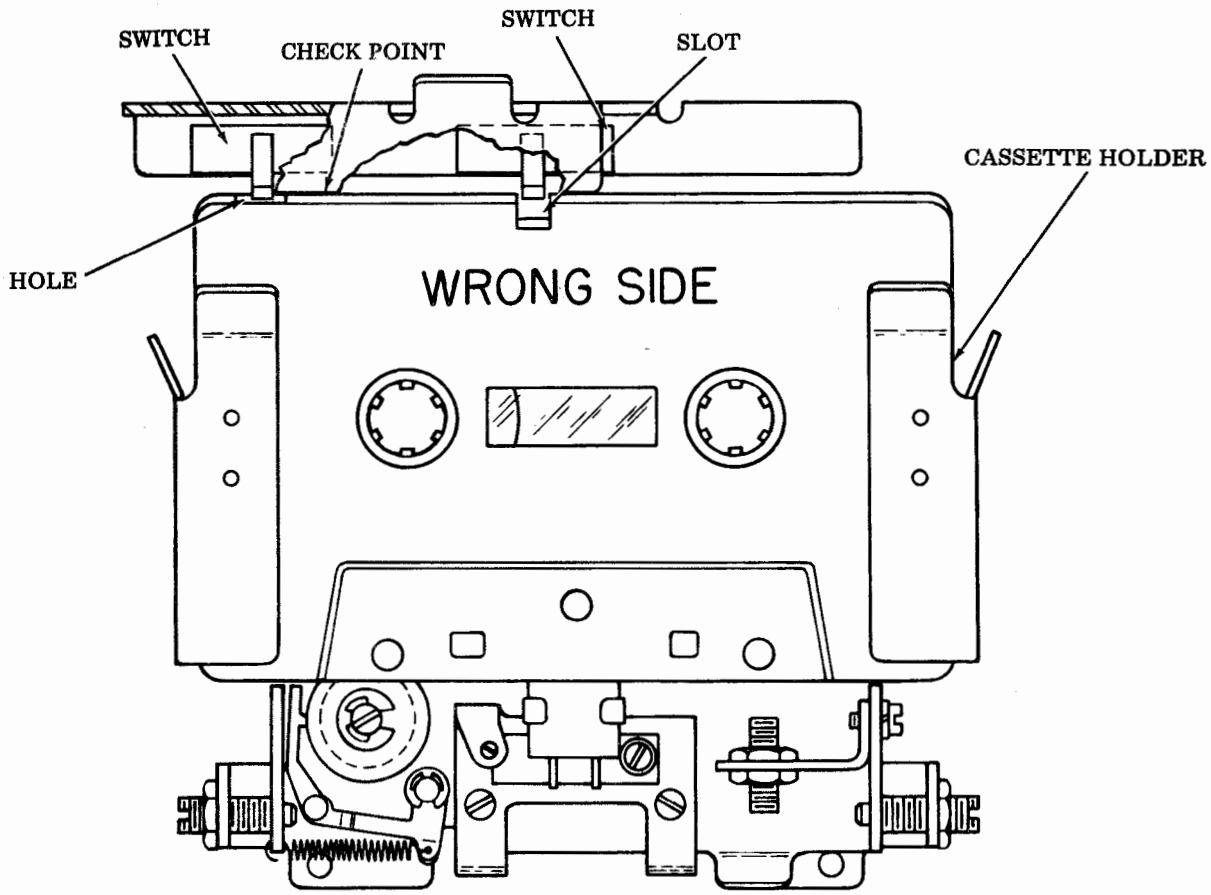
Latch (Final)

Requirement 1: With a standard cassette placed (wrong side out) in the cassette holder and the cassette holder rotated until the latch is resting on the cassette, clearance between the cassette and both ends of the latch shall be
Max 0.015 inch

Requirement 2: The two switch actuators shall be centered with their respective hole or slot.

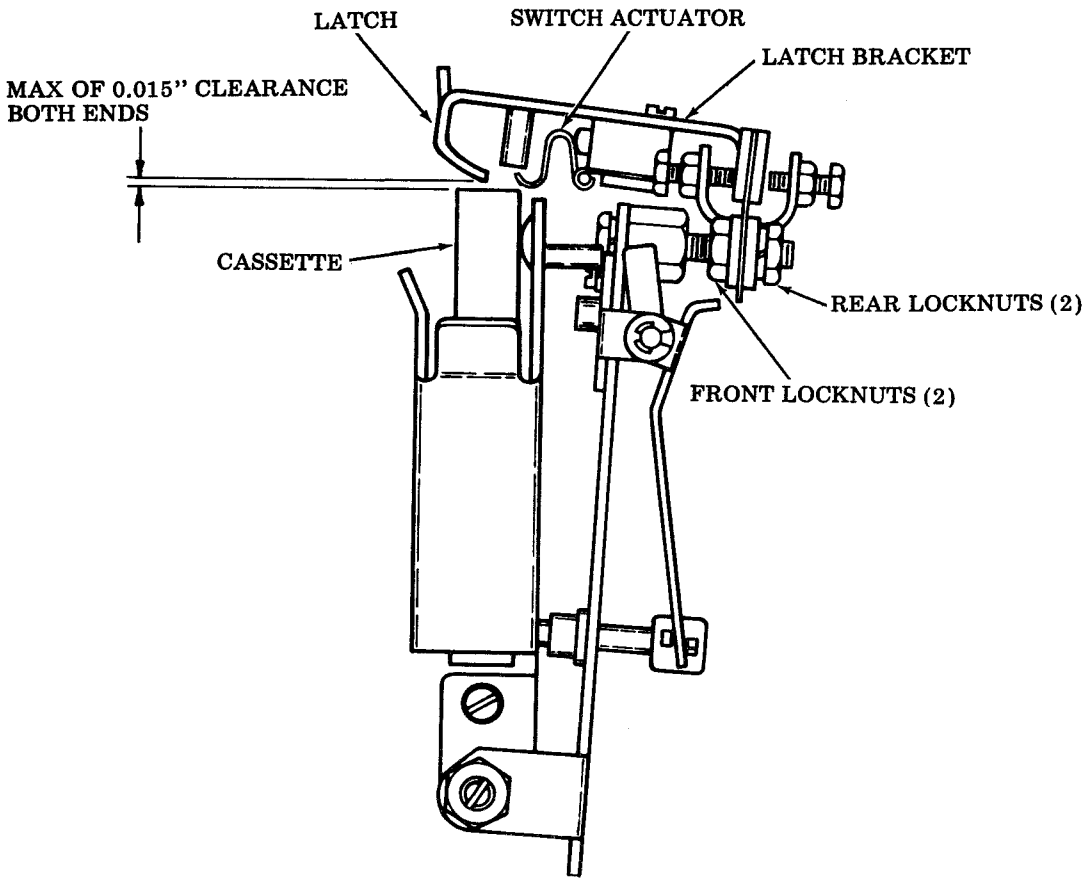
To Adjust: Maintain front locknuts position, loosen the rear locknuts, position the latch and switch to meet the requirements. Tighten locknuts.

Note: Recheck preliminary latch adjustment. Refine if necessary.



E. CASSETTE DRIVE (Cont)

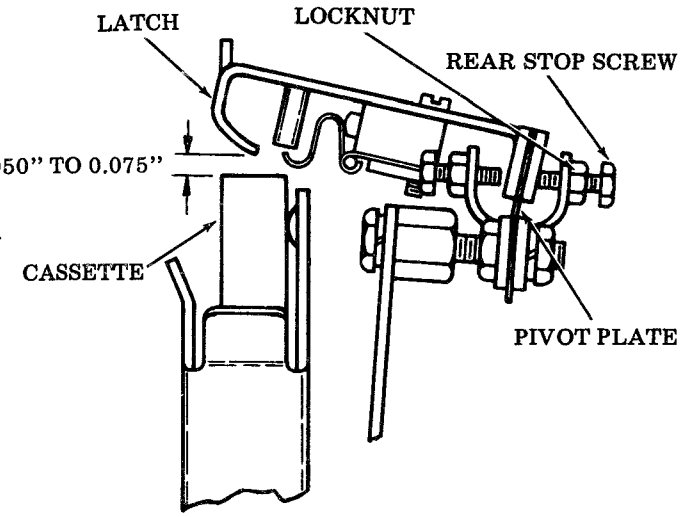
3. CASSETTE HOLDER ADJUSTMENTS, Latch (Final) (Cont)



Latch Stop Screw (Rear)

Requirement: With the latch raised to its uppermost position there shall be clearance between the latch and a standard cassette of
Min 0.050 --- Max 0.075

To Adjust: With locknut loose, position rear stop screw until the requirement is met. Tighten locknut.



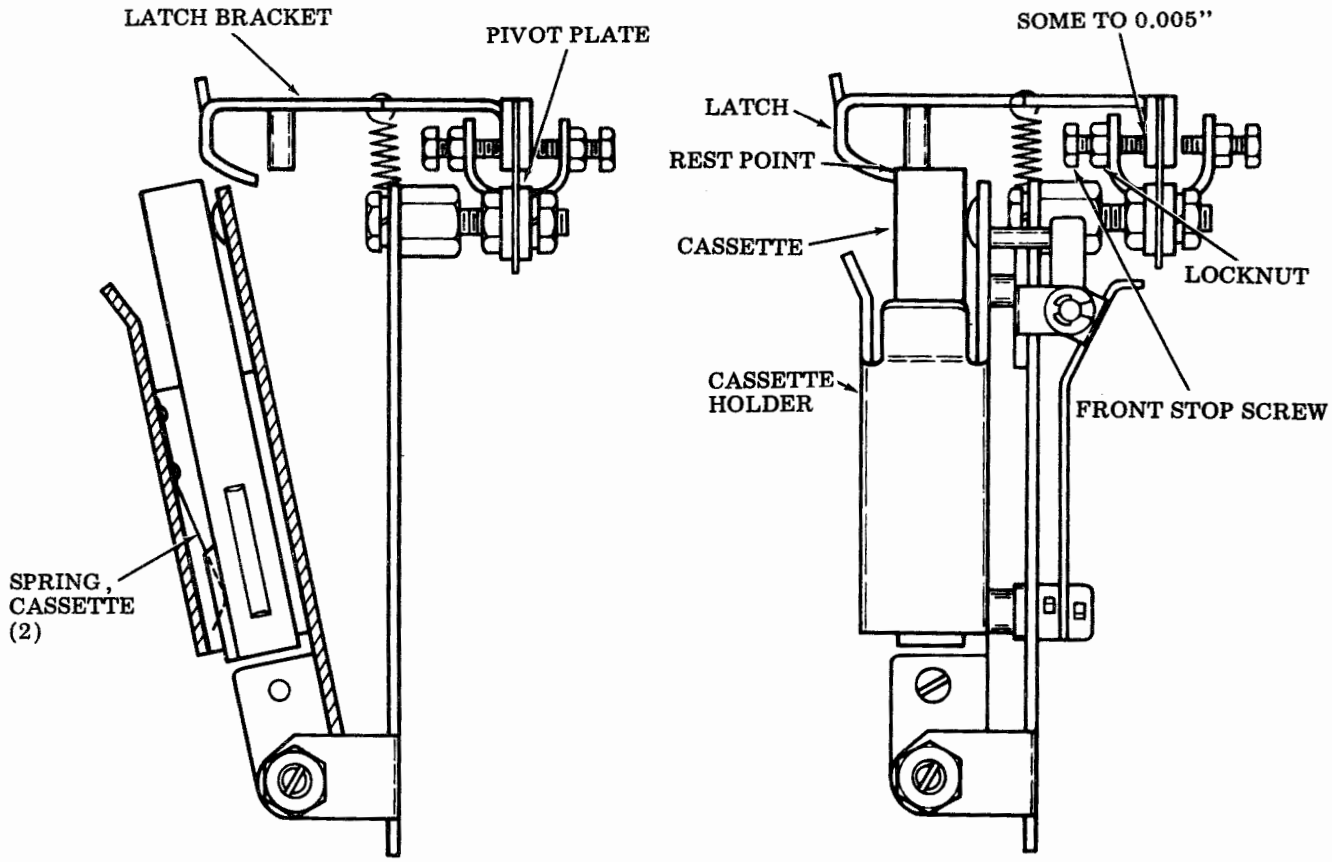
Latch Stop Screw (Front)

Requirement 1: As the cassette holder with a standard cassette installed is pivoting toward the latched position, the cassette shall strike the latch and cam the latch upward.

Requirement 2: In the latched position the latch shall rest on the cassette and there shall be clearance between the front stop screw and the latch bracket of
Min some --- Max 0.005

To Adjust: With locknut loose, position the front stop screw until the requirement is met. Tighten locknut.

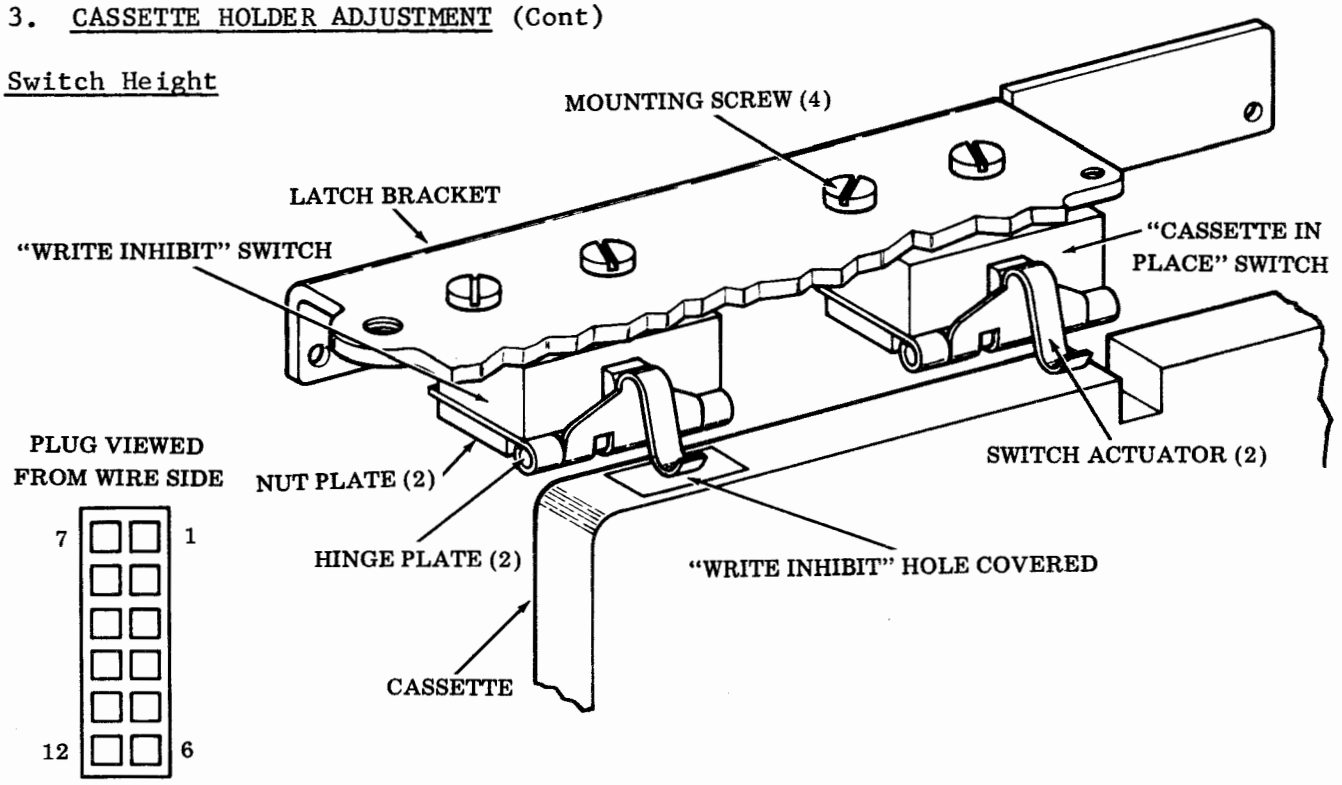
NOTE: Requirements 1 and 2 have to be checked with cassette spring holding cassette in place against the rear of the cassette holder.



E. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENT (Cont)

Switch Height



Requirement 1: As a standard cassette (right side out) is loaded and unloaded into position, the two switches shall operate at the same time.

Requirement 2: There shall be overtravel left on the two switch actuators of Min 0.015

To Check Requirement 1: Operation may be determined by the audible "click" of switches or by use of a continuity checking device, on terminals 7 and 8, ("Write Inhibit" Switch) and terminals 1 and 2 ("Cassette In Place" Switch) to indicate contact closure.

To Check Requirement 2: A 0.015 inch gauge shall pass between the switch actuator and the cassette without raising the switch.

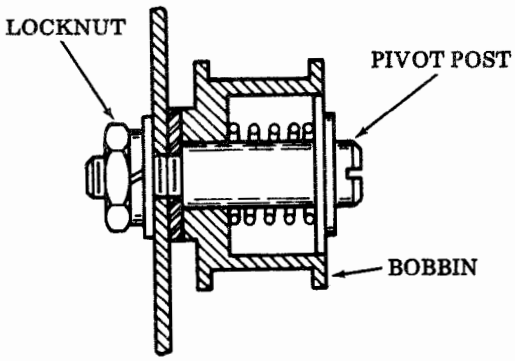
To Adjust: With the switch mounting screws friction tight, position the hinge plate until the requirements are met. Tighten mounting screws.

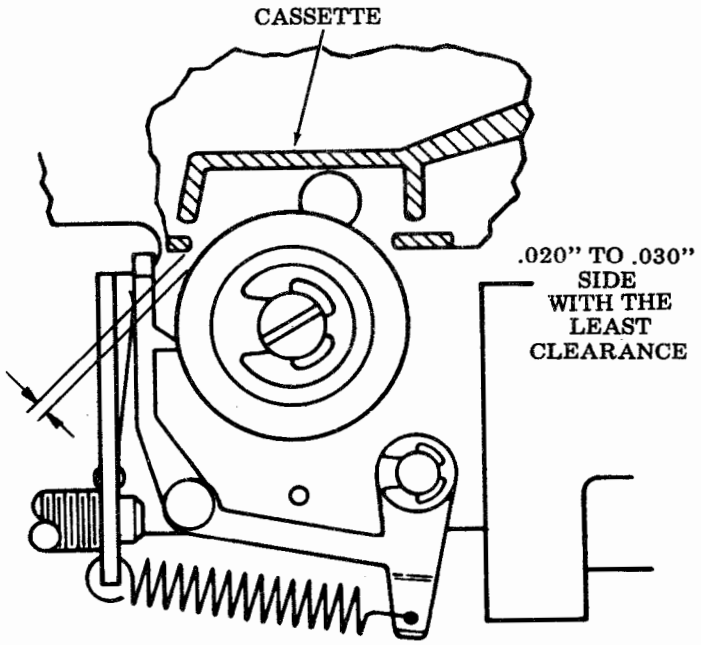
NOTE: Power must be removed from unit when this measurement is taken. Recheck latch adjustment, refine if necessary.

Tape Cleaner

Requirement: With a standard cassette in the loaded position the clearance between the white flange of the tape cleaner bobbin and the side with the least clearance shall be
Min 0.020 --- Max 0.030

To Adjust: With the locknut friction tight, position the bobbin vertically to meet the requirement. Tighten locknut.

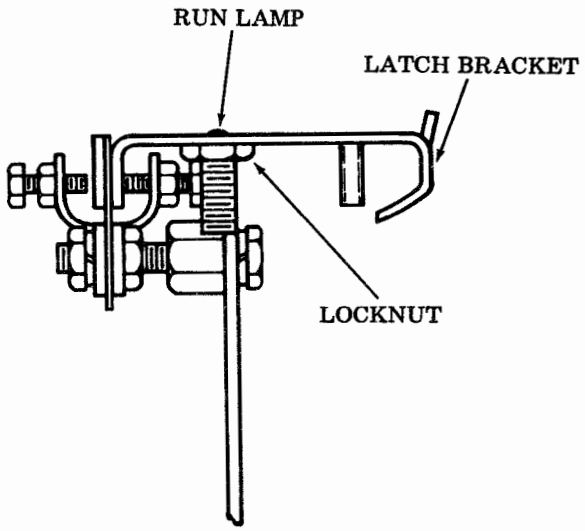




Run Lamp Mounting

Requirement: The tip of the run lamp shall be flush with the top surface of the latch bracket.

To Adjust: With the locknut loose, position the lamp. Tighten the locknut.



E. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Head Adjustment

Requirement 1: With the cassette holder biased rearward against the stop post, recording head assembly shall rest on the locating posts and shall be centered with equal clearance between the locating posts.

Requirement 2: The recording head assembly shall not bind on the locating pins when cassette holder is pivoted outward. Check that the endplay between the cassette holder and pivot screws is taken up, first to the left and then to the right.

To Adjust: With mounting screws friction tight, slide recording head assembly against locating posts and the clearance on both sides should be equal. Tighten mounting screws.

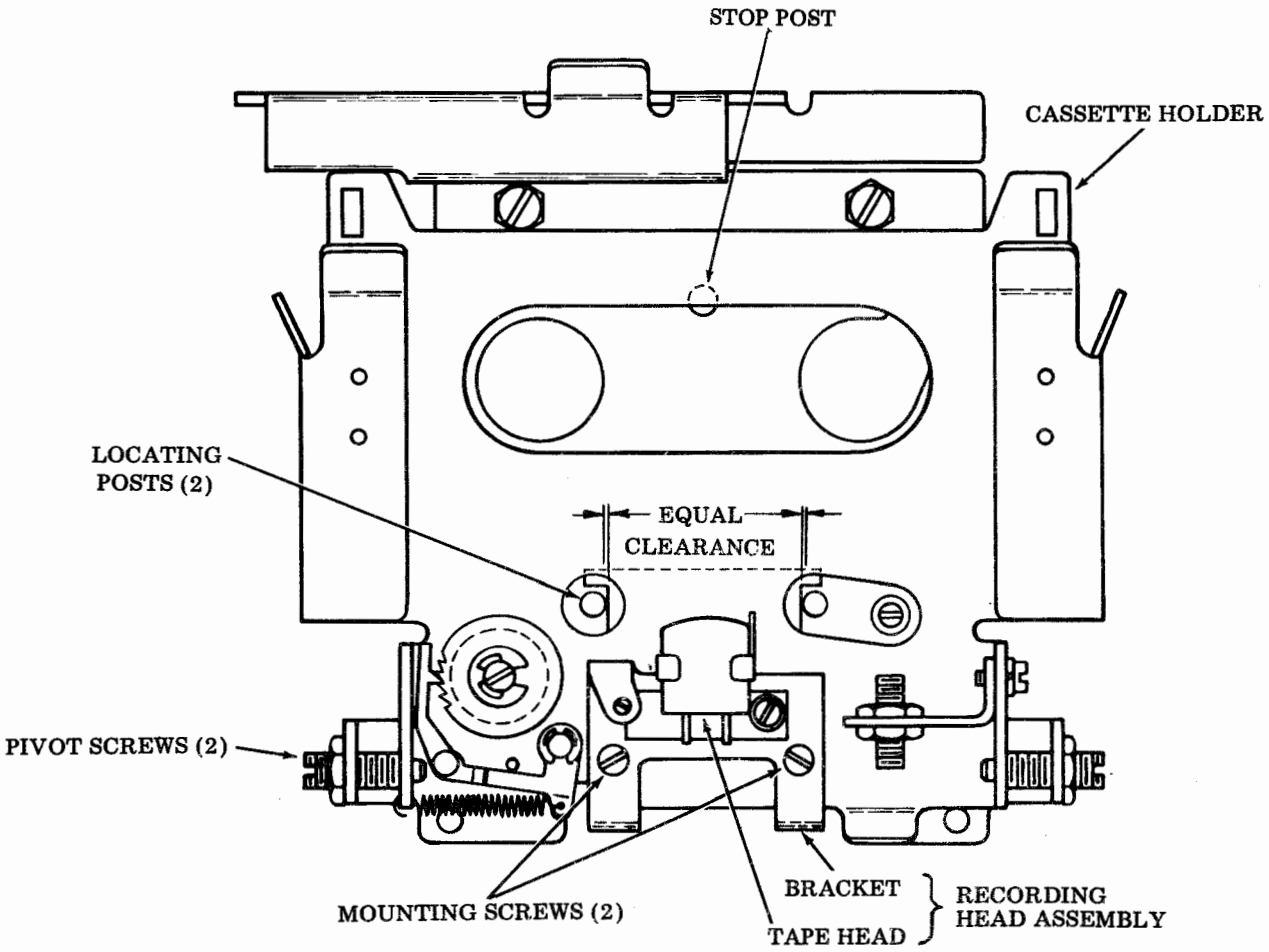
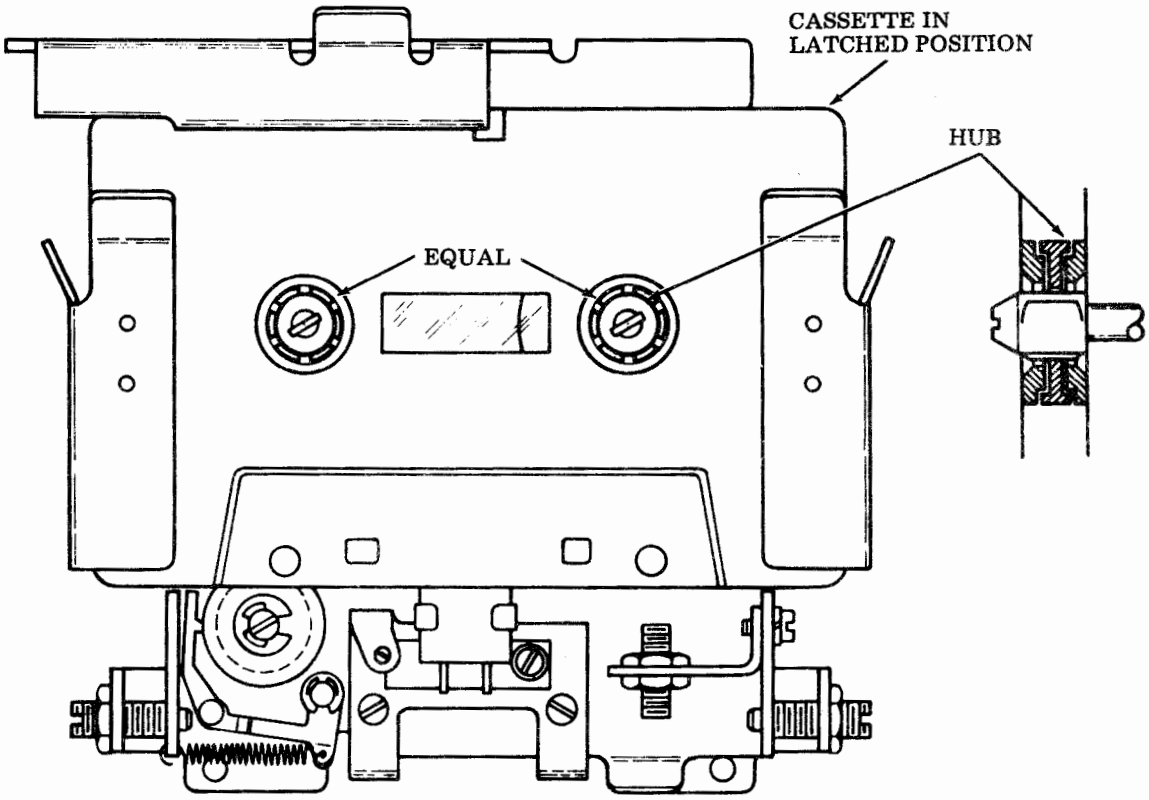


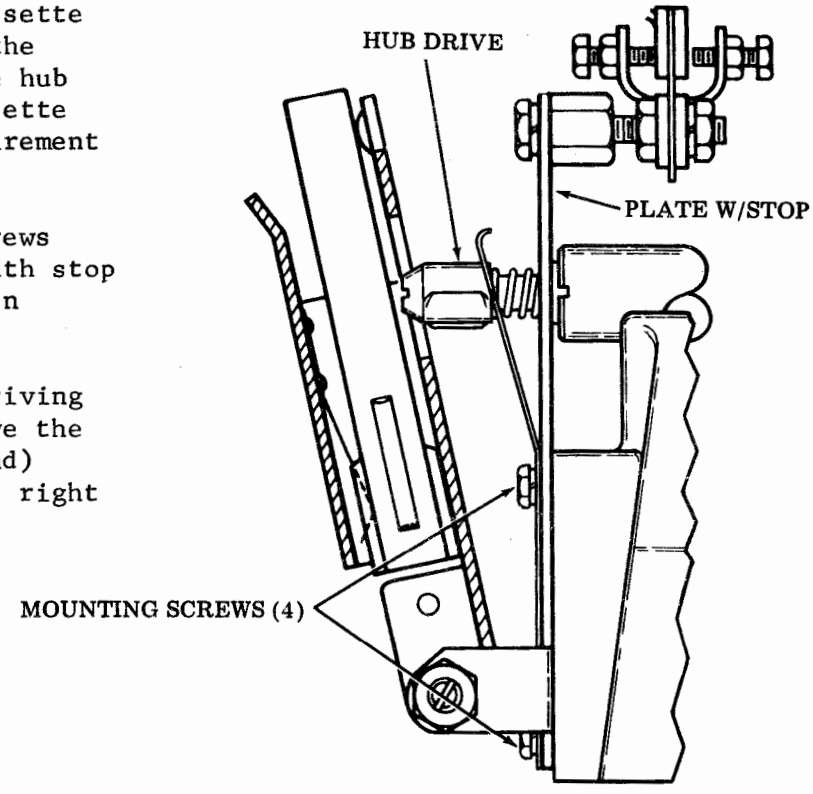
Plate with Cassette Holder



Requirement: With a standard cassette loaded in its latched position, the radial distance between the drive hub (less driving teeth) and the cassette case shall be equal. Check requirement on both hubs.

To Adjust: With the mounting screws friction tight, position plate with stop to meet this requirement. Tighten mounting screws.

NOTE: The flat portion of the driving teeth of the drive hubs must drive the reel clockwise on the left (rewind) shaft and counterclockwise on the right (wind) shaft.



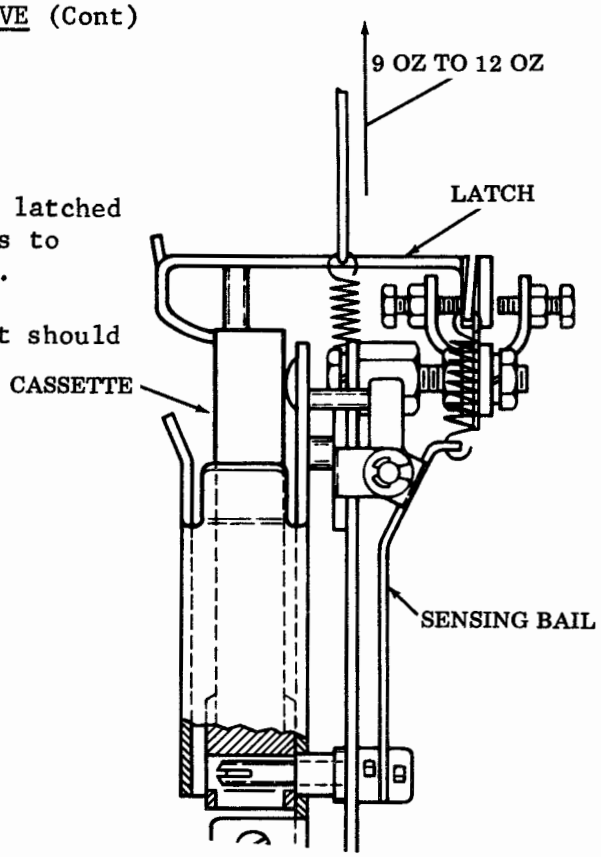
E. CASSETTE DRIVE (Cont)

3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Cassette Latch Spring

Requirement: With a standard cassette in the latched position, it should take 9 ounces to 12 ounces to start spring moving from the installed length.

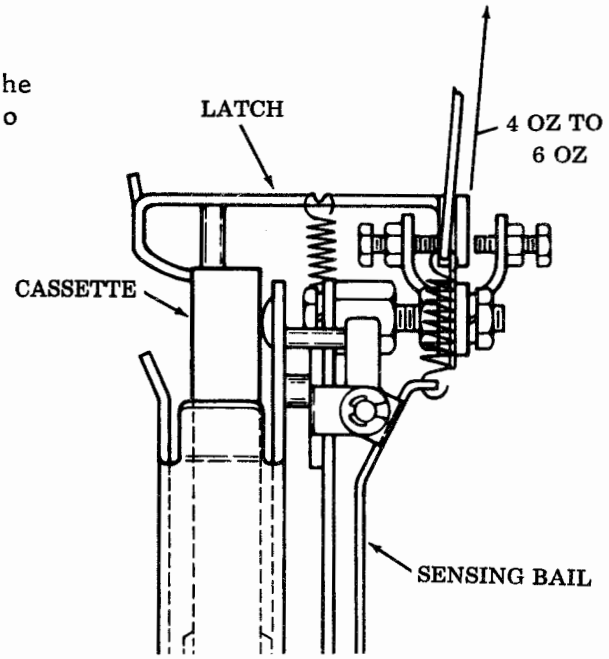
NOTE: If spring does not meet requirement, it should be replaced.



Sensing Bail Spring

Requirement: With a standard cassette in the latched position, it should take 4 ounces to 6 ounces to start spring moving from the installed length.

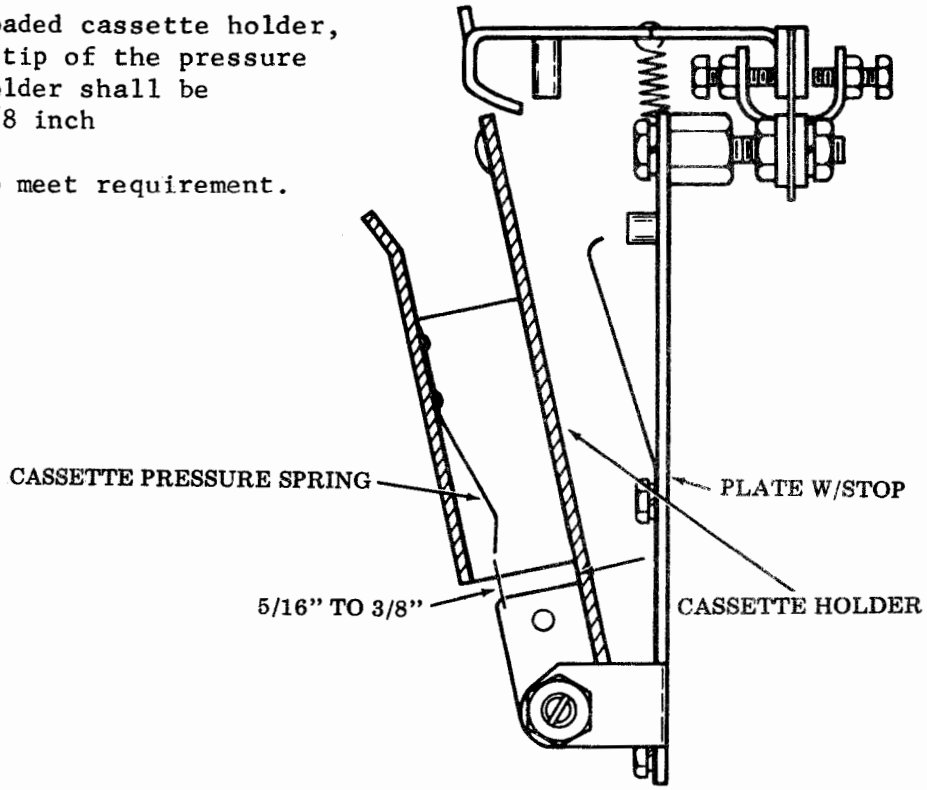
NOTE: If spring does not meet requirement, it should be replaced.



Cassette Pressure Spring

Requirement: With an unloaded cassette holder, the clearance between the tip of the pressure spring and the cassette holder shall be
Min 5/16 inch --- Max 3/8 inch

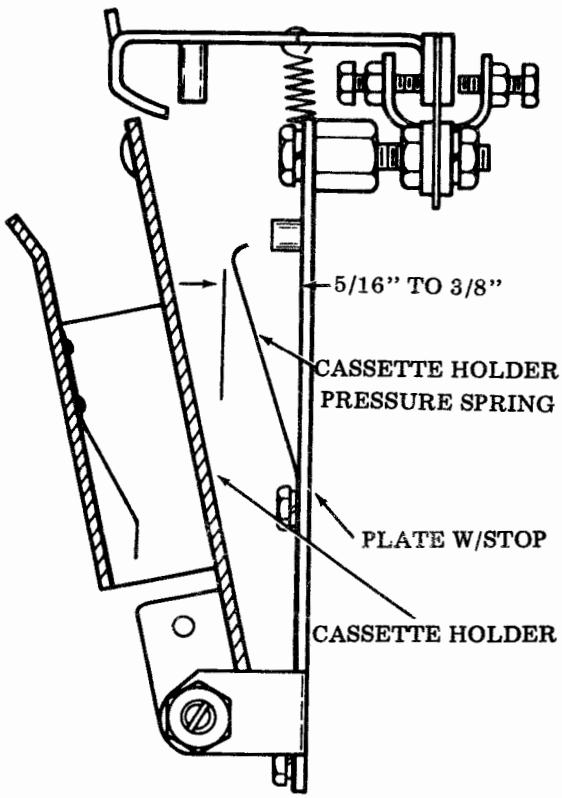
To Adjust: Bend spring to meet requirement.



Cassette Holder Pressure Spring

Requirement: With the cassette holder in the unlatched position the distance between the outside edge of the upper form of the spring and the plate with stop shall be
Min 5/16 inch -- Max 3/8 inch

To Adjust: Bend spring to meet this requirement.



E. CASSETTE DRIVE (Cont)

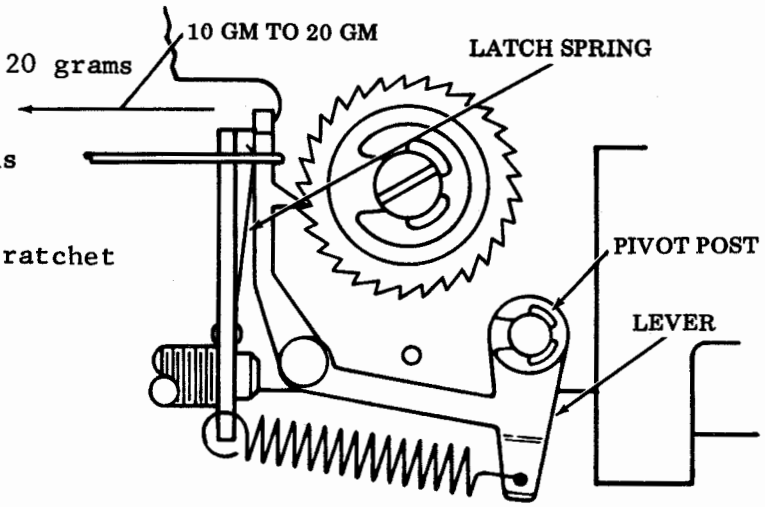
3. CASSETTE HOLDER ADJUSTMENTS (Cont)

Bobbin Latch Spring

Requirement: It should take 10 to 20 grams to start latch moving.

To Adjust: Bend spring to meet this requirement.

NOTE: While checking, hand rotate ratchet wheel 1/2 tooth travel.

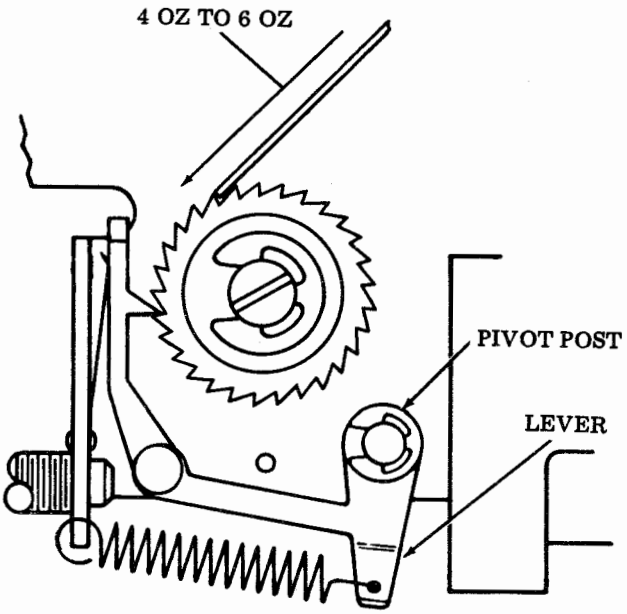


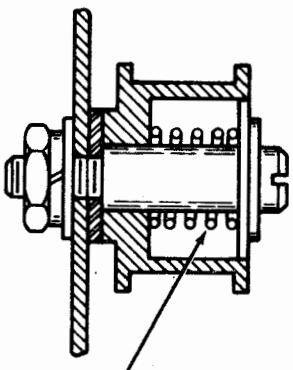
Bobbin Ratchet Spring

Requirement: It should take 4 ounces to 6 ounces of tangential force to start ratchet moving.

NOTE: While checking, hold latch from engaging ratchet wheel.

NOTE: If spring does not meet requirement it should be replaced.

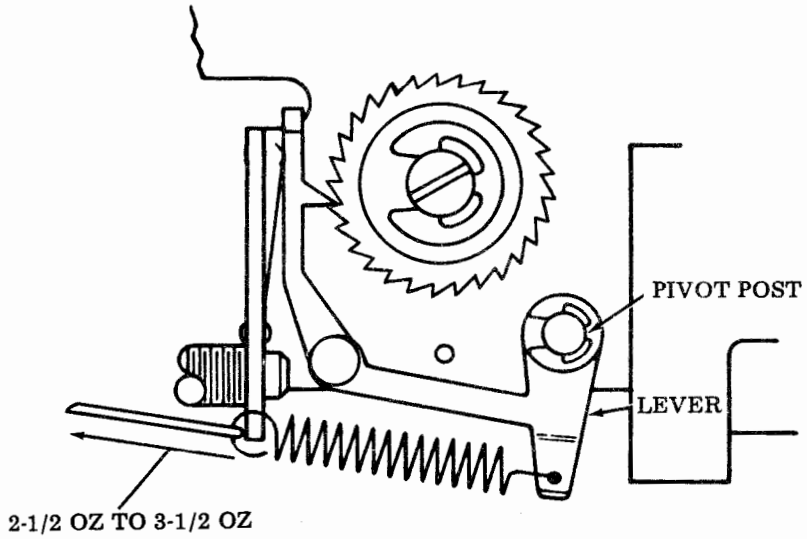




Stepper Spring

Requirement: With the cassette removed, it should take 2-1/2 ounces of 3-1/2 ounces to start spring moving at the installed length.

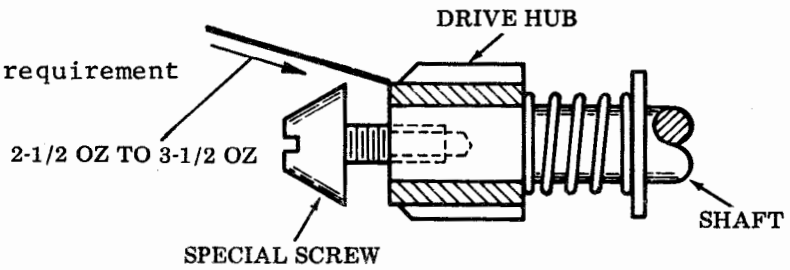
NOTE: If spring does not meet requirement it should be replaced.



Drive Hub Spring

Requirement: With the special screw backed up 4 threads it shall take 2-1/2 ounces to 3-1/2 ounces to push the drive hub flush with the end of the shaft.

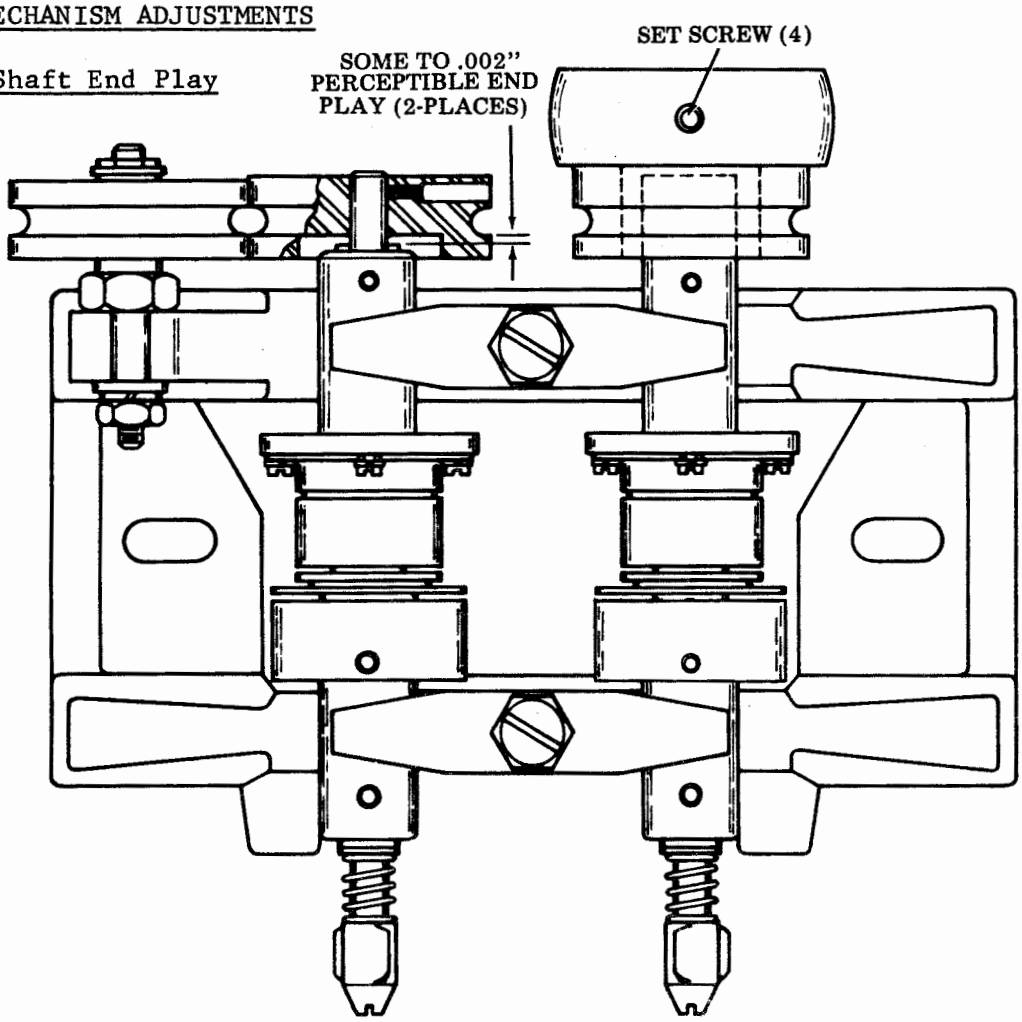
NOTE: If spring does not meet requirement it should be replaced.



E. CASSETTE DRIVE (Cont)

4. DRIVE MECHANISM ADJUSTMENTS

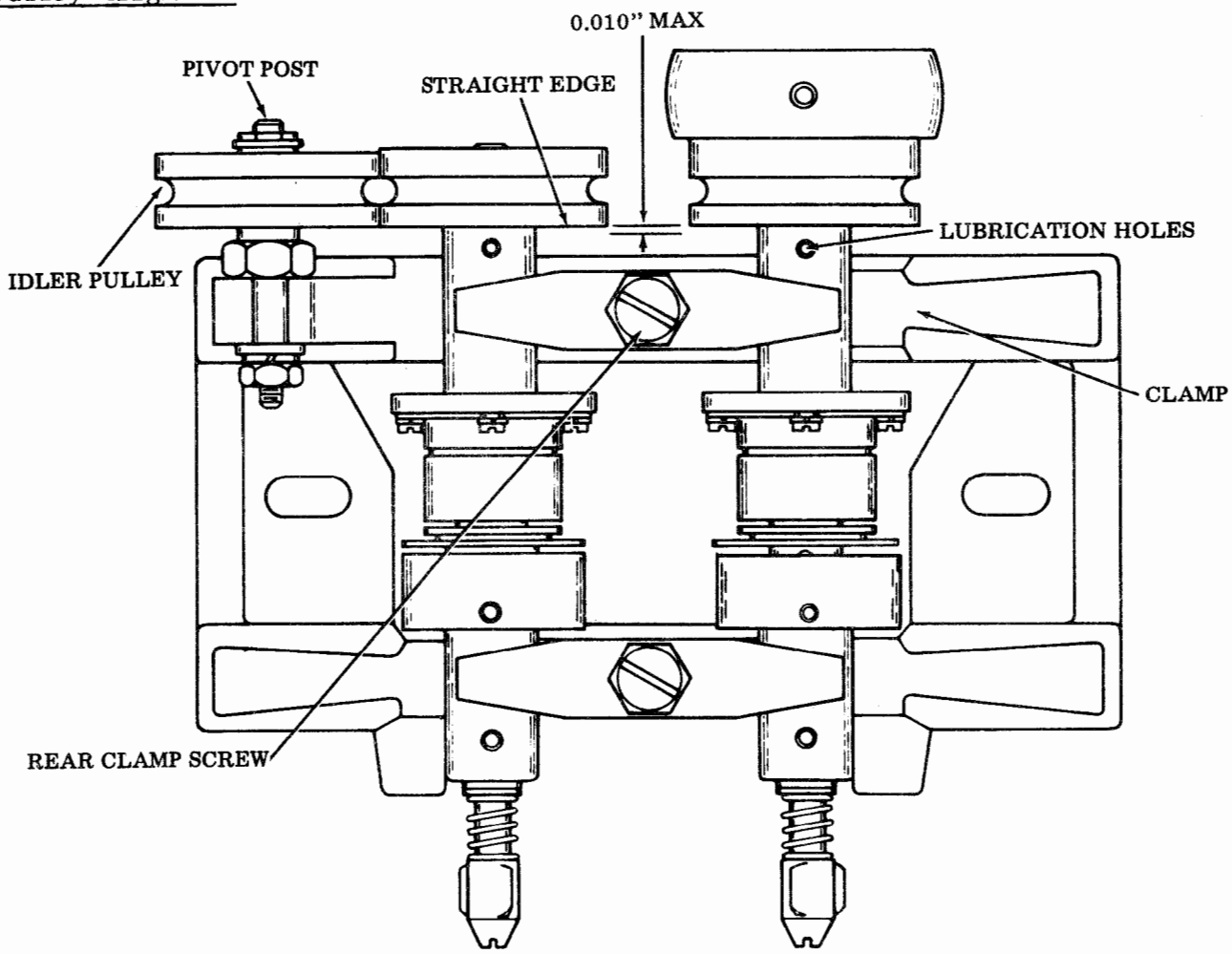
Pulley and Shaft End Play



Requirement: .002 inch perceptible endplay, as gauged by eye, on each shaft.

To Adjust: Position each pulley on the shafts with the two set screws loosened. Tighten set screws.

Pulley Alignment



Requirement: With lubrication holes upwards, the front face of all three pulleys shall be in line within 0.010 as gauged against a straight edge.

To Adjust: With the rear clamp screw friction tight and the O-Ring removed, adjust the shafts with pulleys until the requirement is met. Tighten clamp screw.

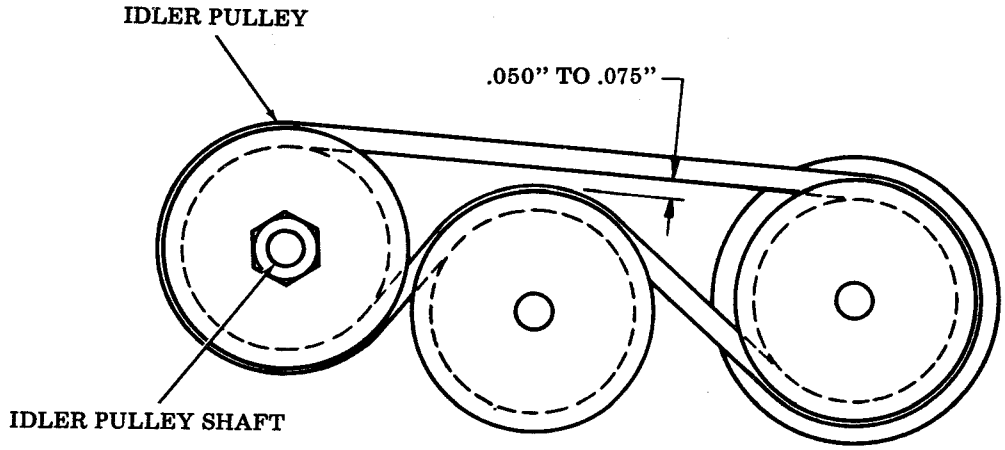
E. CASSETTE DRIVE (Cont)

4. DRIVE MECHANISM ADJUSTMENTS (Cont)

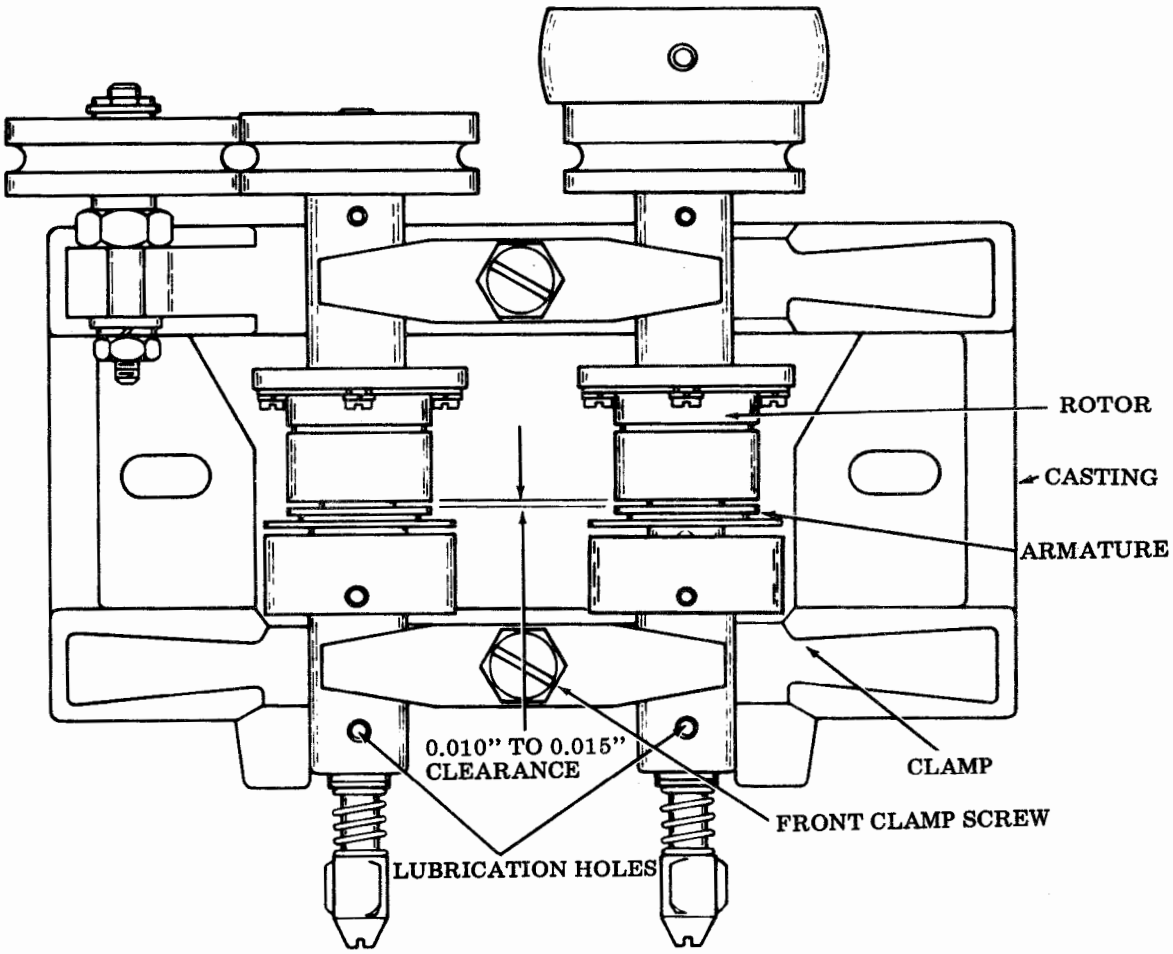
Belt (O-Ring)

Requirement: The gap in the reversing belt shall be
Min 0.050 inch --- Max 0.075 inch

To Adjust: With the idler pulley shaft friction tight, adjust up or down until the requirement is met. Tighten shaft nut.



Clutch



Requirement: With lubrication holes upwards and each shaft biased toward the center, the air gap between the rotor and armature of each clutch shall, at the point of least clearance, be

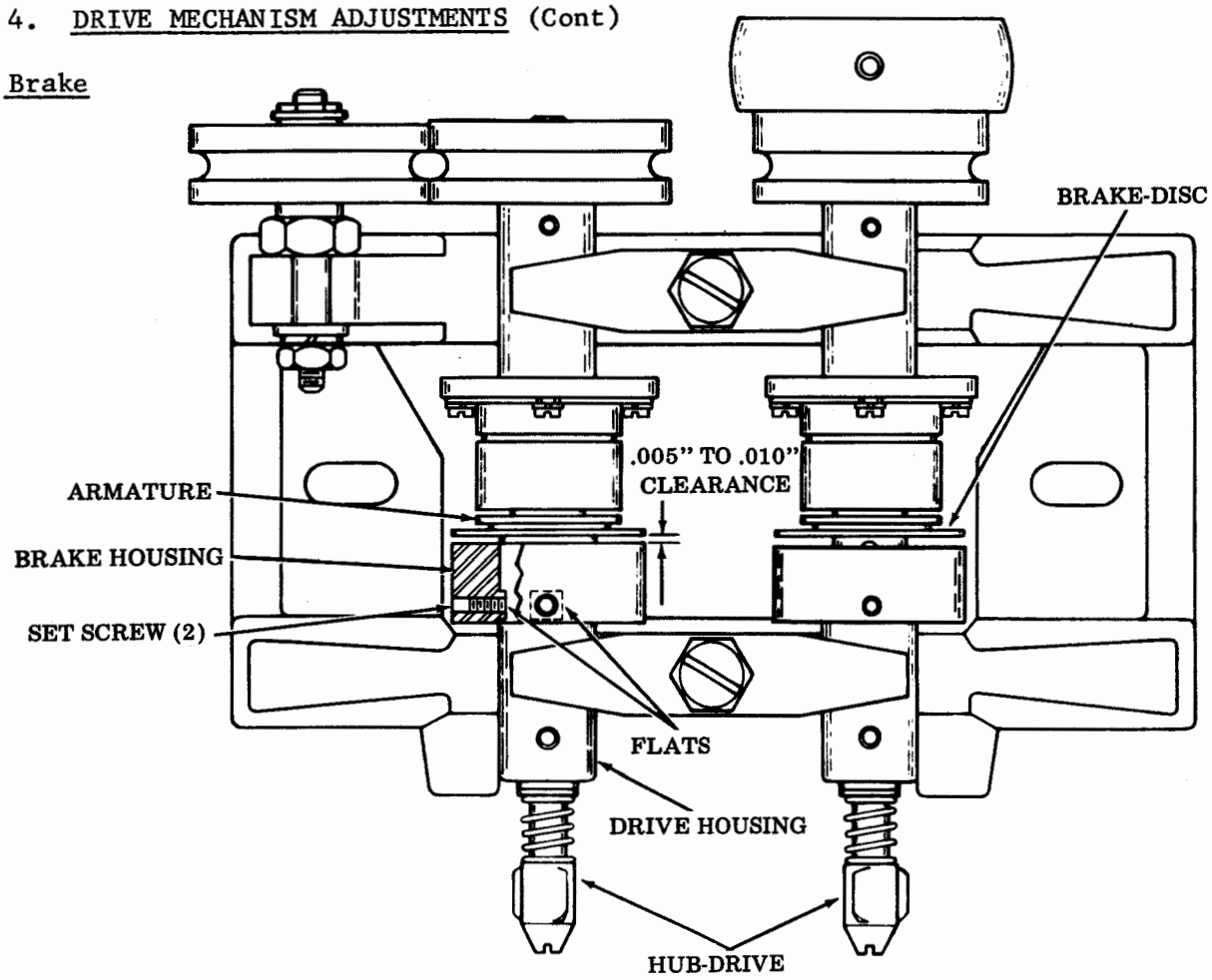
Min 0.010 inch --- Max 0.015 inch

To Adjust: With the front clamp screw friction tight, adjust the armature and shaft assemblies until the requirement is met. Tighten clamp screw.

E. CASSETTE DRIVE (Cont)

4. DRIVE MECHANISM ADJUSTMENTS (Cont)

Brake



Requirement: With the armature biased toward the front (by means of pulling slightly on the hub-drive), the air gap between the brake disc and the brake housing shall, at the point of least clearance, be
Min 0.005 inch --- Max 0.010 inch

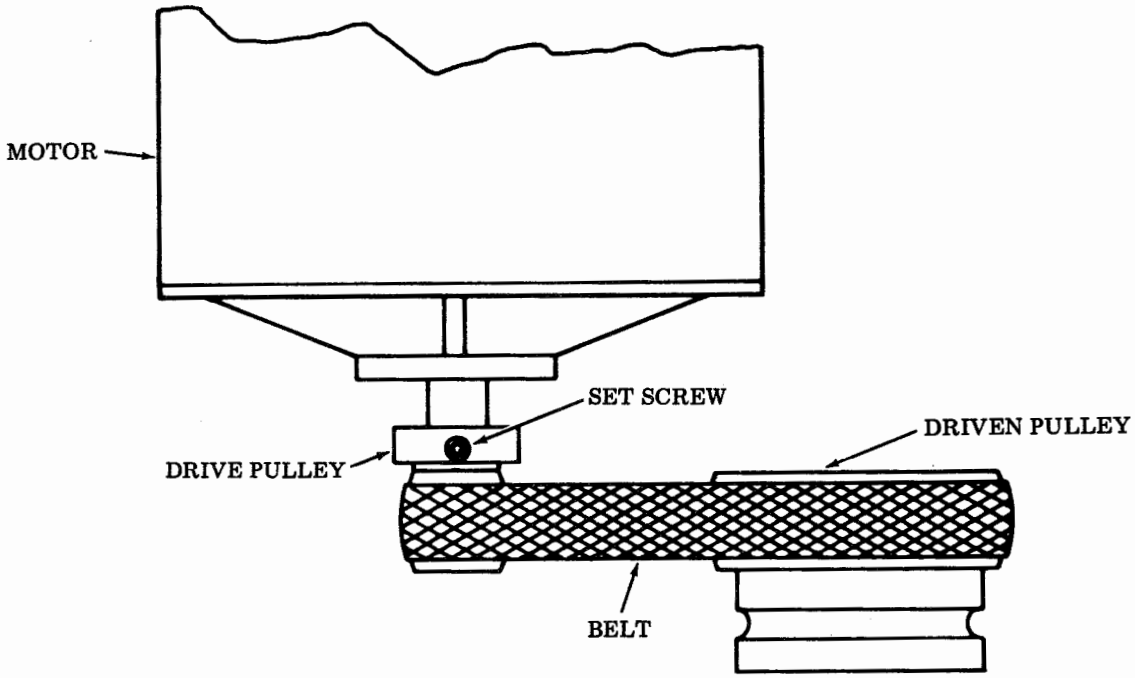
To Adjust: Loosen the two set screws. With the set screws over the mounting flats on the drive housing, slightly tighten the right set screw until friction tight. Adjust the brake coil housing until the requirement is met. Tighten the two set screws.

NOTE: For clarification only one of the two brake assemblies is shown. The adjustment applies to both brake assemblies.

Motor Pulley

Requirement: The flat belt shall be centered on both the motor drive pulley and driven pulley.

To Adjust: With the set screw loose, position the drive pulley to meet the requirement.

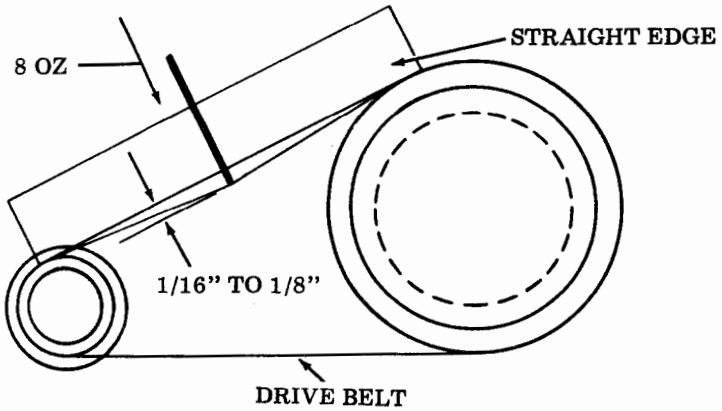


Motor Drive Belt

Requirement 1: With a force of 8 ounces applied perpendicular to the drive belt, approximately midway along its free length, the belt shall deflect 1/16 inch to 1/8 inch from a line tangent to both pulleys.

Requirement 2: While the belt is motor driven (motor on) the belt shall maintain its center position on the large pulley and shall not walk to the edge of the pulley.

To Adjust: With the casting mounting screws friction tight, move casting, left or right with a slight pivot, to meet the requirements.



