

33 TYPING UNIT

ADJUSTMENTS

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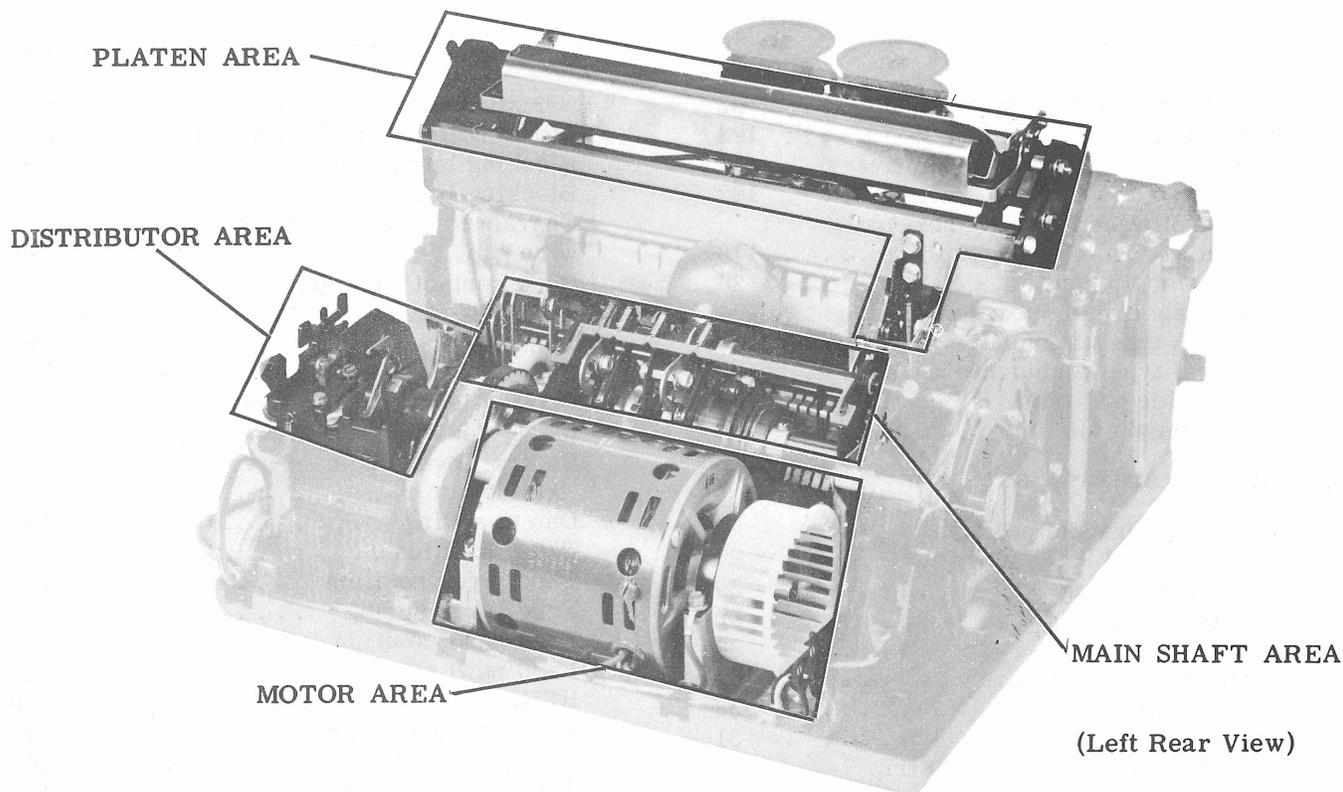


Figure 1 - Distributor, Main Shaft, Motor, and Platen Areas

1. GENERAL

1.01 This section provides adjustment information for the 33 typing unit. It is reissued to add the latest engineering changes and alpha-numeric adjustment codes to the adjustment titles. The codes consist of three-letter combinations to designate the adjustment areas, and numbers to distinguish between the adjustments in these areas. The following TCNs have been included in this reissue: 1440, 1469, 1472, 1482, 1545, 1575, 1576, 1596, 1633. Marginal arrows indicate the changes and additions, however the alpha-numeric codes are not arrowed.

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. Tools needed to perform adjustments are in TP185830 maintenance tool kit and are listed in Section 570-005-800. A 911A test set or 1B test set was used to determine the requirements for the selector receiving margins.

1.03 Adjustments are divided into two categories — basic and variations. Basic adjustments apply to all friction feed and/or

sprocket feed typing units. Adjustments found under variations apply only to typing units which have the particular feature(s) under consideration. The F and S following an adjustment title mean that the adjustment applies only to friction feed (F) or sprocket feed (S) typing units. No letter designation indicates that the adjustment applies to both types of equipment.

1.04 Adjustments are presented in a definite order which is considered the best to follow when completely readjusting the equipment. 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.

Note: Disconnect the typing unit from any ac or dc potential prior to inspection, minor repair, extensive maintenance, or a complete readjustment.

1.05 References to left, right, front, rear, etc, consider the typing unit to be viewed from a position where the carriage area faces

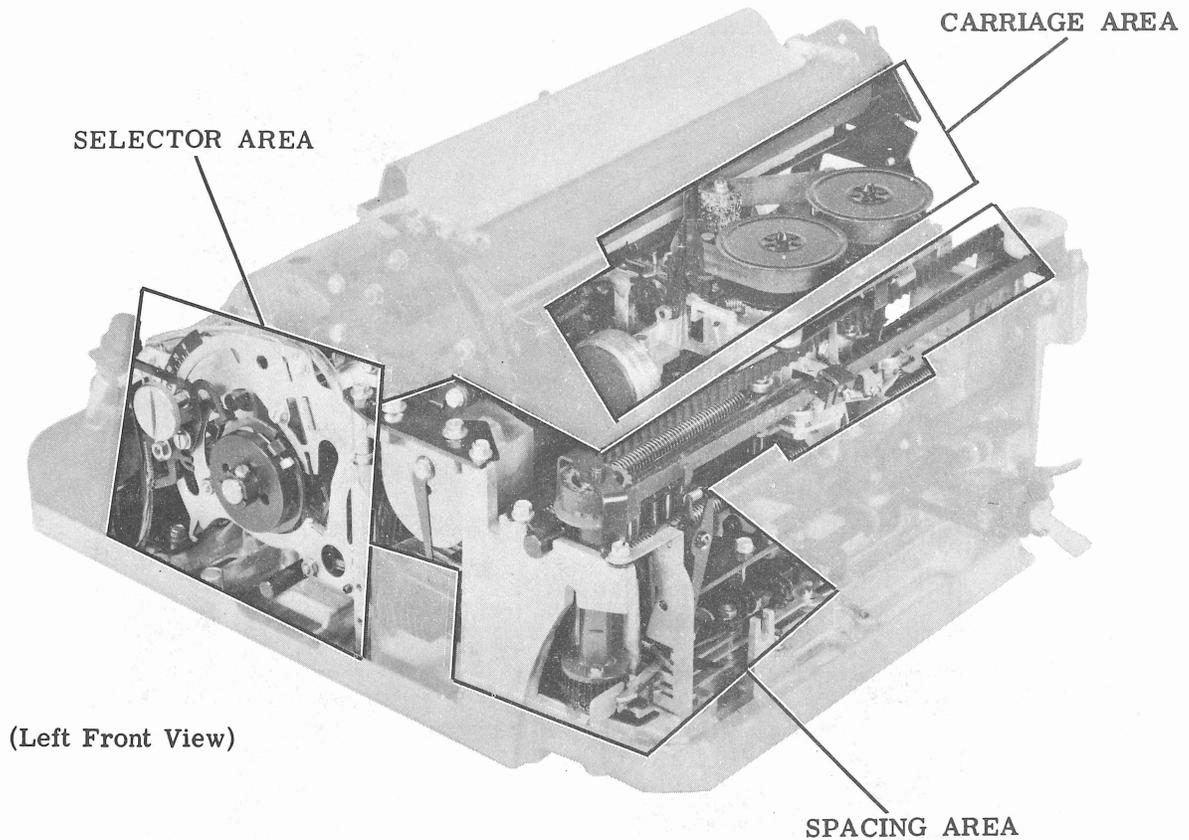


Figure 2 - Carriage, Selector, and Spacing Areas

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

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 Due to a high degree of congestion within certain areas of some typing units, some disassembly will be required prior to making certain adjustments. If parts or subassemblies are removed from the typing unit to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustments that may have been affected by the removal of parts or subassemblies.

Note 1: Do not remove parts and/or subassemblies unless it is considered absolutely necessary to perform an adjustment.

Note 2: Instructions for the disassembly and reassembly of parts and/or subassemblies are given in the appropriate disassembly and reassembly section and/or appropriate illustrated parts section.

Note 3: Do not lift typing unit while holding any part of the selector mechanism. Excessive strain on the selector mechanism, due to the weight of the typing unit, may cause selector malfunctioning. See appropriate disassembly and reassembly section for the proper method of lifting typing unit from its subbase.

1.09 Related adjustments are listed with some of the adjustment texts and are primarily intended to aid in troubleshooting the equipment. As an example, suppose that in searching for a

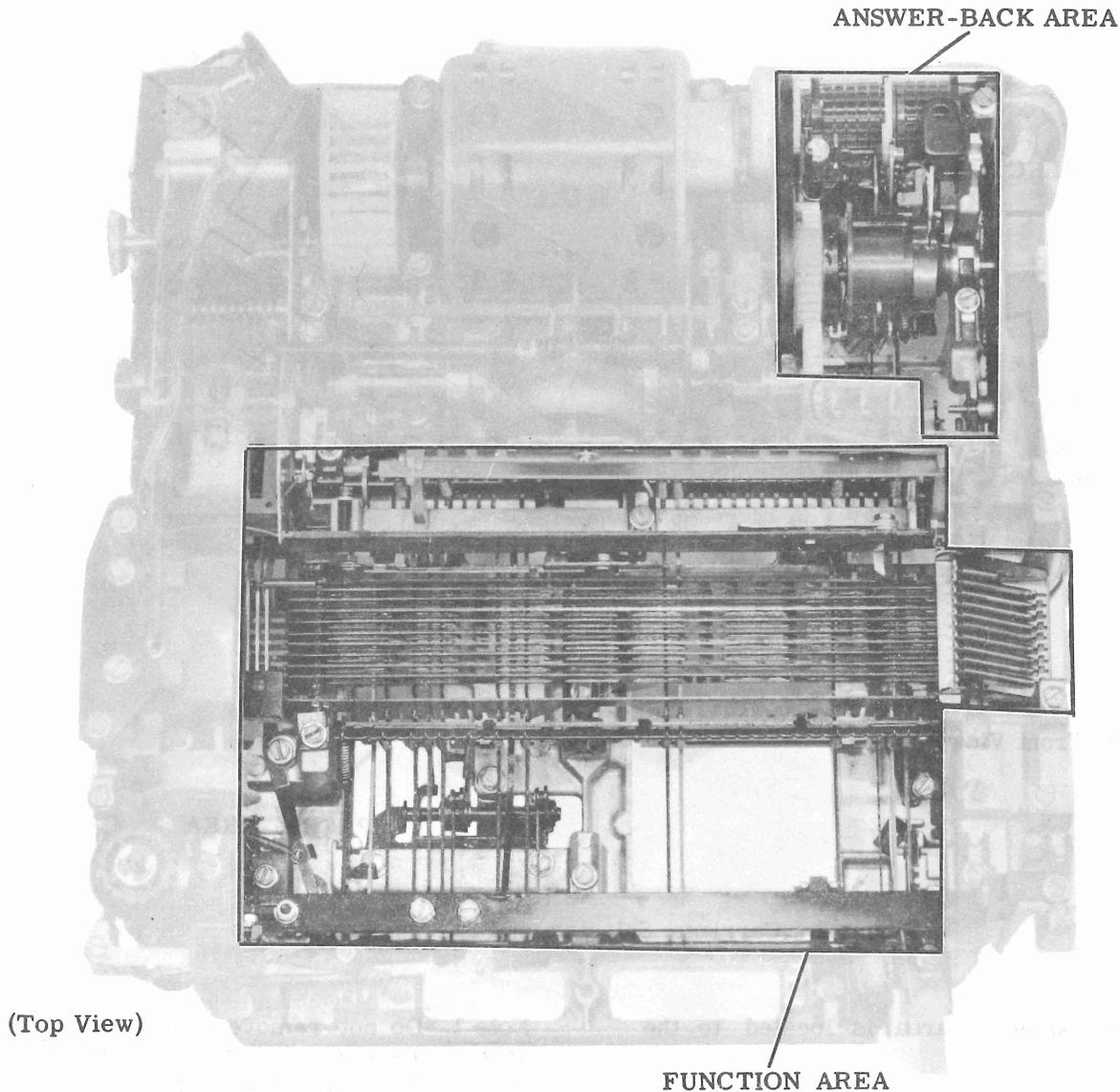


Figure 3 - Answer-Back and Function Areas

trouble it is discovered that the CODEBAR CLUTCH ENDPLAY (MSA-5) adjustment does not meet its requirement. Under Related Adjustments it is indicated that this adjustment is affected by the FUNCTION CLUTCH POSITION adjustment. First, check it to see if it is the cause of the trouble. Also, it is indicated that the CODEBAR CLUTCH ENDPLAY adjustment affects CODEBAR CLUTCH TRIP LEVER LINE-UP and CODEBAR RESET LEVER LINE-UP adjustments. If the former adjustment is changed, check the latter adjustments.

Note: Information in parentheses () following any related adjustment gives the associated paragraph number and area, if different from the paragraph number at the top of the page.

1.10 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 should be replaced by

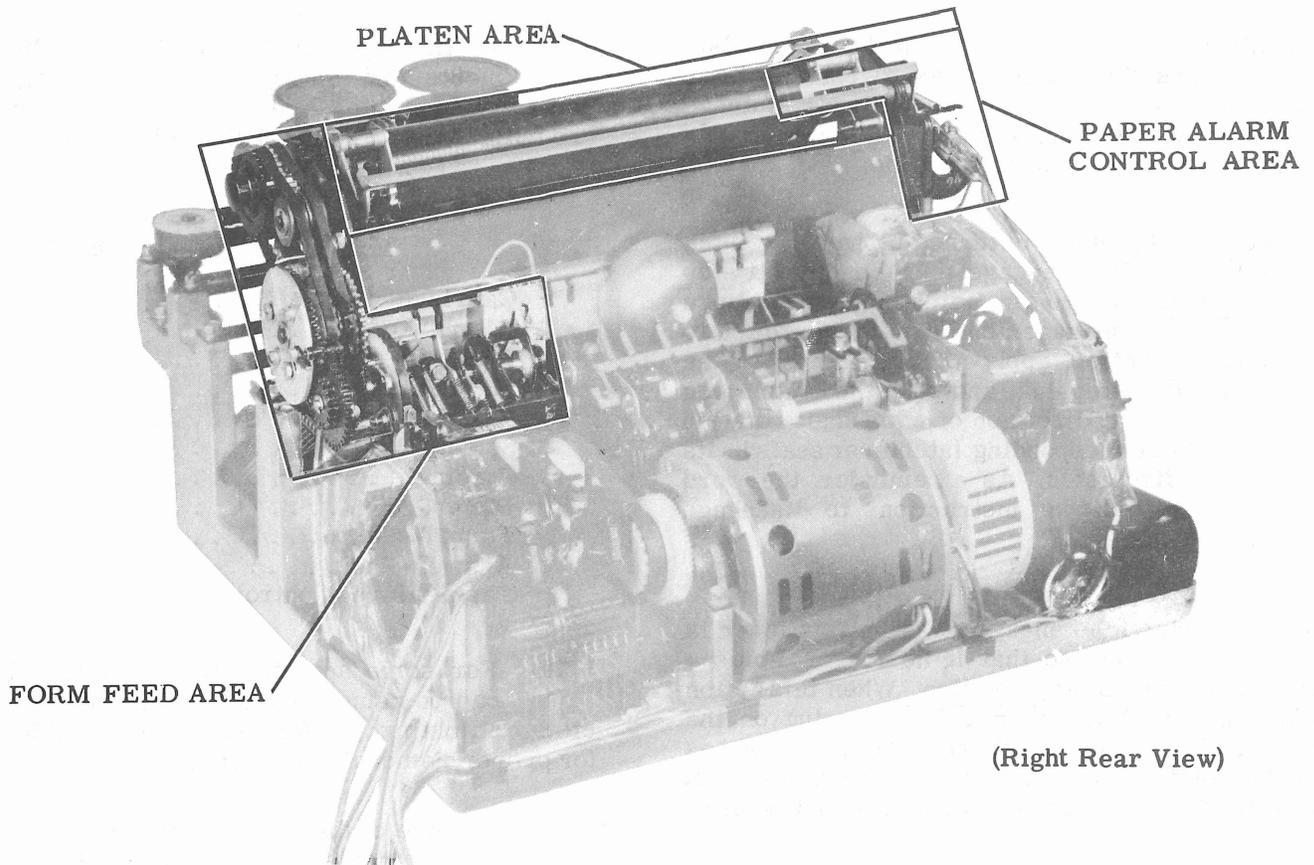


Figure 4 - Paper Alarm Control, Form Feed, and Platen Areas

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 should be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

Note 1: Use only spring scales which are recommended by the manufacturer and found in Maintenance Tools Section 570-005-800.

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

1.11 All adjustment procedures should 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.

1.12 To place the typing unit in the stop condition, use TP185832 armature clip to 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 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 if the typing unit is removed from a set unless the keyboard adjusting bracket is adjusted per 3.17. Adjustment must be remade to set requirements when the typing unit is replaced in an ASR or KSR set.

Note 3: 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. 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.

1.14 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. 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 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 Code combinations within this section are not always given as parity codes. Parity codes are obtained by proper transformation of the eighth code level as explained in the typing unit principles of operation section.

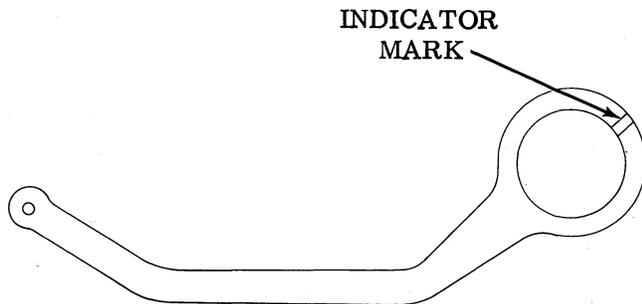
1.18 To aid in physically locating the adjustments and spring tensions, the typing unit is divided into eleven areas. These areas are indicated in Figures 1 through 4 as follows:

<u>Area</u>	<u>Figure</u>
Carriage	2
Distributor	1
Function	3
Main Shaft.	1
Motor.	1
Selector	2
Spacing.	2
Platen	1, 4
Form Feed	4
Answer-Back.	3
Paper Alarm Control	4

1.19 For some adjustments, the typing unit can be removed from the subbase to facilitate adjusting. Refer to Section 574-100-702 for proper removal procedures.

1.20 In some of the adjustment routines, the requirements must be checked at specific points in the operating cycle. With the codebar clutch tripped, the main shaft is rotated to the desired position. Three positions are designated as follows:

Note: Late design units have indicator marks on the function cam and carriage drive link to help locate these positions. For units so equipped, the indicator positions are given in parentheses.



Position 1 — The main shaft is rotated until the function bail is in its uppermost position. (In late design printers, the indicator mark on the carriage drive link is centered within the first notch on the function cam, and the hole on the cam is down.)

Position 2 — The main shaft is rotated until the carriage drive bail is in its rearmost position. (In late design printers, the indicator mark on the carriage drive link is centered within the second notch on the function cam, and the hole on the cam is toward the rear.)

Position 3 — The main shaft is rotated until the function bail is in its lowermost position. (The indicator mark on the carriage drive link is centered within the third notch on the function cam, and the hole on the cam is up.)

1.21 Identification codes have been added to the adjustment titles. Example: Gear Backlash (MRA-1). These codes serve merely to identify a particular adjustment. In the example, MRA is the abbreviation for motor area. The

number designates that the adjustment is the first in a series of adjustments in the motor area. The various codes are divided into the following categories:

- MRA — Motor Area
- DBA — Distributor Area
- MSA — Mainshaft Area
- SLA — Selector Area
- FNA — Function Area
- CRA — Carriage Area
- PLA — Platen and Line Feed Area
- MDA — Margin and Dashpot Area
- SPA — Spacing Area
- ABA — Answer-Back Area
- FPA — Final Printer Adjustments
- MIA — Miscellaneous Adjustments
- KBA — Keyboard Area
- VFA — Variable Feature Area
- FOA — Form-Out Area

2. BASIC UNIT

2.01 Motor Area

GEAR BACKLASH (MRA-1)

To Check

Find position of tightest pinion and intermediate gear engagement. Hold intermediate gear stationary. Observe fan rim radial motion.

Requirement

For 2-1/2 inch diameter fan:
Min 0.010 inch--Max 0.032 inch
play at fan rim.
For 3 inch diameter fan:
Some to 0.050 inch

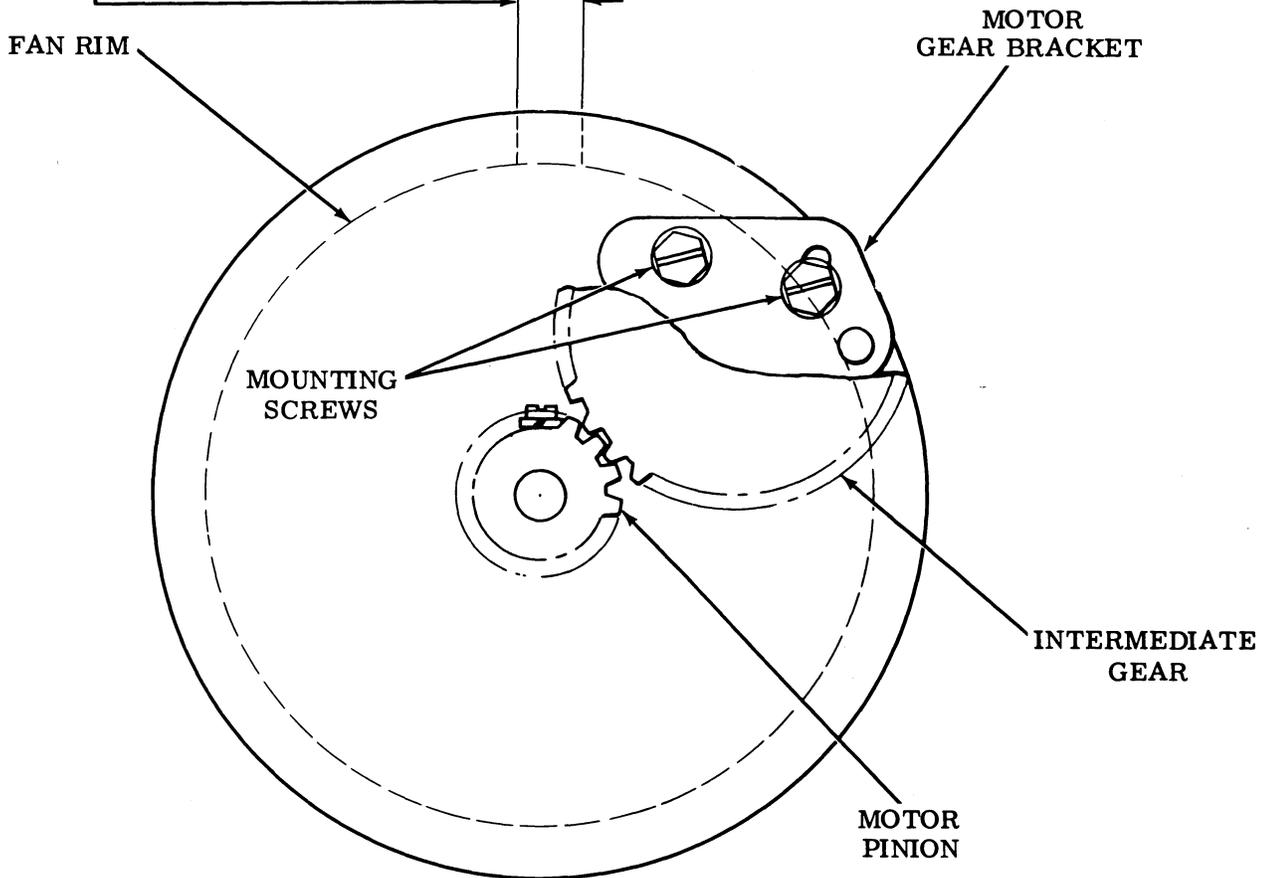
To Adjust

Loosen mounting screws and position motor gear bracket. Tighten screws.

Related Adjustment

Affects

BELT TENSION (2.02)



(Right Side View)

2.02 Motor Area (continued)

BELT TENSION (MRA-2)

To Check

Rotate fan clockwise (viewed from left) until upper level of motor belt becomes taut. Using a spring scale, apply 16 oz force at center of belt.

Requirement

Min 0.100 inch---Max 0.135 inch deflection at center of motor belt.

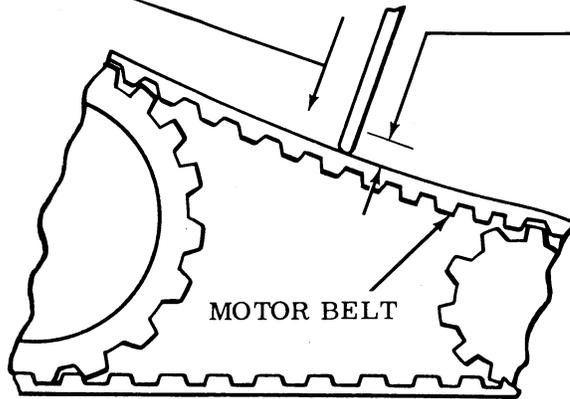
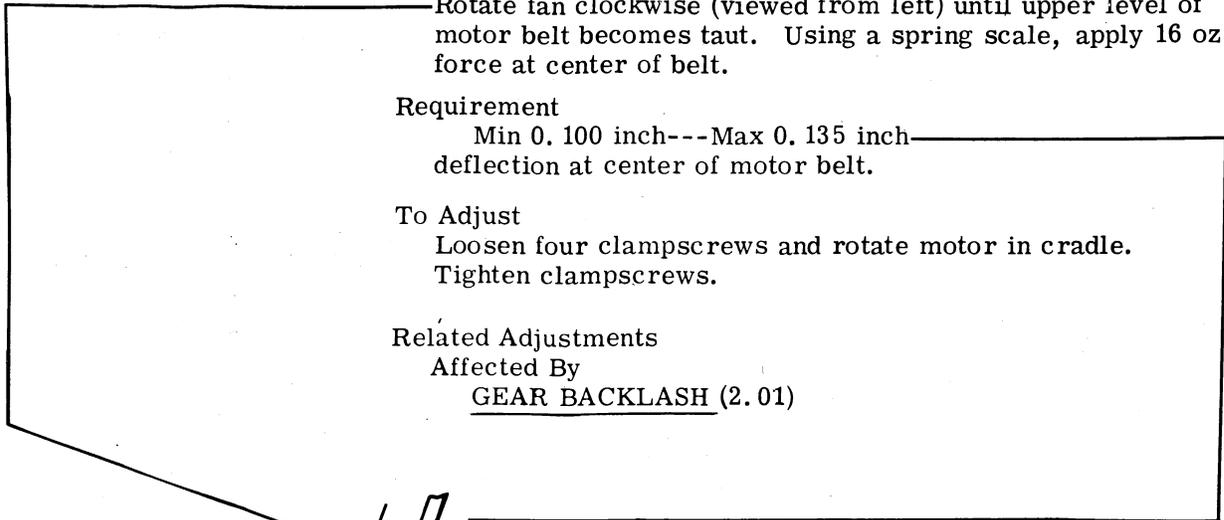
To Adjust

Loosen four clampscrews and rotate motor in cradle. Tighten clampscrews.

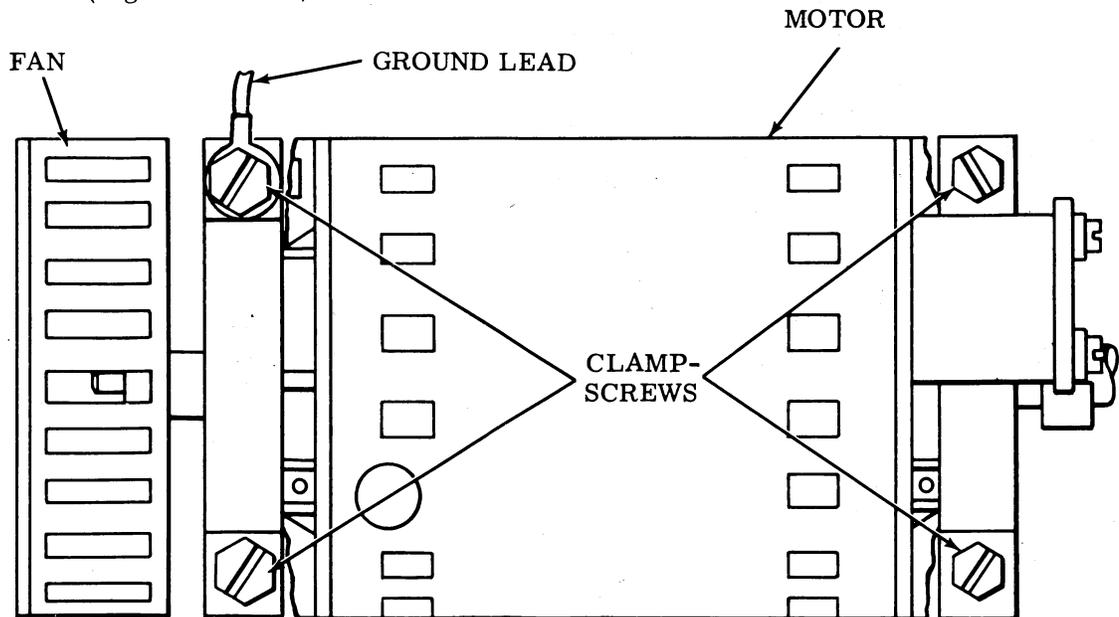
Related Adjustments

Affected By

GEAR BACKLASH (2.01)



(Right Side View)



(Top View)

2.03 Distributor Area

(B) SHAFT LEFT BEARING GAP (DBA-2)

To Check

Disengage distributor clutch. Hold the distributor clutch gear assembly to the right.

Requirement

Min some---Max 0.012 inch between left bearing and clutch gear assembly as gauged by eye.

To Adjust

Disengage (latch) distributor clutch. Hold clutch gear assembly firmly to the right. Position left bearing to meet requirement, with clampscrews loosened. Tighten left bearing clampscrews.

Related Adjustments

Affected By

BRUSH HOLDER GAP (2.03)

(A) BRUSH HOLDER GAP (DBA-1)

(1) Requirement

With brush holder pointer aligned within the locating mark on the disc.
Min 0.010 inch---Max 0.060 inch between brush holder pointer and disc.

(2) Requirement

During entire brush holder rotation
Min 0.002 inch between any brush holder and disc.

To Adjust

With three bearing clampscrews loosened, position distributor shaft assembly and right bearing to the left or right to meet requirement. Tighten right, but not left, bearing clampscrew.

Related Adjustments

Affects

SHAFT LEFT BEARING GAP (2.03)
TRIP SHAFT POSITION (2.04)
DRIVEN GEAR LINE-UP (2.12)

BRUSH HOLDER POINTER

DISC

DISTRIBUTOR SHAFT

CLUTCH GEAR ASSEMBLY

LEFT BEARING

RIGHT BEARING CLAMPSCREW

LEFT BEARING CLAMPSCREWS

(Top View)

2.04 Distributor Area (continued)

TRIP SHAFT POSITION (DBA-3)

To Check

Place distributor clutch in the stop position.

(1) Requirement

With play taken up to minimize all clearances, the trip lever should engage
 Min two-thirds width
 of formed end of shoe lever.

(2) Requirement

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

To Adjust

Loosen clampscrew and post friction tight. Move trip shaft right or left to meet requirements and bias trip shaft towards the front. Tighten clampscrew and post.

Related Adjustments

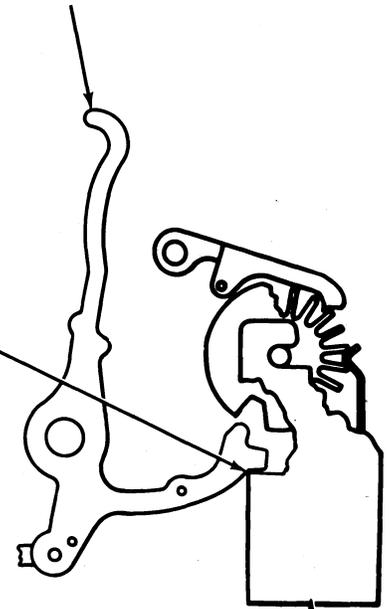
Affects

FEED PAWL POSITION (3.06)

Affected By

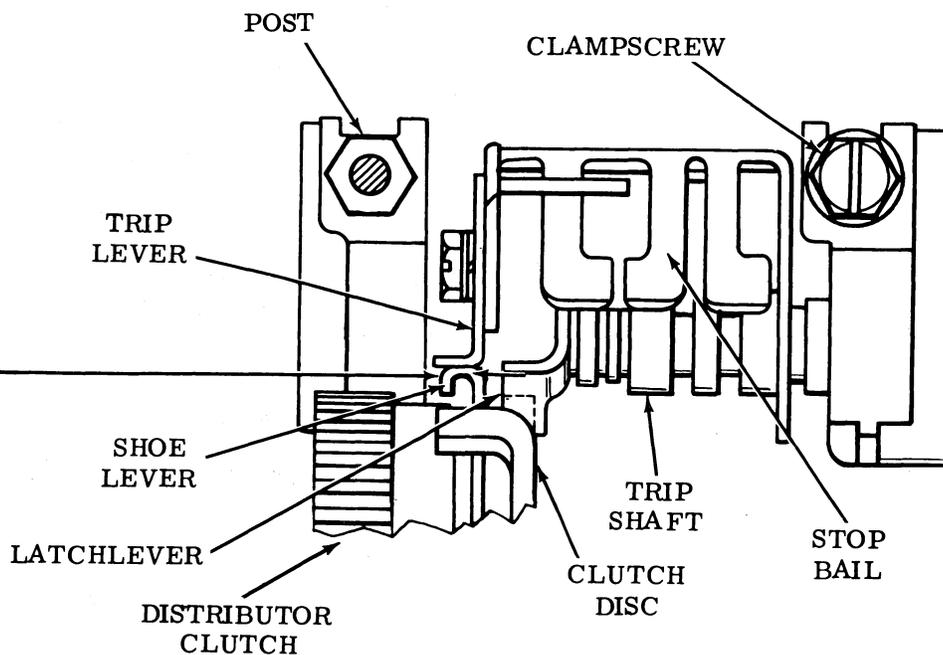
BRUSH HOLDER GAP (2.03)

CONTROL LEVER



(Right Side View)

ANSWER-BACK BLOCK



(Top View)

2.05 Distributor Area (continued)

→ CLUTCH SHOE RELEASE LEVER GAP (DBA-4)

To Check

Place distributor clutch in stop position (in late design units position reference mark on sprocket insert on top and vertically in line with distributor shaft). Trip distributor clutch by moving trip lever rearward. Apply 32 + 1/2 oz pressure against the shoe lever along its normal path of forward travel and release slowly. Measure and record clearance.

(1) Requirement

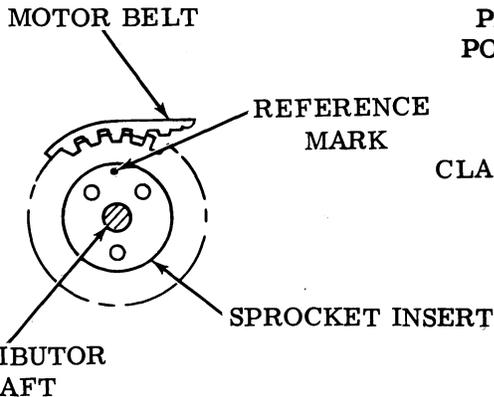
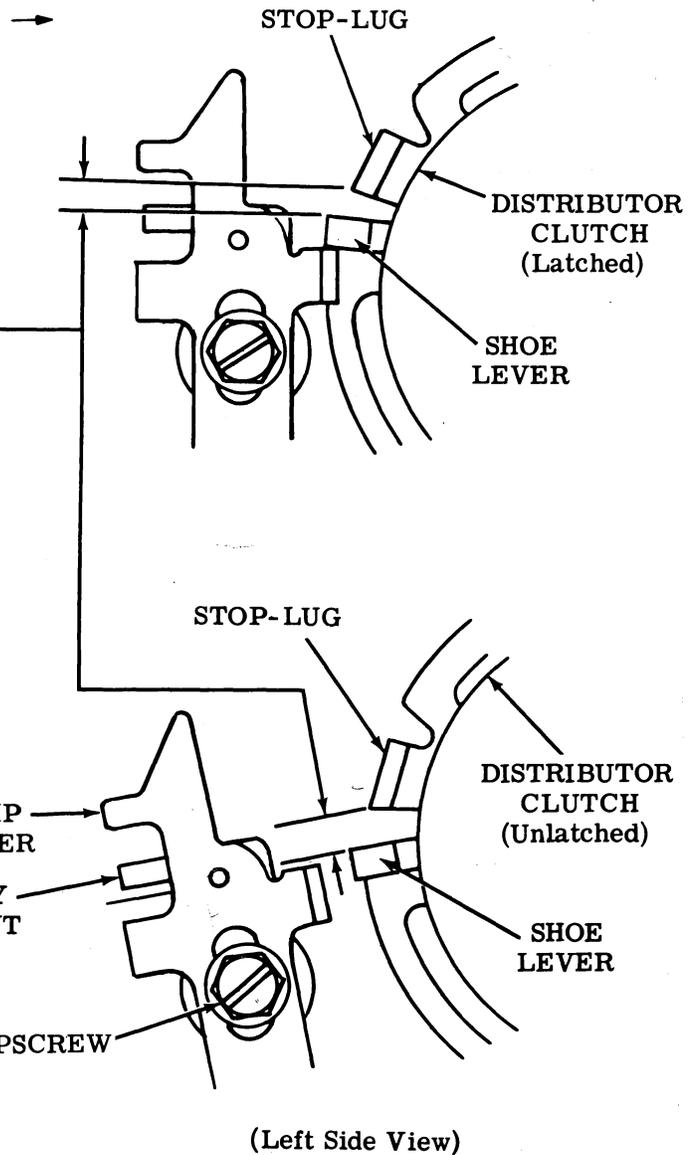
With distributor clutch disengaged (latched) and clutch disc firmly seated against the latchlever
 Min 0.015 inch
 between stop-lug and shoe lever.

(2) Requirement

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

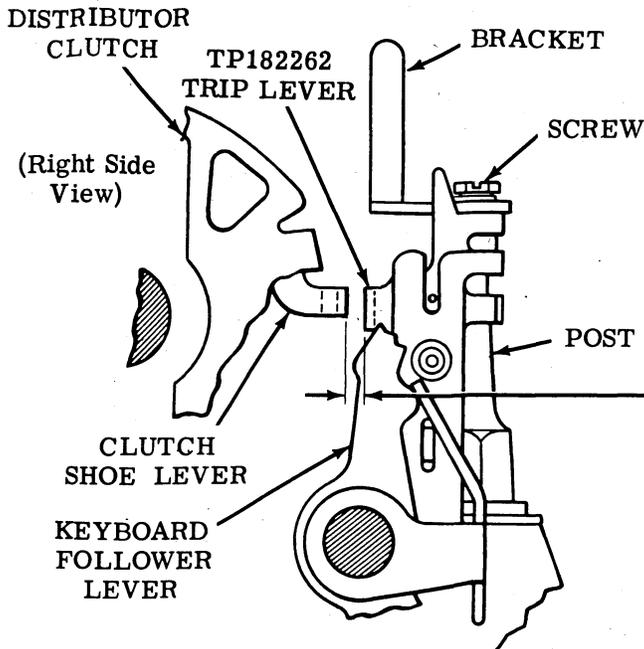
Remove answer-back drum. With clamp-screw friction tight, position trip lever using pry point. Tighten clampscrew. Replace answer-back drum.



2.06 Distributor Area (continued)

Note 1: Before proceeding, replace typing unit onto subbase. For instructions, see the appropriate disassembly and reassembly section.

Note 2: Do not lift typing unit while holding any part of the selector mechanism. Note the proper method for lifting the typing unit. This method is described in the appropriate disassembly and reassembly section.



TRIP LEVER ENGAGEMENT (KBA-8)

Note 3: The answer-back control lever and reader trip lever should not be touching their respective stop bail adjusting tabs when checking this adjustment.

Note 4: Perform (1) To Check only on late design units containing the TP182262 trip lever.

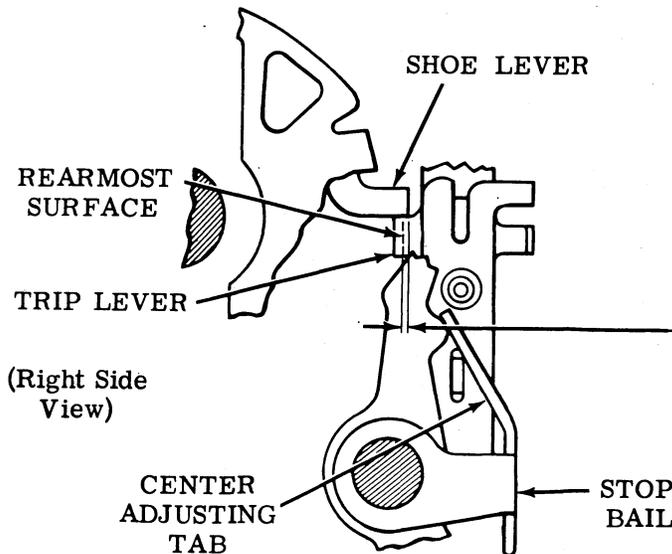
- (1) To Check
Disengage (latch) distributor clutch. Depress any nonfunction keytop to unlatch distributor clutch. If necessary, loosen screw and position bracket to obtain clearance between bracket and trip lever. Tighten screw. Rotate clutch to align upper edges of shoe lever and trip lever.

Requirement

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

To Adjust

Remove answer-back drum. Use TP180993 bending tool to bend center adjusting tab. Replace answer-back drum.



- (2) To Check
Place keyboard universal lever in latched position and rotate distributor clutch to position the shoe lever up to, but not touching the trip lever.

Requirement

Shoe lever should be Min flush---Max 0.015 inch beyond rearmost surface of trip lever.

To Adjust

Loosen screw friction tight and position bracket. Tighten screw.

2.07 Distributor Area (continued)

BRUSH HOLDER POSITION (DBA-5)

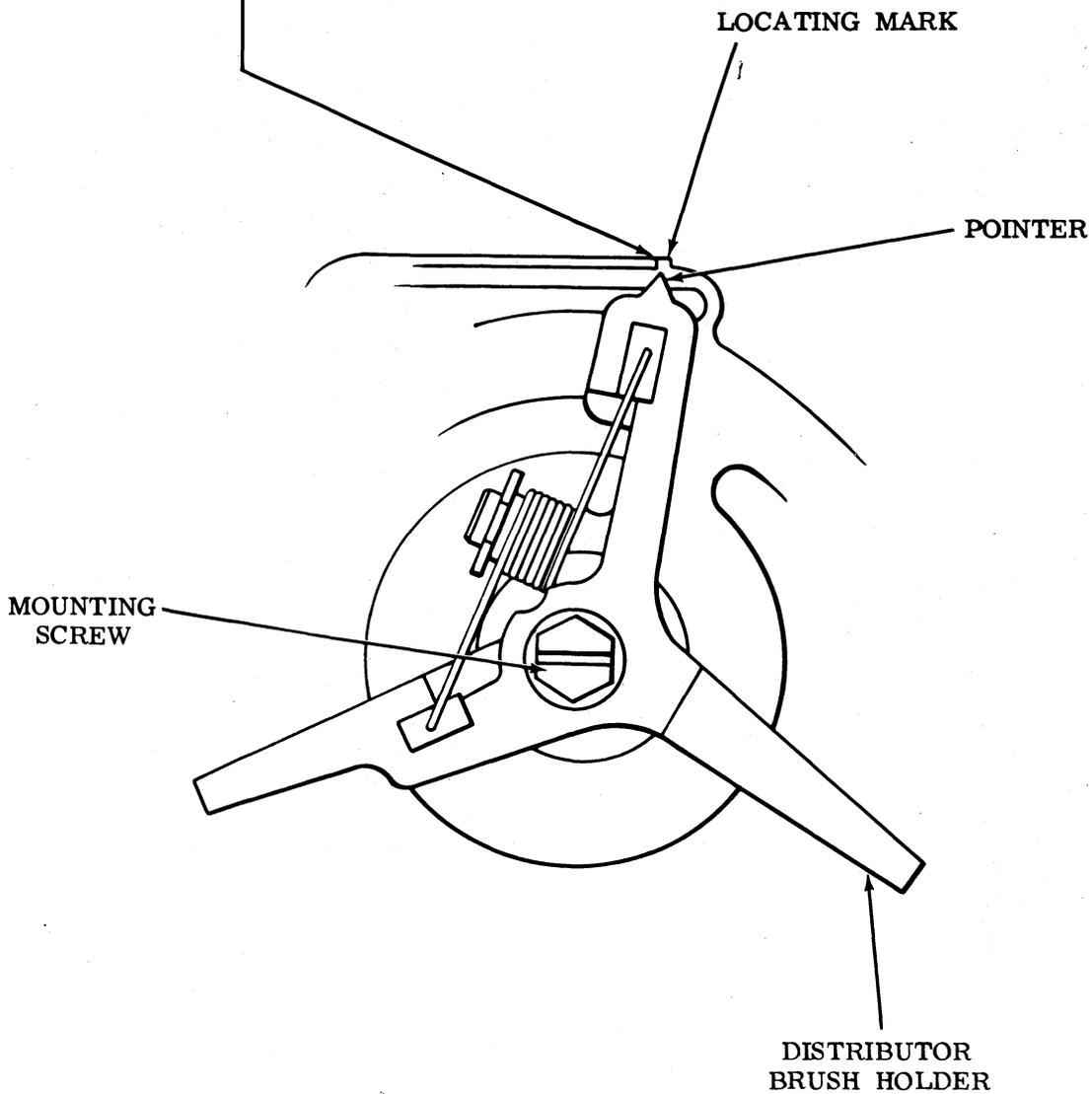
Requirement

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

To Adjust

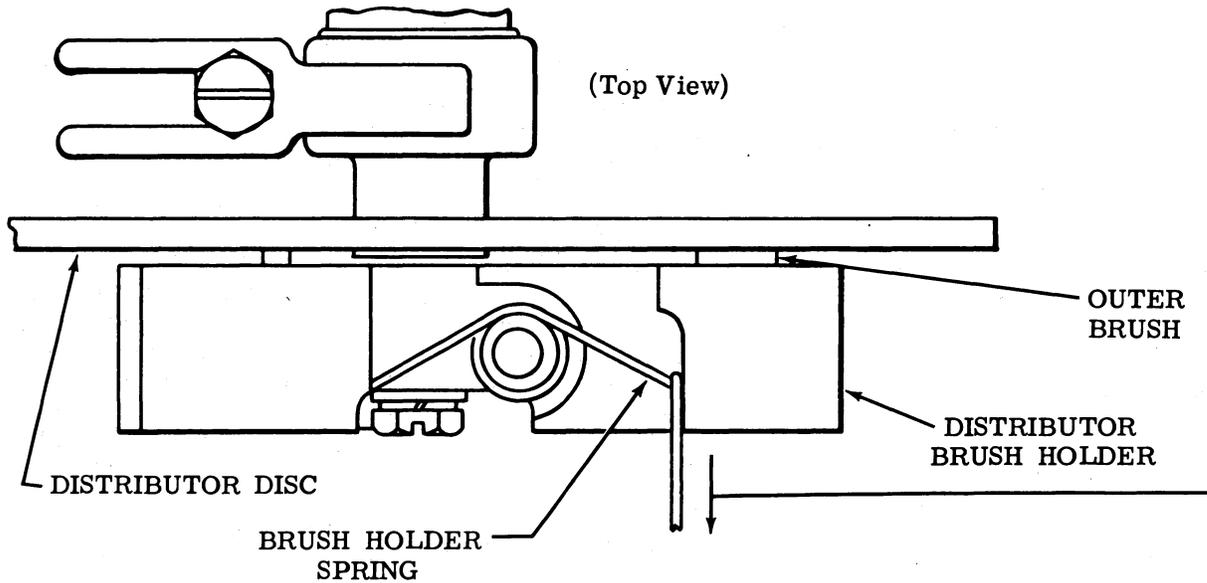
Loosen mounting screw and position distributor brush holder. Tighten mounting screw.

Note: Rotate the brush holder in a clockwise direction only.



(Right Side View)

2.08 Distributor Area (continued)



BRUSH HOLDER SPRING

Requirement

New brush

Min 10-1/2 oz --- Max 13-1/2 oz

Brush worn to 1/4 inch length

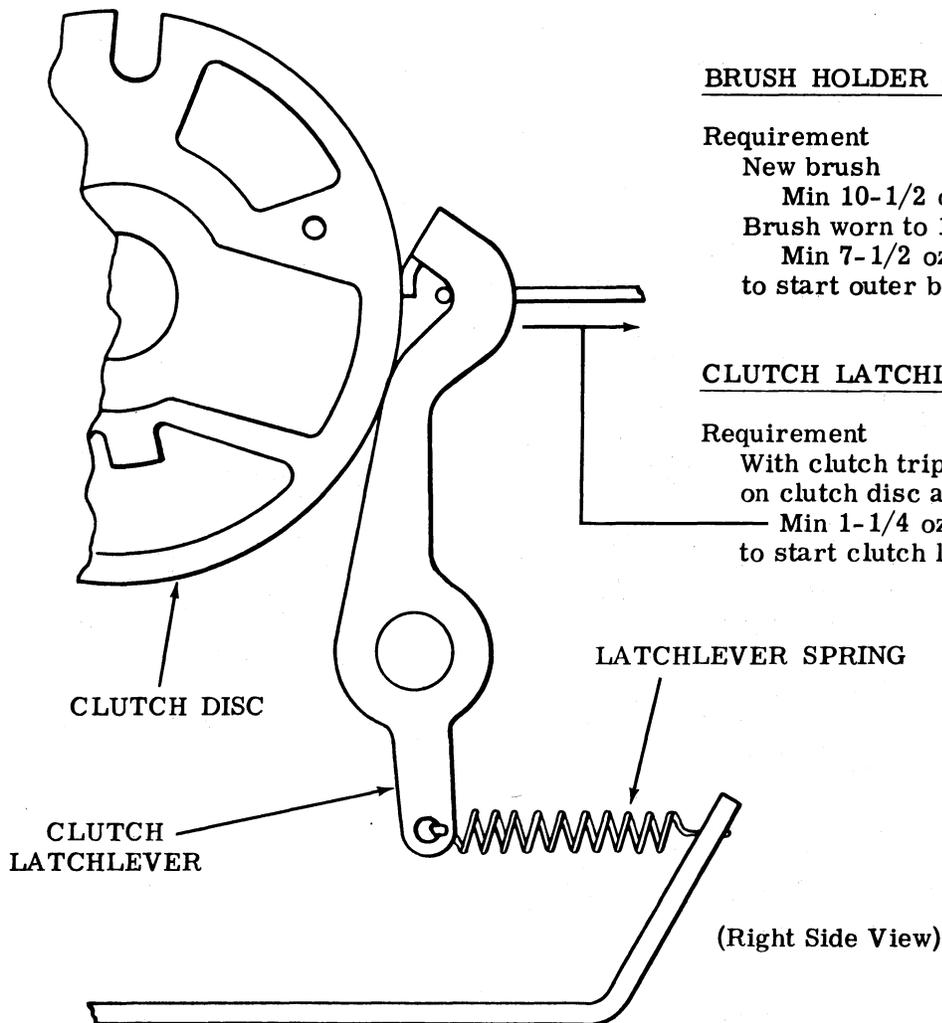
Min 7-1/2 oz --- Max 10-1/2 oz
to start outer brush moving.

CLUTCH LATCHLEVER SPRING

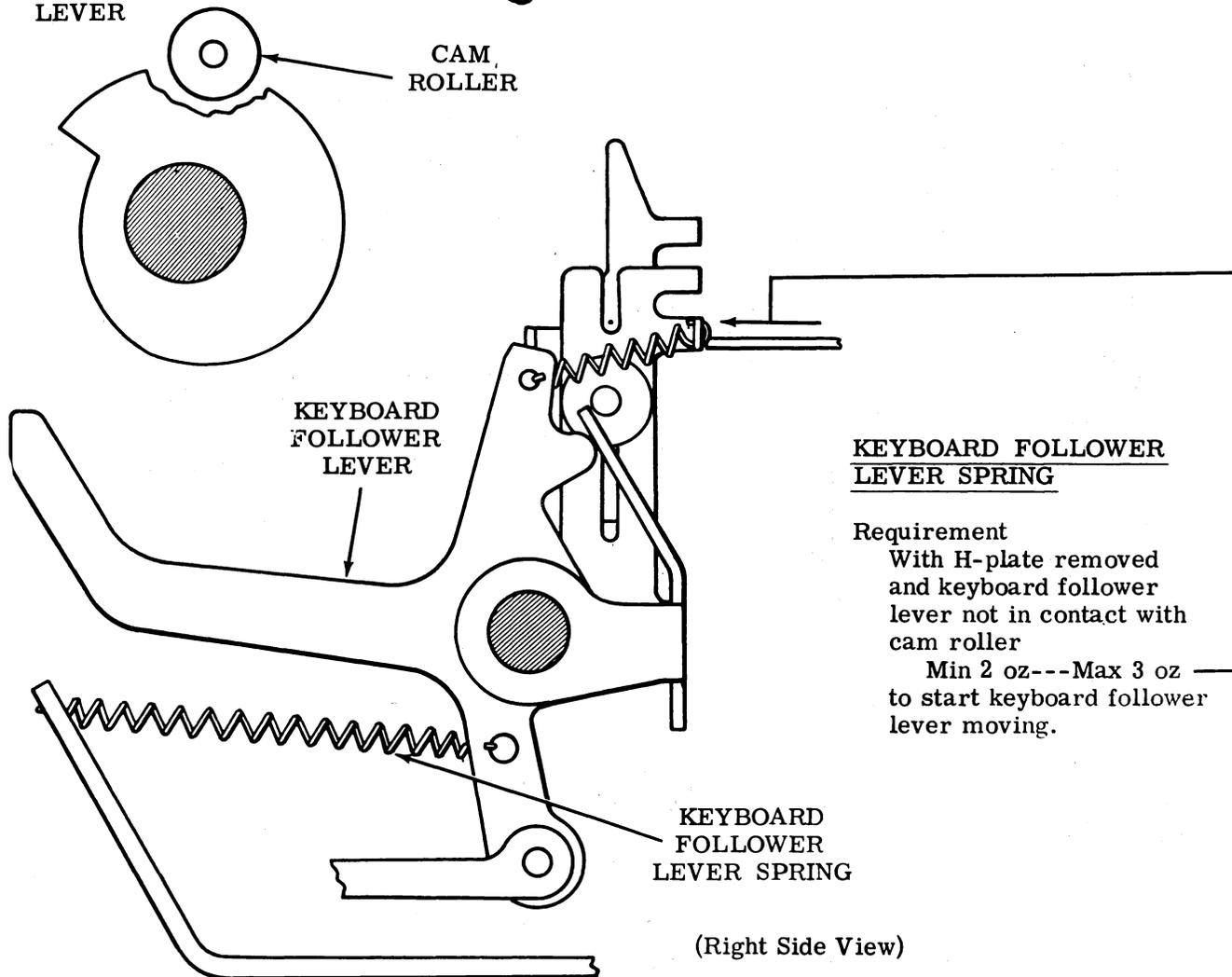
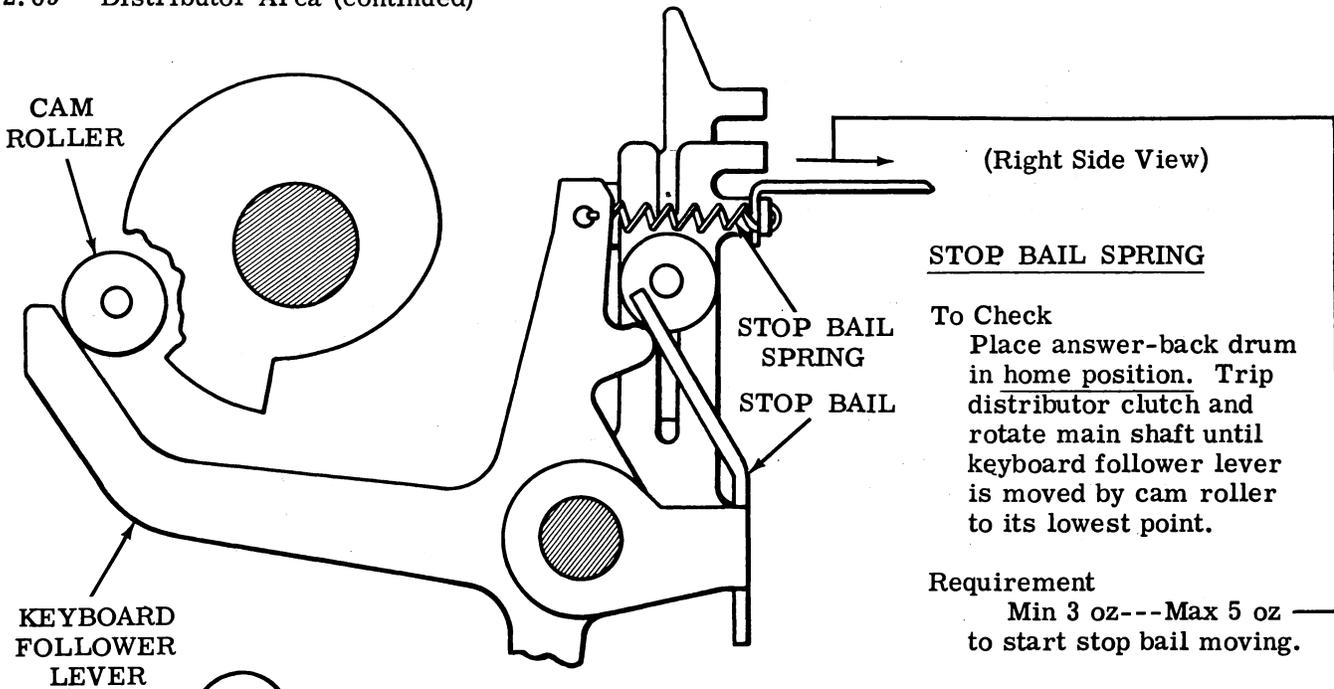
Requirement

With clutch tripped and latchlever resting on clutch disc as shown

Min 1-1/4 oz --- Max 2-1/4 oz
to start clutch latchlever moving.



2.09 Distributor Area (continued)



2.10 Main Shaft Area

Note: If a complete readjustment of the typing unit is to be performed, loosen all screws on main shaft except collar screw immediately to the right of the left main shaft bearing.

(A) LEFT BEARING POSITION (MSA-1)

Related Adjustments
Affects

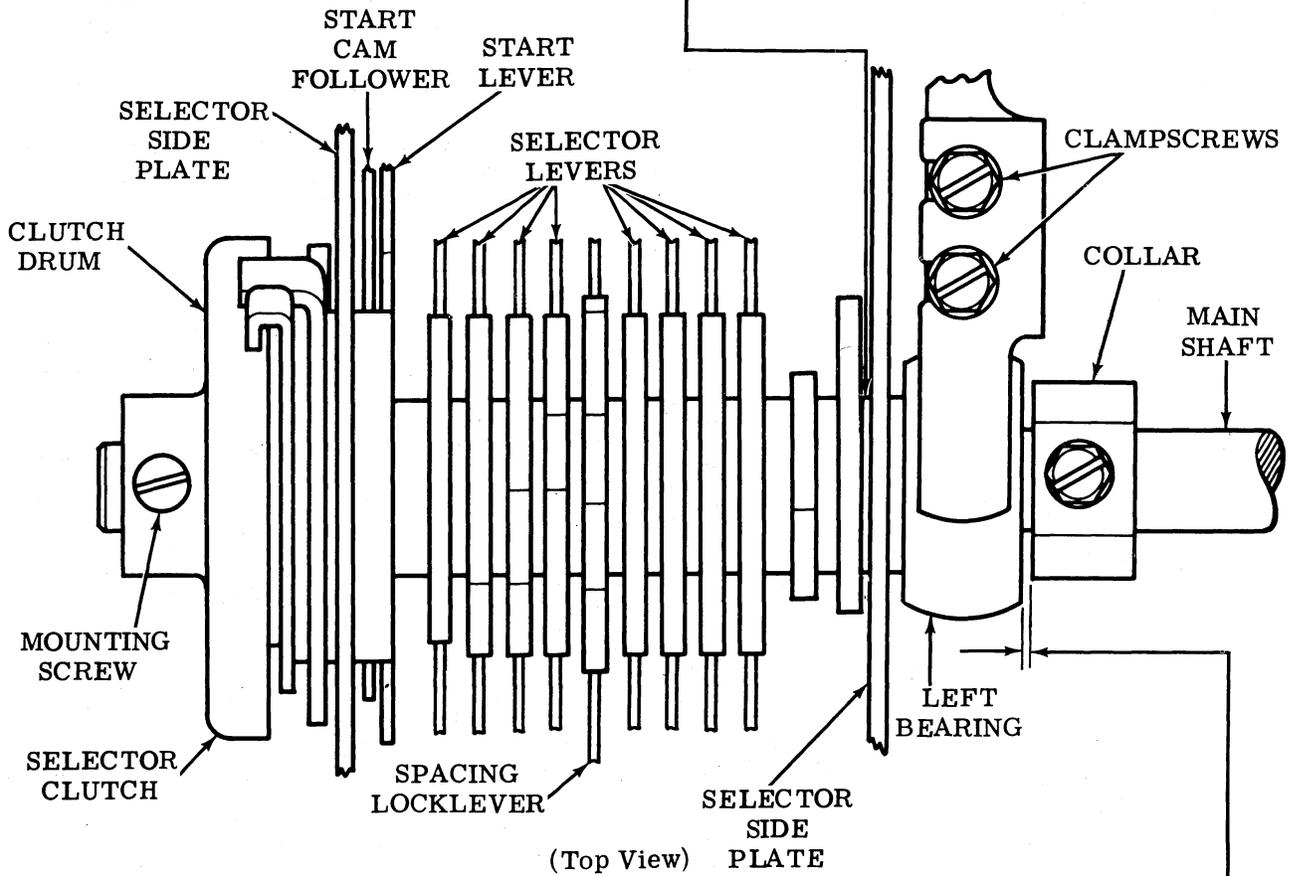
Requirement

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

FUNCTION SHAFT AND CASTING POSITION (2.40)
DRIVEN GEAR LINE-UP (2.12)
CODEBAR CLUTCH TRIP LEVER LINE-UP (2.13)

To Adjust

Loosen left bearing clampscrews and position left bearing. Tighten clampscrews.



(B) SELECTOR CAM ENDPLAY (MSA-2)

To Adjust

To Check

Disengage (latch) selector clutch. Take up play in main shaft toward right.

With the selector clutch drum mounting screw friction tight, position the clutch drum. Tighten mounting screw.

Requirement

Min 0.002 inch---Max 0.012 inch endplay between left bearing and collar.

Related Adjustments
Affects

DRIVEN GEAR LINE-UP (2.12)
CODEBAR CLUTCH TRIP LEVER LINE-UP (2.13)

2.11 Main Shaft Area (continued)

Note: Adjustment (A) is to be done only when completely readjusting the typing unit.

(B) FUNCTION CLUTCH ENDPLAY (MSA-4)

To Check

Disengage (latch) function clutch. Take up clearances to make function clutch endplay a maximum.

Requirement

Min 0.005 inch---Max 0.015 inch endplay in function clutch.

To Adjust

Loosen collar clampscrew and position function clutch to meet requirement. Tighten clampscrew.

Related Adjustment Affected By

FUNCTION CLUTCH POSITION (2.11)

(A) FUNCTION CLUTCH POSITION
(Preliminary) (Final 2.40) (MSA-3)

To Check

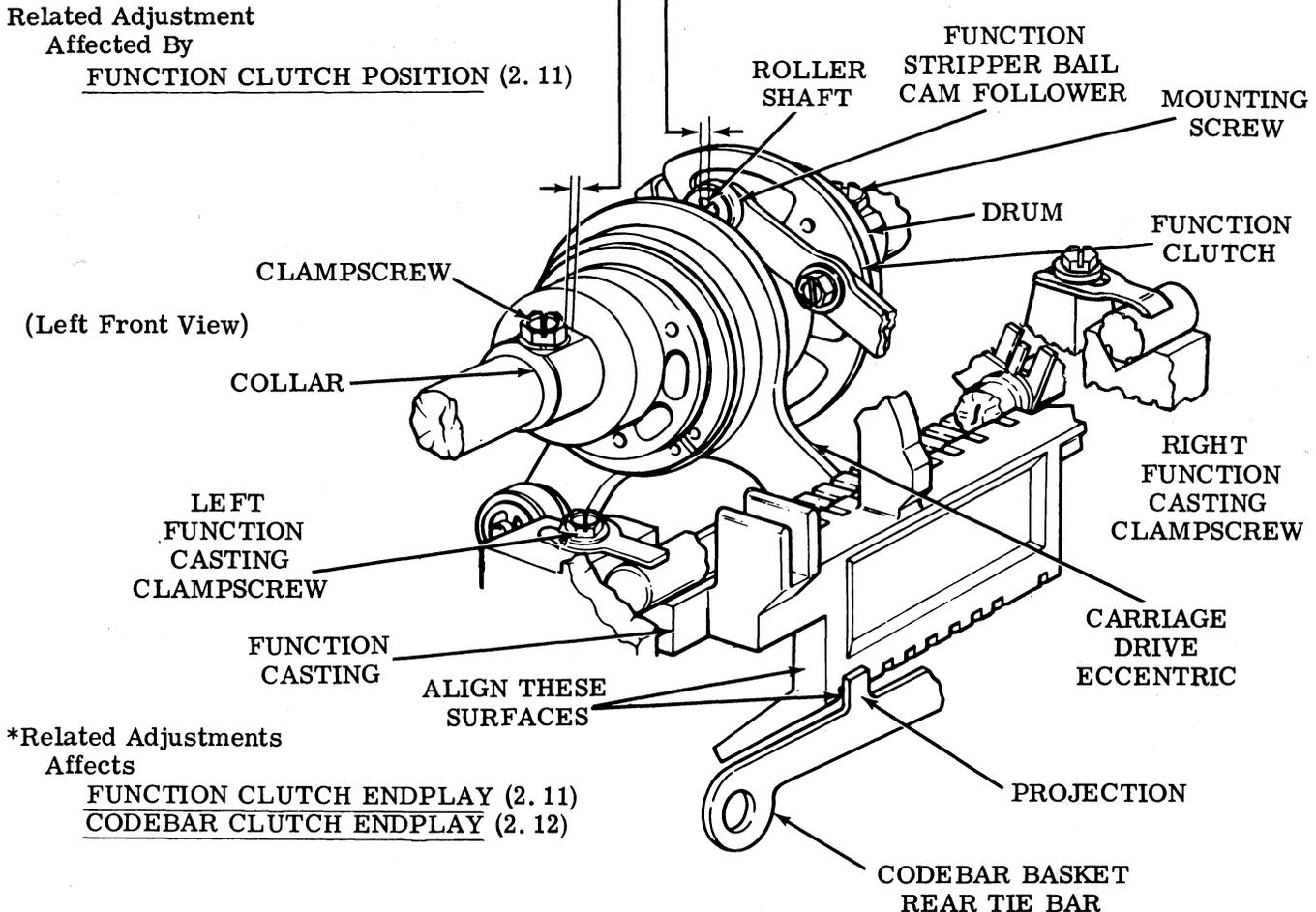
Disengage (latch) function clutch. Take up play to minimize clearance between carriage drive eccentric and end of roller shaft.

Requirement

Min 0.020 inch---Max 0.040 inch clearance between carriage drive eccentric and end of roller shaft as gauged by eye.

To Adjust

Loosen the left and right function casting clampscrews (do not loosen the center clampscrew) friction tight and align the left side of lower portion of function casting with left side of lower projection of codebar basket rear tie bar by moving function casting. Loosen drum mounting screw and position function clutch to meet requirement. Tighten drum mounting screw.*



*Related Adjustments Affects

FUNCTION CLUTCH ENDPLAY (2.11)
CODEBAR CLUTCH ENDPLAY (2.12)

2.12 Main Shaft Area (continued)

CODEBAR CLUTCH ENDPLAY (MSA-5)

To Check

Disengage (latch) codebar clutch. Take up clearances to make codebar clutch endplay a maximum.

Requirement

Min 0.005 inch---Max 0.015 inch endplay in codebar clutch.

To Adjust

Loosen codebar clutch mounting screw and position codebar clutch to meet requirement. Tighten codebar clutch mounting screw.

Related Adjustments

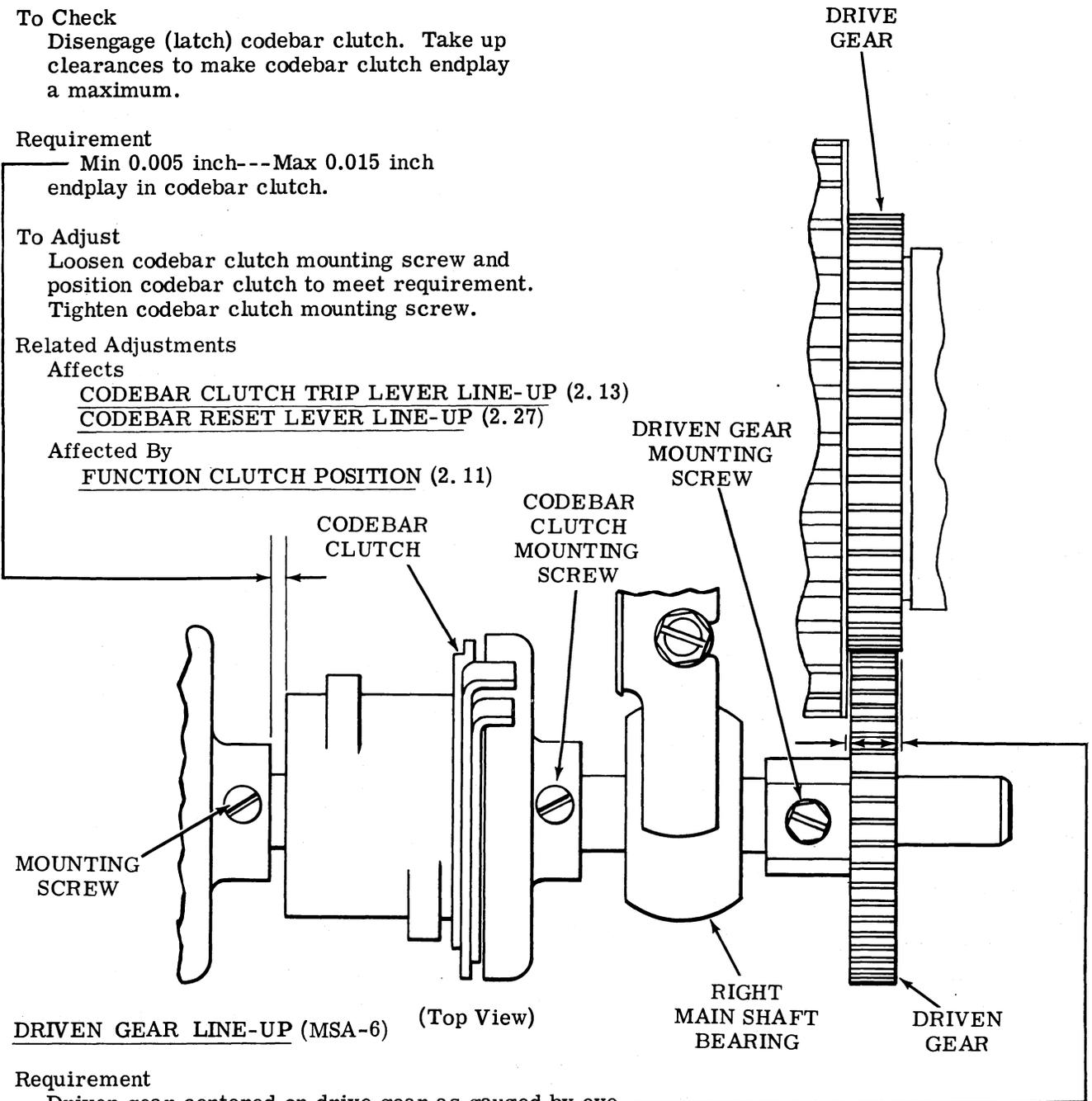
Affects

CODEBAR CLUTCH TRIP LEVER LINE-UP (2.13)

CODEBAR RESET LEVER LINE-UP (2.27)

Affected By

FUNCTION CLUTCH POSITION (2.11)



DRIVEN GEAR LINE-UP (MSA-6) (Top View)

Requirement

Driven gear centered on drive gear as gauged by eye.

To Adjust

Loosen driven gear mounting screw, and position driven gear to meet requirement. Tighten driven gear mounting screw.

Related Adjustments

Affected By

LEFT BEARING POSITION (2.10)

BRUSH HOLDER GAP (2.03)

SELECTOR CAM ENDPLAY (2.10)

2.13 Main Shaft Area (continued)

CODEBAR CLUTCH TRIP LEVER LINE-UP
(MSA-7)

To Check

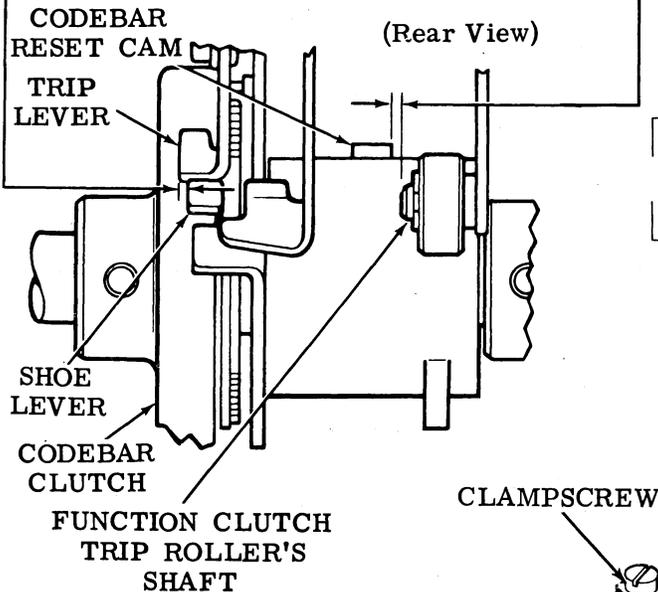
Disengage (latch) codebar and function clutches. Take up the play of the main shaft codebar and function clutches to the left. Take up the play of the trip shaft assembly to the right.

(1) Requirement

As gauged by eye, right edge of codebar clutch trip lever approximately aligned with right edge of shoe lever within 0.020 inch.

(2) Requirement

Min 0.005 inch between function clutch trip roller shaft and codebar reset cam when all play is taken up to make clearance minimum.



To Adjust

Loosen clampscrew and position trip lever.

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

Related Adjustments

Affects

TRIP SHAFT LATCHLEVER ENDPLAY
(2.13)
CODEBAR CLUTCH TRIP LEVER ENGAGEMENT (2.14)

Affected By

LEFT BEARING POSITION (2.10)
SELECTOR CAM ENDPLAY (2.10)
CODEBAR CLUTCH ENDPLAY (2.12)

TRIP SHAFT LATCHLEVER ENDPLAY
(MSA-8)

Requirement

Min some---Max 0.012 inch endplay in function clutch latchlever, as gauged by eye.

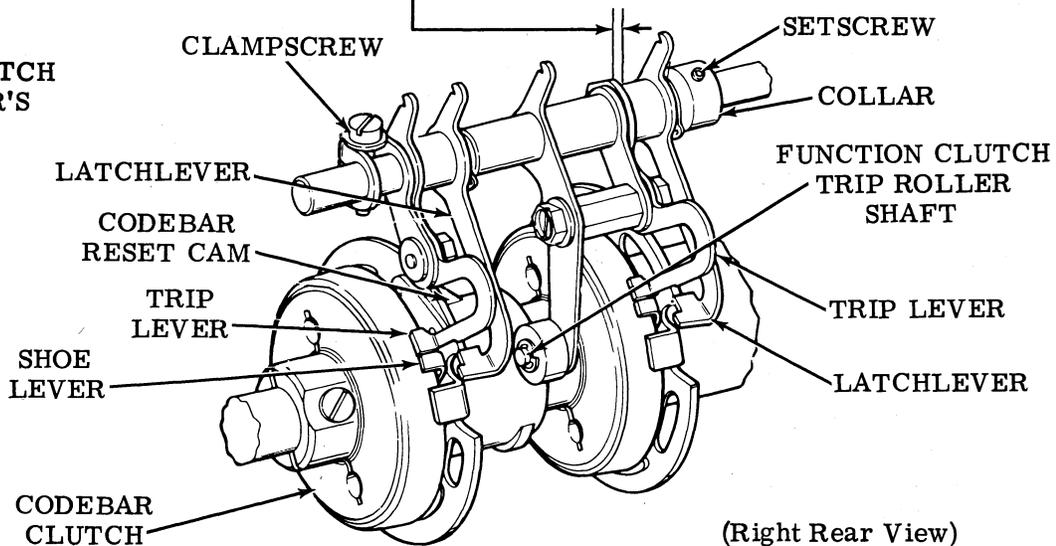
To Adjust

Loosen setscrew and position collar. Tighten setscrew. On units with TP186731 compression ring, compress ring tabs and position ring. Clearance to be measured between function clutch latchlever and trip lever.

