

CHAPTER 6  
CORRECTIVE MAINTENANCE

6-1. INTRODUCTION. This chapter provides information regarding adjustments and repair of Model 28 Compact Page Printer (CPP) Keyboard Send-Receive (KSR) and Receive-Only (RO) Teletypewriter Sets. The chapter is divided in five sections as follows:

- a. Section I - provides adjustment procedures for basic units.
- b. Section II - provides additional adjustment procedures required for variable features of basic units.
- c. Section III - provides adjustment procedures for basic units (earlier designs) that differ from those in Section I.
- d. Section IV - provides additional adjustment procedures required for variable features of basic units (earlier designs) that differ from those in Section II.
- e. Section V - provides repair information in the form of disassembly and reassembly procedures.

6-2. GENERAL. Adjustment procedures provided in this chapter are those required to be performed as a result of an abnormal indication in a periodic mechanical check (Chapter 4), to correct a fault discovered during troubleshooting (Chapter 5), or to be performed after reassembly (section IV of this chapter).

SECTION I - ADJUSTMENTS (BASIC UNITS)

6-3. TYPING UNIT ADJUSTMENTS. When making a complete adjustment of the typing unit, the following conditioning operation should be performed to prevent damage:

- a. Loosen clamp screw on code bar shift lever drive arm.
- b. Move right and left vertical positioning lever eccentric studs in rocker shaft brackets to their lowest position.
- c. Loosen two bearing stud mounting screws and two connecting strip clamp screws in horizontal positioning drive linkage.
- d. Loosen clamp screws and move reversing slide brackets to their uppermost position.
- e. Loosen function reset bail blade mounting screws.
- f. For units equipped with two-stop function clutches, loosen shoulder bushings on each function stripper blade arm, and move stripper blade and arms to their lowest positions.
- g. Loosen carriage return lever clamp screw.
- h. Loosen clamp screws in the oscillating rail slide.
- i. Loosen reversing slide adjusting stud.
- j. Loosen clamp nuts on shift code bar guide plates.

6-3.1 TYPING UNIT ADJUSTMENTS  
(HIGH-LEVEL).

a. Code Bar Mechanism Adjustments. Perform code bar mechanism adjustments in accordance with the following paragraphs:

(1) Code Bar Detent.  
Adjust code bar detent as follows:

- (a) Refer to figure 6-1.
- (b) Remove front plate.
- (c) Disengage all clutches.
- (d) All suppression and shift code bars should detent equally.
- (e) To adjust detenting of suppression and shift code bars, loosen screws and remove or add shims between casting and code bar bracket. Then tighten screws.

(2) Code Bar Detent Spring. Adjust code bar detent spring tension as follows:

NOTE

Unless there is reason to believe these springs are causing a malfunction, do not attempt this adjustment.

- (a) Refer to figure 6-2.
- (b) Carefully remove code bar detent bracket and code bars.
- (c) Apply spring scale hook to each detent ball in sequence and pull in

direction of ball travel. The force required to start ball moving against compression of spring should be between 1-1/2 and 3-1/2 ounces. If scale reading for any spring exceeds the limits, install a new spring.

(d) Replace code bars and code bar detent bracket.

(3) Code Bar Yield Spring. Adjust code bar yield spring tension as follows:

- (a) Refer to figure 6-3.
- (b) Disengage selector clutch, code bar clutch, and type box clutch.
- (c) Place number one code bar in spacing position.
- (d) Attach spring scale hook to number one code bar and pull against spring. Force required to start code bar shift bar pivot moving away from code bar should be between 14 and 23 ounces.

(e) Repeat steps (c) and (d) for number two and common code bar shift bars.

(f) If scale reading for any spring exceeds limits, install a new spring.

(4) Code Bar Shift Lever Link Bracket. Adjust code bar shift lever link bracket as follows:

- (a) Refer to figure 6-4.
- (b) Select blank combination.

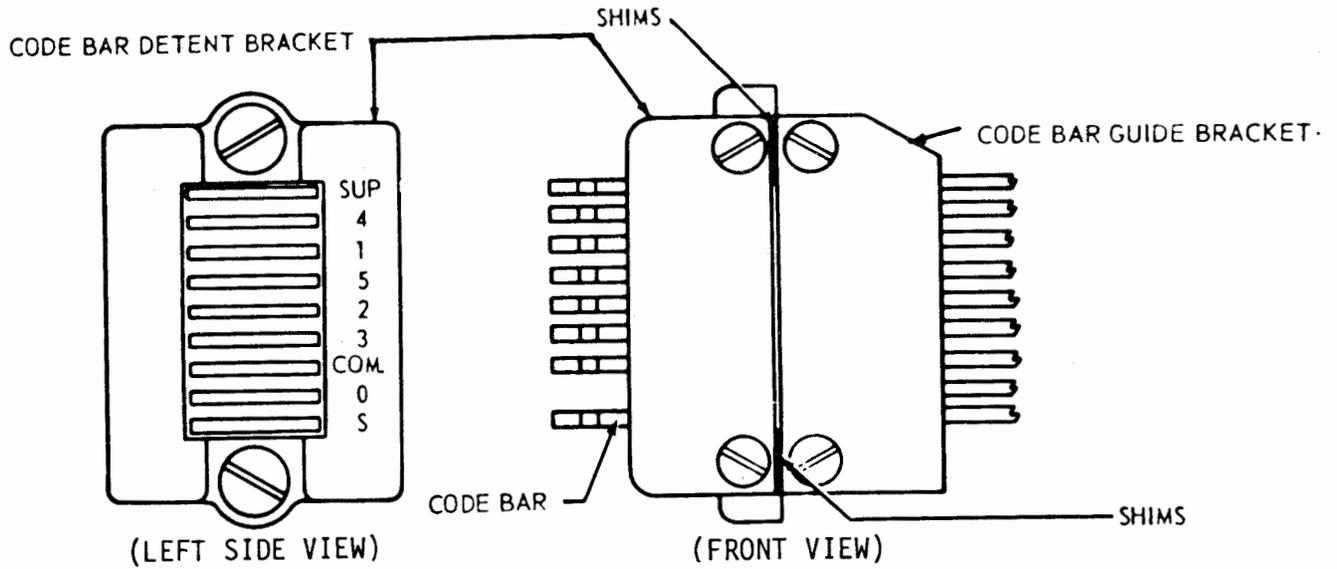


Figure 6-1. Code Bar Detent

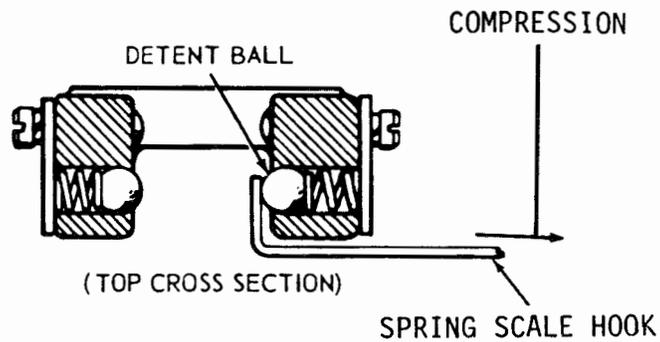


Figure 6-2. Code Bar Detent Spring

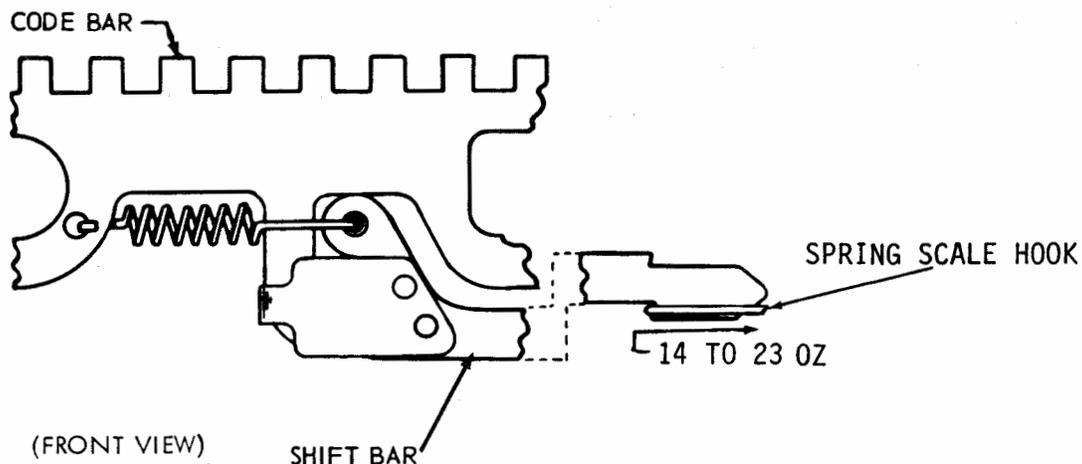


Figure 6-3. Code Bar Yield Spring

(c) Rotate main shaft until code bar shift lever link reaches maximum travel.

(d) Take up play for maximum clearance between front code bar shift lever and shoulder on nearest code bar shift bar.

(e) Clearance should be between 0.002 and 0.025 inch.

(f) If clearance exceeds specified limits, loosen clamp screw and position front adjusting plates to obtain clearance specified in step (e) between front code bar shift lever and shoulder on nearest code bar shift bar. Tighten clamp screws.

(g) Select letters combination.

(h) Rotate main shaft until code bar shift lever link reaches maximum travel.

(i) Take up play for maximum clearance between rear code bar shift lever and shoulder on nearest code bar shift bar.

(j) Clearance should be between 0.002 to 0.012 inch between rear code bar shift lever and shoulder on nearest code bar shift bar. Tighten clamp screws.

(5) Code Bar Shift Lever Drive Arm. Adjust code bar shift lever drive arm as follows:

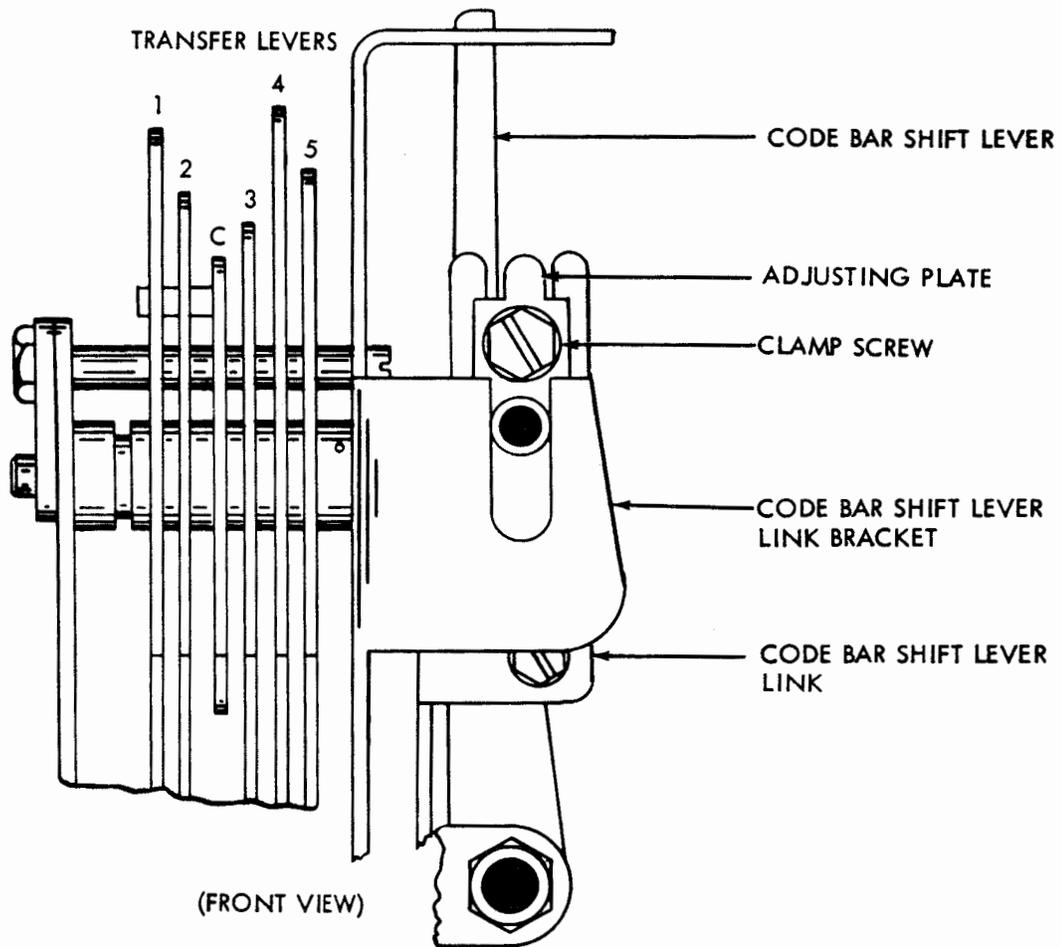
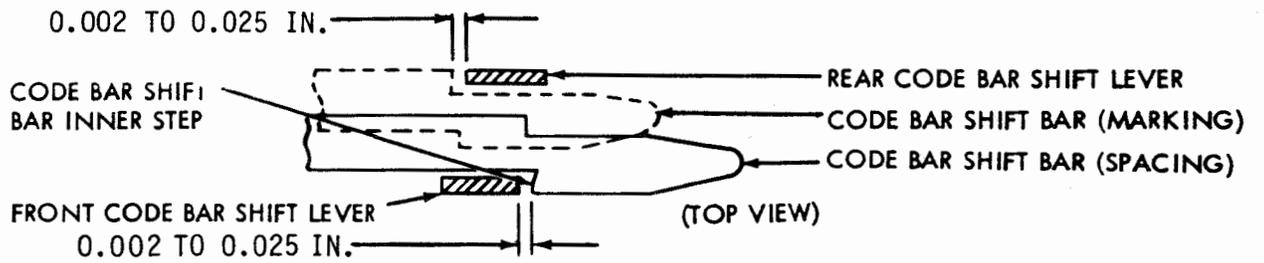


Figure 6-4. Code Bar Shift Lever Link Bracket

(a) Refer to figure 6-5.

(b) Place the code bar shift lever link in uppermost position.

(c) Measure clearance between top of rollers and top of cam slots in code bar shift levers. The clearance on closest lever should not be more than 0.025 inch.

(d) If clearance between top of rollers and top of cam slots in closest code bar shift lever exceeds specified limit, loosen clamp screw. Position code bar shift lever drive arm on its shaft to obtain clearance specified in step (c) and to provide some end play not to exceed 0.006 inch.

(e) Tighten clamp screw.

(6) Transfer Lever Spring. Adjust transfer lever spring as follows:

(a) Refer to figure 6-6.

(b) Hold transfer lever in spacing position.

(c) Attach spring scale to intermediate arm. Force required to start intermediate arm moving should be between 1-1/2 and 2-1/2 ounces.

(d) If scale reading exceeds limits, install a new spring.

(7) Common Transfer Lever Spring. Adjust common transfer lever spring as follows:

(a) Refer to figure 6-6.

(b) Place transfer lever in spacing position.

(c) Attach spring scale hook near upper end of common transfer lever. The force required to start lever moving should be between 1/2 and 1-1/4 ounce.

(d) If scale reading exceeds specified limits, install a new spring.

(8) Transfer Lever Eccentric. Adjust transfer lever eccentric as follows:

(a) Refer to figure 6-7.

(b) Position push levers for either E, LF, or letters.

(c) Disengage selector clutch.

(d) Place code bar shift lever link in uppermost position.

(e) Measure clearance between rear code bar shift lever and code bar shift bar farthest from rear code bar shift lever. Clearance should be between 0.010 and 0.025 inch when play of shift bar is taken up for maximum clearance.

(f) To adjust clearance, loosen clamp screw.

(g) Rotate eccentric bushing to obtain clearance specified in step (e). High part of eccentric should be above horizontal center line.

(h) Tighten clamp screw.

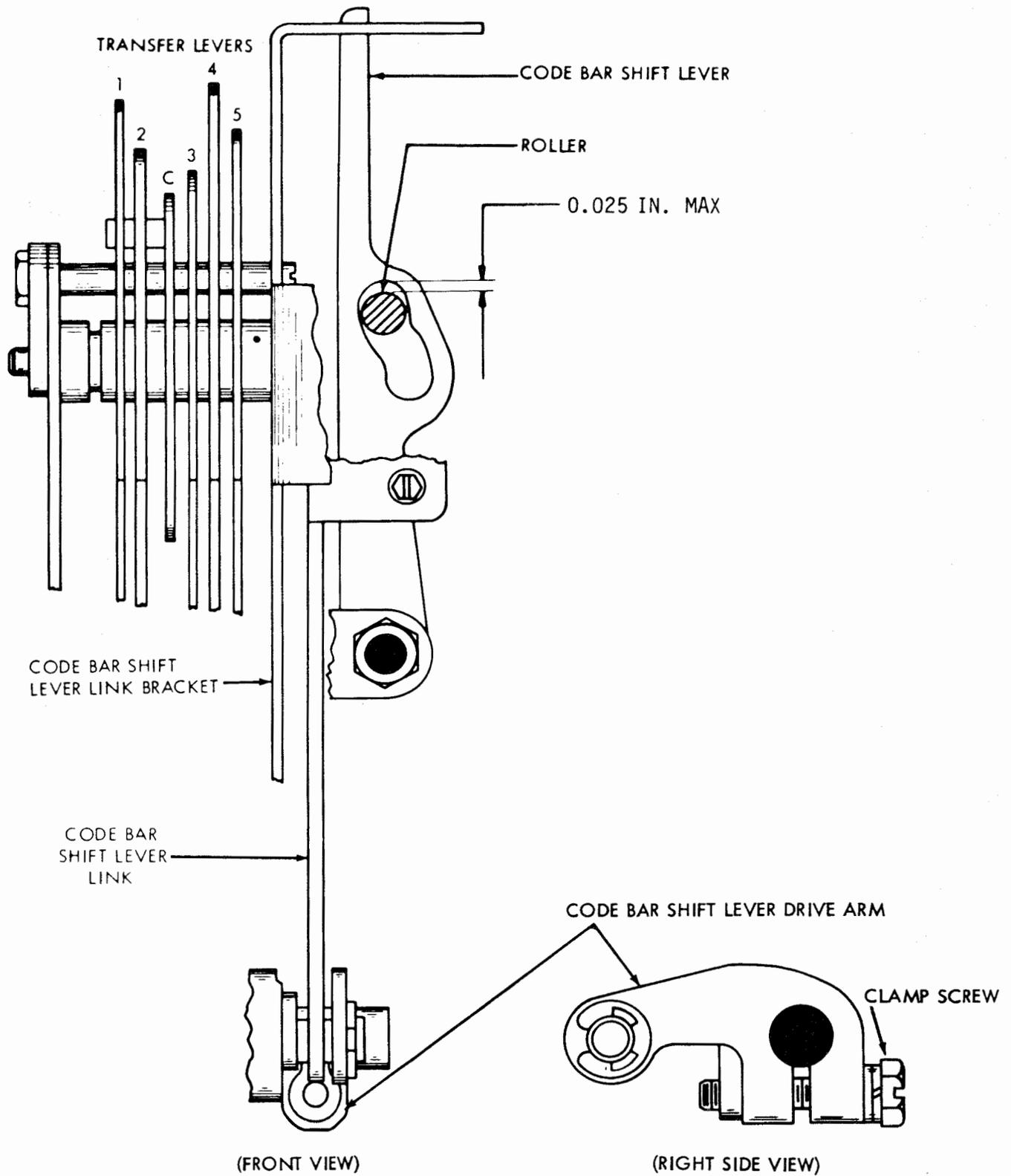


Figure 6-5. Code Bar Shift Lever Driver Arm

COMMON TRANSFER LEVER  
SPRING TENSION 1/2 TO 1-1/4 OZ

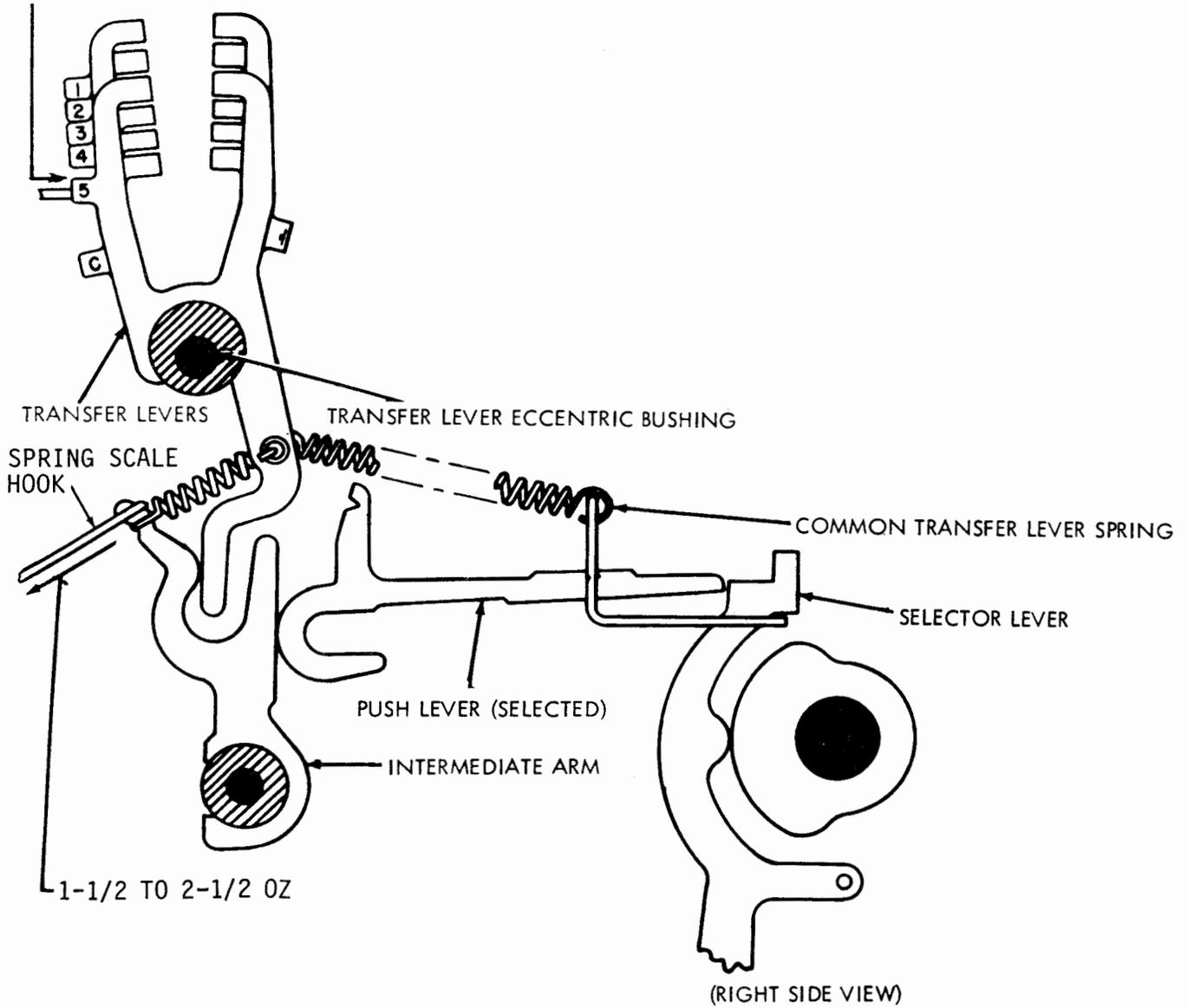


Figure 6-6. Transfer Lever Spring and Common Transfer Lever Spring

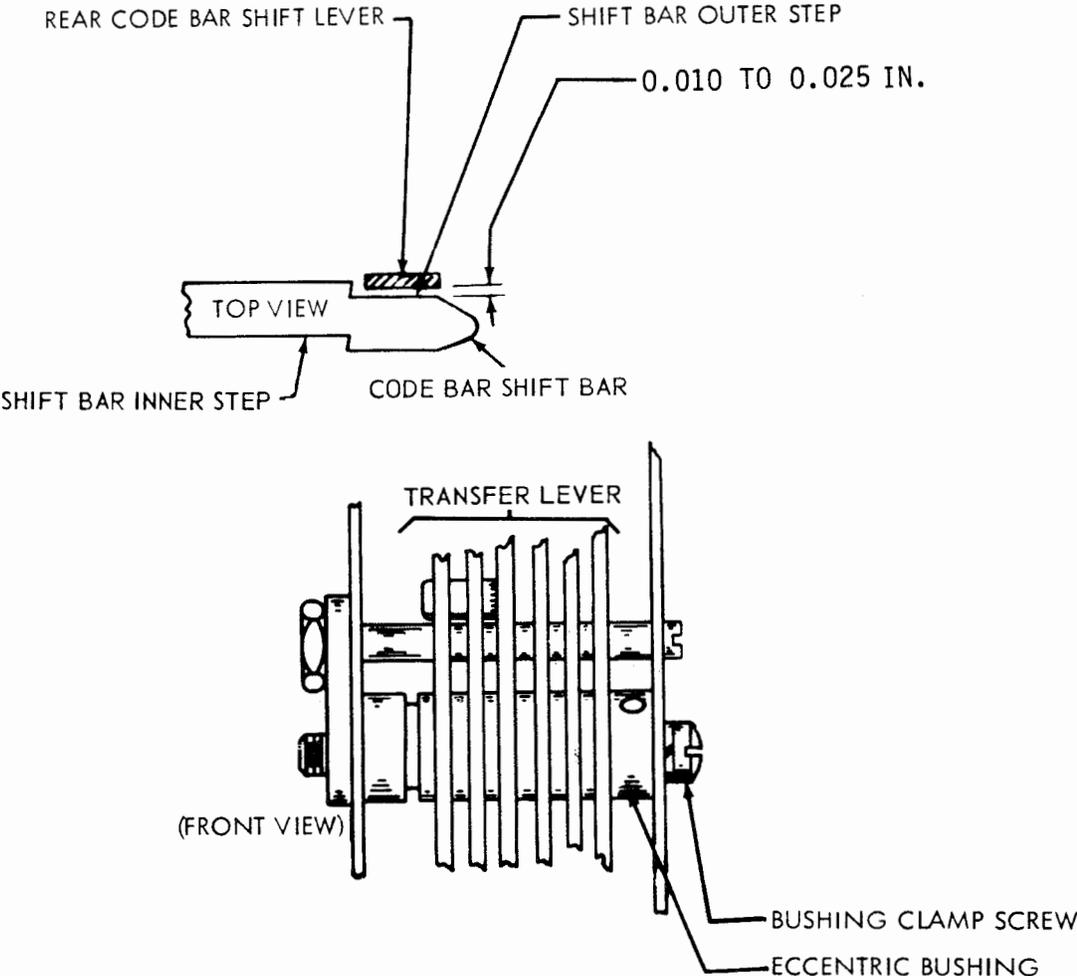


Figure 6-7. Transfer Lever Eccentric

NOTE

One or more code bar shift bars may touch code bar shift levers.

(9) Intermediate Arm Backstop Bracket. Adjust intermediate arm backstop bracket as follows:

(a) Refer to figure 6-8.

(b) Place push levers in not-selected position.

(c) Move all code bar shift bars to the right.

(d) Disengage selector clutch.

(e) Place code bar shift lever link in lowermost position.

(f) Measure clearance between front code bar shift lever and inner step of code bar shift bar farthest from front code bar shift lever. Clearance should be between 0.010 and 0.025 inch when play in parts is taken up for maximum clearance.

(g) To adjust clearance, loosen two clamp screws and position backstop bracket to obtain clearance specified in step (f).

(h) Tighten two clamp screws.

b. Function Mechanism Adjustments. Perform function mechanism adjustment in accordance with the following paragraphs.

(1) Figure-Letters Shift Code Bar Operating

Mechanism. Adjust figures-letters shift code bar operating mechanism as follows:

(a) Refer to figure 6-9.

(b) If unit has one-stop clutches, rotate function clutch until clutch disc stop lug is toward bottom of unit, and hook figures function pawl over end of function bar. If unit has two-stop function clutches, disengage function clutch at stop giving least clearance.

(c) Clearance between upper guide plate extension and shift slide should be not more than 0.020 when play is taken up for maximum clearance.

(d) With a spring scale, apply 32 ounces pull to figures function pawl and measure clearance between shoulder of figures function pawl and face of function bar. Clearance should be not less than 0.002 inch.

(e) Repeat steps (c) and (d) for letters function pawl.

(f) If clearances exceed specified limits, loosen clamp nuts, and position upper or lower guide plate as necessary by the adjusting slot.

(g) Tighten clamp nuts.

NOTE

There should be some clearance between unoperated shift slide and its guide plate when shift slide has

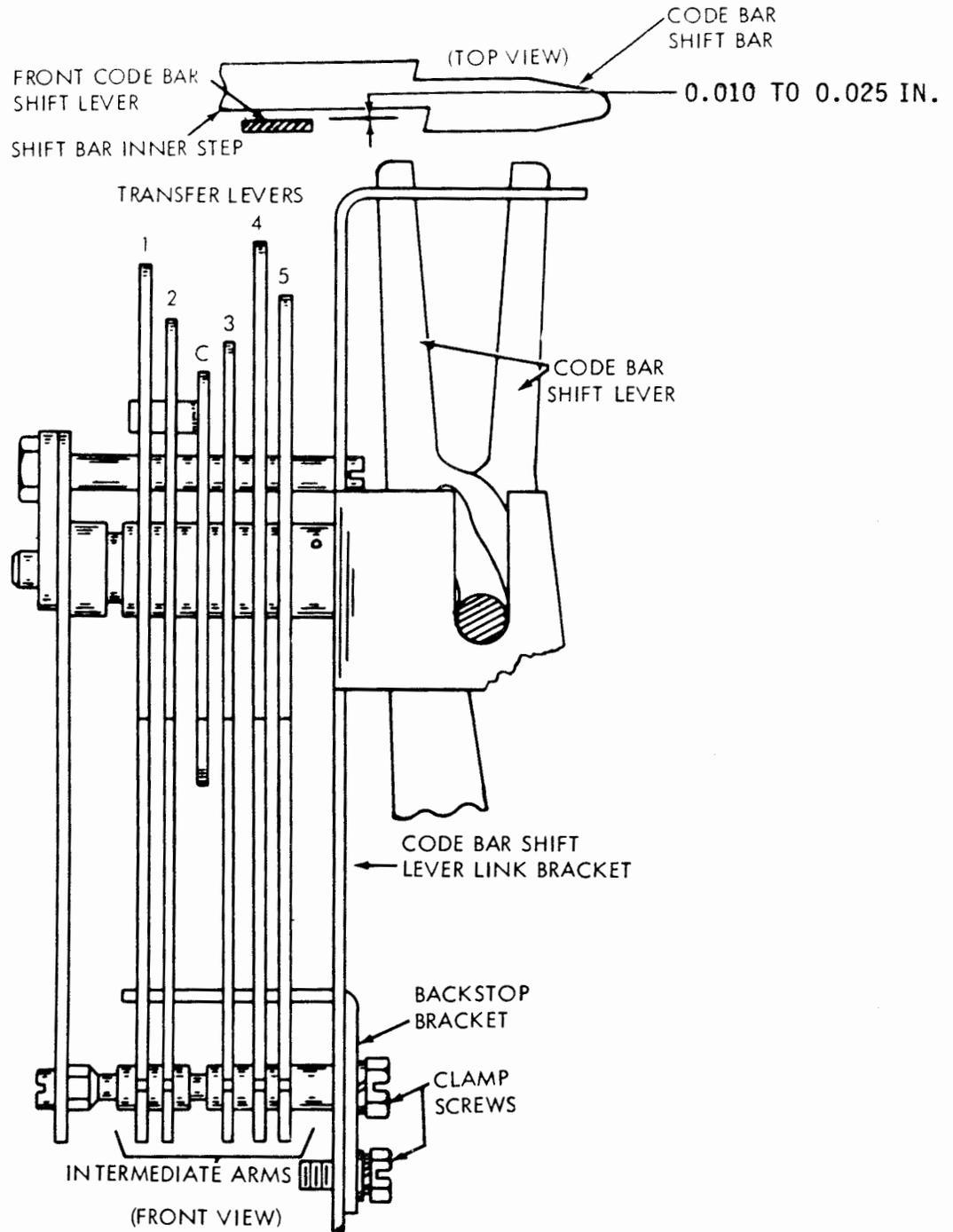


Figure 6-8. Intermediate Arm Backstop Bracket

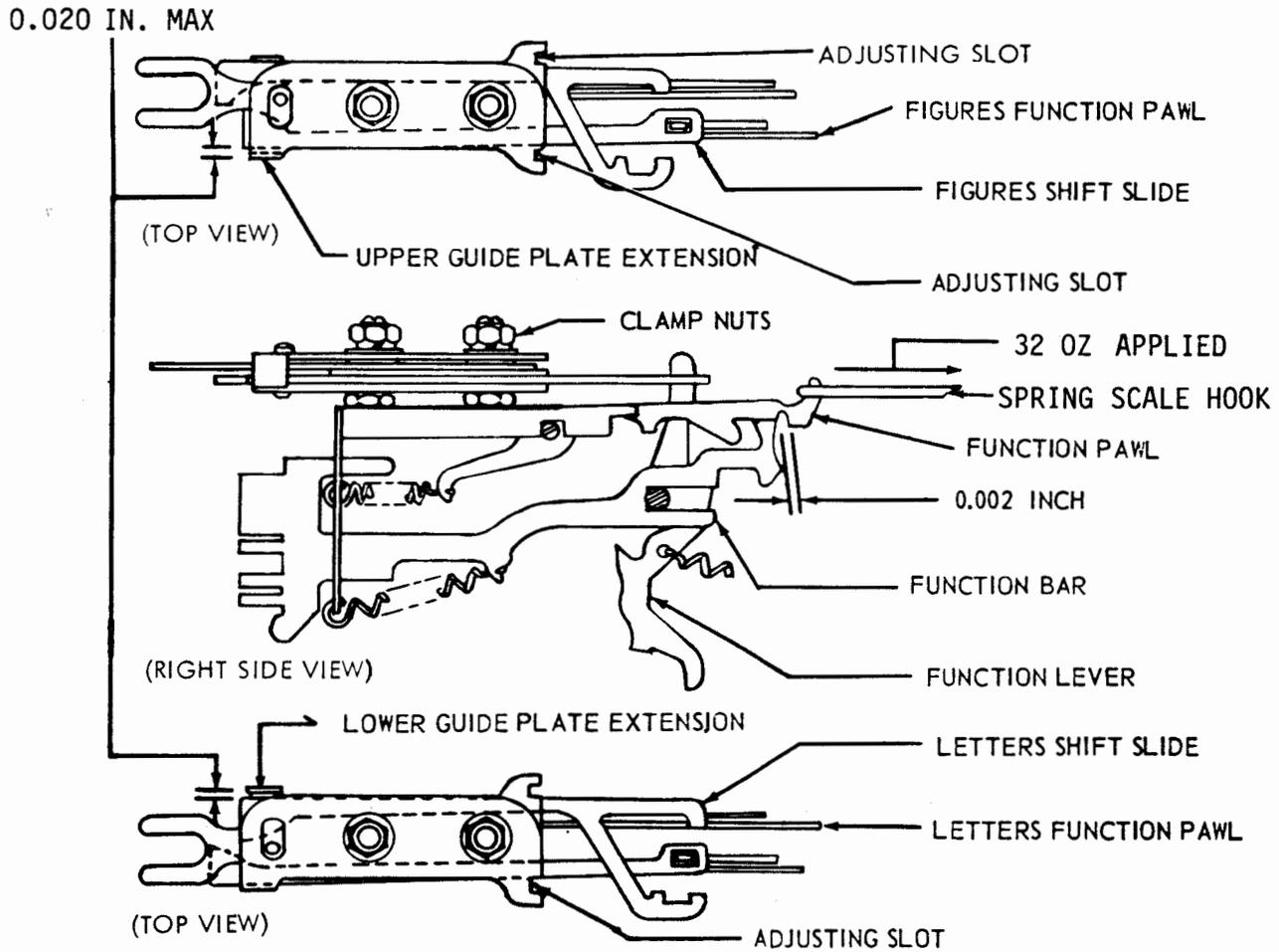


Figure 6-9. Figures-Letters Shift Code Bar Operating Mechanism

reached its position of maximum travel.

checking spring tension.

(2) Function Bar Spring. Adjust function bar spring as follows:

(c) Hold suppression bail in forward position.

(a) Refer to figure 6-10.

(d) Attach spring scale hook to function pawl. The force required to start function lever moving should be between 1-1/2 and 2-3/4 ounces. If function lever has stud that operates two contacts, the required force should be between 2 ounces and 3-1/2 ounces.

CAUTION

Severe wear to the point of operational failure will result if the teletypewriter is operated without each function bar or, where a function bar is missing, a related function pawl clip to hold the function pawl away from the stripper bail.

(e) Repeat step (d) for each spring.

(b) Disengage function clutch and hold function pawl away.

(f) If scale reading for any spring exceeds specified limits, install a new spring.

(c) Attach spring scale hook to function bar. The force required to start function bar moving should be between 2-1/2 and 3-1/2 ounces.

(4) Function Pawl Spring. Adjust function pawl spring as follows:

(d) If scale reading exceeds specified limits, install a new spring.

(a) Refer to figure 6-10.

(3) Function Lever Spring. Adjust function lever spring as follows:

(b) Position function pawl so that rear end rests on function bar.

(a) Refer to figure 6-10.

(c) Attach spring scale hook to function pawl.

(b) Place function lever in unoperated position.

(d) If unit has a one-stop function clutch, the force required to start pawl moving should be between 3 and 5 ounces. If unit has a two-stop function clutch, the force should be between 7 and 10-1/2 ounces. If scale reading exceeds specified limits, install a new spring.

NOTE

If a function lever operates a contact or a slide, hold off contact or slide when

(5) Function Contact Spring. Adjust function contact spring as follows:

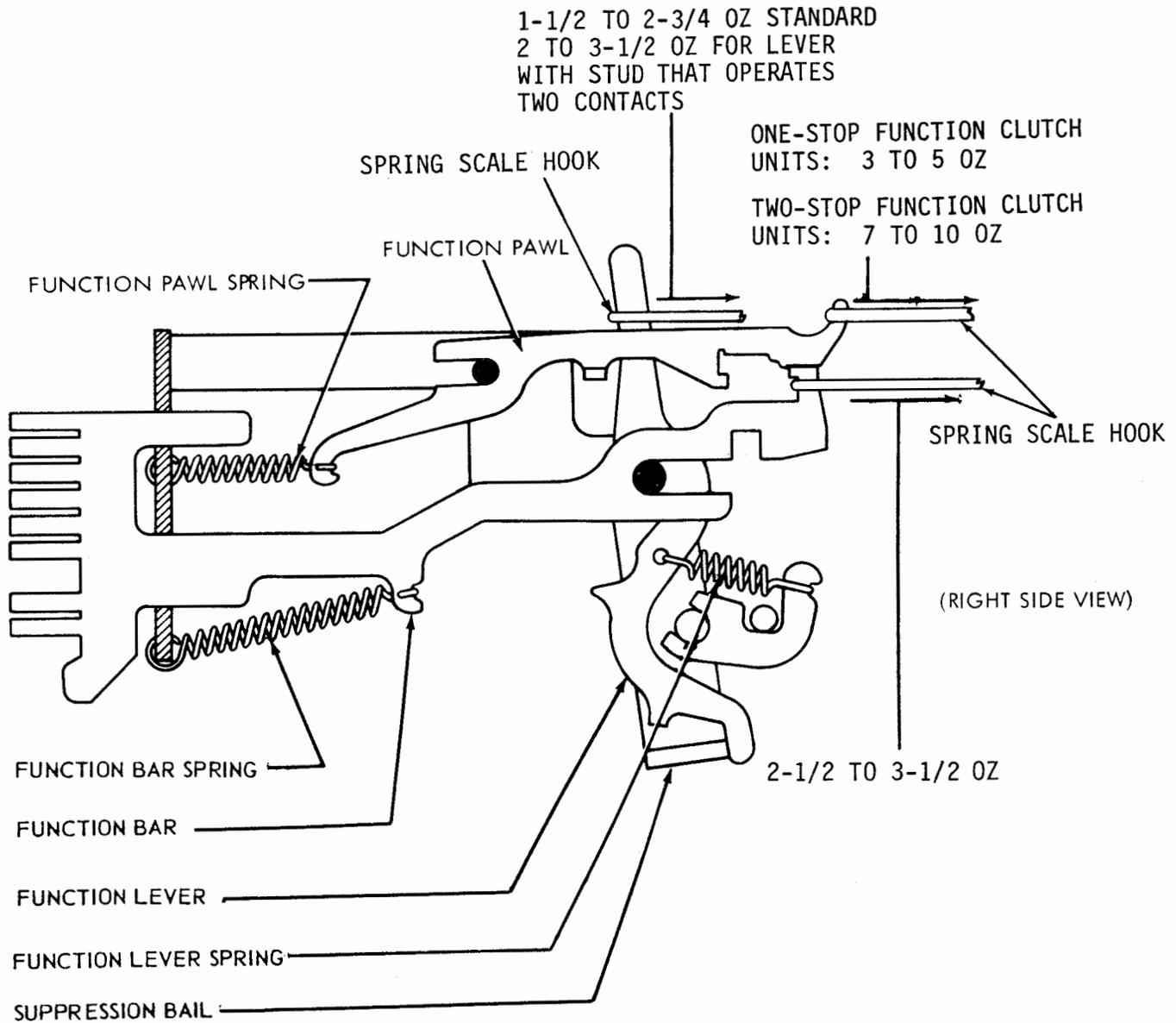


Figure 6-10. Function Bar Spring, Function Lever Spring, and Function Pawl Spring

figure 6-11. (a) Refer to

until code bar clutch trip lever just touches its stop lug.

switch contacts. (b) Close

(d) Unlatch all function pawls from their function bars.

(c) Attach spring scale hook to contact arm. The force required to open switch contact should be between 1 and 2 ounces. If required force exceeds specified limits, install a new spring.

(e) Hold respective function bar in its extreme rearward position with spring hook, using tension of not more than 32 ounces.

(d) If switch is removed from stunt box, perform the following adjustments:

(f) Measure clearance between function bar and reset bail blade at bars in stunt box slot numbers 1, 4, 11, 18, 23, 33, 38, and 41 (slots are numbered left to right when viewed from rear). If a designated slot is vacant, use nearest bar or select bar with highest numbered slot when a bar is located on both sides of vacant slot.

1. Measure clearance between contact arm and vertical portion of contact clip. Clearance should be 0.006 inch minimum. If switch has contacts both front and rear, the same limit is applicable. If clearance is less than 0.006 inch, loosen contact plate screws, and position contact plate. Then tighten contact plate screws. Contact must be made before function lever touches top plate.

(g) Clearance between function bar and reset bail blade should be between 0.018 and 0.035 inch.

(h) If clearance exceeds specified limits, loosen reset bail mounting screws.

2. On switches with front and rear contacts, check gap between formed-over end of front contact clip and bottom of contact arm when rear contact is closed. Gap should be between 0.008 and 0.028 inch.

(i) Tighten mounting screws friction tight. Position blade on reset bail to obtain clearance specified in step (g) between function bar and reset bail blade.