PART 6 -- COMPONENT ACCESS

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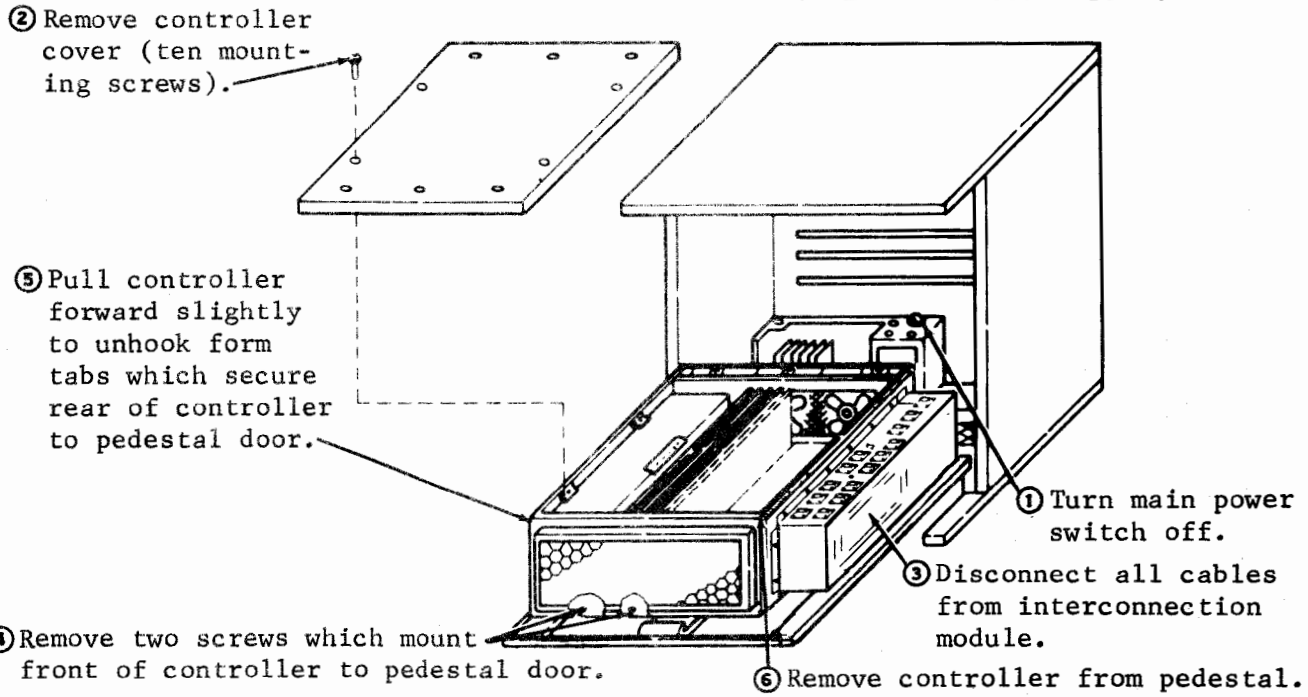
A. GENERAL

For component access information for the display monitor, opcons, printer, cabinets, and pedestals, refer to Part 6 of Manual 363. This section covers component access for the controller and Tempest cassette drive.

B. CONTROLLER

1. REMOVAL AND REPLACEMENT

Note: On late model covers, mounting screws are retained in cover. Loosen these screws.

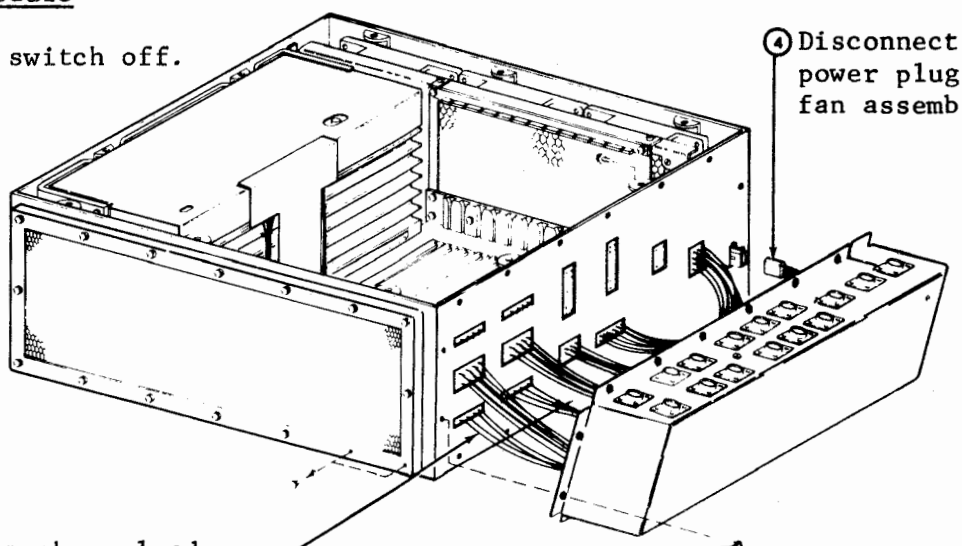


To install controller in pedestal, reverse removal procedures.

B. CONTROLLER (Cont)

1. REMOVAL AND REPLACEMENT (Cont)

Interconnection Module



① Turn main power switch off.

④ Disconnect ac power plug from fan assembly.

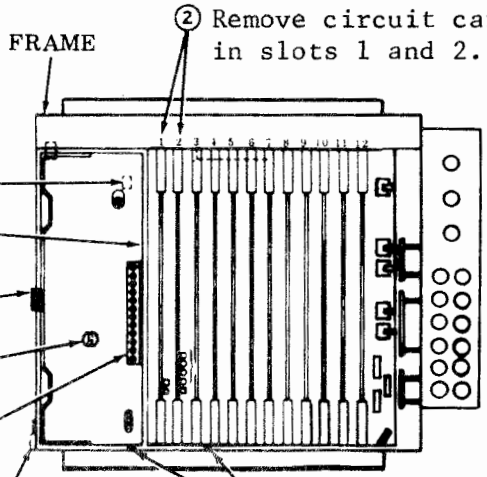
③ Disconnect push-on leads from filter panel to interconnection module.

② Remove 16 181241 screws mounting interconnection module to controller frame.

⑤ Remove interconnection module.

To install interconnection module, reverse removal procedures. Refer to WDP for wiring of filter assemblies.

40PSU103 Power Supply



① Turn main power switch off.

② Remove circuit cards in slots 1 and 2.

⑦ Lift power supply and rest on edge of frame. Reach in at rear of power supply and disconnect ac connector.

⑥ Release power supply handle latch and power supply latch on side of frame.

④ Slide controller forward and tilt up for access to bottom and remove power supply shipping bolt.

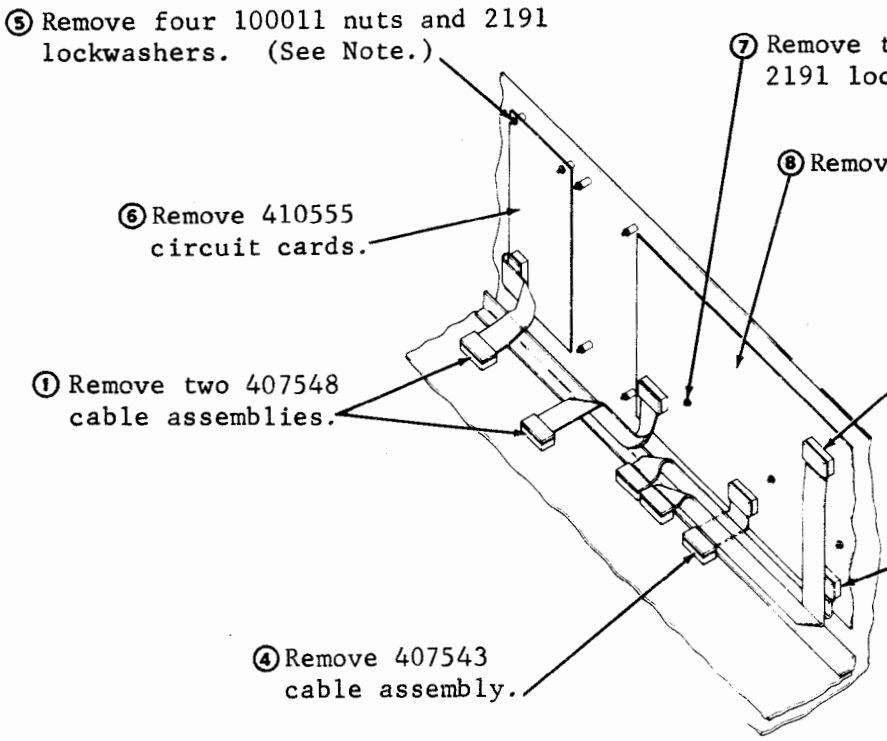
⑤ Return controller to its original position and disconnect leads from power supply to controller back panel.

⑧ Remove power supply from controller.

③ Remove two hold down screws which secure front of controller to pedestal door.

To install power supply, reverse removal procedures.

Controller Interface Cards

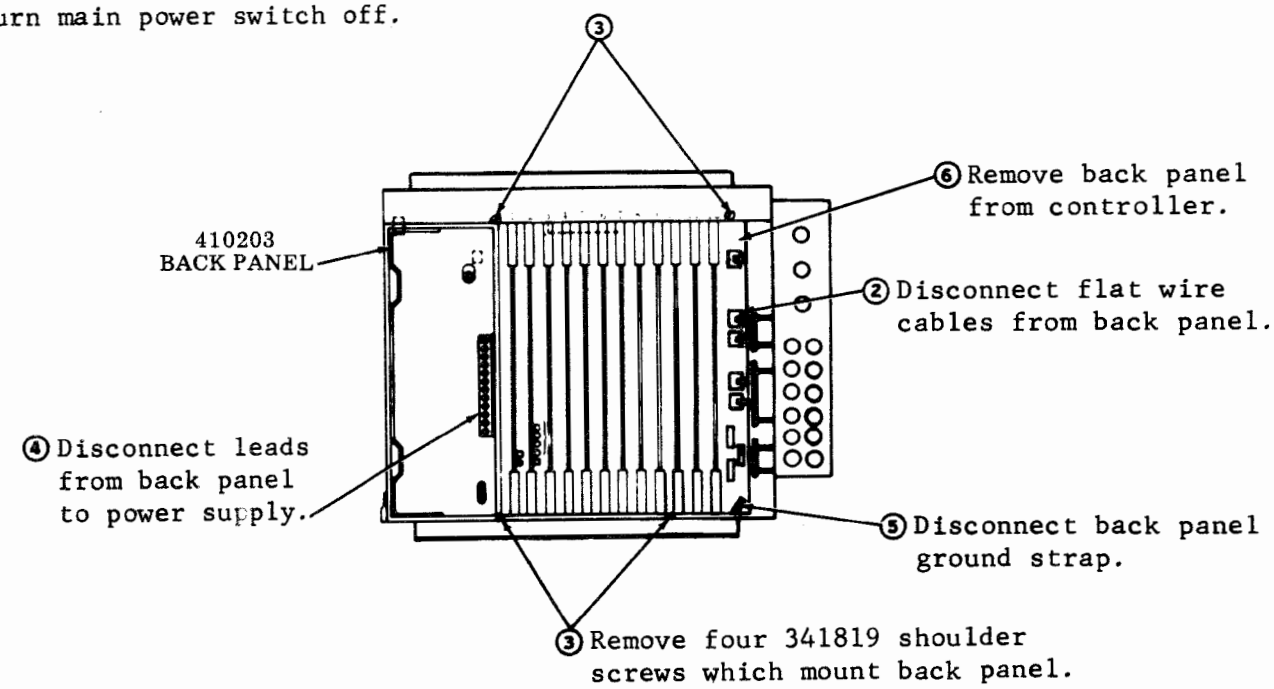


NOTE: Early design models used 3599 nuts, 3640 lockwashers and 125011 flat washers to mount interface cards.

To install circuit cards, reverse removal procedures.

410203 Back Panel

① Turn main power switch off.



To install back panel, reverse removal procedures.

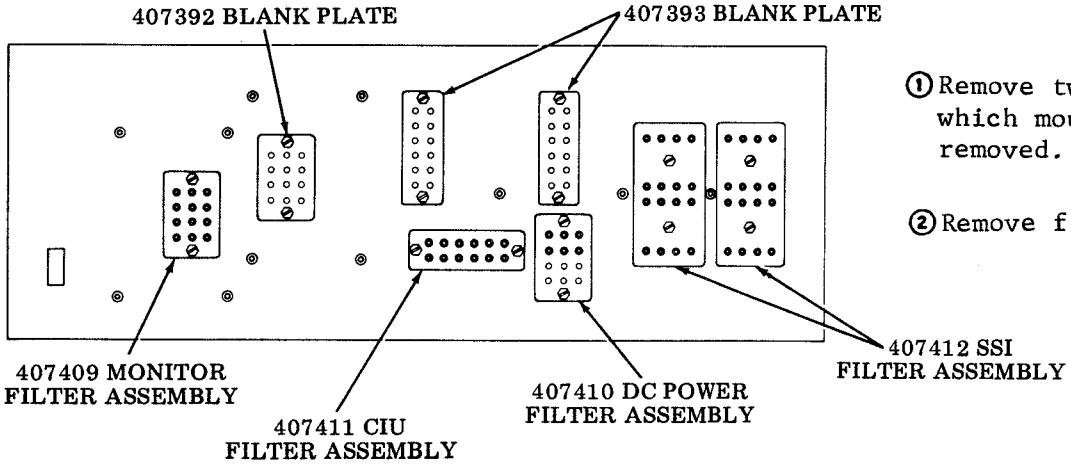
B. CONTROLLER (Cont)

1. REMOVAL AND REPLACEMENT (Cont)

Filter Assemblies

To remove filter assemblies.

- Remove interconnection module.
- Remove controller interface cards.

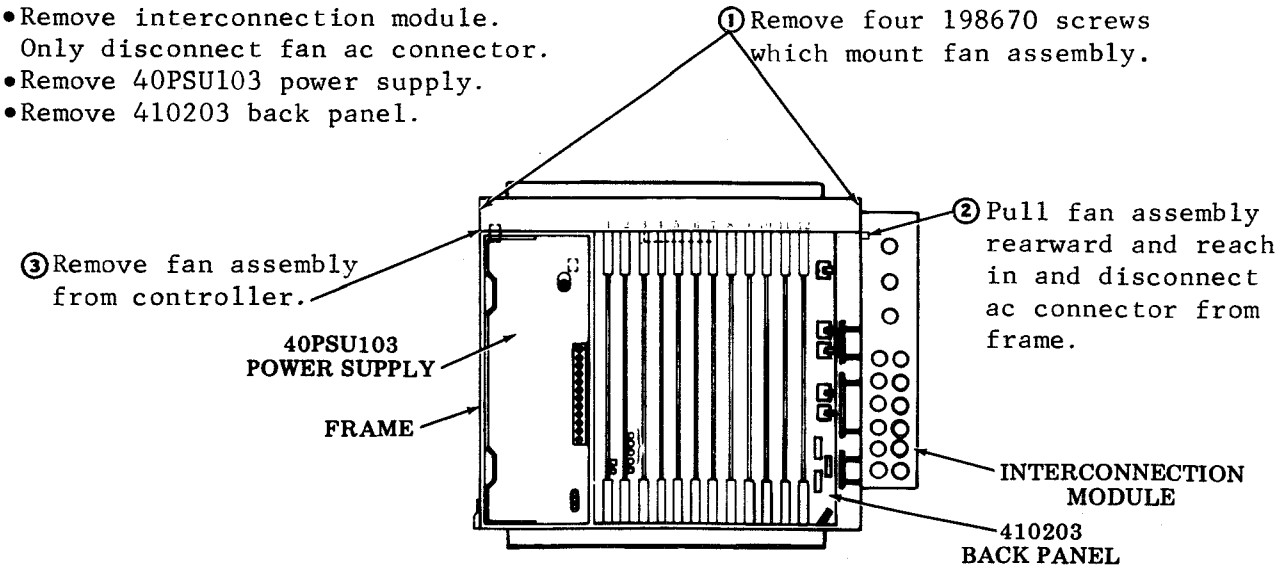


When installing filter assemblies, orientate assembly so that the long filter pins are toward the inside of the controller container.

When installing the 407409 filter assembly, it must be orientated with the long filter pins toward the inside of the controller and the top row must have two feed-through connectors in positions 2 and 3. Feed-through connectors are identified by a glass bead at bottom of connector pin.

Fan Assembly

- Remove interconnection module. Only disconnect fan ac connector.
- Remove 40PSU103 power supply.
- Remove 410203 back panel.

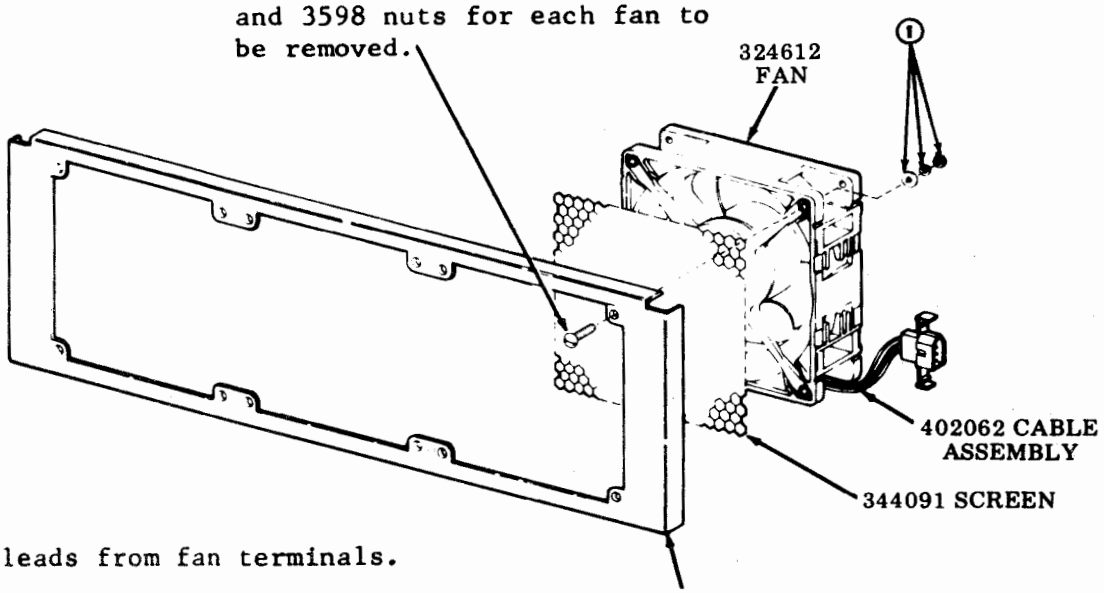


To install fan assembly, reverse removal procedures.

2. DISASSEMBLY/REASSEMBLY

Fan Assembly

① Remove four 81258 screws, 7002 flat washers, 2191 lockwashers and 3598 nuts for each fan to be removed.



② Unsolder leads from fan terminals.

③ Remove fan.

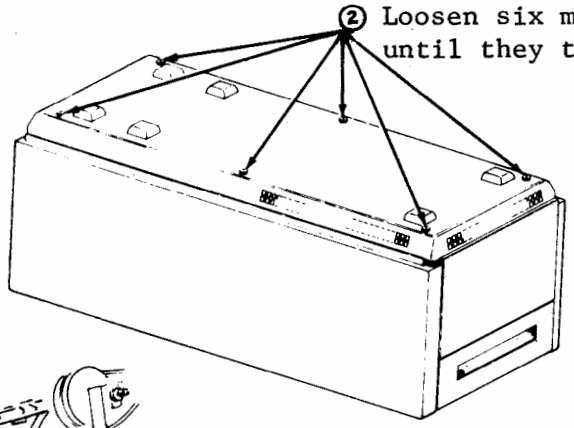
To reassemble fan assembly, reverse disassembly procedures. Refer to 9562WD in WDP for wiring of fan.

C. CASSETTE DRIVE

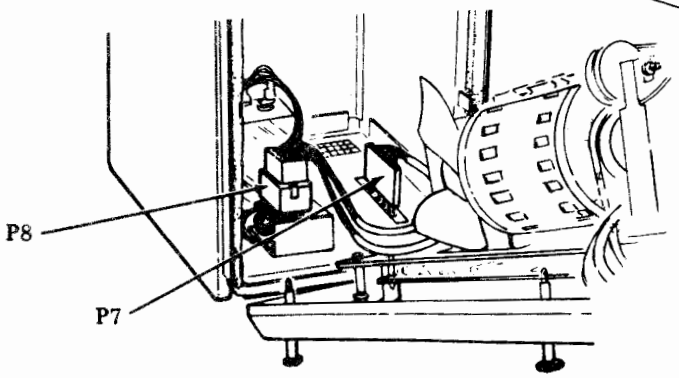
1. REMOVAL AND REPLACEMENT OF UPPER CABINET ASSEMBLY

① Turn cassette drive upside down.

② Loosen six mounting screws until they turn freely.



③ Lay cassette drive on right side. Rotate upper cabinet assembly approximately 60 degrees.

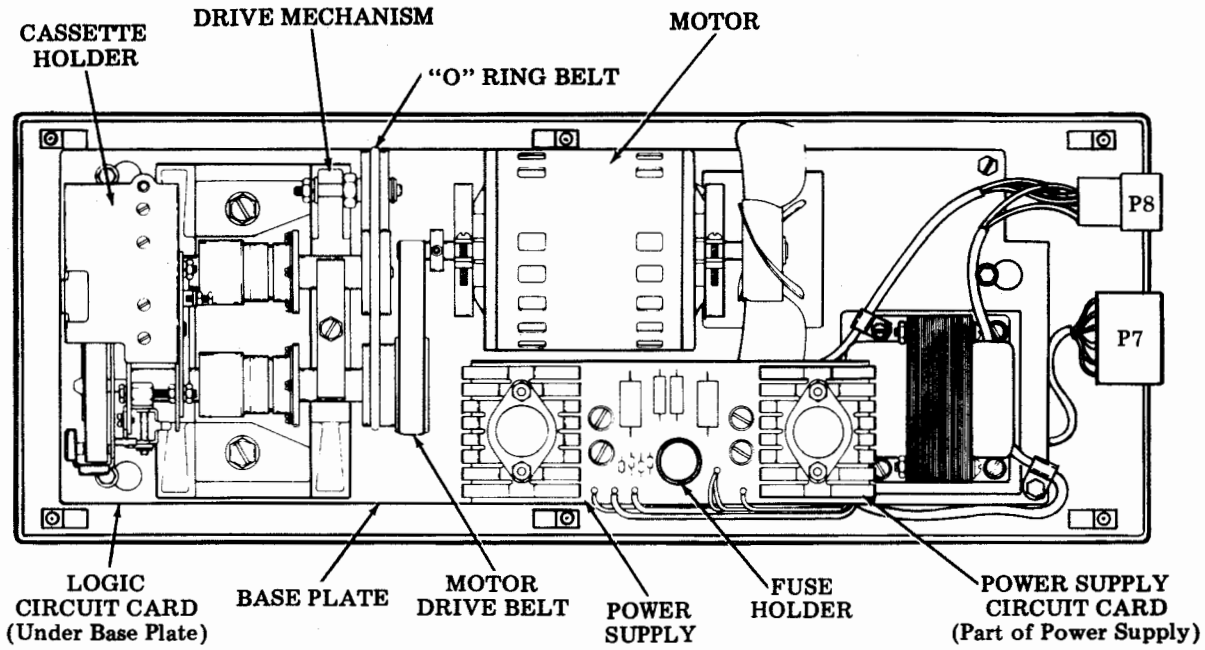


④ Reach in and disconnect P7 signal and P8 ac plugs from interface assembly.

⑤ Remove upper cover assembly.

C. CASSETTE DRIVE (Cont)

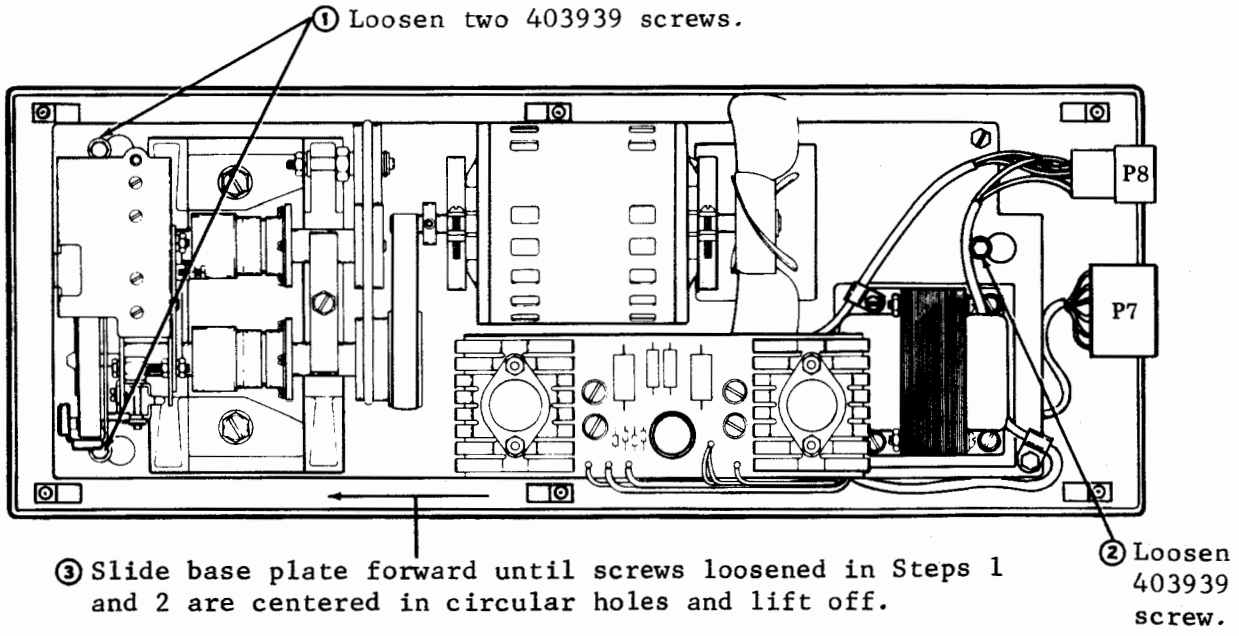
2. SUBASSEMBLY IDENTIFICATION



3. DISASSEMBLY/REASSEMBLY DRIVE

40CD102 Cassette Drive (From Cabinet Base)

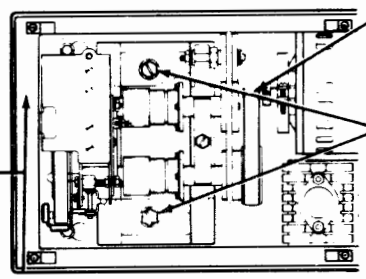
- Remove cabinet.



To install cassette drive with base plate, reverse removal procedures. Before sliding cassette drive rearward, shoulder screws must be centered in circular holes located under power supply and motor.

403300 Drive Belt

Remove cabinet.



③ Remove 403300 drive belt.

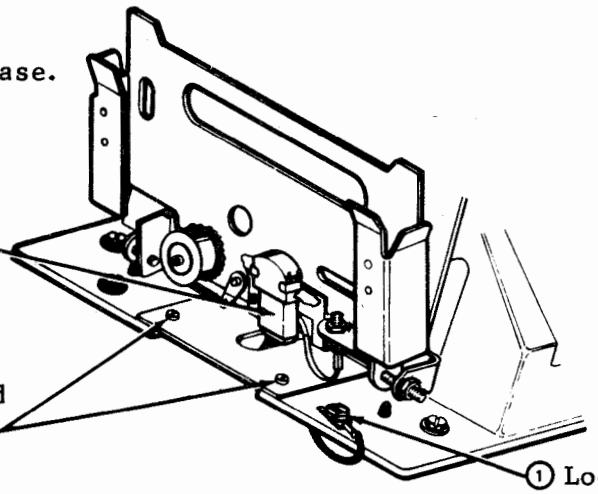
① Loosen two mounting screws.

② Move drive assembly in direction shown to loosen drive belt.

To install drive belt, reverse procedures. Recheck Motor Drive Belt and Motor Pulley adjustments (5-23).

410764 Logic Circuit Card

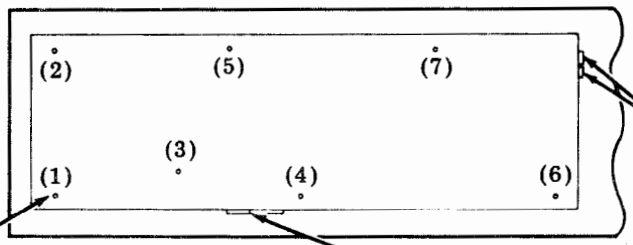
•Remove cassette drive with base.



③ Remove tape head connector.

② Remove two 110434 screws and 110743 lockwashers. Remove 403301 cover with slot.

① Loosen 403939 screw and remove terminal.

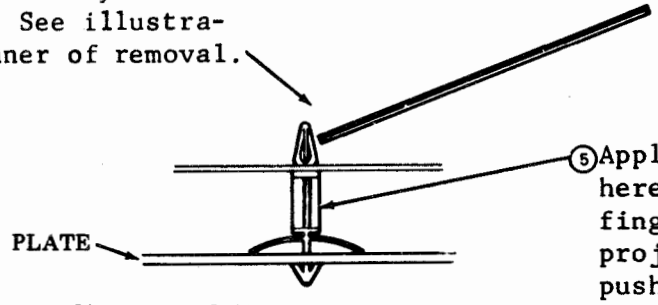


⑦ Remove P1 and P2 connectors.

⑧ Remove P4A and P4B connectors.

⑥ Pry card off of 403586 plastic studs in order shown by numbers in parentheses. See illustration showing manner of removal.

④ Push projection in with orange stick (or equivalent).

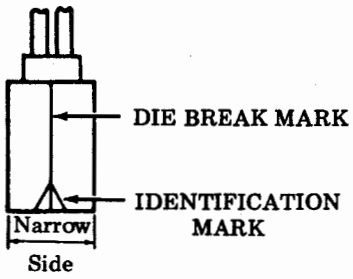


⑤ Apply pressure upward here with thumb or fingers at same time projection is being pushed inward.

Manner of Prying Circuit Card From Plastic Studs

C. CASSETTE DRIVE (Cont)

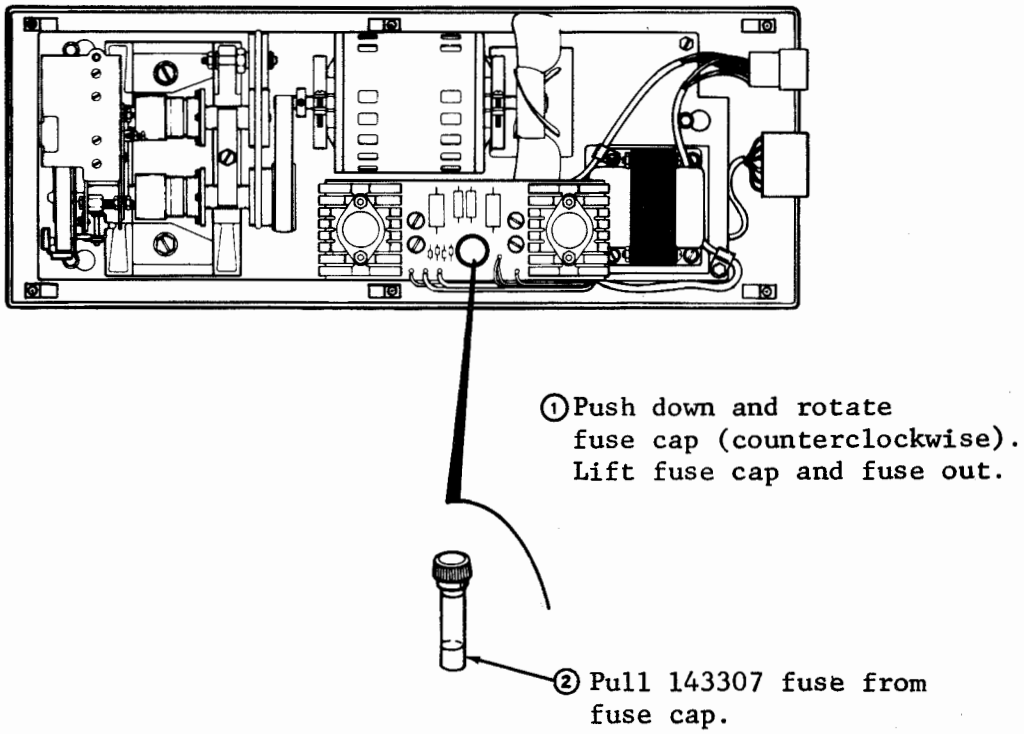
3. DISASSEMBLY/REASSEMBLY DRIVE, 410764 Logic Circuit Card (Cont)



To install 410764 logic circuit card, reverse removal procedures. Circuit card must be installed with component side toward baseplate. Projections or 403586 plastic studs must secure circuit board. The tape head connector must be assembled to the tape head so that the identification mark is to the right as viewed from the front of the cassette drive.

143307 Fuse

- Remove cover.



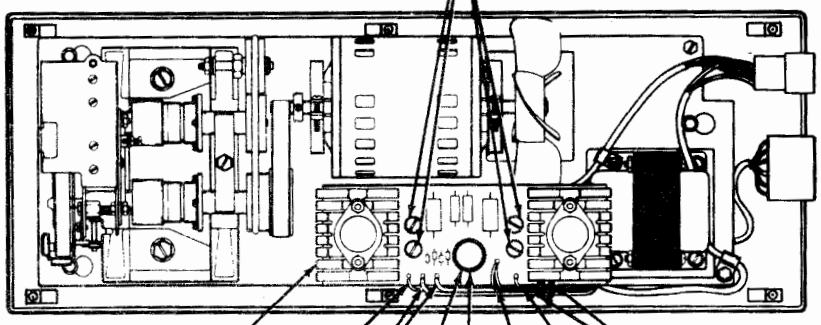
To install fuse, reverse removal procedures.

NOTE: Replace with 143307 0.6 amp Slow-Blow fuse.

410043 Power Supply Circuit Card

- Remove cover.

① Unsolder six leads shown in illustration.



To install circuit card, reverse procedures. Cover lower portion of fuse holder with suitable heat shrink tubing after black leads are soldered in place. Secure cable assembly to power supply circuit board with two RM43679 cable ties.

406103 Transformer (40C102)

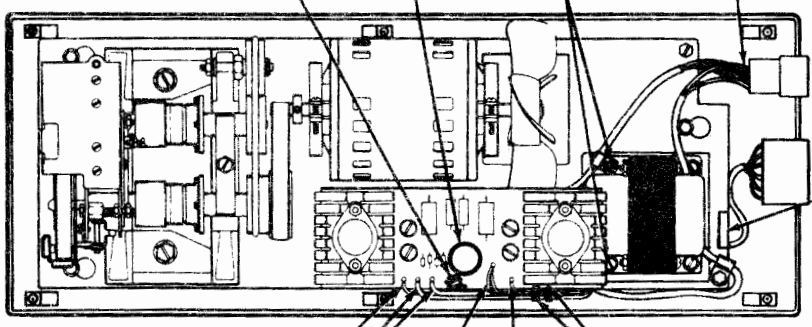
① Cassette drive with base-plate must be free of cabinet base.

⑤ Remove one 151630 screw, 99260 lockwasher and terminal connected to two red-yellow leads.

④ Remove heat shrink tubing from fuse holder. Unsolder two leads.

⑥ Remove two black leads from position 1 and 3 of connector.

⑦ Remove two 184056 screws.



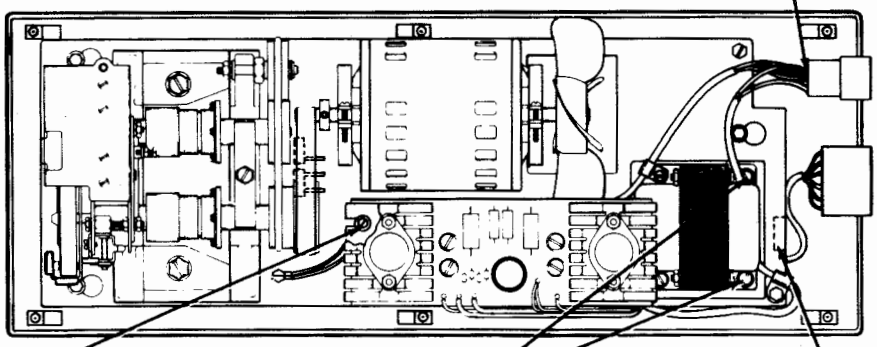
To install 406103 transformer, reverse removal procedures. Cover lower portion of fuse holder with suitable heat shrink tubing after leads are soldered in place. Secure cable assembly to power supply circuit board with two RM43679 cable ties.

C. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY DRIVE (Cont)

406101 Power Supply

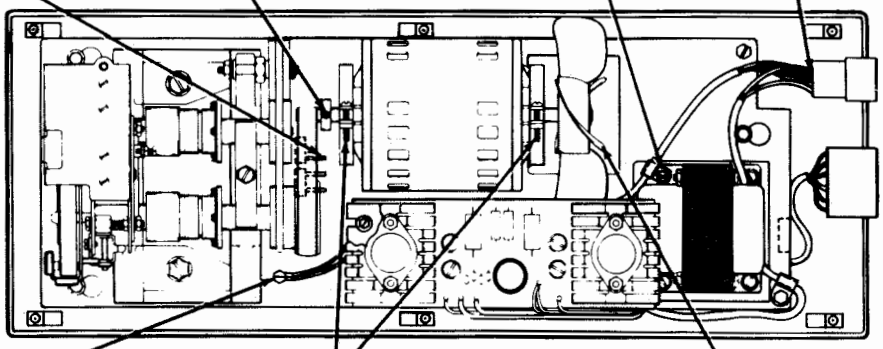
- Cassette drive with baseplate must be free of cabinet base.



To install power supply, reverse procedures.

403303 Motor Assembly

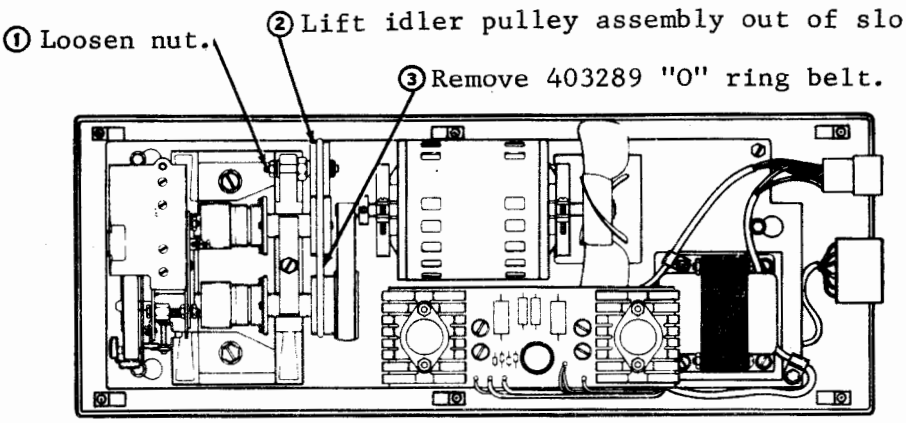
- Remove 403300 belt drive.



To install motor, reverse procedures.

403289 "O" Ring Belt

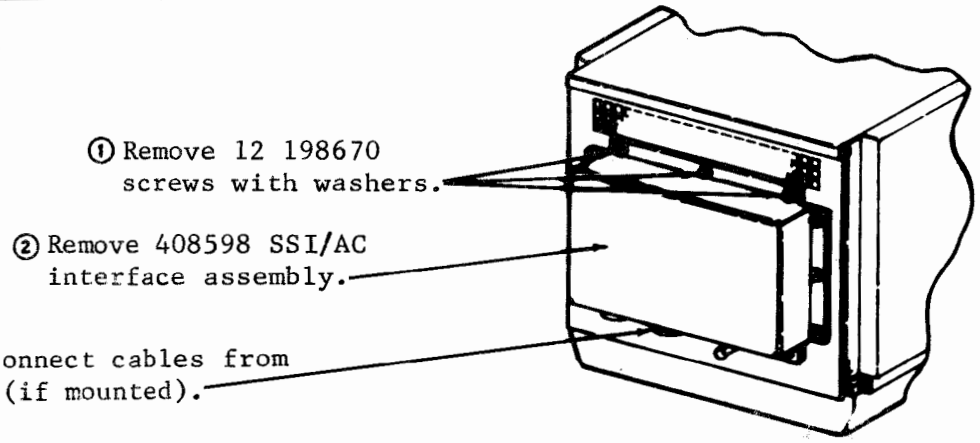
- Remove 403300 drive belt.



To install, reverse procedures. Recheck "O" Ring Belt adjustment (5-21).

4. 408598 SSI/AC INTERFACE REMOVAL AND REPLACEMENT

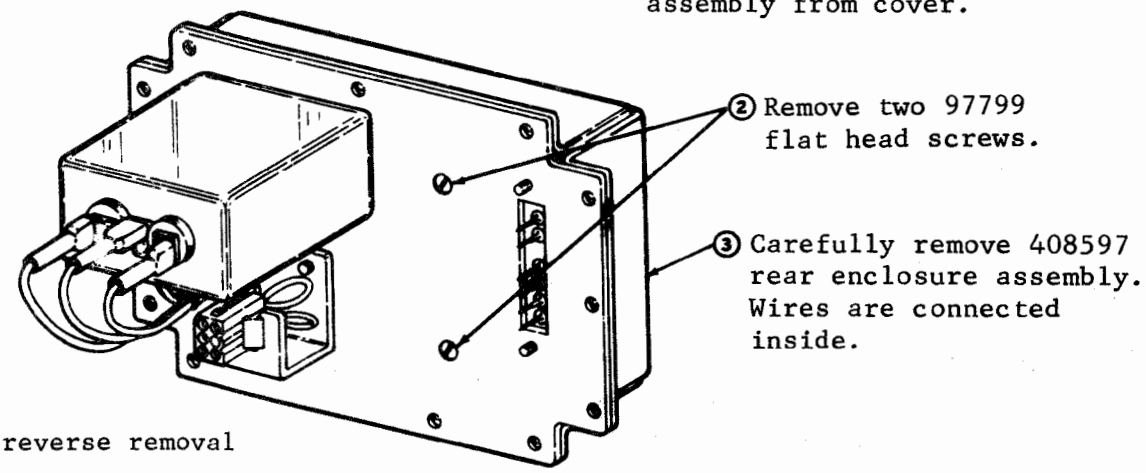
- Remove cover.



To replace 408598 SSI/AC interface assembly, reverse removal procedures.

5. DISASSEMBLY/REASSEMBLY SSI/AC INTERFACE

- Remove 408597 rear enclosure assembly.



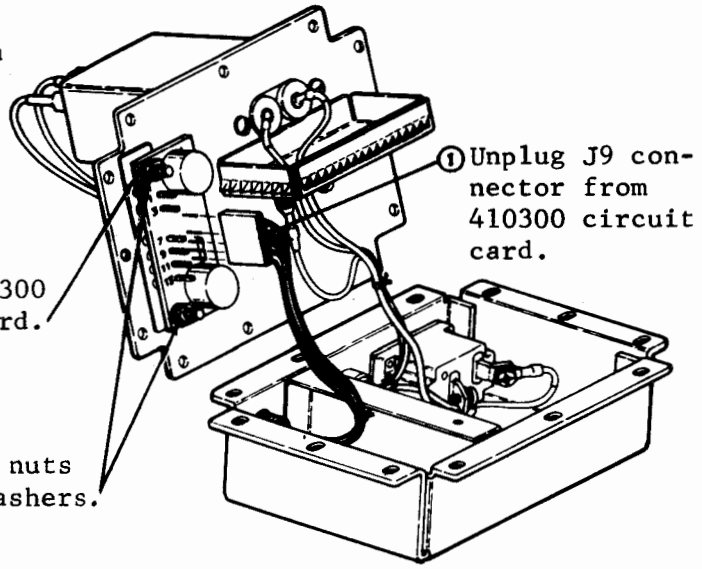
To replace, reverse removal procedures.

C. CASSETTE DRIVE (Cont)

5. DISASSEMBLY/REASSEMBLY SSI/AC INTERFACE (Cont)

410300 Circuit Card

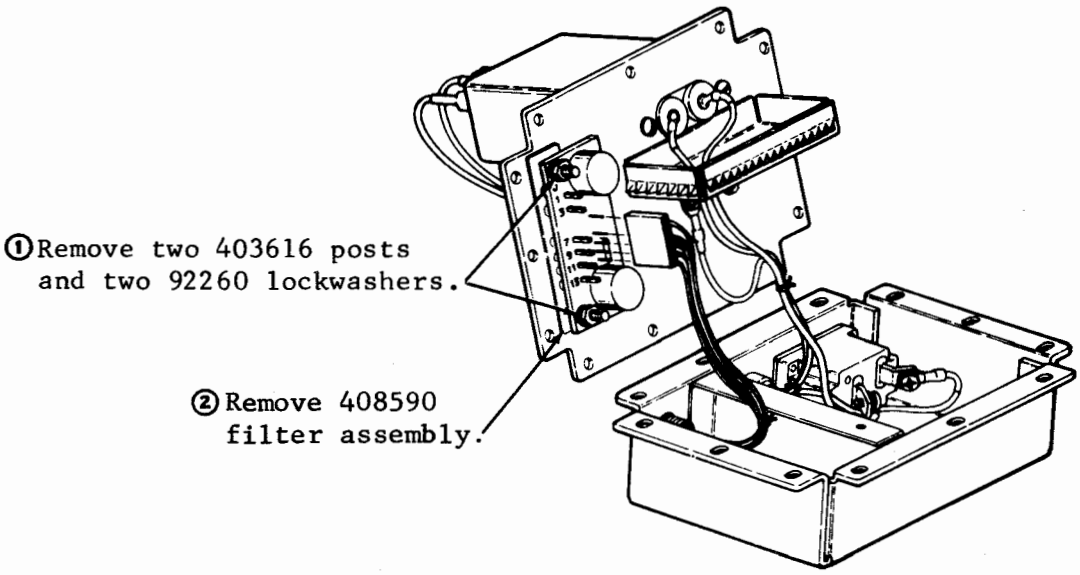
- Remove upper cabinet assembly (6-5).
- Remove SSI/AC interface from cabinet assembly (6-11).
- Remove rear enclosure assembly from interface assembly (6-11).



To install a new 410300 circuit card, reverse removal procedure.

408590 Filter Assembly Removal

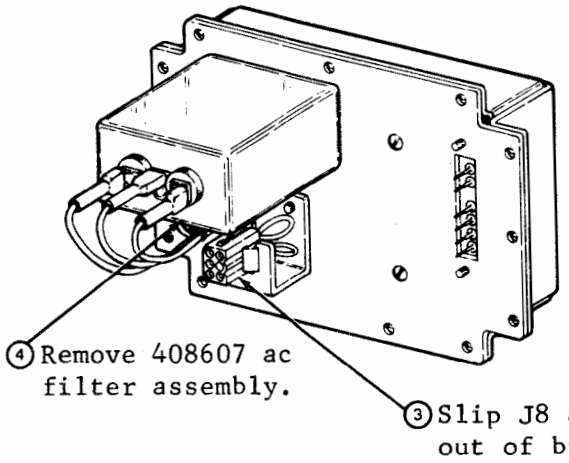
- Remove upper cabinet assembly (6-5).
- Remove SSI/AC interface assembly (6-11).
- Remove rear enclosure assembly from interface assembly (6-11).
- Remove 410300 SSI from circuit card (6-12).

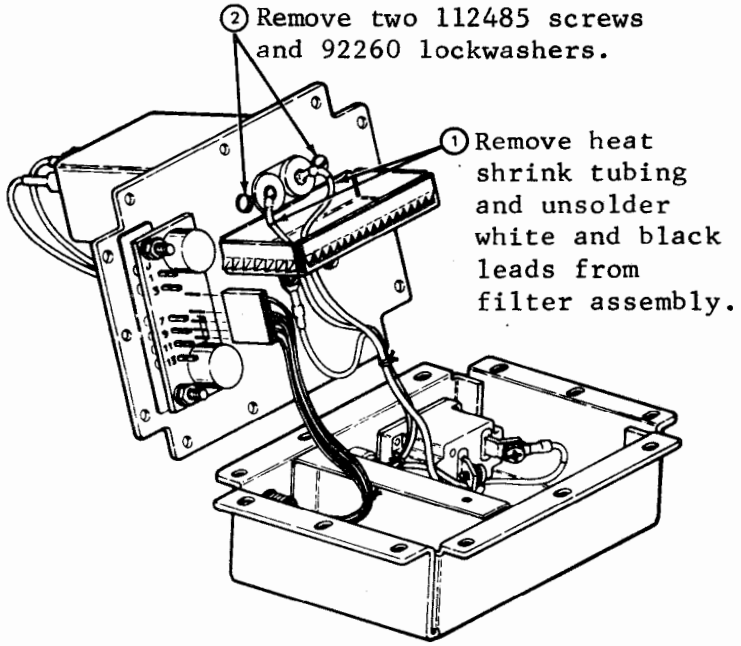


To install new 408590 filter assembly, reverse removal procedure.

408607 AC Filter Assembly Removal

- Remove upper cabinet assembly (6-5).
- Remove SSI/AC interface assembly from upper cabinet assembly (6-11).
- Remove rear enclosure assembly from interface assembly (6-11).





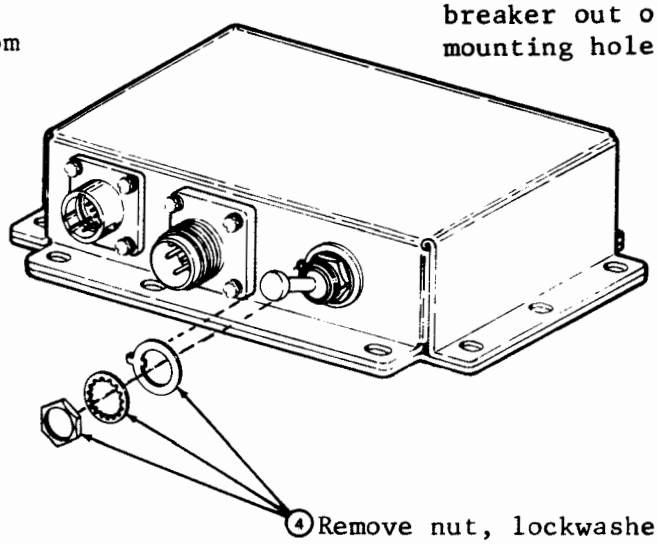
To install the ac filter assembly, reverse the removal procedure. When resoldering leads to line side of filter, solder black lead to terminal 5 and white lead to terminal 4. Leads should be covered with heat shrink tubing after soldering.

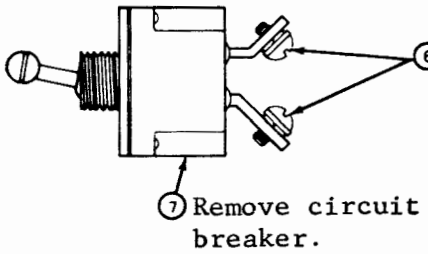
C. CASSETTE DRIVE (Cont)

5. DISASSEMBLY/REASSEMBLY SSI/AC INTERFACE (Cont)

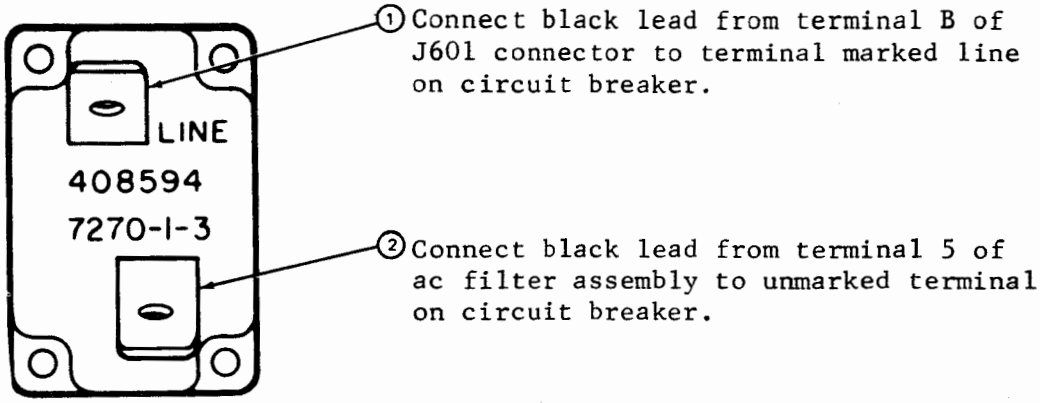
408594 Circuit Breaker Removal

- Remove upper cabinet assembly (6-5).
- Remove SSI/AC interface assembly from upper cabinet assembly (6-11).
- Remove rear enclosure assembly from interface assembly (6-11).





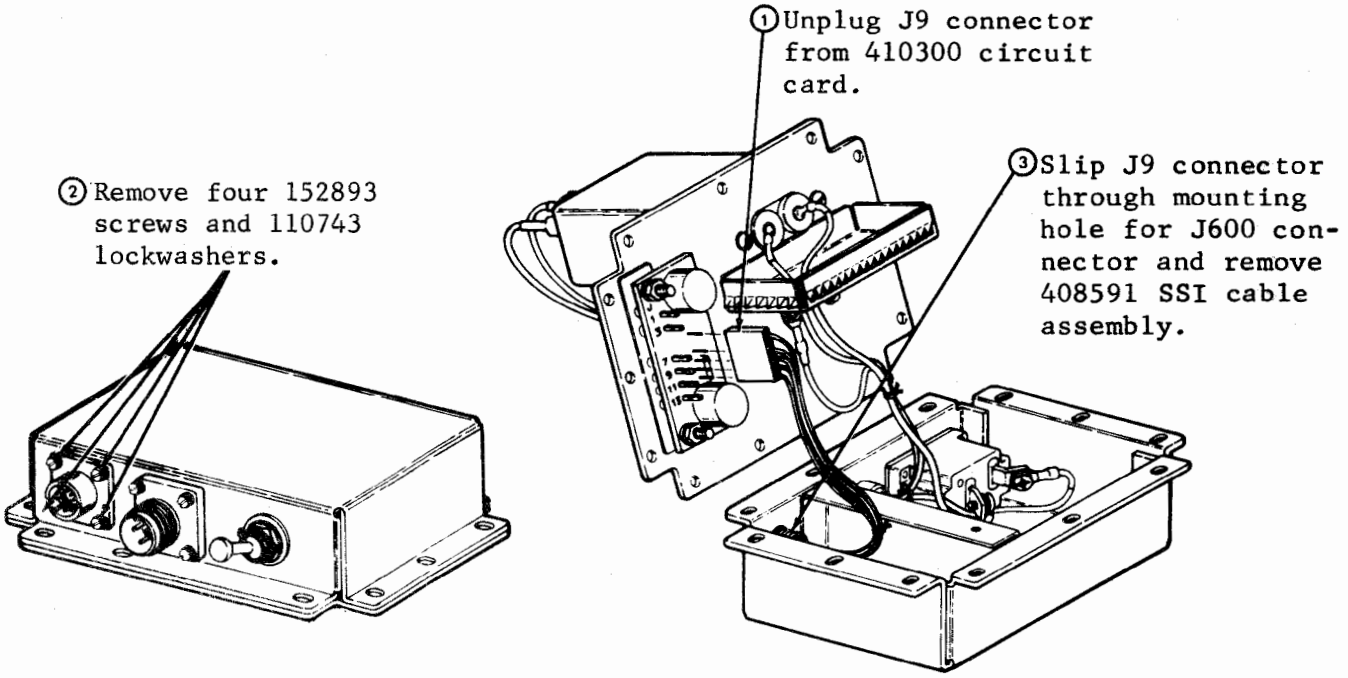
To install a new 408594 circuit breaker, reverse removal procedure. When connecting the black leads, proceed as indicated below.



When mounting circuit breaker in rear enclosure, orientate circuit breaker so that keyway is pointing toward small hole next to circuit breaker mounting hole.

408591 SSI Cable Assembly Removal

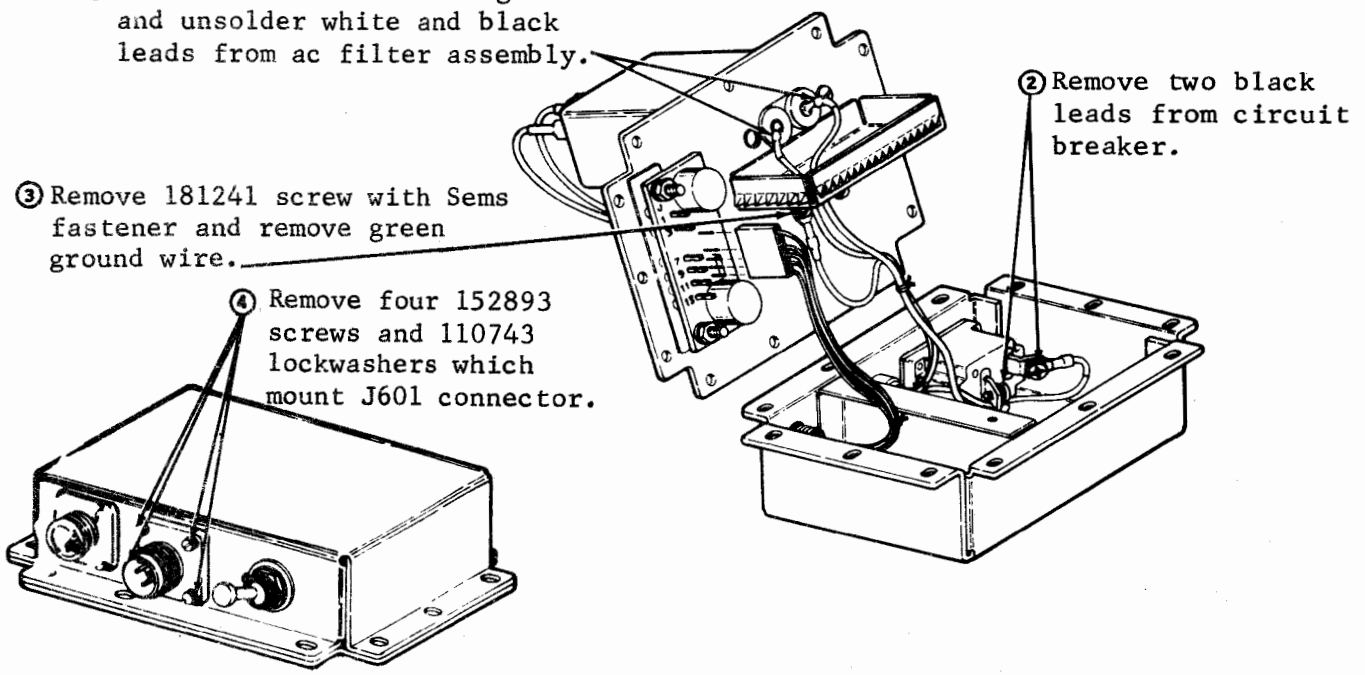
- Remove upper cabinet assembly (6-5).
- Remove SSI/AC interface assembly from the upper cabinet assembly (6-11).
- Remove rear enclosure assembly from the interface assembly (6-11).



To install SSI cable assembly, reverse removal procedure.

408592 AC Cable Assembly Removal

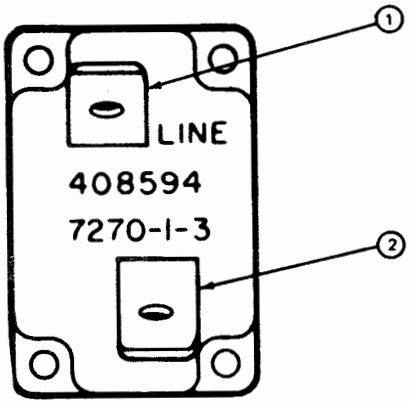
- Remove the upper cabinet assembly (6-5).
- Remove the SSI/AC interface assembly from the upper cabinet assembly (6-11).
- Remove the rear enclosure assembly from the interface assembly (6-11).



C. CASSETTE DRIVE (Cont)

5. DISASSEMBLY/REASSEMBLY SSI/AC INTERFACE, 408592 AC Cable Assembly Removal (Cont)

To install the 408592 ac cable assembly, reverse the removal procedure. When connecting the black leads to the circuit breaker, proceed as indicated below:



① Connect black lead from terminal B of J601 connector to terminal marked line on circuit breaker.

② Connect black lead from terminal 5 of ac filter assembly to unmarked terminal on circuit breaker.

③ When connecting the white and black leads to the ac filter assembly, solder the black lead from circuit breaker to terminal 5 of the ac filter assembly. Solder the white lead from terminal A of J601 connector to terminal 4 of the ac filter assembly. The leads should be covered with heat shrink tubing after soldering.

PART 6 -- COMPONENT ACCESS

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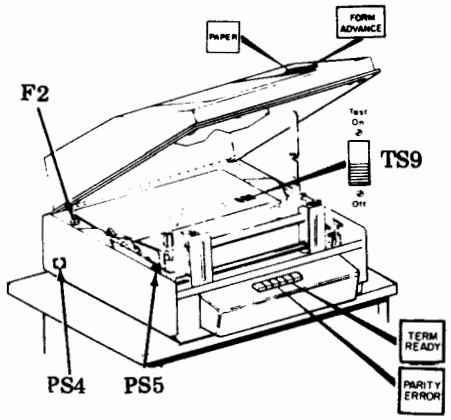
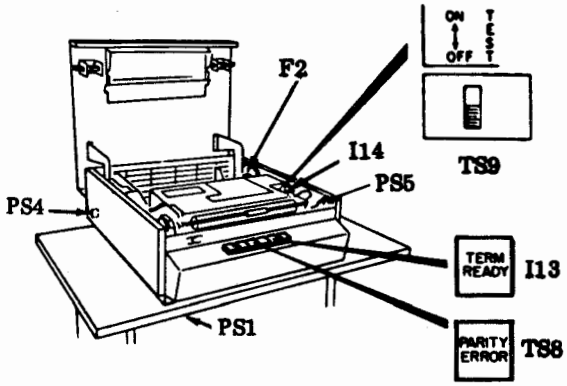
PART 6 -- COMPONENT ACCESS
A. TEST SWITCHES AND INDICATORS

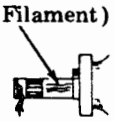
NOTE: The operation of test switches and use of indicators should be done under the direction of PART 4 -- TROUBLESHOOTING of this manual.

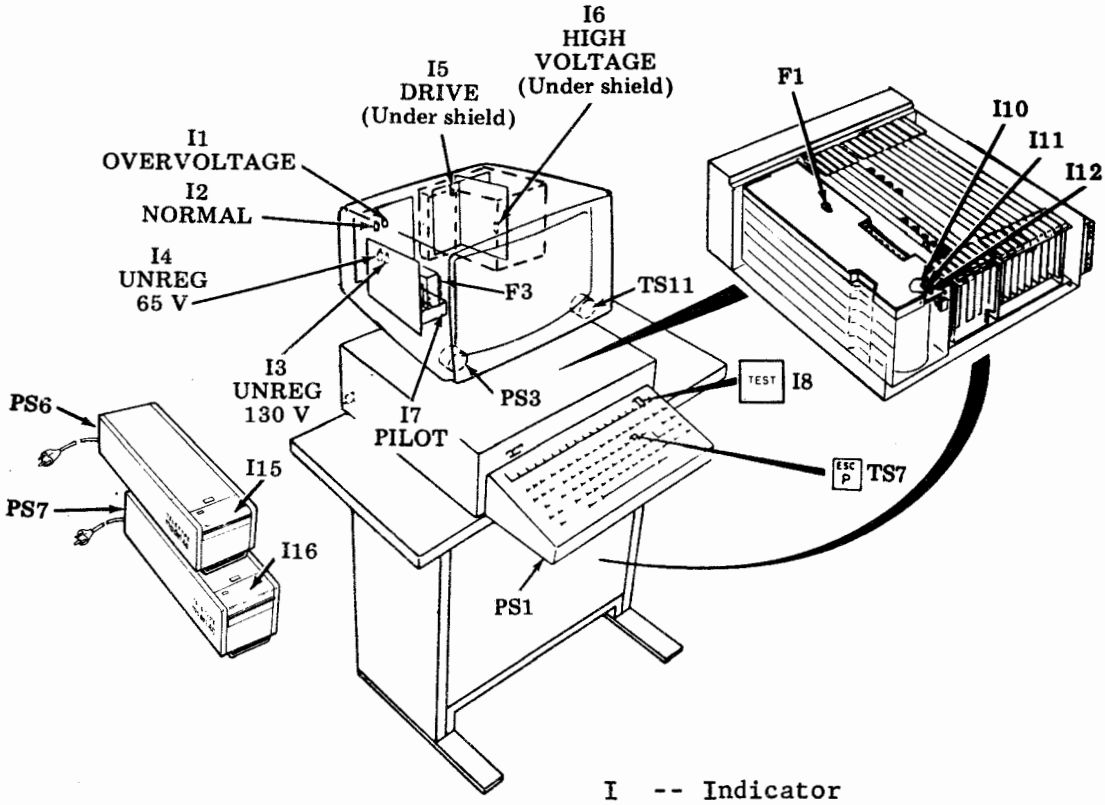
Tractor Feed Printer



Friction Feed Printer







I -- Indicator
TS -- Test Switch
F -- Fuses and Circuit Breaker
PS -- Power or Interlock Switch

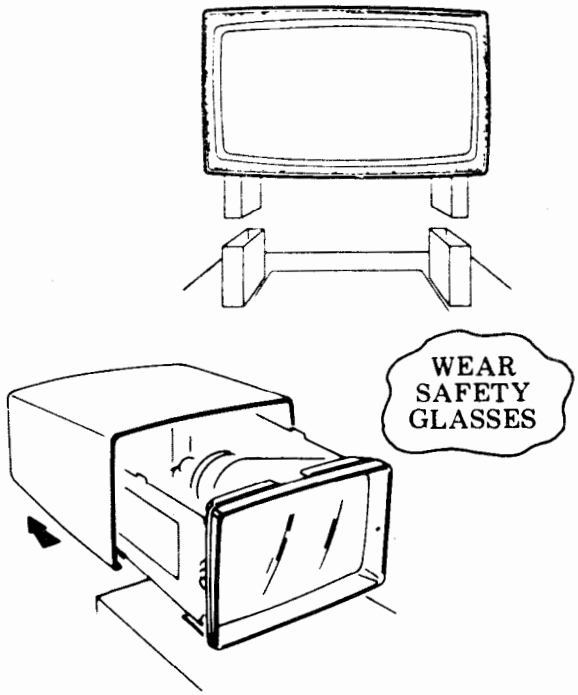
B. DISPLAY MONITOR

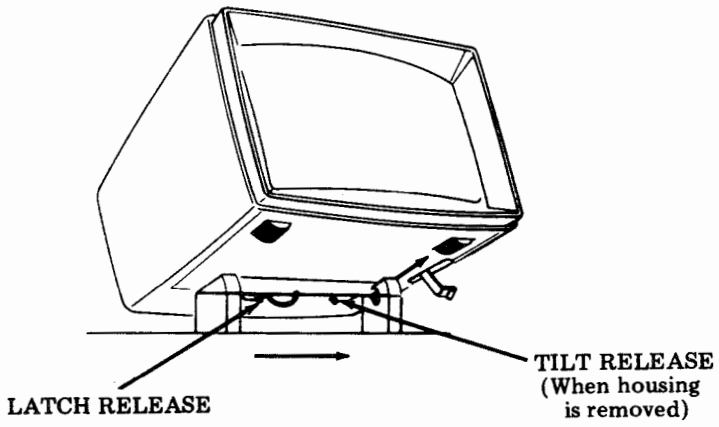
CAUTION: REMOVE ALL POWER FROM THE SET BEFORE PERFORMING ANY COMPONENT REPLACEMENT OR CONVERSIONS. THIS DOES NOT APPLY TO COVER REMOVAL FOR ACCESS TO TEST SWITCHES, OR TO POWER ON ADJUSTMENTS OF THE MONITOR.

