



**SMITH-CORONA PRODUCT SERVICE**  
SCM CORPORATION

**SERVICE BULLETIN**

CORTLAND, NEW YORK

TO: Smith-Corona Technical Service & Training  
Smith-Corona Regional Service Managers  
Smith-Corona Service Locations  
Smith-Corona Servicing Dealers  
List "S"

NO. 19

PRODUCT 3 SERIES

SUBJECT: MOTOR CLUTCH PULLEYS

DATE: March 13, 1979

Motor Clutch Pulleys must be matched to the Motor; machines have been manufactured with three different types of Motors, which can be identified as follows:

1. GE-33: The words "General Electric" are stamped on aluminum Motor Bearing Brackets, which are attached by screws to the Motor Stator. Tape around the coil bears numbers beginning with: 5KSB33.
2. GE-44: The words "General Electric" appear on plastic covers attached to the Motor Bearing Brackets, which are attached by epoxy (not screws) to the Motor Stator. Tape around the coil bears numbers beginning with: 5KSB44.
3. Alliance: The word "Alliance" is stamped on aluminum Motor Bearing Brackets, which are attached by screws to the Motor Stator.

Motor Clutch Pulleys for these Motors are as follows:

MOTOR CLUTCH PULLEY PART NUMBER	COLOR	MOTOR	Hz
496150	Natural	GE-33	60
497266	Gray	GE-33	50
601788*	Blue	GE-33	50*
601789	Natural	GE-44	60
601790	Gray	GE-44	50
498140	Yellow	Alliance	50

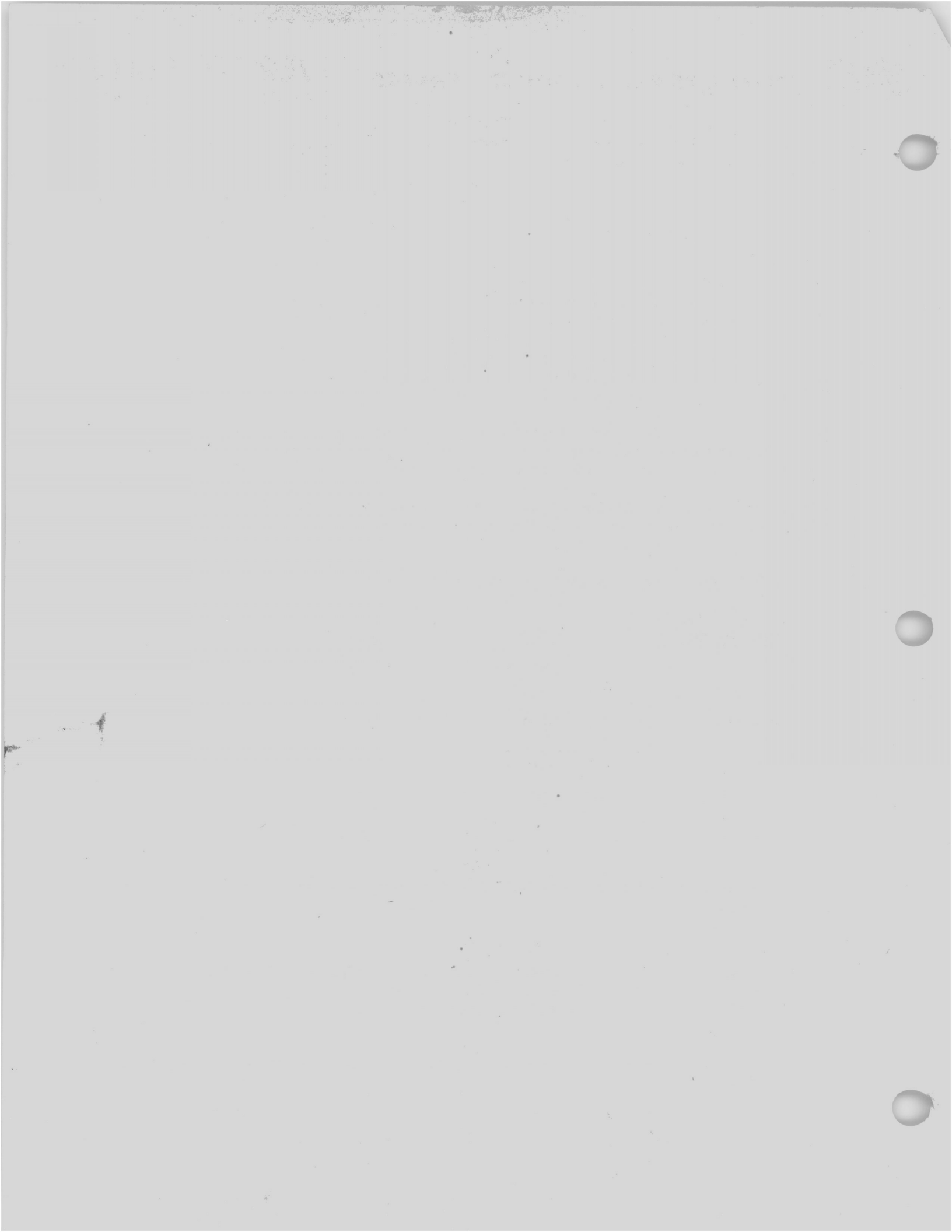
\* Motor Clutch Pulley [P/N 601788] increases impression density on 50Hz machines.

PART NUMBER	DESCRIPTION	LIST PRICE
601788	Motor Clutch Pulley, 50Hz	2.30
601789	Motor Clutch Pulley, 60Hz	2.30
601790	Motor Clutch Pulley, 50Hz	2.30

For prices not listed, refer to Smith-Corona Parts Price List, Form 3-0629, effective January 2, 1979.

Prices are subject to change without notice.

SCM Corporation reserves the right to discontinue parts at any time and/or to furnish substitutes.





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 List "S"

SUBJECT: SERVICE AND PARTS INFORMATION FOR  
SINGLE ELEMENT TYPEWRITERS

## SERVICE BULLETIN

CORTLAND, NEW YORK

NO. 2

PRODUCT

1 SERIES SINGLE ELEMENT TYPEWRITERS
--

DATE: January 31, 1979

### Publications

Enclosed are the following service publications for Single Element Typewriters:

Service Manual	(Form #3-0625-1)	Net Price \$15.00
Parts Manual	(Form #3-0632)	Net Price \$10.00
Service Bulletin #3	(1 Series)	

Dealers may order additional copies of the Service and Parts Manuals from parts ordering sources. SCM locations may order additional copies from Stationery Stores in Syracuse, NY.

These publications are enclosed in a 3 Ring Binder, which should be used to store all technical publications for this model typewriter.

For easy identification, Service Bulletins for Single Element Typewriters will be printed on blue paper.

An Operational Theory Manual covering mechanism movements on Single Element Typewriters will be issued in the near future.

### Service Parts

Parts orders should be placed with parts ordering sources. For parts prices not listed on the reverse side of this bulletin, refer to Smith-Corona Parts Price List (Form #3-0629), effective January 2, 1979.

### Tools

Unique tools required for servicing Single Element Typewriters are listed below. Order these tools from your parts ordering source on a separate parts order that does not include typewriter parts. Use the complete code number, including the "TS" prefix.

<u>TOOL NO.</u>	<u>DESCRIPTION</u>	<u>NET PRICE*</u>
TS 1621	Eccentric Adjuster	5.95
TS 1622	3mm Hex Nut Driver	6.30
TS 1623	6mm Hex Nut Driver	2.05
TS 1624	5mm Open/Box Wrench	3.85
TS 1625	6mm Open/Box Wrench	3.20
TS 1626	7mm Open/Box Wrench	2.85
TS 1627	8mm Open/Box Wrench	2.90
TS 1628	Pin Punch 1/16" x 4"	1.45
TS 1629	Pin Punch 3/32" x 4"	1.45
TS 1630	2mm Allen Wrench	.30
TS 1631	Spring Hook	.95

\* Net priced items are not discounted when sold by Smith-Corona.

<u>PART</u> <u>NUMBER</u>	<u>LIST</u> <u>PRICE</u>	<u>PART</u> <u>NUMBER</u>	<u>LIST</u> <u>PRICE</u>	<u>PART</u> <u>NUMBER</u>	<u>LIST</u> <u>PRICE</u>
670277	.20	671538	7.10	675556	.20
670279	.20	671540	7.10	675637	.20
670281	.20	671549	55.70	675660	1.95
670282	.20	671570	72.65	675661	2.05
670283	.20	671571	72.75	675662	1.75
670529	31.40	671572	69.65	675663	1.80
670531	31.40	671573	73.20	675664	1.65
670532	31.40	671574	70.35	675665	1.95
670533	31.40	671585	4.10	675801	.20
670534	31.40	671587	.50	675981	.20
670535	31.40	671597	.45	698000	3.25
670536	31.40	671598	.45	698001	2.40
670538	31.40	671622	.15	698002	.15
670540	31.40	671631	.15	698003	.15
670541	31.40	671685	.55	698004	.15
670542	31.40	671880	5.50	698005	.15
670543	31.40	671881	1.00	698006	.25
670544	31.40	675073	.30	698007	.15
670545	31.40	675079	1.60	698008	1.05
670546	31.40	675090	.40	698009	.15
670547	31.40	675100	.40	698010	.80
670548	31.40	675110	.20	698011	.15
670549	31.40	675120	.70	698012	.60
670592	.30	675130	1.30	698013	.90
671032	1.35	675240	6.90	698014	.90
671033	1.35	675280	.40	698015	.20
671110	3.25	675300	.80	698016	1.70
671112	1.95	675320	.25	698017	.25
671113	1.75	675350	2.05	698018	.40
671114	3.65	675440	20.00	698085	20.85
671140	.25	675442	20.00	698086	2.50
671424	.15	675470	1.30	698088	2.20
671430	.25				

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SUBJECT: SECURING CAPACITORS AND  
REPLACING TYPING ELEMENTS

# SERVICE BULLETIN

CORTLAND, NEW YORK

NO. 3

PRODUCT \_\_\_\_\_  
1 SERIES  
SINGLE ELEMENT TYPEWRITERS

DATE: January 31, 1979

## Securing Capacitors

The Terminal Capacitor should be secured to the Terminal to assure safe and continuous contact of the Capacitor plugs with Capacitor Plate inside the Terminal. When typewriter service requires removal of the Capacitor, or when a machine in for service has a loose Capacitor, the Capacitor should be securely re-taped to the Terminal as follows:

Discard the old tape. Cut a 5" piece of 3M Scotch Brand #33 3/4" Vinyl Electrical Tape. Be sure Capacitor is fully plugged into the Terminal, and wrap the piece of tape tightly around the Capacitor and the Terminal.

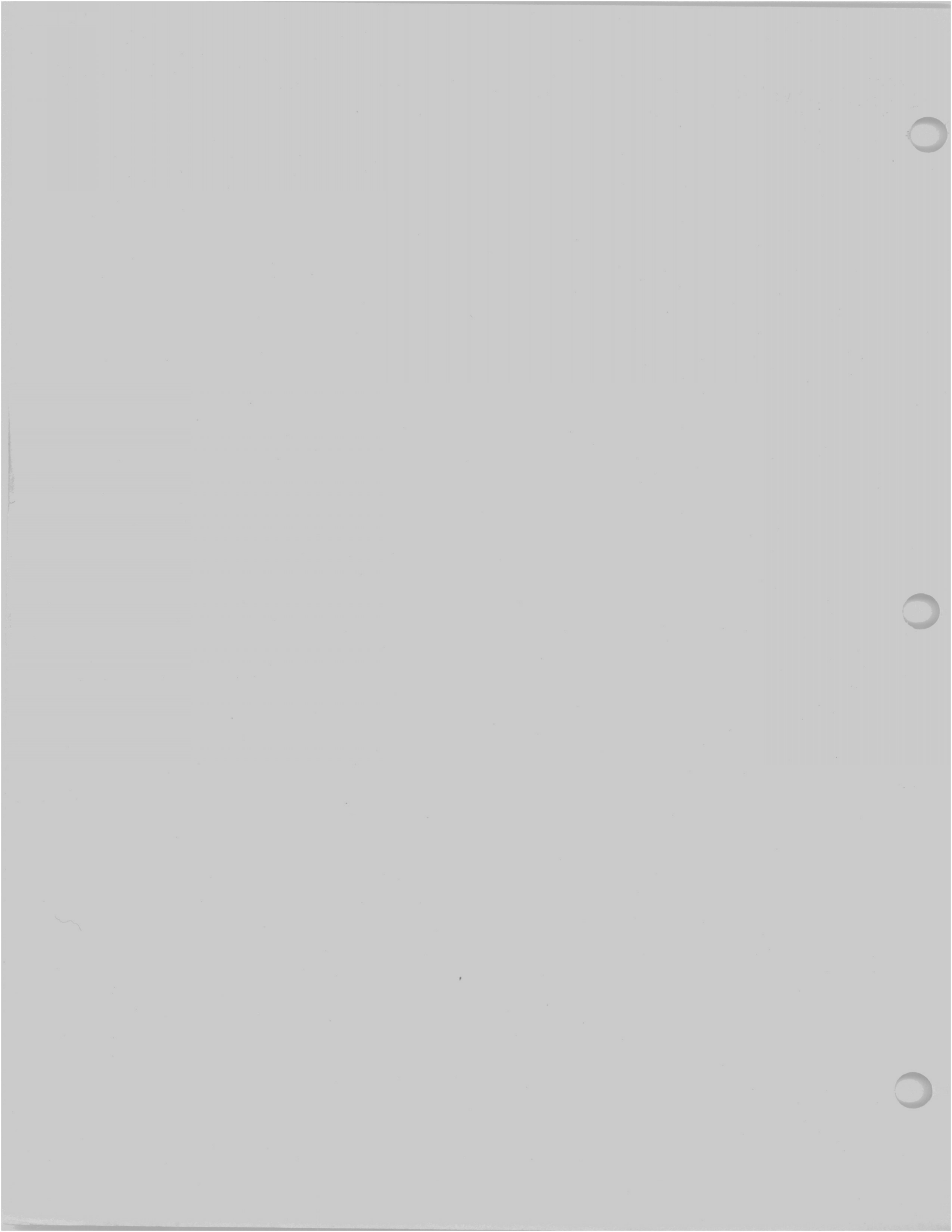
Note: 3M Scotch Brand 3/4" Vinyl Electrical Tape can be purchased locally at hardware and electrical supply stores.

## Replacing Typing Elements

Elements with chipped characters should be replaced only after correcting the machine conditions that caused the damage. Carefully check Printer Adjustments #2, 3, 5, 10, 11, 13, & 15 on every machine returned with a damaged Element.

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WHB





**SMITH-CORONA PRODUCT SERVICE**  
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**SERVICE BULLETIN**

CORTLAND, NEW YORK

Smith-Corona Technical Service & Training  
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List "S"

SUBJECT: CHEMICALLY CLEANING  
ELECTRIC TYPEWRITERS

DATE: March 23, 1979

Most service departments have developed their own system and techniques for chemical cleaning electric typewriters. While most of these "systems" have probably proved satisfactory thru trial and error, we want to provide some additional information and recommendations pertinent to chemically cleaning Smith-Corona electric typewriters.

Machine Disassembly--The following parts must be removed prior to chemical cleaning:

- \*1 - Motor and all electrical wiring and switches
- 2 - Platen and both Platen Knobs
- 3 - Paper Feed Rollers
- 4 - Drive Belts
- 5 - Rubber Feet
- 6 - Line Indicator

\*Removing electrical components will guard against a possible fire hazard from trapped solvents and will prevent contamination of switch contacts. Cleaning solvents will also contaminate the porous bronze bearings in the motor. These bearings were originally impregnated with oil through a vacuum process which can't be duplicated in the field. Relubricating porous bronze bearings is not possible once they have been subjected to a chemical cleaning solution, and only leaves a surface film of oil on the bearings.

Cleaners and Solvents-- All cleaning solutions will attack, in varying degrees: bearing oil, plastic and rubber parts, plating on metal parts, and aluminum parts. Exposure time is the limiting factor.

THE TOTAL CHEMICAL CLEANING TIME SHOULD NOT EXCEED 20 MINUTES.

After chemical cleaning, the machine must be thoroughly rinsed to remove all of the cleaning solution. Use solvent or very hot water for rinsing. The solvent may contain a mixture of light oil, which leaves a thin film of oil over all exposed metal parts. If not, then a light film of oil should be sprayed over the machine before reassembly.

Solutions using aromatic solvents such as Naphthalene, Toluene, Benzene, or chlorinated solvents--chloroform, chloroethene, carbon tetrachloride are potentially more damaging than solutions using pentane, hexane or heptane.

-OVER-

Examples of solvents with low aromatic components are: Dinasol, Savasol, Stoddard Solvent, and Varsol. (Check your supplier for solvent content.)

When using water cleaning solutions, the pH level should be kept low. A pH of 8.5 or above will attack zinc plated parts; above a pH-10 the solution will attack aluminum parts.

Chemically cleaning solution mixtures containing one (1) part cleaner and six (6) parts solvent usually do a good cleaning job. (Follow the manufacturer's recommendations when mixing with a solvent.)

A word about solvents-Always read the precautionary labels on cleaner and solvent containers. (Most solvent containers carry a label setting forth the hazards associated with use and storage.) The immediate area where chemical cleaning is being performed must be well ventilated. Use rubber gloves, if it is necessary to immerse one's hands and arms into a solvent.

Solvents can be used quite safely by practicing good personal hygiene; avoid close or poorly ventilated spaces; keep away from fire or flame; don't smoke while using solvents or around solvent storage; read precautionary labels on containers, and recognize the symptoms of over-exposure.





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NO. 4

PRODUCT 1 SERIES  
SINGLE ELEMENT TYPEWRITERS

SUBJECT: PRINT IMPACT OF THE TYPING ELEMENT

DATE: March 20, 1979

If print density appears lighter than usual when using a fresh fabric ribbon cassette, the following should be checked:

1. Impact Springs (2) [P/N 671660--reference #8 on page 14 of Parts Manual #3-0632] must be of correct length and tension. Check the two springs on the machine with springs of the correct part number obtained from your parts ordering source. Replace these springs if they do not match springs from your parts ordering source.
2. With reference to Service Manual #3-0625-1, the following Adjustments must be correct:

<u>PAGE NO.</u>	<u>ADJUSTMENT</u>
4-2	Carriage Adj. #1
2-51	Printer Adj. #4
2-52	Printer Adj. #5
2-63	Printer Adj. #16
2-68	Printer Adj. #21

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# SMITH-CORONA OPERATIONAL THEORY MANUAL

**SINGLE ELEMENT TYPEWRITERS**

**SMITH-CORONA**  
SCM CORPORATION

## PREFACE

This manual provides operational theory for the major mechanisms of Smith-Corona Single Element Typewriters.

The manual is divided into sections that correspond with functions of the machine. Thus, there is a Backspace Section, Carriage Return Section, etc. Refer to Contents page for a list of functions covered.

Throughout the manual, directional terms such as front, rear, top, bottom, left, right, etc., refer to the machine as it is used by a typist, unless otherwise noted in the text. Consequently, "left" refers to the motor side of the typewriter regardless of machine position required for observing mechanism movements.

Intended for self-training, this manual should be read in sequence, with careful observation of mechanism movements on an unjacketed machine. The technician should be thoroughly familiar with the functions of the machine from an operator's viewpoint. Special attention should be paid to instructions in the text which recommend a particular method of observing a mechanism's movement.

### GENERAL PROCEDURE:

Observe all movements with Power Cord unplugged and Switch ON.

To operate Drive Shafts, rotate Print Cam Shaft Pulley in direction of arrow (→) on top of Left Side Frame (top forward). Never rotate Pulley in opposite direction.

To restore parts to rest position, rotate Print Cam Shaft Pulley. If one or more Interposers remain depressed, turn Switch OFF, then ON.

For standard adjustment information, refer to Smith-Corona Service Manual for Single Element Typewriters.

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## SECTION

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Switch/Power

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Actuation during a Print Cycle

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Activation of C/R Drive  
Carriage Banking at Left Margin  
Switch-C/R Interlock

### 12 LINESPACE

### 13 RIBBON FEED & LIFT

Ribbon Feed  
Ribbon Reverse  
Ribbon Lift



POWER DRIVE

Power Drive  
Switch/Power





Power Drive

When the Motor rotor rotates, the centrifugal MOTOR CLUTCH (1) engages MOTOR PULLEY (2) to drive MOTOR BELT (3), which rotates INTERMEDIATE PULLEY (4) and attached INTERMEDIATE SHAFT (5).

The INTERMEDIATE SHAFT (5) rotates continuously, and powers Spacebar, Backspace, and Carriage Return mechanisms.

Intermediate Pulley also drives CAM SHAFT PULLEY BELT (6) to rotate PRINT CAM SHAFT PULLEY (7), which has two attached Ratchets that rotate continuously with the Pulley.

One Ratchet is on the inside of the Pulley, and it rotates the SHIFT CAM (8) when the Shift Cam's attached clutch is actuated during a shift operation.

The CAM SHAFT RATCHET (9) rotates PRINT CAM SHAFT (12) when a character Keylever is depressed. Each Keylever depression causes PRINT CYCLE CLUTCH (10) to engage CAM SHAFT RATCHET (9) for 180° rotation of PRINT CAM SHAFT (12). At the end of the print cycle (180° rotation), Print Cycle Clutch disengages from Cam Shaft Ratchet.

Mounted on the Print Cam Shaft are three Cam Groups: PRINT CYCLE CAM GROUP (11), TYPING CAM GROUP (13), and SELECTION CAM GROUP (14). These Cam Groups control all functions of the print cycle, such as character selection, escapement, ribbon feed and lift, printing, etc.

Switch/Power

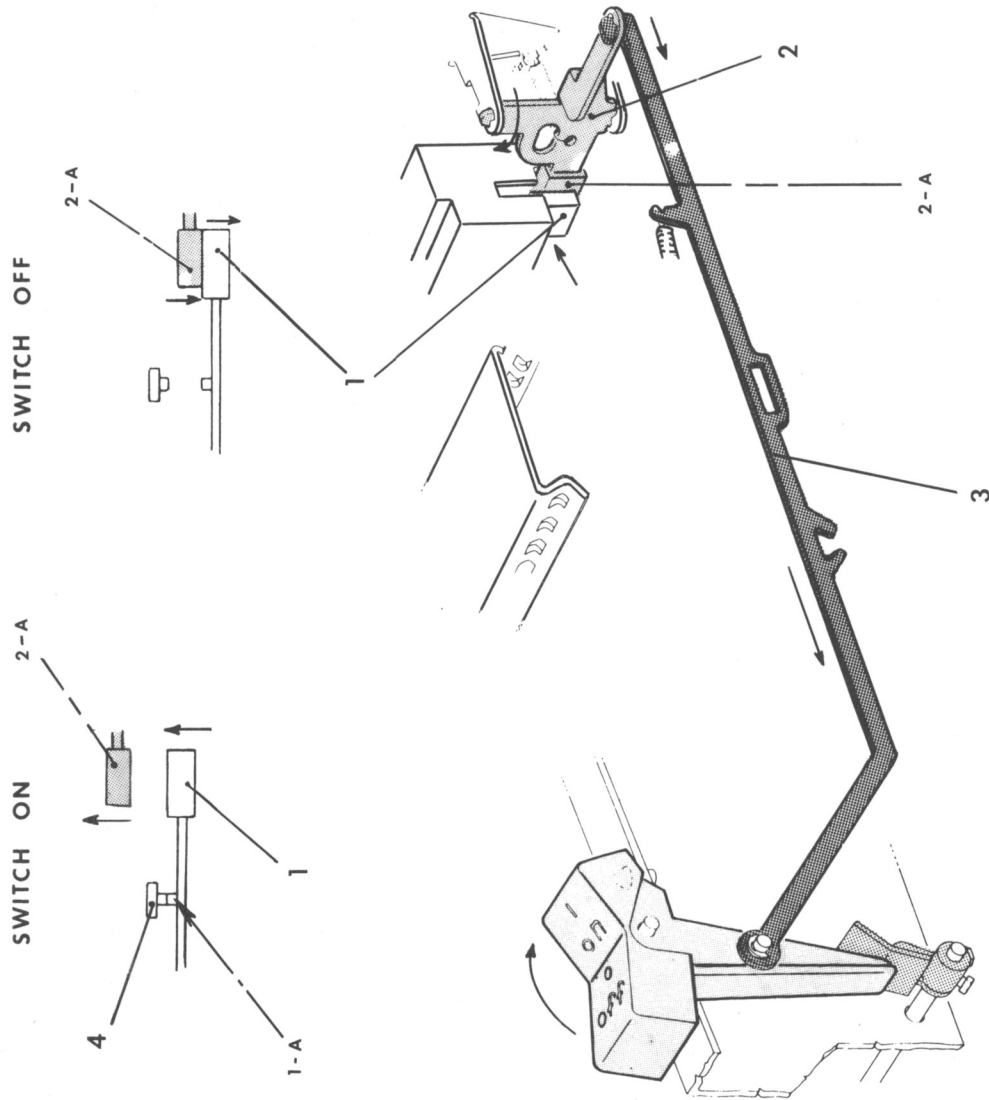
When depressed to "on" position, Switch Knob pulls LINK (3) forward.

LINK (3) rotates SWITCH LEVER (2) clockwise.

SWITCH LEVER CAP (2-A) releases SWITCH ACTUATOR (1).

SWITCH ACTUATOR (1) pivots rearward, allowing CONTACTS (1-A) (4) inside Receptacle Terminal to close. The closed contacts supply current to the motor.

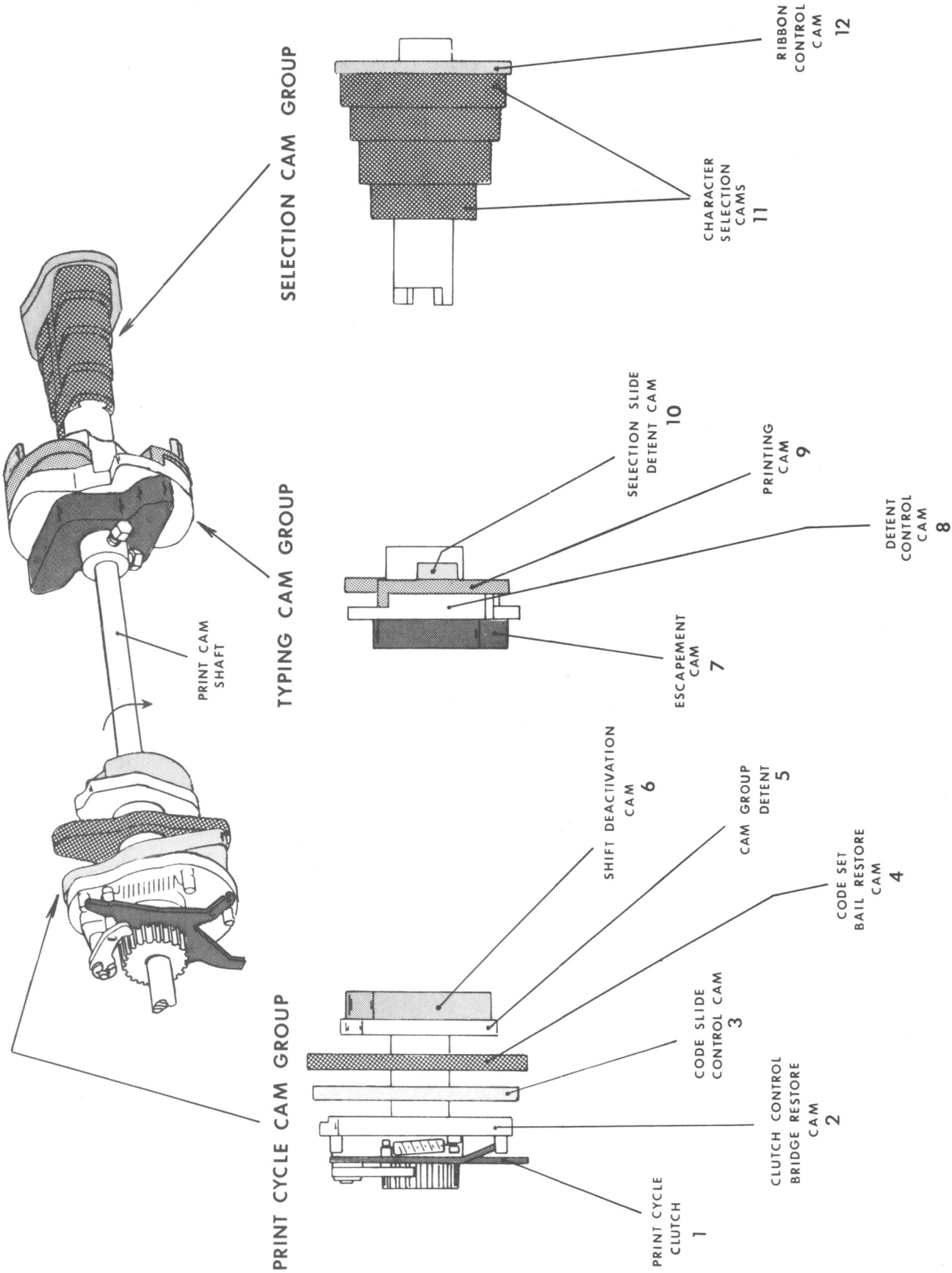
When Switch Knob is turned off, movement is reversed. SWITCH LEVER PAD (2-A) holds SWITCH ACTUATOR (1) forward. Contacts are open; current is not transmitted to motor.



## PRINT CYCLE

Print Cycle Cam Groups  
Keylever/Interposer  
Interposer Release  
Print Cycle Start  
Restoring Code Set Bail & Trigger Bail  
Print Cycle Stop & Rest Position  
Keyboard Deactivation  
Automatic Keyboard Reactivation  
Manual Keyboard Reactivation  
Keylever/Interposer--Single Stroke  
Keylever/Interposer--Repeat Stroke

PRINT CYCLE

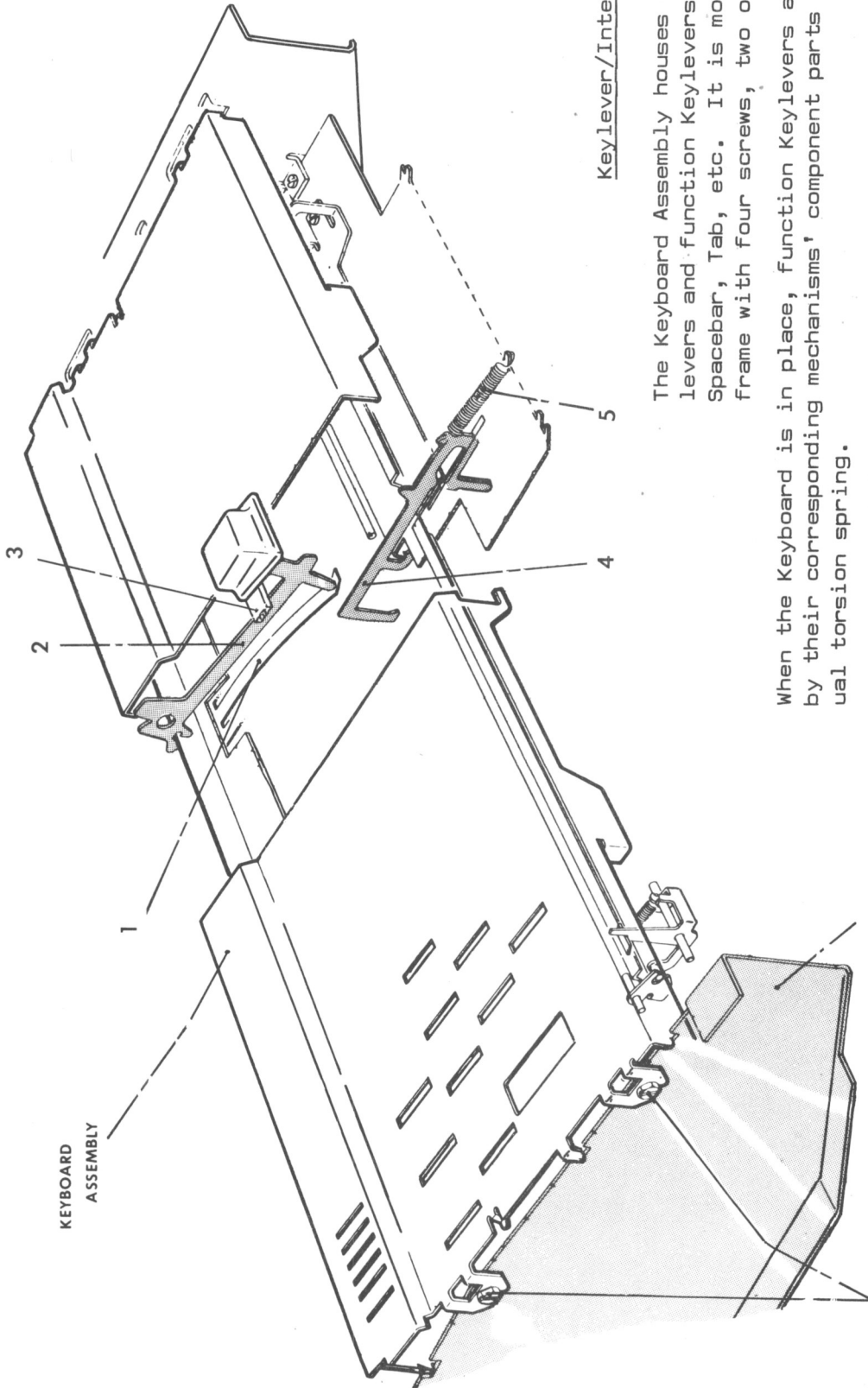


Print Cycle Cam Groups

The Print Cam Shaft and attached Cam Groups rotate one half a revolution [180°] when a print cycle is actuated by keylever depression. Each Cam Group has double sided, symmetrical cam profiles that control various functions of the print cycle. The function of each cam profile is listed below, and is referenced to the page in this manual that describes movement of the corresponding mechanism.

- |                             |   |   |
|-----------------------------|---|---|
| Print<br>Cycle Cam<br>Group | } | <ol style="list-style-type: none"> <li>1. Print Cycle Clutch - pp. 2-6 &amp; 2-8.</li> <li>2. Clutch Control Bridge Restore Cam - p. 2-8.</li> <li>3. Code Slide Control Cam - p. 3-5.</li> <li>4. Code Set Bail Restore Cam - p. 2-7.</li> <li>5. Cam Group Detent - The Cam Follower that contacts this profile applies detent tension to stabilize Print Cycle Cam Group in rest position.</li> <li>6. Shift Deactivation Cam - p. 4-6.</li> </ol> |
| Typing<br>Cam<br>Group      | } | <ol style="list-style-type: none"> <li>7. Escapement Cam - p. 5-3.</li> <li>8. Detent Control Cam - pp. 3-15 &amp; 3-16.</li> <li>9. Printing Cam - p. 3-14.</li> <li>10. Selection Slide Detent Cam - pp. 3-6 &amp; 3-7.</li> </ol>  |
| Selection<br>Cam Group      | } | <ol style="list-style-type: none"> <li>11. Character Selection Cams - pp. 3-8 &amp; 3-9.</li> <li>12. Ribbon Control Cam - p. 13-3.</li> </ol>  |

Note: The above is for reference; it should not interrupt the sequential reading of this manual.



Keylever/Interposer

The Keyboard Assembly houses character Key-levers and function Keylevers such as Shift, Spacebar, Tab, etc. It is mounted to the side frame with four screws, two on each side.

When the Keyboard is in place, function Keylevers are held at rest by their corresponding mechanisms' component parts or by an individual torsion spring.

Character KEYLEVERS (2) are held at rest against rubber UP-STOP (3) by LEAF SPRING (1) tension.

Each character KEYLEVER (2) is located directly above an INTERPOSER (4). Key-lever depression pushes Interposer down.

An Interposer has two functions: After it is depressed, Interposer moves forward under SPRING (5) tension to actuate a print cycle. Then it is driven rearward to determine the code received by the printer for vertical and horizontal character selection.

KEYBOARD ASSEMBLY

SIDE FRAME

ATTACHING SCREWS

Interposer Release

When a Keylever is depressed, INTERPOSER ARM (1-A) moves down into Slot of Guide Plate.

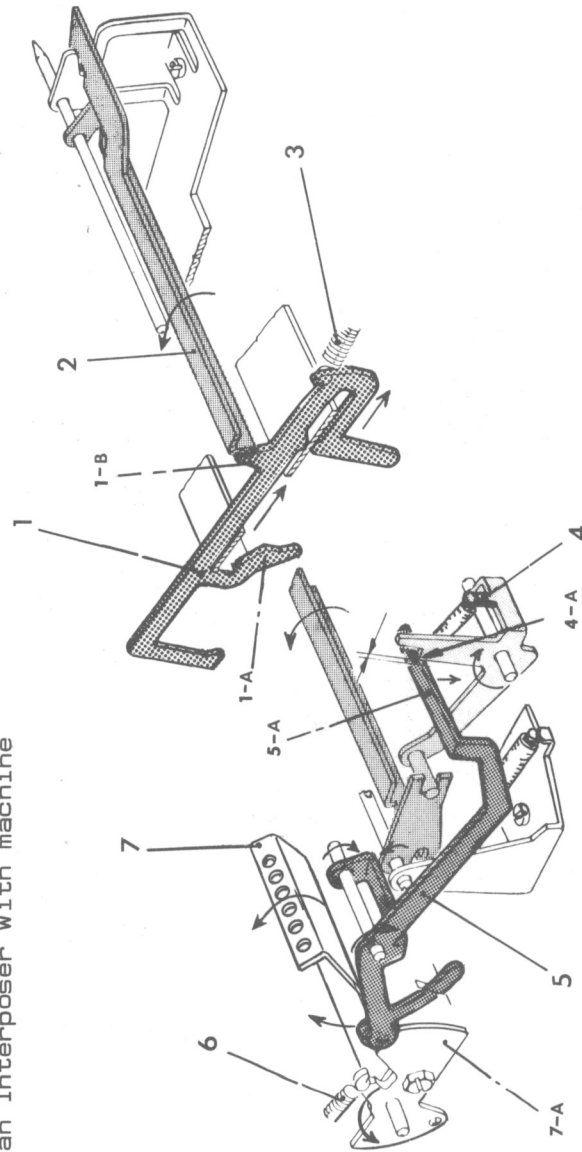
INTERPOSER SPRING (3) pulls Interposer forward.

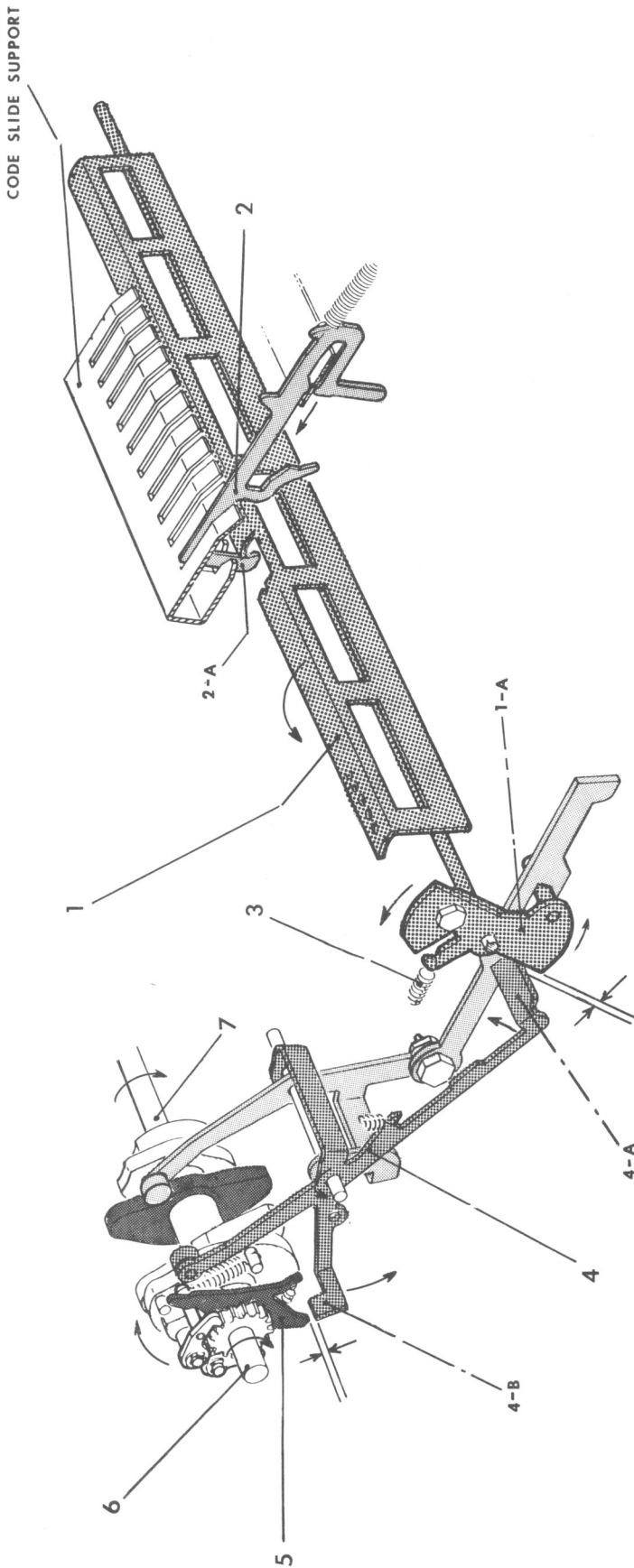
INTERPOSER LUG (1-B) rotates PRINT CYCLE TRIGGER BAIL (2) top rearward.

BAIL (2) movement rotates RELEASE BRIDGE (4) top forward.

Released by LATCHING SURFACE (4-A), SET CONTROL BRIDGE (5) rotates top forward, allowing CODE SET BAIL ARM (7-A) and CODE SET BAIL (7) to rotate top rearward under SPRING (6) tension.

NOTE: To observe movement, hold SET CONTROL BRIDGE ARM (5-A) up, and depress an Interposer with machine at rest.





Print Cycle Start

When released by Interposer action, CODE SET BAIL (1) rotates top rearward under SPRING (3) tension.

CODE SET BAIL ARM (1-A) releases CLUTCH CONTROL BRIDGE ARM (4-A), causing BRIDGE (4) to rotate top rearward.

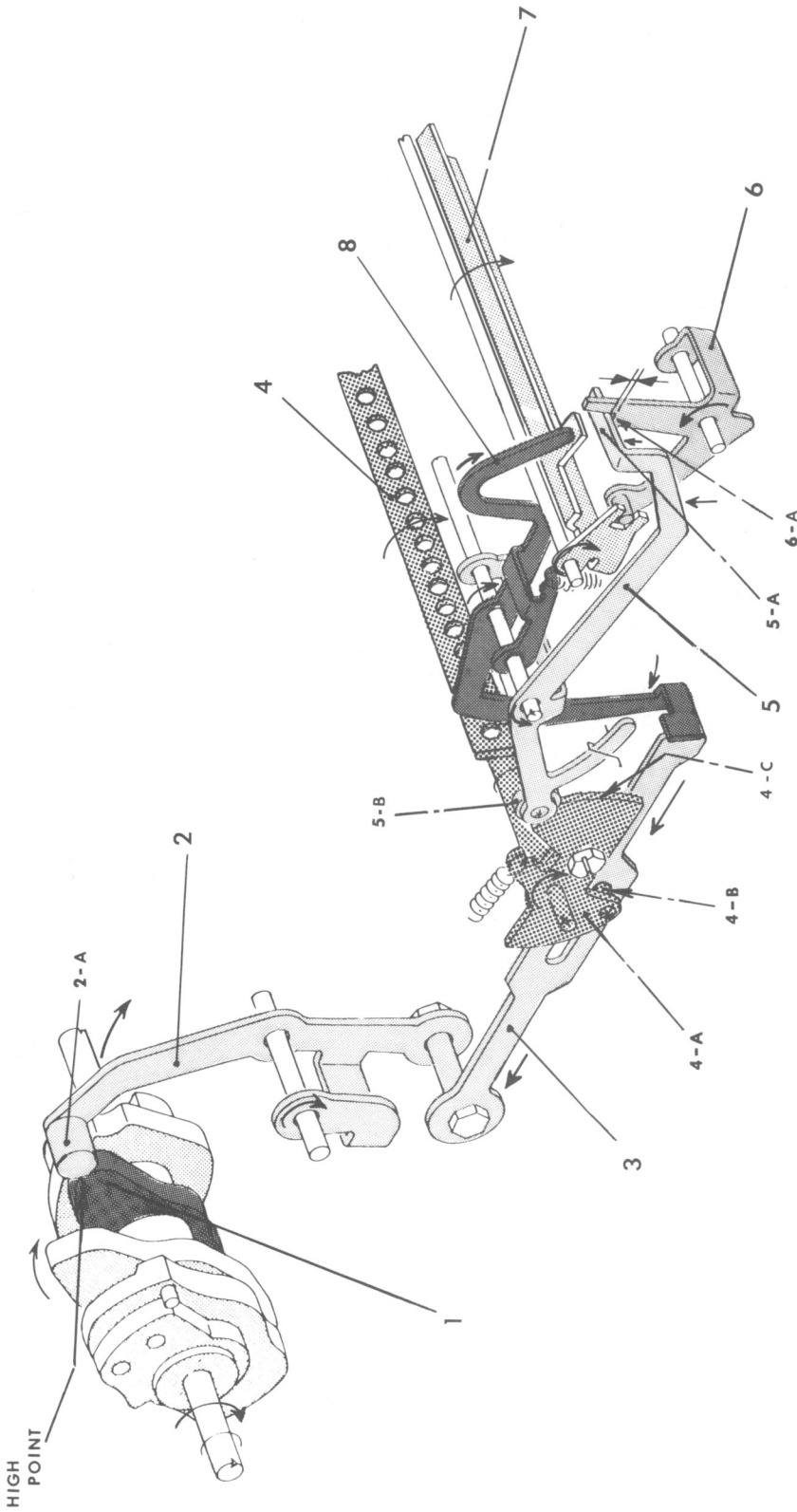
Rear ARM (4-B) releases FLANGE of PRINT CYCLE CLUTCH (5).

Clutch Dogs engage CAM SHAFT RATCHET (6).

Ratchet rotates Print Cycle Cam Group and attached PRINT CAM SHAFT (7) top forward to begin a print cycle. All three Cam Groups rotate with the Shaft.

During its release, BAIL (1) picks up ARM (2-A) of Interposer, and drives Interposer rearward into path of Code Slides, which are mounted in Code Slide Support.





Restoring Code Set Bail and Trigger Bail

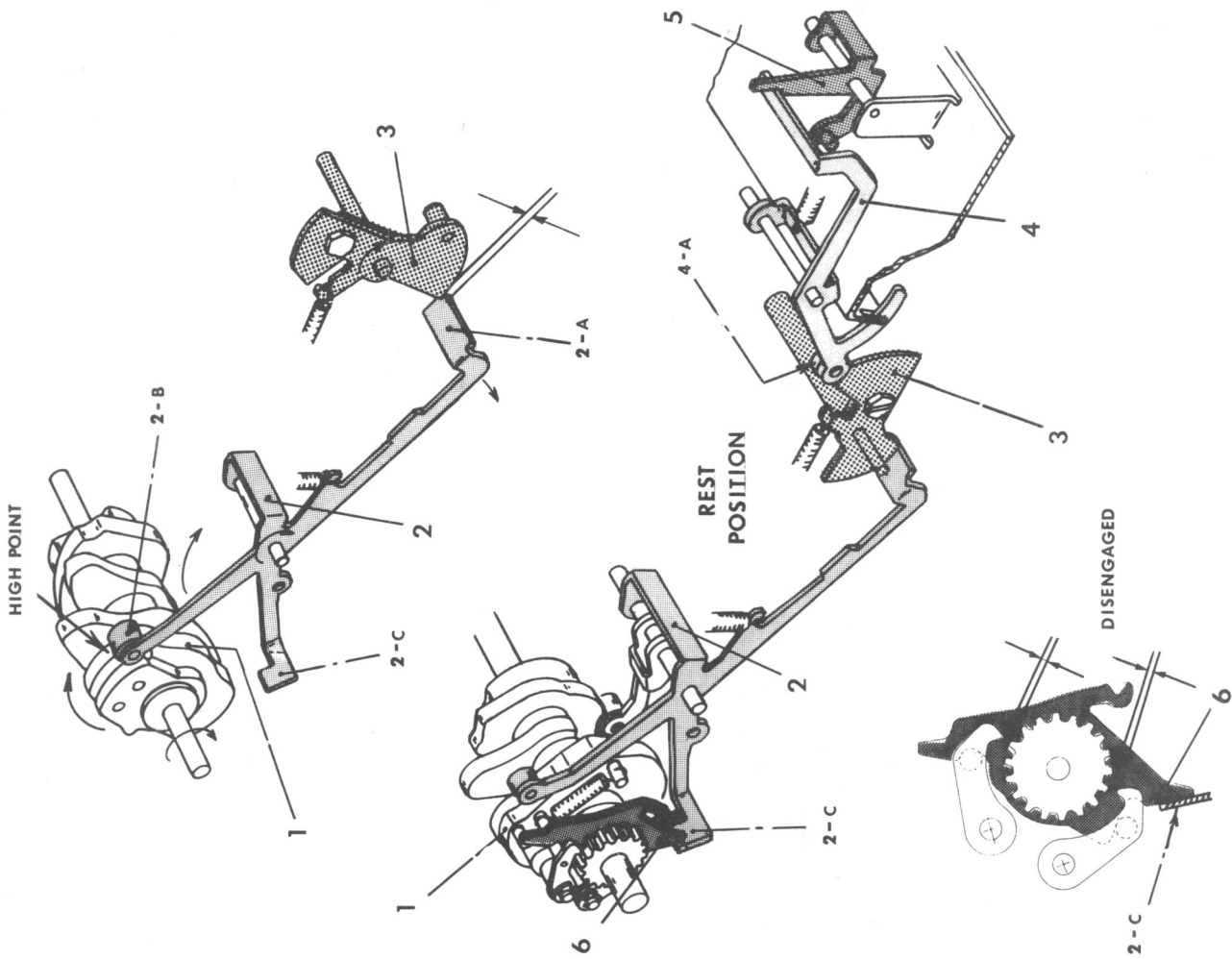
When Print Cycle Cam Group rotates top forward during a print cycle, SET BAIL RESTORE CAM (1) rotates RELOAD BRIDGE (2) top forward, pulling RELOAD LINK (3) rearward.

LINK (3) rotates CODE SET BAIL (4) top forward thru STUD (4-B) on CODE SET BAIL ARM (4-A).

Interposer moves forward with return of Code Set Bail.

LINK (3) also releases TRIGGER BAIL RESTORE BRIDGE (8), which restores TRIGGER BAIL (7) and RELEASE BRIDGE (6) to rest.

As CODE SET BAIL (4) restores, SURFACE (4-C) cams ROLLER (5-B) and rotates SET CONTROL BRIDGE (5) top rearward. ARM (5-A) overtravels latching surface of RELEASE BRIDGE (6), and latches on Release Bridge when Cam Follower returns toward rest position.



Print Cycle Stop

Early in the print cycle, CLUTCH CONTROL CAM (1) rotates CLUTCH CONTROL BRIDGE (2) top forward so that FRONT ARM (2-A) pivots below CODE SET BAIL ARM (3).

After Code Set Bail restores, BRIDGE (2) is released by CAM (1), and rests with FRONT ARM (2-A) held by CODE SET BAIL ARM (3).

In this position, REAR ARM (2-C) of Bridge disengages Print Cycle Clutch to end the print cycle.

Print Cycle Rest Position

SET CONTROL BRIDGE (4) is latched by RELEASE BRIDGE (5).

SET CONTROL BRIDGE ROLLER (4-A) rests on flat of CODE SET BAIL ARM (3), and holds Code Set Bail at rest position.

CODE SET BAIL ARM (3) holds CLUTCH CONTROL BRIDGE (2) so that Print Cycle Clutch is disengaged from Cam Shaft Ratchet.

Keyboard Deactivation

BALL INTERLOCK (3) prevents the start of a print cycle when two Keylevers are depressed at the same time.

When CODE SET BAIL (1) drives an Interposer rearward during a single Keylever depression, INTERPOSER ARM (2-A) enters space between Balls of BALL INTERLOCK (3).

Balls are spaced to permit entry of only one Interposer.

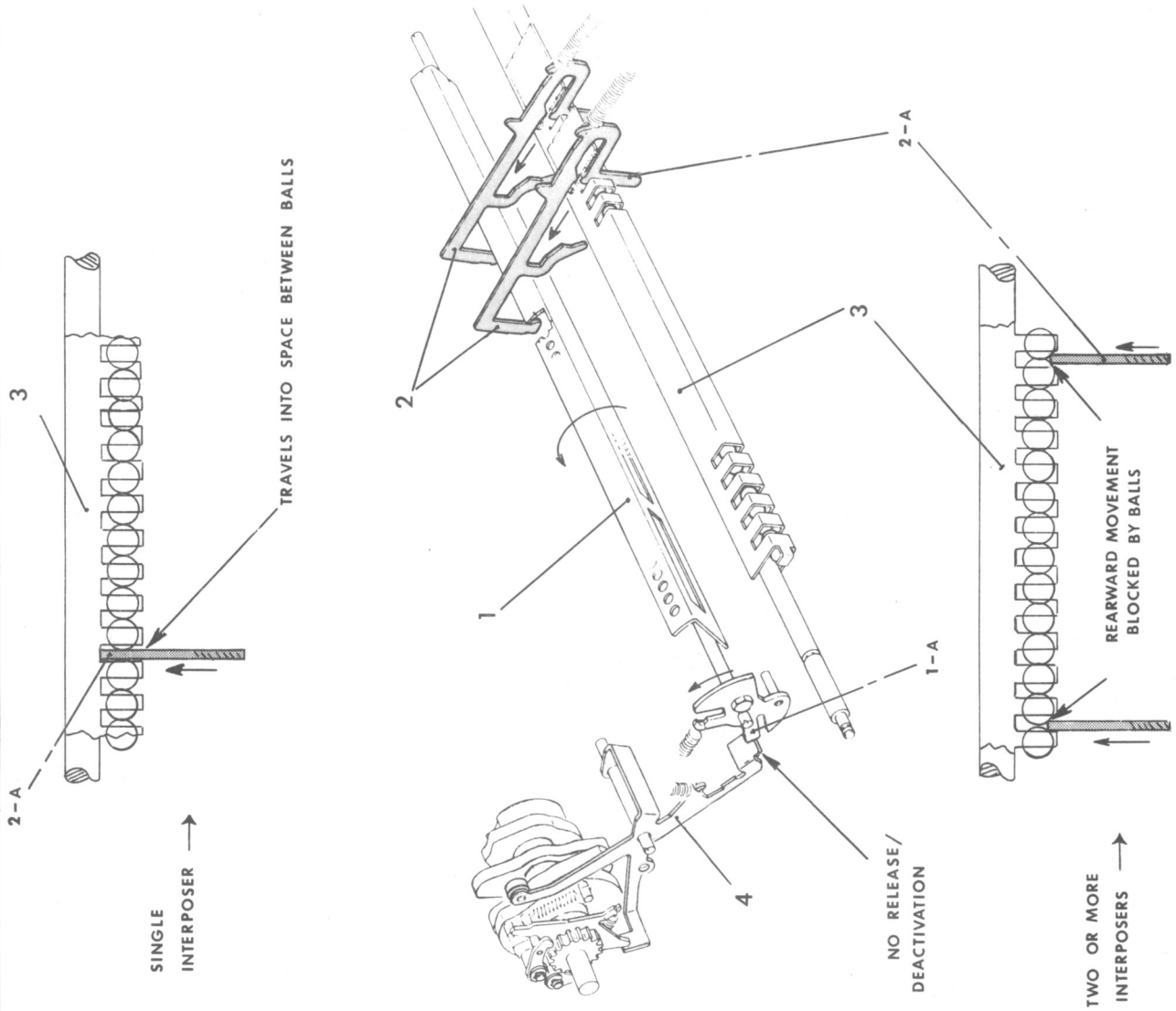
When two Keylevers are depressed at the same time, Ball Interlock prevents full rearward movement of Interposers.

Interposers limit rotation of Code Set Bail.

CODE SET BAIL ARM (1-A) does not rotate far enough to release CLUTCH CONTROL BRIDGE (4), and a print cycle does not start.

Keyboard is deactivated.

Code Set Bail and Interposers must be re-stored by automatic or manual reactivation.



Automatic Keyboard Reactivation

When simultaneous depression of 2 or 3 Keylevers deactivates Keyboard, the Automatic Reactivation Mechanism restores Code Set Bail and Interposers to rest position.

REACTIVATION ARM (4) is attached to Shaft of CODE SET BAIL (1), and rotates with Bail during every Keylever stroke.

When simultaneous release of 2 or 3 Interposers limits rotation of Code Set Bail, REACTIVATION ARM SLOT (4-A) is positioned opposite STUD (3-A) of floating REACTIVATION SLIDE (3).

SPRING (6) pulls SLIDE (3) so that STUD (3-A) enters SLOT (4-A).

The Hook of the oscillating REACTIVATION CAM FOLLOWER (2) lifts SLIDE STUD (3-A) and the trapped REACTIVATION ARM (4), rotating CODE SET BAIL (1) and SET CONTROL BRIDGE (8) to rest position.

Interposers restore with return movement of Code Set Bail.

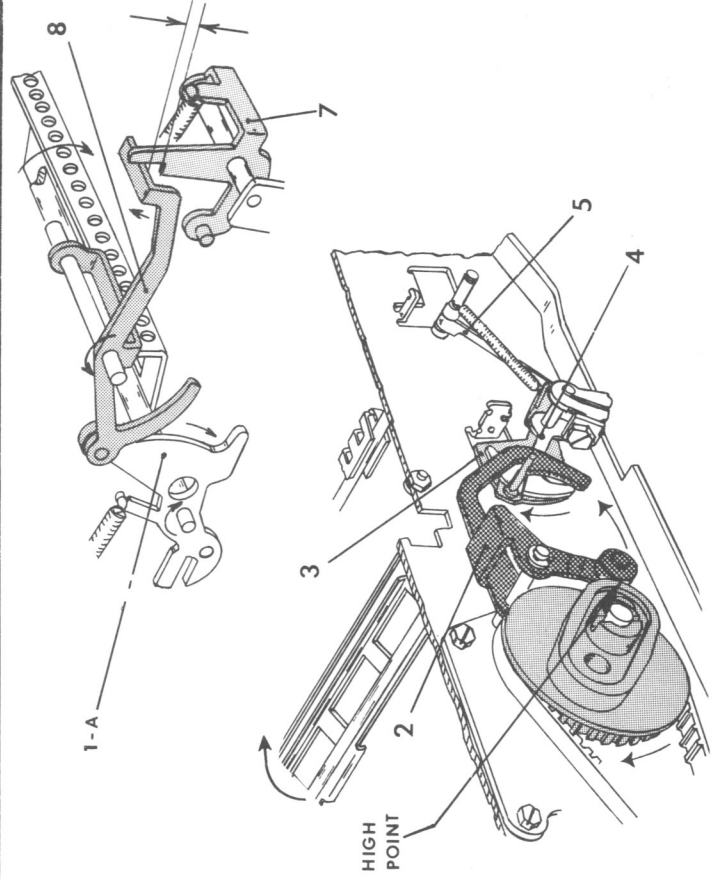
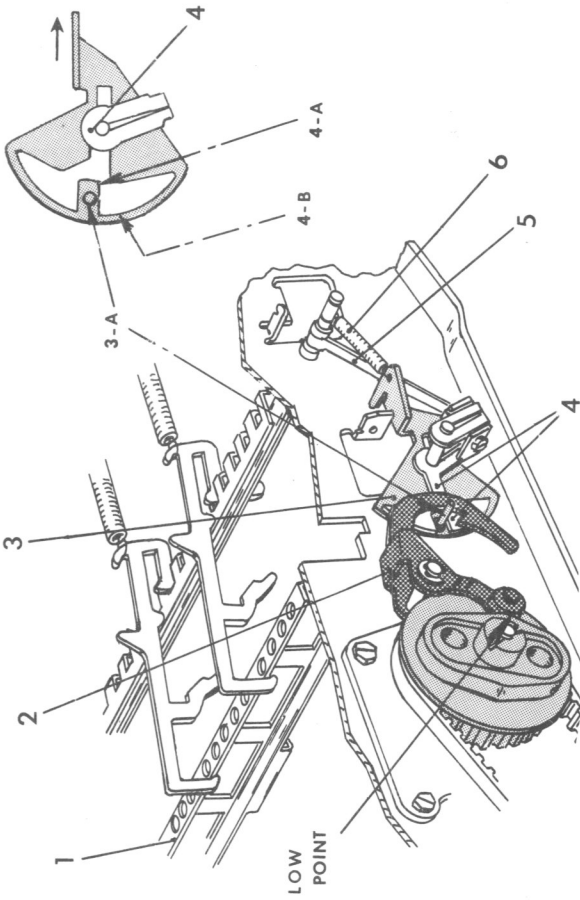
SET CONTROL BRIDGE (8) latches on RELEASE BRIDGE (7) to hold Code Set Bail at rest.

LEAF SPRING (5) disengages SLIDE (3) from REACTIVATION ARM (4).

Keyboard is reactivated.

During a single Keylever depression, REACTIVATION ARM SURFACE (4-B) cams SLIDE STUD (3-A) slightly rearward so it will not enter SLOT (4-A).

When more than 3 Interposers are released simultaneously, Interposer spring tension prevents Code Set Bail from rotating far enough for STUD (3-A) to enter SLOT (4-A). Keyboard must be manually reactivated.



Manual Keyboard Reactivation

Depression of On-Off Switch restores depressed Interposers and deactivated Code Set Bail to rest position.

When Switch Knob is turned off, it rotates RELOAD LEVER (2) and attached RESTORE BAIL (3) top rearward.

BAIL (3) pushes depressed INTERPOSERS (1) rearward.

When Switch Knob is turned on, Interposers restore to rest position.

Movement of RELOAD LEVER (2) also pushes RELOAD LINK (6) rearward.

LINK (6) rotates RELOAD LEVER (7) and attached CODE SET BAIL (8) top forward.

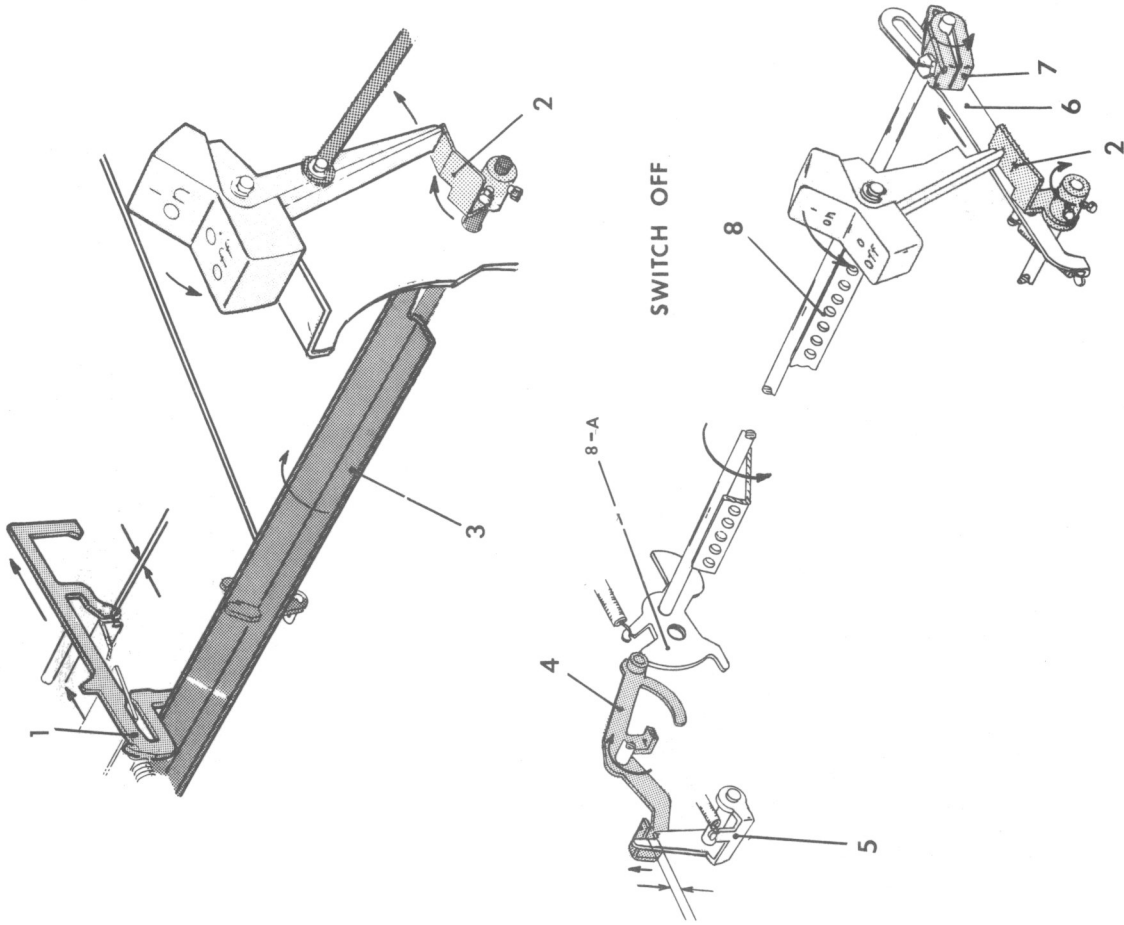
Deactivated Interposers return to rest with Code Set Bail.

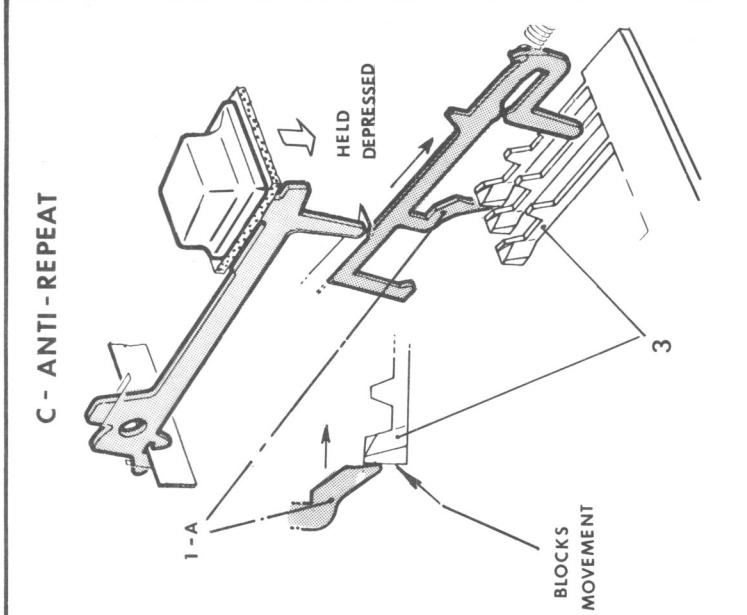
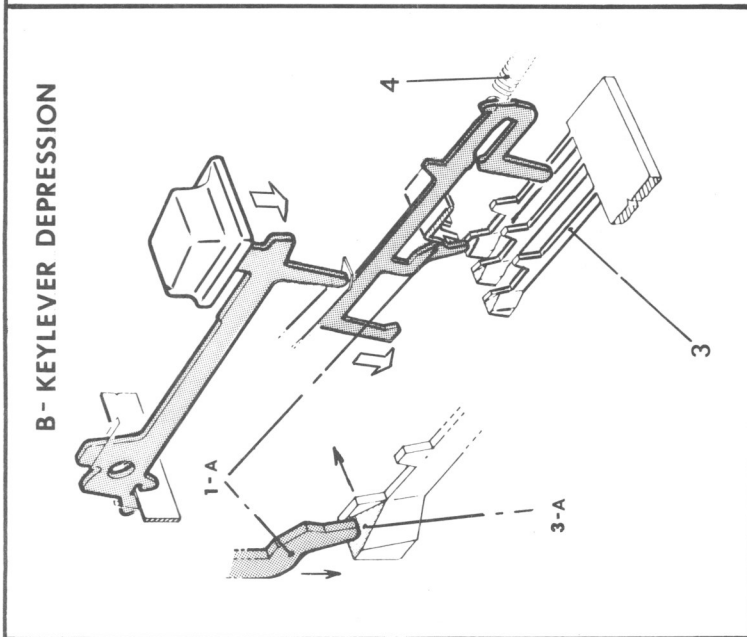
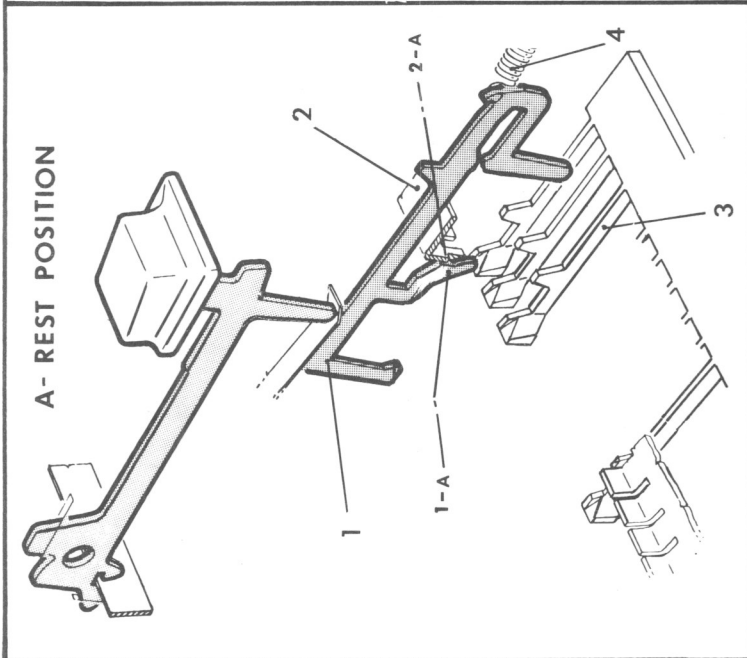
CODE SET BAIL ARM (8-A) rotates SET CONTROL BRIDGE (4) top rearward.

When Switch Knob is turned on, SET CONTROL BRIDGE (4) latches on RELEASE BRIDGE (5) to hold Code Set Bail at rest.

Keyboard is reactivated.

When On-Off Switch is left in off position, reactivation parts remain in their maximum reload positions.





Keylever/Interposer--Single Stroke Action

An ANTI-REPEAT SPRING TAB (3) is located below each Interposer, and it prevents repeating keyaction when a Keylever is held depressed.

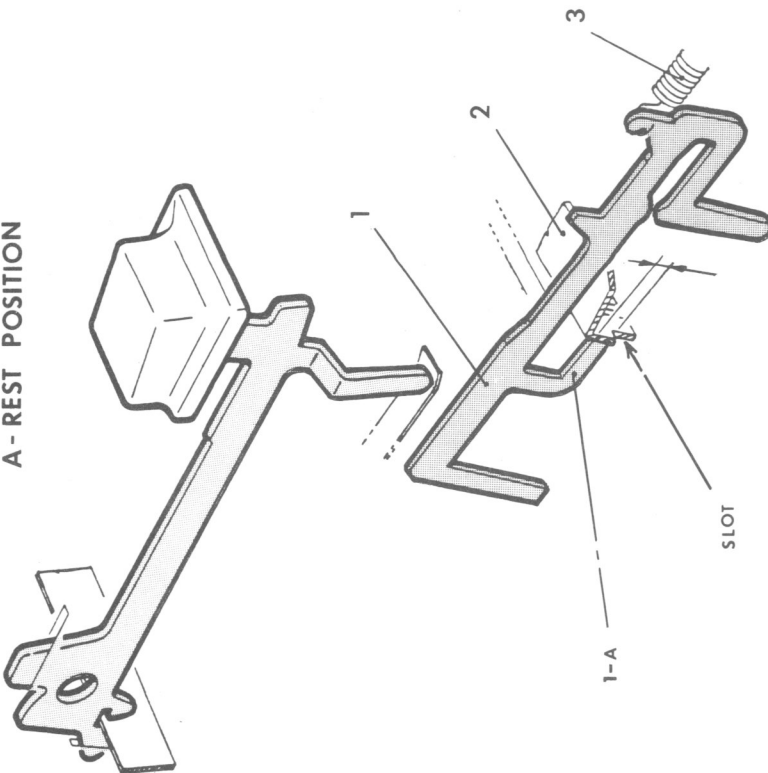
A - Rest Position: INTERPOSER SPRING (4) holds INTERPOSER (1) up and forward with ARM (1-A) against STOP SURFACE (2-A) of INTERPOSER GUIDE PLATE (2).

B - Keylever Depression: When Keylever is depressed, INTERPOSER ARM (1-A) cams against BEVELED SURFACE (3-A) of Anti-Repeat Spring Tab, and enters Slot of Guide Plate.

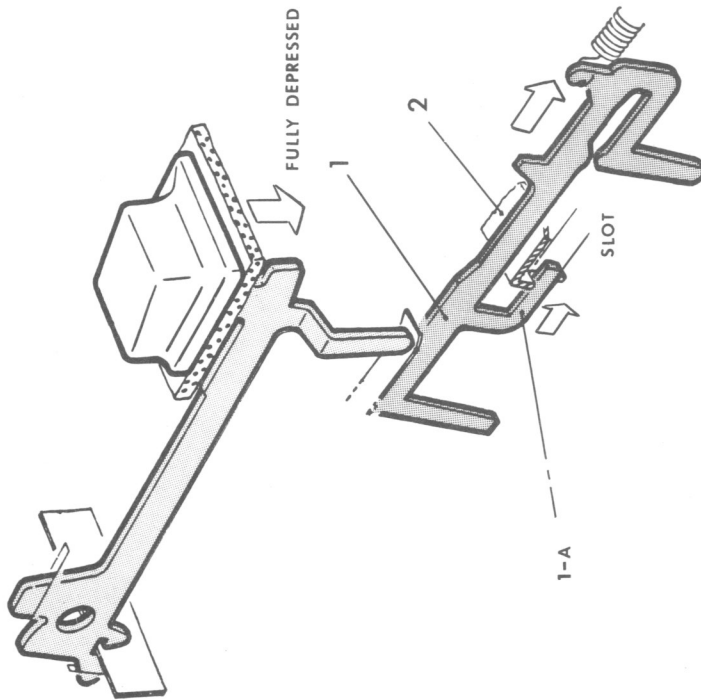
Interposer moves forward under SPRING (4) tension to actuate a print cycle. It is driven rearward for character selection coding, and then returns toward rest position.

C - Anti-Repeat: When Keylever is held depressed, ANTI-REPEAT SPRING TAB (3) blocks forward return movement of Interposer to prevent the start of another print cycle. When Keylever is released, Interposer restores to rest position.

A - REST POSITION



B - REPEAT ACTION



Keylever/Interposer--Repeat Stroke Action

A repeat key is located at position #45 on all Keyboards. At this position, an Anti-Repeat Spring Tab is held out of line with Repeat Interposer, and does not prevent repeating action when Keylever is held depressed.

A - Rest Position: INTERPOSER SPRING (3) holds REPEAT INTERPOSER (1) up and forward with ARM (1-A) above Slot of INTERPOSER GUIDE PLATE (2).

B - Repeat Action: When Repeat Keylever is held depressed after actuating a print cycle, ARM (1-A) passes thru Slot without interference so that Repeat Interposer moves forward and starts another print cycle. Repeating action continues until Repeat Keylever is released and Interposer restores to rest.





**CHARACTER SELECTION**

The Typing Element  
Code Slide Movement  
Setting the Code for Vertical Selection  
Setting the Code for Horizontal Selection  
Carrying out the Code for Vertical and Horizontal Drive  
Vertical Selection  
Clockwise Horizontal Selection  
Counterclockwise Horizontal Selection  
Shift--180° Rotation  
Print Out  
Detent Control - Starwheel Detent  
Vertical Detent & Horizontal Fine Detent

CHARACTER SELECTION CHART

DIRECTION OF ROTATION →

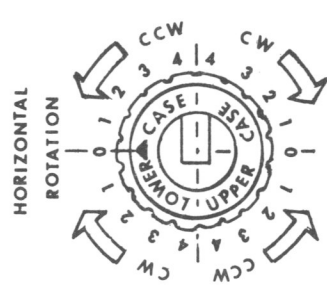
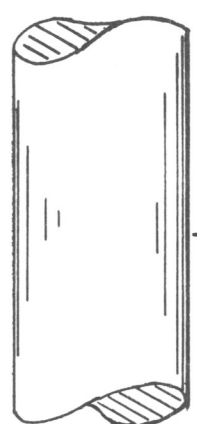
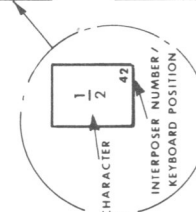
CLOCKWISE	HORIZONTAL ROTATION					COUNTERCLOCKWISE		
	4	3	2	1	0			
1	1	z	i	o	a	c	k	3
4	12	f	m	t	e	r	h	9
	43	'	5	u	s	n	v	0
7	24	w	2	d	x	b	.	;
1/2	42	y	6	-	g	q	p	j
								8
								28
								36
								33
								27
								45

LOWER CASE

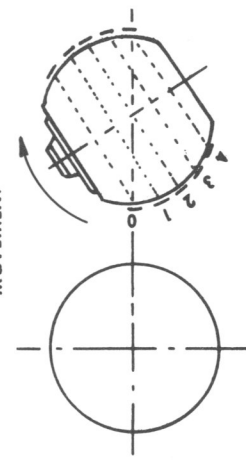
DIRECTION OF ROTATION →

CLOCKWISE	HORIZONTAL ROTATION					COUNTERCLOCKWISE			
	4	3	2	1	0				
1	1	?	Z	I	O	A	C	K	#
\$	12	F	M	T	E	R	H	(	+
"	43	%	U	S	N	L	V	)	*
&	24	W	@	D	X	B	.	:	'
1/4	42	Y	Ç	-	G	Q	P	J	X
									8
									31
									32
									36
									33
									27
									45

UPPER CASE



REST POSITION



1063V KEYBOARD

### Character Selection--The Typing Element

The Typing Element rotates vertically and horizontally to present a selected character to the Platen for typing.

There are 45 lower case characters on one half of the Typing Element, and 45 upper case characters on the other half.

Each half of the Element is divided into 9 horizontal and 5 vertical rows of characters.

The Shift mechanism rotates the Element 180° so that either the lower case half or upper case half of the Element faces the Platen. Once the Element is shifted to upper case, vertical and horizontal character selection movements are the same as for lower case.

For vertical selection, the Element moves 1, 2, 3, or 4 Steps in a top forward direction. Or it may not move vertically at all for selection of a character in the "0" position, which is home position.

For horizontal selection, the Element rotates 1, 2, 3, or 4 Steps in a clockwise or a counterclockwise direction. Or it may not rotate horizontally at all for selection of a character in the "0" position, which is home position.

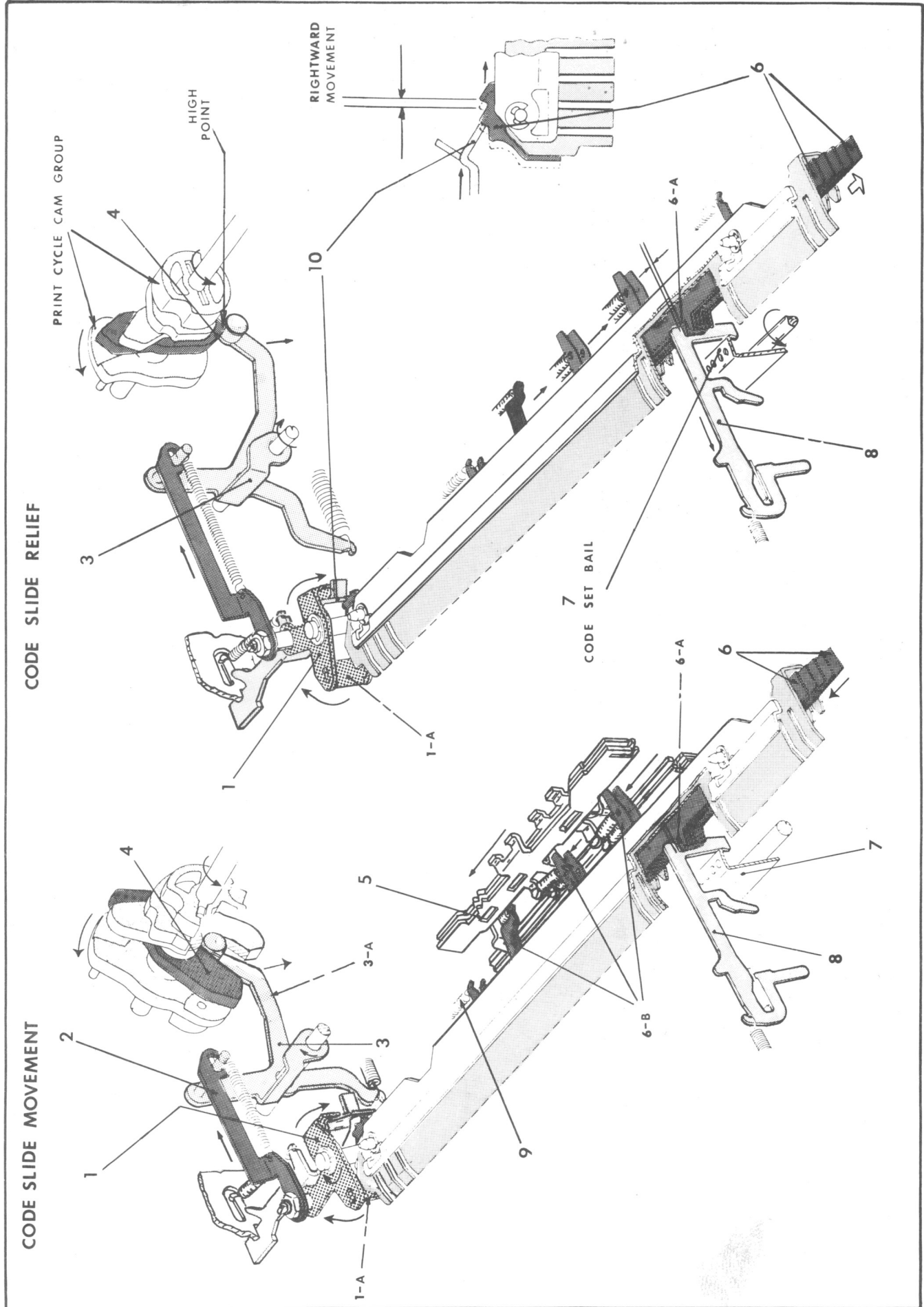
Vertical movement and horizontal rotation take place at the same time.

The Character Selection Chart above shows the vertical and horizontal movements required for character selection on a 1063V Keyboard. [Charts for other Keyboards are shown in Service Manual].

#### Some examples:

1. To select the letter "o," the Element does not move horizontally or vertically.
2. To select the letter "p," the Element moves 4 Steps vertically and rotates 2 Steps horizontally in a counterclockwise direction.
3. To select the upper case "p," the Element is rotated 180° by the Shift mechanism. Horizontal and vertical movement is the same as for the lower case "p."
4. To select a repeat underscore [position #45], the Element moves the maximum amount vertically [4 Steps], and rotates the maximum amount horizontally [4 Steps] in a counterclockwise direction.

3-4 CHARACTER SELECTION



### Character Selection--The Typing Element

The Typing Element rotates vertically and horizontally to present a selected character to the Platen for typing.

There are 45 lower case characters on one half of the Typing Element, and 45 upper case characters on the other half.

Each half of the Element is divided into 9 horizontal and 5 vertical rows of characters.

The Shift mechanism rotates the Element 180° so that either the lower case half or upper case half of the Element faces the Platen. Once the Element is shifted to upper case, vertical and horizontal character selection movements are the same as for lower case.

For vertical selection, the Element moves 1, 2, 3, or 4 Steps in a top forward direction. Or it may not move vertically at all for selection of a character in the "0" position, which is home position.

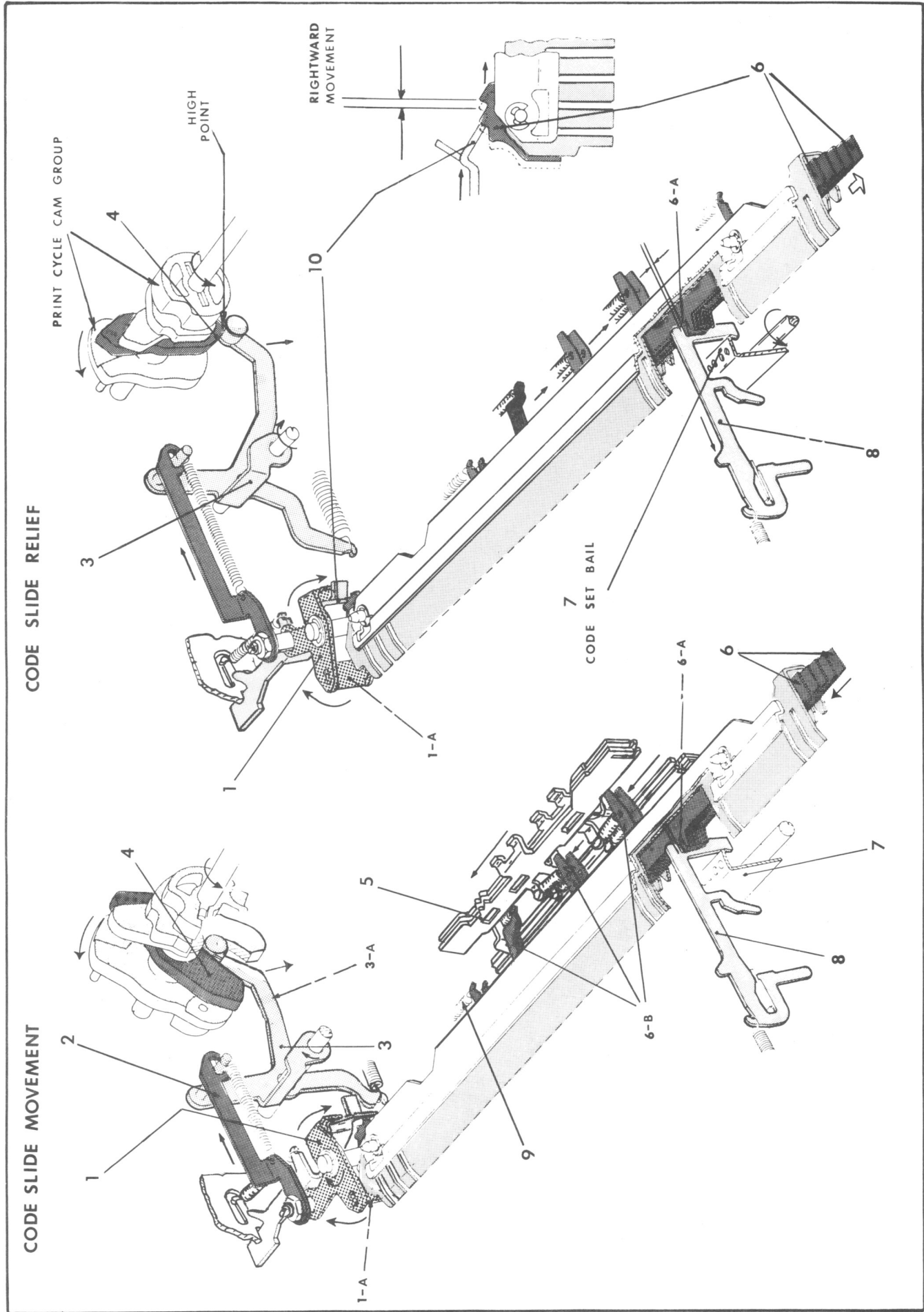
For horizontal selection, the Element rotates 1, 2, 3, or 4 Steps in a clockwise or a counterclockwise direction. Or it may not rotate horizontally at all for selection of a character in the "0" position, which is home position.

Vertical movement and horizontal rotation take place at the same time.

The Character Selection Chart above shows the vertical and horizontal movements required for character selection on a 1063V Keyboard. [Charts for other Keyboards are shown in Service Manual].

#### Some examples:

1. To select the letter "o," the Element does not move horizontally or vertically.
2. To select the letter "p," the Element moves 4 Steps vertically and rotates 2 Steps horizontally in a counterclockwise direction.
3. To select the upper case "P," the Element is rotated 180° by the Shift mechanism. Horizontal and vertical movement is the same as for the lower case "p."
4. To select a repeat underscore (position #45), the Element moves the maximum amount vertically (4 Steps), and rotates the maximum amount horizontally (4 Steps) in a counterclockwise direction.



Code Slide Movement

During a print cycle, CODE SLIDES (6) move left to position SELECTION SLIDES (5) for character selection coding of the Printer unit.

When Print Cycle Cam Group rotates during a print cycle, CODE SLIDE CONTROL CAM (4) rotates CODE SLIDE CONTROL BRIDGE (3) top rearward.

BRIDGE (3), thru LINK (2), rotates CODE SLIDE CONTROL BELLCRANK (1) clockwise.

Leftward movement of BELLCRANK POST (1-A) releases CODE SLIDES (6) so they move left under SPRING (9) tension.

CODE SLIDE ARMS (6-B) push SELECTION SLIDES (5) a corresponding distance to the left.

To observe movement, push BRIDGE ARM (3-A) down with machine at rest.

When a print cycle is actuated, CODE SET BAIL (7) drives INTERPOSER (8) rearward into path of Code Slides.

When a Code Slide moves left, a "coding" TOOTH (6-A) contacts Interposer, stopping movement of Code Slide and corresponding SELECTION SLIDE (5).

TEETH (6-A) "code" the Code Slides so that each moves a set distance for every Interposer position on the Keyboard.

To observe movement, depress an Interposer with machine at rest. Push BRIDGE ARM (3-A) down.

Code Slides #1, 2, 4, & 5 can move 0, 1, or 2 "tooth spaces" to the left.

Code Slide #3 can move 0 or 1 "tooth space" to the left.

Each Code Slide moves its corresponding SELECTION SLIDE (5) the same distance.

Code Slide Relief

As CODE SLIDE CONTROL BRIDGE (3) reaches high point of CAM (4), CODE SLIDE RELIEF PAWL (10) pushes CODE SLIDES (5) slightly to the right.

Rightward movement relieves CODE SLIDE TOOTH (6-A) pressure on Interposer so that Interposer immediately follows Code Set Bail back to rest position.

Selection Slides do not move right at this time because they are locked by Selection Slide Detents for coding of the Printer unit.

Rest Position

When CONTROL BRIDGE (3) returns to rest near the end of the print cycle, BELLCRANK POST (1-A) pushes Code Slides to the right, and holds them at rest position. Springs connecting CODE SLIDE ARMS (6-B) to Selection Slides pull Selection Slides to rest position.

Setting the Code for Vertical Selection

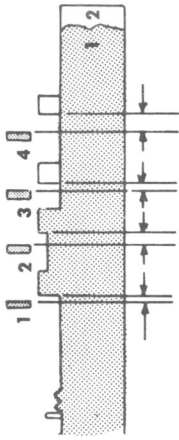
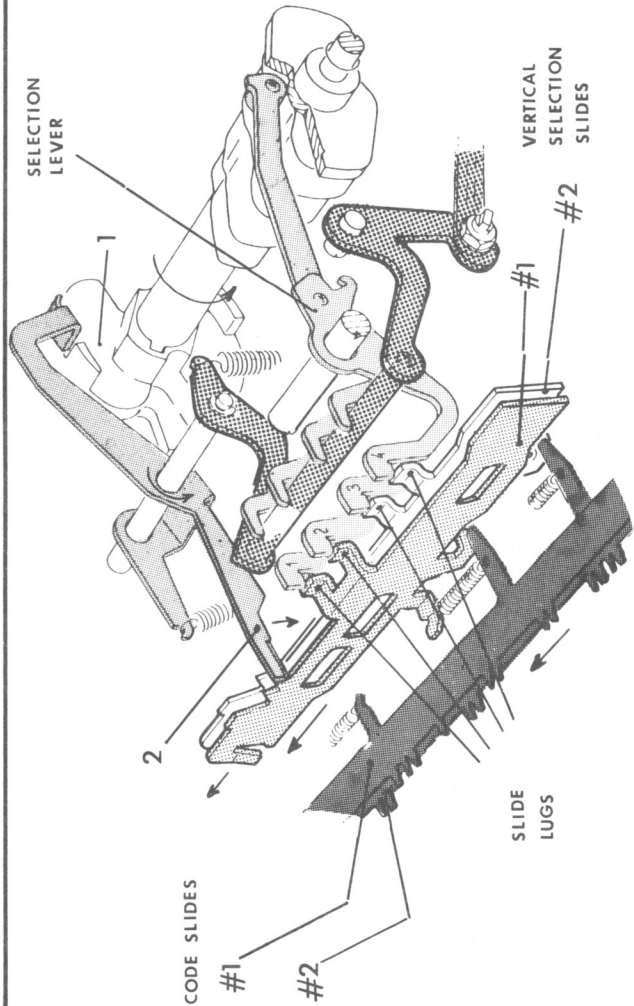
Code Slides #1 & 2 set the code for vertical movement of the Typing Element.

During the print cycle, Code Slides #1 & 2 position Selection Slides #1 & 2 so that Selection Slide Lugs locate under the upper four Selection Levers.

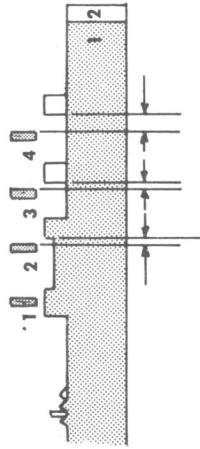
The positions of the Selection Slide Lugs vary for each of the 5 vertical selections. For example: For a character that requires no vertical movement [Vertical Selection 0], the Code Slides do not move, and none of the Selection Slide Lugs locate under Selection Levers. For a character that requires 3 steps of vertical movement [Vertical Selection 3], Selection Slide Lugs locate directly beneath Selection Levers 1, 2, & 3.

The code set for each of the 5 vertical selections is illustrated at the right.

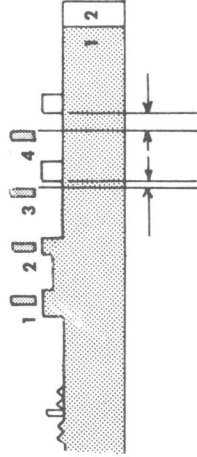
When the code has been set, SELECTION SLIDE DETENT CAM (1) releases SELECTION SLIDE DETENT (2), which locks Selection Slides in place. CAM (1) is the inner profile of the Typing Cam Group, which rotates with the Print Cam Shaft.



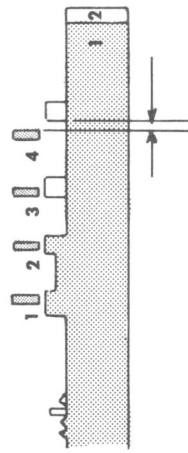
VERTICAL SELECTION 0



VERTICAL SELECTION 1



VERTICAL SELECTION 2



VERTICAL SELECTION 3



VERTICAL SELECTION 4



Setting the Code for Horizontal Selection

Code Slides #4 & 5 set the code for horizontal rotation of the Typing Element in the same way that Code Slides #1 & 2 set the code for vertical movement.

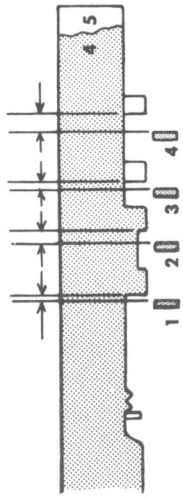
During the print cycle, Code Slides #4 & 5 position Selection Slides #4 & 5 so that Selection Slide Lugs locate above the four lower Selection Levers.

The positions of the Selection Slide Lugs vary for each of 5 horizontal selections; the code set for each selection is illustrated at the right.

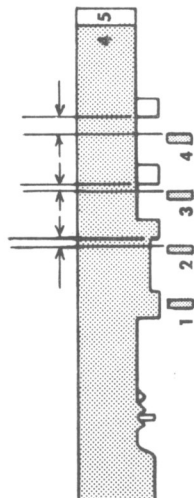
Selection Slides #4 & 5 determine the amount of horizontal movement--that is, whether the Element rotates 0, 1, 2, 3, or 4 Steps.

Selection Slide #3 determines the direction of horizontal rotation--clockwise or counterclockwise. The movement of this Slide is covered on page 3-12.

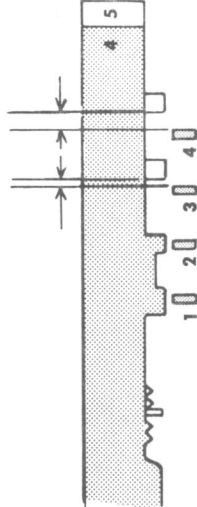
When the code has been set SELECTION SLIDE DETENT CAM (1) releases SELECTION SLIDE DETENT (2), which locks Selection Slides in place.



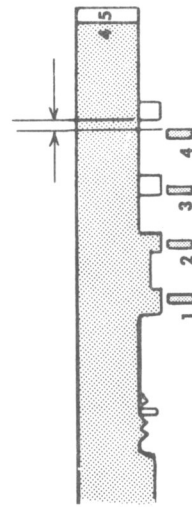
HORIZONTAL SELECTION 0



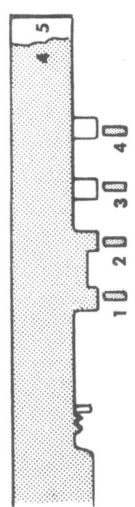
HORIZONTAL SELECTION 1



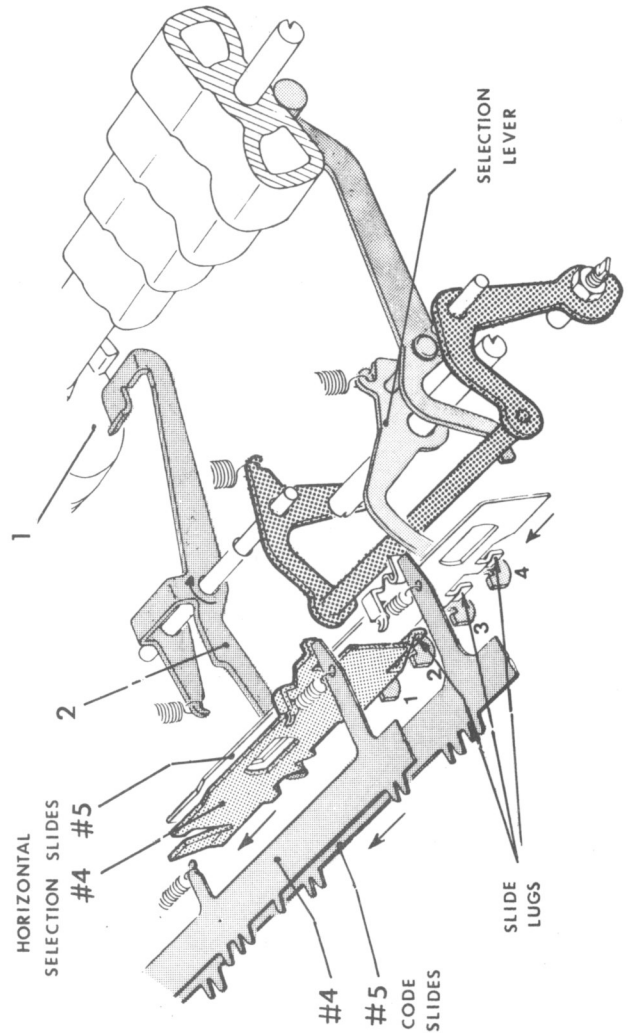
HORIZONTAL SELECTION 2



HORIZONTAL SELECTION 3



HORIZONTAL SELECTION 4



Carrying out the Code for Vertical & Horizontal Drive

The Selection Cam rotates with Print Cam Shaft during a print cycle.

Eight Selection Levers are rotated by the Selection Cam: Four on top control movement of Vertical Drive Frame. Four on bottom control movement of Horizontal Drive Frame.

Vertical Drive

The Code Set determines whether a LUG (2) from Selection Slides #1 & 2 locates under FRONT ARM (1-A) of a Selection Lever.

If a LUG (2) locates under and holds FRONT ARM (1-A), rotation of CAM FOLLOWER (1-C) causes ARM (1-B) to push Vertical Drive Frame down. In this case, the Selection Lever is effective.

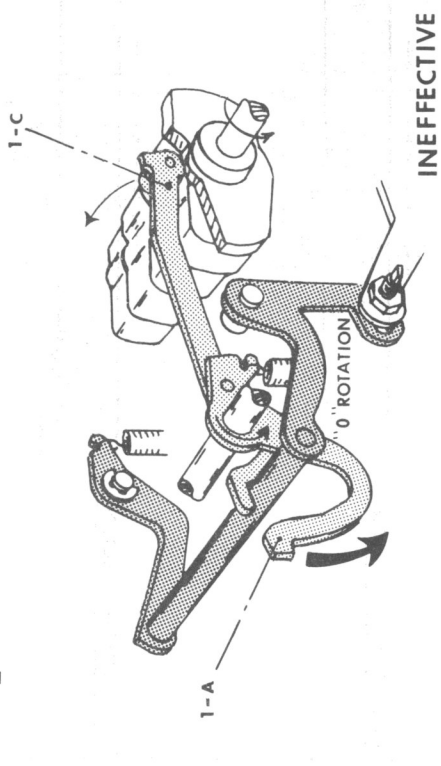
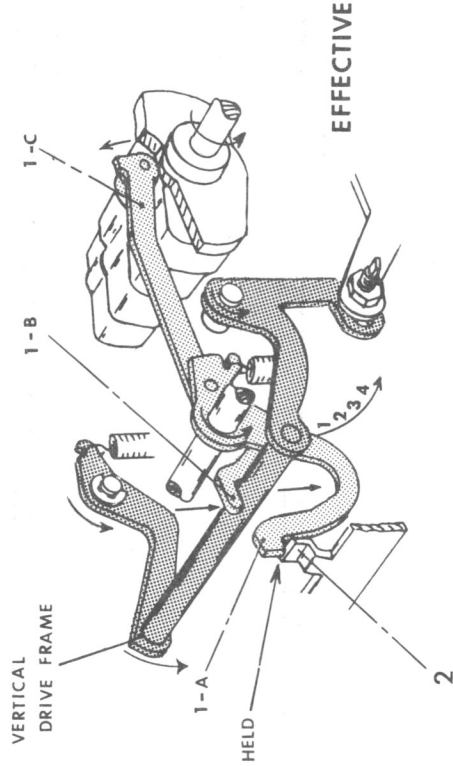
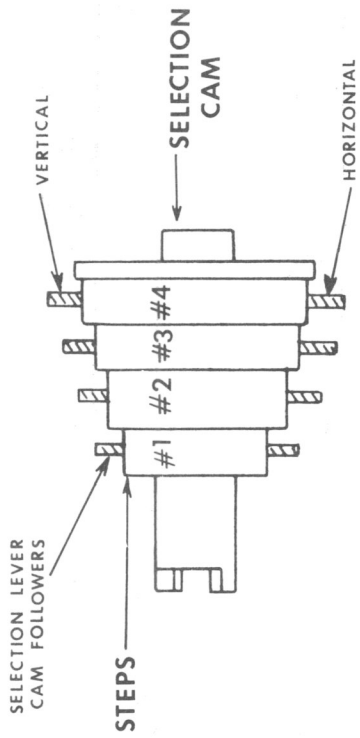
If a LUG (2) does not locate under FRONT ARM (1-A), rotation of CAM FOLLOWER (1-C) causes FRONT ARM (1-A) to move down and Vertical Drive Frame is not moved by Selection Lever. The Selection Lever is ineffective.

To observe movement of Selection Levers, lift CAM FOLLOWER (1-C). Hold FRONT ARM (1-A) with Spring Hook.

Each of the four Selection Levers rotate Vertical Drive Frame a distance that corresponds with the four Steps on the Selection Cam. Thus, if the Selection Lever that follows Cam Step #1 is effective, then Drive Frame rotates one step. If the Selection Lever that follows Cam Step #4 (the highest profile) is effective, then Drive Frame rotates four steps.

The effective Selection Lever that follows the highest Step of the Selection Cam is the one that determines how far Vertical Drive Frame rotates. All others, whether effective or ineffective, do not control the amount of Vertical Drive Frame rotation.

If none of the Selection Levers are effective, Vertical Drive Frame does not rotate (although spring tension takes up down play). Thus, during every print cycle, Vertical Drive Frame rotates 0, 1, 2, 3, or 4 steps.



Horizontal Drive

The lower Selection Levers rotate Horizontal Drive Frame the same way that the upper Selection Levers rotate Vertical Drive Frame.

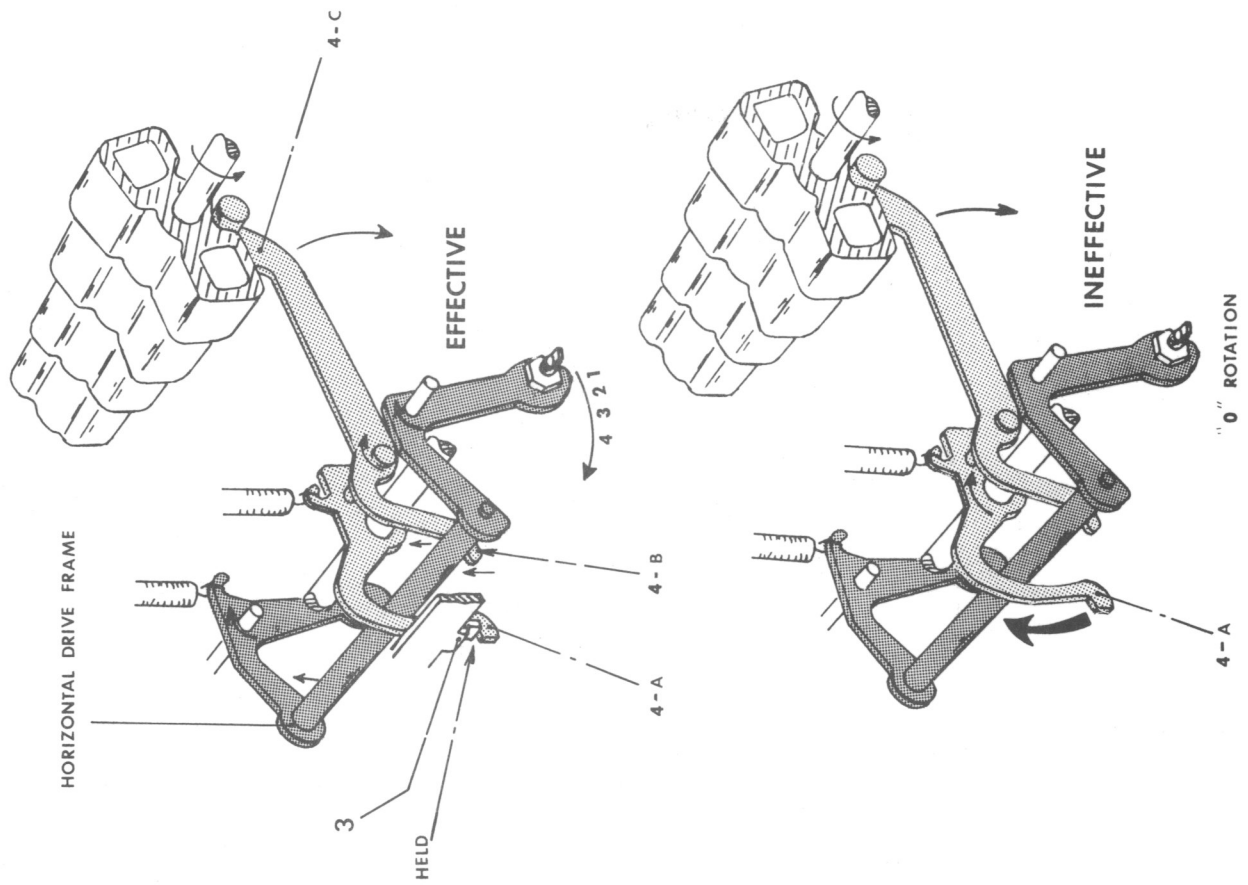
When a code is set, LUGS (3) from Selection Slides #4 & 5 determine whether a Selection Lever is effective or ineffective.

If Selection Lever is effective, ARM (4-B) pushes Horizontal Drive Frame up when Selection Cam rotates CAM FOLLOWER (4-C) during a print cycle.

If Selection Lever is ineffective during a print cycle, FRONT ARM (4-A) moves up, and Horizontal Drive Frame is not moved by Selection Lever.

The effective Selection Lever that follows the highest Step of the Selection Cam is the one that determines how far Horizontal Drive Frame rotates. Thus, if the Selection Levers that follow Cam Steps #1, 2, & 3 are effective, Horizontal Drive Frame rotates 3 Steps. If all four Selection Levers are ineffective, Horizontal Drive Frame does not rotate.

During every print cycle, Horizontal Drive Frame rotates 0, 1, 2, 3, or 4 Steps.



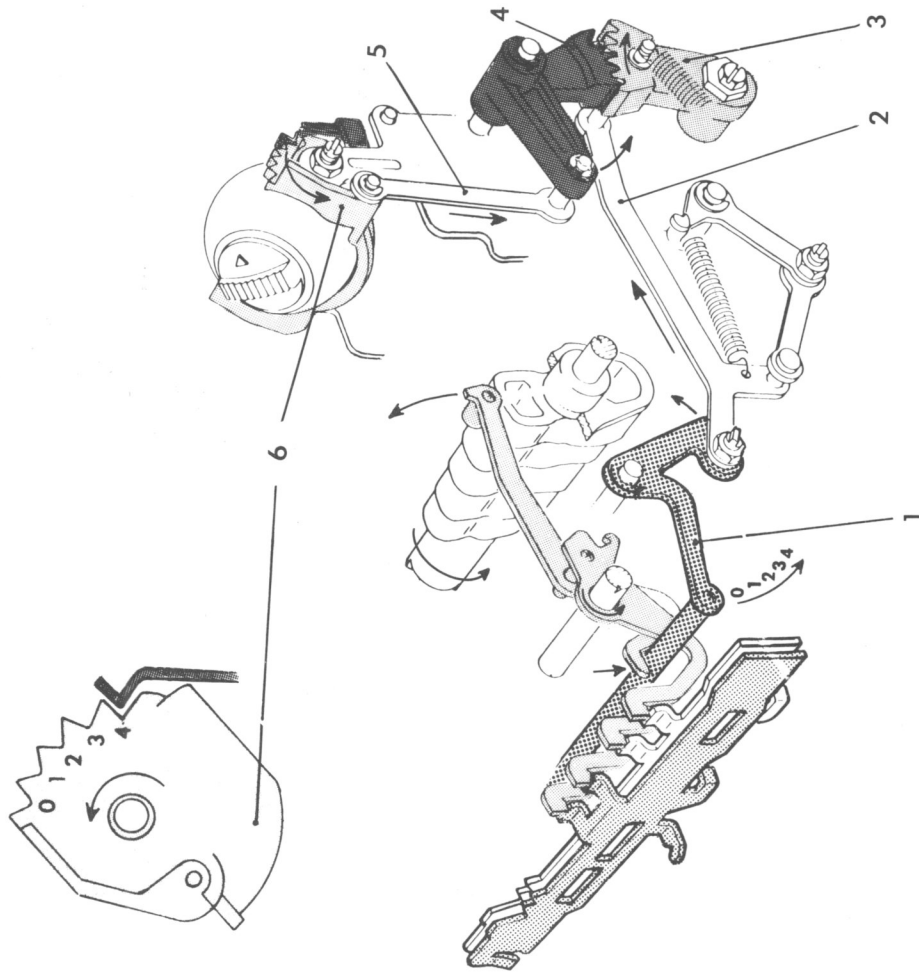
Vertical Selection

During a print cycle, VERTICAL DRIVE FRAME (1) rotates 0, 1, 2, 3, or 4 Steps, depending on which Selection Levers are made effective by the Code Setting movement of Selection Slides #1 & 2.

DRIVE FRAME (1) rotates ELEMENT SUPPORT (6) a corresponding amount thru CONTROL LINK (2), SECTORS (3) (4), and LINK (5).

The five Notches on the Element Support correspond with the five vertical rows of characters on the Typing Element. The driven position of the Element Support presents one of these rows of characters to the Platen for typing.

To observe movement, push VERTICAL DRIVE FRAME (1) down with machine at rest.



Clockwise Horizontal Selection

During a print cycle, HORIZONTAL DRIVE FRAME (1) rotates 0, 1, 2, 3, or 4 Steps, depending on which Selection Levers are made effective by the Code Setting movement of Selection Slides #4 & 5.

LEFT HORIZONTAL DRIVE FRAME ECCENTRIC (2) pushes LEFT SELECTION LINK (3) forward.

LEFT SELECTION LINK (3) rotates CONTROL SECTOR (4) counterclockwise.

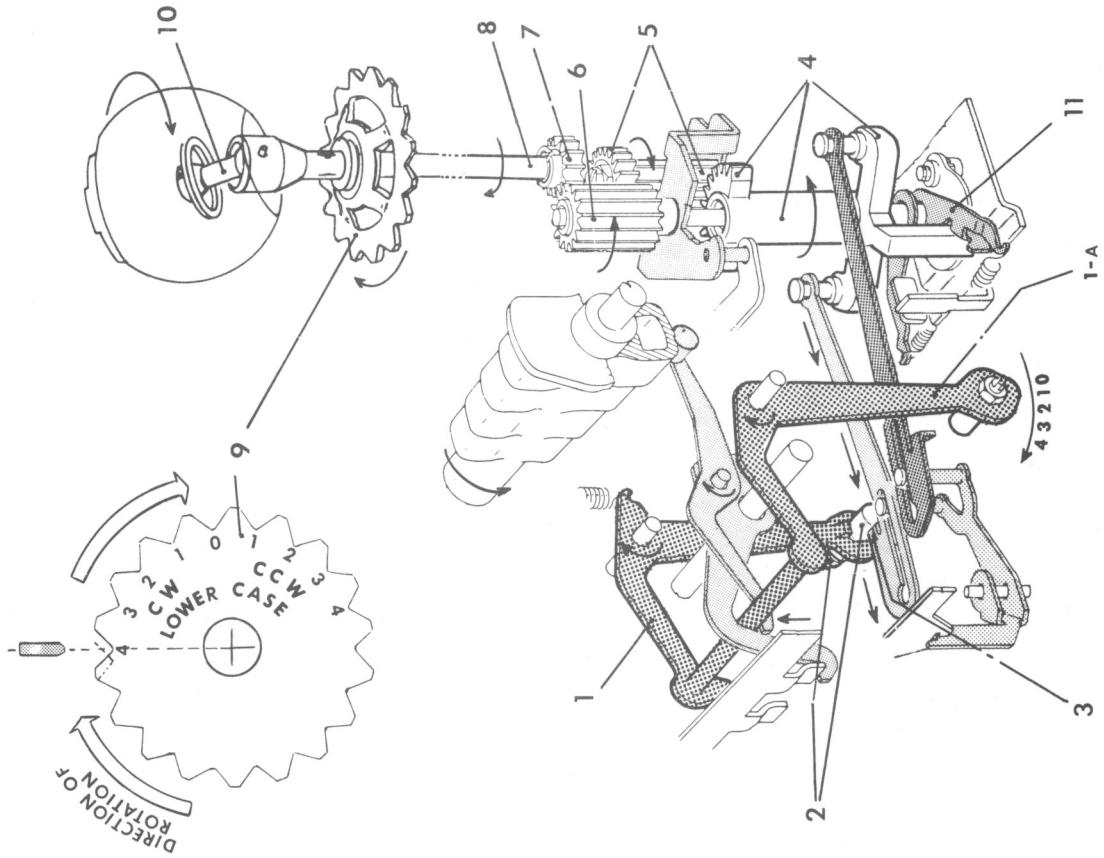
CONTROL SECTOR (4) rotates Typing Element clockwise thru the Gear Train, which consists of PLANETARY GEAR (5), DRIVE GEAR (6), ELEMENT PINION (7), STARWHEEL SHAFT (8) with attached STARWHEEL (9), and DOG BONE (10).

Typing Element rotates the same number of Steps that HORIZONTAL DRIVE FRAME (1) rotates. If Drive Frame rotates 4 Steps, Element rotates so the lower case characters in clockwise position 4 are presented to the Platen for typing. If Drive Frame does not rotate, the Element does not rotate, and characters in position "0" (home position) face the Platen.

Notches on STARWHEEL (9) correspond with horizontal rows of characters on the Typing Element.

When parts return to rest, CENTERING LEVER (11) centers CONTROL SECTOR (4) so that Typing Element and Starwheel are at home ("0") position.

To observe movement, push DRIVE FRAME ARM (1-A) forward with machine at rest.



### Counterclockwise Horizontal Selection

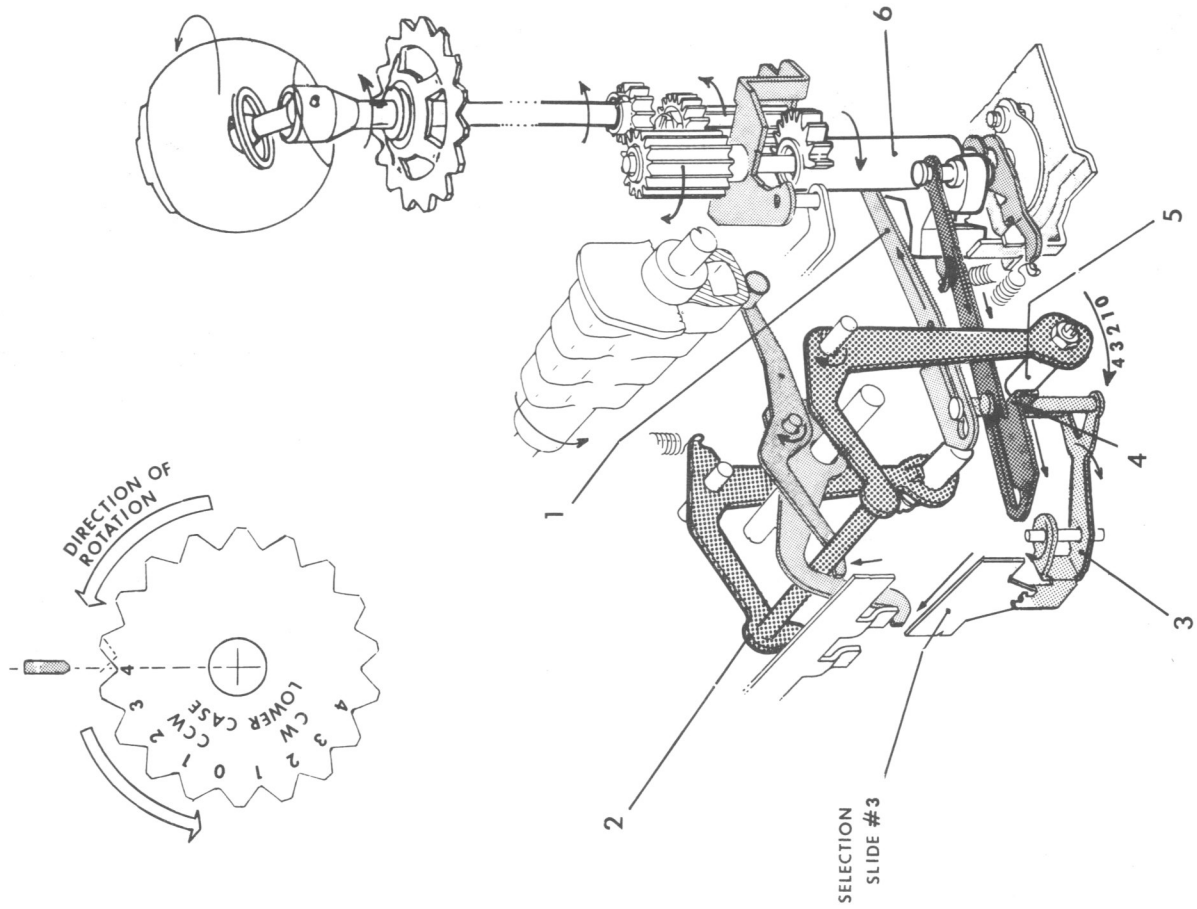
Selection Slide #3 determines the direction of horizontal rotation--clockwise or counterclockwise.

If Selection Slide #3 does not move left when a code is set, LEFT SELECTION LINK (1) stays in front of Left Horizontal Drive Eccentric. Rotation of HORIZONTAL DRIVE FRAME (2) pushes LEFT SELECTION LINK (1) forward. CONTROL SECTOR (6) rotates counterclockwise and Typing Element rotates clockwise.

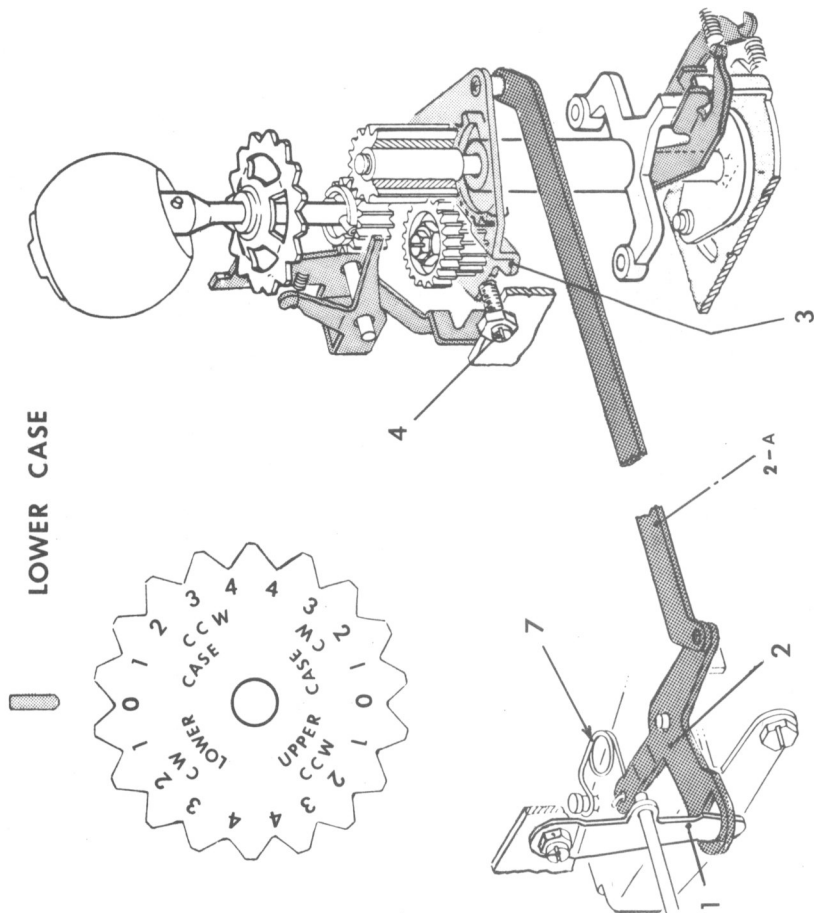
If Selection Slide #3 moves left when a code is set, it rotates BELLCRANK (3), which places RIGHT SELECTION LINK (4) in front of RIGHT HORIZONTAL DRIVE ECCENTRIC (5). Rotation of HORIZONTAL DRIVE FRAME (2) pushes RIGHT SELECTION LINK (4) forward. CONTROL SECTOR (6) rotates clockwise, and Typing Element rotates counterclockwise.

Whether the direction of rotation is clockwise or counterclockwise, the Element rotates the same number of Steps that HORIZONTAL DRIVE FRAME (2) rotates--that is 0, 1, 2, 3, or 4 Steps, depending upon which Selection Levers are made effective by the Code Setting movement of Selection Slides #4 & 5.

To observe movement, rotate BELLCRANK (3) with machine at rest. Also operate a print cycle using Interposer #45.