(6) Function Reset Bail Blade. Adjust function reset bail blade as follows:

(j) Tighten mounting screws.

figure 6-12. (a) Refer to

(k) Loosen carriage return lever clamp screw.

all clutches. (b) Disengage

(l) Latch function pawls by lowered stripper blade.

bar clutch and turn main shaft

(m) Trip code bar clutch and turn main shaft

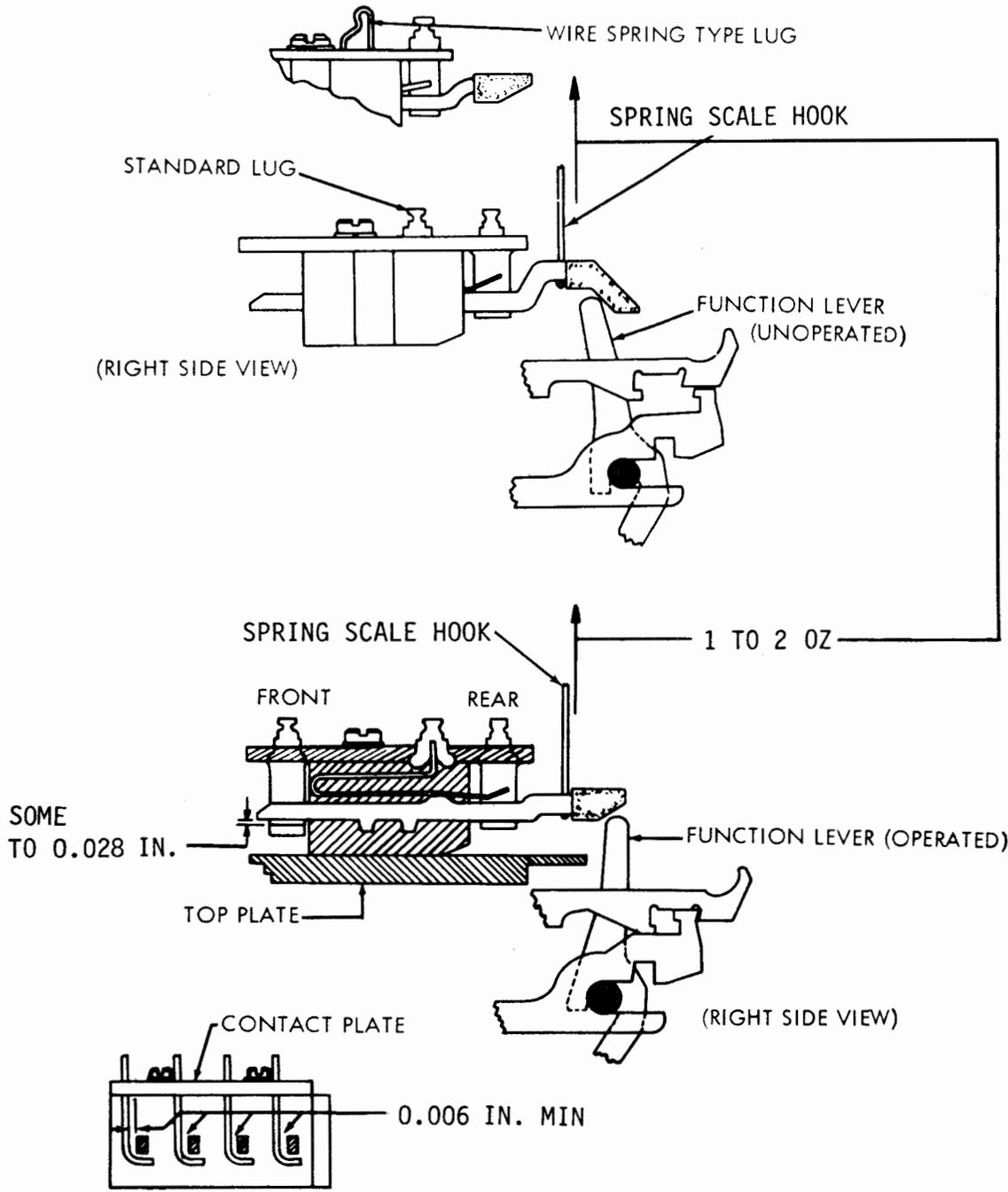


Figure 6-11. Function Contact Spring

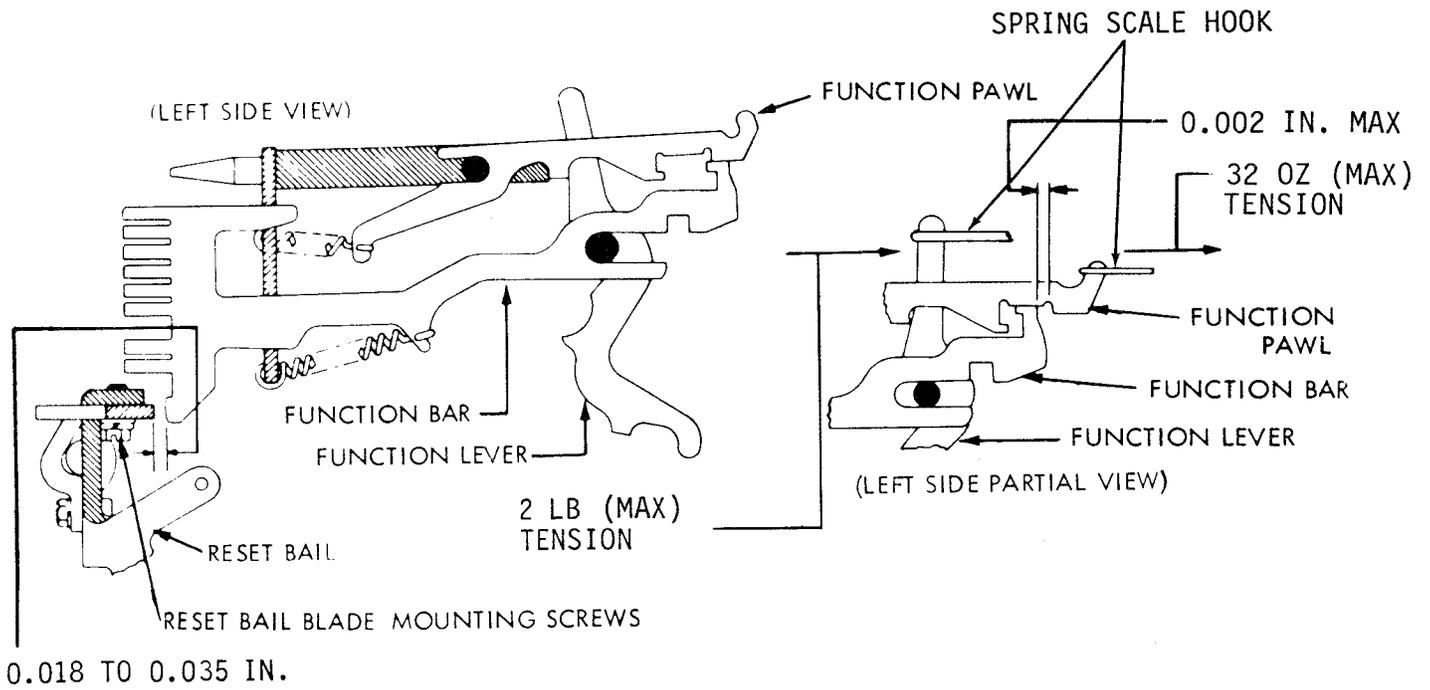


Figure 6-12. Function Reset Bail Blade

until code bar clutch trip lever touches its stop lug.

(n) Strip off any functions which may have been selected.

(o) With tension applied in step (e), each pawl should over-travel its function bar by at least 0.002 inch. Check each pawl separately at slot numbers checked in step (f).

(p) Repeat steps (f), (g), (h), and (i) for any function pawls whose overtravel is less than 0.002 inch, and tighten.

(q) Tighten mounting screws.

NOTE

If function reset bail blade is repositioned, check adjustment of figures-letters shift code bar operating mechanism (paragraph 6-3.1b(1)).

(7) Function Reset Bail Spring. Adjust function reset bail blade as follows:

(a) Refer to figure 6-13.

(b) With typing unit inverted, hold number one code bar in its marking position so that no function bar is selected.

(c) Rotate main shaft until function reset bail springs are in their minimum length position.

(d) Insert a 32-ounce spring scale between clutch trip shaft and space

suppression bail, hook it on front edge of reset bail at middle of bail, and pull rearward. The force required to start bail moving should be between 10 and 22 ounces.

(e) If scale reading exceeds limits, install a new spring.

(8) Keyboard Lock Lever Spring. Adjust keyboard lock lever spring as follows:

(a) Refer to figure 6-14.

(b) With typing unit inverted, attach spring scale hook to bell crank. The force required to start keyboard lock lever moving should be between 1/2 and 1-1/2 ounces.

(c) If scale reading exceeds specified limits, install a new spring.

(9) Stripper Blade Drive Cam Position. Adjust stripper blade drive cam position as follows:

(a) Refer to figure 6-15.

(b) Disengage function clutch.

(c) Observe engagement of stripper blade drive cam upper peak with stripper blade cam arm. Rotate clutch to turn cam to its extreme downward position and observe engagement of lower cam peak. Stripper blade drive cam should move each stripper blade cam arm an equal distance above and below centerline of its pivot as gauged by eye.

(d) If distances above and below pivot centerline are not equal as

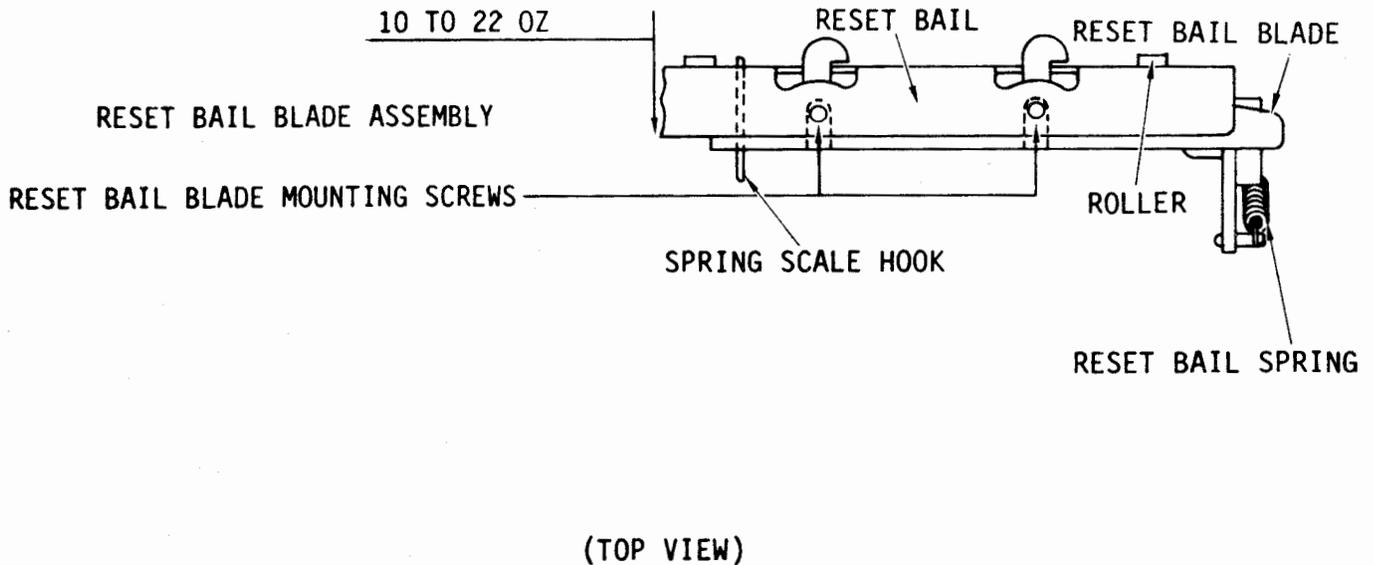


Figure 6-13. Function Reset Bail Spring

gauged by eye, loosen stripper blade drive arm mounting screws and equalize overtravel of each cam peak.

(e) Tighten mounting screws.

(10) Stunt Box Clip.  
Adjust stunt box clip as follows (for units equipped with clips only).

(a) Refer to figure 6-16.

(b) In right-hand position clip should not prevent associated function pawl from engaging its function bar.

(c) To adjust clip in right hand position, position clip in its extreme right-hand position with its

mounting screw loosened, and tighten mounting screw.

(d) In center position, clip should hold function pawl out of engagement with its function bar, but should not interfere with function lever.

(e) To adjust clip in center position, position clip with its mounting screw loosened so that clip holds function pawl out of engagement with its function bar but does not interfere with function lever. Tighten mounting screw.

(f) In left-hand position, clip should hold function pawl upward out of engagement with its function bar

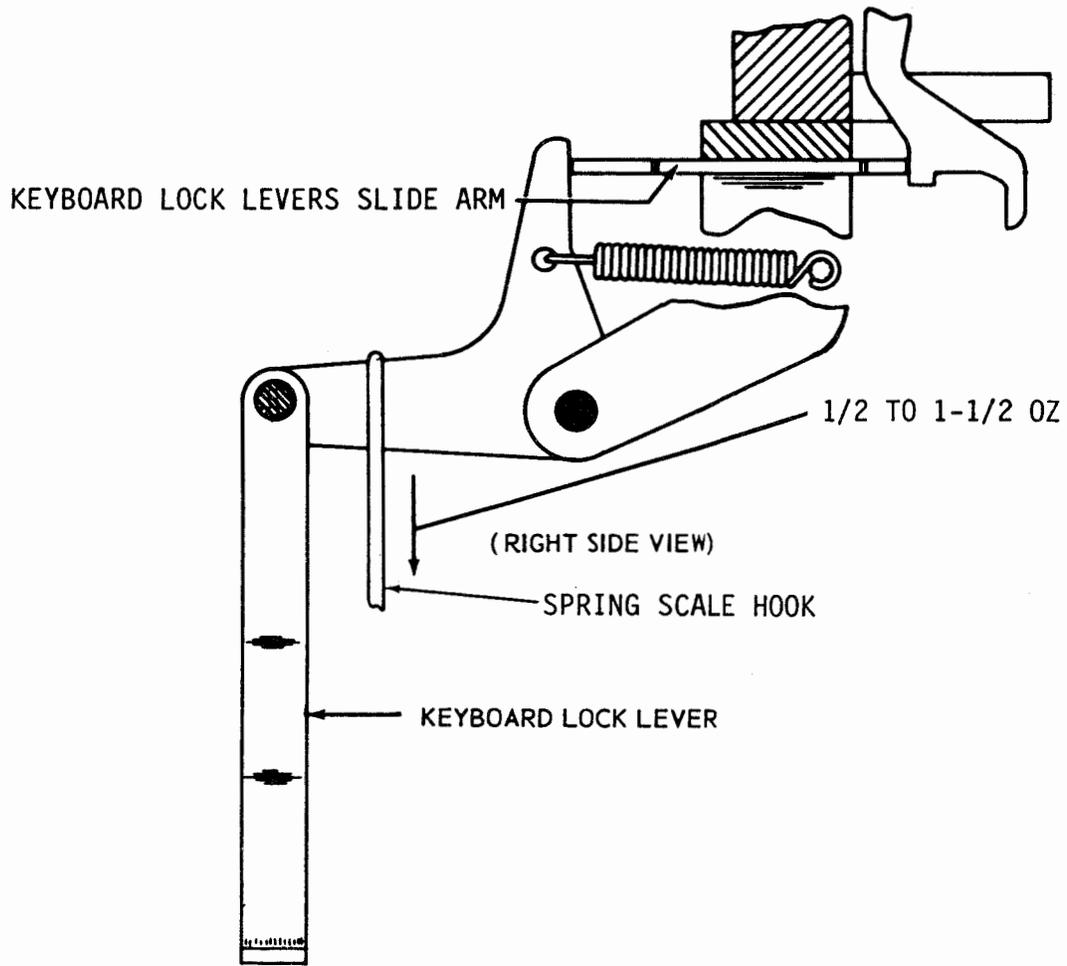


Figure 6-14. Keyboard Lock Lever Spring

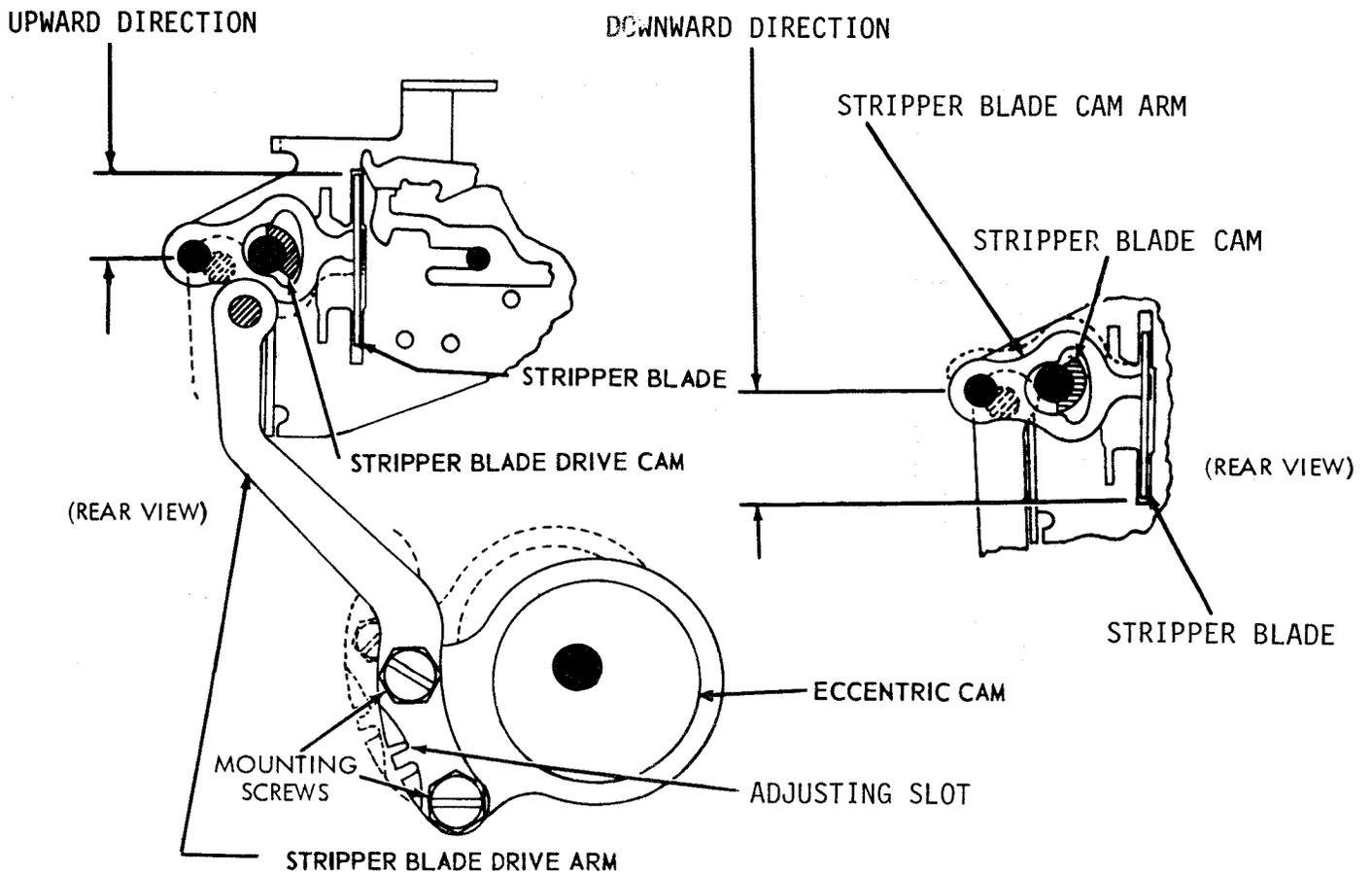


Figure 6-15. Stripper Blade Driver Cam Position

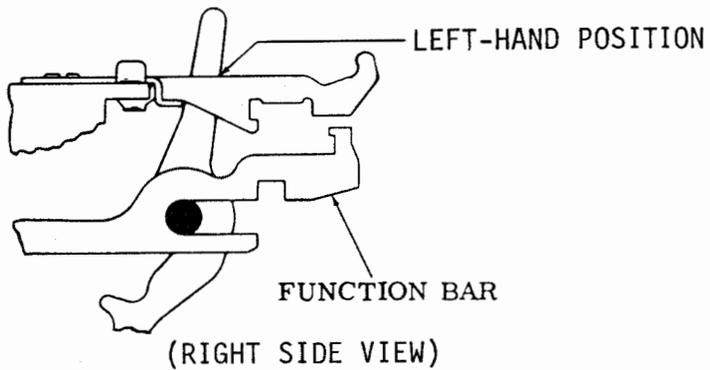
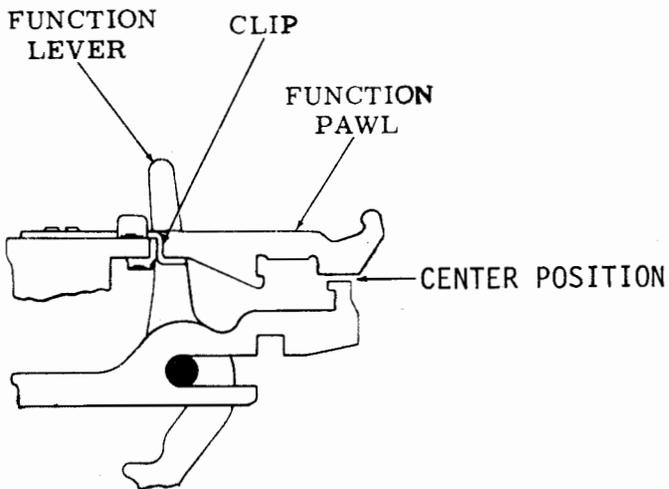
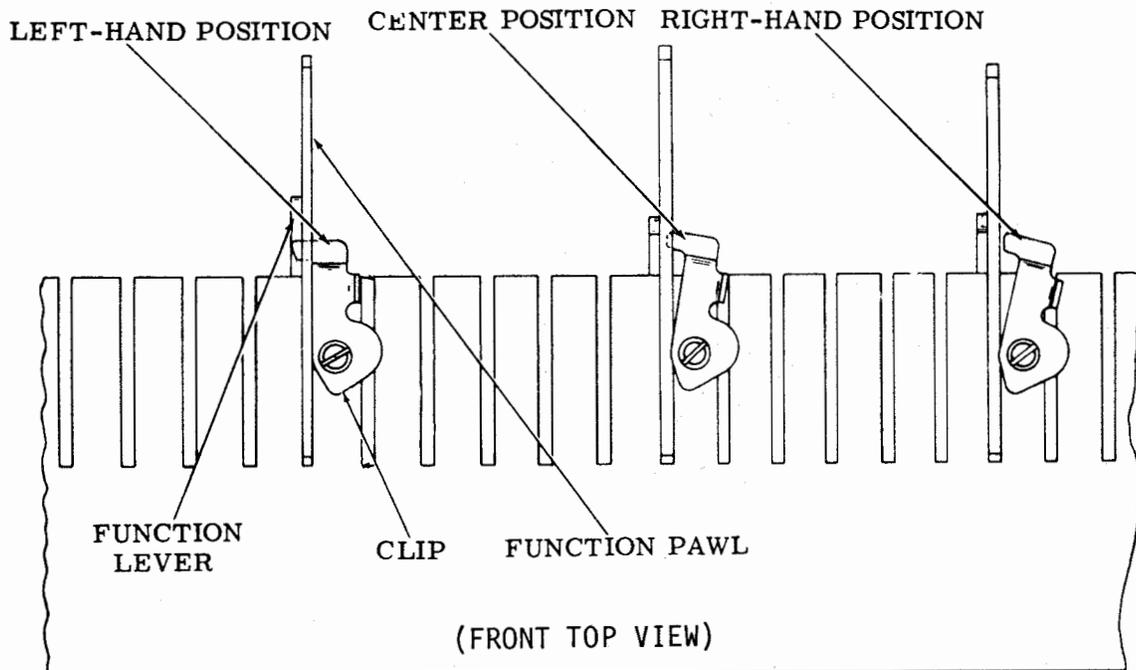


Figure 6-16. Stunt Box Clip

and should hold top end of lever in its rear position.

(g) To adjust clip in left-hand position, position clip in its extreme left hand position and tighten mounting screw.

(11) Unshift-on-Space Function Pawl. Adjust unshift-on-space pawl as follows:

(a) Refer to figure 6-17.

(b) To prevent unshift-on-space function, clearance between lower edge of unshift-on-space function pawl and its function bar should be between 0.015 and 0.060 inch.

(c) If clearance exceeds the limits, loosen disabling screw locknut and turn disabling screw in. Then tighten locknut.

(d) To restore unshift-on-space function, loosen locknut, back off disabling screw so that pawl fully engages function bar. Continue to turn screw out one to three turns. Tighten locknut.

c. Line Feed and Platen Mechanism Adjustments. Perform line feed and platen mechanism adjustments in accordance with the following paragraphs.

(1) Left Margin (Sprocket Feed). Adjust left margin as follows:

(a) Refer to figure 6-18.

(b) Disengage type box clutch, fully return spacing drum, and shift type box to letters position.

(c) Measure clearance between center of letters print indicator on type box and centerline of sprocket pins at left hub. Clearance should be between 5/16 and 7/16 inch.

(d) If clearance exceeds the limits, loosen carriage return ring mounting screws and position carriage return ring to obtain clearance specified in step (c). Then tighten mounting screws.

(e) Disengage spacing clutch, position front spacing feed pawl in its farthest advanced position, fully return spacing drum, and take up play in spacing gear in clockwise direction.

(f) Measure clearance between pawl and shoulder of ratchet wheel tooth immediately ahead. There should be some clearance not to exceed 0.008 inch, and rear pawl, when farthest advanced, should drop into indentation between ratchet wheel teeth and bottom firmly in notch.

(g) If adjustment is required, refine adjustment of step (d) above.

(2) Printing Hammer Stop Bracket (Sprocket Feed). Adjust printing hammer stop bracket as follows:

(a) Refer to figure 6-18.

(b) For units with thick type box and dummy type pallets, use corresponding standard adjustment except there should be some clearance between printing hammer and dummy type pallet, but not exceeding 0.020 inch.

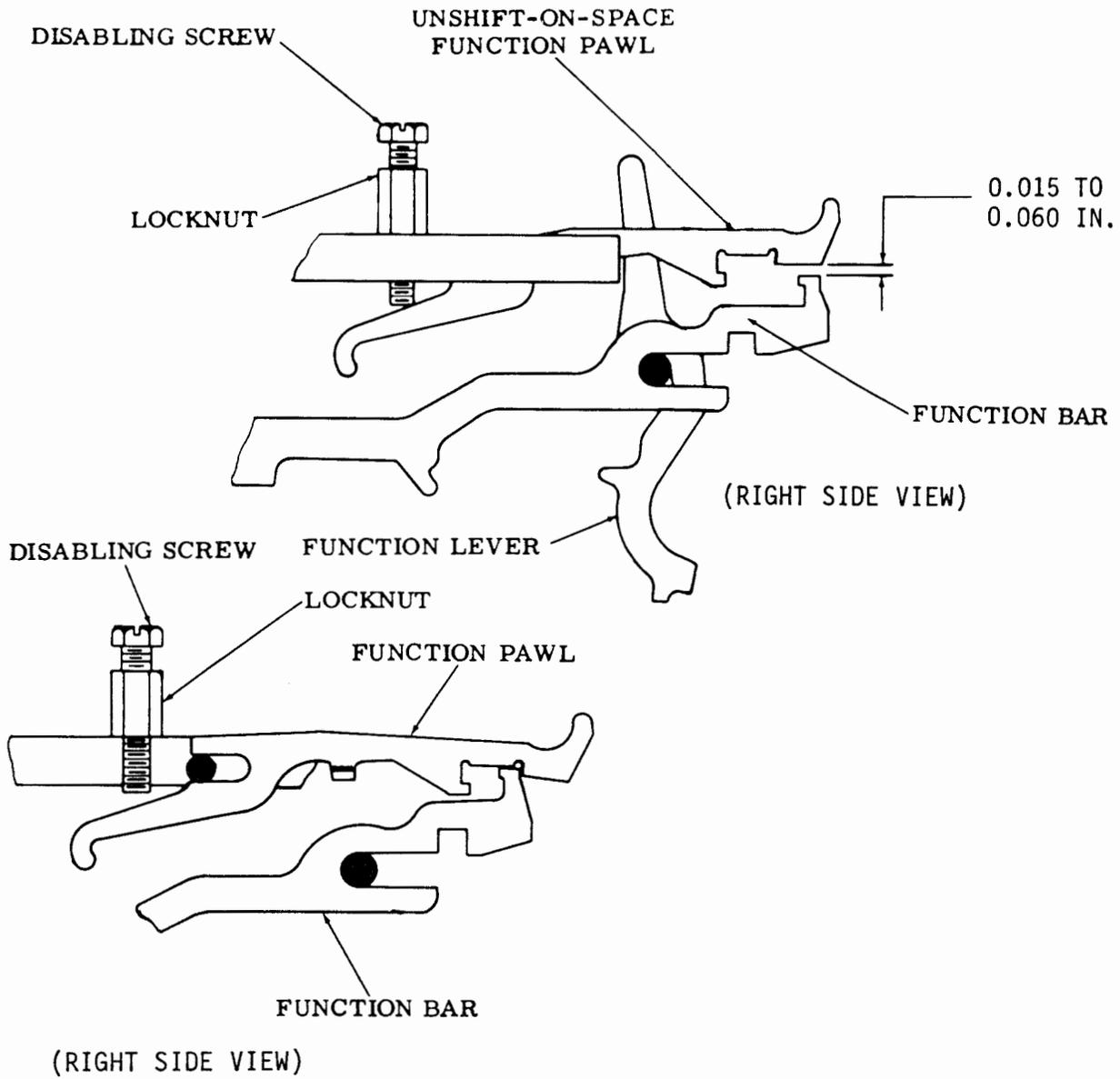


Figure 6-17. Unshift-On-Space Function Pawl

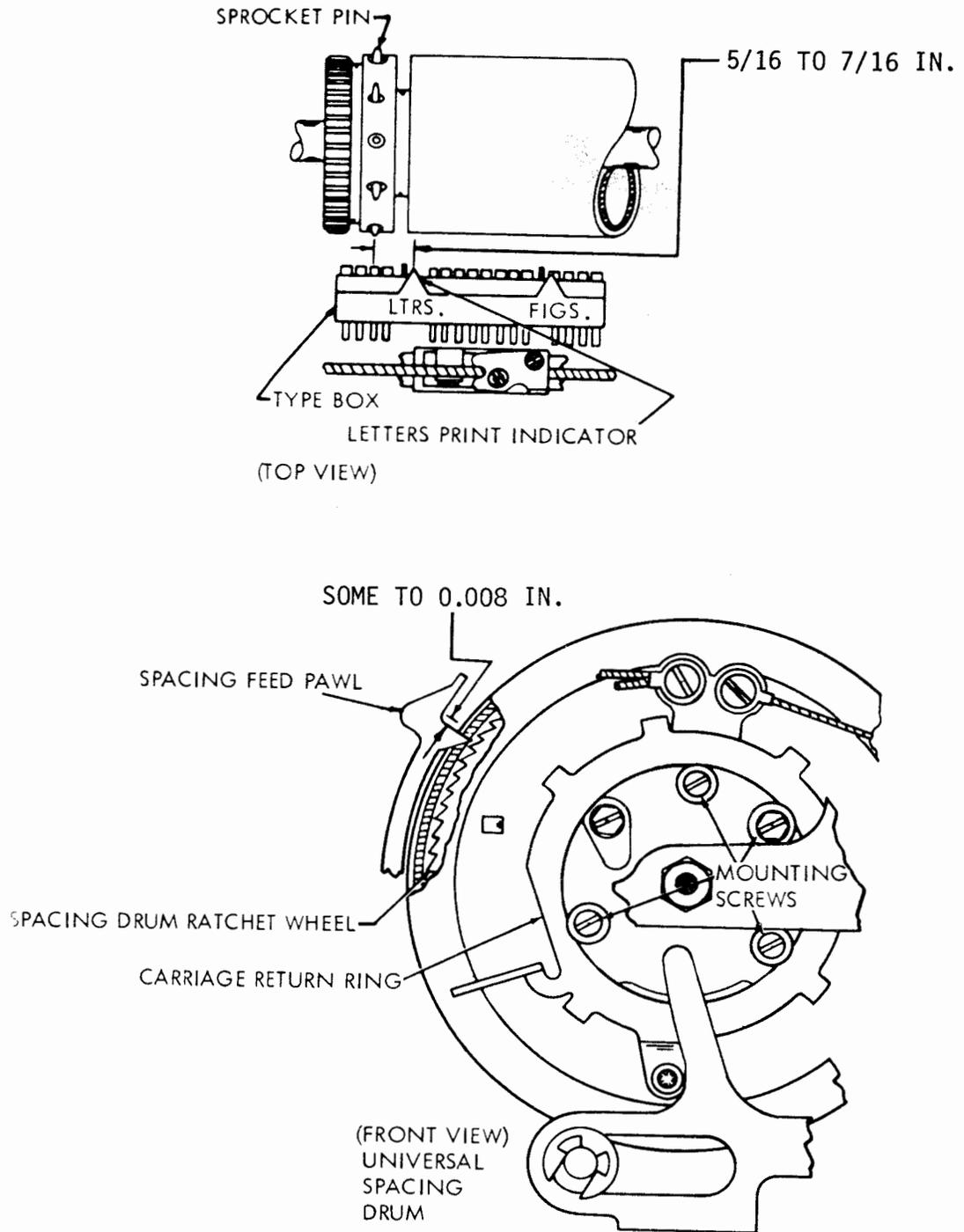


Figure 6-18. Left Margin (Sprocket Feed), Printing Hammer Stop Bracket (Sprocket Feed)

(c) For units with thin type box and no dummy type pallets, use corresponding standard adjustment.

(d) Certain multiple form units will require a refinement of standard adjustments for stop bracket to between 0.005 and 0.015 inch.

(3) Right Margin (Sprocket Feed). Adjust right margin as follows:

(a) Refer to figure 6-19.

(b) Disengage type box clutch.

(c) Place carriage in position to print character on which spacing cutout is to occur.

(d) Place front feed pawl in farthest advanced position.

(e) Hold spacing cutout transfer bail in its uppermost position.

(f) If unit has two-piece spacing cutout bail, push cutout bail toward rear through hole in front plate.

(g) Measure clearance between extension on space suppression ring and transfer bail. Clearance should be between 0.006 and 0.025 inch.

(h) If clearance exceeds specified limits, loosen four mounting screws and position space suppression ring to obtain clearance within specified limits.

(i) Tighten four mounting screws.

NOTE 1

If adjustment was necessary to bring clearance within specified limits, check adjustments in paragraphs 6-3.1h(13) and 6-3.1h(2).

NOTE 2

Range of adjustment is from 0 to 85 characters.

NOTE 3

This adjustment is not applicable to units equipped with automatic carriage return-line feed ring. (See paragraph 6-7.1h(7)).

(4) Line Feed Bar Bell Crank Spring. Adjust line feed bar bell crank spring as follows:

(a) Refer to figure 6-20.

(b) Place left-hand line feed bar in rear position.

(c) Attach spring scale hook to line feed bar at upper end.

(d) The force required to start bar moving should be as follows: for friction feed, between 19 and 24 ounces; for sprocket feed, between 28 and 38 ounces.

(e) If scale reading exceeds limits, install a new spring.

(5) Line Feed Bar Release Lever Spring. Adjust line feed bar release lever spring as follows:

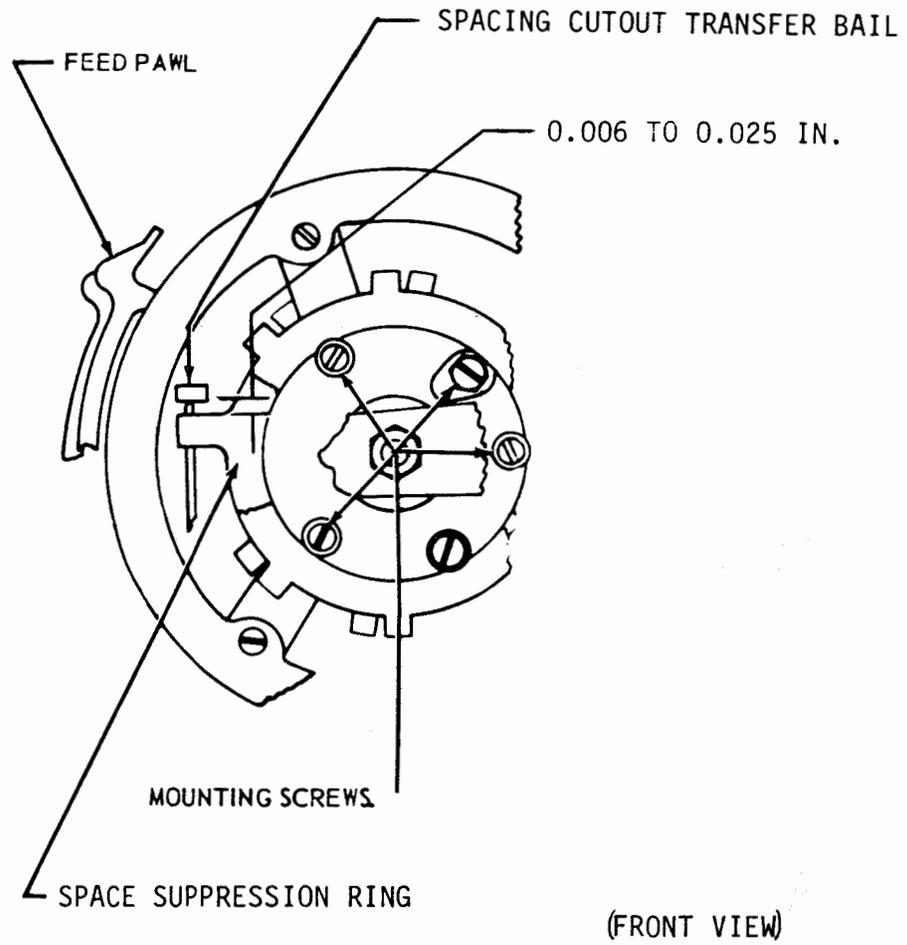


Figure 6-19. Right Margin (Sprocket Feed)

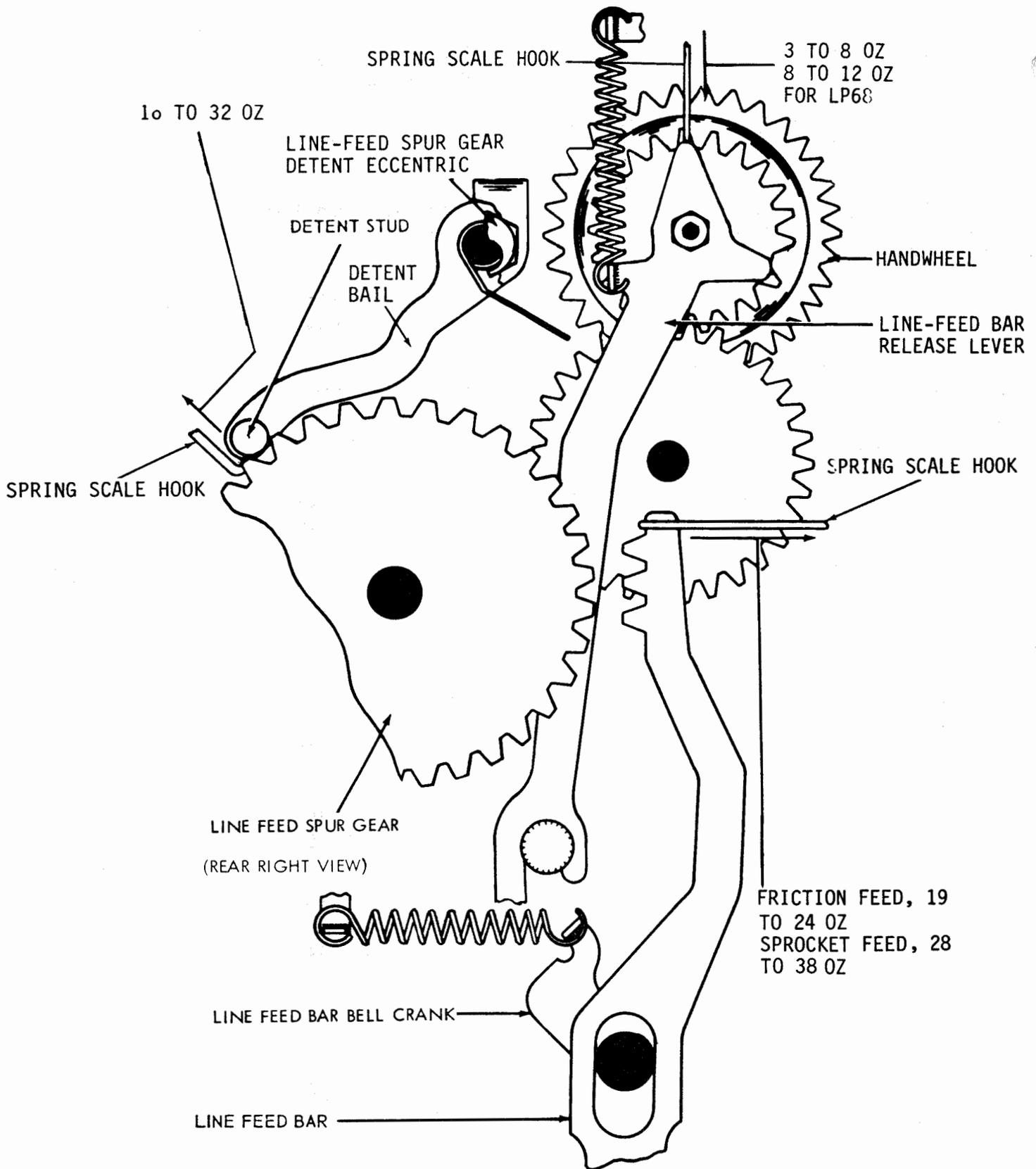


Figure 6-20. Line Feed Bar Bell Crank Spring, Line Feed Bar Release Lever Spring, Line Feed Spur Gear Detent Eccentric, and Platen Detent Bail Spring

(a) Refer to figure 6-20.

(b) Attach spring scale hook to line feed bar release lever.

(c) The force required to start lever moving should be between 3 and 8 ounces. For LP68 the required force should be between 8 and 12 ounces.

(d) If scale reading exceeds limits, install a new spring.

(6) Line Feed Spur Gear Detent Eccentric. Adjust line feed spur gear detent eccentric as follows:

(a) Refer to figure 6-20.

(b) Disengage feed clutch.

(c) Rotate platen until stud is seated between two teeth on line feed spur gear.

(d) When handwheel is released, manually set teeth on feed bars into engagement with teeth on line feed spur gear.

(e) Detent stud should contact one gear tooth and be not more than 0.010 inch from other tooth.

(f) If gap between teeth exceeds specified limit, loosen mounting screw and rotate detent eccentric, keeping high part of eccentric upward, to obtain proper gap dimension.

(g) Tighten mounting screw.

(7) Platen Detent Bail Spring. Adjust platen detent bail spring as follows:

(a) Refer to figure 6-20.

(b) Seat detent between two teeth on line feed spur gear.

(c) Attach spring scale hook to end of detent bail.

(d) Force required to start detent bail moving should be between 16 and 32 ounces.

(e) If scale reading exceeds specified limit, install a new spring.

(8) Line Feed Clutch Phasing. Adjust line feed clutch phasing as follows:

(a) Refer to figure 6-21.

(b) Disengage line feed clutch.

(c) Both line feed bars should engage teeth of line feed spur gear.

(d) To adjust, loosen assembly bearing post; remesh line feed eccentric spur gear with clutch gear.

(e) Tighten bearing post.

(9) Paper Finger (Friction Feed). Adjust paper finger as follows:

(a) Refer to figure 6-22.

(b) Pressure end of paper fingers should

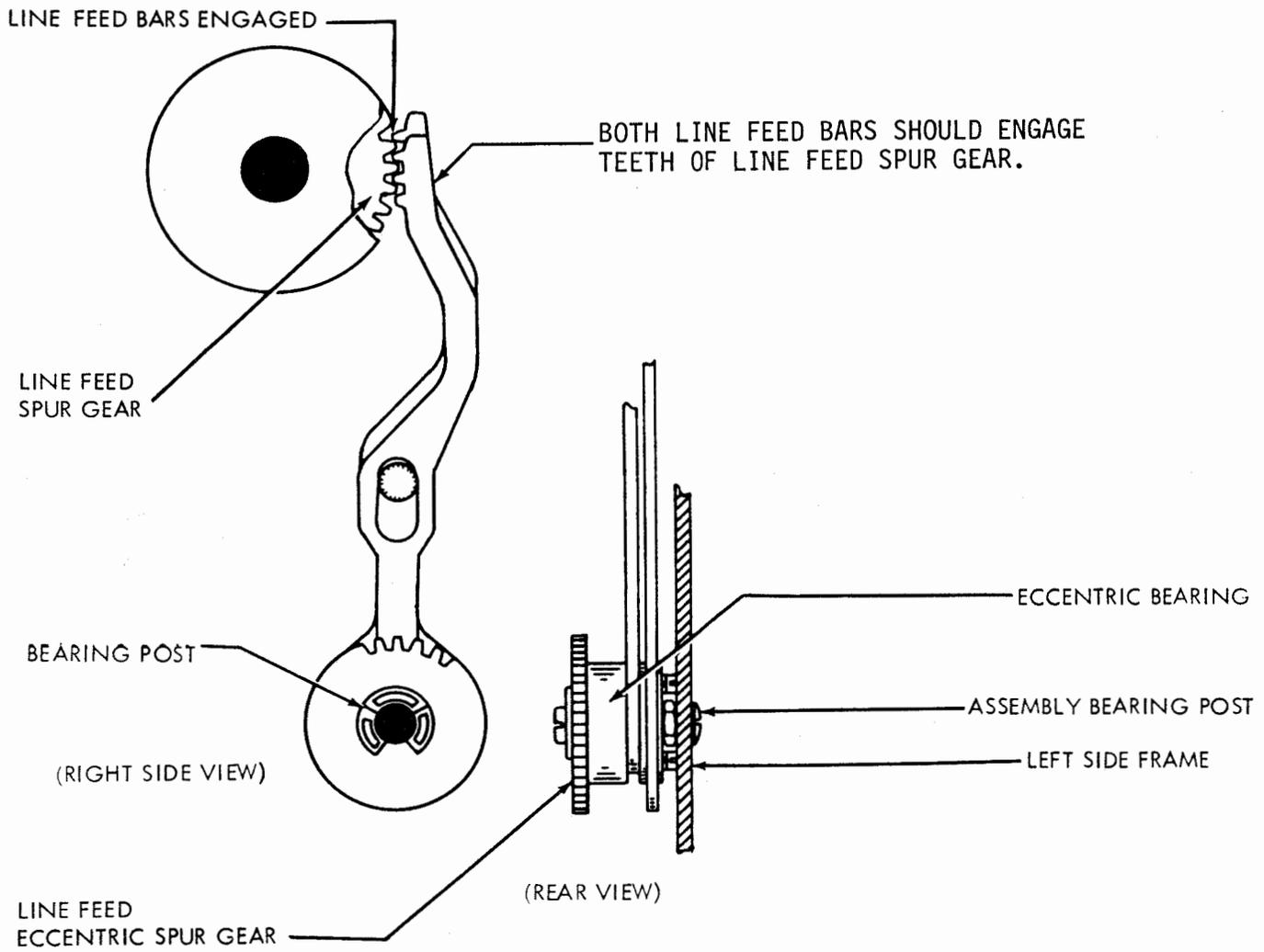


Figure 6-21. Line Feed Clutch Spring

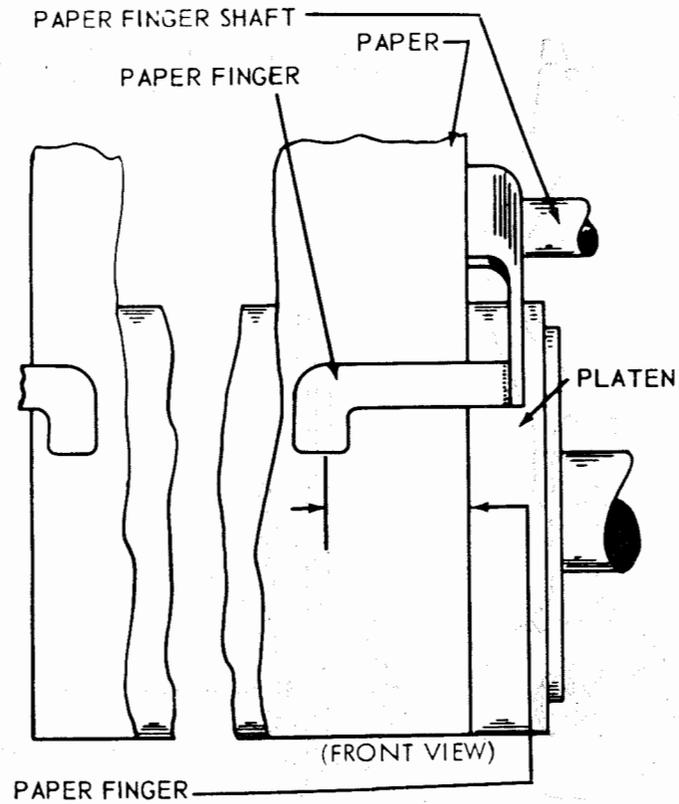


Figure 6-22. Paper Finger (Friction Feed)

overlap paper between 3/8 and 1/2 inch.

(c) If overlap is not as specified, position paper fingers by sliding them on their shaft.

(10) Paper Finger Spring. Adjust paper finger spring as follows:

(a) Refer to figure 6-23.

(b) Attach spring scale hook under end of right paper finger.

(c) Force required to start left paper spring moving from platen should be between 3 and 6 ounces.

(d) If scale reading exceeds specified limits, install a new spring.

(11) Paper Pressure Bail Spring. Adjust paper pressure bail spring as follows:

(a) Refer to figure 6-23.

(b) Hook spring scale over pressure bail at either end of platen.

