

BULLETIN 273B
VOL 2

TECHNICAL MANUAL
32 AND 33
TELETYPEWRITER SETS
KEYBOARD SEND-RECEIVE (KSR)
RECEIVE-ONLY (RO)
AUTOMATIC SEND-RECEIVE (ASR)

CONTENTS
ADJUSTMENTS



TELETYPE[®]
CORPORATION

5855 TOURY AVENUE, SKOKIE, ILLINOIS

BULLETIN 273B
VOL 2

TECHNICAL MANUAL
32 AND 33
TELETYPEWRITER SETS
KEYBOARD SEND-RECEIVE (KSR)
RECEIVE-ONLY (RO)
AUTOMATIC SEND-RECEIVE (ASR)

CONTENTS

ADJUSTMENTS



TELETYPE®
CORPORATION

5555 TOUHY AVENUE, SKOKIE, ILLINOIS

VOLUME 2

INTRODUCTION

Bulletin 273B is a technical manual that provides general and specific information about the 32 and 33 Keyboard Send-Receive (KSR), Receive-Only (RO), and Automatic Send-Receive (ASR) Teletypewriter Sets and their component units. It consists of two volumes.

Volume 1 contains a description of the 32 and 33 Teletypewriter Sets and gives installation instructions. Also included in Volume 1 is information on the disassembly and reassembly, lubrication, and principles of operation of the component units of the Teletypewriter Sets. Volume 2 includes adjustment information on all component units of 32 and 33 Teletypewriter Sets.

Each volume is made up of a group of appropriate independent sections. Each independent section is complete within itself—it is separately identified by a title and section number, and the pages are numbered consecutively.

Each individual section is identified by a 9-digit section number which appears at the top of each page of a section. The section number appears on the left corner of left-hand pages and on the right corner of right-hand pages. In addition, the section number on the first page contains the suffix TC which identifies it as a Teletype Corporation section. All sections are placed in the technical manual in ascending numerical order.

To locate specific information, refer to the table of contents on the following page. In the first column, under "Equipment," find the name of the component unit or set in question. Move across the page to the second column and locate the title being sought. The applicable 9-digit section number can then be found in the third column. Turn to Page 1 of the applicable section, and the contents of that section will be found.

VOLUME 2
TABLE OF CONTENTS

FILING INSTRUCTIONS

1. The following filing instructions apply to changes sent to the field.
2. Asterisks (*) in the table of contents indicate changes.
3. When the issue of a section changes, replace the old issue with the attached new one.
4. In the case of addendums, turn to the affected section and follow the instructions on the first page of the attached addendum.
5. Replace the old table of contents with this new one.

Note: Adjustments for the cover are included in Section 574-126-100.
This section is found in Volume 1 of this bulletin.

<u>Equipment</u>	<u>Title</u>	<u>Section</u>	<u>Issue</u>
Keyboard	Adjustments	574-121-700	1
Typing Unit	Adjustments	574-122-700	2
Tape Reader	Adjustments	574-124-700	1, Add 1
Tape Punch	Adjustments	574-125-700	2, Add 1*

TECHNICAL MANUAL
32 AND 33
TELETYPEWRITER SETS
KEYBOARD SEND-RECEIVE (KSR)
RECEIVE-ONLY (RO)
AUTOMATIC SEND-RECEIVE (ASR)

1. GENERAL

- 1.001 This addendum supplements existing adjustments in Bulletin 273B, Volume 2, Change 5, and applies only to 33TN and 33TX ASR sets.
- 1.002 Adjustments on the following pages augment sections in Bulletin 273B, Volume 2, as follows:

574-121-700	Keyboard	Part 3
574-122-700	Typing Unit	Part 2
574-124-700	Tape Reader	Part 4

Precede the CONTACT WIRES adjustment in Section 574-121-700 with the adjustments found in Paragraphs 3.001 and 3.002 respectively. All of the other adjustment information should be performed in the sequence presented and can follow the existing adjustment information found in the applicable sections listed above.

Note: Disregard the UNIVERSAL LINK and DISTRIBUTOR TRIP LINKAGE adjustments in Section 574-121-700 and the TRIP LEVER ENGAGEMENT adjustment in Section 574-122-700. They are not applicable.

- 1.003 Special lubrication instructions for 33TN and 33TX ASR sets are given in Part 6. All other lubrication instructions can be found in Bulletin 273B, Volume 1.

2. PRINTER ADJUSTMENTS

PRINTER "ON" TRIP ARMATURE ADJUSTMENT (See Figure 1)

- 2.001 Requirement: With the codebar moved to the right and latched, there shall be 0.010" to 0.020" clearance between the edge of the no. 4 function lever and the edge of the codebar tine.
- 2.002 To Adjust: Loosen the printer "OFF" solenoid mounting screws and position solenoid to the right to allow codebar unrestricted motion. Loosen armature clamp screw and adjust length of armature by means of pry points.

PRINTER "OFF" SOLENOID BRACKET ADJUSTMENT (See Figure 2)

- 2.003 Requirement: With the solenoid held electrically energized or with the plunger held mechanically seated, there shall be 0.006" to 0.012" clearance between the end of the trip armature and the latch surface.
- 2.004 To Adjust: Loosen the solenoid mounting screws and position solenoid body by means of pry points.

PRINTER "ON" TRIP MAGNET OVERTRAVEL ADJUSTMENT (See Figure 3)

- 2.005 Requirement: With the armature held against the core, there shall be 0.010" to 0.015" clearance between the armature and latch.
- 2.006 To Adjust: Loosen clamp nut and adjust overtravel by turning adjusting screw.

3. KEYBOARD ADJUSTMENTS

KEYBOARD DRIVE HUB ADJUSTMENT (See Figure 4)

- 3.001 Requirement: With the play taken up to the right, there shall be 0.060" to 0.070" clearance between the adjusting plate and keyboard reset lever.

Note: There is enough play that reset lever will touch adjusting screw.

- 3.002 To Adjust: Loosen setscrew and position hub.

KEYBOARD RESET LEVER ADJUSTMENT (See Figure 4)

- 3.003 Requirement: With the reset solenoid energized, there shall be 0.010" to 0.040" clearance between the keyboard reset lever and the latchlever.
- 3.004 To Adjust: Loosen clamp adjusting screw and position by pry points.

KEYBOARD CLEAR SWITCH ADJUSTMENT (See Figure 4)

- 3.005 Requirement: The switch actuator shall be centered in engagement with the keylever (by eye) and there shall be 0.025" to 0.040" clearance between the keylever and actuator in the unoperated condition.
- 3.006 To Adjust: Loosen bracket mounting screws to meet centering adjustment. Loosen switch mounting screws and position actuator to meet requirement.

KEYBOARD TIMING CONTACT MAGNET ADJUSTMENT (See Figure 4)

3.007 Requirement: There shall be 0.020" to 0.040" clearance between magnet face and reed switch assembly.

3.008 To Adjust: Bend extension lever at form to meet requirement.

KEYBOARD TIMING CONTACT ADJUSTMENT (See Figure 4)

3.009 Requirement: (Preliminary) Position reed switch assembly so that rear edge of assembly is approximately flush with rear edge of bracket.

3.010 Requirement: (Final) With the keyboard reset lever in the latched position, the contact shall be closed; with the keyboard reset lever tripped, the contact shall be open.

3.011 To Adjust: Loosen clamp screw and position switch assembly to meet requirement.

4. READER ADJUSTMENTS

TIMING CONTACT ADJUSTMENTS (See Figure 5)

4.001 Requirement: (Preliminary) Position both switches so that they are in the center of their adjustment slots.

4.002 Requirement: (Final) With the sensing pins fully down, the reset switch (front) shall be closed and the busy switch (rear) shall be open. With the sensing pins fully up in the energized position, the switches shall transfer.

4.003 To Adjust: Loosen adjusting screws and move switches up or down to meet requirement.

5. SPRING TENSIONS

PRINTER "ON" TRIP ARMATURE SPRING TENSION (See Figure 6)

5.001 With the armature de-energized and holding the suppression codebar to the right, it shall take 2 to 3 oz to start the armature moving.

LATCH SPRING TENSION (See Figure 7)

5.002 With the latch disengaged, it shall take 2 to 3 oz to start the codebar moving.

RESET LEVER SPRING TENSION (See Figure 4)

- 5.003 With the reset lever latched, it shall take 9-1/2 to 10-1/2 oz to start the reset lever moving.

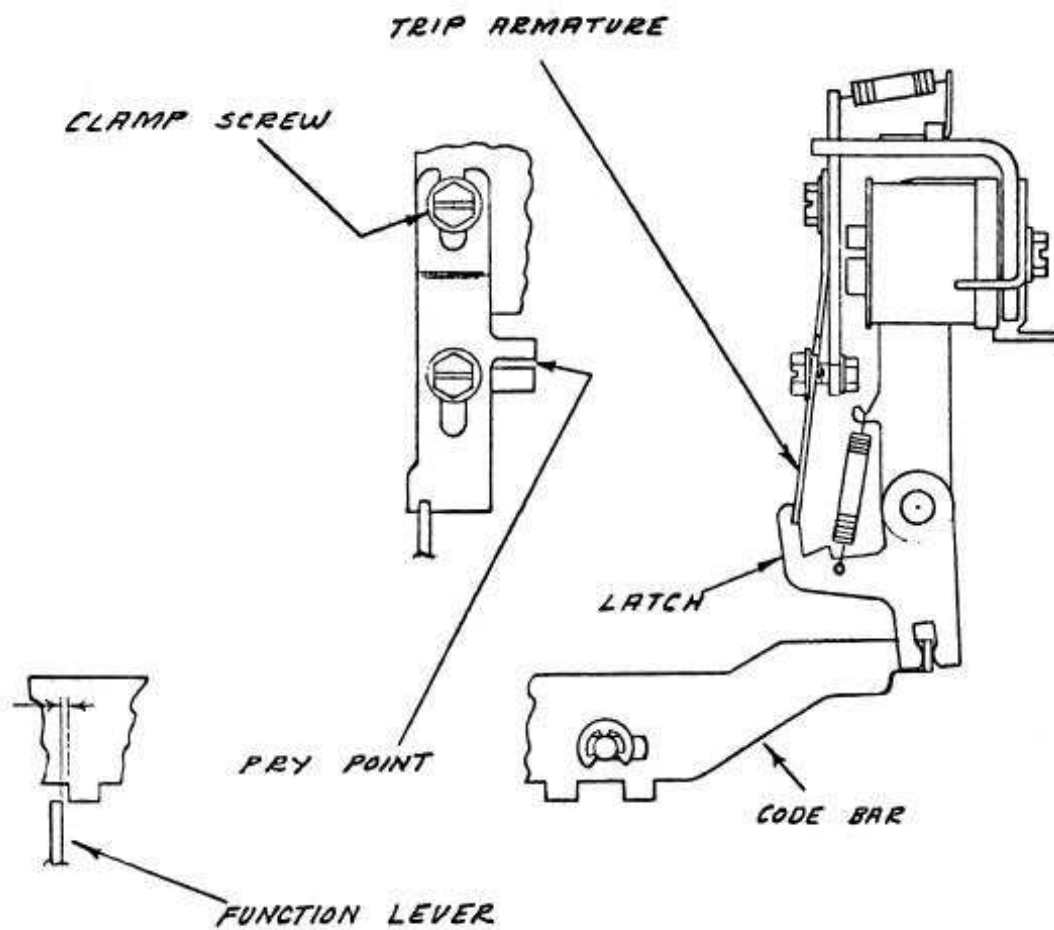
TRIP MAGNET ARMATURE SPRING TENSION (See Figure 8)

- 5.004 With the cam roller on the high part of the trip lever cam and the armature unattracted, it shall take 2 to 3 oz to start the armature moving.

6. LUBRICATION

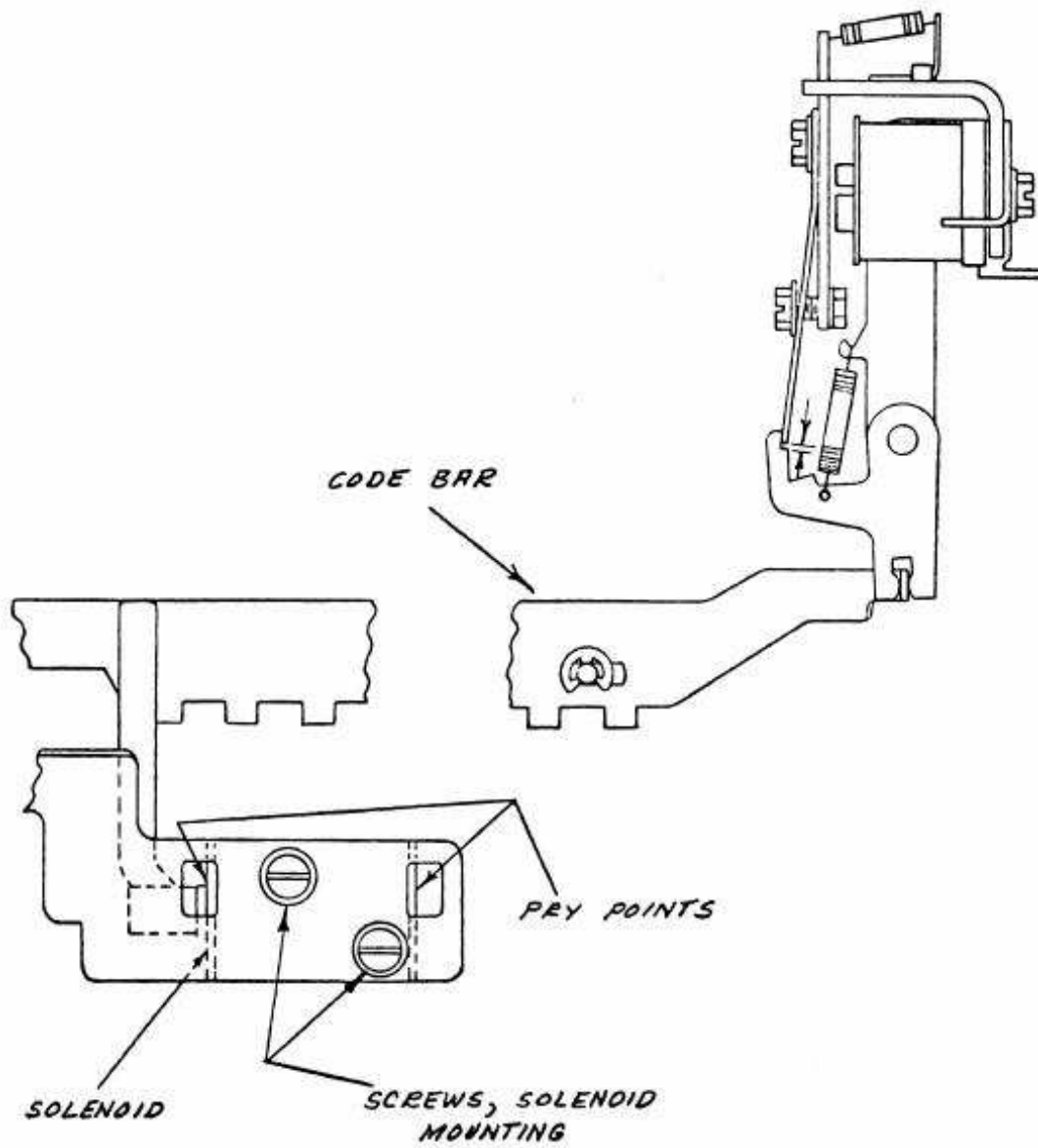
- 6.001 Oil all pivots and slots associated with the keyboard reset lever. Do not oil solenoid.
- 6.002 Should the rotary solenoid require lubrication, use only Beacon 325 or ANG 25 grease or equivalent.
- 6.003 The solenoid should be disassembled with care and cleaned prior to relubrication. There are small loose parts internally and only experienced personnel should perform this task.

Figure No. 1

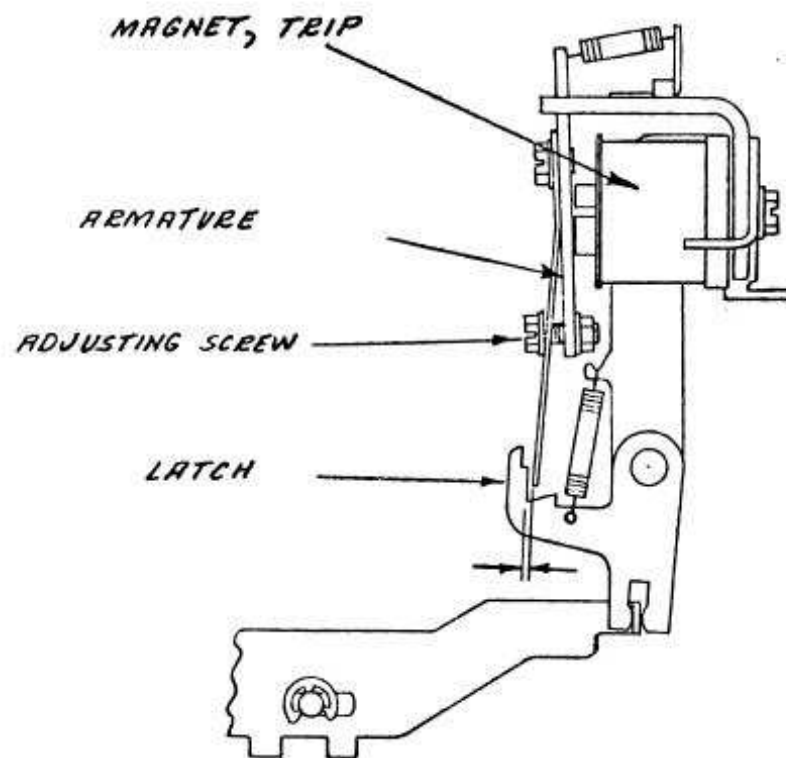


TRIP ARMATURE ADJUSTMENT

Figure No. 2



SOLENOID BRACKET ADJUSTMENT



TRIP MAGNET OVERTRAVEL ADJUSTMENT

Figure No. 4

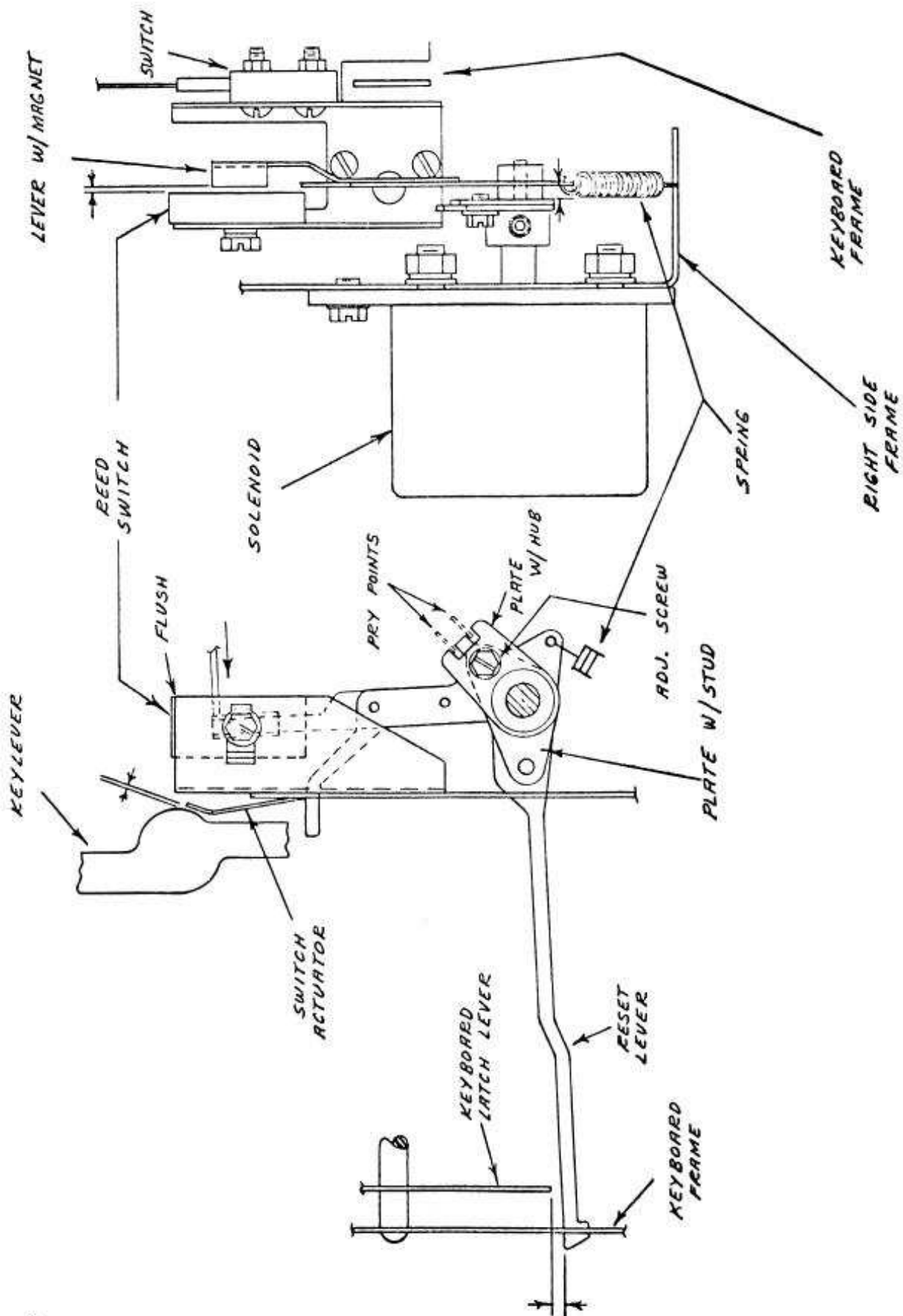
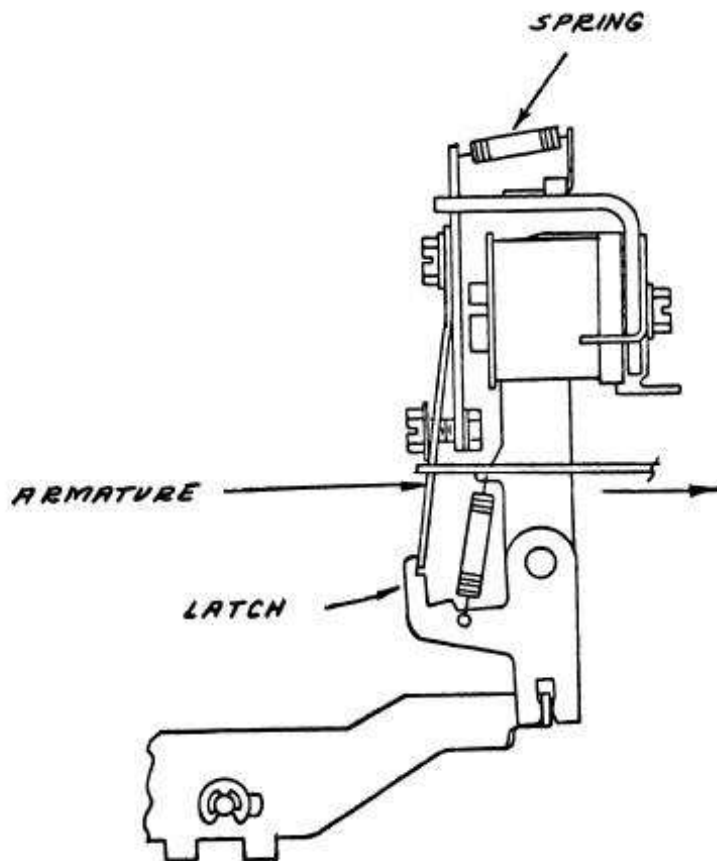
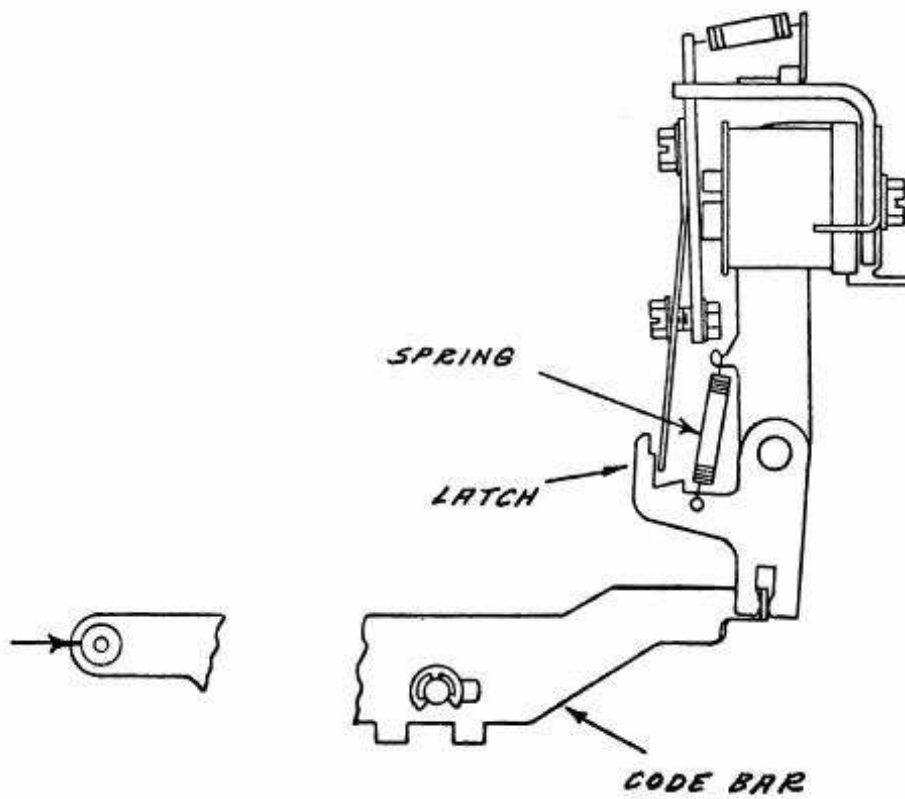


Figure No. 6

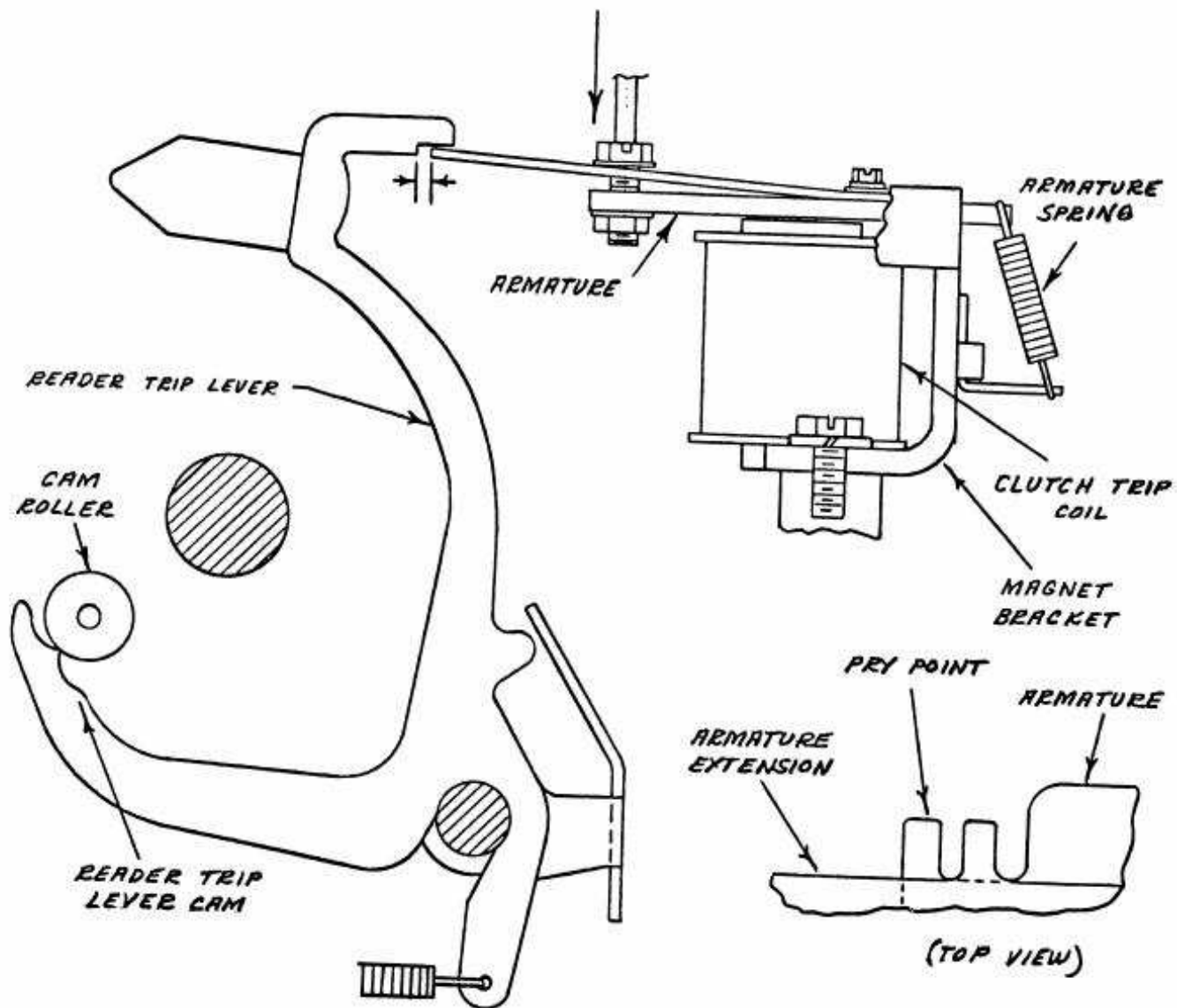


ARMATURE SPRING TENSION



LATCH SPRING TENSION

Figure No. 8

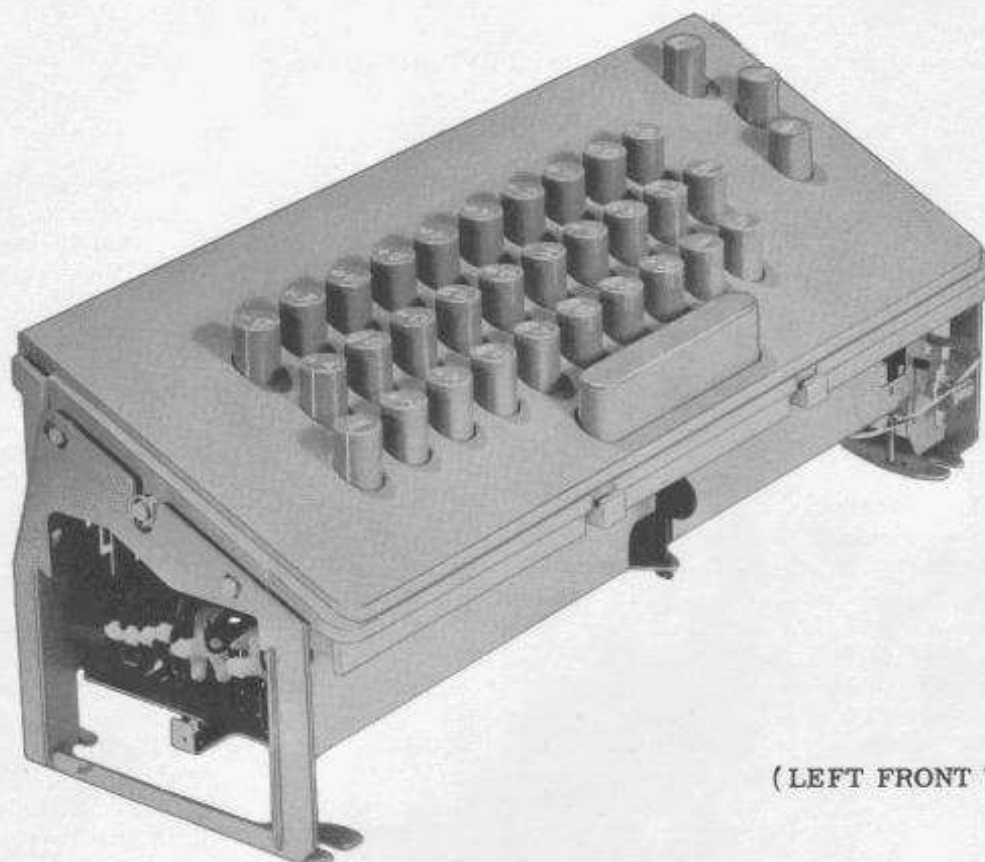


TRIP MAGNET ARMATURE SPRING
(CLUTCH TRIP)

32 AND 33 KEYBOARD

ADJUSTMENTS

CONTENTS	PAGE	
1. GENERAL	1	Required tools, not supplied with 32 or 33 Teletypewriter Sets, are listed in the appropriate maintenance tools publication.
2. BASIC UNITS	5	1.03 The sequence in which the adjustments appear is that which should be followed when a complete readjustment of the keyboard is undertaken. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.
BREAK keylever spring	12	1.04 References to "left," "right," "front," "rear," etc consider the keyboard to be viewed from a position where the spacebar (Figure 3) faces up and the contact mechanism is located to the viewer's right.
Contact block spring	8	1.05 Unless specifically stated otherwise, make screws or nuts friction tight to make an adjustment and tighten them securely once the adjustment has been made.
Contact wires	7	1.06 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.
Contact wire spring	8	1.07 When the keyboard is removed from the subbase to facilitate the making of an adjustment and subsequently replaced, recheck any adjustments that may have been affected. Also, if parts are removed from the keyboard to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustment that may have been affected by the removal of parts.
CTRL keylever spring	12	1.08 Related adjustments are listed with some of the adjustment texts and are primarily intended to aid in trouble shooting the equipment. As an example, suppose that in searching for a trouble it is discovered that Part (2) of <u>CONTACT</u>
Distributor trip linkage	6	
HERE IS keylever spring	12	
Keylever spring	11	
Latchlever spring	8	
Nonrepeat lever spring	8	
REPT keylever spring	12	
Reset bail spring	9	
Shift codebar spring	13	
Spacebar spring	11	
Universal lever spring	10	
Universal link	5	
Universal link spring	9	
1. GENERAL		
1.01 This section is issued to provide adjustment and maintenance information for the 32 and 33 keyboard and to present the information as a separate section. All information included in this section applies equally well to 5- and 8-level keyboards except where noted.		
1.02 In the adjustments covered in this section, location of clearances, position of parts, and point and angle of scale applications are illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings.		
Note: The configuration of an illustration or line drawing does not necessarily indicate that it and its associated text are exclusively applicable to a particular keyboard.		



(LEFT FRONT VIEW)

Figure 1 — 32 Keyboard

WIRES adjustment does not meet its requirement. Under "Related Adjustment," it is indicated that Part (2) of this adjustment is affected by Part (1). Check Part (1) to see if it is the basic cause of the trouble. Also, note that certain adjustments affect other adjustments. For example, see the DISTRIBUTOR TRIP LINKAGE adjustment. Note that this adjustment affects the TRIP LEVER ENGAGEMENT adjustment. (See the appropriate typing unit section.) If the former adjustment is changed, check the latter adjustment.

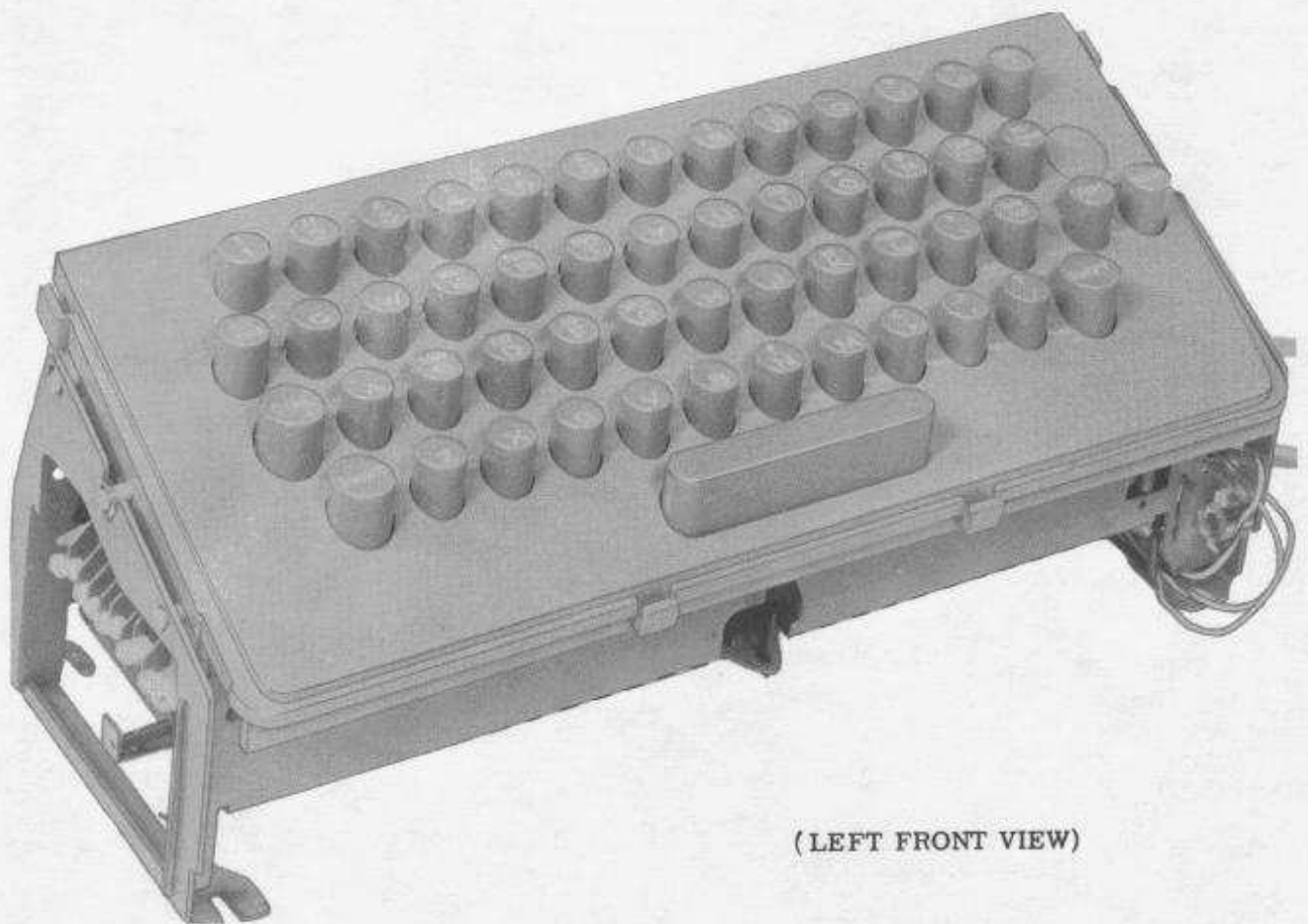
1.09 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is important that spring tensions be measured by spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements shall be replaced by new ones. Only those springs that directly affect the operation of the keyboard are measured, however, others may be measured indirectly

in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then, if the requirement is not met, any springs that are indirectly measured in the procedure shall be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use spring scales which are recommended by the manufacturer of 32 and 33 Teletypewriter Sets and found in the appropriate maintenance tools publication.

Note 2: The spring tensions may be checked in any sequence.

1.10 With the keyboard and typing unit assembled together on the subbase, all adjustment procedures shall be started with the typing unit in the stop condition. It is in the stop condition when the selector armature is in its attracted



(LEFT FRONT VIEW)

Figure 2 — 33 Keyboard

(frontward) position and all clutches are disengaged. Furthermore, the keyboard universal lever shall be latched in its down position when the typing unit is in the stop condition.

Note: The keyboard is tripped when the universal lever is in its up position.

1.11 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches as instructed in 1.12 following.

Note 1: A stop position is that position where a shoe lever contacts a trip lever.

Note 2: The distributor clutch will not disengage unless the answer-back drum is in its

home position, which is the position where the control lever is fully detented into the indent on the answer-back drum.

1.12 When disengaged, a clutch is latched so that a shoe lever is held in its stop position by a trip lever while a corresponding latchlever is seated in a notch of the clutch disc. This allows the clutch shoes to release their tensions on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any clutch shoes dragging.

Note: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. Where an adjustment procedure calls for disengagement, rotate the clutch to a stop position, apply a screwdriver to the associated stop-lug, and push the clutch disc in the normal direction of main shaft

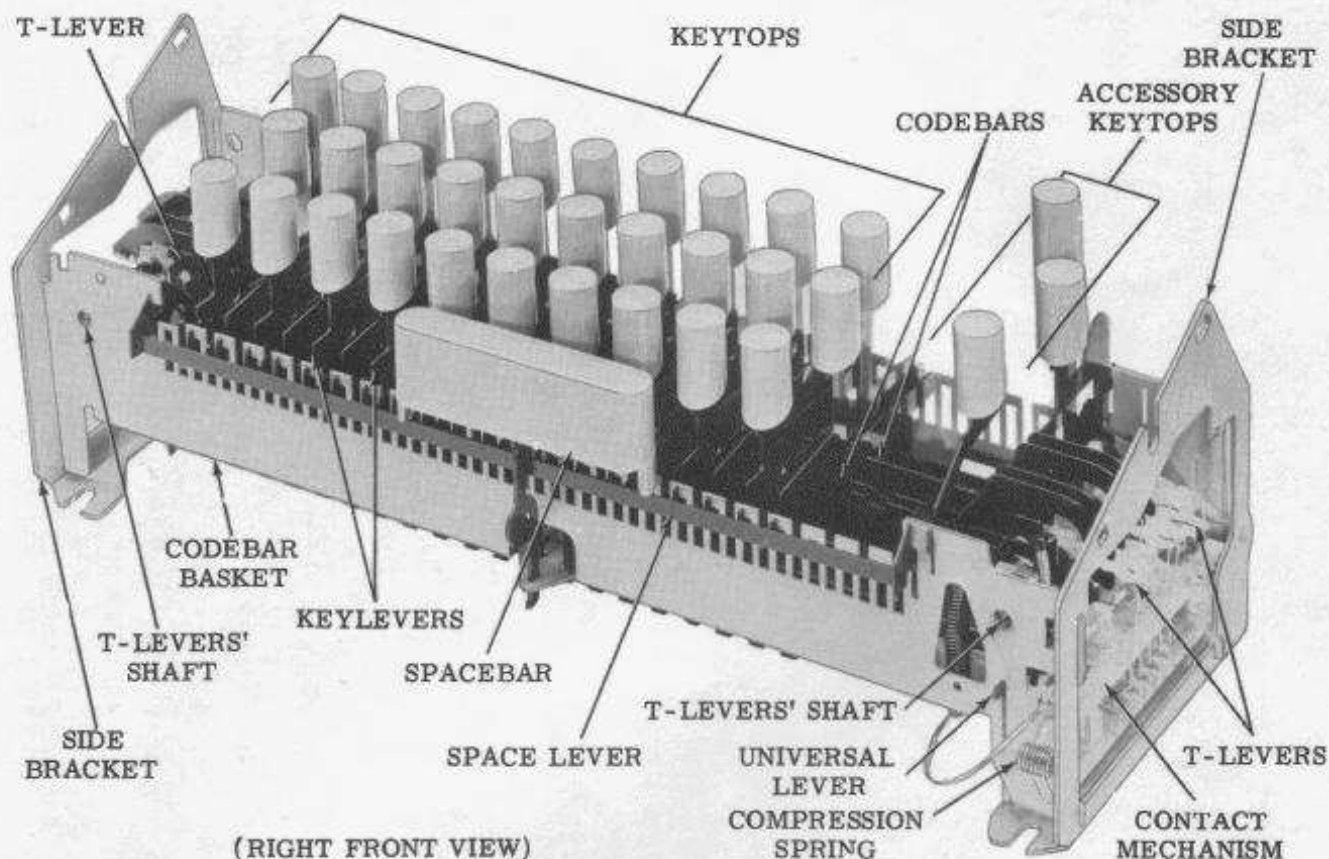


Figure 3 — Keyboard (Cover Removed)

rotation until the corresponding latchlever seats in its clutch disc notch. As a reminder, the word "latched" follows instructions to disengage the clutches.

1.13 A clutch is engaged when a trip lever is moved up so that it no longer holds a shoe lever in its stop position. When this action occurs, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch shoes wedge against the drum, so that when the shaft is turned, the clutch will turn in unison with it.

1.14 General Maintenance Principles.

(a) Lubrication instructions and intervals are given in the appropriate lubrication sections.

(b) To maintain the operational effectiveness of the equipment, it is recommended that certain parts be replaced at intervals based upon the speed and operating hours, as indicated below:

Operating Speed (Words per Minute)	Recommended Maintenance Overhaul Interval (Operating Hours*)	Estimated Service Life (Operating Hours*)
60 or 66	2500	7500
100	1500	4500

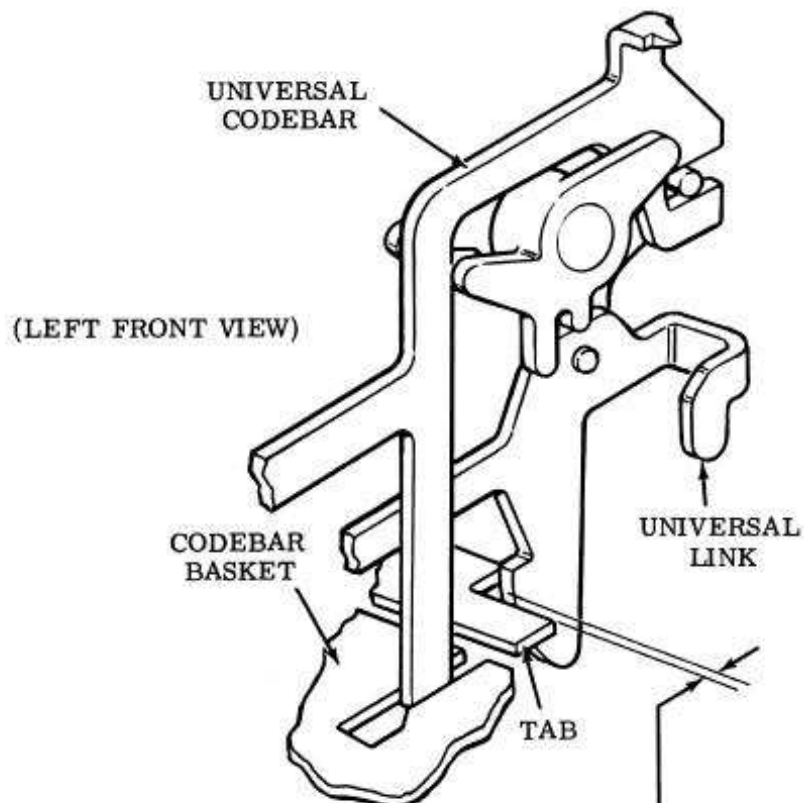
*Typing Unit Operating Hours

The parts are available in overhaul maintenance kits listed in the appropriate parts publications.

2. BASIC UNITS

2.01 Universal Link

Note: This adjustment can be made more easily with the keyboard removed from the subbase. If it has not been previously removed, remove the keyboard and the call control unit now. For instructions, see the appropriate keyboard section.



UNIVERSAL LINK

Requirement

With the universal lever latched in its down position

Min 0.089 inch---Max 0.103 inch
between the universal link and the codebar basket.

To Adjust

Place screwdriver through opening and bend tab on codebar basket.

2.02 Distributor Trip Linkage

Note 1: Replace keyboard onto subbase at this point.
For instructions, see the appropriate keyboard section.
Do not replace the call control unit.

DISTRIBUTOR TRIP LINKAGE

To Check

With typing unit in stop condition, depress the RUB OUT key (8-level) or LTRS key (5-level) to trip distributor clutch. Rotate main shaft until the keyboard follower lever is moved to its lowest point by cam roller.

Note 2: Prior to gauging the required gap, push end of universal lever that protrudes through the front of codebar basket to bottom of its guide slot and allow it to snap up.

Requirement

Early design keyboards with universal lever TP180086:
Min 0.010 inch---Max 0.035 inch
between latchlever and universal lever.

Late design keyboards with universal lever TP182240:
Min 0.010 inch---Max 0.040 inch
between latchlever and universal lever.

To Adjust

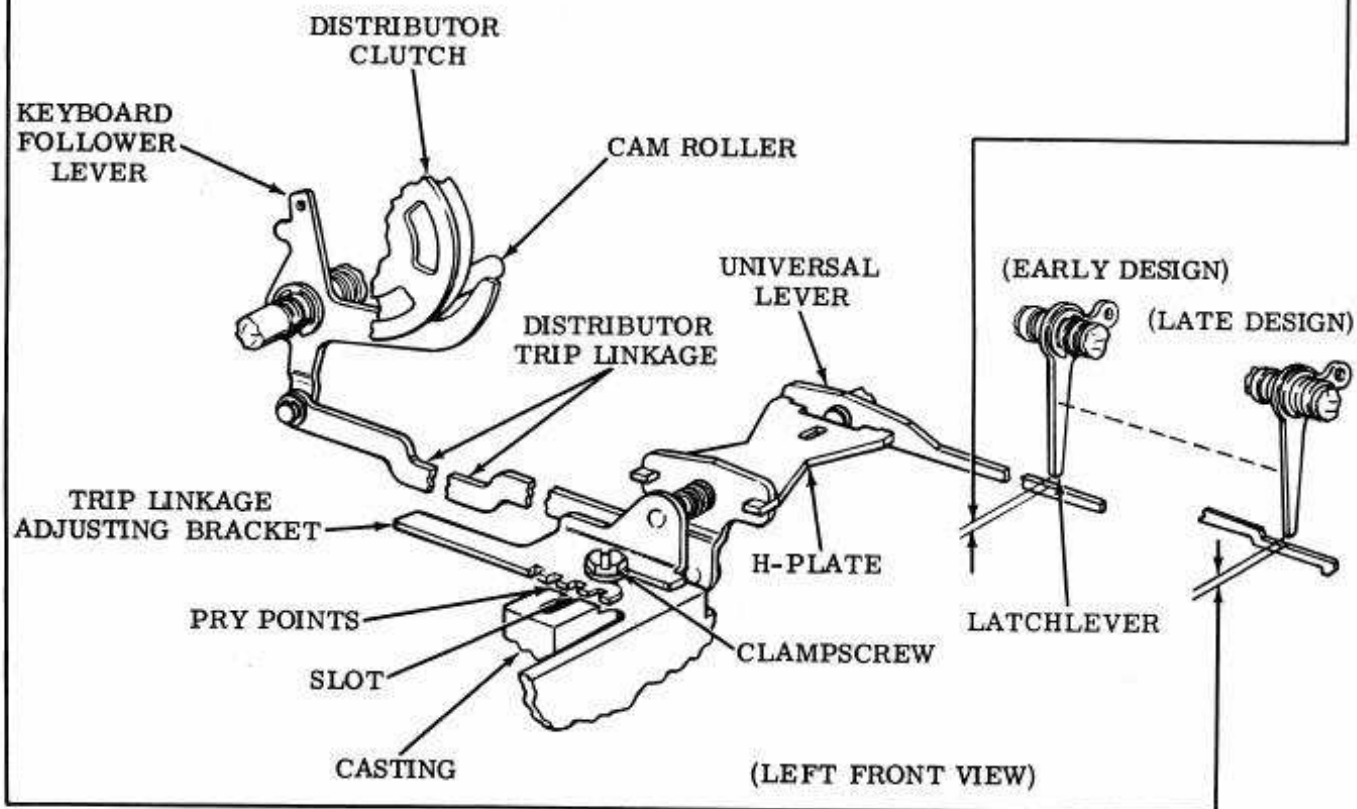
With clampscrew loosened, position trip linkage adjusting bracket using slot in casting and pry points.

Related Adjustment

Affects

TRIP LEVER ENGAGEMENT

(See appropriate typing unit section.)



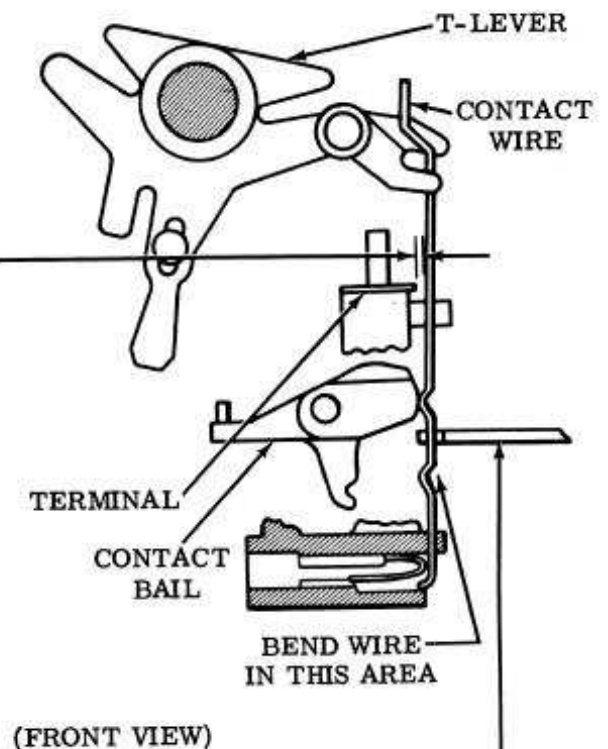
2.03 Contact Wires

CONTACT WIRES

- (1) To Check
Place typing unit in stop condition and T-levers down in marking position.

Requirement
Min 0.008 inch---Max 0.027 inch
between terminal and each contact wire.

To Adjust
Bend contact wire with bending tool
no. TP 98055.

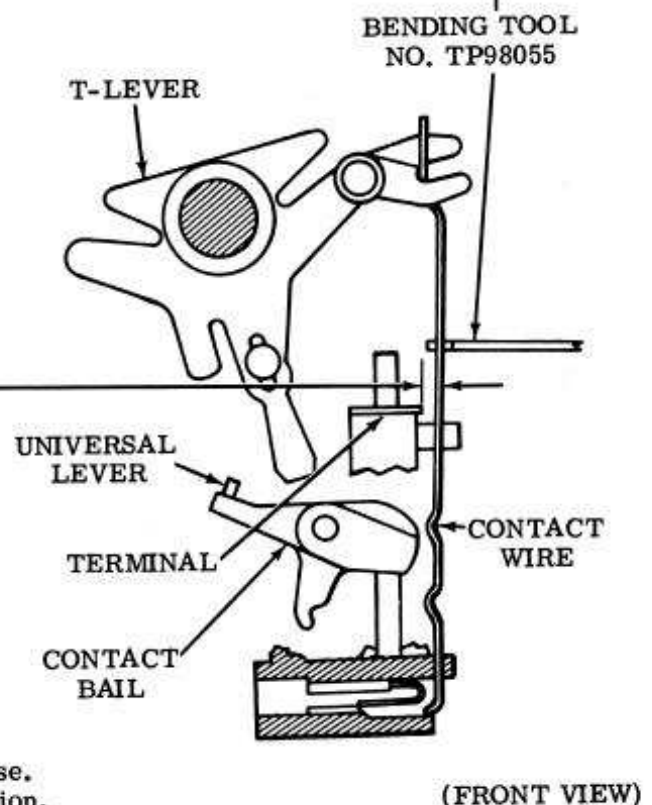


- (2) To Check
With typing unit in stop condition, place T-levers up in spacing position. Place universal lever in up position by depressing universal codebar.

Requirement
Min 0.020 inch---Max 0.040 inch
between terminal and each contact wire.

To Adjust
Bend contact wire with bending tool
no. TP98055.

Related Adjustment
Affected By
Part (2) of this adjustment is affected
by Part (1).



Note: If necessary, to facilitate the bending of the contact wires, remove the keyboard from the subbase. For instructions, see the appropriate keyboard section. After bending contact wires, replace keyboard onto subbase and recheck DISTRIBUTOR TRIP LINKAGE adjustment.

SECTION 574-121-700

2.04 Nonrepeat Lever Spring, Latchlever Spring, Contact Block Spring, and Contact Wire Spring

NONREPEAT LEVER SPRING

Requirement

With keyboard cover removed and typing unit in stop condition

Min $\frac{3}{4}$ oz---Max 1- $\frac{1}{2}$ oz
to start nonrepeat lever moving.

Note 1: To facilitate making NONREPEAT LEVER SPRING adjustment, remove keyboard cover. (For instructions, see the appropriate keyboard section.)

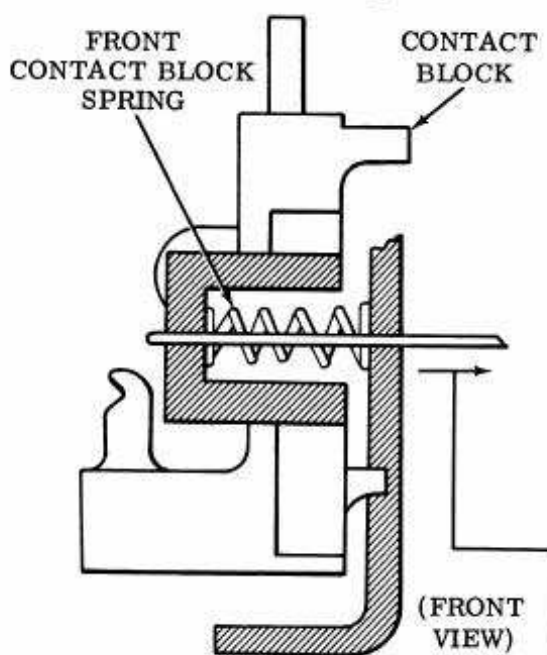
LATCHLEVER SPRING

To Check

With call control unit removed, trip distributor clutch and rotate main shaft until keyboard follower lever is moved by cam roller to its lowest point.

Requirement

Min $\frac{1}{2}$ oz---Max 1 oz
to start latchlever moving.

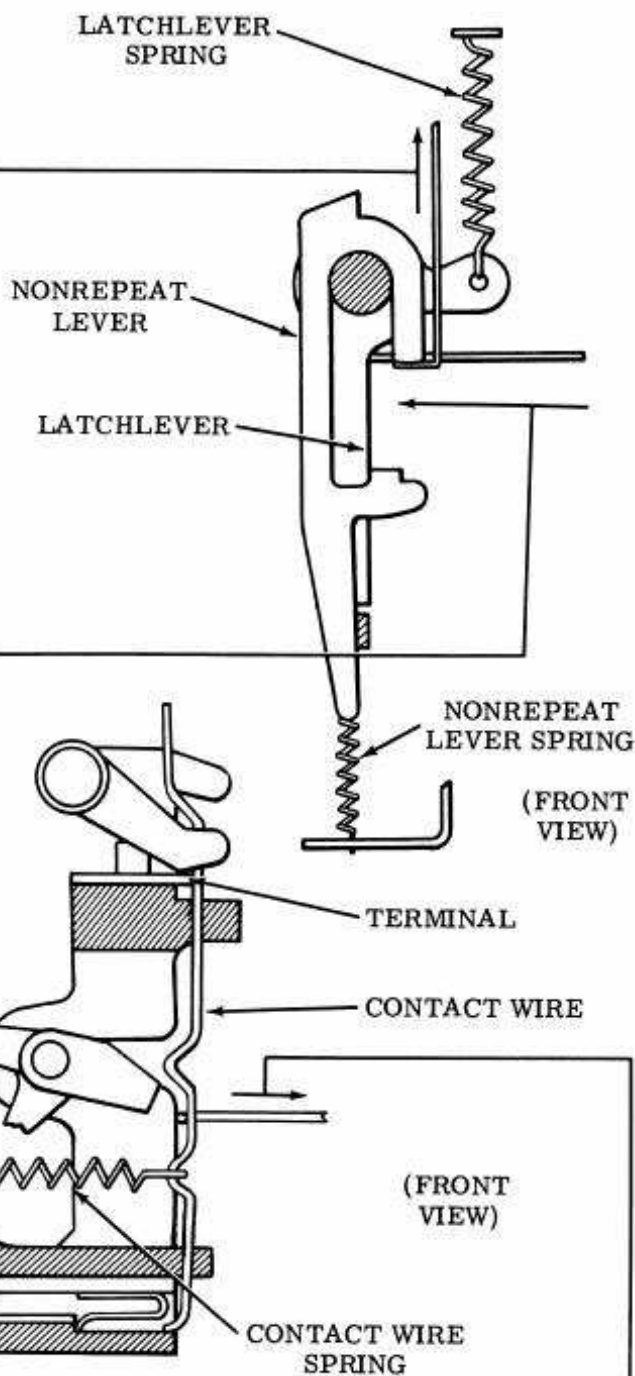


CONTACT BLOCK SPRING

Requireme.

With call control unit removed
Min 18 oz---Max 42 oz
to start contact block moving.

Note 2: Check both front and rear contact block springs.



CONTACT WIRE SPRING

To Check

With call control unit removed, place T-levers in down (marking) position. Trip keyboard by depressing universal codebar.

Requirement

Min $\frac{3}{4}$ oz---Max 1- $\frac{1}{4}$ oz
to start each contact wire moving away from terminal.

2.05 Reset Bail Spring and Universal Link Spring

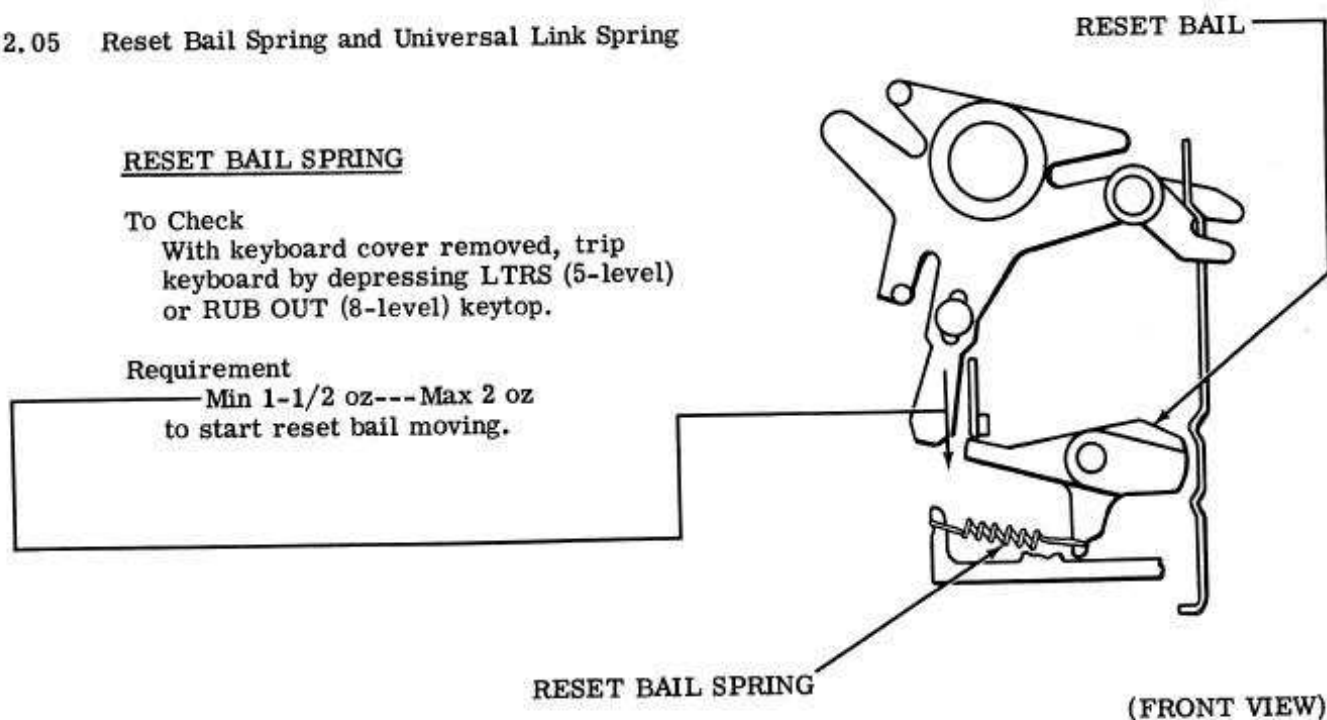
RESET BAIL SPRING

To Check

With keyboard cover removed, trip keyboard by depressing LTRS (5-level) or RUB OUT (8-level) keytop.

Requirement

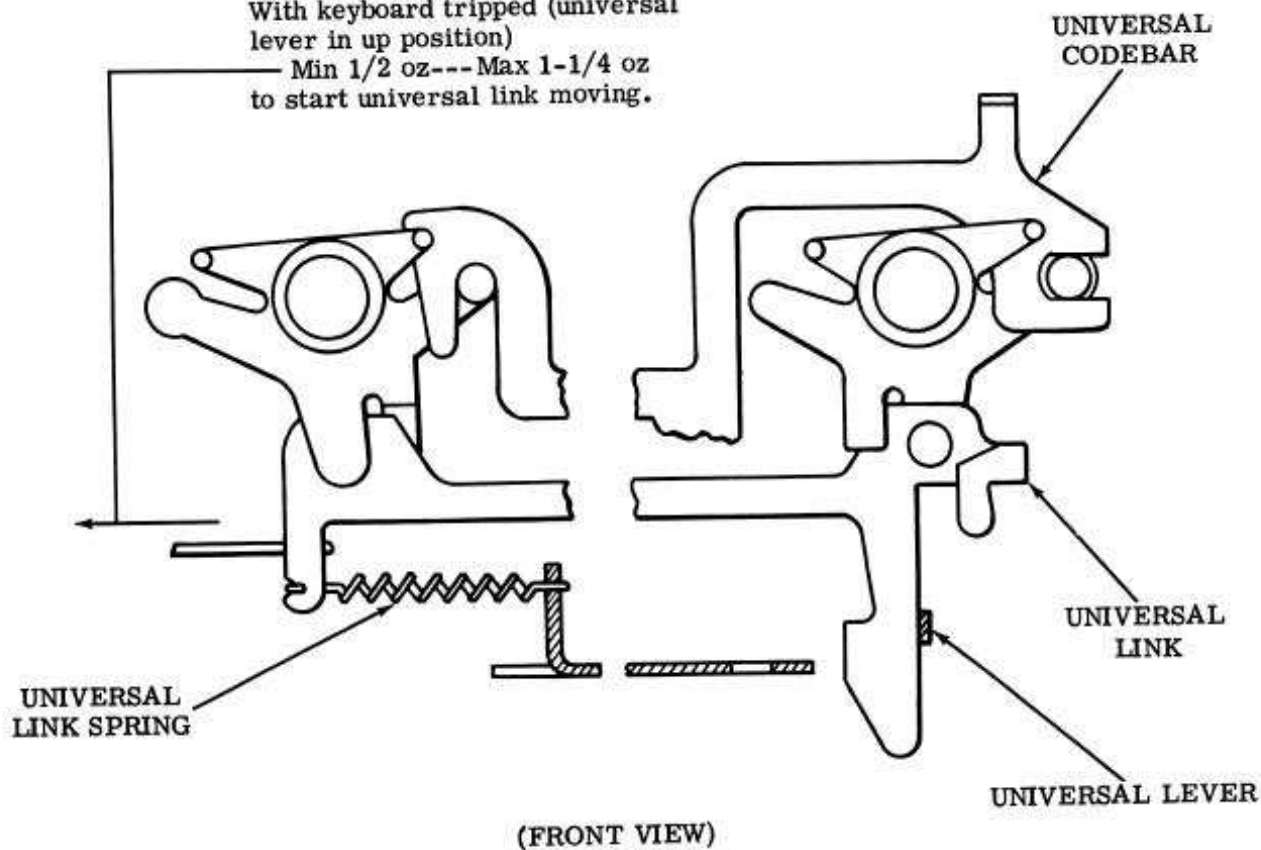
Min 1-1/2 oz---Max 2 oz
to start reset bail moving.

UNIVERSAL LINK SPRING

Requirement

With keyboard tripped (universal lever in up position)

Min 1/2 oz---Max 1-1/4 oz
to start universal link moving.



2.06 Universal Lever Spring

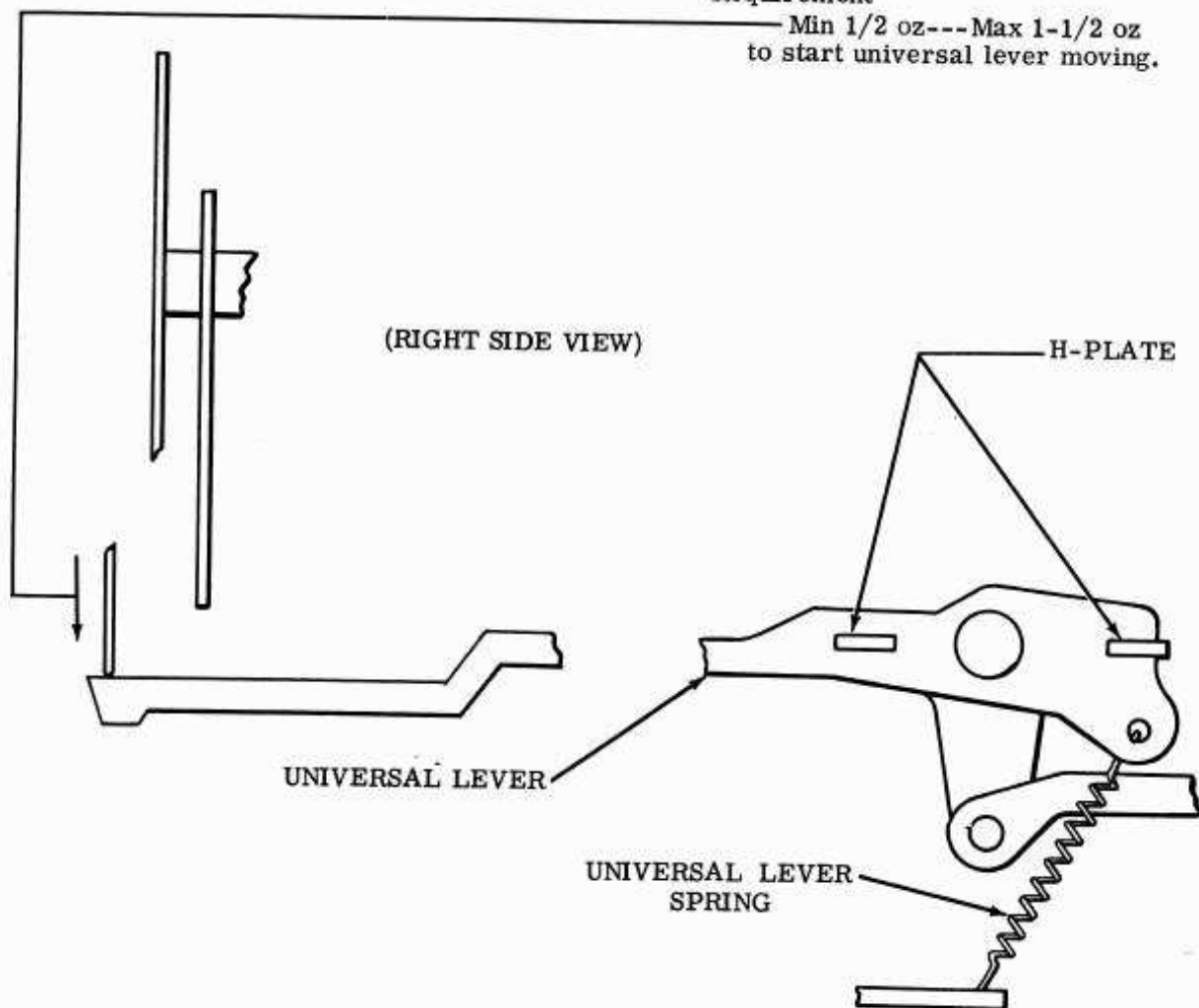
UNIVERSAL LEVER SPRING

To Check

With keyboard cover removed, place typing unit in stop condition. Remove H-plate. (See the appropriate keyboard section.)

Requirement

Min 1/2 oz---Max 1-1/2 oz
to start universal lever moving.



Note: Replace call control unit onto subbase. Also replace keyboard cover and H-plate. For instructions, see the appropriate keyboard section.

2.07 Spacebar Spring and Keylever Spring

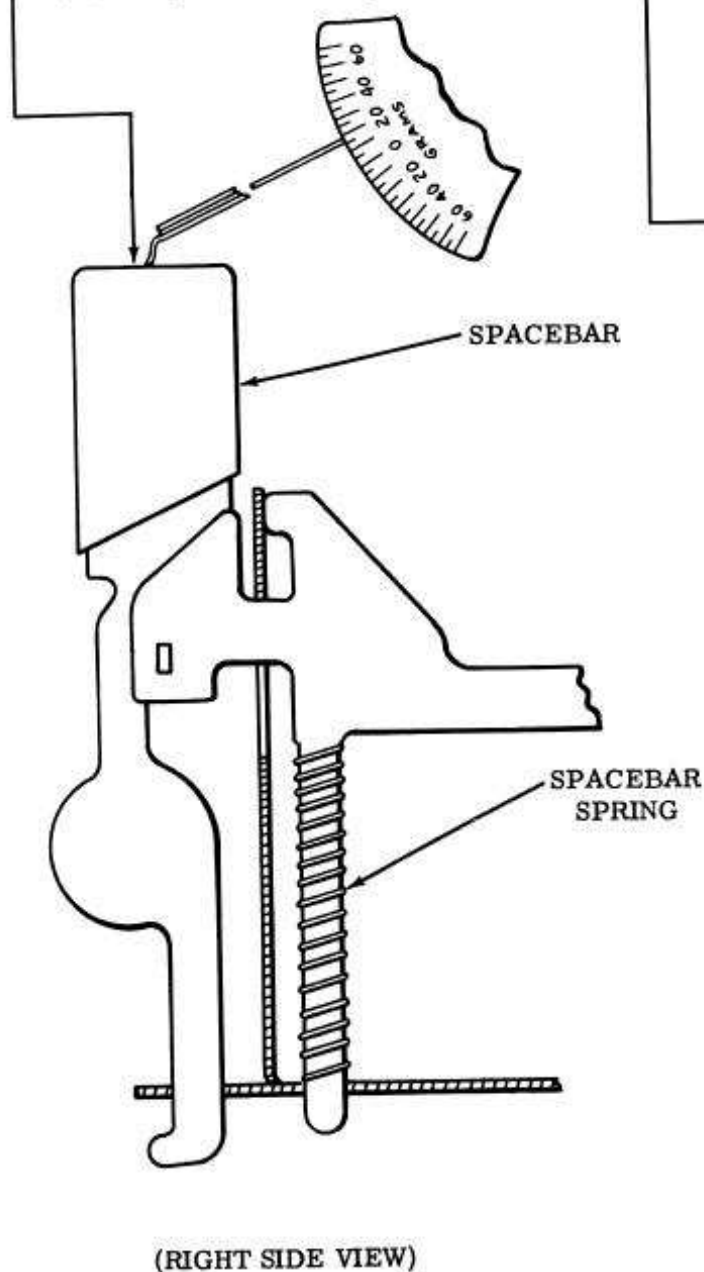
SPACEBAR SPRING

To Check

With universal lever down, depress spacebar and then release.

Requirement

Min 5 grams---Max 25 grams to start spacebar moving.

KEYLEVER SPRING

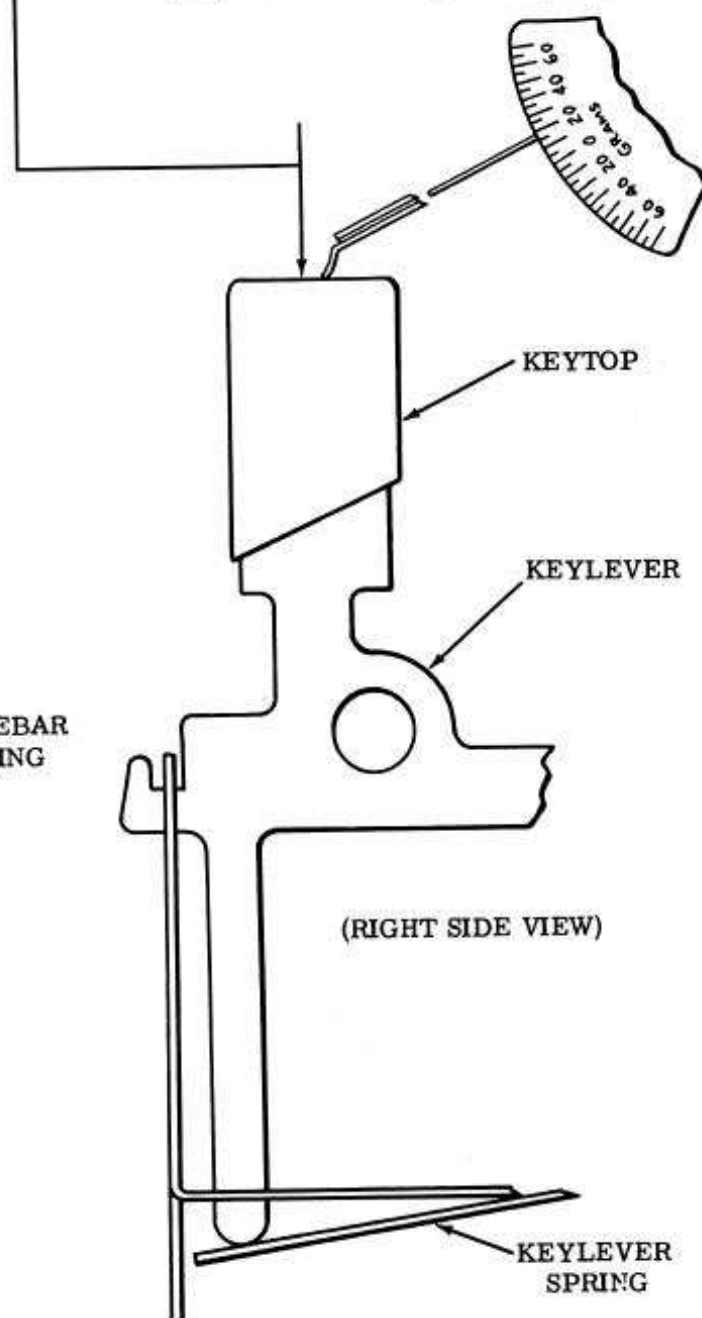
To Check

With universal lever down, select any keytop and depress. Release keytop.

Requirement

Min 5 grams---Max 25 grams to start selected keytop moving.

Note: Check each keylever spring.



2.08 HERE IS, BREAK, CTRL,
and REPT Keylever Springs

"BREAK" KEYLEVER SPRING

Requirement

5-level:

Min 12 oz---Max 18 oz

8-level:

Min 4-1/2 oz---Max 10 oz
to start keytop moving.

"CTRL" KEYLEVER SPRING

Requirement

8-level:

Min 1-1/2 oz---Max 3-1/2 oz
to start keytop moving.

"HERE IS" KEYLEVER SPRING

Requirement

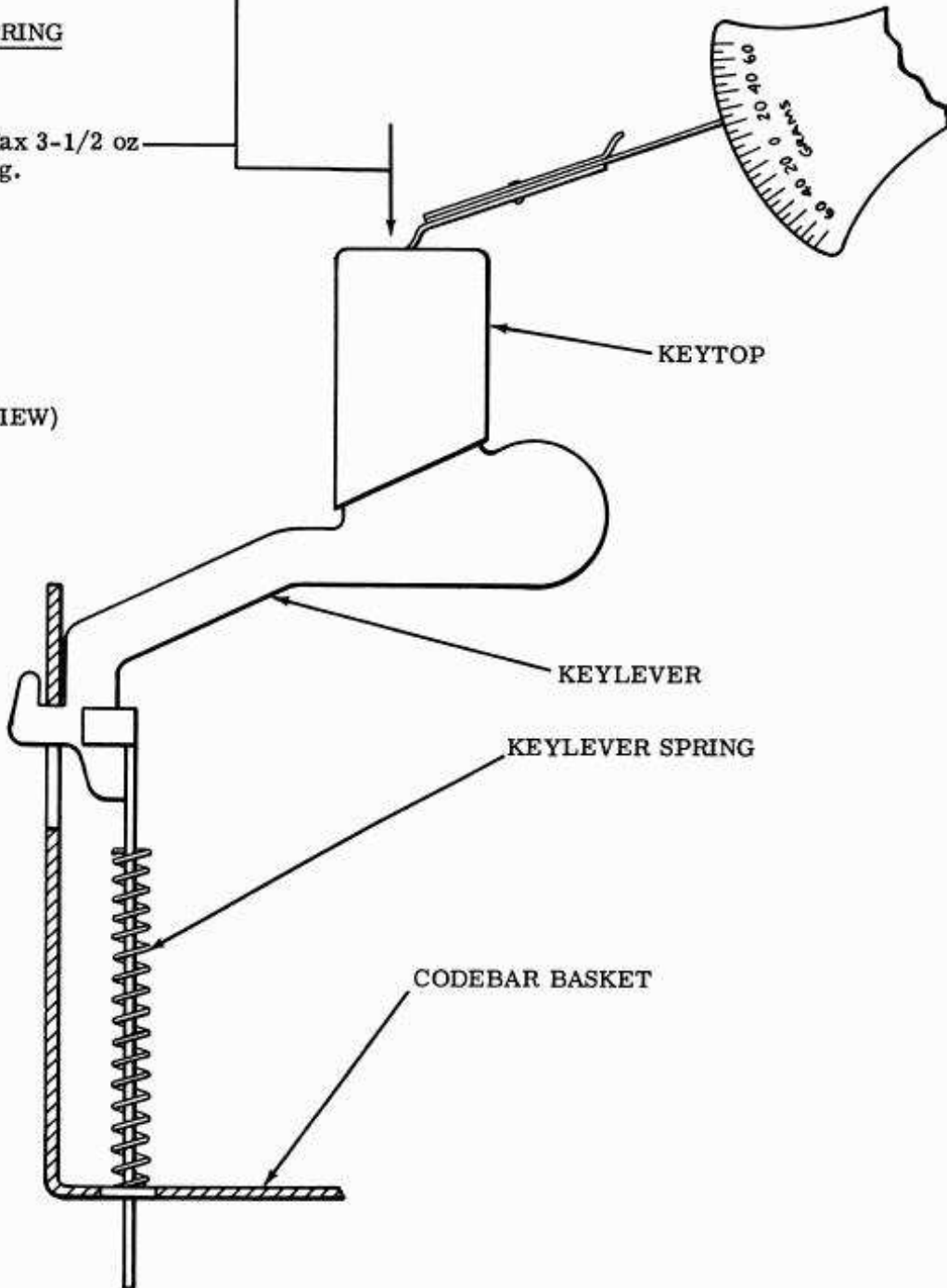
Min 18 grams---Max 35 grams
to start keytop moving.

"REPT" KEYLEVER SPRING

Requirement

Min 15 grams---Max 30 grams
to start keytop moving.

(RIGHT SIDE VIEW)



2.09 Shift Codebar Spring

Note: The SHIFT CODEBAR SPRING adjustment applies only to 8-level keyboards.

SHIFT CODEBAR SPRING

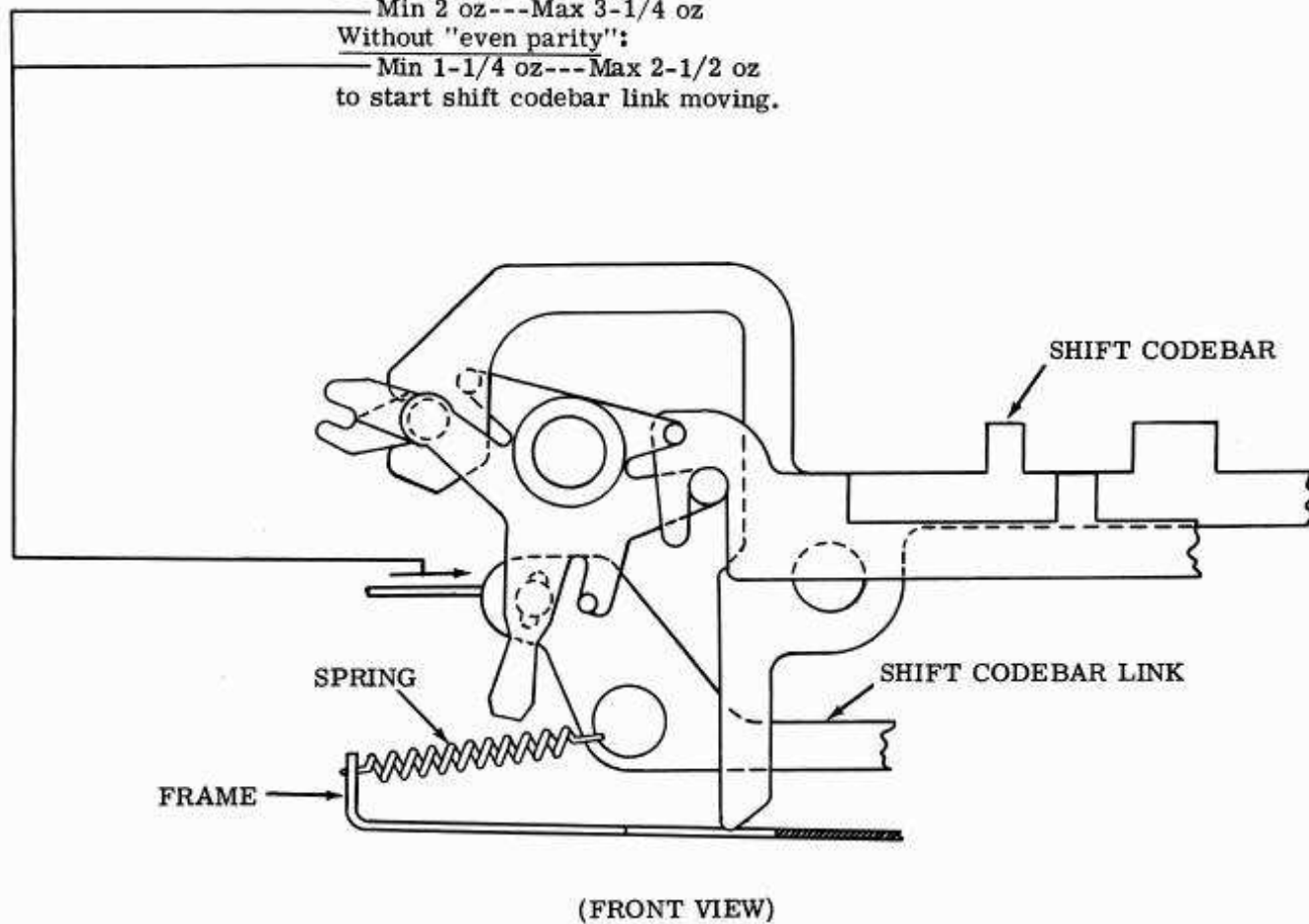
Requirement

With "even parity":

— Min 2 oz---Max 3-1/4 oz

Without "even parity":

— Min 1-1/4 oz---Max 2-1/2 oz
to start shift codebar link moving.



32 AND 33 TYPING UNIT

ADJUSTMENTS

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	3 ←	Left bearing	12
2. BASIC UNITS	10	Shaft	12
COMMON MECHANISMS	10	Stop ball spring	83
Carriage Area		Trip lever	14
Drive bail	53	Trip lever engagement	81
Front rollers	47	Trip shaft	13
Left slide guideplate	59	Function Area	
Power bail roller	48	Automatic codebar spring	39
Print drive lever	54	Bell clapper	48
Print hammer bail spring	65	Carriage drive bail	46
Print hammer trip lever spring	65	Casting	44
Print latch arm	57	Codebar guide	36
Print reset arm	55	Codebar reset bail spring	30
Print suppression latchlever	62	Codebar reset lever	34
Print trip lever	61	Codebar reset lever position	33
Pulse lever	52	Codebar springs	39
Rear rail	50	Function bail spring	56
Rear roller	47	Function lever springs	56
Reset lever	51	Function pawl spring	40
Ribbon drive lever spring	68	Left rocker drive arm	40
Ribbon feed pawl spring	68	Line length	77 ←
Ribbon guide	60	No. 1 codebar guide	38
Ribbon guide spring	65	Print suppression and No. 3 (4)	
Ribbon power lever	67	codebar spring	39
Ribbon ratchet spring	68	Print suppression cam follower ...	43
Ribbon reverse arm spring	68	Print suppression cam follower	
Right slide guideplate	59	roller	35
Rotary drive bail spring	64	Print suppression cam follower	
Rotary racks	49	spring	43
Slide guideplate springs	58	Print suppression latch	35
Slide springs	63	Right rocker drive arm	41
Stop plate	58	Rocker shaft endplay	32
Typewheel	66	Rocker shaft position	32
Typewheel return spring	64	Stripper bail	42
Vertical drive bail spring	64	Main Shaft Area	
Distributor Area		Clutch shoe lever spring	23
Brush holder	15	Clutch shoe spring	23
Brush holder spring	82	Codebar and function clutch trip	
Clutch latchlever spring	82	levers	22
Keyboard follower lever spring	83	Codebar clutch	18
		Codebar clutch follower arm	20
		Codebar clutch trip lever	19

CONTENTS PAGE

Driven gear	18
Function clutch endplay	17
Function clutch follower lever	21
Function clutch—preliminary	17
Latchlevers	19
Latchlever springs	22
Left bearing	16
Trip lever springs	21

Miscellaneous Area

Bearing alignment	31
Final printing alignment	85
Main shaft torque	31

Motor Area

Belt tension—preliminary	11
Gear bracket—preliminary	10
Gear bracket and belt tension— final	11

Selector Area

Armature bracket	25
Armature spring	26
Blocking levers	37
Blocking lever springs	37
Clutch endplay	16
Clutch torque	30
Clutch trip lever	24
Latchlever spring	27
Magnet core	25
Push lever springs	29
Receiving margins	84
Selector lever springs	28
Spacing locklever spring	28
Start lever spring	27
Stripper bail spring	29
Trip lever spring	24

Spacing Area

Carriage return latch spring	79
Carriage return lever	45
Carriage return lever spring	71
Carriage return spring	46
Carriage return unlatch lever	79
Check pawl spring	73
Dashpot orifice	78
Drive roller	73
End-of-line latch spring	77
Feed pawl	69
Feed pawl engagement	72
Feed pawl spring	74
Left margin	76
Left margin printing	80
Space bellcrank spring	55
Space suppression lever	70

CONTENTS PAGE

Space suppression lever spring	74
Space suppression trip lever	71
Spacing belt tension	75
Upper carriage return latch springs.	79

FRICTION FEED MECHANISMS ... 86

Paper Feed Area

Line feed blocking lever spring	95
Line feed drive arm	89
Line feed drive link	91
Line feed drive link spring— horizontal	95
Line feed drive link spring— vertical	95
Line feed pawl downstop	92
Line feed pawl spring	88
Line feed stripper plate	94
Line feed upstop bracket	90
Paper guide	97
Paper guideplate springs	96
Paper guide springs	96
Paper straightener bail spring	96
Platen detent	88
Platen detent pawl spring	91
Platen—horizontal	86
Platen—vertical	87
Pressure roller	93
Single-double line feed	88

SPROCKET FEED MECHANISMS .. 98

Function Area

Line feed function strip lever spring .	107
Line feed strip lever	115

Paper Feed Area

Detent position	117
Detent ratchet pawl spring	117
End-of-line bell	121
Left hand margin	121
Left sprocket ring	100
Paper guideplate	98
Paper guideplate spring	99
Paper guide spring	99
Platen—horizontal	102
Platen knob	99
Platen knob spring	99
Platen—vertical	103
Printing line position	122
Right guide	101
Right hand margin	121
Right sprocket ring	100
Wire guide—final	124
Wire guide—preliminary	101

CONTENTS	PAGE
Platen Drive Area	
Cam lobe	109
Cam zero position	118
Form-out belt tension	104
Form-out downstop	112
Form length	123
Form-out lever overtravel	108
Form-out lever spring	108
Idler	110
Latchlever assembly endplay	104
Latchlever assembly spring	108
Latchlever spring	105
Line feed	116
Line feed bail spring	116
Line feed clutch endplay	104
Line feed clutch trip lever	105
Line feed downstop	113
Line feed lever line-up and end-play	107
Line feed lever spring	116
Line feed lever upstop	114
Reader-stop bail spring	120
Reader-stop contact	120
Reader-stop contact gap	120
Reader-stop contact pressure	120
Reset	111
Reset cam lobe line-up	118
Reset follower lever spring	109
Trip lever and latchlever endplay	106
Trip lever spring	105
Trip shaft endplay	106
Zeroizing button	110
3. VARIATIONS TO BASIC UNITS	125
Answer-Back Area	
Armature spring	138
Blinding contact wire	132
Blocking follower lever	125
Blocking follower lever spring	135
Blocking latch spring	138
Clutch stop bail	127
Contact wire spring	134
Control lever spring—horizontal	135
Control lever spring—vertical (early design)	138
Control lever spring—vertical (late design)	139
Detent spring	134
Drum	126
Feed lever	129
Feed lever spring	133
Feed pawl	128
Feed pawl spring	134

CONTENTS	PAGE
HERE IS adjusting bracket	130
Tripbail	131
Trip lever	137
Trip lever overtravel and armature gap	136
Trip lever spring	139
Trip magnet	136
Miscellaneous Areas	
Function box contacts	140
Keyboard trip lever (RO)	141
Low-paper contacts operating arm ..	142
Paper Alarm Control Area	
Low-paper alarm contact	145
Low-paper alarm contact gap	144
Low-paper alarm contact pressure ..	144
Low-paper and paper-out alarm contact	145
Low-paper lever spring	144
Paper-out alarm contact	143
Paper-out alarm contact gap	143
Paper-out alarm contact pressure ..	143
Paper-out lever spring	143

1. GENERAL

1.01 This section, which provides adjustment and maintenance information, has been revised to update the adjustments for sprocket feed mechanisms and to reorganize the section's contents. All information included in this section applies equally well to 5- and 8-level typing units except where noted. Changes are indicated by arrows placed in the margins.

1.02 In the adjustments covered in this section, location of clearances, position of parts, and point and angle of scale applications are illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings. Required tools, not supplied with 32 or 33 Teletypewriter Sets, are listed in the appropriate maintenance tools publication.

Note: The configuration of an illustration or line drawing does not necessarily indicate that it and its associated text are exclusively applicable to a particular typing unit.

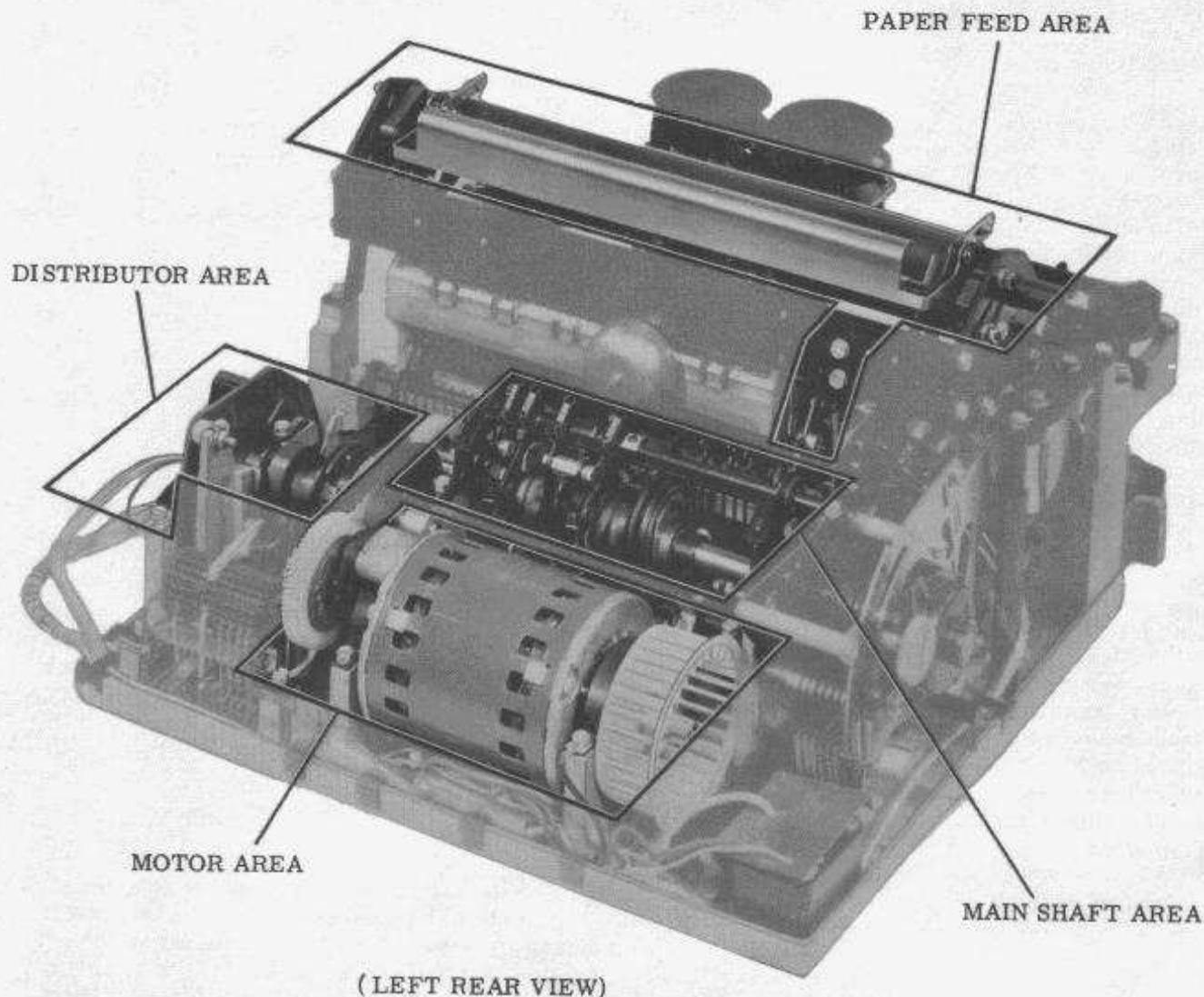


Figure 1 — Distributor, Main Shaft, Motor, and Paper Feed Areas

1.03 The sequence in which the adjustments appear is that which should be followed when a complete readjustment of the typing unit is undertaken. Certain interrelated adjustments, which appear on the same page, should be checked and adjusted in a definite sequence. The sequence is indicated by the letters "(A)," "(B)," etc. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.

1.04 References to "left," "right," "front," "rear," etc consider the typing unit to be viewed from a position where the carriage

area faces up and the selector area is located to the viewer's left.

1.05 Unless specifically stated otherwise, make screws or nuts friction tight to make an adjustment and tighten them securely once the adjustment has been made.

1.06 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.

1.07 If parts or subassemblies are removed from the typing unit to facilitate the making of an adjustment, be sure that they

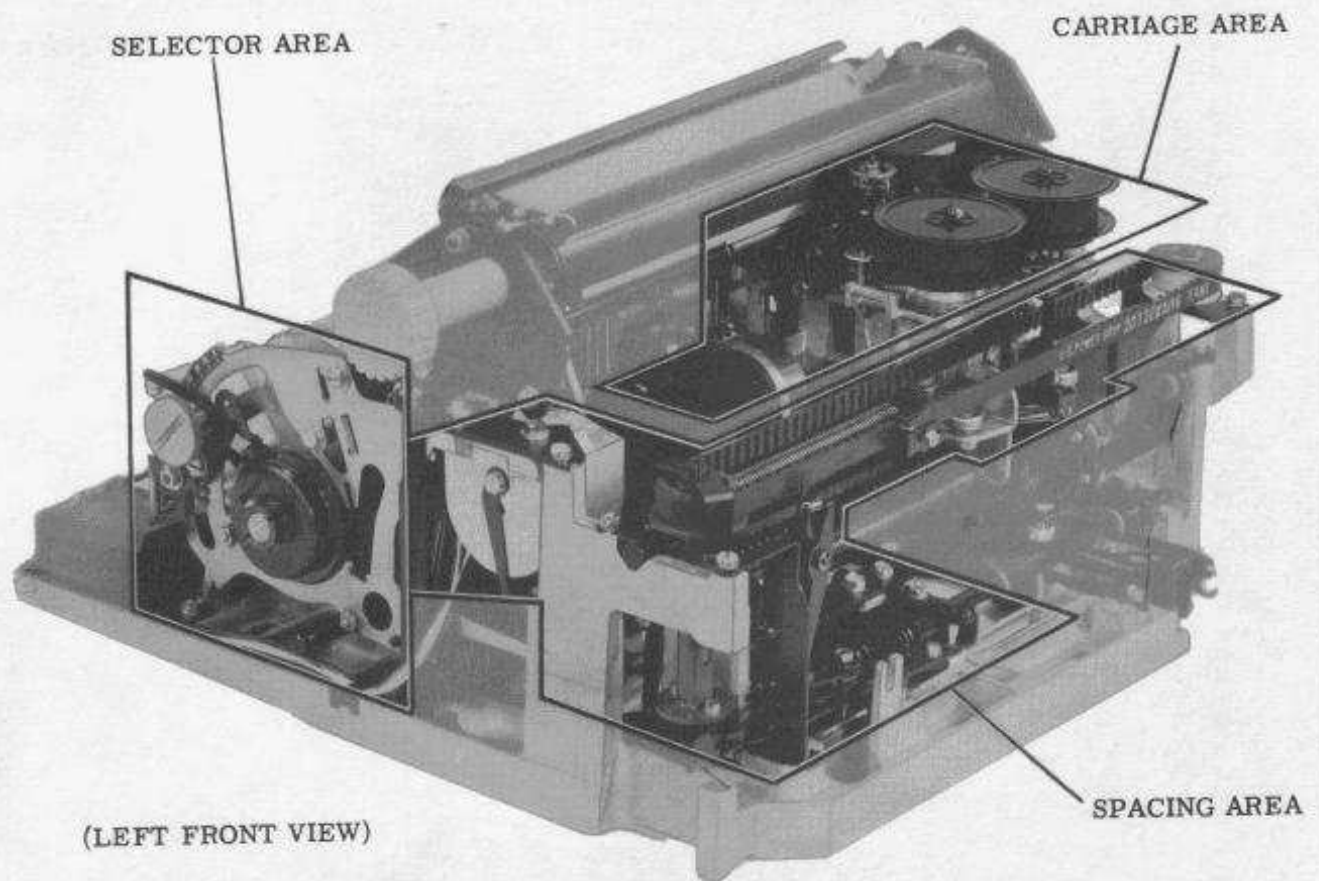


Figure 2 — Carriage, Selector, and Spacing Areas

are subsequently replaced. Recheck any adjustments that may have been affected by the removal of parts or subassemblies.

1.08 Related adjustments are listed with some of the adjustment texts and are primarily intended to aid in trouble shooting the equipment. As an example, suppose that in searching for a trouble it is discovered that the FUNCTION CLUTCH—PRELIMINARY (Main Shaft Area) adjustment does not meet its requirement. Under "Related Adjustments" it is indicated that this adjustment is "Affected By" the LEFT BEARING (Main Shaft Area) and CASTING (Function Area) adjustments. Check these to see if either is the cause of the trouble. Also, it is indicated that the FUNCTION CLUTCH—PRELIMINARY (Main Shaft Area) adjustment affects the FUNCTION CLUTCH ENDPLAY (Main Shaft Area) adjustment. If the former adjustment is changed, check the latter adjustment.

1.09 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is important that spring tensions be measured by spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements shall be replaced by new ones. Only those springs that directly affect the operation of the typing unit are measured, however, others may be measured indirectly in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then, if the requirement is not met, any springs that are indirectly measured in the procedure shall be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use spring scales which are recommended by the manufacturer of 32 and 33 Teletypewriter Sets found in the appropriate maintenance tools publication.

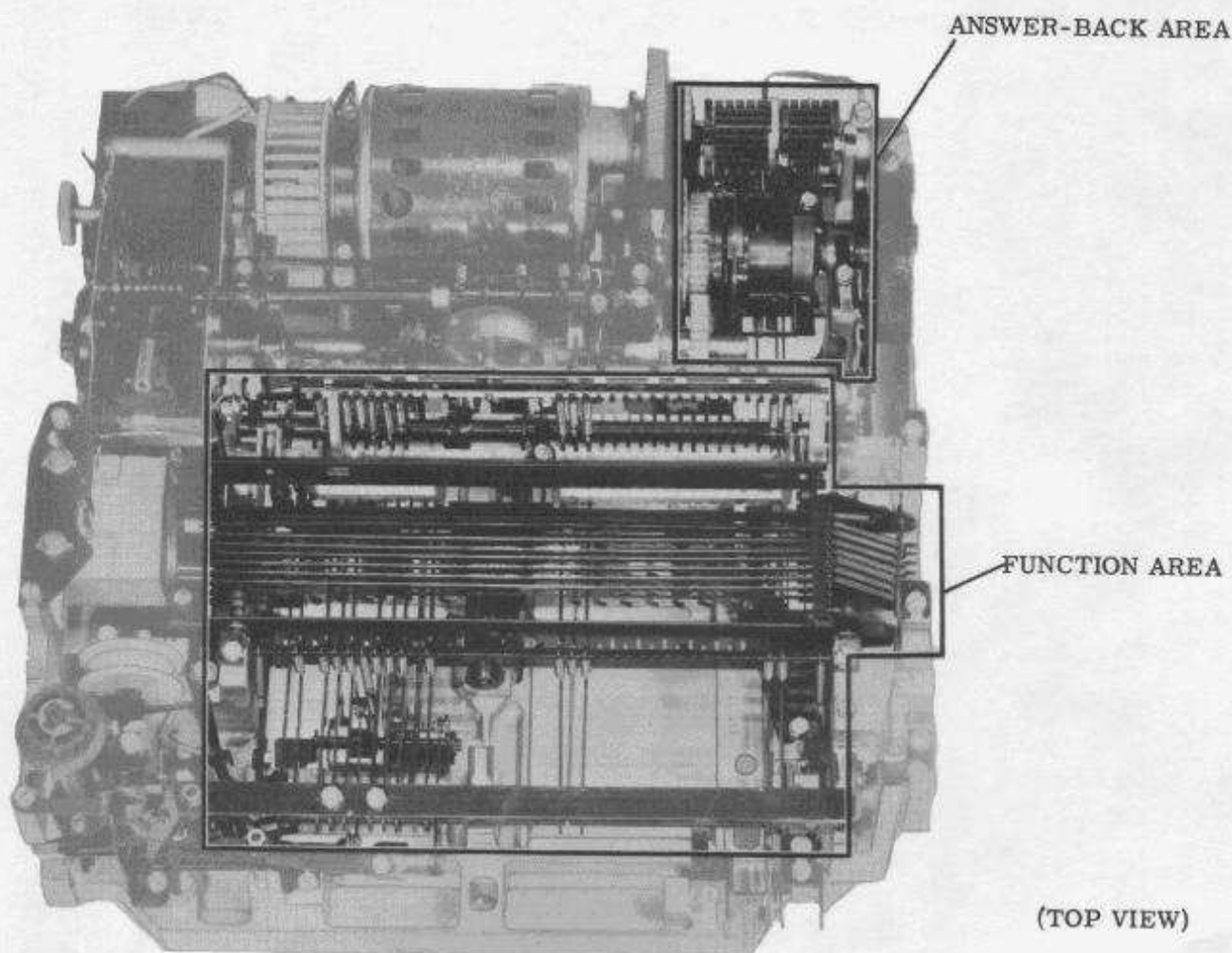


Figure 3 — Answer-Back and Function Areas

Note 2: The spring tensions may be checked in any sequence.