1. REMOVAL

① Removal of entire monitor unit from set:
Grasp monitor by sides near supports and simply lift up. Electrical cable connectors are part of support assembly.

② Removal of monitor housing:
Tilt monitor back and disengage latch. Slide housing back partially. Position monitor to its normal position making sure it locks in that position. Remove housing completely.





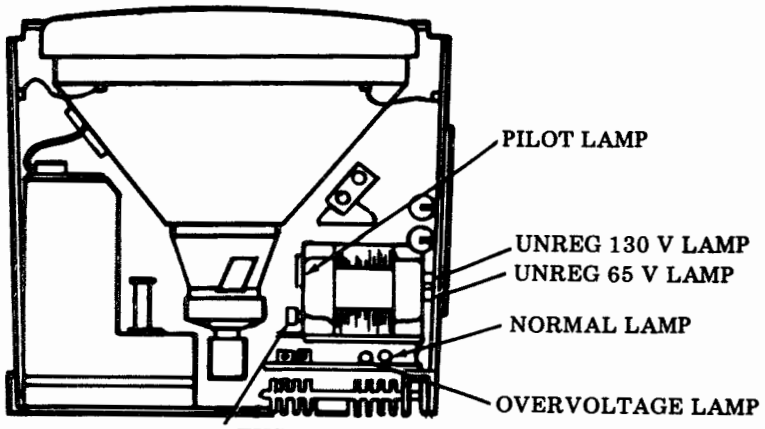
B. DISPLAY MONITOR (Cont)

2. DISASSEMBLY INFORMATION

When removing a subassembly or part from the display monitor, follow the removal procedure and note the sequence of removal to enable proper reassembly. For reassembly, reverse the removal procedure except where different instructions are given.

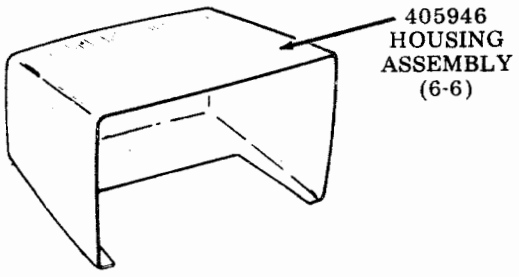
For all disassembly or reassembly procedures or when disconnecting or reconnecting any of the electrical components of the display monitor, all power and video signals to the monitor should be turned OFF to avoid safety hazards and prevent electrical component damage. A recommended safety practice is to unplug all ac input power cords.

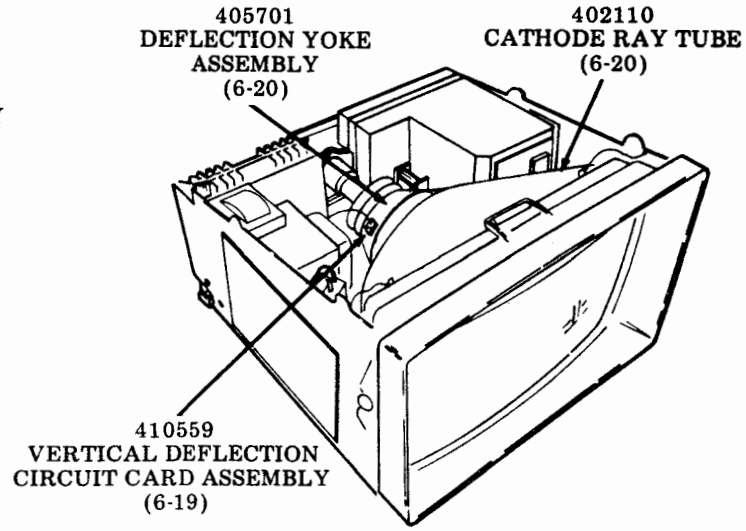
CAUTION: WEAR APPROVED SAFETY GLASSES WHEN THE MONITOR HOUSING IS REMOVED, AS THE DISPLAY TUBE IS FRAGILE IN THE NECK AREA AND IS SUBJECT TO IMPLOSION IF BROKEN. BE CAREFUL NOT TO STRIKE THE TUBE WITH TOOLS OR COMPONENTS WHEN WORKING IN ITS VICINITY.



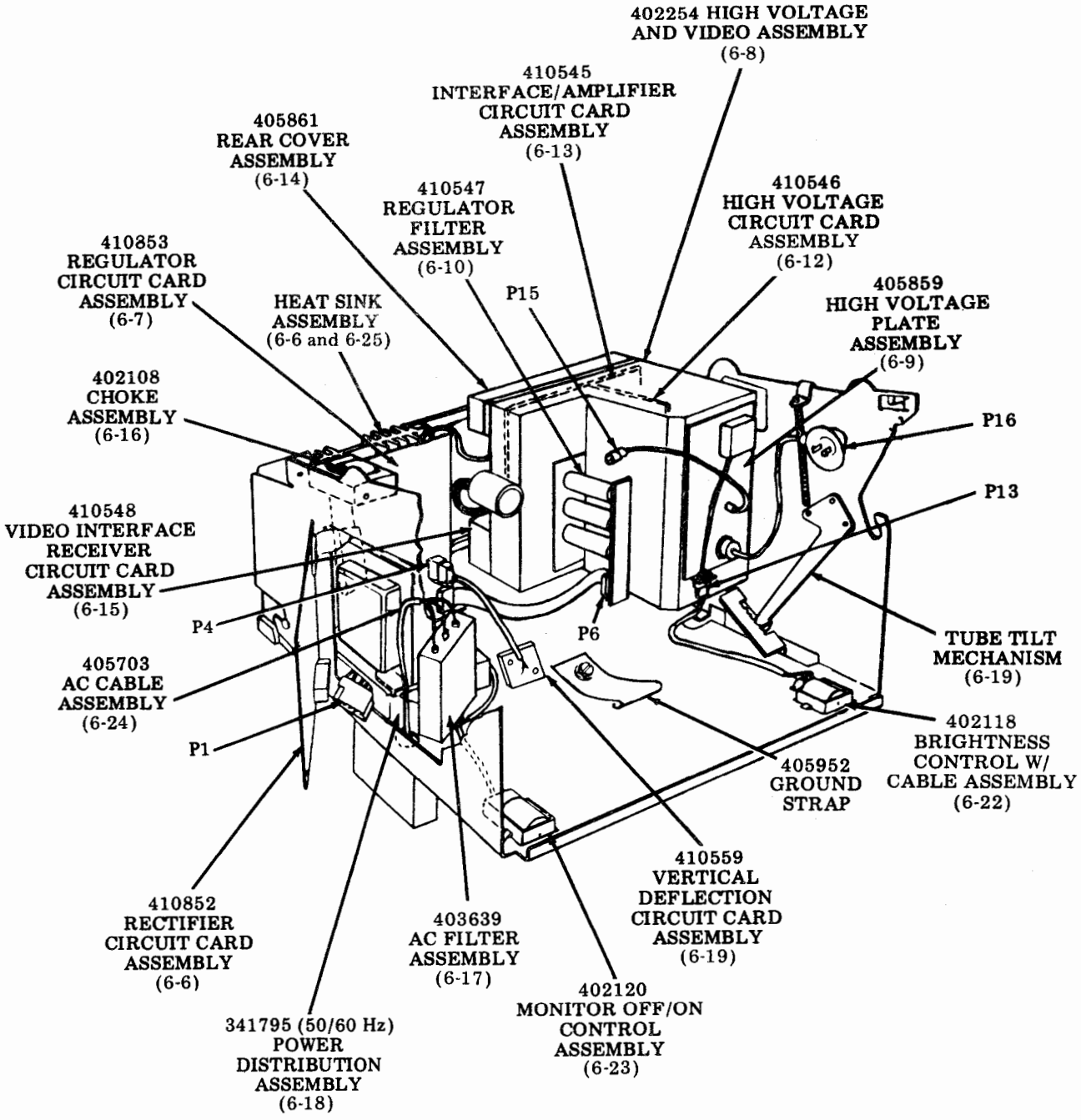
3. SUBASSEMBLY IDENTIFICATION

NOTE: The number indicated in parentheses after each assembly designates the page covering the disassembly/reassembly procedures.





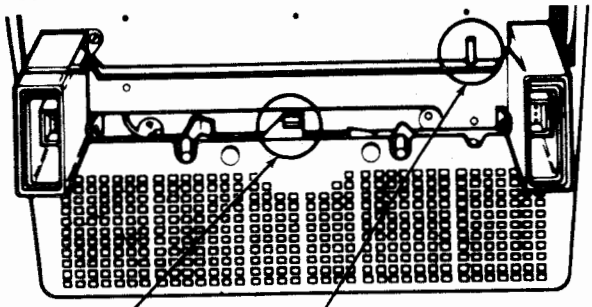
NOTE: The number indicated in parentheses after each assembly designates the page covering the disassembly/reassembly procedures.



B. DISPLAY MONITOR (Cont)

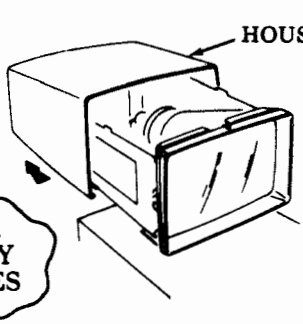
4. DISASSEMBLY/REASSEMBLY

405946 Housing Assembly

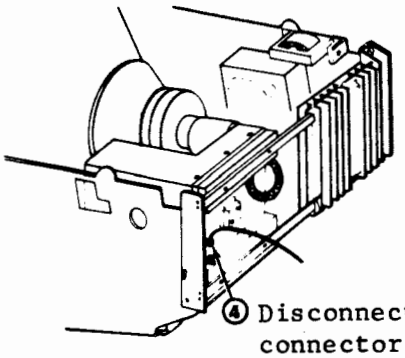


① Release latch.

③ Tilt Release -- Prevents monitor from tilting back when housing is removed.

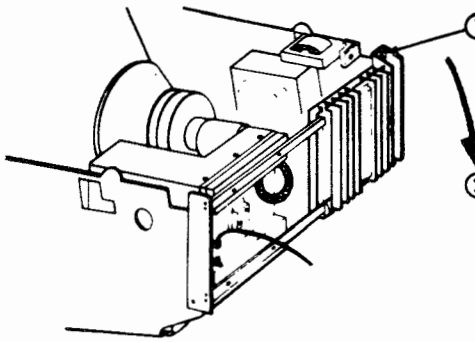


② Move housing back.



④ Disconnect P901 video cable connector to enable removal of housing.

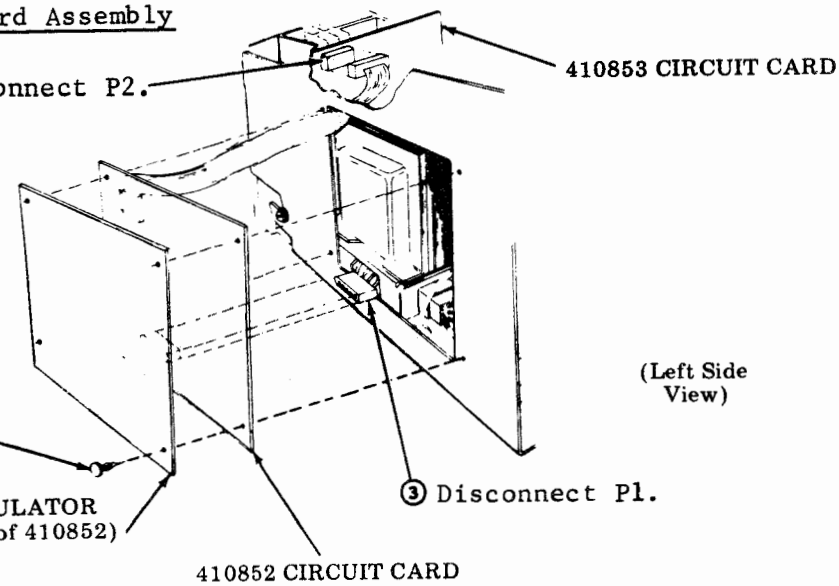
Heat Sink to Lowered Position



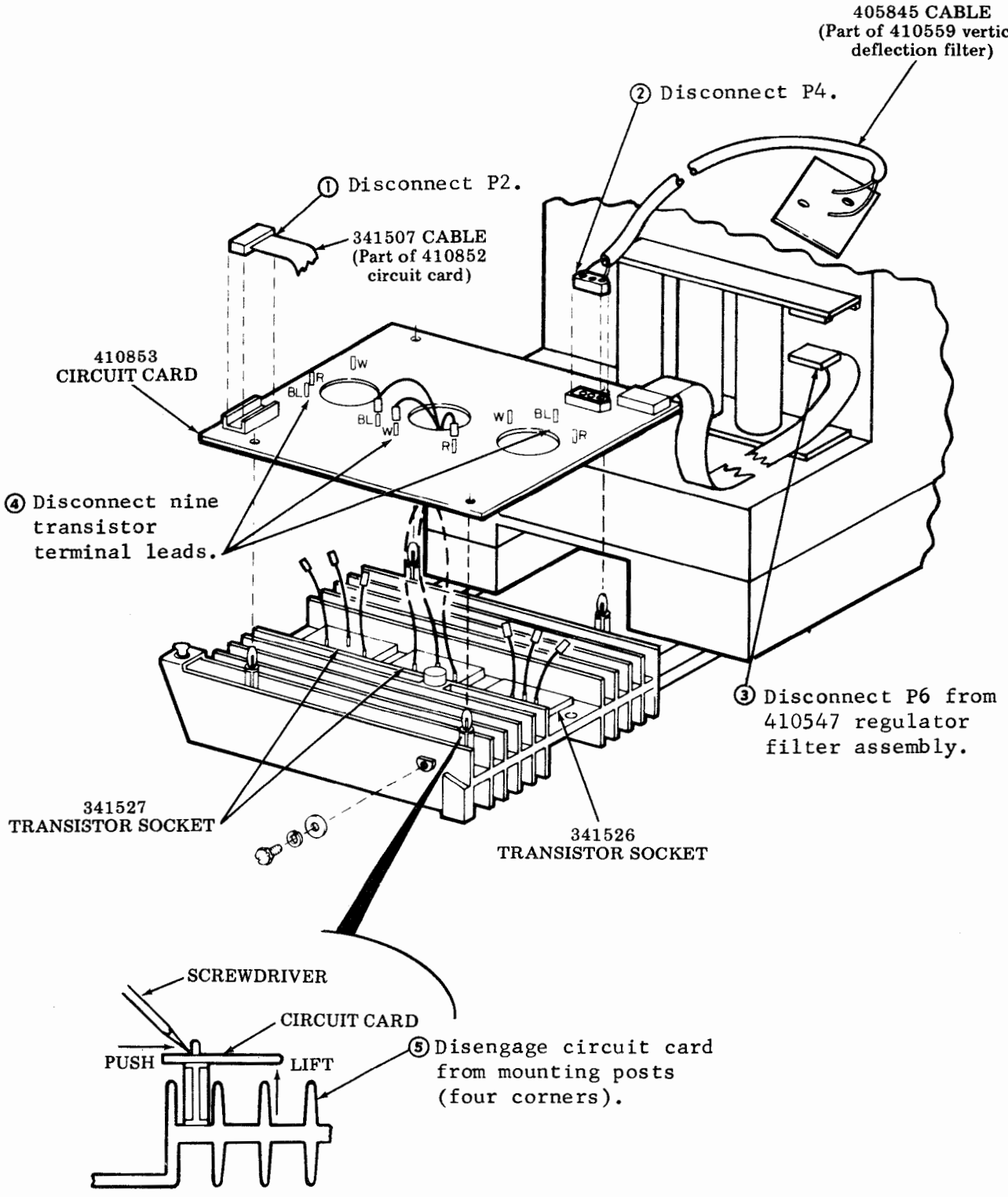
① Rotate slotted fastener head 1/4-turn counterclockwise.

② Lower.

410852 Rectifier Circuit Card Assembly



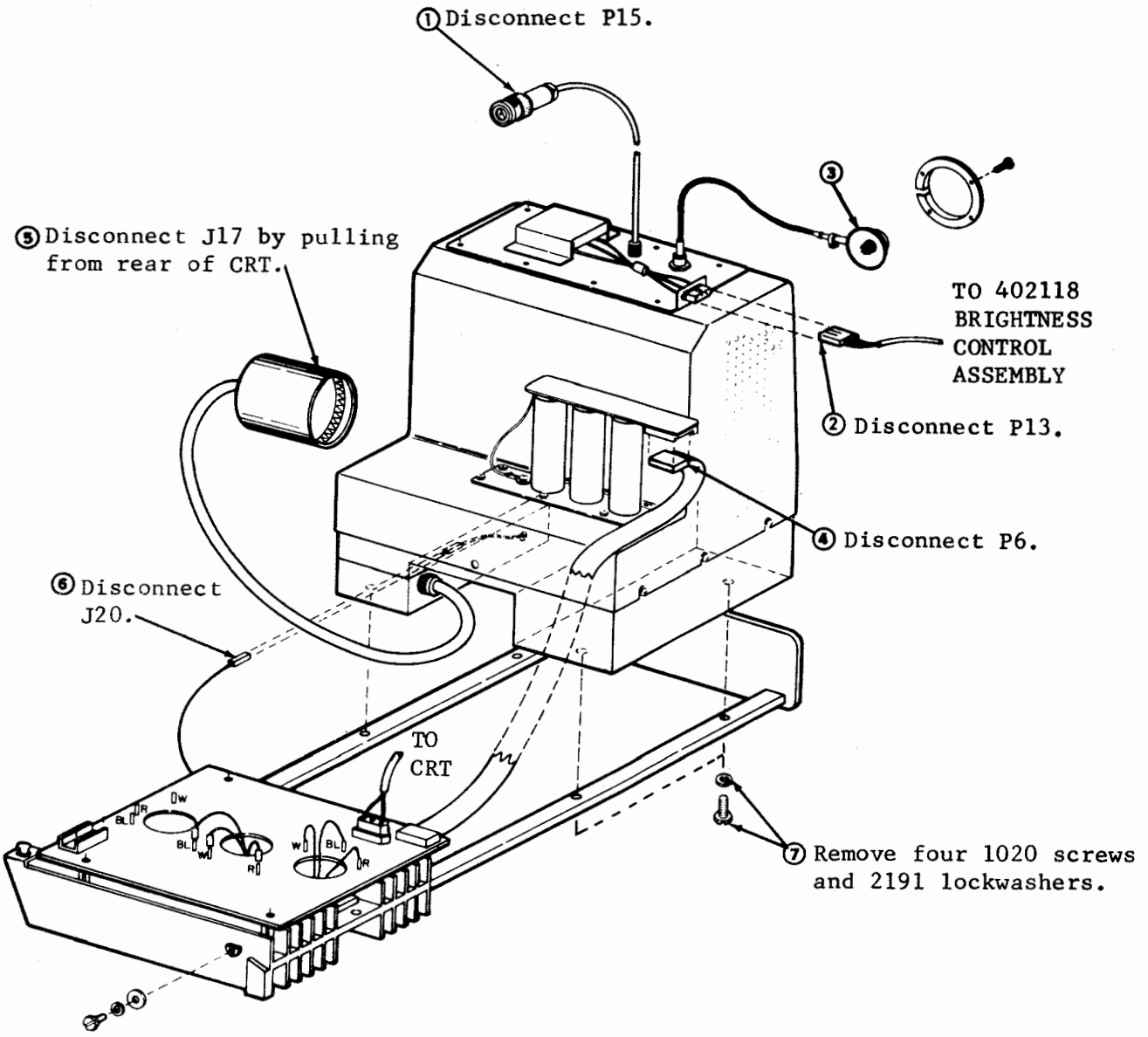
410853 Regulator Circuit Card Assembly

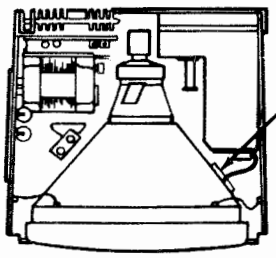


B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

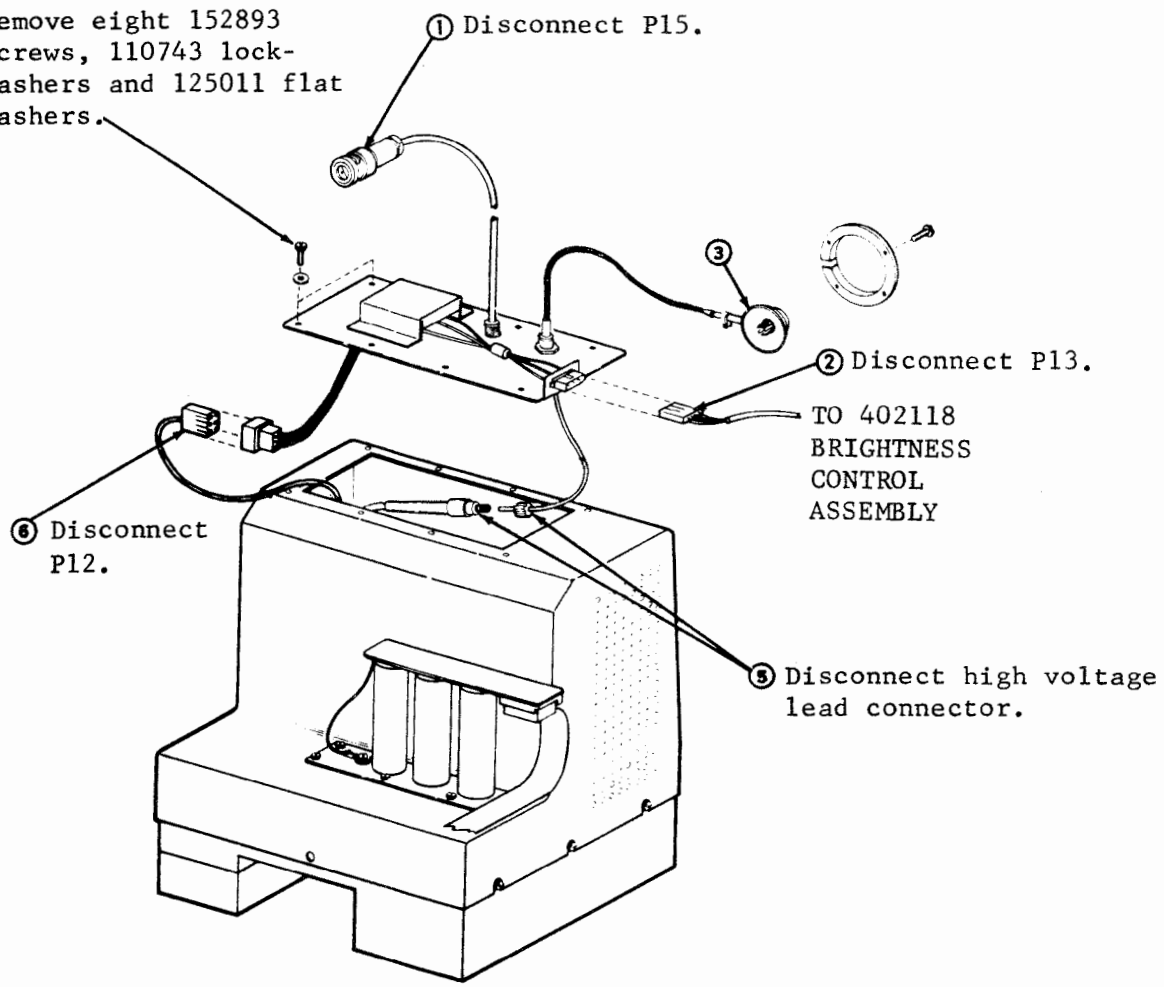
402254 High Voltage and Video Assembly

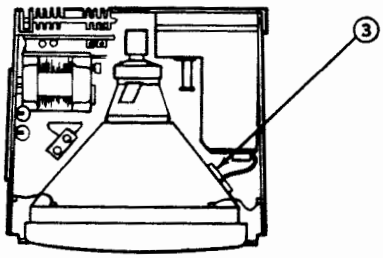




③ Disconnect high voltage lead from side of CRT by removing five 152893 screws, 110743 lockwashers and 125011 flat washers. Remove cover and pull connector from socket in CRT.

405859 High Voltage Plate Assembly





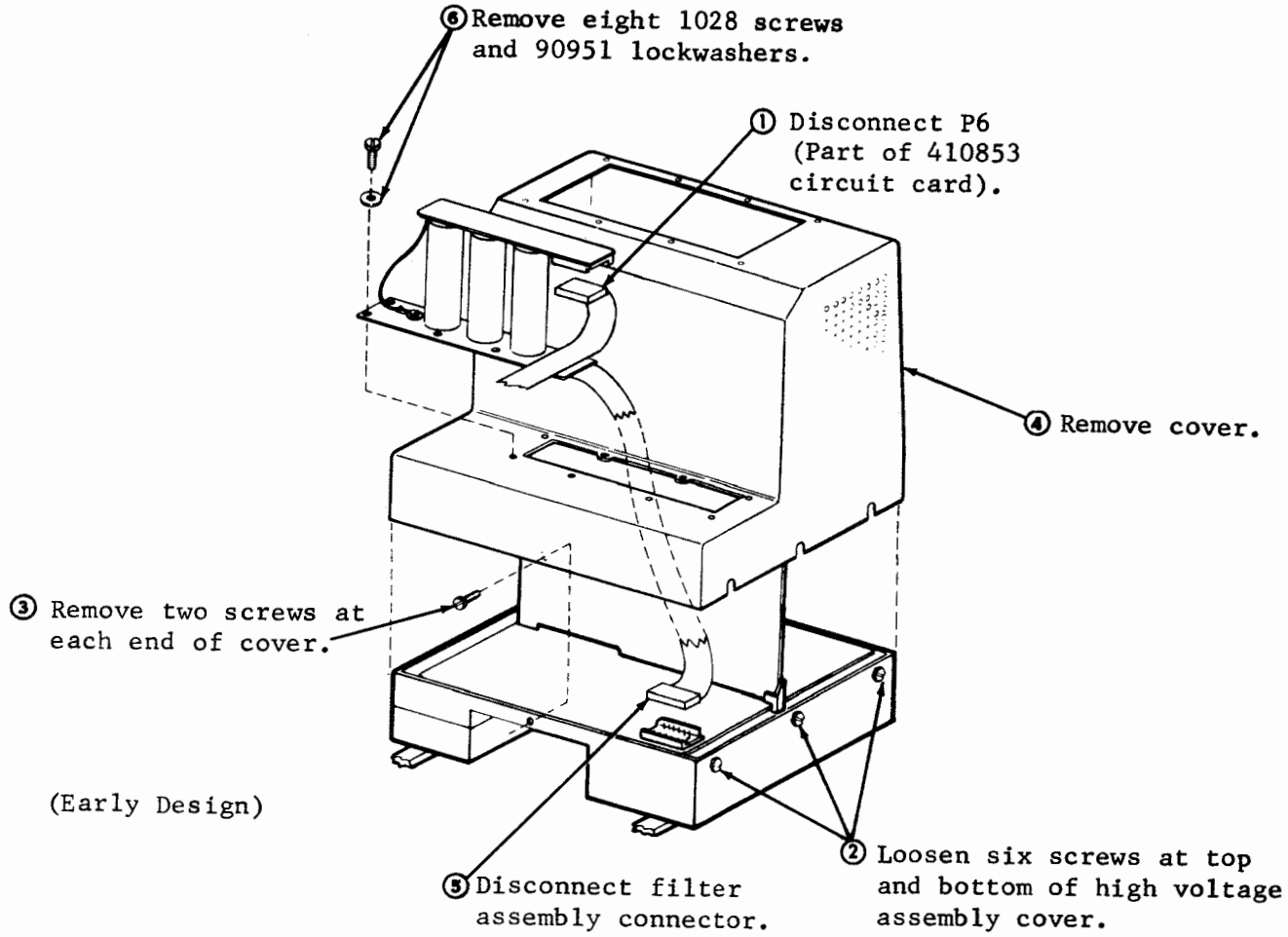
③ Disconnect high voltage lead from side of CRT by removing five 152893 screws, 110743 lockwashers and 125011 flat washers. Remove cover and pull connector from socket in CRT.

B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

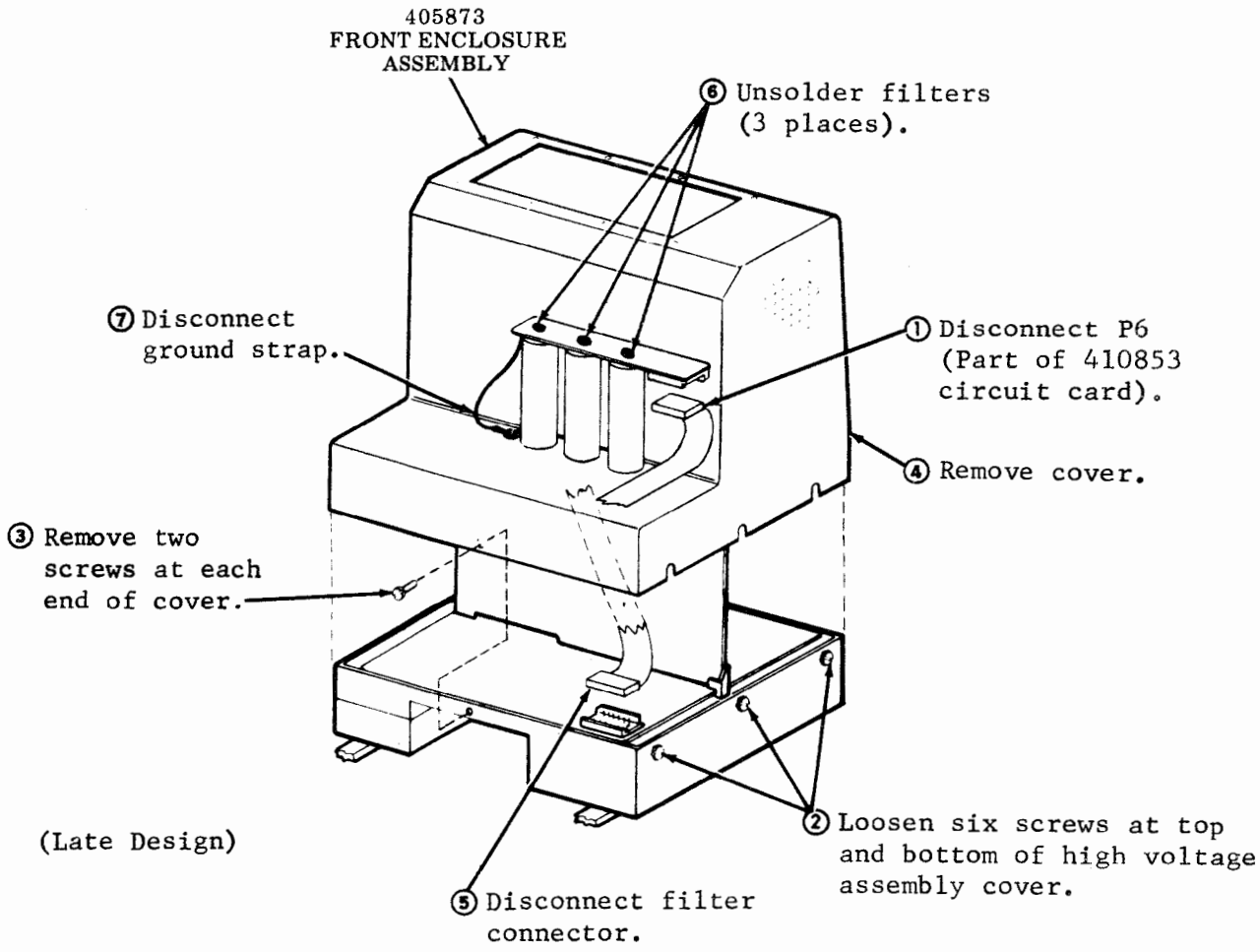
410547 Regulator Filter Assembly

- Remove 405859 high voltage plate assembly (6-9).



410100 Circuit Card Assembly

- Remove 405859 high voltage plate assembly (6-9).



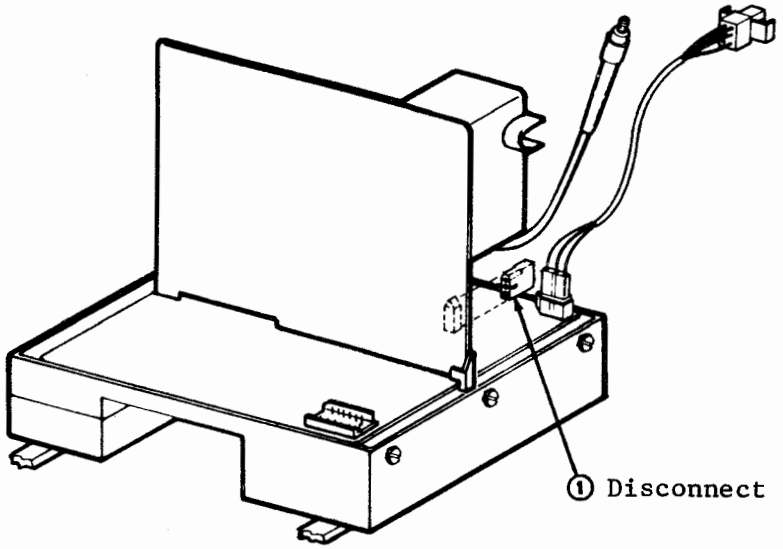
(Late Design)

B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

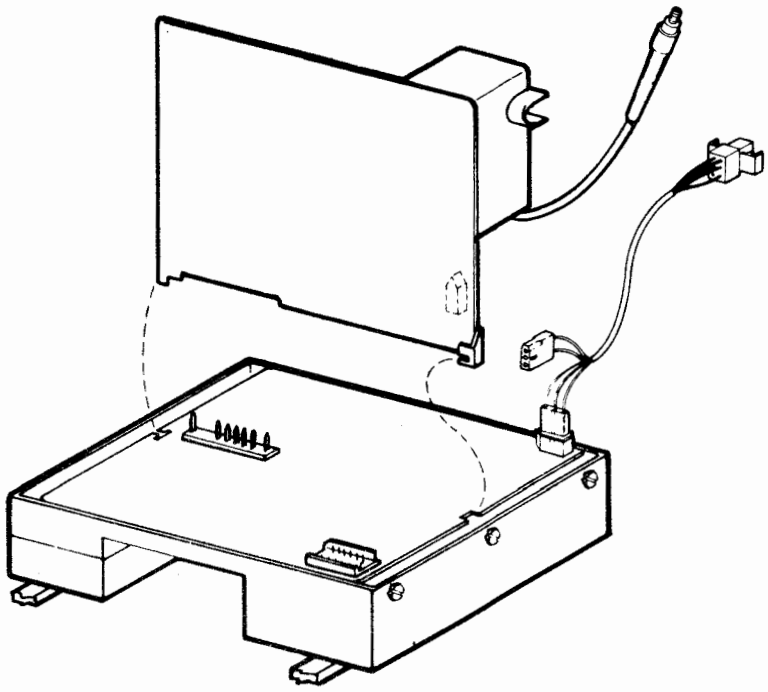
410546 High Voltage Circuit Card Assembly

- Remove 405859 high voltage plate assembly (6-9).
- Remove high voltage assembly cover (6-10 and 6-11).



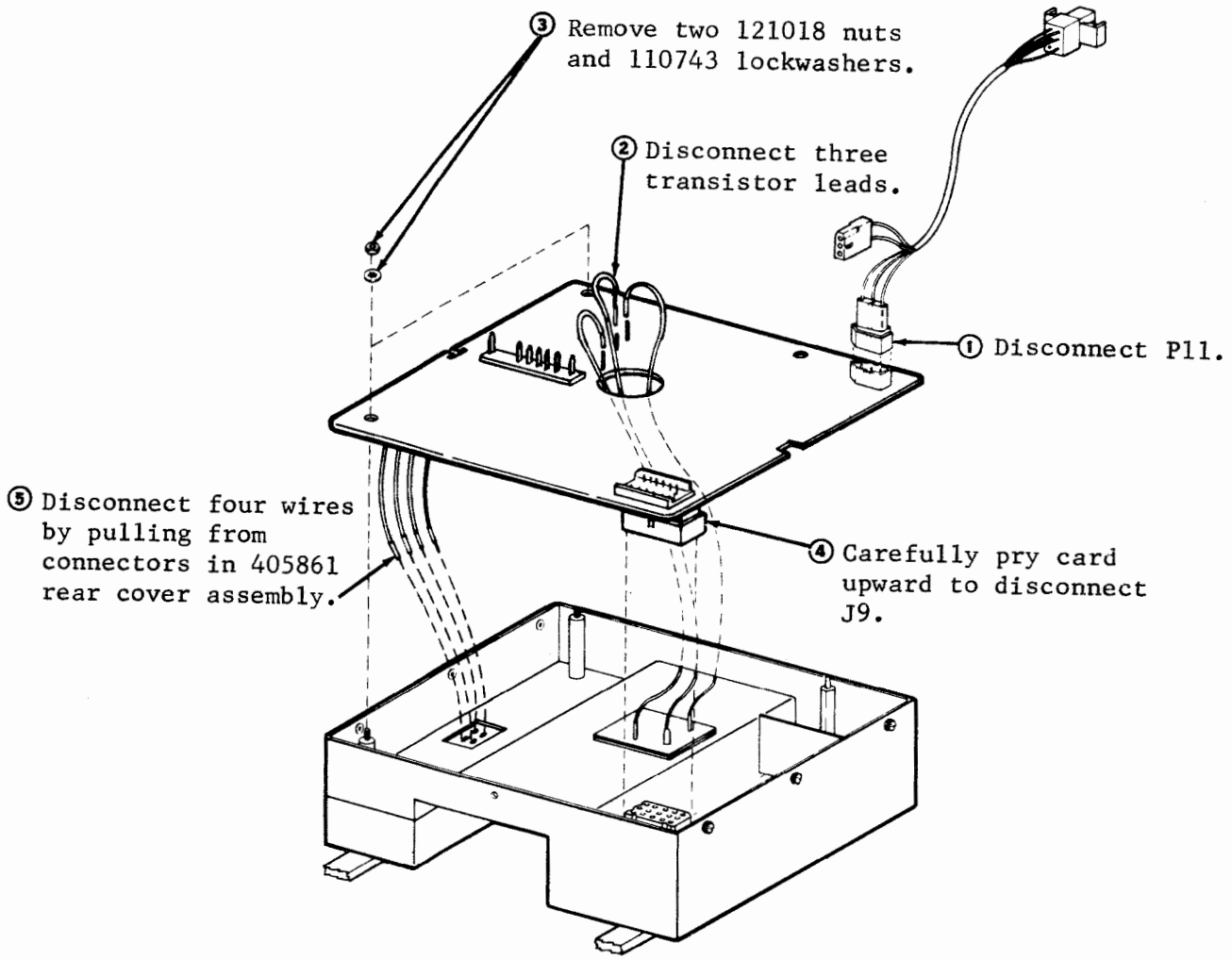
① Disconnect P10.

② Rotate and unhook 410546 circuit card.



410545 Interface/Amplifier Circuit Card Assembly

- Remove 405859 high voltage plate assembly (6-9).
- Remove high voltage assembly cover (6-10 and 6-11).
- Remove 410546 high voltage circuit card assembly (6-12).

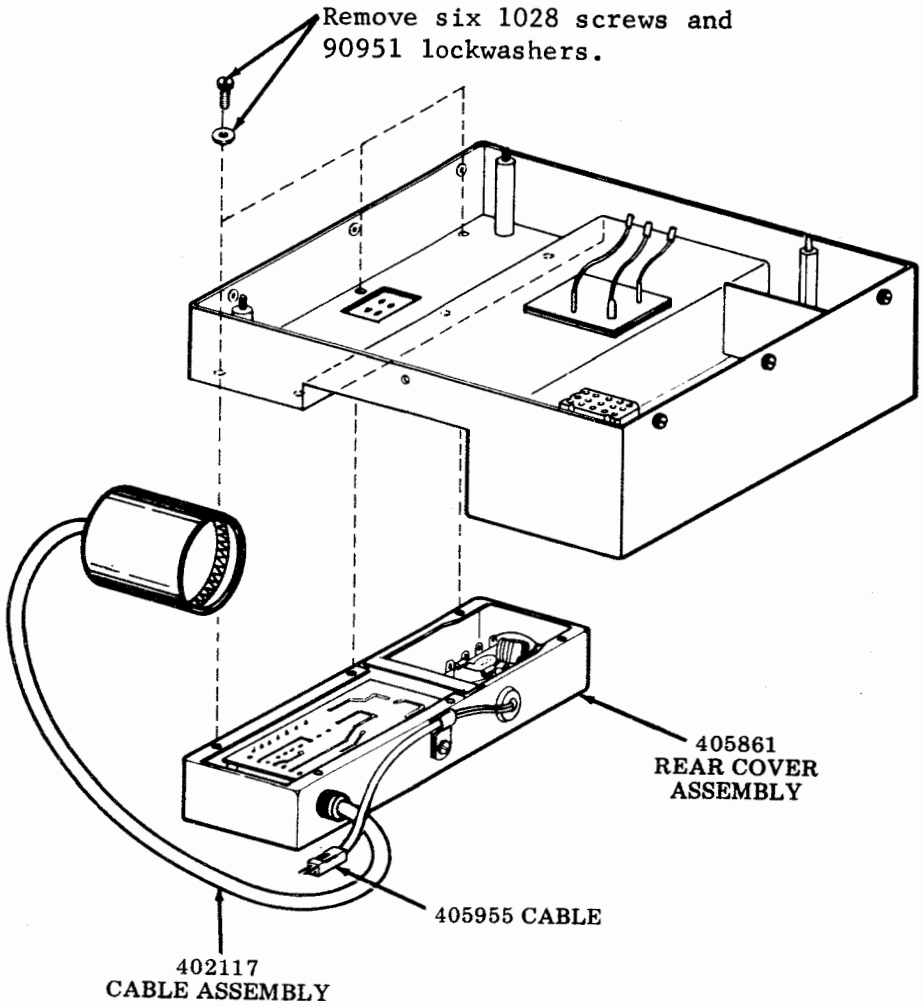


B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

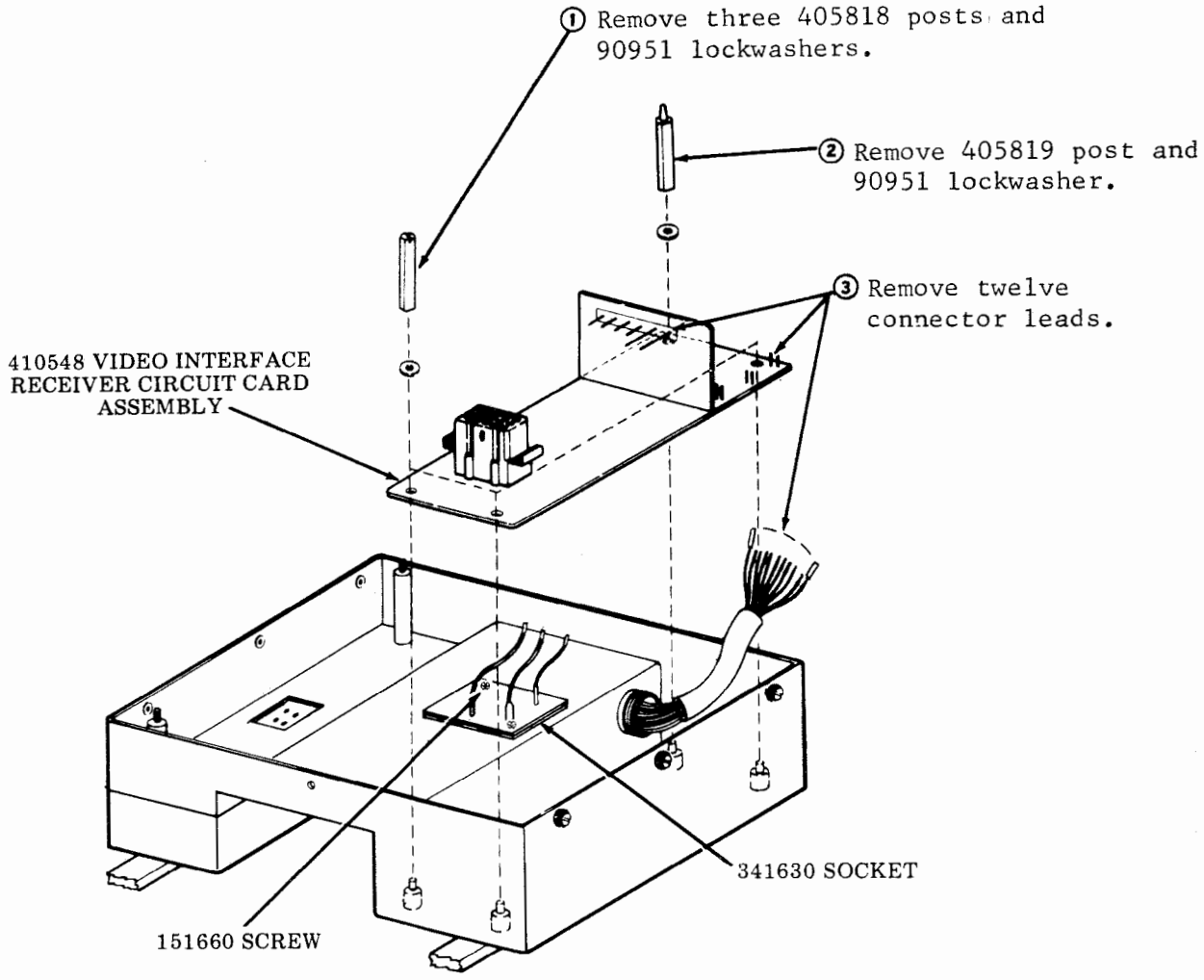
405861 Rear Cover Assembly

- Remove 402254 high voltage and video assembly (6-8) from heat sink.
- Remove 405859 high voltage plate assembly (6-9).
- Remove high voltage assembly cover (6-10 and 6-11).
- Remove 410546 high voltage circuit card assembly (6-12).
- Remove 410545 interface/amplifier circuit card assembly (6-13).



410548 Video Interface Receiver Circuit Card Assembly

- Remove 405859 high voltage plate assembly (6-9).
- Remove high voltage assembly cover (6-10 and 6-11).
- Remove 410546 high voltage circuit card assembly (6-12).
- Remove 410545 interface/amplifier circuit card assembly (6-13).

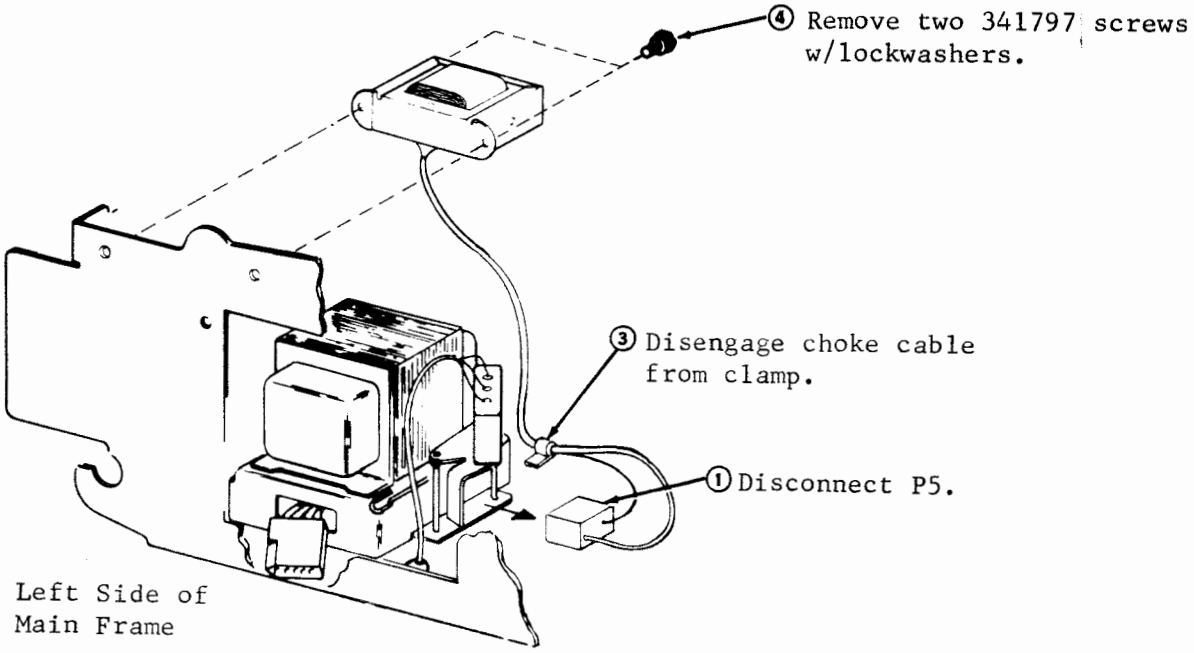


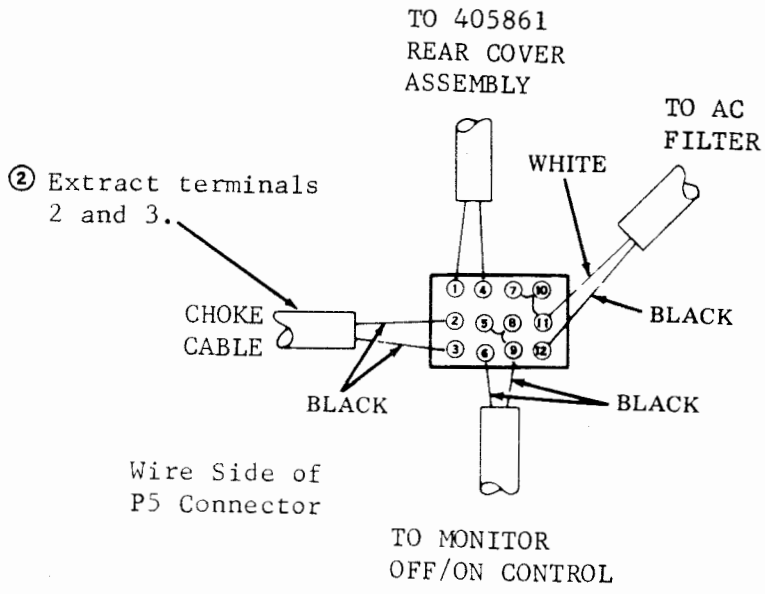
B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

402108 Choke Assembly

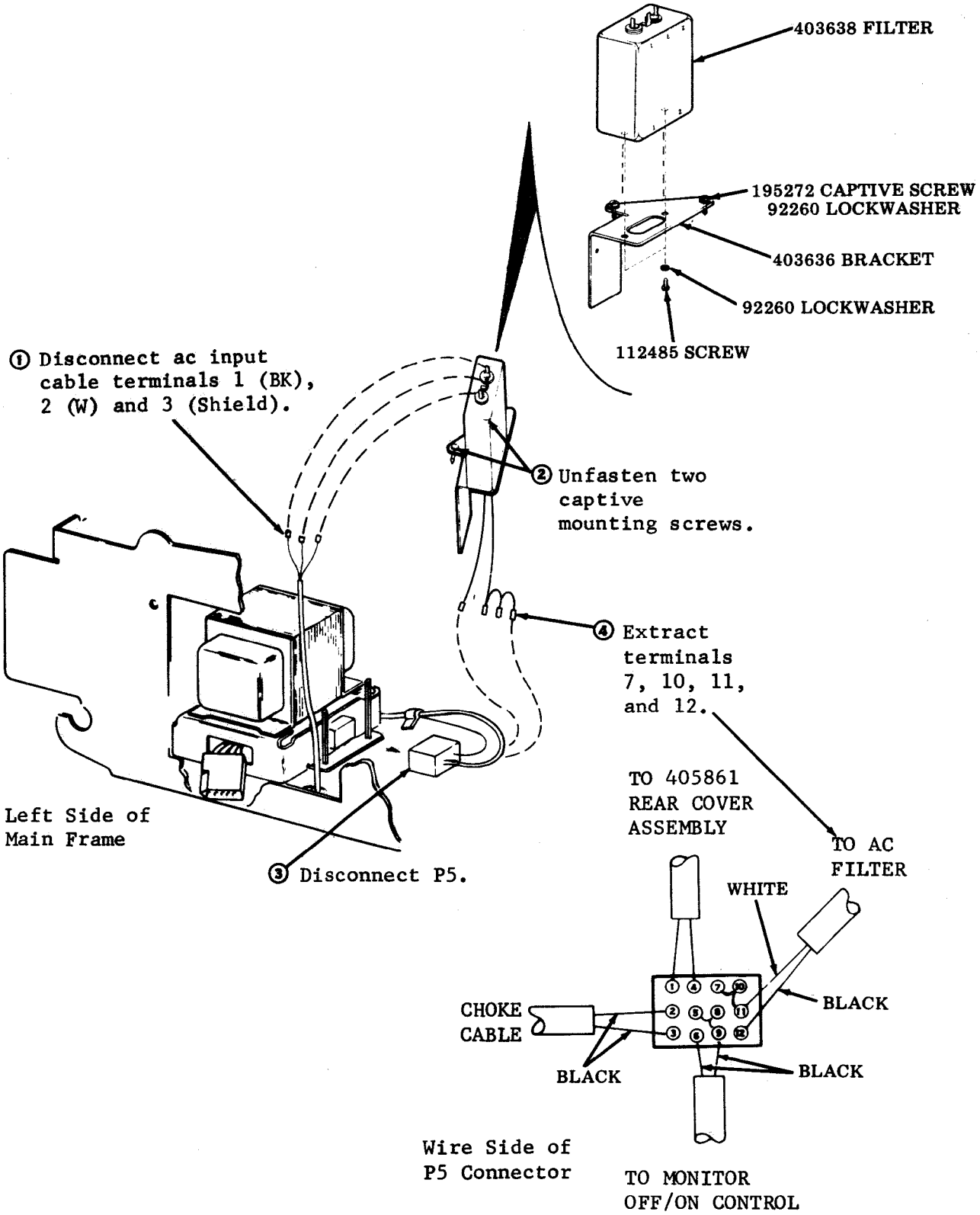
- Remove 410852 rectifier circuit card assembly (6-6).





403639 AC Filter Assembly

- Remove 410852 rectifier circuit card assembly (6-6).

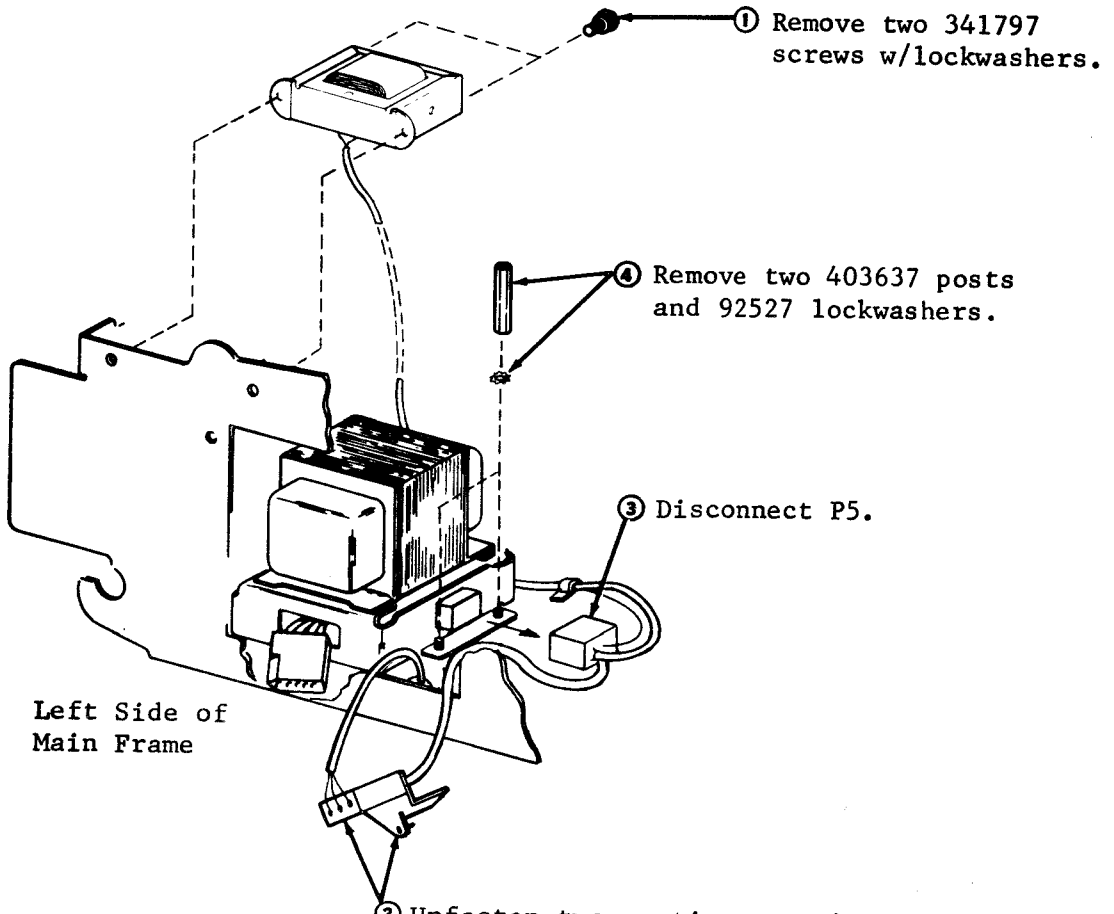


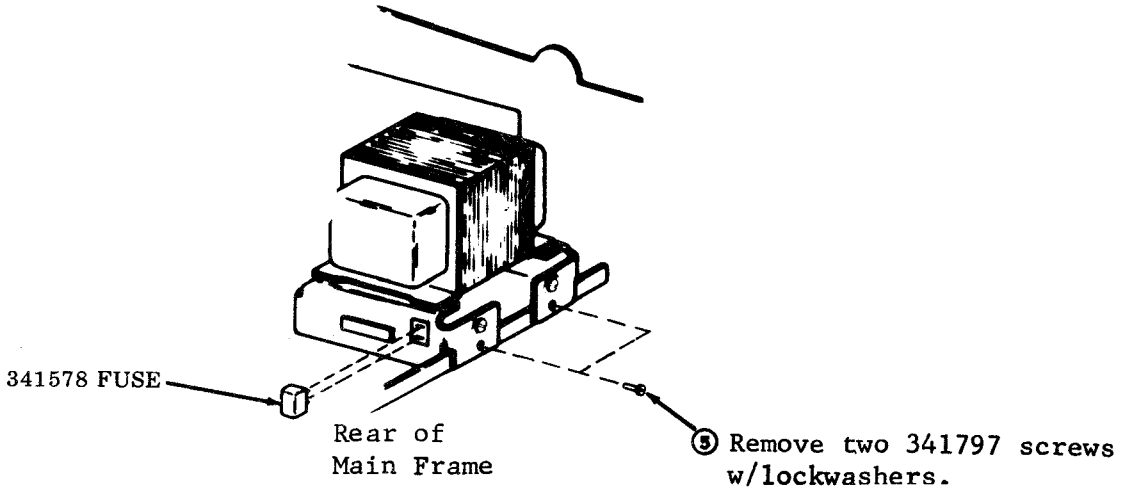
B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

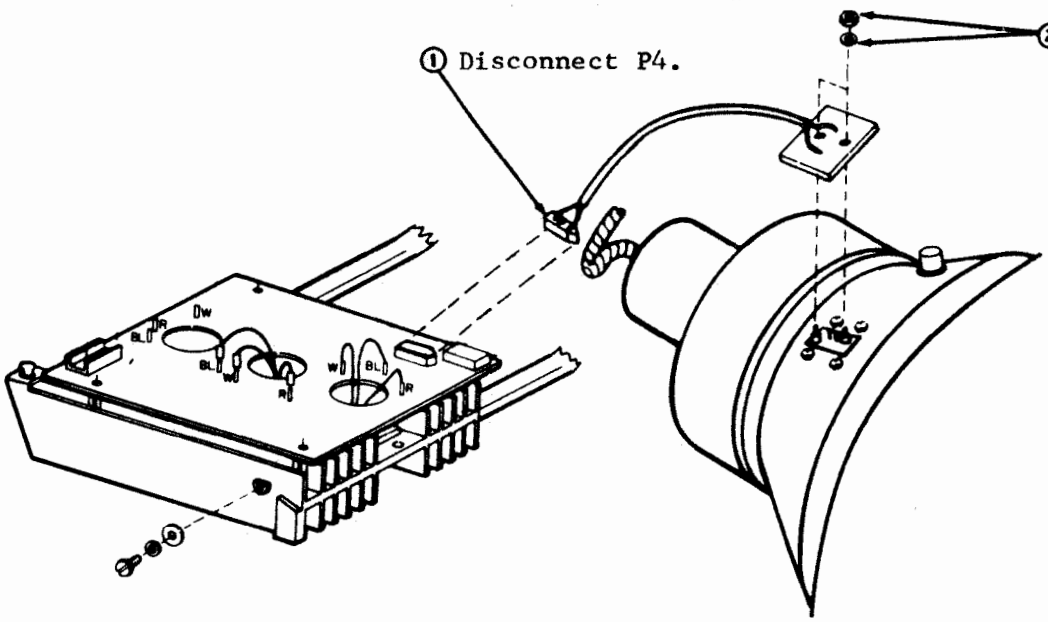
341795 (50/60 Hz) Power Distribution Assembly

- Remove 410852 rectifier circuit card assembly (6-6).

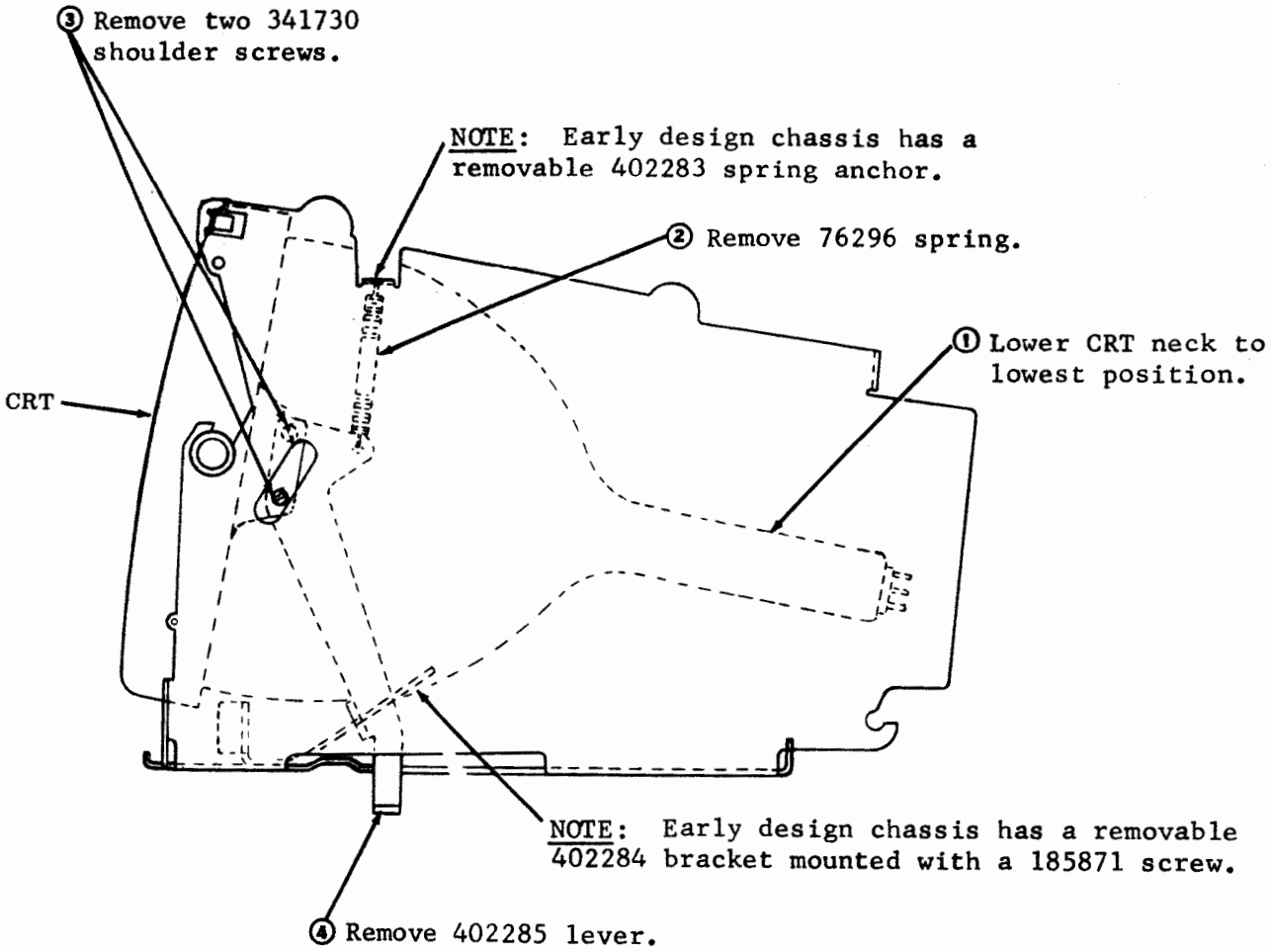




410559 Vertical Deflection Circuit Card Assembly



Tube Tilt Mechanism



B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

402110 Cathode Ray Tube
405701 Deflection Yoke Assembly

(See facing page for location of parts.)