(c) Force required to move pressure bail from platen should be between 7 and 20 ounces.

(d) Repeat step (b) and (c) at opposite end of platen

(e) If scale reading for either spring exceeds specified limits, replace spring.

(12) Pressure Roller Lever Spring. Adjust pressure roller lever spring as follows:

(a) Refer to figure 6-23.

(b) Attach spring scale hook to each center lever alternately.

(c) Force required to start each center lever moving should be between 28 and 36 ounces.

(d) If scale reading exceeds specified limits, install a new spring.

(13) Paper Finger Locking Arm Spring (Sprocket Feed). Adjust paper finger locking arm spring as follows:

(a) Refer to figure 6-24.

(b) Attach spring scale hook to locking arm.

(c) Force required to move arm away from platen should be between 1 and 1-1/2 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(14) Paper Finger or Guide Bracket Latch Spring. Adjust paper finger or guide latch spring as follows:

(a) Refer to figure 6-24.

(b) Place paper finger or guide bracket against platen.

(c) Attach spring scale hook to paper finger or guide bracket latch.

(d) Force required to start latch moving

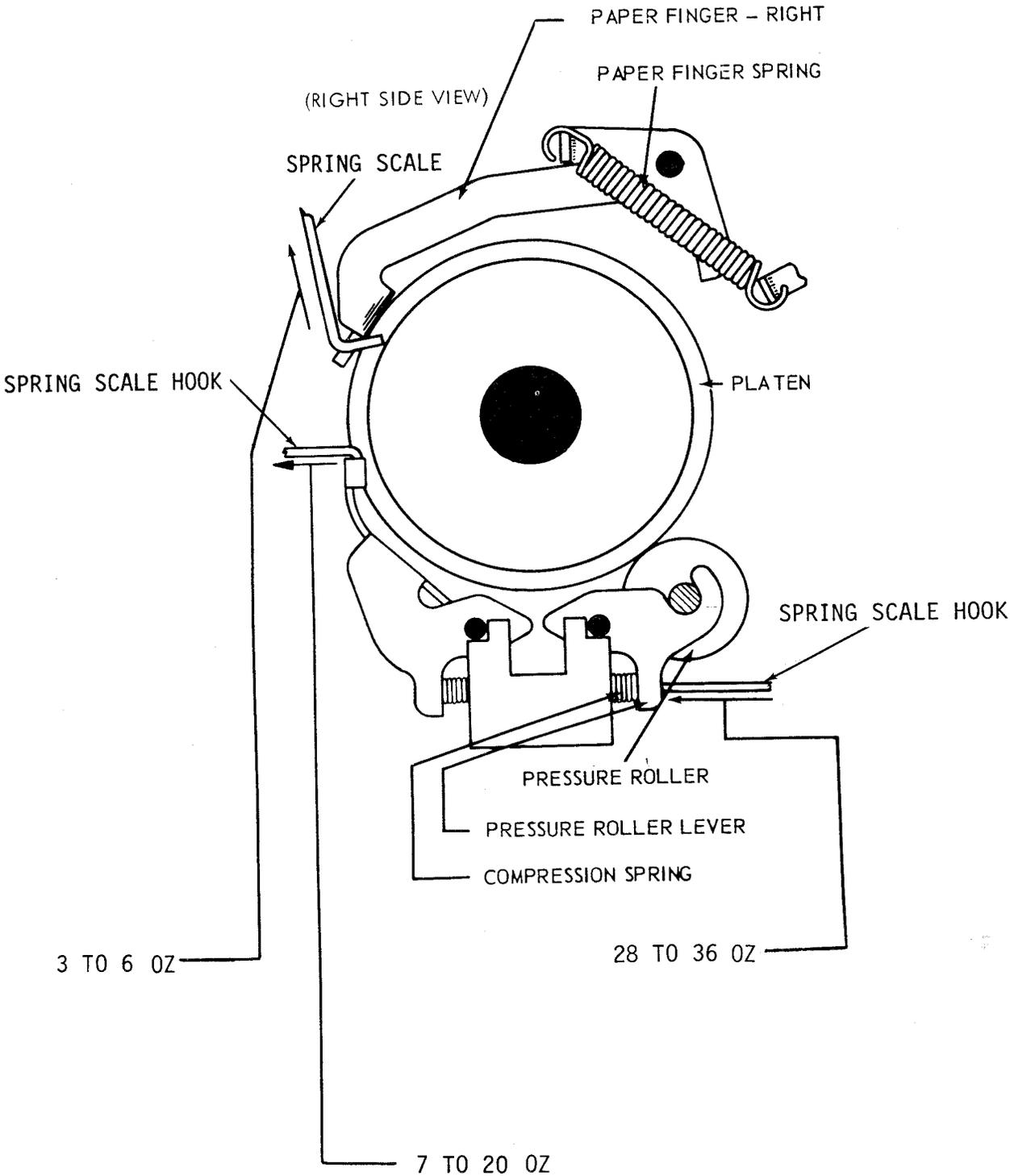


Figure 6-23. Paper Finger Spring, Paper Pressure Bail Spring, and Pressure Roller Lever Spring

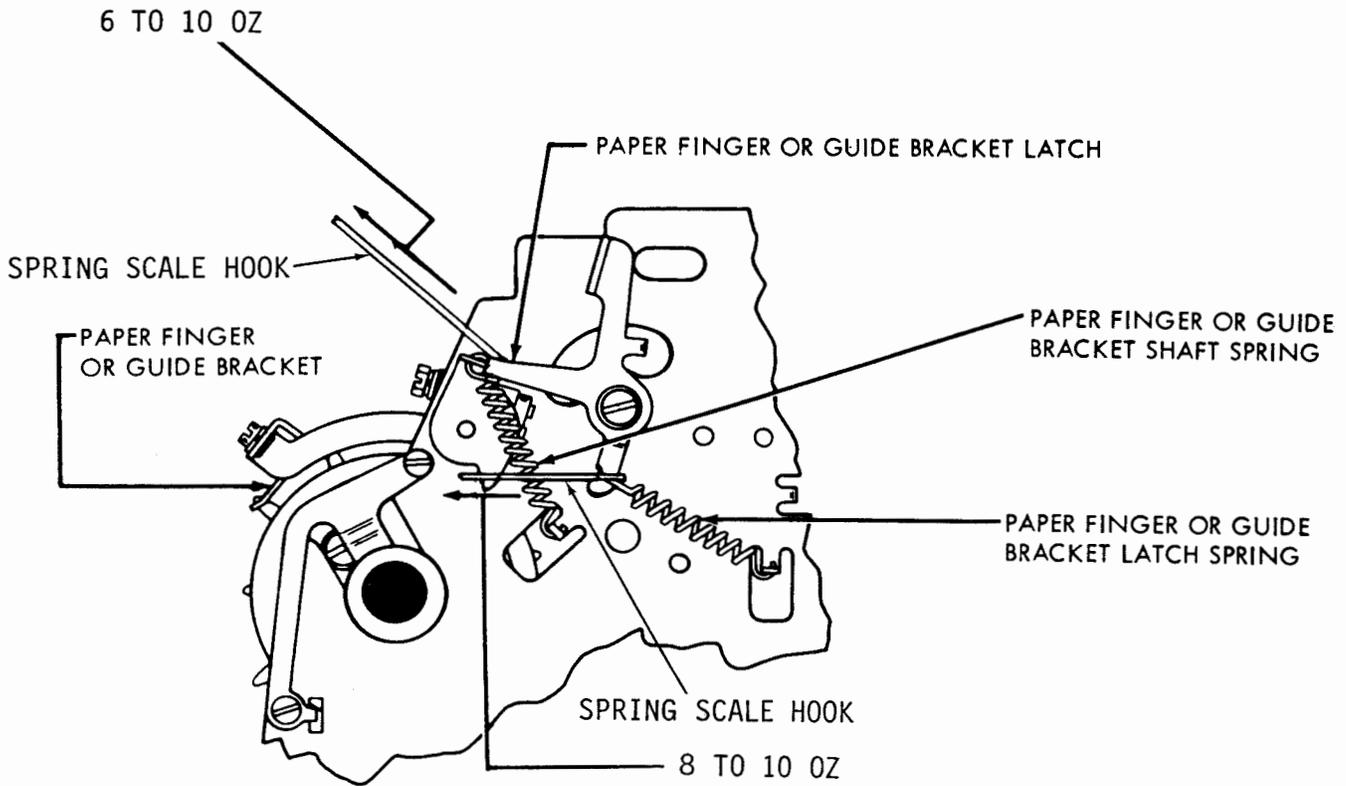


Figure 6-24. Paper Finger Locking Arm Spring, Paper Finger or Guide Bracket Latch Spring, and Paper Finger or Guide Bracket Shaft Spring

should be between 8 and 12 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(15) Paper Finger or Guide Bracket Shaft Spring.  
Adjust paper finger or guide shaft spring as follows:

(a) Refer to figure 6-24.

(b) Attach spring scale hook to end of paper finger on guide bracket shaft spring.

(c) Force required to move paper finger or guide bracket against platen should be between 6 and 10 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(16) Paper Finger or Guide Bracket (Sprocket Feed).  
Adjust paper finger or guide bracket as follows:

(a) Refer to figure 6-25.

(b) Ensure sprocket pin is centered in paper finger or guide bracket slot. If any change is made in the above adjustment, recheck following related adjustments:

Horizontal positioning drive linkage

Right vertical positioning lever eccentric stud

Left vertical positioning lever eccentric stud

Vertical positioning lock lever

Ribbon feed lever bracket

Function stripper blade arms

Spacing trip lever bail cam plate

Reversing slide brackets

Ribbon reverse spur gear

Printing track

Printing arm

(c) To adjust, loosen both clamp screws and position assembly horizontally to center sprocket pin in paper finger or guide bracket slot. Tighten clamp screws.

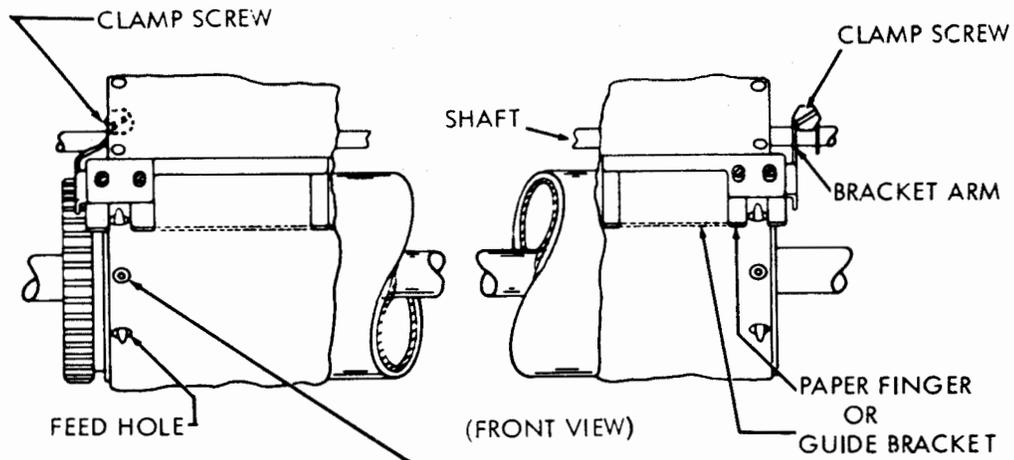
(d) Gap between platen and paper finger or guide bracket slot should be as follows:

1. For stapled multiple copy, between 0.050 and 0.105 inch.

2. For single copy or unstapled multiple copy, between 0.020 and 0.060 inch.

(e) If gap between platen and paper finger or guide bracket slot exceeds specified limits, loosen both clamp screws and rotate assembly to obtain gap specified in step (d).

(f) Measure clearance between leading edge of paper finger or guide bracket and ribbon guide (not illustrated). The clearance should be a minimum of 0.035 inch, and both right and left paper fingers must be parallel to same printed line as gauged by eye.



SPROCKET PIN SHOULD BE CENTRALLY LOCATED IN THE PAPER FINGER OR GUIDE BRACKET SLOT.

STAPLED MULTIPLE COPY, 0.050 TO 0.105 IN. SINGLE COPY OR UNSTAPLED MULTIPLE COPY, 0.020 TO 0.060 IN.

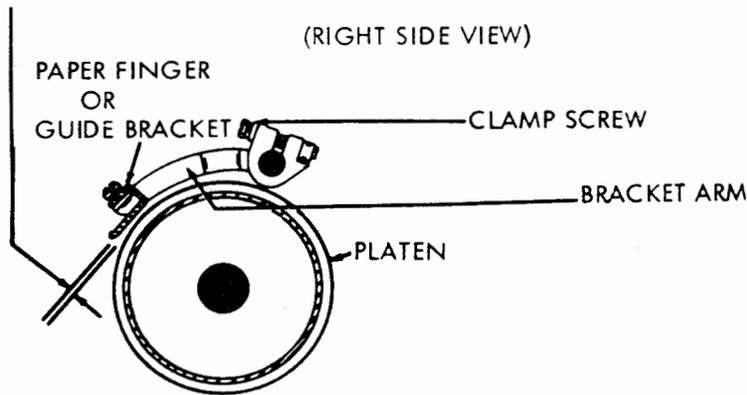


Figure 6-25. Paper Finger or Guide Bracket (Sprocket Feed)

(g) If clearance exceeds specified limit or paper fingers are not parallel to same printed line, loosen both clamp screws, select letters combination, and rotate type box clutch 1/2 revolution. Position paper fingers by means of elongated mounting holes.

(h) Tighten clamp screws and repeat steps (e) and (f).

(17) Paper Guide (Sprocket Feed). Adjust paper guide as follows:

(a) Refer to figure 6-26.

(b) Measure clearance between platen and front edge of paper guide. Clearance should be as follows:

1. For stapled multiple copy, between 0.050 and 0.105 inch.

2. For single copy or unstapled multiple copy, between 0.020 and 0.060 inch,

(c) If clearance exceeds specified limits, loosen mounting screws, position guide to obtain specified clearance, and tighten mounting screws.

(18) Sprocket Pin Spring. Adjust sprocket pin spring as follows:

(a) Refer to figure 6-26.

(b) Apply spring scale to sprocket spring.

(c) Force required to start depressing pin should be between 6 and 8 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(19) Paper Straightener Collar (Friction Feed). Adjust paper straightener collar as follows:

(a) Refer to figure 6-27.

(b) Measure distance from paper straightener shaft left shoulder to left collar.

(c) Distance should be 9/32 to 21/64 inch.

(d) If distance exceeds specified limits, loosen left collar set screw, position collar to obtain specified distance and tighten set screw.

(e) Measure distance from paper straightener shaft right shoulder to right collar.

(f) Distance should be 1/16 to 5/64 inch.

(g) If distance exceeds specified limits, loosen right collar set screw; position collar to obtain specified distance, and tighten set screw.

(20) Paper Straightener Lever Spring. Adjust paper straightener lever spring as follows:

(a) Refer to figure 6-27.

(b) Attach spring scale pushrod to paper straightener lever at point of attachment to paper straightener lever spring.

(c) Force required to start lever moving

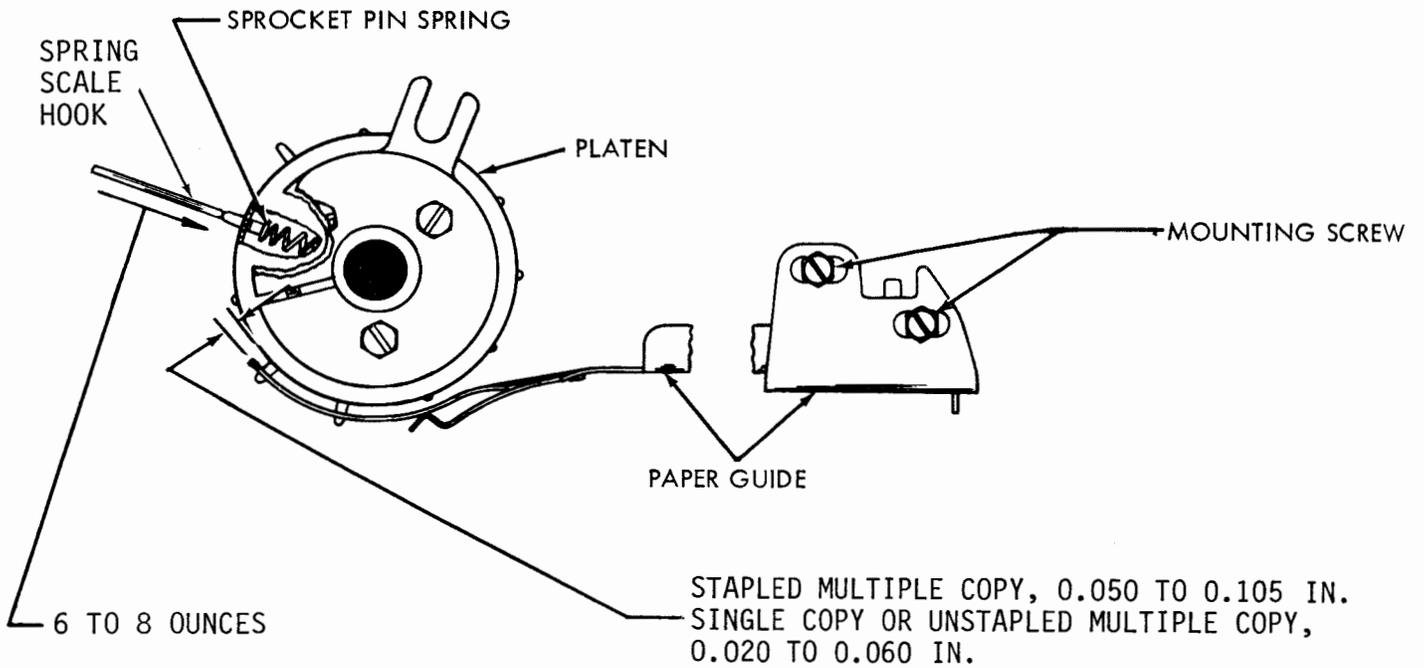


Figure 6-26. Paper Guide (Sprocket Feed) and Sprocket Pin Spring

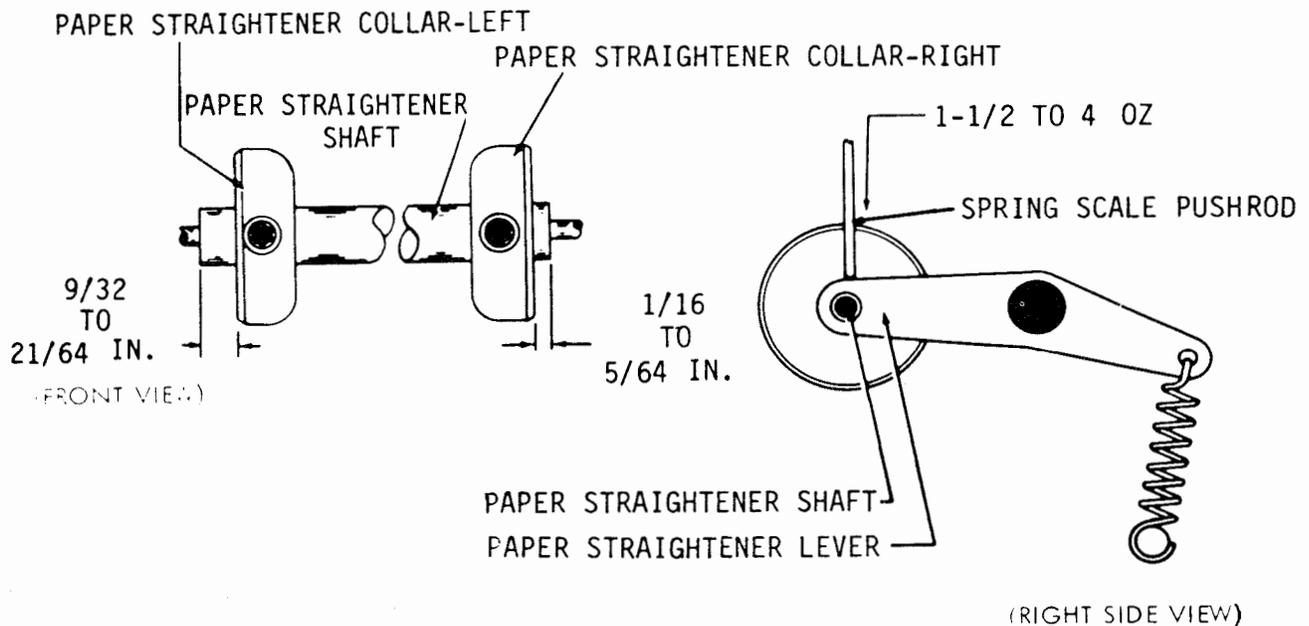


Figure 6-27. Paper Straightener Collar (Friction Feed) and Paper Straightener Lever Spring

should be between 1-1/2 and 4 ounces.

(d) If scale reading exceeds specified limits, install a new spring.

(21) Platen End Play (Sprocket Feed). Adjust platen end play as follows:

(a) Refer to figure 6-28.

(b) Disengage line feed pawls.

(c) Measure platen shaft end play.

(d) End play should be 0.010 maximum.

(e) If end play exceeds specified limit, loosen

clamp screw and position platen spur gear to obtain specified end play.

(f) Tighten clamp screw.

(22) Printed Line (Sprocket Feed). Adjust printed line as follows:

NOTE

This adjustment is a field adjustment.

(a) Refer to figure 6-29.

(b) The bottom of the printed line should be  $1/32 + 1/64$  inch (plus a multiple of  $1/6$  inch) above horizontal

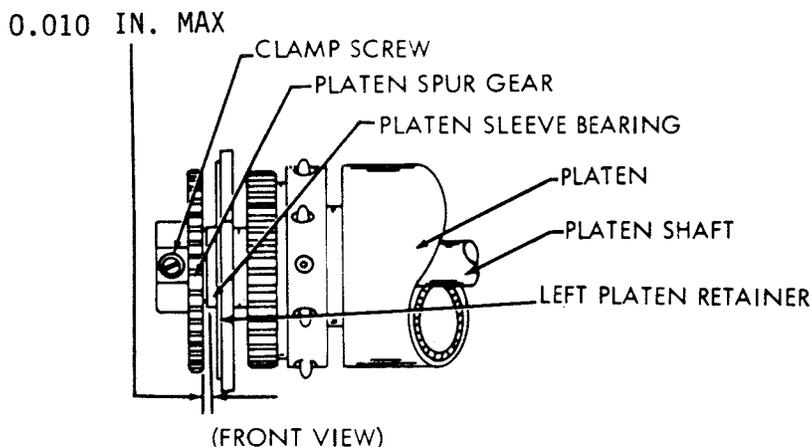


Figure 6-28. Platen End Play (Sprocket Feed)

line drawn even with the bottom edge of any sprocket hole.

$\pm 1/32$  inch to a line drawn perpendicular to edge of paper.

(c) If necessary to adjust, loosen screws and position left sprocket. If other than standard paper is used, it may be necessary to make a variation in this adjustment.

(d) If drawn line is not perpendicular to printed line within specified limits, loosen clamp screw and position right sprocket.

(e) Tighten clamp screw.

(23) Sprocket Pin Separation. Adjust sprocket pin separation as follows:

(24) Single-Double Line Feed Stripper Bail Assembly Spring. Adjust single-double line feed stripper bail assembly springs as follows:

(a) Refer to figure 6-29.

(a) Refer to figure 6-30.

(b) Place a single sheet of sprocket feed paper on platen with paper feed holes centered on sprocket pins.

(b) Disengage line feed clutch.

(c) Printed line should be parallel within

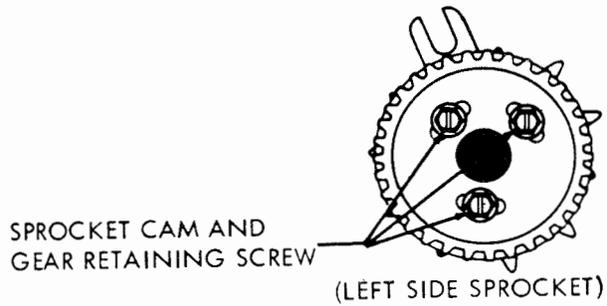
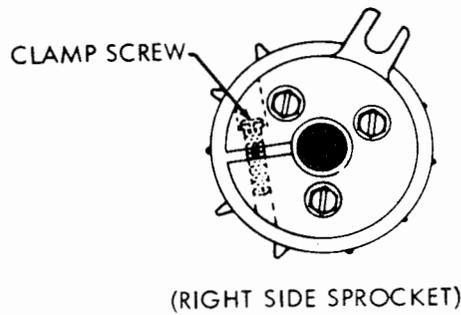
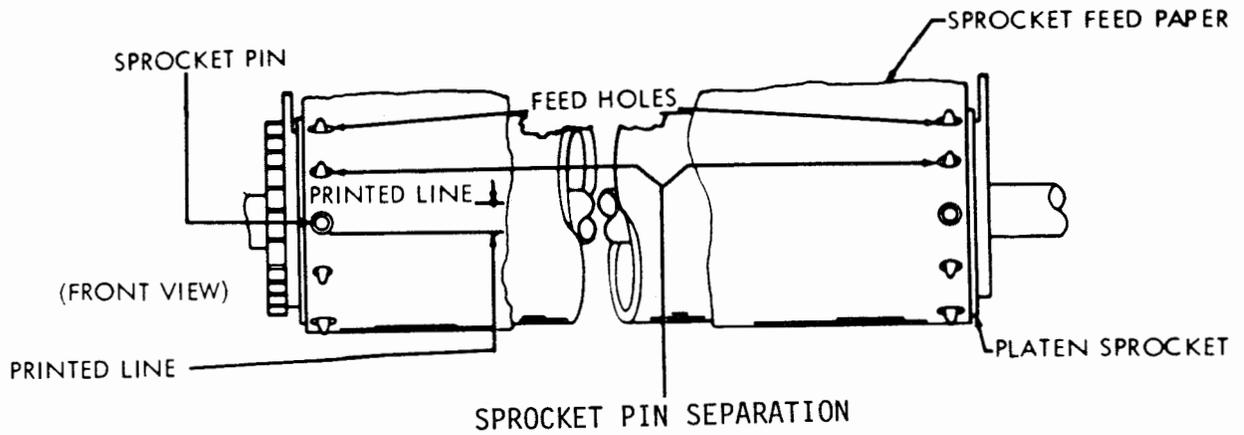


Figure 6-29. Printed Line (Sprocket Feed) and Sprocket Pin Separation

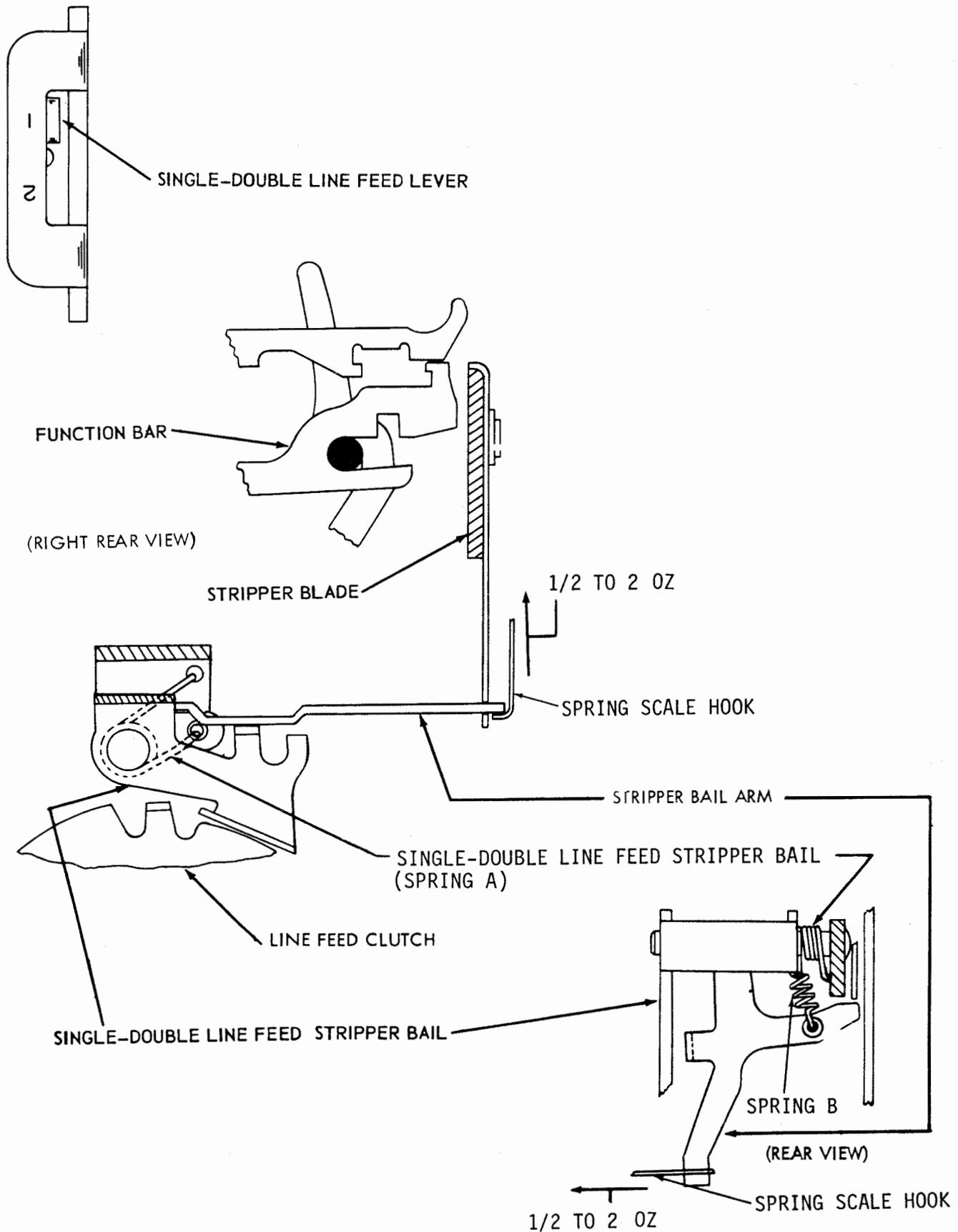


Figure 6-30. Single-Double Line Feed Stripper Bail Assembly Springs

(c) Set single-double line feed lever in single line feed position.

(d) Attach spring scale hook to stripper bail arm so as to move arm upward. Force required to start stripper bail arm moving upward should be between 1/2 and 2 ounces.

(e) If scale reading exceeds specified limits, replace spring A.

(f) Attach spring scale hook to stripper bail arm so as to move arm to left. Force required to start stripper bail arm moving to left should be between 1/2 and 2 ounces.

(g) If scale reading exceeds specified limits, replace spring B.

(25) Paper Finger. Adjust paper finger as follows:

(a) Refer to figure 6-31.

(b) Check to see that pressure ends of paper fingers overlap the paper between 3/8 and 1/2 inch.

(c) If overlap is not as specified, position fingers by sliding them on their shaft to obtain specified overlap.

d. Mainshaft and Tripshaft Mechanisms Adjustments. Perform mainshaft and tripshaft mechanisms adjustments in accordance with the following paragraphs.

(1) Clutch Drum Position (Except Selector). Adjust clutch drum position as follows:

(a) Refer to figure 6-32.

(b) Hold clutch shoe lever disengaged and measure clutch end play.

(c) There should be some end play but not exceeding 0.015 inch.

(d) If end play exceeds specified limit, loosen mounting screws and position each drum and spacing clutch set collar.

(e) Tighten mounting screws.

(2) Clutch Shoe Lever Spring. Adjust clutch shoe lever spring as follows:

(a) Refer to figure 6-32.

(b) Engage clutch.

(c) Hold cam disc to prevent turning.

(d) Attach spring scale hook to clutch shoe lever and pull at tangent to clutch.

(e) Force required to move shoe lever in contact with stop lug should be as follows: for one-stop clutches, 15 to 20 ounces; for two-stop clutches, 16 to 22 ounces.

(f) If scale reading exceeds specified limits, install a new spring.

(3) Clutch Shoe Spring. Adjust clutch shoe spring as follows:

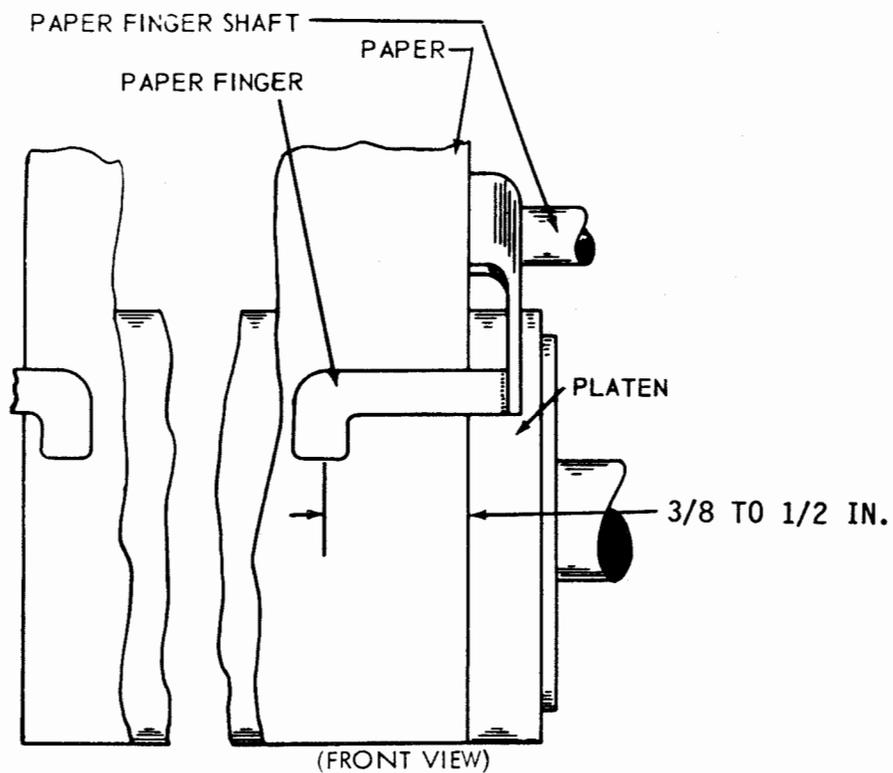


Figure 6-31. Paper Finger

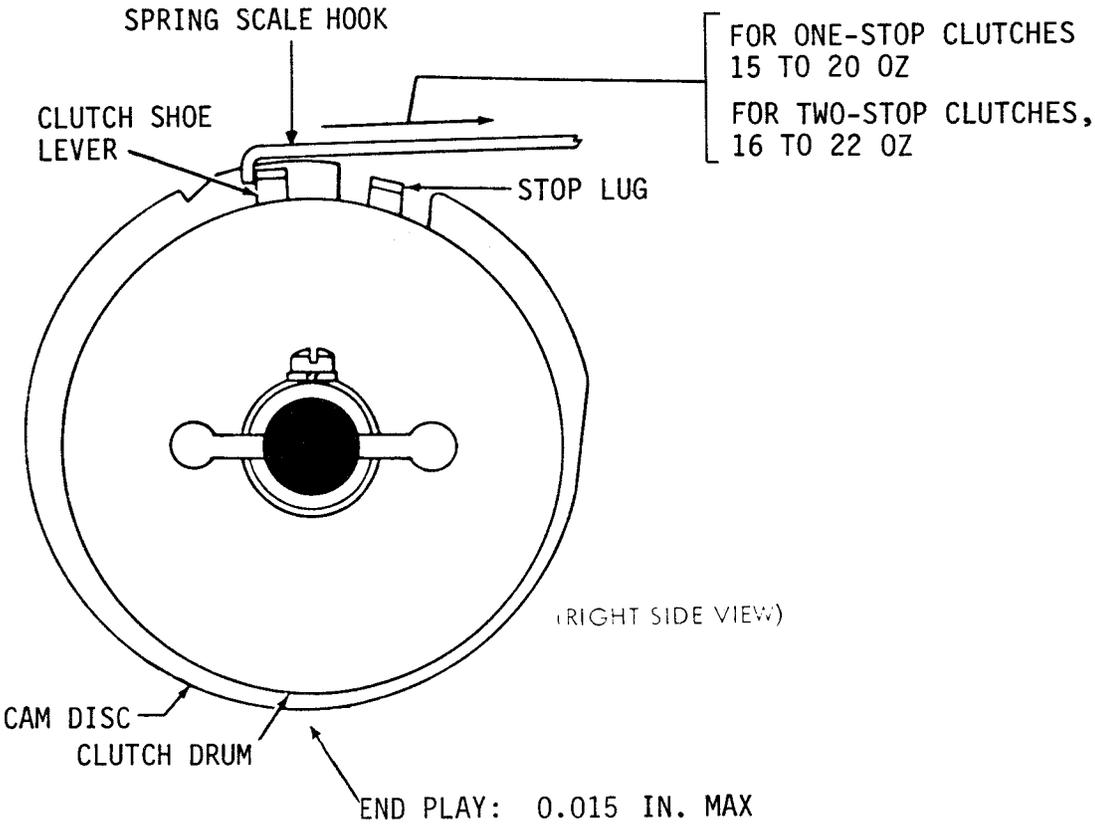


Figure 6-32. Clutch Drum Position and Clutch Shoe Lever Spring

NOTE

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

- (a) Refer to figure 6-33. clutch drum.
- (b) Remove spring scale hook to primary shoe at a tangent to friction surface.
- (c) Attach spring scale hook to primary shoe at a tangent to friction surface.
- (d) Force required to start primary shoe moving away from secondary shoe at point of contact should be between 3 and 5 ounces.
- (e) If scale reading exceeds specified limits, install a new spring.

(4) Clutch Latch-Lever Spring (Except Selector). Adjust clutch latchlever spring as follows:

- (a) Refer to figure 6-34. This adjustment applies to code bar clutch, function clutch, spacing clutch, line feed clutch, and type box clutch.
- (b) Turn clutch to stop position, but with latch lever not latched.
- (c) Attach spring scale hook to latch lever.
- (d) Force required to move latch lever

from lug should be between 5 and 7-1/4 ounces.

(e) If scale reading exceeds specified limits, install a new spring.

(5) Code Bar Clutch Trip Lever. Adjust code bar clutch trip lever as follows:

- (a) Refer to figure 6-34.
- (b) Disengage selector clutch and code bar clutch.
- (c) Code bar clutch should engage clutch shoe lever by full thickness of shoe lever and have some end play, but not exceeding 0.006 inch.
- (d) If engagement is not as specified, loosen clamp screw and position trip lever on its shaft.
- (e) Tighten clamp screw.

(6) Trip Shaft Lever Spring. Adjust trip shaft lever spring as follows:

- (a) Refer to figure 6-34.
- (b) Position trip shaft lever on low part of cam.
- (c) Engage code bar clutch and rotate one quarter turn.
- (d) Attach spring scale hook to trip shaft lever.
- (e) Force required to start lever moving should be between 1 and 2 ounces.

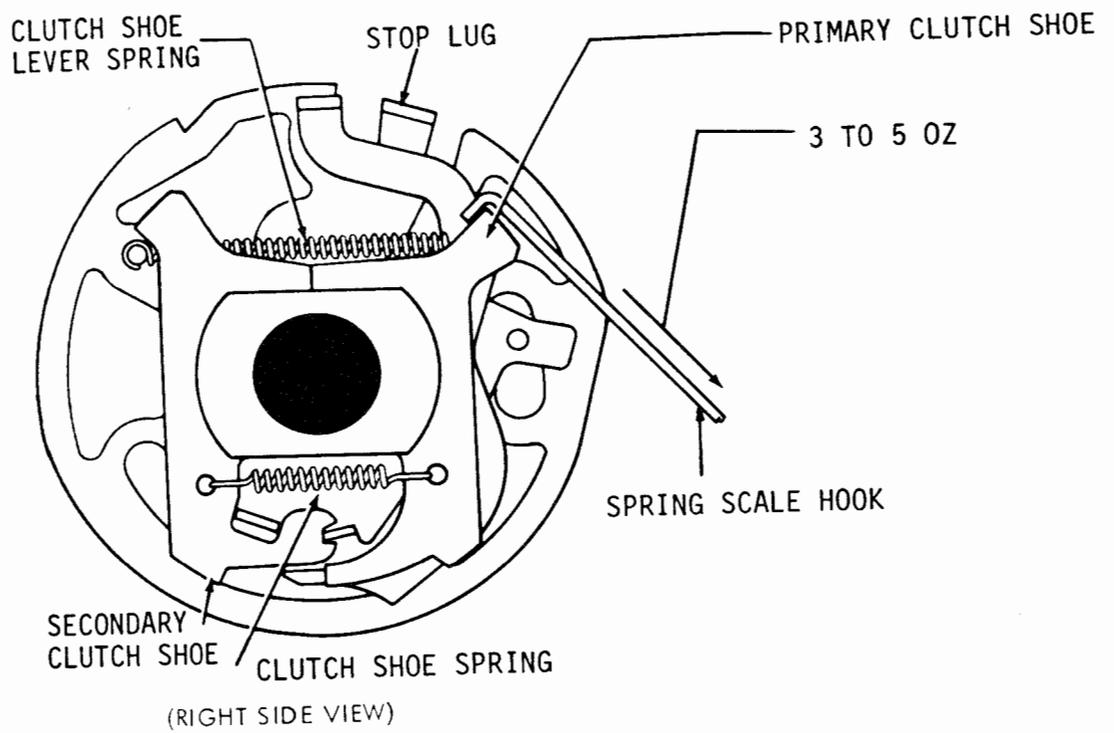


Figure 6-33. Clutch Shoe Spring

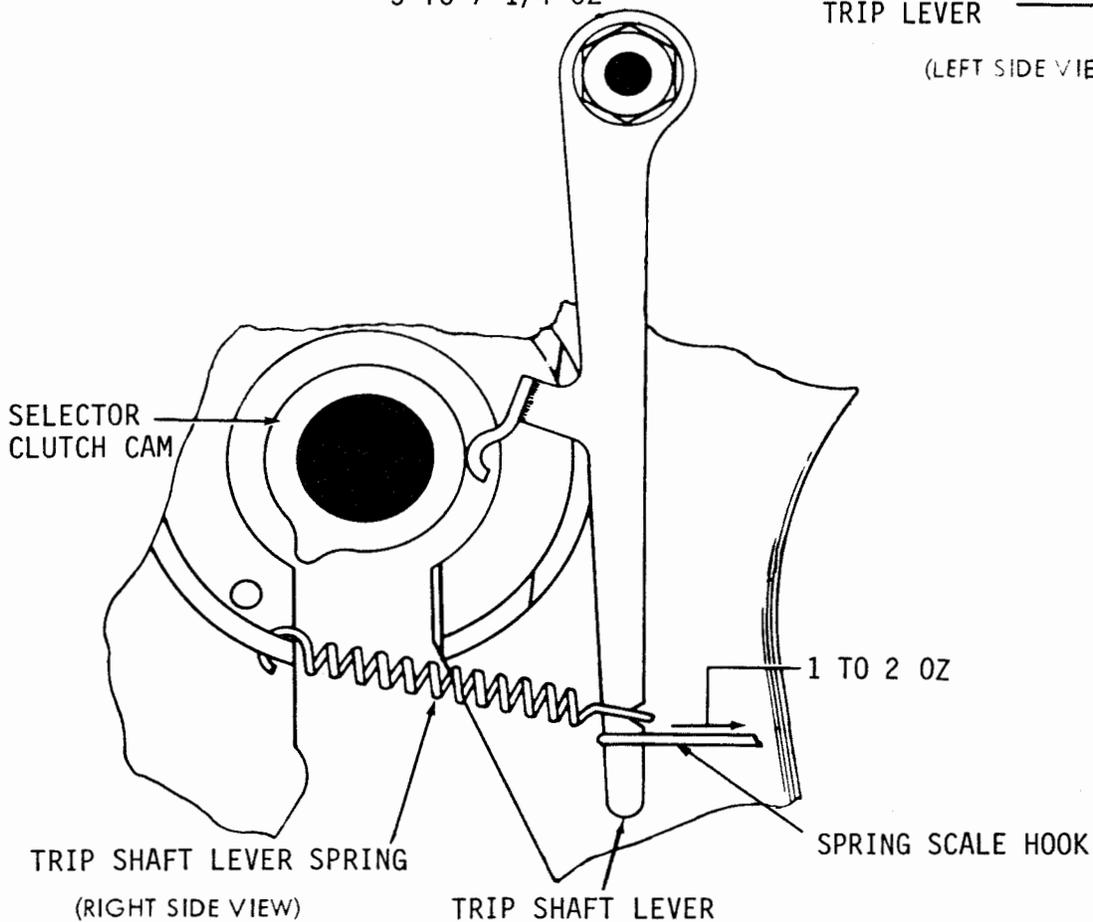
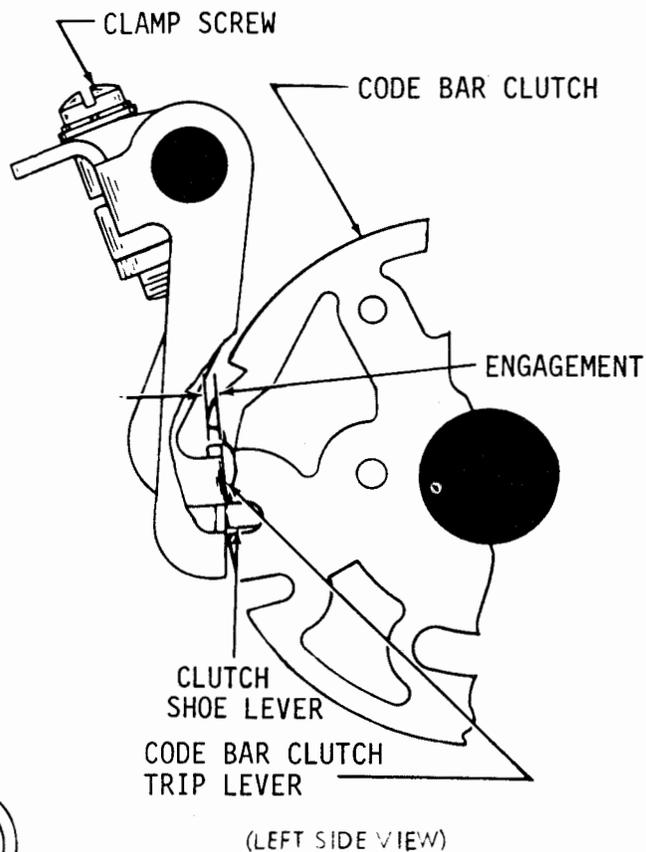
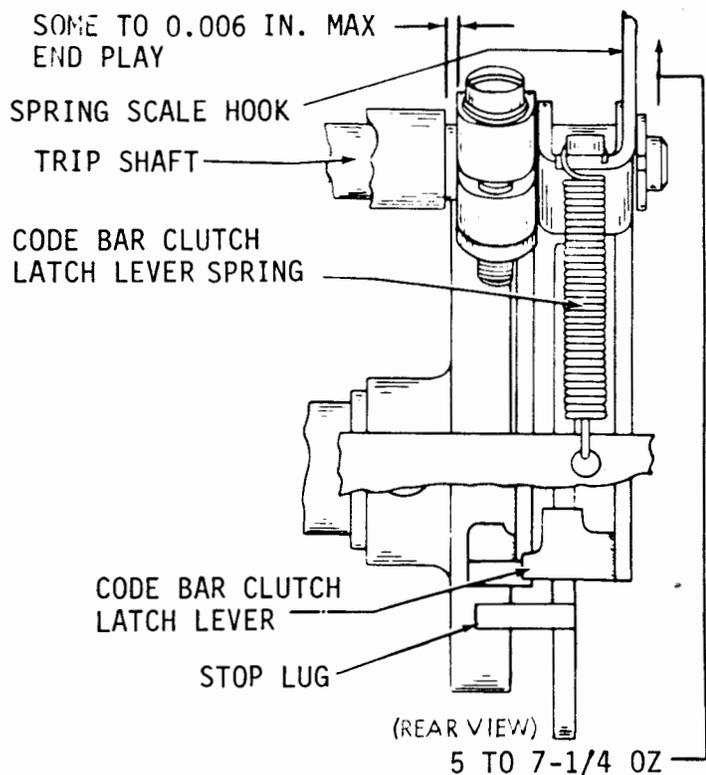


Figure 6-34. Clutch Latch Lever Spring (Except Selector), Code Bar Clutch Trip Lever, and Trip Lever Spring

(f) If scale reading exceeds specified limits, install new spring.