LOWER CASE

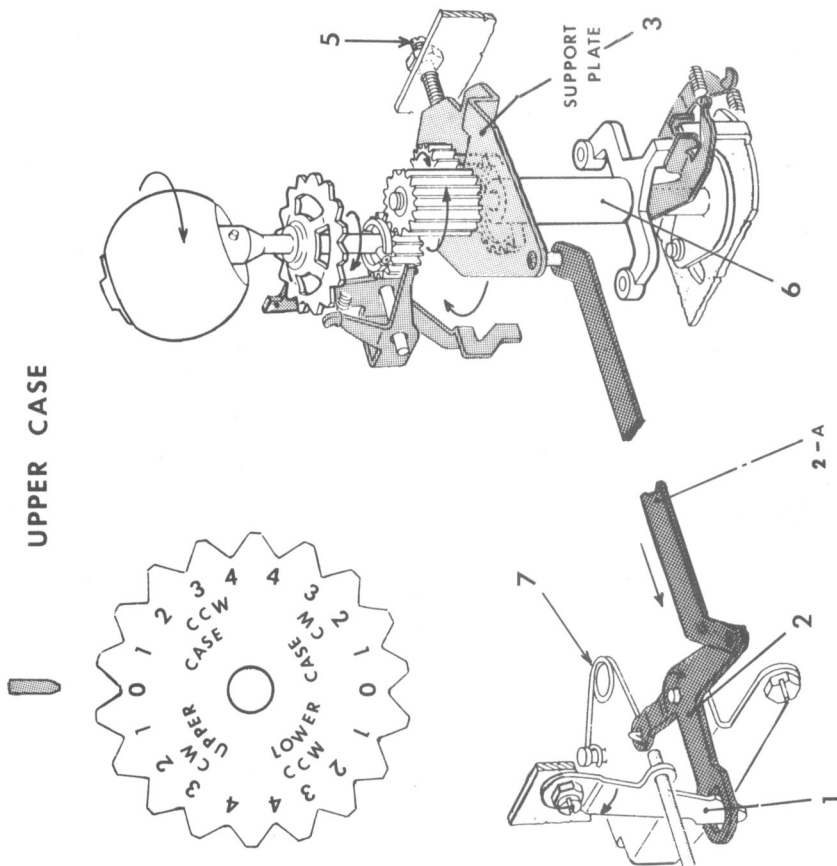


Shift--180° Rotation

When the Shift mechanism is at lower case rest position, GEAR SUPPORT PLATE (3) rests against LOWER CASE STOP SCREW (4). Typing Element and Starwheel are oriented thru Gear Train so that Lower Case Horizontal Position "0" faces the Platen.

During a shift to upper case, Shift mechanism causes SHIFT LEVER (1) to move rearward, rotating BELLCRANK (2) clockwise. SHIFT LINK (2-A) moves left, and rotates GEAR SUPPORT PLATE (3) clockwise until it contacts UPPER CASE STOP SCREW (5). Typing Element and Starwheel are

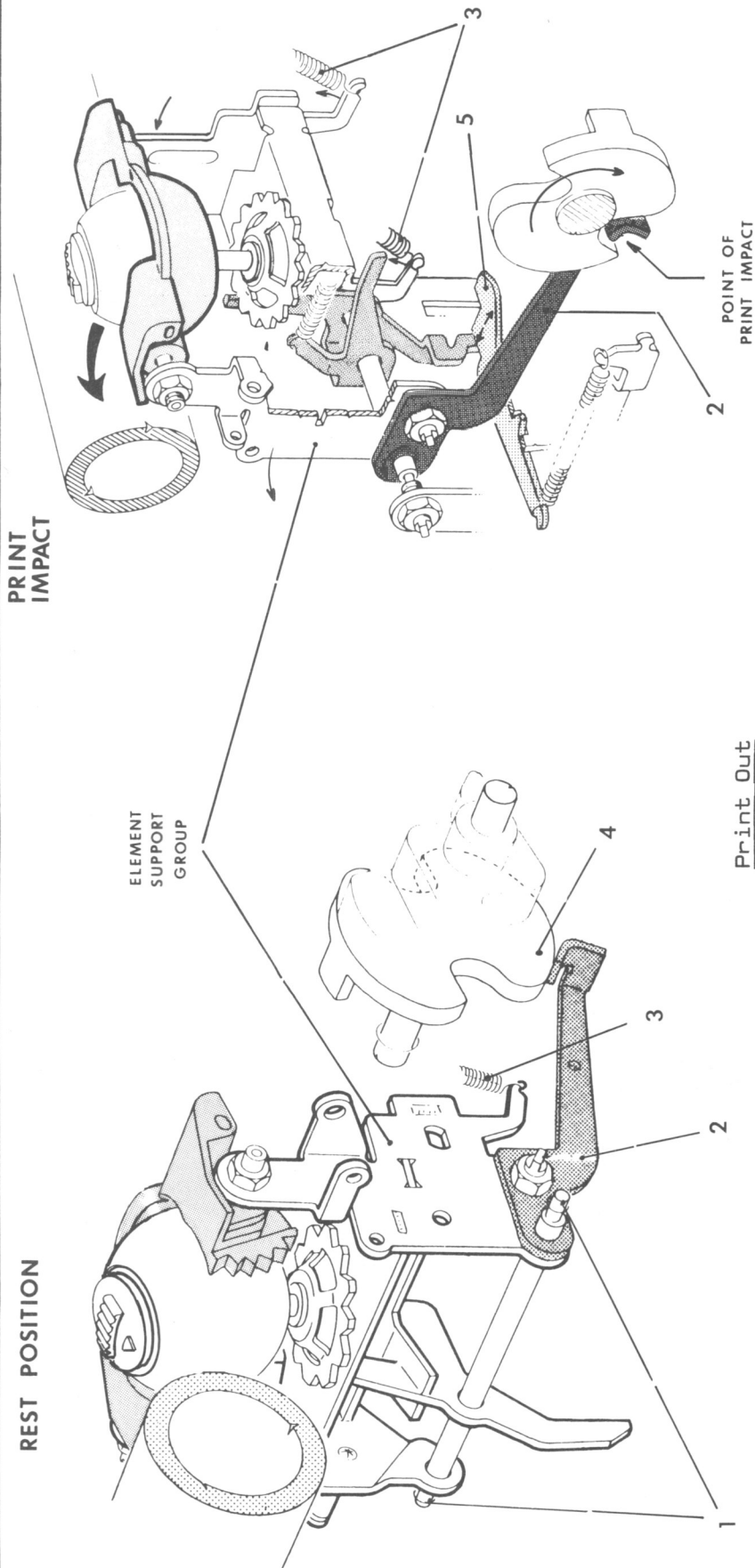
UPPER CASE



oriented thru Gear Train so that Upper Case Horizontal Position "0" faces the Platen.

CONTROL SECTOR (6) does not move during Shift operation. TORSION SPRING (7) toggles BELLCRANK (2) to hold SUPPORT PLATE (3) at rest under spring tension in either case. Vertical and horizontal character selection movements are the same in lower and upper case positions.

To observe movement, depress Shift Keylever, and rotate Print Cam Shaft Pulley.



In rest position, Element Support Group is held away from Platen by TYPING ARM (2) contact with high surface of PRINTING CAM (4), which is one profile of the Typing Cam Group.

When Cam Group rotates during a print cycle, TYPING ARM (2) drops into low point of Printing Cam, and releases Support Group.

Element Support Group rotates on PIVOTS (1) under IMPACT SPRING (3) tension, and the Element strikes the Platen for a print out.

After impact, DAMPING LEVER (5) pushes Element Support Group slightly away from Platen to hold Element off Platen until Group is restored to rest. This prevents typing blurs, and it controls the impact of the Element.

PRINTING CAM (4) reloads Support Group as Cam Group rotates to rest position. To observe movement, rotate to point of print impact, and pivot Support Group forward and rearward.



Detent Control

Three Detents stabilize the Typing Element for print impact: STARWHEEL DETENT (2), Vertical Detent, and Horizontal Fine Detent.

All three Detents are activated when DETENT CONTROL LEVER (3) drops into low point of DETENT CONTROL CAM (4), which is one profile of the Typing Cam Group.

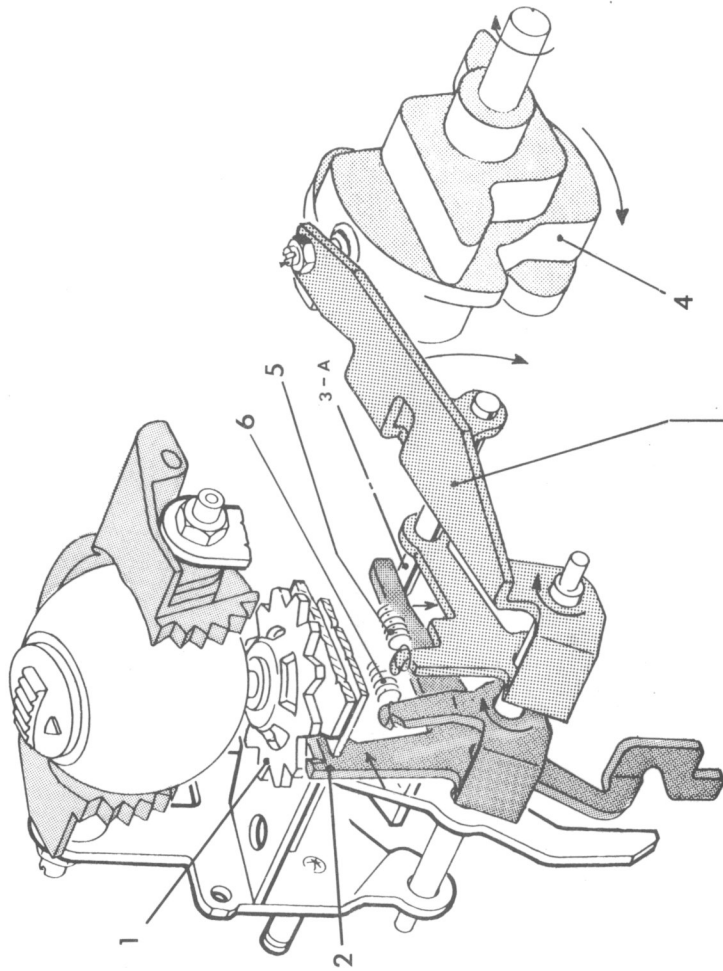
To observe movement, rotate to point of print impact. Push Element Support Group forward, and lift DETENT CONTROL LEVER (3) up.

Starwheel Detent

DETENT CONTROL LEVER (3) drops down under SPRING (5) tension.

Attached STUD (3-A) releases STARWHEEL DETENT (2), which rotates under SPRING (6) tension into Notch of STARWHEEL (1) as Element Support Group moves toward Platen.

REST POSITION

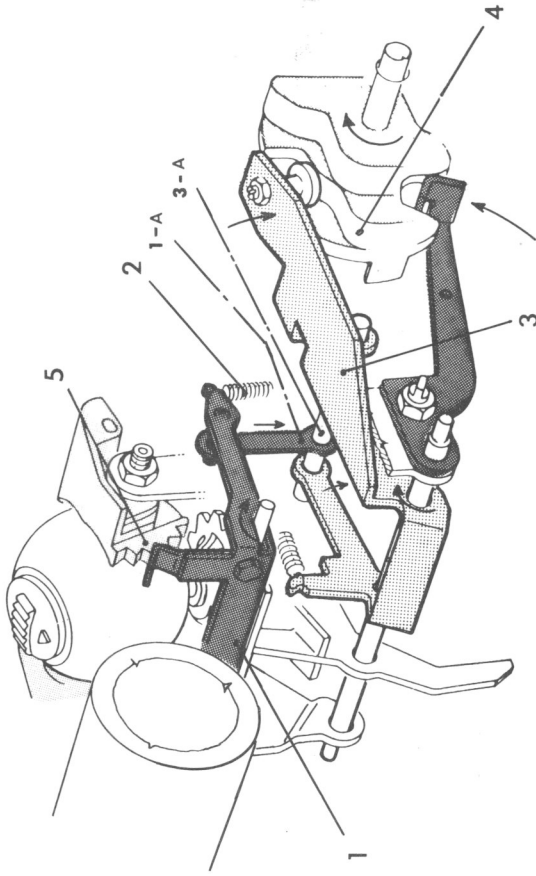


DETENT CONTROL LEVER 3

Vertical Detent

When DETENT CONTROL LEVER (3) drops into low point of DETENT CONTROL CAM (4), STUD (3-A) releases VERTICAL DETENT LINK (1-A).

VERTICAL DETENT (1) pivots top forward under SPRING (2) tension, and engages right and left notches of the ELEMENT SUPPORT (5).



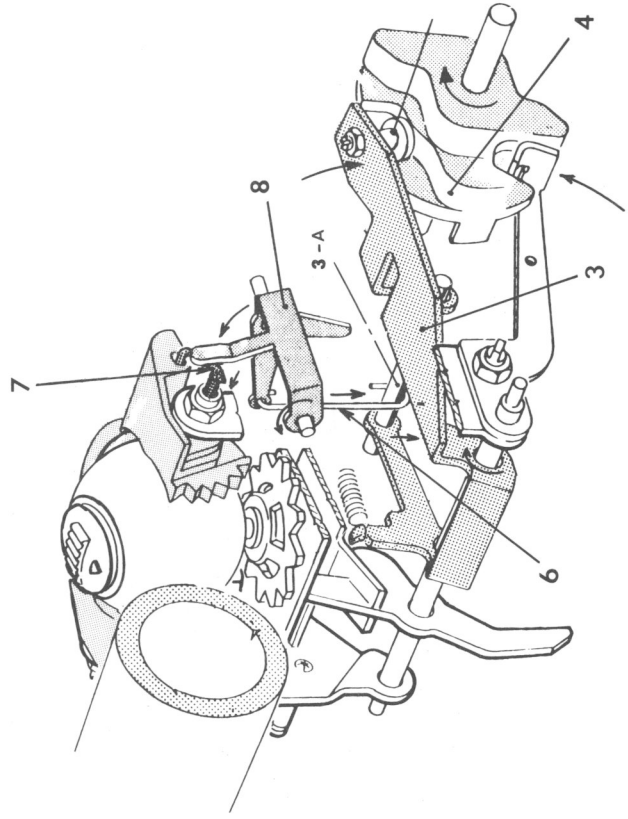
Horizontal Fine Detent

STUD (3-A) also pulls LINK (6) down.

LINK (6) rotates BELLCRANK (8), which pushes FINE DETENT (7) to engage Typing Element.

DETENT (7) engages Notch between characters on Typing Element.

After print impact, Detent Control Cam raises LEVER (3) to restore all Detents to rest position.



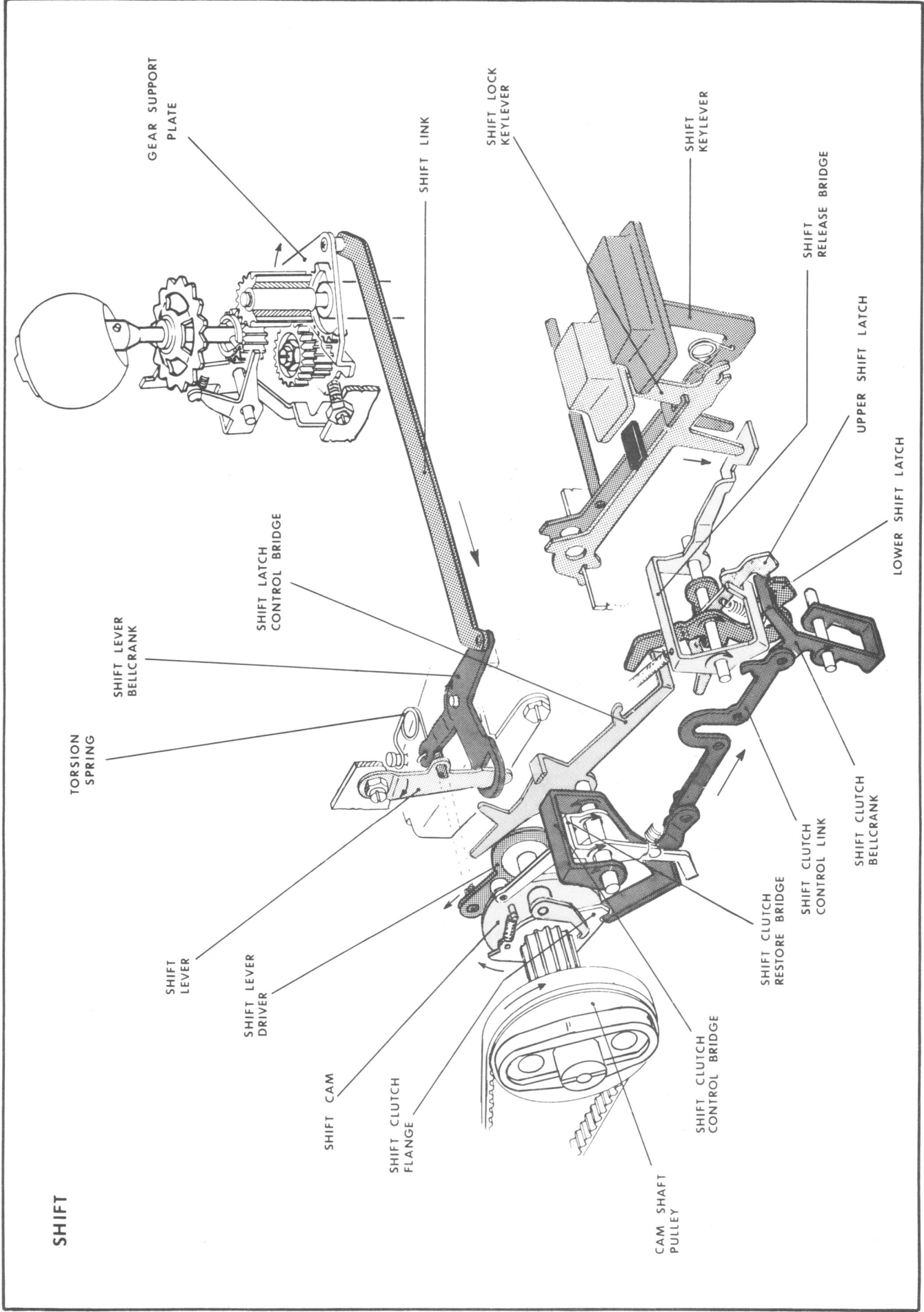
**SHIFT**

Shift Drive

Shift Clutch Control

Shift Latch Control

Shift Deactivation during a Print Cycle



SHIFT

### Shift Drive

Depression or release of Shift Keylever causes SHIFT CLUTCH DOG (2-A) to engage RATCHET (1) and rotate SHIFT CAM (2).

When Shift Keylever is depressed, SHIFT CAM (2) rotates top forward 180° to upper case rest position.

When Shift Keylever is released, SHIFT CAM (2) rotates top forward to lower case rest position.

During a shift to upper case, CAM LOBE (2-B) cams SHIFT LEVER DRIVER (3) rearward.

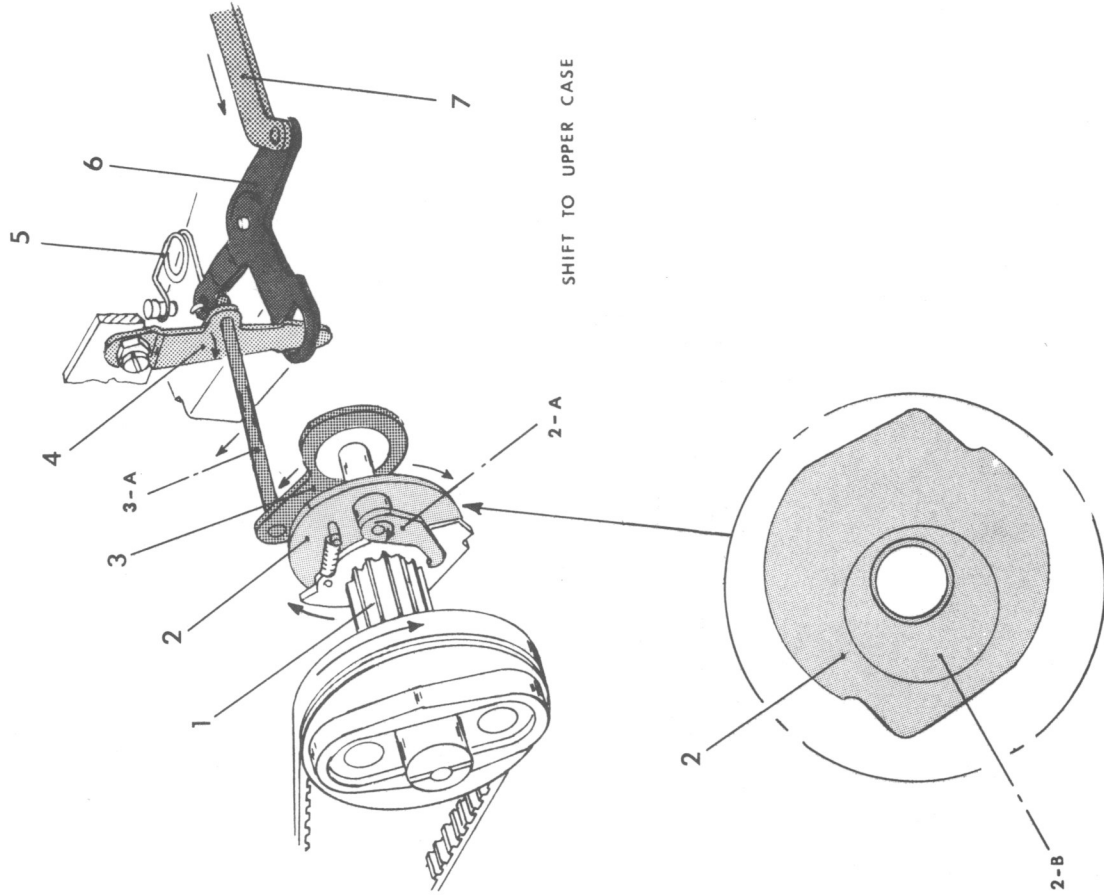
DRIVER STUD (3-A) pivots SHIFT LEVER (4) rearward.

SHIFT LEVER (4) rotates BELLCRANK (6) clockwise.

SHIFT LINK (7) moves left, and rotates Gear Support Plate to upper case rest position.

During a shift to lower case, CAM LOBE (2-B) cams SHIFT LEVER DRIVER (3) forward. STUD (3-A) pivots LEVER (4) forward, rotating BELLCRANK (6) counterclockwise. LINK (7) and Gear Support Plate return to lower case rest position.

TORSION SPRING (5) toggles BELLCRANK (6) to hold LINK (7) and Gear Support Plate at rest under spring tension in either case.



### Shift Clutch Control

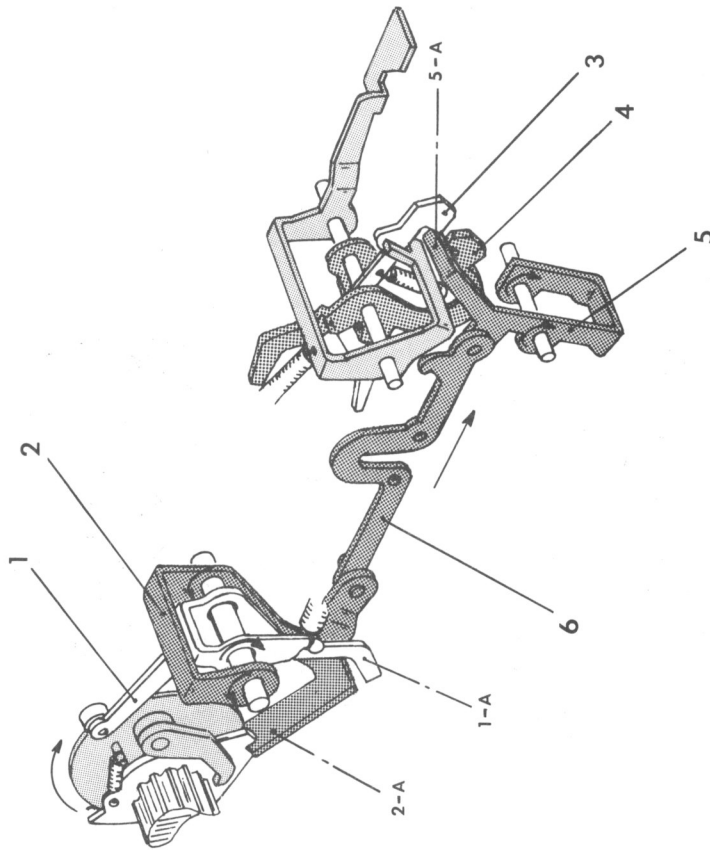
When Shift Keylever is depressed, LOWER SHIFT LATCH (4) releases ARM (5-A) of SHIFT CLUTCH BELLCRANK (5).

BELLCRANK (5) rotates top forward under spring tension.

CLUTCH CONTROL LINK (6) moves forward, and rotates CLUTCH CONTROL BRIDGE (2) top rearward. ARM (2-A) releases Shift Clutch Flange, and Clutch Dog engages Ratchet.

As Shift Cam rotates, its outer surface rotates SHIFT CLUTCH RESTORE BRIDGE (1) top forward.

BRIDGE ARM (1-A) restores CONTROL BRIDGE (2) to disengage Shift Clutch. LINK (6) moves rearward and restores BELLCRANK (5), which latches on UPPER (3) or LOWER (4) Shift Latch.



### Shift Latch Control

SHIFT LATCH CONTROL BRIDGE (2) controls movement of UPPER (4) and LOWER (5) Shift Latches during Shift Keylever depression and release.

SHIFT LEVER DRIVER (1) cams LATCH CONTROL BRIDGE (2) top rearward during a shift to upper case, and top forward during a shift to lower case. Movement of BRIDGE (2) positions ARM (2-A) in respect to rear Arms of Upper and Lower Latches.

### Shift Keylever Depression

When depressed, Shift Keylever rotates RELEASE BRIDGE (3) top forward.

ARM (3-A) pushes LOWER LATCH (5) down to release CLUTCH BELLCRANK ARM (6-A).

LATCH CONTROL BRIDGE ARM (2-A) prevents movement of UPPER LATCH (4), which is connected by a spring to Lower Latch.

During shift movement to upper case, ARM (2-A) moves up, allowing UPPER LATCH (4) to move down and latch BELLCRANK ARM (6-A) as it restores. Since Keylever is depressed, RELEASE BRIDGE ARM (3-A) holds LOWER LATCH (5) out of path of BELLCRANK ARM (6-A).

### Shift Keylever Release

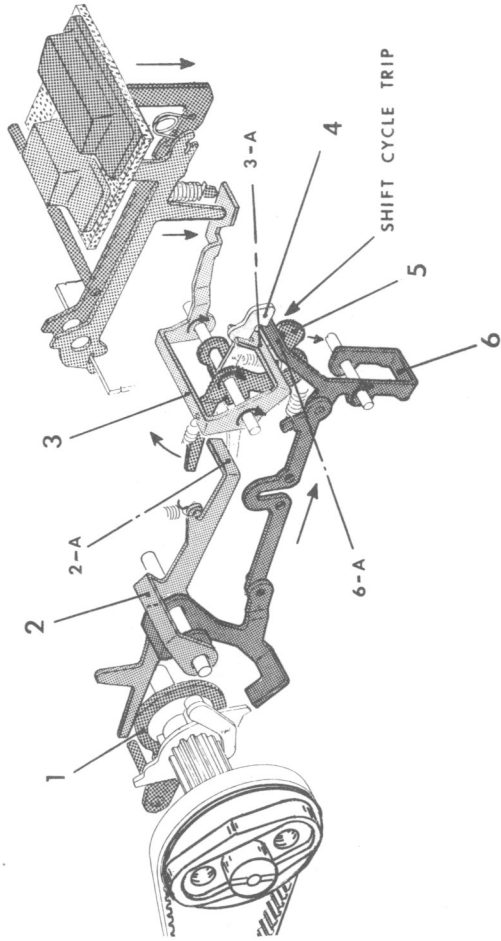
When released, Shift Keylever allows RELEASE BRIDGE (3) to rotate top rearward.

ARM (3-A) lifts UPPER LATCH (4) to release CLUTCH BELLCRANK ARM (6-A).

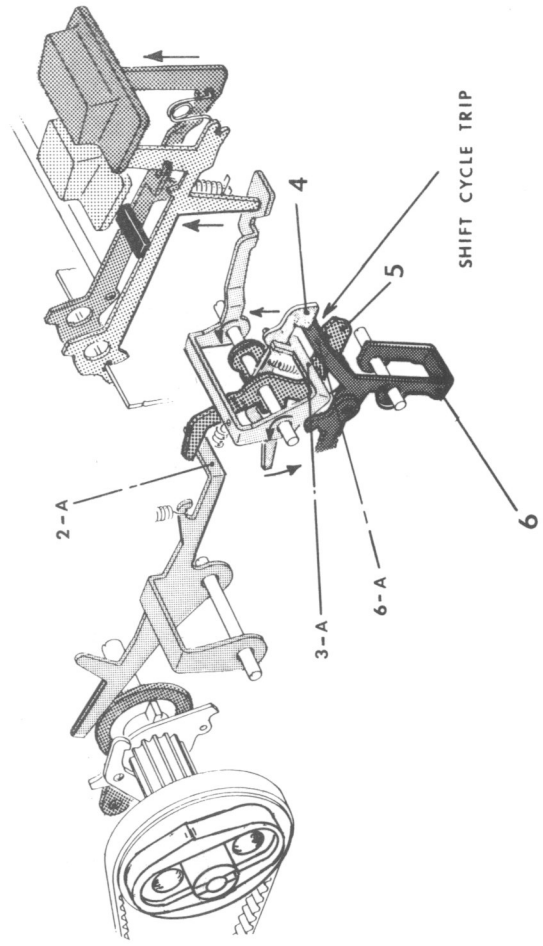
LATCH CONTROL BRIDGE ARM (2-A) prevents movement of LOWER LATCH (5).

During shift movement to lower case, ARM (2-A) moves down, allowing LOWER LATCH (5) to move up and latch BELLCRANK ARM (6-A) as it restores. RELEASE BRIDGE ARM (3-A) holds UPPER LATCH (4) out of path of BELLCRANK ARM (6-A).

### KEYLEVER DEPRESSION



### KEYLEVER RELEASE



### Shift Deactivation During a Print Cycle

The SHIFT DEACTIVATION BRIDGE (2) holds a shift cycle in memory when Shift Keylever is depressed while a print cycle is in operation.

When Print Cycle Cam Group rotates during a print cycle, SHIFT DEACTIVATION CAM (1) rotates DEACTIVATION BRIDGE (2) top rearward.

BRIDGE ARM (2-A) rises into path of SHIFT CLUTCH CONTROL BELLCRANK ARM (4-A).

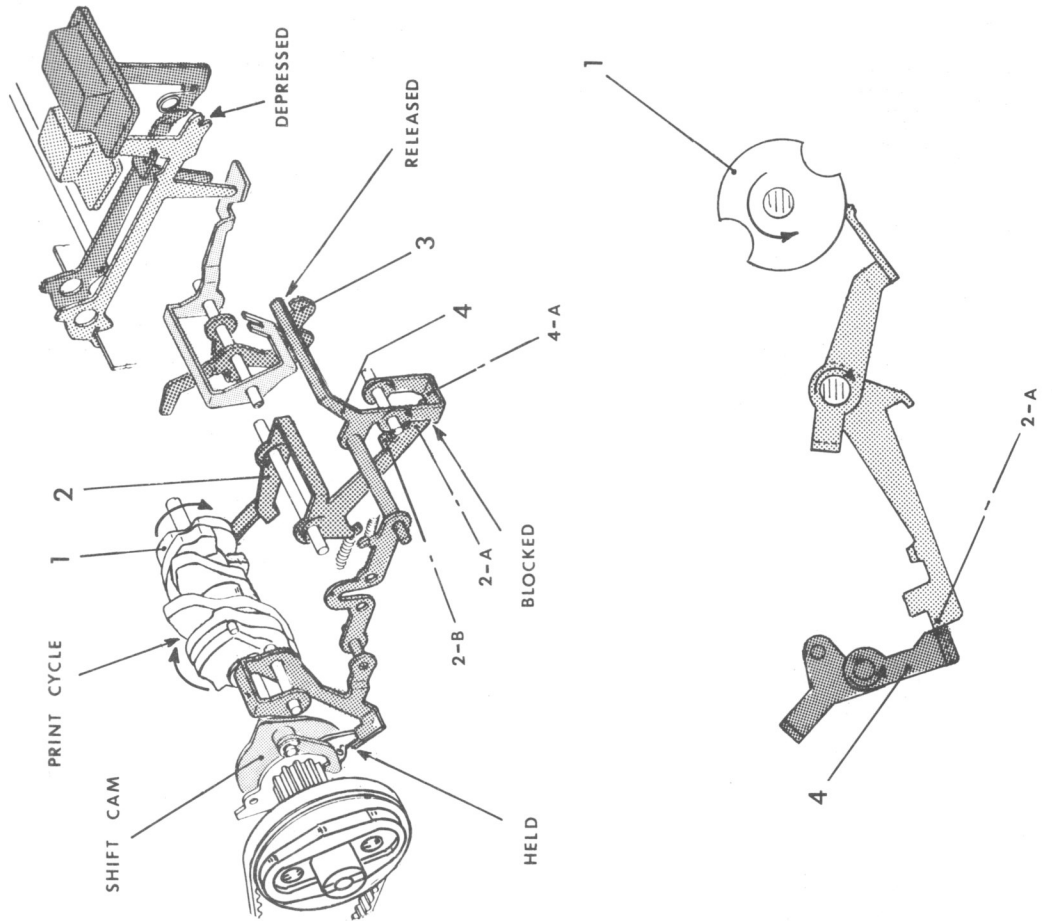
If Shift Keylever is depressed, LOWER LATCH (3) releases BELLCRANK (4), but DEACTIVATION BRIDGE ARM (2-A) prevents full rotation of BELLCRANK (4) so the Shift Clutch is not released.

When the print cycle is completed, DEACTIVATION BRIDGE (2) restores to rest, and releases SHIFT CLUTCH BELLCRANK (4). Since BELLCRANK (4) is not held by a Shift Latch, it rotates top forward and starts a shift cycle.

To observe movement, depress a character Keylever. Rotate Print Cam Shaft 1/4 revolution; then depress Shift Keylever.

NOTE: DEACTIVATION BRIDGE (2) rotates immediately into Shift deactivation position thru ARM (2-B) contact with Print Cycle Clutch Bridge. To observe movement, depress a character Keylever and then Shift Keylever.

NOTE: If a shift cycle is in operation, and a character Keylever is depressed, SURFACE (4-A) of SHIFT CLUTCH BELLCRANK (4) holds the print cycle in memory until shift cycle is completed. To observe movement, depress Shift Keylever and then a character Keylever.





CARRIAGE SPACING

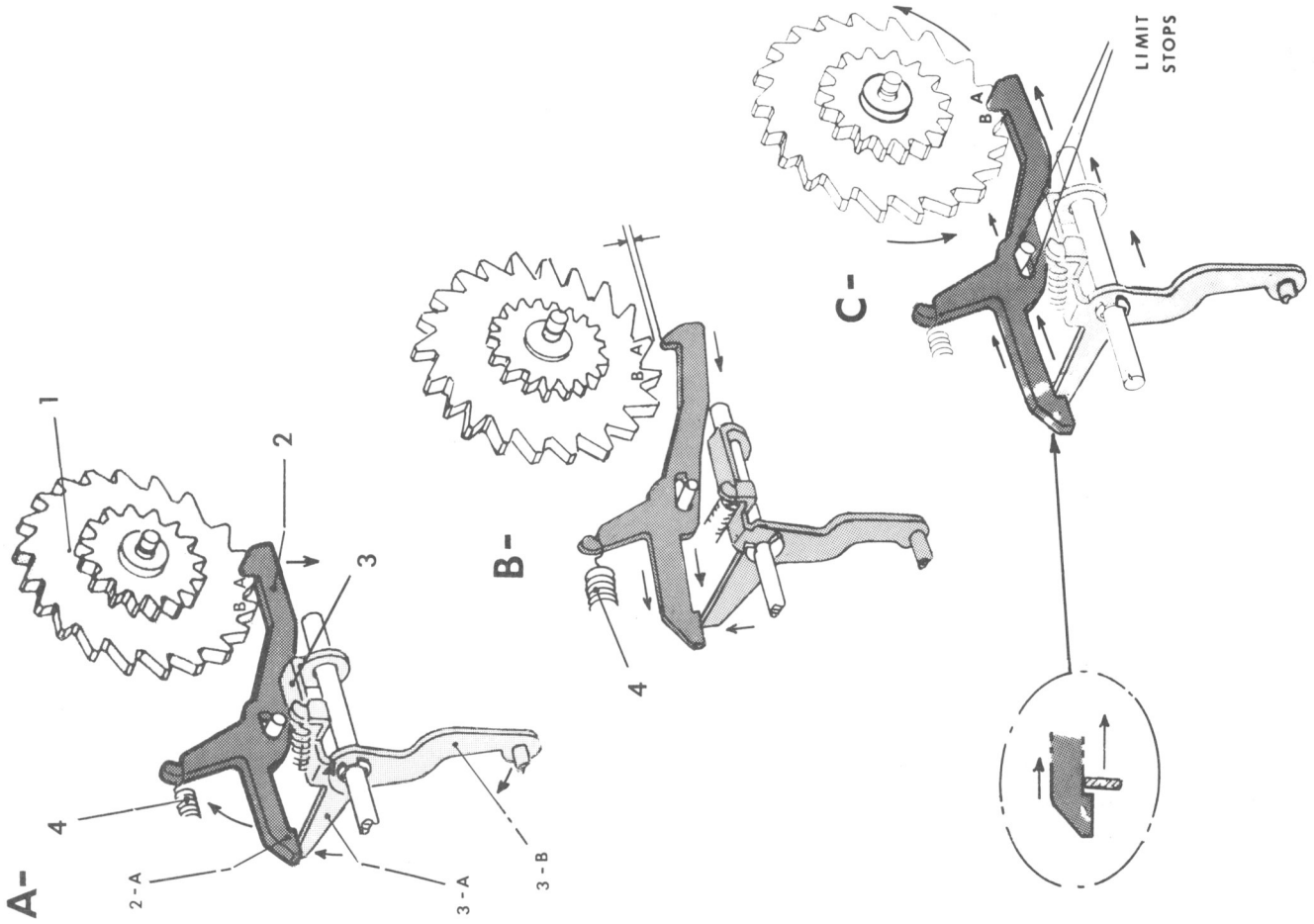
Escapement Mechanism

Escapement Trip during a Print Cycle

Dead Key Mechanism

Escapement Silencer

Carriage Release



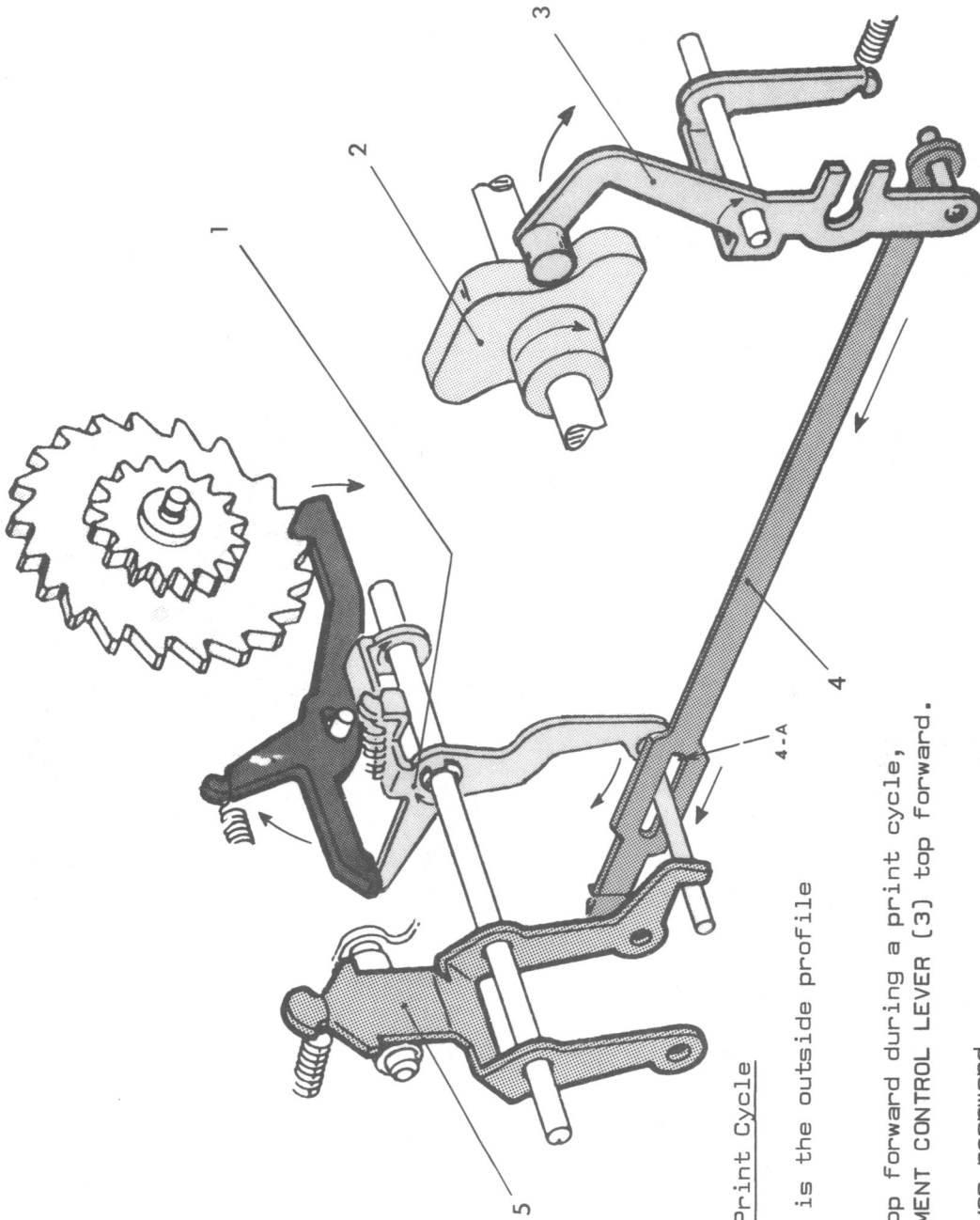
Escapement Mechanism

The Escapement mechanism controls horizontal movement and rest positions of the Carriage. The ESCAPEMENT PAWL (2) holds ESCAPEMENT WHEEL (1), which is gear meshed with the Escapement Rack attached to Carriage Top Plate. When PAWL (2) releases Escapement Wheel, Carriage moves left under tension from Carriage Mainspring.

Escapement Trip

- A. When ESCAPEMENT TRIP LEVER (3) rotates top forward, its REAR ARM (3-A) rotates ESCAPEMENT PAWL (2) clockwise to disengage Tooth A of Escapement Wheel.
  - B. SPRING (4) pulls the disengaged PAWL (2) left against limit, and Pawl engages Tooth B of Wheel.
  - C. Escapement Wheel rotates counterclockwise under Carriage Mainspring tension. PAWL (2) and LEVER (3) move right with Wheel rotation until they contact limit stops, stopping rotation of Wheel and movement of Carriage.
- When TRIP LEVER (3) is released, it rotates top rearward under Spring tension. When ARM (3-A) clears STEP (2-A), LEVER (3) moves left to rest position.

To observe movement, push TRIP LEVER ARM (3-B) rearward. Manually hold Carriage.



Escapement Trip during a Print Cycle

The ESCAPEMENT CONTROL CAM (2) is the outside profile of the Typing Cam Group.

When Print Cam Shaft rotates top forward during a print cycle, CONTROL CAM (2) rotates ESCAPEMENT CONTROL LEVER (3) top forward.

ESCAPEMENT CONTROL LINK (4) moves rearward.

Front Edge of LINK SLOT (4-A) rotates ESCAPEMENT TRIP LEVER (1) top forward to trip Escapement.

When parts return to rest, SPACER CONTROL BRIDGE (5) holds TRIP LEVER (1) at rest position.

Dead Key Mechanism

The Dead Key mechanism prevents escapement trip during a print cycle when a Dead Key-lever is depressed.

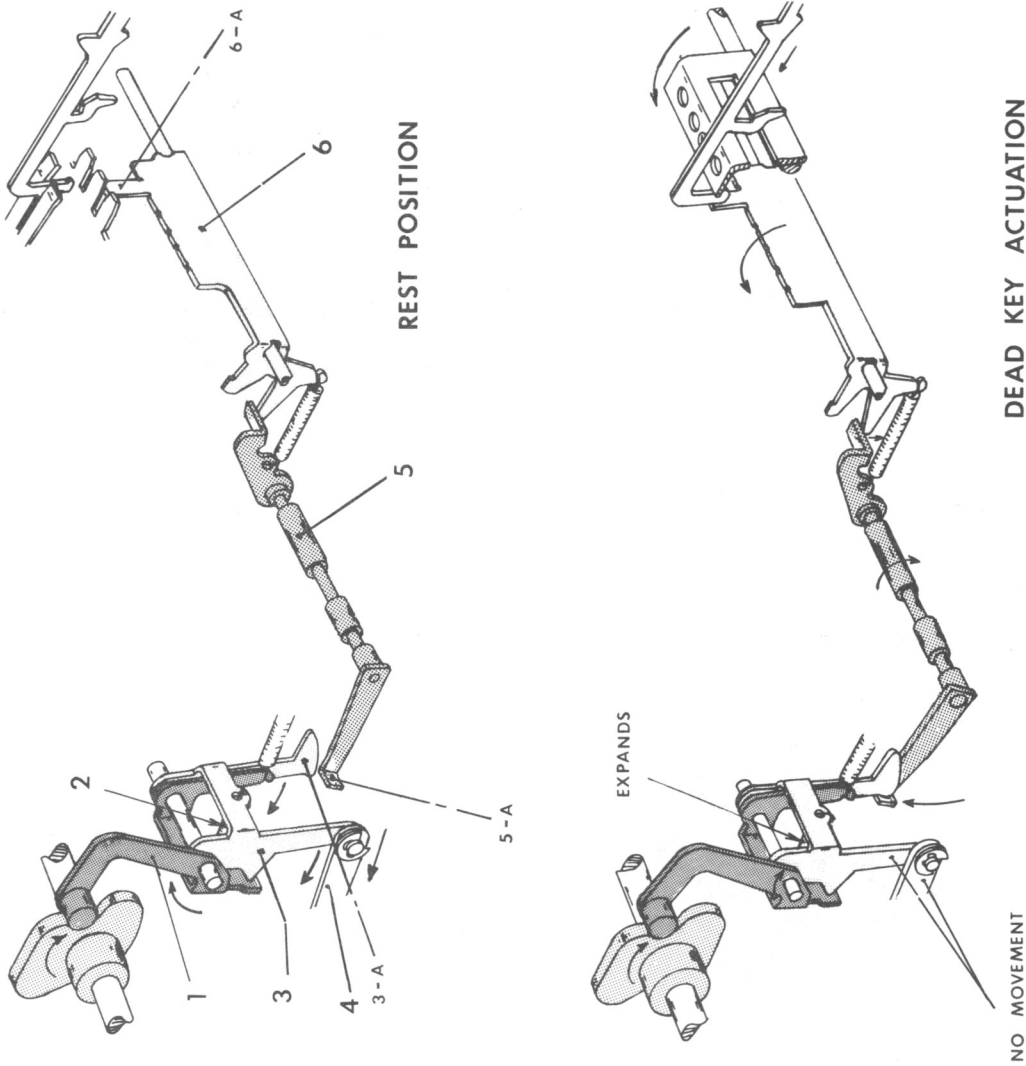
On machines with Dead Key mechanism, the ESCAPEMENT CONTROL LEVER (1) is connected by SPRING (2) to ESCAPEMENT JOINT LEVER (3).

During non Dead Key actuation, LEVER (1) and JOINT (3) rotate as one part to move LINK (4) rearward for an escapement trip.

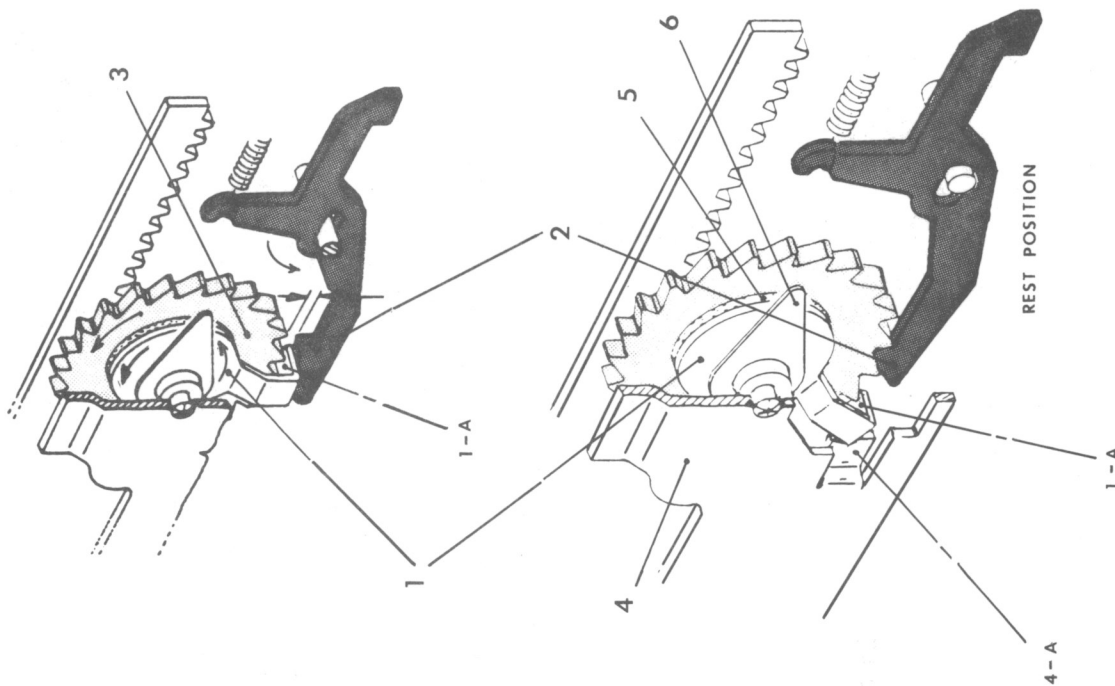
When a Dead Key-lever is depressed, Dead Key Interposer contacts ARM (6-A), rotating DEAD KEY COMB (6) top rearward.

DEAD KEY HOOK FRAME (5) rotates top forward, placing DEAD KEY HOOK (5-A) in path of JOINT LEVER ARM (3-A).

During a print cycle, HOOK (5-A) prevents rotation of JOINT LEVER (3) and movement of LINK (4). SPRING (2) expands when CONTROL LEVER (1) is rotated top forward by Escapement Control Cam.



CARRIAGE MOVED FROM  
LEFT TO RIGHT



REAR VIEWS

### Escapement Silencer

The ESCAPEMENT SILENCER (1) prevents ESCAPEMENT PAWL (2) from ratcheting on ESCAPEMENT WHEEL (3) when Carriage is moved from left to right.

As viewed from the rear, SILENCER (1) rotates counterclockwise when Wheel rotates counterclockwise. EAR (1-A) disengages ESCAPEMENT PAWL (2) from Wheel.

When Carriage stops moving left, WHEEL (3) and SILENCER (1) rotate clockwise, and PAWL (2) engages Wheel to hold Carriage at rest. Clockwise movement of Silencer is stopped by LUG (4-A) of ESCAPEMENT SUPPORT PLATE (4).

Movement of Silencer is controlled by LEAF SPRING (6) and lubricated FRICTION PAD (5).

Carriage Release

The Carriage Release Lever disengages ESCAPEMENT PAWL (6) from Escapement Wheel to permit free movement of Carriage.

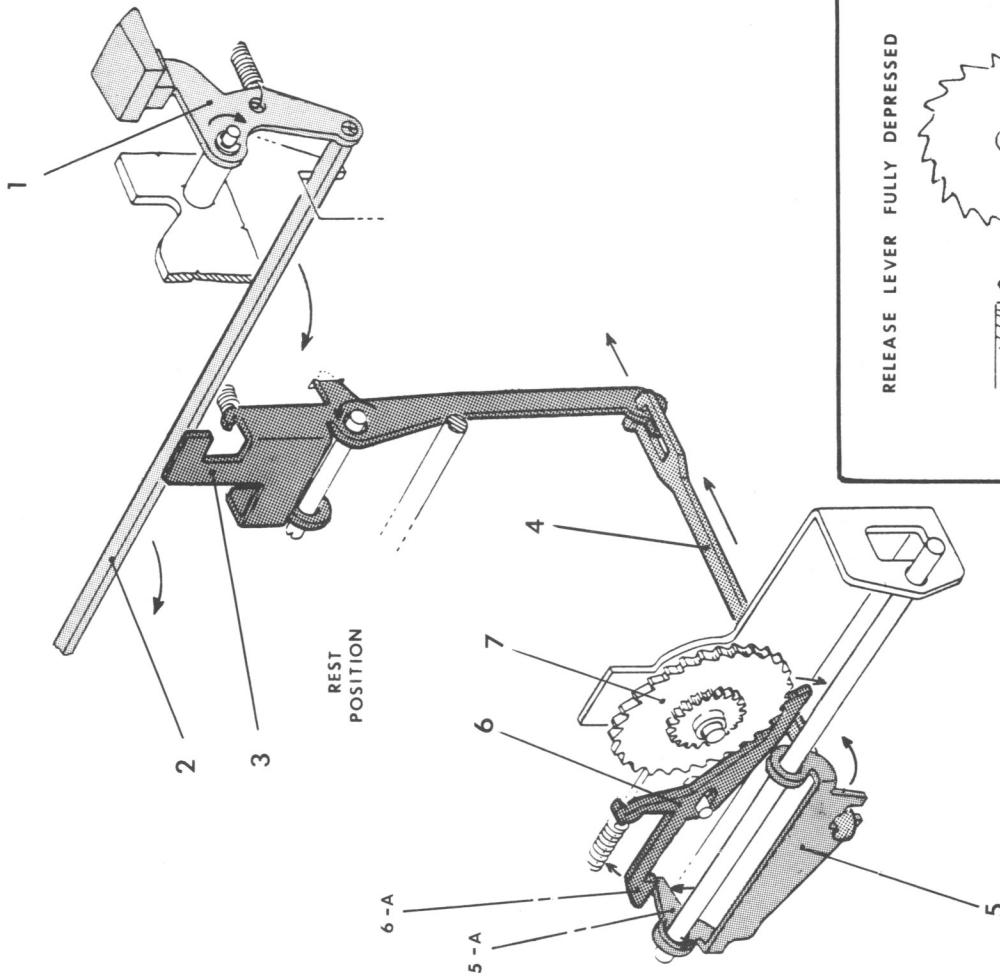
When CARRIAGE RELEASE LEVER (1) is depressed, CARRIAGE RELEASE BAIL (2) rotates BELLCRANK (3) top forward.

LINK (4) moves rearward, rotating CARRIAGE RELEASE BRIDGE (5) top forward.

RELEASE BRIDGE ARM (5-A) rotates ESCAPEMENT PAWL (6) clockwise, and holds Pawl disengaged from Escapement Wheel until Carriage Release Lever is released.

**NOTE:** Escapement does not "trip" because PAWL LUG (6-A) does not overshoot BRIDGE ARM (5-A) when Pawl moves left after disengaging Wheel.

To observe movement, push CARRIAGE RELEASE BRIDGE (5) rearward. Manually hold Carriage.



RELEASE LEVER FULLY DEPRESSED

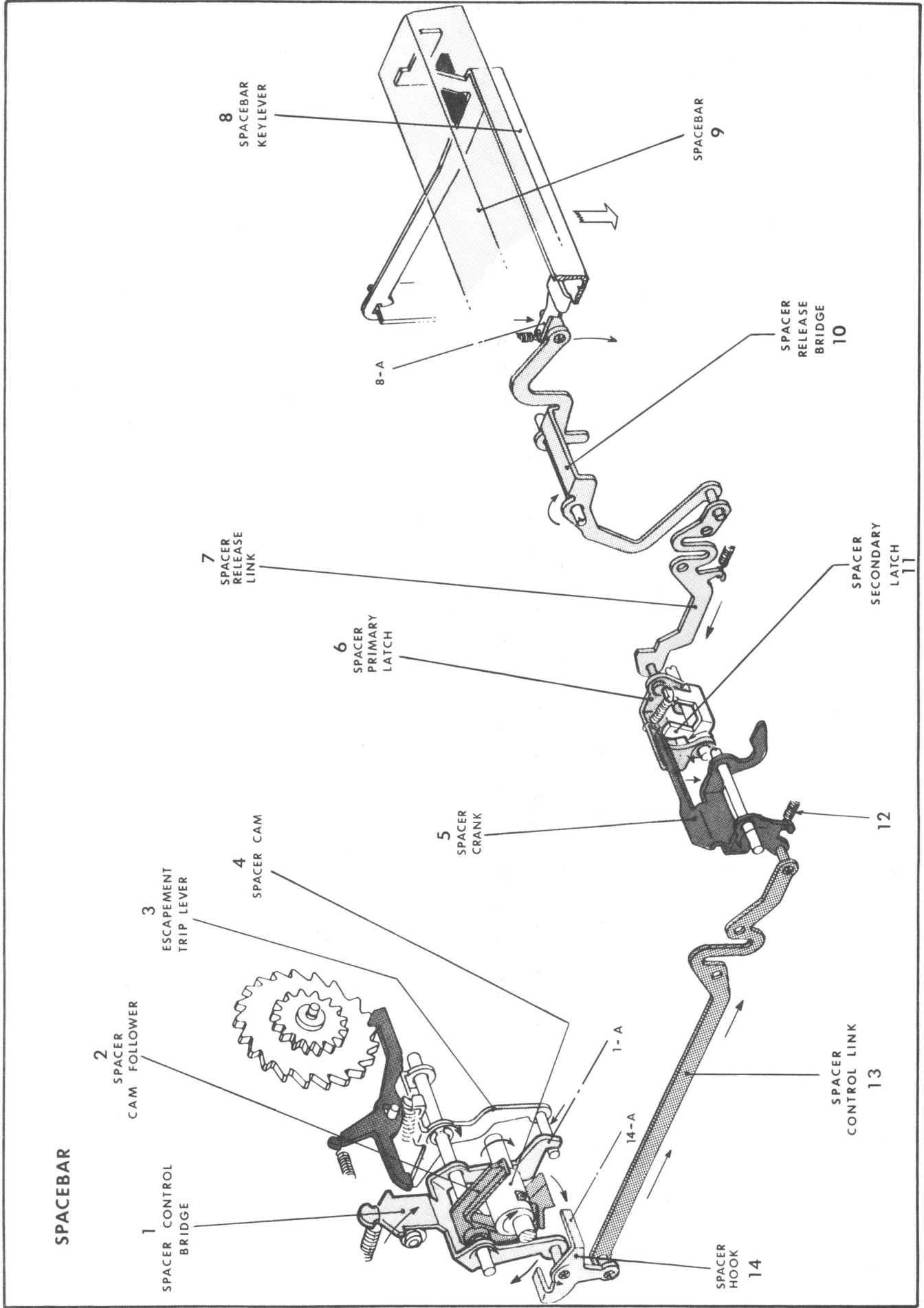
**SPACEBAR**

Spacebar Actuation, Trip, & Restore

Spacebar Latches--Single & Repeat Spacebar Action

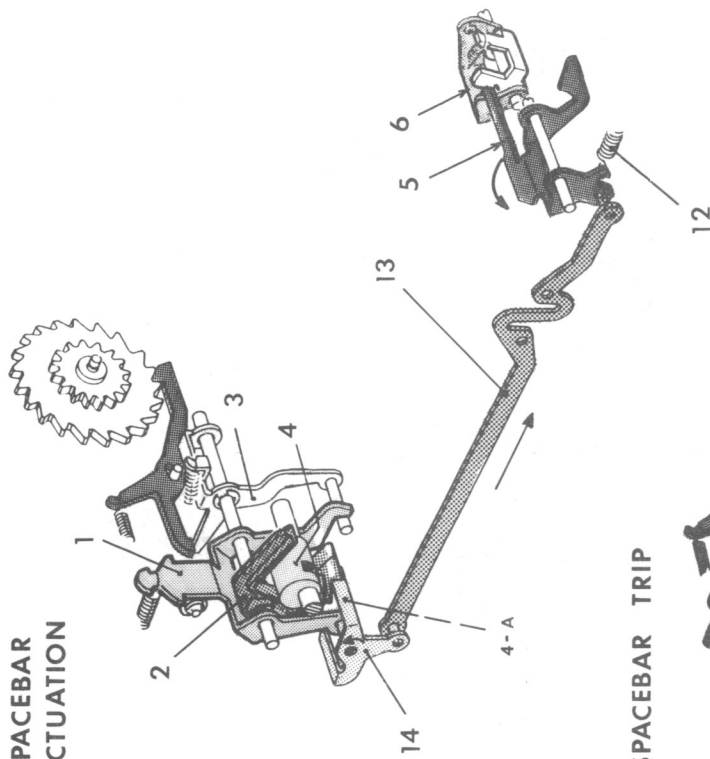
Initial Blockout of a Spacing Actuation during a Print Cycle

Secondary Blockout of a Spacing Actuation during a Print Cycle

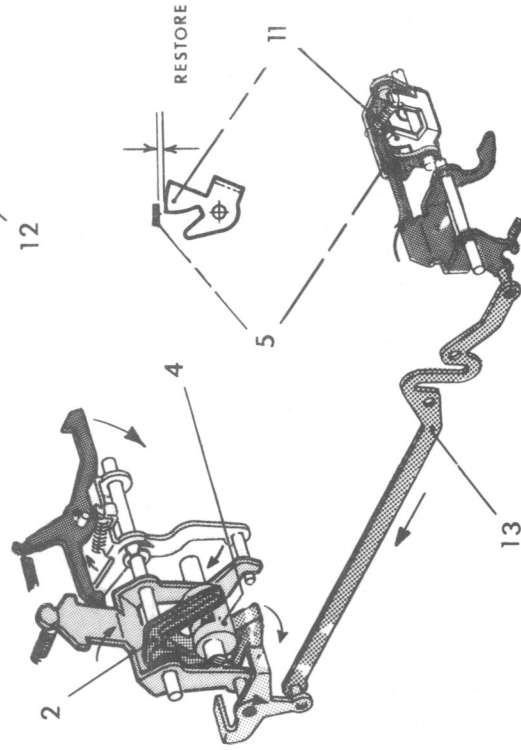




### SPACEBAR ACTUATION



### SPACEBAR TRIP



#### Spacebar

The Spacebar mechanism trips the Escapement for single and repeat spacing of the Carriage. It is powered by the Intermediate Shaft, which continuously rotates SPACER CAM (4) and SPACER CAM FOLLOWER (2).

#### Actuation

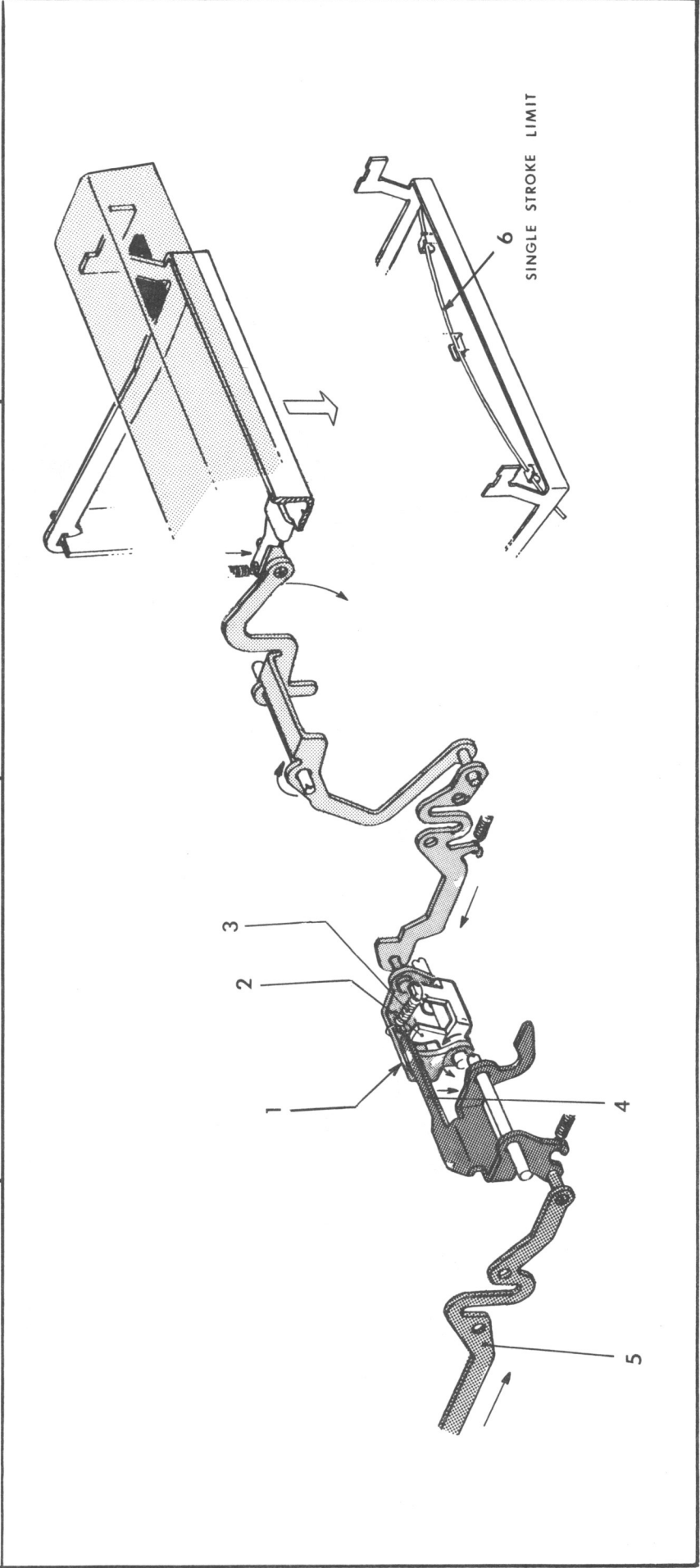
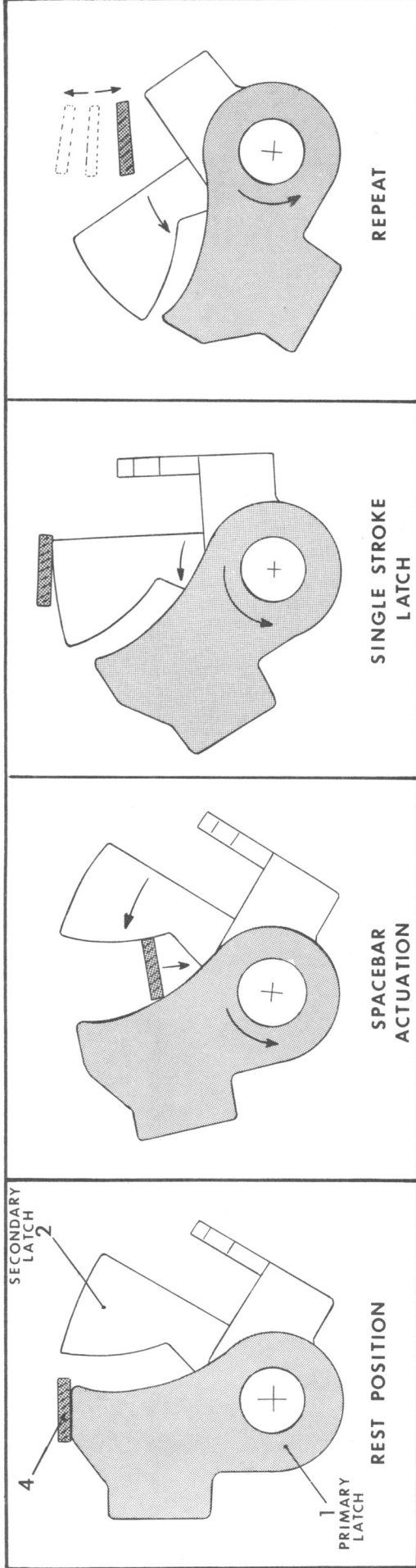
When Spacebar KEYLEVER (8) is depressed, KEYLEVER ARM (8-A) rotates SPACER RELEASE BRIDGE (10) top forward. SPACER RELEASE LINK (7) moves rearward, and rotates PRIMARY LATCH (6) top rearward. PRIMARY LATCH (6) releases SPACER CRANK (5), which rotates top rearward under SPRING (12) tension. SPACER CONTROL LINK (13) moves forward and rotates SPACER HOOK (14) top rearward so that HOOK ARM (14-A) engages the oscillating CAM FOLLOWER (2).

#### Trip

On a down stroke, CAM FOLLOWER (2) rotates HOOK (14) and attached SPACER CONTROL BRIDGE (1) top forward. SPACER CONTROL BRIDGE ARM (1-A) rotates ESCAPEMENT TRIP LEVER (3) top forward to trip Escapement.

#### Restore

During trip, LINK (13) moves rearward and restores SPACER CRANK (5) above PRIMARY (6) or SECONDARY LATCH (11), depending on whether Spacebar is held depressed or released.



Spacebar Latches--Single & Repeat Spacebar Action

The Spacebar Latches hold Spacebar mechanism at rest, and provide single and repeat Spacebar action. A SPRING ROD (6) attached to Keyboard Assembly is the single stroke limit for Spacebar, and provides increased tension when Spacebar is depressed into repeat zone.

Rest Position

When Spacebar mechanism is at rest, SPACER CRANK (4) rests on PRIMARY LATCH (1).

Spacebar Actuation

Connected by SPRING (3), both PRIMARY (1) and SECONDARY (2) Latches rotate top rearward when Spacebar is depressed.

CRANK (4) blocks movement of SECONDARY LATCH (2), which is higher than Crank.

PRIMARY LATCH (1) continues rotating and releases CRANK (4), which drops between both Latches to actuate Spacebar mechanism.

Single Stroke Latch

As the Escapement is tripped by Spacebar mechanism, LINK (5) moves rearward and restores CRANK (4) above Latches.

If Spacebar is held in single stroke zone, SECONDARY LATCH (2) pivots under CRANK (4) as Crank reaches its maximum upward travel.

SECONDARY LATCH (2) holds CRANK (4) until Spacebar is released or depressed into repeat zone.

If Spacebar is released, both Latches rotate top forward. CRANK (4) slips off SECONDARY LATCH (2) onto the lower PRIMARY LATCH (1)--rest position.

Repeat Spacing

If Spacebar is fully depressed, SECONDARY LATCH (2) rotates rearward of CRANK (4) after the first spacing stroke.

Held by neither Latch, CRANK (4) continues to rotate, providing repeat action until Spacebar is released.

### Initial Blockout of a Spacing Actuation During a Print Cycle

When Spacebar is depressed immediately after a print cycle is entered, the spacing cycle is held in memory until the print cycle is completed.

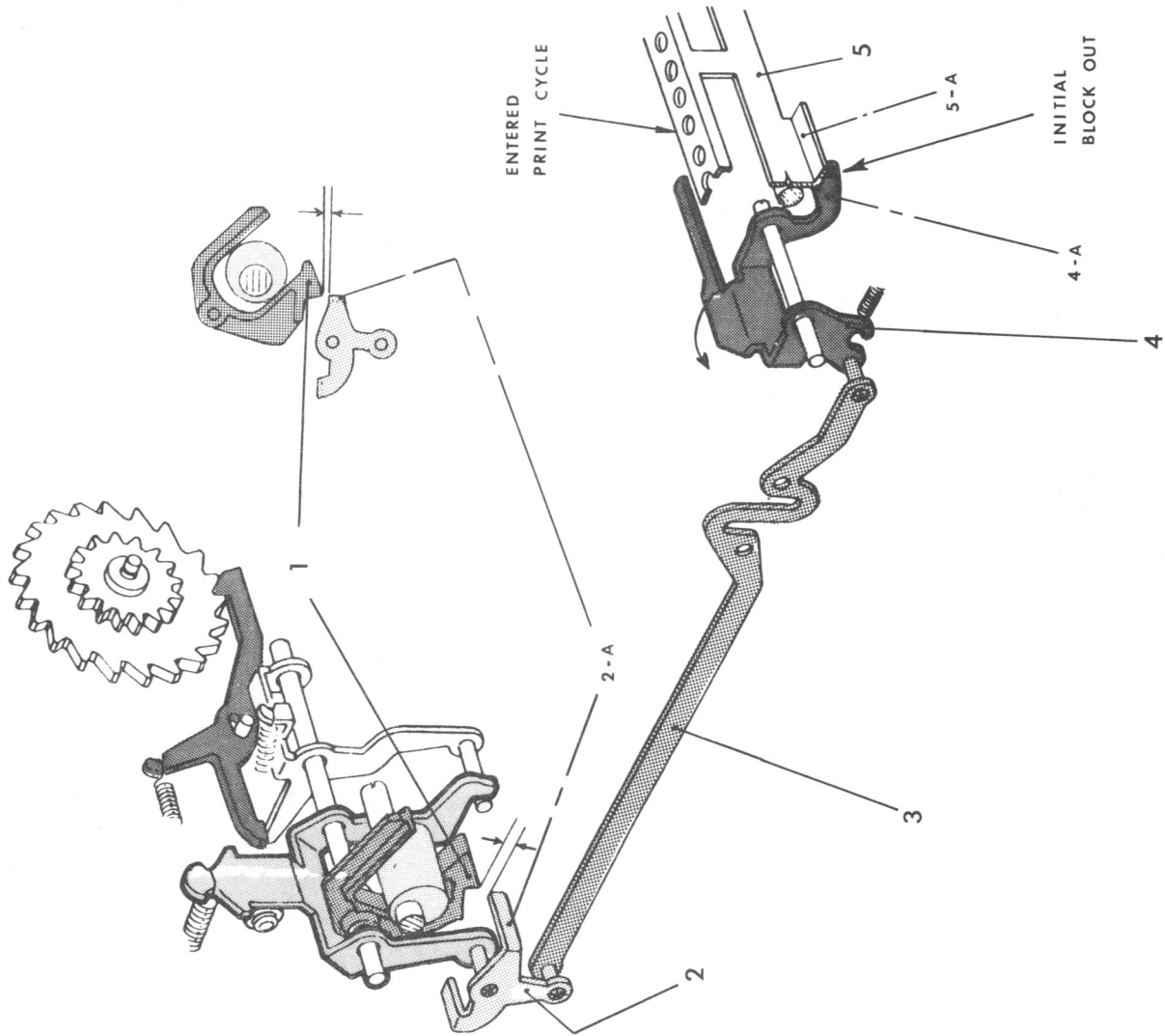
Initial blockout of the spacing actuation occurs when SPACER CRANK ARM (4-A) contacts LUG (5-A) of actuated CODE SET BAIL (5).

LUG (5-A) prevents full rotation of CRANK (4) and movement of LINK (3).

SPACER HOOK (2-A) does not rotate far enough to engage SPACER CAM FOLLOWER (1) for an Escapement trip.

This initial blockout of the spacing actuation lasts until Code Set Bail restores during the print cycle. Secondary blockout, required for the remainder of the print cycle, is described on the following page.

To observe movement, depress an Interposer and then the Spacebar with machine at rest.



### Secondary Blockout of a Spacing Actuation During a Print Cycle

CODE SET BAIL (5) restores early during the print cycle, releasing SPACER CRANK (4). A secondary blockout of a spacing actuation holds the spacing cycle in memory until the print cycle is completed.

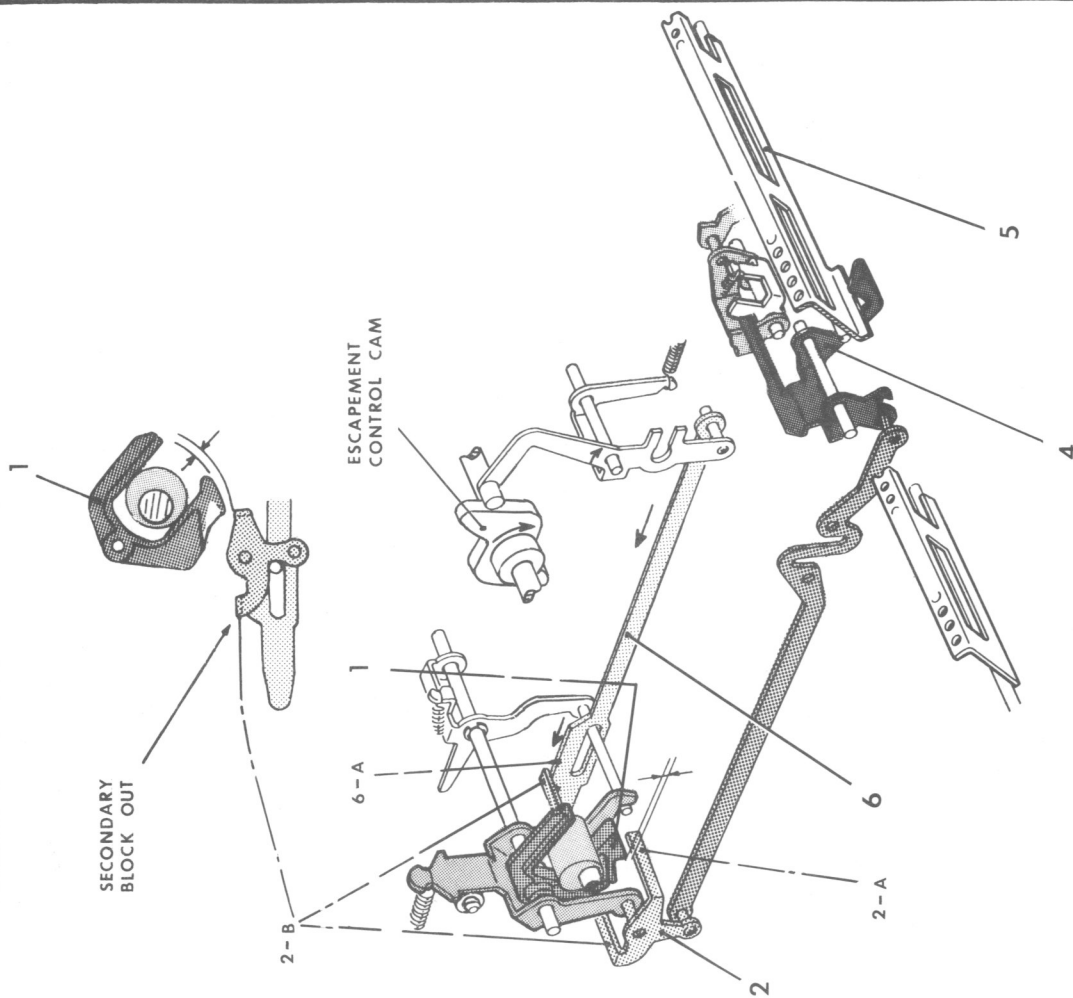
During a print cycle, ESCAPEMENT CONTROL LINK (6) moves rearward to trip Escapement.

If Spacebar has been depressed, SURFACE (6-A) of LINK (6) holds SPACER HOOK ARM (2-B) to prevent full rotation of HOOK (2-A) into path of CAM FOLLOWER (1). The spacing actuation is blocked, but Escapement trips due to Keylever action.

When LINK (6) moves forward near the end of the print cycle, SURFACE (6-A) releases HOOK ARM (2-B).

HOOK (2-A) engages CAM FOLLOWER (1) for an Escapement trip actuated by Spacebar.

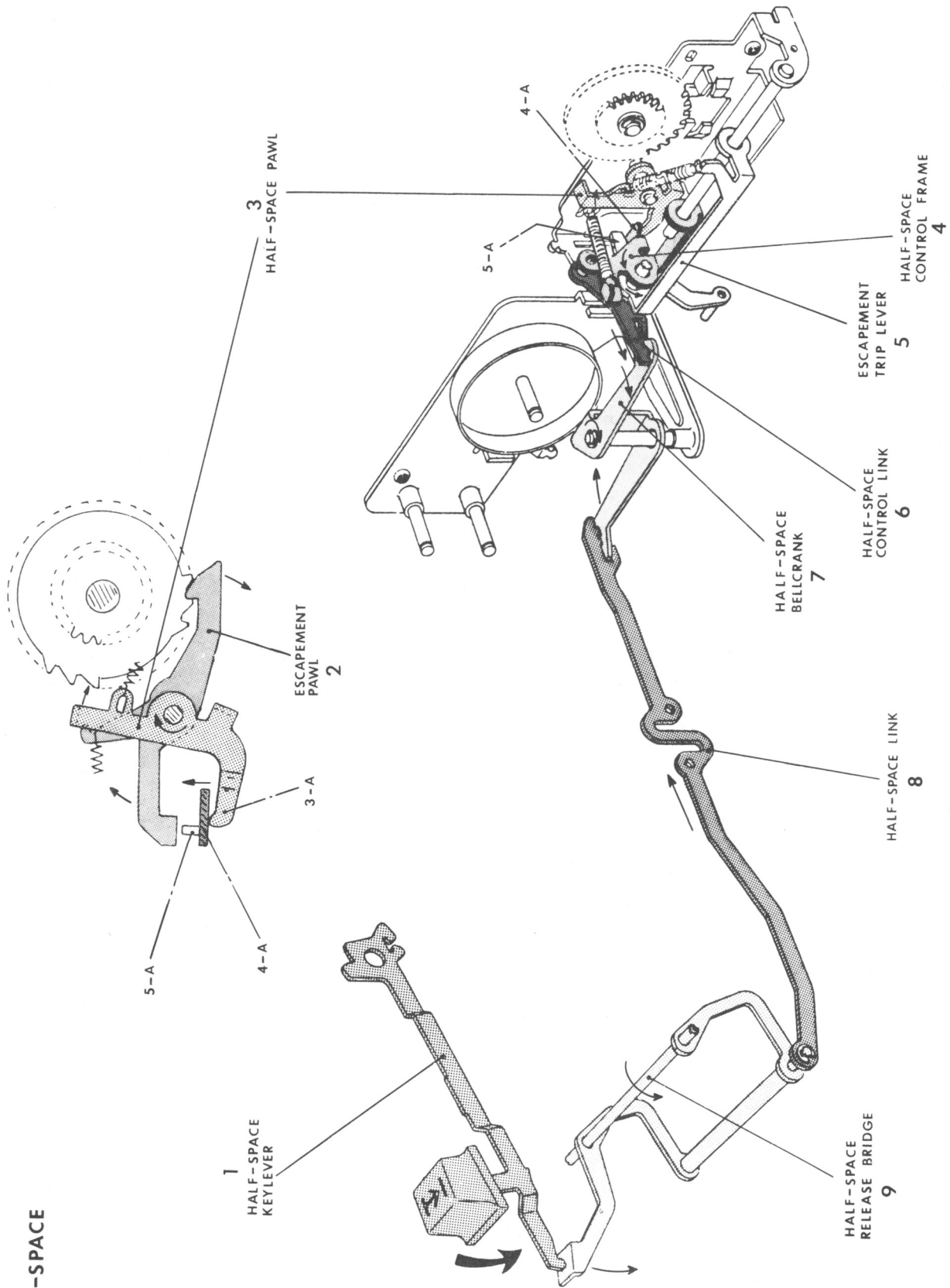
To observe movement, depress an Interposer and then the Spacebar with machine at rest. Rotate Print Cam Shaft Pulley.





HALF-SPACE

HALF-SPACE





Half-Space

When Half-Space Keylever is depressed, Escapement Wheel and Carriage move one half space. When Keylever is released, Carriage and Wheel move the remaining half-space.

When depressed, HALF-SPACE KEYLEVER (1) rotates RELEASE BRIDGE (9) top forward.

LINK (8) moves rearward, and rotates BELLCRANK (7) clockwise.

BELLCRANK (7) pulls CONTROL LINK (6) forward, rotating attached HALF-SPACE CONTROL FRAME (4) top forward.

CONTROL FRAME ARM (4-A) lifts ESCAPEMENT TRIP LEVER ARM (5-A), which trips Escapement.

At the same time, ARM (4-A) releases HALF-SPACE PAWL ARM (3-A). PAWL (3) rotates clockwise under spring tension and engages Escapement Wheel, stopping Wheel half way between its normal full space rotation.

Since Escapement is tripped by TRIP LEVER (5), ESCAPEMENT PAWL (2) is already engaged in next Escapement Wheel Tooth. When Keylever is released, HALF-SPACE PAWL (3) releases Escapement Wheel, and Wheel rotates to rest position.



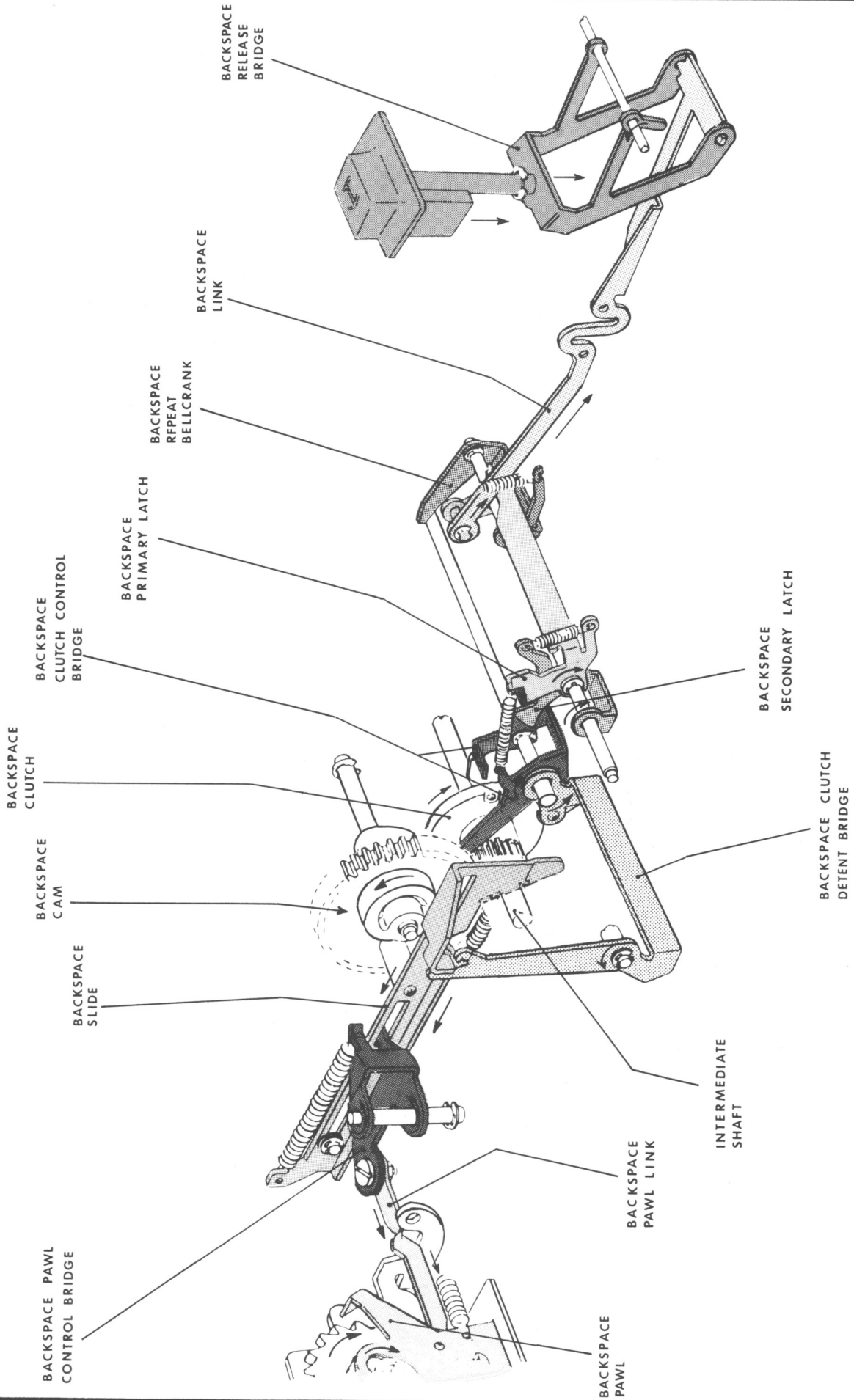
**BACKSPACE**

Backspace Actuation & Disengagement

Backspace Drive

Backspace Latches--Single & Repeat Action

**BACKSPACE**



Backspace

Powered by the Intermediate Shaft, the Backspace Mechanism provides single and repeat backspacing of the Carriage.

Actuation

Backspace Keylever depression rotates Release Bridge top rearward. LINK [5] moves forward, and rotates PRIMARY LATCH [6] top forward.

PRIMARY LATCH [6] releases ARM [8-B], and CLUTCH CONTROL BRIDGE [8] rotates top forward.

BRIDGE ARM [8-A] releases CLUTCH DOG [2] on BACKSPACE CLUTCH [1]. DOG [2] engages BACKSPACE RATCHET [3], which rotates BACKSPACE CLUTCH [1] top forward.

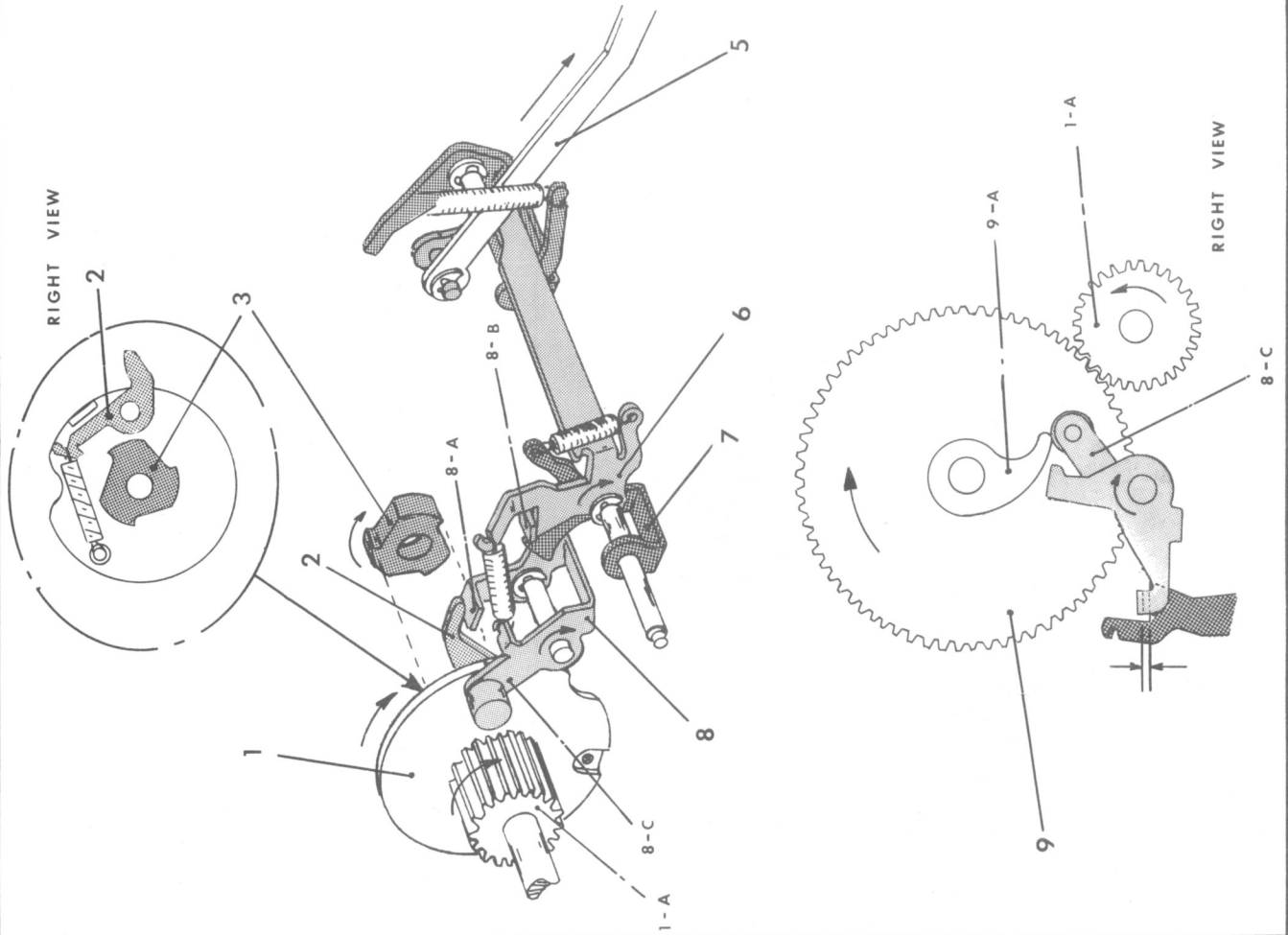
GEAR [1-A] rotates BACKSPACE CAM [9] top rearward.

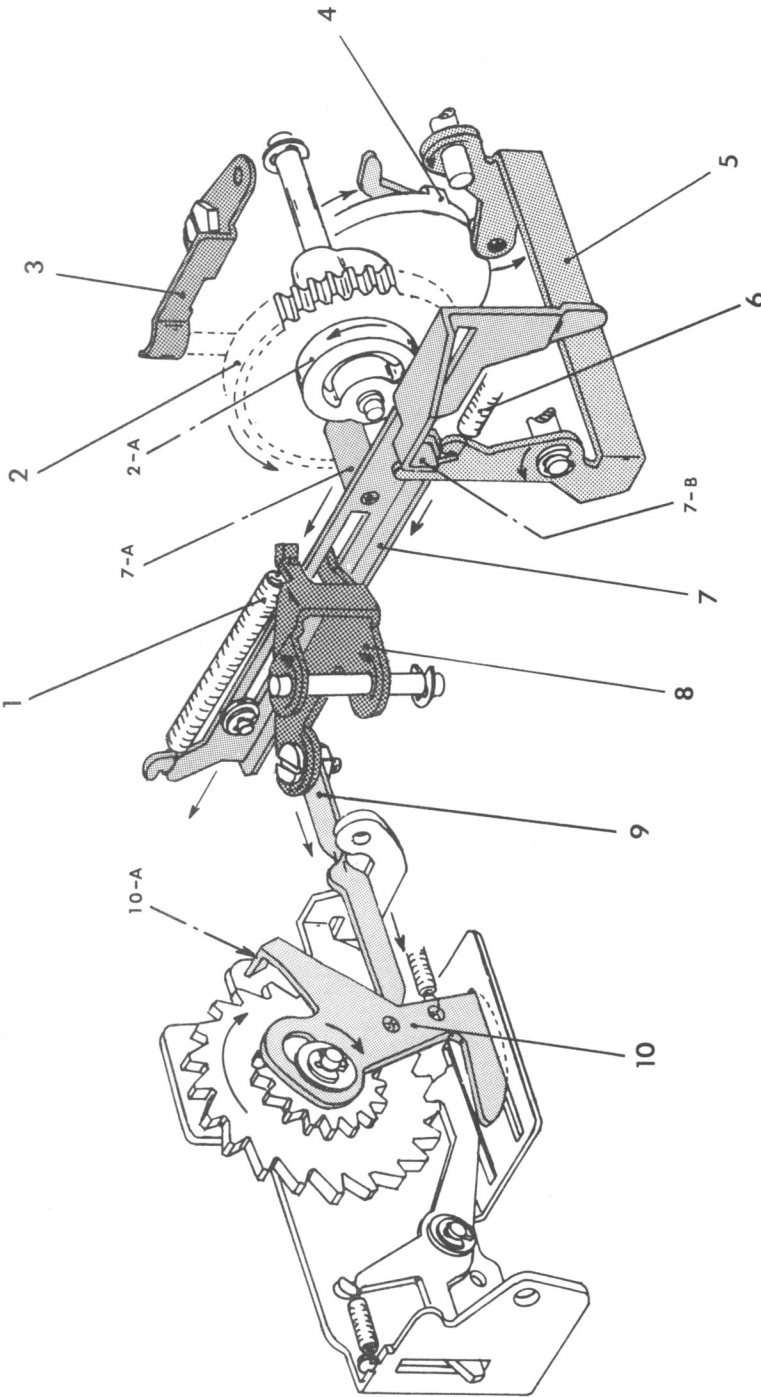
To observe movement, hold but do not lift CONTROL BRIDGE ARM [8-B] with Spring Hook. Pull BACKSPACE LINK [5] forward.

Disengagement

Backspace Clutch rotates three revolutions to rotate Backspace Cam one full revolution.

Near end of Backspace cycle, RIGHT LOBE [9-A] of BACKSPACE CAM [9] cams BRIDGE ARM [8-C] down, releasing CLUTCH CONTROL BRIDGE [8] so that ARM [8-B] latches on PRIMARY [6] or SECONDARY [7] Latch. ARM [8-A] disengages CLUTCH DOG [2] from Ratchet, and stops rotation of Backspace Clutch.





#### Backspace Drive

When BACKSPACE CAM (2) rotates top rearward during Backspace cycle, LEFT LOBE (2-A) cams STUD (7-A) to push BACKSPACE SLIDE (7) rearward.

SLIDE (7) rotates PAWL CONTROL BRIDGE (8) counterclockwise thru SPRING (1) connection.

LINK (9) moves left, and rotates BACKSPACE PAWL (10) clockwise. EAR (10-A) rotates Escape-ment Wheel slightly more than one space.

If Carriage is at left margin, SPRING (1) yields and absorbs motion of SLIDE (7).

CLUTCH DETENT BRIDGE (5) applies detent tension to steady BACKSPACE CLUTCH (4) at rest.

When SLIDE (7) moves rearward, EAR (7-B) pivots BRIDGE (5) top rearward to relieve detent pressure on the rotating Clutch.

BACKSPACE CAM BRAKE (3) maintains speed of CAM (2) as parts return to rest under SPRING (1) (6) tension.

Backspace Latches--Single & Repeat Action

The Backspace Latches hold Backspace mechanism at rest, and provide single and repeat Backspace Action. BACKSPACE REPEAT BELL-CRANK [4] defines the limit for single stroke Keylever depression, and provides increased tension when Keylever is depressed into repeat zone.

Rest Position

When Backspace mechanism is at rest, CLUTCH CONTROL BRIDGE ARM [3-A] rests on PRIMARY LATCH [1].

Actuation

Connected by a Spring, both PRIMARY [1] and SECONDARY [2] Latches rotate top forward when Backspace Keylever is depressed.

ARM [3-A] blocks movement of SECONDARY LATCH [2], which is higher than Arm.

PRIMARY LATCH [1] continues rotating and releases ARM [3-A], which drops between both Latches to actuate Backspace Clutch.

Single Stroke Latch

Right Lobe on Backspace Cam restores BRIDGE ARM [3-A] above Latches near end of Backspace cycle.

If Keylever is held in single stroke zone, SECONDARY LATCH [2] pivots under ARM [3-A] as Arm reaches its maximum upward travel.

SECONDARY LATCH [2] holds ARM [3-A] until Keylever is released or depressed into repeat zone.

If Keylever is released, both Latches rotate top rearward. ARM [3-A] slips off SECONDARY LATCH [2] onto the lower PRIMARY LATCH [1]--rest position.

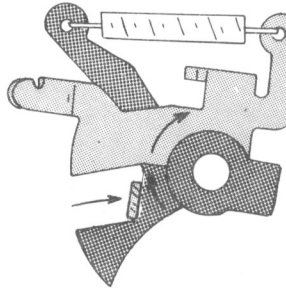
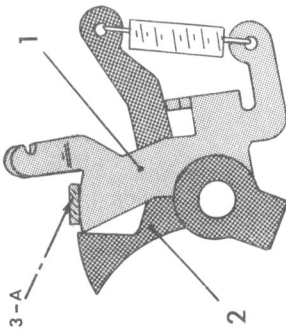
Repeat Backspace

If Keylever is fully depressed, SECONDARY LATCH [2] rotates in front of ARM [3-A] after the first Backspace cycle.

Held by neither Latch, BRIDGE [3] continues to rotate, providing repeat Backspace action until Keylever is released.

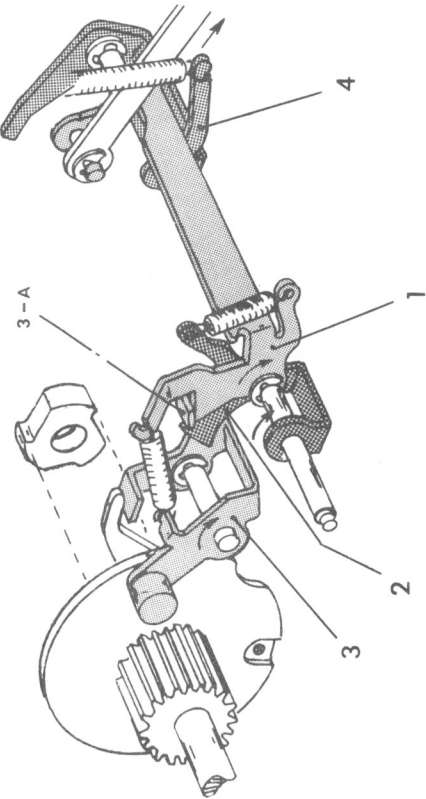
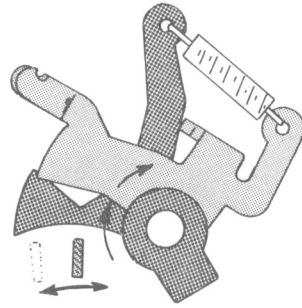
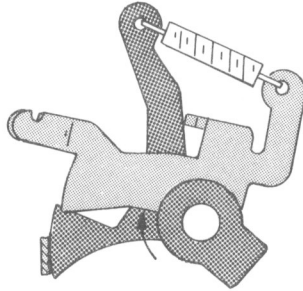
BACKSPACE ACTUATION

REST POSITION



SINGLE STROKE LATCH

REPEAT





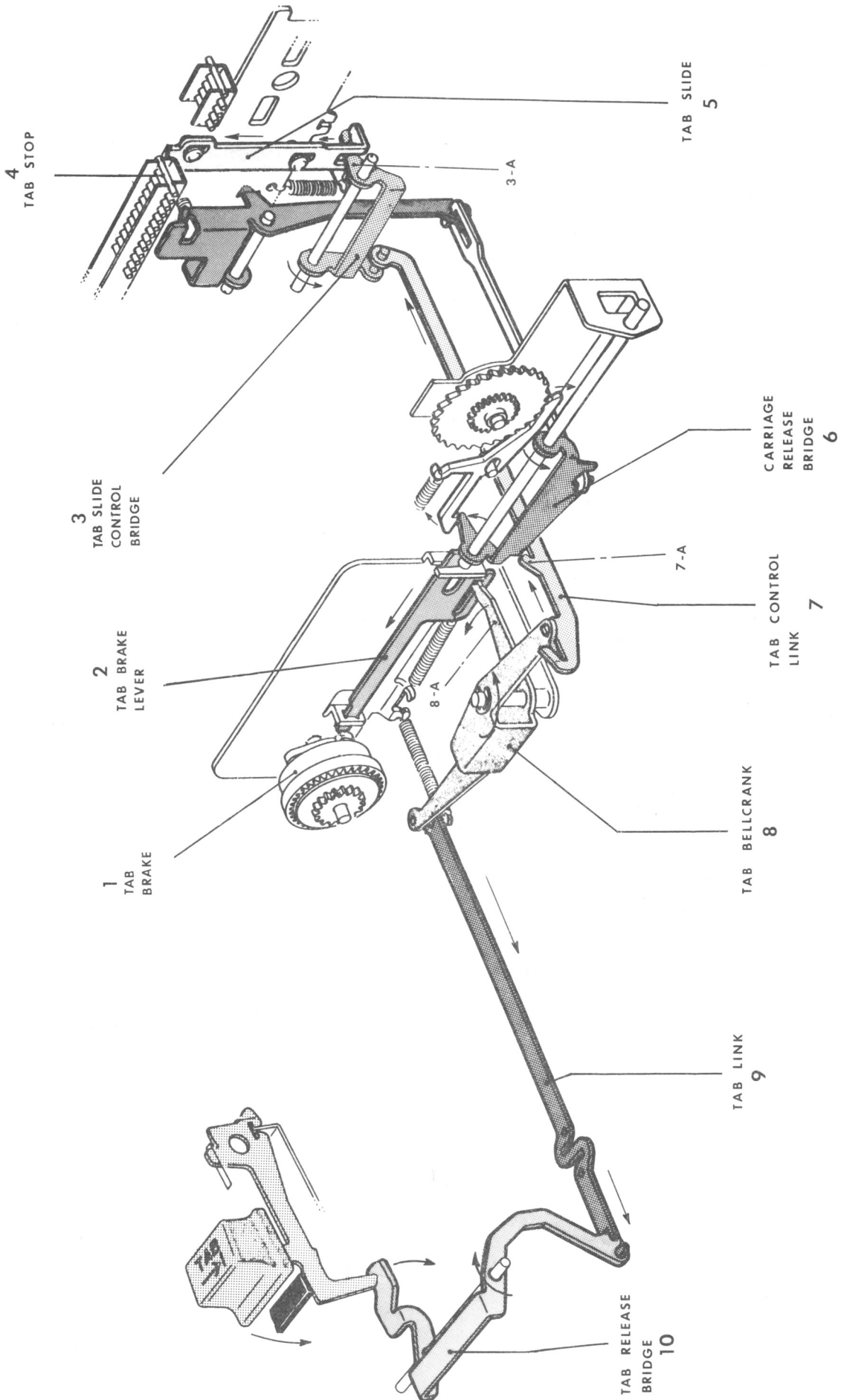


**TAB-SET-CLEAR**

Tabulator & Tab Brake

Tab-Set-Clear

TABULATOR



### Tabulator

The Tab mechanism releases the Escapement and allows the Carriage to move left under Mainspring tension until a set Tab Stop contacts TAB SLIDE (5). Tab Brake controls Carriage speed during tabulation.

When depressed, Tab Keylever rotates TAB RELEASE BRIDGE (10) top rearward. TAB LINK (9) moves forward, and rotates TAB BELLCRANK (8) counterclockwise.

TAB CONTROL LINK (7) moves rearward. LINK LUG (7-A) rotates CARRIAGE RELEASE BRIDGE (6) top forward to disengage Escapement Pawl from Escapement Wheel.

TAB CONTROL LINK (7) also rotates TAB SLIDE CONTROL BRIDGE (3) top forward. ARM (3-A) releases TAB SLIDE (5), which moves up under spring tension into path of TAB STOP (4).

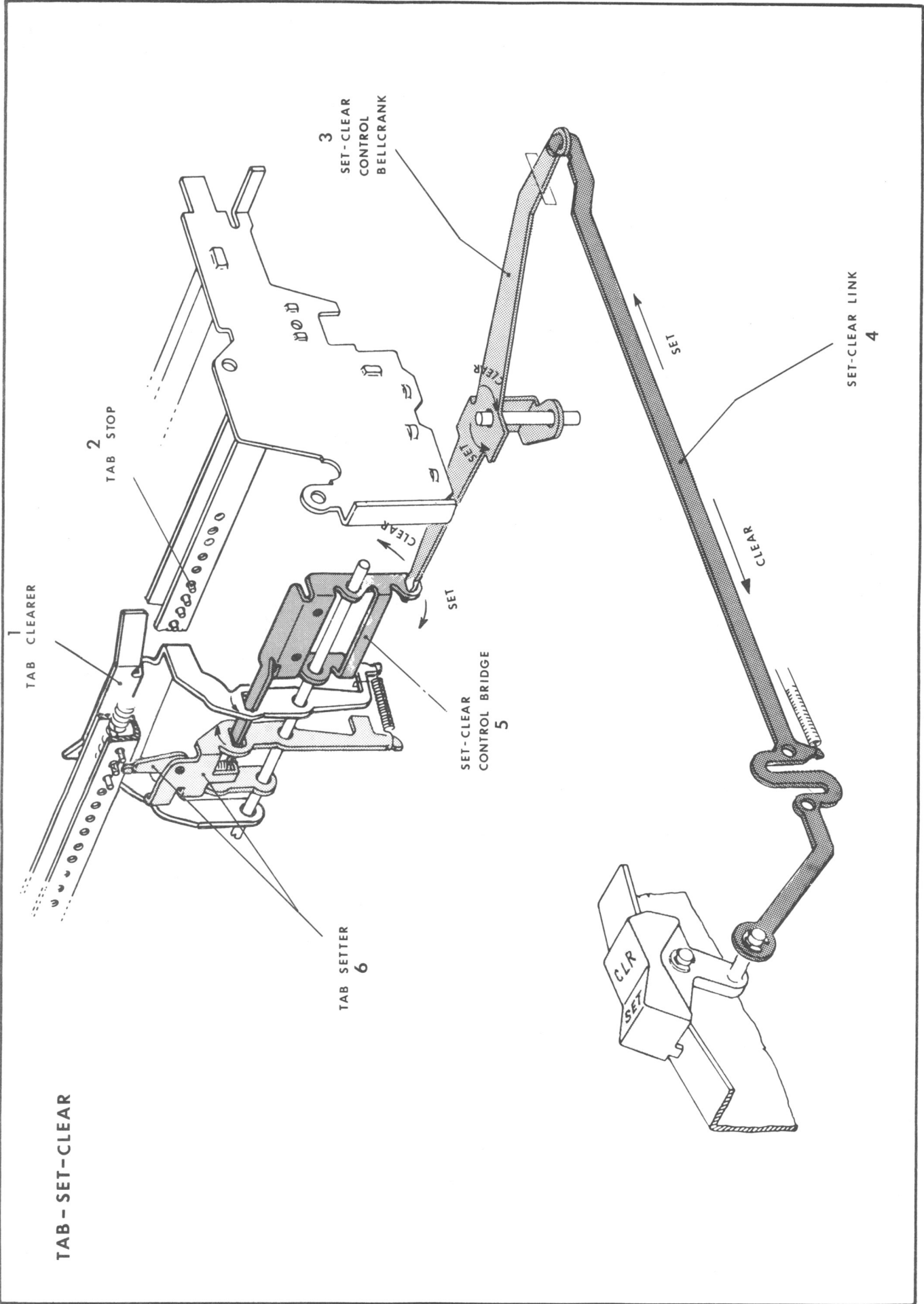
Carriage moves until TAB SLIDE (5) contacts a set TAB STOP (4).

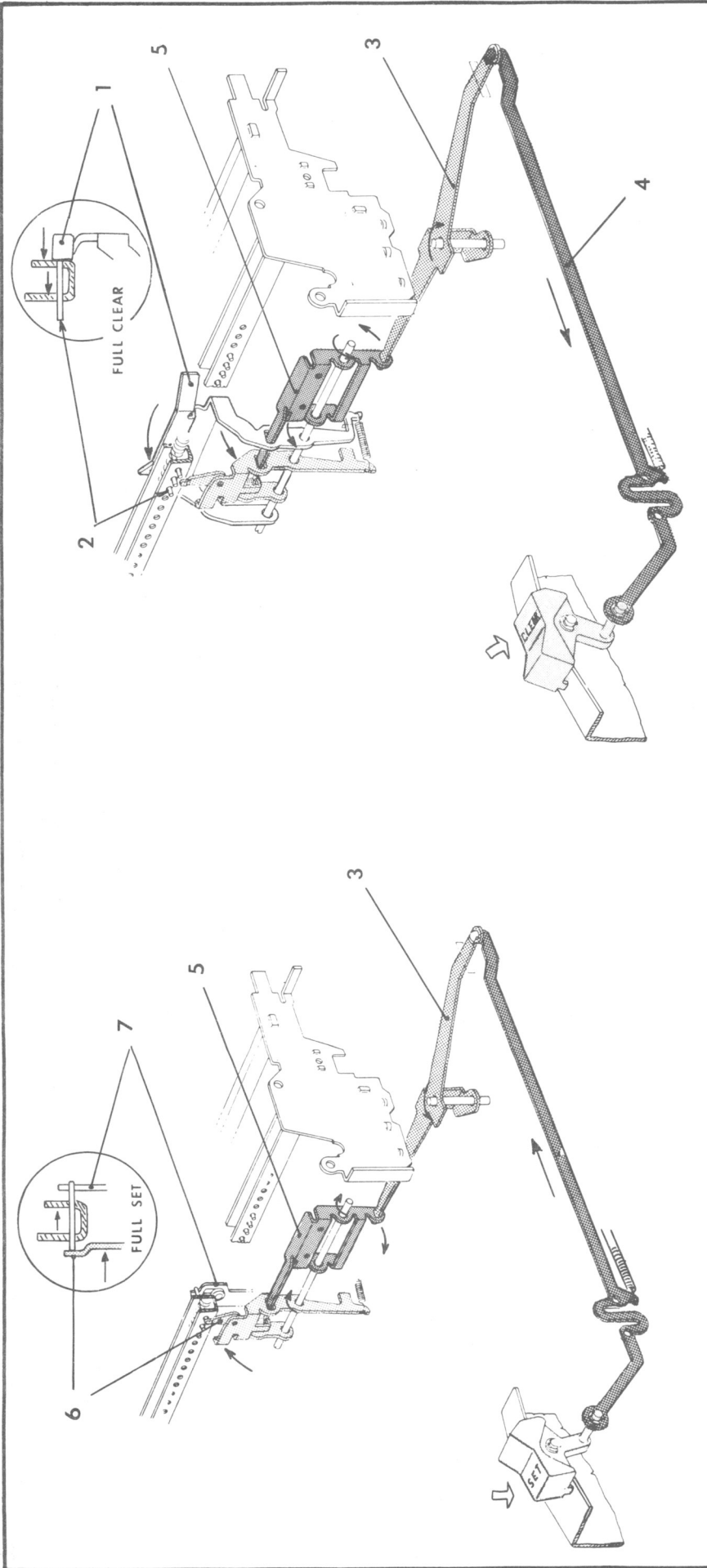
When Tab Keylever is released, parts return to rest under spring tension. BRIDGE ARM (3-A) holds TAB SLIDE (5) down out of path of Tab Stops.

### Tab Brake

When TAB BELLCRANK (8) rotates counterclockwise during Tab Keylever depression, ARM (8-A) releases TAB BRAKE LEVER (2).

LEVER (2) moves left under spring tension into path of pick-up lugs on back of Tab Brake, activating friction clutch inside Tab Brake. Brake is coupled by an intermediate gear to Mainspring Drum, and controls speed of Spring Drum as Carriage moves left during tabulation.





Tab-Set-Clear

Tab Stops are assembled along Tab Rack, which is part of the Carriage Assembly. The Set Clear mechanism sets and clears the Tab Stop that corresponds with Carriage position.

Tab Set

When Set-Clear Button is rotated top forward to "Set," LINK (4) moves rearward and rotates CONTROL BELLCRANK (3) counterclockwise.

CONTROL BRIDGE (5) and TAB SETTER (6) rotate top rearward.

TAB SETTER (6) pushes TAB STOP (2) rearward into path of TAB SLIDE (7).

Tab Clear

Movement is reversed: Set-Clear Button rotates top rearward to "Clear."

LINK (4) moves forward. BELLCRANK (3) rotates clockwise. CONTROL BRIDGE (5) and TAB CLEARER (1) rotate top forward.

TAB CLEARER (1) pushes TAB STOP (2) forward out of path of TAB SLIDE (7).



MARGIN

Margin-LineLock

Margin Release

Margin-LineLock

Right and Left Margin Stops are attached to Margin Rack, which is part of the Carriage Assembly.

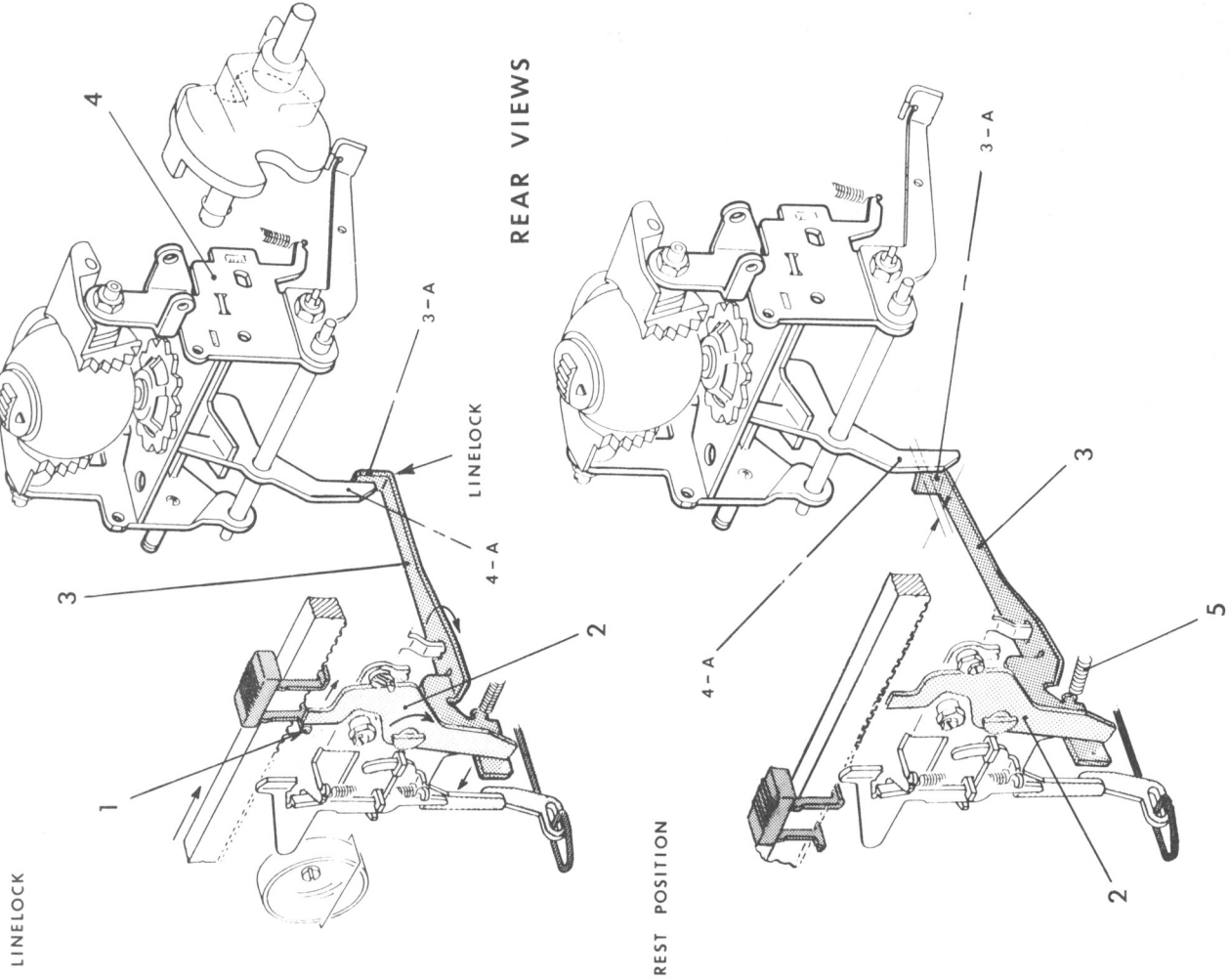
When Carriage moves to Right Margin, RIGHT MARGIN STOP (1) rotates MARGIN STOP LEVER (2) clockwise as viewed from the rear.

STOP LEVER (2) rotates LINELOCK LEVER (3) clockwise so that EAR (3-A) locates in front of LINELOCK ARM (4-A), which is part of the ELEMENT SUPPORT GROUP (4).

LINELOCK LEVER EAR (3-A) prevents the Element Support Group from striking the Platen should a Keylever be depressed.

When Carriage is moved away, Right Margin releases STOP LEVER (2). LINELOCK LEVER (3) pivots counterclockwise under SPRING (5) tension so that EAR (3-A) clears ARM (4-A) for unimpeded typing action.

When Carriage is returned to the Left Margin, Left Margin Stop rotates MARGIN STOP LEVER (2) counterclockwise as viewed from the rear. This movement is used for disengaging the Carriage Return mechanism, and is described in the Carriage Return Section which follows.





### Margin Release

The Margin Release Keylever permits bypassing either Right or Left Margin.

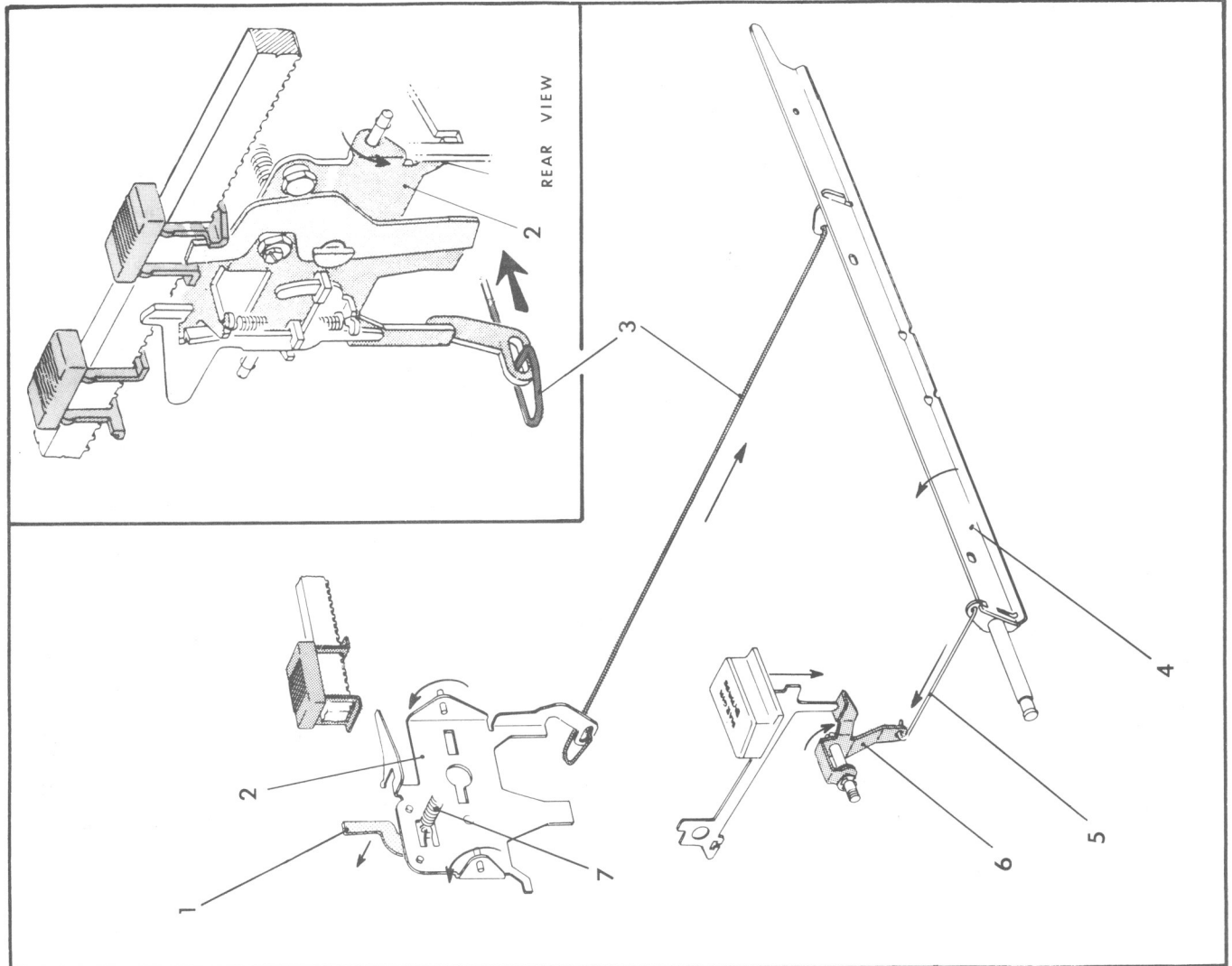
When depressed, Margin Release Keylever rotates BELLCRANK (6) top forward.

LINK (5) moves rearward, rotating RESTORE BAIL (4) top rearward.

MARGIN RELEASE LINK (3) moves forward, and rotates MARGIN RELEASE FRAME (2) top rearward so that MARGIN STOP LEVER (1) clears Margin Stop.

Carriage can now move to Left or Right Final Stops, which are part of the Carriage Assembly.