1.10 All adjustment procedures shall be started with the typing unit in the stop condition. It is in the stop condition when the selector armature is in its attracted (frontward) position and all clutches are disengaged.

1.11 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches as instructed in 1.12 following.

Note 1: A stop position is that position where a shoe lever contacts a trip lever.

Note 2: The distributor clutch will not disengage unless the answer-back drum is in its home position, which is the position where the control lever is fully detented into the indent on the answer-back drum.

1.12 When disengaged, a clutch is latched so that a shoe lever is held in its stop position by a trip lever while a corresponding latchlever is seated in a notch of the clutch disc. This allows the clutch shoes to release their tension on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any clutch shoes dragging.

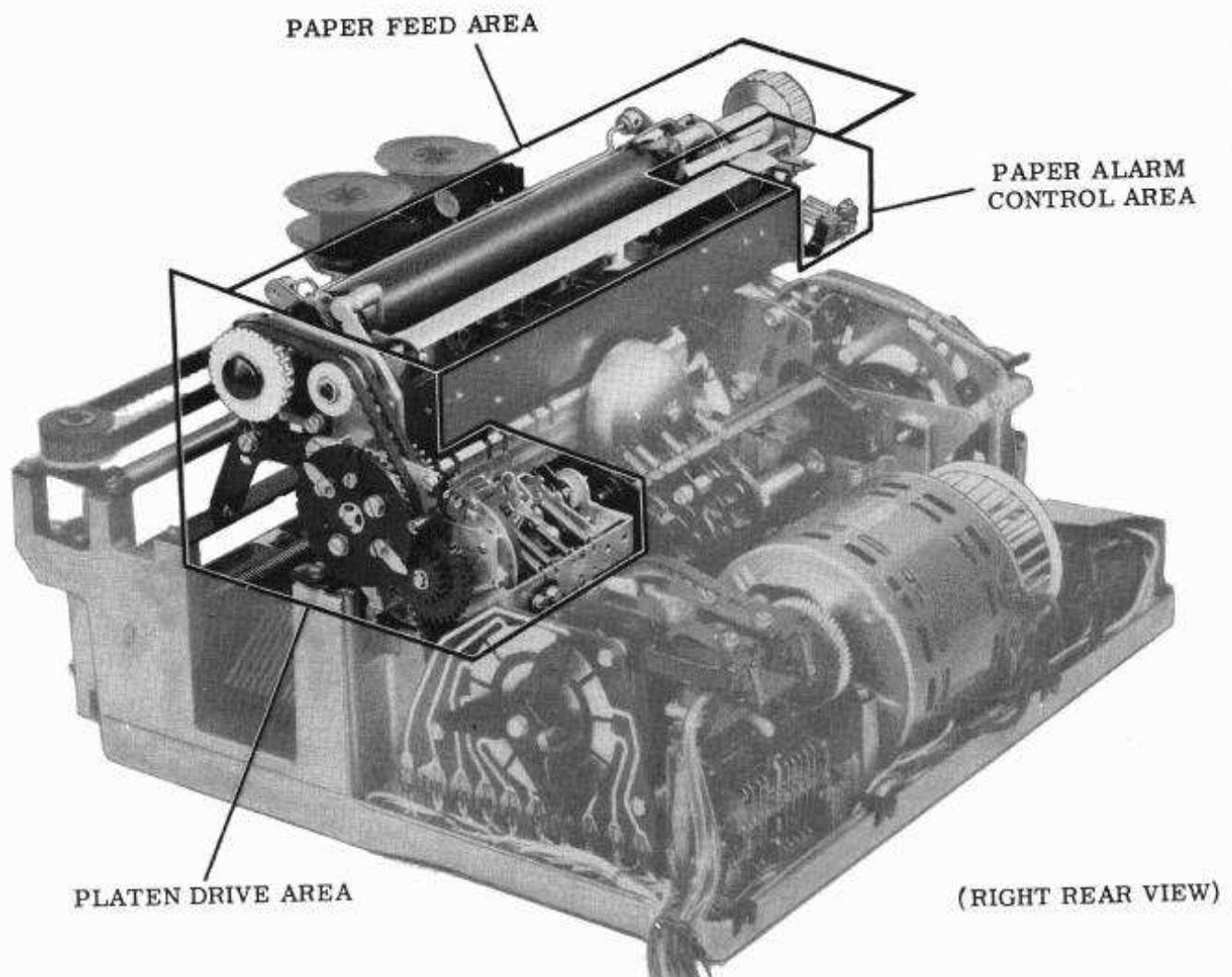


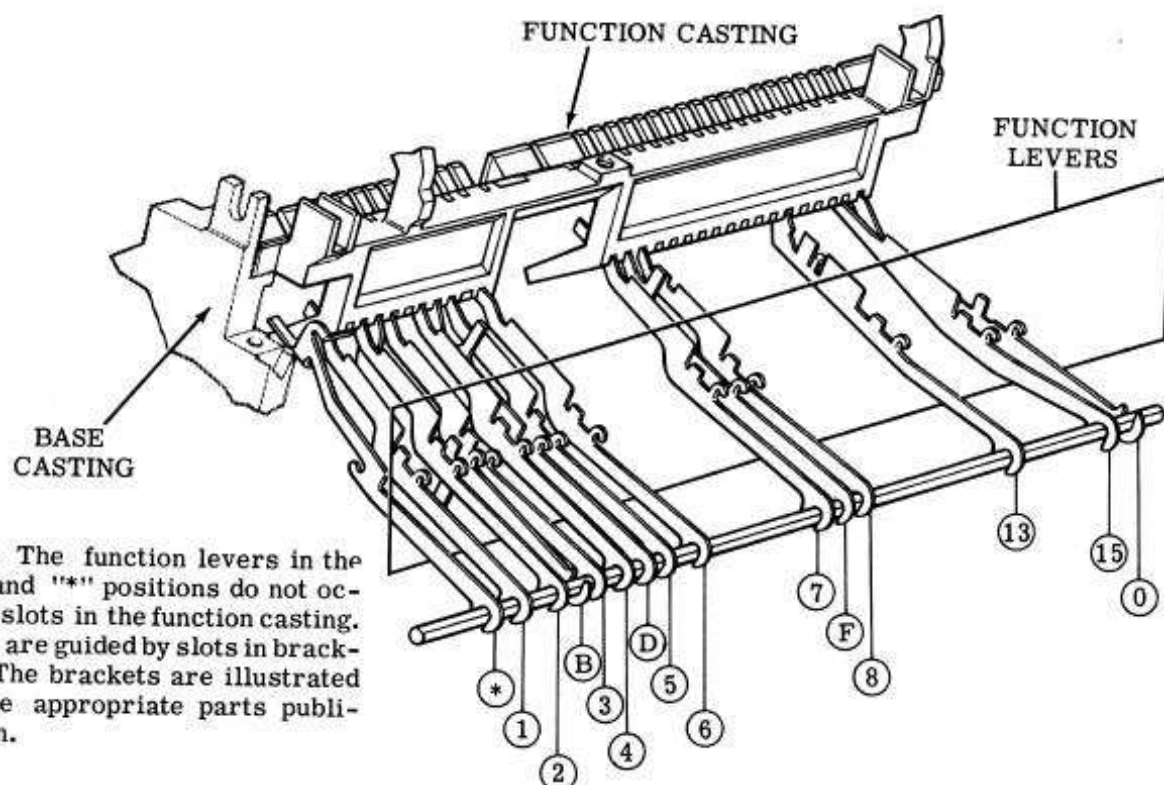
Figure 4 — Paper Alarm Control, Paper Feed, and Platen Drive Areas

Note: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. Where an adjustment procedure calls for disengagement, rotate the clutch to a stop position, apply a screwdriver to the associated stop-lug, and push the clutch disc in the normal direction of main shaft rotation until the corresponding latchlever seats in its clutch disc notch. As a reminder, the word "latched" follows instructions to disengage the clutches.

- 1.13 A clutch is engaged when a trip lever is moved up so that it no longer holds a shoe lever in its stop position. When this action occurs, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch shoes

wedge against the drum, so that when the shaft is turned, the clutch will turn in unison with it.

- 1.14 **Manual Operation:** To manually operate the typing unit, place it in the stop condition as instructed in 1.11 and 1.12 above. Momentarily permit the armature to move to its unattracted (rearward) position to trip the selector clutch. Slowly rotate the main shaft clockwise (as viewed from the left) until all push levers have moved under their respective selector levers. Using a spring hook, strip the push levers from under the selector levers corresponding to the spacing elements of the code combination to be set up. Then continue to rotate the main shaft until the proper condition is set up or the character is cleared through the typing unit.



Note: The function levers in the "1" and "*" positions do not occupy slots in the function casting. They are guided by slots in brackets. The brackets are illustrated in the appropriate parts publication.

FUNCTION LEVER CHART			
SLOT	FUNCTION LEVER	FOUND ON	
		32	33
*	LINE FEED BLOCKING	X	X
1	LINE FEED	X	X
2	CARRIAGE RETURN	X	X
B	CARRIAGE RETURN ACTUATING	X	X
3	SPACE	X	X
4	LETTERS SHIFT	X	
D	"LTRS"- "FIGS" SHIFT BLOCKING	X	
5	FIGURES SHIFT OR	X	
	PRINT SUPPRESS		X ^c
6	PRINT SUPPRESS	"TA" ONLY ^a	X ^b
7	SIGNAL BELL	X	X
F	END-OF-LINE BELL	X	X
8	PRINT SUPPRESS	"A" ONLY ^a	
13	END-OF-TRANSMISSION		X
15	ANSWER-BACK	X	X
0	ANSWER-BACK BLOCKING	X	X

a - Suppresses printing upon receipt, by selector, of the blank code combination.

b - Suppresses printing upon receipt, by selector, of any code combination in which the "6" and "7" levels are spacing.

c - Suppresses printing upon receipt, by selector, of any code combination in which the "3," "4," "5," "6," and "7" levels are marking.

Figure 5 — Function Lever Positions

1.15 On 32 typing units, the selector levers are numbered "1" through "5" from left to right. To set up the character "Y," for example, whose 5-level code combination is 1-3-5, strip the push levers from the "2" and "4" selector levers. On 33 typing units, the selector levers are numbered "1," "2," "3," "4," "5," "7," "6," and "8" from left to right. To set up the character "Y," for example, whose 8-level code combination is 1--45-78, strip the push levers from the "2," "3," and "6" selector levers.

1.16 To aid in locating the adjustments and spring tensions, the typing unit is divided into twelve areas. These areas are indicated in Figures 1 through 4 as follows:

<u>Area</u>	<u>Figure</u>
Carriage	2
Distributor	1
Function	3
Main Shaft	1
Motor	1
Selector	2
Spacing	2
Paper Feed (Friction Feed)	1
Paper Feed (Sprocket Feed)	4
Platen Drive	4
Answer-Back	3
Paper Alarm Control	4

1.17 **Function Lever Positions:** The function casting has two different types of slots—alpha and numeric—in which function levers may be positioned. In the numeric slots, function levers sense codebars and may be selected or blocked. If they are selected, they perform some mechanical function or operate an electrical contact. The alpha slots differ from the

numeric slots in that the codebars are not sensed by any function levers placed in these slots. Blocking levers or arms and drive levers are placed in alpha slots.

Note: Function levers for sensing codebars shall not be placed in any of the alpha slots.

The positions and functions of the more commonly used function levers and their slots are shown in Figure 5. Function levers found in slots other than those shown in Figure 5 merely indicate that additional features and functions are provided by the typing unit being viewed.

1.18 General Maintenance Principles:

(a) Lubrication instructions and intervals are given in the appropriate lubrication sections.

(b) To maintain the operational effectiveness of the equipment, it is recommended that certain parts be replaced at intervals based upon the speed and operating hours as indicated below:

<u>Operating Speed (Words per Minute)</u>	<u>Recommended Maintenance Overhaul Interval (Operating Hours*)</u>	<u>Estimated Service Life (Operating Hours*)</u>
60 or 66	2500	7500
100	1500	4500

*Typing Unit Operating Hours

The parts are available in overhaul maintenance kits listed in the appropriate parts publications.

2. BASIC UNITS

COMMON MECHANISMS

2.01 Motor Area

GEAR BRACKET—PRELIMINARY

Requirement

With head of motor pinion screw pointing upward and intermediate gear held stationary.

Min Some---Max 0.032 inch play at rim of fan.

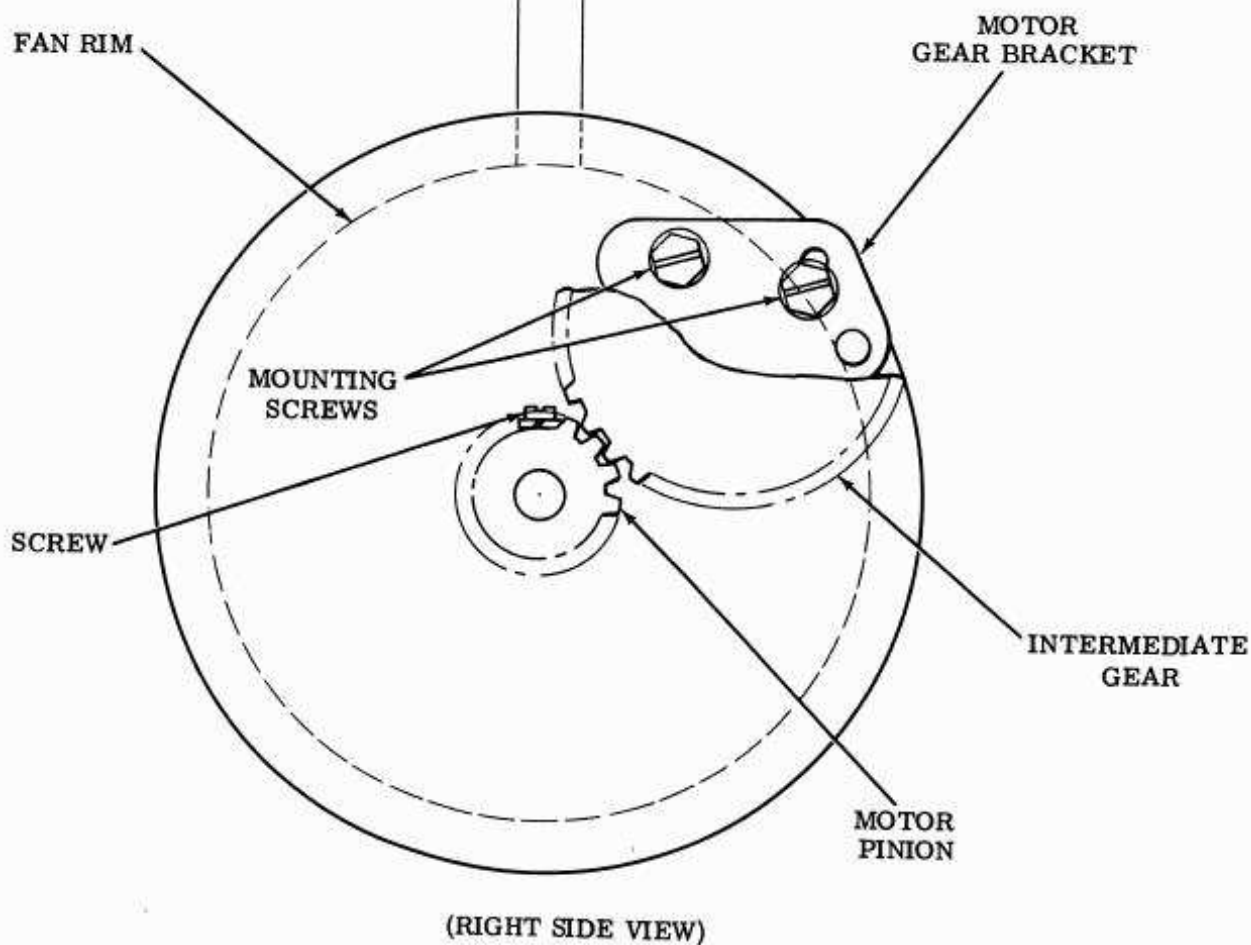
To adjust

Position motor gear bracket with mounting screws loosened.

Related Adjustment

Affects

BELT TENSION—PRELIMINARY (Motor Area)



2.02 Motor Area (continued)

BELT TENSION—PRELIMINARY

Requirement

Min 0.100 inch---Max 0.135 inch—
deflection at center of motor belt when
16 oz pressure is applied at center of belt.

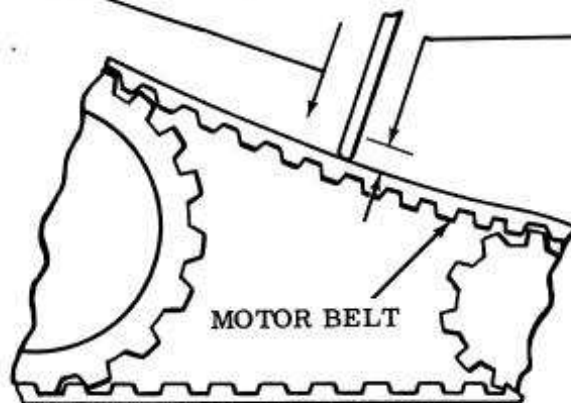
To Adjust

With four clampscrews loosened, rotate
motor in cradle.

Related Adjustment

Affected by

GEAR BRACKET—PRELIMINARY
(Motor Area)



MOTOR BELT

(RIGHT SIDE VIEW)

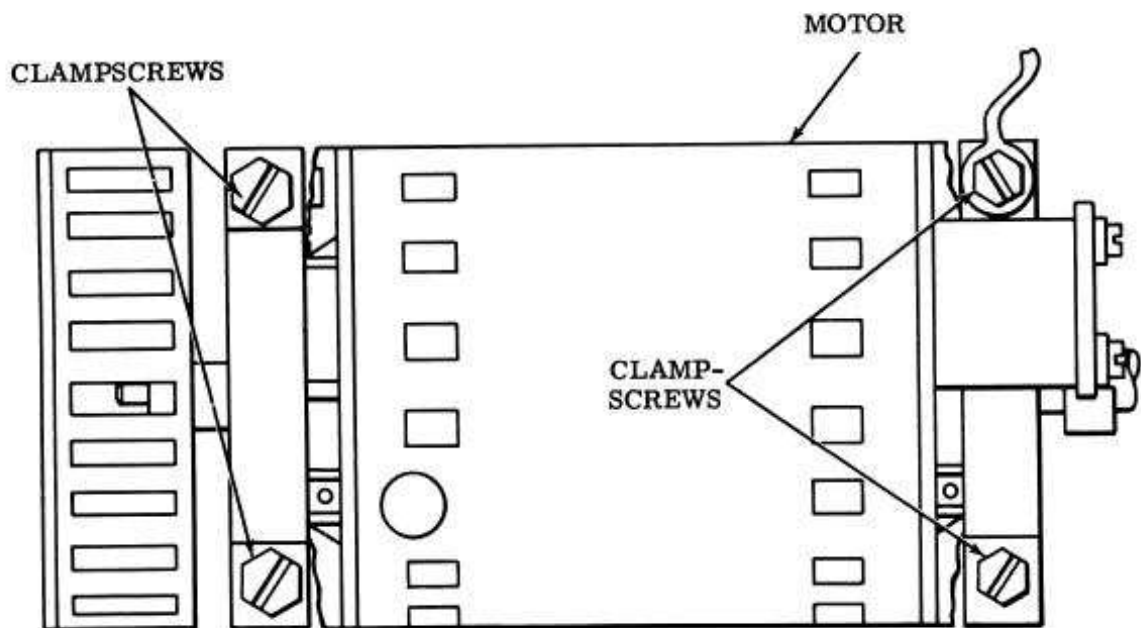
GEAR BRACKET AND BELT TENSION—FINAL

Requirement

The requirements specified in the GEAR BRACKET—PRELIMINARY (Motor Area) and the BELT TENSION—PRELIMINARY (Motor Area) adjustments shall be considered final if the RECEIVING MARGINS (Selector Area) adjustment requirements can be met.

To Adjust

If necessary, refine GEAR BRACKET—PRELIMINARY (Motor Area) and BELT TENSION—PRELIMINARY (Motor Area) adjustments.



(TOP VIEW)

2.03 Distributor Area

(B) LEFT BEARING

Requirement

As gauged by eye

Min Some---Max 0.012 inch
between left bearing and clutch
gear assembly.

To Adjust

Disengage (latch) distributor clutch.
Hold clutch gear assembly firmly to
right. Position left bearing with
clampscrews loosened.

Related Adjustments

Affected By

SHAFT (Distributor Area)

(A) SHAFT

Requirement

As gauged by eye

Min 0.010 inch---Max 0.060 inch
between brush holder and disc at
closest point.

To Adjust

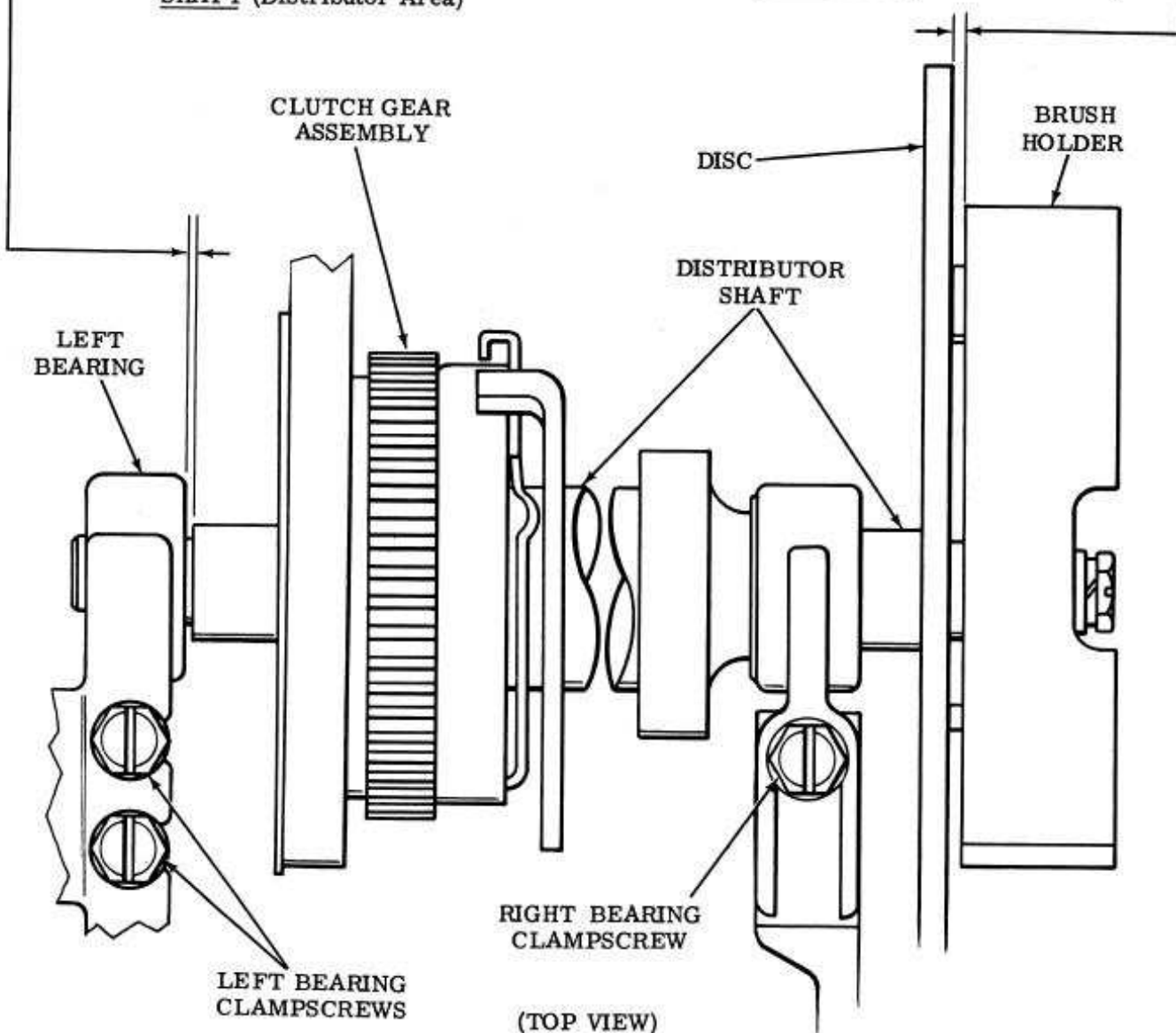
Position distributor shaft with three
bearing clampscrews loosened.
Tighten right, but not left, bearing
clampscrew.

Related Adjustments

Affects

LEFT BEARING (Distributor Area)

TRIP SHAFT (Distributor Area)



2.04 Distributor Area (continued)

TRIP SHAFT

(1) To Check

With distributor clutch in the stop position, take up and hold the play of the distributor shaft toward the left side of the typing unit. Take up play of latchlever toward right side of the typing unit and release.

Requirement

The latchlever shall engage the clutch disc
Min Full thickness _____
of clutch disc.

(2) To Check

With distributor clutch in the stop position, take up and hold the play of the distributor shaft toward the left side of the typing unit. Take up play of shoe lever toward the left side of the typing unit and release. Take up the play of the trip lever toward the right side of the typing unit and release.

Requirement

Trip lever shall engage shoe lever
Min Two-thirds width _____
of formed end of shoe lever.

Related Adjustment

Affected By
SHAFT (Distributor Area)

(3) To Check

Take up play on distributor shaft toward the right side of the typing unit and release. Take up play of shoe lever toward the right side of the typing unit and release. Take up play of trip lever toward the left side of the typing unit and release.

Requirement

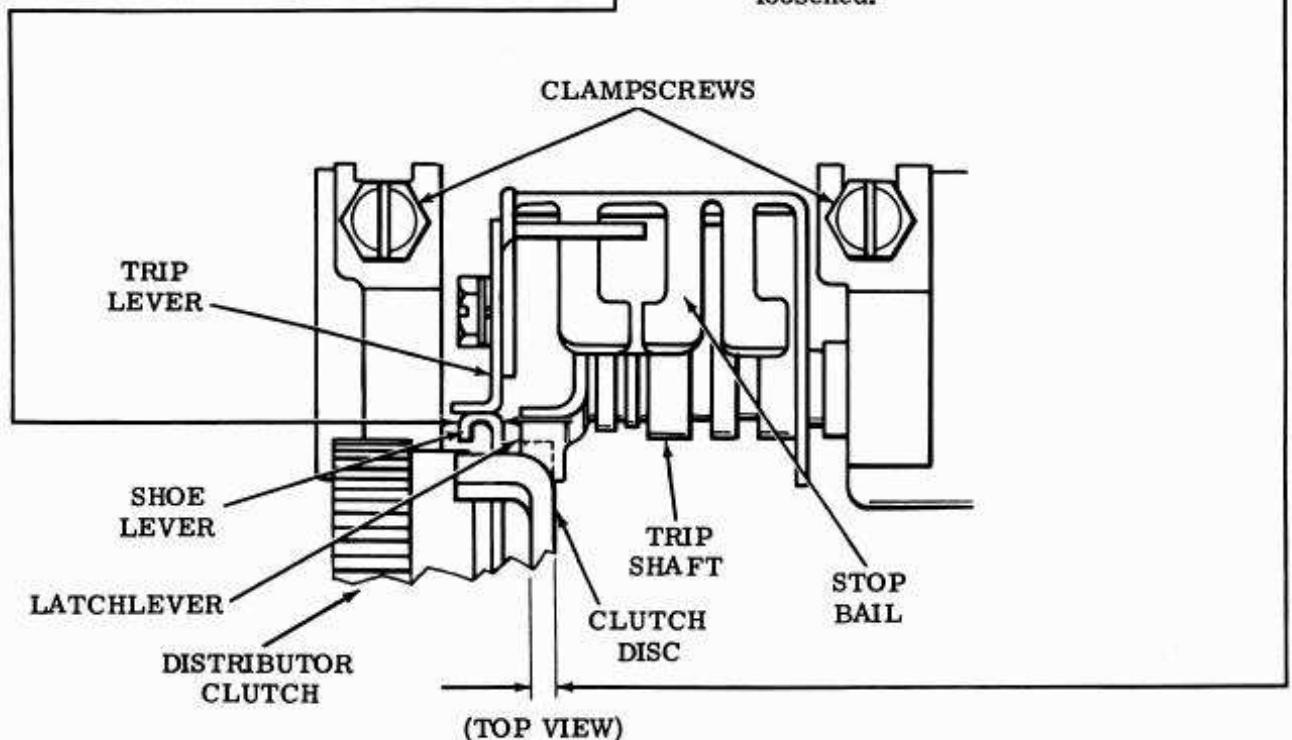
Trip lever shall engage shoe lever
Min Two-thirds width _____
of formed end of shoe lever.

(4) Requirement

Rear extension of control lever shall not bind in its slot in answer-back block.

To Adjust

Position trip shaft with clampscrews loosened.



2.05 Distributor Area (continued)

TRIP LEVER

To Check

Disengage (latch) distributor clutch. Make sure keyboard universal lever is in its down position. Measure and record clearance between shoe lever and stop-lug. Trip distributor clutch by moving trip lever rearward. Measure and record same clearance.

Requirement

- (1) With distributor clutch disengaged (latched)
Min 0.015 inch
between stop-lug and shoe lever.
- (2) Clearance between stop-lug and shoe lever
Min 0.050 inch---Max 0.080 inch
greater when distributor clutch is engaged than when disengaged.

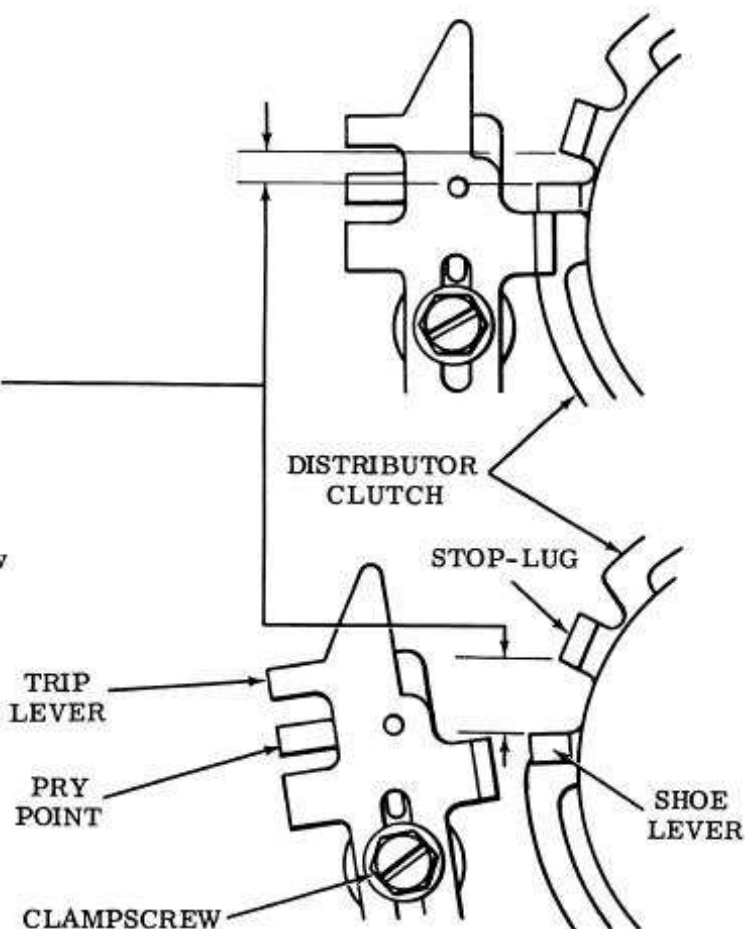
To Adjust

Remove answer-back drum. Using pry point, position trip lever with clampscrew loosened. Replace answer-back drum.

Related Adjustment

Affects

BRUSH HOLDER (Distributor Area)



(LEFT SIDE VIEW)

2.06 Distributor Area (continued)

BRUSH HOLDER

Requirement

With distributor clutch disengaged (latched), pointer shall be within locating mark.

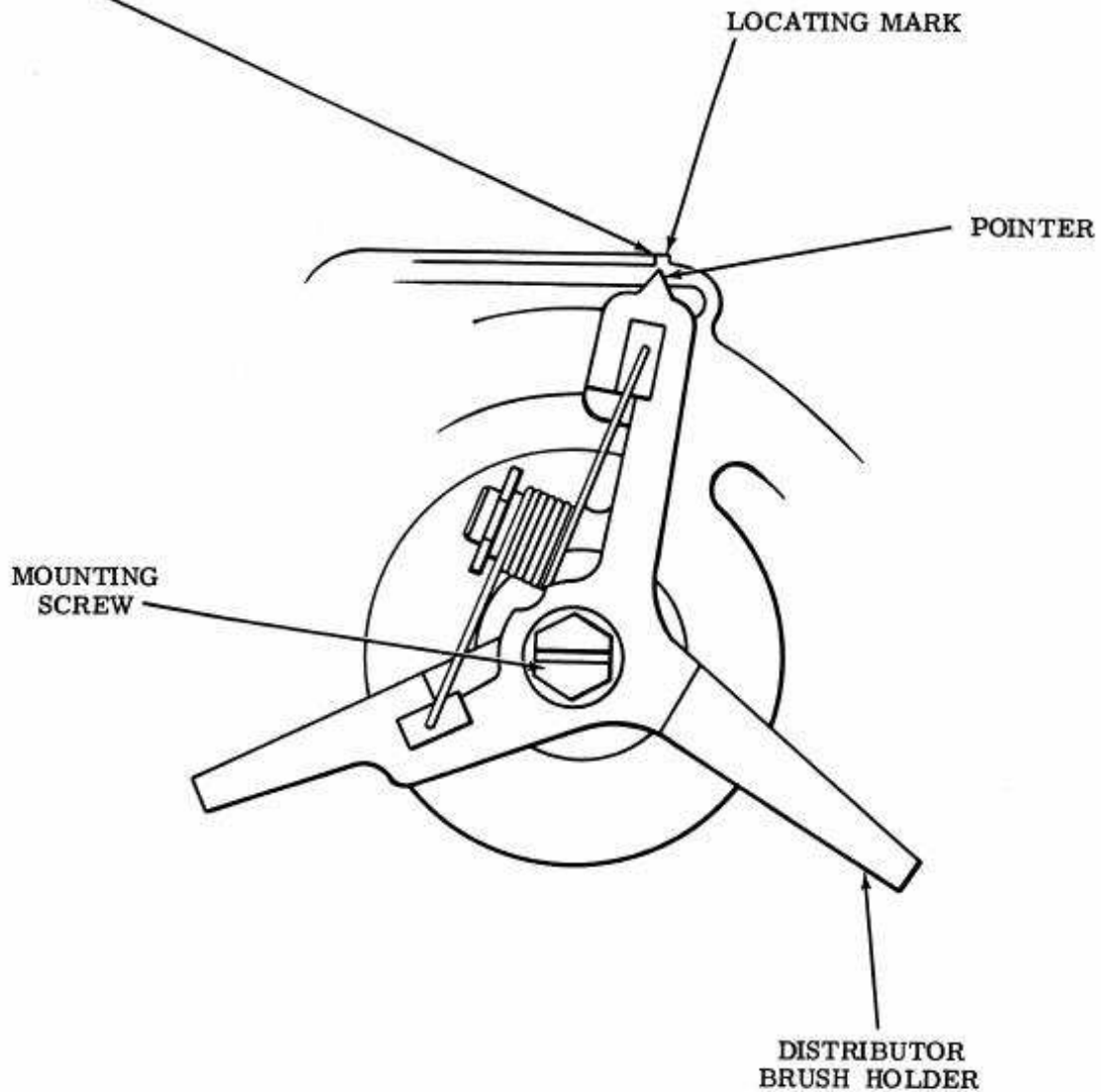
To Adjust

Position distributor brush holder with mounting screws loosened.

Related Adjustment

Affected By

TRIP LEVER (Distributor Area)



(RIGHT SIDE VIEW)

2.07 Main Shaft Area and Selector Area

LEFT BEARINGRequirement

The start cam follower, selector levers, and spacing lock lever shall fully engage their cams when cam sleeve is in contact with the left bearing, and the left side of the left bearing shall protrude beyond selector side plate.

To Adjust

With left bearing clampscrews loosened, position left bearing.

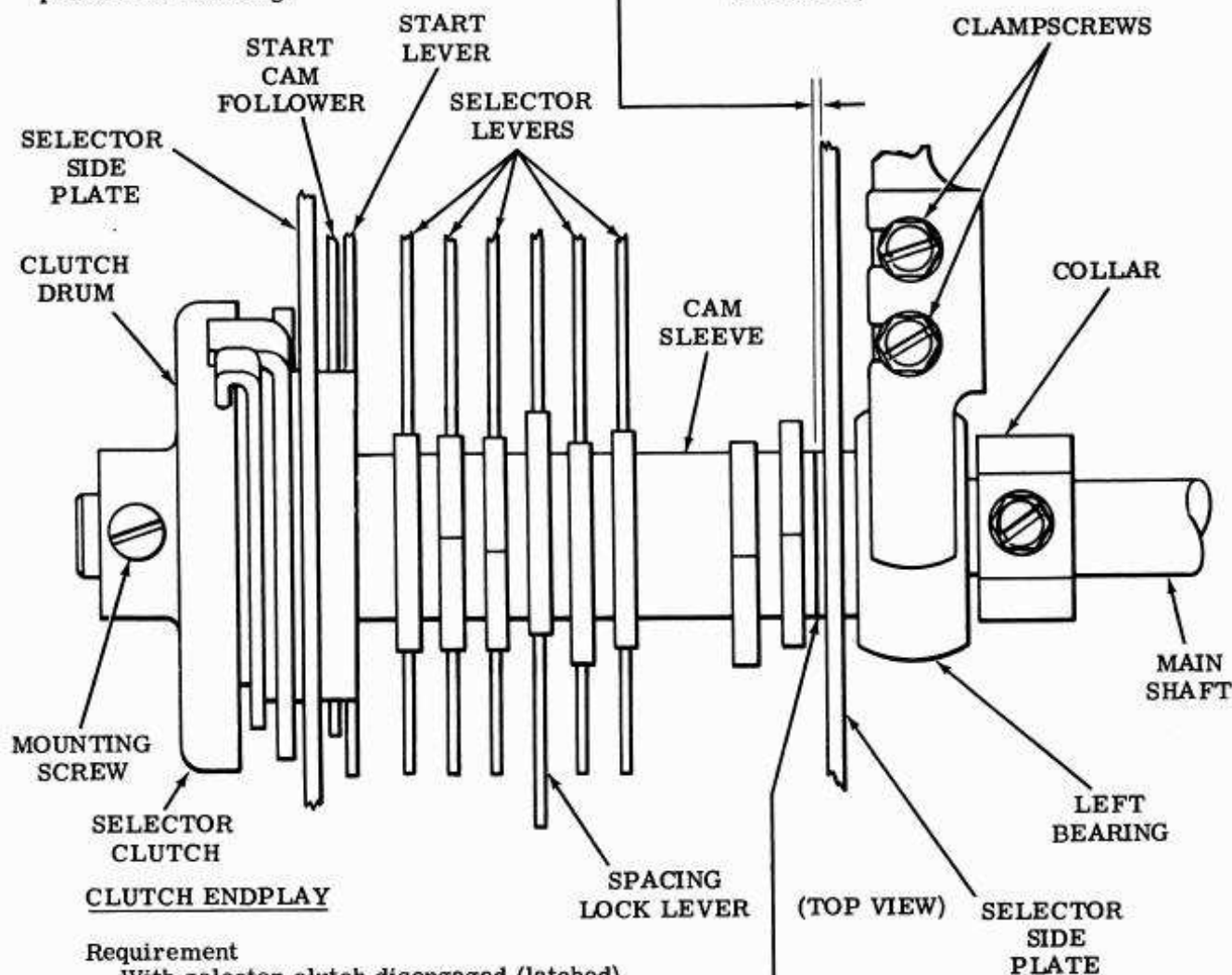
Note: If a complete readjustment of typing unit is undertaken, loosen all set screws on main shaft except for one in collar to right of left bearing.

Related AdjustmentsAffects

FUNCTION CLUTCH—PRELIMINARY
(Main Shaft Area)

DRIVEN GEAR (Main Shaft Area)

CODEBAR CLUTCH TRIP LEVER (Main Shaft Area)

Requirement

With selector clutch disengaged (latched), there shall be

Min 0.002 inch---Max 0.012 inch
endplay in the selector clutch.

To Adjust

With the selector clutch drum mounting screw friction tight, position the clutch drum in its oversize hole.

2.08 Main Shaft Area

FUNCTION CLUTCH ENDPLAY**Requirement**

With function clutch disengaged (latched)

Min Some---Max 0.015 inch endplay in function clutch, as gauged by eye, when all play is taken up to make it maximum.

To Adjust

Position function clutch with mounting screw loosened.

Related Adjustments**Affects**

CODEBAR CLUTCH
(Main Shaft Area)

Affected By

FUNCTION CLUTCH — PRELIMINARY (Main Shaft Area)

** Common Mechanisms

Note: Make this adjustment only when a complete adjustment of the typing unit is being undertaken.

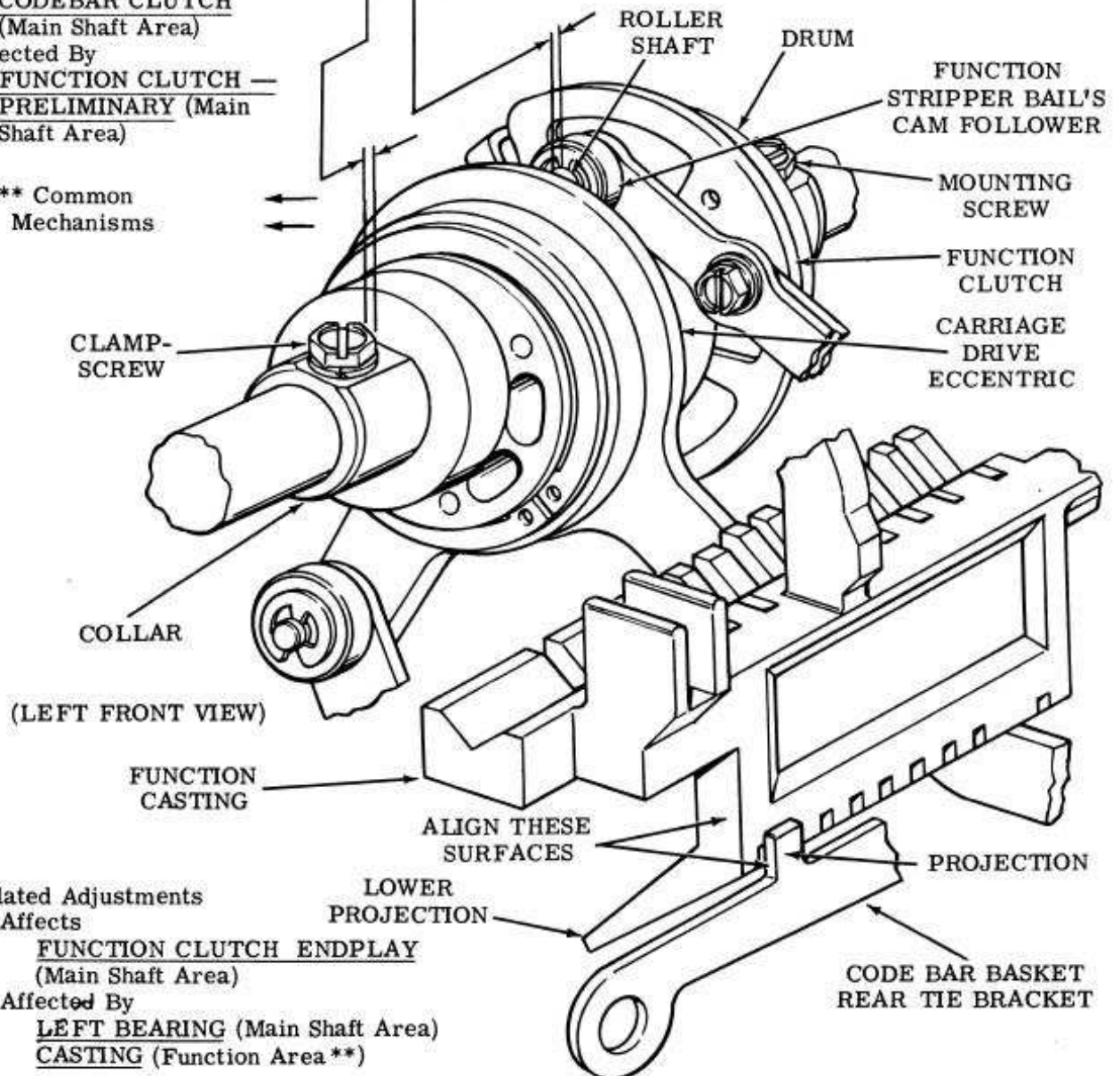
FUNCTION CLUTCH—PRELIMINARY ***Requirement**

As gauged by eye, clearance between carriage drive eccentric and the end of function stripper bail cam follower

Min 0.020 inch---Max 0.040 inch when all play is taken up to make clearance minimum.

To Adjust

With function casting clampscrews friction tight, line up left side of lower portion of function casting with left side of lower projection from codebar basket rear tie bracket by moving the function casting. Loosen clamp-screw in the collar and position function clutch.



2.09 Main Shaft Area (continued)

CODEBAR CLUTCH

Requirement

With codebar clutch disengaged (latched)

Min Some --- Max 0.015 inch
endplay in codebar clutch, as gauged by eye, when play
is taken up to make clearance maximum.

To Adjust

Position codebar clutch with codebar clutch mounting
screw loosened.

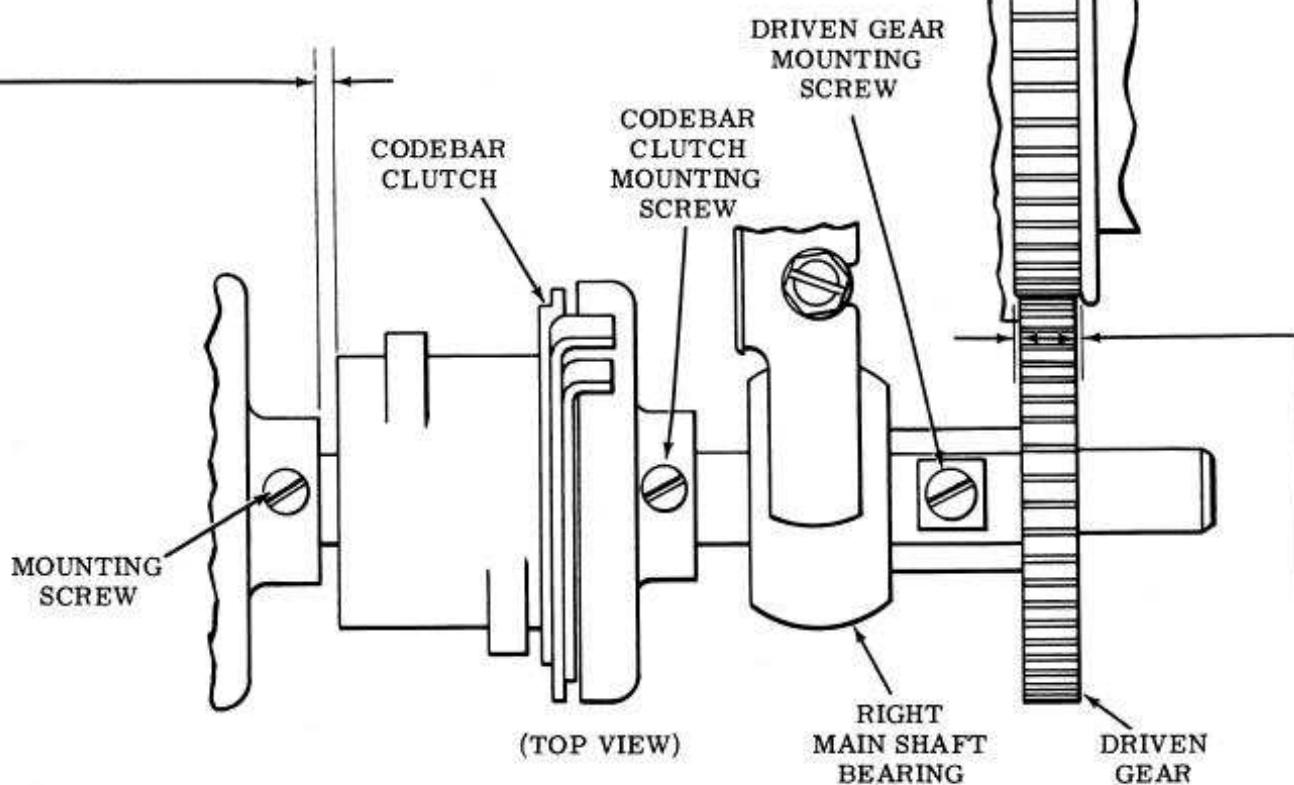
Related Adjustments

Affects

CODEBAR CLUTCH TRIP LEVER (Main Shaft Area)

Affected By

FUNCTION CLUTCH ENDPLAY (Main Shaft Area)



DRIVEN GEAR

Requirement

As gauged by eye, driven gear centered on drive gear.

To Adjust

Position driven gear with driven gear mounting
screw loosened.

Related Adjustments

Affected By

SHAFT (Distributor Area)

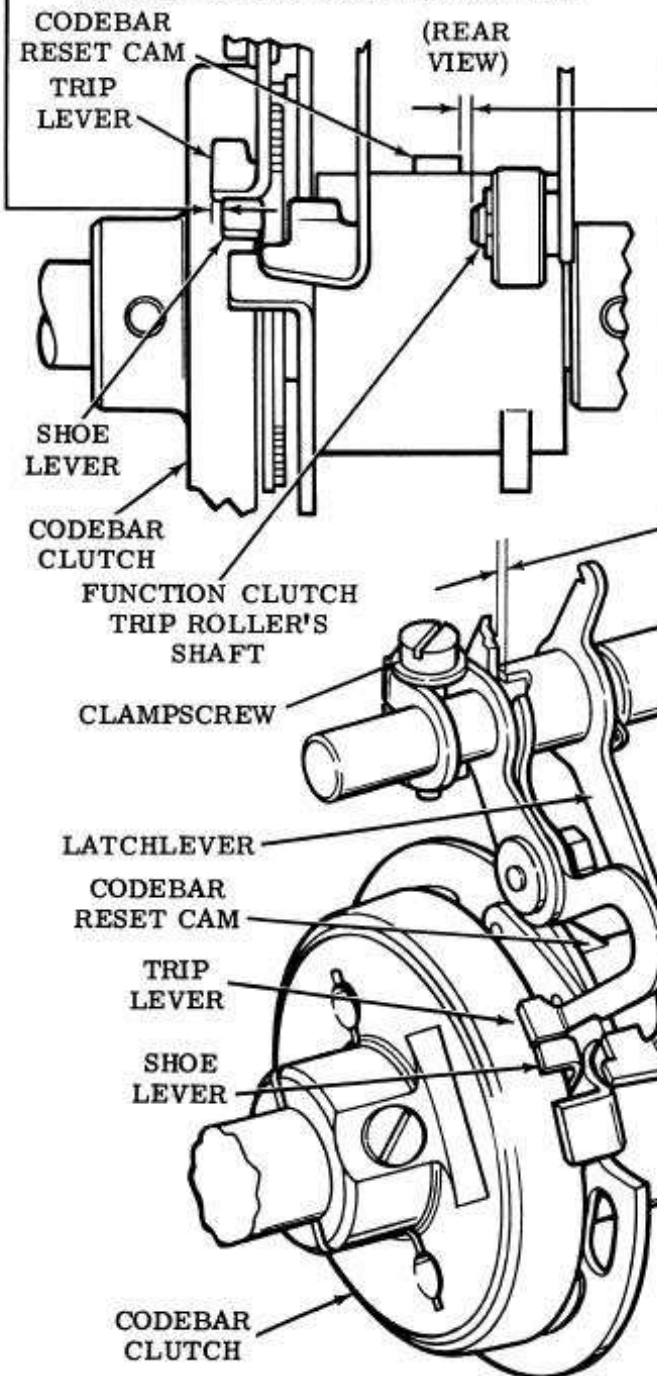
LEFT BEARING (Distributor Area)

2.10 Main Shaft Area (continued)

CODEBAR CLUTCH TRIP LEVER

Requirement

- (1) As gauged by eye, codebar clutch trip lever approximately aligned with shoe lever within 0.030 inch.
- (2) Min 0.005 inch between function clutch trip roller's shaft and codebar reset cam when all play is taken up to make clearance minimum.



To Adjust

Position trip lever with clampscrew loosened.

Note: It may also be necessary to loosen set screw in collar.

Related Adjustments

Affects

LATCHLEVERS (Main Shaft Area)
CODEBAR CLUTCH FOLLOWER ARM (Main Shaft Area)

Affected By

LEFT BEARING (Main Shaft Area)
CODEBAR CLUTCH (Main Shaft Area)

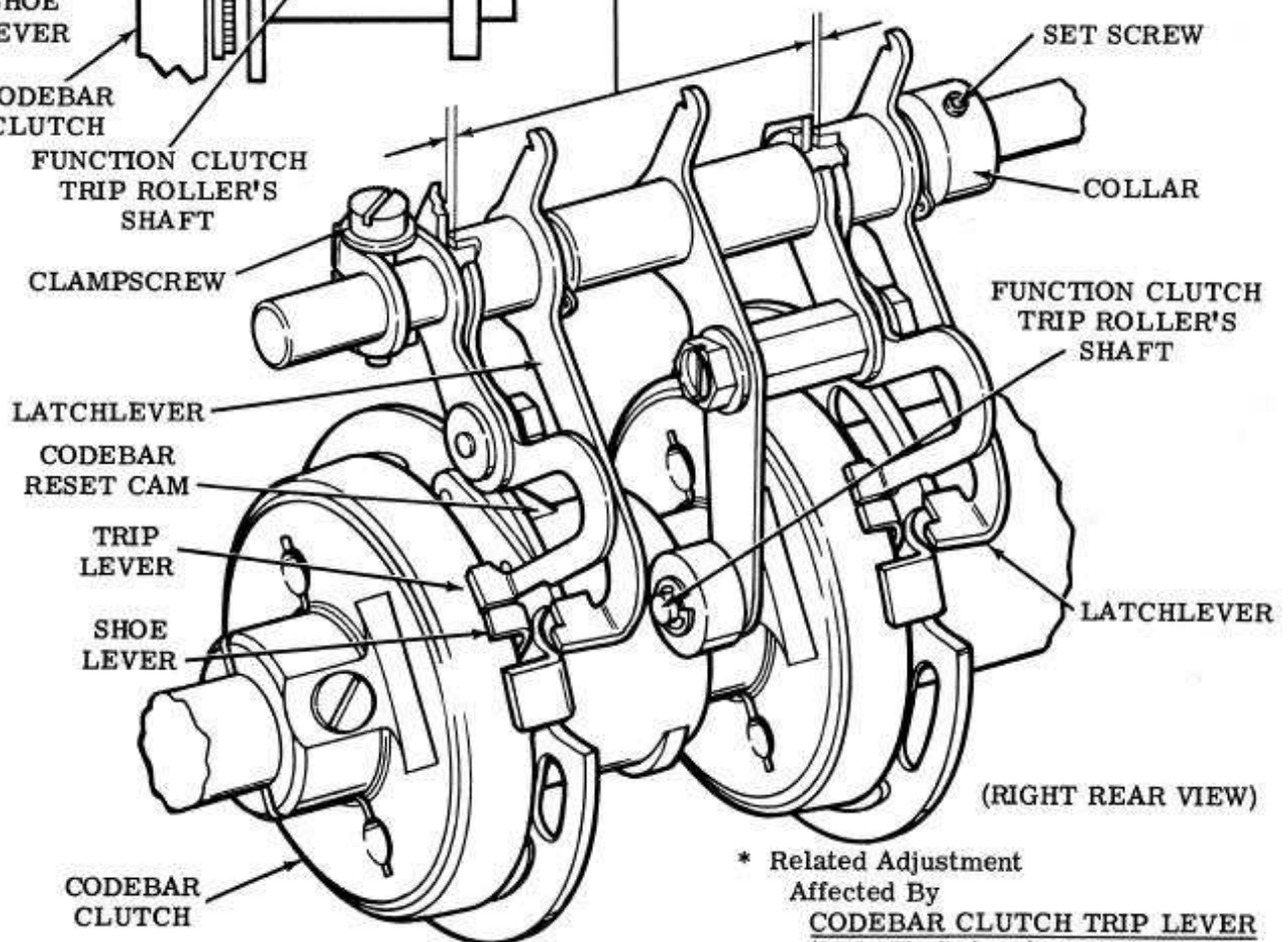
LATCHLEVERS *

Requirement

Min Some---Max 0.012 inch endplay in latchlevers, as gauged by eye.

To Adjust

Position collar with set screw loosened.

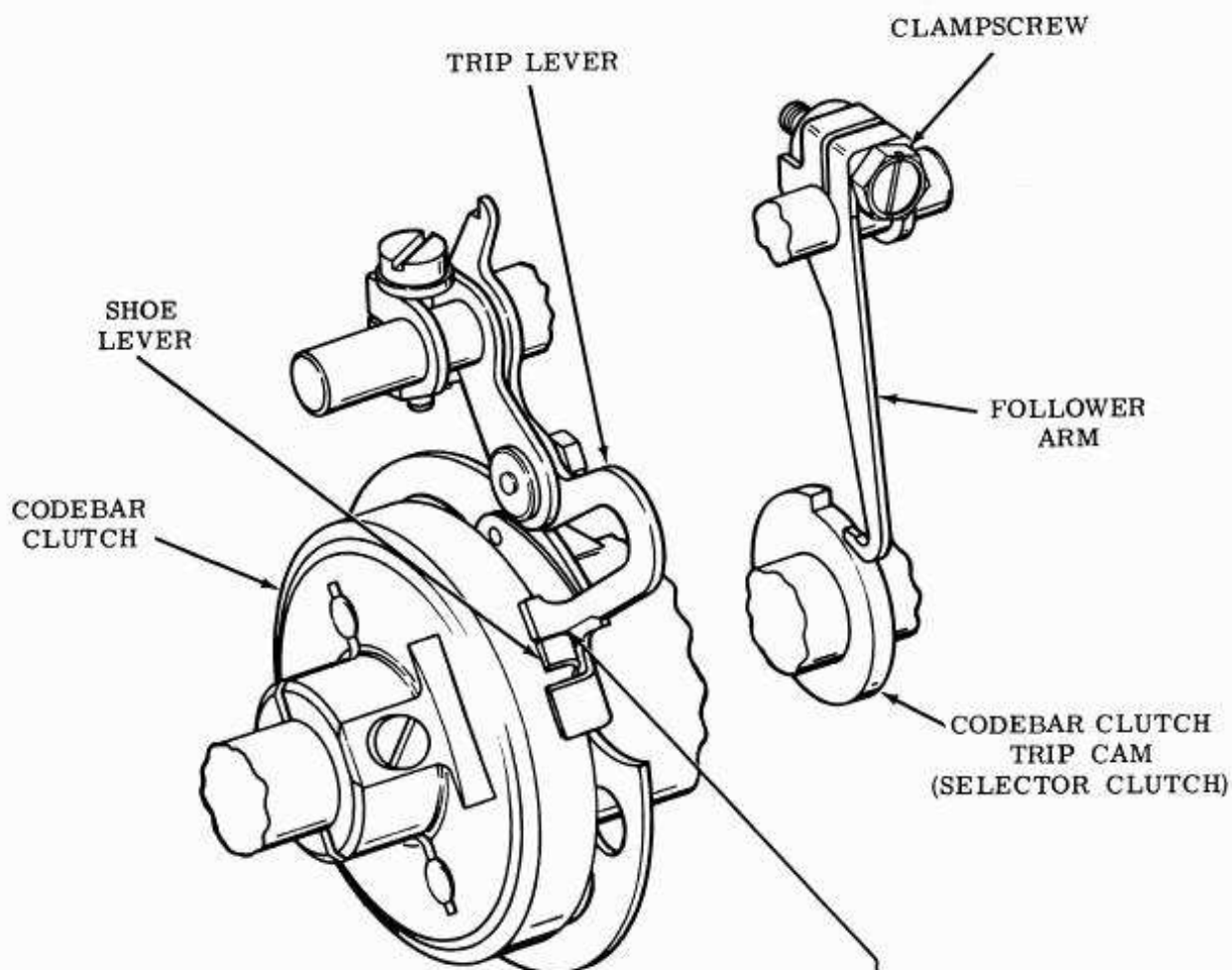


* Related Adjustment

Affected By

CODEBAR CLUTCH TRIP LEVER (Main Shaft Area)

2.11 Main Shaft Area (continued)



(RIGHT REAR VIEW)

CODEBAR CLUTCH FOLLOWER ARM

Requirement

With typing unit in stop condition, trip lever shall engage shoe lever by approximately full thickness of shoe lever, as gauged by eye.

To Adjust

Position codebar clutch trip cam follower arm with its clampscrew loosened.

Note: Make sure follower arm is at center of codebar clutch trip cam.

Related Adjustment

Affected By

CODEBAR CLUTCH TRIP LEVER (Main Shaft Area)

2.12 Main Shaft Area (continued)

TRIP LEVER SPRINGS

Note: Check for both codebar and function clutches.

Requirement

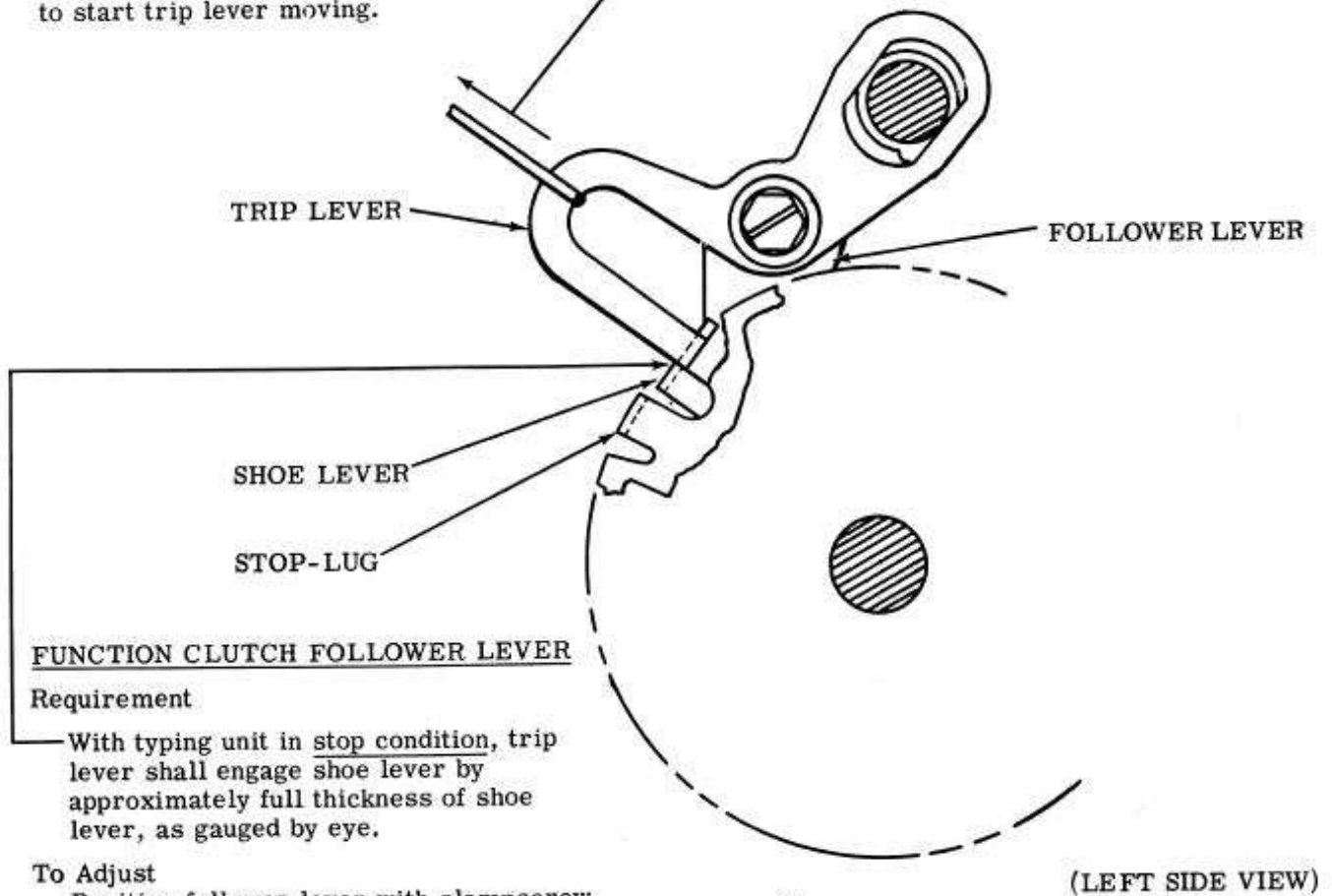
With clutch engaged, codebar clutch:

Min 6 oz --- Max 12 oz

function clutch:

Min 2 oz --- Max 4 oz

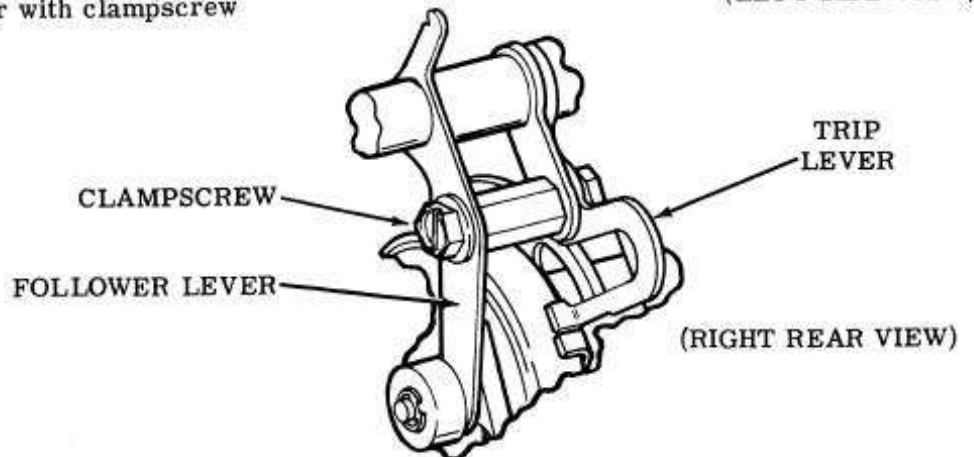
to start trip lever moving.

FUNCTION CLUTCH FOLLOWER LEVERRequirement

With typing unit in stop condition, trip lever shall engage shoe lever by approximately full thickness of shoe lever, as gauged by eye.

To Adjust

Position follower lever with clampscrew loosened.



2.13 Main Shaft Area (continued)

Note 1: Make this adjustment for both function and codebar clutches.

CODEBAR AND FUNCTION CLUTCH TRIP LEVERS

- (1) To Check
Disengage (latch) clutch.

Requirement

Min 0.015 inch —
between shoe lever and stop-lug.

- (2) To Check
With the clutch disengaged (latched), trip clutch by lifting trip lever, permitting trip lever to come to rest on shoe lever.

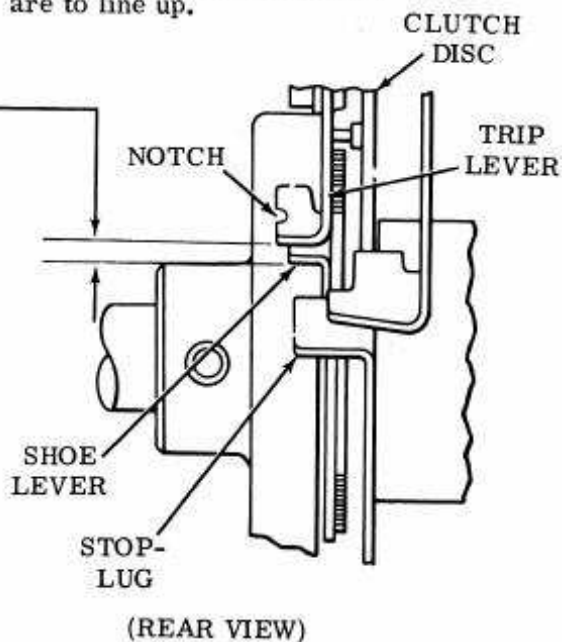
Requirement

Min 0.055 inch---Max 0.085 inch
between edge of trip lever and edge of shoe lever.

To Adjust

With clampscrew loosened, lengthen or shorten trip lever clearance to meet requirement.

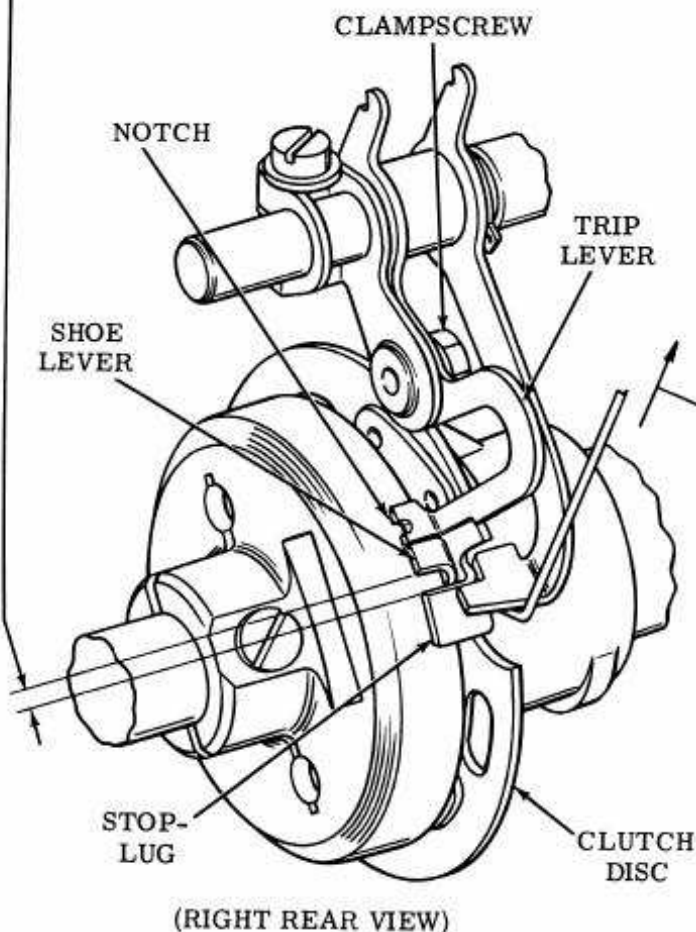
Note 2: On typing units with either a scribed line or a notch on the trip lever, gauge by eye the alignment of the scribed line or notch and the front edge of the shoe lever. They are to line up.



LATCHLEVER SPRINGS

Requirement

With latchlever resting on high portion of clutch disc
Min 2 oz---Max 3 oz —
to start latchlever moving.



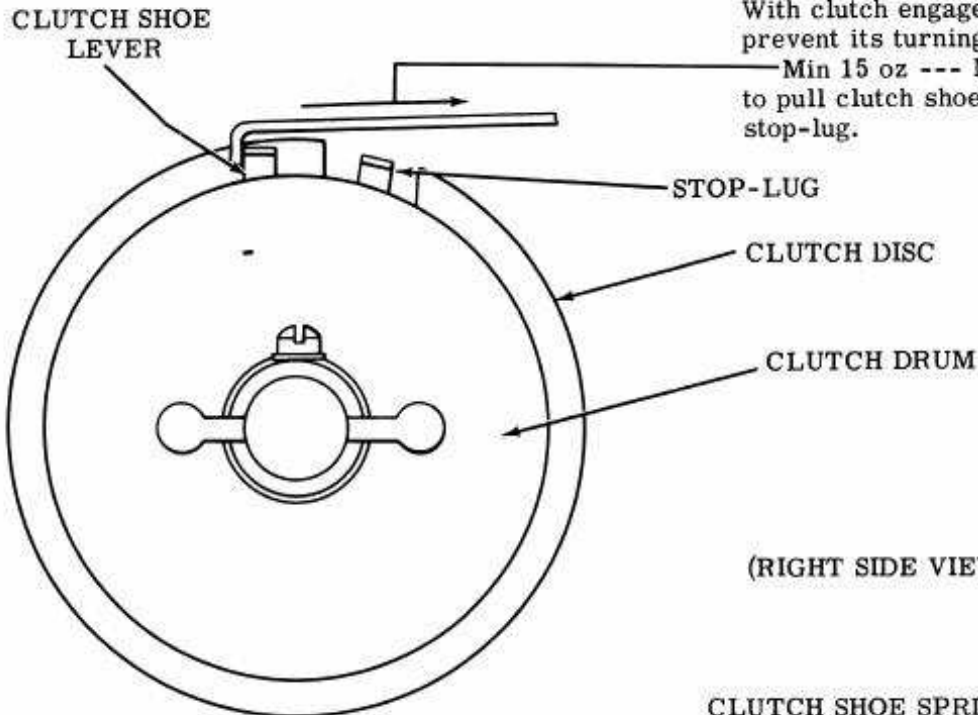
2.14 Main Shaft Area (continued)

Note 1: These tensions apply to all clutches.

CLUTCH SHOE LEVER SPRINGRequirement

With clutch engaged and clutch disc held to prevent its turning

Min 15 oz --- Max 20 oz
to pull clutch shoe lever into contact with stop-lug.



(RIGHT SIDE VIEW)

CLUTCH SHOE SPRING

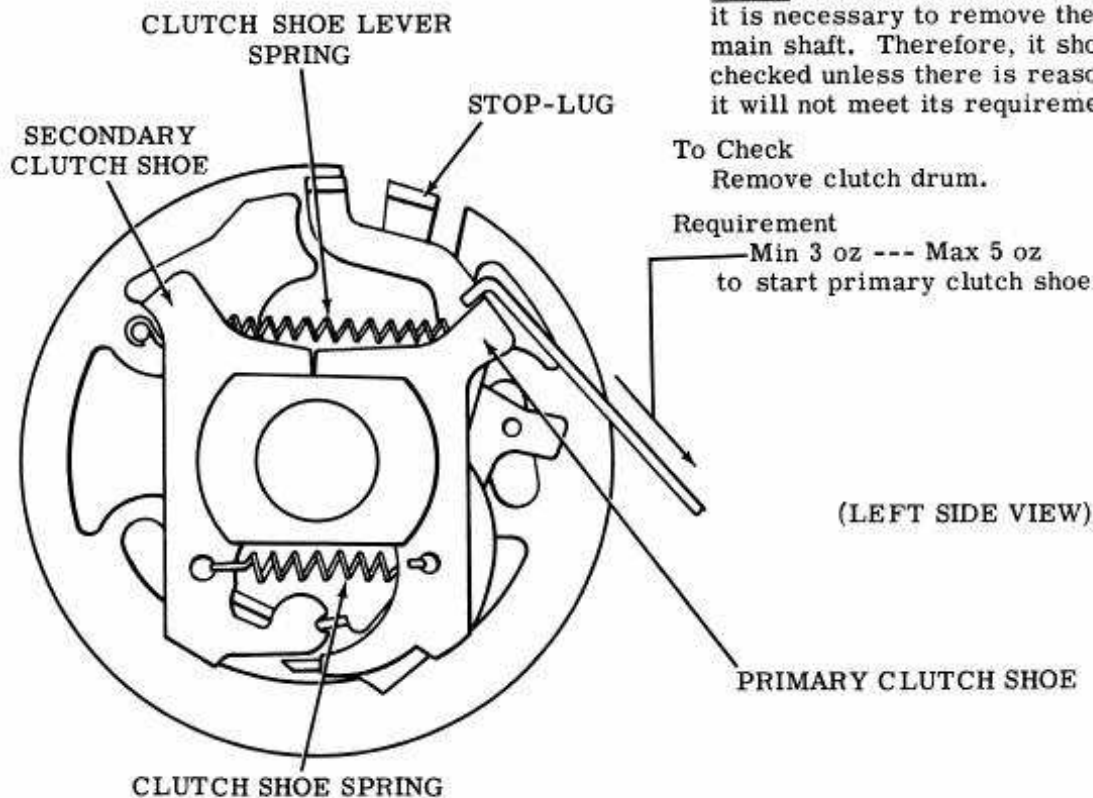
Note 2: In order to check this spring tension, it is necessary to remove the clutch from the main shaft. Therefore, it should not be checked unless there is reason to believe it will not meet its requirement.

To Check

Remove clutch drum.

Requirement

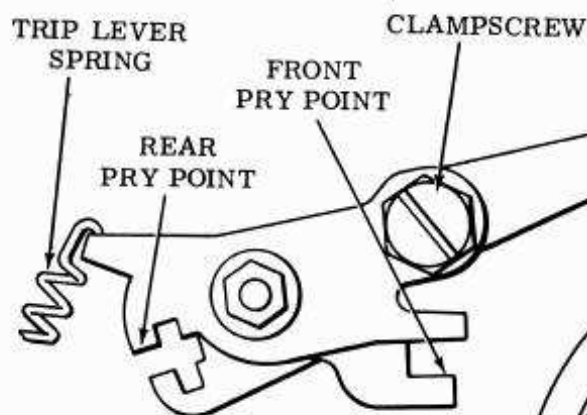
Min 3 oz --- Max 5 oz
to start primary clutch shoe moving.



(LEFT SIDE VIEW)

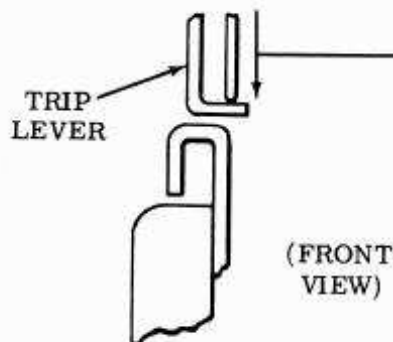
2.15 Selector Area (continued)

(RIGHT SIDE VIEW)

TRIP LEVER SPRINGRequirement

With typing unit in stop condition and shoe lever held away from trip lever
Min 6 oz---Max 7-3/4 oz
to start trip lever moving.

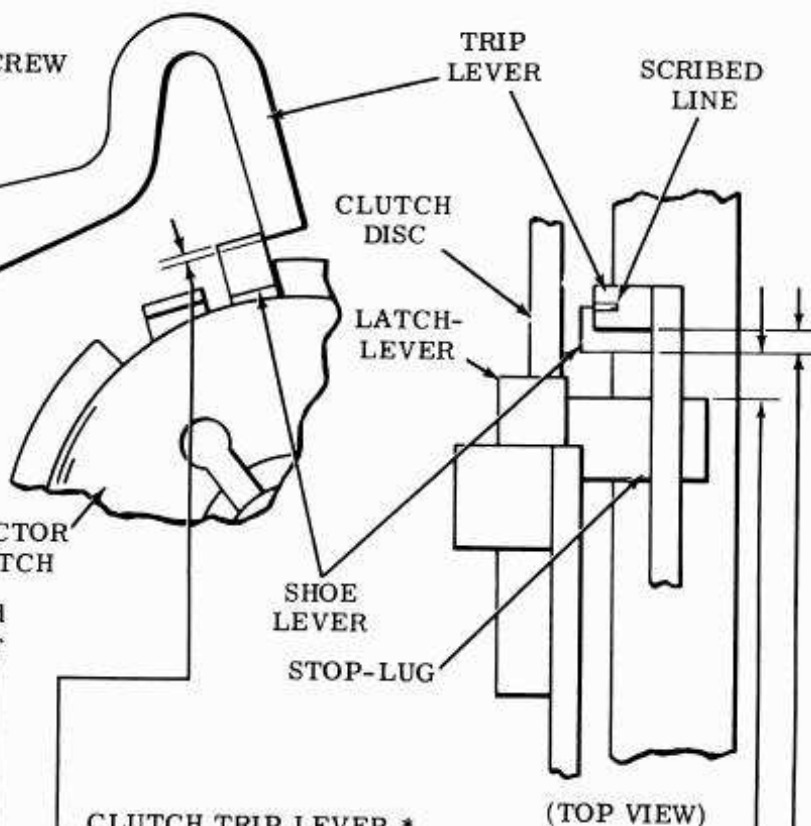
Note 1: Start lever and latchlever springs also influence this spring tension. Check them individually if above requirement is not met. If they meet requirements, replace trip lever spring.



* Related Adjustments
Affects

MAGNET CORE (Selector Area)
ARMATURE BRACKET (Selector Area)

Note 2: On typing units with either a scribed line or a notch on the trip lever, gauge by eye the alignment of the scribed line or notch and the front edge of the shoe lever. They are to line up.

CLUTCH TRIP LEVER *

(TOP VIEW)

- (1) To Check
Disengage (latch) selector clutch.

Requirement

— Trip lever shall engage shoe lever by approximately the full thickness of the shoe lever.

- (2) To Check
Disengage (latch) selector clutch.

Requirement

Min 0.015 inch
— between shoe lever and stop-lug.

- (3) To Check
With selector clutch disengaged (latched), trip clutch by lifting trip lever and permitting the trip lever to come to rest on the shoe lever.

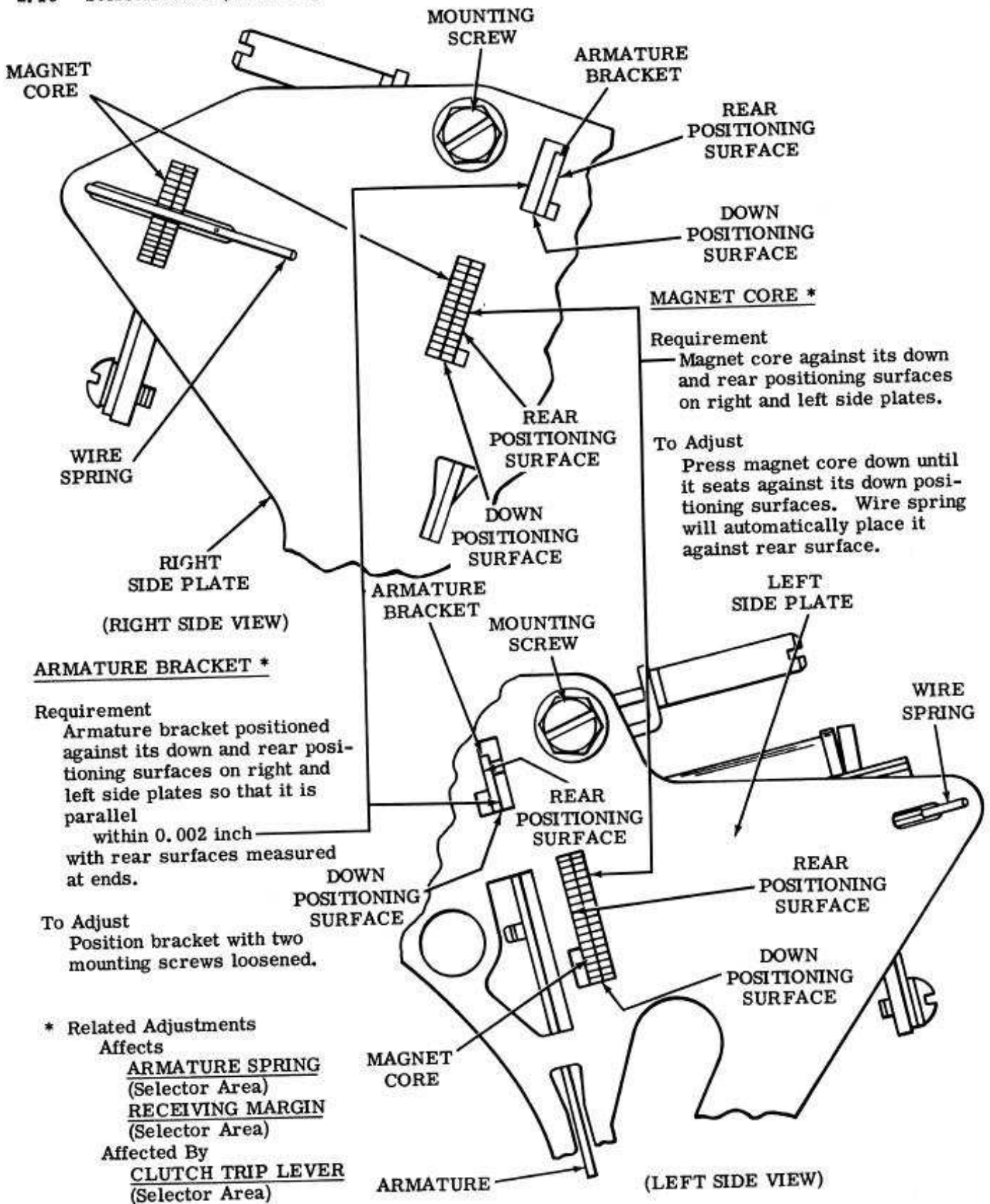
Requirement

Min 0.055 inch---Max 0.085 inch
— between edge of trip lever and edge of shoe lever.

To Adjust

With clampscrew friction tight, position trip lever using front and/or rear pry points.

2.16 Selector Area (continued)



2.17 Selector Area (continued)

ARMATURE SPRING

To Check

Place typing unit in stop condition and carriage near right margin.
Hold start lever away from armature.

Requirement

Min 3 oz --- Max 3-1/2 oz _____
to start armature moving.

To Adjust

Rotate adjusting nut clockwise to increase armature spring tension and
counterclockwise to decrease it.

Related Adjustments

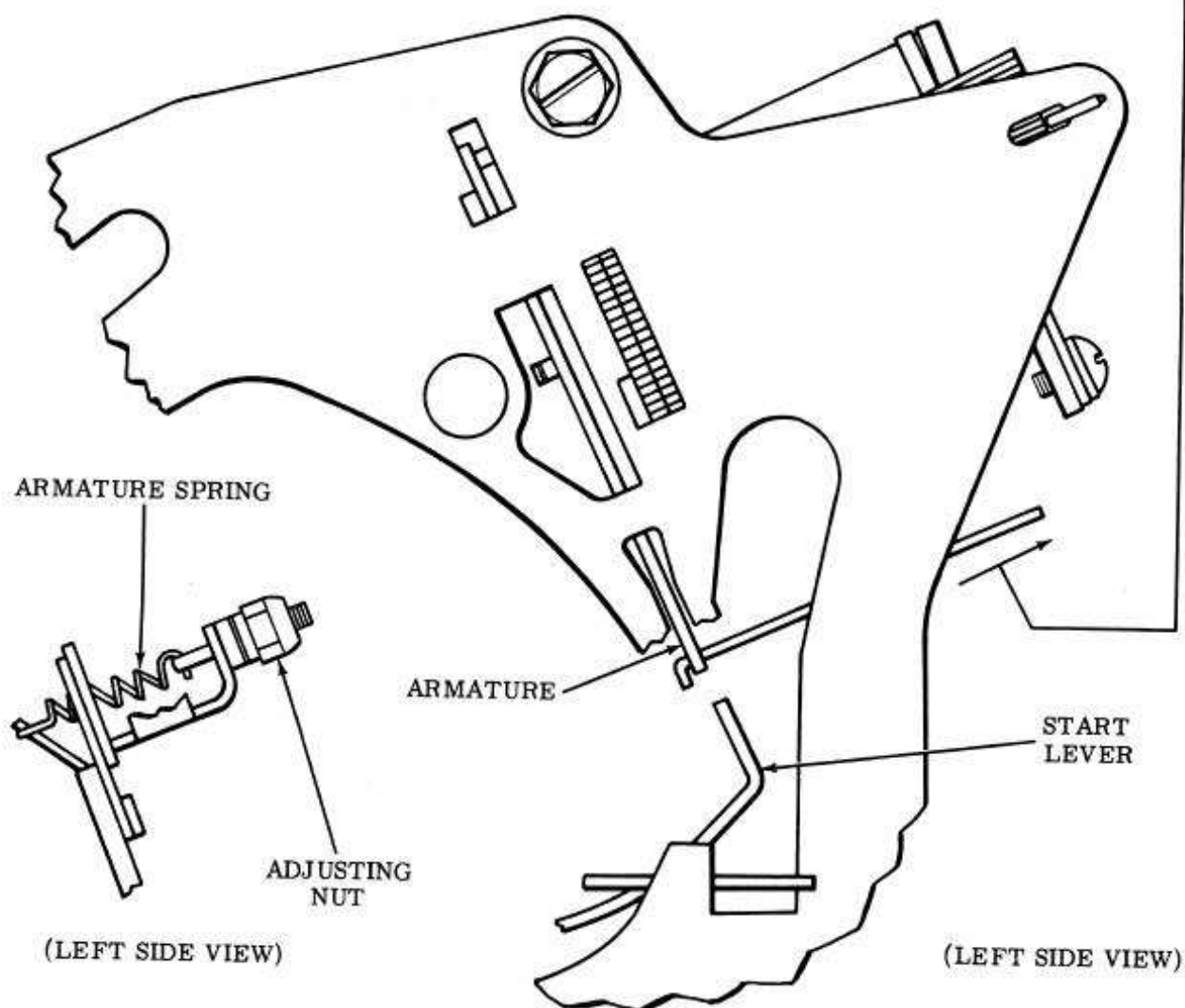
Affects

RECEIVING MARGINS (Selector Area)

Affected By

MAGNET CORE (Selector Area)

ARMATURE BRACKET (Selector Area)

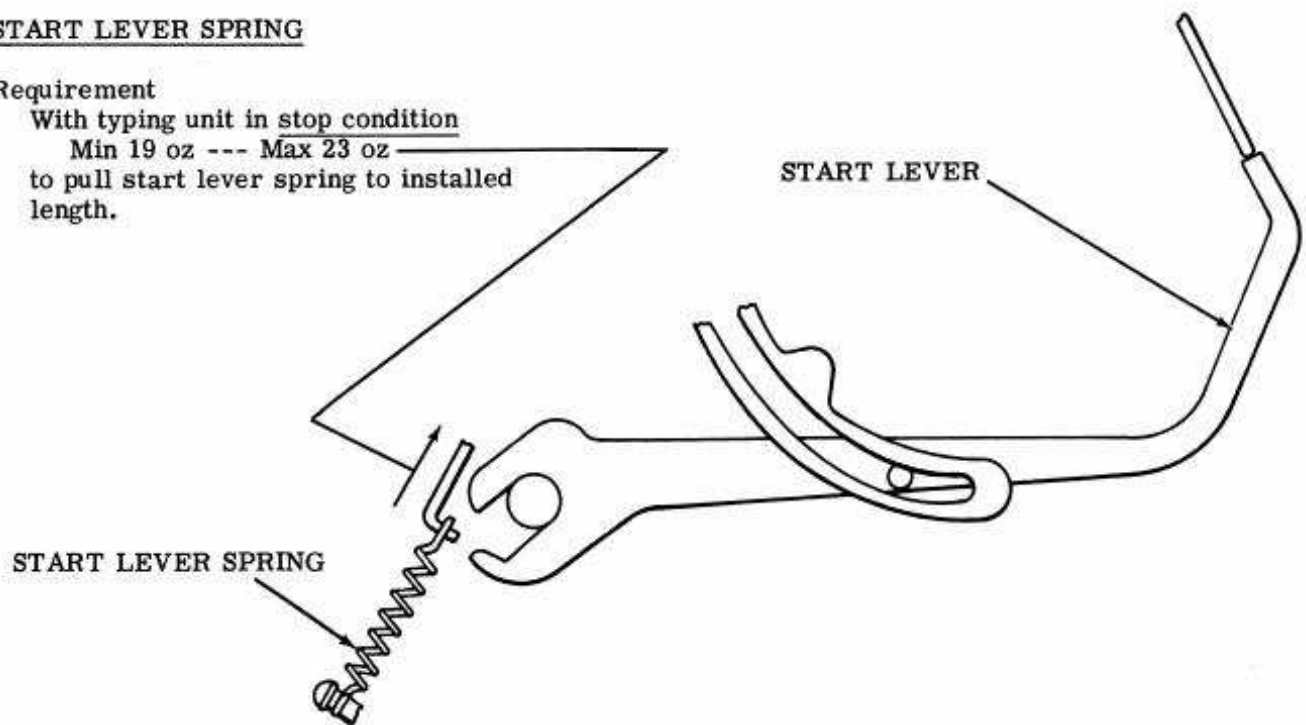


2.18 Selector Area (continued)

START LEVER SPRING

Requirement

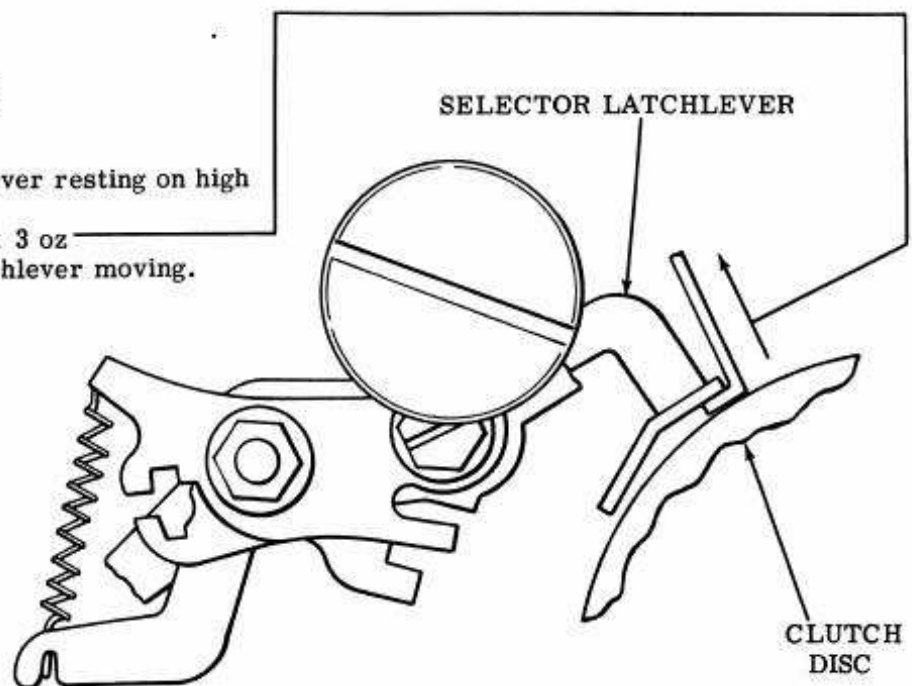
With typing unit in stop condition

Min 19 oz --- Max 23 oz
to pull start lever spring to installed
length.

(LEFT SIDE VIEW)

LATCHLEVER SPRING

Requirement

With selector latchlever resting on high
part of clutch discMin 2 oz --- Max 3 oz
to start selector latchlever moving.

(LEFT SIDE VIEW)

2.19 Selector Area (continued)

SELECTOR LEVER SPRINGS

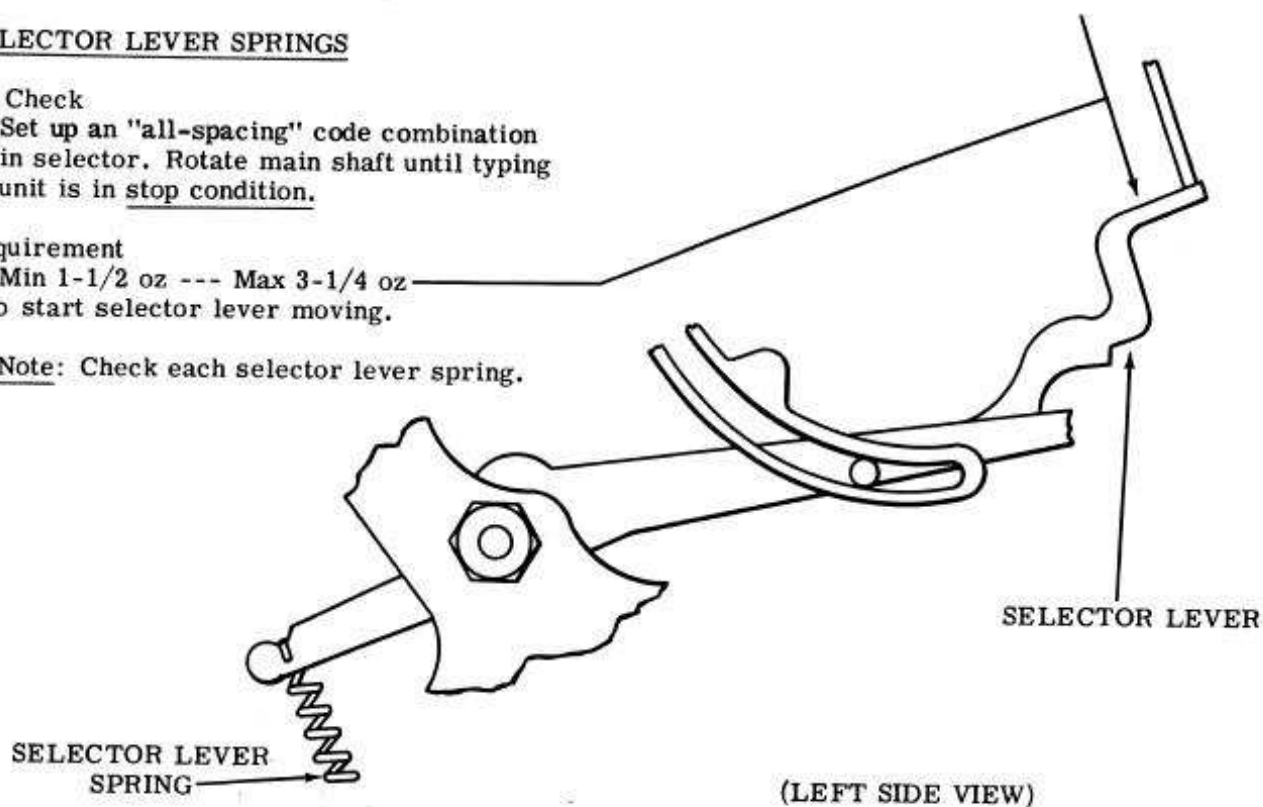
To Check

Set up an "all-spacing" code combination in selector. Rotate main shaft until typing unit is in stop condition.

Requirement

Min 1-1/2 oz --- Max 3-1/4 oz
to start selector lever moving.

Note: Check each selector lever spring.



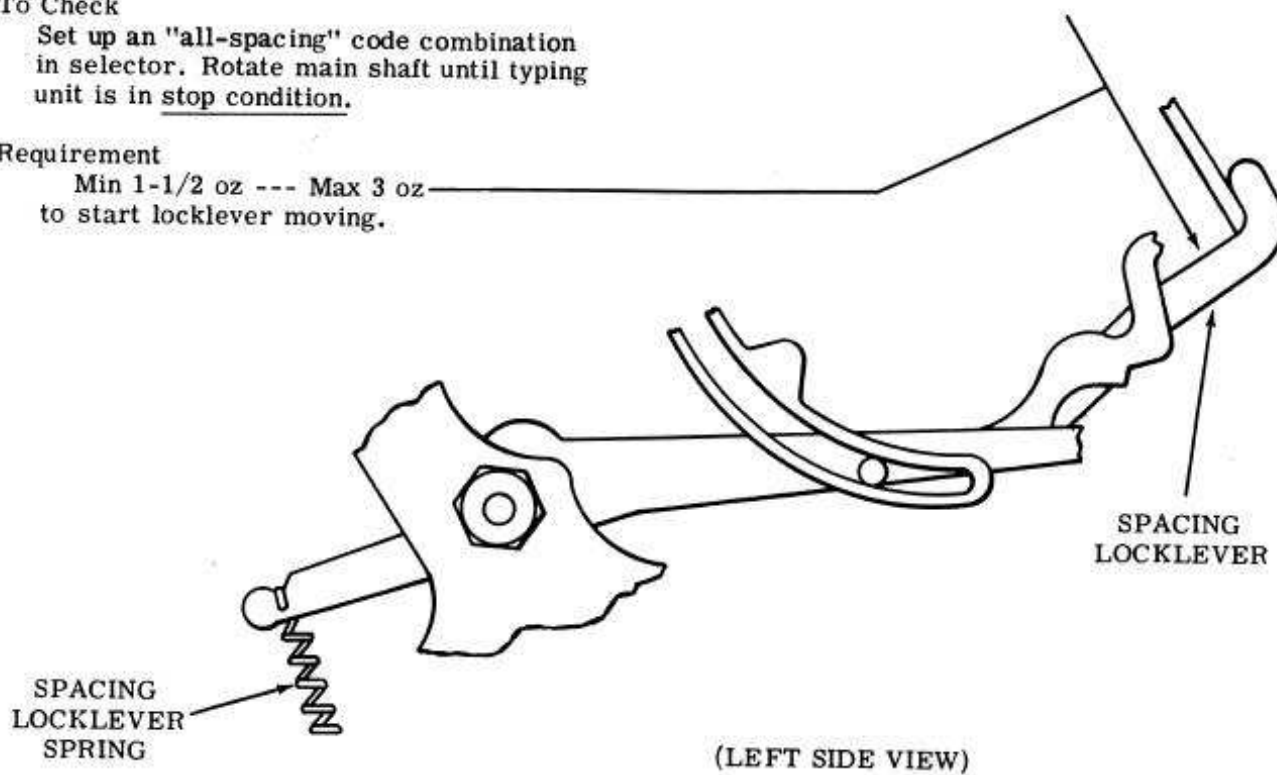
SPACING LOCKLEVER SPRING

To Check

Set up an "all-spacing" code combination in selector. Rotate main shaft until typing unit is in stop condition.

Requirement

Min 1-1/2 oz --- Max 3 oz
to start locklever moving.



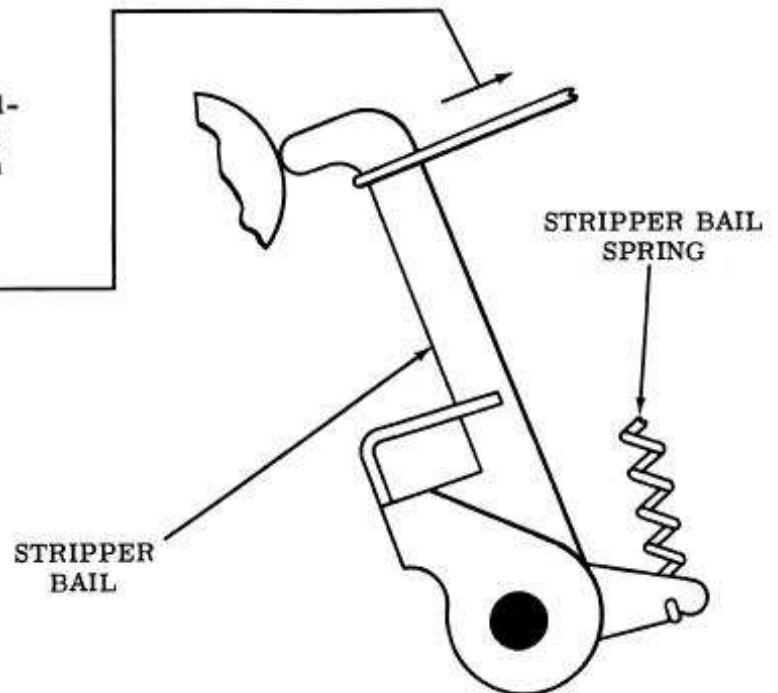
2.20 Selector Area (continued)

STRIPPER BAIL SPRINGTo Check

Set range finder at "60." Set up an "all-spacing" code combination in selector. Rotate main shaft until typing unit is in stop condition.

Requirement

Min 1/4 oz --- Max 1 oz
to start stripper ball moving.



(LEFT SIDE VIEW)

PUSH LEVER SPRINGS

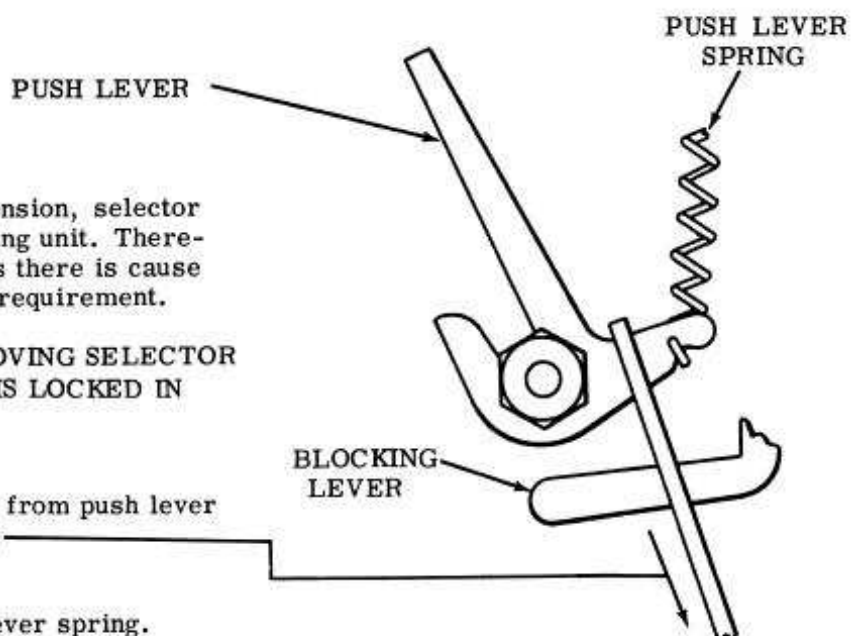
Note 1: To measure this tension, selector must be removed from typing unit. Therefore, do not check it unless there is cause to suspect it will not meet requirement.