(7) Clutch Shoe Lever. Adjust clutch shoe lever as follows:

(a) Refer to figure 6-35.

(b) Disengage clutch and measure gap between clutch shoe lever and its stop lug. Make note of gap measurement.

(c) Engage clutch by tripping clutch and rotating it until clutch shoe lever is toward bottom of unit and again measure gap between clutch shoe lever and its stop lug. Make note of gap measurement.

(d) Find difference between the two gap measurements, by subtracting measurement with clutch disengaged from measurement with clutch engaged. Difference should be between 0.055 and 0.085 inch.

(e) If difference exceeds specified value, loosen two clamp screws on clutch disc.

(f) Engage wrench or screwdriver with adjusting disc lug and rotate disc.

(g) Tighten clamp screws.

(8) Type Box Clutch Trip Lever. Adjust type box clutch trip lever as follows:

(a) Refer to figure 6-36.

(b) Position trip shaft cam follower roller on lowest surface of cam (located on code bar clutch).

(c) Measure clearance between inner face of type box clutch trip lever and clutch disc stop lug. Clearance should be between 0.025 and 0.045 inch.

(d) If clearance exceeds specified limits, loosen clamp screw and position stop to obtain specified clearance.

(9) Clutch Trip Lever Spring. Adjust trip lever spring as follows:

(a) Refer to figure 6-37.

(b) Engage and rotate clutch until trip lever rests on stop lug.

(c) Apply spring scale hook to trip lever.

(d) Force required to move lever away from stop lug should be as follows: for spacing clutch, between 11 and 16 ounces; for line feed clutch, between 9 and 12 ounces; for type box clutch, between 5 and 7-ounces.

(e) If scale reading exceeds specified limits, install new spring.

(10) Spacing Clutch Trip Lever. Adjust spacing clutch trip lever as follows:

(a) Refer to figure 6-38.

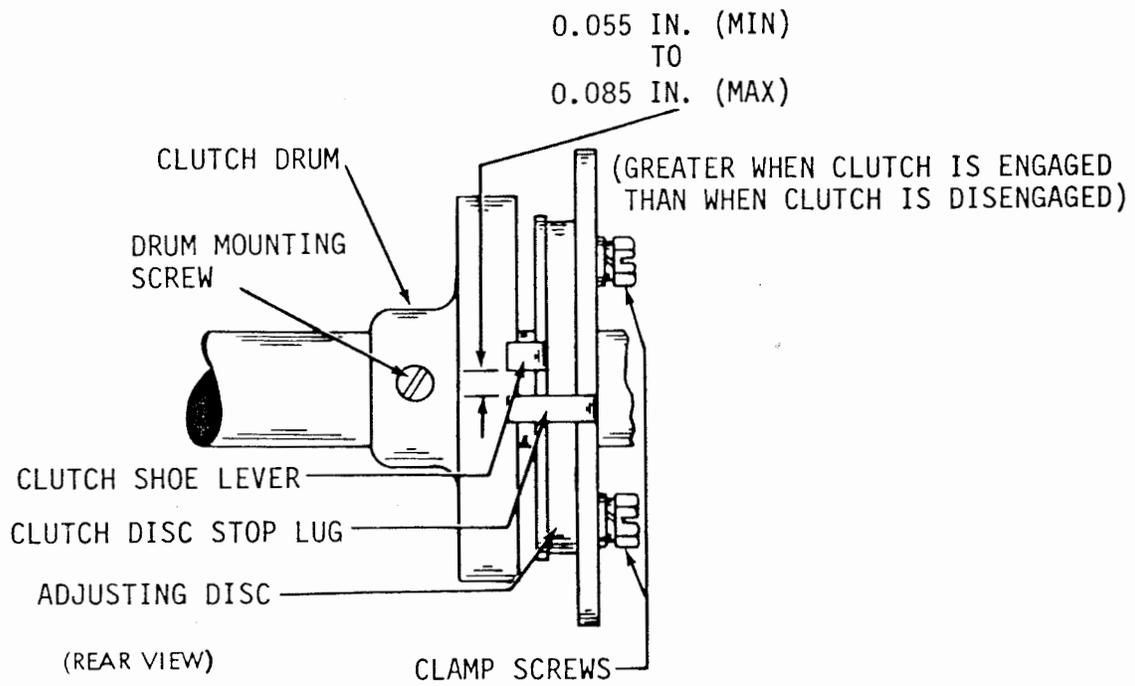


Figure 6-35. Clutch Shoe Lever

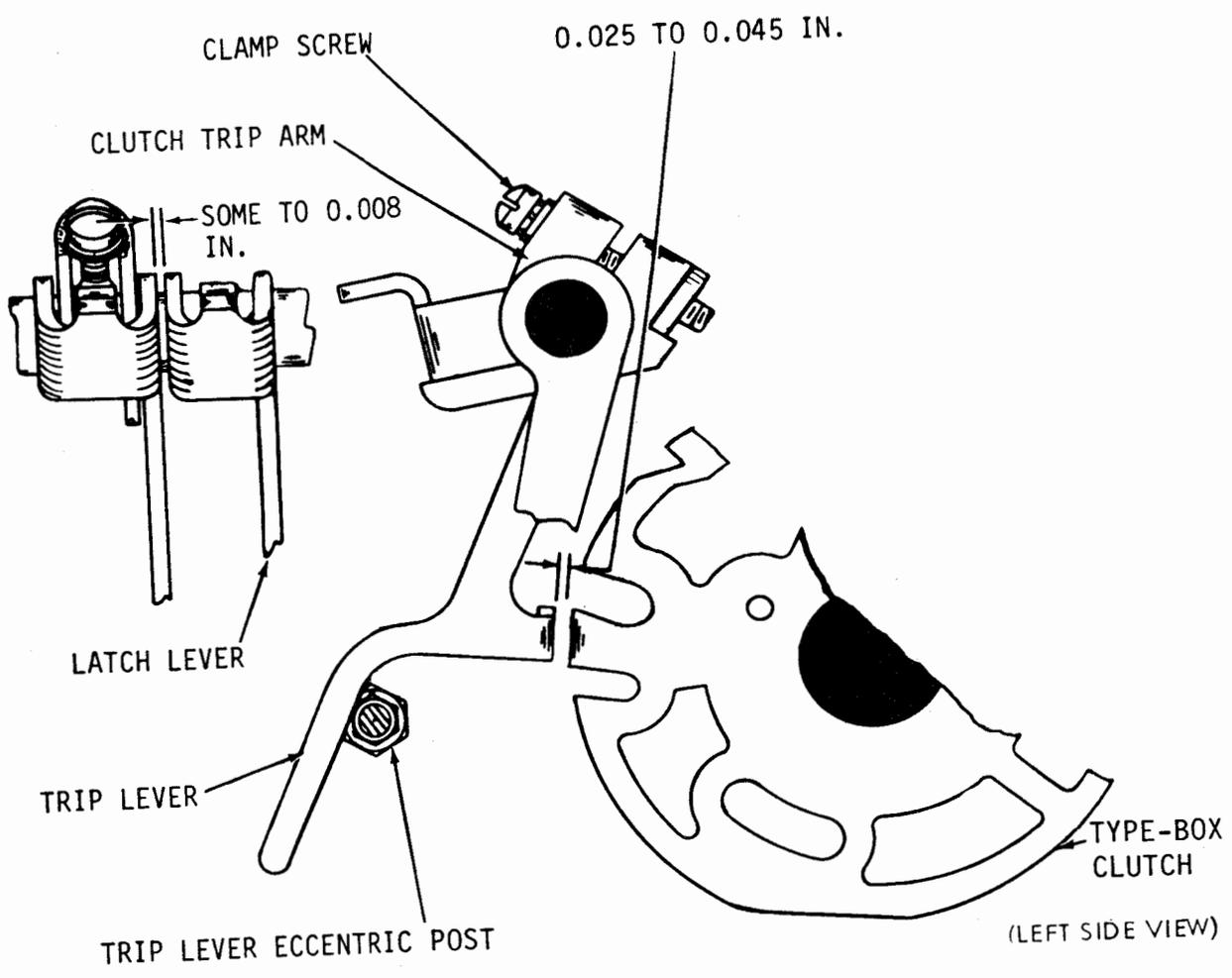


Figure 6-36. Type Box Clutch Trip Lever

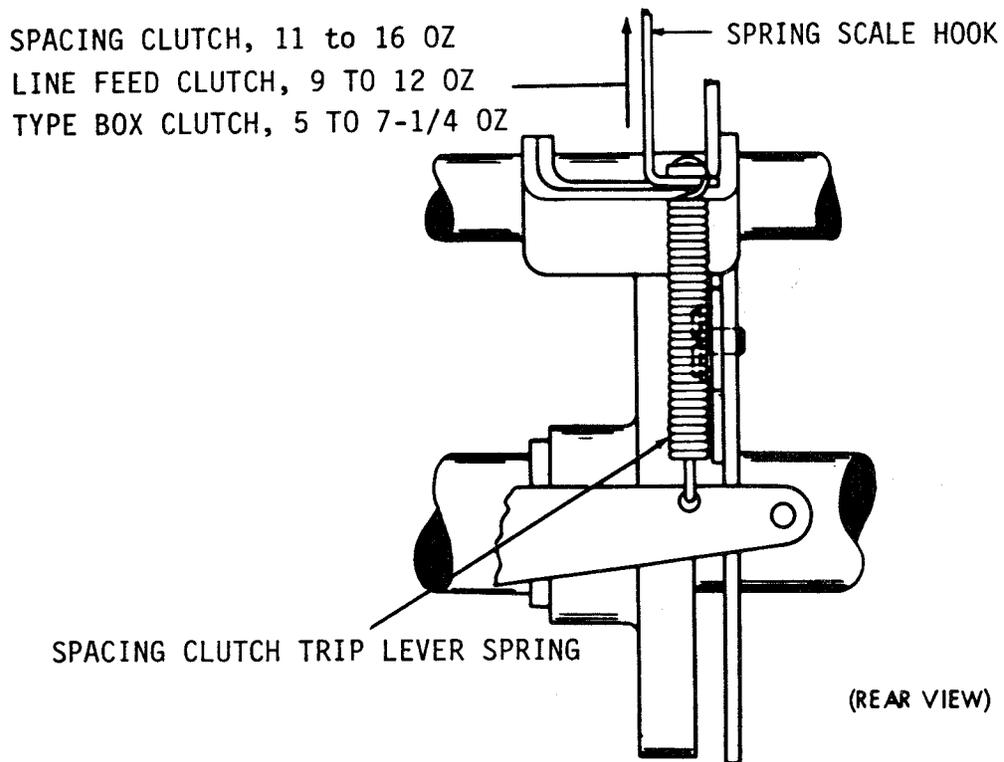


Figure 6-37. Clutch Trip Lever Spring

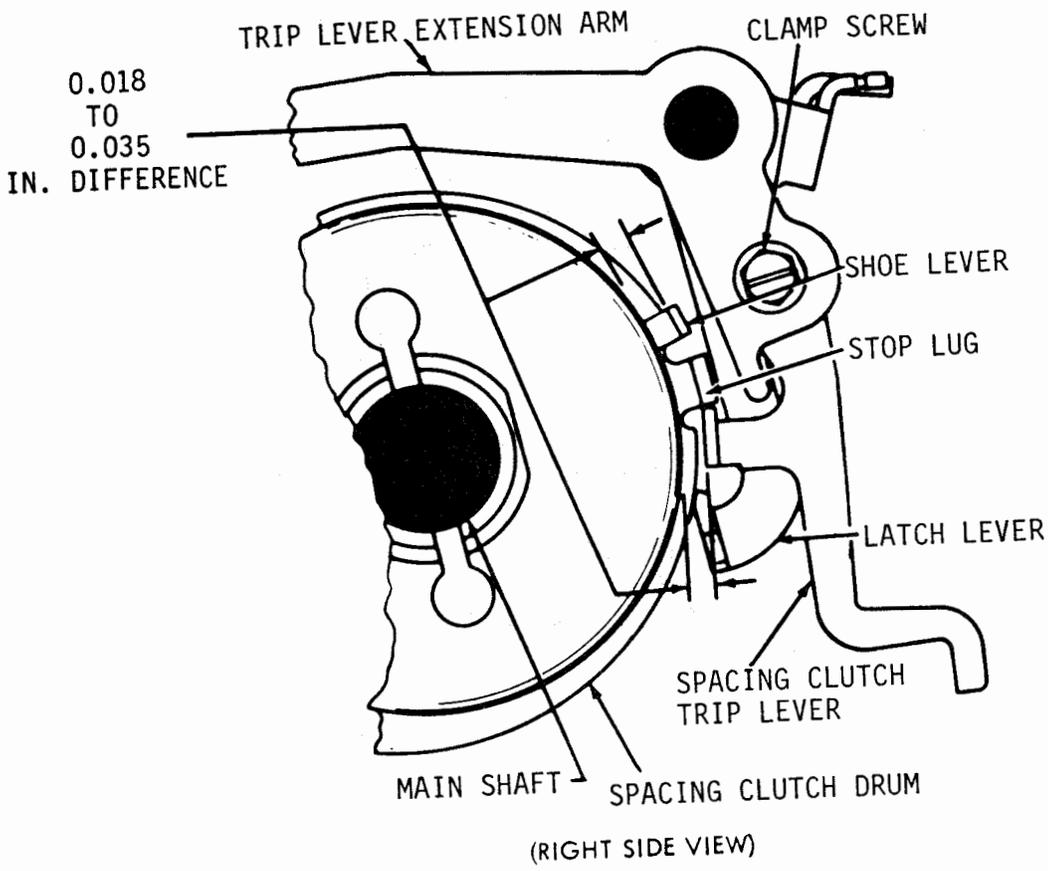


Figure 6-38. Spacing Clutch Trip Lever

(b) Disengage clutch.

(c) Trip clutch trip lever and rotate main shaft until trip lever is over shoe lever.

(d) Take up shoe lever play inward by snapping trip lever over shoe lever.

(e) Measure and note clearance between shoe lever and drum at each stop position to find stop position which yields greatest clearance. As gauged by eye, there should be some overbite on all stop lugs.

(f) Position trip lever at stop which yields greatest clearance and rotate main shaft slowly until trip lever just falls off stop lug.

(g) Measure and note clearance between trip lever and clutch drum.

(h) Find difference between greatest clearance measured in step (e) and clutch drum measured in step (g) by subtracting.

(i) The greatest clearance in step (e) should be between 0.018 and 0.035 inch greater than clearance between trip lever and clutch drum obtained in step (g).

(j) If difference in clearances exceeds specified limits, loosen clamp screw and position trip lever to adjust clearance between trip lever and clutch drum.

(k) Tighten clamp screw.

(11) Clutch Trip Shaft Set Collars. Adjust trip shaft set collars as follows:

(a) Refer to figure 6-39.

(b) Measure spacing cut-out lever side play.

(c) There should be some side play not exceeding 0.008 inch.

(d) If side play exceeds specified limits, loosen spacing cutout lever set collar set screw and position set collar to obtain specified side play.

(e) Visually gauge right end of stop extensions on trip lever and shoe lever for approximate alignment.

(f) If stop extensions are misaligned, loosen line feed clutch trip lever set collar set screw and position set collar to obtain approximate alignment of stop extensions.

(g) Measure line feed clutch latch lever side play.

(h) There should be some side play not exceeding 0.008 inch.

(i) If side play exceeds specified limits, loosen latch lever set collar set screw and position set collar to obtain specified side play.

(12) Code Bar Clutch Cam Follower Spring. Adjust code bar clutch cam follower spring as follows:

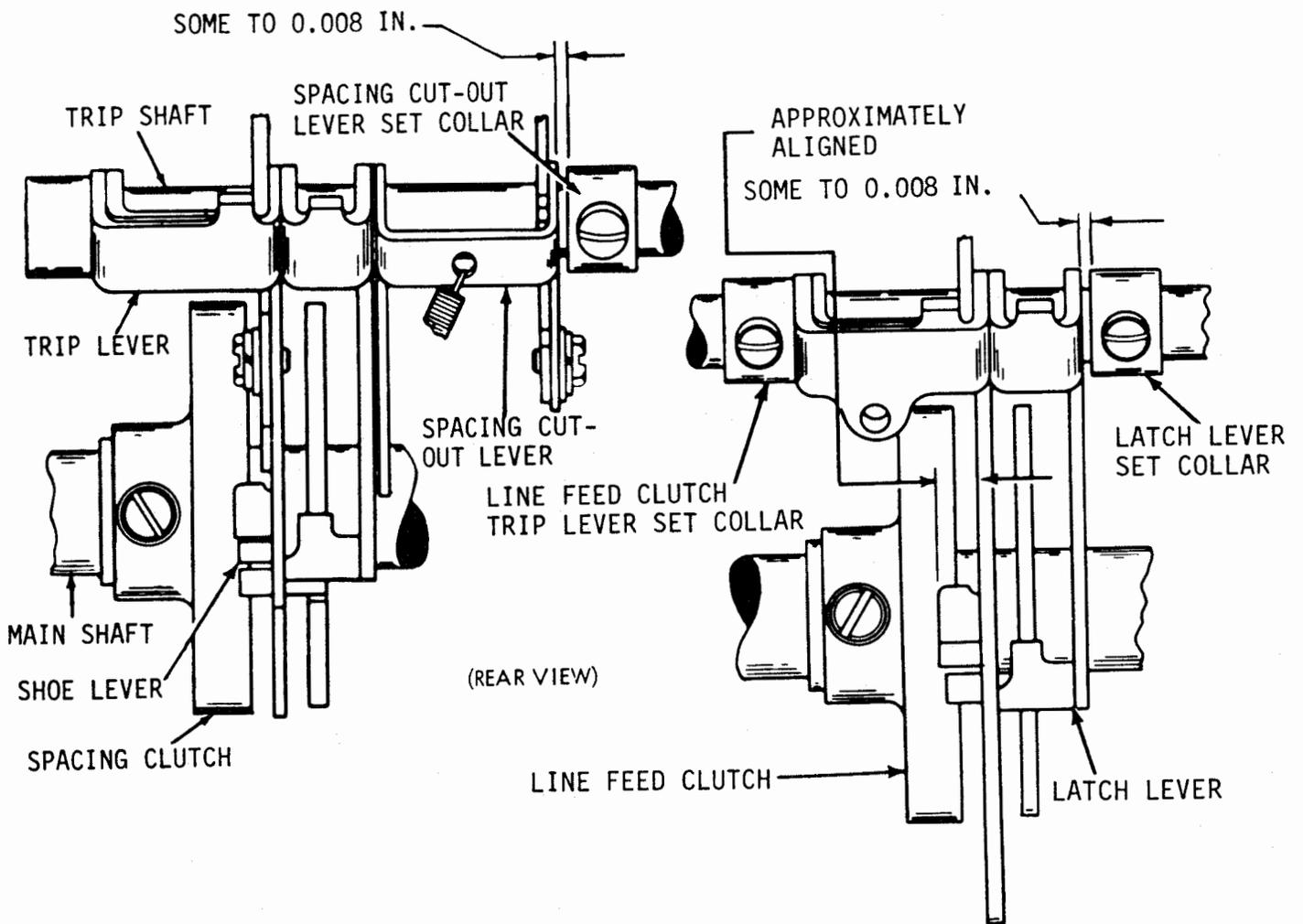


Figure 6-39. Clutch Trip Shaft Set Collars

figure 6-40.

(a) Refer to

(b) Position cam so that cam follower roller rests on low part of cam.

(c) Unhook code bar clutch cam follower spring from spring bracket.

(d) Attach spring scale hook to loose end of spring.

(e) Force required to pull spring to installed length should be between 20 and 24 ounces. Hook spring on spring hook.

(f) If scale reading exceeds specified limits, install new spring.

(13) Function Clutch Trip Lever. Adjust function clutch trip lever as follows:

(a) Refer to figure 6-41.

(b) Disengage code bar clutch and function clutch trip lever.

(c) Function clutch trip lever should engage clutch shoe lever by full thickness of shoe lever. On two-stop clutches, make this check at lug having least bite.

(d) There should be some end play on trip shaft lever, but not in excess of 0.006 inch.

(e) If either engagement in step (c) or end play in step (d) is not as specified, loosen clamp screw and position trip lever on its shaft.

clamp screw.

(f) Tighten

(14) Type Box Clutch Trip Lever Eccentric Post.

(a) Refer to figure 6-42.

(b) Disengage type box clutch.

(c) Trip lever should engage clutch shoe lever by full thickness of shoe lever.

(d) If engagement of trip lever and clutch shoe lever is not as specified, loosen trip lever eccentric post clamping nut and position eccentric post to obtain specified engagement.

(e) Tighten clamping nut.

(15) Line Feed Clutch Trip Lever Eccentric Post.

Adjust line feed clutch lever adjusting post as follows:

(a) Refer to figure 6-43.

(b) Disengage clutch.

(c) Trip clutch trip lever and rotate main shaft until trip lever is over shoe lever.

(d) Take up play of shoe lever inward by snapping trip lever over shoe lever.

(e) Measure and note clearance between shoe lever and drum at each stop position to find stop position which yields greatest clearance. As gauged by eye, there should be some overbite on all stop lugs.

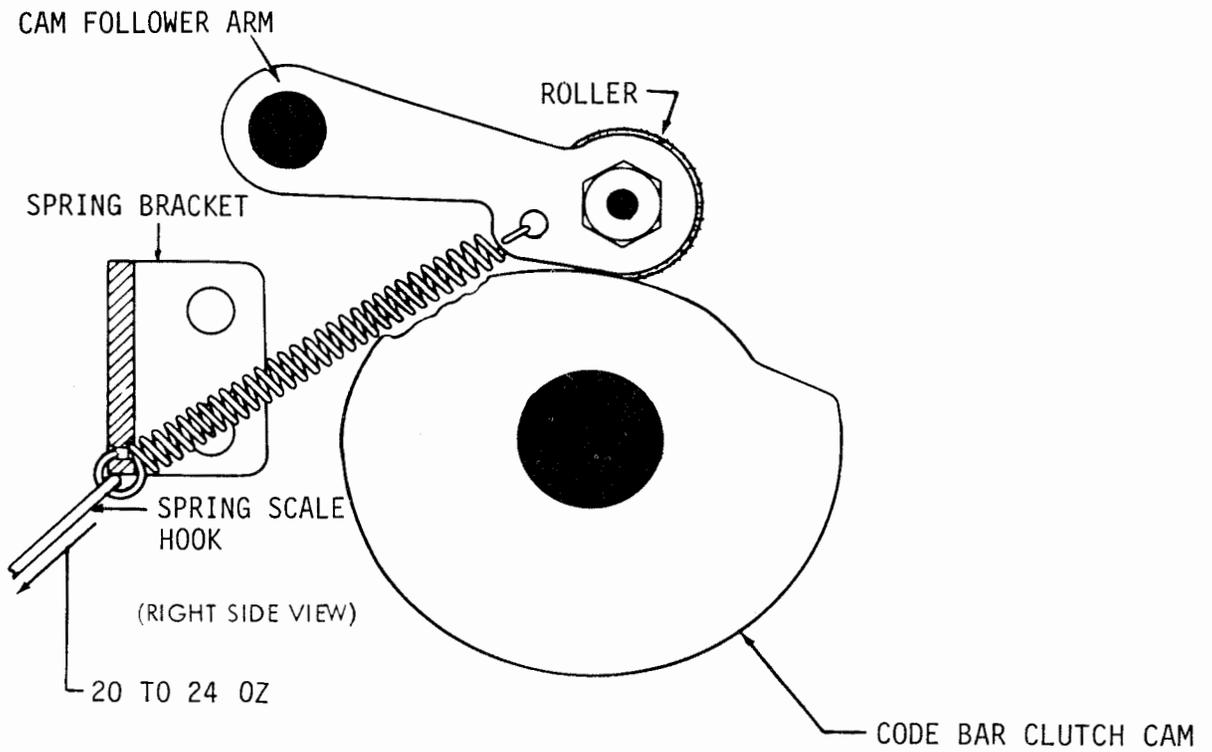


Figure 6-40. Code Bar Clutch Cam Follower Spring

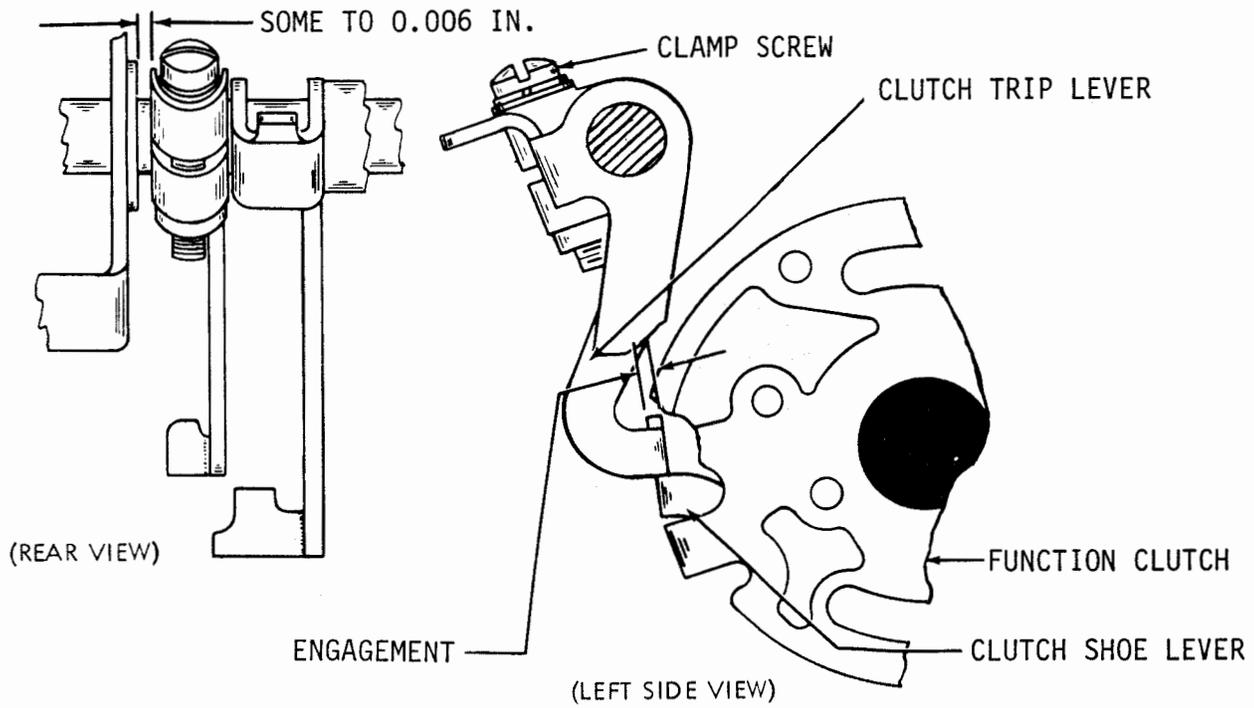


Figure 6-41. Function Clutch Trip Lever

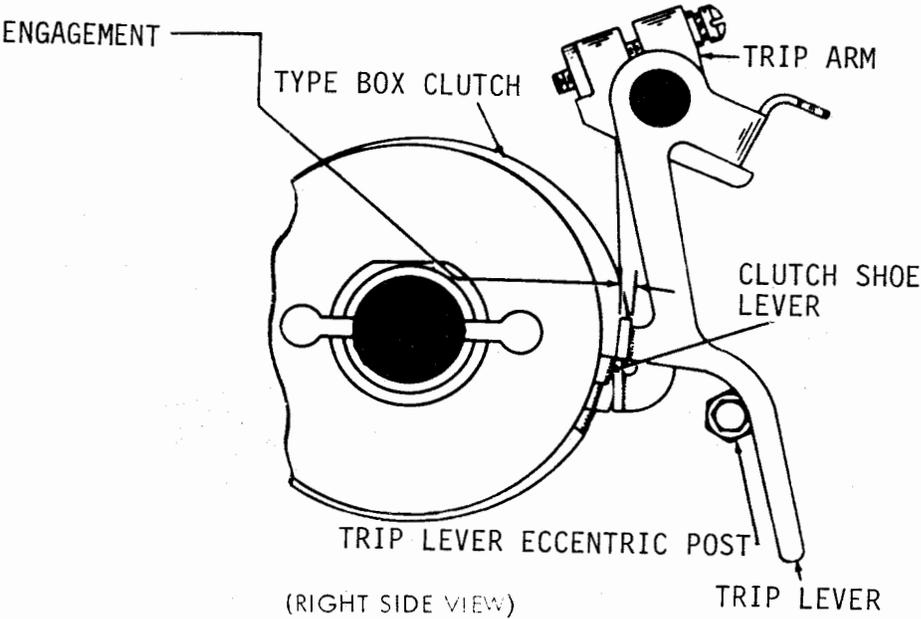


Figure 6-42. Type Box Clutch Trip Lever Eccentric Post

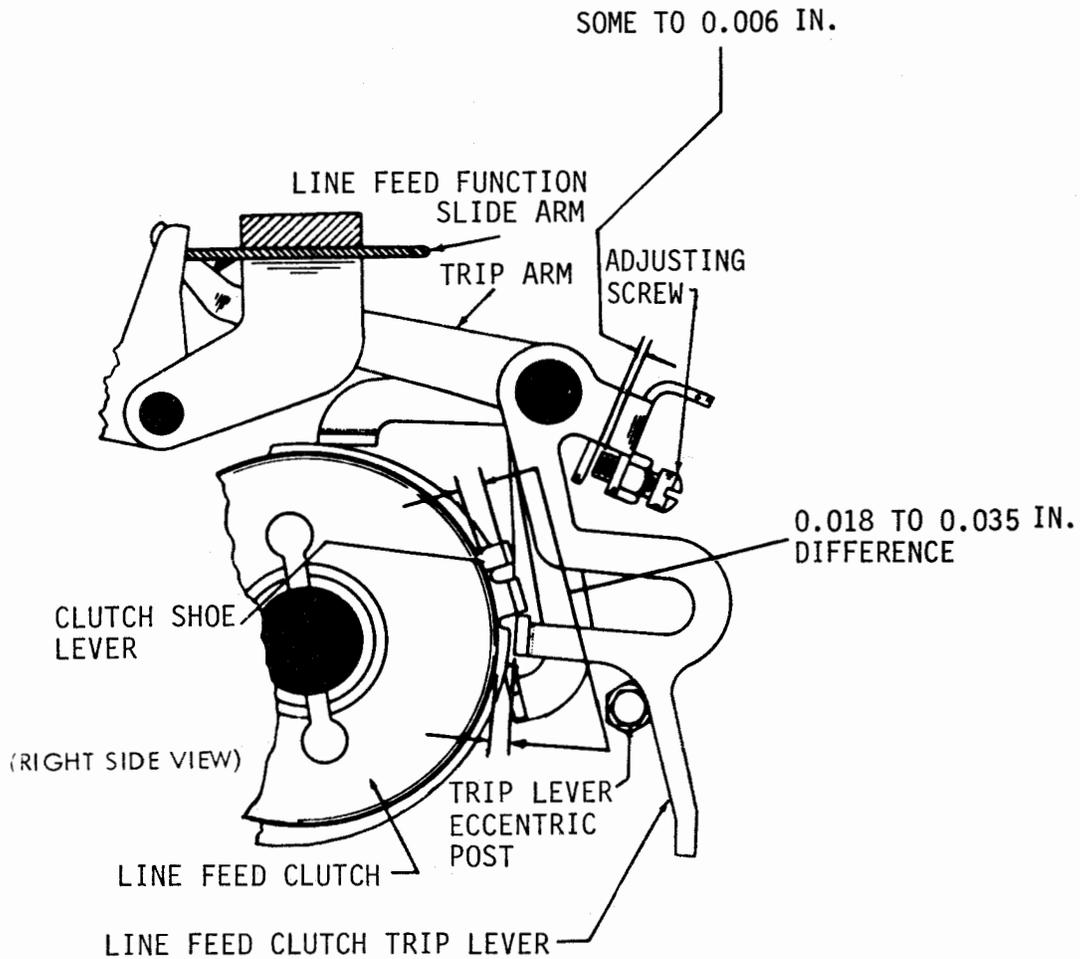


Figure 6-43. Line Feed Clutch Trip Lever Eccentric Post and Line Feed Clutch Trip Lever Adjusting Screw

(f) Position trip lever at stop which yields greatest clearance and rotate main shaft slowly until trip lever just falls off stop lug.

(g) Measure and note clearance between trip lever and clutch drum.

(h) Find difference between greatest clearance measured in step (e) and clearance between trip lever and clutch drum measured in step (g) by subtracting.

(i) The greatest clearance in step (e) should be between 0.018 and 0.035 inch greater than clearance between trip lever and clutch drum obtained in step (g).

(j) If difference in clearance exceeds specified limits, loosen clamp nut, back off trip lever adjusting screw, and position trip lever eccentric stop post.

(k) Tighten clamp nut.

(16) Line Feed Clutch Trip Lever Adjusting Screw. Adjust line feed clutch trip lever adjusting screw as follows:

(a) Refer to figure 6-43.

(b) Place line feed function slide arm in rear position.

(c) Place clutch trip lever against its eccentric post.

(d) Hold trip arm against its function slide arm.

(e) There should be some clearance not exceeding 0.006 inch.

(f) If clearance exceeds specified limits, loosen adjusting screw clamp nut and adjust screw to obtain specified clearance.

(g) Tighten adjusting nut clamp nut.

e. Positioning Mechanism Adjustments. Perform positioning mechanism adjustments in accordance with the following paragraphs.

(1) Breaker Slide Bail Spring. Adjust breaker slide bail spring as follows:

(a) Refer to figure 6-44.

(b) Place breaker lever bails in lower position.

(c) Attach spring scale hook to breaker slide bail.

(d) Force required to start bail moving should be between 1/2 and 1-3/4 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(2) Horizontal Positioning Lock Lever Spring. Adjust horizontal positioning lock lever spring as follows:

(a) Refer to figure 6-45.

(b) Place lock lever in upper position.

(c) Attach spring scale hook to horizontal positioning lock lever.

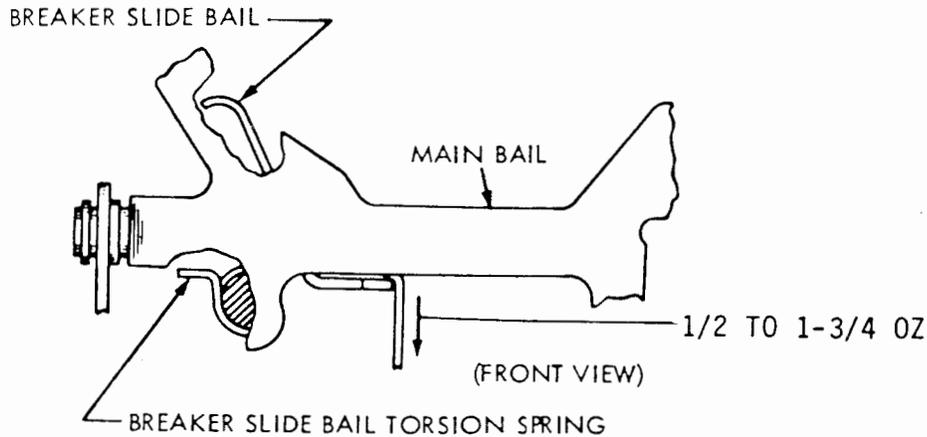


Figure 6-44. Breaker Slide Bail Spring

(d) Force required to start lever moving upward should be between 28 and 43 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(3) Rocker Shaft Bracket Eccentric Stud. Adjust rocker shaft bracket eccentric stud as follows:

(a) Refer to figure 6-45.

(b) Disengage type box clutch.

(c) Take up play in locking arm toward front.

(d) Measure gap between lower side of lock lever roller and top edge of shoulder on horizontal positioning lock lever.

(e) Gap should be between 0.055 and 0.090 inch.

(f) If gap exceeds specified limits, loosen nut and position eccentric stud in lower end of rocker shaft left bracket. Tighten nut. Keep high part of eccentric (marked with dot) below centerline of drive link.

(g) Ensure rocker shaft drive link is free in its bearing (not under load) when clutch is in its stop position and when it is rotated 180 degrees from its stop position.

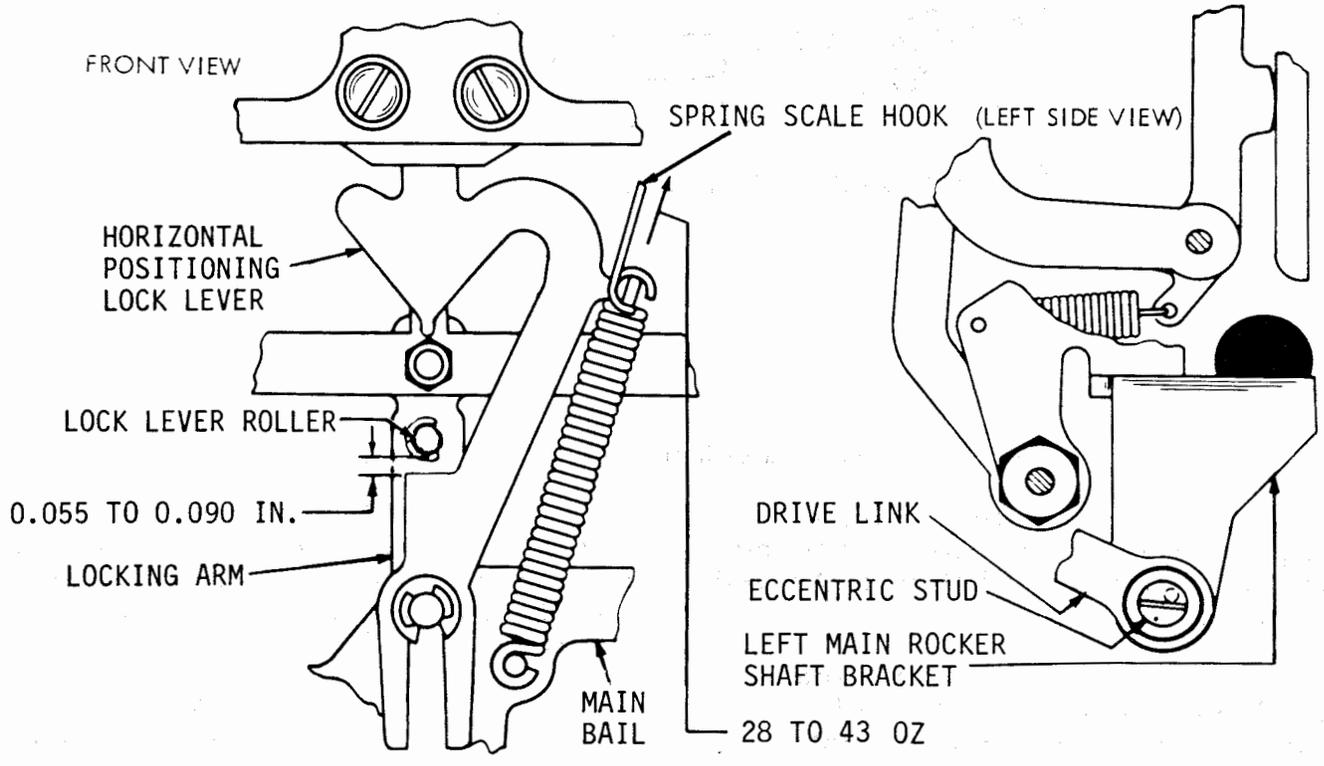


Figure 6-45. Horizontal Positioning Lock Lever Spring and Rocker Shaft Bracket Eccentric Stud

(h) If rocker shaft drive link is not free in its bearing, check manually by moving link toward left side frame and then in reverse direction. Ensure that stud is free in type box clutch bearing when clutch is in its stop position and when it is rotated 180 degrees from stop position.

(i) If any change is made in the above adjustment, recheck following related adjustments:

Horizontal positioning drive linkage

Right vertical positioning lever eccentric stud

Left vertical positioning lever eccentric stud

Vertical positioning lock lever

Ribbon feed lever bracket

Function stripper blade arms

Spacing trip lever bail cam plate

Reversing slide brackets

Ribbon reverse spur gear

Printing track

Printing arm

(4) Decelerating Slide Spring. Adjust decelerating slide spring as follows:

(a) Refer to figure 6-46.

(b) Place printing bail in downward position.

(c) Place printing carriage and decelerating slide assembly in right hand position.

(d) Attach spring scale hook to right hand decelerating slide.

(e) Force required to start slide moving should be between 1/2 and 1-1/2 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(g) Repeat steps (c), (d), (e), and (f) for left hand decelerating slide spring.

(5) Horizontal Positioning Drive Linkage. Adjust horizontal positioning drive linkage as follows:

(a) Refer to figure 6-47.

(b) Disengage type box clutch.

(c) Move code bars 4 and 5 to spacing (right).

(d) Measure clearance between each side of center horizontal stop and decelerating slides on side where knee link is straight. Clearances should be between 0.090 and 0.110 inch and should be equal within 0.008 inch.

(e) If clearances exceed specified limits, loosen bearing stud mounting screws and connecting strip mounting screws so they are friction tight.

(f) Position one or both bearing studs on connecting strip to provide

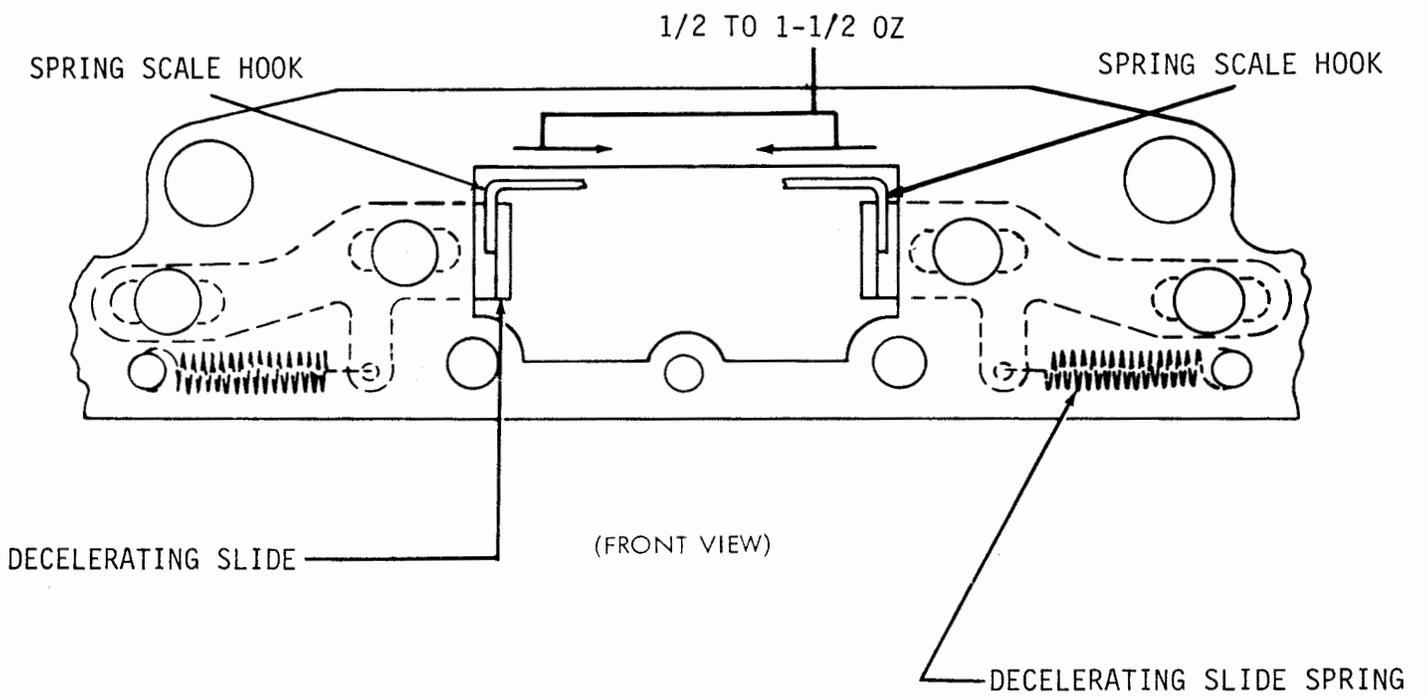


Figure 6-46. Decelerating Slide Spring

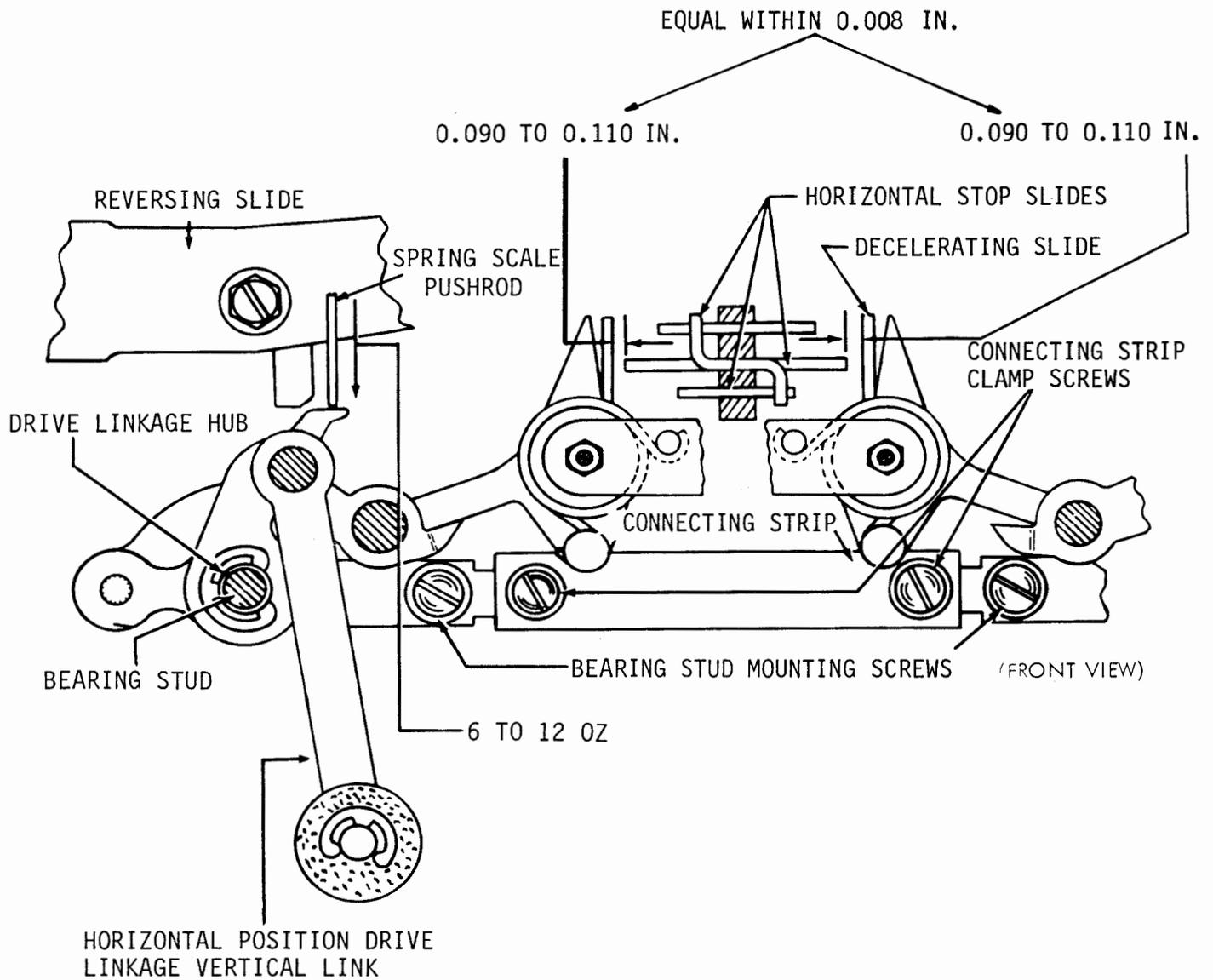


Figure 6-47. Horizontal Positioning Drive Linkage and Horizontal Positioning Drive Linkage Spring

0.095 to 0.105 inch between center horizontal slide and decelerating slide on side where linkage is not buckled.