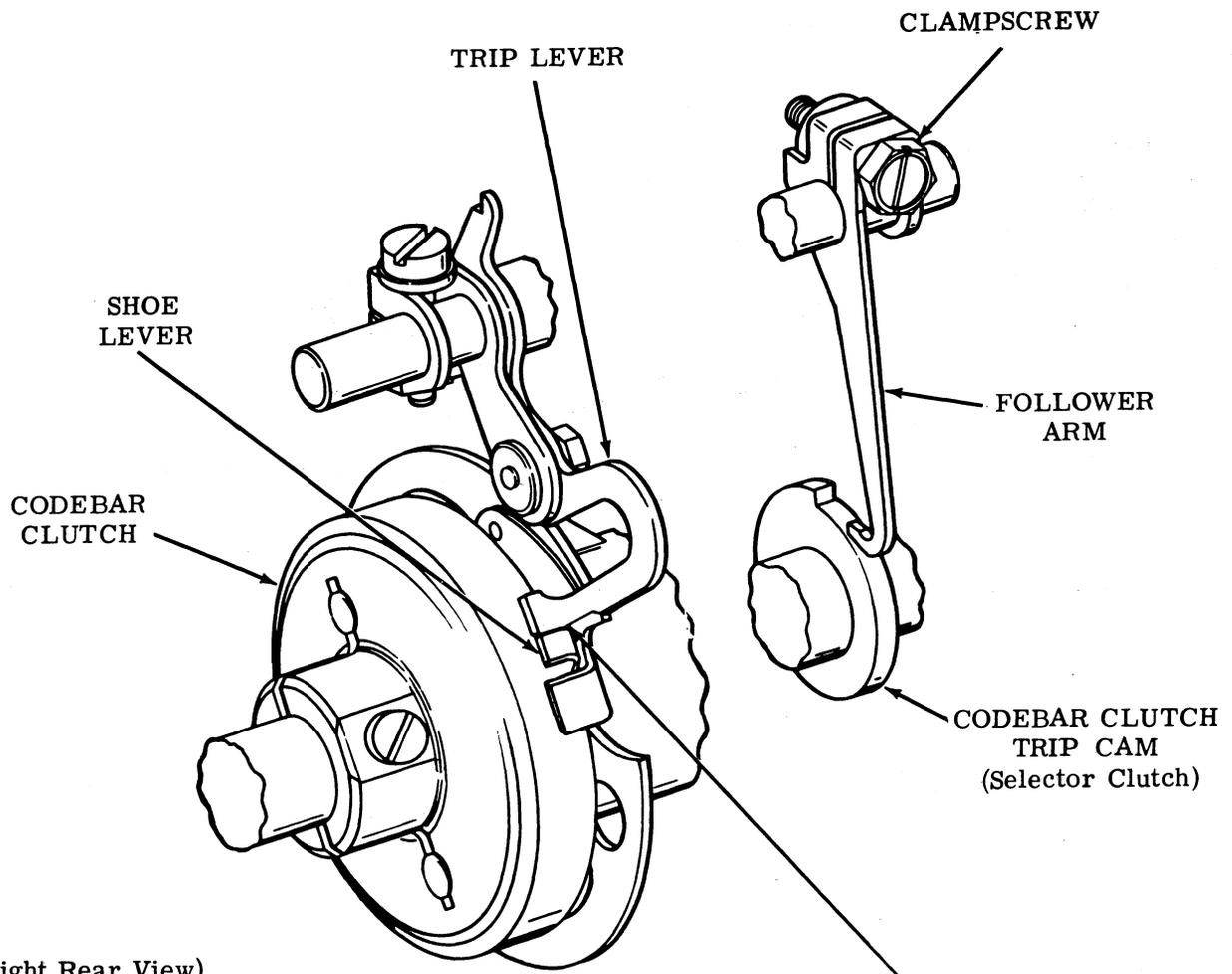
Related Adjustments

Affected By

CODEBAR CLUTCH TRIP LEVER LINE-UP (2.13)



2.14 Main Shaft Area (continued)



(Right Rear View)

CODEBAR CLUTCH TRIP LEVER ENGAGEMENT (MSA-9)

Requirement

With typing unit in stop condition, the upper surfaces of the trip lever and the shoe lever should be flush within 0.005 inch.

To Adjust

Loosen clampscrew and position codebar clutch trip cam follower arm. Tighten clampscrew.

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

Related Adjustments

Affected By

CODEBAR CLUTCH TRIP LEVER LINE-UP (2.13)

2.15 Main Shaft Area (continued)

TRIP LEVER SPRINGS

Note: Check for both codebar and function clutches.

Requirement

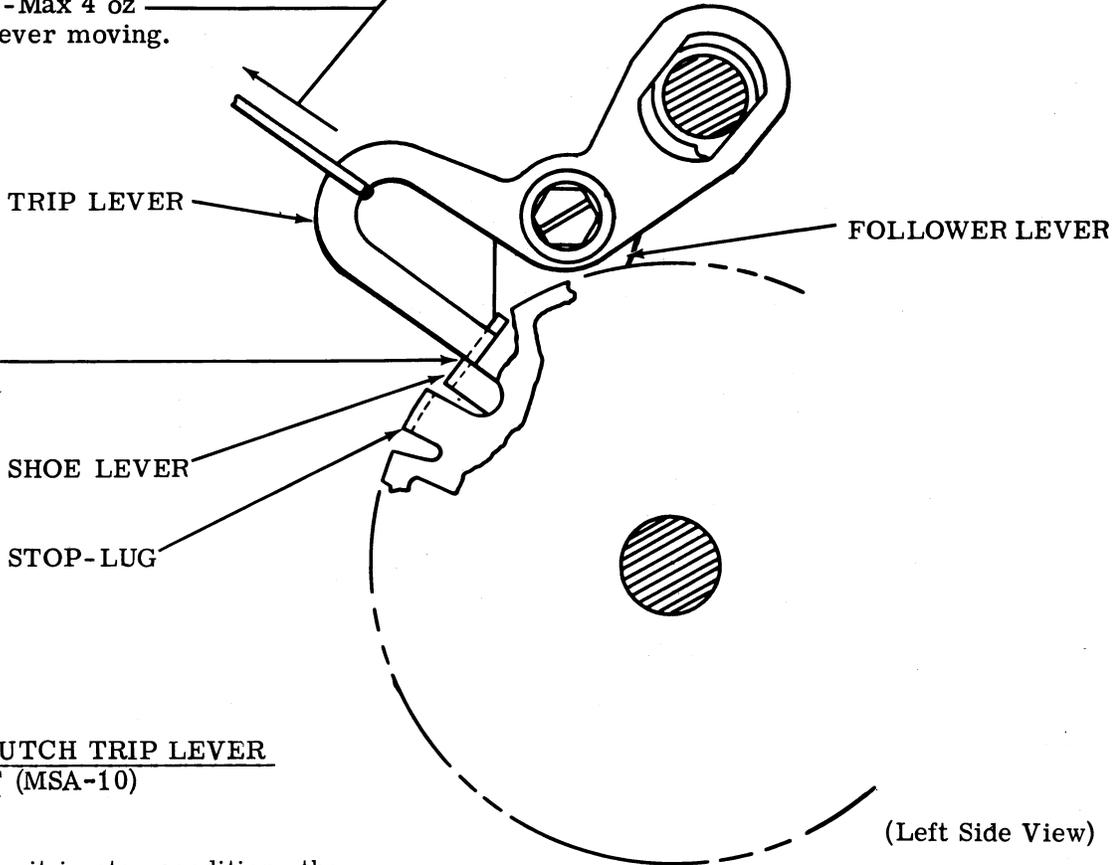
With clutch engaged, codebar clutch

Min 6 oz---Max 12 oz

function clutch

Min 2 oz---Max 4 oz

to start trip lever moving.

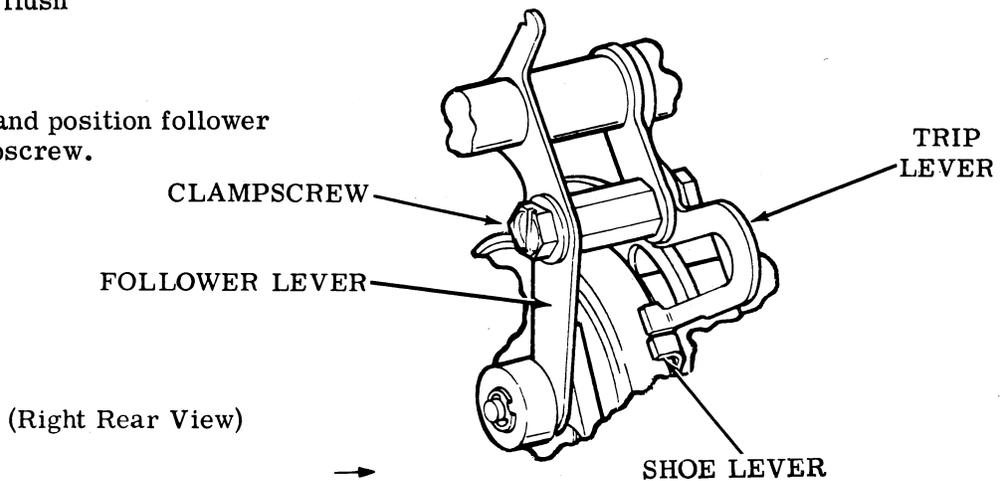


Requirement

With typing unit in stop condition, the upper surfaces of the trip lever and the shoe lever should be flush within 0.005 inch.

To Adjust

Loosen clampscrew and position follower lever. Tighten clampscrew.



2.16 Main Shaft Area (continued)

CODEBAR AND FUNCTION CLUTCH SHOE RELEASE LEVER GAPS (MSA-11 and MSA-12)

To Check

Disengage clutch. Rotate main shaft until screw heads on main shaft are up. Push up on the stop-lug to engage latchlever. Push down on the shoe lever until it touches the stop-lug, then release. Trip clutch. Hold clutch disc against latchlever and pull shoe lever away from stop-lug with 32 oz \pm 1/2 oz force. Release tension slowly.

(1) Requirement

The top leading edge of the shoe lever must be aligned within the width of the notch in the trip lever when viewed perpendicular to the notch.

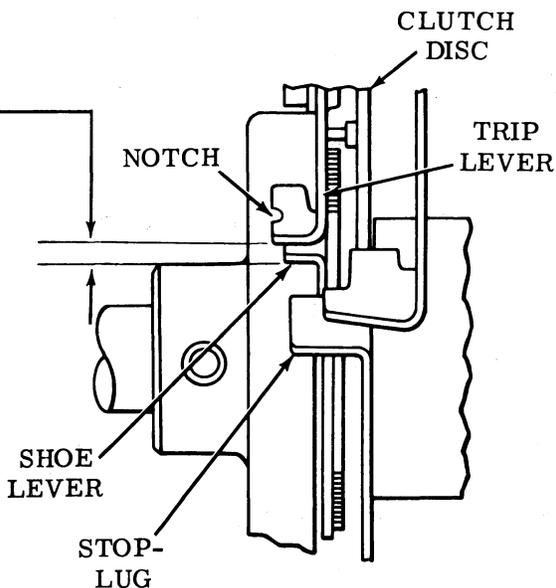
On units with a line scribed on the trip lever, the line should line up (gauge by eye) with the leading edge of the shoe lever.

On units without a scribed line or notch on the trip lever, there should be

0.055 inch to 0.085 inch greater clearance between the stop lug and the shoe lever when the clutch is engaged than when disengaged and latched.

(2) Requirement

0.015 inch minimum clearance between shoe lever and stop-lug when clutch is in stop position and latched, with the latchlever firmly seated against the clutch disc.



(Rear View)

To Adjust

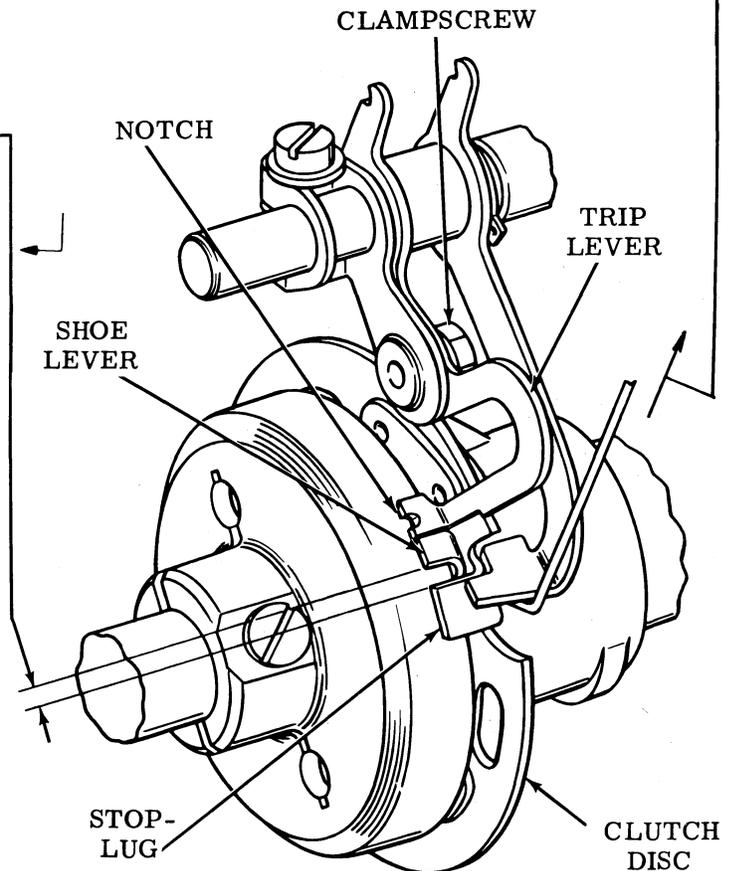
Clutch in stop position. Clutch drum mounting screw head up. Disengage clutch and firmly seat clutch disc against latchlever. Trip clutch. Hold clutch disc against latchlever and apply 32 oz \pm 1/2 oz force against shoe lever and away from stop-lug. Loosen trip lever clamp screw and position trip lever to meet requirement

CODEBAR AND FUNCTION CLUTCH LATCHLEVER SPRINGS

Requirement

With latchlever resting on high portion of clutch disc

Min 2 oz---Max 3 oz to start latchlever moving.

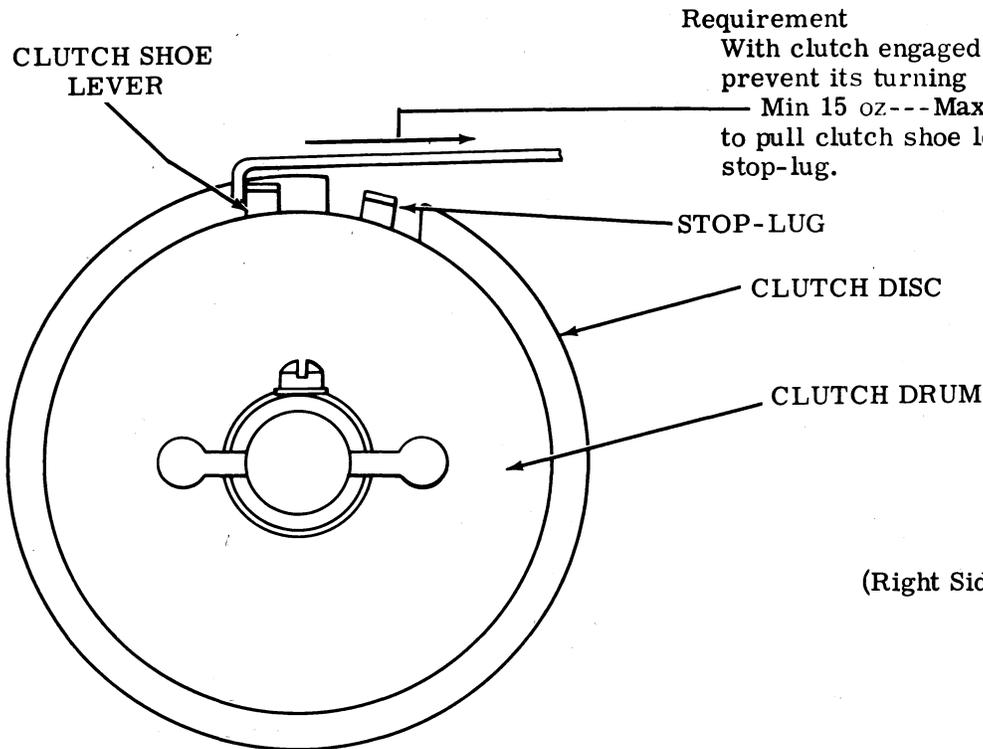


(Right Rear View)

2.17 Main Shaft Area (continued)

Note 1: These tensions apply to all clutches.

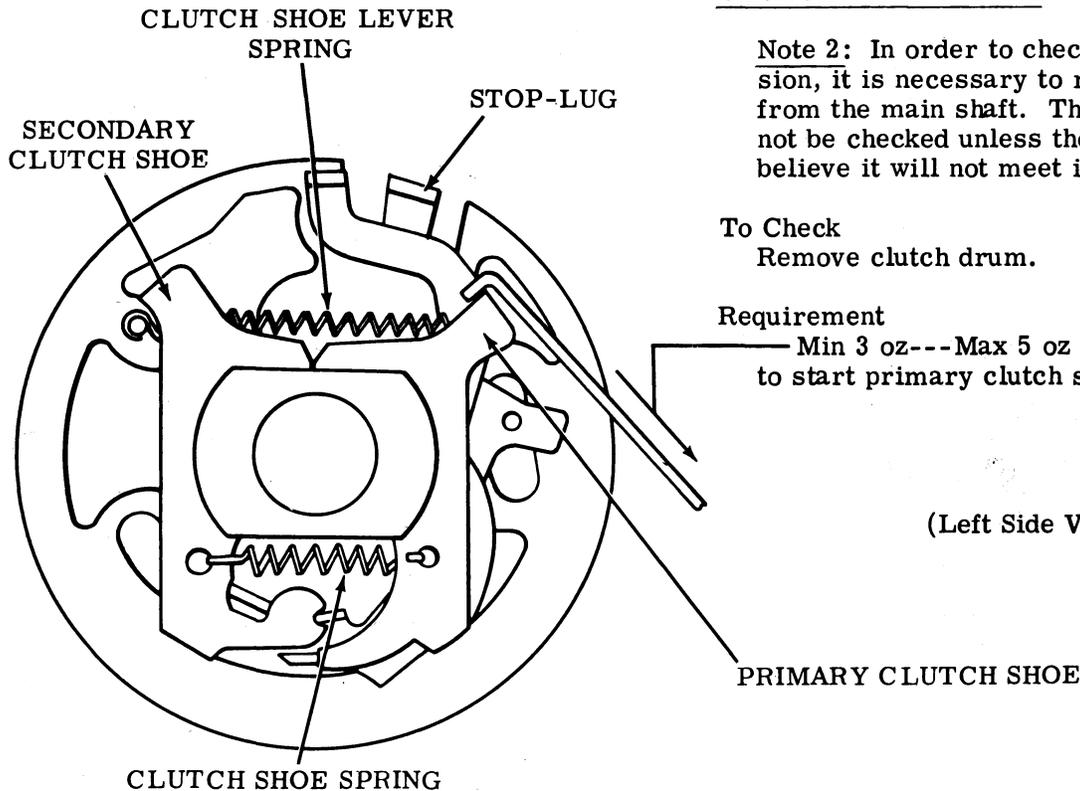
CLUTCH SHOE LEVER SPRING



Requirement
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



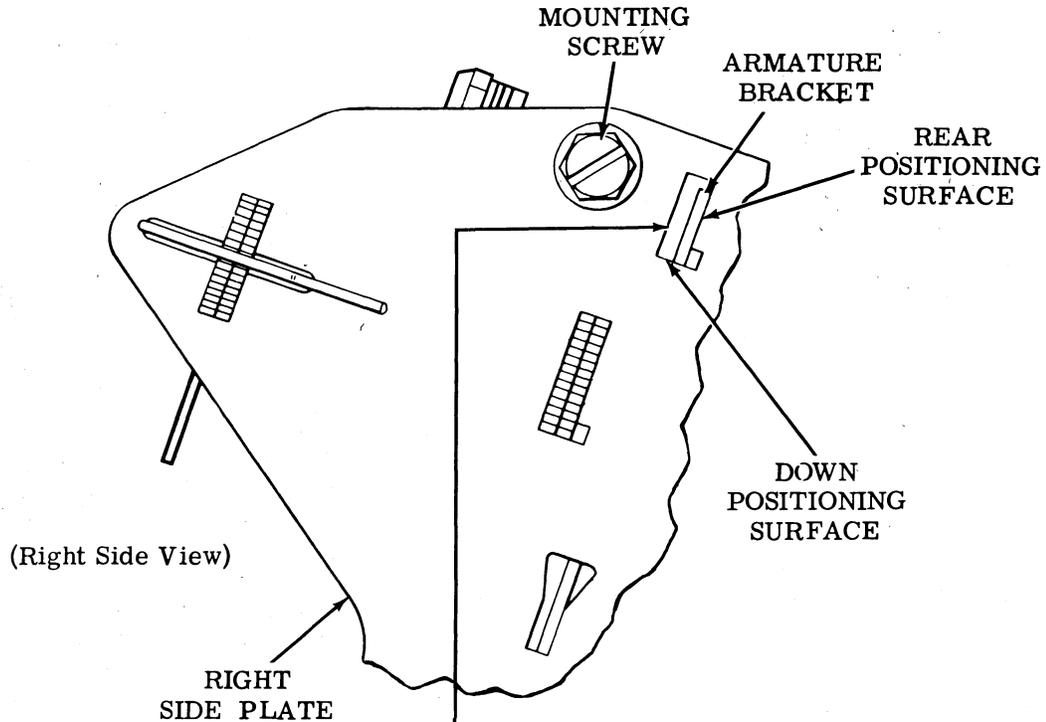
Note 2: In order to check this spring tension, it is necessary to remove the clutch from the main shaft. Therefore, it should not be checked unless there is reason to believe it will not meet its requirement.

To Check
Remove clutch drum.

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

(Left Side View)

2.18 Selector Area



ARMATURE BRACKET POSITION
(Preliminary) (SLA-1)

Requirement

Armature bracket should be positioned against its down and rear positioning surfaces on right and left side plates so that it is parallel within 0.002 inch with rear surfaces measured at ends.

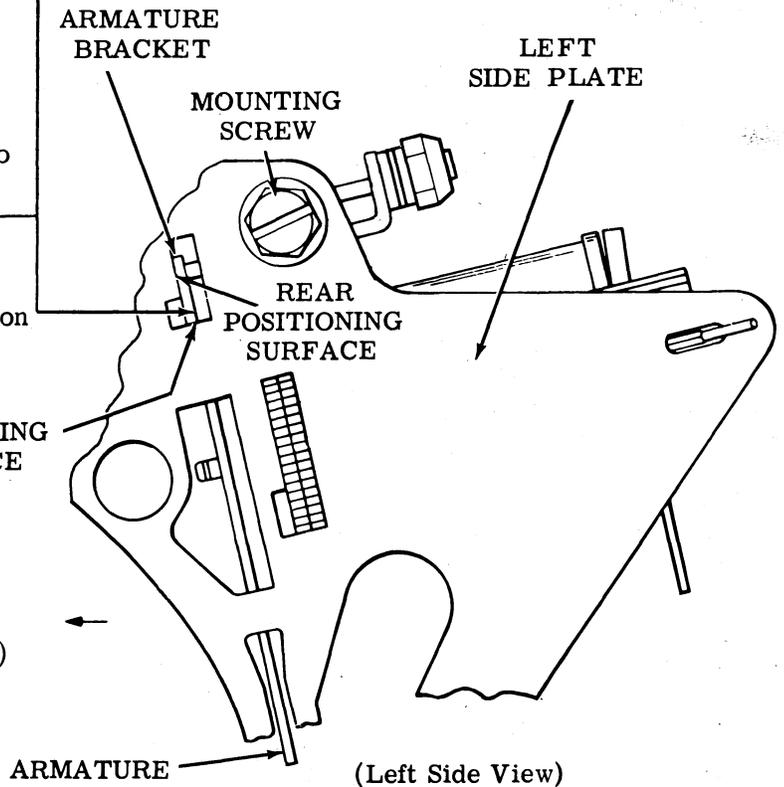
To Adjust

Loosen two mounting screws and position bracket. Tighten mounting screws.

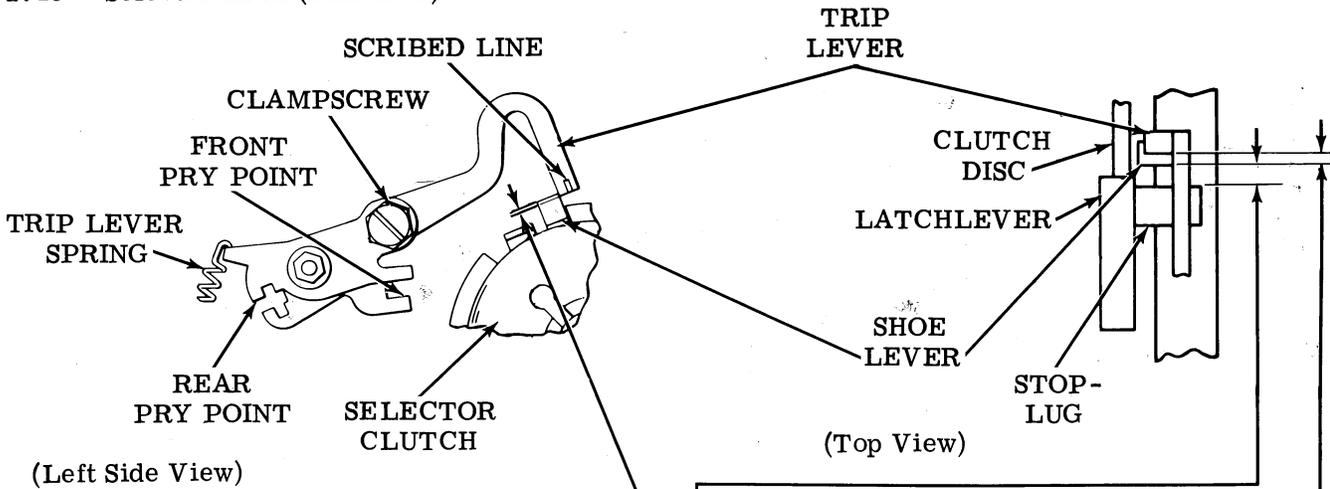
Related Adjustments

Affects

- ARMATURE SPRING (2.20)
- RECEIVING MARGINS (2.123)
- SHOE RELEASE LEVER GAP AND TRIP LEVER ENGAGEMENT (2.19)



2.19 Selector Area (continued)

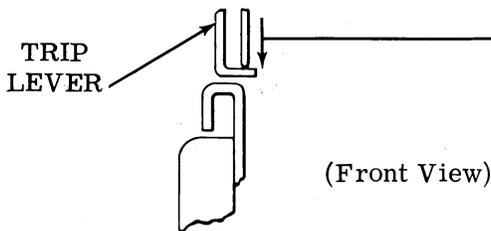


TRIP LEVER SPRING

Requirement

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: 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.



- (1) **Requirement**
 The forward edge of the trip lever should be approximately in line with the forward edge of the scribed line on the trip lever (gauge by eye).
- (2) **Requirement**
 Clearance between the shoe lever and stop-lug should be
 Min 0.055 inch---Max 0.085 inch
 greater when clutch is engaged than when disengaged.
- (3) **Requirement**
 There should be a minimum of
 0.015 inch
 clearance between the stop-lug and the shoe lever when the clutch is disengaged and latched.
- (4) **Requirement**
 With the clutch disengaged and latched, the trip lever should engage the shoe lever thus:
 Minimum: 2/3 thickness of shoe lever
 Maximum: Upper surfaces of the levers should be flush.

SHOE RELEASE LEVER GAP AND TRIP LEVER ENGAGEMENT (SLA-2)

To Check

Set up an all spacing code combination in the selector. Rotate main shaft to disengage clutch and continue to rotate main shaft until clutch mounting screw head is up. Push up on the stop lug so latchlever seats in notch of clutch disc, then release. Hold the clutch disc against the latchlever and pull the shoe lever away from the stop-lug with a force of 32 ± 1/2 oz. Release tension slowly.

To Adjust

Loosen clampscrew friction tight. Position trip lever to meet requirements (1), (2), and (3); using pry points position trip lever to meet requirement (4).

Related Adjustments

Affects

RECEIVING MARGINS (2.123)

Affected By

ARMATURE BRACKET POSITION (2.18)

2.20 Selector Area (continued)

ARMATURE SPRING

Note: This is a preliminary adjustment. It should not be considered final until RECEIVING MARGINS (2.123) adjustment is completed, and, as finally adjusted, it could fall outside limits specified below.

To Check

Place typing unit in stop condition and move carriage near right margin. Remove armature clip. Rotate selector clutch until start lever, selector levers, and spacing locklever do not contact armature.

Requirement

Min 2-1/4 oz---Max 4-3/4 oz _____
to pull armature to midpoint of travel.

To Adjust

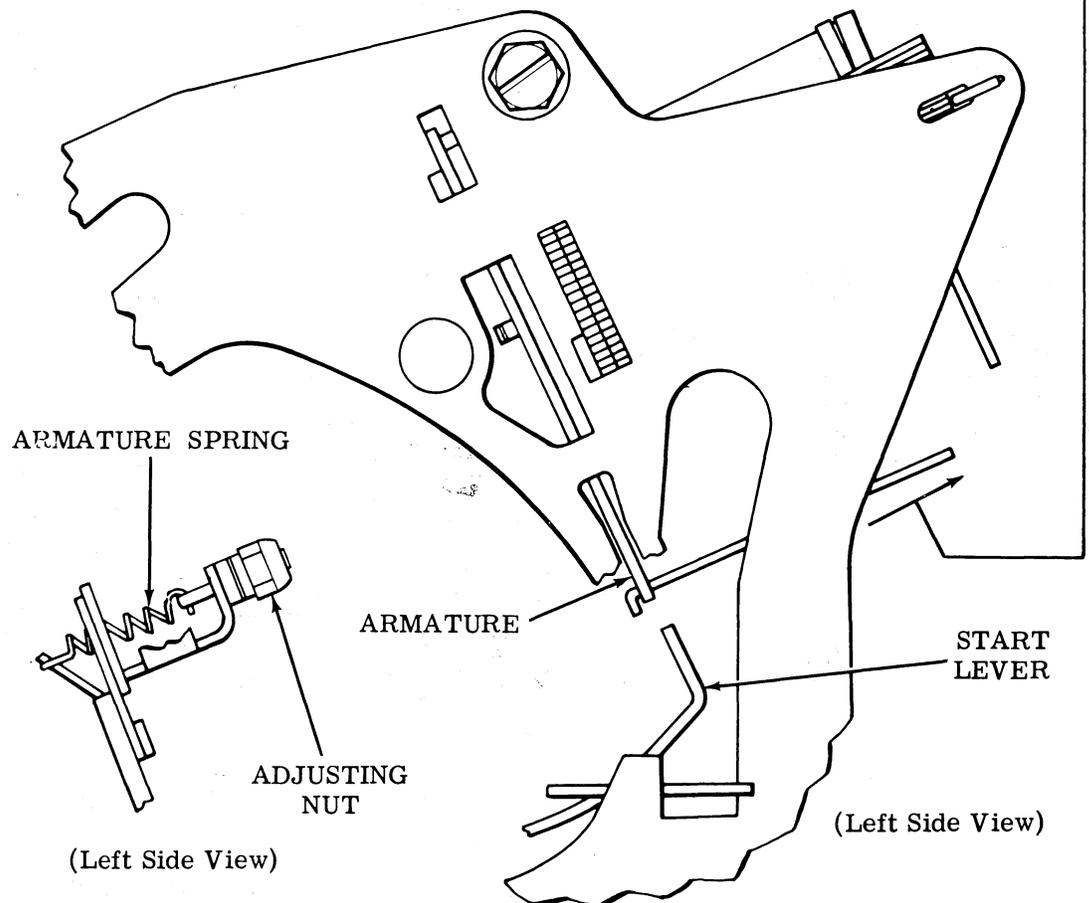
Rotate adjusting nut clockwise to increase armature spring tension and counter-clockwise to decrease it.

Related Adjustments**Affects**

RECEIVING MARGINS (2.123)

Affected By

ARMATURE BRACKET POSITION (2.18)



2.21 Selector Area (continued)

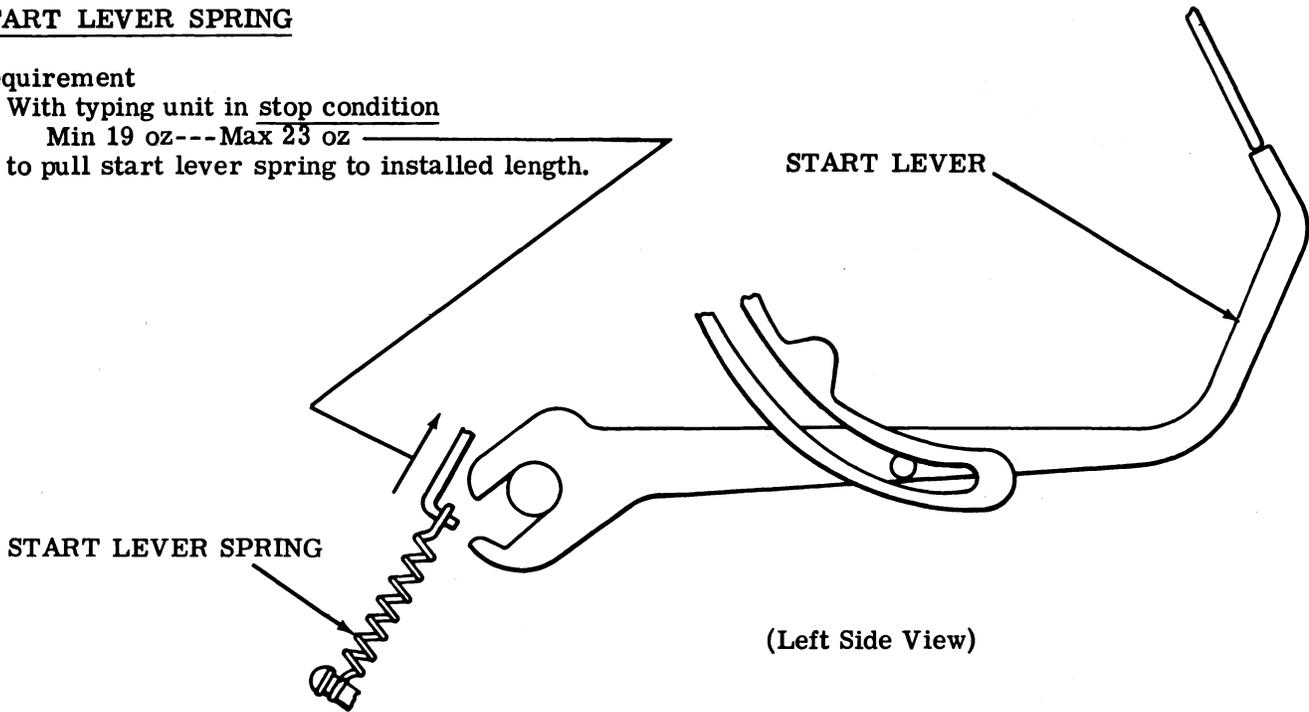
START LEVER SPRING

Requirement

With typing unit in stop condition

Min 19 oz---Max 23 oz

to pull start lever spring to installed length.



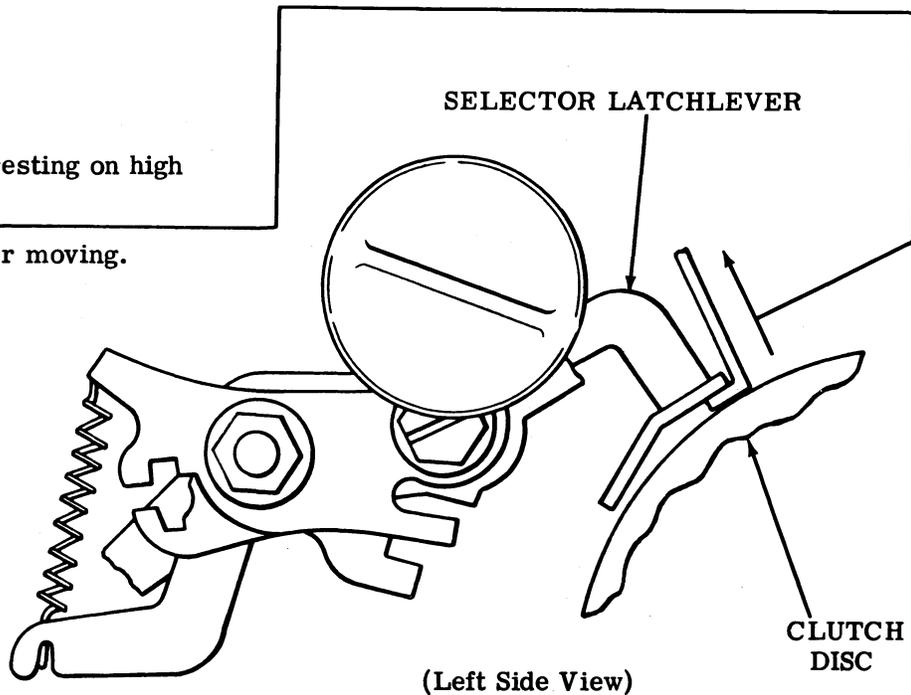
LATCHLEVER SPRING

Requirement

With selector latchlever resting on high part of clutch disc

Min 2 oz---Max 3 oz

to start selector latchlever moving.



2.22 Selector Area (continued)

SELECTOR LEVER SPRINGS

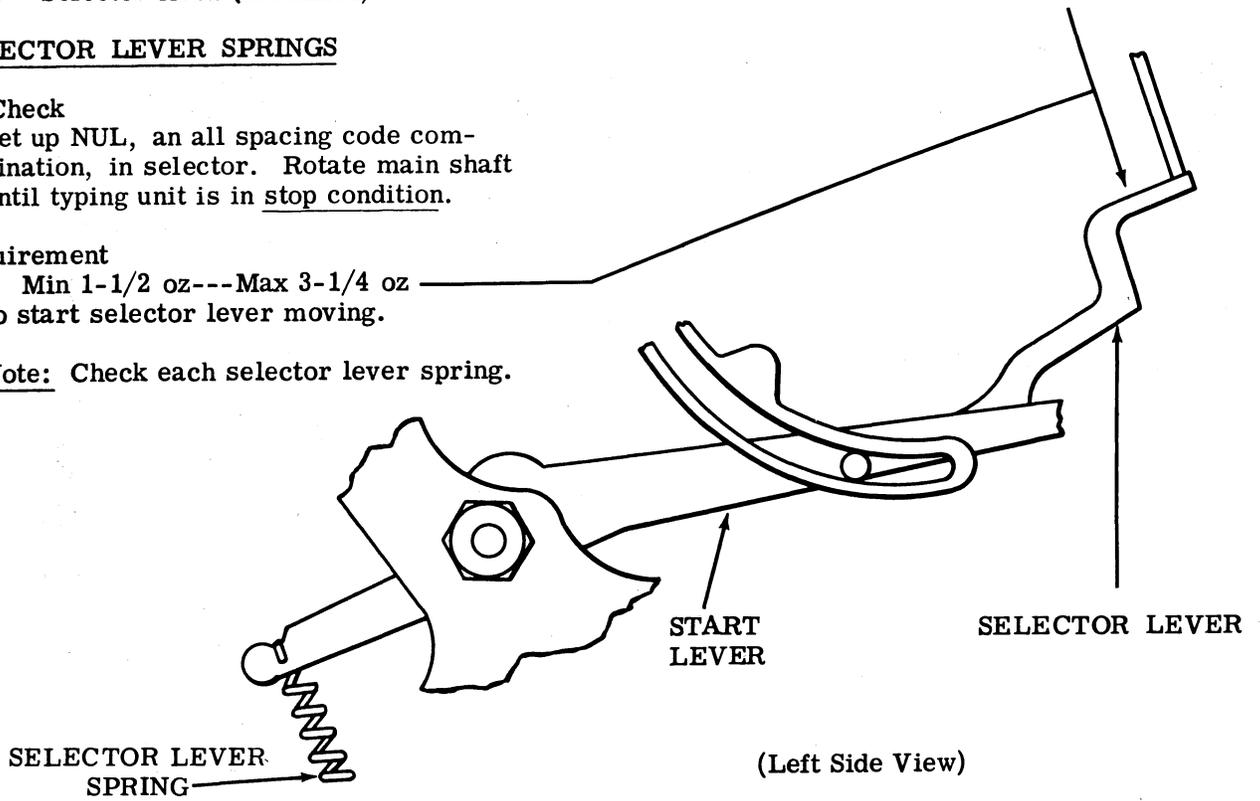
To Check

Set up NUL, 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.



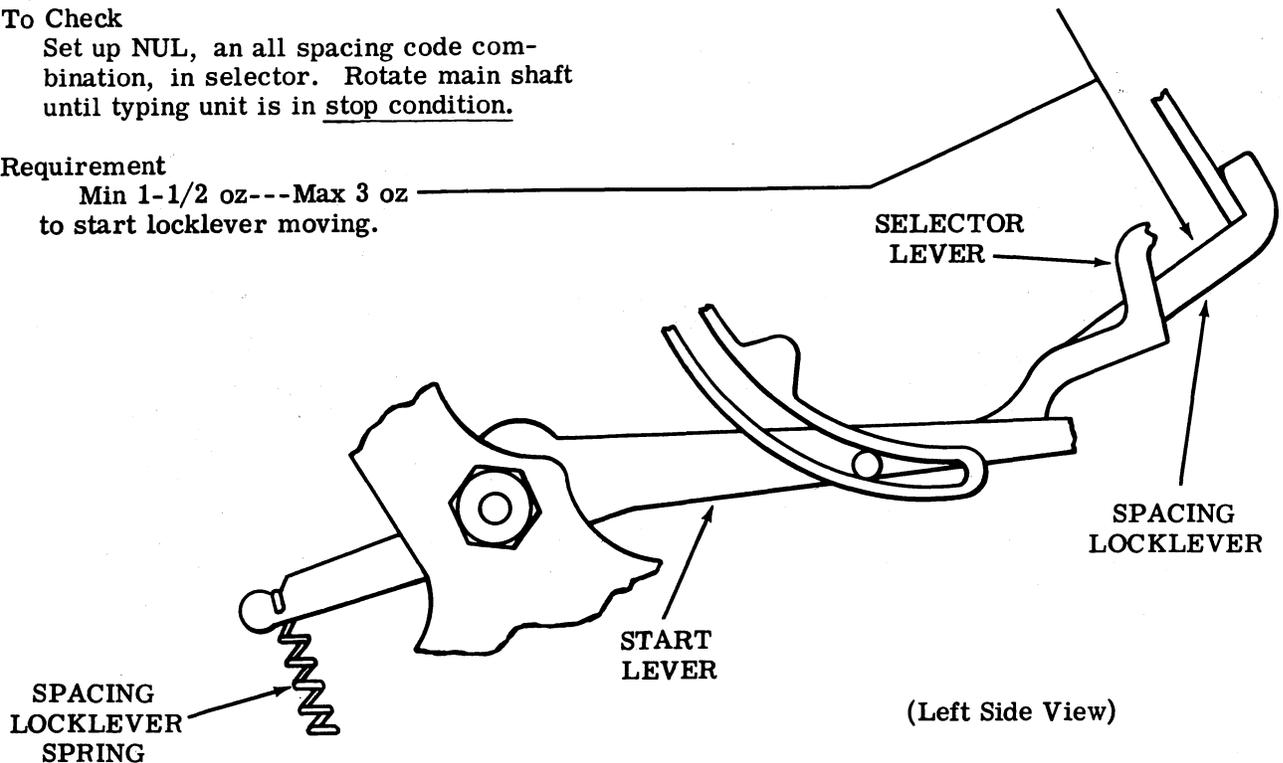
SPACING LOCKLEVER SPRING

To Check

Set up NUL, 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.



2.23 Selector Area (continued)

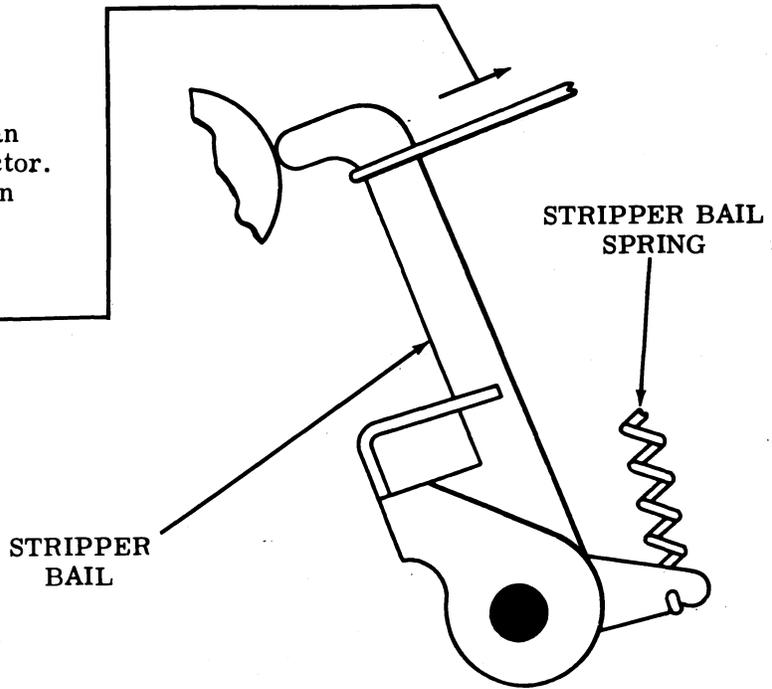
STRIPPER BAIL SPRING

To Check

Set range finder at 60. Set up NUL, 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 bail moving.



(Left Side View)

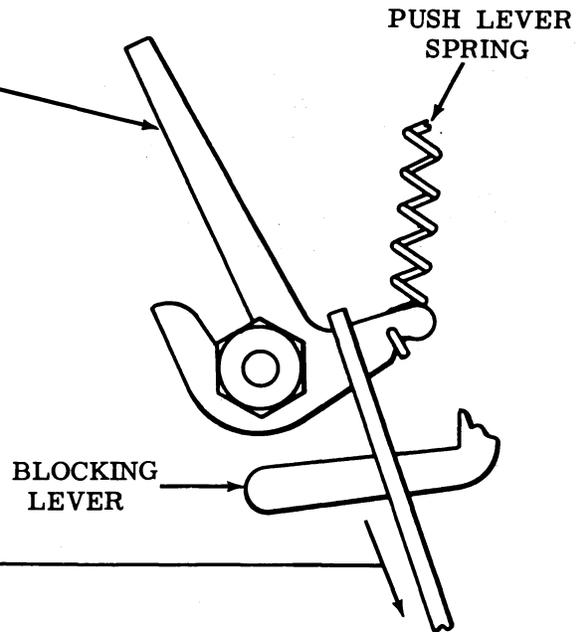
PUSH LEVER SPRINGS

Note 1: To measure this tension, selector mechanism 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 CLUTCH, MAKE SURE ARMATURE IS IN THE SPACING POSITION. HOLD SELECTOR LEVERS IN PLACE AWAY FROM SELECTOR CLUTCH WITH TP184098 TOOL.

Requirement

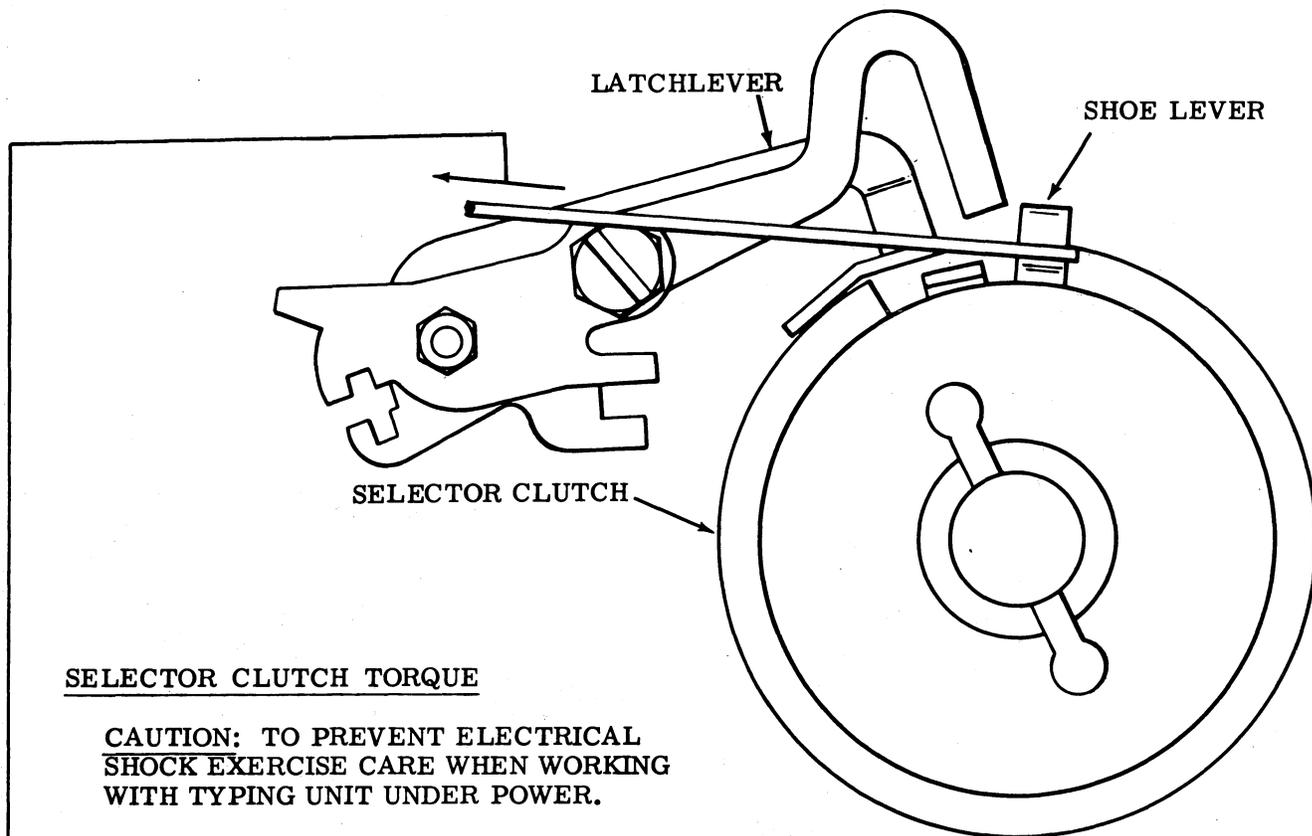
With blocking lever held away from push lever
Min 1-1/2 oz---Max 3 oz
to start push lever moving.



(Left Side View)

Note 2: Check each push lever spring.

2.24 Selector Area (continued)

**SELECTOR CLUTCH TORQUE**

CAUTION: TO PREVENT ELECTRICAL SHOCK EXERCISE CARE WHEN WORKING WITH TYPING UNIT UNDER POWER.

To Check

Place TP185832 armature clip so as to hold armature attracted. Plug typing unit plugs into proper call control unit receptacle and apply power to typing unit. Hold shoe lever with spring scale as shown. Trip selector clutch by moving armature rearward. Allow selector clutch to advance until latchlever is disengaged. Check requirement. Remove all power connections.

Requirement

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

(Left Side View)

2.25 Function Area (continued)

ROCKER SHAFT POSITION AND ENDPLAY (FNA-1)

(1) Requirement

Both bearings should be centered on base casting, as gauged by eye.

To Adjust

Loosen collar setscrews and bearing clampscrews and position bearings.
Tighten bearing clampscrews.

(2) Requirement

The left end of function rocker shaft should line up with inside top edge of base casting lip, however:

0.030 inch misalignment is permissible to the left.

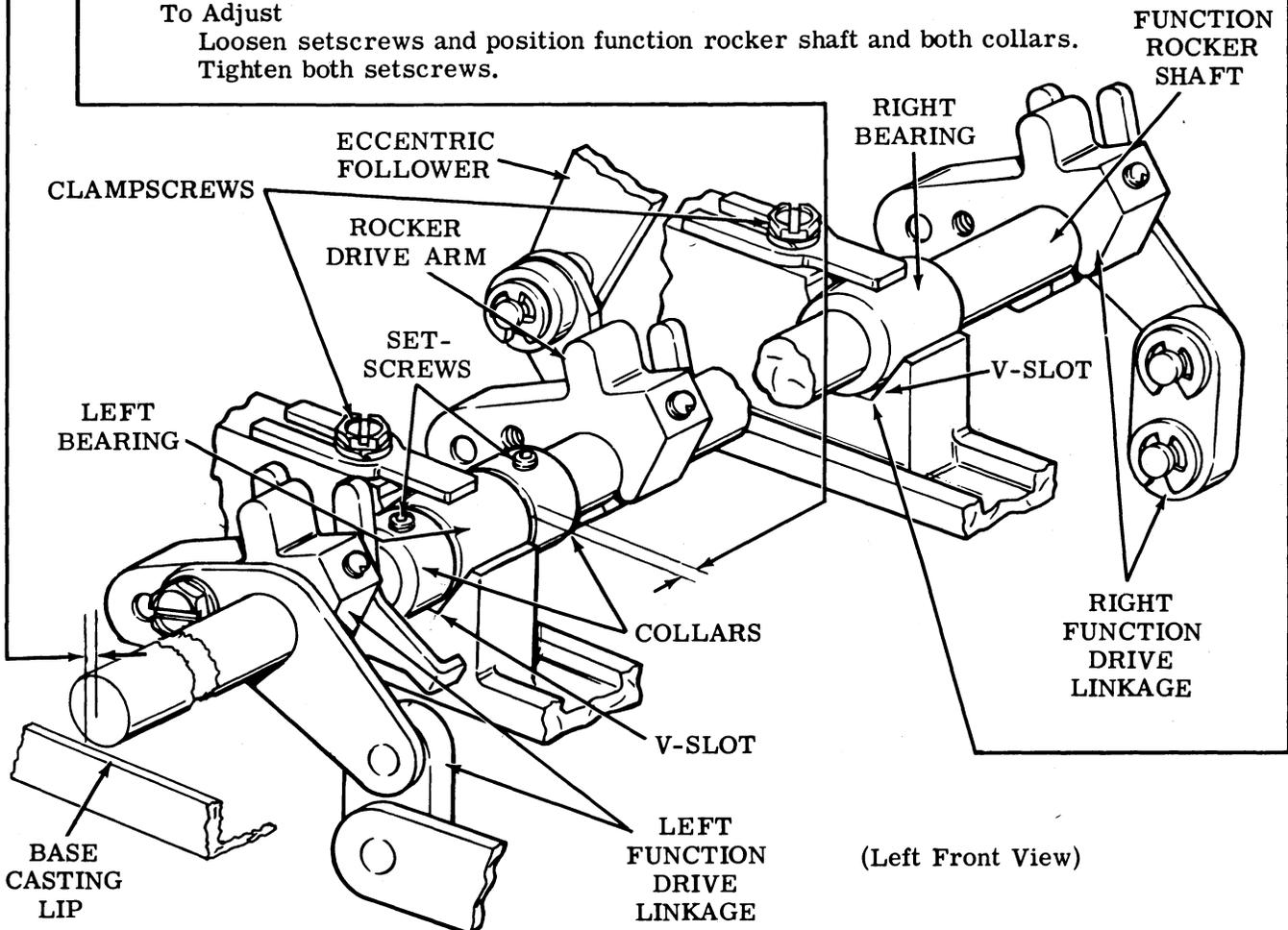
0.060 inch misalignment is permissible to the right.

(3) Requirement

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

To Adjust

Loosen setscrews and position function rocker shaft and both collars.
Tighten both setscrews.



Related Adjustments
Affects

CODEBAR RESET LEVER LINE-UP (2.27)

CODEBAR RESET LEVER POSITION (2.28)

PRINT SUPPRESSION LATCH — HORIZONTAL CLEARANCE (2.29)

2.26 Function Area

(A) BEARING ALIGNMENT (FNA-2)

Note 1: 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 should be aligned with their respective shaft.

To Adjust

- (a) With bearing clamps loosened, position bearing using finger pressure while rotating associated shaft. Tighten clampscrews.
- (b) If bind still exists, keep bearing clamp tightened and apply a light blow vertically to top of bearing clamp.

Note 2: If adjustment is made per (a), the bearing adjustment and the related adjustments should be checked.

(B) MAIN SHAFT ROTATION (FNA-3)

Note 1: After making any adjustments which affect the typing unit drive system, the main shaft should be checked for binds or excessive drag. Excessive drag or binding when the main shaft is rotated will cause inadequate receiving margins.

To Check

With all clutches disengaged (latched), manually rotate main shaft.

Requirement

No excessive drag or binding should be detected.

Note 2: If binds or excessive drag occurs, remove motor belt at intermediate gear and recheck requirement.

To Adjust

If excessive drag or binding occurs with motor belt installed, but does not occur when belt is removed, check the following adjustments:

GEAR BACKLASH (Motor Area) (2.01)

BELT TENSION (Motor Area) (2.02)

If drag or binding occurs with motor belt removed, check the following adjustments.

LEFT BEARING POSITION (Main Shaft Area) (2.10)

SELECTOR CAM ENDPLAY (Main Shaft Area) (2.10)

SHOE RELEASE LEVER GAP AND TRIP LEVER ENGAGEMENT (Selector Area) (2.19)

FUNCTION CLUTCH ENDPLAY (Main Shaft Area) (2.11)

CODEBAR CLUTCH ENDPLAY (Main Shaft Area) (2.12)

CODEBAR AND FUNCTION CLUTCH SHOE RELEASE LEVER GAPS

(Main Shaft Area) (2.16)

DRIVEN GEAR LINE-UP (Main Shaft Area) (2.12)

SHAFT LEFT BEARING GAP (Distributor Area) (2.03)

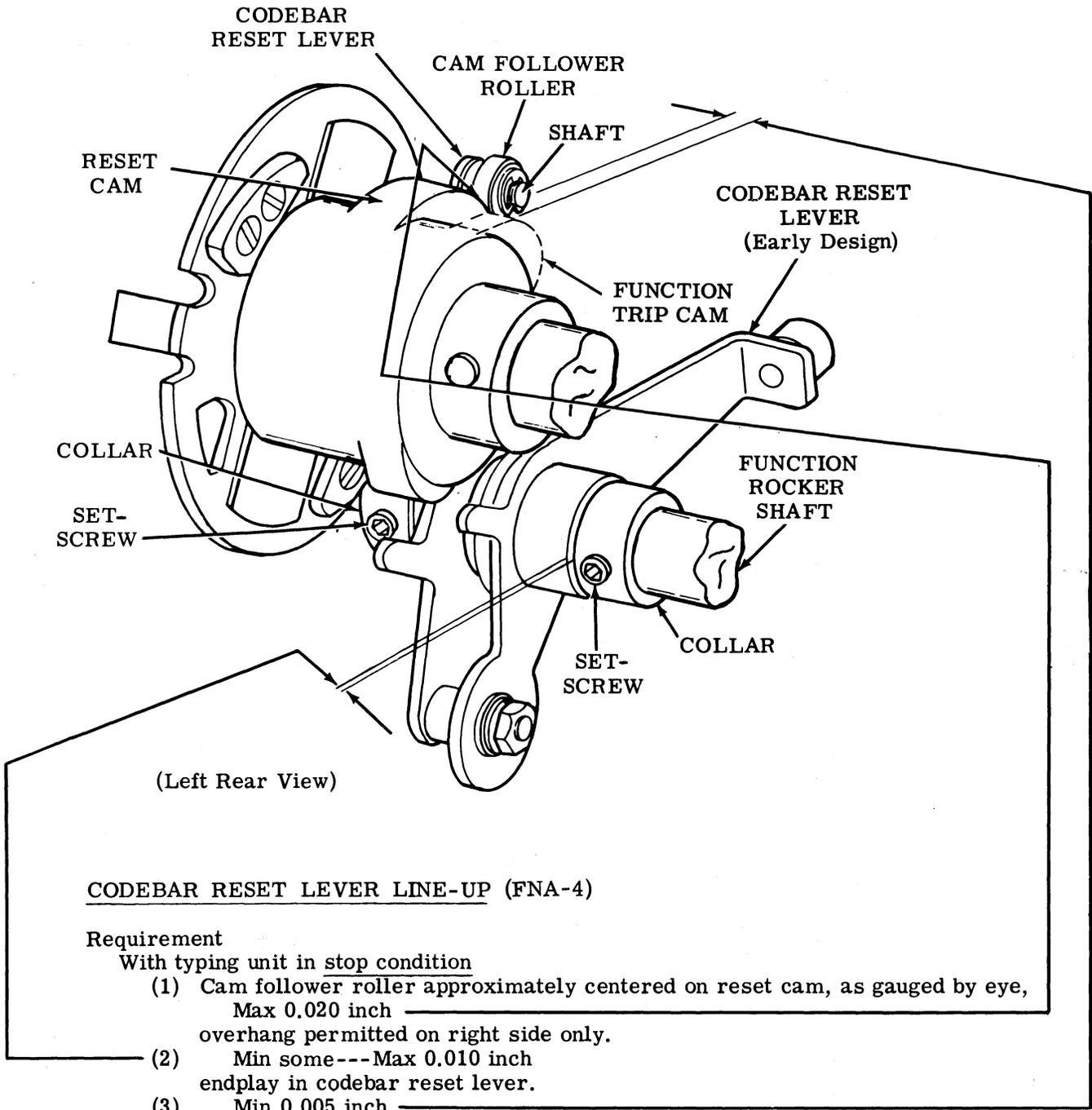
CLUTCH SHOE RELEASE LEVER GAP (Distributor Area) (2.05)

FORM FEED CLUTCH ENDPLAY - S (Main Shaft Area) (2.93)

BEARING ALIGNMENT (Function Area) (2.26)

Replace motor belt and recheck requirement.

2.27 Function Area (continued)



CODEBAR RESET LEVER LINE-UP (FNA-4)

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 right 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

Loosen setscrews and position two collars.

Related Adjustments

Affects

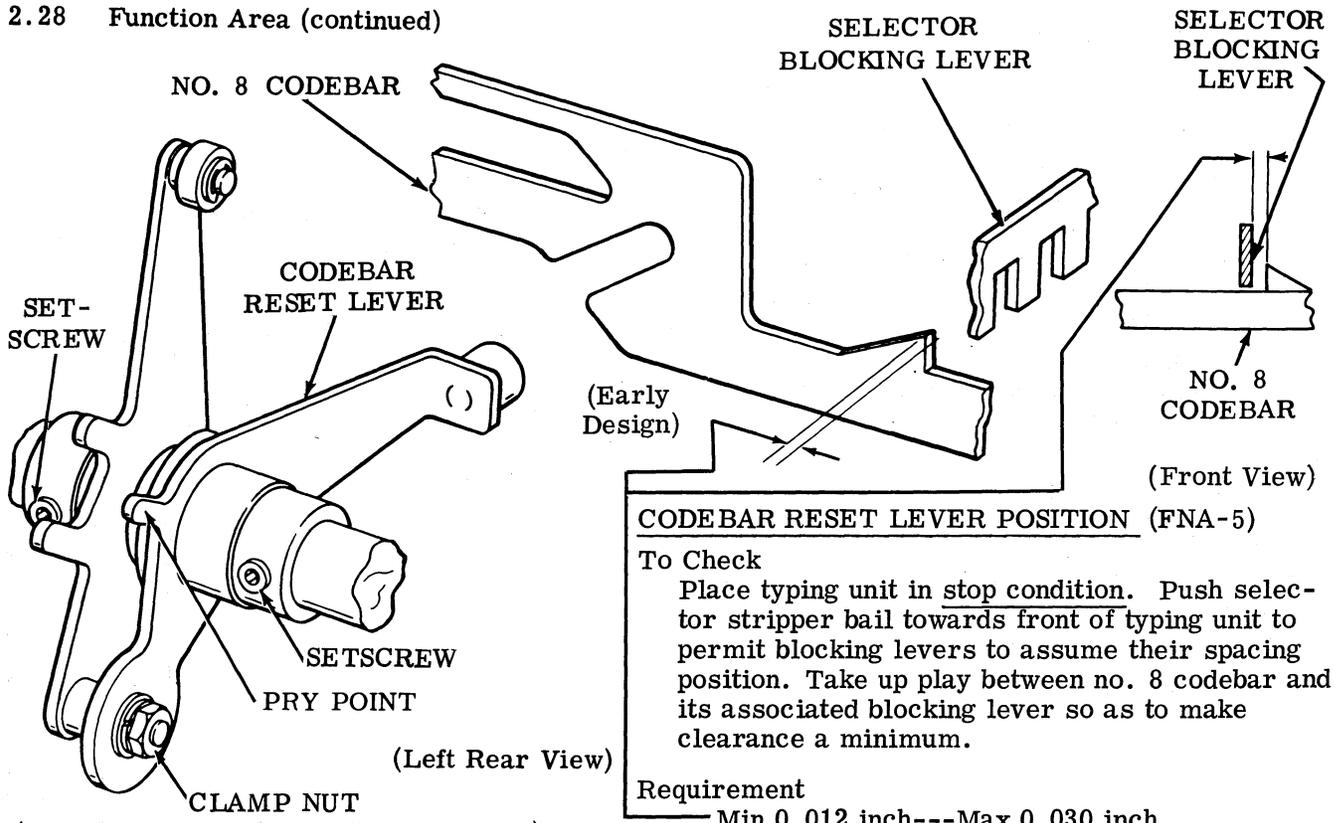
CODEBAR RESET LEVER POSITION (2.28)

Affected By

ROCKER SHAFT POSITION AND ENDPLAY (2.25)

CODEBAR CLUTCH ENDPLAY (2.12)

2.28 Function Area (continued)



CODEBAR RESET LEVER POSITION (FNA-5)

To Check

Place typing unit in stop condition. Push selector stripper bail towards front of typing unit to permit blocking levers to assume their spacing position. Take up play between no. 8 codebar and its associated blocking lever so as to make clearance a minimum.

Requirement

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

To Adjust

Early Design
With clamp nut loosened, use pry point to adjust codebar reset lever. Tighten clamp nut.

Late Design
With the two arm assembly clampscrews loose, rotate adjusting (remaining) screw. Tighten clampscrews.

Related Adjustments

Affects

- PRINT SUPPRESSION LATCH — HORIZONTAL CLEARANCE (2.29)
- PRINT SUPPRESSION LATCH — VERTICAL CLEARANCE (2.39)
- FUNCTION SHAFT AND CASTING POSITION (2.40)
- REAR RAIL POSITION (Carriage Area) (2.45)
- FOURTH PULSE LINKAGE POSITIONING (Carriage Area) (2.47)
- PRINT SUPPRESSION LATCHLEVER RELEASE (Carriage Area) (2.57)
- SPACE SUPPRESSION LEVER CLEARANCE — PRINTING (Spacing Area) (2.65)

Affected By

- ROCKER SHAFT POSITION AND ENDPLAY (2.25)
- CODEBAR RESET LEVER LINE-UP (2.27)

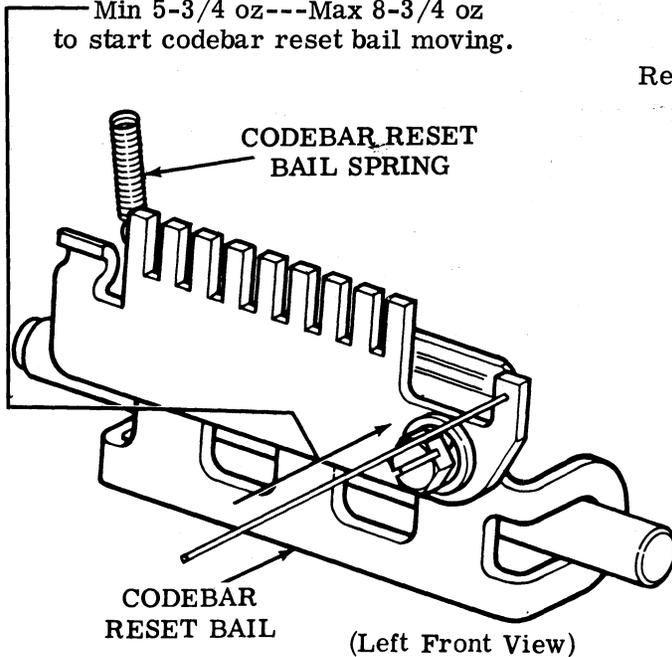
CODEBAR RESET BAIL SPRING

To Check

Set up NUL, 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.



2.29 Function Area (continued)

PRINT SUPPRESSION LATCH — HORIZONTAL CLEARANCE (FNA-6)

(1) Requirement

With typing unit in the stop condition
 Min 0.010 inch---Max 0.025 inch
 between print suppression latch and
 the first latch surface of the print
 suppression codebar.

(2) Requirement

Print suppression cam follower and
 latch should move freely.

To Adjust

Loosen clamp nut(s) and setscrews in
 collars (see Note 1 and Note 2). Position
 latch bracket using pry point to meet
 Requirement (1). Tighten clamp nuts.
 Position collars to meet Requirement
 (2). Tighten setscrews.

Related Adjustments

Affects

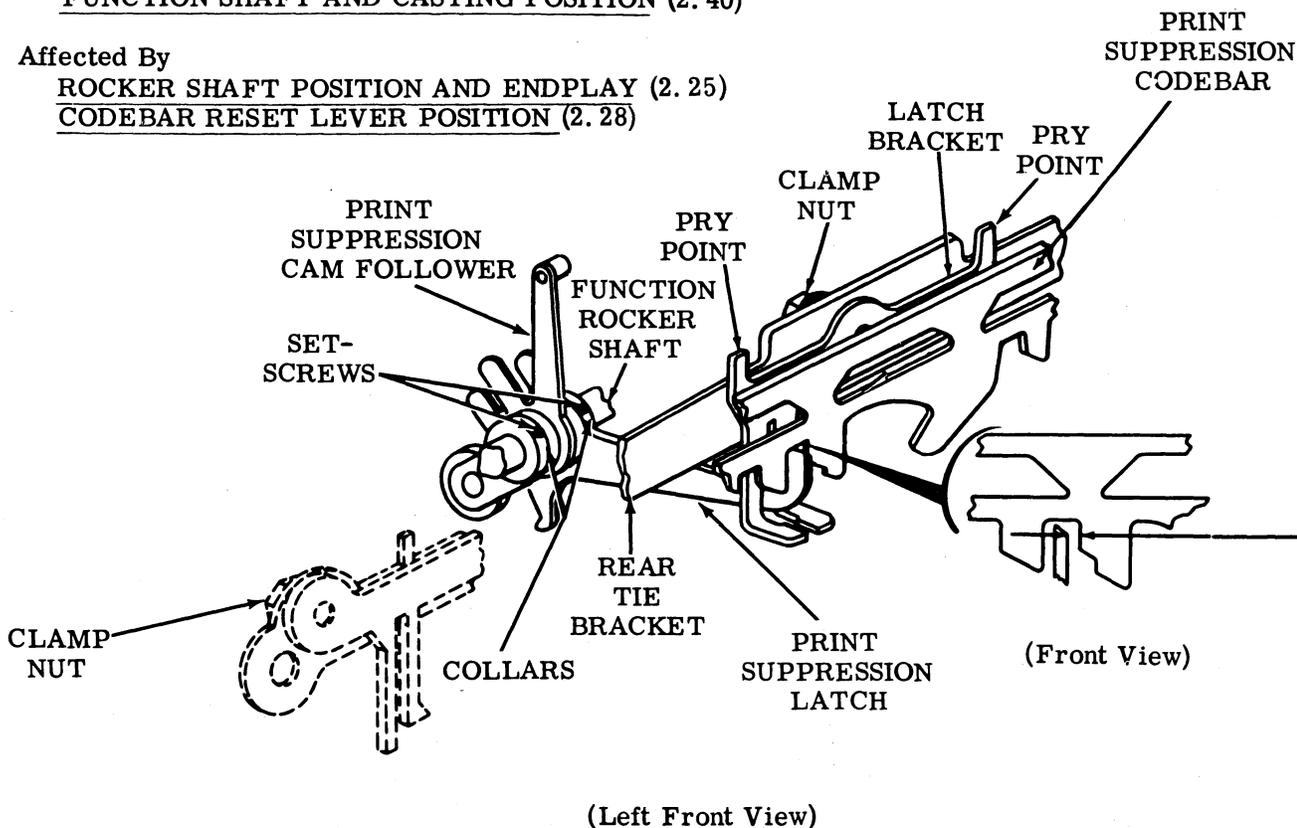
FUNCTION SHAFT AND CASTING POSITION (2.40)

Affected By

ROCKER SHAFT POSITION AND ENDPLAY (2.25)
CODEBAR RESET LEVER POSITION (2.28)

Note 1: Disregard Requirement (2)
 for typing units which are not equipped
 with TP180744 collars.

Note 2: Some typing units have one
 clamp nut to loosen, others two,
 depending upon the configuration of
 the latch bracket used.



2.30 Function Area (continued)

CODEBAR RESET GUIDE POSITION (FNA-7)

(1) Requirement

Codebars should have no noticeable curvature when viewed from their ends.

Note: The following To Check is for units equipped with TP181574 EOT function lever, TP180801 universal function lever, or similar function levers.

To Check

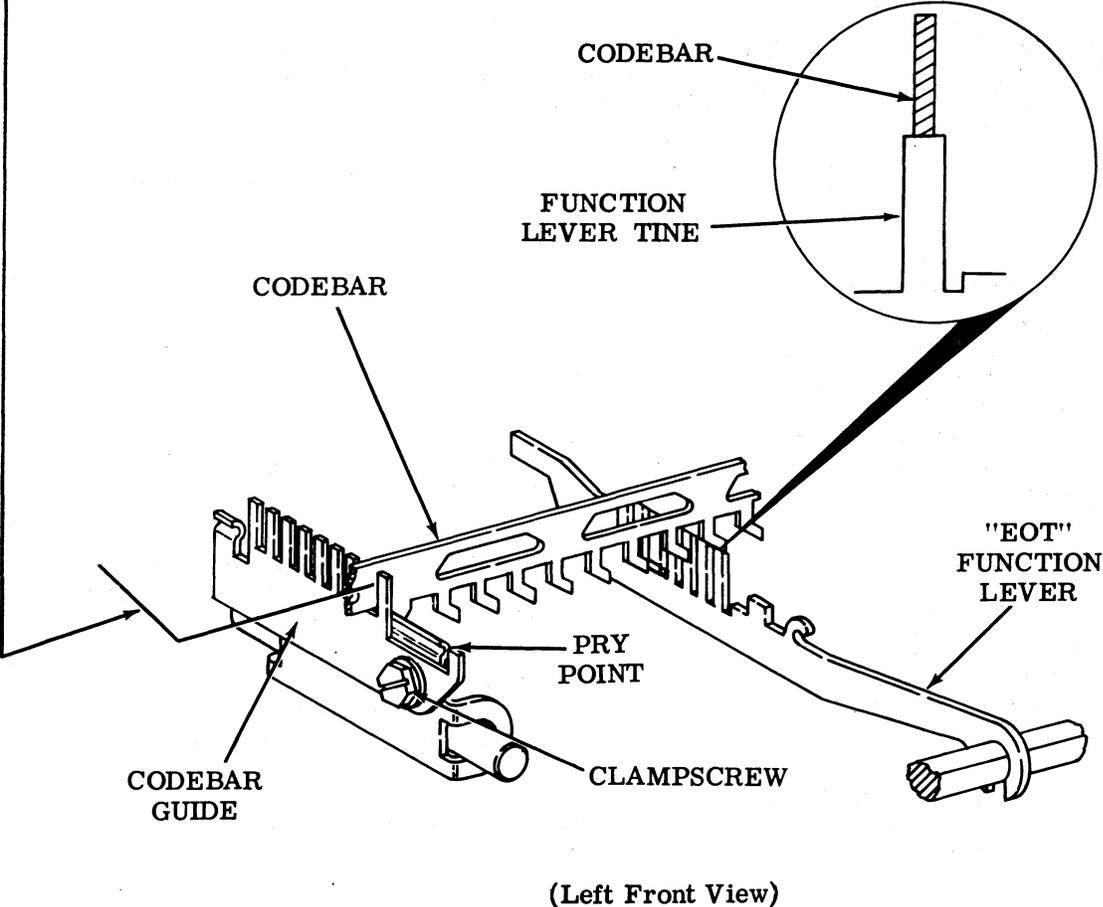
Manually set up RUBOUT, an all marking code combination, in the selector. Rotate main shaft until the function lever reaches its highest point of travel (position no. 1). Lightly take up any play between the function lever and codebars.

(2) Requirement

The codebars should fully engage the function lever tines.

To Adjust

Loosen clampscrew and position codebar guide using pry point. Tighten clampscrew.



2.31 Function Area (continued)

SELECTOR BLOCKING LEVERS POSITIONING (FNA-8)

Note: Set range finder to 80 on scale for both (1) and (2) To Check.