CAUTION: BEFORE REMOVING SELECTOR MAKE SURE ARMATURE IS LOCKED IN SPACING POSITION.

Requirement

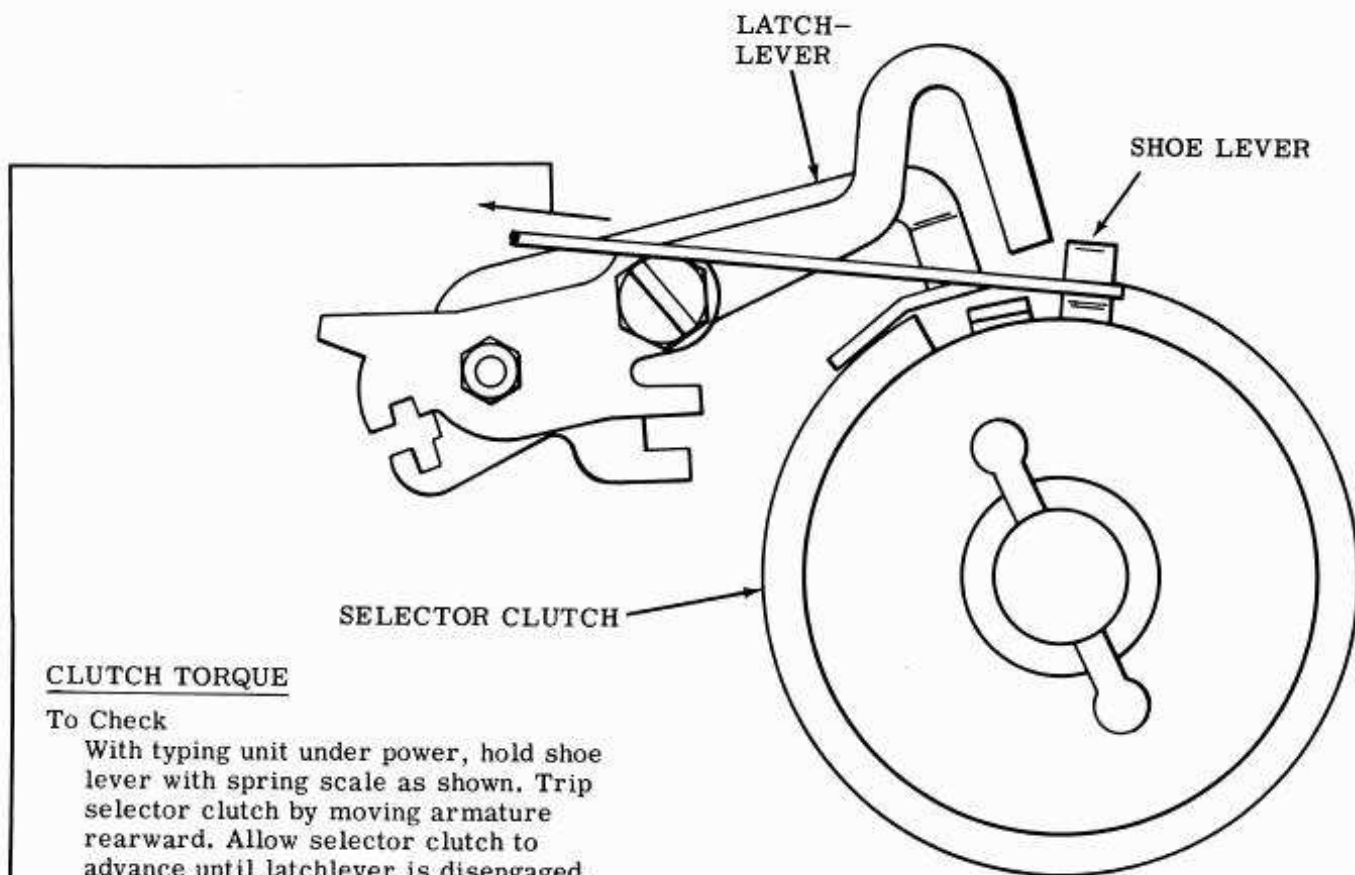
With blocking lever held away from push lever
Min 1-1/2 oz --- Max 3 oz
to start push lever moving.

Note 2: Check each push lever spring.



(LEFT SIDE VIEW)

2.21 Function and Selector Areas



CLUTCH TORQUE

To Check

With typing unit under power, hold shoe lever with spring scale as shown. Trip selector clutch by moving armature rearward. Allow selector clutch to advance until latchlever is disengaged.

Requirement

Min 13 oz --- Max 16 oz
to hold shoe lever.

(LEFT SIDE VIEW)

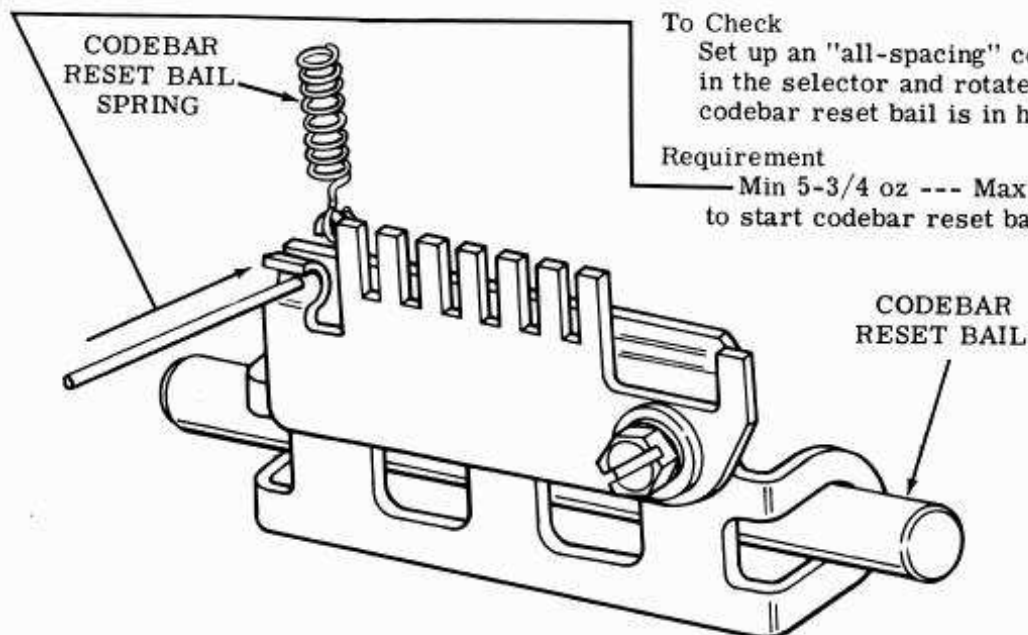
CODEBAR RESET BAIL SPRING

To Check

Set up an "all-spacing" code combination in the selector and rotate main shaft until codebar reset bail is in highest position.

Requirement

Min 5-3/4 oz --- Max 8-3/4 oz
to start codebar reset bail moving.



(LEFT FRONT VIEW)

2.22 Miscellaneous Areas

MAIN SHAFT TORQUE

Note 1: This adjustment need not be checked unless complete readjustment is being undertaken or adjustments affecting drive system have been changed.

(1) To Check

With motor belt in place, disengage (latch) all clutches.

Requirement

With all clutches disengaged (latched), no excessive drag or binding when main shaft is rotated.

(2) To Check

With all clutches disengaged (latched), remove motor belt.

Requirement

With all clutches disengaged (latched), no excessive drag or binding when main shaft is rotated.

Note 2: Excessive drag or binding when the main shaft is rotated will cause insufficient receiving margins.

To Adjust

If requirements are not met, check following adjustments:

GEAR BRACKET—PRELIMINARY (Motor Area)

BELT TENSION—PRELIMINARY (Motor Area)

CLUTCH ENDPLAY (Selector Area)

LEFT BEARING (Main Shaft Area)

BEARING ALIGNMENT (Miscellaneous Areas)

FUNCTION CLUTCH ENDPLAY (Main Shaft Area)

CODEBAR CLUTCH (Main Shaft Area)

DRIVEN GEAR (Main Shaft Area)

CLUTCH TRIP LEVER (Selector Area)

If any of above adjustments are changed, recheck BEARING ALIGNMENT (Miscellaneous Area).

BEARING ALIGNMENT

Note 3: This adjustment applies to main shaft bearings, distributor shaft bearings, function rocker shaft bearings, and codebar reset bail bearings. It should only be made if bearing clamps have been loosened, or if a bind is detected in associated shafts.

Requirement

Bearings aligned with their respective shafts.

Note 4: When aligning main shaft bearings, loosen selector mounting screws.

To Adjust

With bearing clampscrews tight, tap shaft with screwdriver handle, piece of wood, or soft mallet in area adjacent to bearing.

CAUTION: WHEN TAPPING THE SHAFT, BE CAREFUL NOT TO SCAR OR DISTORT THE SHAFT.

2.23 Function Area

(B) ROCKER SHAFT ENDPLAY

Requirement

As gauged by eye

Min Some --- Max 0.010 inch
endplay in function rocker shaft.

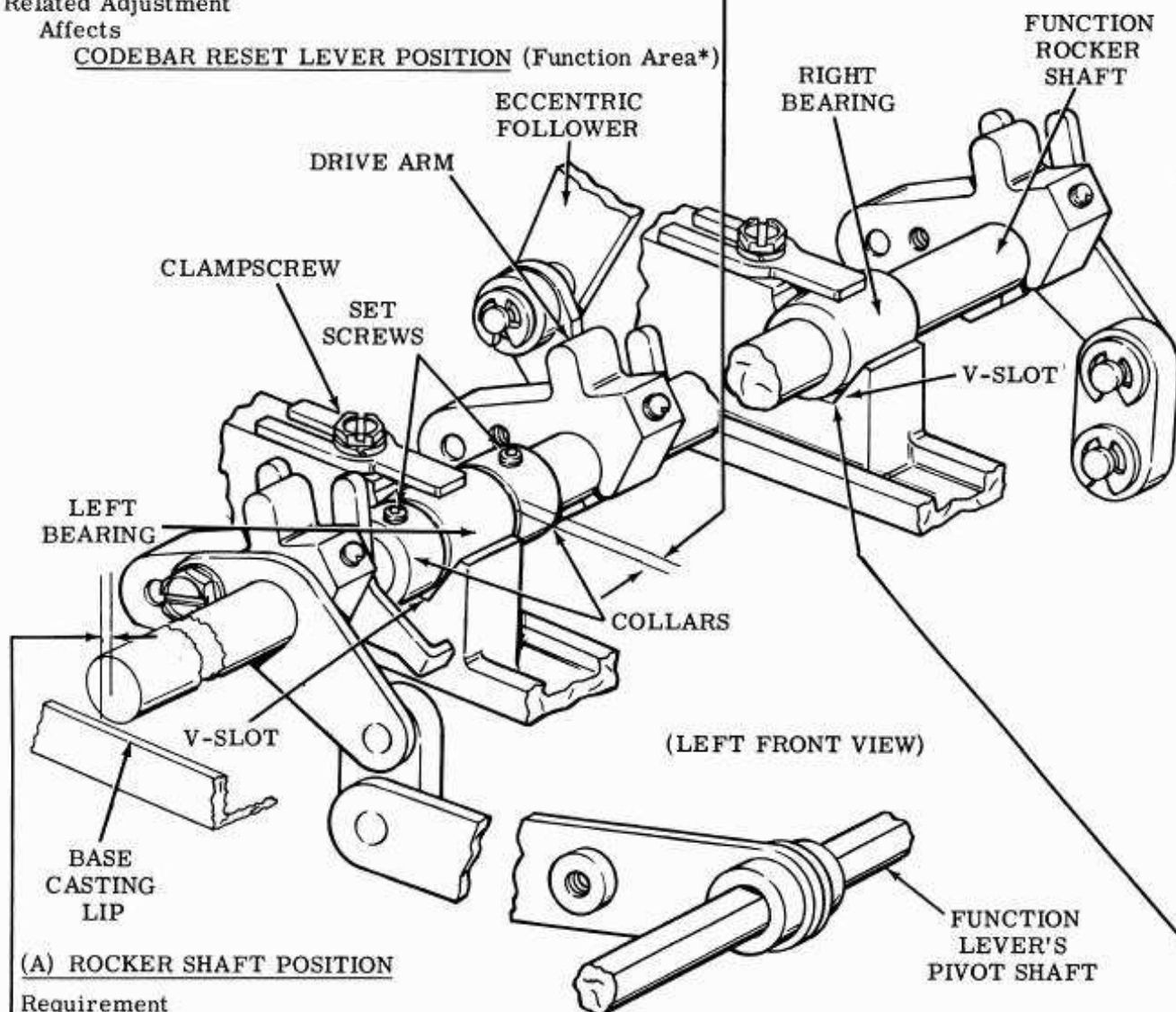
To Adjust

Position two collars with set screws loosened.

Related Adjustment

Affects

CODEBAR RESET LEVER POSITION (Function Area*)



(A) ROCKER SHAFT POSITION

Requirement

- (1) The left end of function rocker shaft is to line up with inside top edge of base casting lip, however:
0.020 inch misalignment is permissible to the left.
0.030 inch misalignment is permissible to the right.
- (2) Both bearings to be centered on base casting, as gauged by eye.

To Adjust

Position function rocker shaft with left bearing clampscrew loosened.

Related Adjustment

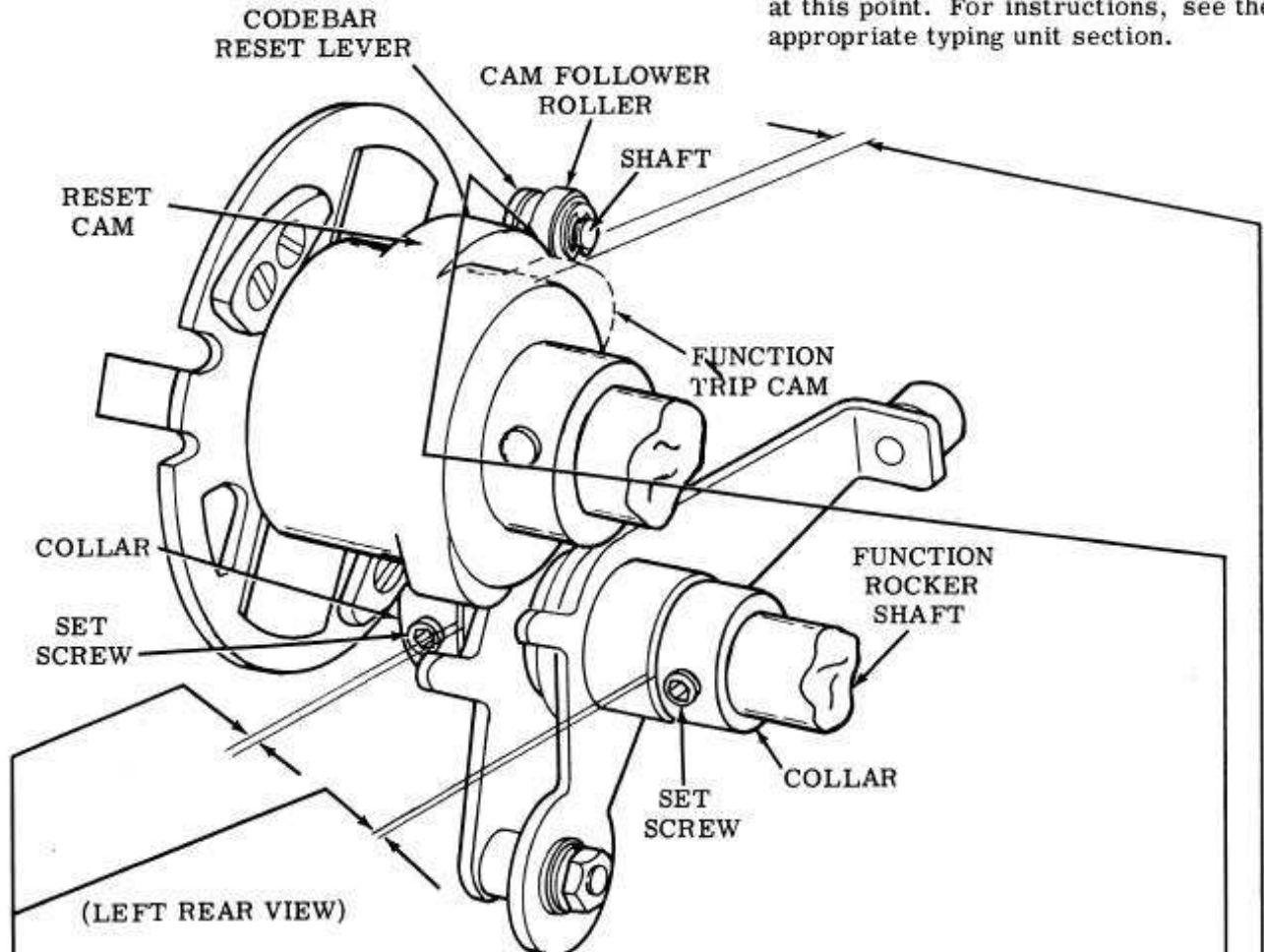
Affects

CODEBAR RESET LEVER POSITION (Function Area*)

→ * Common Mechanism

2.24 Function Area (continued)

Note: If typing unit is being completely readjusted, it is recommended that it be removed from the subbase and that the motor be removed from typing unit at this point. For instructions, see the appropriate typing unit section.



CODEBAR RESET LEVER POSITION

Requirement

With typing unit in stop condition

- (1) Cam follower roller approximately centered on reset cam, as gauged by eye,
Max 0.020 inch overhang permitted on left side only.
- (2) Min Some --- Max 0.010 inch endplay in codebar reset lever.
- (3) Min 0.005 inch between cam follower roller's shaft and function trip cam.

To Adjust

Position two collars with set screws loosened.

Related Adjustments

Affects

CODEBAR RESET LEVER (Function Area *)

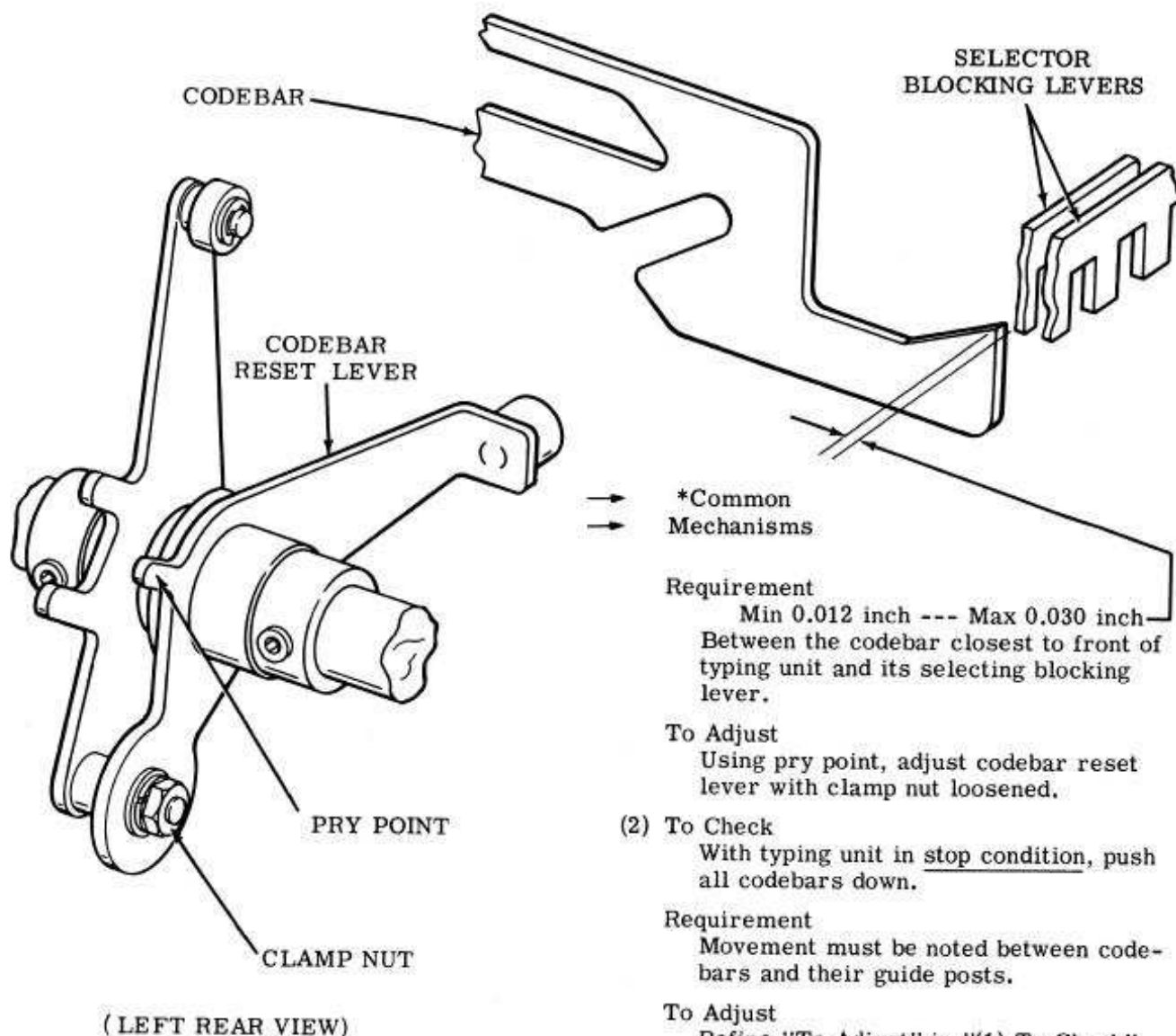
Affected By

ROCKER SHAFT POSITION (Function Area *)

ROCKER SHAFT ENDPLAY (Function Area *)

* Common Mechanisms

2.25 Function Area (continued)



*Common
Mechanisms

Requirement

Min 0.012 inch --- Max 0.030 inch
Between the codebar closest to front of
typing unit and its selecting blocking
lever.

To Adjust

Using pry point, adjust codebar reset
lever with clamp nut loosened.

(2) To Check

With typing unit in stop condition, push
all codebars down.

Requirement

Movement must be noted between code-
bars and their guide posts.

To Adjust

Refine "To Adjust" in "(1) To Check"
above.

Related Adjustments

Affects

PRINT SUPPRESSION LATCH

(Function Area *)

PRINT SUPPRESSION CAM

FOLLOWER (Function Area *)

Affected By

CODEBAR RESET LEVER

POSITION (Function Area *)

Note 1: The following adjustments can be made
easier by removing platen and dashpot
cylinder. For instructions, see the appropriate
typing unit section.

CODEBAR RESET LEVER

(1) To Check

With typing unit in stop condition, manu-
ally operate the typing unit and position
the codebar closest to front of typing
unit and its selecting blocking lever so
that the clearance between them is a
minimum.

Note 2: If interference is noted between
the carriage drive link and codebars
during the normal operating cycle and/or
if it adds to the typing unit's inherent
noise, refine CODEBAR RESET
LEVER (Function Area *) adjustment.

2.26 Function Area (continued)

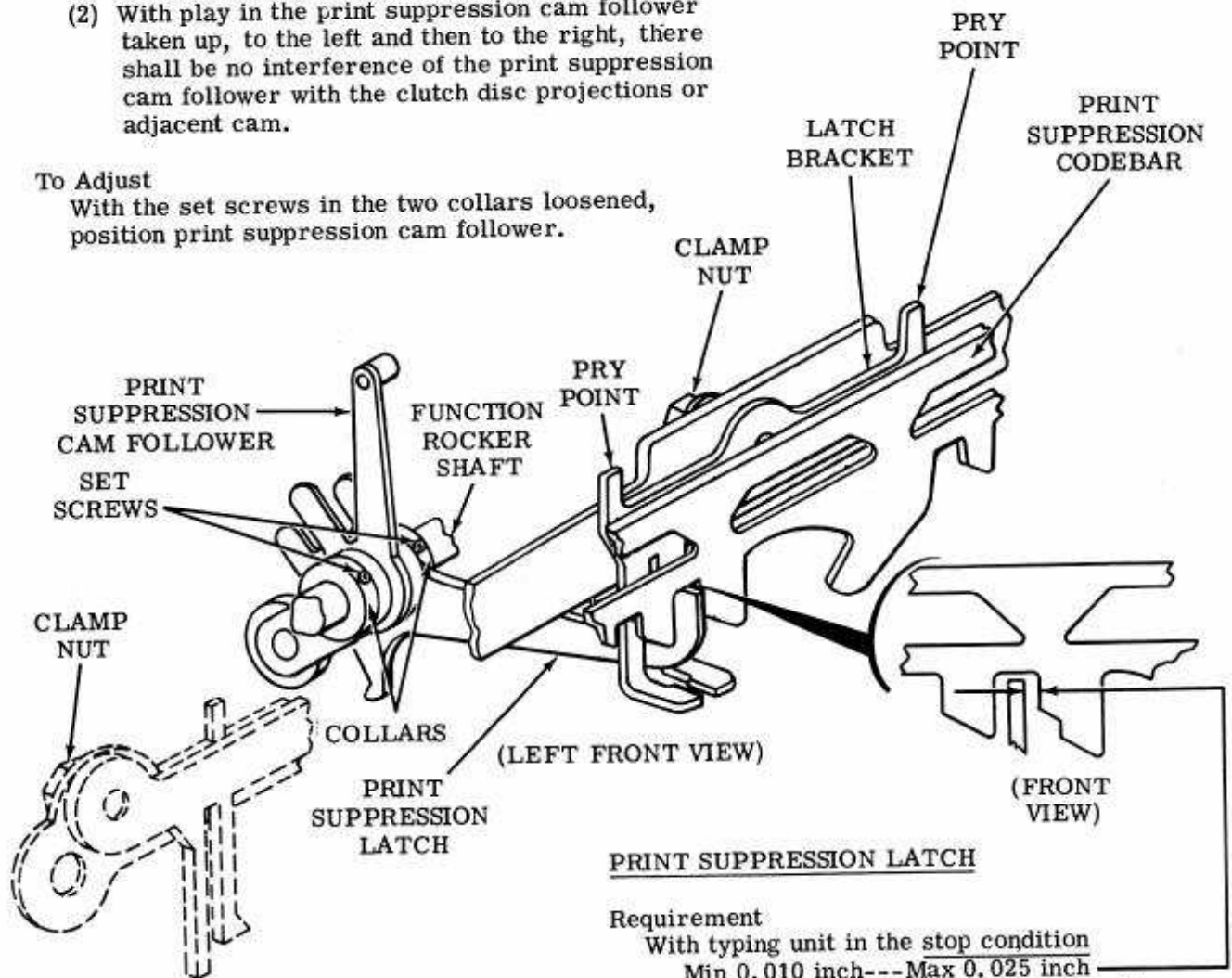
PRINT SUPPRESSION CAM FOLLOWER ROLLER

Requirement

- (1) The print suppression cam follower shaft shall move freely on the function rocker shaft with no binds or interference.
- (2) With play in the print suppression cam follower taken up, to the left and then to the right, there shall be no interference of the print suppression cam follower with the clutch disc projections or adjacent cam.

To Adjust

With the set screws in the two collars loosened, position print suppression cam follower.



**Common Mechanisms

PRINT SUPPRESSION LATCH

Requirement

With typing unit in the stop condition
Min 0.010 inch---Max 0.025 inch
between print suppression latch and print
suppression codebar, as gauged by eye.

To Adjust

Using a pry point, position latch bracket
with clamp nuts * loosened.

Related Adjustments

Affects

CASTING (Function Area **)

Affected By

CODEBAR RESET LEVER (Function Area **)

* Note: Some typing units have one clamp nut to loosen, others two, depending upon the configuration of the latch bracket used.

2.27 Function Area (continued)

CODEBAR GUIDE

To Check

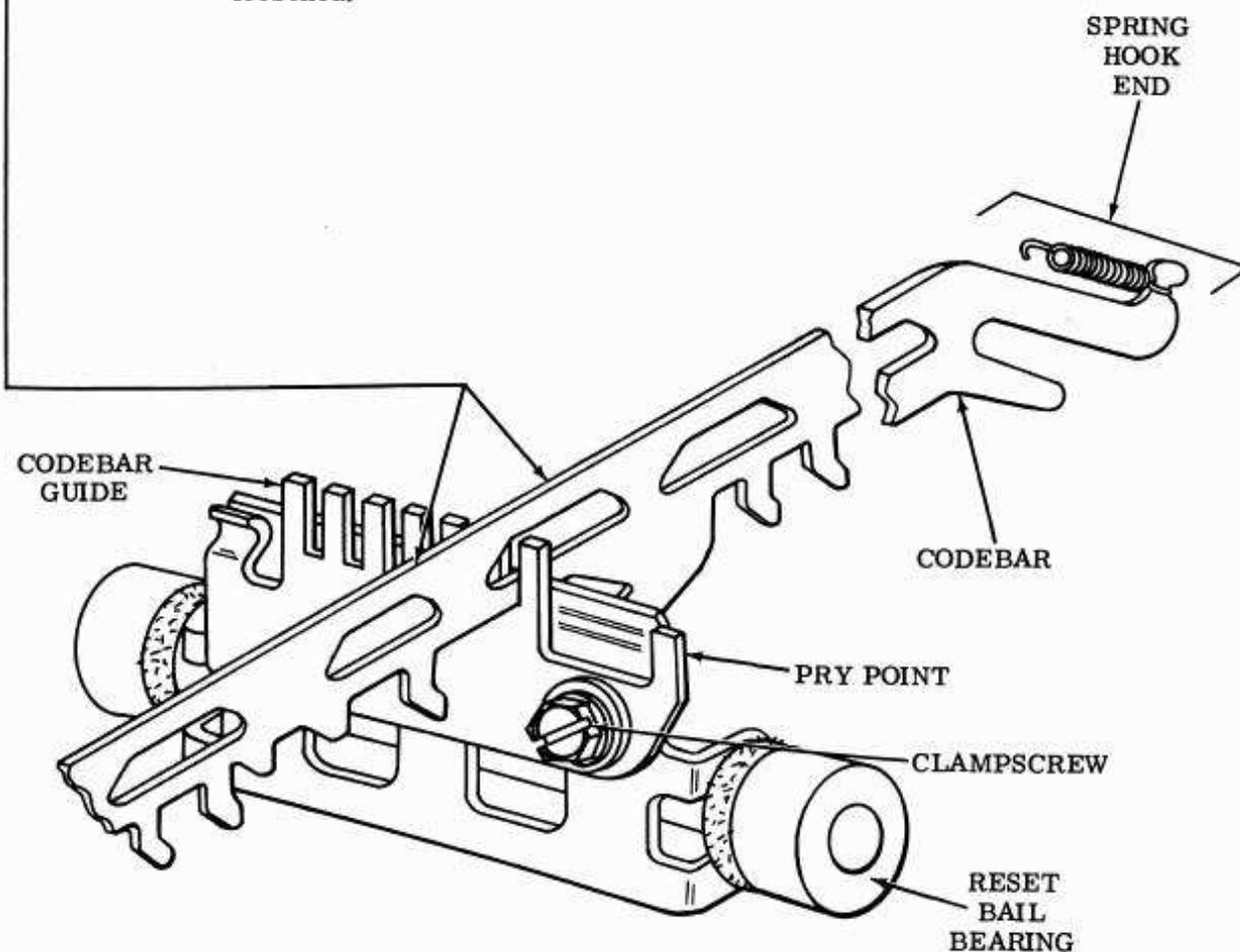
Position carriage at left side of typing unit. Push and pull codebars at spring hook end.

Requirement

No excessive deflection in either direction of codebars near their center.

To Adjust

Using pry point, position codebar guide with clampscrew loosened.



(LEFT FRONT VIEW)

2.28 Selector Area (continued)

Note 1: For the following adjustment on 8-level typing units only, set the range finder to "80" on the scale.

BLOCKING LEVERS

(1) To Check

Manually operate the typing unit and set up an "all-marking" code combination in the selector. With the selector clutch disengaged (latched) and the selector levers on the peak of their respective cams, manually trip the codebar clutch and rotate the main shaft until the codebars are approximately flush with the left edge of blocking levers.

Requirement

(a) Min 0.003 inch between all blocking levers, except no. 1 blocking lever, and their associated codebars.

(b) Min 0.006 inch---Max 0.045 inch between the no. 1 blocking lever and its associated codebar.

To Adjust

With clamp nut loosened, position eccentric shaft with hex wrench in hex hole.

Note 2: Keep the high part of the eccentric shaft to the rear of the typing unit.

(2) To Check

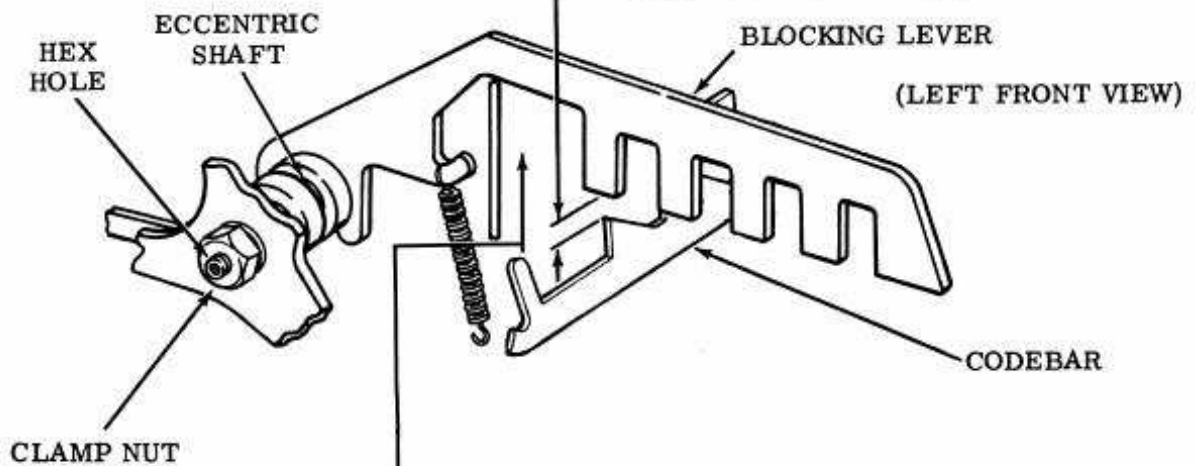
With the selector armature in its unattracted position, place the selector clutch shoe lever just past the trip lever. Hold the selector armature in its attracted position and rotate the main shaft until the shoe lever is approximately 90° past the trip lever. Notice any vertical motion of the no. 1 and/or no. 2 blocking levers while rotating the main shaft.

Requirement

There shall be no vertical motion of the no. 1 and/or no. 2 blocking levers while rotating main shaft through arc of 90°.

To Adjust

Refine "To Adjust" in "(1) To Check" above.

BLOCKING LEVER SPRINGS

To Check

Set up an "all-spacing" code combination in the selector. Rotate main shaft until typing unit is in stop condition.

Requirement

Min 1/2 oz---Max 1-1/4 oz to start blocking lever moving.

Note 3: Check for each blocking lever spring.

2.29 Function Area (continued)

Note: The following adjustment applies only to 8-level typing units.

NO. 1 CODEBAR GUIDE

To Check

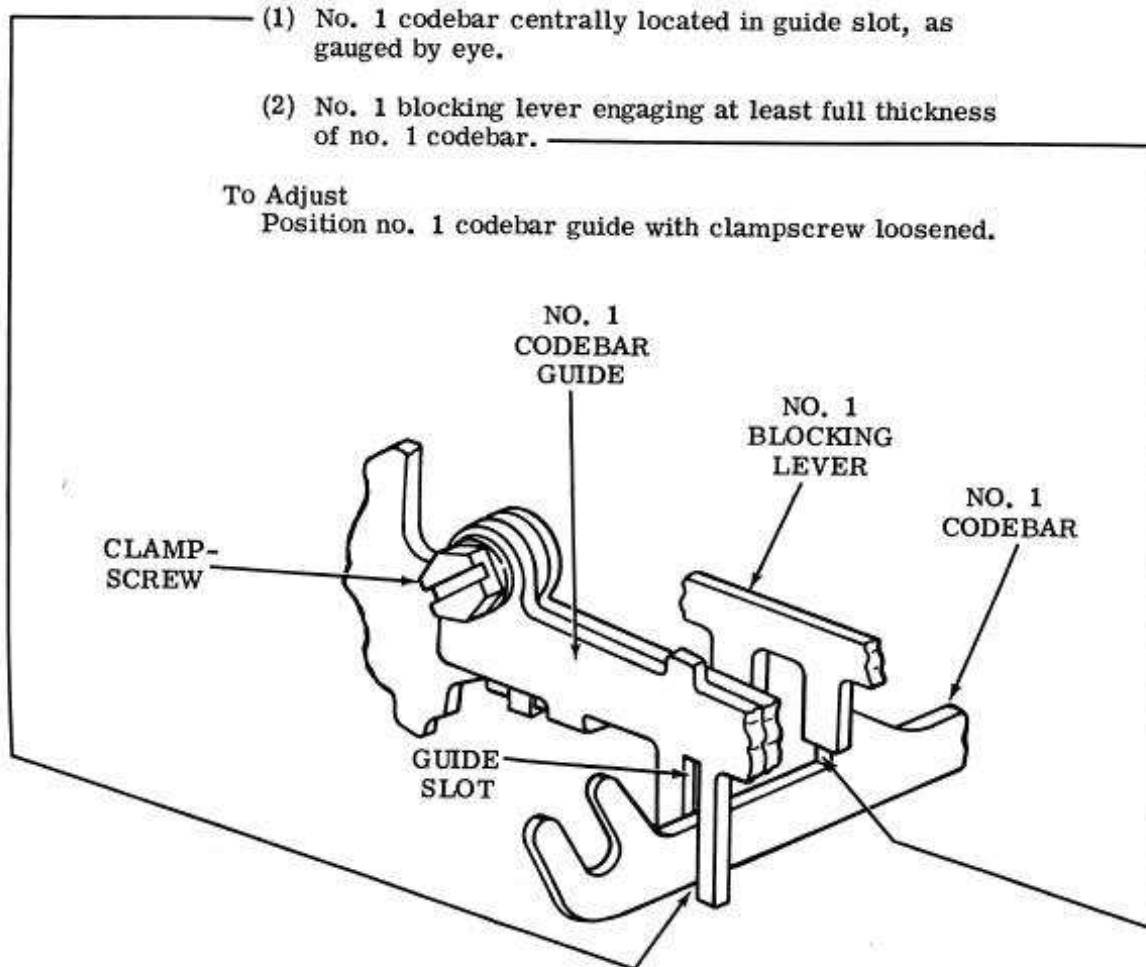
Place typing unit in stop condition and manually operate the typing unit until the no. 1 blocking lever is in its lowest position.

Requirement

- (1) No. 1 codebar centrally located in guide slot, as gauged by eye.
- (2) No. 1 blocking lever engaging at least full thickness of no. 1 codebar.

To Adjust

Position no. 1 codebar guide with clampscrew loosened.



(LEFT FRONT VIEW)

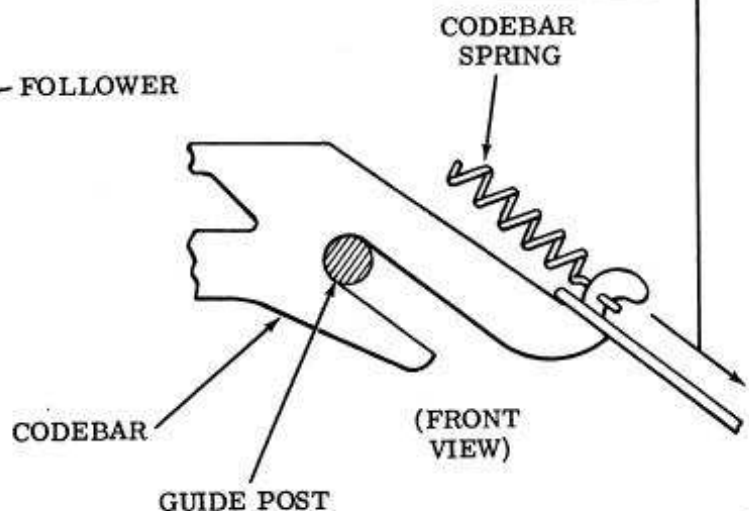
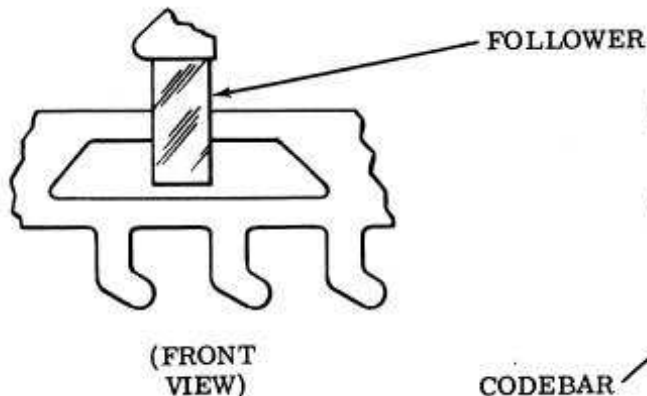
2.30 Function Area (continued)

AUTOMATIC CODEBAR SPRINGRequirement

With carriage at left margin

Min 1/2 oz---Max 1-3/4 oz
to start automatic codebar moving.AUTOMATIC
CODEBARAUTOMATIC
CODEBAR
SPRING

(FRONT VIEW)

PRINT SUPPRESSION AND NO. 3 (4)* CODEBAR SPRINGRequirementWith typing unit in stop condition and no. 3 (4)*
codebar's follower on carriage lifted.Min 12 oz---Max 14 oz
to start codebar moving.Note 1: Check the print suppression
and no. 3 (4)* codebar springs.* Note 2: No. 3 on 5-level typing units.
No. 4 on 8-level typing units.CODEBAR SPRINGSNote 3: Check each codebar
spring other than automatic
print suppression and no. 3 (4)*.RequirementWith typing unit in stop condition
and codebar's follower liftedMin 5-1/2 oz---Max 7-1/2 oz
to start codebar moving.

2.31 Function Area (continued)

FUNCTION PAWL SPRING

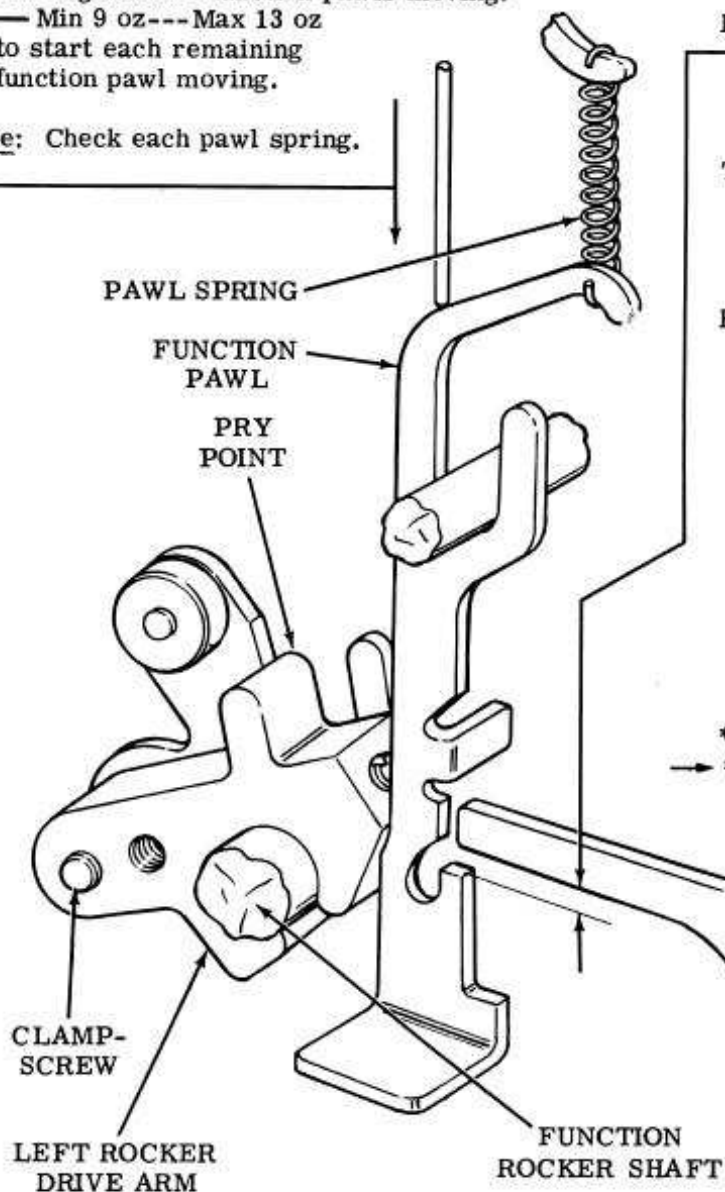
Requirement

With typing unit in stop condition and all external loads which would influence the requirement removed

Min 1-1/4 oz---Max 2-1/2 oz to start answer-back, blocking, and carriage return function pawls moving.

Min 9 oz---Max 13 oz to start each remaining function pawl moving.

Note: Check each pawl spring.



(LEFT FRONT VIEW)

LEFT ROCKER DRIVE ARM

To Check

Set up "carriage return" code combination (---4-) or (1-34---8) in selector. Rotate main shaft until function bail is at highest point of travel.

Requirement

Min 0.020 inch---Max 0.040 inch between carriage return function lever and its function pawl.

To Adjust

Using pry point, adjust left rocker drive arm with clampscrew loosened.

Related Adjustments

Affects

RIGHT ROCKER DRIVE ARM
(Function Area **)

CARRIAGE RETURN LEVER
(Spacing Area)

SPACE SUPPRESSION TRIP LEVER (Spacing Area)

LINE FEED DRIVE ARM
(Paper Feed Area*)

Affected By

RIGHT ROCKER DRIVE ARM
(Function Area **)

* Friction Feed Mechanisms

→ **Common Mechanisms

2.32 Function Area (continued)

RIGHT ROCKER DRIVE ARM

To Check

Set up answer-back character "WRU" (-234-) or (1-3----8) code combination in selector. Rotate main shaft until function bail is at its highest point. Make sure that distributor clutch has not been tripped.

Requirement

Min 0.015 inch --- Max 0.050 inch between answer-back function lever and its function pawl.

To Adjust

Using pry point, adjust right rocker drive arm with clampscrew loosened. Recheck LEFT ROCKER DRIVE ARM (Function Area***) adjustment.

Related Adjustments

Affects

CARRIAGE RETURN LEVER (Spacing Area)

FORM-OUT LEVER OVERTRAVEL (Platen Drive Area)

LINE FEED DRIVE ARM (Paper Feed Area*)

LINE FEED STRIP LEVER (Function Area**)

SPACE SUPPRESSION TRIP LEVER (Spacing Area)

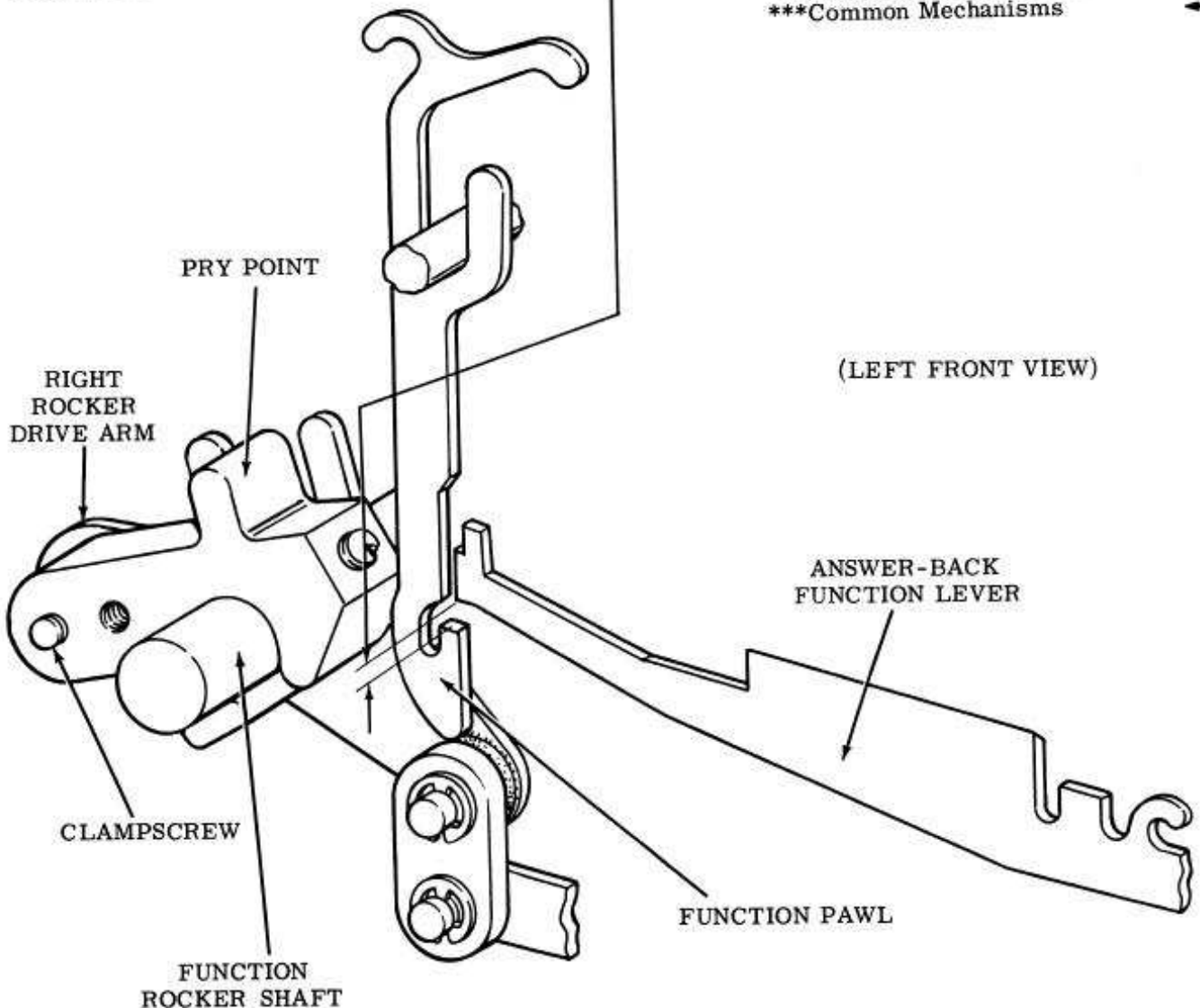
Affected By

LEFT ROCKER DRIVE ARM (Function Area***)

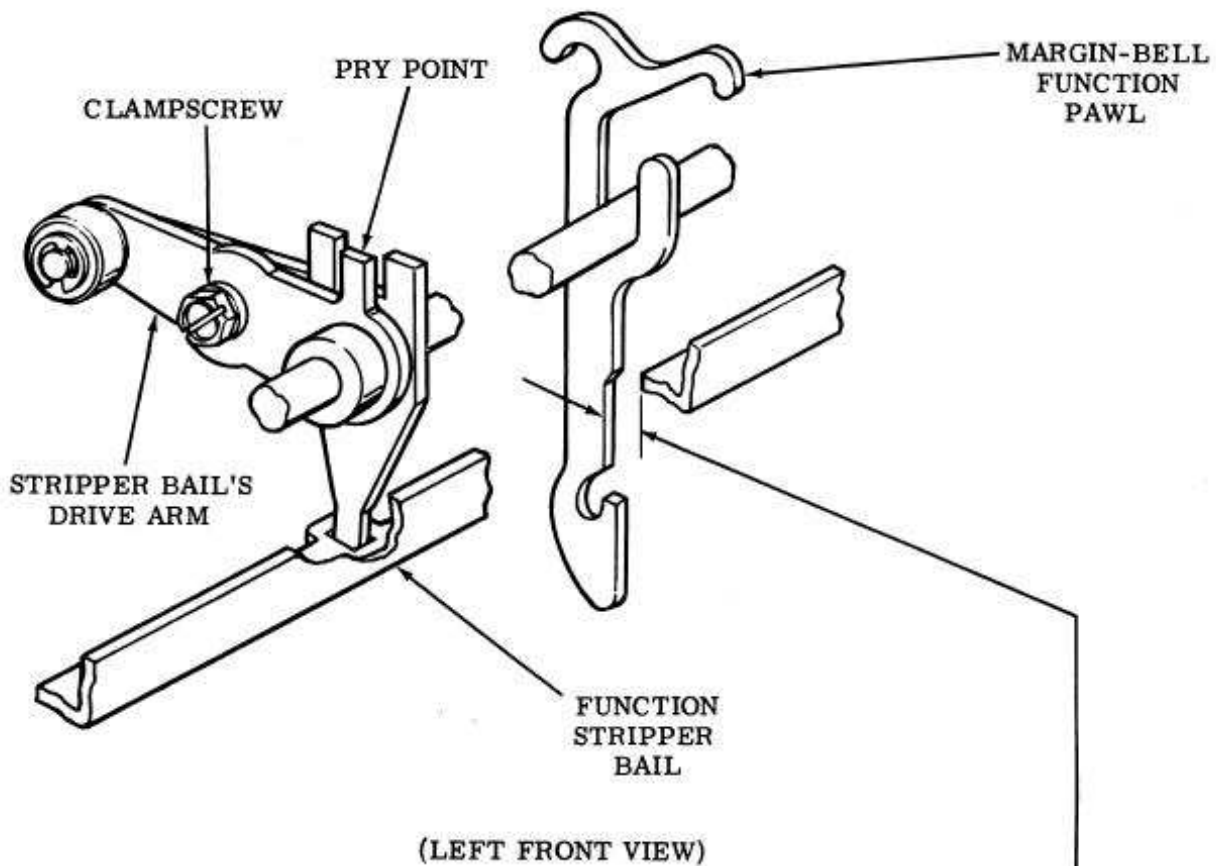
*Friction Feed Mechanisms

**Sprocket Feed Mechanisms

***Common Mechanisms



2.33 Function Area (continued)



STRIPPER BAIL

Requirement

With typing unit in stop condition

Min 0.015 inch --- Max 0.025 inch
between function stripper bail and edge of
stripped margin-bell function.

To Adjust

Using pry point, adjust stripper bail's drive
arm with clampscrew loosened.

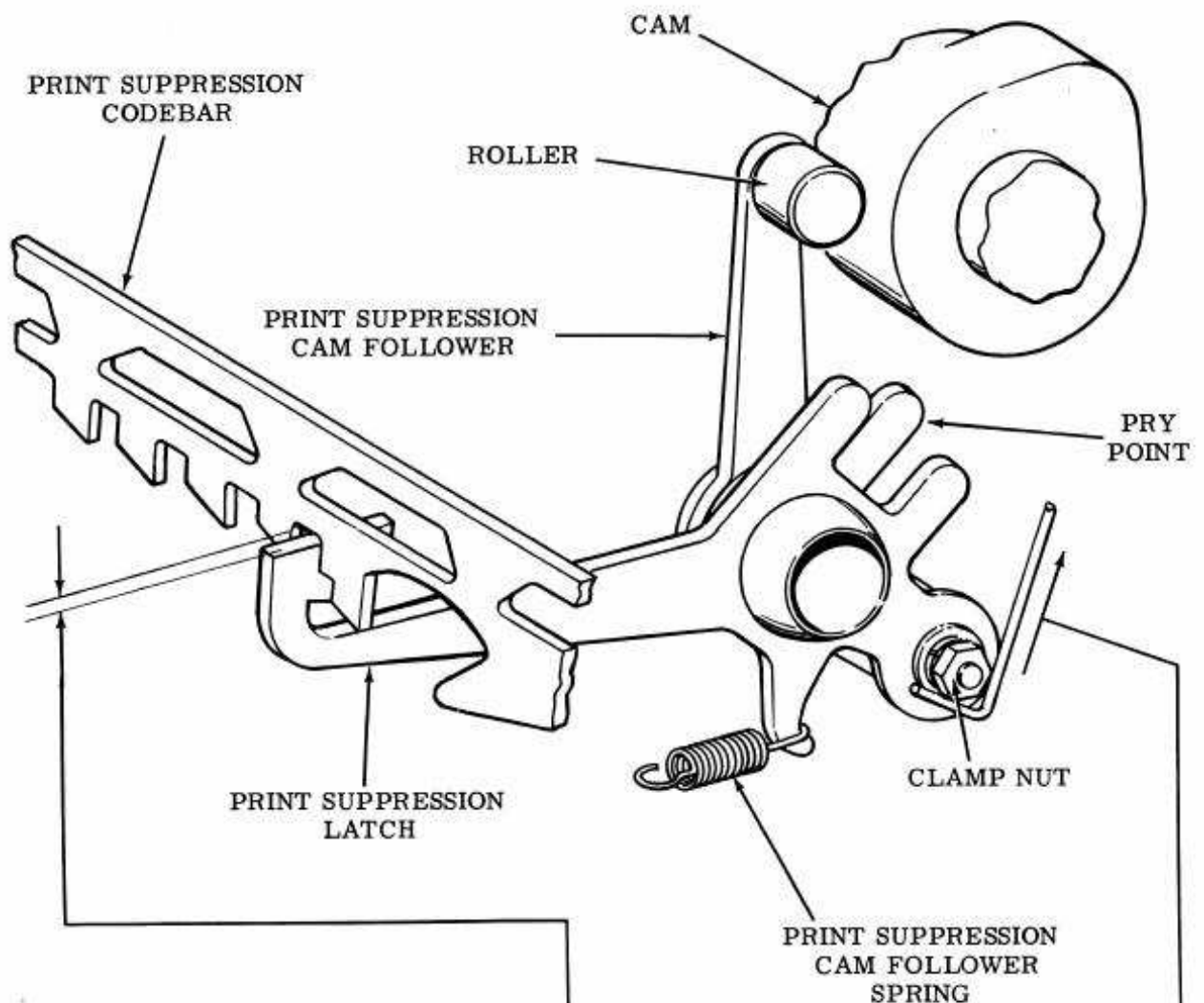
Related Adjustment

Affects

LINE FEED STRIPPER PLATE (Paper
Feed Area*)

*Friction Feed Mechanisms

2.34 Function Area (continued)

PRINT SUPPRESSION CAM FOLLOWER**Requirement**

With typing unit in stop condition and print suppression cam follower roller resting on its cam

Min 0.005 inch --- Max 0.030 inch
between print suppression latch and print suppression codebar.

To Adjust

Using pry point, position print suppression cam follower with clamp nut loosened.

Related Adjustment**Affected By**

CODEBAR RESET LEVER (Function Area*)

*Common Mechanisms

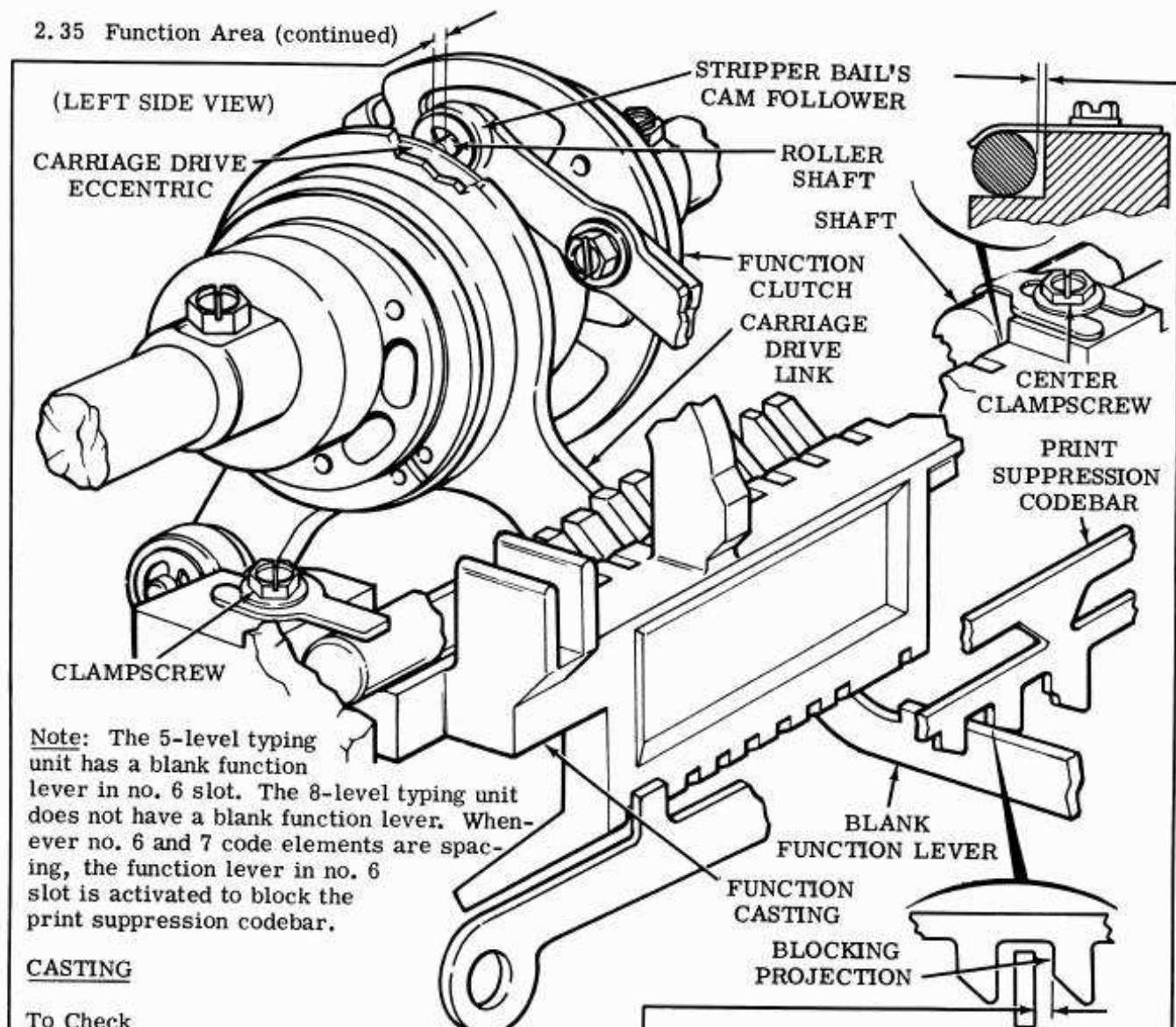
(RIGHT SIDE VIEW)

PRINT SUPPRESSION CAM FOLLOWER SPRING**Requirement**

With typing unit in stop condition

Min 4-1/2 oz --- Max 7-1/4 oz
to start print suppression cam follower moving.

2.35 Function Area (continued)

CASTING

To Check

Manually set up an "all-spacing" code combination in selector. Rotate main shaft until function bail approaches high part of travel, but stop rotating main shaft before print suppression cam follower reaches high part of its cam.

(1) Requirement

(a) As gauged by eye

Min 0.030 inch---Max 0.050 inch between blocking projections on print suppression codebar and blank function lever.

(b) Min 0.005 inch

between carriage drive eccentric and roller shaft on stripper bail's cam follower.

To Adjust

Position function casting with two end clampscrews loosened.

(2) Requirement

The shaft shall be in contact with, or not more than

Max 0.003 inch away from the vertical surface at the center of the function casting.

To Adjust

With the center and two end clampscrews loosened, position shaft. Recheck "(1) Requirement" above.

Related Adjustments

Affects

FUNCTION CLUTCH—PRELIMINARY
(Main Shaft Area)

Affected By

PRINT SUPPRESSION LATCH
(Function Area *)

*Common Mechanisms

2.36 Spacing Area

CARRIAGE RETURN LEVER**To Check**

Set up "carriage return" code combinations (---4-) or (1-34---8) in selector. Rotate main shaft until function bail reaches lowest point of travel.

Requirement

- (1) Early design:
carriage return lever flush with carriage return latch
Within 0.005 inch
as gauged by eye.
- (2) Late design:
Min Some --- Max 0.030 inch
between carriage return lever and
carriage return latch with clampscrew
loosened.

To Adjust

Using pry points, position carriage return lever with clampscrew loosened.

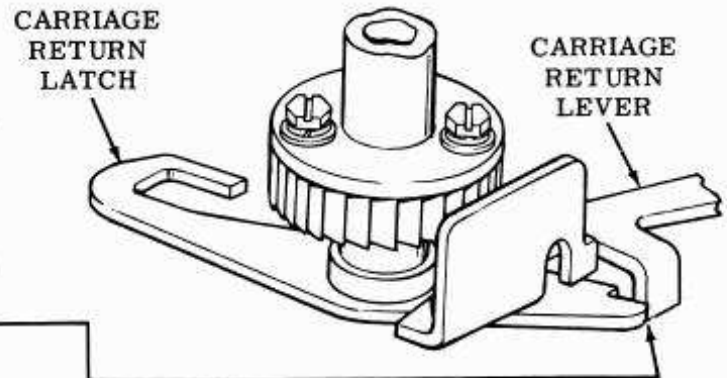
Related Adjustments**Affected By**

LEFT ROCKER DRIVE ARM (Function Area *)
RIGHT ROCKER DRIVE ARM (Function Area *)

*Common Mechanisms ←

(LATE DESIGN)

(LEFT FRONT VIEW) (EARLY DESIGN)



PRY POINTS

CLAMPSCREW

CARRIAGE RETURN
LEVER

(LEFT FRONT VIEW)

CARRIAGE RETURN
LATCH

2.37 Function and Spacing Areas

CARRIAGE DRIVE BAIL

To Check

Rotate main shaft until carriage drive bail is parallel to the base casting.

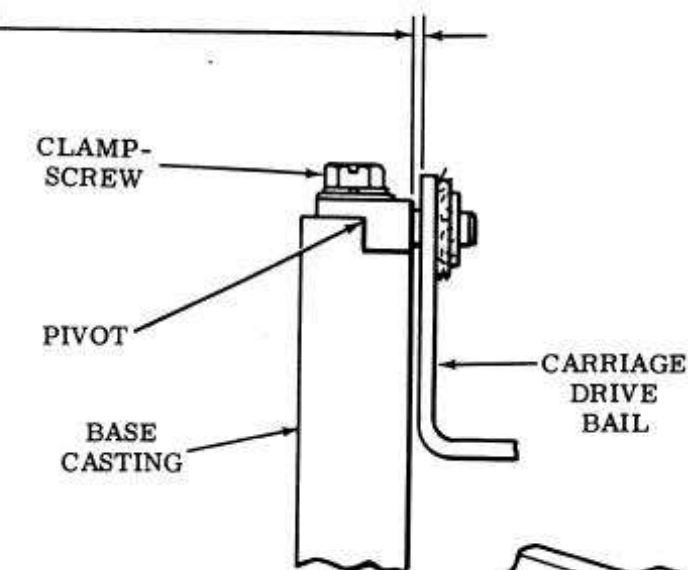
Requirement

As gauged to eye

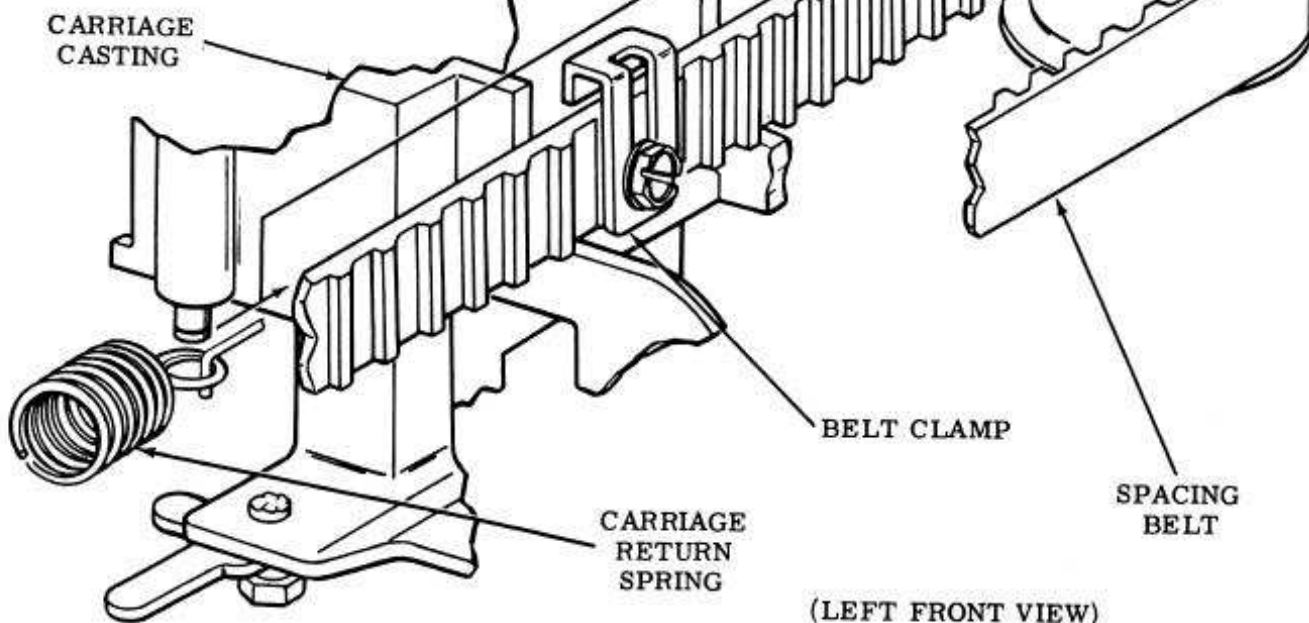
Min Some --- Max 0.015 inch
endplay in carriage drive bail.

To Adjust

Position carriage drive bail's left pivot with
clampscrew loosened.



(FRONT VIEW)



(LEFT FRONT VIEW)

CARRIAGE RETURN SPRING

Requirement

With typing unit in stop condition and carriage
at right margin

Min 56 oz --- Max 64 oz
to pull carriage return spring to installed
length.

2.39 Function and Carriage Areas

BELL CLAPPER

(1) Requirement

With typing unit in stop condition

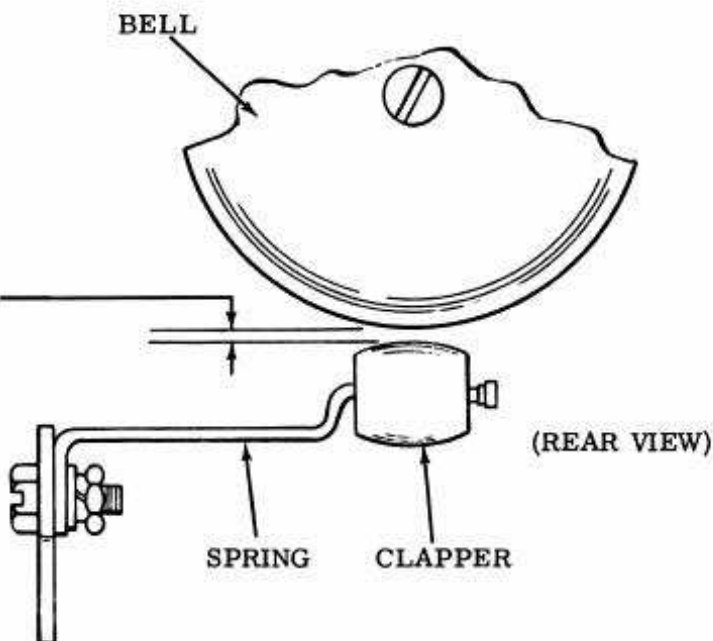
Min 0.030 inch---Max 0.070 inch
between clapper and bell.

To Adjust

Using pliers, bend clapper spring.

(2) Requirement

The bell must be audible when the
appropriate selection is made.



Note: Remove ribbon mechanism at this point
in complete readjustment procedure. For in-
structions, see the appropriate typing unit
section.

POWER BAIL ROLLER

To Check

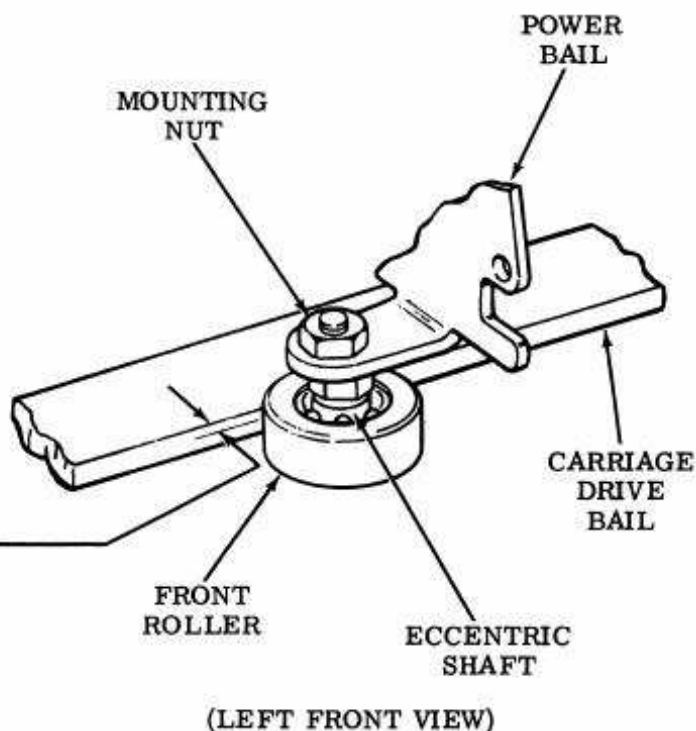
Trip function clutch and rotate main
shaft until carriage drive bail is
parallel to base casting.

Requirement

Front roller shall spin freely with
Min Some--- Max 0.005 inch
clearance.

To Adjust

With mounting nut loosened, position
front roller against drive bail by means
of eccentric shaft. Back off shaft slowly
to meet requirement.



2.40 Carriage Area

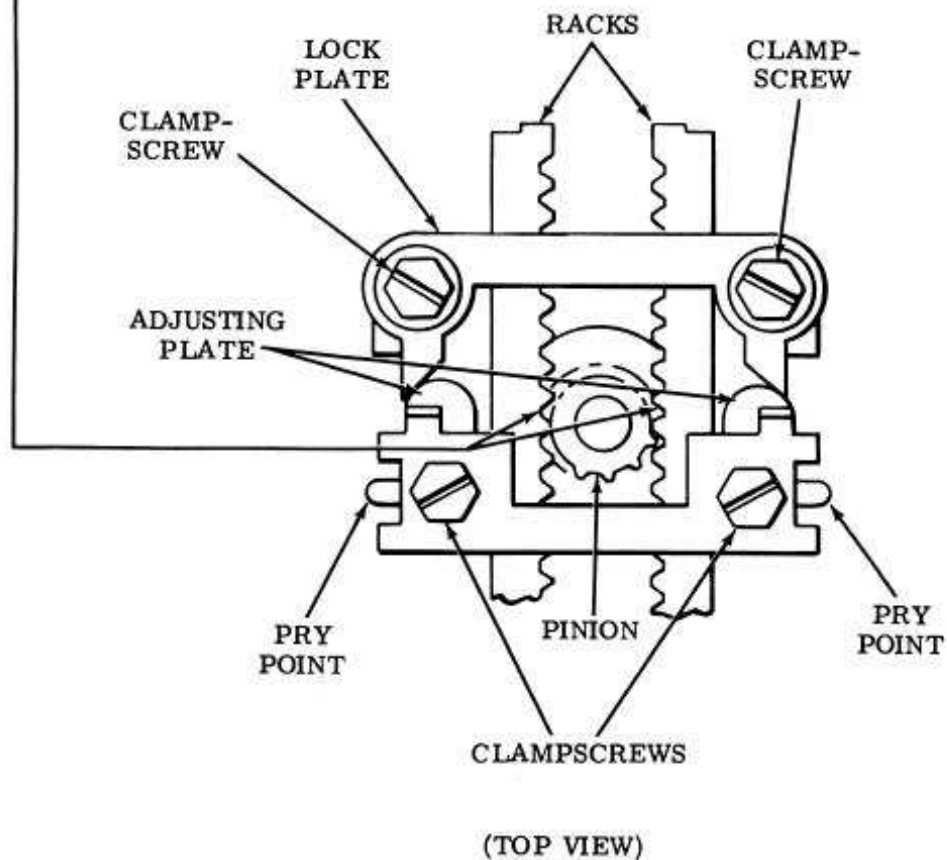
ROTARY RACKS

To Check
Put typing unit in stop condition.

Requirement
0.006 inch backlash
between pinion and each rack.

To Adjust
Loosen adjusting plate and lock plate clamp-screws. Place 0.006 inch feeler gauge between one of racks and adjusting plate. Using pry point, position adjusting plate for no play between rack and pinion. Make adjustment for other rack. Tighten adjusting plate clampscrews. Remove feeler gauge. Position lock plate tight against adjusting plate and tighten its clampscrews.

Related Adjustment
Affects
STOP PLATE (Carriage Area)



2.41 Carriage Area (continued)

REAR RAIL

(1) To Check

Position the carriage on the left side of the typing unit with the center of the typewheel 2-7/8 inches from the platen left mounting plate. Manually operate the typing unit until the codebars fully rise. Depress the letters blocking lever.

Note: Depression of the letters blocking lever is required only on 5-level typing units.

Continue to rotate the main shaft until the shift slide barely comes to rest on the stop plate.

Requirement

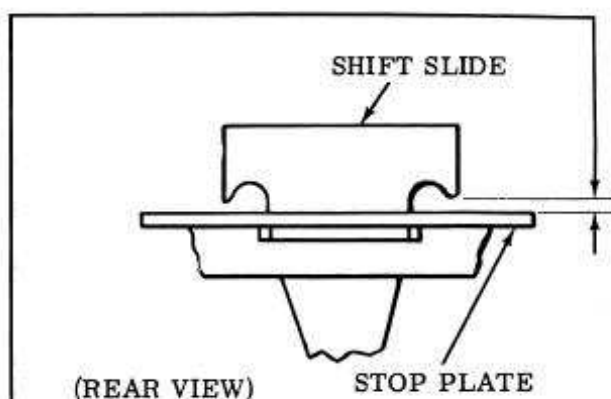
With all play in shift slide taken up in the downward direction
Min 0.028 inch --- Max 0.042 inch ---
between bottom edge of shift slide and top edge of stop plate. Record the measurement.

(2) To Check

Position the carriage to the right side of the typing unit with the center of the typewheel 1/2 inch from the right-hand margin. Manually operate the typing unit until the codebars fully rise. Depress the letters blocking lever (see above note). Continue to rotate the main shaft until the shift slide barely comes to rest on the stop plate.

Requirement

Perform "Requirement" in "(1) To Check" above.



(3) To Check

Calculate the difference between the recorded measurements in "(1) To Check" and "(2) To Check" above.

Requirement

Max 0.010 inch
difference between recorded measurements.

To Adjust

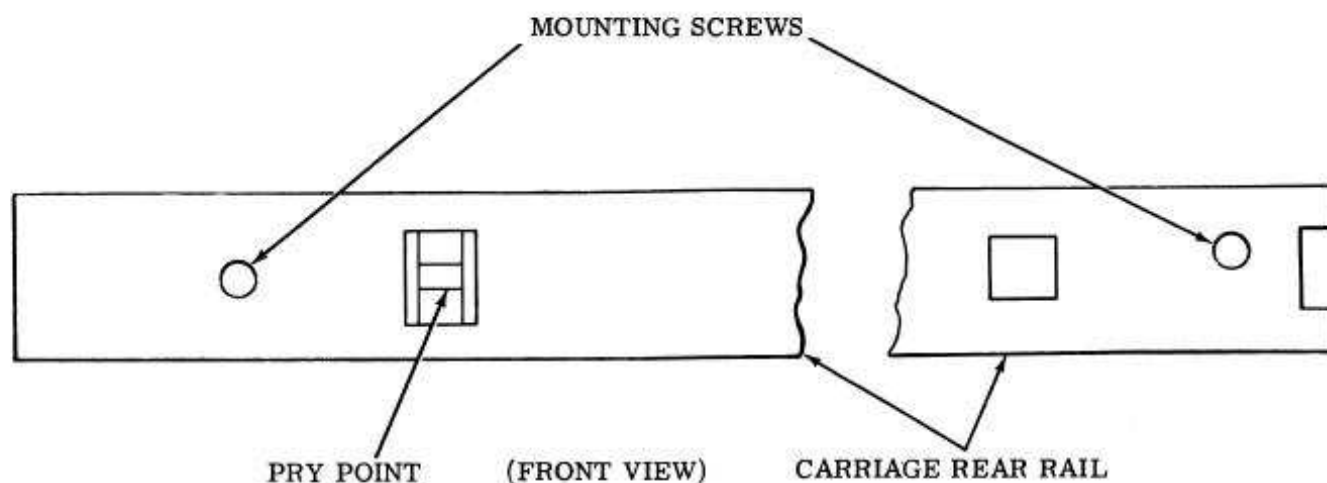
With two carriage rear rail mounting screws friction tight, position carriage rear rail using pry point.

Related Adjustments

Affects

REAR ROLLER (Carriage Area)
RESET LEVER (Carriage Area)
PULSE LEVER (Carriage Area)
DRIVE BAIL (Carriage Area)
PLATEN-VERTICAL (Paper Feed Area*)
PRINT RESET ARM (Carriage Area)
PRINT DRIVE LEVER (Carriage Area)

*Friction or Sprocket Feed Mechanisms



2.42 Carriage Area (continued)

RESET LEVER

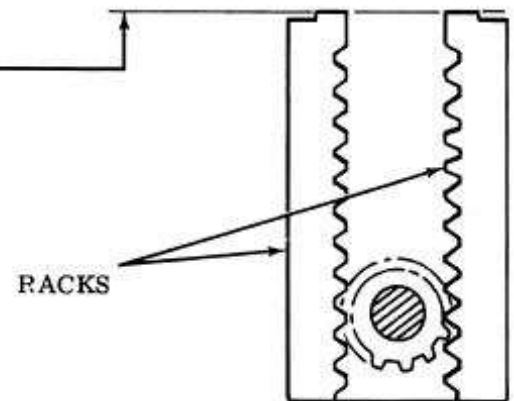
Requirement

When typing unit returns to stop condition, racks shall be completely reset.

To Adjust

Place carriage to left margin. Using finger pressure on power bail and reset lever, position reset lever with clampscrew loosened.

Note: With above adjustment completed, only a small amount of play shall be present when typewheel is rotated back and forth.



TOP VIEW

Related Adjustments

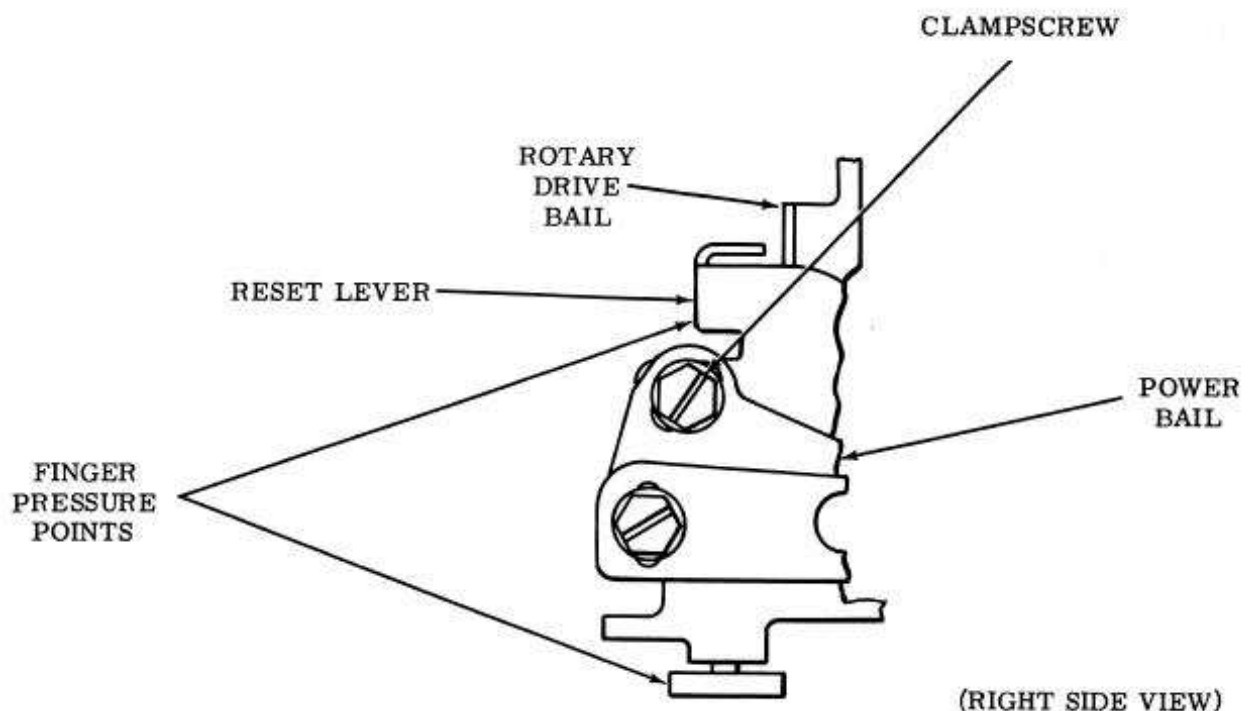
Affects

RIBBON POWER LEVER (Carriage Area)

Affected By

REAR RAIL (Carriage Area)

DRIVE BAIL (Carriage Area)



(RIGHT SIDE VIEW)

2.43 Carriage Area (continued)

PULSE LEVER

(1) To Check

Place carriage to left margin. With an "all-marking" code combination set up in selector, manually operate the typing unit until the function clutch just trips.

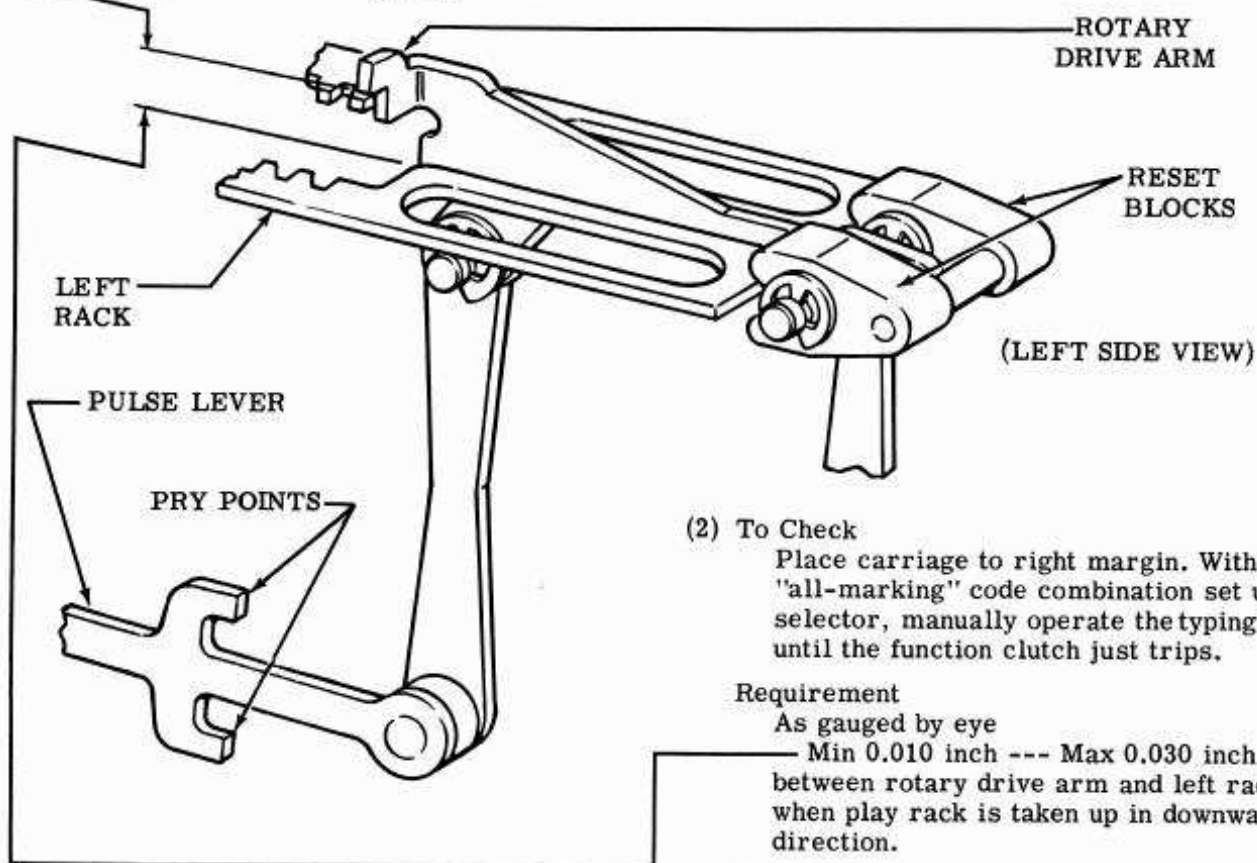
Requirement

As gauged by eye

Min 0.010 inch --- Max 0.040 inch
between rotary drive arm and left rack
when play in rack is taken up in down-
ward direction.

To Adjust

Bend pulse lever using pry points.



(2) To Check

Place carriage to right margin. With an "all-marking" code combination set up in selector, manually operate the typing unit until the function clutch just trips.

Requirement

As gauged by eye

Min 0.010 inch --- Max 0.030 inch
between rotary drive arm and left rack
when play rack is taken up in downward
direction.

To Adjust

Repeat "(1) To Check" above and refine
"To Adjust" under "(1) To Check" above.

Related Adjustment

Affected By

REAR RAIL (Carriage Area)

Note: When the typing unit is operated under power, the typewheel shall shift from right to left or left to right side and print the proper characters uniformly.

2.44 Carriage Area (continued)

DRIVE BAIL

To Check

Place carriage approximately 1/2 inch from left margin. Set up an "all-spacing" code combination in the selector. Rotate main shaft until carriage drive bail reaches its rearmost position.

(1) Requirement

approx 0.030 inch
between print hammer bail and print
hammer trip lever.

To Adjust

With print hammer trip lever
clampscrew loosened, position
print hammer trip lever using
pry point.

(2) Requirement

With carriage approximately 1/2
inch from right margin, clearance
between print hammer bail and
print hammer trip lever to be
within 0.020 inch
of "(1) Requirement" above.

To Adjust

With carriage drive bail right pivot
clampscrew loosened, position
right pivot.

Note: Carriage drive bail shall not
be biased to the right or left.

Related Adjustments

Affects

PRINT DRIVE LEVER (Carriage Area)

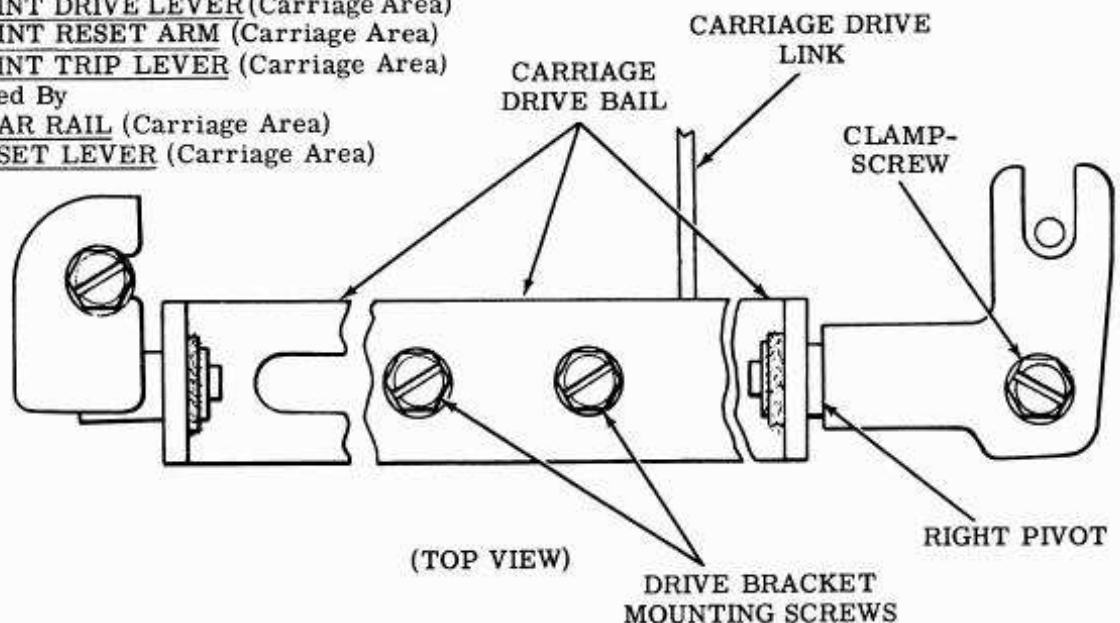
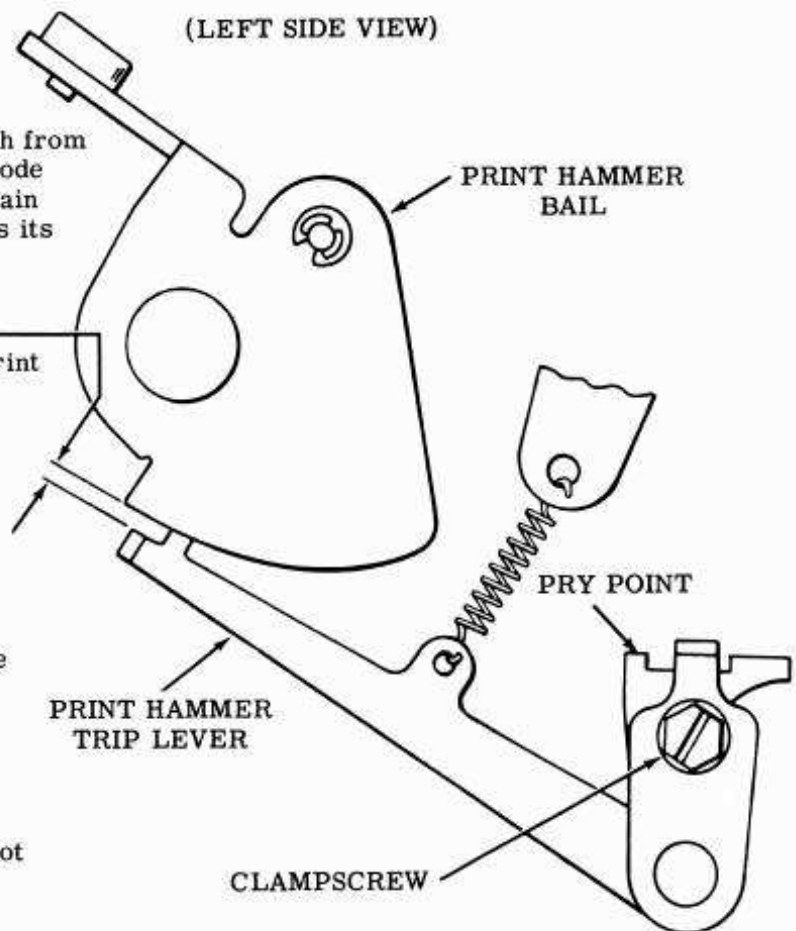
PRINT RESET ARM (Carriage Area)

PRINT TRIP LEVER (Carriage Area)

Affected By

REAR RAIL (Carriage Area)

RESET LEVER (Carriage Area)



2.45 Carriage Area (continued)

PRINT DRIVE LEVER

To Check

Place typing unit in stop condition.

Requirement

As gauged with an adjusting tool no. TP180588

Min 0.229 inch --- Max 0.239 inch

between vertical drive bail and common vertical stop arm.

Note: An adjusting tool no. TP180588 has a nominal dimension of 0.234 inch.

To Adjust

With print drive lever clampscrew loosened, position print drive lever using pry points.

Related Adjustments

Affects

PRINT RESET ARM (Carriage Area)

PRINT TRIP LEVER (Carriage Area)

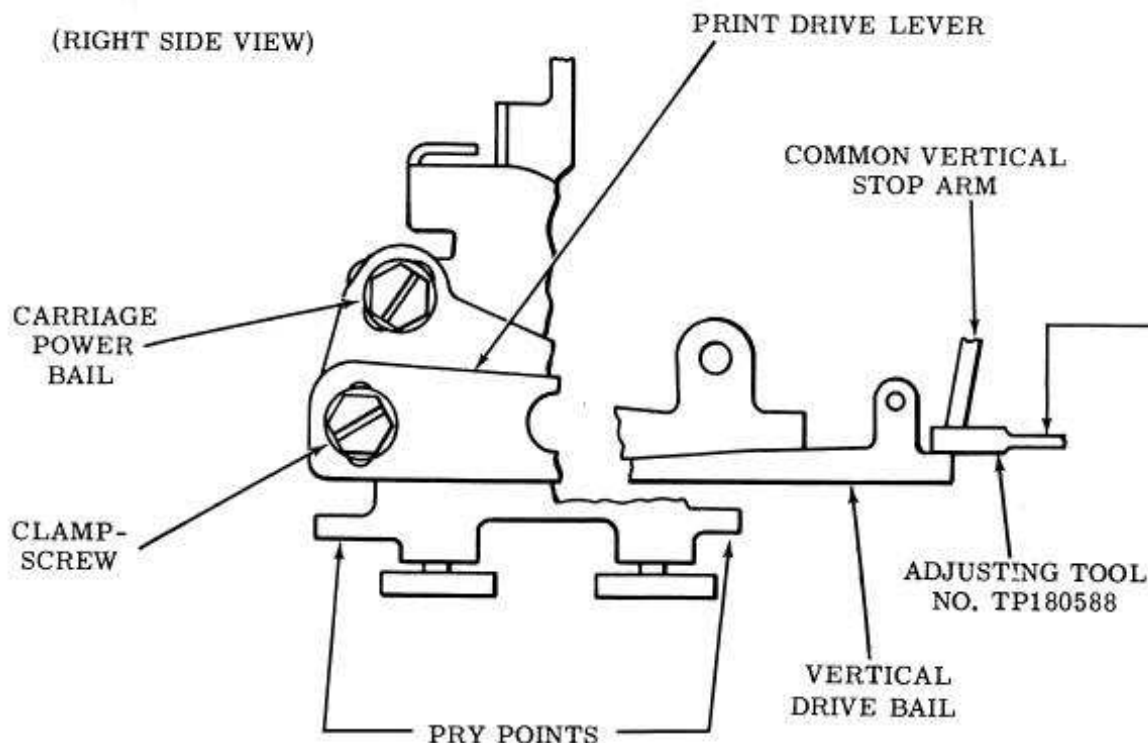
PLATEN-VERTICAL (Paper Feed Area*)

Affected By

REAR RAIL (Carriage Area)

DRIVE BAIL (Carriage Area)

*Friction or Sprocket Feed Mechanisms



2.46 Carriage and Spacing Areas

PRINT RESET ARMRequirement

With typing unit in stop condition

Min 0.009 inch --- Max 0.030 inch
between print hammer bail and print
hammer trip lever.

To Adjust

With clamp nut loosened position print reset
arm's eccentric pivot with hex wrench in hex
hole.

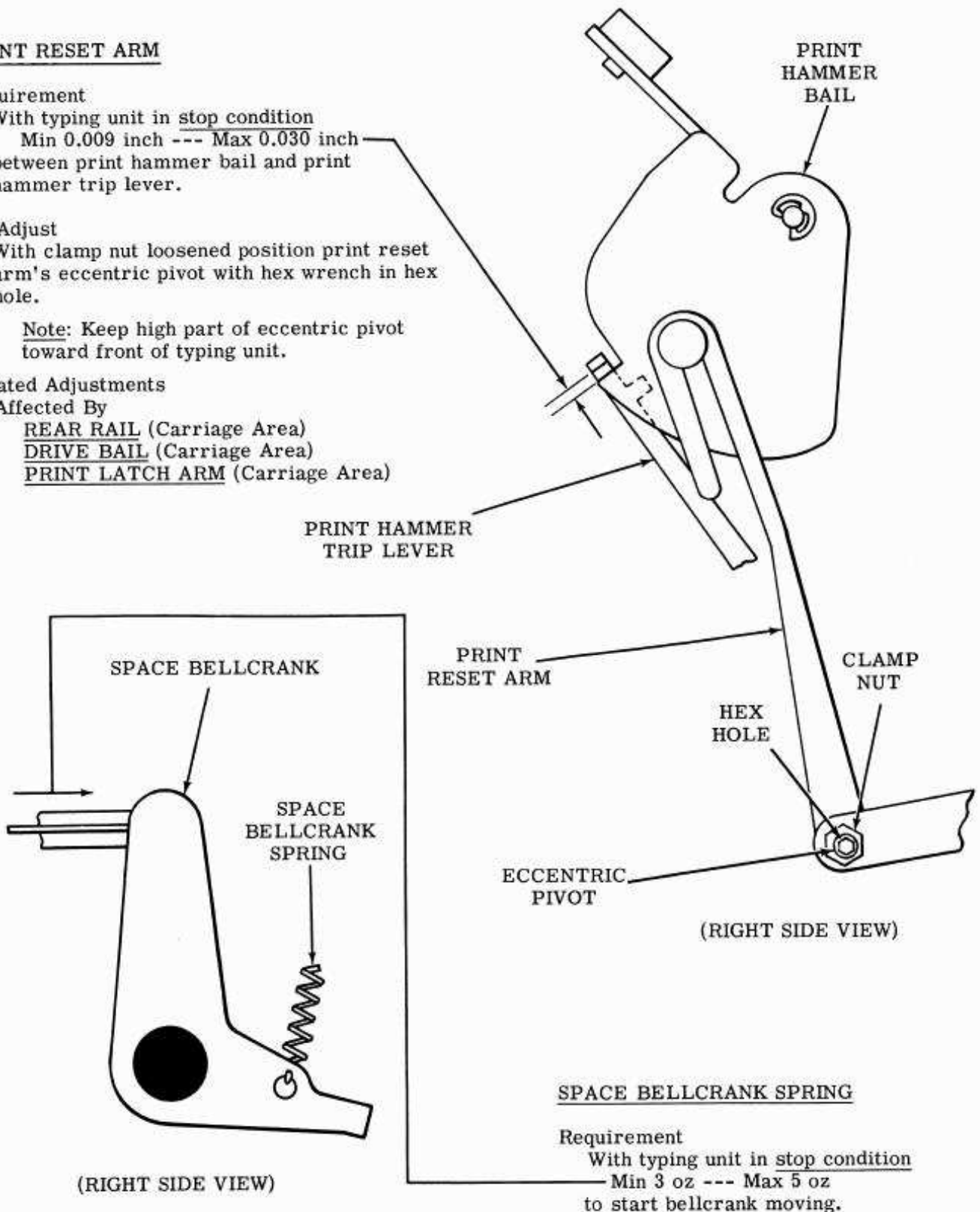
Note: Keep high part of eccentric pivot
toward front of typing unit.

Related AdjustmentsAffected By

REAR RAIL (Carriage Area)

DRIVE BAIL (Carriage Area)

PRINT LATCH ARM (Carriage Area)



2.47 Function Area

FUNCTION LEVER SPRINGS

Requirement

With typing unit in stop condition, the spring scale requirements to start each function lever moving are:

- (1) Min 19 oz---Max 24 oz to start LF and AUTO LF function levers moving.

Note 1: Hold the blocking pawl up when checking this requirement.

- (2) Min 3-1/2 oz---Max 5-1/2 oz to start carriage return function lever moving.

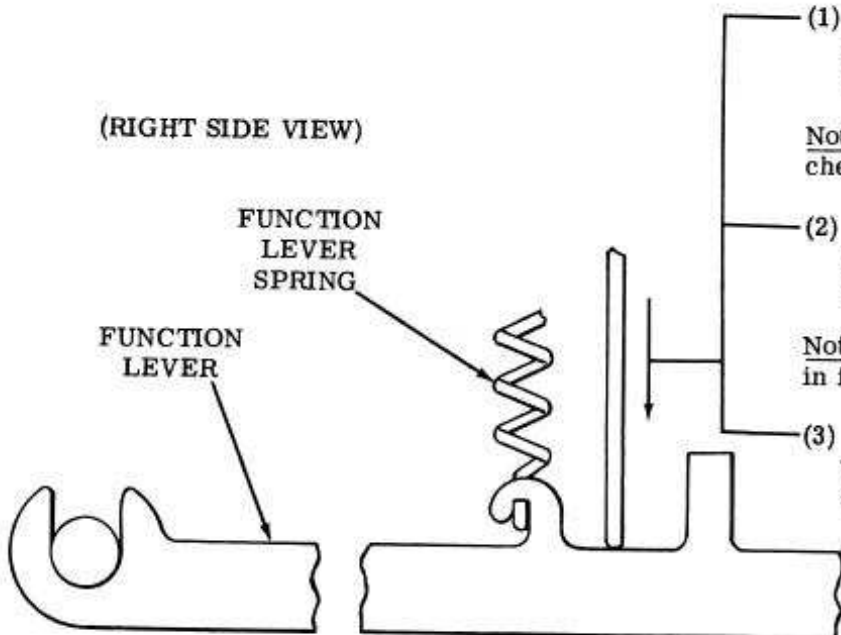
Note 2: Hold carriage return lever in frontward position.

- (3) Min 3-1/2 oz---Max 5-1/2 oz to start remaining function levers moving.