- Remove 410852 rectifier circuit card assembly (6-6).

① Disengage captive mounting screws and move ac filter assembly aside.

② Disconnect J17.

③ Disconnect P15.

④ Disconnect high voltage lead from side of CRT by removing five 152893 screws, 110743 lockwashers and 125011 flat washers. Remove cover and pull connector from socket in CRT.

⑤ Disengage 410559 vertical deflection circuit card assembly from CRT (see 6-19).

⑥ Remove four 152893 screws, 110743 lockwashers, 125011 flat washers.

NOTE: Insert 402244 ferrite sleeve on filter marked "0". Above ferrite sleeve, solder one end of 328793 disc capacitor to portion of filter leg that is round. Other end of disc capacitor to be between shield and washer of screw as shown. Both leads of capacitor to be as short as possible.

⑦ Remove 402285 tube tilt lever (see 6-19).

⑧ Remove four 181523 springs.

⑨ Rotate rod rearward and remove by disengaging from holes in chassis.

⑩ Remove mask.

⑪ Remove top two 181243 screws w/lockwashers, 107116 lockwashers, and 3598 nuts to disengage ground straps.

⑫ Rotate neck of CRT toward vertical and lift to disengage pivot points from chassis.

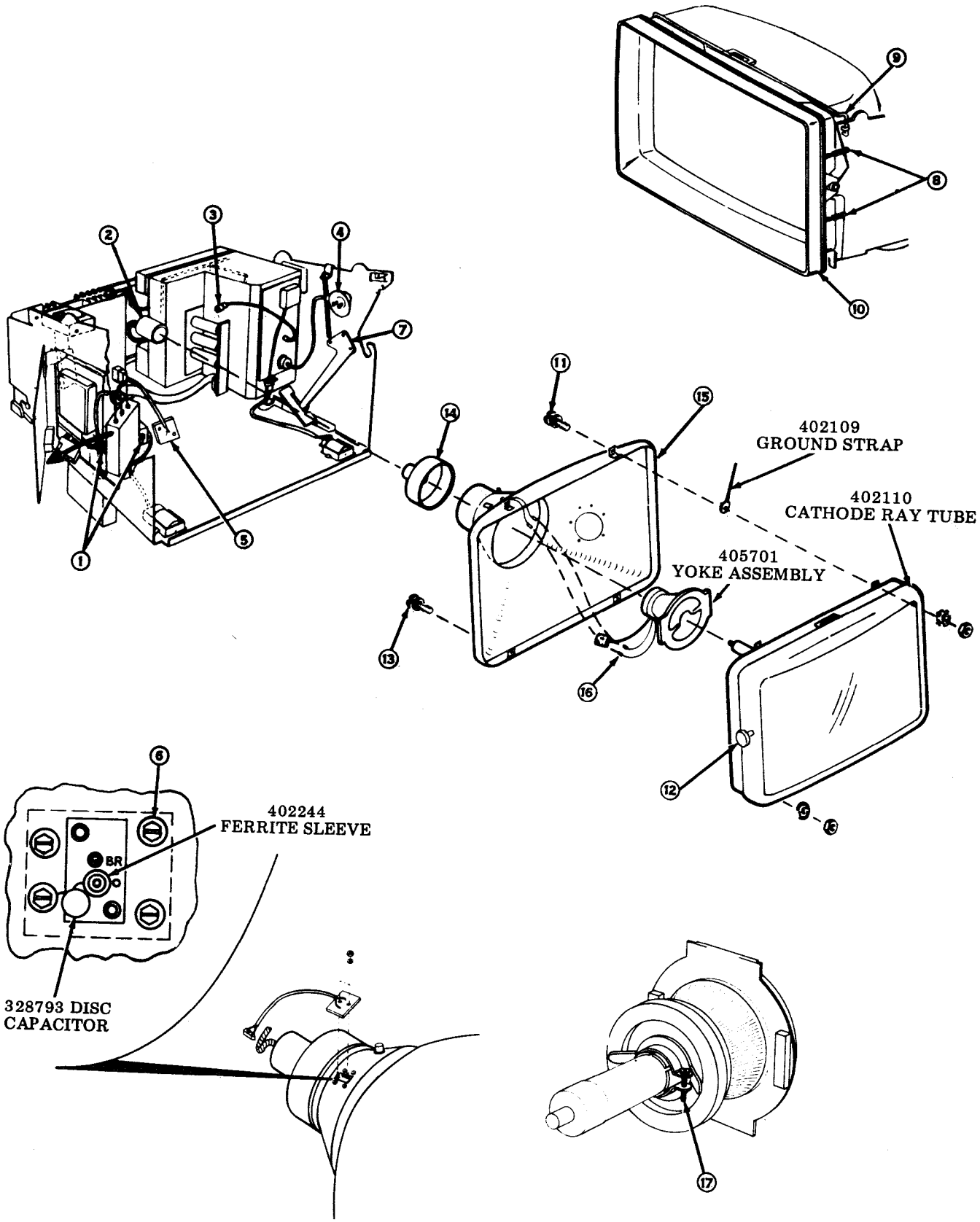
⑬ Remove bottom two 181243 screws w/lockwashers, 107116 lockwashers, and 3598 nuts.

⑭ Remove 402112 intermediate shield.

⑮ Carefully remove shield from CRT.

⑯ Disconnect two leads.

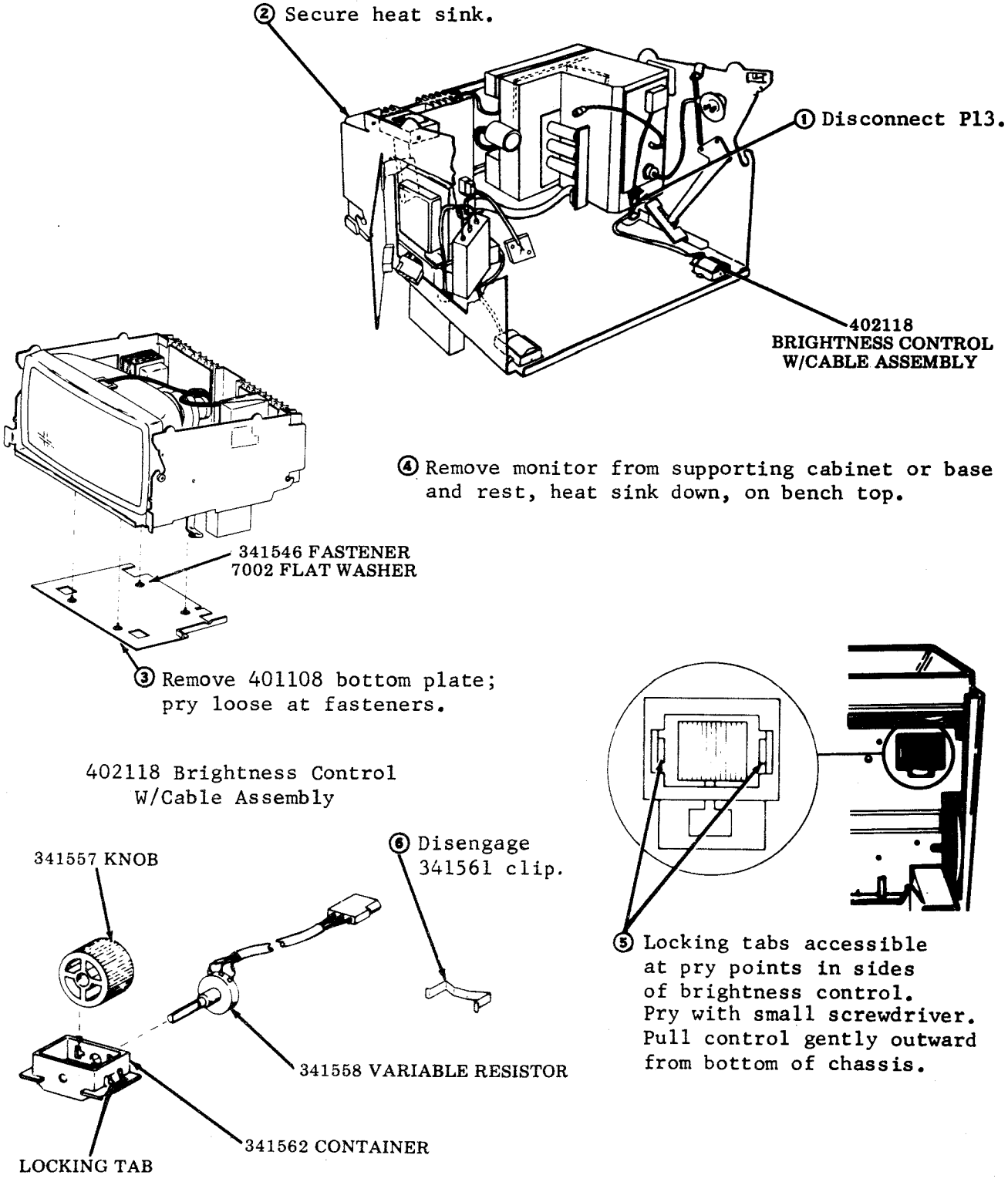
⑰ Loosen yoke clamp screw. Slide yoke rearward off CRT neck. In reassembly, do not overtighten yoke clamp screw.


402109
GROUND STRAP
402110
CATHODE RAY TUBE
405701
YOKE ASSEMBLY
402244
FERRITE SLEEVE
328793 DISC
CAPACITOR
BR

B. DISPLAY MONITOR (Cont)

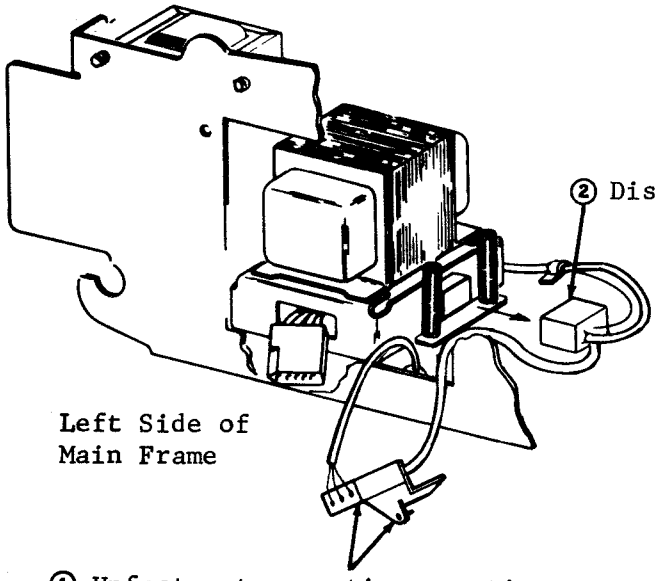
4. DISASSEMBLY/REASSEMBLY (Cont)

402118 Brightness Control W/Cable Assembly

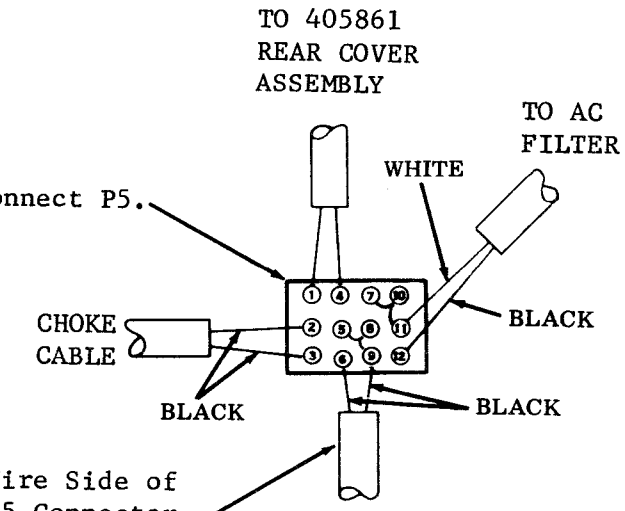


402120 Monitor Off/On Control Assembly

•Remove 410852 rectifier circuit card assembly (6-6).



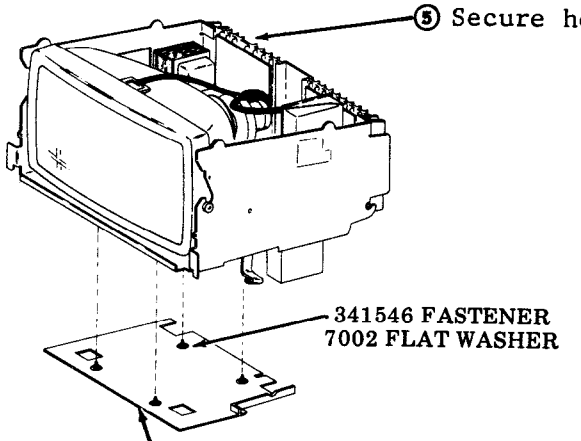
② Disconnect P5.



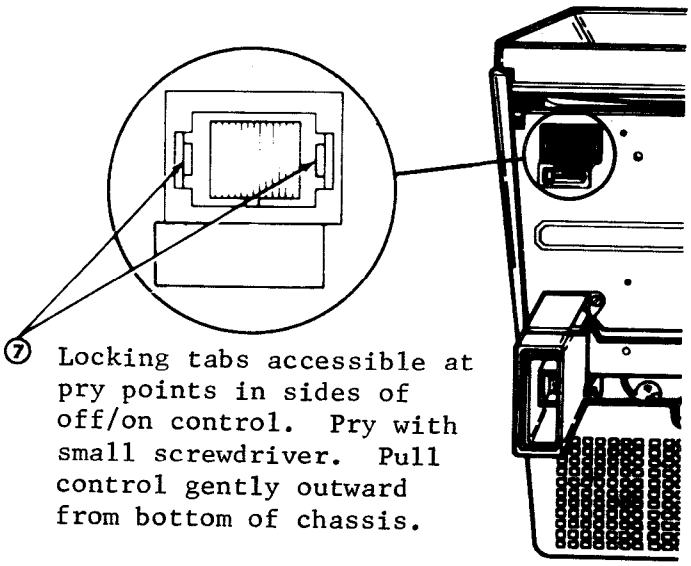
① Unfasten two captive mounting screws to move ac filter aside (see 6-17).

③ Extract terminals 5, 6, 8, and 9.

⑤ Secure heat sink.

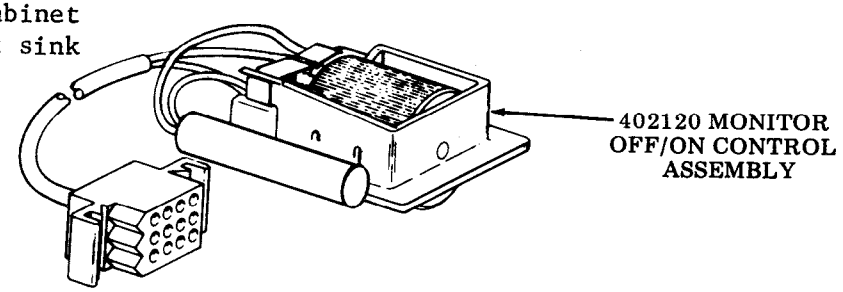


④ Remove 401108 bottom plate; pry loose at fasteners.



⑦ Locking tabs accessible at pry points in sides of off/on control. Pry with small screwdriver. Pull control gently outward from bottom of chassis.

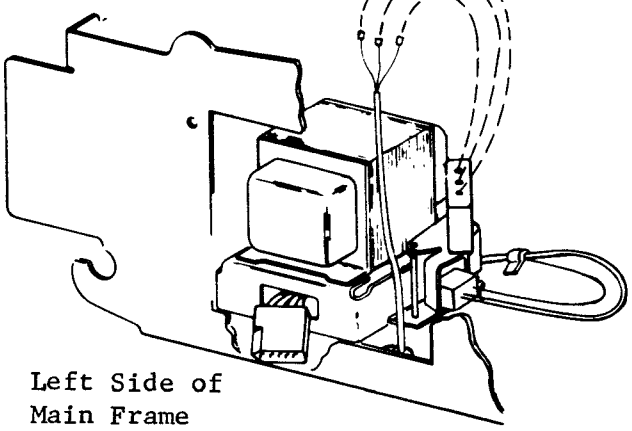
⑥ Remove monitor from cabinet or base and rest, heat sink down, on bench top.

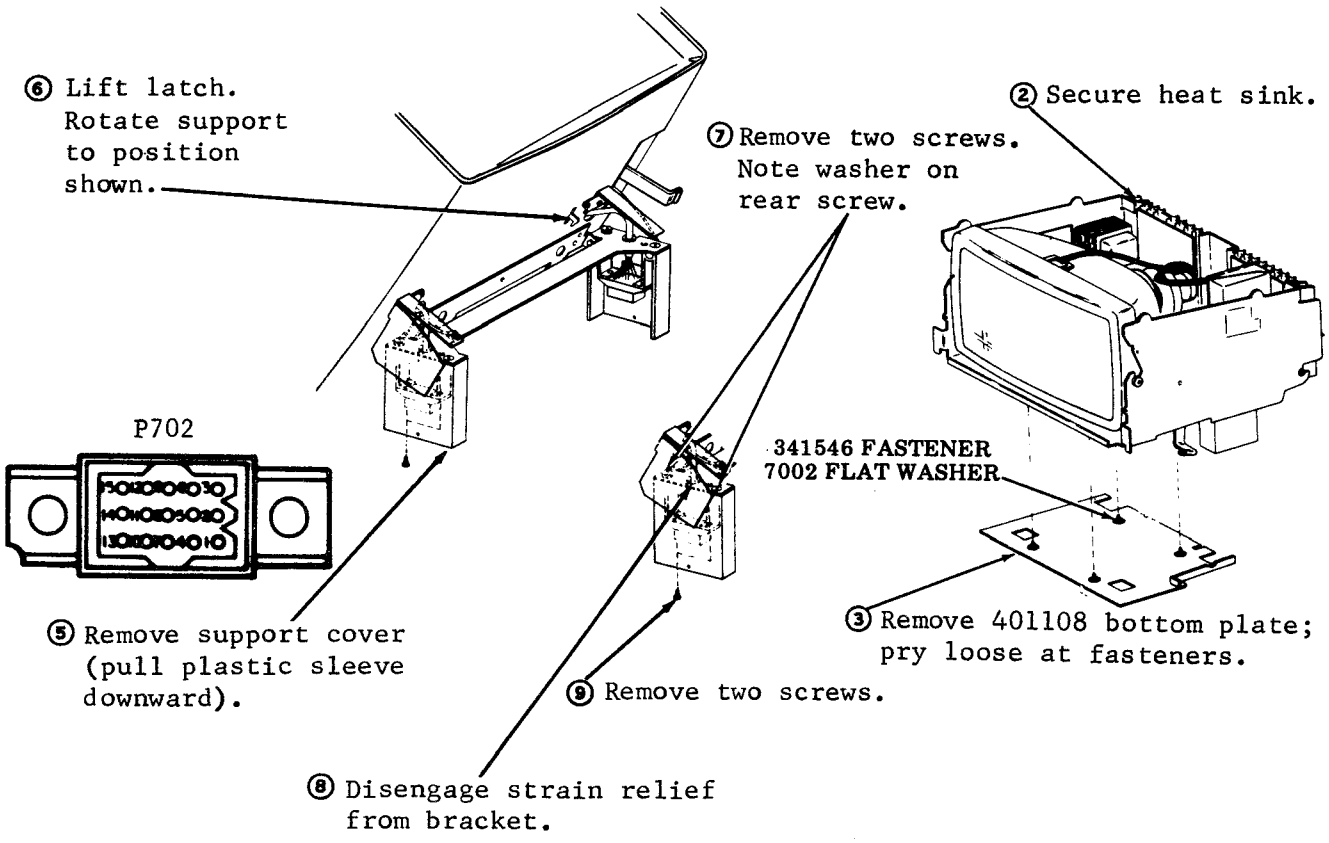


B. DISPLAY MONITOR (Cont)

4. DISASSEMBLY/REASSEMBLY (Cont)

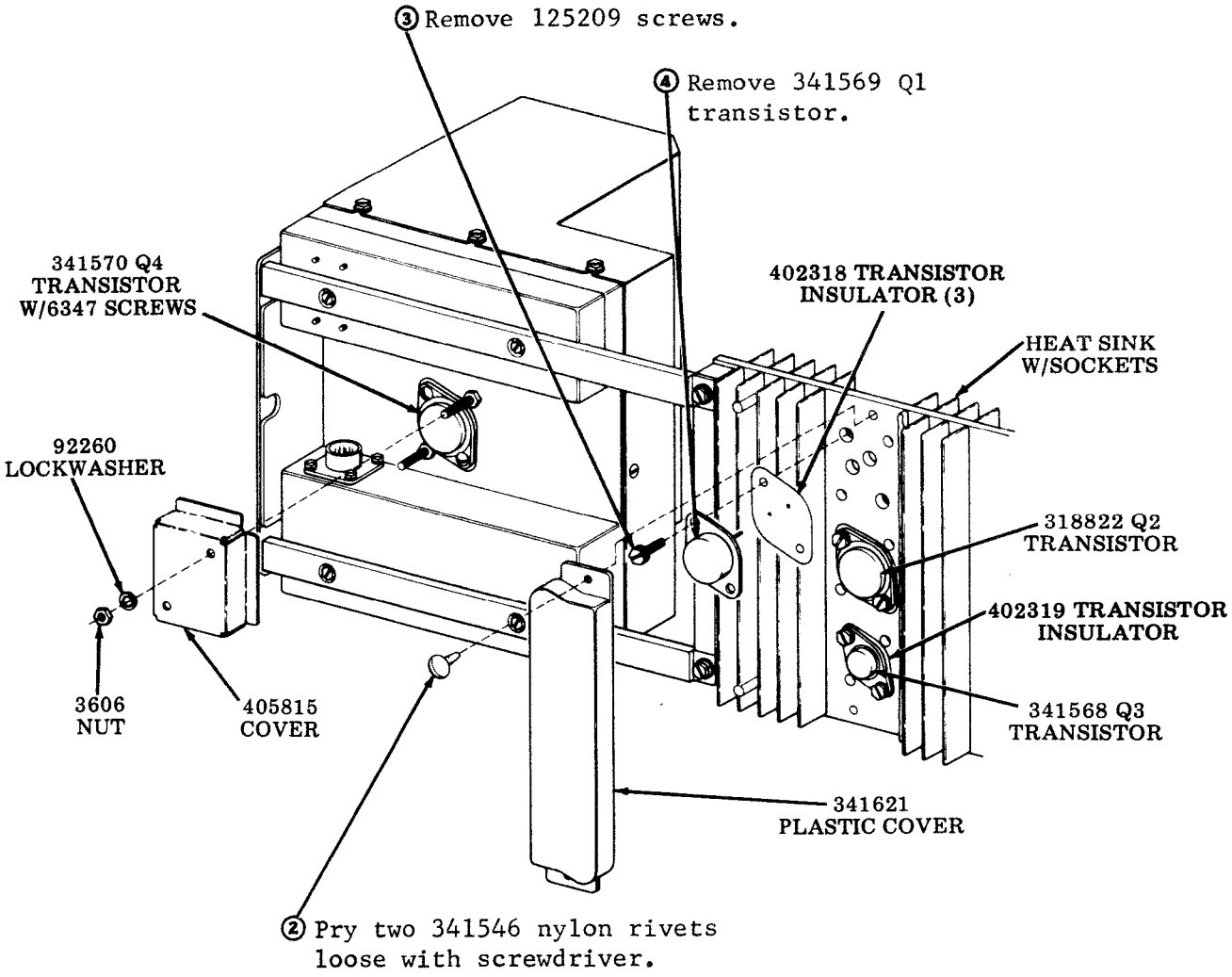
405703 AC Cable Assembly





Heat Sink Transistors

① Secure heat sink in upright position.



NOTE: The 402318 and 402319 transistor insulators require heat conducting paste (both sides).

C. OPCONS

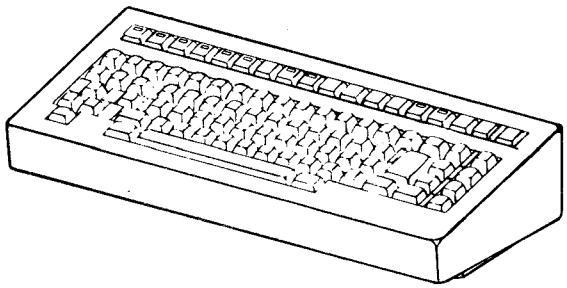
1. GENERAL

Precautions should be taken to assure that the opcon is disassembled and reassembled under clean conditions. No oil, grease, or other liquids should be present on loose parts, subassemblies, keyswitches, or the complete opcon.

Reference in the procedures to left or right, up or down, and top or bottom, etc, refer to the opcon in its normal operating position.

When removing a subassembly or part from the opcon, do not force or pry parts to provide the necessary clearance for removal. No forcing is required to accomplish a removal procedure. Follow the removal procedure and note how each part is removed and the sequence of its removal so that proper reassembly can be accomplished.

40K103/RCE KD, KDP
AND KDPM^2 Opcons



2. REMOVAL

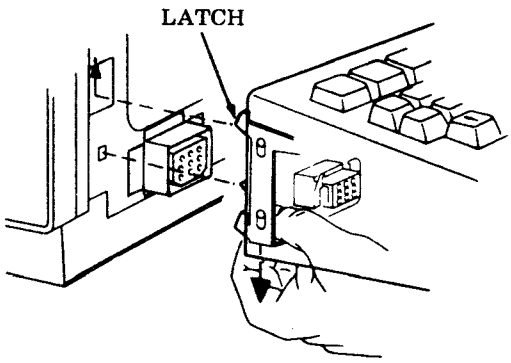
The following procedures apply to all opcons.

To remove opcon from set or station:

① Place thumb on left inward tab of opcon and press downward to unlatched position.

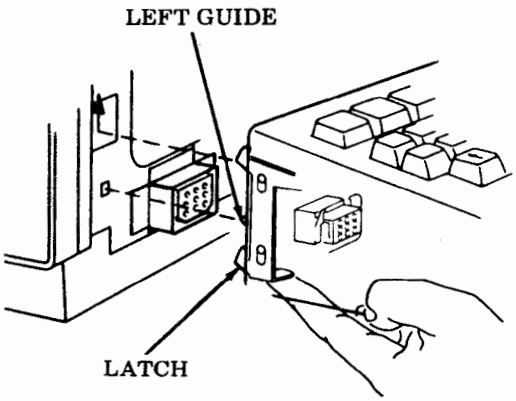
② Hold opcon firmly with left hand, and with right hand place thumb on right inward tab and press downward to unlatched position.

③ Pull opcon forward to disengage from cabinet.



3. REPLACEMENT

The following procedures apply to all opcons.



To install opcon on set or station:

① Slide left and right latches down.

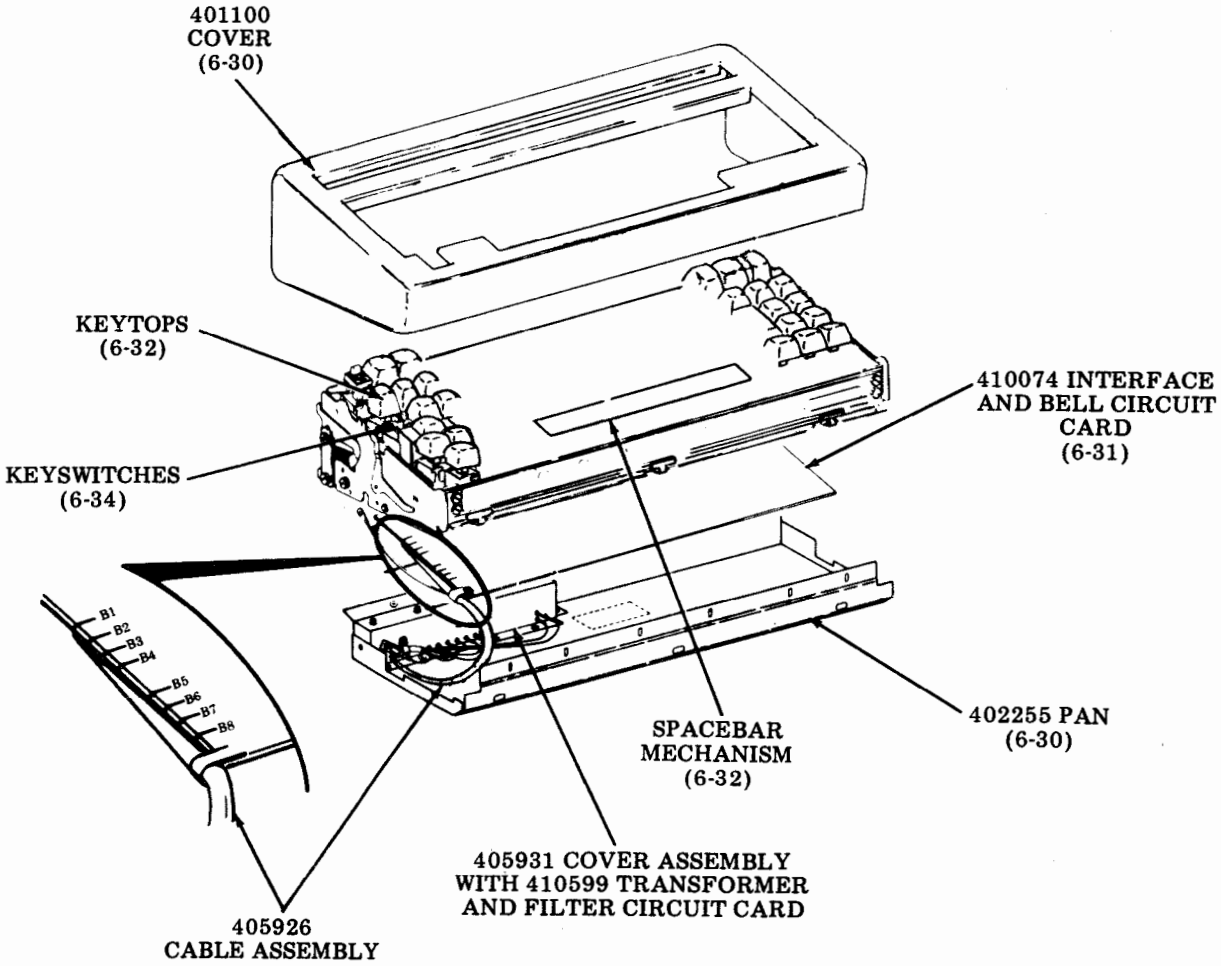
② Engage connector and left and right guides into slots.

③ Slide left and right latches upward into latched position.

CAUTION: CHECK THAT OPCON IS FIRMLY ATTACHED ON BOTH SIDES BEFORE RELEASING HOLD.

4. SUBASSEMBLY IDENTIFICATION -- KD, KDP AND KDPM[2]

NOTE: The number indicated in parentheses after each assembly designates the page covering the disassembly/reassembly procedures.



C. OPCONS (Cont)

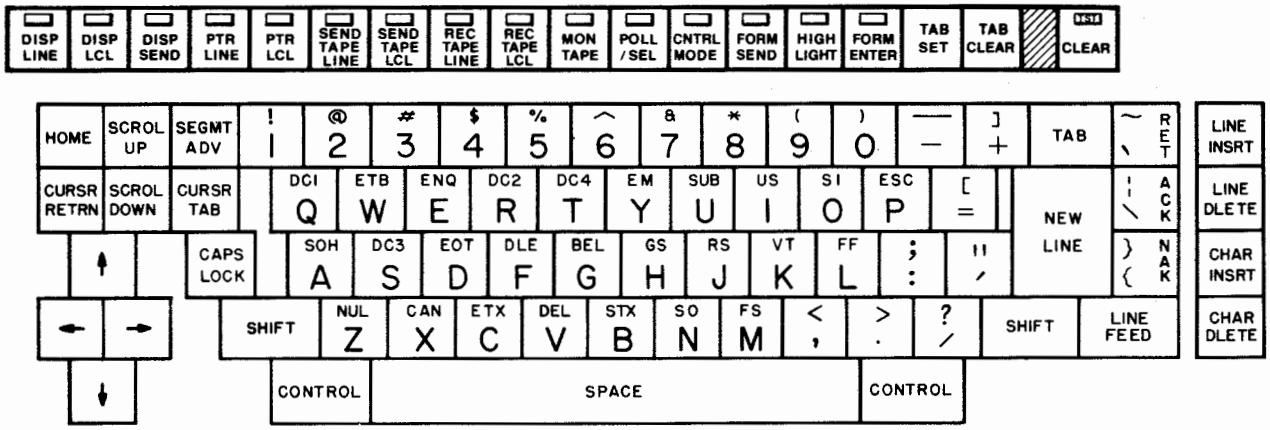
5. CONVERSIONS -- KP, KD AND KDP

Conversions from one 40K103 opcon keyboard arrangement to another is accomplished in the following ways:

a. Disabling certain mode selections by substituting blank blocking keytops for keytops having descriptive designations.
b. Enabling certain mode selections by substituting keytops with descriptive designations for blank blocking keytops.

Keyboard arrangements are directly related to the various Tempest Model 40 Set arrangements relative to selectable controller and/or printer options. The variable keytops involved are shown and described.

Keyboard Arrangement 40K103/RCE



Key repeats when held fully depressed. 340701 blocking keytop.

All 40K103 opcons have the same typewriter field, cursor controls and editing features keytop arrangement.

Control Keytop

a. Indicator
b. Non-Indicator

Data Keytop

Blocking Keytops

a. Control b. Data c. Wide Cursor Tab

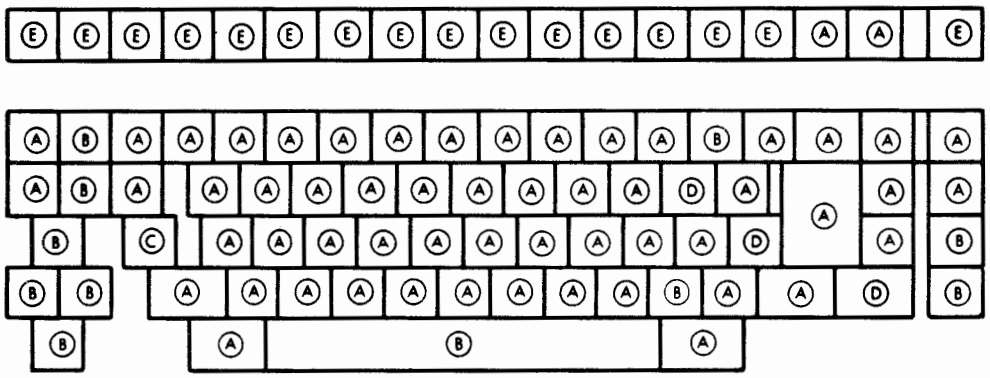
6. KEYTOP AND KEYSWITCH IDENTIFICATION -- KD, KDP and KDPM[2]

Keytop Identification

TP PART NO.	KEYTOP DESCR	TP PART NO.	KEYTOP DESCR	TP PART NO.	KEYTOP DESCR
340701	BLOCKING(Control)	340859	VT K	346101	REC
340714	BLOCKING (Data)	340860	FF L	346102	LOCAL
*340767	NEW LINE	340861	: ;	346103	S/R
340818	HOME	340862	" /	346104	PRINT ON LINE
340819	SCROL UP	340863	LINE DLETE	346105	PRINT LOCAL
340821	' 1	340865	←	346106	INTRPT
340822	@ 2	340866	→	346107	HIGH LIGHT
340823	# 3	340867	SHIFT	346108	FORM ENTER
340824	$ 4	340868	NUL Z	346110	TAB SET
340825	% 5	340869	CAN X	346111	TAB CLEAR
340826	^ 6	340870	ETX C	346121	FORM SEND
340827	& 7	340871	DEL V	346123	MSG WTG
340828	* 8	340872	STX B	346124	OPT II
340829	(9	340873	SO N	346126	PARITY ERROR
340830	) 0	340874	FS M	346127	TERM READY
340831	_ -	340875	< ,	346158	CLEAR TO SEND
340835	CURSR RETRN	340876	> .	346159	KBD OVRN
340836	SCROL DOWN	340877	? /	346170	DISP LINE
340837	CURSR TAB	340879	↓	346171	DISP LCL
340838	DC1 Q	340880	CONTROL	346172	DISP SEND
340839	ETB W	340881	CHAR INSRT	346173	PTR LINE
340840	ENQ E	340882	CHAR DLETE	346174	PTR LCL
340841	DC2 R	340887	SUB U	346175	SEND TAPE LINE
340842	DC4 T	340888	TAB	346176	SEND TAPE LCL
340843	EM Y	340889	] +	346177	REC TAPE LINE
340845	US I	340890	[=	346178	REC TAPE LCL
340846	SI O	340891	RETURN	346179	MON TAPE
340847	ESC P	340892	} NAK {	346180	POLL/SEL
340849	LINE INSRT	340893	| ACK \	346181	CNTRL MODE
340850	↑	340894	CAPS LOCK	346259	BLOCKING (Wide Cursor Tab)
340852	SOH A	340895	SEGMT ADV		~ ` ¤
340853	DC3 S	340896	~ SYN `	346449	; :
340854	EOT D	340897	DLE F	346450	CLEAR
340856	BEL G	340898	CURSOR TAB (Wide)	405933	BLANK W/TST
340857	GS H	340986	LINE FEED	405935	INDICATOR
340858	RS J	346100	SEND		

*The 340764 compression spring between the 340767 keytop and the housing must be ordered separately.

Keyswitch Identification

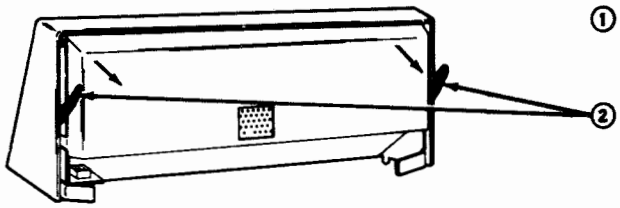


KEYSWITCH NO.	TYPES	PUSH ROD COLOR
Ⓐ 340720	Basic	White
Ⓑ 340721	Repeat	Green
Ⓒ 340722	Latching	Black
Ⓓ 341097	Combination	Yellow
Ⓔ 405925	Indicator	Black

C. OPCONS (Cont)

7. DISASSEMBLY/REASSEMBLY -- KD, KDP AND KDPM^2

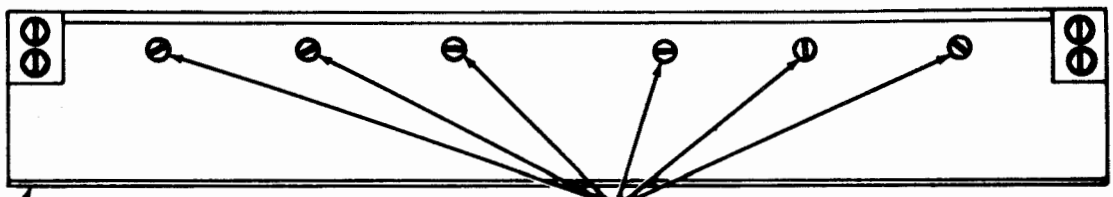
401100 Cover



① Stand opcon upright on back side as shown.

② Use a thin bladed screwdriver or orange stick and pry left and right levers down. Remove cover.

402255 Pan

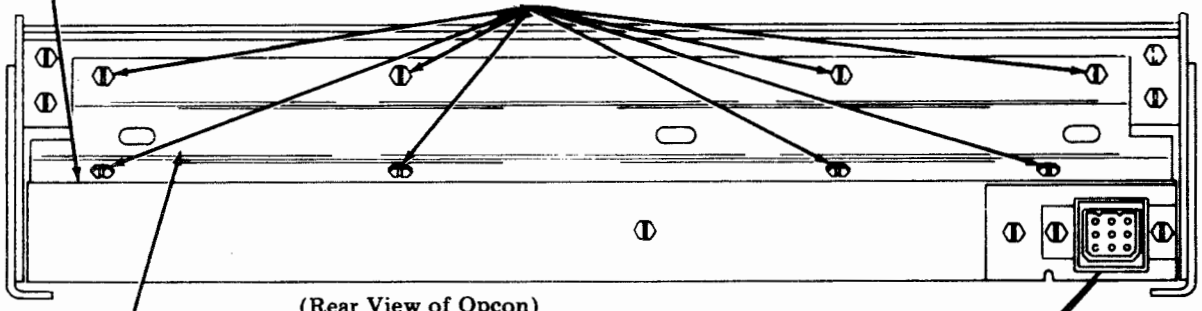


(Front View of Opcon)

① Remove six 152893 screws, 110743 lockwashers and 125011 flat washers.

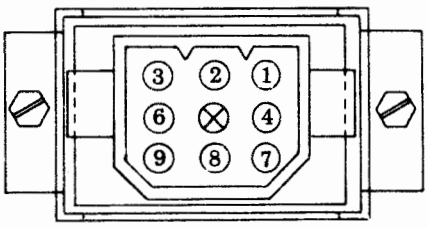
402255 PAN

② Remove eight 152893 screws, 110743 lockwashers and 125011 flat washers.

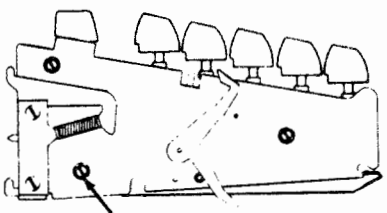


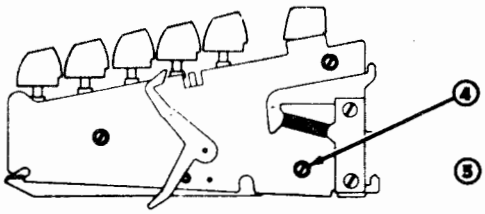
(Rear View of Opcon)

③ Remove plate.



SSI Connector Orientation





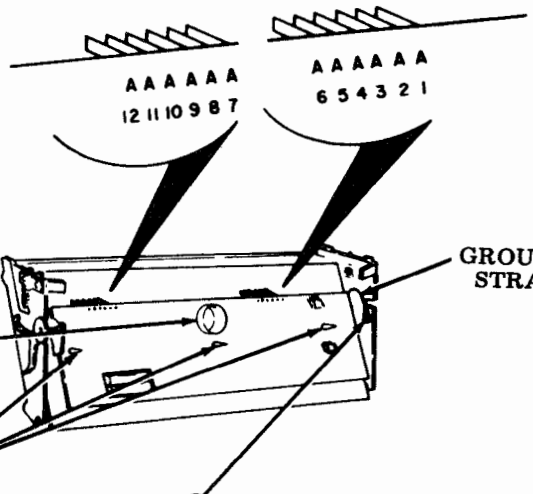
④ Remove two 184056 screws; one from each side of frame.

⑤ Remove pan.

410074 Interface and Bell Circuit Card

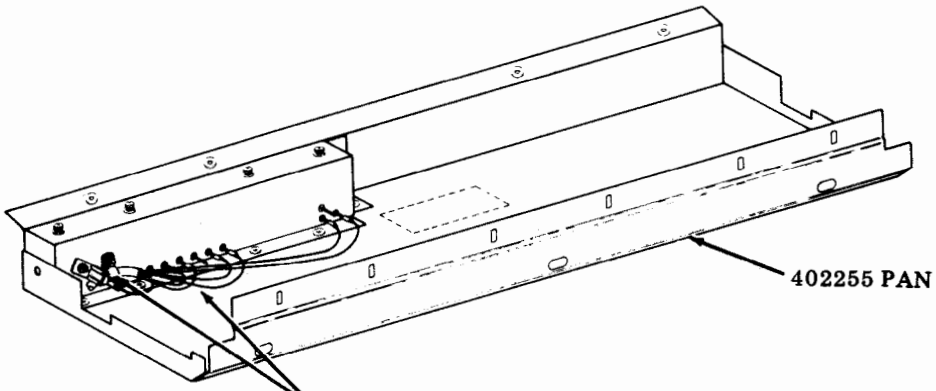
CAUTION 1: DURING REASSEMBLY, CAREFULLY SEAT PINS OF CIRCUIT CARD INTO RECEPTACLES BEFORE APPLYING PRESSURE.

CAUTION 2: DURING DISASSEMBLY AND REASSEMBLY, AVOID HANDLING OF CRYSTAL IN TUNED HOLDER, AS DAMAGE MAY OCCUR.



② Using long nose pliers, compress three locking tabs on plastic standoffs one at a time while applying upward pressure to circuit card.

① Remove 151722 screw and 107116 lockwasher securing ground strap to left side frame.



③ Remove push on terminals of 405926 cable assembly.

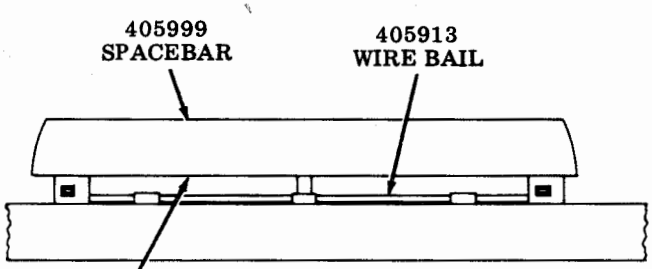
④ Remove circuit card.

C. OPCONS (Cont)

7. DISASSEMBLY/REASSEMBLY -- KD, KDP AND KDPM^2 (Cont)

Spacebar Mechanism

- Remove 401100 cover (6-30).
- Remove both control keytops (6-32).



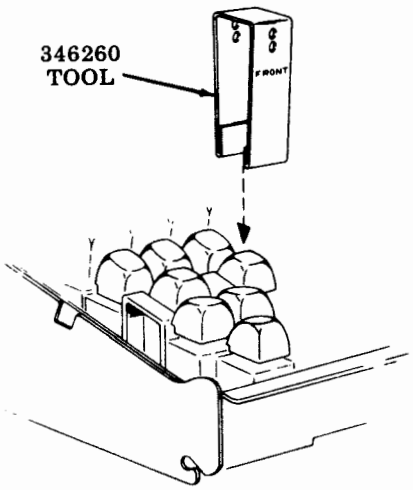
① Disengage 405913 wire bail from two snap clips formed out of top shield using a small screwdriver. Push bail to rear.

② With wire bail removed, push spacebar to right and upward to release spacebar from guides keyswitch assembly.

Keytops

To remove data keytops:

Place 346260 tool over the keytop and pull up to remove.

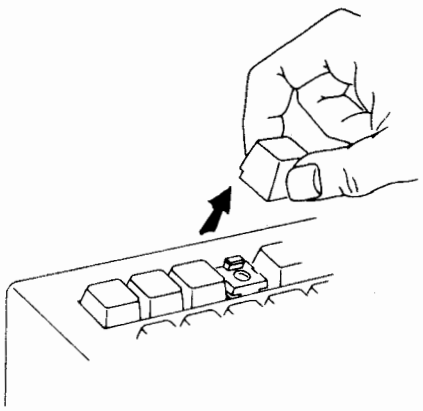


CAUTION 1: THE CAPS LOCK KEYTOP MUST BE IN THE FULLY EXTENDED, UNLATCHED POSITION BEFORE ATTEMPTING TO REMOVE THE KEYTOP. FAILURE TO OBSERVE THIS PRECAUTION WILL RESULT IN A DAMAGED KEYSWITCH.

To remove control keytops and blocking keytops:

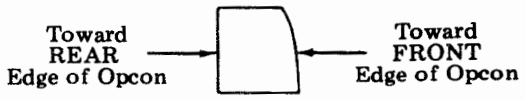
① Grasp keytop using thumb and index finger.

② Exert upward force until keytop releases.



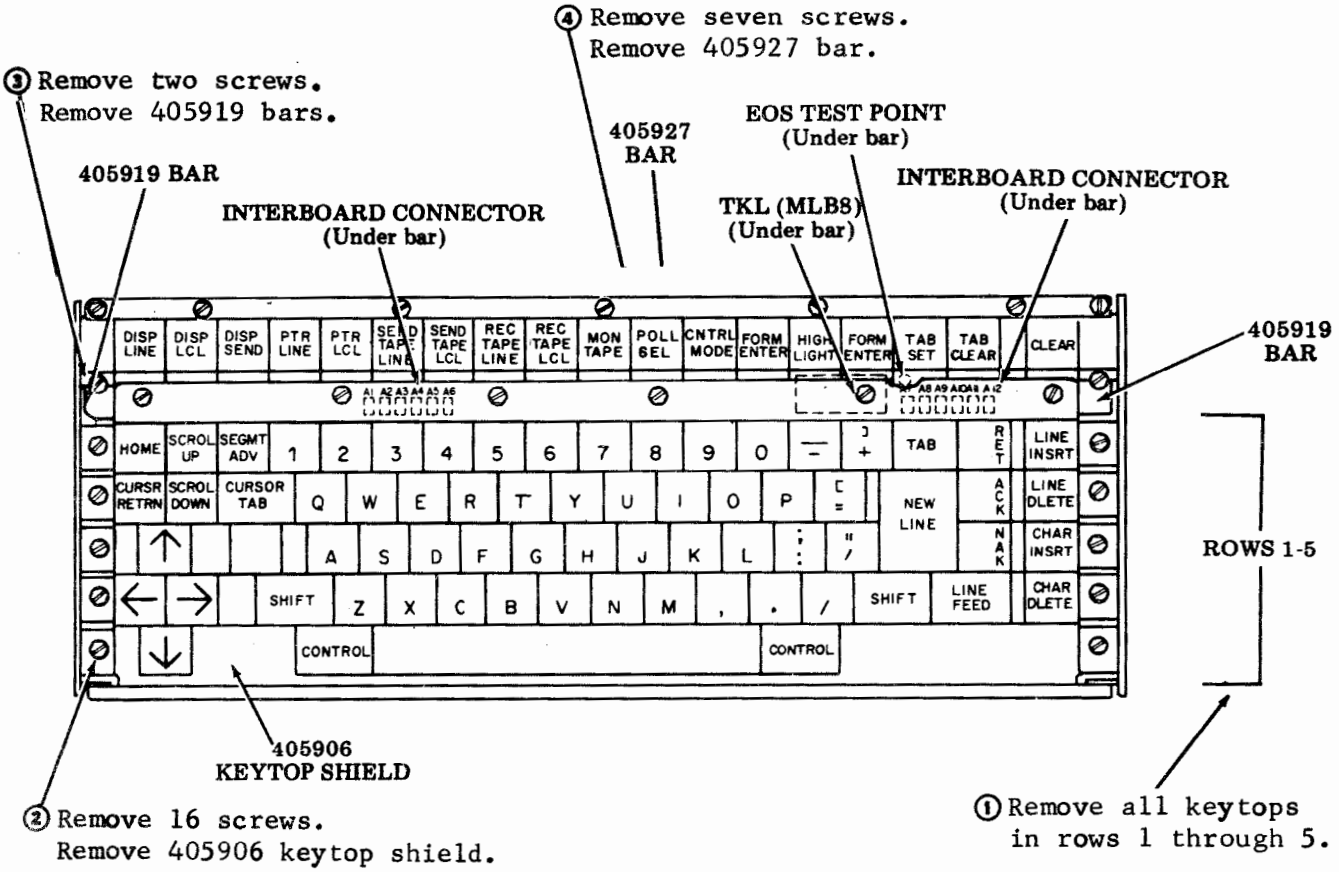
In reassembly of the blocking keytop for the CAPS LOCK switch only, operate the switch to the latched (down) position. For all other blocking keytops, position keytop over switch housing and snap down until ridges are retained by notches in switch body.

CAUTION 2: CONTROL ROW BLOCKING KEYTOPS ARE NOT THE SAME ON THE FRONT AND REAR SIDE AND MUST BE ASSEMBLED WITH THE PROPER ORIENTATION.



Profile of Control Row Blocking Keytop

405906 Keytop Shield



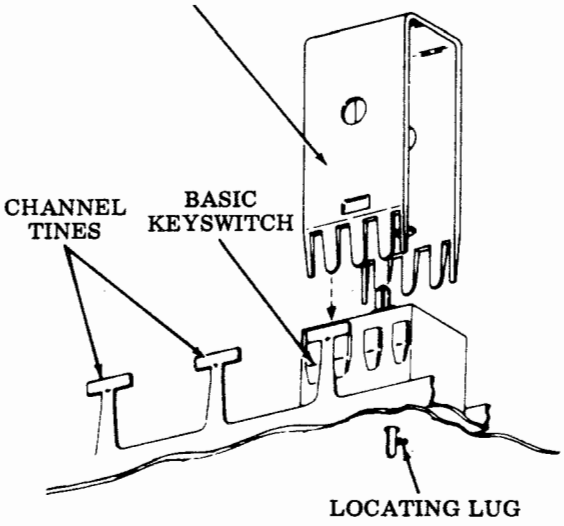
C. OPCONS (Cont)

7. DISASSEMBLY/REASSEMBLY -- KD, KDP AND KDPM^2 (Cont)

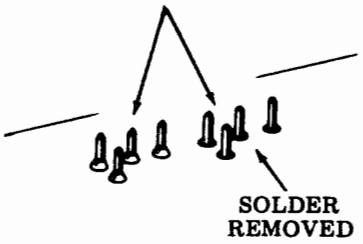
Keyswitches

- Remove 401100 cover (6-30).
- Remove 402255 pan (6-30).
- Remove 410074 interface and bell circuit card (6-31).
- Remove keytops (6-32).
- Remove 405906 keytop shield (6-33).

② Place 346257 tool over keyswitch and press downward. When tool bottoms and embossed projections snap into notches on keyswitch, squeeze and pull back on tool to lift keyswitch out.



① Remove solder from around terminal pins of keyswitch to be removed.



CAUTION: USE A LOW WATTAGE SOLDERING IRON (AVOID PROLONGED CONTACT WITH PINS) ALONG WITH A DESOLDERING TOOL TO PREVENT DAMAGE TO KEYSWITCH CARD CIRCUITS AND COMPONENTS.

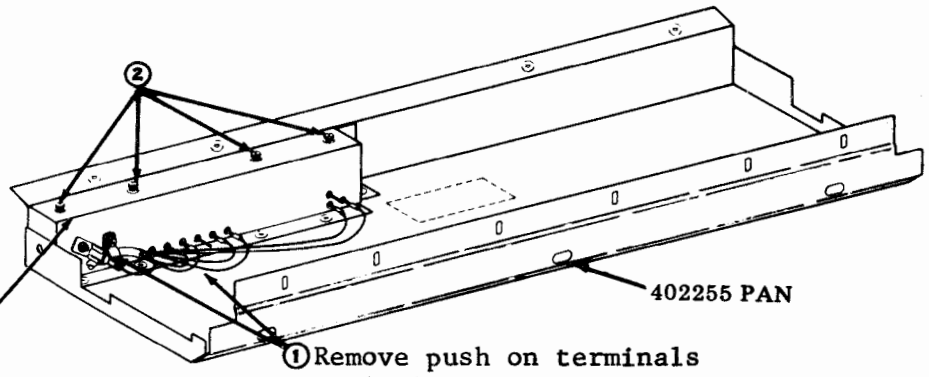
NOTE: The tool tines must pass between keyswitch housing and inside of channel tines.

In reassembly, insert new keyswitch, observe position of locating lug, and press keyswitch into channel. Switch must snap fully into front and rear channel tines. Hold keyswitch in place and resolder.

405931 Cover Assembly

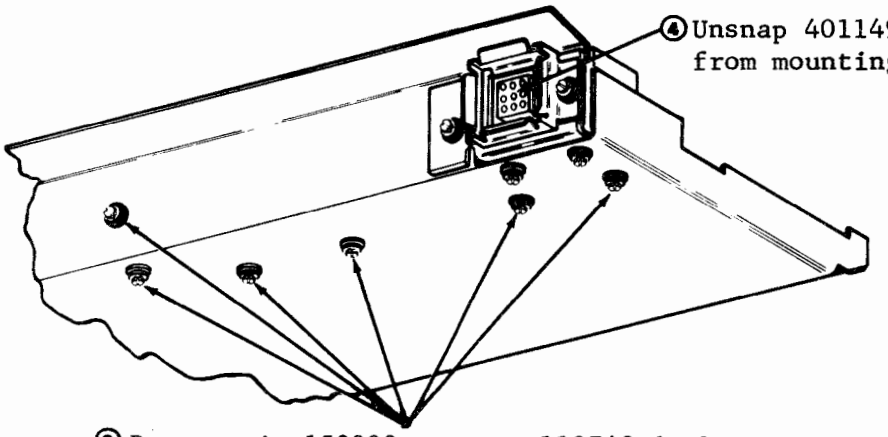
- Remove 402255 pan.

② Remove four 152893 screws, 110743 lockwashers and 125011 flat washers.



⑤ Remove 405931 cover assembly.

① Remove push on terminals of 405926 cable assembly.

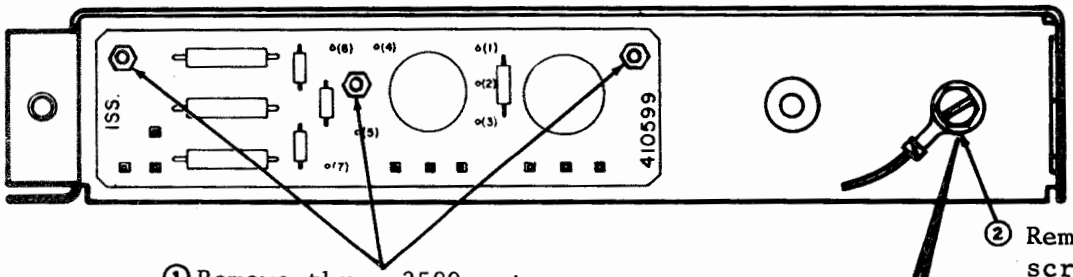


④ Unsnap 401149 connector from mounting bracket.

③ Remove six 152893 screws, 110743 lockwashers and 125011 flat washers.

410599 Transformer and Filter Circuit Card

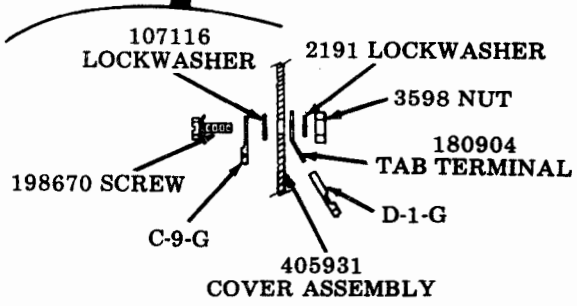
- Remove 402255 pan.
- Remove 405931 cover assembly.



① Remove three 3599 nuts and 110743 lockwashers.

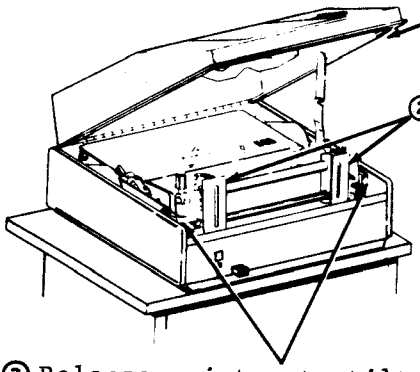
② Remove 198670 screw.

③ Remove 410599 circuit card.



D. TRACTOR FEED PRINTER

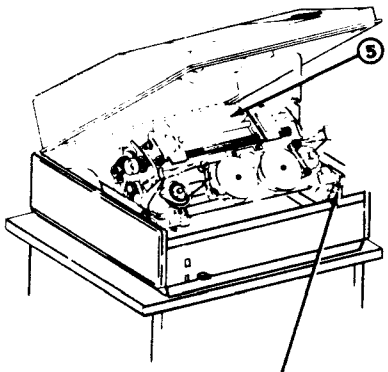
1. REMOVAL AND REPLACEMENT OF ENTIRE PRINTER ASSEMBLY



① Open cover.

② Remove paper by releasing paper guide and opening forms tractors.

③ Release printer to tilt position by pressing left and right latchlevers to paper.

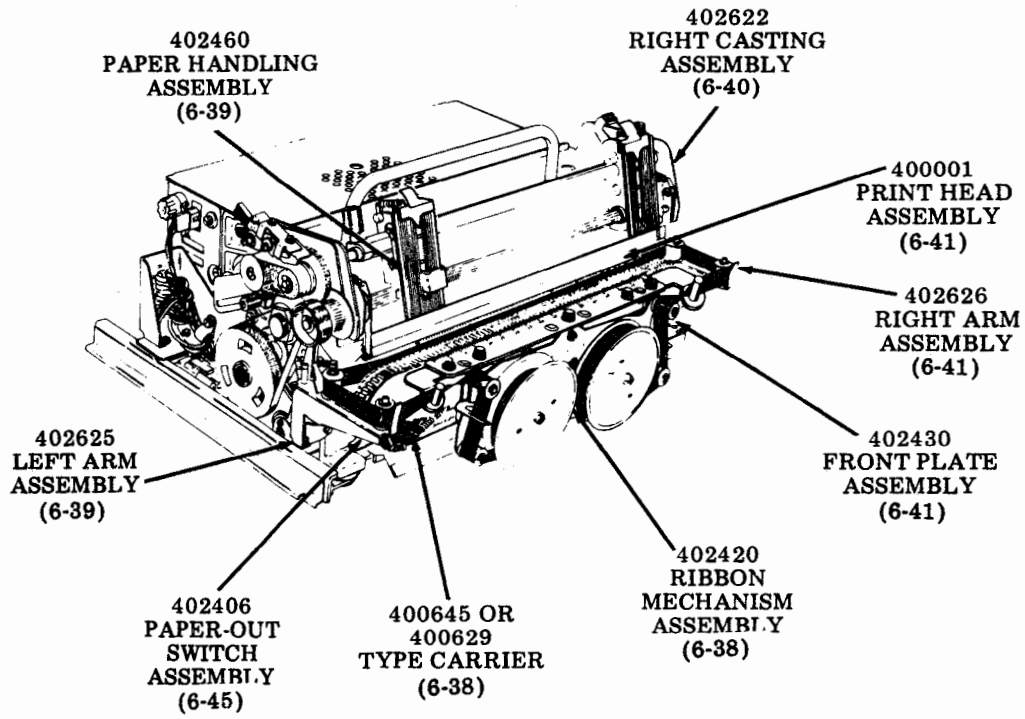


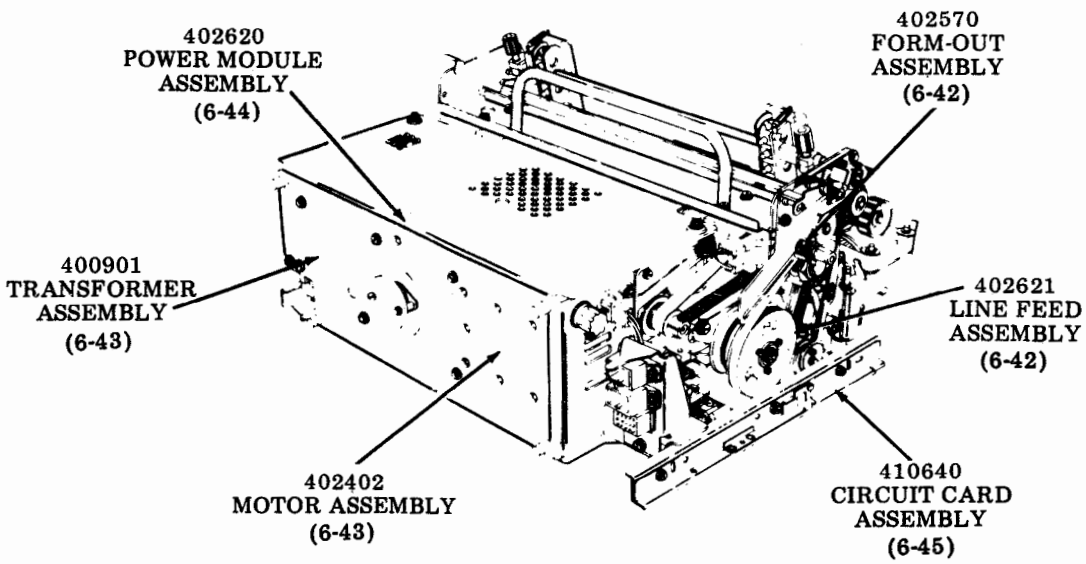
⑤ Pull printer forward by grasping handle at top, and slide off mounting tracks.

④ Insert screwdriver in right mounting track and pry up detent.

2. SUBASSEMBLY IDENTIFICATION

NOTE: The number indicated in parentheses after each assembly designates the page covering the disassembly/reassembly procedures.



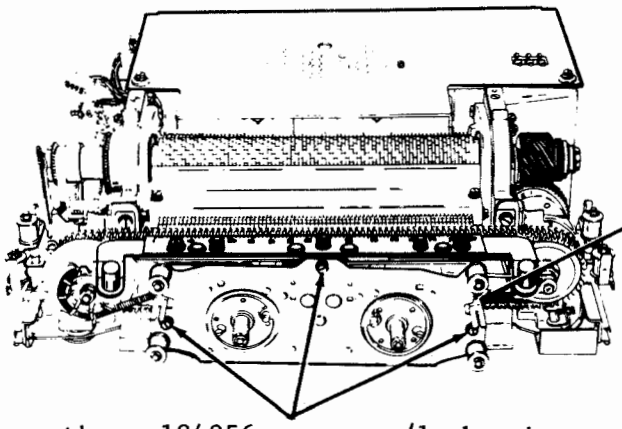


D. TRACTOR FEED PRINTER (Cont)

3. DISASSEMBLY/REASSEMBLY

402420 Ribbon Mechanism Assembly

① Remove 402444 ribbon (not shown).



③ Move to right to remove 400630 belt.

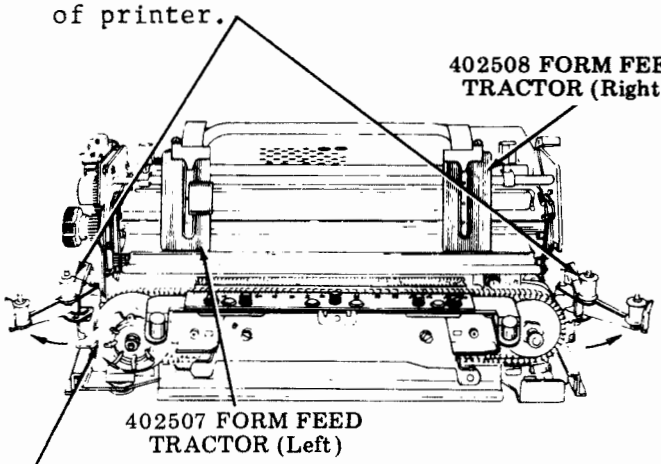
② Remove three 184056 screws w/lockwashers.