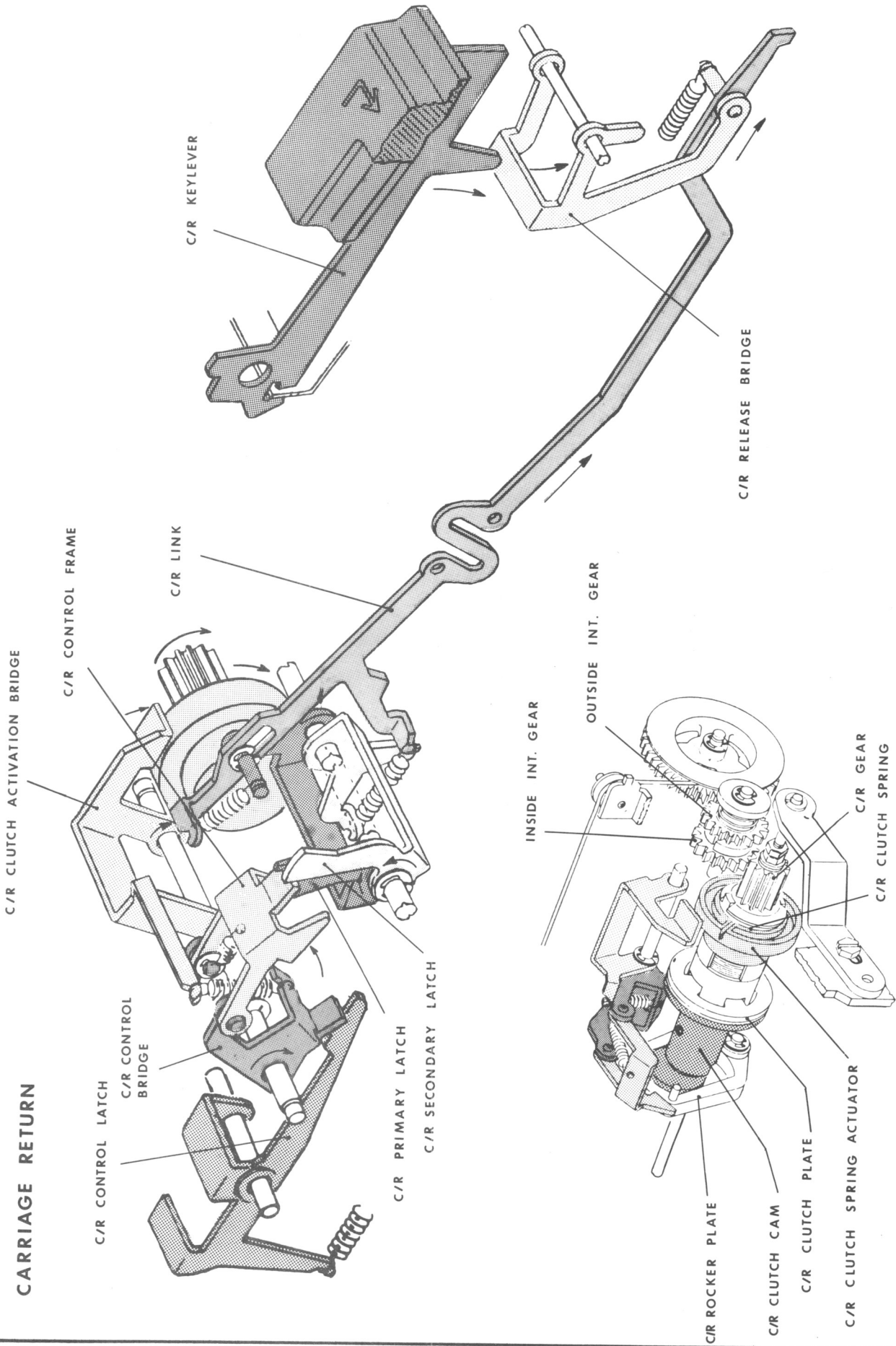
When Keylever is released, parts return to rest under SPRING (7) tension so that STOP LEVER (1) is in path of Margin Stops.





CARRIAGE RETURN

- C/R Drive
- Activation of C/R Drive
- Carriage Banking at Left Margin
- Switch-C/R Interlock



### Carriage Return Drive

Powered by the Intermediate Shaft, the Carriage Return mechanism activates the Linespace mechanism and returns the Carriage to the left margin.

C/R CLUTCH CAM (1) is pinned to the Intermediate Shaft. FRICTION CLUTCH (2) is attached to CLUTCH CAM (1). CLUTCH SPRING (3) and CLUTCH SPRING ACTUATOR (4) are attached to FRICTION CLUTCH (2). The entire assembly rotates continuously with the Intermediate Shaft.

When pressure is applied to CLUTCH SPRING ACTUATOR (4), CLUTCH SPRING (3) tightens on hub of C/R GEAR DRIVER (5) which is keyed to C/R GEAR (6). DRIVER (5) and GEAR (6) rotate with CLUTCH SPRING (3) until pressure on ACTUATOR (4) is released.

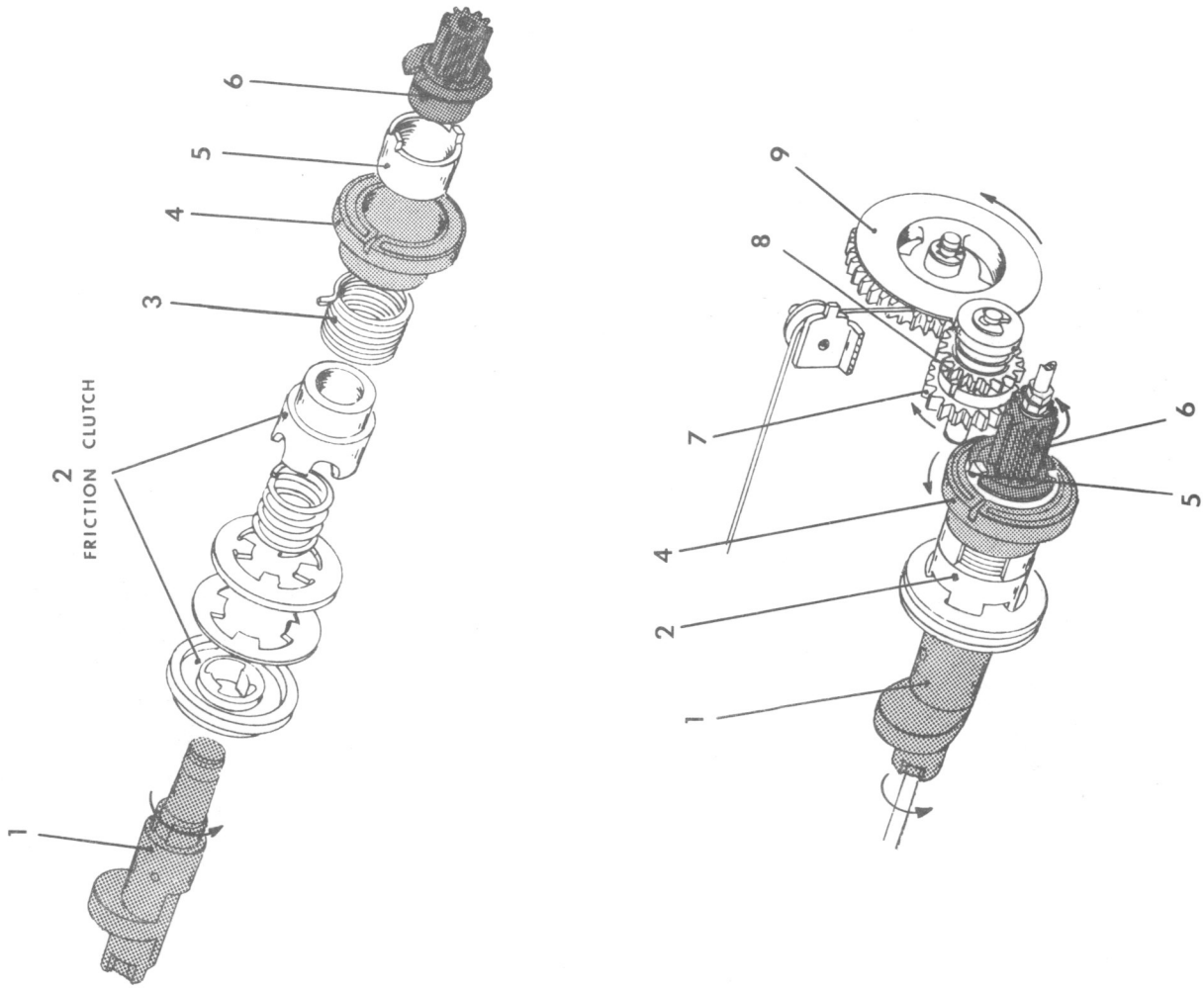
To observe movement, rotate Intermediate Shaft with machine at rest. Apply pressure to outside rim of CLUTCH SPRING ACTUATOR (4).

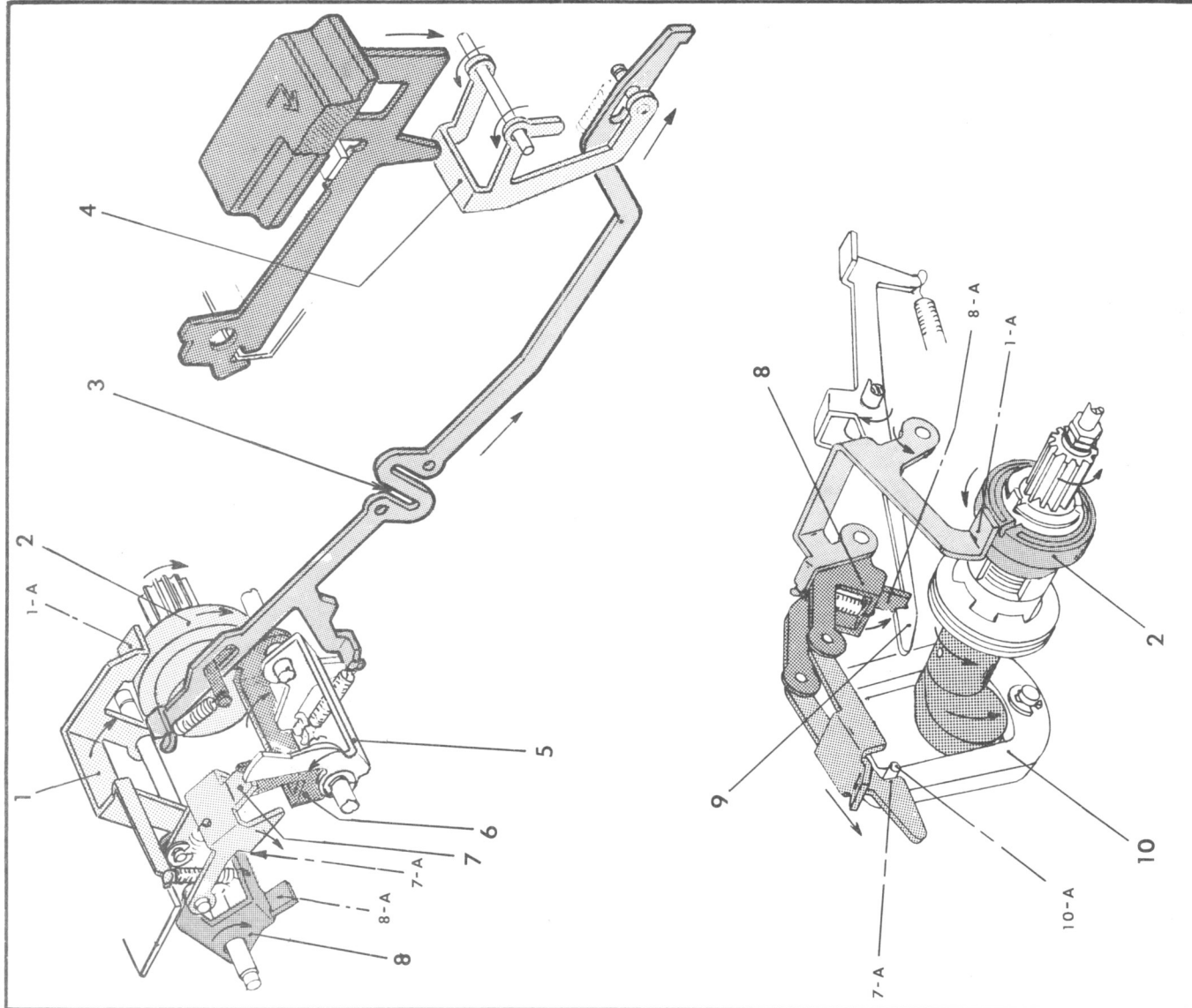
C/R GEAR (6) rotates INSIDE INTERMEDIATE GEAR (7), which, coupled to OUTSIDE INTERMEDIATE GEAR (8), rotates C/R SPRING DRUM (9).

C/R SPRING DRUM (9) winds the C/R Cord. The Cord activates Linespace, and pulls the Carriage to the right.

**NOTE:** A Clock Spring inside SPRING DRUM (9) causes Drum to take up C/R Cord when Carriage moves to right independently of C/R mechanism.

**NOTE:** FRICTION CLUTCH (2) slips if Carriage movement is blocked, uncoupling CLUTCH SPRING (3) from the driven CLUTCH CAM (1). It also slips to cushion the initial coupling of CLUTCH SPRING (3) to DRIVER (5) when Carriage Return is activated.





#### Activation of C/R Drive

C/R Keylever depression rotates RELEASE BRIDGE (4) top rearward.

LINK (3) moves forward, and rotates PRIMARY LATCH (6) top forward.

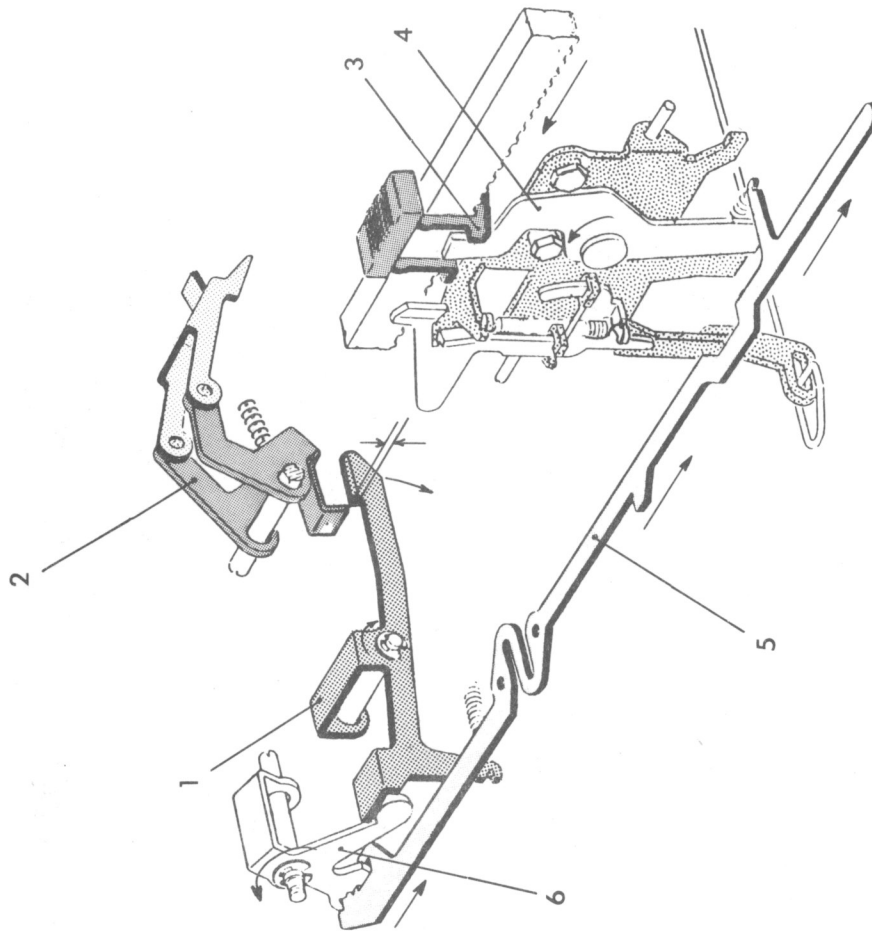
LATCH (6) releases CONTROL FRAME (7), which pivots down so that HOOK (7-A) is in path of STUD (10-A) of the constantly oscillating C/R ROCKER PLATE (10).

STUD (10-A) pulls CONTROL FRAME (7) forward, and then lifts it upward. This motion rotates CONTROL BRIDGE (8) bottom rearward so that EAR (8-A) latches on CONTROL LATCH (9). It also causes CLUTCH ACTIVATION BRIDGE (1) to pivot down so that ARM (1-A) applies pressure to CLUTCH SPRING ACTUATOR (2).

To observe movement, pull CONTROL FRAME (7) forward, and lift it upward with machine at rest. When CONTROL BRIDGE (8) is latched, pull LINK (3) forward to observe movement of Latches.

The pressure of ARM (1-A) on ACTUATOR (2) provides Carriage Return Drive--that is rotation of C/R Gear. C/R Drive continues until the Carriage banks at left margin, causing LATCH (9) to release CONTROL BRIDGE (8)--see following page.

If C/R Keylever is held depressed after CONTROL BRIDGE (8) is unlatched by Carriage Banking movement, SECONDARY LATCH (5) holds CONTROL FRAME (7) out of path of STUD (10-A) to prevent repeating action. When C/R Keylever is released, PRIMARY LATCH (6) rotates under CONTROL FRAME (7) to hold C/R mechanism at rest.



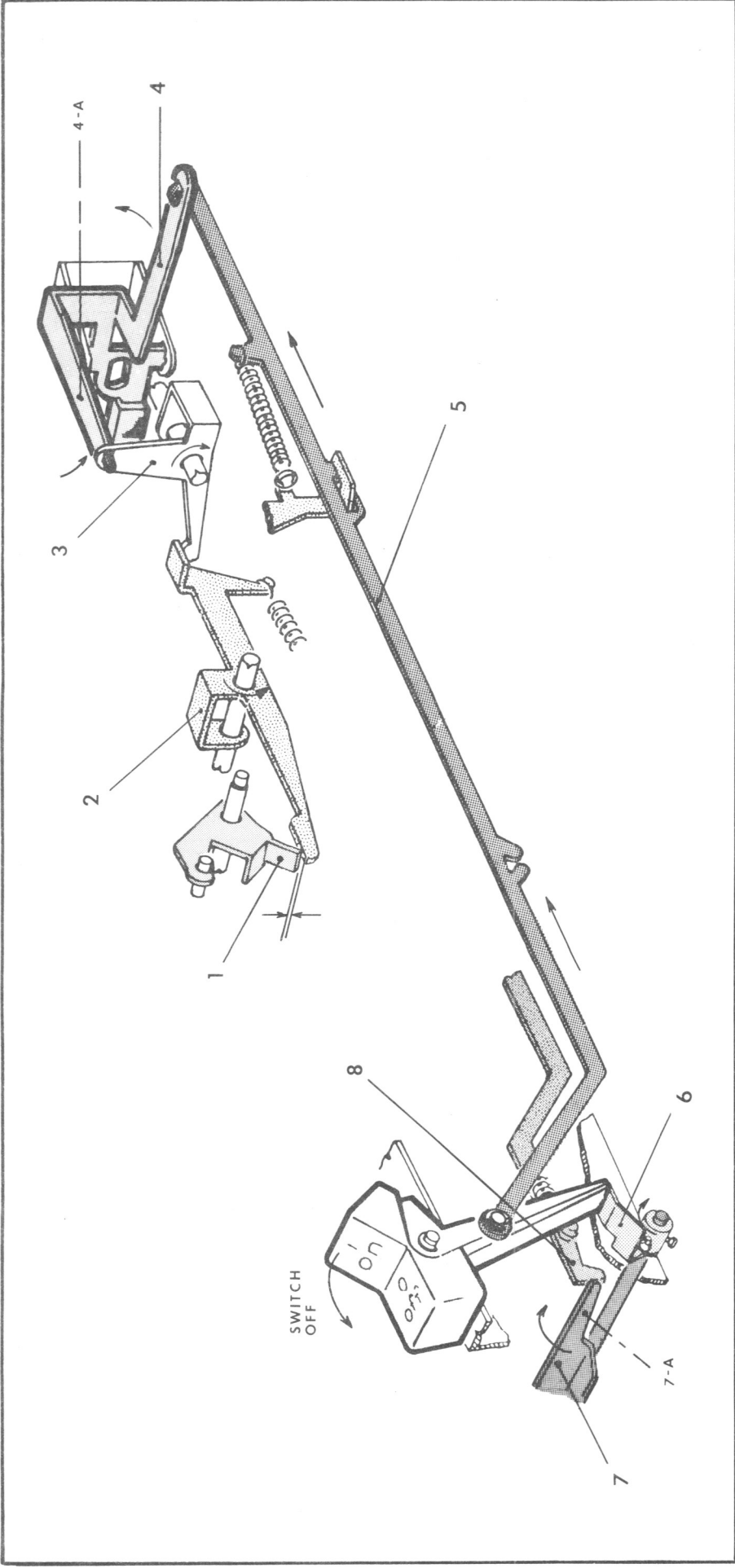
REAR VIEW

#### Carriage Banking at Left Margin

When Carriage returns to left margin, LEFT MARGIN STOP (3) rotates MARGIN STOP LEVER (4) counterclockwise as viewed from the rear.

LEVER (4) pushes LINK (5) to the right, which rotates BELLCRANK (6) counterclockwise as viewed from the rear.

BELLCRANK (6) rotates C/R CONTROL LATCH (1) top forward to unlatch C/R CONTROL BRIDGE (2) and disengage C/R mechanism.



Switch-C/R Interlock

The Switch-C/R Interlock disengages the C/R mechanism and prevents C/R activation by Keylever depression when Switch is off.

When Switch Knob is rotated to "off" position, it rotates RELOAD LEVER (6) top rearward and pushes LINK (5) rearward.

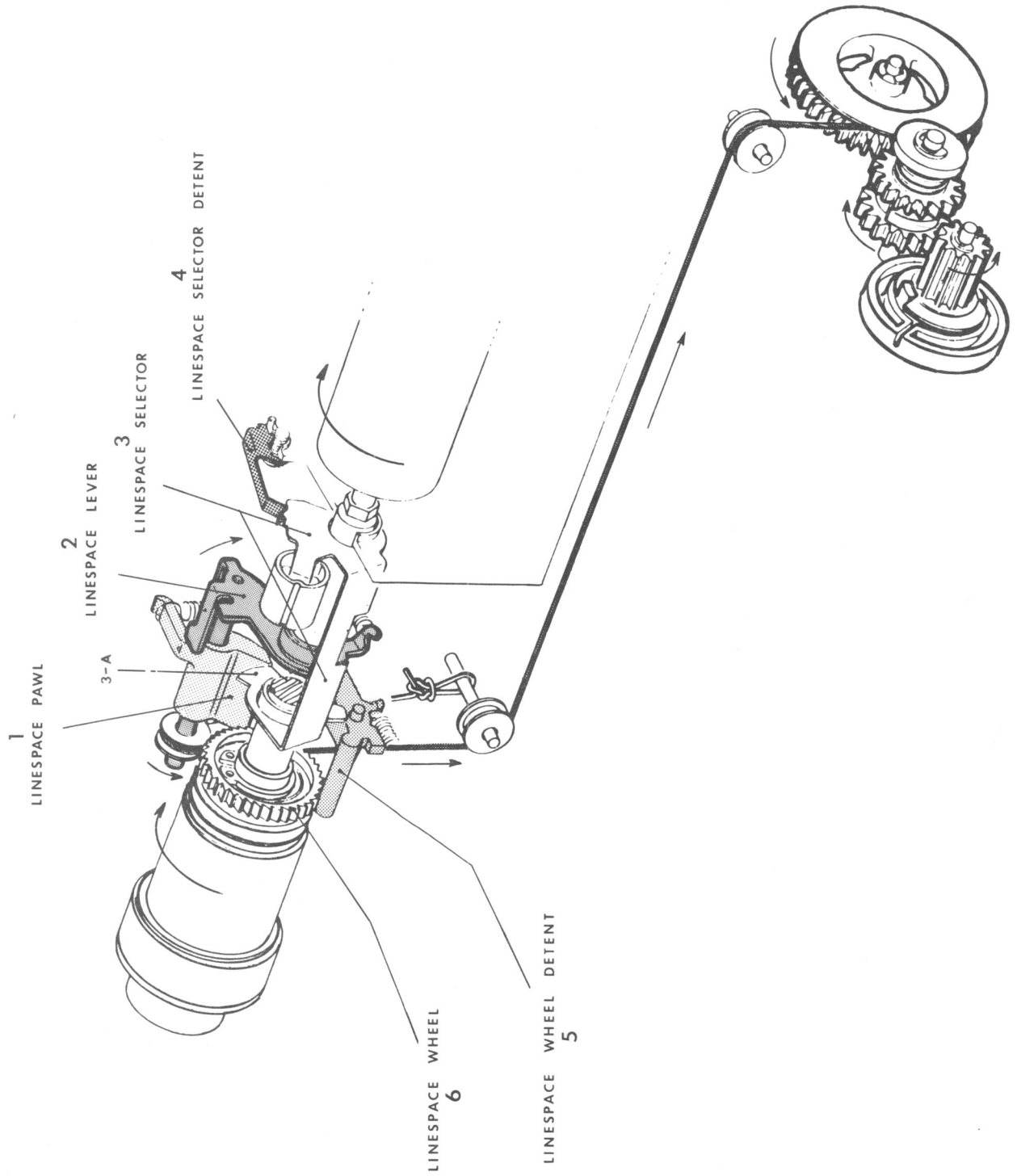
LINK (5) rotates ON-OFF SWITCH LEVER (4) counterclockwise. LEVER ARM (4-A) rotates BELLCRANK (3) clockwise. C/R CONTROL LATCH (2) rotates top forward to unlatch C/R CONTROL BRIDGE (1) for disengagement of C/R mechanism.

RELOAD LEVER (6) rotates attached RESTORE BAIL (7) top rearward. EAR (7-A) of RESTORE (7) blocks forward movement of C/R LINK (8) so that C/R Keylever cannot be depressed to activate Carriage Return.



LINESPACE

LINESPACE



Linespace

The Linespace mechanism automatically rotates the Platen when the C/R Keylever is depressed.

When C/R Cord moves right during a Carriage Return movement, it pulls LINESPACE LEVER (2) down.

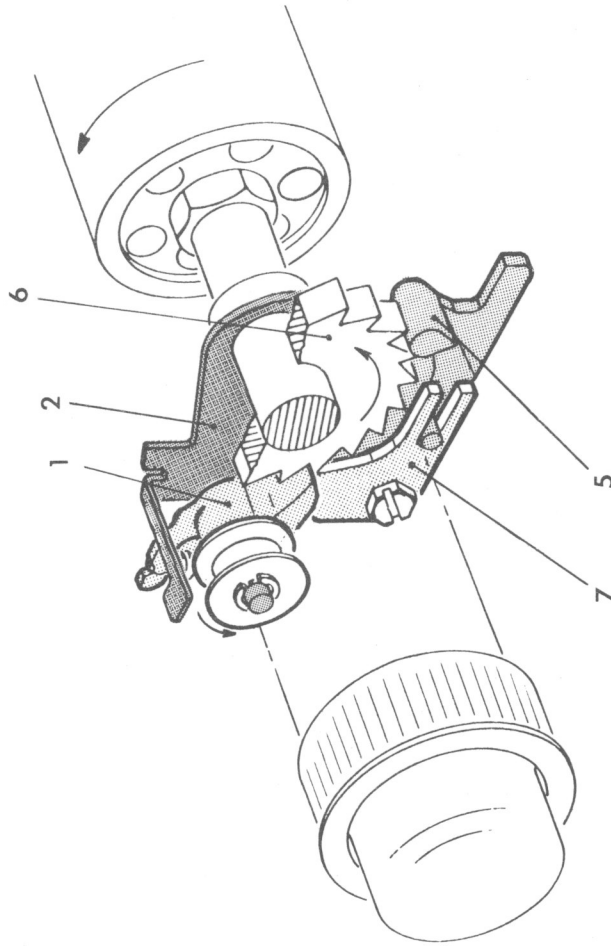
Attached LINESPACE PAWL (1) moves down with LEVER (2), and engages LINESPACE WHEEL (6).

PAWL (1) rotates Wheel top rearward until Pawl contacts LINESPACE ARREST PLATE (7).

LINESPACE WHEEL DETENT (5) seats between Teeth of Wheel to hold Wheel (and Platen) steady at rest.

When LINESPACE SELECTOR (3) is set in positions #1, 2, & 3, CAM SURFACE (3-A) determines which Tooth of LINESPACE PAWL (1) engages, and thus the number of spaces Wheel rotates during a Linespace stroke.

When SELECTOR (3) is set at position "0," it cams DETENT (5) away from Wheel to permit free movement of Wheel.





RIBBON FEED-LIFT

Ribbon Feed

Ribbon Reverse

Ribbon Lift

RIBBON FEED

3  
RIBBON  
CONTROL  
SLIDE

2  
RIBBON  
CONTROL  
ROCKER

1  
LEFT  
RATCHET  
WHEEL

4  
RIGHT  
RATCHET  
WHEEL

SELECTION CAM

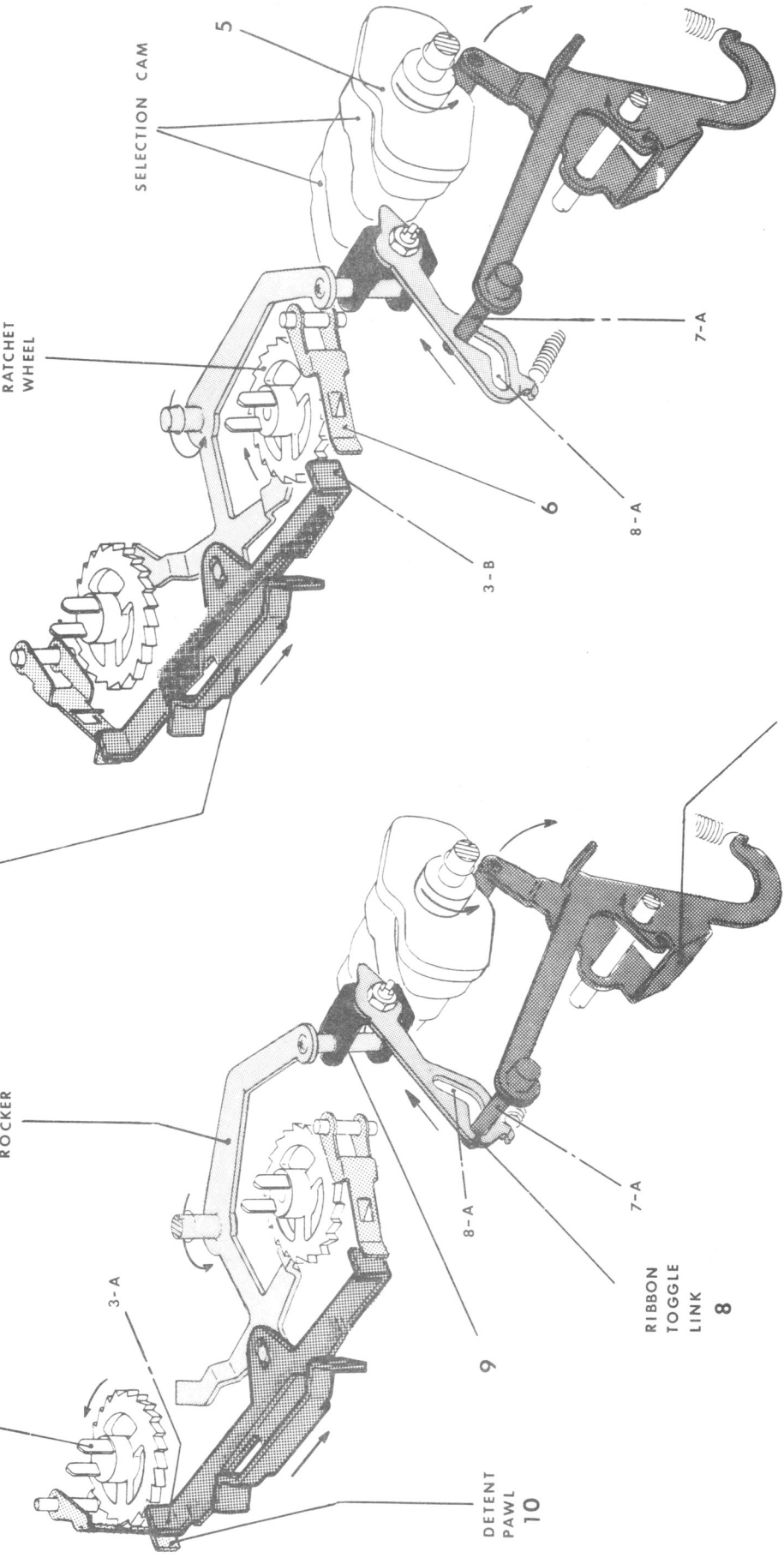
10  
DETENT  
PAWL

8  
RIBBON  
TOGGLE  
LINK

7  
RIBBON  
CONTROL  
BRIDGE

LEFT SIDE FEED

RIGHT SIDE FEED



### Ribbon Feed

The Ribbon Service Group houses the feed and reverse mechanisms. The Ribbon Cassette mounts on top of the Ribbon Service Group.

Ribbon Feed, Reverse, and Lift movements are powered by RIBBON CONTROL CAM (5), which is the right profile of Selection Cam.

RIBBON CONTROL CAM (5) rotates CONTROL BRIDGE (7) top rearward during a print cycle.

STUD (7-A) pushes TOGGLE LINK (8) and PIVOT (9) rearward.

CONTROL ROCKER (2) rotates counterclockwise, and moves RIBBON CONTROL SLIDE (3) to the right.

CONTROL SLIDE (3) rotates either Left or Right RIBBON RATCHET WHEEL (1) (4), which rotates the corresponding Ribbon Spool in the Ribbon Cassette. DETENT PAWL (6) or (10) detents the Wheel that advances the Ribbon.

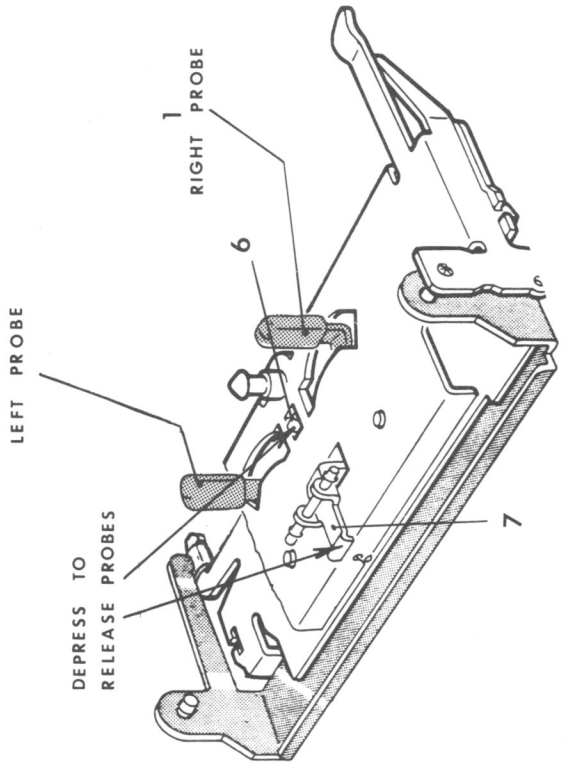
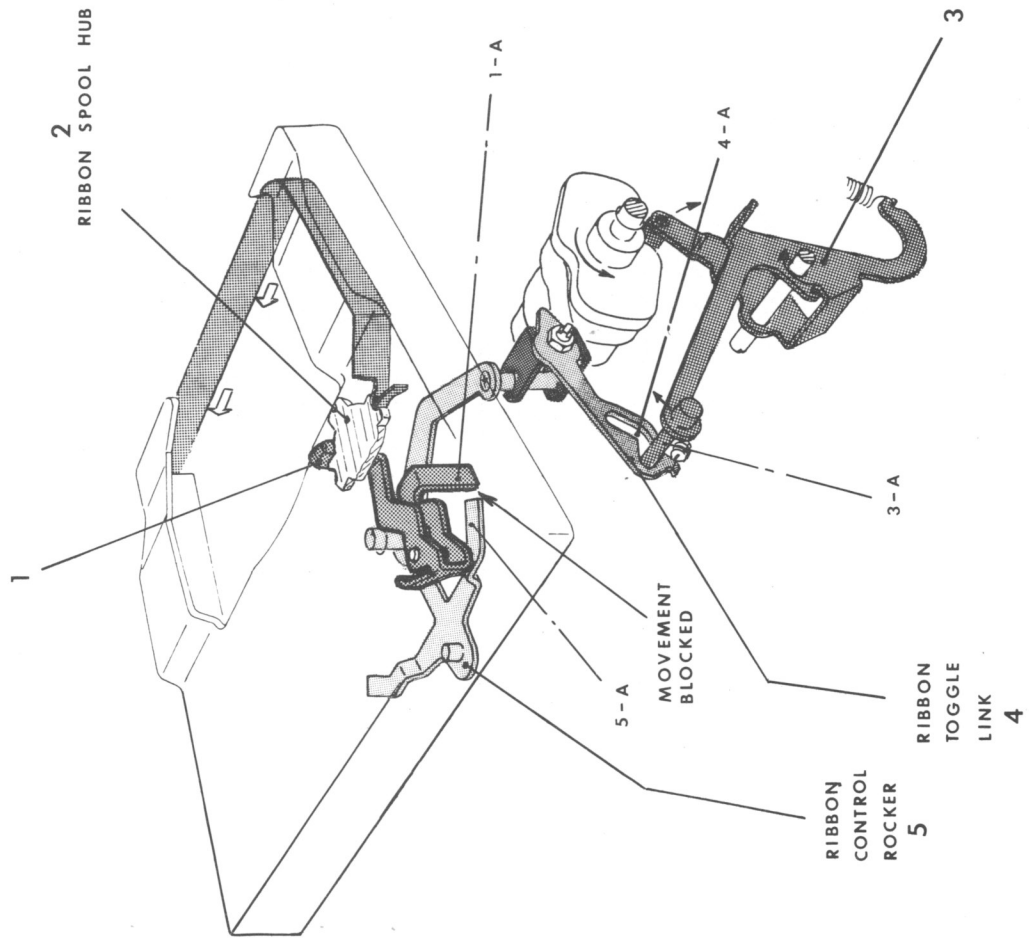
The location of TOGGLE LINK SLOT (8-A) on CONTROL BRIDGE STUD (7-A) determines which RATCHET WHEEL (1) (4) is rotated by SLIDE (3), and thus the direction of Ribbon Feed.

When front of SLOT (8-A) is located on STUD (7-A), SLIDE (3) is positioned so that EAR (3-A) rotates LEFT RIBBON RATCHET WHEEL (1) counterclockwise on the upstroke of CONTROL BRIDGE (7) rotation.

When rear of SLOT (8-A) is located on STUD (7-A), SLIDE (3) is positioned so that EAR (3-B) rotates RIGHT RIBBON RATCHET WHEEL (4) clockwise on the downstroke of CONTROL BRIDGE (7) rotation.

To change direction of Ribbon Feed, move TOGGLE LINK (8) forward or rearward with machine at rest. To observe movement, rotate RIBBON CONTROL BRIDGE (7).

RIBBON REVERSE





### Ribbon Reverse

When Ribbon Cassette is installed, it releases right and left PROBES (1). When released, PROBE (1) pivots against wound ribbon on the corresponding ribbon spool of the Cassette.

The wound ribbon on a spool holds PROBE (1) so that PROBE ARM (1-A) has clearance from CONTROL ROCKER ARM (5-A) as ROCKER (5) rotates counterclockwise during ribbon feed movement.

When a Ribbon Spool is empty, PROBE (1) pivots into recess of RIBBON SPOOL HUB (2), which places PROBE ARM (1-A) in path of CONTROL ROCKER ARM (5-A).

During next print cycle, PROBE ARM (1-A) blocks rotation of ROCKER (5) and movement of LINK (4).

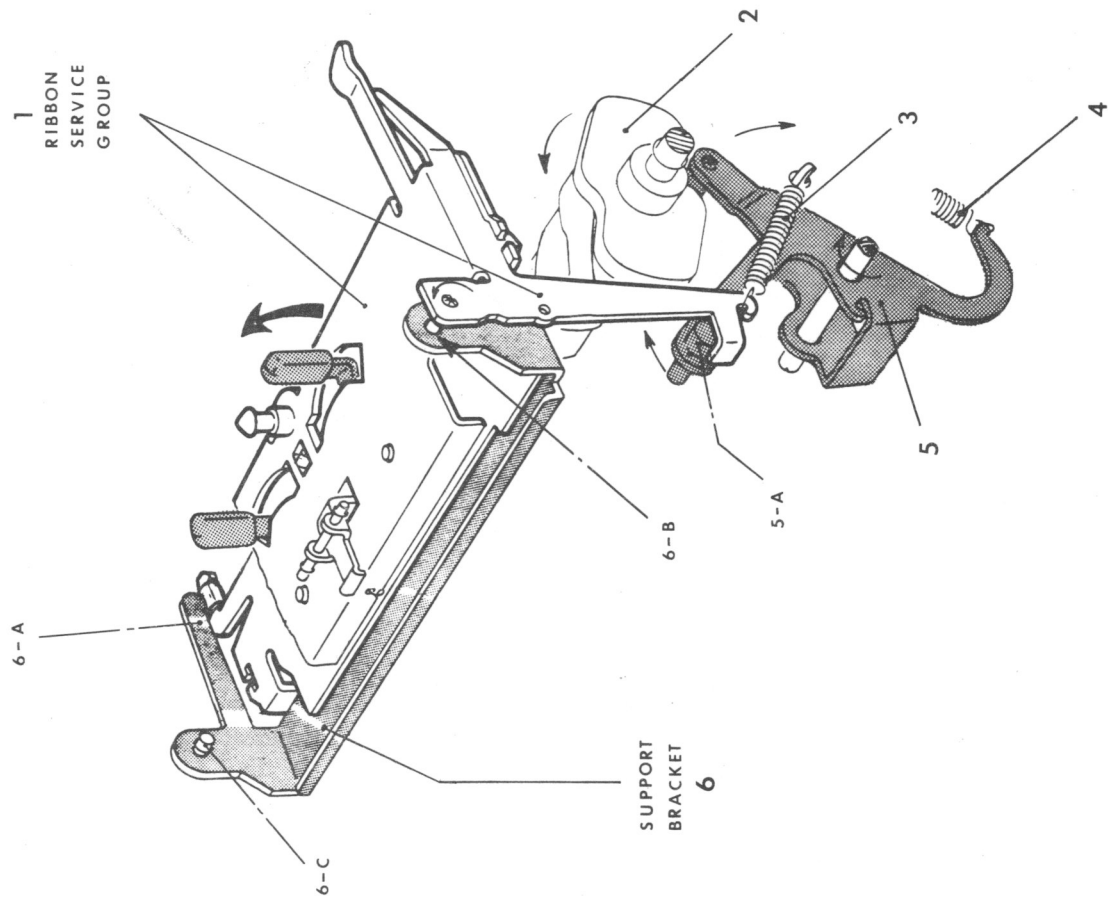
With LINK (4) movement blocked, rotation of CONTROL BRIDGE (3) causes STUD (3-A) to move to the opposite end of TOGGLE LINK SLOT (4-A). The direction of ribbon feed is now reversed for ribbon feed on the next print cycle.

Ribbon reverse movement is similar on right and left sides. However, when ribbon is feeding on the left side, reverse action occurs on the upstroke of CONTROL BRIDGE (3) rotation. When ribbon is feeding on the right side, reverse action occurs on the downstroke of CONTROL BRIDGE (3) rotation.

To release Probes without installing Cassette, depress PROBES RELEASE LEVER (7) and PROBES LATCH (6).

To observe ribbon reverse movements, move LINK (4) so front of SLOT (4-A) is located on STUD (3-A). Release Probes, and restore left Probe back to center. Rotate CONTROL BRIDGE (3). Release Left Probe and move Right Probe back to center. Rotate CONTROL BRIDGE (3).

## RIBBON LIFT

Ribbon Lift

The Ribbon Service Group pivots up and down on PIVOTS (6-B) (6-C) of Support Bracket.

When CONTROL BRIDGE (5) rotates top rearward during a print cycle, STUD (5-A) releases RIBBON SERVICE GROUP (1), which pivots up under SPRING (3) tension.

Upward movement of Group places the ribbon between Typing Element and Platen.

SUPPORT BRACKET ARM (6-A) limits upward movement of Group.

CONTROL BRIDGE (5) returns to rest thru SPRING (4) tension. STUD (5-A) restores and holds Group at rest position.

To observe movement, rotate CONTROL BRIDGE (5) top rearward.



# SMITH-CORONA SERVICE MANUAL

SINGLE ELEMENT  
TYPEWRITERS

**SMITH-CORONA**  
SCM CORPORATION

## PREFACE

This manual provides adjustment information for Smith-Corona Single Element Typewriters.

The manual is divided into sections that correspond with individual mechanisms of the machine. Thus, there is a Backspace Section, Carriage Return Section, etc. The Printing Action Section is divided into five sub-sections that, in total, cover all mechanisms pertaining to the printing function. Refer to Contents and Index page for a detailed listing of subjects covered.

Throughout the manual, directional terms such as front, rear, top, bottom, left, right, etc., always refer to the machine as it is used by a typist. Consequently, "left" always refers to the motor side of the typewriter regardless of the machine position necessary for checking a requirement or making an adjustment.

References to specific Interposers apply to all Keyboards unless otherwise noted in the text. Character Selection Charts for all Keyboards are included in the Printing Action Section.

Information pertaining to the safety of the user or technician is identified by the words SAFETY RELATED.

Satisfactory adjustment and performance require that all parts be properly lubricated and their movements be free of binds. Worn or broken parts should be replaced.

GENERAL PROCEDURE: Casing removal is required for access to checks and adjustments. Additional access requirements are noted when applicable.

SAFETY RELATED: All adjustments should be checked with Power Cord unplugged and Switch on.

Always rotate Print Cam Shaft in direction of arrow (→) on top of left Side Frame (top forward). Never rotate Shaft in opposite direction.

To restore parts to rest position, rotate Print Cam Shaft. If one or more Interposers remain depressed, turn Switch OFF, then ON.

For any mechanism that works off of one of the double sided cams, the adjustment requirement should be checked twice--once on each side of the cam. If results are not the same, replace the cam.

SEQUENCE OF ADJUSTMENTS: Adjustments in each Section are consecutively numbered and should be performed in sequence. The first page of every Section includes a Branch Display that shows sequence relationships among adjustments. For example:



Read this display as follows: #13 affects #14 & 15. #14 affects #16 but not #15. #15 affects no other adjustment. #16 depends on #14 being correct.

The Branch Displays show adjustment relationships; all adjustments must be correct for proper typewriter performance.

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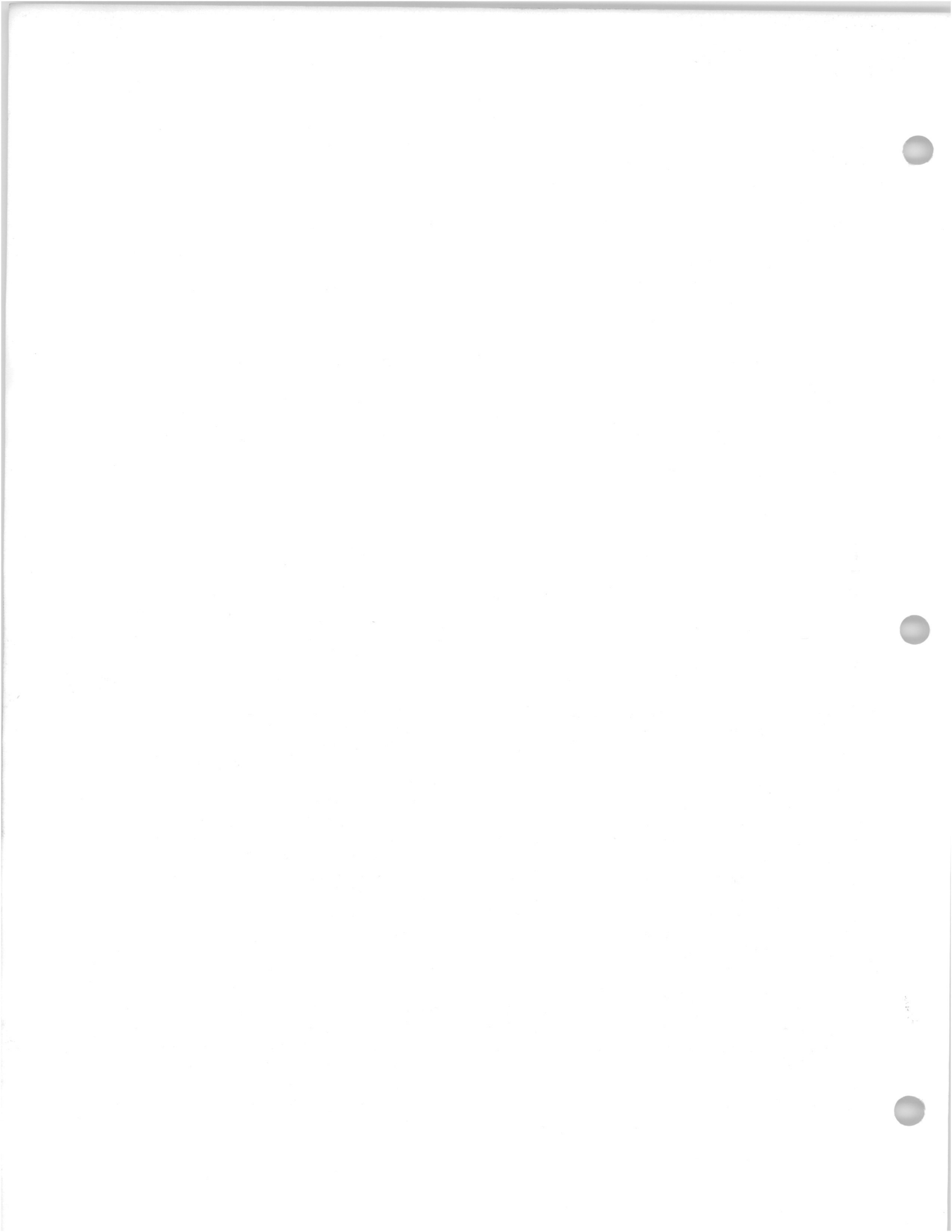
- 1 Power Drive-Switch/Interlock
- 2 Printing Action Adjustments
  - Character Selection Charts
  - Keylever/Interposer Checks
  - Keyaction Adjustments
  - Code Set Checks
  - Printer Adjustments
- 3 Shift Adjustments
- 4 Carriage Adjustments
- 5 Escapement Adjustments
- 6 Spacebar Adjustments

### SECTION

- 7 Half-Space Adjustments
- 8 Backspace Adjustments
- 9 Ribbon Feed-Lift Adjustments
- 10 Paper Feed Adjustments
- 11 Margin Adjustments
- 12 Carriage Return Adjustments
- 13 Linespace Adjustments
- 14 Tab-Set-Clear Adjustments

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POWER DRIVE ADJUSTMENTS

POWER DRIVE ADJUSTMENTS

**POWER DRIVE**

1. Freeness of Print Cam Shaft Pulley.
2. End play of Print Cam Shaft.
3. Cam Shaft Pulley Belt tension/Straightness of Intermediate Shaft.
4. Motor Belt tension.

1

2

3 → C/R ADJ. # 2

→ SPACEBAR ADJ. # 2, 3, 4

4

**SWITCH / INTERLOCK**

SWITCH/INTERLOCK ADJUSTMENTS

1. Switch/Keyboard Interlock/Manual Keyboard Reactivation.
2. Switch/CR Interlock.
3. Switch/Power.
4. Switch/Code Set Bail Interlock/Manual Keyboard Reactivation.
5. Functional check of Switch/Carriage Interlock.

1 → MARGIN ADJ. # 5

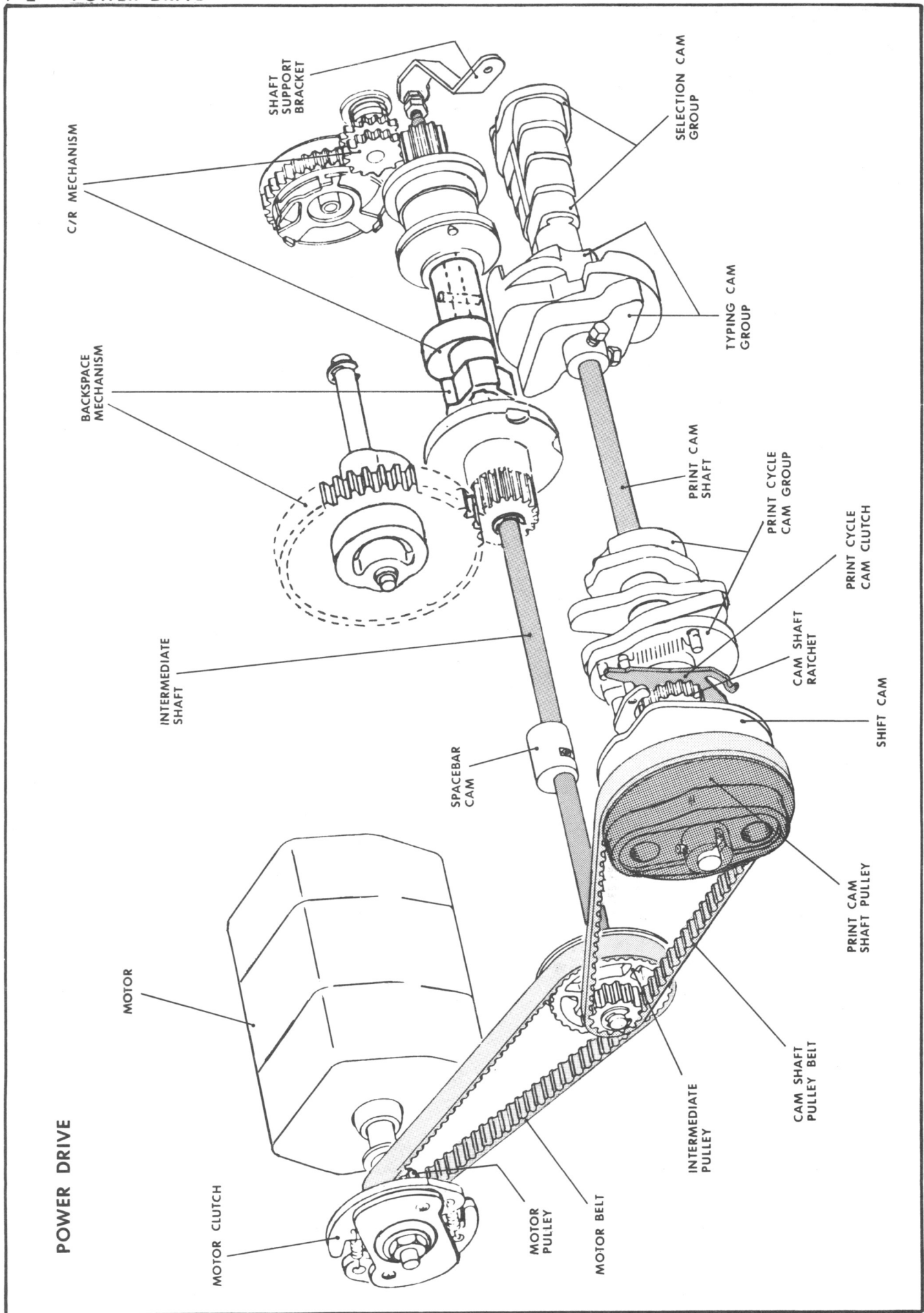
↓

C/R ADJ. # 4 → 2

3

KEYACTION ADJ. # 3 → 4

5





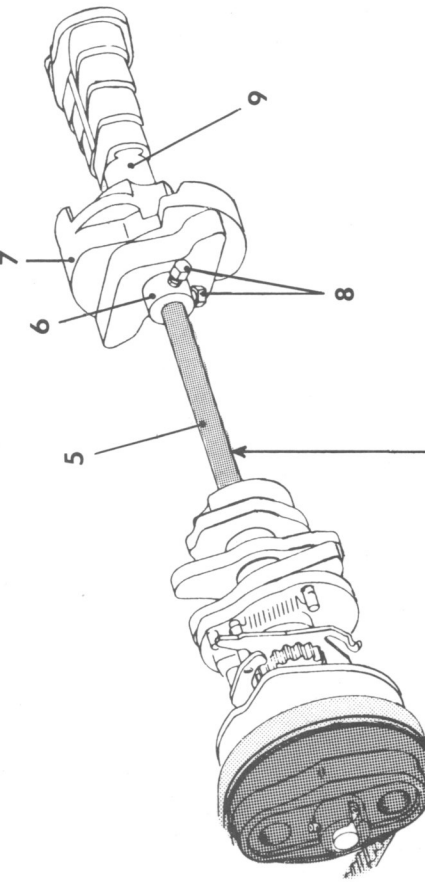
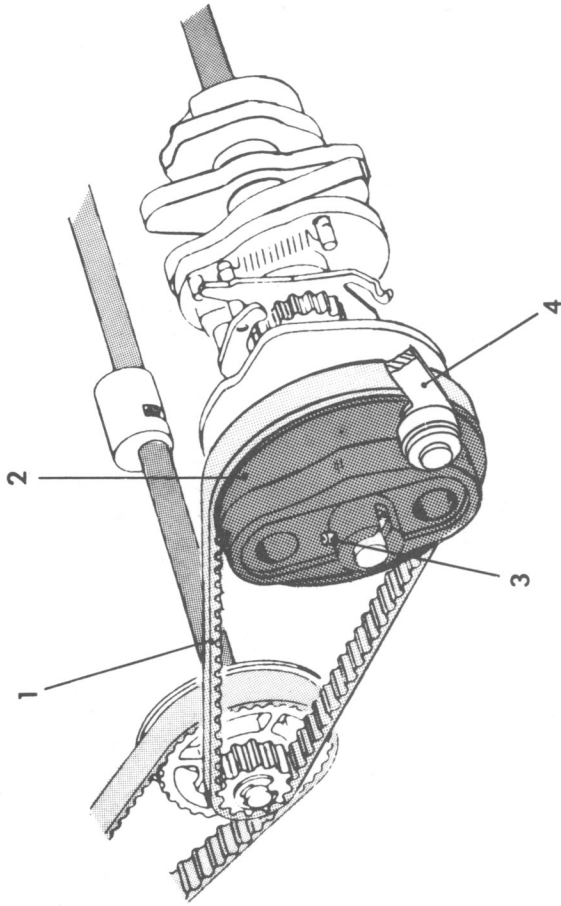
POWER DRIVE ADJUSTMENTS

1. Freeness of Print Cam Shaft Pulley.

REQUIREMENT: CAM SHAFT PULLEY (2) should rotate freely.

TO CHECK: With machine at rest, remove CAM SHAFT PULLEY BELT (1), and pivot REACTIVATION CAM FOLLOWER (4) away from Pulley. Check requirement.

ADJUSTMENT: Loosen SCREW (3) and position PULLEY (2) on Ratchet Shaft; tighten Screw.



.002" - .006"  
0.05 - 0.15 mm  
END PLAY

2. End play of Print Cam Shaft.

REQUIREMENT: PRINT CAM SHAFT (5) should have .002"-.006" end play.

ADJUSTMENT: Loosen CAM SHAFT HUB SCREWS (8). Push CAM SHAFT (5) to the left. Hold Shaft and push TYPING CAM GROUP (7) to the right against SELECTION CAM BEARING (9). Position HUB (6) .002"-.006" away from TYPING CAM GROUP (7). Tighten SCREWS (8).



POWER DRIVE ADJUSTMENTS

4. Motor Belt tension.

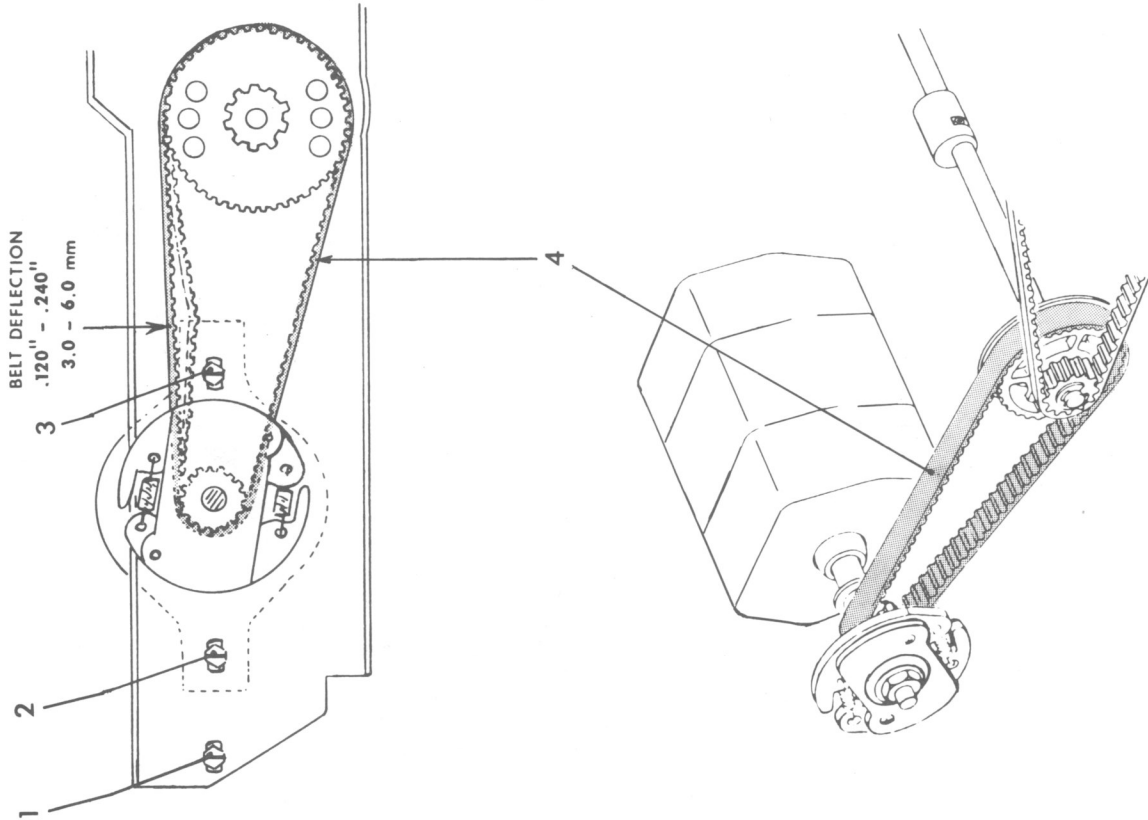
REQUIREMENT:

With machine at rest, MOTOR BELT (4) should deflect .120"-.240" when light pressure is applied to Belt.

NOTE: This specification permits Belt to run with minimum noise and without skipping teeth when drive train is under load.

ADJUSTMENT:

Loosen MOTOR SUPPORT SCREWS (2) & (3) and Back Frame SCREW (1). Move Motor forward or rearward to obtain correct Belt tension; tighten Screws.



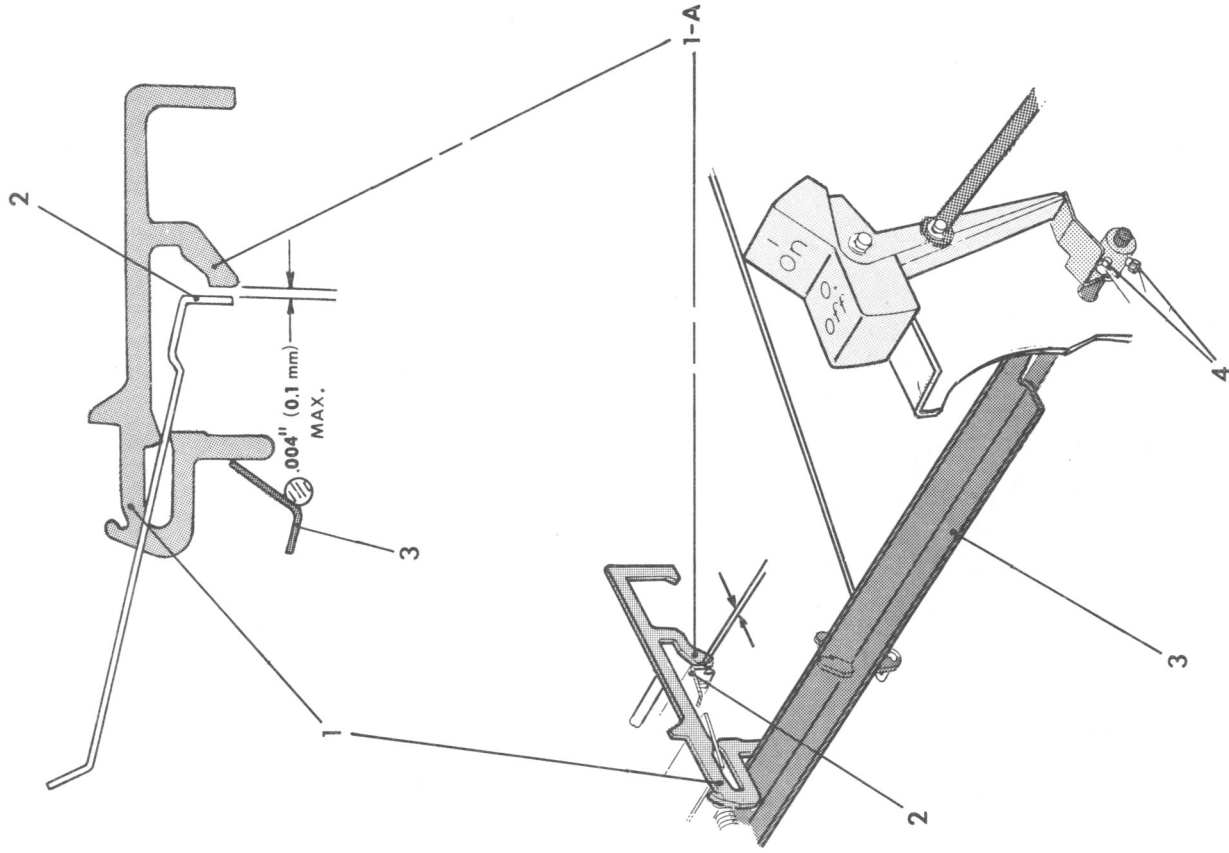
1. Switch/Keyboard Interlock/Manual Keyboard Reactivation.

**REQUIREMENT:** With machine at rest and Switch Knob "off," there should be clearance between ARM (1-A) of INTERPOSERS (1) and rear of INTERPOSER GUIDE PLATE (2). Clearance should not exceed .004".

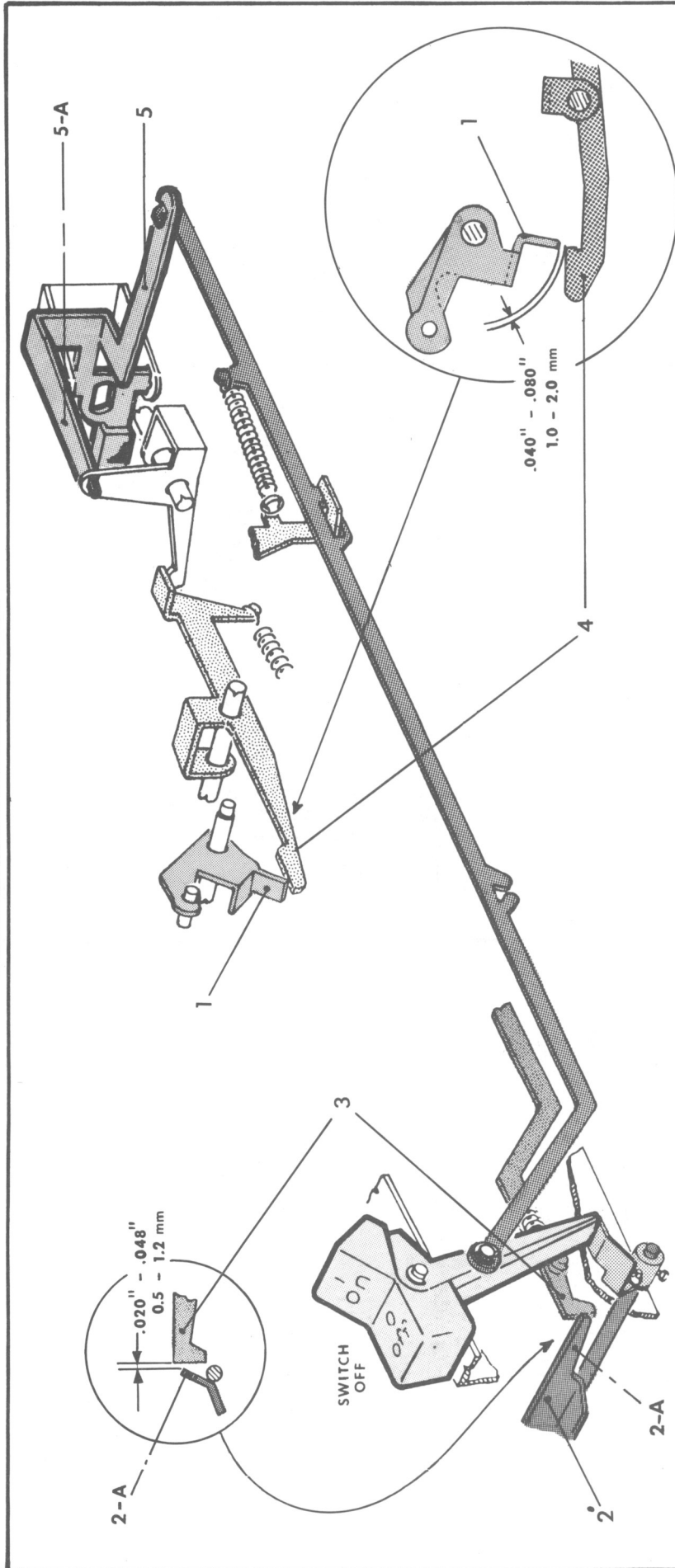
**NOTE:** Excessive clearance increases pressure necessary to operate on-off Switch.

**ADJUSTMENT:** Loosen SCREWS (4). Rotate INTERPOSER RESTORE BAIL (3) top rearward to increase clearance, top forward to decrease clearance; tighten Screws.

Check Margin Adjustment #5 for readjustment of Margin Release Link.



SWITCH/INTERLOCK ADJUSTMENTS



2. Switch/CR Interlock.

REQUIREMENT:

A) With machine at rest, Keyboard in place, and Switch Knob "off," there should be .020"-.048" clearance between CARRIAGE RETURN LINK (3) and ARM (2-A) of INTERPOSER RESTORE BAIL (2).

NOTE: Carriage Return Adjustment #4 must be correct before checking requirement.

ADJUSTMENT: Form ARM (2-A) forward or rearward.

REQUIREMENT:

B) With machine at rest and Switch off, there should be .040"-.080" clearance between C/R CONTROL BRIDGE (1) and CONTROL BRIDGE LATCH (4) as illustrated.

ADJUSTMENT: Form ON-OFF SWITCH LEVER ARM (5-A) left or right.

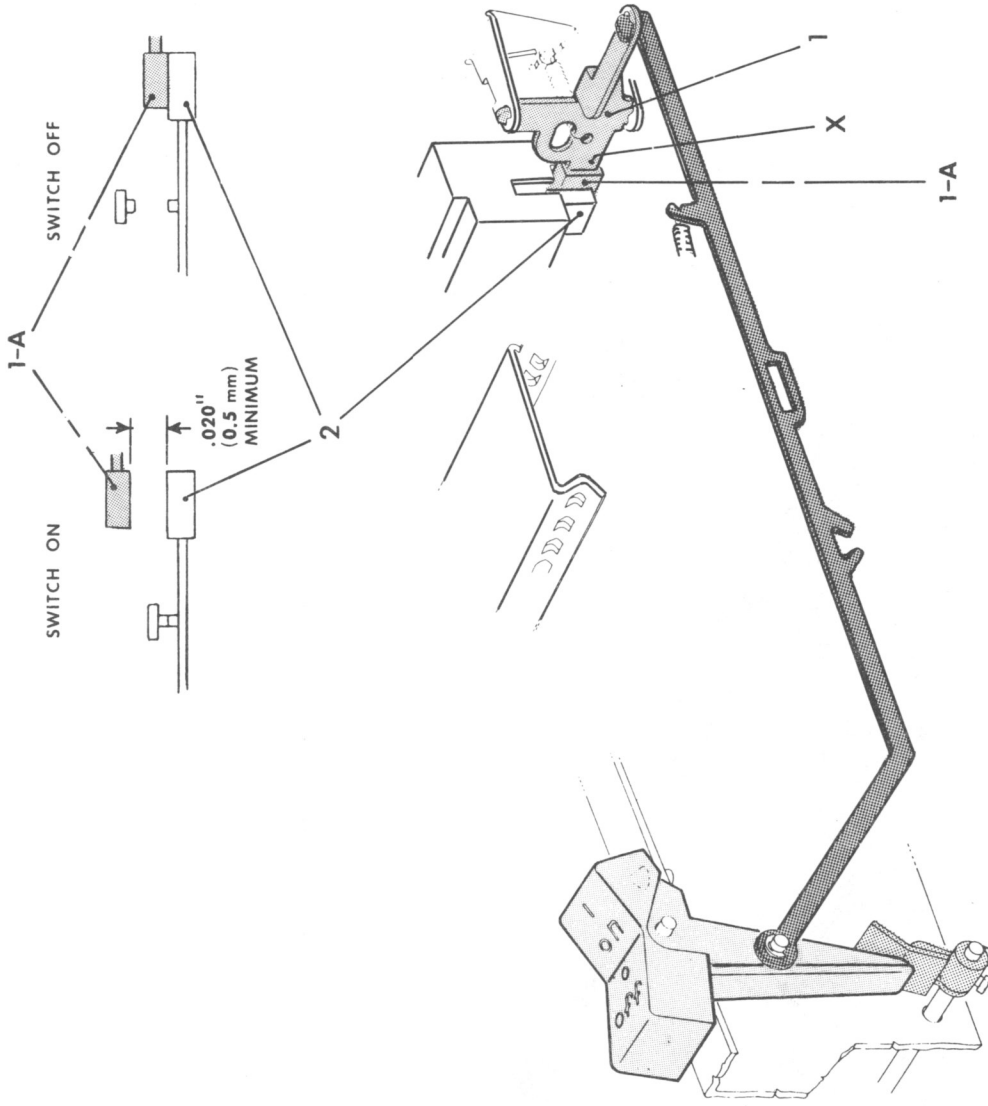
3. Switch/Power. SAFETY RELATED

REQUIREMENT:

- A) With Switch Knob "on," there should be at least .020" clearance between CAP (1-A) of ON-OFF SWITCH LEVER (1) and SWITCH ACTUATOR (2).
- B) With Switch Knob "off," ON-OFF SWITCH LEVER CAP (1-A) should safely hold SWITCH ACTUATOR (2) in off position.

TO CHECK: With Switch off and Power Cord plugged in, lightly push SWITCH ACTUATOR (2) rearward. Motor should not turn on.

ADJUSTMENT: Form ON-OFF SWITCH LEVER (1) forward or rearward at X.



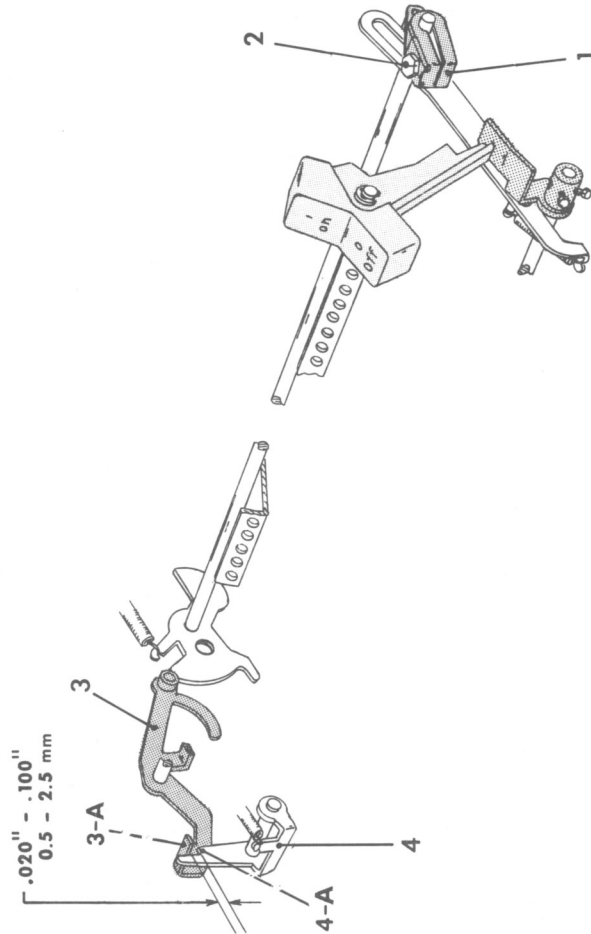
## SWITCH/INTERLOCK ADJUSTMENTS

4. Switch/Code Set Bail Interlock/Manual Keyboard Reactivation.

**REQUIREMENT:** With machine at rest and Switch Knob "off," there should be .020"-.100" clearance between SET CONTROL BRIDGE ARM [3-A] and STEP [4-A] of RELEASE BRIDGE [4].

**NOTE:** Keyaction Adjustment #3 must be correct before checking requirement.

**ADJUSTMENT:** Loosen SCREW [2] and position RELOAD LEVER [1] on Shaft of Code Set Bail.

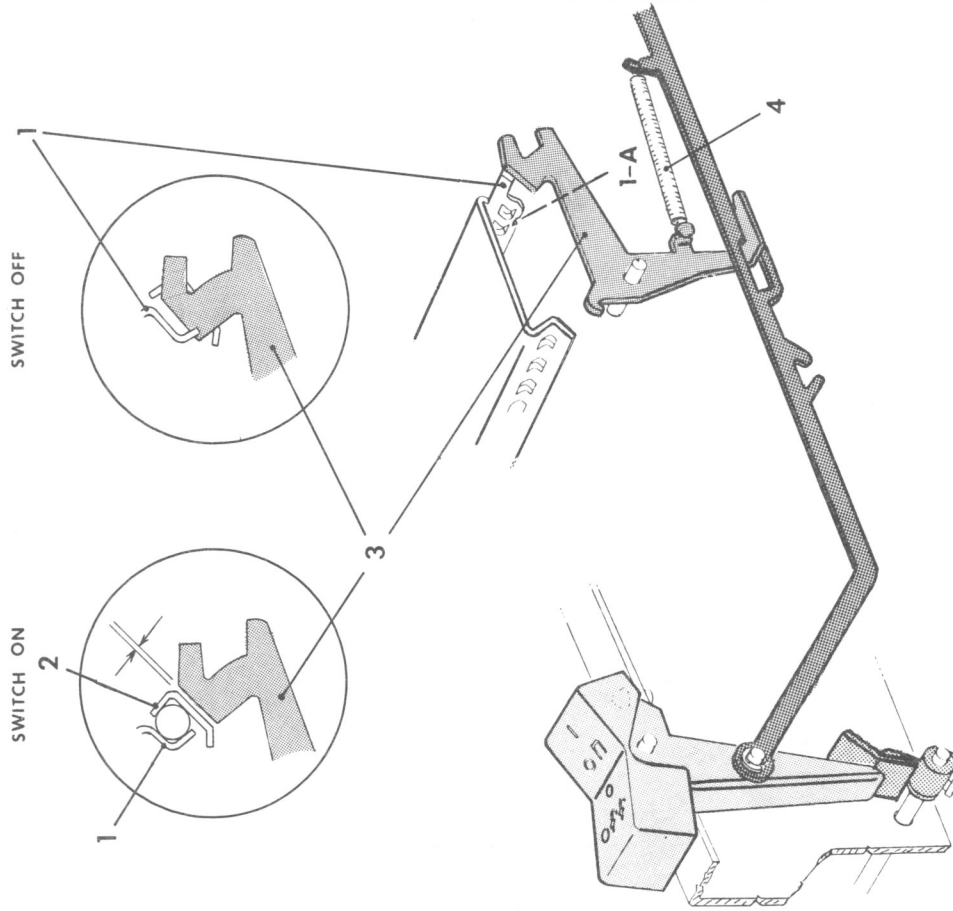


5. Functional check of Switch/Carriage Interlock.

REQUIREMENT:

- A) With Switch Knob "on," CARRIAGE LOCKING LEVER (3) should rest below inside surface of REAR CARRIAGE RAIL (2).
- B) With Switch Knob "off," CARRIAGE LOCKING LEVER (3) should be in path of UPPER CARRIAGE RAIL (1), and should lock into SLOT (1-A) of RAIL (1) when SLOT (1-A) and LEVER (3) are opposite one another. Check by moving Carriage.

ADJUSTMENT: There is no standard adjustment. Check for broken, bent, or binding parts. Check SPRING (4) tension on Carriage Locking Lever.





PRINTING ACTION ADJUSTMENTS

Printing Action Adjustments control print cycle and character selection movements. Adjustment and related information is organized as follows:

- Page 2-3 CHARACTER SELECTION CHARTS--A chart for each Keyboard shows vertical and horizontal rotation required for print out of all characters, along with the number of the Interposer that corresponds with each character.
- Page 2-23 KEYLEVER/INTERPOSER CHECKS--These pages cover Keyboard installation as well as functional checks of nonadjustable Keylever/Interposer components.
- Page 2-29 KEYACTION ADJUSTMENTS #1-9--These adjustments control Keyaction at rest, release of a print cycle, Automatic Keyboard reactivation, and Code Slide movement.
- Page 2-41 CODE SET CHECKS #1-4--These are not adjustments, but checks which verify proper code setting of the Printer Mechanism during Keyaction movements.
- Page 2-47 PRINTER ADJUSTMENTS--These adjustments control Printer Mechanism movements so that the Printer correctly carries out the code set for each character selection.

GENERAL PROCEDURE:

Casing removal is required for access to checks and adjustments. Additional access requirements are noted when applicable.

All adjustments should be checked with Power Cord unplugged and Switch on. **[SAFETY RELATED]**

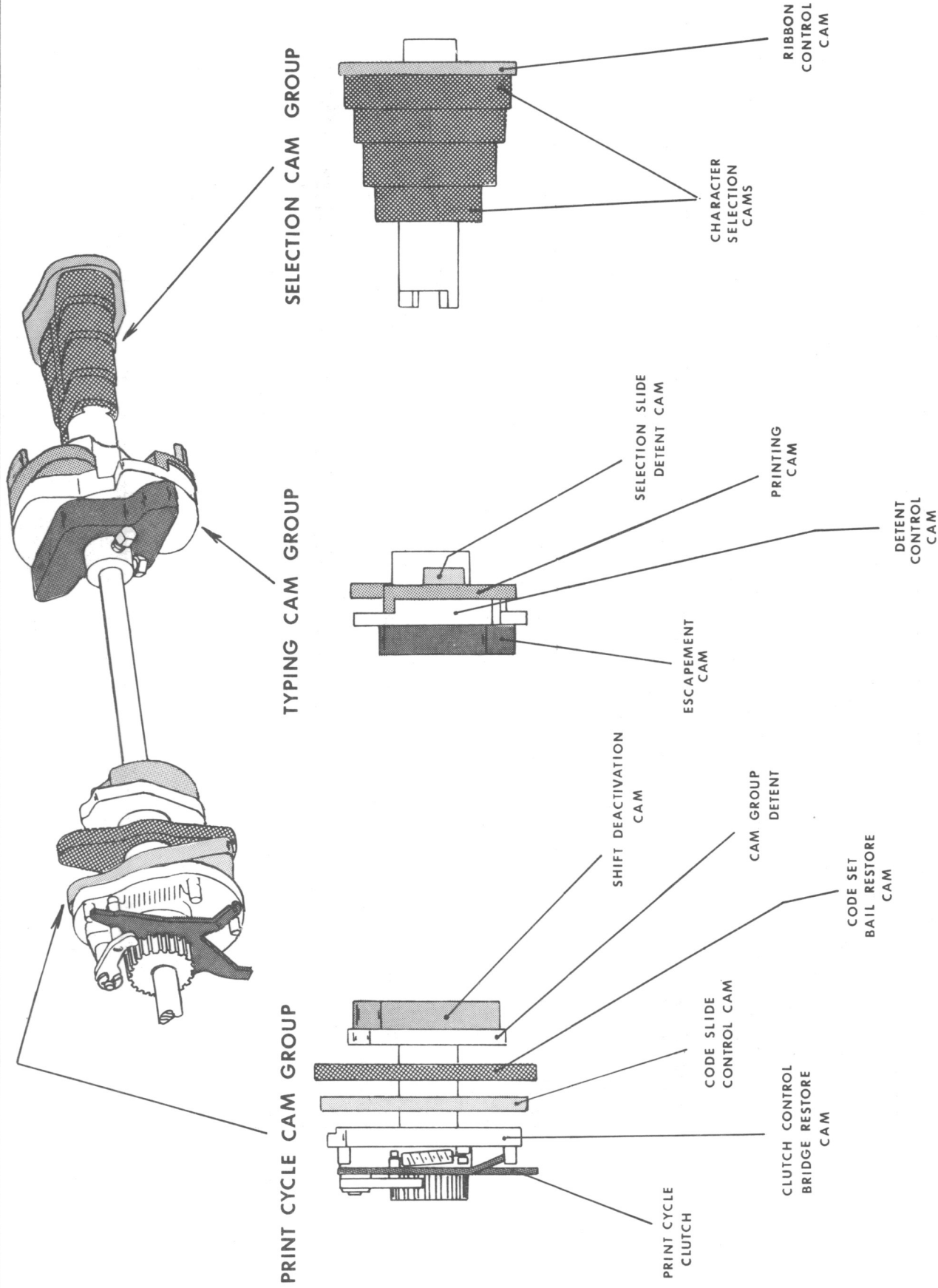
Always rotate Print Cam Shaft in direction of arrow () on top of Left Side Frame (top forward). Never rotate Shaft in opposite direction.

To restore parts to rest position, rotate Print Cam Shaft. If one or more Interposers remain depressed, turn Switch OFF, then ON.

For any mechanism that works off of one of the double sided cams, the adjustment requirement should be checked twice--once on each side of the cam. If results are not the same, replace the cam.

2-2 PRINTING ACTION

PRINT CYCLE



# CHARACTER SELECTION CHART

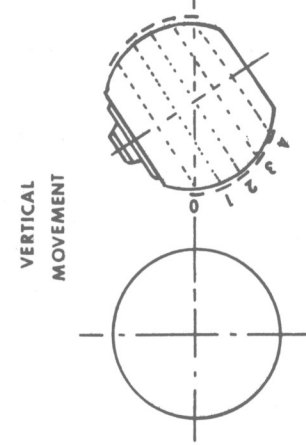
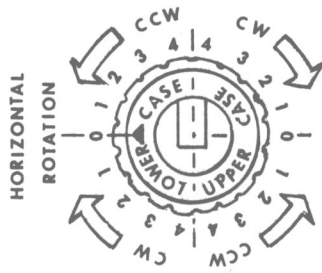
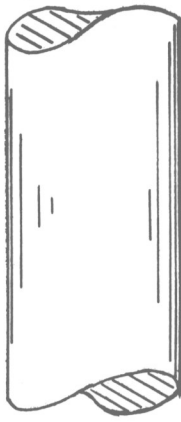
DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION  
 COUNTERCLOCKWISE

CLOCKWISE

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4				
1	1	41	5	30	34	3	13	31	8	3			
4	12	15	29	18	10	14	23	32	44	=			
'	43	16	26	7	25	35	17	36	28	8			
7	24	6	4	11	9	21	37	39	33	,			
$\frac{1}{2}$	42	22	20	40	19	2	38	27	45	-			

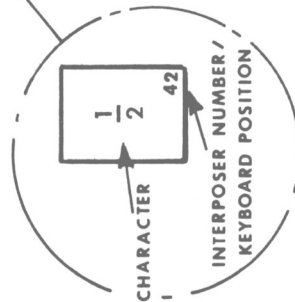
LOWER CASE



KEYBOARD : 1063 V  
 DEAD KEYS : —  
 LINESPACE : 47 TEETH  
 WHEEL

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4				
!	1	41	5	30	34	3	13	31	8	#			
\$	12	15	29	18	10	14	23	32	44	+			
"	43	16	26	7	25	35	17	36	28	*			
&	24	6	4	11	9	21	37	39	33	,			
$\frac{1}{4}$	42	22	20	40	19	2	38	27	45	X			

UPPER CASE



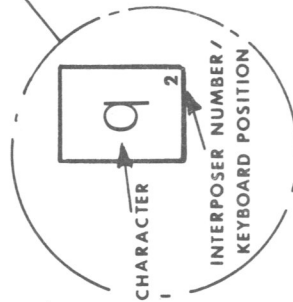
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION

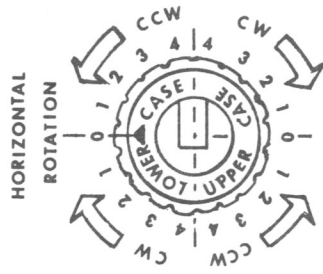
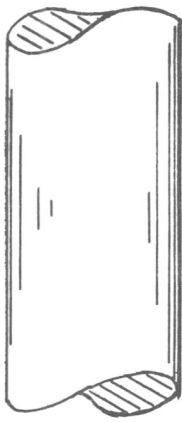
		HORIZONTAL ROTATION						
		CLOCKWISE	2	1	0	COUNTERCLOCKWISE		
VERTICAL MOVEMENT	0	k 31	i 30	o 34	a 3	c 13	è 24	ò 41
	1	, 29	t 18	e 10	n 25	d 11	à 36	) 40
	2	é 4	u 7	l 35	r 14	v 17	( 16	f 1
	3	w 5	h 23	x 9	b 21	' 12	ù 43	^ 28
	4	q 2	ç 32	g 19	; 33	p 38	j 27	_ 45

LOWER CASE

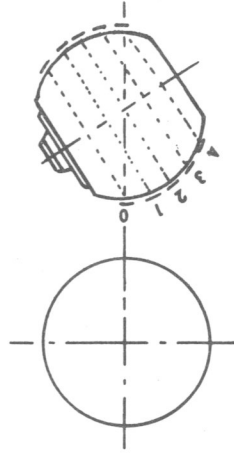


UPPER CASE

		HORIZONTAL ROTATION						
		CLOCKWISE	2	1	0	COUNTERCLOCKWISE		
VERTICAL MOVEMENT	0	K 31	I 30	O 34	A 3	C 13	7 24	! 41
	1	? 29	T 18	E 10	N 25	D 11	& 36	° 40
	2	2 4	S 7	L 35	R 14	V 17	5 16	1 1
	3	W 5	H 23	X 9	B 21	4 12	% 43	8 28
	4	Q 2	9 32	G 19	. 33	P 38	J 27	X 45



VERTICAL MOVEMENT



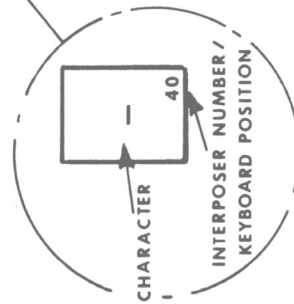
KEYBOARD : 1-N  
DEAD KEYS : —  
LINESPACE : 40 TEETH  
WHEEL

# CHARACTER SELECTION CHART

DIRECTION OF ROTATION →

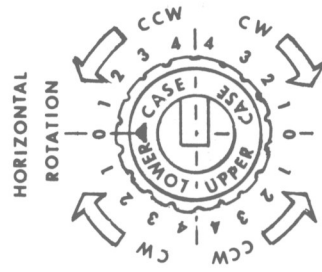
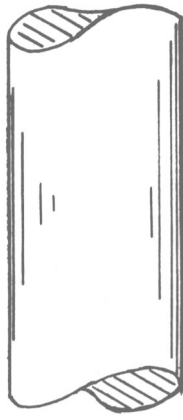
	HORIZONTAL ROTATION				VERTICAL MOVEMENT			
	CLOCKWISE 4	3	2	1	0	1	2	3
1	2	i	o	a	c	k	=	
2	f	m	t	e	r	h	9	
3	7	u	s	n	l	v	8	
4	4	w	d	x	b	.	,	
5	5	y	g	6	q	p	—	

LOWER CASE

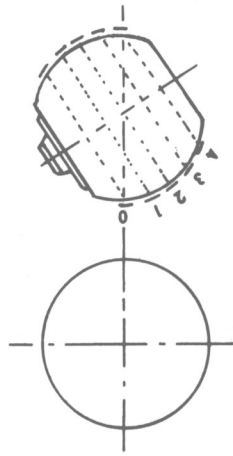


UPPER CASE

	HORIZONTAL ROTATION				VERTICAL MOVEMENT			
	CLOCKWISE 4	3	2	1	0	1	2	3
*	"	Z	I	O	A	C	K	+
1/3	F	M	T	E	R	H	(	/
1/4	&	U	S	N	L	V	)	'
%	@	W	D	X	B	.	:	,
?	f	Y	G	—	Q	P	J	X



VERTICAL MOVEMENT



KEYBOARD : 16-N  
DEAD KEYS : —  
LINESPACE : 47 TEETH  
WHEEL

# CHARACTER SELECTION CHART

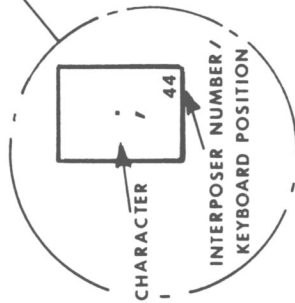
DIRECTION OF ROTATION  
CLOCKWISE →

HORIZONTAL ROTATION COUNTERCLOCKWISE ←

VERTICAL MOVEMENT

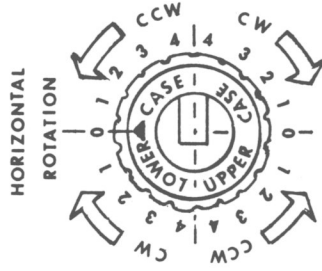
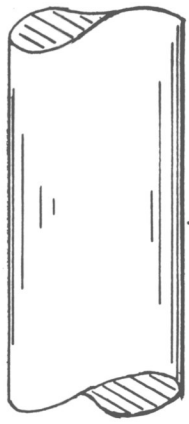
	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE			
	0	1	2	3	0	1	2	3	0	1	2	3
'	43	^	42	3	o	34	14	23	h	23	4	24
8	28	9	32	13	e	30	10	18	t	35	8	12
=	40	0	36	29	s	7	26	11	u	5	39	20
1	1	x	9	6	w	15	21	31	k	17	41	37
;	44	,	33	19	g	38	16	2	y	22	27	45

LOWER CASE

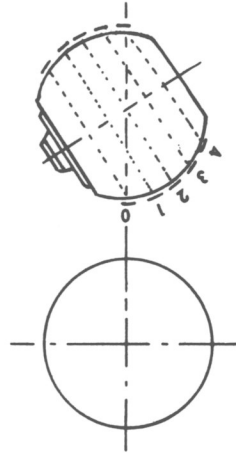


UPPER CASE

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE			
	0	1	2	3	0	1	2	3	0	1	2	3
'	43	..	42	3	O	34	14	23	H	23	4	24
(	28	)	32	13	E	30	10	18	L	35	8	12
+	40	1/4	36	29	S	7	26	11	Z	5	39	20
"	1	X	9	6	F	15	21	31	V	17	41	37
f	44	?	33	19	G	38	16	2	Y	22	27	45



VERTICAL MOVEMENT



KEYBOARD : 24-N  
DEAD KEYS : 42-43  
LINESPACE : 47 TEETH  
WHEEL

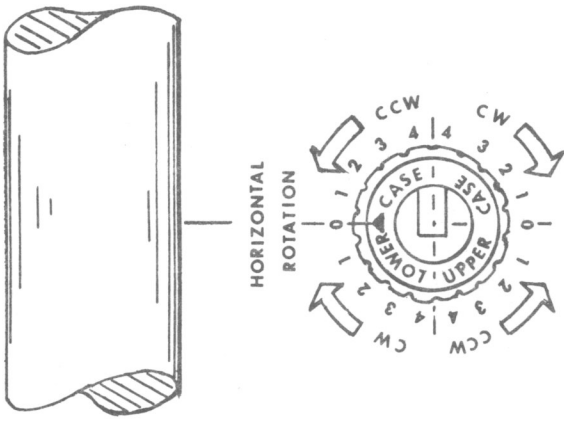
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION COUNTERCLOCKWISE  
VERTICAL MOVEMENT

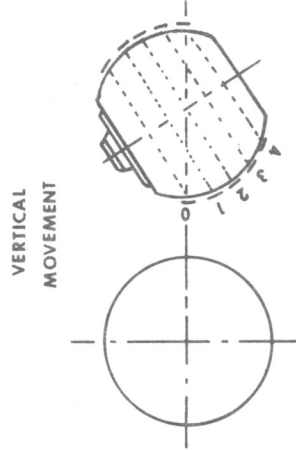
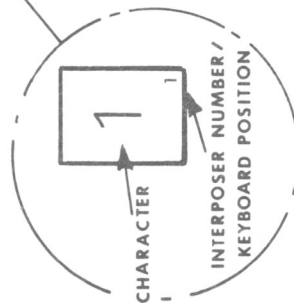
CLOCKWISE 4 3 2 1 0 1 2 3 4	HORIZONTAL ROTATION				
	4	3	2	1	0
41	4	5	30	34	3
42	15	29	18	10	14
40	24	26	7	25	35
8	12	6	11	9	21
1	16	22	19	20	2
44	31	13	3	3	44
28	32	23	23	14	28
43	36	17	17	35	43
33	39	37	37	21	33
45	27	38	2	2	45

LOWER CASE



CLOCKWISE 4 3 2 1 0 1 2 3 4	COUNTERCLOCKWISE				
	4	3	2	1	0
41	4	5	30	34	3
42	15	29	18	10	14
40	24	26	7	25	35
8	12	6	11	9	21
1	16	22	19	20	2
44	31	13	3	3	44
28	32	23	23	14	28
43	36	17	17	35	43
33	39	37	37	21	33
45	27	38	2	2	45

UPPER CASE



KEYBOARD : 26-N  
DEAD KEYS : \_\_\_\_\_  
LINESPACE : 47 TEETH  
WHEEL

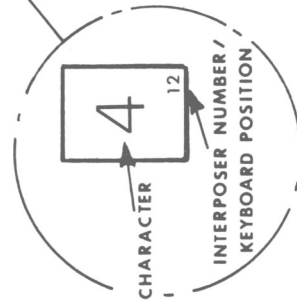
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION      COUNTERCLOCKWISE

		HORIZONTAL ROTATION					COUNTERCLOCKWISE				
		0	1	2	3	4	0	1	2	3	4
CLOCKWISE	4	^ 44	è 42	a 3	n 25	o 34	r 14	h 23	é 36	à 43	
	3	' 39	6 20	c 13	i 30	e 10	t 18	l 35	9 32	+ 40	
	2	3 8	5 16	m 29	s 7	u 26	d 11	z 22	7 24	, 33	
	1	2 4	x 9	w 6	f 15	b 21	k 31	v 17	\$ 1	. 37	
	0	4 12	- 41	g 19	p 38	8 28	q 2	y 5	j 27	_ 45	

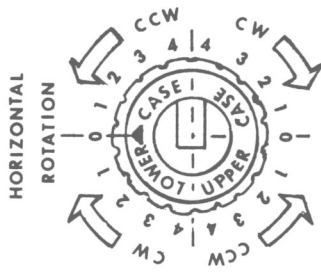
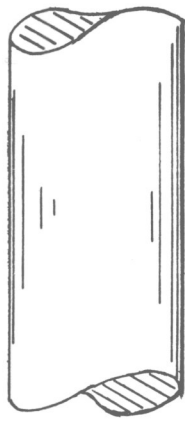
LOWER CASE



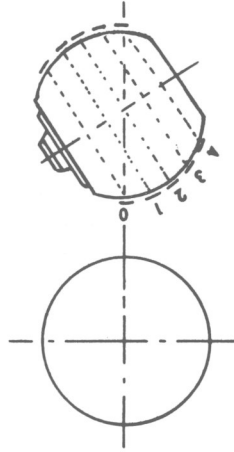
UPPER CASE

CLOCKWISE      COUNTERCLOCKWISE

		CLOCKWISE					COUNTERCLOCKWISE				
		0	1	2	3	4	0	1	2	3	4
CLOCKWISE	4	.. 44	ù 42	A 3	N 25	O 34	R 14	H 23	/ 36	:	43
	3	1/ 39	( 20	C 13	I 30	E 10	T 18	L 35	= 32	§ 40	
	2	* 8	& 16	M 29	S 7	U 26	D 11	Z 22	) 24	? 33	
	1	" 4	X 9	W 6	F 15	B 21	K 31	V 17	f 1	; 37	
	0	% 12	9 41	G 19	P 38	_ 28	Q 2	Y 5	J 27	X 45	



VERTICAL MOVEMENT



KEYBOARD : 34 -N  
DEAD KEYS : 44  
LINESPACE : 44 TEETH  
WHEEL



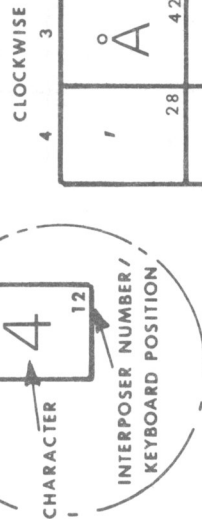
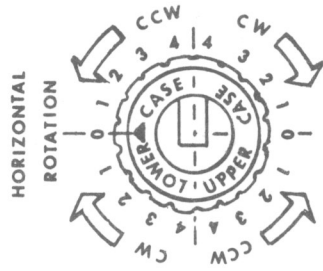
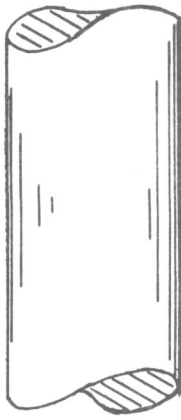
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
 → CLOCKWISE  
 ← COUNTERCLOCKWISE

HORIZONTAL ROTATION  
 0 1 2 3 4  
 COUNTERCLOCKWISE

8 <sup>28</sup>	2 <sup>4</sup>	:	7 <sup>24</sup>	4 <sup>12</sup>	å <sup>42</sup>	æ <sup>39</sup>	5 <sup>16</sup>	x <sup>9</sup>	3/4 <sup>44</sup>	a <sup>3</sup>	c <sup>13</sup>	m <sup>29</sup>	w <sup>6</sup>	g <sup>19</sup>	n <sup>25</sup>	i <sup>30</sup>	s <sup>7</sup>	f <sup>15</sup>	p <sup>38</sup>	o <sup>34</sup>	e <sup>10</sup>	u <sup>26</sup>	b <sup>21</sup>	3 <sup>8</sup>	r <sup>14</sup>	t <sup>18</sup>	d <sup>11</sup>	k <sup>31</sup>	q <sup>2</sup>	h <sup>23</sup>	l <sup>35</sup>	z <sup>5</sup>	v <sup>17</sup>	y <sup>22</sup>	ø <sup>43</sup>	- <sup>41</sup>	.	6 <sup>20</sup>	j <sup>27</sup>	\$ <sup>1</sup>	,	+	9 <sup>32</sup>	_ <sup>45</sup>
-----------------	----------------	---	-----------------	-----------------	-----------------	-----------------	-----------------	----------------	-------------------	----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	---	-----------------	-----------------	-----------------	---	---	-----------------	-----------------

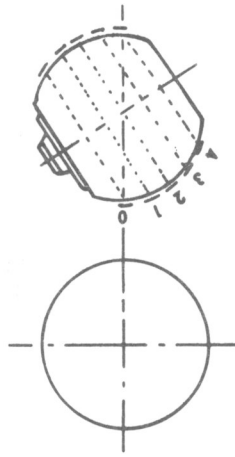
LOWER CASE



UPPER CASE

' <sup>28</sup>	" <sup>4</sup>	= <sup>40</sup>	) <sup>24</sup>	% <sup>12</sup>	À <sup>42</sup>	Æ <sup>39</sup>	& <sup>16</sup>	X <sup>9</sup>	1/4 <sup>44</sup>	A <sup>3</sup>	C <sup>13</sup>	M <sup>29</sup>	W <sup>6</sup>	G <sup>19</sup>	N <sup>25</sup>	I <sup>30</sup>	S <sup>7</sup>	F <sup>15</sup>	P <sup>38</sup>	O <sup>34</sup>	E <sup>10</sup>	U <sup>26</sup>	B <sup>21</sup>	_ <sup>8</sup>	R <sup>14</sup>	T <sup>18</sup>	D <sup>11</sup>	K <sup>31</sup>	Q <sup>2</sup>	H <sup>23</sup>	L <sup>35</sup>	Z <sup>5</sup>	V <sup>17</sup>	Y <sup>22</sup>	Ø <sup>43</sup>	? <sup>41</sup>	1/2 <sup>37</sup>	( <sup>20</sup>	J <sup>27</sup>	f <sup>1</sup>	/ <sup>33</sup>	÷ <sup>36</sup>	.. <sup>32</sup>	X <sup>45</sup>
-----------------	----------------	-----------------	-----------------	-----------------	-----------------	-----------------	-----------------	----------------	-------------------	----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	----------------	-----------------	-----------------	----------------	-----------------	-----------------	-----------------	-----------------	-------------------	-----------------	-----------------	----------------	-----------------	-----------------	------------------	-----------------

VERTICAL MOVEMENT



KEYBOARD : 35-N  
 DEAD KEYS : \_\_\_\_\_  
 LINESPACE : 47 TEETH  
 WHEEL

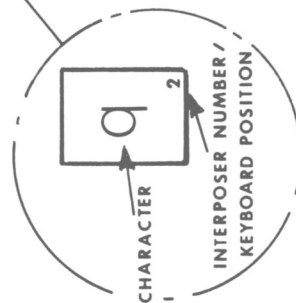
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION  
 COUNTERCLOCKWISE

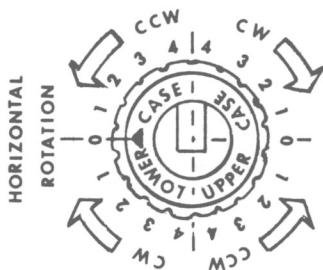
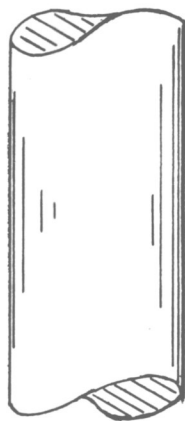
	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4				
	'	k	z	i	o	a	c	ñ	'				
	36	31	5	30	34	3	13	39	42				
	°	f	m	t	e	n	d	-	9				
	41	15	29	18	10	25	11	40	32				
	5	7	u	s	l	r	v	4	3				
	16	24	26	7	35	14	17	12	8				
	"	2	w	h	x	b	.	;	8				
	1	4	6	23	9	21	37	43	28				
	q	y	=	6	g	,	p	j	—				
	2	22	44	20	19	33	38	27	45				

LOWER CASE

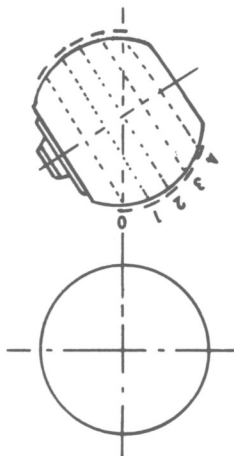


UPPER CASE

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4				
	)	K	Z	I	O	A	C	Ñ	..				
	36	31	5	30	34	3	13	39	42				
	!	F	M	T	E	N	D	+	(				
	41	15	29	18	10	25	11	40	32				
	½	%	U	S	L	R	V	¼	#				
	16	24	26	7	35	14	17	12	8				
	Bs	\$	W	H	X	B	/	:	&				
	1	4	6	23	9	21	37	43	28				
	Q	Y	?	—	G	?	P	J	X				
	2	22	44	20	19	33	38	27	45				



VERTICAL MOVEMENT



KEYBOARD : 41-N  
 DEAD KEYS : 42  
 LINESPACE : 47 TEETH  
 WHEEL

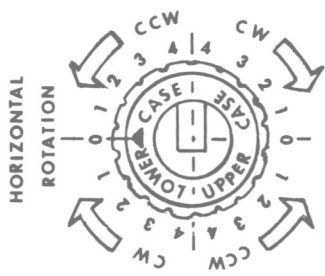
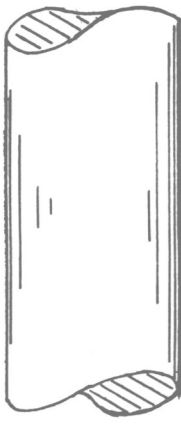
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION COUNTERCLOCKWISE

	CLOCKWISE				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
2	4	39	3	25	34	14	23	40	
3	8	37	13	30	10	18	35	20	
-	42	16	29	7	26	11	5	43	
0	36	9	6	15	21	31	17	44	
8	28	32	19	38	24	2	22	27	45

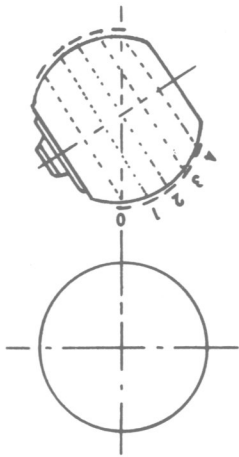
LOWER CASE



	CLOCKWISE				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
"	4	39	3	25	34	14	23	40	
%	8	37	13	30	10	18	35	20	
=	42	16	29	7	26	11	5	43	
1/2	36	9	6	15	21	31	17	44	
( )	28	32	19	38	24	2	22	27	45

UPPER CASE

VERTICAL MOVEMENT



KEYBOARD : 51-N  
 DEAD KEYS : \_\_\_\_\_  
 LINESPACE : 47 TEETH  
 WHEEL

# CHARACTER SELECTION CHART

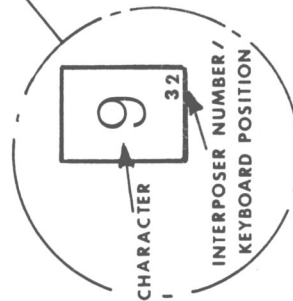
DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION COUNTERCLOCKWISE

CLOCKWISE

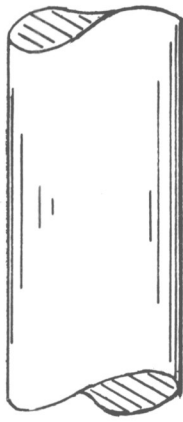
	CLOCKWISE				HORIZONTAL ROTATION COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
0	å 33	ä 37	a 3	n 25	o 34	r 14	h 23	ö 41	O 36
1	2 4	3 8	c 13	i 30	e 10	t 18	l 35	- 42	. 43
2	' 44	5 16	m 29	s 7	u 26	d 11	z 5	" 40	' 39
3	1 1	x 9	w 6	f 15	b 21	k 31	v 17	4 12	8 28
4	9 32	6 20	g 19	p 38	7 24	q 2	y 22	j 27	_ 45

LOWER CASE

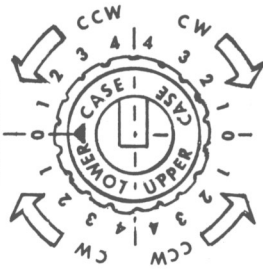


UPPER CASE

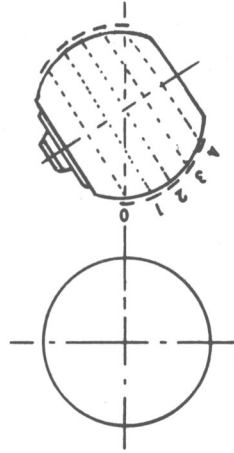
	CLOCKWISE				HORIZONTAL ROTATION COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
0	À 33	Ä 37	A 3	N 25	O 34	R 14	H 23	Ö 41	S 36
1	+ 4	& 8	C 13	I 30	E 10	T 18	L 35	ü 42	? 43
2	' 44	( 16	M 29	S 7	U 26	D 11	Z 5	' 40	: 39
3	\$ 1	X 9	W 6	F 15	B 21	K 31	V 17	% 12	) 28
4	/ 32	= 20	G 19	P 38	_ 24	Q 2	Y 22	J 27	X 45



HORIZONTAL ROTATION



VERTICAL MOVEMENT



KEYBOARD : 90-N  
DEAD KEYS : 44  
LINESPACE : 47 TEETH  
WHEEL

# CHARACTER SELECTION CHART

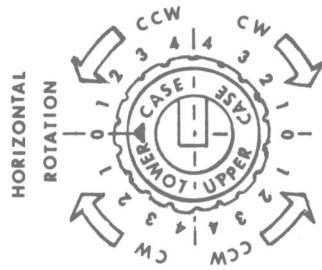
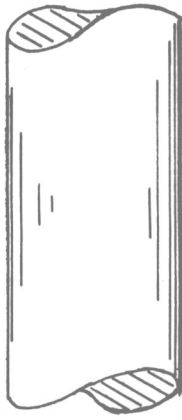
DIRECTION OF ROTATION  
↑

HORIZONTAL ROTATION COUNTERCLOCKWISE

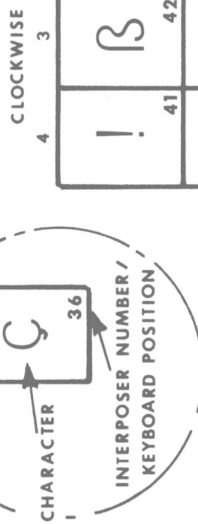
CLOCKWISE

	CLOCKWISE				HORIZONTAL ROTATION COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
-	41	42	3	25	34	14	23	39	43
8	28	32	13	30	10	18	35	8	44
,	40	12	29	7	26	11	5	24	33
2	4	9	6	15	21	31	17	1	37
ç	36	16	19	38	20	2	22	27	45

LOWER CASE

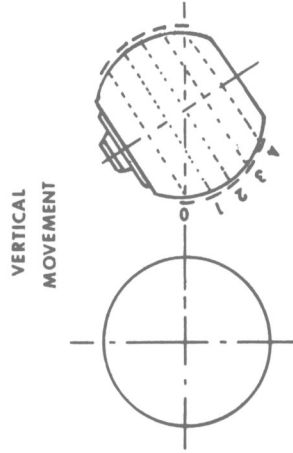


VERTICAL MOVEMENT



	CLOCKWISE				COUNTERCLOCKWISE				
	4	3	2	1	0	1	2	3	4
!	41	42	3	25	34	14	23	39	43
'	28	32	13	30	10	18	35	8	44
^	40	12	29	7	26	11	5	24	33
"	4	9	6	15	21	31	17	1	37
)	36	16	19	38	20	2	22	27	45

UPPER CASE



KEYBOARD : 110-N  
DEAD KEYS : 40-44  
LINESPACE : 47 TEETH  
WHEEL

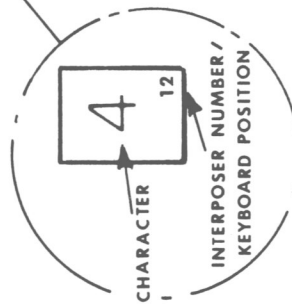
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION COUNTERCLOCKWISE

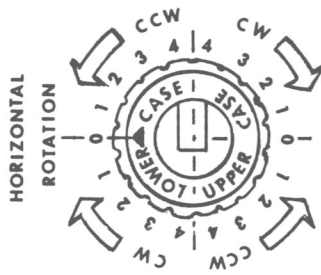
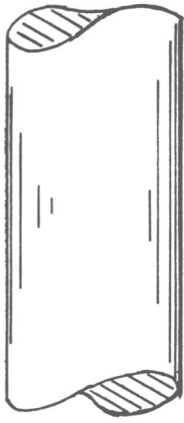
		HORIZONTAL ROTATION COUNTERCLOCKWISE					VERTICAL MOVEMENT								
		4	3	2	1	0	1	2	3	4	0	1	2	3	4
LOWER CASE	CLOCKWISE	36	42	3	25	34	14	23	39	43	ä	ö	h	r	o
		41	20	13	30	10	18	35	32	40	,	l	t	e	i
		8	16	29	7	26	11	22	24	33	'	z	d	u	s
		4	9	6	15	21	31	17	\$	1	v	y	k	b	f
		12	44	19	38	28	2	5	j	27	—	g	p	8	a

LOWER CASE

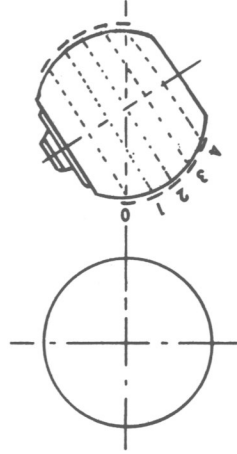


UPPER CASE

		HORIZONTAL ROTATION COUNTERCLOCKWISE					VERTICAL MOVEMENT								
		4	3	2	1	0	1	2	3	4	0	1	2	3	4
UPPER CASE	CLOCKWISE	36	42	3	25	34	14	23	39	43	:	+	H	R	O
		41	20	13	30	10	18	35	32	40	'	^	L	E	N
		8	16	29	7	26	11	22	24	33	*	)	Z	U	S
		4	9	6	15	21	31	17	f	1	V	Y	K	B	F
		12	44	19	38	28	2	5	J	27	X	G	P	—	Q



VERTICAL MOVEMENT



KEYBOARD : 112-N  
DEAD KEYS : 40  
LINESPACE : 44 TEETH  
WHEEL

# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION  
 COUNTERCLOCKWISE

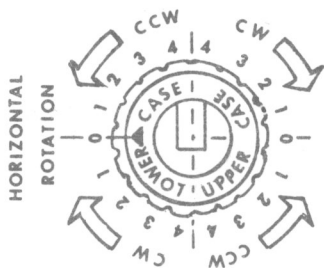
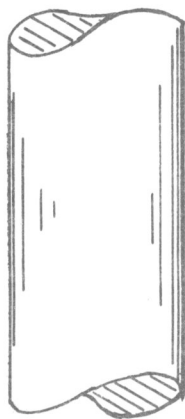
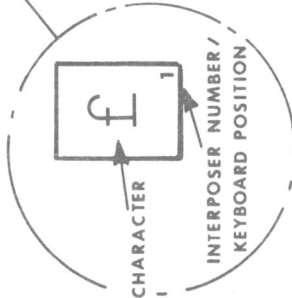
	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE																																				
	4	3	2	1	0	1	2	3	4																																				
LOWER CASE	" 8	è 24	t 18	a 2	o 34	i 30	r 14	é 4	à 36	! 41	^ 42	l 35	s 7	e 10	n 25	d 11	= 44	- 20	, 29	v 17	c 13	u 26	m 39	f 15	; 33	) 40	( 16	ù 43	w 5	h 23	b 21	k 31	x 9	: 37	' 12	f 1	j 27	q 3	a 19	g 19	- 28	p 38	y 22	ç 32	_ 45

LOWER CASE

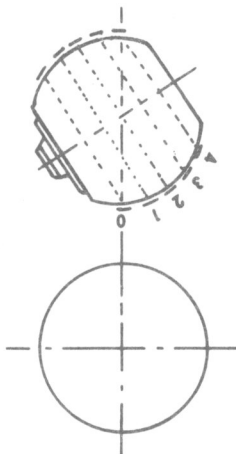
CLOCKWISE

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE																																		
	4	3	2	1	0	1	2	3	4																																		
UPPER CASE	3 8	7 24	T 18	A 2	O 34	I 30	R 14	2 4	& 36	§ 41	.. 42	L 35	S 7	E 10	N 25	D 11	Z 6	+ 44	6 20	? 29	V 17	C 13	U 26	M 39	F 15	. 33	4 40	5 16	% 43	W 5	H 23	B 21	K 31	X 9	/ 37	1 1	J 27	Q 3	8 28	P 38	Y 22	9 32	X 45

UPPER CASE



VERTICAL MOVEMENT



KEYBOARD : 138-N  
 DEAD KEYS : 42  
 LINESPACE : 47 TEETH  
 WHEEL

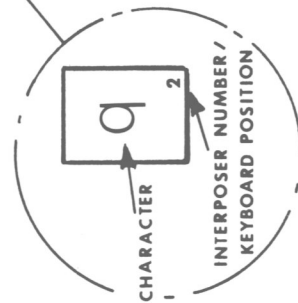
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION  
CLOCKWISE COUNTERCLOCKWISE

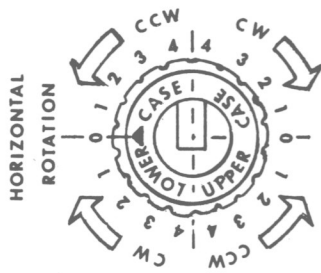
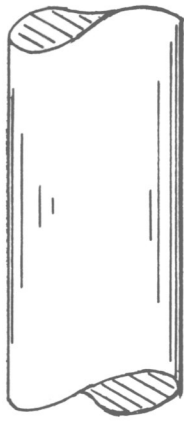
		HORIZONTAL ROTATION					VERTICAL MOVEMENT				
		CLOCKWISE		COUNTERCLOCKWISE			0		1		
		4	3	2	1	0	1	2	3	4	
1	1	k	z	i	o	a	c	ñ	a	43	
-	36	f	m	t	e	n	d	4	'	42	
2	4	3	u	s	l	r	v	5	`	44	
9	32	6	w	h	x	b	:	.	,	33	
q	2	y	8	7	g	ç	p	j	_	45	

LOWER CASE

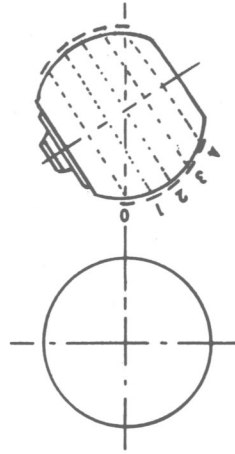


UPPER CASE

		HORIZONTAL ROTATION					VERTICAL MOVEMENT				
		CLOCKWISE		COUNTERCLOCKWISE			0		1		
		4	3	2	1	0	1	2	3	4	
1/2	1	K	Z	I	O	A	C	Ñ	o	43	
!	36	F	M	T	E	N	D	(	..	42	
"	4	/	U	S	L	R	V	)	^	44	
?	32	&	W	H	X	B	%	=	,	33	
Q	2	Y	?	_	G	\$	P	J	X	45	



VERTICAL MOVEMENT



KEYBOARD : 140-N  
DEAD KEYS : 44-42  
LINESPACE : 40 TEETH  
WHEEL



# CHARACTER SELECTION CHART

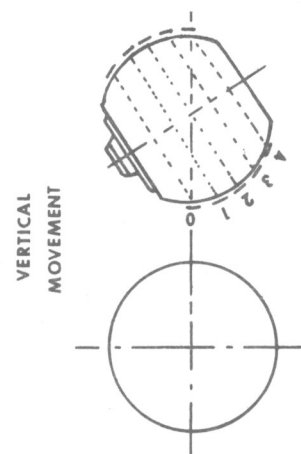
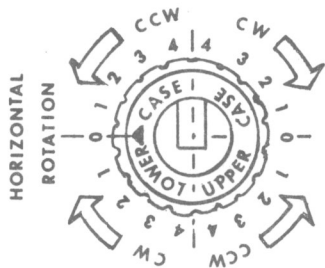
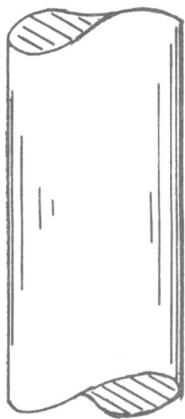
DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION  
 COUNTERCLOCKWISE

CLOCKWISE

	0	1	2	3	4				
4	β	ü	a	n	o	r	h	ö	ä
3	-	6	c	i	e	t	l	+	,
2	3	9	m	s	u	d	z	7	,
1	2	x	w	f	b	k	v	1	.
0	4	5	g	p	8	q	y	j	_
	12	16	19	38	28	2	5	27	45

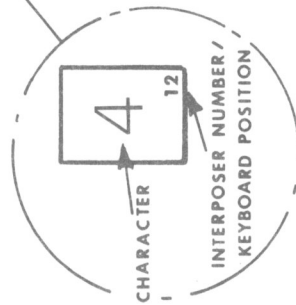
LOWER CASE



KEYBOARD : 158 -N  
 DEAD KEYS : 44  
 LINESPACE : 47 TEETH  
 WHEEL

	0	1	2	3	4				
4	:	Ü	A	N	O	R	H	Ö	Ä
3	'	(	C	I	E	T	L	/	,
2	=	§	M	S	U	D	Z	)	?
1	"	X	W	F	B	K	V	;	!
0	%	&	G	P	_	Q	Y	J	X
	12	16	19	38	28	2	5	27	45

UPPER CASE





# CHARACTER SELECTION CHART

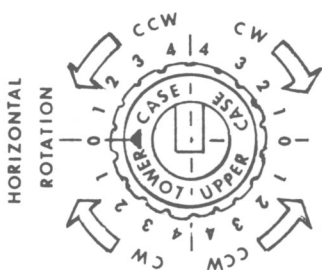
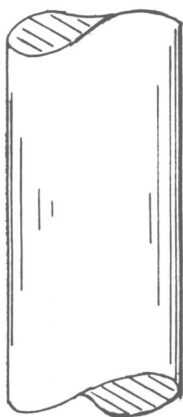
DIRECTION OF ROTATION  
→

CLOCKWISE  
3  
2  
1  
0  
1  
2  
3  
4  
HORIZONTAL ROTATION  
COUNTERCLOCKWISE

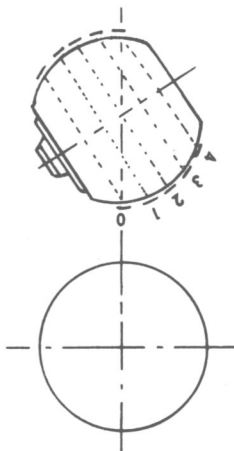
VERTICAL MOVEMENT  
0 1 2 3 4

4	å	ä	a	n	o	r	h	ö	O
3	1	3	c	i	e	t	l	.	-
2	'	2	m	s	u	d	z	"	4
1	8	x	w	f	b	k	v	5	7
0	9	,	g	p	6	q	y	j	-
4	33	37	3	25	34	14	23	41	36
3	1	8	13	30	10	18	35	39	42
2	44	4	29	7	26	11	5	40	12
1	28	9	6	15	21	31	17	16	24
0	32	43	19	38	20	2	22	27	45

LOWER CASE



VERTICAL MOVEMENT

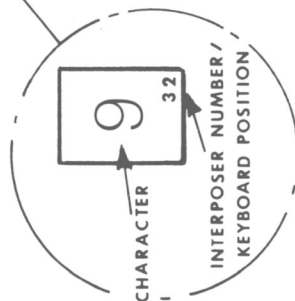


KEYBOARD : 208-N  
DEAD KEYS : 44  
LINESPACE : 47 TEETH  
WHEEL

CLOCKWISE  
4  
3  
2  
1  
0  
1  
2  
3  
4  
COUNTERCLOCKWISE

4	Å	Ä	A	N	O	R	H	Ö	§
3	f	)	C	I	E	T	L	:	=
2	'	(	M	S	U	D	Z	'	?
1	\$	X	W	F	B	K	V	%	&
0	/	+	G	P	_	Q	Y	J	X
4	33	37	3	25	34	14	23	41	36
3	1	8	13	30	10	18	35	39	42
2	44	4	29	7	26	11	5	40	12
1	28	9	6	15	21	31	17	16	24
0	32	43	19	38	20	2	22	27	45

UPPER CASE



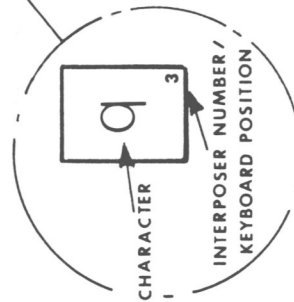
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
→

HORIZONTAL ROTATION COUNTERCLOCKWISE

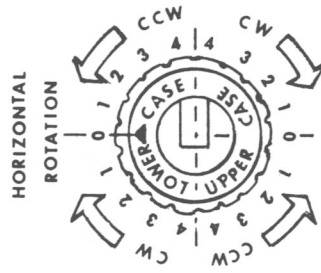
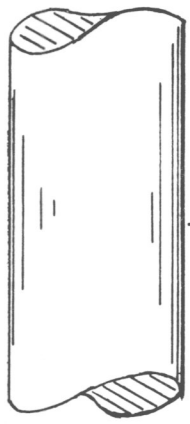
		HORIZONTAL ROTATION					COUNTERCLOCKWISE				
		0	1	2	3	4	0	1	2	3	4
CLOCKWISE	4	^ 43	k 31	z 6	i 30	o 34	a 2	c 13	o 40	' 42	
	3	6 20	f 15	m 39	t 18	e 10	n 25	d 11	\$ 44	8 28	
	2	3 8	7 24	u 26	s 7	l 35	r 14	v 17	9 32	5 16	
	1	? 33	2 4	w 5	h 23	x 9	b 21	= 1	. 41</td <td>4 12</td>	4 12	
	0	q 3	y 22	- 36	g 19	ç 29	p 38	j 27			

LOWER CASE

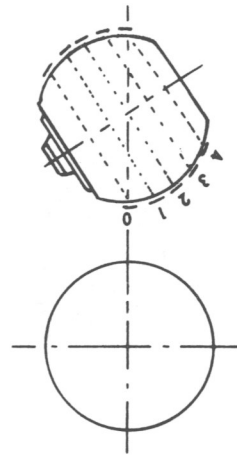


UPPER CASE

		HORIZONTAL ROTATION					COUNTERCLOCKWISE				
		0	1	2	3	4	0	1	2	3	4
CLOCKWISE	4	' 43	k 31	z 6	i 30	o 34	A 2	C 13	a 40	~ 42	
	3	) 20	F 15	M 39	T 18	E 10	N 25	D 11	f 44	% 28	
	2	" 8	/ 24	U 26	S 7	L 35	R 14	V 17	& 32	( 16	
	1	! 33	§ 4	W 5	H 23	X 9	B 21	+ 1	:	' 41	
	0	Q 3	Y 22	- 36	G 19	ç 29	P 38	J 27	X 45		



VERTICAL MOVEMENT



KEYBOARD : 287-N  
DEAD KEYS : 42-43  
LINESPACE : 47 TEETH  
WHEEL

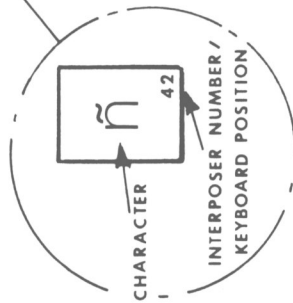
# CHARACTER SELECTION CHART

DIRECTION OF ROTATION  
 →

HORIZONTAL ROTATION COUNTERCLOCKWISE  
 0 1 2 3 4  
 VERTICAL MOVEMENT  
 0 1 2 3 4

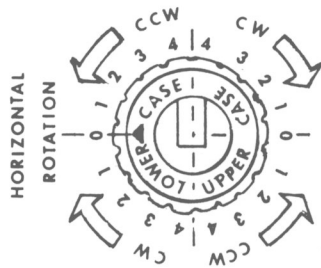
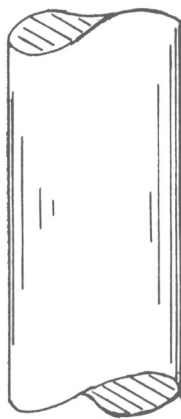
	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE																																				
	4	3	2	1	0	1	2	3	4																																				
LOWER CASE	¿ 1	+ 41	z 5	i 30	o 34	a 3	c 13	k 31	3 8	4 12	f 15	m 29	t 18	e 10	r 14	h 23	g 32	' 44	43	^ 16	u 26	s 7	n 25	l 35	v 17	o 36	8 28	7 24	w 6	d 4	x 9	b 21	.	37	;	39	ñ 42	y 22	6 20	- 40	g 19	q 2	p 38	j 27	— 45

LOWER CASE

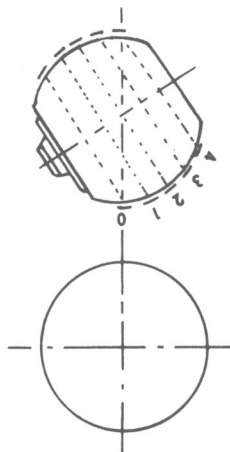


UPPER CASE

	CLOCKWISE				HORIZONTAL ROTATION				COUNTERCLOCKWISE																																				
	4	3	2	1	0	1	2	3	4																																				
UPPER CASE	i 1	? 41	Z 5	I 30	O 34	A 3	C 13	K 31	f 8	12	F 15	M 29	T 18	E 10	R 14	H 23	( 32	44	43	% 16	U 26	S 7	N 25	L 35	V 17	) 36	* 28	24	\$ 12	W 6	D 4	X 9	B 21	" 37	:	39	Ñ 42	Y 22	Ç 20	/ 40	G 19	Q 2	P 38	J 27	= 45



VERTICAL MOVEMENT

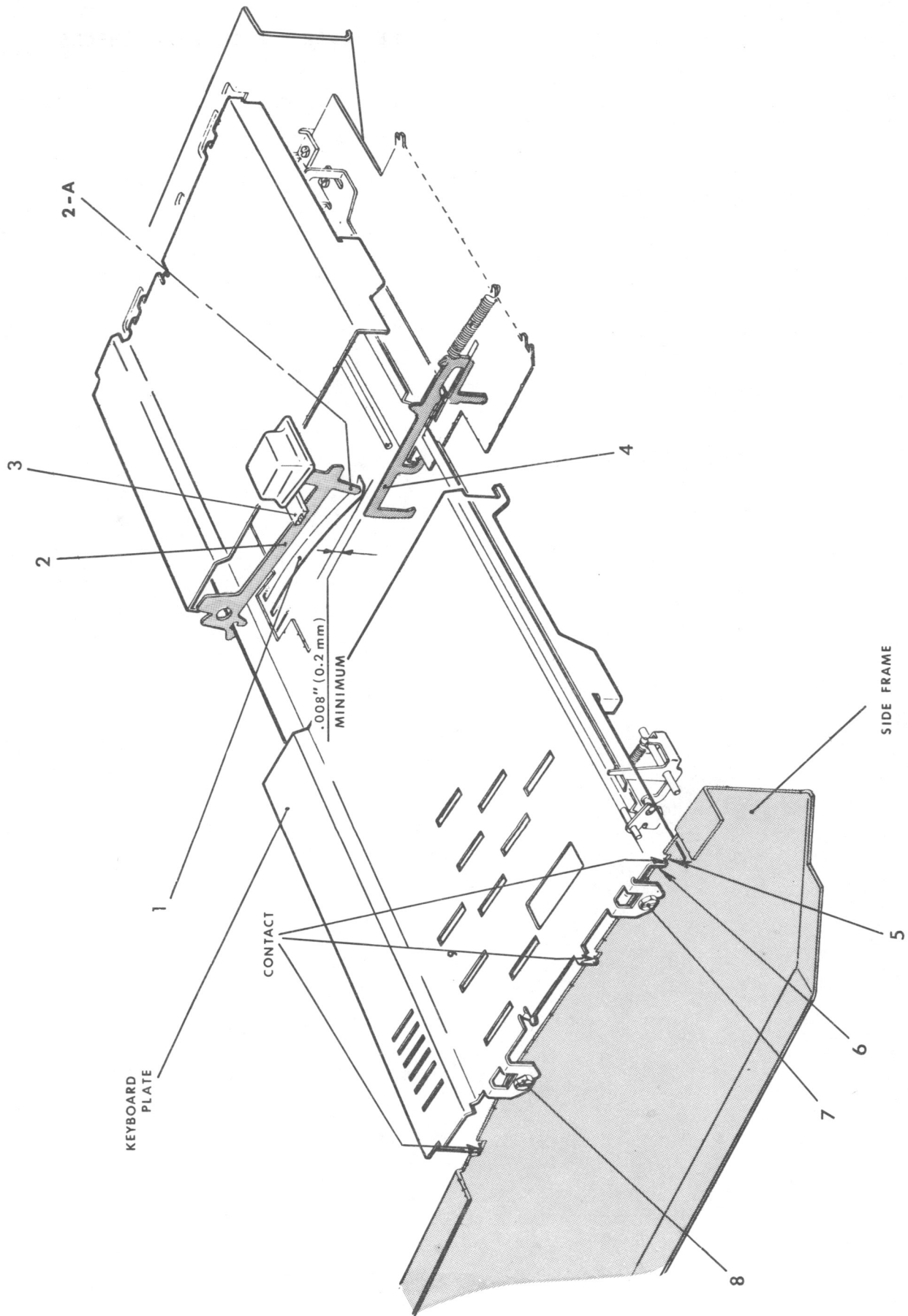


KEYBOARD : 799-N  
 DEAD KEYS : —  
 LINESPACE : 47 TEETH  
 WHEEL



KEYLEVER / INTERPOSER CHECKS

KEYBOARD INSTALLATION





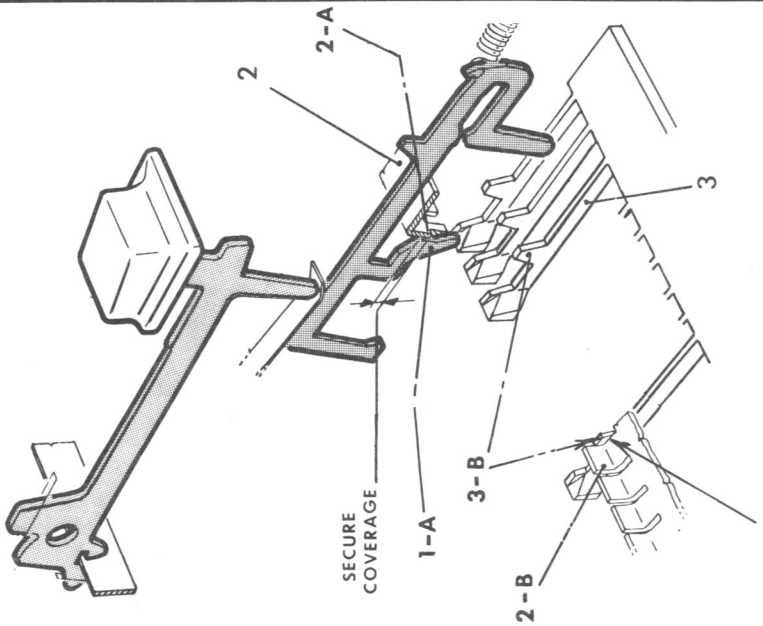
KEYLEVER / INTERPOSER CHECKSKEYBOARD INSTALLATION

Loosen SCREWS (7) & (8) on left and right sides of Keyboard. Put Keyboard in place, and push Keyboard down and to the front while tightening Screws. In this position, Keyboard PLATE LUGS (6) should contact bottom of NOTCHES (5) in Side Frame on right and left sides.