(RIGHT SIDE VIEW)

FUNCTION
LEVER
SPRING

FUNCTION
LEVER



FUNCTION BAIL SPRING

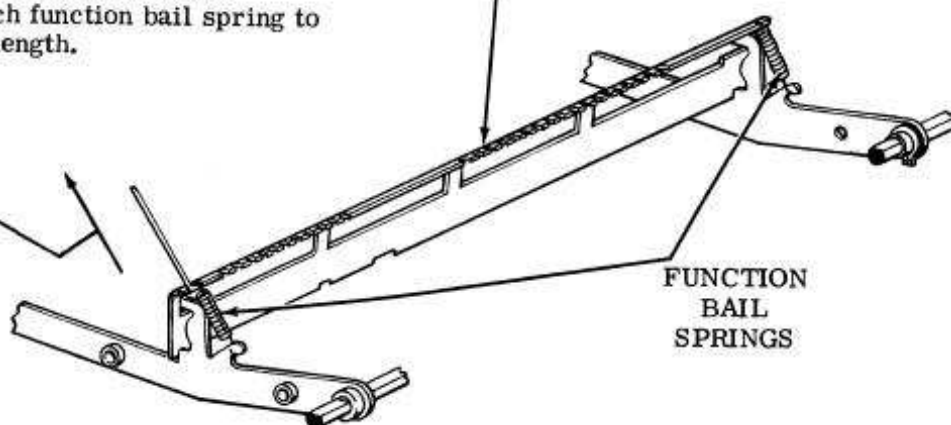
Requirement

With typing unit in stop condition

Min 72 oz---Max 104 oz to pull each function bail spring to installed length.

FUNCTION
BAIL

FUNCTION
BAIL
SPRINGS



(LEFT FRONT VIEW)

2.48 Carriage Area

PRINT LATCH ARM**To Check**

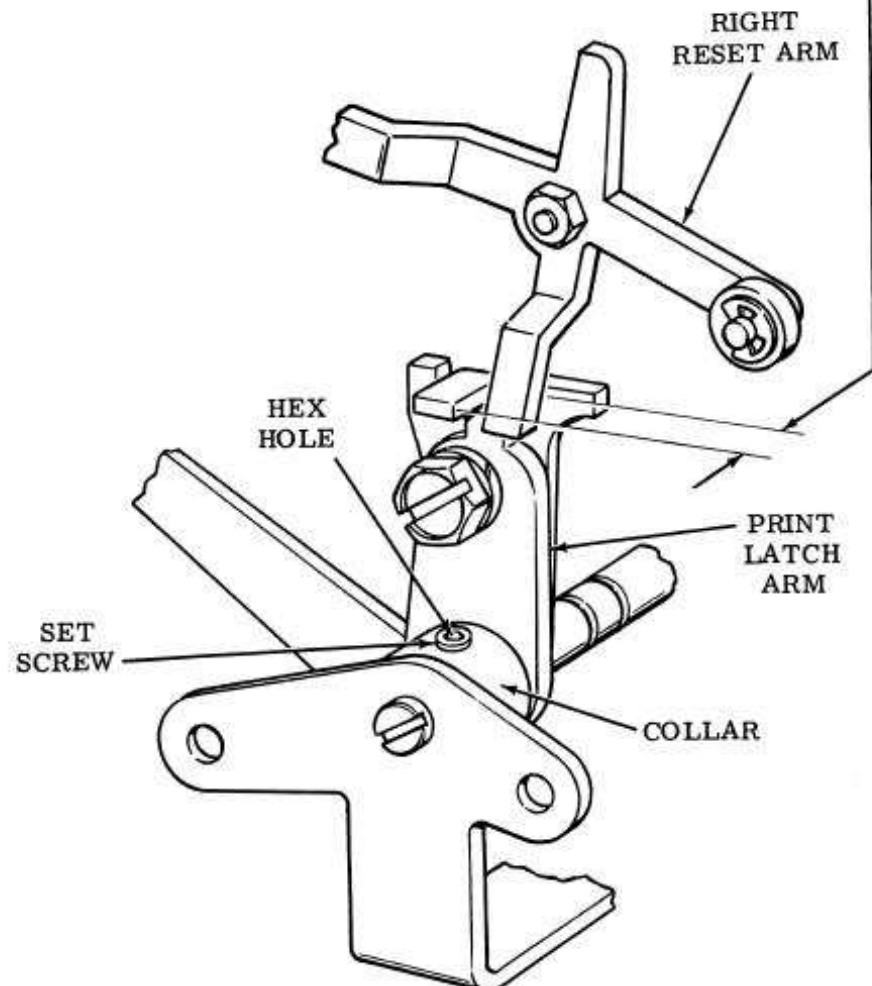
Take up play in print suppression latch-lever towards carriage casting.

Requirement

Print latch arm shall have
Min full engagement
with right reset arm with no binds.

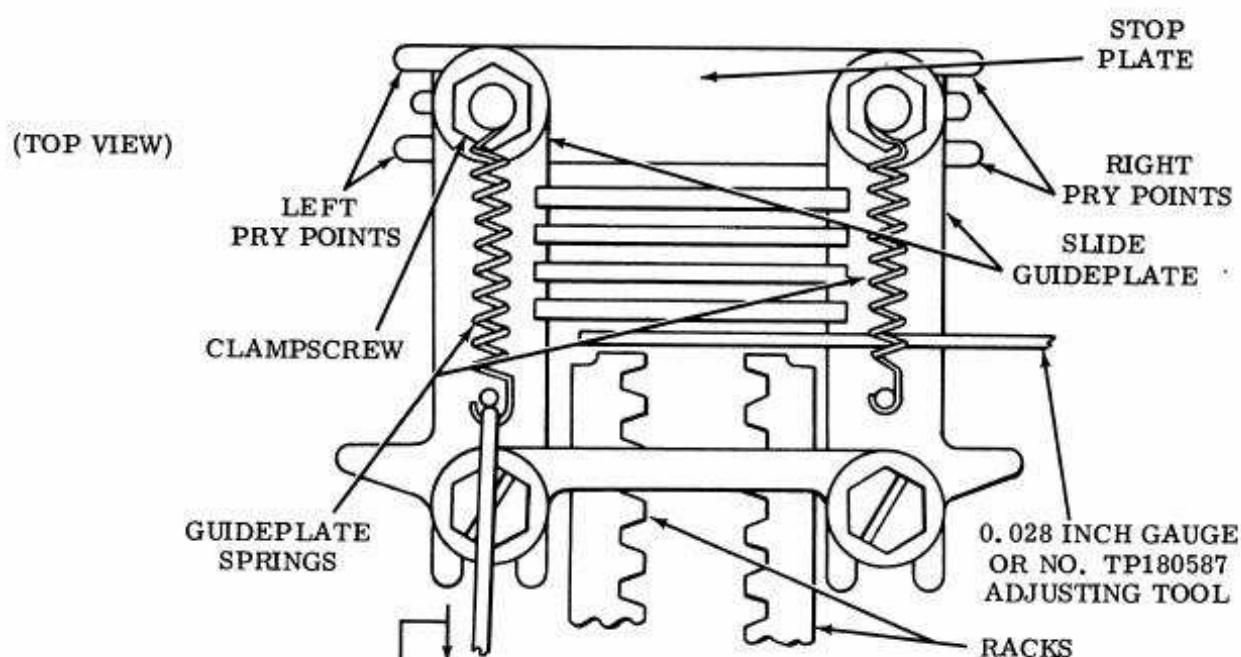
To Adjust

With hex wrench in hex hole, loosen
set screw. Position collar.



(RIGHT REAR VIEW)

2.49 Carriage Area (continued)

STOP PLATETo Check

Set up code combination in selector of a character in counterclockwise field of typewheel. Rotate main shaft until carriage drive bail is in rearmost position. Check to see if vertical row containing character is properly selected. Repeat for a character in clockwise field.

Requirement

Typewheel positioning correct in both clockwise and counterclockwise directions.

To Adjust

Place typing unit in stop condition. Open up LEFT SLIDE GUIDEPLATE (Carriage Area) and RIGHT SLIDE GUIDEPLATE (Carriage Area) adjustments. Loosen two clampscrews friction tight. Place either 0.028 inch gauge or tool no. TP180587 across end of racks. Hold reset lever in place and position stop plate so that entire slide assembly is tight against racks and tool.

Related AdjustmentsAffects

RIGHT SLIDE GUIDEPLATE (Carriage Area)
LEFT SLIDE GUIDEPLATE (Carriage Area)

Affected By

ROTARY RACKS (Carriage Area)

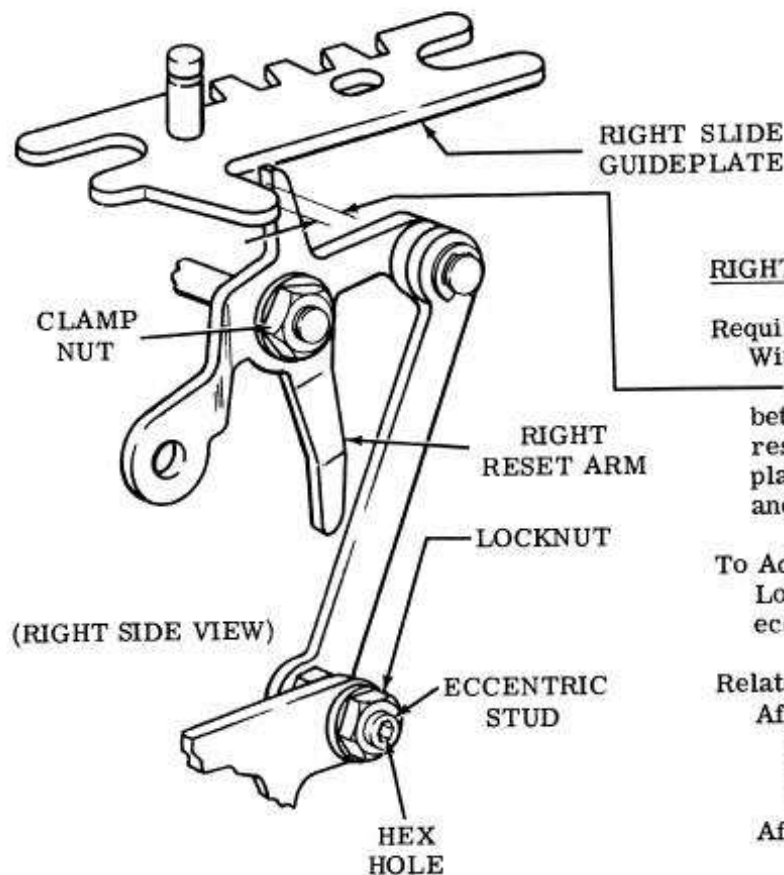
Note 1: To check slide guideplate springs, it is necessary to remove the carriage mechanism from the typing unit. Do not check unless there is reason to believe that the slide guideplate springs will not meet their requirement.

SLIDE GUIDEPLATE SPRINGSRequirement

Min 1 oz---Max 3 oz
 to pull each spring to installed length.

Note 2: Check right and left spring.

2.50 Carriage Area (continued)

RIGHT SLIDE GUIDEPLATERequirement

With typing unit in stop condition

Min Some---Max 0.015 inch
between right slide guideplate and the right
reset arm when right and left slide guide-
plates are held toward front to make clear-
ance a minimum.

To Adjust

Loosen eccentric stud locknut. Rotate
eccentric stud with hex wrench in hex hole.

Related AdjustmentsAffects

LEFT SLIDE GUIDEPLATE (Carriage
Area)

PRINT TRIP LEVER (Carriage Area)

Affected By

PRINT DRIVE LEVER (Carriage Area)
STOP PLATE (Carriage Area)

LEFT SLIDE GUIDEPLATERequirement

With typing unit in stop condition

Min Some---Max 0.015 inch
between left slide guideplate and left reset
arm when the right and left slide guideplates
are held toward the front to make clearance
a maximum.

To Adjust

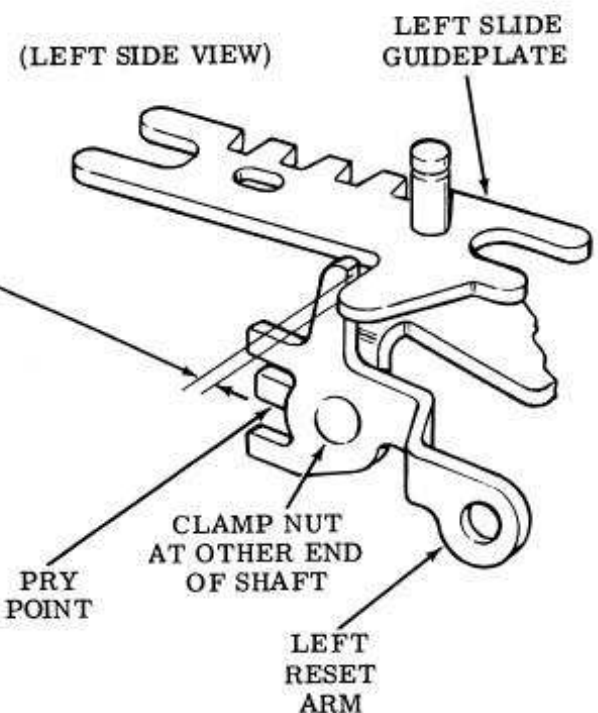
Loosen left reset arm clamp nut. Position
left reset arm using pry point.

Related AdjustmentsAffects

RIBBON GUIDE (Carriage Area)

Affected By

RIGHT SLIDE GUIDEPLATE
(Carriage Area)



2.51 Carriage Area (continued)

RIBBON GUIDE

To Check

Manually operate the typing unit until the right ribbon link separates

Min 0.010 inch --- Max 0.015 inch
from ribbon guide.

Requirement

Clearance between left ribbon link and ribbon guide

Min Not less than equal to

Max Not more than 0.010 inch greater than
clearance between right ribbon link and ribbon guide.

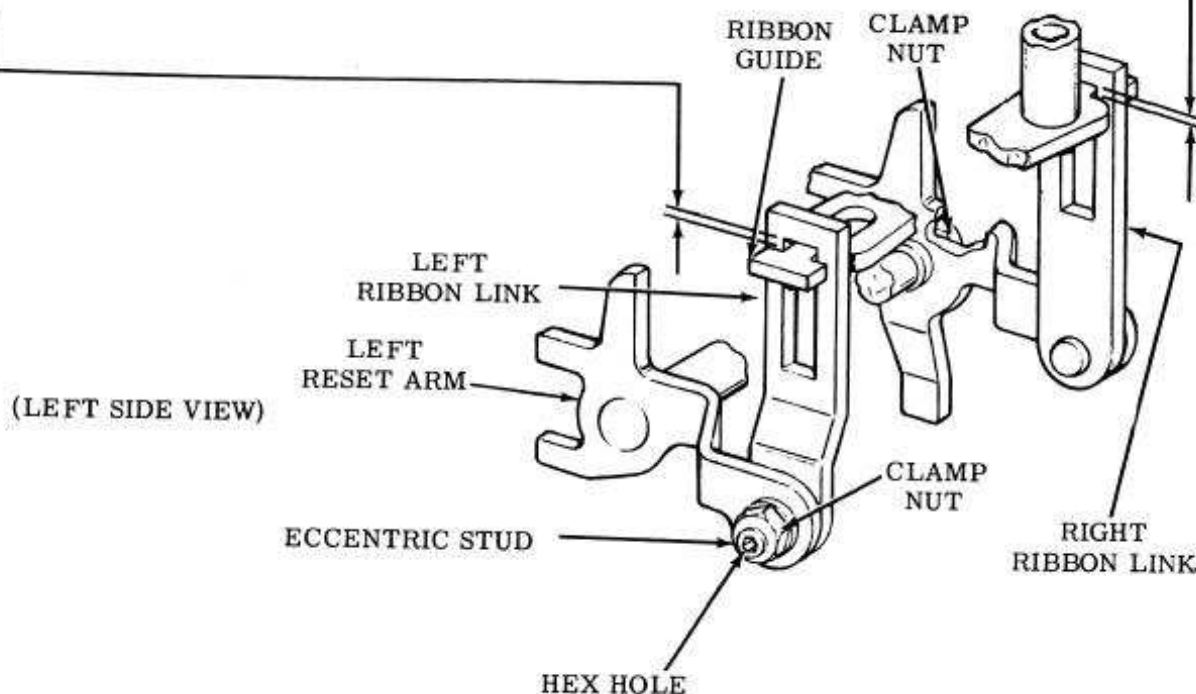
To Adjust

Loosen left reset arm clamp nut. Position eccentric stud using hex wrench in hex hole.

Related Adjustment

Affected By

LEFT SLIDE GUIDEPLATE (Carriage Area)



2.52 Carriage Area (continued)

PRINT TRIP LEVERTo Check

Place carriage approximately 1/2 inch from left margin. Set up an "all-spacing" code combination in the selector. Rotate main shaft until carriage drive bail reaches its rearmost position.

(1) Requirement

Min 0.040 inch --- Max 0.100 inch
clearance between print hammer bail and
print hammer trip lever.

(2) Requirement

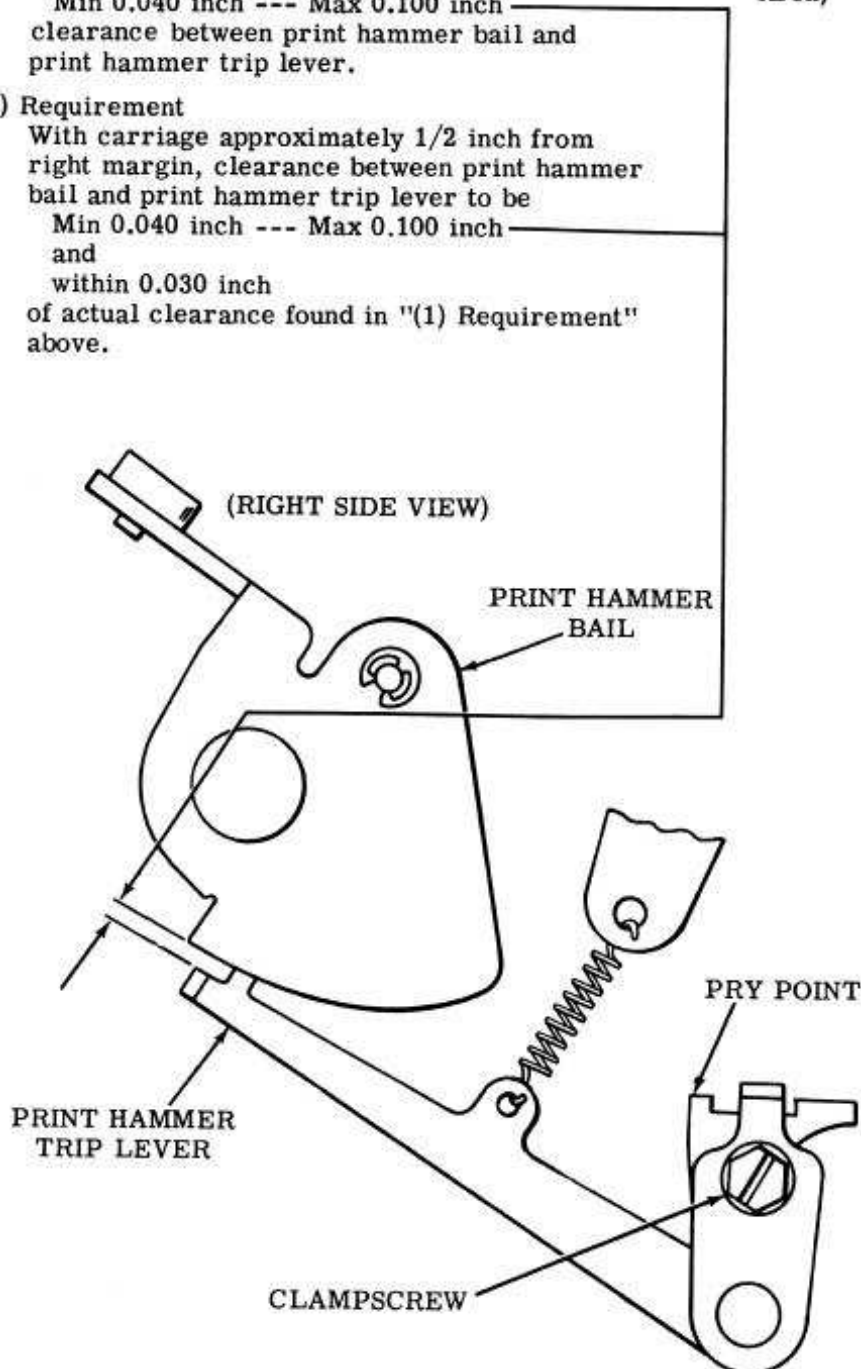
With carriage approximately 1/2 inch from
right margin, clearance between print hammer
bail and print hammer trip lever to be
Min 0.040 inch --- Max 0.100 inch
and
within 0.030 inch
of actual clearance found in "(1) Requirement"
above.

To Adjust

With clampscrew loosened, position
print hammer trip lever using pry
point.

Related AdjustmentsAffected By

PRINT DRIVE LEVER (Carriage Area)
RIGHT SLIDE GUIDEPLATE (Carriage
Area)



2.53 Carriage Area (continued)

PRINT SUPPRESSION LATCHLEVER

(1) To Check

Place carriage approximately 1/2 inch from left margin. Set up the "T" (---5) or (--3-5-78) code combination in the selector. Rotate main shaft until the carriage drive bail reaches its rearmost position. Take up the play in the print suppression latchlever to the right.

Requirement

Min 0.030 inch --- Max 0.050 inch
between print suppression latch lever and print hammer bail.

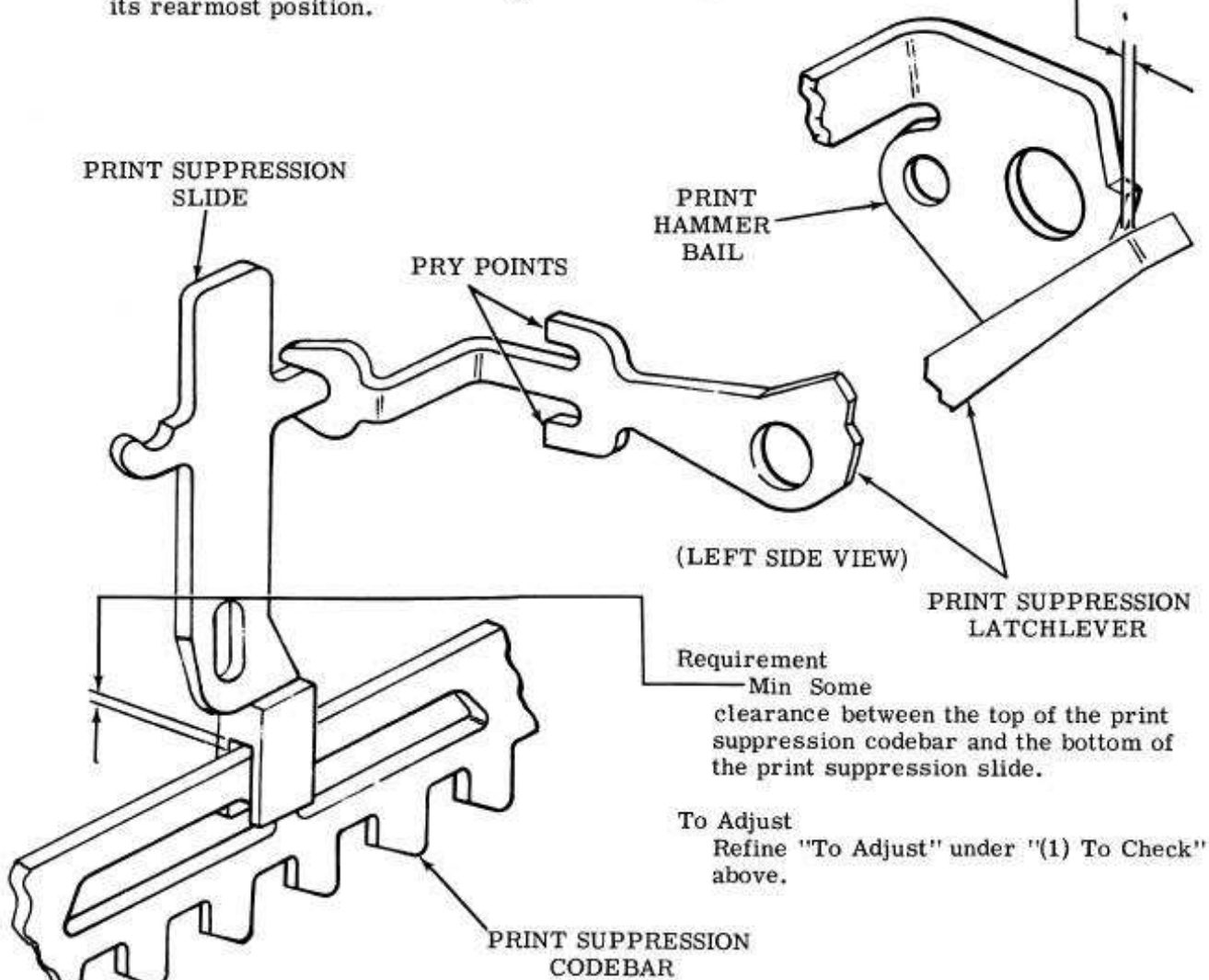
To Adjust

With print suppression latchlever held against print hammer bail, bend print suppression latchlever using pry points.

Note: Use top pry point to make gap larger. Use bottom pry point to make gap smaller.

(2) To Check

Set up an "all-spacing" code combination in the selector. Rotate main shaft until the carriage drive bail reaches its rearmost position.



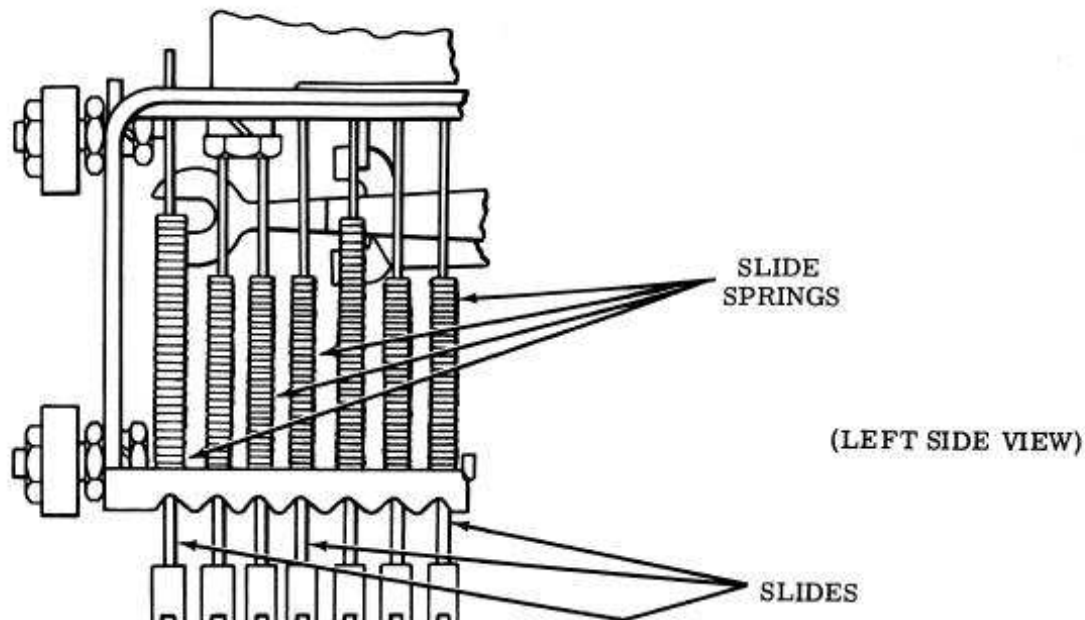
Requirement

Min Some
clearance between the top of the print
suppression codebar and the bottom of
the print suppression slide.

To Adjust

Refine "To Adjust" under "(1) To Check"
above.

2.54 Carriage Area (continued)

SLIDE SPRINGS

Note 1: To check tensions of the slide springs, it is necessary to remove the carriage mechanism from typing unit. For instructions see the appropriate typing unit section. Do not check unless there is reason to believe that the slide springs do not meet their requirements.

Requirement

With carriage power bail in its stop position, towards the front, it shall require the following to start slides moving:

Note 2: Slide numbers outside parentheses apply to 5-level typing units, and slide numbers inside parentheses apply to 8-level typing units.

SLIDE NO.	4(5) AND 5(6)	3(4)	1(2) AND 2(3)	0(1)	P-S*
Min	1/4 oz	3-3/4 oz	2 oz	1/4 oz	3-3/4 oz
Max	1-1/4 oz	4-1/2 oz	3 oz	1 oz	4-1/2 oz

* Print suppression

2.55 Carriage Area (continued)

ROTARY DRIVE BAIL SPRING

To Check

Set up an "all-marking" code combination in selector and rotate main shaft until the carriage drive bail is in its rear-most position.

Requirement

Min 17 oz
Max 21-1/2 oz
to start rotary drive bail moving.

VERTICAL DRIVE BAIL SPRING

Requirement

With typing unit in stop condition
Min 13 oz---Max 18 oz
to start typewheel moving.

TYPEWHEEL RETURN SPRING

Requirement

With typing unit in stop condition
Min 2-1/2 oz---Max 4-1/2 oz
to move typewheel to platen.

(RIGHT SIDE VIEW)



ROTARY
DRIVE
BAIL

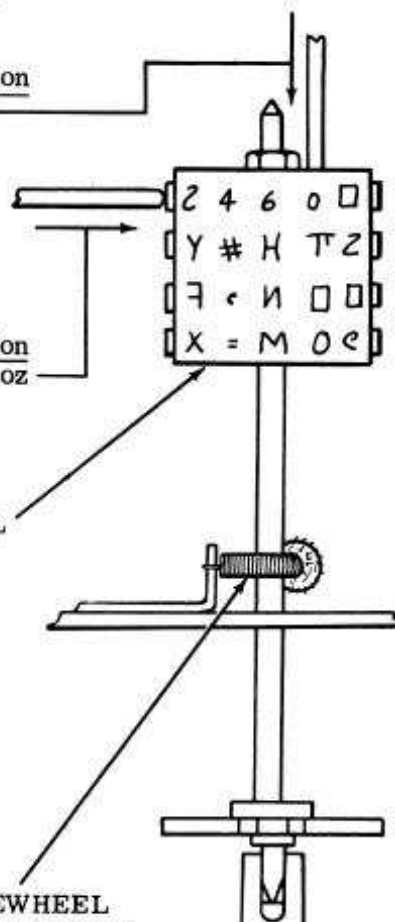
ROTARY
DRIVE BAIL
SPRING

VERTICAL
DRIVE BAIL
SPRING

VERTICAL
DRIVE BAIL

TYPEWHEEL

TYPEWHEEL
RETURN SPRING

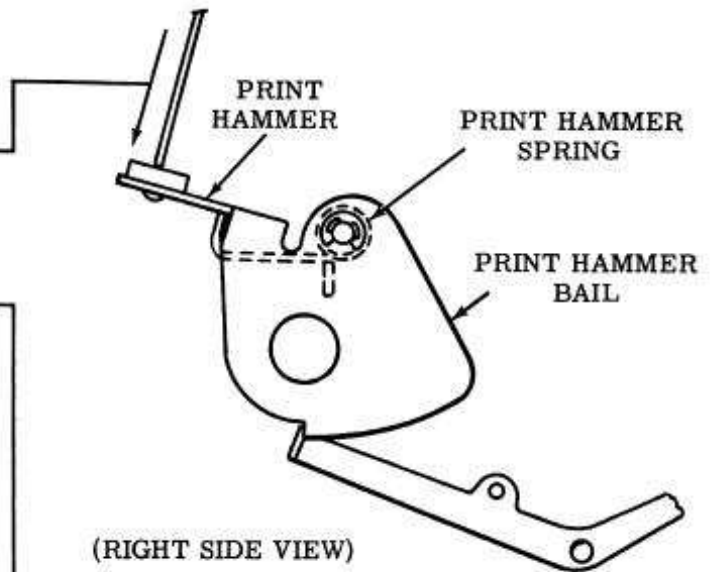
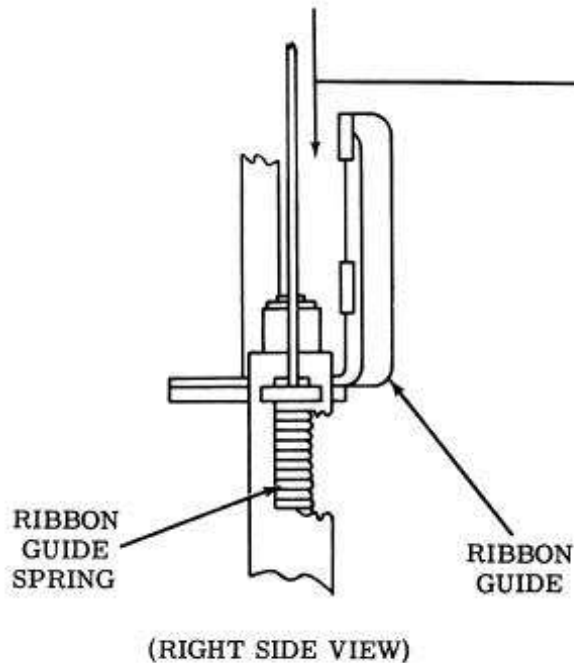


2.56 Carriage Area (continued)

PRINT HAMMER BAIL SPRING

Requirement

With typing unit in stop condition
Min 3 oz --- Max 4-1/2 oz
to start print hammer moving.

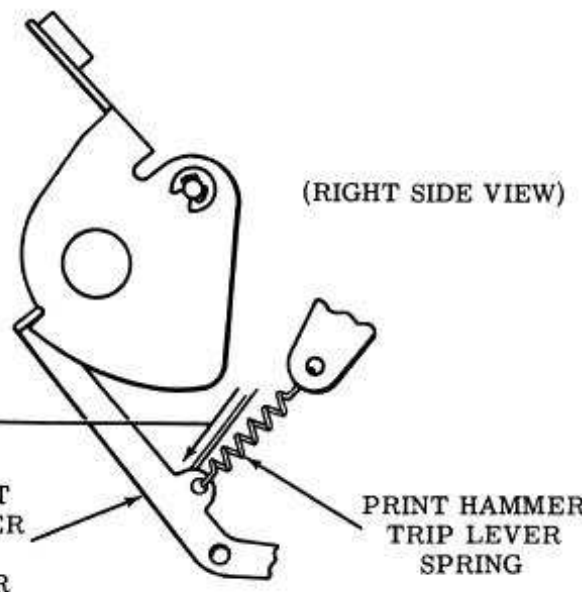
RIBBON GUIDE SPRING

To Check

Remove ribbon from ribbon guide. Trip selector clutch and rotate main shaft until carriage drive bail is in rearmost position.

Requirement

Min 6 oz --- Max 9 oz
to start ribbon guide moving.

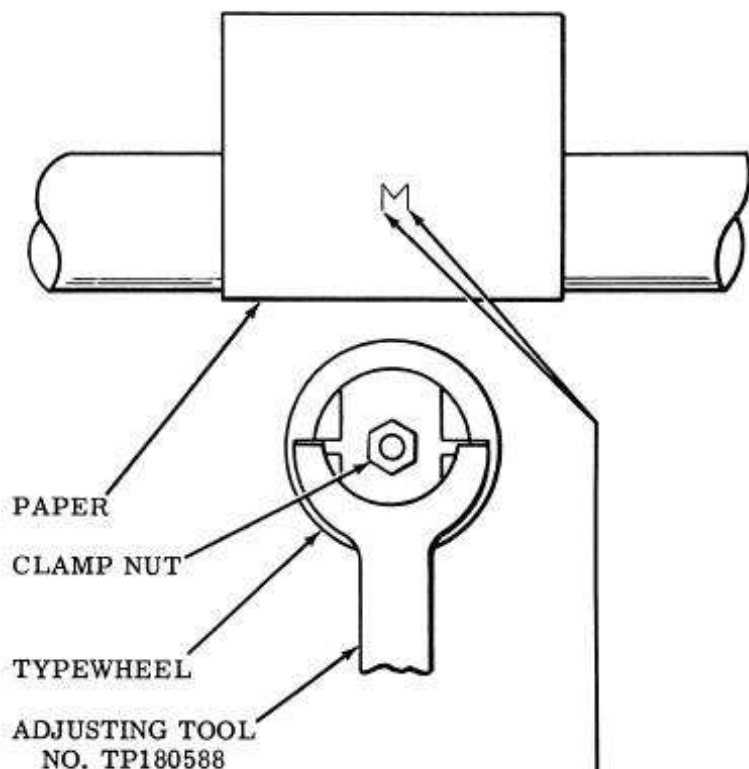
PRINT HAMMER TRIP LEVER SPRING

Requirement

With typing unit in stop condition
Min 1 oz --- Max 2-1/2 oz
to start print hammer trip lever moving.



2.57 Carriage Area (continued)



(TOP VIEW)

Note 1: Replace platen, ribbon mechanism, and dashpot cylinder. For instructions, see the appropriate typing unit section.

TYPEWHEEL

To Check

Place paper in typing unit. Set up the character "M" code combination (--345) or (1-34--78) in the selector. Rotate the main shaft until the character is printed.

Requirement

When the printed character is examined by eye from the left side to the right, the shading shall be approximately the same.

Note 2: Consistent shading from the top of the printed character to the bottom may not occur until the PLATEN-VERTICAL (Paper Feed Area*) adjustment has been made.

To Adjust

With clamp nut loosened, position typewheel while it is held with an adjusting tool no. TP180588.

*Friction or Sprocket Feed Mechanisms

2.58 Carriage Area (continued)

RIBBON POWER LEVER

(1) To Check

Manually operate the typing unit until the carriage drive bail is in the rearmost position. Seat feed pawl against left ribbon ratchet.

Requirement

As gauged by eye

Min. Some --- Max 0.045 inch
between face of left ribbon ratchet tooth
and corner tip of check pawl.

(2) To Check

Repeat "(1) To Check" above, except seat feed pawl against right ribbon ratchet.

Requirement

Repeat "Requirement" of "(1) To Check" above, except clearance is between face of right ribbon ratchet tooth and corner tip of check pawl.

To Adjust

With locknut loosened, position the eccentric stud with hex wrench in hex hole.

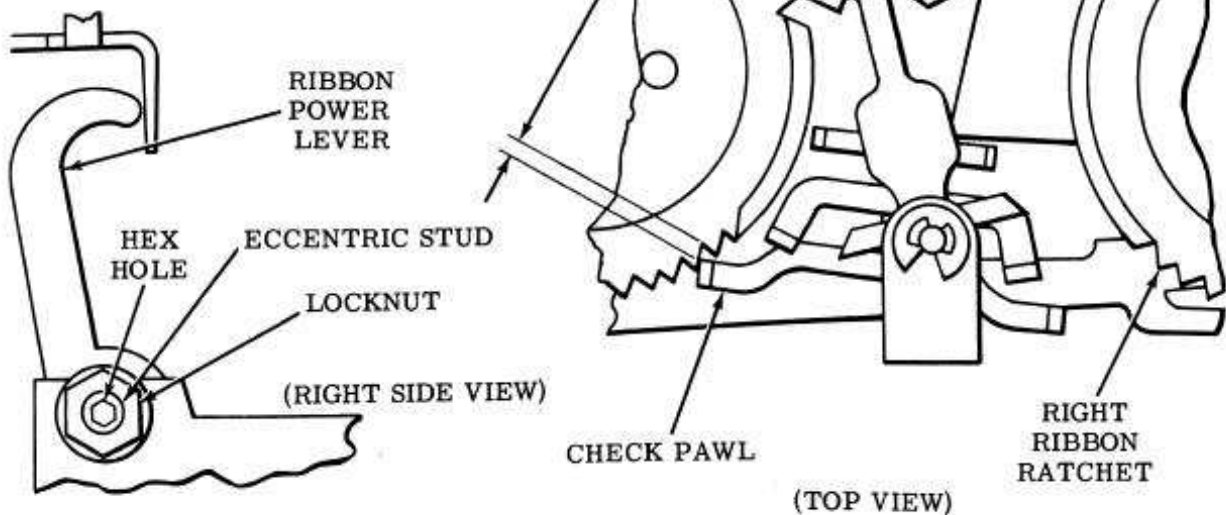
Note 1: Position eccentric stud to the bottom of its mounting slot when tightening locknut.

Note 2: When the typing unit is operated under power, the feed pawl shall advance either the left or right ribbon ratchet one tooth on each operation.

Related Adjustment

Affected By

RESET LEVER (Carriage Area)



2.59 Carriage Area (continued)

RIBBON RATCHET SPRING

Requirement

With feed and check pawls disengaged from spacing ratchet

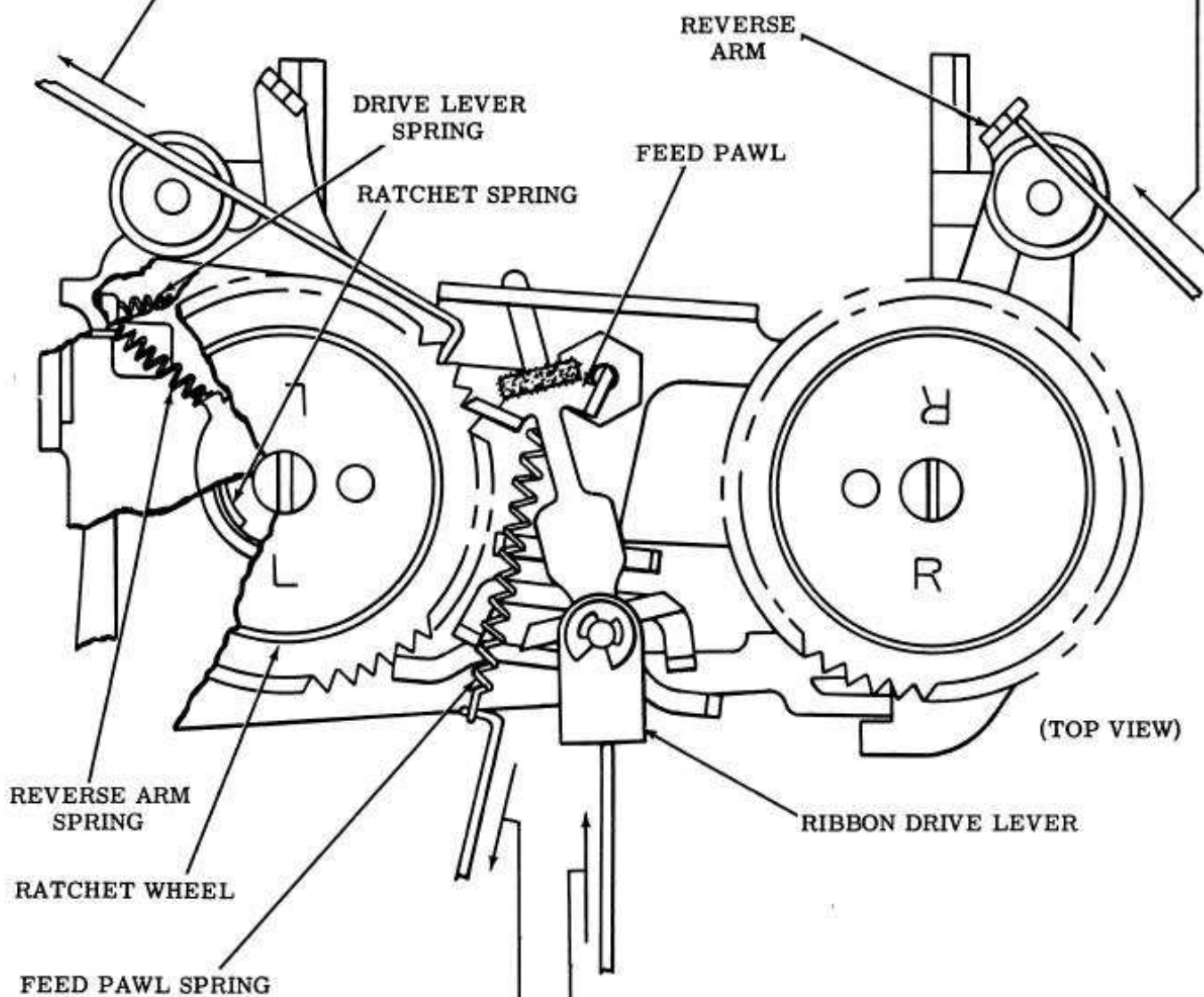
Min 1-1/2 oz --- Max 3-1/2 oz
to start ratchet wheel moving.

RIBBON REVERSE ARM SPRING

Requirement

With typing unit in stop condition and ribbon removed

Min 1-1/2 oz --- Max 3 oz
to start reverse arm moving.



RIBBON FEED PAWL SPRING

Requirement

With typing unit in stop condition

Min 2-1/2 oz --- Max 4 oz
to pull feed pawl spring to installed length.

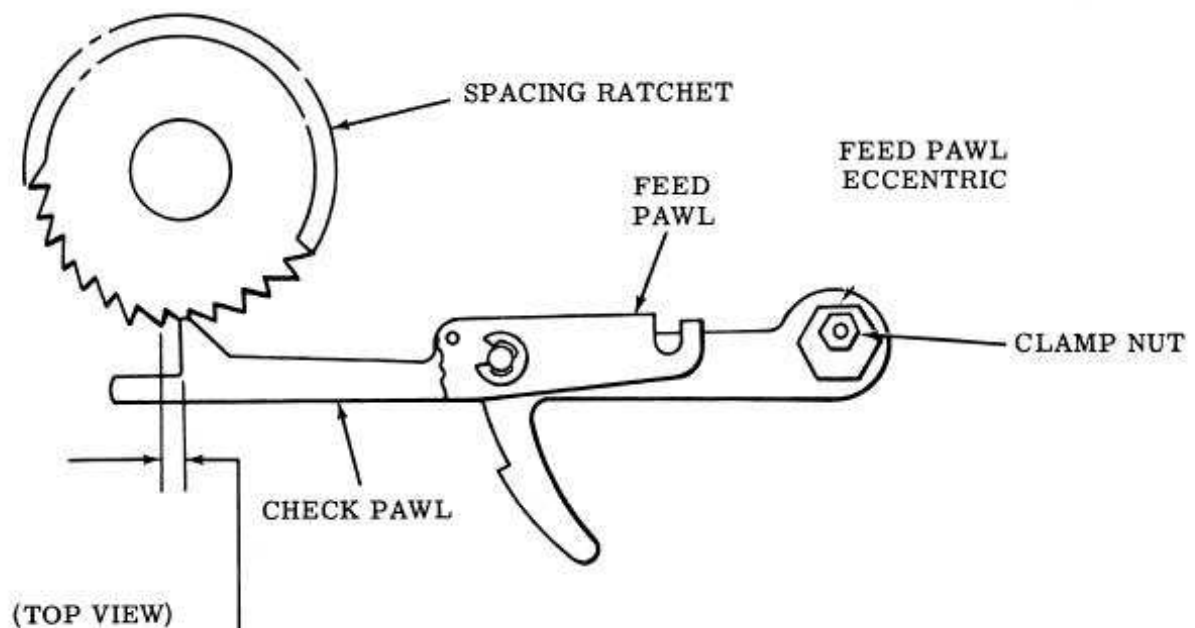
RIBBON DRIVE LEVER SPRING

Requirement

With typing unit in stop condition

Min 5-1/2 oz --- Max 9 oz
to start ribbon drive lever moving.

2.60 Spacing Area

FEED PAWL

Requirement

With carriage near center of platen and typing unit in stop condition
 Min 0.004 inch --- Max 0.018 inch
 between check pawl and spacing ratchet tooth, as gauged by eye.

To Adjust

Rotate feed pawl eccentric with clamp nut loosened. Keep high part of eccentric toward front.

Related Adjustment

Affected By

DRIVE BAIL (Carriage Area)

2.61 Spacing Area (continued)

SPACE SUPPRESSION LEVERTo Check

Move carriage to the center of platen. Set up the "T" code combination (----5) or "@" code combination (-----78) in the selector.

Note 1: Set up the "T" code combination in 5-level typing units and the "@" code combination in 8-level typing units.

Note 2: It may be necessary to trip the space suppression lever on typing units which have been maladjusted.

Rotate the main shaft until the front vertical surface of the right end of feed pawl is aligned with notch on space suppression lever as gauged by eye.

Note 3: If the feed pawl is moved too far to the rear, it will be necessary to disengage the feed pawl from spacing ratchet.

Place the space suppression lever against the right end of the feed pawl while holding the print suppression codebar toward the right side of the typing unit. Rotate the main shaft slowly forward or backward until the front vertical surface of the right end of feed pawl is aligned flush with notch on space suppression lever.

Note 4: If the feed pawl is moved too far to the rear when aligning its right end with the notch on the space suppression lever, begin again this "To Check" procedure.

Quickly release the print suppression codebar so that the space suppression lever moves sharply to the right. Take up play in feed pawl by moving left end up.

ECCENTRIC

CODEBAR

CLAMPSCREW

"0" CODEBAR

EXTENSION

SPACE
SUPPRESSION
LEVER(TOP VIEW)
EARLY DESIGN
5-LEVEL
TYPING UNITSFEED
PAWL

(TOP VIEW)

Requirement

- (1) Min 0.005 inch---Max 0.040 inch between right end of feed pawl and tip of notch on the space suppression lever.

Note 5: The following requirement applies only to early design 5-level typing units.

- (2) Min Some clearance between left end of "0" codebar and rear extension of space suppression lever.
- (3) The position of high part of eccentric shall be toward the rear of the typing unit.

To Adjust

With eccentric clampscrew friction tight, position eccentric. Tighten eccentric clampscrew and again perform "To Check" procedure above. Recheck "Requirement" above and readjust if necessary.

Related Adjustments

Affects

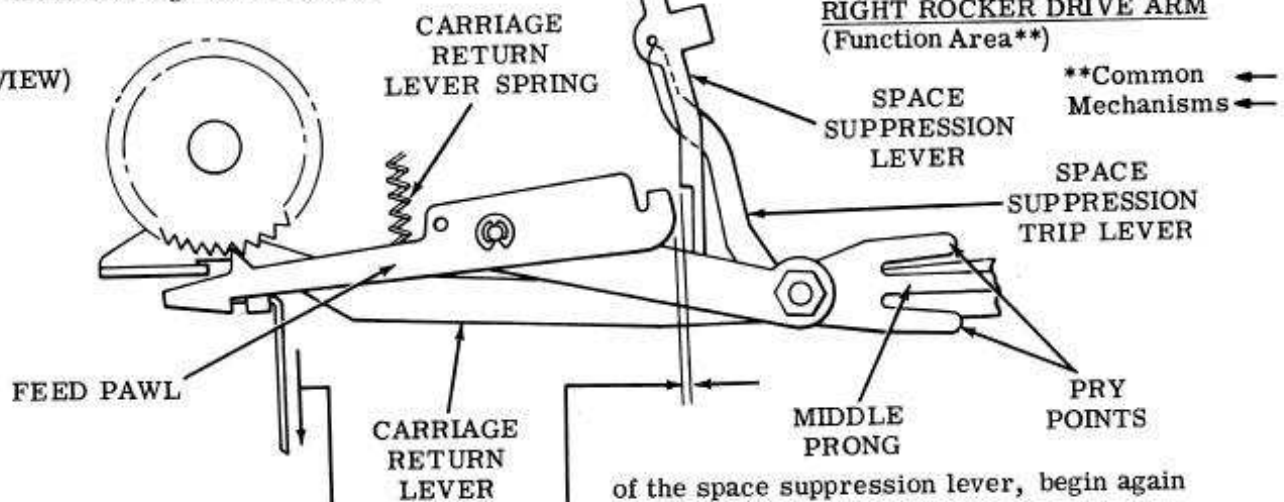
FEED PAWL ENGAGEMENT (Spacing Area)

2.62 Spacing Area (continued)

CARRIAGE RETURN LEVER SPRINGTo Check

Place typing unit in stop condition and manually return carriage. Hold feed pawl and check pawl away from carriage return lever.

(TOP VIEW)

Requirement

Min 1 oz---Max 3 oz
to start carriage return lever moving.

SPACE SUPPRESSION TRIP LEVER *To Check

Move carriage to the center of platen.
Set up "space" code combination (--3--) or
(-----6-8) in the selector.

Note 1: It may be necessary to trip the space suppression lever on typing units which have been maladjusted.

Rotate main shaft until front vertical surface of right end of feed pawl is aligned with notch on space suppression lever as gauged by eye.

Note 2: If the feed pawl is moved too far to the rear, it will be necessary to disengage feed pawl from spacing ratchet.

Place the space suppression lever against the right end of the feed pawl while pushing the space suppression trip lever to the rear at the point where it is connected to the space function lever linkage. Rotate the main shaft slowly forward or backward until front vertical surface of right end of feed pawl is aligned flush with notch on space suppression lever.

Note 3: If the feed pawl is moved too far to the rear when aligning its right end with the notch

of the space suppression lever, begin again this "To Check" procedure.

Quickly release space suppression lever so that it moves directly to the right and space suppression trip lever moves directly forward. Take up play in feed pawl by moving left end up.

Requirement

- (1) Min 0.005 inch---Max 0.040 inch between right end of feed pawl and tip of notch on space suppression lever as gauged by eye.
- (2) The space suppression trip lever shall unhesitatingly and fully return to its forward position after being moved toward the rear.

To Adjust

Position the space suppression trip lever by bending the middle prong of its pry points. Repeat "To Check" procedure above and recheck "Requirement" above. Readjust if necessary.

Note 4: Use front pry point to increase clearance and rear pry point to decrease clearance between feed pawl and space suppression lever.

Note 5: If space suppression trip lever binds at its connection to the space function lever linkage, bend formed right end of space suppression trip lever to make it parallel to the space function lever linkage and relieve the bind.

2.63 Spacing Area (continued)

FEED PAWL ENGAGEMENT

To Check

Place carriage to the center of platen.
Set up an "all-spacing" code combination
in the selector. Rotate main shaft until
feed pawl engages notch on space sup-
pression lever.

Requirement

Min 0.015 inch
engagement between right end of feed
pawl and notch of space suppression
lever as gauged by eye.

To Adjust

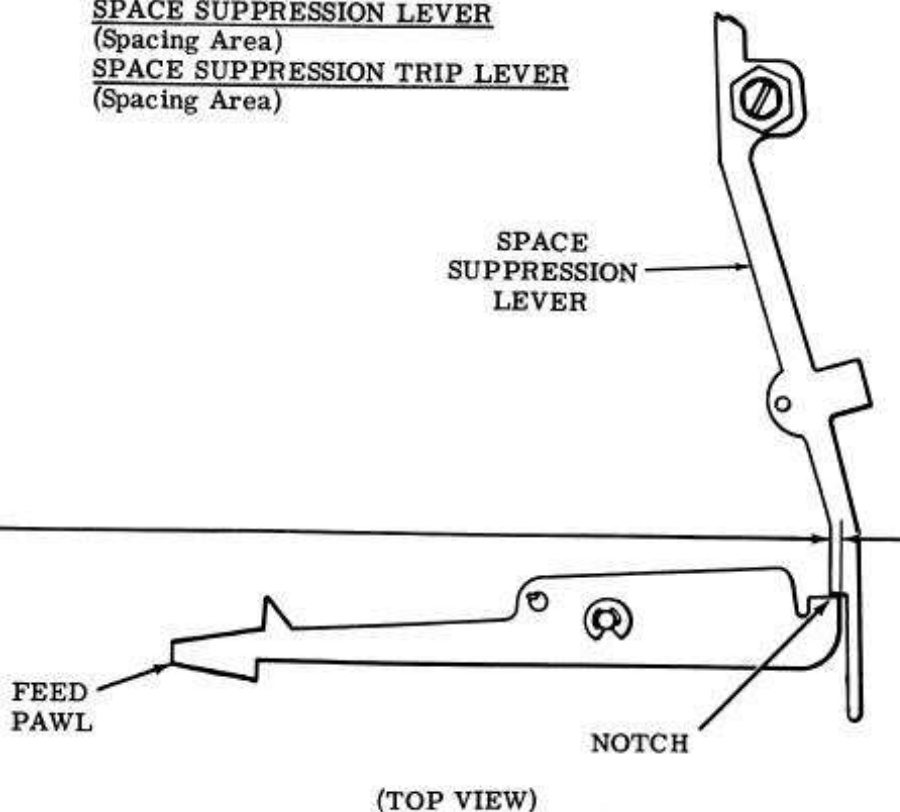
Refine SPACE SUPPRESSION LEVER
(Spacing Area) and SPACE SUPPRESSION
TRIP LEVER (Spacing Area) adjustments
within their requirements.

Related Adjustments

Affected By

SPACE SUPPRESSION LEVER
(Spacing Area)

SPACE SUPPRESSION TRIP LEVER
(Spacing Area)



2.64 Spacing Area (continued)

DRIVE ROLLER**To Check**

Place carriage to left margin and set up any character code combination, except a function code combination, in selector. Rotate main shaft until carriage drive bail reaches its rearmost position.

(2) The typing unit shall consistently single space from left to right margin.

To Adjust

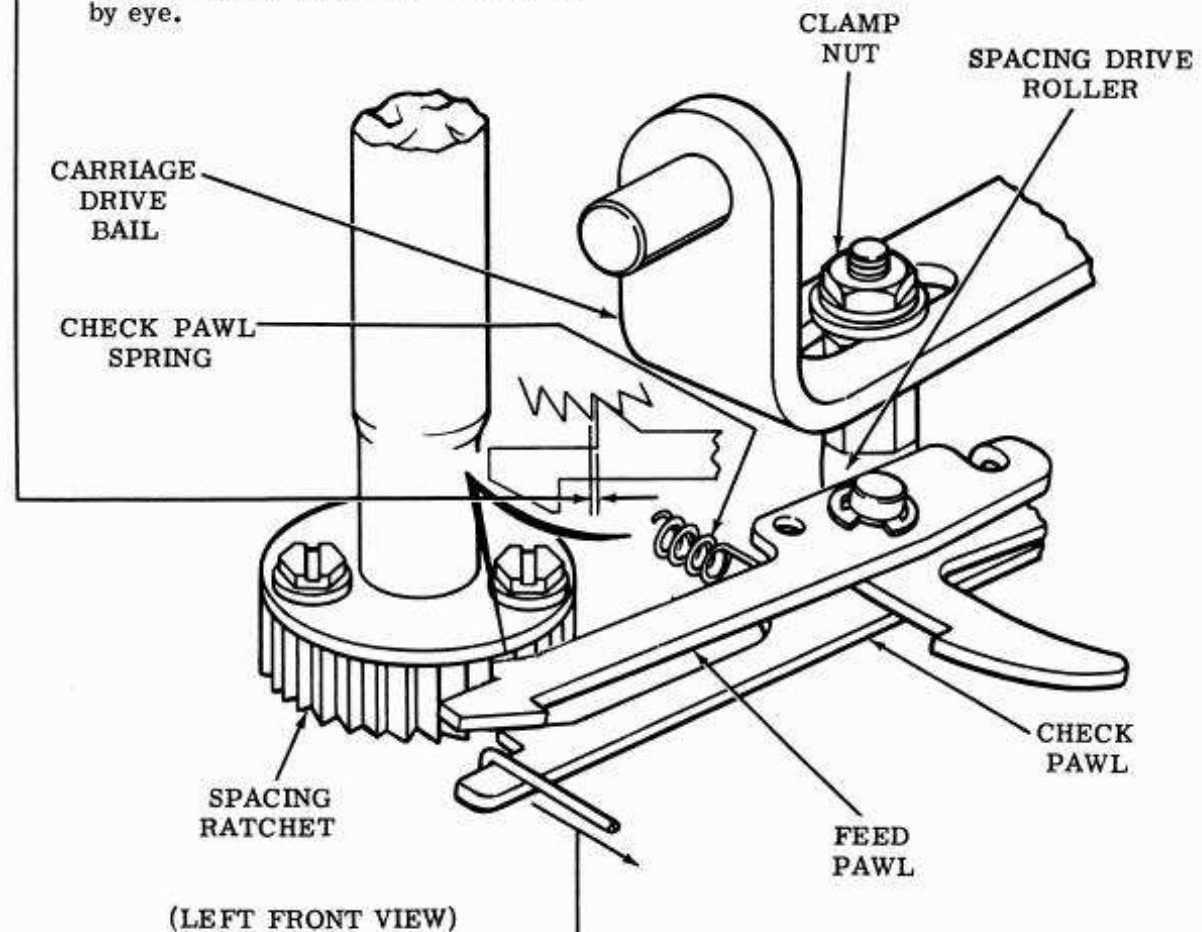
With clamp nut loosened, position spacing drive roller.

Requirement

- (1) Min 0.005 inch---Max 0.030 inch between the feeding surface of the feed pawl and the face of ratchet as gauged by eye.

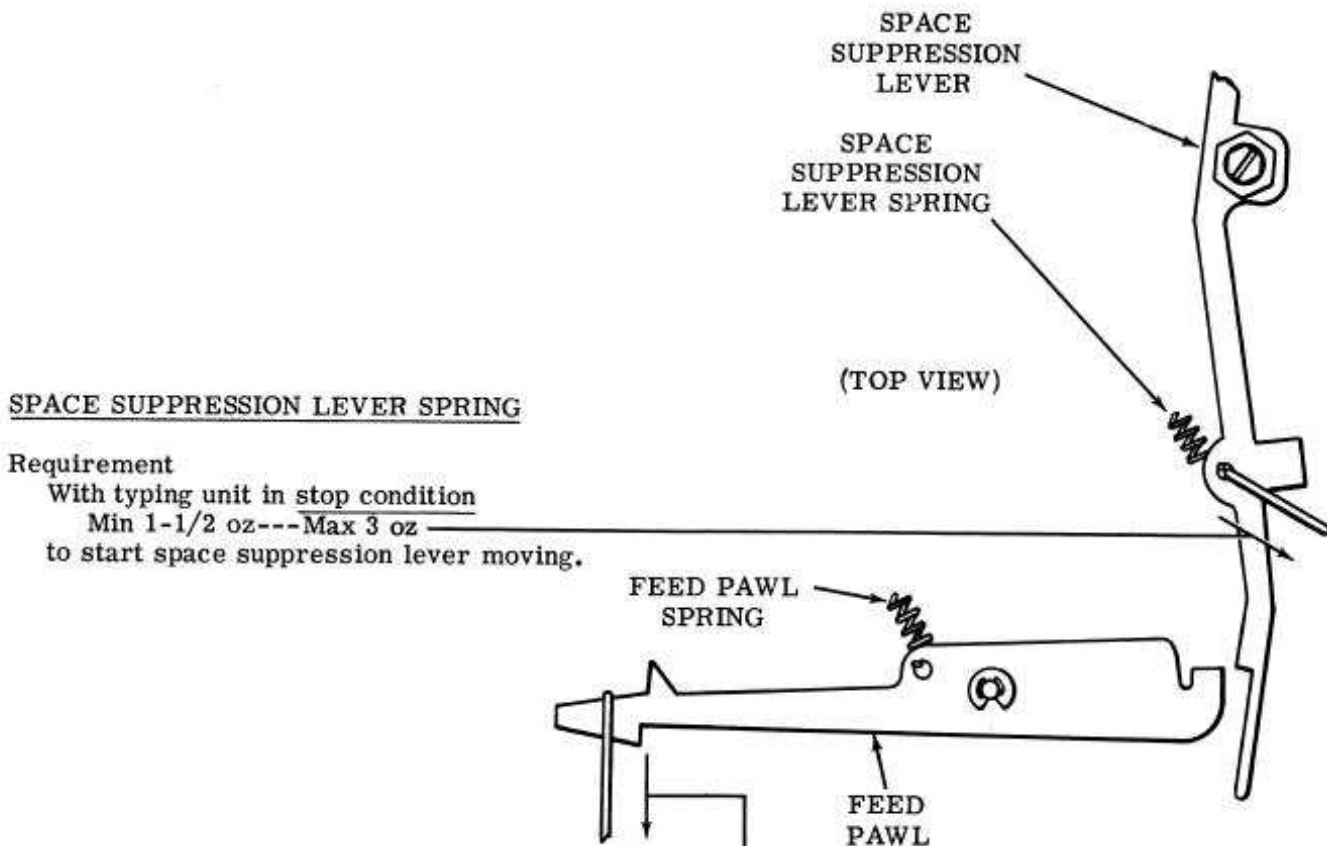
Related Adjustment

Affected By
DRIVE BAIL (Carriage Area)

CHECK PAWL SPRING**Requirement**

With typing unit in stop condition
Min 3/4 oz---Max 1-1/2 oz
to start check pawl moving.

2.65 Spacing Area (continued)



SPACE SUPPRESSION LEVER SPRING

Requirement

With typing unit in stop condition

Min 1-1/2 oz---Max 3 oz
to start space suppression lever moving.

FEED PAWL
SPRING

FEED
PAWL

FEED PAWL SPRING

Requirement

With typing unit in stop condition
and feed pawl disengaged from
spacing ratchet

Min 2 oz---Max 4 oz
to start feed pawl moving.

Note: When a complete readjustment is being undertaken on typing units equipped with friction feed mechanisms, proceed, at this point, to the Paper Feed Area* and perform the adjustments there.

* Friction Feed Mechanisms.

2.66 Spacing Area (continued)

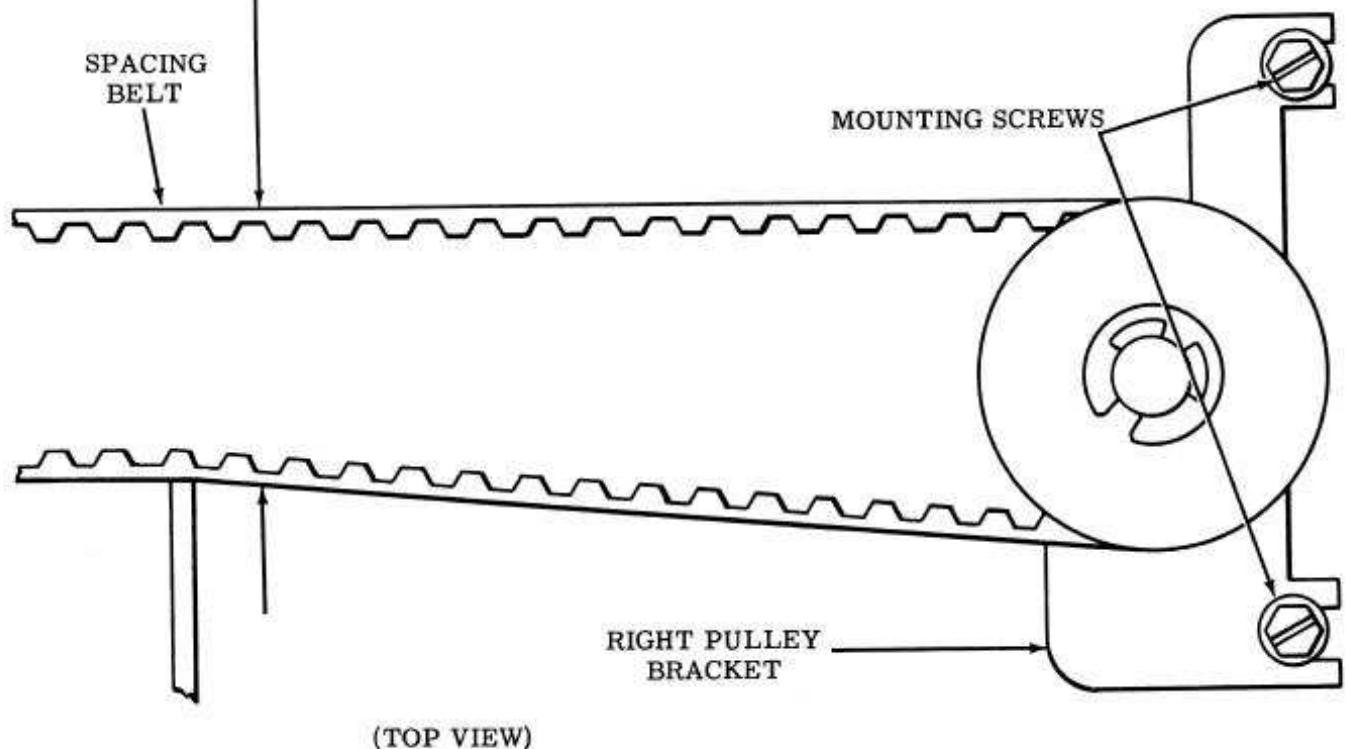
SPACING BELT TENSIONRequirement

With typing unit in stop condition, carriage at left margin, and 8 oz of pressure applied near center of belt

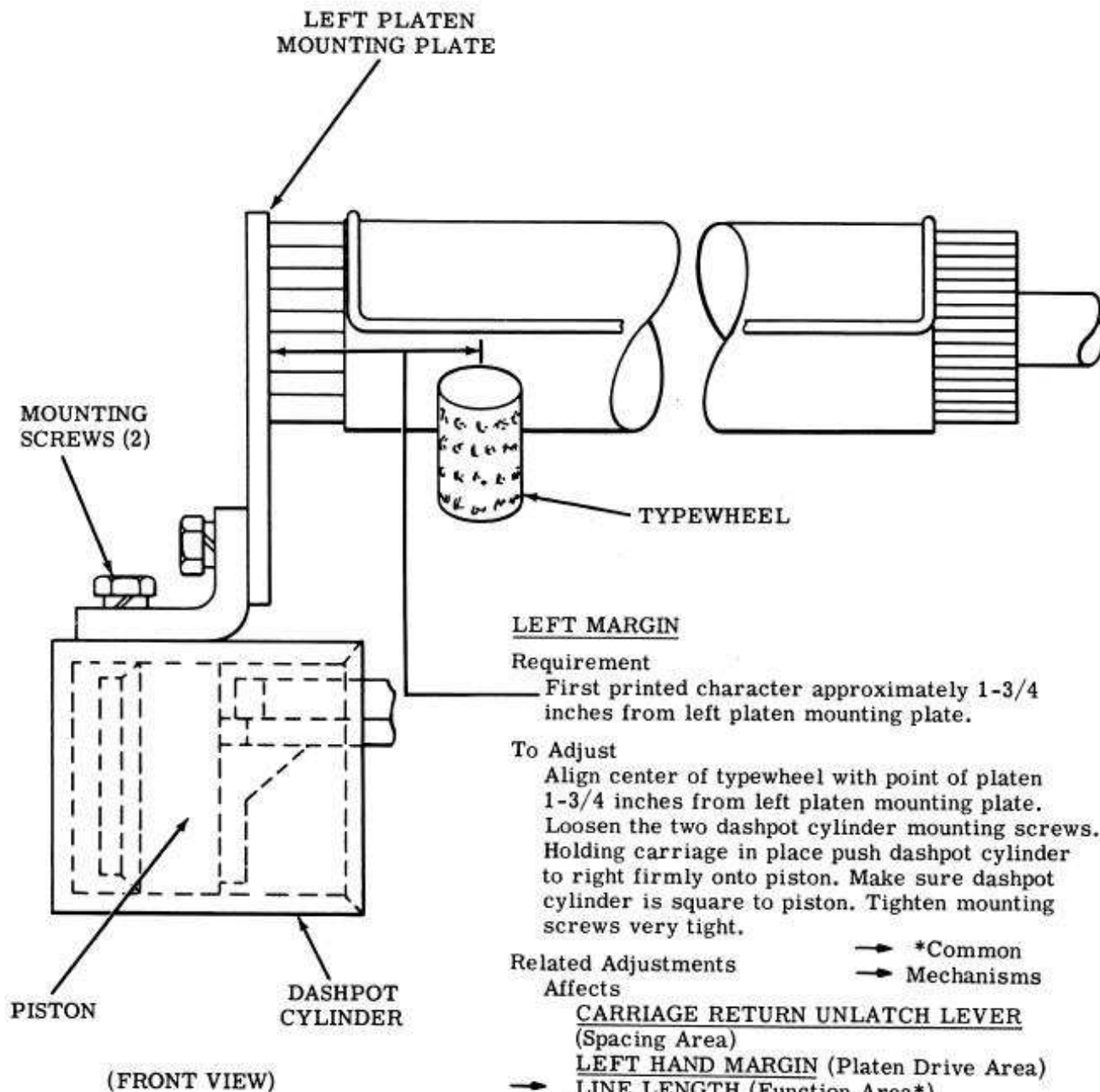
Min 9/16 inch --- Max 11/16 inch
between outer surfaces of belt.

To Adjust

Position right pulley bracket with mounting screws loosened.



2.67 Spacing Area (continued)



2.68 Function and Spacing Areas

END-OF-LINE LATCH SPRINGRequirement

With typing unit in stop condition, carriage return lever unlatched

Min 1-1/2 oz---Max 3 oz
to start end-of-line latch moving.

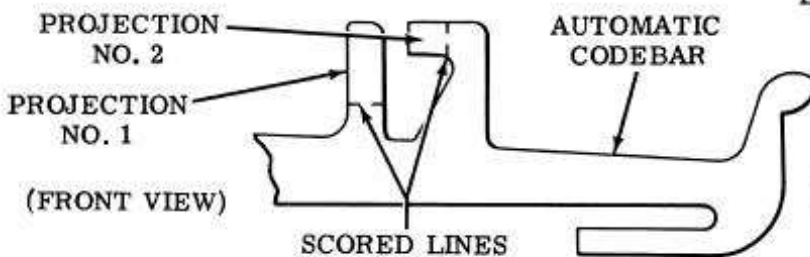
LINE LENGTHAutomatic Carriage Return - Line Feed:Requirement

Select either a 69, 72, or 74 character line length.

To Adjust

TP180948 Automatic Codebar: Break off projection(s) as follows:

Line Length (Characters)	Projection Removed
69	None
72	1
74	1 and 2



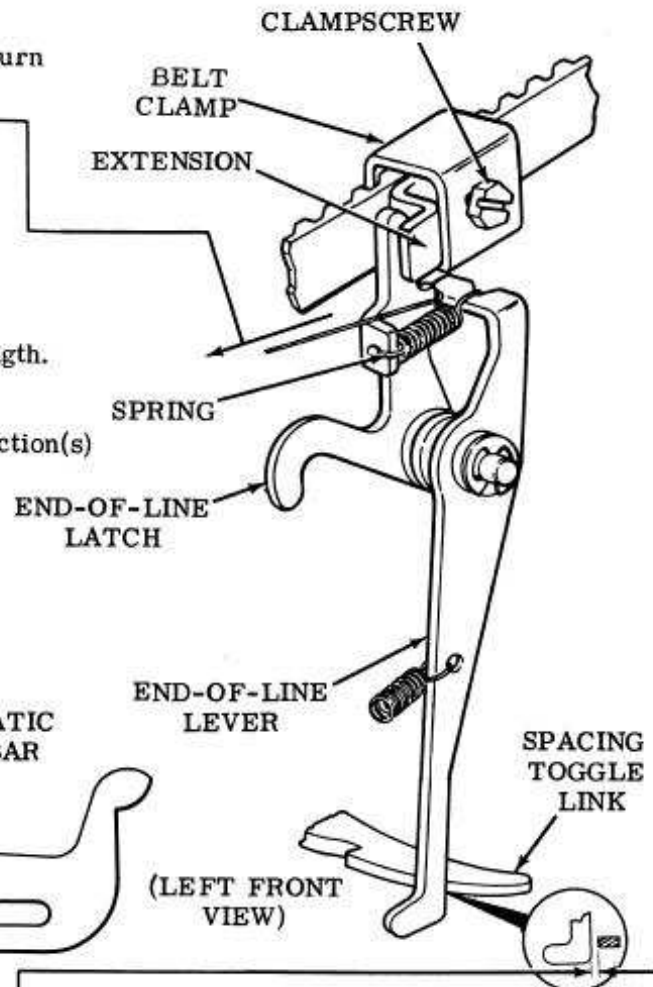
TP183495, TP183496, and TP183497 Automatic Codebars: Use the proper Automatic Codebar as follows:

Line Length (Characters)	Automatic Codebar
69	TP183495
72	TP183496
74	TP183497

Note 1: On friction feed typing units using TP180948 automatic codebar, break off projection(s) as instructed in "Automatic Carriage Return — Line Feed" above so that the end-of-line bell will ring at the proper time.

Note 2: On sprocket feed typing units using TP180948 automatic codebar, do not break off any projections. Leave the automatic codebar as shown on the line drawing so that the end-of-line bell will ring at the proper time.

Note 3: Use either TP180948 or TP183498 automatic codebar and no other on typing units equipped with end-of-line space suppression.

End-Of-Line Space Suppression:Requirement

Select the proper line length as follows:
With the carriage located one character before the end of a line (for example: character 71 on a 72 character line), rotate the main shaft until the carriage drive bail reaches its rearmost position

Min 0.025 inch---Max 0.100 inch
between end-of-line lever and spacing toggle link.

To Adjust

Position belt clamp and extension with clamp-screw loosened.

Related AdjustmentsAffects

END-OF-LINE BELL (Paper Feed Area*) ←

Affected By

LEFT MARGIN (Spacing Area) ←

LEFT HAND MARGIN (Platen Drive Area) ←

RIGHT HAND MARGIN (Platen Drive Area) ←

*Sprocket Feed Mechanisms ←

2.69 Spacing Area

DASHPOT ORIFICE

To Check

With the carriage at right margin, manually disengage the check pawl and feed pawl of the spacing mechanism. Note the bounce of the carriage as it returns from right to left.

Requirement

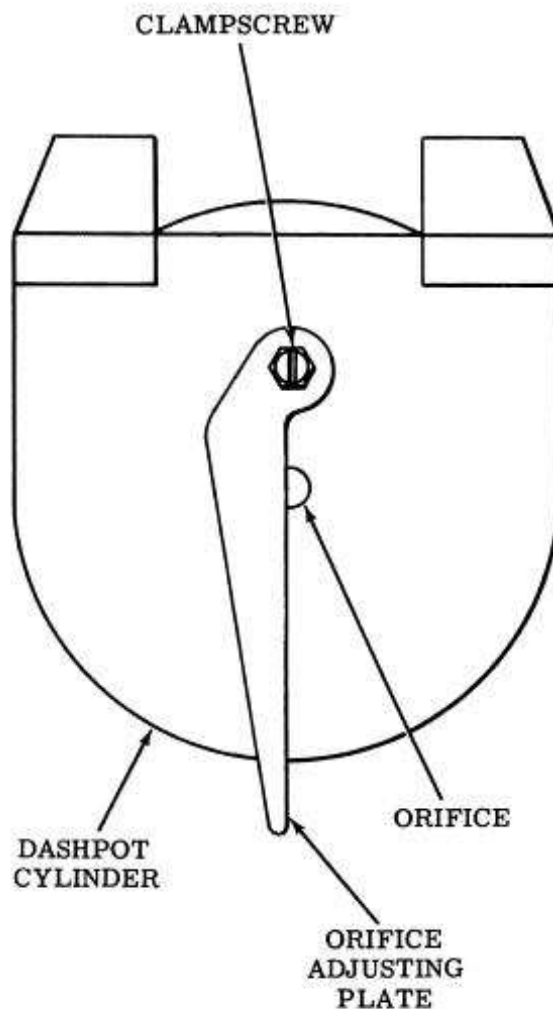
No pneumatic or mechanical bounce of carriage upon its return.

To Adjust

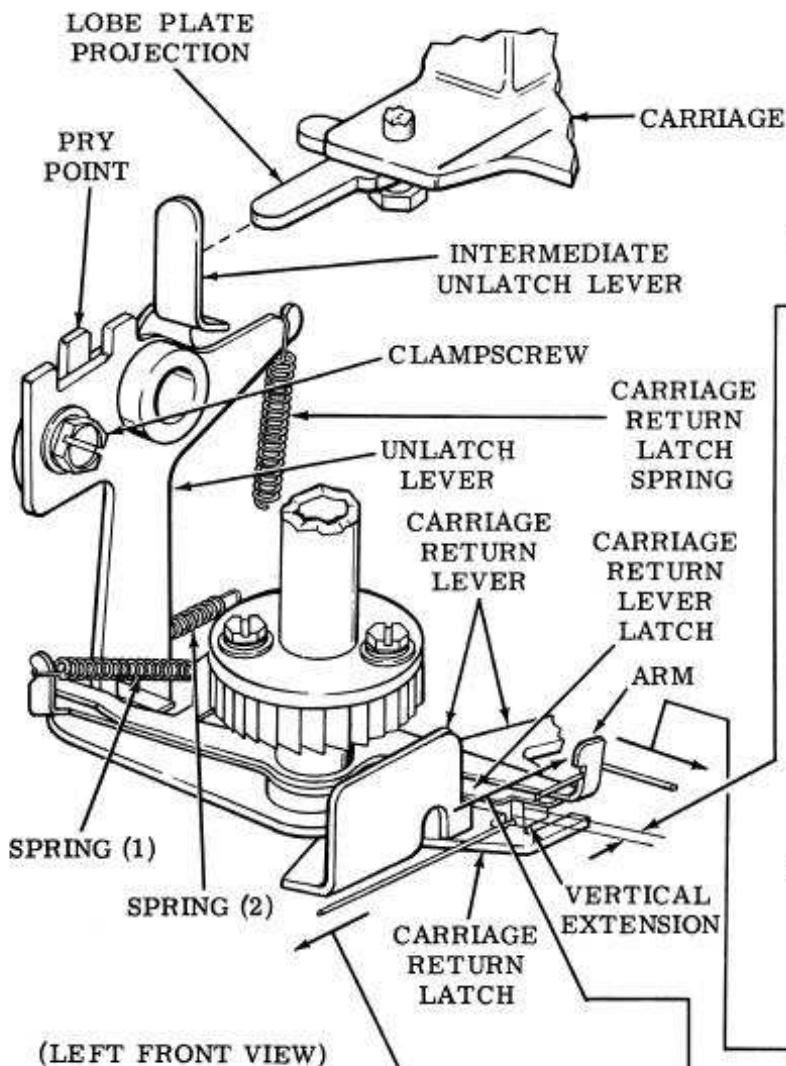
Position orifice adjusting plate with clampscrew loosened.

→ Note: The orifice should never become fully uncovered. If it does become fully uncovered, it is possible that the lobe plate projection may be broken.
→

(LEFT SIDE VIEW)



2.70 Spacing Area (continued)

CARRIAGE RETURN LATCH SPRING**To Check**

With typing unit in stop condition and carriage return lever unlatched, place carriage away from left margin.

Requirement

Min 1-1/2 oz---Max 3 oz _____
to start carriage return latch moving.

CARRIAGE RETURN UNLATCH LEVER**To Check**

With check and feed pawls engaged, place carriage to right margin. Pull carriage return lever forward and allow carriage to return to the left margin and act to pivot the carriage return latch to its unlatched position. Take up play in carriage return latch toward right and make the clearance specified in "Requirement" below a minimum.

Requirement

As gauged by eye

Min Some---Max 0.050 inch
clearance between the carriage return latch and the vertical extension of the carriage return lever.

To Adjust

Loosen clampscrew and position intermediate unlatch lever to the middle of its range. Tighten clampscrew friction tight. Check to see that the selected lobe plate projection touches the intermediate unlatch lever. If it does not, select the lobe plate projection that does. Refine carriage return latch position by positioning unlatch lever using pry point with clampscrew loosened. Check FRONT ROLLERS (Carriage Area) adjustment.

Related Adjustments**Affected By**

LEFT MARGIN (Spacing Area)
LEFT HAND MARGIN (Platen Drive Area)

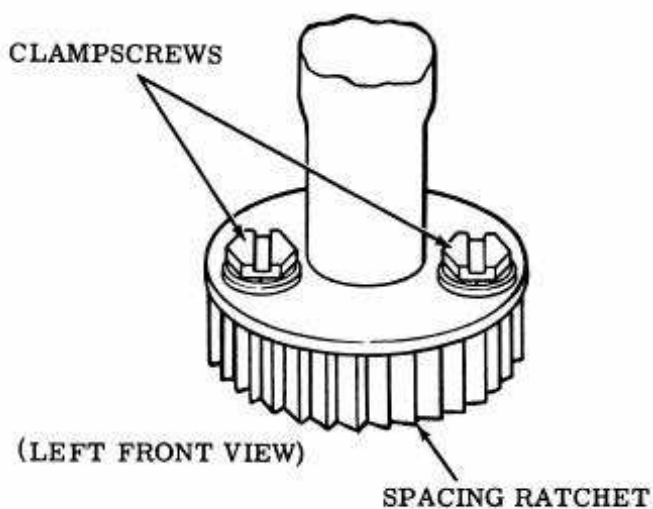
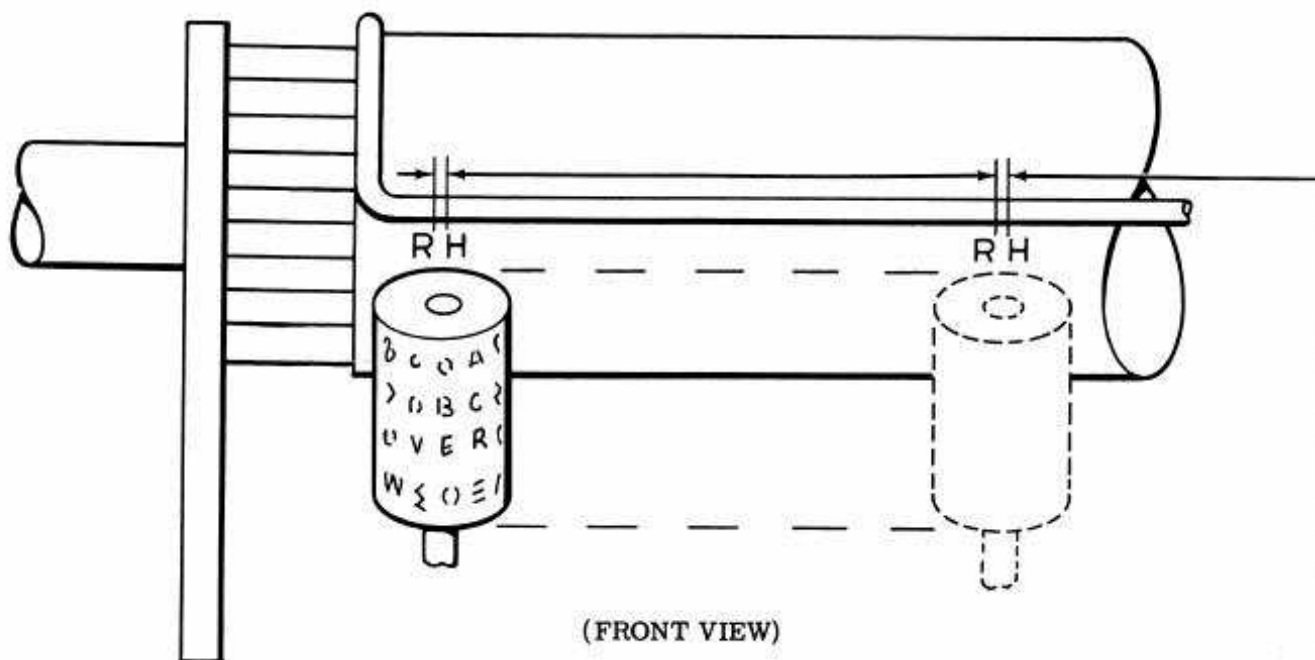
UPPER CARRIAGE RETURN LATCH SPRINGS**To Check**

Place typing unit in stop condition and engage feed pawl and check pawl with spacing ratchet.

Requirement

- (1) Min 1 oz---Max 2 oz _____
to start arm moving.
- (2) Min 1/2 oz---Max 1-1/2 oz _____
to start arm moving.

2.71 Spacing Area (continued)



LEFT MARGIN PRINTING

To Check

Print two or more characters such as "RH" at left margin and at center of line.

Requirement

Character to character spacing approximately same at center of line as at left margin.

To Adjust

Position spacing ratchet with clamp-screws loosened.

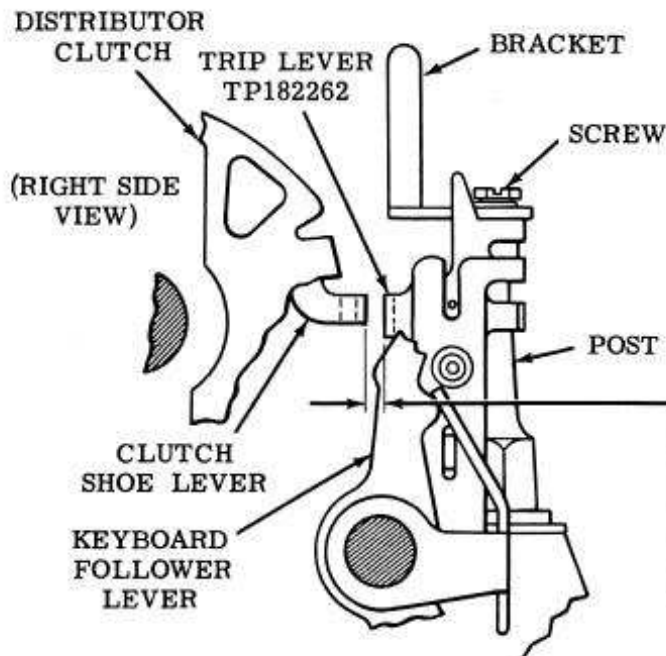
Related Adjustment

Affected By

LEFT-HAND MARGIN (Platen Drive Area)

2.72 Distributor Area

Note 1: If not previously done, replace motor onto typing unit and then replace typing unit onto subbase. For instructions, see the appropriate typing unit section. Remake GEAR BRACKET—PRELIMINARY (Motor Area) and BELT TENSION—PRELIMINARY (Motor Area) adjustments.

TRIP LEVER ENGAGEMENT

Note 2: "(1) Requirement" applies only to late design typing units with trip lever TP182262.

(1) Requirement

Disengage (latch) the distributor clutch. Then, depress any keytop (nonfunction) to unlatch the distributor clutch.

Note 3: Some clearance must exist between the bracket and the trip lever. To obtain clearance, loosen screw and position bracket.

With the upper edge of the clutch shoe lever in line with the upper edge of the trip lever

Min 0.015 inch---Max 0.035 inch between the clutch shoe lever and the trip lever.

To Adjust

Remove the answer-back drum. Bend the center adjusting tab with bending tool no. TP180993. Replace answer-back drum.

Note 4: The answer-back control lever and reader trip lever should not be touching their respective stop bail adjusting tabs when checking this adjustment.

(2) Requirement

With the typing unit operating under power and the keyboard universal lever in latched position, the clutch shoe lever shall be

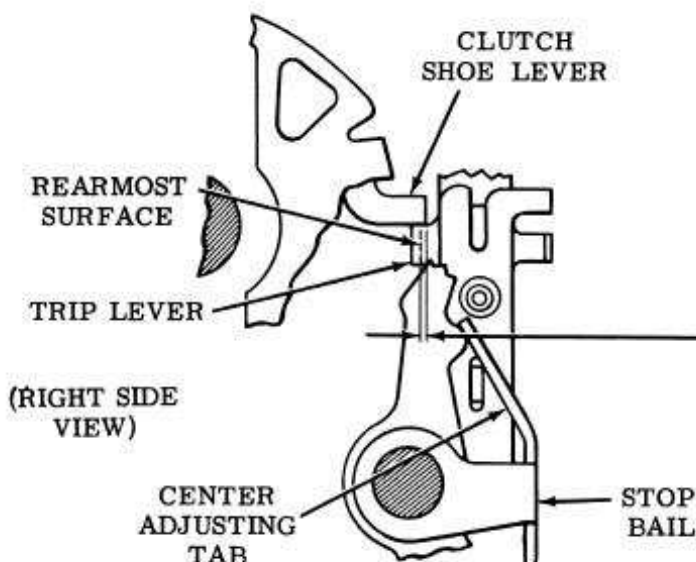
Min Flush---Max 0.015 inch beyond rearmost surface of trip lever.

To Adjust

Early design without trip lever TP182262: Remove answer-back drum. Bend center adjusting tab with bending tool no. TP180993. See Note 3 above. Replace answer-back drum.

Late design with trip lever TP182262:

With screw loosened friction tight, position bracket.



Related Adjustments

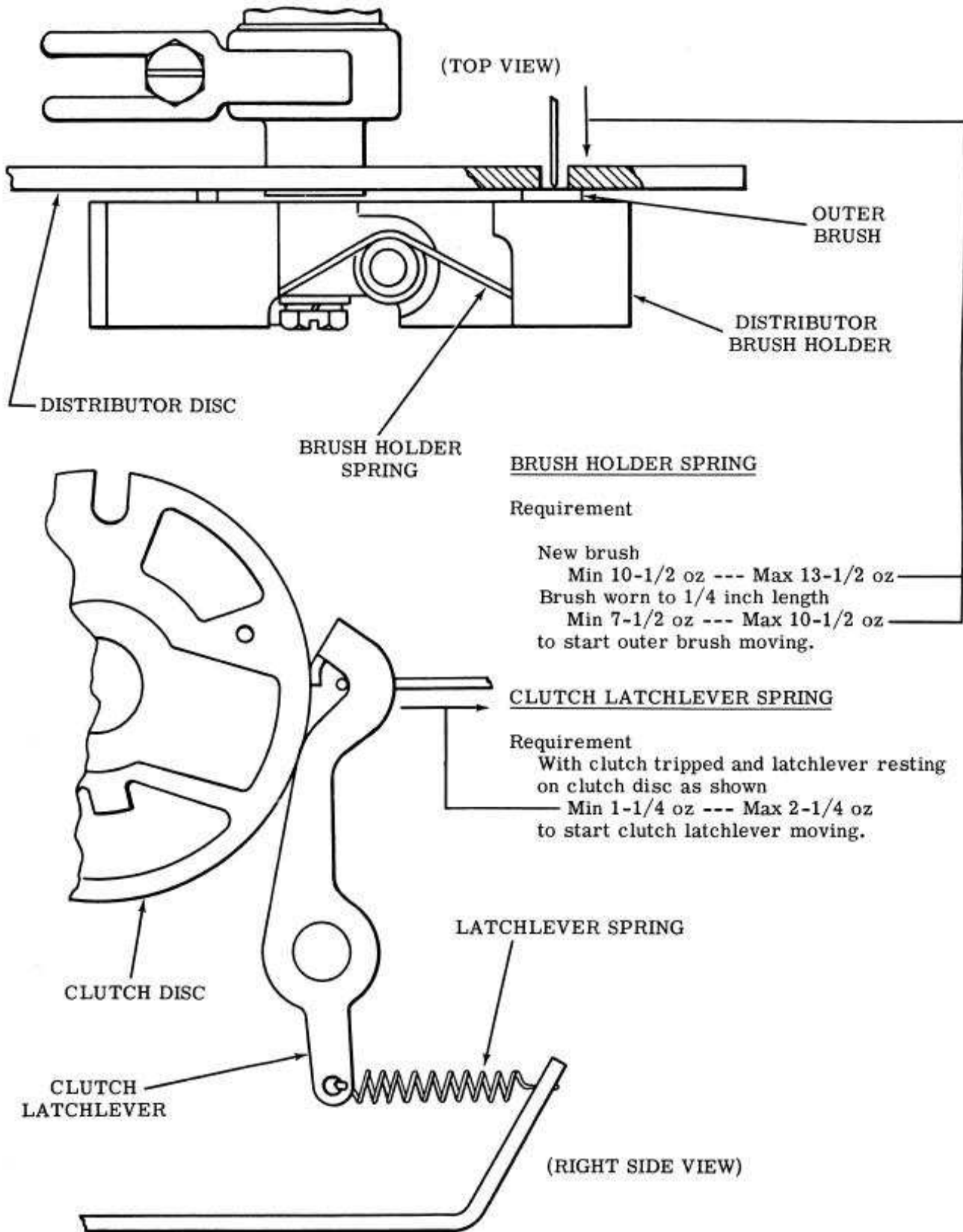
Affects

CLUTCH STOP BAIL (Answer-Back Area)
SHOE LEVER (See the appropriate tape reader section.)

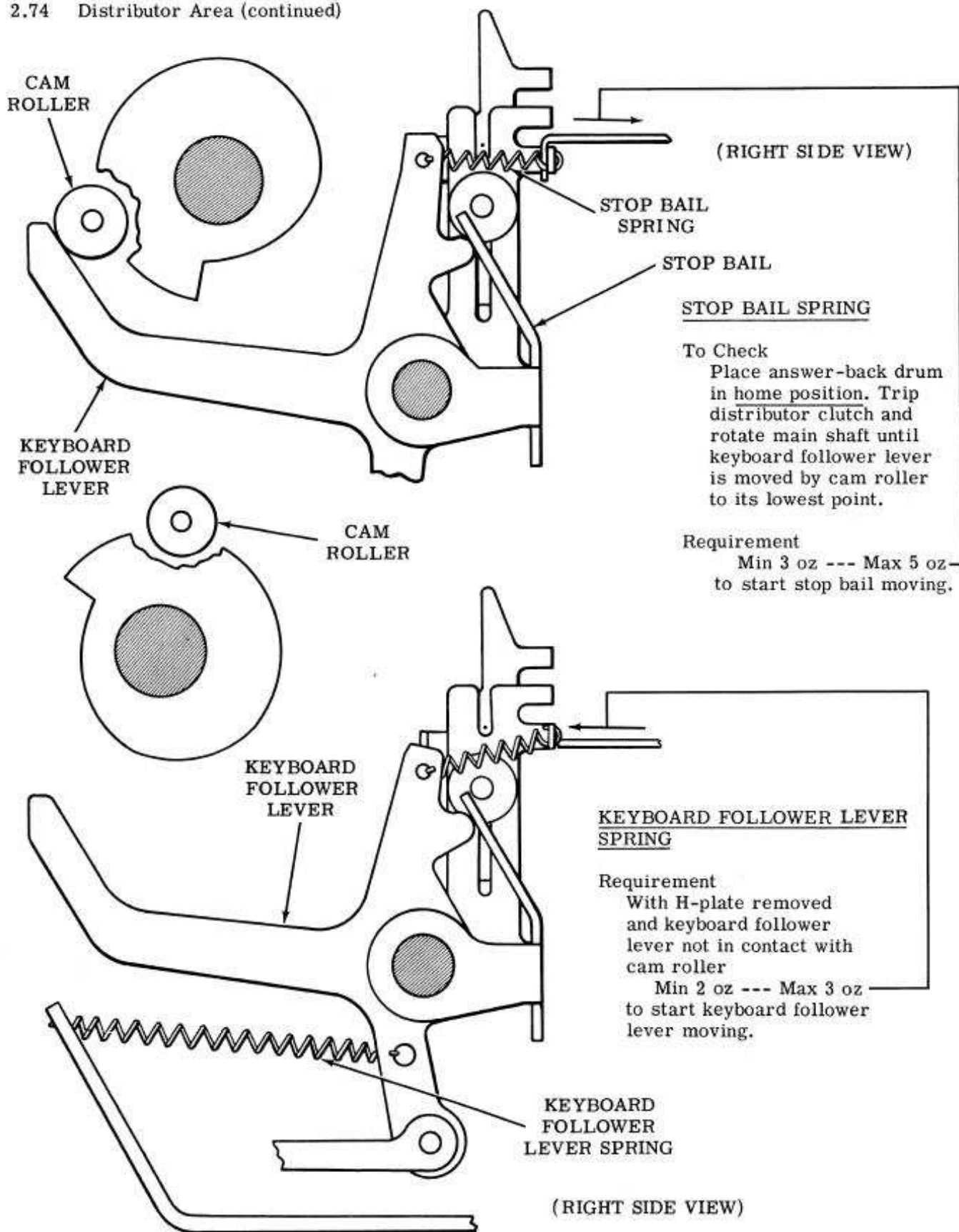
Affected By

DISTRIBUTOR TRIP LINKAGE (See the appropriate keyboard section.)

2.73 Distributor Area (continued)



2.74 Distributor Area (continued)



2.75 Selector Area

RECEIVING MARGINS

To Check

Set up test situation using typing unit and Signal Distortion Test Set to check selector receiving margins.

Requirement

Obtain minimum selector receiving margins as follows:

<u>LEVEL</u>	<u>SPEED</u>	<u>RANGE</u>		
		<u>ZERO DISTORTION</u>	<u>OVERALL BIAS</u>	<u>END DISTORTION</u>
5 and 6	All Speeds	72 Pt	38 Per cent	35 Per cent*
8	All Speeds	No Req't	37 Per cent **	35 Per cent**

*At bias optimum setting.

**At same range scale setting.

To Adjust

Refine ARMATURE SPRING (Selector Area) and, if necessary, refine ARMATURE BRACKET (Selector Area) adjustments.

Note: The refinement of the ARMATURE BRACKET (Selector Area) adjustment need not be performed unless the refinement of the ARMATURE SPRING (Selector Area) adjustment fails to bring about the minimum selector receiving margins.

Related Adjustments

Affected By

MAGNET CORE (Selector Area)

ARMATURE BRACKET (Selector Area)

ARMATURE SPRING (Selector Area)

2.76 Miscellaneous Areas

FINAL PRINTING ALIGNMENTGENERAL

When typing unit is adjusted as instructed on previous pages, quality of printed copy should be good. However, minor readjustments may be necessary.

To Check

Print "TH" at various points along length of printing line.

Requirement

Quality of printed characters shall be good.

To Adjust

Use the following guide in making readjustments.

Shading of top and bottom of characters not equal and/or underscoring or overscoring of characters ---

--- refine PLATEN-VERTICAL (Paper Feed Area*) adjustment by moving platen toward portion of light shading.

Left character "T" of poor quality ---

--- using left pry points, refine STOP PLATE (Carriage Area) adjustment.

Right character "H" of poor quality ---

--- using right pry points, refine STOP PLATE (Carriage Area) adjustment.

Characters spread out ---

--- refine STOP PLATE (Carriage Area) adjustment by moving plate frontward.

Characters run together ---

--- refine STOP PLATE (Carriage Area) adjustment by moving plate rearward.

Both characters of light shading on left side ---

--- refine TYPEWHEEL (Carriage Area) adjustment by rotating wheel clockwise as viewed from top.

Both characters of light shading on right side ---

--- refine TYPEWHEEL (Carriage Area) adjustment by rotating wheel counterclockwise as viewed from top.

*Friction or Sprocket Feed Mechanisms

FRICTION FEED MECHANISMS

2.77 Paper Feed Area

PLATEN—HORIZONTAL

To Check

Place the flat on left side of platen up and horizontally to base casting.

(1) Requirement

Min 0.042 inch---Max 0.058 inch
between ribbon guide and platen at both left and right margins.

To Check

Place carriage to center of platen and rotate platen until maximum clearance is obtained between platen and ribbon guide. Set up any character code combination in selector. Rotate main shaft until carriage drive bail is in its rearmost position. Push typewheel to the rear until it just touches the platen.

Note: The typing unit shall not have paper or ribbon installed.

(2) Requirement

Typewheel shall not touch inside of either ribbon guide.

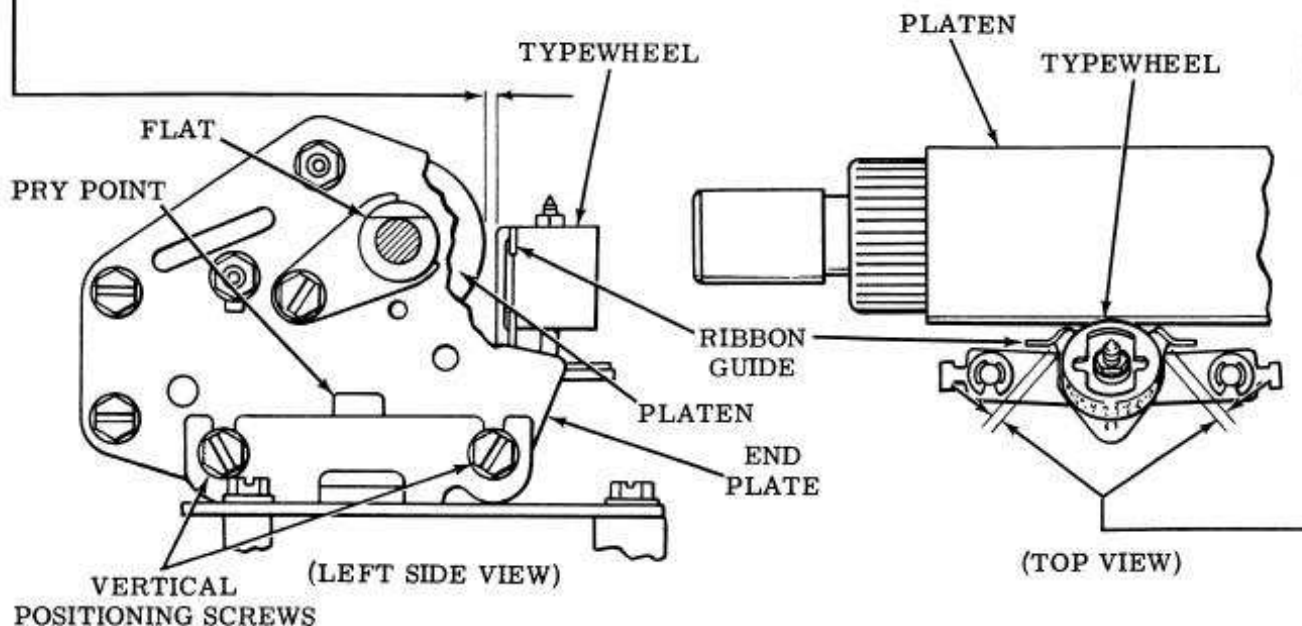
(3) Requirement

No smudging of printed characters when typing unit is operated under power.

To Adjust

Loosen four vertical positioning screws. Place both ends of platen in lowest position. Loosen four horizontal positioning screws. Position platen horizontally to meet requirements. Tighten horizontal positioning screws only. Bend ribbon guide if necessary. Proceed to PLATEN-VERTICAL (Paper Feed Area*) adjustment.

*Friction Feed Mechanisms



2.78 Paper Feed Area (continued)

PLATEN—VERTICAL**To Check**

Place paper in typing unit. Set up the character "M" code combination (--345) or (1-34--78) in the selector and rotate the main shaft until the character is printed. Repeat several times along the length of the platen.

Requirement

When each printed character is examined by eye from top to bottom, the shading shall be approximately the same.

To Adjust

With four vertical positioning screws loosened, position the platen using pry points.

Note: When positioning the platen using pry points, be sure to raise the end plates and not to twist them.