In reassembly, perform Ribbon Feed Drive Belt Tension adjustment (5-17).

400645 Monocase or 400629 Up-Low Type Carrier

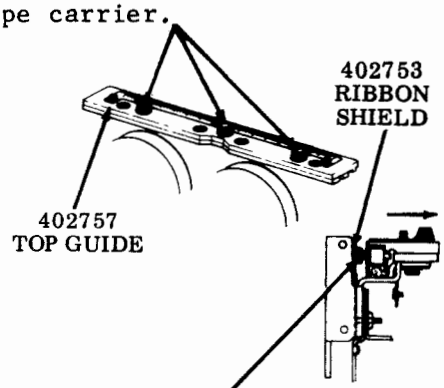
① Remove 402444 ribbon (not shown).

② Release thumb levers on left and right ribbon guide brackets allowing guides to spring to sides of printer.



④ Flags should be to left and right of backup bar for ease of removal. Lift up arm on left type carrier pulley to release spring bias on pulley. While holding arm up, lift type carrier from right pulley and remove.

③ Remove three thumbscrews and lockwashers, then remove carrier top guide from over type carrier.

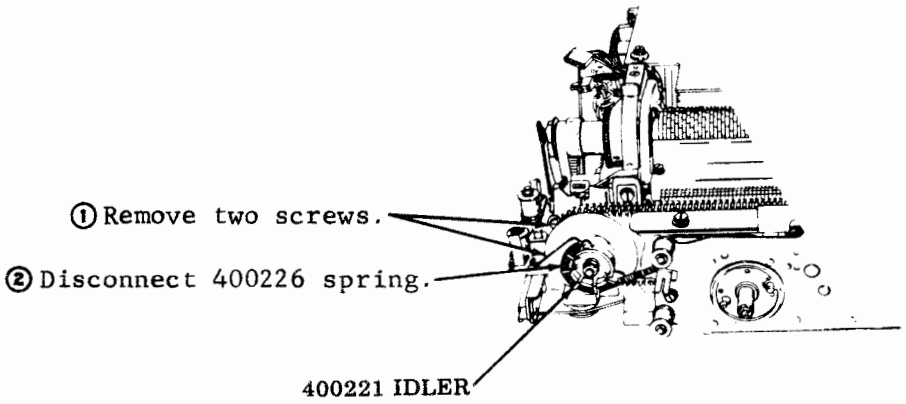


⑤ When replacing carrier top guide, make sure it is positioned to front. This insures that type carrier is positioned against backup bar.

CAUTION: WHEN REPLACING TYPE CARRIER, PLACE CARRIER ON THE LEFT PULLEY FIRST AND MAKE SURE ALL PALLET STEMS AT THE TOP OF BELT ARE LOCATED UNDER BACKUP BAR.

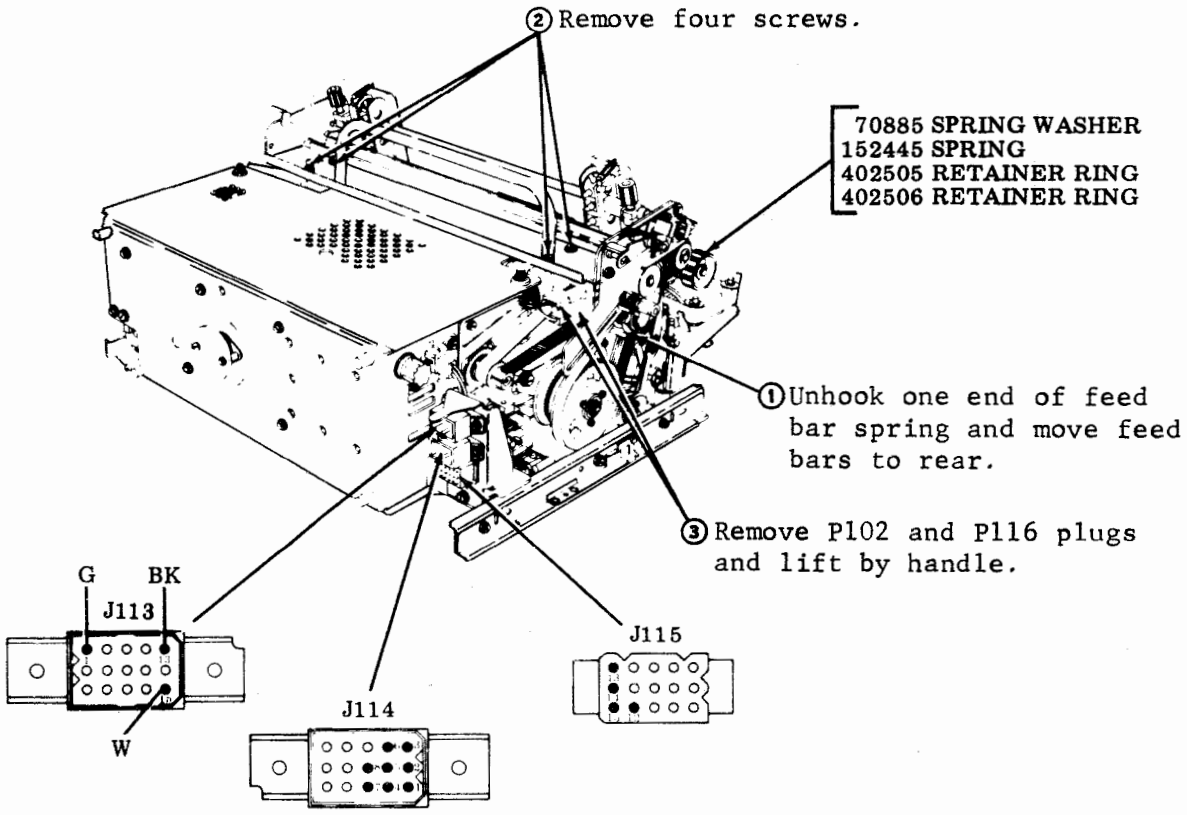
402625 Left Arm Assembly

•Remove 400645 or 400629 type carrier (6-38).



In reassembly, Left Carrier Sprocket adjustment (5-14) must be made.

402460 Paper Handling Assembly

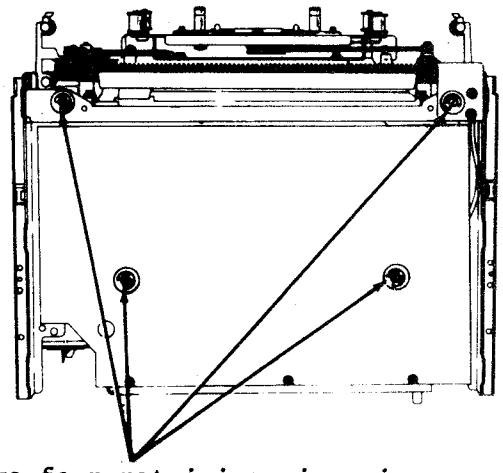


D. TRACTOR FEED PRINTER (Cont)

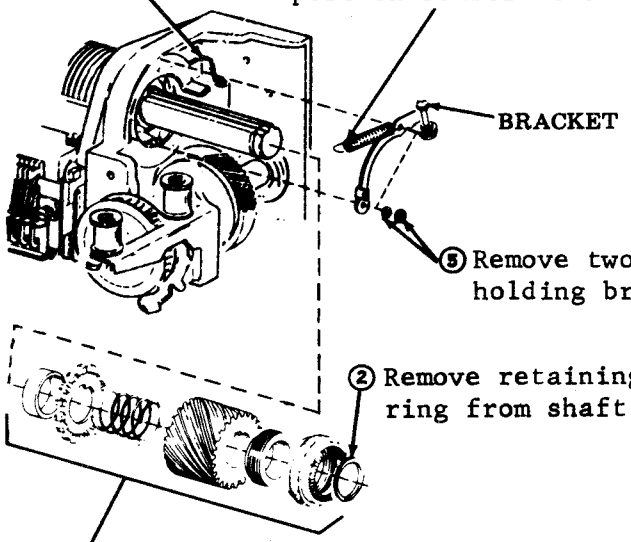
3. DISASSEMBLY/REASSEMBLY (Cont)

402622 Right Casting Assembly

- Remove 400645 or 400629 type carrier (6-38).
- Remove 410640 circuit card assembly (6-45).
- Remove 402430 front plate assembly (6-41).
- Remove 402460 paper handling assembly (6-39).
- Remove 402620 power module assembly (6-44).



① Remove four retaining rings in order to remove printer base.



④ Unhook 110438 spring from post on sensor bracket.

⑤ Remove two 3599 nuts and 3640 lockwashers holding bracket to the plate. Remove bracket.

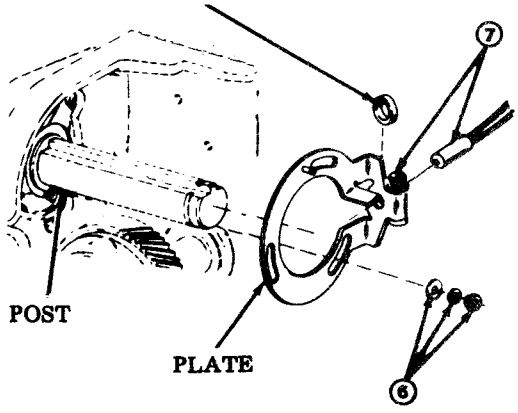
② Remove retaining ring from shaft.

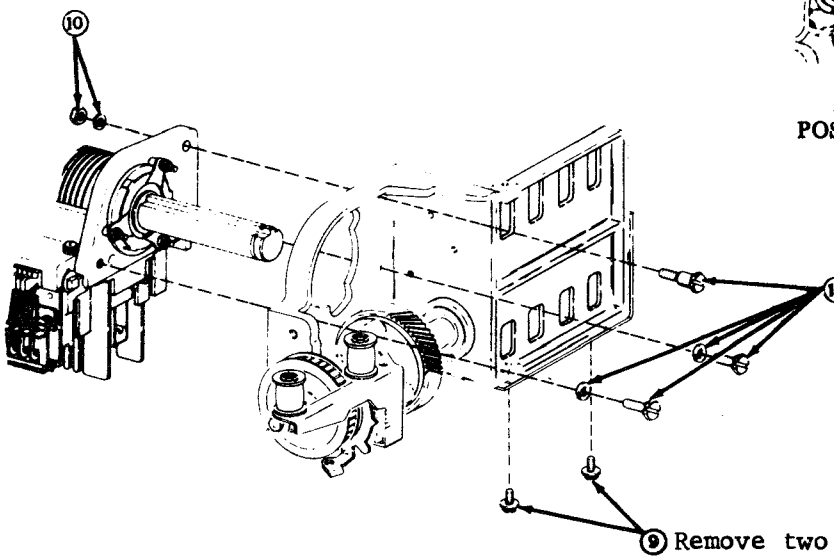
③ Slide off adjusting ring, collar, gear, spring, timing wheel, and bushing from shaft.

⑥ Remove 3599 nut, 3640 lockwasher, and 125011 flat washer holding plate to post. Remove plate.

⑦ Loosen screw holding the sensor. Remove sensor.

⑧ Be careful not to lose 400931 spacer.





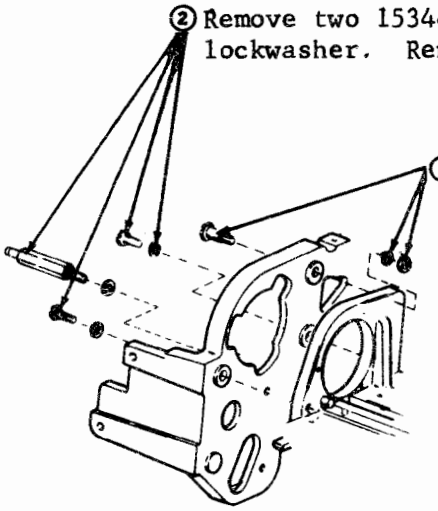
⑩ Remove 400293 shoulder screw, 2669 lockwasher, and 112626 nut; remove two 153442 screws and 45815 lockwashers; remove right casting assembly.

⑨ Remove two 184057 screws w/lockwashers holding bottom pan to casting.

400001 Print Head Assembly

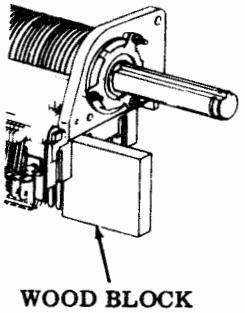
- Remove 400645 or 400629 type carrier (6-38).
- Remove 410640 circuit card assembly (6-44).
- Remove 402430 front plate assembly (6-40).
- Remove 402622 right casting assembly (6-39).

② Remove two 153442 screws, 45815 lockwashers, 400317 post, and 45815 lockwasher. Remove 400001 print head assembly.



① At left casting, remove 400923 shoulder screw, 2669 lockwasher, and 112626 nut.

NOTE: It is suggested that when the right casting is removed, a 3-inch piece of wood be placed under the right end of the print head to keep it from dropping.



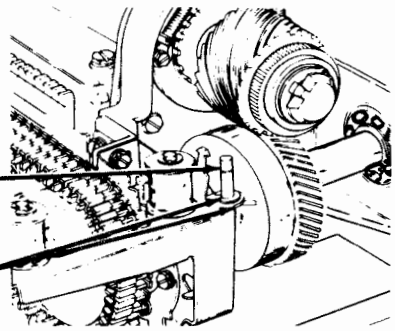
In reassembly, perform 402622 Right Casting Assembly (6-40), 402430 Front Plate Assembly (6-41), 410640 Circuit Card Assembly (6-45), and 400645 or 400629 Type Carrier (6-38) procedures. Perform Ribbon Feed Drive Belt Tension adjustment (5-17).

402626 Right Arm Assembly

① Remove 402444 ribbon (not shown).

③ Remove post -- being careful of two springs mounted on post.

② Remove two retaining rings.



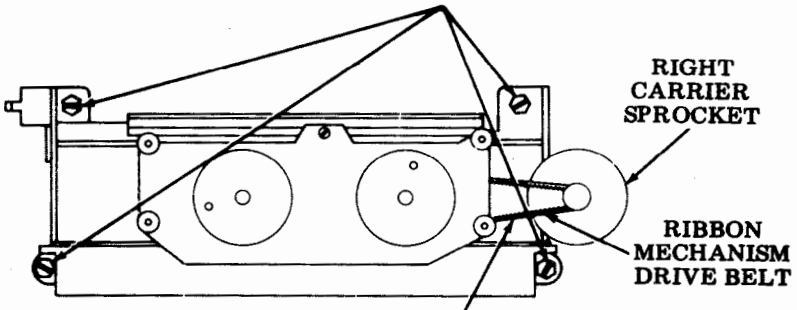
402430 Front Plate Assembly

- Remove 400645 or 400629 type carrier (6-38).

CAUTION: DO NOT LOSE FOUR SPACERS.

In reassembly, make Ribbon Feed Drive Belt Tension adjustment (5-17).

① Remove four mounting screws.

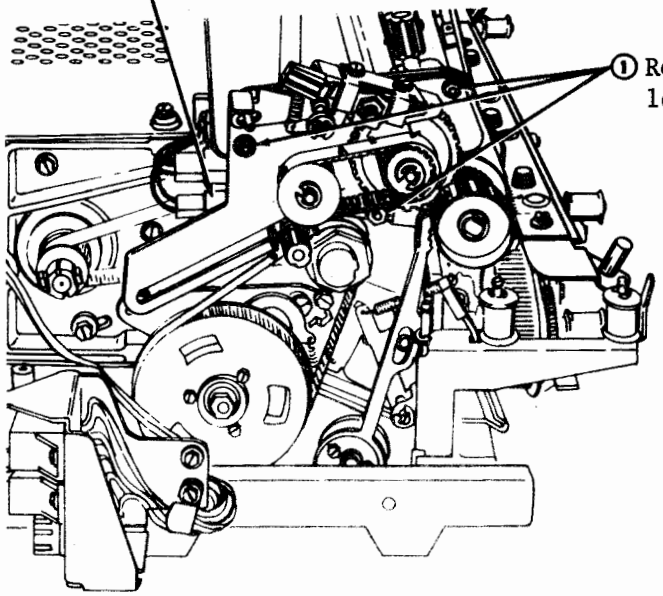


② Move assembly to right to remove ribbon mechanism drive belt.

D. TRACTOR FEED PRINTER (Cont)

3. DISASSEMBLY/REASSEMBLY (Cont)

402570 Form-Out Assembly



Form-Out Belt Selection

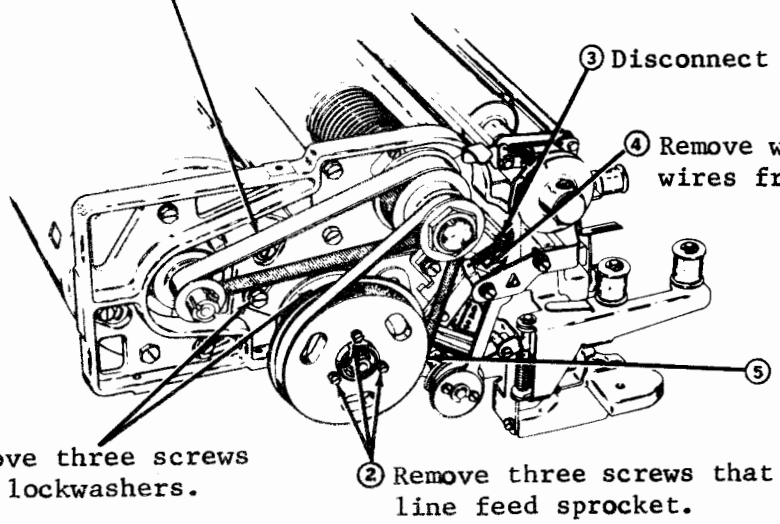
Form Selector Setting 4	3	2	1	Color of Belt	TP Part No.
Length of Form, Inches					
3-1/3†	2-1/2	5	10	Amber	402571
3-2/3†	2-3/4*	5-1/2	11	Blue	402572
4	3	6	12	Yellow	402573
4-1/3†	3-1/4*	6-1/2	13	Brown	402574
4-2/3†	3-1/2	7	14	Red	402575
5	3-3/4*	7-1/2	15	Pink	402576
5-1/3†	4	8	16	Lt Green	402577
5-2/3†	4-1/4*	8-1/2	17	Green	402578
6	4-1/2	9	18	Lt Blue	402579
7-1/3†	5-1/2	11	22	White	402580

*These settings are not used on 6 line per inch printers.
†These settings are not used on 8 line per inch printers.

In reassembly, remake Form-Out Gear Backlash adjustment (5-25).

402621 Line Feed Assembly

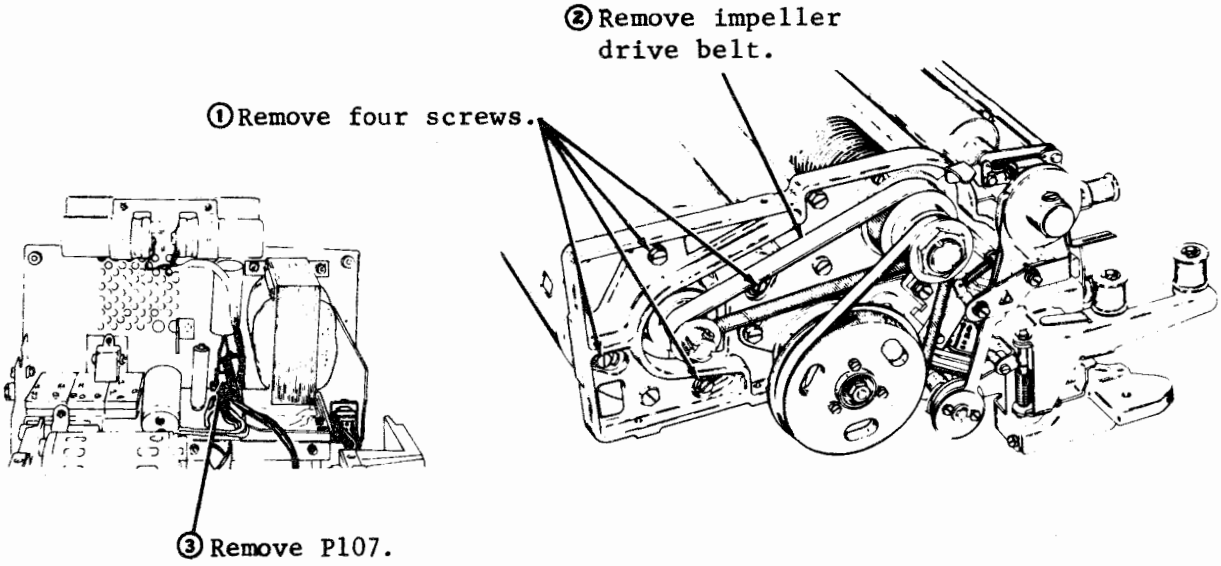
- Remove 402570 form-out assembly (6-42).



In reassembly, Feed Bar Drive Belt Tension adjustment (5-24) must be made.

402402 Motor Assembly

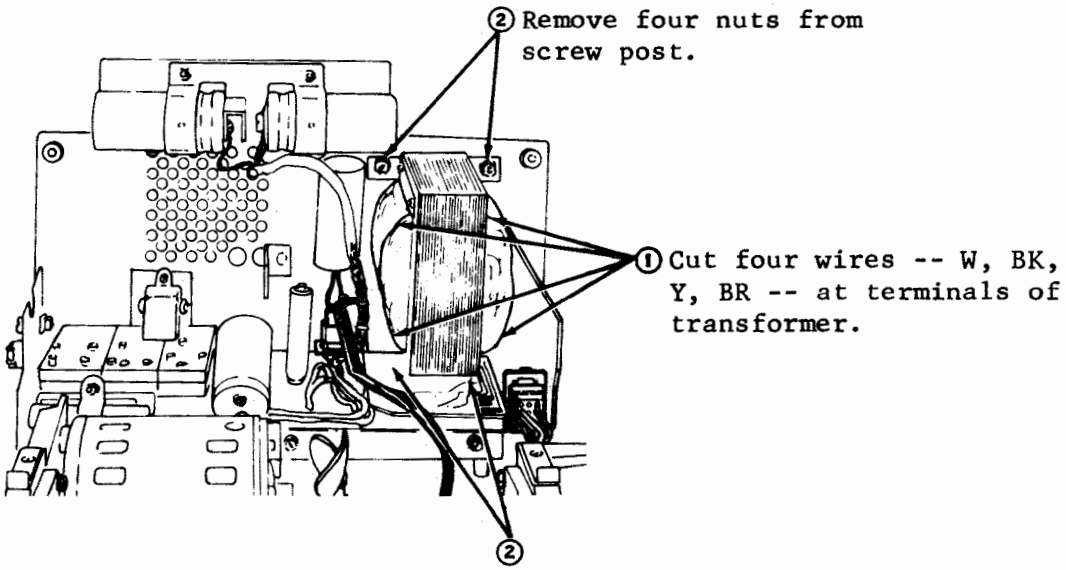
- Remove 402460 paper handling assembly (6-39).
- Remove 402620 power module assembly (6-44).



In reassembly, make Impeller Shaft Drive Belt Tension adjustment (5-25).

400901 Transformer Assembly

- Remove 402460 paper handling assembly (6-39).
- Remove 402620 power module assembly (6-44).



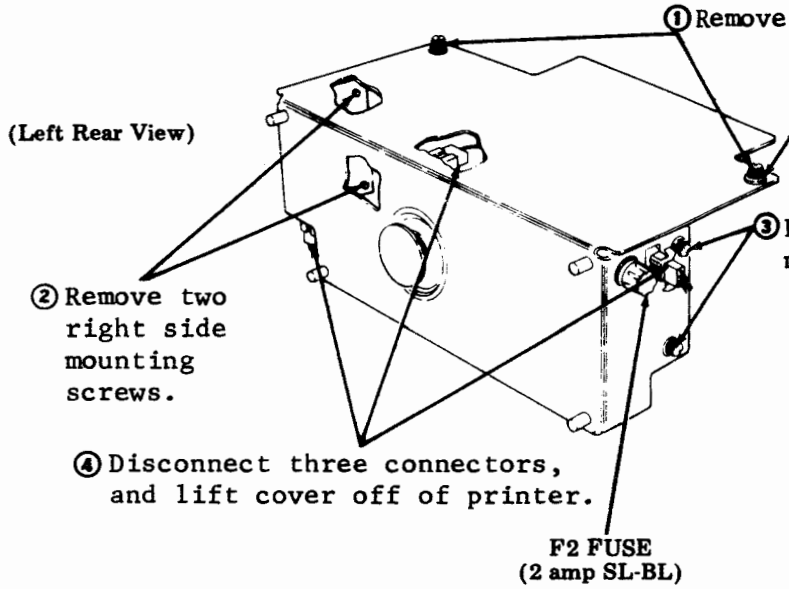
NOTE: When installing a new transformer, the four wires must be soldered to its terminals -- W to 1, BK to 2, Y to 3, BR to 4.

D. TRACTOR FEED PRINTER (Cont)

3. DISASSEMBLY/REASSEMBLY (Cont)

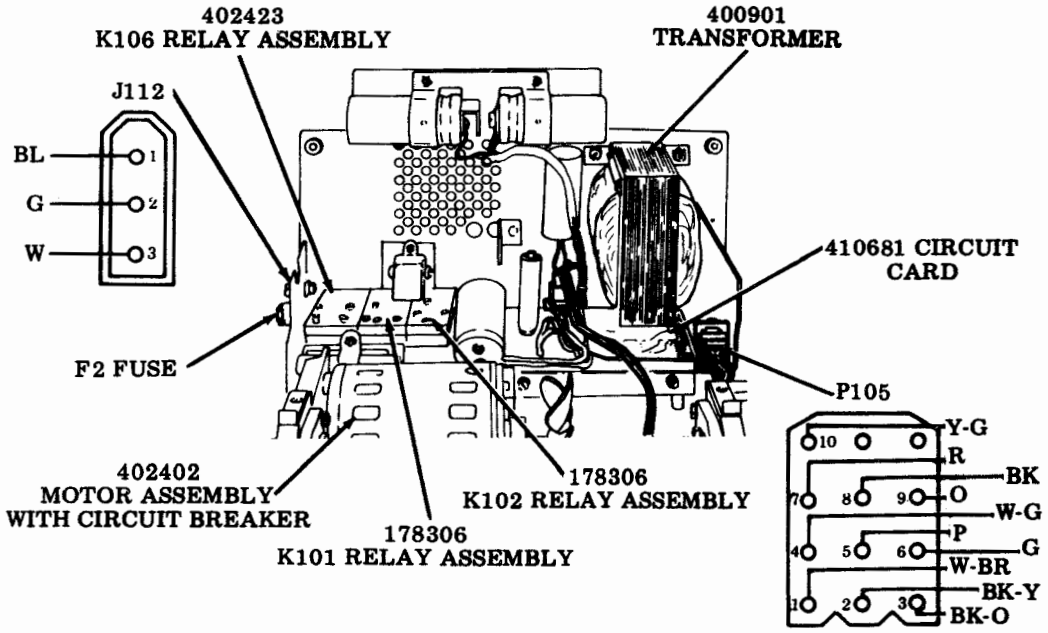
402620 Power Module Assembly

- Remove 410640 circuit card assembly (6-45).
- Remove 402460 paper handling assembly (6-39).

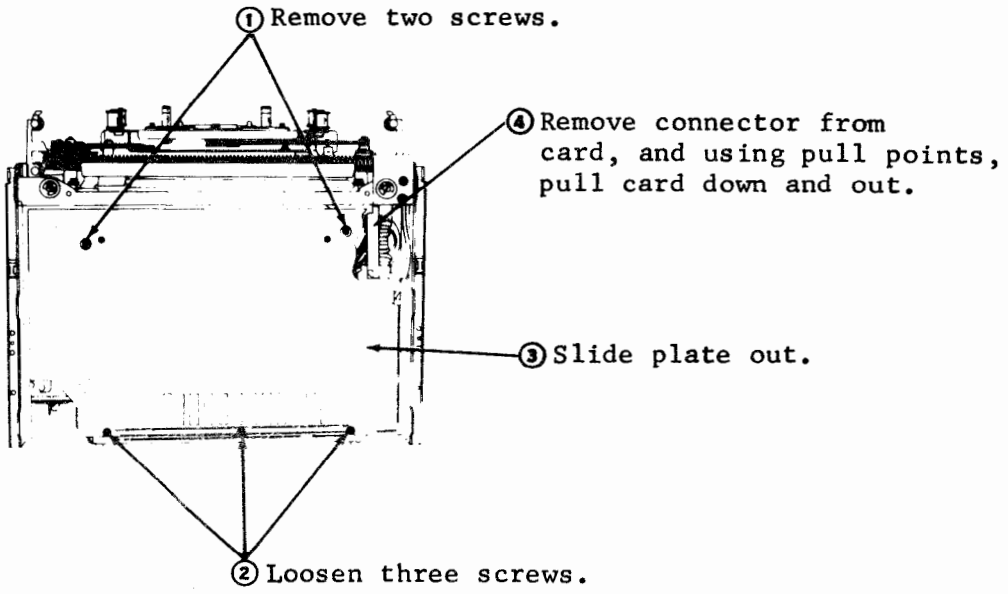


NOTE: Removal of lower screw is facilitated by sliding connector mounting bracket to rear. Remove rear mounting screw (or post) from bracket, loosen two mounting screws that hold bottom of bracket to frame, and slide bracket to rear until cover mounting screw is accessible.

To reassemble, reverse the disassembly procedures.

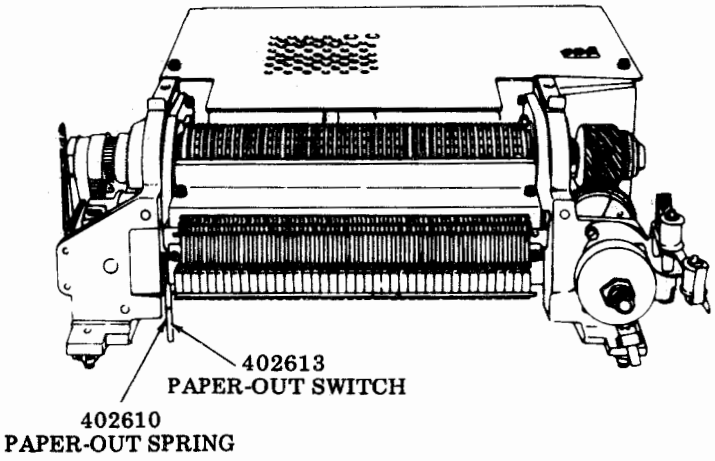


410640 Circuit Card Assembly



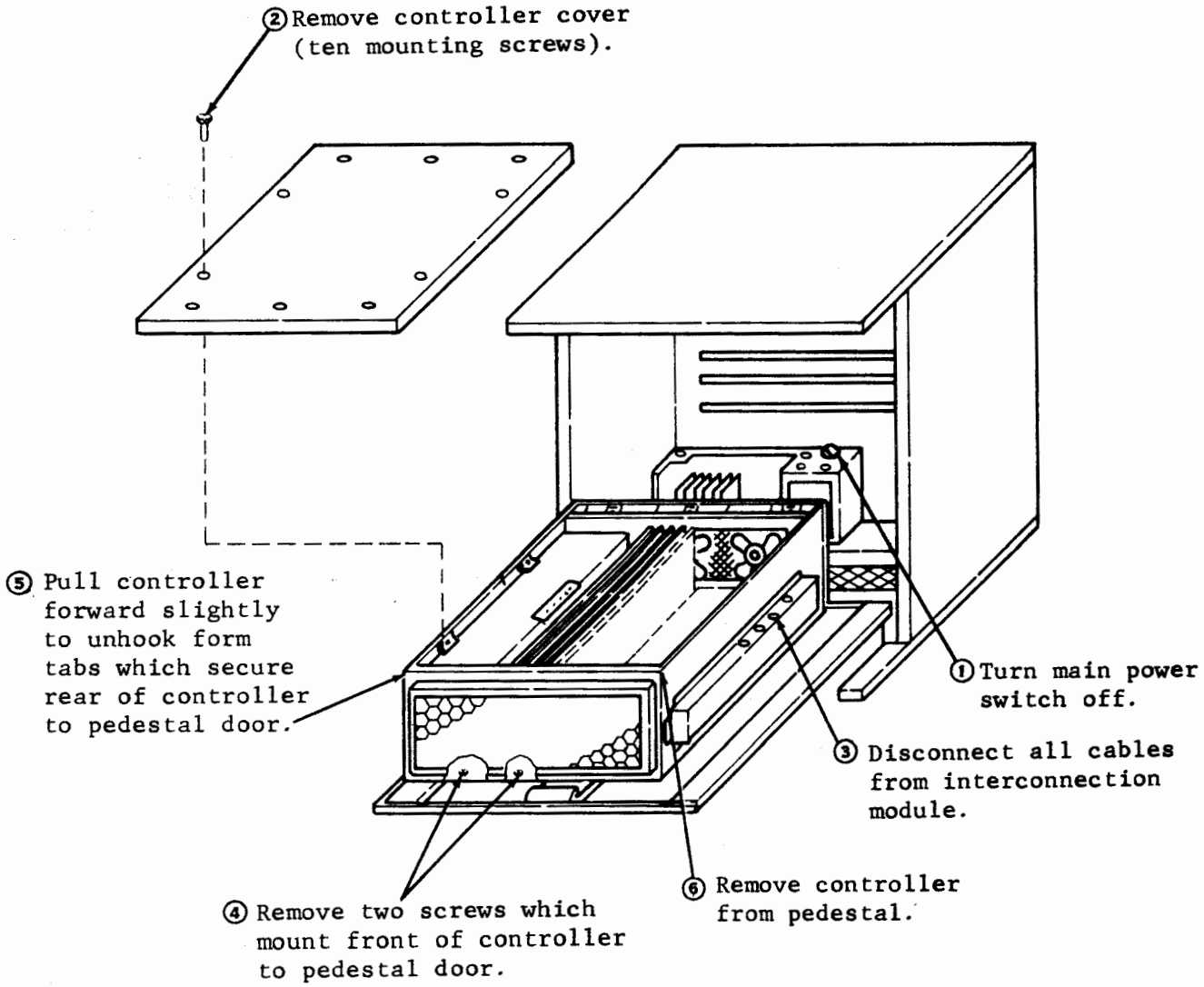
402406 Paper-Out Switch Assembly

Remove front mounting screw on paper-out switch assembly.
Slide switch out.



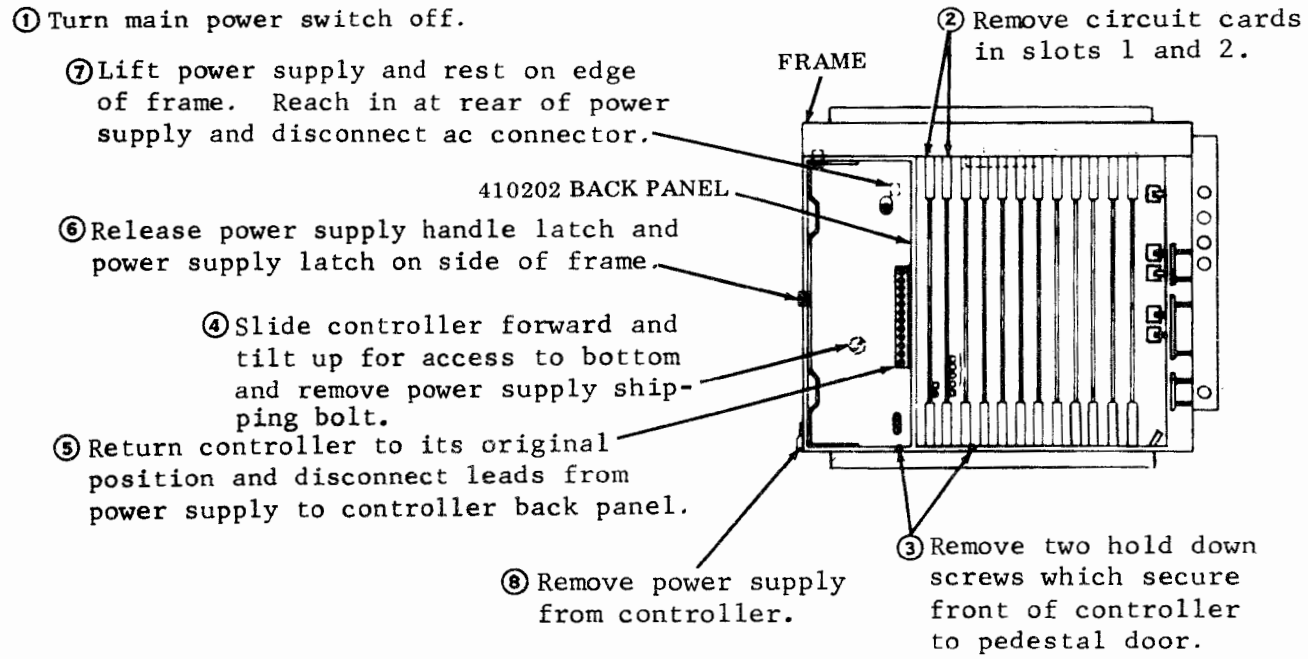
E. CONTROLLER

1. REMOVAL AND REPLACEMENT



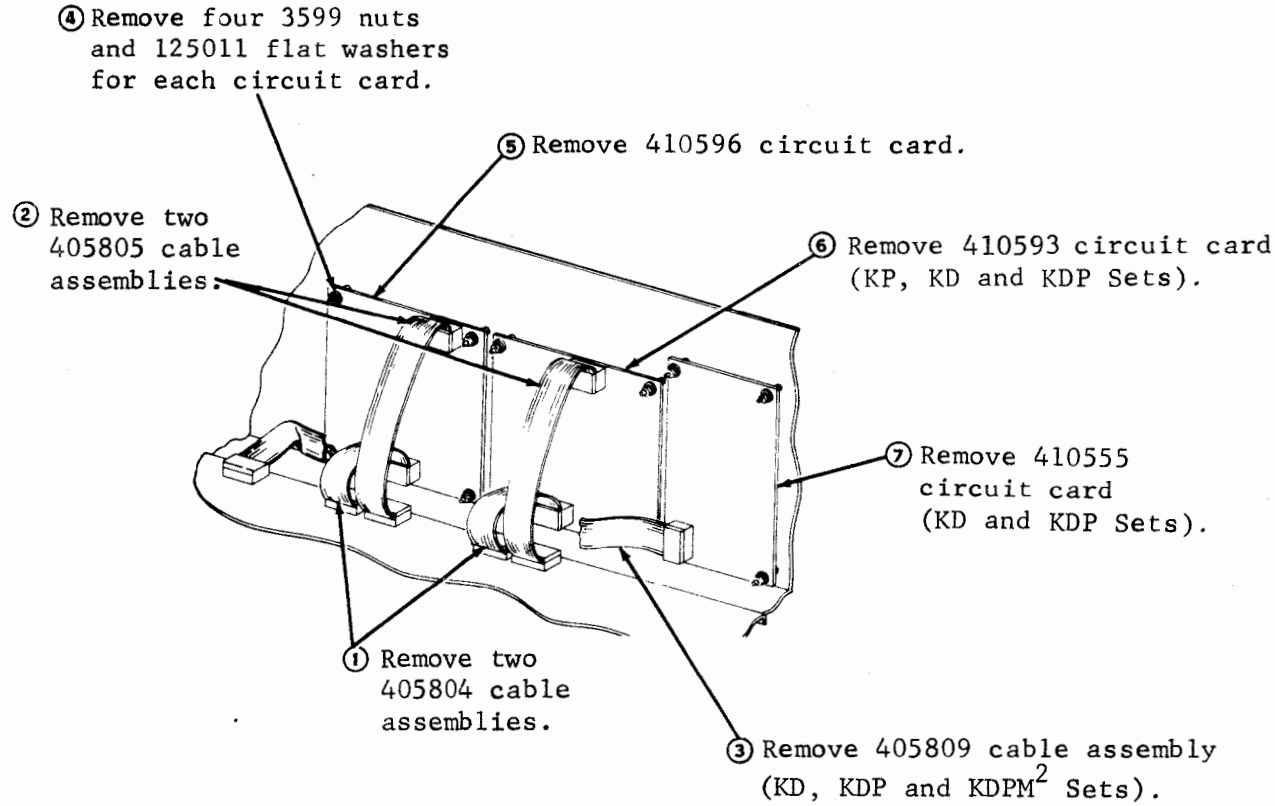
To install controller in pedestal reverse removal procedures.

40PSU103 Power Supply



To install power supply reverse removal procedures.

Controller Interface Card

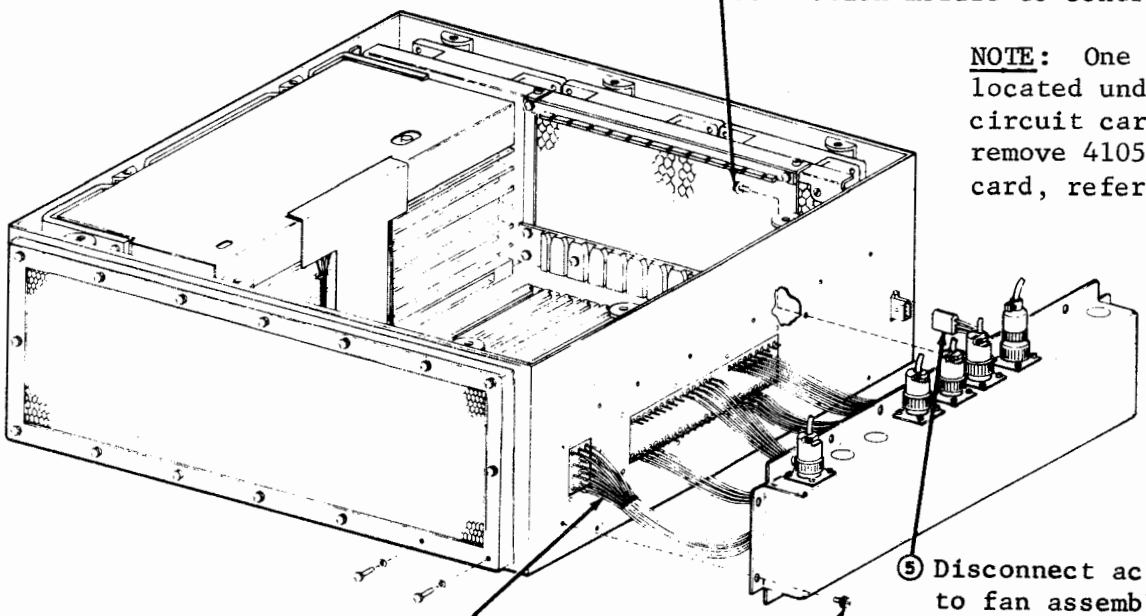


E. CONTROLLER (Cont)

1. REMOVAL AND REPLACEMENT (Cont)

Interconnection Module

① Turn main power switch off.



③ On inside of controller frame remove four 184056 screws mounting interconnection module to controller frame.

NOTE: One screw is located under 410555 circuit card. To remove 410555 circuit card, refer to Page 6-47.

⑤ Disconnect ac power plug to fan assembly.

④ Disconnect push on leads from filter panel to interconnection module.

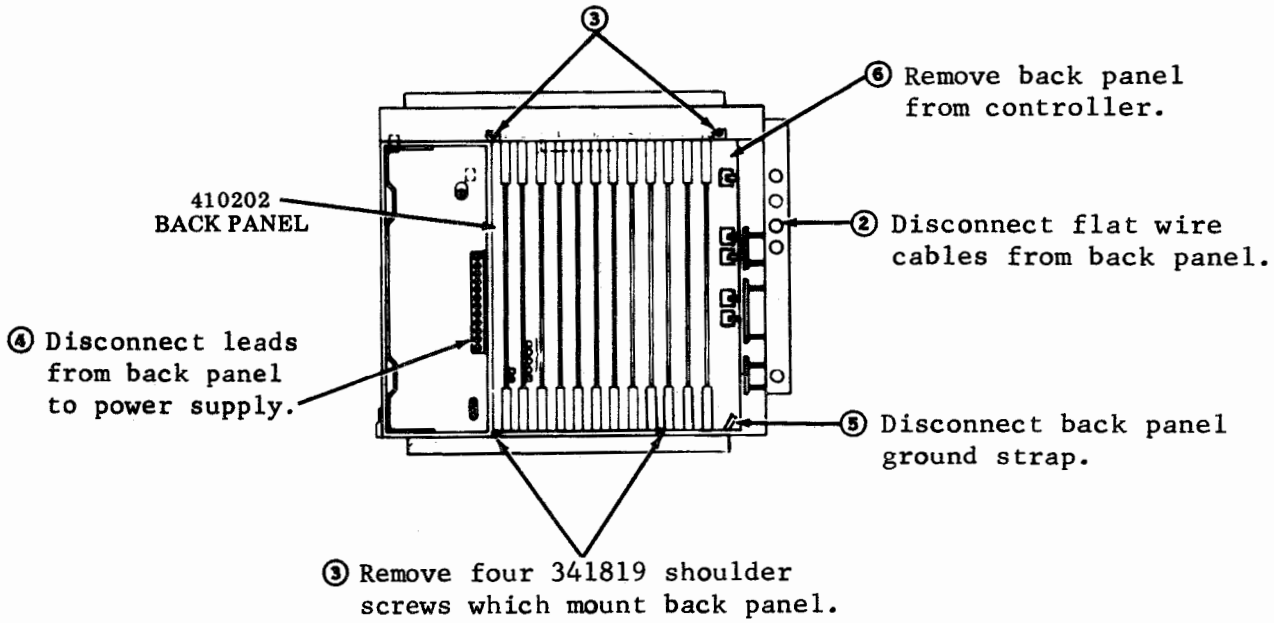
② Remove 16 184056 screws mounting interconnection module to controller frame.

⑥ Remove interconnection module.

To install interconnection module reverse removal procedures. Refer to WDP for wiring of filter panel.

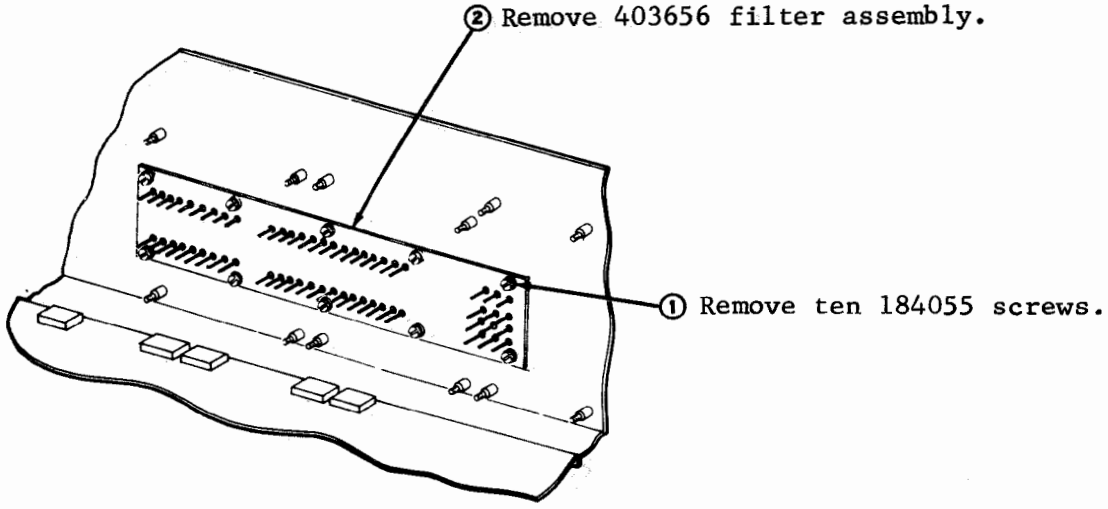
410202 Back Panel

① Turn main power switch off.



To install back panel reverse removal procedures.

403656 Filter Assembly

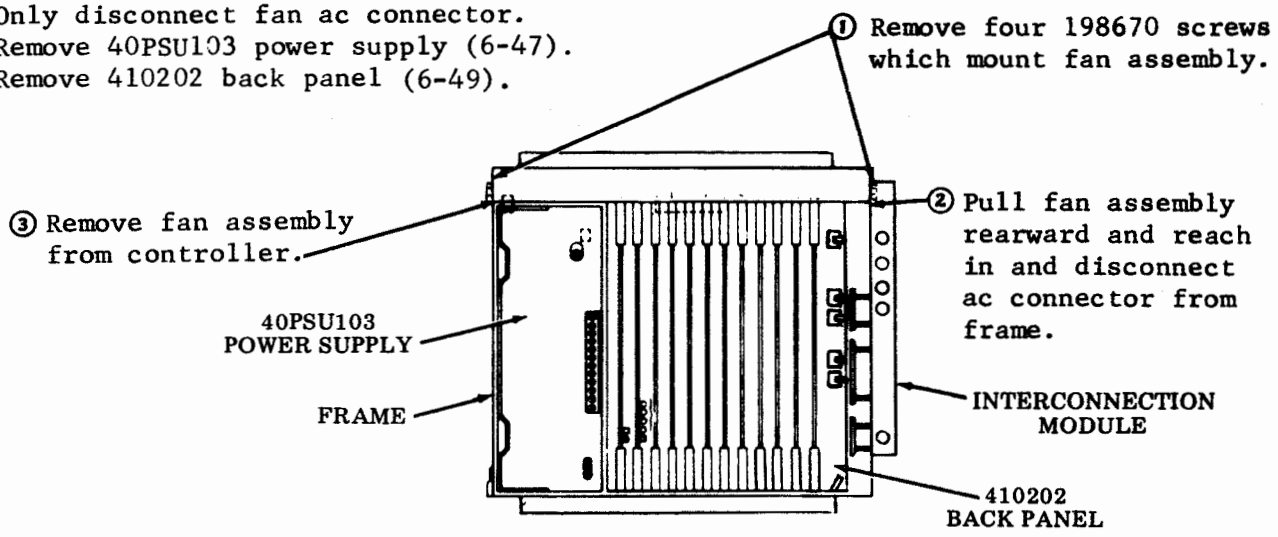


E. CONTROLLER (Cont)

1. REMOVAL AND REPLACEMENT (Cont)

Fan Assembly

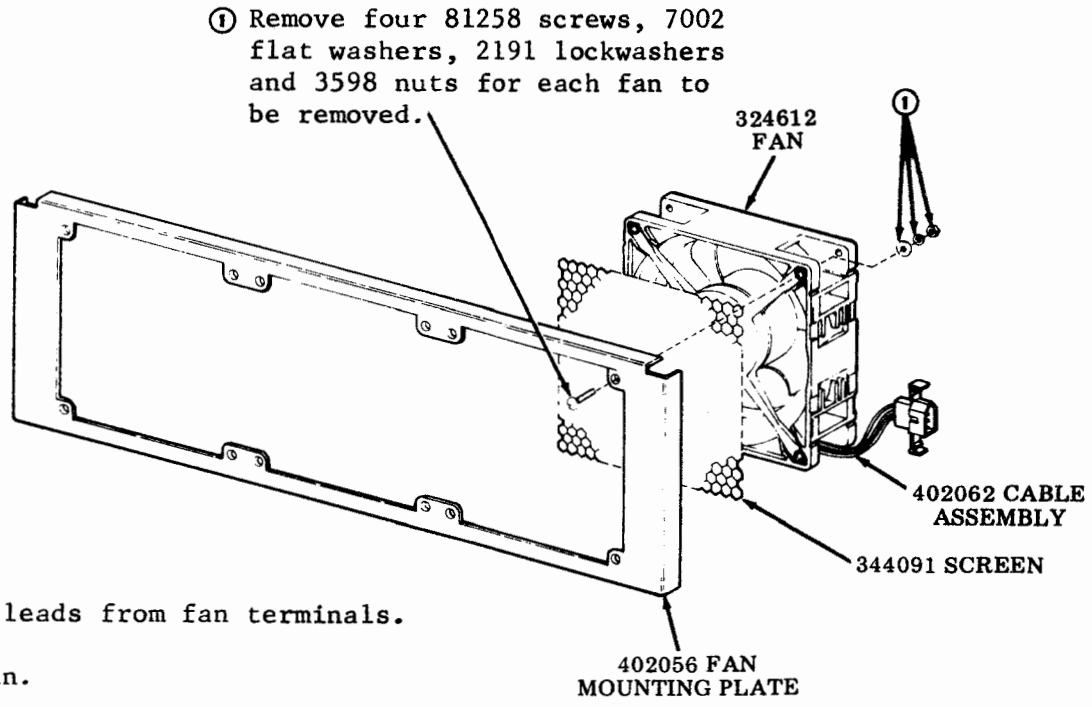
- Remove interconnection module (6-48). Only disconnect fan ac connector.
- Remove 40PSU103 power supply (6-47).
- Remove 410202 back panel (6-49).



To install fan assembly reverse removal procedures.

2. DISASSEMBLY/REASSEMBLY

Fan Assembly



② Unsolder leads from fan terminals.

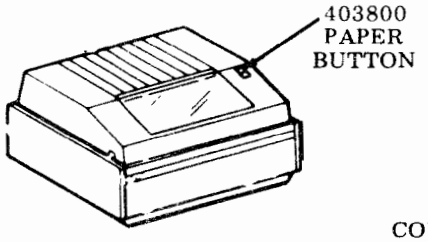
③ Remove fan.

To reassemble fan assembly reverse disassembly procedures. Refer to 9562WD in WDP for wiring of fan.

F. CABINETS

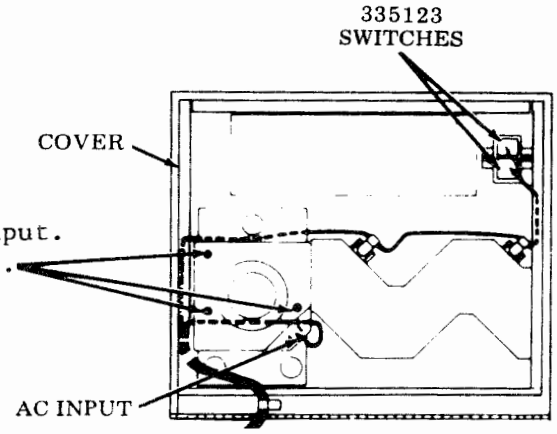
1. REMOVAL -- 40CAB352/RC CABINET PARTS

To replace 333588 lamp in 335123 switch:
① Remove 403800 PAPER button.
② Replace lamp.

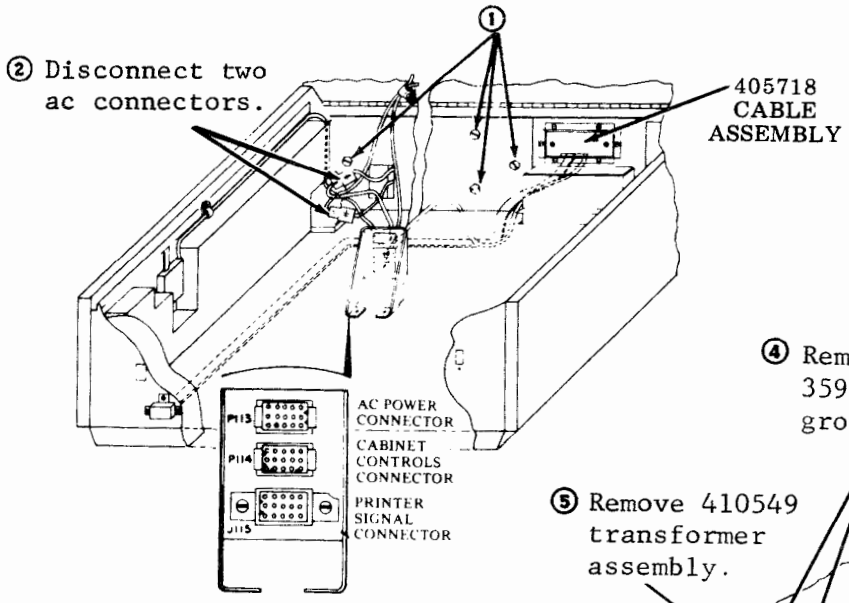


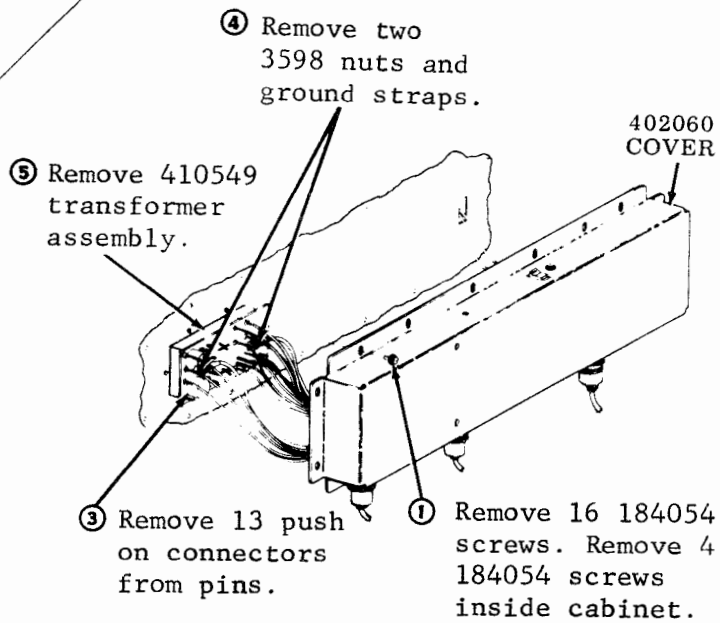
To remove 335123 switches:
① Remove switch button.
② Remove nut from top of switch.
③ Unsolder leads.
④ Remove switch.

To remove 403785 fan:
① Disconnect plug from ac input.
② Remove three 150978 screws.
③ Remove fan assembly.



410549 Transformer Assembly

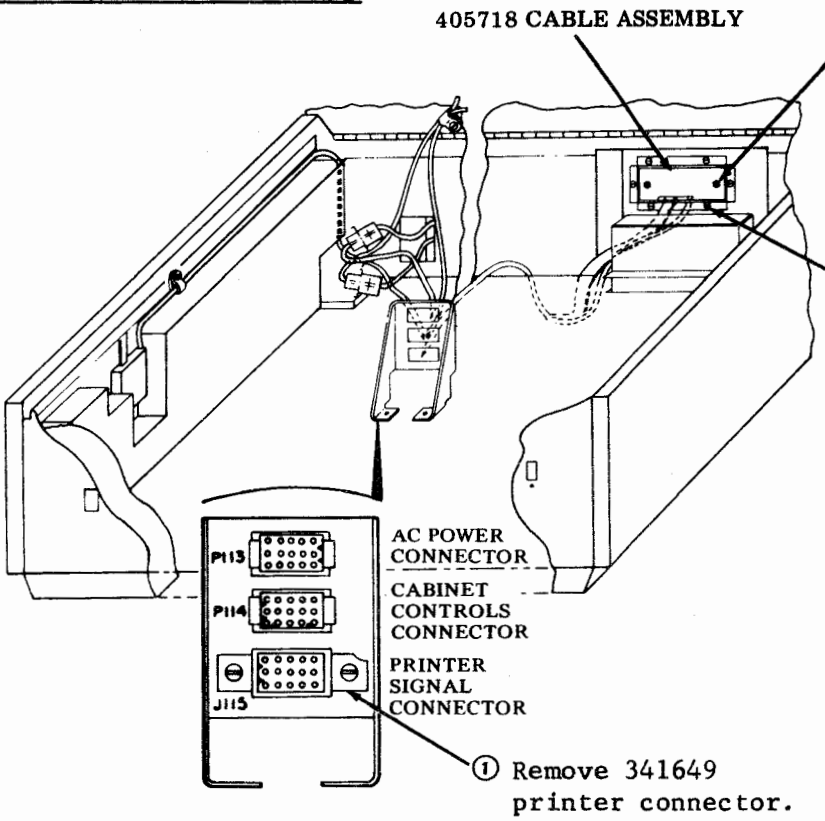




F. CABINETS (Cont)

1. REMOVAL -- 40CAB352/RC CABINET PARTS (Cont)

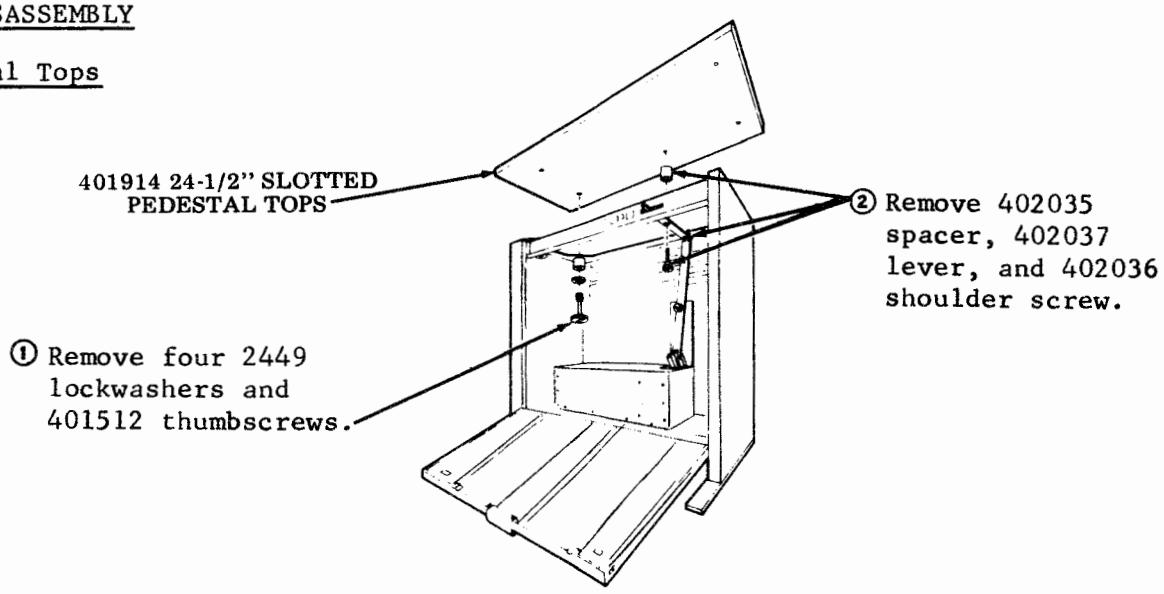
403615 Filter Panel Assembly



G. PEDESTAL

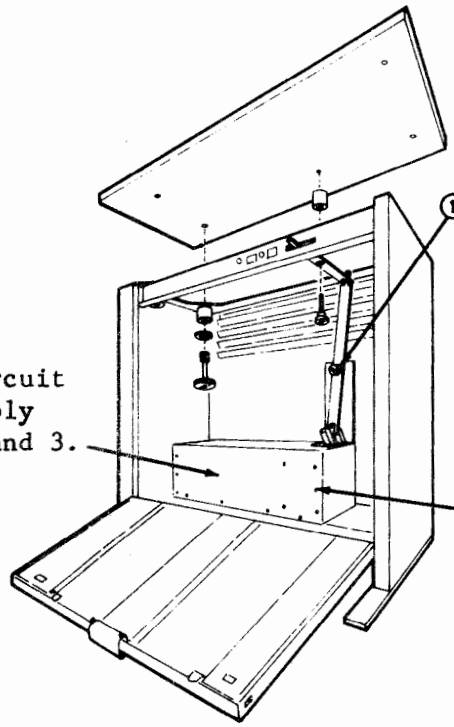
1. DISASSEMBLY

Pedestal Tops



2. REMOVAL AND REPLACEMENT

Interface Assembly



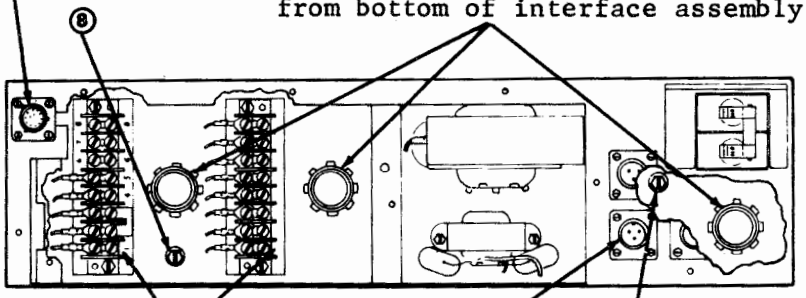
① Remove 402039 shoulder screw, 402038 spacer and 402040 lever which actuate circuit breaker.

③ Remove interface circuit card mounting assembly (6-), Steps 1, 2 and 3.

② Remove interface cover (18 screws).

⑥ Disconnect signal cable to controller and power cables to devices.

⑦ Remove three sealtite connectors from bottom of interface assembly.

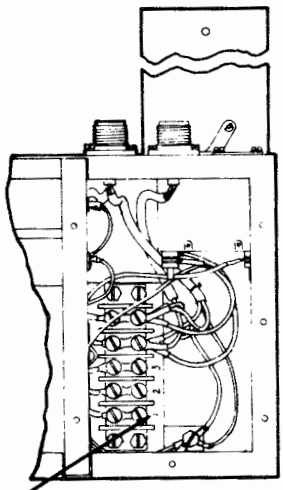


④ Remove signal, clock and control leads that connect interface to external circuitry.

(Top View)

⑧ Remove 151723 screws in ac compartment and remove interface assembly from pedestal.