(1) To Check

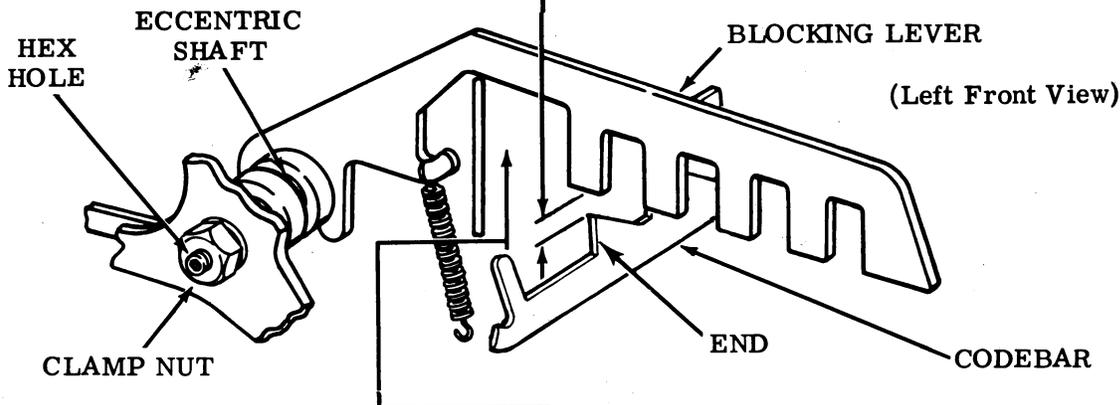
Manually operate typing unit and set up RUBOUT, an all marking code combination in selector. Continue rotating main shaft to the "unlatched", stop position. Trip the codebar clutch and rotate the main shaft until the left end of the no. 1 codebar is flush with the left (outer) edge of the no. 1 blocking lever.

(1) Requirement

Min 0.006 inch---Max 0.050 inch
between the no. 1 blocking lever and its associated codebar.

(2) Requirement

Min 0.003 inch
between all remaining blocking levers and their associated codebars.



(2) To Check

Manually rotate main shaft. Hold armature forward in its marking position and rotate main shaft until selector clutch shoe lever is in vertical (12 o'clock) position. Continue rotating main shaft until shoe lever reaches 3 o'clock position as viewed from left, and note any vertical motion of no. 1 or no. 2 blocking levers.

Requirement

No visible vertical motion of no. 1 or no. 2 blocking levers while selector clutch shoe lever is moving from 12 o'clock to 3 o'clock position.

BLOCKING LEVER SPRINGS

To Check

Set up NUL, 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: Check each blocking lever spring.

To Adjust

Loosen clamp nut and position eccentric with hex key wrench. Keep high part of eccentric toward rear of typing unit. Tighten clamp nut.

Related Adjustments

Affects

CODEBAR GUIDE POSITION (2. 32)

2.32 Function Area (continued)

CODEBAR GUIDE POSITION (FNA-9)

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.

(1) Requirement

No. 1 codebar centrally located in guide slot, as gauged by eye.

(2) Requirement

No. 1 blocking lever should engage the full thickness of no. 1 codebar.

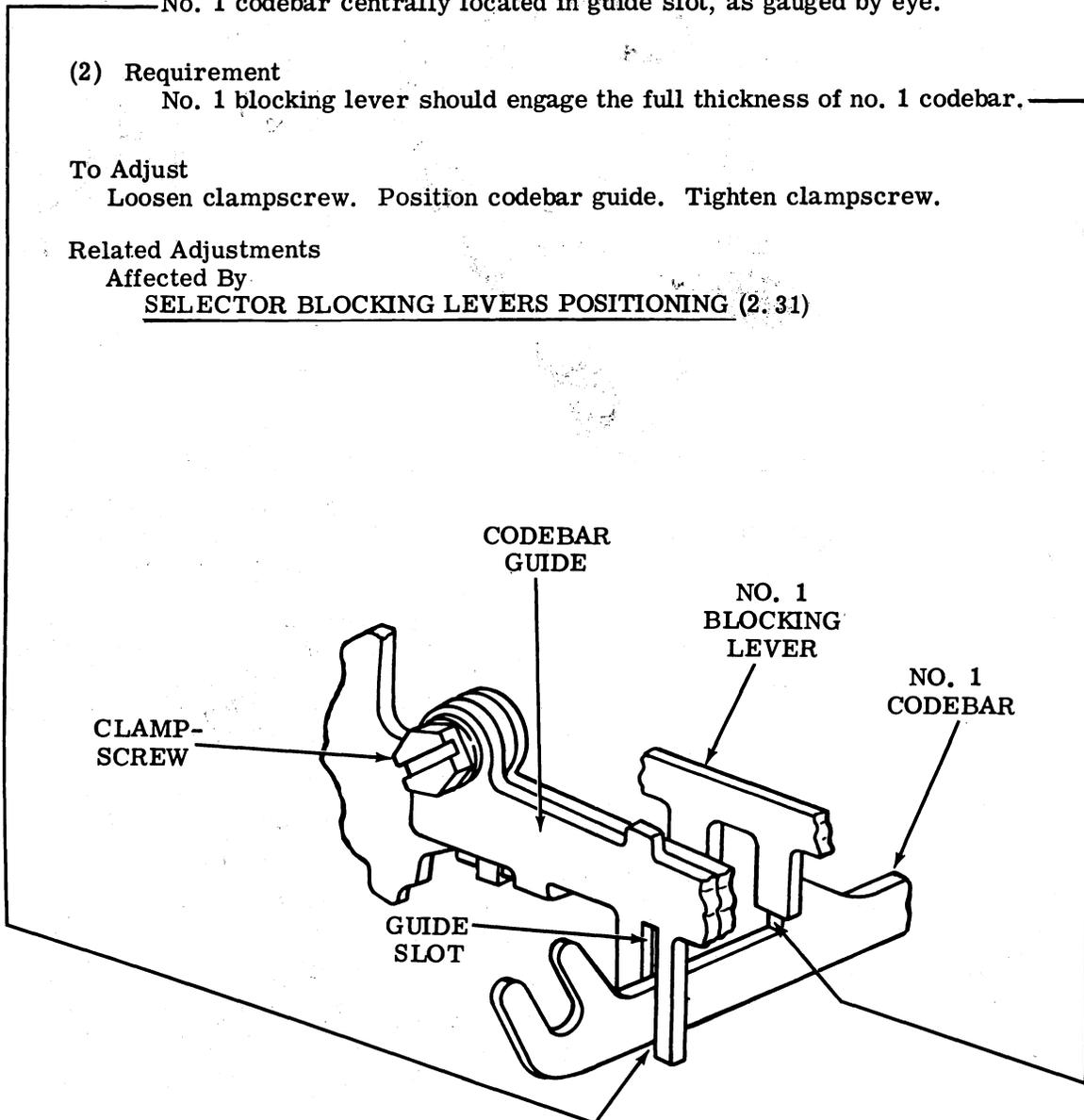
To Adjust

Loosen clampscrew. Position codebar guide. Tighten clampscrew.

Related Adjustments

Affected By

SELECTOR BLOCKING LEVERS POSITIONING (2.31)



(Left Front View)

2.33 Function Area (continued)

AUTOMATIC CODEBAR SPRING

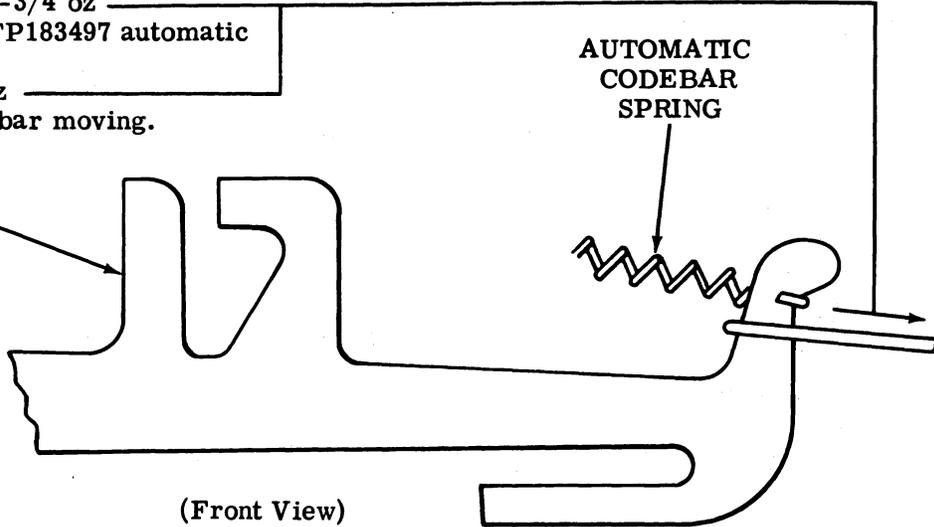
Requirement

With carriage at left margin TP180948 automatic codebar

Min 1/2 oz---Max 1-3/4 oz
TP183495, TP183496, TP183497 automatic codebars

Min 2 oz---Max 3 oz
to start automatic codebar moving.

AUTOMATIC CODEBAR



PRINT SUPPRESSION AND NO. 4 CODEBAR SPRING

Requirement

With typing unit in stop condition and no. 4 codebar follower on carriage lifted

Min 12 oz---Max 14 oz
to start codebar moving.

Note 1: Check the print suppression and no. 4 codebar spring.

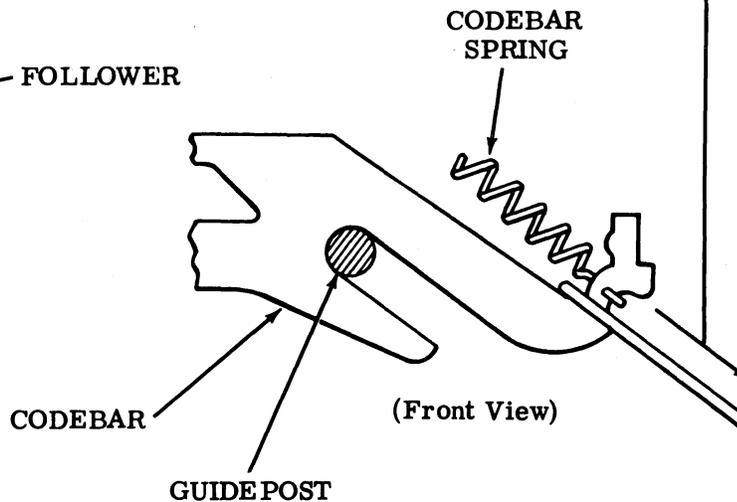
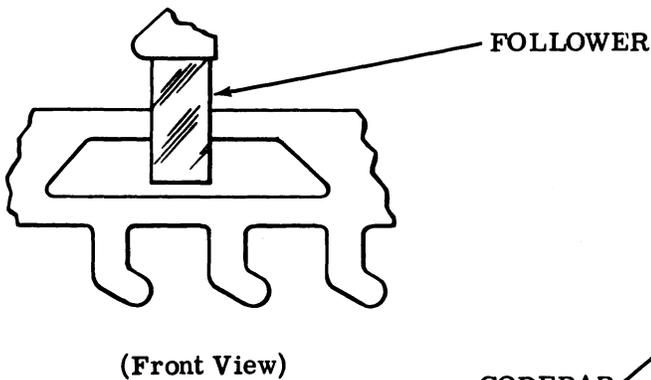
CODEBAR SPRINGS

Note 2: Check each codebar spring other than automatic, print suppression and no. 4.

Requirement

With typing unit in stop condition and codebar follower lifted.

Min 5-1/2 oz---Max 7-1/2 oz
to start codebar moving.



2.34 Function Area (continued)

FUNCTION PAWL SPRING

Requirement

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

Pawl Spring	TP49420 (26 Turns)	TP86283 (38 Turns)	TP180863 (33 Turns)
-------------	-----------------------	-----------------------	------------------------

Min	9 oz	1-1/4 oz	3 oz
Max	13 oz	2-1/2 oz	5-1/2 oz

to start each function pawl moving.

Check each pawl spring. The TP180863 spring is used with the carriage return function pawl on both sprocket feed and friction feed typing units. On sprocket feed typing units the TP86283 spring is used with the automatic line feed and manual line feed; automatic line feed, or line feed, and answer-back blocking function pawls. All others are the TP49420 spring. On friction feed typing units the TP86283 spring is used with the answer-back blocking function pawl. All others are the TP49420 spring.

LEFT ROCKER DRIVE (FNA-10)

To Check

Set up carriage return code combination (1-34---8) in selector. Rotate main shaft until function bail is at highest point of travel (position no. 1). Take up carriage return function lever play in an upward direction at the pivot to minimum clearance.

Requirement

Min 0.015 inch---Max 0.050 inch between carriage return function lever and its function pawl.

To Adjust

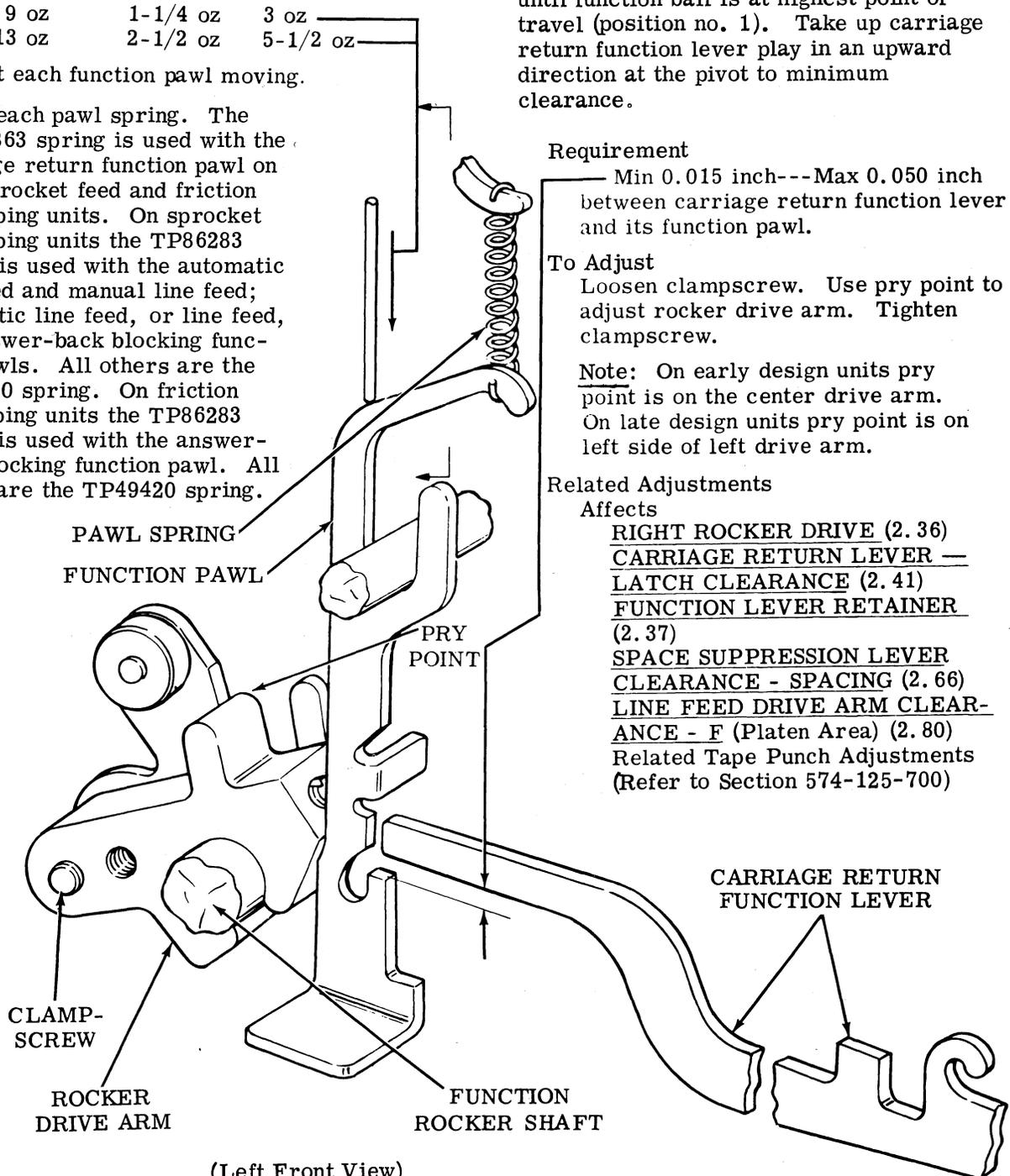
Loosen clampscrew. Use pry point to adjust rocker drive arm. Tighten clampscrew.

Note: On early design units pry point is on the center drive arm. On late design units pry point is on left side of left drive arm.

Related Adjustments

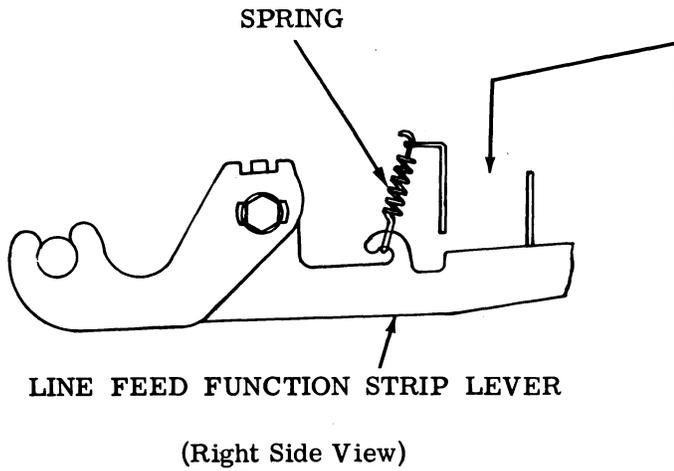
Affects

- RIGHT ROCKER DRIVE (2.36)
- CARRIAGE RETURN LEVER — LATCH CLEARANCE (2.41)
- FUNCTION LEVER RETAINER (2.37)
- SPACE SUPPRESSION LEVER CLEARANCE - SPACING (2.66)
- LINE FEED DRIVE ARM CLEARANCE - F (Platen Area) (2.80)
- Related Tape Punch Adjustments (Refer to Section 574-125-700)



(Left Front View)

2.35 Function Area (continued)



LINE FEED FUNCTION STRIP LEVER SPRING - S

Requirement

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

Min 23 oz---Max 30 oz
to start the line feed function strip lever moving.

FUNCTION LEVER SPRINGS

Requirement

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

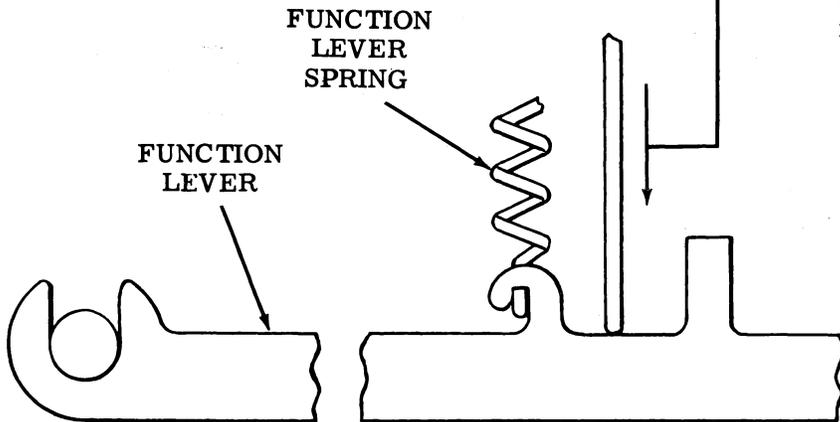
- (1) Min 19 oz---Max 24 oz to start LF and AUTO LF function levers moving.

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)

2.36 Function Area (continued)

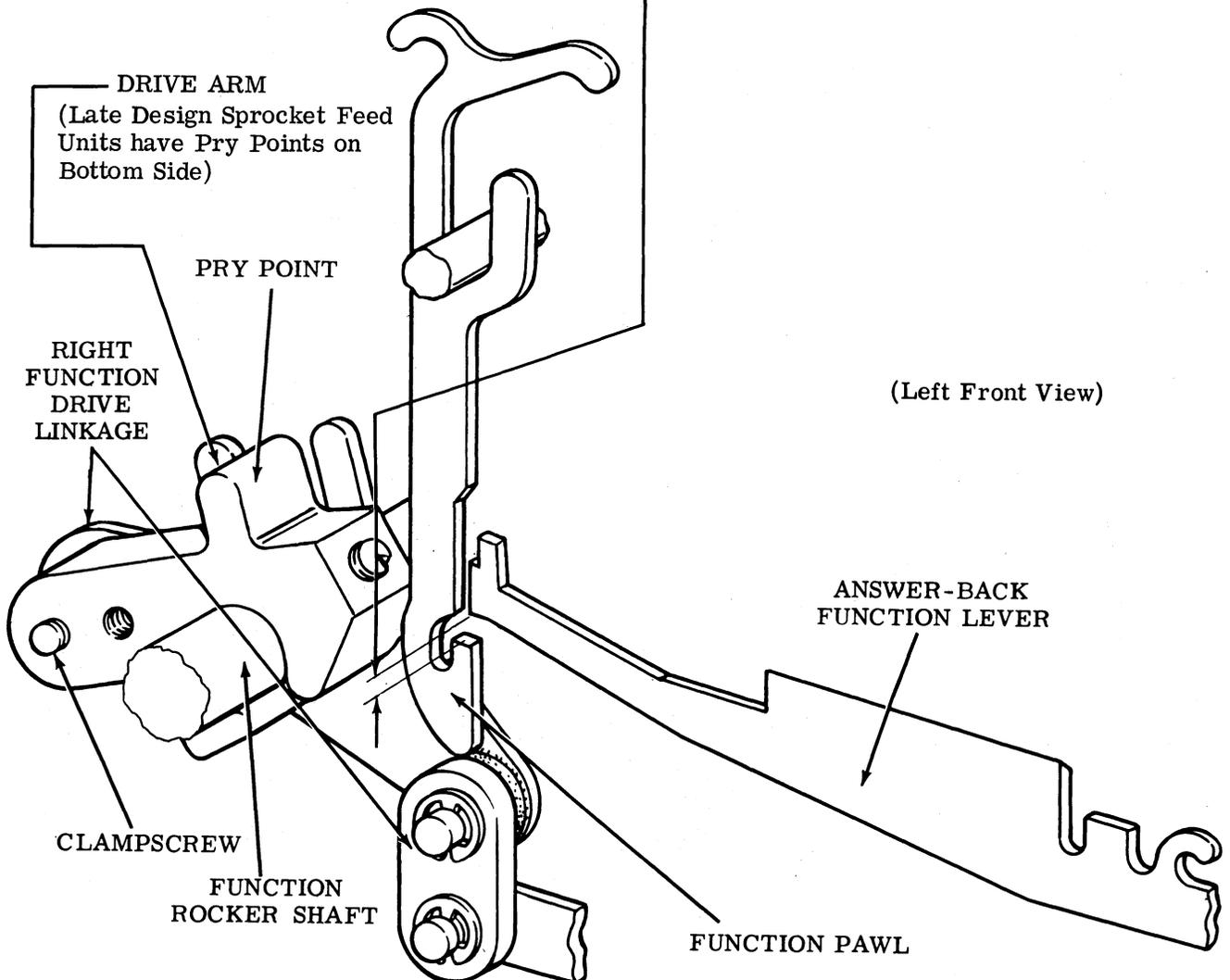
RIGHT ROCKER DRIVE (FNA-11)

To Check

Disengage (latch) distributor clutch. Make sure the answer-back blocking lever is fully latched by the answer-back blocking pawl. Set up answer-back character ENQ code combination (1-3-----) in selector. Trip codebar clutch and rotate main shaft until function bail is at its highest point (position no. 1). Make sure that distributor clutch has not been tripped. Take up answer-back function lever play in an upward direction at the pivot to minimize clearance.

Requirement

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



To Adjust

Loosen clampscrew. Use pry point to adjust right rocker arm. Tighten clampscrew.

Related Adjustments

Affects

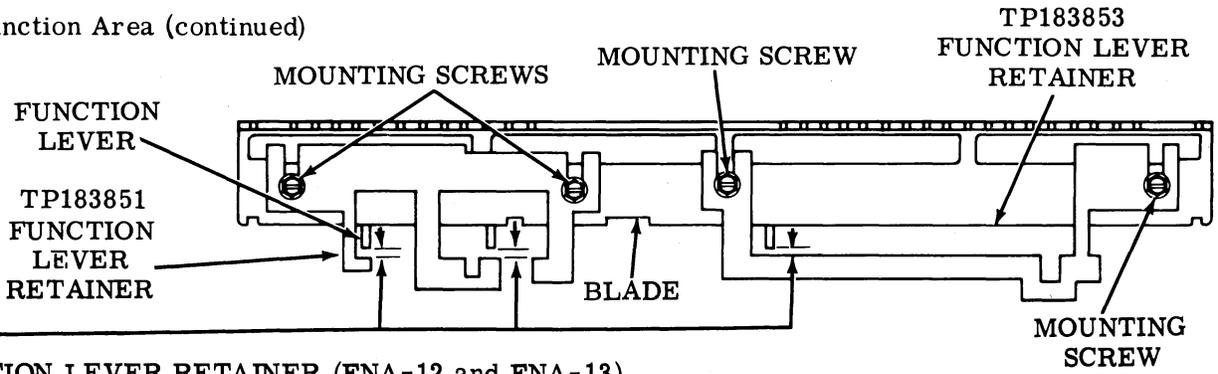
- FORM-OUT LEVER OVERTRAVEL - S
(Form Feed Area (2.98))
- LINE FEED PAWL STRIPPING - S
(Form Feed Area) (2.107)
- TRIPBAIL POSITIONING (3.08)

Affected By

LEFT ROCKER DRIVE (2.34)

Note: If typing unit is not equipped with the answer-back feature, select a code combination which will permit the right-most function lever to be selected.

2.37 Function Area (continued)



FUNCTION LEVER RETAINER (FNA-12 and FNA-13)

Units equipped with TP183851 (left) and TP183853 (right) function lever retainers. (FNA-12)

To Check

With an all spacing code combination in the selector, manually operate the typing unit until the blade is at its highest point of travel (position no. 1).

Requirement

Min some---Max 0.040 inch between the function lever retainers and function levers at the closest point.

Note: The lower edges at the mounting portion of the retainer should not extend below the lower edge of the blade.

Units equipped with the TP185980 function lever retainers and the print-nonprint feature. (FNA-13)

To Check

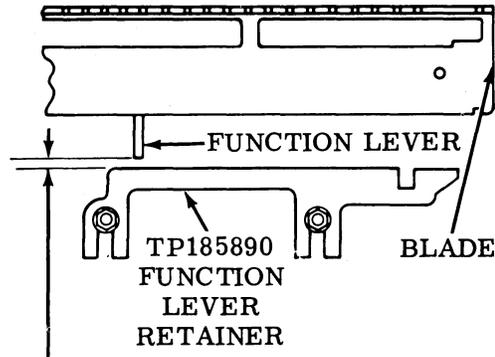
With an all spacing code combination in the selector, manually operate the typing unit until the blade is at the lowest point of travel (position no. 3).

Requirement

Min some---Max 0.020 inch between the retainer and the function lever closest to it.

To Adjust

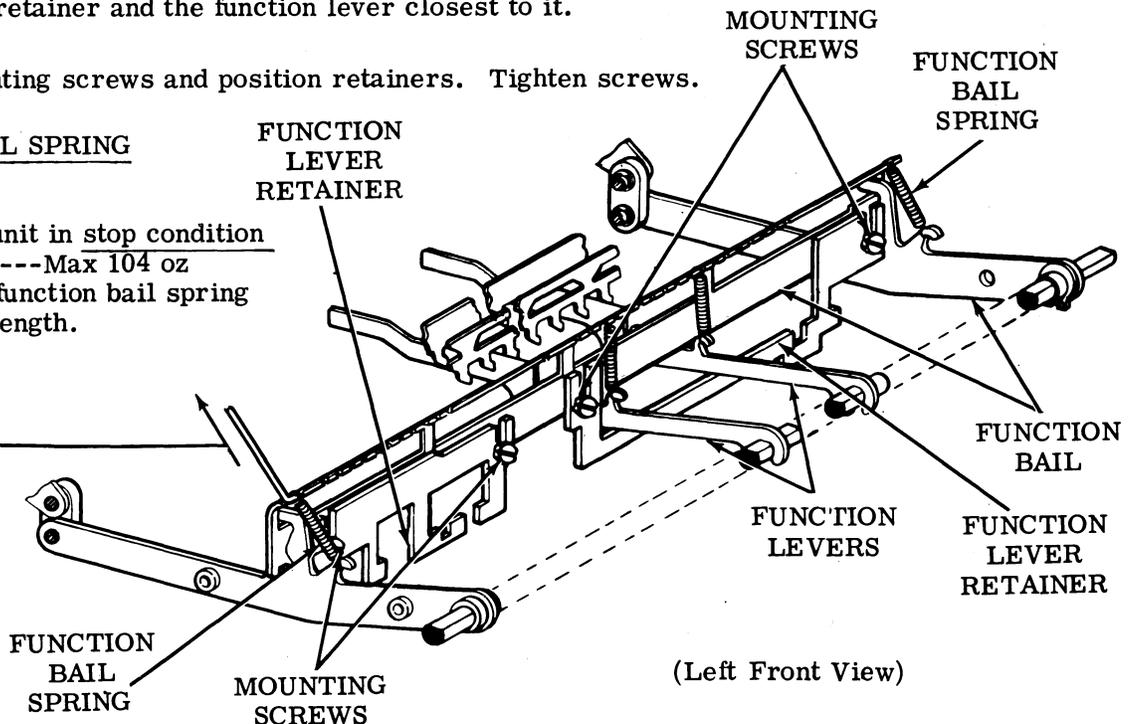
Loosen mounting screws and position retainers. Tighten screws.



FUNCTION BAIL SPRING

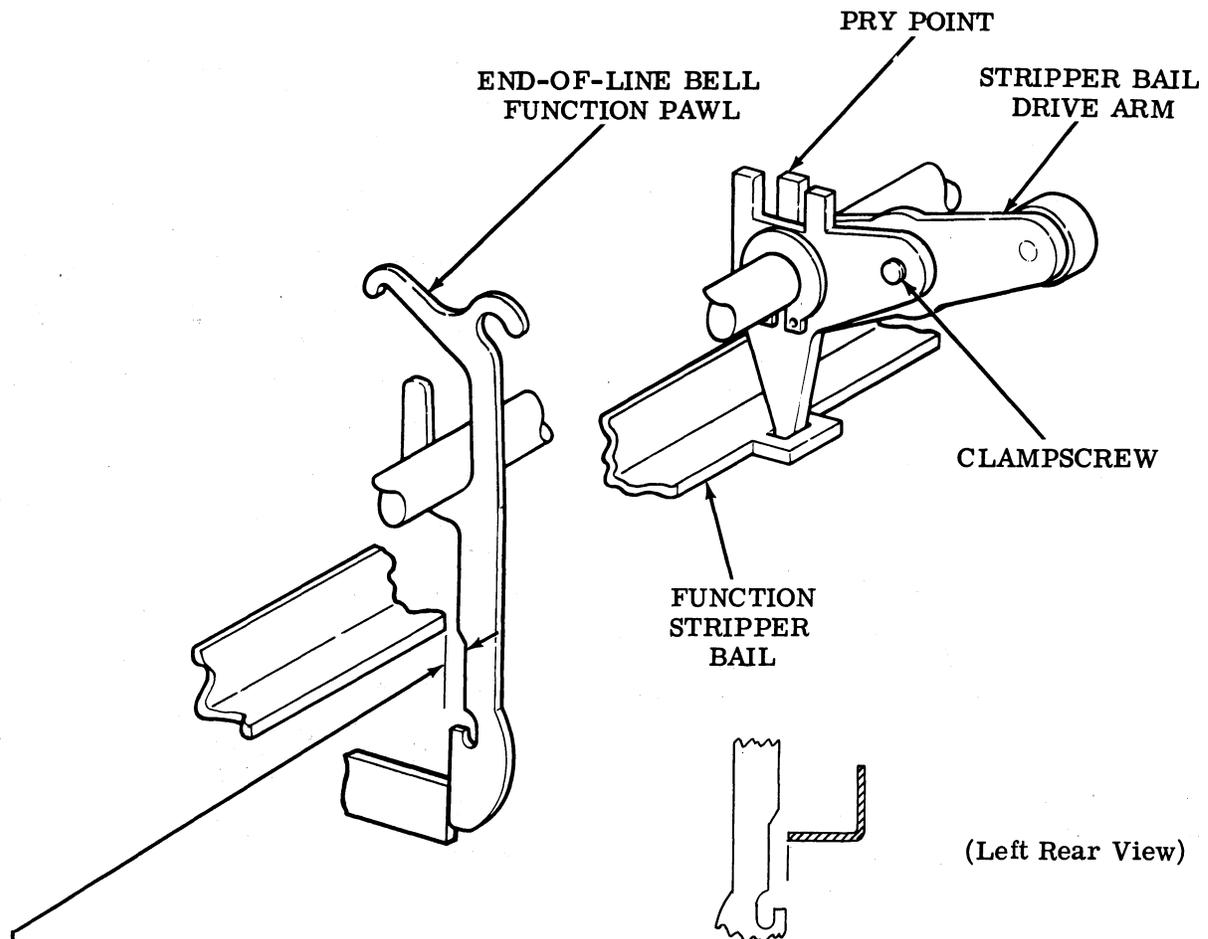
Requirement

With typing unit in stop condition
Min 72 oz---Max 104 oz
to pull each function bail spring to installed length.



(Left Front View)

2.38 Function Area (continued)



STRIPPER BAIL CLEARANCE (FNA-14)

Requirement

With typing unit in stop condition

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

Note: For typing units which are not equipped with the
end-of-line bell function pawl, check requirement at the TP180792
function pawl closest to slot F in function casting.

To Adjust

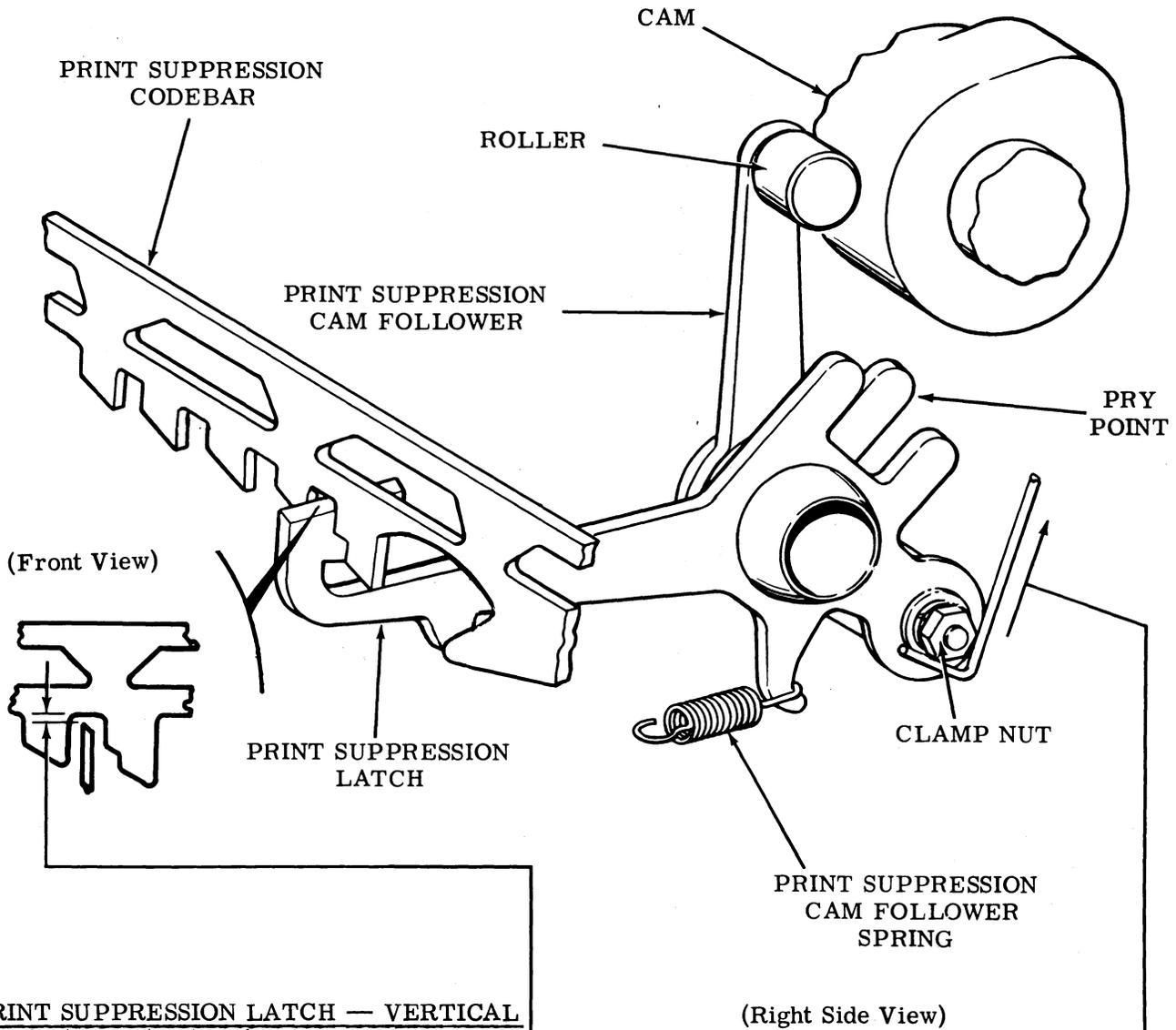
Loosen clampscrew. Use pry point to position stripper bail drive
arm. Tighten clampscrew.

Related Adjustment

Affects

LINE FEED STRIPPER PLATE CLEARANCE - F (Platen Area) (2.85)

2.39 Function Area (continued)



PRINT SUPPRESSION LATCH — VERTICAL CLEARANCE (FNA-15)

Requirement

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

Min 0.015 inch---Max 0.050 inch
between print suppression latch and print suppression codebar.

To Adjust

Loosen clamp nut. Using pry point, position print suppression cam follower. Tighten clamp nut.

Related Adjustments

Affected By

CODEBAR RESET LEVER POSITION (2.28)

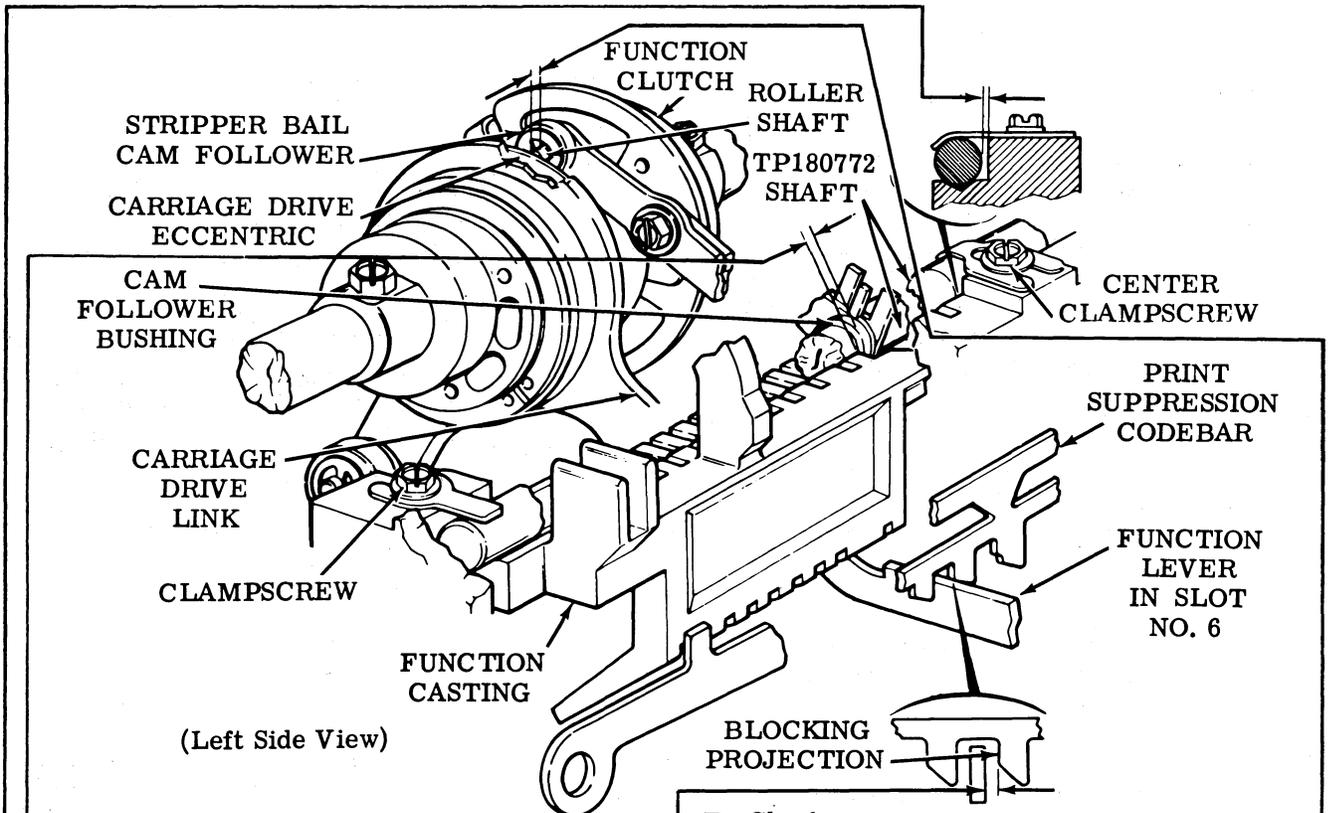
PRINT SUPPRESSION CAM FOLLOWER SPRING

Requirement

With typing unit in stop condition

Min 10 oz---Max 14 oz
to start print suppression cam follower moving.

2. 40 Function Area (continued)



FUNCTION SHAFT AND CASTING POSITION — FINAL (FNA-16)

Note: The Requirement (1) applies only to TP180772 shafts which have raised rings which serve to locate the stripper bail cam follower.

- (1) Requirement
 Min some---Max 0.010 inch between stripper bail cam follower and left side of slot in function casting.

To Adjust
 Loosen clampscrews and position TP180772 shaft.

- (2) Requirement
 The shaft should 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 to meet Requirements (1) and (2).

To Check

Manually set up NUL, an all spacing code combination in selector. Rotate main shaft until suppression cam follower just begins to rise on its cam.

- (3) Requirement
 Min 0.030 inch---Max 0.050 inch between blocking projection on print suppression codebar and the function lever in slot no. 6.

- (4) Requirement
 Min 0.005 inch between carriage drive eccentric and roller shaft on stripper bail cam follower with play taken up to make clearance a minimum.

To Adjust

With the two end clampscrews loosened, position casting to meet Requirements (3) and (4). Tighten clampscrews.

Note: On units with TP187103 bracket, also loosen the left-rear codebar basket clampscrew.

Related Adjustments

Affected By

- CODEBAR RESET LEVER POSITION (2.28)
- PRINT SUPPRESSION LATCH — HORIZONTAL CLEARANCE (2.29)
- LEFT BEARING POSITION (2.10)

2.41 Function Area (continued)

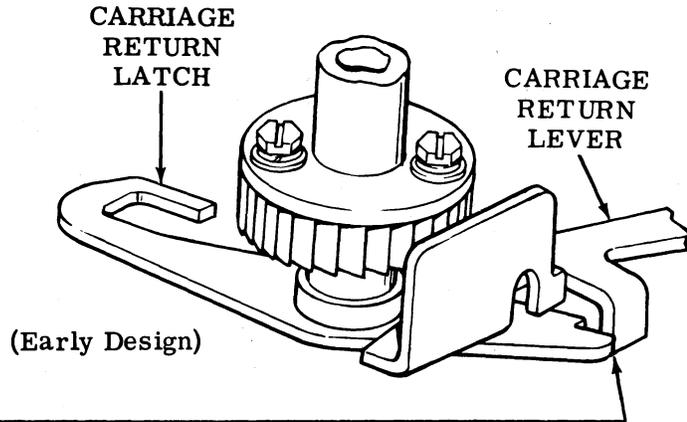
CARRIAGE RETURN LEVER – LATCH CLEARANCE (FNA-17) (Left Front View)

To Check

Position carriage to center of typing unit and carefully remove carriage return spring. Set up carriage return code combination (1-34---8) in selector. Rotate main shaft until function bail reaches lowest point of travel (position no. 3). Position left end of carriage return lever rearward to eliminate its play.

(1) Requirement

Early design carriage return lever flush with carriage return latch
Within 0.005 inch



(2) Requirement

Late design
Min some---Max 0.030 inch between carriage return lever and carriage return latch.

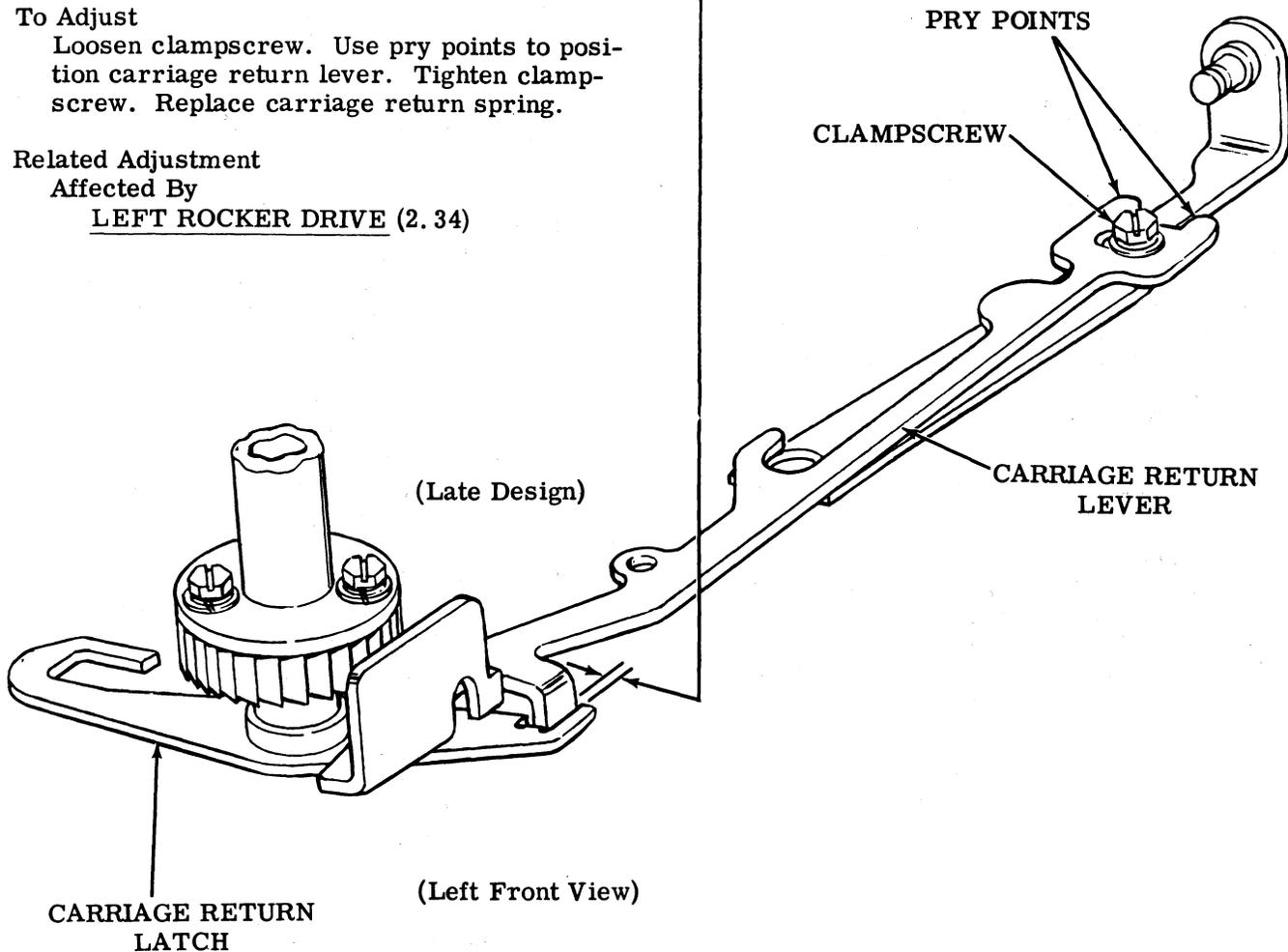
To Adjust

Loosen clampscrew. Use pry points to position carriage return lever. Tighten clampscrew. Replace carriage return spring.

Related Adjustment

Affected By

LEFT ROCKER DRIVE (2.34)



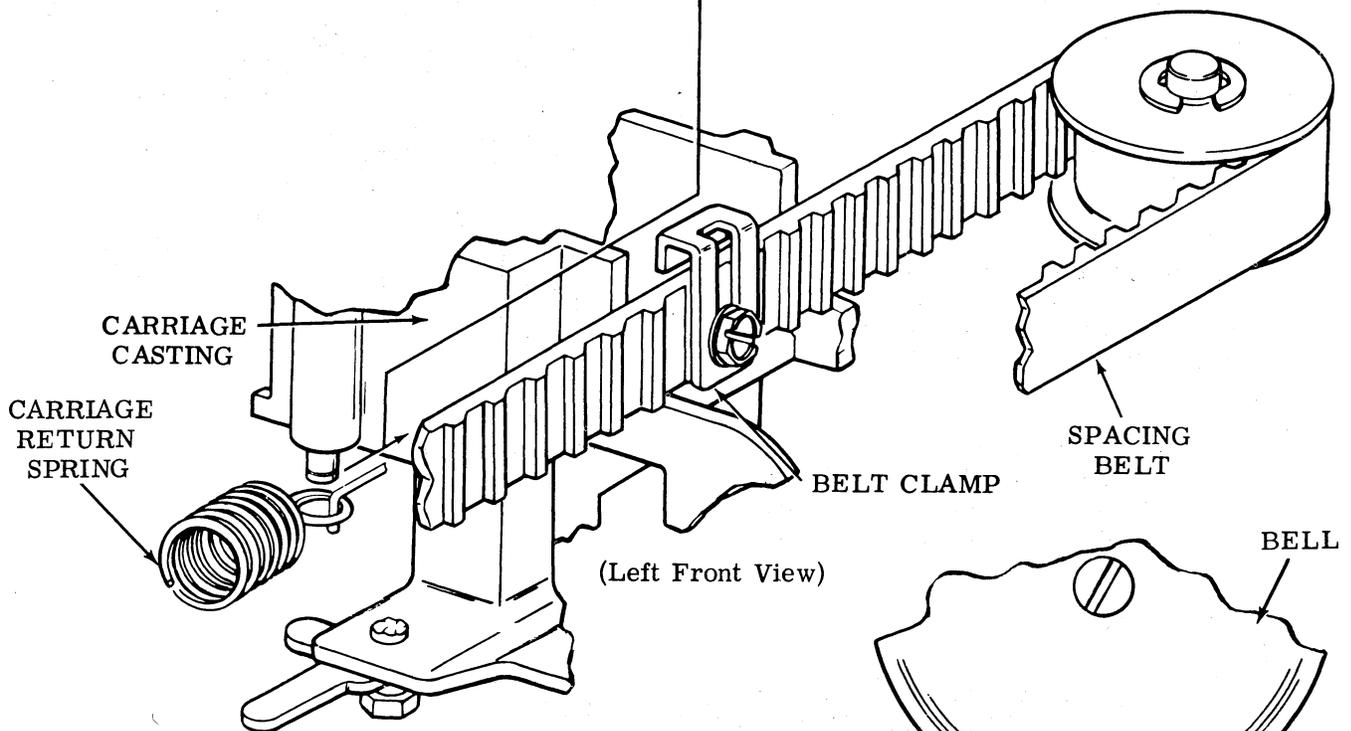
2.42 Function Area (continued)

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.



BELL CLAPPER GAP (FNA-18)

(1) Requirement

With typing unit in stop condition

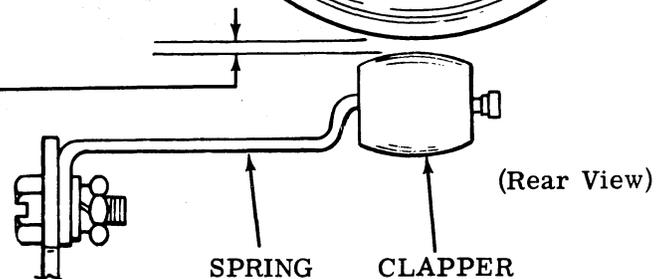
Min 0.030 inch---Max 0.070 inch
between clapper and bell.

To Adjust

Using pliers, bend clapper spring.

(2) Requirement

The bell must be audible when operated.



2.43 Carriage Area

FRONT ROLLERS CLEARANCE (CRA-1)

Note 1: This adjustment does not apply to typing units equipped with nonadjustable parts such as TP183503 bearing housing and TP183504 bearing retainer.

To Check

Place typing unit in stop condition.
Remove the carriage return spring.
Take up roller play toward the front of the typing unit.

Requirement

Min some---Max 0.005 inch
between carriage front roller and
carriage front rail.

To Adjust

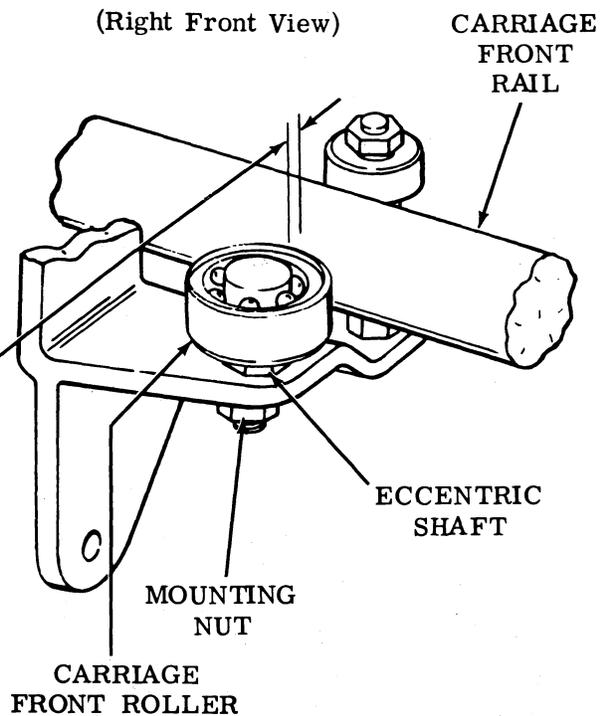
Loosen mounting nut and position
each roller against rail by means
of eccentric shaft. Slowly back off
eccentric shaft to meet requirement.
Tighten mounting nut.

Note 2: Some positions of carriage front
roller may show a slight drag condition.
This is acceptable providing there is no
perceptible increase in carriage friction
due to condition.

Related Adjustments

Affects

- PRINT DRIVE LEVER POSITIONING (2.48)
- PRINT SUPPRESSION LATCHLEVER RELEASE (2.57)
- RIBBON POWER LEVER DRIVE (2.62)
- PLATEN HORIZONTAL POSITION - F (2.70)
- PLATEN HORIZONTAL POSITION - S (2.89)



2.44 Carriage Area (continued)

POWER BAIL ROLLER CLEARANCE (CRA-2)

To Check

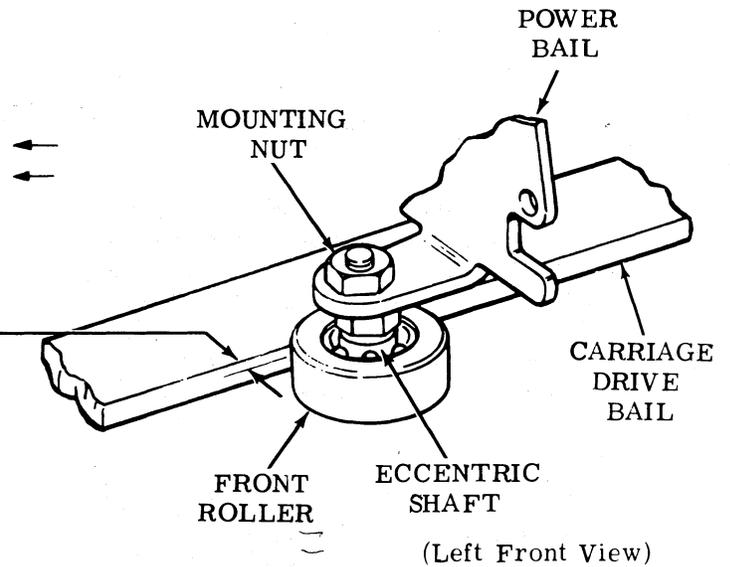
Position carriage so power bail roller is over the carriage drive bail arm. Trip function clutch and rotate main shaft until carriage drive bail is at lowest point of travel.

Requirement

Min some---Max 0.005 inch between front roller and carriage drive bail.

To Adjust

Loosen mounting nut and position front roller by means of eccentric shaft. Tighten mounting nut.



RACK AND PINION BACKLASH (CRA-3)

Note 1: This adjustment is to be performed only on early design carriages having the TP180548 adjusting plate and TP180549 bracket. Late design carriages do not require this adjustment.

To Check

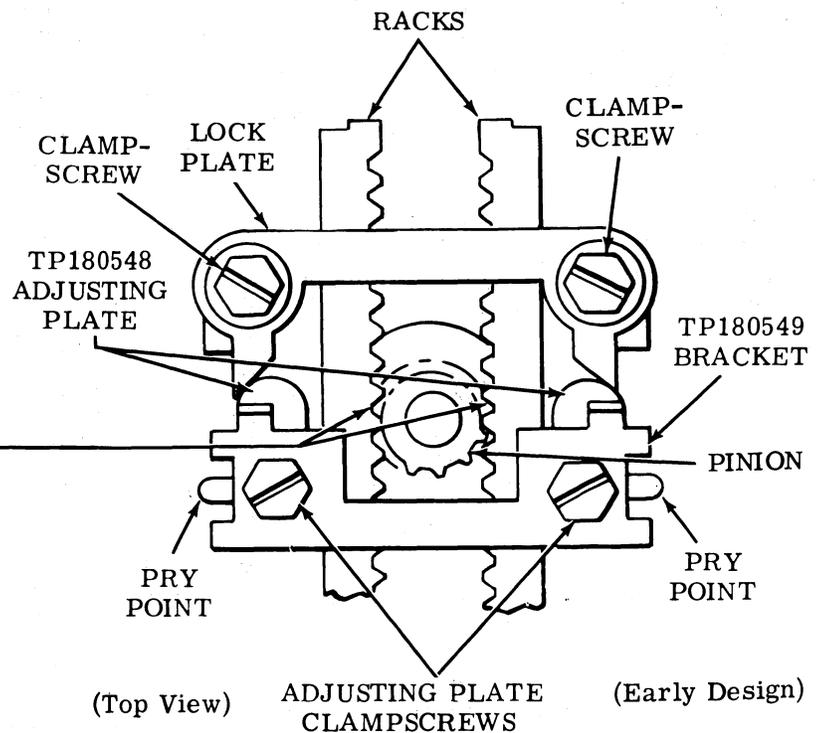
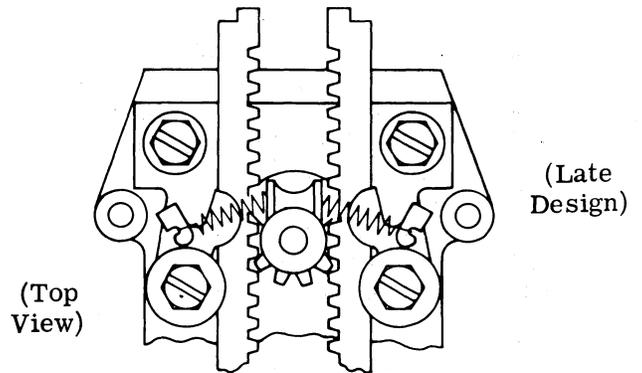
Place typing unit in stop condition.

Requirement

Each rack should have Min some---Max 0.010 inch backlash.

To Adjust

Loosen lock plate clampscrews and move lock plate towards the rear. Loosen one adjusting plate clampscrew friction tight and place a 0.006-inch feeler gauge between the rack and adjusting plate. Position adjusting plate for no play between the rack and pinion using pry point. Tighten adjusting plate clampscrew and remove feeler gauge. Repeat procedure for adjusting plate on other side. Position lock plate against adjusting plates. Tighten lock plate clampscrews.

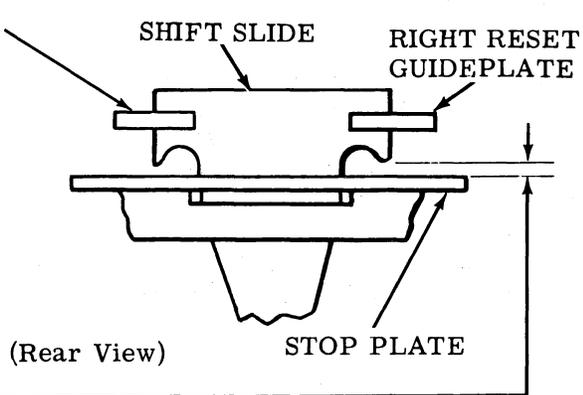


Note 2: Do not loosen both adjusting plate clampscrews at the same time.

2.45 Carriage Area (continued)

REAR RAIL POSITION (CRA-4)

- (1) To Check
Position the dashpot plunger just outside the dashpot cylinder. With the selector no. 1 code lever in the marking condition, rotate the main shaft until the shift slide is in its uppermost position and contacts the stop plate. Take up all play to minimize the required clearance.



Requirement
Min 0.025 inch---Max 0.040 inch
between bottom edge of shift slide
and top edge of stop plate.

- (2) To Check
Condition the typing unit as in (1) To Check above except place carriage to the right with center of the typewheel 1/2 inch from the right hand margin.

Requirement
Min 0.025 inch---Max 0.040 inch
between bottom edge of shift slide
and top edge of stop plate.

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

Requirement
Max 0.010 inch
difference between recorded measurements.

Related Adjustments

- Affects
- PRINT DRIVE LEVER POSITIONING (2.48)
 - FOURTH PULSE LINKAGE POSITIONING (2.47)
 - RESET LEVER POSITIONING (2.49)
 - PRINT SUPPRESSION LATCHLEVER RELEASE (2.57)
 - PRESSURE ROLLER CLEARANCE - F (Platen Area) (2.84)
 - REAR ROLLER CLEARANCE (2.46)
 - RIGHT SLIDE GUIDEPLATE RESET (2.52)
 - LEFT SLIDE GUIDEPLATE RESET (2.53)
 - PRINT HAMMER TRIP LEVER RELEASE (2.54)
 - PRINT HAMMER TRIP LEVER RESET (2.55)
 - RIBBON POWER LEVER DRIVE (2.62)
 - VERTICAL TYPE ALIGNMENT - F (2.71)
 - VERTICAL TYPE ALIGNMENT - S (2.90)

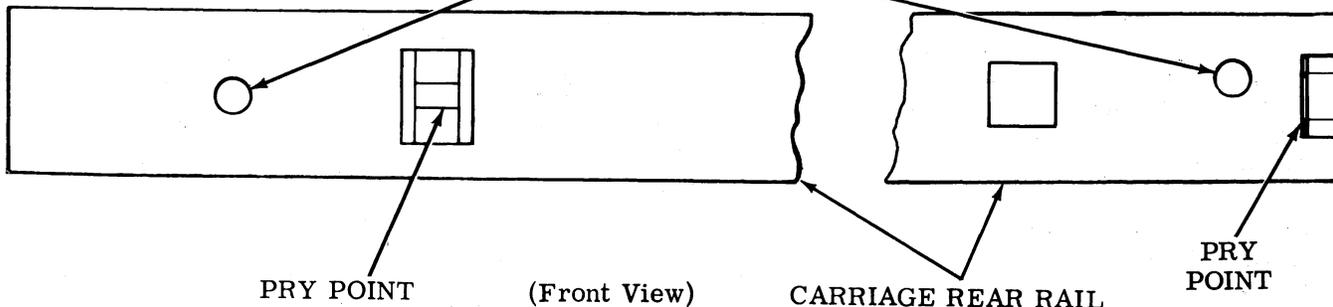
To Adjust

Loosen two carriage rear rail mounting screws (if hex, use TP186307 hex wrench when available) friction tight, and position carriage rear rail using pry point. Tighten mounting screws.

Affected By

- CODEBAR RESET LEVER POSITION (Function Area) (2.28)

MOUNTING SCREWS (Hex Screws — Late Design)

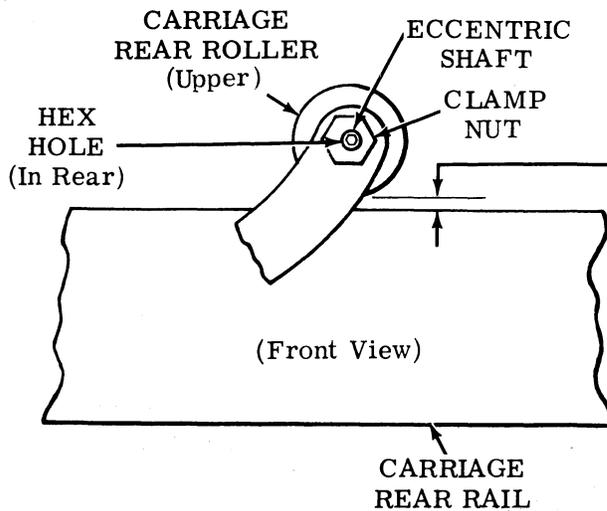


2.46 Carriage Area (continued)

REAR ROLLER CLEARANCE (CRA-5)

To Check

Rotate main shaft until carriage drive bail is in rearmost position. Position carriage so dashpot plunger is just clear of dashpot cylinder and check requirement. Also check requirement with carriage within 1/2 inch from right margin.



Requirement

Min some---Max 0.008 inch between carriage rear rail and carriage rear roller (upper).

To Adjust

Loosen clamp nut and position eccentric shaft with hex wrench in hex hole. Tighten clamp nut.

Related Adjustments

Affects

FOURTH PULSE LINKAGE POSITIONING (2.47)

PRINT DRIVE LEVER POSITIONING (2.48)

RESET LEVER POSITIONING (2.49)

RIGHT SLIDE GUIDEPLATE RESET (2.52)

PRINT HAMMER TRIP LEVER RELEASE (2.54)

PRINT HAMMER TRIP LEVER RESET (2.55)

Affected By

REAR RAIL POSITION (2.45)

2.47 Carriage Area (continued)

FOURTH PULSE LINKAGE POSITIONING (CRA-10)

To Check

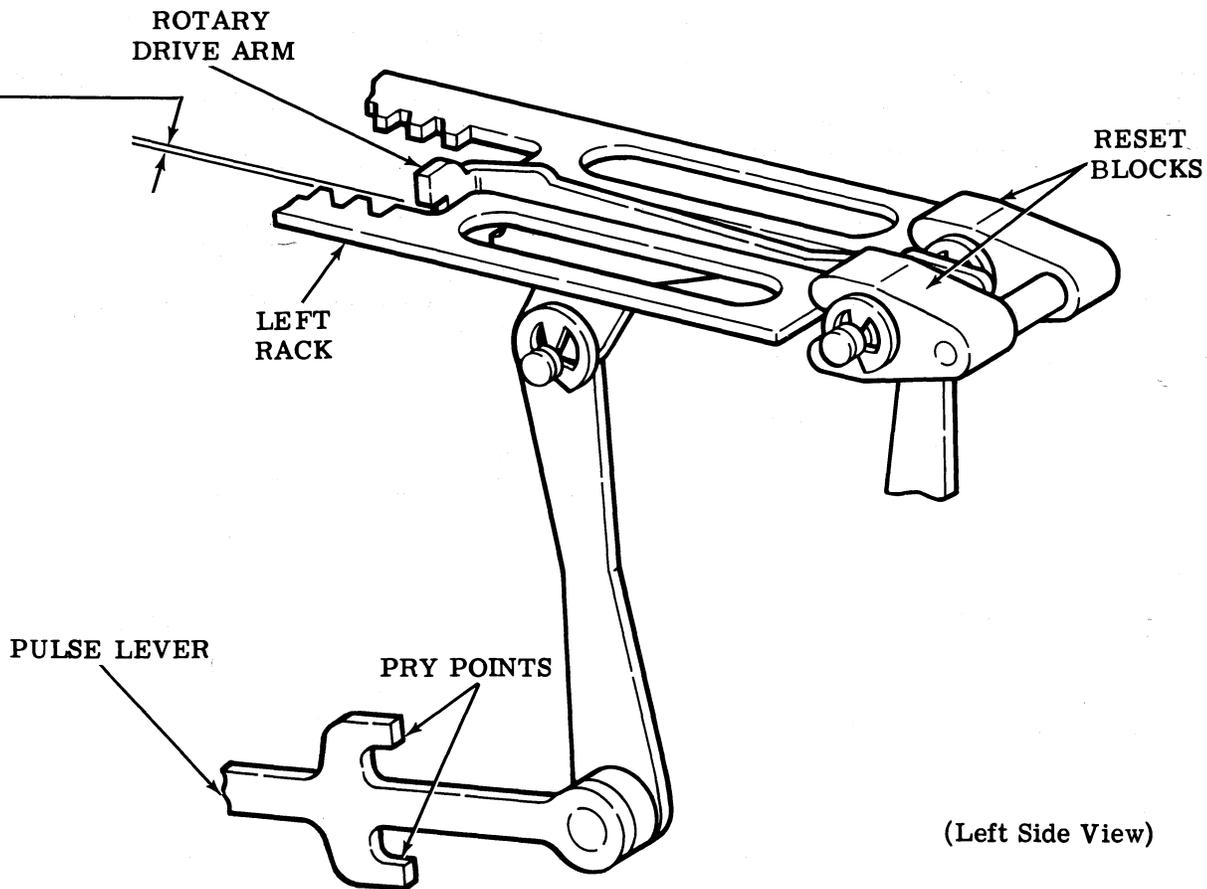
Place carriage to center of platen. With an all marking code combination set up in selector, manually operate the typing unit until the function clutch just trips. Take up play in left rack in a downward direction.

Requirement

Min 0.010 inch---Max 0.050 inch
between rotary drive arm and left rack.

To Adjust

Bend pulse lever using pry points.



Related Adjustments

Affected By

CODEBAR RESET LEVER POSITION (Function Area) (2.28)

REAR RAIL POSITION (2.45)

REAR ROLLER CLEARANCE (2.46)

2.48 Carriage Area (continued)

(B) PRINT DRIVE LEVER POSITIONING (CRA-6)**To Check**

Place typing unit in stop condition and move carriage until its power bail rollers are positioned directly above the carriage drive link. Take up play in vertical drive bail in a downward direction, and take up play in common stop arm toward the left.

Requirement

Late design typing units equipped with TP183993 function clutch cam sleeve

Min 0.065 inch---Max 0.090 inch
between vertical drive bail and common stop arm.

Early design typing units equipped with TP180806 function clutch cam sleeve

Min 0.229 inch---Max 0.239 inch
between vertical drive bail and common stop arm as gauged with a TP180588 adjusting tool.

Note: The TP180588 adjusting tool has a nominal dimension of 0.234 inch.

To Adjust

Loosen print drive lever clampscrew and position print drive lever using pry points. Tighten clampscrew.

Related Adjustments**Affects**

RIGHT SLIDE GUIDEPLATE

RESET (2.52)

PRINT HAMMER TRIP LEVER

RESET (2.55)

LEFT SLIDE GUIDEPLATE

RESET (2.53)

RIBBON POSITIONING (2.56)

VERTICAL TYPE ALIGNMENT - F
(2.71)

VERTICAL TYPE ALIGNMENT - S
(2.90)

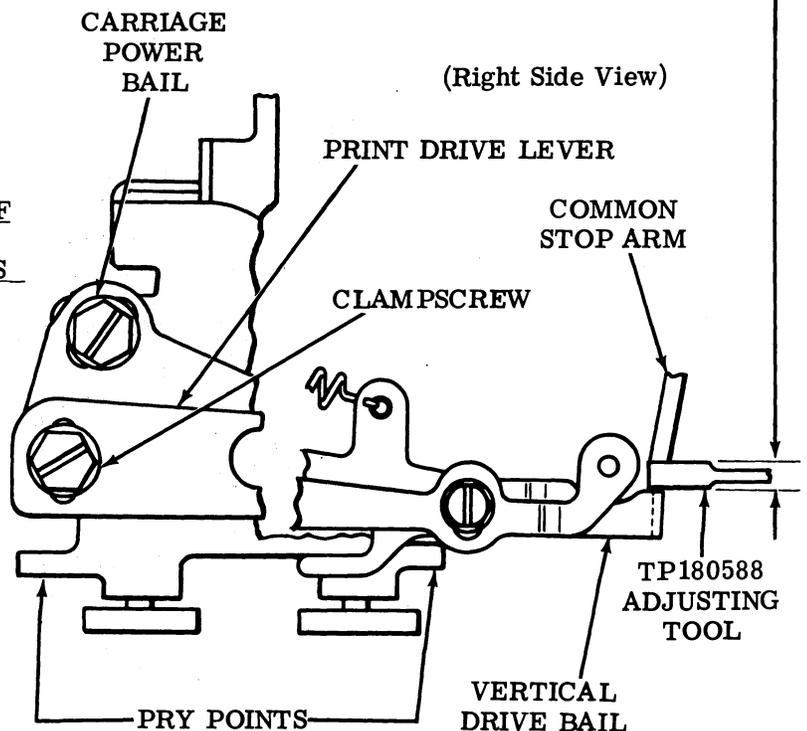
PRINT SUPPRESSION LATCH-
LEVER ENDPLAY (2.50)

Affected By

REAR RAIL POSITION (2.45)

FRONT ROLLERS CLEARANCE
(2.43)

REAR ROLLER CLEARANCE
(2.46)



2.49 Carriage Area (continued)

RESET LEVER POSITIONING (CRA-11)

Requirement

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

To Adjust

Place carriage in center of typing unit. Loosen clampscrew and allow positioning spring to fully reset racks. Tighten clampscrew.

Related Adjustments

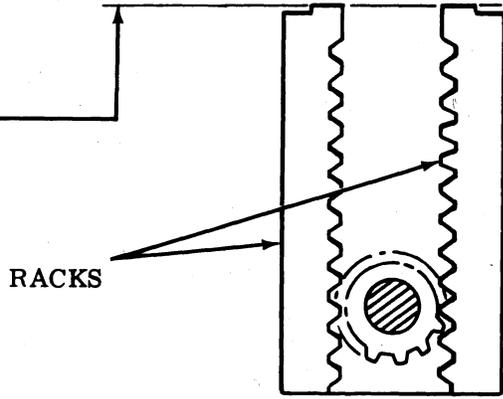
Affects

RIBBON POWER LEVER DRIVE (2.62)

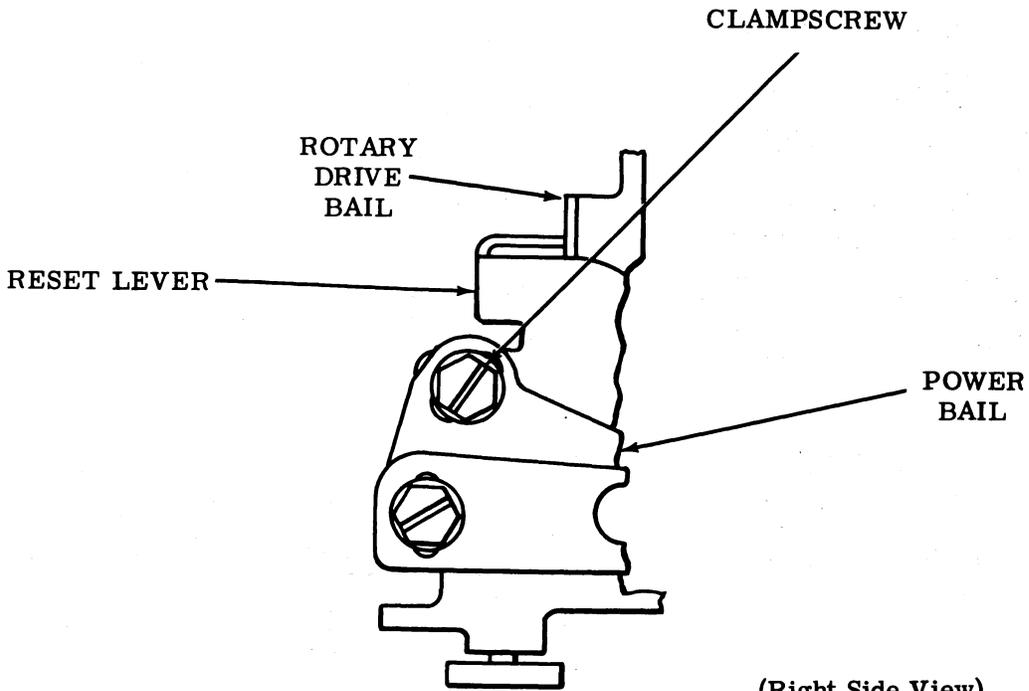
Affected By

REAR RAIL POSITION (2.45)

REAR ROLLER CLEARANCE (2.46)



(Top View)



(Right Side View)

2.50 Carriage Area (continued)

PRINT SUPPRESSION LATCHLEVER ENDPLAY (CRA-12)

To Check

Take up play in print suppression latchlever towards carriage casting.

Requirement

Print suppression latchlever should fully engage print hammer bail with no binds.