Related Adjustments**Affects**

LINE FEED UPSTOP BRACKET (Paper Feed Area*)

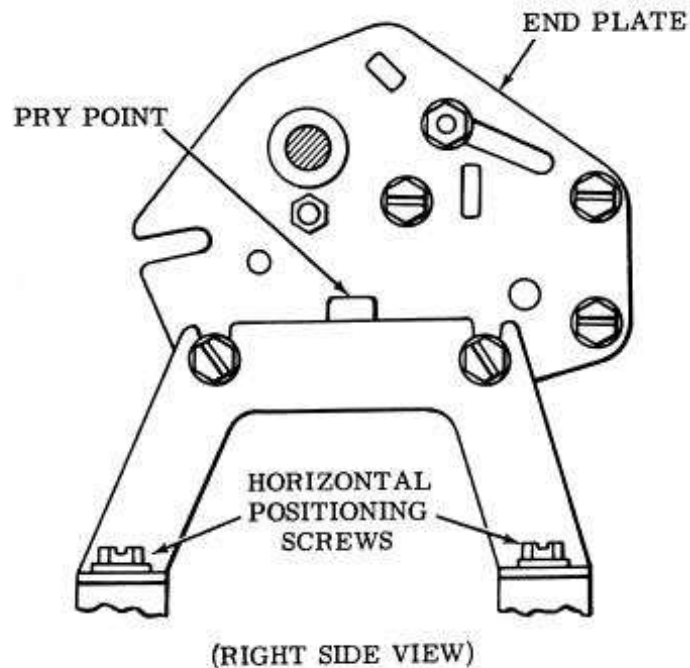
PRESSURE ROLLER (Paper Feed Area*)

Affected By

REAR RAIL (Carriage Area)

PRINT DRIVE LEVER (Carriage Area)

*Friction Feed Mechanisms



2.79 Paper Feed Area (continued)

SINGLE-DOUBLE LINE FEED

Requirement

Upstop stud at lower end of slot.

To Adjust

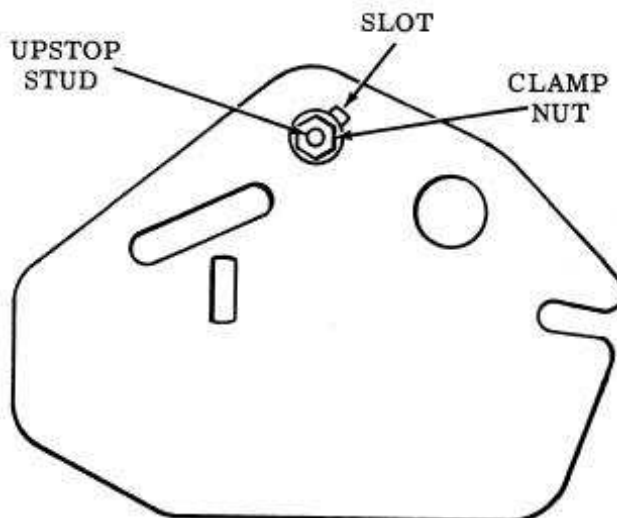
Position stud with clamp nut loosen.

Related Adjustment

Affects

PLATEN DETENT (Paper Feed Area*)

Note: If double line feed is desired, position stud at upper end of slot after all adjustments have been made.

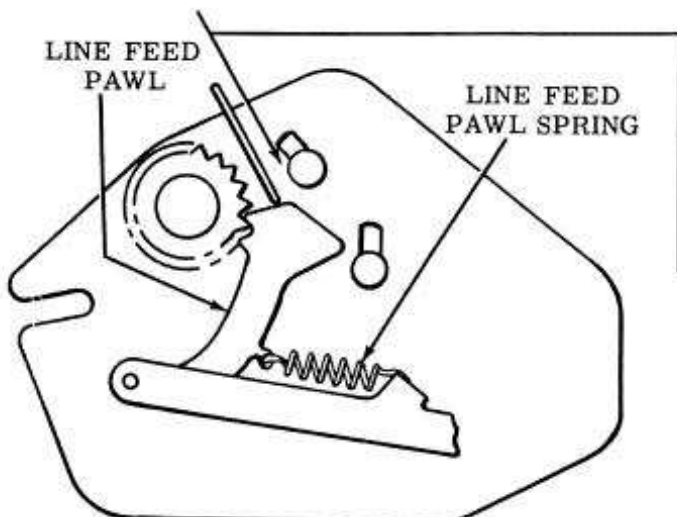


(LEFT SIDE VIEW)

LINE FEED PAWL SPRING

Requirement

With typing unit in stop condition
Min 3/4 oz --- Max 1-3/4 oz
to start line feed pawl moving.



(RIGHT SIDE VIEW)

PLATEN DETENT

Requirement

When operated by finger pressure, line feed pawl shall fully seat in platen ratchet without interference from teeth.

To Adjust

Position platen detent pawl's pivot with clamp nut loosened.

Related Adjustments

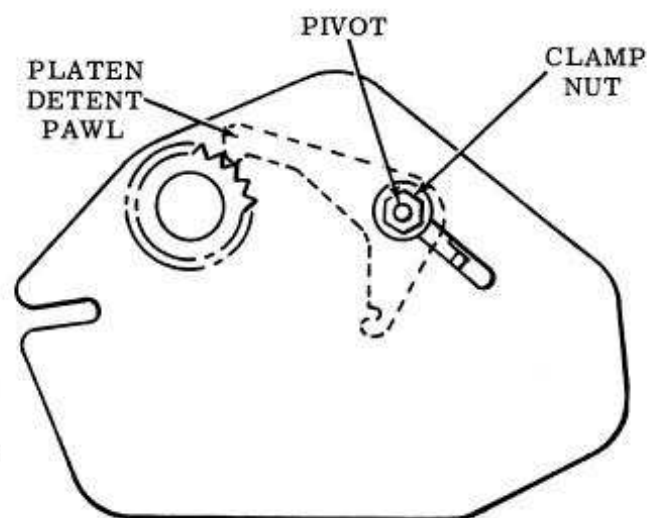
Affects

LINE FEED PAWL DOWNSTOP (Paper Feed Area*)

Affected By

SINGLE-DOUBLE LINE FEED (Paper Feed Area*)

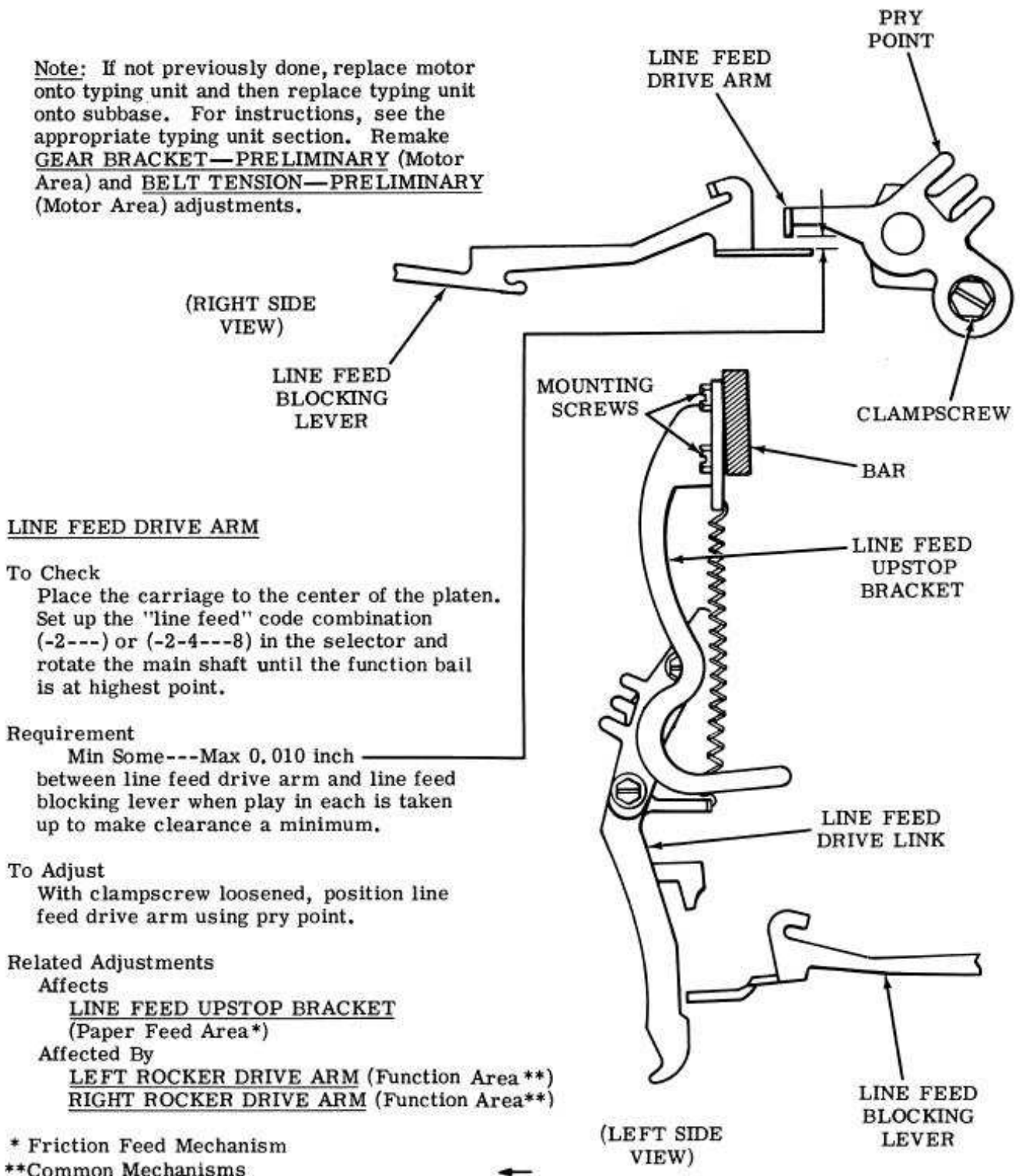
*Friction Feed Mechanism



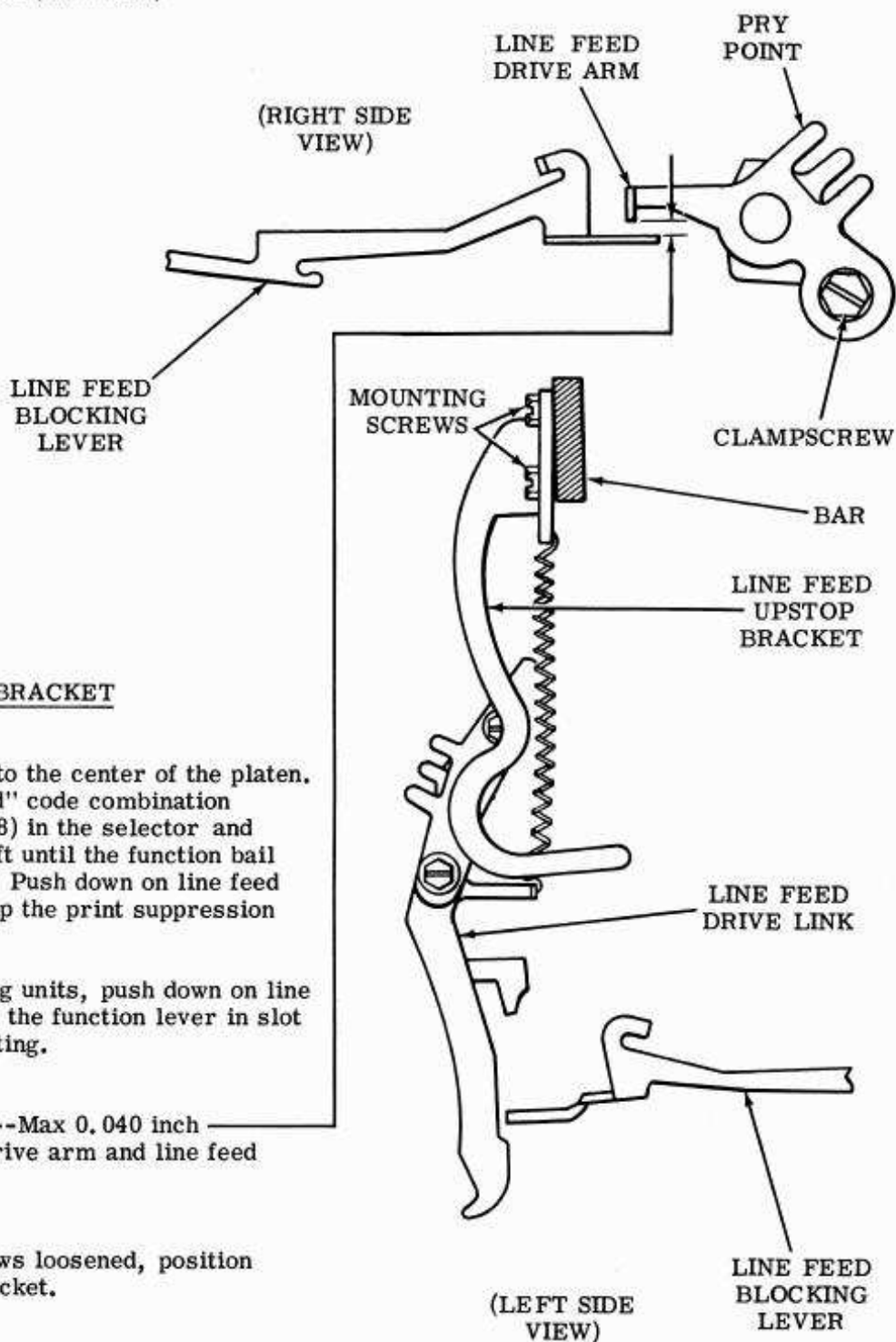
(RIGHT SIDE VIEW)

2.80 Paper Feed Area (continued)

Note: If not previously done, replace motor onto typing unit and then replace typing unit onto subbase. For instructions, see the appropriate typing unit section. Remake GEAR BRACKET—PRELIMINARY (Motor Area) and BELT TENSION—PRELIMINARY (Motor Area) adjustments.



2.81 Paper Feed Area (continued)



LINE FEED UPSTOP BRACKET

To Check

Place the carriage to the center of the platen. Set up the "line feed" code combination (-2---) or (-2-4---8) in the selector and rotate the main shaft until the function bail is at highest point. Push down on line feed function lever to trip the print suppression codebar.

Note: On 8-level typing units, push down on line feed function lever and the function lever in slot "6" in the function casting.

Requirement

Min 0.020 inch---Max 0.040 inch
between line feed drive arm and line feed blocking lever.

To Adjust

With mounting screws loosened, position line feed upstop bracket.

Related Adjustments

Affected By

PLATEN—VERTICAL (Paper Feed Area*)
LINE FEED DRIVE ARM (Paper Feed Area*)

* Friction Feed Mechanisms

2.82 Paper Feed Area (continued)

LINE FEED DRIVE LINK**To Check**

Place the carriage to the center of the platen. Place the flat on left side of platen up and horizontally to base casting, and set up the "line feed" code combination (-2---) or (-2-4---8) in the selector. Rotate main shaft until function bail reaches its lowest point while noticing the motion supplied by the drive arm of the function rocker shaft to the line feed pawl.

Requirement

- (1) The motion supplied by the drive arm of the function rocker shaft to the line feed pawl shall be adequate to rotate the platen the required amount.
- (2) With the typing unit operating under power, the spacing of the line feed shall be uniform and consistent with no backlash.

Note: With the platen detent pawl held away from the ratchet and the function bail at its lowest point of travel, there shall be no more than a barely perceptible motion in the platen when the platen detent pawl is lowered into its seat between two ratchet teeth.

To Adjust

Loosen two clampscrews and use pry points to position line feed drive link so that line feed pawl rotates platen one tooth and the platen detent pawl seats fully in ratchet. Tighten clampscrews.

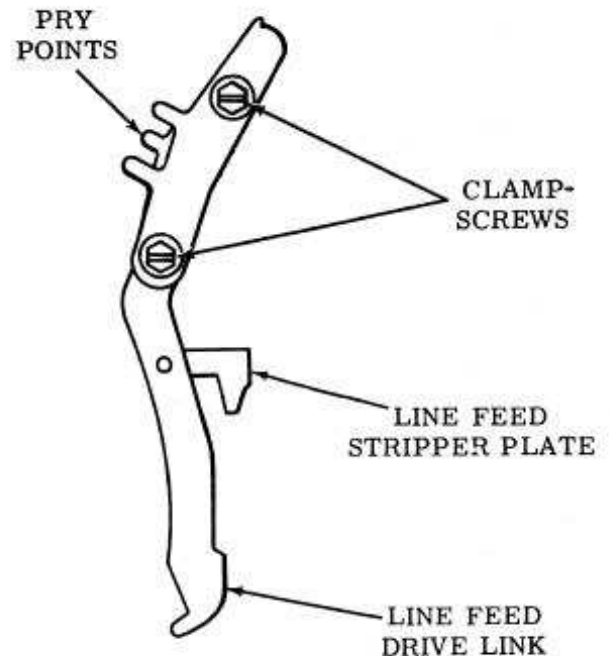
Related Adjustment**Affected By**

LINE FEED PAWL DOWNSTOP
(Paper Feed Area*)

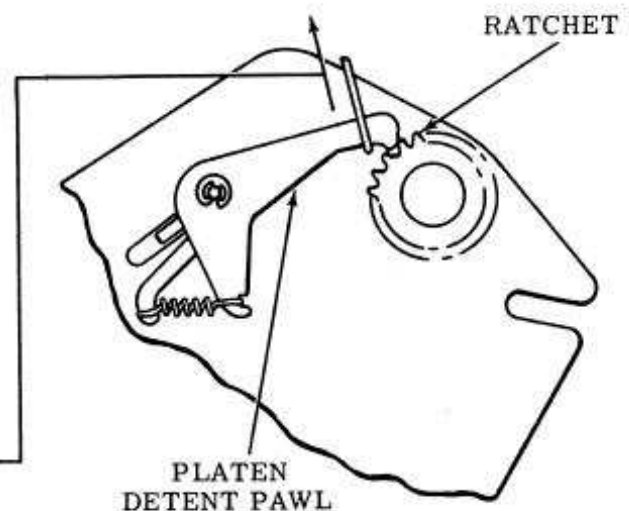
*Friction Feed Mechanisms

PLATEN DETENT PAWL SPRING**Requirement**

Min 24 oz---Max 30 oz _____
to start platen detent pawl moving.



(LEFT SIDE VIEW)



(LEFT SIDE VIEW)

2.83 Paper Feed Area (continued)

LINE FEED PAWL DOWNSTOP

To Check

Place the carriage to the center of the platen,
Place the flat on left side of platen up and
horizontally to base casting and set up the
"line feed" code combination (-2---) or
(-2-4---8) in the selector. Rotate main
shaft until line feed pawl has rotated platen
one tooth and platen detent pawl has fully
seated in ratchet.

Requirement

Min Some --- Max 0.010 inch
between back of line feed pawl and its downstop.

To Adjust

With downstop clamp nut loosened, position
downstop.

Related Adjustments

Affects

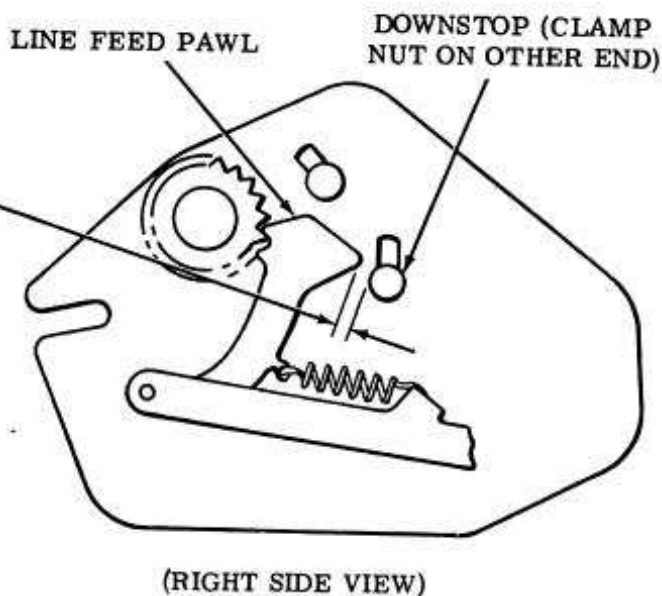
LINE FEED DRIVE LINK (Paper Feed Area*)

Affected By

PLATEN DETENT (Paper Feed Area*)

LINE FEED DRIVE LINK (Paper Feed Area*)

*Friction Feed Mechanisms



2.84 Paper Feed Area (continued)

PRESSURE ROLLER

Requirement

With pressure roller released (pressure lever in forward position)

Min 0.010 inch

gauged by eye, between pressure roller and slide spring posts on slide guide on carriage.

Note: Clearance should not be so large that roller is not detented in released position.

To Adjust

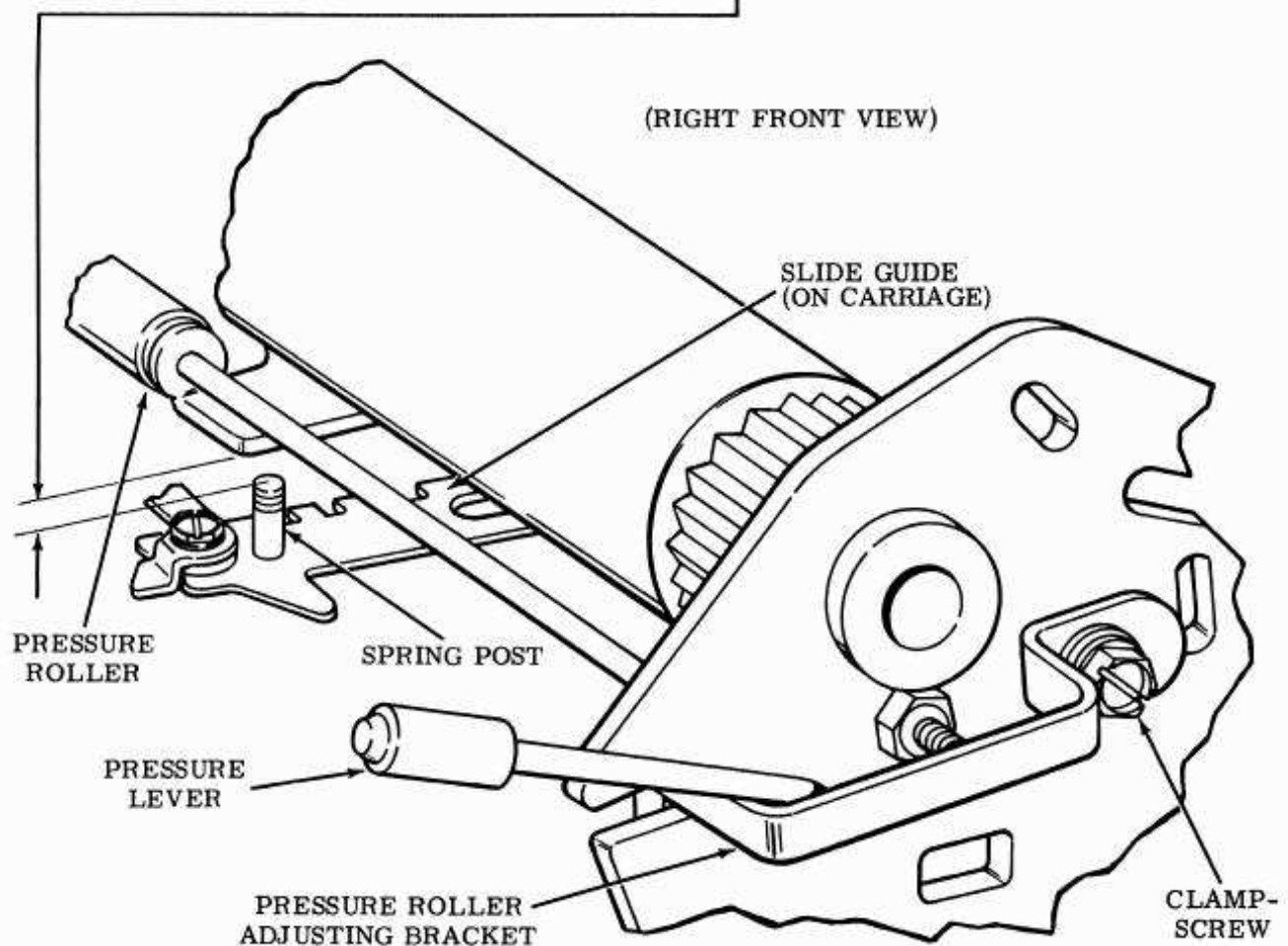
Position pressure roller adjusting bracket with clampscrew loosened.

Related Adjustment

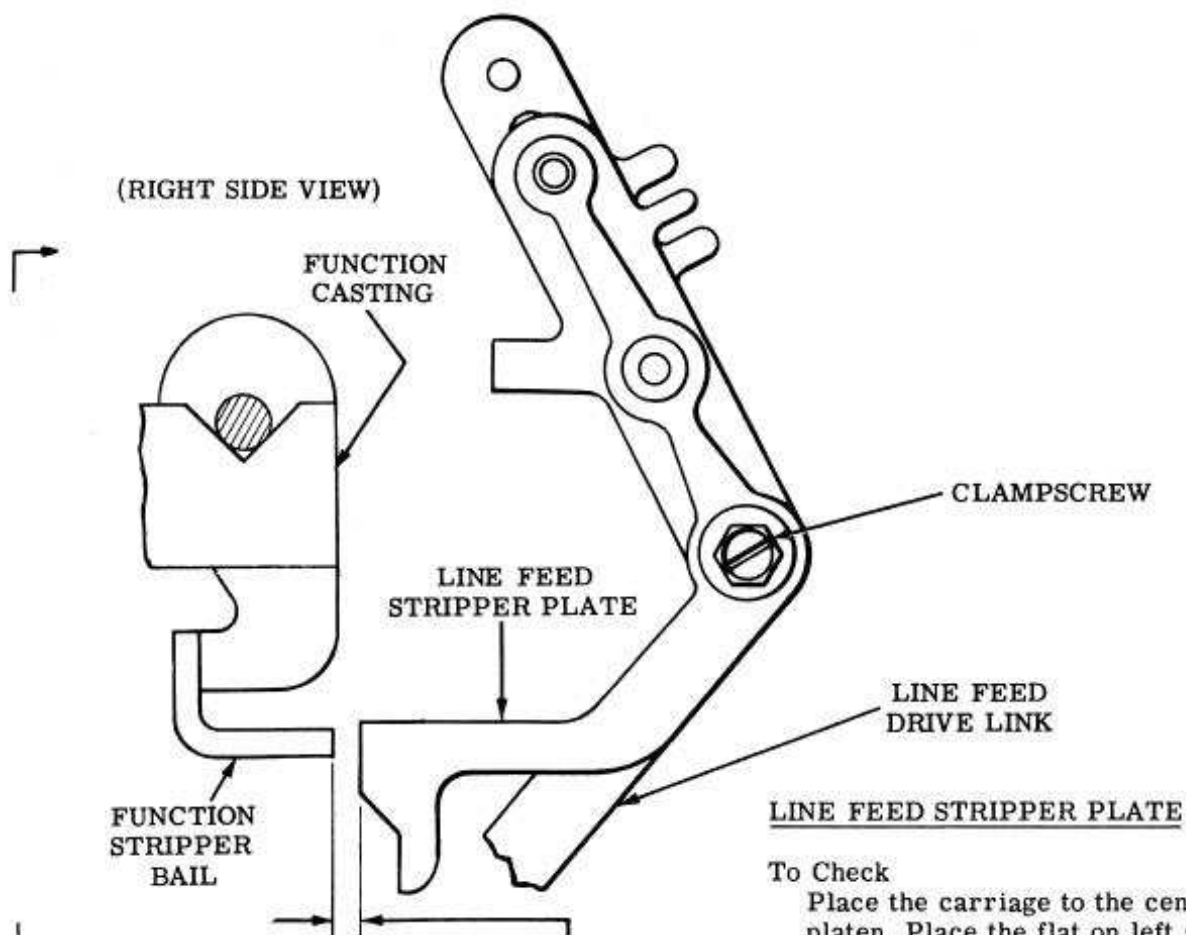
Affected By

PLATEN-VERTICAL (Paper Feed Area*)

*Friction Feed Mechanisms



2.85 Paper Feed Area (continued)



To Check

Place the carriage to the center of the platen. Place the flat on left side of platen up and horizontally to base casting and set up with "line feed" code combination (-2---) or (-2-4---8) in the selector. Rotate the main shaft until function bail reaches its lowest point.

Requirement

The line feed stripper plate shall be
Min Contacting --- Max 0.005 inch
away from function stripper bail

To Adjust

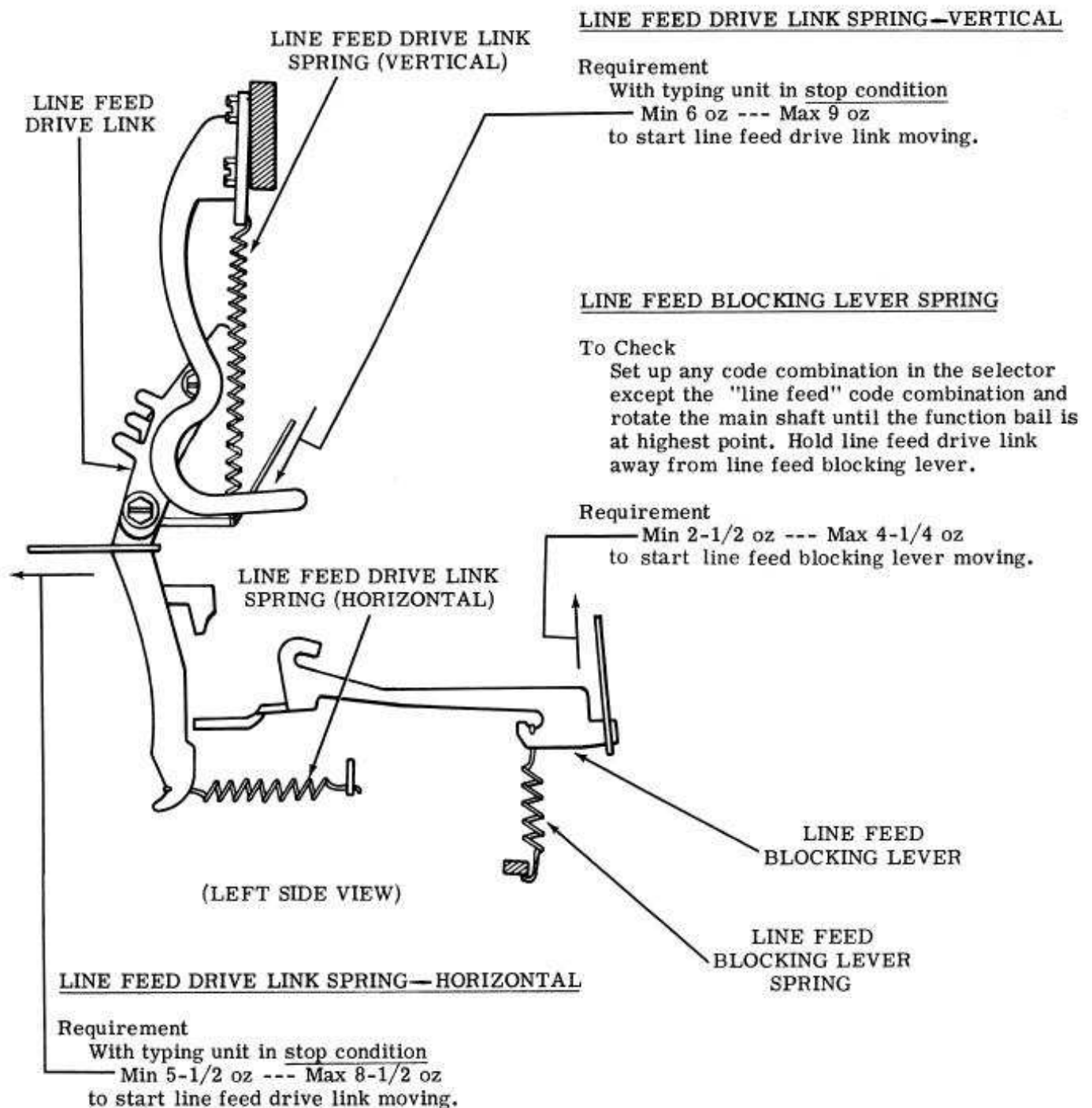
With clampscrew loosened, position line feed stripper plate.

Related Adjustment

Affected By
STRIPPER BAIL (Function Area *)

*Common Mechanisms

2.86 Paper Feed Area (continued)



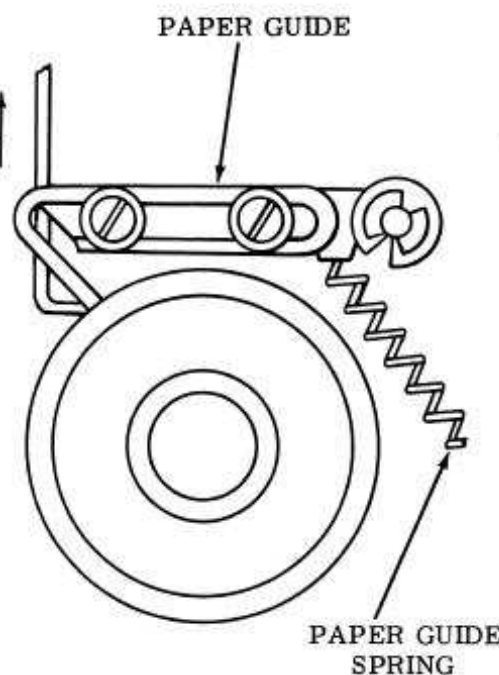
2.87 Paper Feed Area (continued)

PAPER GUIDE SPRINGS

Requirement

With scale at either the left or right end of paper guide

Min 1-1/2 oz --- Max 3-1/2 oz
to start paper guide moving.



(RIGHT SIDE VIEW)

PAPER STRAIGHTENER BAIL SPRING

Requirement

With scale at center of paper straightener bail

Min 1 oz --- Max 3 oz
to start paper straightener bail moving.

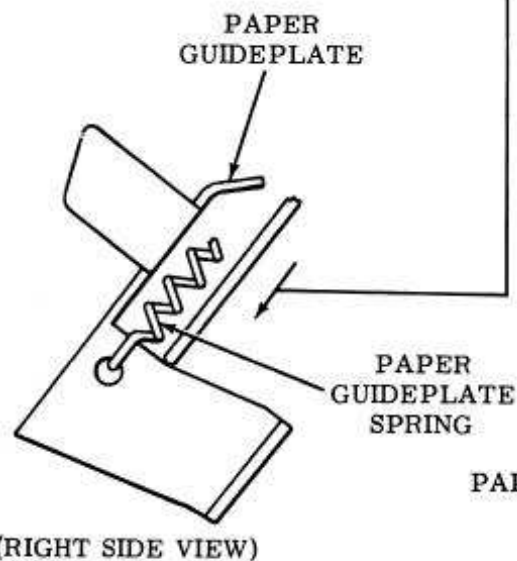
PAPER GUIDEPLATE SPRINGS

Requirement

With pressure lever released

Min 3/4 oz --- Max 1-3/4 oz
to start paper guideplate moving.

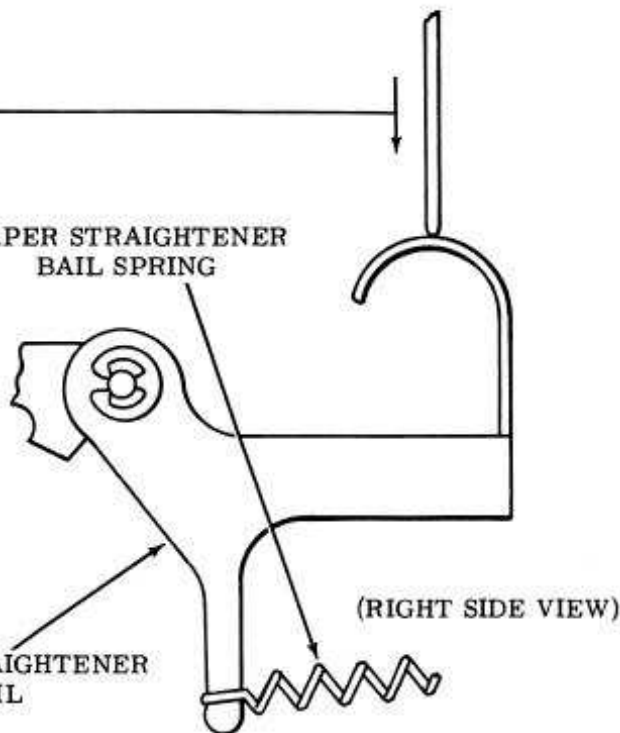
Note: Check each of two springs.



(RIGHT SIDE VIEW)

PAPER STRAIGHTENER BAIL SPRING

PAPER STRAIGHTENER BAIL



(RIGHT SIDE VIEW)

2.88 Paper Feed Area (continued)

PAPER GUIDE

(1) Requirement

The copy holder wire shall fall somewhere between two lines of printed copy, not obscuring more than $1/2$ the height of either line.

To Adjust

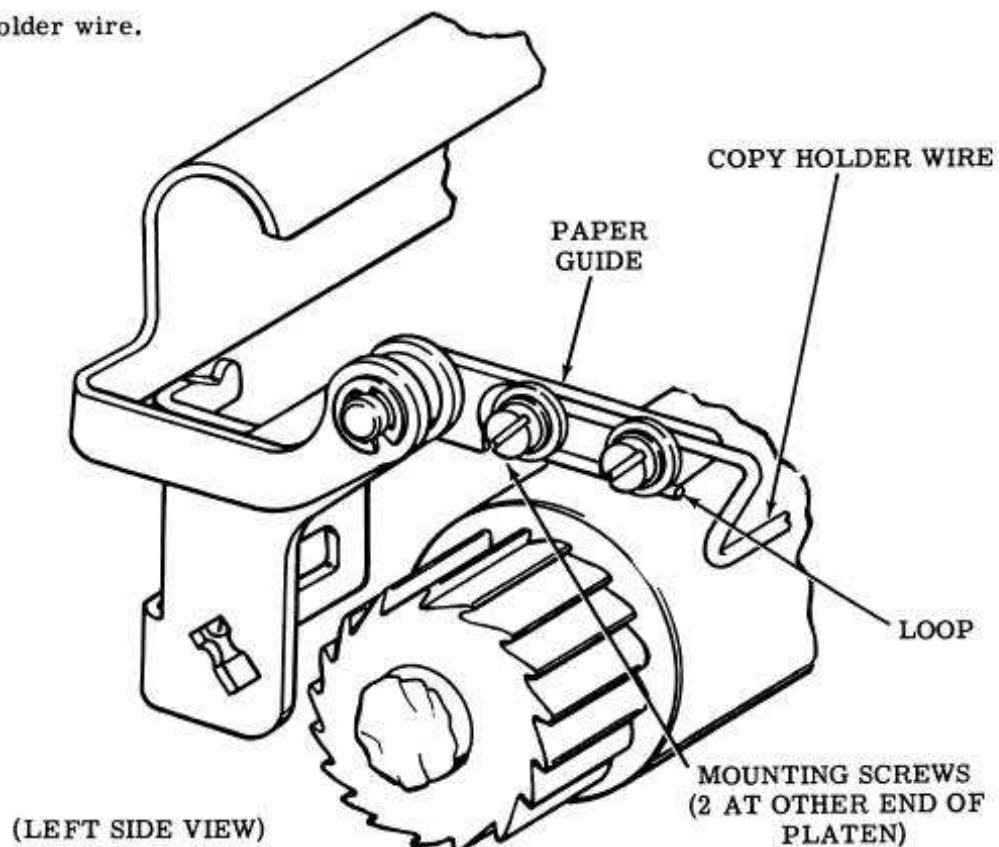
Position copy holder wire with four mounting screws loosened.

(2) Requirement

The copy holder wire shall return and rest against the platen at both ends and middle after raising and releasing.

To Adjust

Bend copy holder wire.



Note: When a complete readjustment is being undertaken on typing units equipped with friction feed mechanisms, the sequence is altered to perform the adjustments in the paper feed area*. The PAPER GUIDE (Paper Feed Area*) adjustment above is the last adjustment in the paper feed area*, therefore, return now to the point where the sequence was interrupted and continue.

*Friction Feed Mechanisms

SPROCKET FEED MECHANISMS

2.89 Paper Feed Area

PAPER GUIDEPLATE

Requirement

With no sprocket forms in the platen mechanism

Min 0.008 inch---Max 0.018 inch between the platen and the left and right ends of the paper guideplate—adjacent to the fingers. Record the two clearances. **

To Adjust

Loosen locknut and adjust screw.

Note 1: If the PAPER GUIDEPLATE (Paper Feed Area*) adjustment cannot be made as indicated above, remove the platen mechanism from the typing unit. (See instructions in the appropriate typing unit section.) Then, preliminary adjust according to the following adjustment instructions:

Requirement

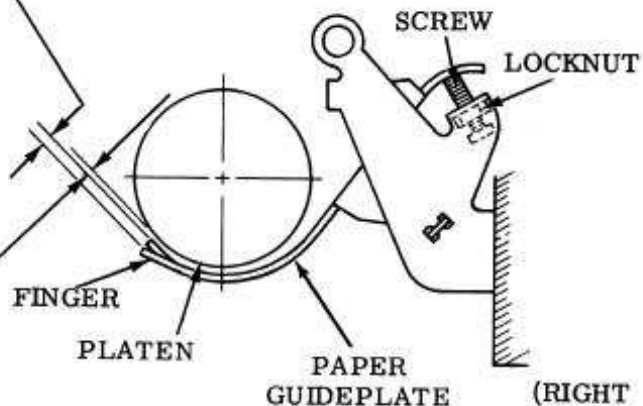
With the screw backed off and no sprocket forms in the platen mechanism

Min Zero---Max 0.012 inch between the platen and the left and right ends of the paper guideplate—adjacent to the fingers. Record the two clearances.**

To Adjust

Loosen end plate screws friction tight and position end plates.

**Note 2: The fingers at both the left and right ends of the platen shall be Min Some---Max 0.015 inch beyond the recorded gap between the platen and the left and right ends of the paper guideplate. Bend fingers to meet the requirement.



Related Adjustments

Affects

PLATEN—HORIZONTAL

(Paper Feed Area*)

PLATEN—VERTICAL

(Paper Feed Area*)

LOW-PAPER ALARM CONTACT

(Paper Alarm Control Area)

LOW-PAPER AND PAPER-OUT

ALARM CONTACT (Paper Alarm

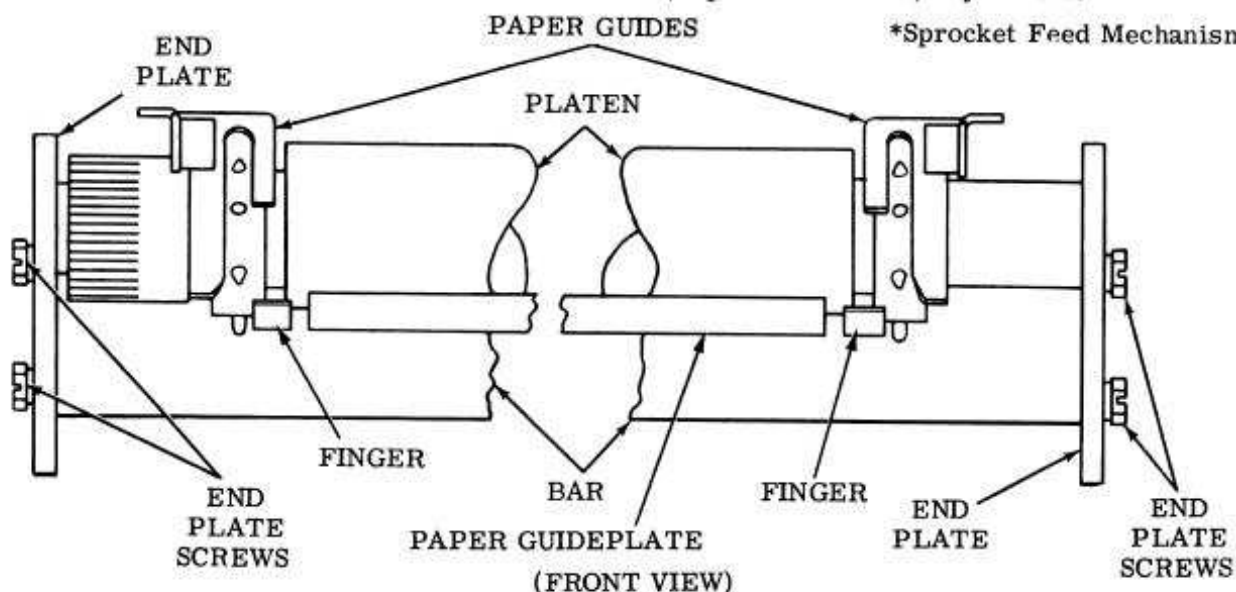
Control Area)

PAPER-OUT ALARM CONTACT

(Paper Alarm Control Area)

Replace platen mechanism onto the typing unit. (See instructions in the appropriate typing unit section.) Perform PAPER GUIDEPLATE (Paper Feed Area*) adjustment.

*Sprocket Feed Mechanisms



2.90 Paper Feed Area (continued)

PAPER GUIDE SPRINGRequirement

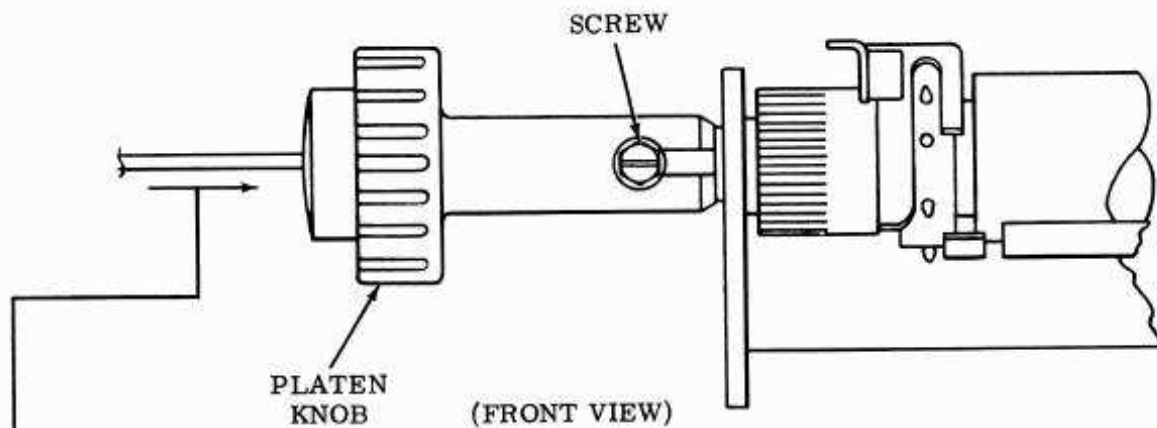
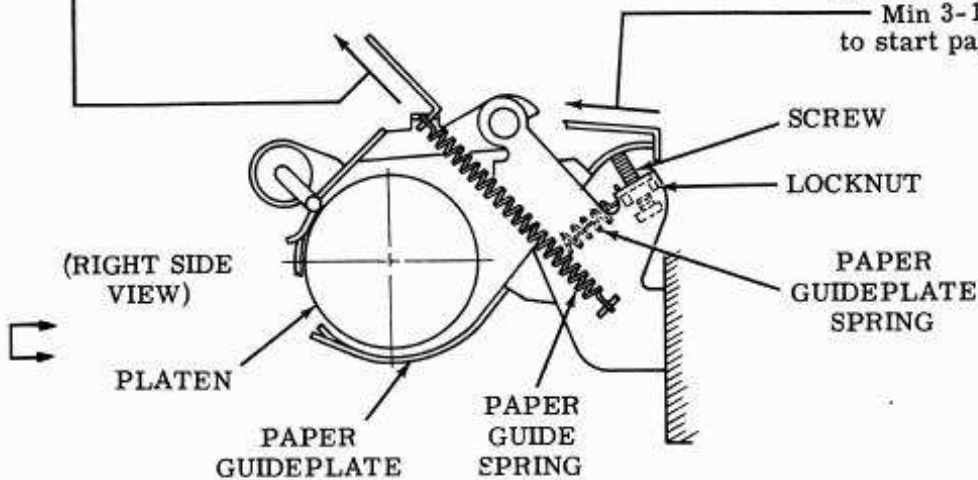
With paper guides resting on platen

Min 16 oz---Max 18 oz
to pull each paper guide
spring to installed length.

PAPER GUIDEPLATE SPRINGRequirement

With a spring scale positioned
at middle of paper guideplate

Min 3-1/2 oz---Max 7-1/2 oz
to start paper guideplate moving.

PLATEN KNOB SPRINGRequirement

With a spring scale positioned
on platen knob

Min 15 oz---Max 23 oz
to start platen knob moving.

PLATEN KNOBRequirement

The platen knob shall be fully seated toward
the right.

To Adjust

With screw loosened, position platen knob.

2.91 Paper Feed Area (continued)

LEFT SPROCKET RING

Requirement

The left sprocket ring pins shall be located within the slot of the paper guide and shall not contact the side surfaces of the paper guide slot.

To Adjust

With set screws loosened, position the left sprocket ring.

Note: Do not tighten set screws until RIGHT SPROCKET RING (Paper Feed Area*) adjustment has been completed.

Related Adjustments

Affects

LEFT HAND MARGIN
(Paper Feed Area*)
RIGHT SPROCKET RING
(Paper Feed Area*)
PRINTING LINE POSITION
(Paper Feed Area*)
WIRE GUIDE - FINAL
(Paper Feed Area*)

* Sprocket Feed Mechanisms

RIGHT SPROCKET RING

To Check

With the set screws of the left and right sprocket rings in line, place a single sprocket form on the platen with the sprocket form feed holes over the left and right sprocket ring pins.

Requirement

The left and right sprocket ring pins shall be in line and centrally located in the sprocket form feed holes.

To Adjust

With set screws loosened, position the left and/or right sprocket rings as required.

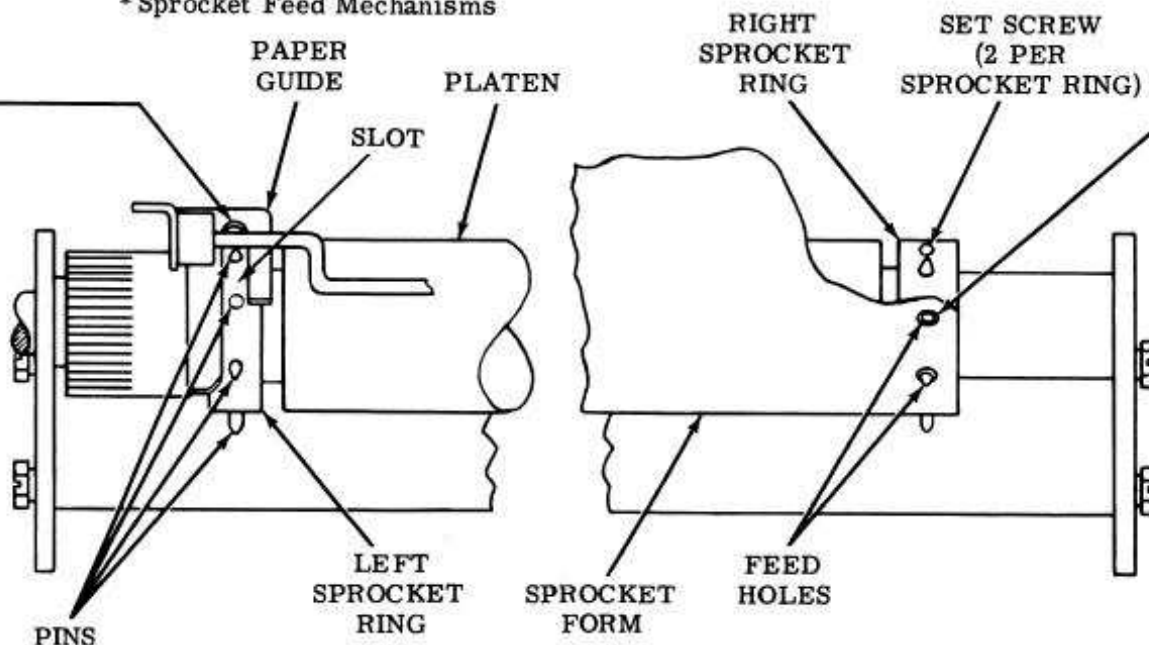
Related Adjustments

Affects

PRINTING LINE POSITION
(Paper Feed Area*)
RIGHT GUIDE (Paper Feed Area*)
RIGHT HAND MARGIN (Paper Feed Area*)
WIRE GUIDE - FINAL (Paper Feed Area*)

Affected By

LEFT SPROCKET RING (Paper Feed Area*)



(FRONT VIEW)

2.92 Paper Feed Area (continued)

RIGHT GUIDERequirement

The right sprocket ring pins shall be located within the slot of the paper guide and shall not contact the side surfaces of the paper guide slot.

To Adjust

With the right paper guide screws and the set screw which secures the wire guide on the right side loosened, position the right paper guide.

Related AdjustmentsAffects

WIRE GUIDE - FINAL (Paper Feed Area*)
WIRE GUIDE - PRELIMINARY (Paper Feed Area*)

Affected By

RIGHT SPROCKET RING (Paper Feed Area*)

WIRE GUIDE—PRELIMINARYTo Check

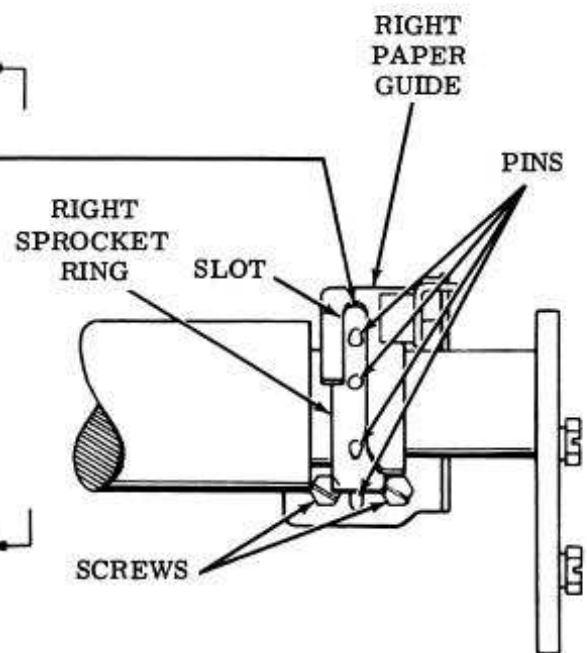
Place a sprocket form into the platen mechanism.

Requirement

With the sprocket form and the left and right paper guides fully engaged with the left and right sprocket rings, respectively, the wire guide shall contact the sprocket form.

To Adjust

Loosen set screws. Hold the sprocket form and the left and right paper guides against the left and right sprocket rings, respectively. Rotate wire guide in a clockwise direction (as viewed from the right side) until it just comes into contact with the sprocket form.



(FRONT VIEW)

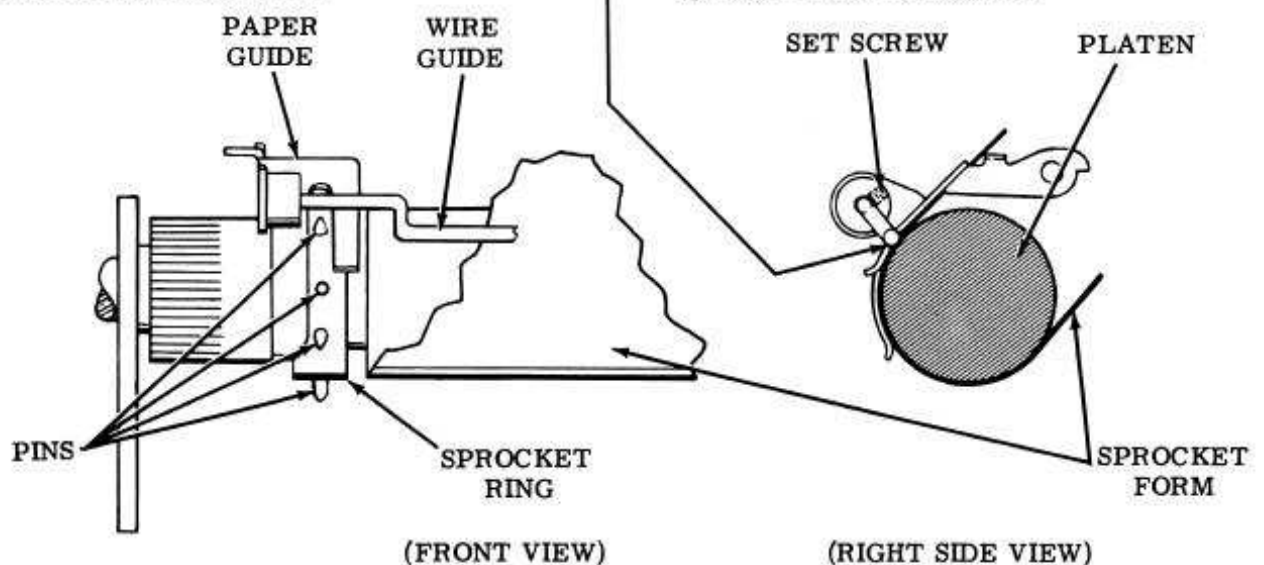
Related AdjustmentsAffects

WIRE GUIDE—FINAL
(Paper Feed Area*)

Affected By

RIGHT GUIDE (Paper Feed Area*)

*Sprocket Feed Mechanisms



(FRONT VIEW)

(RIGHT SIDE VIEW)

2.93 Paper Feed Area (continued)

Note 1: Before making the PLATEN—HORIZONTAL (Paper Feed Area*) adjustment, loosen the nut securing the idler post and back off the idler.

PLATEN—HORIZONTAL**To Check**

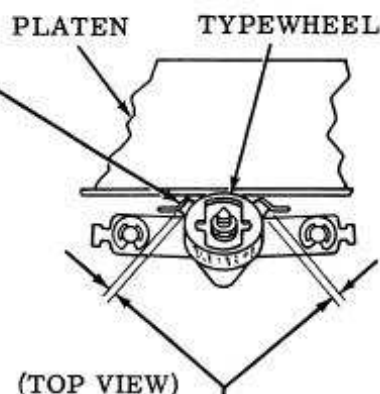
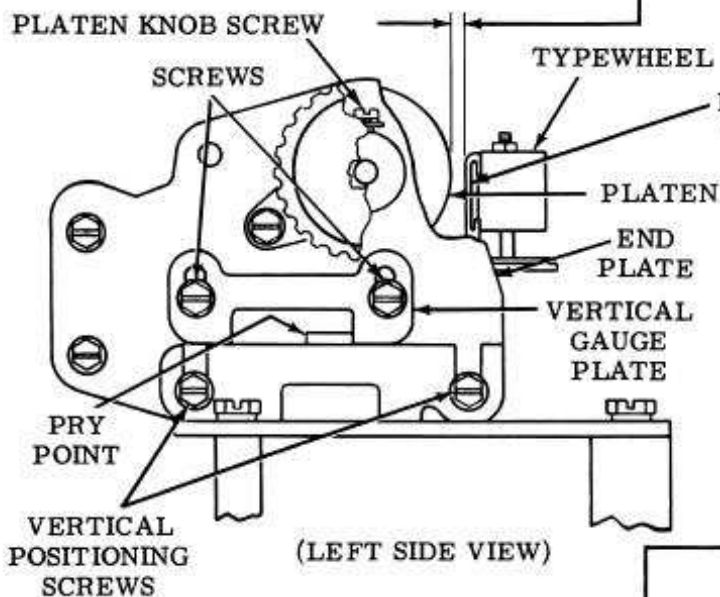
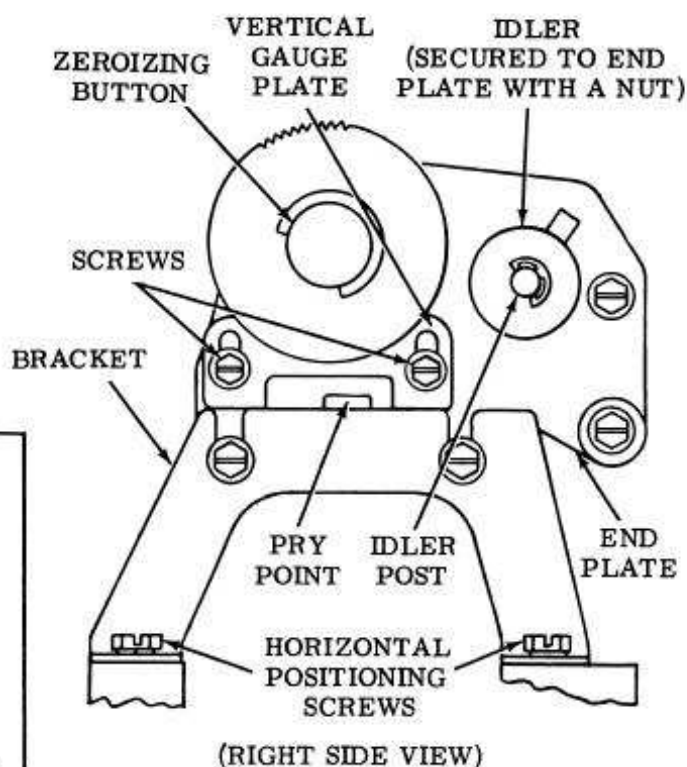
Place the platen knob screw up and permit the detent ratchet pawl to seat in a groove of the detent ratchet.

(1) Requirement

Min 0.042 inch---Max 0.058 inch between ribbon guide and platen at both left and right margins.

To Check

Place typing unit carriage to center of platen and rotate platen until maximum clearance is obtained between platen and ribbon guide. Set up any character code combination (except function) in selector. Rotate main shaft until carriage drive bail is in its rearmost position. Push type-wheel to the rear until it just touches platen.



Note 2: The typing unit shall not have sprocket forms or ribbon installed.

(2) Requirement

Typewheel shall not touch inside of either ribbon guide.

(3) Requirement

No smudging of printed characters when typing unit is operated under power.

* Sprocket Feed Mechanisms

To Adjust

Loosen four vertical positioning screws. Place both ends of platen in lowest position. Loosen four horizontal positioning screws. Position platen horizontally to meet requirements. Tighten horizontal positioning screw only. Bend ribbon guide, if necessary.

Proceed to PLATEN—VERTICAL (Paper Feed Area*) adjustment.

2.94 Paper Feed Area (continued)

Note 1: Before making the PLATEN—VERTICAL (Paper Feed Area*) adjustment, loosen the nut securing the idler post and back off the idler. See illustrations on the preceding page in connection with PLATEN—HORIZONTAL (Paper Feed Area*) adjustment.

Note 2: Loosen the vertical gauge plate screw and back off the vertical gauge plate on each side of the platen mechanism. After making the PLATEN—VERTICAL (Paper Feed Area*) adjustment, position each vertical gauge plate so that it is resting on the top of its associated bracket.

PLATEN—VERTICALTo Check

Place a sprocket form in the typing unit. Set up the character "M" code combination (--345) or (1-34--78) in the selector and rotate the main shaft until the character is printed. Repeat several times along the length of the platen.

Requirement

When each printed character is examined by eye from top to bottom, the shading shall be approximately the same.

To Adjust

With four vertical positioning screws loosened, position the platen using pry points.

Note 3: When positioning the platen using pry points, be sure to raise the end plates and not to twist them.

Related AdjustmentsAffects

CAM ZERO POSITION (Platen Drive Area)
DETENT POSITION (Paper Feed Area*)
IDLER (Platen Drive Area)
WIRE GUIDE - FINAL (Paper Feed Area*)

Affected By

PAPER GUIDE PLATE (Paper Feed Area*)
PRINT DRIVE LEVER (Carriage Area)
REAR RAIL (Carriage Area)

* Sprocket Feed Mechanisms

2.95 Platen Drive Area

LINE FEED CLUTCH ENDPLAY

Requirement

Min Some---Max 0.012 inch
endplay between washer and line feed
clutch.

To Adjust

With drum screw loosened, position drum.

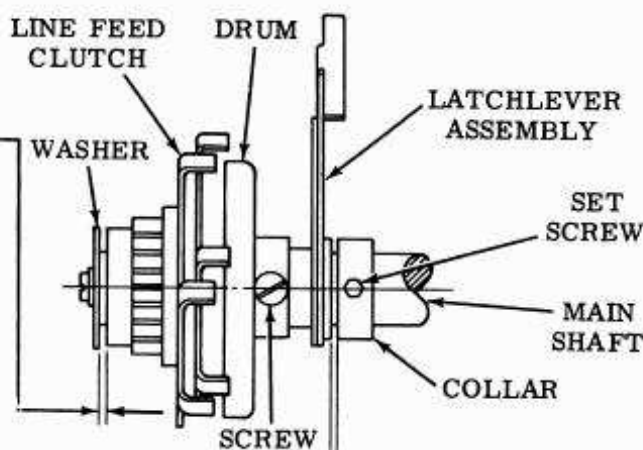
LATCHLEVER ASSEMBLY ENDPLAY

Requirement

Min Some---Max 0.012 inch
endplay between latchlever assembly
and collar.

To Adjust

With set screw loosened, position collar.



(TOP VIEW)

FORM-OUT BELT TENSION

Requirement

The form-out belt tension shall not be
too tight or too loose.

To Adjust

With three form-out assembly bracket
mounting screws loosened, hook a
spring scale under the trip shaft at the
latchlever. Position and pull up with a
force of 7 pounds and hold. Tighten the
three form-out assembly bracket mount-
ing screws in the following order:
first, the right front mounting screw;
then, the right rear mounting screw,
and finally, the left mounting screw.

Related Adjustments

Affects

CAM ZERO POSITION (Platen Drive Area)

DETENT POSITION (Paper Feed Area*)

IDLER (Platen Drive Area)

FORM-OUT DOWNSTOP (Platen
Drive Area)

FORM-OUT LEVER OVERTRAVEL
(Platen Drive Area)

LINE FEED (Platen Drive Area)

LINE FEED CLUTCH TRIP LEVER
(Platen Drive Area)

LINE FEED DOWNSTOP (Platen
Drive Area)

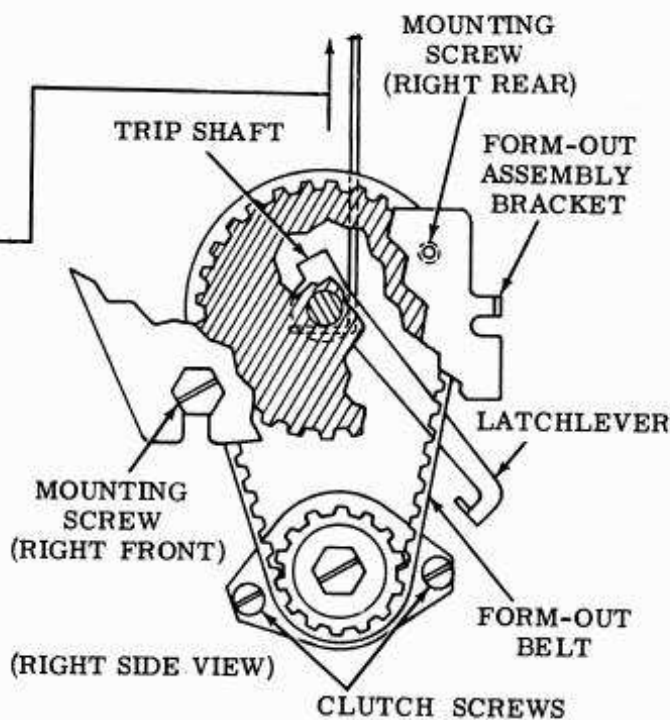
LINE FEED LEVER LINE-UP AND
ENDPLAY (Platen Drive Area)

LINE FEED LEVER UPSTOP (Platen
Drive Area)

READER-STOP CONTACT (Platen
Drive Area)

RESET (Platen Drive Area)

RESET CAM LOBE LINE-UP (Platen
Drive Area)



(RIGHT SIDE VIEW)

Note 1: Since it is difficult to measure the FORM-OUT BELT TENSION (Platen Drive Area) requirement adequately, make the adjustment only if the form-out belt tension is suspected to be too tight or too loose.

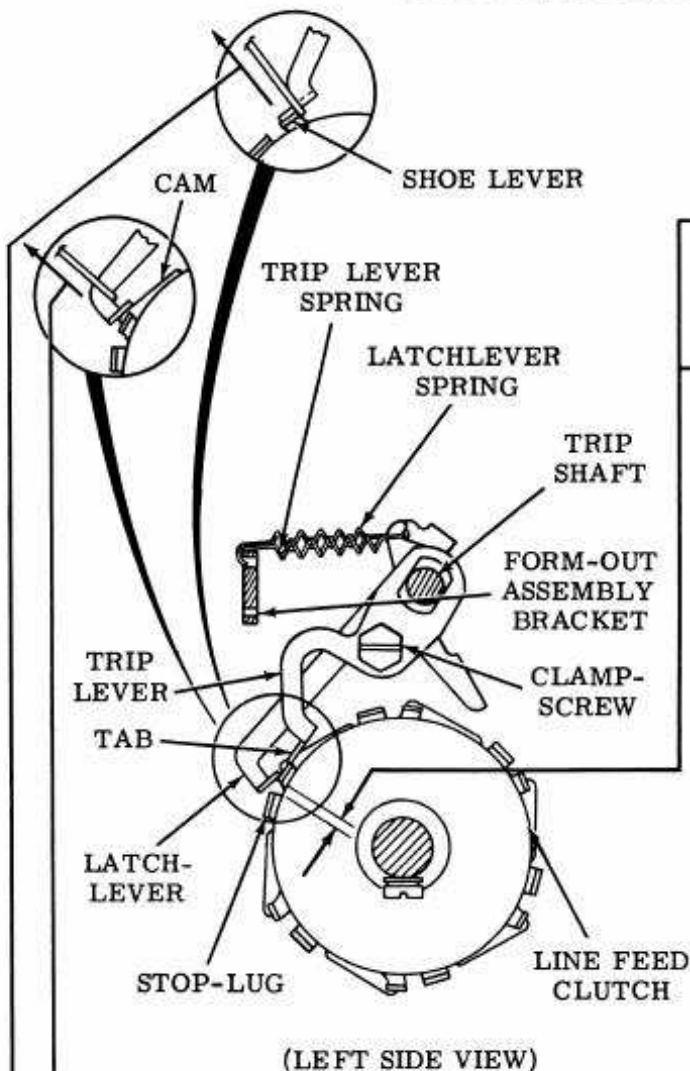
Note 2: Make certain that the shaft is free by rotating reset follower lever. If necessary free trip shaft by repositioning the left mounting bracket of the form-out assembly bracket against the form-out assembly bracket.

Note 3: The left mounting screw is located on the left side of the form-out bracket.

→ *Sprocket Feed Mechanisms

2.96 Platen Drive Area (continued)

CAUTION: DO NOT DISTURB THE CLUTCH SCREWS. CLUTCH SCREWS ARE SECURED BY AN ADHESIVE AT THE FACTORY.

LINE FEED CLUTCH TRIP LEVER

Requirement

- (1) Clearance between each stop-lug and its associated shoe lever
— Min 0.040 inch---Max 0.070 inch
greater when line feed clutch is engaged than when disengaged (latched).
- (2) With line feed clutch disengaged (latched)
— Min 0.015 inch
between each stop-lug and its associated shoe lever.

Note: Check each stop-lug and its associated shoe lever.

To Adjust

With clampscrew loosened, position trip lever.

Related Adjustments

Affects

FORM-OUT DOWNSTOP
(Platen Drive Area)
LINE FEED DOWNSTOP
(Platen Drive Area)

Affected By

FORM-OUT BELT TENSION
(Platen Drive Area)

TRIP LEVER SPRING

Requirement

With trip lever tab resting on top of a shoe lever
— Min 4-1/4 oz---Max 6-1/4 oz
to start trip lever moving.

LATCHLEVER SPRING

Requirement

With latchlever resting on the high part of a cam
— Min 2-1/4 oz---Max 3-1/2 oz
to start latchlever moving.

2.97 Platen Drive Area (continued)

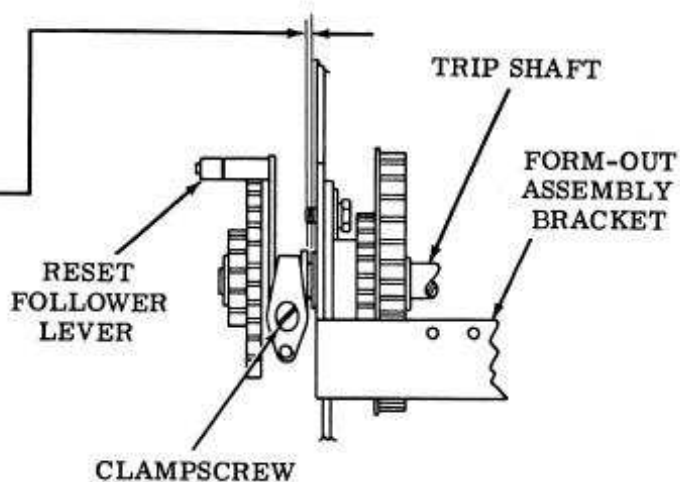
TRIP SHAFT ENDPLAY

Requirement

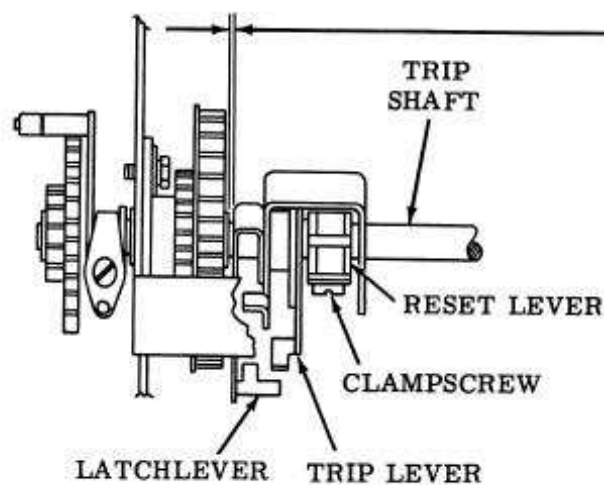
Min Some---Max 0.010 inch
endplay of the trip shaft.

To Adjust

With clampscrew loosened,
position reset follower lever
on trip shaft.



(REAR VIEW)



(REAR VIEW)

TRIP LEVER AND LATCHLEVER ENDPLAY

Requirement

The trip lever and latchlever shall have
Min Some---Max 0.010 inch
endplay.

To Adjust

With clampscrew loosened, position
reset lever

→ 2.98 Function and Platen Drive Areas

LINE FEED LEVER LINE-UP AND ENDPLAY

Requirement

- (1) The line feed pawl shall fully engage the flat on the tab of the line feed lever.
- (2) The line feed lever shall have _____ Min Some---Max 0.010 inch endplay.
- (3) There must be some clearance between the line feed lever and the main shaft gear.

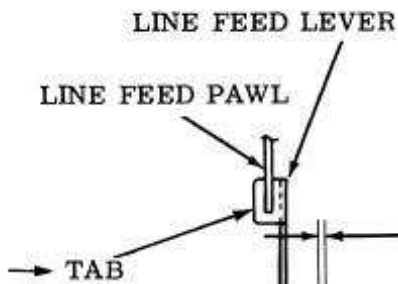
To Adjust

With set screws in two collars and the main shaft gear screw loosened, position line feed lever and main shaft gear.

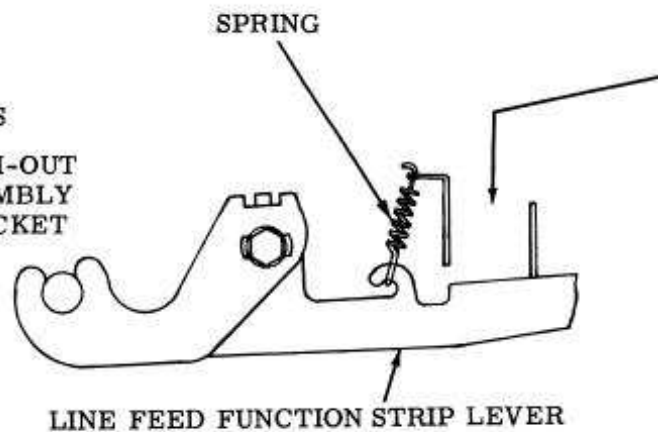
Related Adjustment

Affected By

FORM-OUT BELT TENSION (Platen Drive Area)



(TOP VIEW)



(RIGHT SIDE VIEW)

LINE FEED FUNCTION STRIP LEVER SPRING

Requirement

With a spring scale positioned on the line feed function strip lever

Min 64 oz---Max 70 oz _____

to start the line feed function strip lever moving.

2.99 Platen Drive Area

***Note:** If the form-out character is other than **FIGS Z**, set up the correct form-out code combination.

FORM-OUT LEVER OVERTRAVEL

To Check

With the "form-out" code combination (1---5)* or (--34---8) set up in selector, rotate the main shaft until the form-out function lever is in its lowermost position.

Requirement

Min 0.010 inch---Max 0.020 inch clearance between form-out lever and notch of arm.

To Adjust

With screw loosened and form-out function lever held against its pawl, position arm using pry points.

Related Adjustments

Affected By

FORM-OUT BELT TENSION

(Platen Drive Area)

RIGHT ROCKER DRIVE ARM

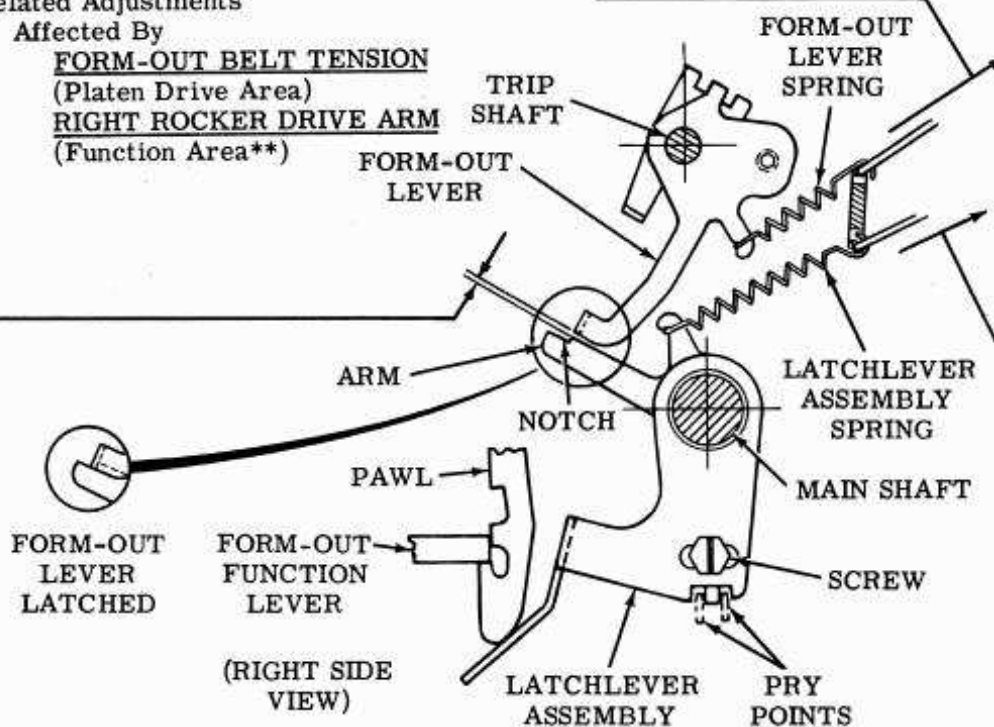
(Function Area**)

→ **Common mechanisms

FORM-OUT LEVER SPRING

Requirement

With the form-out lever latched
Min 33 oz---Max 37 oz
to pull form-out lever spring to installed length.



LATCHLEVER ASSEMBLY SPRING

Requirement

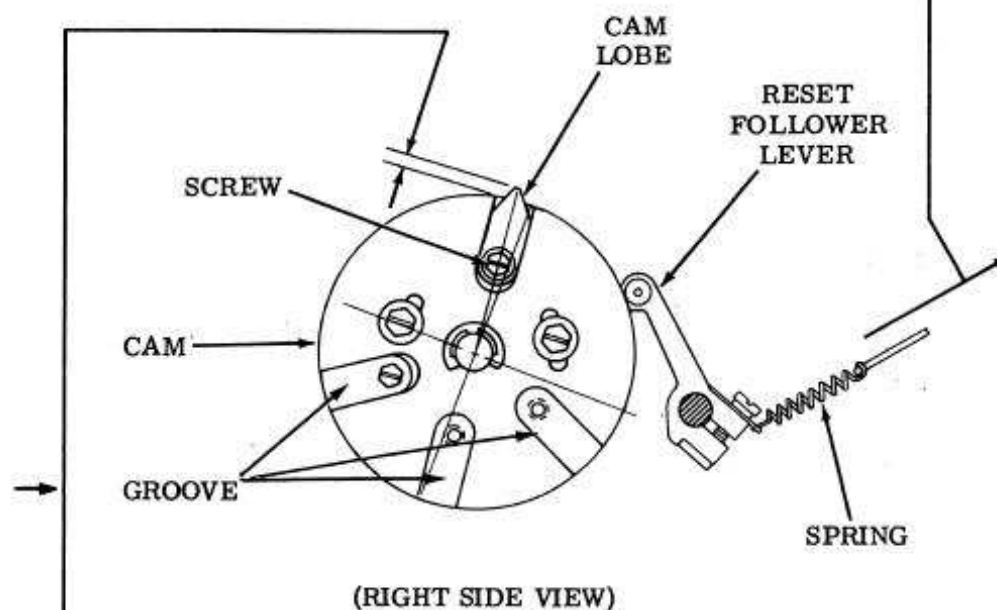
With the form-out lever latched
Min 4 oz---Max 5-1/4 oz
to pull latchlever assembly spring to installed length.

2.100 Platen Drive Area (continued)

RESET FOLLOWER LEVER SPRINGRequirement

With reset follower lever on low part of cam

Min 12 oz---Max 16 oz
to pull reset follower lever
spring to installed length.

CAM LOBE

Note: Cam lobes, in addition to the one opposite the three closely spaced grooves, shall be adjusted according to the RESET adjustment.

Requirement

The top of the cam lobe shall be
Min 0.050 inch---Max 0.055 inch
above the low point of the cam.

To Adjust

With screw loosened, position the cam lobe.

Related AdjustmentAffects

RESET (Platen Drive Area)

2.102 Platen Drive Area (continued)

RESET**To Check**

With the typing unit in stop condition, place the reset follower lever on the high point of the cam lobe by pushing in on the zeroizing button and rotating the pulley until the required situation is obtained.

Requirement

Min 0.005 inch---Max 0.015 inch
clearance between the latching surface of the arm and the form-out lever.

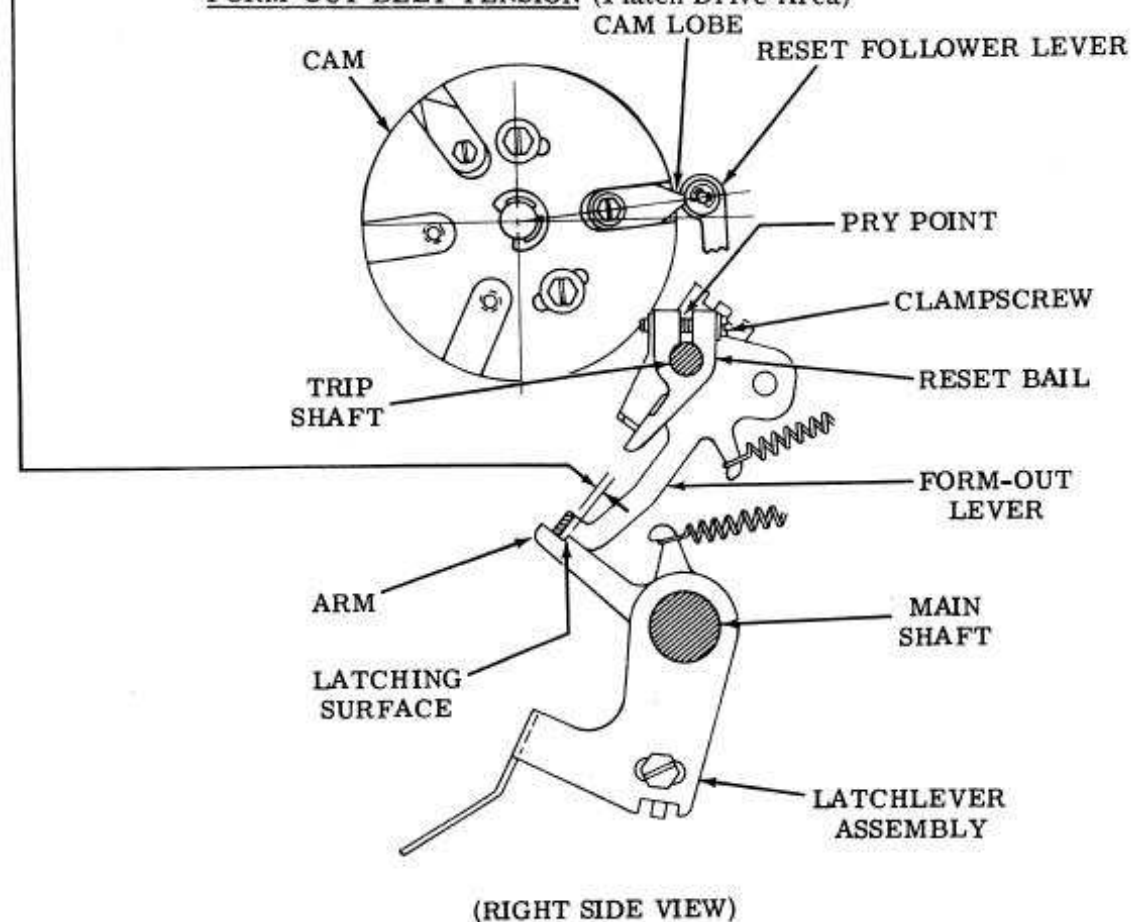
To Adjust

With clampscrew loosened friction tight and the reset follower lever on the high point of the cam lobe, position the reset bail using pry points.

Related Adjustments**Affected By**

CAM LOBE (Platen Drive Area)

FORM-OUT BELT TENSION (Platen Drive Area)



2.103 Platen Drive Area (continued)

FORM-OUT DOWNSTOP**To Check**

With the typing unit in stop condition, place the reset follower lever on the low part of its cam by pushing in on the zeroizing button and rotating the pulley until the required situation is obtained. With screw loosened, position the pry point of the form-out lever to the center of lever groove. Loosen the downstop bracket screw and push the downstop bracket to its lowermost position. Then, with the line feed lever screw loosened, position the line feed lever so that it does not interfere with the making of this adjustment.

Requirement

The top surface of the trip lever shall be
Min Flush---Max 0.005 inch
above top surface of a shoe lever.

Note: Check requirement at each stop-lug.

To Adjust

With form-out lever held against the latching surface of the latchlever assembly arm and the form-out lever screw loosened, position form-out lever using pry points.

Related Adjustments**Affects**

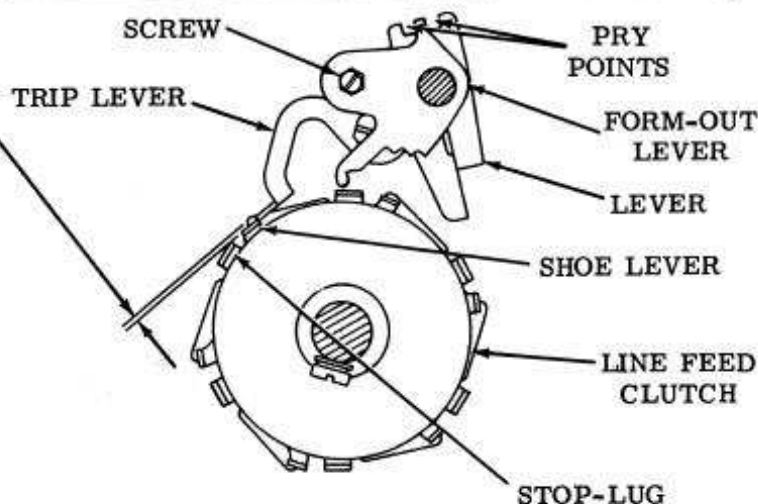
LINE FEED (Platen Drive Area)

LINE FEED DOWNSTOP (Platen Drive Area)

Affected By

FORM-OUT BELT TENSION (Platen Drive Area)

LINE FEED CLUTCH TRIP LEVER (Platen Drive Area)



(LEFT SIDE VIEW)

2.104 Platen Drive Area (continued)

LINE FEED DOWNSTOP**To Check**

With typing unit in stop condition, place the reset follower lever on the high point of the cam lobe by pushing in on the zeroizing button and rotating the pulley until the required situation is obtained.

Requirement

The top surface of the trip lever shall be
 Min Flush---Max 0.005 inch
 above top surface of a shoe lever.

Note: Check requirement at each stop-lug.

To Adjust

Loosen screw and position the line feed lever so that it does not interfere with the making of this adjustment. With downstop bracket screw loosened, position downstop bracket so that line feed bail positions trip lever to meet requirement.

Related Adjustments**Affects**

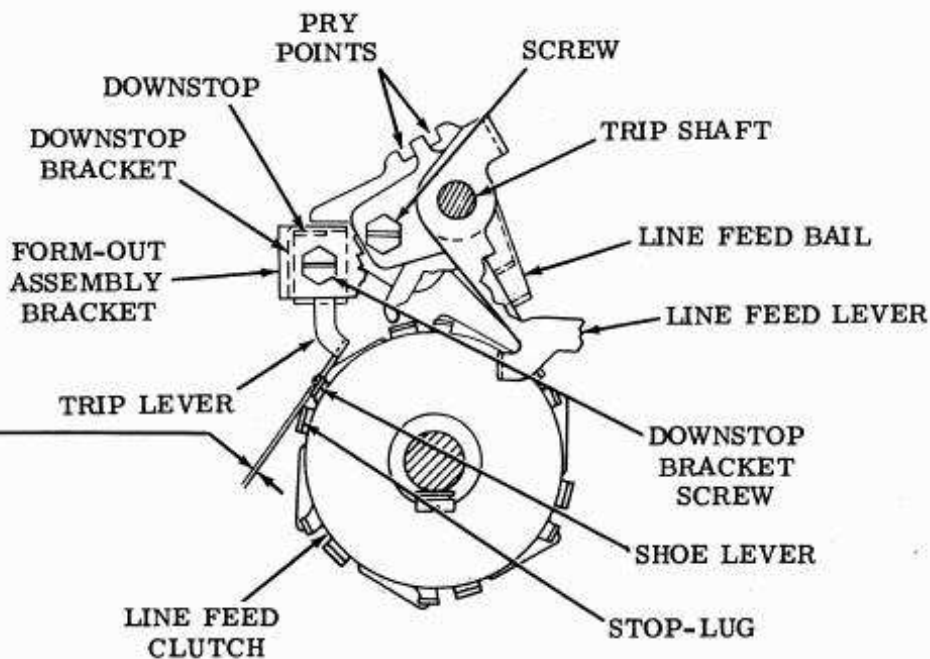
LINE FEED (Platen Drive Area)

Affected By

FORM-OUT BELT TENSION (Platen Drive Area)

FORM OUT DOWNSTOP (Platen Drive Area)

LINE FEED CLUTCH TRIP LEVER (Platen Drive Area)



(LEFT SIDE VIEW)

2.105 Platen Drive Area (continued)

LINE FEED LEVER UPSTOP

To Check

Set up the typing unit for double line feed (see LINE FEED LEVER (Platen Drive Area) adjustment). Trip line feed clutch and rotate main shaft until the blocking edge of the trip lever is in line with the counterclockwise edge of a stop-lug.

Requirement

Min 0.030 inch---Max 0.035 inch
between trip lever and stop lug.

To Adjust

Note: For typing units with a reader feed magnet contact assembly, remove it. Replace it after making adjustment.
For instructions, see the appropriate tape reader section.

With screws loosened, position upstop.

Related Adjustments

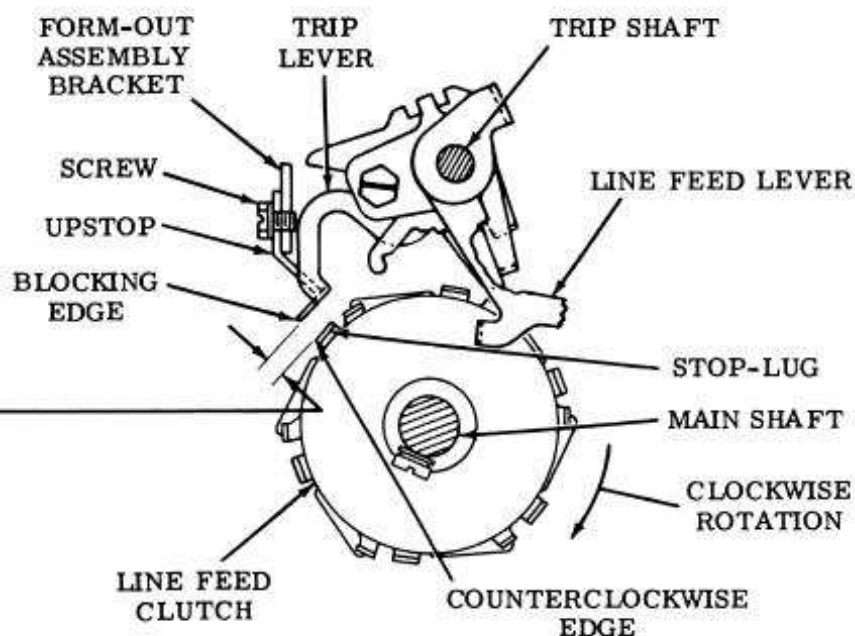
Affects

CONTACT GAP (applies to typing units with a reader feed magnet contact assembly. For adjustment instructions, see the appropriate tape reader section).

LINE FEED (Platen Drive Area)

Affected By

FORM-OUT BELT TENSION (Platen Drive Area)



(LEFT SIDE VIEW)

2.106 Function Area

LINE FEED STRIP LEVER

Note: The typing unit was set up for double line feed during the LINE FEED LEVER UPSTOP (Platen Drive Area) adjustment and shall remain in that condition for this adjustment.

To Check

With the typing unit set up for double line feed (LINE FEED (Platen Drive Area) adjustment), push the line feed strip lever down and allow the line feed upstop pawl to assume its normal position against the line feed strip lever. Manually set up the LINE FEED code combination in the selector and rotate the main shaft until the line feed clutch trip lever trips.

To Adjust

Place the typing unit in the stop condition. Push the line feed strip lever down and allow the line feed upstop pawl to assume its normal position against the line feed strip lever. After loosening the screw friction tight and positioning it to the most forward position in its elongated hole, manually set up the LINE FEED code combination in the selector. Rotate the main shaft until the line feed clutch trip lever trips and just passes over the second of two shoe levers. Using pry points, carefully pry the line feed strip lever to the rear to where the line feed pawl just strips off the line feed function lever. Repeat this adjustment procedure and refine if necessary.

Related AdjustmentsAffects

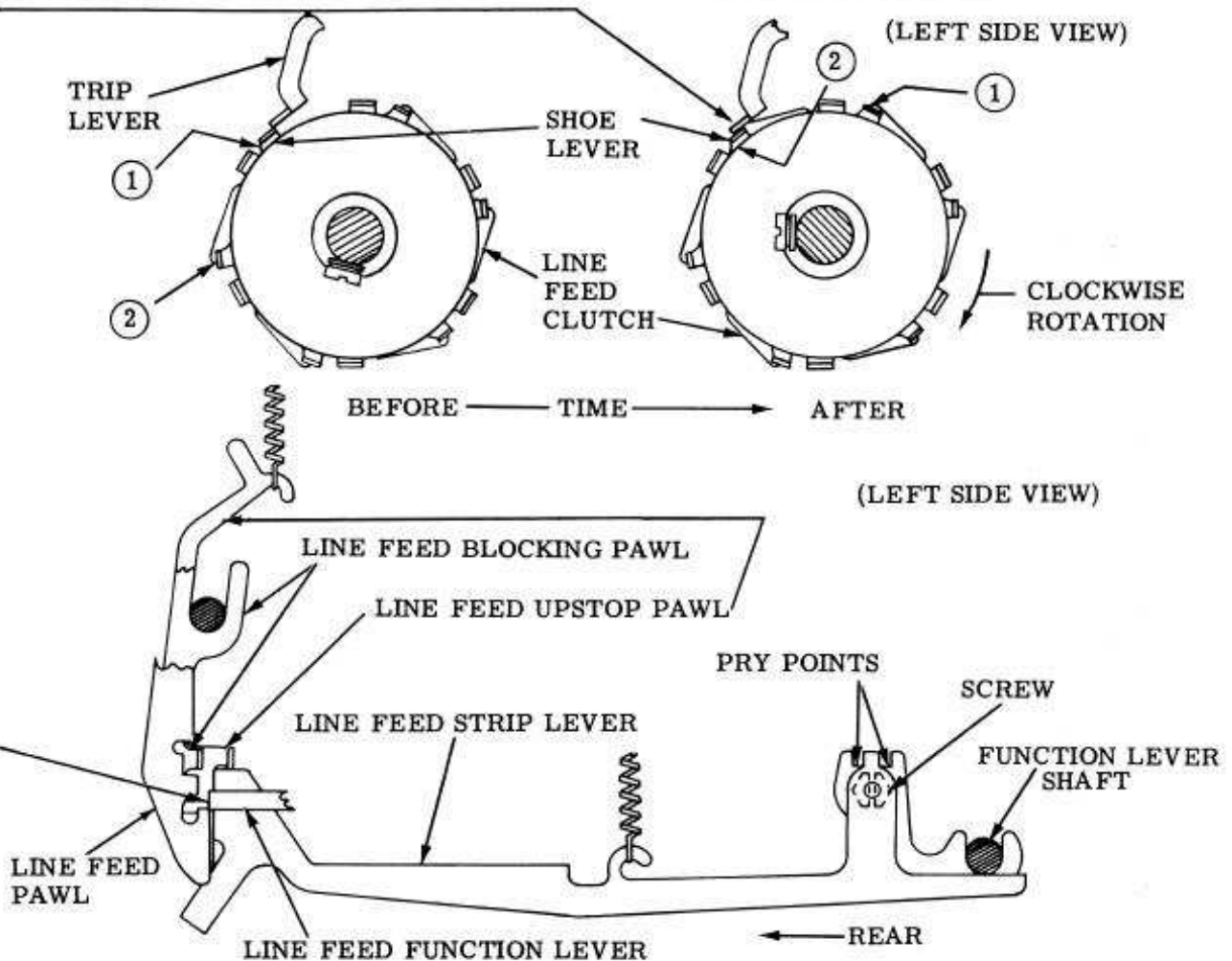
LINE FEED (Platen Drive Area)

Affected By

RIGHT ROCKER DRIVE ARM (Function Area*)

*Common MechanismsRequirement

After the line feed clutch trip lever has just passed over the second of two shoe levers, the line feed pawl shall strip the line feed function lever.



2.107 Platen Drive Area

LINE FEED BAIL SPRING

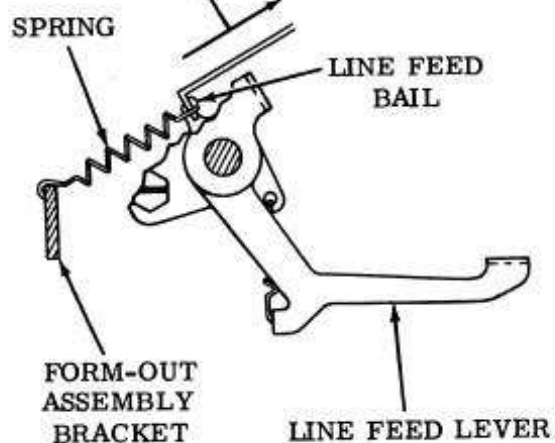
Requirement

Min 6-1/4 oz---Max 7-1/2 oz
to pull line feed bail spring to
installed length.

LINE FEED LEVER SPRING

Requirement

With arm held against its downstop
Min 17-3/4 oz---Max 24-1/2 oz
to start line feed lever moving.



(LEFT SIDE VIEW)

LINE FEED

To Check

Place typing unit in stop condition.

Requirement

Single line feed:

Min 0.115 inch---Max 0.125 inch
between pawl and line feed lever.

Double line feed:

Min Zero---Max 0.010 inch
between pawl and line feed lever.

To Adjust

While holding rear part of line feed lever
against downstop, loosen screw friction
tight. Position line feed lever using pry
points.

Related Adjustments

Affected By

FORM-OUT BELT TENSION (Platen
Drive Area)

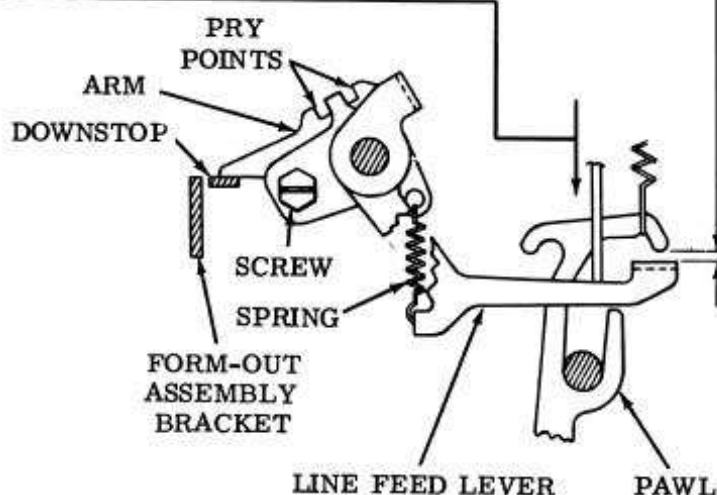
FORM-OUT DOWNSTOP (Platen Drive
Area)

LINE FEED DOWNSTOP (Platen Drive
Area)

LINE FEED LEVER UPSTOP (Platen
Drive Area)

LINE FEED STRIP LEVER (Function
Area*)

*Sprocket Feed Mechanisms



(LEFT SIDE VIEW)

2.108 Paper Feed Area

DETENT POSITION**To Check**

Set up a **LINE FEED** code combination in the selector and clear it through the typing unit by manual operation. Disengage (latch) all clutches.

Requirement

- (1) The pawl shall be fully seated in the groove of the detent ratchet.
- (2) Min Some---Max 0.030 inch between the plate and detent ratchet.

To Adjust

Set up a **LINE FEED** code combination in the selector. With the set screws loosened, apply finger pressure to the pawl to fully seat it in a groove of the detent ratchet and manually operate the typing unit to complete the line feed cycle. Disengage (latch) all clutches and tighten set screws to meet requirement.

Related Adjustments**Affected By**

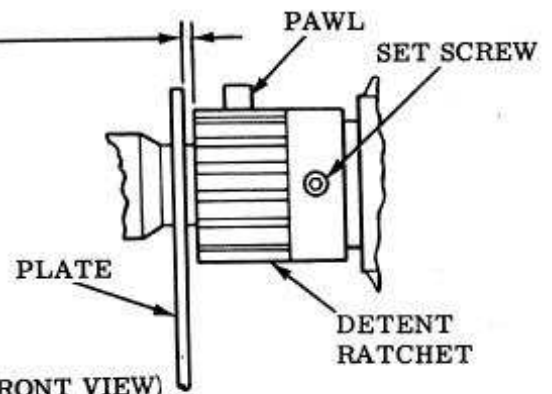
FORM-OUT BELT TENSION (Platen Drive Area)

IDLER (Platen Drive Area)

PLATEN-HORIZONTAL (Paper Feed Area*)

PLATEN-VERTICAL (Paper Feed Area*)

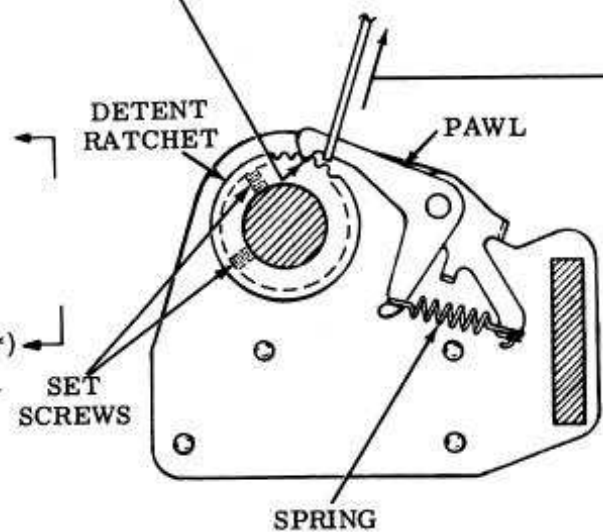
*Sprocket Feed Mechanisms



(FRONT VIEW)

DETENT RATCHET PAWL SPRING**Requirement**

With a spring scale positioned under detent ratchet pawl
Min 24 oz---Max 30 oz
to start pawl moving.



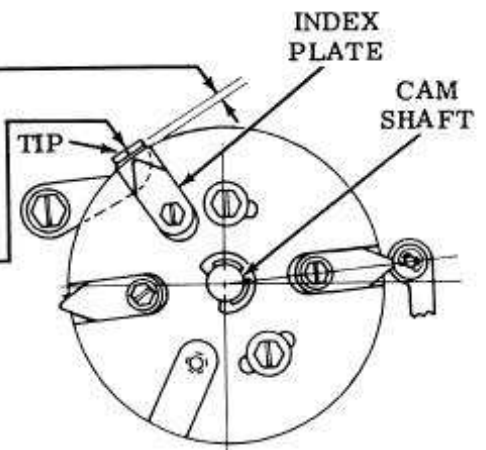
(RIGHT SIDE VIEW)

2.110 Platen Drive Area (continued)

CAM ZERO POSITION (Continued)

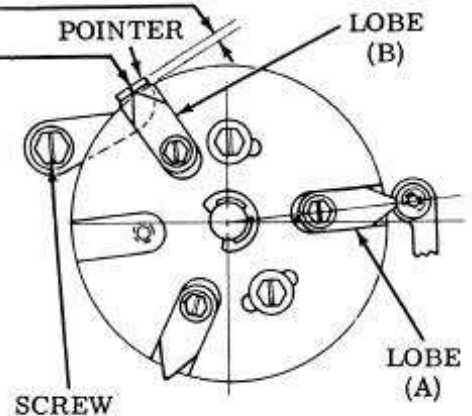
Two cam lobes:

- (1) With reset follower lever on high point of cam lobe and zeroizing button in its most right position
Min 0.025 inch---Max 0.035 inch between bottom surface of pointer and low part of cam.
- (2) With one's line-of-sight in line with the aluminized surface of index plate and center of cam shaft, tip of pointer shall fall within aluminized surface on plate.