(Front View)



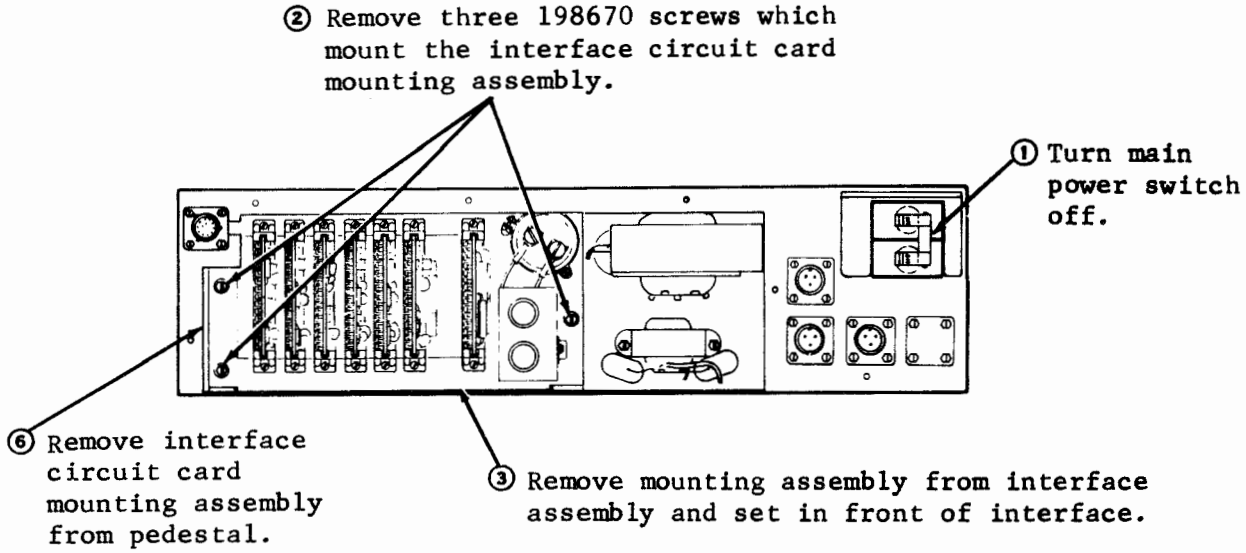
⑤ Be sure main break for ac power line is turned off. Disconnect ac leads to interface.

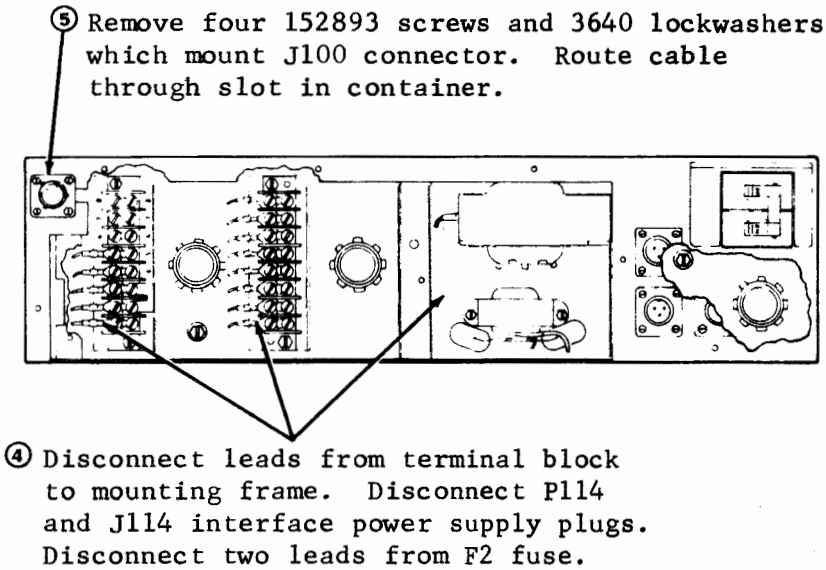
To install interface assembly reverse removal procedures.

G. PEDESTAL (Cont)

2. REMOVAL AND REPLACEMENT (Cont)

Interface Circuit Card Mounting Assembly

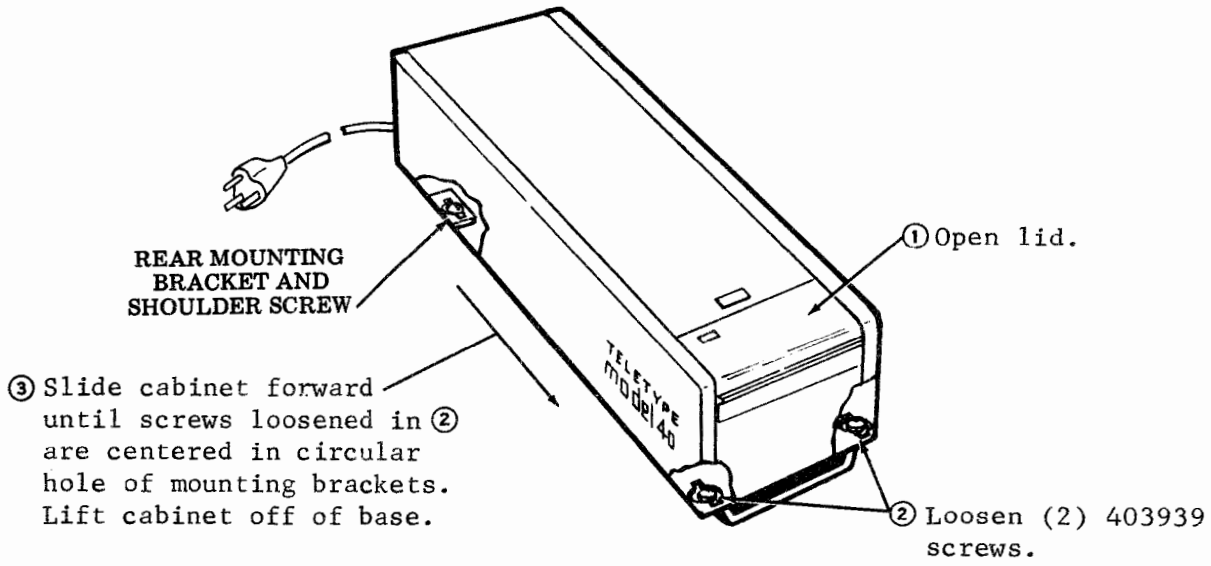




To install interface circuit card mounting assembly reverse removal procedures. Refer to 9559WD in WDP0457 for reconnecting leads to terminal blocks.

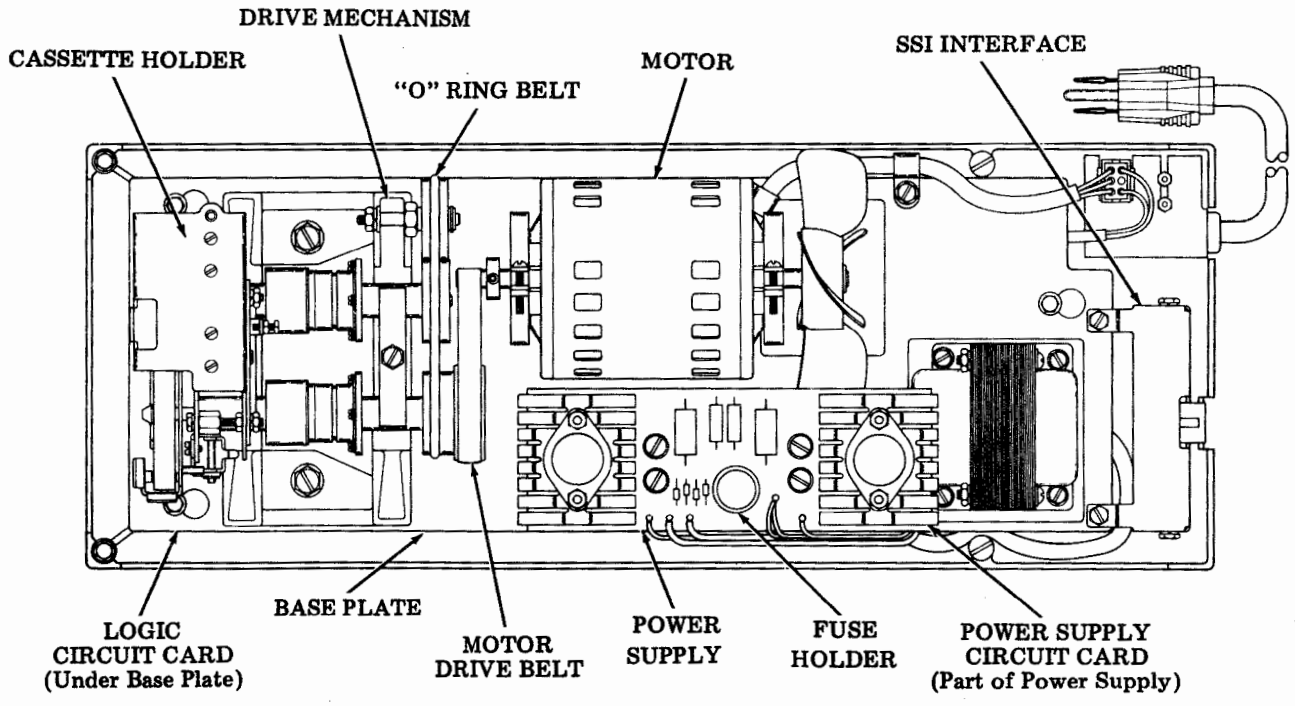
H. CASSETTE DRIVE

1. REMOVAL AND REPLACEMENT OF CABINET



To install cabinet reverse removal procedures. Before sliding cabinet rearward, rear shoulder screws must be centered in circular holes in rear mounting brackets.

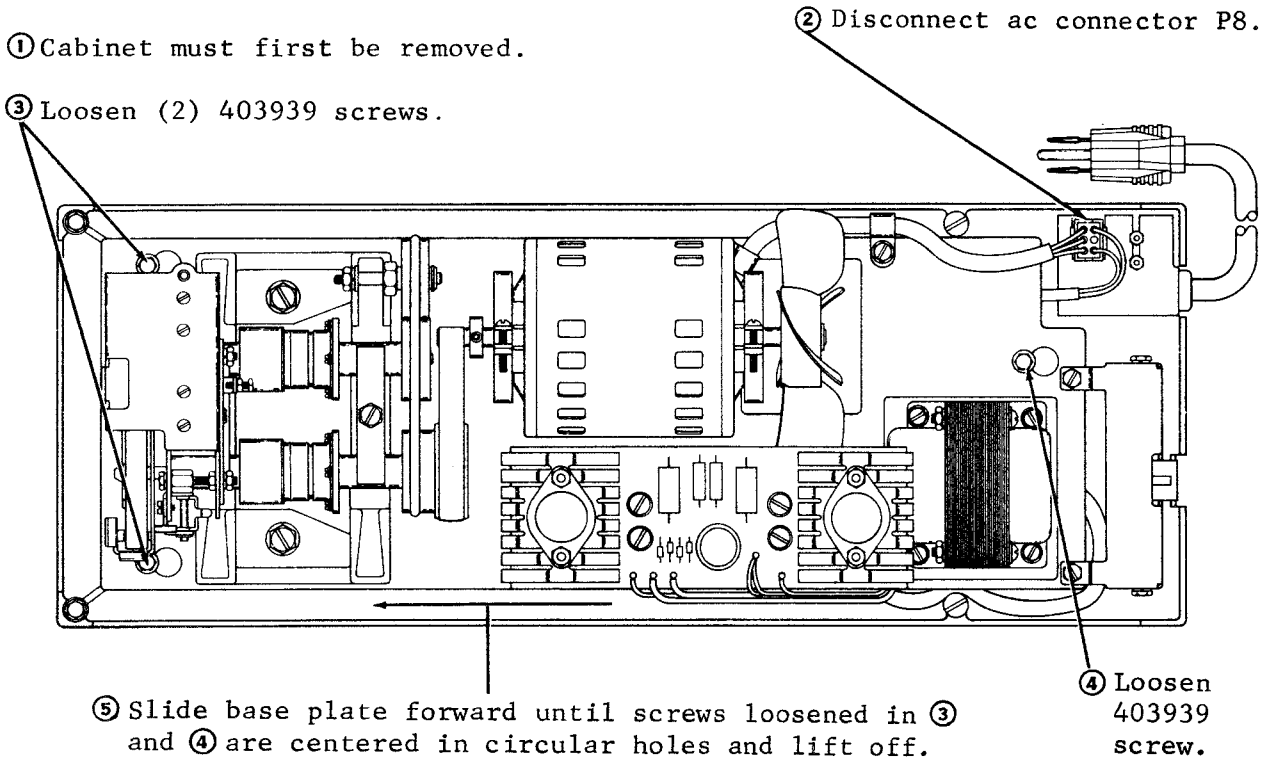
2. SUBASSEMBLY IDENTIFICATION (40CD101 CASSETTE DRIVE)



H. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY

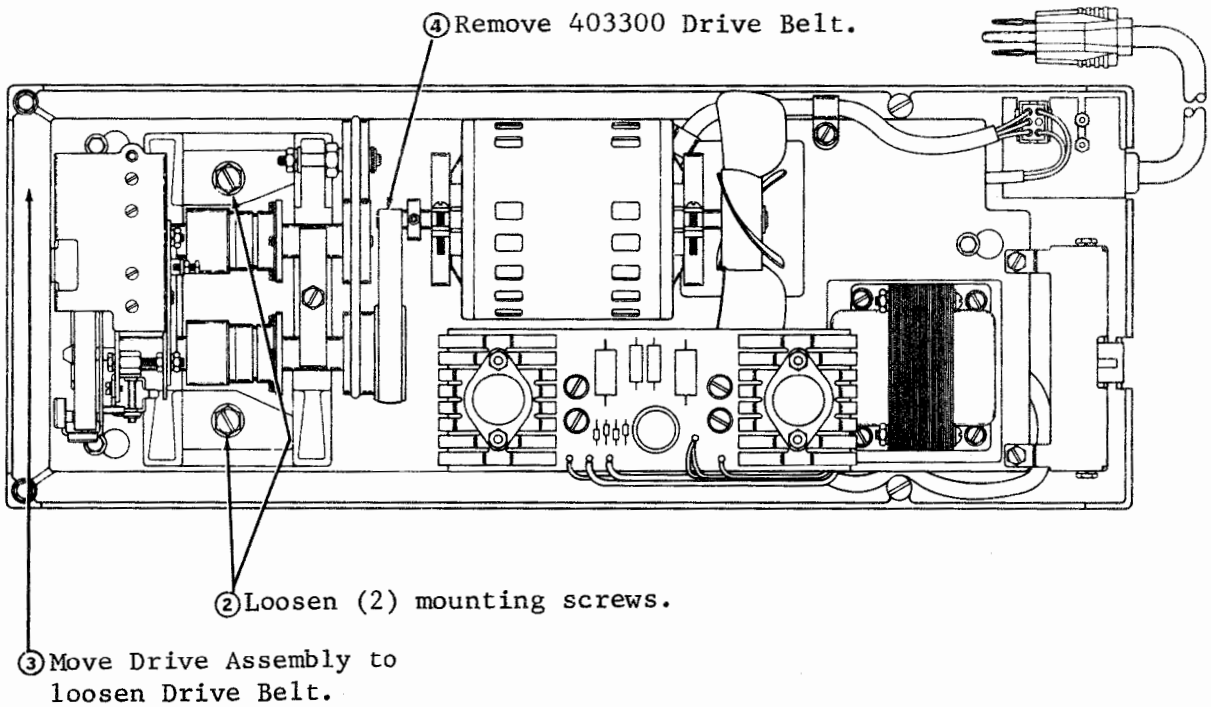
40CD101 Cassette Drive (from cabinet base)



To install Cassette Drive with Base Plate reverse removal procedures. Before sliding Cassette Drive rearward, shoulder screws must be centered in circular holes located under Power Supply and Motor.

403300 Drive Belt

①Cabinet must first be removed.



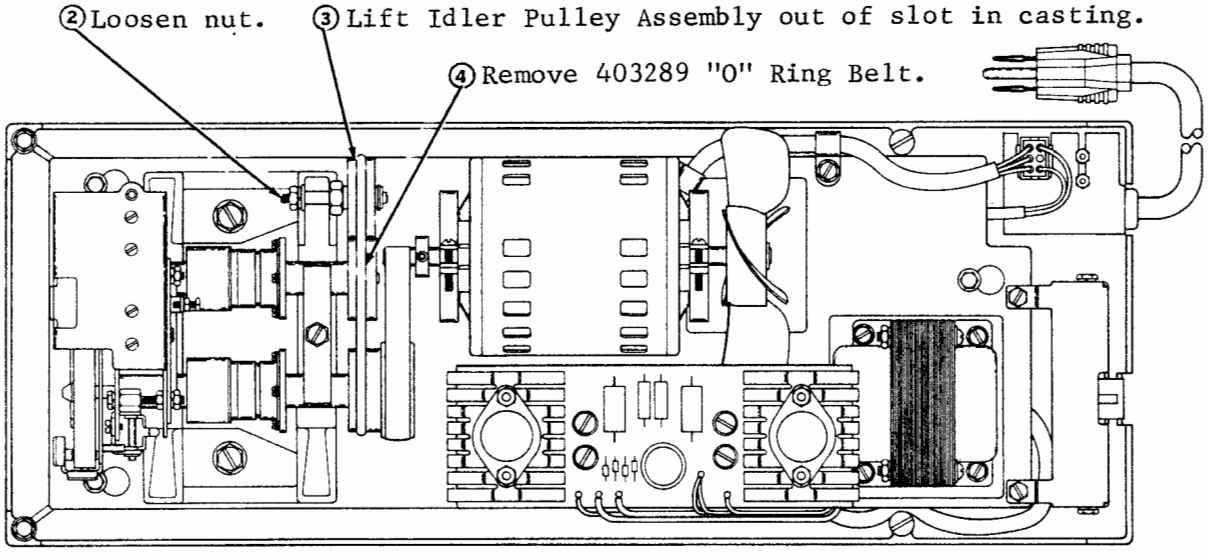
To install Drive Belt, reverse procedures. Recheck Motor Drive Belt adjustment and Motor Pulley adjustment (See Part 5.E, page).

H. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY (Cont)

403289 "O" Ring Belt

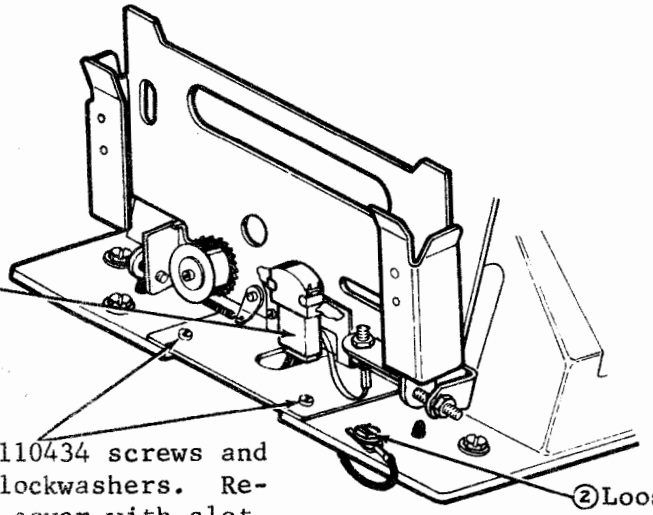
①403300 Drive Belt must first be removed.



To install reverse procedure. Recheck "O" Ring Belt adjustment (See Part 5.E page).

410572 Logic Circuit Card

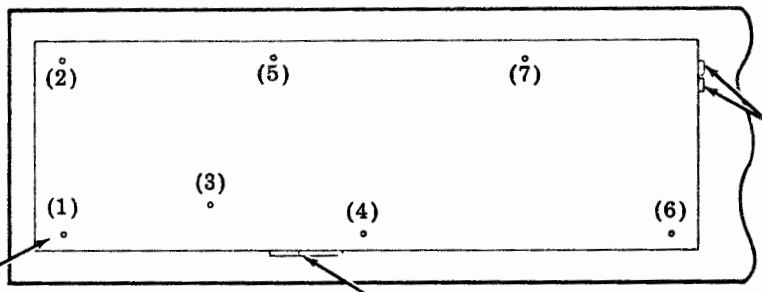
① Cassette Drive with Base must first be removed.



④ Remove tape head connector.

③ Remove (2) 110434 screws and (2) 110743 lockwashers. Remove 403301 cover with slot.

② Loosen 403939 screw and remove terminal.



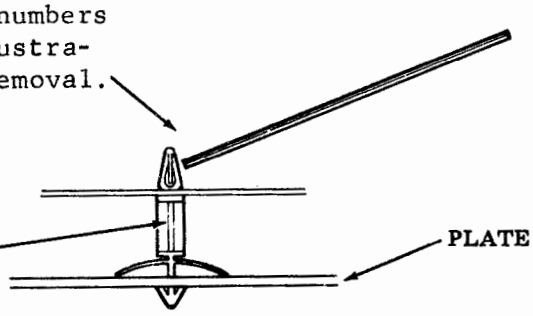
⑥ Remove connectors P1 and P2.

⑦ Remove connectors P4A and P4B.

⑤ Pry card off of 403586 plastic studs in order shown by numbers in parentheses. See illustration showing manner of removal.

① Push projection in with orange stick (or equivalent).

② Apply pressure upward here with thumb or fingers at same time projection is being pushed inward.

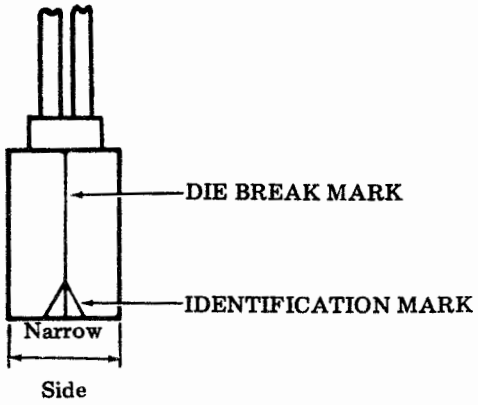


MANNER OF PRYING CIRCUIT CARD FROM PLASTIC STUDS

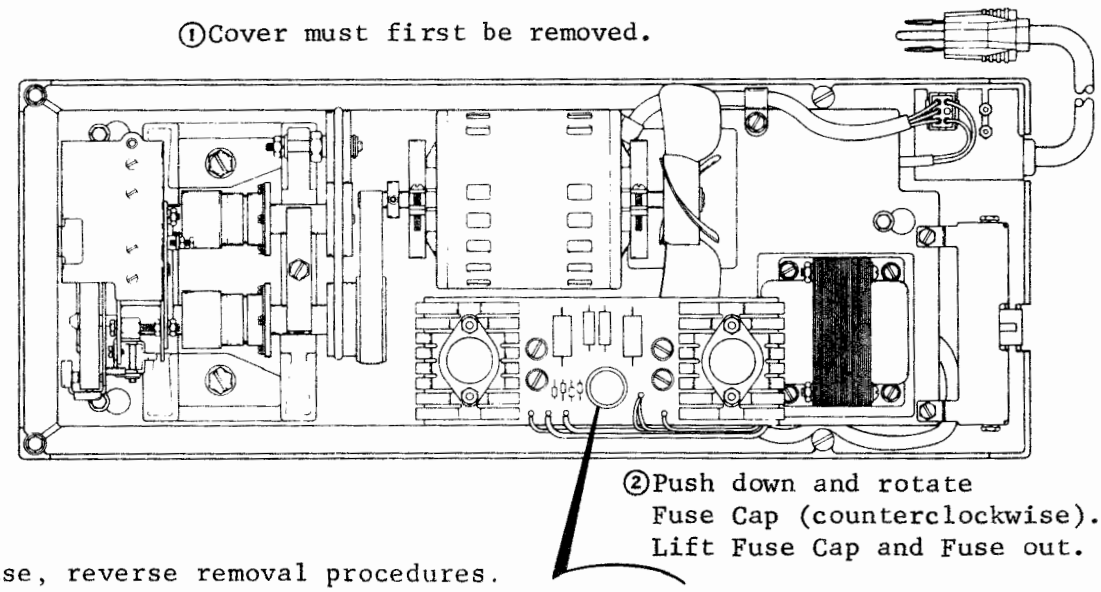
H. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY, 410572 Logic Circuit Card (Cont)

To install 410572 circuit card, reverse removal procedures. Circuit card must be installed with component side toward base plate. Projections or 403586 plastic studs must secure circuit board. The tape head connector must be assembled to the tape head so that the identification mark is to the right as viewed from the front of the cassette drive. See illustration below.

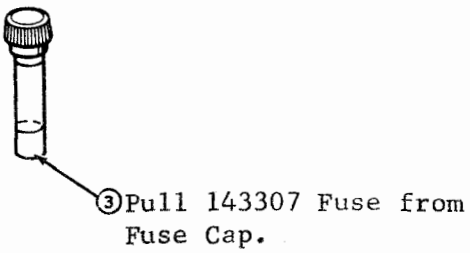


143307 Fuse



To install Fuse, reverse removal procedures.

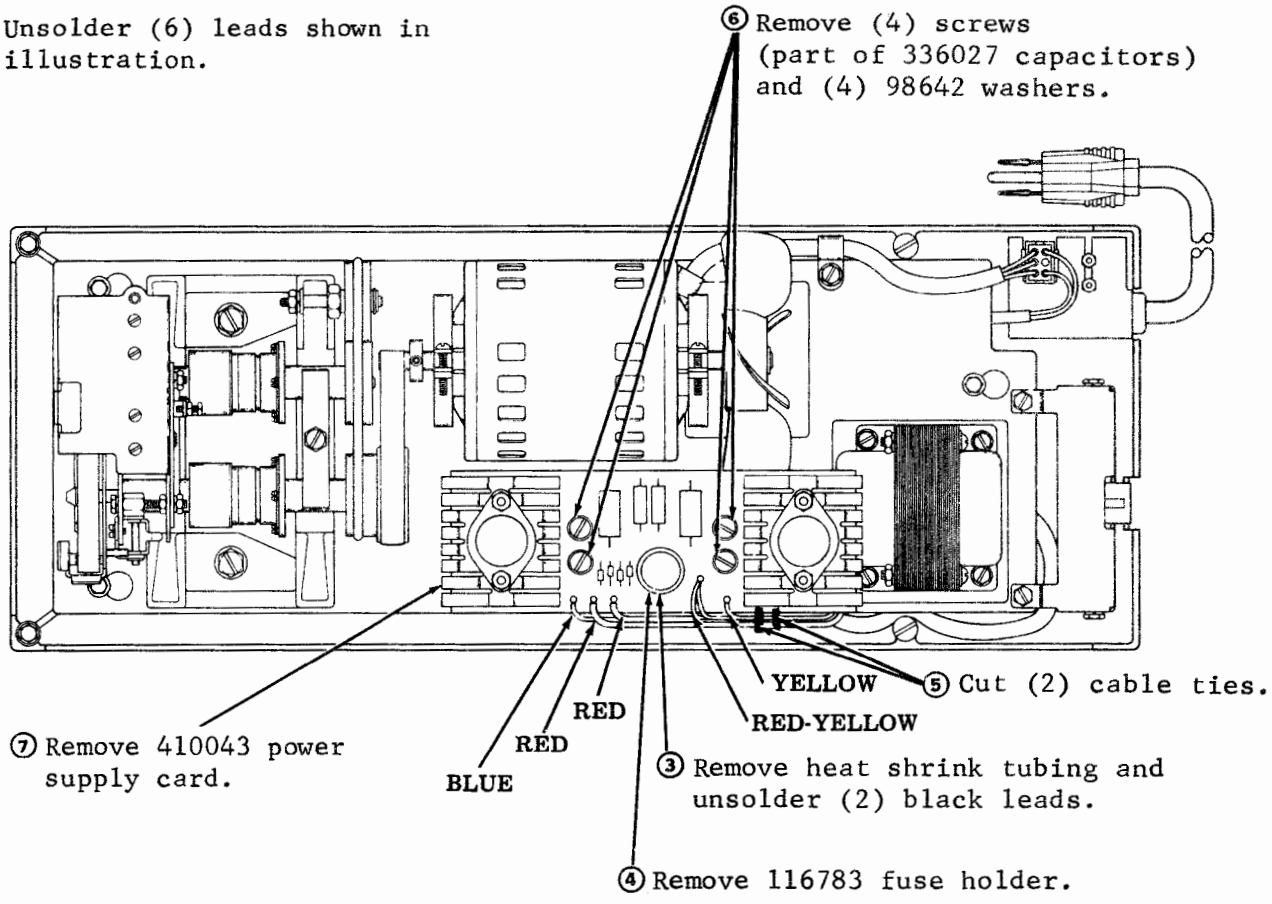
NOTE: Replace with 143307 0.6 amp Slo-Blo fuse.



410043 Power Supply Circuit Card

① Cover must first be removed.

② Unsolder (6) leads shown in illustration.

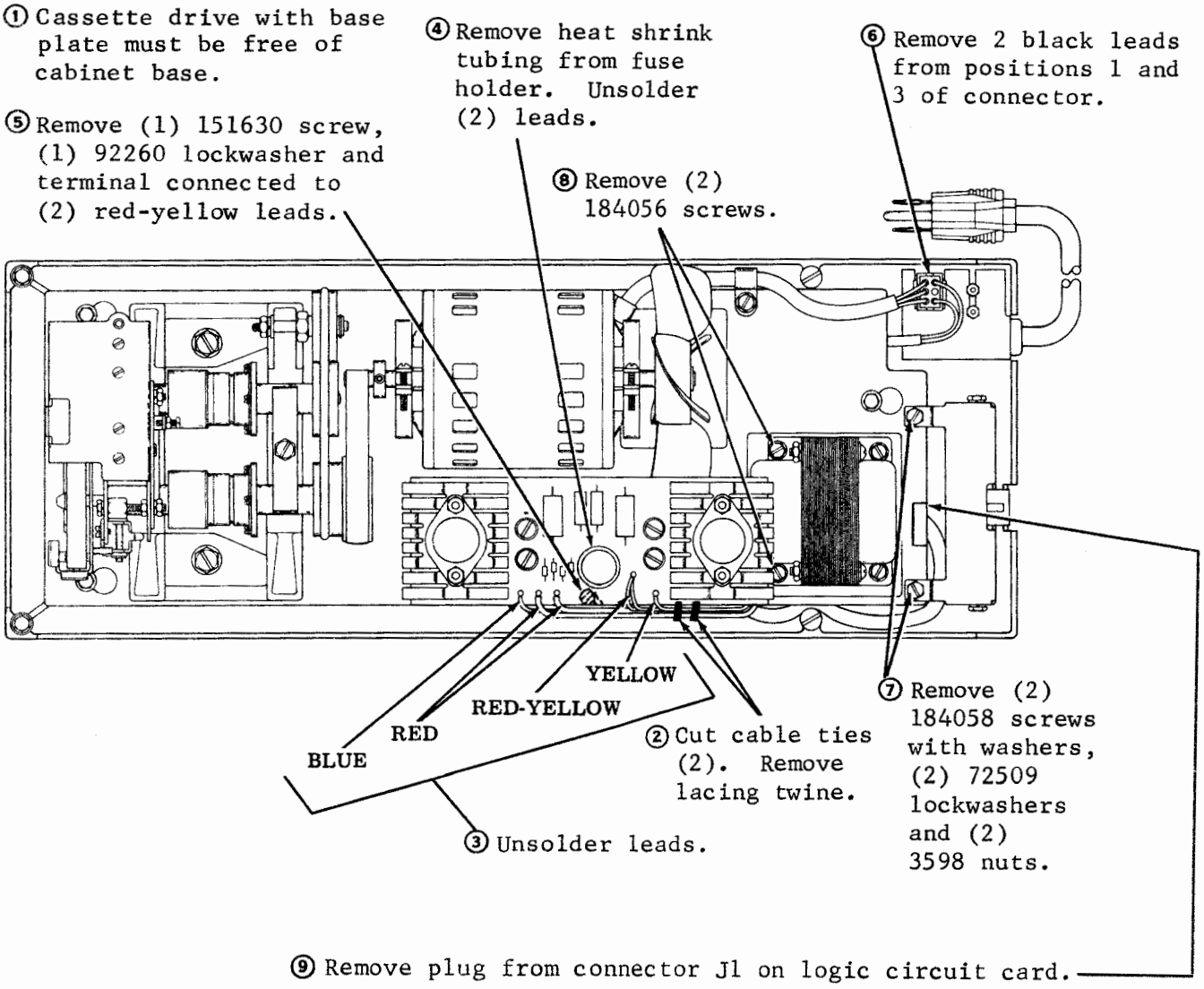


To install circuit card, reverse procedures. Cover lower portion of Fuse Holder with suitable heat shrink tubing after black leads are soldered in place. Secure cable assembly to power supply circuit board with (2) 43679RM cable ties.

H. CASSETTE DRIVE (Cont)

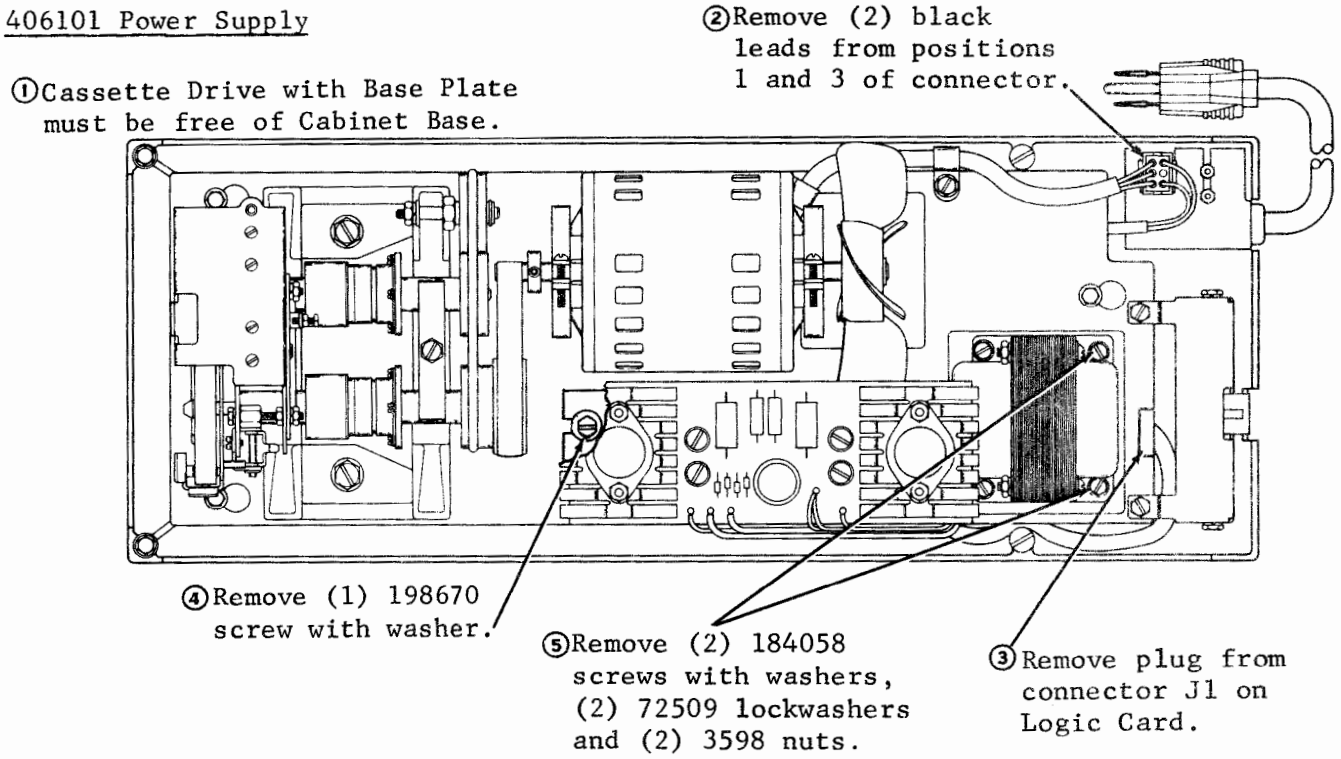
3. DISASSEMBLY/REASSEMBLY (Cont)

406103 Transformer



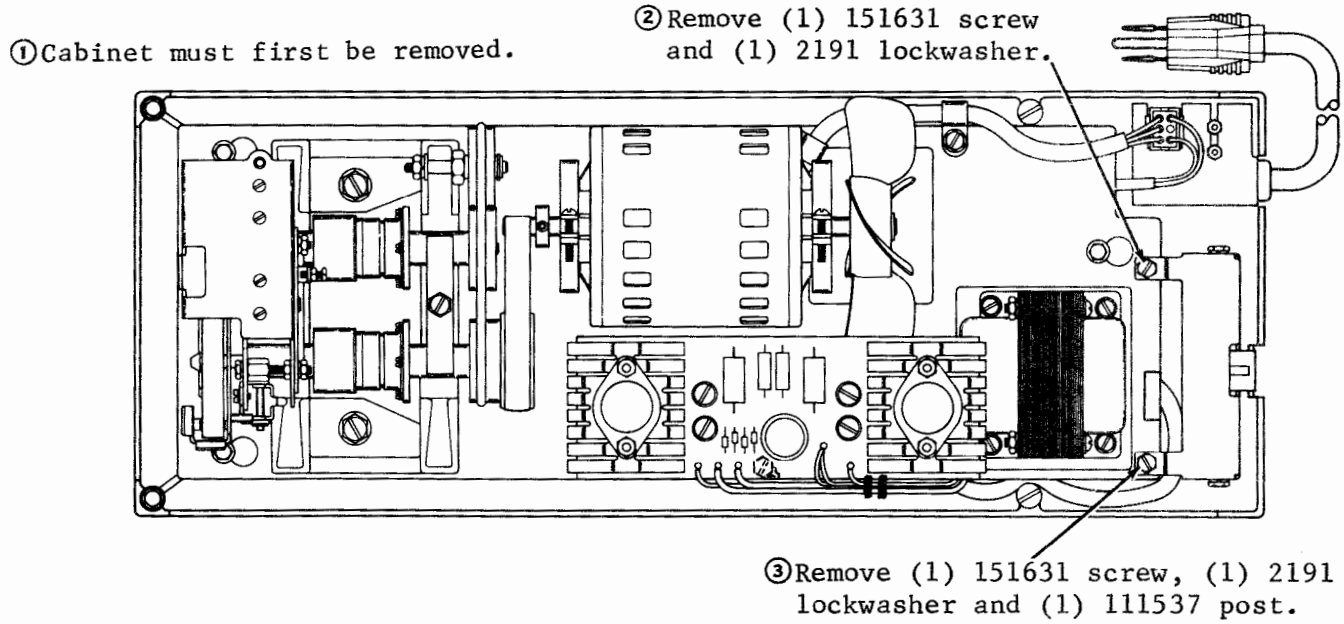
To install 406103 transformer, reverse removal procedures. Cover lower portion of Fuse Holder with suitable heat shrink tubing after leads are soldered in place. Secure cable assembly to Power Supply circuit board with (2) 43679RM cable ties.

406101 Power Supply



To install Power Supply, reverse procedures.

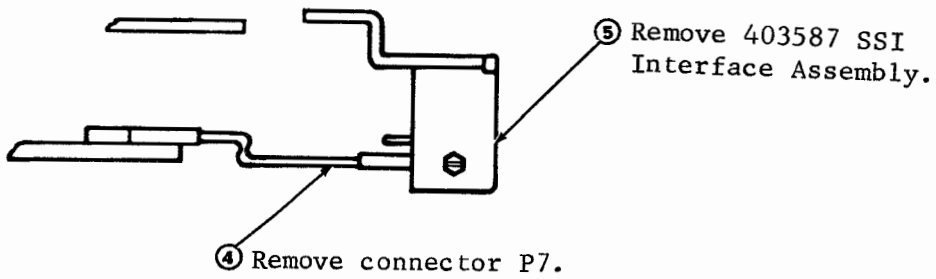
403587 SSI Interface Assembly



H. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY (Cont)

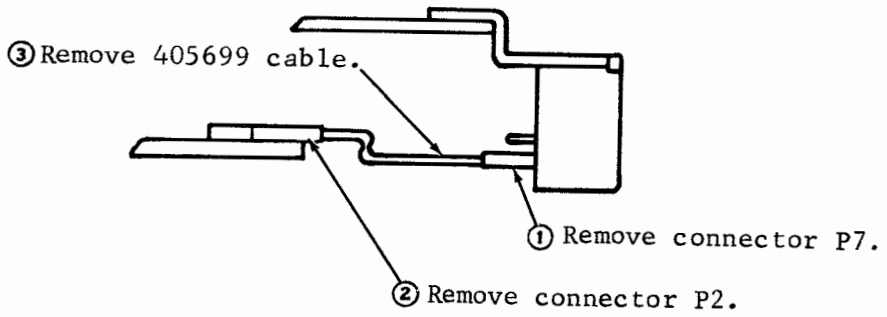
403587 SSI Interface Assembly (Cont)



To install SSI Interface Assembly reverse procedures.

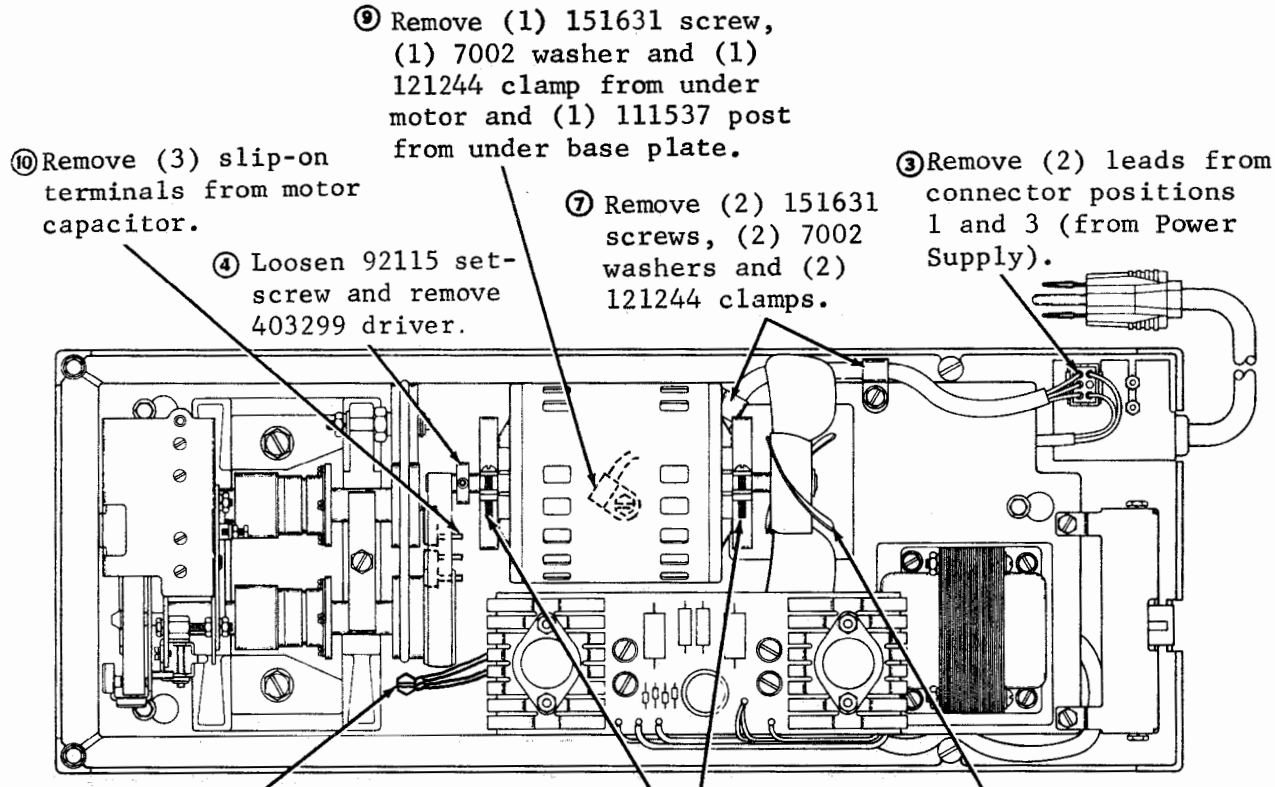
405699 SSI Interface Cable

①Cassette drive with base plate must be free of cabinet base.



403303 Motor Assembly

①403300 Drive Belt must first be removed.



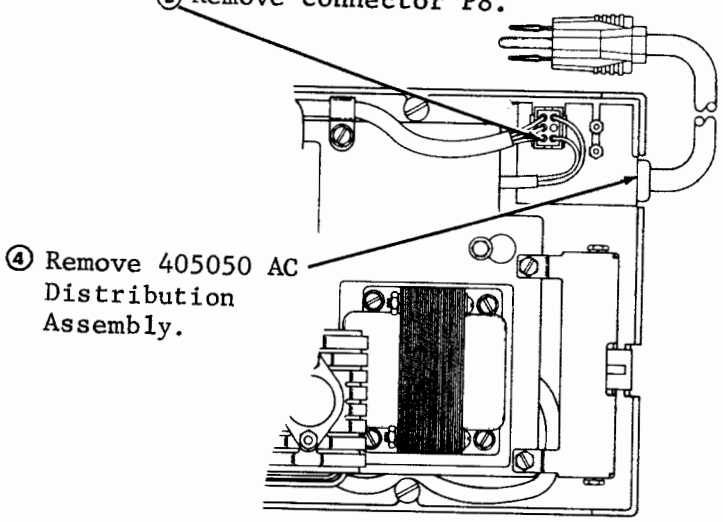
To install motor reverse procedures.

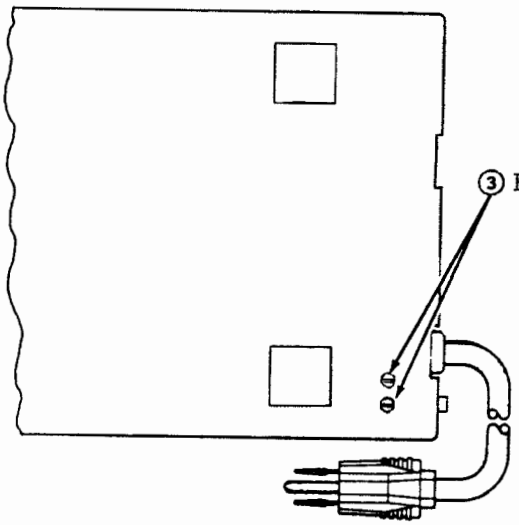
H. CASSETTE DRIVE (Cont)

3. DISASSEMBLY/REASSEMBLY (Cont)

405050 AC Distribution Assembly

① Cover must first be removed.





To install AC Distribution Assembly, reverse procedures.

PART 7 -- ROUTINE MAINTENANCE

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A. CHECK POINTS

1. GENERAL

a. All connectors are seated properly and securely.
b. Look for pinched or crimped wires or cables.
c. Doors and panels open and close properly.
d. Latches open easily and close securely.
e. Covers are secure.
f. Red oxide at any point (cassette drive only).

2. FAN ASSEMBLY

a. Unrestricted flow of air.
b. Quiet operation.

A. CHECK POINTS (Cont)

3. MONITOR

a. Check for excessive buildup of dust.
b. Ventilating slots are clear.

4. OPCON

No loose keys.

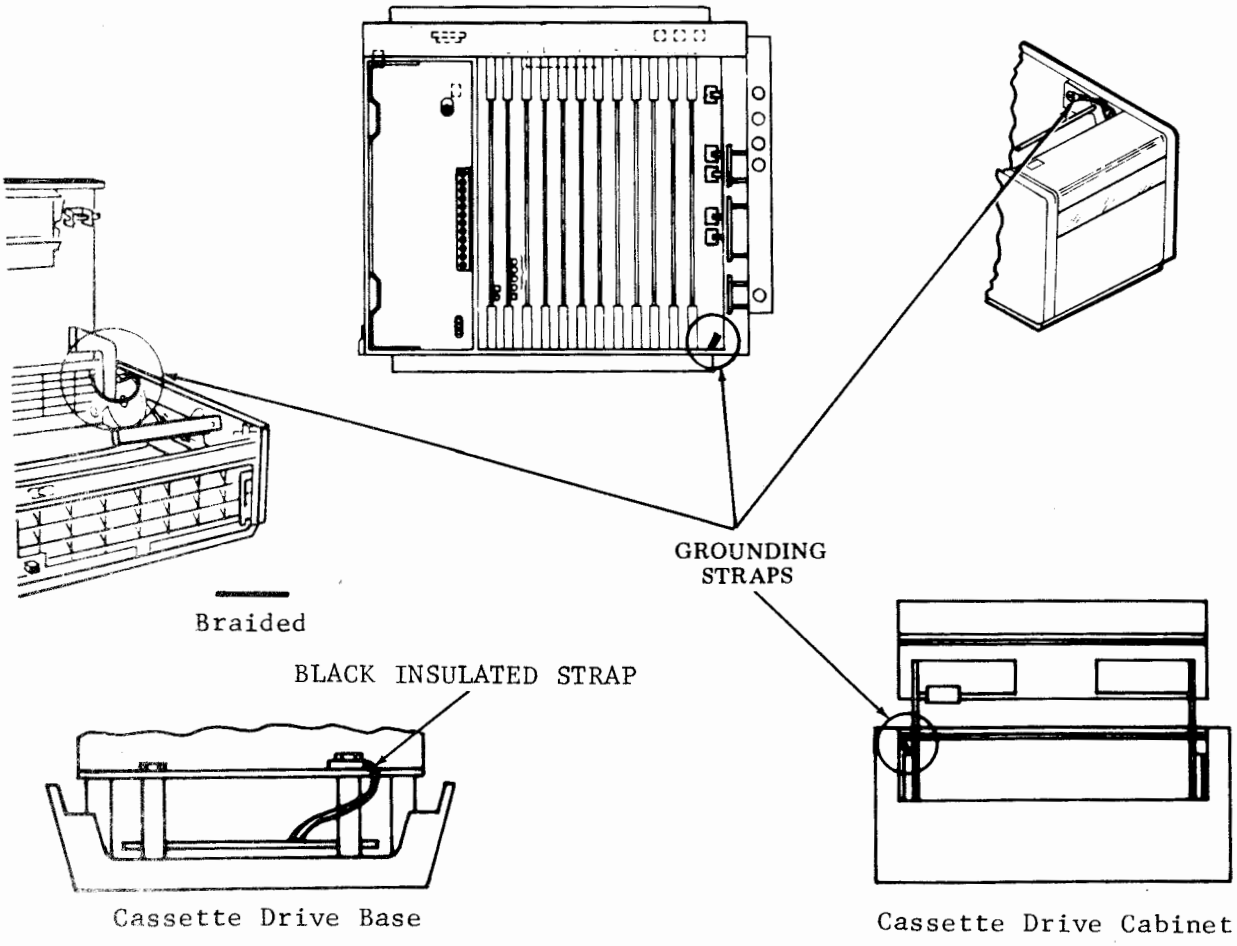
5. PRINTER

Check printed copy for smears.

6. GROUNDING STRAPS AND FUSES

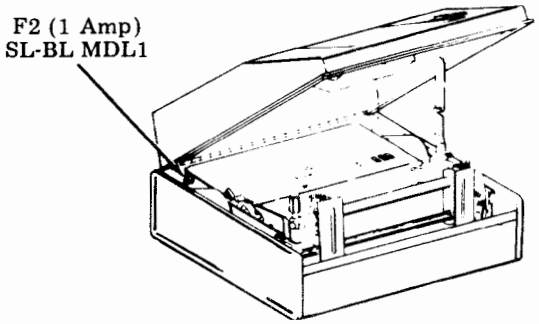
Grounding Straps

During servicing or prior to operational checkout, make sure all grounding straps are connected.

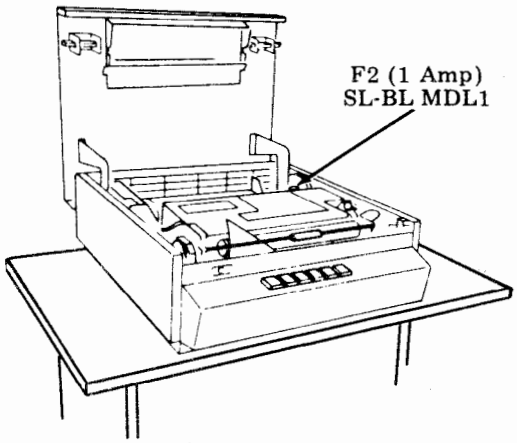


Fuses

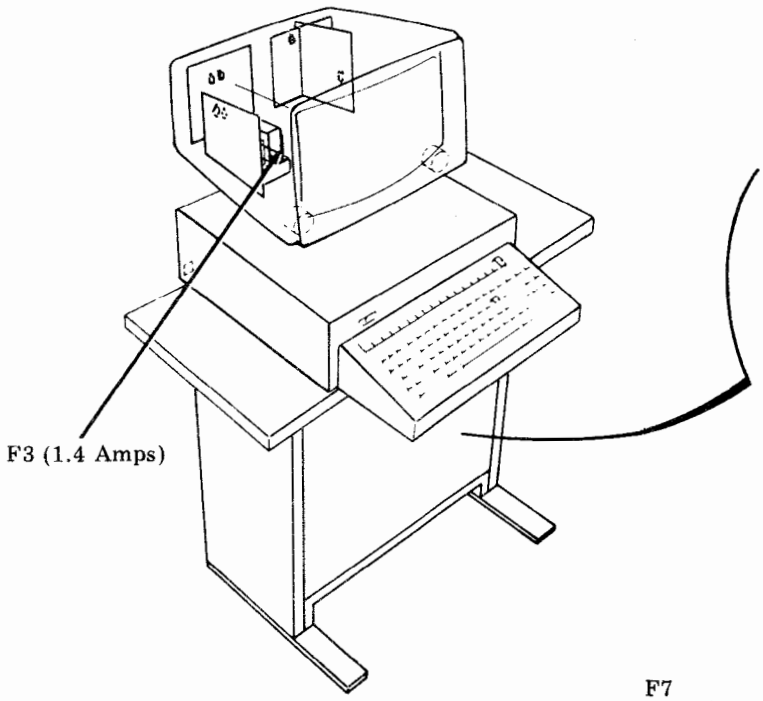
Check fuses for condition and ratings (fuse ratings are critical; no higher rating than specified should be used).

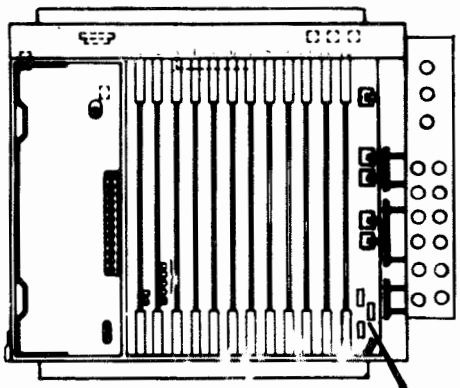


Tractor Feed Printer



Friction Feed Printer

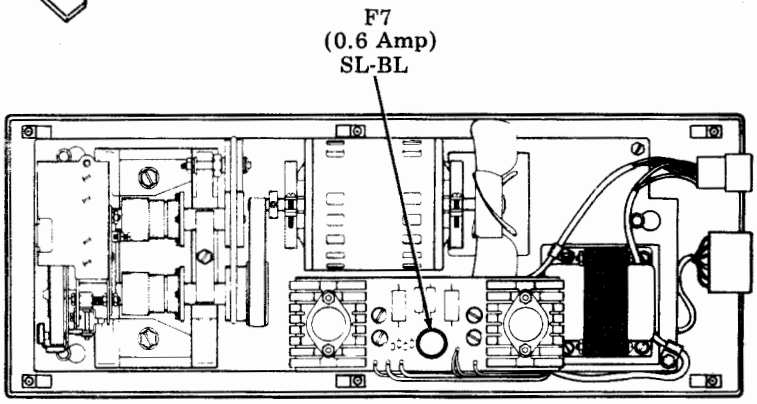




CONTROLLER

40C435/AEB/088
40C435/ACE/059
ONLY

F4 2.5 AMP
F5 2.5 AMP
F6 2.5 AMP



B. CLEANING

1. CABINETS AND PEDESTALS

NOTE: Avoid cleaning methods that spread dust and debris to surrounding areas.

Clean all ventilating screens; while vacuuming, use a soft-bristled brush to remove debris.

Clean exterior surfaces:

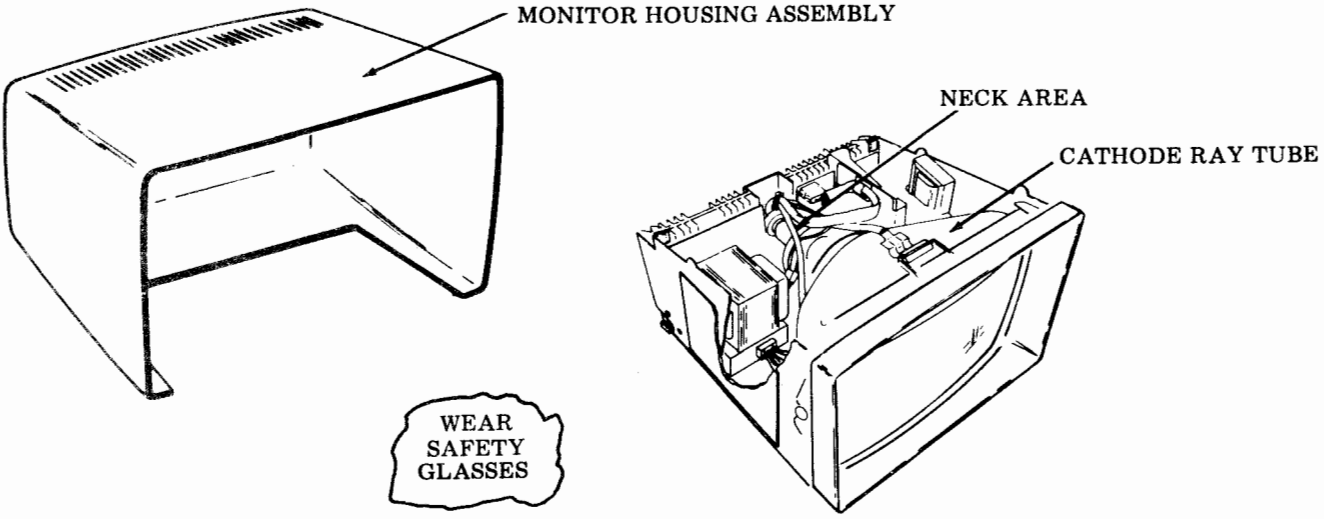
- Wash with mild detergent solution.
- Rinse with damp cloth.
- Buff dry with soft cloth.

2. MONITOR

WARNING 1: BE CAREFUL WHEN WORKING IN AREA OF PICTURE TUBE. KEEP SHARP OBJECTS, THAT COULD SCRATCH TUBE, OUT OF WAY.

a. Face of tube.
b. Any dust buildup on outside or inside.

DANGER: TURN OFF ALL THE POWER AND SIGNAL SOURCES BEFORE REMOVING OR REPLACING ANY COMPONENT. WEAR APPROVED SAFETY GLASSES WHEN THE HOUSING OF THE MONITOR IS REMOVED, AS THE DISPLAY TUBE IS FRAGILE IN THE NECK AREA AND IS SUBJECT TO IMPLOSION IF BROKEN. BE CAREFUL NOT TO STRIKE THE GLASS OF THE TUBE WITH TOOLS OR COMPONENTS WHEN WORKING IN ITS VICINITY.



WARNING 2: TO AVOID POSSIBLE INTERNAL DAMAGE TO CIRCUITRY, WEAR A 346392 STATIC DISCHARGE STRAP CONNECTED TO GROUND TO ALLOW STATIC DISCHARGE BEFORE HANDLING CIRCUIT CARDS FOR REMOVAL OR REPLACEMENT. AVOID TOUCHING CIRCUIT LANDS OR COMPONENTS AS MUCH AS POSSIBLE.

3. PRINTER (Also See D. PRINTER ROUTINING)

a. Type faces.
b. Paper chute.
c. Paper roller.

4. CASSETTE DRIVE

a. Using 337401 recording head cleaner and a cotton swab, the tape head, hub drivers and cassette locating pins should be cleaned each week or sooner if dirt or oxide deposits are detected on the hub drivers and locating pins.
b. Mating surfaces of the armature and the rotor faces. Place a small piece of paper between the armature and the rotor faces of each clutch assembly; apply pressure to each face; withdraw paper from between the armature and rotor. Repeat for each pole face until the withdrawn paper is clean.
c. The 403238 tape cleaner should be replaced once at every service interval, after normal usage. Under heavy usage, it should be replaced twice between service intervals.

C. LUBRICATION

1. OPCON

Never lubricate the keyswitch assemblies on the operator console.

2. PRINTER

The printer can be lubricated by positioning it in the ribbon changing (maintenance) position.

Lubricate the printer just prior to placing in service or before putting it in storage. Thereafter, lubricate the mechanisms every 2000 hours of running time.

Apply lubricant to points as indicated.

On small parts, a minimum amount of lubricant should be applied so that the lubricant remains on the parts and does not run off.

Excessive lubricant should be removed with a dry, lint-free cloth.

The following areas must be kept dry, free of all lubricant:

a. All electrical components, including terminals.
b. All parts normally touched by the operator, including exposed surfaces in ribbon, paper handling areas, and all large flat areas.

The following symbols indicate the quantity of lubricant to be used in a specified area: Symbols 01, 02, 03, etc, refer to 1, 2, 3, etc, drops of oil. The following list of symbols applied to the lubrication instructions and the type of lubricant to be used:

O 89970 Oil
G Apply thin film of 145867 grease.
S Staurate felt oilers, washers, and wicks with oil.
D Keep dry, no lubricant permitted.

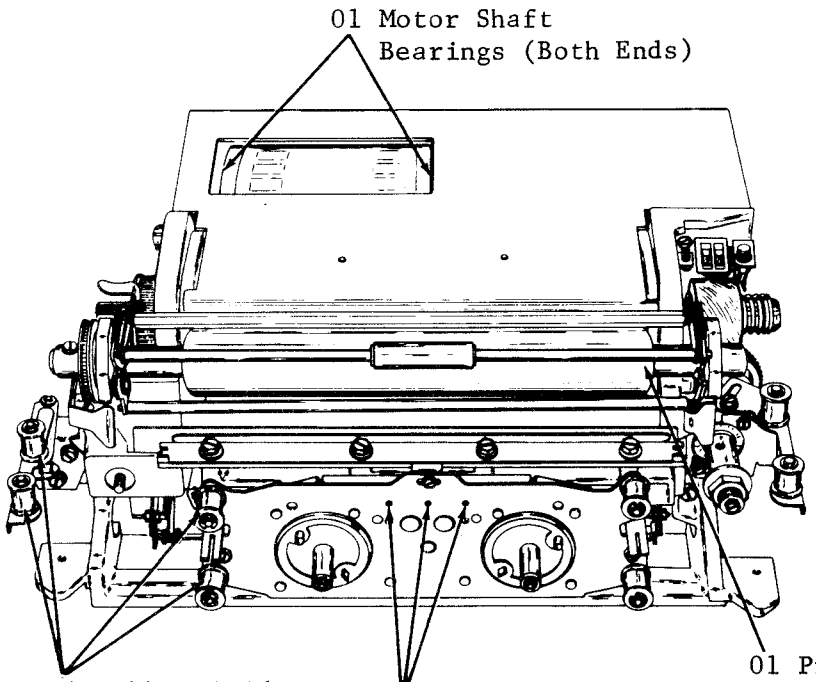
CAUTION: SEVERE PERMANENT DAMAGE TO THE SINTERED TYPE AND SHIELDED TYPE BEARINGS ON THIS UNIT WILL OCCUR IF THE PRINTER IS SUBJECTED TO VAPOR DEGREASING, DEGREASING AGENTS, SUBMERGED IN DETERGENT SOLUTIONS, OR SPRAYED OR WIPED WITH CLEANING SOLVENTS OF ANY KIND.