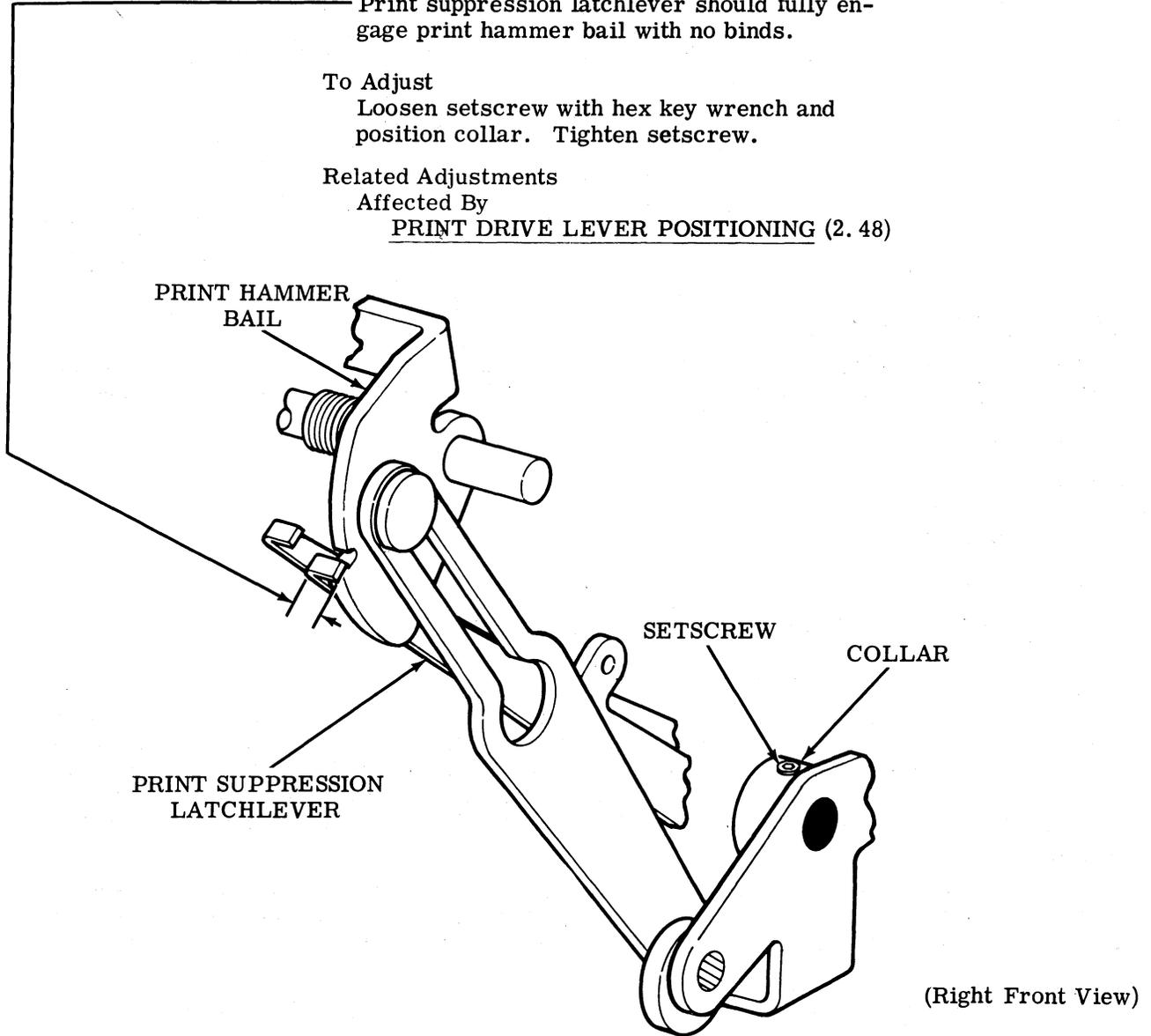
To Adjust

Loosen setscrew with hex key wrench and position collar. Tighten setscrew.

Related Adjustments

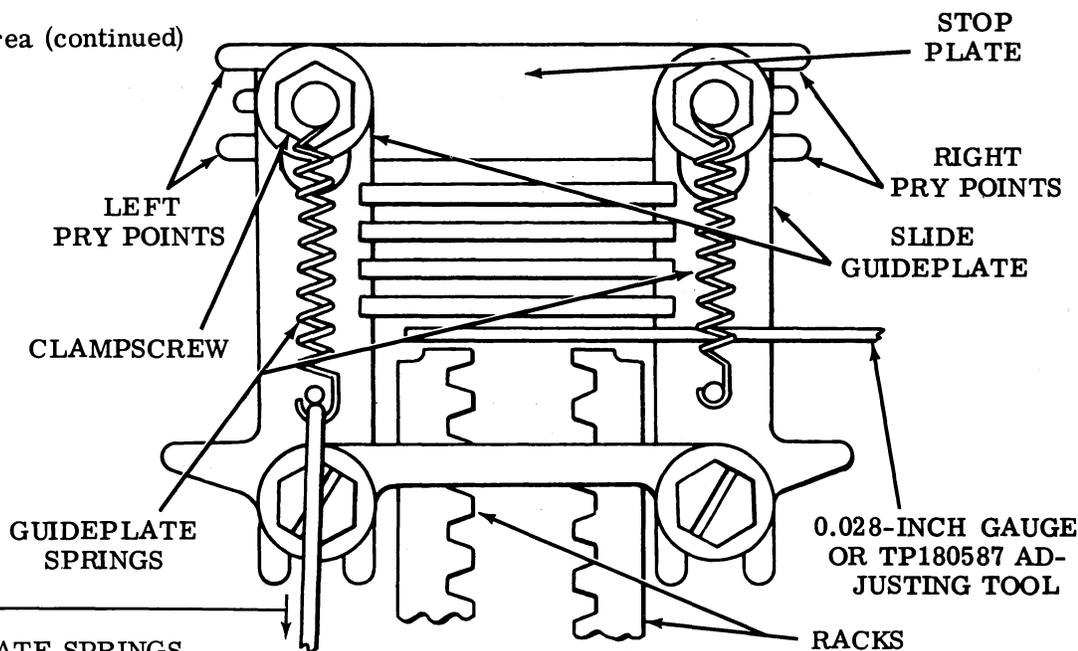
Affected By

PRINT DRIVE LEVER POSITIONING (2.48)



2.51 Carriage Area (continued)

(Top View)

SLIDE GUIDEPLATE SPRINGS

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

Requirement

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

Note 2: Check right and left springs.

TYPEWHEEL POSITIONING (Preliminary) (CRA-7)

Note 1: Final print alignment is found in 2.124.

Note 2: This adjustment is to be made only during a complete readjustment of the carriage. The adjustment may be made with the carriage removed from the printer and the requirement will be considered met when adjusted in accordance with the instruction. It is preferable to perform the adjustment prior to the assembly of the carriage to the typing unit. To perform the adjustment with the carriage on the typing unit, the platen assembly must be removed.

To 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.

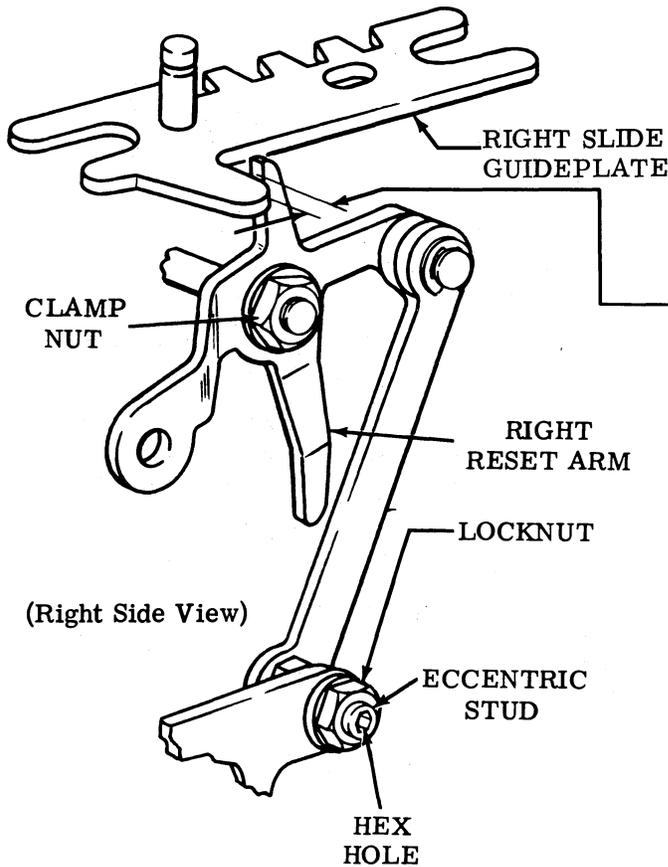
To Adjust

Place typing unit in stop condition. Open up LEFT SLIDE GUIDEPLATE RESET (2.53) and RIGHT SLIDE GUIDEPLATE RESET (2.52) adjustments. Loosen two clampscrews friction tight. Place either 0.028-inch gauge or TP180587 adjusting tool 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

LEFT SLIDE GUIDEPLATE RESET (2.53)
RIGHT SLIDE GUIDEPLATE RESET (2.52)
FINAL PRINTING ALIGNMENT (2.125)

2.52 Carriage Area (continued)



(Right Side View)

RIGHT SLIDE GUIDEPLATE RESET (CRA-8)

Requirement

With typing unit in stop condition and the carriage positioned over the carriage drive link

Min some---Max 0.015 inch between right slide guideplate and the right reset arm when play of the slide guideplates is taken up toward the front (by holding the middle of the rear slide forward) to make clearance a maximum.

To Adjust

Loosen eccentric stud locknut. With high point of eccentric to rear, rotate eccentric stud with hex wrench in hex hole. Tighten locknut.

Related Adjustments

Affects

- LEFT SLIDE GUIDEPLATE RESET (2.53)
- PRINT HAMMER TRIP LEVER RELEASE (2.54)
- RIBBON POSITIONING (2.56)

Affected By

- REAR RAIL POSITION (2.45)
- REAR ROLLER CLEARANCE (2.46)
- PRINT DRIVE LEVER POSITIONING (2.48)
- TYPEWHEEL POSITIONING (2.51)

2.53 Carriage Area (continued)

LEFT SLIDE GUIDEPLATE RESET (CRA-8)

Requirement

With typing unit in stop condition and the carriage positioned over the carriage drive link

Min some---Max 0.015 inch between left slide guideplate and left reset arm when play of the slide guideplates is taken up toward the front (by holding the middle of the rear slide forward) to make clearance a maximum.

To Adjust

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

Related Adjustments

Affects

RIBBON POSITIONING (2.56)

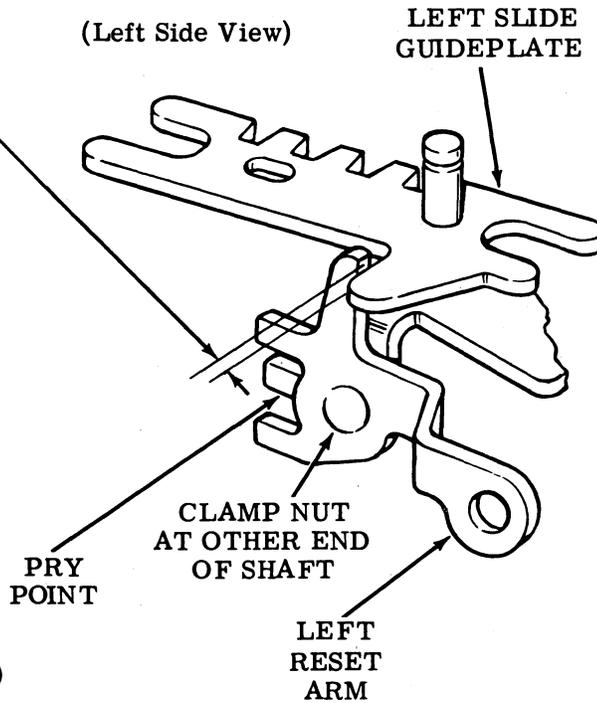
Affected By

REAR RAIL POSITION (2.45)

PRINT DRIVE LEVER POSITIONING (2.48)

TYPEWHEEL POSITIONING (2.51)

RIGHT SLIDE GUIDEPLATE RESET (2.52)



2.54 Carriage Area (continued)

PRINT HAMMER TRIP LEVER RELEASE AND CARRIAGE DRIVE BAIL ENDPLAY (CRA-9)

To Check

Place carriage at left margin. Set up an all marking code combination in the selector. Rotate main shaft until carriage drive bail reaches its rearmost position (position no. 2). Take up print hammer trip lever lightly toward the bail and release.

(1) Requirement

Min 0.040 inch---Max 0.110 inch between print hammer bail and print hammer trip lever.

To Adjust

Loosen print hammer trip lever clampscrew and position print hammer trip lever using pry point. Tighten clampscrew.

(2) Requirement

With carriage at the right margin, clearance between print hammer bail and print hammer trip lever to be within 0.020 inch of Requirement (1) above.

To Adjust

With carriage drive bail right pivot clampscrew friction tight, position right pivot. Tighten clampscrew.

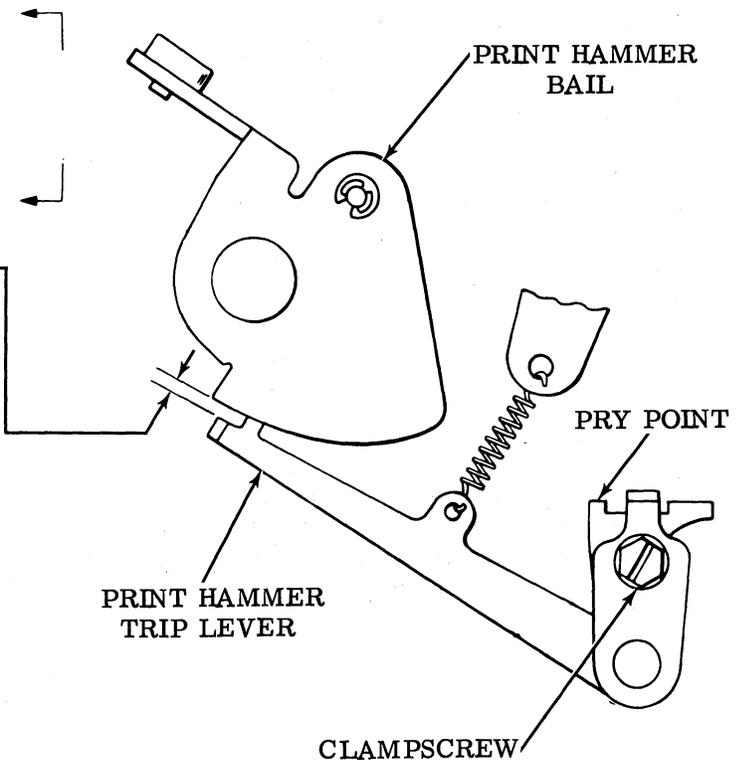
(3) Requirement

Vertical endplay of carriage drive bail should be Min some---Max 0.015 inch

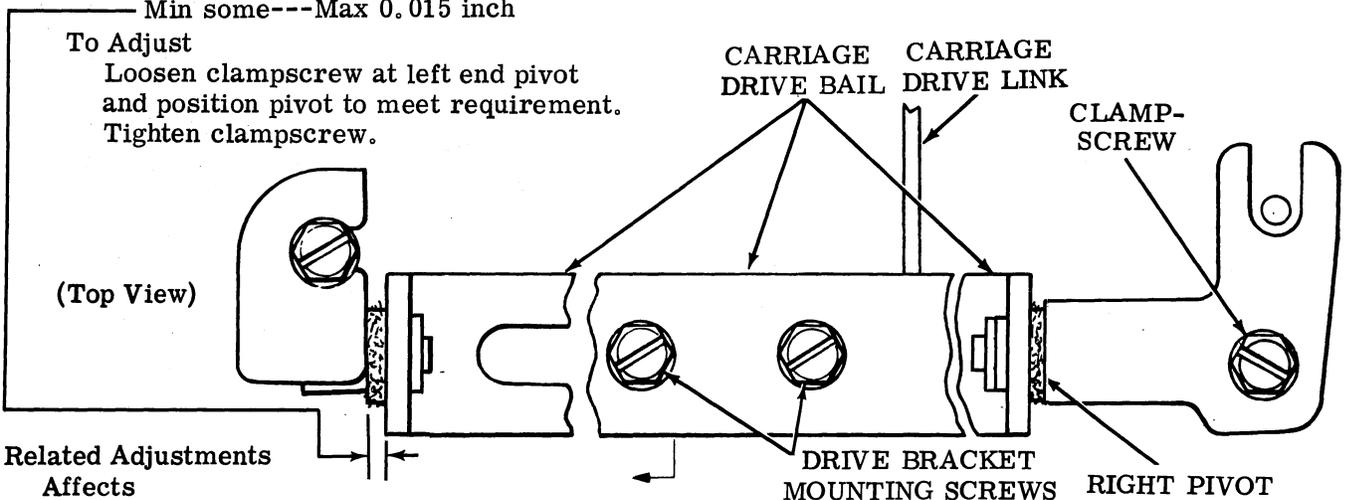
To Adjust

Loosen clampscrew at left end pivot and position pivot to meet requirement. Tighten clampscrew.

(Right Side View)



(Top View)



Related Adjustments Affects

- FEED PAWL STOP POSITION (Spacing Area) (2.64)
- PRINT HAMMER TRIP LEVER RESET (2.55)

- RIGHT SLIDE GUIDEPLATE RESET (2.52)
- REAR RAIL POSITION (2.45)
- REAR ROLLER CLEARANCE (2.46)

2.55 Carriage Area (continued)

PRINT HAMMER TRIP LEVER RESET (CRA-13)

Requirement

With typing unit in stop condition
Min 0.010 inch---Max 0.050 inch
between print hammer bail and print
hammer trip lever.

To Adjust

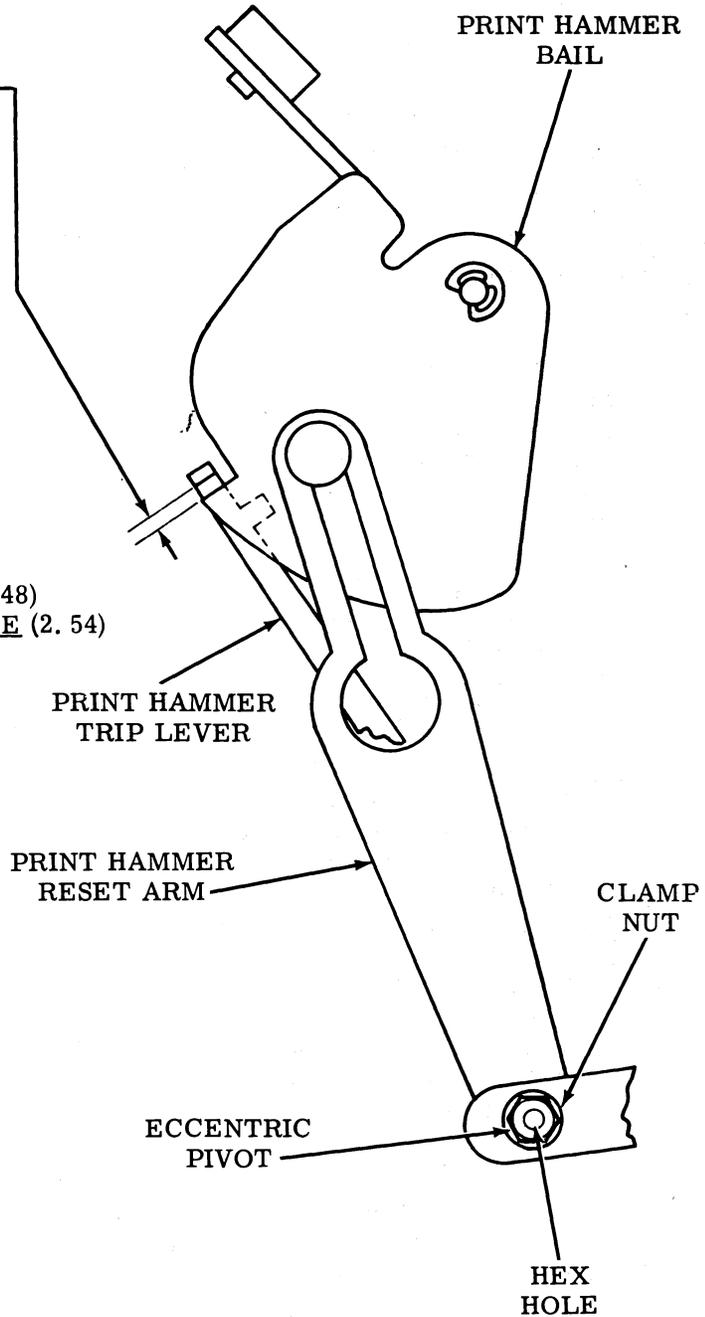
Loosen clamp nut and position print
hammer reset arm eccentric pivot
with hex key wrench in hex hole.
Tighten clamp nut.

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

Related Adjustment

Affected By

- REAR RAIL POSITION (2.45)
- REAR ROLLER CLEARANCE (2.46)
- PRINT DRIVE LEVER POSITIONING (2.48)
- PRINT HAMMER TRIP LEVER RELEASE (2.54)



2.56 Carriage Area (continued)

Note: Do not perform the following adjustment on typing units equipped with the two-color printing feature. Typing units with TP186732 ribbon link do not require this adjustment. See below for configuration.

RIBBON POSITIONING (CRA-14)

To Check

Trip function clutch and rotate main shaft until carriage drive bail is in its rearmost position (position no. 2). Continue rotating main shaft until the right ribbon link, during its downward travel, just contacts the top surface of the ribbon guide.

Requirement

Min some---Max 0.010 inch
between the left ribbon link and the ribbon guide as gauged by eye.

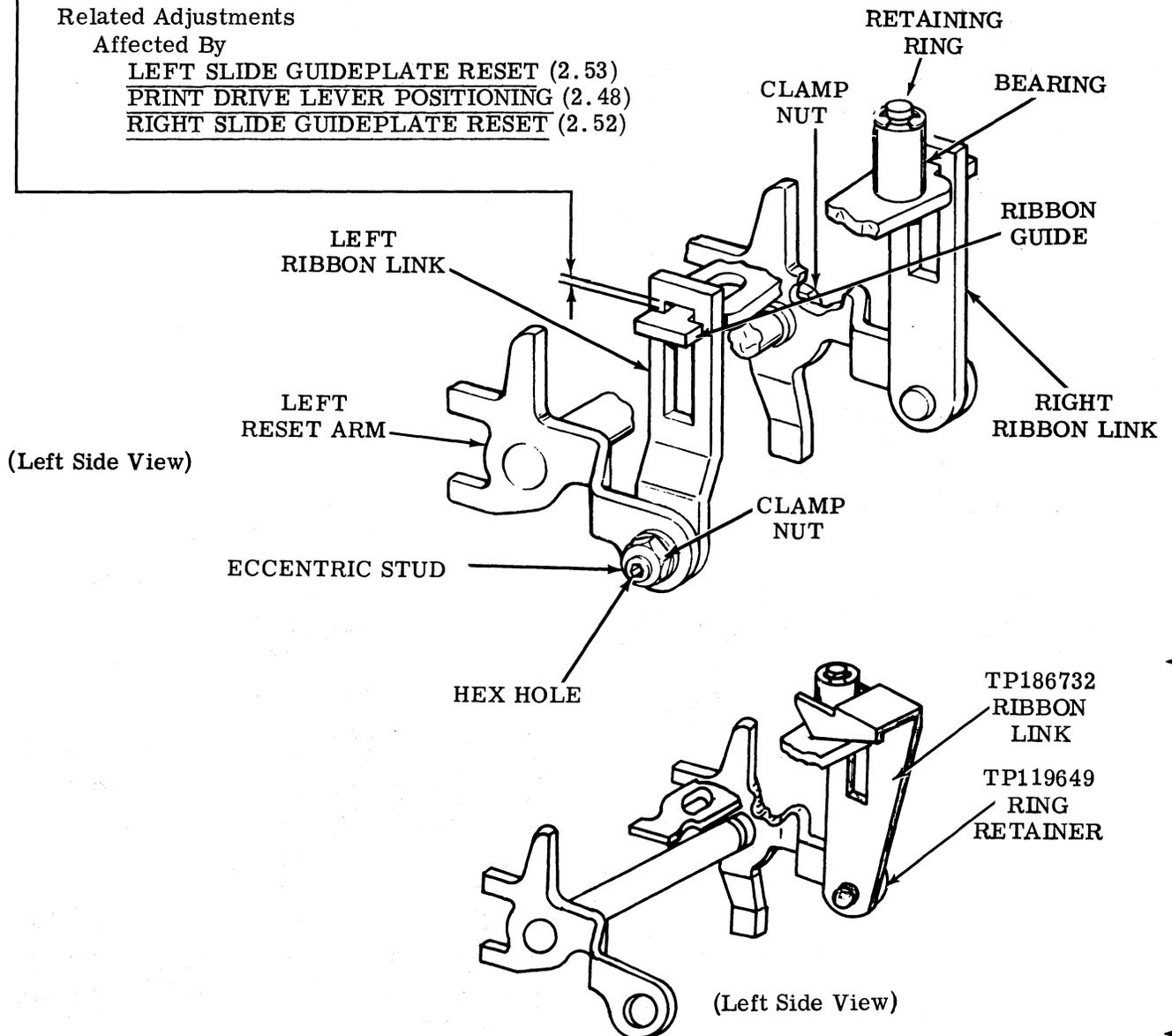
To Adjust

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

Related Adjustments

Affected By

- LEFT SLIDE GUIDEPLATE RESET (2.53)
- PRINT DRIVE LEVER POSITIONING (2.48)
- RIGHT SLIDE GUIDEPLATE RESET (2.52)



2.57 Carriage Area (continued)

PRINT SUPPRESSION LATCHLEVER RELEASE (CRA-15)

To Check

Move carriage until its power bail roller is positioned directly over the carriage drive link. Set up an all marking code combination in the selector. Rotate main shaft until the function clutch just trips. Take up play in latchlever upward and hold gap to a minimum.

Requirement

Min 0.015 inch--- Max 0.055 inch
between print suppression latchlever 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.

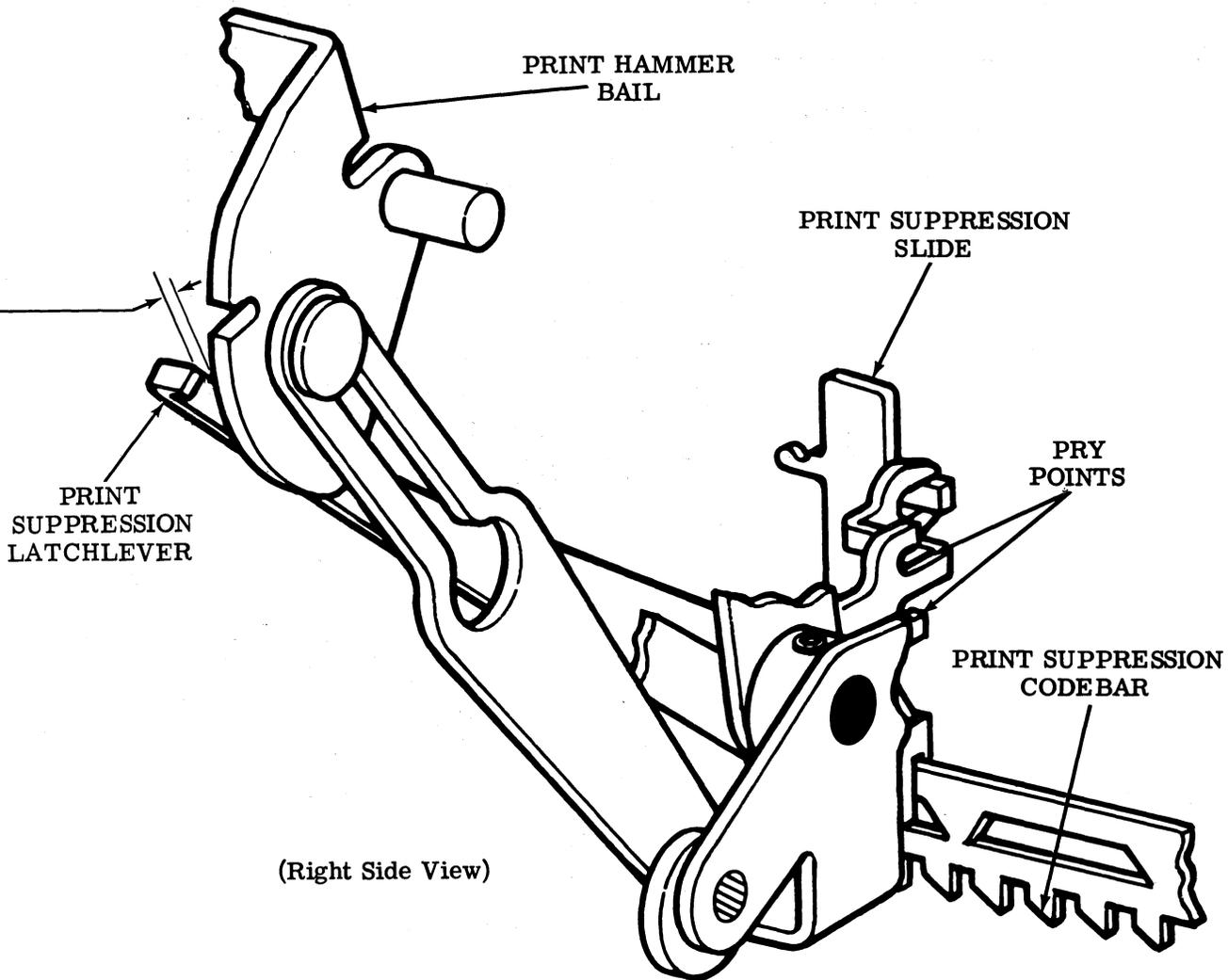
Related Adjustments

Affected By

CODEBAR RESET LEVER POSITION (Function Area) (2.28)

FRONT ROLLERS CLEARANCE (2.43)

REAR RAIL POSITION (2.45)



2.58 Carriage Area (continued)

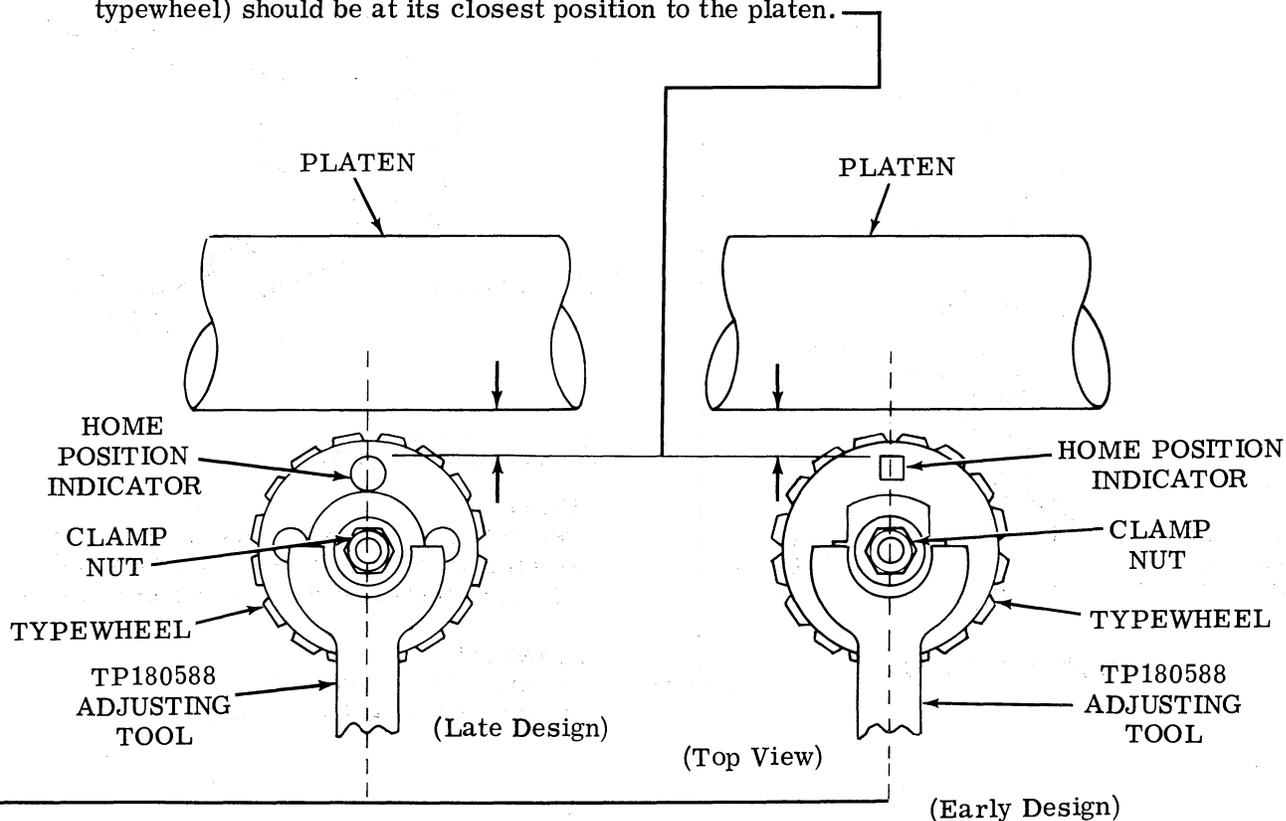
TYPEWHEEL "HOME" POSITION (Preliminary) (CRA-16)

To Check

Place typing unit in the stop condition.

(1) Requirement

The typewheel home position indicator (projection or hole, depending on the style of typewheel) should be at its closest position to the platen.



(2) Requirement

The typewheel home position indicator (projection or hole, depending on the style of typewheel) and the clamp nut should be aligned perpendicular to the platen, as gauged by eye.

To Adjust

Loosen clamp nut and position typewheel using TP180588 adjusting tool. Tighten clamp nut.

Related Adjustments

Affects

FINAL PRINTING ALIGNMENT (2.125)

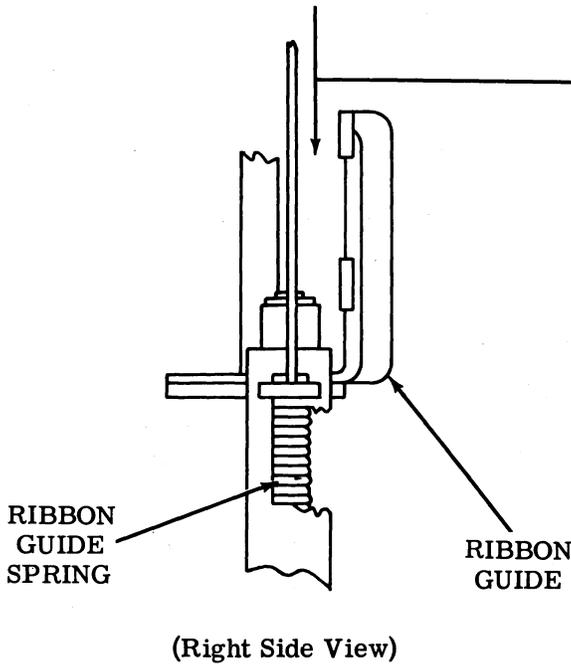
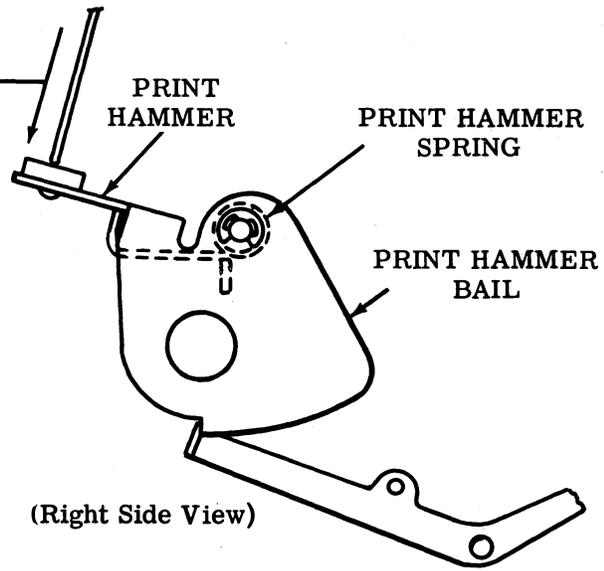
2.59 Carriage Area (continued)

PRINT HAMMER BAIL SPRING

Requirement

With typing unit in stop condition

Min 3 oz---Max 4-1/2 oz
to start print hammer moving.



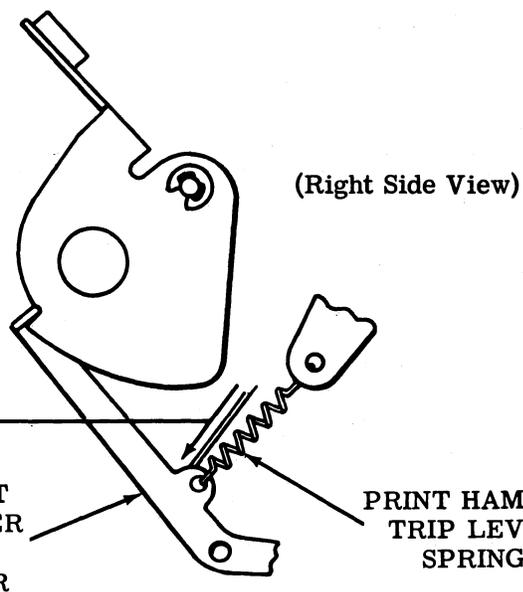
RIBBON GUIDE SPRING

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.

2.60 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

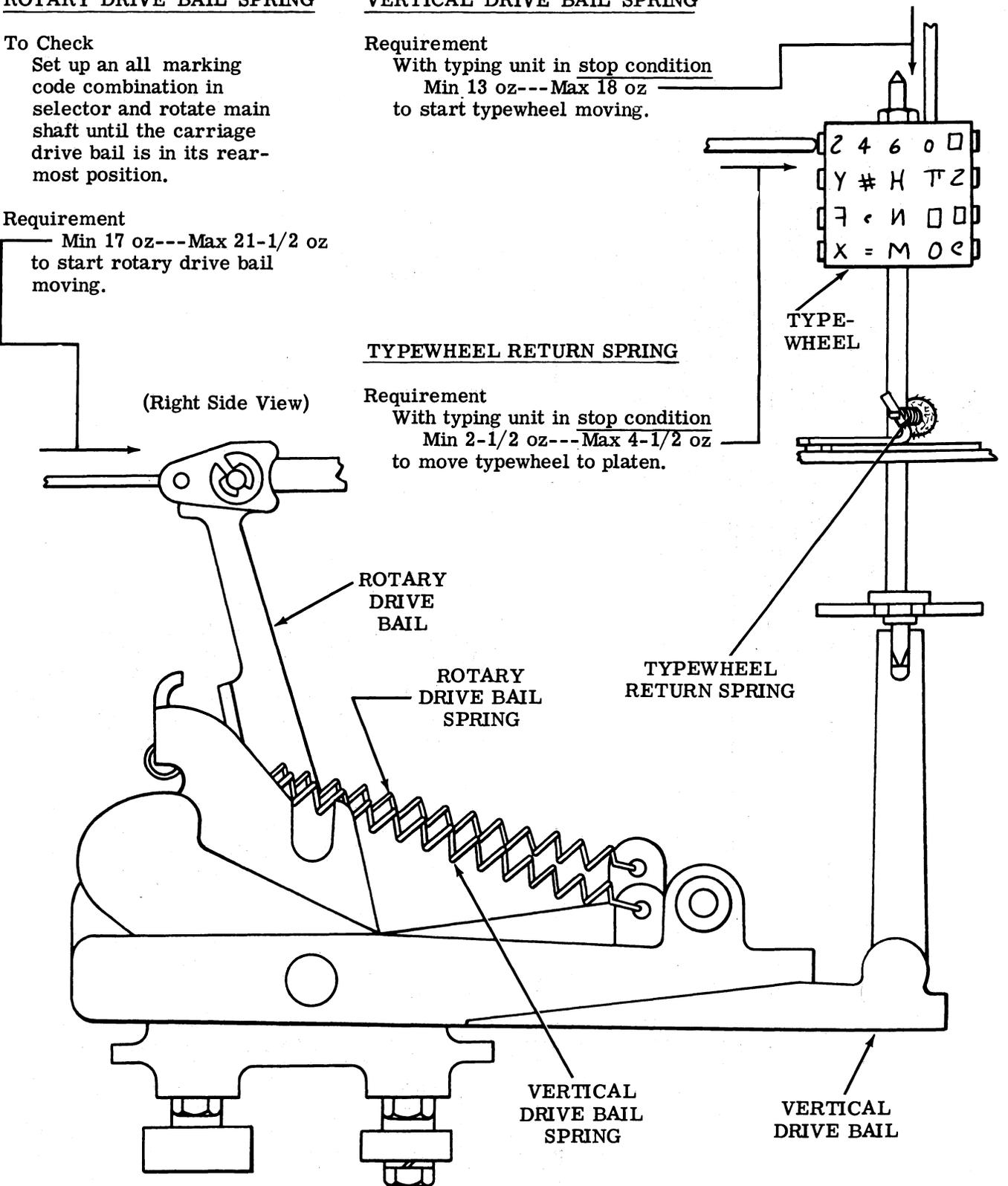
Requirement

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

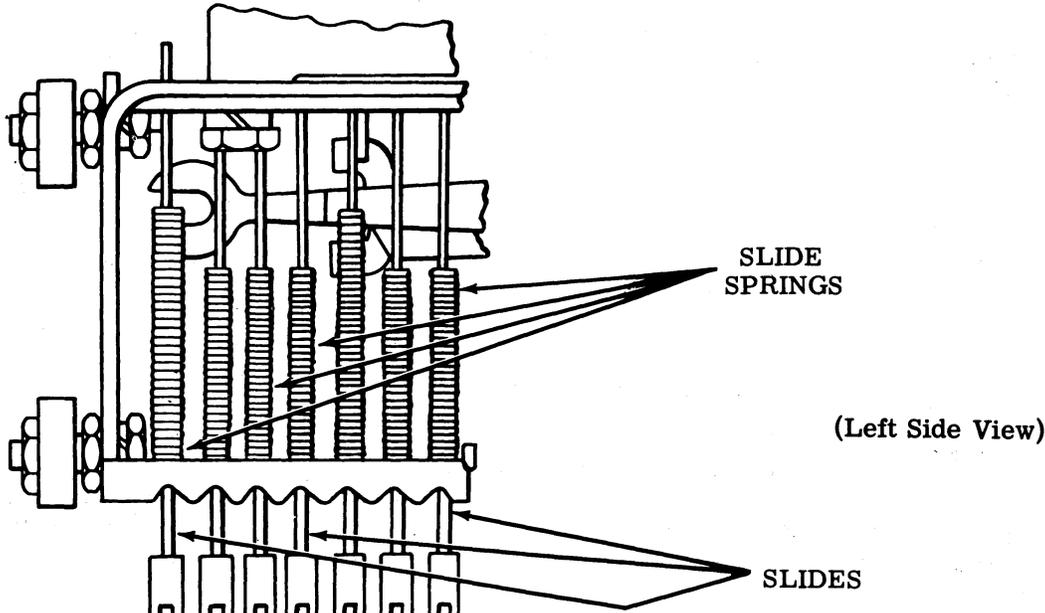
TYPEWHEEL RETURN SPRING

Requirement

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



2.61 Carriage Area (continued)



SLIDE SPRINGS

Note: To check tensions of the slide springs, it is necessary to remove the carriage mechanism from typing unit. For instructions see appropriate disassembly and reassembly 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 should require values as shown in chart, to start slides moving.

* Print Suppression

SLIDE NO.	5 AND 7	4	2 AND 3	1	PS*
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

2. 62 Carriage Area (continued)

RIBBON POWER LEVER DRIVE (CRA-17)

(1) To Check

Manually operate the typing unit until the carriage drive bail is in the rearmost position. Rotate left ribbon ratchet until the ribbon spool shaft and ribbon spool pin are approximately aligned with the tip of the feed pawl. Seat feed pawl against left ribbon ratchet.

Requirement

Min 0.010 inch---Max 0.045 inch
between face of left ribbon ratchet tooth and the corner tip of check pawl.

(2) To Check

Repeat (1) To Check above, except apply all instructions to right ribbon ratchet.

Requirement

Min 0.010 inch---Max 0.045 inch
between face of right ribbon ratchet tooth and corner tip of check pawl.

To Adjust

Loosen locknut and position the eccentric stud with hex key wrench in hex hole. Tighten locknut.

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

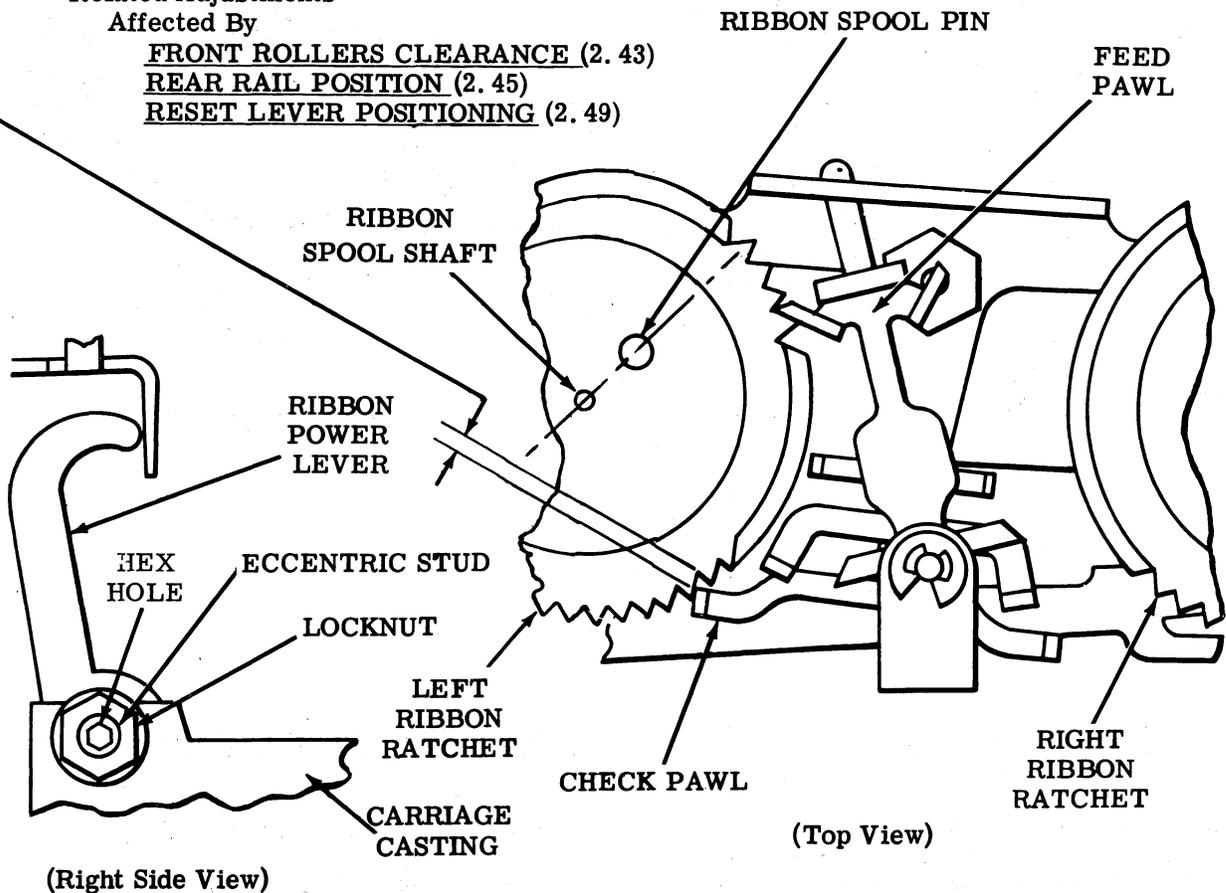
Related Adjustments

Affected By

FRONT ROLLERS CLEARANCE (2. 43)

REAR RAIL POSITION (2. 45)

RESET LEVER POSITIONING (2. 49)



2.63 Carriage Area (continued)

RIBBON RATCHET SPRING

Requirement

With feed and check pawls disengaged from ratchet wheel.

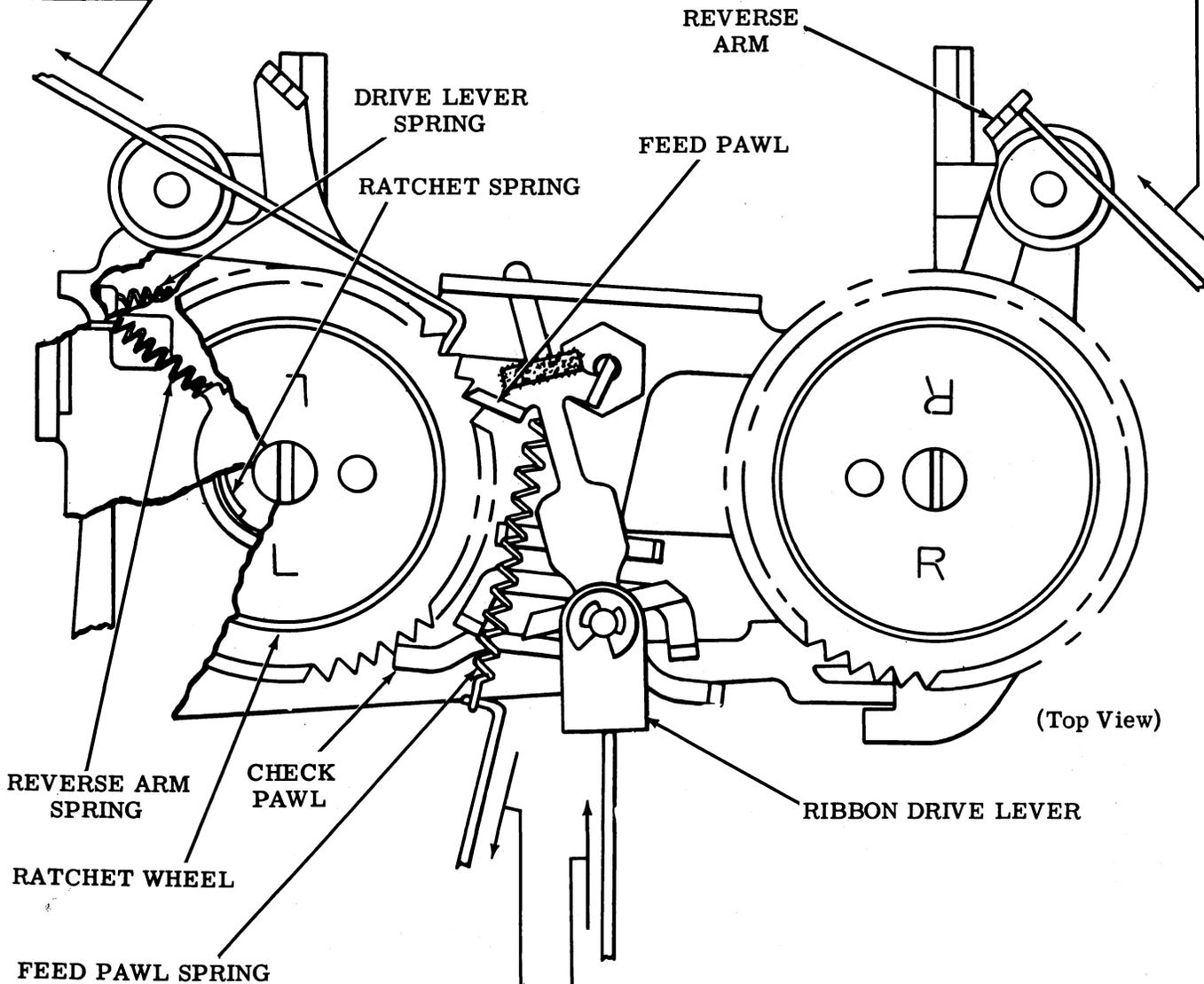
Min 1-1/2 oz---Max 3-1/2 oz
to start ratchet wheel moving.

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.

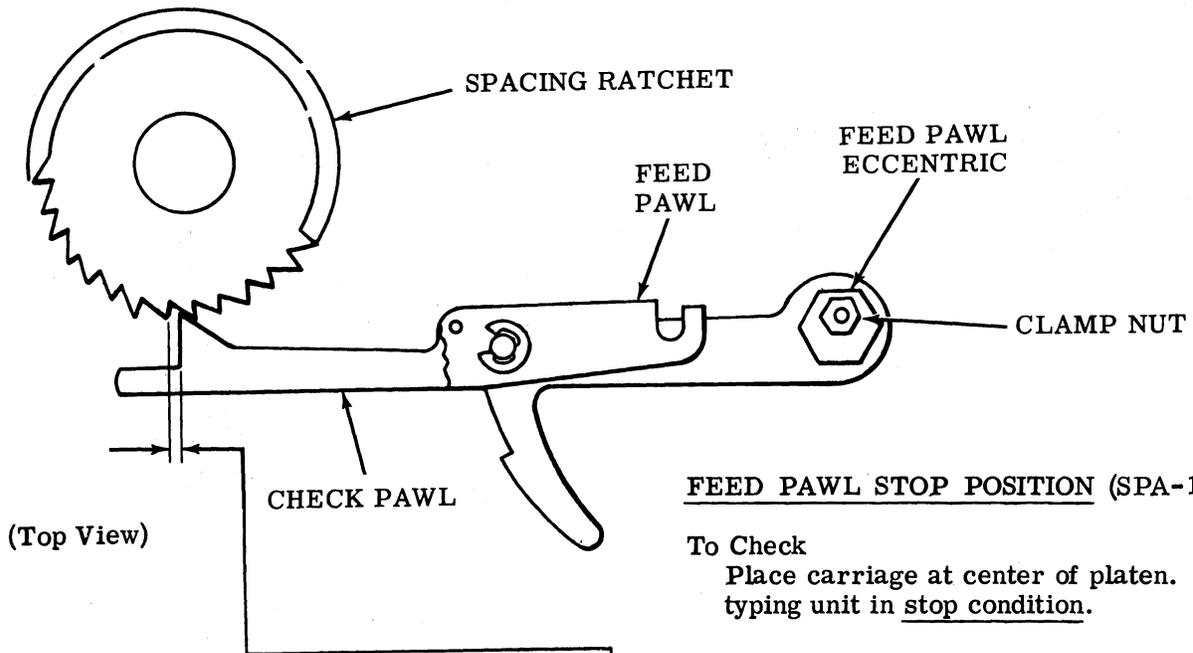
RIBBON DRIVE LEVER SPRING

Requirement

With typing unit in stop condition

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

2.64 Spacing Area



(Top View)

FEED PAWL STOP POSITION (SPA-1)

To Check

Place carriage at center of platen. Place typing unit in stop condition.

Requirement

With feed pawl in full engagement with spacing ratchet
 Min 0.004 inch---Max 0.018 inch
 between check pawl and spacing ratchet tooth.

To Adjust

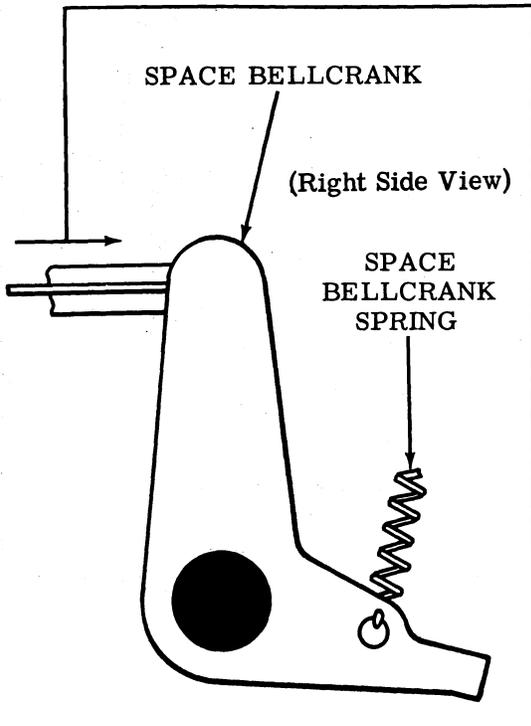
Loosen clamp nut. Rotate feed pawl eccentric. Keep high part of eccentric toward front. Tighten clamp nut.

Related Adjustment

Affected By

PRINT HAMMER TRIP LEVER RELEASE
 (Carriage Area) (2.54)

SPACE BELLCRANK SPRING



(Right Side View)

(1) Requirement (Units with pry point adjustment of space suppression lever)
 With typing unit in stop condition
 Min 3 oz---Max 5 oz
 to start bellcrank moving.

(2) Requirement (Units with eccentric adjustment of space suppression lever)
 With typing unit in stop condition
 Min 5 oz---Max 7 oz
 to start bellcrank moving.

2.65 Spacing Area (continued)

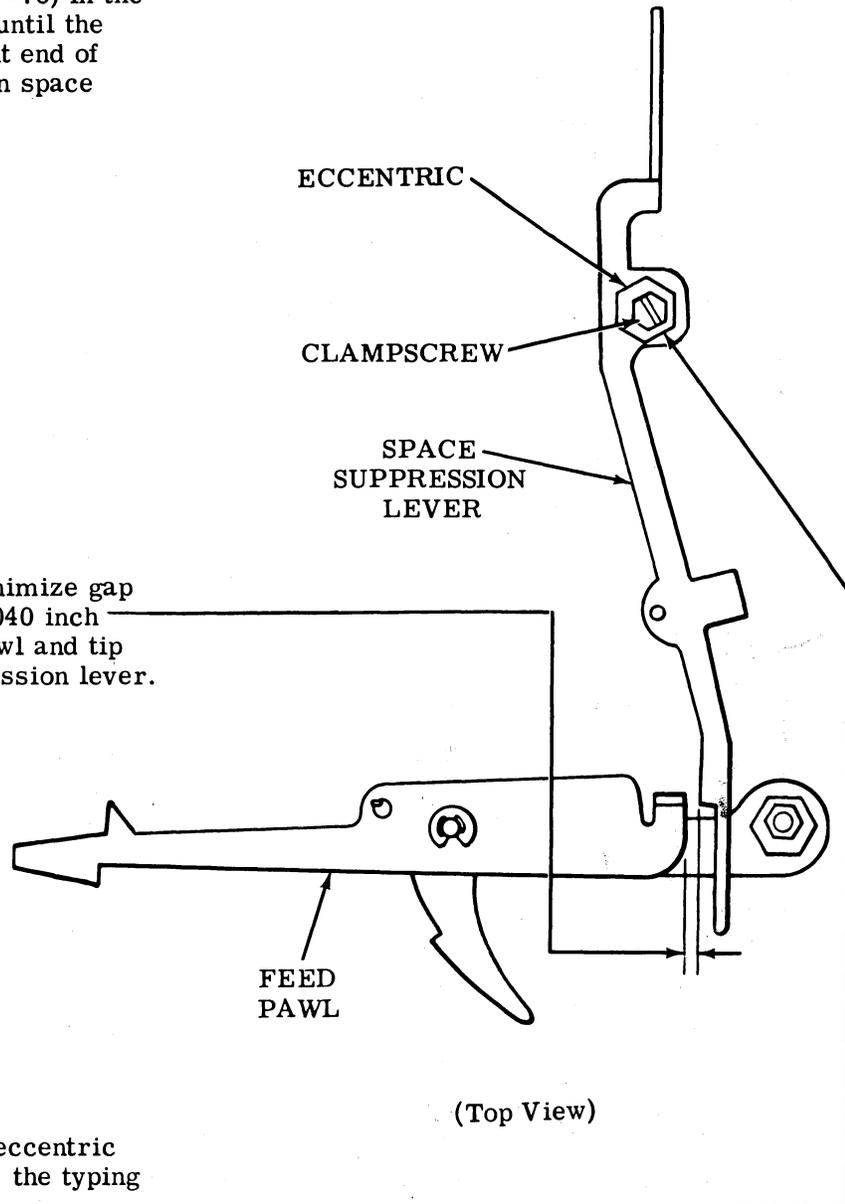
SPACE SUPPRESSION LEVER CLEARANCE — PRINTING (SPA-2)

To Check

Move carriage to the center of platen. Set up the @ code combination (-----78) in the selector. Rotate the main shaft until the front vertical surface of the right end of feed pawl is aligned with notch on space suppression lever.

(1) Requirement

With all play taken up to minimize gap
Min 0.005 inch---Max 0.040 inch
between right end of feed pawl and tip
of notch on the space suppression lever.



(2) Requirement

The position of high part of eccentric should be toward the rear of the typing unit.

To Adjust

Loosen eccentric clampscrew friction tight. Position eccentric. Tighten eccentric clampscrew.

Related Adjustment

Affected By

CODEBAR RESET LEVER POSITION
(Function Area) (2.28)

2.66 Spacing Area (continued)

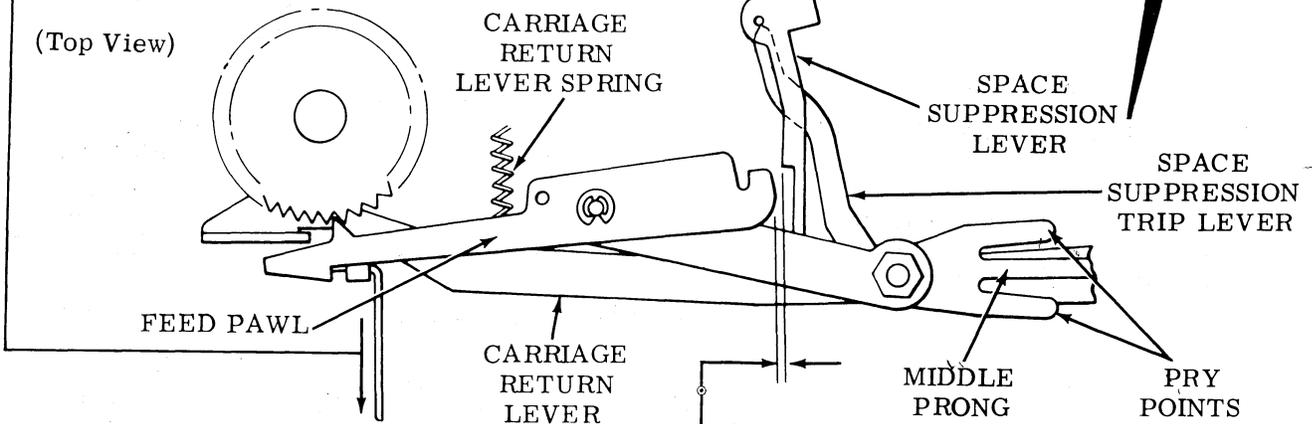
CARRIAGE RETURN LEVER SPRING

To Check

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

Requirement

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



SPACE SUPPRESSION LEVER CLEARANCE — SPACING (SPA-3)

- (1) To Check (Typing units with pry points)
Move carriage to the center of platen. Set up space code combination (-----6-8) in the selector. Rotate main shaft until front vertical surface of right end of feed pawl is aligned with notch on space suppression lever.

Requirement

With all play taken up to minimize gap
Min some---Max 0.040 inch
between right end of feed pawl and tip of notch on space suppression lever. With an all marking code combination set up in the selector, rotate main shaft through one complete revolution and check for horizontal motion of the space suppression lever. If motion occurs, refine requirement to min side and recheck.

To Adjust

Position space suppression trip lever by bending middle prong. Use front pry point to increase clearance. Use rear pry point to decrease clearance.

- (2) To Check (Typing units with eccentric — see inset)
Move carriage to center of platen. Set up space code combination (-----6-8) in selector. Rotate main shaft until front vertical surface of right end of feed pawl is aligned with notch on space suppression lever.

Requirement

Min 0.005 inch---Max 0.040 inch
between right end of feed pawl and tip of notch of space suppression lever. Take up all play to minimize clearance.

To Adjust

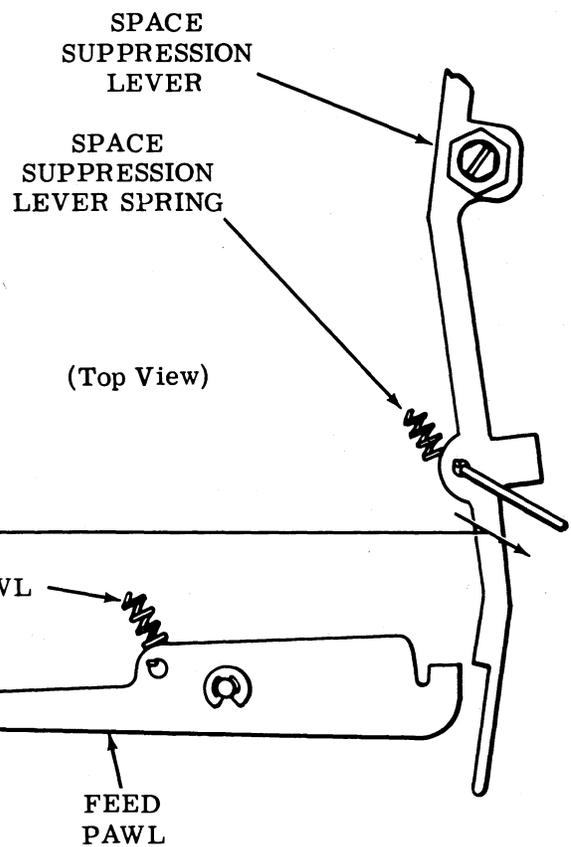
Loosen clamp nut and position eccentric keeping high part of eccentric toward bottom of unit. Rotate high part of eccentric to rear to increase gap and forward to decrease gap.

Related Adjustments

Affected By

LEFT ROCKER DRIVE (2.34)

2.67 Spacing Area (continued)



SPACE SUPPRESSION LEVER SPRING

Requirement

With typing unit in stop condition

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

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.

2.68 Spacing Area (continued)

FEED PAWL TRAVEL (SPA-4)

To Check

Place carriage to left margin and set up the character M code combination (1-34--78) in selector. Rotate main shaft until carriage drive bail reaches its rearmost position (position no. 2). Hold check pawl away from ratchet. ←

Requirement

Min 0.005 inch---Max 0.030 inch between the feeding surface of the feed pawl and the face of ratchet.

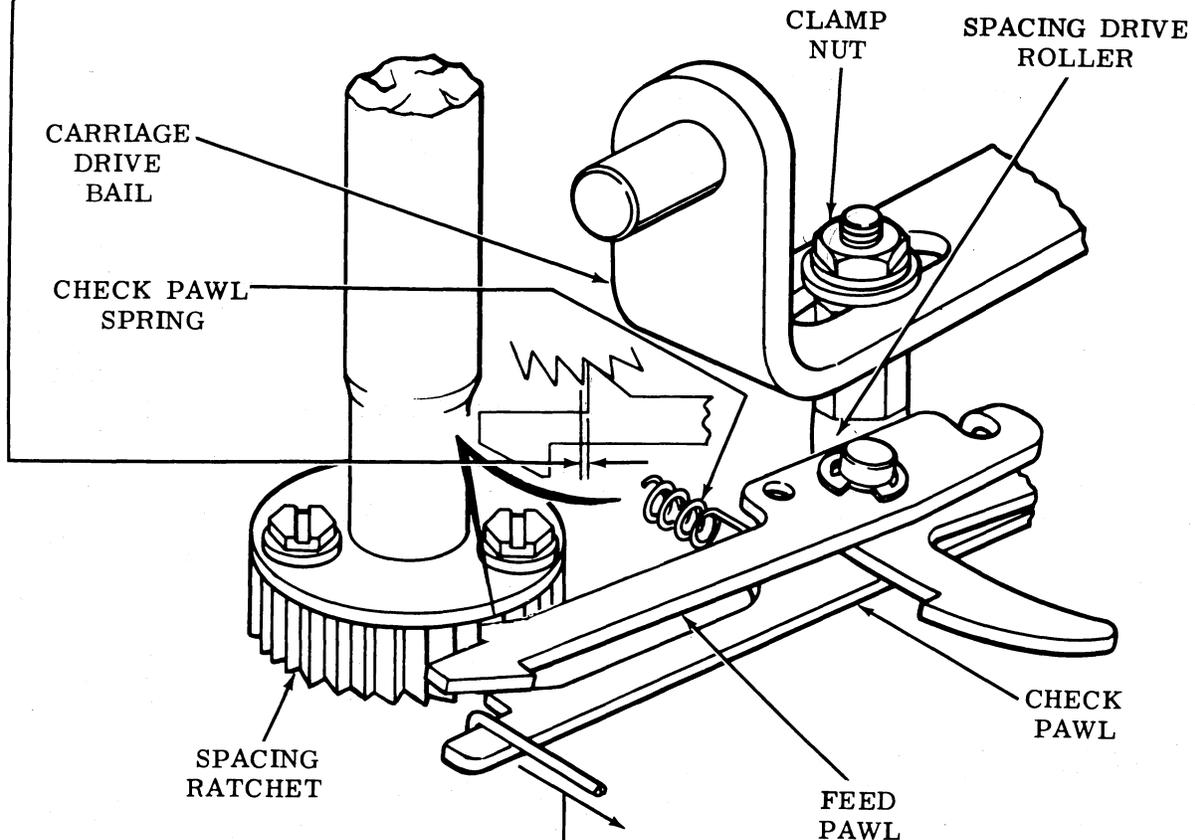
To Adjust

Loosen clamp nut. Position spacing drive roller. Tighten clamp nut.

Related Adjustment

Affected By

- LEFT MARGIN POSITION - F (2.72)
- LEFT MARGIN PRINTING (2.120)



(Left Front View)

CHECK PAWL SPRING

Requirement

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

2.69 Spacing Area (continued)

SPACING BELT TENSION (MDA-1)

Requirement

With the carriage piston in the dashpot cylinder, the typing unit in the stop condition, and 10 ounces of pressure applied near center of belt

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

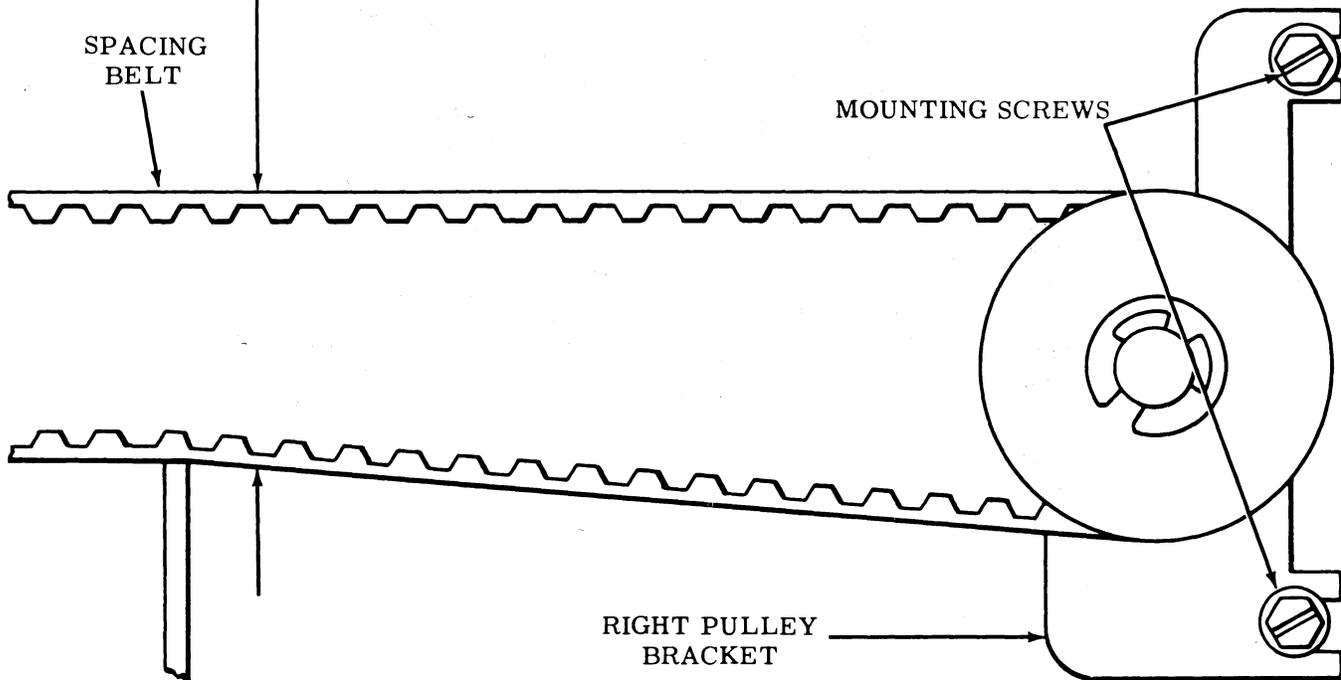
To Adjust

Loosen mounting screws and position right pulley bracket. Tighten screws.

Related Adjustment

Affects

LEFT MARGIN PRINTING (2.120)



(Top View)

2.70 Platen Area

PLATEN — HORIZONTAL POSITION - F (PLA-1)

(1) To Check

Place the flat surface on the left side of the platen up so that it is horizontal to the base casting. Place the carriage at the left margin and check requirement. Move the carriage to the right margin and again check requirement.

Requirement

Min 0.050 inch---Max 0.065 inch
between ribbon guide and platen at both left and right margins.

Note 1: Units with antismudge shields, maintain clearance between ribbon guide and platen. For units with two-color printing not having the TP183885 plate, the clearance should be Min 0.070 inch---Max 0.085 inch.

(2) To Check

Place carriage to center of platen and rotate platen until maximum clearance is obtained between platen and ribbon guide. Set up the E code combination (1-3---78) in the selector. Rotate main shaft until carriage drive bail is in its rearmost position. (Position no. 2). Push typewheel to the rear until it just touches the platen.

Note 2: The typing unit should not have paper or ribbon installed.

Requirement

Typewheel should not touch inside of either ribbon guide.

To Adjust

Loosen four horizontal positioning screws. Position platen horizontally. Tighten positioning screws.

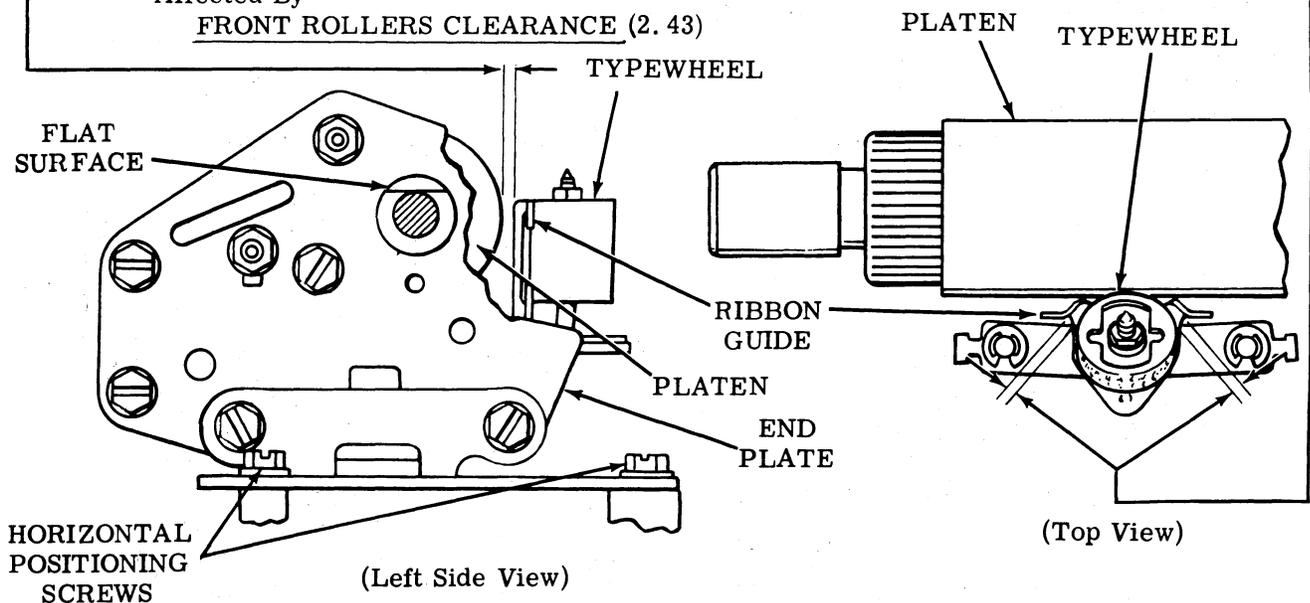
Related Adjustments

Affects

LINE FEED STRIPPER PLATE CLEARANCE - F (2.85)

Affected By

FRONT ROLLERS CLEARANCE (2.43)



2.71 Platen Area (continued)

VERTICAL TYPE ALIGNMENT - F (PLA-2)

For typing units equipped with adjustable vertical drive bail such as TP180606:

(1) To Check

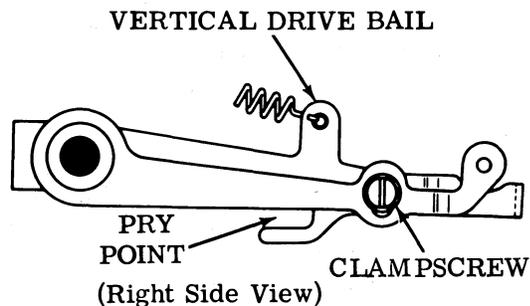
Place paper and ribbon in unit. Place carriage to left margin. Set up the E code combination (1-3---78) in the selector and rotate the main shaft until the character is printed.

Requirement

When the printed character is examined by eye from top to bottom, the shading should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen clampscrew on vertical drive bail and position the typewheel using pry point. Tighten adjusting screw.



(2) To Check

Place carriage to right margin. Set up the E code combination (1-3---78) in the selector and rotate main shaft until the character is printed.

Requirement

When the printed character is examined by eye from top to bottom, the shading should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen vertical positioning screws on right side. Position the right end of the platen using pry point. Do not twist the platen. Tighten positioning screws.

For typing units equipped with nonadjustable vertical drive bail such as TP180526:

To Check

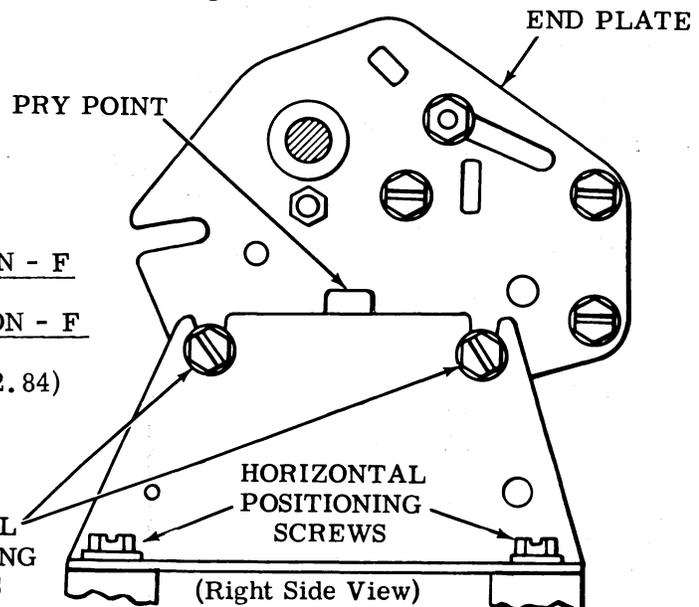
Place paper in typing unit. Set up the E code combination (1-3---78) in the selector and rotate the main shaft until the character is printed. Repeat several times along the length of the platen.