TWO CAM LOBES

Three cam lobes:

- (1) With reset follower lever on high point of cam lobe (A) and zeroizing button in its most right position
Min 0.025 inch---Max 0.035 inch between bottom surface of pointer and low part of cam.
- (2) With one's line-of-sight in line with the highlight surface of cam lobe (B) and center of cam shaft, tip of pointer shall fall within highlight surface on lobe (B).

THREE CAM LOBES
(RIGHT SIDE VIEWS)

To Adjust

With screw loosened, position pointer.

Related Adjustments

Affected By

FORM-OUT BELT TENSION (Platen Drive Area)
IDLER (Platen Drive Area)
PLATEN-HORIZONTAL (Paper Feed Area*)
PLATEN-VERTICAL (Paper Feed Area*)
RESET CAM LOBE LINE-UP (Platen Drive Area)

*Sprocket Feed Mechanisms

2.111 Platen Drive Area (continued)

READER-STOP CONTACT

To Check

With the typing unit in stop condition, place the reset follower lever on the low part of the cam by pushing in on the zeroizing button and rotating the pulley until the required situation is obtained.

Requirement

Min 0.010 inch---Max 0.015 inch between reader-stop bail and insulator.

To Adjust

With clampscrew loosened, position contact bracket.

Related Adjustment

Affected By

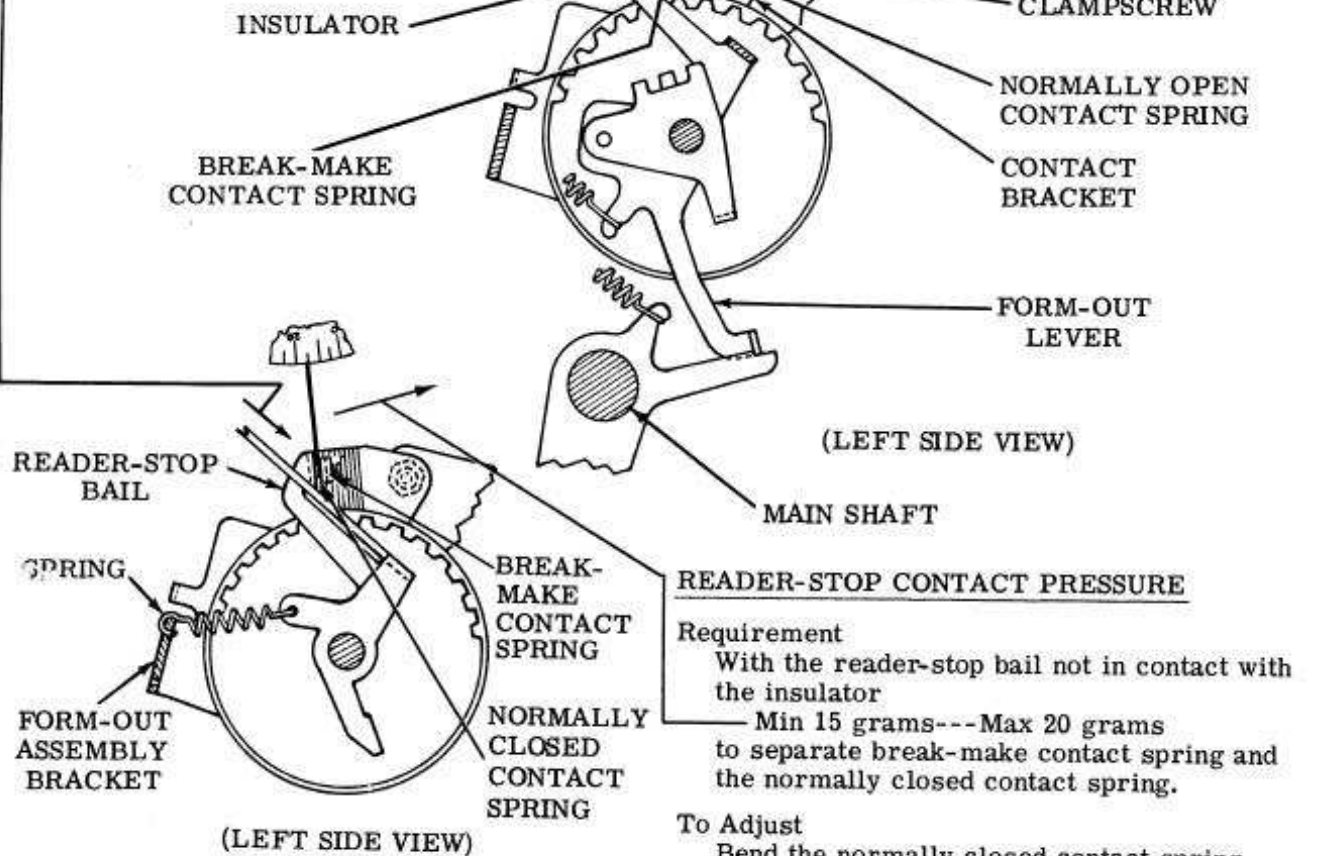
FORM-OUT BELT TENSION (Platen Drive Area)

READER-STOP BAIL SPRING

Requirement

With the form-out lever latched

Min 1-1/4 oz---Max 2-1/2 oz to start reader-stop bail spring moving.



READER-STOP CONTACT GAP

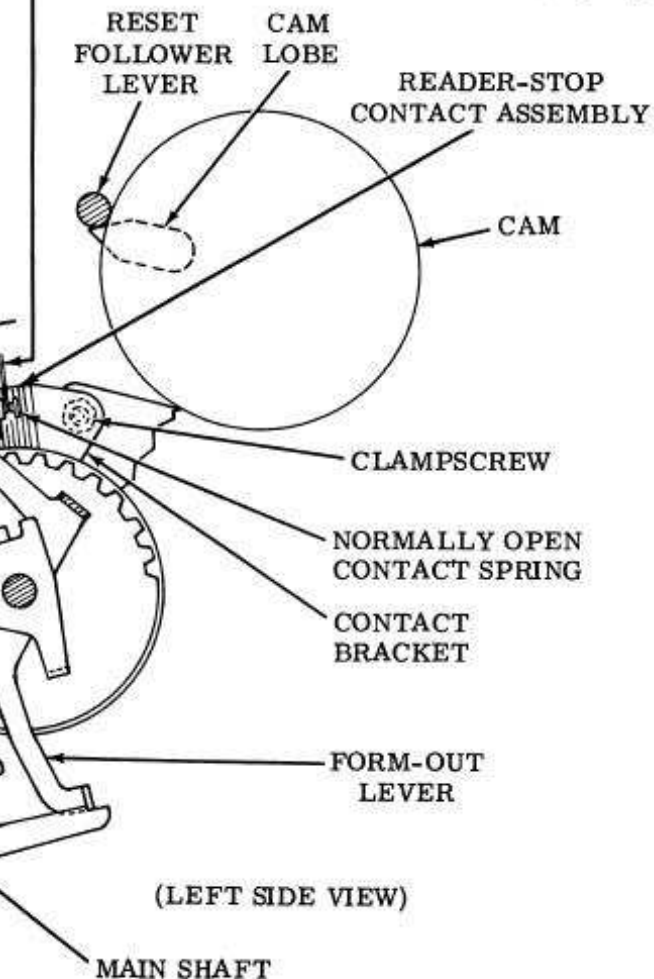
Requirement

With the reader-stop bail not in contact with the insulator

Min 0.010 inch---Max 0.015 inch between a contact of the break-make contact spring and the contact of the normally open contact spring.

To Adjust

Bend the normally open contact spring.



READER-STOP CONTACT PRESSURE

Requirement

With the reader-stop bail not in contact with the insulator

Min 15 grams---Max 20 grams to separate break-make contact spring and the normally closed contact spring.

To Adjust

Bend the normally closed contact spring.

LEFT HAND MARGINTo Check

Place carriage to the left hand margin, fully seating the piston in the dashpot cylinder.

Requirement

Min 0.055 inch---Max 0.065 inch between the closest sprocket ring pin and the ribbon lifter.

To Adjust

With two dashpot cylinder mounting screws loosened, position dashpot cylinder.

Related AdjustmentsAffects

CARRIAGE RETURN UNLATCH LEVER
(Spacing Area)

LINE LENGTH (Function Area**)

RIGHT HAND MARGIN (Paper Feed Area*)

Affected By

LEFT MARGIN (Spacing Area)

LEFT SPROCKET RING (Paper Feed Area*)

RIGHT HAND MARGINTo Check

Place carriage to the right to the 72nd character position. Hold feed pawl out of engagement with spacing ratchet, so that only check pawl is engaged.

Requirement

Min 0.030 inch clearance between sprocket ring pin and the ribbon lifter.

To Adjust

Refine LEFT HAND MARGIN (Paper Feed Area*) adjustment.

Related AdjustmentsAffects

LINE LENGTH (Function Area**)

Affected By

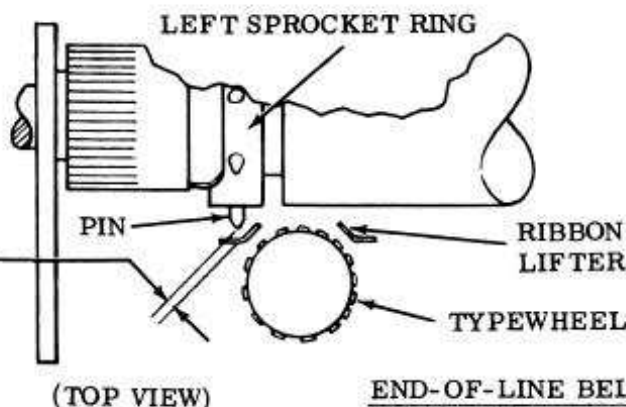
LEFT HAND MARGIN (Paper Feed Area*)

LEFT MARGIN (Spacing Area)

RIGHT SPROCKET RING (Paper Feed Area*)

*Sprocket Feed Mechanisms

**Common Mechanisms

END-OF-LINE BELL

CAUTION: THIS ADJUSTMENT APPLIES ONLY TO TYPING UNITS WITH SPROCKET FEED.

Requirement

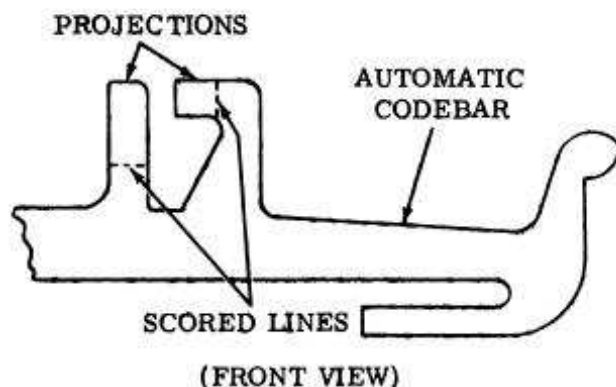
The end-of-line bell shall ring at the proper time when a 72 character line length is provided.

To Adjust

Use either TP180948 or TP183498 automatic codebar and no other. Do not remove any projections from TP180948 automatic codebar.

Related AdjustmentAffected By

LINE LENGTH (Function Area**)



2.113 Paper Feed Area (continued)

PRINTING LINE POSITION

To Check

With a single sheet of a sprocket form in the platen mechanism, place platen in its detent position with the top edge of the feed holes of the sprocket form engaged with the top edge of the left and right sprocket ring pins. Print the character "M" several times to establish a printing line.

Requirement

Printed Form:

Printed line shall be in register with sprocket form.

Nonprinted Form:

- (1) A horizontal line shall be $1/6$ inch, or a multiple of $1/6$ inch, from the bottom of any feed hole.
- (2) The bottom of a printing line shall be $1/32$ inch $\pm 1/64$ inch above a horizontal line.

To Adjust

With set screws loosened, position the right and/or left sprocket rings.

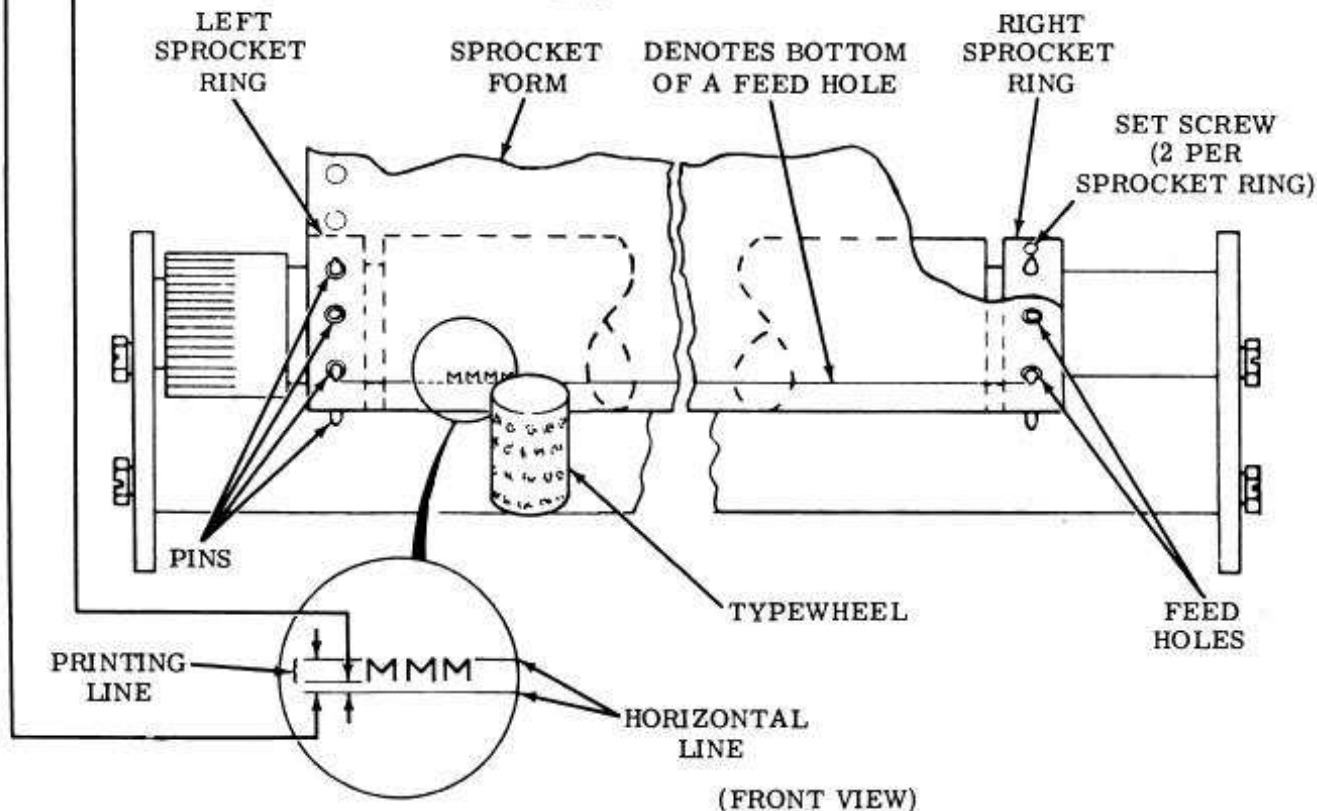
Related Adjustments

Affected By

LEFT SPROCKET RING (Paper Feed Area*)

RIGHT SPROCKET RING (Paper Feed Area*)

*Sprocket Feed Mechanisms



2.114 Platen Drive Area

FORM LENGTHTo Check

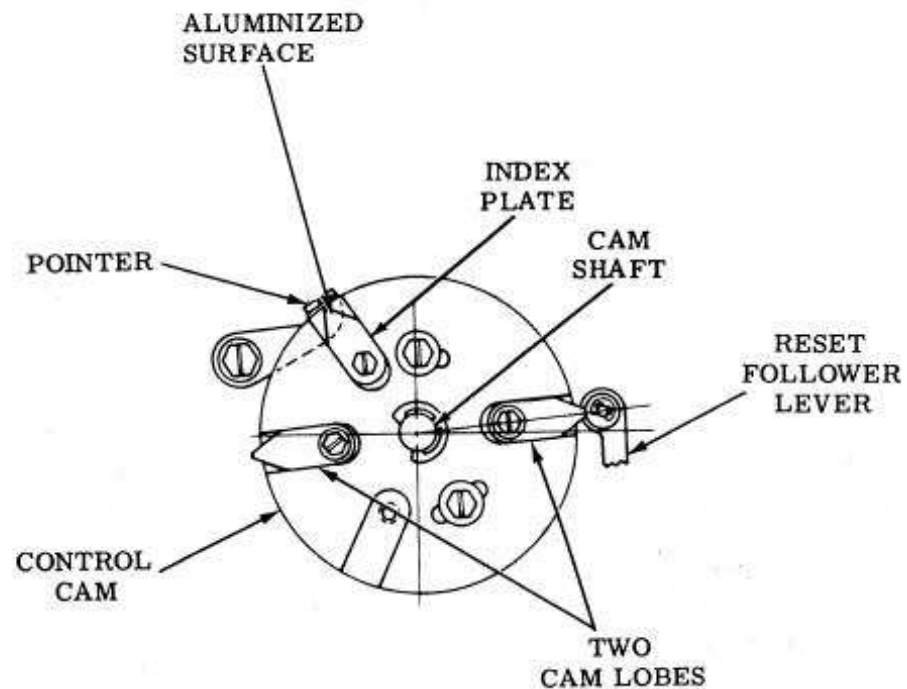
The control cam of the platen drive mechanism normally will come with two cam lobes. This causes sprocket forms to feed out one-half the basic form length.

Requirement

A longer form length.

To Adjust

Line up the pointer with the aluminized surface of the index plate. Remove and discard the cam lobe which is located in the other side of the control cam opposite the reset follower lever.



(RIGHT SIDE VIEW)

2.115 Paper Feed Area

WIRE GUIDE—FINAL

To Check

With a single sheet of sprocket form in the platen mechanism, place platen in its detent position with the top edge of the feed holes of the sprocket form engaged with the top edge of the sprocket ring pins.

Requirement

Wire guide shall lie between printing lines.

To Adjust

Loosen set screws. Hold sprocket form and the left and right paper guides against the left and right sprocket rings respectively. Rotate wire guide in a clockwise direction (as viewed from the right side) until it just comes into contact with the sprocket form.

Related Adjustments

Affected By

LEFT SPROCKET RING (Paper Feed Area*)

PLATEN-HORIZONTAL (Paper Feed Area*)

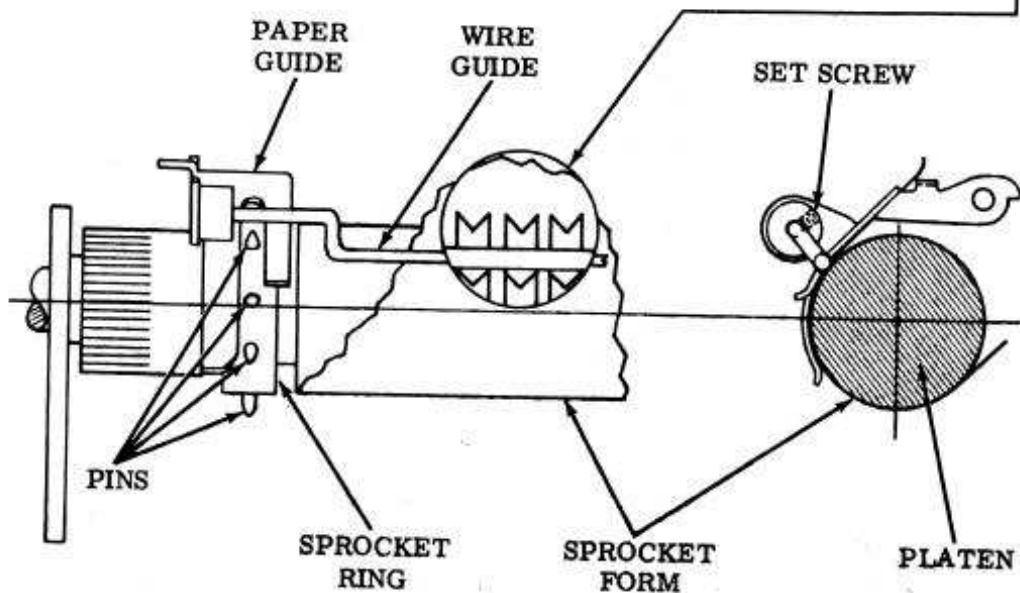
PLATEN-VERTICAL (Paper Feed Area*)

RIGHT GUIDE (Paper Feed Area*)

RIGHT SPROCKET RING (Paper Feed Area*)

WIRE GUIDE-PRELIMINARY (Paper Feed Area*)

*Sprocket Feed Mechanisms



(FRONT VIEW)

(RIGHT SIDE VIEW)

3. VARIATIONS TO BASIC UNITS

3.01 Answer-Back Area

BLOCKING FOLLOWER LEVERTo Check

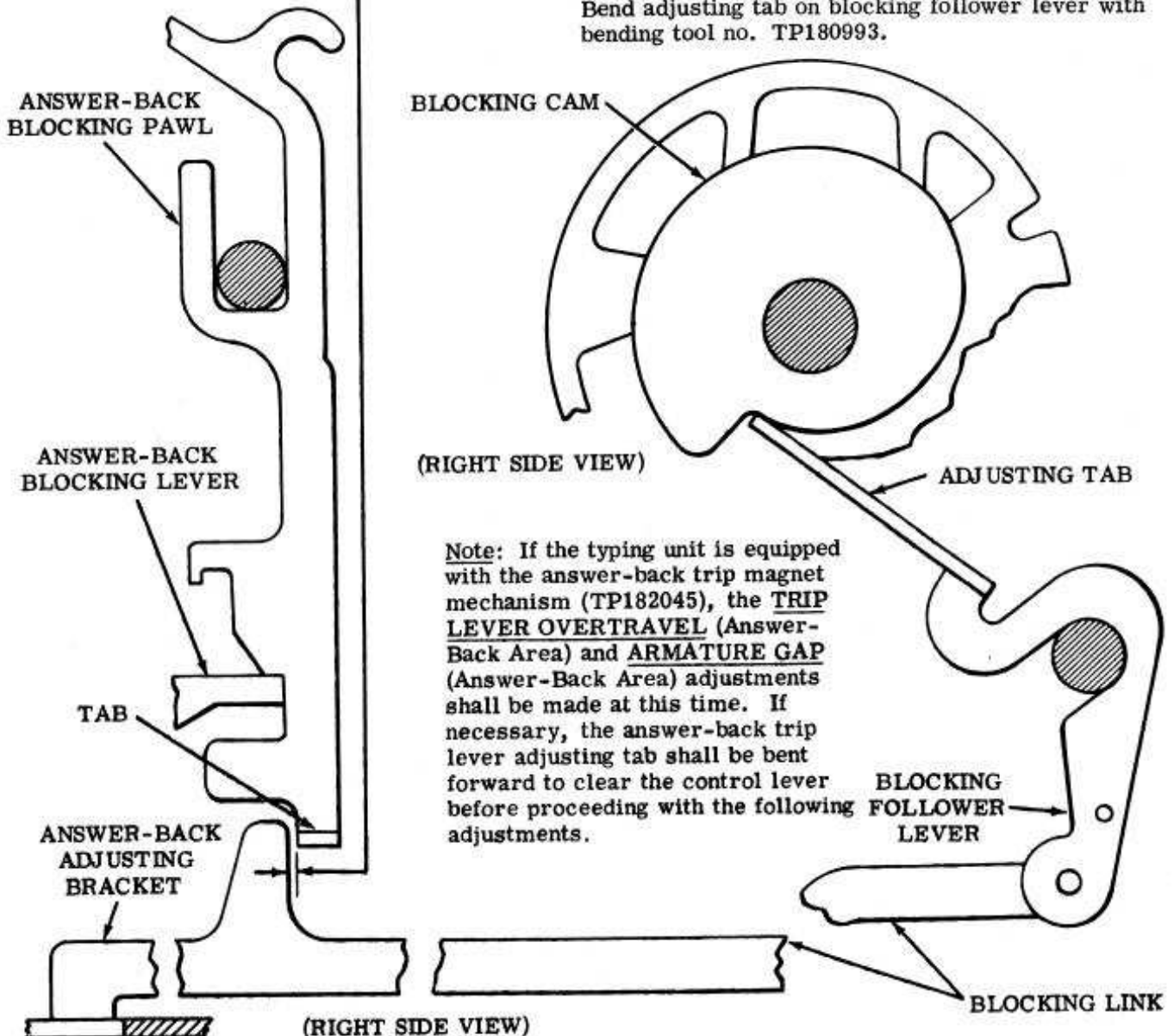
Disengage (latch) distributor and function clutches, engage the answer-back blocking lever fully in indent of answer-back blocking pawl. Take up play in the blocking cam in a downward direction, and hold the answer-back blocking pawl toward the front of the typing unit.

Requirement

Min Some---Max 0.020 inch between the blocking link and tab on answer-back blocking pawl.

To Adjust

Bend adjusting tab on blocking follower lever with bending tool no. TP180993.



3.02 Answer-Back Area (continued)

DRUMTo Check

Engage lower extension of control lever in indent of answer-back drum and locate detent lever between "ST" and "20" rows on answer-back drum. Disengage (latch) distributor clutch.

Note 2: If necessary to insure clearance between the feed lever adjusting tab and the control lever, bend the feed lever adjusting tab toward the front of the typing unit.

Hold the feed pawl out of engagement with the answer-back drum and manually move the upper extension of the control lever toward the rear of the typing unit while checking to see that the answer-back drum is fully detented. Move the upper extension

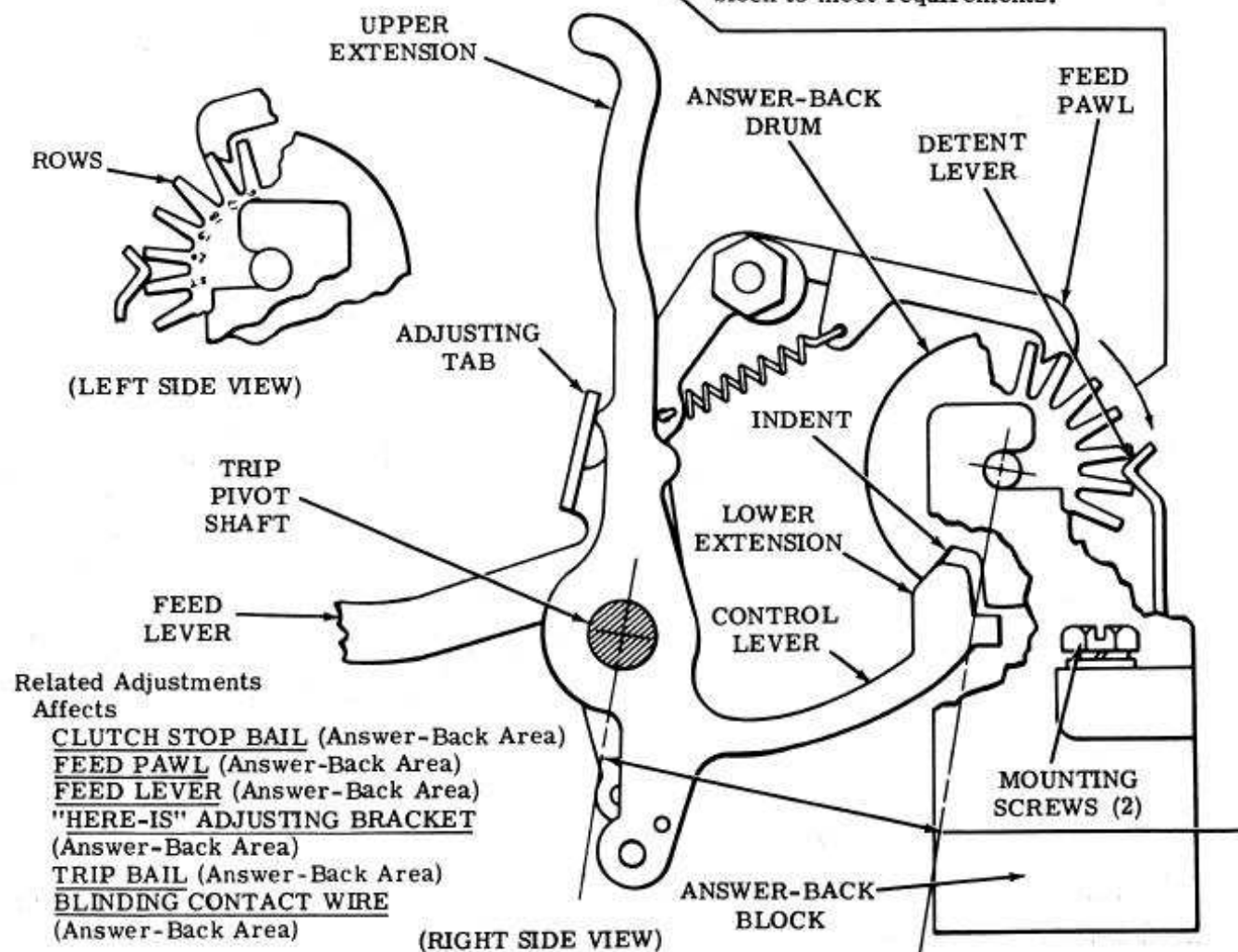
of the control lever toward the front of the typing unit while noticing any clockwise movement of the answer-back drum.

Requirement

- (1) Barely perceptible clockwise movement of answer-back drum from its fully detented position when upper extension of control lever is moved toward front of typing unit.
- (2) The axis of the answer-back drum shall be parallel to the trip pivot shaft as gauged by eye.

To Adjust

Loosen HERE-IS adjusting bracket clampscrew and answer-back bracket clampscrew with answer-back block mounting screws friction tight. Move block to meet requirements.



Related Adjustments Affects

CLUTCH STOP BAIL (Answer-Back Area)
 FEED PAWL (Answer-Back Area)
 FEED LEVER (Answer-Back Area)
 "HERE-IS" ADJUSTING BRACKET (Answer-Back Area)
 TRIP BAIL (Answer-Back Area)
 BLINDING CONTACT WIRE (Answer-Back Area)

3.03 Answer-Back Area (continued)

CLUTCH STOP BAILTo Check

Trip distributor clutch and manually rotate main shaft to place upper edge of clutch shoe lever in line with upper edge of trip lever. Lift feed pawl and manually rotate answer-back drum counterclockwise until detent lever is located between "1" and "2" on answer-back drum.

Requirement

Min 0.015 inch --- Max 0.035 inch
between clutch shoe lever and trip lever.

To Adjust

Bend right adjusting tab using bending tool no. TP180993.

Note: As gauged by eye, the plane of right adjusting tab shall be parallel to the axis of trip pivot shaft.

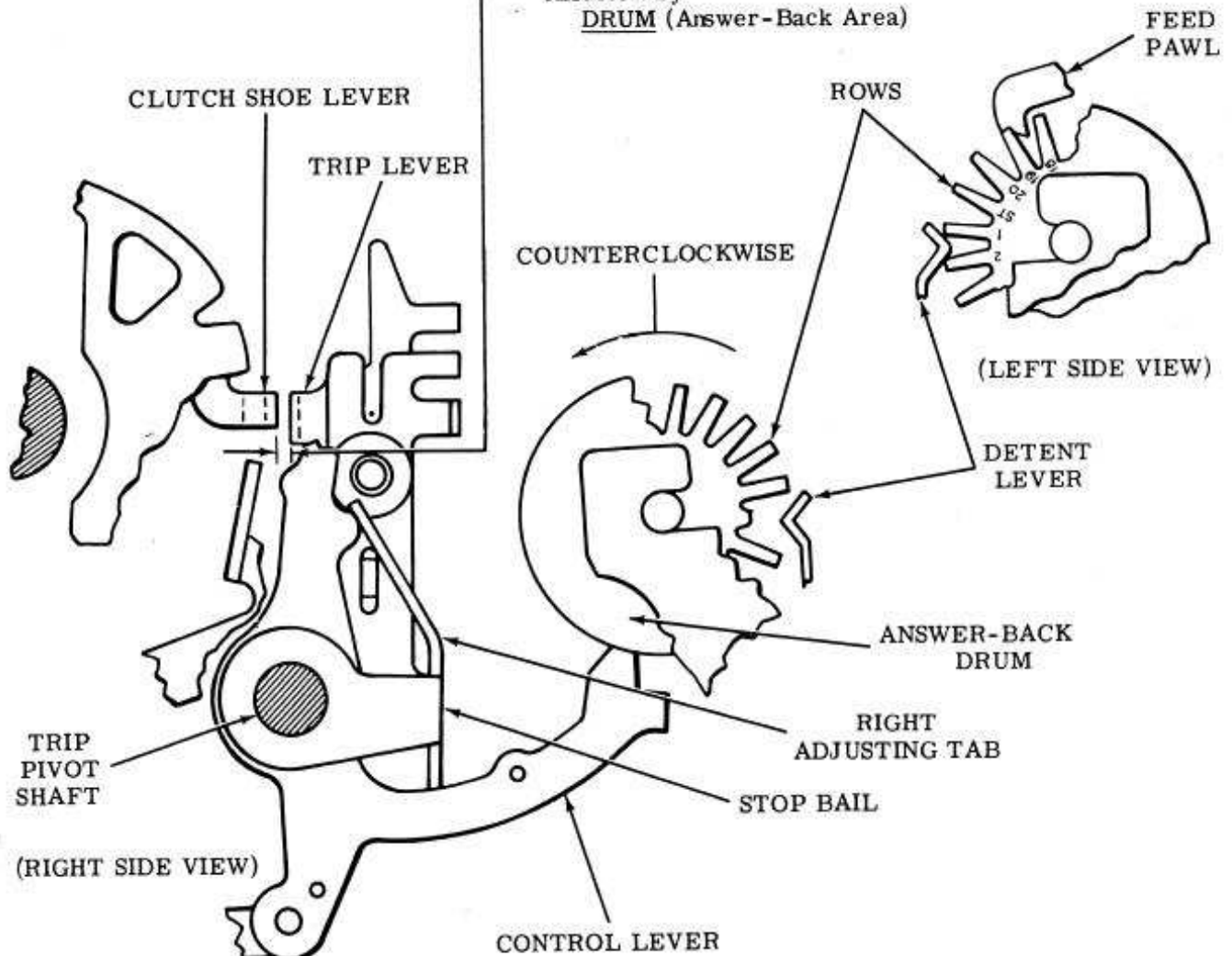
Related AdjustmentsAffects

SHOE LEVER (See appropriate tape reader section.)

TRIP LEVER ENGAGEMENT (Distributor Area)

Affected By

DRUM (Answer-Back Area)



3.04 Answer-Back Area (continued)

FEED PAWL

(1) To Check

With answer-back drum fully detented in its home position, disengage (latch) distributor clutch. Manually trip distributor clutch and rotate main shaft until the cam roller is on high part of feed lever.

Requirement

Some clearance between feed lever adjusting tab and control lever.

To Adjust

Bend feed lever adjusting tab toward the front of the typing unit.

(2) To Check

With the answer-back drum fully detented in its home position, disengage (latch) distributor clutch. Manually trip distributor clutch and rotate main shaft until cam roller is on high part of feed lever. Lift up the feed pawl and position the feed

lever to either the left or right to make the entire width of the feed pawl tooth ride only on the answer-back drum feed ratchet and to make the feed lever perpendicular to the answer-back drum axis as gauged by eye.

Requirement

Feed pawl tooth to rest on rear half of the top of row "16" of answer-back drum feed ratchet.

To Adjust

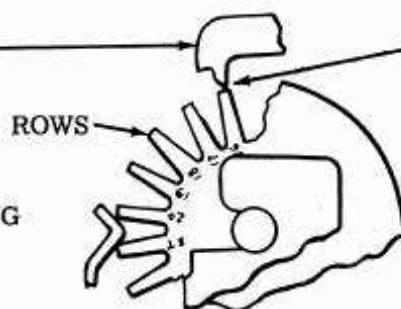
With feed pawl adjusting nut and screw friction tight, position feed pawl.

Related Adjustment

Affects

TRIP BAIL (Answer-Back Area)

FEED
PAWL

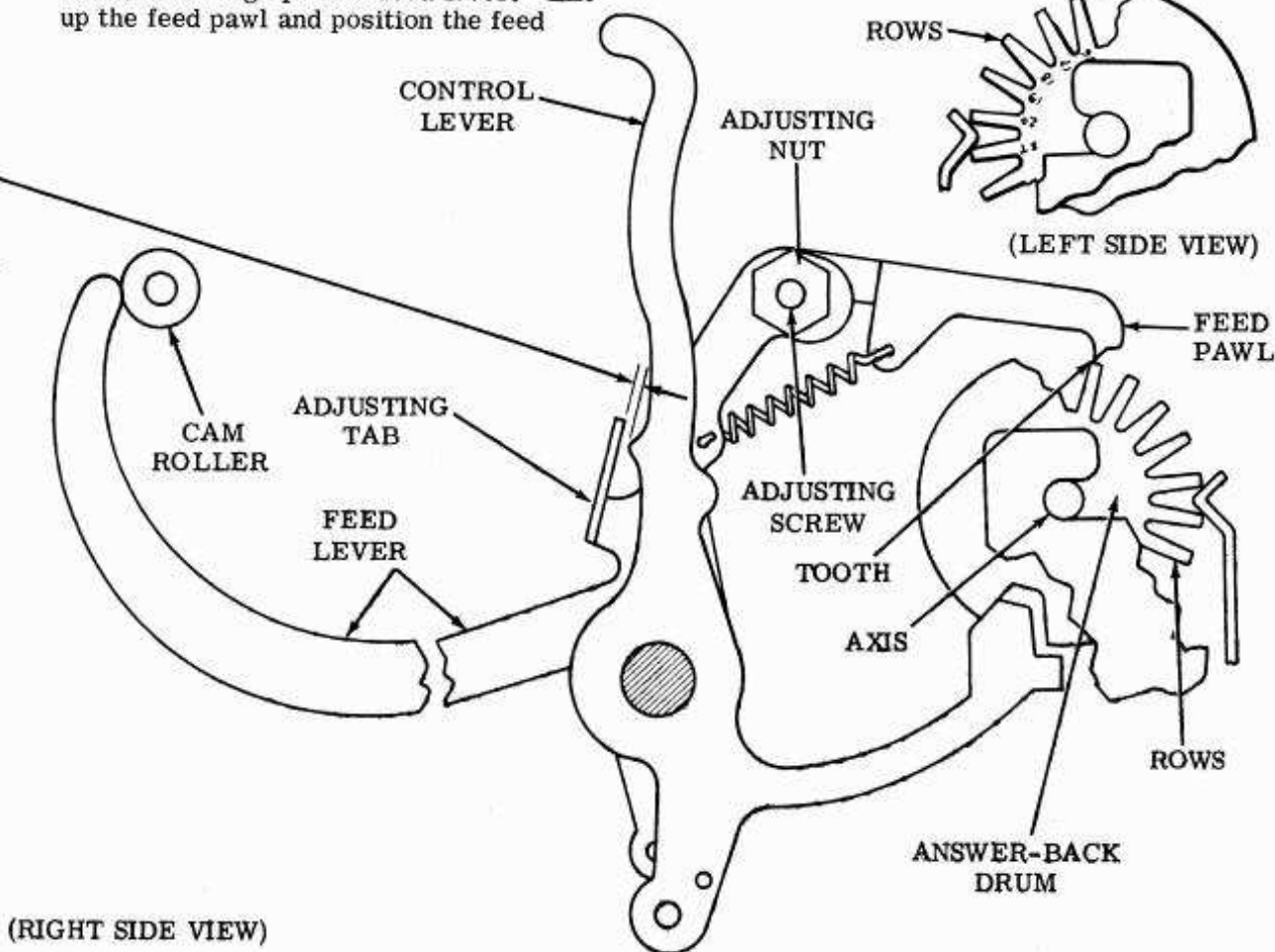


(LEFT SIDE VIEW)

FEED
PAWL

ROWS

ANSWER-BACK
DRUM



(RIGHT SIDE VIEW)

3.05 Answer-Back Area (continued)

FEED LEVER

To Check

With answer-back drum fully detented in its home position, trip distributor clutch and manually rotate main shaft until cam roller is not touching the feed lever. Take up the play in the control lever toward the front of the typing unit. Lift up the feed pawl and position the feed lever to either the left or right to make the entire width of the feed pawl tooth ride only on the answer-back drum feed ratchet and to make the feed lever perpendicular to the answer-back drum axis as gauged by eye. Take up play in feed pawl toward the rear of the typing unit and release.

Requirement

Min 0.006 inch --- Max 0.020 inch
between feed pawl and face of answer-back drum feed ratchet of row "16."

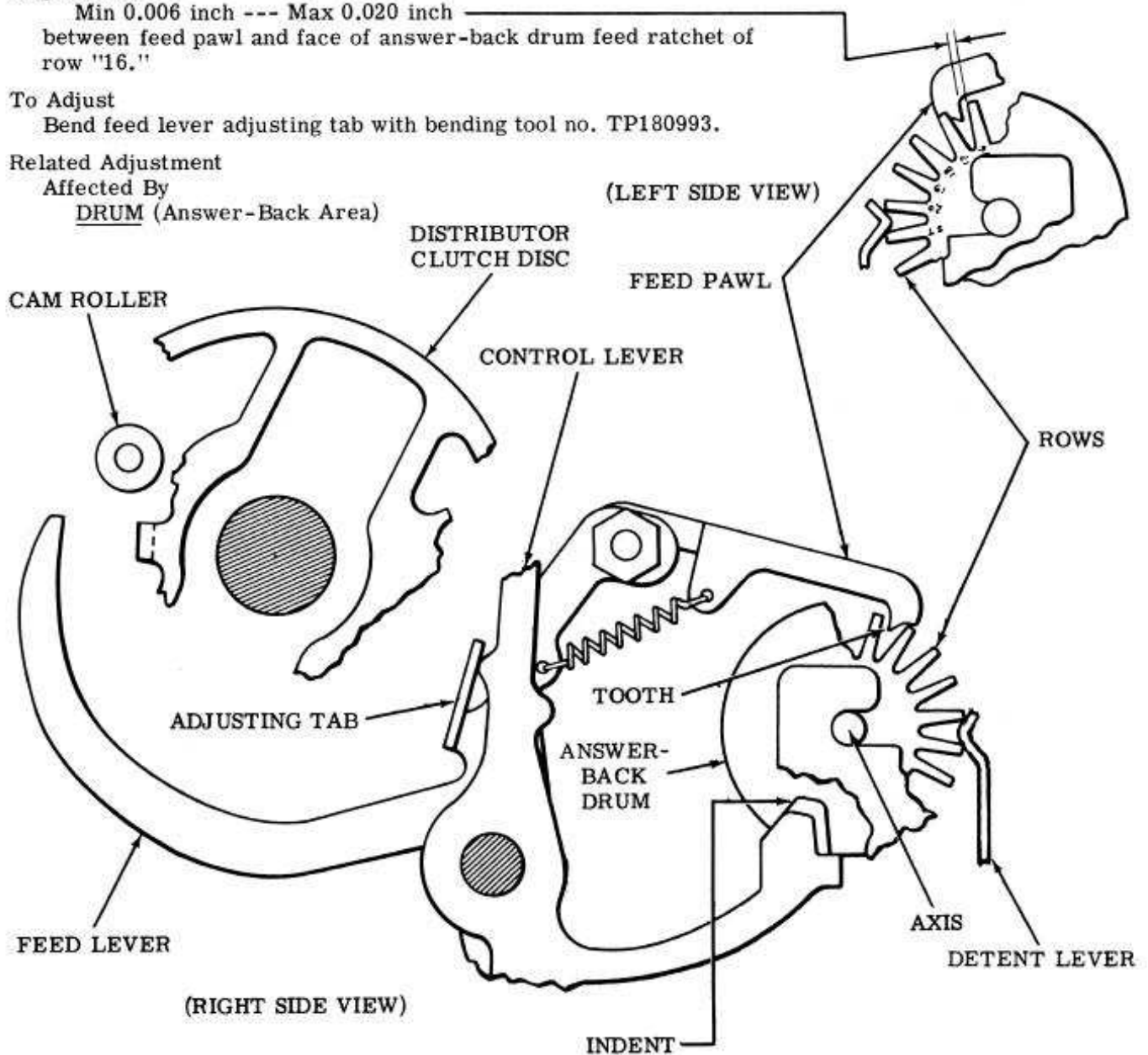
To Adjust

Bend feed lever adjusting tab with bending tool no. TP180993.

Related Adjustment

Affected By

DRUM (Answer-Back Area)



3.06 Answer-Back Area (continued)

"HERE IS" ADJUSTING BRACKET

(1) To Check

With answer-back drum fully detented in its home position, trip distributor clutch and manually rotate main shaft until feed lever is no longer in contact with cam roller. Depress HERE IS key with a force of from 20 oz to 24 oz.

Requirement

Early design typing units—HERE IS adjusting bracket does not have a stop projection:

Min 0.015 inch---Max 0.030 inch overtravel between feed pawl and face of answer-back drum feed ratchet tooth of row "17."

Late design typing units—HERE IS adjusting bracket has a stop projection:

Min 0.025 inch---Max 0.045 inch overtravel between feed pawl and face of answer-back drum feed ratchet tooth of row "17."

(2) To Check

With the answer-back drum fully detented in its home position and HERE IS key in its unoperated position, disengage (latch) distributor clutch.

Requirement

Some clearance between tip of HERE IS key and bellcrank.

To Adjust

With clampscrew loosened friction tight, position HERE IS adjusting bracket using pry points.

Related Adjustments

Affects

BLOCKING FOLLOWER LEVER

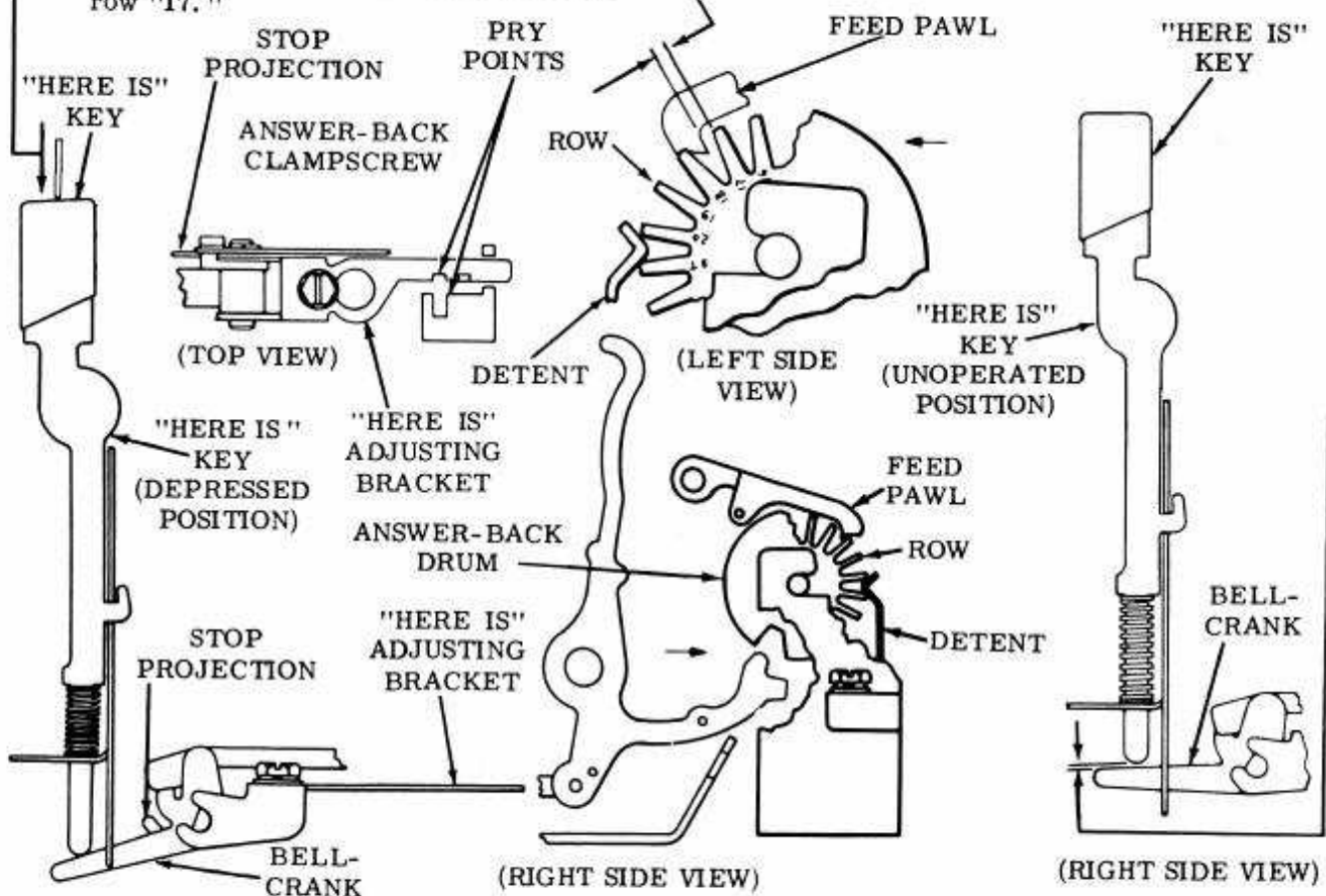
(Answer-Back Area)

BLINDING CONTACT WIRE

(Answer-Back Area)

Affected By

FEED PAWL (Answer-Back Area)



3.07 Answer-Back Area (continued)

TRIPBAIL

(1) To Check

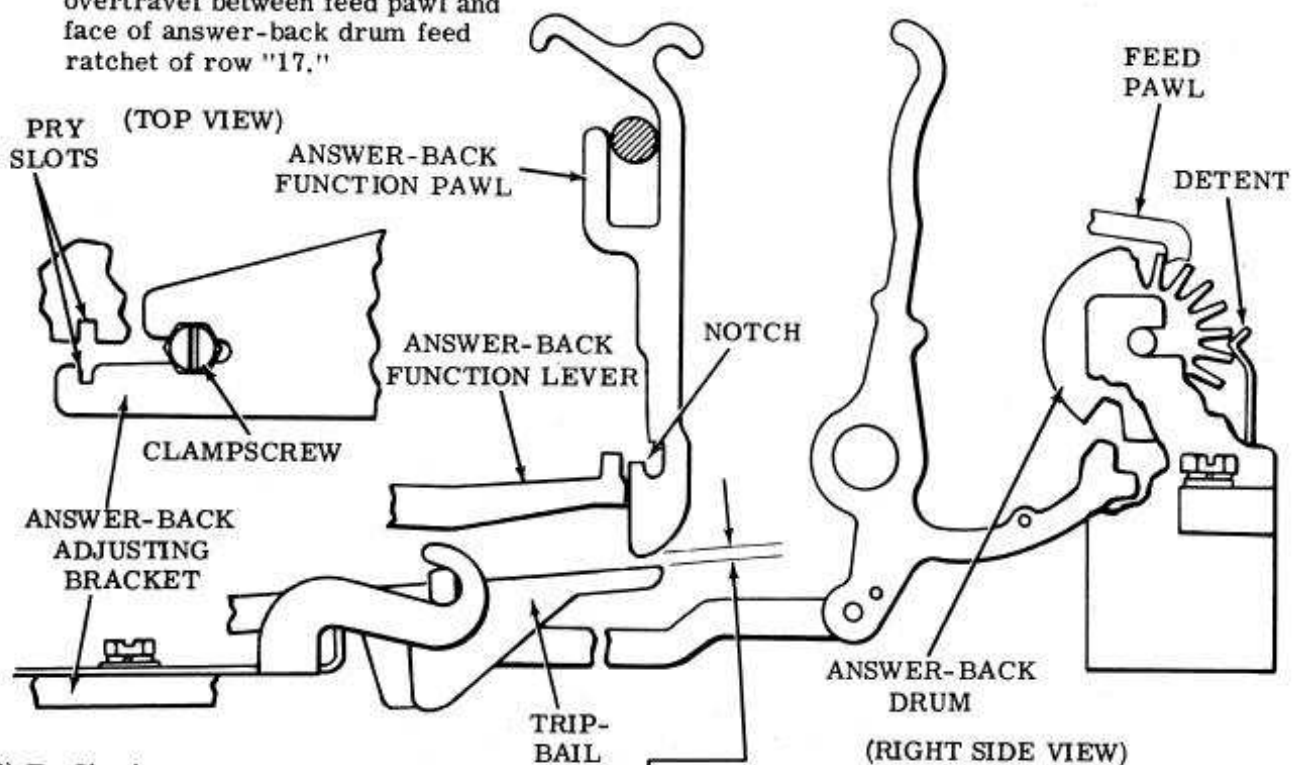
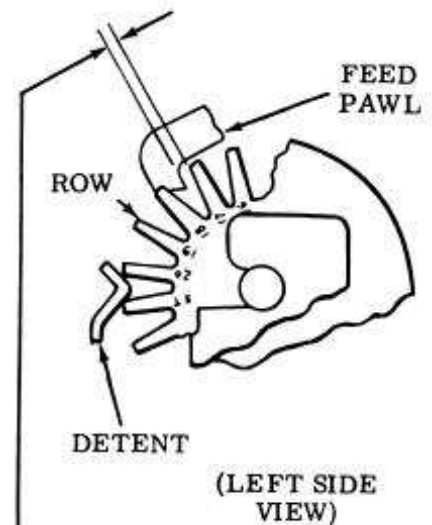
With the typing unit in stop condition, trip function clutch. Rotate main shaft until the function bail is in its highest position. Push the answer-back function pawl down until its notch is engaged by its function lever. Trip the distributor clutch and continue to rotate the main shaft until the answer-back function pawl reaches its lowest point of travel.

Note: The feed pawl will move back to pick up the next tooth on the answer-back drum feed ratchet.

With the feed pawl centered on the answer-back drum feed ratchet, take up play in feed pawl toward the rear.

Requirement

Min 0.020 inch---Max 0.055 inch
overtravel between feed pawl and
face of answer-back drum feed
ratchet of row "17."



(2) To Check

With the answer-back drum in its home position, place the typing unit in stop condition. Place the answer-back function pawl in its unselected position, and take up play in tripbail in the downward direction.

Requirement

Some clearance
between the tip of answer-back function
pawl and top face of tripbail.

To Adjust

With clampscrew loosened friction tight,
position answer-back adjusting bracket
using pry slots.

Related Adjustment

Affected By
FEED PAWL (Answer-Back Area)

3.08 Answer-Back Area (continued)

BLINDING CONTACT WIRE

To Check

With answer-back drum fully detented in its home position, disengage (latch) distributor clutch.

Requirement

Min 0.015 inch --- Max 0.045 inch
between blinding contact wire and common contact.

To Adjust

Position adjusting spring on the tie link.

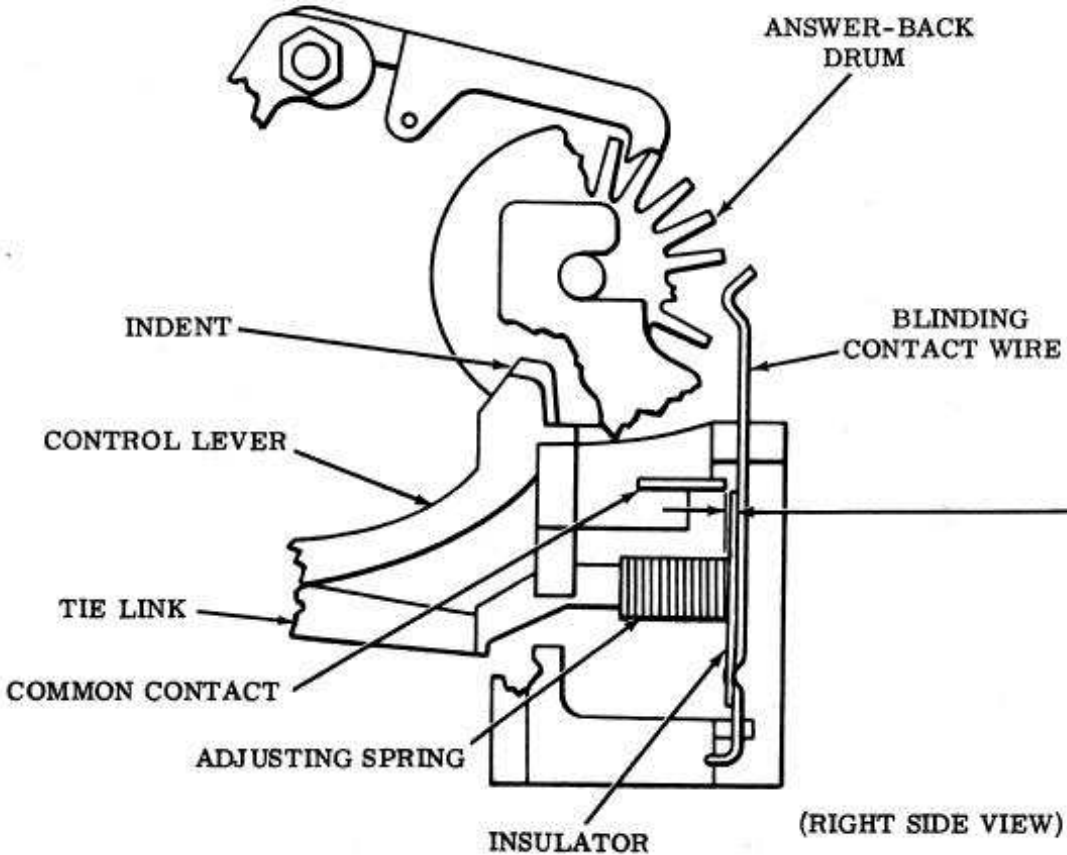
Related Adjustments

Affects

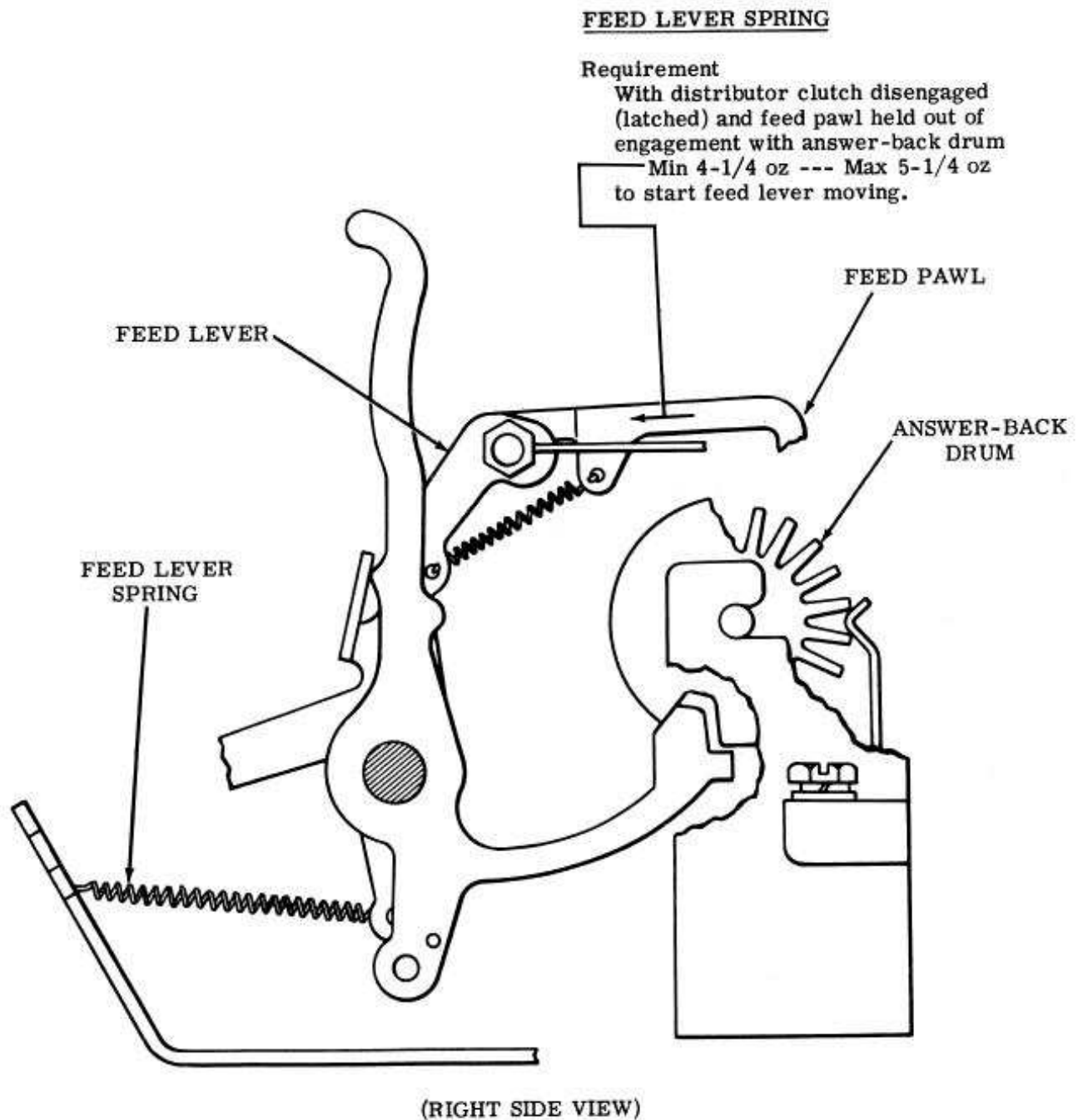
TRIP LEVER OVERTRAVEL AND
ARMATURE GAP (Answer-Back Area)
TRIP LEVER (Answer-Back Area)

Affected By

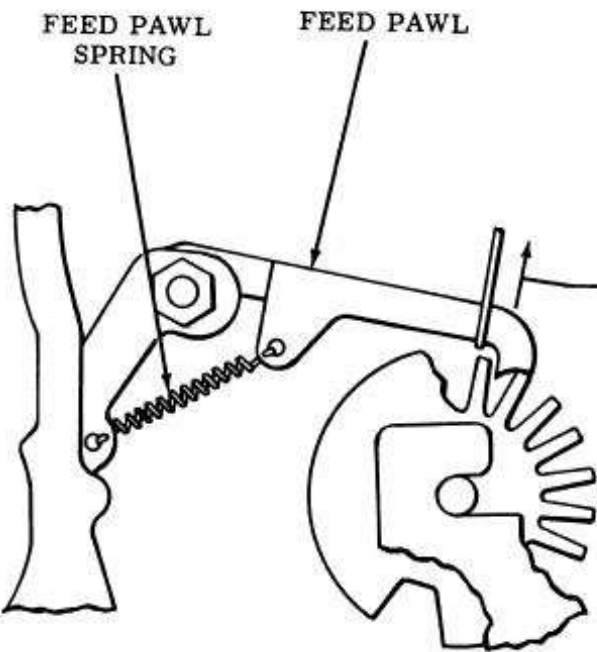
DRUM (Answer-Back Area)



3.09 Answer-Back Area (continued)



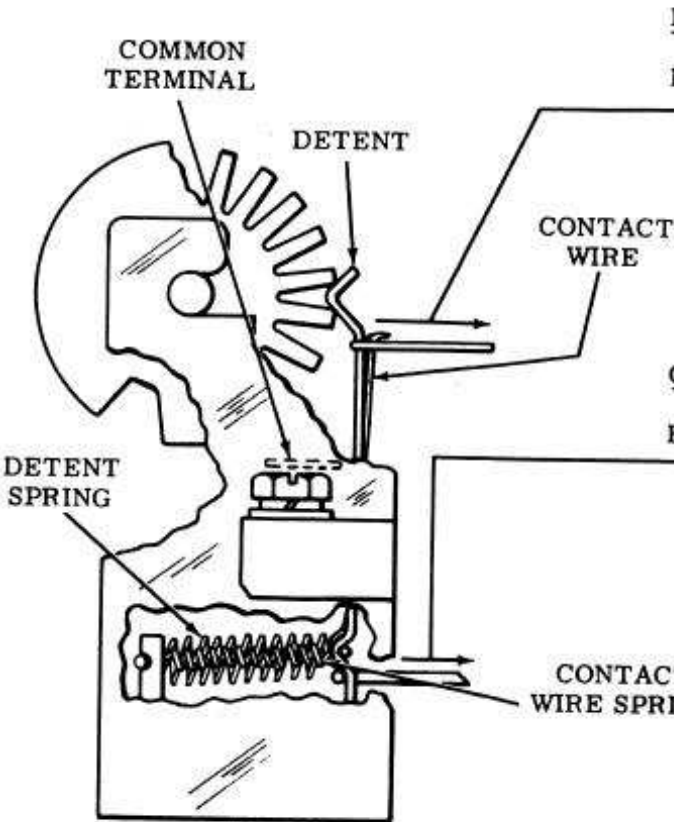
3.10 Answer-Back Area (continued)



(RIGHT SIDE VIEW)

FEED PAWL SPRING

Requirement
With distributor clutch disengaged
(latched)
Min 1/2 oz --- Max 1-1/4 oz
to start feed pawl moving.



(RIGHT SIDE VIEW)

DETENT SPRING

Requirement
Min 8 oz --- Max 12 oz
to start detent moving.

CONTACT WIRE SPRING

Requirement
Min 1 oz --- Max 2 oz
to start contact wire moving away
from common terminal.

3.11 Answer-Back Area (continued)

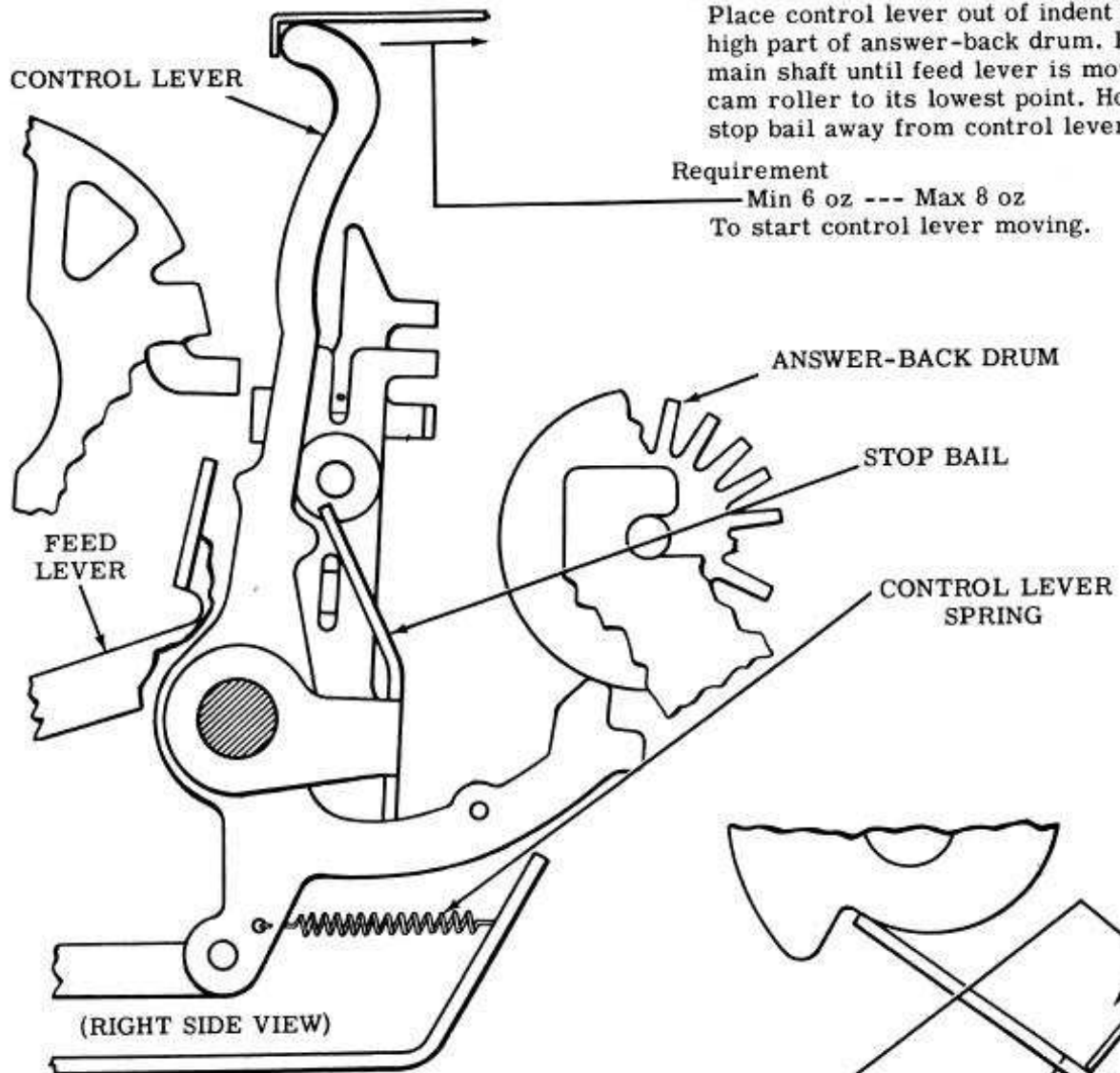
CONTROL LEVER SPRING — HORIZONTALTo Check

Place control lever out of indent and on high part of answer-back drum. Rotate main shaft until feed lever is moved by cam roller to its lowest point. Hold stop bail away from control lever.

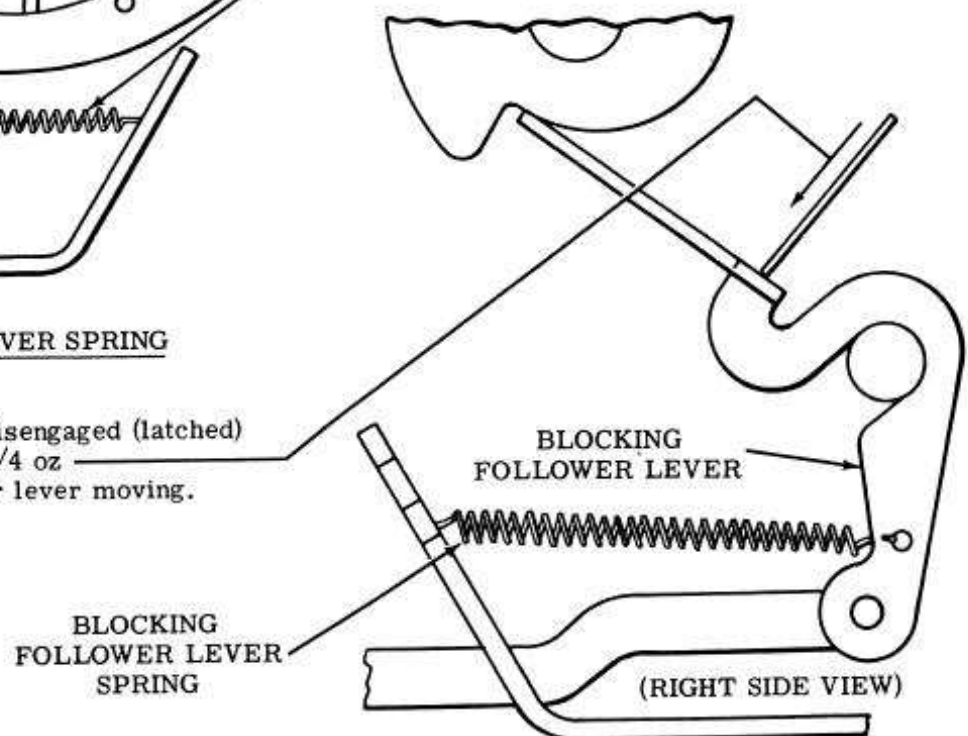
Requirement

Min 6 oz --- Max 8 oz

To start control lever moving.

BLOCKING FOLLOWER LEVER SPRINGRequirement

With distributor clutch disengaged (latched)
Min 1 oz --- Max 2-1/4 oz
to start blocking follower lever moving.



3.12 Answer-Back Area (continued)

Note: The adjustments on this page apply only to typing units with armature extension TP180845 and trip lever TP180843.

TRIP MAGNETRequirement

Magnet bracket to be positioned as far forward and to the left on base casting post as possible.

To Adjust

Position magnet bracket with three mounting screws loosened.

Related AdjustmentsAffects

TRIP LEVER OVERTRAVEL AND ARMATURE GAP (Answer-Back Area)
TRIP LEVER (Answer-Back Area)
TRIP MAGNET (see the appropriate tape reader section)

TRIP LEVER OVERTRAVEL AND ARMATURE GAPTo Check

With the answer-back drum fully detented in its home position, trip distributor clutch and rotate main shaft until the pointer of the distributor brush holder is in line with the intersection of the conductor path and the stop segment. Place armature extension down so that armature is in its attracted position, and take up play toward the rear of the typing unit. Take up play in blocking cam in an upward and counterclockwise direction.

(1) Requirement

Min 0.006 inch---Max 0.015 inch between the end of armature extension and end of answer-back blocking latch.

To Adjust

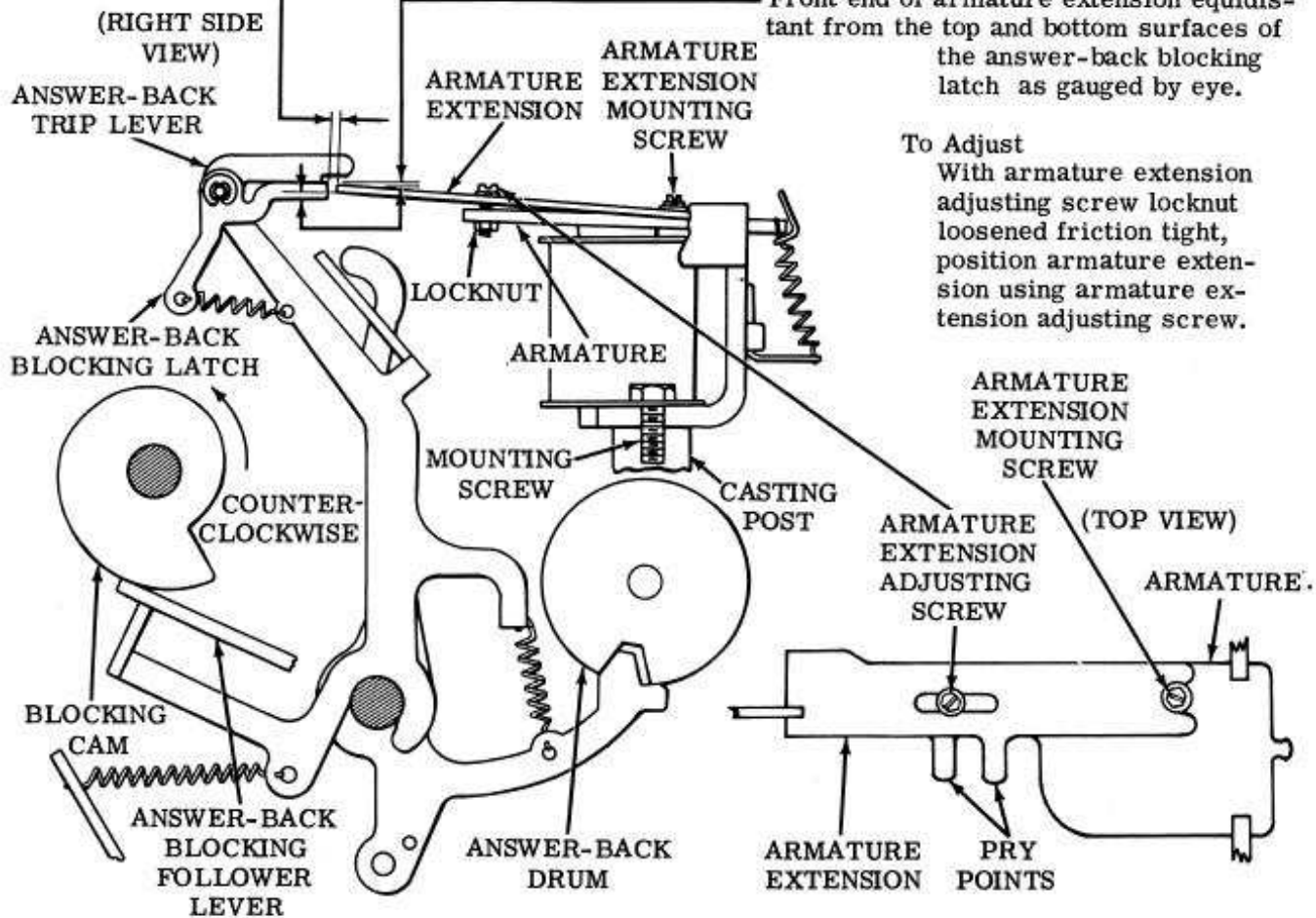
With armature extension mounting screw loosened friction tight, position the armature extension using pry points.

(2) Requirement

Front end of armature extension equidistant from the top and bottom surfaces of the answer-back blocking latch as gauged by eye.

To Adjust

With armature extension adjusting screw locknut loosened friction tight, position armature extension using armature extension adjusting screw.



3.13 Answer-Back Area (continued)

Note: The following adjustment applies only to typing units with armature extension TP180845 and trip lever TP180843.

TRIP LEVERTo Check

With the answer-back drum fully detented in its home position, place the typing unit in its stop condition. With the armature in its unattracted position, take up the play in the trip lever toward the right and the play in the control lever toward the left. Take up play in the armature toward

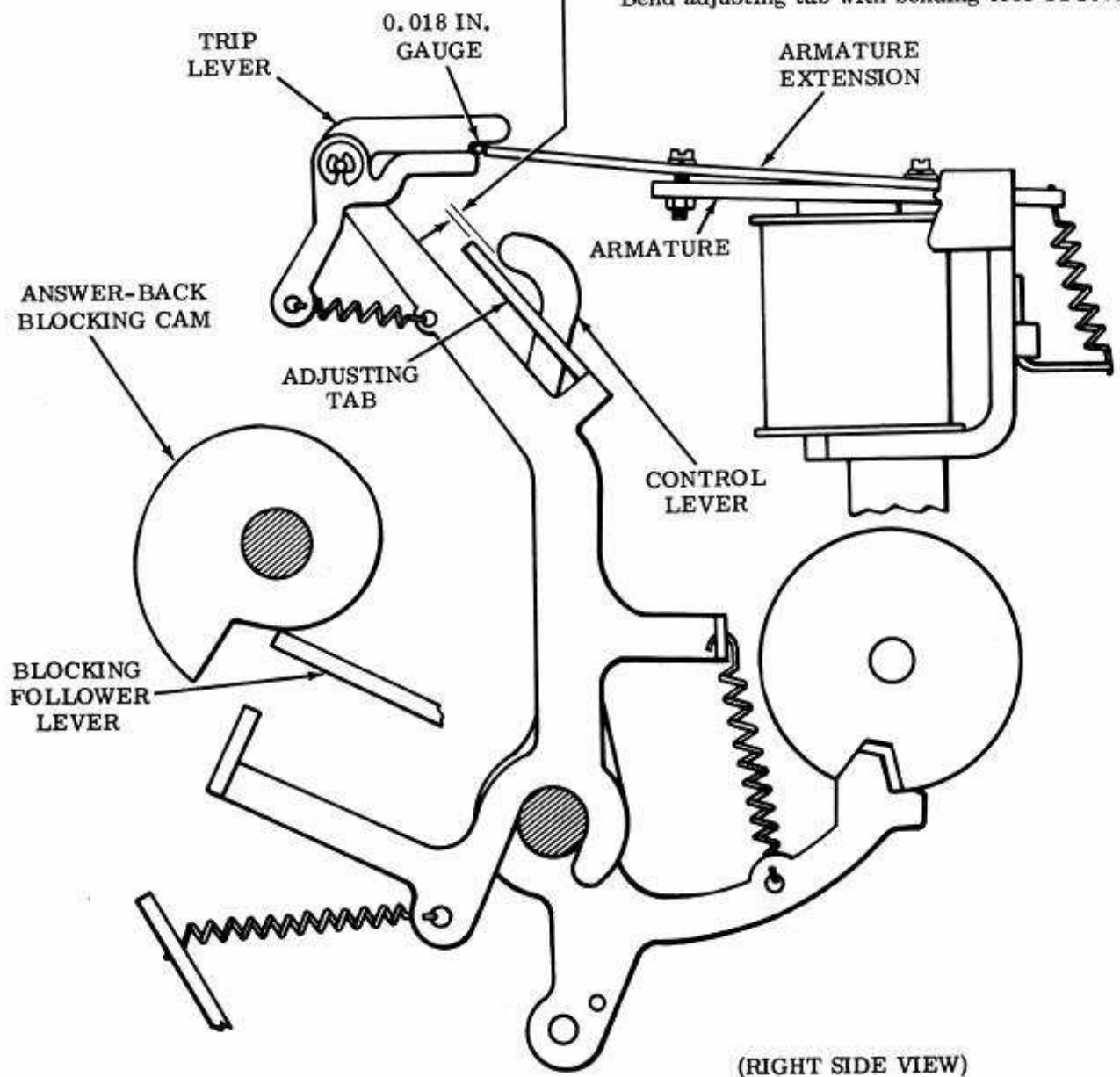
the rear, and place an 0.018 inch gauge between the end of the armature extension and the shoulder of the trip lever.

Requirement

Min Some---Max 0.008 inch between adjusting tab and tip of control lever.

To Adjust

Bend adjusting tab with bending tool TP180993.



(RIGHT SIDE VIEW)

3.14 Answer-Back Area (continued)

CONTROL LEVER SPRING—VERTICAL (Early Design)

Note: This adjustment applies to early design typing units with trip lever TP180843.

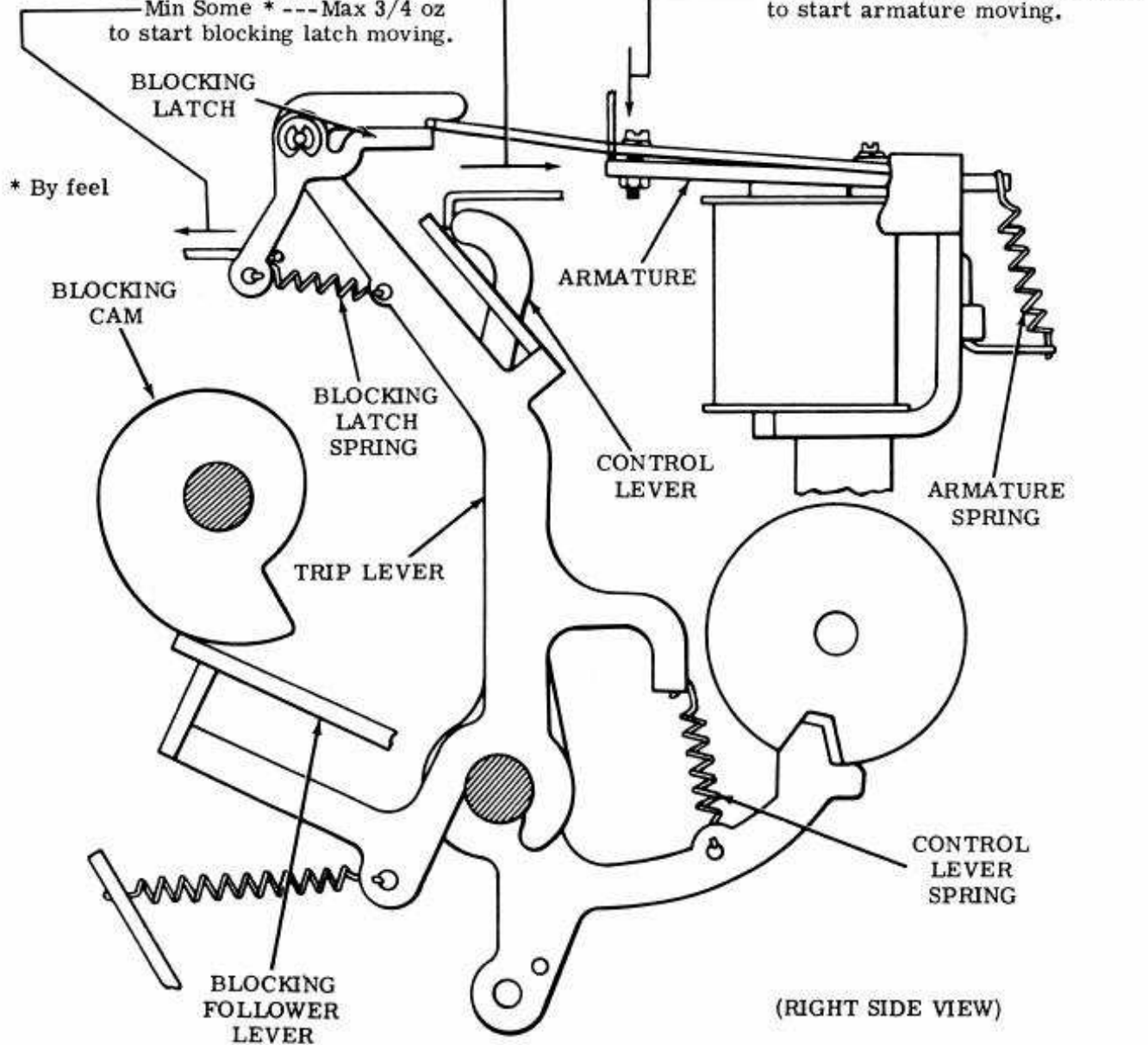
Requirement

With distributor clutch tripped and blocking follower lever on high part of blocking cam
Min 7-1/2 oz---Max 10-1/2 oz
to start control lever moving.

BLOCKING LATCH SPRING

Requirement

With distributor clutch disengaged (latched)
Min Some * ---Max 3/4 oz
to start blocking latch moving.



ARMATURE SPRING

To Check

Trip distributor clutch. Rotate main shaft until blocking follower lever is on high part of blocking cam and armature is in its un-attracted position.

Requirement

Min 2-1/2 oz---Max 3-1/2 oz
to start armature moving.

3.15 Answer-Back Area (continued)

TRIP LEVER SPRING**To Check**

Disengage (latch) distributor clutch. Manually trip armature. Position stop bail so that its adjusting tab does not interfere with control lever. Hold armature in its attracted position.

Requirement

Min 3 oz --- Max 4-1/2 oz
to start trip lever moving.

CONTROL LEVER SPRING—VERTICAL
(Late Design)

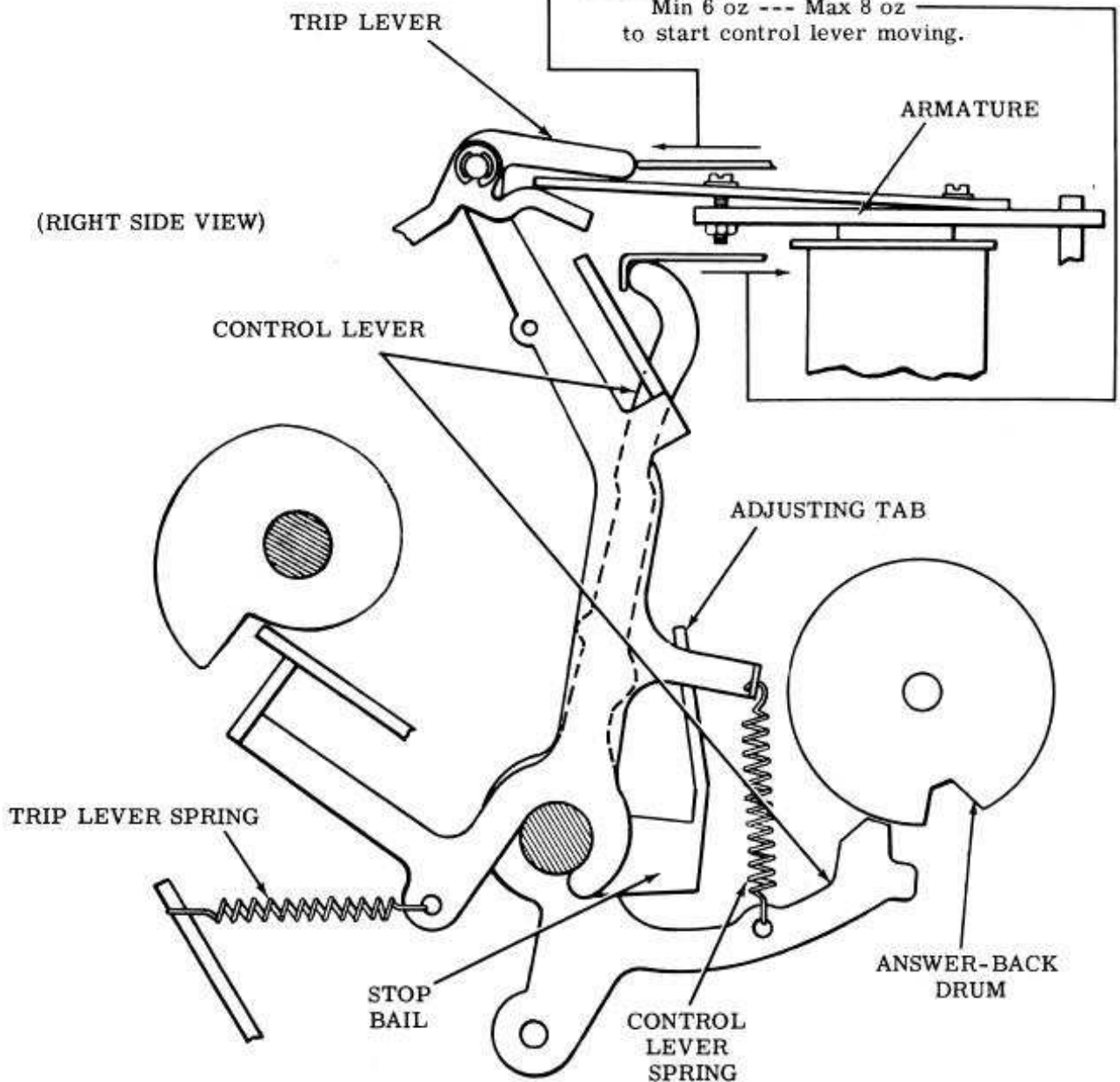
Note: This adjustment applies to late design typing units with trip lever TP182276.

To Check

Disengage (latch) distributor clutch. Manually rotate the answer-back drum until control lever is on high part of answer-back drum. Position stop bail so that its adjusting tab does not interfere with control lever.

Requirement

Min 6 oz --- Max 8 oz
to start control lever moving.



3.16 Miscellaneous Areas

FUNCTION BOX CONTACTS

To Check

Set up code combination in selector that is to operate the contact function pawl, and rotate the main shaft until the function bail is in its highest position.

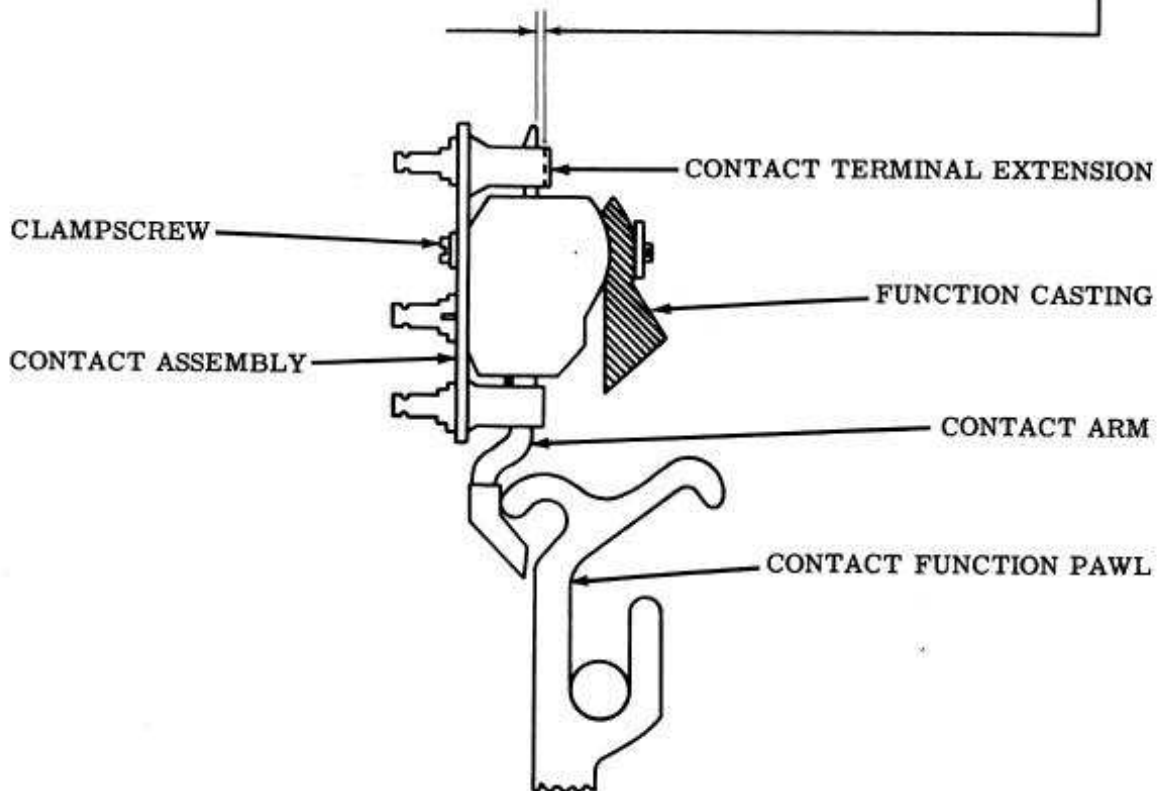
Requirement

Min 0.010 inch --- Max 0.020 inch
between the front surface of the contact arm and the rear surface of the contact terminal extension at the closest point.

To Adjust

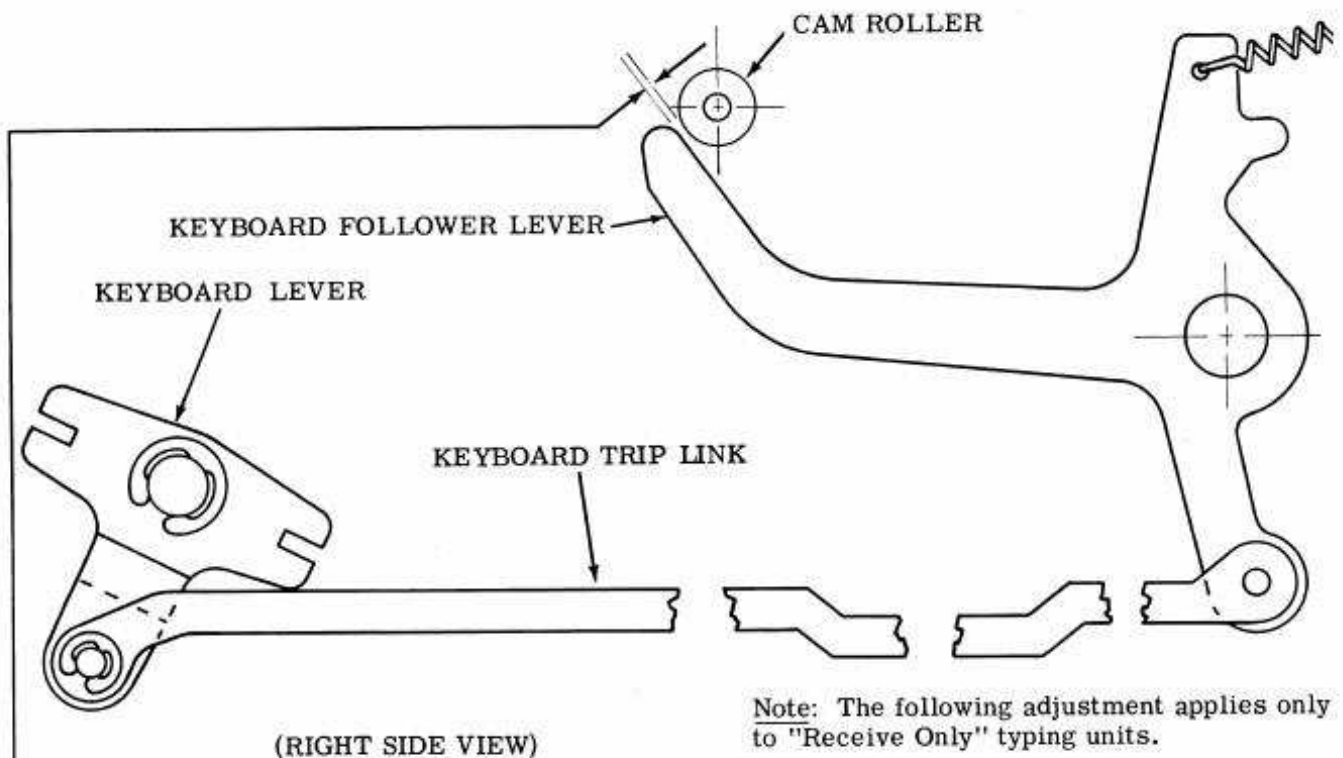
With two clampscrews loosened friction tight, position the contact assembly on the function casting.

Note: When adjusting, be sure that the contact arm lines up with and is in contact with the contact function pawl.



(LEFT SIDE VIEW)

3.17 Miscellaneous Areas (continued)



Note: The following adjustment applies only to "Receive Only" typing units.

KEYBOARD TRIP LEVER (RO)To Check

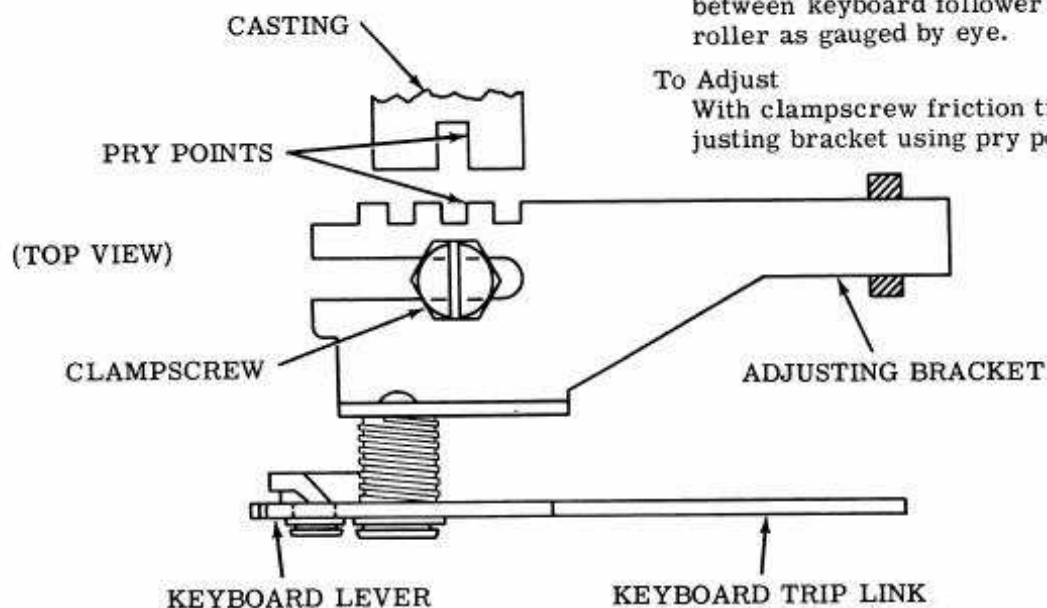
With distributor clutch tripped, rotate main shaft until cam roller is on high part of keyboard follower lever. Place keyboard lever in its lowest position.

Requirement

Min Some --- Max 0.025 inch between keyboard follower lever and cam roller as gauged by eye.

To Adjust

With clampscrew friction tight, move adjusting bracket using pry points.



3.18 Miscellaneous Areas (continued)

Note: The following adjustment applies only to typing units with switch no. TP181441.

LOW-PAPER CONTACTS OPERATING ARM

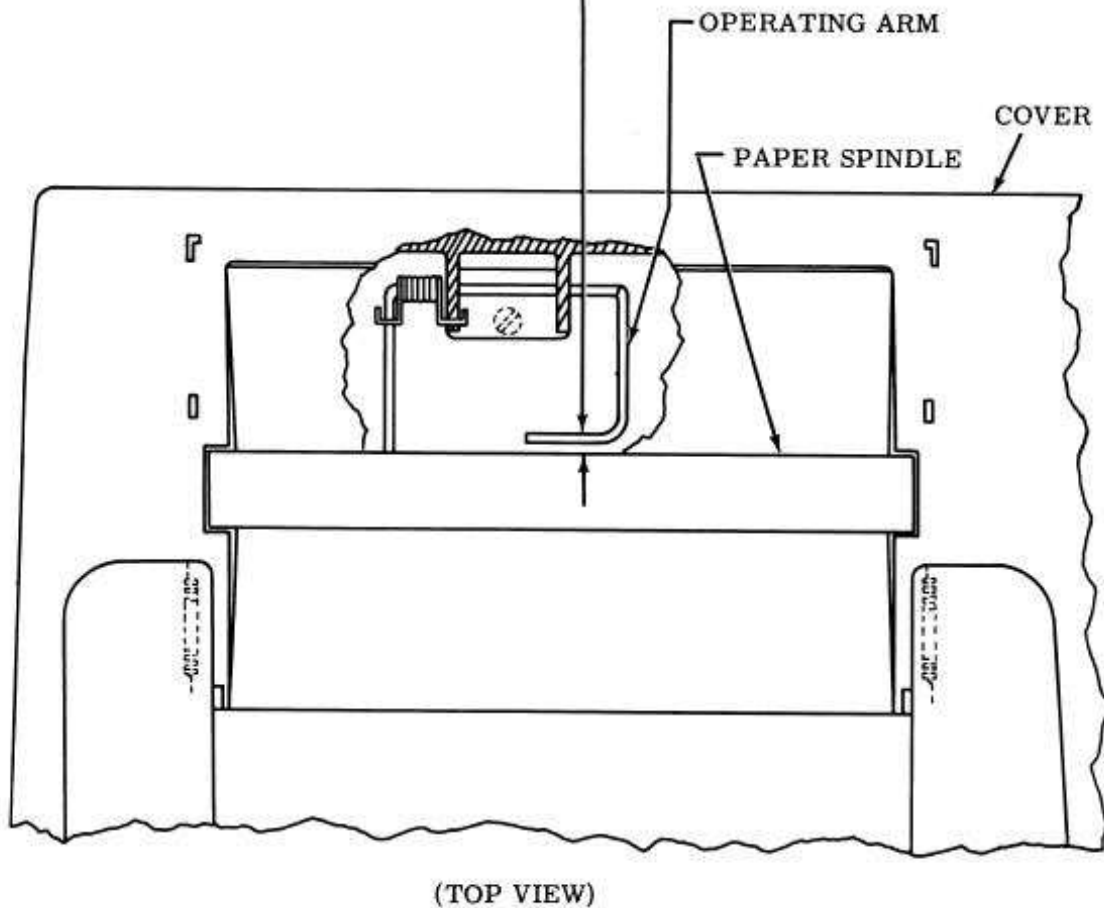
Requirement

With paper spindle in place, clearance between operating arm and spindle

Min 1/4 inch --- Max 3/16 inch

To Adjust

Bend the wire operating arm. If switch operates when roll diameter is too large, bend arm closer to roll. If switch operates when roll diameter is too small, bend arm away from roll.



3.19 Paper Alarm Control Area

(A) PAPER-OUT ALARM CONTACT PRESSURERequirement

With the paper-out lever not in contact with insulator

Min 15 grams---Max 20 grams to separate the contacts of the break-make contact spring and normally closed contact spring.

To Adjust

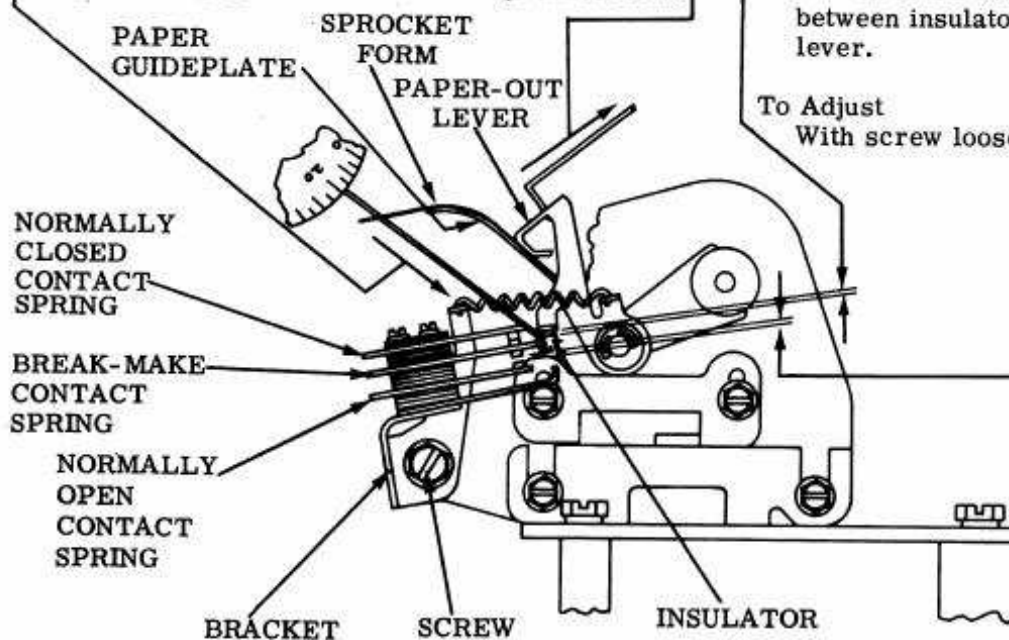
Bend normally closed contact spring.

PAPER-OUT LEVER SPRINGTo Check

Place a single sheet of a sprocket form between the paper-out lever and paper guide plate. Hold the sprocket form taut over the cutout in the paper guideplate and allow the paper-out lever to rest on the sprocket form. Position a spring scale over the paper-out lever at the rectangular opening in the paper guideplate.

Requirement

Min 1 oz---Max 1-1/2 oz to move paper-out lever from sprocket form.

(B) PAPER-OUT ALARM CONTACT GAPRequirement

With the paper-out lever not in contact with insulator

Min 0.010 inch---Max 0.015 inch between the contacts of the break-make contact spring and the normally open contact spring.

To Adjust

Bend normally open contact spring.