(g) Tighten two inner mounting screws.

(h) Change position of reversing slide and check opposite clearance. Equalize by shifting both studs and connecting strip as a unit.

(i) Hold drive linkage hub against lower vertical link of drive linkage and tighten two outer bearing stud mounting screws.

(j) Check linkage for freeness throughout a complete cycle.

(k) Type box clutch disc should have some movement in normal direction of rotation in stop position.

(6) Horizontal Positioning Drive Linkage Spring. Adjust horizontal positioning drive linkage spring as follows:

(a) Refer to figure 6-47.

(b) Place linkage in unbuckled position.

(c) Apply spring scale pushrod near end of upper extensions of right hand spring.

(d) Force required to start link buckling should be between 6 and 12 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(f) Repeat steps (b), (c), (d), and (e) for left hand spring.

(7) Horizontal Stop Slide Spring. Adjust horizontal stop slide spring as follows:

(a) Refer to figure 6-48.

(b) Place code bars in marking position (left).

(c) Rotate type box clutch one quarter turn from its stop position.

(d) Hold horizontal motion decelerating slides away from horizontal stop slides.

(e) Attach spring scale hook to each slide and measure force required to start slide moving.

NOTE

When checking upper and lower slides, hold middle slide 1/32 inch forward.

(f) Force required to start slides moving should be as follows: for upper and lower slides, between 1/2 and 1-1/2 ounces; for middle slide, between 1-3/4 and 3 ounces.

(8) Left Vertical Positioning Lever Eccentric Stud. Adjust left vertical positioning lever eccentric stud as follows:

(a) Refer to figure 6-49.

(b) Place common code bar in spacing position.

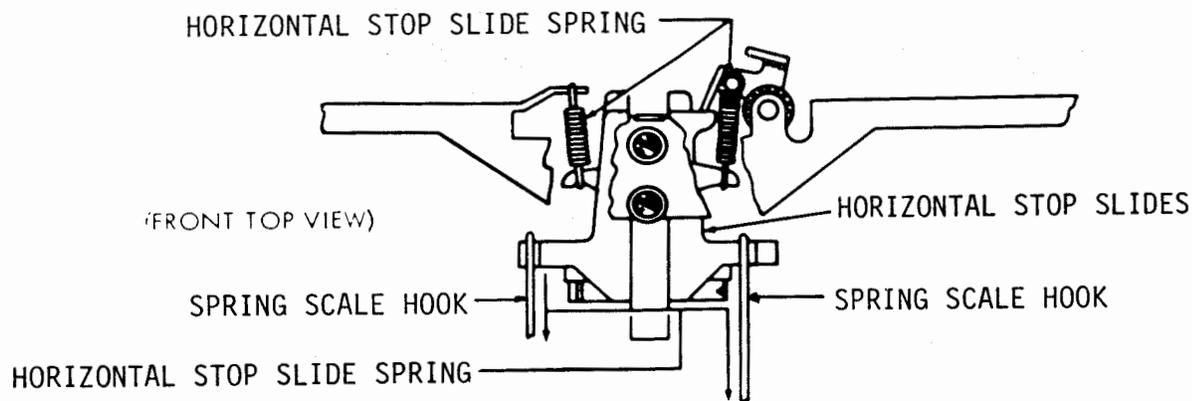


Figure 6-48. Horizontal Stop Slide Spring

box clutch.

(c) Trip type

(d) Rotate main shaft until right vertical positioning lever toe touches common code bar. Lower link of right vertical positioning lever should buckle 0.008 inch maximum. Left vertical positioning lever toe should touch common code bar, buckling its lower link equally with lower link of right vertical positioning lever within 0.006 inch. Neither lower link should buckle more than 0.008 inch.

(e) If buckling exceeds specified limits, loosen eccentric stud nut.

(f) Position eccentric stud on rocker shaft

left bracket inner arm, and position high part of cam (marked with dot) toward rear.

(g) Tighten eccentric stud nut.

(9) Vertical Positioning Lock Lever Spring. Adjust vertical positioning lock lever spring as follows:

(a) Refer to figure 6-49.

(b) Disengage type box clutch.

(c) Attach spring scale hook to upper end of left vertical positioning lock lever.

(d) Force required to start lock lever

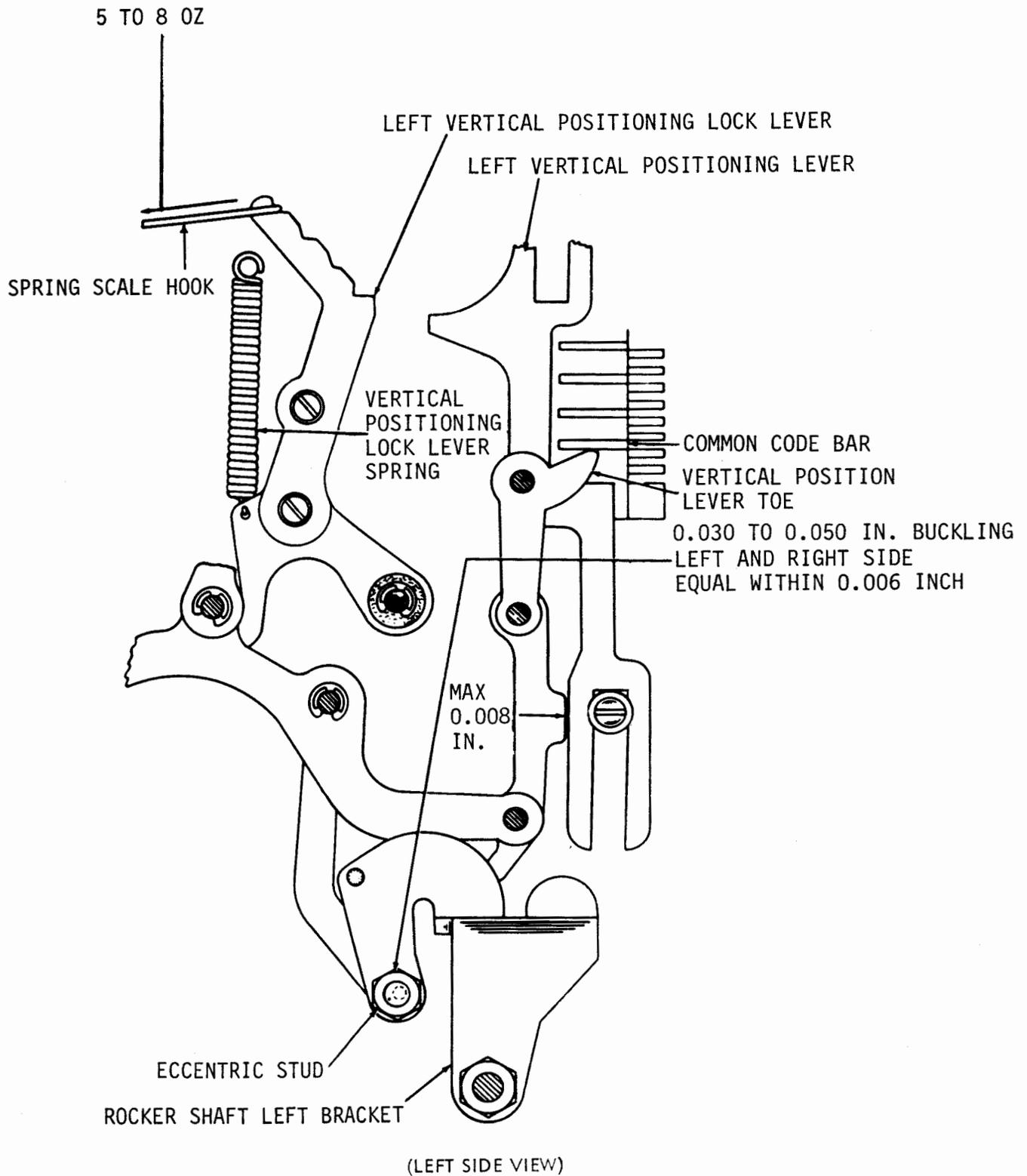


Figure 6-49. Left Vertical Positioning Lever Eccentric Stud and Vertical Positioning Lock Lever Spring

moving should be between 5 and 8 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(f) Repeat steps (c), (d), and (e) for right vertical positioning lock lever spring.

(10) Reversing Slide Adjusting Stud. Adjust reversing slide adjusting stud as follows:

(a) Refer to figure 6-50.

(b) Disengage type box clutch.

(c) Place number 3 code bar in spacing position (right). Reversing slide detent should be fully seated in right hand notches of detent lever.

(d) Place number 3 code bar in marking position (left). Reversing slide detent should be fully seated in left hand notches of detent lever.

(e) If reversing slide detent rollers do not seat fully in both right hand and left hand notches of detent lever, loosen reversing slide stud mounting nut.

(f) Position reversing slide stud in its elongated hole to allow full seating of reversing slide detent rollers in both left hand and right hand notches of detent lever.

(g) Tighten mounting nut.

(11) Reversing Slide Detent Spring. Adjust reversing slide detent spring as follows:

(a) Refer to figure 6-50.

(b) Place reversing slide in left hand position.

(c) Attach spring scale hook in upper right detent notch.

(d) Force required to start detent moving should be between 2 and 4-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(12) Reversing Slide Brackets. Adjust reversing slide brackets as follows:

(a) Refer to figure 6-51.

(b) Disengage type box clutch, code bar clutch, and function clutch.

(c) Move reversing slide to its extreme right hand position.

(d) Measure amount of buckling of left horizontal positioning drive linkage. Buckling should be between 0.030 and 0.050 inch.

(e) Move reversing slide to its extreme left hand position.

(f) Measure amount of buckling of right horizontal positioning drive linkage. Buckling should be between 0.030 and 0.050 inches.

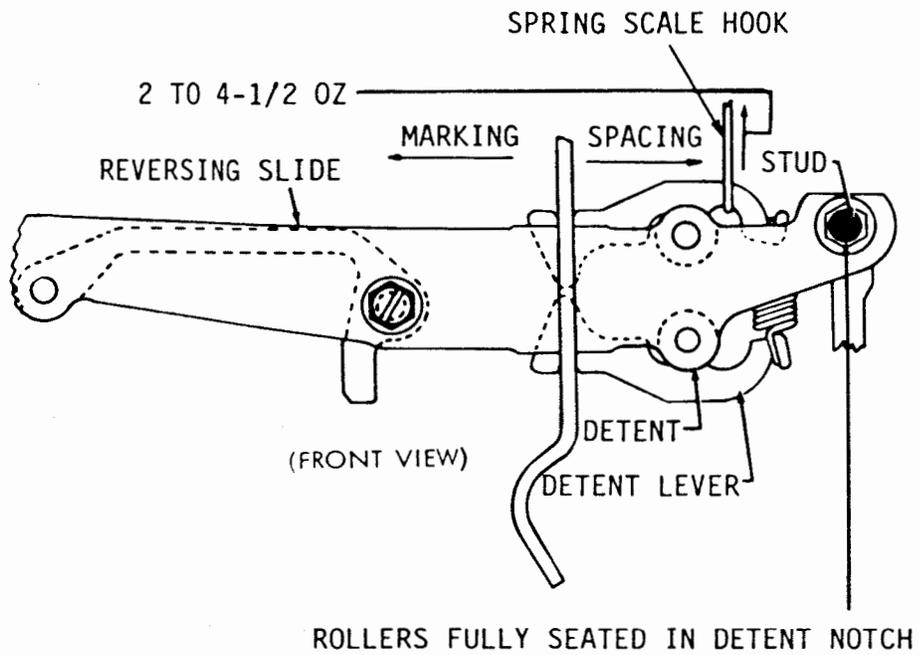


Figure 6-50. Reversing Slide Adjusting Stud and Reversing Slide Detent Spring

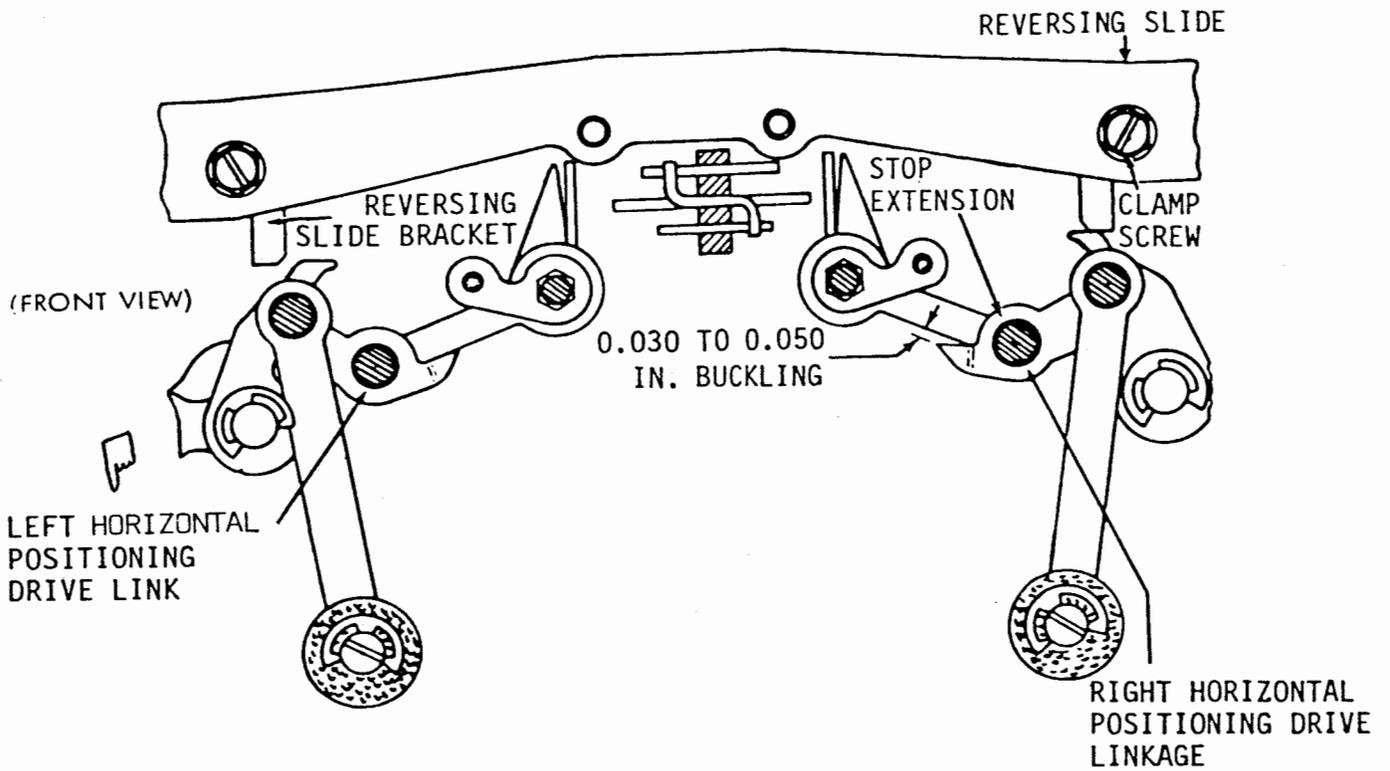


Figure 6-51. Reversing Slide Brackets

(g) If buckling of either left or right horizontal positioning drive linkage exceeds specified limits, loosen corresponding clamp screw and position reversing slide bracket.

(h) Tighten clamp screw.

(13) Right Vertical Positioning Lever Eccentric Stud. Adjust right vertical positioning lever eccentric stud as follows:

(a) Refer to figure 6-52.

(b) Disengage type box clutch.

(c) Place common code bar in spacing position.

(d) Take up play by pressing downward on common code bar at guide block to minimize clearance between toe of vertical positioning lever and bottom of common code bar.

(e) While holding common code bar downward, measure clearance between toe of vertical positioning lever and bottom of common code bar. Clearance should be between 0.030 and 0.050 inch.

(f) If clearance exceeds specified limits, loosen eccentric stud nut.

(g) Position eccentric stud in right rocker shaft bracket so that high part of eccentric (marked with dot) is toward rear. (High part of eccentric can also be identified by exposed portion of flat

surface of vertical positioning link.)

(h) Tighten link.

(14) Vertical Positioning Lever Spring. Adjust vertical positioning lever spring as follows:

(a) Refer to figure 6-52.

(b) Place right and left vertical positioning lever toes in contact with suppression code bar with levers not buckled.

(c) Attach spring scale hook to lower right vertical positioning lever just above link extension.

(d) Force required to move link extension away from vertical positioning lever should be between 4 and 12 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(15) Rocker Shaft Left Bracket. Adjust rocker shaft left bracket as follows:

(a) Refer to figure 6-53.

(b) Rocker shaft left bracket should be firmly seated against inner bearing race.

(c) If seating is not firm as specified, loosen mounting screws.

(d) Hold rocker shaft in extreme left position and position bracket against inner bearing race.

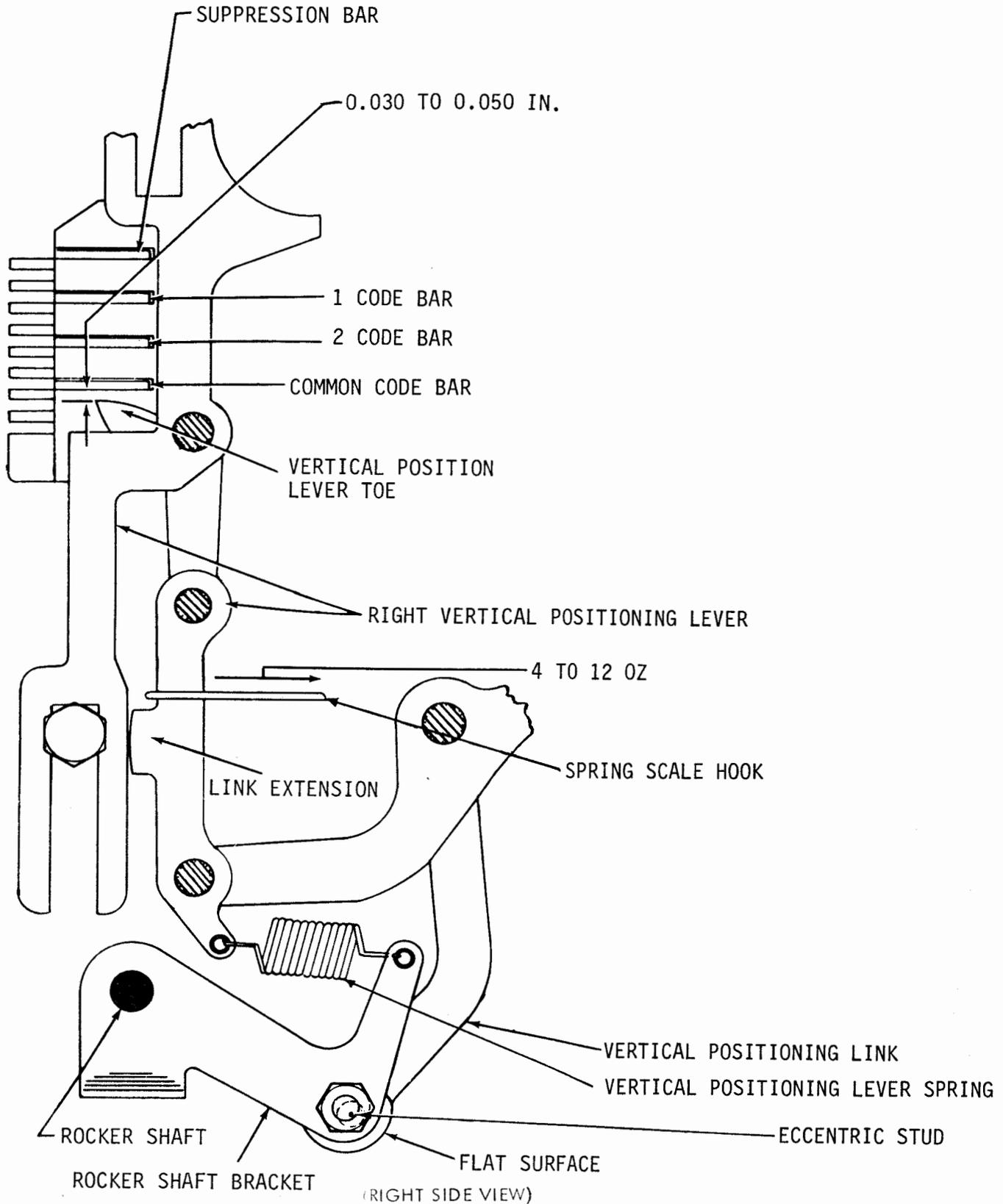


Figure 6-52. Right Vertical Positioning Lever Eccentric Stud and Vertical Positioning Lever Spring

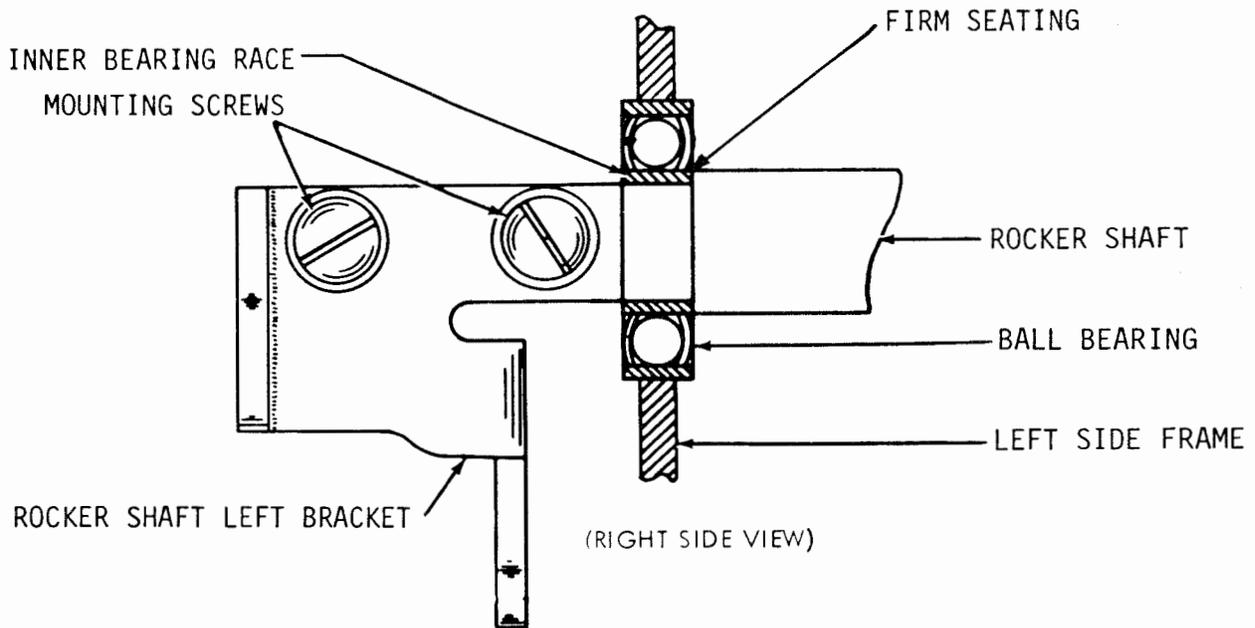


Figure 6-53. Rocker Shaft Left Bracket

(e) Tighten mounting screws.

just touching figure "9" type pallet.

(16) Shift Linkage.  
Adjust shift linkage as follows:

(f) If figure "9" type pallet is not centered as specified, loosen two clamp screws and position left shift linkage on oscillator rail.

(a) Refer to figure 6-54.

(g) Tighten two clamp screws.

(b) Position carriage near midpoint of platen. Place type box in position to print letter "O".

(h) To recheck, shift alternately from "W" to "2" and take up play in each direction. Refine adjustment, if necessary, by repeating steps (f) and (g).

(c) Manually buckle right shift linkage.

(d) Shift type box to left.

(e) Figure "9" type pallet should be approximately in center of printing hammer when hammer is

(17) Shift Linkage Spring. Adjust shift linkage spring as follows:

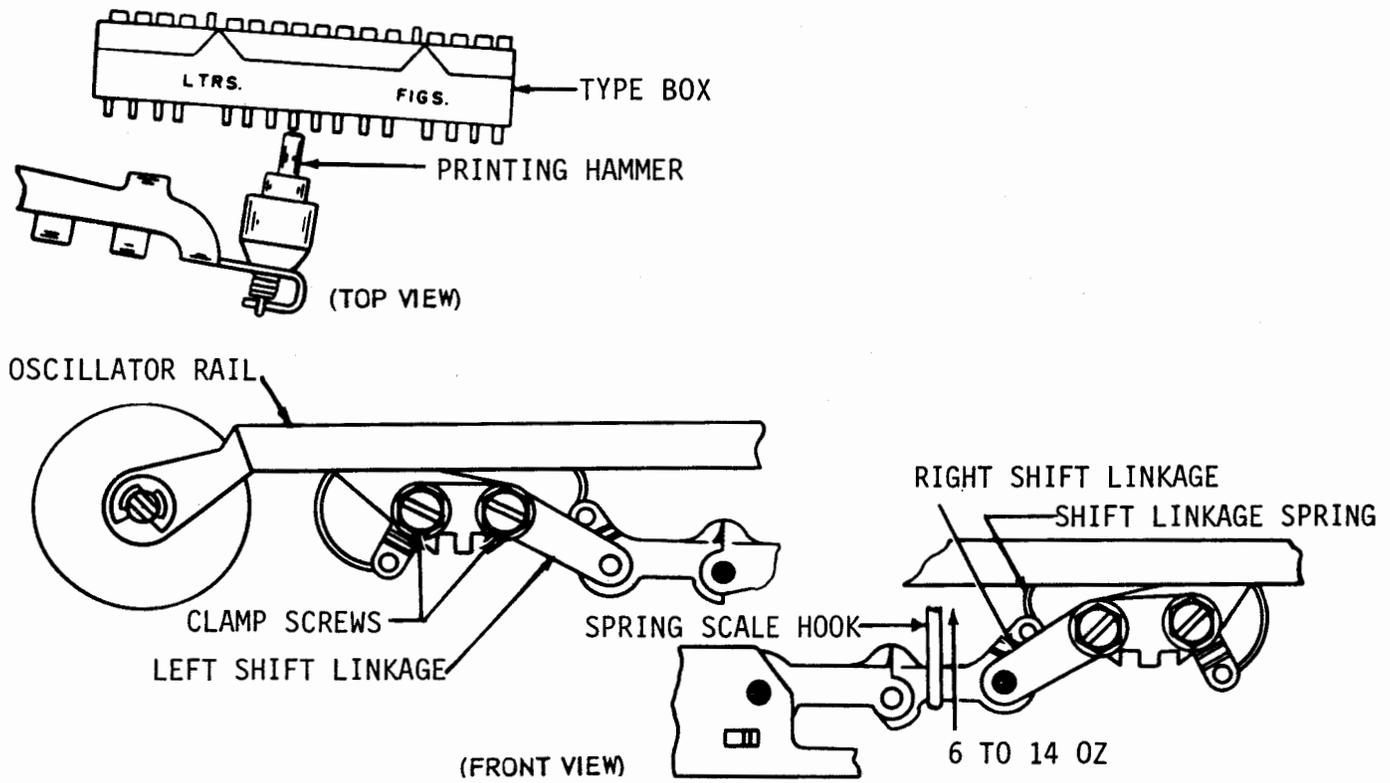


Figure 6-54. Shift Linkage and Shift Linkage Spring

## NOTE

For shift mechanisms with torsion springs, see paragraph 6-15.1e(3).

- (a) Refer to figure 6-54.
- (b) Position right shift linkage in straight position.
- (c) Attach spring scale hook to right shift linkage.
- (d) Force required to start link moving should be between 6 and 14 ounces.
- (e) If scale reading exceeds specified limits, install new spring.
- (f) Repeat steps (b) through (e) for left shift linkage spring.

(18) Type Box Position (Sprocket Feed). Adjust type box position as follows:

- (a) Refer to figure 6-55.
- (b) Disengage type box and spacing clutches.
- (c) Shift type box to letters position.
- (d) Loosen four mounting screws so that space suppression ring, or automatic carriage return line feed ring is free to rotate on drum.
- (e) If unit is equipped with limited adjustment spacing drum place spacing cutout and automatic carriage return line feed arms in maximum

counterclockwise position. Engage farthest advanced feed pawl with tooth above drum cutaway section.

(f) Measure clearance between letters print indicator and centerline of sprocket pins in right hub. Clearance should be between 5/16 and 7/16 inch.

(g) If clearance exceeds specified limits, loosen two type box clamp screws and two printing carriage clamp screws.

(h) Position type box to obtain clearance specified in step (f).

(i) Tighten type box clamp screws. Tighten printing carriage clamp screws only after printing carriage position adjustment paragraph 6-3.1f(4) has been completed.

(19) Vertical Positioning Lock Lever. Adjust vertical positioning lock lever as follows:

- (a) Refer to figure 6-56.
- (b) Set up letters combination on code bars.
- (c) Position main side operating levers at upper end of travel.
- (d) Fully engage (manually, if necessary) upper notch of vertical positioning lock lever with vertical slide projection.
- (e) Measure clearance between upper surface of follower arm rear extension and inner extension of main side

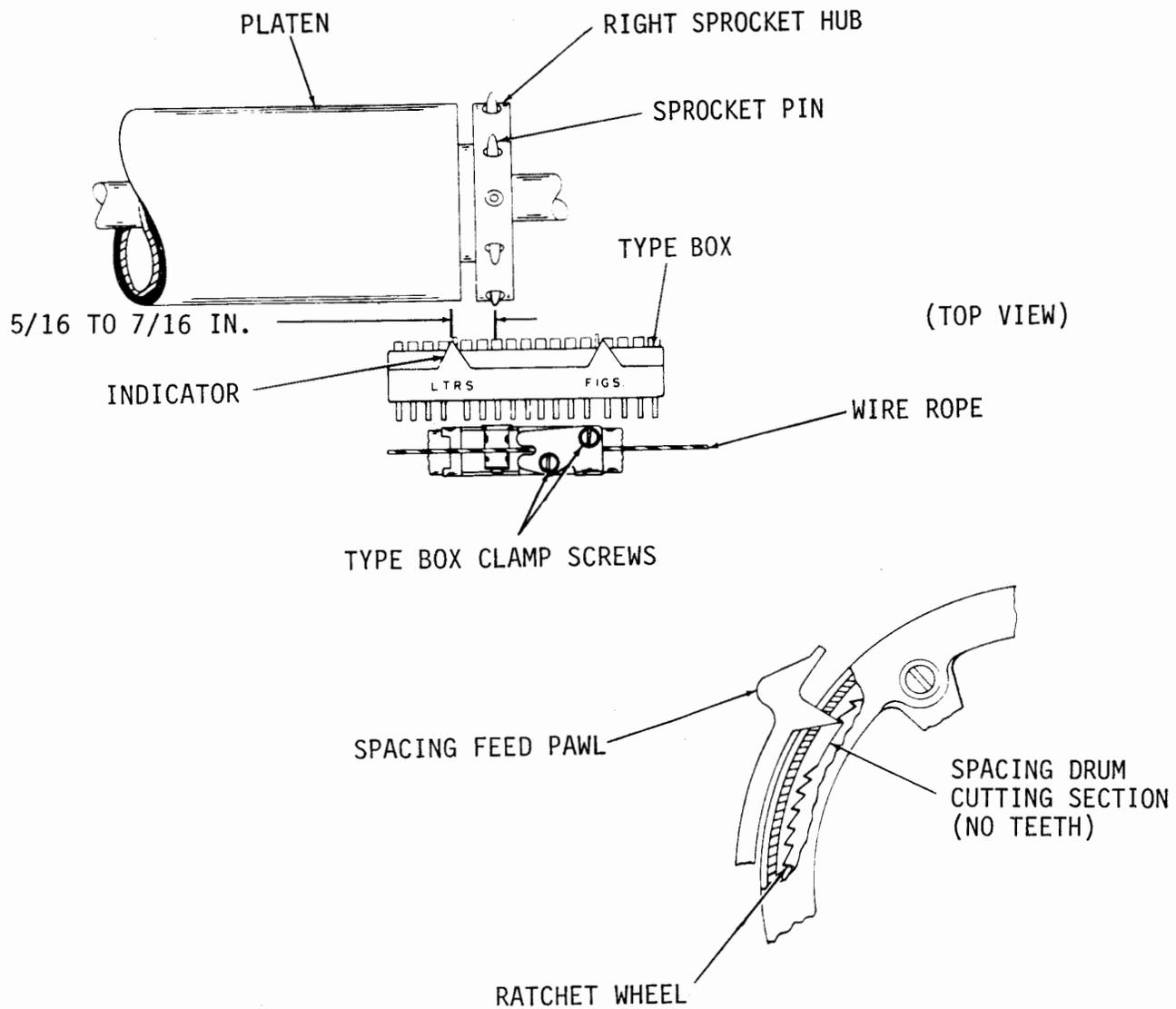


Figure 6-55. Type Box Position (Sprocket Feed)

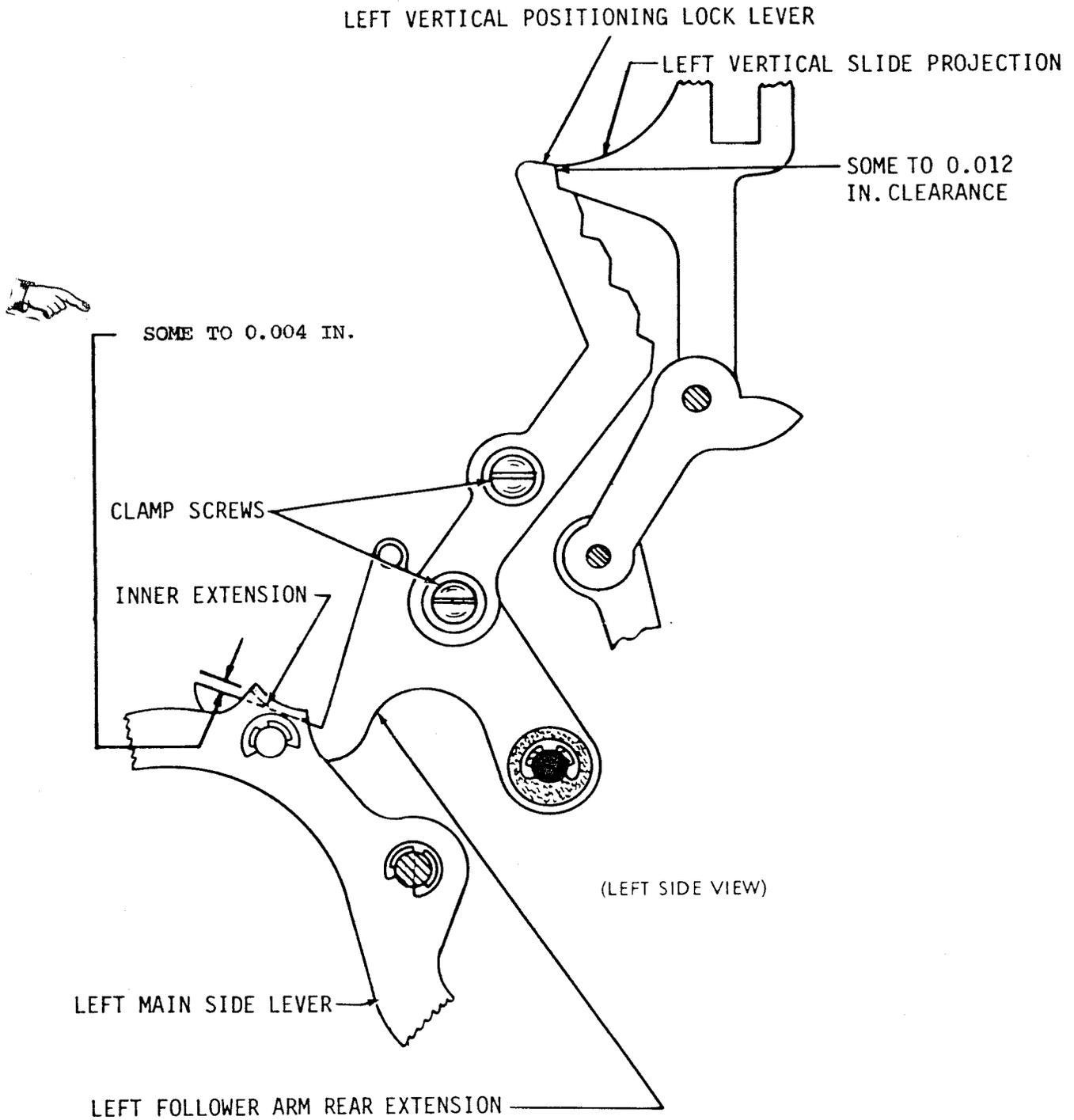


Figure 6-56. Vertical Positioning Lock Lever

lever. Clearance should be some not more than 0.004 inches.

(f) Take up play by pulling upward with 8 ounces tension on type box carriage track, and measure clearance between vertical surfaces of left vertical positioning lock lever and left vertical slide projection. Clearance should be some not more than 0.012 inch.

(g) If either clearance measured in (e) or (f) exceeds specified limits, loosen clamp screws and position right and left vertical positioning lock levers.

(h) Tighten clamp screws.

f. Printing Mechanism Adjustments. Perform printing mechanism adjustment in accordance with the following paragraphs.

(1) Printing Arm. Adjust printing arm as follows:

(a) Refer to figure 6-57.

(b) Place printing track in maximum downward position.

(c) Position printing hammer operating bail against its stop.

(d) Place printing hammer operating bail spring brakcet in the number 1 position. (The number 2 and number 3 positions are to be used only for marking multiple copies.)

(e) With printing arm slide held downward over each printing track mounting screw for maximum

clearance, measure clearance between secondary printing arm and forward extension of hammer operating bail. There should be some clearance not exceeding 0.015 inch.

(f) Place printing track in uppermost position.

(g) Latching extension of printing hammer operating bail should overtravel latching surface of operating bail latch by not less than 0.006 inch. Check right and left positions.

(h) If either measurement obtained in (e) or (g) exceeds specified limits, loosen secondary printing arm clamp screws and position secondary printing arm as necessary.

(i) Tighten secondary printing arm clamp screws.

(2) Printing Hammer Stop Bracket. Adjust printing hammer stop bracket as follows:

(a) Refer to figure 6-57.

(b) Place type box in position to print character "M".

(c) Place printing track in its maximum downward position.

(d) Hold printing hammer stop bracket toward platen with 8 ounces force.

(e) Measure clearance between printing hammer at any point along entire length of platen. Clearance should be 0.005 to 0.050 inch.

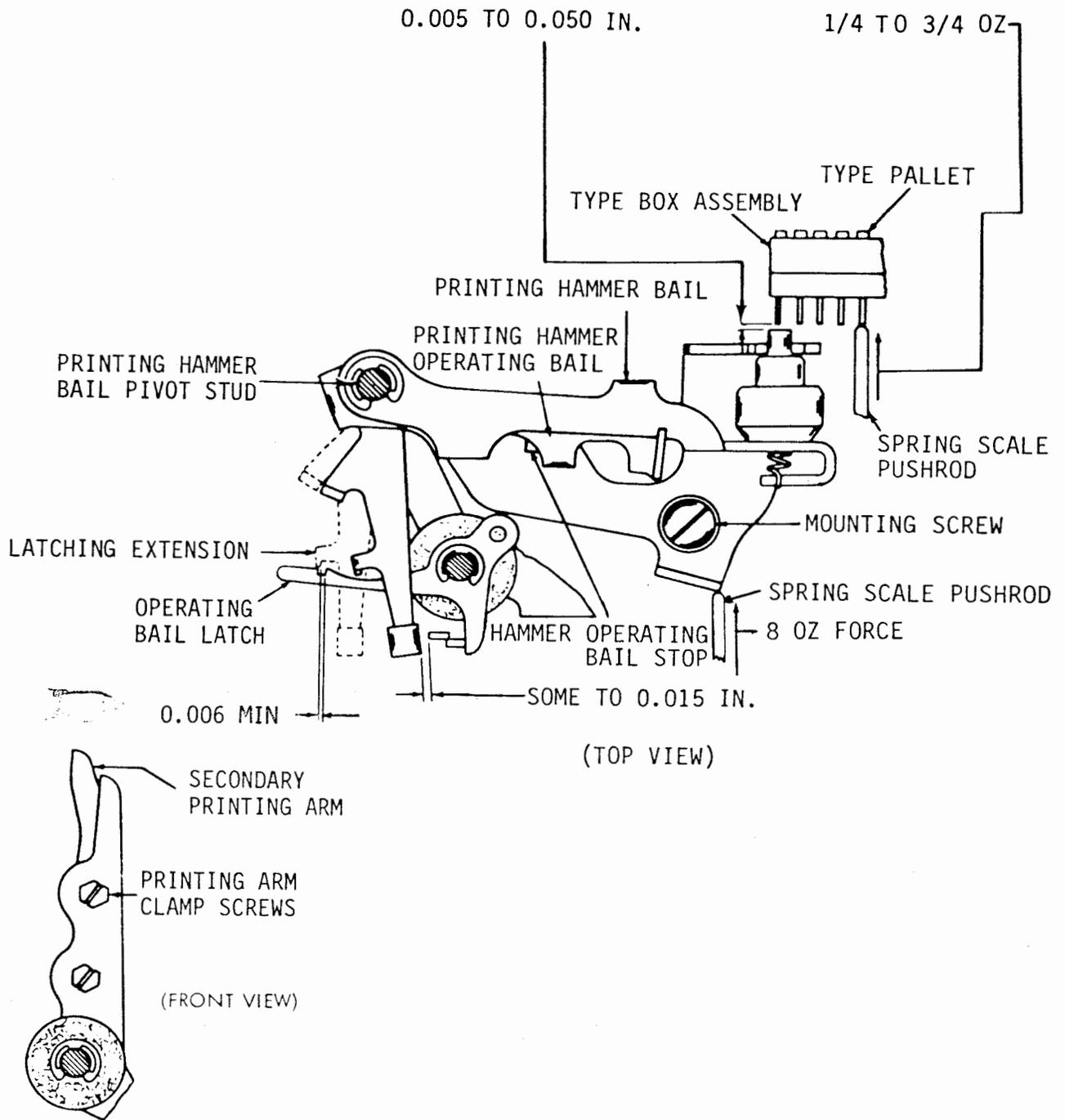


Figure 6-57. Printing Arm, Printing Hammer Stop Bracket, and Type Pallet Spring

(f) If clearance exceeds specified limits, loosen position mounting bracket by means of its mounting screw.

(g) Tighten screws.

(3) Type Pallet Spring. Adjust type pallet spring as follows:

(a) Refer to figure 6-57.

(b) Remove box from unit.

(c) Apply 8 ounce spring scale pushrod vertically to end of pallet shank.

(d) Force required to start pallet moving should be between 1/4 and 3/4 ounce.

(e) If scale reading exceeds limits, install new spring.

(4) Printing Carriage Lower Roller. Adjust printing carriage lower roller as follows:

(a) Refer to figure 6-58.

(b) Loosen carriage wire rope clamp screws.

(c) Ensure play of carriage on track is minimum with no binding throughout full length of track.

(d) To adjust (eccentric bushings) loosen screw nut and position lower roller keeping high part of eccentric (chamfered corner) toward right.

(e) Tighten nut.

(f) To adjust (sliding screw) loosen mounting screw and position lower roller.

(g) Tighten screw.

(5) Type Box Carriage Roller Arm Spring. Adjust type box carrier roller arm spring as follows:

(a) Refer to figure 6-59.

(b) Attach spring scale hook to type box latch.

(c) Force required to start upper roller nearest type box latch moving away from carriage track should be 28 to 36 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(6) Printing Carriage Position. Adjust printing carriage position as follows:

(a) If this adjustment is made, check the following related adjustments:

- 6-3.1h(13)
- 6-3.1h(8)
- 6-3.1h(9)
- 6-3.1h(15)

(b) Refer to figure 6-60.