Requirement

When each printed character is examined by eye from top to bottom, the shading should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen four vertical positioning screws. Position the platen using pry points. Do not twist the platen. Tighten positioning screws.



Related Adjustments

Affects

LINE FEED PAWL DOWNSTOP POSITION - F
(2.83)

LINE FEED UPSTOP BRACKET POSITION - F
(2.81)

PRESSURE ROLLER CLEARANCE - F (2.84)

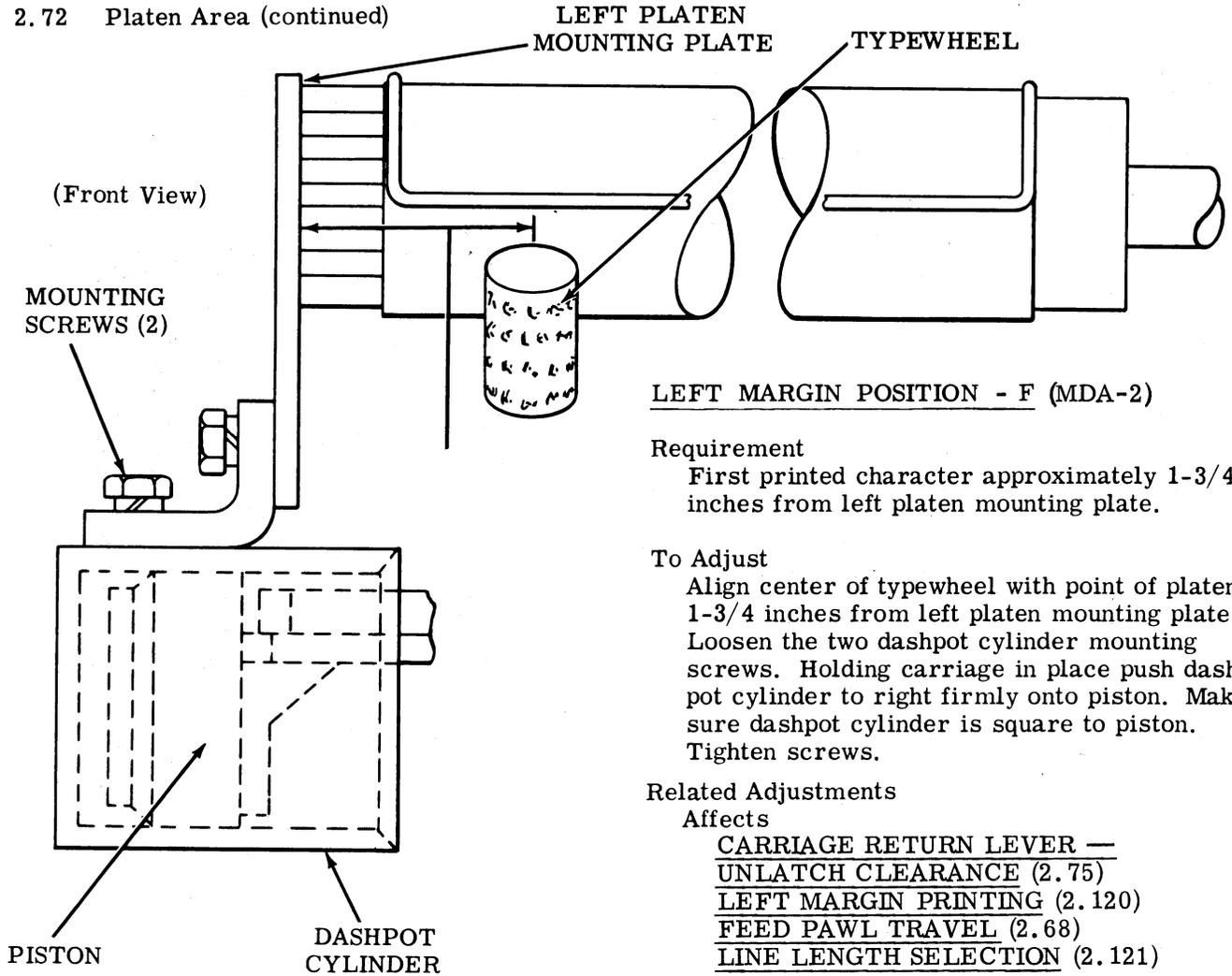
LINE FEED DRIVE LINK POSITION - F
(2.82)

FINAL PRINTING ALIGNMENT (2.125)

Affected By

REAR RAIL POSITION (2.45)
PRINT DRIVE LEVER
POSITIONING (2.48)

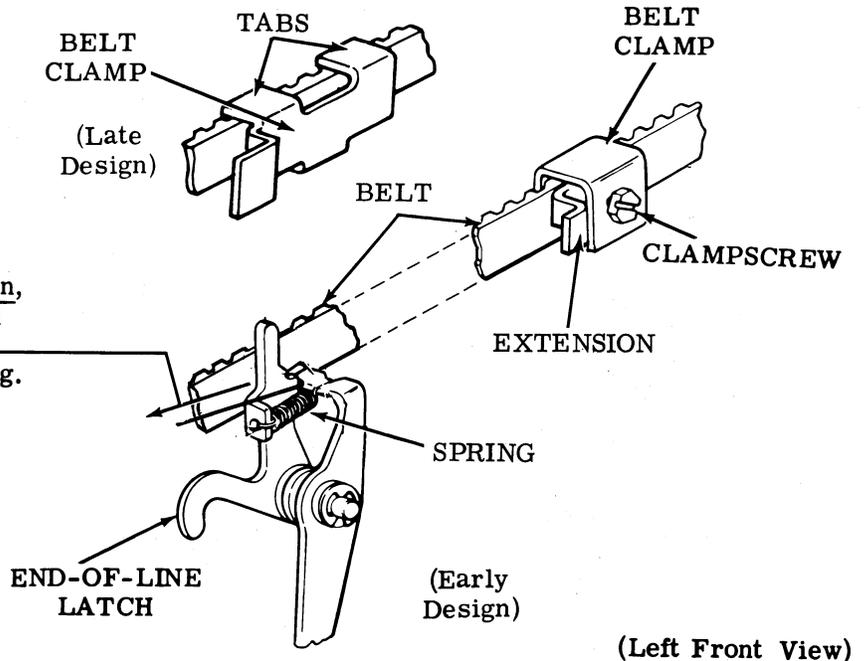
2.72 Platen Area (continued)



2.73 Function Area (continued)

END-OF-LINE LATCH SPRING

Requirement
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.



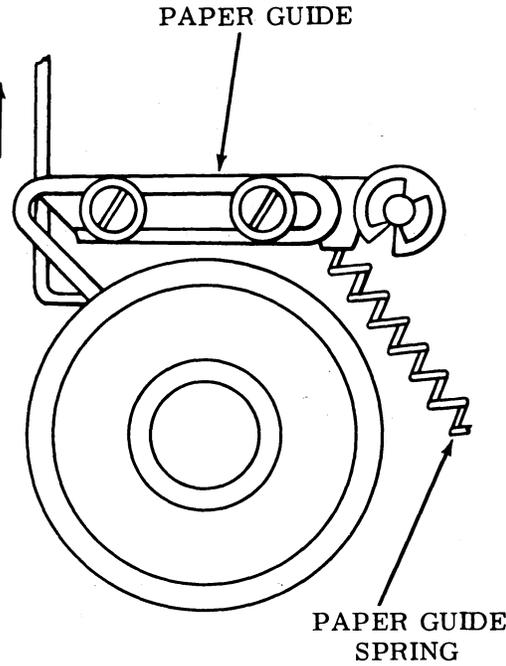
2.74 Platen Area (continued)

PAPER GUIDE SPRINGS - F

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 - F

Requirement

With scale at center of paper straightener bail

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

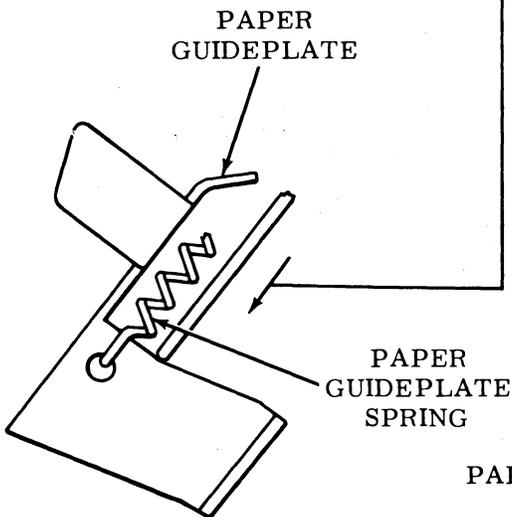
PAPER GUIDEPLATE SPRINGS - F

Requirement

With pressure lever released

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

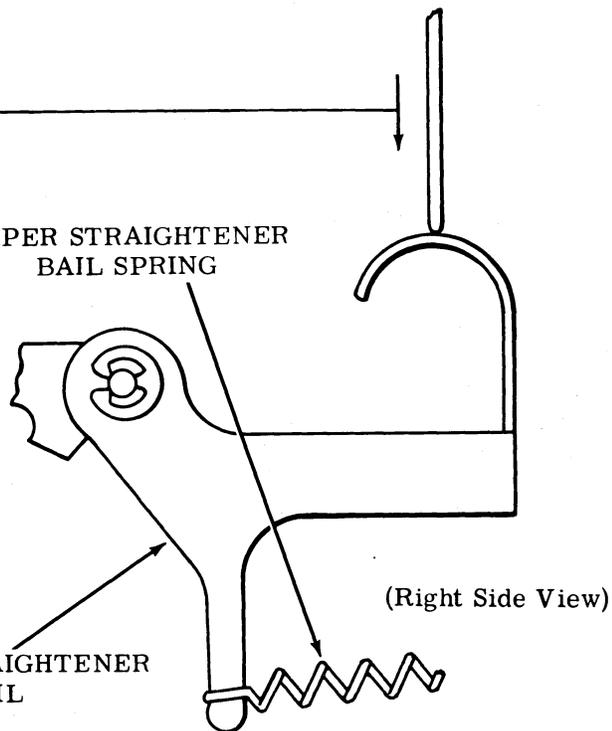
Note: Check each of two springs.



(Right Side View)

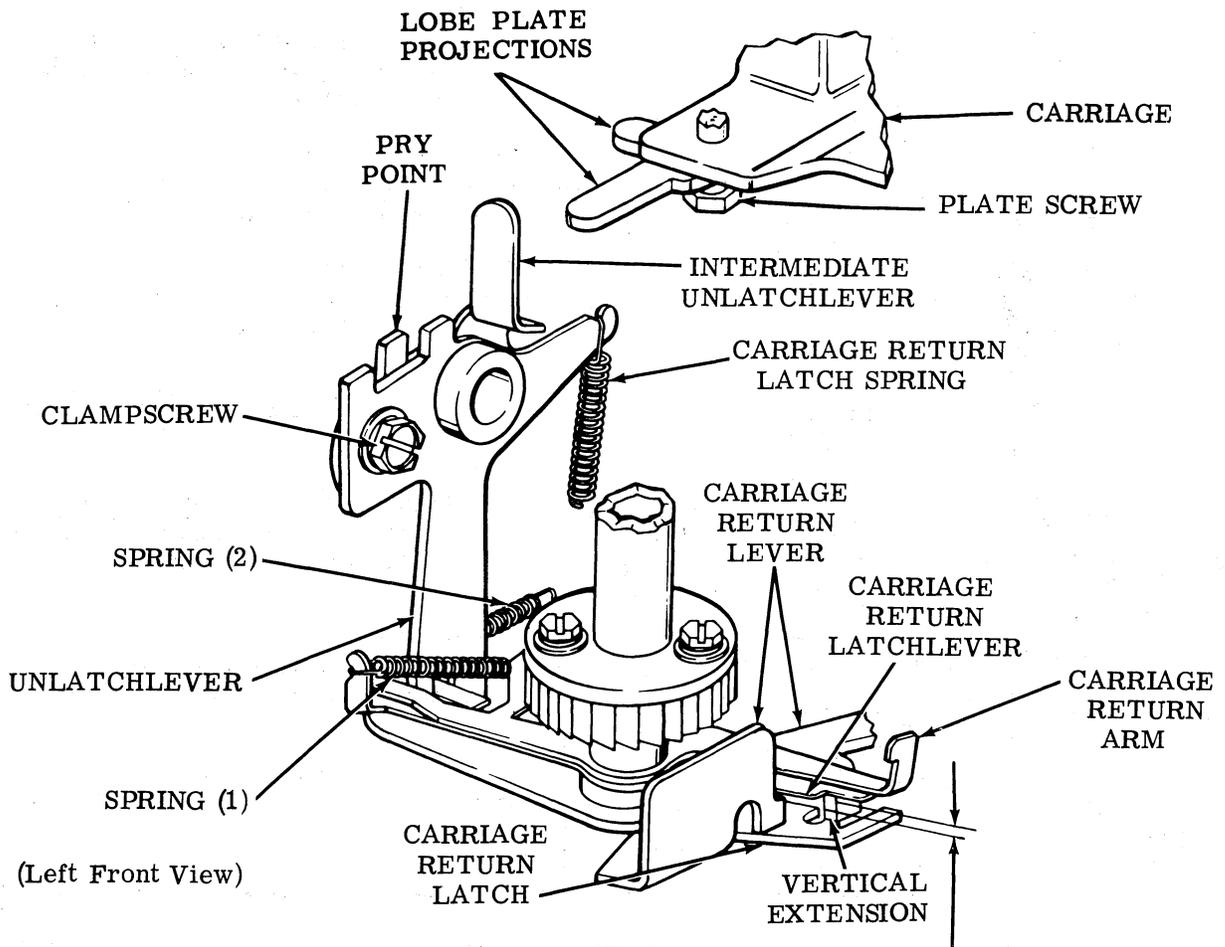
PAPER STRAIGHTENER BAIL SPRING

PAPER STRAIGHTENER BAIL



(Right Side View)

2.75 Spacing Area (continued)



CARRIAGE RETURN LEVER - UNLATCH CLEARANCE (MDA-5)

(1) To Check

Move carriage to left margin by placing carriage return lever in its forward latched position. Take up all play to minimize the required clearances.

Requirement

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

To Adjust

Loosen clampscrew. Use pry points to position carriage return latch. Tighten clampscrew.

Note: Perform the following check only if the typing unit is being completely readjusted.

(2) To Check

Repeat To Check (1) above.

Requirement

The intermediate unlatch lever should be aligned with the lobe plate projection which most nearly touches it.

To Adjust

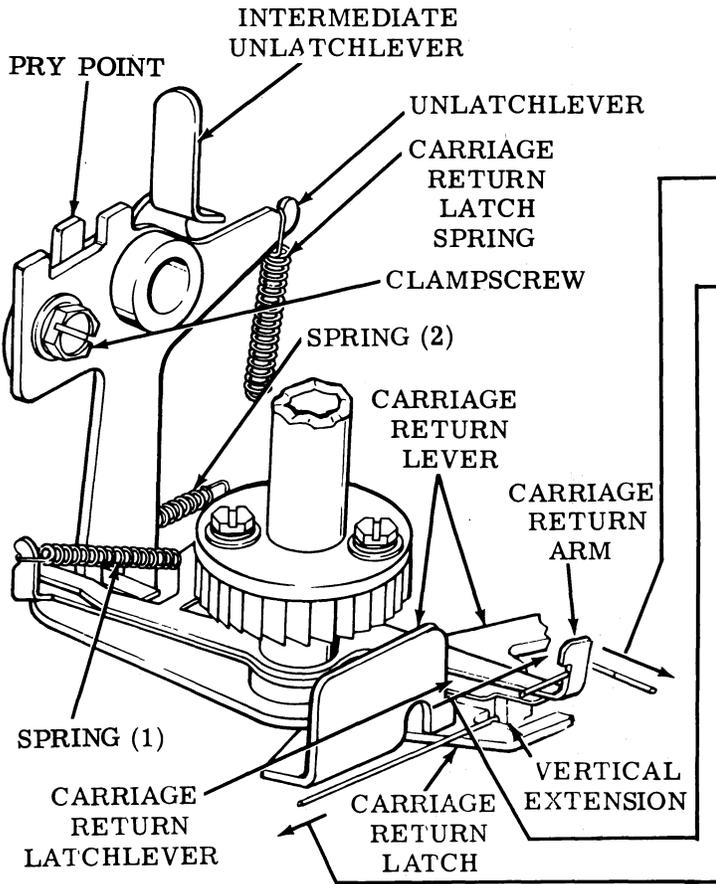
Loosen plate screw. Position lobe projection plate. Tighten plate screw. Check FRONT ROLLERS CLEARANCE (2.45).

Related Adjustments

Affected By

- LEFT MARGIN POSITION - S (2.118)
- LEFT MARGIN POSITION - F (2.72)

2.76 Spacing Area (continued)



CARRIAGE RETURN ARM SPRINGS

To Check

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

(1) Requirement

Min 1 oz---Max 2 oz to start arm moving.

(2) Requirement

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

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 BOUNCE (MDA-4)

To Check

Place carriage at right margin, manually disengage the check pawl and feed pawl of the spacing mechanism.

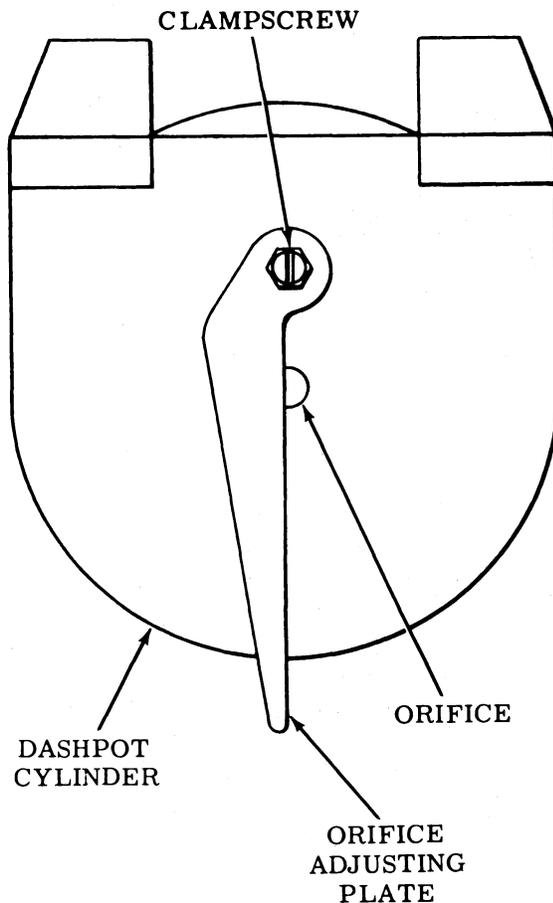
Requirement

No pneumatic or mechanical bounce of carriage upon its return.

To Adjust

Loosen orifice adjusting plate clampscrew and close the orifice completely. Then gradually open until pneumatic bounce is eliminated while operating unit. Tighten clampscrew. (Do not overtighten.)

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.



2.77 Platen Area (continued)

LINE FEED SELECTION - F (PLA-3)

(1) Requirement

Upstop stud should be at bottom of slot for single line feed or at top for double line feed.

To Adjust

Loosen clamp nut. Position upstop stud. Tighten clamp nut.

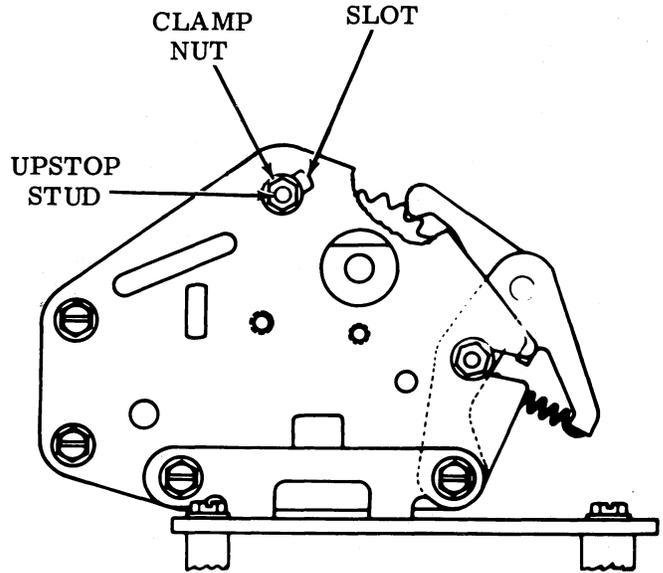
Note: The following requirement applies only to typing units equipped with operator-controlled line feed feature containing TP185788 shift lever.

(2) Requirement

Same as Requirement (1) above.

To Adjust

Place TP185788 shift lever in upper detent for single line feed or in lower detent for double line feed.

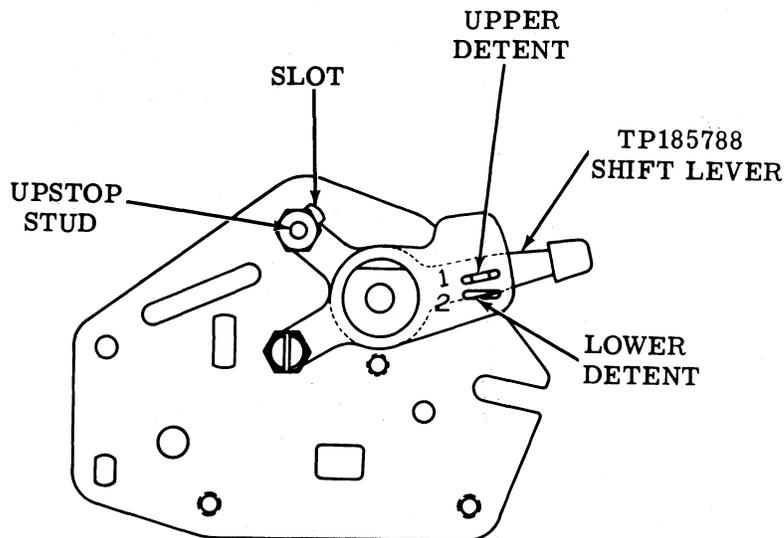


(Left Side View)

Related Adjustments

Affects

DETENT POSITION - F (2.78)



(Left Side View)

2.78 Platen Area (continued)

DETENT POSITION - F (PLA-4)

To Check

Place typing unit in single line feed condition.

Requirement

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

To Adjust

Early Design (typing units equipped with TP181030 bracket)

Loosen clamp nut (1). Position platen detent pawl pivot. Tighten clamp nut.

Late Design (typing units equipped with TP185796 bracket)

Loosen clamp nuts (2) and (3).

Position platen detent to upper end of adjusting slot. Back off detent pawl to meet requirement. Tighten clamp nuts.

Related Adjustments

Affects

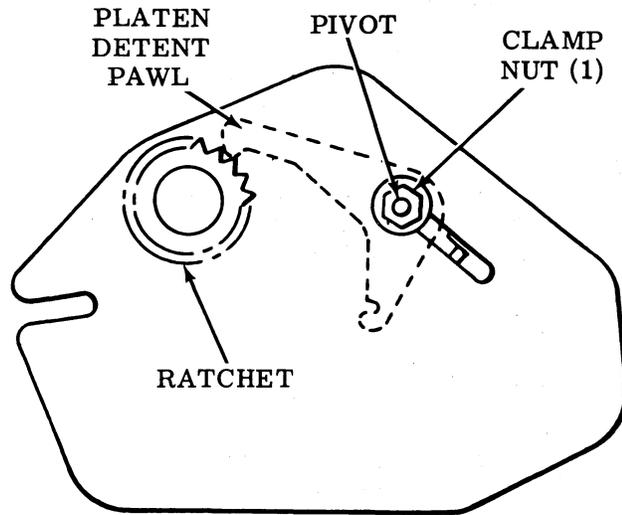
LINE FEED DRIVE LINK POSITION - F
(2.82)

Affected By

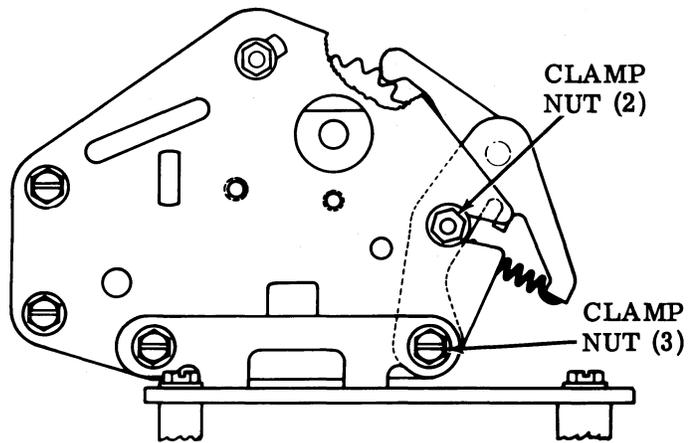
VERTICAL TYPE ALIGNMENT - F
(2.71)

LINE FEED SELECTION - F (2.77)

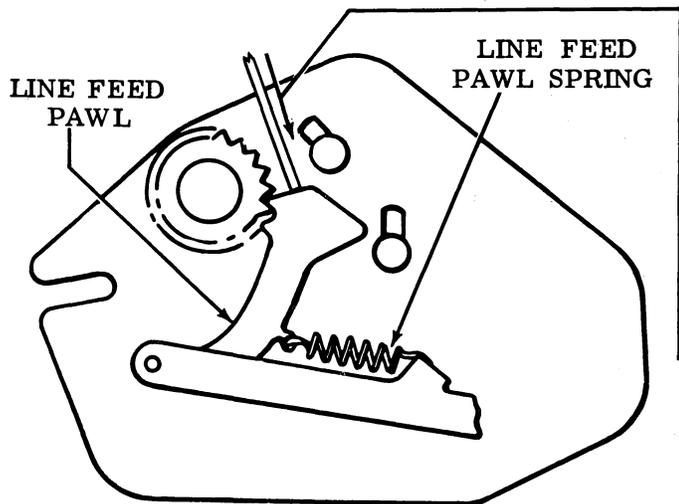
Note: This adjustment is affected by VERTICAL TYPE ALIGNMENT - F (2.71) only when equipped with TP180526 nonadjustable vertical drive bail.



EARLY DESIGN
(Right Side View)



LATE DESIGN
(Left Side View)



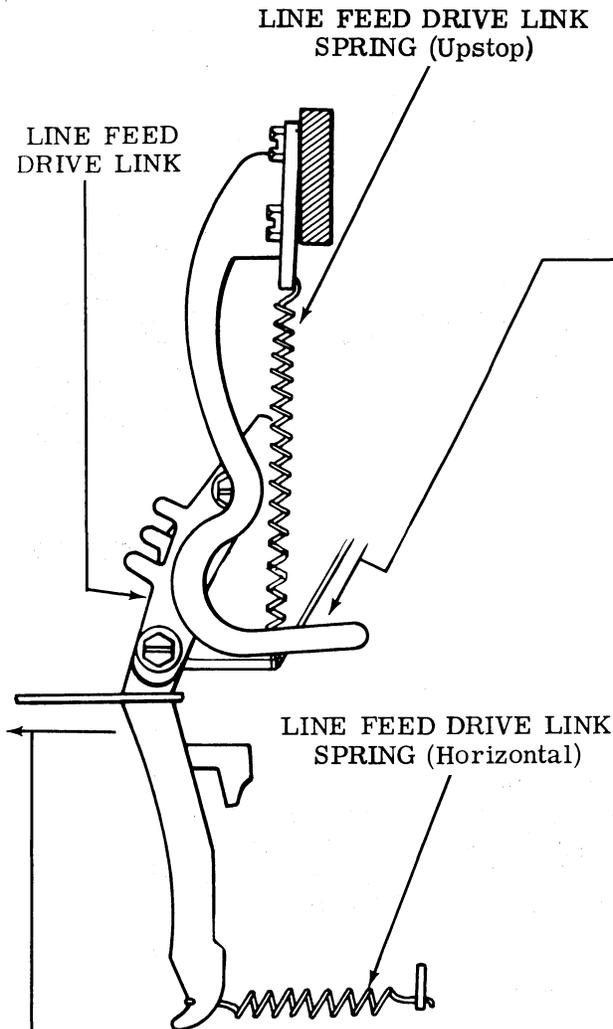
(Right Side View)

LINE FEED PAWL SPRING - F

Requirement

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

2.79 Platen Area (continued)



(Early Design)
(Left Side View)

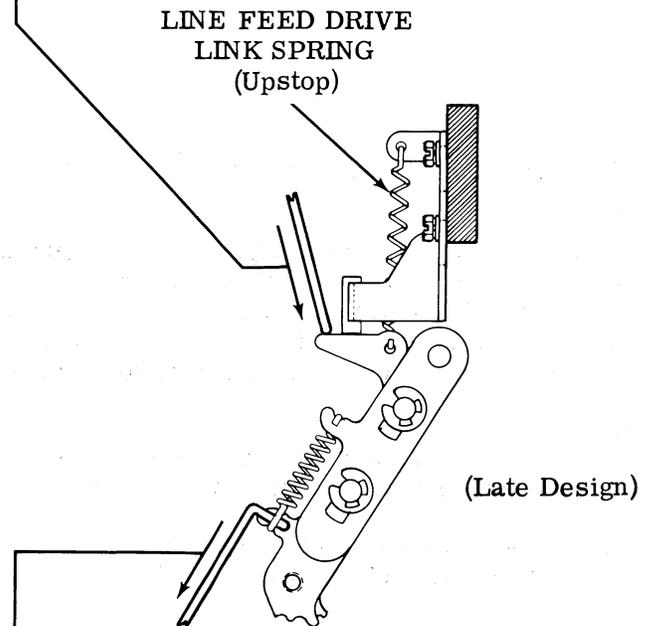
LINE FEED DRIVE LINK SPRING — HORIZONTAL - F

Requirement
With typing unit in stop condition
—Min 5-1/2 oz---Max 8-1/2 oz
to start line feed drive link moving.

LINE FEED DRIVE LINK SPRING — UPSTOP - F

Requirement
Early Design: With typing unit in stop condition
—Min 6 oz---Max 9 oz
to start line feed drive link moving.

Late Design: With typing unit in stop condition
—Min 4 oz---Max 7 oz
to start line feed drive link moving.

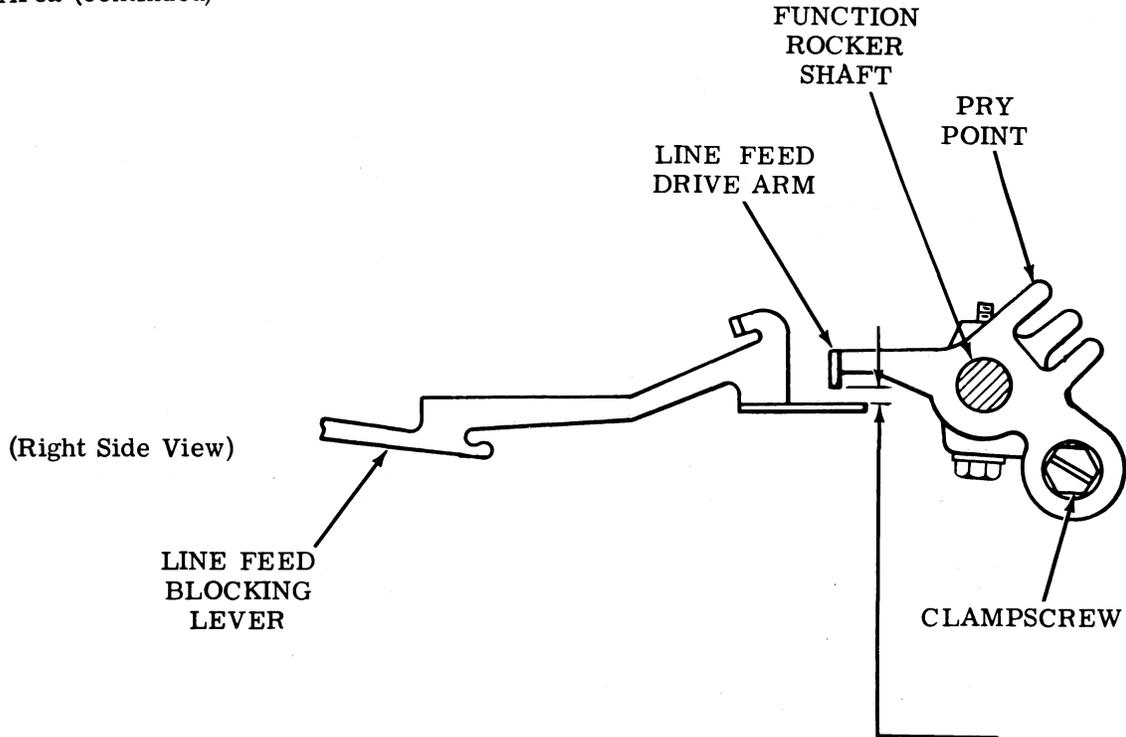


(Left Side View)

LINE FEED LINK YIELD SPRING - F
(Late design units only)

Requirement
—Min 32 oz---Max 44 oz
to pull yield spring to installed length.

2.80 Platen Area (continued)



LINE FEED DRIVE ARM CLEARANCE - F (PLA-5)

To Check

Place carriage to center of platen. Manually operate typing unit and set up line feed code combination (-2-4---8) in selector. Rotate main shaft until function bail is at highest point (position no. 1). While holding print suppression codebar to right, take up play in line feed function lever (upward) and hold. Release print suppression codebar and take up play in blocking lever (downward). Release all levers.

Requirement

Min some---Max 0.010 inch
between line feed drive arm and line feed blocking lever.

Note: The minimum requirement (some) will be considered met if there is no clearance between the line feed function lever and the function drive bail.

To Adjust

Loosen clampscrew. Position line feed drive arm using pry point. Tighten clampscrew.

Related Adjustments

Affects

LINE FEED UPSTOP BRACKET POSITION - F (2.81)

LINE FEED PAWL DOWNSTOP POSITION - F (2.83)

Affected By

LEFT ROCKER DRIVE (Function Area)(2.34)

2.81 Platen Area (continued)

LINE FEED UPSTOP BRACKET POSITION - F (PLA-6)**To Check**

Place typing unit in stop condition.
Trip function clutch by lifting its
trip lever. Rotate main shaft until
function bail is at highest point
(position no. 1). Push down on line
feed drive link to engage and latch
line feed blocking lever.

Requirement

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

To Adjust

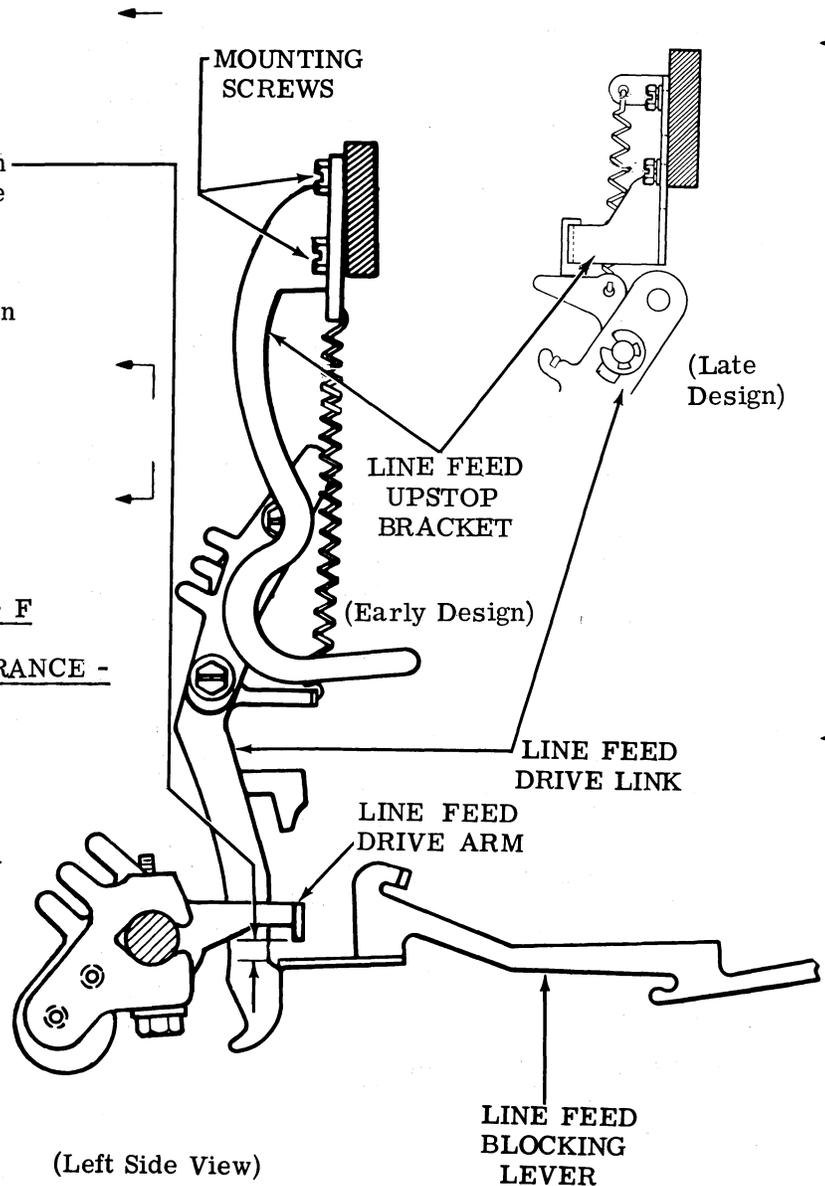
Loosen mounting screws and position
line feed upstop bracket. Tighten
mounting screws. If downstop
interferes with feed pawl spring
bracket, loosen downstop clamp nut
and move downstop up to provide
clearance.

Related Adjustments**Affected By**

VERTICAL TYPE ALIGNMENT - F
(2.71)

LINE FEED DRIVE ARM CLEARANCE -
F (2.80)

Note: This adjustment is affected
by VERTICAL TYPE ALIGNMENT -
F (2.71) only when equipped with
TP180526 nonadjustable vertical
drive bail.



2.82 Platen Area (continued)

LINE FEED DRIVE LINK POSITION - F (PLA-7)

Note: This adjustment applies to early design units with pry adjustment of drive link. For late design units with yield spring drive link, this adjustment is not required.

To Check

Place the carriage to the center of the platen. Place the flat surface on left side of platen up and horizontally to base casting, and set up the line feed code combination (-2-4---8) in the selector. Rotate main shaft until function bail reaches its lowest point (position no. 3) while noticing the motion supplied by the drive arm of the function rocker shaft to the line feed pawl.

(1) Requirement

The motion supplied by the drive arm of the function rocker shaft to the line feed pawl should be adequate to rotate the platen the required amount.

(2) Requirement

Hold platen detent pawl away from ratchet and rotate main shaft until function bail is in its lowest position (position no. 3). Lower platen detent pawl into its seat between two ratchet teeth. The platen should barely move.

To Adjust

Loosen line feed stripper plate clampscrew and back off line feed stripper plate (see LINE FEED STRIPPER PLATE CLEARANCE adjustment). Loosen downstop nut friction tight (2.83) and position downstop to lowermost position. Loosen two clampscrews and use pry points to position line feed drive link so that line feed pawl indexes platen one tooth and platen detent pawl seats fully in ratchet. Tighten clampscrews.

Related Adjustments

Affects

LINE FEED PAWL DOWNSTOP POSITION - F (2.83)

Affected By

DETENT POSITION - F (2.78)
VERTICAL TYPE ALIGNMENT - F (2.71)

PLATEN DETENT PAWL SPRING - F

Requirement

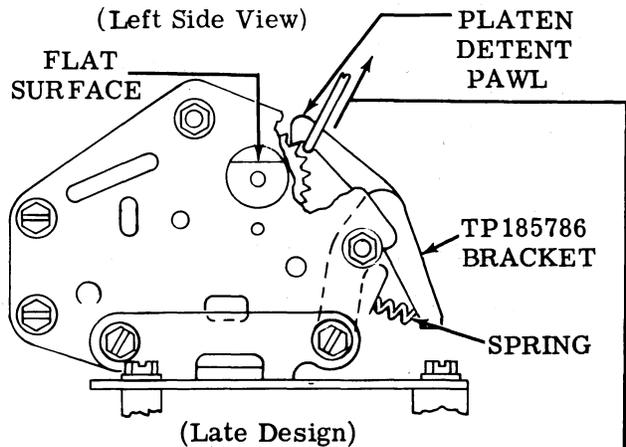
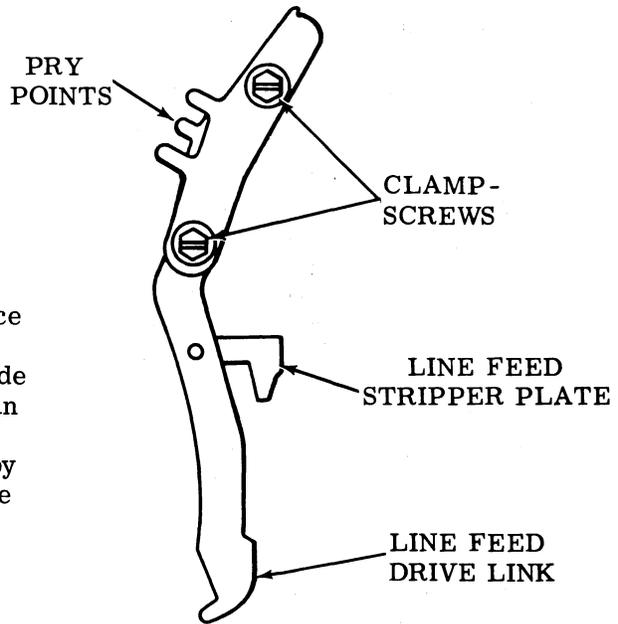
Early Design

Min 24 oz---Max 30 oz _____

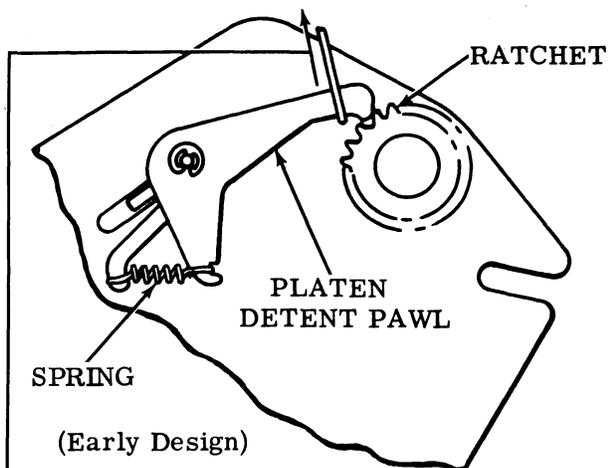
Late Design

Min 31 oz---Max 37 oz _____

to start platen detent pawl moving.



(Left Side View)



(Early Design)

(Left Side View)

2.83 Platen Area (continued)

LINE FEED PAWL DOWNSTOP POSITION - F
(PLA-8)

Early Design (Line feed drive link without yield spring) ←
←

To Check

Place the flat surface on the left side of platen up and horizontal to base casting. Set up the line feed code combination (-2-4---8) in the selector. Rotate main shaft until function bail reaches its lowest position (position no. 3). Take up play of platen in left end plate toward the rear and hold.

Requirement

With platen detent pawl fully seated in ratchet
Min 0.005 inch---Max 0.015 inch
between back of line feed pawl and its downstop.

To Adjust

Loosen downstop clamp nut. Position downstop. Tighten clamp nut.

Late Design (Line feed drive link with yield spring) ←

To Check

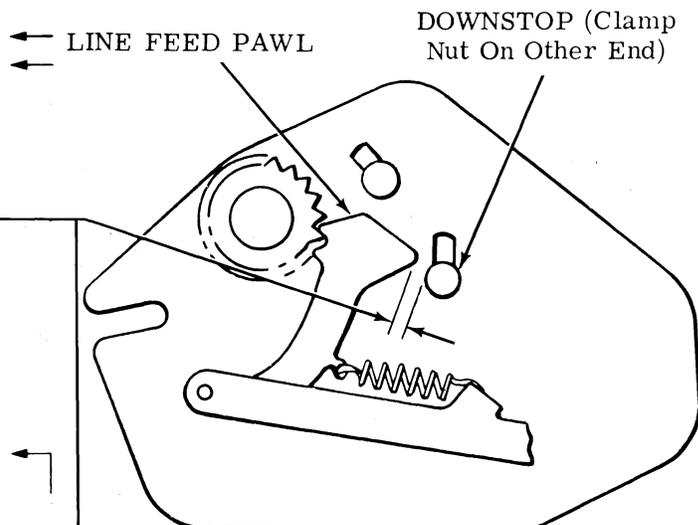
Place the flat surface on the left side of the platen up and horizontal to base casting. Manually engage ratchet with line feed pawl and advance platen one tooth.

Requirement

With platen detent pawl fully seated in ratchet
Min 0.005 inch---Max 0.015 inch
between back of line feed pawl and its downstop.

To Adjust

Loosen downstop clamp nut friction tight and position downstop post to the bottom of its slot. Unhook spring from upstop bracket. Position downstop post to meet requirement. Tighten clamp nut. Rehook spring on upstop bracket. ←



(Right Side View)

Note: Yield spring of line feed drive link should not extend while making or checking this requirement. ←

Related Adjustments

Affected By

- LINE FEED DRIVE ARM CLEARANCE - F (2.80)
- LINE FEED DRIVE LINK POSITION - F (2.82)
- VERTICAL TYPE ALIGNMENT - F (2.71)

2.84 Platen Area (continued)

PRESSURE ROLLER CLEARANCE - F (PLA-10)

To Check

Carriage drive bail in rearmost position (position no. 2). Release pressure roller (pressure lever placed in forward position).

Requirement

Min 0.010 inch
between pressure roller and left mounting screw.

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

To Adjust

Loosen clampscrew. Position pressure roller adjusting bracket. Tighten clampscrew.

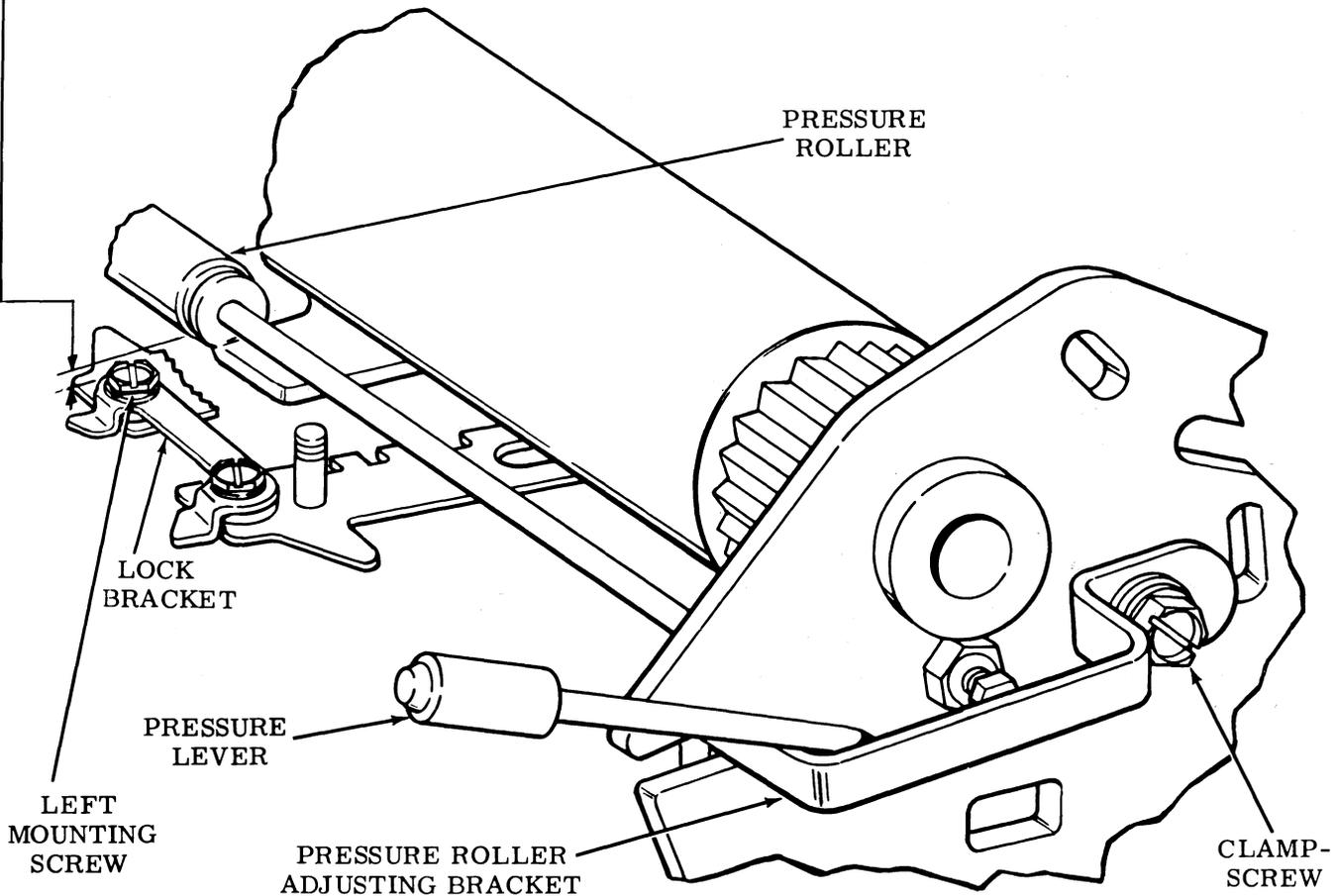
Related Adjustment

Affected By

REAR RAIL POSITION (Carriage Area)(2.45)

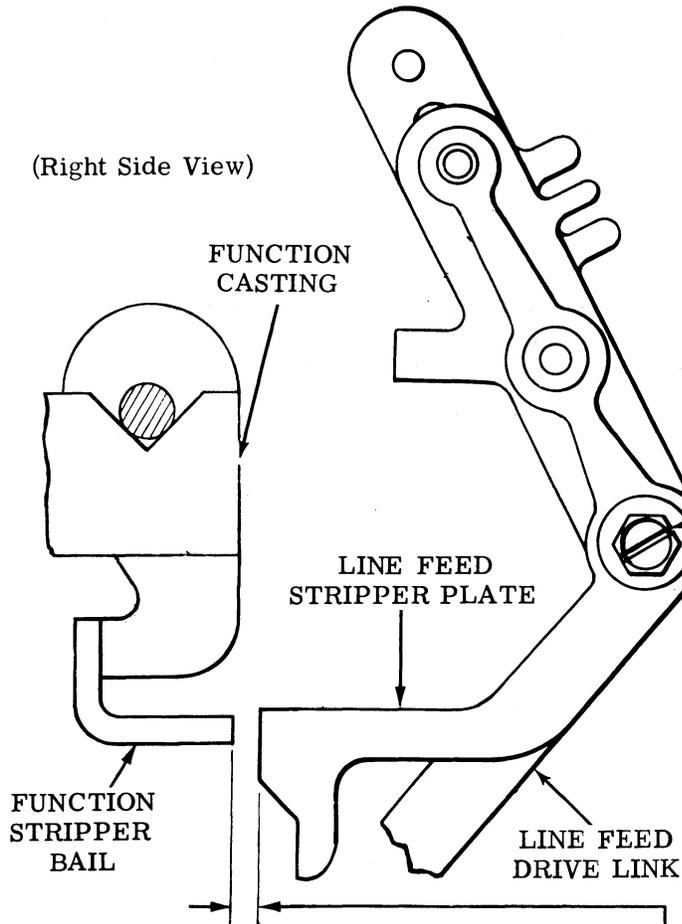
VERTICAL TYPE ALIGNMENT - F (2.71)

Note: This adjustment is affected by VERTICAL TYPE ALIGNMENT - F (2.71) only when equipped with TP180526 nonadjustable vertical drive bail.



(Right Front View)

2.85 Platen Area (continued)



FUNCTION STRIPPER BAIL

FUNCTION CASTING

LINE FEED STRIPPER PLATE

LINE FEED DRIVE LINK

CLAMPSCREW

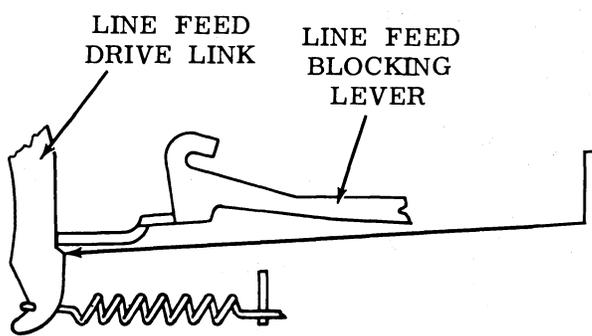
LINE FEED STRIPPER PLATE CLEARANCE - F (PLA-9)

To Check

Set up the line feed code combination (-2-4---8) in the selector. Rotate the main shaft until function bail reaches its lowest point (position no. 3).

Note: Either of the following requirements may be used.

- (1) Requirement
With the end of line feed blocking lever in contact with vertical surface of line feed drive link
Min none---Max. 0.005 inch clearance between line feed stripper plate and function stripper bail.
- (2) Requirement
With contact between line feed stripper plate and function stripper bail
Min none---Max 0.005 inch clearance between line feed blocking lever and vertical surface of line feed drive link.



LINE FEED DRIVE LINK

LINE FEED BLOCKING LEVER

(Left Side View)

To Adjust

Loosen clampscrew. Push line feed drive link firmly to the front, against line feed blocking lever. Position line feed stripper plate. Tighten clampscrew.

Related Adjustments

Affected By
STRIPPER BAIL CLEARANCE (2.38)
PLATEN — HORIZONTAL POSITION - F (2.70)

2.86 Platen Area (continued)

COPYHOLDER WIRE POSITION - F (PLA-11)

(1) Requirement

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

To Adjust

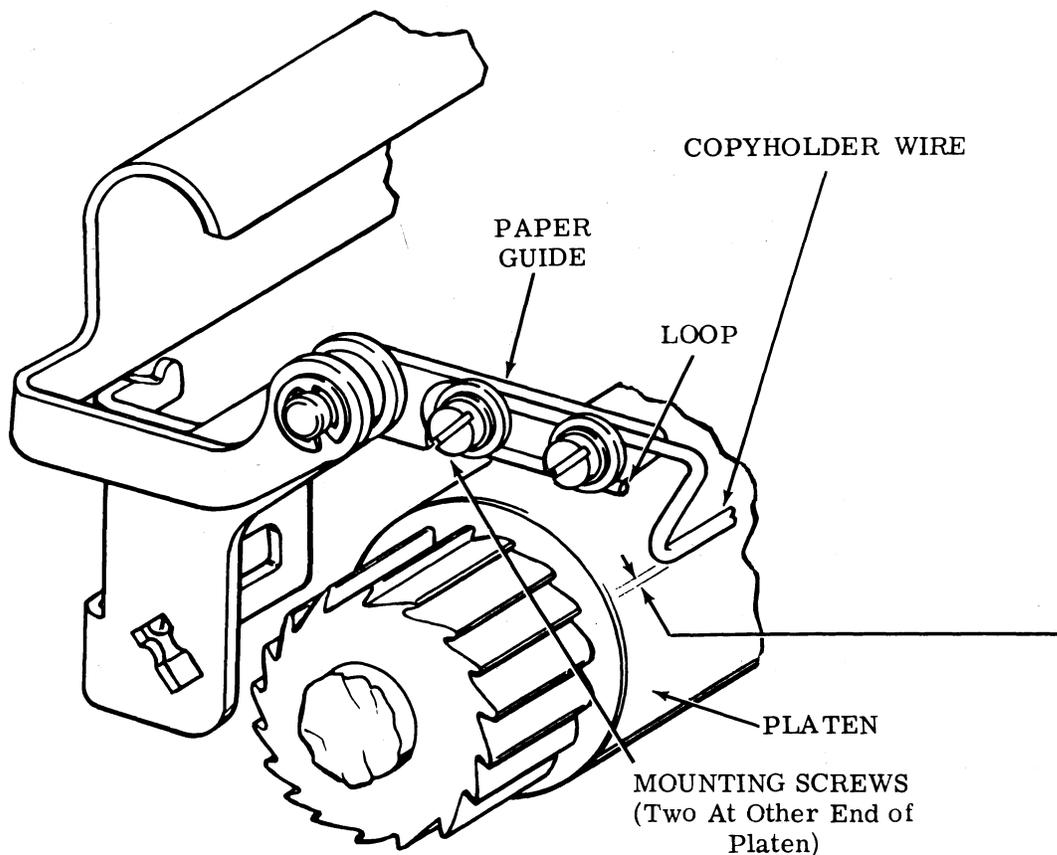
Loosen four mounting screws. Position copyholder wire. Tighten screws.

(2) Requirement

After raising and releasing, the copyholder wire should return and rest against the platen at its center with a maximum of 0.020 inch between platen and copyholder wire at both the left and right ends.

To Adjust

Bend copyholder wire.



(Left Side View)

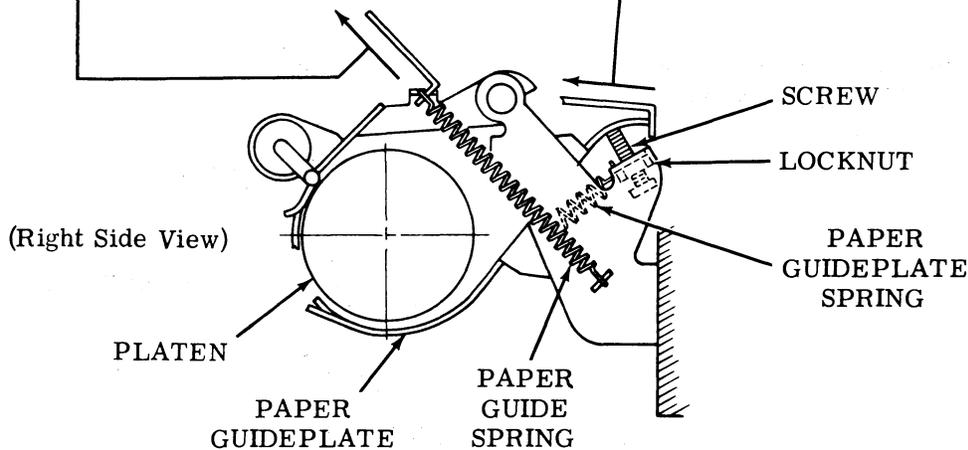
2.87 Platen Area (continued)

PAPER GUIDE SPRING - S

Requirement

With paper guides resting on platen

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

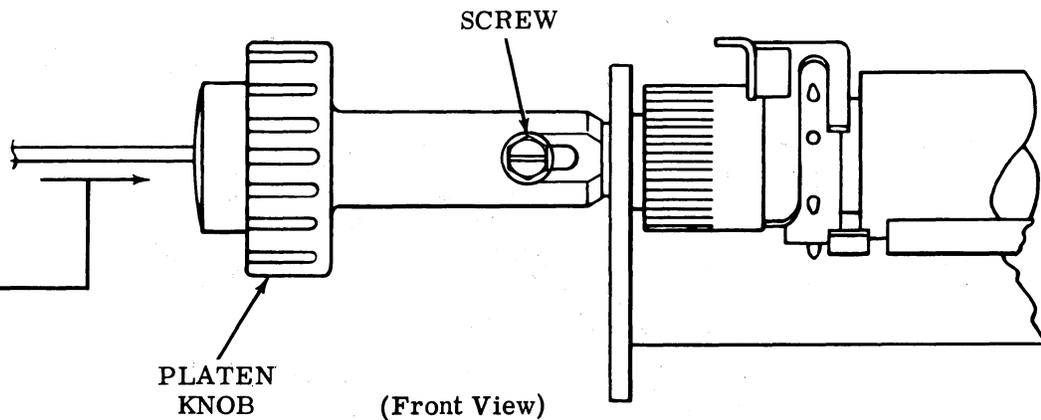


PAPER GUIDEPLATE SPRING - S

Requirement

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 SPRING - S

Requirement

With a spring scale positioned on platen knob

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

PLATEN KNOB POSITION - S (FOA-22)

Requirement

The platen knob should be fully seated toward the right.

To Adjust

When typing unit is on its subbase and cover is installed, loosen screw and position platen knob. Tighten screw.

2.88 Platen Area (continued)

PLATEN ENDPLAY - F (PLA-12)

Note: This adjustment applies only to typing units equipped with TP185816 adjusting screw.

To Check

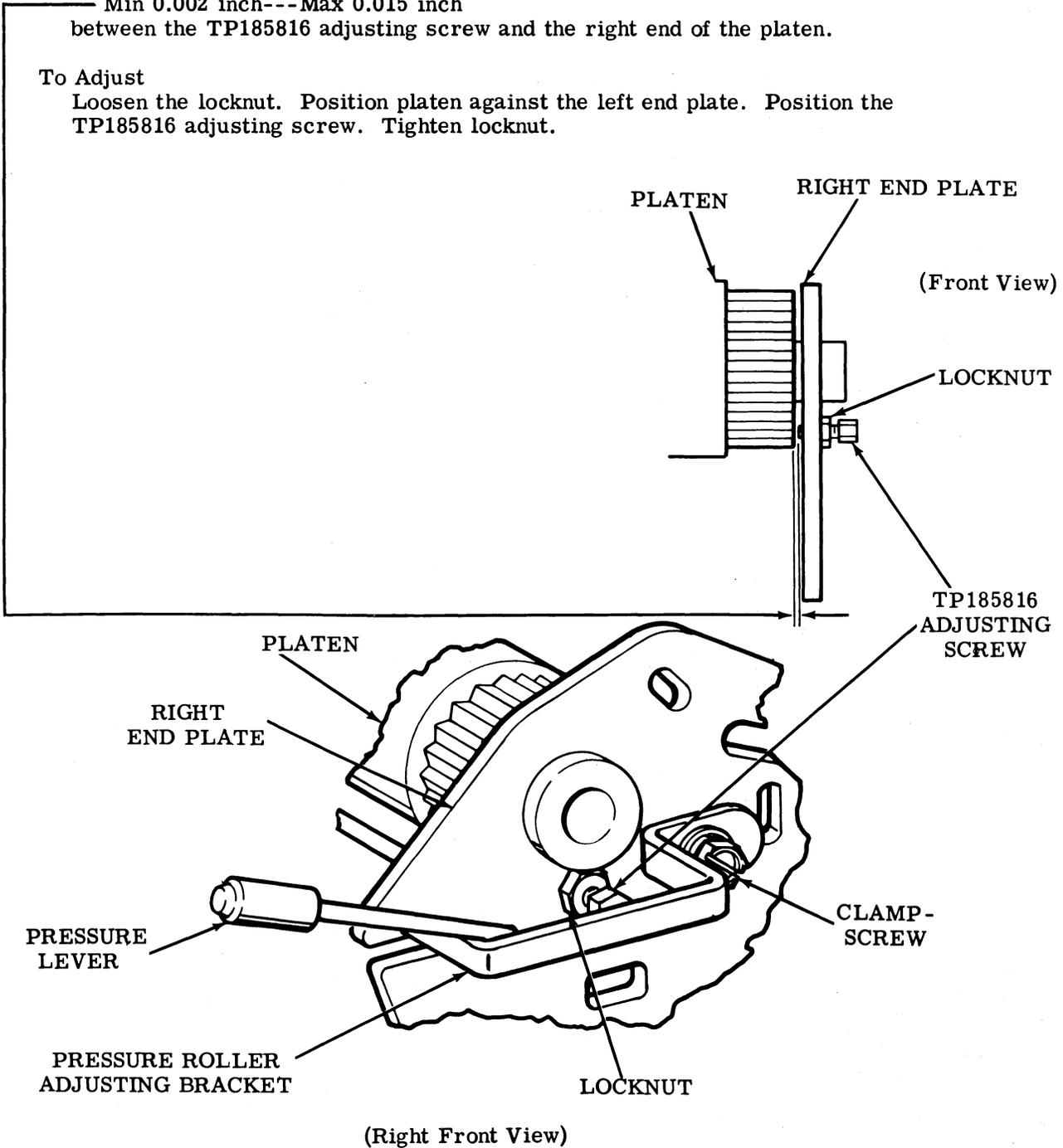
Position platen against the left end plate.

Requirement

Min 0.002 inch---Max 0.015 inch
between the TP185816 adjusting screw and the right end of the platen.

To Adjust

Loosen the locknut. Position platen against the left end plate. Position the TP185816 adjusting screw. Tighten locknut.



2.89 Platen Area (continued)

Note 1: If the idler has not previously been backed off, loosen the nut securing the idler post to end plate and position idler to low point in slot before making the following adjustment.

PLATEN - HORIZONTAL POSITION - S (FOA-23)

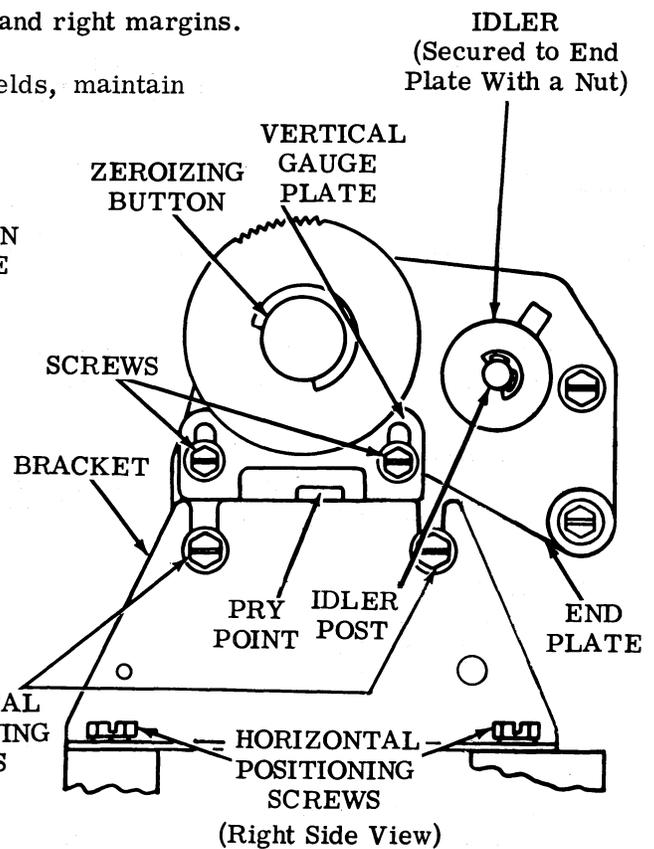
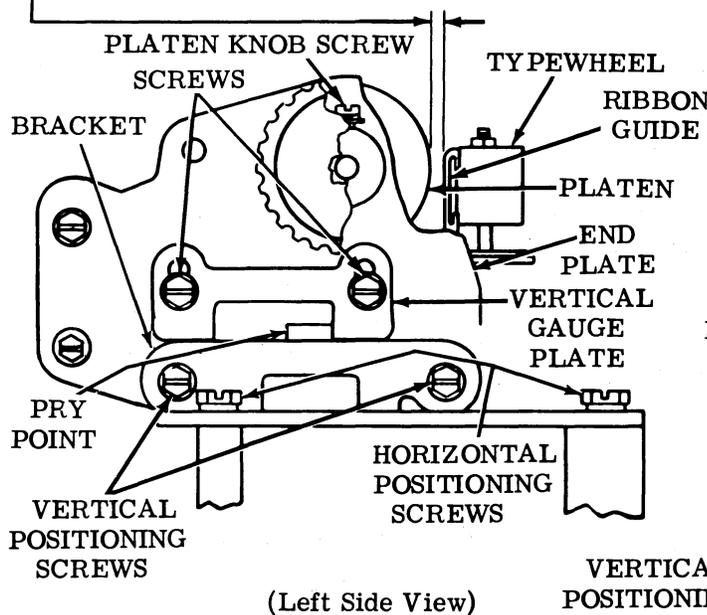
(1) To Check

Place the platen knob screw up and permit the detent ratchet pawl to seat in a groove of the detent ratchet. Place the carriage at the left margin and check requirement. Move the carriage to the right margin and again check requirement.

Requirement

Min 0.050 inch---Max 0.065 inch
between ribbon guide and platen at both left and right margins.

Note 2: Units equipped with antismudge shields, maintain clearance between ribbon guide and platen.



(2) To Check

Place carriage to center of platen and rotate platen until maximum clearance is obtained between platen and ribbon guide. Set up E code combination (1-3---78) in the 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 3: The typing unit should not have sprocket forms or ribbon installed.

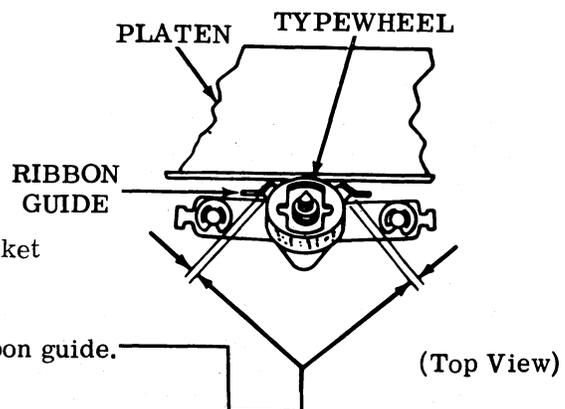
Requirement

Typewheel should not touch side of either ribbon guide.

Related Adjustments

Affected By

FRONT ROLLERS CLEARANCE (2.43)



2.90 Platen Area (continued)

PLATEN — HORIZONTAL POSITION - S (continued)

To Adjust

Loosen four horizontal positioning screws. Position platen horizontally. Tighten the four horizontal positioning screws.

Related Adjustments

Affects

VERTICAL TYPE ALIGNMENT - S (2.90)

IDLER POSITION - S (2.100)

DETENT POSITION - S (2.109)

FORM FEED BELT TENSION - S (2.94)

CAM ZERO POSITION (2.110)

WIRE GUIDE POSITION - S (2.117)

Note: If the idler has not previously been backed off, loosen the nut securing the idler post and back off the idler before making the VERTICAL TYPE ALIGNMENT - S (2.90) adjustment.

VERTICAL TYPE ALIGNMENT - S (FOA-24)

Typing units equipped with adjustable vertical drive bail such as TP180606:

(1) To Check

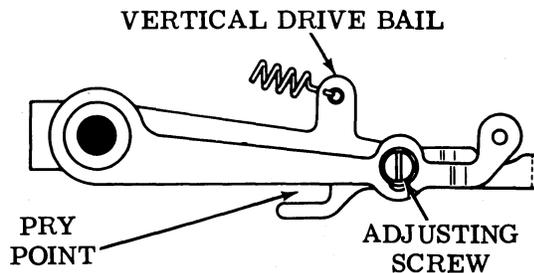
Place carriage to left margin. Set up the E code combination (1-3---78) in the selector and rotate the main shaft until the character is printed.

Requirement

When the printed character is examined by eye from top to bottom, the shading should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen adjusting screw on vertical drive bail and position the typewheel using pry point.



(Right Side View)

(2) To Check

Place carriage to right margin. Set up the E code combination (1-3---78) in the selector and rotate main shaft until the character is printed.

Requirement

When the printed character is examined by eye from top to bottom, the shading should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen the vertical gauge plate screws on the right side of the platen mechanism and back off the vertical gauge plate. Loosen vertical positioning screws on right side. Position the right end of the platen using pry point. Do not twist the platen. After adjusting, position the vertical gauge plate on the right side so that it is resting on its associated bracket. Tighten all screws.

2.91 Platen Area (continued)

VERTICAL TYPE ALIGNMENT - S (continued)

Typing units equipped with nonadjustable vertical drive bail such as TP180526:

To Check

Place paper in typing unit. Set up the E code combination (1-3---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 should be approximately the same with no overscoring or underscoring.

To Adjust

Loosen the vertical gauge plate screws and back off the vertical gauge plate on each side of the platen mechanism. Loosen four vertical positioning screws and position the platen using pry points. Do not twist the platen. After adjusting, position each vertical gauge plate so that it is resting on the top of its associated bracket. Tighten all screws.

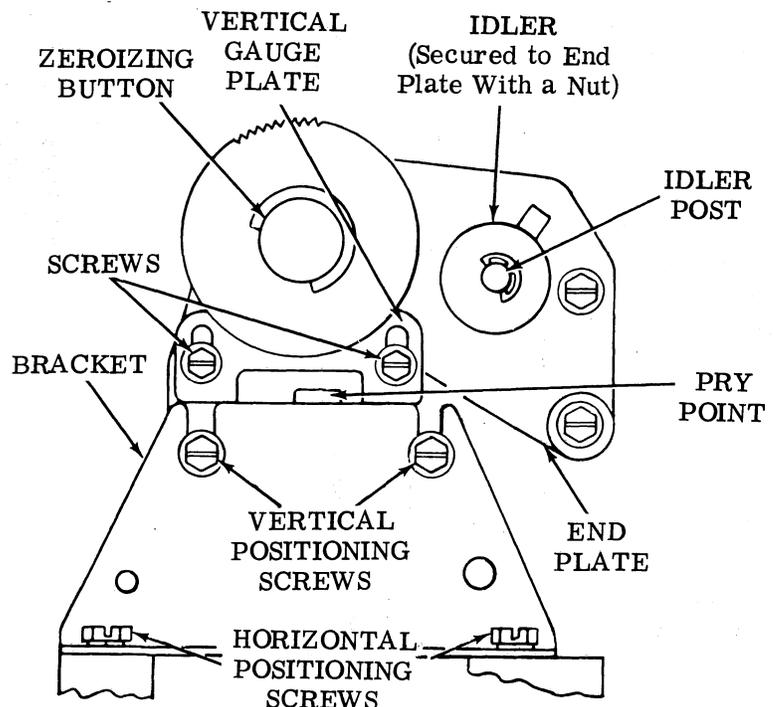
Related Adjustments**Affects**

IDLER POSITION - S (2.100)
DETENT POSITION - S (2.109)
CAM ZERO POSITION (2.110)
WIRE GUIDE POSITION (2.117)
FINAL PRINTING ALIGNMENT (2.125)

Affected By

PLATEN — HORIZONTAL POSITION - S (2.89)
REAR RAIL POSITION (2.45)
PRINT DRIVE LEVER POSITIONING (2.48)

(Right Side View)



2.92 Platen Area (continued)

PAPER GUIDEPLATE CLEARANCE - S (FOA-21)

Requirement

With no sprocket forms in the platen mechanism

Min 0.008 inch---Max 0.025 inch between the platen and the left and right ends of the paper guideplate adjacent to the fingers. Record the two clearances (see Note 2).

To Adjust

Loosen locknut and adjust screw. Tighten locknut.

Note 1: If the adjustment cannot be made as indicated above, remove the platen mechanism from the typing unit. For instructions, see appropriate disassembly and reassembly section. Then, preliminary adjust as follows:

Preliminary Requirement

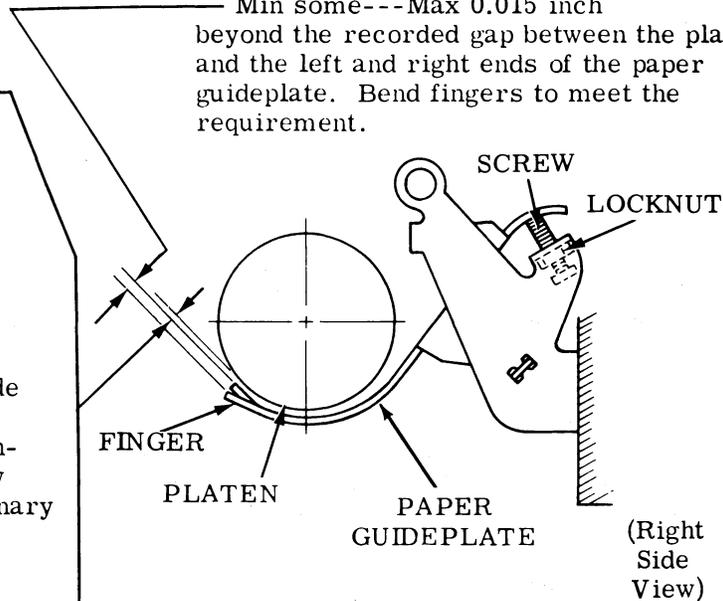
With the screw backed off and no sprocket forms in the platen mechanism

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 (see Note 2).

Preliminary Adjust

Loosen end plate screws friction tight and position end plates. Tighten screws.

Note 2: The fingers at both the left and right ends of the platen should 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.

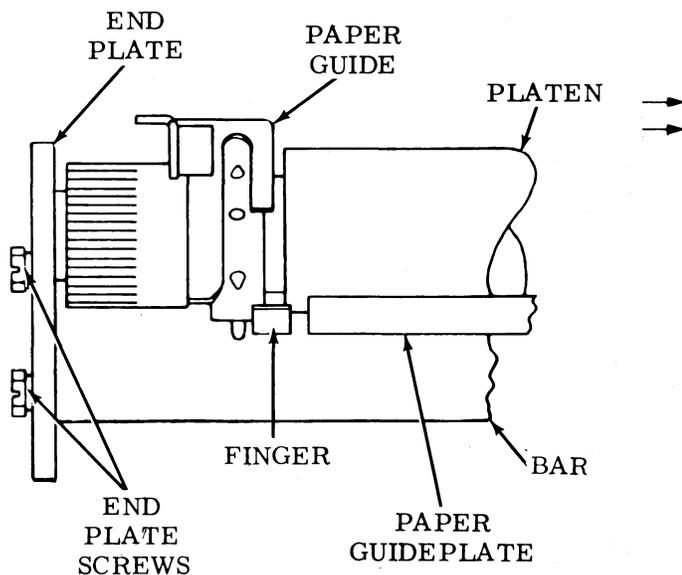


Note 3: Replace platen mechanism onto the typing unit. For instructions see appropriate disassembly and reassembly section. Check requirement.