CONDITIONS TO CHECK

1. LEAF SPRING (1) should contact KEYLEVER ARM (2-A). Check on all Keylevers.
2. All character Keylevers and Shift Keylevers should rest against UP-STOP (3).
3. With Keyboard in place, there should be at least .008" clearance between LEAF SPRING (1) and INTERPOSER (4). Check across Keyboard by lightly depressing Keylevers.
4. Keylevers should have some additional travel after tripping Interposers. To check, depress Keylever slowly with machine at rest and Switch on.

Correction: Replace defective parts.

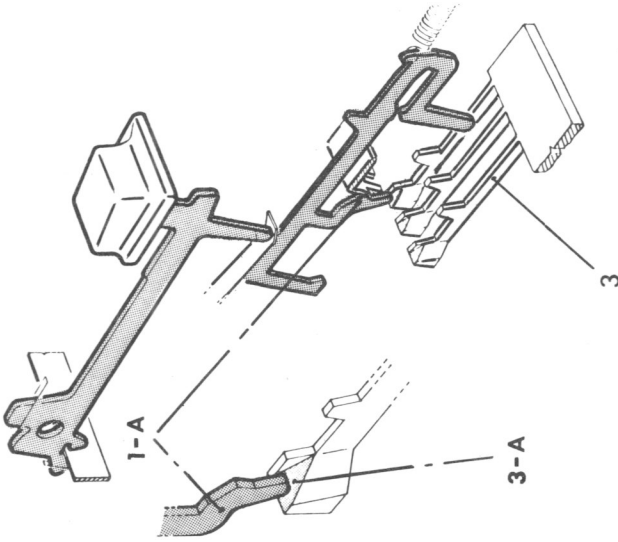


CONTACT

Rest Position

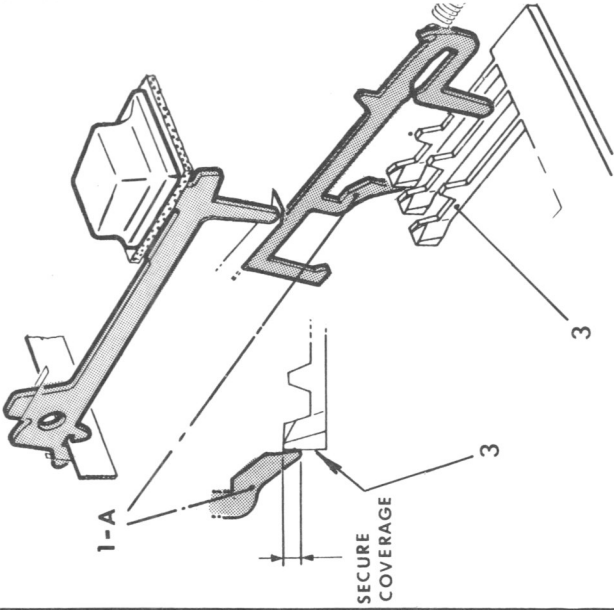
REQUIREMENT:

- A) In rest position, INTERPOSER ARM (1-A) should have secure coverage on STOP SURFACE (2-A) of INTERPOSER GUIDE PLATE (2).
- B) LUGS (3-B) on ANTI-REPEAT SPRING TAB (3) must contact left edge of Slots of LOWER INTERPOSER GUIDE PLATE (2-B).



Initial Depression of Keylever & Interposer

REQUIREMENT: During initial depression of Keylever, INTERPOSER ARM (1-A) should contact BEVELED SURFACE (3-A) of ANTI-REPEAT SPRING TAB (3).



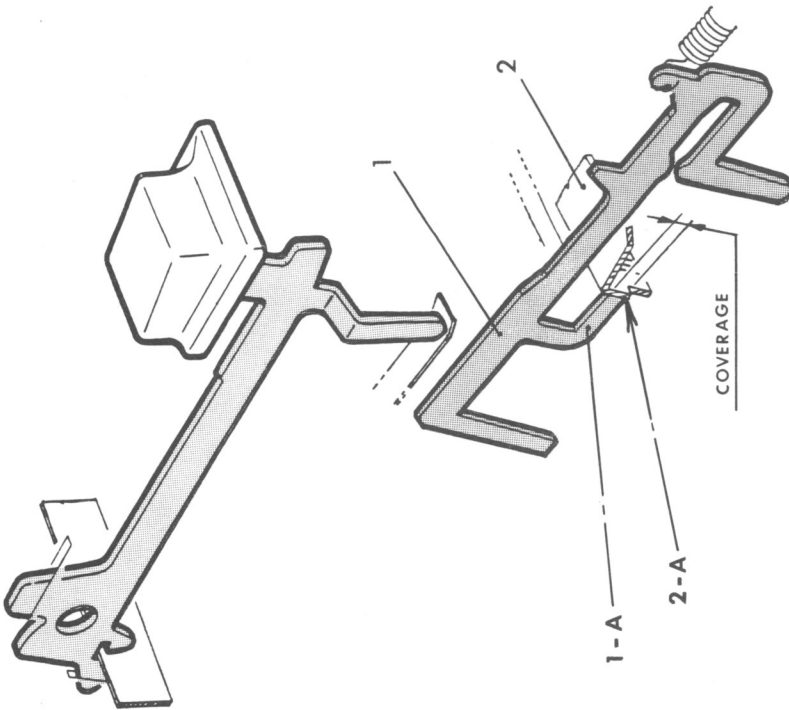
Keylever fully depressed at end of Print Cycle

REQUIREMENT: With machine at rest, hold a character Keylever fully depressed, and rotate Print Cam Shaft until print cycle is completed: INTERPOSER ARM (1-A) should have secure coverage on rear of ANTI-REPEAT SPRING TAB (3).

NOTE: When Keylever is released, INTERPOSER ARM (1-A) should immediately restore to rest position.

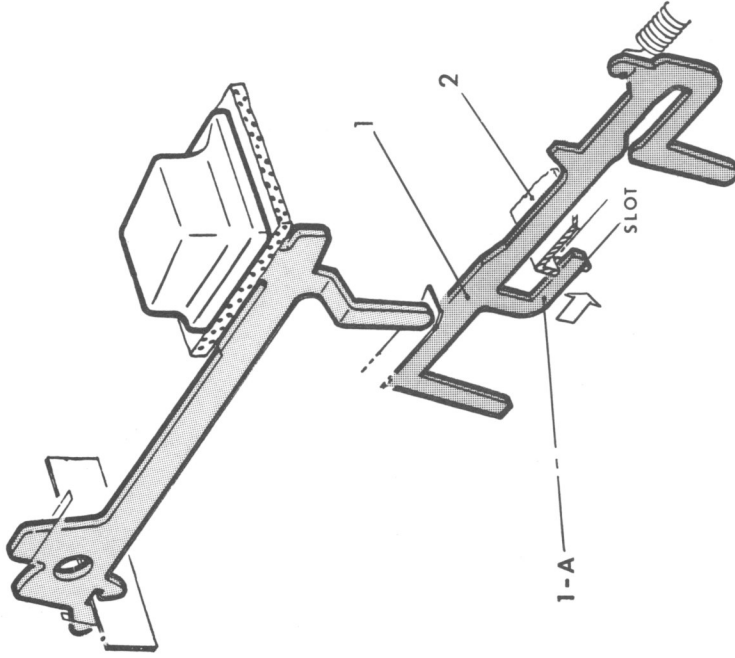
CORRECTION: Replace defective parts

KEYLEVER / INTERPOSER CHECKS  
REPEAT STROKE



Rest Position

REQUIREMENT: In rest position, REPEAT INTERPOSER ARM (1-A) should have good coverage on STOP SURFACE (2-A) of INTERPOSER GUIDE PLATE (2)



Repeat Keylever fully depressed  
at end of Print Cycle

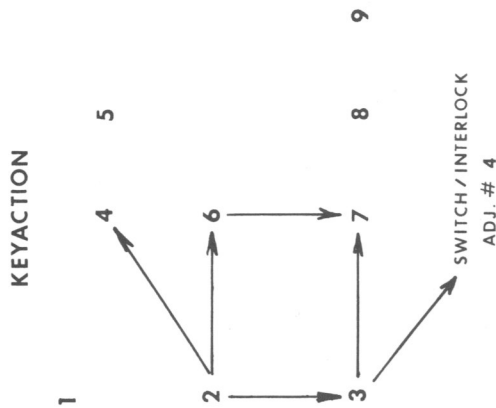
REQUIREMENT: With machine at rest, hold Repeat Keylever fully depressed, and rotate Print Cam Shaft: REPEAT INTERPOSER ARM (1-A) should pass thru Slot of INTERPOSER GUIDE PLATE (2) during the first Print Cycle. NOTE: INTERPOSER ARM (1-A) should not contact an Anti-Repeat Spring Tab.

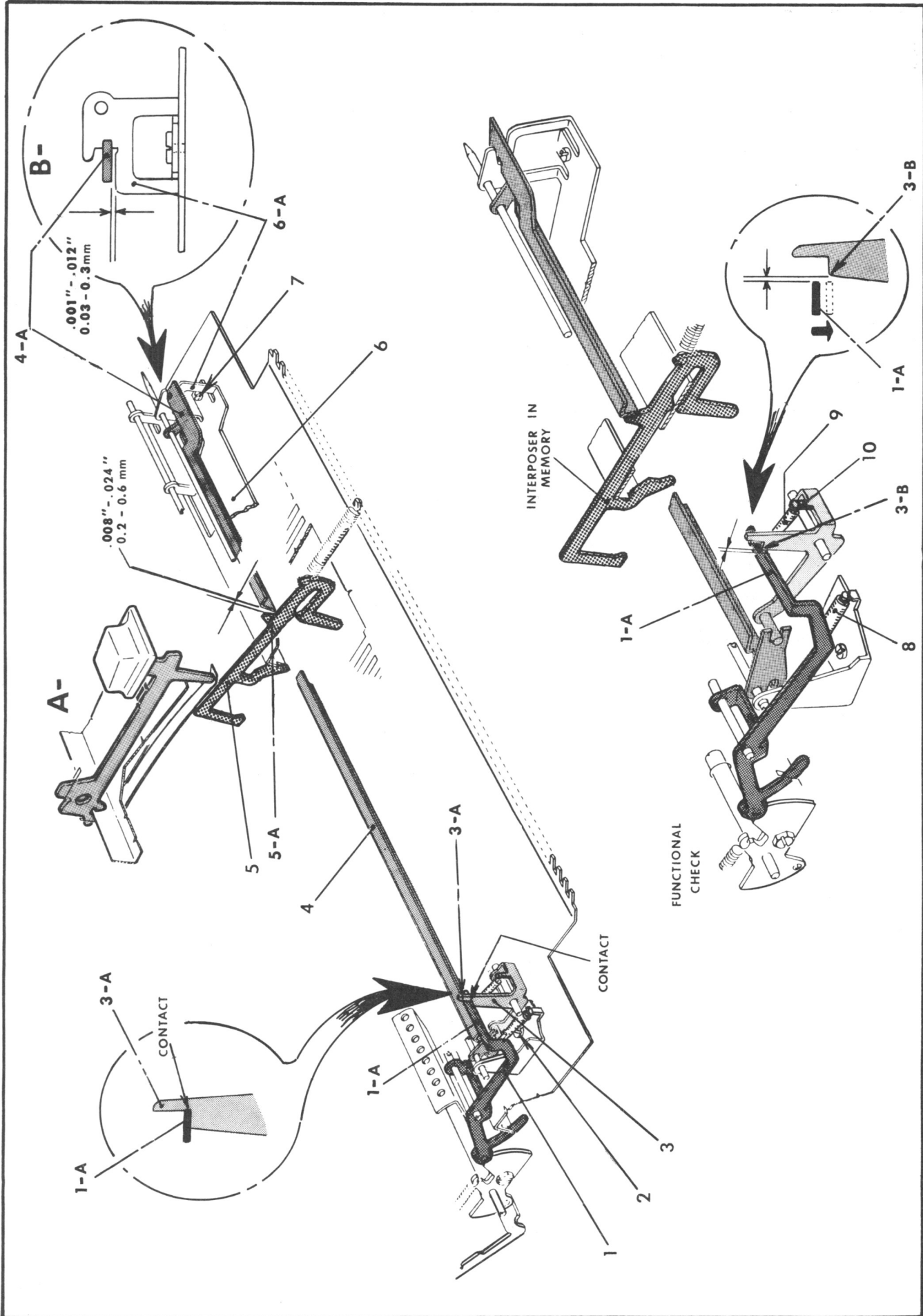
CORRECTION: Replace defective parts.



KEYACTION ADJUSTMENTS

1. Rest position and actuation of Print Cycle Trigger Bail.
2. Actuated position of Code Set Bail & Interposers.
3. Restoration of Set Control Bridge & Code Set Bail.
4. Actuation of Print Cycle Clutch.
5. Rest position and restoration of Clutch Control Bridge.
6. Entry of Reactivation Slide Stud for automatic Keyboard reactivation.
7. Automatic Keyboard reactivation.
8. Entry position of Code Slide Relief Pawl.
9. Rest position of Code Slides, and Code Slide Movement during a print cycle.





KEYACTION ADJUSTMENTS

1. Rest position and actuation of PRINT CYCLE TRIGGER BAIL (4).

REQUIREMENT: With all parts at rest:

- A) There should be .008"-.024" clearance between INTERPOSER LUGS (5-A) and TRIGGER BAIL (4). Clearance should be equal at right, left, and center of Interposer Group.
- B) There should be .001"-.012" clearance between bottom of TRIGGER BAIL ARM (4-A) and top of TRIGGER BAIL BRACKET ARM (6-A).

NOTE: When Requirements A & B are correct, SET CONTROL BRIDGE ARM (1-A) should contact ARM (3-A) to have full coverage on latching surface of RELEASE BRIDGE (3).

ACCESS: Remove Keyboard.

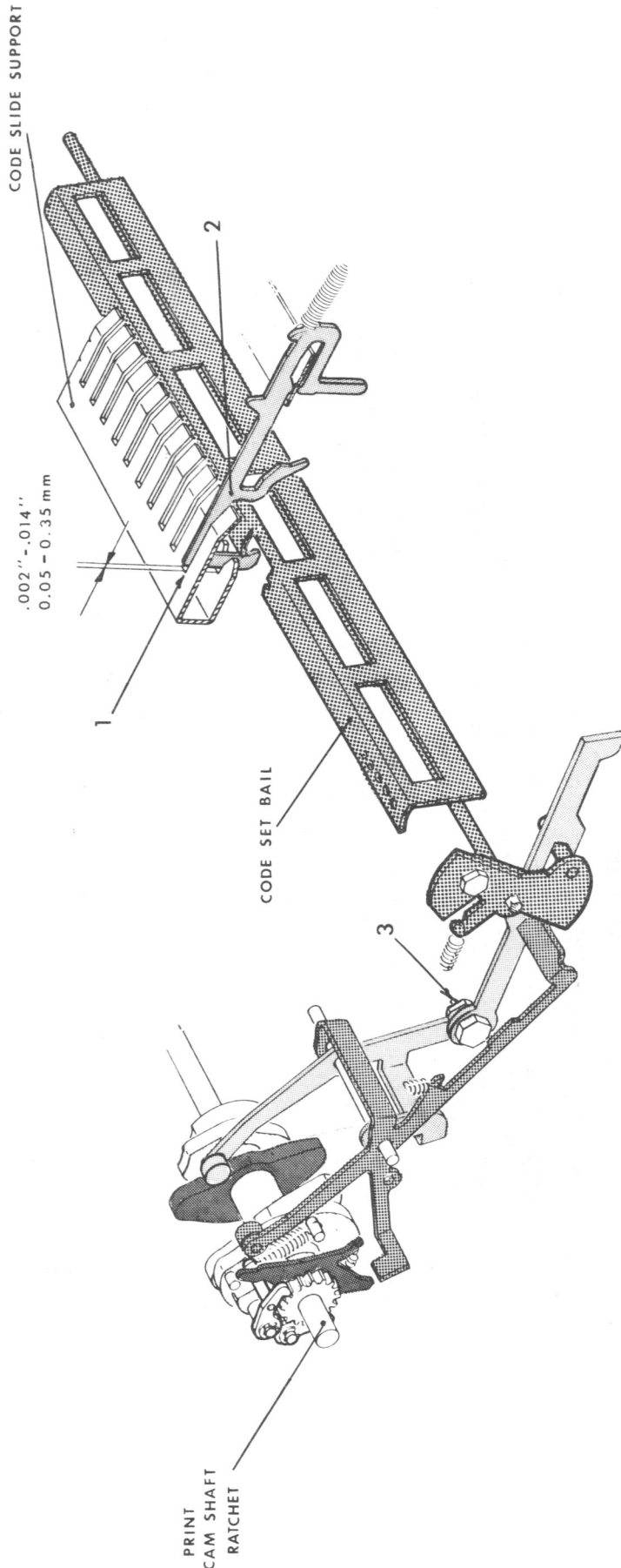
- ADJUSTMENT:
- A) Loosen SCREWS (2) & (7), and move TRIGGER BAIL BRACKET (6) forward or rearward to obtain Requirement A. Unhook SPRING (8) to facilitate adjustment; tighten Screws.
- B) Form TRIGGER BAIL ARM (4-A) up or down to obtain Requirement B.

NOTE: Make adjustments with machine at rest. If SET CONTROL BRIDGE (1) will not re-latch, rotate Print Cam Shaft so that SET CONTROL BRIDGE ARM (1-A) can be lifted above STEP (3-B) of RELEASE BRIDGE (3).

FUNCTIONAL CHECK: Depress two Interposers one at a time. Rotate Print Cam Shaft slowly until Interposer in memory (second one depressed) travels to furthest point forward: At this point, there should be front to rear clearance between SET CONTROL BRIDGE ARM (1-A) and RELEASE BRIDGE STEP (3-B) to allow the start of a second cycle upon further rotation of Print Cam Shaft.

Check with Interposers from center and ends of Interposer Group. If there is not sufficient clearance, adjust to the minimum clearance specified in Requirement A above (.008"). If requirement cannot be obtained with one particular Interposer, check the lubrication, free movement, and spring tension on that Interposer.

KEYACTION ADJUSTMENTS



2. Actuated position of Code Set Bail and Interposers.

**REQUIREMENT:** When an Interposer is depressed to actuate a print cycle, there should be .002"-.014" clearance between INTERPOSER (2) and back of GUIDE SLOT (1) of Code Slide Support.

**TO CHECK:** With machine at rest, depress Interposer #1, and view clearance through window in Code Slide Support Plate. Rotate Print Cam Shaft to restore parts to rest. Check again with Interposer #23. Repeat with Interposer #40.

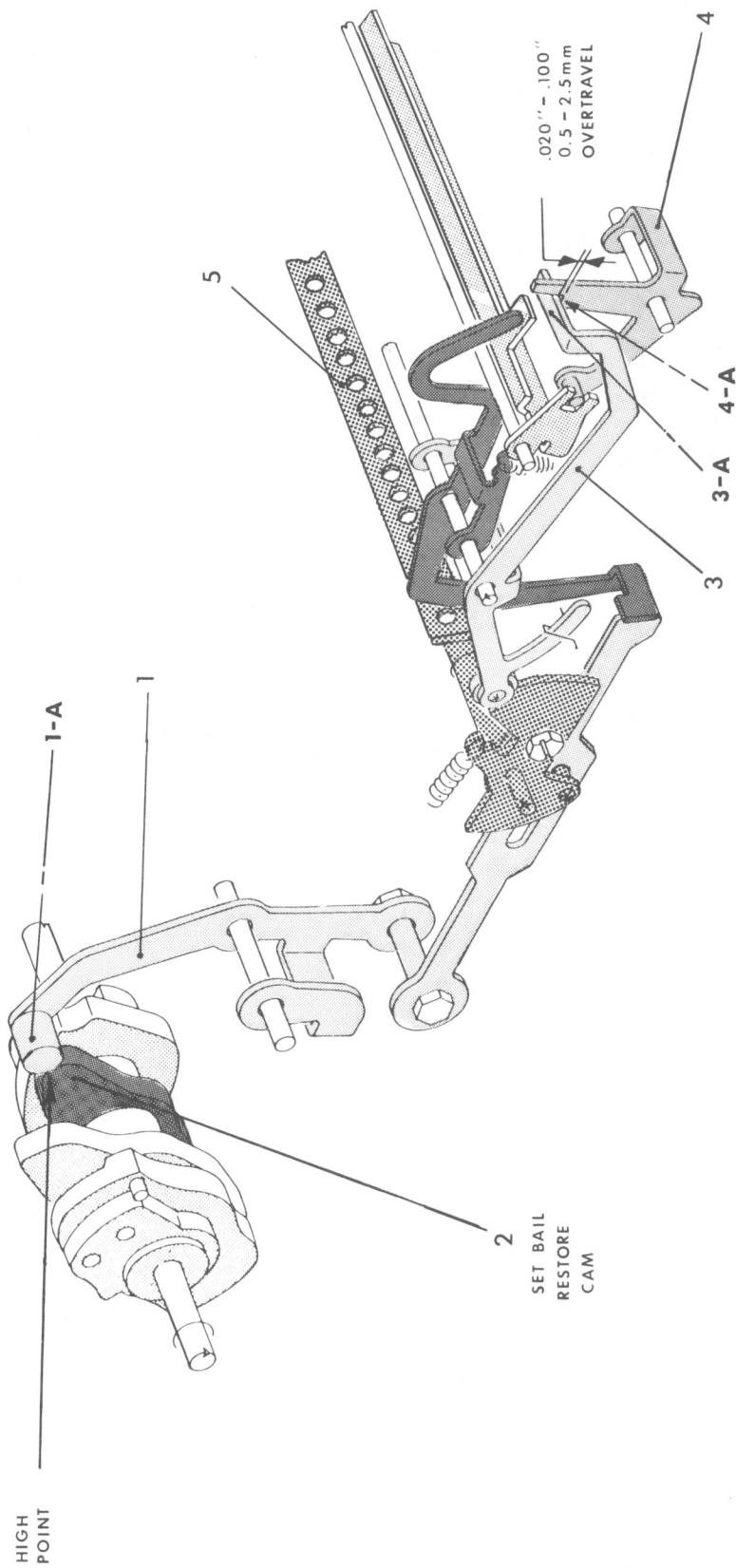
**ACCESS:** Remove Keyboard.

**ADJUSTMENT:** With parts at rest, depress Interposer #1. Loosen Lock Nut and regulate RELOAD LINK ECCENTRIC (3) to obtain requirement. Return parts to rest and recheck requirement.

**NOTE:** This adjustment prevents Interposers from bottoming on Code Slide Support, which will cause wear on Interposers. It also establishes the fully actuated position of Code Set Bail and its related parts.



KEYACTION ADJUSTMENTS



3. Restoration of SET CONTROL BRIDGE (3) and CODE SET BAIL (5) during a print cycle.

REQUIREMENT: When RELOAD BRIDGE CAM FOLLOWER (1-A) reaches high point of SET BAIL RESTORE CAM (2) during a print cycle, SET CONTROL BRIDGE ARM (3-A) should overtravel STEP (4-A) of RELEASE BRIDGE (4) by .020"-.100".

TO CHECK: Depress Interposer and rotate Print Cam Shaft.

ACCESS: Remove Keyboard.

ADJUSTMENT: Form SET CONTROL BRIDGE ARM (3-A) up or down.

Check Switch/Interlock Adjustment #4 in addition to Keyaction Adjustment #7.

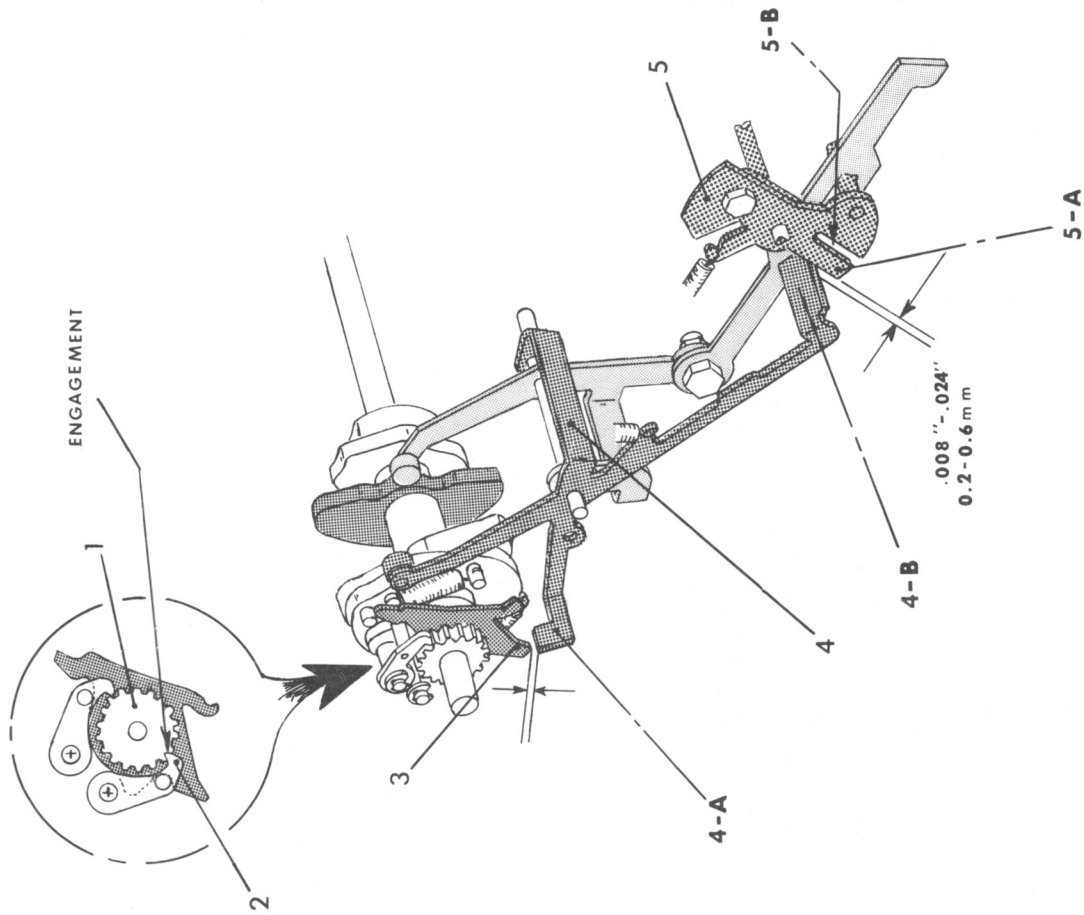
## 4. Actuation of Print Cycle Clutch.

**REQUIREMENT:** When an Interposer is depressed, there should be .008"-.024" clearance between CLUTCH CONTROL BRIDGE ARM (4-B) and LUG (5-A) of CODE SET BAIL ARM (5).

**TO CHECK:** With machine at rest, depress an Interposer (or a Keylever if Keyboard is in place).

**ADJUSTMENT:** Open or close SLOT (5-B) to move LUG (5-A) toward or away from ARM (4-B).

**NOTE:** The required clearance assures release of CLUTCH FLANGE (3) by ARM (4-A) for engagement of CLUTCH DOGS (2) with RATCHET (1) when an Interposer is depressed. The specification also assures that CLUTCH FLANGE (3) is not released by ARM (4-A) when two Interposers are depressed at the same time.



## KEYACTION ADJUSTMENTS

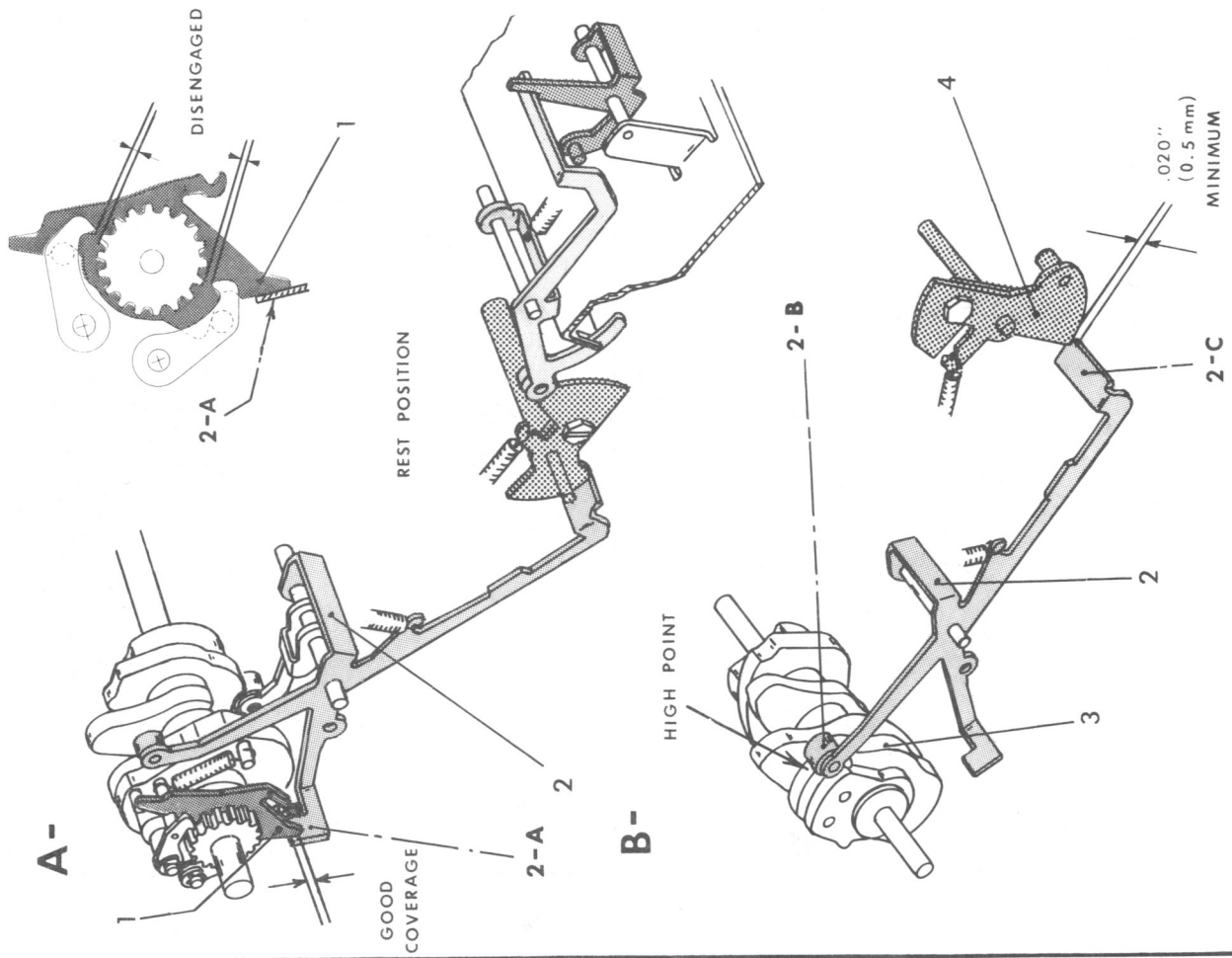
5. Rest position and restoration of CLUTCH CONTROL BRIDGE (2).

REQUIREMENT:

- A) In rest position, CLUTCH CONTROL BRIDGE ARM (2-A) should have good coverage (top to bottom) on CLUTCH FLANGE (1) to hold Clutch Dogs disengaged from Ratchet.
- B) When CAM FOLLOWER (2-B) of CLUTCH CONTROL BRIDGE (2) reaches high point of CLUTCH CONTROL BRIDGE RESTORE CAM (3) during a print cycle, ARM (2-C) should clear CODE SET BAIL ARM (4) by at least .020" (top to bottom).

TO CHECK: With machine at rest, depress an Interposer (or a Keylever if Keyboard is in place), and rotate Print Cam Shaft.

ADJUSTMENT: Form CLUTCH CONTROL BRIDGE ARM (2-C) up or down.

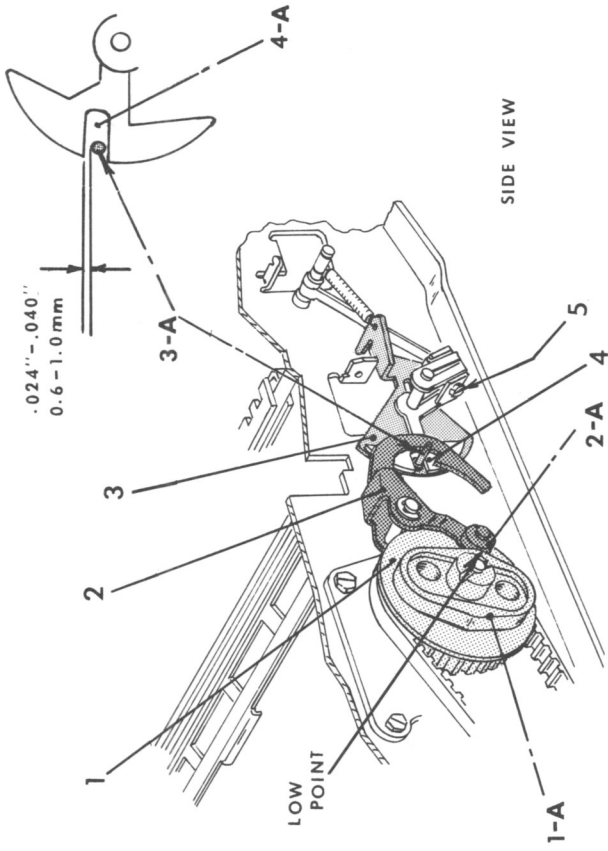


KEYACTION ADJUSTMENTS

6. Entry of REACTIVATION SLIDE STUD (3-A) for automatic Keyboard reactivation.

**REQUIREMENT:** With all parts at rest, rotate CAM SHAFT PULLEY (1) so that REACTIVATION BRIDGE CAM FOLLOWER (2-A) is at low point of CAM (1-A). Simultaneously depress two Keylevers (or Interposers): REACTIVATION SLIDE STUD (3-A) should enter SLOT (4-A) of SET BAIL REACTIVATION ARM (4) so that top of STUD (3-A) is .024"-.040" from top of SLOT (4-A). NOTE: In this position STUD (3-A) will favor bottom of SLOT (4-A) but will not bottom in Slot.

**ADJUSTMENT:** Loosen SCREW (5) and position SET BAIL REACTIVATION ARM (4) on Code Set Bail Shaft.

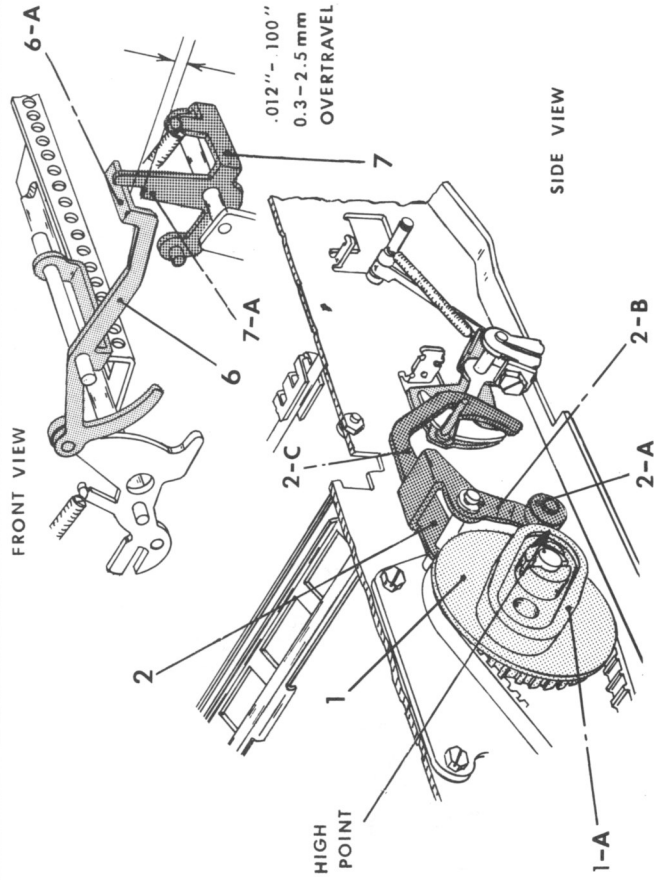


7. Automatic Keyboard reactivation.

**REQUIREMENT:** With all parts at rest, rotate CAM SHAFT PULLEY (1) so that REACTIVATION BRIDGE CAM FOLLOWER (2-A) is at low point of CAM (1-A). Simultaneously depress two Interposers; then rotate PULLEY (1): SET CONTROL BRIDGE ARM (6-A) should overtravel STEP (7-A) of RELEASE BRIDGE (7) by .012"-.100" as CAM FOLLOWER (2-A) reaches high point of CAM (1-A).

**ACCESS:** Remove Keyboard to view RELEASE BRIDGE (7).

**ADJUSTMENT:** Support Reactivation Bridge at (2-B) and form Hook Arm up or down at (2-C) to increase or decrease overtravel. Check that Hook Arm does not impede entry of Slide Stud (Req. #6 above).



## KEYACTION ADJUSTMENTS

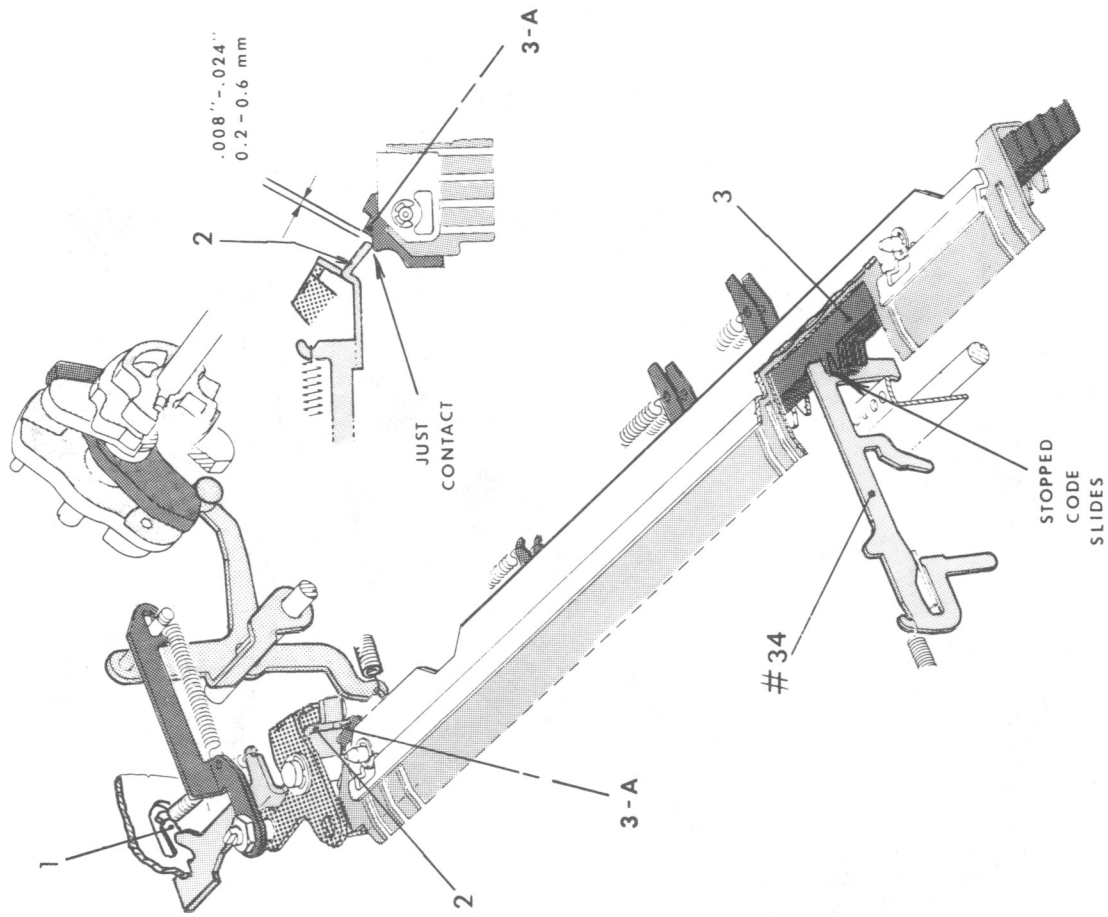
8. Entry position of CODE SLIDE RELIEF PAWL (2).

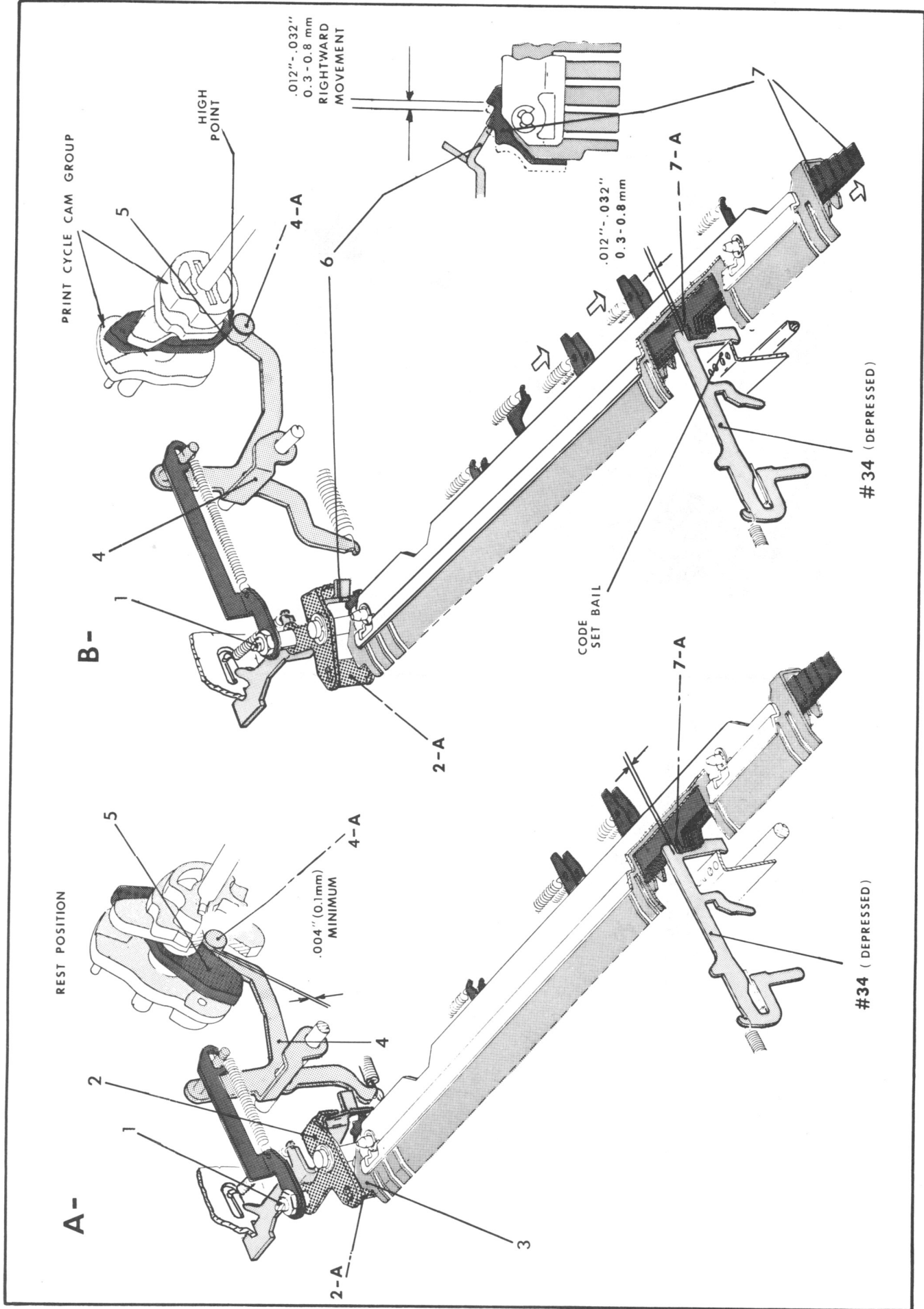
REQUIREMENT: When CODE SLIDE RELIEF PAWL (2) just contacts CODE SLIDES (3) during a print cycle, there should be .008"-.024" clearance between PAWL (2) and TOOTH (3-A) of a stopped CODE SLIDE (3).

TO CHECK: Depress Interposer #34, and rotate Print Cam Shaft until PAWL (2) just contacts CODE SLIDES (3).

ACCESS: Remove Keyboard.

ADJUSTMENT: Form LUG (1) on left Side Frame right for less clearance, left for more.





## KEYACTION ADJUSTMENTS

9. Rest position of Code Slides, and Code Slide Movement during a print cycle.

REQUIREMENT:

- A) With all parts at rest, there should be at least .004" clearance between CAM FOLLOWER (4-A) and CODE SLIDE CONTROL CAM (5).
- B) CODE SLIDE RELIEF PAWL (6) should push stopped CODE SLIDES (7) .012"-.032" to the right as CAM FOLLOWER (4-A) reaches high point of CODE SLIDE CONTROL CAM (5) during a print cycle.

TO CHECK: Depress Interposer #34, and slowly rotate Print Cam Shaft.

ACCESS: Remove Keyboard.

ADJUSTMENT: With all parts at rest, loosen Lock Nut and regulate Code Slide Control ECCENTRIC (1) to move CAM FOLLOWER (4-A) toward or away from CAM (5). Adjust to provide maximum rightward movement of Code Slides (Req. B) without loading Cam Follower on Cam.

NOTE: If wobble of Print Cycle Cam Group causes BRIDGE (4) and Code Slides to move while machine is idling, adjust ECCENTRIC (1) to move CAM FOLLOWER (4-A) slightly further away from CAM (5). If requirements cannot be maintained, replace Cam Shaft Ratchet or related parts.

ADJUSTMENT OBJECTIVES:

REQUIREMENT A: Clearance between CAM FOLLOWER (4-A) and CAM (5) assures that POST (2-A) of CODE SLIDE CONTROL BELLCRANK (2) contacts left side of SUPPORT Slides (3) to establish correct rest position of Code Slides. Correct rest position permits a depressed Interposer to freely enter path of CODE SLIDE STOPS (7-A) without binding on the side of STOPS (7-A). Note that when Interposer #34 is depressed, Code Slides move slightly to the left during initial rotation of Print Cam Shaft. This movement indicates lateral clearance between the depressed Interposer and CODE SLIDE STOPS (7-A) at rest position.

REQUIREMENT B: Rightward movement of Code Slides at the specified point of the print cycle relieves CODE SLIDE STOP (7-A) pressure on the Interposer so that Interposer can immediately return with Code Set Bail back to rest position. A lack of rightward movement will delay return of Interposers, resulting in sluggish Keyboard action and wear on Interposers.

These specifications also time initial leftward movement of Code Slides to occur early during the print cycle so that Code Slides complete their movement to the left before Selection Slide Detents lock in Selection Slides for Printer coding.





CODE SET CHECKS

Code Set Checks on the following four pages verify correct movement and detenting of Vertical and Horizontal Selection Slides for correct coding of the Printer Mechanism during a print cycle. They are useful for determining whether incorrect character selection is due to improper code setting during Keyaction movements, or faulty operation of the Printer mechanism.

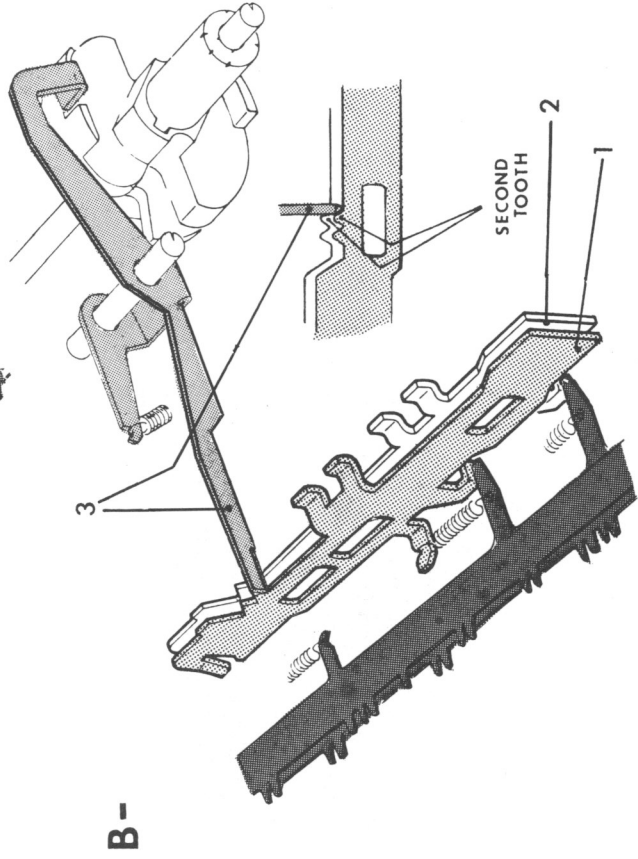
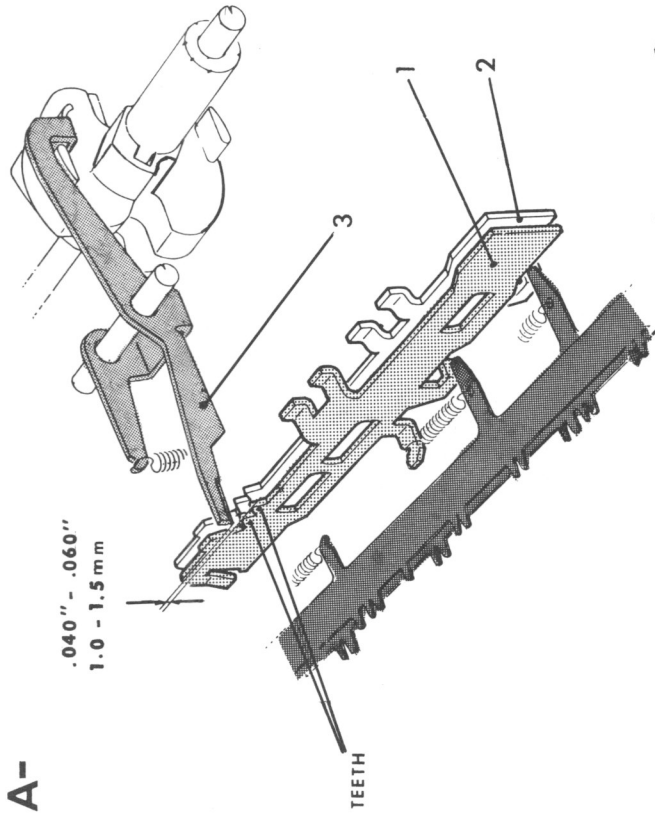
The Code Set Check Requirements are not obtained through standard adjustments, but, rather, depend on proper functioning of parts built and assembled to specification. Failure to meet a requirement requires careful evaluation of parts and movements to determine cause, which will likely be an unhooked spring, or binding, worn, loose, missing, bent, or broken parts.

1. Operation of VERTICAL SELECTION SLIDE DETENT (3).

REQUIREMENT:

- A) Depress Interposer #45, and rotate Print Cam Shaft just until VERTICAL SELECTION SLIDES (1) & (2) stop moving to the left: There should be .040"-.060" clearance between VERTICAL SELECTION SLIDE DETENT (3) and Teeth of Selection Slides.
- B) Depress Interposer #45, and rotate Print Cam Shaft until VERTICAL SELECTION SLIDE DETENT (3) drops to engage VERTICAL SELECTION SLIDES (1) & (2): DETENT (3) should drop just to the right of the second Tooth of Selection Slides.

ACCESS: Remove Keyboard.



CODE SET CHECKS

2. Lateral movement of Vertical Selection Slides.

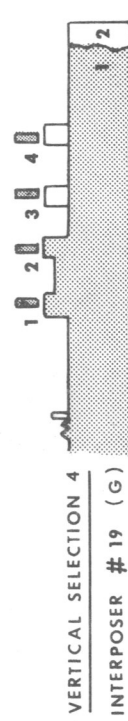
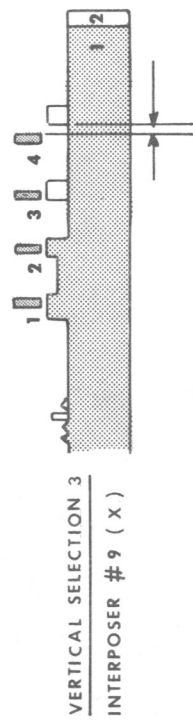
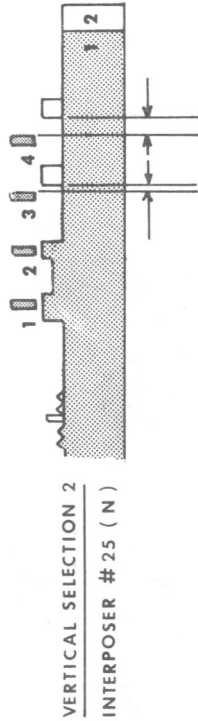
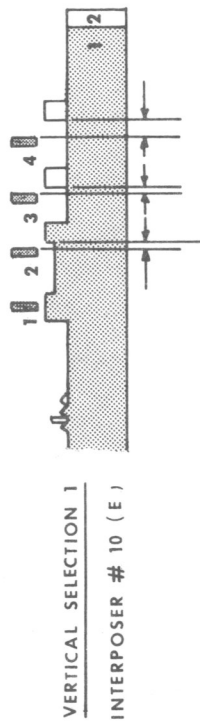
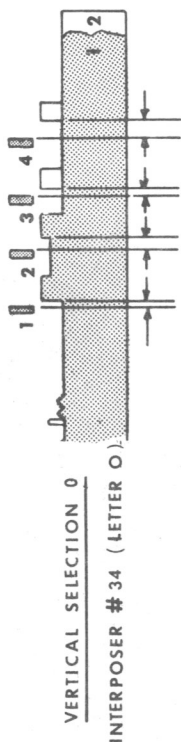
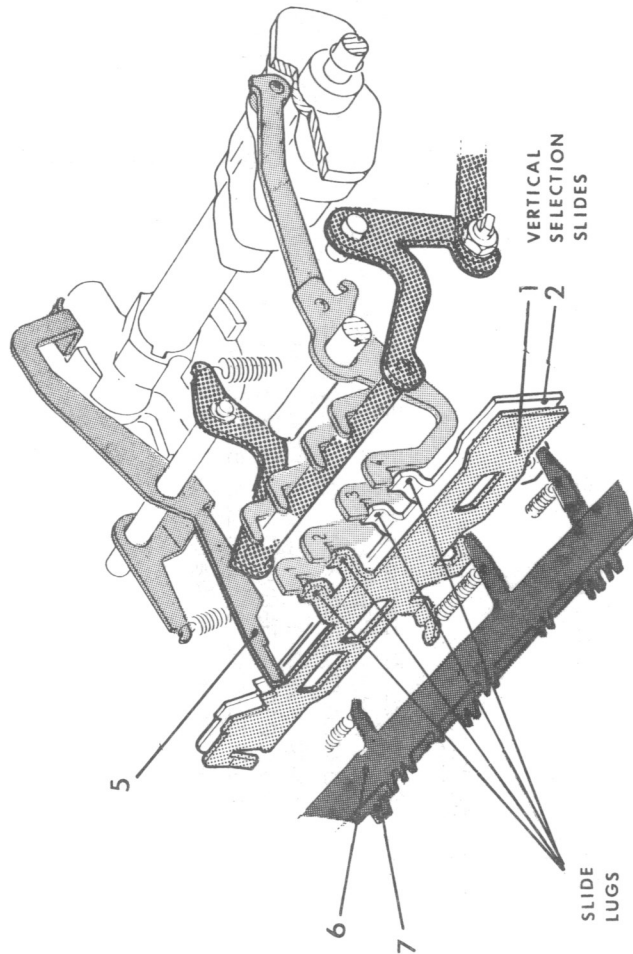
**REQUIREMENT:** During a print cycle, CODE SLIDES [6] & [7] should position #1 & 2 Vertical Selection Slides for correct vertical coding of the Printer unit.

**TO CHECK:** Depress the Interposer indicated next to the illustrations at the right. For Keyboards other than 1063, use an Interposer that commands the corresponding vertical selection (see Character Selection Chart). Rotate Print Cam Shaft just until SLIDE DETENT [5] engages Selection Slides: Vertical Selection Slide Lugs should be positioned (right to left) as illustrated in respect to VERTICAL SELECTION LEVERS [1] [2] [3] [4].

**NOTE:** Position of Selection Slides should be the same when checked with any character from the corresponding vertical selection.

**ACCESS:** Remove Keyboard.

**NOTE:** If VERTICAL SELECTION LEVERS [1] [2] [3] [4] interfere with Selection Slide movement, check Printer Adjustment #17.



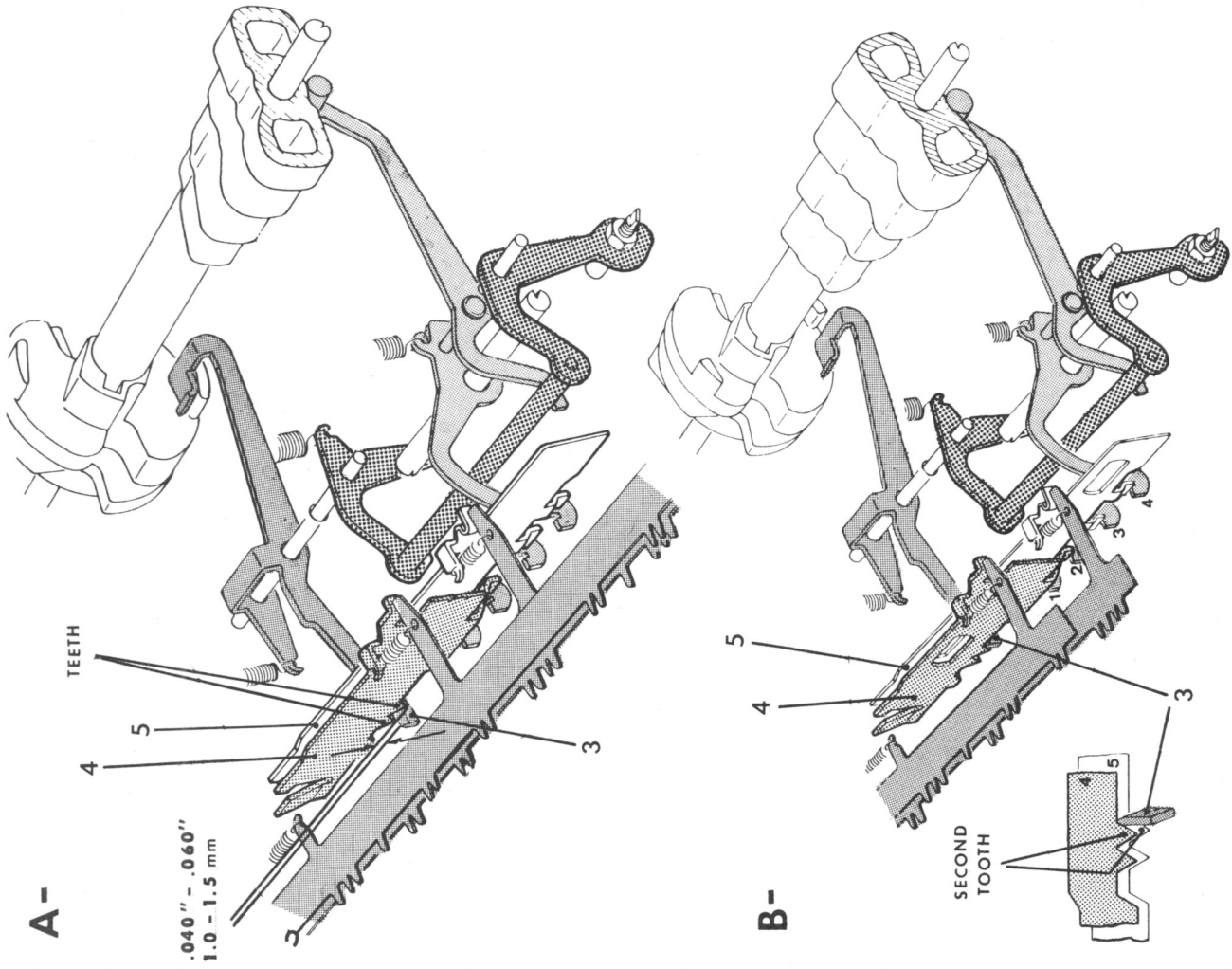
3. Operation of HORIZONTAL SELECTION SLIDE DETENT (3).

REQUIREMENT:

A) Depress Interposer #45 (Repeat Key), and rotate Print Cam Shaft just until HORIZONTAL SELECTION SLIDES (4) (5) stop moving to the left: There should be .040"-.060" clearance between HORIZONTAL SELECTION SLIDE DETENT (3) and Teeth of Selection Slides.

B) Depress Interposer #45, and rotate Print Cam Shaft until HORIZONTAL SELECTION SLIDE DETENT (3) engages HORIZONTAL SELECTION SLIDES (4) (5): DETENT (3) should make contact just to the right of the second Tooth of Selection Slides.

ACCESS: Tip machine up and view from bottom.



CODE SET CHECKS

4. Lateral movement of Horizontal Selection Slides.

**REQUIREMENT:** During a print cycle, CODE SLIDES [7] & [8] should position #4 & 5 Horizontal Selection Slides for correct horizontal coding of the Printer unit.

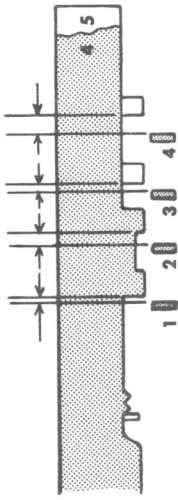
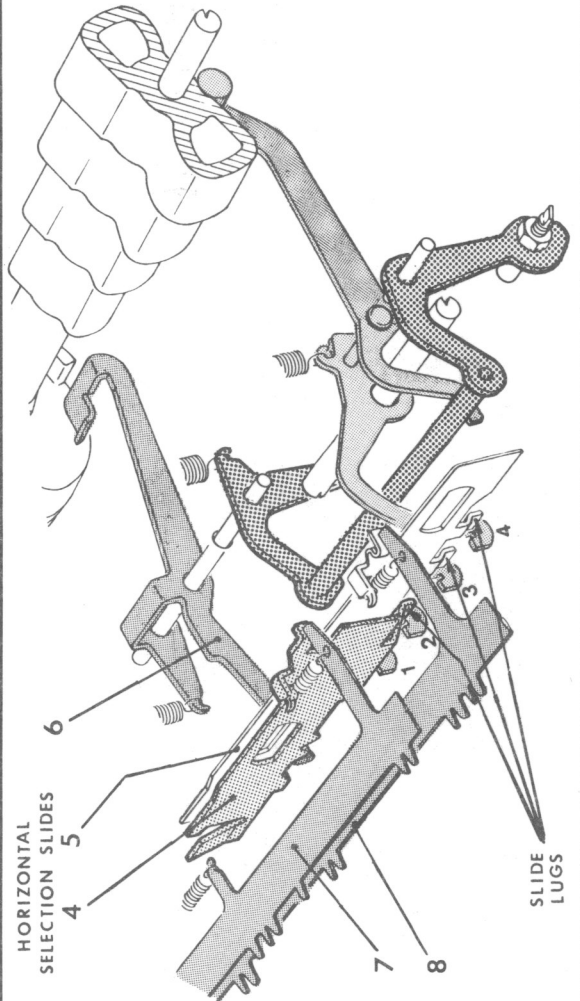
**TO CHECK:** Depress the Interposer indicated next to the illustrations at the right. For Keyboards other than 1063, use an Interposer that commands the corresponding horizontal selection (see Character Selection Chart).

Rotate Print Cam Shaft just until SLIDE DETENT [6] engages Selection Slides. Horizontal Selection Slide Lugs should be positioned (right to left) as illustrated in respect to HORIZONTAL SELECTION LEVERS [1] [2] [3] [4].

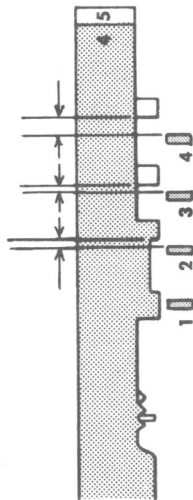
**NOTE:** Position of Selection Slides should be the same when checked with any character from the corresponding horizontal selection.

**ACCESS:** Tip machine up and view from bottom.

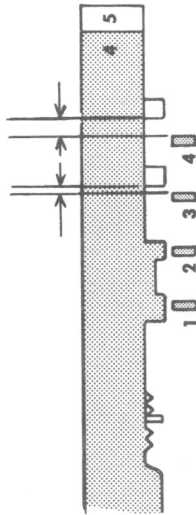
**NOTE:** IF HORIZONTAL SELECTION LEVERS [1] [2] [3] [4] interfere with Selection Slide movement, check Printer Adjustment #9.



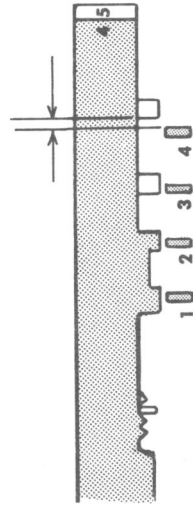
HORIZONTAL SELECTION 0  
INTERPOSER # 34 ( LETTER O )



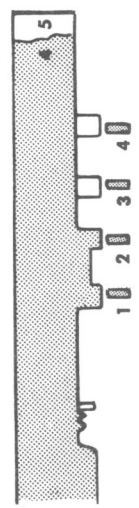
HORIZONTAL SELECTION 1  
INTERPOSER # 3 ( A )



HORIZONTAL SELECTION 2  
INTERPOSER # 13 ( C )



HORIZONTAL SELECTION 3  
INTERPOSER # 31 ( K )



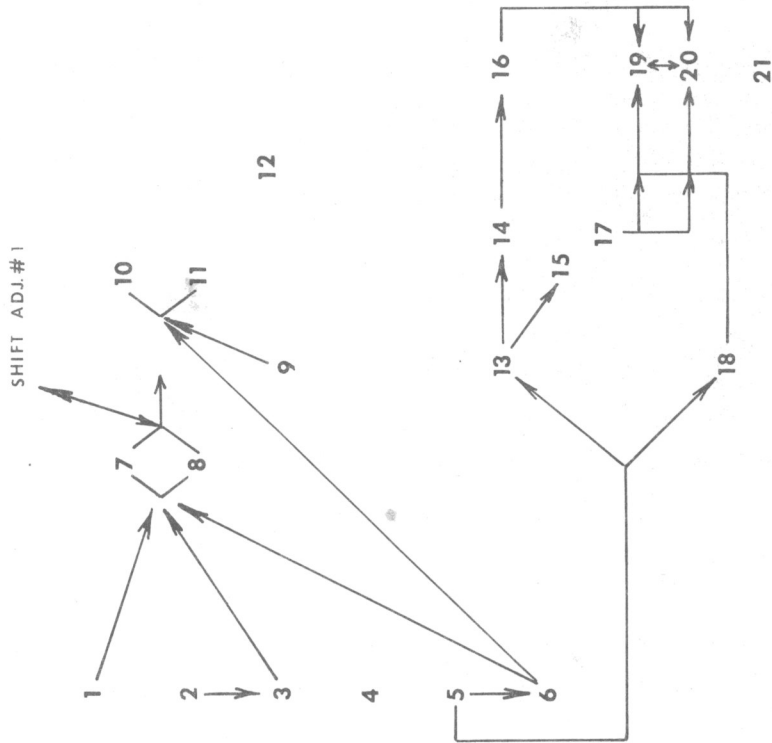
HORIZONTAL SELECTION 4  
INTERPOSER # 8 ( NO. 3 )



PRINTER ADJUSTMENTS

1. Planetary Gear Mesh with Drive Gear and Control Sector.
2. Centering the Typing Element Support with minimum end play.
3. Centering the Starwheel Detent.
4. End play of Typing Element Support Group.
5. Rest position of Element Support Group.
6. Mesh between Drive Gear and Element Pinion.
7. Centering the Starwheel in Lower Case.
8. Centering the Starwheel in Upper Case.
9. Rest position of Horizontal Drive Frame.
10. Amount of horizontal rotation in a clockwise direction.
11. Amount of horizontal rotation in a counterclockwise direction.
12. Lateral position of Horizontal Selection Links during clockwise and counterclockwise selection.
13. Timing Starwheel Detent engagement with Starwheel.
14. Timing Vertical Detent engagement with Element Support.
15. Timing Fine Detent engagement with Typing Element.
16. Type on feet (top to bottom).
17. Rest position of Vertical Drive Frame.
18. Mesh between Drive Gear Sector and Vertical Control Sector.
19. Vertical rest position of Typing Element Support.
20. Amount of vertical rotation.
21. Damping the printing action for impression.

PRINTER



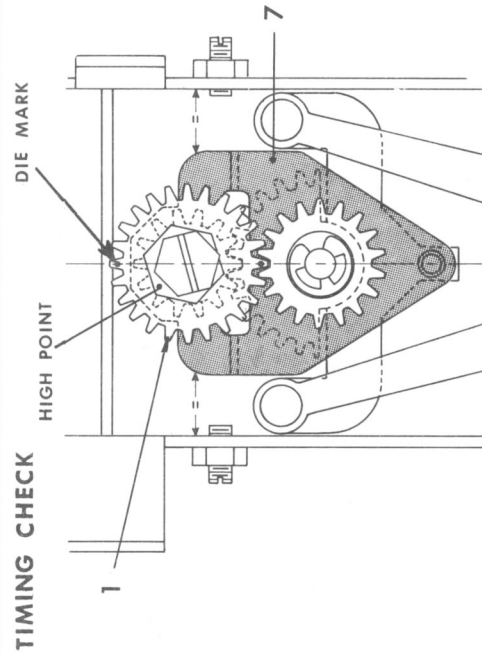
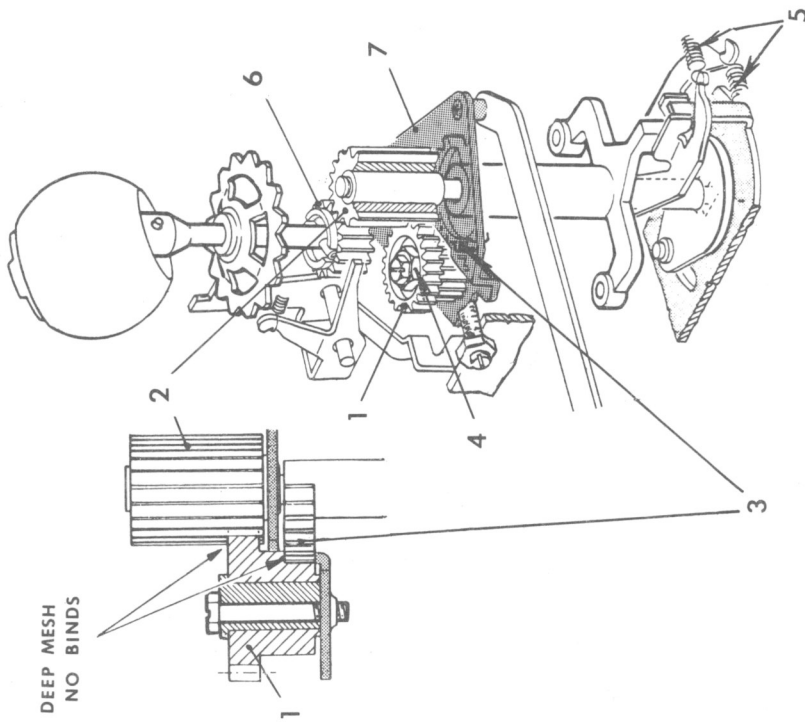
1. PLANETARY GEAR [1] mesh with DRIVE GEAR [2] & CONTROL SECTOR [3].  
REQUIREMENT: PLANETARY GEAR [1] should mesh as deep as possible with DRIVE GEAR [2] and CONTROL SECTOR [3] without binding rotation of Gears. NOTE: Gear drag is acceptable providing Gears smoothly rotate--see Note on Adjustment #6.

TO CHECK: With machine at rest, unhook Centering Lever SPRINGS [5]. Rotate DRIVE GEAR [2] counterclockwise and back to home; then push Selection Slide #3 to the left, and rotate Drive Gear clockwise and back to home. Shift to upper case and repeat. At various points hold PLANETARY GEAR [1] and lightly rotate DRIVE GEAR [2] to check for minimal play, or to determine if bind is due to mesh between Planetary Gear and Drive Gear. Likewise, hold CONTROL SECTOR [3] and lightly rotate PLANETARY GEAR [1] to check for minimal play or to determine if bind is due to mesh between Planetary Gear and Control Sector. Rehook SPRINGS [5].

ADJUSTMENT: Loosen Lock Screw and regulate ECCENTRIC NUT [4] to move Planetary Gear toward or away from Drive Gear and Control Sector. High point of Eccentric should favor left side of machine. Form SUPPORT PLATE [7] at form if necessary to equalize Planetary Gear mesh with Drive Gear and Control Sector.  
ADJUSTMENT ACCESS: Remove Element Support Group.

PLANETARY GEAR TIMING CHECK: With SHIFT SUPPORT PLATE [7] at lower case rest position, depress Shift Release Bridge to actuate a Shift cycle, and rotate Print Cam Shaft Pulley until SHIFT SUPPORT PLATE [7] is centered between walls of Printer Housing. At this point, the two Planetary Gear Teeth with die marks should align at 12 o'clock and 6 o'clock. If they do not, remove Lock Screw and ECCENTRIC NUT [4], and reinstall Planetary Gear.

NOTE: The die marks identify the two teeth of the upper gear that directly align with two teeth of the bottom gear. Correct Planetary Gear alignment orients DRIVE GEAR [2] to provide an even range of adjustment for upper and lower case rest positions of SHIFT SUPPORT PLATE [7]--Adjustments #7 & 8.





PRINTER ADJUSTMENTS

2. Centering the Typing Element Support (3) with minimum end play.

REQUIREMENT:

A) With FINE DETENT (5) engaged with Element, STARWHEEL (1) should not move when ELEMENT SUPPORT (3) is rotated from vertical position 0 to position 4.  
NOTE: Element Support must be lightly held against RIGHT PIVOT SCREW (2) when checking requirement.

NOTE: Slight movement of STARWHEEL (1) not exceeding .004" is acceptable.

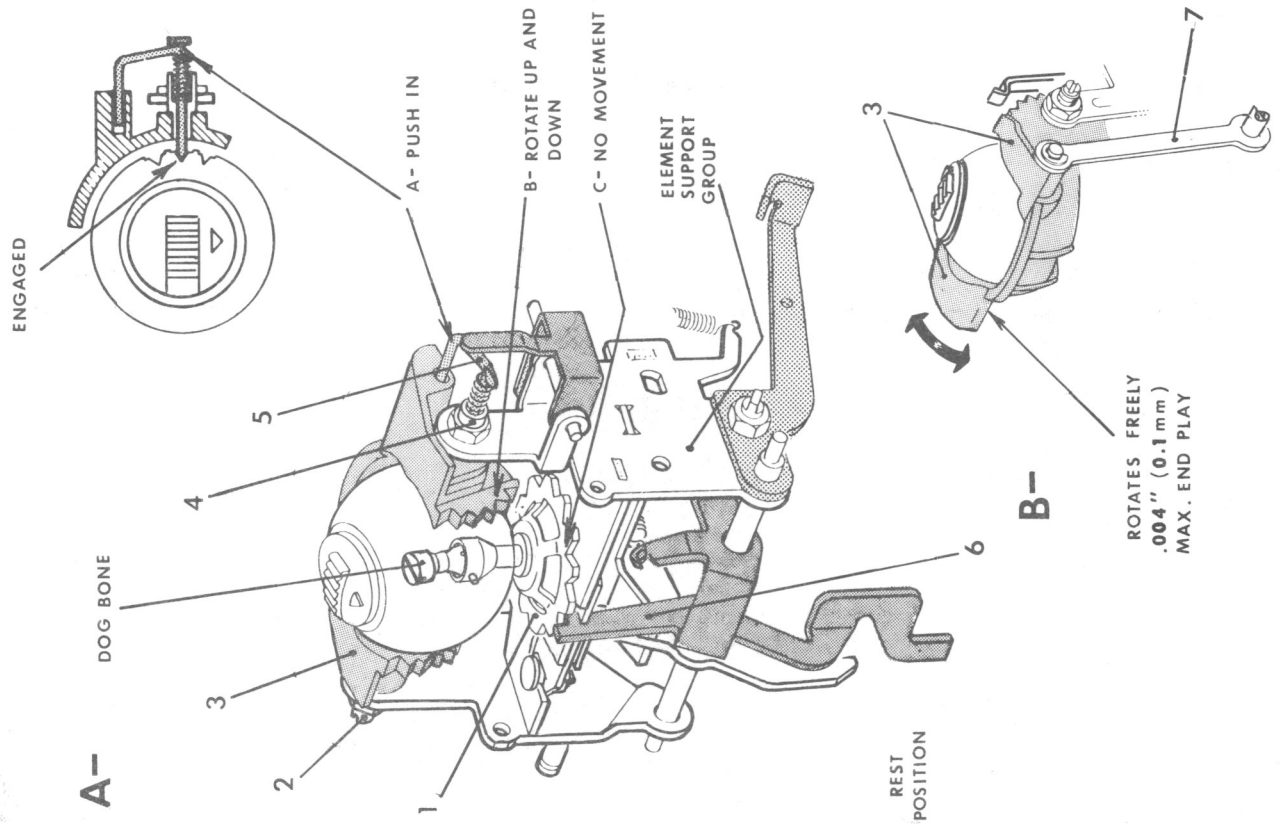
TO CHECK with Element Support Group removed: Lift Detent Control Lever to disengage Detents. Push FINE DETENT (5) to engage Element, and rotate ELEMENT SUPPORT (3) to check requirement.

TO CHECK with Element Support Group in machine: For accurate check, unhook Centering Lever Springs and check that there are no binds in Element rotation (see checking procedure for Adjustment #6). With machine at rest, disconnect ELEMENT SUPPORT LINK (7). Push FINE DETENT (5) to engage Element, and rotate ELEMENT SUPPORT (3) to check requirement.

B) ELEMENT SUPPORT (3) should rotate freely up and down with no more than .004" end play. To check freeness, disconnect LINK (7) and pivot Element Support.

ADJUSTMENT: Loosen Lock Nut and regulate RIGHT PIVOT SCREW (2) to position Element Support. (Req. A). At the same time, loosen Lock Nut and regulate LEFT PIVOT SCREW (4) to maintain minimum end play and freeness of Element Support.

NOTE: If Requirement A cannot be obtained, check Dog Bone and related parts.



### 3. Centering the STARWHEEL DETENT (1).

**REQUIREMENT:** With ELEMENT SUPPORT (4) in vertical position 2 and FINE DETENT (5) engaged with Typing Element, STARWHEEL DETENT (1) should be centered with "V" Notch of STARWHEEL (2) so that left and right play of Starwheel is equal in respect to Starwheel Detent. To check equal play, lightly take up Starwheel play in one direction, then in opposite direction.

#### TO CHECK with Element Support Group removed:

Rotate Element Support to vertical position 2. Pivot Starwheel Detent slightly away from Starwheel and check requirement.

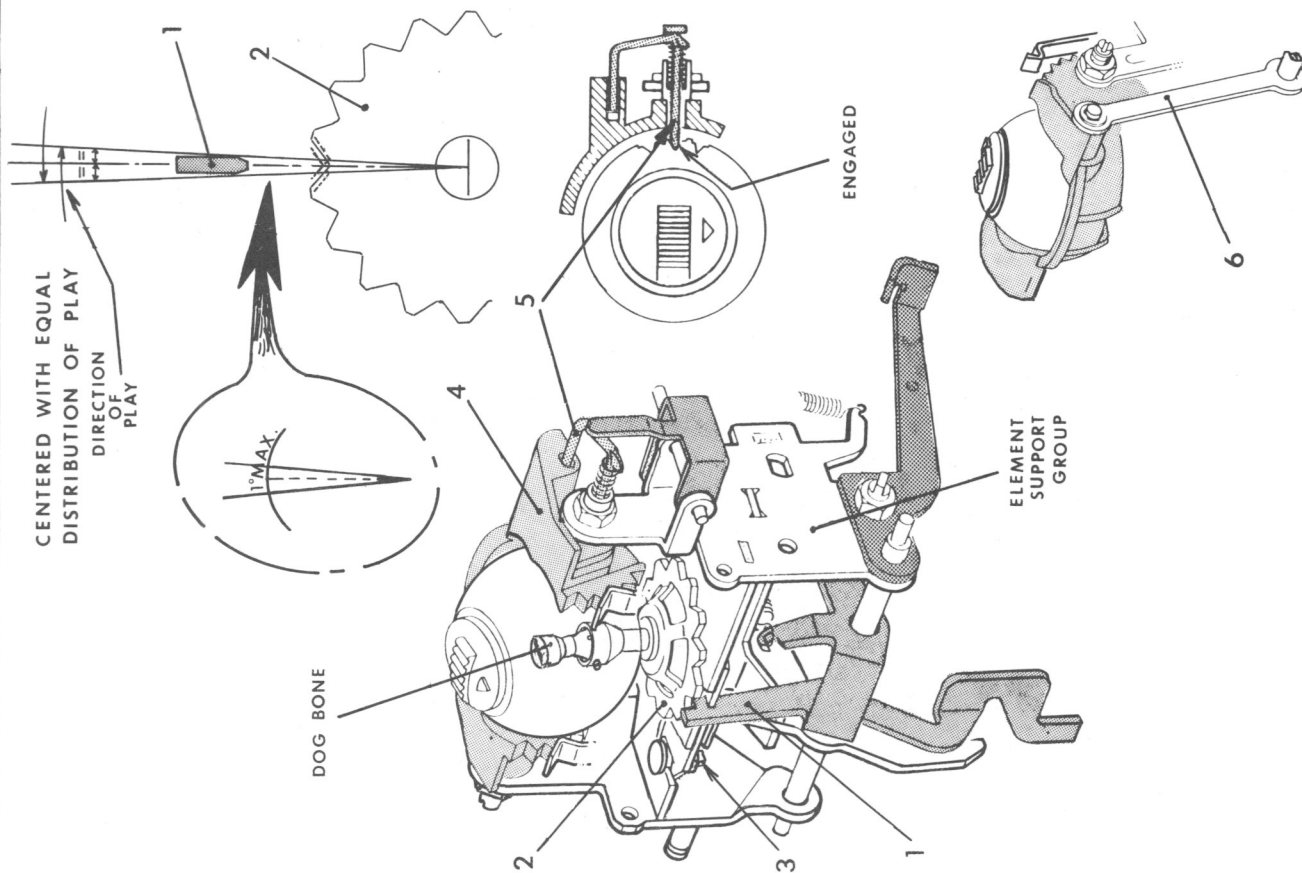
#### TO CHECK with Element Support Group in machine:

Unhook Centering Lever Springs. Remove Vertical Detent for visual access to Starwheel and Starwheel Detent. With machine at rest, rotate Element Support to approximate vertical position 2. Push FINE DETENT (5) to engage Element; check requirement. Rehook Springs.

**NOTE:** If Starwheel play exceeds  $1^{\circ}$  with Fine Detent engaged, check Dog Bone and related parts.

**ADJUSTMENT ACCESS:** Remove Element Support Group.

**ADJUSTMENT:** Loosen Lock Nut and regulate ECCENTRIC (3) to move STARWHEEL DETENT (1) left and right.



PRINTER ADJUSTMENTS

4. End play of Typing Element Support Group.

REQUIREMENT: ELEMENT SUPPORT GROUP (2) should pivot freely with no more than .004" end play.

TO CHECK: Depress an Interposer and rotate

Print Cam Shaft to point of print impact.

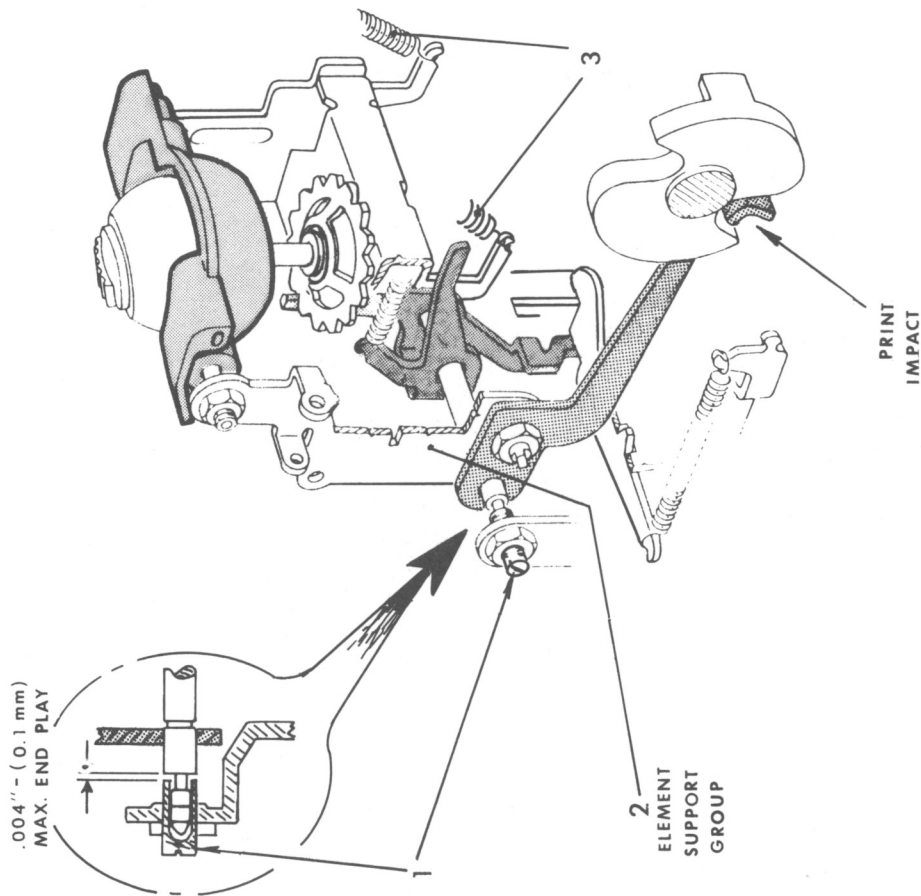
Unhook IMPACT SPRINGS (3). Move Element

Support Group forward and rearward to check

for free movement. Move Group right and

left to check for excess play.

ADJUSTMENT: Loosen Lock Nut and regulate Element Support Group PIVOT SCREW (1). Rehook Impact Springs.

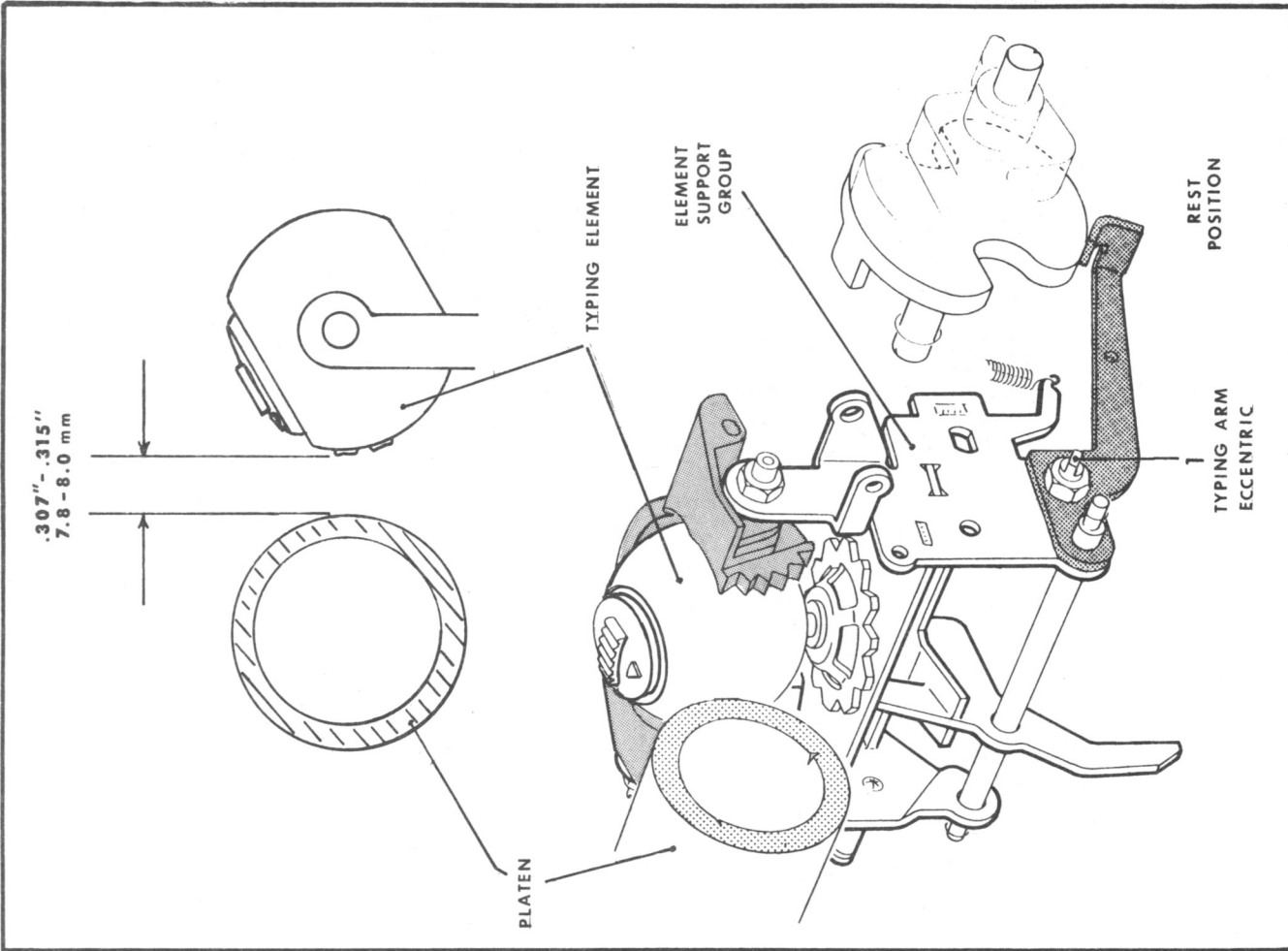


PRINTER ADJUSTMENTS

5. Rest position of Element Support Group.

**REQUIREMENT:** In rest position there should be .307"-.315" clearance between Type Face and Platen.

**ADJUSTMENT:** Loosen Lock Nut and regulate Typing Arm Eccentric (1) to move Element Support Group toward or away from Platen.



PRINTER ADJUSTMENTS

6. Mesh between DRIVE GEAR (2) and ELEMENT PINION (1).

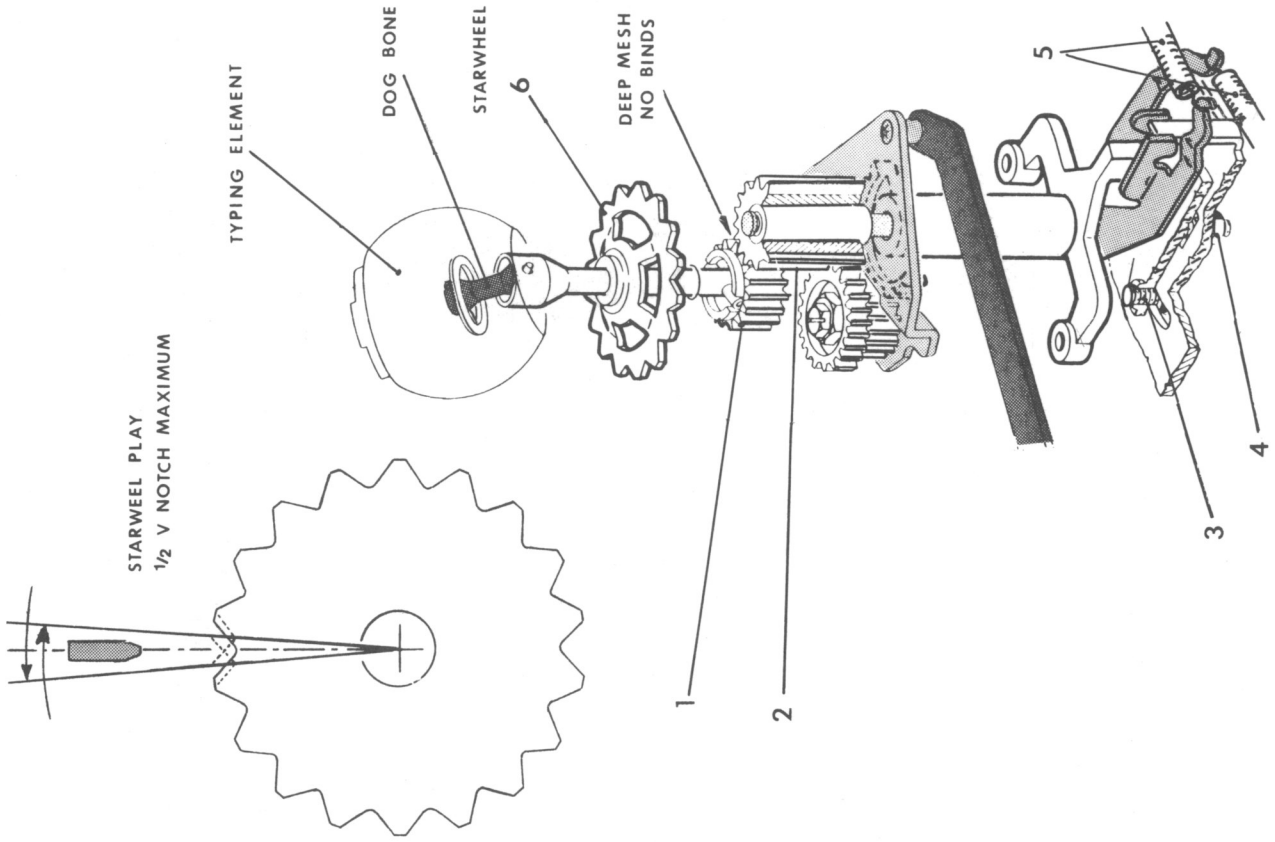
**REQUIREMENT:** DRIVE GEAR (2) should mesh as deep as possible with ELEMENT PINION (1) without binding rotation of Gears.

**TO CHECK:** With machine at rest, unhook CENTERING LEVER SPRINGS (5). To check movement, rotate Element clockwise and back to home; then push Selection Slide #3 to the left, and rotate Element counterclockwise and back to home. Shift to upper case and repeat. At various points, hold DRIVE GEAR (2) with Spring Hook, and lightly rotate Starwheel to check for minimal play or to determine if bind is due to mesh between Drive Gear and Element Pinion.

**ADJUSTMENT:** Loosen NUT (4) slightly, and loosen SCREW (3) just so it will move in its Guide Slot. Move SCREW (3) left for deeper mesh, right to increase play. Tighten Nut then Screw; check requirement. Mesh is not established until NUT (4) is tight. Hook SPRINGS (5).

**NOTE:** With machine at rest, total STARWHEEL (6) play should be 1/4 to 1/2 of a "V" notch of the Starwheel. Determine source of excess play per Adjustments #1 & 6.

Gear drag is acceptable providing Gears and Element smoothly rotate, especially when returning to rest position. Check during a slow manual shift and character selection (maximum horizontal rotation, clockwise/counterclockwise, upper & lower case). Adjust to remove backlash--do not load gears on their pivots.



PRINTER ADJUSTMENTS

7. Centering the Starwheel in Lower Case.

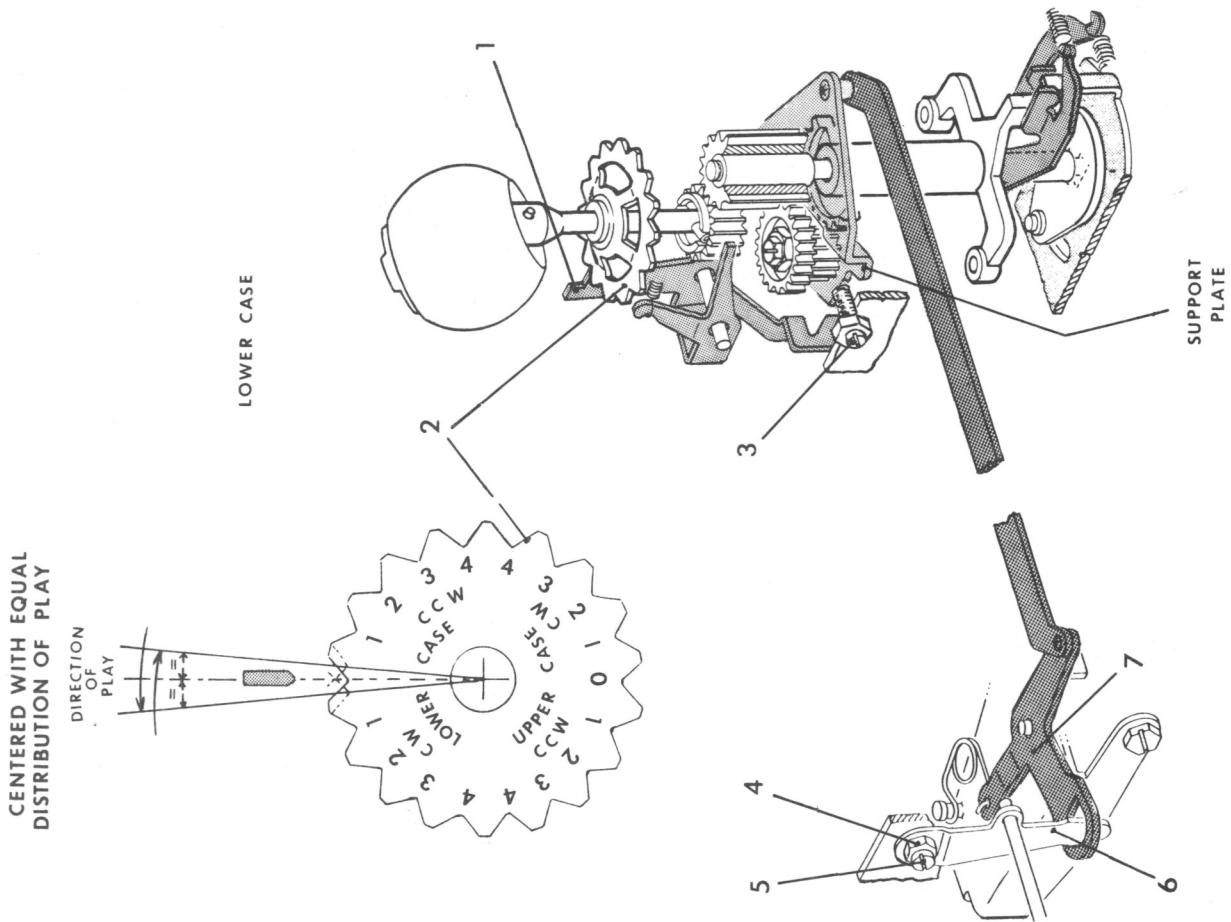
Shift Adjustment #1 must be correct before checking requirement.

**REQUIREMENT:** With Shift in lower case and all parts at rest, "V" Notch of STARWHEEL (2) should be centered with STARWHEEL DETENT (1) so that left and right play of Starwheel is equal in respect to Starwheel Detent. To check, lightly take up Starwheel play in one direction, then in opposite direction.

**ACCESS:** Remove Vertical Detent for visual access to Starwheel and Starwheel Detent.

**ADJUSTMENT:** Loosen Lock Nut and regulate LEFT SUPPORT PLATE ADJUSTING SCREW (3) to establish lower case rest position of Starwheel.

**NOTE:** If SHIFT LEVER (6) contacts SHIFT LEVER BELLCRANK (7) during adjustment, loosen SCREW (5), and regulate ECCENTRIC (4) to center Shift Lever in hole of Bellcrank.



PRINTER ADJUSTMENTS

8. Centering the Starwheel in Upper Case.

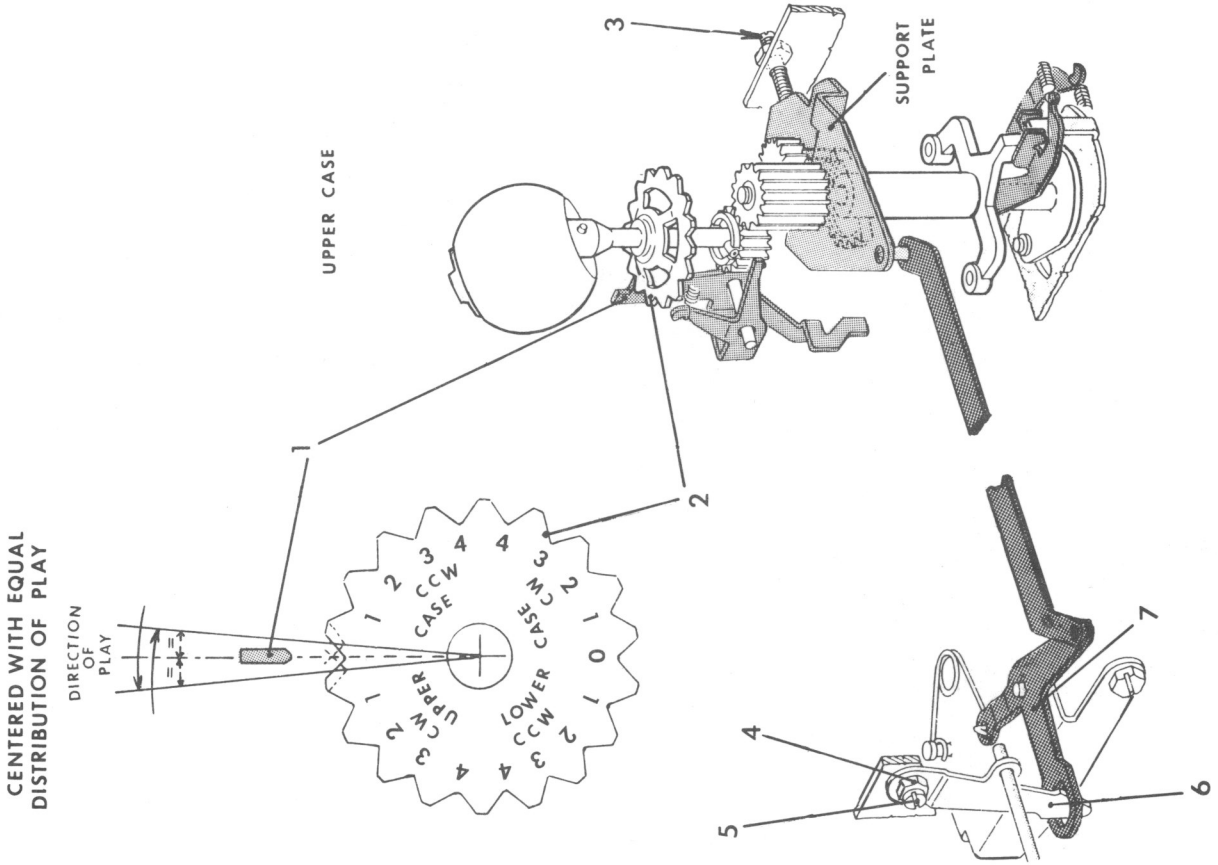
Shift Adjustment #1 must be correct before checking requirement.

REQUIREMENT: With Shift in upper case and all parts at rest, "V" Notch of STARWHEEL (2) should be centered with STARWHEEL DETENT (1) so that left and right play of Starwheel is equal in respect to Starwheel Detent. To check, lightly take up Starwheel play in one direction, then in opposite direction.

ACCESS: Remove Vertical Detent for visual access to Starwheel and Starwheel Detent.

ADJUSTMENT: Loosen Lock Nut and regulate RIGHT SUPPORT PLATE ADJUSTING SCREW (3) to establish upper case rest position of Starwheel.

NOTE: If SHIFT LEVER (6) contacts SHIFT LEVER BELL-CRANK (7) during adjustment, loosen SCREW (5), and regulate ECCENTRIC (4) to center Shift Lever in hole of Bellcrank.



PRINTER ADJUSTMENTS

9. Rest position of Horizontal Drive Frame.

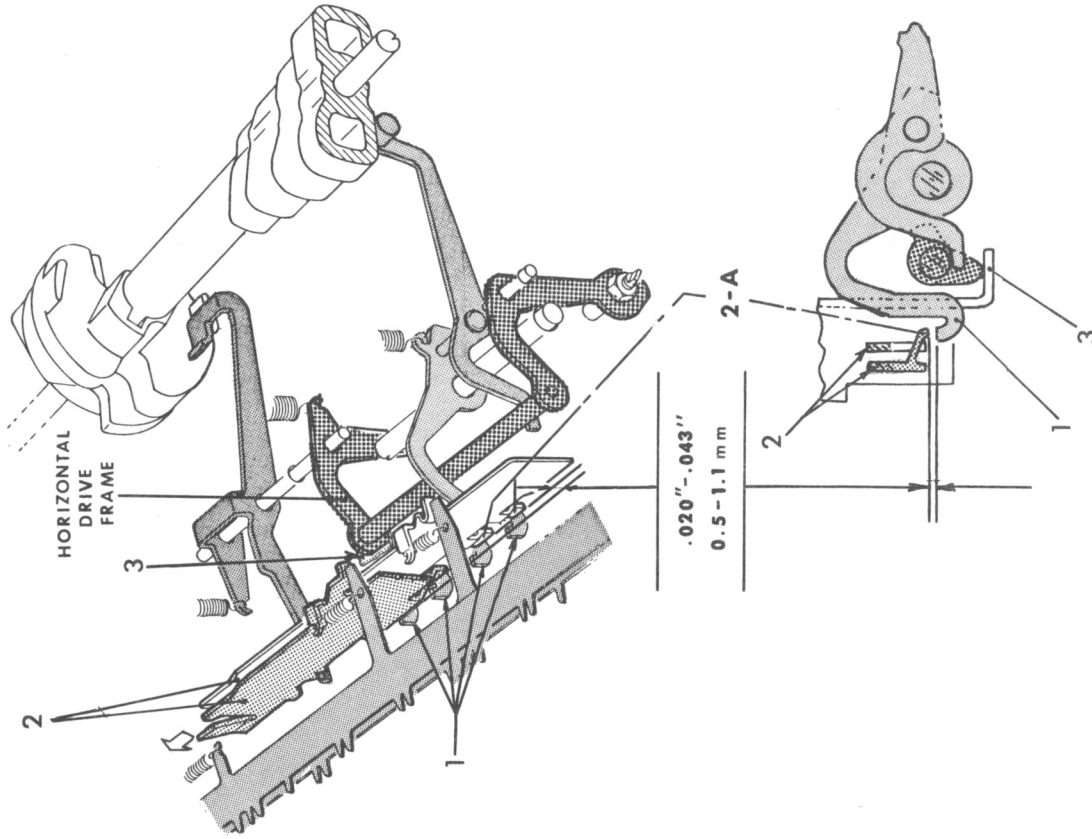
**REQUIREMENT:** There should be .020"-.043" clearance between HORIZONTAL SELECTION LEVERS (1) and SELECTION SLIDE LUGS (2-A) during leftward movement of #4 and 5 HORIZONTAL SELECTION SLIDES (2).

**TO CHECK:** Depress Interposer #45 (Repeat Key), and slowly rotate Print Cam Shaft just until left edges of LUGS (2-A) pass over opposite SELECTION LEVERS (1). Verify clearance by checking for up-play on LEVERS (1).

**ACCESS:** Tip machine up and view Selection Slides and Levers from the bottom.

**ADJUSTMENT:** Form HORIZONTAL DRIVE FRAME DOWN STOP (3) up to increase clearance, down to decrease clearance.

**NOTE:** DOWN STOP (3) is a projecting lug on the Selection Slide Support.





PRINTER ADJUSTMENTS

10. Amount of horizontal rotation in a clockwise direction.

**REQUIREMENT:**

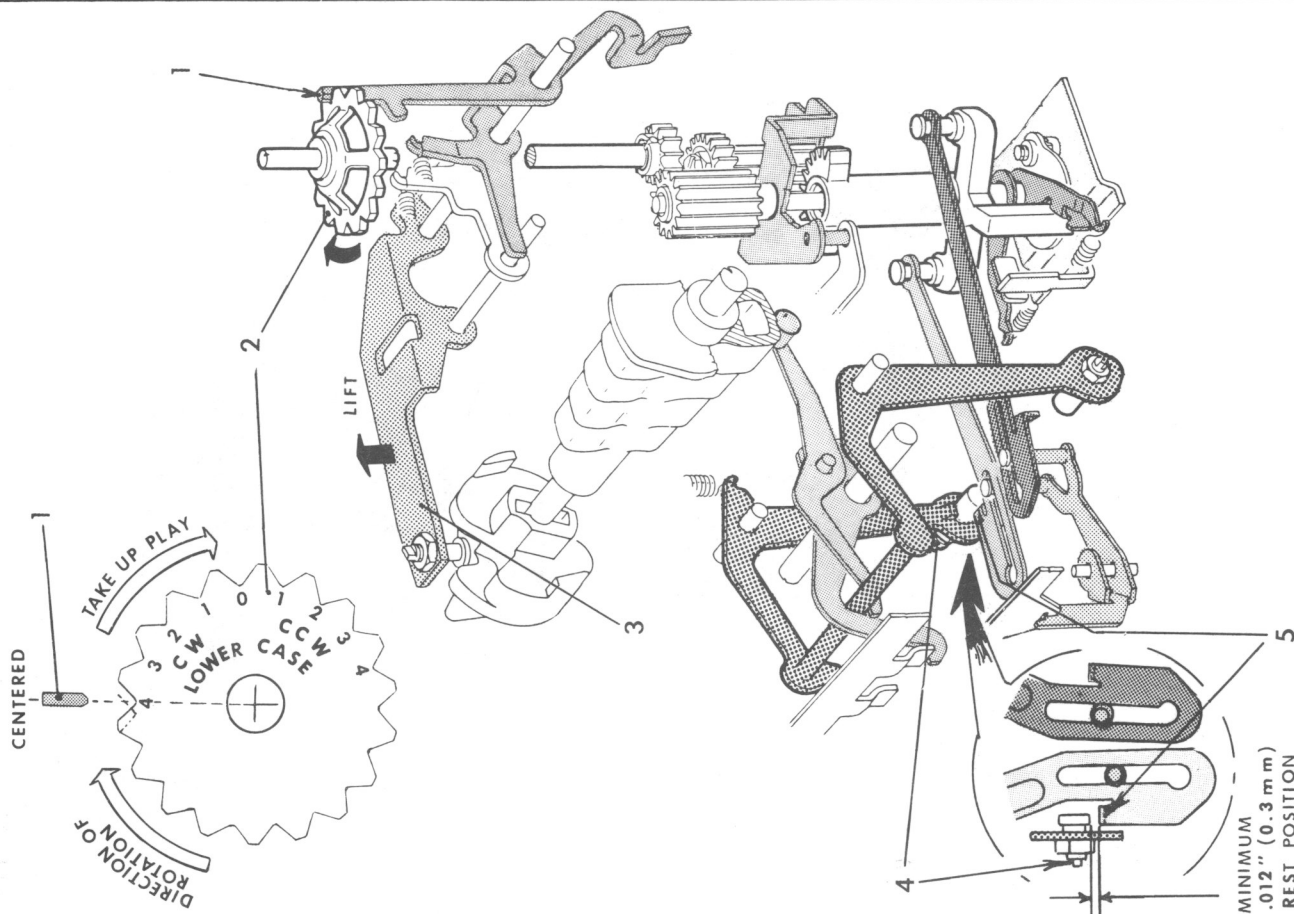
A) With Shift in lower case, depress an Interposer that commands maximum clockwise horizontal rotation [#43 on 1063 Keyboards--see Character Selection Chart]. Rotate Print Cam Shaft to point of print impact. Push Element Support Group forward, and lift DETENT CONTROL LEVER (3) so that STARWHEEL DETENT (1) disengages STARWHEEL (2): "v" of Starwheel Notch #CW4 should be centered opposite STARWHEEL DETENT (1), with Starwheel play taken up in a clockwise direction.