C. LUBRICATION (Cont)

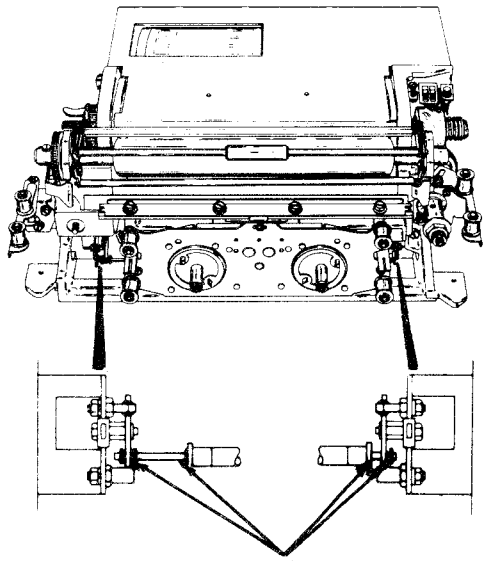
2. PRINTER (Cont)

Friction Feed

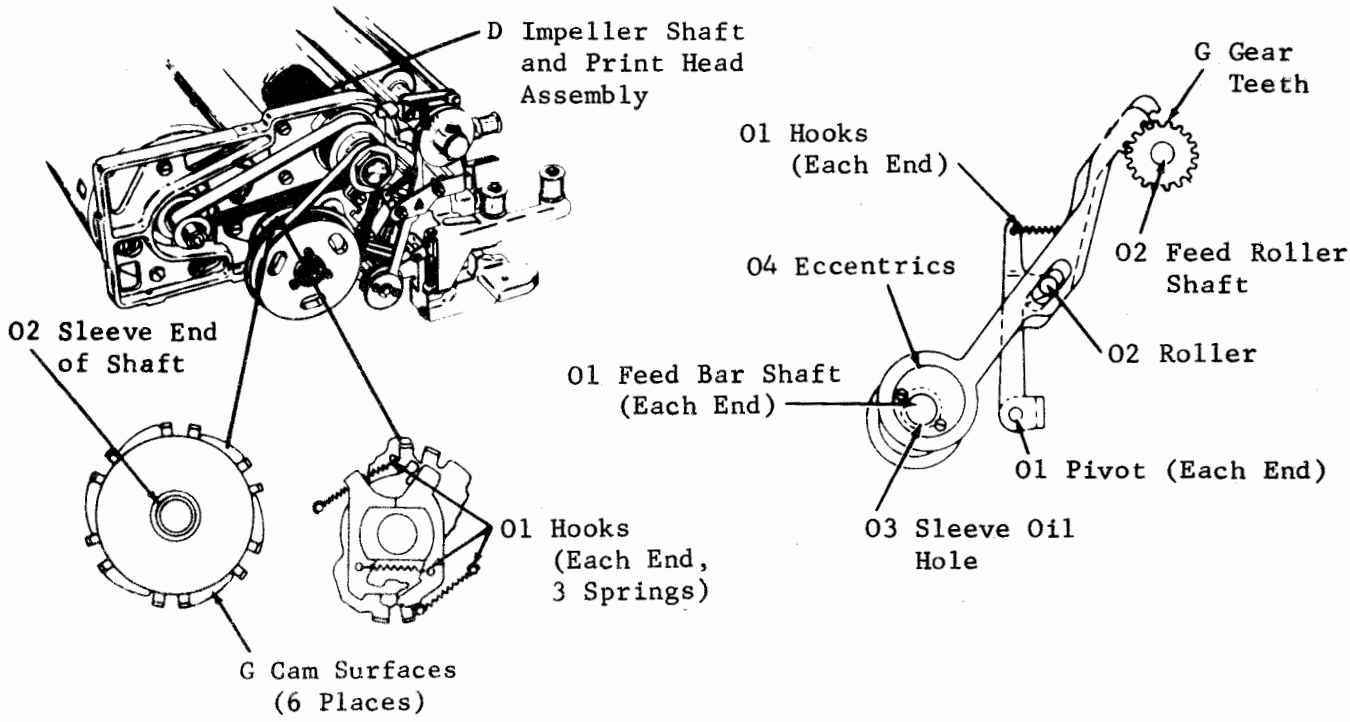
Lubrication -- Front and Top



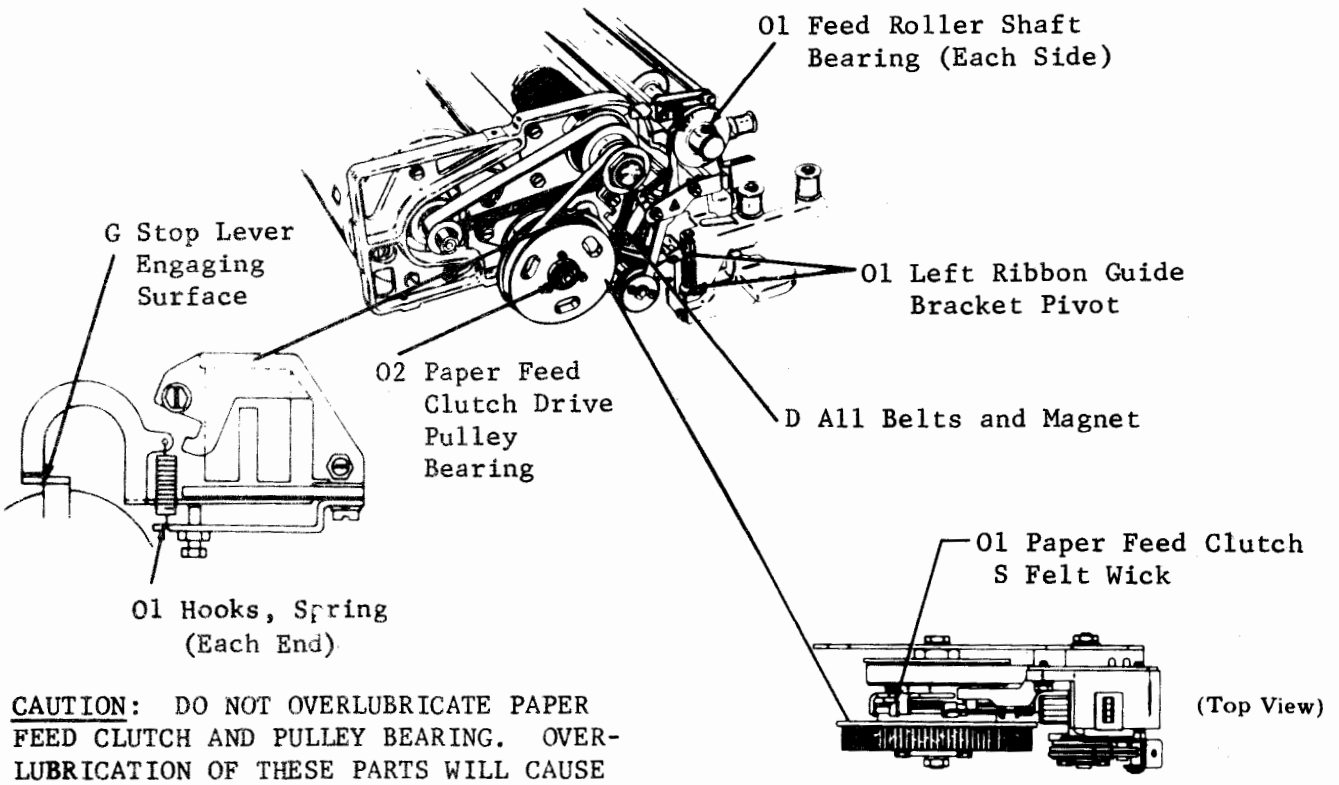
Lubrication -- Front



Lubrication -- Left Side



NOTE: Lubrication for these parts is done at the time of disassembly or extensive overhaul.

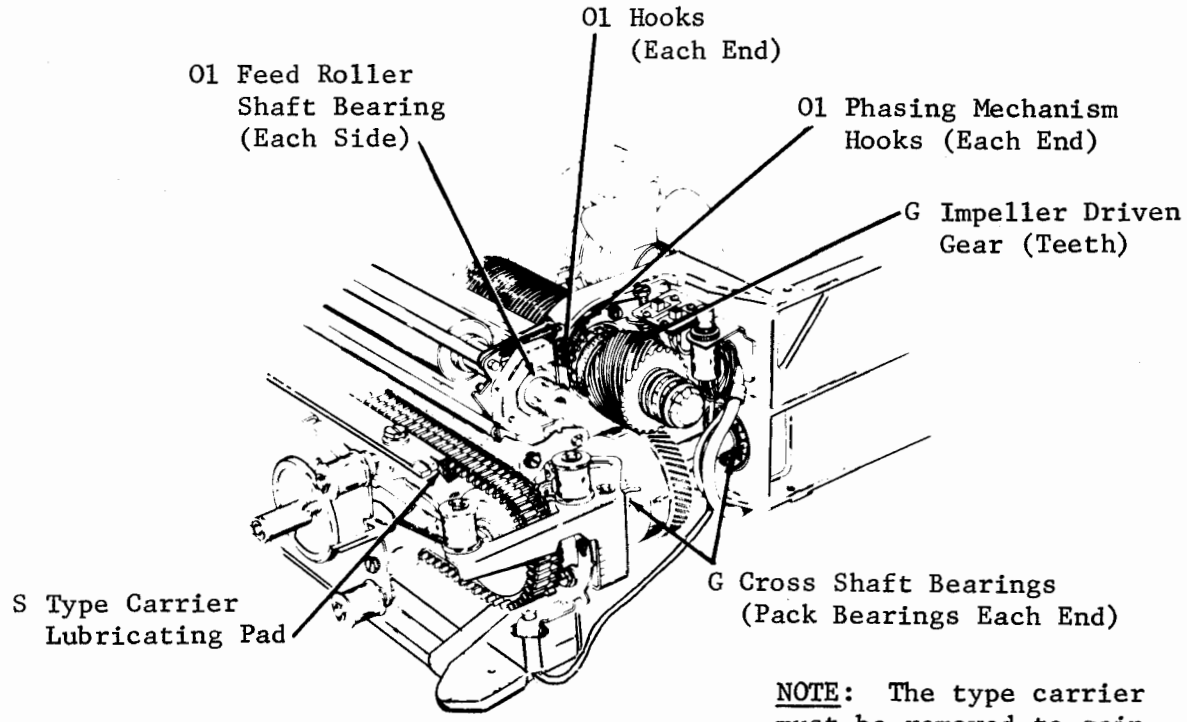


CAUTION: DO NOT OVERLUBRICATE PAPER FEED CLUTCH AND PULLEY BEARING. OVER-LUBRICATION OF THESE PARTS WILL CAUSE OIL TO BE THROWN ON THE CIRCUIT CARD.

C. LUBRICATION (Cont)

2. PRINTER, Friction Feed (Cont)

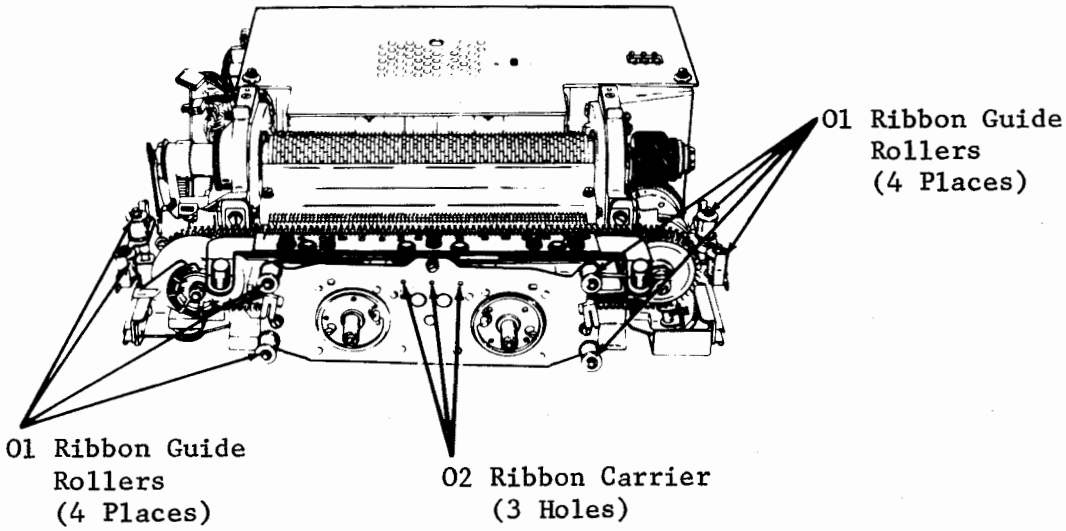
Lubrication -- Right Side



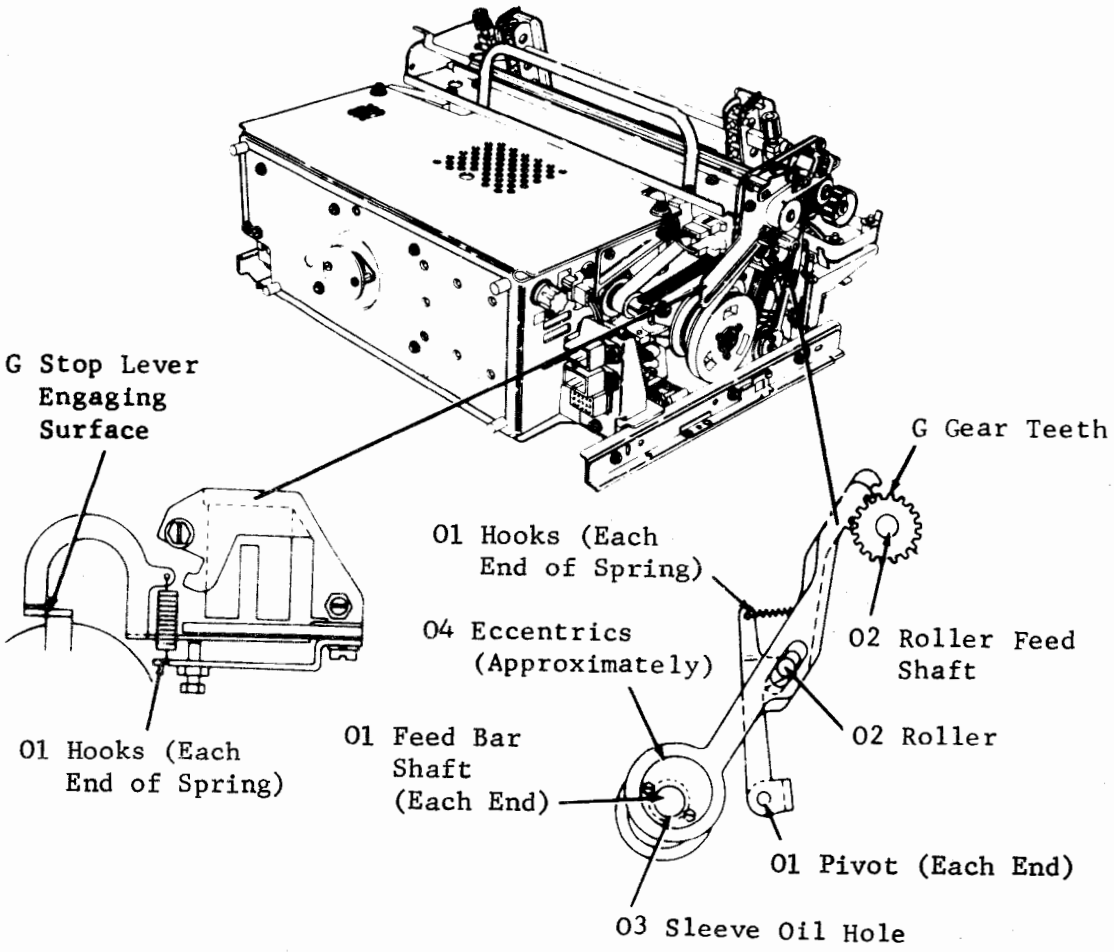
NOTE: The type carrier must be removed to gain access to the pad.

Tractor Feed Printer

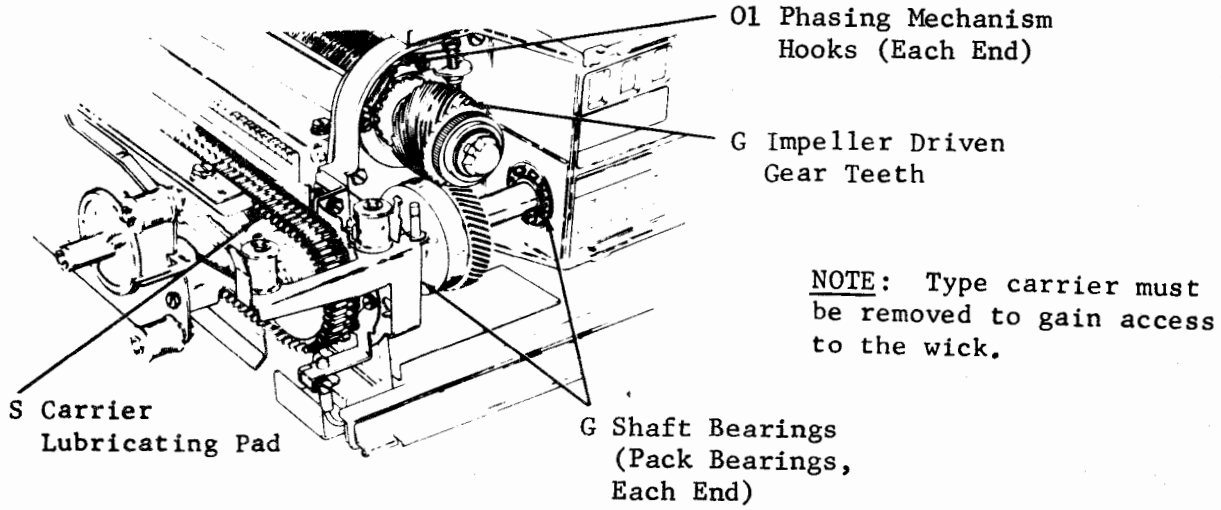
Lubrication -- Front Top



Lubrication -- Left Side



Lubrication -- Right Side

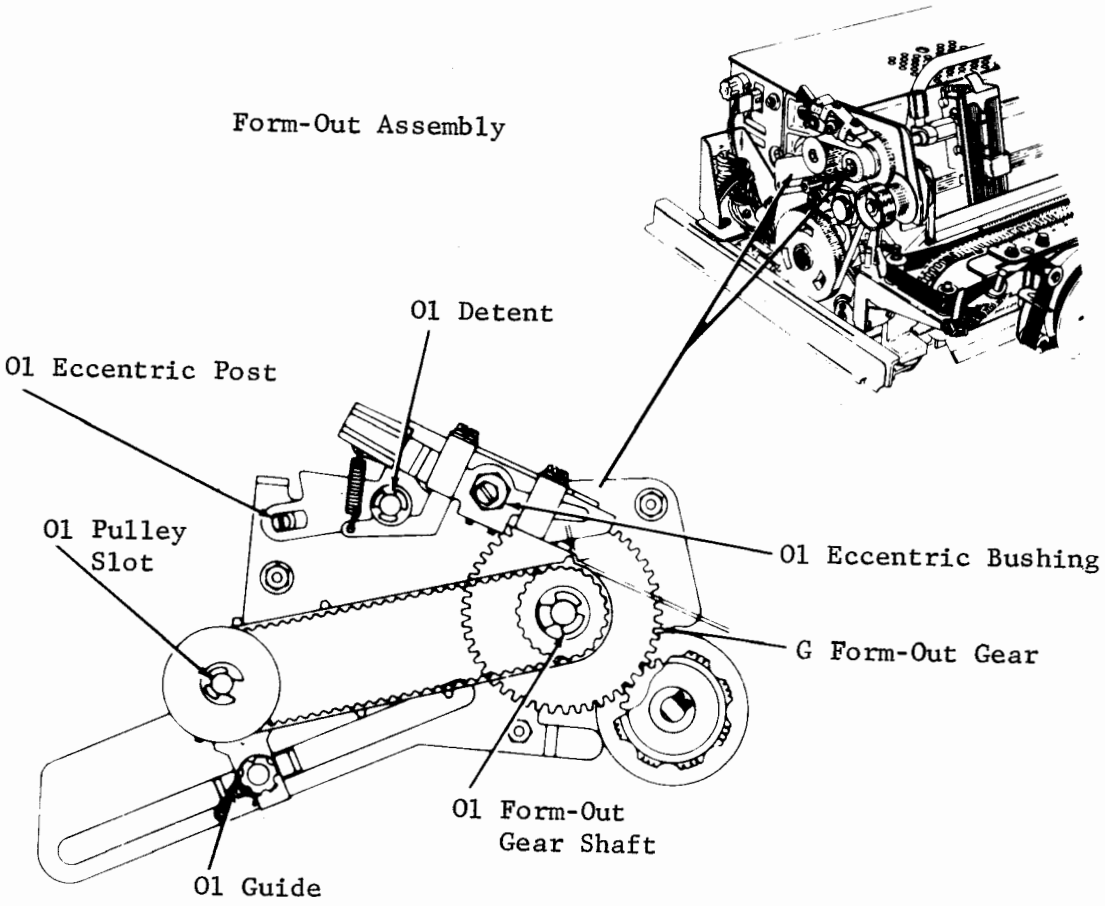


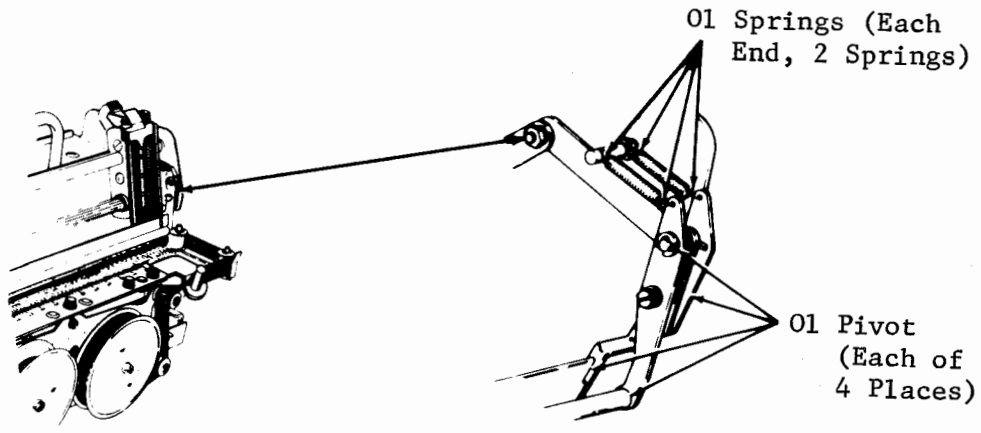
NOTE: Type carrier must be removed to gain access to the wick.

C. LUBRICATION (Cont)

2. PRINTER, Tractor Feed (Cont)

Lubrication -- Left Side





Paper Positioner Assembly

3. CASSETTE DRIVE

Lubricate the cassette drive just prior to placing in service or before putting it in storage. The cassette drive should be relubricated after it has been in service a few weeks. Thereafter, relubricate every 2,000 hours of running time or 6 months, whichever occurs first.

Apply lubricants to points as indicated.
On small parts, a minimum amount of lubricant should be applied so that the lubricant remains on the parts and does not run off.
Excessive lubricant should be removed with a dry, lint-free cloth.

The following areas must be kept dry, free of all lubricant:

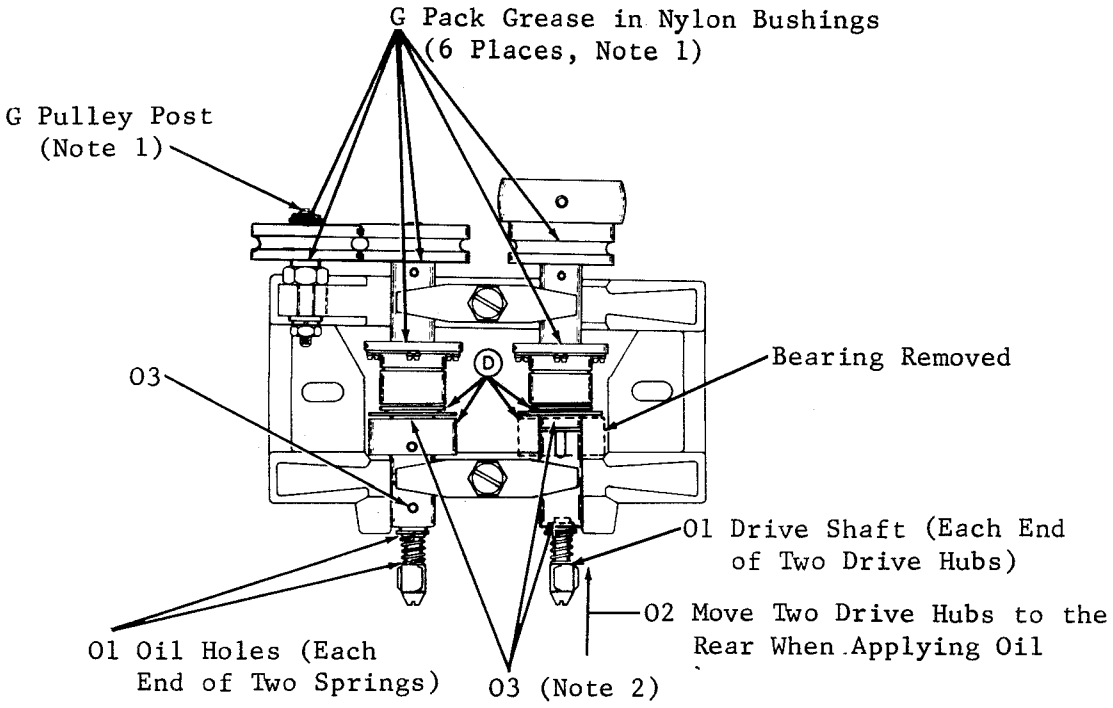
All electrical components, including terminals.
All parts normally touched by the operator, including exposed surfaces in the cassette holder area and all large flat areas.
Reading head.
Surfaces of the tape cleaner which contact the magnetic tape.
Friction surfaces of the magnetic clutches.

The following symbols indicate the quantity of lubricant to be used on a specified area: Symbols 01, 02, 03, etc., refer to 1, 2, 3, etc., drops of oil. The following list of symbols applies to the lubrication instructions and the type of lubricant to be used:

O 89970 Oil
G Pack grease between nylon bushings (143484--one pound can or 145867 4 ounce tube).
D Keep dry, no lubricant permitted.

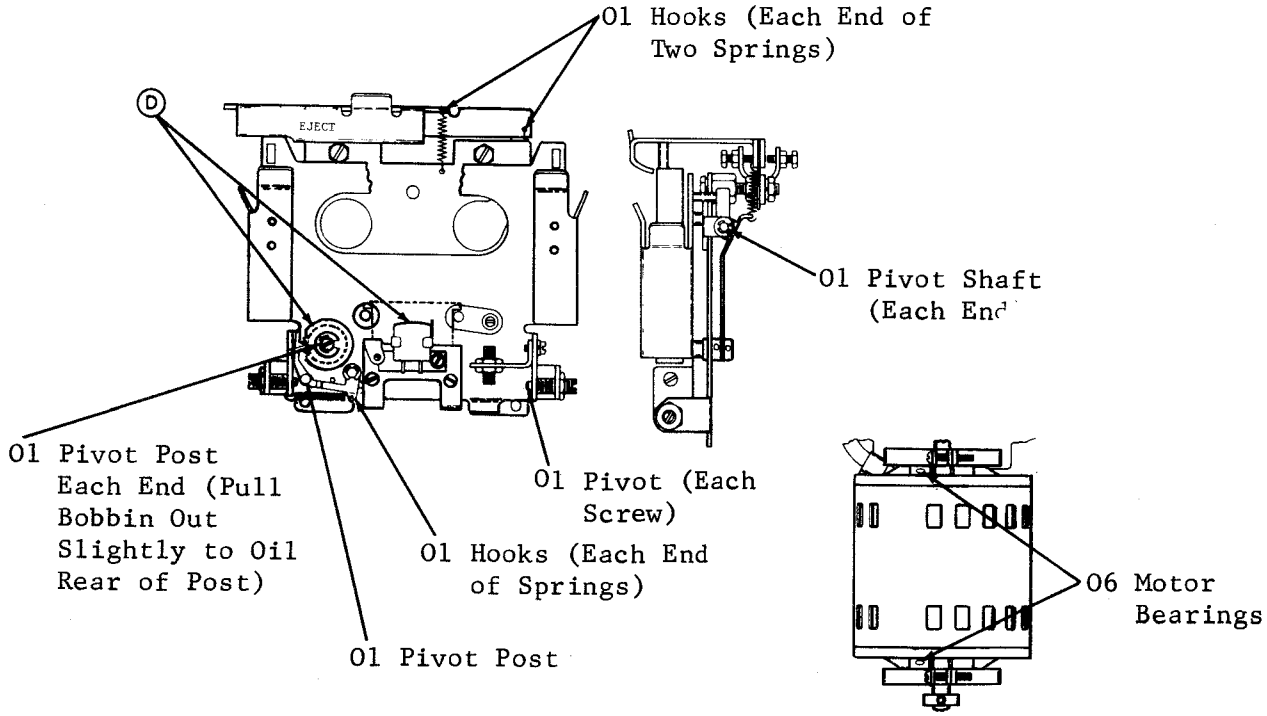
C. LUBRICATION (Cont)

3. CASSETTE DRIVE (Cont)



NOTE 1: These nylon bushings should be greased only when the unit is reassembled.

NOTE 2: These four nylon bushings and fiber friction washers should be oiled (03 drops), whenever a nylon bushing or a friction washer is replaced.



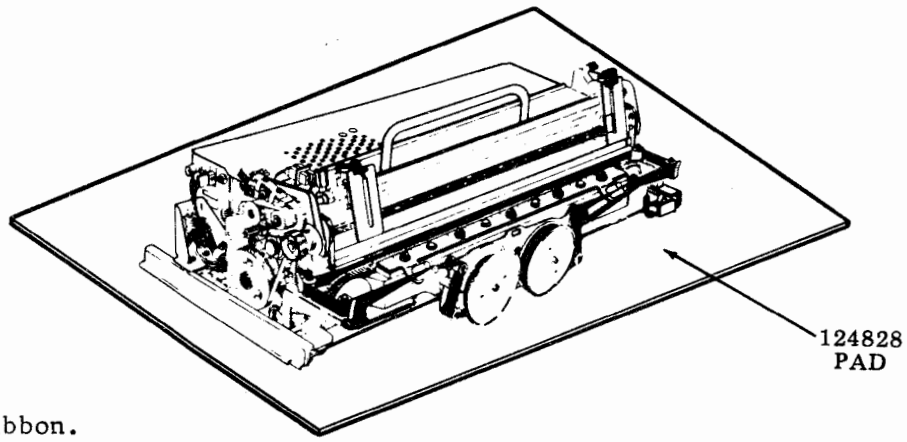
D. PRINTER ROUTINING

1. GENERAL

Printer

The printer should be routined after 2000 hours of running time or one year. Printer should be removed from the cabinet before routining is begun. See PART 6 -- COMPONENT ACCESS for printer removal.

- To prevent damage to furniture, the printer should be placed on a pad such as 124828 protective pad, or other suitable substitute.



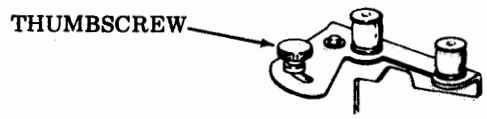
- Remove the ribbon.

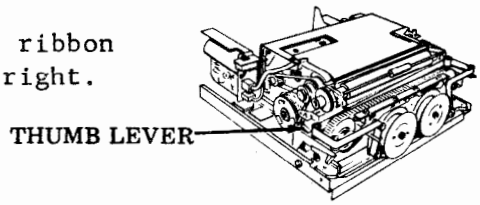
2. TYPE CARRIER REMOVAL AND CLEANING

Friction Feed

Ribbon Bracket

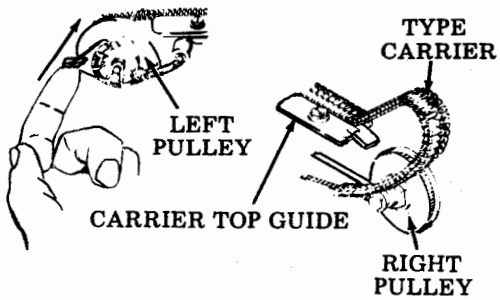
- Remove type carrier.
- Release thumb lever on left ribbon guide bracket allowing guide to swing to the left.
- Loosen thumbscrew on the right ribbon bracket; swing bracket to the right.





Type Carrier

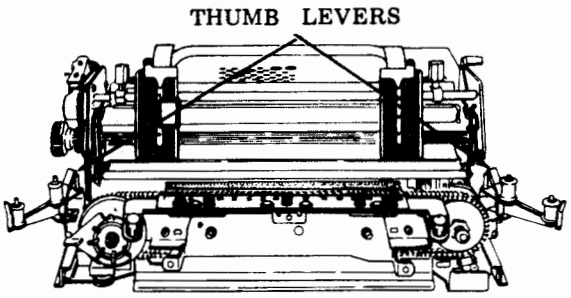
- Lift up on left pulley to release spring bias. While holding arm up, lift type carrier from right pulley and remove.



D. PRINTER ROUTINING (Cont)

2. TYPE CARRIER REMOVAL AND CLEANING (Cont)

Tractor Feed

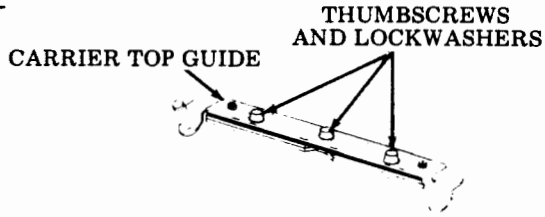


Ribbon Guide Brackets

- Release thumb levers on left and right ribbon guide brackets allowing guides to spring to sides of printer.

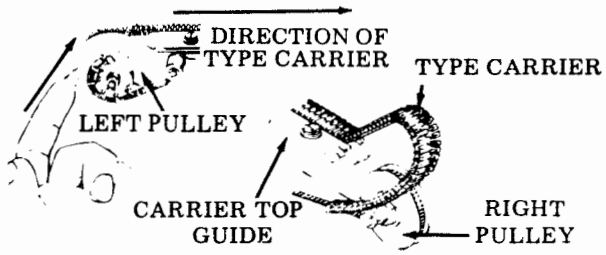
Carrier Top Guide (80-Column Tractor Only)

- On 80-column tractor, remove three thumbscrews and lockwashers securing carrier top guide; remove guide.



Type Carrier Removal

- Lift finger lever on left pulley and hold. Remove type carrier starting at right pulley as shown. (Release finger lever.)



- Clean type carrier with brush and mineral spirits. Care should be taken that the customer's furniture is not damaged. Inspect type carrier. Replace any pallets that are worn, missing, or mutilated. Set type carrier aside.

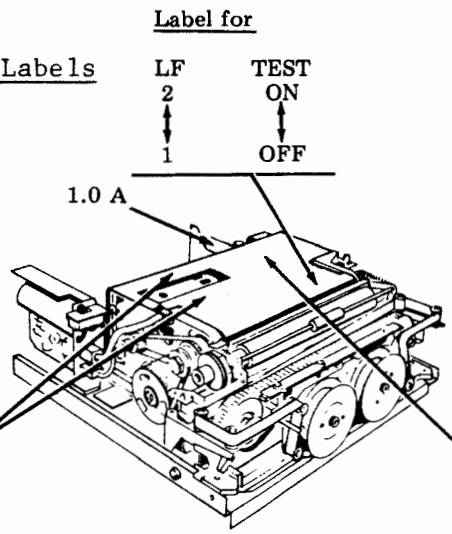
3. CLEANING

- Check that the printed instructions on the printer cover are legible. Clean with cloth.

80-Column Friction Printer Labels

Label for Ribbon Loading

1. Ribbon is to wind and unwind at bottom of spool.
2. Put new spool on free-wheeling spindle.
3. Using routing shown, pass ribbon between paper and type carrier.
4. Attach ribbon to empty spool and wind until eyelet is on spool.
5. Put spool on spindle and wind up slack on free-wheeling spool.



Label for Paper Loading

1. Release pressure roller and load with paper unrolling as shown.
2. Fold paper approximately 45 degrees in either direction.
3. Rotate paper until leading edge appears under pressure roller shaft. Be sure paper is not between type pallets and ribbon.
4. Pull through approximately 12 inches of paper and align edge of paper roll.
5. Engage pressure roller with paper, insert paper through window opening and close cover.

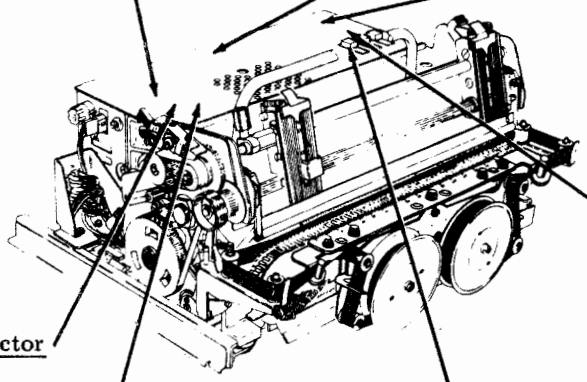
80-Column Tractor Printer Labels

Label for Form Selection

Form Selector Setting				Color of Belt
4	3	2	1	
Length of Form				
3-1/3	2-1/2	5	10	Amber
3-2/3		5-1/2	11	Blue
4	3	6	12	Yellow
4-1/3		6-1/2	13	Brown
4-2/3	3-1/2	7	14	Red
5		7-1/2	15	Pink
5-1/3	4	8	16	Lt Green
5-2/3		8-1/2	17	Green
6	4-1/2	9	18	Lt Blue
7-1/3	5-1/2	11	22	White

Label for Ribbon Loading

1. Ribbon is to wind and unwind at bottom of spool.
2. Put new spool on free-wheeling spindle.
3. Using routing shown, pass ribbon between paper and type carrier.
4. Attach ribbon to empty spool and wind until eyelet is on spool.
5. Put spool on spindle and wind up slack on free-wheeling spool.



Label for Type Carrier Changing

1. Remove ribbon and swing ribbon guides out by pressing thumb levers.
2. Lift finger lever and remove carrier starting at right pulley.
3. Install new carrier starting at left pulley; follow above instruction in reverse.
4. Rotate carrier by hand in direction shown, aligning any protruding type pallets to prevent snagging.
5. Option switch selection should agree with font arrangement of type carrier.

Label for Form Selector

Depress when changing belts.

Label for Idler Assembly

Loosen and move thumbscrew until idler assembly is approximately at right angles to slot.

Label for

FORMS	LF	TEST
ON	1	ON
↕	↕	↕
OFF	2	OFF

Label for Paper Loading

1. Release paper guides and open tractors.
2. Fold one form down; if multiple forms, separate.
3. Sight down paper path and thread paper, keeping to the left.
4. Close tractors and paper guides.
5. Set right tractor for paper width.
6. Set left tractor for left margin.
7. Pull knob and turn to align form.

D. PRINTER ROUTINING (Cont)

3. CLEANING (Cont)

132-Column Tractor Printer Labels

Label for Form Selection

Form Selector Setting				Color of Belt
4	3	2	1	
Length of Form				
3-1/3	2-1/2	5	10	Amber
3-2/3		5-1/2	11	Blue
4	3	6	12	Yellow
4-1/3		6-1/2	13	Brown
4-2/3	3-1/2	7	14	Red
5		7-1/2	15	Pink
5-1/3	4	8	16	Lt Green
5-2/3		8-1/2	17	Green
6	4-1/2	9	18	Lt Blue
7-1/3	5-1/2	11	22	White

Label for Ribbon Loading

1. Ribbon is to wind and unwind at bottom of spool.
2. Put new spool on free-wheeling spindle.
3. Using routing shown, pass ribbon between paper and type carrier.
4. Attach ribbon to empty spool and wind until eyelet is on spool.
5. Put spool on spindle and wind up slack on free-wheeling spool.

Label for

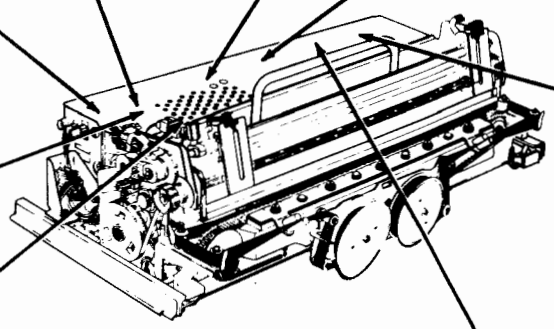
FORMS ON ↕ OFF

LF 1 ↕ 2

TEST ON ↕ OFF

Label for Paper Loading

1. Release paper guides and open tractors.
2. Fold one form down; if multiple forms, separate.
3. Sight down paper path and thread paper, keeping to the left.
4. Close tractors and paper guides.
5. Set right tractor for paper width.
6. Set left tractor for left margin.
7. Pull knob and turn to align form.



Label for Form Selector

Depress when changing belts.

Label for Type Centering

1. Disconnect ac power after printing with test switch.
2. Hold gear from rotating and turn collar clockwise for character clipped on right side and counterclockwise for character clipped on left side.

Label for Idler Assembly

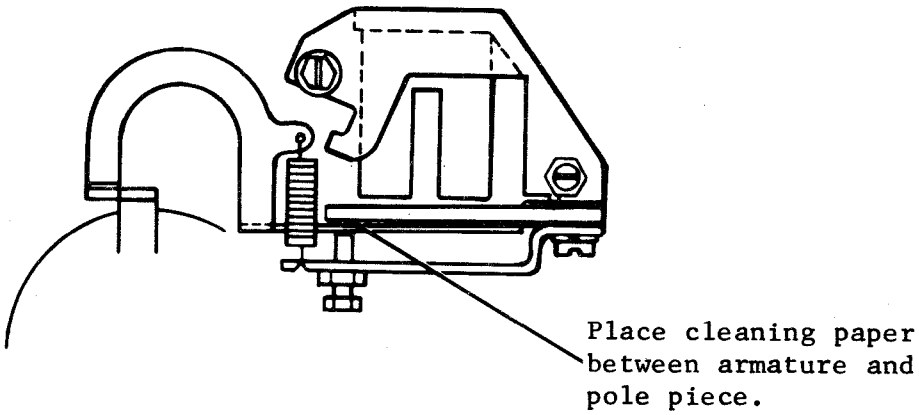
Loosen and move thumbscrew until idler assembly is approximately at right angles to slot.

Label for Type Carrier Changing

1. Remove ribbon and swing ribbon guides out by pressing thumb levers.
2. Lift finger lever and remove carrier starting at right pulley.
3. Install new carrier starting at left pulley; follow above instruction in reverse.
4. Rotate carrier by hand in direction shown, aligning any protruding type pallets to prevent snagging.
5. Option switch selection should agree with font arrangement of type carrier.

Line Feed Magnet

- Place a piece of cleaning paper between the line feed armature and pole piece; manually hold the armature against the pole piece and pull the paper out. Perform the operation twice. Discard paper.

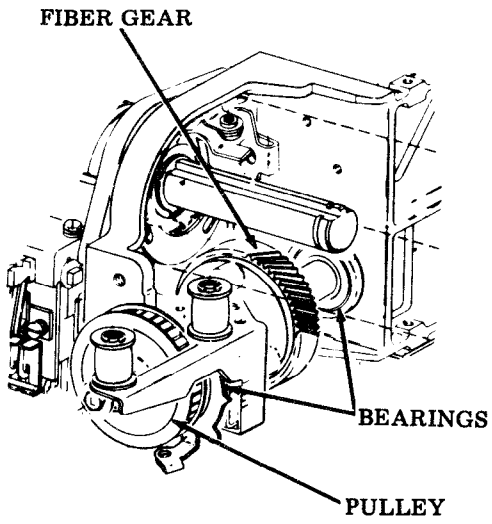


- Clean with a brush, dust and paper lint that has accumulated on the printer, inside the paper chute, on the sides, and on the front. Make sure furnishings are not damaged.

4. CHECKS

Printer Cross Shaft

- Check the fiber gear on the cross shaft for worn or chipped teeth. Check for red oxide around the bearings. At the bearings check that the inner roll does not turn on the shaft. If it does, replace the shaft. Check for play in the shaft by lifting up and down. Check for worn, dented, or pitted teeth on the right pulley. If any of these conditions exist, replace printer.



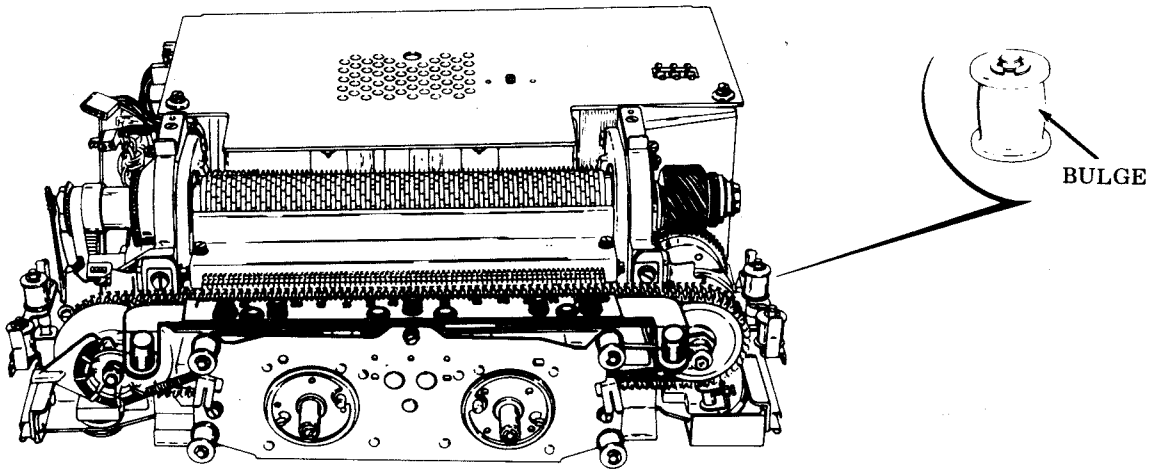
D. PRINTER ROUTINING (Cont)

4. CHECKS (Cont)

Tractor Feed Printer -- Ribbon Rollers

- Check for worn, chipped or cracked ribbon rollers; replace if necessary.

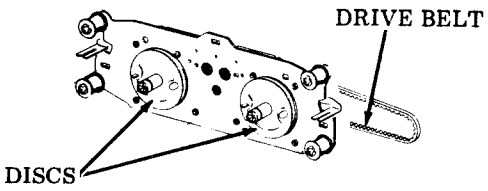
Tractor feed printers should be equipped with late design rollers. Check that the late design rollers have been properly installed with the groove and bulge downward.



- Check the ribbon for curling. If any curling occurs on the ribbon, perform the Ribbon Tracking adjustment after the printer is in the cabinet.

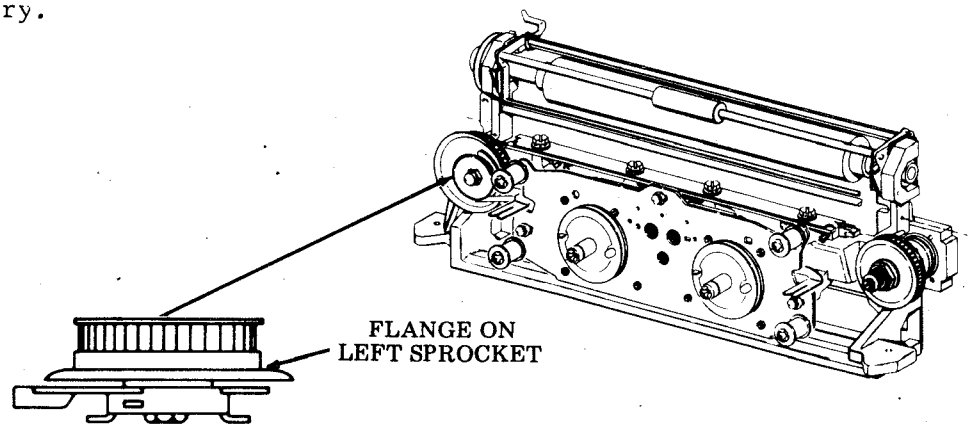
Ribbon Feed Drive Belt

- Check the ribbon feed drive belt for missing teeth. Check for damage or worn areas on the ribbon discs. Replace if necessary. If belt is replaced, perform the Ribbon Feed Drive Belt adjustment.

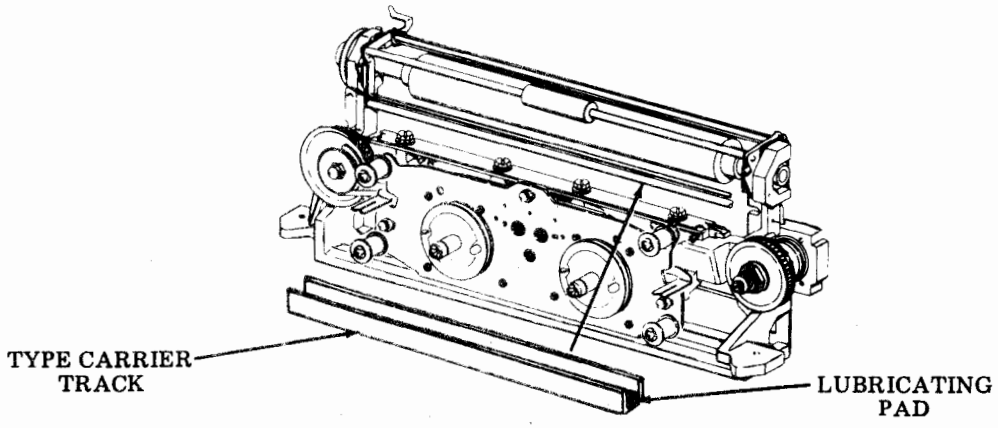


Left Sprocket

- Check for wear, dents, or pitting on the left sprocket flange. Replace if necessary.

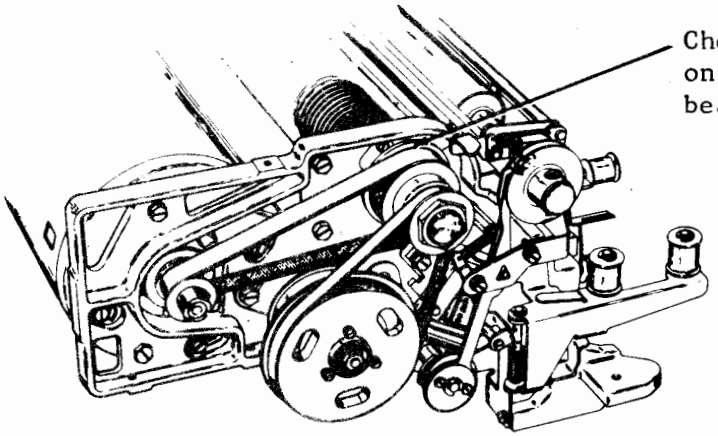


- Check for wear and pitting on the type carrier track. Make sure type carrier lubricating pad is in place and is not damaged. Replace if necessary. If front plate is replaced, perform the Backup Bar adjustment.



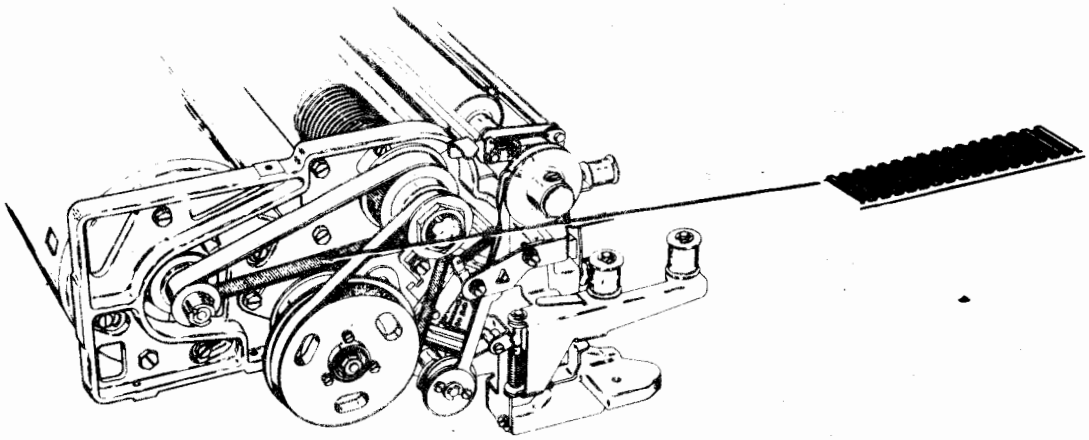
Impeller Shaft Bearing

- Rotate the impeller shaft and check that the shaft rotates freely with no binds in the two supporting bearings. Look at both ends of the shaft for any red oxide deposits near the bearing area. If red oxide is present, replace printer.



Impeller Shaft Drive Belt

- Check impeller shaft drive belt for missing teeth; replace if necessary. If belt is replaced, perform the Impeller Shaft Drive Belt Tension adjustment.

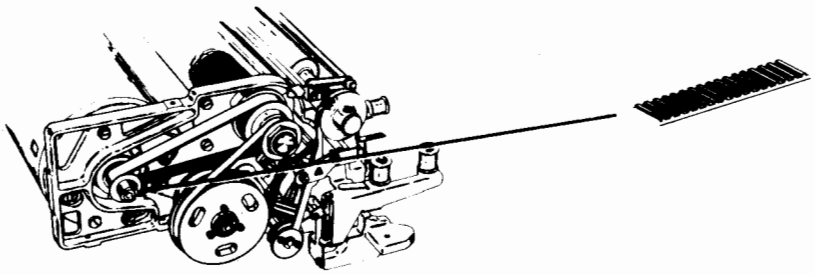


D. PRINTER ROUTINING (Cont)

4. CHECKS (Cont)

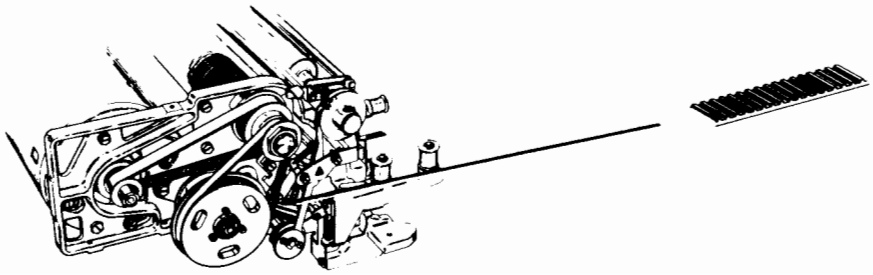
Feed Bar Drive Belt

- Check feed bar drive belt for missing teeth; replace if necessary. If belt is replaced, perform the Feed Bar Drive Belt Tension adjustment.



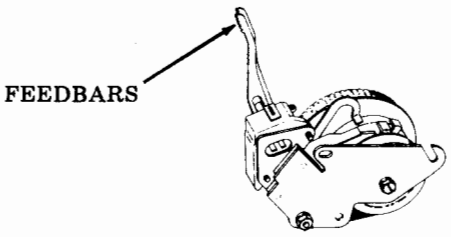
Clutch Drive Belt

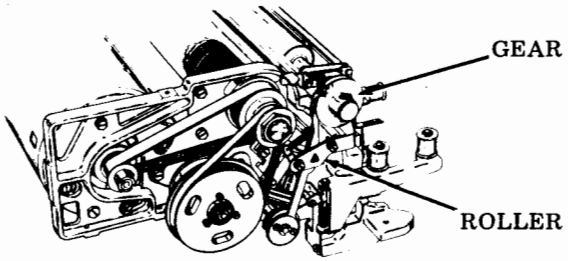
- Check clutch drive belt for missing teeth; replace if necessary. If belt is replaced, perform the Clutch Drive Belt Tension adjustment.



Line Feed Mechanism

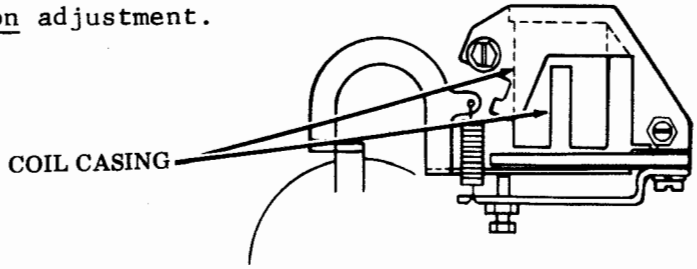
- Check for excessive wear on the feed bars, gear, and roller; replace if necessary. If line feed mechanism is replaced, perform the Line Feed Bar Eccentric adjustment.





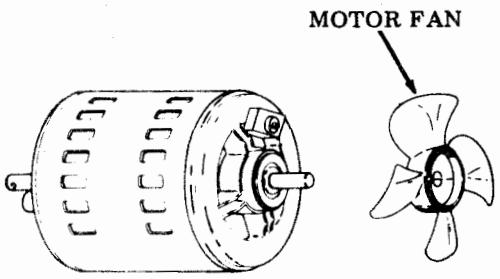
Magnet Coil

- Check that the line feed coil is securely mounted on its core. Check for discoloration due to overheating on the line feed coil casing. If either of these conditions exist, replace the line feed mechanism and perform the Feed Bar Drive Belt Tension adjustment.



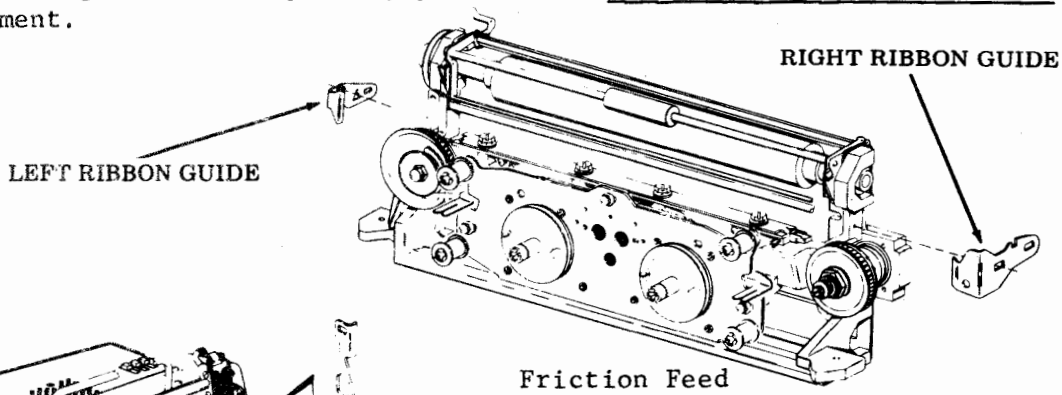
Motor Shaft

- Check for free rotation of motor shaft. Check for cracks on the motor fan. Replace if necessary. If motor fan is replaced, perform the Motor Fan Spacing adjustment.

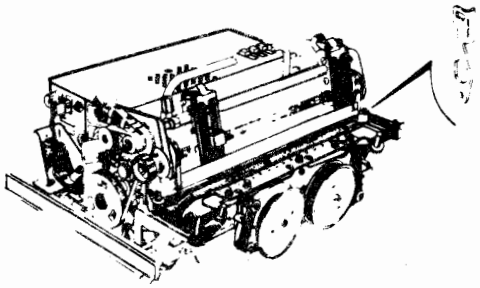


Ribbon Guides

- Check for wear, bending, cracks, or deformities in the left and right ribbon guides. If ribbon guides are replaced, perform the Left and Right Ribbon Guide (Final) adjustment.



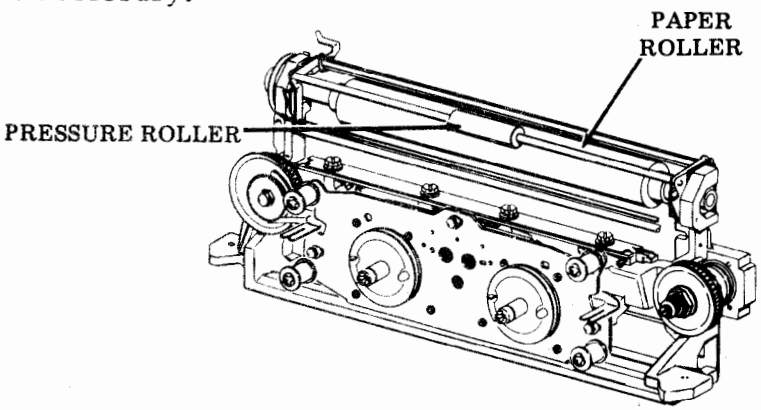
Friction Feed



Tractor Feed

Friction Feed Only -- Front Plate Rollers

- Check for excessive wear or deformities on the paper roller and pressure roller. Replace if necessary.



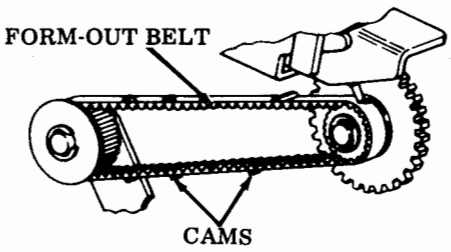
D. PRINTER ROUTINING (Cont)

4. CHECKS (Cont)

On Tractor Feed Printers

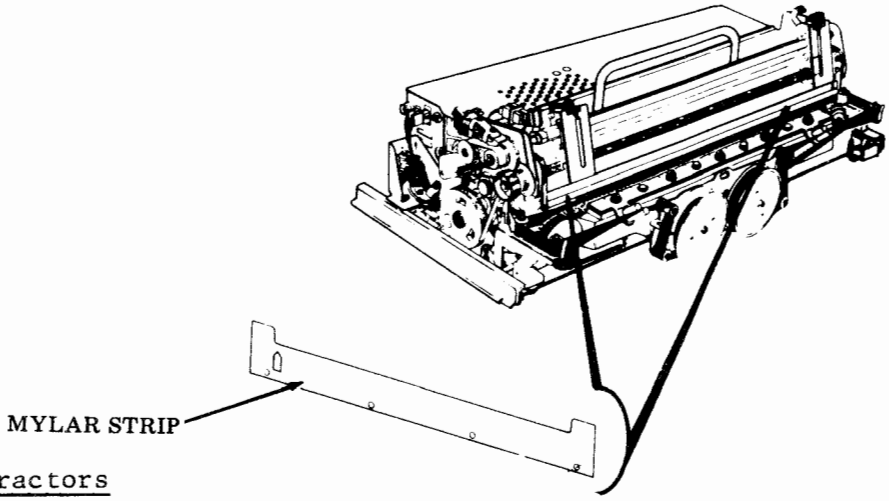
Form-Out Belt

- Check for missing teeth or worn cams on the form-out belt. Replace if necessary. If form-out belt is replaced, perform the Form-Out Contact to Belt Spacing adjustment.



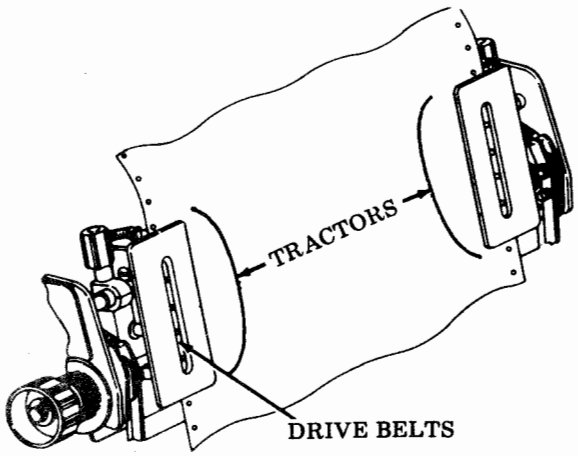
Mylar Strip

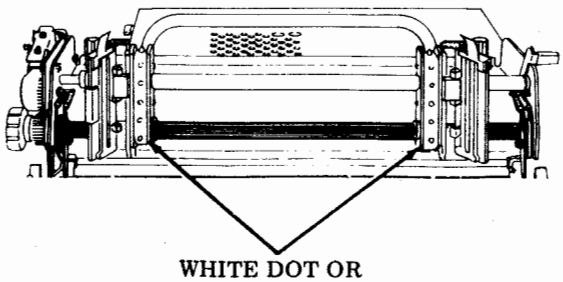
- Check for missing, distorted, or torn mylar strip tabs on the front casting assembly. Also replace any mylar strip that has a rough surface.



Tractors

- Check for bends, cracks, or deformities in the tractors. Check for free operation of the tractors. Check that no pins are missing on the tractors. Check the amber drive belts for tears, distortion, or mutilation. Replace if necessary. When replacing the tractors make sure that the white dots or raised marks are in line with each other horizontally across the shaft.

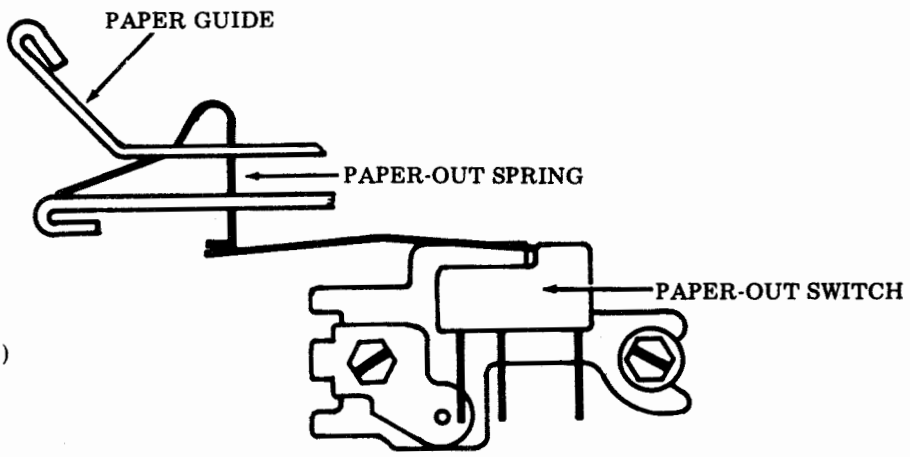




On 80-Column Printer

- Check paper-out contact arm. If it is bent, straighten it and recheck its requirement. Refer to PART 5 -- ADJUSTMENTS.

Paper-Out Contact Switch (80-Column Printer)



(Side View)

On 132-Column Printer

- Check that paper-out contact arm is not bent and that switch operates properly. If defective, replace. If switch is replaced, perform the Paper-Out Switch adjustment.

5. LUBRICATION

a. The printer can be lubricated by positioning it in the ribbon changing (maintenance) position.
b. Lubricate the printer just prior to placing in service or before putting it in storage. Thereafter, lubricate the mechanisms every 2000 hours of running time or 1 year, whichever comes first.
c. Apply lubricant to points as indicated.
d. On small parts, a minimum amount of lubricant should be applied so that the lubricant remains on the parts and does not run off.
e. Excessive lubricant should be removed with a dry, lint-free cloth.
f. The following areas must be kept dry, free of all lubricant:
All electrical components, including terminals.
All parts normally touched by the operator, including exposed surfaces in ribbon, paper handling areas, and all large flat areas.
g. The following symbols indicate the quantity of lubricant to be used in a specified area: Symbols 01, 02, 03, etc, refer to 1, 2, 3, etc, drops of oil. The following list of symbols applies to the lubrication instructions and the type of lubricant to be used:

D. PRINTER ROUTINING (Cont)

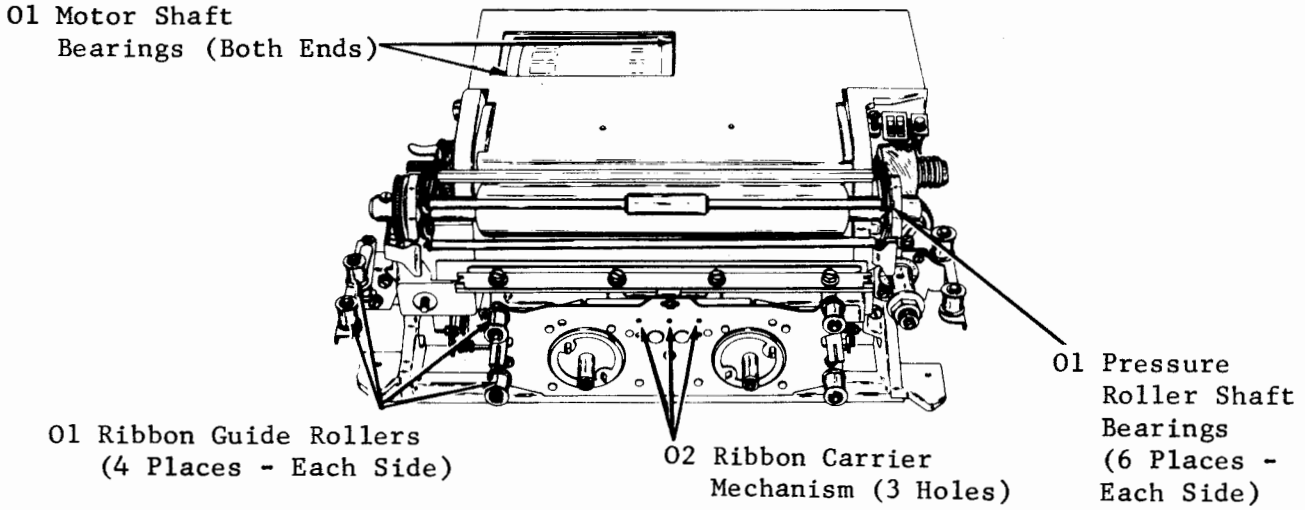
5. LUBRICATION (Cont)

O	Oil 88970
G	Apply a thin film of grease; 143484 Mobil 2 - 1 lb can 145867 Mobil 2 - 4 oz tube
S	Saturate felt oilers, washers, and wicks with oil.
D	Keep dry, no lubricant permitted.
B	Ball bearings are packed with grease and normally need no lubrication. If lubrication is required, use 195298 grease (Beacon 325 - 5 lb can).