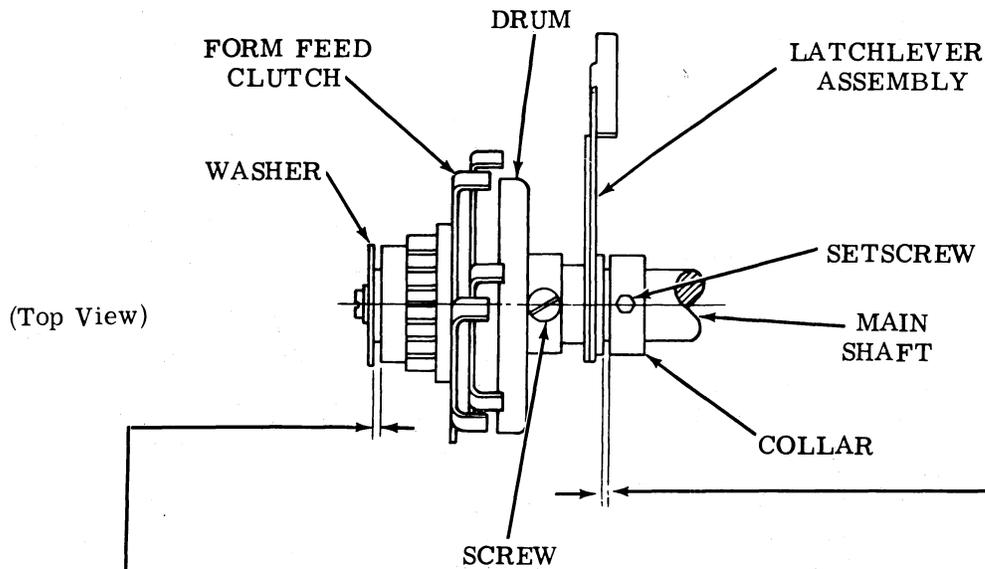
Related Adjustments

Affects

- PAPER ALARM CONTACT LEVER CLEARANCE - S (2.119)
- PAPER ALARM CONTACT PRESSURE AND GAP - S (2.119)



2.93 Main Shaft Area (continued)



(A) FORM FEED CLUTCH ENDPLAY - S (FOA-1)

Requirement

Min some---Max 0.012 inch
endplay between washer and form
feed clutch.

To Adjust

Loosen drum screw and position drum.

(B) LATCHLEVER ENDPLAY (FOA-2)

Requirement

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

To Adjust

Loosen setscrew and position collar.
Tighten screw.

2.94 Form Feed Area

FORM FEED BELT TENSION - S (FOA-3)

Note 1: Check tension only if the form feed belt is suspected of not meeting its requirement.

Requirement

The form feed belt tension should not be too tight or too loose.

To Adjust

Loosen three form feed assembly bracket mounting screws and 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 feed assembly bracket mounting 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

FORM-OUT LEVER OVERTRAVEL - S (2.98)

FORM-OUT LEVER — RESET CLEARANCE - S (Late Design) (2.102)
and (Early Design) (2.101)

TRIP LEVER ENGAGEMENT — LINE FEED - S (Early Design) (2.104)

TRIP LEVER UPSTOP POSITION - S (Early Design) (2.106)

LINE FEED SELECTION - S (2.108)

IDLER POSITION - S (2.100)

DETENT POSITION - S (2.109)

RESET FOLLOWER LEVER — RESET POSITION - S (2.110)

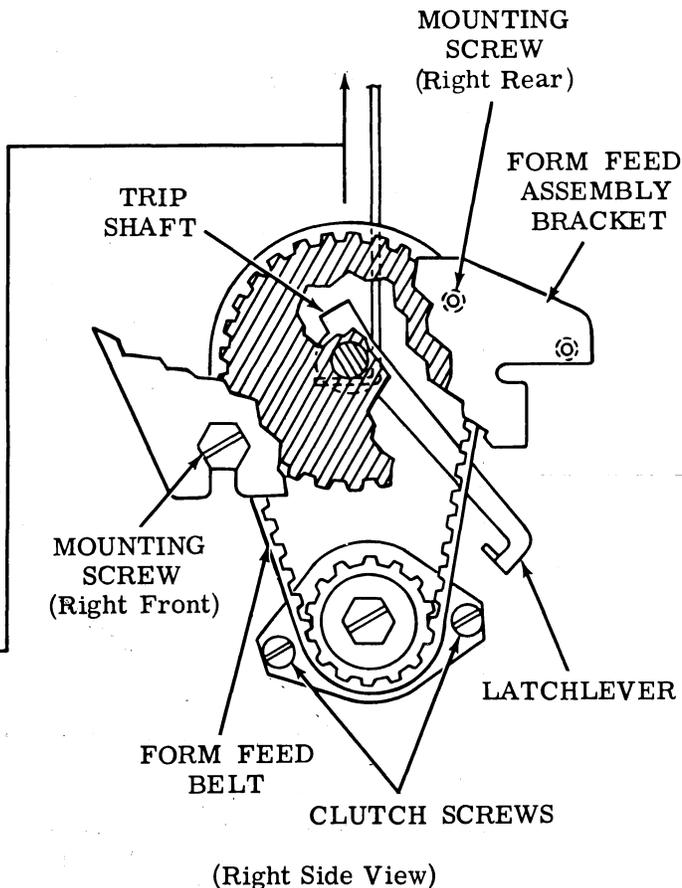
CAM ZERO POSITION - S (2.110)

CLUTCH SHOE LEVER GAP - S (2.95)

TRIP SHAFT ENDPLAY - S (2.97)

TRIP LEVER ENGAGEMENT — FORM-OUT - S (2.103)

FORM-OUT CONTACT PRESSURE AND GAP - S (2.113)



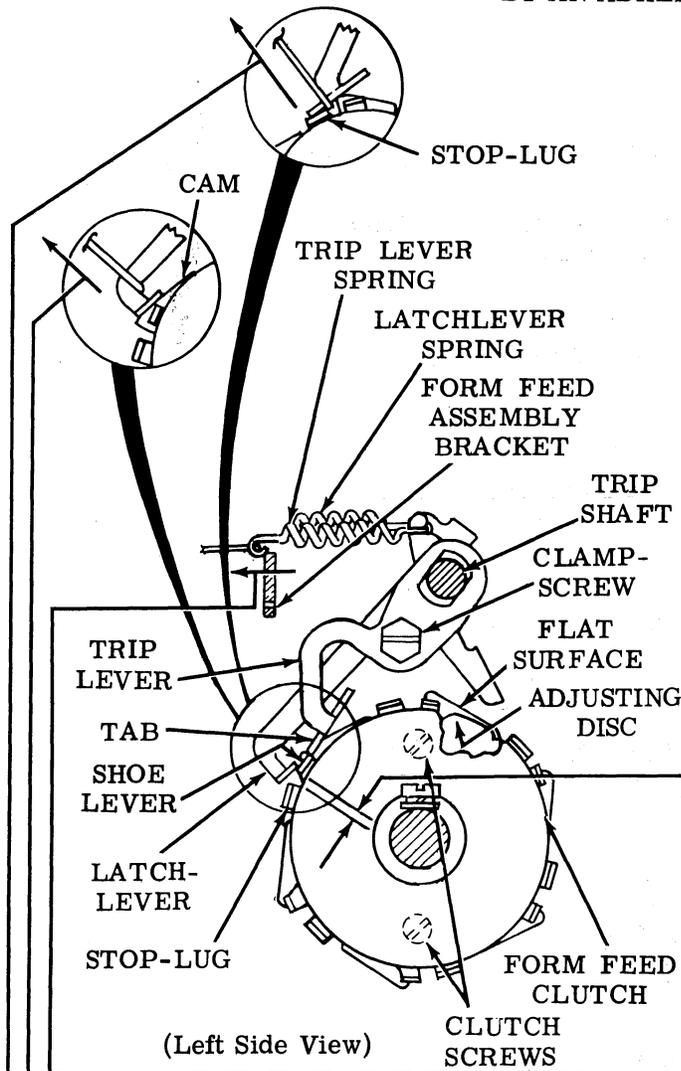
Note 2: Make certain that the shaft is free by rotating reset follower lever. If necessary, free trip shaft by repositioning the left mounting bracket of the form feed assembly bracket against the form feed assembly bracket.

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

Affected By
PLATEN — HORIZONTAL POSITION - S (2.89)

2.95 Form Feed Area (continued)

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



CLUTCH SHOE LEVER GAP - S (FOA-4)

(1) To Check

Rotate the main shaft until the form feed clutch is in that stop position which brings the flat surface of the adjusting disc to the position illustrated and the head of the clutch drum mounting screw is up. Disengage (latch) the form feed clutch. Pull the shoe lever down until it stops against the stop-lug and release.

Requirement

Min 0.015 inch---Max 0.040 inch between the stop-lug and the shoe lever.

(2) To Check

With form feed clutch conditioned as in (1) To Check, measure and record clearance between shoe lever and stop-lug. Raise trip lever to trip (engage) form feed clutch. Hold the clutch disc against latchlever, pull the shoe lever away from the stop-lug with a force of $32 \pm 1/2$ oz and release slowly. Again measure and record shoe lever, stop-lug clearance.

Requirement

Clearance between stop-lug and shoe lever
Min 0.055 inch---Max 0.085 inch greater when form feed clutch is engaged than when disengaged.

To Adjust

Loosen clampscrew and position trip lever. Tighten clampscrew.

Note: If the above requirements cannot be met, it may be necessary to adjust the clutch mechanism. This is normally a factory adjustment and should not be performed unless absolutely necessary. To adjust, loosen the two clutch screws friction tight and position adjusting disc. Apply TP186171 Glyptal adhesive to clutch screw threads. Tighten both screws before adhesive dries.

Related Adjustments

Affects

- TRIP LEVER ENGAGEMENT — LINE FEED - S (Early Design) (2.104)
- TRIP LEVER ENGAGEMENT — FORM-OUT - S (2.103)
- TRIP LEVER ENGAGEMENT — (Preliminary) - S (2.96)

Affected By

- FORM FEED BELT TENSION - S (2.94)

LATCHLEVER SPRING - S

Requirement

With latchlever resting on the high part of the cam
Min 3 oz---Max 7 oz to start latchlever moving.

TRIP LEVER SPRING - S

Requirement

With trip lever tab resting on top of a stop-lug
Early Design
Min 3 oz---Max 4-1/2 oz to start lever moving.
Late Design
Min 14 oz---Max 18 oz to pull trip lever spring to installed length.

2.96 Form Feed Area (continued)

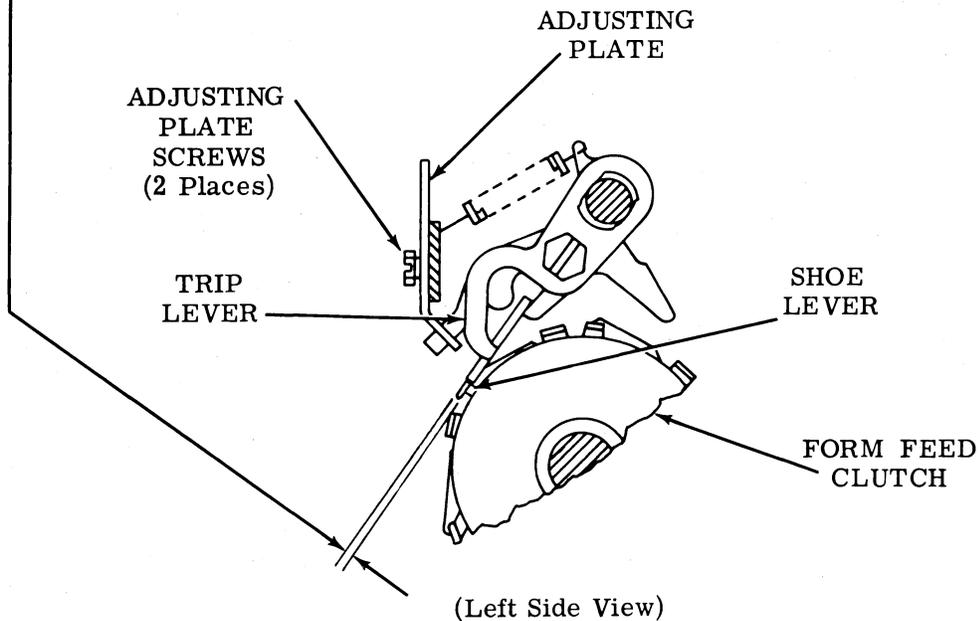
TRIP LEVER ENGAGEMENT (Preliminary) - S (FOA-14)

Note: This adjustment applies to late design typing units containing the TP185998 nickel plated plate.

To Check
Rotate form feed clutch until a shoe lever is just about to contact the trip lever.

Requirement
Top surface of trip lever should be flush to 0.010 inch below top surface of shoe lever.

To Adjust
Loosen the two adjusting plate screws and position adjusting plate. Tighten both screws.



Related Adjustments

Affects

TRIP LEVER ENGAGEMENT (Final) - LINE FEED - S (Late Design) (2.105)

Affected By

CLUTCH SHOE LEVER GAP - S (2.95)

2.97 Form Feed Area (continued)

TRIP SHAFT ENDPLAY - S (FOA-5)

Requirement

Min some---Max 0.012 inch endplay of the trip shaft.

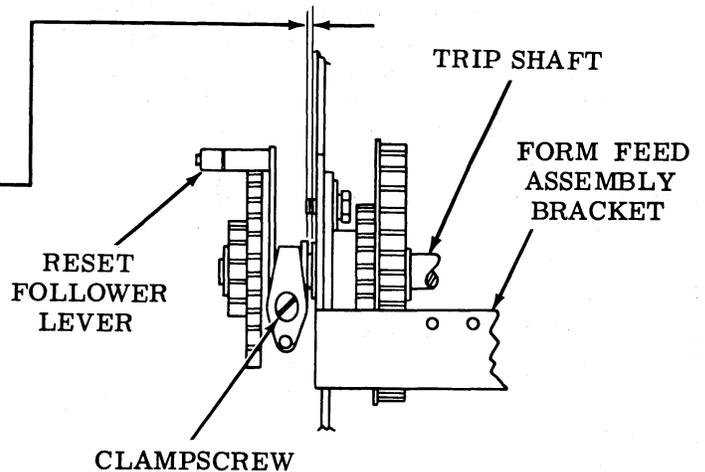
To Adjust

Loosen clampscrew and position reset follower lever on trip shaft. Tighten clampscrew.

Related Adjustments

Affected By

FORM FEED BELT TENSION - S (2.94)



(Rear View)

LINE FEED LEVER LINE-UP AND ENDPLAY - S (FOA-6)

(1) **Requirement**

The line feed pawl should engage the flat on the tab of the line feed lever.

(2) **Requirement**

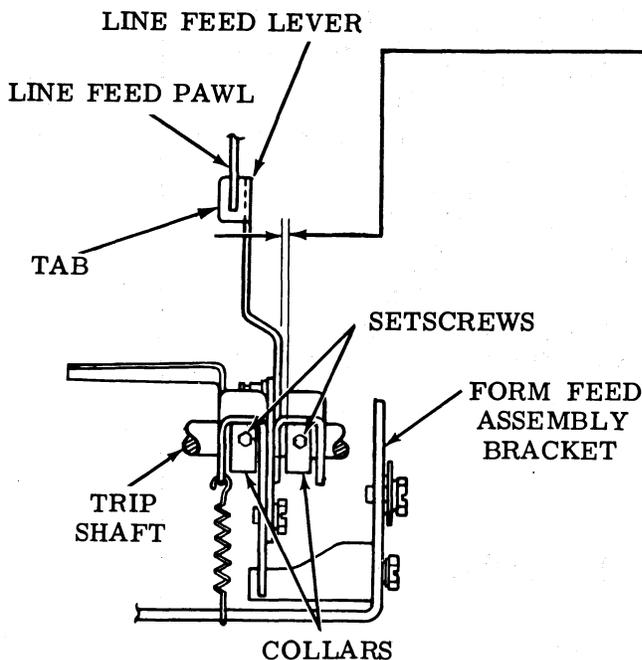
With all endplay taken up toward the right --- Min some---Max 0.012 inch between line feed lever and collar.

(3) **Requirement**

There must be some clearance between the line feed lever and the main shaft gear.

To Adjust

Loosen collar setscrews and position collars to meet Requirements (1) and (2). Loosen main shaft gear screw and position main shaft gear to meet Requirement (3). Tighten all screws.



(Front View)

2.98 Form Feed Area (continued)

FORM-OUT LEVER OVERTRAVEL - S (FOA-7)

To Check

With the reset lever on the low part of the cam and with the form-out code combination (--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

Loosen screw, hold form-out function lever against its pawl, and position arm using pry points. Tighten screw.

Related Adjustment

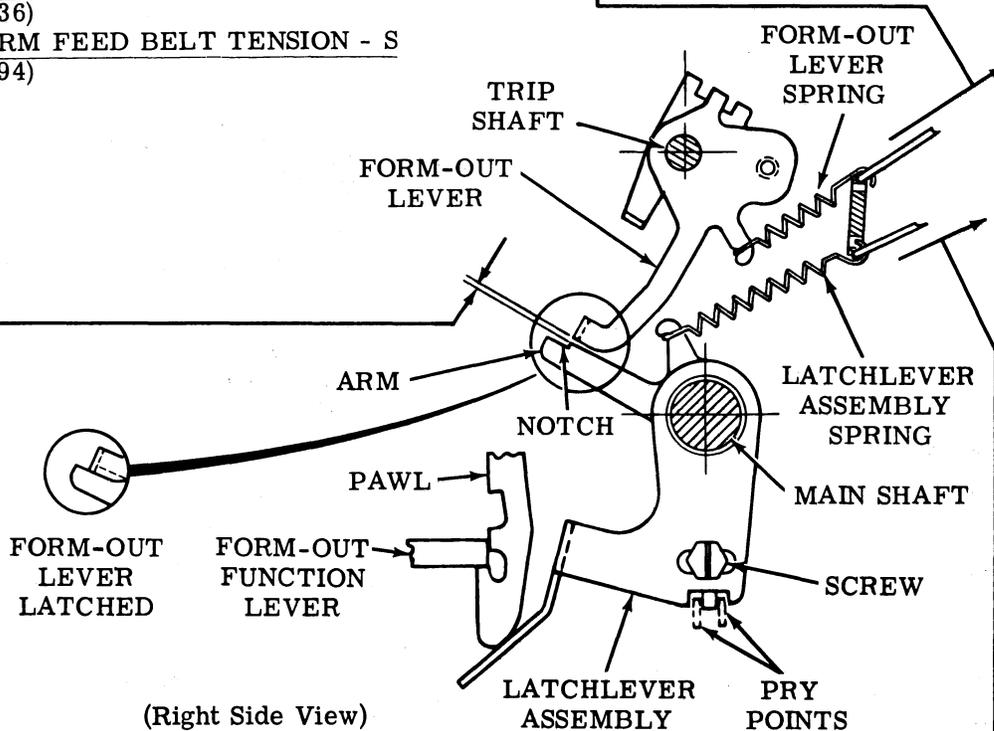
Affected By

- RIGHT ROCKER DRIVE (Function Area)
(2.36)
- FORM FEED BELT TENSION - S
(2.94)

FORM-OUT LEVER SPRING - S

Requirement

With the form-out lever latched
Min 34 oz---Max 44 oz
to pull form-out lever spring to installed length.



LATCHLEVER ASSEMBLY SPRING - S

Requirement

With the form-out lever latched
Min 9 oz---Max 11 oz
to pull latchlever assembly spring to installed length.

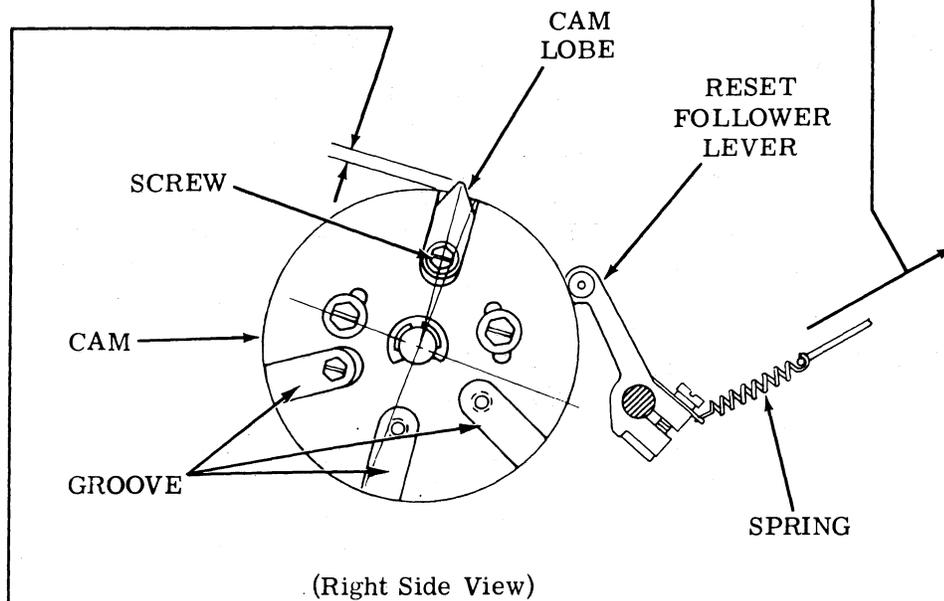
2.99 Form Feed Area (continued)

RESET FOLLOWER LEVER SPRING - S

Requirement

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 POSITION - S (FOA-8)

Note: Cam lobes, in addition to the one opposite
the three closely spaced grooves, should be
adjusted according to the FORM-OUT LEVER ---
RESET CLEARANCE - S (2.101 or 2.102) adjustment.

Requirement

The top of the cam lobe should be
Min 0.065 inch---Max 0.070 inch
above the low point of the cam.

To Adjust

Loosen screw and position the cam lobe.
Tighten screw.

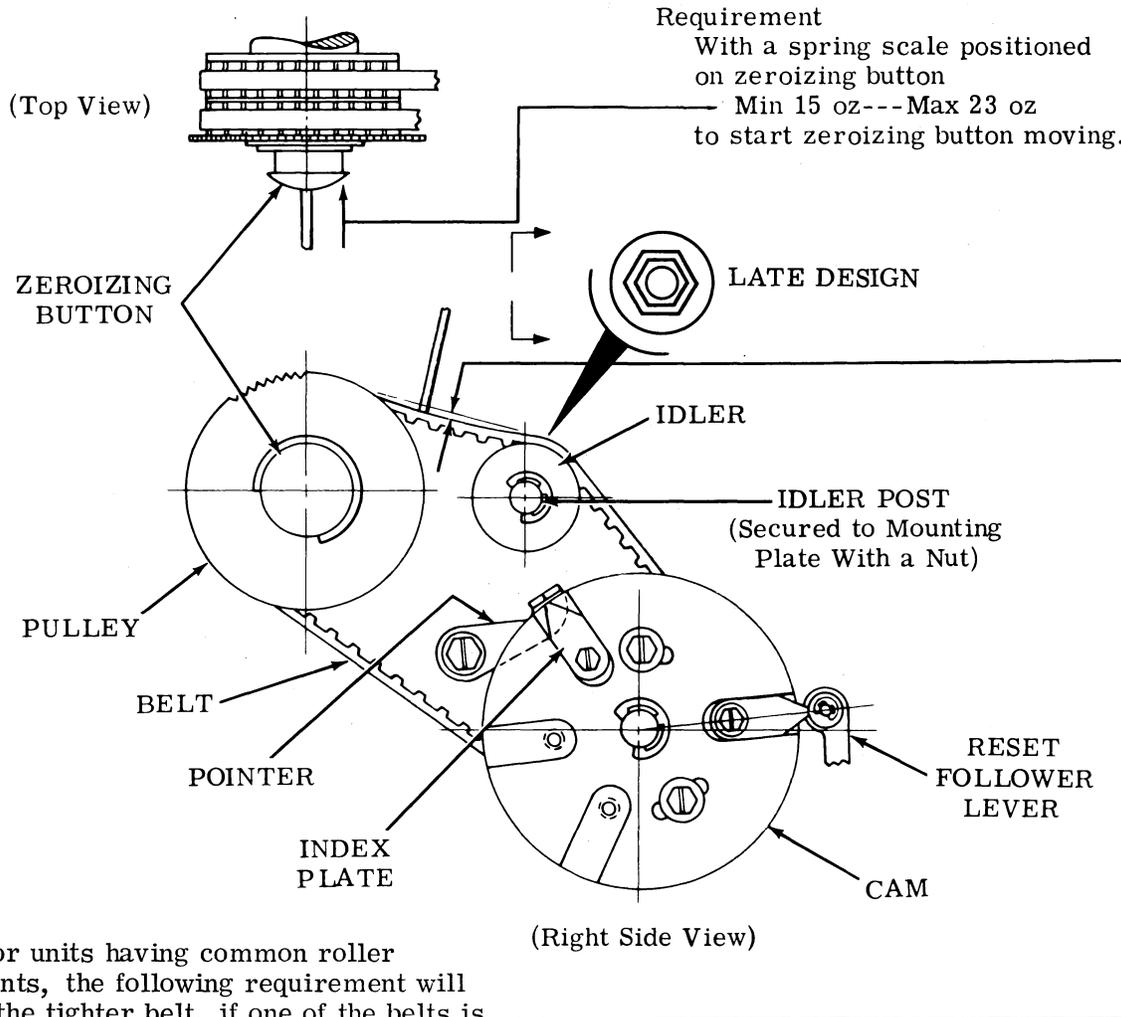
Related Adjustment

Affects

FORM-OUT LEVER --- RESET CLEARANCE - S (2.101 or 2.102)

2. 100 Platen Area (continued)

ZEROIZING BUTTON - S



Note: For units having common roller adjustments, the following requirement will apply to the tighter belt, if one of the belts is tighter than the other. If there is no difference in belt tightness, then the requirement applies to the outer belt. On units having independent roller adjustments, the requirement applies to both belts.

To Check

Place a 16 oz spring load to the belt between the idler and the pulley and note the amount of deflection.

Requirement

Min 1/32 inch---Max 1/16 inch deflection of belt.

To Adjust

For units with common adjustments, loosen nut on idler post and position to meet requirement. For units with independent adjustments, loosen nut on idler post and position for inner belt; loosen eccentric clamp nut and position eccentric for outer belt.

Related Adjustments

Affects

- DETENT POSITION - S (2. 109)
- RESET FOLLOWER LEVER --
- RESET POSITION - S (2. 110)
- CAM ZERO POSITION (2. 110)

Affected By

- PLATEN -- HORIZONTAL POSITION - S (2. 89)
- VERTICAL TYPE ALIGNMENT - S (2. 90)

2.101 Form Feed Area (continued)

FORM-OUT LEVER - RESET CLEARANCE - S (Early Design) (FOA-10)

To Check

With the typing unit in stop condition, rotate the main shaft until all clutch mounting screw-heads are in the vertical position. Place the reset follower lever on the high point of the cam lobe by pushing in on the zeroizing button and rotating the pulley.

(1) Requirement

Min 0.005 inch---Max 0.020 inch
between the latching surface of the arm and the form-out lever.

(2) Requirement

The trip lever and latchlever should have
Min some---Max 0.012 inch
endplay.

Related Adjustments

Affects

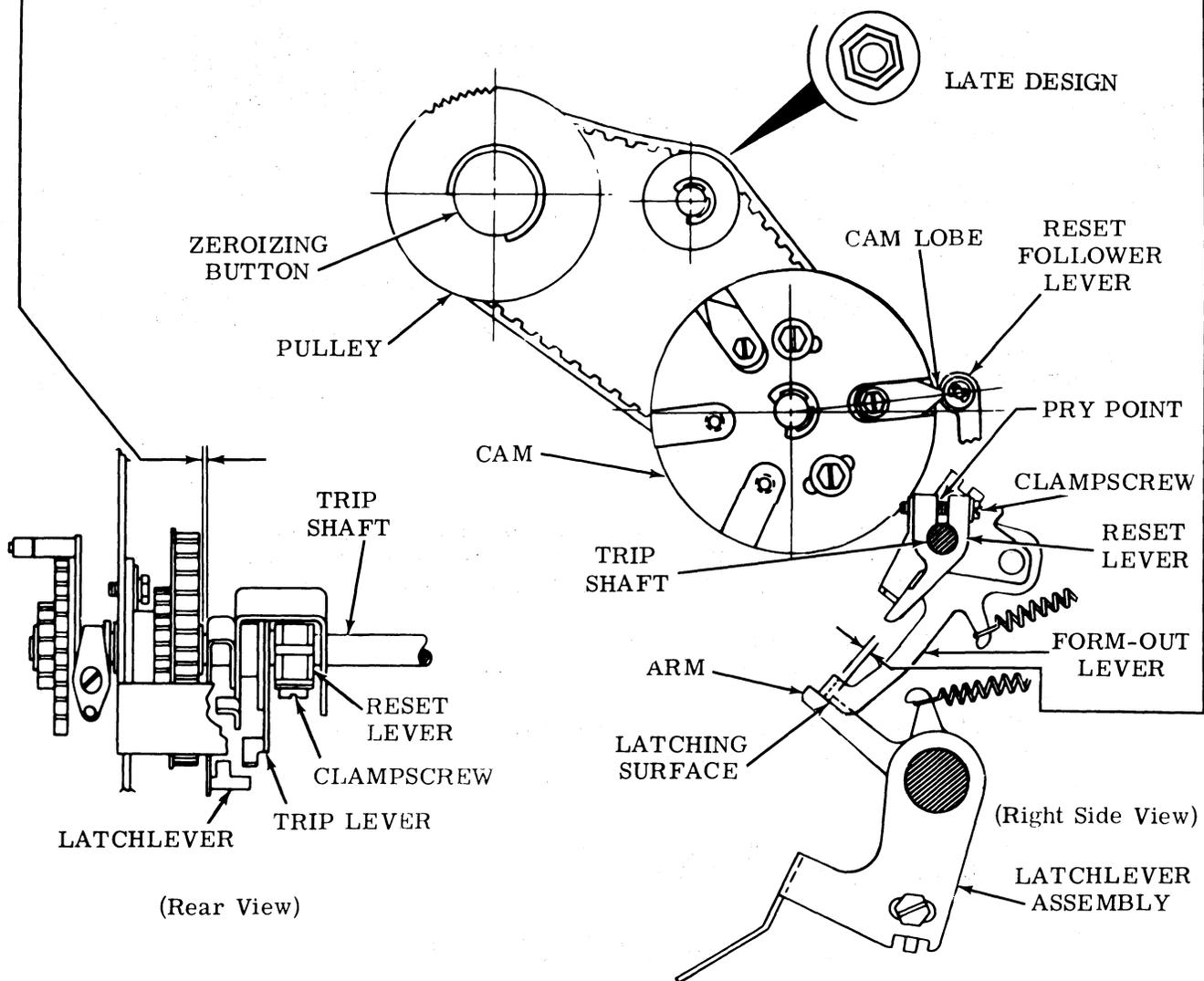
TRIP LEVER ENGAGEMENT - LINE
FEED - S (Early Design) (2.104)
FORM-OUT CONTACT OPERATING
BAIL CLEARANCE - S (2.113)

Affected By

FORM FEED BELT TENSION - S (2.94)
CAM LOBE POSITION - S (2.99)

To Adjust

Place reset follower lever on high point of cam lobe. Loosen clampscrew friction tight and, using pry point, position the reset lever. Tighten clampscrew.



2.102 Form Feed Area (continued)

FORM-OUT LEVER — RESET CLEARANCE - S (Late Design) (FOA-15)

Note: Check To Check (1) only when making a complete readjustment of typing unit.

(1) To Check

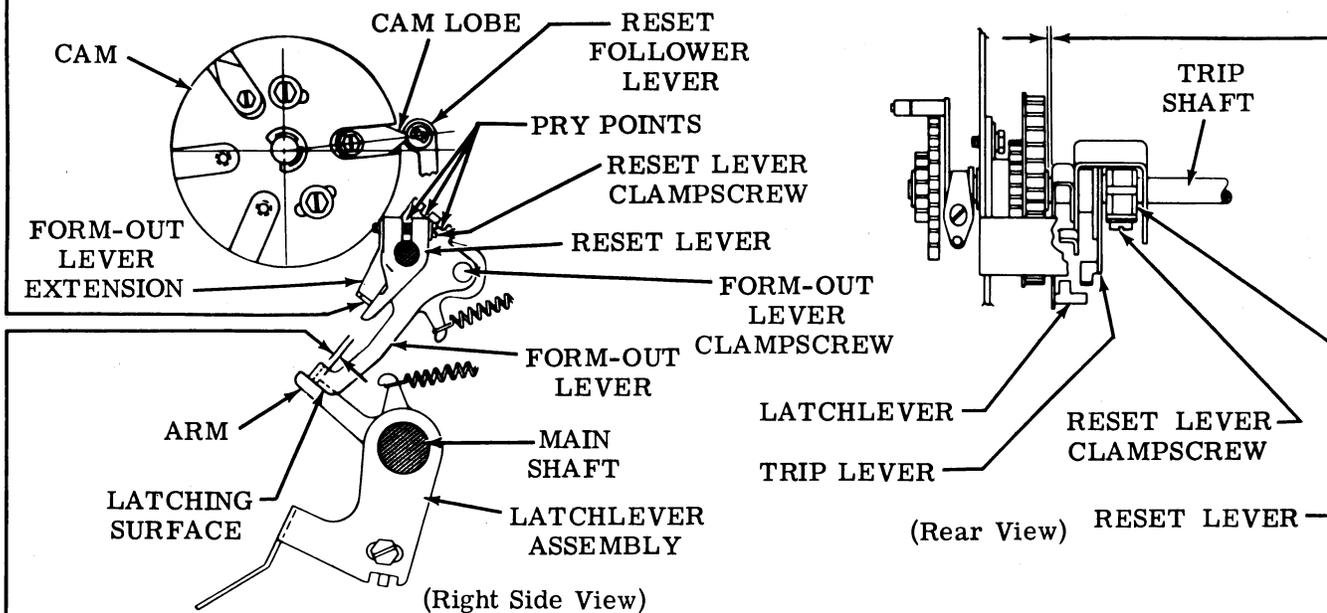
With typing unit in stop condition rotate main shaft until all clutch mounting screwheads are in vertical position. Place reset follower lever on low part of cam by pushing in on zeroizing button and rotating pulley. Push down on arm of latchlever assembly to unlatch form-out lever.

Requirement

- (a) Reset lever should just touch underside of form-out lever extension.
 (b) The trip lever and latchlever should have
 Min some---Max 0.012 inch
 endplay.

To Adjust

Loosen reset lever clampscrew and position reset lever using pry point.
 Tighten clampscrew.



(2) To Check

With typing unit in stop condition rotate main shaft until all clutch mounting screwheads are in vertical position. Place reset follower lever on high point of cam lobe by pushing in on zeroizing button and rotating pulley.

Requirement

- Min 0.005 inch---Max 0.020 inch
 between latching surface of arm and form-out lever.

To Adjust

With form-out lever clampscrew friction tight, position form-out lever using pry points. Tighten clampscrew.

Related Adjustments

Affected By

- FORM FEED BELT TENSION - S (2.94)
CAM LOBE POSITION - S (2.99)

Affects

- FORM-OUT CONTACT OPERATING BAIL CLEARANCE - S (2.113)

2.103 Form Feed Area (continued)

TRIP LEVER ENGAGEMENT — FORM-OUT - S (FOA-9)

Note 1: The following adjustment applies only to early design typing units.

To Check

Rotate form feed clutch until a shoe lever just about contacts the trip lever. Hold form-out lever against latching surface of latchlever assembly.

Note 2: If the reset lever and/or line feed bail interfere when checking this adjustment,

- (a) Loosen reset lever clampscrew and position reset lever so that it does not interfere.
- (b) Loosen line feed downstop screw and position downstop to lowermost position. Position line feed lever so that line feed bail does not interfere.

(1) Requirement

Top surface of shoe lever should not be above top surface of trip lever.

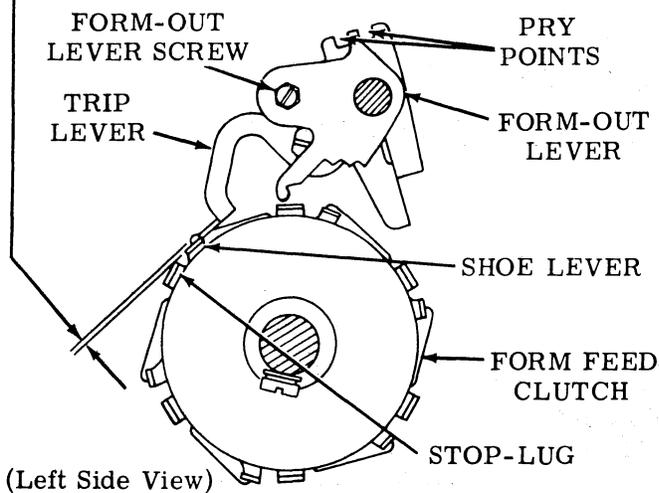
(2) Requirement

Shoe lever should engage trip lever
Min 2/3 thickness
of trip lever.

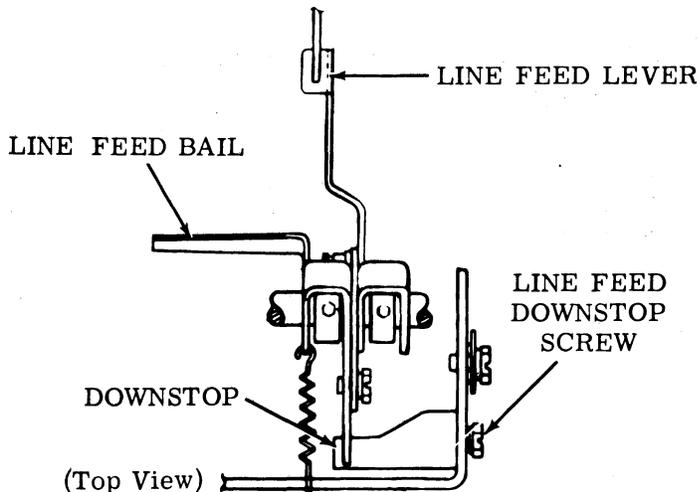
Note 3: Check requirements at each of the six shoe levers.

To Adjust

Loosen form-out lever screw. Hold form-out lever against latching surface of latchlever assembly and position trip lever using form-out lever pry points. Tighten all screws.



(Left Side View)



(Top View)

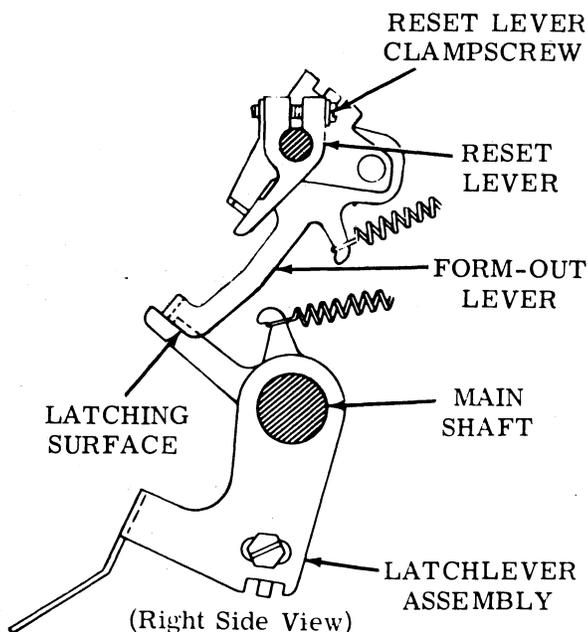
Related Adjustments

Affects

TRIP LEVER ENGAGEMENT —
LINE FEED - S (Early Design)(2.104)
LINE FEED SELECTION (2.108)

Affected By

FORM FEED BELT TENSION - S (2.94)
CLUTCH SHOE LEVER GAP - S
(2.95)



(Right Side View)

2.104 Form Feed Area (continued)

Note 1: The following adjustment applies only to early design typing units.

TRIP LEVER ENGAGEMENT — LINE FEED - S (Early Design) (FOA-11)

To Check

Rotate form feed clutch until a shoe lever just about contacts the trip lever. Place the reset follower lever on the high point of the cam lobe by pushing in on the zeroizing button and rotating the pulley.

(1) Requirement

Top surface of shoe lever should never be above top surface of trip lever.

(2) Requirement

Shoe lever should engage trip lever
Min 2/3 thickness of trip lever.

Note 2: Check Requirement (1) and (2) at each of six shoe levers.

To Adjust

Loosen downstop screw and position downstop so that line feed bail positions trip lever to meet Requirements (1) and (2). Tighten screw.

Related Adjustments

Affects

LINE FEED SELECTION - S (2.108)

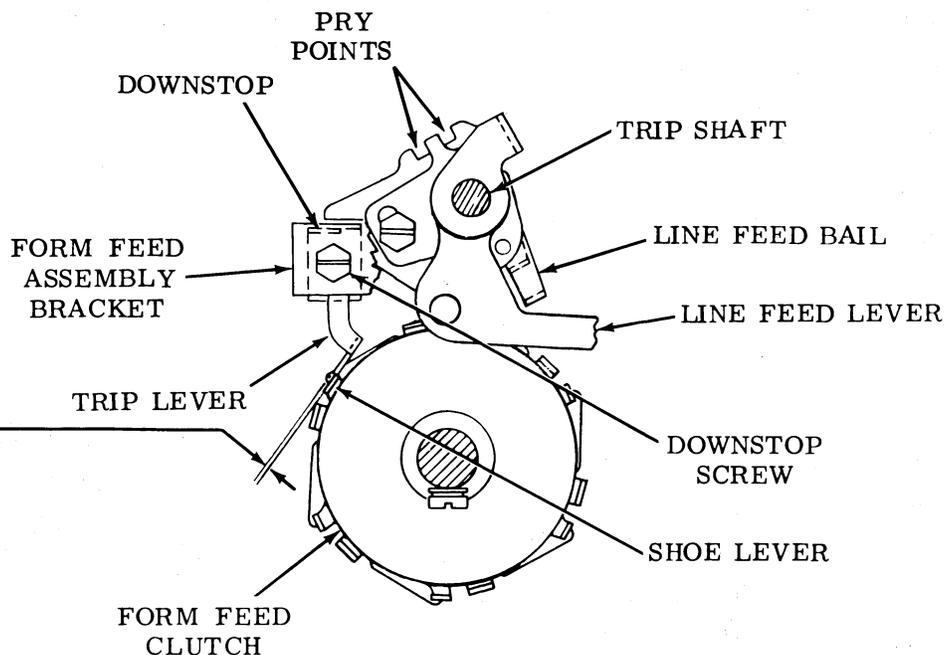
Affected By

CLUTCH SHOE LEVER GAP - S (2.95)

TRIP LEVER ENGAGEMENT — FORM-OUT - S (2.103)

FORM FEED BELT TENSION - S (2.94)

FORM-OUT LEVER RESET CLEARANCE - S (EARLY DESIGN) (2.101)



(Left Side View)

2.105 Form Feed Area (continued)

TRIP LEVER ENGAGEMENT (Final) - S (Late Design) (FOA-16)

Note: This adjustment applies to late design typing units containing the TP185998 nickel plated plate.

To Check

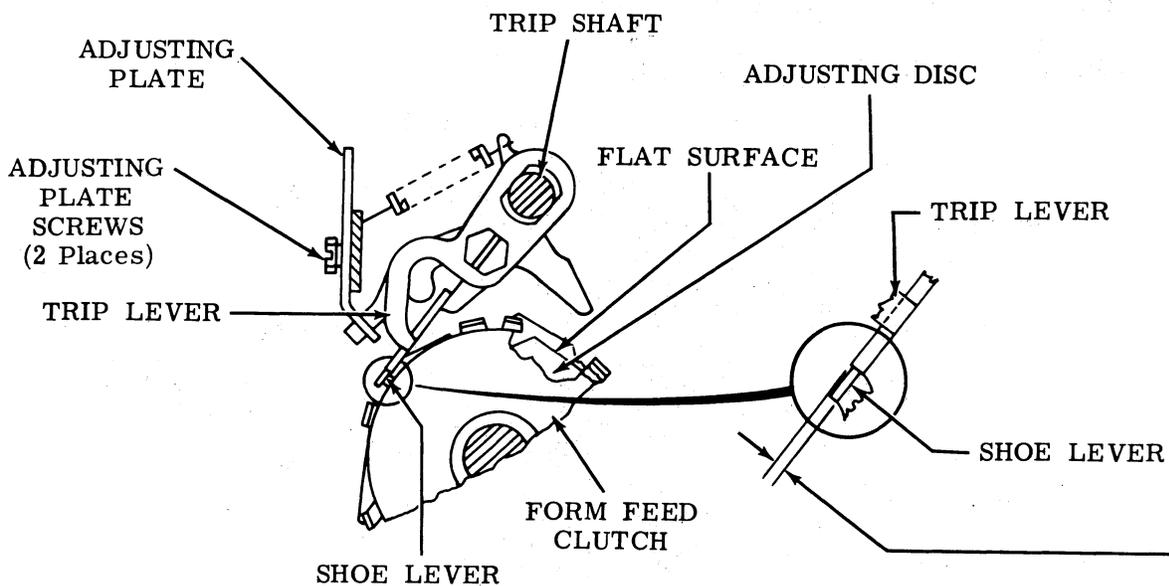
Rotate main shaft until the flat surface of the form feed clutch adjusting disc is positioned as illustrated. Disengage (latch) form feed clutch. Continue rotating main shaft until all clutch mounting screwheads are in a vertical position. Trip form feed clutch and rotate main shaft until the advancing shoe lever is just about to contact the trip lever.

Requirement

Shoe lever should be aligned with trip lever.

To Adjust

Loosen two adjusting plate screws and position adjusting plate. Tighten both screws.



(Left Side View)

Related Adjustments

Affected By

TRIP LEVER ENGAGEMENT (Preliminary) - S (2.96)

2.106 Form Feed Area (continued)

TRIP LEVER UPSTOP POSITION - S (Early Design) (FOA-12)

Note: The following adjustment applies only to early design typing units.

To Check

Rotate main shaft until the flat surface of the form feed clutch adjusting disc is positioned as illustrated. Disengage (latch) the form feed clutch. Resume rotating the main shaft until all the clutch mounting screwheads are in a vertical position. Press down the line feed bail to trip clutch and rotate main shaft until stop-lug is directly under the trip lever.

Requirement

Min 0.020 inch---Max 0.035 inch
between trip lever and stop-lug.

To Adjust

Loosen upstop screws and position upstop. Tighten screws.

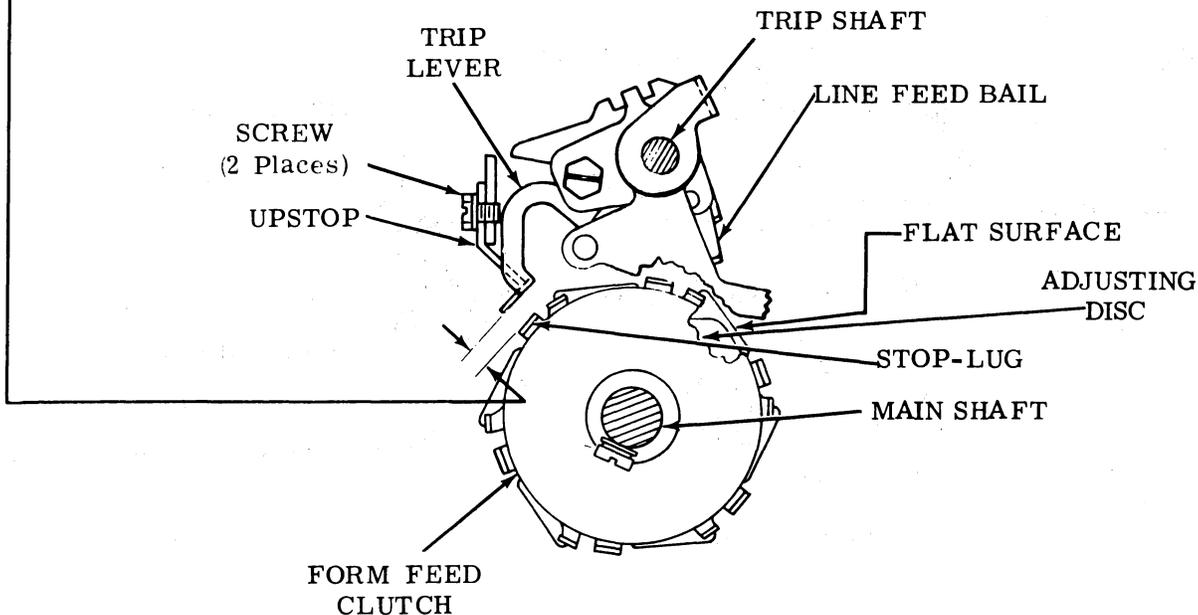
Related Adjustments

Affects

FORM-OUT CONTACT PRESSURE AND GAP - S (2.113)

Affected By

FORM FEED BELT TENSION - S (2.94)



(Left Side View)

2.107 Form Feed Area (continued)

LINE FEED PAWL STRIPPING - S (FOA-18)

To Check

Set up the typing unit for single line feed (LINE FEED SELECTION - S (2.108) 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 (-2-4---8) in the selector and rotate the main shaft until the line feed pawl just strips off the line feed function lever.

Requirement

The trip lever should fall
Min on---Max 0.035 inch
before stop-lug.

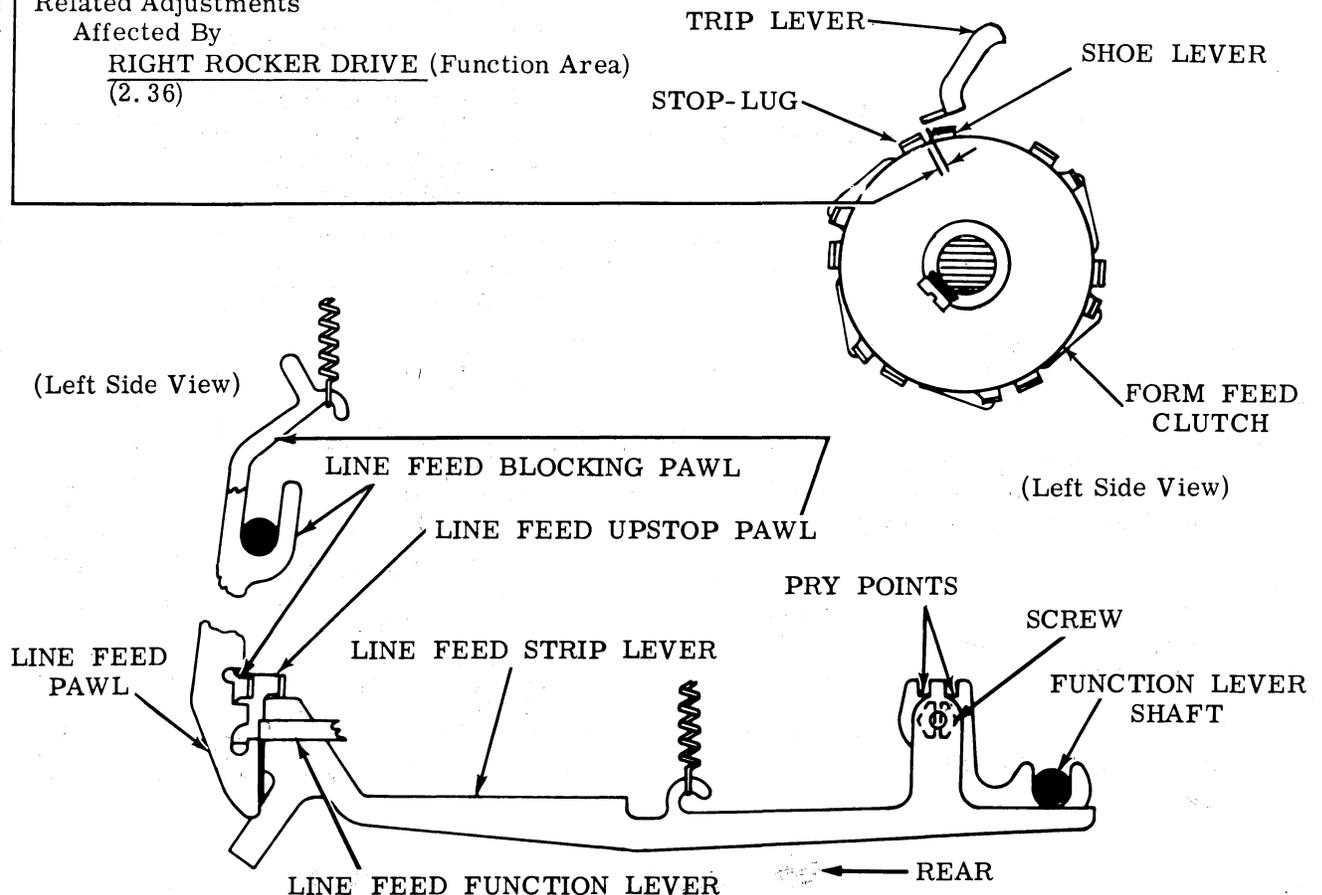
To Adjust

- Loosen screw friction tight. Using pry points position line feed strip lever rearward three-fourths of its full adjusting range.
- Check LINE FEED SELECTION - S (2.108) adjustment for single line feed.
- Set up line feed code combination (-2-4---8) in selector and rotate main shaft until line feed pawl just strips off line feed function lever.
- Check requirement and tighten screw if requirement is met.
- If requirement is not met, move line feed strip lever slightly toward front of typing unit. Repeat steps (b), (c), and (d). Continue this procedure until requirement is met.

Related Adjustments

Affected By

RIGHT ROCKER DRIVE (Function Area)
(2.36)



2.108 Form Feed Area (continued)

LINE FEED BAIL SPRING - S

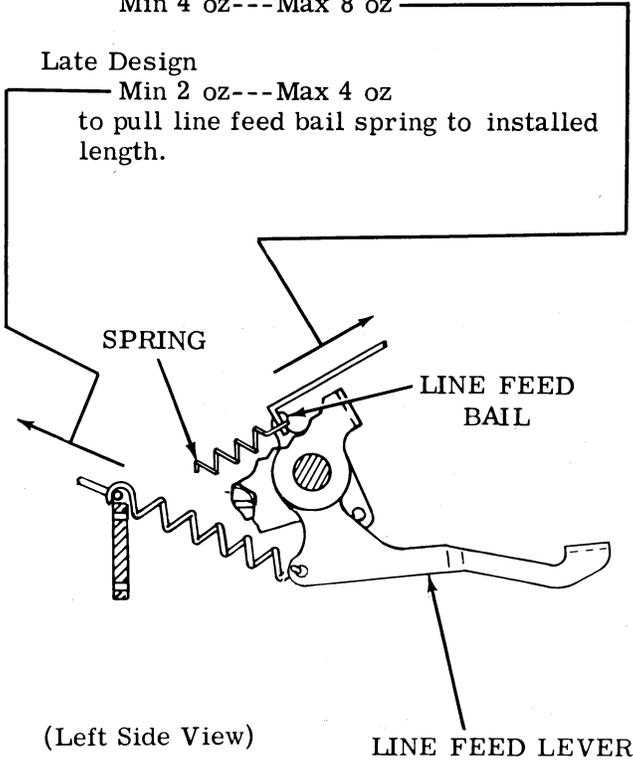
Requirement

Early Design

Min 4 oz---Max 8 oz

Late Design

Min 2 oz---Max 4 oz
to pull line feed bail spring to installed length.



LINE FEED SELECTION - S
(FOA-13 or FOA-17)

To Check

Place typing unit in stop condition.

Requirement

Single line feed

Min 0.110---Max 0.130 inch
between pawl and line feed lever.

Double line feed

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

To Adjust

Early Design (FOA-13)

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

Late Design (FOA-17)

With screw friction tight, position line feed lever using pry points. Tighten screw.

Related Adjustments

Affected By

FORM FEED BELT TENSION - S
(2.94)

TRIP LEVER ENGAGEMENT -

LINE FEED - S (Early Design) (2.104)

TRIP LEVER ENGAGEMENT -

FORM-OUT - S (2.103)

LINE FEED LEVER SPRING - S

Requirement

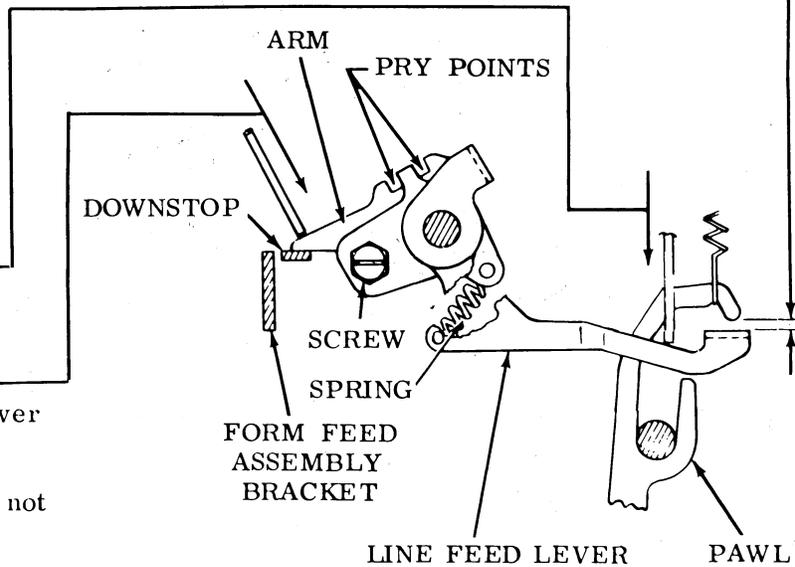
Early Design

With arm held against downstop
Min 21 oz---Max 35 oz
to start line feed lever moving.

Late Design

Min 27 oz---Max 40 oz
to push arm down until line feed lever contacts pawl.

Note: Late design typing units are not equipped with a downstop.



(Left Side View)

2.109 Platen Area (continued)

DETENT POSITION - S (FOA-26)

CAUTION: TO PREVENT ELECTRICAL SHOCK EXERCISE CARE WHEN WORKING WITH TYPING UNIT UNDER POWER.

To Check

Set up line feed code combination (-2-4---8) in selector. Place TP185832 armature clip so as to hold armature attracted. Plug in typing unit plugs into proper call control receptacles and apply power to typing unit. Engage code-bar clutch to permit a line feed cycle to complete itself under power. Check requirement. Remove all power connections.

(1) Requirement

The pawl should be fully seated with a Max 0.007 inch between pawl and detent ratchet tooth.

(2) Requirement

Min some---Max 0.030 inch between the plate and detent ratchet.

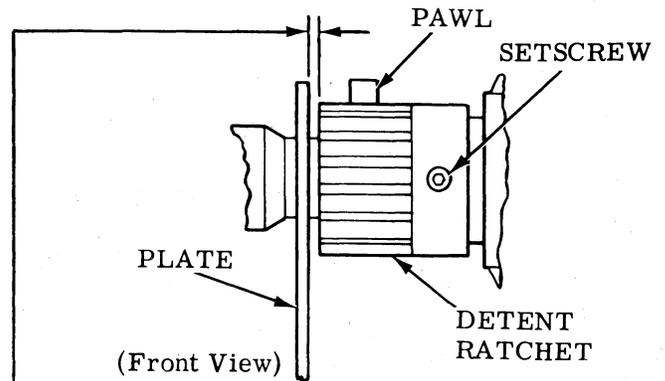
To Adjust

Loosen both setscrews. Use finger pressure to engage and hold pawl firmly in detent ratchet. Depress line feed keytop. Tighten setscrews.

Related Adjustments

Affected By

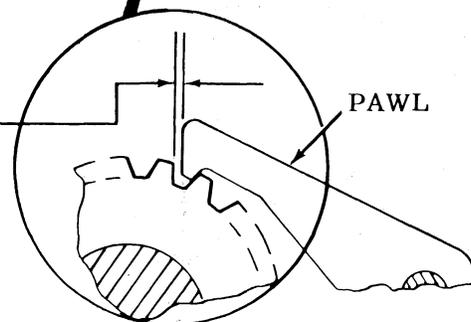
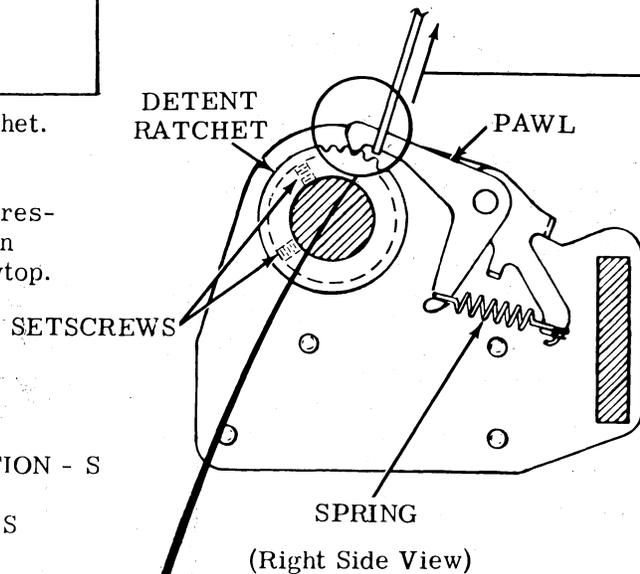
- FORM FEED BELT TENSION - S (Form Feed Area) (2.94)
- PLATEN — HORIZONTAL POSITION - S (2.89)
- VERTICAL TYPE ALIGNMENT - S (2.30)
- IDLER POSITION - S (2.100)



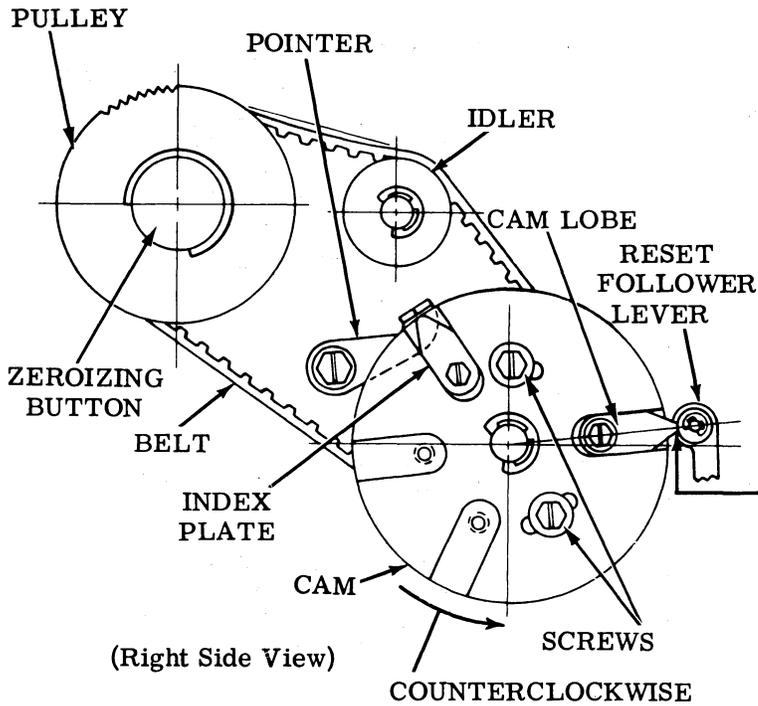
DETENT RATCHET PAWL SPRING - S

Requirement

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



2.110 Platen Area (continued)



(A) RESET FOLLOWER LEVER -- RESET POSITION - S (FOA-30)

CAUTION: TO PREVENT ELECTRICAL SHOCK EXERCISE CARE WHEN WORKING WITH TYPING UNIT UNDER POWER.

To Check

Set up form-out code combination (--34---8) in selector. Place TP185832 armature clip so as to hold armature attracted. Plug typing unit plugs into proper call control unit receptacles and apply power to typing unit. Engage codebar clutch to permit a form-out cycle to complete itself under power. Check requirement. Remove all power connections.

Requirement

At the end of form-out cycle, reset follower lever should come to rest on flat surface of cam lobe.

To Adjust

Loosen screws and adjust cam. Tighten screws.

Related Adjustments

Affects

CAM ZERO POSITION (2.110)

Affected By

FORM FEED BELT TENSION - S (2.94)

IDLER POSITION - S (2.100)

PLATEN -- HORIZONTAL POSITION - S (2.89)

VERTICAL TYPE ALIGNMENT - S (2.90)

(B) CAM ZERO POSITION (FOA-31)

To Check

With cam lobes and index plates located on cam as shown on associated line drawings, place typing unit in stop condition.

Note: Reset follower lever must rest on proper cam lobe to zero a sprocket form. Place it in such position by depressing zeroizing button and rotating pulley until reset follower lever rests on cam lobe opposite three closely spaced grooves (on cam) facing toward the front of typing unit.

One cam lobe: (FOA-32)

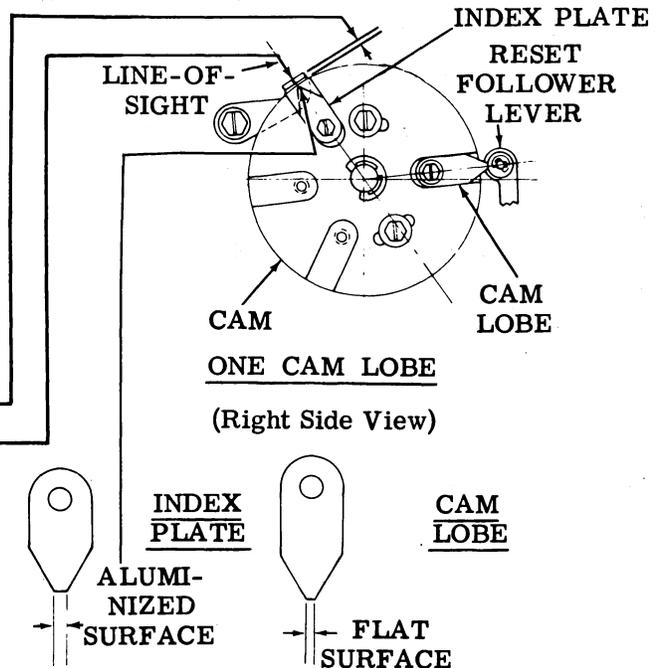
(1) **Requirement**

With reset follower lever on flat surface of cam lobe and zeroizing button in its right most position

Min some---Max 0.035 inch between bottom surface of pointer and low part of cam.

(2) **Requirement**

When viewed along line-of-sight shown, tip of pointer should be aligned with index plate aluminized surface, as gauged by eye.



2.111 Platen Area (continued)

CAM ZERO POSITION (continued)

Two cam lobes: (FOA-33)

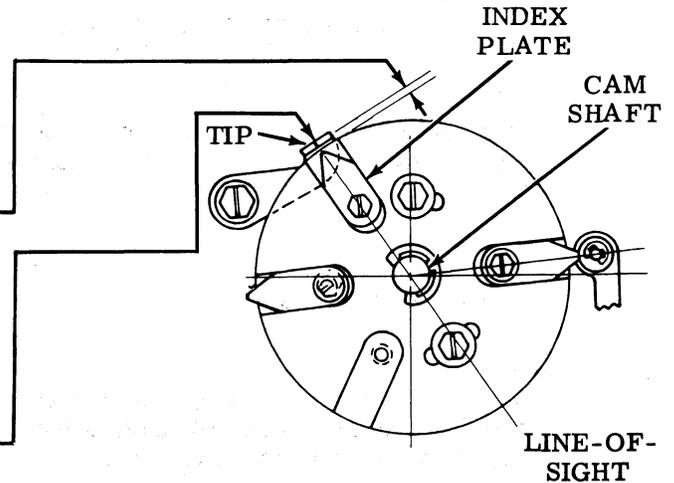
(1) Requirement

With reset follower lever on flat surface of cam lobe and zeroizing button in its rightmost position

Min some---Max 0.035 inch between bottom surface of pointer and low part of cam.

(2) Requirement

When viewed along line-of-sight shown, tip of pointer should be aligned with index plate aluminized surface, as gauged by eye.



TWO CAM LOBES

Three cam lobes: (FOA-34)

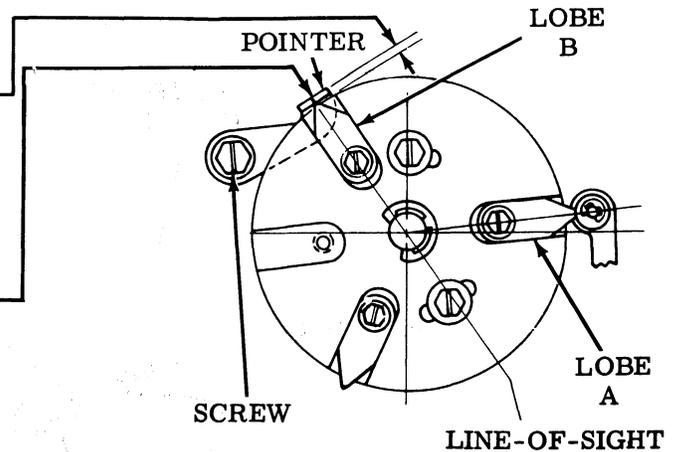
(1) Requirement

With reset follower lever on flat surface of cam lobe A and zeroizing button in its rightmost position

Min some---Max 0.035 inch between bottom surface of pointer and low part of cam.

(2) Requirement

When viewed along line-of-sight shown, tip of pointer should be aligned with flat surface of lobe B, as gauged by eye.



THREE CAM LOBES

(Right Side Views)

To Adjust

Loosen screw and position pointer. Tighten screw.

Related Adjustments

Affected By

FORM FEED BELT TENSION - S

(2.94)

IDLER POSITION - S (2.100)

RESET FOLLOWER LEVER —

RESET POSITION - S (2.110)

2.112 Platen Area (continued)

FORM LENGTH SELECTION - S (FOA-39)

To 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.

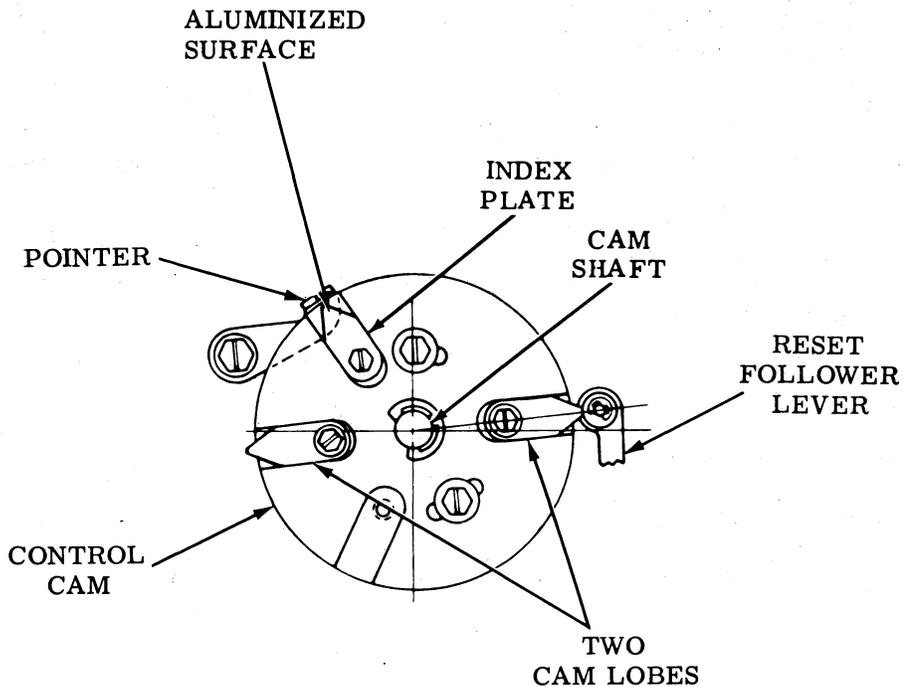
Requirement

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.

Note: A listing of gears which provide various form feed lengths can be found in the appropriate parts section.



(Right Side View)

2.113 Form Feed Area (continued)

FORM-OUT CONTACT OPERATING BAIL CLEARANCE -S (FOA-20)

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 0.005 inch---Max 0.015 inch between form-out bail and insulator.

To Adjust

Loosen clampscrew and position contact bracket. Tighten clampscrew.

Related Adjustments

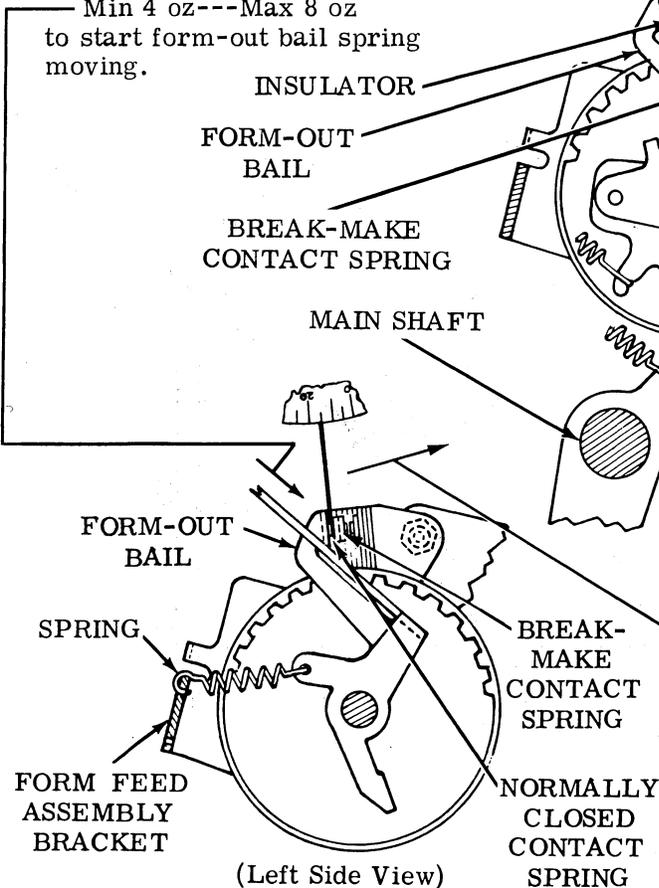
Affected By

- TRIP LEVER ENGAGEMENT — FORM-OUT - S (2.103)
- FORM-OUT LEVER RESET CLEARANCE - S (EARLY DESIGN) (2.101)
- FORM-OUT LEVER RESET CLEARANCE - S (LATE DESIGN) (2.101)

FORM-OUT BAIL SPRING - S

Requirement

With the form-out lever latched
Min 4 oz---Max 8 oz to start form-out bail spring moving.



FORM-OUT CONTACT PRESSURE AND GAP - S (FOA-19)

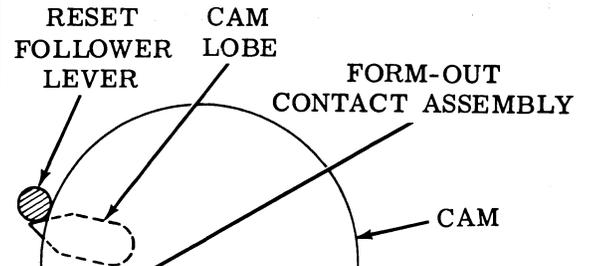
(1) Requirement

With the form-out bail not in contact with the insulator

Min 0.008 inch---Max 0.018 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.



(2) Requirement

With the form-out 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.

Related Adjustments

Affected By

- FORM FEED BELT TENSION - S (2.94)
- TRIP LEVER UPSTOP POSITION - S (Early Design) (2.106)

2.114 Platen Area (continued)

PRINTING LINE POSITION (Preliminary) - S
(FOA-27)

(1) Requirement

The left sprocket ring pins should be centrally located within the paper guide slot.

To Adjust

Loosen setscrews and position the left sprocket ring.

Note: Do not tighten setscrews until adjustment has been completed.

(2) Requirement

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

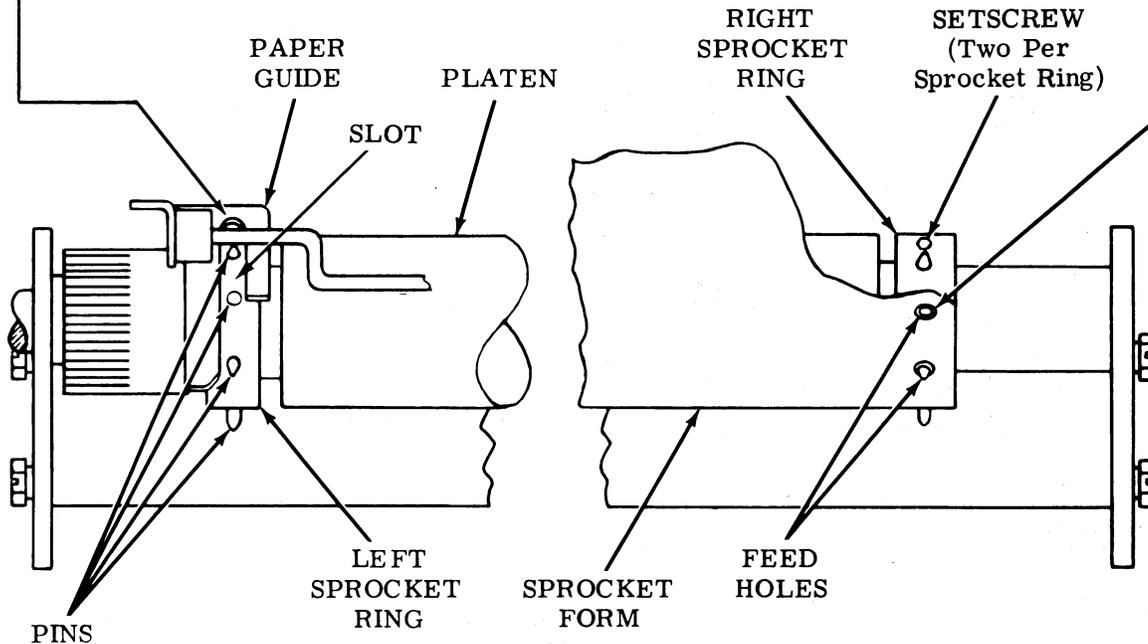
To Adjust

Loosen setscrews and position the left and/or right sprocket rings as required. Tighten all setscrews.