(C) PAPER-OUT ALARM CONTACT

Note: This adjustment applies only to typing units with a paper-out alarm and no low-paper alarm.

To Check

Place a single sheet of a sprocket form between the paper-out lever and paper guideplate. Hold the sprocket form taut over the cutout in the paper guideplate.

Requirement

Min 0.020 inch---Max 0.030 inch between insulator and paper-out lever.

To Adjust

With screw loosened, position bracket.

(LEFT SIDE VIEW)

Related AdjustmentAffected By

PAPER GUIDEPLATE (Paper Feed Area*)

*Sprocket Feed Mechanisms

3.20 Paper Alarm Control Area (continued)

(A) LOW-PAPER ALARM CONTACT PRESSURE

Requirement

With the low-paper lever not in contact with insulator

Min 15 grams---Max 20 grams
to separate the contacts of the break-make contact spring and normally closed contact spring.

To Adjust

Bend normally closed contact spring.

LOW-PAPER LEVER SPRING

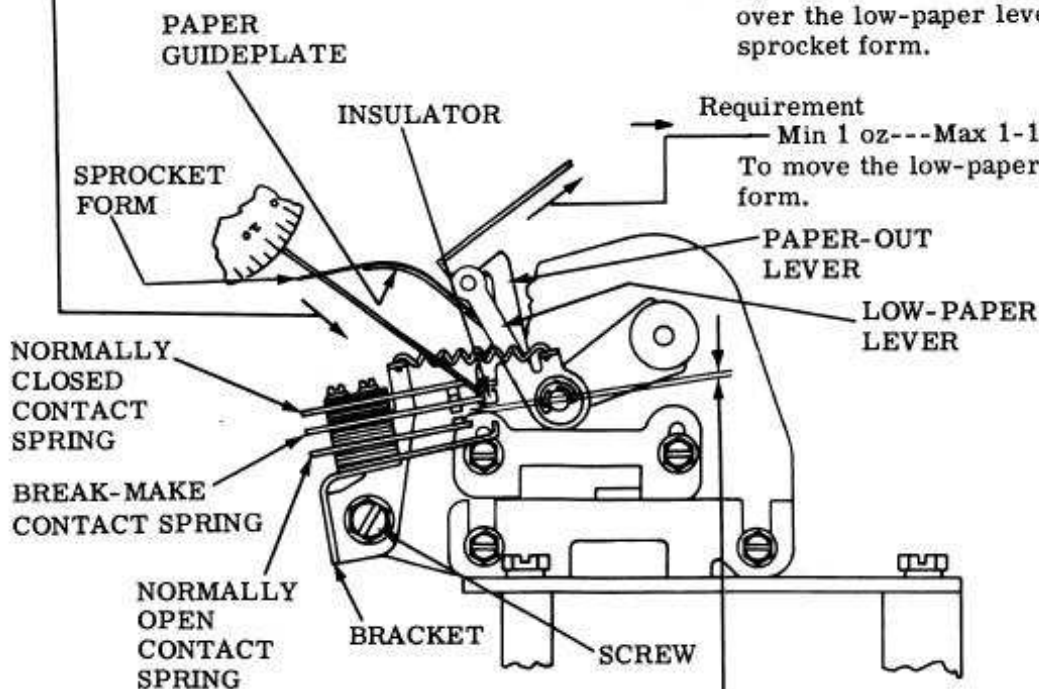
To Check

Place a single sheet of a sprocket form between the low-paper lever and the paper guideplate. Hold the sprocket form taut over the cutout in the paper guideplate and allow the low-paper lever to rest on the sprocket form. Position a spring scale over the low-paper lever adjacent to the sprocket form.

Requirement

Min 1 oz---Max 1-1/2 oz

To move the low-paper lever from sprocket form.



(LEFT SIDE VIEW)

(B) LOW-PAPER ALARM CONTACT GAP

Requirement

With the low-paper lever not in contact with insulator

Min 0.010 inch---Max 0.015 inch
between the contacts of the break-make contact spring and the normally open contact spring.

To Adjust

Bend the normally open contact spring.

3. 21 Paper Alarm Control Area (continued)

LOW-PAPER ALARM CONTACT

Note: This adjustment applies only to typing units with a low-paper alarm and no paper-out alarm.

To Check

Place a single sheet of a sprocket form between the low-paper lever and paper guideplate. Hold the sprocket form taut over the cutout in the paper guideplate.

Requirement

Min 0.020 inch---Max 0.030 inch between insulator and low-paper lever.

To Adjust

With screw loosened, position bracket.

Related Adjustment

Affected By

PAPER GUIDEPLATE (Paper Feed Area*)

LOW-PAPER AND PAPER-OUT ALARM CONTACT

Note: This adjustment applies only to typing units with both a low paper alarm and a paper-out alarm.

To Check

Place a single sheet of a sprocket form between the paper-out lever and paper guideplate.

Requirement

- (1) Min 0.020 inch---Max 0.030 inch between low-paper insulator and low-paper lever.
- (2) Some clearance between paper-out insulator and paper-out lever.
- (3) With no sprocket forms in the typing unit, the contacts of the break-make contact spring and normally open contact spring shall be fully engaged.

To Adjust

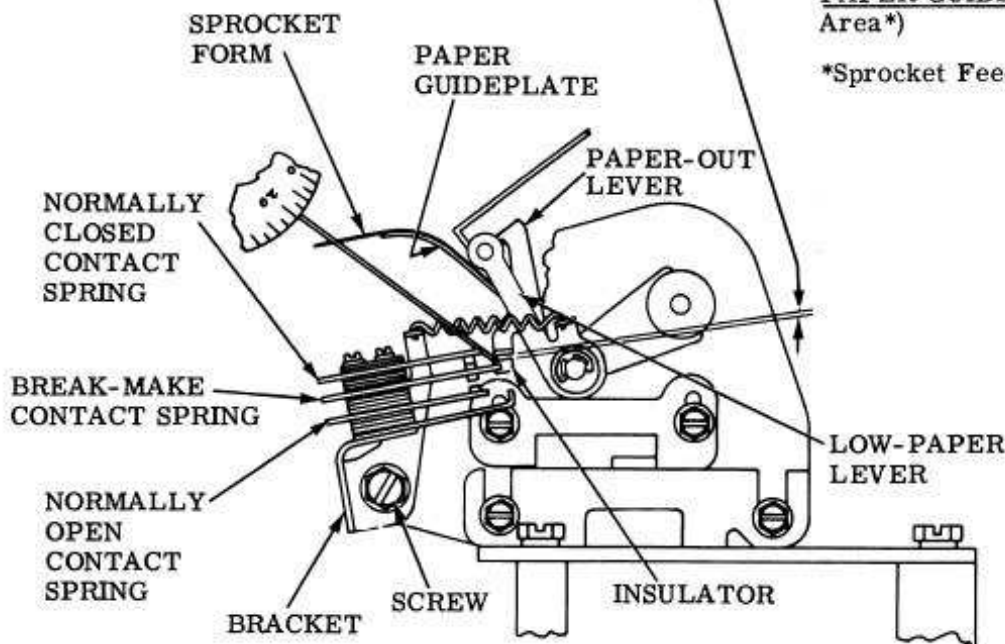
With screw loosened, position bracket.
If necessary, bend the contact pile up.

Related Adjustment

Affected By

PAPER GUIDEPLATE (Paper Feed Area*)

*Sprocket Feed Mechanisms



(LEFT SIDE VIEW)

32 AND 33 TAPE READER

ADJUSTMENTS

CONTENTS	PAGE
1. GENERAL	1
2. BASIC UNIT	5
Clutch Trip Area	
Armature extension	7
Contact gap	8
Feed magnet contact spring	9
Magnet core	5
Reader trip lever spring	9
Shoe lever	7
Trip magnet	5
Trip lever overtravel	6
Trip magnet armature spring	6
Tape Reader Area	
Armature spring	20
Blocking pawl	14
Blocking pawl spring	11
Contact wires spring	16
Control (or tape-out) contact wires	16
Control detent spring	19
Detent lever	10
Detent lever spring	10
Feed pawl (adjustment with gauge no. TP183103)	11
Feed pawl (adjustment without gauge no. TP183103)	13
Latch spring	21
Reader mounting bracket (early design)	22
Reader mounting bracket (late design)	23
Sensing contact wire spring	19
Sensing pin	15
Sensing pin spring	15
Start contact wires	17
Tape lid latch handle	18
Tape lid spring	18
Tape-out pin spring	20
Tight-tape lever spring	19
Upstop spring	11

1. GENERAL

1.01 This section is issued to provide adjustment and maintenance information for the 32 and 33 tape reader and to present the information as a separate section. All information included in this section applies equally well to 5- and 8- level tape readers except where noted.

1.02 In the adjustments covered in this section, location of clearances, position of parts, and point and angle of scale applications are illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings.

Note: The configuration of an illustration or line drawing does not necessarily indicate that it and its associated text are exclusively applicable to a particular tape reader.

Required tools, not supplied with 32 or 33 Teletypewriter Sets, are listed in the appropriate maintenance tools publication.

1.03 The sequence in which the adjustments appear is that which should be followed when a complete readjustment of the tape reader is undertaken. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.

1.04 References to "left," "right," "front," "rear," etc consider the tape reader to be viewed from a position where the feed wheel faces up and the lid latch is located to the viewer's right. Orientation references to the clutch trip area consider the armature extension to be facing up with the contact bracket pry points located to the viewer's right.

REPLACING PAGE ADDENDUM

Filing Instructions

1. Remove from the section the pages numbered the same as those attached to this sheet.
2. Insert the attached pages into the section in their place.
3. Place this sheet ahead of Page 1 of the section.

32 AND 33 TAPE READER

ADJUSTMENTS

1. GENERAL

1.001 This addendum supplements Section 574-124-700, Issue 1. The attached page must be inserted into the section in accordance with the filing instructions above.

1.002 This addendum is issued to make changes in text. Changes and additions are indicated by arrows in the margins.

Attached:
Page 13, dated February 1965, revised
Page 14, dated February 1965, revised

1.05 Unless specifically stated otherwise, make screws or nuts friction tight to make an adjustment and tighten them securely once the adjustment has been made.

1.06 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.

1.07 If parts are removed from the tape reader to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustment that may have been affected by the removal of parts.

1.08 Related adjustments are listed with some of the adjustment text and are primarily intended to aid in trouble shooting the equipment. As an example, suppose that in searching

for a trouble it is discovered that the BLOCKING PAWL (Tape Reader Area) adjustment does not meet its requirement. Under "Related Adjustment," it is indicated that this adjustment is affected by the DETENT LEVER (Tape Reader Area) and FEED PAWL (Tape Reader Area) adjustment. Check these to see if either is the cause of the trouble. Also, note that certain adjustments affect other adjustments. For example, see the DETENT LEVER (Tape Reader Area) adjustment. Note that this adjustment affects the FEED PAWL (Tape Reader Area) and BLOCK PAWL (Tape Reader Area) adjustments. If the former adjustment is changed, check the latter adjustment.

1.09 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is important that spring tensions be measured by

TAPE READER AREA

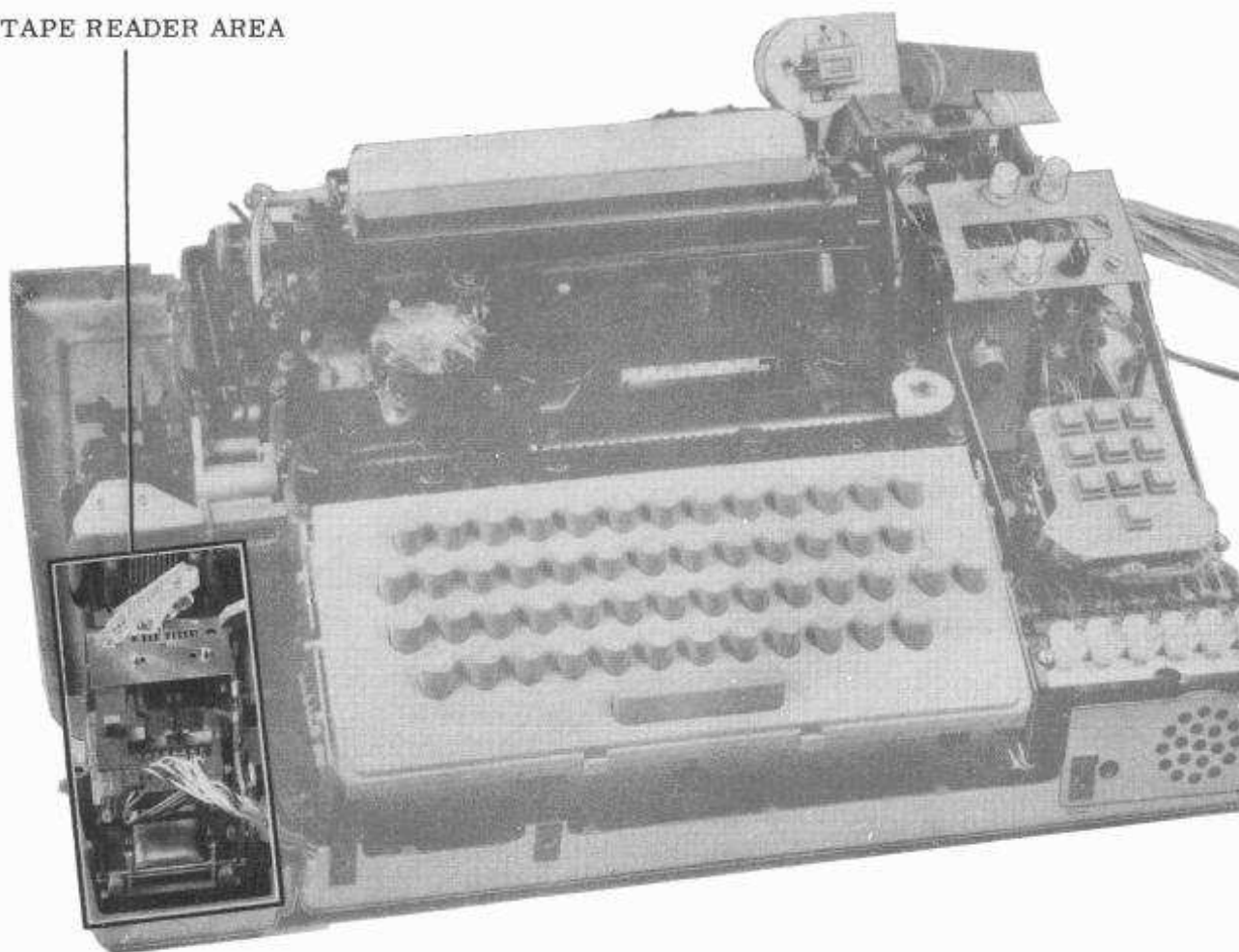


Figure 1 — Tape Reader Area

spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements shall be replaced by new ones. Only those springs that directly affect the operation of the tape reader are measured, however, others may be measured indirectly in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then, if the requirement is not met, any springs that are indirectly measured in the procedure shall be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use spring scales which are recommended by the manufacturer of 32 and 33 Teletypewriter Sets and found in the appropriate maintenance tools publication.

Note 2: The spring tensions may be checked in any sequence.

1.10 Certain adjustments specify that an armature is to be in its attracted position prior to checking a requirement. This refers to an armature's position when it is magnetically attracted to its magnet core. When an armature is to be in its attracted position while making an adjustment, place it there manually.

CAUTION: THE TAPE READER FEED MAGNET OPERATES UNDER HIGH VOLTAGE. PRECAUTIONARY MEASURES SHALL BE TAKEN WHENEVER POWER TO THE TAPE READER IS TURNED ON. HIGH VOLTAGE FROM THE POWER PACK WILL CONTINUE UNTIL APPROXIMATELY 10 SECONDS AFTER THE TAPE READER HAS BEEN DISCONNECTED.

1.11 After paper tape has been removed from the tape reader to facilitate the making of adjustment(s) and/or it is necessary to

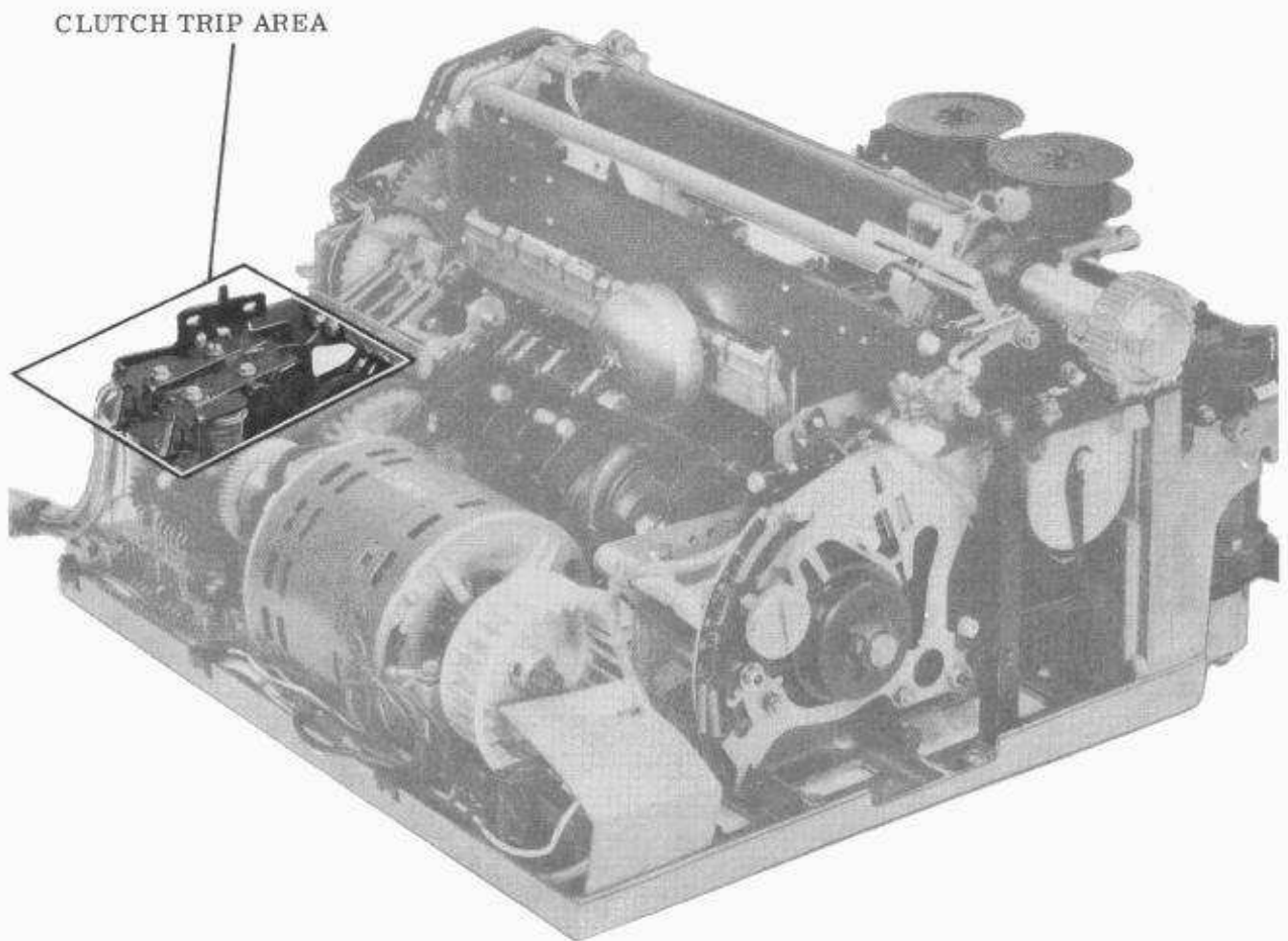


Figure 2 — Clutch Trip Area (Without Reader Feed Magnet Contact Assembly)

insert into the tape reader the paper tape originating from the tape punch, allow enough slack in the paper tape between the tape punch and the tape reader so that the tape reader tape lid can be easily closed.

Note: The FREE position of the control lever is used to facilitate the insertion and/or removal of paper tape from the tape reader. However, do not place the control lever directly into the FREE position while the tape reader is operating under power. Place the control lever into the STOP position and wait until after the tape reader has stopped before moving the control lever beyond the STOP position and into the FREE position.

1.12 All adjustments in the "clutch trip area" shall be started with the typing unit in the stop condition. It is in the stop condition when the selector armature is in its attracted (frontward) position and all clutches are disengaged.

1.13 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches as instructed in 1.14 below.

Note 1: A stop position is that position where a shoe lever contacts a trip lever.

Note 2: The distributor clutch will not disengage unless the answer-back drum is in its home position, which is the position where the control lever is fully detented into the indent on the answer-back drum.

1.14 When disengaged, a clutch is latched so that a shoe lever is held in its stop position by a trip lever while a corresponding latch-lever is seated in a notch of the clutch disc. This allows the clutch shoes to release their tensions on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any clutch shoes dragging.

Note: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. Where an adjustment procedure requires disengagement, rotate the clutch to a stop position, apply a screwdriver to the associated stop-lug, and push the clutch disc in

the normal direction of main shaft rotation until the corresponding latch-lever seats in its clutch disc notch.

1.15 A clutch is engaged when a trip lever is moved up so that it no longer holds a shoe lever in its stop position. When this action occurs, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch shoes wedge against the drum, so that when the shaft is turned, the clutch will turn in unison with it.

1.16 There are two areas in which tape reader adjustments and spring tensions are found. As aids in locating the areas, Figures 1 and 2 are provided. They indicate the areas as follows:

Area	Figure
Clutch trip	2
Tape reader	1

1.17 General Maintenance Principles:

- Lubrication instructions and intervals are given in the appropriate lubrication sections.
- To maintain the operational effectiveness of the equipment, it is recommended that certain parts be replaced at intervals based upon the speed and operating hours, as indicated below:

Operating Speed (Words per Minute)	Recommended Maintenance Overhaul Interval (Operating Hours*)	Estimated Service Life (Operating Hours*)
60 or 66	2500	7500
100	1500	4500

*Typing Unit Operating Hours

The parts are available in overhaul maintenance kits listed in the appropriate parts publications.

2. BASIC UNIT

2.01 Clutch Trip Area

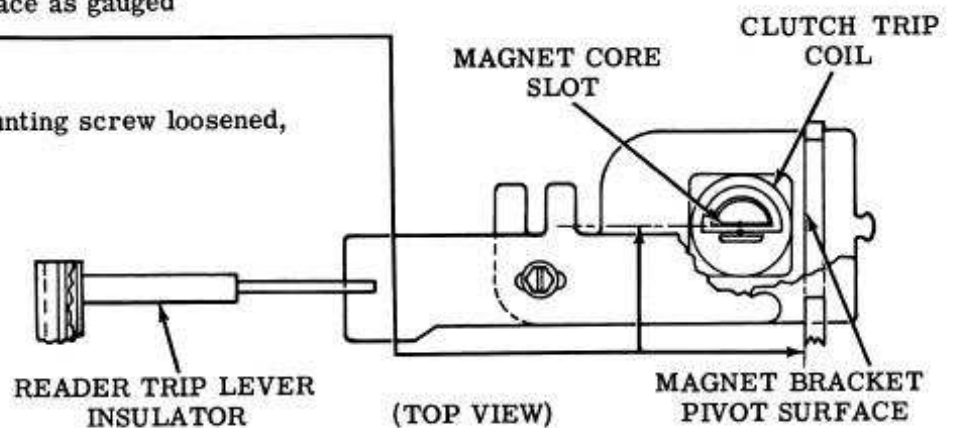
MAGNET CORE

Requirement

Magnet core slot to be perpendicular to magnet bracket pivot surface as gauged by eye.

To Adjust

With clutch trip coil mounting screw loosened, position clutch trip coil.



TRIP MAGNET

Requirement

Magnet bracket to be positioned as far forward and to the left on base casting post as possible.

To Adjust

Position magnet bracket with three mounting screws loosened.

Related Adjustments

Affects

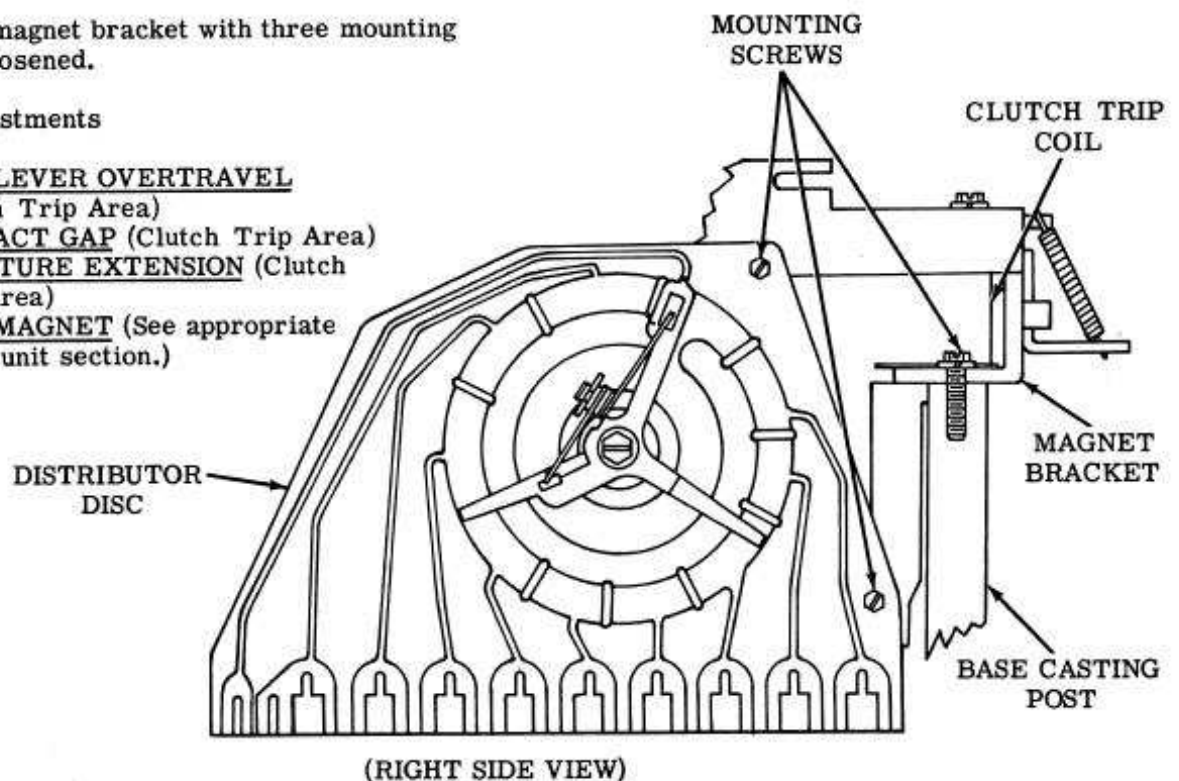
TRIP LEVER OVERTRAVEL

(Clutch Trip Area)

CONTACT GAP (Clutch Trip Area)

ARMATURE EXTENSION (Clutch Trip Area)

TRIP MAGNET (See appropriate typing unit section.)



2.02 Clutch Trip Area (continued)

TRIP LEVER OVERTRAVEL

To Check

Trip distributor clutch by momentarily holding armature in its attracted position. Rotate main shaft until cam roller is on high part of reader trip lever cam. Take up play in the armature toward the rear and release. Position the reader trip lever to the center of the armature extension.

Requirement

Min 0.010 inch --- Max 0.018 inch
between the end of armature extension and
latching surface of reader trip lever.

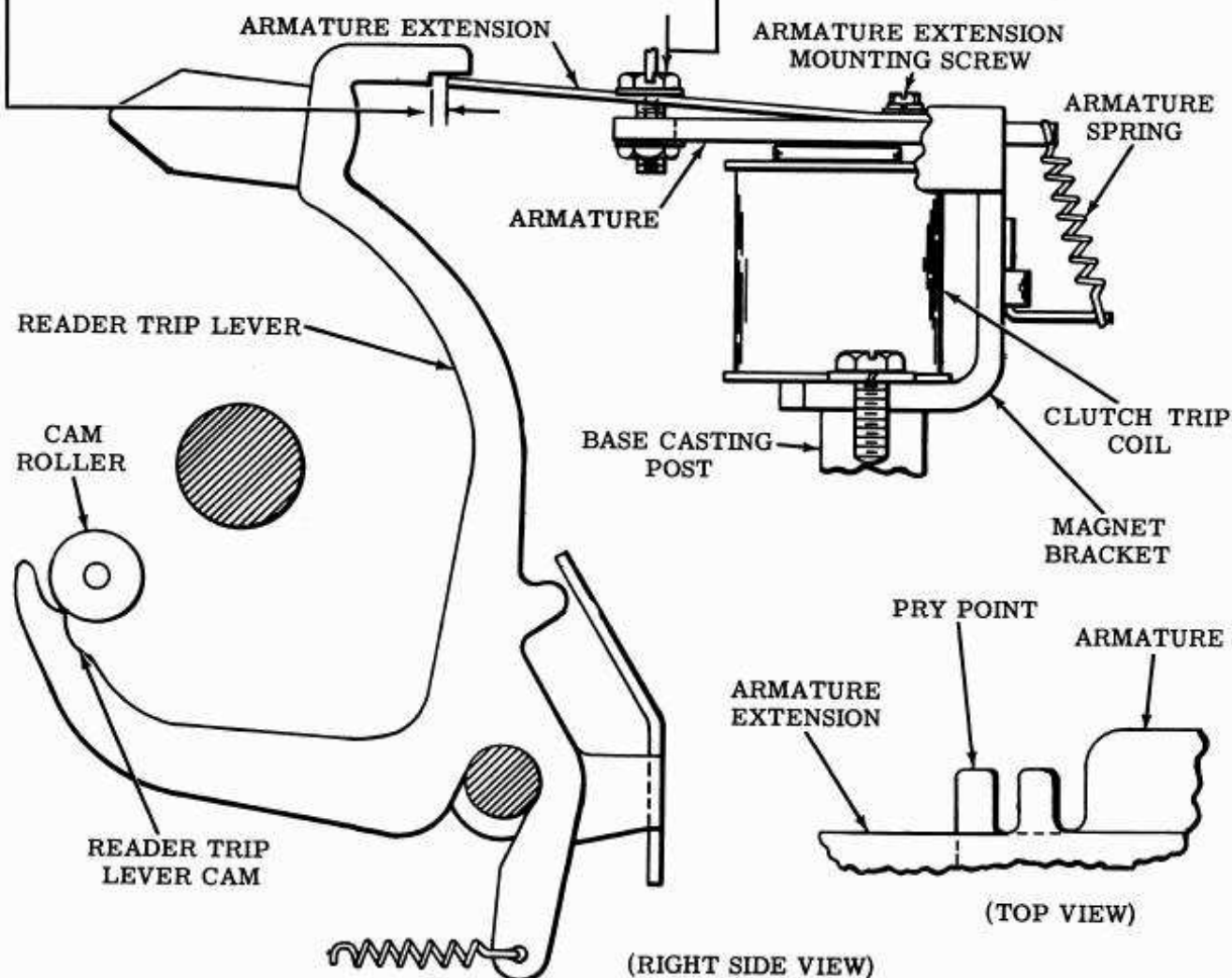
To Adjust

With armature extension mounting screw
loosened friction tight, position armature
extension using pry point.

Related Adjustment

Affects

CONTACT GAP (Clutch Trip Area)



2.03 Clutch Trip Area (continued)

ARMATURE EXTENSION**To Check**

Place typing unit in stop condition. Hold armature in attracted position and rotate main shaft until a clearance of

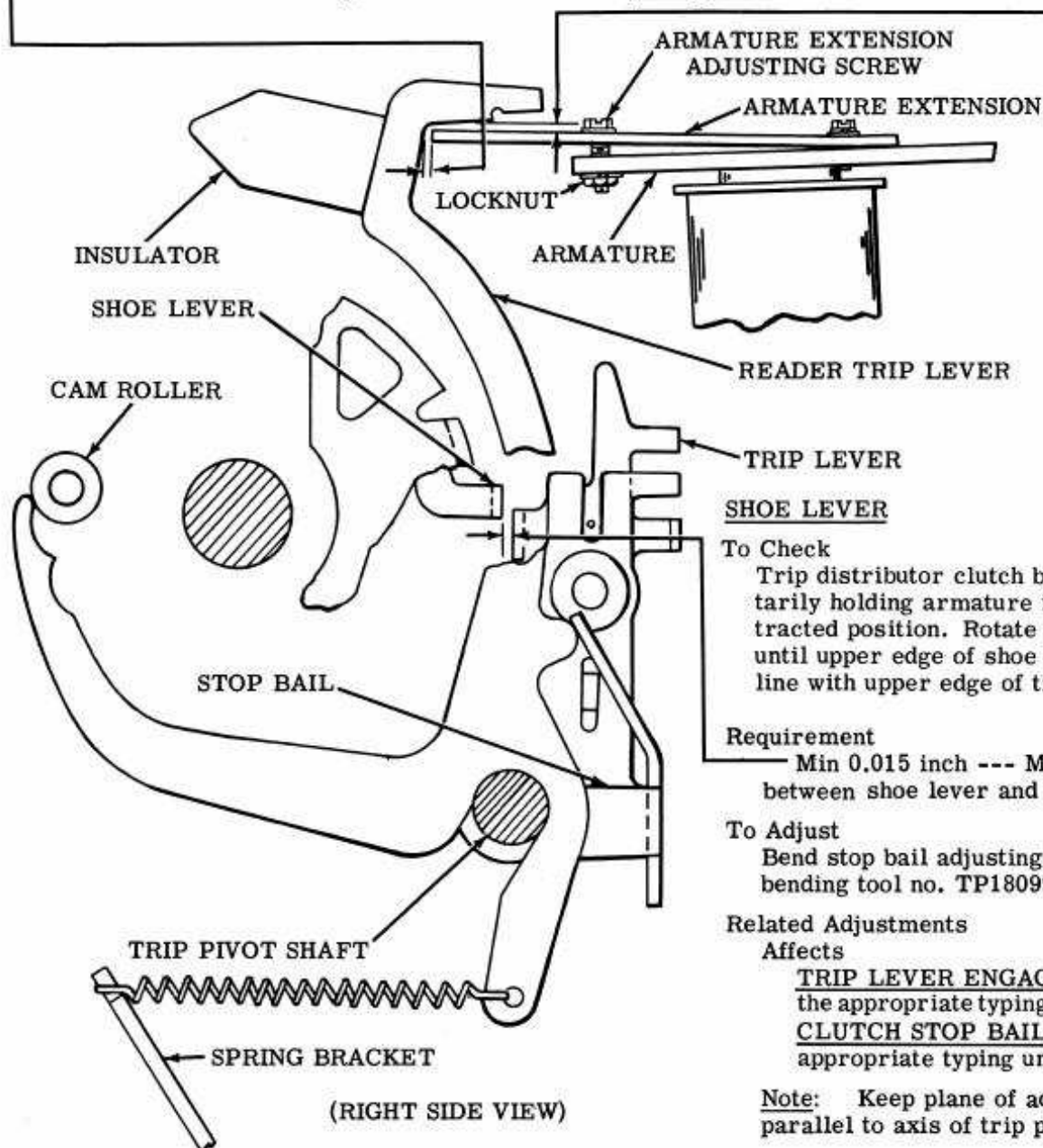
Min Some --- Max 0.040 inch exists between end of armature extension and reader trip lever.

Requirement

Min Some --- Max 0.010 inch between the armature extension and reader trip lever at its closest point.

To Adjust

With armature extension adjusting screw and locknut loosened, position armature extension using armature extension adjusting screw.

SHOE LEVER**To Check**

Trip distributor clutch by momentarily holding armature in its attracted position. Rotate main shaft until upper edge of shoe lever is in line with upper edge of trip lever.

Requirement

Min 0.015 inch --- Max 0.035 inch between shoe lever and trip lever.

To Adjust

Bend stop bail adjusting tab with bending tool no. TP180993.

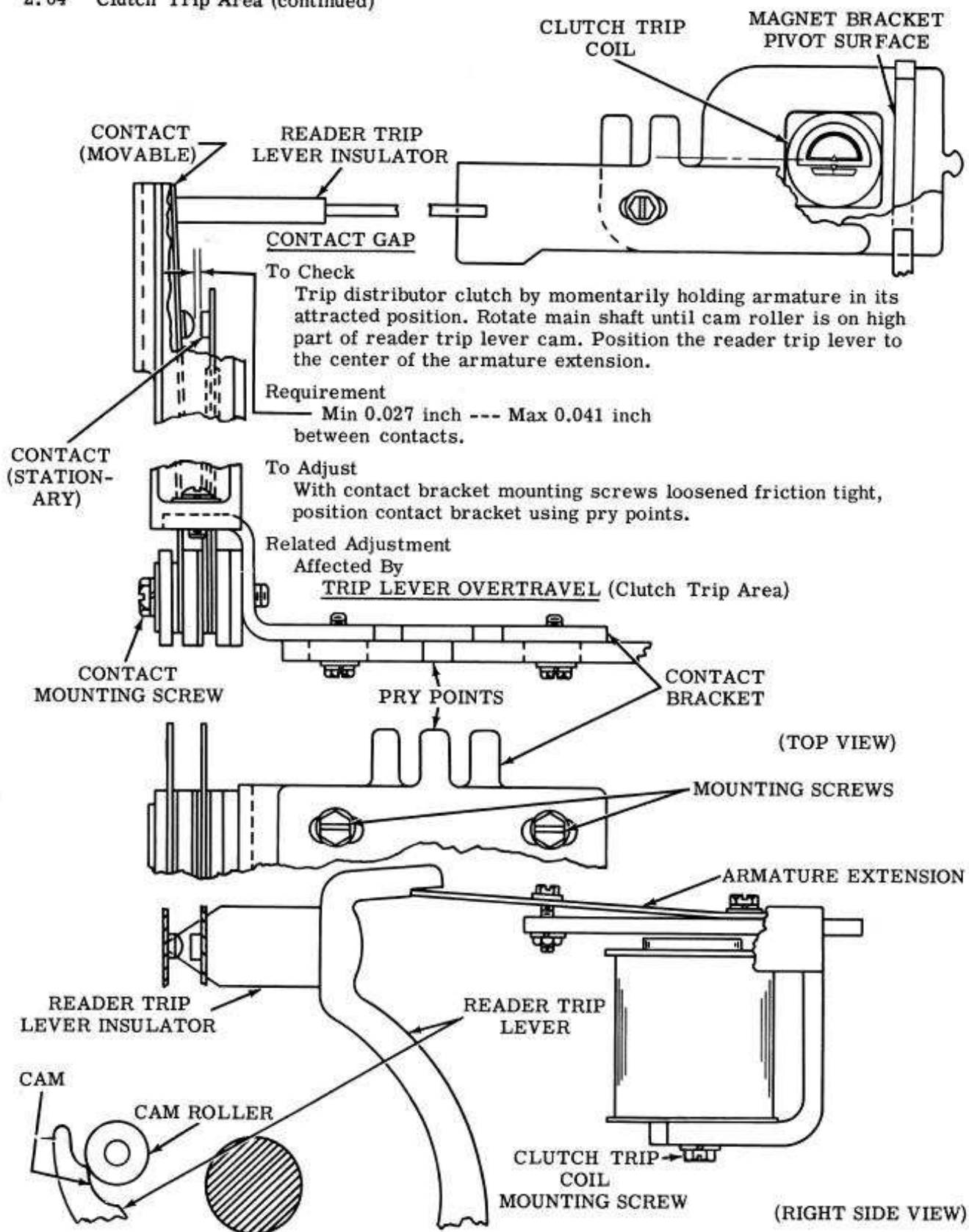
Related Adjustments**Affects**

TRIP LEVER ENGAGEMENT (See the appropriate typing unit section.)

CLUTCH STOP BAIL (See the appropriate typing unit section.)

Note: Keep plane of adjusting tab parallel to axis of trip pivot shaft.

2.04 Clutch Trip Area (continued)



2.05 Clutch Trip Area (continued)

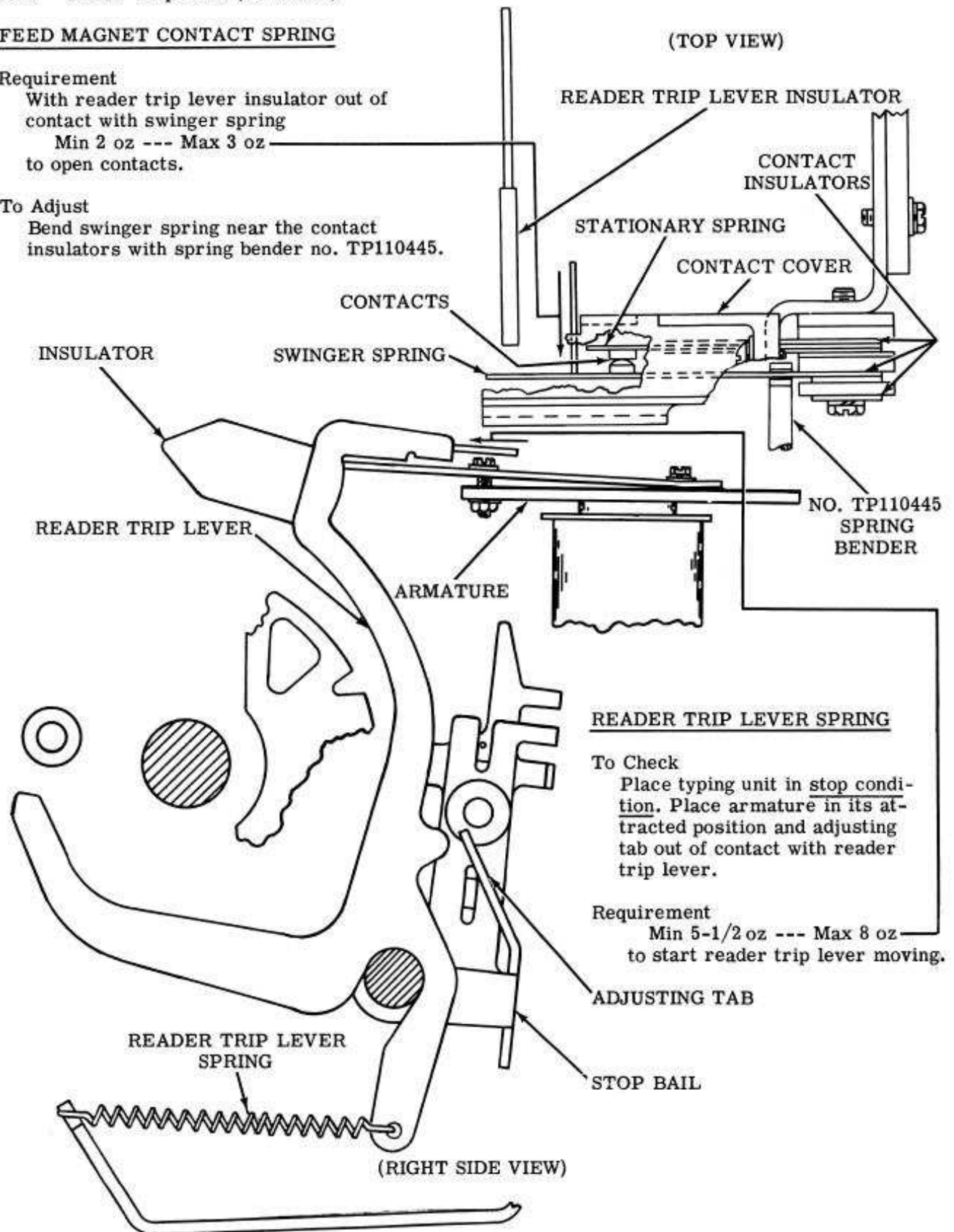
FEED MAGNET CONTACT SPRINGRequirement

With reader trip lever insulator out of contact with swinger spring

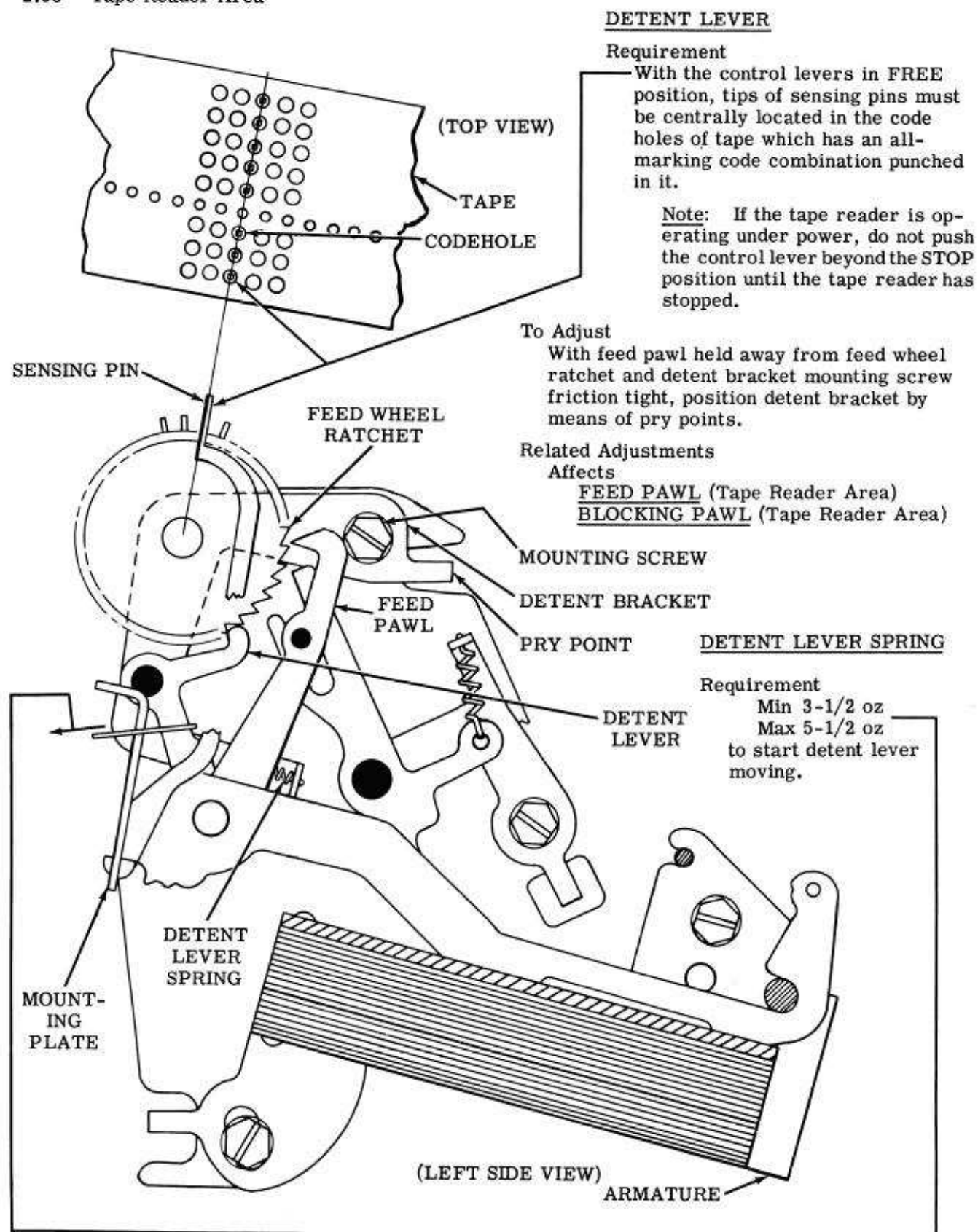
Min 2 oz --- Max 3 oz
to open contacts.

To Adjust

Bend swinger spring near the contact insulators with spring bender no. TP110445.



2.06 Tape Reader Area



2.07 Tape Reader Area (continued)

FEED PAWL (Adjustment with Gauge No. TP183103)

To Check

Place armature in unattracted position. Visually check to see if there is some clearance between the blocking pawl and ratchet tooth. If not, provide clearance. See BLOCK PAWL (Tape Reader Area) adjustment.

UPSTOP SPRING

Requirement

With armature spring post removed from its slot in magnet bracket
Min 14 oz --- Max 20 oz
to start upstop bushing moving.

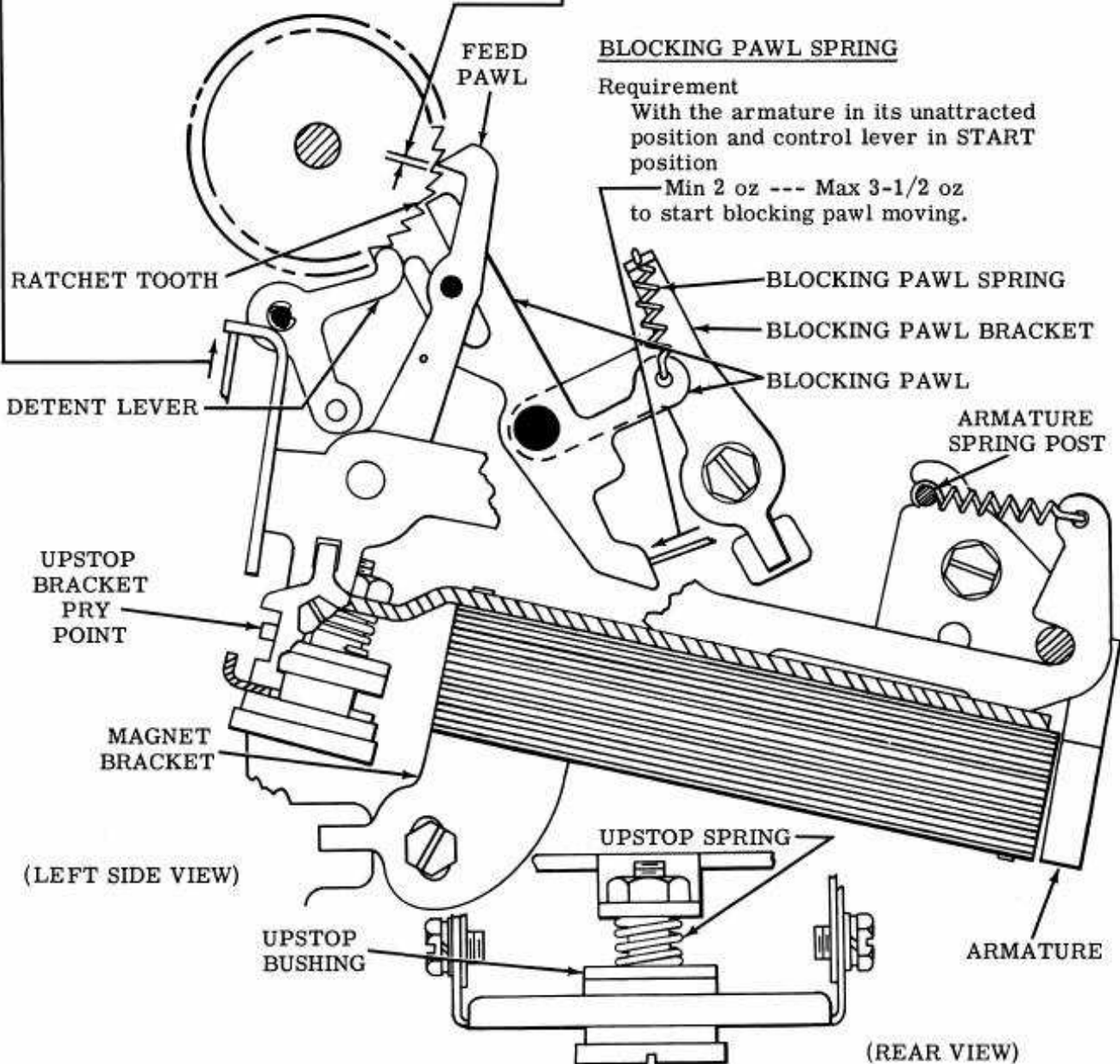
Requirement

Min Same --- Max 0.008 inch
between the feed pawl and ratchet tooth
with a total of five ratchet teeth between
the feed pawl and detent lever. (Continued
on following page.)

BLOCKING PAWL SPRING

Requirement

With the armature in its unattracted
position and control lever in START
position
Min 2 oz --- Max 3-1/2 oz
to start blocking pawl moving.



2.08 Tape Reader Area (continued)

FEED PAWL (Continued from preceding page.)

To Adjust

- (1) With armature in attracted position and two upstop bracket mounting screws friction tight, insert gauge no. TP183103 between upstop bracket and shoulder of upstop shoulder screw. Position upstop bracket so that it lies flat on gauge. Tighten upstop bracket mounting screws.
- (2) With armature in unattracted position and three magnet bracket mounting screws friction tight, position magnet bracket by means of pry point. Tighten magnet bracket mounting screws.

Note: For tape readers with vibration damper plate TP183136, tighten magnet bracket mounting screws "A" and "B" first. Then, rotate the vibration dampener plate until the upper finger presses firmly on contact block extension. Finally, tighten magnet bracket mounting screw "C."

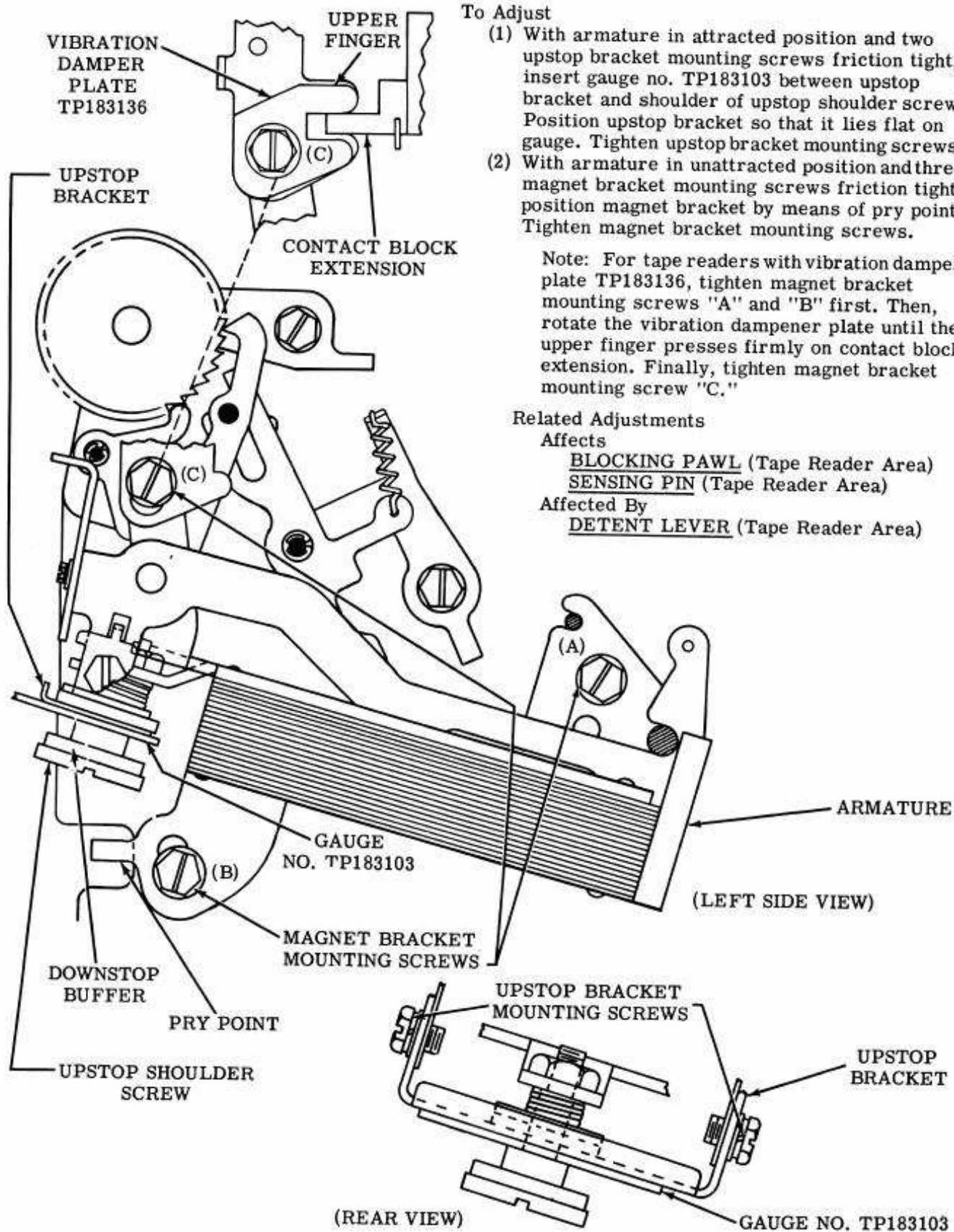
Related Adjustments

Affects

BLOCKING PAWL (Tape Reader Area)
SENSING PIN (Tape Reader Area)

Affected By

DETENT LEVER (Tape Reader Area)



2.09 Tape Reader Area (continued)

FEED PAWL (Adjustment without Gauge
No. TP183103)

(1) To Check

Place armature in attracted position and loosen two upstop bracket mounting screws so that the upstop bracket does not limit the feed pawl motion.

Requirement

Min 0.035 inch --- Max 0.045 inch between feed pawl and ratchet tooth and a total of six ratchet teeth between feed pawl and detent lever.

To Adjust

With three magnet bracket mounting screws loosened friction tight, position magnet bracket using pry point.

(2) To Check

→ Place armature in unattracted position. Visually check to see if there is some clearance between the blocking pawl and ratchet tooth. If not, provide clearance. See BLOCKING PAWL (Tape Reader Area) adjustment. Place upstop bracket flat against downstop buffer.

Requirement

Min Some --- Max 0.008 inch between feed pawl and ratchet tooth.

To Adjust

With two upstop bracket mounting screws loosened friction tight, position upstop bracket using upstop bracket pry point.

(3) To Check

Place armature in attracted position.

Requirement

Min 0.025 inch --- Max 0.035 inch between feed pawl and ratchet tooth.

To Adjust

With three magnet bracket mounting screws loosened friction tight, position magnet bracket using pry point.

Note: For tape readers with vibration damper plate TP183136, tighten magnet bracket mounting screws "A" and "B" first. Then, rotate the vibration damper plate until the upper finger presses firmly on contact block extension. Finally tighten magnet bracket mounting screw "C."

Recheck "Requirement" in "(2) To Check" above.

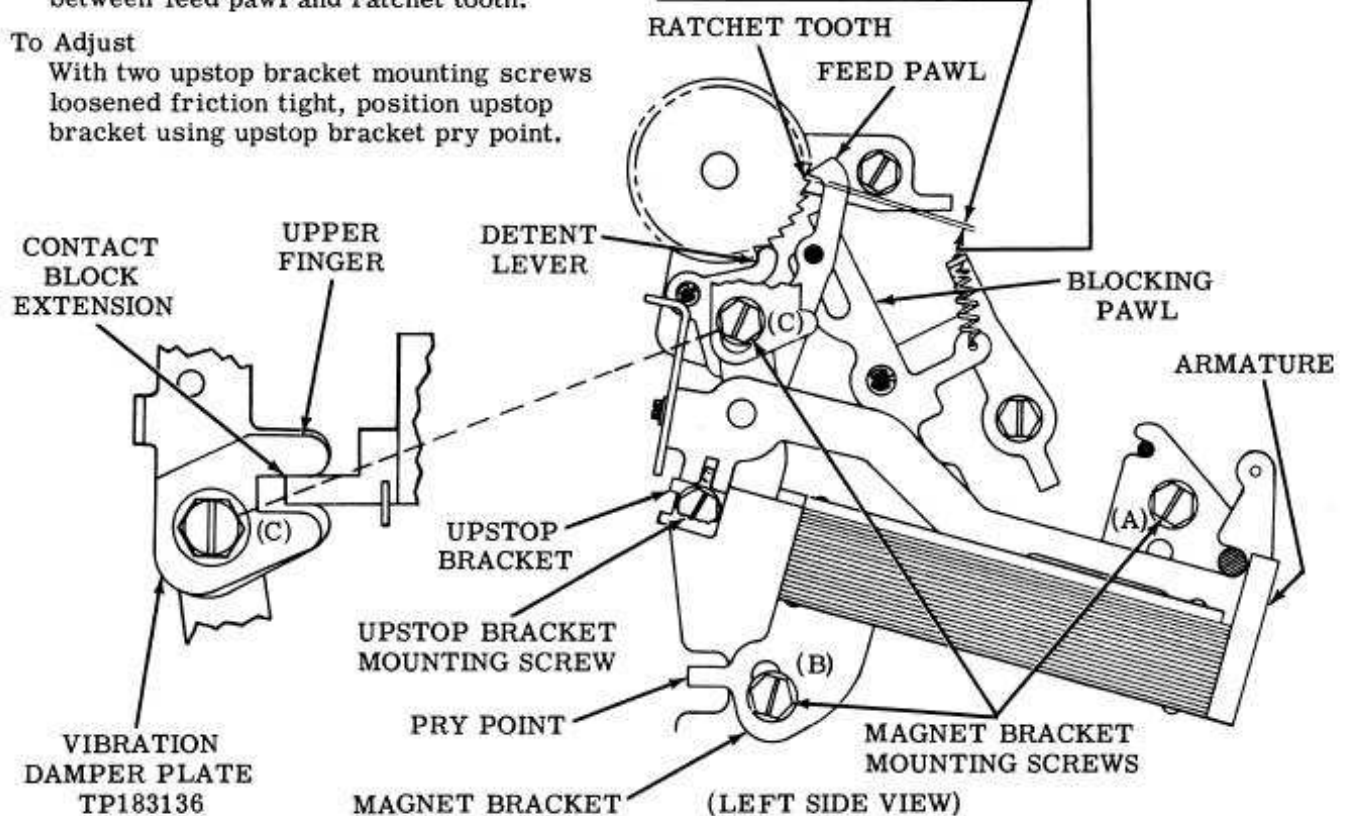
Related Adjustments

Affects

BLOCKING PAWL (Tape Reader Area)
SENSING PIN (Tape Reader Area)

Affected By

TRIP LEVER OVERTRAVEL (Tape Reader Area)



2.10 Tape Reader Area (continued)

BLOCKING PAWL

To Check

→ Place armature in unattracted position. Check to see that there is some clearance between feed pawl and ratchet tooth. If not, provide clearance. See FEED PAWL (Tape Reader Area) adjustment.

Requirement

Min Some --- Max 0.010 inch
between blocking pawl and ratchet tooth.

Note: When a tape winder is used

Min Some --- Max 0.003 inch
between blocking pawl and ratchet.

To Adjust

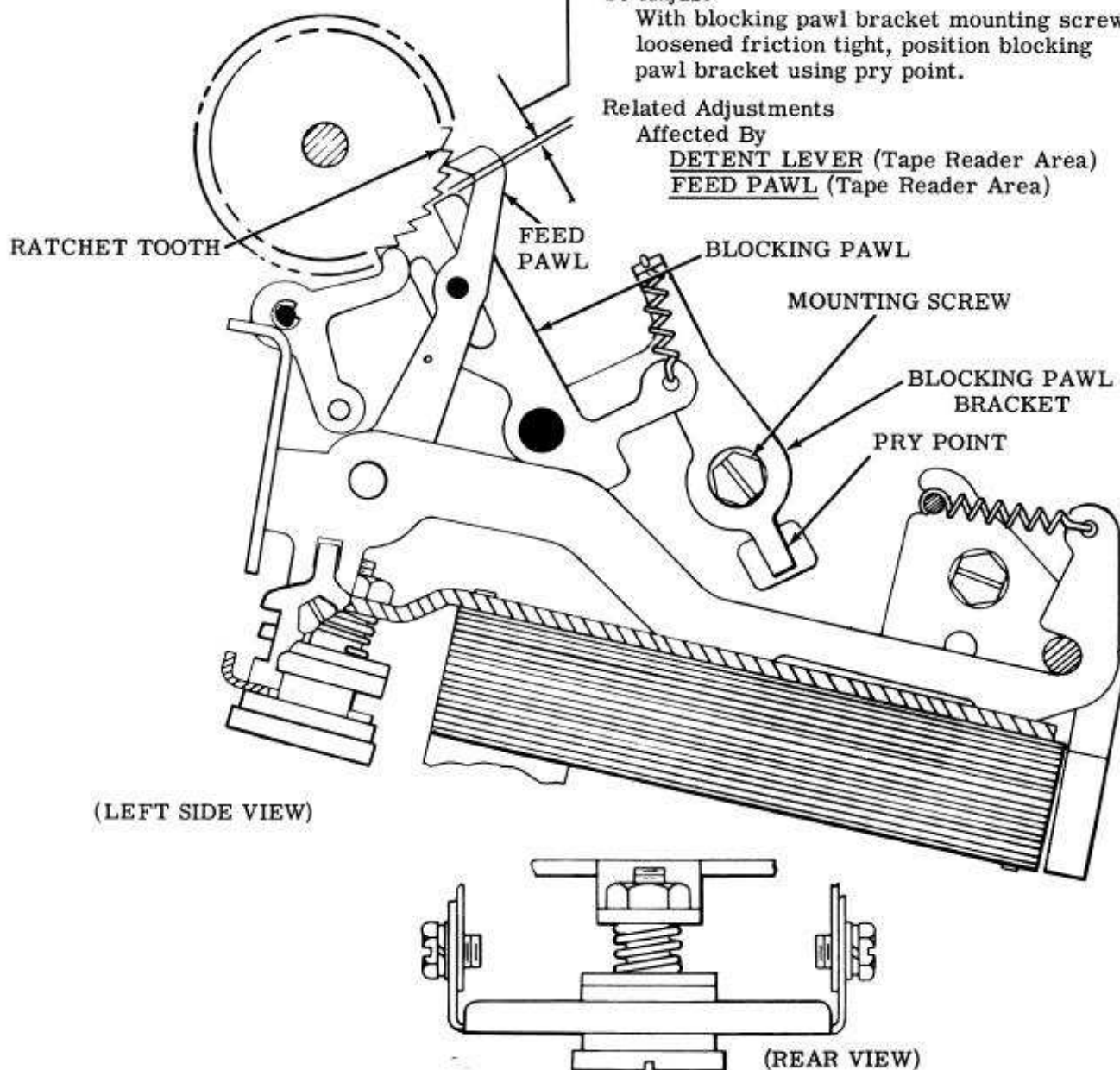
With blocking pawl bracket mounting screw loosened friction tight, position blocking pawl bracket using pry point.

Related Adjustments

Affected By

DETENT LEVER (Tape Reader Area)

FEED PAWL (Tape Reader Area)

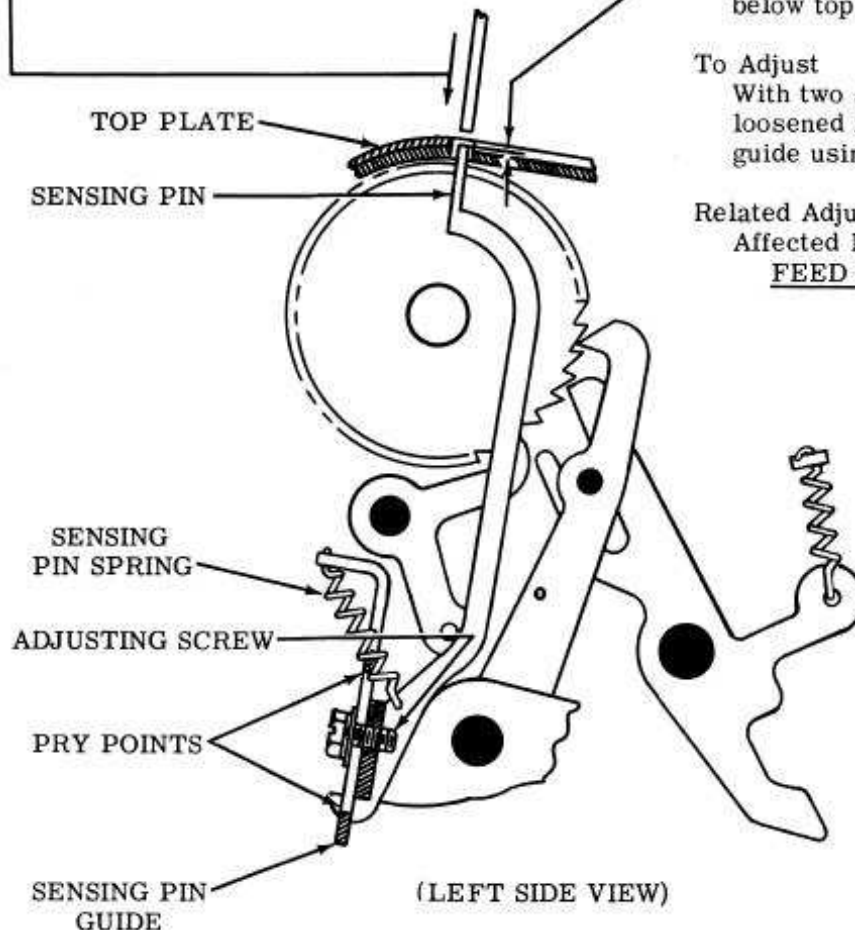


2.11 Tape Reader Area (continued)

SENSING PIN SPRING

Requirement

With armature in its attracted position
Min 1-1/2 oz --- Max 2-3/4 oz
to position sensing pin flush with top plate.

SENSING PIN

Requirement

With armature in unattracted position, the
tip of all sensing pins shall be
Min Flush --- Max 0.015 inch
below top surface of top plate.

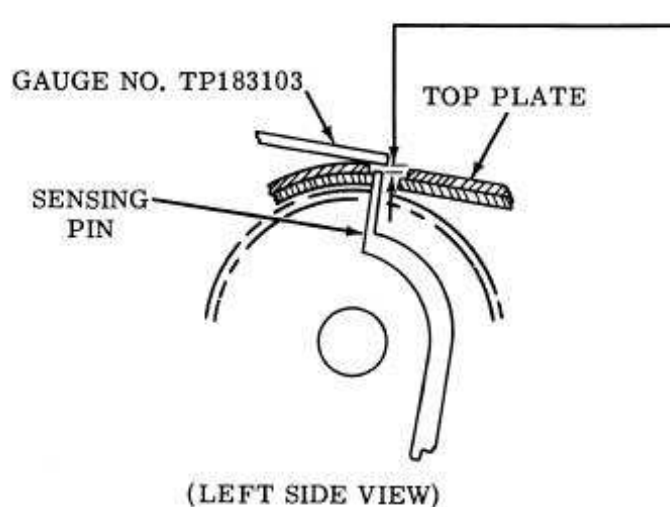
To Adjust

With two sensing pin guide adjusting screws
loosened friction tight, position sensing pin
guide using pry points.

Related Adjustment

Affected By

FEED PAWL (Tape Reader Area)



Note: This adjustment may be made by using the thin-slotted end of gauge no. TP183103. To check the above minimum requirement (Flush), hold the gauge flat against the top plate in back of the sensing pins and move it forward against sensing pins. If any sensing pin is deflected by the gauge, then the above minimum requirement is not met. The sensing pin guide must be lowered. To check the above maximum requirement (0.015 inch), hold the gauge directly above the sensing pins and measure the clearance. Adjust, if necessary, as indicated above.

2.12 Tape Reader Area (continued)

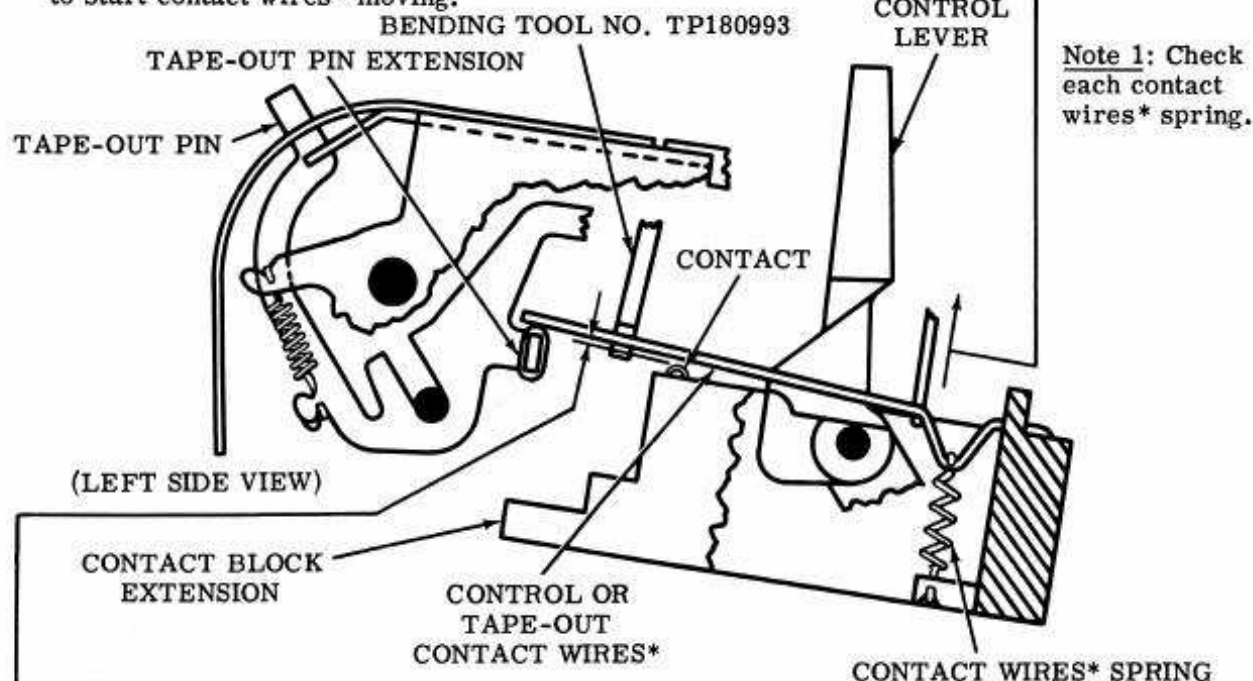
CONTACT WIRES* SPRING

To Check

Place control lever in START position and fully depress tape-out pin.

Requirement

Min 1-1/4 oz --- Max 2-1/4 oz
to start contact wires* moving.



CONTROL (OR TAPE-OUT) CONTACT WIRES*

Requirement

With tape-out pin in its fully up position,
Min 0.015 inch --- Max 0.025 inch
between control (or tape-out) contact
wires* and contact.

Note 2: For tape readers without automatic
reader control: Place the control lever in
START position.

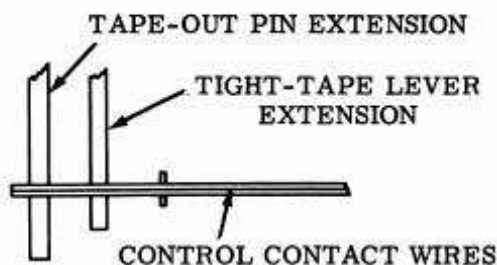
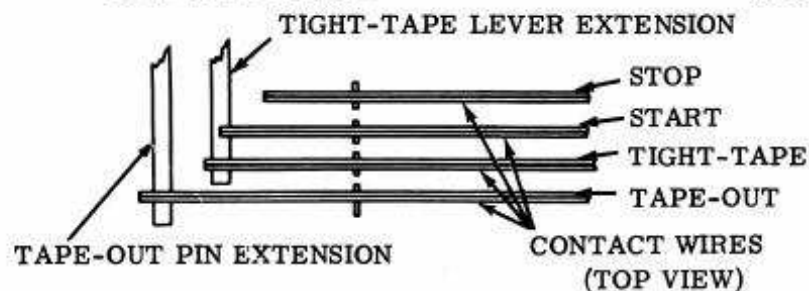
To Adjust

Bend control (or tape-out) contact wires* between the contact and the tape-out pin
extension with bending tool no. TP180993.

*Note 3: The location of the contact wires is shown below:

TAPE READERS WITH AUTOMATIC
READER CONTROL

TAPE READERS WITHOUT AUTOMATIC
READER CONTROL



2.13 Tape Reader Area (continued)

Note: The following adjustment applies only to tape readers with automatic reader control.

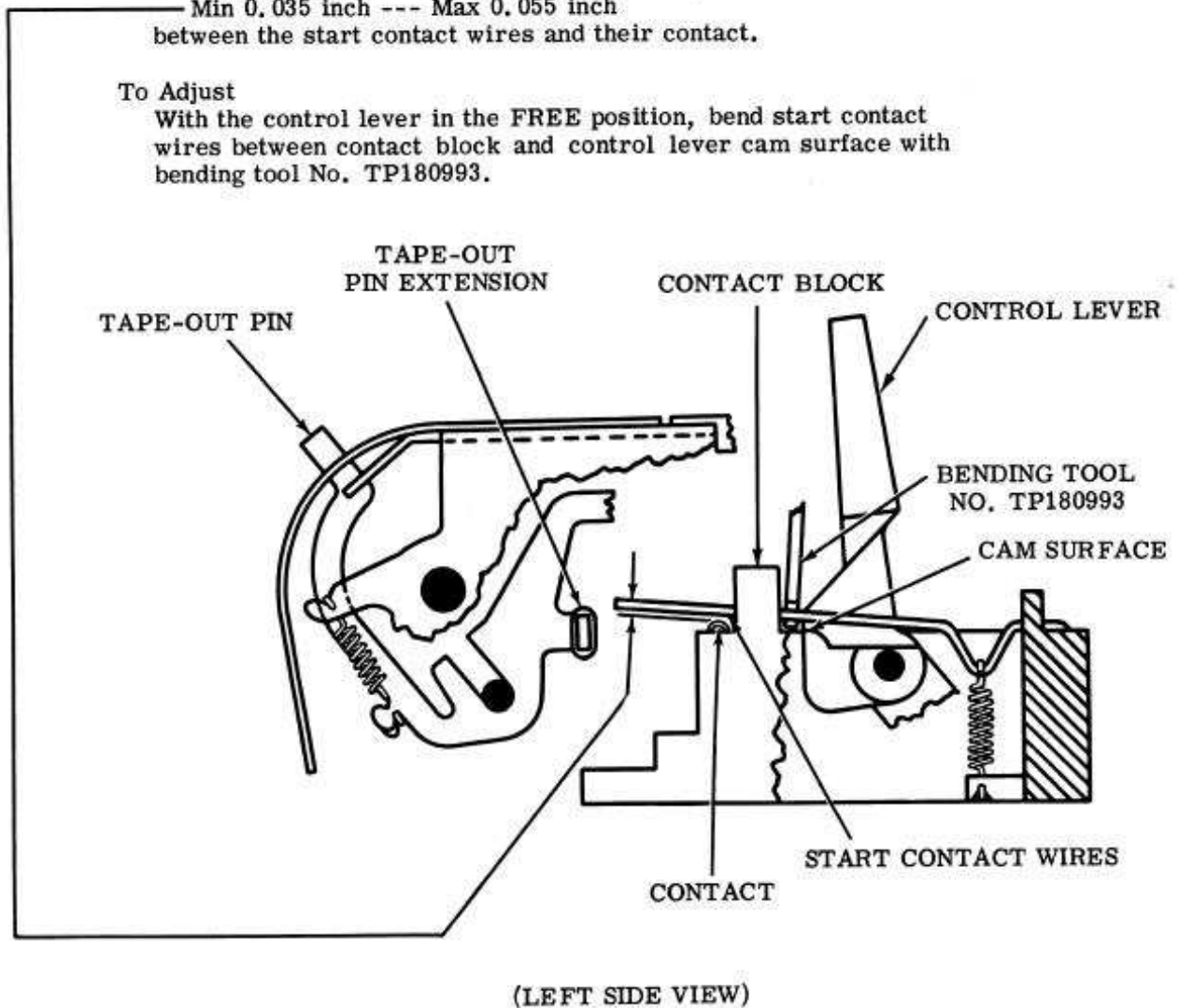
START CONTACT WIRESRequirement

With the control lever in the neutral position (resting in a position midway between START and STOP positions)

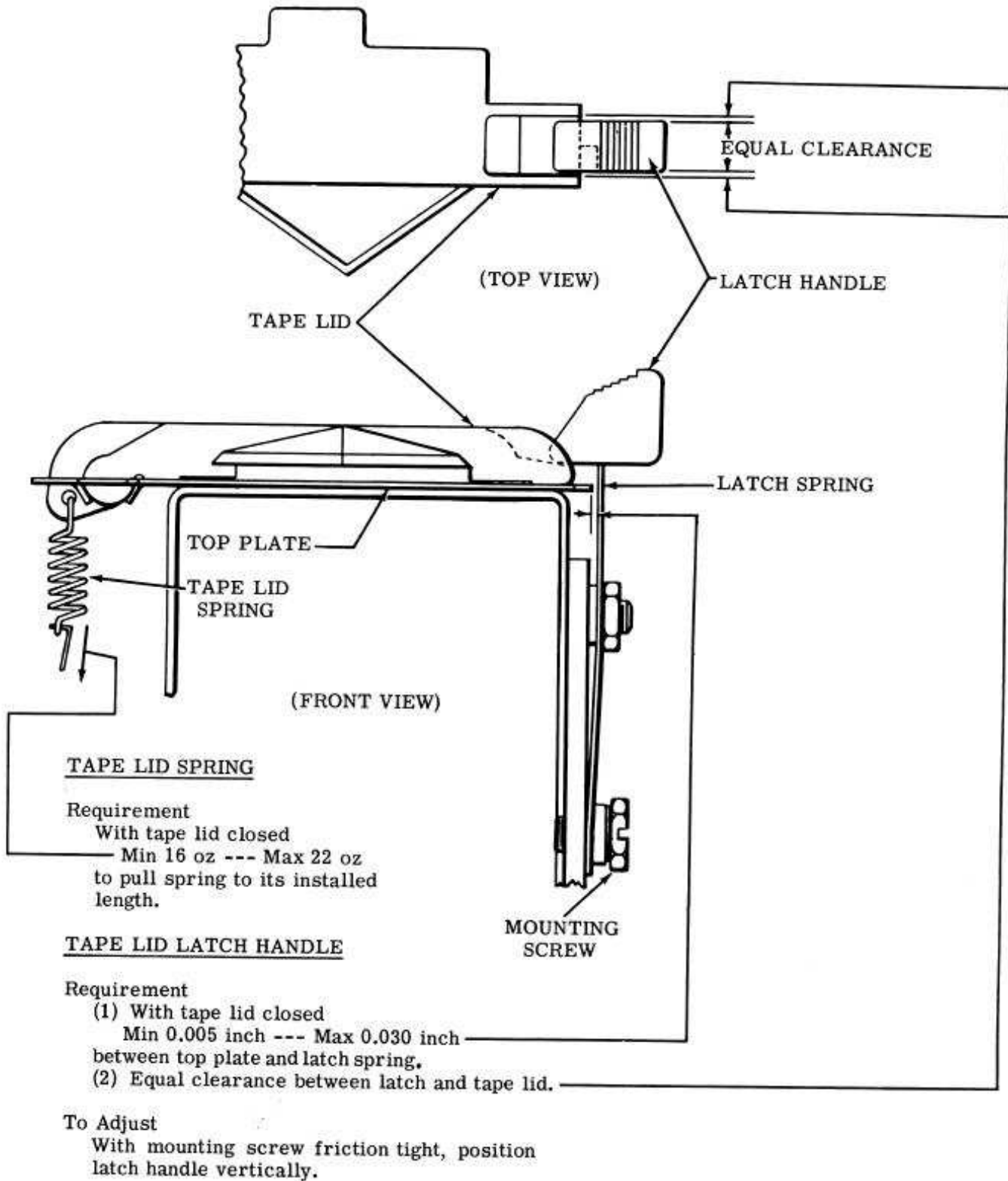
Min 0.035 inch --- Max 0.055 inch
between the start contact wires and their contact.

To Adjust

With the control lever in the FREE position, bend start contact wires between contact block and control lever cam surface with bending tool No. TP180993.



2.14 Tape Reader Area (continued)

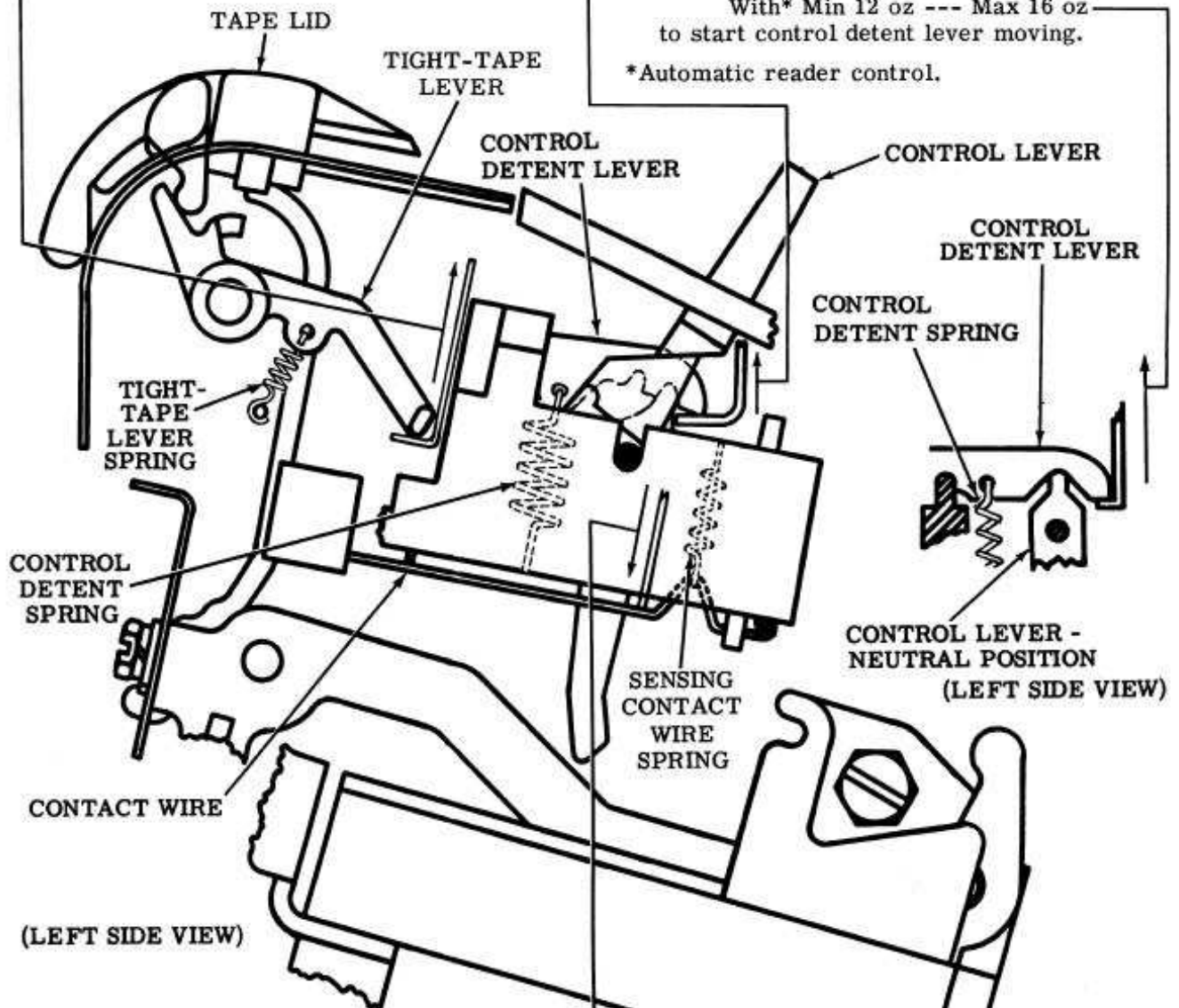


2.15 Tape Reader Area (continued)

TIGHT-TAPE LEVER SPRING

Requirement

With the tape lid closed

Min 1 oz --- Max 2-1/4 oz
to start tight-tape lever moving.

(LEFT SIDE VIEW)

SENSING CONTACT WIRE SPRING

Requirement

With armature in its attracted position

Min 3/4 oz --- Max 1-3/4 oz
to start contact wire moving.CONTROL DETENT SPRING

Requirement

Place control lever in STOP position,

Note: For tape readers with automatic reader control, place the control lever in the neutral position.

Without* Min 5 oz --- Max 9 oz

With* Min 12 oz --- Max 16 oz

to start control detent lever moving.

*Automatic reader control.

2.16 Tape Reader Area (continued)

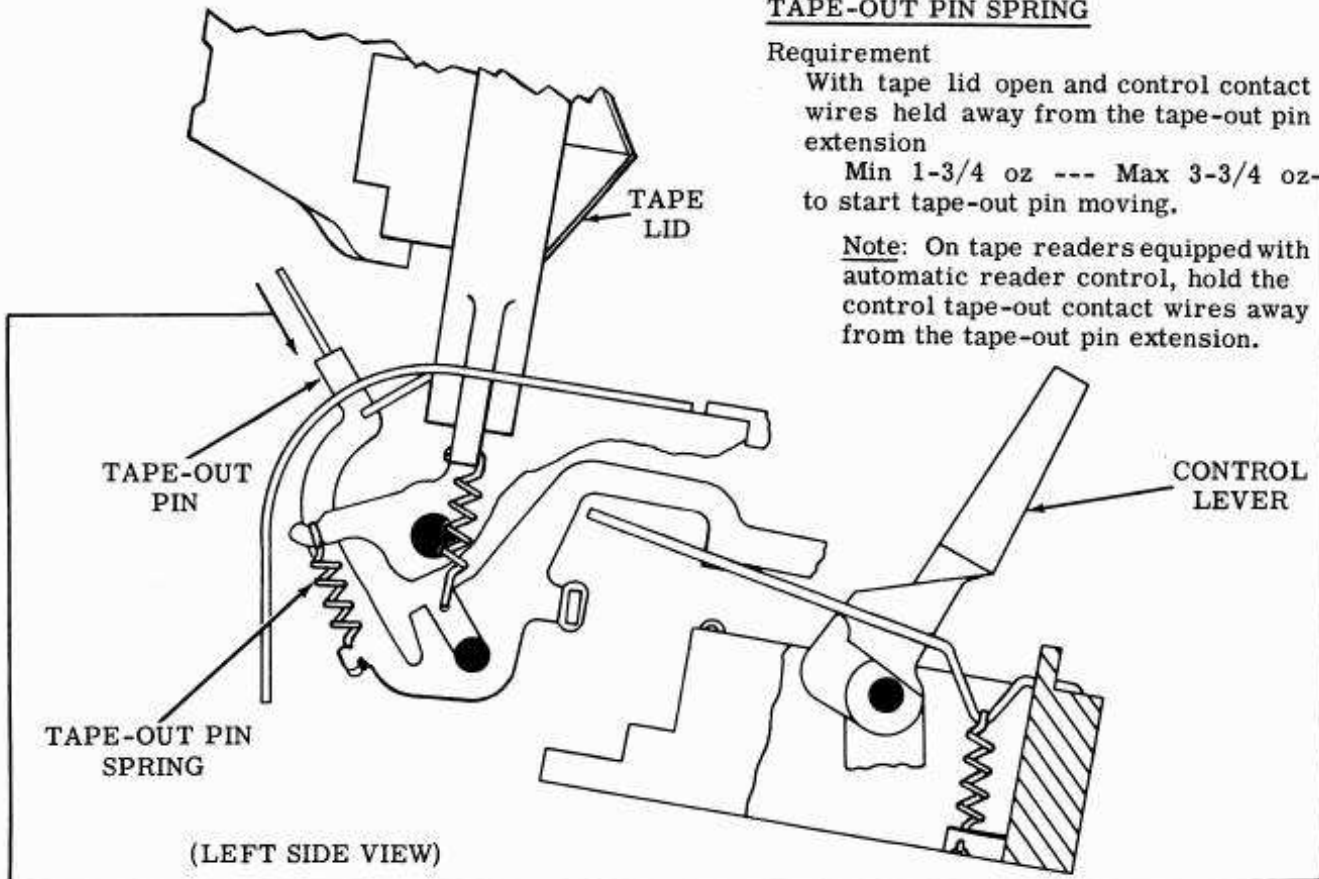
TAPE-OUT PIN SPRING

Requirement

With tape lid open and control contact wires held away from the tape-out pin extension

Min 1-3/4 oz --- Max 3-3/4 oz to start tape-out pin moving.

Note: On tape readers equipped with automatic reader control, hold the control tape-out contact wires away from the tape-out pin extension.

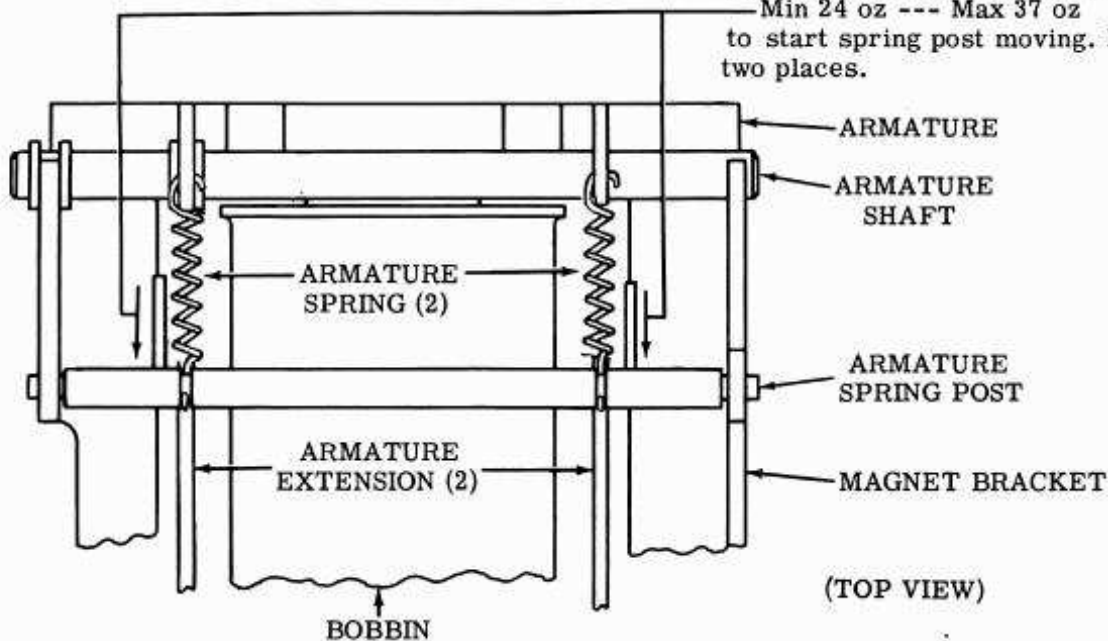


ARMATURE SPRING

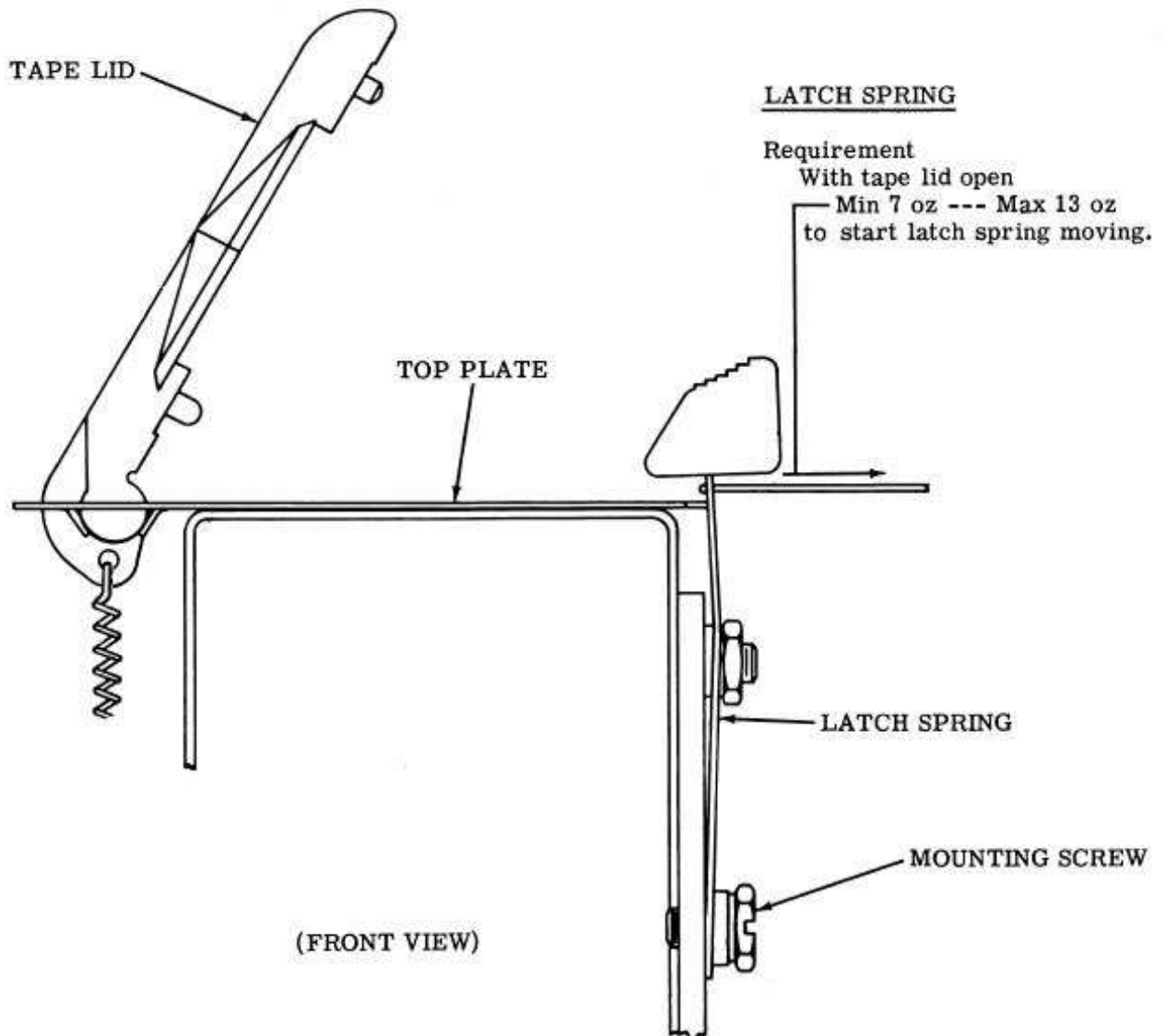
Requirement

With armature in its unattracted position

Min 24 oz --- Max 37 oz to start spring post moving. Measure at two places.



2.17 Tape Reader Area (continued)



2.18 Tape Reader Area (continued)

Note: The following adjustment applies to tape readers with early design bases.

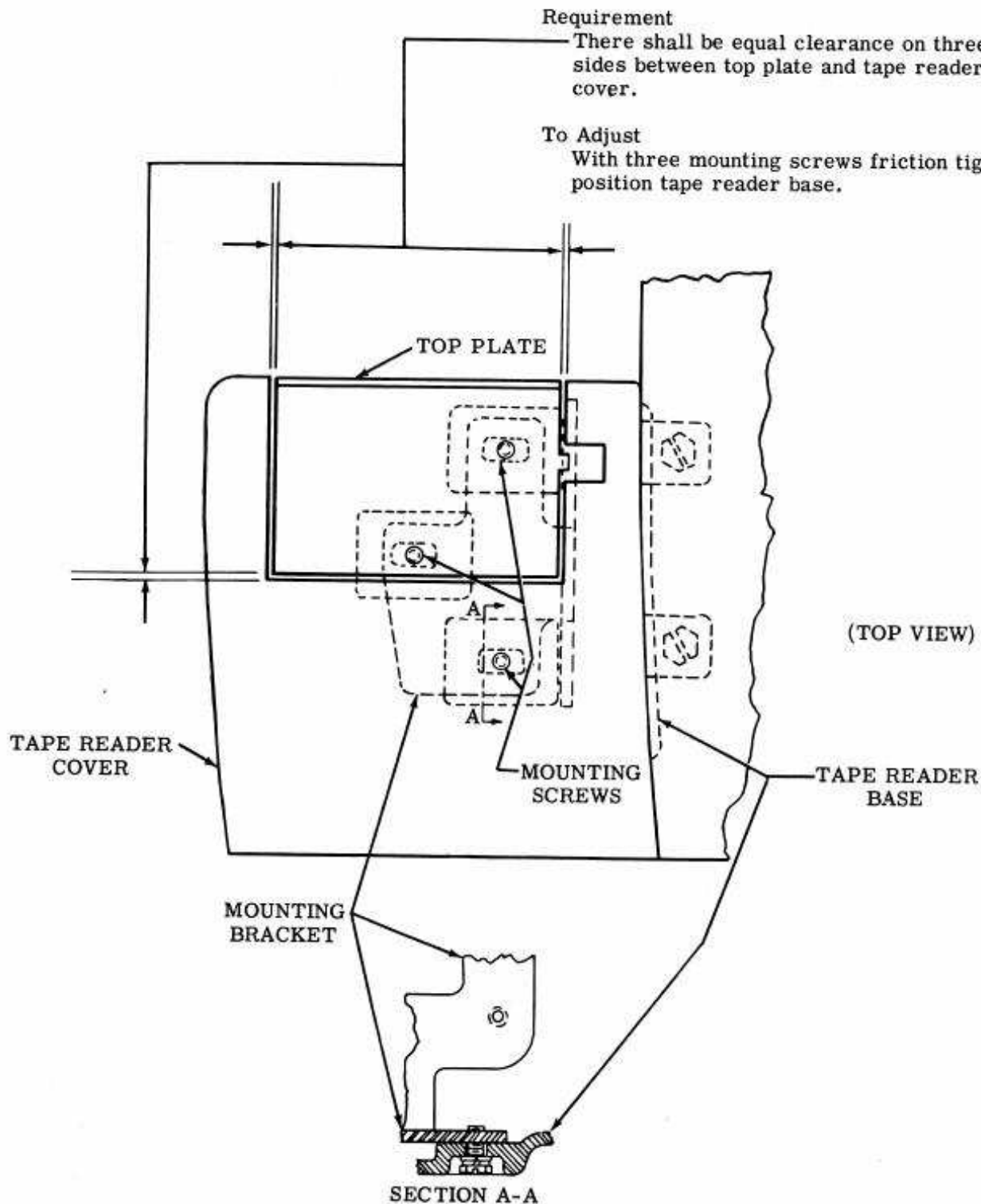
READER MOUNTING BRACKET (Early Design)

Requirement

There shall be equal clearance on three sides between top plate and tape reader cover.

To Adjust

With three mounting screws friction tight, position tape reader base.



2.19 Tape Reader Area (continued)

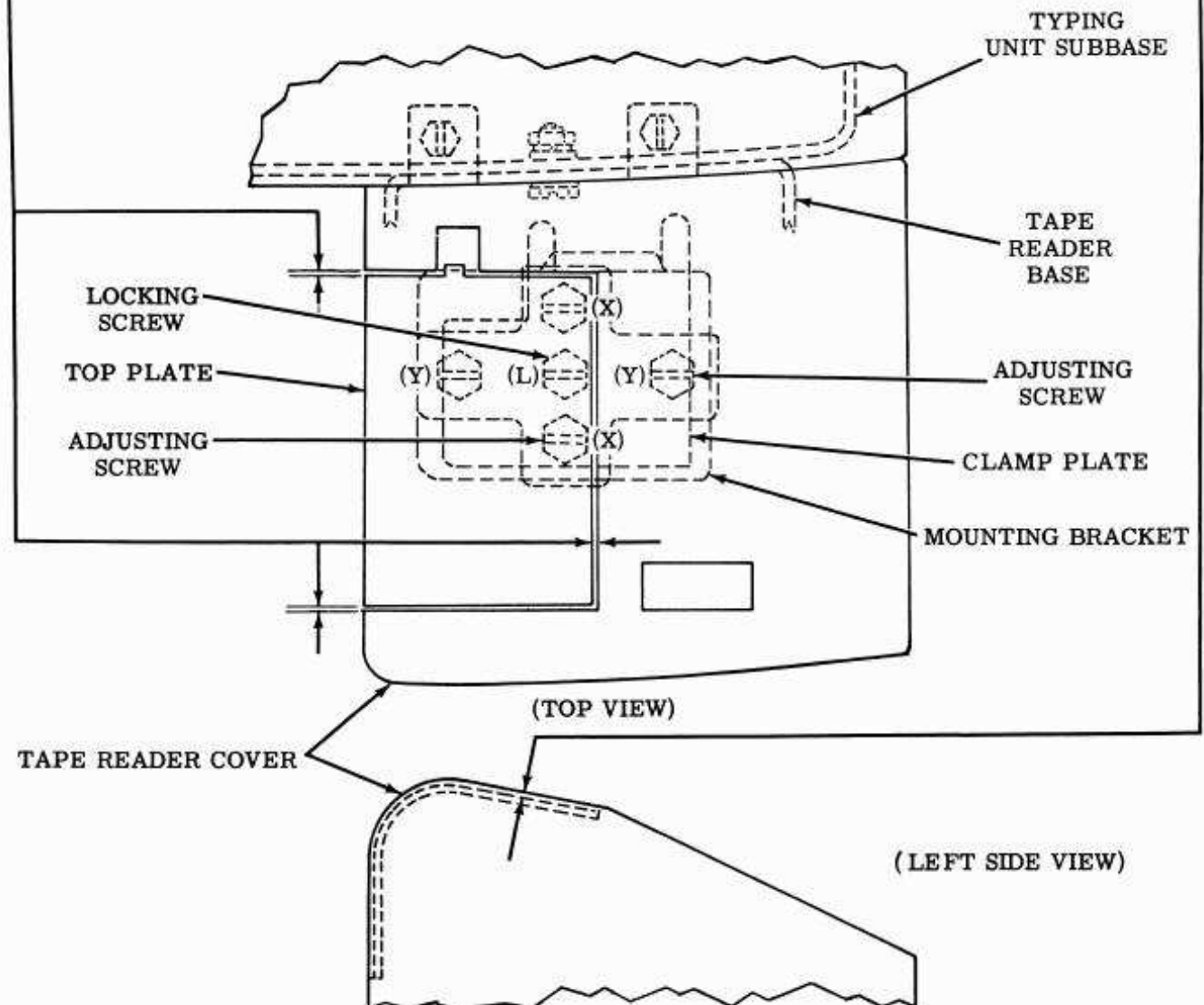
Note: The following adjustment applies to tape readers with late design bases.

READER MOUNTING BRACKET (Late Design)Requirement

- (1) Top plate to be
Min Flush --- Max 0.030 inch
below cover.
- (2) Equal clearance between top plate and tape reader cover on three sides.