**NOTE:** Starwheel rotation should be the same when requirement is checked with any character requiring maximum clockwise horizontal rotation. If result varies with vertical movement, check Adjustment #2. If result does not correspond in upper case, check Adjustments #7 & 8.

B) In rest position, there should be at least .012" clearance between LEFT HORIZONTAL CONTROL ECCENTRIC (4) and LEFT SELECTION LINK (5).

**ACCESS:** Remove Vertical Detent for visual access to Starwheel and Starwheel Detent.

**ADJUSTMENT:** Loosen Lock Nut and regulate LEFT HORIZONTAL CONTROL ECCENTRIC (4) to increase or decrease clockwise rotation of Starwheel. If a minimum of .012" clearance (Requirement B) cannot be maintained during this adjustment, remake Adjustment #9 to the minimum specification (.020").



11. Amount of horizontal rotation in a counterclockwise direction.

**REQUIREMENT:**

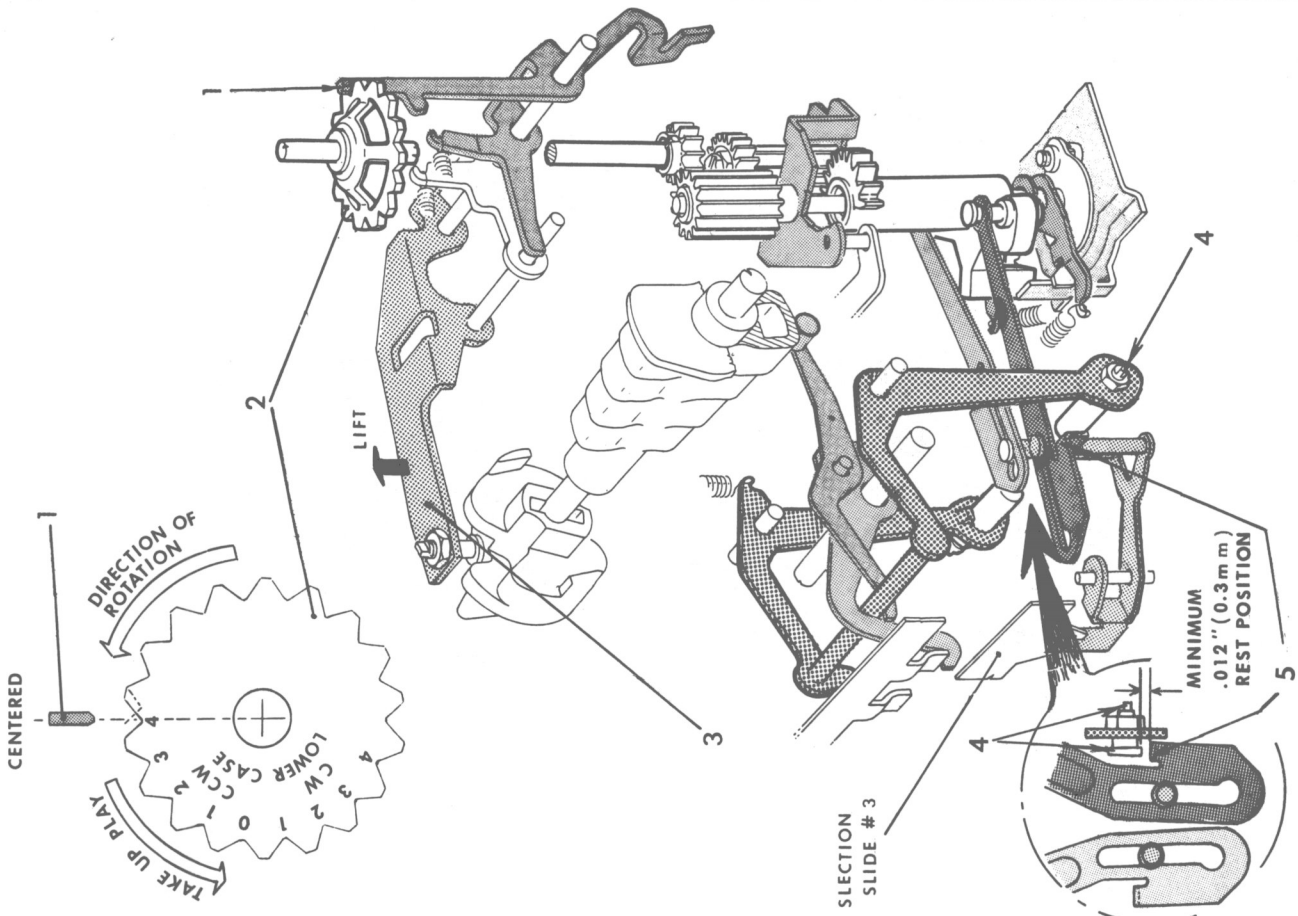
A) With Shift in lower case, depress Interposer #45 (Repeat Key), and rotate Print Cam Shaft to point of print impact. Push Element Support Group forward, and lift DETENT CONTROL LEVER (3) so that STARWHEEL DETENT (1) disengages STARWHEEL (2): "V" of Starwheel Notch #CCW4 should be centered opposite STARWHEEL DETENT (1), with Starwheel play taken up in a counterclockwise direction.

**NOTE:** Starwheel rotation should be the same when requirement is checked with any character requiring maximum counterclockwise horizontal rotation (see Character Selection Chart). If result varies with vertical position, check Adjustment #2. If result does not correspond in upper case, check Adjustments #7 & 8.

B) There should be at least .012" clearance between RIGHT HORIZONTAL CONTROL ECCENTRIC (4) and RIGHT SELECTION LINK (5) when machine is at rest and Selection Slide #3 is pushed to the left.

**ACCESS:** Remove Vertical Detent for visual access to Starwheel and Starwheel Detent.

**ADJUSTMENT:** Loosen Lock Nut and regulate RIGHT HORIZONTAL CONTROL ECCENTRIC (4) to increase or decrease counterclockwise rotation of Starwheel. If a minimum of .012" clearance (Requirement B) cannot be maintained during this adjustment, remake Adjustment #9 to the minimum specification (.020").



PRINTER ADJUSTMENTS

12. Lateral position of HORIZONTAL SELECTION LINKS (4) and (8) for clockwise and counterclockwise selection.

REQUIREMENT:

A) During a clockwise selection, LEFT SELECTION LINK LUG (4-A) should have full coverage on LEFT HORIZONTAL CONTROL ECCENTRIC (2) without contacting ARM (6-B) of HORIZONTAL DRIVE FRAME (6).

TO CHECK: Depress an Interposer that commands a clockwise selection, and rotate Print Cam Shaft until HORIZONTAL SELECTION SLIDE DE- TENT (1) engages #3 HORIZONTAL SELECTION SLIDE (3). Check requirement.

B) During a counterclockwise selection, RIGHT SELECTION LINK LUG (8-A) should have full coverage on RIGHT HORIZONTAL CONTROL ECCENTRIC (7) without contacting ARM (6-A) of HORIZONTAL DRIVE FRAME (6).

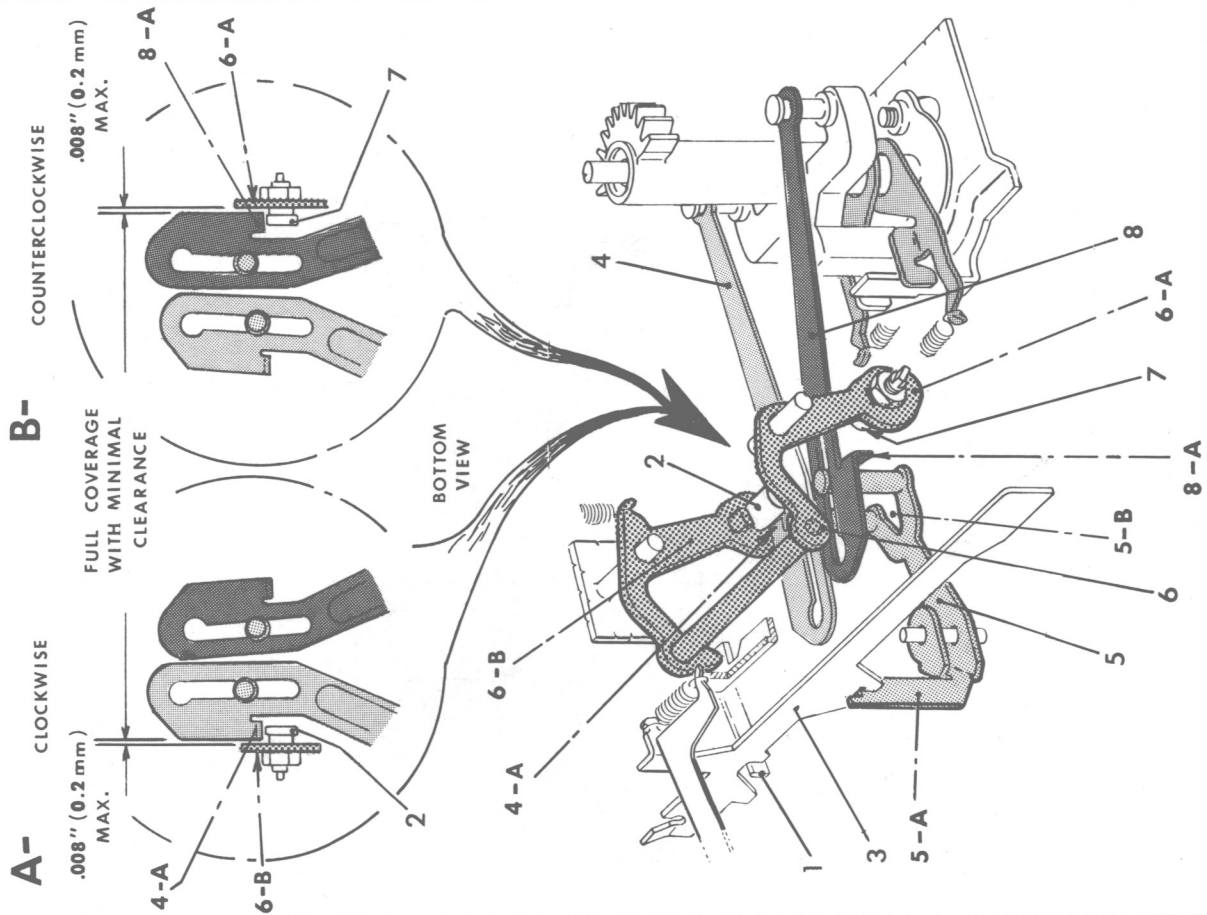
TO CHECK: Repeat above checking procedure using Interposer #45 (Repeat Key).

NOTE: Coverage A should approximately equal coverage B.

ACCESS: Tip machine up and view from bottom.

ADJUSTMENT: Support SELECTION SLIDE BELLCRANK (5) and form BELLCRANK ARM (5-A) left or right to equalize coverage.

NOTE: If necessary, open or close BELLCRANK SLOT (5-B) to increase or decrease total left and right coverage. Do not distort Bellcrank. Check free movement of Bellcrank and LINKS (4) (8).

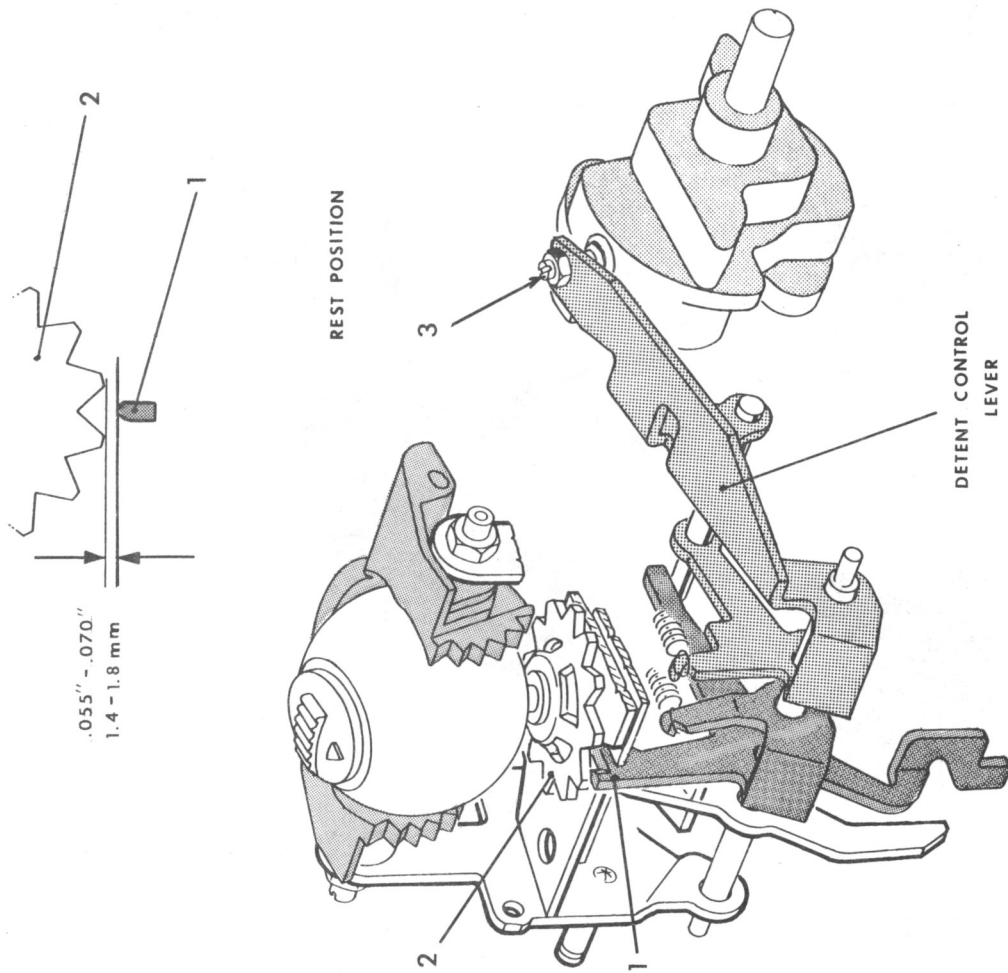


13. Timing Starwheel Detent engagement with Starwheel.

REQUIREMENT: In rest position, there should be .055"-.070" clearance between STARWHEEL DETENT (1) and teeth of STARWHEEL (2) as illustrated.

ACCESS: Remove Vertical Detent to measure clearance.

ADJUSTMENT: Loosen Lock Nut and regulate DETENT CONTROL LEVER ADJUSTING SCREW (3) to move Starwheel Detent toward or away from Starwheel.



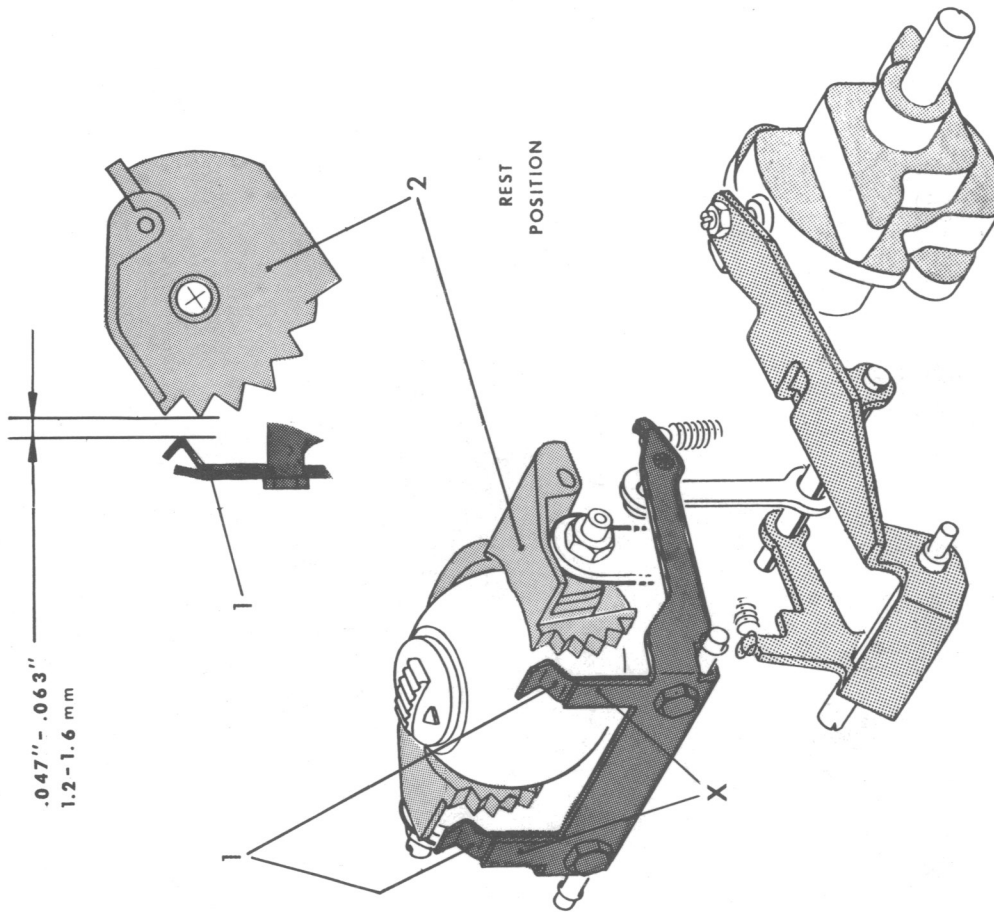
PRINTER ADJUSTMENTS

14. Timing Vertical Detent engagement with Element Support.

REQUIREMENT: In rest position there should be .047"-.063" clearance between VERTICAL DETENTS (1) and ELEMENT SUPPORT (2) as illustrated. Clearance on left side should equal clearance on right side.

ADJUSTMENT: Form VERTICAL DETENTS (1) at X toward or away from Element Support.

NOTE: Form the Detents so the spring steel and soft steel do not separate--overform if necessary. Separation of spring steel and soft steel may affect line of write.



15. Timing FINE DETENT (1) engagement with Typing Element.

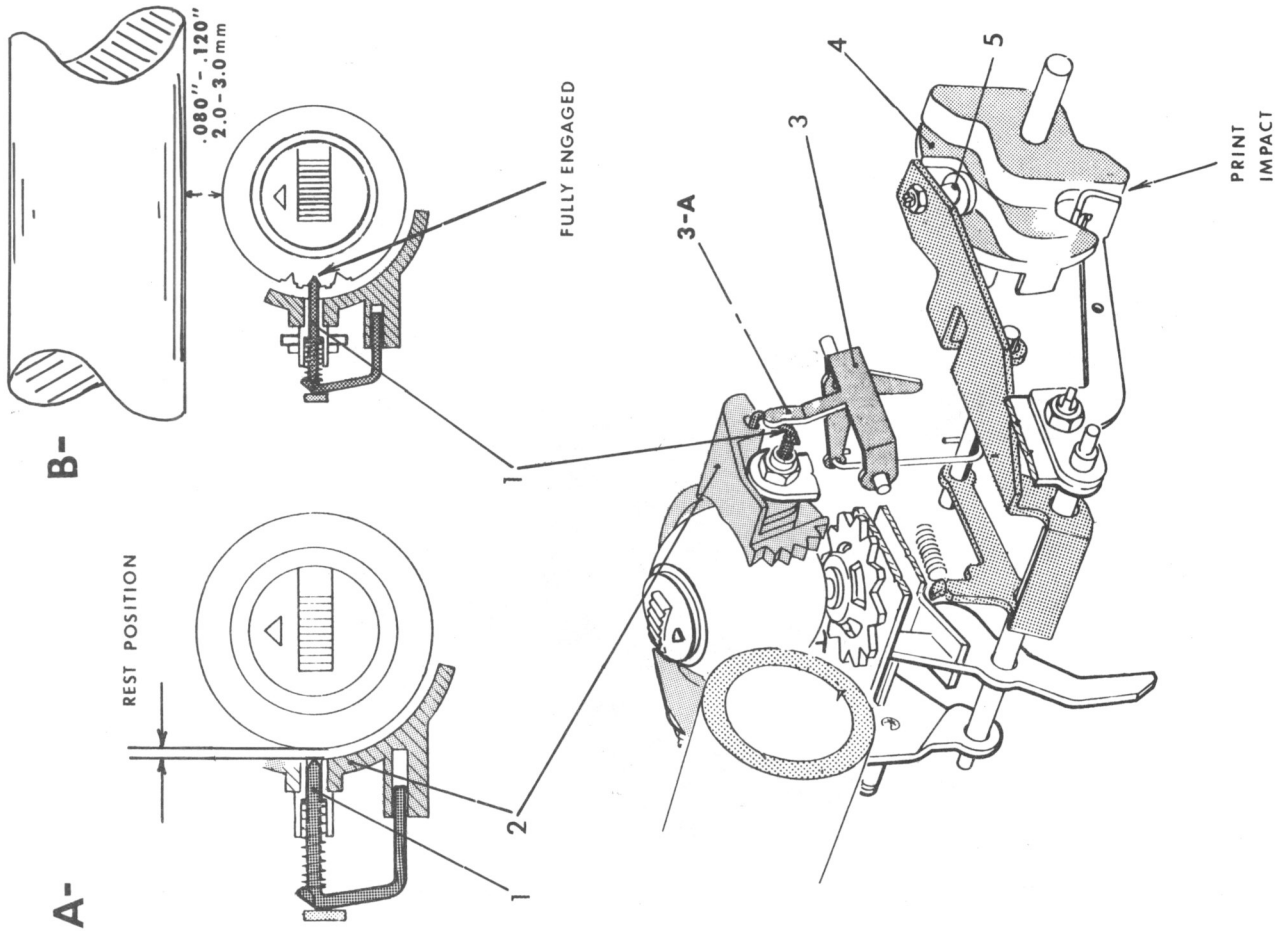
REQUIREMENT:

A) With machine at rest, point of FINE DETENT (1) should not protrude thru inner profile of ELEMENT SUPPORT (2).

B) FINE DETENT (1) should fully engage Typing Element when Element is .080"-.120" from Platen.

TO CHECK, depress an Interposer, and rotate Print Cam Shaft until DETENT CONTROL LEVER ADJUSTING SCREW (5) is opposite low point of DETENT CONTROL CAM (4). Pivot Element Support Group forward and rearward to check requirement.

ADJUSTMENT: Support FINE DETENT BELLCRANK (3), and form ARM (3-A) toward or away from FINE DETENT (1).



PRINTER ADJUSTMENTS

16. Type On Feet (top to bottom).

REQUIREMENT:

A) The full contour of Type should contact the contour of Platen so that characters print on feet (top to bottom).

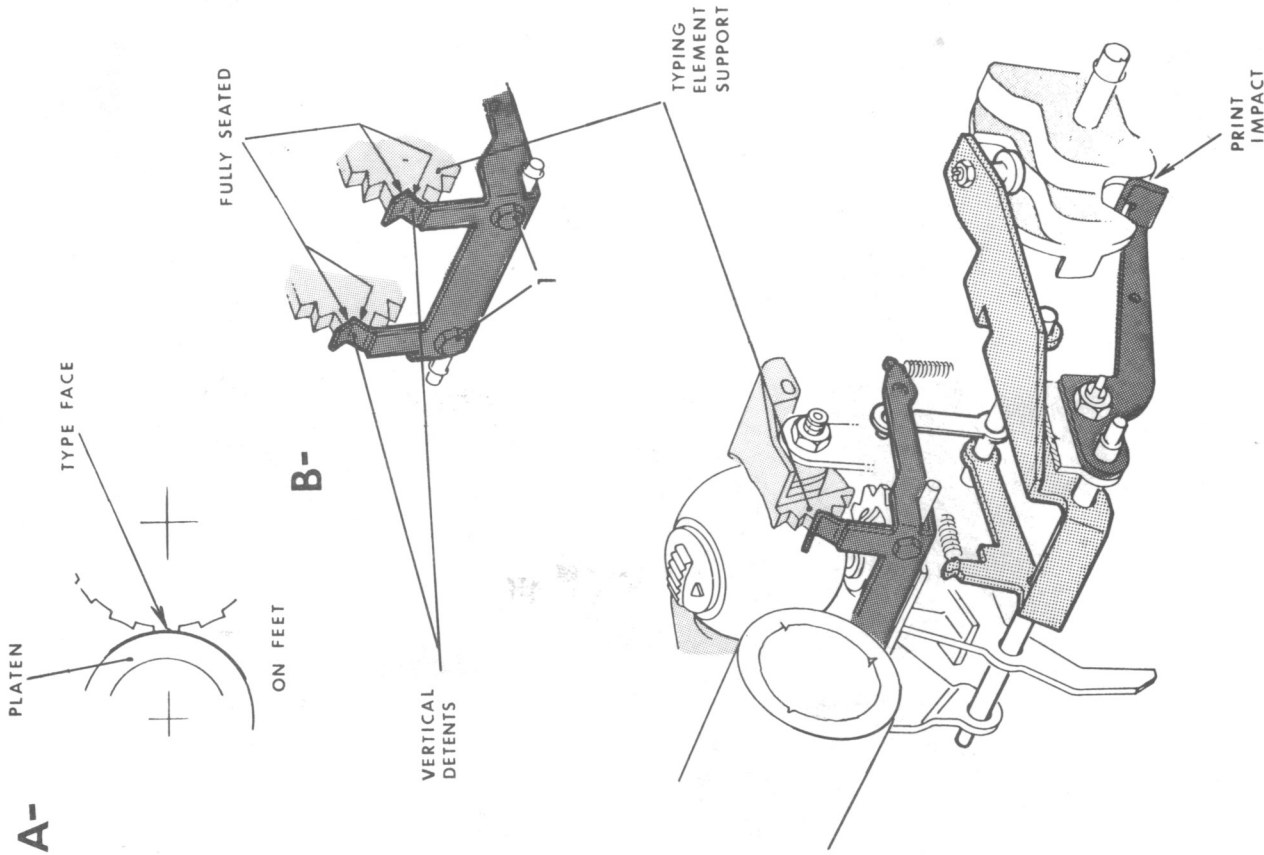
TO CHECK: Depress Interposer #36 (numeral "0"), and rotate Print Cam Shaft to point of print impact. Lightly bring Typing Element to Platen and check requirement.

NOTE: For Keyboards other than 1063, check with the upper case letter "O" (Interposer #34).

B) Vertical Detents should fully seat into left and right notches of Element Support. Check at point of print impact.

ADJUSTMENT: Regulate right and left Vertical Detent ECCENTRICS (1) to raise or lower Vertical Detents.

NOTE: After adjustment, type sample in both cases, and determine overall on feet impression of line of write.



## PRINTER ADJUSTMENTS

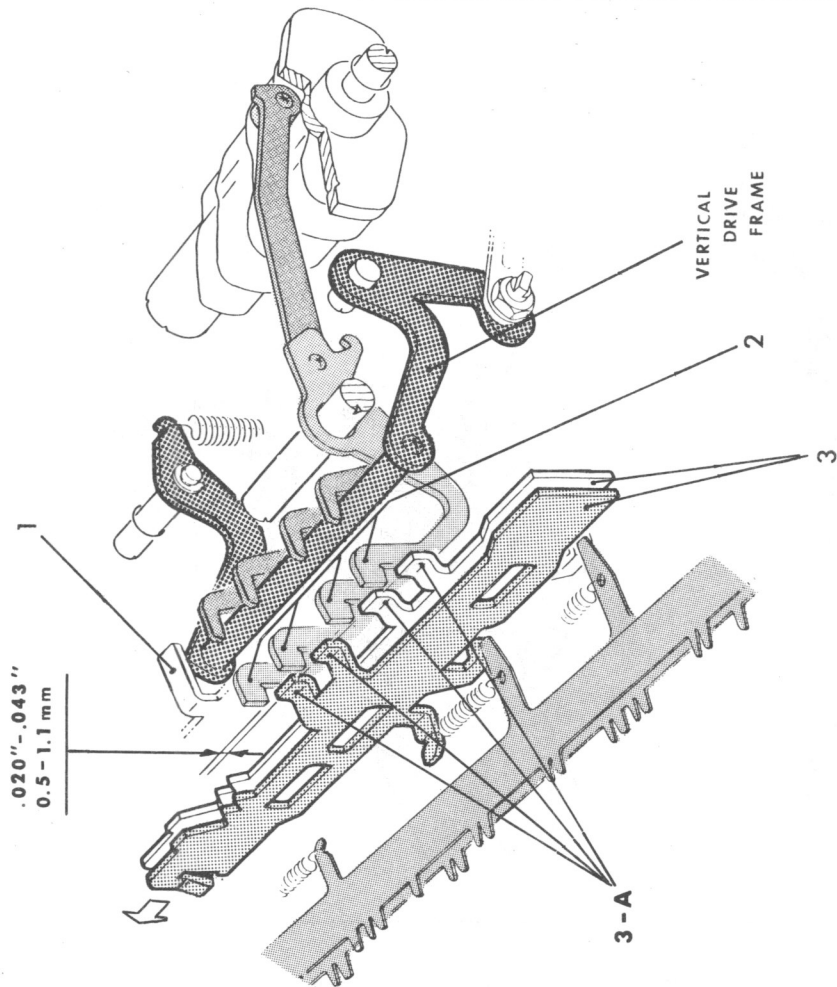
17. Rest position of Vertical Drive Frame.

**REQUIREMENT:** There should be .020"-.043" clearance between Vertical Selection LEVERS (2) and SLIDE LUGS (3-A) during leftward movement of #1 & 2 Vertical Selection SLIDES (3).

**ACCESS:** Remove Keyboard for visual access.

**TO CHECK:** Depress Interposer #45 (Repeat Key), and slowly rotate Print Cam Shaft just until left edges of LUGS (3-A) pass under opposite Selection LEVERS (2). Verify clearance by checking for down play on LEVERS (2).

**ADJUSTMENT:** Form Vertical Drive Frame UP STOP (1) up to decrease clearance, down to increase clearance.





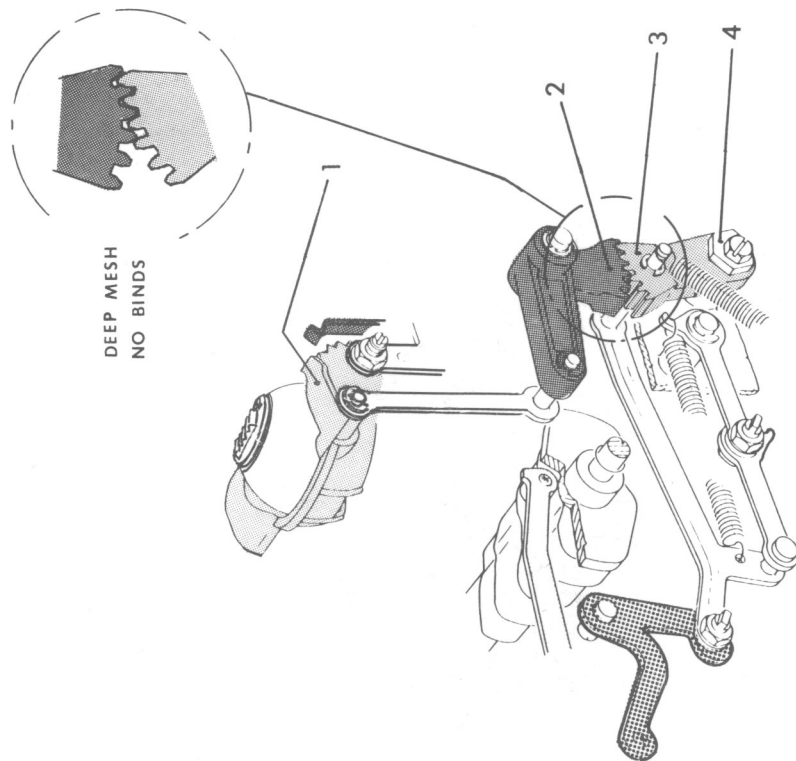
PRINTER ADJUSTMENTS

18. Mesh between DRIVE GEAR SECTOR (3) and VERTICAL CONTROL SECTOR (2).

REQUIREMENT: DRIVE GEAR SECTOR (3) should mesh as deep as possible with VERTICAL CONTROL SECTOR (2) without binding vertical movement of ELEMENT SUPPORT (1).

TO CHECK: Slowly rotate Element Support up and down. Check that Support freely returns to rest position, and check that play between the two Sectors is minimal.

ADJUSTMENT: Loosen Lock Screw and regulate Vertical Drive Sector ECCENTRIC (4) to increase or decrease mesh.



PRINTER ADJUSTMENTS

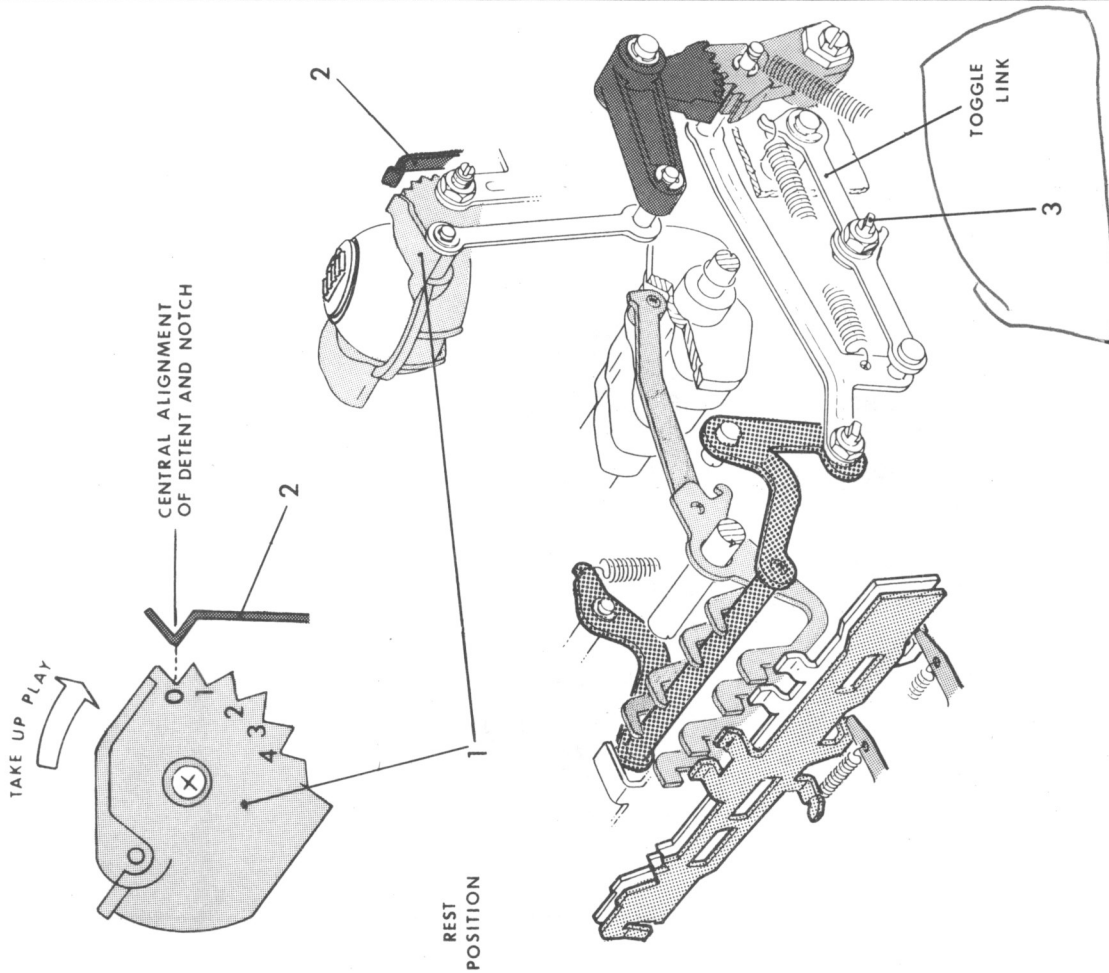
19. Vertical rest position of Typing Element Support.

**REQUIREMENT:** In rest position, Notch #0 of TYPING ELEMENT SUPPORT (1) should align centrally with "v" of VERTICAL DETENT (2), with play of Element Support taken up in a top rearward direction.

**ADJUSTMENT:** Loosen Lock Nut and regulate Toggle Link ECCENTRIC (3) to raise or lower rest position of Element Support.

**NOTE:** To correct slapping noise during a maximum [4th] Vertical Selection, adjust ECCENTRIC (3) to raise Element Support slightly higher than specification. To improve vertical alignment of characters, adjust to lower Element Support. Deviate from specification only when all other Printing Action Adjustments are correct.

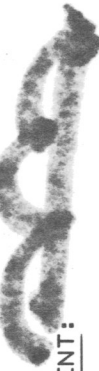
009.00



SLAPPING D.G.

PRINTER ADJUSTMENTS

20. Amount of Vertical movement.

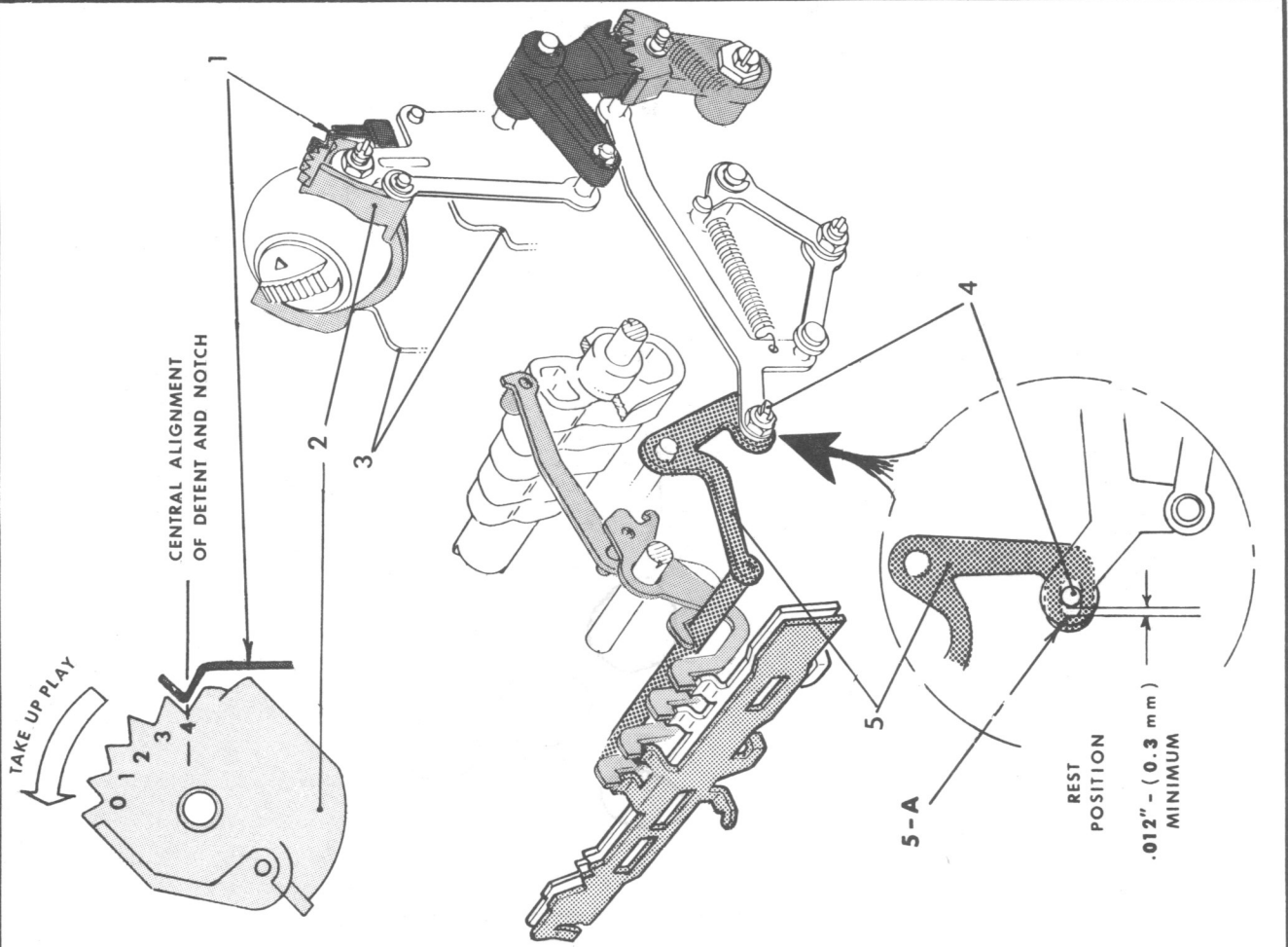


**REQUIREMENT:**

- A) Depress Interposer #45 [Repeat Key], and rotate Print Cam Shaft to point just before print impact: Notch #4 of ELEMENT SUPPORT [2] should align centrally with "V" of VERTICAL DETENT [1], with play of Element Support taken up in a top forward direction.
- B) In rest position, there should be at least .012" clearance between VERTICAL CONTROL ECCENTRIC [4] and front of SLOT [5-A] of VERTICAL DRIVE FRAME [5]. Check by feeling for free down play on VERTICAL DRIVE FRAME [5].

**ADJUSTMENT:** Loosen Lock Nut and regulate Vertical Control ECCENTRIC [4] to increase or decrease vertical drive of Element Support. If a minimum of .012" clearance in rest position [Requirement B] cannot be maintained during this adjustment, remake Adjustment #17 to the minimum specification.

**NOTE:** To correct vertical alignment of underscore, adjust to drive Element Support slightly further than specification. If print out of half characters occurs, reduce drive. Deviate from specification only when all other Printing Action Adjustments are correct.



PRINTER ADJUSTMENTS

21. Damping the printing action for impression.

REQUIREMENT:

A) When machine is manually cycled to point of print impact, there should be at least .020" between Type Face and Platen.

TO CHECK: Depress Interposer and rotate Print Cam Shaft to point of print impact.

B) Print density should be sufficient so that characters are legible on the original as well as the last page of a pack that includes 3 carbon sheets. Also, characters should print clearly on a single sheet, without track marks above or below characters, and without perforating paper.

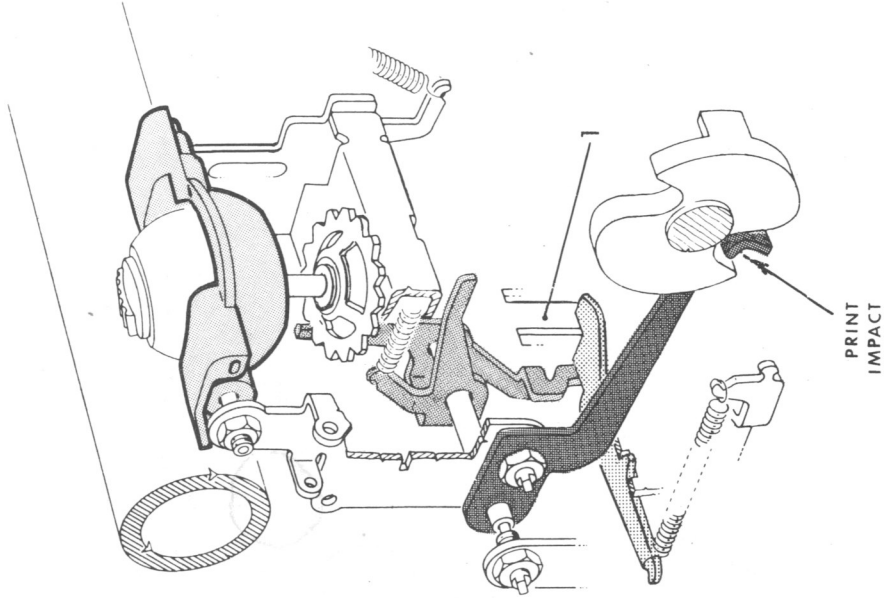
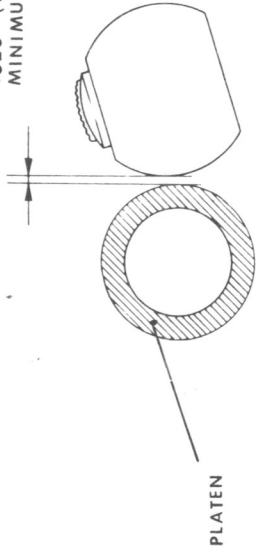
TO CHECK: Type under power.

ADJUSTMENT: Form ARM (1) on Printer Housing rearward to increase, forward to decrease clearance between Type Face and Platen. Increase the clearance to reduce impression; reduce the clearance to increase impression.

NOTE: ARM (1) is on bottom rear of Printer Housing; for access, tip machine on its back.



.020" (0.5 mm)  
MINIMUM



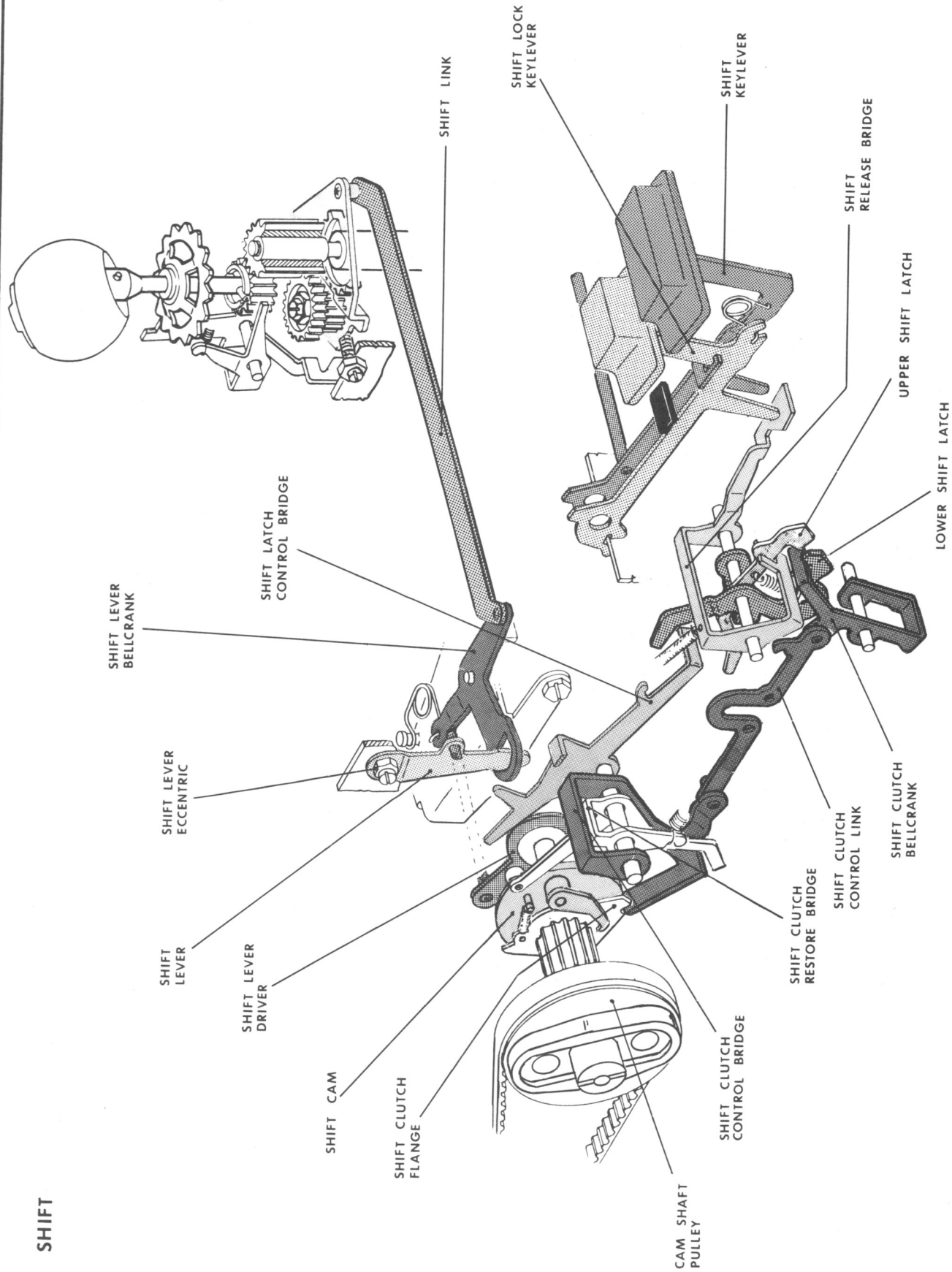
SHIFT ADJUSTMENTS

SHIFT

PRINTER ADJ. # 7 AND 8 → 1

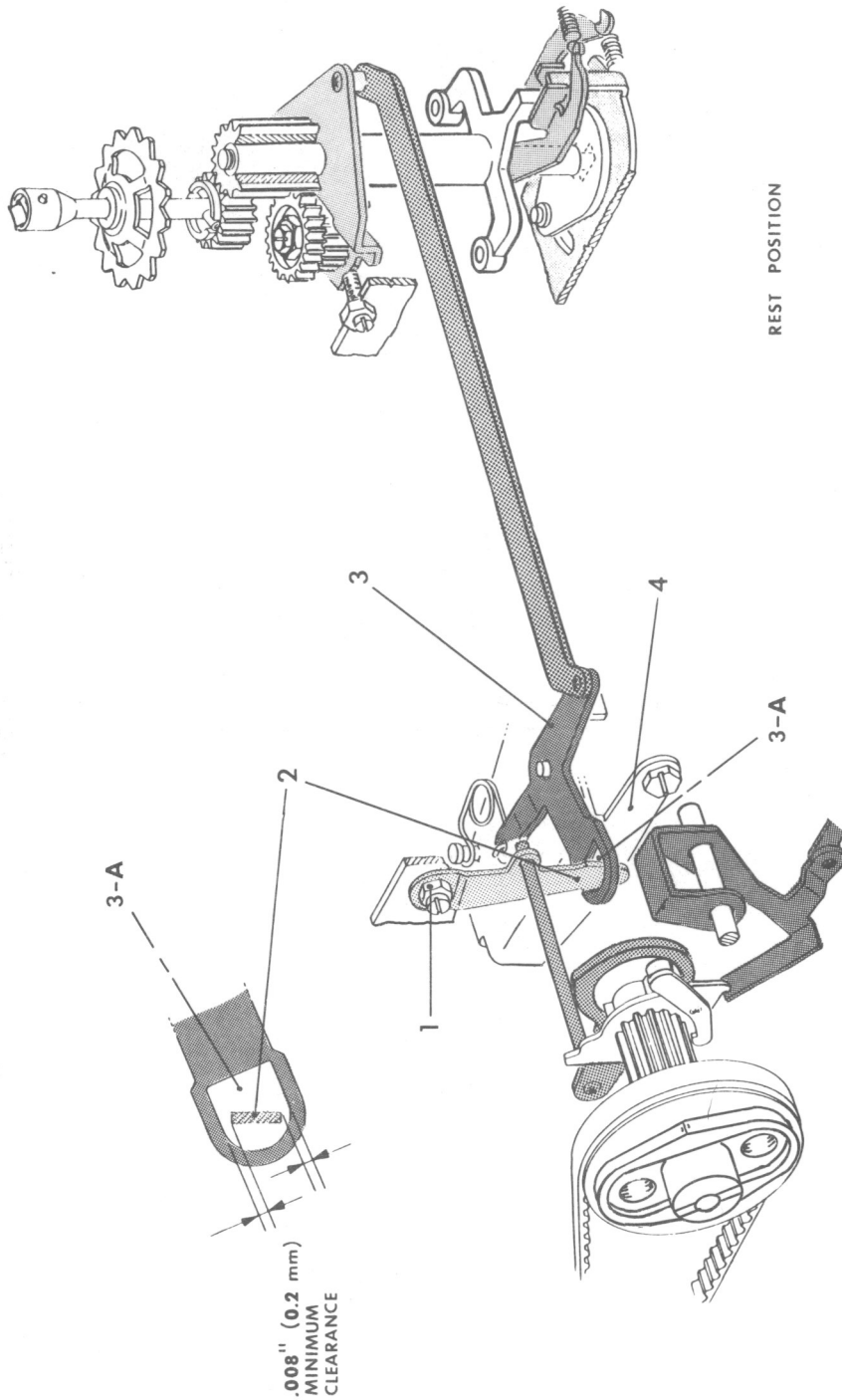


1. Rest position of Shift Lever in lower and upper case.
2. Shift Latch Control.
3. Shift deactivation during a print cycle.
4. Shift Clutch Control.
5. Shift Keylever Trip.



SHIFT

SHIFT ADJUSTMENTS



1. Rest position of SHIFT LEVER (2) in lower and upper case.

REQUIREMENT: A) With machine at rest in lower case, there should be at least .008" clearance between SHIFT LEVER (2) and inside edge of HOLE (3-A) in SHIFT LEVER BELLCRANK (3).

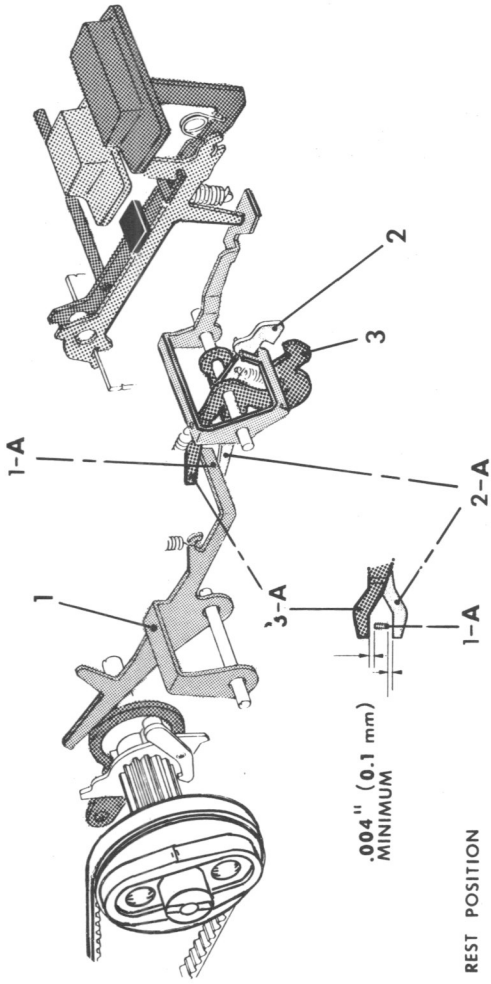
B) Check same requirement with machine at rest in upper case.

ADJUSTMENT: Loosen Lock Screw and regulate SHIFT LEVER ECCENTRIC (1). If requirement cannot be obtained with Eccentric, re-position BRACKET (4) within limits of Screw holes, or loosen Lock Screw and lift SHIFT LEVER (2) up.

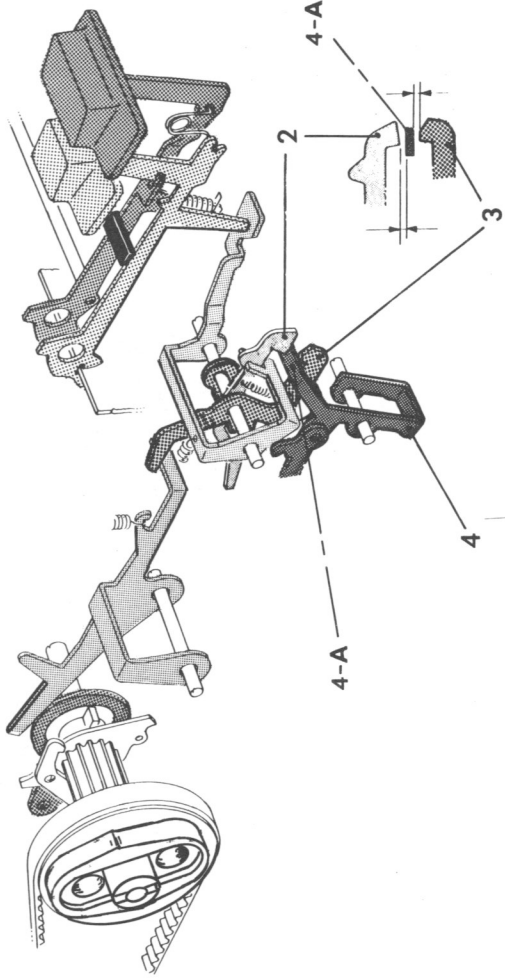
2. Shift Latch Control.

**REQUIREMENT:** With machine at rest in lower case, SHIFT LATCH CONTROL BRIDGE ARM (1-A) should have at least .004" clearance from ARMS (2-A) & (3-A) of UPPER and LOWER SHIFT LATCHES (2) & (3). Check with Keyboard in place.

**ADJUSTMENT:** Form BRIDGE ARM (1-A) up or down.



REST POSITION



FUNCTIONAL CHECK

**FUNCTIONAL CHECK:** Depress and hold Shift Keylever; rotate Cam Shaft Pulley until Shift is at upper case position. Release Shift Keylever: UPPER and LOWER SHIFT LATCHES (2) & (3) should clear SHIFT CLUTCH BELLCRANK ARM (4-A) so that Shift mechanism will cycle back to lower case during further rotation of Cam Shaft Pulley.

**NOTE:** Keyboard must be in place, and Shift Adjustment #5 must be correct before making this check.



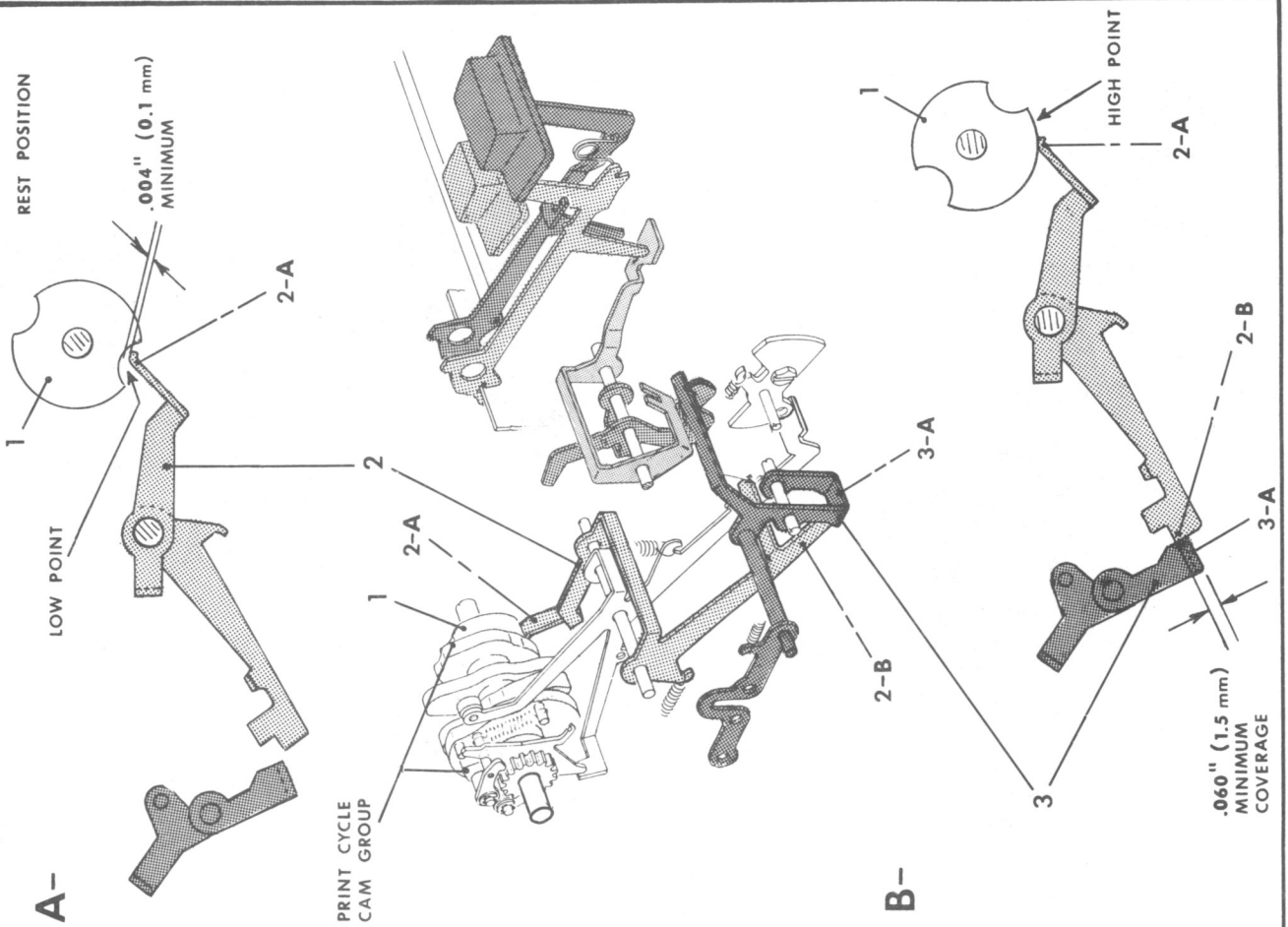
3. Shift deactivation during a print cycle.

REQUIREMENT:

A) With machine at rest, there should be at least .004" clearance between SHIFT DEACTIVATION CAM FOLLOWER (2-A) and low point of SHIFT DEACTIVATION CAM (1).

B) With machine at rest, depress a character Keylever (or Interposer); then depress Shift Keylever. Rotate Cam Shaft Pulley until CAM FOLLOWER (2-A) is on high point of SHIFT DEACTIVATION CAM (1): DEACTIVATION BRIDGE ARM (2-B) should have at least .060" coverage (top to bottom) on CROSS SECTION (3-A) of SHIFT CLUTCH CONTROL BELLCRANK (3).

ADJUSTMENT: Form DEACTIVATION BRIDGE CAM FOLLOWER (2-A) up or down.



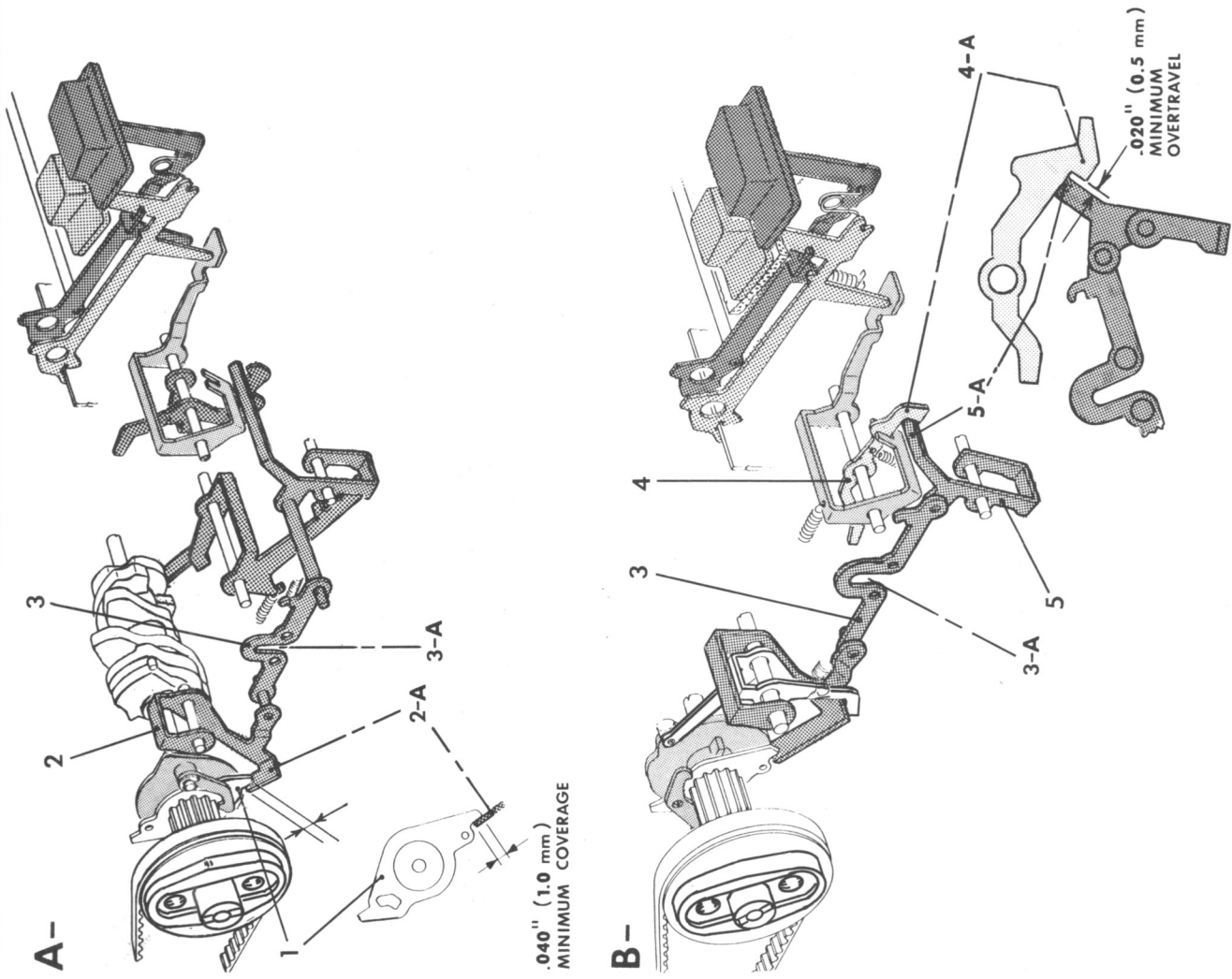
4. Shift Clutch Control.

REQUIREMENT:

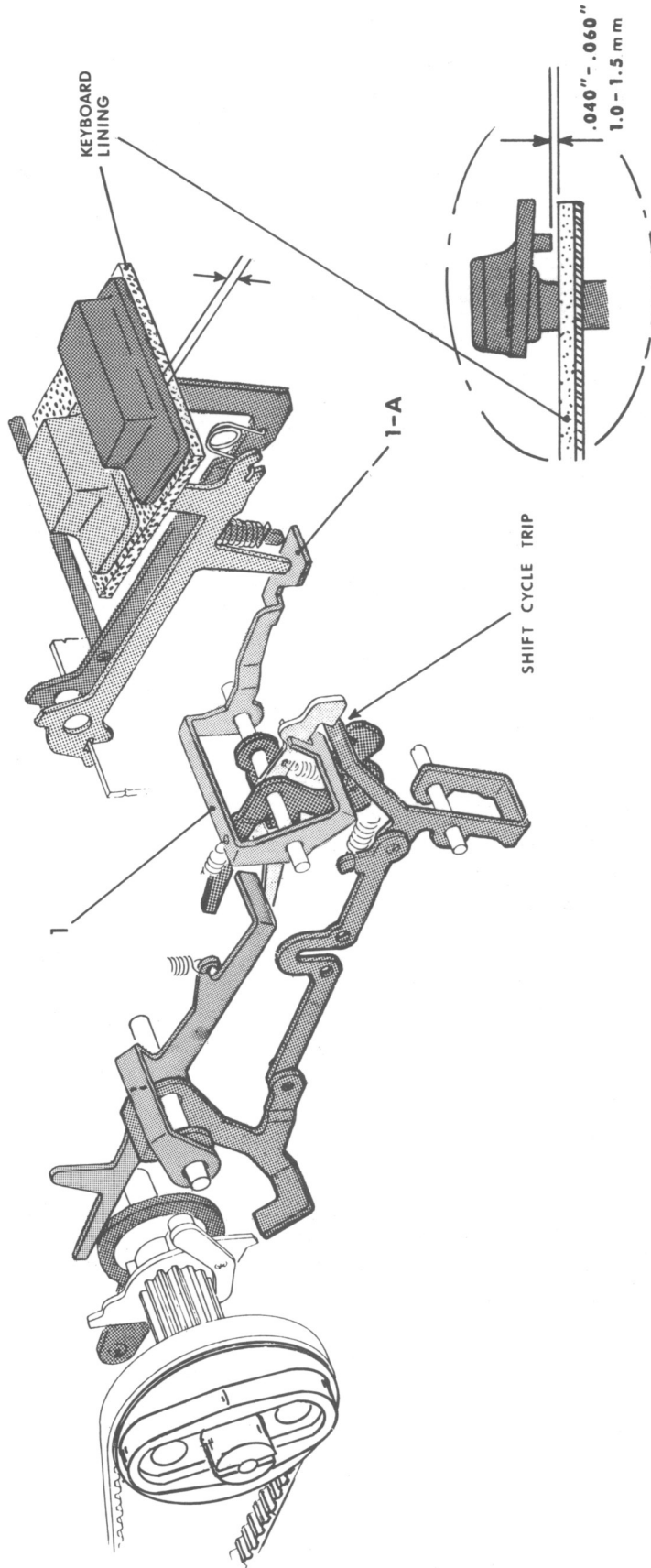
A) With machine at rest in lower case, depress a character Keylever (or Interposer); then depress Shift Keylever, and rotate Print Cam Shaft 1/4 revolution: CLUTCH CONTROL BRIDGE ARM (2-A) should have at least .040" coverage on SHIFT CLUTCH FLANGE (1).

B) With machine at rest in lower case, depress and hold Shift Keylever; rotate Cam Shaft Pulley just past Shift movement to upper case: SHIFT CLUTCH BELLCRANK ARM (5-A) should overtravel LATCHING SURFACE (4-A) of UPPER SHIFT LATCH (4) by at least .020".

ADJUSTMENT: Open or close SLOT (3-A) of SHIFT CLUTCH CONTROL LINK (3). Adjust for maximum coverage (Req. A) and minimum overtravel (Req. B).



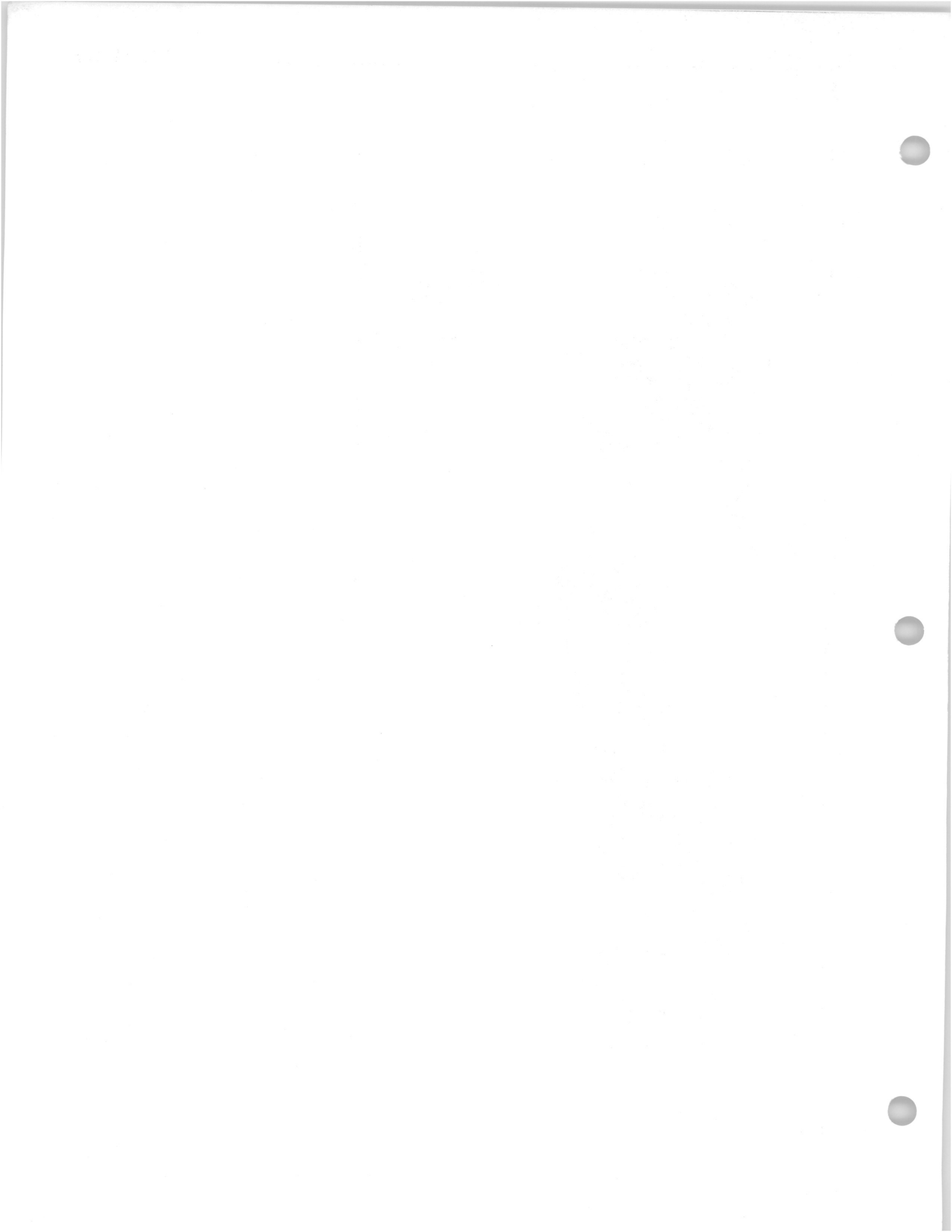
## SHIFT ADJUSTMENTS



## 5. Shift Keylever Trip.

**REQUIREMENT:** When Left Shift Keybutton is depressed, there should be .040"-.060" clearance between bottom of Keybutton and top of Keyboard Lining at Shift Cycle Trip.

**ADJUSTMENT:** Form SHIFT RELEASE BRIDGE LUG (1-A) up or down. Check Adjustment #2.



CARRIAGE ADJUSTMENTS

CARRIAGE

1. Carriage fit.
2. Clearance between Front Rail and Rail Back Up Screws.
3. Escapement Rack mesh with Escapement Wheel Pinion.
4. Carriage Mainspring Tension.
5. Carriage Release.

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2

3 → MARGIN ADJ. # 2 AND 3

4

5

CARRIAGE ADJUSTMENTS

1. Carriage fit.

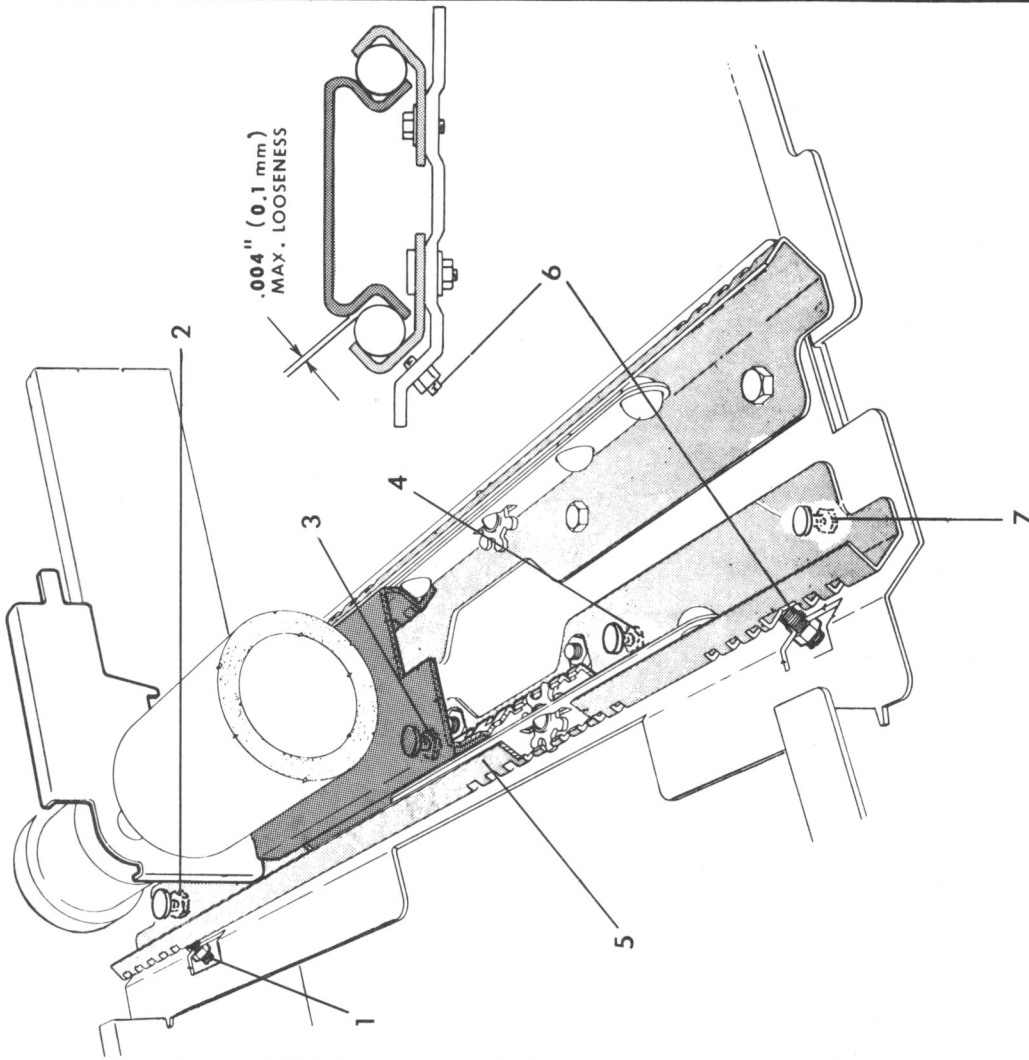
REQUIREMENT: Carriage should travel smoothly on its raceways, free of binds and looseness. NOTE: Looseness (play between Balls and Rails) should not exceed .004".

ADJUSTMENT: Loosen NUTS (2) (3) (4) (7); move FRONT RAIL (5) forward or rearward, and tighten Nuts.

NOTE: Loosen at least two Nuts for spot fitting.

NOTE: Back out SCREWS (1) & (6) if Front Rail must be moved forward to correct Carriage bind. Make Adjustment #2.

ADJUSTMENT ACCESS: Tip machine up for access to Nuts from the bottom.

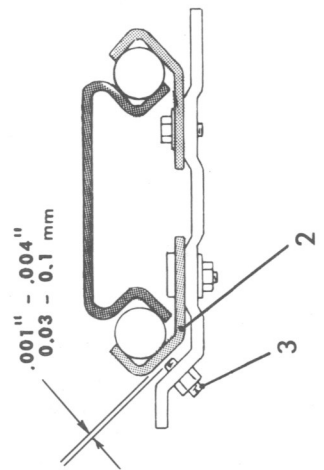
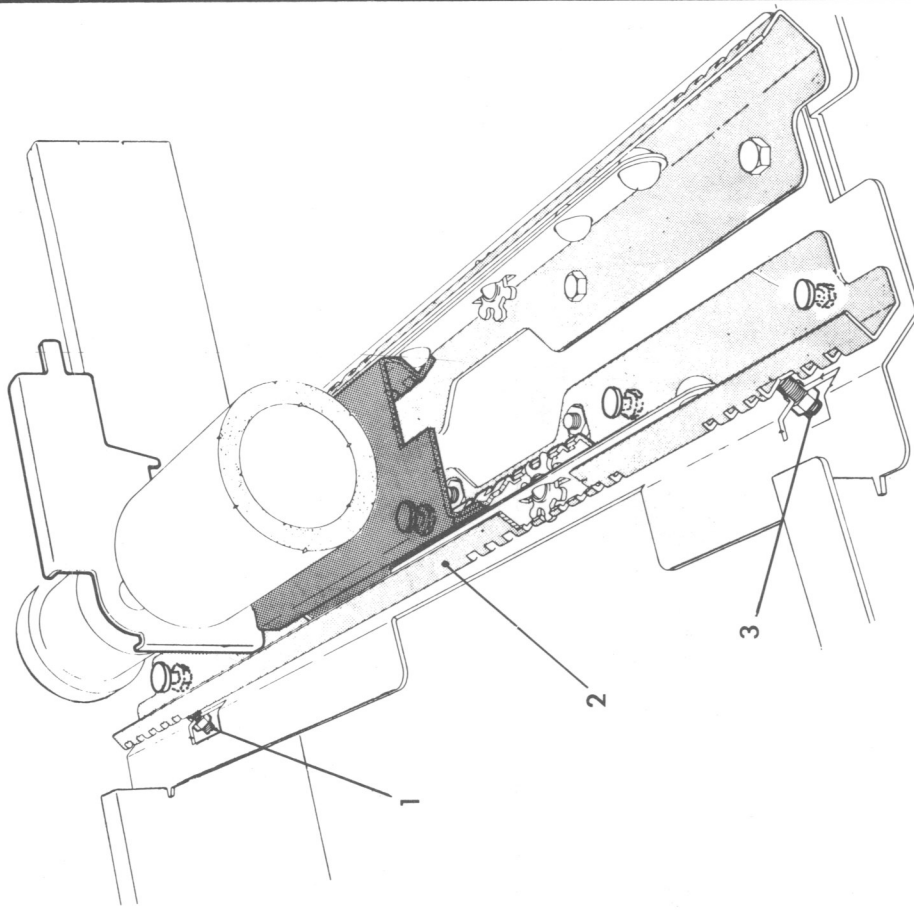


CARRIAGE ADJUSTMENTS

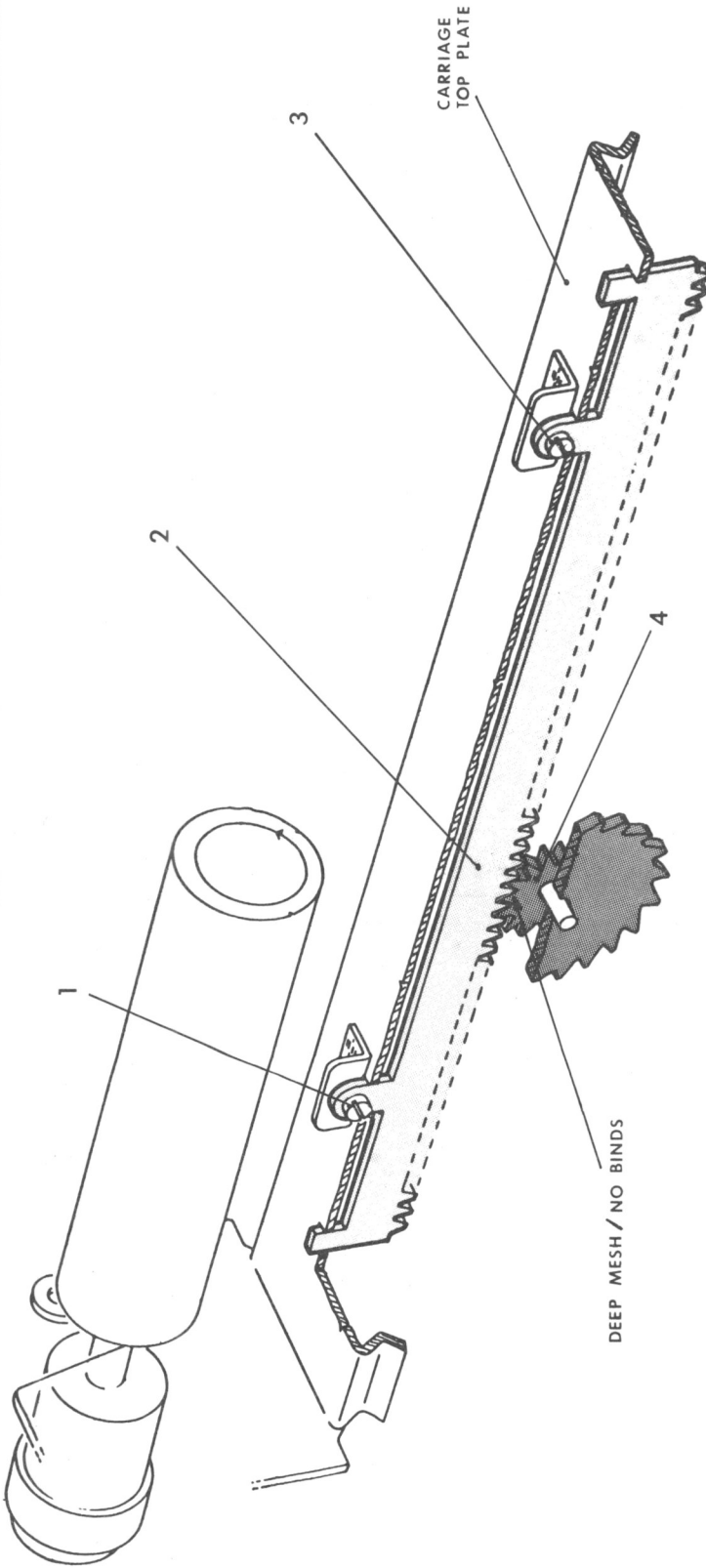
2. Clearance between Front Rail and Rail Back Up Screws.

REQUIREMENT: There should be .001"-.004" clearance between RAIL BACK UP SCREWS (1) & (3) and FRONT RAIL (2).

ADJUSTMENT: Loosen Lock Nuts and regulate RAIL BACK UP SCREWS (1) & (3).



CARRIAGE ADJUSTMENTS



3. Escapement Rack mesh with Escapement Wheel Pinion.

REQUIREMENT: ESCAPEMENT RACK (2) should mesh as deeply as possible with ESCAPEMENT WHEEL PINION (4) without impeding Carriage travel. Check mesh at center and both ends.

TO CHECK: Hold Escapement Wheel with Spring Hook and move Carriage back and forth to check play.

ADJUSTMENT: Loosen SCREWS (1) & (3); move Rack up or down to obtain requirement, and tighten Screws.

ACCESS: Adjustment Screws are accessible from the rear of the machine, and are located above Carriage Top Plate.



## CARRIAGE ADJUSTMENTS

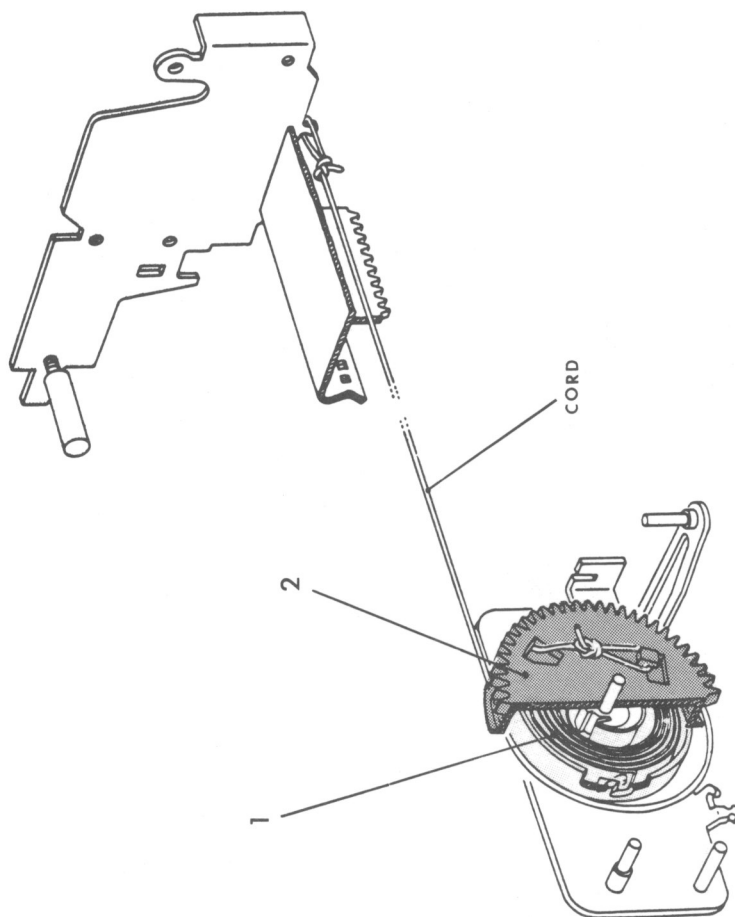
## 4. Carriage Mainspring Tension.

**REQUIREMENT:** MAINSPRING [1] tension on Carriage should be at least 16 oz. [450g] when Carriage is at extreme left, and no more than 39 oz. [1100g] when Carriage is at extreme right.

To check without gage: Move Carriage to extreme left; backspace once, and depress a character key with Switch on: Mainspring tension on Carriage should be sufficient to cause Carriage to move one space and engage LineLock mechanism.

**ADJUSTMENT:**

- A) If Mainspring is completely relaxed, move Carriage to extreme right and remove Cord from SPRING DRUM [2]. Wind Spring Drum top to right 6-7 turns; insert Cord. Check that Cord winds evenly on Drum throughout Carriage travel.
- B) To increase or decrease Mainspring tension, move Carriage to extreme right. Remove Cord from Spring Drum. Wind Drum top to right to increase tension. Allow Drum to rotate top to left to decrease tension. Reinsert Cord, and check that Cord winds evenly throughout Carriage travel.



5. Carriage Release.

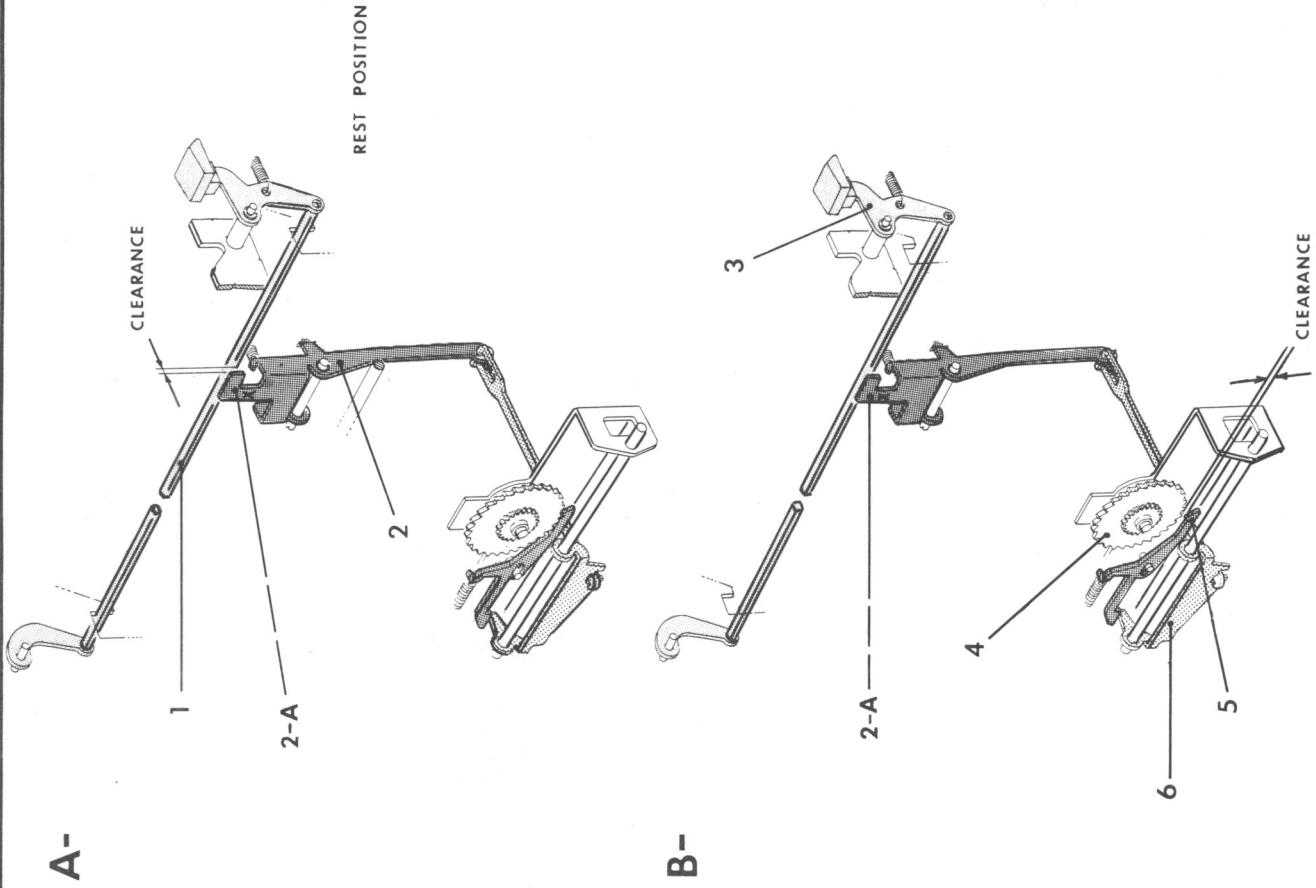
REQUIREMENT:

- A) In rest position, there should be clearance between CARRIAGE RELEASE BELLCRANK EAR (2-A) and CARRIAGE RELEASE BAIL (1). Observe by checking for free down travel on Carriage Release Lever.
- B) When CARRIAGE RELEASE LEVER (3) is depressed, ESCAPEMENT PAWL (5) should clear ESCAPEMENT WHEEL (4) slightly before Release Lever bottoms. Check along entire Carriage travel.

ADJUSTMENT: Form CARRIAGE RELEASE BELLCRANK EAR (2-A) forward or rearward at X.

ACCESS: Insert twister from the left rear of machine.

NOTE: For adjustment of CARRIAGE RELEASE CONTROL BRIDGE (6), see Escapement Adjustment #5.



ESCAPEMENT ADJUSTMENTS

**ESCAPEMENT**



1. Rest position of Escapement Trip Lever.
2. Escapement Trip.
3. Coverage of Spacer Control Bridge Ear on Escapement Trip Lever Stud.
4. Lateral position of Escapement Trip Lever Arm.
5. Lateral position of Carriage Release Control Bridge Arm.
6. Escapement Silencer.
7. Dead Key Adjustment.



ESCAPEMENT ADJUSTMENTS

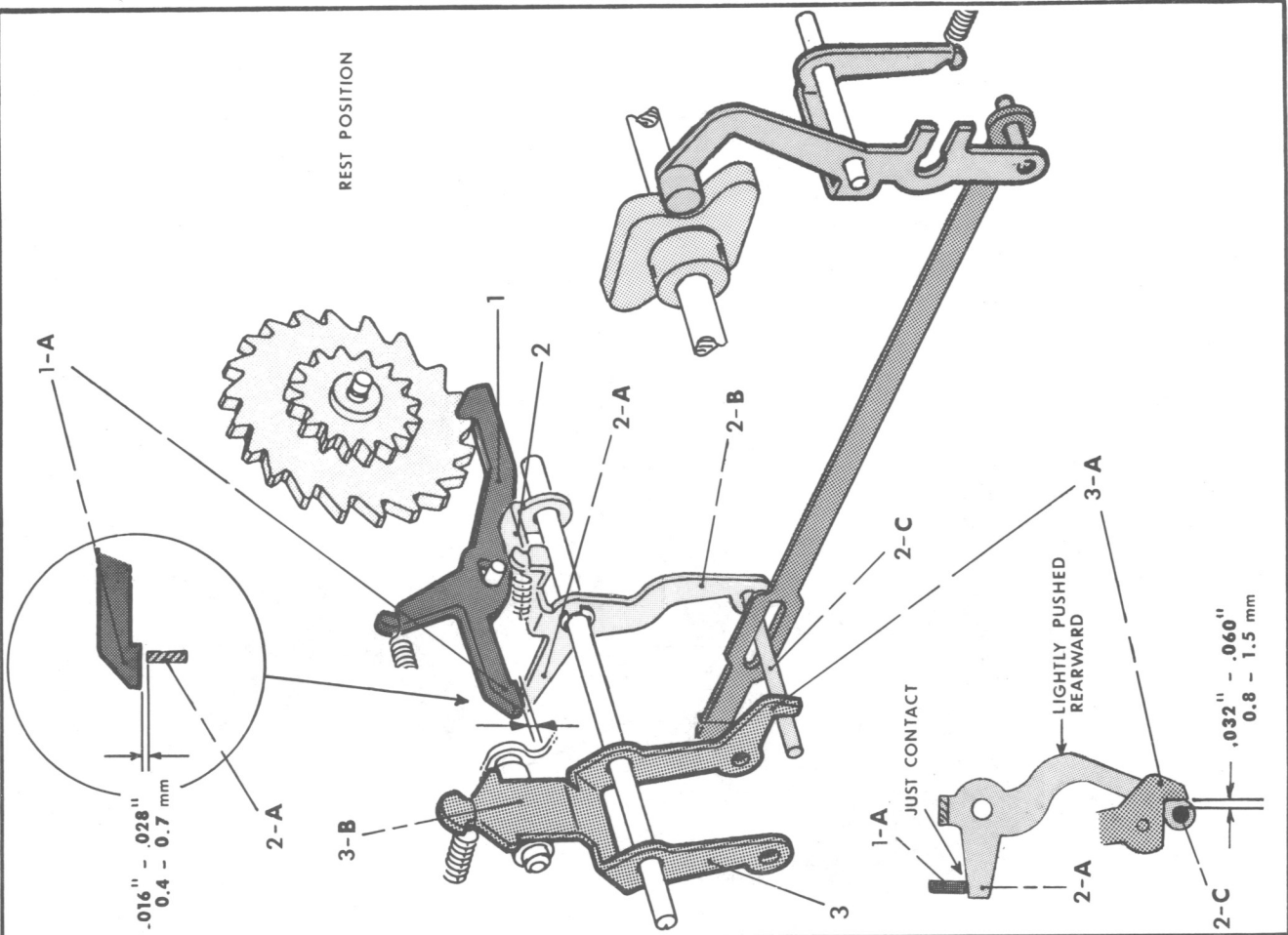
1. Rest position of ESCAPEMENT TRIP LEVER (2).

REQUIREMENT:

With machine at rest, there should be .016"-.028" clearance between ARM (2-A) of ESCAPEMENT TRIP LEVER (2) and STEP (1-A) of ESCAPEMENT PAWL (1).

TO CHECK: Lightly push ESCAPEMENT TRIP LEVER ARM (2-B) rearward until ARM (2-A) just contacts STEP (1-A). At this point, gage clearance between TRIP LEVER STUD (2-C) and EAR (3-A) of SPACER CONTROL BRIDGE (3): .032"-.060" will yield the clearance specified in requirement above.

ADJUSTMENT: Insert Twister thru hole in Side Frame, and form LUG (3-B) on SPACER CONTROL BRIDGE (3) forward or rearward to raise or lower rest position of ARM (2-A).



## 2. Escapement Trip.

REQUIREMENT:

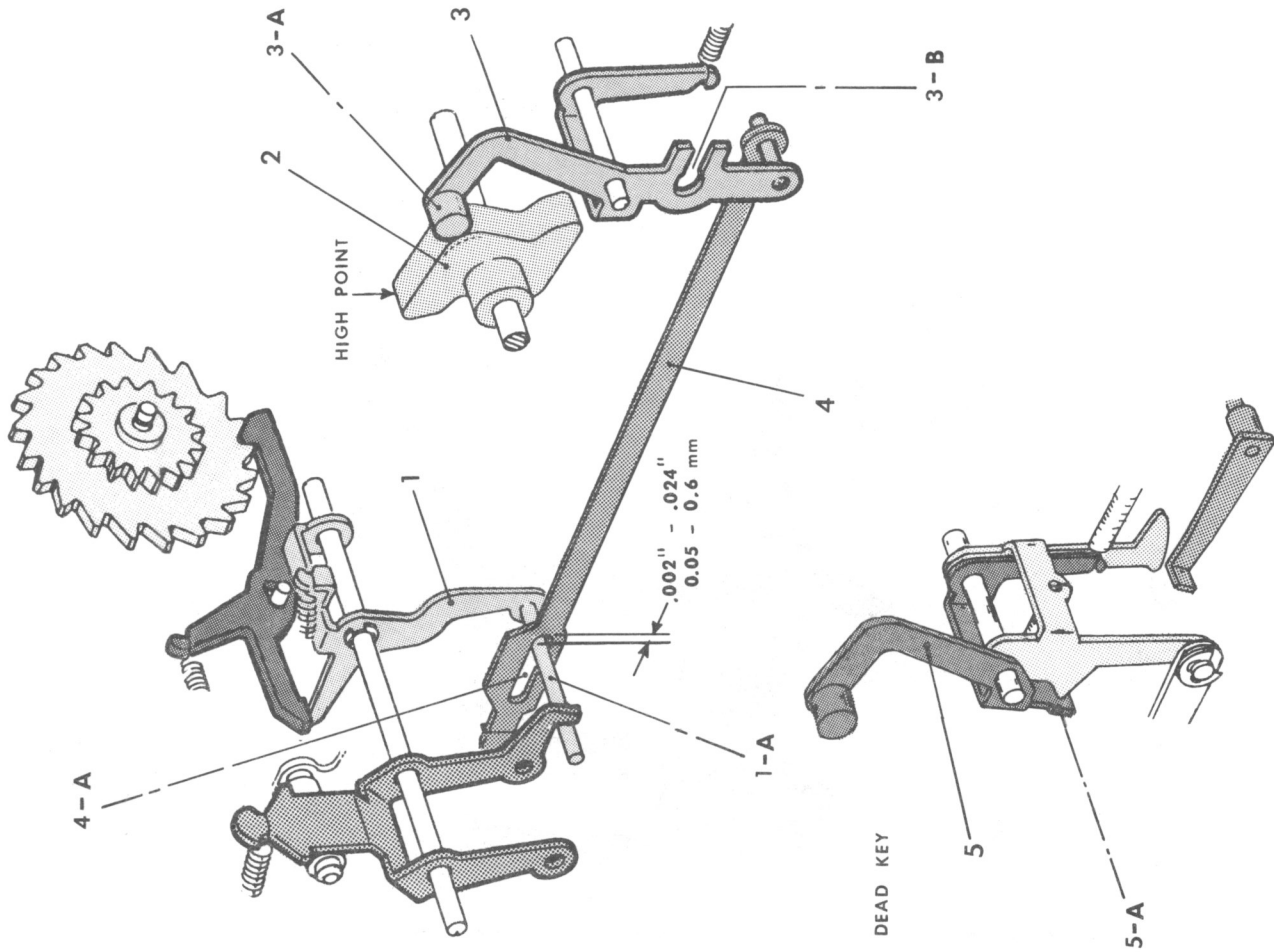
When CAM FOLLOWER (3-A) is on concentric portion (dotted area) of ESCAPEMENT CONTROL CAM (2) during a print cycle, there should be .002"-.024" clearance between ESCAPEMENT TRIP LEVER STUD (1-A) and front of SLOT (4-A) of ESCAPEMENT CONTROL LINK (4).

TO CHECK: With machine at rest, depress a character Key/lever and rotate Print Cam Shaft.

ADJUSTMENT: Open or close SLOT (3-B) of ESCAPEMENT CONTROL LEVER (3).

On machines with Dead Key mechanism, form LUG (5-A) of ESCAPEMENT CONTROL LEVER (5) forward or rearward.

NOTE: This adjustment provides correct timing of Escapement trip during a print cycle: Escapement should trip slightly before CAM FOLLOWER (3-A) reaches high point of ESCAPEMENT CONTROL CAM (2).



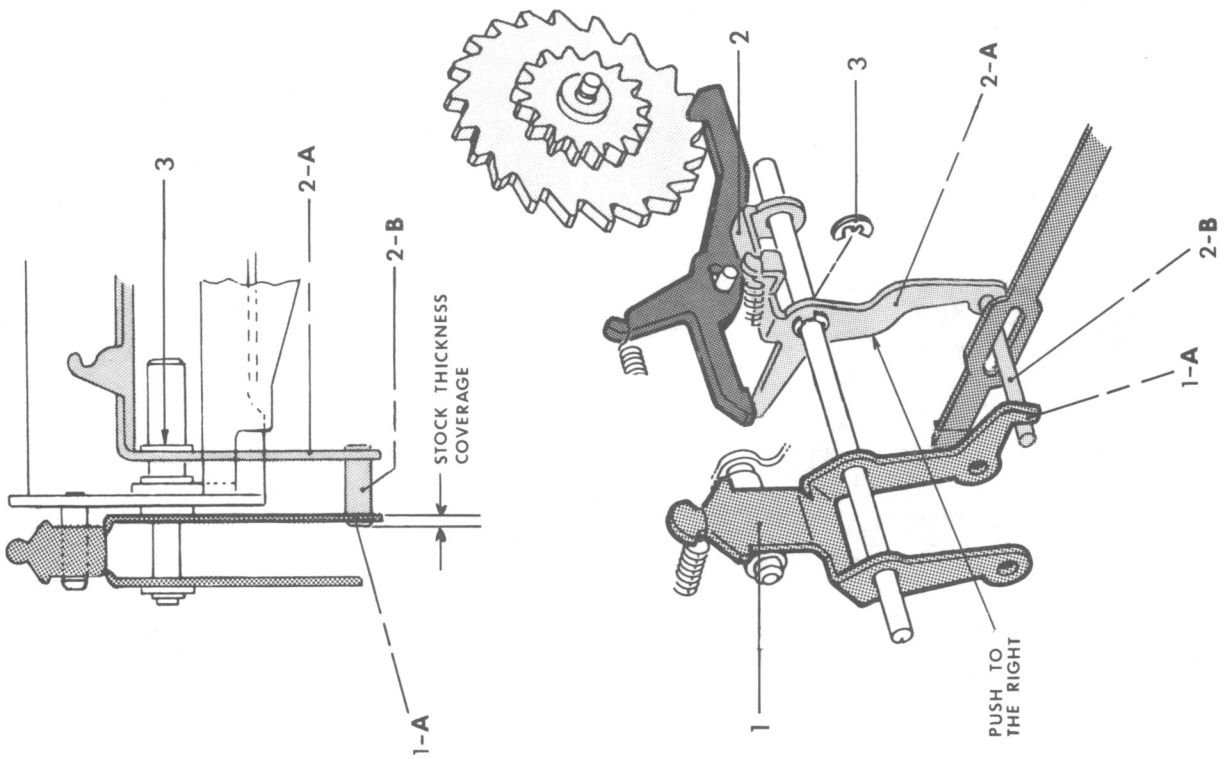
ESCAPEMENT ADJUSTMENTS

- Coverage of SPACER CONTROL BRIDGE EAR (1-A) on ESCAPEMENT TRIP LEVER STUD (2-B).

REQUIREMENT:

When ESCAPEMENT TRIP LEVER (2) is pushed to the right against E-RING (3), SPACER CONTROL BRIDGE EAR (1-A) should have at least stock thickness coverage on TRIP LEVER STUD (2-B). Check with machine at rest.

ADJUSTMENT: Form TRIP LEVER ARM (2-A) left or right.



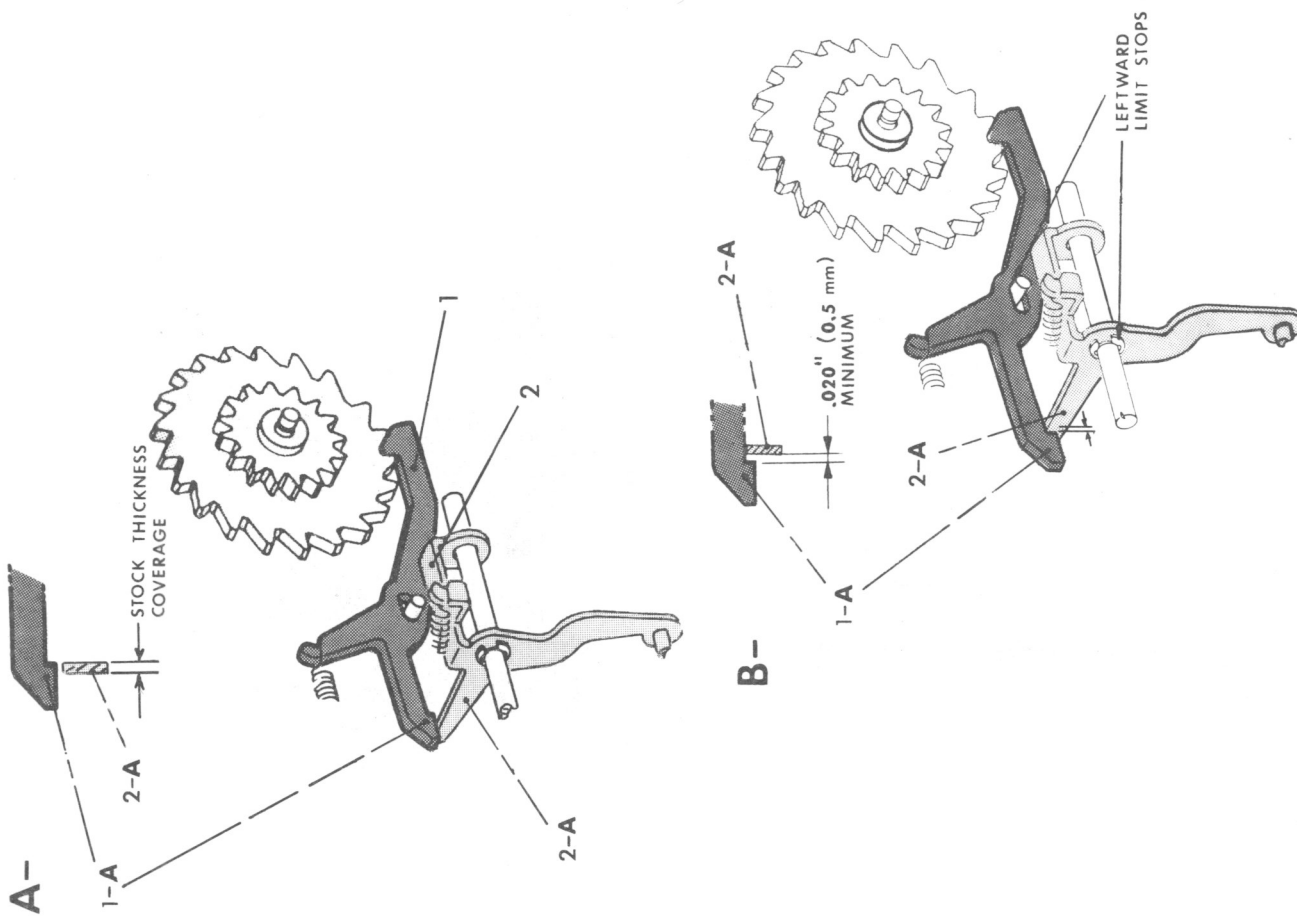
4. Lateral position of ESCAPEMENT TRIP LEVER ARM (2-A).

REQUIREMENT:

- A) ESCAPEMENT TRIP LEVER ARM (2-A) should have at least stock thickness coverage on STEP (1-A) of ESCAPEMENT PAWL (1) as illustrated. Check with machine at rest by lightly rotating TRIP LEVER (2) so that ARM (2-A) moves toward STEP (1-A).
- B) When ESCAPEMENT PAWL (1) and ESCAPEMENT TRIP LEVER (2) move leftward against their limit stops, TRIP LEVER ARM (2-A) should have at least .020" right to left clearance from STEP (1-A) of ESCAPEMENT PAWL (1).

TO CHECK: With machine at rest, manually hold Carriage to prevent Carriage movement. Rotate TRIP LEVER (2) just until it trips ESCAPEMENT PAWL (1). Observe clearance.

ADJUSTMENT: Form TRIP LEVER ARM (2-A) left or right.





ESCAPEMENT ADJUSTMENTS

5. Lateral position of CARRIAGE RELEASE CONTROL BRIDGE ARM (2-A).

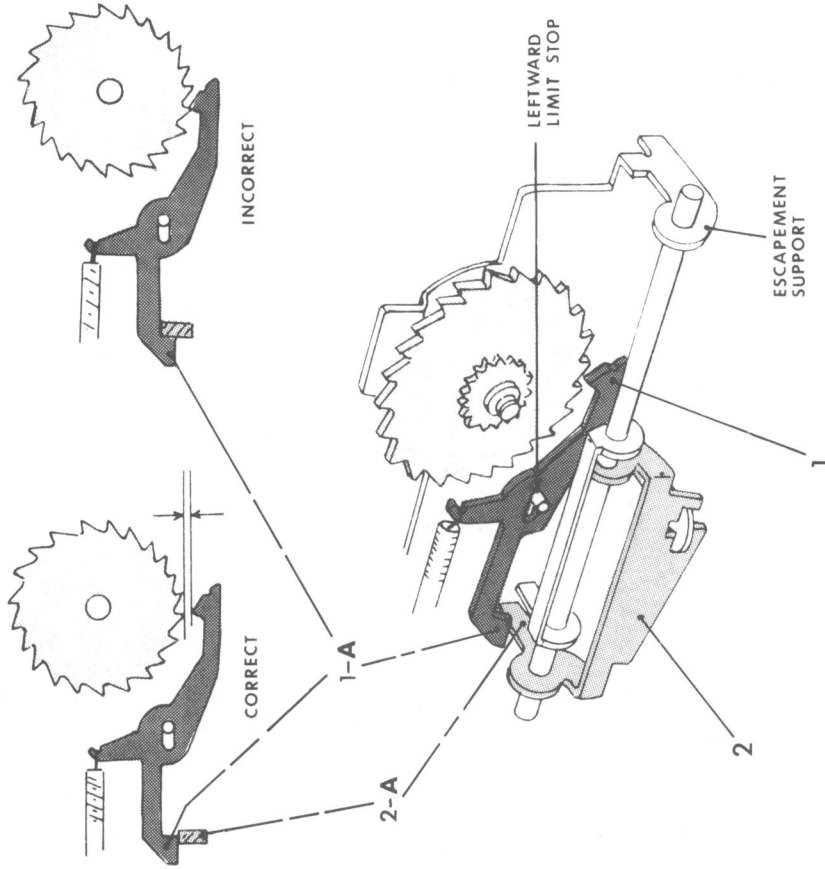
REQUIREMENT:

When ESCAPEMENT PAWL (1) moves leftward against its limit stop, STEP SURFACE (1-A) should not travel beyond ARM (2-A) of CARRIAGE RELEASE CONTROL BRIDGE (2) as illustrated.

TO CHECK: With machine at rest, manually hold Carriage to prevent Carriage movement. Rotate BRIDGE (2) just until ARM (2-A) trips ESCAPEMENT PAWL (1). Observe requirement. NOTE: If STEP SURFACE (1-A) has traveled beyond left edge of ARM (2-A), Escapement Pawl will, at this point, engage Escapement Wheel--it should not.

ADJUSTMENT: Form ARM (2-A) to the left.

Caution: Do not form ARM (2-A) so that it binds on side of Escapement Support.



6. Escapement Silencer.

REQUIREMENT:

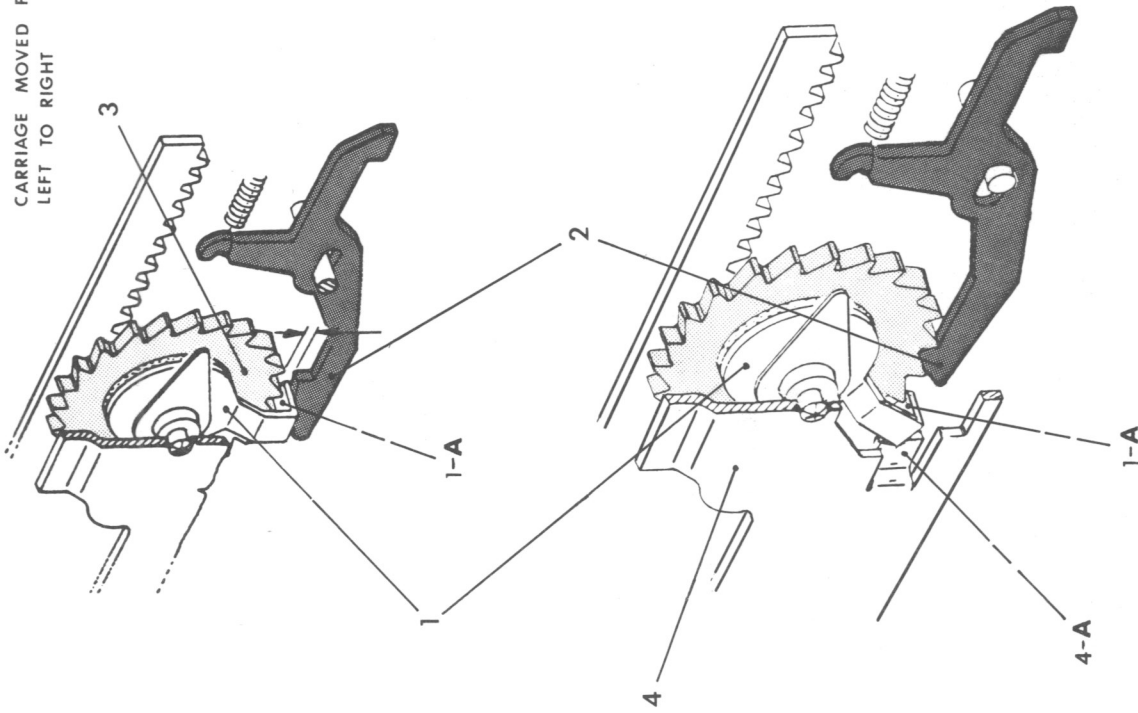
When Carriage is pulled from left to right, ESCAPEMENT SILENCER EAR (1-A) should push ESCAPEMENT PAWL (2) clear of ESCAPEMENT WHEEL (3) teeth. Check with machine at rest; do not use Carriage Release Lever to check requirement.

ADJUSTMENT: Form ESCAPEMENT SILENCER EAR (1-A) toward PAWL (2) if Pawl does not clear Wheel.

ACCESS: Tip machine on its back to view Escapement area.

NOTE: When Carriage is at rest, ESCAPEMENT SILENCER EAR (1-A) should rest against LUG (4-A) of ESCAPEMENT SUPPORT PLATE (4). If SILENCER (1) rest position is not correct, or if SILENCER (1) does not move to contact PAWL (2) when checking requirement above, check lubrication and free movement of Silencer.

CARRIAGE MOVED FROM LEFT TO RIGHT



REAR VIEWS

ESCAPEMENT ADJUSTMENTS

7. Dead Key Adjustment.

REQUIREMENT:

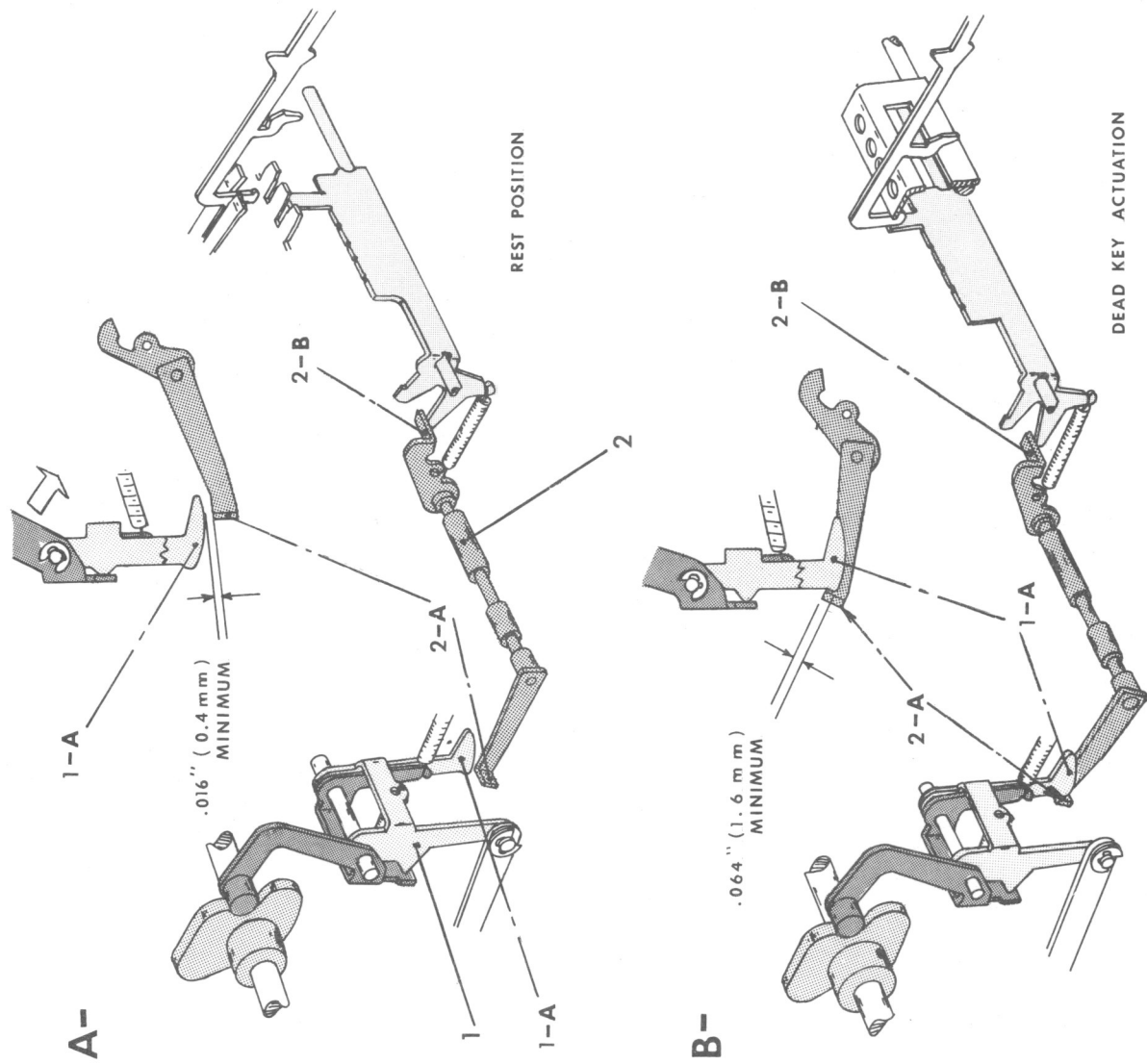
A) During a non-Dead Key print cycle, DEAD KEY HOOK (2-A) should have at least .016" passing clearance from ARM (1-A) of ESCAPEMENT JOINT LEVER (1).

TO CHECK: With machine at rest, rotate ESCAPEMENT JOINT LEVER (1) so that ARM (1-A) is opposite HOOK (2-A).

B) During a Dead Key print cycle, DEAD KEY HOOK (2-A) should have at least .064" coverage (top to bottom) on ARM (1-A) of ESCAPEMENT JOINT LEVER (1).

TO CHECK: With machine at rest, depress Dead Key Keylever.

ADJUSTMENT: Form ARM (2-B) of DEAD KEY HOOK FRAME (2) up or down.