(c) Place type box in letters position.

(d) Select "M" type pallet.

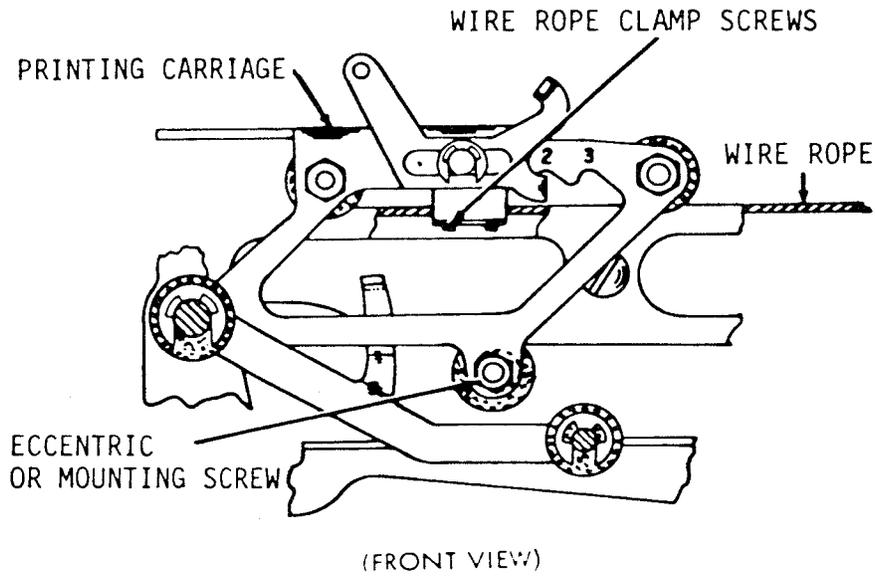


Figure 6-58. Printing Carriage Lower Roller

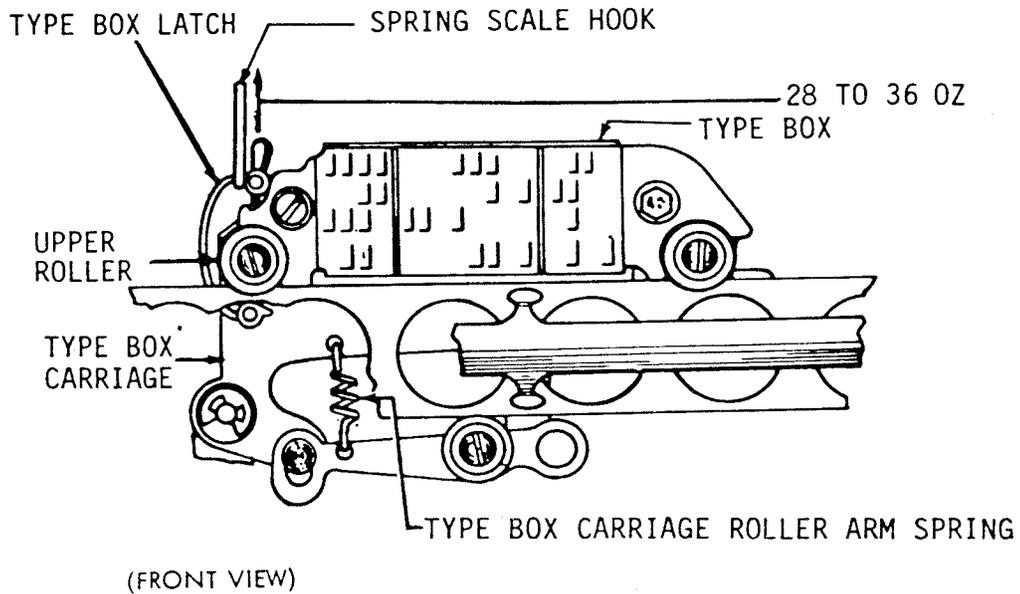


Figure 6-59. Type Box Carriage Roller Arm Spring

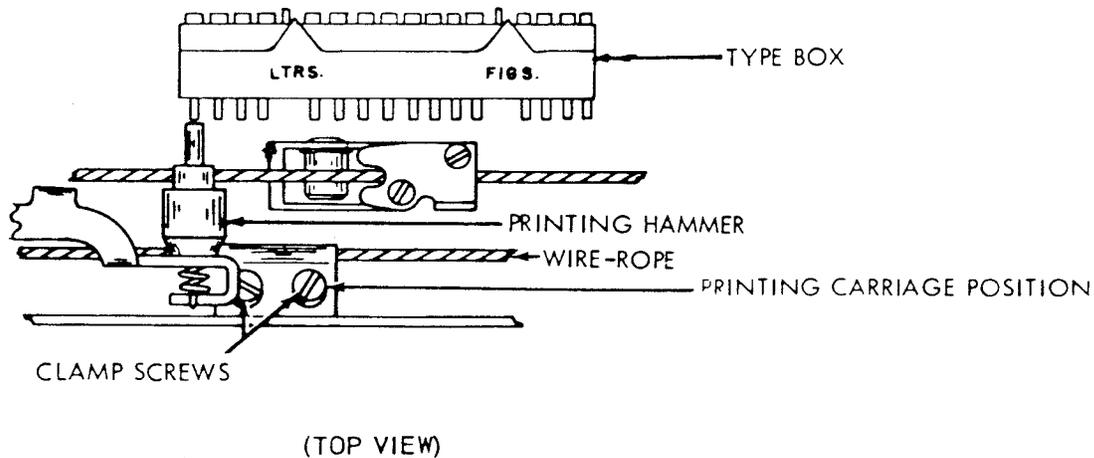


Figure 6-60. Printing Carriage Position

(e) Place type box in printing position.

(f) "M" type pallet should be approximately in center of printing hammer when hammer is just touching "M" type pallet.

(g) Take up play in type box carriage in each direction and set hammer in center of play.

(h) If adjustment is required, loosen clamp screws and position printing carriage on wire rope.

(i) Tighten clamp screws.

(7) Printing Hammer Bearing Stud. Adjust printing hammer bearing stud as follows:

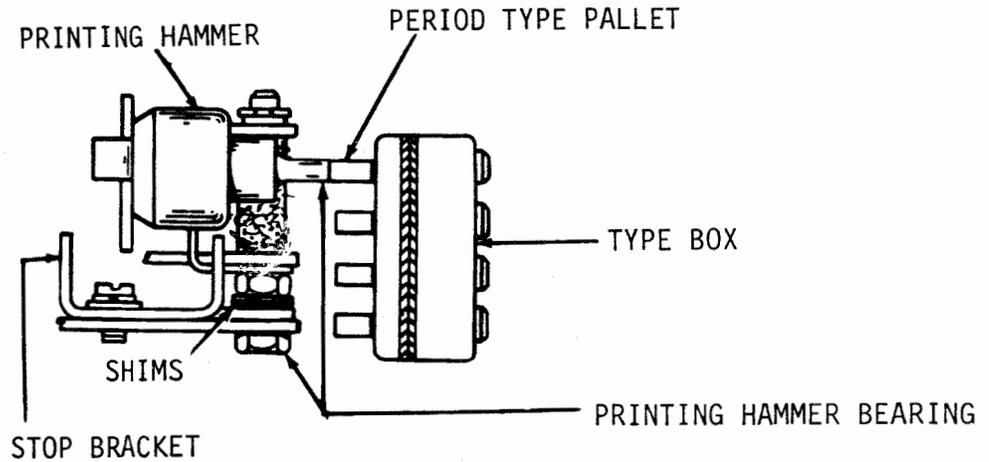
(a) Refer to figure 6-61.

(b) Place type box at midpoint of platen and in position to print period.

(c) Place printing hammer in contact with type pallet and press it downward at bearing stud.

(d) Hammer should be fully on end of type pallet.

(e) If face of hammer is not fully on end of



(RIGHT SIDE VIEW)

Figure 6-61. Printing Hammer Bearing Stud

type pallet, loosen nut and add or remove shims between shoulder on bearing post and stop bracket.

(8) Printing Hammer Operating Bail Latch Spring. Adjust printing hammer operating bail latch spring as follows:

- (a) Refer to figure 6-62.
- (b) Place printing track in its extreme upward position.
- (c) Apply spring scale pushrod to printing hammer bail.
- (d) Place printing track in its extreme upward position.

(e) Force required to start latch moving should be between 3 and 4-1/2 ounces.

(f) If spring scale reading exceeds specified limits, install new spring.

(9) Printing Hammer Operating Bail Spring. Adjust printing hammer operating bail spring as follows:

- (a) Refer to figure 6-62.
- (b) Place operating bail in latched position.
- (c) Position spring adjusting bracket in left hand notch.

0.015 TO 0.040 IN.

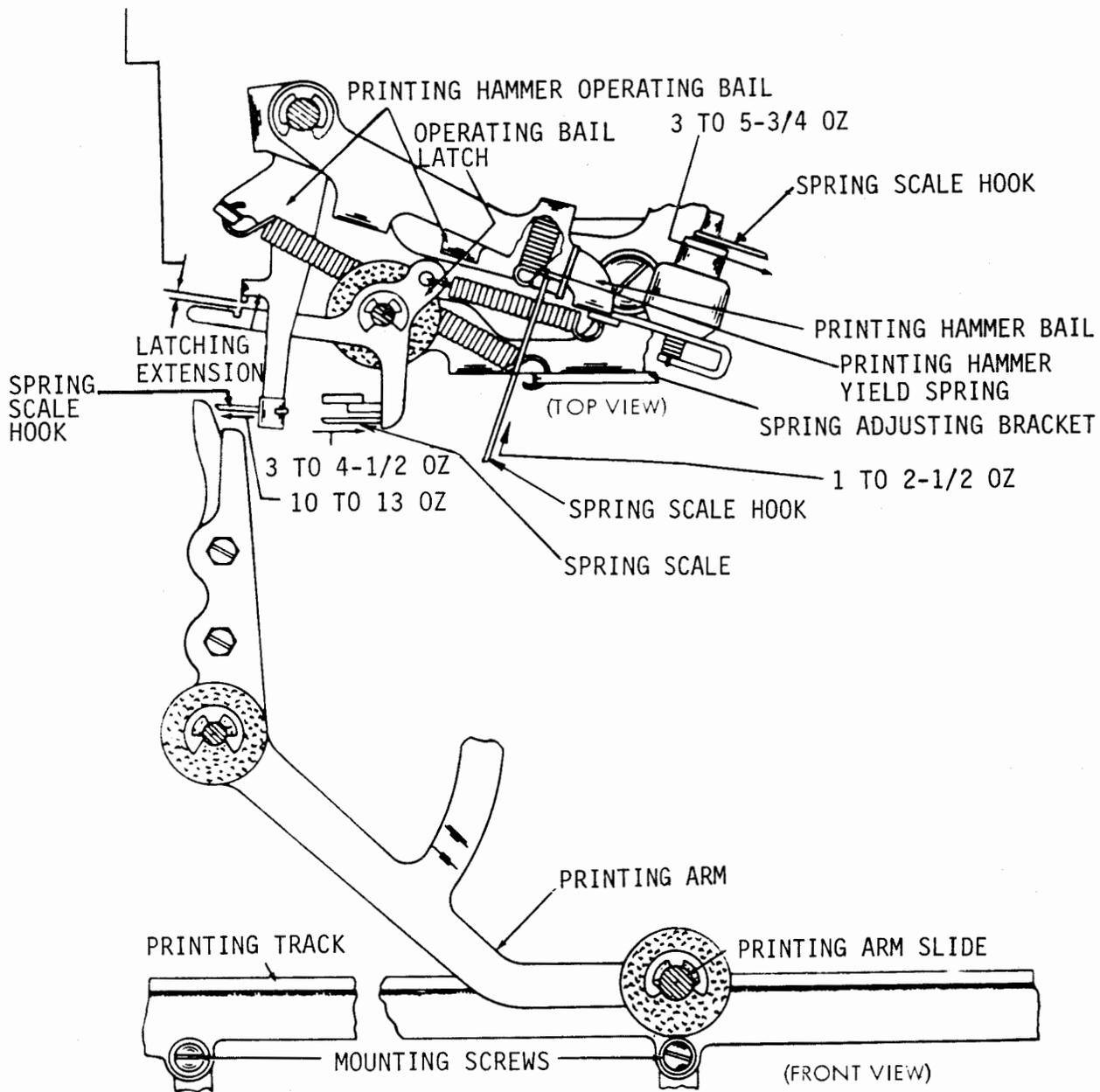


Figure 6-62. Printing Hammer Operating Bail Latch Spring, Printing Hammer Bail Spring, Printing Hammer Plunger Spring, Printing Hammer Yield Spring, and Printing Track

(d) Unhook hammer yield spring.

(e) Attach spring scale hook to printing hammer operating bail.

(f) Force required to start bail moving should be between 10 and 13 ounces.

(g) If spring scale reading exceeds specified limits, install new spring.

(10) Printing Hammer Plunger Spring. Adjust printing hammer plunger spring as follows:

(a) Refer to figure 6-62.

(b) Attach spring scale hook to printing hammer plunger.

(c) Force required to start plunger moving should be between 3 and 5-3/4 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(11) Printing Hammer Yield Spring. Adjust printing hammer yield spring as follows:

(a) Refer to figure 6-62.

(b) Position printing hammer operating bail against its stop.

(c) Attach spring scale hook to hammer bail.

(d) Force required to start hammer bail moving should be between 1 and 2-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(12) Printing Track. Adjust printing track as follows:

(a) Refer to figure 6-62.

(b) Place printing track in its extreme downward position.

(c) ("Blank selection in figures")

(d) Hold printing hammer operating bail latching extension with left face in line with latch shoulder.

(e) Position printing arm slide alternately over each track mounting screw.

(f) Reset printing bail each time.

(g) Measure clearance between latching extension and operating bail. Clearance should be between 0.015 and 0.040 inch.

(h) If clearance exceeds specified limits, loosen printing track mounting screws and position printing track up or down to obtain specified clearance.

(13) Ribbon Feed Lever Bracket. Adjust ribbon feed lever bracket as follows:

(a) Refer to figure 6-63.

(b) Place left reversing lever in upward position.

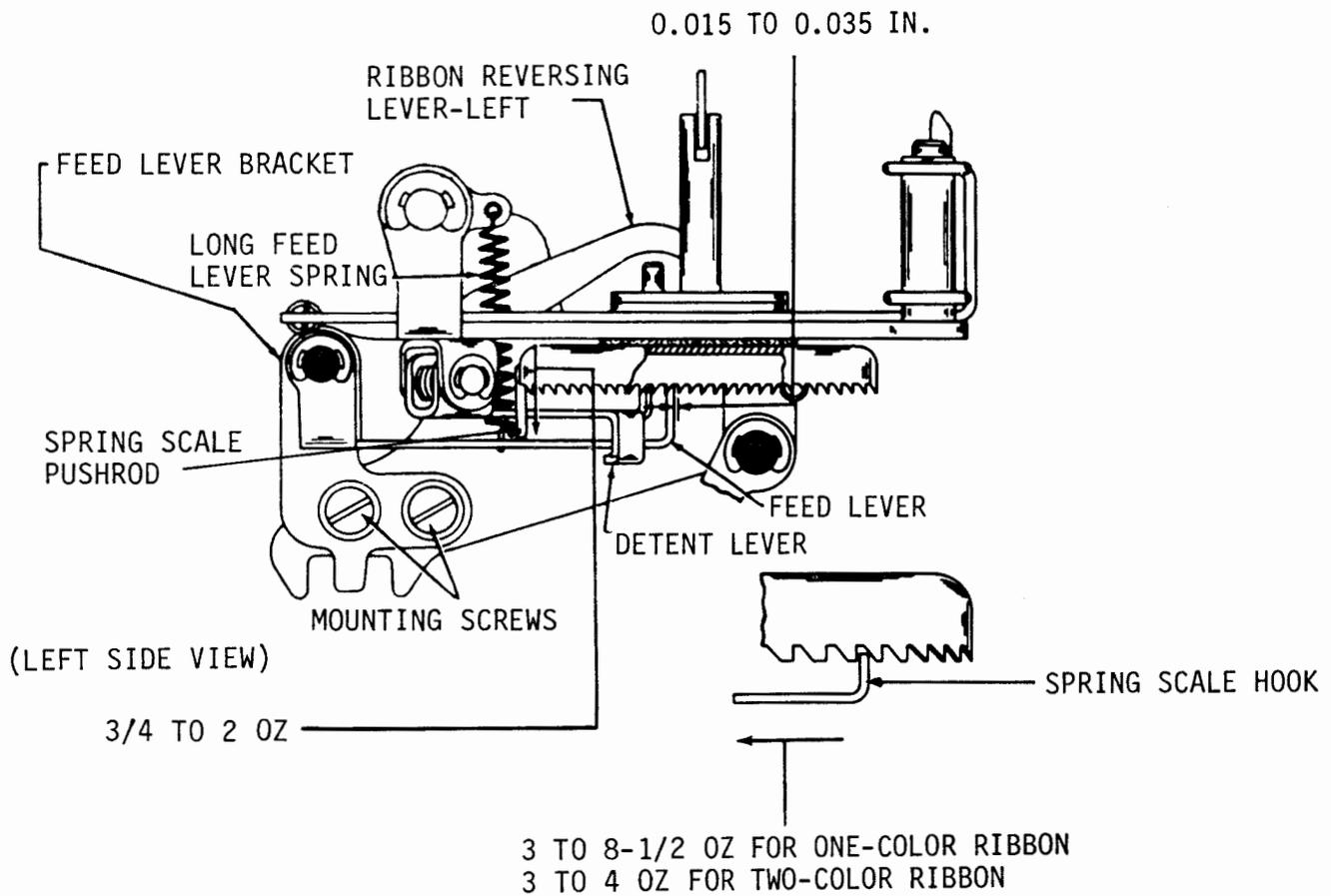


Figure 6-63. Ribbon Feed Lever Bracket, Ribbon Feed Lever Spring, and Ribbon Ratchet Wheel Friction Spring

- (c) Place ribbon mechanism in upper position.
- (d) Hold ratchet against detent lever.
- (e) Measure clearance between front face of feed lever and shoulder of tooth on ratchet wheel. Clearance should be between 0.015 and 0.035 inch.
- (f) If clearance exceeds specified limits, loosen feed lever bracket mounting screws and position feed lever bracket to obtain specified clearance.
- (g) Tighten screws.
- (h) Place right reversing lever in upward position.
- (i) Repeat steps (c) through (g) for right-hand mechanism.

NOTE

Rotate main shaft. Ratchet wheel should step one tooth only with each operation. On units with two-color ribbon, position feed lever bracket to upper forward position to meet maximum requirement.

(14) Ribbon Feed Lever Spring. Adjust ribbon feed lever spring as follows:

- (a) Refer to figure 6-63.
- (b) Place both long and short ribbon feed lever springs in uppermost position.

- (c) Apply spring scale pushrod to long ribbon feed lever at point near its spring and push downward.
- (d) Force required to start lever moving should be between 3/4 and 2 ounces.
- (e) If scale reading exceeds specified limits, install new spring.
- (f) Apply spring scale pushrod to short ribbon feed lever at point near long lever spring and push downward.
- (g) Force required to start lever moving should be between 3/4 and 2 ounces.
- (h) If scale reading is less than 3/4 ounces, pull lower end of torsion spring to rear. If scale reading is greater than 2 ounces, install new spring.
- (i) Measure all four pawls in like manner.

(15) Ribbon Ratchet Wheel Friction Spring. Adjust ribbon ratchet wheel friction spring as follows:

- (a) Refer to figure 6-63.
- (b) Disengage feed levers.
- (c) Apply spring scale hook to ratchet wheel.
- (d) Force required to start ratchet wheel moving should be as follows: for one-color ribbon, between 3 and 8-1/2 ounces; for two-color ribbon, between 3 and 4 ounces.

(16) Ribbon Lever Spring. Adjust ribbon lever spring as follows:

(a) Refer to figure 6-64.

(b) Attach spring scale to right ribbon lever.

(c) Force required to start lever moving should be between 1-1/2 and 3 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(e) Repeat steps (b), (c), and (d) for left spring.

(17) Ribbon Tension Spring. Adjust ribbon tension spring as follows:

(a) Refer to figure 6-64.

(b) Position ribbon ratchet wheel so that each driving pin is toward outside of spool shaft.

(c) Attach spring scale hook to spool.

(d) Force required to start spool shaft moving should be between 3 and 5-1/2 ounces.

(e) If scale reading exceeds specified limits, install a new spring.

(18) Ribbon Reverse Detent. Adjust ribbon reverse detent as follows:

(a) Refer to figure 6-65.

(b) Buckle ribbon reverse detent in its downward position.

(c) Take up play in detent lever lightly toward right side of printer.

(d) Measure clearance between detent link and detent lever.

(e) There should be some clearance not exceeding 0.055 inch.

(f) If clearance exceeds specified limits, loosen upper and lower set screws, hold left ribbon lever in its downward position, and position detent link. Tighten upper set screw in hub of detent link.

(g) Buckle detent link upward and tighten lower set screw.

(19) Ribbon Reverse Detent Lever Spring (If Unit is Equipped). Adjust ribbon reverse detent lever spring as follows:

(a) Refer to figure 6-65.

(b) Buckle link in upward position.

(c) Attach spring scale hook to detent lever at point where spring is attached.

(d) Force required to start detent lever moving toward rear should be between 10 and 18 ounces.

(e) If scale reading exceeds specified limits, install new spring.

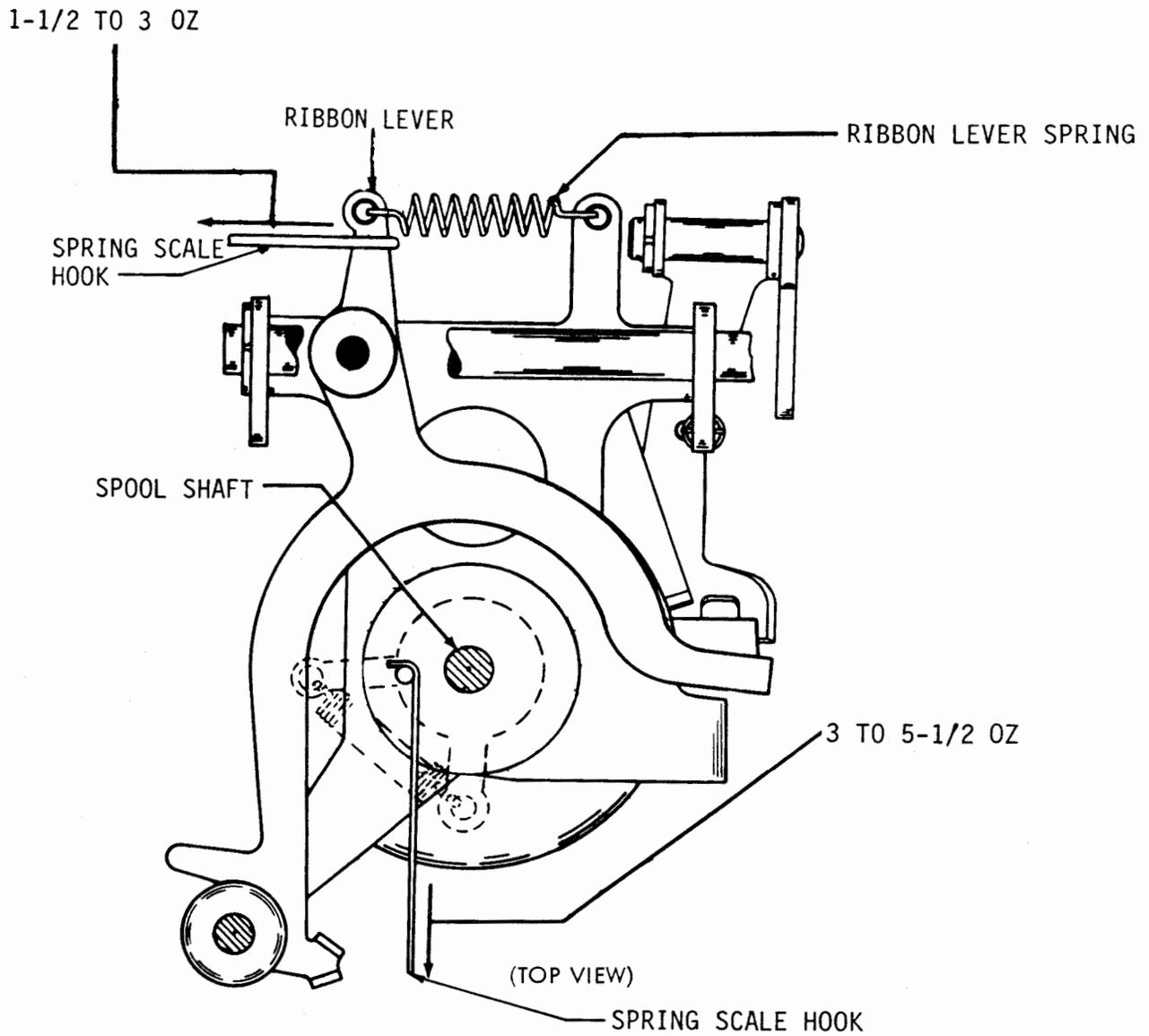


Figure 6-64. Ribbon Lever Spring and Ribbon Tension Spring

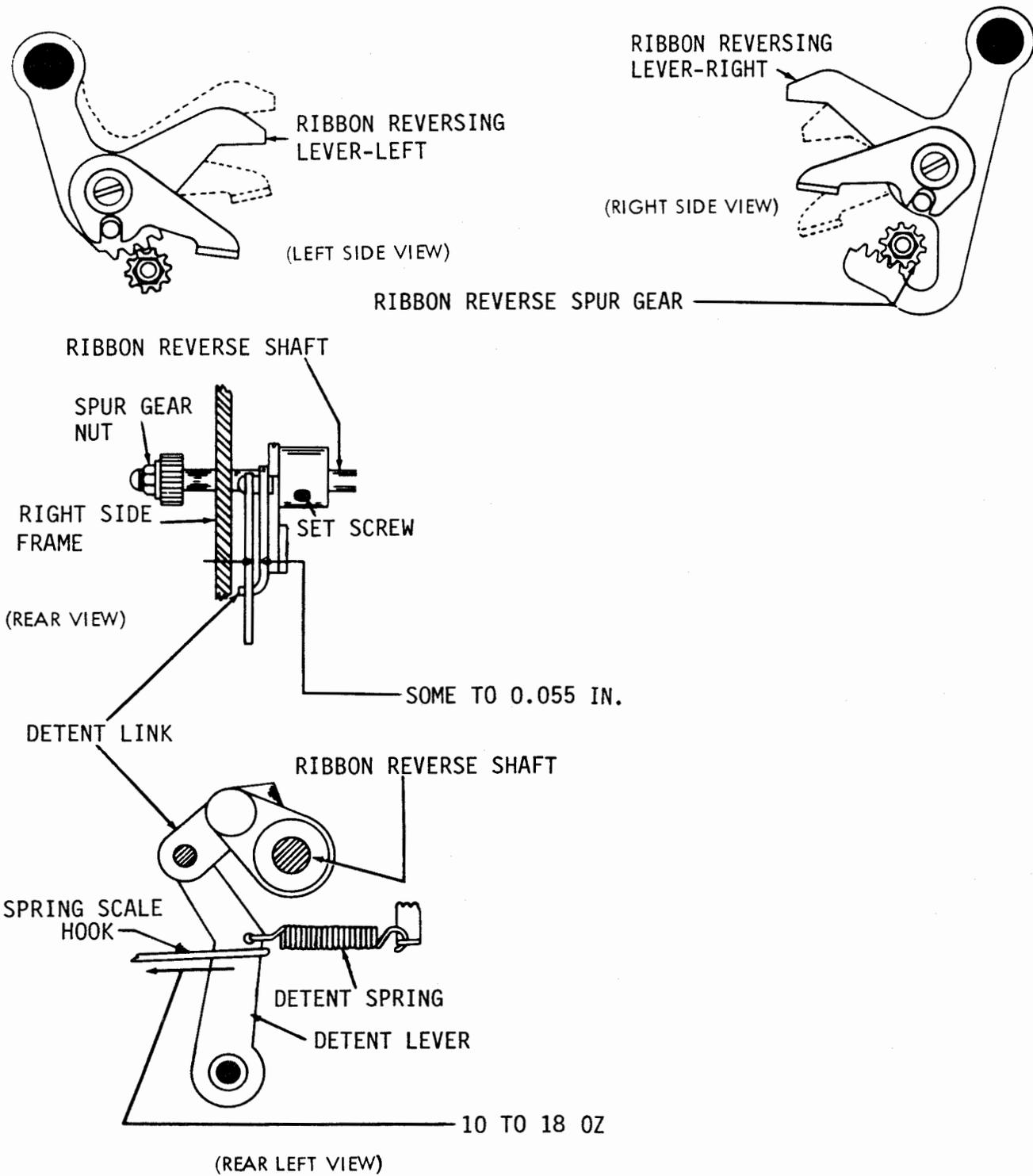


Figure 6-65. Ribbon Reverse Detent, Ribbon Reverse Detent Lever Spring, and Ribbon Reverse Spur Gear

(20) Ribbon Reverse Spur Gear. Adjust ribbon reverse spur gear as follows:

- (a) Refer to figure 6-65.
- (b) Place right reversing lever in its maximum downward position.
- (c) Left reversing lever should be in its maximum upward position.
- (d) If left reversing lever is not in its maximum upward position, loosen set screws in detent cam. Loosen left spur gear unit.
- (e) Securely tighten right spur gear nut.
- (f) Move right reversing lever to its maximum downward position, hold left reversing lever in its maximum upward position, and tighten left spur gear nut.
- (g) Rotate type box clutch 1/2 turn and move right reversing lever under segment.
- (h) There should be some clearance between segment and lever.
- (i) If there is no clearance, repeat steps (d) through (h).

(21) Type Box Alignment. Adjust type box alignment as follows:

- (a) Refer to figure 6-66.

NOTE

This adjustment applies only to units so equipped and

should be made with the type box in its upper position.

- (b) Examine a line of printed characters. As gauged visually, top and bottom of each character should be impressed equally.
- (c) If impression of tops and bottoms are not equal, loosen adjusting screw and clamp nut.
- (d) Operate unit under power. Repeat characters E and Z. Turn adjusting screw in or out in steps of 1/4 turn until tops and bottoms of all characters make equal impression.

NOTE

Some typing units are equipped with a ribbon guide which has a type box retaining clip with a limited yield. In cases where it is necessary to back the adjusting screw out to provide heavier printing at the top of a character, it may be necessary to bend the spring clip on the ribbon guide toward the front so that the tab at the bottom of the type box is held against the head of the adjusting screw.

- (e) Tighten adjusting screw clamp nut.
- (f) Recheck printing stop bracket adjustment (6-3.1c(3)) and readjust if necessary.

g. Selector Mechanism Adjustments. Perform selector mechanism adjustments in accordance with the following paragraphs.

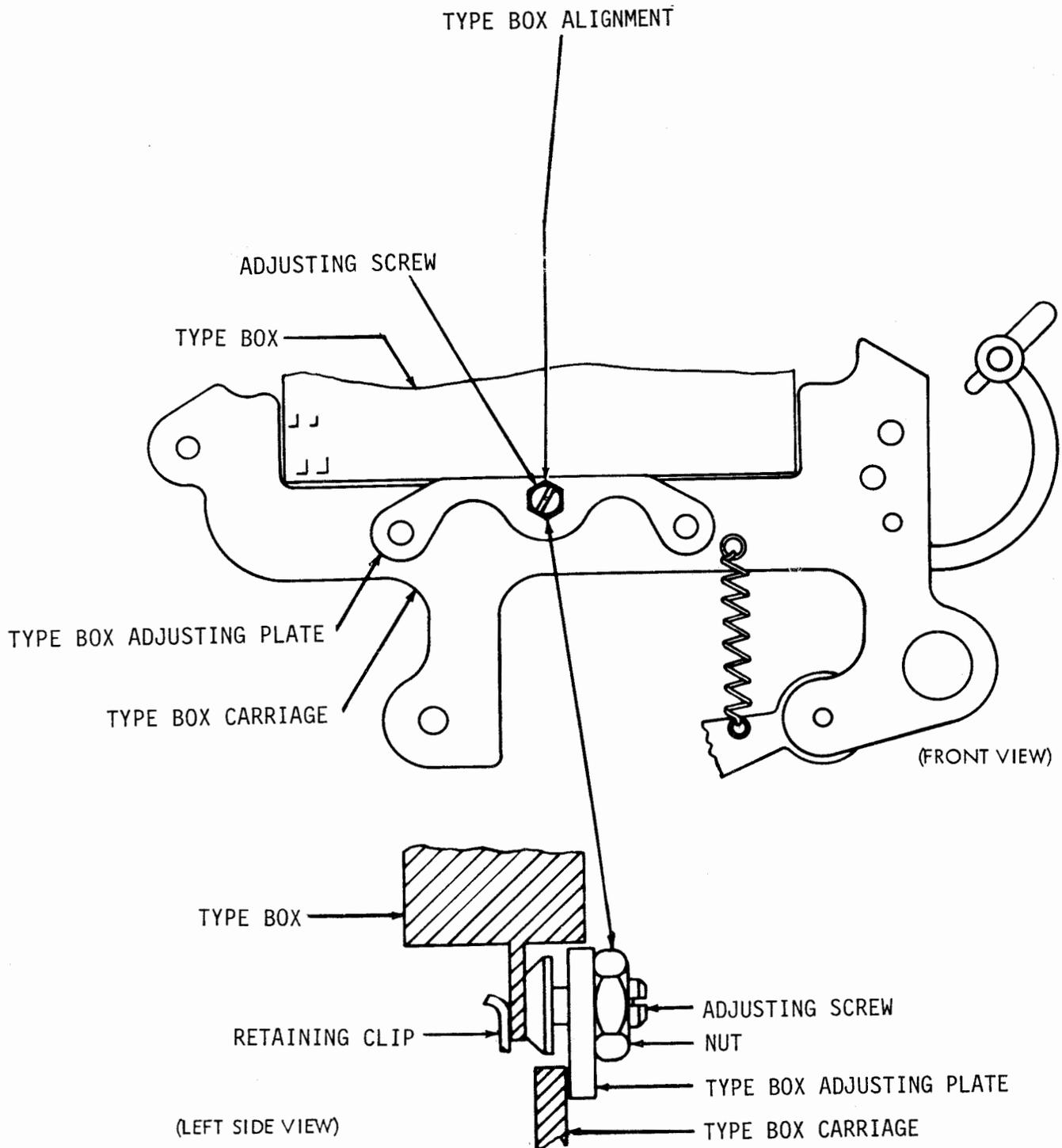


Figure 6-66. Type Box Alignment

(1) Marking Lock Lever Spring. Adjust marking lock lever spring as follows:

- (a) Refer to figure 6-67.
- (b) Select letters combination.
- (c) Rotate main shaft until selector clutch is disengaged.
- (d) Apply spring scale pushrod to lower extension of marking lock lever.
- (e) Force required to start lock lever moving should be between 1-1/2 and 3 ounces.
- (f) If scale reading exceeds specified limits, install new spring.

(2) Start Lever Spring. Adjust start lever spring as follows:

- (a) Refer to figure 6-68.
- (b) Unhook latch lever spring.
- (c) Position stop arm bail in indent of its cam.
- (d) Set range scale at 60.
- (e) Apply spring scale pushrod to clutch stop arm.
- (f) Force required to start stop arm moving should be between 2-1/2 and 4-1/2 ounces.
- (g) If scale reading exceeds specified limits, install new spring.

(h) Reinstall latch lever spring unhooked in step (b).

(3) Push Lever Reset Bail Spring. Adjust push lever reset bail spring as follows:

- (a) Refer to figure 6-69.
- (b) Position push lever reset bail on low part of cam.
- (c) Apply spring scale pushrod to reset bail.
- (d) Force required to move bail from cam should be between 4 and 8 ounces.
- (e) If scale reading exceeds specified limits, install new spring.

(4) Selector Clutch Latch Lever Spring. Adjust selector clutch latch lever spring as follows:

- (a) Refer to figure 6-70.
- (b) Position latch so it rests on low part of its cam disc.
- (c) Attach spring scale hook to latch lever.
- (d) Force required to start latch moving should be between 2 and 3-1/2 ounces.
- (e) If scale reading exceeds specified limits, install new spring.

(5) Spacing Lock Lever Spring. Adjust spacing lock lever spring as follows:

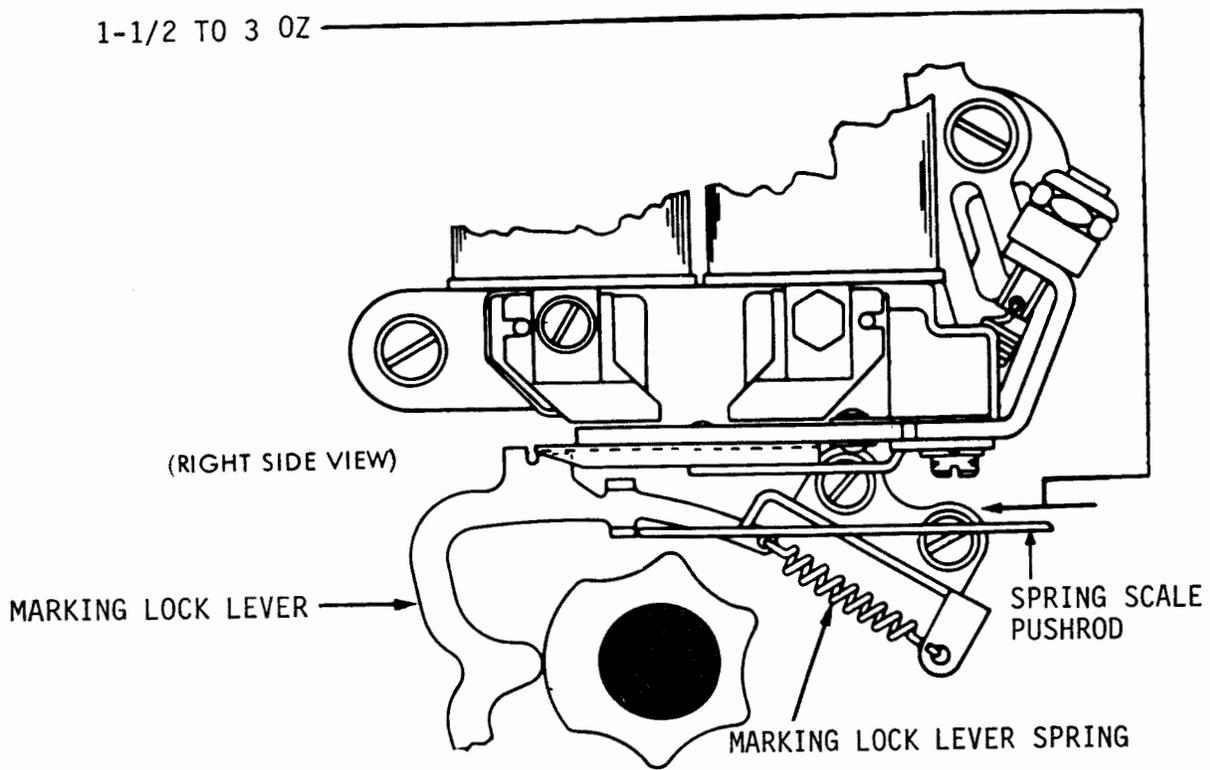


Figure 6-67. Marking Lock Lever Spring

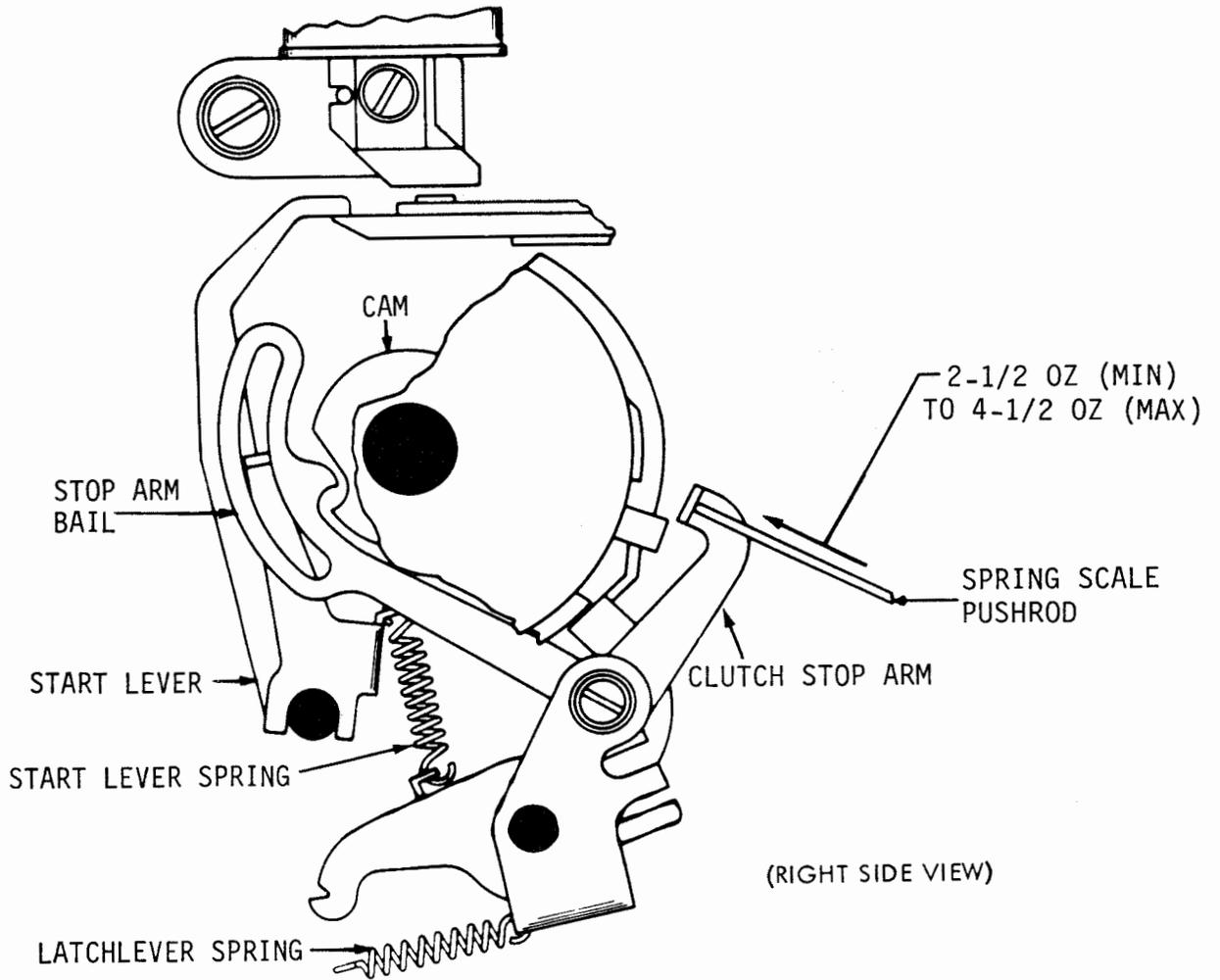


Figure 6-68. Start Lever Spring

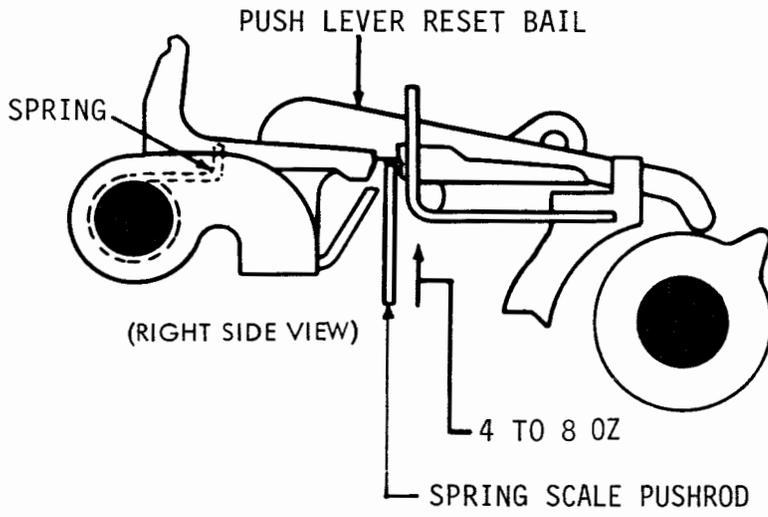
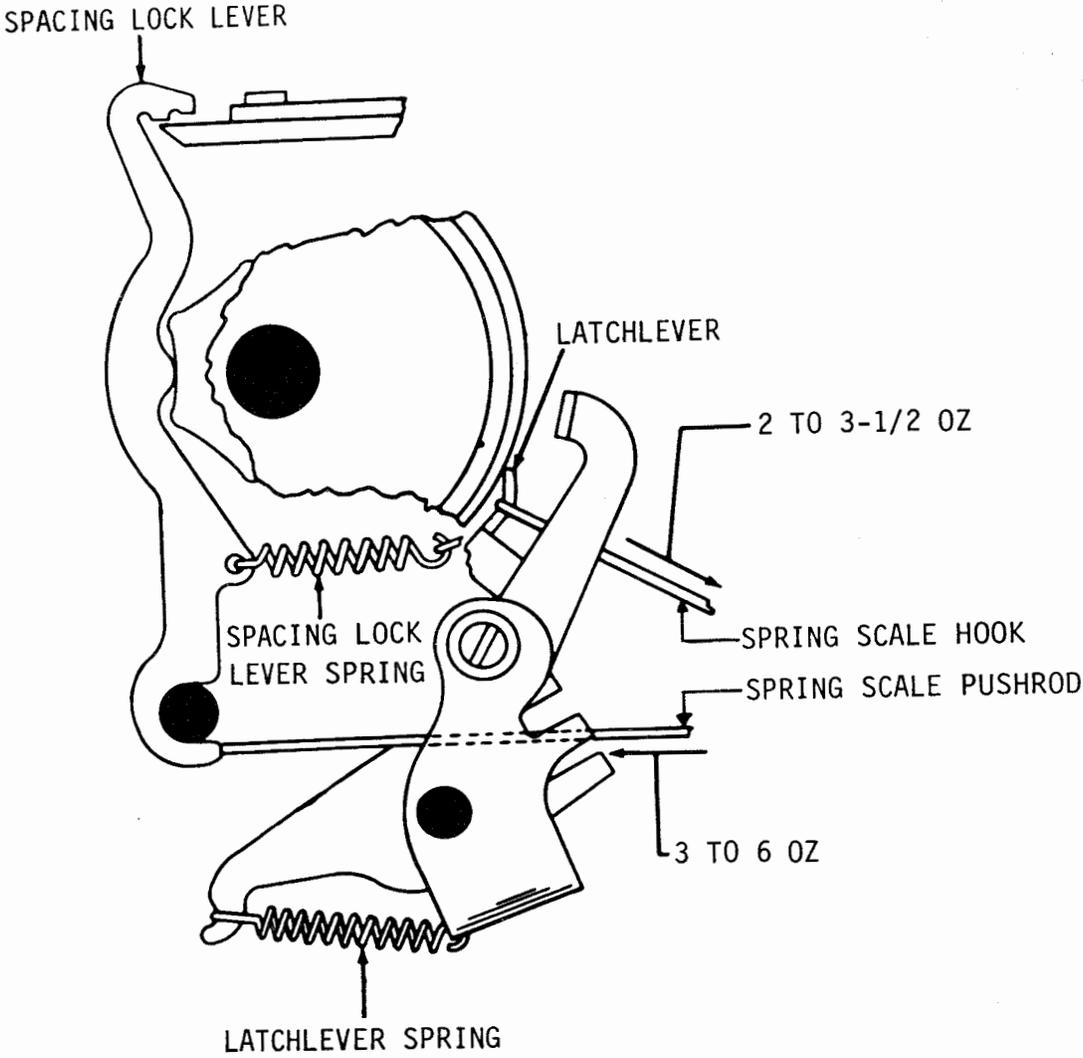


Figure 6-69. Push Lever Reset Bail Spring



(RIGHT SIDE VIEW)

Figure 6-70. Selector Clutch Latch Lever Spring and Spacing Lock Lever Spring

(a) Refer to figure 6-70.