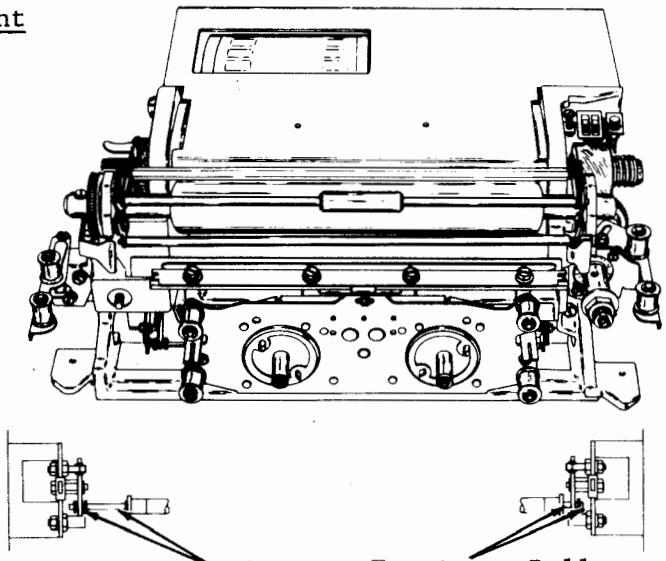
CAUTION: SEVERE PERMANENT DAMAGE TO THE SINTERED TYPE AND SHIELDED TYPE BEARINGS ON THIS UNIT WILL OCCUR IF THE PRINTER IS SUBJECTED TO VAPOR DEGREASING, DEGREASING AGENTS, SUBMERGED IN DETERGENT SOLUTIONS, OR SPRAYED OR WIPED WITH CLEANING SOLVENTS OF ANY KIND.

Friction Feed Printers

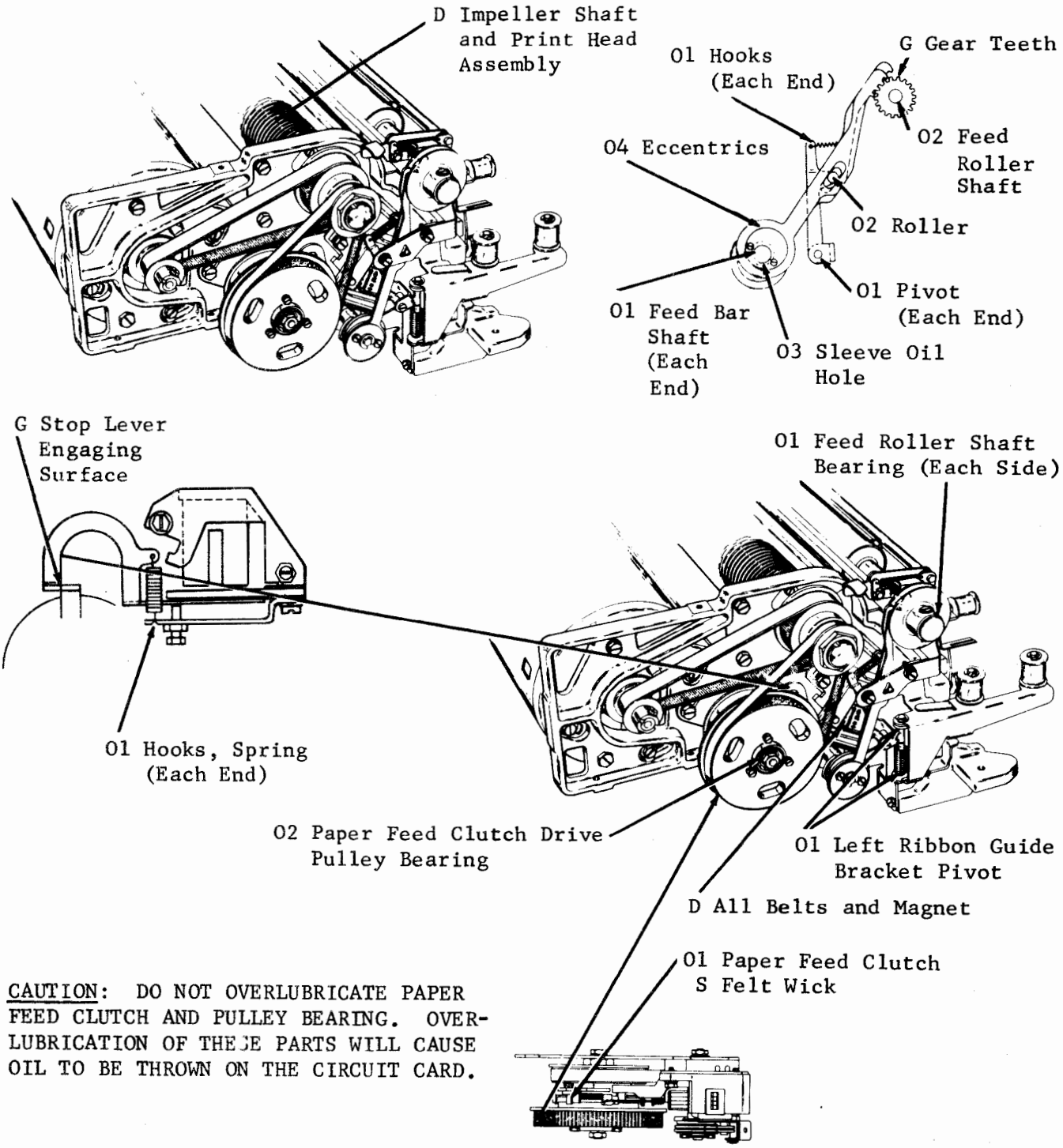
Lubrication -- Front and Top



Lubrication -- Front

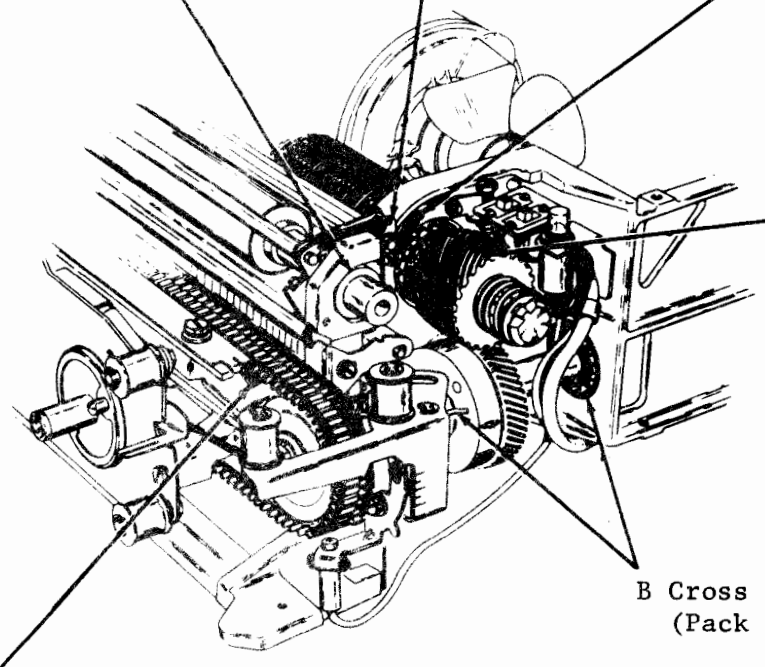


Lubrication -- Left Side



CAUTION: DO NOT OVERLUBRICATE PAPER FEED CLUTCH AND PULLEY BEARING. OVER-LUBRICATION OF THESE PARTS WILL CAUSE OIL TO BE THROWN ON THE CIRCUIT CARD.

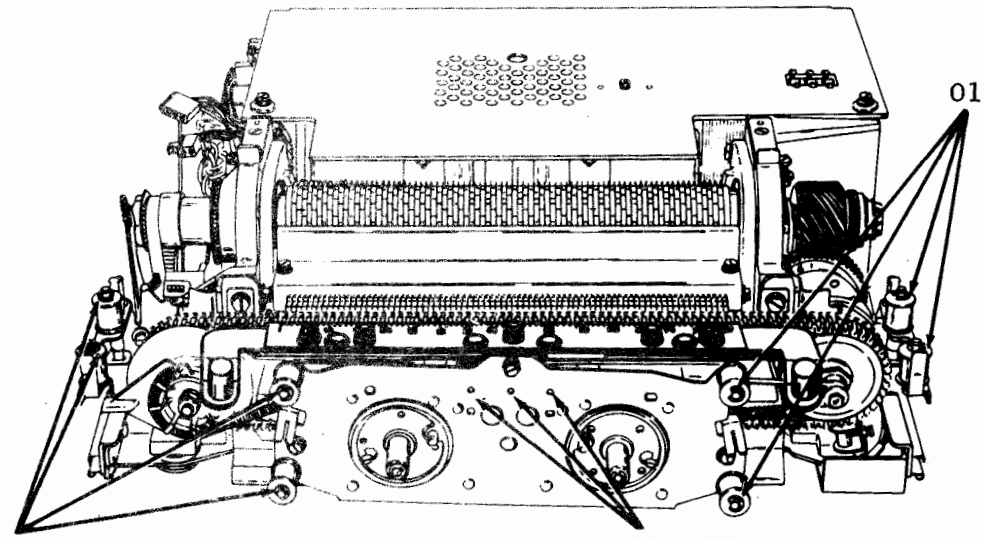
Lubrication -- Right Side



NOTE: Type carrier must be removed to gain access to the wick.

Tractor Feed Printers

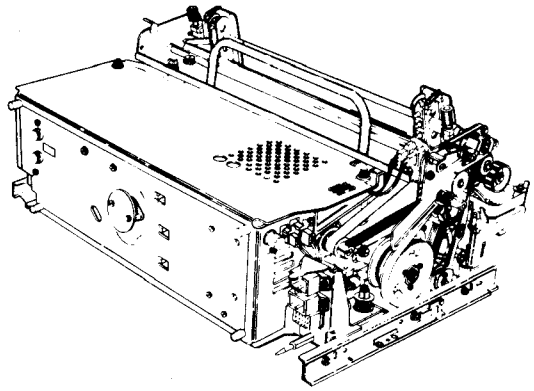
Lubrication -- Front Top



D. PRINTER ROUTINING (Cont)

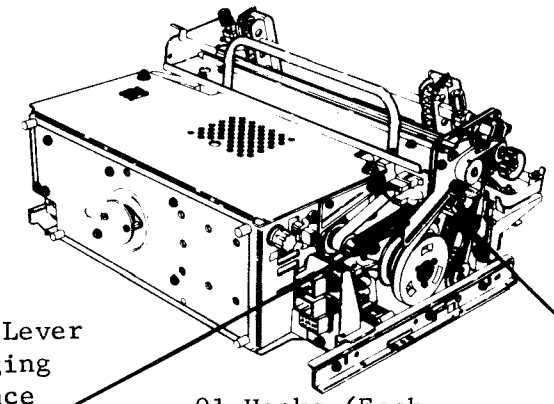
5. LUBRICATION, Tractor Feed Printers (Cont)

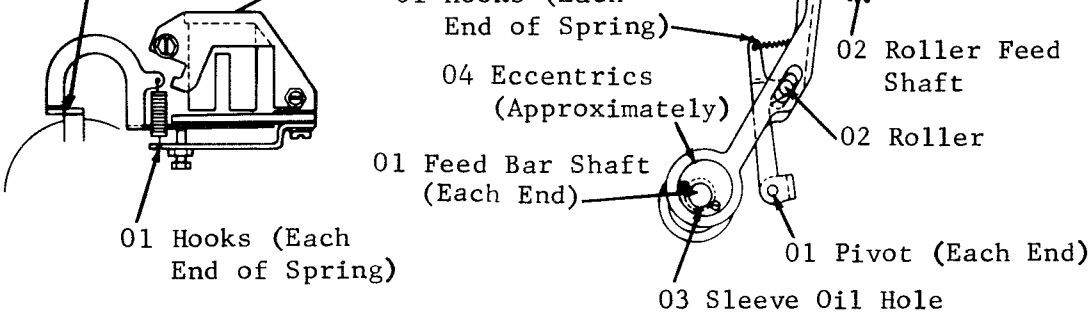
Lubrication -- Left Side of Printer



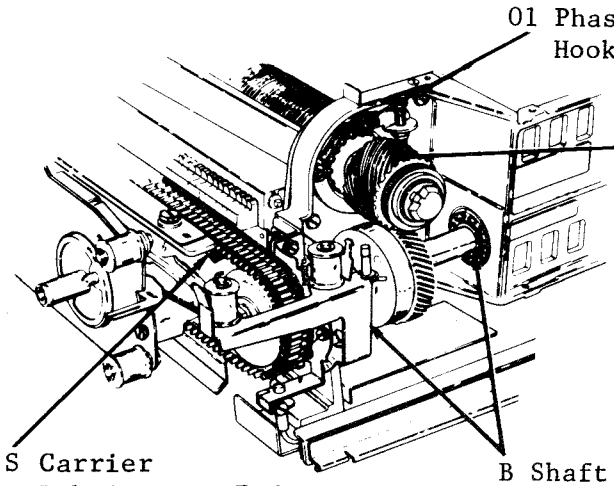
132 Column

80 Column





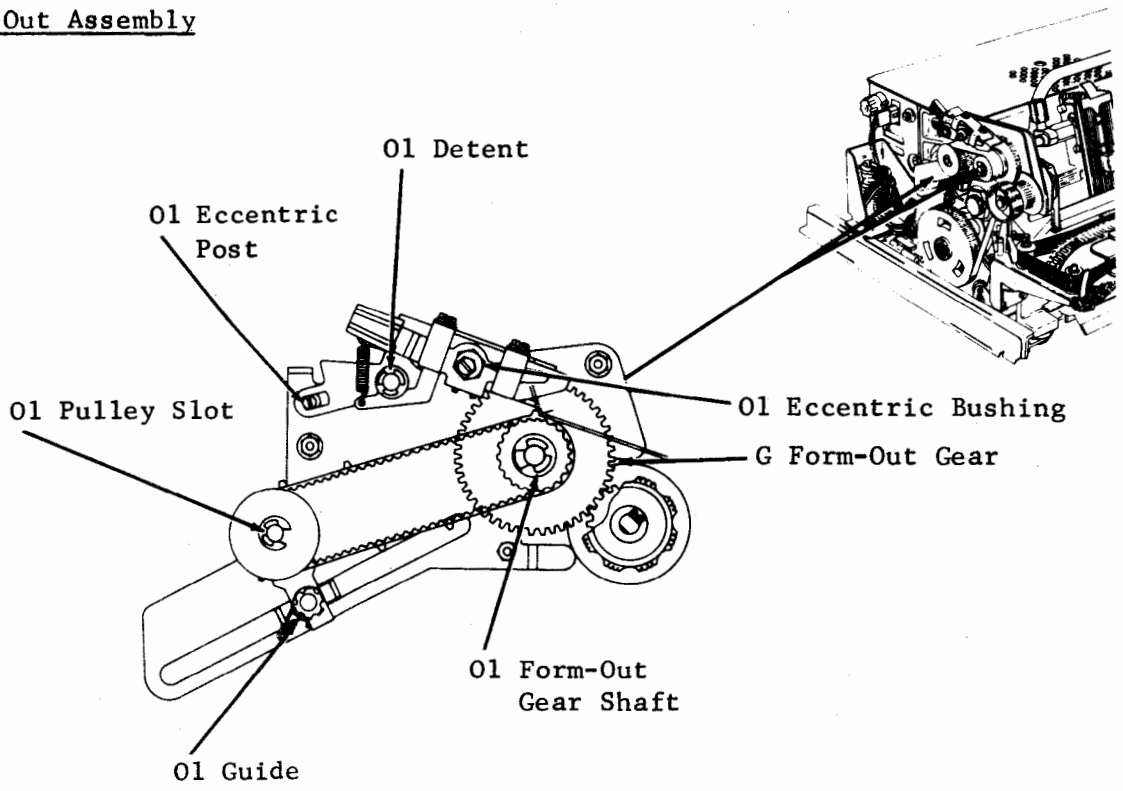
Lubrication -- Right Side of Printer



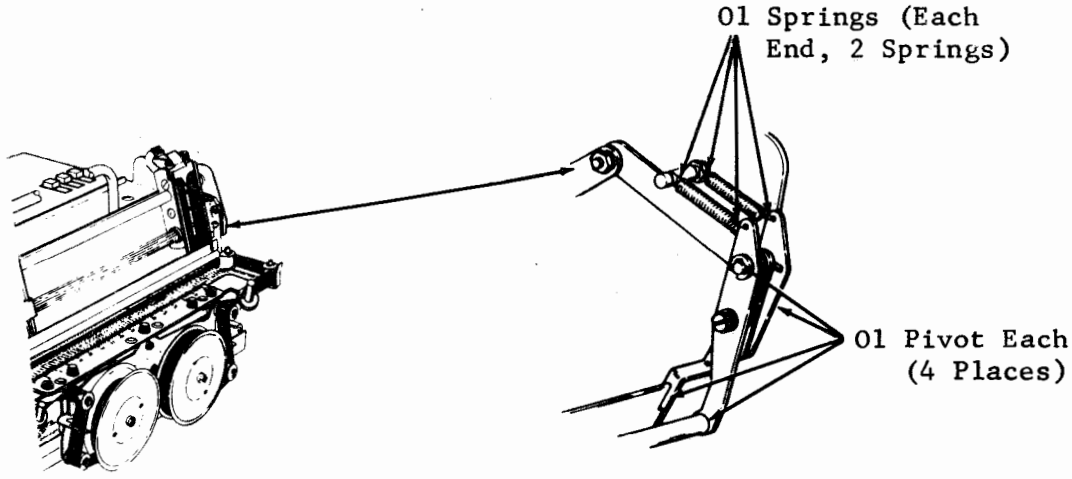
NOTE: Type carrier must be removed to gain access to the wick.

Lubrication -- Left Side of Printer

Form-Out Assembly



Paper Positioner Assembly

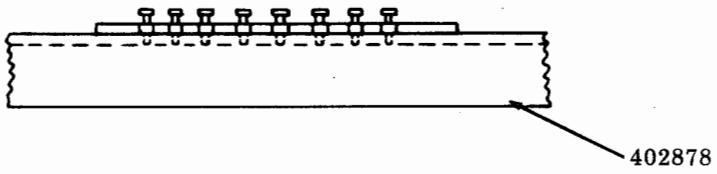


D. PRINTER ROUTINING (Cont)

6. PRINTER REASSEMBLY INTO CABINET

Remount the printer in the cabinet; reconnect ac, SSI, and interlock cables.

Replace the type carrier. If lubrication is to be done, saturate the lubricating pad before replacing carrier. Before replacing the type carrier, seat all the pallets using the 402878 gauge. The gauge is marked for 80-column and 132-column. Be sure to use the proper side of the gauge to match the printer being routined. Reinstall the type carrier starting at the left pulley. Once the carrier is in place, rotate the impeller shaft by hand, one complete revolution of the carrier to seat all pallets.



Reinstall the ribbon. See label on printer or PART 2 -- INSTALLATION for correct ribbon routing. Install paper.

7. CABINETS CHECKS

Test operation of interlock switch; pull up on switch plunger and apply power, then lower plunger. Motor should stop.

Check for air circulation in printer cabinet and make sure motor and fan are working properly.

8. PRINTER TESTING

Test the printer for proper operation. The test should include a check on the following:

- Operation of PAPER button on the printer cabinet (friction feed)
- Operation of FORMS ADVANCE button (tractor feed)
- Proper printer test message operation with test switch ON
- Simulation of low paper and paper-out (friction feed) or form-out (tractor feed)
- Line feed -- single or double.

Refer to PART 3 -- OPERATIONAL CHECKOUT of this manual for detailed checkout procedures. Extensive checkout should not be necessary during routine maintenance. However, the printer must be checked out sufficiently to make sure a working unit is being returned to service. For this purpose a brief off-line checkout should suffice.

During the printer test, the print quality must be examined. Printed copy should have no smudges; characters should not be clipped on either side; no characters should be missing; characters should be clear.

Return the unit to service.

PART 8 -- CONVERSIONS

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A. GENERAL

This part covers conversion sets into different configurations by adding various components. The conversion covered in this part are listed below:

Conversions

KD to KDP
KD to KDM, KDM^2 or KDM^3
KD to KDPM, KDPM^2 or KDPM^3

B. CONVERSION OF KD TO KDP

1. MATERIAL REQUIRED

Material required to convert a KD set to a KDP set is listed below:

80-Column Friction Feed

40P101/AA or AB Printer
40CAB202/RC Printer Cabinet
*40CAB902/AA Pedestal
*401911 Top

80-Column Tractor Feed

40P151/AA or AB Printer
40CAB352RC Printer Cabinet
40CAB902/AA Pedestal
401911 Top

132-Column Tractor Feed

40P201/AA or AB Printer
40CAB353/RC Printer Cabinet
40CAB904/AA Pedestal
401913 Top

*The 80-column friction feed printer may be set on a customer-provided table or adjacent to the KD, if its pedestal has a 34 inch top.

B. CONVERSION OF KD TO KDP (Cont)

2. INSTALLATION

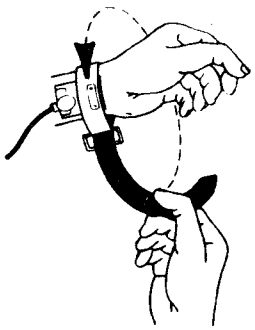
a. Unpack pedestal per instructions on outside of carton. If top is not installed on pedestal, unpack pedestal top and install on pedestal. Mount the top using the four screws provided with pedestal cabinet body. Position assembled pedestal next to KD set.

b. Unpack printer cabinet per instructions on outside of carton. Place printer cabinet on printer pedestal. On tractor feed printer cabinets, center paper throat in bottom of cabinet over slot in pedestal top.

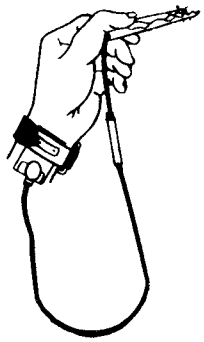
c. Unpack printer per instructions on outside of container. Before installing printer in printer cabinet, the printer options must be set.

CAUTION 1: TURN OFF ALL POWER OR SIGNAL SOURCES BEFORE REMOVING OR REPLACING ANY COMPONENT.

CAUTION 2: TO AVOID POSSIBLE INTERNAL DAMAGE TO CIRCUITRY, WEAR A 346392 STATIC DISCHARGE STRAP CONNECTED TO GROUND TO ALLOW STATIC DISCHARGE BEFORE HANDLING CIRCUIT CARDS FOR REMOVAL OR REPLACEMENT. AVOID TOUCHING CIRCUIT LANDS OR COMPONENTS AS MUCH AS POSSIBLE.

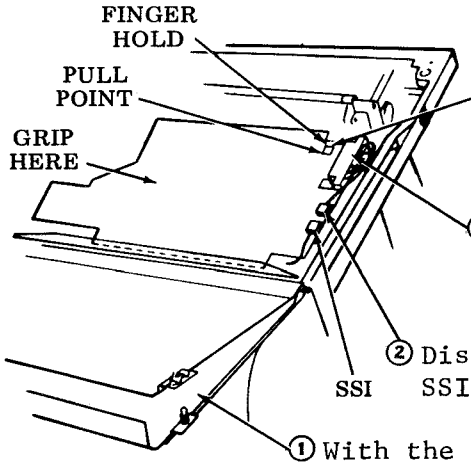


Attach static ground strap tightly to wrist as shown.



Attach clip end of static discharge strap to frame ground.

410640 Printer Logic Circuit Card Removal -- Friction Feed

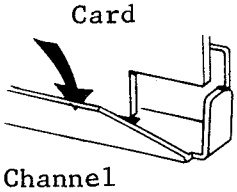


③ Using finger hold and a firm grip of card edge on opposite side as shown, use an even pulling force and unplug 410640 card from two rows of magnet assembly contacts.

④ Carefully lift bottom edge of card out from metal channel and unplug J3 connector from edge contacts of card. Remove card.

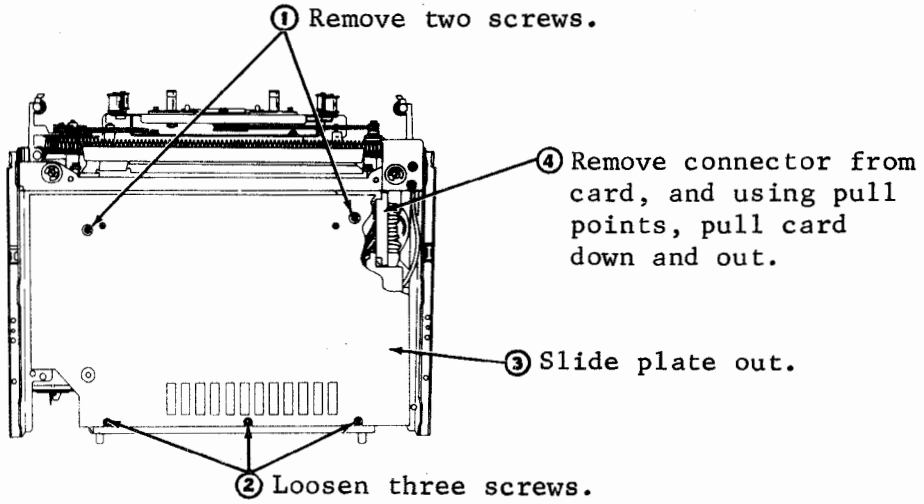
② Disconnect P103 printer cable connector from the 400921 SSI connector.

① With the printer in the upright position, remove two screws that secure paper chute to bottom of printer and allow the chute to hinge down.



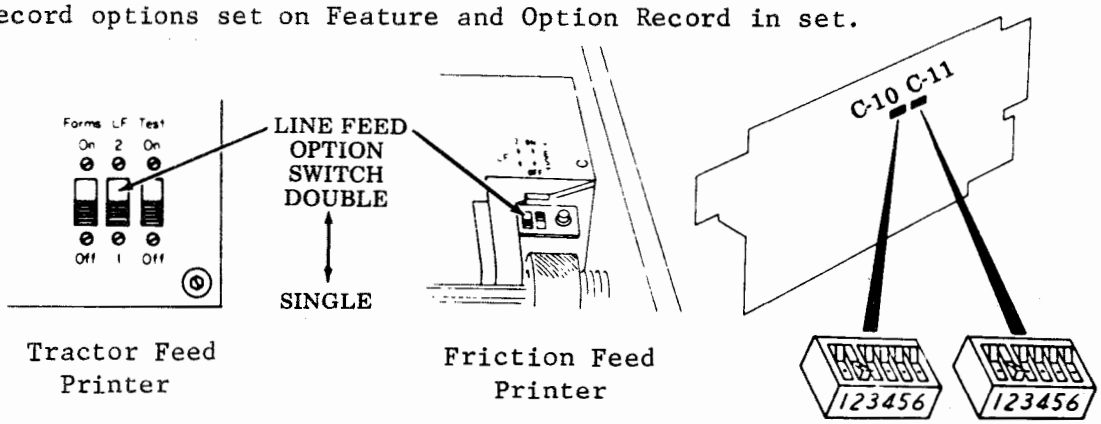
NOTE: During reassembly, make certain that the J3 connector is plugged onto the card and that the card is located within the channel before plugging it into the two rows of magnet assembly contacts. Apply slight pressure at both ends and middle of card to fully seat it on magnet contacts.

410640 Printer Logic Circuit Card Removal -- 80-Column Tractor Feed



410640 Printer Logic Circuit Card Options -- 80-Column Friction and Tractor Feed Printers

NOTE: Record options set on Feature and Option Record in set.



Tractor Feed Printer

Friction Feed Printer

17. Printer margin and form length		C-10						C-11						
		1	2	3	4	5	6	1	2	3	4	5	6	
c.	Last character on 80th column	–	–	–	–	–	–	○	●	●	○	–	–	*
d.	Last character on 79th column	–	–	–	–	–	–	○	●	●	●	–	–	
d.	Last character on 78th column	–	–	–	–	–	–	●	○	○	●	–	–	
d.	Last character on 77th column	–	–	–	–	–	–	●	○	●	○	–	–	
d.	Last character on 76th column	–	–	–	–	–	–	●	○	●	●	–	–	
d.	Last character on 75th column	–	–	–	–	–	–	●	●	○	●	–	–	
d.	Last character on 74th column	–	–	–	–	–	–	●	●	●	○	–	–	
d.	Last character on 73rd column	–	–	–	–	–	–	●	●	●	●	–	–	

NOTE: Options 17a, b, e, and f are not used.

Legend applies to options:
● Indicates dot end of rocker switch depressed.
○ Indicates blank end of rocker switch depressed.
– Position of rocker switch does not affect option.
*Factory programmed.
**Required setting for Tempest treated equipment.

B. CONVERSION OF KD TO KDP (Cont)

2. INSTALLATION, 410640 Printer Logic Circuit Card Options -- 80-Column Friction and Tractor Feed Printers (Cont)

18. Printer paper feed out		C-10						C-11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	No paper feed out	●	–	–	–	–	–	–	–	–	–	–	○	(See Note)
b.	Paper feed out on RM loss -- 16 lines	○	–	–	–	–	–	–	–	–	–	–	○	
c.	Paper feed out on RM loss -- or ETX	○	–	–	–	–	–	–	–	–	–	–	●	*

NOTE: If Option I (Automatic Paging on Printer) is selected, printer must be set for no paper feed-out Option 18a, forms switch must be on Option 39a, and if double-line is selected (Option 20b), Option J in Controller Options will also have to be selected. Automatic Paging on Printer Option is not available for friction feed printers.

19. Printer errored character symbol		C-10						C-11						
		1	2	3	4	5	6	1	2	3	4	5	6	
c.	Not printed on parity error	–	–	–	●	●	–	–	–	–	–	–	–	**
d.	Printers with 96 character set	–	●	○	–	–	–	–	–	–	–	–	–	
e.	Printers with 64 character set	–	○	●	–	–	–	–	–	–	–	–	–	
f.	Printers with extended ASCII † character set	–	○	○	–	–	–	–	–	–	–	–	–	

NOTE: Options 19a and b are not used.

20. Line feed on printer														
a.	Single													*
b.	Double	(See Page 8-3, figure)												

See Note following Option 18.

21. Foldover on up-low printer		C-10						C-11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	Lower case and upper case print	–	–	–	–	–	–	–	–	–	–	○	–	*
b.	Lower case prints as upper case	–	–	–	–	–	–	–	–	–	–	●	–	

† American National Standard Code for Information Interchange

(See Legend for ●, ○, –, * and ** on Page 8-3.)

22. Foldover on monocase printer		C-10						C-11						
		1	2	3	4	5	6	1	2	3	4	5	6	
a.	Lower case not folded over	–	–	–	–	–	–	–	–	–	–	○	–	
b.	Lower case printed as upper case	–	–	–	–	–	–	–	–	–	–	●	–	*

39. Forms switch (tractor feed printer only)		
a.	On	
b.	Off	*

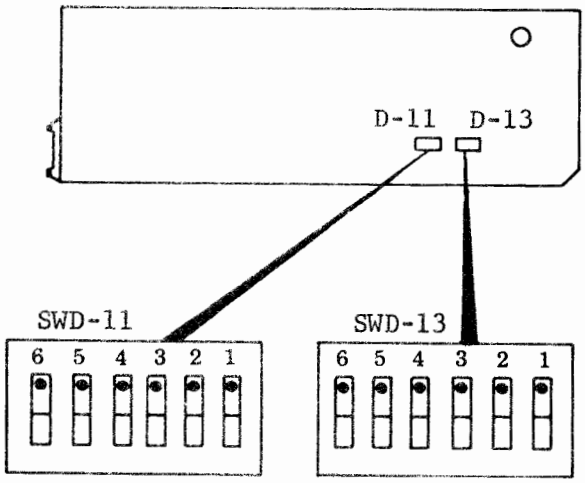
(See Note following Option 18 on Page 8-4.)

Activating Printer Options -- 132-Column Tractor Feed Printer

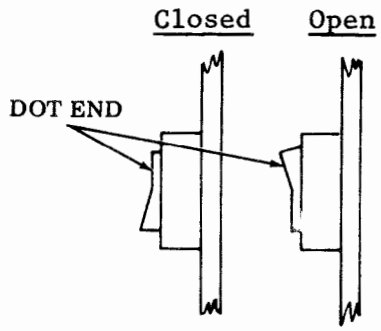
Tilt the printer backwards and rest it on its back (ribbon spools up). Locate the proper option switch and activate each option as required.

NOTE: Record options set on Feature and Option Record in set.

410729 Printer Logic Circuit Card Options



Printer circuit card viewed from beneath printer -- access to switches is through a cutout in bottom pan of printer.



17. Printer margin and form width		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
e.	Last character on column 132	–	–	–	–	–	–	○	○	○	●	–	–	*
f.	Last character on column 131	–	–	–	–	–	–	○	○	●	○	–	–	
g.	Last character on column 130	–	–	–	–	–	–	○	○	●	●	–	–	
h.	Last character on column 129	–	–	–	–	–	–	○	●	○	●	–	–	
i.	Last character on column 128	–	–	–	–	–	–	○	●	●	○	–	–	
j.	Last character on column 127	–	–	–	–	–	–	○	●	●	●	–	–	
k.	Last character on column 126	–	–	–	–	–	–	●	○	○	●	–	–	
l.	Last character on column 125	–	–	–	–	–	–	●	○	●	○	–	–	
m.	Last character on column 124	–	–	–	–	–	–	●	○	●	●	–	–	
n.	Last character on column 123	–	–	–	–	–	–	●	●	○	●	–	–	
o.	Last character on column 122	–	–	–	–	–	–	●	●	●	○	–	–	
p.	Last character on column 121	–	–	–	–	–	–	●	●	●	●	–	–	

NOTE: Options 17a, b, c, and d are not used.

(See Legend for ●, ○, –, * and ** on Page 8-3.)

B. CONVERSION OF KD TO KDP (Cont)

2. INSTALLATION, Activating Printer Options -- 132-Column Tractor Feed Printer (Cont)

18. Printer paper feed out		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	No paper feed out	–	–	●	–	–	–	–	–	–	–	–	○	
b.	Paper feed out on RM loss -- 16 lines (See Note)	–	–	○	–	–	–	–	–	–	–	–	○	
c.	Paper feed out on RM loss or ETX	–	–	○	–	–	–	–	–	–	–	–	●	*

NOTE: The actual controlling SSI signal is loss of Receive Message. The feed out will be 16 lines, as stated, only if Option 39b (Forms switch Off) is selected; if Option 39a (Forms switch On) is selected, the printer will feed out paper to the next form feed position.

(See Note following Option 18 on Page 8-4.)

19. Printer errored character symbol		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Printed on even parity error	–	–	–	●	○	–	–	–	–	–	–	–	*
b.	Printed on odd parity error	–	–	–	○	●	–	–	–	–	–	–	–	
c.	Not printed on parity error	–	–	–	●	●	–	–	–	–	–	–	–	**
d.	Printers with 96 character set	●	○	–	–	–	–	–	–	–	–	–	–	
e.	Printers with 64 character set	○	●	–	–	–	–	–	–	–	–	–	–	
f.	Printers with extended ASCII character set	○	○	–	–	–	–	–	–	–	–	–	–	
g.	Printers with longest character set having less than 64 characters.	○	●	–	–	–	–	–	–	–	–	–	–	

20. Line feed on printer		LF switch (See figure on Page 8-7.)	
a.	Single	1	*
b.	Double	2	

(See Note following Option 18 on Page 8-4.)

21. Foldover on up-low printer		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Lower case and upper case print	–	–	–	–	–	–	–	–	–	–	○	–	*
b.	Lower case prints as upper case	–	–	–	–	–	–	–	–	–	–	●	–	

22. Foldover on monocase printer		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Lower case prints as error symbol	–	–	–	–	–	–	–	–	–	–	○	–	
b.	Lower case prints as upper case	–	–	–	–	–	–	–	–	–	–	●	–	*

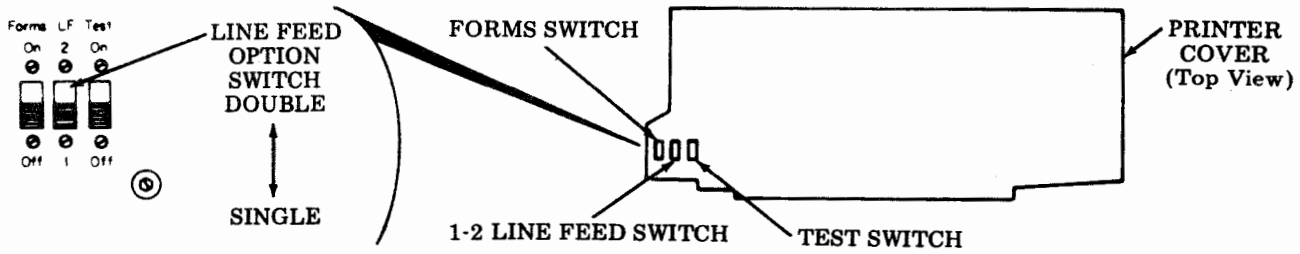
(See Legend for ●, ○, –, * and ** on Page 8-4.)

23. Extended ASCII on printer (Extended ASCII)		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	Prints extended ASCII characters (no parity check)	–	–	–	O	O	–	–	–	–	–	–	–	
b.	Does not print extended ASCII (See Option 19a, b, or c.)	–	–	–	(As in 19.)		–	–	–	–	–	–	–	*

39. Forms switch (See figure below.)		
a.	On	
b.	Off	*

(See Note following Option 18 on Page 8-4.)

48. Incomplete form suppresses paper alarm		D-11						D-13						
		6	5	4	3	2	1	6	5	4	3	2	1	
a.	No (Paper out not gated with form out)	–	–	–	–	–	●	–	–	–	–	–	–	*
b.	Yes (Paper out gated with form out)	–	–	–	–	–	O	–	–	–	–	–	–	



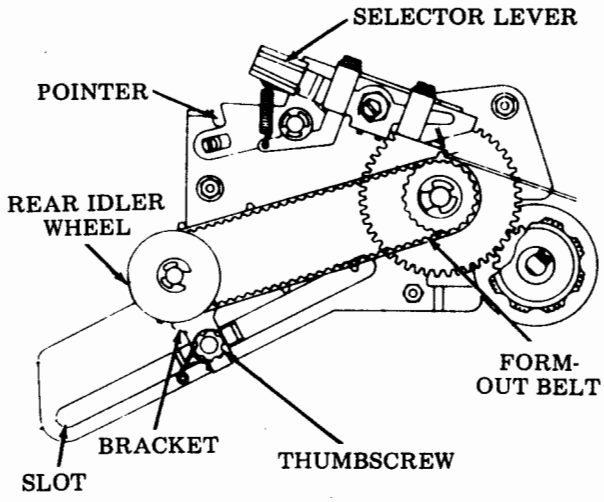
(See Legend for ●, O, –, * and ** on Page 8-4.)

B. CONVERSION OF KD TO KDP (Cont)

2. INSTALLATION (Cont)

Form-Out Belt -- Tractor Feed (80- and 132-Column)

① Refer to the Station Installation Worksheet and determine if tractor feed printer requires use of form-out belt other than 402572 (blue belt) which is part of 40P201/-- and 40P151/-- Tractor Feed Printers. This will be indicated by use of belt number.



FORM SELECTOR SETTING				BELT COLOR	TP PART NO.
4	3	2	1		
FORM LENGTHS (INCHES)					
3-1/3	2-1/3	5	10	Amber	402571
3-2/3		5-1/2	11	*Blue	402572
4	3	6	12	Yellow	402573
4-1/3		6-1/2	13	Brown	402574
4-2/3	3-1/2	7	14	Red	402575
5		7-1/2	15	Pink	402576
5-1/3	4	8	16	Lt Green	402577
5-2/3		8-1/2	17	Green	402578
6	4-1/2	9	18	Lt Blue	402579
7-1/3	5-1/2	11	22	White	402580

*Shipped with 40P201/-- and 40P151/-- Tractor Feed Printers.

② Loosen thumbscrew and move rear idler wheel forward.

③ Hold form selector lever depressed until old belt is removed and new belt is placed on wheels.

NOTE 1: Arrow on belt should point inward.

④ Position rear wheel back to remove slack in belt keeping bracket to which wheel is mounted at right angles to the slot.

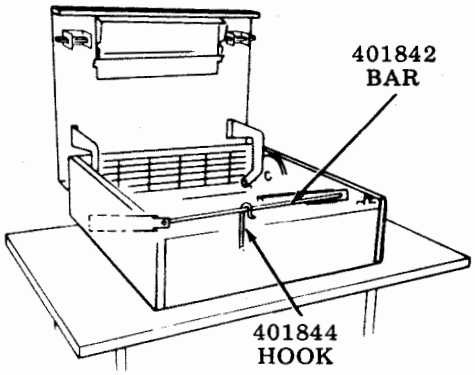
⑤ Tighten thumbscrew and place form selector pointer at proper scale setting for proper form length.

NOTE 2: If the paging option (Controller Option I) is to be used, the blue 402572 form-out belt must be used and the form selector switch set at 1 (11-inch form).

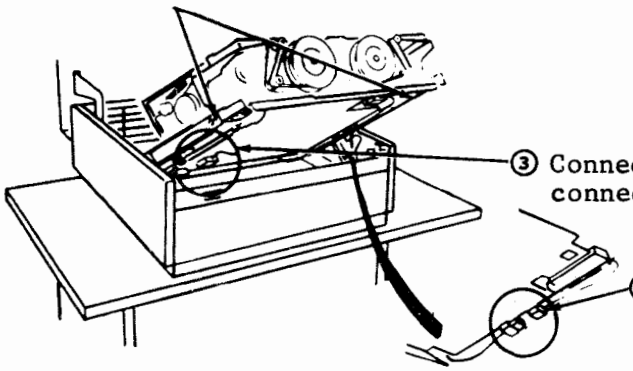
NOTE 3: If the printer is being added to a KD set that has a 50 hertz power input, the motor pulley on the printer will have to be changed. Refer to Page 2-7 of this supplement for procedure for changing motor pulley.

Printer Into Cabinet -- Friction Feed

① Press down on 401842 bar. Detack 401844 hook, then release track up slowly. Remove bar and hook and retain for shipping purposes.

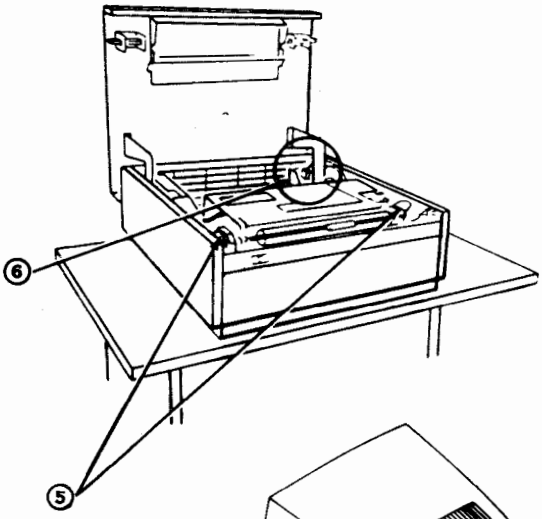


② Install printer in tracks until detents are seated.



③ Connect 115 V ac connector.

④ Connect printer to SSI cable.



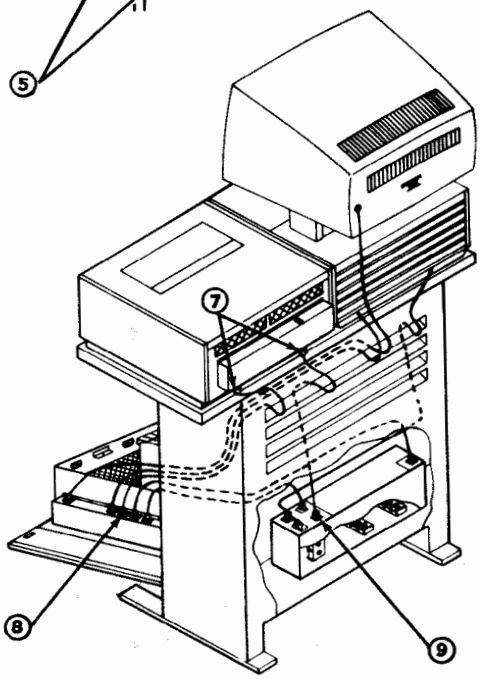
⑤ Lower printer by depressing the left and right release levers, and then press down on printer until it latches.

⑥ Connect interlock cable.

⑦ Route cables from printer cabinet to controller as shown.

⑧ Connect SSI printer connector into J302 printer port on 40C433/ACS/059 controller or into J310 printer port of 40C435/AEB/088 controller.

⑨ Connect ac printer power cord into J200 of interface assembly.

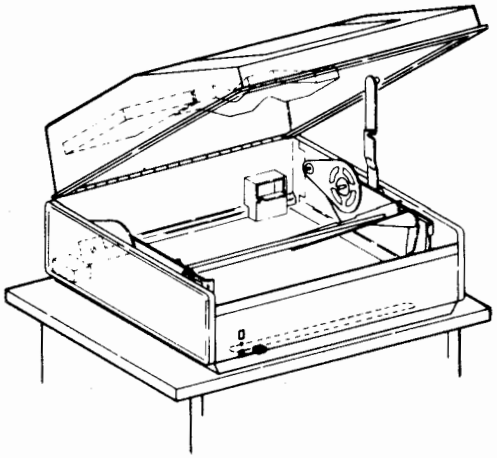


B. CONVERSION OF KD TO KDP (Cont)

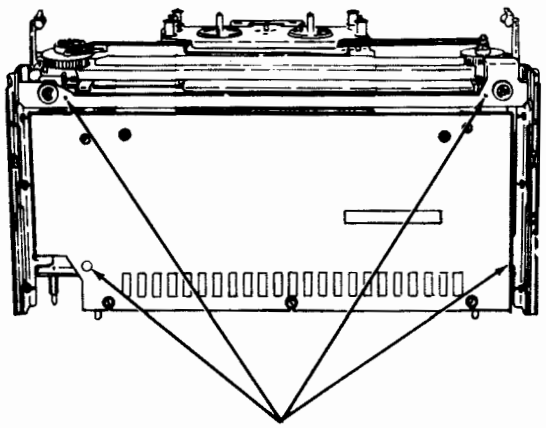
2. INSTALLATION (Cont)

Printer Into Cabinet -- Tractor Feed

① Place cabinet on pedestal with opening in bottom of cabinet over slot in pedestal. Open lid by depressing latches on either side of lid and then raising it until it locks.

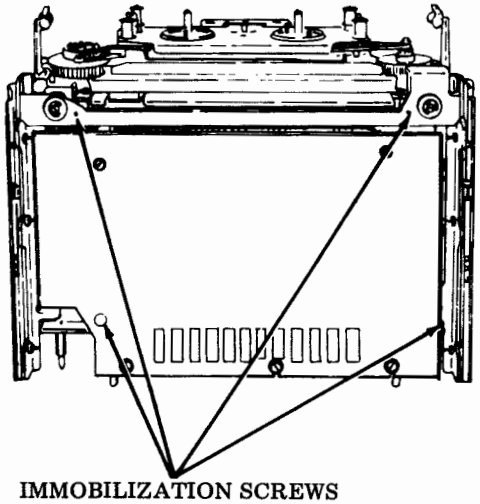


CAUTION: BEFORE INSTALLING PRINTER IN CABINET BACK OFF THE FOUR BLACK SHOCK MOUNT IMMOBILIZING SCREWS SEVEN OR EIGHT TURNS.



IMMOBILIZATION SCREWS
(4 Places)

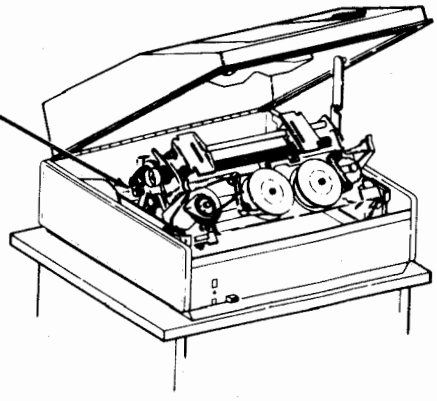
132 Column



IMMOBILIZATION SCREWS
(4 Places)

80 Column

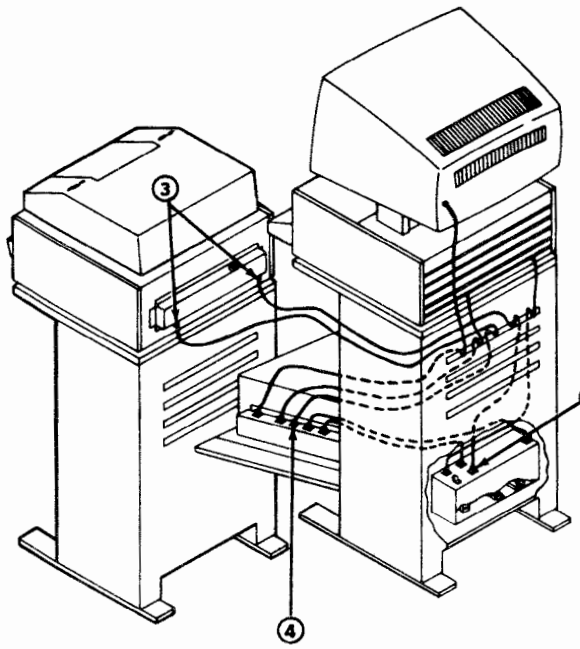
② Install printer in tracks until detents are seated.



NOTE: With printer properly seated all power and SSI connections will be made.

③ Route cables from printer cabinet to controller as shown.

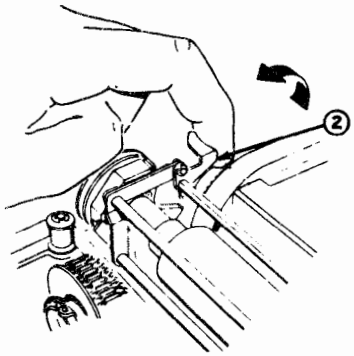
④ Connect SSI printer connector into J302 printer port of 40C433/ACE/059 controller or J310 of 40C435/AEB/088 controller.



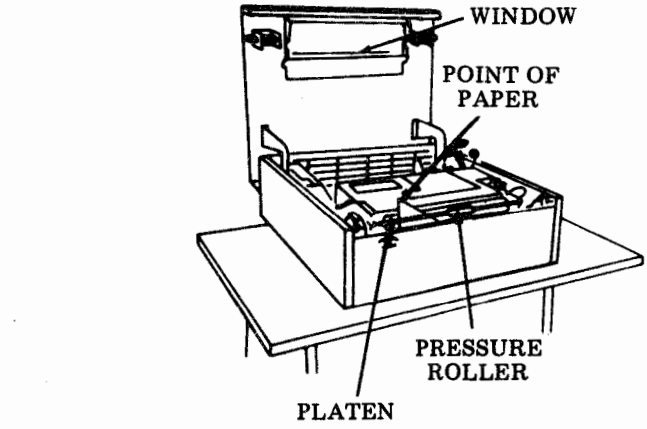
⑤ Connect ac printer power cable into J200 of interface assembly.

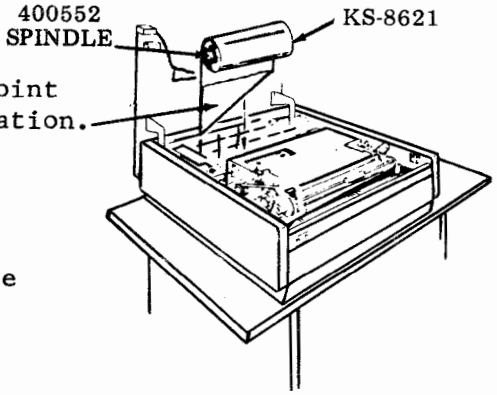
Paper Into Printer -- Friction Feed

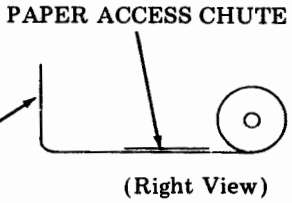
① Install paper roll on spindle and place in printer.



② Pull pressure roller release lever up and to the front.







③ Push paper point toward front under printer through paper access chute and up behind ribbon.

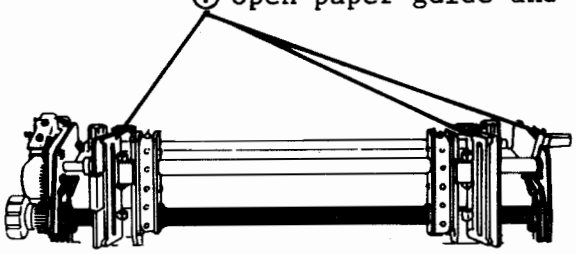
④ With paper extending out, thread paper through window, close paper release lever and while holding point of paper, close cover.

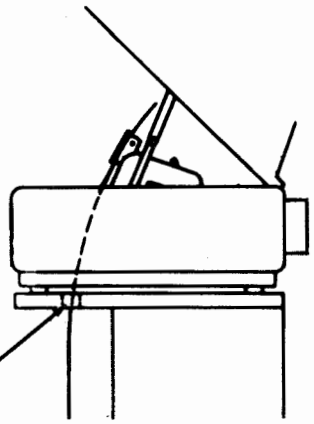
B. CONVERSION OF KD TO KDP (Cont)

2. INSTALLATION (Cont)

Paper Into Printer -- Tractor Feed (80- and 132-Column)

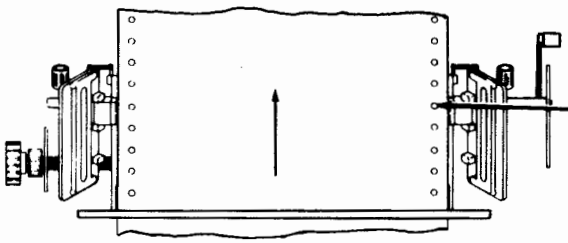
① Open paper guide and tractor covers.



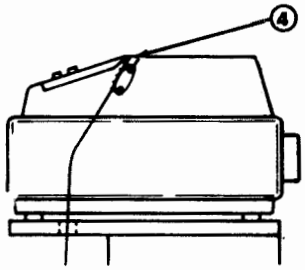


NOTE: If multiple forms are used, separate and fold one form down before inserting.

② Insert paper up through slot in pedestal, through opening in bottom of printer cabinet, and feed through printer.



③ Align holes in paper over pins on tractor and close tractor covers and paper guide.

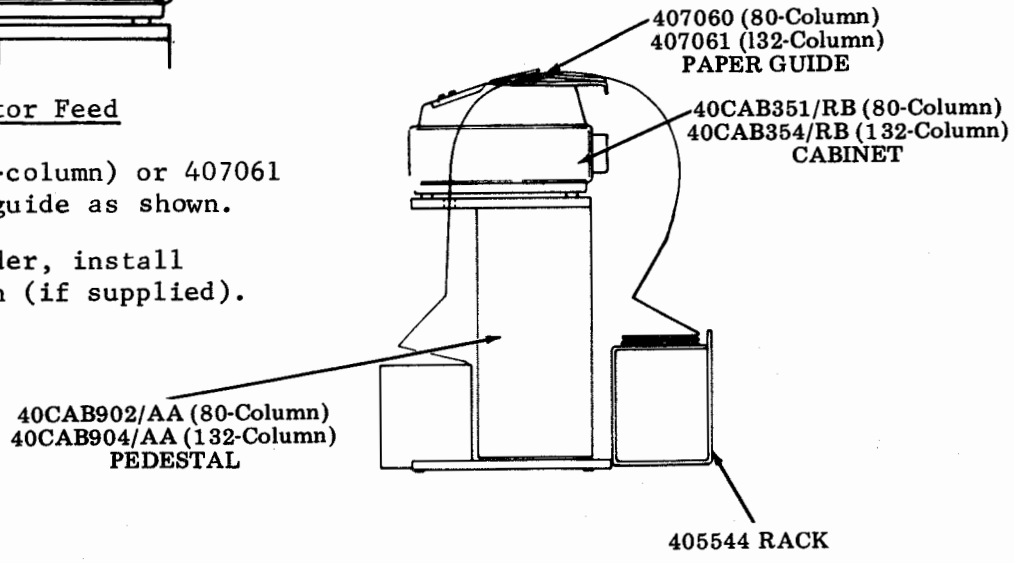


④ Manually advance and feed through slot in cabinet cover and then close cover.

Paper Guide -- Tractor Feed

Assemble 407060 (80-column) or 407061 (132-column) paper guide as shown.

If included with order, install 405544 rack as shown (if supplied).



3. CONTROLLER OPTIONING

Adding a printer to the KD set may require some of the controller options to be changed. Refer to Pages 2-20 and 2-21 of Manual 363 for options. Options related to printer are Options A, F, I, J and L. If any of these options are to be changed, use the following procedures:

- Remove controller cover.
- Remove 410411 CIU/PIT/SID circuit card.
- Reoption circuit card for options desired using switch setting information on Pages 2-26 and 2-27 of Manual 363.
- Record options on Controller Feature and Option Record sheet in document holder in set.
- Replace 410411 circuit card in slot from which it was removed.
- Replace controller cover.

After the printer installation has been completed, an operational check should be performed to insure proper operation prior to placing in service. Refer to Part 3 of Manual 363 for procedure.

C. CONVERSION OF KD TO KDM, KDM^2 OR KDM^3

1. MATERIAL REQUIRED

Material required to convert a KD set to KDM, KDM^2, or KDM^3 is listed below:

For each cassette drive to be added, one of the following should be ordered:

4016RA 001 RA Cassette Drive Set

NOTE: KD sets containing the 40C433/ACS/059 Controller have the capability of adding up to two cassette drives. KD sets containing the 40C435/ACS/059 Controller have the capability of adding up to three cassette drives. If three cassette drives are to be added, a 410406 circuit card will have to be ordered. If KD to be converted has a 24 inch 401914 top and three cassette drives are to be added, the 34 inch 401533 top should be ordered for proper arrangement of cassette drives.

2. INSTALLATION

a. If pedestal top change is required, remove display and display cabinet with opcon from pedestal. Replace top. Refer to Page 6-52 of Manual 363 for procedure.
b. Unpack cassette drives per instructions on outside of carton.

NOTE: If cassette drives are being added to a KD that has a 50 hertz ac input, the motor pulley on each of the cassette drives will have to be changed. Refer to Page 2-7 of this supplement for procedure for changing cassette drive motor pulley.

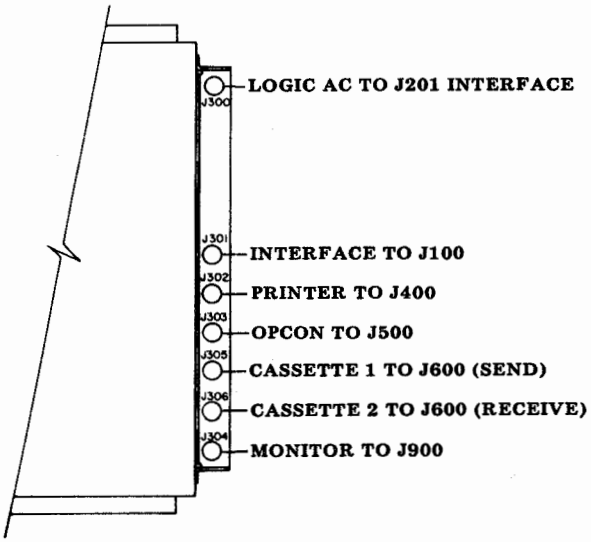
c. Place cassette drive(s) on KD pedestal. Refer to Page 2-17 of Manual 363 or Page 2-8 of this supplement for locations.

C. CONVERSION OF KD TO KDM, KDM^2 OR KDM^3 (Cont)

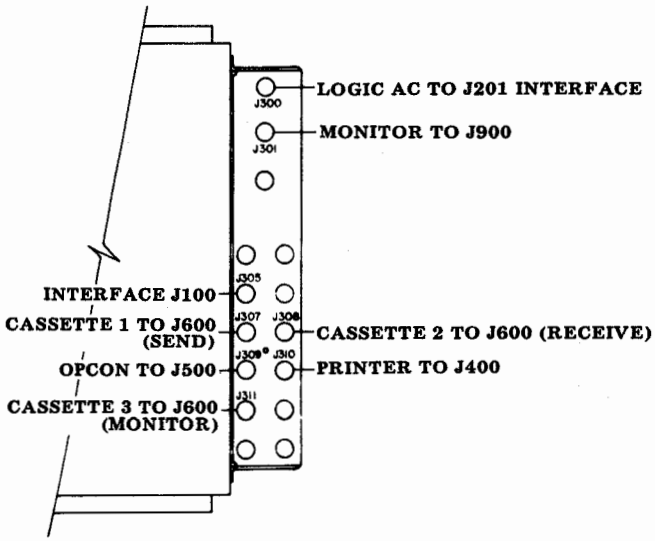
2. INSTALLATION (Cont)

d. Route the 405785 signal (labeled SSI) cable(s) from J600 connector of the cassette drive(s) to the controller. Refer to Page 2-17 of Manual 363 or Page 2-9 of this supplement for cable routing. Connect the SSI cables to the controller as indicated below:

40C433/ACS/059 Controller



40C435/ACS/059 Controller



3. CONTROLLER OPTIONING

The addition of cassette drives to the KD will require some reoptioning of the controller. To reoption the controller, follow the procedure outlined below:

- Remove controller cover.
- Remove 410411 CIU/PIT/SID circuit card.

Before reoptioning the 410411 circuit card, the function of the cassette drives being added must be determined (Send, Receive or Monitor). Once the function of the cassette drives has been determined, the 410411 circuit card can be optioned accordingly. Refer to Page 2-27 in Manual 363 for switch settings for the 40C433/ACS/059 Controller or Page 2-16 of this supplement for switch settings for the 40C435/ACS/059 Controller, if only two cassette drives were added.

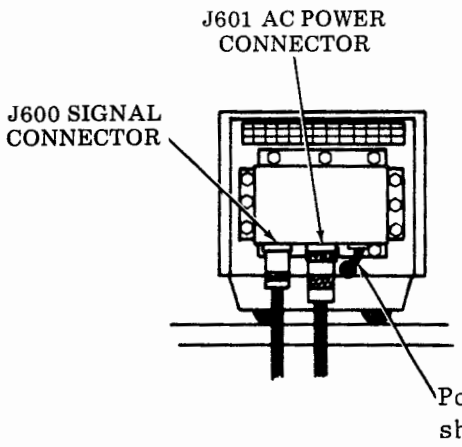
- Record option setting on Controller Feature and Option Record sheet in set.
- Replace 410411 circuit card in slot from which it was removed.
- Replace controller cover.

If three cassette drives are being added to the 40C435/ACS/059 Controller, a 410406 circuit card will have to be added to the controller. To add the second 410406 circuit card, perform the following:

- Move the 410811 circuit card in slot 10 to slot 11.
- Move the 410913 circuit card in slot 9 to slot 10.
- Move the 410912 circuit card in slot 8 to slot 9.
- Move the 410461 circuit card in slot 7 to slot 8.
- Move the 410461 circuit card in slot 6 to slot 7.
- Remove the 410411 circuit card in slot 5. Option the 410411 circuit card for the addition of cassette drives (Options P, Q and R).
- Replace 410411 circuit card in slot 6.
- Option the additional 410406 circuit card as shown for the 410406 circuit card in slot 5 shown on the controller arrangement form on Page 2-18 of this supplement.
- Install the additional 410406 circuit card in slot 5.
- Record options set on Controller Feature and Option Record sheet in set.
- Replace controller cover.

4. AC POWER CONNECTION

Connect the screw-type connector of the 408600 ac power cord to J601 connector of each of the cassette drives. Before plugging power cord into a grounded 3-pin standard power receptacle, a continuity check is required from the ground lug of the 3-pin plug to the cassette drive frame. Before plugging ac power cord into receptacle, insure the power switch on the cassette drive is in the off position.



Before applying power to the cassette drive or controller, insure that the magnetic tape cassette is removed from the cassette drive, or in the unlatched position.

NOTE: The cassette shipped with each cassette drive set is not preformatted. Before using it in the system, the cassette must be placed in a receive cassette drive and the erase function performed on the tape.

After the conversion of the KD has been completed, an operational check should be performed to insure proper operation prior to placing it in service. Refer to Part 3 of Manual 363 or Part 3 of this supplement for checkout procedure.

Important Notes Concerning Terminal Operation

Cassettes should never be removed from the drive mechanism unless the tape is rewound to the beginning, ie, on clear leader. When the tape is positioned on the leader, the lamp on top of the cassette drive will be off. This lamp turns on whenever the tape moves off the clear leader. Therefore, never remove cassettes when the lamp is on. Refer to Manual 362, How To Operate, for instructions on how to rewind cassettes.

C. CONVERSION OF KD TO KDM, KDM^2 OR KDM^3 (Cont)

3. CONTROLLER OPTIONING, Important Notes Concerning Terminal Operation (Cont)

Controller power should not be turned on or off until all cassettes are unlatched. Failure to do so may result in erroneous operation of the cassettes requiring them to be unlatched and latched (possibly several times) before they will operate properly.

After controller power is turned off, wait several seconds before turning back on.

Cassette power should not be turned off until all cassettes are rewound and unlatched. Failure to do so may result in data errors on the tape at the location under the heads at the time of power off.

D. CONVERSION OF KD TO KDPM, KDPM^2 OR KDPM^3

1. GENERAL

For conversion of a KD set to a KDPM, KDPM^2 or KDPM^3, the procedures outlined in Parts 2 and 3 should be combined and followed.

After the conversion has been completed, an operational check should be performed to insure proper operation prior to placing in service. Refer to Part 3 of Manual 363 or Part 3 of this supplement for procedure.