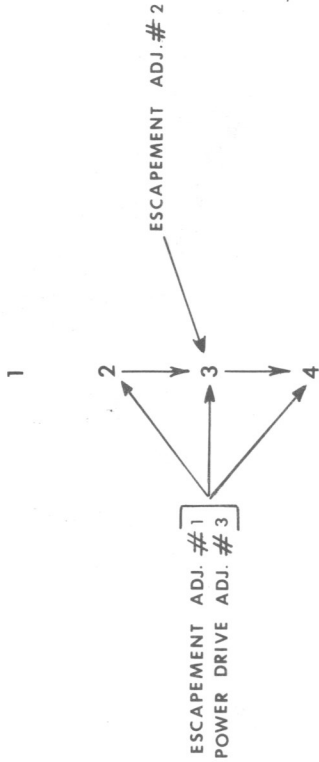


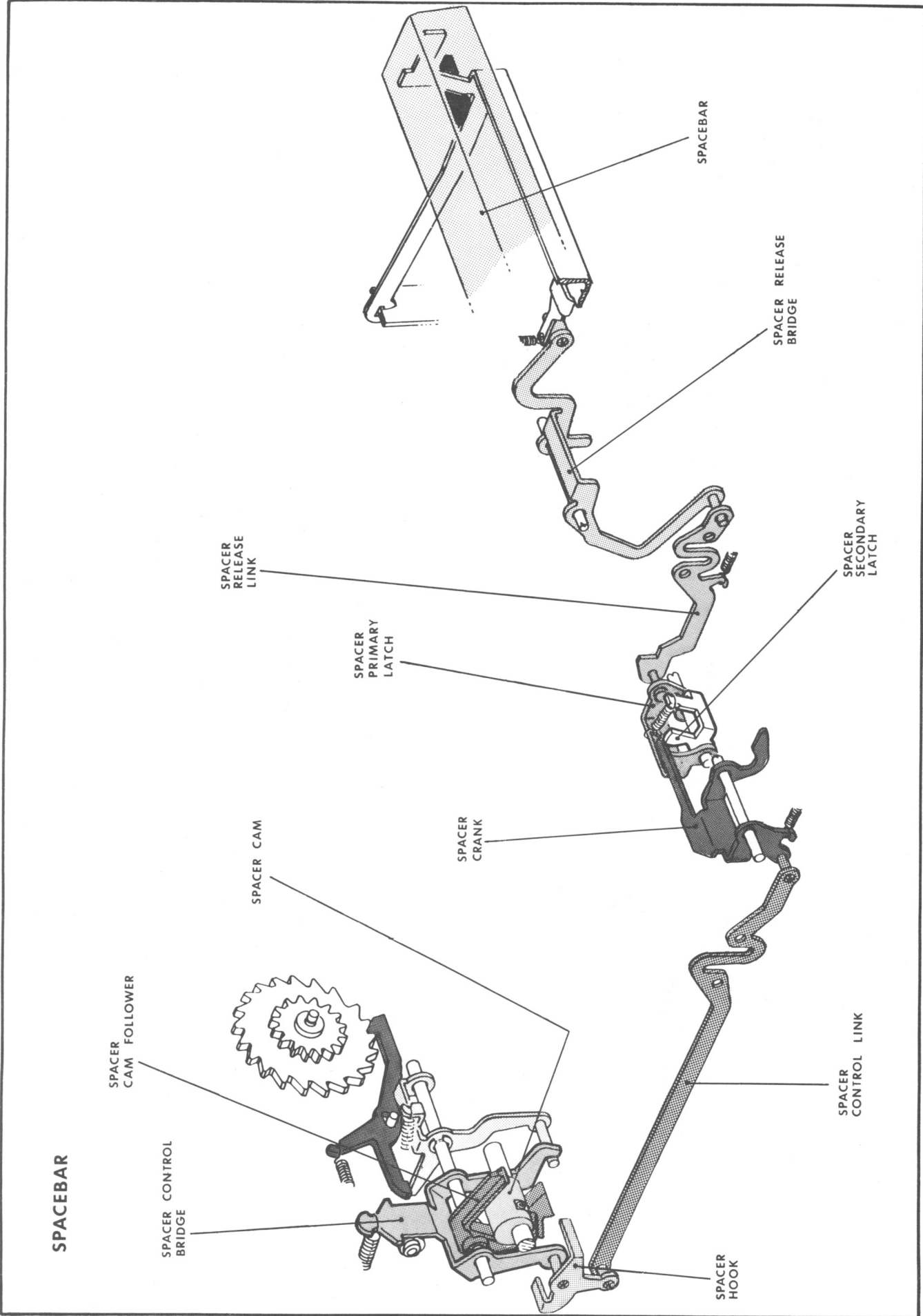


SPACEBAR ADJUSTMENTS

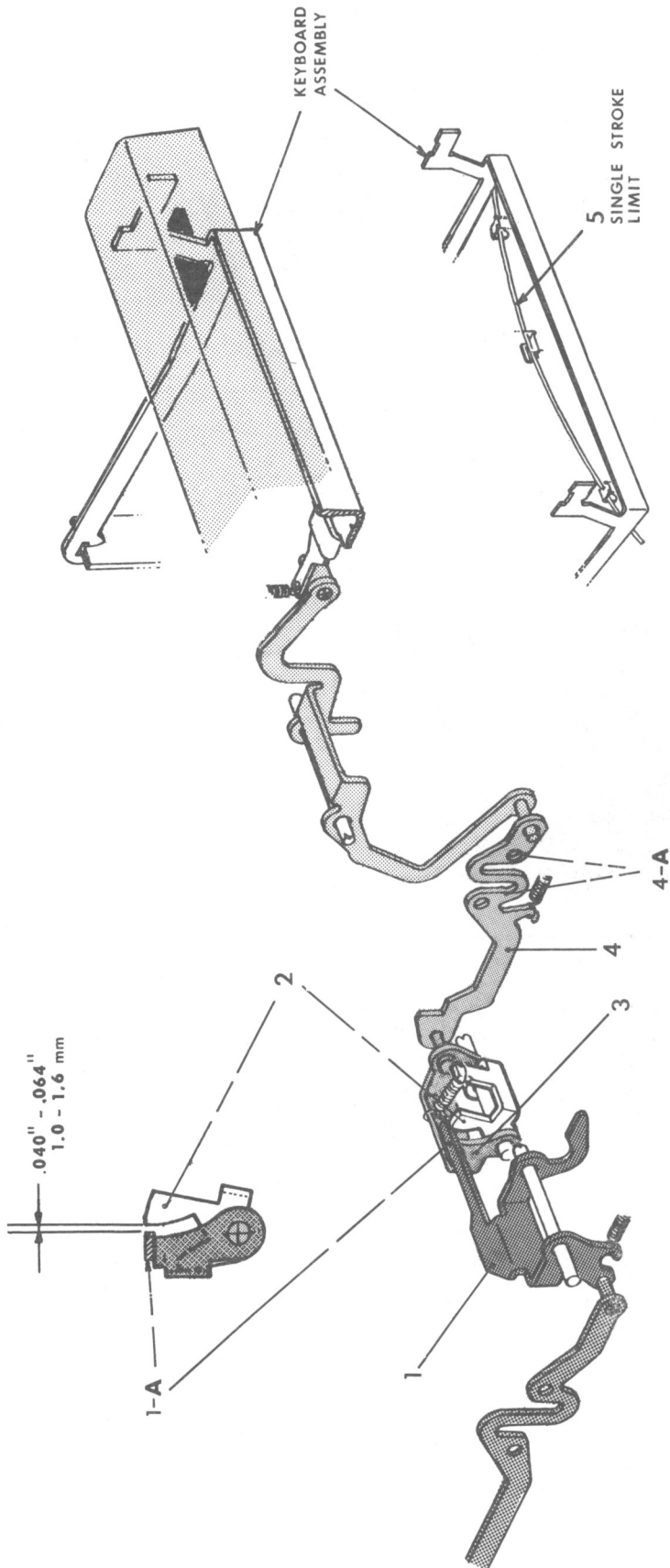
SPACEBAR

1. Rest position of Spacebar Latch.
2. Position of Spacer Hook for initial block-out of a spacing actuation during a print cycle.
3. Secondary block-out of a spacing actuation during a print cycle.
4. Engagement and travel of Spacer Hook.





SPACEBAR ADJUSTMENTS



1. Rest position of Spacebar LATCHES (2) & (3).

REQUIREMENT:

With machine at rest and Keyboard in place, there should be  $.040'' - .064''$  clearance between SPACER SECONDARY LATCH (2) and SPACER CRANK ARM (1-A).

ADJUSTMENT: Shorten or lengthen SPACER RELEASE LINK (4) by forming at (4-A).

NOTE:

This adjustment provides:

- Free travel of Spacebar before spacing actuation.
- One spacing actuation when Spacebar is depressed to its SINGLE STROKE LIMIT (5).
- Repeat spacing actuation when Spacebar is fully depressed.

2. Position of SPACER HOOK (2) for initial block-out of a spacing actuation during a print cycle.

REQUIREMENT:

Rotate Print Cam Shaft until point of CAM FOLLOWER STEP (1-A) is opposite SPACER HOOK ARM (2-A). Depress a character Keylever or Interposer, and then depress Spacebar. There should be .024"-.048" between ARM (2-A) and point of STEP (1-A).

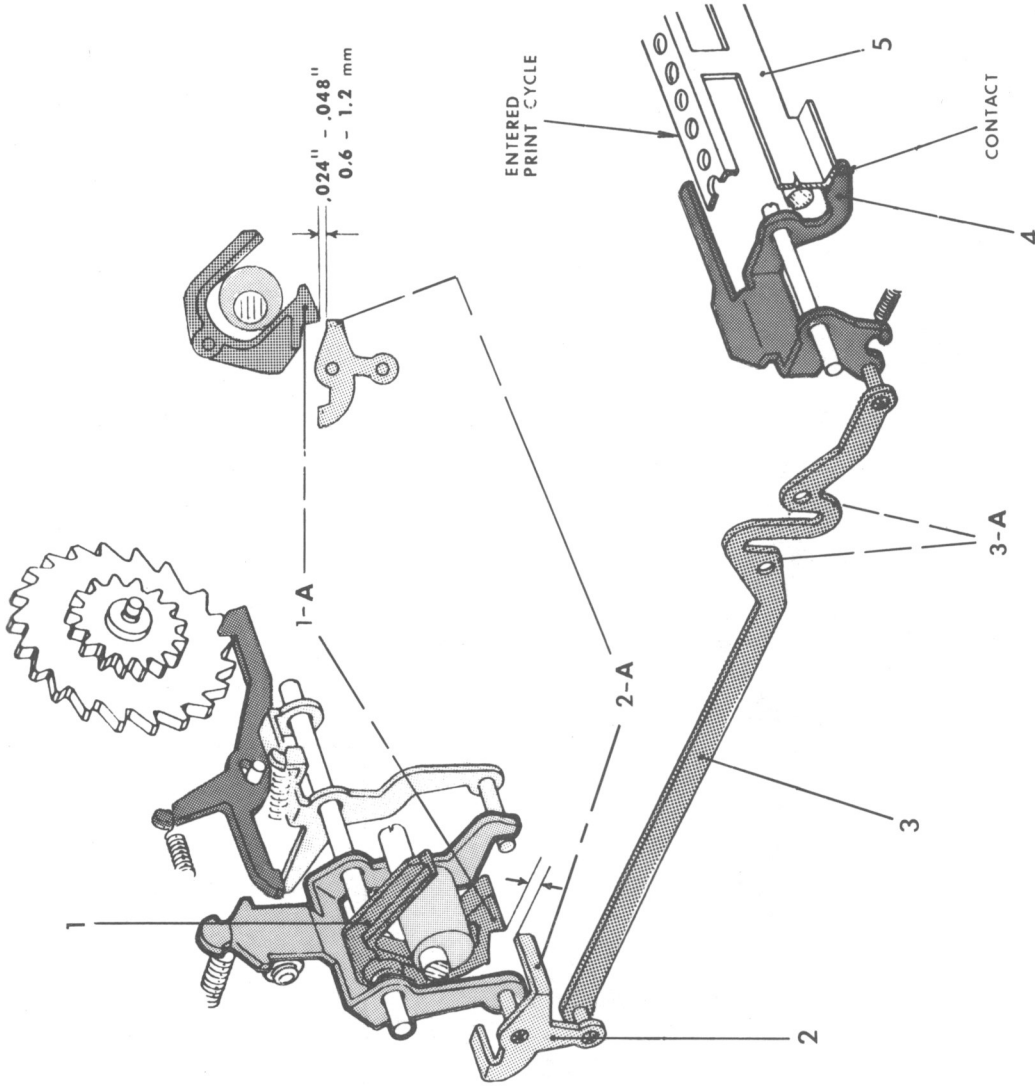
NOTE: Escapement Adjustment #1 must be correct.

ADJUSTMENT: Shorten or lengthen SPACER CONTROL LINK (3) by forming at (3-A).

NOTE: Adjust to low end of range. \*

NOTE: When Spacebar and a print cycle are actuated at the same time, SPACER CRANK (4) contacts the actuated CODE SET BAIL (5) to limit movement of CONTROL LINK (3) and attached SPACER HOOK (2). This initial block-out of spacing actuation lasts until Code Set Bail restores during the print cycle. Secondary block-out, required for the remainder of the print cycle, is described on the following page.

\* Helps prevent machine deactivation.





## SPACEBAR ADJUSTMENTS

3. Secondary block-out of a spacing actuation during a print cycle.

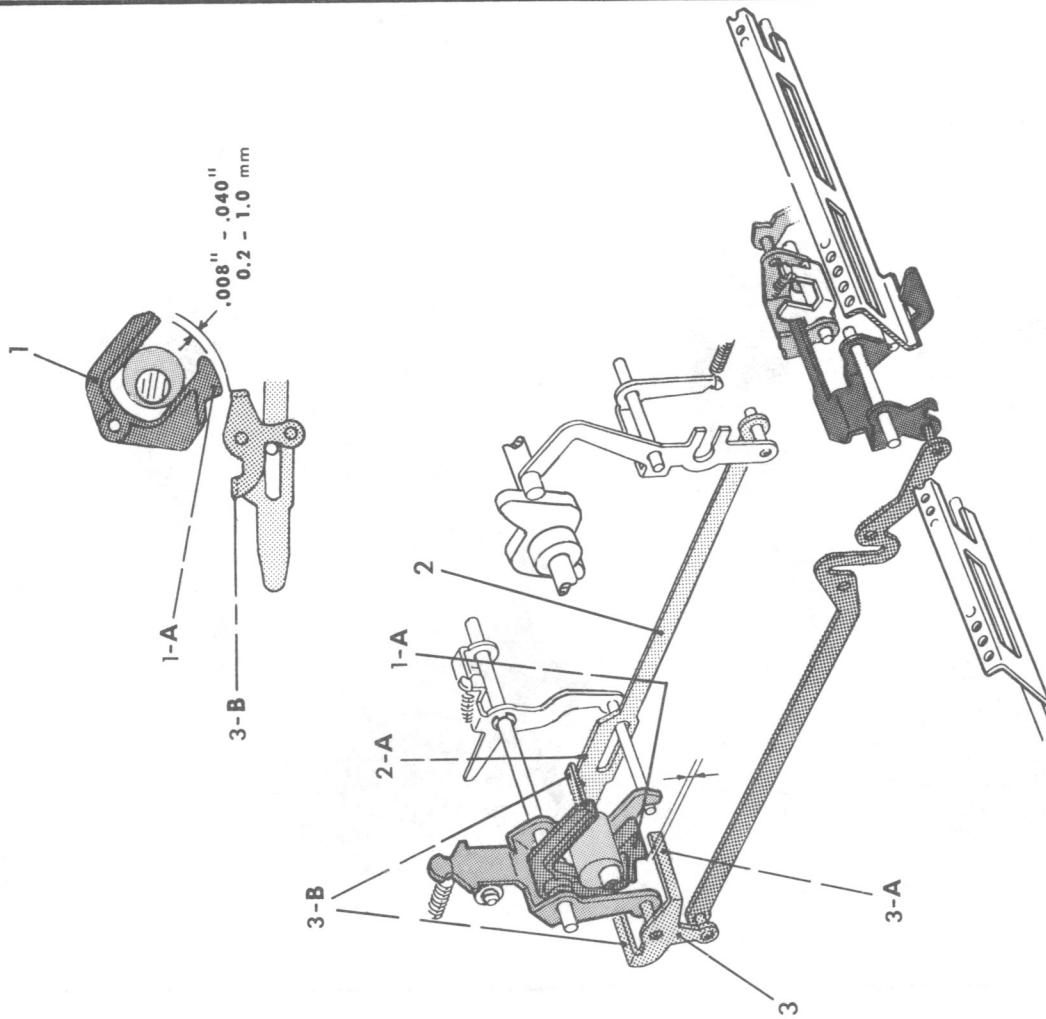
REQUIREMENT:

Rotate Print Cam Shaft until point of CAM FOLLOWER STEP (1-A) is opposite SPACER HOOK ARM (3-A). Depress character Keylever or Interposer. Then depress Spacebar, and rotate Print Cam Shaft just to point of print impact. SPACER HOOK ARM (3-B) should contact SURFACE (2-A) of ESCAPEMENT CONTROL LINK (2) to provide .008"-.040" passing clearance between HOOK ARM (3-A) and point of CAM FOLLOWER STEP (1-A).

NOTE: Escapement Adjustments #1 & 2 must be correct.

ADJUSTMENT: Form SPACER HOOK ARM (3-B) up or down.

NOTE: If ARM (3-B) does not have front to rear coverage on LINK SURFACE (2-A) at checkpoint, form ARM (3-B) forward. It should be approximately parallel with rear frame.



## 4. Engagement and travel of SPACER HOOK (2).

REQUIREMENT:

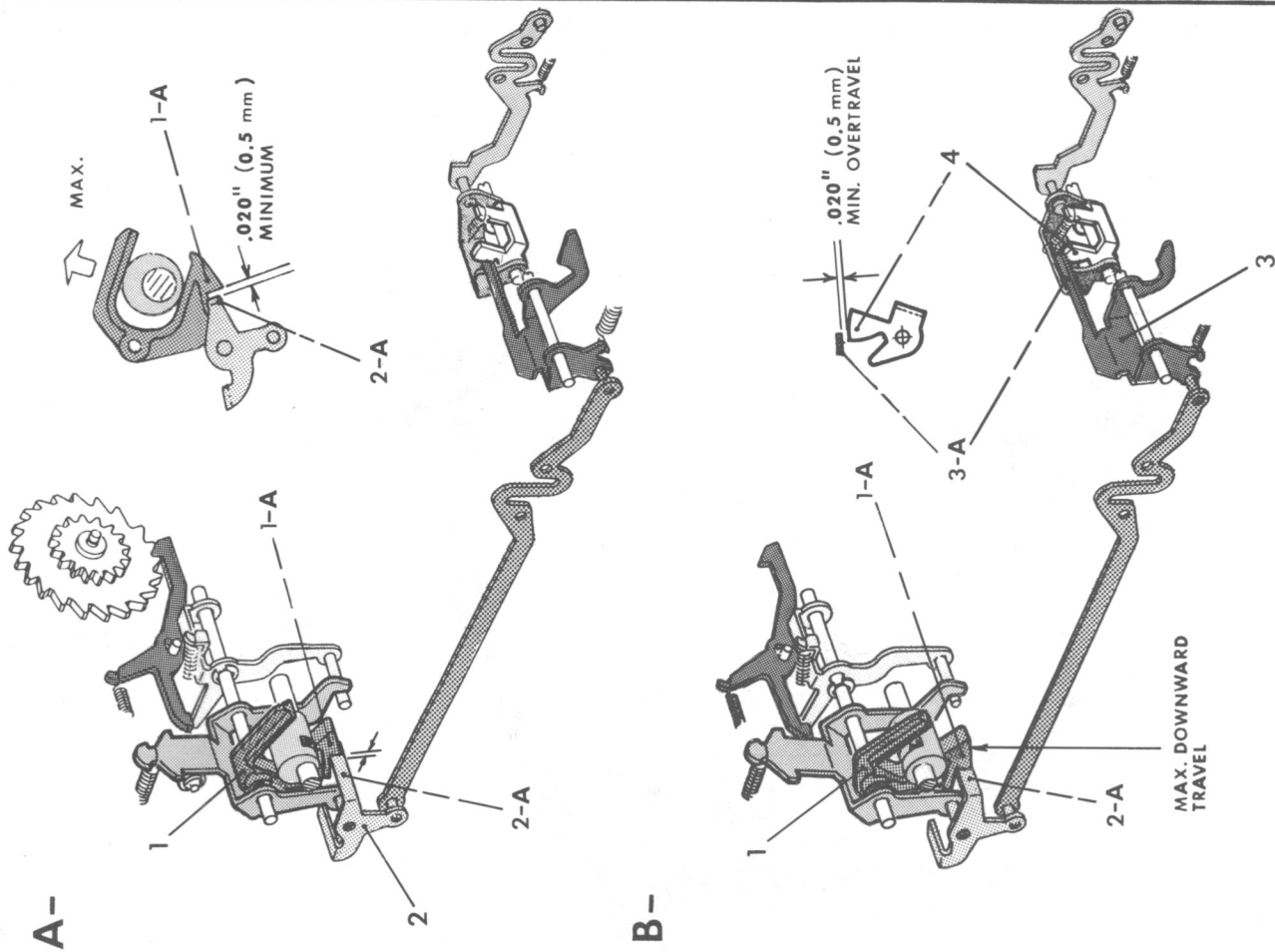
- A) Rotate Print Cam Shaft until SPACER CAM FOLLOWER (1) rotates to its furthest point upward. Depress Spacebar: There should be at least .020" front to rear clearance between SPACER HOOK ARM (2-A) and CAM FOLLOWER STEP (1-A).
- B) When ARM (2-A) is engaged with STEP (1-A) and CAM FOLLOWER (1) rotates to its furthest point downward, SPACER CRANK ARM (3-A) should lift at least .020" above SPACER SECONDARY LATCH (4). Check by rotating Print Cam Shaft with Spacebar depressed and held on its single stroke limit.

NOTE: Escapement Adjustment #1 must be correct.

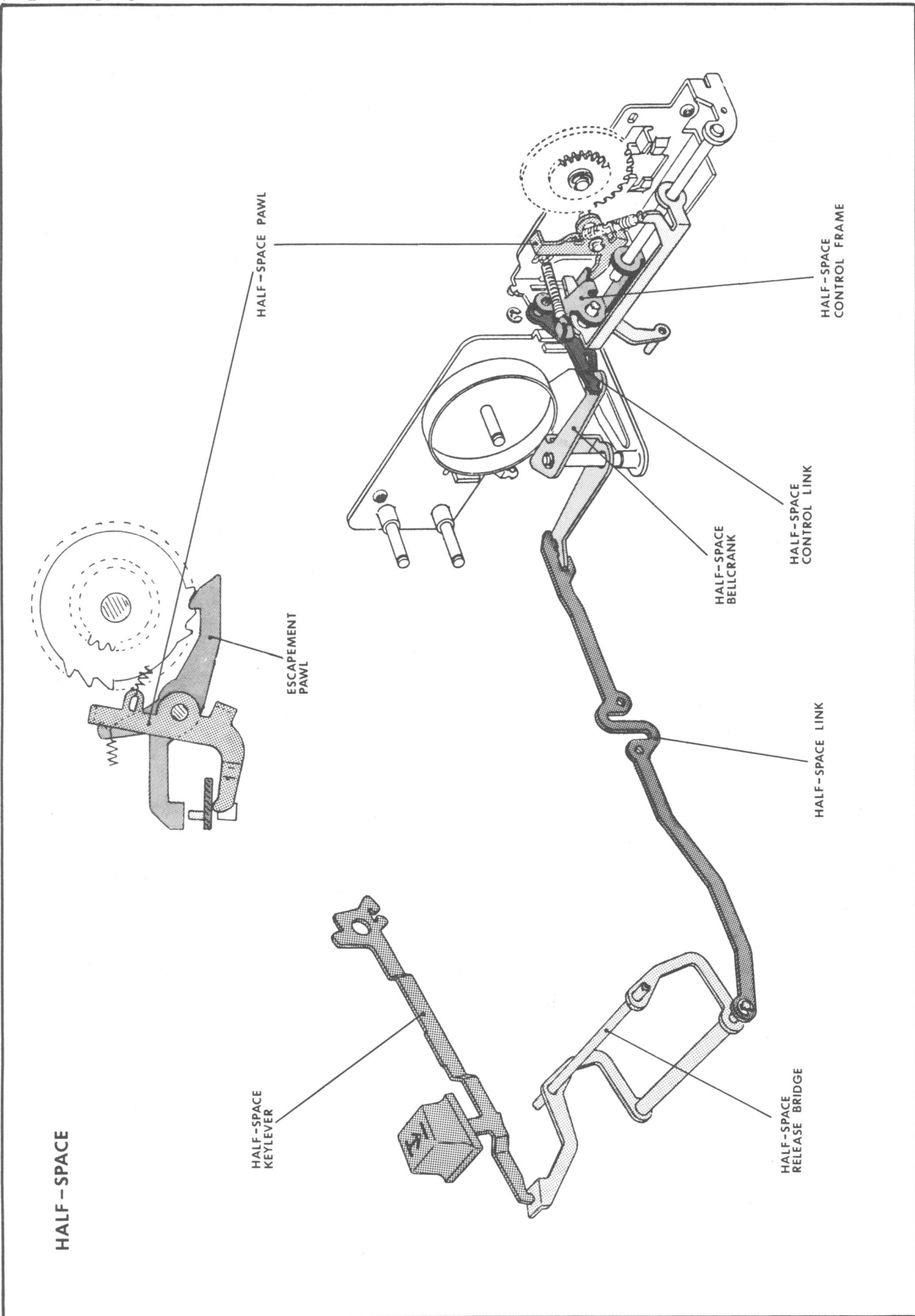
ADJUSTMENT: Form SPACER HOOK ARM (2-A) forward or rearward. Adjust to minimize deformation of ARM (2-A). \*

NOTE: If HOOK ARM (2-A) must be excessively deformed to obtain Requirement B, form CRANK ARM (3-A) up to obtain .020" over-travel (Req. B).

\* Helps prevent machine deactivation.



HALF-SPACE ADJUSTMENT



HALF-SPACE

HALF-SPACE ADJUSTMENT

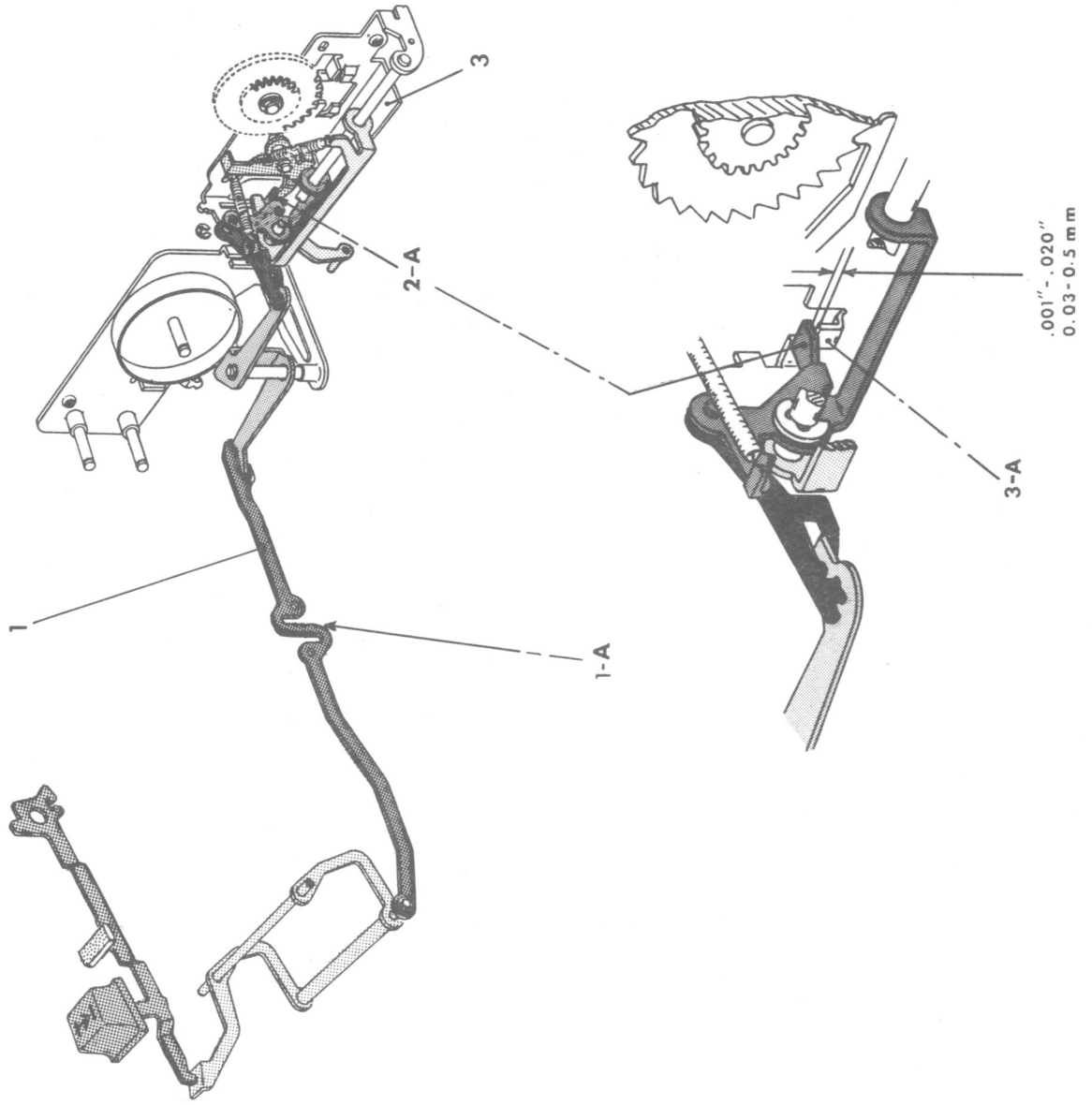
1. Half-Space Linkage Adjustment.

**REQUIREMENT:** With machine at rest, there should be .001"-.020" clearance between HALF-SPACE CONTROL FRAME EAR (2-A) and LUG (3-A) of ESCAPEMENT SUPPORT (3).

**ACCESS:** Tip machine up, and view Escapement area from the bottom.

**ADJUSTMENT:** Shorten or lengthen HALF-SPACE LINK (1) by forming at (1-A).

**NOTE:** This adjustment provides free travel of Half-Space Keylever before Half-Space trip. It also assures Half-Space trip before Keylever bottoms.



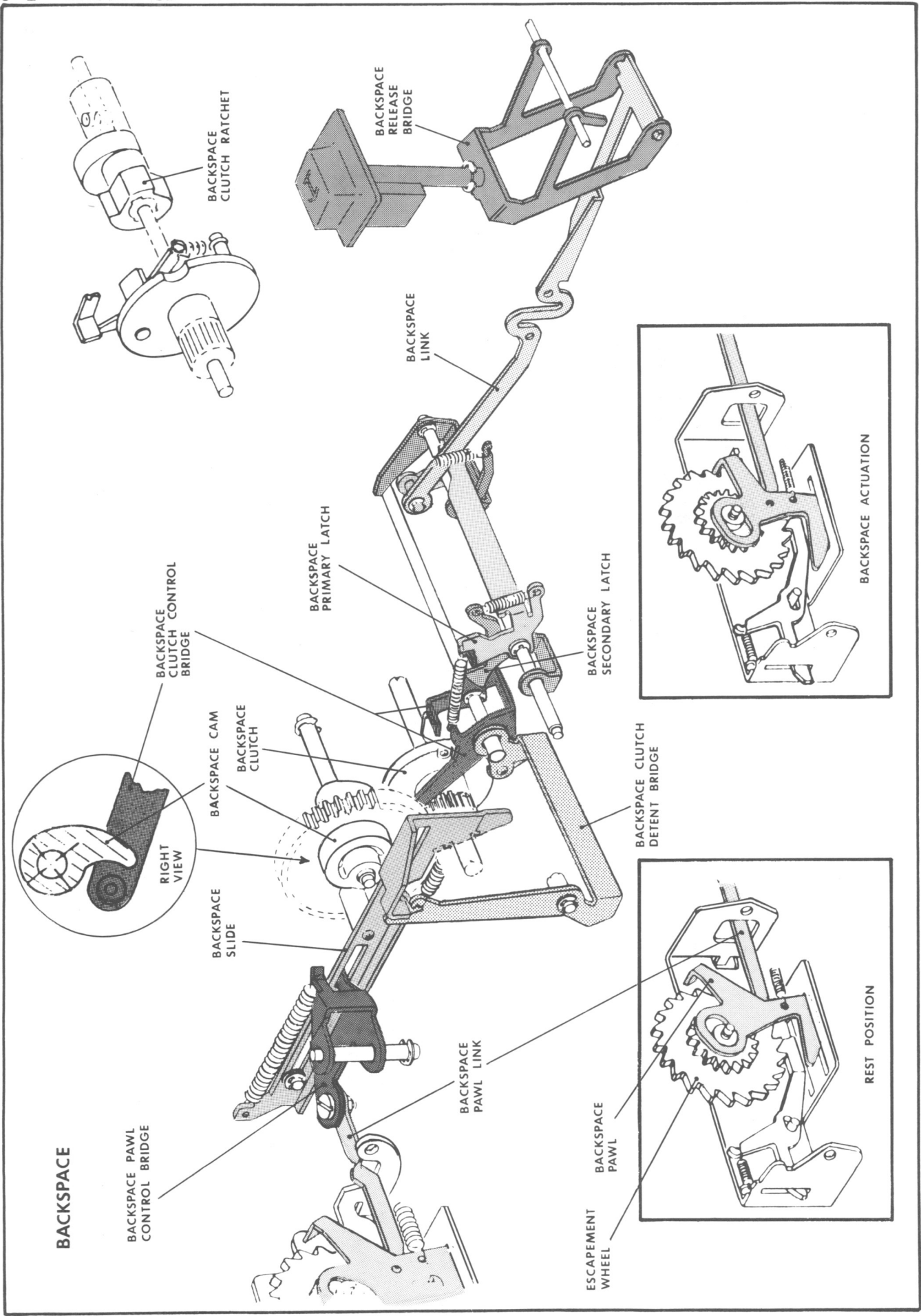


BACKSPACE ADJUSTMENTS

**BACKSPACE**

- 1. Backspace Cam and Clutch synchronization.
- 2. Rest position of Backspace Latches.
- 3. Rest position and actuation of Backspace Pawl.
- 4. Rest position of Backspace Clutch Detent Bridge.
- 5. Backspace Cam Brake.

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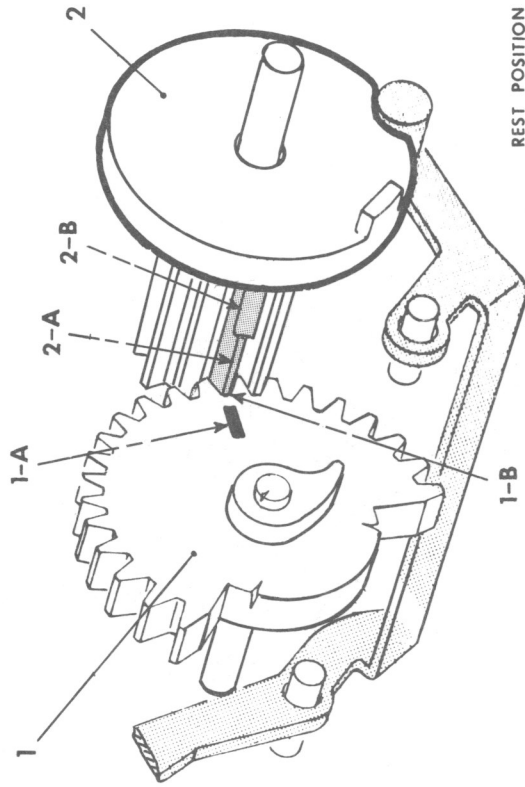


BACKSPACE ADJUSTMENTS

1. Backspace CAM (1) and CLUTCH (2) synchronization.

REQUIREMENT: With machine at rest, the BACKSPACE CLUTCH GEAR TOOTH (2-A) identified by STEP (2-B) should engage the BACKSPACE CAM GEAR NOTCH (1-B) identified by GROOVE (1-A) in CAM (1).

ADJUSTMENT: Remove and reinstall BACKSPACE CAM (1) to obtain requirement.



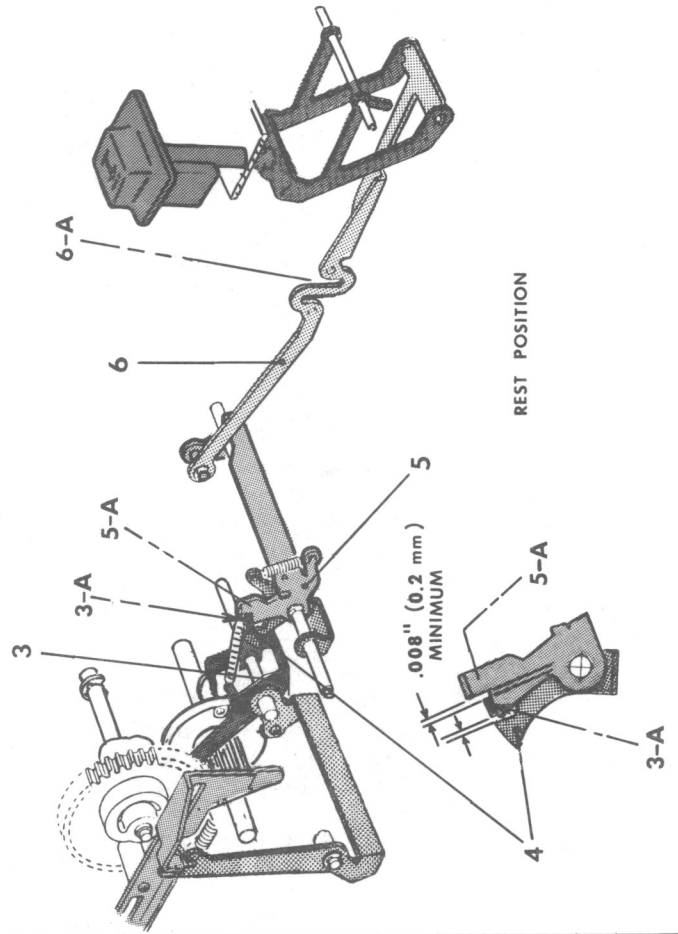
2. Rest position of Backspace Latches.

REQUIREMENT: With machine at rest and Keyboard in place:

A) There should be at least .008" clearance between PRIMARY LATCH ARM (5-A) and CLUTCH CONTROL BRIDGE ARM (3-A).

B) There should be at least .008" clearance between SECONDARY LATCH (4) and ARM (3-A).

ADJUSTMENT: Shorten or lengthen BACKSPACE LINK (6) by forming at (6-A).



3. Rest position and actuation of BACKSPACE PAWL (1).

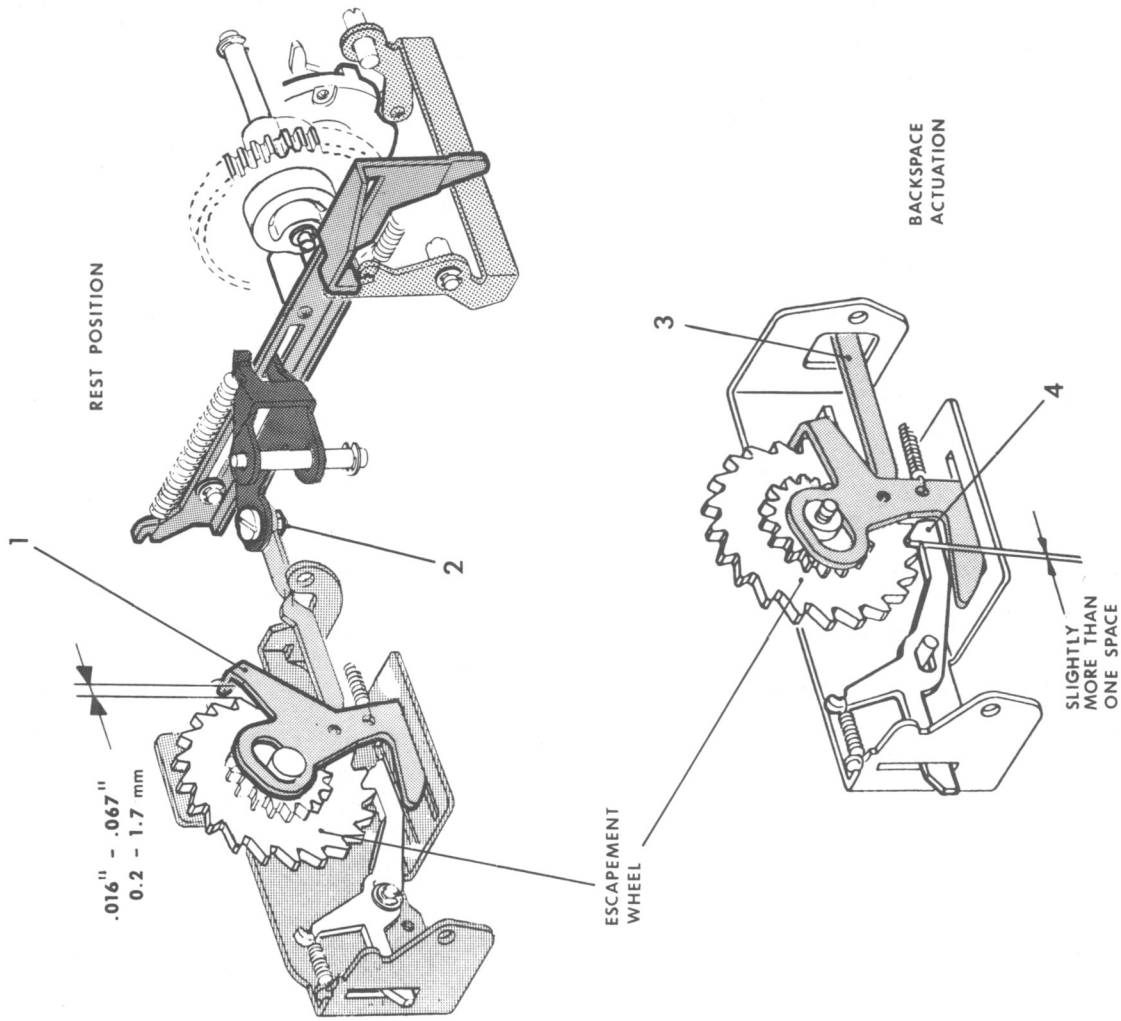
REQUIREMENT:

With machine at rest, there should be .016"-.067" clearance between BACKSPACE PAWL (1) and Escapement Wheel Teeth as illustrated.

ADJUSTMENT: Loosen Lock Nut and regulate BACKSPACE PAWL LINK ECCENTRIC (2). Do not distort PAWL LINK (3) when making adjustment.

FUNCTIONAL CHECK:

The above requirement should provide sufficient rotation of Escapement Wheel during Backspace cycle. To check, depress Backspace Keylever and rotate Intermediate Shaft until Backspace PAWL LINK (3) reaches its maximum movement to the left: Escapement Wheel should rotate slightly more than one space in respect to ESCAPEMENT PAWL (4).



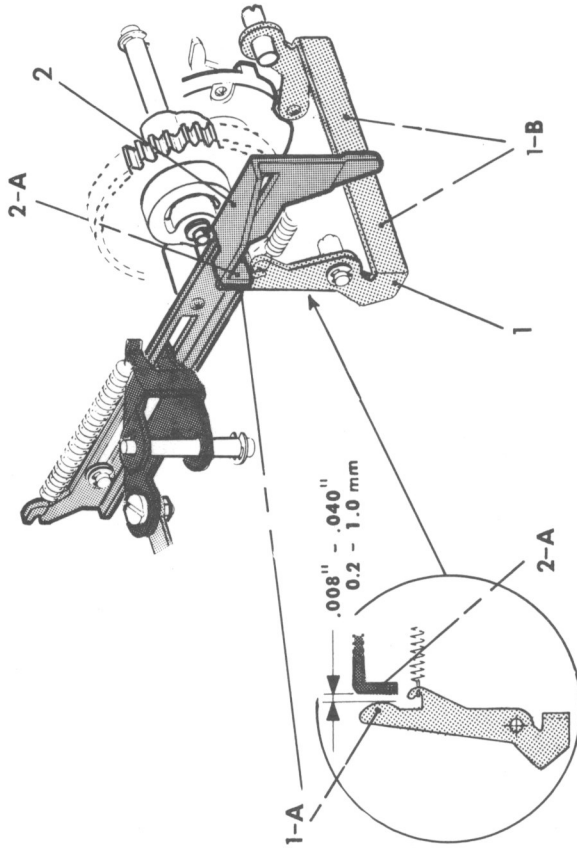
BACKSPACE ADJUSTMENTS

4. Rest position of BACKSPACE CLUTCH DETENT BRIDGE (1).

REQUIREMENT:

With machine at rest, there should be .008"-.040" clearance between CLUTCH DETENT BRIDGE ARM (1-A) and BACKSPACE SLIDE LUG (2-A).

ADJUSTMENT: With two pair of pliers form CROSS SECTION (1-B) to move ARM (1-A) toward or away from LUG (2-A).

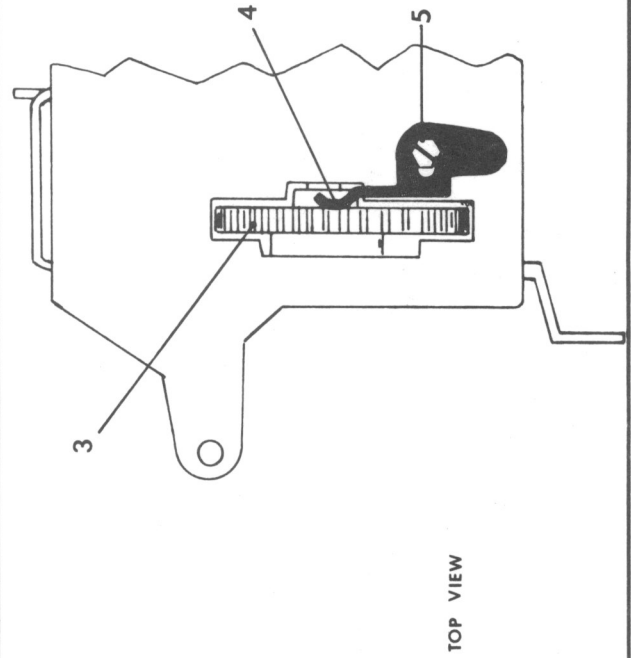


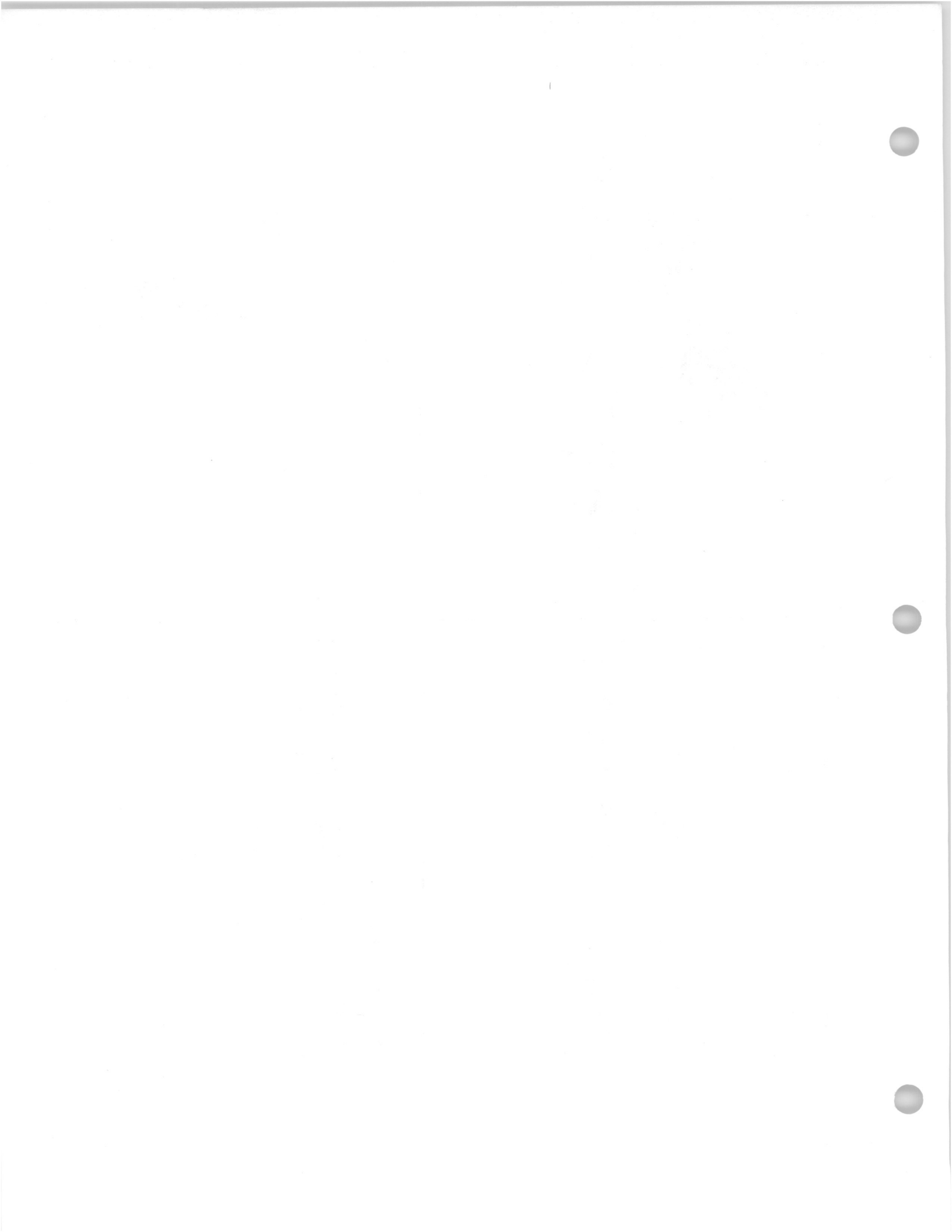
5. BACKSPACE CAM BRAKE (4).

REQUIREMENT: BACKSPACE CAM BRAKE (4) should apply sufficient drag on BACKSPACE CAM (3) to minimize noise of Backspace parts returning to rest position.

TO CHECK: Depress Backspace Keylever, and slowly rotate Print Cam Shaft Pulley for complete Backspace cycle: BACKSPACE CAM (3) should not snap back to rest position near end of cycle; rather, it should restore to rest with rotation of Intermediate Shaft.

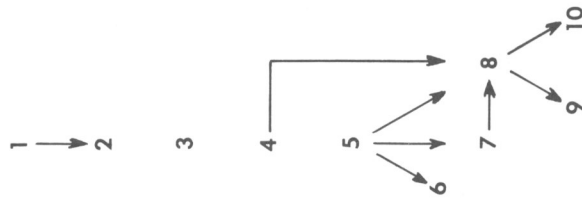
ADJUSTMENT: Loosen SCREW (5); push BRAKE (4) against CAM (3) and tighten SCREW (5).



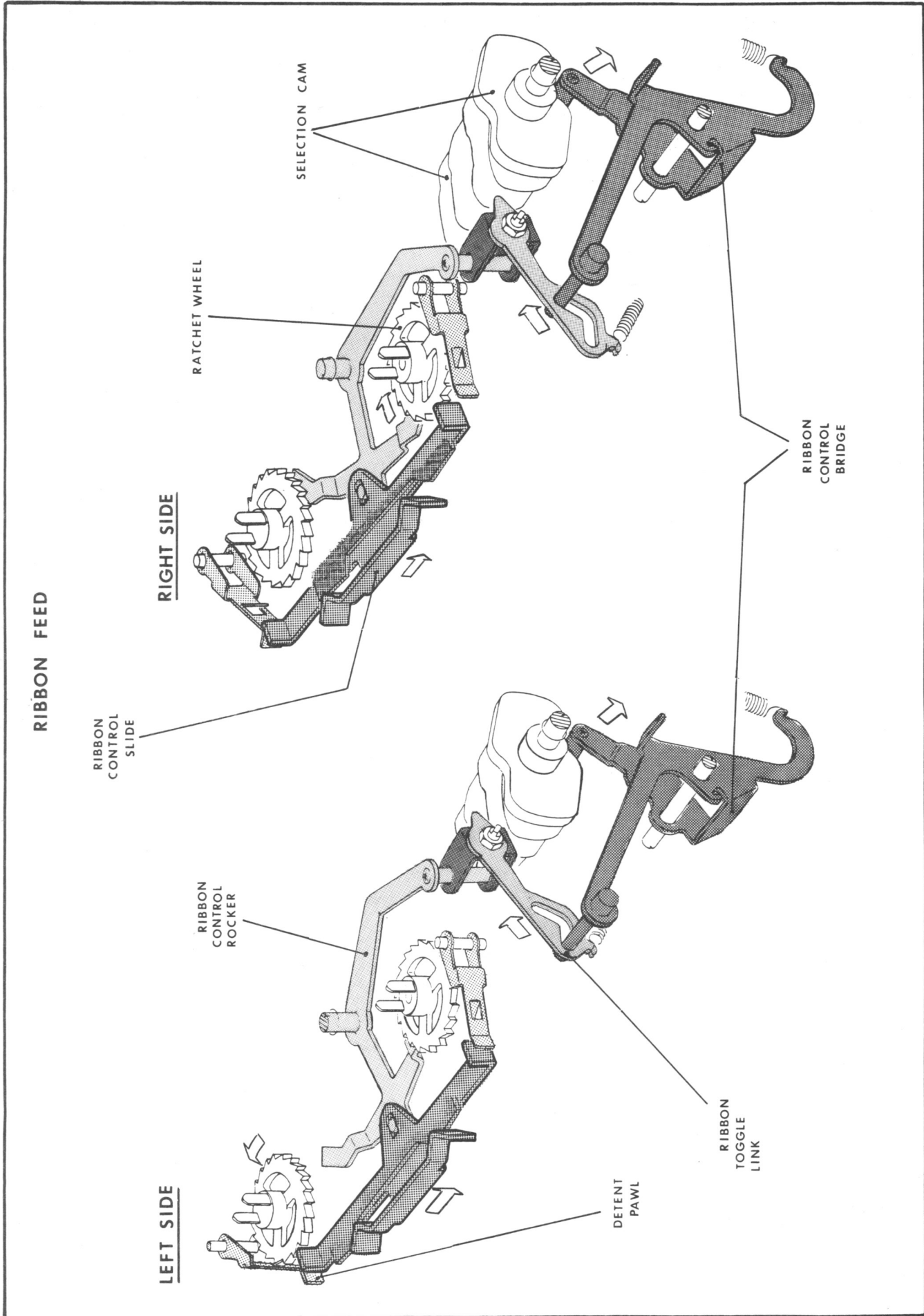


RIBBON FEED-LIFT ADJUSTMENTS

RIBBON FEED-LIFT

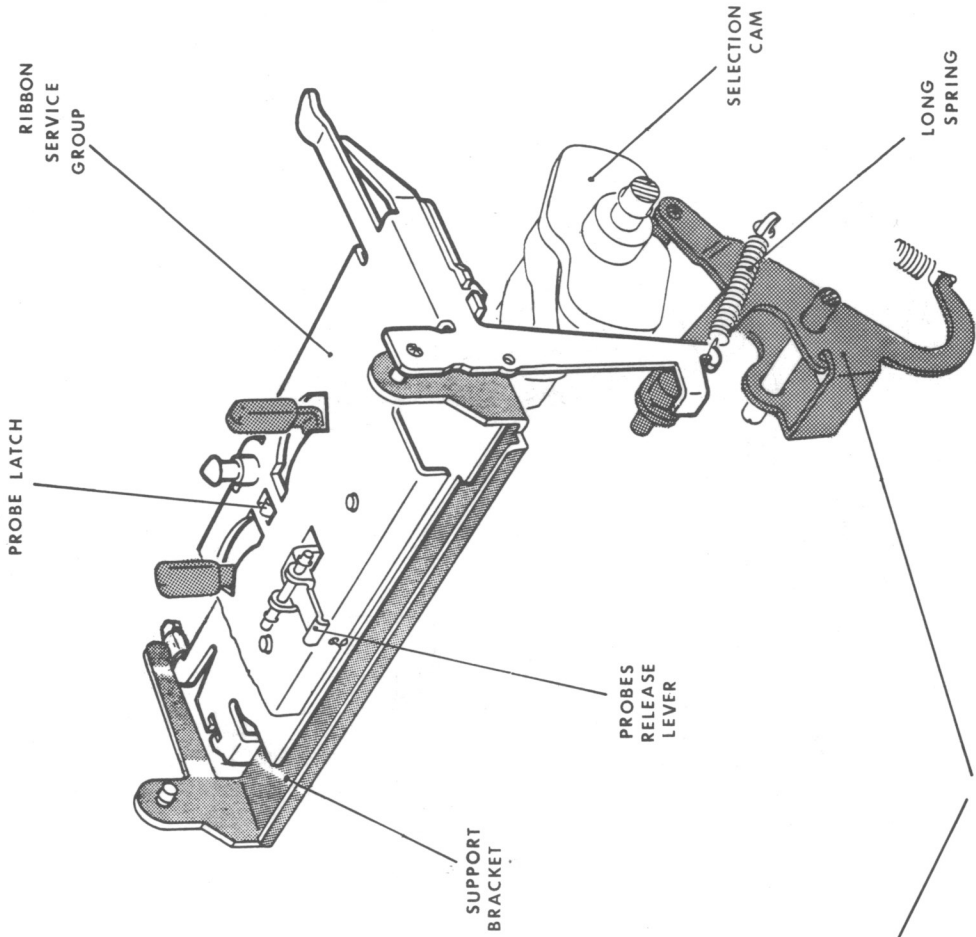


1. Rest position of Ribbon Cassette.
2. Position of Probes at end of Ribbon travel for Ribbon Reverse.
3. Timing of Ribbon Reverse.
4. Total clearance between Ribbon Control Rocker and right and left Probe Arms.
5. Rest position of Ribbon Service Group.
6. Limiting down play of Ribbon Service Group for Cassette installation.
7. Ribbon Lift.
8. Position of Ribbon Control Rocker for Ribbon Feed and Ribbon Reverse.
9. Ribbon Feed on Left Ribbon Ratchet Wheel.
10. Ribbon Feed on Right Ribbon Ratchet Wheel.

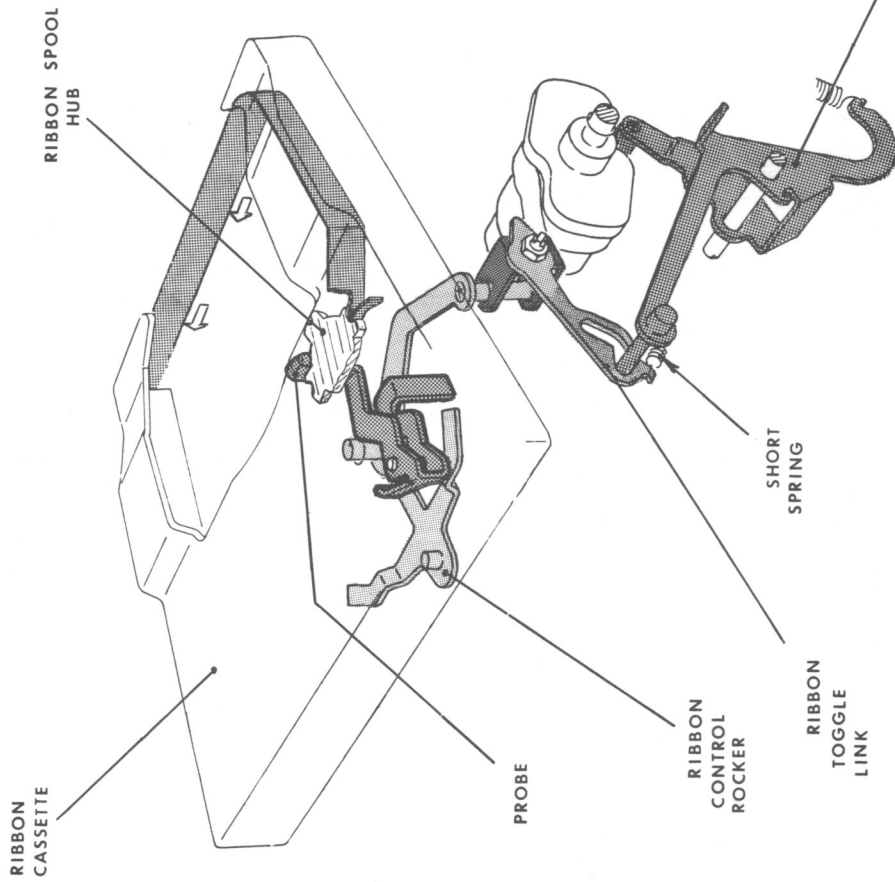


1-875-1464

RIBBON LIFT



RIBBON REVERSE

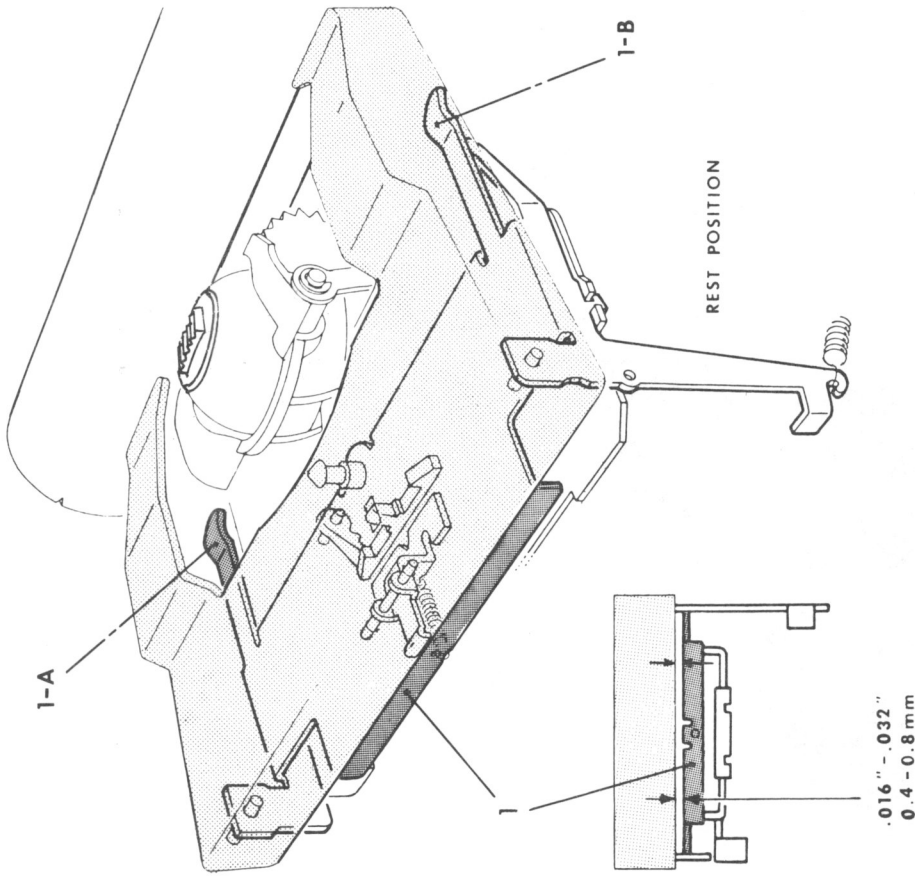


1. Rest position of Ribbon Cassette.

REQUIREMENT:

With machine at rest and Ribbon Cassette in place, there should be .016"-.032" clearance between UPPER SUPPORT PLATE (1) and front bottom of Cassette.

ADJUSTMENT: Form SUPPORT PLATE ARMS (1-A) and (1-B) up or down. Adjust for approximately equal clearance on right and left sides.





RIBBON FEED-LIFT ADJUSTMENTS

2. Position of Probes at end of Ribbon travel for Ribbon Reverse.

REQUIREMENT:

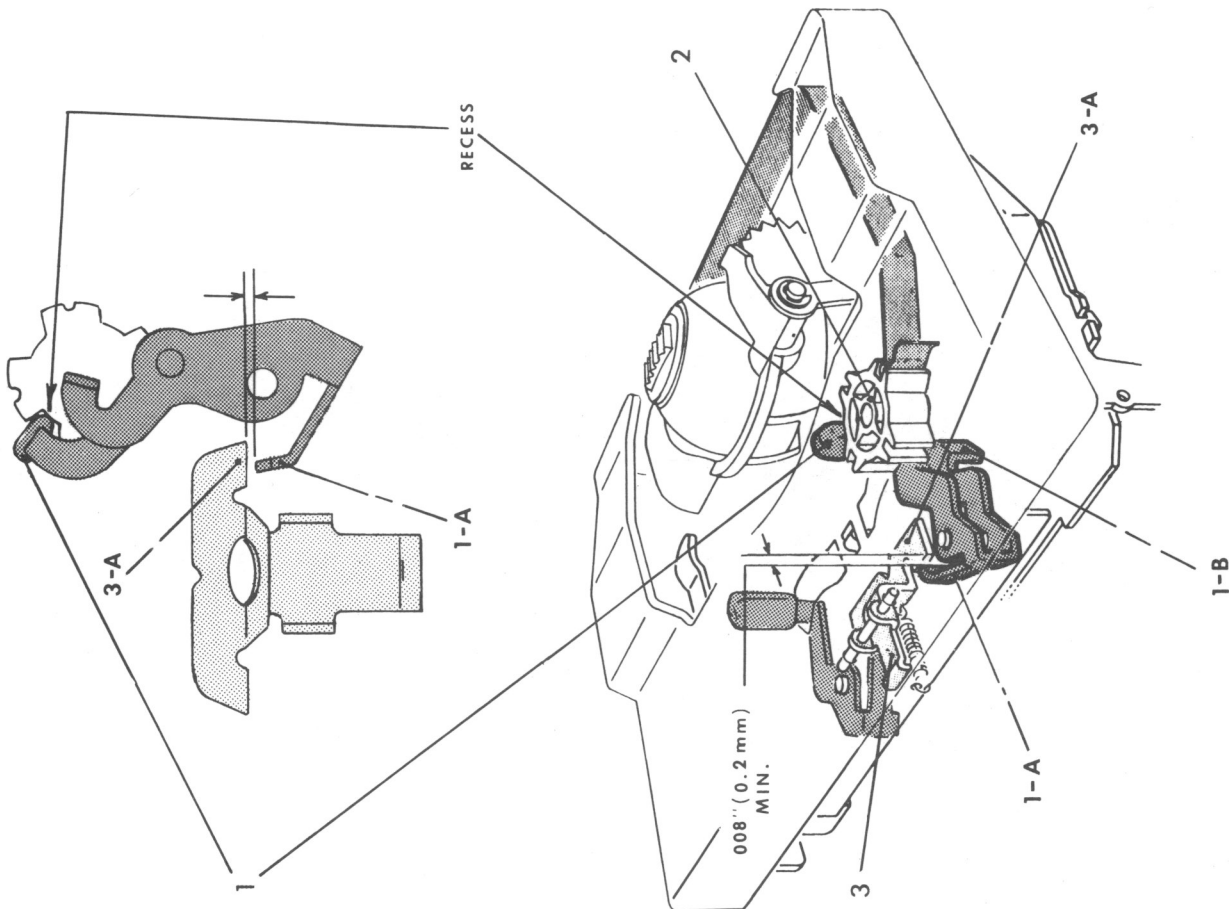
- A) PROBES RELEASE LEVER ARM (3-A) should not impede movement of RIGHT PROBE (1) into recess of RIGHT RIBBON SPOOL (2).
- TO CHECK: Remove Ribbon Service Group; Wind Ribbon completely onto the Left Spool of a Cassette. Rotate RIGHT RIBBON SPOOL (2) so that RIGHT PROBE (1) will enter recess of Spool Hub. Install Cassette on removed Group. Tip Group over for view of bottom. Check for at least .008" clearance between LEVER ARM (3-A) and PROBE ARM (1-A).

- B) Check same requirement using similar procedure on left side.

SUGGESTION: Remove ribbon from Cassette, and check both sides at same time.

ADJUSTMENT: Form PROBE ARM (1-A) toward or away from LEVER ARM (3-A). Make similar adjustment on left side. Adjust for approximate equal clearance on right and left sides.

NOTE: This adjustment assures that PROBE ARM (1-B) pivots fully into path of Arm of Ribbon Control Rocker for ribbon reverse movement.



3. Timing of Ribbon Reverse.
- REQUIREMENT:
- A) When RIGHT PROBE (2) is on Lobe of RIGHT RIBBON SPOOL HUB (1), RIGHT PROBE ARM (2-A) should have .040"-.060" lateral clearance from RIBBON CONTROL ROCKER ARM (3-A).

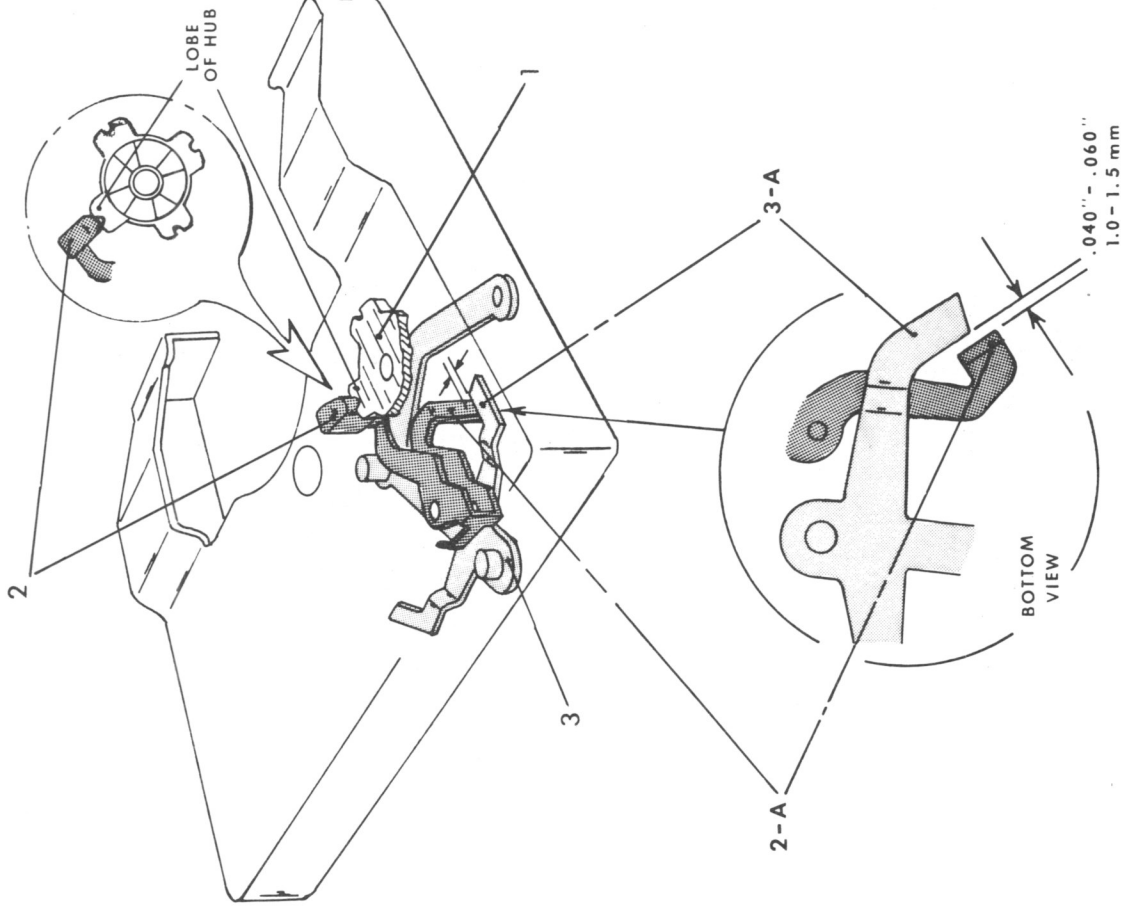
TO CHECK: Remove Ribbon Service Group. Wind Ribbon completely onto the Left Spool of a Cassette. Install Cassette on the removed Group and tip Group over for view from bottom. Rotate Right Ribbon Ratchet Wheel just until PROBE ARM (2-A) reaches its maximum movement towards the center-- at this point PROBE (2) is on Lobe of SPOOL HUB (1). Pivot CONTROL ROCKER (3) so that ARM (3-A) is opposite PROBE ARM (2-A). Check the required clearance between the two Arms.

- B) Check same requirement using similar procedure on left side.

SUGGESTION: Remove ribbon from Cassette to check requirements.

ADJUSTMENT: Form PROBE ARM (2-A) left or right. Make similar adjustment on left side.

NOTE: This adjustment assures full use of ribbon before ribbon reverse movement. It also assures that when PROBE (2) enters recess of Empty Spool Hub, PROBE ARM (2-A) is in path of ROCKER ARM (3-A) for ribbon reverse movement.



RIBBON FEED-LIFT ADJUSTMENTS

4. Total clearance between Ribbon Control Rocker and right and left Probe Arms.

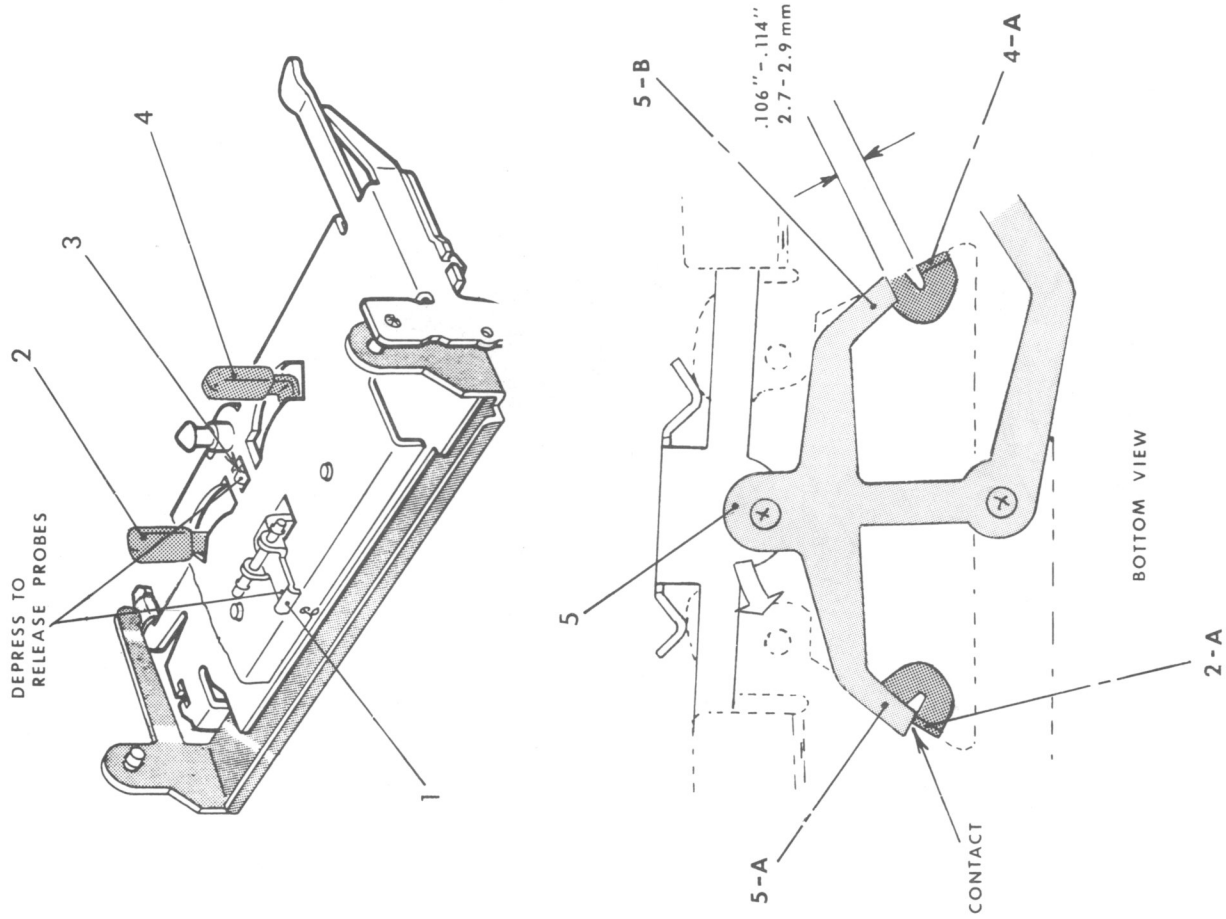
REQUIREMENT:

There should be .106"-.114" clearance between RIBBON CONTROL ROCKER ARM (5-B) and RIGHT PROBE ARM (4-A) when checked as follows:

TO CHECK: Remove Ribbon Service Group. Depress PROBES RELEASE LEVER (1) and RELEASE LUG (3) to release right and left PROBES (2) (4). Tip Group over for view of bottom. Pivot ROCKER (5) so that LEFT ARM (5-A) contacts LEFT PROBE ARM (2-A) as illustrated. Check clearance requirement between RIGHT ARM (5-B) and RIGHT PROBE ARM (4-A).

ADJUSTMENT: Form right or left PROBE ARM (2-A) (4-A) forward or rearward. Form the Arm that will require the least amount of deformation.

NOTE: This adjustment controls the motion required for ribbon reverse.

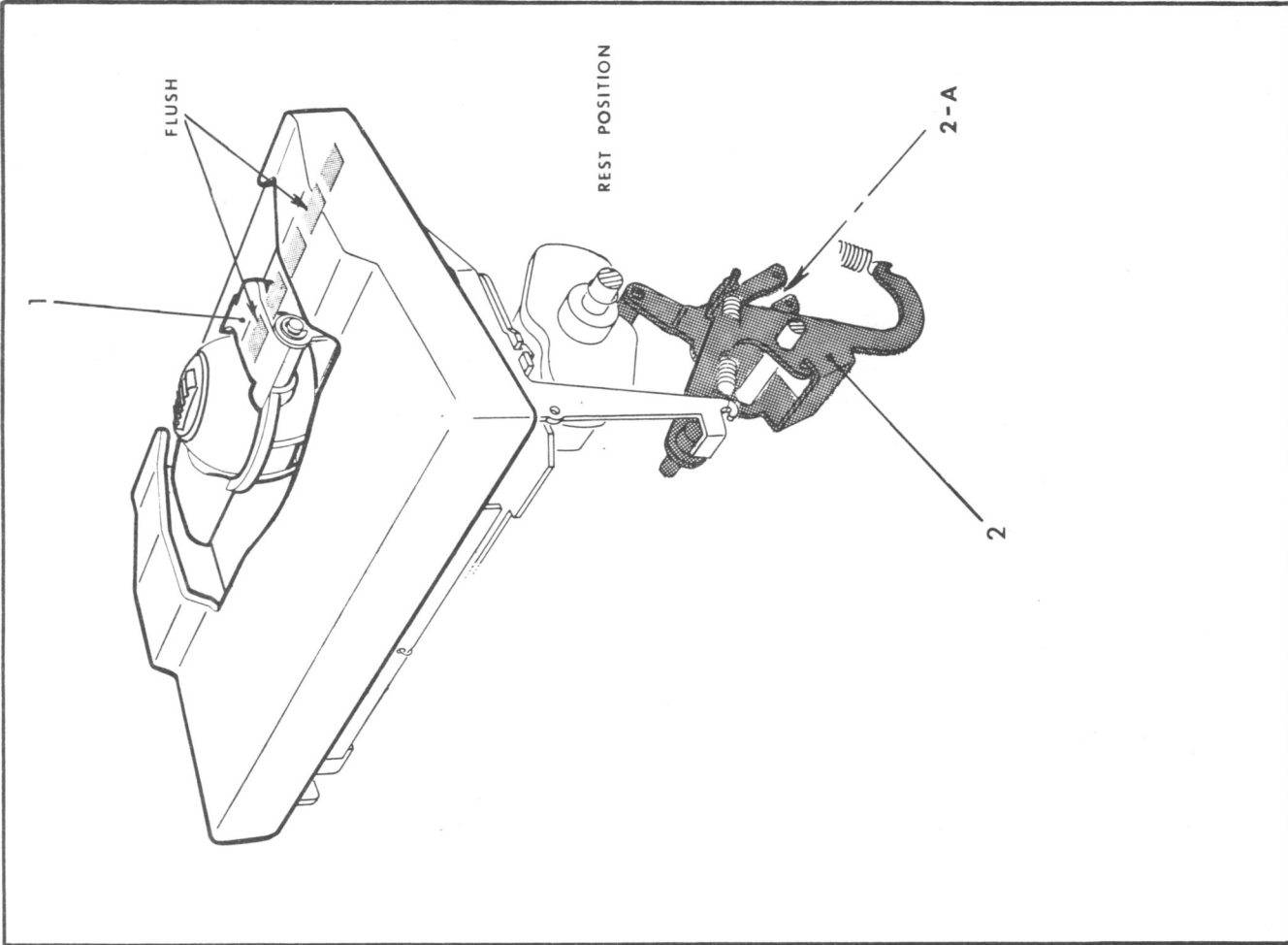


5. Rest position of Ribbon Service Group.

REQUIREMENT:

With machine at rest and Ribbon Cassette in place, top of Cassette should be flush with top of ELEMENT SUPPORT (1).

ADJUSTMENT: Open or close SLOT (2-A) of RIBBON CONTROL BRIDGE (2) to raise or lower rest position of Ribbon Service Group.



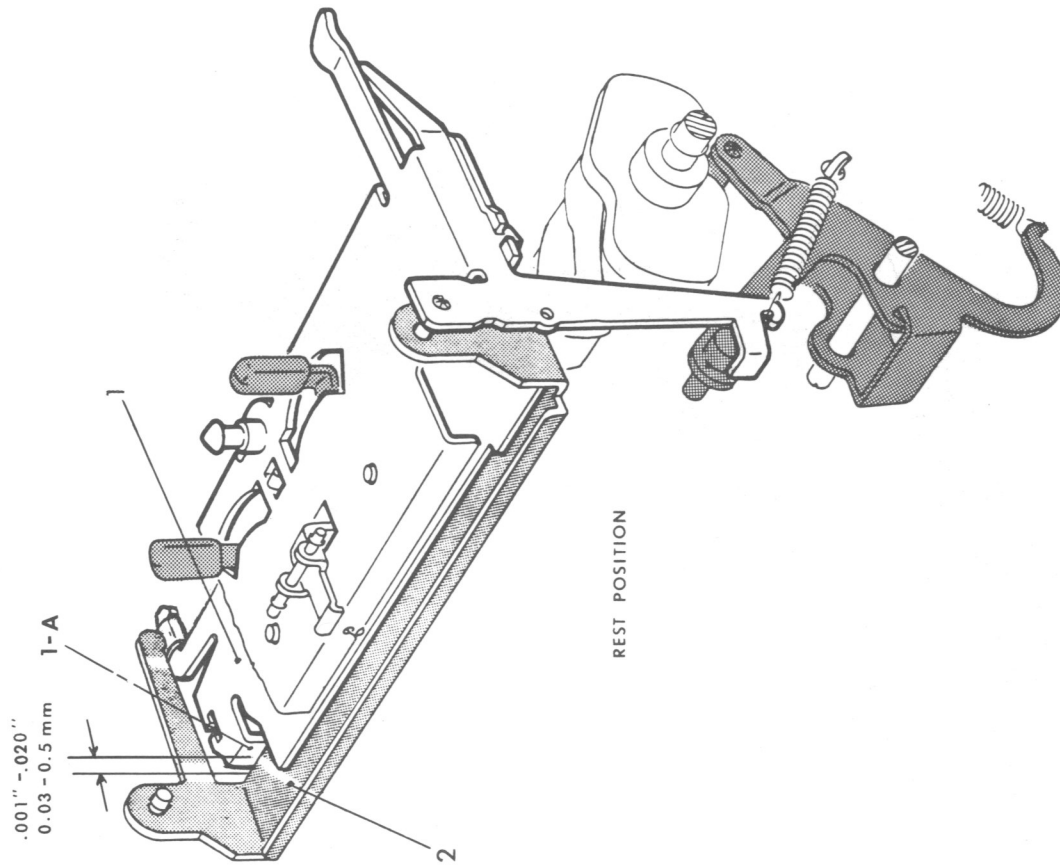
RIBBON FEED-LIFT ADJUSTMENTS

6. Limiting down play of Ribbon Service Group for Cassette installation.

REQUIREMENT:

With machine at rest, there should be .001"-.020" clearance between Lower SUPPORT PLATE LUG (1-A) and SUPPORT BRACKET (2).

ADJUSTMENT: Form SUPPORT PLATE LUG (1-A) forward or rearward.



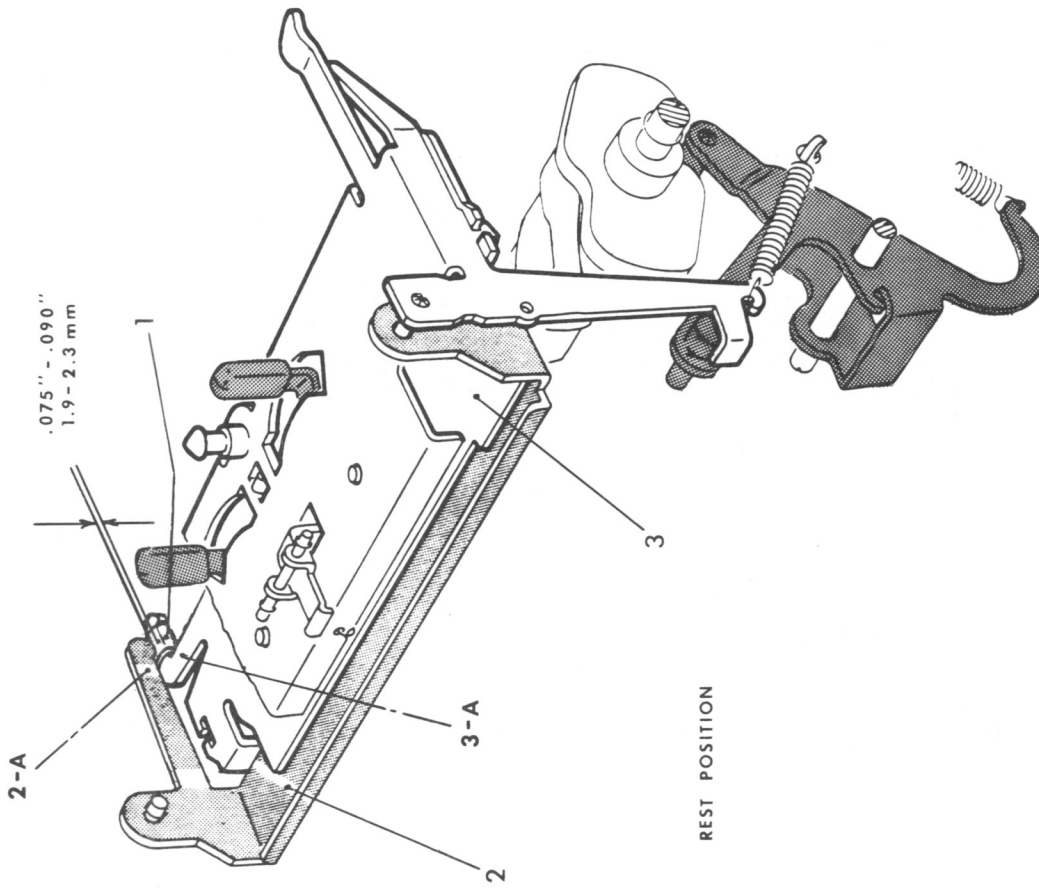
7. Ribbon Lift.

REQUIREMENT:

With machine at rest, there should be .075"-.090" clearance between SUPPORT PLATE BUMPER (1) and ARM (2-A) of SUPPORT BRACKET (2).

ADJUSTMENT: Form SUPPORT PLATE ARM (3-A) up or down.

FUNCTIONAL CHECK: This adjustment should provide correct amount of Ribbon Lift during printing action. To check, install Ribbon Cassette; depress character key, and rotate Print Cam Shaft to point of print impact: Selected character should strike center of the ribbon. Check with long characters such as 1/2 & %.



RIBBON FEED-LIFT ADJUSTMENTS

8. Position of RIBBON CONTROL ROCKER (2) for Ribbon Feed and Ribbon Reverse.

REQUIREMENT:

A) There should be .008"-.024" entry clearance between RIGHT PROBE ARM (1-A) and RIBBON CONTROL ROCKER ARM (2-A).

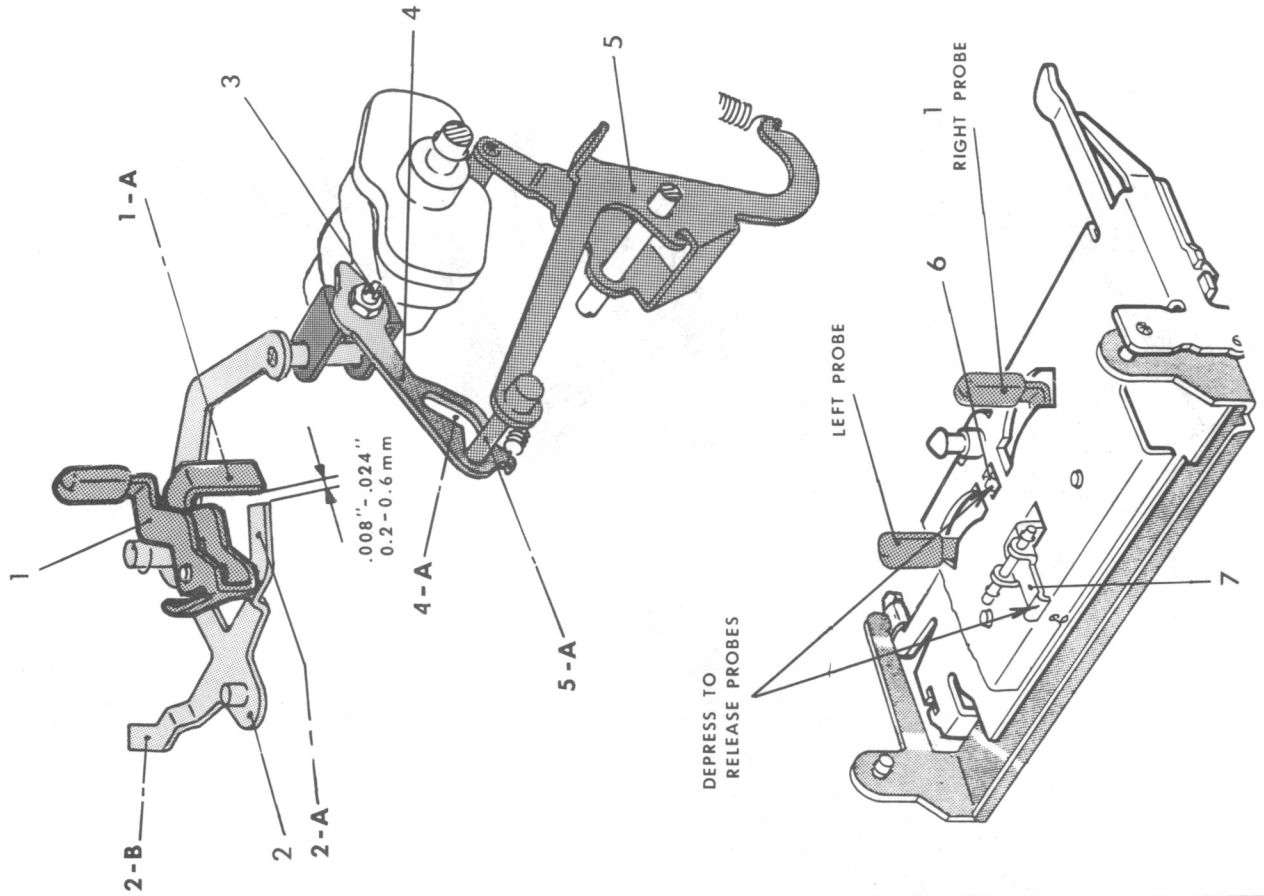
TO CHECK: With machine at rest and Ribbon Cassette removed, push RIBBON TOGGLE LINK (4) rearward so that CONTROL BRIDGE STUD (5-A) locates in front end of SLOT (4-A). Depress PROBES RELEASE LEVER (7) and RELEASE LUG (6) to release Right and Left Probes. Check requirement.

B) There should be .008"-.024" entry clearance between the corresponding Left Probe Arm and ROCKER ARM (2-B).

TO CHECK: Pull RIBBON TOGGLE LINK (4) forward so that CONTROL BRIDGE STUD (5-A) locates in rear end of SLOT (4-A). Depress a character key, and rotate Print Cam Shaft just to point of print impact. Check requirement.

ACCESS: Tip machine up and view clearance requirements from the bottom, or gain top to bottom view thru slotted hole in appropriate Ribbon Ratchet Wheel.

ADJUSTMENT: Loosen Lock Nut, and regulate RIBBON CONTROL ECCENTRIC (3). Adjust to obtain Requirement A; this should yield the clearance specified in Requirement B.



9. Ribbon Feed on Left Ribbon Ratchet Wheel.

REQUIREMENT:

With machine at rest and STUD (5-A) located in front end of SLOT (4-A), there should be .020"-.040" clearance between RIBBON CONTROL SLIDE LUG (3-A) and Tooth of LEFT RIBBON RATCHET WHEEL (2).

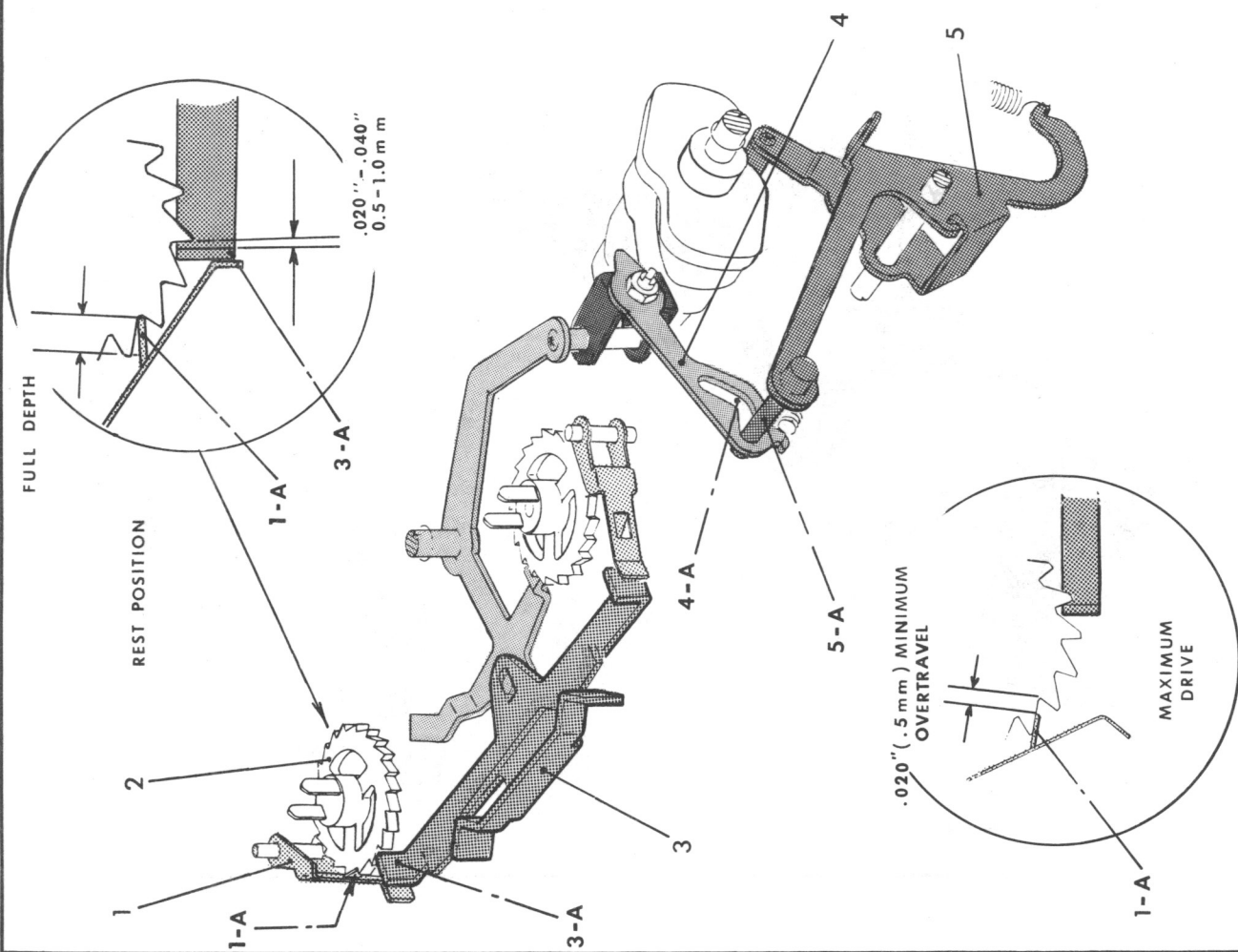
TO CHECK: Push RIBBON TOGGLE LINK (4) rearward so that CONTROL BRIDGE STUD (5-A) locates in front end of SLOT (4-A).

ADJUSTMENT: Form DETENT PAWL LUG (1-A) forward or rearward to change position of Ratchet Wheel.

NOTE: LUG (1-A) should have full depth coverage on Ratchet Wheel Tooth. Do not distort DETENT PAWL (1)--it should be straight.

FUNCTIONAL CHECK: When RIBBON CONTROL

SLIDE (3) reaches its maximum movement to the right, LEFT RATCHET WHEEL (2) Tooth should overtravel DETENT PAWL LUG (1-A) by at least .020". To check, depress a character Key/lever and rotate Print Cam Shaft.





RIBBON FEED-LIFT ADJUSTMENTS

10. Ribbon Feed on Right Ribbon Ratchet Wheel.

REQUIREMENT:

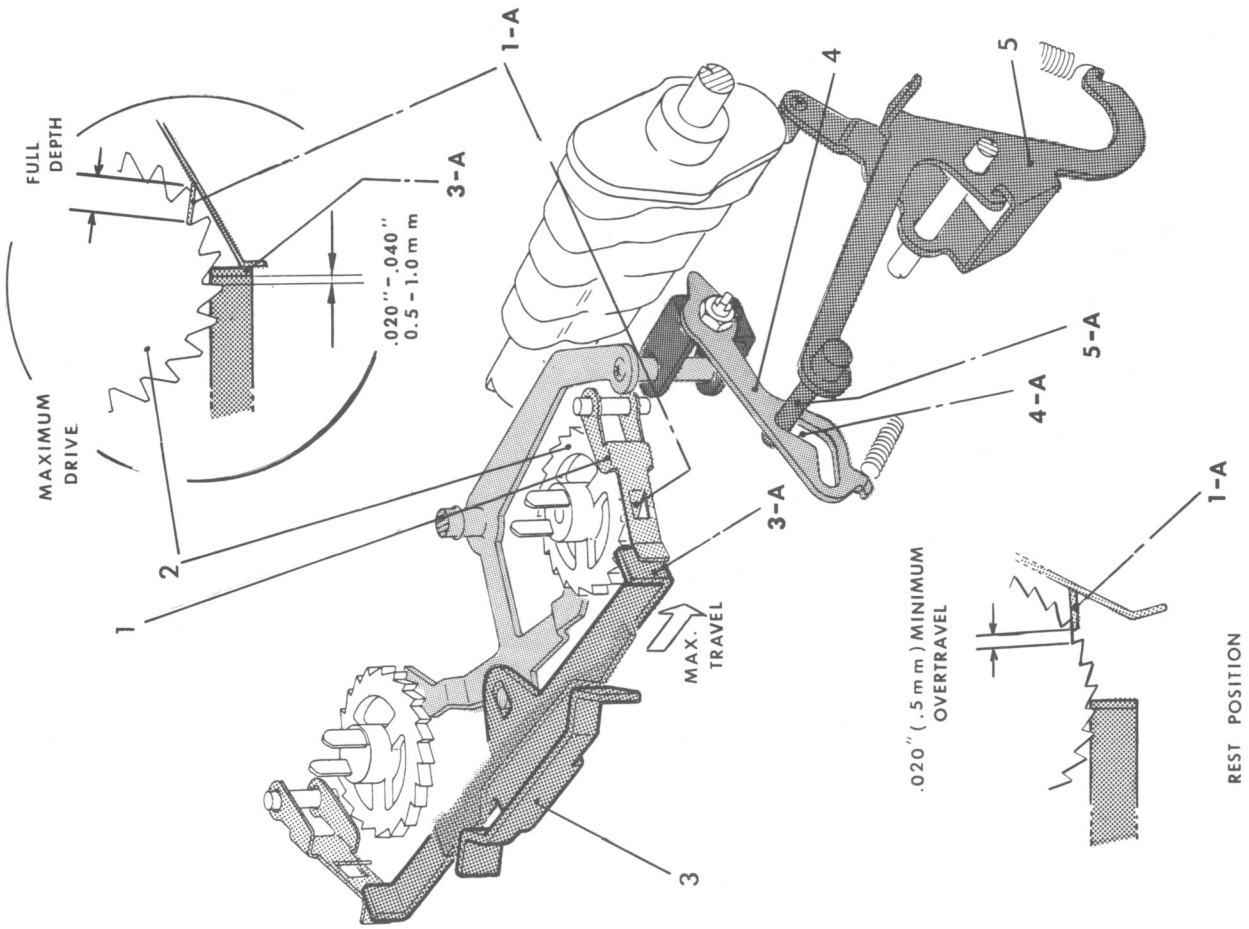
With STUD (5-A) located in rear end of SLOT (4-A) and RIBBON CONTROL SLIDE (3) at its maximum travel to the right, there should be .020"-.040" clearance between SLIDE LUG (3-A) and Tooth of RIGHT RIBBON RATCHET WHEEL (2).

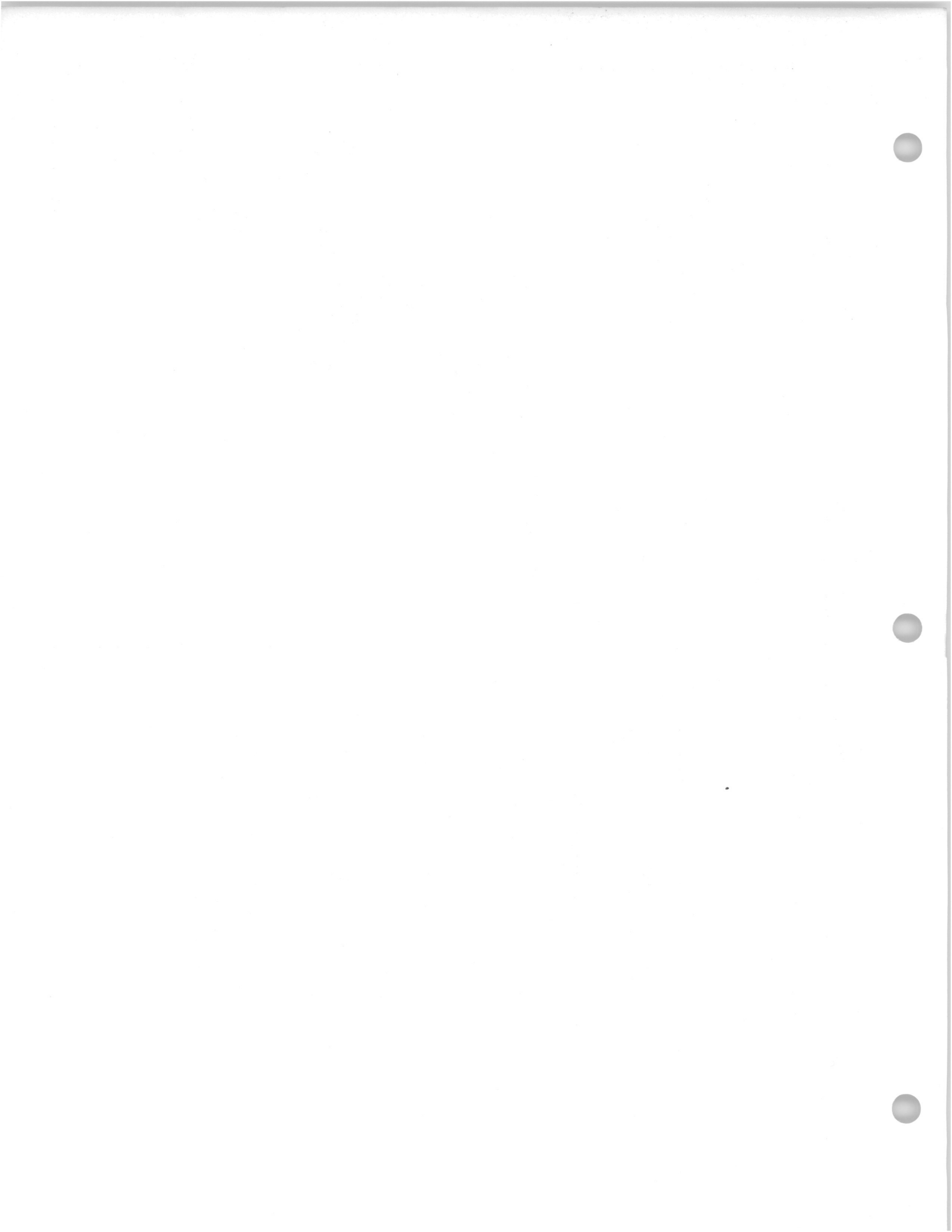
TO CHECK: Pull RIBBON TOGGLE LINK (4) forward so that CONTROL BRIDGE STUD (5-A) locates in rear end of SLOT (4-A). Depress a character Keylever, and rotate Print Cam Shaft until SLIDE (3) reaches its maximum movement to the right.

ADJUSTMENT: Form DETENT PAWL LUG (1-A) forward or rearward to change position of Ratchet Wheel.

NOTE: LUG (1-A) should have full depth coverage on Ratchet Wheel Tooth. Do not distort Detent Pawl--it should be straight.

FUNCTIONAL CHECK: When Print Cam Shaft is further rotated past check point to rest position, RIGHT RATCHET WHEEL (2) Tooth should overtravel DETENT PAWL LUG (1-A) by at least .020".





PAPER FEED ADJUSTMENTS

PAPER FEED

1. Platen Freeness.
2. Line Indicator and Card Holders.
3. Rest position of Paper Release Lever.
4. Feed Roll tension and Paper Release/  
Functional check.

1

2

3

4

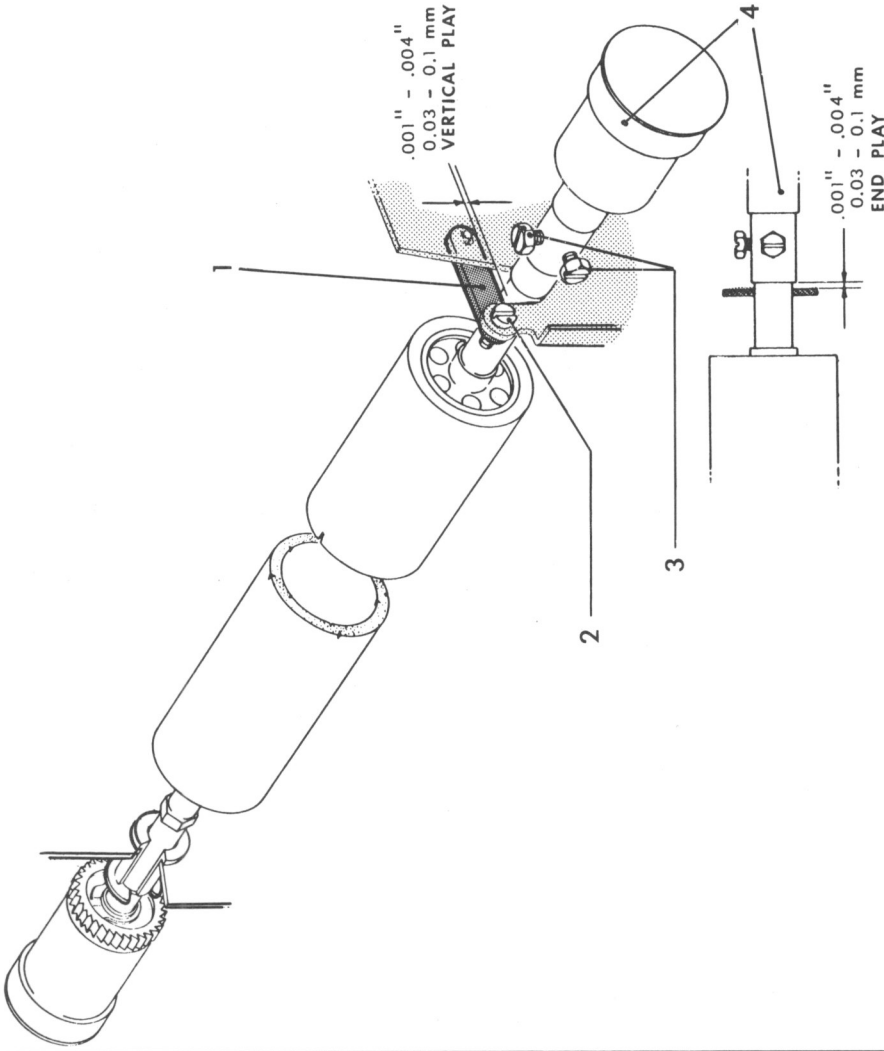
1. Platen freeness.

REQUIREMENT:

- A) Platen should have  $.001'' - .004''$  end play.
- B) Right end of Platen should have  $.001'' - .004''$  up and down play.

ADJUSTMENT:

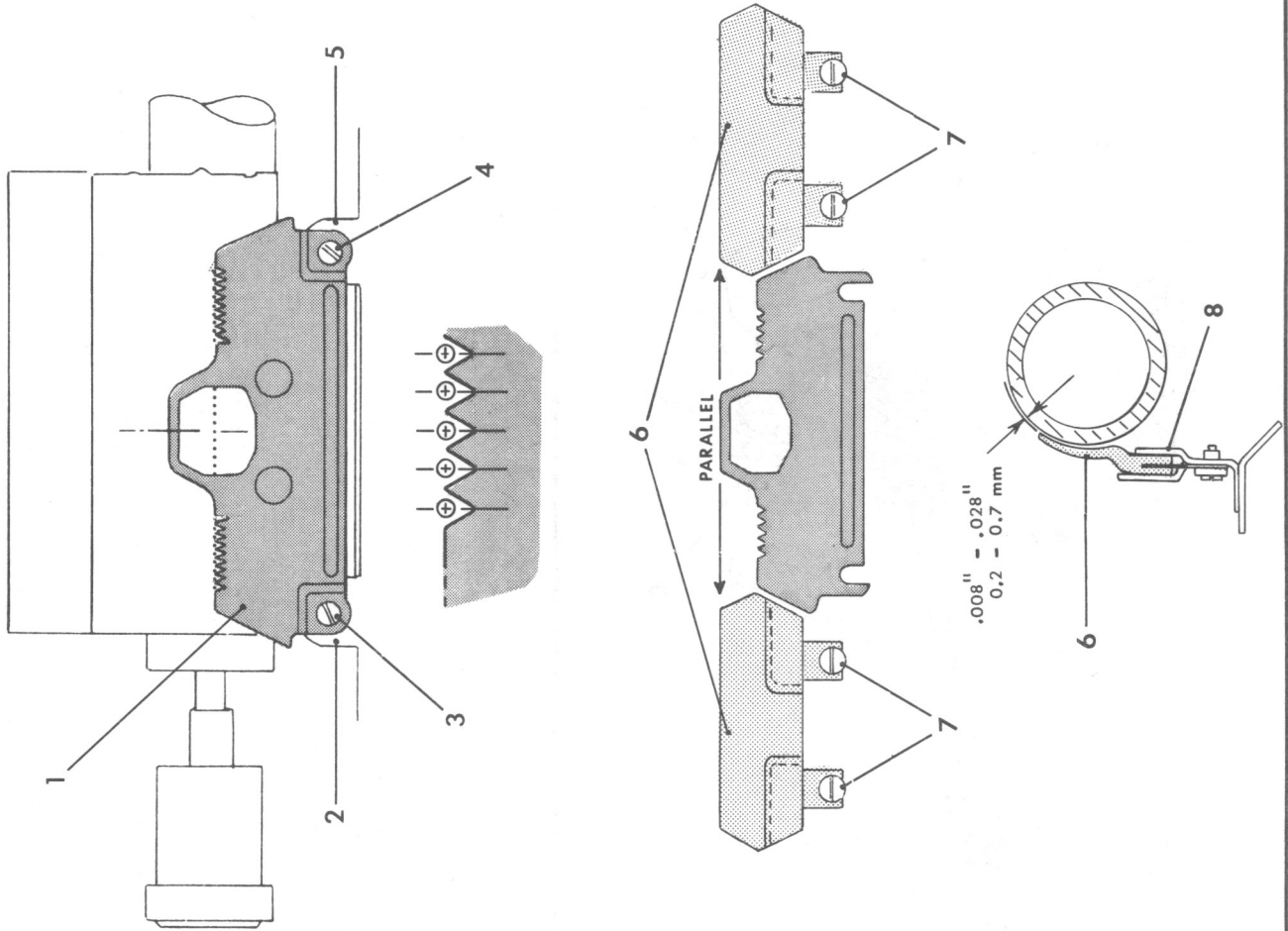
- A) Loosen SCREWS (3), and position RIGHT PLATEN KNOB (4) on Shaft of Platen for end play requirement. Tighten Screws.
- B) Loosen SCREW (2), and position front end of SECURING PLATE (1) while tightening Screw to obtain up and down play.

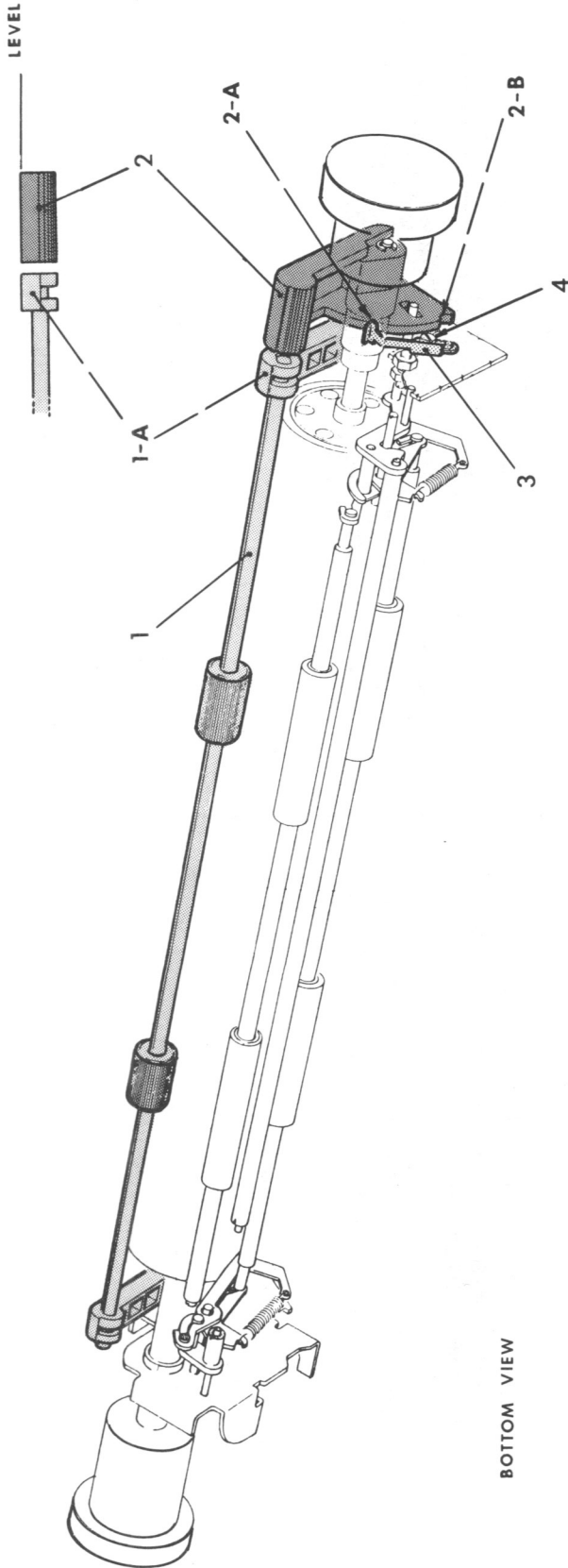


PAPER FEED ADJUSTMENTS

2. Line Indicator and Card Holders.

- A) REQUIREMENT: LINE INDICATOR (1) should be aligned horizontally and vertically with typed periods as illustrated.  
ADJUSTMENT: Loosen SCREWS (3) (4); position LINE INDICATOR (1); tighten SCREWS.
- B) REQUIREMENT: LINE INDICATOR (1) should have .008"-.028" clearance from Platen on both sides.  
ADJUSTMENT: Form SUPPORT LUGS (2) (5) forward or rearward.
- C) REQUIREMENT: Top of CARD HOLDERS (6) should be the same height as and parallel with top of LINE INDICATOR (1).  
ADJUSTMENT: Loosen SCREWS (7); position CARD HOLDERS (6) up or down and tighten SCREWS.
- D) REQUIREMENT: CARD HOLDERS (6) should have .008"-.028" clearance from Platen.  
ADJUSTMENT: Form SUPPORT LUGS (8) forward or rearward.





BOTTOM VIEW

3. Rest position of Paper Release Lever.

REQUIREMENT:

In rest position, PAPER RELEASE LEVER (2) should be level with RIGHT ARM (1-A) of PAPER BAIL (1), and DETENT (3) should firmly seat into UPPER NOTCH (2-A) of Release Lever.

ADJUSTMENT: Loosen SCREW (4) and position RELEASE LEVER DETENT (3).

NOTE: When LEVER (2) is raised to full release position, DETENT (3) should firmly seat into LOWER NOTCH (2-B).

PAPER FEED ADJUSTMENTS

4. Feed Roll tension and Paper Release.

FUNCTIONAL CHECK

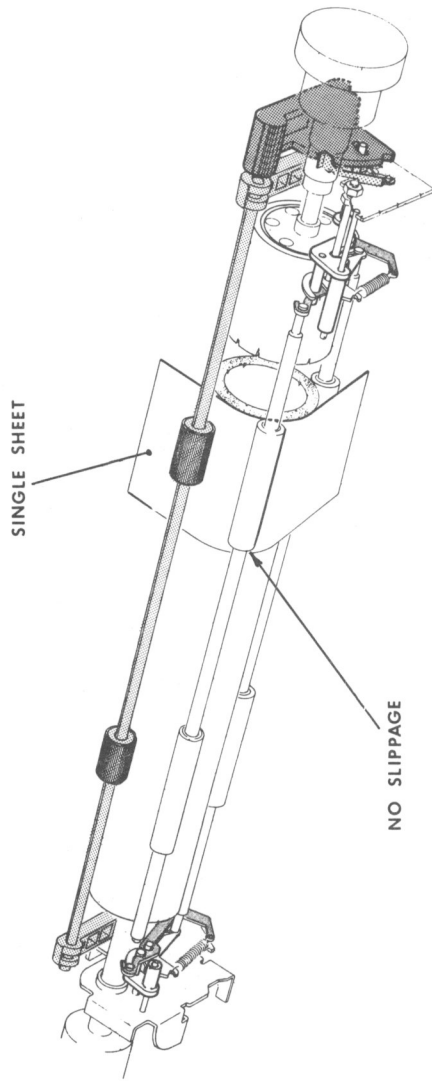
REQUIREMENT:

A) Front and rear Feed Rollers should exert firm, even pressure on a single sheet of bond paper.

To check, insert strip of bond paper between Platen and Feed Roll. Hold Platen and firmly pull paper strip--it should not slip, but tension should not be so great that paper easily tears.

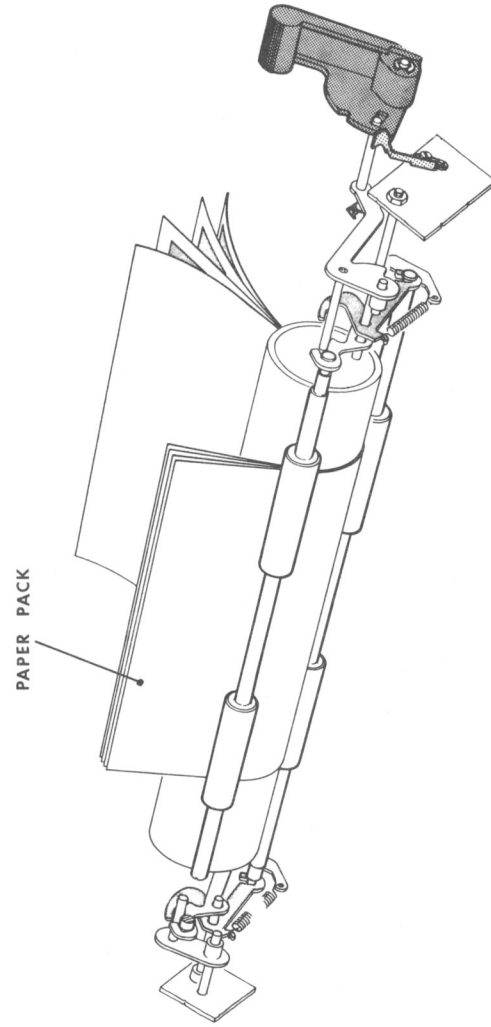
B) Paper Release mechanism should freely release a paper pack consisting of one sheet of bond paper and three carbons.

CORRECTIVE MEASURE: Replace defective parts.

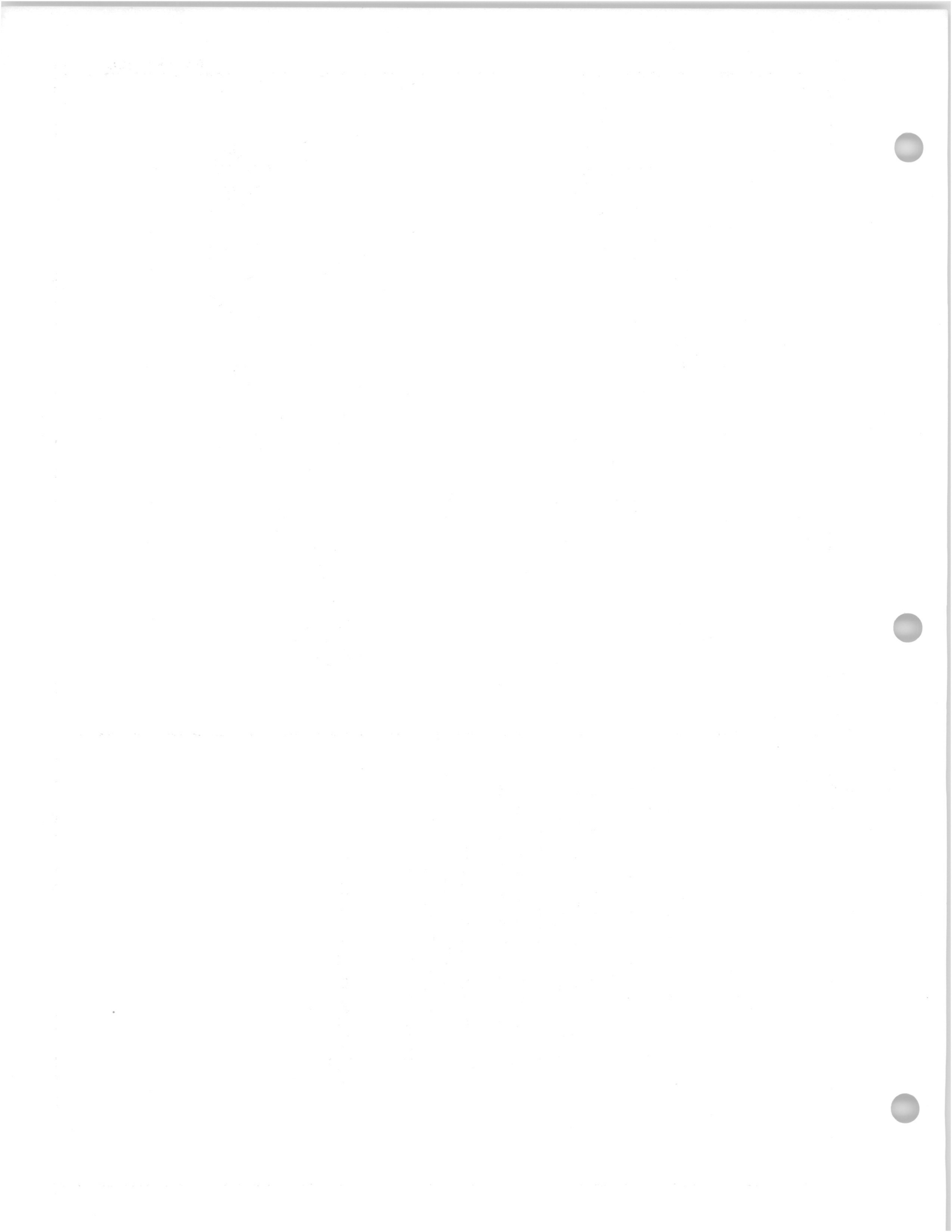


REST POSITION

BOTTOM VIEWS



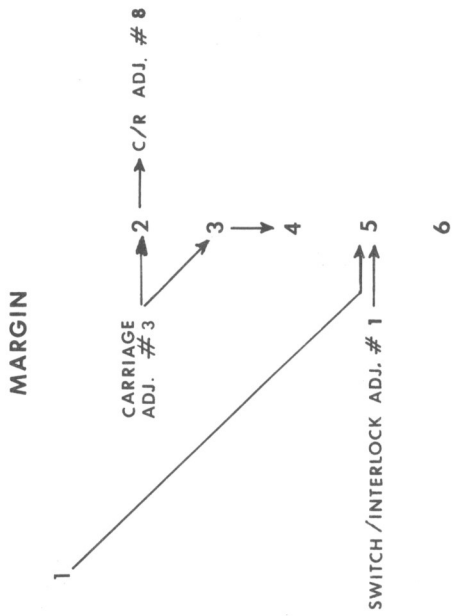
FULL RELEASE POSITION





MARGIN ADJUSTMENTS

1. Margin Stop contact.
2. Carriage Banking at Left Margin.
3. Carriage Banking at Right Margin  
(for Linelock).
4. Linelock.
5. Margin Release.
6. Bell.