(b) Release selector armature.

(c) Position spacing lock lever on low part of its cam.

(d) Apply spring scale pushrod to lower end of lock lever.

(e) Force required to move spacing lock lever from its pivot shaft should be between 3 and 6 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(6) Range Finder Knob Phasing. Adjust range finder knob phasing as follows:

(a) Refer to figure 6-71.

(b) Rotate range finder knob either clockwise or counterclockwise to the stop.

(c) Zero on range scale should be within 3 points of index mark.

(d) If zero is more than 3 points away from index, remove mounting nut and disengage knob from rack.

(e) Position knob so that 0 on range scale is at index.

(f) Engage knob with rack and replace mounting nut.

(g) Rotate knob to set 60 on range scale at index.

(7) Selector Clutch Stop Arm. Adjust selector clutch stop arm as follows:

(a) Refer to figure 6-71.

(b) Set range scale at 60.

(c) Disengage selector clutch.

(d) Position armature in marking position.

(e) Clutch stop arm should engage clutch shoe lever by approximately full thickness of shoe lever. If not, loosen clamp screw and position stop arm on stop arm bail.

(f) Tighten clamp screw.

(8) Selector Receiving Margin for Dual Speed Operation (60 and 100 WPM).

(a) Refer to figure 6-72.

(b) Set range scale at common optimum setting for dual speed operation.

(c) Page printer should accept signals with 35 percent bias and end distortion when operating at 60 or 100 words per minute (wpm).

(d) Set bias selector between limits of 0 and -7 percent internal bias at 100 wpm. (Do not readjust for 60 wpm.)

(e) Calculate common optimum bias as follows:

$$O_c = \frac{UMB_{100} + LSB_{60}}{2}$$

where

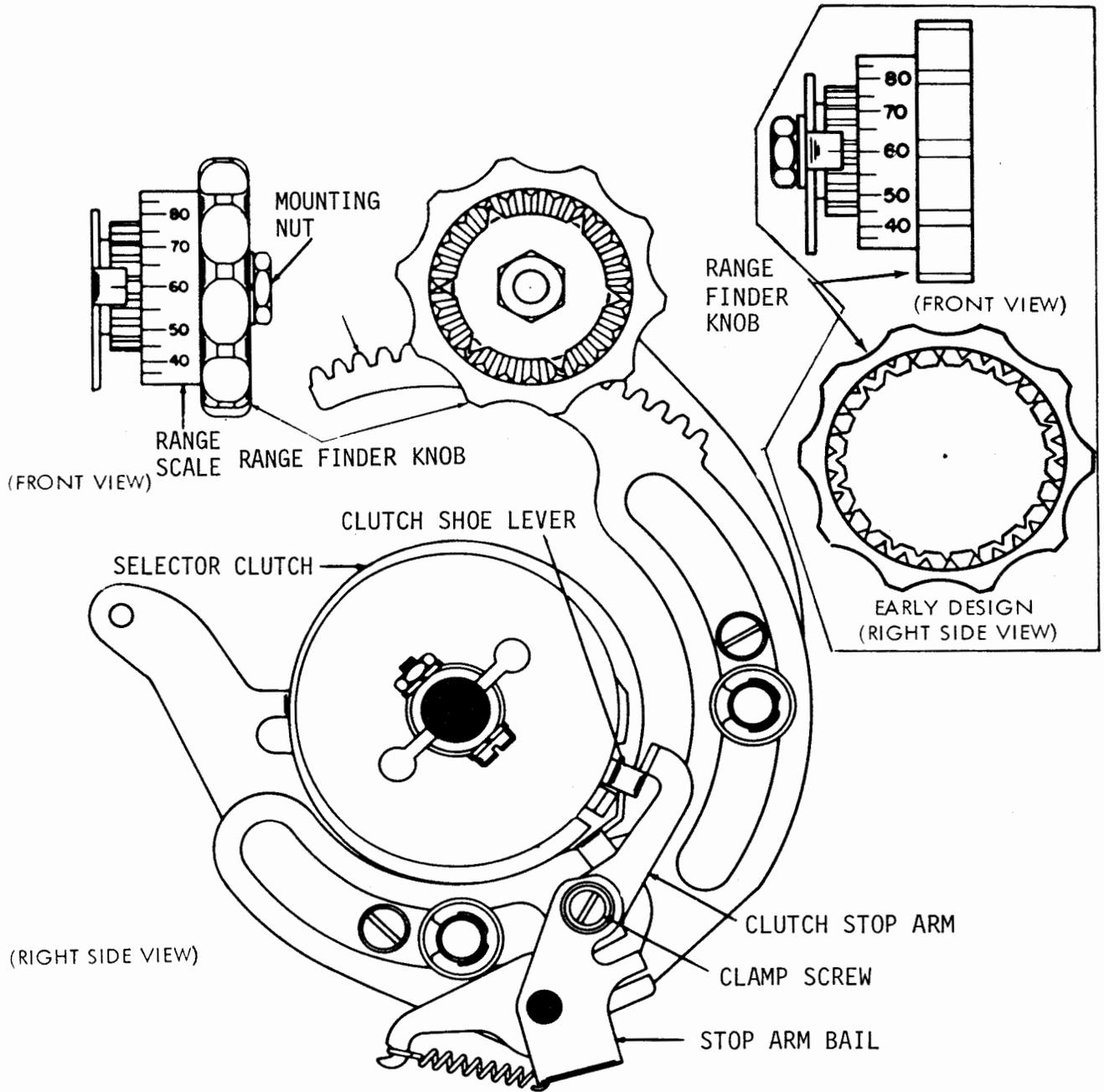


Figure 6-71. Range Finder Knob Phasing and Selector Clutch Stop Arm

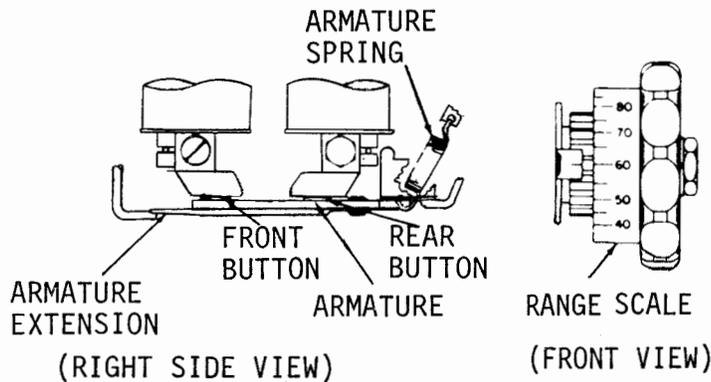


Figure 6-72. Selector Receiving Margin (Dual Speed Operation)

$O_c$  = common optimum bias setting  
 $UMB_{100}$  = upper orient limit marking bias at 100 wpm  
 $LSB_{60}$  = lower orient limit spacing bias at 60 wpm

of new equipment, range and distortion tolerances specified in table 6-1 should be met.

(c) When checking units with a single button armature (for bell service only), shunt signal line by a switchboard simulator.

(9) Selector Receiving Margin. Adjust selector receiving margin as follows:

(d) If adjustment is required, perform the adjustments described in 6-3.1g(13) and (14).

(a) Refer to figure 6-72.

(b) When adjusting units employing armature with one anti-freeze button and a signal distortion test is used for determining receiving margins of selector and where condition of components is equivalent to that

(e) When adjusting units employing armature with two anti-freeze buttons, adjust selector armature spring tension as described in 6-3.1g(13) and (14) when a distortion test set is available. Do not use simulator with units employing two-button armature.

Table 6-1. Selector Margin Minimum Requirements

Current	Speed WPM	Points Range (Zero Distortion)	Percent Marking and Spacing Bias Tolerated	End Distortion Tolerated (Scale) Set at Bias Optimum
0.060 amp (windings parallel)	70 75 100 50 + 75 baud	72	40	35
0.020 amp (windings series)	60 75	72	40	35

(f) Front anti-freeze button must contact magnet core when magnet coils are energized.

NOTE

Separate 50 baud or 75 baud tests are not required. Units geared for 74 baud are tested with the usual 74.2 baud 60 opm, 7.42 unit signals.

(10) Selector Armature. Adjust selector armature as follows:

NOTE

The following selector armature adjustments may be omitted if selector magnet bracket, paragraph 6-3.1g(14) and selector receiving margin, paragraph 6-3.1g(9) adjustments have been completed.

- (a) Refer to figure 6-73.
- (b) Measure clearance between armature clamp strip and magnet bracket casting. Clearance should be 0.010 inch minimum.
- (c) Outer edge of armature should be flush with outer edge of pole pieces within 0.015 inch.
- (d) Start lever should drop freely into armature extension slot.
- (e) If any of the requirements of (b), (c), and (d) are not met, loosen mounting screws and position armature spring adjusting nut to

hold armature firmly against pivot edge of casting.

(f) Tighten mounting screws.

(11) Selector Armature Downstop (Preliminary). Adjust selector armature downstop as follows:

- (a) Refer to figure 6-74.
- (b) De-energize magnet.
- (c) Position lock levers on high part of their cams.
- (d) Position armature so it rests against its downstop.
- (e) Measure clearance between end of armature and left edge of left pole piece. Clearance should be between 0.030 and 0.035 inch.
- (f) If clearance exceeds specified limits, loosen mounting screw and position downstop to obtain specified clearance.
- (g) Tighten mounting screw.

(12) Selector Armature Downstop (Final). Adjust selector armature downstop as follows:

- (a) Refer to figure 6-75.
- (b) De-energize magnet.
- (c) Position locklevers on low part of their cams.

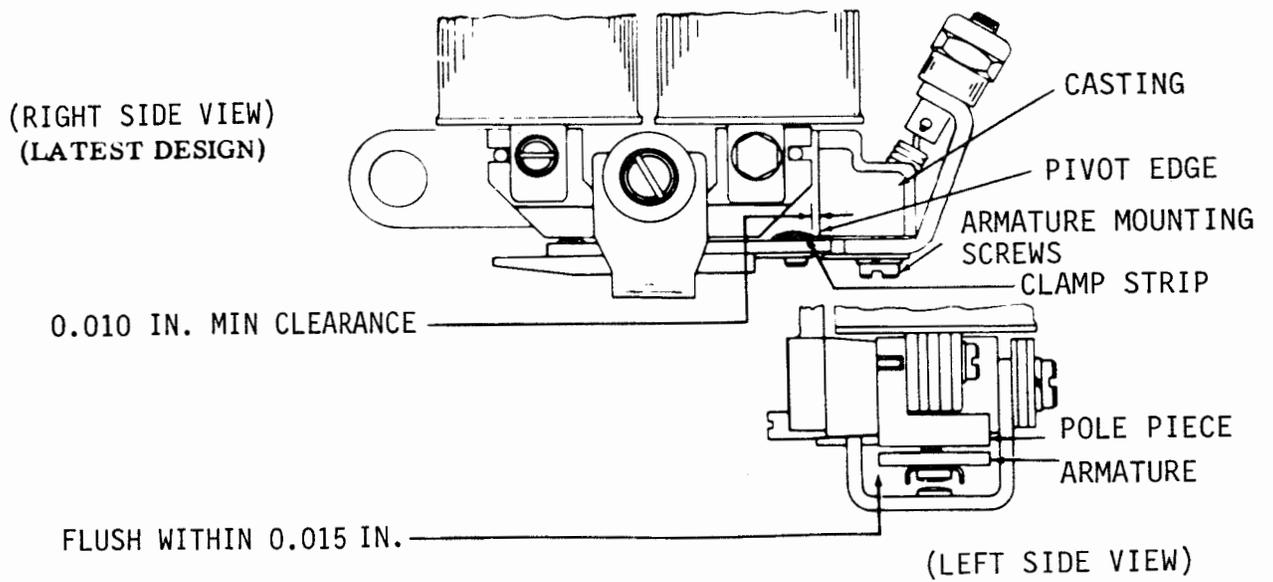


Figure 6-73. Selector Armature

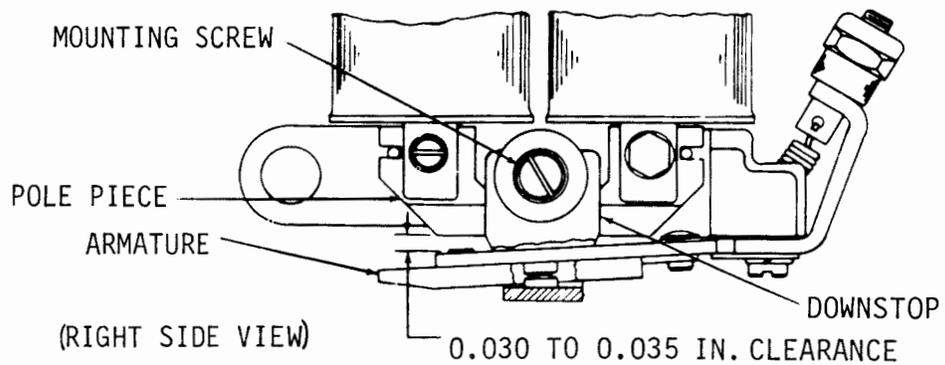


Figure 6-74. Selector Armature Downstop (Preliminary)

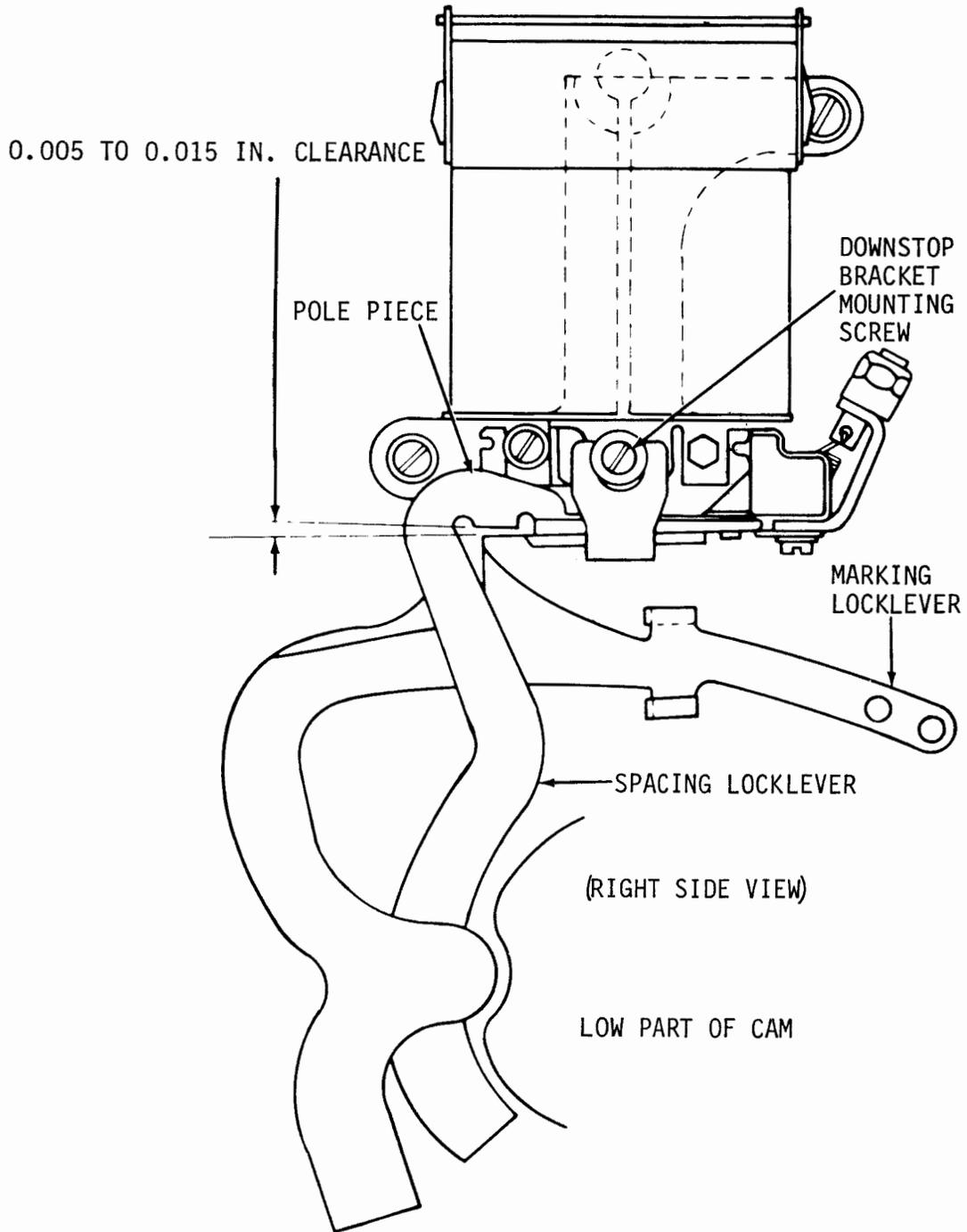


Figure 6-75. Selector Armature Downstop (Final)

(d) Measure clearance between top of armature extension and bottom of spacing lock lever. Clearance should be between 0.005 and 0.015 inch.

(e) If clearance exceeds specified limits, loosen mounting screw and position downstop to obtain specified clearance.

(f) Tighten mounting screw.

(13) Selector Armature Spring (Double Button). Adjust selector armature spring as follows:

(a) Refer to figure 6-76.

(b) Position start lever, marking lock lever, and spacing lock lever on high part of their cams.

(c) Attach spring scale hook to armature by hooking it under end of armature extension.

(d) Holding spring scale as nearly vertical as possible, measure force required to pull rear button of armature against its pole piece.

(e) Force required to pull rear button against its pole piece should be 14 grams for 0.020-ampere series-connected selector magnets or 21 grams for 0.060-ampere parallel-connected selector magnets.

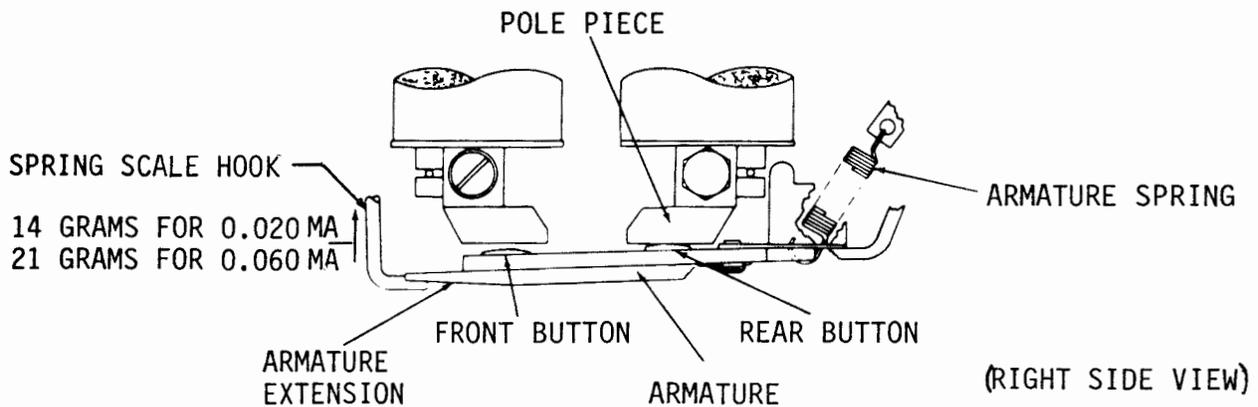


Figure 6-76. Selector Armature Spring (Double Button)

(f) If required force is not as specified in step (e), adjust armature spring tension by positioning adjusting nut.

NOTE

Armature spring tension can be adjusted for maximum selector performance only when the printer is connected to the specific circuit over which it is to operate under service conditions. Since there are several operating speeds and since circuits vary widely, it is impossible to adjust the spring for maximum performance at the factory. The foregoing spring tension requirement is given to permit operation prior to measurement of receiving margins. Readjustment made to obtain satisfactory receiving margin should not be disturbed in order to meet the requirements of this adjustment. The final spring tension should be held as close as possible to the values given above -- consistent with good receiving margins.

(g) If a distortion test set is available, refine selector armature spring adjustment to meet selector receiving margin as described in 6-3.1g(9).

(14) Selector Magnet Bracket. Adjust selector magnet bracket as follows:

NOTE

The appropriate selector armature spring tension preliminary adjustments, para-

graphs 6-3.1a(15) or (13), must be made prior to the selector magnet adjustment.

(a) Refer to figure 6-77.

(b) Position cam so that spacing lock lever rests on one of the high spots of the cam.

(c) Energize magnets to position armature in contact with pole piece.

(d) Measure clearance between end of armature extension and shoulder on spacing lock lever.

(e) Repeat steps (b), (c), and (d) for each remaining high spot of cam. Clearance at each high spot should be between 0.020 and 0.035 inch.

(f) If clearance at any high spot exceeds specified limits, loosen two magnet bracket mounting screws and adjusting link clamp screw.

(g) Position magnet bracket to obtain specified clearance at each high spot.

(h) Tighten adjusting link clamp screw only.

(i) Repeat steps (b) and (c).

(j) Measure clearance between upper surface of armature extension and lower surface of spacing lock lever when lock lever is held downward.

(k) Repeat steps (i) and (j) for each

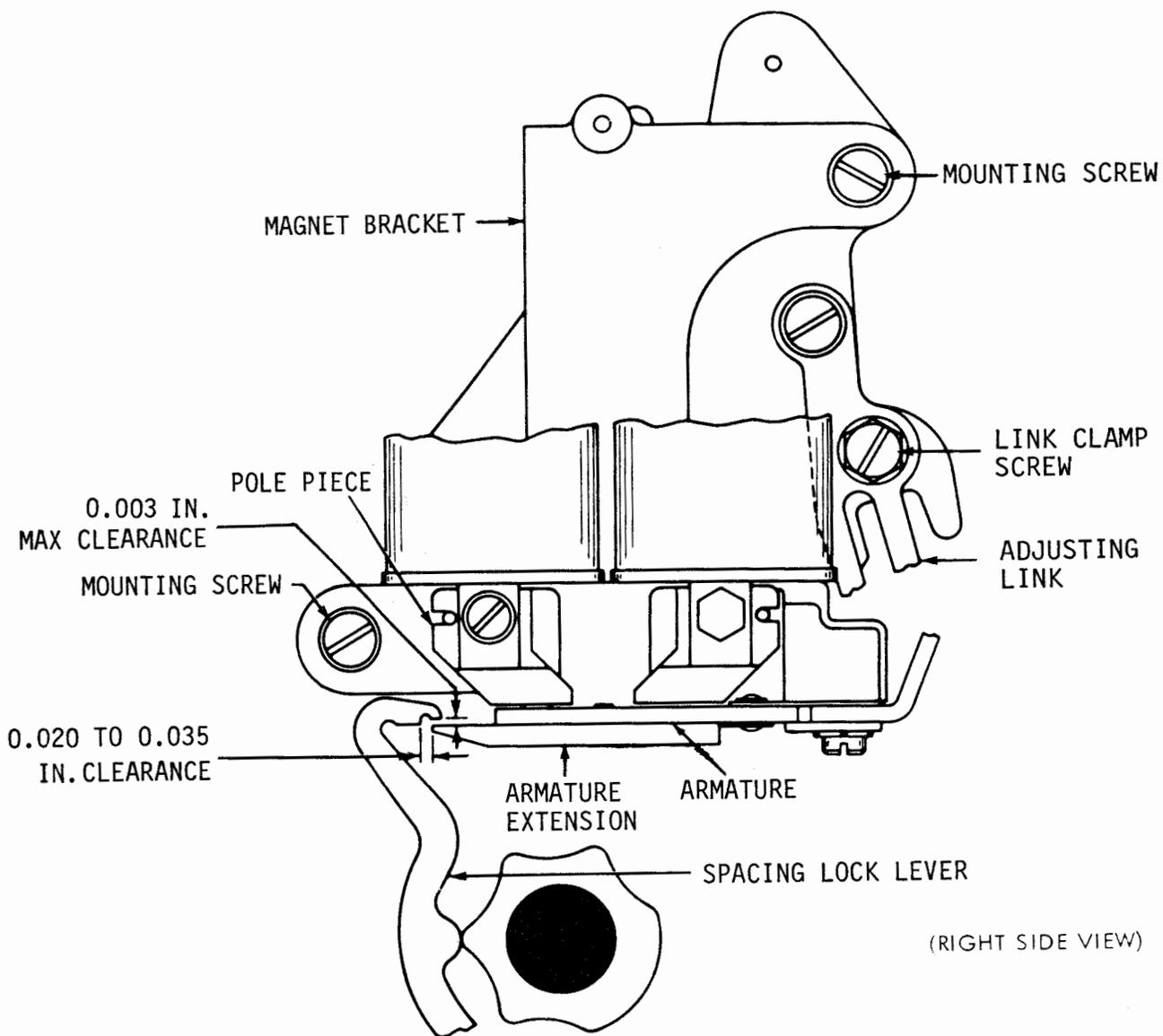


Figure 6-77. Selector Magnet Bracket

remaining high spot of cam. Clearance at each high spot should be 0.003 inch maximum.

(l) If clearance at any high spot exceeds specified limit, position upper end of magnet bracket to obtain specified clearance at each high spot.

(m) Tighten two magnet bracket mounting screws.

(n) Repeat steps (b) through (g).

(o) If further clearance adjustment was required in step (f), tighten adjusting link clamp screw and two magnet bracket mounting screws.

(15) Selector Armature Spring (Single Button). Adjust selector armature spring as follows:

CAUTION

Before proceeding with the adjustment of the selector armature spring, the type of armature (one anti-freeze button or two anti-freeze buttons) must be known. Excessive tension on or mishandling of a two-button armature can damage the thin leaf attached to the pivot end.

(a) If removal for examination is necessary, disassemble as follows:

1. Disconnect armature spring.
2. Remove armature mounting screws.
3. Withdraw armature from selector.

4. Reassemble and recheck the following adjustments:

Selector Armature, paragraphs 6-15.1g(5) or 6-3.1g(10)

Selector Armature Downstop Bracket, paragraph 6-3.1g(12)

Selector Magnet Bracket, paragraph 6-3.1g(14)

(b) Refer to figure 6-78.

(c) Position start lever, marking lock lever, and spacing lock lever on high part of their cams.

(d) Attach spring scale hook to armature by hooking it under end of armature extension.

(e) Holding spring scale as nearly vertical as possible, measure force required to pull armature to marking position.

(f) Force required to pull armature to marking position should be between 1-1/2 and 2 ounces for 0.020-ampere series-connected selector magnets or between 2-1/2 and 3 ounces for 0.060-ampere parallel-connected selector magnets.

(g) If required force is not as specified in step (e), adjust armature spring tension by positioning adjusting nut.

NOTE

Spring tensions shown in this paragraph permit operation of printer prior to measurement of receiving margins.

1-1/2 TO 2 OZ FOR 0.020 MA  
 2-1/2 TO 3 OZ FOR 0.060 MA

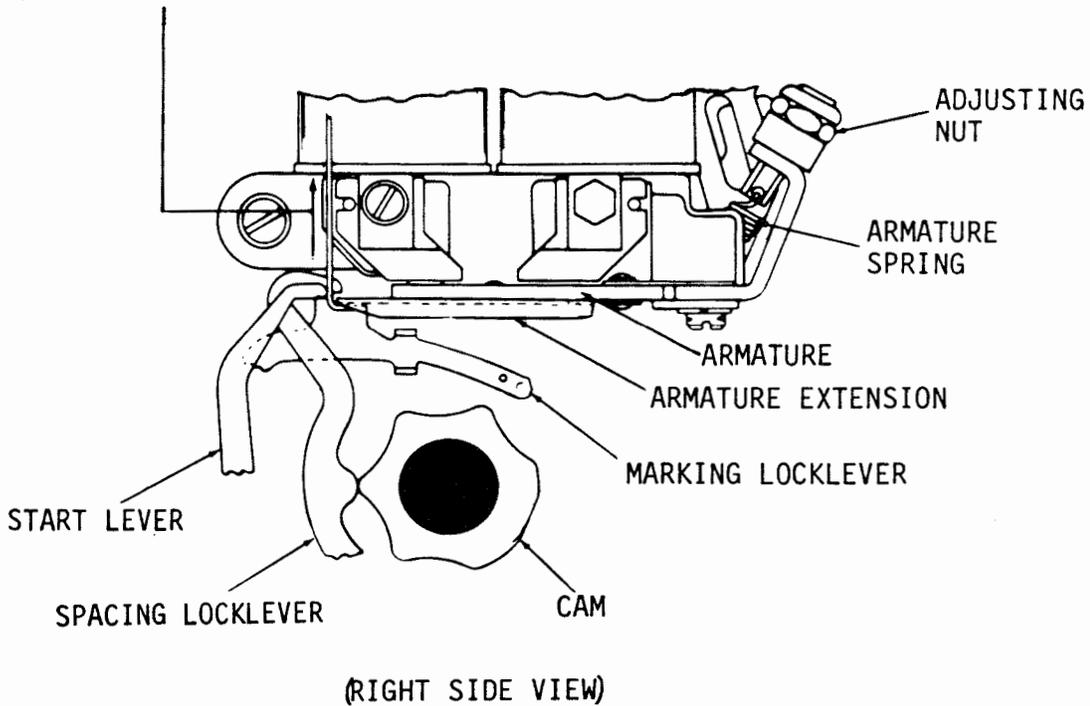


Figure 6-78. Selector Armature Spring (Single Button)

Refine spring tensions for maximum selector performance with unit connected to specific circuits in which it is to function (operating at desired speed and line current). See paragraph 6-3.1g(9).

touch lubricator wick, but should not raise it more than 1/32 inch.

NOTE

There should be some clearance between marking lock lever spring and reservoir.

(16) Selector Cam Lubricator. Adjust selector cam lubricator as follows:

(a) Refer to figure 6-79.

(b) Measure clearance between lubricator tube and high part of lock lever cam. Clearance should be 0.020 inch minimum.

(c) High part of selector lever cam should

(d) If clearance in (b) or (c) exceeds specified tolerances, loosen lubricator bracket mounting screws, and position bracket to obtain specified clearance.

(e) Tighten screws.

(17) Selector Clutch Drum. Adjust selector clutch drum as follows:

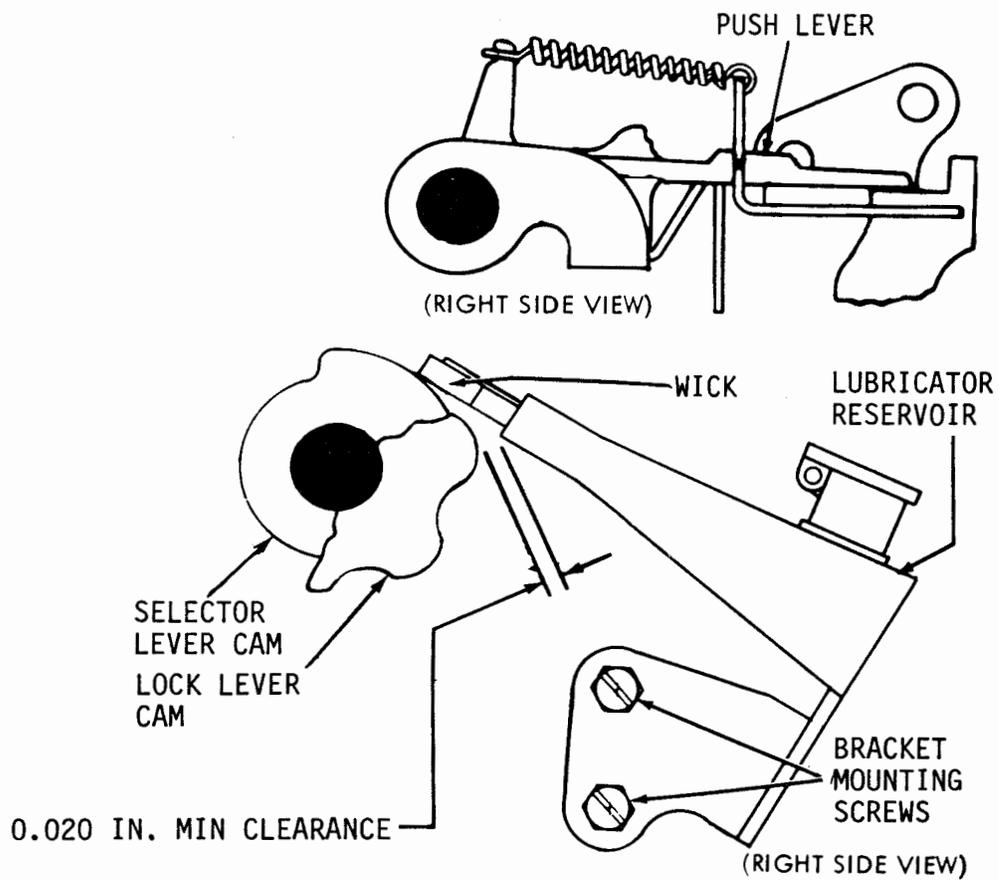


Figure 6-79. Selector Cam Lubricator

(a) Refer to figure 6-80.

(b) Latch selector clutch in stop position.

(c) Measure cam-clutch assembly end play. There should be some end play not exceeding 0.010 inch.

(d) If end play exceeds specified limits, loosen clutch drum mounting screw and position drum to obtain specified clearance.

(e) Tighten mounting screws.

(18) Selector Lever Spring. Adjust selector lever spring as follows:

(a) Refer to figure 6-81.

(b) Place unit upside down on bench.

(c) Position reset bail on peak of its cam.

(d) Apply spring scale hook to each of five selector levers.

(e) Force required to start each lever should be between 1-1/4 and 2-1/2 ounces.

NOTE

When checking No. 4 selector lever spring, unhook start lever spring if necessary and reconnect spring when check is completed.

(f) If scale reading for any spring exceeds

specified limits, install a new spring.

(19) Selector Push Lever Spring. Adjust selector push lever spring as follows:

(a) Refer to figure 6-82.

(b) Place push lever in spacing position.

(c) Apply spring scale pushrod to each of five push levers.

(d) Force required to move each push lever from corresponding selector lever should be between 3/4 and 1-1/2 ounces.

(e) If scale reading for any spring exceeds specified limits, install a new spring.

h. Spacing Mechanism Adjustments. Perform spacing mechanism adjustments in accordance with the following paragraphs.

(1) Automatic Carriage Return/Line Feed Bell Crank Spring. Adjust automatic CR and LF bell crank spring as follows:

(a) Refer to figure 6-83.

(b) Attach spring scale hook to bell crank.

(c) Force required to move bell crank should be between 2-1/2 and 7 ounces.

(d) If spring scale reading exceeds specified limits, install a new spring.

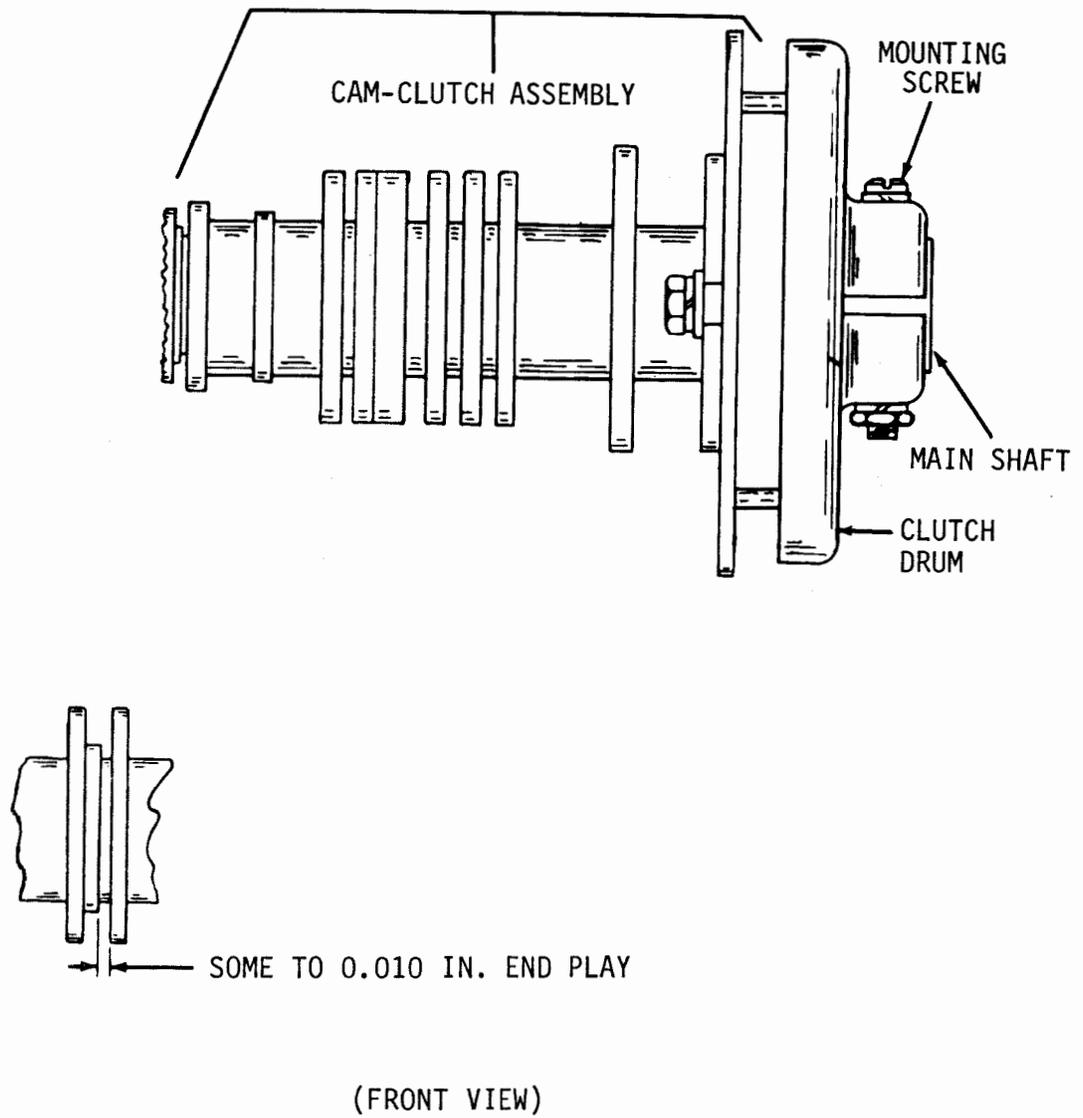


Figure 6-80. Selector Clutch Drum

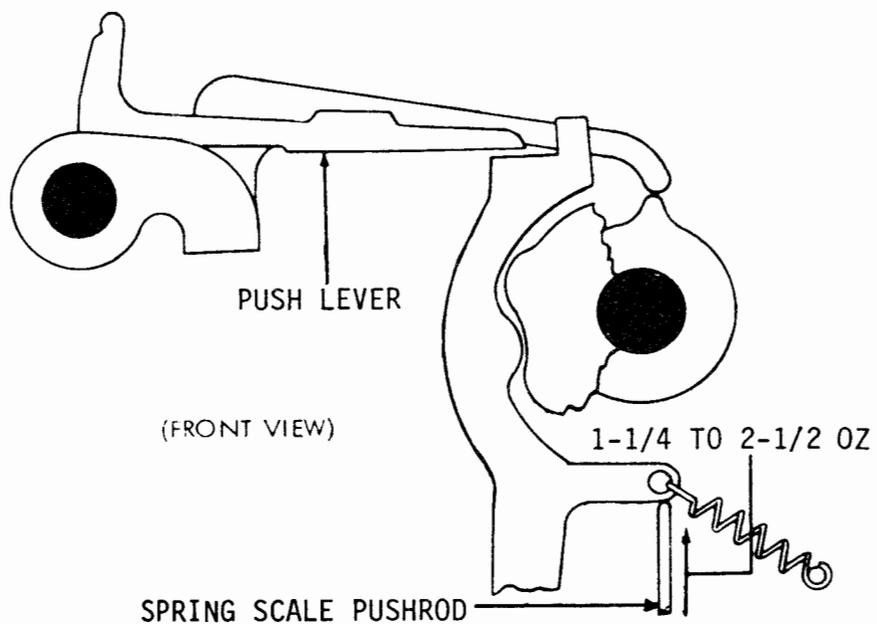


Figure 6-81. Selector Lever Spring

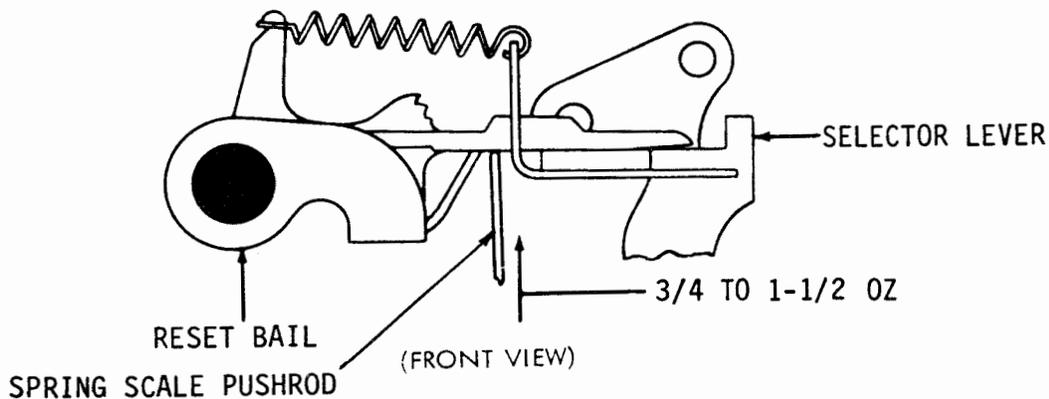


Figure 6-82. Selector Push Lever Spring

(2) Left Margin.

Adjust left margin as follows:

- (a) Refer to figure 6-84.
- (b) Disengage type box clutch.
- (c) Place spacing drum in its return position.
- (d) Shift type box to letters condition.
- (e) Measure clearance between left edge of platen and letters print indicator. Clearance between left edge of platen and letters print indicator should be between 15/16 and 1-1/16 inch.

NOTE

Left margin may be varied as required from 0 to 1 inch. Maximum range adjustment for mechanisms with standard 10-characters per inch spacing is 85 characters for friction feed platen or 74 characters for sprocket feed platen.

(f) If clearance exceeds specified limits, loosen clamp screws and position spacing drum stop arm to obtain specified clearance.

(g) Disengage spacing clutch.

(h) Place front spacing feed pawl in farthest advanced position.

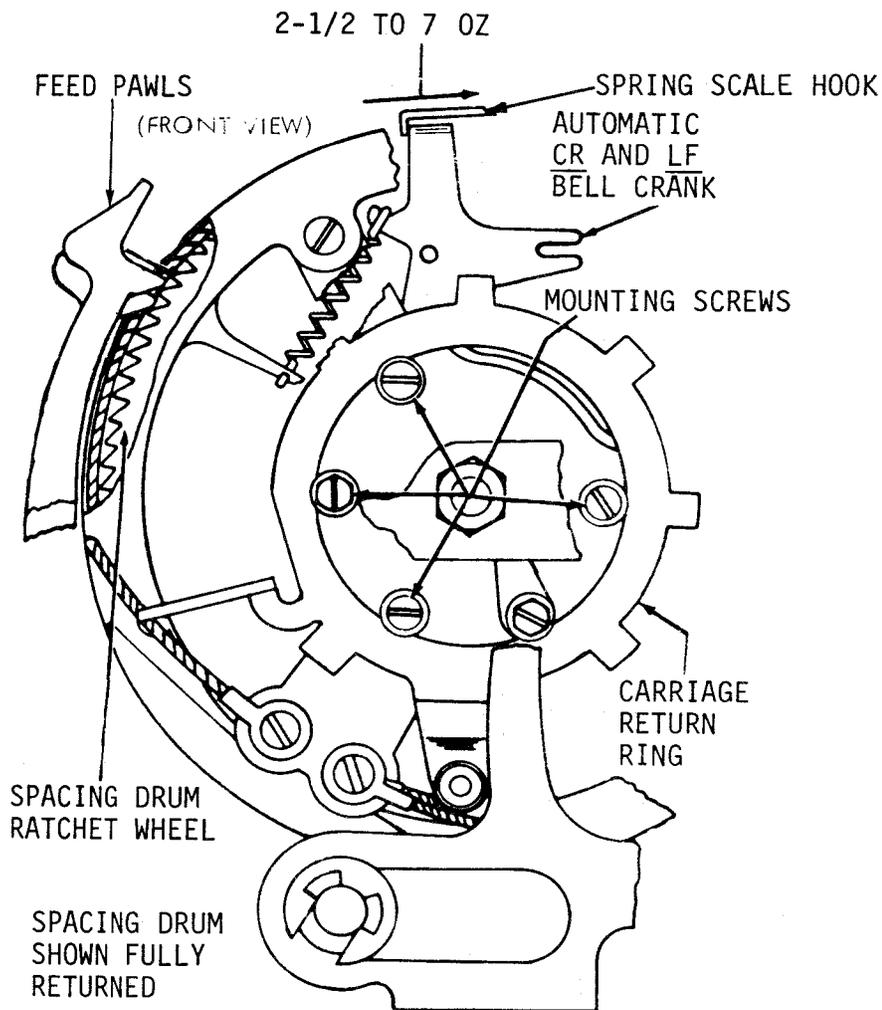
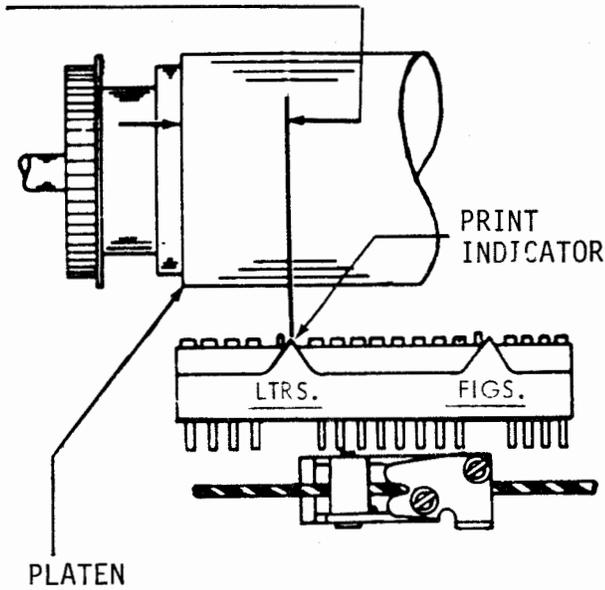


Figure 6-83. Automatic Carriage Return/Line Feed Bell Crank Spring

5/16 TO 1-1/16 IN.