To Adjust

With four adjusting screws and a locking screw loosened and mounting bracket lying flat on tape reader base, position tape reader. Run two adjusting screws (X) up until requirement is approximately met. Tighten locking screw friction tight. Run two adjusting screws (Y) up until requirement is approximately met. Refine all four adjusting screws. Tighten locking screw (L).



REPLACING PAGE ADDENDUM

Filing Instructions:

1. Remove from the section the pages numbered the same as those attached to this sheet.
2. Insert the attached pages into the section in their place.
3. Place this sheet ahead of Page 1 of the section.

32 AND 33 TAPE PUNCH

ADJUSTMENTS

1. GENERAL

- 1.001 This addendum supplements Section 574-125-700TC, Issue 2, and is issued to correct an error in and to clarify the Ten Characters Per Inch adjustment. Arrows in the margins indicate changes and additions.
- 1.002 Insert the attached page in accordance with the filing instructions above.

Attached:

Page 11 dated October 1965, reissued
Page 12 dated October 1965, revised

32 AND 33 TAPE PUNCH

ADJUSTMENTS

CONTENTS	PAGE	1. GENERAL
1. GENERAL	1	1.01 This section provides adjustment and maintenance information for the 32 and 33 tape punches. It is reissued to add automatic control information and to generally update the section. The adjustment information applies equally well to 5- and 8-level tape punches except where noted. Since this is a general revision, marginal arrows ordinarily used to indicate changes and additions are omitted.
2. BASIC UNIT	5	1.02 There is just one area in which tape punch adjustments and spring tensions are found. Figure 1 is provided to show this area — tape punch area.
Tape Punch Area		1.03 In the adjustments covered in this section, location of clearances, position of parts, and point and angle of scale applications are illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings.
Backspace lever spring	17	
Chad chute extension	13	
Codebar extension springs	14	
Control detent lever spring	18	
Control pushbuttons	18	
Detent lever spring	16	
Drive link spring	19	
Feed pawl spring	16	
Feed wheel ratchet and pawl — final ..	11	
Feed wheel ratchet and pawl — preliminary	6	
Pawl and lever spring	15	
Pawl upstop assembly — final	10	
Pawl upstop assembly — preliminary	5	
Punch block assembly	19	
Punch penetration	9	
Sensing lever springs	14	
Stripper bail spring	15	
Stripper bail upstop	7	
Tape bias spring	13	
Tape guide compression spring	18	
Tape guide tension spring	17	
Tape nudger	5	
Tape punch drive	8	
Ten characters per inch	12	
3. AUTOMATIC CONTROLS	20	
Tape Punch Area		
Control bail assembly	20	
Control bail assembly spring	25, 26	
Feed wheel ratchet and pawl gap	22	
Latch bail gap	24	
Latch bail spring	22	
Lever overtravel	21	
LOCK ON	26	
On mechanism return spring	28	
Sensing lever and bail gap	23	
Tape-to-tape lever spring	28	
UNLOCK	27	
Visual ON OFF indicator	25	

1.04 The sequence in which the adjustments appear is that which should be followed when a complete readjustment of the tape punch is undertaken. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.

1.05 References to "left," "right," "front," or "rear," etc consider the tape punch to be viewed from a position where the tape guide assembly faces up and the backspace lever is located to the viewer's left.

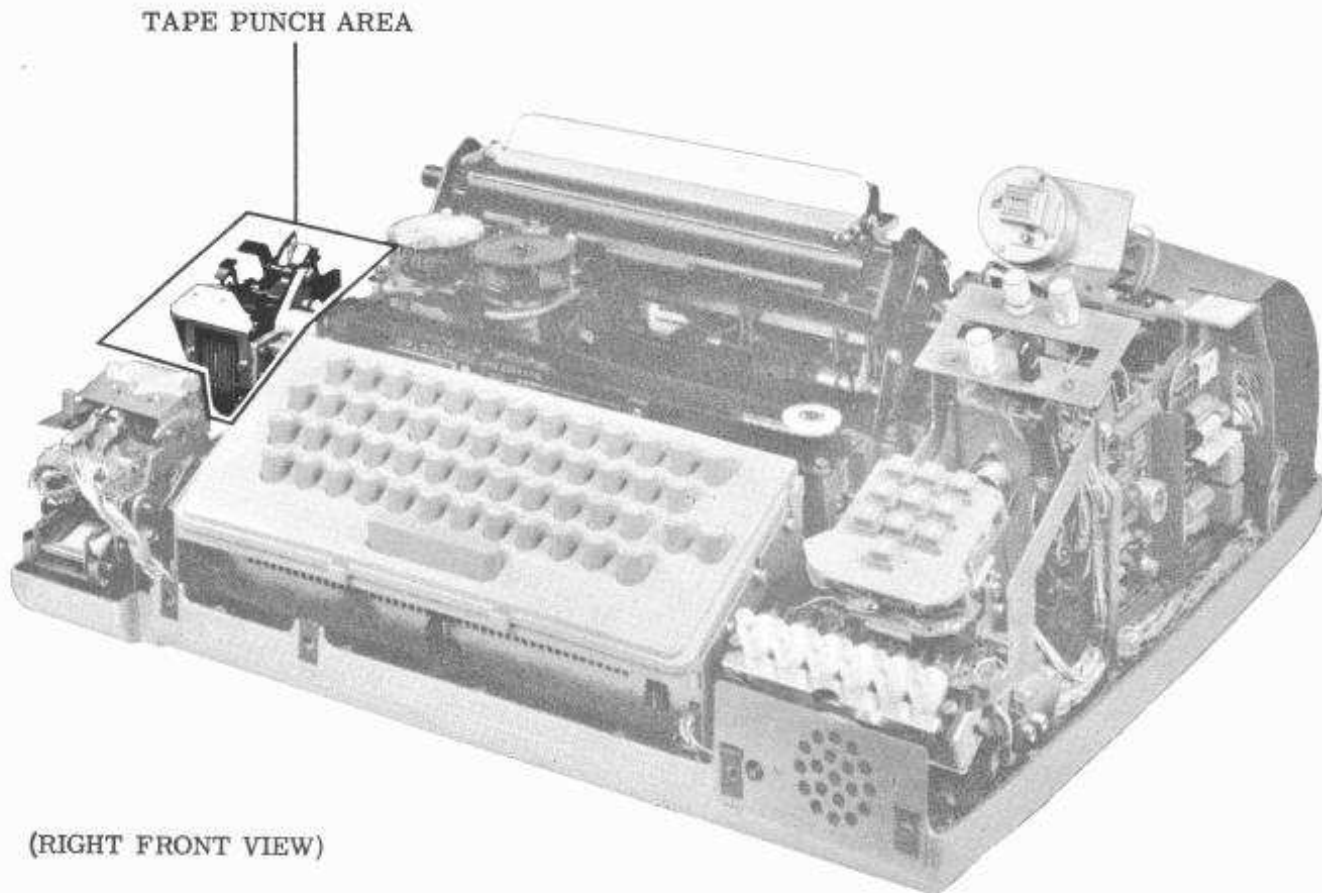


Figure 1 - Tape Punch Area

1.06 Unless specifically stated otherwise, make screws or nuts friction tight to make an adjustment and tighten them securely once the adjustment has been made.

1.07 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.

1.08 If the tape punch is removed from the typing unit to facilitate the making of an adjustment and subsequently replaced, recheck any adjustment that may have been affected. Also, if parts are removed from the tape punch to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustment that may have been affected by the removal of the parts.

1.09 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is im-

portant that spring tensions be measured by spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements shall be replaced by new ones. Only those springs that directly affect the operation of the tape punch are measured, however, others may be measured indirectly in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then, if the requirement is not met, any springs that are indirectly measured in the procedure shall be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use spring scales which are recommended by the manufacturer of 32 and 33 teletypewriter sets and found in the appropriate maintenance tools publication.

Note 2: The spring tensions may be checked in any sequence.

1.10 Certain adjustments require that the tape punch be either "on" or "off." When a tape punch is "on," it is capable of converting coded intelligence into punched tape. When it is "off," the tape punch is not capable of converting coded intelligence into punched tape. These conditions can be further identified as follows:

(a) Manual Controls: A tape punch within this grouping is "off" when the control lever is detented in its most clockwise position and, when detented, locks the drive post in the off position (1.11). The opposite is true when the tape punch is "on"—the control lever is raised to its most counterclockwise position and does not lock the drive post in the off position.

(b) Automatic Controls: A tape punch within this grouping is "off" when the feed pawl does not engage the feed wheel ratchet—the lever of the control bail assembly is latched by the latch bail. Again, the opposite is true when a tape punch is "on"—the feed pawl engages a tooth of the feed wheel ratchet and the lever of the control bail assembly is not latched by the latch bail.

1.11 With the tape punch and typing unit assembled together, all adjusting procedures shall be started with the typing unit in the stop condition. It is in the stop condition when the selector armature is in its attracted (frontward) position and all clutches are disengaged. Furthermore, when the typing unit is in the stop condition, the tape punch will be in the off position.

Note: The off position of the tape punch is roughly the midpoint of the path which the feed pawl arm takes while oscillating during a tape punch cycle. A tape punch cycle begins with counterclockwise movement (feed and select) of the feed pawl arm, then clockwise movement (punch), and finally counterclockwise movement (strip and punch pin withdrawal) to the off position.

1.12 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches as instructed in 1.13 below.

Note 1: A stop position is that position where a shoe lever contacts a trip lever.

Note 2: The distributor clutch will not disengage unless the answer-back drum is in its home position, which is the position where the control lever is fully detented into the indent on the answer-back drum.

1.13 When disengaged, a clutch is latched so that a shoe lever is held in its stop position by a trip lever while a corresponding latchlever is seated in a notch of the clutch disc. This allows the clutch shoes to release their tension on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any clutch shoes dragging.

Note: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. To fully disengage a clutch, rotate the clutch to a stop position, apply a screwdriver to the associated stop-lug, and push the clutch disc in the normal direction of main shaft rotation until the corresponding latchlever seats in its clutch disc notch.

1.14 A clutch is engaged when a trip lever is moved up so that it no longer holds a shoe lever in its stop position. When this action occurs, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch shoes wedge against the drum so that when the shaft is turned the clutch will turn in unison with it.

1.15 Manual Operation: To manually operate the typing unit, place it in the stop condition as instructed in 1.12 and 1.13 above. Momentarily permit the armature to move to its unattracted (rearward) position to trip the selector clutch. Slowly rotate the main shaft clockwise (as viewed from the left) until all push levers have moved under their respective selector levers. Using a spring hook, strip the push levers from under the selector levers corresponding to the spacing elements of the code combination to be set up. Then continue to rotate the main shaft until the proper condition is set up or the character is cleared through the typing unit.

1.16 On 32 typing units, the selector levers are number "1" through "5" from left to right. To set up the character "Y," for example, whose 5-level code combination is 1-3-5, strip the push levers from the "2" and "4" selector levers. On 33 typing units, the selector levers are numbered "1," "2," "3," "4," "5," "7," "6," and "8" from left to right. To set up the character "Y," for example, whose 8-level code combination is 1--45-78, strip the push levers from the "2," "3," and "6" selector levers.

1.17 Coded intelligence is transferred from the typing unit selector to the tape punch via the codebar extension, sensing levers, etc. This coded intelligence is ultimately evidenced by the code combinations which are punched into paper tape by the punch pins which are located in the punch block assembly of the tape punch. Each punch pin, except the feed (F) punch pin, represents a code level. The relationship between code levels, sensing levers, and codebar extension is illustrated in Figure 2.

1.18 General Maintenance Principles:

(a) Lubrication instructions and intervals are given in the appropriate lubrication sections.

(b) To maintain the operational effectiveness of the equipment, it is recommended that certain parts be replaced at intervals based upon the speed and operating hours as indicated below:

Operating Speed (Words per Minute)	Recommended Maintenance Overhaul Interval (Operating Hours *)	Estimated Service Life (Operating Hours *)
60 or 66	2500	7500
100	1500	4500

* Typing Unit Operating Hours

The parts are available in overhaul maintenance kits listed in the appropriate parts publication.

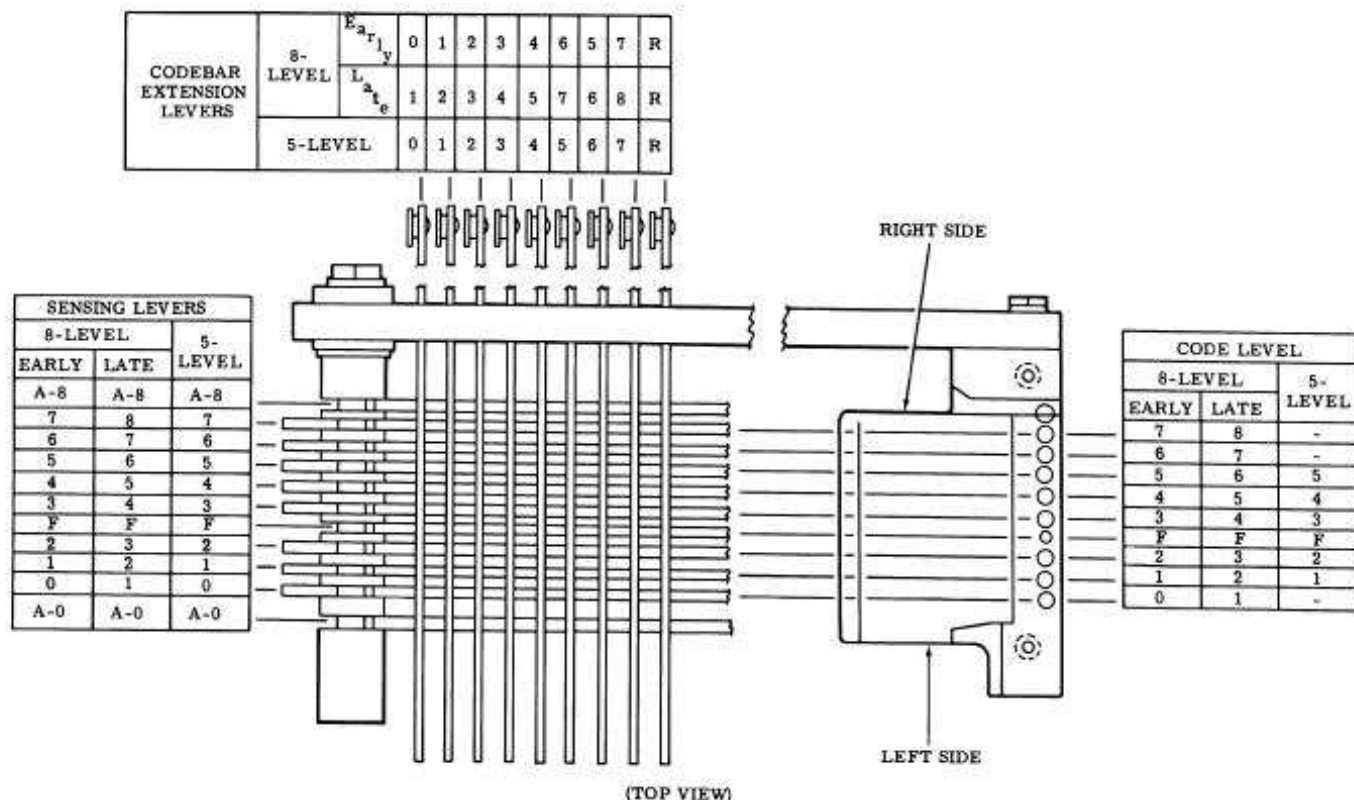


Figure 2 - Tape Punch Code Level Cross Reference Chart

2. BASIC UNIT

2.01 Tape Punch Area

Note 1: Prior to making adjustments, remove the chad extension TP182915. Reassemble when the adjustments are completed.

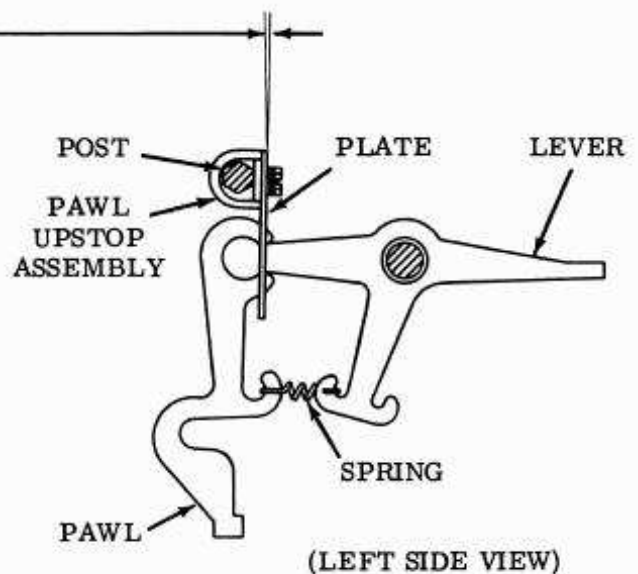
PAWL UPSTOP ASSEMBLY—PRELIMINARY

Requirement

At the time of disassembly or reassembly of the pawl upstop assembly, it shall be positioned so that it is vertical or nearly vertical.

To Adjust

Loosen the screw which secures the pawl upstop assembly post to the tape punch casting and position pawl upstop assembly.



TAPE NUDGER

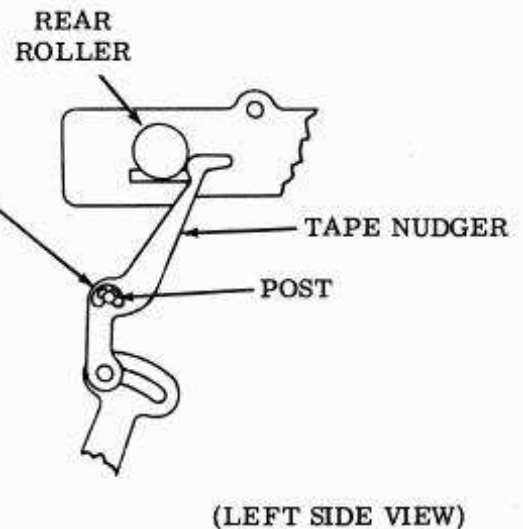
Note 2: This adjustment applies only to tape punches which have an elongated hole in the tape punch casting.

Requirement

At the time of disassembly or reassembly of the post, it shall be in its most rearward position.

To Adjust

Loosen the screw which secures the post to the tape punch casting and position the post.

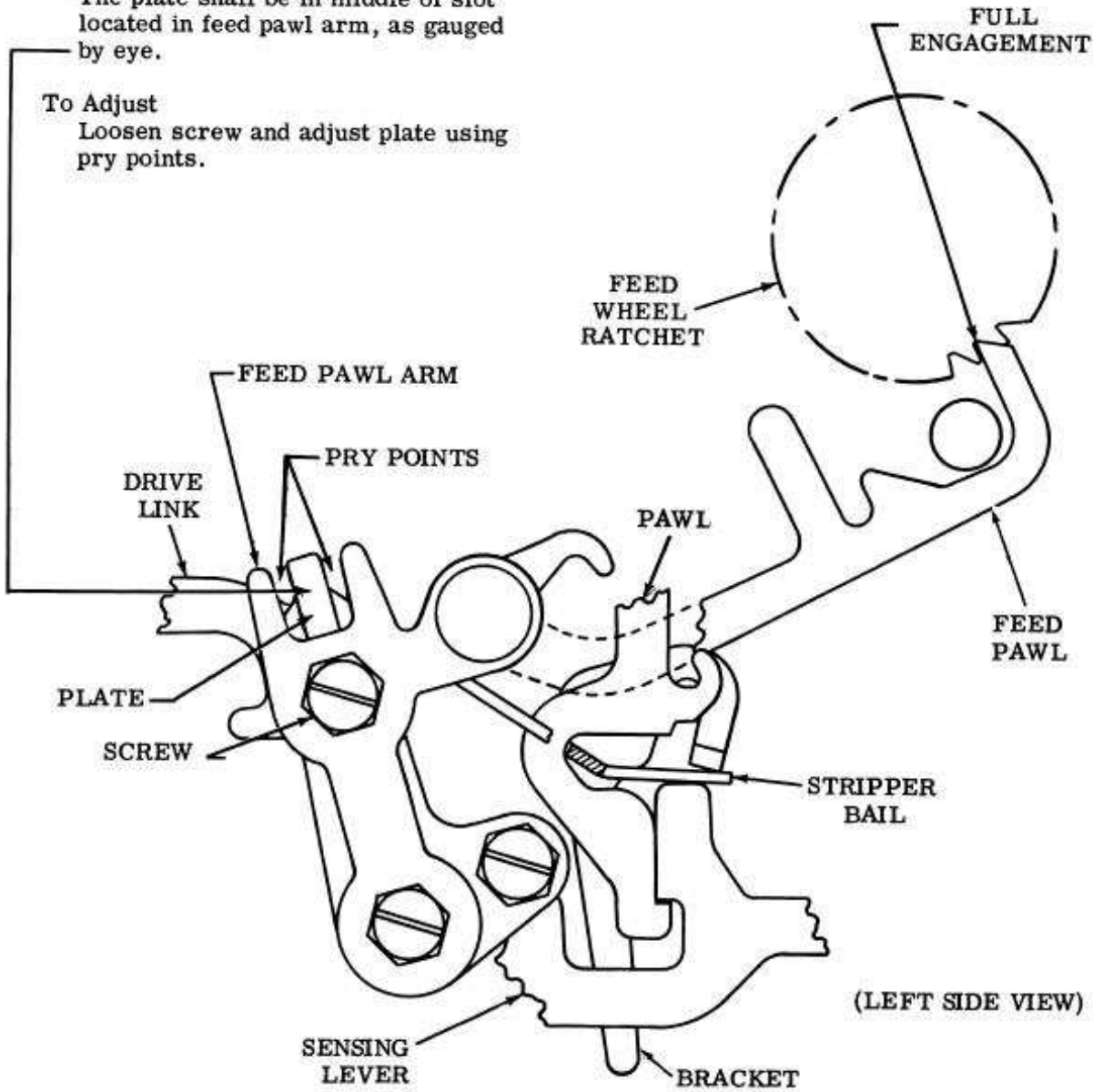


2.02 Tape Punch Area (continued)

FEED WHEEL RATCHET AND PAWL— PRELIMINARY

Requirement
The plate shall be in middle of slot located in feed pawl arm, as gauged by eye.

To Adjust
Loosen screw and adjust plate using pry points.



2.03 Tape Punch Area (continued)

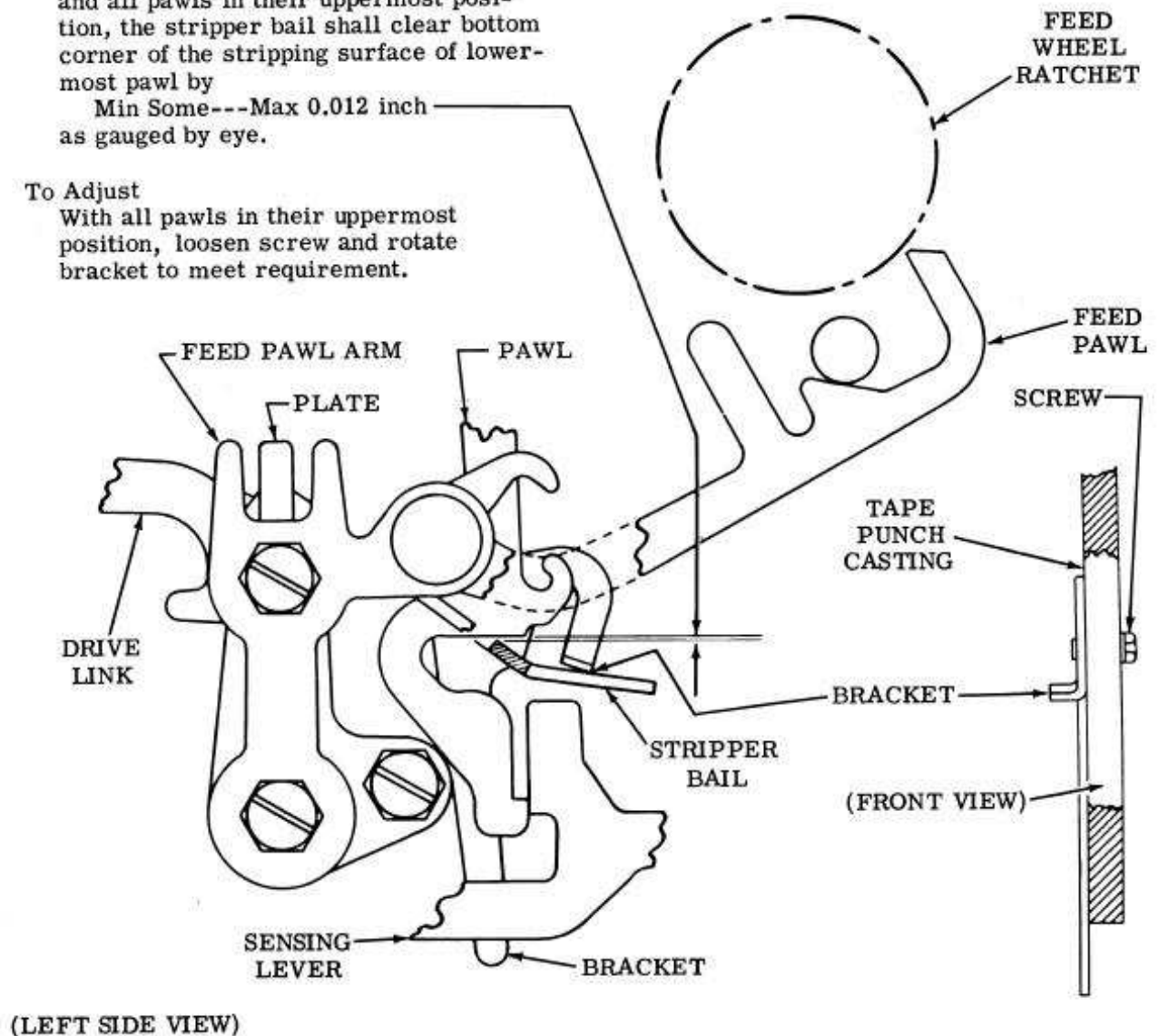
STRIPPER BAIL UPSTOPRequirement

With the tape punch in the off position and all pawls in their uppermost position, the stripper bail shall clear bottom corner of the stripping surface of lowermost pawl by

Min Some---Max 0.012 inch
as gauged by eye.

To Adjust

With all pawls in their uppermost position, loosen screw and rotate bracket to meet requirement.



2.04 Tape Punch Area (continued)

Note 1: For the adjustments which follow, the tape punch shall be mounted to the typing unit. For instructions, see section titled "32 and 33 Tape Punch, Disassembly and Reassembly."

Note 2: The following Tape Punch Area adjustments must be made in sequence: TAPE PUNCH DRIVE, PUNCH PENETRATION, PAWL UPSTOP ASSEMBLY — FINAL, and FEED WHEEL RATCHET AND PAWL — FINAL. Prior to making the above adjustments, check or make the following Tape Punch Area adjustments: PAWL UPSTOP ASSEMBLY — PRELIMINARY, TAPE NUDGER, FEED WHEEL RATCHET AND PAWL — PRELIMINARY, and STRIPPER BAIL UPSTOP.

TAPE PUNCH DRIVETo Check

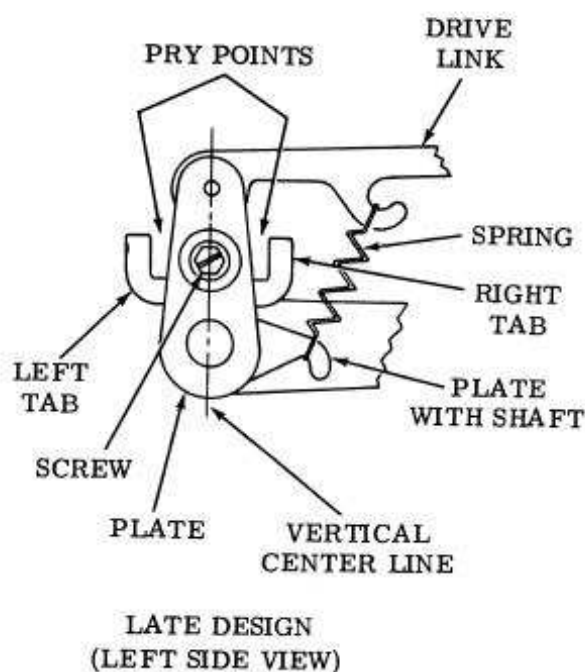
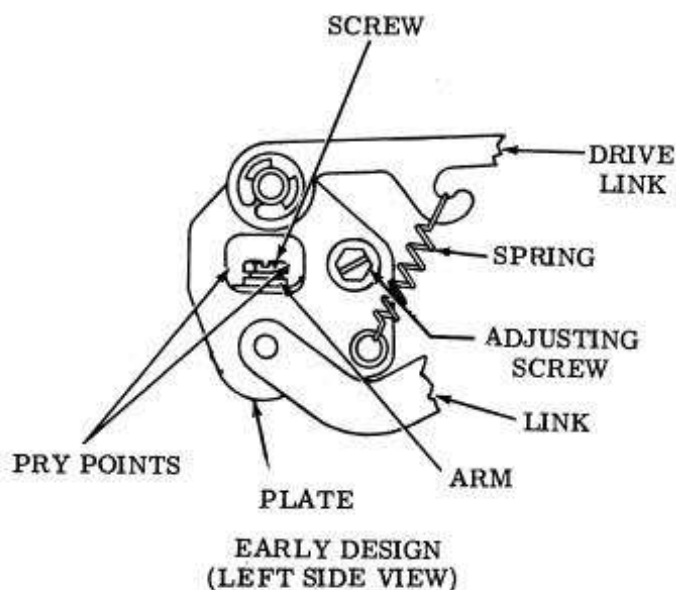
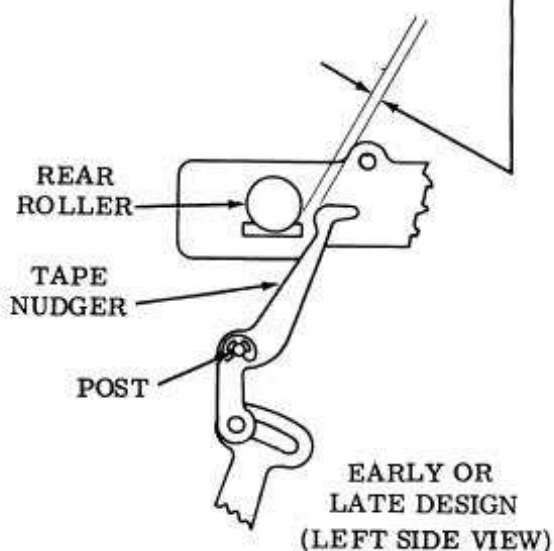
With no tape in the tape punch and with the tape punch "on," manually rotate the main shaft until the function rocker shaft and stripper bail are in their most forward positions. Take up rear roller play toward rear and tape nudger play in a clockwise direction.

Requirement

Min 0.070 inch---Max 0.090 inch between the rear roller and highest point on tape nudger.

To Adjust

Loosen screw and position plate using pry points.



Note 3: When subsequently rechecking the TAPE PUNCH DRIVE adjustment, the requirement shall be considered met if there is

Min 0.030 inch---Max 0.120 inch between the rear roller and highest point on tape nudger.

2.05 Tape Punch Area (continued)

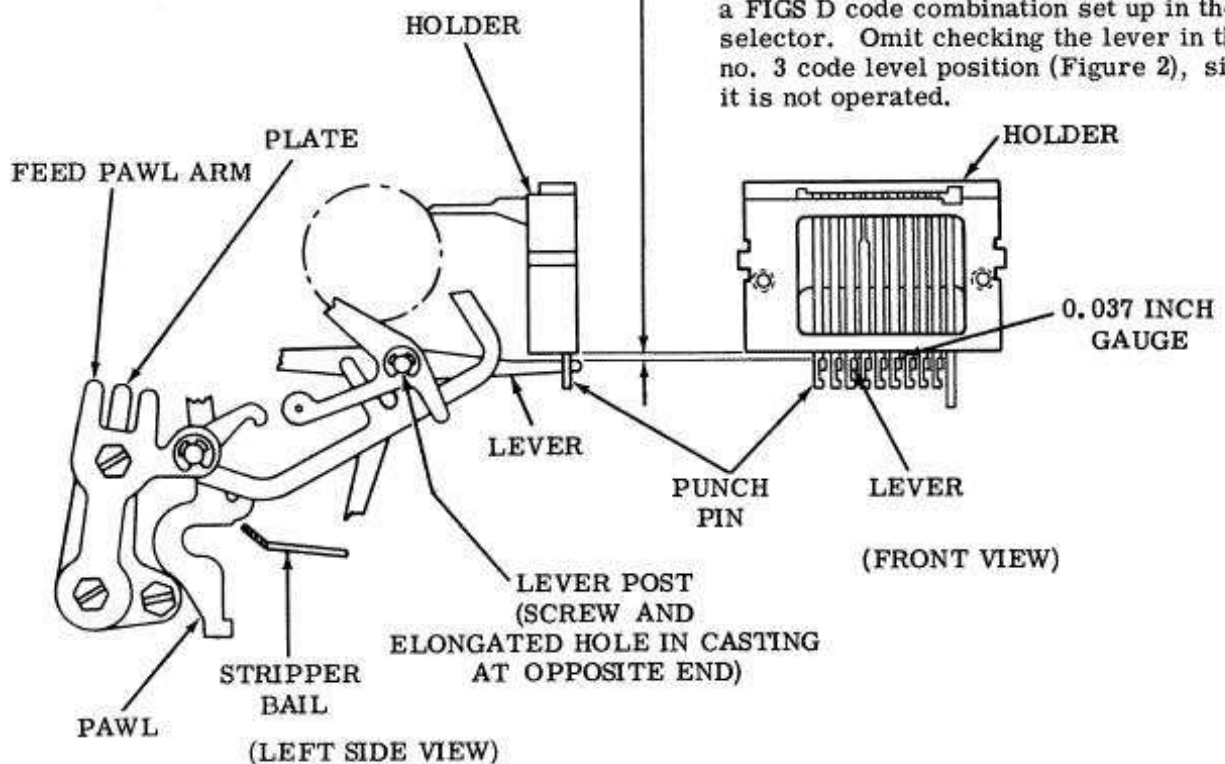
PUNCH PENETRATION**To Check**

With no tape in the tape punch and with the tape punch "on," set up an "all-marking" code combination in the selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their most forward positions. Determine which lever has the least and which has the greatest clearance between lever's top surface and the bottom surface of the holder.

Requirement

- (1) Min 0.032 inch---Max 0.037 inch between the bottom surface of the holder and the top surface of the lever which has the greatest clearance.
- (2) Min 0.017 inch between the bottom surface of the holder and the top surface of the lever which has the least clearance.

Note 1: For those 5-level tape punches equipped with an auxiliary drive bail TP182186, repeat the above procedure with a FIGS D code combination set up in the selector. Omit checking the lever in the no. 3 code level position (Figure 2), since it is not operated.

**To Adjust**

Loosen the lever post screw and position the lever post in its elongated hole.

Note 2: When subsequently rechecking the PUNCH PENETRATION adjustment, the requirement shall be considered met if there is

Min 0.017 inch---Max 0.037 inch between the bottom surface of the holder and the top surface of each lever.

2.06 Tape Punch Area (continued)

PAWL UPSTOP ASSEMBLY — FINAL

To Check

With the tape punch "on," set up an "all-marking" code combination in the selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their rearmost positions.

Note 1: For tape punches equipped with special features such as FIGS D or automatic controls, use the following "To Check" procedure:

To Check

With the tape punch "on," set up the code combination in the selector that will cause the special feature to operate. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their rearmost positions. Check requirement (1). Then, set up an "all-marking" code combination in selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their rearmost positions. Check requirement (2).

(1) Requirement

Min 0.005 inch---Max 0.020 inch between the leftmost sensing lever (Figure 2) and its associated pawl.

Note 2: There shall also be some clearance between the rightmost sensing lever (Figure 2) and its associated pawl.

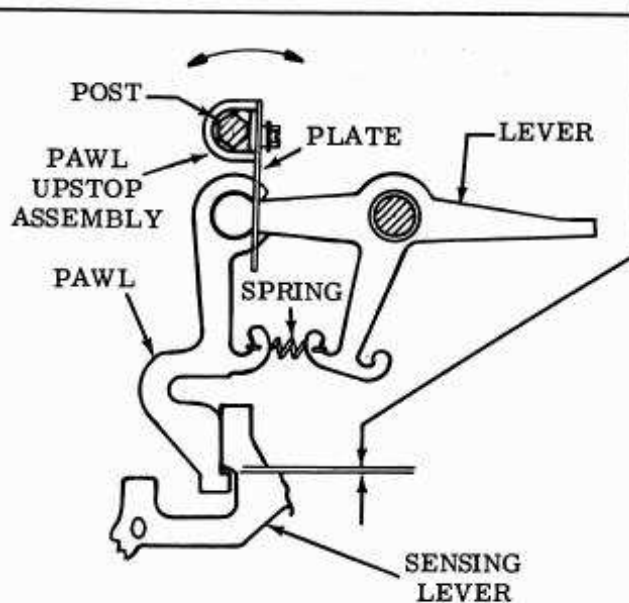
Note 3: "Some clearance" can be determined by feeling movement when pressing down on a sensing lever while holding its assembled lever in its most downward position.

(2) Requirement

Some clearance between the feed lever and its associated pawl and each sensing lever and its associated pawl.

To Adjust

Loosen the screw which secures the pawl upstop assembly post to the tape punch casting. Provide proper clearance by rotating the pawl upstop assembly. Recheck requirement (1) above and refine if necessary. Remake STRIPPER BAIL UPSTOP (Tape Punch Area) adjustment.



(LEFT SIDE VIEW)

CAUTION: EXERCISE CARE AND SEE THAT THE PLATE OF THE PAWL UPSTOP ASSEMBLY ALWAYS GUIDES THE PAWL AND LEVER SIMULTANEOUSLY. AVOID ROTATING PLATE IN A COUNTERCLOCKWISE DIRECTION FROM ITS VERTICAL POSITION IF POSSIBLE.

2.07 Tape Punch Area (continued)

FEED WHEEL RATCHET AND PAWL—FINAL**To Check**

With no tape in the tape punch and with the tape punch "on," set up an "all-marking" code combination in the selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their rearmost positions. Take up all play in stripper bail toward rear.

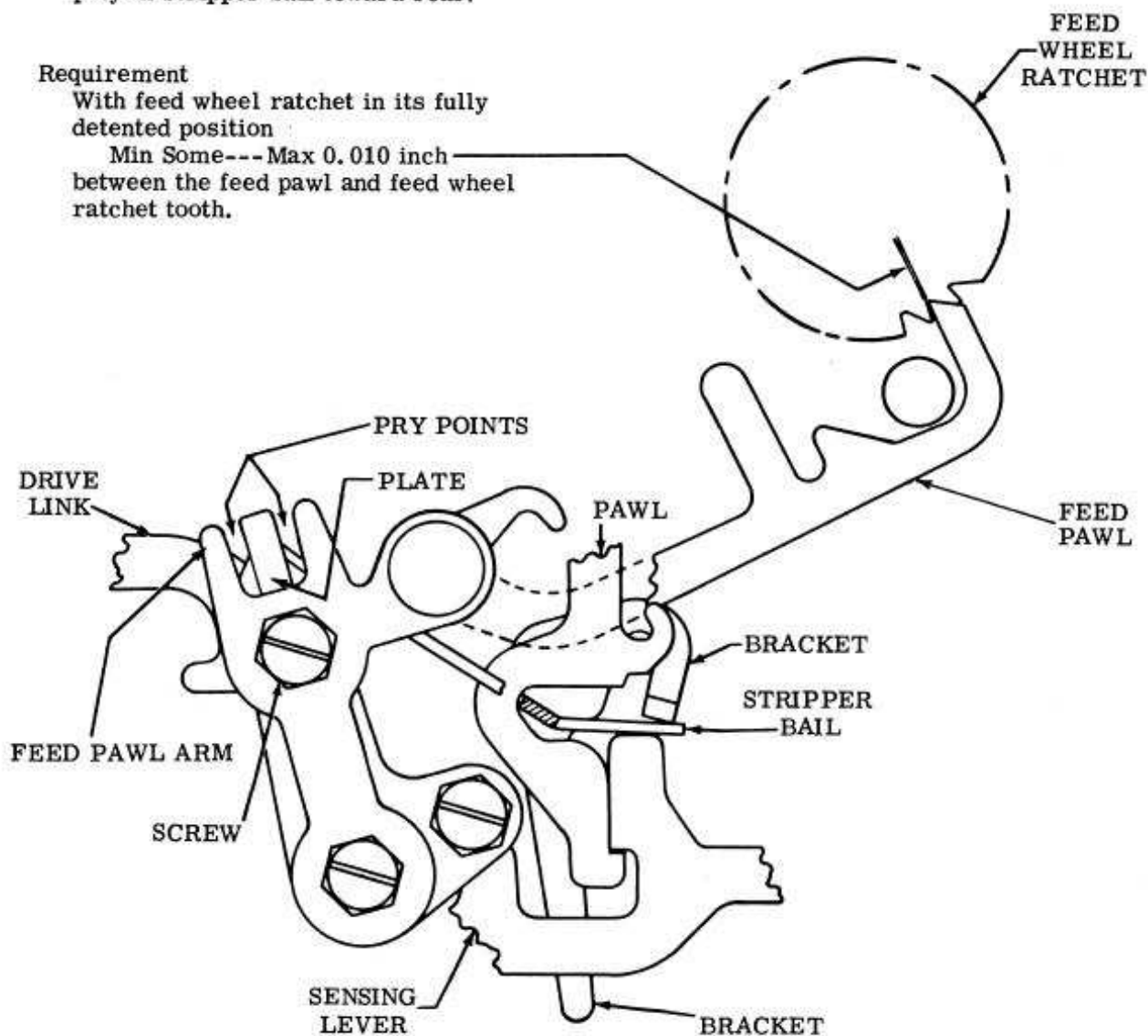
To Adjust

Loosen screw and position plate w/bushing using pry points. Backspace feed wheel ratchet one full revolution, one tooth at a time, using backspace lever. Check each tooth to see if the requirement is met. Gauge by eye. Readjust where necessary.

Requirement

With feed wheel ratchet in its fully detented position

Min Some---Max 0.010 inch
between the feed pawl and feed wheel
ratchet tooth.



(LEFT SIDE VIEW)

2.08 Tape Punch Area (continued)

TEN CHARACTERS PER INCH

- **Note 1:** From left to right, with the smooth side of gauge TP156011 up, there are six holes in line—five holes with 0.072-inch diameters and one hole with an 0.086-inch diameter.

To Check

- Position one end of spring to lower notch of arm w/bushing. Operate the typing unit under power and perforate either alternate R and Y or R and "hyphen" code combinations in approximately 8 inches of tape. Tear the 8-inch length of punched tape from the tape punch and place it to the smooth side of gauge TP156011. Concentrically align a no. 2 code hole of the punched tape with the first 0.072-inch diameter hole of gauge TP156011.

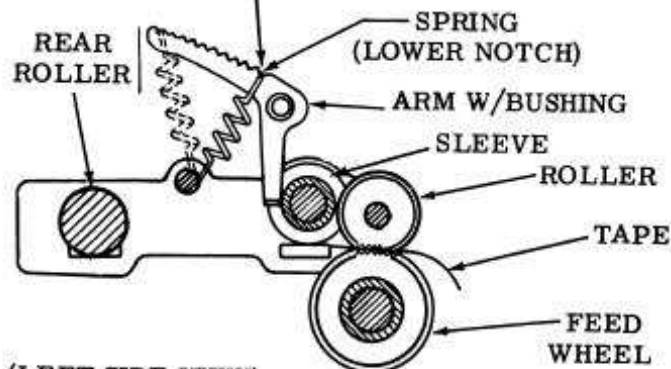
Note 2: Perforate alternate R and Y code combinations when checking 5-level tape punches. Use the R and "hyphen" code combinations when checking 8-level tape punches.

Requirement

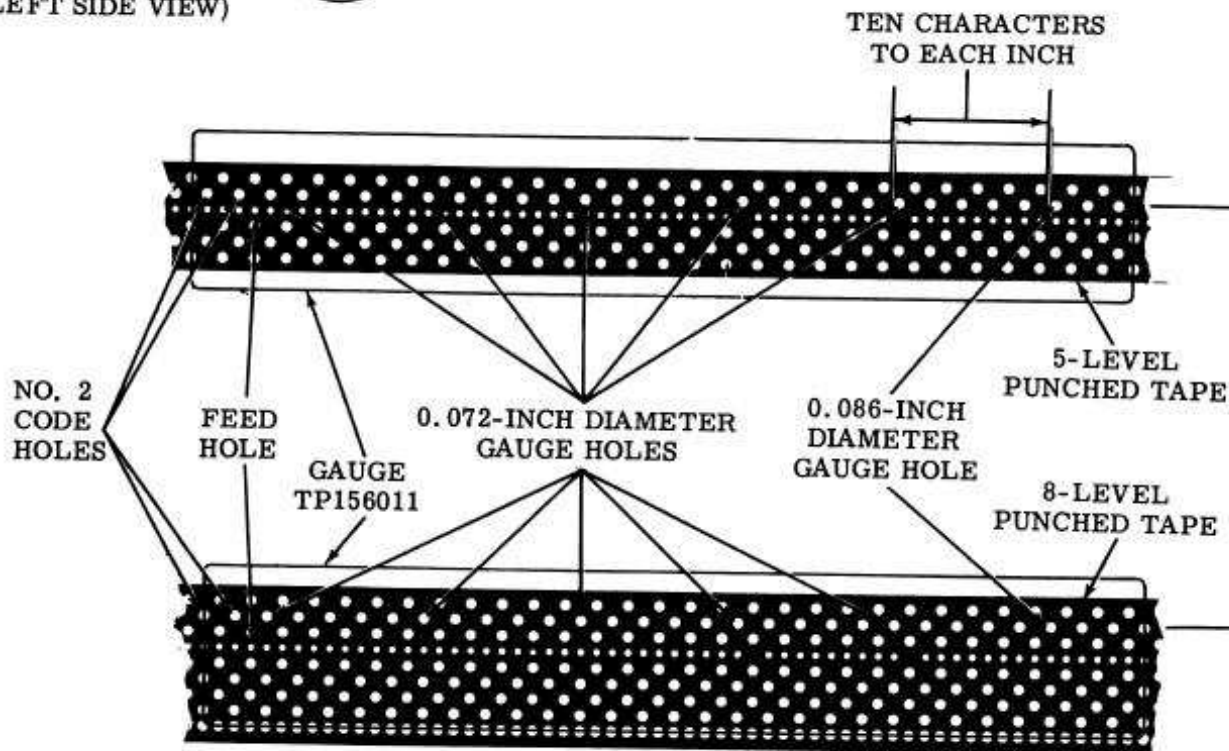
- (1) The four remaining 0.072-inch diameter gauge holes shall be visible through corresponding no. 2 code holes in the punched tape.
- (2) The no. 2 code hole which corresponds with the 0.086-inch diameter gauge hole shall lie entirely within the perimeter of that gauge hole.

To Adjust

Position spring up arm w/bushing, notch by notch, until requirement is met.



(LEFT SIDE VIEW)



(TOP VIEW)

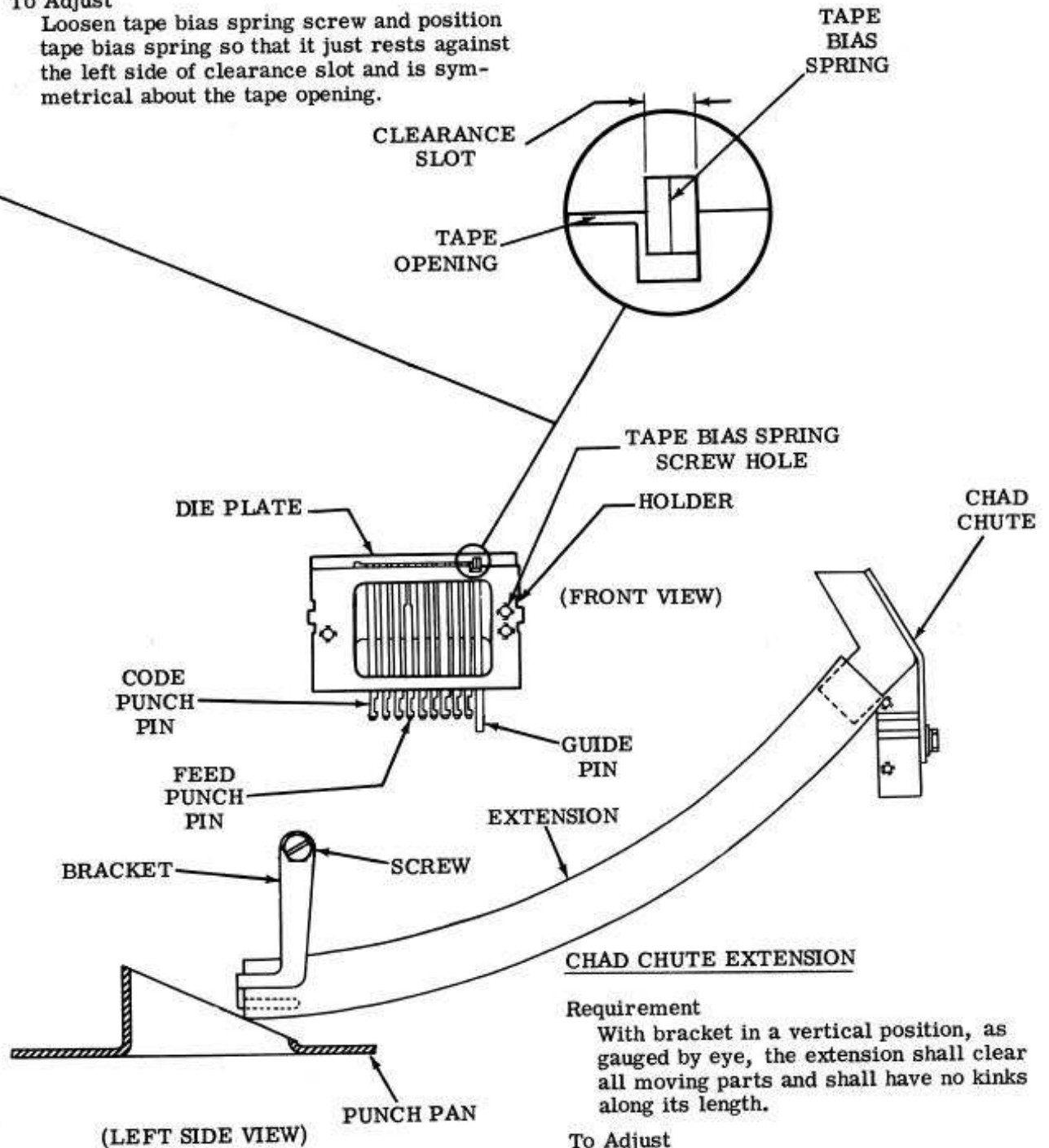
2.09 Tape Punch Area (continued)

TAPE BIAS SPRINGRequirement

With tape removed from the tape punch, tape bias spring shall rest against side of clearance slot in die plate and shall be symmetrical about the tape opening, as gauged by eye.

To Adjust

Loosen tape bias spring screw and position tape bias spring so that it just rests against the left side of clearance slot and is symmetrical about the tape opening.

Requirement

With bracket in a vertical position, as gauged by eye, the extension shall clear all moving parts and shall have no kinks along its length.

To Adjust

Loosen screw and position bracket to meet requirement.

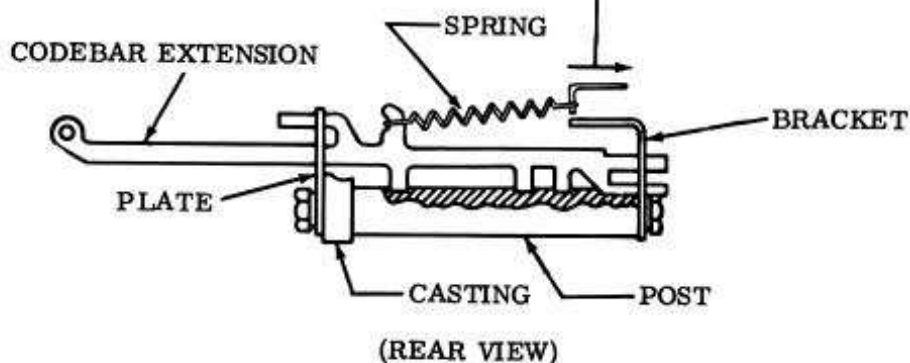
2.10 Tape Punch Area (continued)

CODEBAR EXTENSION SPRINGS

Requirement

With the typing unit in stop condition and
the tape punch in off position

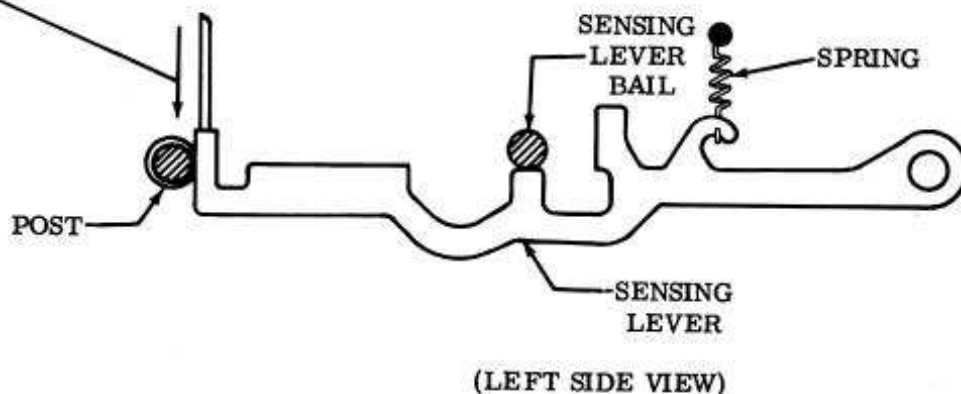
Min $\frac{3}{4}$ oz---Max $1\frac{1}{4}$ oz
to pull spring to its installed length.



SENSING LEVER SPRINGS

Requirement

With the tape punch in off position
Min 15 grams---Max 32 grams
to start sensing lever moving.



2.11 Tape Punch Area (continued)

PAWL AND LEVER SPRINGRequirement

With the tape punch in off position,

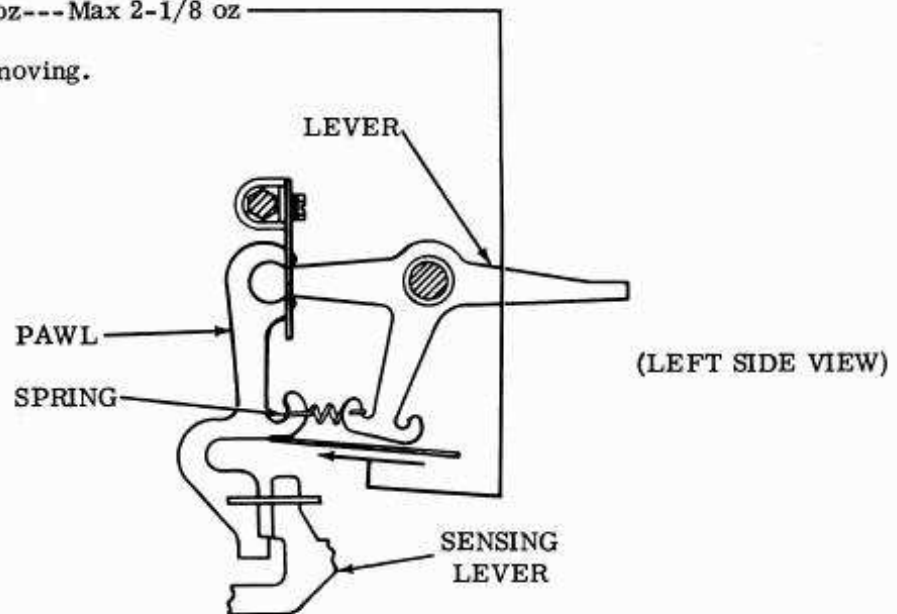
Upper spring

Min $7/8$ oz---Max $1-1/2$ oz

Lower spring

Min $1-1/2$ oz---Max $2-1/8$ oz

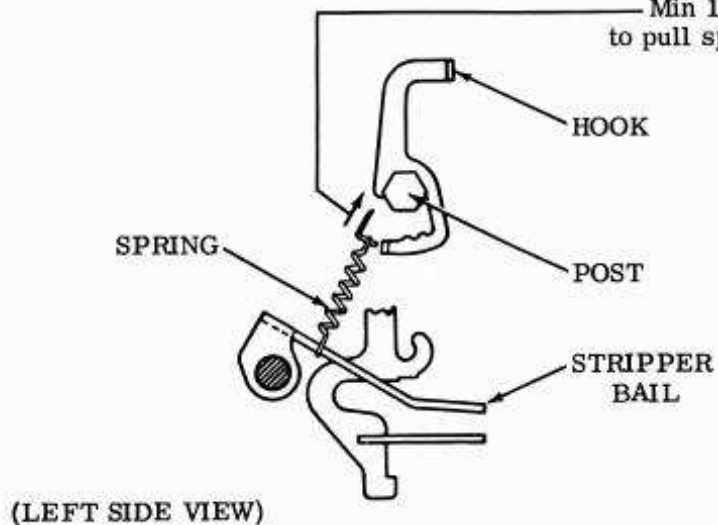
to start pawl moving.

STRIPPER BAIL SPRINGRequirement

With the tape punch in off position

Min 12 oz---Max 15 oz

to pull spring to its installed length.



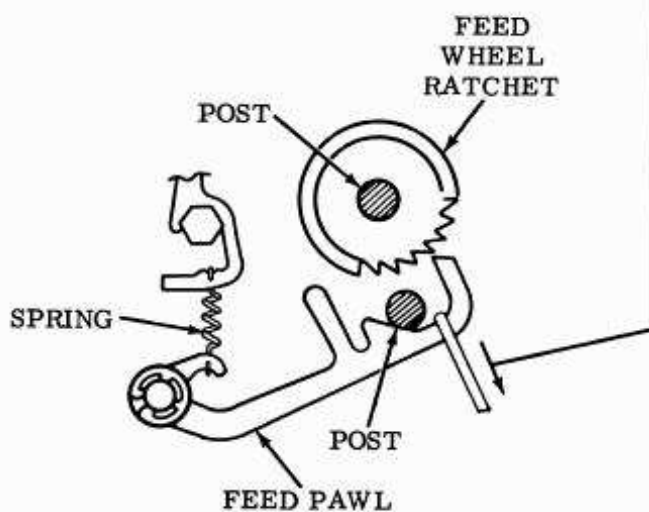
2.12 Tape Punch Area (continued)

FEED PAWL SPRING

Requirement

With tape punch in off position

Min 1/2 oz---Max 1 oz
to start feed pawl moving.



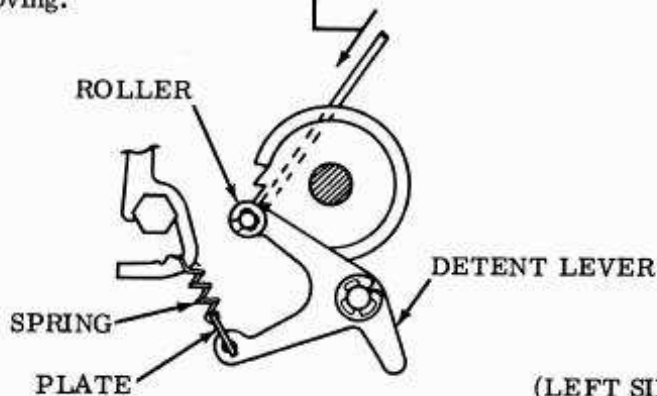
(LEFT SIDE VIEW)

DETENT LEVER SPRING

Requirement

With the tape punch in off position

Min 10 oz---Max 13 oz
to start detent lever moving.



(LEFT SIDE VIEW)

2.13 Tape Punch Area (continued)

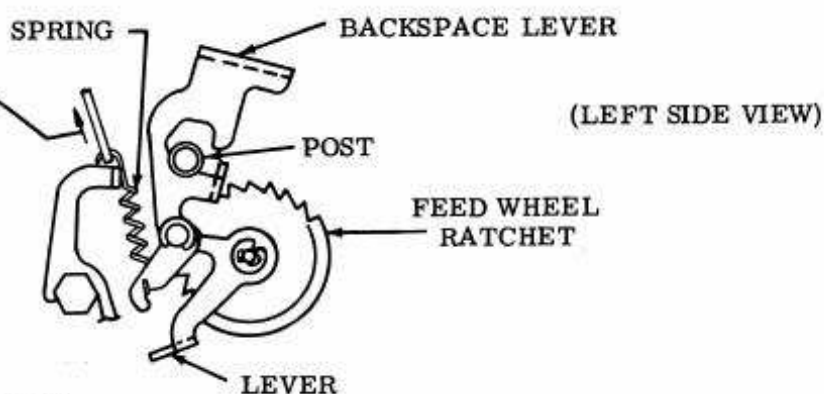
BACKSPACE LEVER SPRING

Requirement

With the tape punch in off position

Min 3/4 oz---Max 1-1/2 oz

to pull spring to its installed length.

TAPE GUIDE TENSION SPRING

Requirement

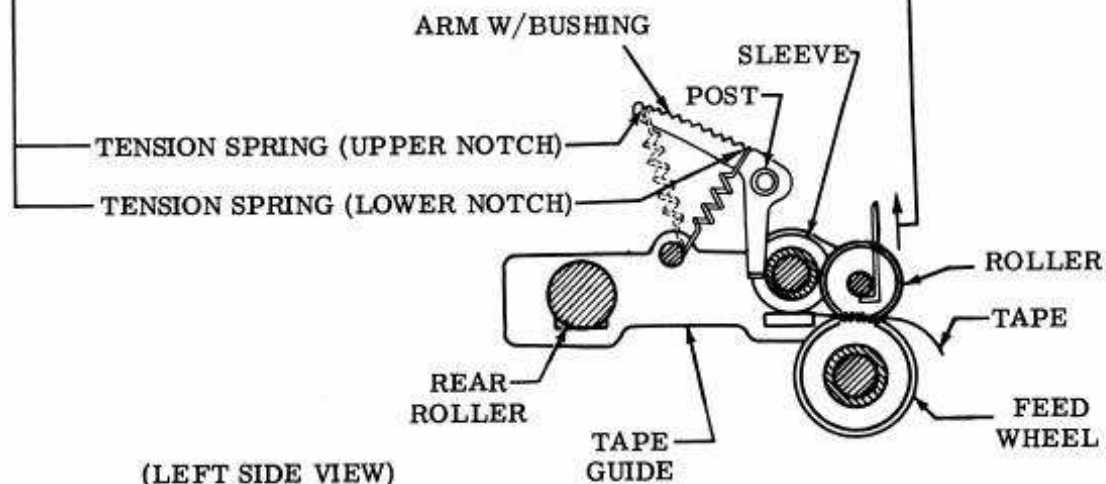
With the tape punch in off position
and with tension spring inUpper notch

Min 40 oz---Max 48 oz

Lower notch

Min 22 oz---Max 28 oz

to start tape guide moving.

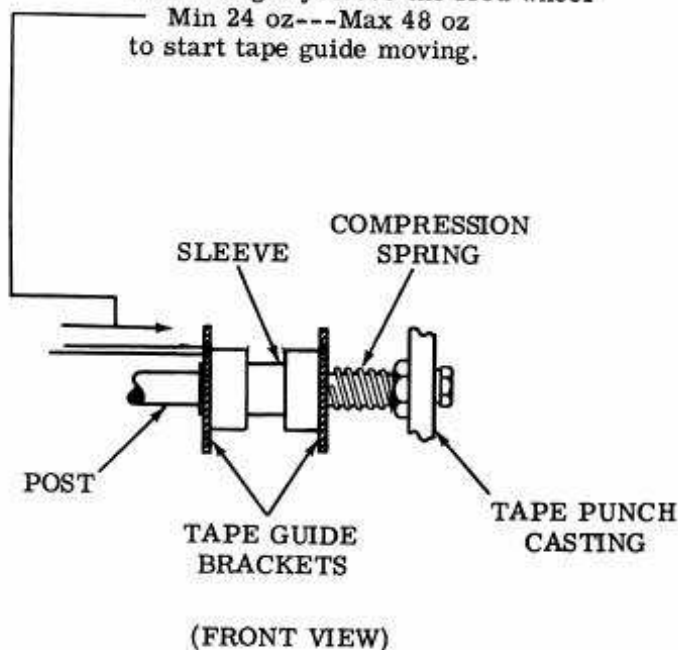


2.14 Tape Punch Area (continued)

TAPE GUIDE COMPRESSION SPRING

Requirement

With the tape punch in off position, remove the tension spring. Place roller slightly above the feed wheel
Min 24 oz---Max 48 oz
to start tape guide moving.

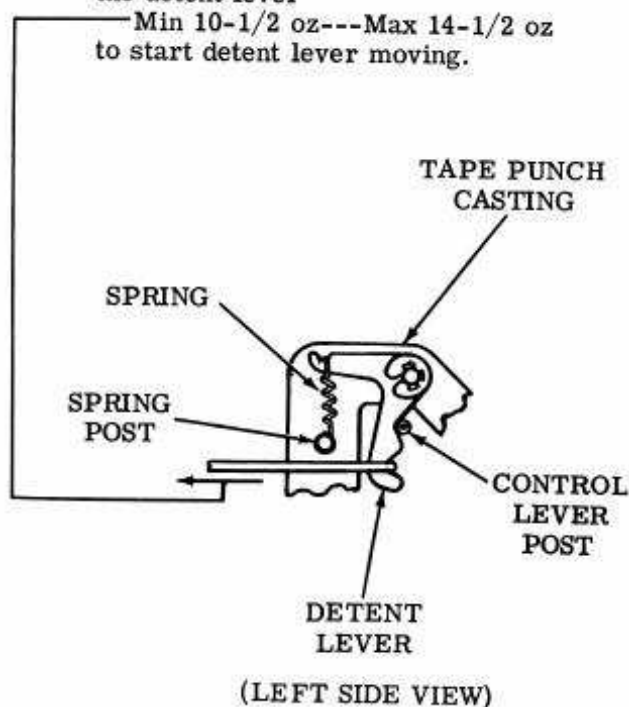


CONTROL DETENT LEVER SPRING

Note: This adjustment applies only to tape punches equipped with detent lever TP182843.

Requirement

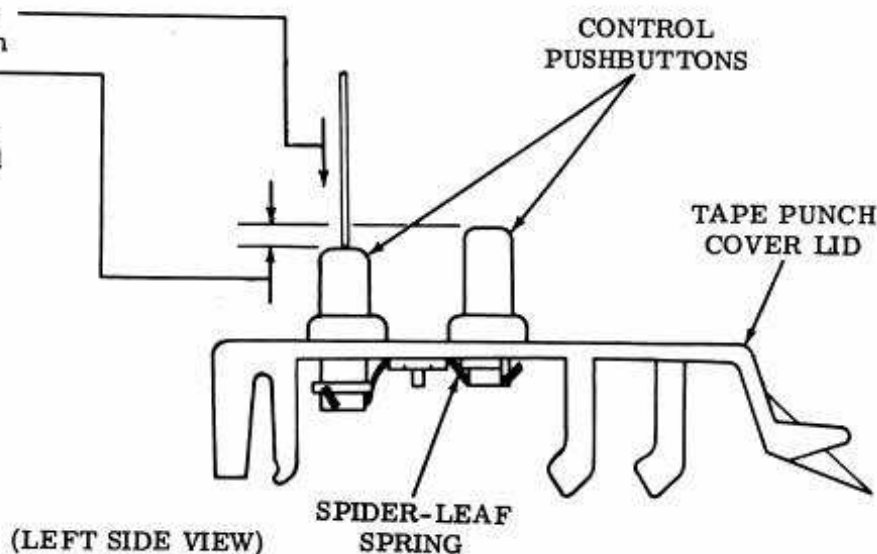
With the tape punch in off position — the control lever post in the upper notch of the detent lever
Min 10-1/2 oz---Max 14-1/2 oz
to start detent lever moving.



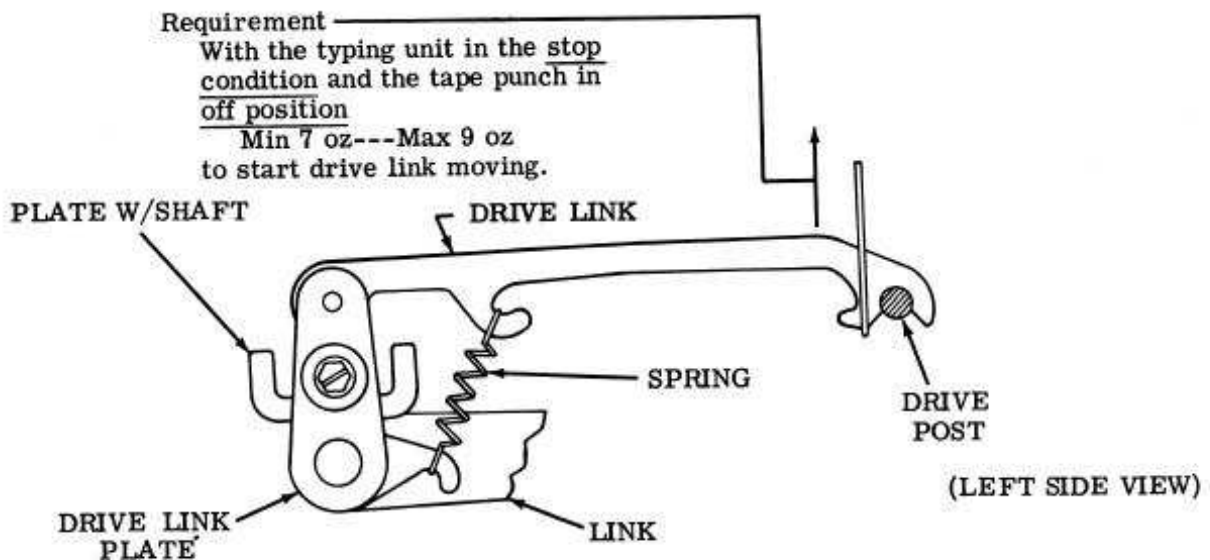
CONTROL PUSHBUTTONS

Requirement

Min 1/2 oz---Max 1-1/2 oz
to push each control pushbutton
down 1/8 inch
as gauged by eye, while
remaining control pushbuttons
remain in their normal upward
positions.



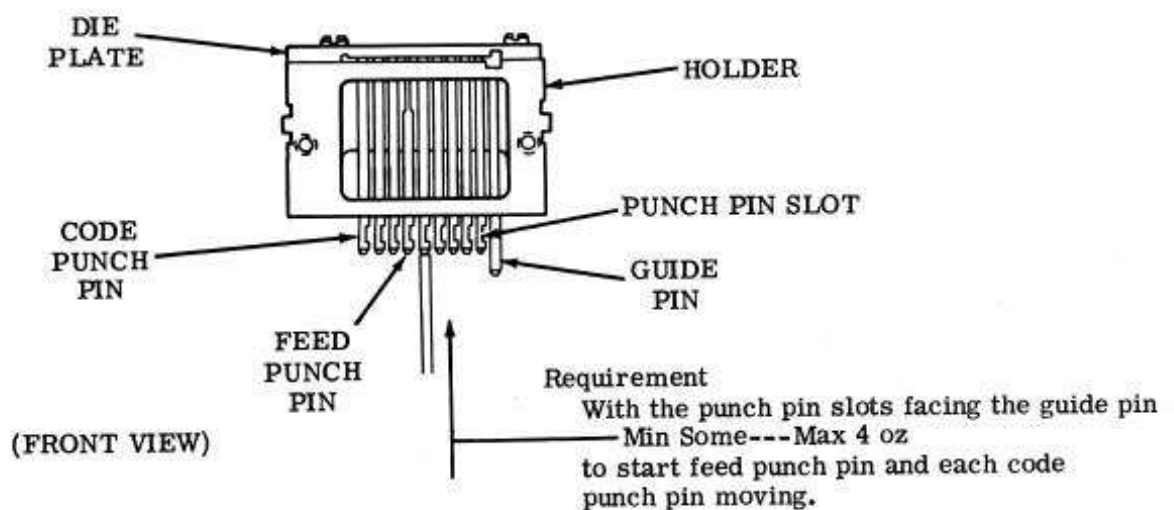
2.15 Tape Punch Area (continued)

DRIVE LINK SPRING

Note 1: The following adjustment applies to either 5-level or 8-level tape punches.

PUNCH BLOCK ASSEMBLYTo Check

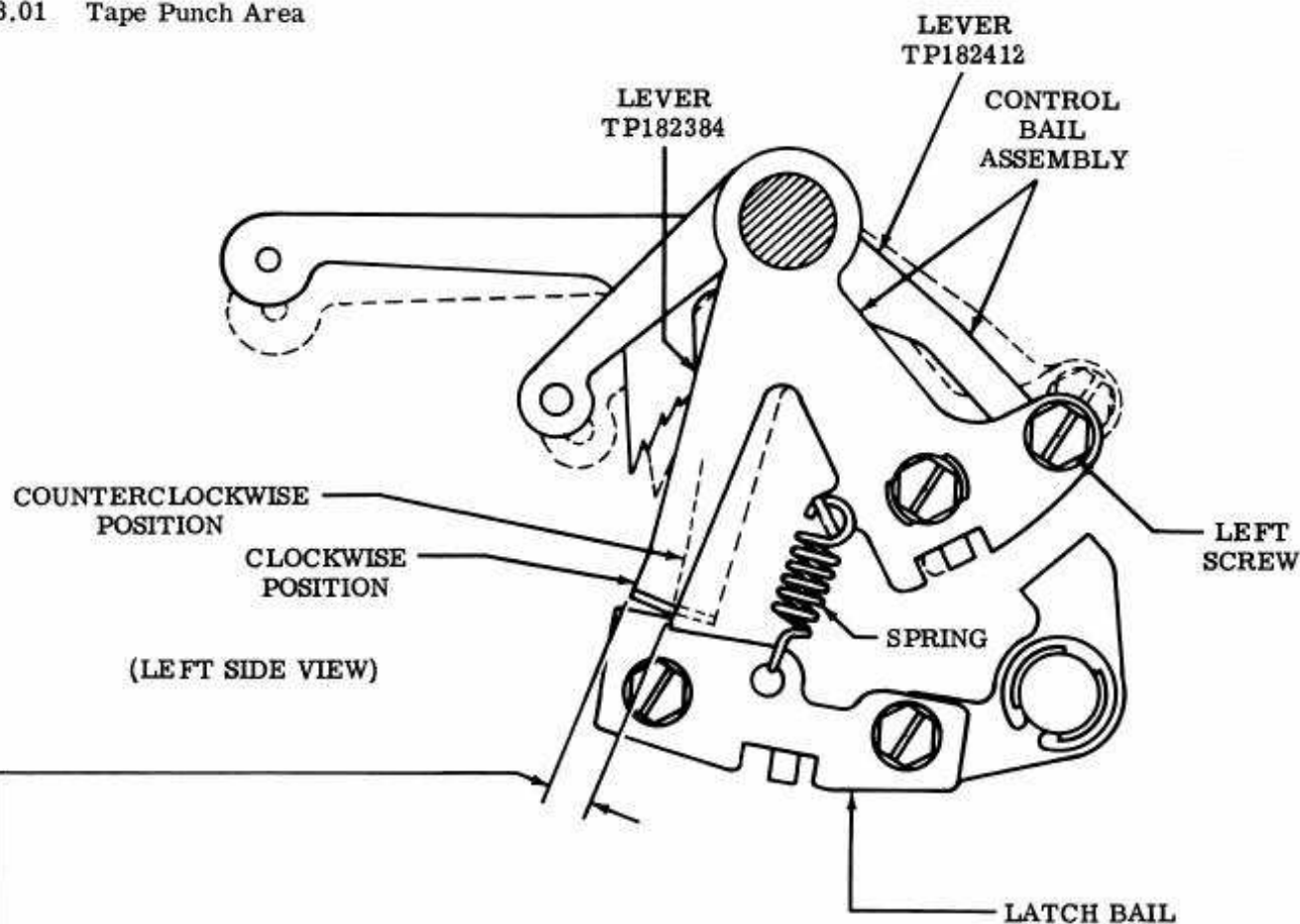
Remove the punch block assembly from the tape punch. Replace after performing this adjustment. (For instructions, see the appropriate tape punch section.)



Note 2: The above requirement must be met anywhere along each punch pin's travel in holder.

3. AUTOMATIC CONTROLS

3.01 Tape Punch Area



CONTROL BAIL ASSEMBLY

To Check

With the typing unit in the stop condition and the tape punch "on," gently oscillate the control bail assembly from its clockwise position to its counterclockwise position and back again. Repeat this oscillating motion several times while noting requirement.

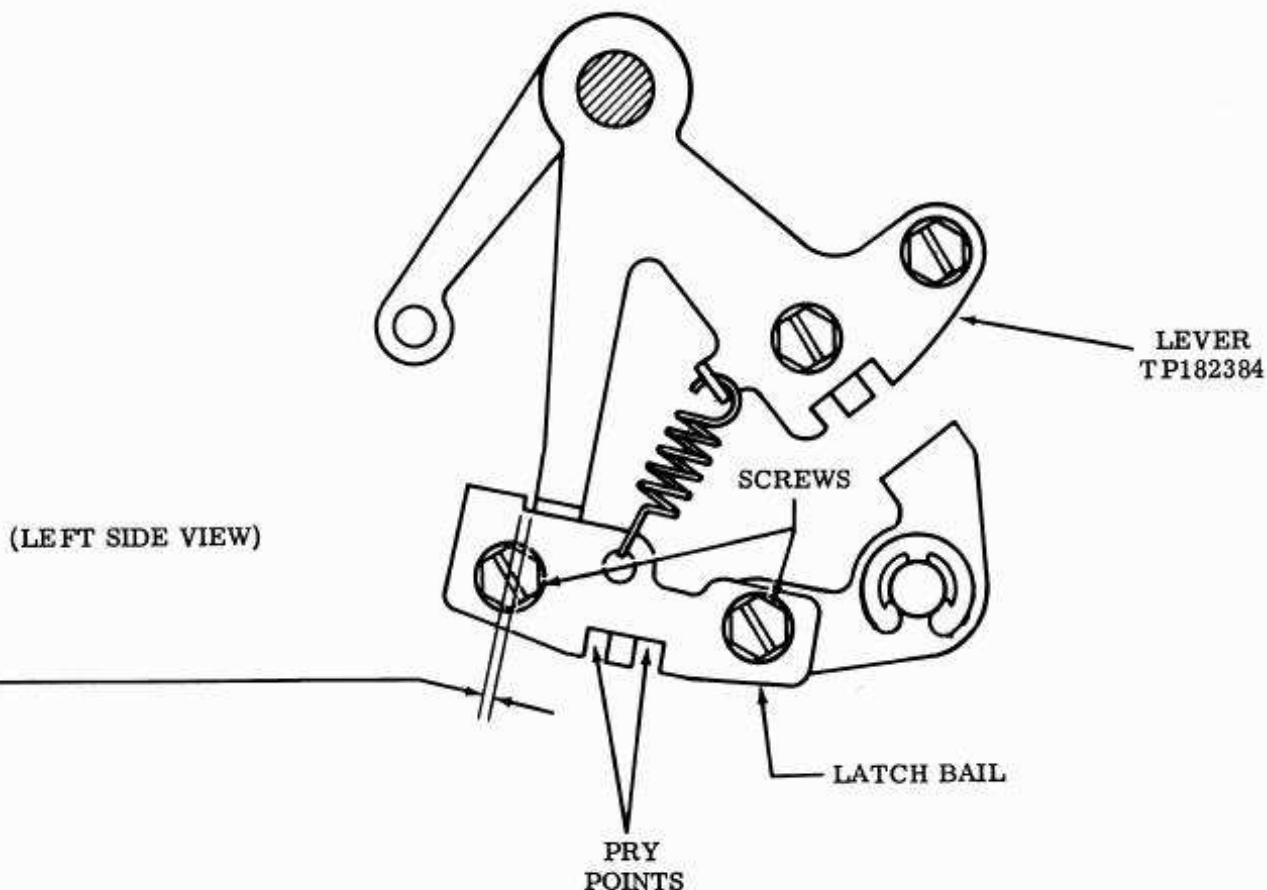
Requirement

- (1) The control bail assembly shall be free from binds along its normal travel.
- (2) When released from its counterclockwise position, the control bail assembly shall return to its clockwise position under spring tension.

To Adjust

Remove the control bail spring, latch bail spring, and the left screw. Loosen the right screw and retighten. Without bending lever TP182384 and lever TP182412, the threaded hole of post TP182388 shall fall within the hole in lever TP182384. Bend if necessary. Reassemble left screw before reassembling springs. Recheck requirement and refine, if necessary.

3.02 Tape Punch Area (continued)

LEVER OVERTRAVELTo Check

With the tape punch "on," set up the **TAPE** (--3-5---) code combination in the selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their most forward positions.

Note: The code combination which will automatically turn the tape punch off is the one to select. In this case, the 8-level "even parity" code combination is given.

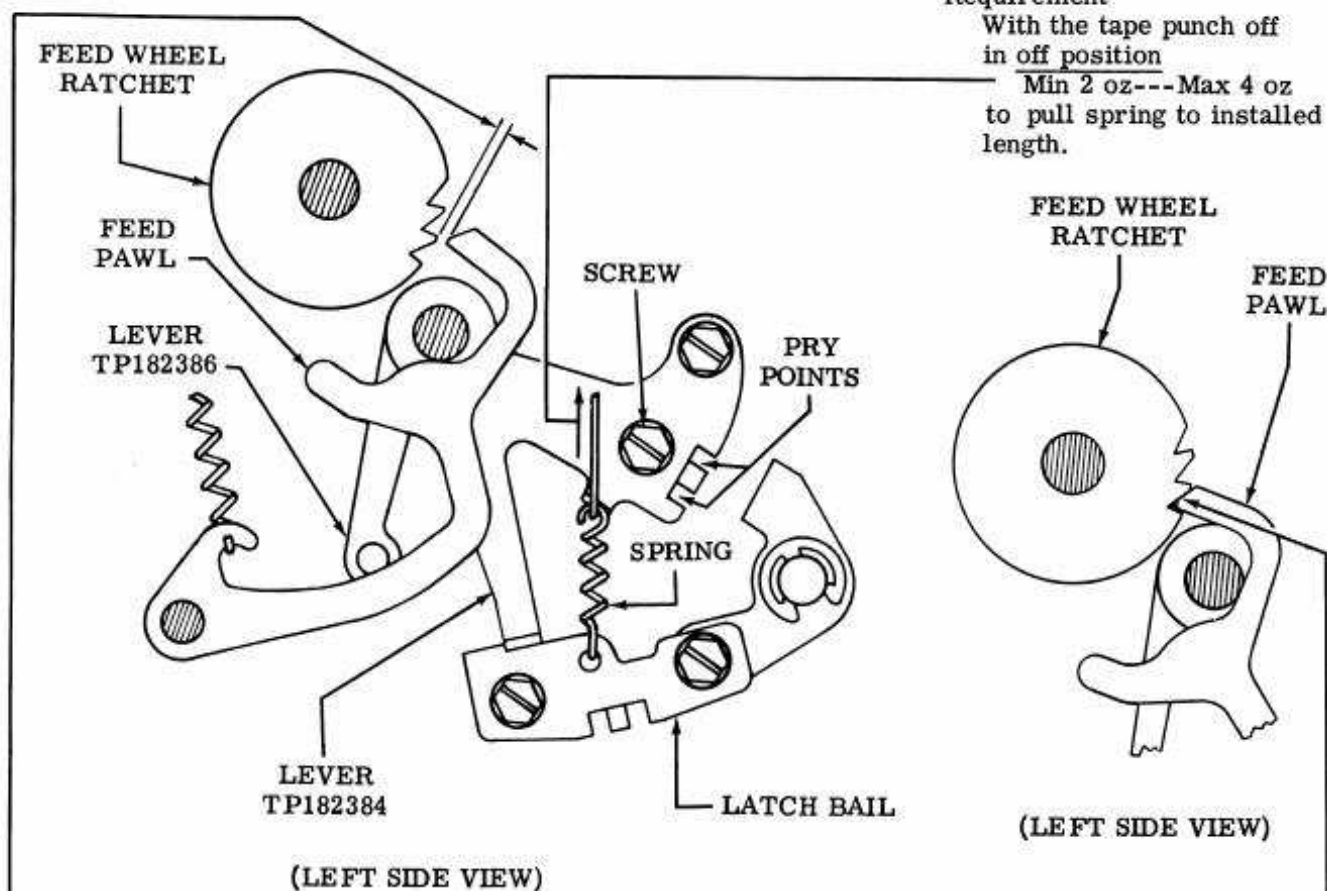
Requirement

Min 0.005 inch---Max 0.015 inch
between the lever TP182384 and latch bail.

To Adjust

Loosen screws and position latch bail using pry points.

3.03 Tape Punch Area (continued)



3.04 Tape Punch Area (continued)

SENSING LEVER AND BAIL GAP

Note: This adjustment applies only to tape punches equipped with the sense suppression option — bail TP182430 etc.

To Check

With the tape punch "off," manually rotate the main shaft until the tape punch is in the off position.

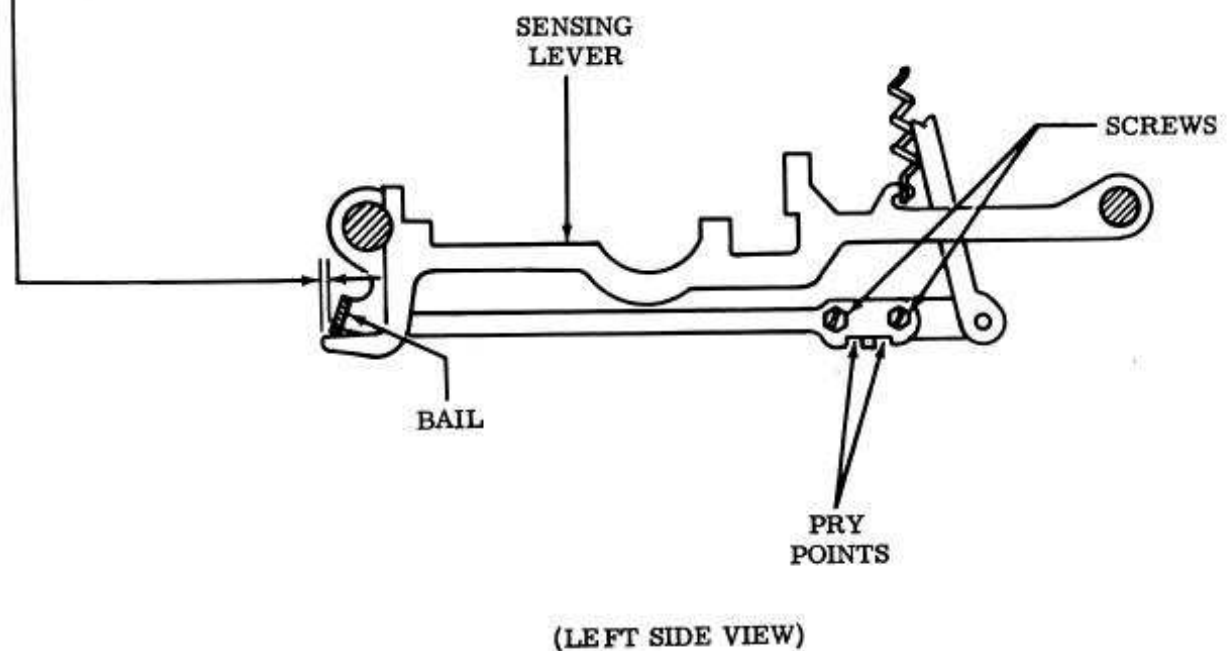
Requirement

The sensing lever associated with the leftmost code level (Figure 2) shall be

Min 0.010 inch underflush---Max 0.010 inch overflush with the bail.

To Adjust

Loosen screws and position bail using pry points.



3.05 Tape Punch Area (continued)

LATCH BAIL GAP

Note: This adjustment applies only to tape punches equipped with the tape-to-tape mode option — lever TP182424 etc.

To Check

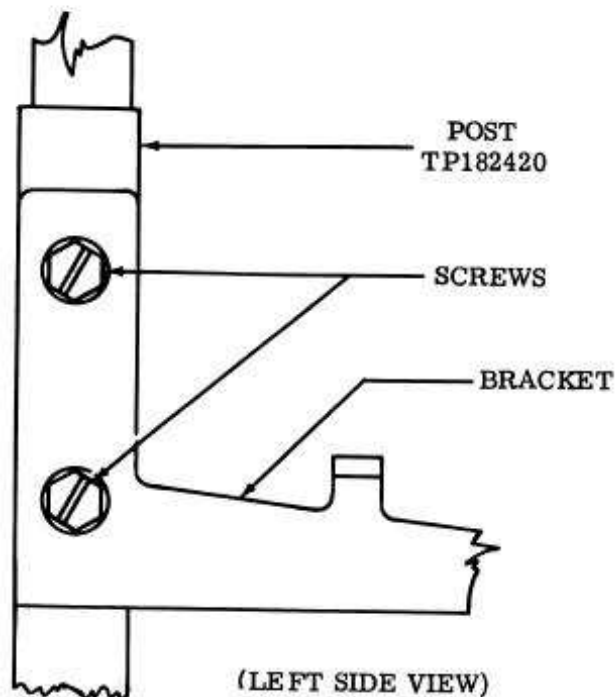
With the typing unit in the tape-to-tape mode, place the typing unit in the stop condition and the tape punch in the off position.

Requirement

Min 0.015 inch---Max 0.030 inch between the latch bail and lever TP182384.

To Adjust

Loosen screws and position bracket.



LEVER
TP182384

LEVER
TP182424

LATCH BAIL

(LEFT SIDE VIEW)

3.06 Tape Punch Area (continued)

VISUAL "ON OFF" INDICATOR

Note: This adjustment applies only to tape punches equipped with the visual ON OFF indicator — indicator arm TP182446 etc.

To Check

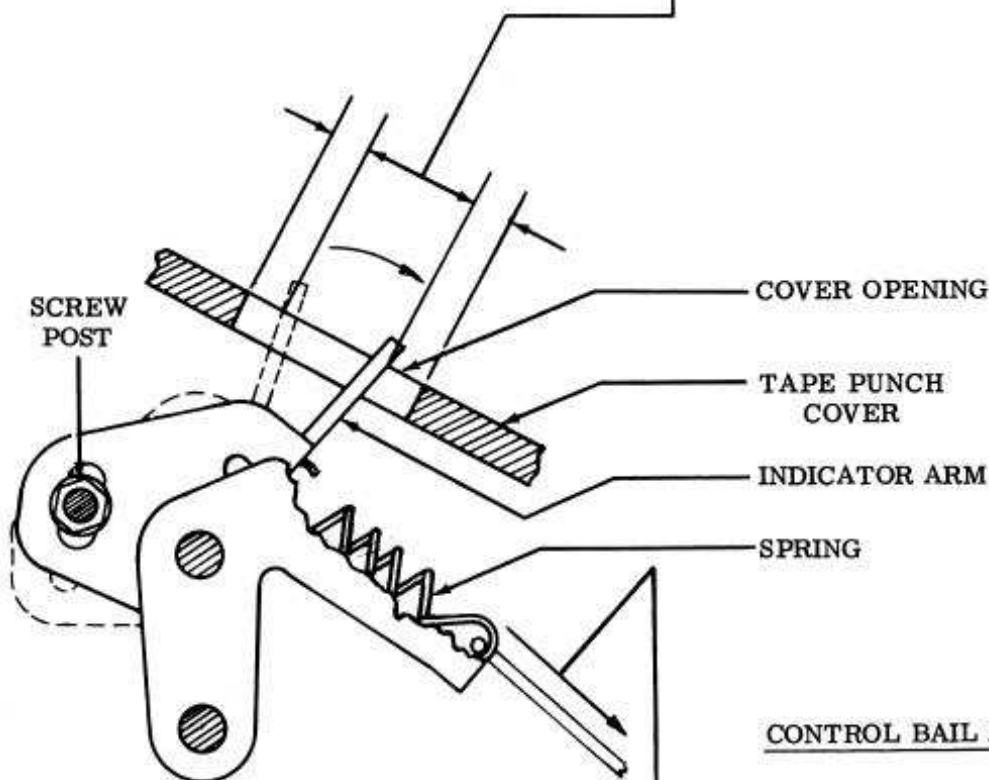
With the tape punch cover in place over the tape punch, place the tape punch "off." Note the gap between the rear edge of the cover opening and the rear edge of the indicator arm. Place the tape punch "on." Note the gap between the front edge of the cover opening and the front edge of the indicator arm.

Requirement

The two gaps noted in "To Check" shall be equal, as gauged by eye.

To Adjust

With the tape punch lid removed from the tape punch cover, loosen screw post and position indicator arm.



(LEFT SIDE VIEW)

CONTROL BAIL ASSEMBLY SPRING

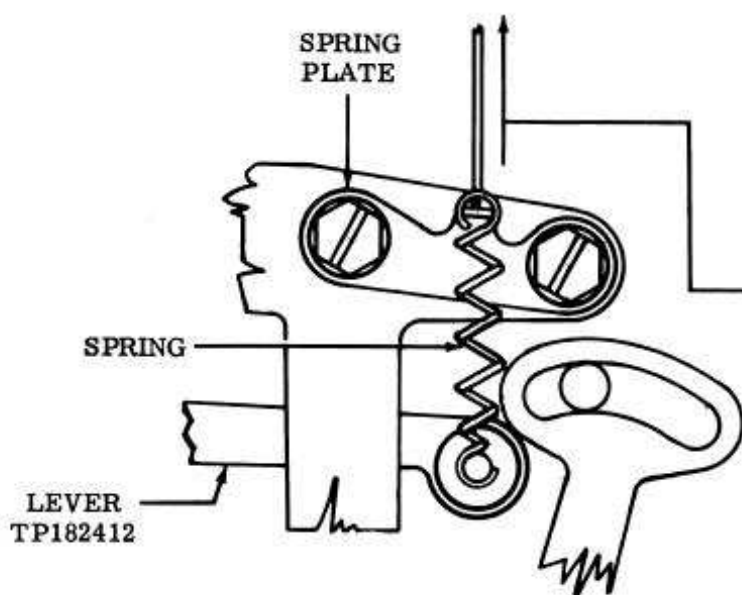
Note: This adjustment applies only to tape punches equipped with the visual ON OFF indicator — indicator arm TP182446 etc.

Requirement

With the tape punch "off" in off position

Min 2 oz---Max 3 oz
to pull spring to installed length.

3.07 Tape Punch Area (continued)



CONTROL BAIL ASSEMBLY SPRING

Note: This adjustment applies only to tape punches which are not equipped with visual ON OFF indicator — indicator arm TP182446 etc.

Requirement

With the tape punch "off" in off position
Min 2-1/2 oz---Max 3-1/4 oz
to pull the spring to installed length.

(RIGHT SIDE VIEW)

"LOCK ON"

Note: This adjustment applies only to tape punches equipped with the LOCK ON option — lock bail TP182466 etc.

To Check

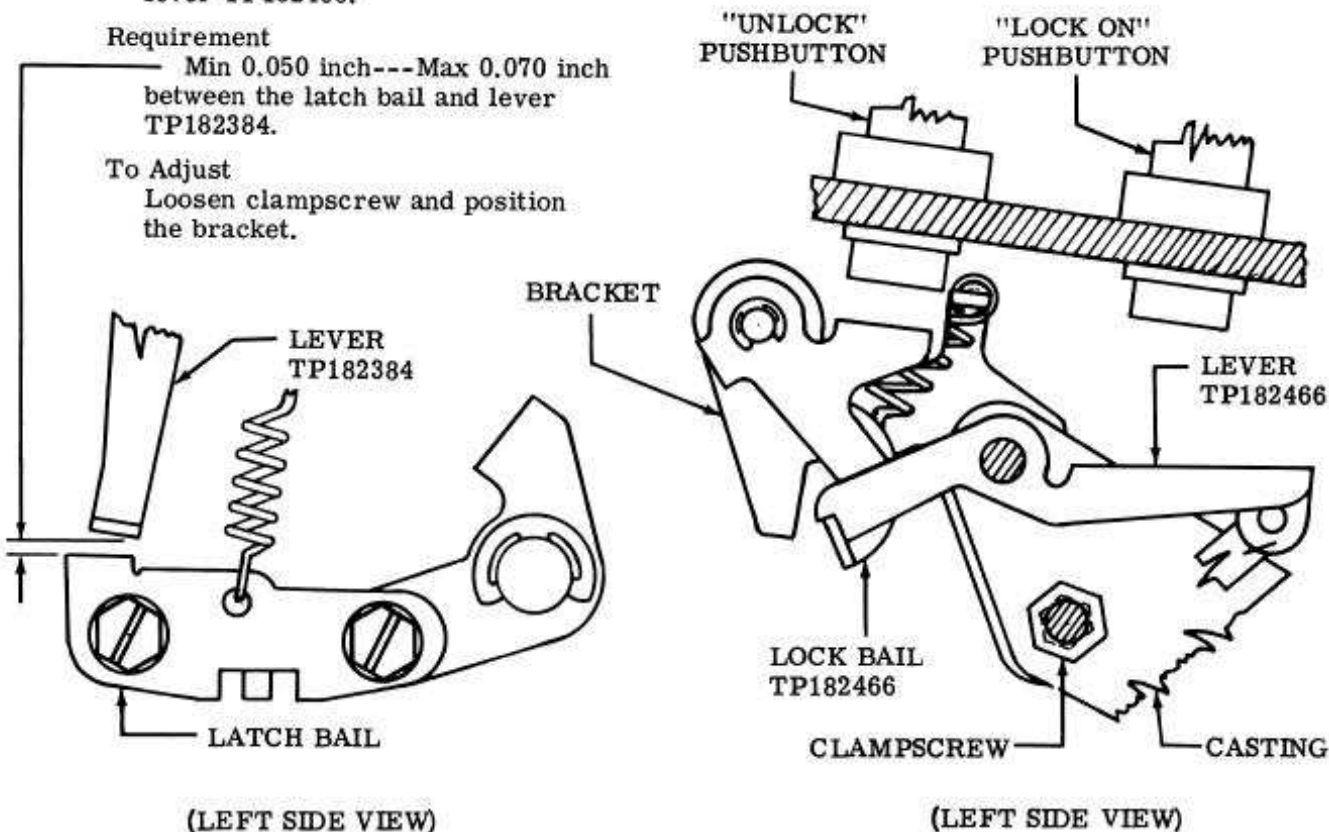
With the typing unit in the stop condition and the tape punch in the off position, depress the LOCK ON pushbutton and allow the lock bail TP182466 to latch the lever TP182466.

Requirement

Min 0.050 inch---Max 0.070 inch
between the latch bail and lever
TP182384.

To Adjust

Loosen clampscrew and position
the bracket.



(LEFT SIDE VIEW)

(LEFT SIDE VIEW)

3.08 Tape Punch Area (continued)

"UNLOCK"

Note: This adjustment applies only to tape punches equipped with the LOCK ON option — lock bail TP182466 etc.

To Check

With the tape punch "on," depress the UNLOCK pushbutton. Set up the TAPE (-2--5---) code combination in the selector. Manually rotate the main shaft until the function rocker shaft and stripper bail are in their most forward positions.

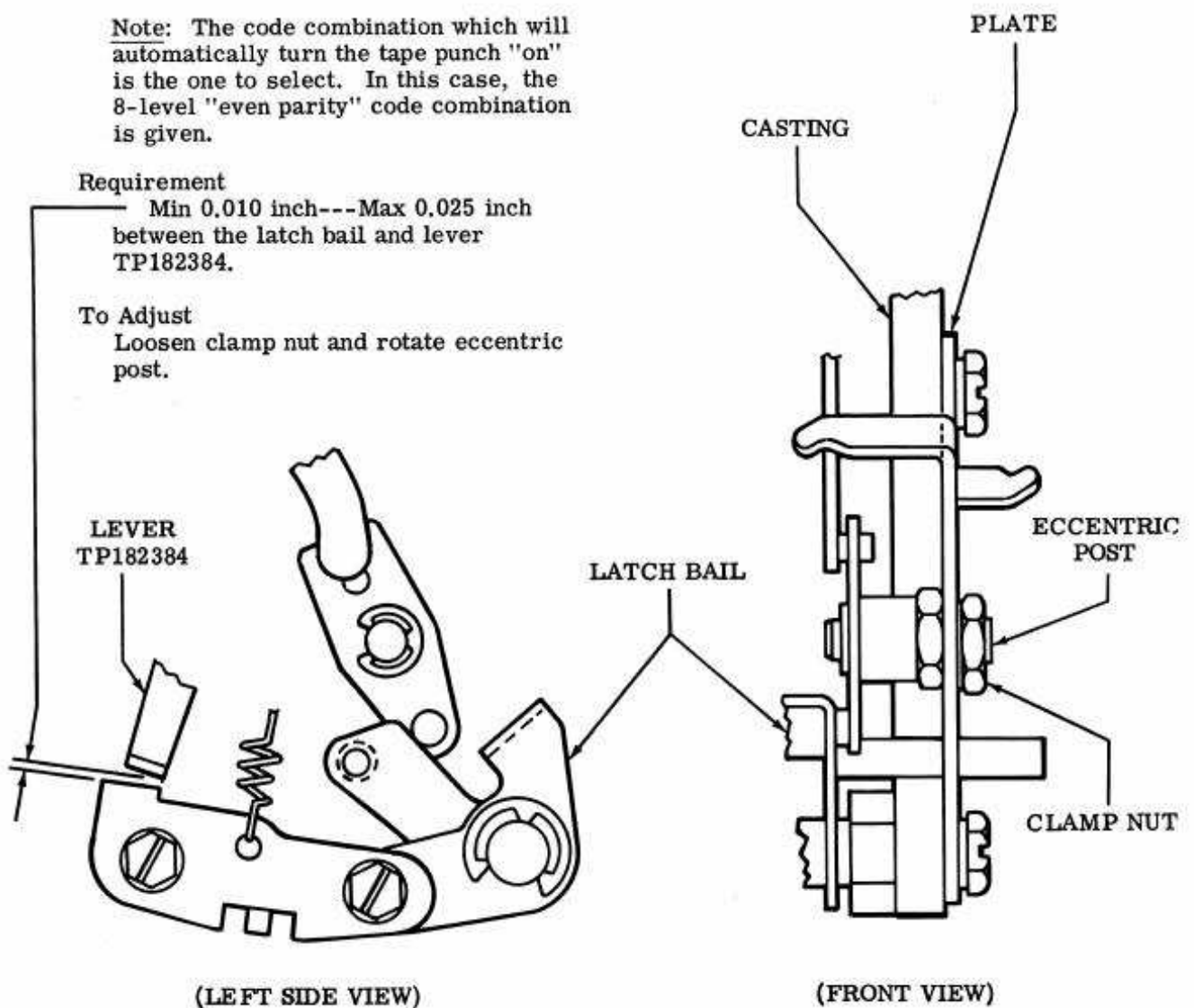
Note: The code combination which will automatically turn the tape punch "on" is the one to select. In this case, the 8-level "even parity" code combination is given.

Requirement

Min 0.010 inch---Max 0.025 inch
between the latch bail and lever
TP182384.

To Adjust

Loosen clamp nut and rotate eccentric post.

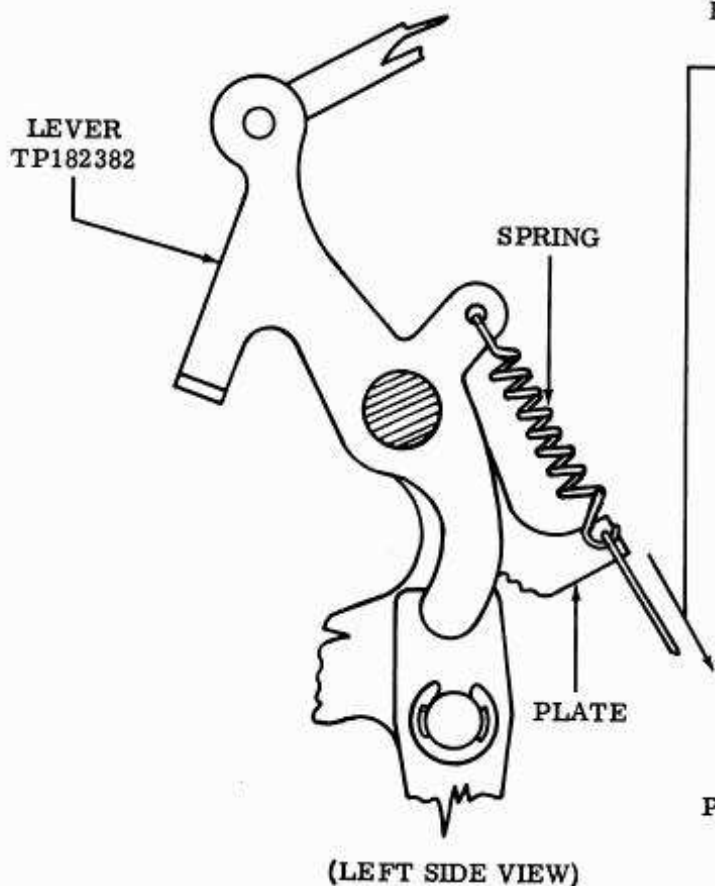


3.09 Tape Punch Area (continued)

ON MECHANISM RETURN SPRING

Requirement

With the tape punch "off" in the off position
Min 1/2 oz---Max 2-1/2 oz
to pull spring to installed length.



TAPE-TO-TAPE LEVER SPRING

Note: This adjustment applies only to tape punches equipped with the tape-to-tape mode option — lever TP182424 etc.

Requirement

With tape punch out of tape-to-tape mode and in off position

Min 1-1/2 oz---Max 2 oz
to pull spring to installed length.