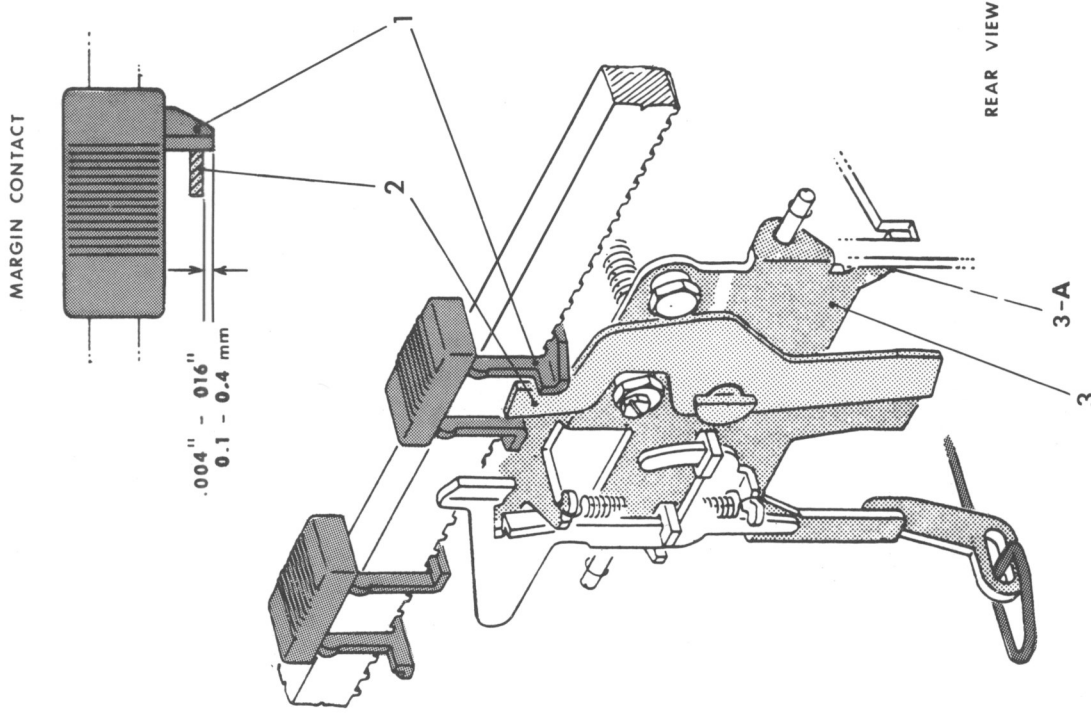
1. Margin Stop contact.

REQUIREMENT:

With Carriage at Left Margin, LEFT MARGIN STOP (1) should extend .004"-.016" beyond rear edge of MARGIN STOP LEVER (2).

ADJUSTMENT:

Form ARM (3-A) of MARGIN RELEASE FRAME (3) forward or rearward to change front to rear rest position of FRAME (3) and MARGIN STOP LEVER (2).



MARGIN ADJUSTMENTS

2. Carriage Banking at Left Margin.

REQUIREMENT:

- A) With Carriage at Left Margin, first typed character should align with Paper Table Scale Graduation Mark just below Margin Stop Indicator.
- B) With Carriage at Left Margin, manually rotate MARGIN STOP LEVER (3) so it contacts ECCENTRIC (1): There should be .060"-.075" clearance between MARGIN STOP LEVER ARM (3-A) and MARGIN STOP (2).

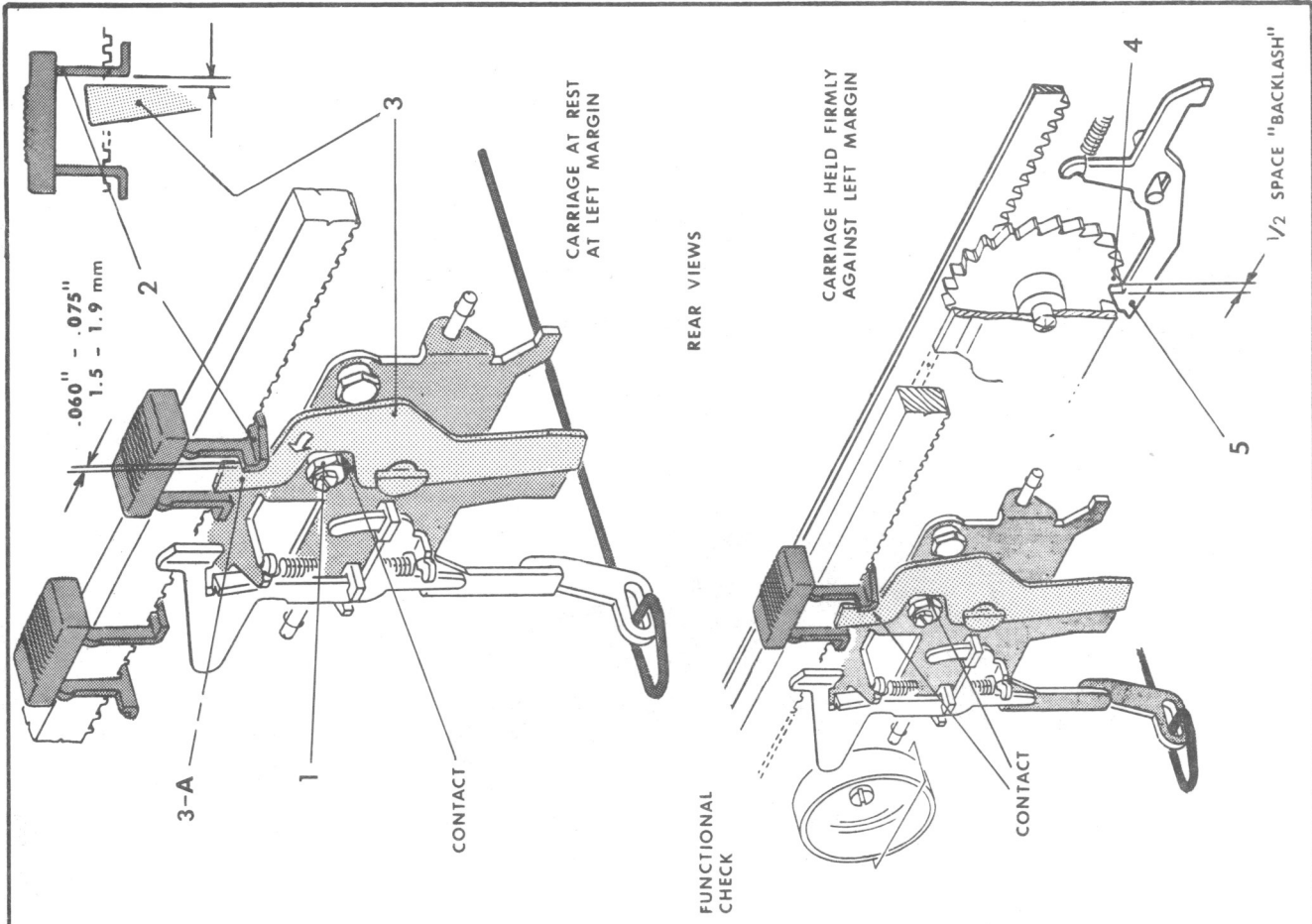
ADJUSTMENT: With Carriage at Left Margin, loosen Lock Screw and regulate ECCENTRIC (1). Tighten Screw.

NOTE: If Requirement A checks OK, do not move Carriage while making adjustment to obtain Requirement B. If Requirement A is not correct, move Carriage one space to the right (to correct overbank), or one space to the left (to correct underbank). Then, do not move Carriage while adjusting for Requirement B.

NOTE: To prevent Lock Screw from loosening, adjust ECCENTRIC (1) so high point favors bottom of machine.

NOTE: Check C/R Adjustment #8.

FUNCTIONAL CHECK: This adjustment provides 1/2 space "Escapement Wheel Backlash." To check, hold Carriage firmly against Left Margin, and tip machine to view Escapement Wheel Area: ESCAPEMENT WHEEL TOOTH (4) should overtravel ESCAPEMENT PAWL (5) 1/2 space in respect to PAWL (5). NOTE: Distance from working surface of one Tooth to working surface of next Tooth constitutes one full space.



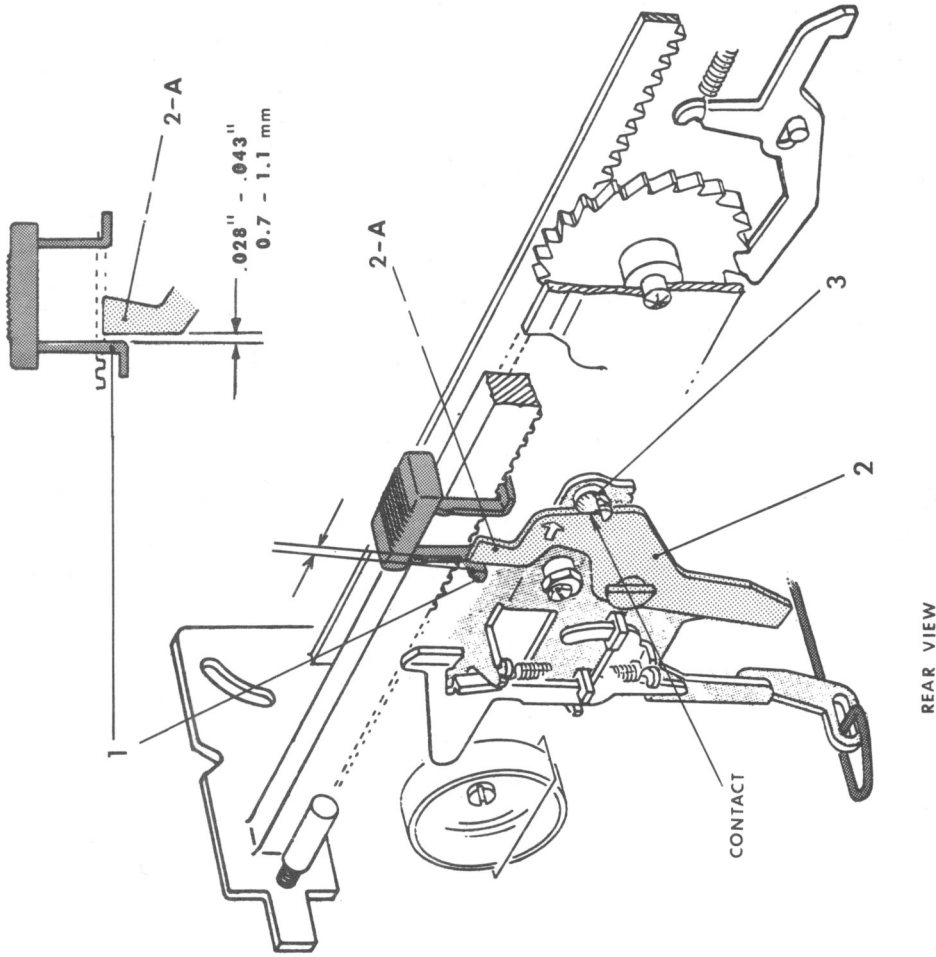
3. Carriage Banking at Right Margin  
 (for Line-lock).

REQUIREMENT:

Tabulate into Right Margin; backspace once. Manually rotate MARGIN STOP LEVER (2) so it contacts ECCENTRIC (3). There should be .028"-.043" clearance between RIGHT MARGIN STOP (1) and ARM (2-A) of MARGIN STOP LEVER (2).

ADJUSTMENT: Loosen Lock Screw and regulate ECCENTRIC (3). Tighten Screw.

NOTE: To prevent Lock Screw from loosening, adjust ECCENTRIC (3) so high point favors top of machine.



MARGIN ADJUSTMENTS

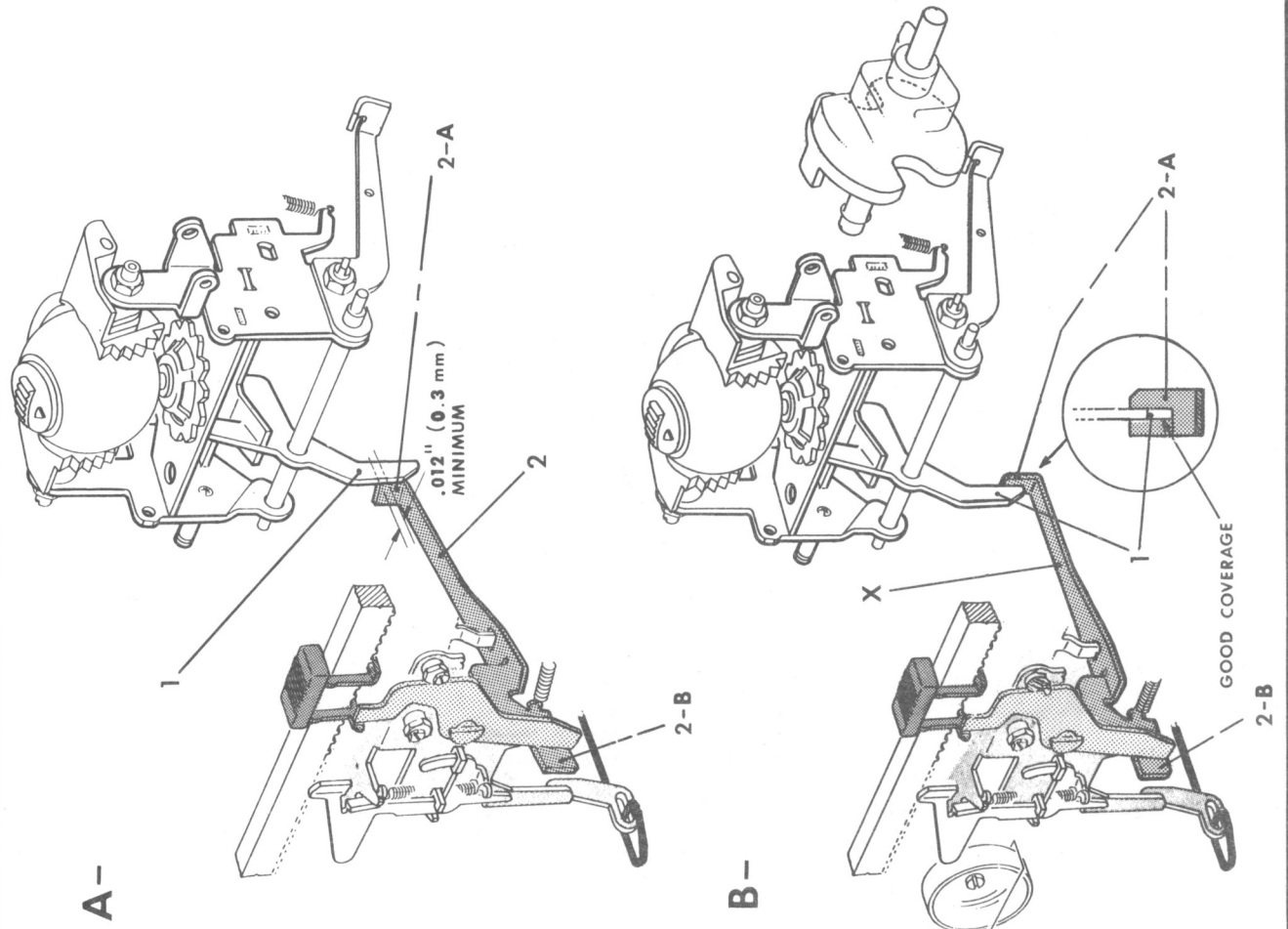
4. Line lock.

REQUIREMENT:

- A) Tabulate into Right Margin; backspace once; There should be at least .012" lateral clearance between LINELOCK LEVER LUG (2-A) and LINELOCK ARM (1).
- B) Tabulate into Right Margin; backspace once; then space Carriage one space with Spacebar or character key: LINELOCK LEVER LUG (2-A) should have good right to left coverage on LINELOCK ARM (1).

ADJUSTMENT: Form LINELOCK LEVER ARM (2-B) left or right.

NOTE: When Line lock is fully actuated (Illustration B), ARM (1) should have good top to bottom coverage on LUG (2-A): Form LEVER (2) at (X) to adjust height of LUG (2-A). Also, there should be some front to rear clearance between ARM (1) and LUG (2-A), but not so much that Typing Element prints thru Line lock: Form LUG (2-A) forward or rearward.



## 5. Margin Release.

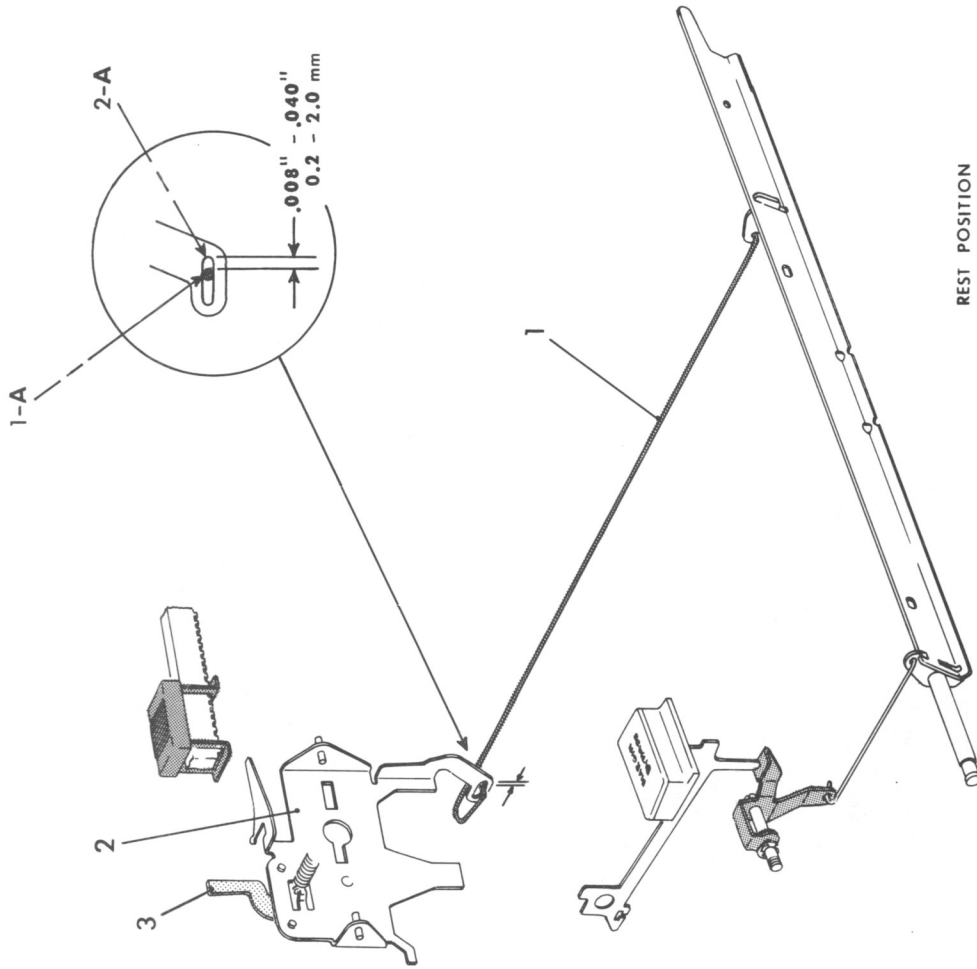
REQUIREMENT:

With machine at rest, Keyboard in place, and Switch on, there should be .008"-.040" clearance between MARGIN RELEASE LINK ARM (1-A) and front of SLOT (2-A) of MARGIN RELEASE FRAME (2).

NOTE: Switch/Interlock Adjustment #1 must be correct.

ADJUSTMENT: Form MARGIN RELEASE LINK ARM (1-A) forward or rearward.

NOTE: This adjustment assures that when Margin Release Keypress (2) is depressed, MARGIN RELEASE FRAME (2) pivots sufficiently rearward for MARGIN STOP LEVER (3) to clear Margin Stop. This adjustment also assures that MARGIN RELEASE LINK (1) does not influence rest position of MARGIN RELEASE FRAME (2) when all parts are at rest.



REST POSITION

MARGIN ADJUSTMENTS

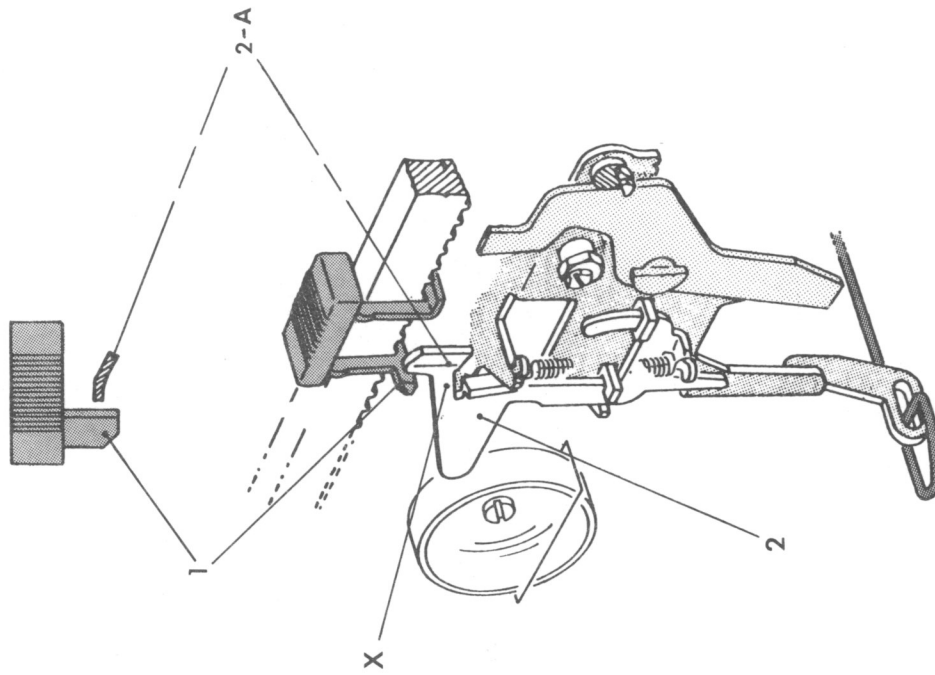
## 6. Bell.

REQUIREMENT:

- A) BELL HAMMER TRIP ARM (2-A) should have good front to rear coverage on RIGHT MARGIN STOP (1) so that Bell rings as Carriage moves into Right Margin.
- B) TRIP ARM (2-A) should cam off Right MARGIN STOP (1) so that Bell does not ring when Carriage is moved from Right Margin to Left Margin.
- C) TRIP ARM (2-A) should not impede Carriage movement in either direction.

ADJUSTMENT:

Form BELL HAMMER (2) at (X) to move TRIP ARM (2-A) forward or rearward.







CARRIAGE RETURN ADJUSTMENTS

CARRIAGE RETURN

1

POWER DRIVE ADJ. #3 → 2

3

4 → SWITCH/INTERLOCK ADJ. # 2

↓

5

6

CARRIAGE ADJ. #3 → 7

↓

8

1. End play of C/R Gear.
2. C/R Gear mesh with Inside Intermediate Gear.
3. C/R Drum Spring tension.
4. Rest position of C/R Primary Latch.
5. Rest position of C/R Secondary Latch.
6. Latching the C/R Control Bridge.
7. Carriage Banking at Left Margin.
8. Unlatching the C/R Control Bridge.

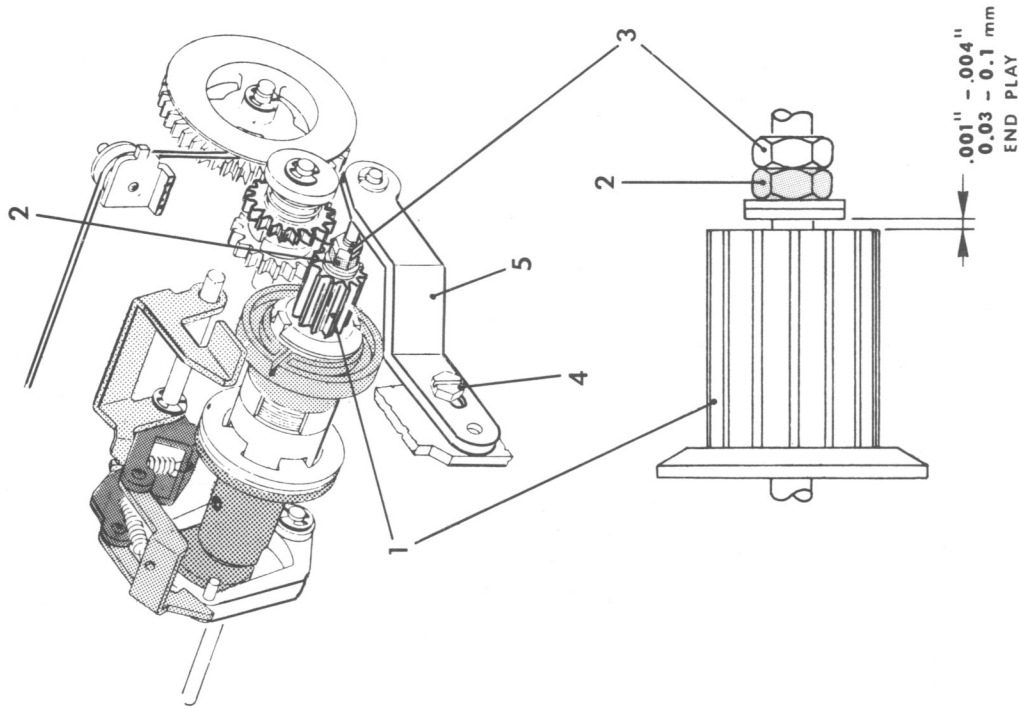


CARRIAGE RETURN ADJUSTMENTS

1. End play of C/R GEAR (1).

**REQUIREMENT:** With machine at rest, C/R GEAR (1) should have .001"-.004" end play.

**ADJUSTMENT:** Remove SCREW (4) and SHAFT SUPPORT BRACKET (5). Hold INSIDE NUT (2) and loosen OUTSIDE NUT (3). Regulate INSIDE NUT (2) to obtain requirement; then hold it in place and tighten OUTSIDE NUT (3). Replace BRACKET (5) and SCREW (4). **NOTE:** Intermediate Shaft determines correct location of Bracket. Hold BRACKET (5) so it does not move end of Intermediate Shaft, and tighten SCREW (4).

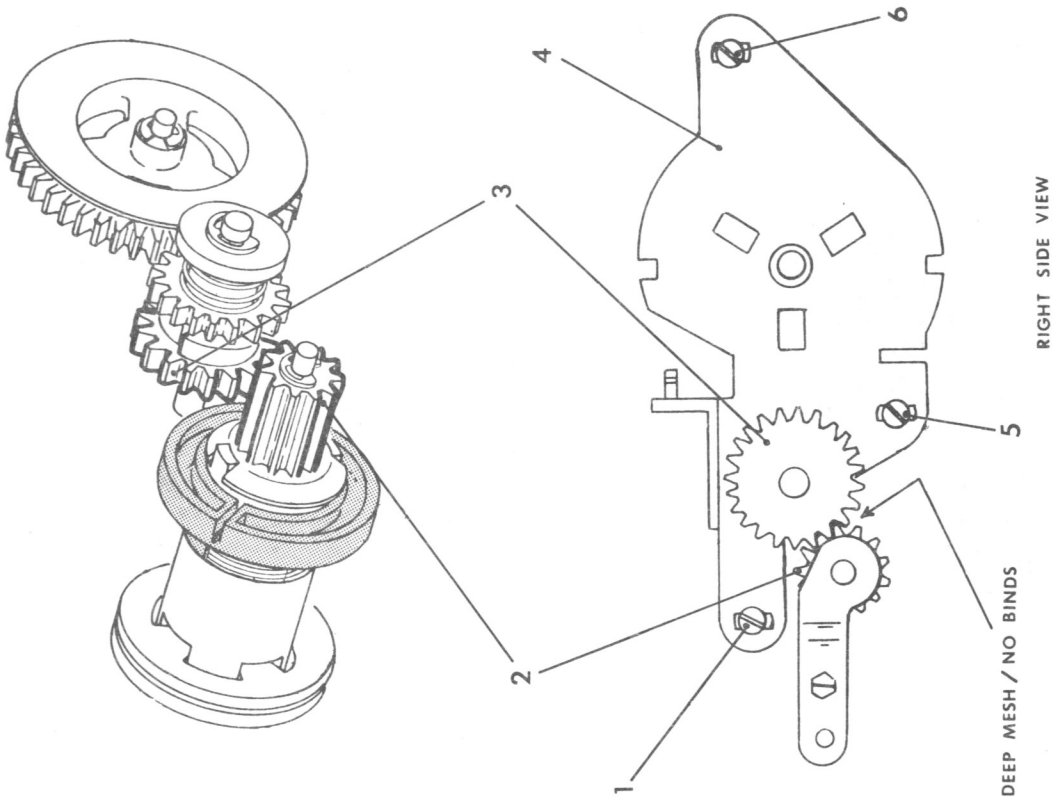


2. C/R Gear mesh with Inside Intermediate Gear.

REQUIREMENT: INSIDE INTERMEDIATE GEAR (3) should mesh as deep as possible with C/R GEAR (2) without binding rotation of Gears.

To check freeness, rotate C/R GEAR (2) top to rear. At various points hold INSIDE GEAR (3) with Spring Hook, and lightly rotate C/R GEAR (2) to check for minimum play.

ADJUSTMENT: Loosen SCREWS (1) (5) (6), and move C/R DRUM MOUNTING PLATE (4) up or down to increase or decrease mesh; tighten Screws.



CARRIAGE RETURN ADJUSTMENTS

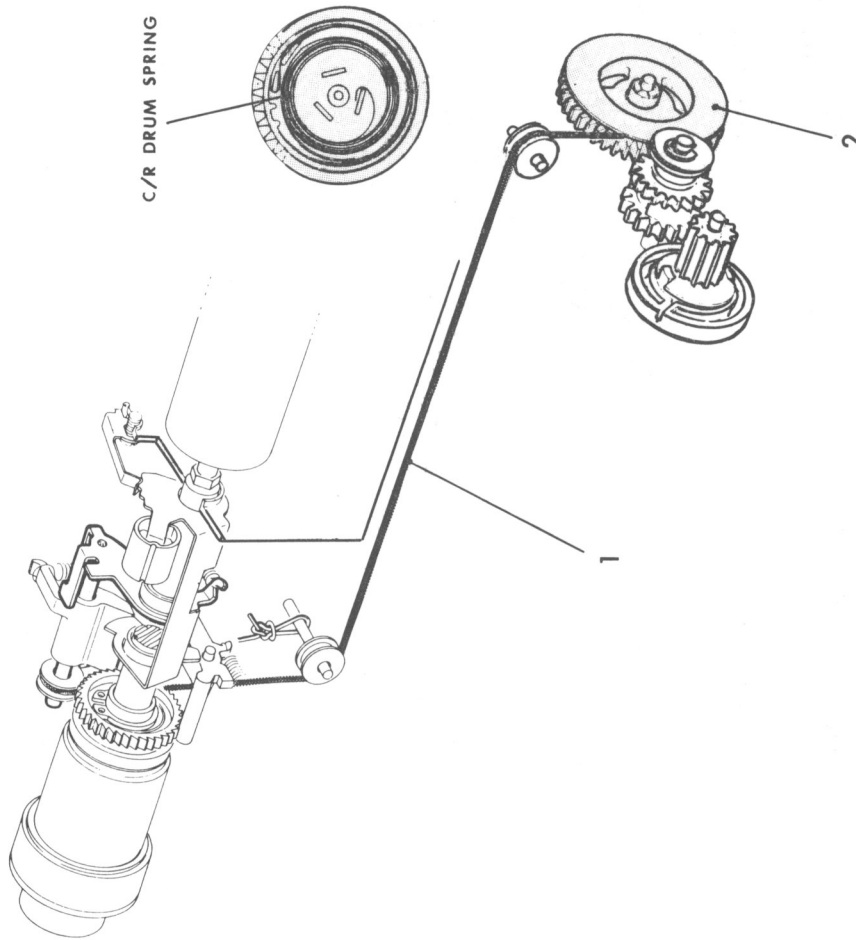
## 3. C/R Drum Spring tension.

REQUIREMENT:

C/R SPRING DRUM (2) should maintain tension on C/R CORD (1) during entire travel of Carriage.

ADJUSTMENT:

Remove C/R Cord from C/R SPRING DRUM (2). Rotate Drum top rearward until Drum Spring is completely wound (approximately 10 revolutions). Then unwind Drum two full revolutions, and re-install C/R Cord.



4. Rest position of C/R PRIMARY LATCH (3).

REQUIREMENT:

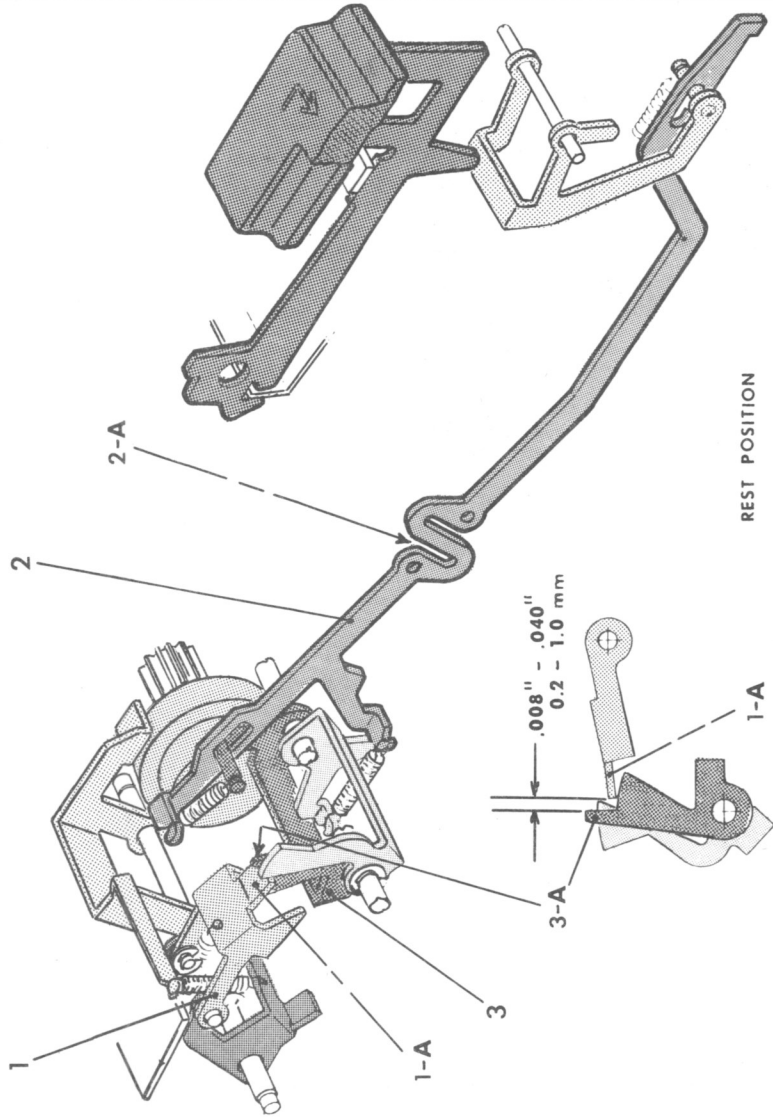
With machine at rest and Keyboard in place, there should be .008"-.040" clearance between ARM (3-A) of PRIMARY LATCH (3) and LUG (1-A) of C/R CONTROL FRAME (1).

NOTE: Requirement can be viewed from the top.

ADJUSTMENT: Shorten or lengthen C/R LINK (2) by forming at (2-A).

NOTE: This adjustment assures that C/R Keylever has slight free down travel before actuating C/R; it also assures that C/R actuation occurs before C/R Keylever bottoms.

Check Switch/Interlock Adjustment #2.



CARRIAGE RETURN ADJUSTMENTS

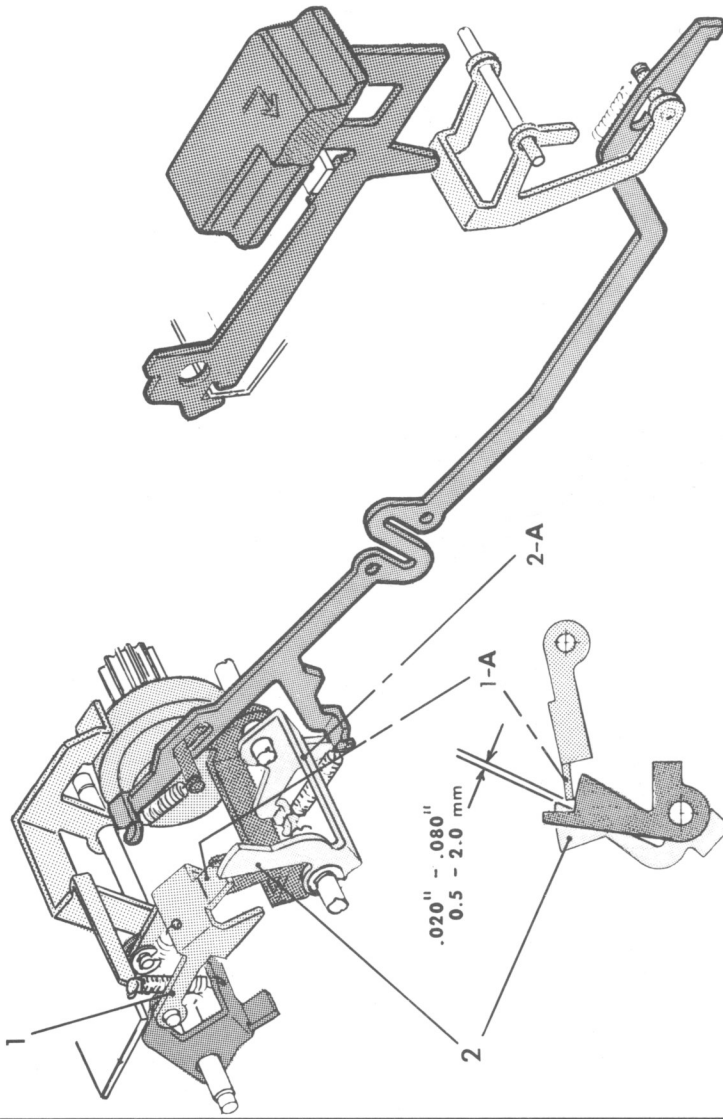
5. Rest position of C/R SECONDARY LATCH (2).

REQUIREMENT:

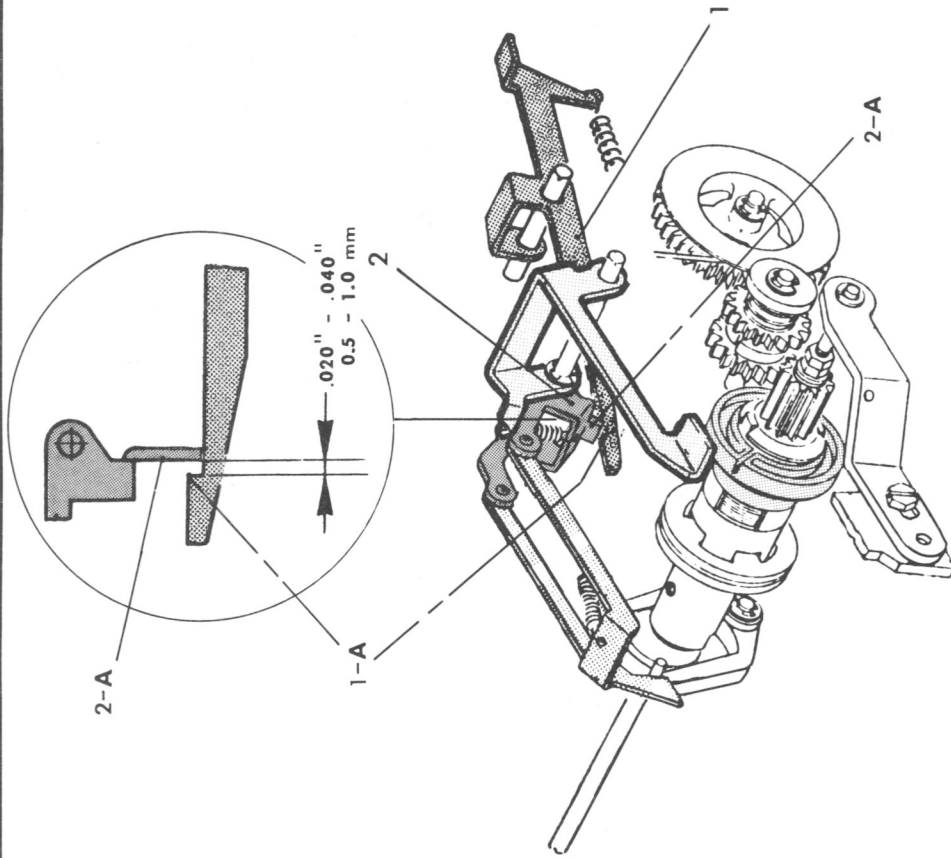
With machine at rest and Keyboard in place, there should be .020"-.080" clearance between C/R SECONDARY LATCH (2) and LUG (1-A) of C/R CONTROL FRAME (1).

NOTE: Requirement can be viewed from the top.

ADJUSTMENT: With two pair of pliers, form CROSS SECTION (2-A) to move Secondary Latch toward or away from LUG (1-A).



REST POSITION



6. Latching the C/R CONTROL BRIDGE (2).

REQUIREMENT:

During C/R actuation, LUG (2-A) of C/R CONTROL BRIDGE (2) should overtravel STEP (1-A) of C/R CONTROL LATCH (1) by .020"-.040".

TO CHECK: Depress C/R Key, and rotate Intermediate Shaft until C/R CONTROL BRIDGE LUG (2-A) travels to furthest point rearward; check requirement.

ADJUSTMENT: Form LUG (2-A) forward or rearward.



7. Carriage Banking at Left Margin.

REQUIREMENT:

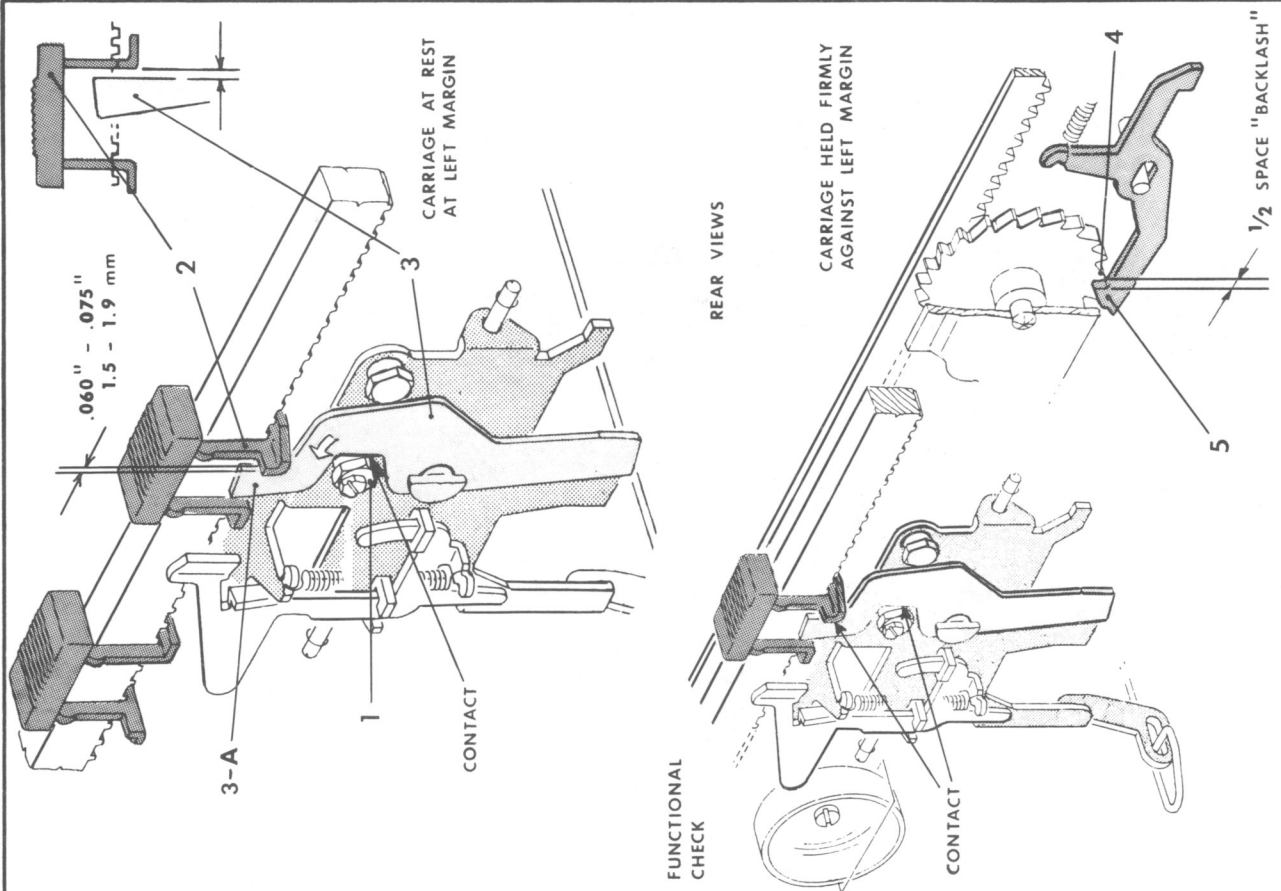
- A) With Carriage at Left Margin, first typed character should align with Paper Table Scale Graduation Mark just below Margin Stop Indicator.
- B) With Carriage at Left Margin, manually rotate MARGIN STOP LEVER (3) so it contacts ECCENTRIC (1): There should be .060"-.075" clearance between MARGIN STOP LEVER ARM (3-A) and MARGIN STOP (2).

ADJUSTMENT: With Carriage at Left Margin, loosen Lock Screw and regulate ECCENTRIC (1).

NOTE: If Requirement A checks OK, do not move Carriage while making adjustment to obtain Requirement B. If Requirement A is not correct, move Carriage one space to the right [to correct overbank] or one space to the left [to correct underbank]. Then, do not move Carriage while adjusting for Requirement B.

NOTE: To prevent Lock Screw from loosening, adjust ECCENTRIC (1) so high point favors bottom of machine.

FUNCTIONAL CHECK: This adjustment provides 1/2 space "Escapement Wheel Backlash." To check, hold Carriage firmly against Left Margin, and tip machine to view Escapement Wheel Area: ESCAPEMENT WHEEL TOOTH (4) should overtravel ESCAPEMENT PAWL (5) 1/2 space in respect to PAWL (5). NOTE: Distance from working surface of one Tooth to working surface of next Tooth constitutes one full space.



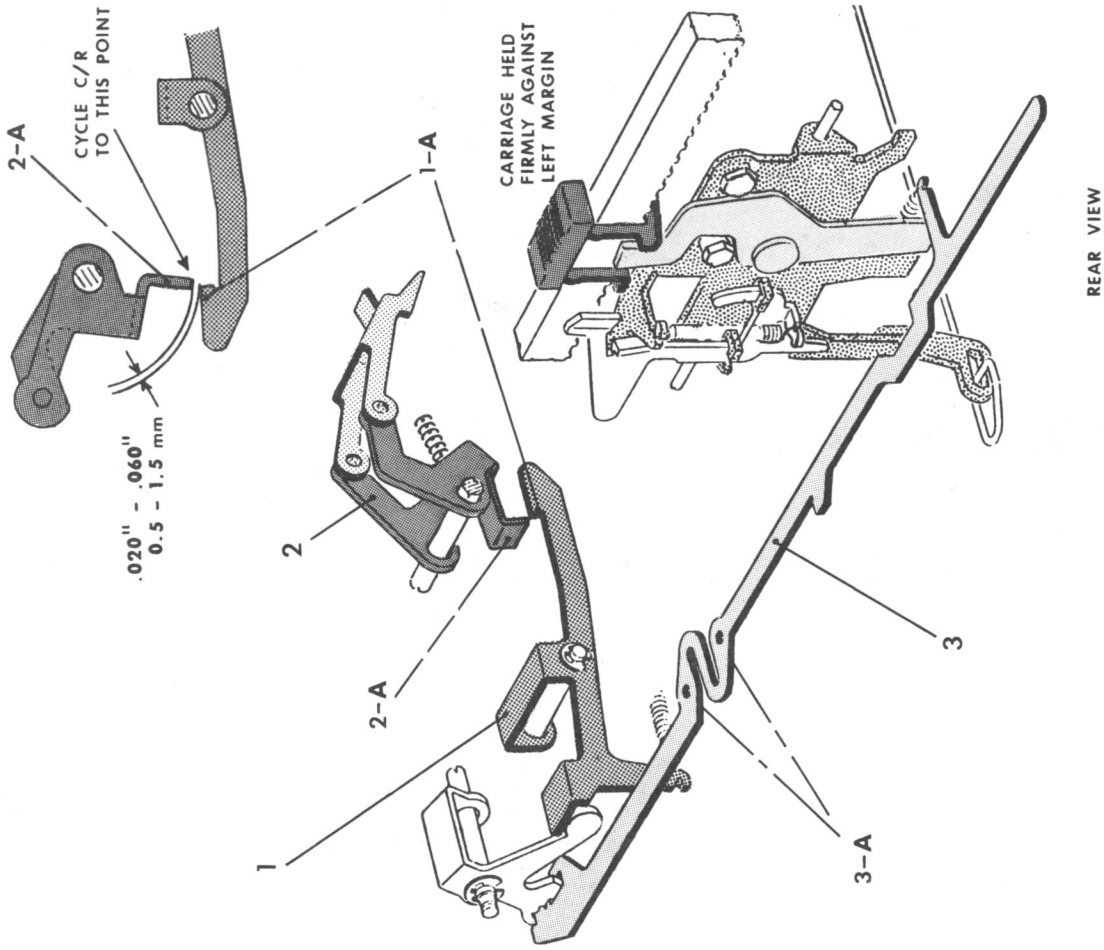
## 12-10 CARRIAGE RETURN

8. Unlatching the C/R CONTROL BRIDGE (2).

REQUIREMENT:

With Carriage at Left Margin, depress C/R Key and rotate Intermediate Shaft until LUG (2-A) of C/R CONTROL BRIDGE (2) just passes STEP (1-A) of C/R CONTROL LATCH (1). Push Carriage firmly against Left Margin: LATCH STEP (1-A) should pivot  $.020''-.060''$  below LUG (2-A) as illustrated.

ADJUSTMENT: Shorten or lengthen C/R LATCH CONTROL LINK (3) by forming at (3-A).

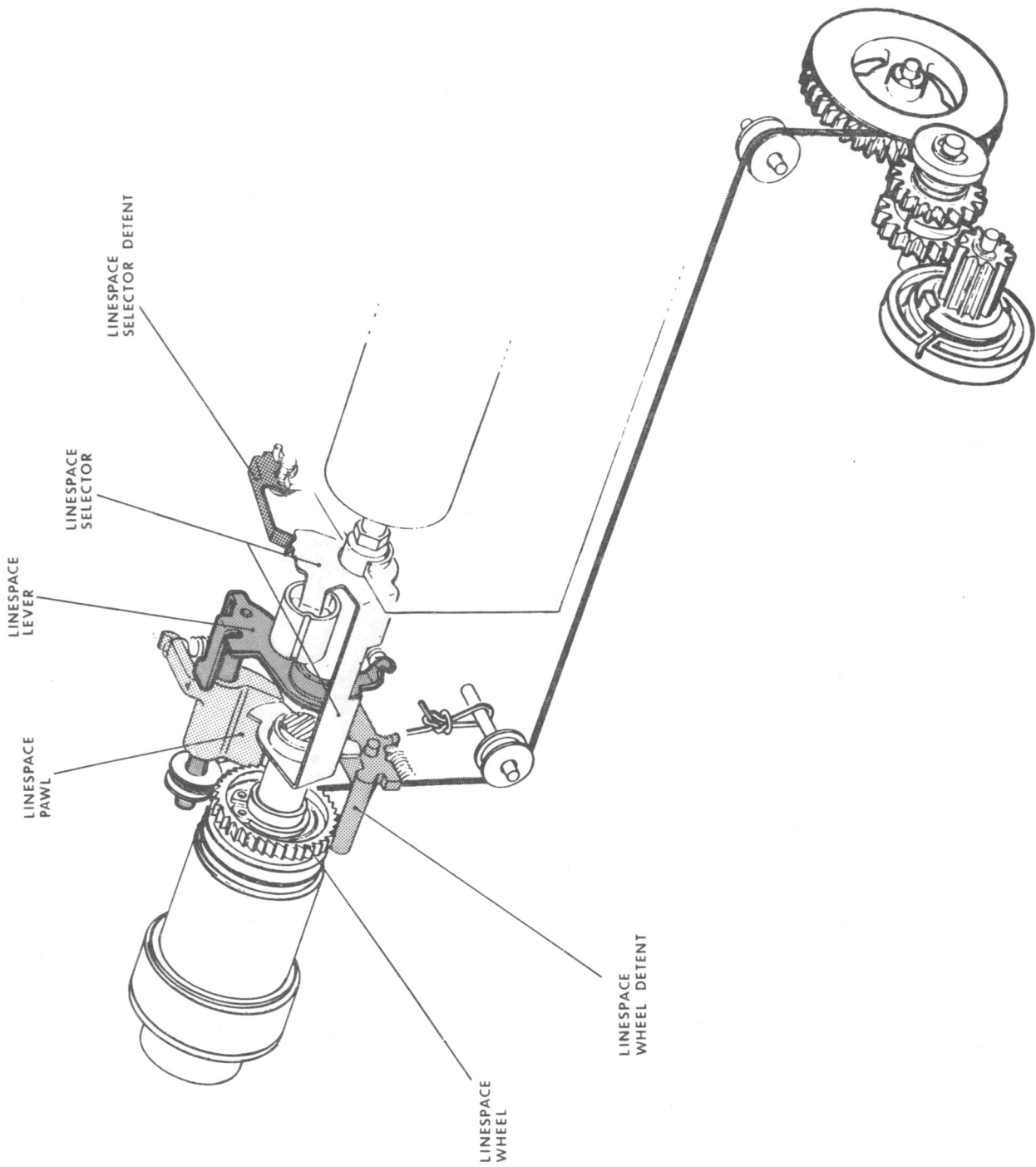


LINESPACE ADJUSTMENTS

LINESPACE



1. Linespace Pawl engagement.
2. Limiting the Linespace Stroke to prevent Platen Roll.



LINESPACE ADJUSTMENTS

1. Linespace Pawl engagement.

REQUIREMENT:

A) During a Linespace stroke, LINESPACE PAWL (1) should contact LINESPACE WHEEL (5) approximately 1/2 Tooth space above the Tooth that will cause Wheel to rotate the number of Teeth indicated in the chart below for each Linespace Selector position.

LINESPACE WHEEL	LINESPACE SELECTOR POSITIONS			
	1	2	3	4
40 TEETH	2	3	4	NUMBER OF TEETH ROTATED
44 TEETH	1	2	3	
47 TEETH	2	3	4	

NOTE: Character Selection Charts indicate the Linespace Wheel designated for each Keyboard.

TO CHECK: Push LINESPACE LEVER (9) down.

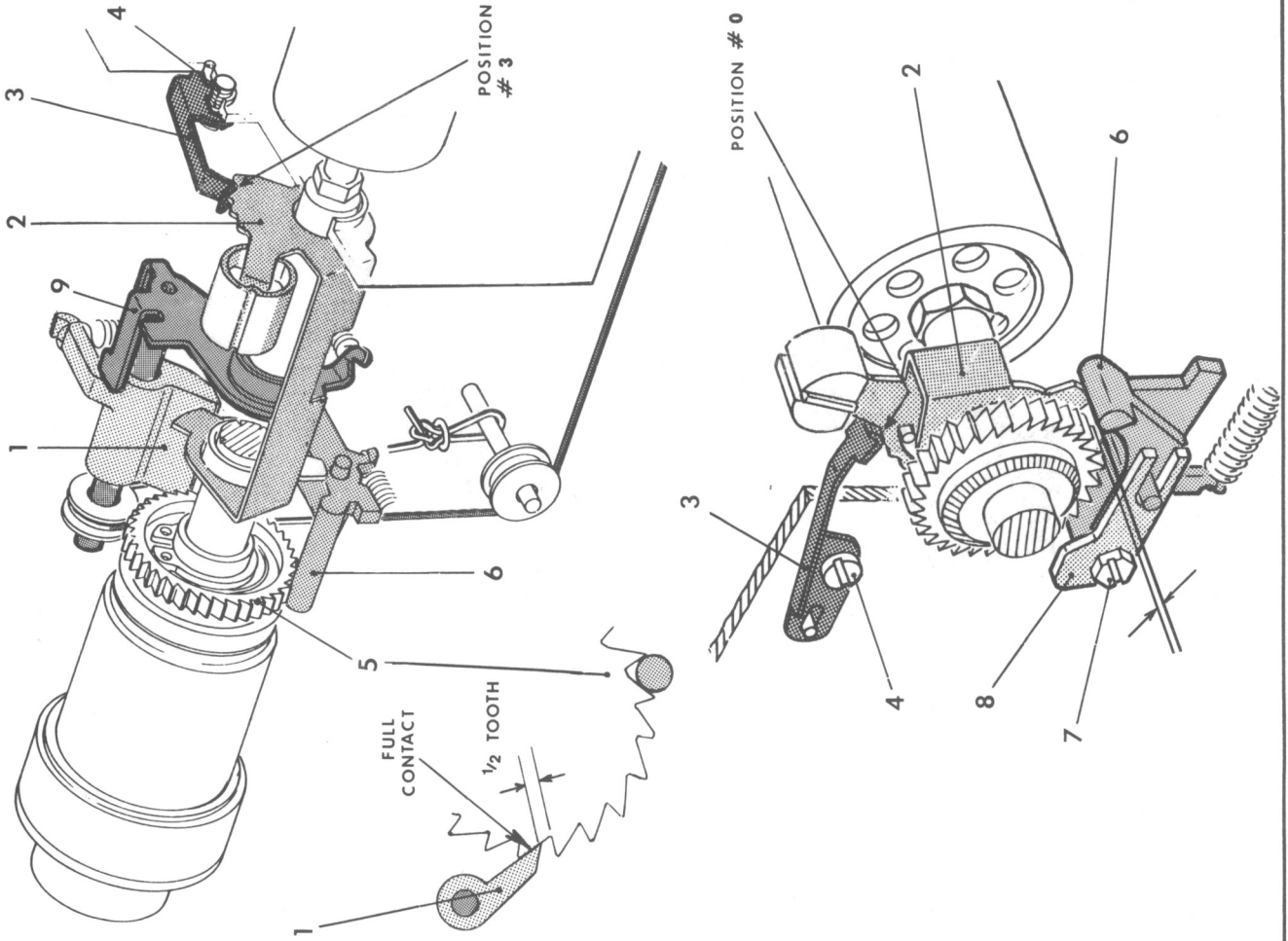
Check in Linespace Selector positions 1, 2, & 3 at several places around Linespace Wheel.

B) When LINESPACE SELECTOR (2) is in position #0, WHEEL DETENT (6) should clear Teeth of LINESPACE WHEEL (5).

C) LINESPACE SELECTOR (2) should detent firmly into all positions.

ADJUSTMENT: Loosen SCREW (4). Position LINESPACE SELECTOR DETENT (3) to obtain requirements; tighten Screw.

NOTE: If LINESPACE PAWL (1) contacts LINESPACE ARREST PLATE (8) before rotating WHEEL (5) the correct number of Teeth on DETENT (6), loosen SCREW (7) and move ARREST PLATE (8) out of the way; check Adjustment #2.



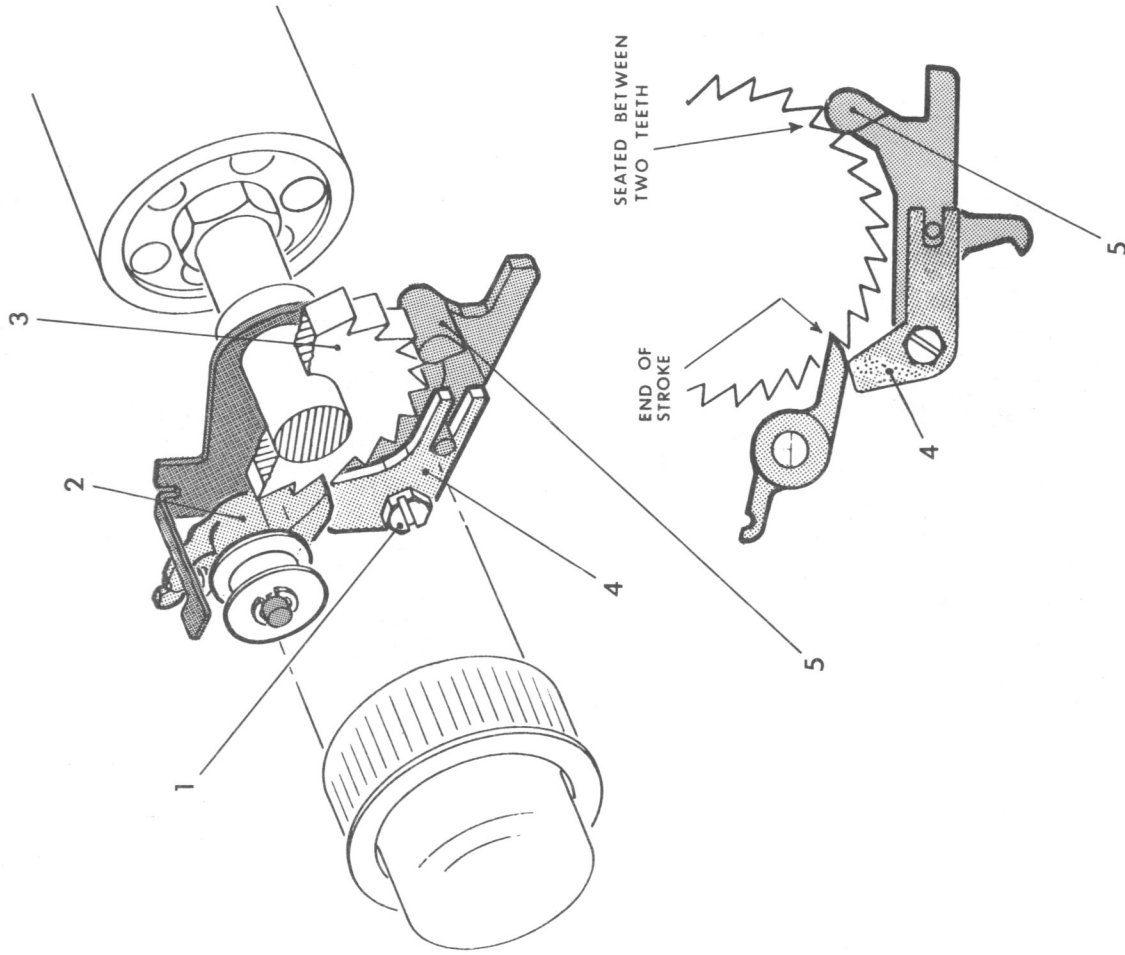
2. Limiting the Linespace Stroke to prevent Platen Roll.

REQUIREMENT:

At the end of a Linespace Stroke, LINESPACE WHEEL DETENT (5) should seat between two teeth of LINESPACE WHEEL (3) so that Platen does not roll forward or rearward.

TO CHECK: Pull C/R Cord down. Check at all Linespace Selector positions.

ADJUSTMENT: Loosen SCREW (1) and position LINESPACE ARREST PLATE (4) to stop downward travel of PAWL (2) just as DETENT (5) seats between two Linespace Wheel Teeth. Tighten Screw.



TAB-SET-CLEAR ADJUSTMENTS

TAB

1. Tab Linkage Adjustment.

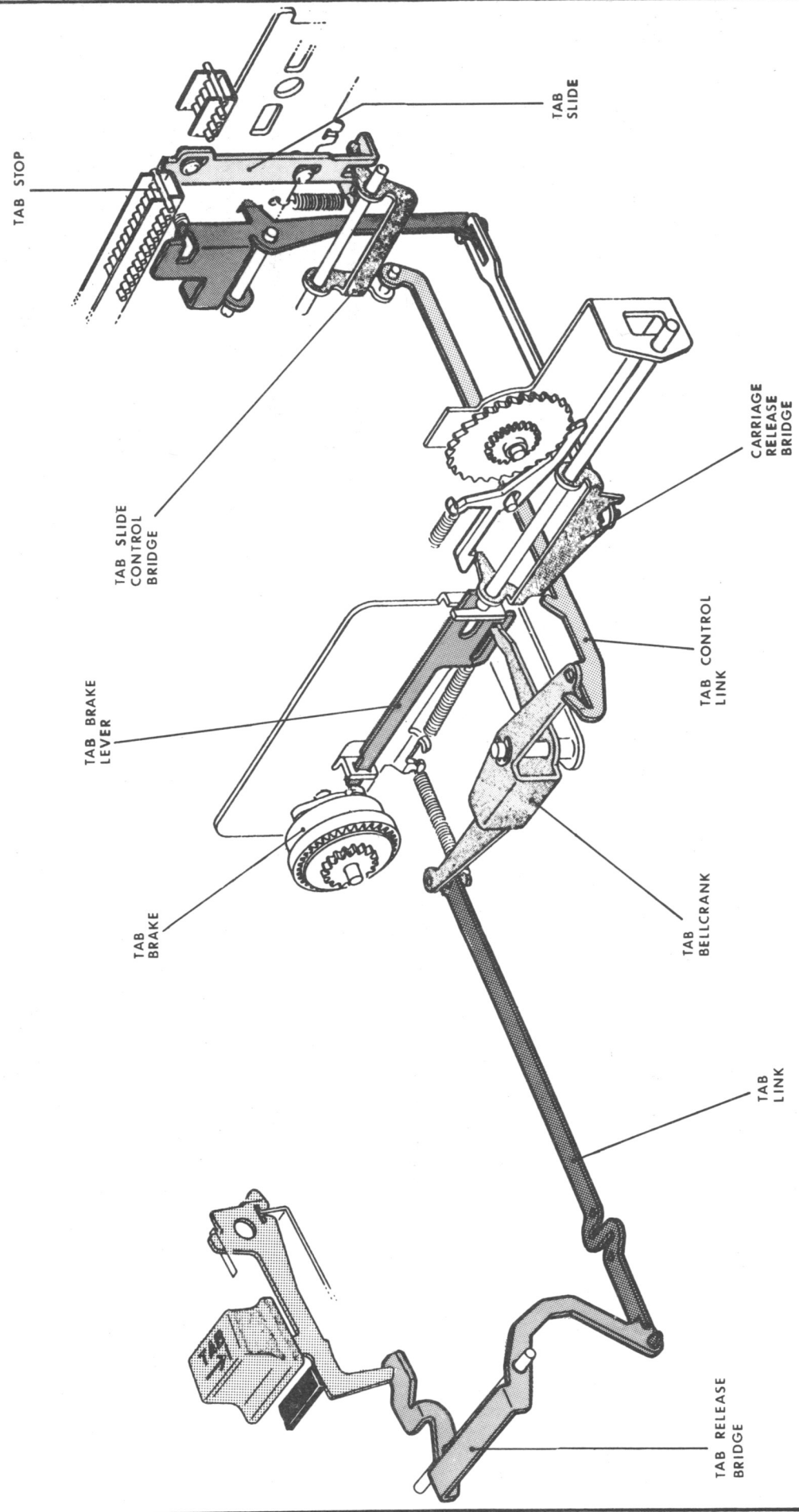
TAB

SET - CLEAR

1. Centering Tab Setter with Tab Stops.
2. Set-Clear linkage Adjustment.
3. Rest position of Tab Clearer.

SET-CLEAR

TABULATOR





TAB ADJUSTMENT

1. Tab Linkage Adjustment.

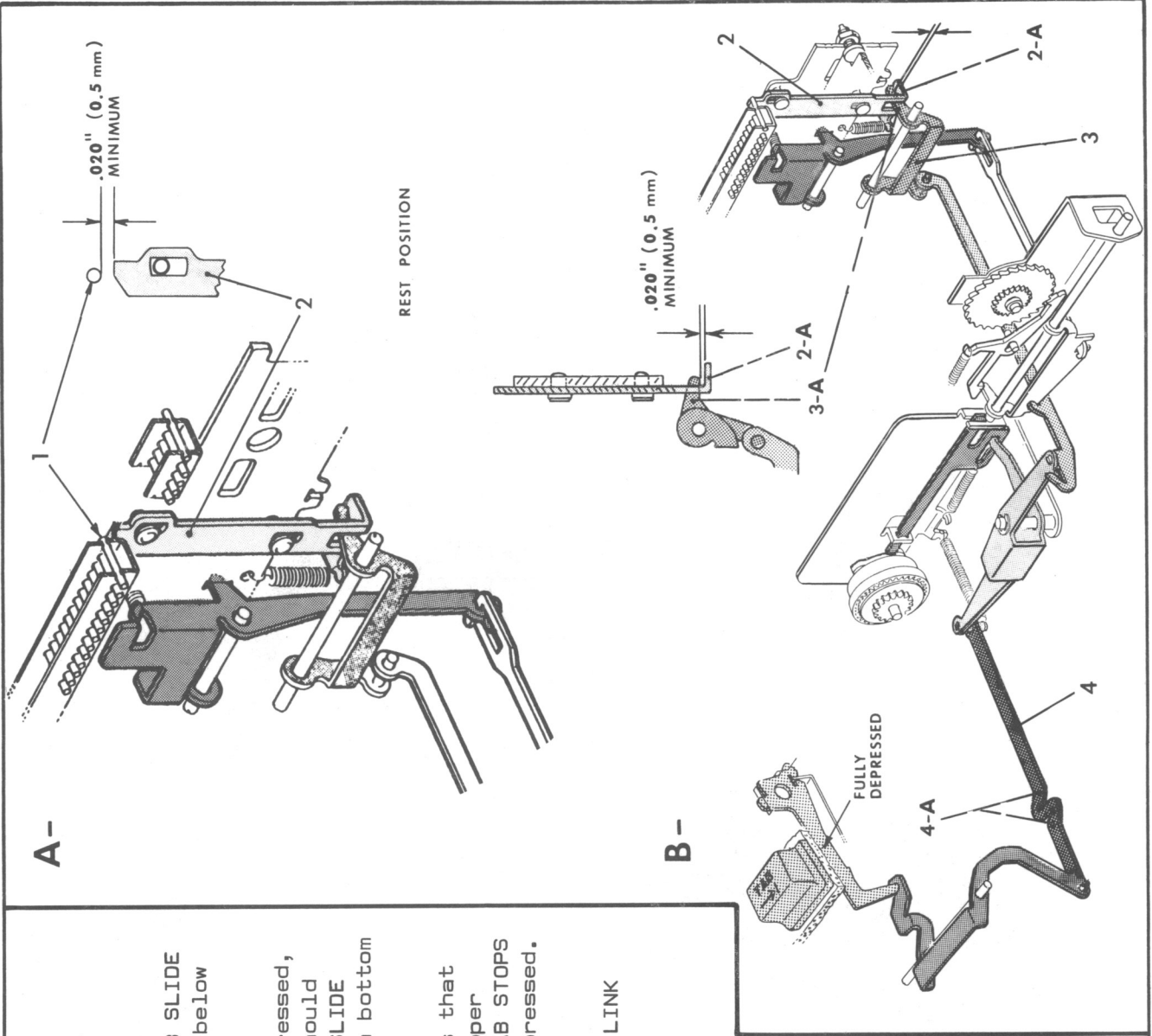
REQUIREMENT:

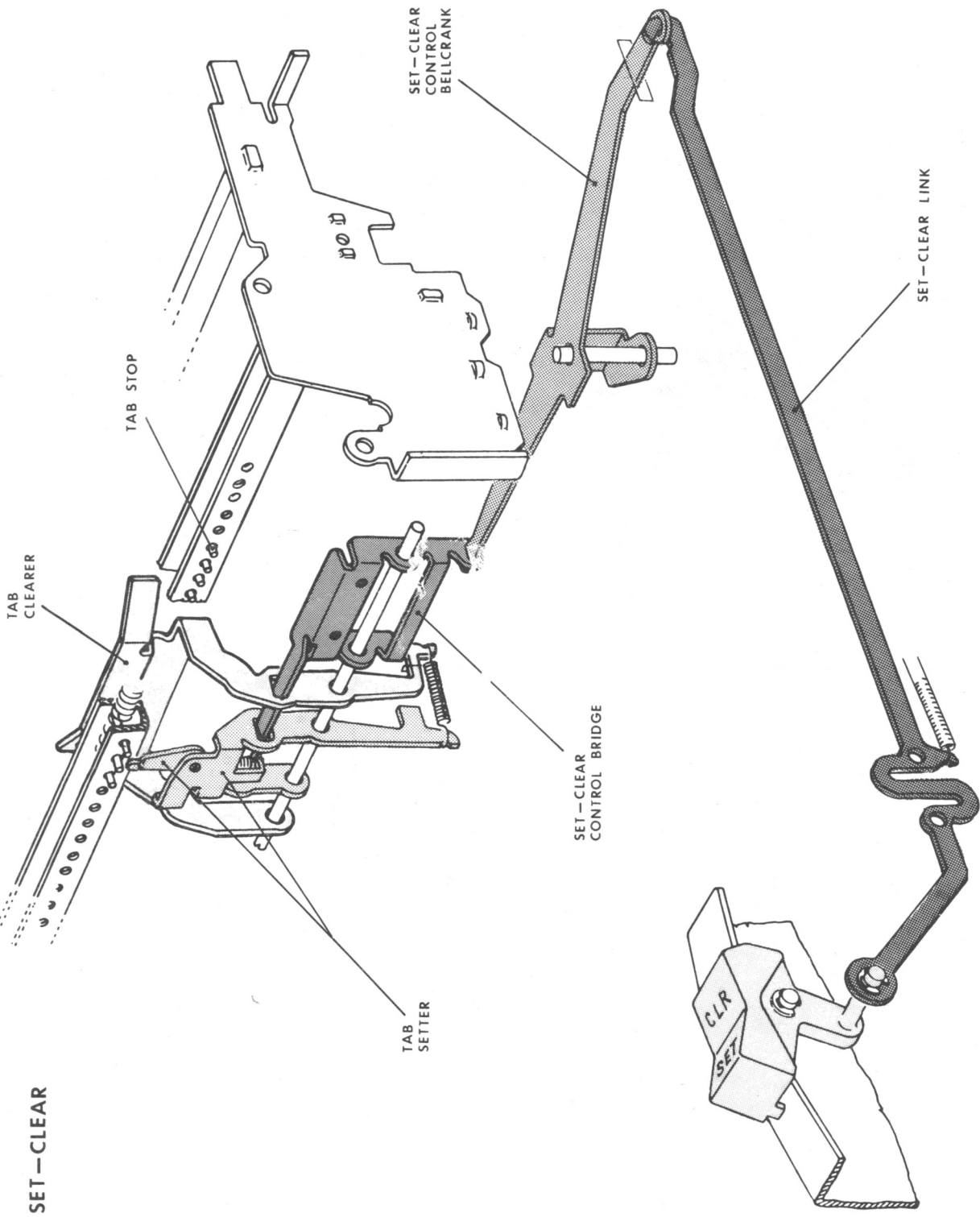
- A) With Tab mechanism at rest, TAB SLIDE (2) should rest at least .020" below TAB STOPS (1).
- B) When Tab Keylever is fully depressed, TAB CONTROL BRIDGE ARM (3-A) should rise at least .020" above TAB SLIDE ARM (2-A). View clearance from bottom rear of machine.

NOTE: This requirement assures that TAB SLIDE (2) rises to its upper limit for good coverage on TAB STOPS (1) when Tab Key is fully depressed.

ADJUSTMENT: Shorten or lengthen TAB LINK (4) by forming at (4-A).

NOTE: Tab Keylever trip can be raised or lowered within the requirement specifications listed above.





TAB SET-CLEAR

SET-CLEAR ADJUSTMENTS

1. Centering TAB SETTER (3) with TAB STOPS (1).

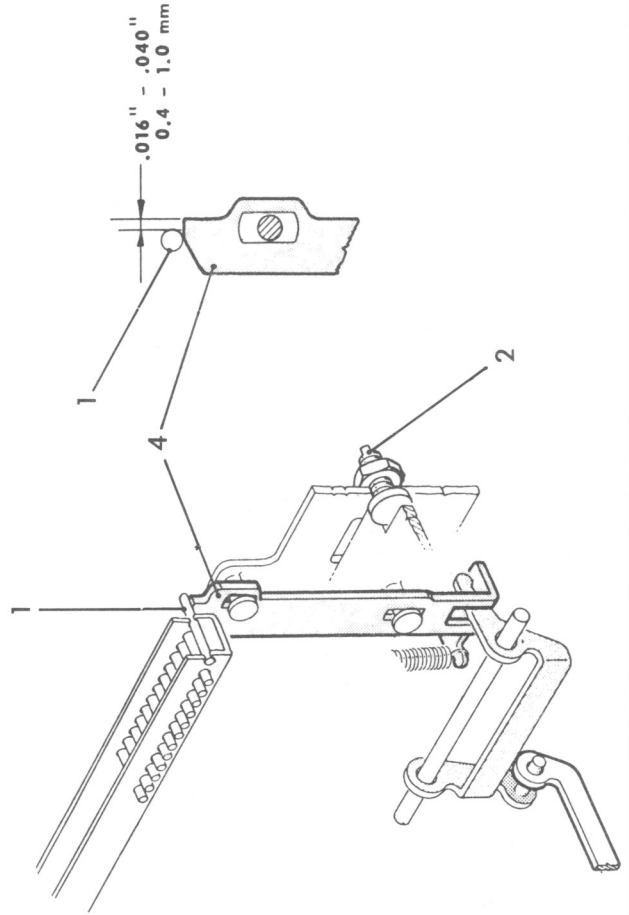
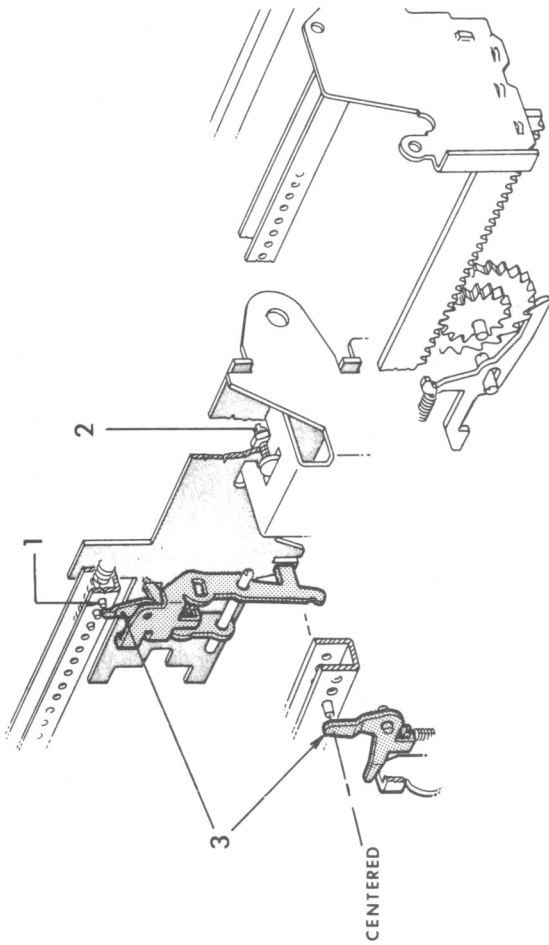
REQUIREMENT:

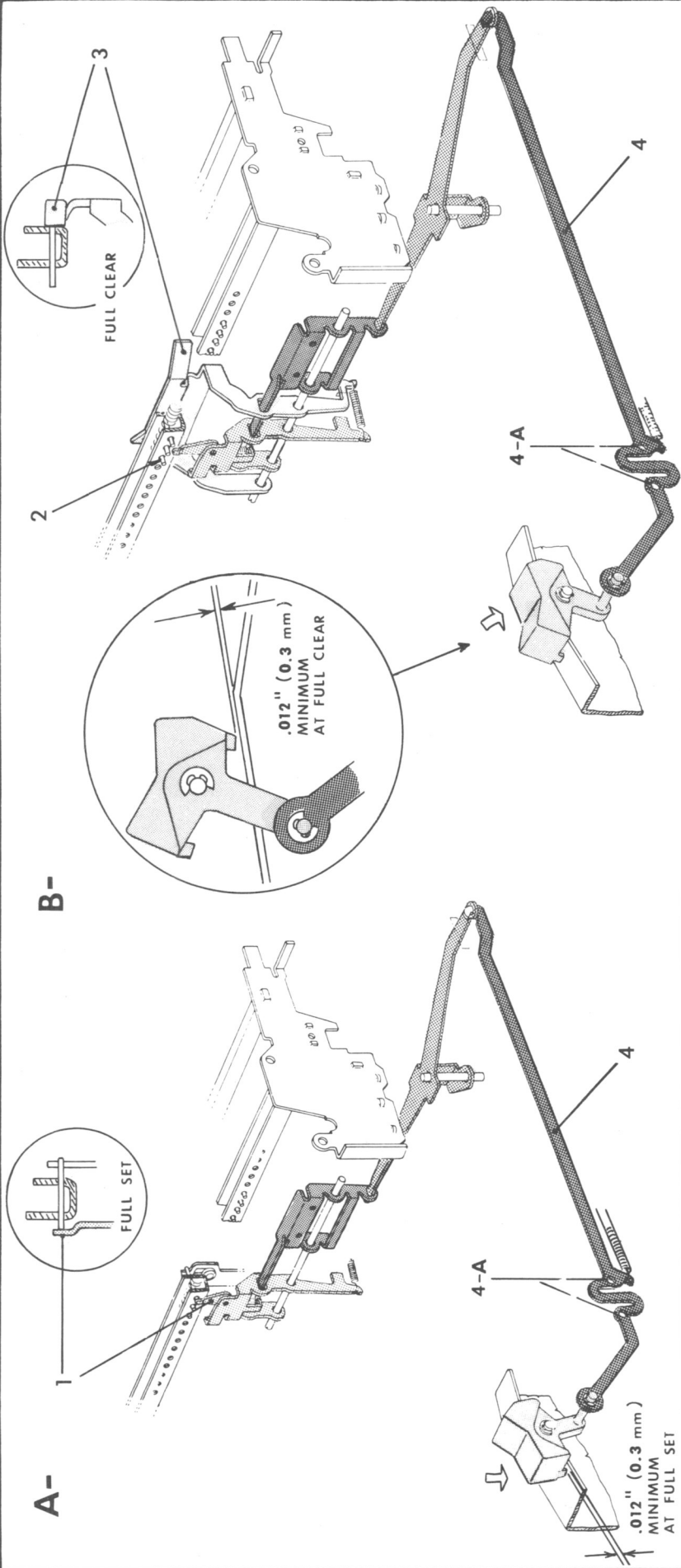
TAB SETTER (3) should be centered (right to left) with TAB STOPS (1). Check with Carriage at rest at center and extreme ends. View thru Paper Holder slot in Paper Table.

ADJUSTMENT: Loosen Lock Nut and regulate ECCENTRIC (2) to move TAB SETTER (3) right or left.

NOTE: ECCENTRIC (2) is within the Rear Services Group. Gain access thru hole in Margin Release Frame.

NOTE: ECCENTRIC (2) also establishes right to left position of TAB SLIDE (4). To check, tabulate to a Set Tab Stop and release Tab Keylever. Manually hold Carriage, and slowly depress Keylever until TAB SLIDE (4) is just below SET TAB STOP (1): SLIDE (4) should overlap STOP (1) as illustrated by .016"-.040".





2. Set-Clear Linkage Adjustment.

REQUIREMENT:

A) When Set-Clear Keybutton is depressed to Set position, TAB SETTER (1) should fully set a TAB STOP (2) before Keybutton bottoms on Side Frame.

B) When Set-Clear Keybutton is depressed to Clear position, TAB CLEARER (3) should fully clear a TAB STOP (2) before Keybutton bottoms on Side Frame.

ADJUSTMENT: Shorten or lengthen SET-CLEAR LINK (4) by forming at (4-A). Adjust for equal throw.

NOTE: Maintain clearance between TAB SETTER (1) and a cleared TAB STOP (2) with all parts at rest. Form TAB SETTER (1) if necessary.

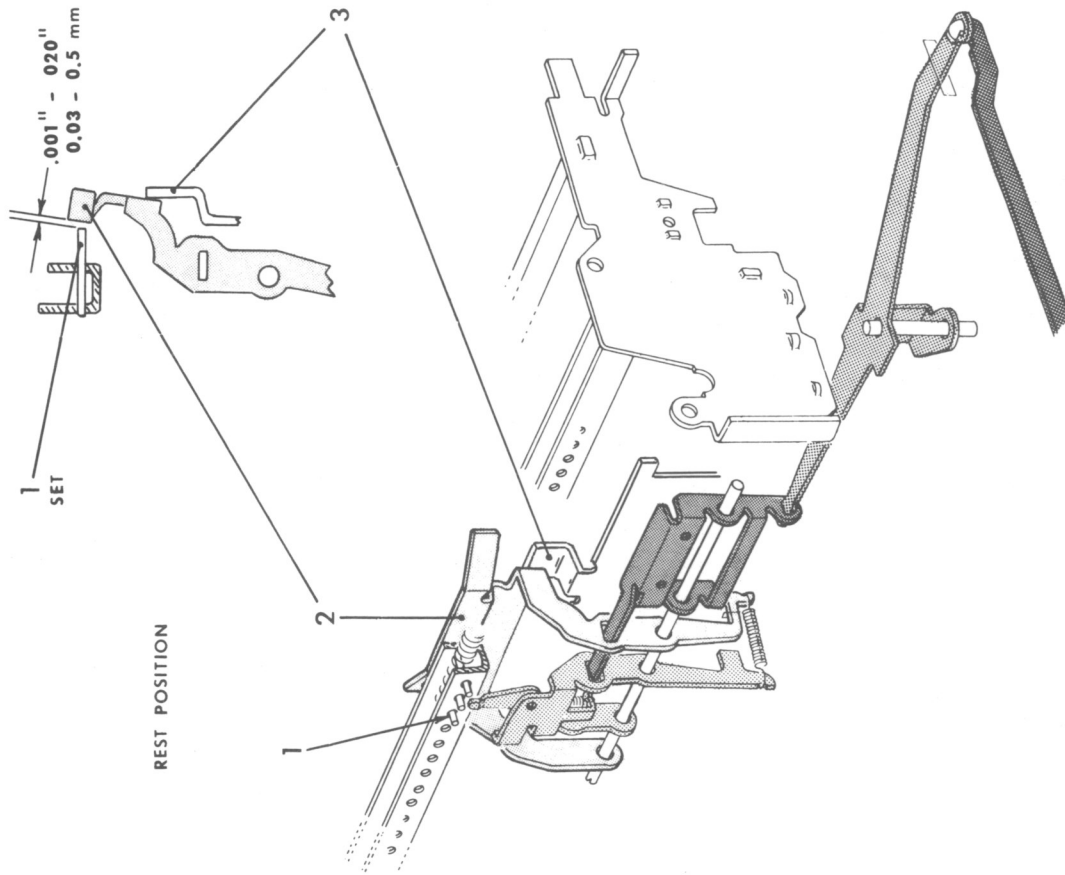
SET-CLEAR ADJUSTMENTS

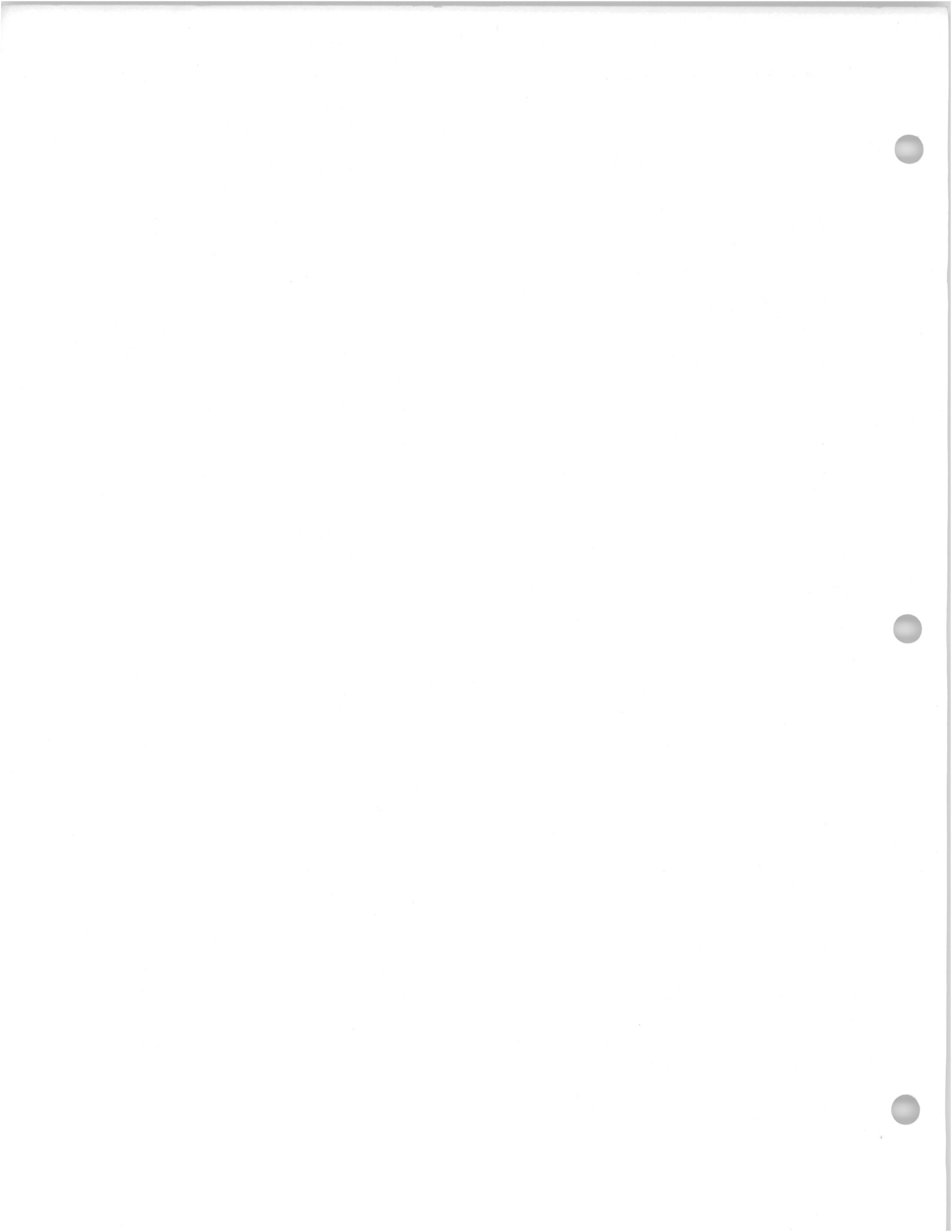
3. Rest position of TAB CLEARER (2).

REQUIREMENT:

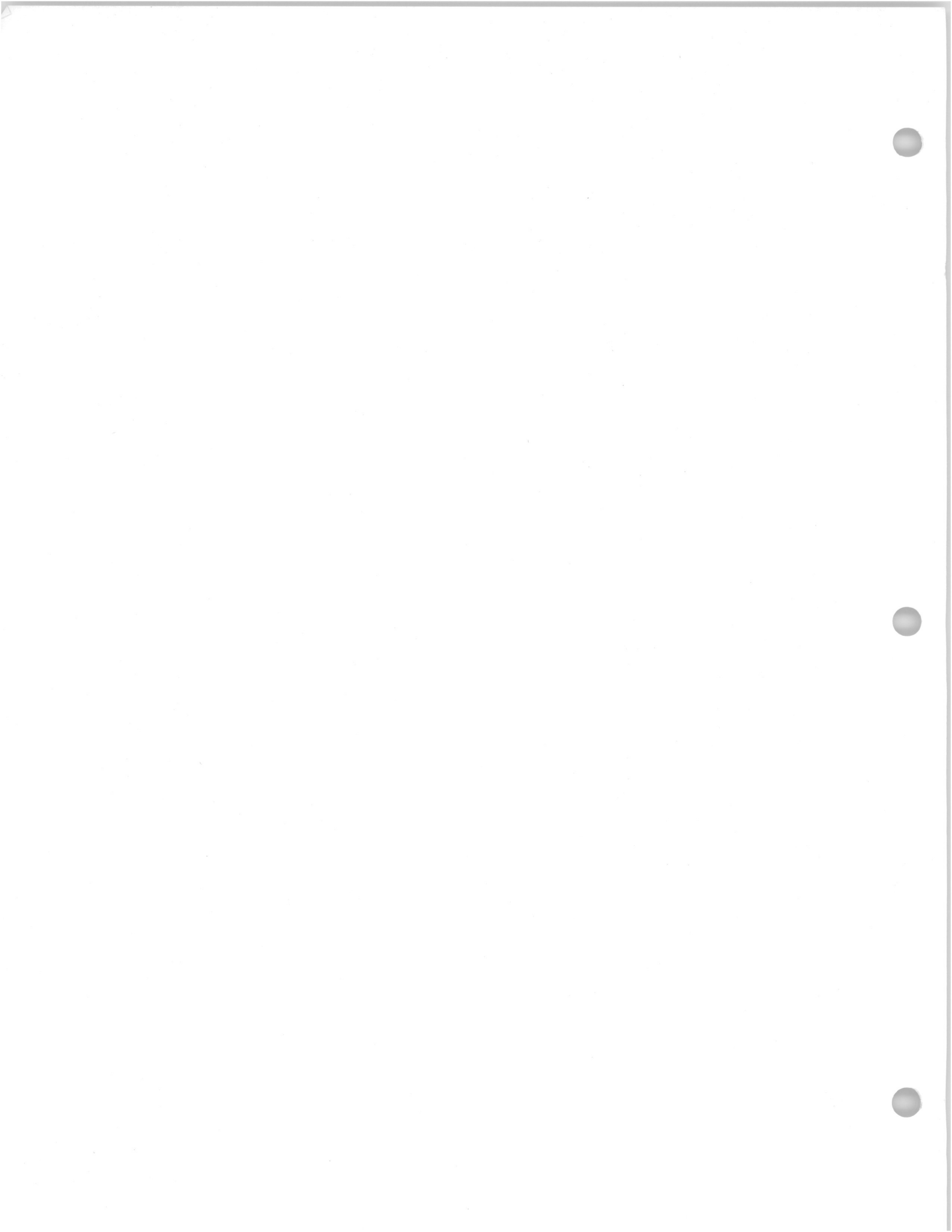
With Set-Clear mechanism at rest, there should be .001"-.020" clearance between a SET TAB STOP (1) and TAB CLEARER (2).

ADJUSTMENT: Form STOP ARM (3) on Rear Services Group forward or rearward.

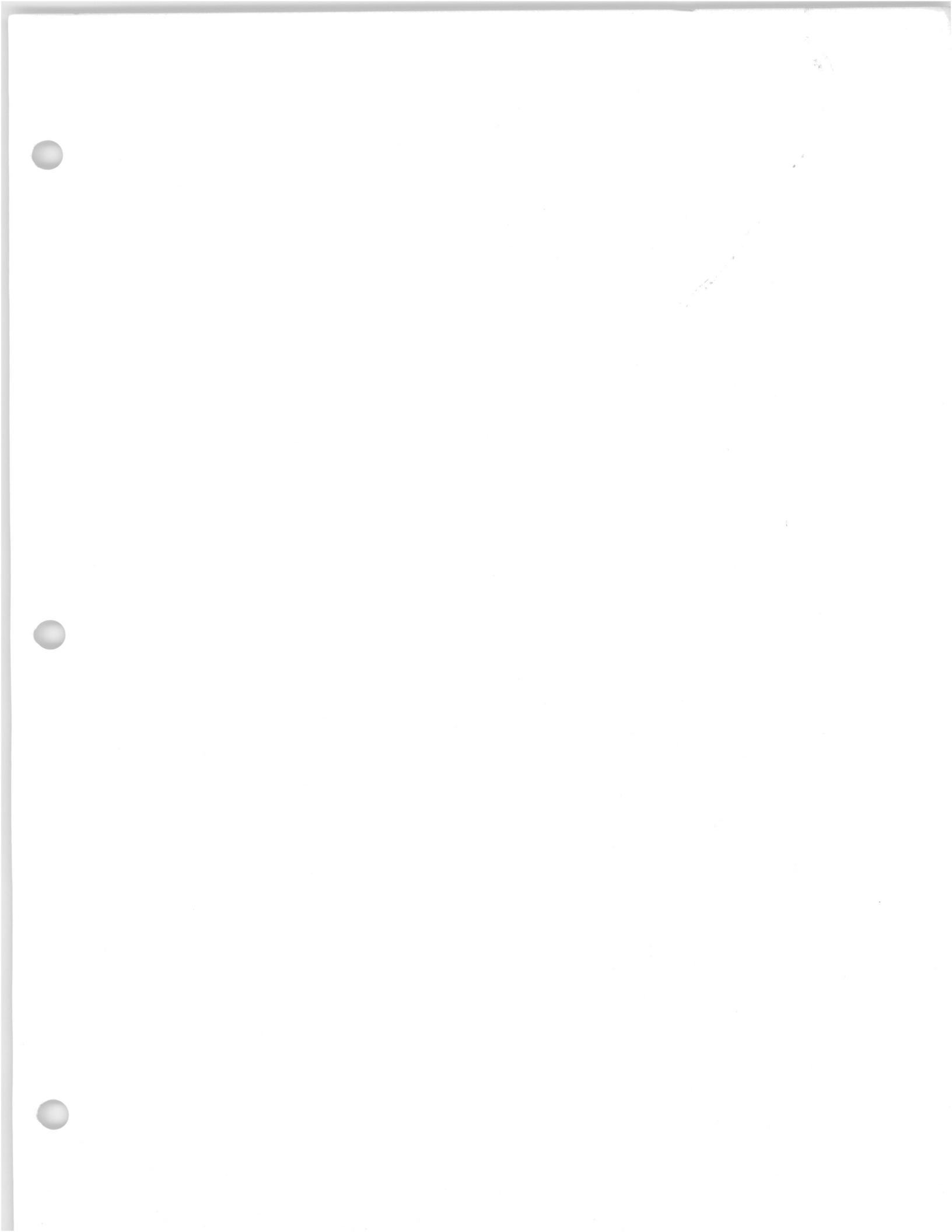


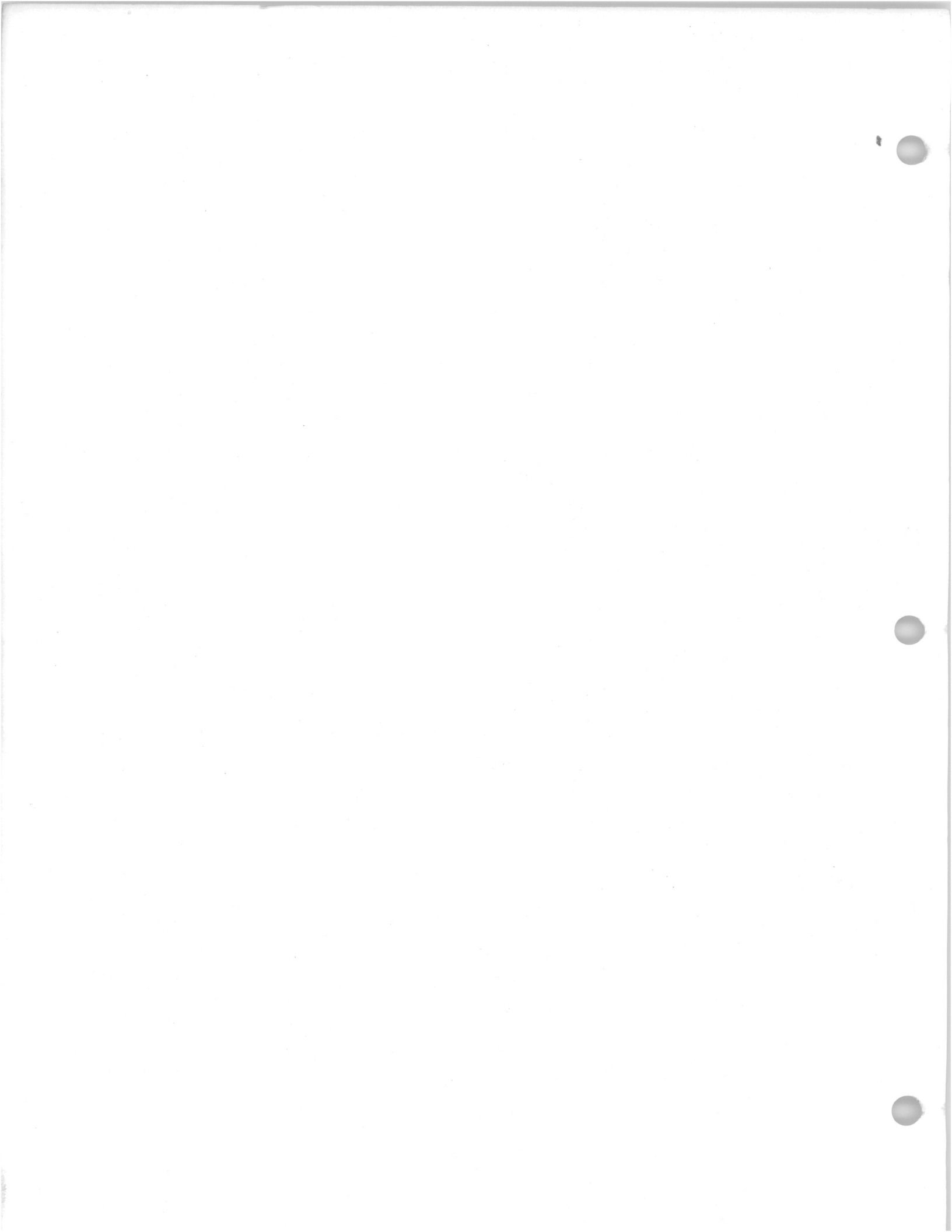














# **SMITH-CORONA PARTS MANUAL**

## **MODEL 1 GLB, VANTAGE**

**SMITH-CORONA**  
SCM CORPORATION

## PREFACE

This Parts Manual lists and illustrates parts necessary for the maintenance of the Smith-Corona Single Element Typewriter, Model 1GLB.

A "Reference Number" is used on parts illustrations. This number is listed numerically in the parts listing beneath the illustration, and refers directly to the part number.

When a reference number is used two or more times in the "REF" column, it is an indication that the illustrated part has variations in appearance, color, pitch, etc. Use extreme care in selecting parts in these areas.

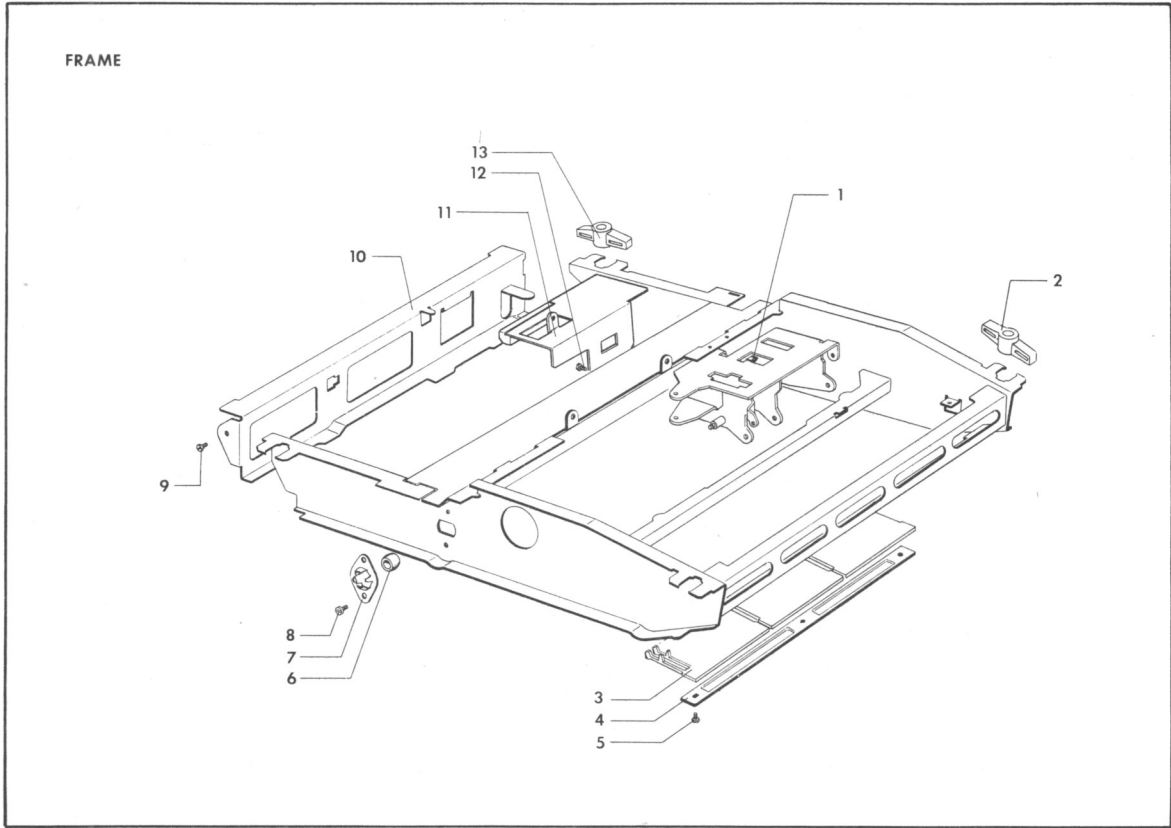
In the rear of this manual is a numerical listing of all part numbers including the first page on which each part number is listed (Page 47 thru 49).

ORDERING INSTRUCTIONS: State correct Part Number on all parts orders. State additional information if asked for. It is not necessary to state part name unless part number is not known. Do not order by reference numbers.

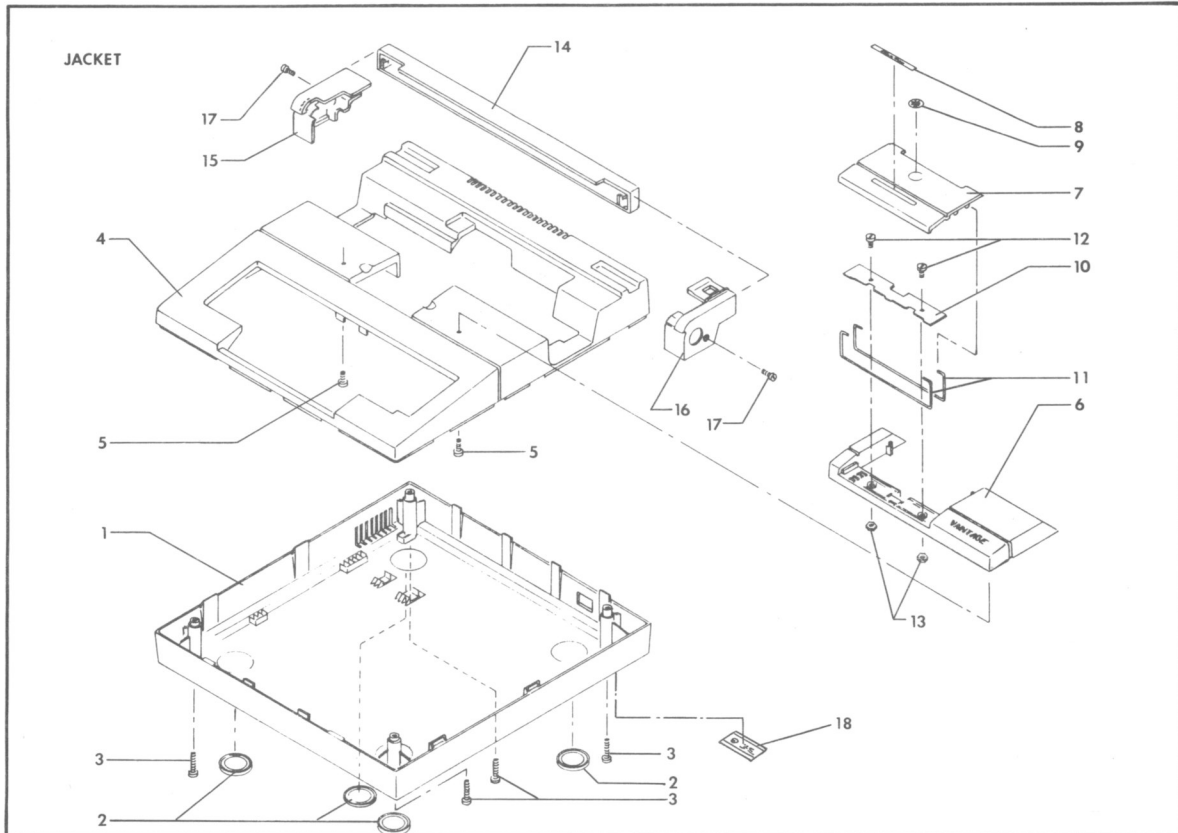
SCM CORPORATION reserves the right to discontinue parts at any time and/or to furnish substitutes.