Related Adjustments

Affects

RIGHT PAPER GUIDE POSITION - S
(2.116)



(Front View)

2.115 Platen Area (continued)

PRINTING LINE POSITION (Final) - S (FOA-27)

To Check

Place a single sheet of sprocket form in platen mechanism. Print the character M several times to establish a printed line.

Note: On nonprinted forms, draw a horizontal line across form connecting bottom of sprocket feed holes.

Requirement

Printed Form

Printed line should be aligned with sprocket form lines.

Nonprinted Form

- (a) Printed line should be aligned with drawn line.
- (b) Printed line should not touch drawn line.
- (c) Printed line should not be more than 1/32 inch above drawn line with no more than 1/64 inch variation along its entire length.

To Adjust

Early Design

Modify Requirement (2) of PRINTING LINE POSITION (Preliminary) - S (2.114)

Late Design (containing adjusting clampscrew)

Loosen clampscrew and position platen. Tighten clampscrew.

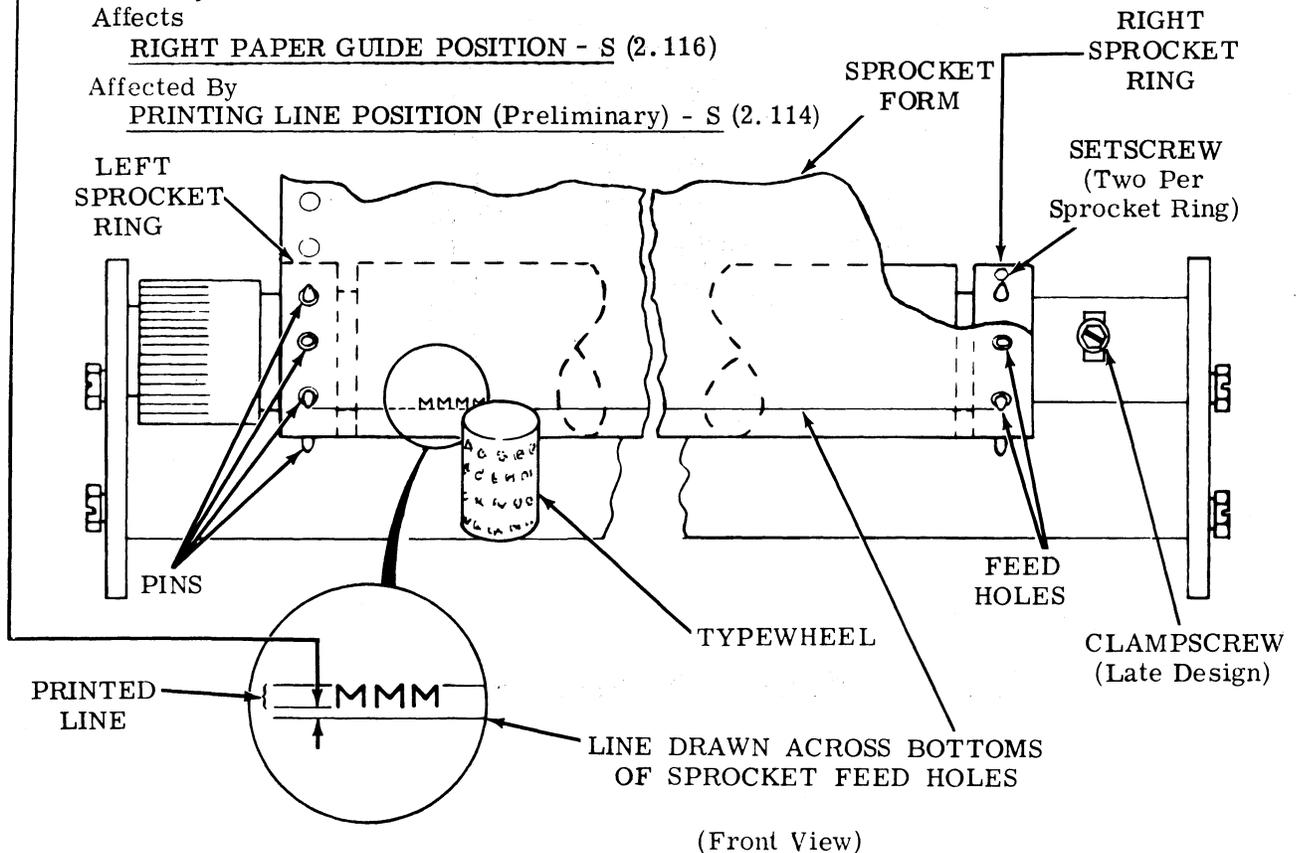
Related Adjustments

Affects

RIGHT PAPER GUIDE POSITION - S (2.116)

Affected By

PRINTING LINE POSITION (Preliminary) - S (2.114)



2.116 Platen Area (continued)

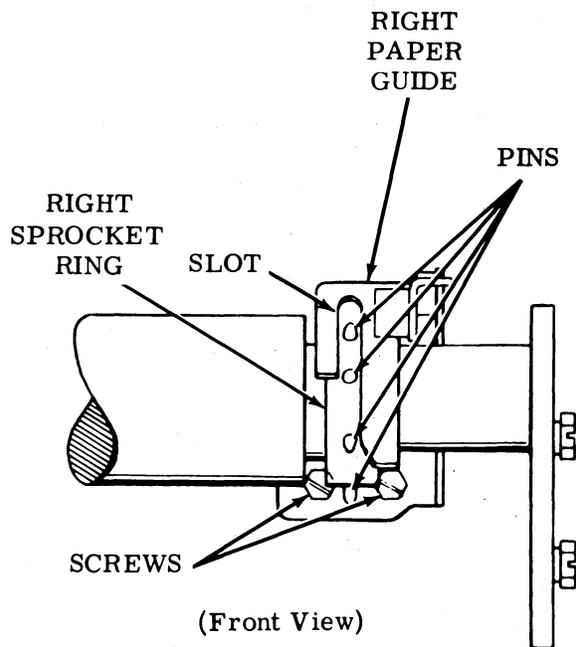
RIGHT PAPER GUIDE POSITION - S (FOA-28)

Requirement

The right sprocket ring pins should be centrally located within the paper guide slot.

To Adjust

Loosen screws and position right paper guide.
Tighten screws.



Related Adjustments

Affected By

PRINTING LINE POSITION (Final) - S (2.115)

2.117 Platen Area (continued)

WIRE GUIDE POSITION - S (FOA-29)**To Check**

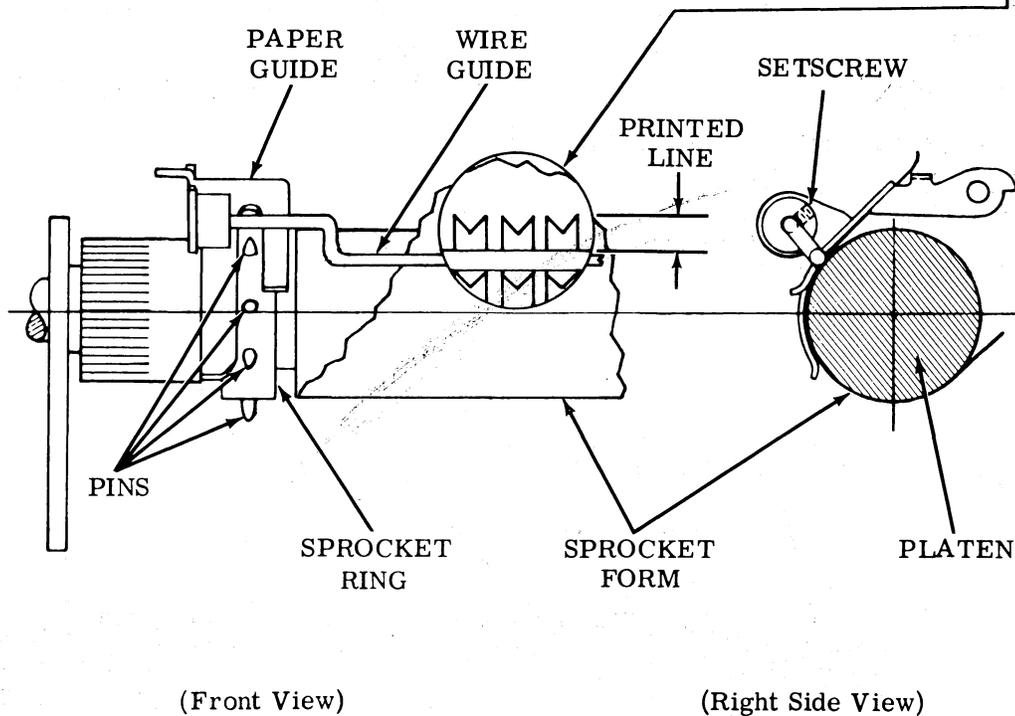
Put a sprocket form containing several lines of printed copy in the unit. Place platen in its detented position with top edge of form feed holes engaging top edge of sprocket ring pins. Place left and right paper guides in contact with their associated sprocket rings.

Requirement

The wire guide should fully contact the sprocket form and should be centrally located between the lines of printed copy with a maximum of 1/2 line overlap.

To Adjust

Loosen setscrew at each end of wire guide. Hold paper guides against their sprocket rings and position wire guide. Tighten both setscrews.

**Related Adjustments**

Affected By

PLATEN — HORIZONTAL POSITION - S (2.89)

VERTICAL TYPE ALIGNMENT - S (2.90)

2.118 Platen Area (continued)

LEFT MARGIN POSITION - S (FOA-35)

To Check

Place platen knob screw in a vertical position and carriage to the left hand margin. Fully seat piston in dashpot cylinder.

(1) Requirement

Approximately 3/8 inch between edge of sprocket ring pin and V-projection.

(2) Requirement

Min 0.030 inch between the closest sprocket ring pin and ribbon guide.

To Adjust

Loosen two dashpot cylinder mounting screws and position dashpot cylinder. Tighten screws.

Related Adjustments

Affects

- RIGHT MARGIN POSITION - S (2.118)
- CARRIAGE RETURN LEVER
- UNLATCH CLEARANCE (2.75)
- LEFT MARGIN PRINTING (2.120)
- LINE LENGTH SELECTION (2.121)

RIGHT MARGIN POSITION - S (FOA-36)

To 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 between right sprocket ring pin and ribbon guide.

To Adjust

Refine LEFT MARGIN POSITION - S (2.118) adjustment.

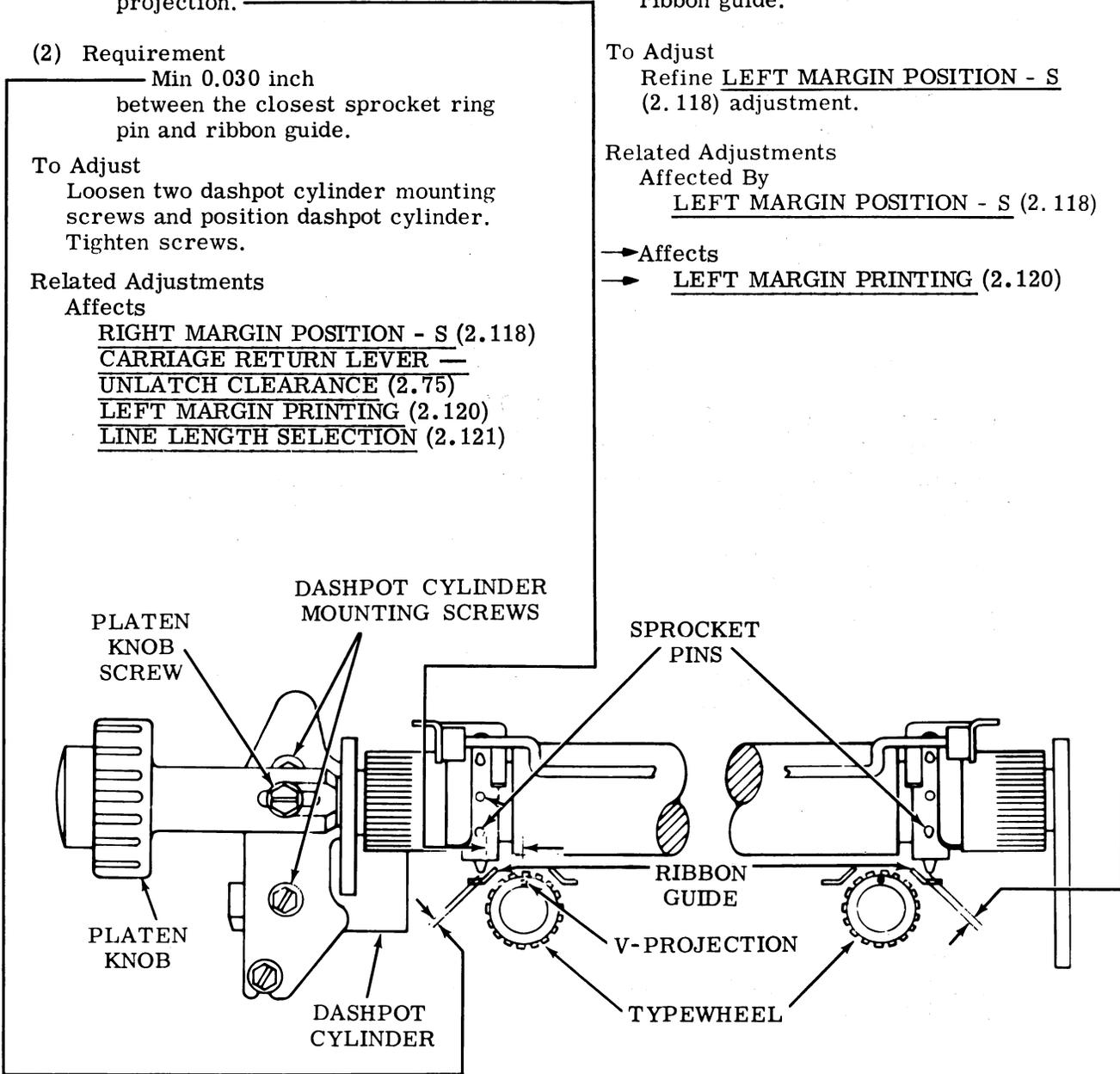
Related Adjustments

Affected By

LEFT MARGIN POSITION - S (2.118)

→ Affects

→ LEFT MARGIN PRINTING (2.120)



(Top View)

2.119 Paper Controls (Paper Alarm Control Area)

(A) PAPER ALARM CONTACT PRESSURE AND GAP - S (FOA-40)

(1) Requirement

With the paper alarm 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.

(C) PAPER LEVER SPRING - S

Note: This spring tension is to be checked after the PAPER ALARM CONTACT PRESSURE AND GAP - S (FOA-40) and PAPER ALARM CONTACT LEVER CLEARANCE (FOA-41) requirements are satisfied.

To Check

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

Requirement

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

(2) Requirement

With the paper alarm lever not in contact with insulator
 --- Min 0.010 inch---Max 0.020 inch between the contacts of the break-make contact spring and the normally open contact spring.

To Adjust

Bend normally closed contact spring.

Related Adjustment

Affected By

PAPER GUIDEPLATE CLEARANCE - S (Platen Area) (2.92)

(B) PAPER ALARM CONTACT LEVER CLEARANCE - S (FOA-41)

To Check

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

Requirement

Min 0.005 inch---Max 0.030 inch between insulator and paper alarm lever.

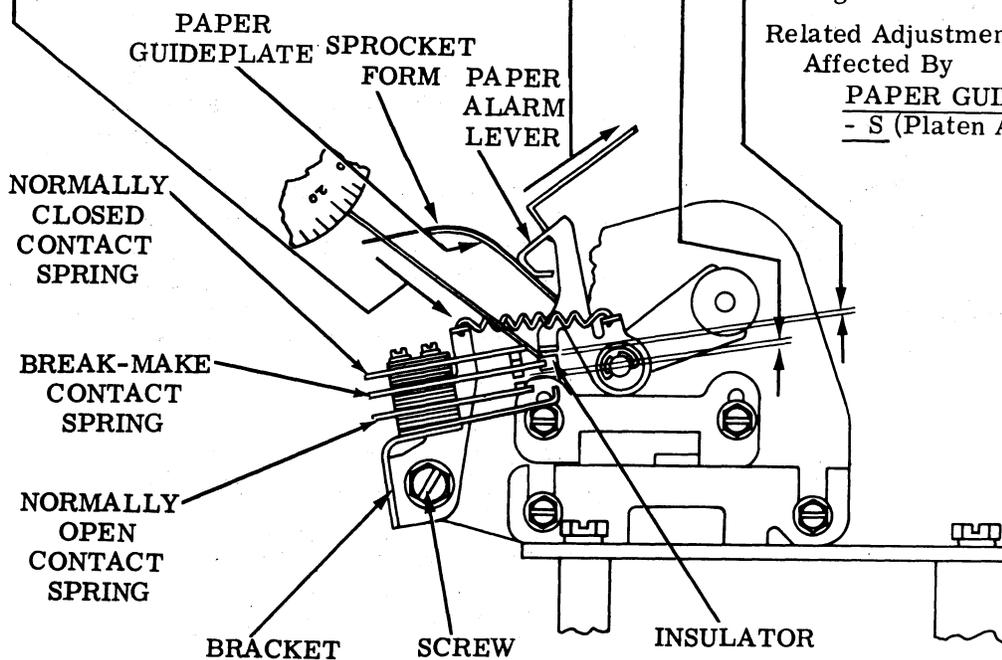
To Adjust

Loosen screw and position bracket. Tighten screw.

Related Adjustment

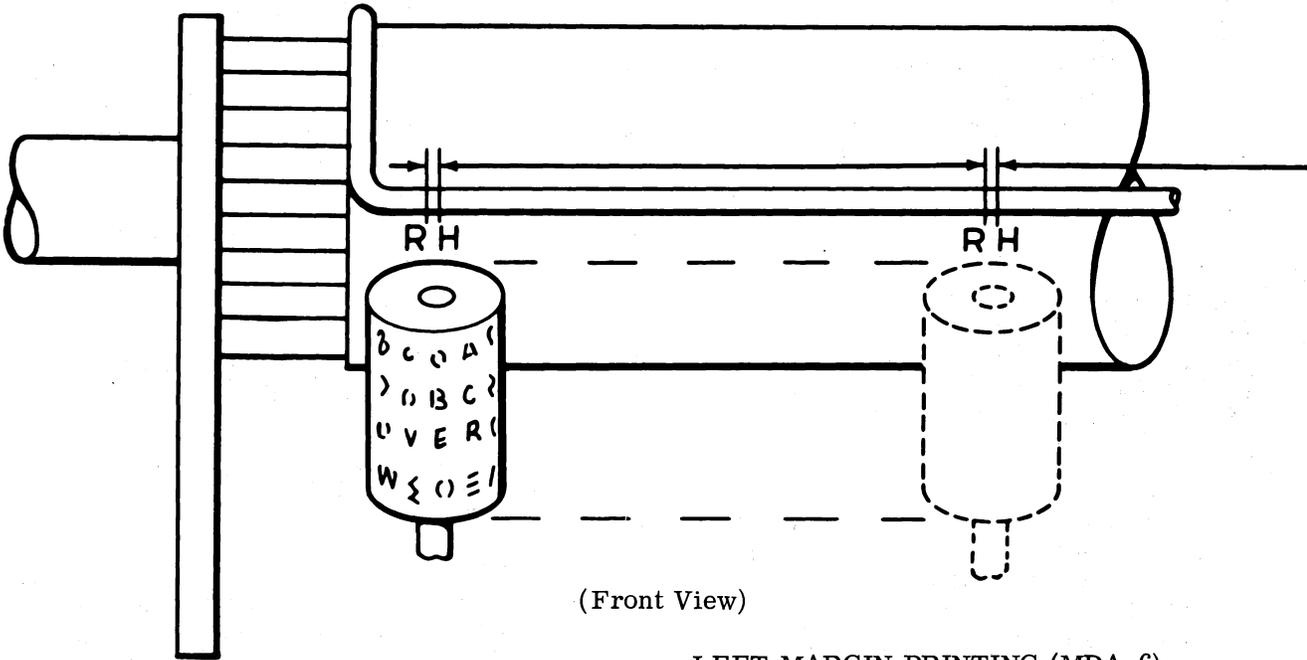
Affected By

PAPER GUIDEPLATE CLEARANCE - S (Platen Area) (2.92)



(Left Side View)

2.120 Spacing Area (continued)



(Front View)

LEFT MARGIN PRINTING (MDA-6)

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

With spacing ratchet clampscrews friction tight, seat piston firmly in the dashpot. Rotate the carriage return arm counter-clockwise to permit the feed pawl and check pawl to move toward the spacing ratchet. Position the spacing ratchet so that the check pawl rests on top of a spacing ratchet tooth. Tighten spacing ratchet clampscrews. Recheck Requirement and refine adjustment if necessary.

Related Adjustments

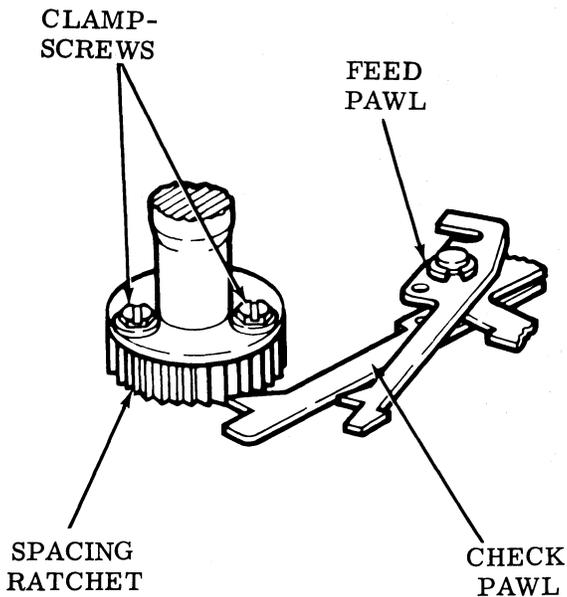
Affects

- FEED PAWL TRAVEL (2.68)
- RIGHT MARGIN POSITION (2.118)

Affected By

- SPACING BELT TENSION (2.69)
- LEFT MARGIN POSITION - S (Platen Area) (2.118)
- LEFT MARGIN POSITION - F (Platen Area) (2.72)
- RIGHT MARGIN POSITION (2.118)

Note: FEED PAWL TRAVEL (2.68) adjustment must be rechecked in conjunction with this adjustment.



(Left Front View)

2.121 Function Area (continued)

LINE LENGTH SELECTION (MDA-3)

- (1) Requirement (Units with end-of-line space suppression)

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

Early Design: Loosen clampscrew and position belt clamp and extension. Tighten clampscrew.

Late Design: Bend tabs away from belt and position belt clamp. Crimp belt clamp and tabs securely on belt.

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

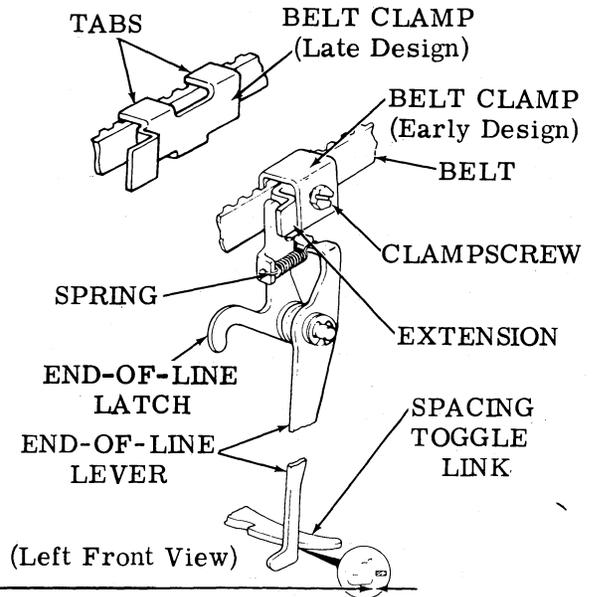
- (2) Requirement (Units with automatic carriage return-line feed)

Select either a 69, 72, or 74 character line length. The left edge of the last printed character (69, 72, or 74) at the end of a complete line may touch the right edge of the next to last character. Also, the last printed character may be displaced vertically below the next to last character by as much as 1/4 character for single line feed or 1 character for double line feed.

To Adjust

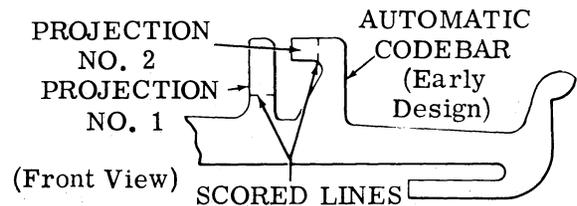
TP180948 Automatic Codebar: On sprocket feed units using TP180948 codebar, do not break off any projections. On friction feed units, break off projections on TP180948 codebar as follows:

Line Length (Characters)	End-of-Line Bell (Characters)	Projection Removed
69	65	None
72	68	1
74	70	1 and 2



TP183495, TP183496, TP183497 automatic codebars: Use the proper automatic codebar as follows:

Line Length (Characters)	End-of-Line Bell (Characters)	Automatic Codebar
69	68	TP183495
72	71	TP183496
74	73	TP183497



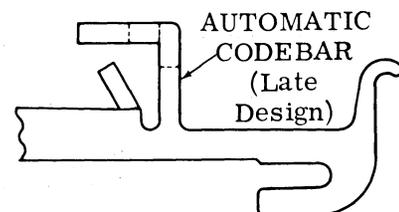
Note 1: Use either TP180948 or TP183498 automatic codebar and no other on typing units equipped with end-of-line space suppression.

Note 2: The late design TP183495-96-97 or 98 codebar must be used with the TP185971 set of parts providing the end-of-line bell to ring on the 61st character.

Related Adjustments

Affected By

- LEFT MARGIN POSITION - S (2.118)
- LEFT MARGIN POSITION - F (2.72)



2.122 Function Area (continued)

MARGIN BELL BELLCRANK CLEARANCE

→ (MDA-7) (FOA-38)

Note: The (A) adjustment applies only to typing units equipped with the margin bell feature to ring on approximately the 61st character for friction feed units and approximately the 63rd character for sprocket feed units. (It is permissible for bell to ring twice as carriage is spaced along the line.) The (B) adjustment applies only to typing units equipped with combination of automatic carriage return and margin bell features.

(A) To Check

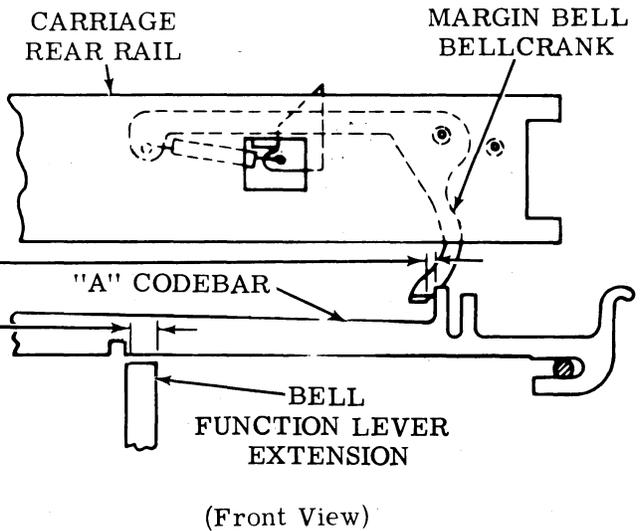
→ Place carriage at left margin. Place typing unit in stop position.

(1) Requirement

→ Min 0.005 inch---Max 0.020 inch between the bellcrank extension and the "A" codebar when the bellcrank upstop is held against the upper surface of the cutout in the rear rail.

(2) Requirement

→ The bell function lever extension and the "A" codebar should fully engage.

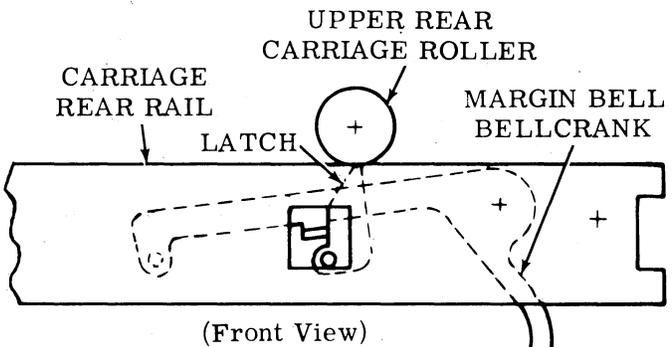


To Adjust

→ Using the TP180993 bending tool, bend vertical leg of bellcrank to meet Requirement (1) and bend the bell function lever extension to meet Requirement (2).

(B) To Check

→ By positioning carriage to approximately the 61st character, upper rear carriage roller will fully depress latch on margin bell bellcrank.

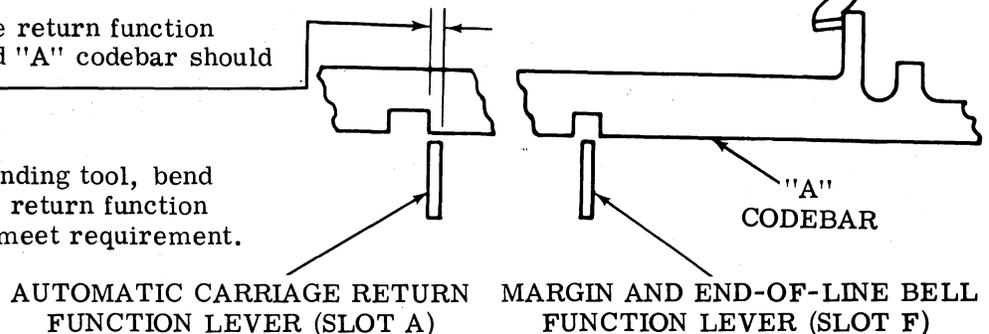


Requirement

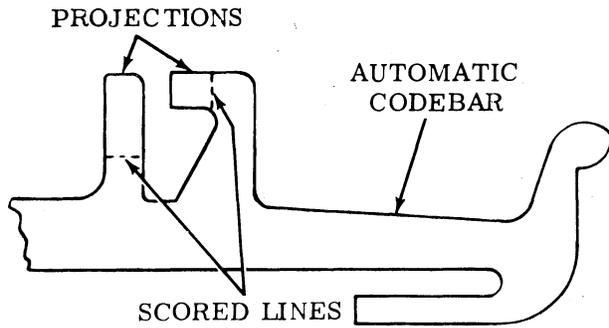
→ Automatic carriage return function lever extension and "A" codebar should fully engage.

To Adjust

→ Using TP180993 bending tool, bend automatic carriage return function lever extension to meet requirement.



2.123 Function Area (continued)



(Front View)

END-OF-LINE BELL SIGNAL - S (FOA-37)

Note: This requirement applies only to sprocket feed typing units equipped with TP180948 automatic codebar.

Requirement

The bell should ring at approximately the 68th character.

To Adjust

The automatic codebar projections must not be removed. Replace codebar.

2.124 Selector Area (continued)

RECEIVING MARGINS (FPA-1)

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>SPEED</u>	<u>RANGE ZERO DISTORTION</u>	<u>OVERALL BIAS</u>	<u>END DISTORTION</u>
All Speeds	No Requirement	35 Percent*	33 Percent*

*At same range scale setting.

To Adjust

Refine ARMATURE SPRING (2.20) and, if necessary, refine ARMATURE BRACKET POSITION (Preliminary) (2.18) and/or BELT TENSION (Motor Area) (2.02) adjustments.

Note: The refinement of the ARMATURE BRACKET POSITION (2.18) or BELT TENSION (Motor Area) (2.02) adjustment need not be performed unless the refinement of the ARMATURE SPRING (2.20) adjustment fails to bring about the minimum selector receiving margins.

Related Adjustments

Affected By

- ARMATURE BRACKET POSITION (2.18)
- ARMATURE SPRING (2.20)
- SHOE RELEASE LEVER GAP AND TRIP LEVER ENGAGEMENT (2.19)

SECTION 574-122-700

2.125 Carriage Area (continued)

FINAL PRINTING ALIGNMENT (FPA-2)

Note: 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 should 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 VERTICAL TYPE ALIGNMENT (Platen Area) (2.71 - F or 2.90 - S) adjustment by either moving typewheel vertically (late design) or moving platen toward portion of light shading (early design).

Note: The following punctuation marks, comma (,), apostrophe ('), dash (-), underline (_), and period (.), may exhibit underscoring or overscoring. The overscoring or underscoring is acceptable on these characters provided the nature of another character is not changed and the mark is not interpreted as a character.

Left character T or poor quality ---

---using left pry points, refine TYPEWHEEL POSITIONING (2.51) adjustment.

Right character H of poor quality ---

---using right pry points, refine TYPEWHEEL POSITIONING (2.51) adjustment.

Characters spread out ---

---refine TYPEWHEEL POSITIONING (2.51) adjustment by moving plate frontward.

Characters run together ---

---refine TYPEWHEEL POSITIONING (2.51) adjustment by moving plate rearward.

Both characters of light shading on left side ---

---refine TYPEWHEEL "HOME" POSITION (2.58) adjustment by rotating wheel clockwise as viewed from top.

Both characters of light shading on right side ---

---refine TYPEWHEEL "HOME" POSITION (2.58) adjustment by rotating wheel counterclockwise as viewed from top.

Related Adjustments

Affected By

TYPEWHEEL "HOME" POSITION (2.58)
VERTICAL TYPE ALIGNMENT - F (2.71)
VERTICAL TYPE ALIGNMENT - S (2.90)
TYPEWHEEL POSITIONING (2.51)

3. VARIATIONS TO BASIC ADJUSTMENTS

3.01 Answer-Back Area

Note 1: In a complete readjustment of the answer-back, loosen the "Here Is" and answer-back adjusting bracket mounting screws and retain in this condition until the brackets are adjusted in their normal sequence.

Note 2: The answer-back trip lever adjusting tab should clear the control lever before proceeding with the following adjustments.

BLOCKING LINK CLEARANCE (ABA-1)
(For sets with blocking link as shown at right.)

To Check

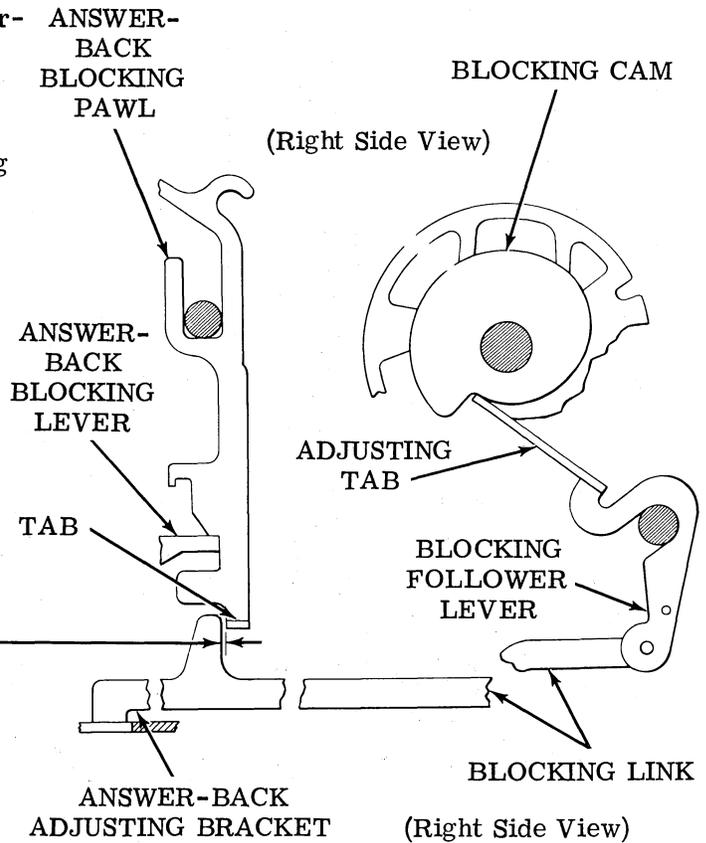
Disengage (latch) distributor and function clutches, engage the answer-back blocking lever fully in indent of answer-back blocking pawl. Take up play in the answer-back blocking pawl toward the front of the typing unit.

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 TP180993 bending tool.



BLOCKING LINK CLEARANCE (ABA-1)
(For sets with blocking link as shown at right.)

To Check

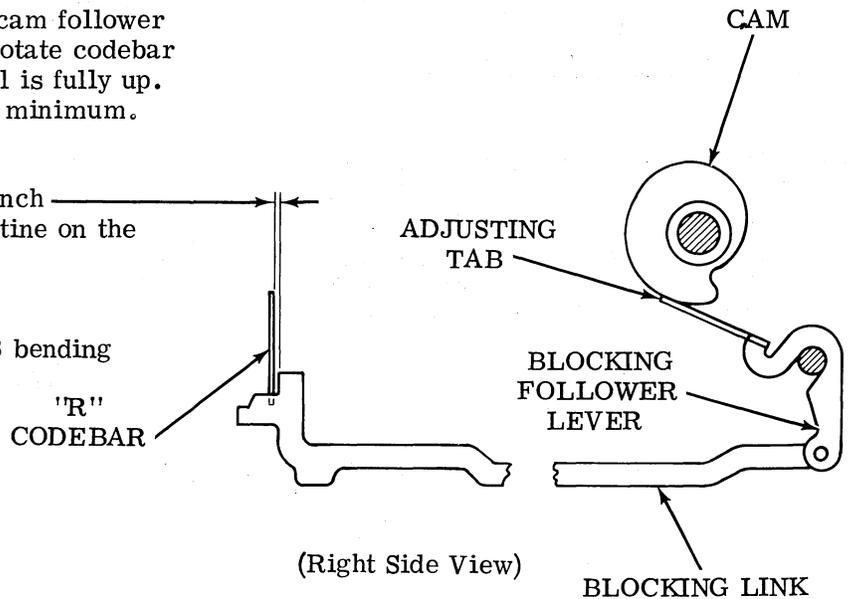
Rotate distributor clutch so that cam follower is on the high part of the cam. Rotate codebar clutch until the codebar reset bail is fully up. Take up clearance to make gap a minimum.

Requirement

Min 0.050 inch---Max 0.070 inch
between the "R" codebar and the tine on the blocking link.

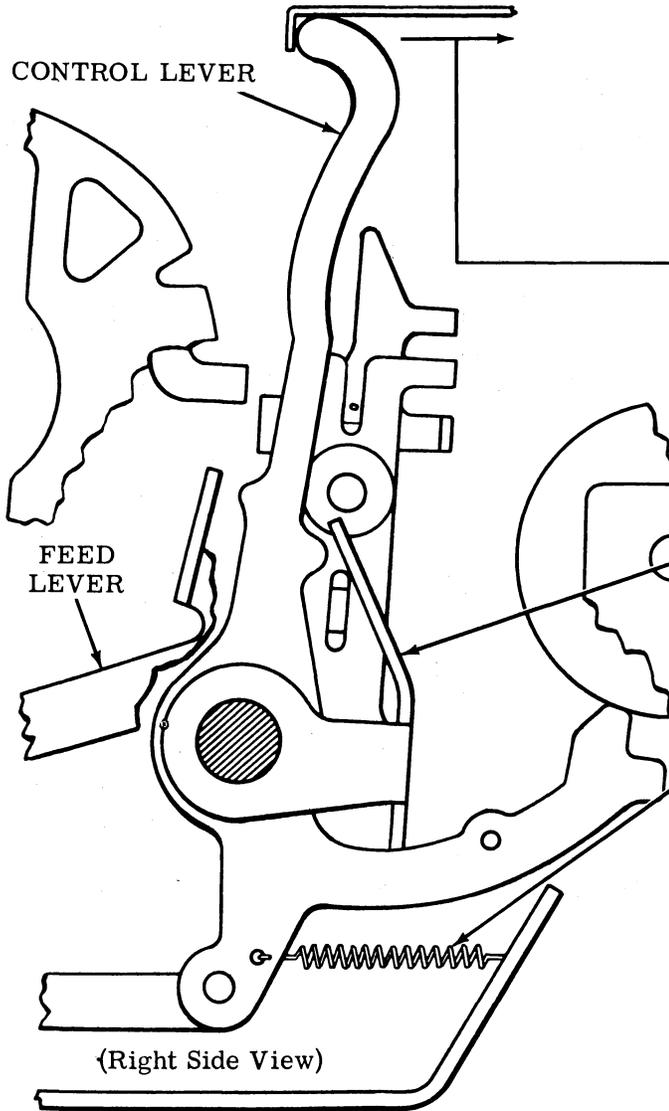
To Adjust

Bend adjusting tab with TP180993 bending tool.



3.02 Answer-Back Area (continued)

CONTROL LEVER SPRING — HORIZONTAL



To 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.

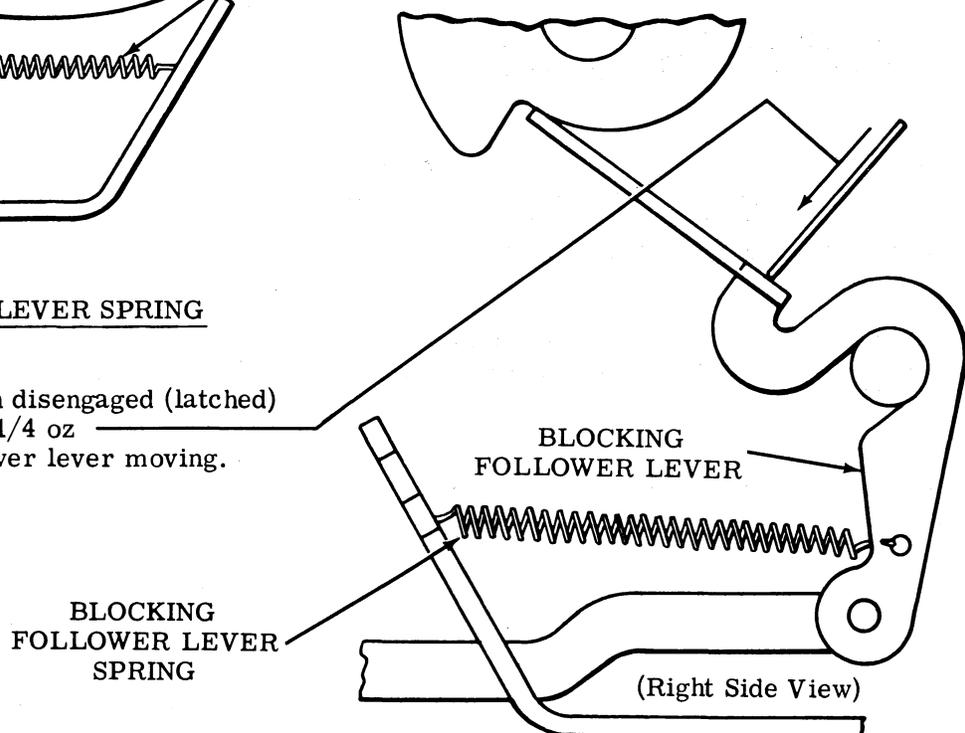
Requirement

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

BLOCKING FOLLOWER LEVER SPRING

Requirement

With distributor clutch disengaged (latched)
Min 1 oz---Max 2¹/₄ oz
to start blocking follower lever moving.



3.03 Answer-Back Area (continued)

DRUM POSITION (ABA-2)

To Check

With distributor clutch disengaged (latched) rotate answer-back drum until lower extension of control lever engages indent of answer-back drum and detent lever is between ST and 20 rows on answer-back drum.

(1) Requirement

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.

(2) Requirement

With finger pressure, push lightly on drum in a counterclockwise direction. While maintaining this light pressure, pull drum detent lever out of engagement with drum. There should be no or barely perceptible counterclockwise movement of answer-back drum.

Note 1: For instructions on coding the answer-back drum, see the appropriate installation section.

Note 2: Make sure there is clearance between the feed lever adjusting tab and the control lever, bend the feed lever adjusting tab toward the front of the typing unit.

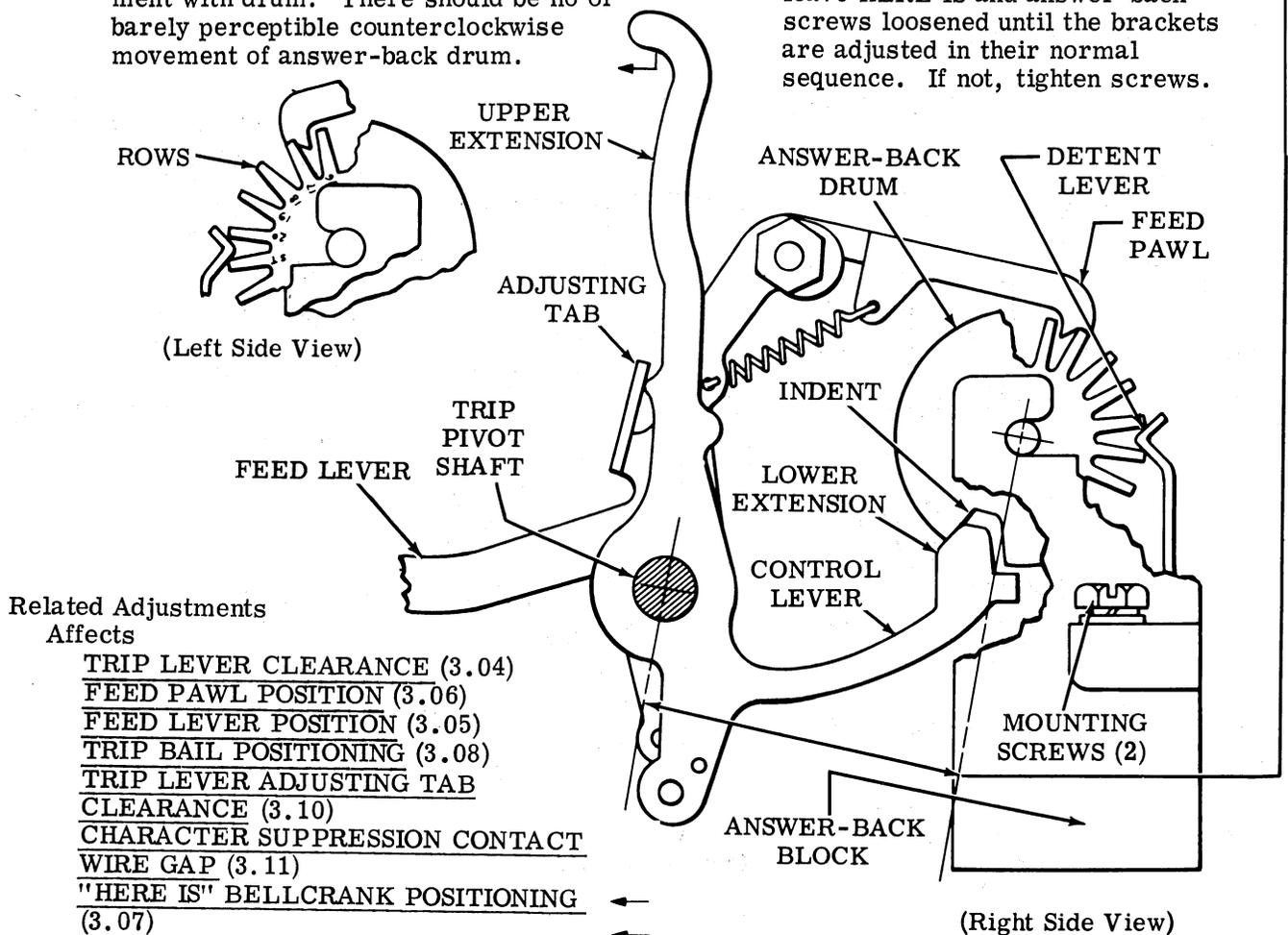
(3) Requirement

The axis of the answer-back drum should 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, position block to meet requirements.

Note: If complete readjustment of answer-back is to be performed, leave HERE IS and answer-back screws loosened until the brackets are adjusted in their normal sequence. If not, tighten screws.



3.04 Answer-Back Area (continued)

TRIP LEVER CLEARANCE (ABA-3)

To 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 row 1 and 2 on answer-back drum.

Requirement

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

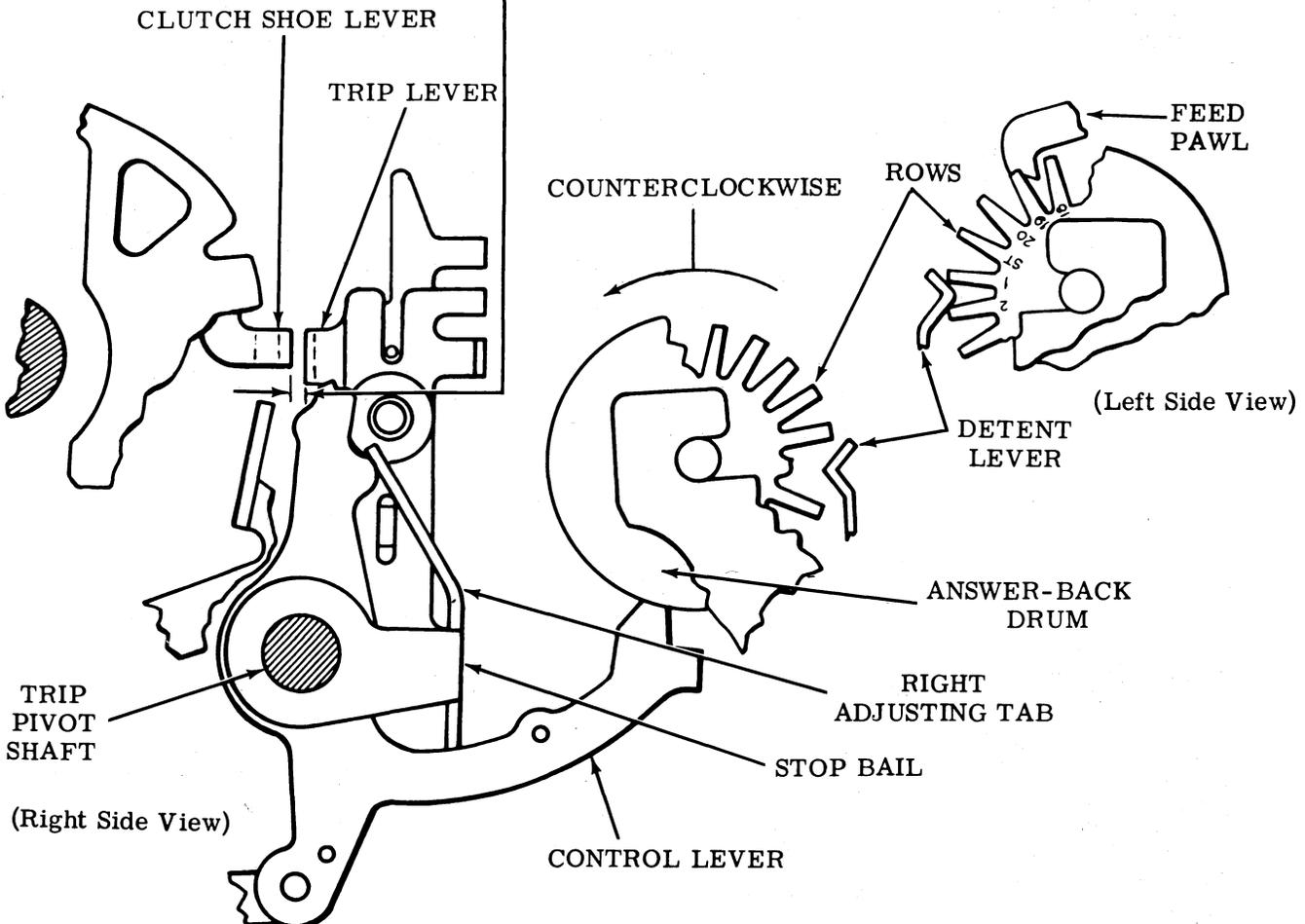
To Adjust

Bend right adjusting tab using TP180993 bending tool.

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

Related Adjustments

Affected By
DRUM POSITION (3.03)



3.05 Answer-Back Area (continued)

FEED LEVER POSITION (ABA-4)**To Check**

With answer-back drum fully detented in its home position, trip distributor clutch and manually rotate main shaft until cam roller is adjacent to high part of feed lever. Rotate cam roller to minimize clearance (late design rollers with identifying groove near clutch disc do not require rotation to determine minimum clearance). Hold feed pawl clear of answer-back drum.

Requirement

Min some---Max 0.005 inch
between feed lever and cam roller.

To Adjust

Bend feed lever adjusting tab with
TP180993 bending tool.

Related Adjustments**Affects**

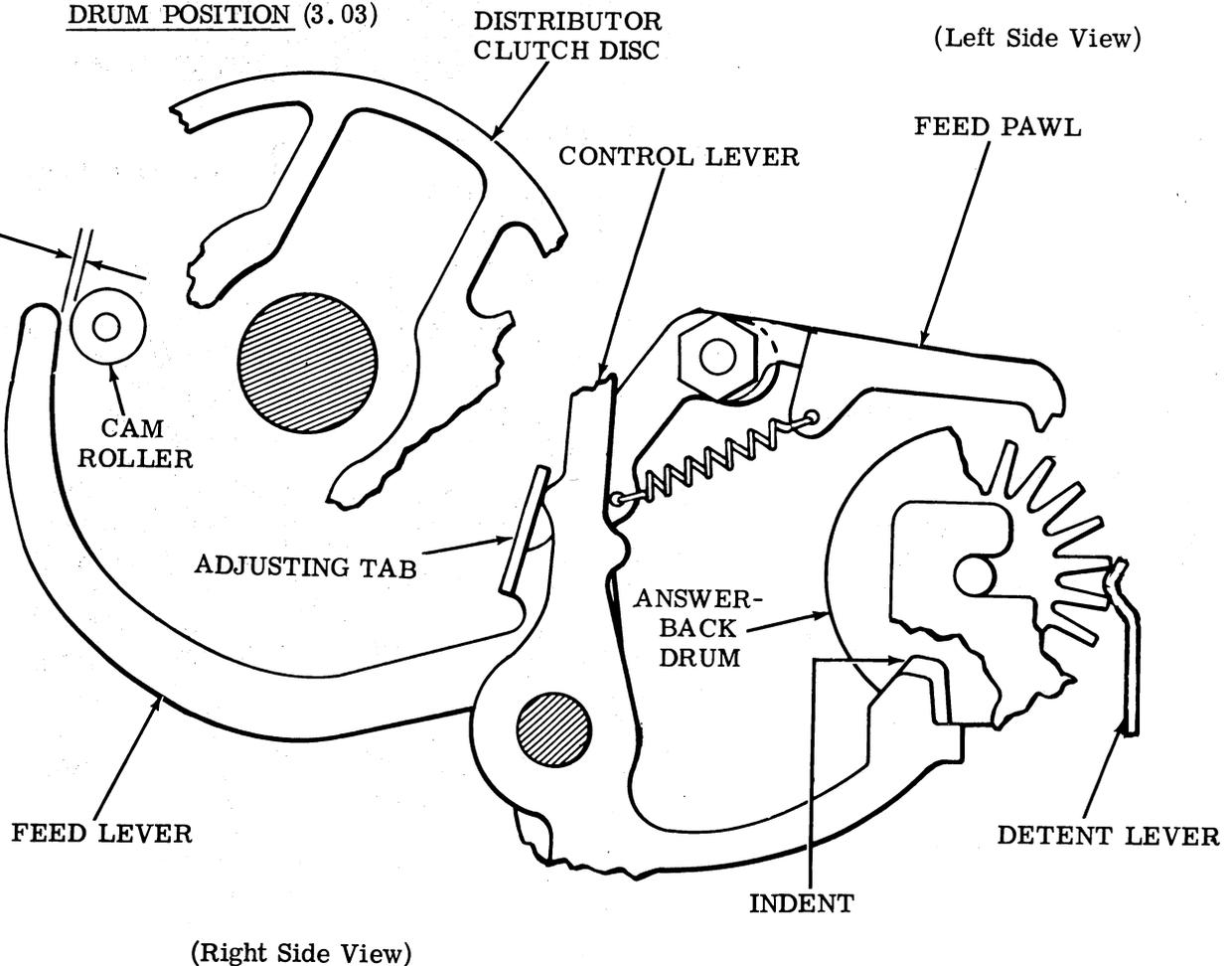
TRIPBAIL POSITIONING (3.08)
FEED PAWL POSITION (3.06)
"HERE IS" BELLCRANK
POSITIONING (3.07)

Affected By

DRUM POSITION (3.03)

Note 1: The minimum requirement is met if there is no movement of the answer-back feed pawl when rotating the distributor shaft to its stop position.

Note 2: For increased feed margin, particularly when changing drums, hold this requirement to the minimum side.



3.06 Answer-Back Area (continued)

FEED PAWL POSITION (ABA-5)

(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 adjacent to high part of feed lever. With feed pawl positioned fully within answer-back ratchet, take up all play to minimize required clearance.

Requirement

Min some---Max 0.005 inch between feed pawl and rear face of no. 16 drum tooth.

Note: The "some" requirement is met if when feed pawl is raised above no. 16 tooth it returns behind it under its own spring force.

To Adjust

With adjusting nut and screw friction tight, position feed pawl against rear surface of no. 16 tooth. Tighten nut and screw.

(2) To Check

Push the top of the control lever toward the rear of typing unit and simultaneously rotate the main shaft. Observe the operation of the feed pawl.

Requirement

While operating, the feed pawl should be centrally located on feed ratchet teeth.

To Adjust

Bend feed lever just below feed pawl.

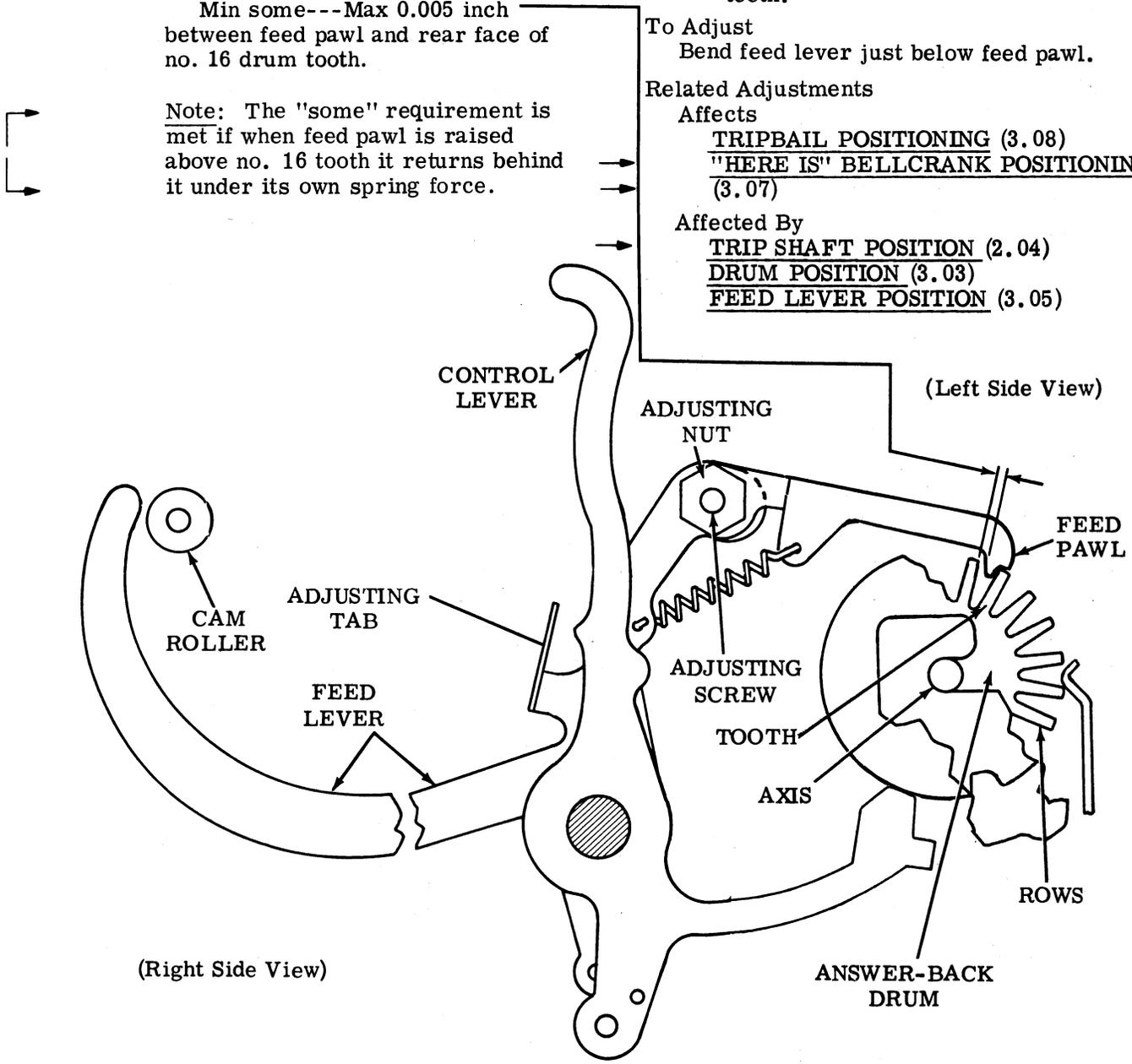
Related Adjustments

Affects

TRIPBAIL POSITIONING (3.08)
"HERE IS" BELLCRANK POSITIONING (3.07)

Affected By

TRIP SHAFT POSITION (2.04)
DRUM POSITION (3.03)
FEED LEVER POSITION (3.05)



3.07 Answer-Back Area (continued)

"HERE IS" BELLCRANK POSITIONING (ABA-6)

Note: This adjustment cannot be checked unless the typing unit is replaced on the subbase with the keyboard.

(1) To Check

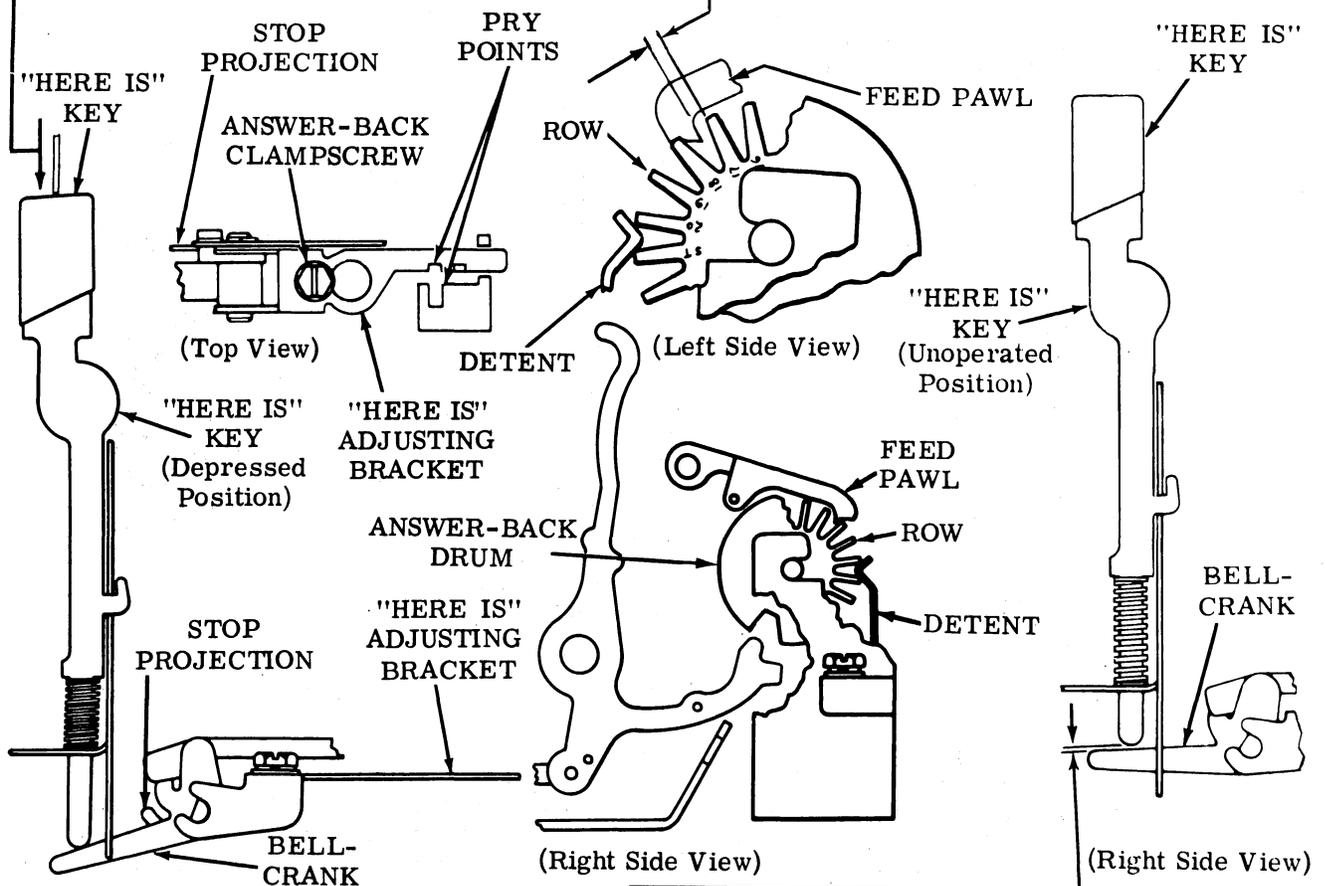
Place set under power. Disengage all clutches. Apply a force of 10 to 20 ounces vertically down on the HERE IS keytop for approximately one character cycle.

Requirement

The distributor clutch and answer-back drum should operate within the same character cycle.

To Adjust

Place keyboard fully forward (keyboard side brackets touching the bosses on the front of the subbase). Answer-back drum fully detented in its stop position. Depress the HERE IS keytop to trip the distributor clutch and rotate the distributor shaft until the answer-back feed lever is not in contact with the clutch disc cam roller. With the HERE IS keylever depressed with a force of 20 ounces there should be 0.020 inch to 0.040 inch overtravel between the answer-back feed pawl and the face of answer-back drum feed ratchet tooth of row 17. Loosen clampscrew friction tight and position HERE IS adjusting bracket (using pry points) to meet the 0.020 to 0.040 inch overtravel.



(2) To Check

Disengage distributor clutch. Answer-back drum fully detented in its stop position. HERE IS keylever in its unoperated position.

Requirement

Some clearance between the HERE IS keylever and the HERE IS nylon bellcrank.

Related Adjustments

Affects

- TRIPBAIL POSITIONING (3.08)
- CHARACTER SUPPRESSION CONTACT WIRE GAP (3.11)

Affected By

- DRUM POSITION (3.03)
- FEED PAWL POSITION (3.06)
- FEED LEVER POSITION (3.05)

3.08 Answer-Back Area (continued)

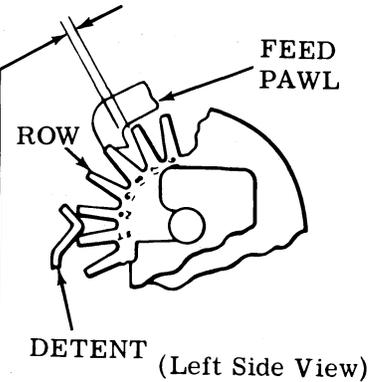
TRIPBAIL POSITIONING (ABA-7)

(1) To Check

Place the typing unit in stop condition. Trip function clutch and 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 (position no. 3).

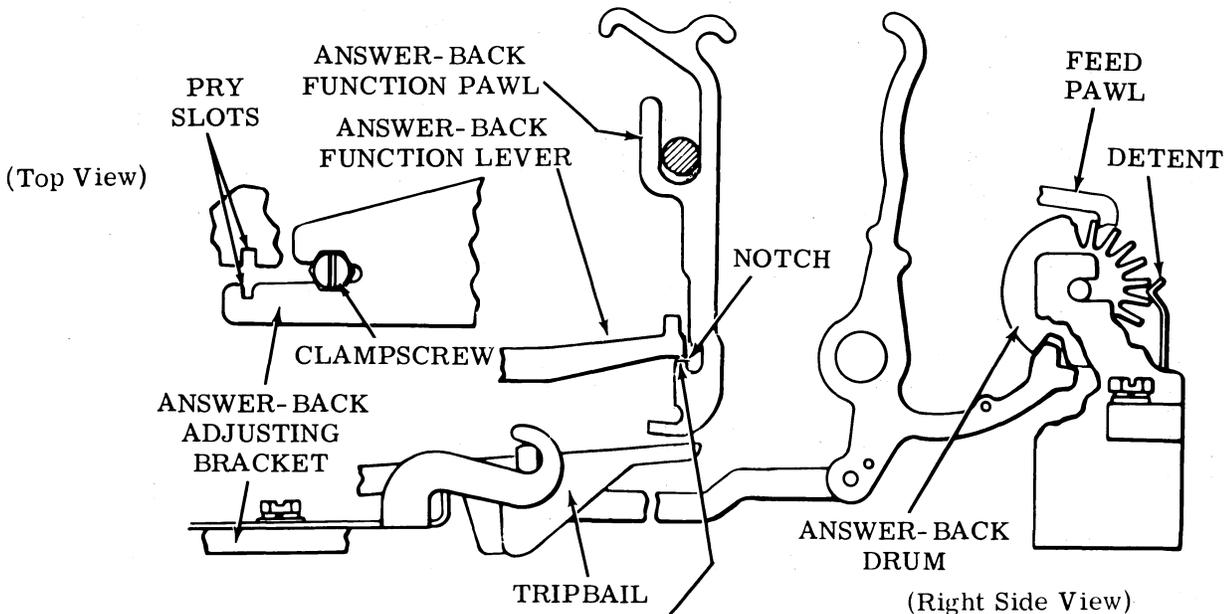
Note: The feed pawl will move back to pick up the next tooth on the answer-back drum feed ratchet.

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



Requirement

Min 0.010 inch---Max 0.040 inch overtravel between feed pawl and face of answer-back drum feed ratchet of row 17.



(2) To Check

With typing unit in stop condition, set up the code combination for the answer-back call character in the selector. Rotate the main shaft until the answer-back function pawl moves forward to its selected position. Observe the forward movement of the answer-back function pawl.

Requirement

As function bail approaches its highest point of travel, answer-back function pawl must move forward freely to its selected position without hesitation.

To Adjust

With clampscrew friction tight, use pry points to position answer-back bracket to meet requirement (1). Tighten clampscrew.

Related Adjustments

Affected By

- DRUM POSITION (3.03)
- FEED PAWL POSITION (3.06)
- RIGHT ROCKER DRIVE (2.36)
- FEED LEVER POSITION (3.05)

3.09 Answer-Back Area (continued)

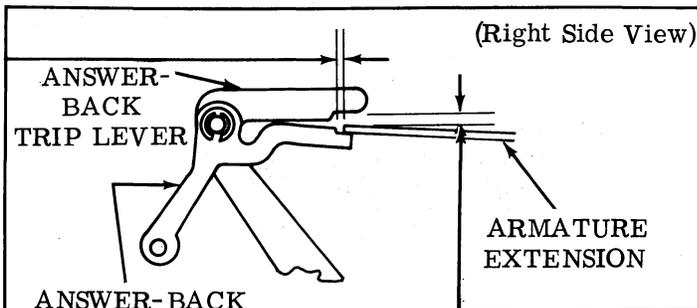
Note: The adjustment on this page applies only to typing units equipped with an answer-back trip magnet mechanism. Before proceeding with adjustment, make sure magnet bracket is positioned as far forward and to the left on base casting post as mounting screws will permit.

TRIP LEVER OVERTRAVEL AND ARMATURE GAP (VFA-1)

To 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. Control lever must be clear of answer-back to trip lever adjusting tab — if necessary, bend tab forward to provide clearance. Place armature in its attracted position, and take up play toward rear of typing unit.

(1) Requirement

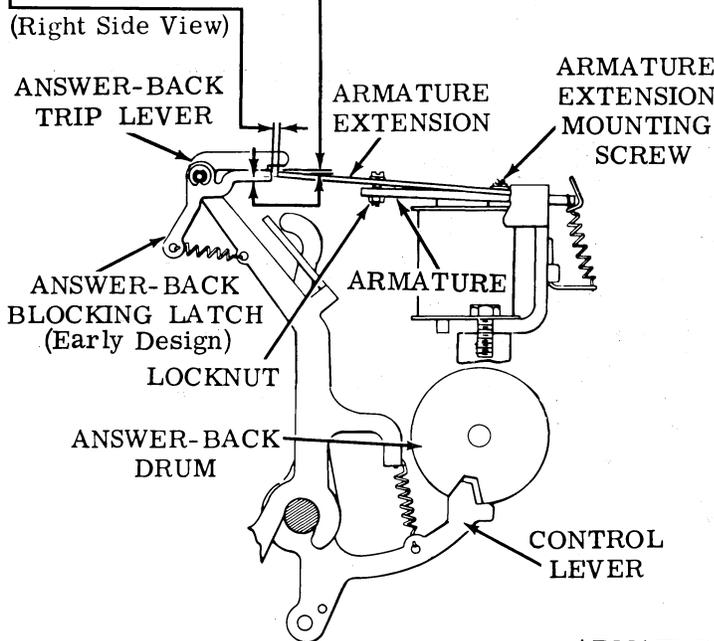


Min 0.006 inch---Max 0.015 inch
between the end of armature extension and the blocking surface of the answer-back blocking latch when the latch is vertically aligned with the trip lever.

To Adjust

Loosen armature extension mounting screw friction tight. Position the armature extension using pry points. Tighten screw.

(2) Requirement



Units with early design blocking latch. Front end of armature extension should be vertically centered between the top and bottom surfaces of the answer-back blocking latch as gauged by eye.

Units with late design blocking latch
Min 0.055 inch---Max 0.075 inch
between armature extension and lower surface of answer-back trip lever.

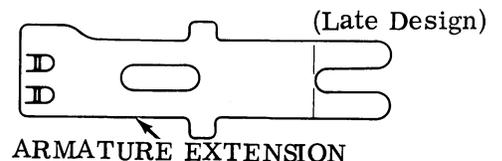
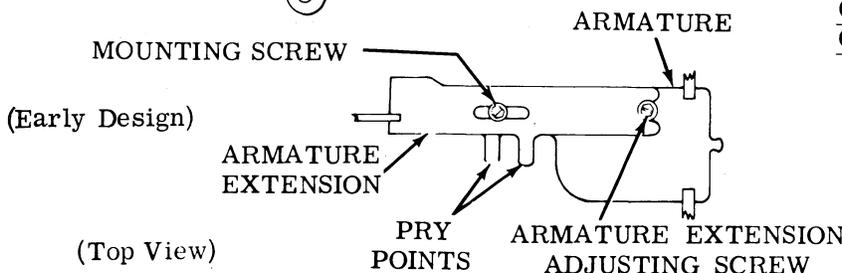
To Adjust

Loosen armature extension adjusting screw locknut friction tight. Position armature extension using armature extension adjusting screw. Tighten locknut.

Related Adjustments

Affects

- TRIP LEVER ADJUSTING TAB CLEARANCE (3.10)
- CHARACTER SUPPRESSION
- CONTACT WIRE GAP (3.11)



3.10 Answer-Back Area (continued)

Note: The following adjustment applies only to typing units equipped with an answer-back trip magnet mechanism.

TRIP LEVER ADJUSTING TAB CLEARANCE (VFA-2)

To Check

With the answer-back drum fully detented in its home position, place the typing unit in its stop position. Take up play in the armature toward the rear and center the trip lever between the armature extension guide ears. Center the control lever on the adjusting tab of the trip lever.

Related Adjustments

Affects

CHARACTER SUPPRESSION CONTACT WIRE GAP (3.11)

Requirement

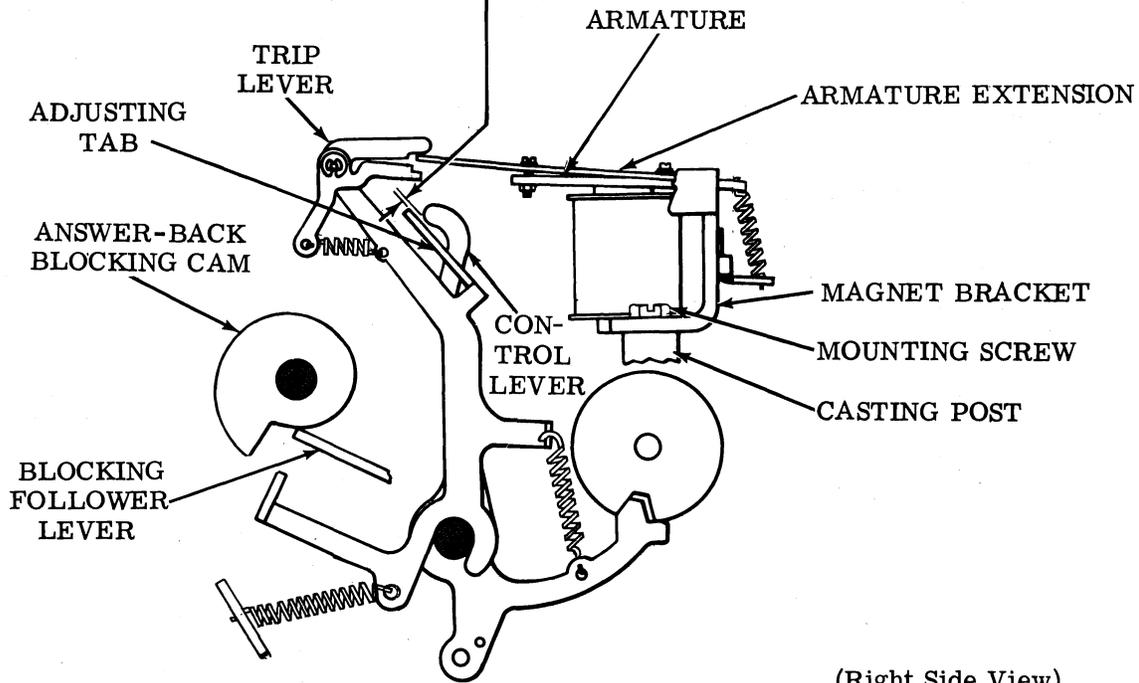
Min some---Max 0.020 inch between adjusting tab and tip of control lever.

Affected By

TRIP LEVER OVERTRAVEL AND ARMATURE GAP (3.09)
DRUM POSITION (3.03)

To Adjust

Bend adjusting tab at its inner edge to the front or rear using TP180993 bending tool.



3.11 Answer-Back Area (continued)

CHARACTER SUPPRESSION CONTACT WIRE GAP (ABA-8)

To Check

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

Requirement

Min 0.030 inch---Max 0.055 inch
between suppression contact wire and
common contact.

To Adjust

Position adjusting spring on the tie link. (Exercise caution to avoid twisting tie link.)

Related Adjustments

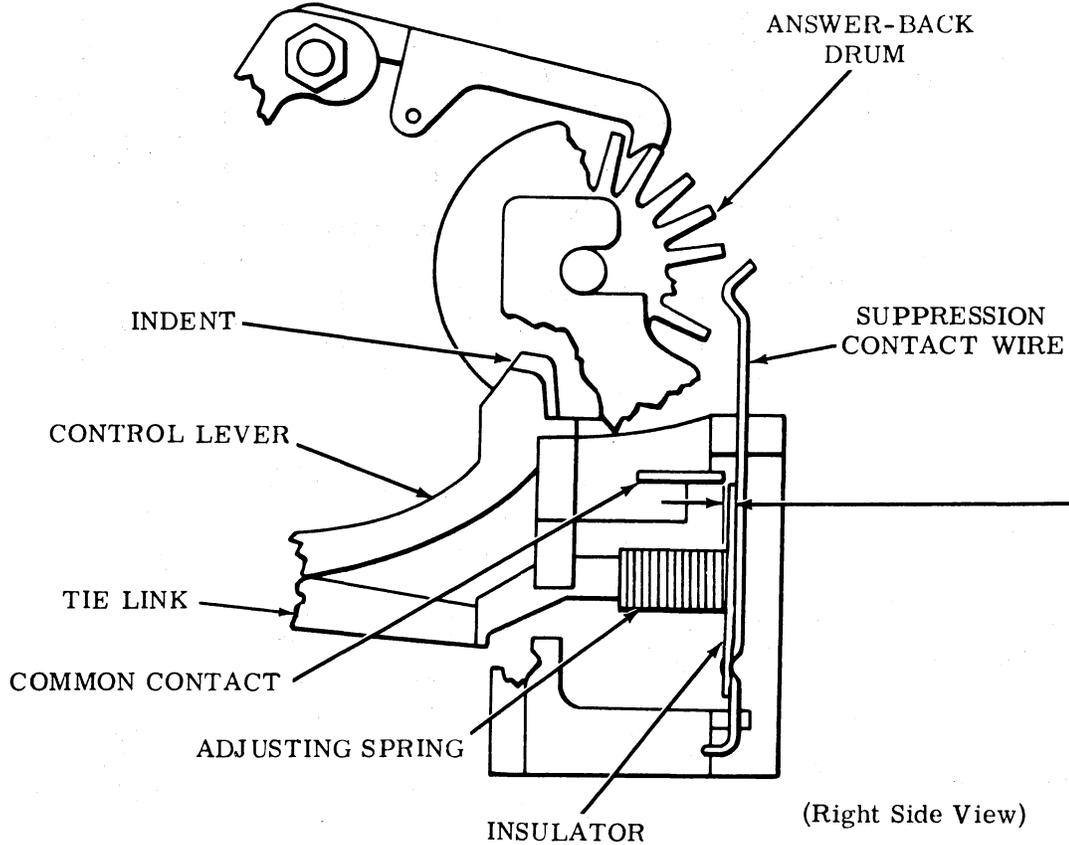
Affected By

TRIP LEVER OVERTRAVEL AND ARMATURE GAP (3.09)

DRUM POSITION (3.03)

TRIP LEVER ADJUSTING TAB CLEARANCE (3.10)

"HERE IS" BELLCRANK POSITIONING (3.07)



3.12 Answer-Back Area (continued)

CONTROL LEVER SPRING — VERTICAL (Early Design)

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

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.

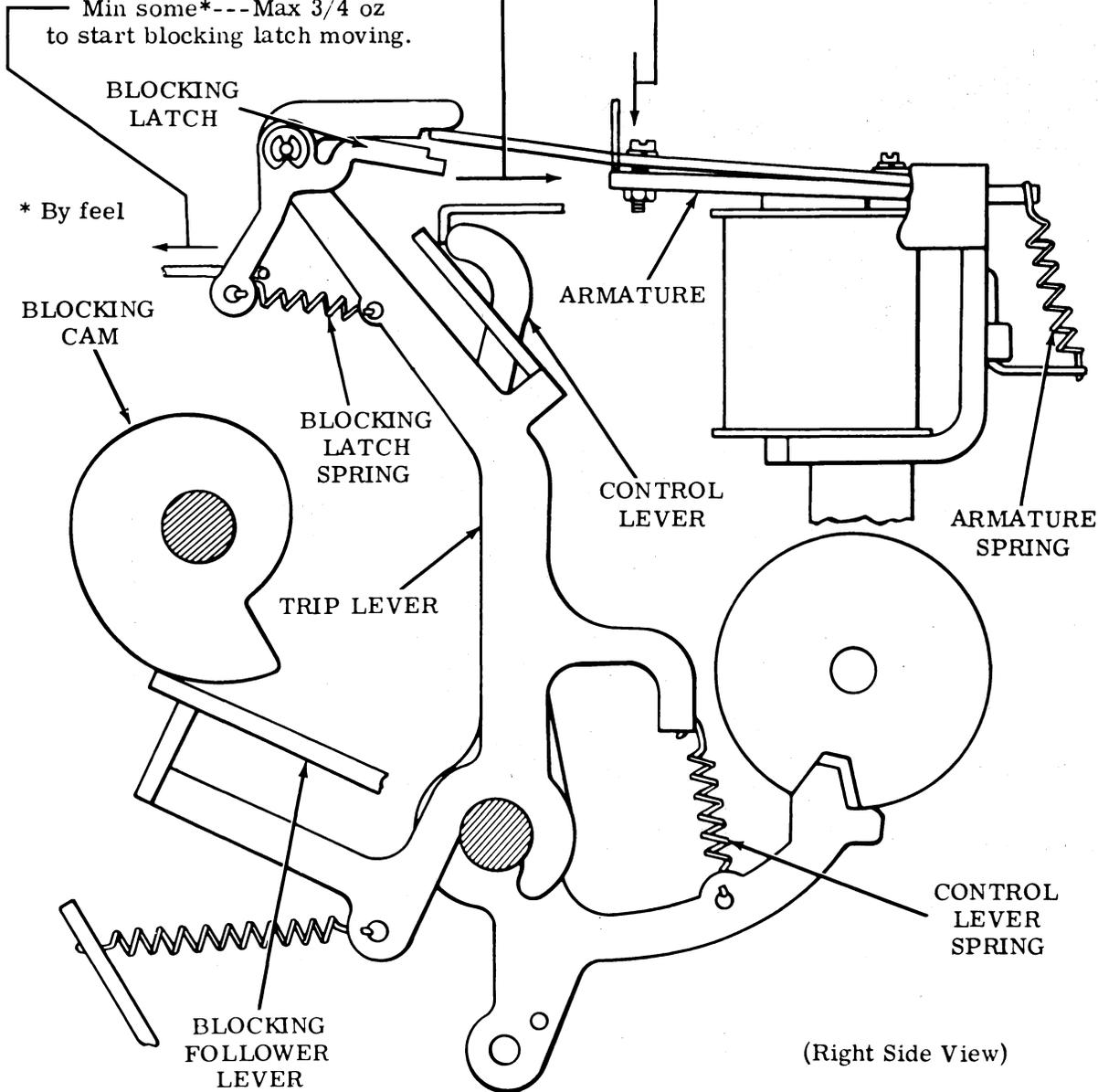
ARMATURE SPRING

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.



* By feel

(Right Side View)

3.13 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 TP182276 trip lever.

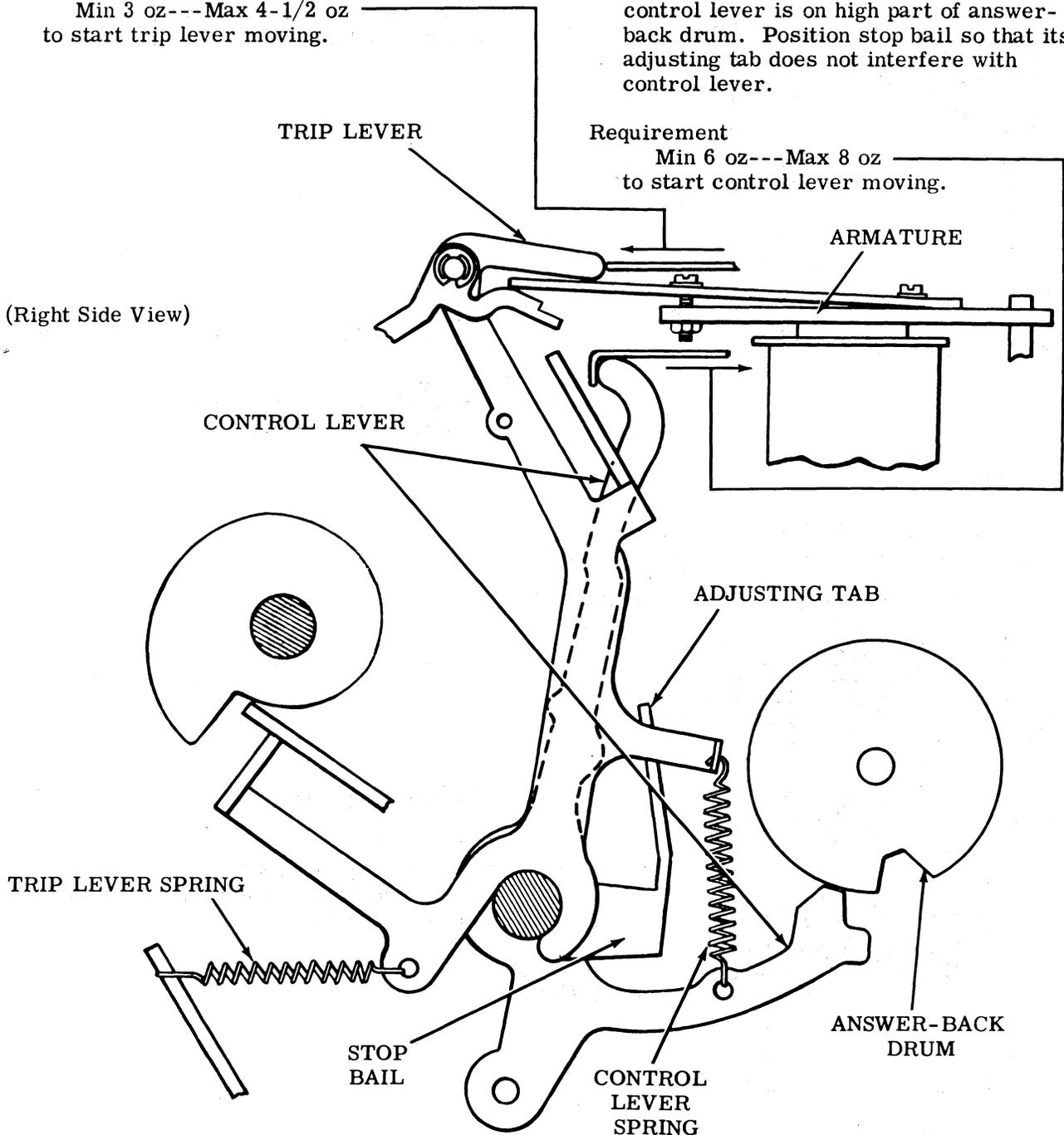
To Check

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.

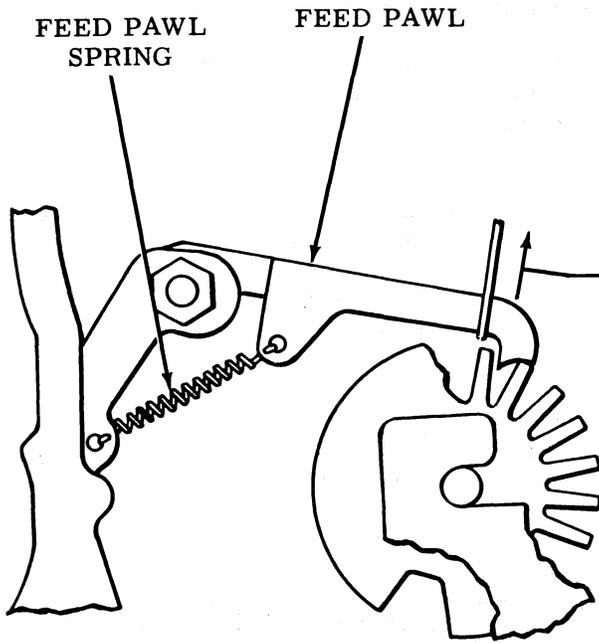
Requirement

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

(Right Side View)



3.14 Answer-Back Area (continued)



(Right Side View)

FEED PAWL SPRING

Requirement

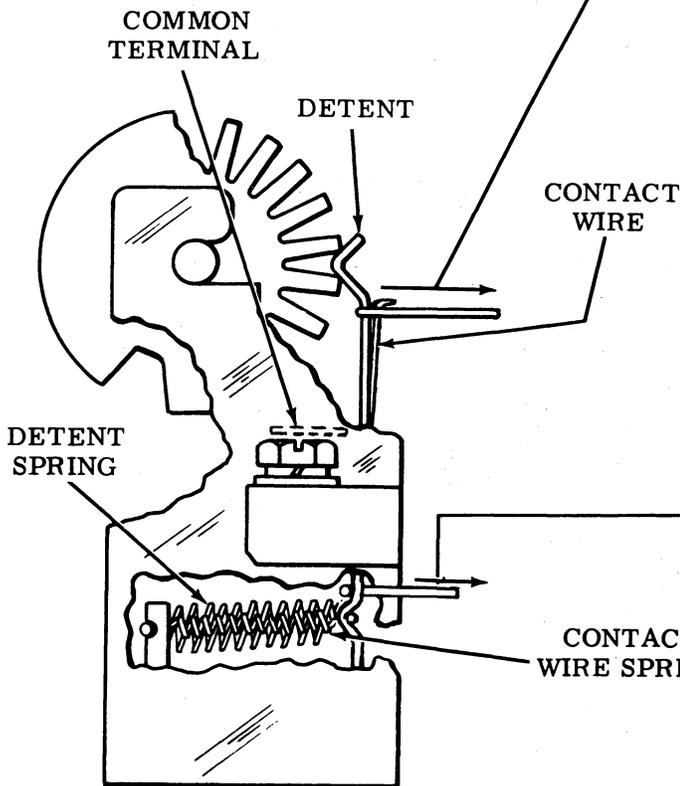
With distributor clutch disengaged (latched)

Min 1/2 oz---Max 1-1/4 oz to start feed pawl moving.

DETENT SPRING

Requirement

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



(Right Side View)

CONTACT WIRE SPRING

Requirement

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

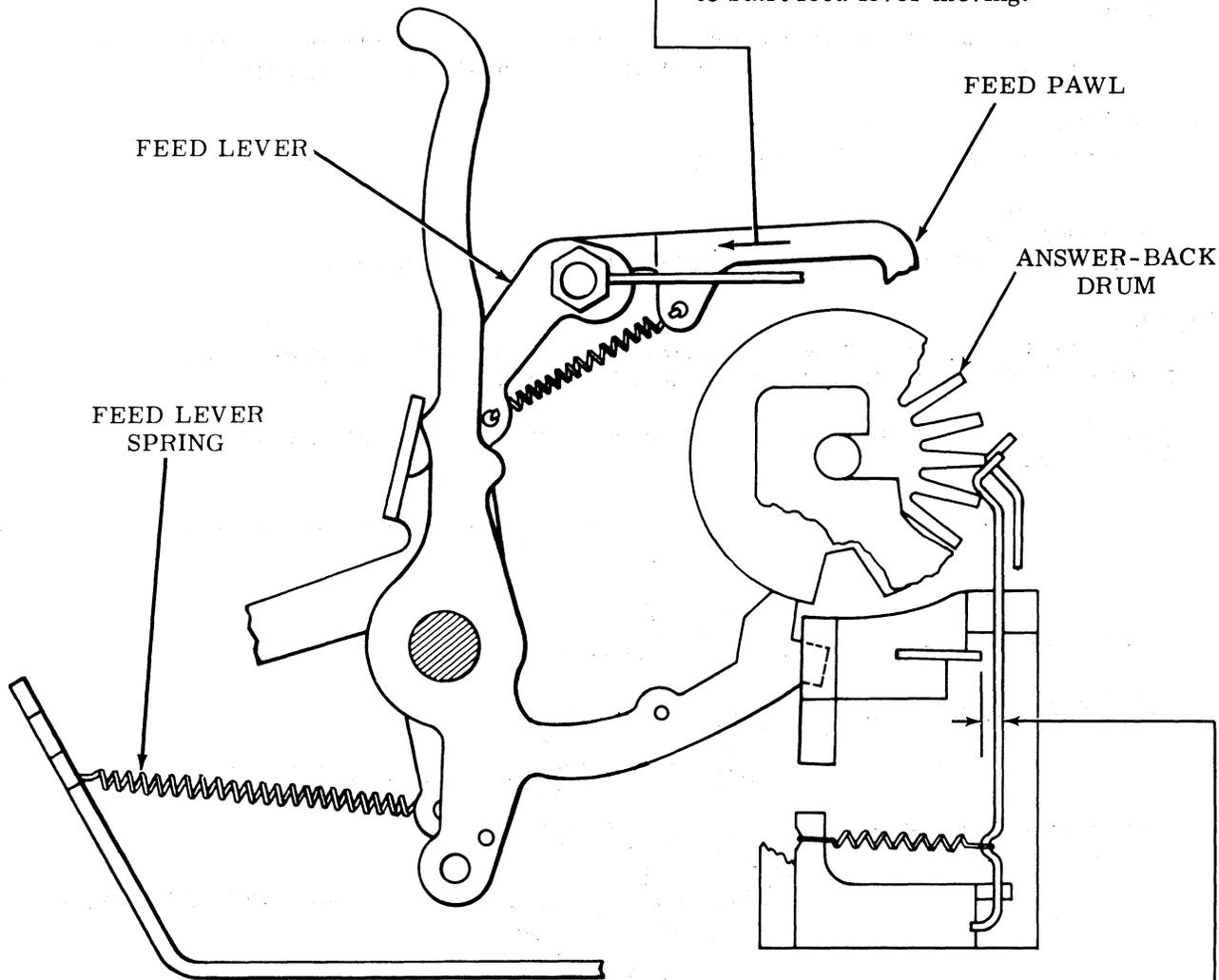
3.15 Answer-Back Area (continued)

FEED LEVER SPRING

Requirement

With distributor clutch disengaged (latched) and feed pawl held out of engagement with answer-back drum

Min 4-1/4 oz---Max 5-1/4 oz to start feed lever moving.



(Right Side View)

CODE CONTACT WIRE GAP (ABA-9)

To Check

Manually rotate drum until contact wires are riding between no. 1 and no. 2 tooth (detent riding on top of no. 1 tooth).

Requirement

Min 0.010 inch---Max 0.035 inch between code contact wires and common contact bar. Measure each contact wire between rows where a tine above or below is still present.

To Adjust

Bend contact wires.

3.16 Function Area

CONTACT ASSEMBLY POSITION (MIA-1)

(1) To Check

Set up code combination in selector that is to operate the function pawl associated with a contact arm and rotate the main shaft until the function bail is in its highest position (position no. 1).

Requirement

Min 0.010 inch--Max 0.020 inch
between the contact arm and the contact at the closest point as illustrated.

(2) To Check

Place typing unit in stop condition.

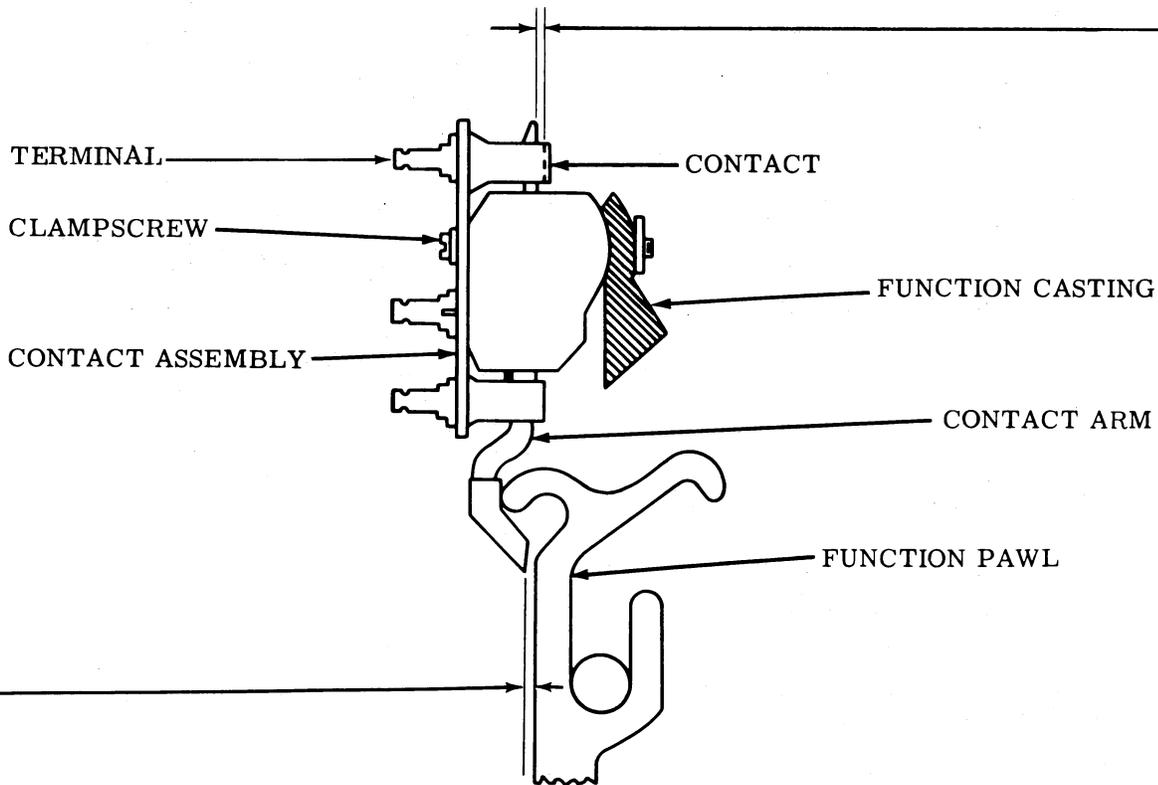
Requirement

Min some
clearance between the function pawl and the tip of the contact arm.

To Adjust

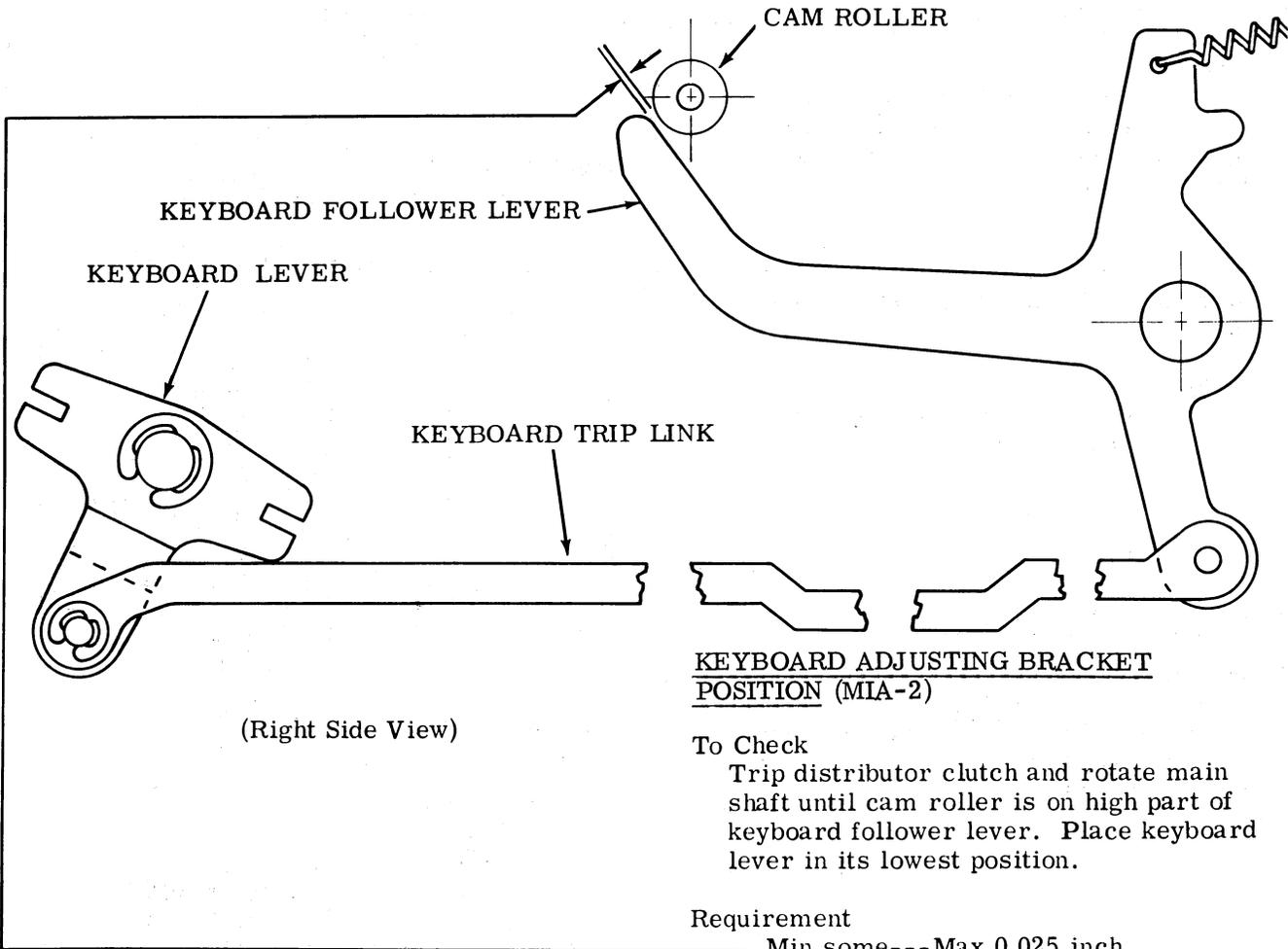
With two clampscrews friction tight, position the contact assembly on the function casting. If necessary, bend the upper contact. Tighten clampscrews.

Note: For (1) To Check, be sure that the contact arm lines up with and is in contact with the function pawl.



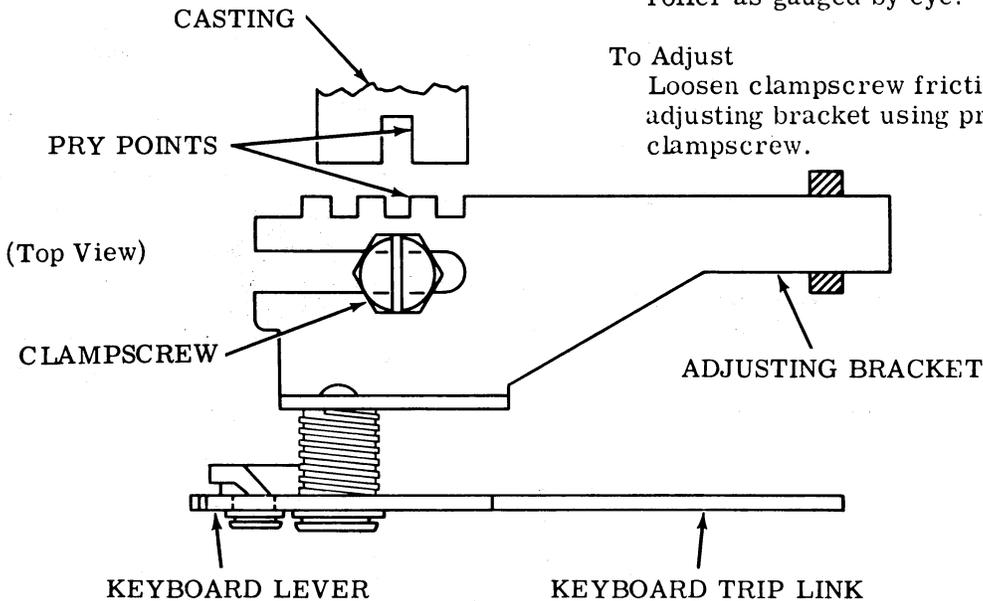
(Left Side View)

3.17 Distributor Area (Receive-Only Sets)



To Check
 Trip distributor clutch and 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
 Loosen clampscrew friction tight. Move adjusting bracket using pry points. Tighten clampscrew.

→3.18 Main Shaft Area (Auxiliary Contact Assembly — TP183594)

→TIME DELAY CONTACT BRACKET POSITION (VFA-6)

To Check

Place the typing unit in the stop condition. Engage the function clutch and rotate the main shaft until the cam follower is on high part of its cam.

Requirement

Max 0.010 inch separation of front contact spring from stiffener.

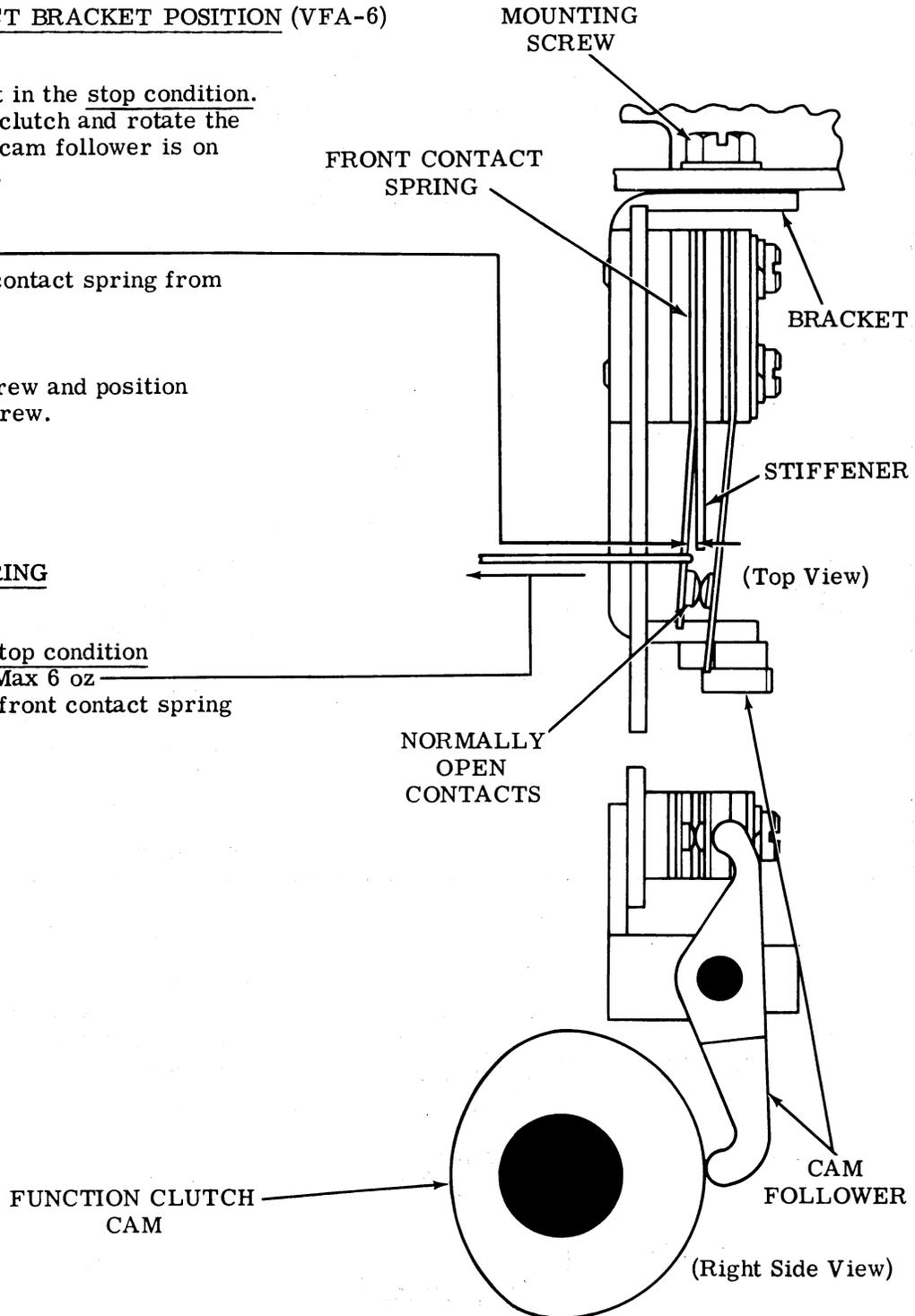
To Adjust

Loosen mounting screw and position bracket. Tighten screw.

FRONT CONTACT SPRING

Requirement

With typing unit in stop condition
Min 4-1/2 oz --- Max 6 oz
to just separate the front contact spring from the stiffener.



3.19 Function Area (continued)

Note: The following adjustment applies only to typing units equipped with automatic print-nonprint feature.

NONPRINT FUNCTION LEVER CLEARANCE (VFA-7)**To Check**

Push the nonprint codebar to the right until trip armature latches the latch bellcrank. Rotate main shaft until function lever is at its highest point of travel. Take up all play to minimize the required clearance.

Requirement

Min 0.005 inch---Max 0.025 inch
between the function lever in slot 4 in function casting and tine of nonprint codebar.

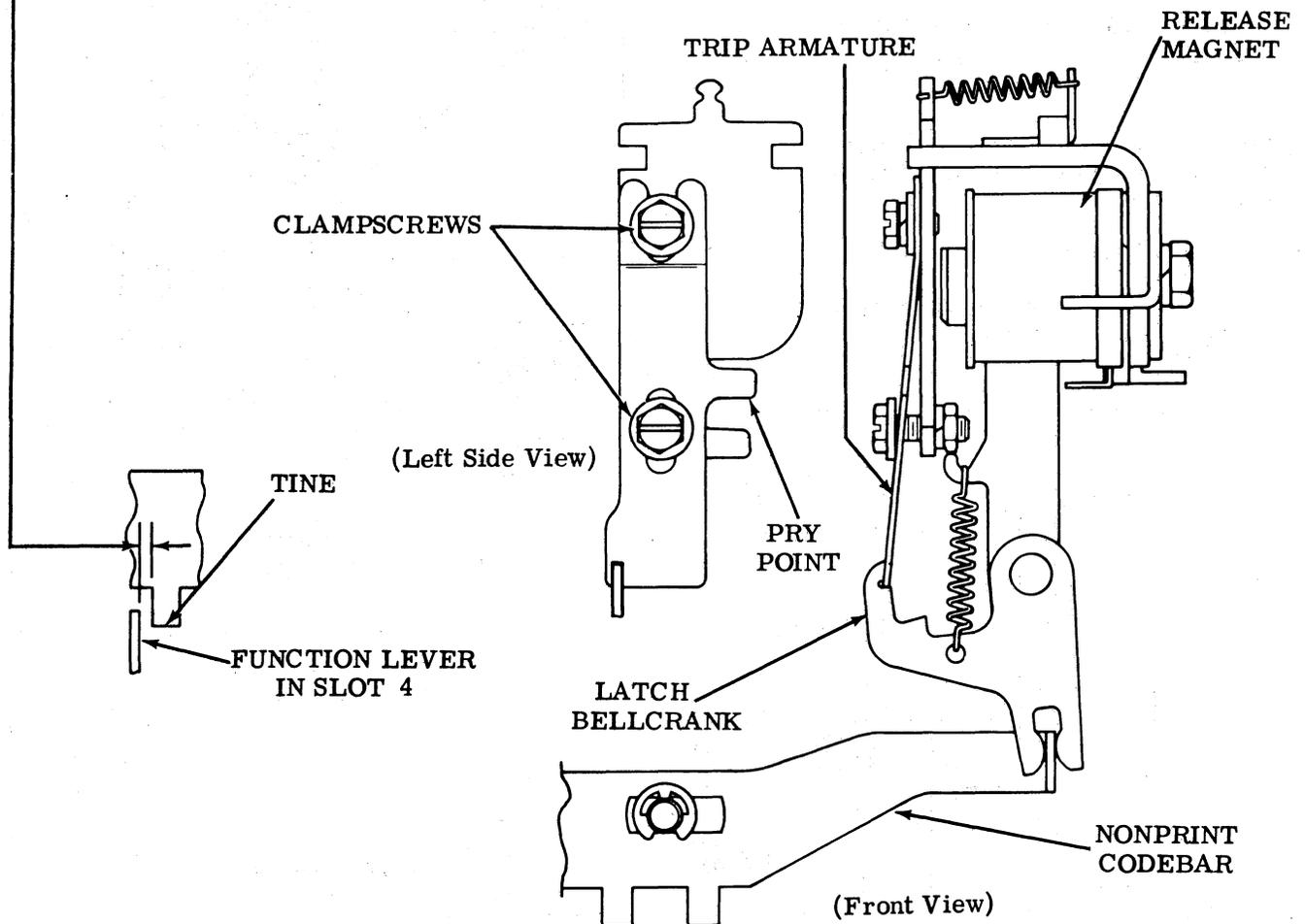
To Adjust

Loosen clampscrews and adjust length of trip armature using pry point. Tighten clampscrews.

Related Adjustments**Affects**

SOLENOID BRACKET POSITION (3.20)

RELEASE MAGNET OVERTRAVEL (3.21)



3.20 Function Area (continued)

Note: The following adjustments apply only to typing units equipped with the automatic print-nonprint feature — for units containing the manual print-nonprint feature, refer to 3.22.

ARMATURE SPRING

To Check

With release magnet de-energized, place plunger to position it assumes when solenoid is energized. Hold plunger seated in that position.

Requirement

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

SOLENOID BRACKET POSITION (VFA-8)

To Check

Energize solenoid.

Requirement

Min 0.015 inch---Max 0.030 inch
between trip armature and latch bellcrank.

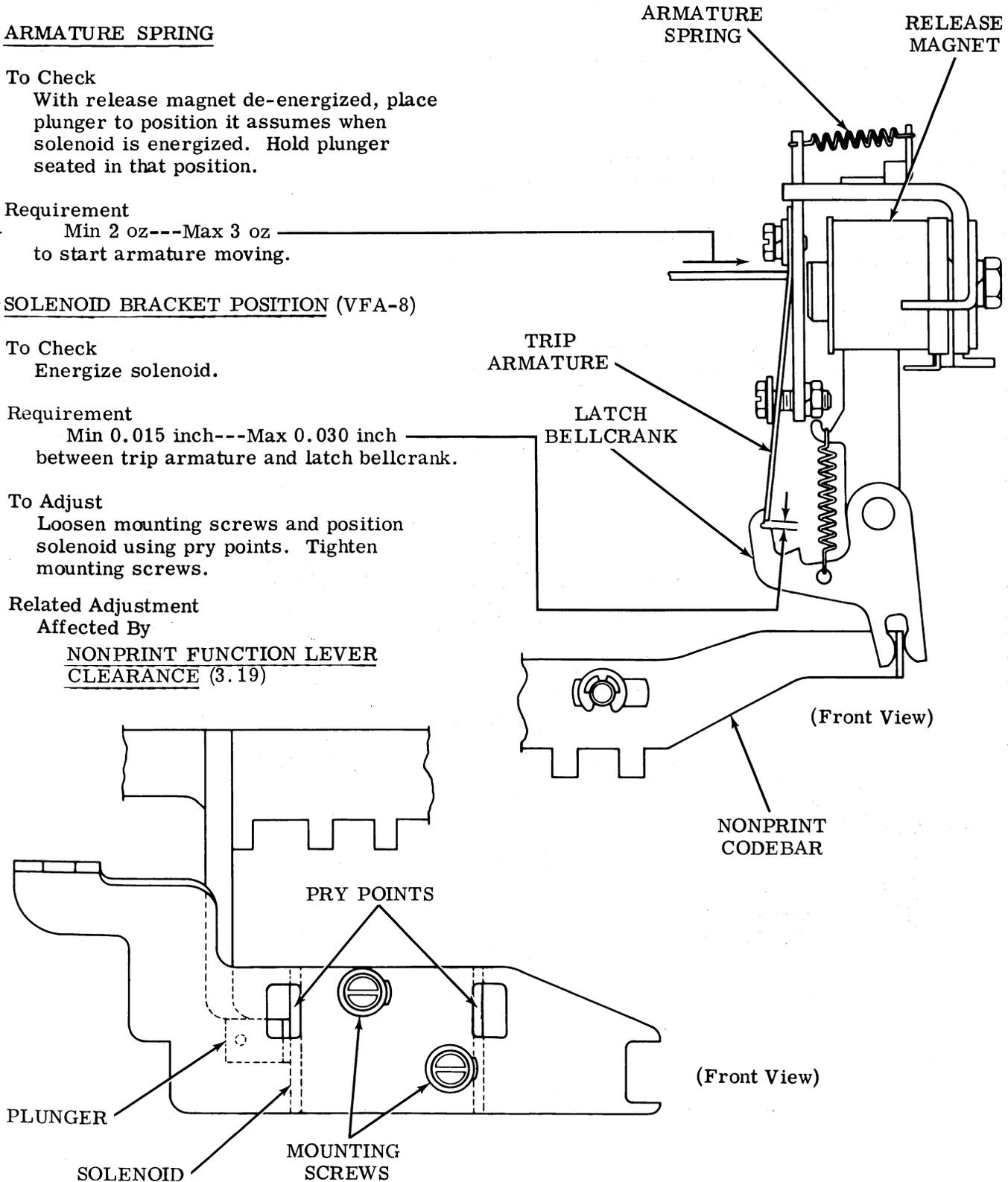
To Adjust

Loosen mounting screws and position solenoid using pry points. Tighten mounting screws.

Related Adjustment

Affected By

NONPRINT FUNCTION LEVER
CLEARANCE (3.19)



3.21 Function Area (continued)

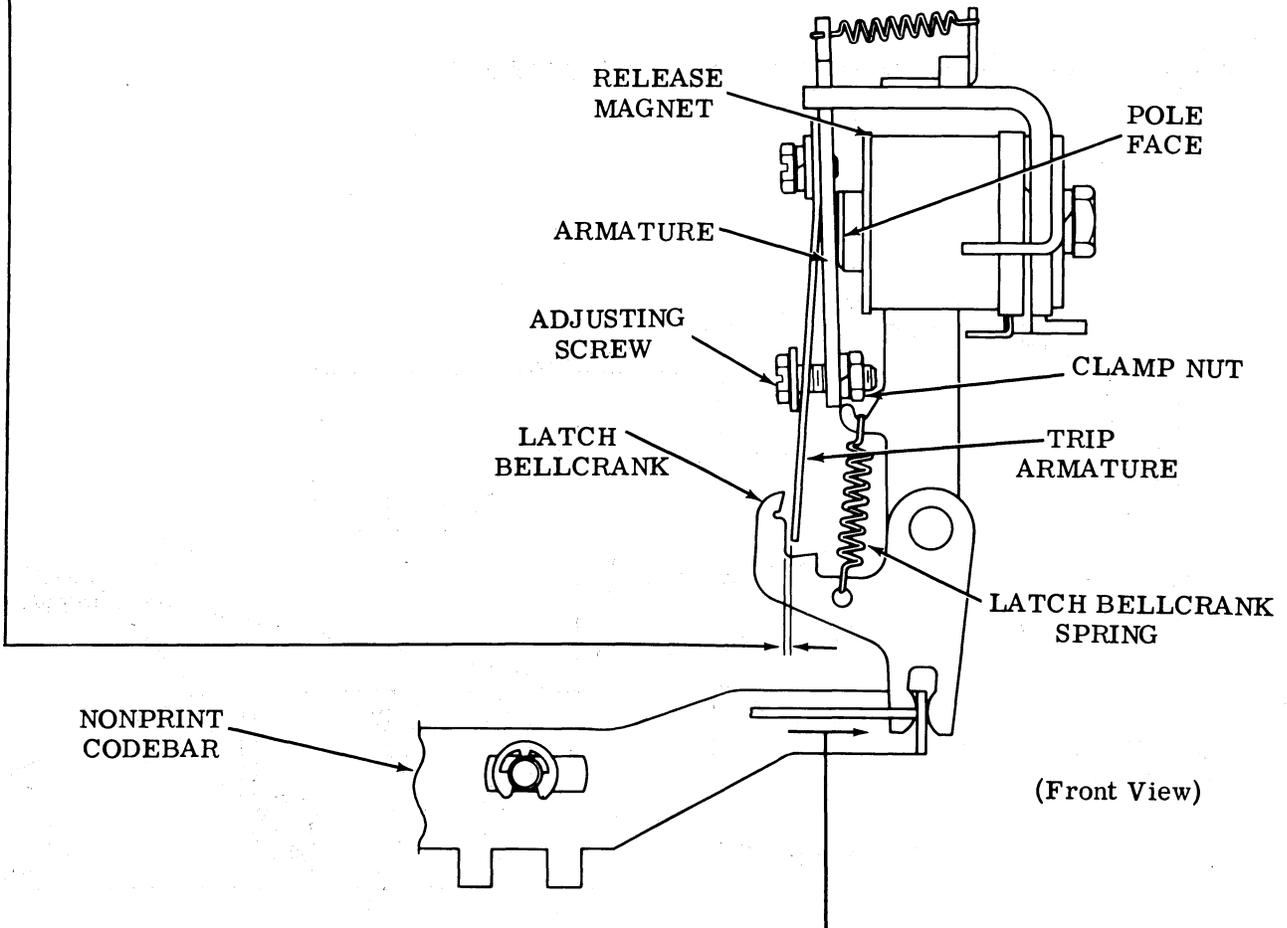
RELEASE MAGNET OVERTRAVEL (VFA-9) ←

Note: The following adjustments apply only to typing units equipped with the automatic print-nonprint feature.

To Check
Hold armature against release magnet pole face.

Requirement
Min 0.010 inch---Max 0.015 inch
between trip armature and latch bellcrank.

To Adjust
Loosen clamp nut and position trip armature by turning adjusting screw. Tighten clamp nut.



Related Adjustment
Affected By
NONPRINT FUNCTION LEVER
CLEARANCE (3. 19)

LATCH BELLCRANK SPRING

To Check
Hold armature against pole face of
release magnet.

Requirement
Min 2 oz---Max 3 oz
to start typing unit suppression codebar
moving.

3.22 Function Area (continued)

Note: The following adjustment applies only to typing units equipped with the manual print-nonprint feature — for units containing the automatic print-nonprint feature, refer to 3.20.

SOLENOID BRACKET POSITION

To Check

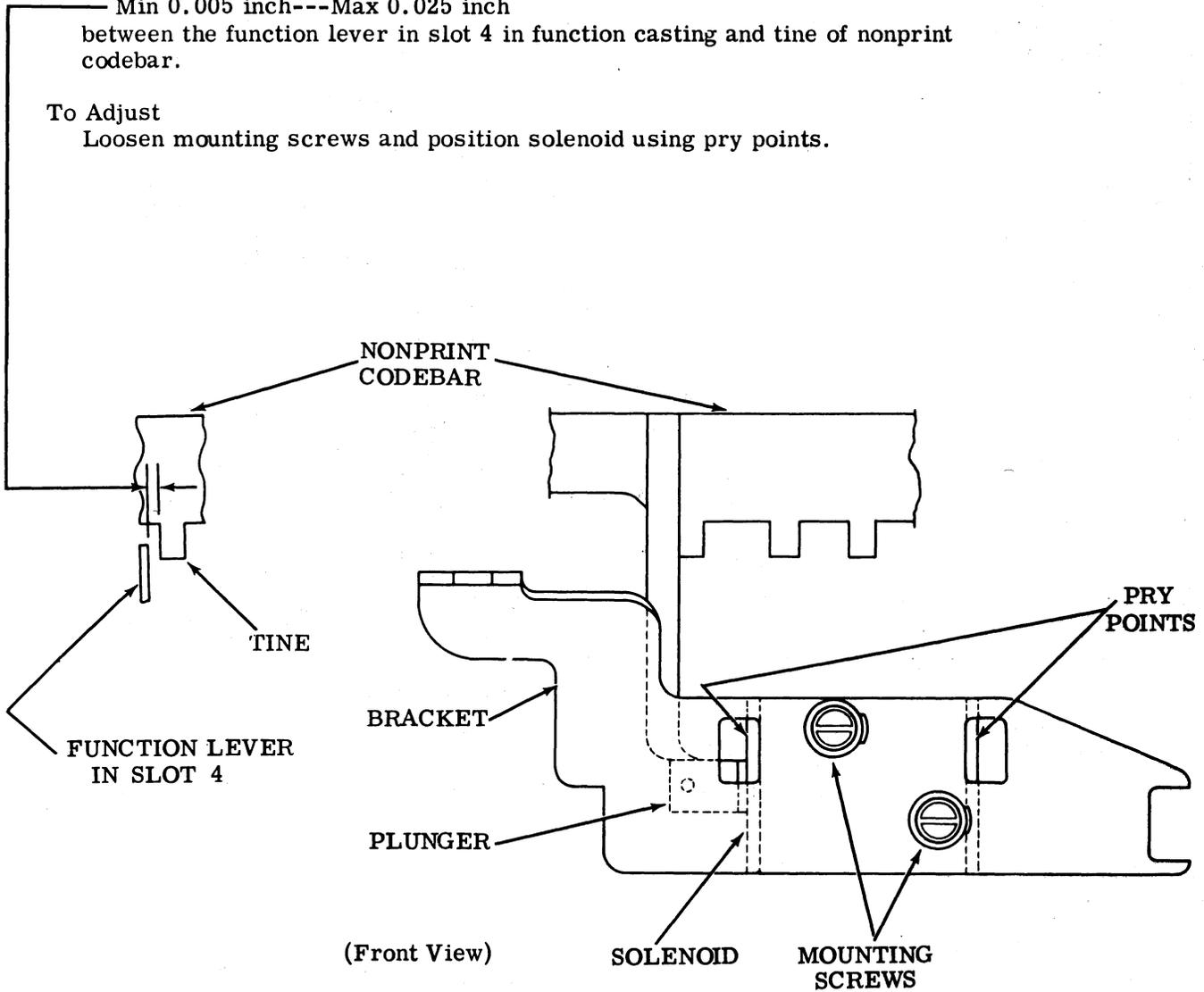
Place plunger to position it assumes when solenoid is energized. Hold plunger seated in that position.

Requirement

Min 0.005 inch---Max 0.025 inch
between the function lever in slot 4 in function casting and tine of nonprint codebar.

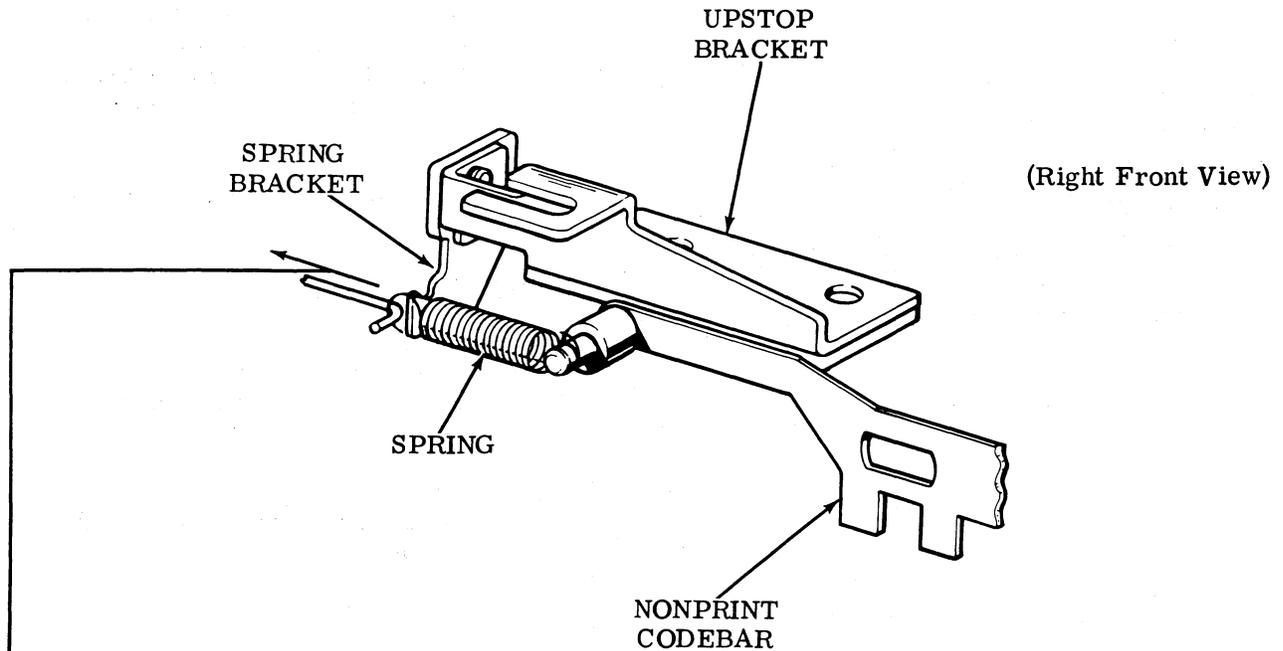
To Adjust

Loosen mounting screws and position solenoid using pry points.



3.23 Function Area (continued)

Note: The following adjustment applies only to typing units equipped with the manual print-nonprint feature.



NONPRINT CODEBAR SPRING

To Check

Place nonprint codebar in its unoperated position.

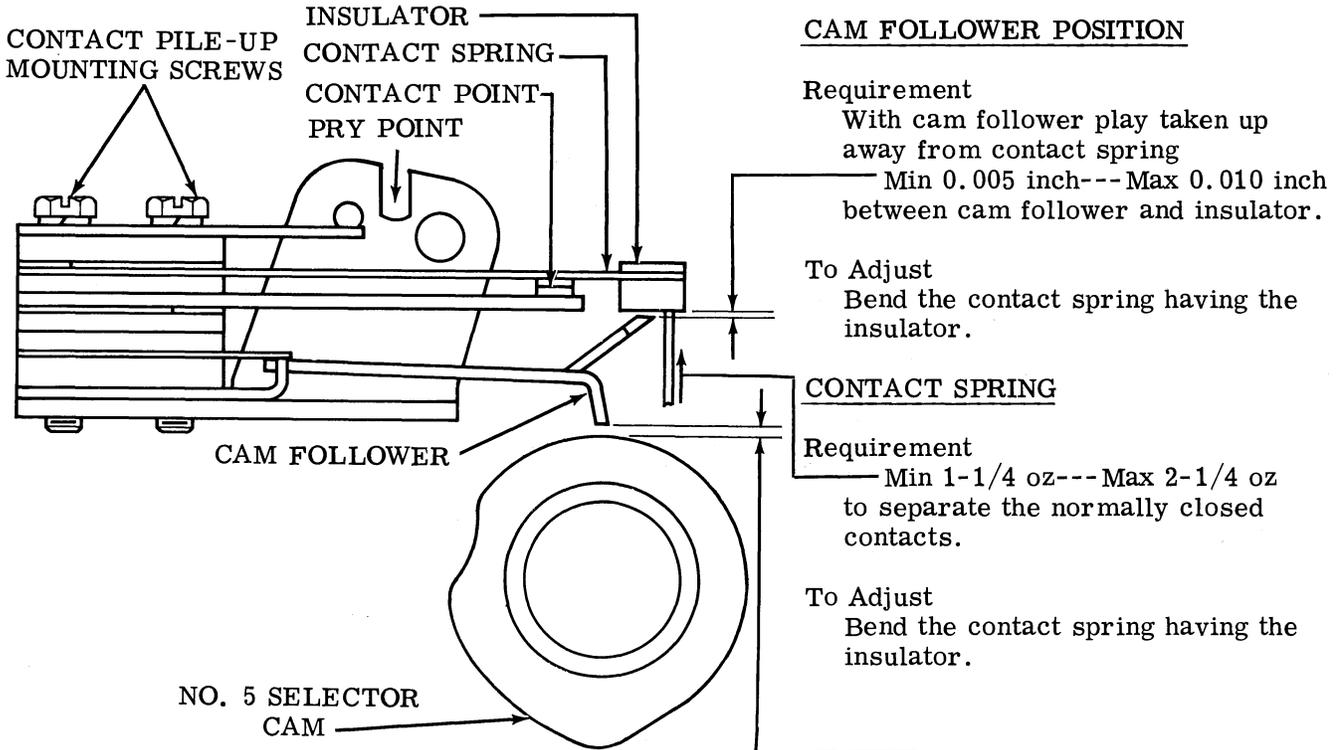
Requirement

Min 3 oz---Max 3-1/2 oz
to pull spring to installed length.

3.24 Selector Area

Note 1: The following information applies to typing units equipped with the Character Detect Contact Assembly.

Note 2: Place selector clutch in the stop position for the following requirements.



CAM FOLLOWER POSITION

Requirement
With cam follower play taken up away from contact spring
Min 0.005 inch---Max 0.010 inch between cam follower and insulator.

To Adjust
Bend the contact spring having the insulator.

CONTACT SPRING

Requirement
Min 1-1/4 oz---Max 2-1/4 oz to separate the normally closed contacts.

To Adjust
Bend the contact spring having the insulator.

CONTACT POSITIONING

Requirement
With the play in cam follower taken up away from cam surface
Min 0.008 inch---Max 0.015 inch between cam follower and cam surface.

To Adjust
With contact pile-up mounting screws loose, use pry point to position the contact assembly; tighten mounting screws. Check to see that the cam follower is positioned to ride on a portion of the 6th level cam (4th cam from left as viewed from rear) when follower is biased to the left. The same condition shall exist when follower is biased to the right. If necessary, refine adjustment.

CHARACTER DETECT CONTACT

Note: If available, use an oscilloscope or signal distortion test set (DXD) to obtain a visible display of character detect contact operation.

Requirement
The normally closed character detect contact should open between the beginning of the number 1 pulse and 5 milliseconds before the end of the number 5 pulse. Contact reclosure shall occur between 5 milliseconds after opening and the end of the number 8 pulse. At no time shall the contact opening be less than 5 milliseconds. Signal breaks up to 1.5 milliseconds duration are acceptable.

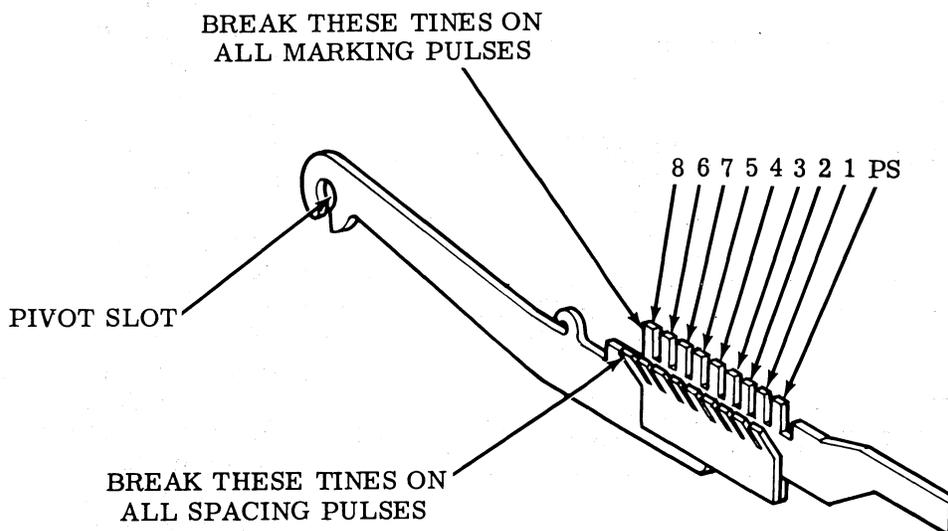
To Adjust
Check CONTACT POSITIONING, CONTACT SPRING, and CAM FOLLOWER POSITION requirements. If necessary readjust.

3.25 Function Area (continued)

CODING AND INSTALLATION OF TP180801 UNIVERSAL FUNCTION LEVER

Note: The following instructions do not apply to the answer-back function lever and the carriage return drive function lever.

- (a) The tines on the universal function lever are numbered from right to left in the illustration as follows: PS, 1, 2, 3, 4, 5, 7, 6, 8.
- (b) There are two rows of tines on the universal function lever. The straight row of tines corresponds to the marking pulses of a given code combination. The bent row of tines corresponds to the spacing pulses of a given code combination.
- (c) Break both the marking and spacing no. 8 tines on units without parity. On units with parity do not break off the marking and spacing no. 8 tines.
- (d) The tines on the universal function lever are easily broken off with long nose pliers.
- (e) The TP180801 universal function lever is to be installed only in the numbered slots of the function casting.
- (f) If the typing unit is equipped with a function lever retainer, lower the retainer sufficiently to allow the universal function lever to be installed under the codebar basket. Readjust the function lever retainer.
- (g) Place the universal function lever under the codebar basket with the open end of the pivot slot on the pivot shaft.
- (h) Holding the lever vertically, squeeze it onto the pivot shaft with a pair of pliers. This is a "snap" fit and sufficient pressure should be applied with the pliers to get the lever fully on the shaft. The lever should pivot freely once on the shaft.
- (i) Locate the proper numerical slot on the function casting, place the lever in the slot, and install a TP91120 spring.



CHART

FUNCTION LEVER CODE ARRANGEMENT

SLOTS	FRICITION FEED	SPROCKET FEED
SEE NOTE 2	LINE FEED BLOCKING	
1 SEE NOTE 2	LINE FEED NEW LINE	NEW LINE
A	AUTOMATIC CARRIAGE RETURN NEW LINE	NEW LINE
2	CARRIAGE RETURN NEW LINE	CARRIAGE RETURN NEW LINE
B	CARRIAGE RETURN ACTUATING	CARRIAGE RETURN ACTUATING
3	SPACE	SPACE
4	PRINT SUPPRESSION ON DELETE, DCI, AND NUL	PRINT SUPPRESSION ON DELETE, DCI, AND NUL
5	PRINT SUPPRESSION ON DELETE	PRINT SUPPRESSION ON DELETE
6	PRINT SUPPRESSION ON ALL CONTROL CHARAC- TERS	PRINT SUPPRESSION ON ALL CONTROL CHARAC- TERS
7	BELL	BELL
F	MARGIN BELL	MARGIN BELL
8	SO ENQ, DC1	SO ENQ, DC1
9	SI ACK DC1	SI ACK DC1
10	ACK ENQ EOT ENQ/EOT (See Note 3) DC1 DC2	ACK ENQ/EOT (See Note 3) DC1 DC2
11	DC3 * DC4 ACK DC3/DC1 (See Note 3)	DC3 DC4 DC3/DC1 (See Note 3)
12	BELL U EOT ETX ENQ	EOT ENQ ETX
13	EOT	LINE FEED
M		LINE FEED STRIP
14	ACK ETX	FORM OUT
15	ANSWERBACK (ENQ)	ANSWERBACK (ENQ)
0	ANSWERBACK BLOCKING	ANSWERBACK BLOCKING

Note 1: Some slots have more than one function lever designation. The particular function lever for these slots depends on the set. Some sets have no function lever in these slots.

Note 2: The function levers in the line feed blocking and line feed (or new line) positions do not occupy slots in the function casting. They are guided by slots in brackets. The brackets are illustrated in the appropriate parts sections.

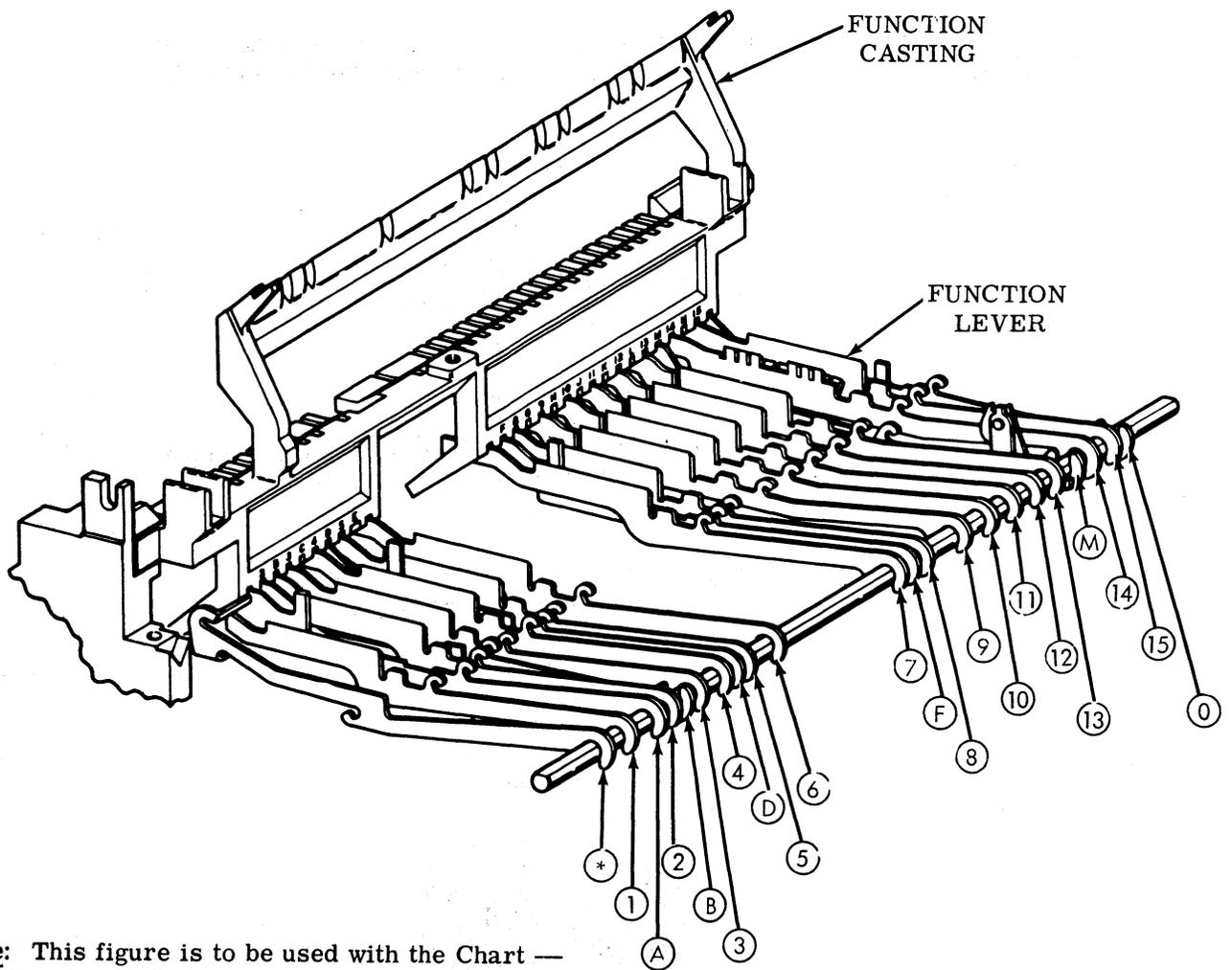
Note 3: The function lever will respond to either code combination and momentarily open a normally closed contact on the function casting.

Abbreviations:

DC1 - Reader On
DC2 - Punch On
DC3 - Reader Off
DC4 - Punch Off
SI - Shift In
SO - Shift Off
ACK - Acknowledge
ENQ - Enquire
EOT - End of Transmission
ETX - End of Text
NUL - Null
LF - Line Feed
BEL - Bell

Note 4: This figure is to be used with the function lever arrangement shown in Figure 5.

Note 5: The following slots have no function levers at present: C, D, E, G, H, J, K, L, N.



Note: This figure is to be used with the Chart —
Function Lever Code Arrangement.

Figure 5 - Function Lever Code Arrangement

3.26 Answer-Back Area (continued)

CODING THE ANSWER-BACK DRUM

- (a) To remove the answer-back drum for coding, press back and down on the tab portion of the TP180854 brace until it becomes detented in its open position. Lift feed pawl slightly (do not overextend its spring) and remove drum.
- (b) Code the answer-back drum in a counterclockwise direction starting with row no. 1 (see illustration).

Note: The ST row is the first row sensed at the beginning of an answer-back cycle. It is coded at the factory for character suppression and must not be recoded.

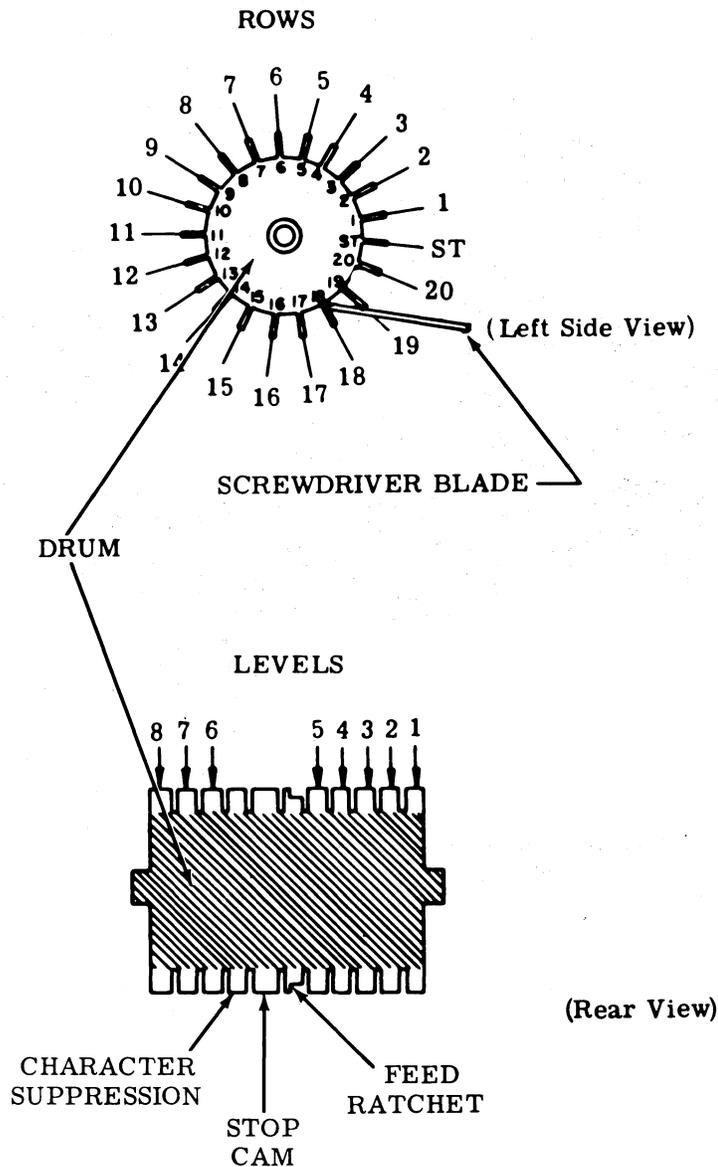


Figure 6 - Answer-Back Drum

3.27 Answer-Back Area (continued)

CODING THE ANSWER-BACK DRUM (continued)

- (c) A particular character is coded by either retaining or removing tines within a row, as illustrated in Figure 6. A tine may be removed by either of the two following methods:

Method 1: Place the end of a screwdriver blade at the base of a tine in the row previously coded. Press the side of the blade against the top of the unwanted tine until the tine breaks off. Figure 6 illustrates this method — pressure applied to base of row no. 18 and against top of adjacent tine being removed from row no. 19.

Method 2: Place the unwanted tine in the slot of a TP161686 tine tool, or grasp the tine firmly with long-nose pliers. With the tool or pliers held stationary, rotate the answer-back drum back and forth until the tine breaks off near its base. Do not damage adjacent tines.

Note: If a coding error is made, or for some other reason it is necessary to suppress (erase) characters from the answer-back drum, remove the character suppression tine from the row(s) affected.

- (d) The length of an answer-back sequence can be varied either by removing the stop cam tine(s) and/or the character suppression tine(s).
- (e) For short sequences, code the drum for either 2- or 3-cycle operation by removing the appropriate tine(s) as indicated in Figure 7.
- (f) Removal of the character suppression tine from any row prevents transmission from the answer-back mechanism. To shorten the answer-back sequence, remove the suppression tine from any unused row(s) after the end of a message.

3.28 Answer-Back Area (continued)

CODING THE ANSWER-BACK DRUM (continued)

- (g) In switched network service, the station identification for 1-cycle operation may not exceed 14 characters, including spaces. The answer-back drum should be coded as follows:

ABBREVIATION

ACK
CR
LF
RO
SP
SUP

KEY TO ABBREVIATION

Acknowledge
Carriage Return
Line Feed
Rub Out
Space
Character Suppression

- (1) Example 1:

SUP CR LF RO
TELETYPE SP NILES CR LF ACK
Company City

Station Identification
(Maximum - 14 characters)

Note: In this system, the ACK character code combination must be the final significant character code combination in the coded answer-back message.

- (2) Example 2:

SUP CR LF RO
ERIE SP BOST CR LF ACK SUP SUP SUP SUP SUP
Company City

Station Identification
(Less than maximum number of characters)

Note: If the station identification is less than the maximum of 14 characters in length, then the remaining rows on the answer-back drum must be coded with the character suppression code according to Example 2 above.

- (h) To replace the answer-back drum, place the TP180854 brace in its detented open position, and lift feed pawl (do not overextend its spring). Replace drum with its shaft firmly seated in the contact block slots. Release feed pawl and TP180854 brace. Rotate answer-back drum to assure proper seating of its associated parts. Check that the contact wires are located in their proper slots.

ASCII CODE				ASCII CODE			
1967 Edition	1965 Edition	1963 Edition	MARKING REMOVE TINES	1967 Edition	1965 Edition	1963 Edition	MARKING REMOVE TINES
NUL		NULL	NONE	2			2-5-6-8
SOH		SOM	1-8	3			1-2-5-6
STX		EOA	2-8	4			3-5-6-8
ETX		EOM	1-2	5			1-3-5-6
EOT			3-8	6			2-3-5-6
ENQ		WRU	1-3	7			1-2-3-5-6-8
ACK		RU	2-3	8			4-5-6-8
BEL		BELL	1-2-3-8	9			1-4-5-6
BS		FE _o	4-8	:			2-4-5-6
HT		HT/SK	1-4	;			1-2-4-5-6-8
LF			2-4	<			3-4-5-6
VT		VTAB	1-2-4-8	=			1-3-4-5-6-8
FF			3-4	>			2-3-4-5-6-8
CR			1-3-4-8	?			1-2-3-4-5-6
SO			2-3-4-8	@		@	7-8
SI			1-2-3-4	A			1-7
DLE		DC _o	5-8	B			2-7
DC1			1-5	C			1-2-7-8
DC2			2-5	D			3-7
DC3			1-2-5-8	E			1-3-7-8
DC4		DC4 (STOP)	3-5	F			2-3-7-8
NAK		ERR	1-3-5-8	G			1-2-3-7
SYN		SYNC	2-3-5-8	H			4-7
ETB		LEM	1-2-3-5	I			1-4-7-8
CAN		S _o	4-5	J			2-4-7-8
EM		S ₁	1-4-5-8	K			1-2-4-7
SUB	SS	S ₂	2-4-5-8	L			3-4-7-8
ESC		S ₃	1-2-4-5	M			1-3-4-7
FS		S ₄	3-4-5-8	N			2-3-4-7
GS		S ₅	1-3-4-5	O			1-2-3-4-7-8
RS		S ₆	2-3-4-5	P			5-7
US		S ₇	1-2-3-4-5-8	Q			1-5-7-8
SP		b	6-8	R			2-5-7-8
!			1-6	S			1-2-5-7
"			2-6	T			3-5-7-8
#			1-2-6-8	U			1-3-5-7
\$			3-6	V			2-3-5-7
%			1-3-6-8	W			1-2-3-5-7-8
&			2-3-6-8	X			4-5-7-8
'			1-2-3-6	Y			1-4-5-7
(4-6	Z			2-4-5-7
)			1-4-6-8	[1-2-4-5-7-8
*			2-4-6-8	\		~	3-4-5-7
+			1-2-4-6]			1-3-4-5-7-8
,			3-4-6-8	^		†	2-3-4-5-7-8
-			1-3-4-6	—		←	1-2-3-4-5-7
.			2-3-4-6	!		ACK	3-4-5-6-7-8
/			1-2-3-4-6-8	}		ALT. MODE	1-3-4-5-6-7
0			5-6	~		ESC	2-3-4-5-6-7
1			1-5-6-8	DEL			1-2-3-4-5-6-7-8
				{			1-2-4-5-6-7

REMOVE TINES IN THE FOLLOWING ROWS TO GET THE PROPER CYCLE		
CYCLES	CHARACTER SUPPRESSION	STOP CAM
1 Cycle	Row ST	Row 6
2 Cycle	Row ST Row 11	Row 6 Row 17
3 Cycle	Row ST Row 7 Row 14	Row 6 Row 13 Row 20

Note 1: Blank spaces in the ASCII (United States of America Standard Code for Information Interchange) columns indicate no change from the latest edition of the code.

Note 2: Codes shown are for even parity operation. For nonparity operation, remove the eighth level tine.

Note 3: Tines present on the drum represent spacing bits. Tines removed from the drum represent marking bits.

Figure 7 - Answer-Back Drum Code Arrangement