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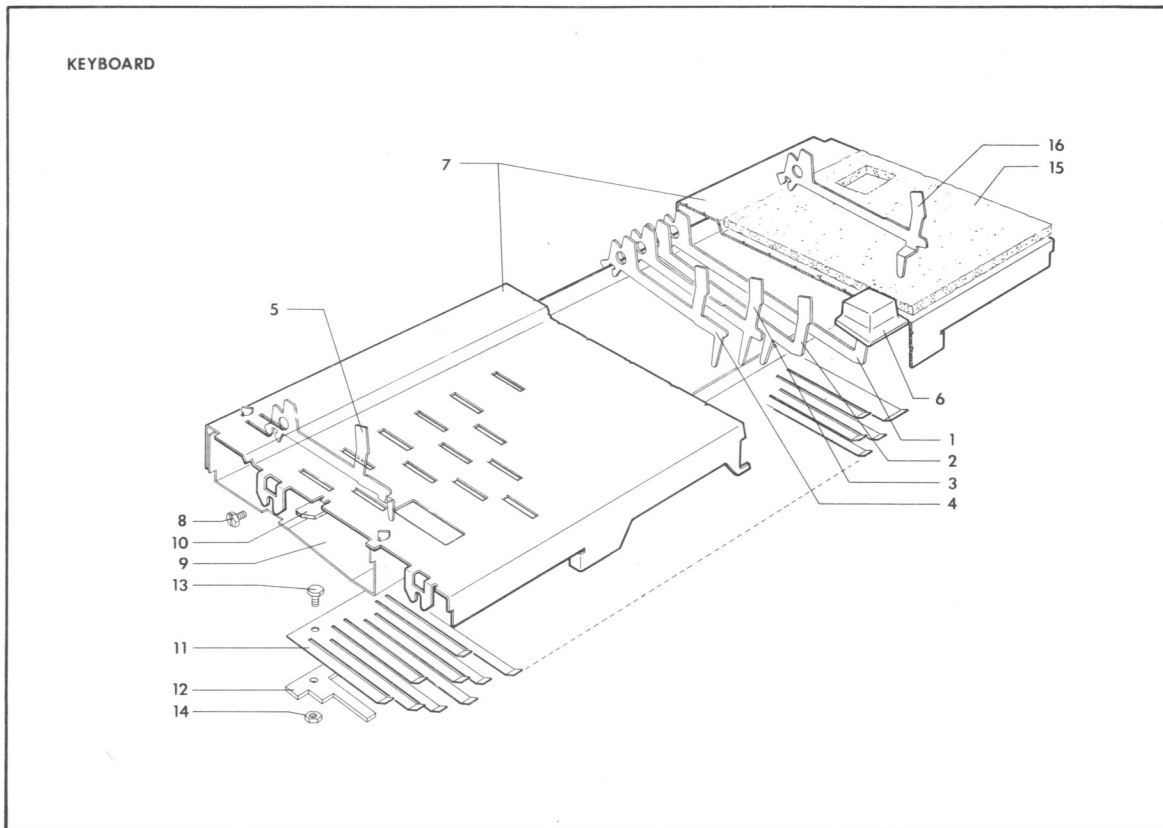
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REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671607	Shock Absorber	8	671794	Screw
2	671476	Rubber Pad, Front	9	671803	Screw
3	670510	Antirepeat Leaf Spring	10	670429	Rear Frame
4	670511	Leaf Spring Plate	11	671264	Bell Support
5	671800	Screw	12	671803	Screw
6	671646	Bushing	13	671475	Rubber Pad, Rear
7	671154	Bushing Support			

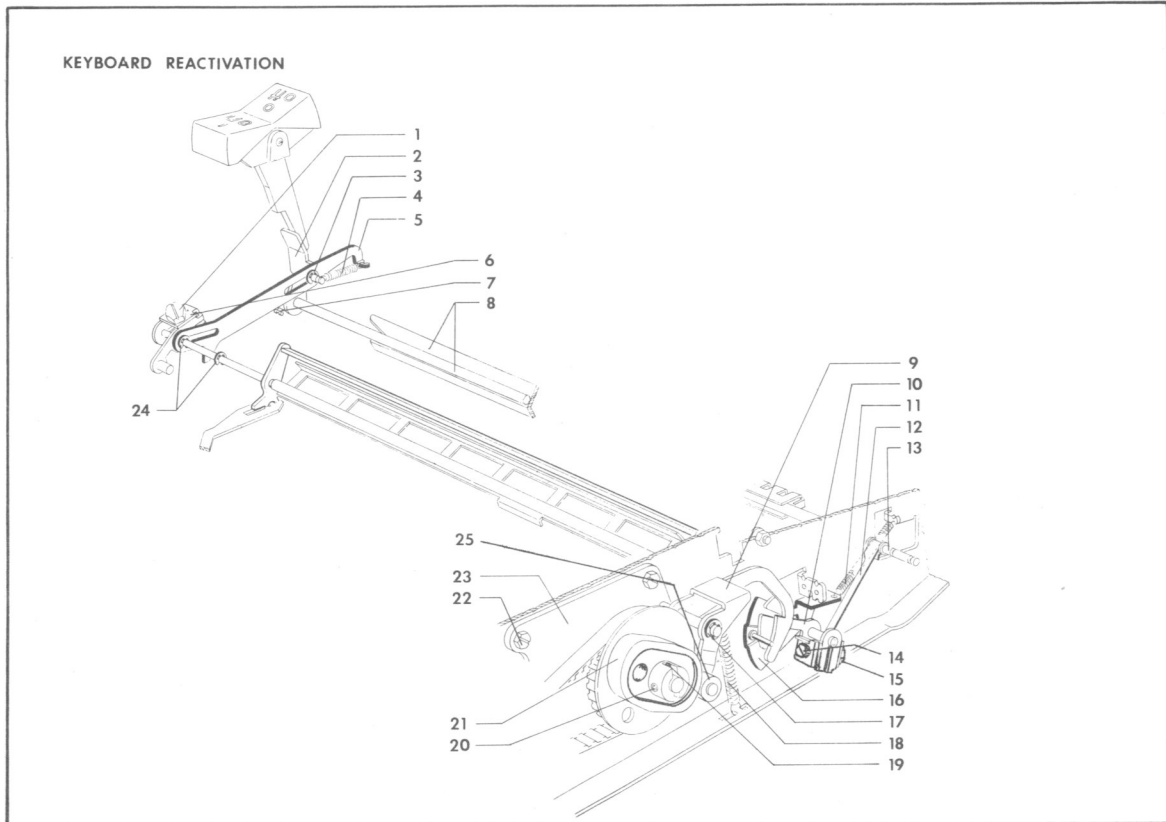


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	675390	Casing Base	13	671831	Nut
2	671605	Casing Base Foot	14	675420	Carriage Coverback
3	671791	Screw	15	675415	Carriage End Cover, Left
4	675005	Casing Top	16	675400	Carriage End Cover, Right
5	675071	Screw	17	671793	Screw
6	675070	Deck	18	675078	Electrical Rating Label (115/60)
7	675060	Deck Door	18	670283	Electrical Rating Label (100/60)
8	675020	Nameplate	18	670282	Electrical Rating Label (100/50)
9	675031	Medallion	18	670277	Electrical Rating Label (120/50)
10	671499	Hinge Plate	18	675801	Electrical Rating Label (220/50)
11	671498	Wire Hinge	18	670279	Electrical Rating Label (220/60)
12	671796	Screw	18	670281	Electrical Rating Label (240/50)

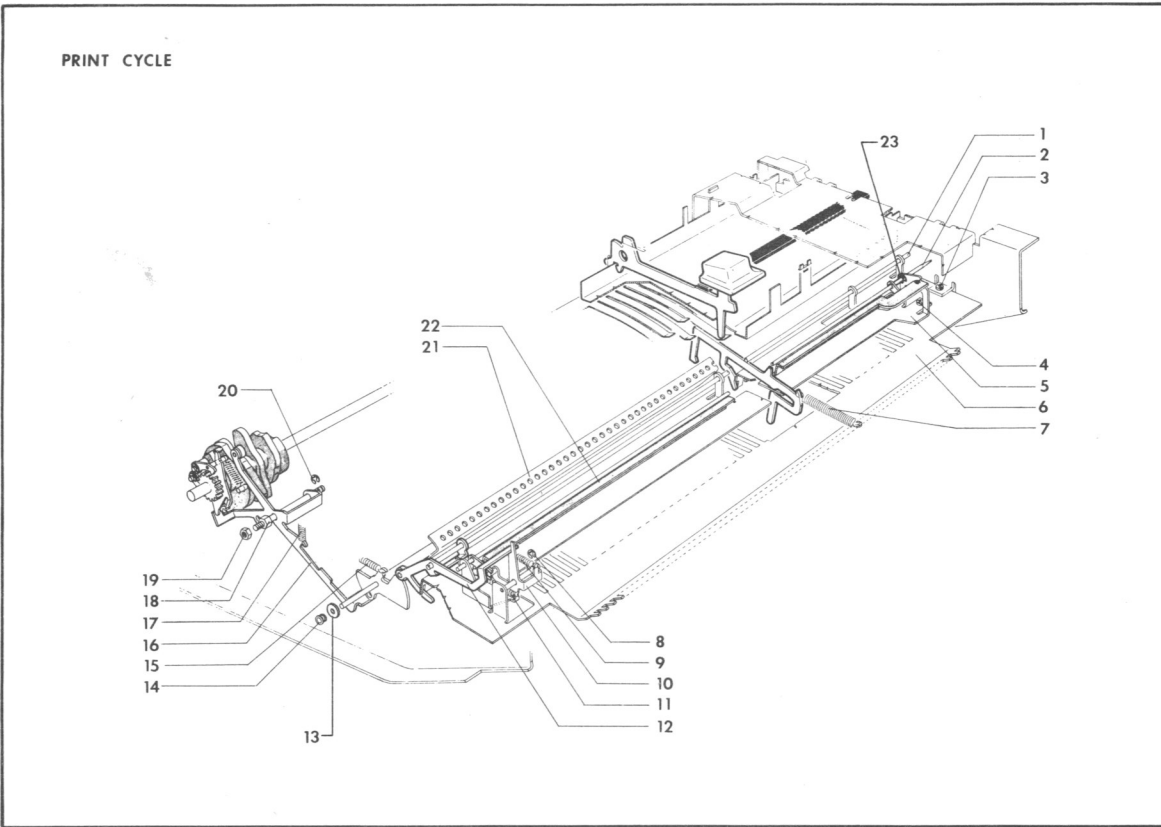


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	698002	Keylever, First Bank	9	698001	Keyboard Plate, Lower
2	698003	Keylever, Second Bank	10	670465	Keylever Rest
3	698004	Keylever, Third Bank	11	670463	Leaf Spring Comb
4	698005	Keylever, Fourth Bank	12	698010	Spring Anchor Comb
5	698007	Keylever, Fourth Bank, Offset	13	670476	Screw
6	675080	Keybutton	14	671832	Nut
7	698000	Keyboard Plate, Upper	15	670466	Keyboard Lining
8	671803	Screw	16	698006	Keylever, Third Bank, Offset

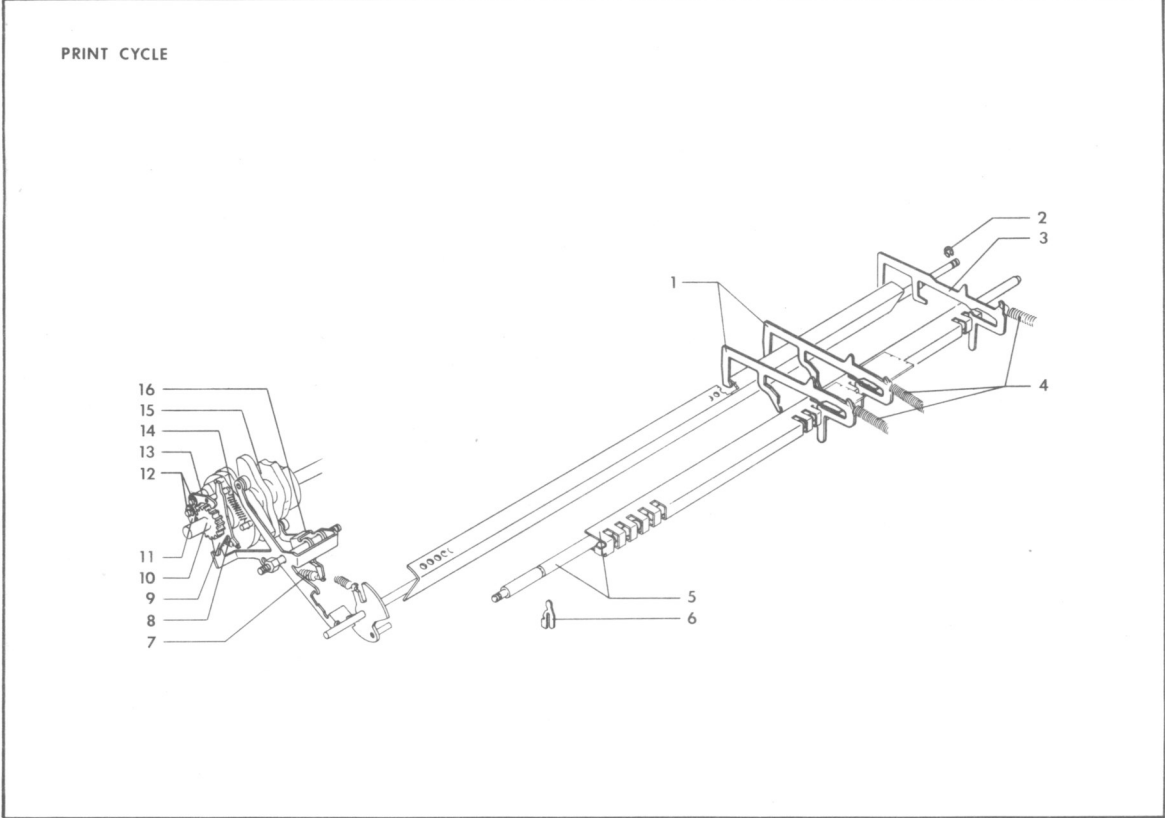




REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671805	Screw	13	698086	Ball Interlock Assembly
2	675702	Keyboard Locking Lever	14	671805	Screw
3	671852	Retainer	15	670418	Nut
4	671870	Spring	16	671159	Keyboard Reactivation Slide
5	671162	Reload Link	17	671853	Retainer
6	671163	Reload Lever	18	671677	Spring
7	670420	Screw	19	671608	Spring Pin
8	671164	Interposer Restore Bail	20	671807	Screw
9	671168	Reactivation Bridge	21	671157	Cam Shaft Pulley
10	671161	Set Bail Reactivation Arm	22	671808	Screw
11	671866	Spring	23	671155	Support Plate Assembly
12	671169	Reactivation Leaf Spring	24	671853	Retainer
			25	671424	Rubber Roller

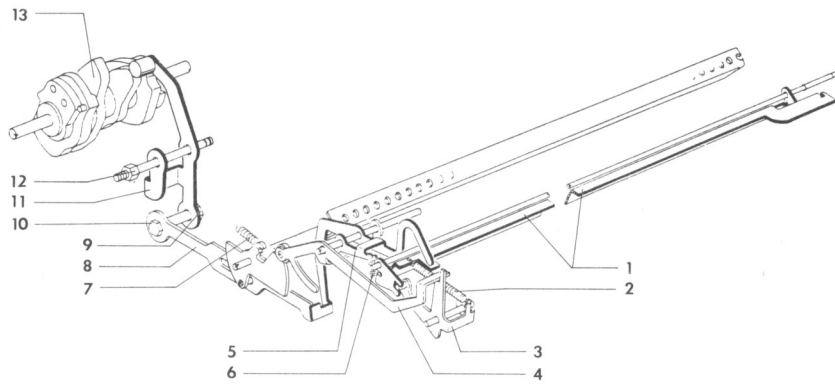


REF	PART NO.	PART NAME	REF	PART NO.	PART NAME
1	670508	Interposer Rest Rod	12	675684	Set Control Bridge
2	671643	Wire	13	671844	Washer
3	671792	Screw	14	671415	Bushing
4	671794	Screw	15	671450	Spring
5	670507	Trigger Bail Bracket	16	670962	Clutch Control Bridge
6	670519	Interposer Guide Plate	17	671667	Spring
7	670512	Spring	18	671409	Stud
8	671852	Retainer	19	671836	Nut
9	671656	Spring	20	671853	Retainer
10	699012	Release Bridge	21	675712	Code Set Bail
11	671676	Spring	22	670509	Print Cycle Trigger Bail
			23	671851	Retainer



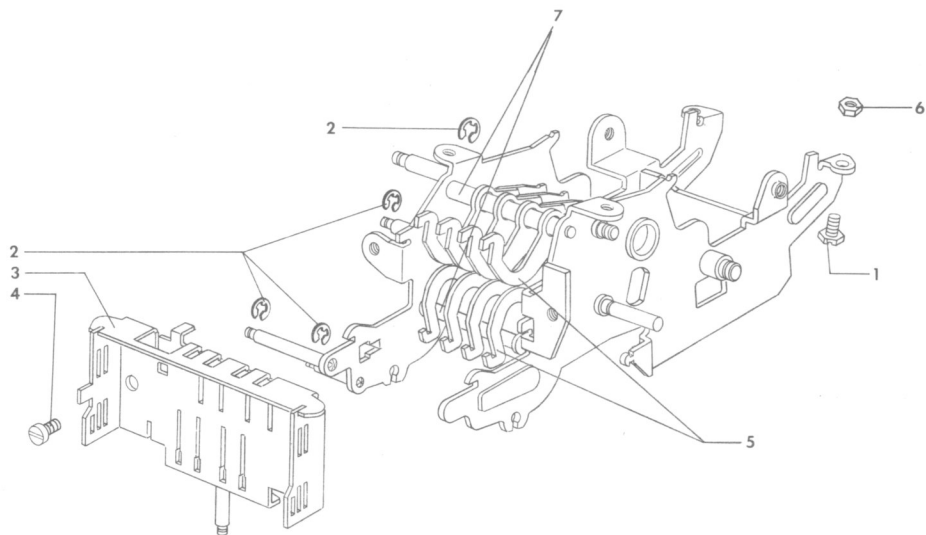
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670503	Interposer	9	671147	Clutch Flange
2	671853	Retainer	10	671151	Cam Shaft Ratchet
3	670504	Interposer, Repeat	11	671150	Clutch Dog Assembly, Lower
4	670512	Spring	12	671852	Retainer
5	698086	Ball Interlock Assembly	13	671149	Clutch Dog Assembly, Upper
6	670522	Retainer	14	671653	Spring
7	671644	Spring	15	670968	Print Cycle Cam Group
8	671653	Spring	16	670963	Cam Group Detent Bridge

## PRINT CYCLE

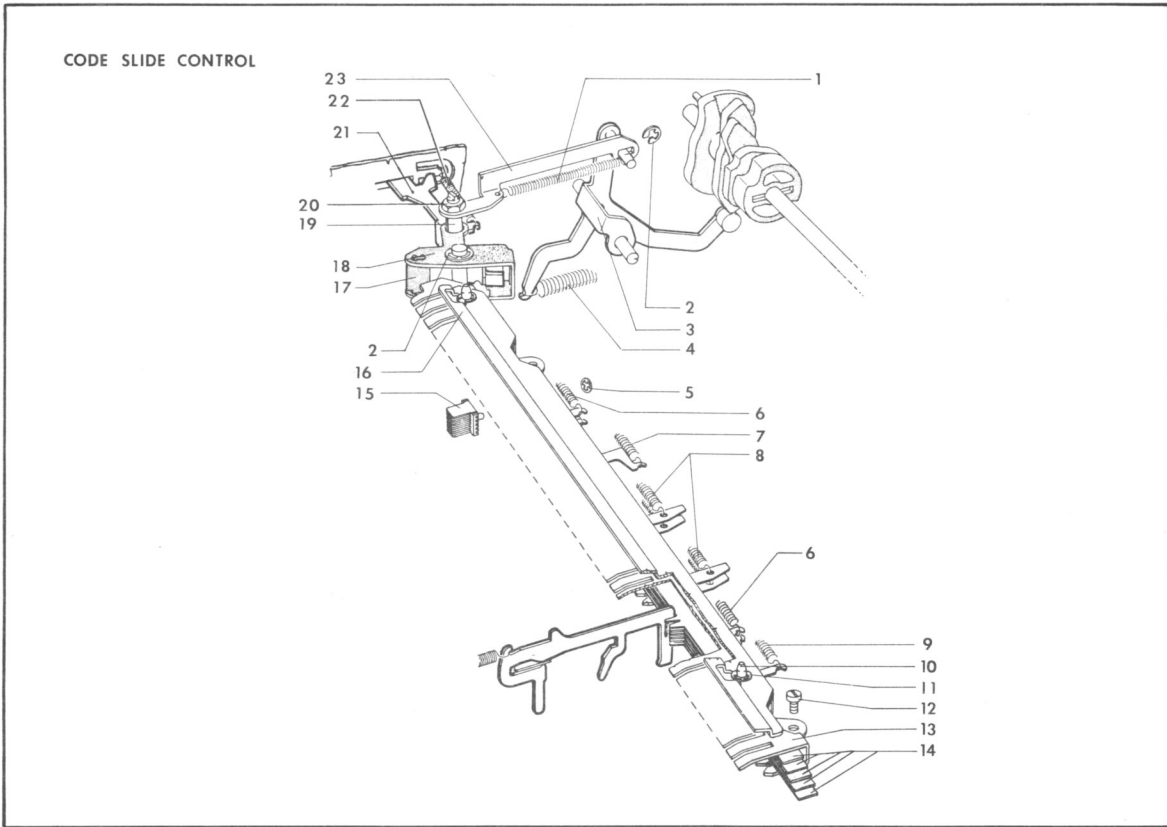


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670509	Print Cycle Trigger Bail	8	670960	Reload Link
2	671656	Spring	9	671832	Nut
3	698012	Release Bridge	10	671388	Eccentric Screw
4	675684	Set Control Bridge	11	670959	Reload Bridge
5	670516	Trigger Bail Reload Bridge	12	671409	Stud
6	671657	Spring	13	670968	Print Cycle Cam Group
7	671450	Spring			

## CENTRAL FRAME

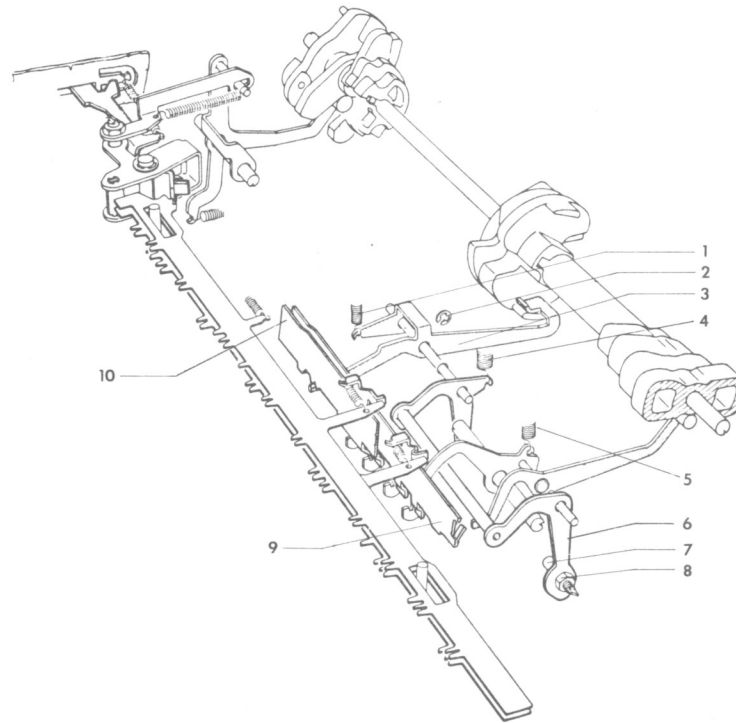


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671808	Screw	4	671795	Screw
2	671852	Retainer	5	670559	Selection Lever Assembly
3	670550	Selection Slide Support	6	671835	Nut
			7	670592	Selection Lever Shaft

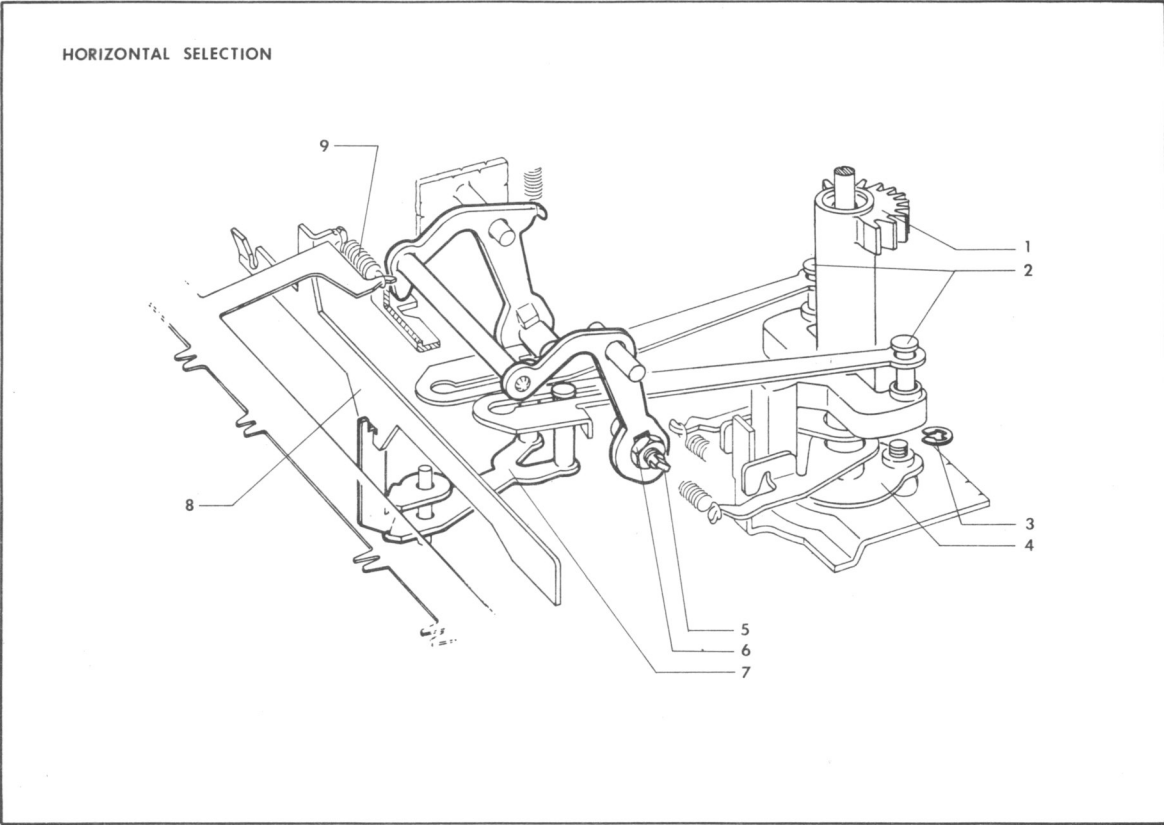


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670250	Spring	14	670538	Code Slide Set (Keyboard 51-N)
2	671853	Retainer	14	670540	Code Slide Set (Keyboard 90-N)
3	675692	Code Slide Control Bridge	14	670541	Code Slide Set (Keyboard 110-N)
4	671434	Spring	14	670542	Code Slide Set (Keyboard 112-N)
5	671433	Retainer	14	670543	Code Slide Set (Keyboard 138-N)
6	671873	Spring	14	670544	Code Slide Set (Keyboard 140-N)
7	671868	Spring	14	670545	Code Slide Set (Keyboard 158-N)
8	671683	Spring	14	670546	Code Slide Set (Keyboard 184-N)
9	671873	Spring	14	670547	Code Slide Set (Keyboard 799-N & 1063V)
10	671414	Code Slide Guide Pin	14	670548	Code Slide Set (Keyboard 208-N)
11	671852	Retainer	14	670549	Code Slide Set (Keyboard 287-N)
12	671795	Screw	15	670527	Code Slide Guide
13	670523	Code Slide Support	16	670528	Code Slide Support Plate
14	670529	Code Slide Set (Keyboard 1-N)	17	670967	Code Slide Control Post
14	670531	Code Slide Set (Keyboard 16-N)	18	670966	Code Slide Control Bellcrank
14	670532	Code Slide Set (Keyboard 24-N)	19	671407	Eccentric Screw
14	670533	Code Slide Set (Keyboard 26-N)	20	671832	Nut
14	670534	Code Slide Set (Keyboard 34-N)	21	670972	Code Slide Relief Pawl
14	670535	Code Slide Set (Keyboard 35-N)	22	671648	Spring
14	670536	Code Slide Set (Keyboard 41-N)	23	670965	Code Slide Control Link

## HORIZONTAL SELECTION

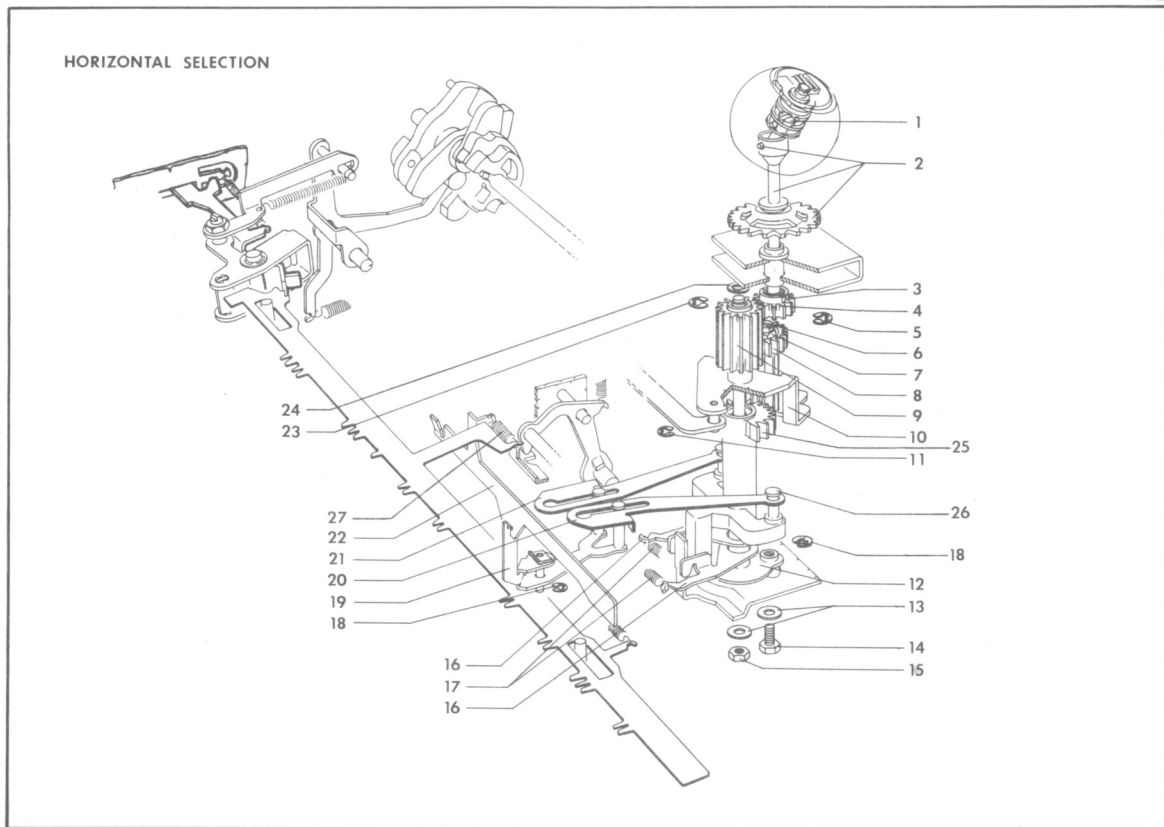


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671674	Spring	6	670567	Horizontal Drive Frame
2	671853	Retainer	7	670566	Eccentric Screw
3	670579	Horizontal Selection Slide Detent	8	671832	Nut
4	671678	Spring	9	698014	Selection Slide #5
5	671448	Spring	10	698013	Selection Slide #4

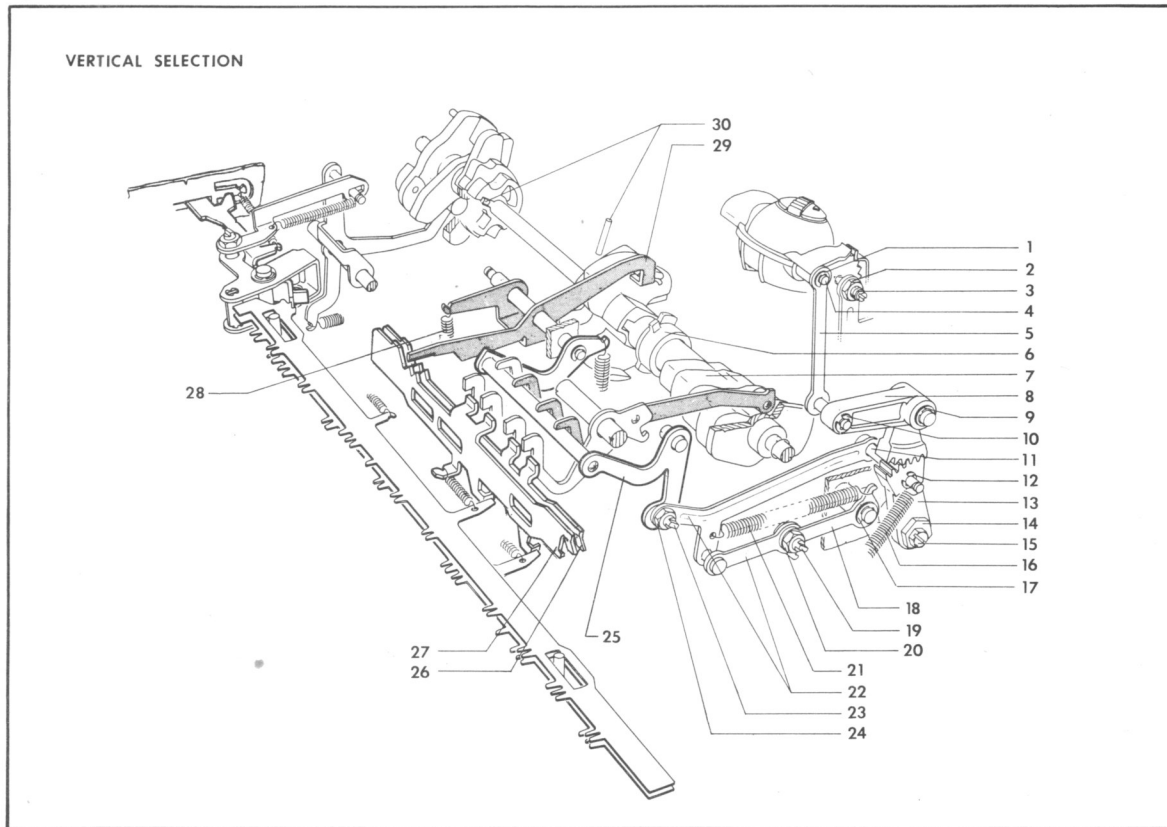


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670595	Selection Control Sector	6	671832	Nut
2	671432	Pin	7	670556	Selection Slide Bellcrank
3	671852	Retainer	8	670553	Selection Slide #3
4	670593	Gear Shaft Assembly	9	671868	Spring
5	670566	Eccentric Screw			

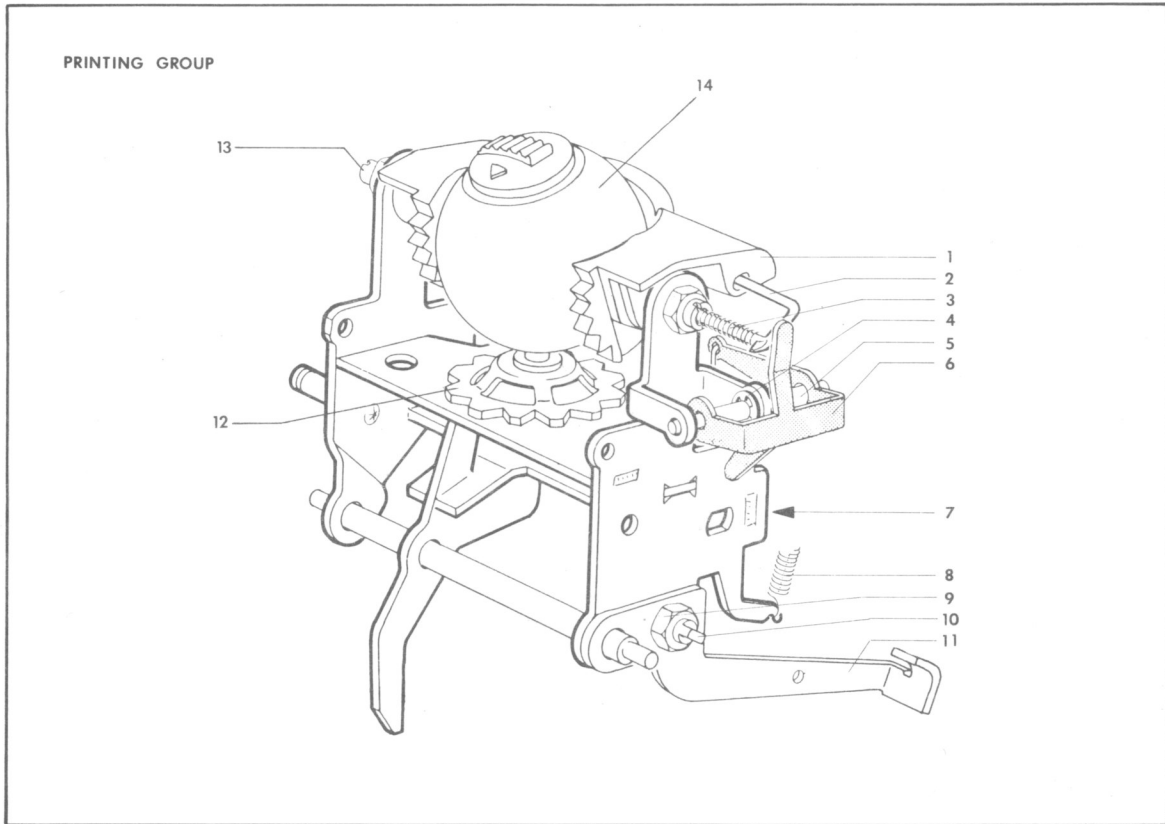




REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670909	Dog Bone	15	671837	Nut
2	670923	Starwheel Shaft Assembly	16	670600	Centering Lever
3	671827	Spring Pin	17	671878	Spring
4	670924	Pinion	18	671852	Retainer
5	671853	Retainer	19	670556	Selection Slide Bellcrank
6	671804	Screw	20	670577	Selection Link, Right
7	671361	Eccentric Nut	21	670576	Selection Link, Left
8	670596	Planetary Gear	22	670553	Selection Slide #3
9	670597	Drive Gear	23	671853	Retainer
10	675690	Pivot Plate	24	671848	Washer
11	671852	Retainer	25	670595	Selection Control Sector
12	670593	Gear Shaft Assembly	26	671432	Pin
13	671849	Washer	27	671868	Spring
14	671808	Screw			

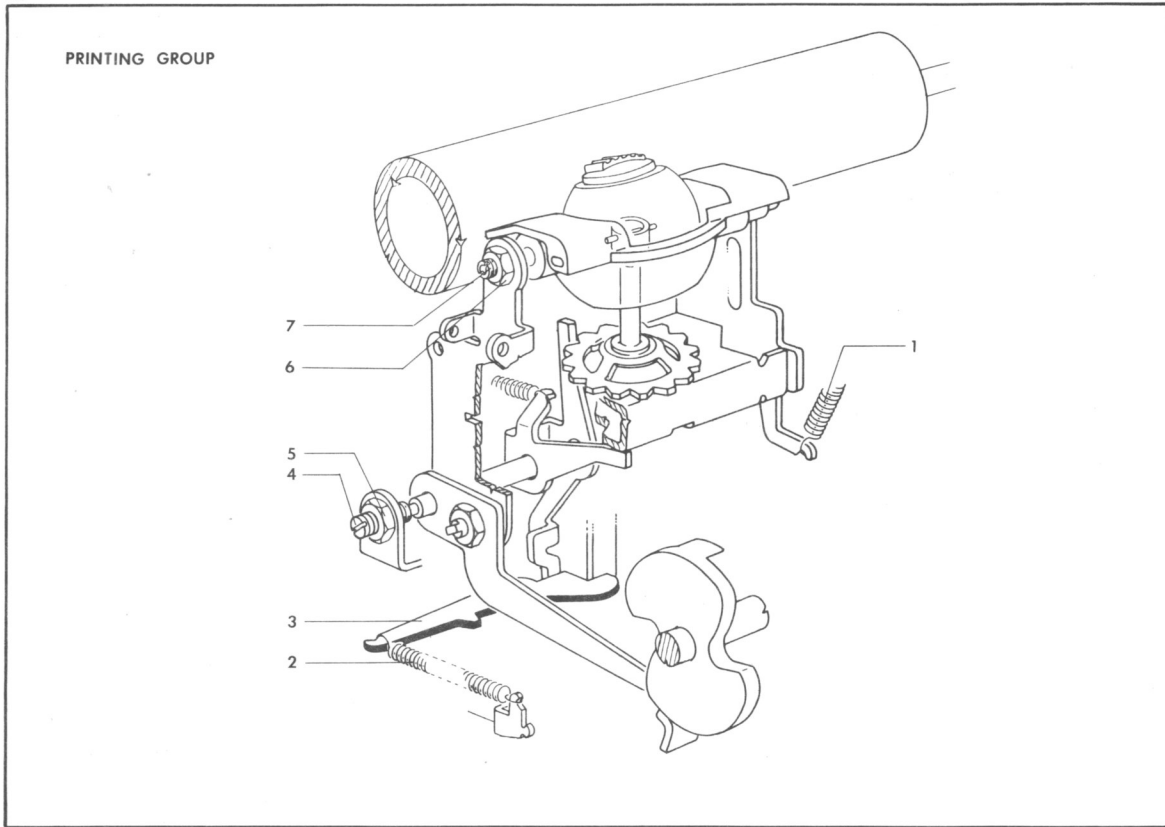


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671852	Retainer	16	671679	Spring
2	671839	Nut	17	671854	Retainer
3	671383	Screw	18	670581	Toggle Link
4	671378	Pin	19	671388	Eccentric Screw
5	670934	Element Support Link	20	671833	Nut
6	670572	Selection Cam Bushing	21	671671	Spring
7	670571	Selection Cam Group	22	670586	Vertical Control Link Assembly
8	670933	Vertical Control Sector	23	698015	Eccentric Screw
9	671853	Retainer	24	671833	Nut
10	671852	Retainer	25	670562	Vertical Drive Frame
11	671360	Vertical Selection Link Pin	26	670552	Selection Slide #2
12	671852	Retainer	27	670551	Selection Slide #1
13	670573	Vertical Drive Sector	28	671674	Spring
14	671361	Eccentric Nut	29	670580	Vertical Selection Slide Detent
15	671804	Screw	30	671826	Pin



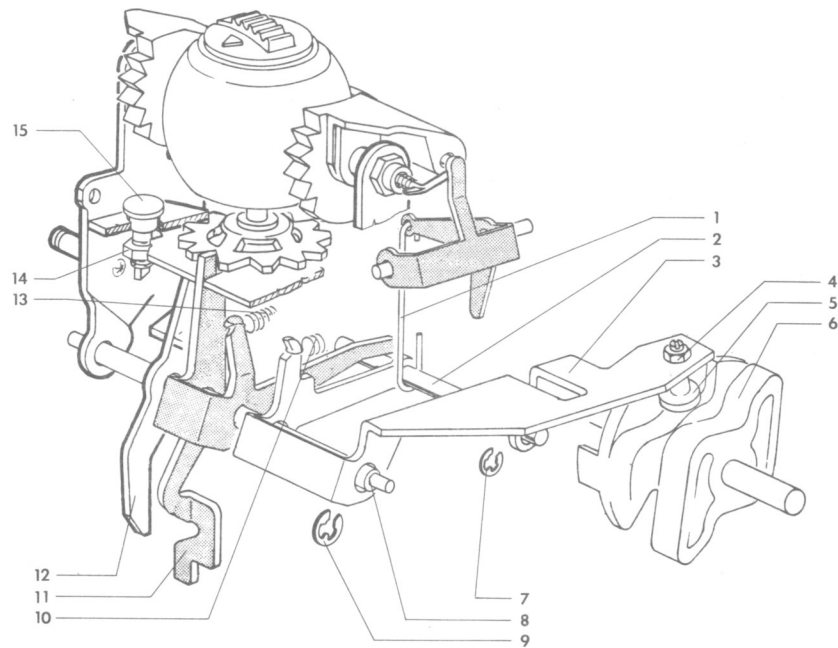
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670903	Element Support	13	671383	Screw
2	670927	Fine Detent	14	675765	Element (Pica 10 Pitch)
3	670930	Spring	14	675766	Element (Casual 10 Pitch)
4	671852	Retainer	14	675767	Element (Pride 10 Pitch)
5	671381	Shaft	14	675770	Element (Pride 12 Pitch)
6	670928	Fine Detent Bellcrank	14	675768	Element (Precise 10 Pitch)
7	670910	Element Support Group	14	675772	Element (Precise 12 Pitch)
8	671660	Spring	14	675769	Element (Elite 12 Pitch)
9	671833	Nut	14	675771	Element (Classical 12 Pitch)
10	671388	Eccentric Screw	14	675814	Element (Script 10 Pitch)
11	670915	Typing Arm	14	675815	Element (Script 12 Pitch)
12	670923	Starwheel Shaft Assembly			

1063 V  
KEYBOARD



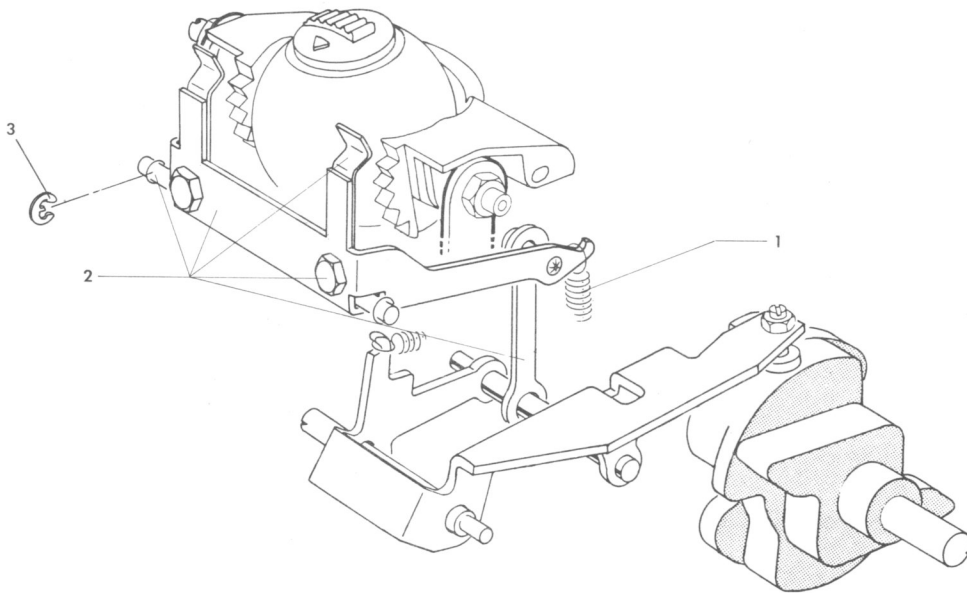
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671660	Spring	5	671839	Nut
2	671679	Spring	6	671839	Nut
3	670578	Damping Lever	7	670925	Screw
4	670926	Screw			

## PRINTING GROUP

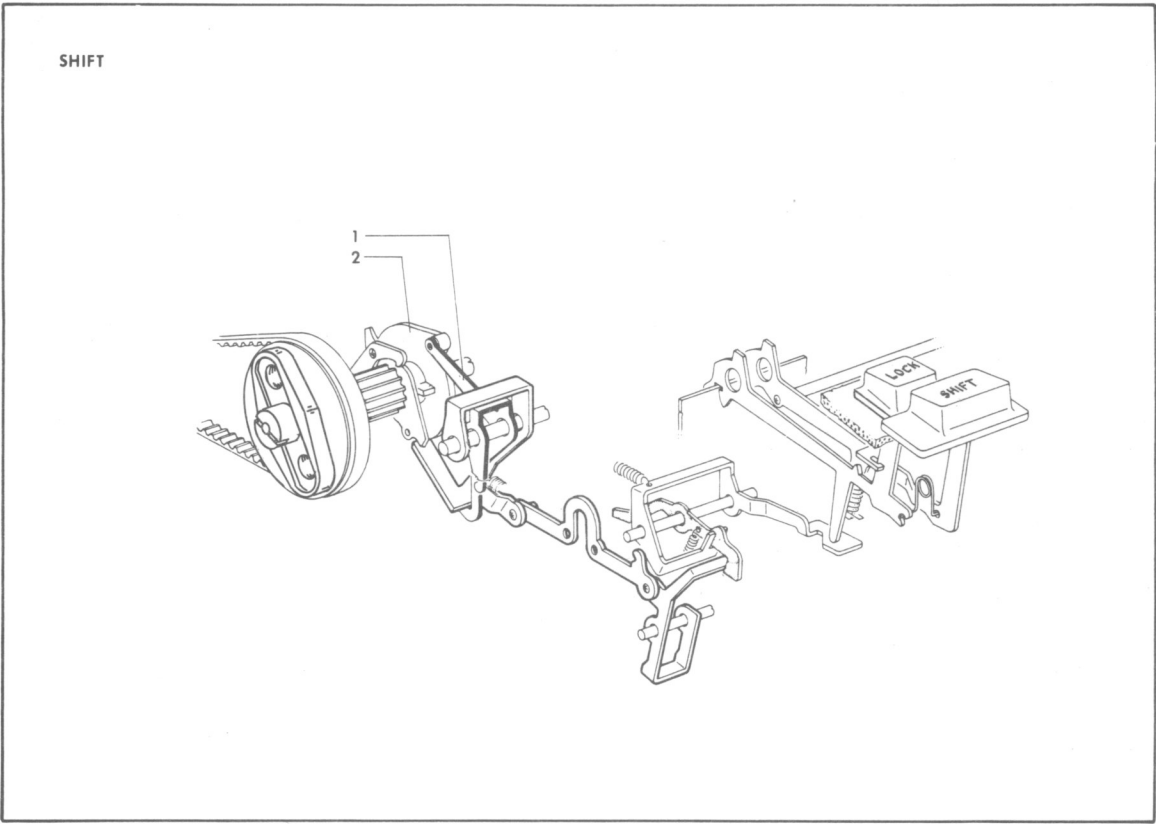


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670929	Link	9	671854	Retainer
2	671380	Detent Control Pin	10	671877	Spring
3	670914	Detent Control Lever	11	670916	Starwheel Detent
4	671833	Nut	12	670917	Linelock Arm
5	671438	Screw	13	671877	Spring
6	670583	Typing Cam Group	14	671833	Nut
7	671852	Retainer	15	671437	Eccentric Screw
8	670918	Shaft			

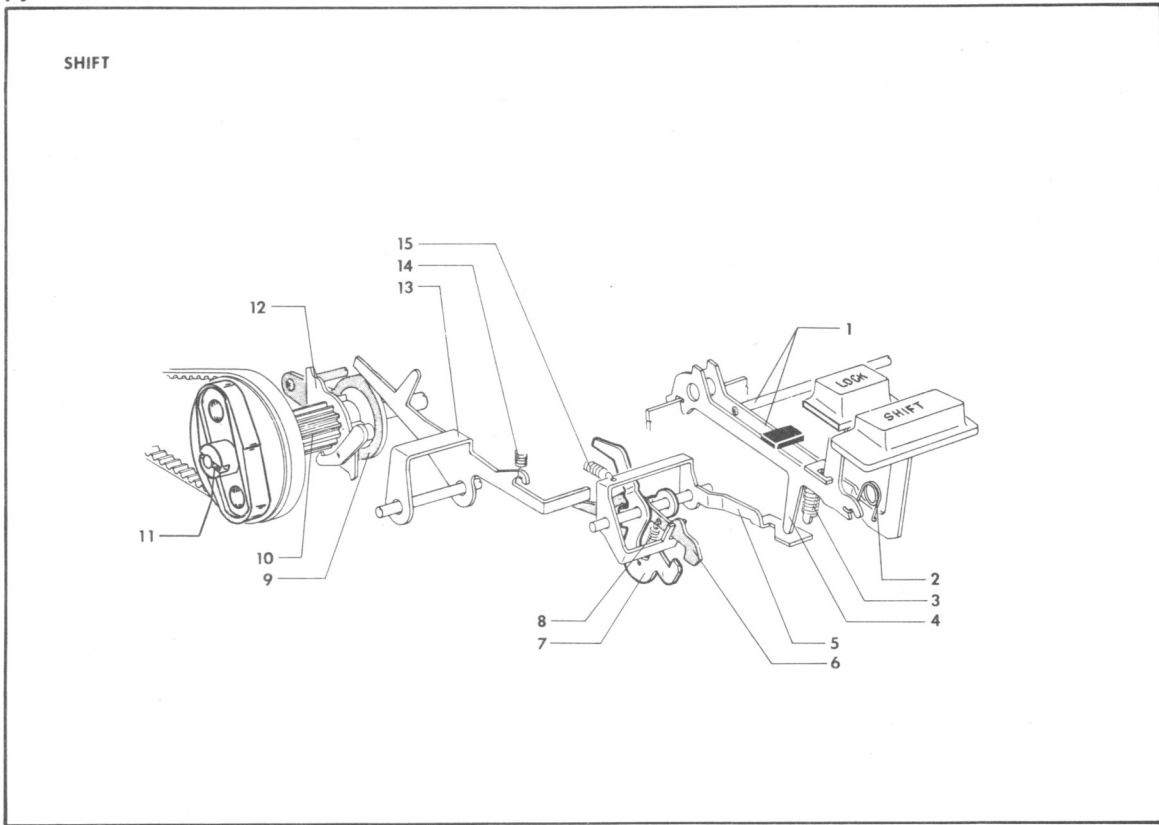
PRINTING GROUP



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671648	Spring	3	671852	Retainer
2	670937	Vertical Detent Assembly			



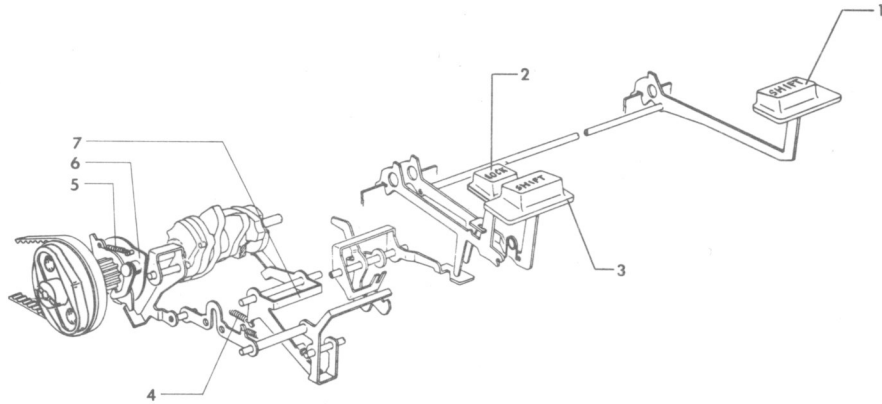
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670977	Shift Clutch Restore Bridge	2	670986	Shift Cam



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670448	Shift Keylever Assembly	9	670978	Shift Lever Driver
2	670462	Spring	10	671151	Cam Shaft Ratchet
3	671435	Spring	11	671608	Spring Pin
4	698017	Shift Lock Lever	12	670984	Shift Clutch Flange
5	670973	Shift Release Bridge	13	670989	Shift Latch Control Bridge
6	670974	Shift Latch, Upper	14	671649	Spring
7	671172	Shift Latch, Lower	15	671684	Spring
8	671653	Spring			

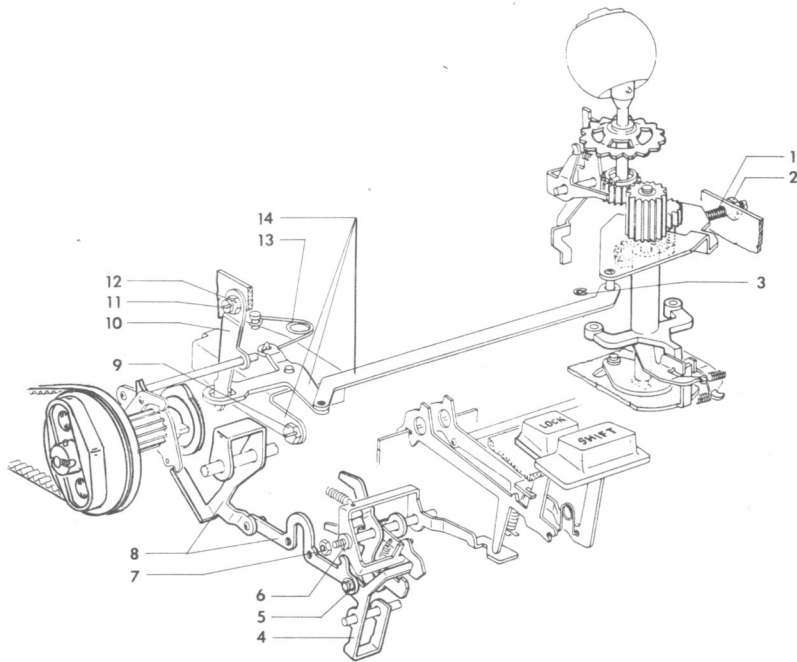


SHIFT



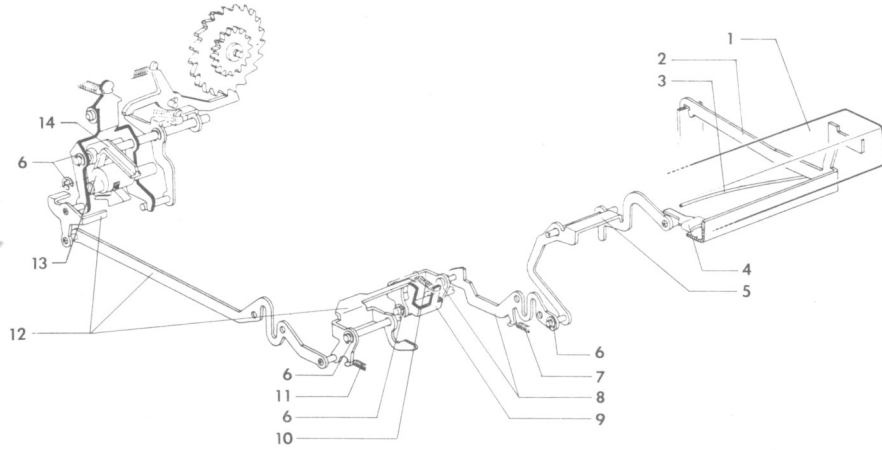
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	675100	Shift Button, Right [International]	3	675160	Shift Button, Left
1	675150	Shift Button, Right	4	671873	Spring
2	675300	Shift Lock Button, Left [International]	5	671651	Spring
2	675310	Shift Lock Button, Left	6	670986	Shift Cam
3	675090	Shift Button, Left [International]	7	670961	Shift Deactivation Bridge

## SHIFT

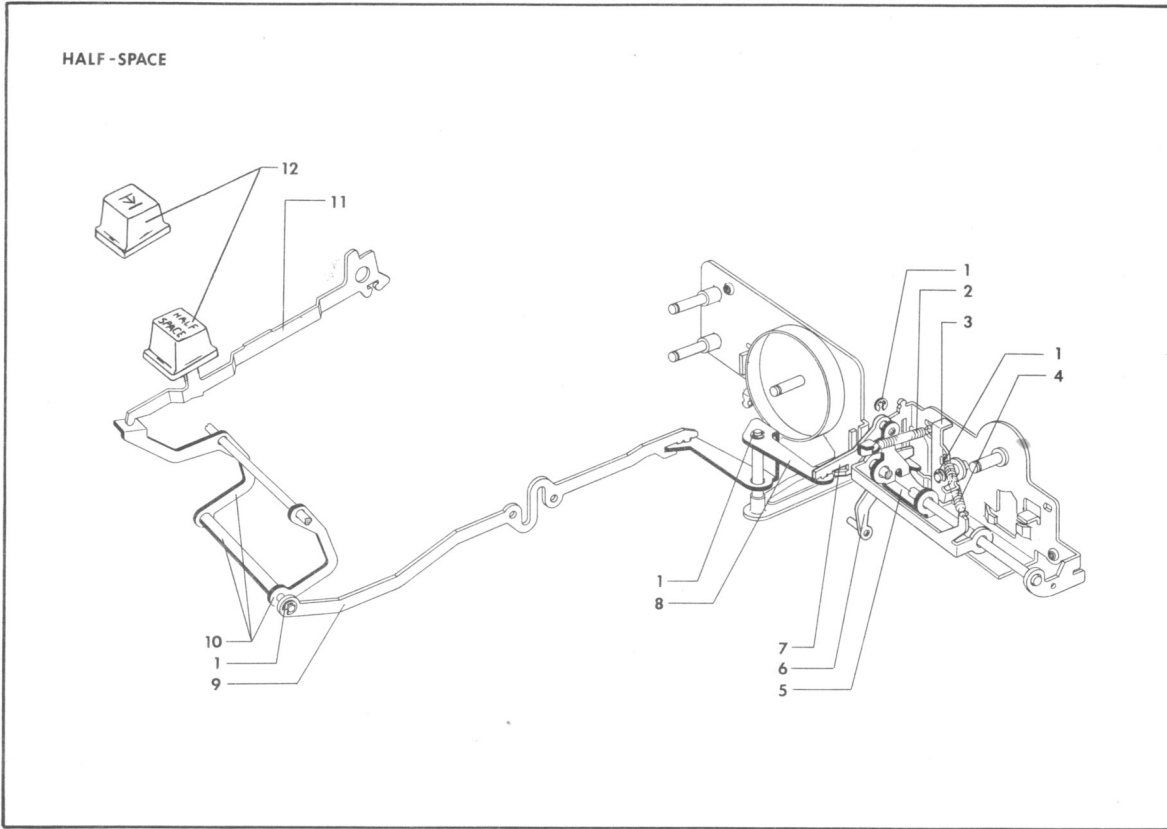


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671885	Screw	8	675696	Shift Clutch Control Bridge Assembly
2	671833	Nut	9	671803	Screw
3	671852	Retainer	10	670979	Shift Lever
4	670991	Shift Clutch Control Bellcrank	11	671796	Screw
5	671852	Retainer	12	671413	Eccentric Nut
6	671171	Shaft	13	670983	Spring
7	671834	Nut	14	675700	Link Support Assembly

SPACEBAR



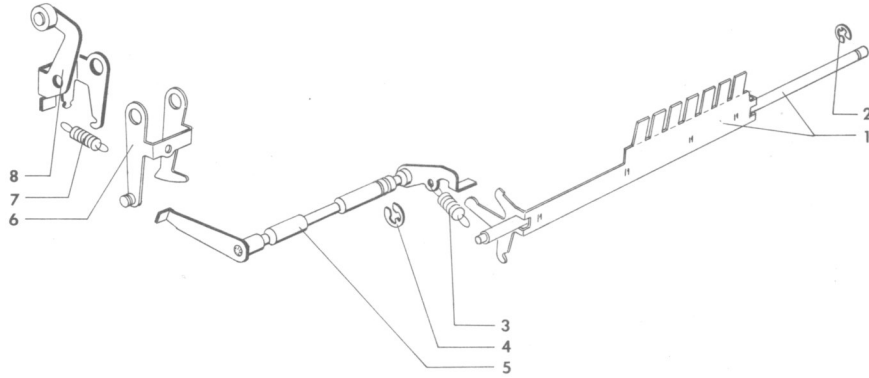
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	675140	Spacebar	8	671103	Spacer Primary Latch Assembly
2	698008	Spacebar Keylever	9	671102	Spacer Secondary Latch
3	670461	Spring Rod	10	671687	Spring
4	671607	Shock Absorber	11	671668	Spring
5	675682	Spacer Release Bridge	12	671100	Spacer Control Link Assembly
6	671852	Retainer	13	671106	Spacer Cam
7	671670	Spring	14	671105	Spacer Cam Follower



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671852	Retainer	7	671276	Halfspace Control Link
2	671875	Spring	8	671277	Halfspace Bellcrank
3	671270	Halfspace Pawl [10 Pitch]	9	671279	Halfspace Link
3	671271	Halfspace Pawl [12 Pitch]	10	671323	Halfspace Release Bridge
4	671651	Spring	11	698018	Halfspace Keylever
5	671275	Halfspace Control Frame	12	675320	Halfspace Button [International]
6	671274	Escapement Trip Lever	12	675330	Halfspace Button

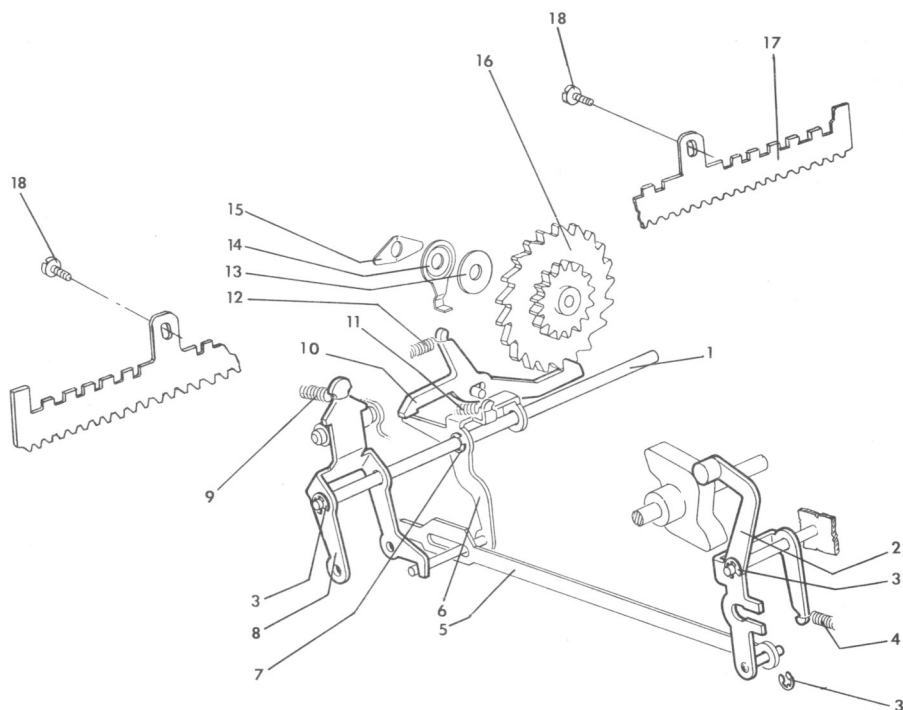
16-17

DEAD KEY



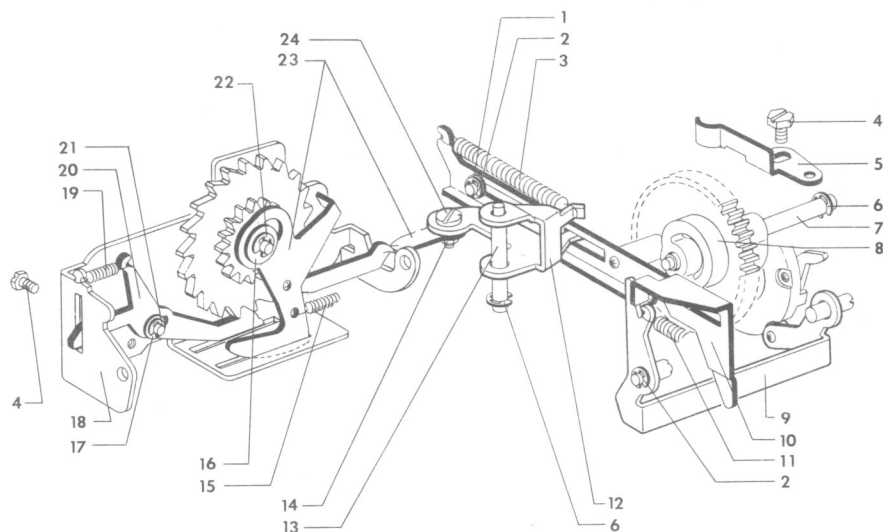
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671114	Dead Key Bail	5	671110	Dead Key Bail Bridge
2	671852	Retainer	6	671112	Escapement Joint Lever
3	671622	Spring	7	671685	Spring
4	671853	Retainer	8	671113	Escapement Control Lever

## ESCAPEMENT

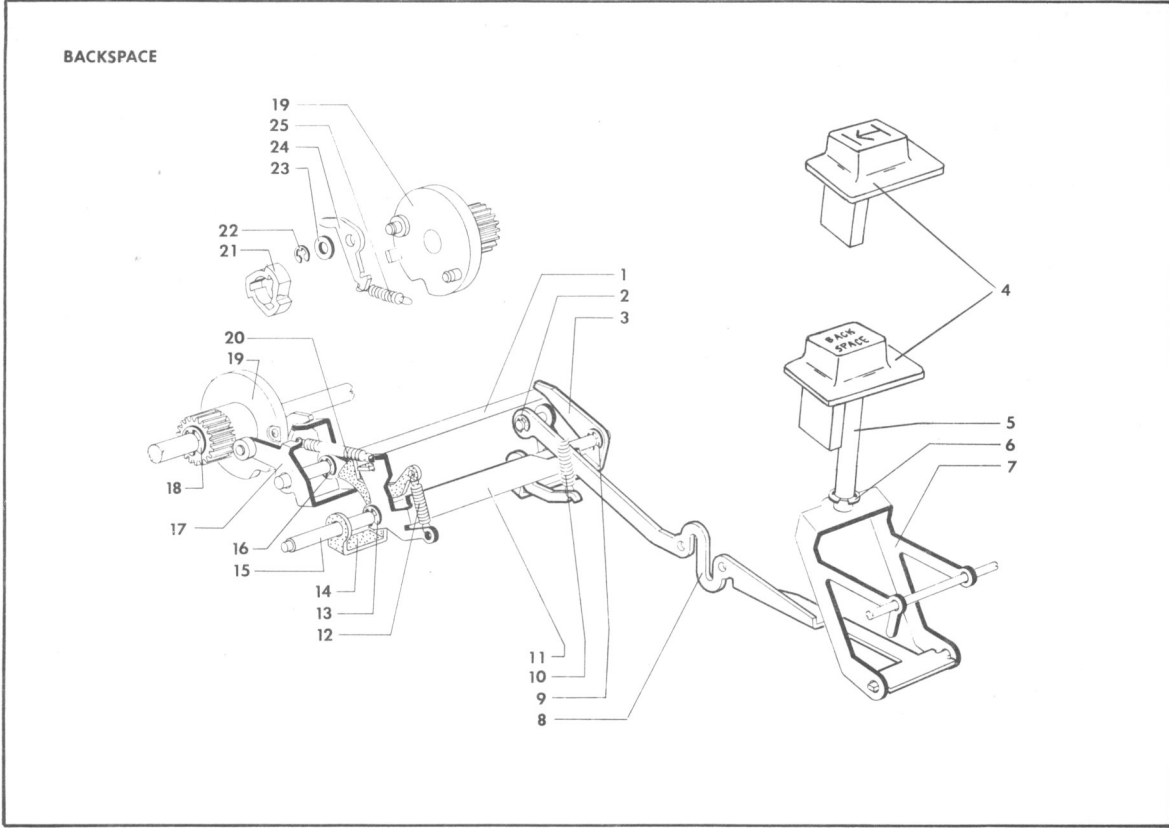


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671094	Shaft	11	671651	Spring
2	675688	Escapement Control Lever	12	671653	Spring
3	671852	Retainer	13	671088	Washer
4	671613	Spring	14	671089	Escapement Silencer
5	671101	Escapement Control Link	15	671090	Silencer Leaf Spring
6	671274	Escapement Trip Lever	16	671084	Escapement Wheel [12 Pitch]
7	671853	Retainer	16	671086	Escapement Wheel [10 Pitch]
8	671095	Spacer Control Bridge	17	671195	Escapement Rack [10 Pitch]
9	671669	Spring	17	671193	Escapement Rack [12 Pitch]
10	671091	Escapement Pawl	18	671792	Escapement Rack Screw

ESCAPEMENT – BACKSPACE

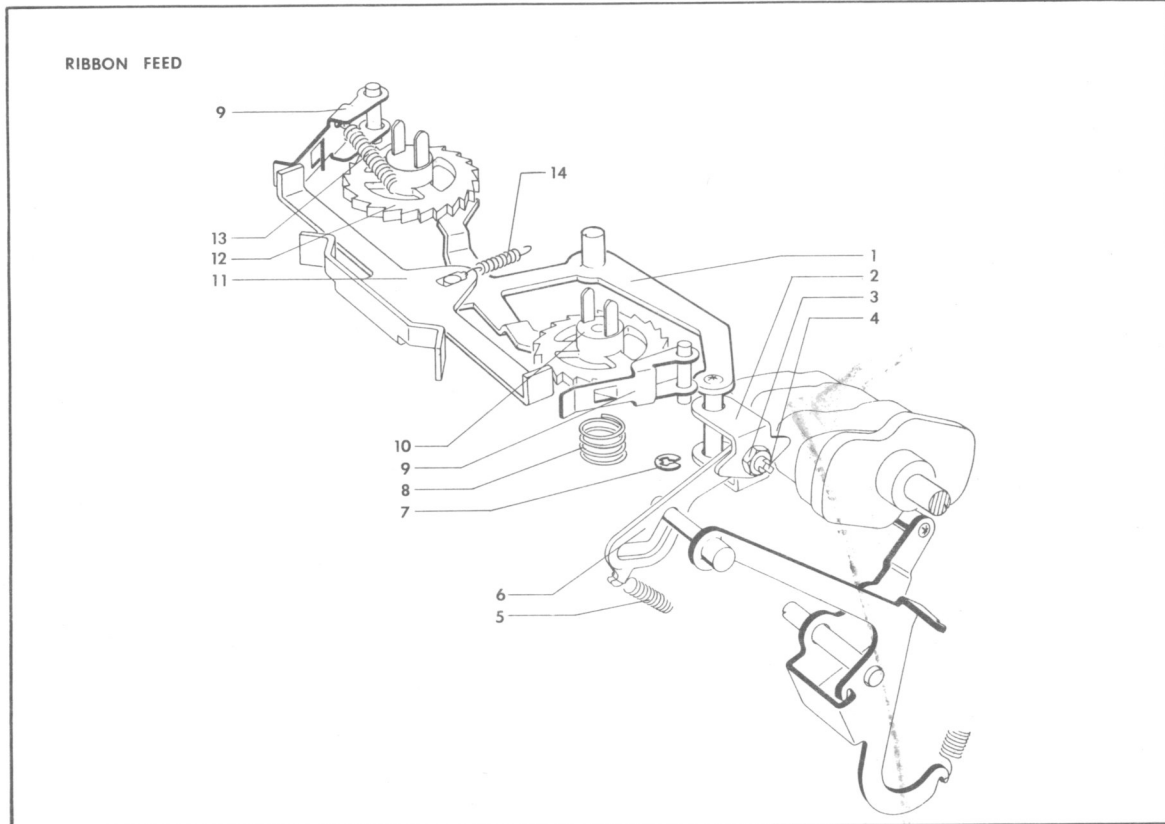


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671281	Washer	13	671292	Shaft
2	671852	Retainer	14	671833	Nut
3	671290	Spring	15	671878	Spring
4	671803	Screw	16	671847	Washer
5	671304	Backspace Cam Brake	17	671841	Washer
6	671853	Retainer	18	675716	Escapement Support
7	671287	Shaft	19	671653	Spring
8	671286	Backspace Cam	20	671091	Escapement Pawl
9	671296	Backspace Clutch Detent	21	671852	Retainer
10	671289	Backspace Slide	22	671853	Retainer
11	671675	Spring	23	671306	Backspace Pawl Assembly
12	671293	Backspace Pawl Control Bridge	24	671294	Eccentric Screw



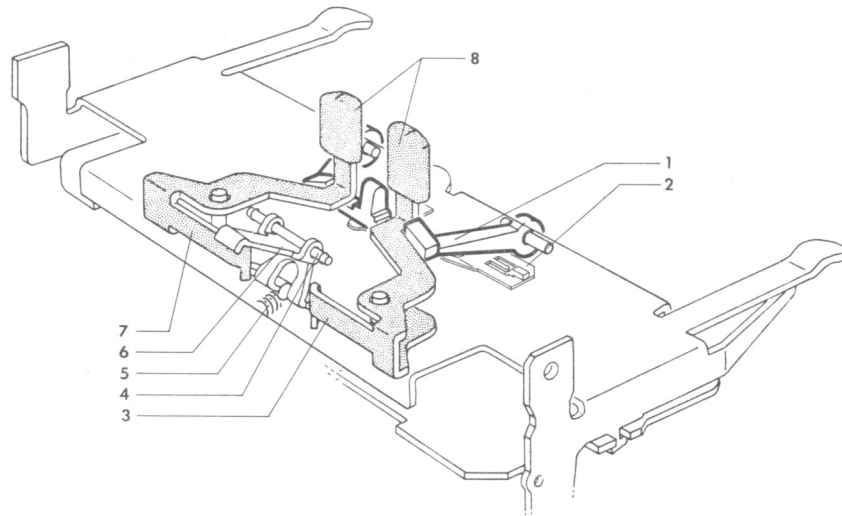
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671265	Shaft	13	671853	Retainer
2	671852	Retainer	14	671299	Backspace Secondary Latch
3	671301	Backspace Repeat Bellcrank	15	671302	Shaft
4	675130	Backspace Button [International]	16	671853	Retainer
4	675190	Backspace Button	17	671298	Backspace Clutch Control Bridge
5	670460	Pin	18	671854	Retainer
6	671853	Retainer	19	671283	Backspace Clutch
7	670513	Backspace Release Bridge	20	671666	Spring
8	671303	Backspace Link	21	671282	Backspace Clutch Ratchet
9	671853	Retainer	22	671852	Retainer
10	671659	Spring	23	671840	Washer
11	671300	Backspace Primary Latch	24	671285	Backspace Clutch Dog
12	671651	Spring	25	671653	Spring



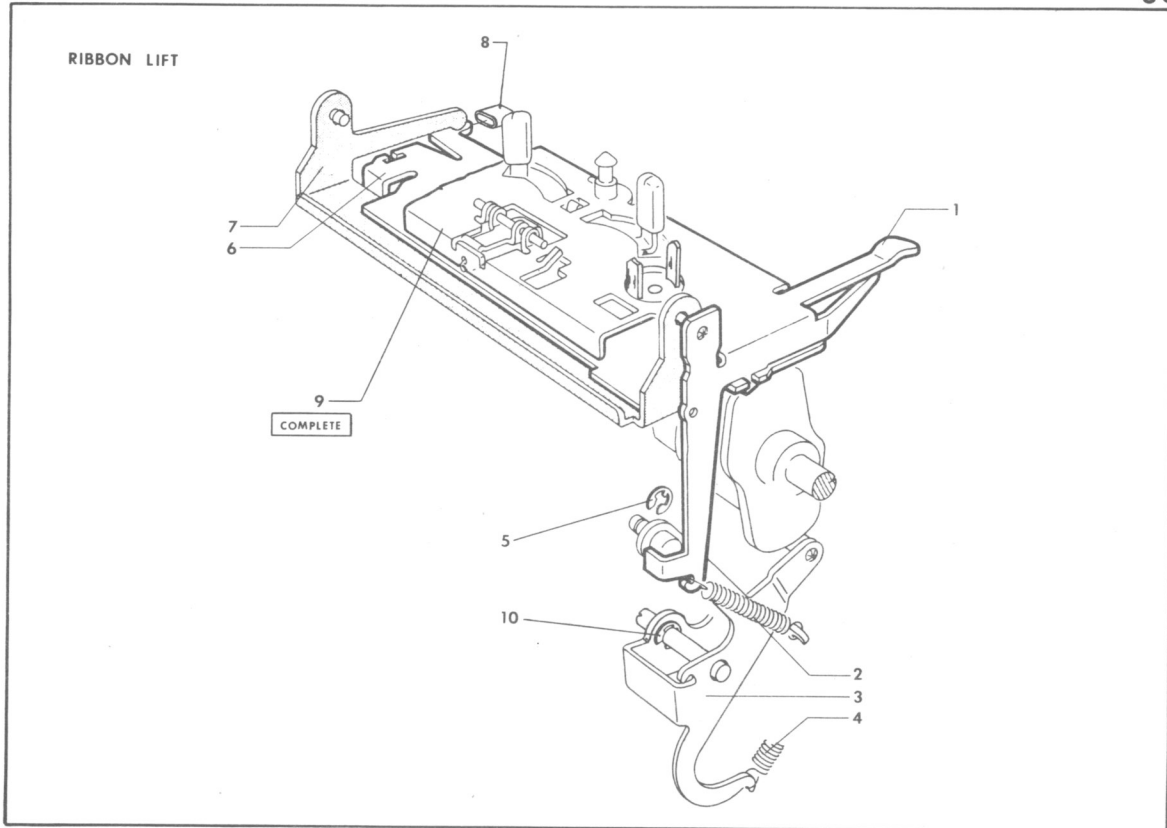


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670949	Ribbon Control Rocker	8	670956	Spring
2	670950	Ribbon Toggle Link Pivot	9	670944	Detent Pawl
3	671833	Nut	10	670942	Ribbon Ratchet Wheel, Right
4	671444	Eccentric Screw	11	670948	Ribbon Control Slide
5	671674	Spring	12	670943	Ribbon Ratchet Wheel, Left
6	670951	Ribbon Toggle Link	13	671654	Spring
7	671852	Retainer	14	671687	Spring

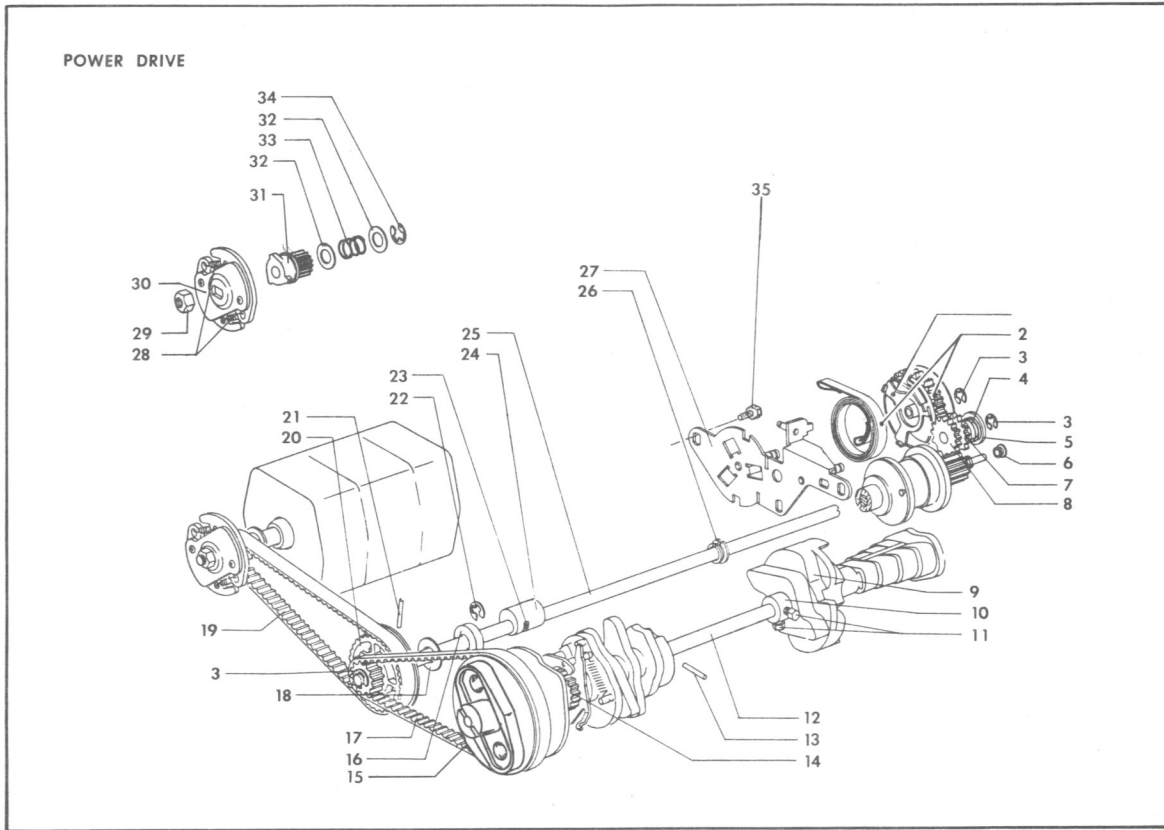
RIBBON REVERSE



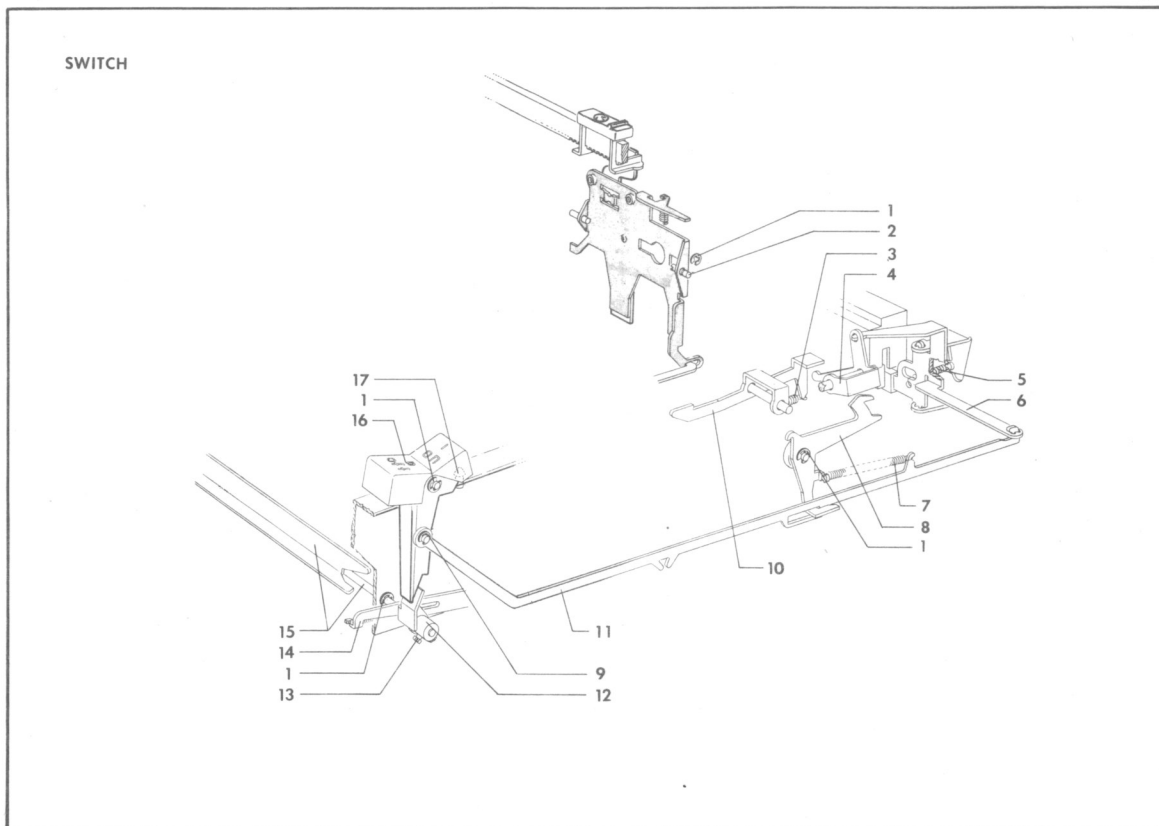
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670955	Probe Latch	5	671690	Spring
2	670954	Leaf Spring	6	670947	Probe Release Lever
3	670945	Probe, Right	7	670946	Probe, Left
4	671397	Pin	8	670953	Cap



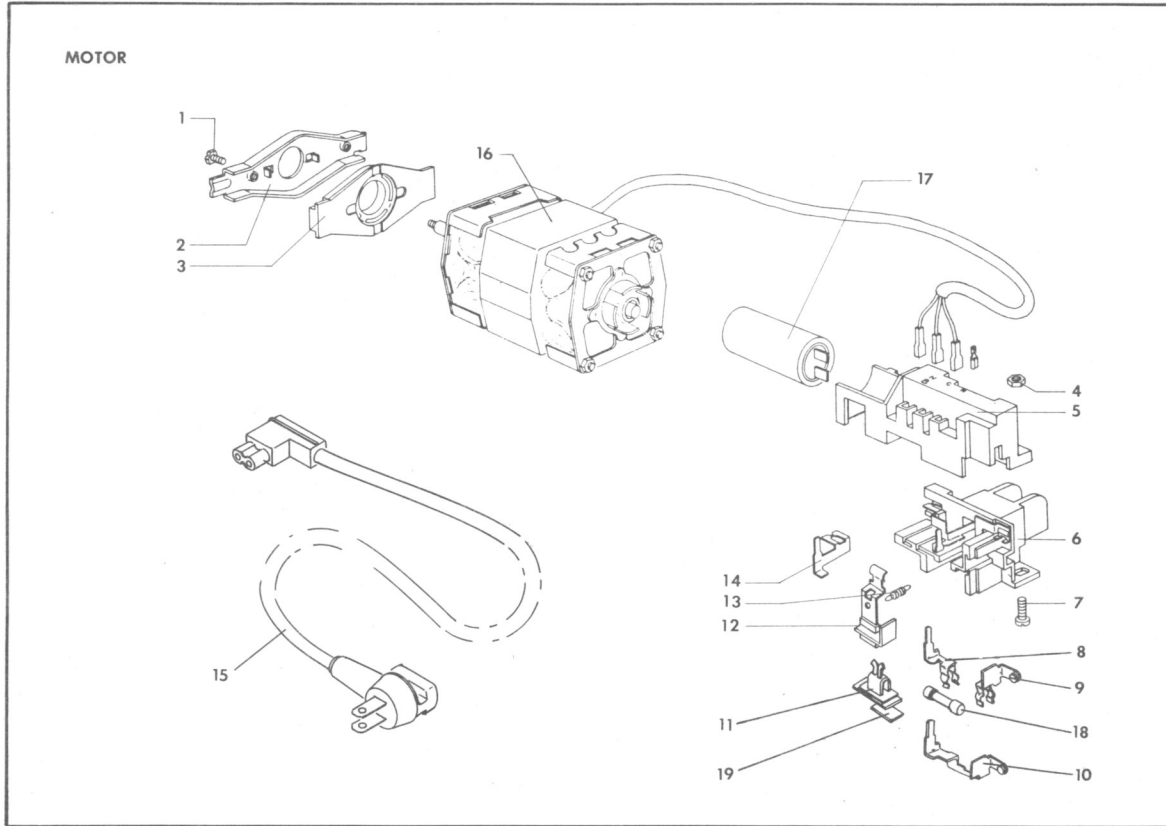
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	670940	Ribbon Support Plate, Upper	6	670941	Ribbon Support Plate, Lower
2	671673	Spring	7	670952	Support Bracket
3	670582	Ribbon Control Bridge	8	671607	Ribbon Support Plate Bumper
4	671679	Spring	9	698085	Ribbon Services Group
5	671852	Retainer	10	671853	Retainer



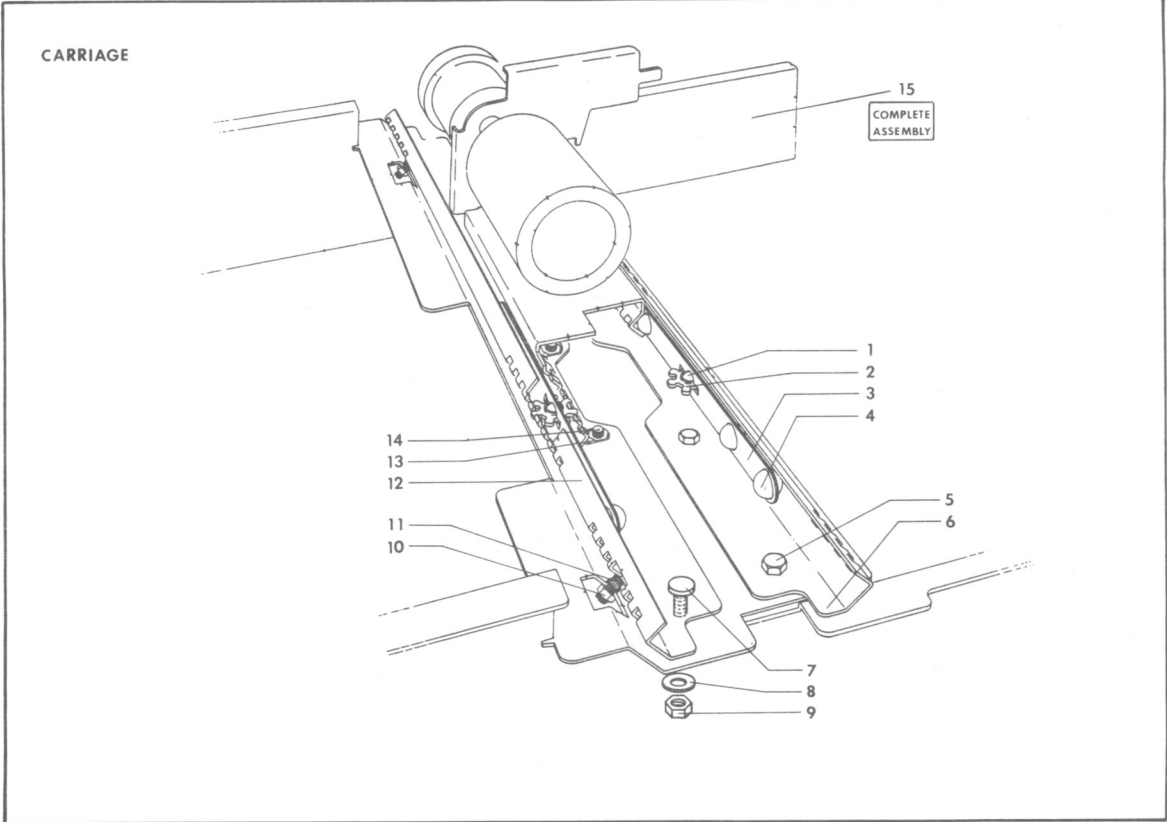
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671127	C/R Spring Drum Flange	19	670417	Motor Belt
2	671130	C/R Spring Drum Assembly	20	671156	Intermediate Pulley
3	671854	Retainer	21	671608	Spring Pin
4	671124	Spring	22	671854	Retainer
5	671125	Spring Cup	23	671827	Spring Pin
6	671415	Bushing	24	671106	Spacebar Cam
7	671123	Outside Intermediate Gear	25	671245	Intermediate Shaft
8	671122	Inside Intermediate Gear	26	671624	Double Flange Bushing
9	670583	Typing Cam Group	27	699016	C/R Spring Drum Mounting Plate
10	671850	Cam Shaft Hub	28	670251	Spring
11	670420	Screw	29	671836	Nut
12	670584	Print Cam Shaft	30	671610	Motor Clutch
13	671826	Dowel Pin	31	671139	Motor Pulley [60Hz]
14	671151	Cam Shaft Ratchet	31	671140	Motor Pulley [50Hz]
15	671608	Spring Pin	32	671142	Washer
16	671135	Shoulder Pad	33	671374	Spring
17	671144	Cam Shaft Pulley Belt	34	671855	Retainer
18	671621	Washer	35	671803	Screw



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671853	Retainer	10	671256	C/R Control Latch
2	671427	Shaft	11	670496	On-Off Switch Link
3	671651	Spring	12	675702	Keyboard Locking Lever
4	671259	C/R Interlock Bellcrank	13	671806	Screw
5	671652	Spring	14	671162	Reload Link
6	670434	On-Off Switch Lever	15	671164	Interposer Restore Bail
7	671867	Spring	16	675450	On-Off Switch Keybutton
8	671132	Carriage Locking Lever	17	670499	Bumper
9	671852	Retainer			

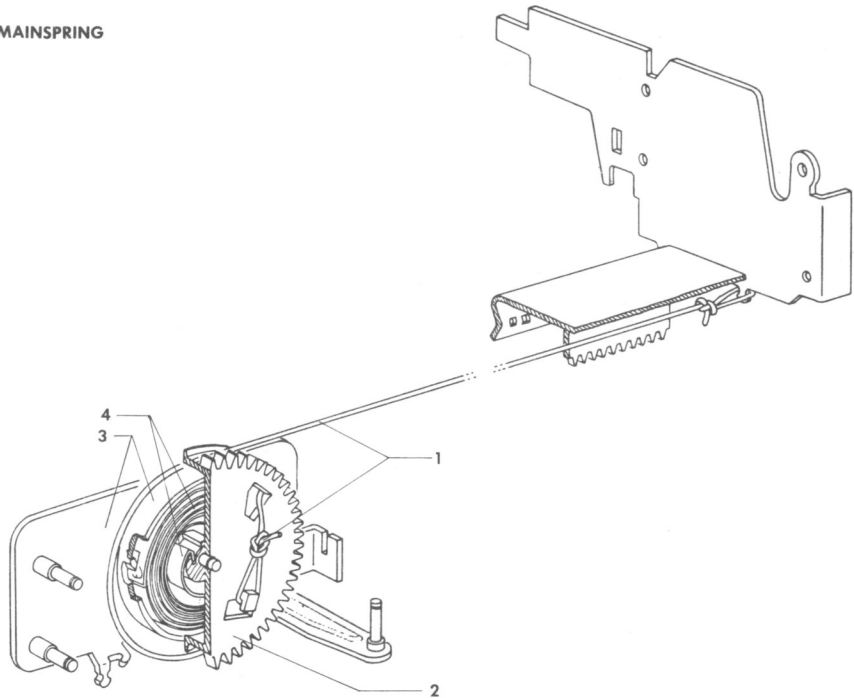


REF	PART NO	PART NAME	REF	PART NO	PART NAME			
1	671803	Screw	10	671583	Terminal			
2	670430	Motor Support	11	671581	Cap			
3	670431	Rubber Bushing	12	671579	Switch Actuator			
4	671834	Nut	13	671663	Spring			
5	671580	Receptacle Terminal	14	671586	Capacitor Plate			
6	671555	Receptacle	15	675680	Cord Set (USA, Canada)			
7	671797	Screw	15	671538	Cord Set (Australia)			
8	671587	Clip, Left	15	671540	Cord Set (Europe)			
9	671585	Clip, Right						
REF	P/N	PART NAME	REF	P/N	PART NAME	REF	P/N	PART NAME
16	671551	Motor [115/60]	17	671879	Capacitor			
16	671570	Motor [100/60]						
16	671571	Motor [100/50]						
16	671574	Motor [120/50]						
16	671549	Motor [220/50]						
16	671572	Motor [220/60]	17	671880	Capacitor	18	671881	Fuse
16	671573	Motor [240/50]						



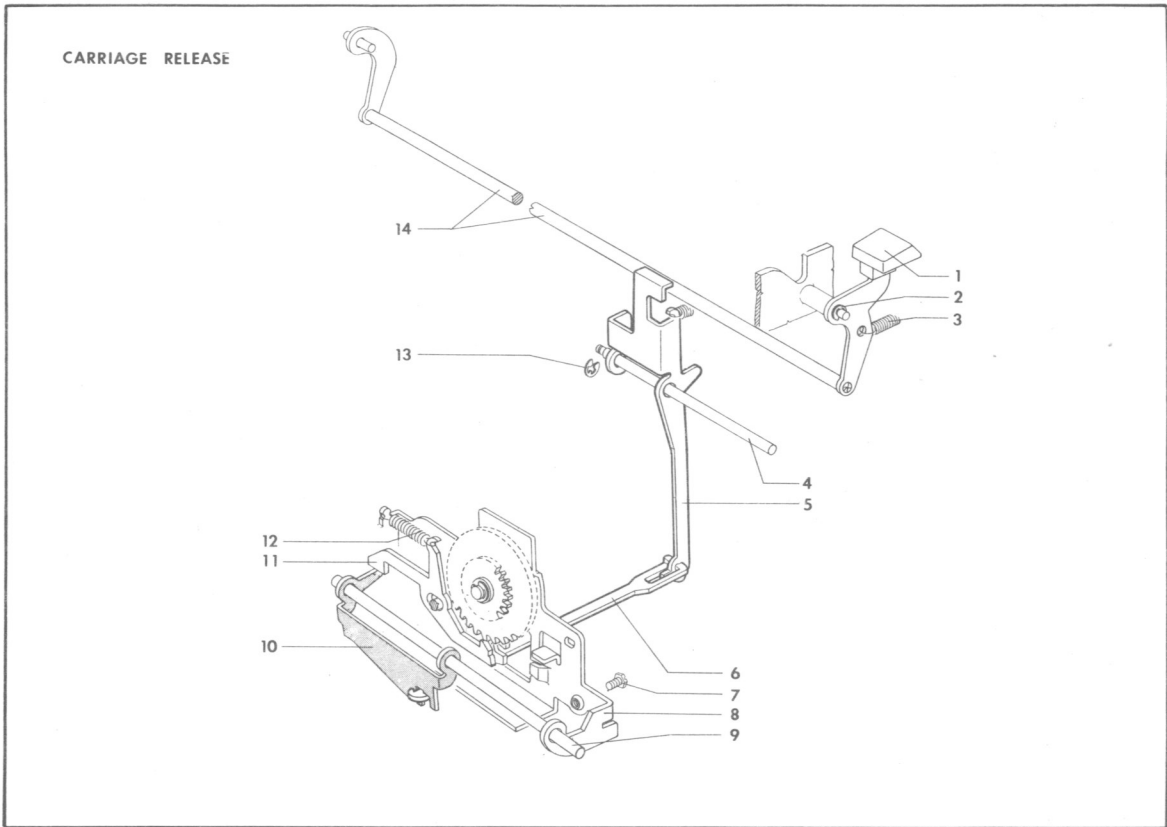
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671862	Pinion Ball	9	671835	Nut
2	671011	Pinion	10	671833	Nut
3	671010	Truck	11	671885	Screw
4	671864	Ball	12	670432	Front Rail
5	671803	Screw	13	671835	Nut
6	670433	Rear Rail	14	671808	Screw
7	671441	Screw	15	--	Refer to Page 41
8	671845	Washer			

CARRIAGE — MAINSPRING

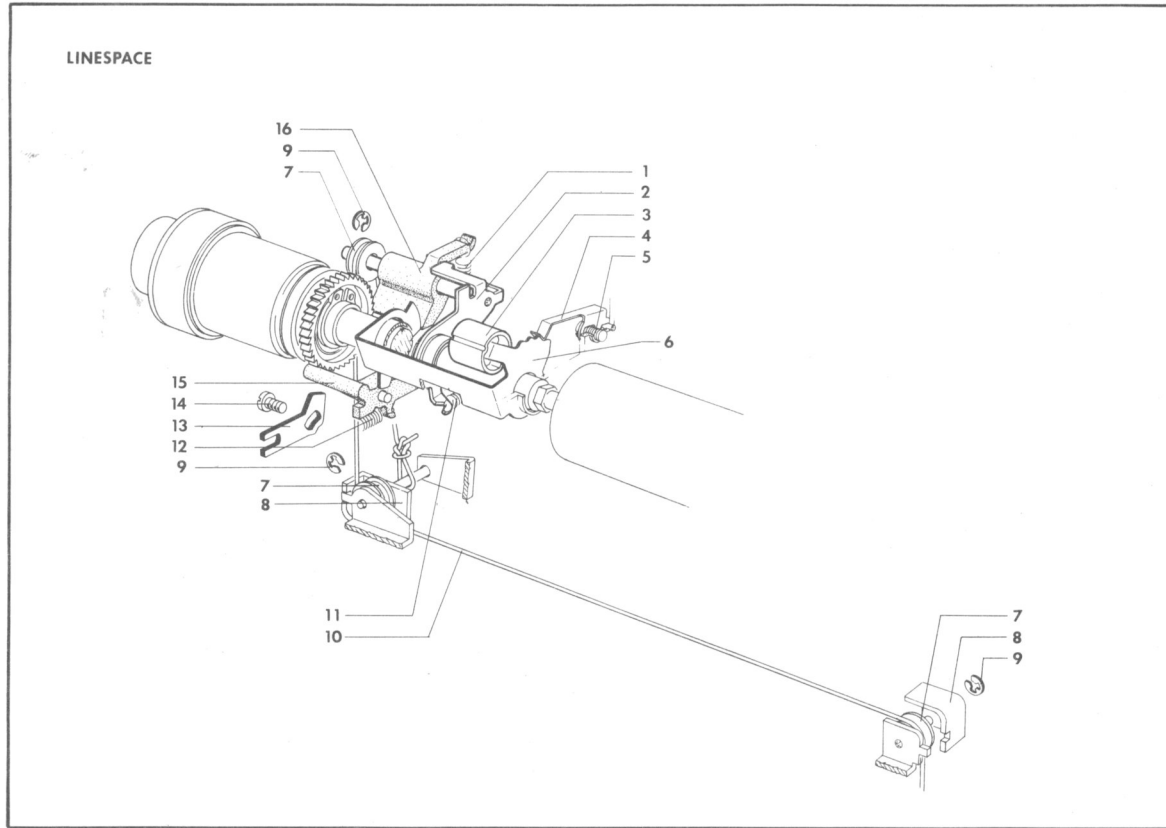


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671216	Carriage Cord	3	671280	Spring Drum Bracket Assembly
2	671077	Spring Drum	4	671623	Mainspring

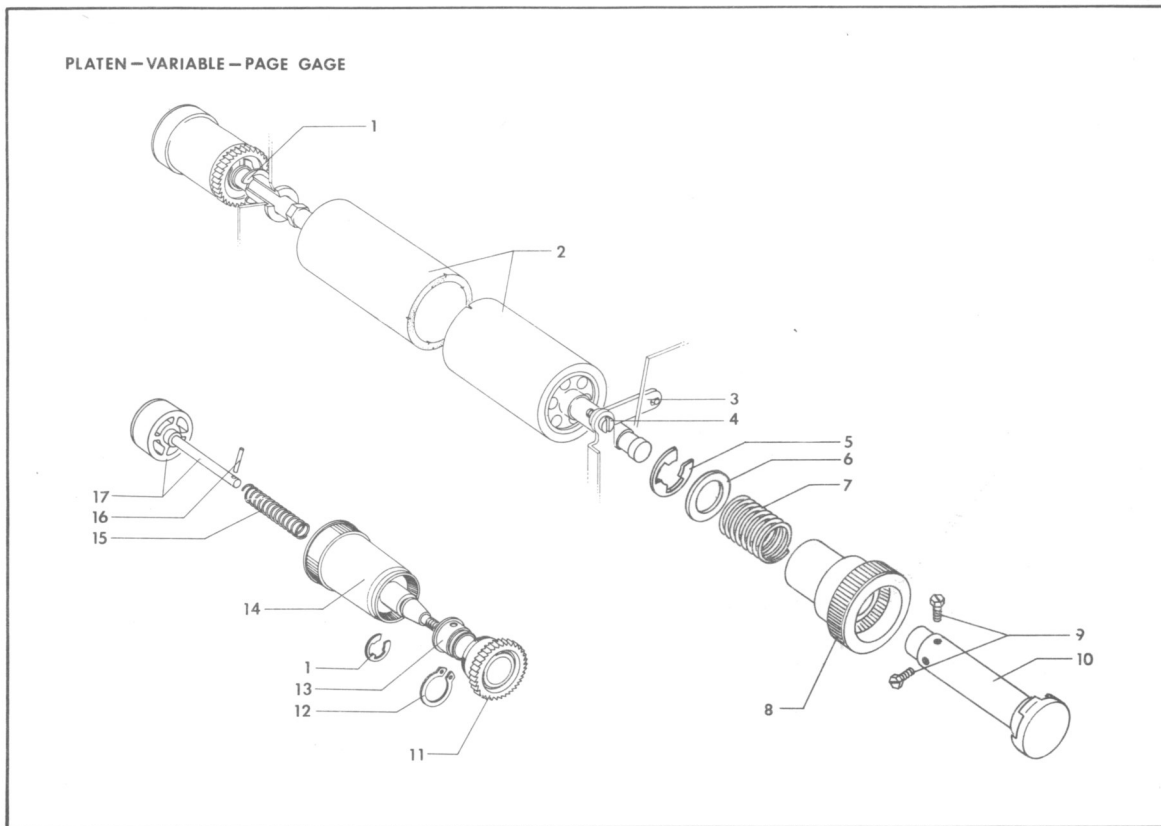




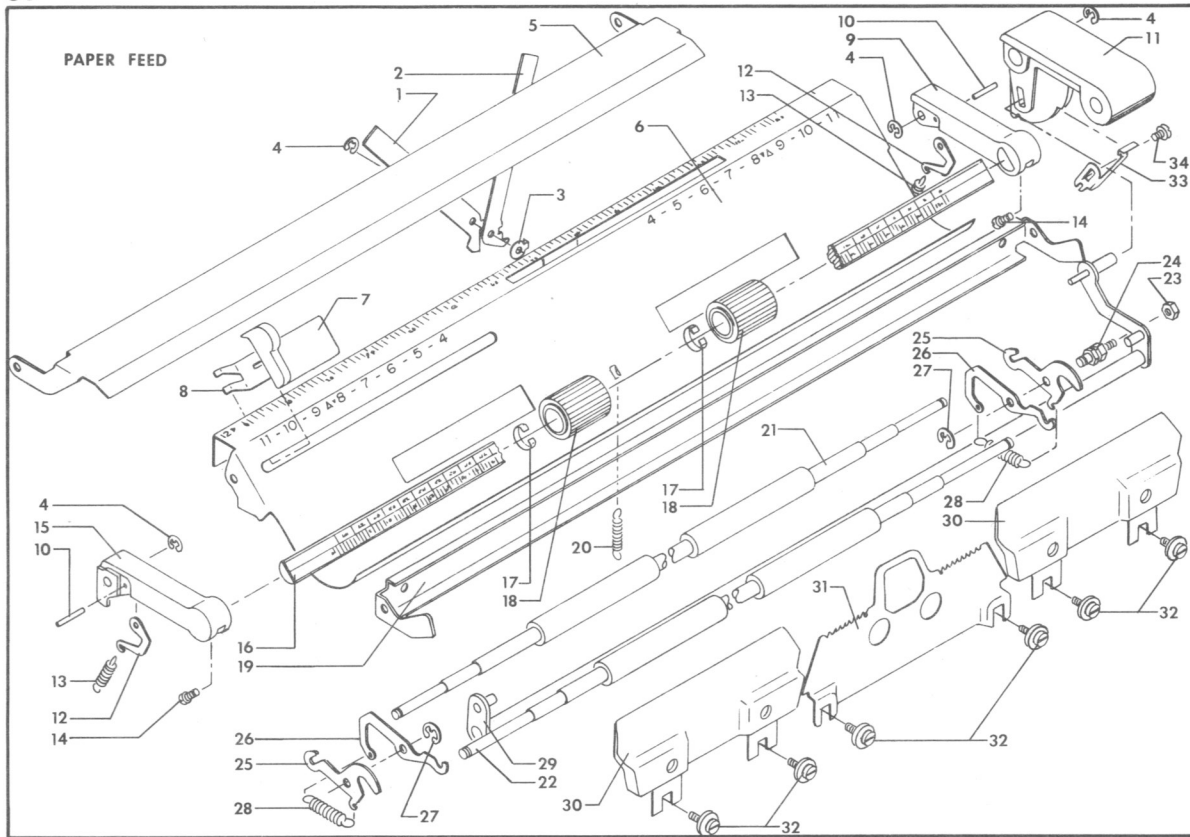
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671045	Carriage Release Keybutton	8	675716	Escapement Support
2	671852	Retainer	9	671094	Shaft
3	671612	Spring	10	671093	Carriage Release Control Bridge
4	671428	Shaft	11	671091	Escapement Pawl
5	671066	Carriage Release Bellcrank	12	671653	Spring
6	671067	Carriage Release Link	13	671852	Retainer
7	671803	Screw	14	671201	Carriage Release Bail Assembly



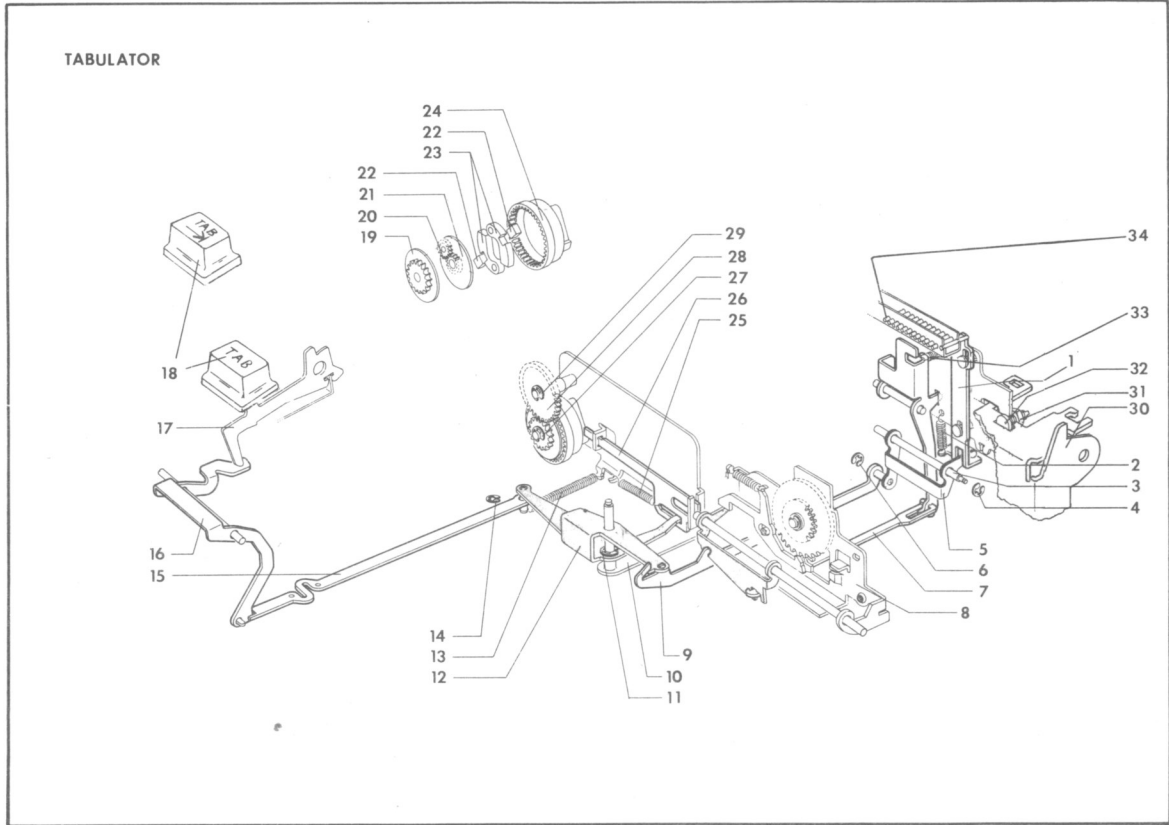
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671682	Spring	8	671136	Pulley Cap
2	675708	Linespace Lever	9	671852	Retainer
3	671049	Linespace Selector Knob	10	671217	C/R Cord
4	671037	Linespace Selector Detent	11	671443	Spring
5	671794	Screw	12	671449	Spring
6	671031	Linespace Selector [40 Tooth]	13	671036	Linespace Arrest Plate
6	671032	Linespace Selector [47 Tooth]	14	671799	Screw
6	671033	Linespace Selector [44 Tooth]	15	671029	Linespace Wheel Detent
7	671131	Pulley	16	671030	Linespace Pawl



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671856	Retainer	10	675360	Platen Knob Insert
2	671197	Platen	11	671593	Linespace Wheel [40 Tooth]
3	671024	Securing Plate	11	671598	Linespace Wheel [44 Tooth]
4	671799	Screw	11	671597	Linespace Wheel [47 Tooth]
5	671857	Retainer	12	671596	Retainer
6	671334	Washer	13	671594	Bushing
7	671331	Spring	14	675240	Platen Knob, Left
8	675340	Platen Knob, Right	15	671606	Spring
8	675350	Platen Knob, Right [Metric]	16	671595	Pin
9	671803	Screw	17	675230	Pushbutton

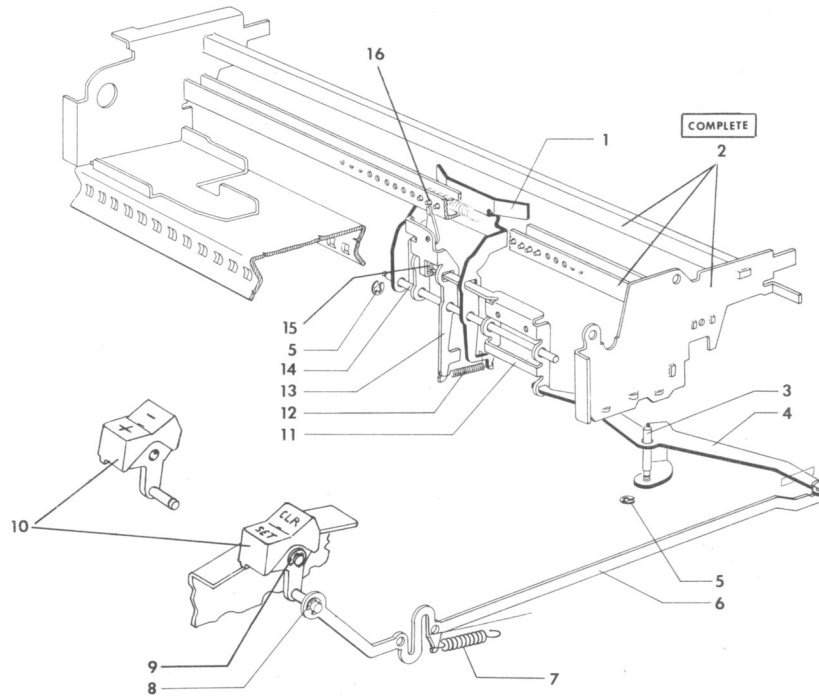


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671018	Paper Holder, Left	18	671359	Paper Bail Roller
2	671017	Paper Holder, Right	19	671335	Paper Bail Frame
3	671016	Paper Holder Leaf Spring	20	671868	Spring
4	671852	Retainer	21	671214	Paper Feed Roll, Rear
5	675430	Erasure Table	22	671211	Paper Feed Roll, Front
6	675440	Paper Table [12 Pitch]	23	671832	Nut
6	675442	Paper Table [10 Pitch]	24	671373	Stud
7	671340	Paper Edge Guide	25	671590	Lever, Rear
8	671615	Spring	26	671600	Lever, Front
9	675370	Paper Bail Arm, Right	27	671853	Retainer
10	671827	Pin	28	671619	Spring
11	671048	Paper Release Lever	29	671358	Paper Release Bail
12	671014	Spring Anchor	30	671341	Paper Guide
13	671449	Spring	31	671019	Line Indicator [12 Pitch]
14	671645	Screw	31	671021	Line Indicator [10 Pitch]
15	675380	Paper Bail Arm, Left	32	675077	Screw
16	671225	Paper Bail [12 Pitch]	33	671037	Release Lever Detent
16	671227	Paper Bail [10 Pitch]	34	671794	Screw
17	671618	Spring Clip			

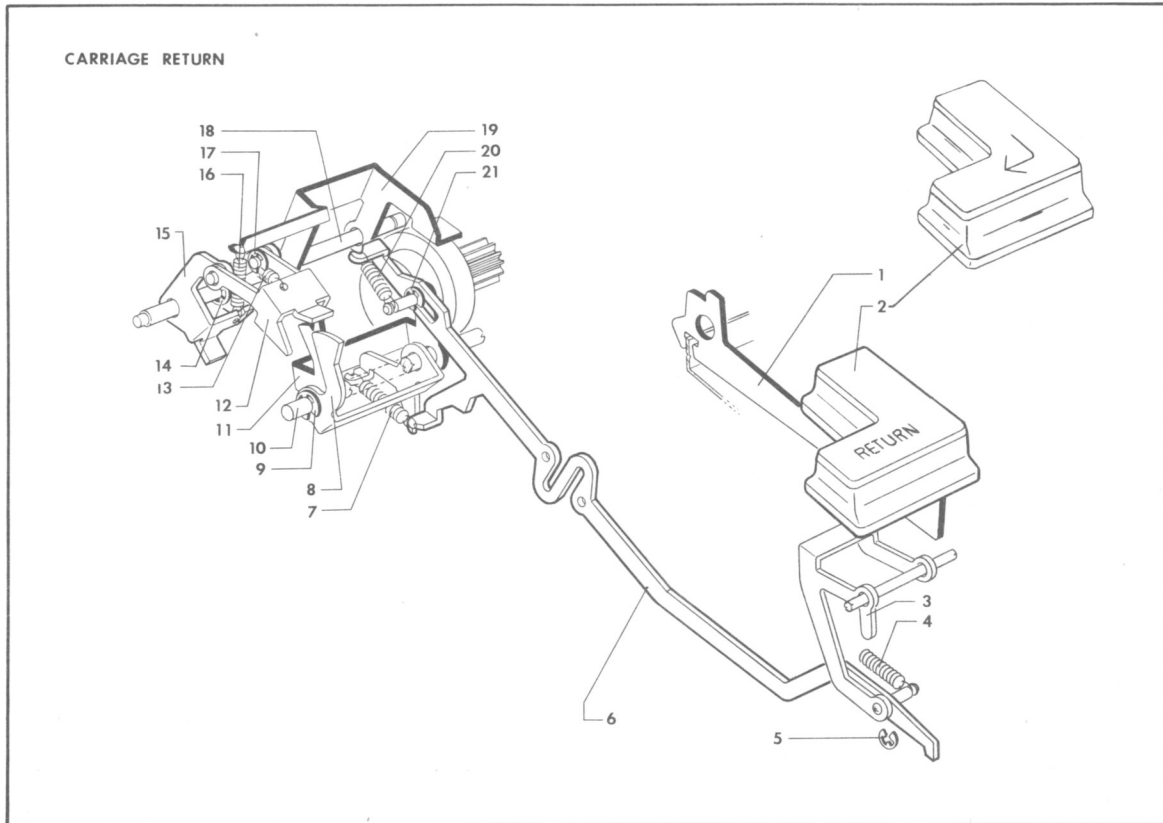


REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671073	Tabulator Slide	18	675170	Tabulator Button
2	671868	Spring	19	671081	Tabulator Gear Pinion
3	671429	Shaft	20	671629	Brake Gear
4	671852	Retainer	21	671626	Brake Holder Disc
5	671071	Tabulator Slide Control Bridge	22	671628	Brake
6	671852	Retainer	23	671627	Brake Shoe
7	671067	Carriage Release Link	24	671082	Tabulator Brake Housing
8	675716	Escapement Support	25	671665	Spring
9	671065	Tabulator Control Link	26	671083	Tabulator Brake Lever
10	671280	Spring Drum Bracket Assembly	27	671853	Retainer
11	671853	Retainer	28	671080	Gear
12	671064	Tabulator Control Bellcrank	29	671853	Retainer
13	671613	Spring	30	671055	Rear Services Housing
14	671852	Retainer	31	671837	Nut
15	671063	Tabulator Link	32	671430	Eccentric Screw
16	670515	Tabulator Release Bridge	33	671612	Spring
17	698011	Tabulator Keylever	34	671591	Tabulator Stop
18	675110	Tabulator Button [International]			

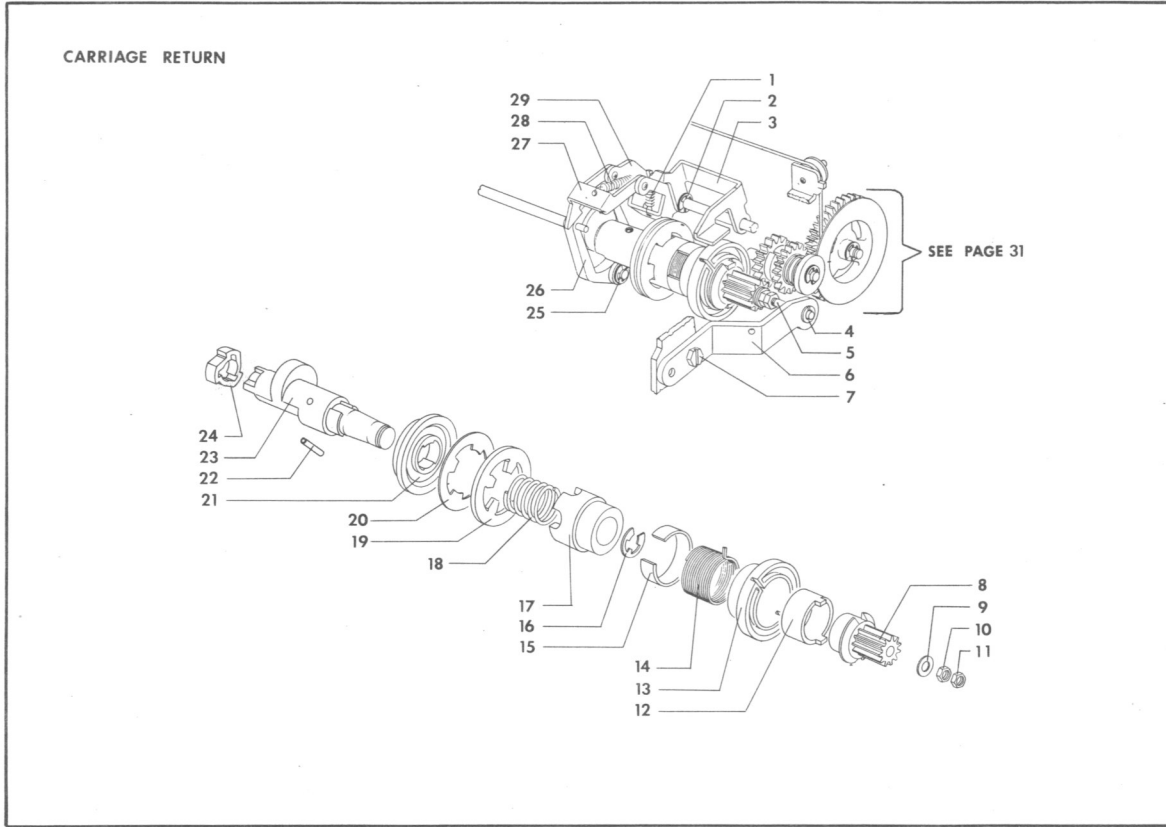
TABULATOR SET AND CLEAR



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671058	Tab Clearer	9	671853	Retainer
2	671218	Carriage Assembly [12 Pitch]	10	675460	Set-Clear Button
2	671220	Carriage Assembly [10 Pitch]	10	675470	Set-Clear Button [International]
3	671263	Shaft	11	671059	Set-Clear Control Bridge
4	671262	Set-Clear Control Bellcrank	12	670251	Spring
5	671852	Retainer	13	671056	Tab Setter
6	670497	Set-Clear Link	14	671428	Shaft
7	671680	Spring	15	671657	Spring
8	671852	Retainer	16	671591	Tabulator Stop



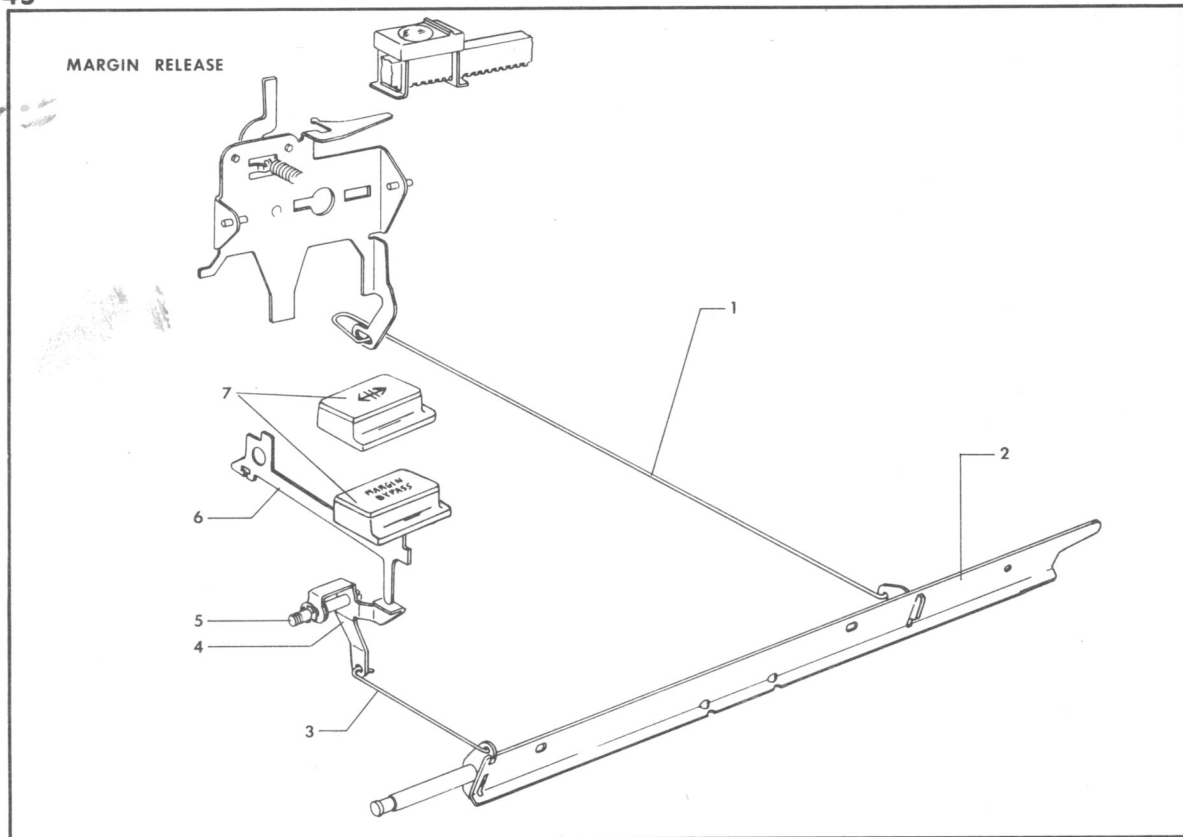
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	698009	C/R Keylever	11	671267	C/R Primary Latch
2	675120	C/R Keybutton [International]	12	671252	C/R Control Frame
2	675180	C/R Keybutton	13	671871	Spring
3	671326	C/R Release Bridge	14	671853	Retainer
4	671647	Spring	15	671253	C/R Control Bridge
5	671852	Retainer	16	671876	Spring
6	671268	C/R Link	17	671852	Retainer
7	671865	Spring	18	671255	Shaft
8	671266	C/R Secondary Latch	19	671254	C/R Clutch Control Bridge
9	671853	Retainer	20	671865	Spring
10	671265	Shaft	21	671852	Retainer



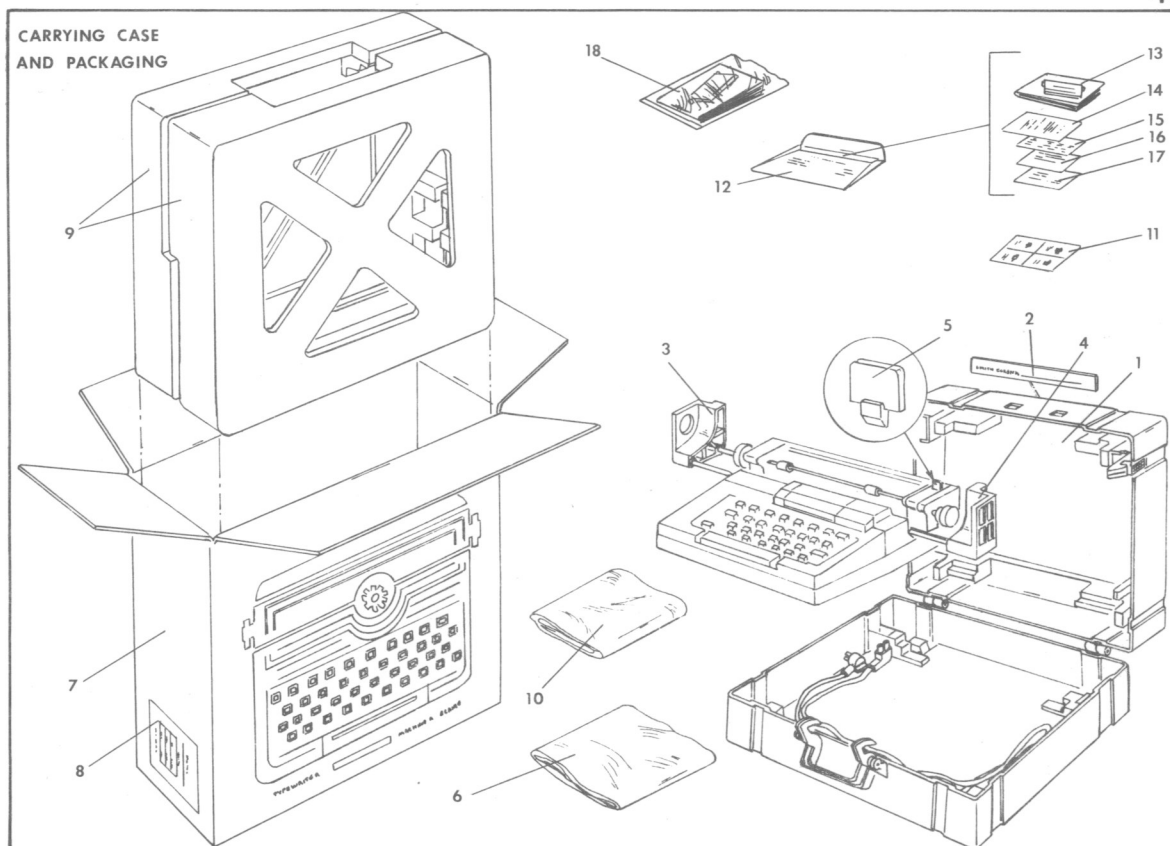
REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671876	Spring	16	671856	Retainer
2	671853	Retainer	17	671117	C/R Drag Cup
3	671254	C/R Clutch Control Bridge	18	671305	Spring
4	671415	Bushing	19	671116	Clutch Plate
5	671245	Intermediate Shaft	20	671115	Auxiliary Plate
6	671244	Shaft Support Bracket	21	671247	Clutch Disc
7	671803	Screw	22	671608	Pin
8	671121	C/R Gear	23	671246	C/R Clutch Cam
9	671846	Washer	24	671282	Backspace Clutch Ratchet
10	671269	Nut	25	671853	Retainer
11	671838	Nut	26	671249	C/R Rocker Plate Assembly
12	671133	C/R Gear Driver	27	671252	C/R Control Frame
13	671120	C/R Clutch Spring Actuator	28	671871	Spring
14	671118	C/R Clutch Spring	29	671253	C/R Control Bridge
15	671119	Retaining Ring			







REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	671061	Margin Release Link, Right	5	671171	Shaft
2	671164	Interposer Restore Bail	6	698004	Keylever
3	671176	Margin Release Link, Left	7	675290	Margin Bypass Keybutton
4	671170	Bellcrank	7	675280	Margin Bypass Keybutton [International]



REF	PART NO	PART NAME	REF	PART NO	PART NAME
1	675510	Carrying Case	10	671662	Typewriter Shipping Bag
2	675073	Case Nameplate	11	675559	Unpacking Instructions (USA)
3	671528	Carriage Shipping Block, Left	12	675552	Printed Parts Envelope (USA)
4	671527	Carriage Shipping Block, Right	13	675553	Instruction Book (USA)
5	671515	Carriage Release Shipping Block	14	675556	Service Points Listing (USA)
6	671516	Case Shipping Bag	15	675555	Typing Course Offer (USA)
7	698088	Carton	16	675554	Ribbon Cassette Order Form (USA)
8	675981	Carton Label	17	675557	Typing Element Order Form (USA)
9	675079	Foam Packing			
<u>INTERNATIONAL PRINTED LITERATURE:</u>					
11	675637	Unpacking Instructions			
18	675660	Literature Kit (Puerto Rico)			
18	675661	Literature Kit (Canada; 1063V Keyboard)			
18	675665	Literature Kit (Canada)			
18	675662	Literature Kit (United Kingdom)			
18	675663	Literature Kit (France)			
18	675664	Literature Kit (Standard)			

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670279	2	670542	9	670930	14	671032	37
670281	2	670543	9	670933	13	671033	37
670282	2	670544	9	670934	13	671036	37
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670418	4	670547	9	670941	30	671048	39
670419	44	670548	9	670942	28	671049	37
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670433	34	670556	11	670948	28	671063	40
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670527	9	670914	16	671010	34	671105	22
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670535	9	670925	15	671021	39	671116	43
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