(TOP VIEW)

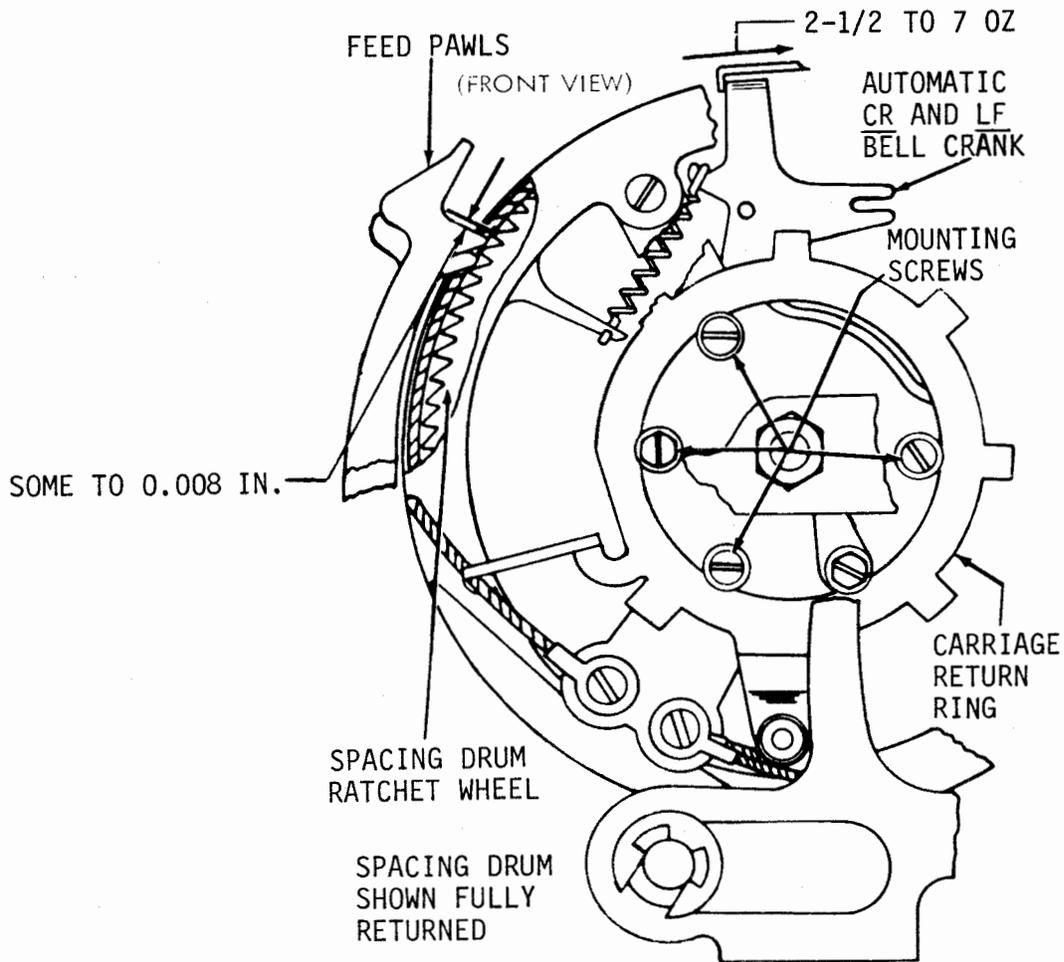


Figure 6-84. Left Margin

(i) Place spacing drum in fully returned position (dashpot plunger fully depressed).

(j) Take up play in spacing shaft gear in counterclockwise direction (see Spacing Gear Phasing, paragraph 6-3.1h(19)).

(k) Measure clearance between pawl and shoulder of ratchet wheel tooth immediately ahead. There should be some clearance not exceeding 0.008 inch.

(l) Ensure that rear pawl, when farthest advanced, drops into indentation between ratchet wheel teeth and bottoms firmly in notch.

(m) If rear pawl does not seat as specified, return the print carriage to its left position and loosen four carriage return ring mounting screws.

(n) Hold carriage return ring in its counterclockwise position and position type box so that LTRS indicator aligns with required margin.

(o) Tighten mounting screws.

#### NOTE

If adjustments are made to satisfy requirements specified in steps (k) and (l), recheck the adjustment of 6-3.1h(13), 6-3.1h(15), and 6-3.1f(6).

(3) Carriage Draw-Wire Rope. Adjust carriage draw-wire rope as follows:

(a) Refer to figure 6-85.

(b) Place horizontal positioning mechanism in its lowest position.

(c) Measure clearance between lower draw-wire rope and carriage return latch bail post. Clearance shall be a minimum of 0.006 inch.

(d) Measure clearance between lower draw-wire rope and left horizontal positioning mechanism drive linkage. Clearance should be a minimum of 0.030 inch.

(e) If clearance in either step (e) or (d) exceeds limits, advance printing carriage to extreme right-hand position.

(f) Rotate type box clutch 1/2 revolution.

(g) Loosen rope clamp screw one turn only.

(h) Loosen pulley bearing stud mounting screws, and position pulley bearing studs to obtain clearances as specified in step (c) and (d).

(i) Tighten mounting screws.

(j) Ensure cable has moved around its equalizing clamp so that rear cable has slightly greater tension than front cable as gauged by feel.

(k) Tighten clamp screw.

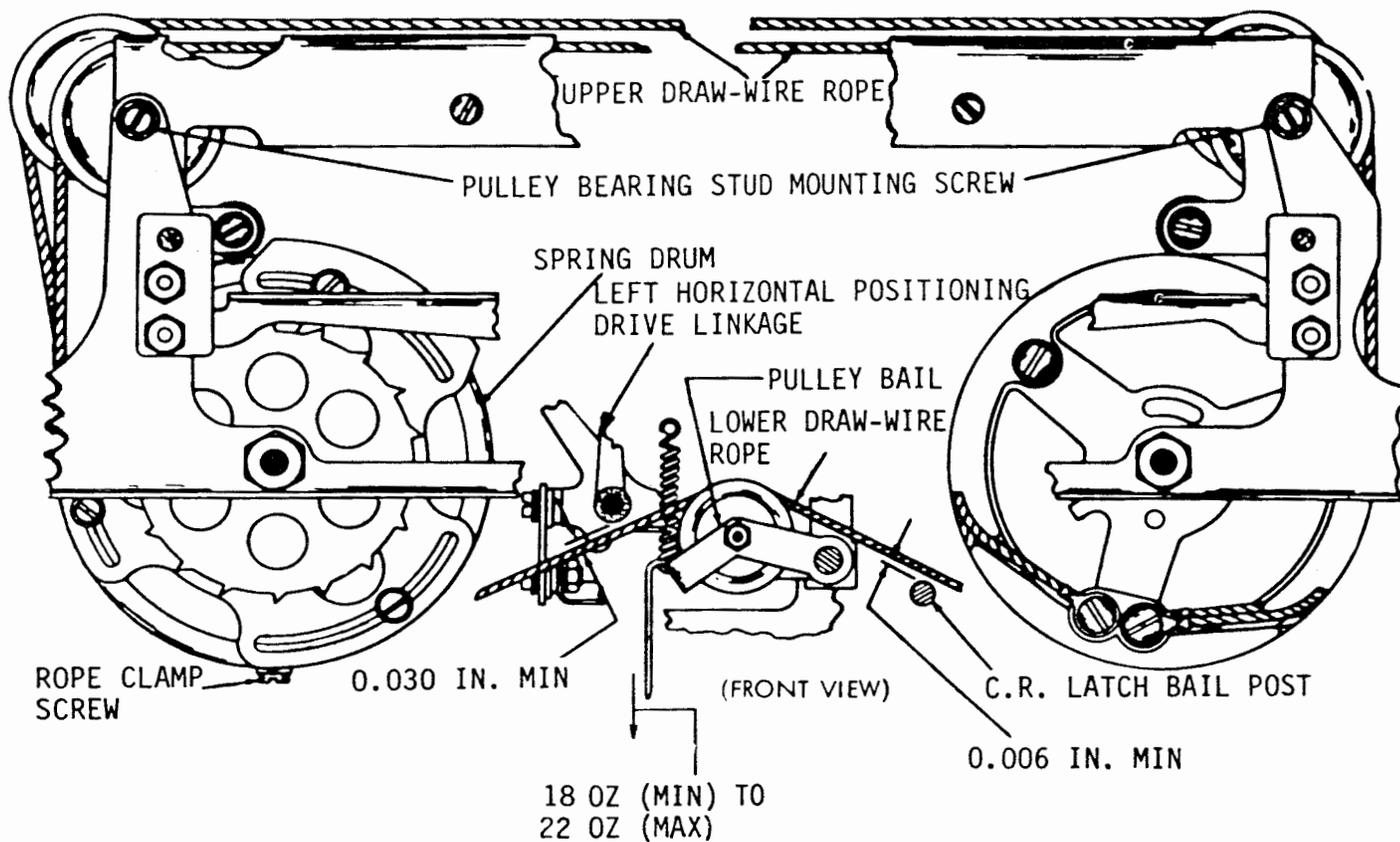


Figure 6-85. Carriage Draw-Wire Rope and Lower Draw-Wire Rope Pulley Bail Spring

(4) Lower Draw-Wire Rope Pulley Bail Spring. Adjust lower draw-wire rope pulley bail spring as follows:

- (a) Refer to figure 6-85.
- (b) Unhook spring from pulley bail.
- (c) Rest bail extension on opening in front plate.
- (d) Attach spring scale hook to free end of spring.
- (e) Force required to extend spring to position length should be between 18 and 22 ounces.
- (f) If scale reading exceeds specified limits, install new spring.

(5) Carriage Return Latch Bail. Adjust carriage return latch bail as follows:

- (a) Refer to figure 6-86.
- (b) Place carriage in fully returned position.
- (c) Hold right side of bail against its retainer to take up play in carriage return bail to right.
- (d) Measure clearance between carriage return latch bail and carriage return lever. Clearance should be between 0.004 and 0.040 inch.
- (e) If clearance exceeds specified limits, loosen clamp screw and position latch bail plate to obtain specified clearance.

(6) Carriage Return Latch Bail Spring. Adjust carriage return latch bail spring as follows:

- (a) Refer to figure 6-86.
- (b) Place spacing drum in fully returned position.
- (c) Attach spring scale hook to carriage return latch bail.
- (d) Force required to start latch bail moving should be between 3 and 4-1/2 ounces.
- (e) If scale reading exceeds specified limits, install new spring.

(7) Carriage Return Lever. Adjust carriage return lever as follows:

- (a) Refer to figure 6-87.
- (b) Set up carriage return function on selector.
- (c) If unit is equipped with one-stop function clutch, rotate main shaft until function clutch stop lug is toward bottom of unit. If unit is equipped with two-stop function clutch, rotate main shaft until function clutch is disengaged in stop position that results in least clearance.
- (d) Hook carriage return function pawl over its function bar.
- (e) Hold spacing drum so that carriage return latch bail is latched.

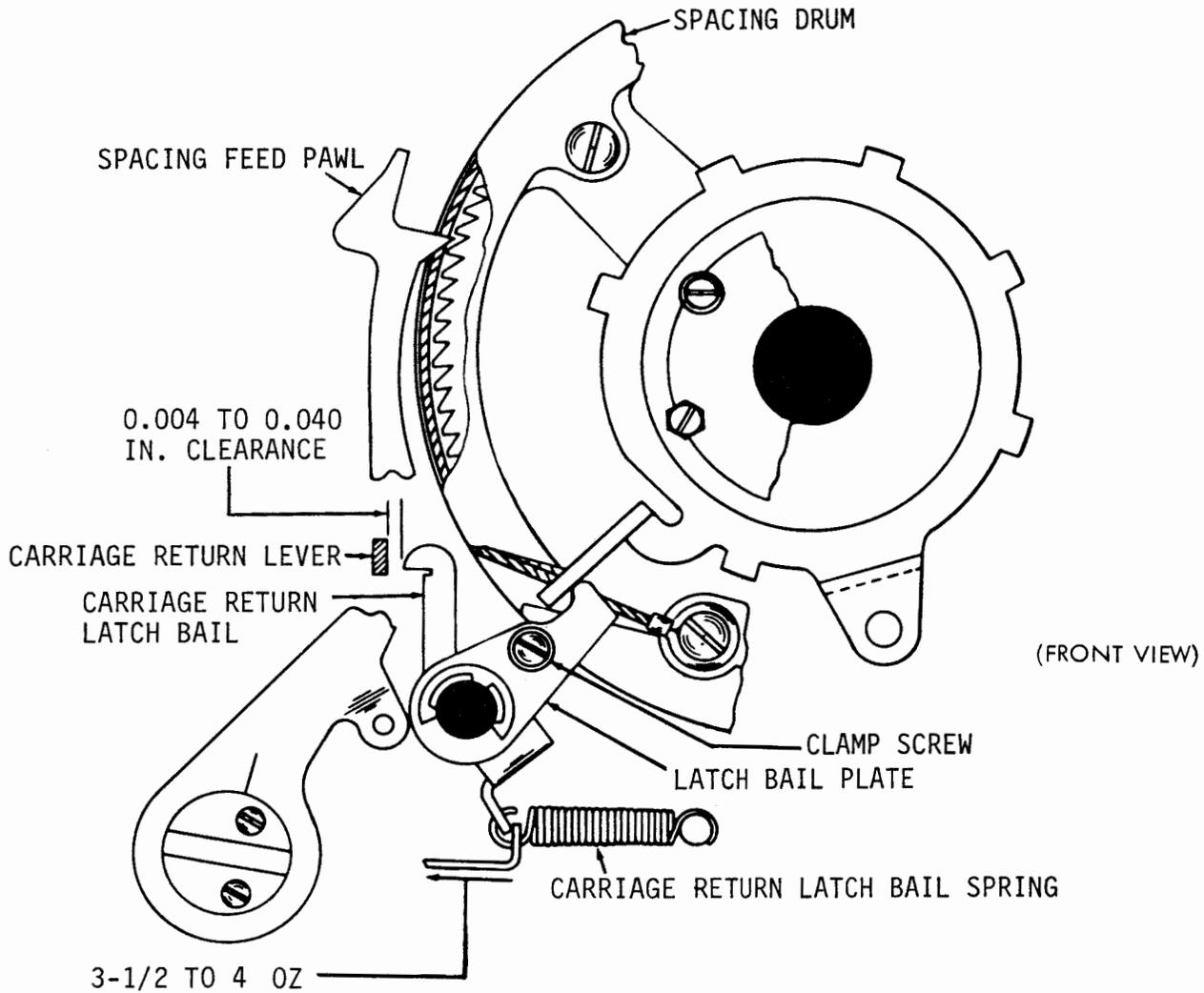


Figure 6-86. Carriage Return Latch Bail and Carriage Return Latch Bail Spring

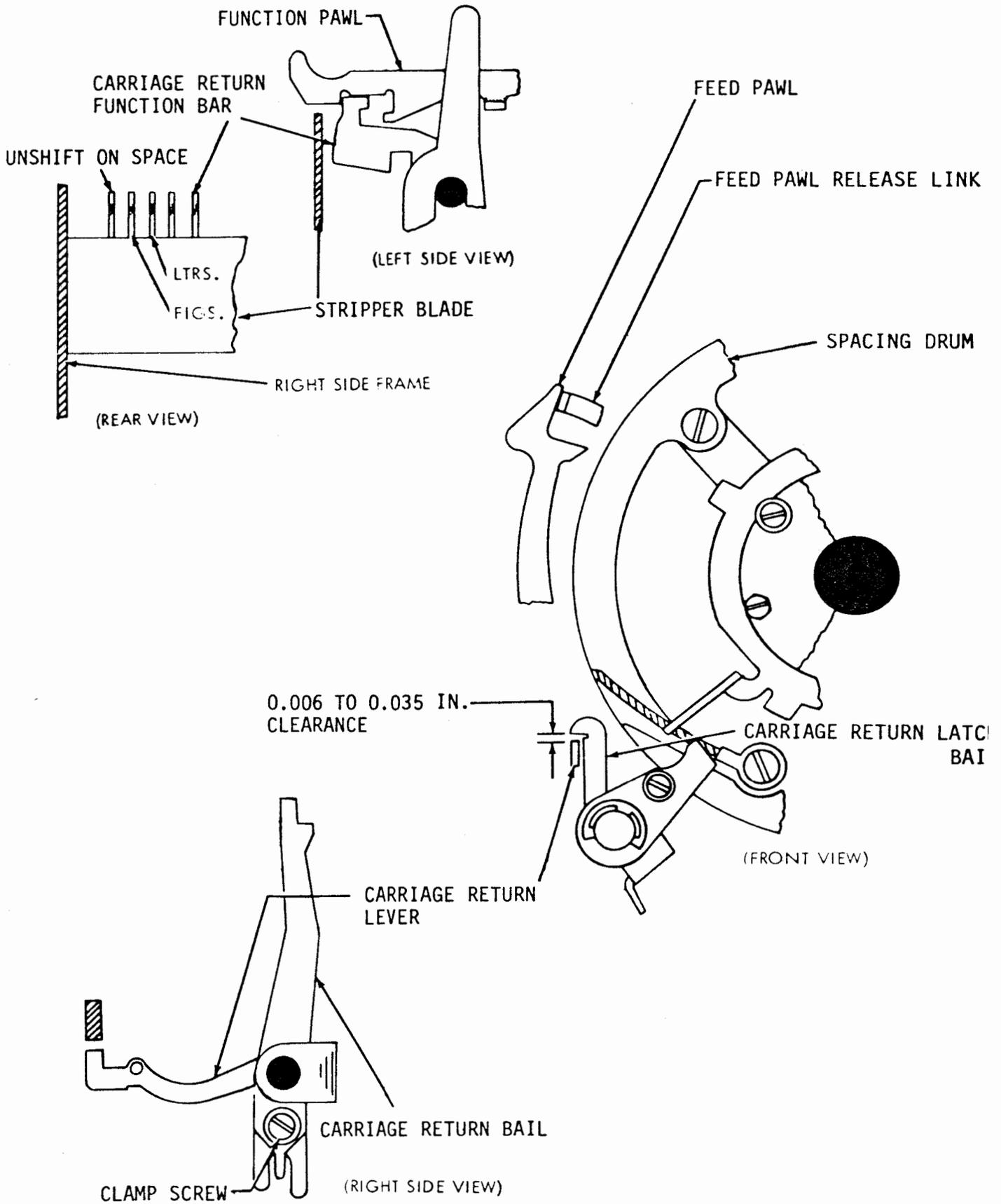


Figure 6-87. Carriage Return Lever

(f) Measure clearance between latch bail and carriage return lever. Clearance should be between 0.006 and 0.035 inch.

(g) If clearance exceeds specified limits, loosen clamp screw.

(h) Position carriage return lever on carriage return bail to obtain specified clearance between carriage return lever and latch bail.

(i) Tighten clamp screw.

(8) Carriage Return Spring. Adjust carriage return spring as follows:

(a) Refer to figure 6-88.

(b) Place spacing drum in returned position.

(c) Place printing track in lower position.

(d) Remove lower cable roller spring. Hold spacing pawl, buffer slide, and carriage return latch to prevent interference with spacing drum.

(e) Attach spring scale hook to a tooth on spring drum.

(f) Force required to start spring drum moving should be between 3-1/2 and 4-1/4 pounds.

(g) If spring scale reading exceeds specified limits, loosen spring drum nut.

(h) To increase spring tension, rotate spring

drum ratchet wheel. To decrease spring tension, operate escapement lever to decrease tension.

(i) Tighten nut.

(9) Spacing Feed Pawl Release Link Spring. Adjust spacing feed pawl release link spring as follows:

(a) Refer to figure 6-88.

(b) Attach spring scale hook to feed pawl release link.

(c) Force required to start spring stretching should be between 1/2 and 2-1/2 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(10) Dashpot Vent Screw. Adjust dashpot vent screw as follows:

(a) Refer to figure 6-89.

(b) Operate printer at any speed from automatic transmission with one carriage return and one line feed signal between lines. First character of each line should be printed in same location as if unit was manually operated slowly.

(c) Type box carriage should return from any length of line without bouncing.

(d) If bouncing occurs, loosen vent screw locking nut and turn down vent screw until slight pneumatic bounce is perceptible, then back off screw until effect

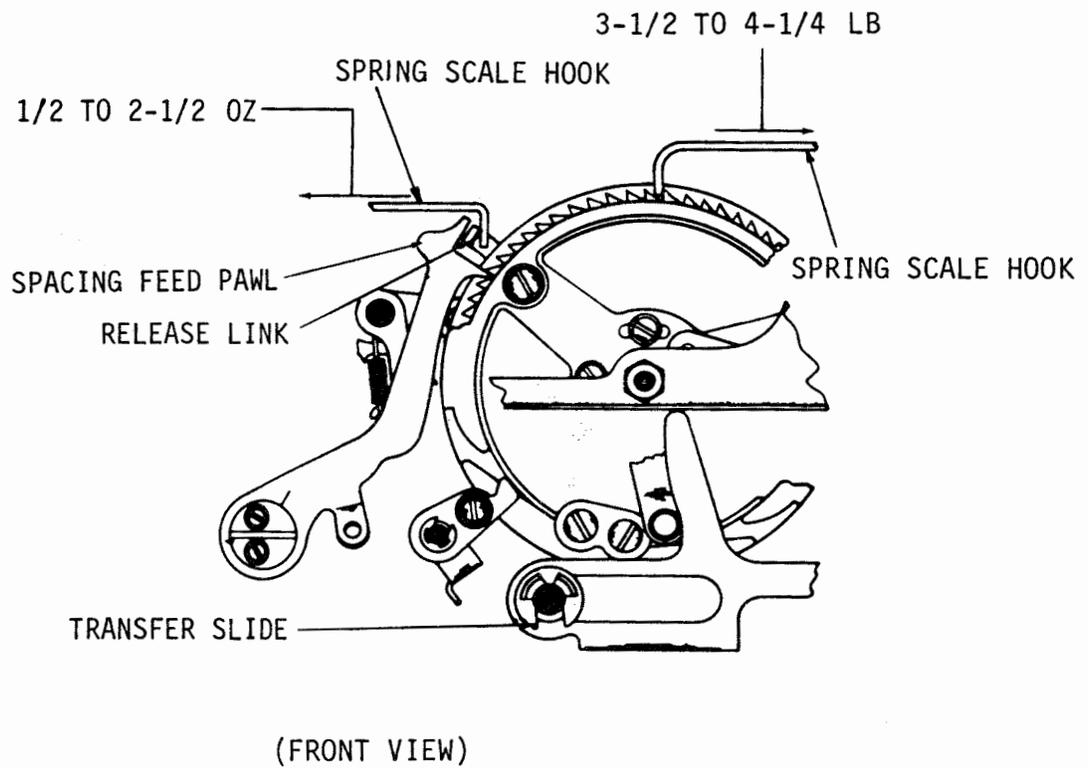


Figure 6-88. Carriage Return Spring and Spacing Feed Pawl Release Link Spring

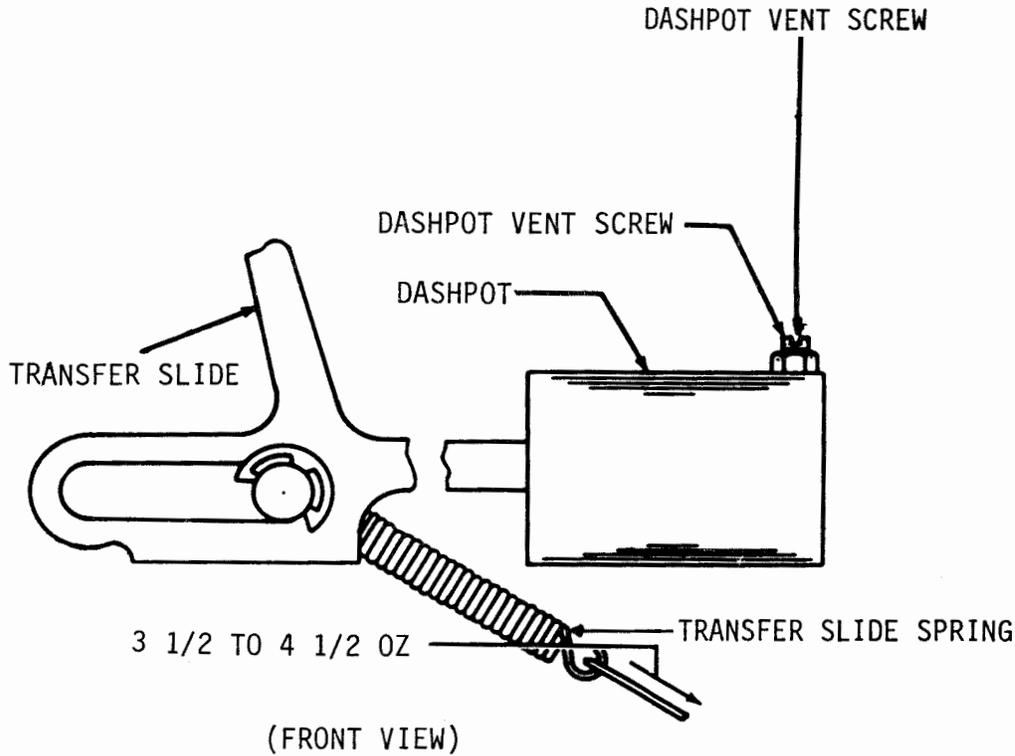


Figure 6-89. Dashpot Vent Screw and Transfer Slide Spring

disappears. Continue backing off screw 1/4 turn if dashpot has two vent holes, or 1 full turn if dashpot has only one vent hole.

(e) Tighten vent screw locking nut.

NOTE

At altitudes higher than 2000 feet above sea level, it may also be necessary to reduce carriage return spring tension toward minimum limit. See paragraph 6-3.1h(8).

(11) Transfer Slide Spring. Adjust transfer slide spring as follows:

(a) Refer to figure 6-89.

(b) Place transfer slide in extreme left position.

(c) Unhook transfer slide spring end which is not connected to transfer slide.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to its installed length should be between 3-1/2 and 4-1/2 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise, reconnect free spring end.

(12) Margin Indicator Lamp. Adjust margin indicator lamp as follows:

- (a) Refer to figure 6-90.
- (b) Operate the unit under power. Margin indicator lamp should light on the desired character.
- (c) If lamp does not light on desired character, loosen three mounting screws.
- (d) Set type box carriage to print desired character and position cam disc counterclockwise so that margin indicator switch just opens.

(e) Tighten three mounting screws.

## NOTE

In the event of a line shorter than 72 characters is required, it may be necessary to remove cam disc screws and insert them in adjacent slots in the disc if the rotation in one slot is not enough.

(13) Oscillating Rail Slide Position. Adjust oscillating rail slide position as follows:

- (a) Refer to figure 6-91.
- (b) Place carriage return ring and automatic carriage return-line feed ring free in maximum counterclockwise position on spacing drum.
- (c) Disengage spacing clutch.

(d) Engage farthest advanced feed pawl with tooth immediately above cutaway section of ratchet.

(e) Measure clearance between rail slide and pulley. Clearance should be between 0.025 and 0.050 inch.

(f) If clearance exceeds specified limits, loosen five mounting screws and position slide on wire rope to obtain specified clearance.

(g) Tighten five mounting screws.

## NOTE

If adjustment in step (f) is necessary perform the adjustments in paragraph 6-3.1h(2), 6-2.1h(15), and 6-3.1f(6).

(14) Spacing Feed Pawl Spring. Adjust spacing feed pawl spring as follows:

- (a) Refer to figure 6-91.
- (b) Place each spacing pawl in least advanced position resting against ratchet wheel.
- (c) Unhook each spring from bracket.
- (d) Attach spring hook to each spring in succession.
- (e) Force required to extend each spring to its installed length should be between 2-1/2 and 6 ounces.
- (f) If scale reading for any spring exceeds specified limits, install a new spring.

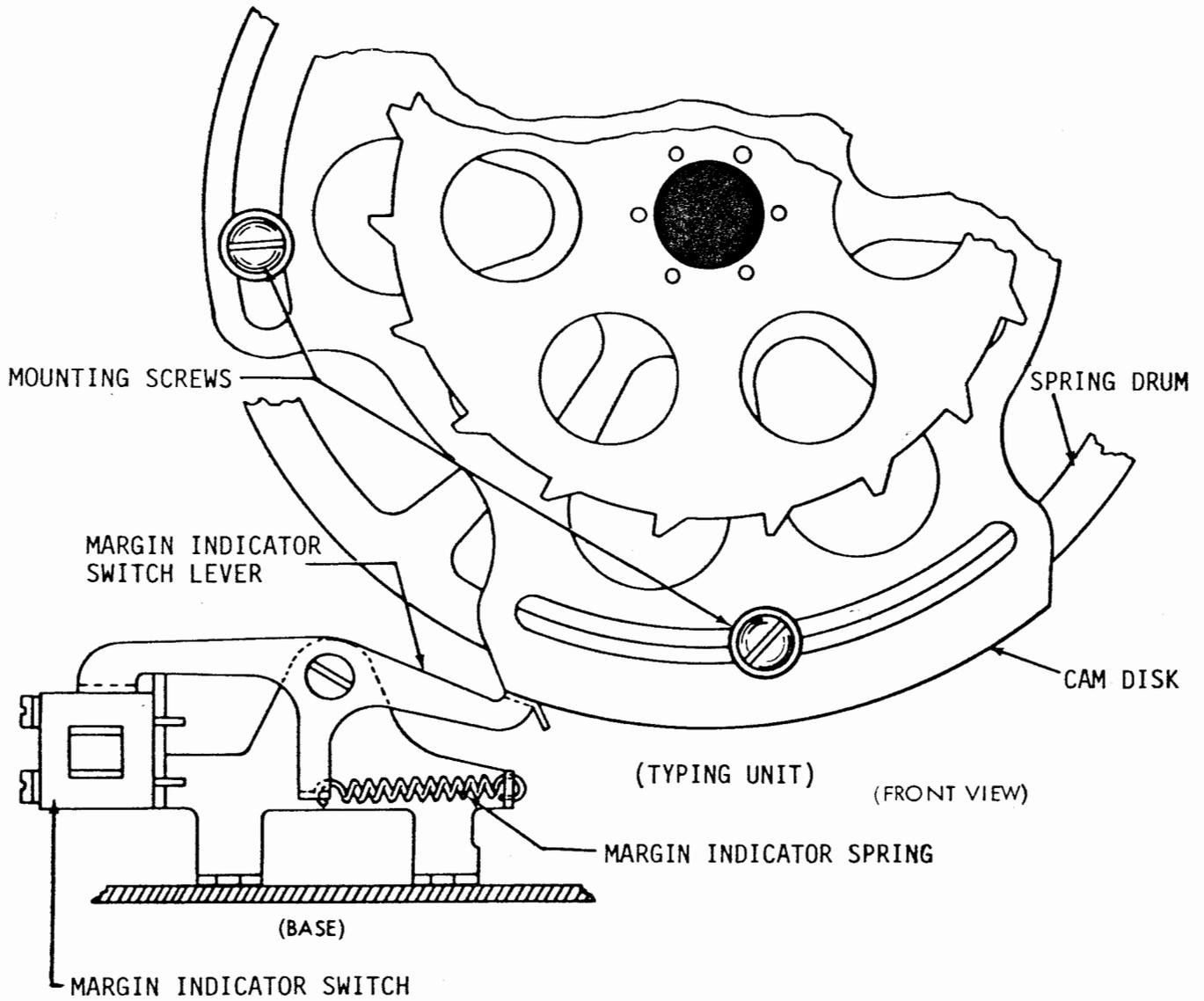


Figure 6-90. Margin Indicator Lamp

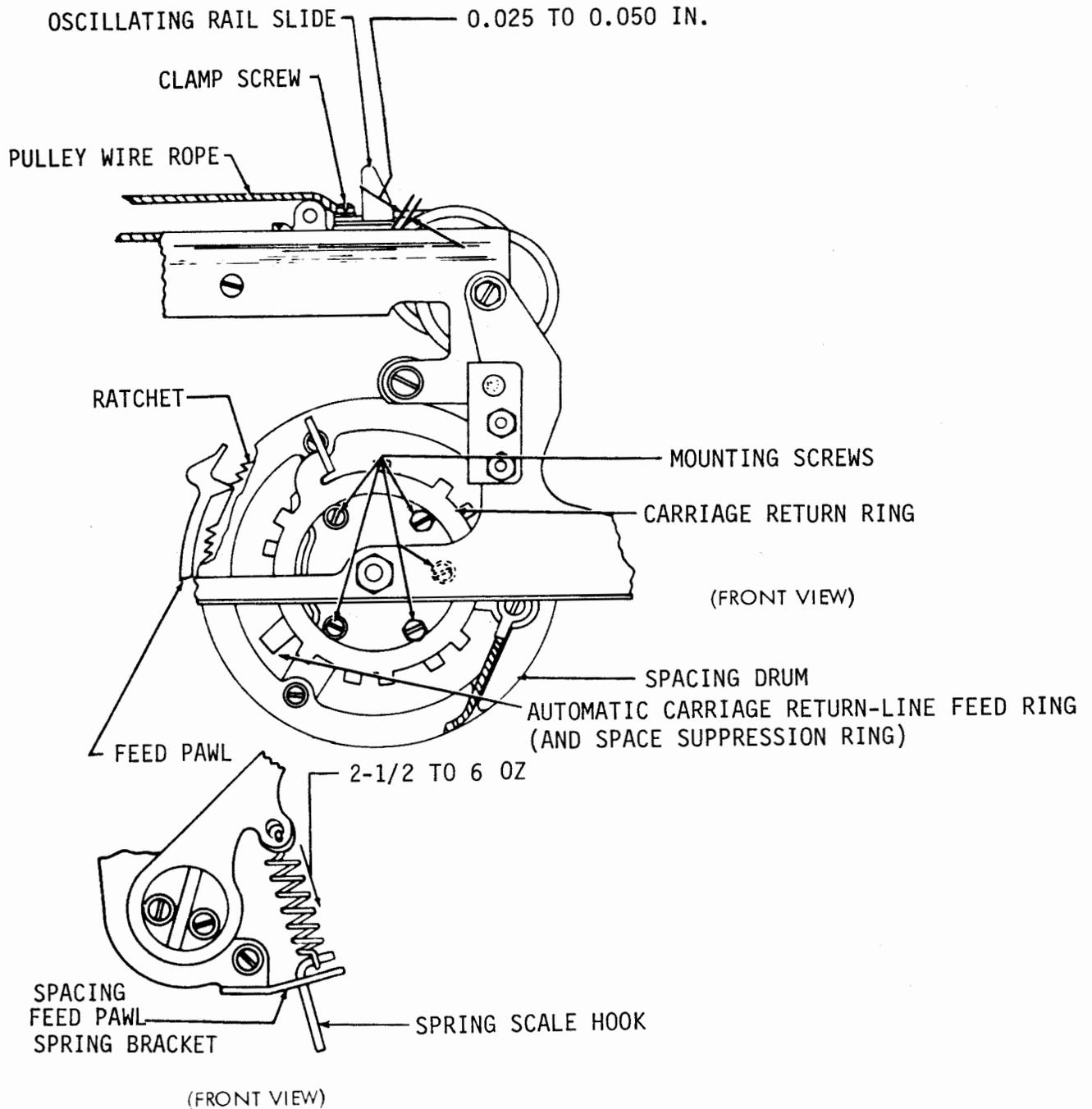


Figure 6-91. Oscillating Rail Slide Position and Spacing Feed Pawl Spring

NOTE

If it is necessary to install a new spring perform adjustments in paragraphs 6-3.1h(13), 6-3.1h(15), and 6-3.1f(6).

(15) Right Margin.  
Adjust right margin as follows:

NOTE

This adjustment is not applicable to units equipped with automatic carriage return-line feed ring. For units so equipped perform the adjustment procedure of paragraph 6-3.1h(17).

- (a) Refer to figure 6-92.
- (b) Disengage type box clutch.
- (c) Place carriage in position to print character on which spacing cutout is to occur.
- (d) Place front feed pawl in farthest advanced position.
- (e) Hold spacing cutout transfer bail in its uppermost position.
- (f) If unit has two-piece spacing cutout bail, push cutout bail toward rear of unit through hole in front plate.
- (g) Measure clearance between extension on space suppression ring and transfer bail. Clearance should be between 0.006 and 0.025 inch.
- (h) If clearance exceeds specified

limits, loosen four mounting screws indicated in the figure and position space suppression ring. Range of adjustment is from 0 to 85 characters.

(i) Tighten four mounting screws.

NOTE

If adjustment in step (h) is necessary, perform adjustments in paragraphs 6-3.1h(13), 6-3.1h(2) and 6-3.1f(6).

(16) Spacing Cutout Transfer Bail Spring. Adjust spacing cutout transfer bail spring as follows:

- (a) Refer to figure 6-92.
- (b) Apply spring scale pushrod to spacing cutout transfer bail.
- (c) Force required to start bail moving should be between 1 and 3-1/2 ounces.
- (d) If spring scale reading exceeds specified limits, install new spring.

NOTE

If it is necessary to install a new spring, perform adjustments in paragraphs 6-3.1f(13), 6-3.1h(2), and 6-3.1f(6).

(17) Right Margin with Automatic Carriage Return Line Feed Ring. Adjust right margin on units equipped with automatic carriage return-line feed ring as follows:

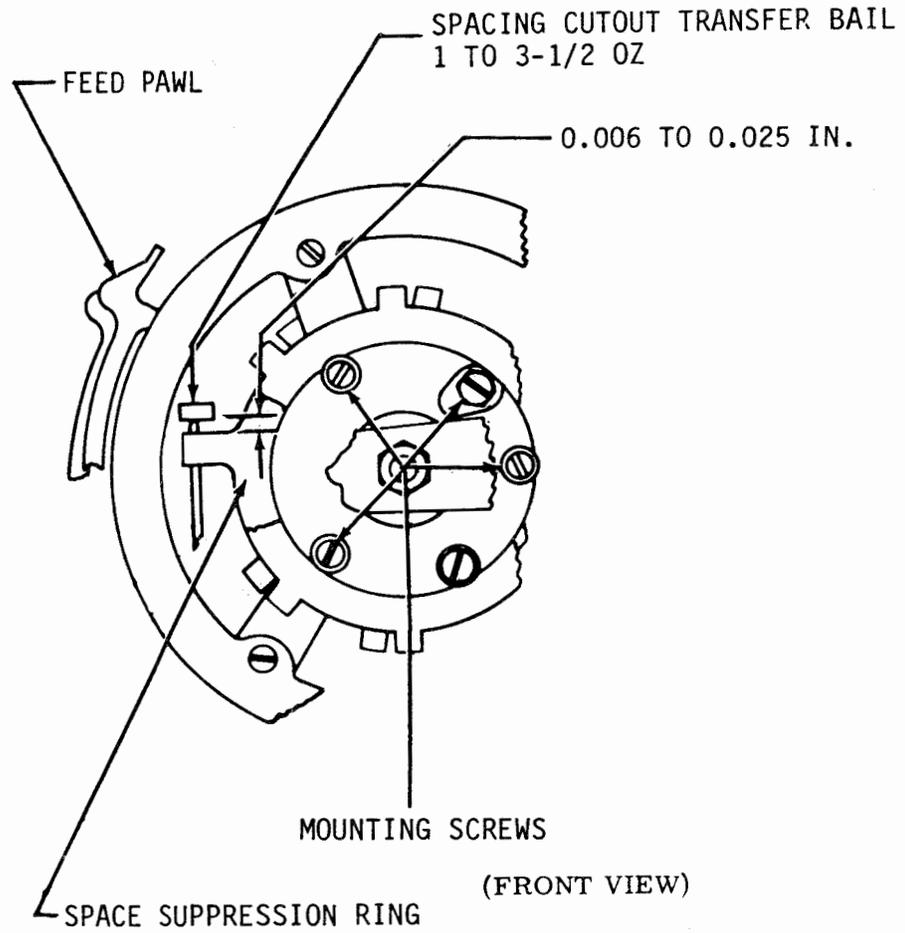


Figure 6-92. Right Margin and Spacing Cutout Transfer Bail Spring

(a) Refer to figure 6-93.

(b) Disengage type box clutch.

(c) Position carriage two spaces before character on which automatic carriage return-line feed is to occur.

(d) Advance front feed pawl to farthest position.

(e) Measure clearance between extension on ring and automatic carriage return-line feed bell crank. Clearance should be between 0.040 and 0.055 inch.

(f) If clearance exceeds specified limits, loosen four mounting screws indicated in the figure and position ring. Range of adjustment is from 0 to 85 characters.

(g) Tighten four mounting screws.

(18) Spacing Gear Clearance. Adjust spacing gear clearance as follows:

(a) Refer to figure 6-94.

(b) Place carriage in fully returned position.

(c) There should be a minimum of backlash without binding.

(d) To increase clearance, loosen upper mounting screw and insert shims between spacing shaft bearing and front plate. Tighten upper mounting screw.

(e) To decrease backlash, loosen lower mounting screw and insert shims between spacing shaft bearing and front plate. Tighten lower mounting screw.

(19) Spacing Gear Phasing. Adjust spacing gear phasing as follows:

(a) Refer to figure 6-94.

(b) Disengage spacing clutch.

(c) Ensure index line on spacing pawl is centered between the two lines on pawl retaining washer.

(d) If index line is not centered, remove mounting screw from spacing shaft gear.

(e) Hold pawls in alignment and engage spacing shaft gear with clutch gear at a point where spacing shaft gear mounting screw hole is in line with tapped hole in spacing shaft.

(f) Insert mounting screw in spacing shaft gear and tighten.

(20) Spacing Suppression Bail Spring. Adjust spacing suppression bail spring as follows:

(a) Refer to figure 6-95.

(b) Place suppression bail in rear position.

(c) Apply spring scale pushrod near center of horizontal portion of suppression bail.

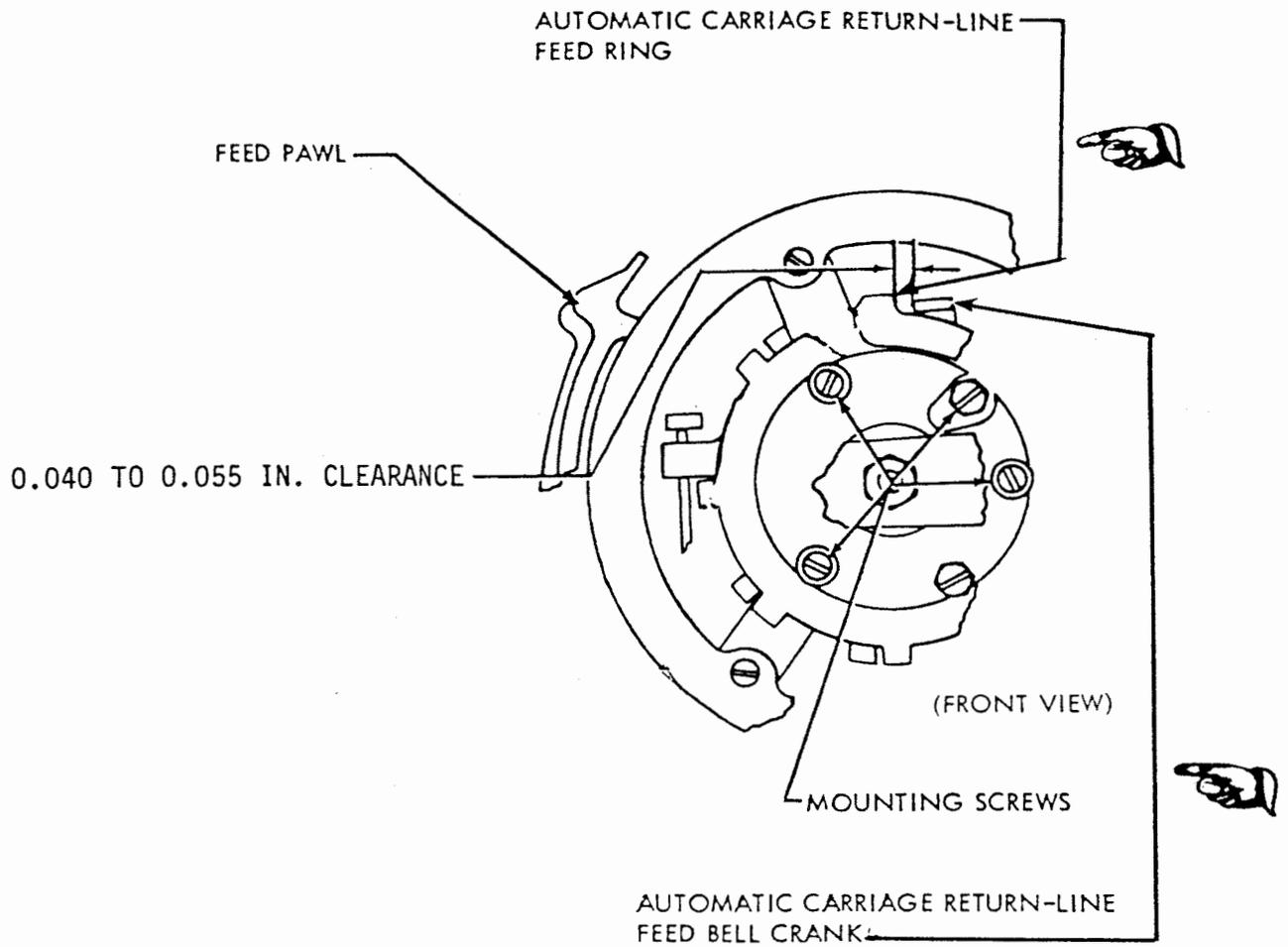


Figure 6-93. Right Margin with Automatic Carriage  
Return-Line Feed Ring

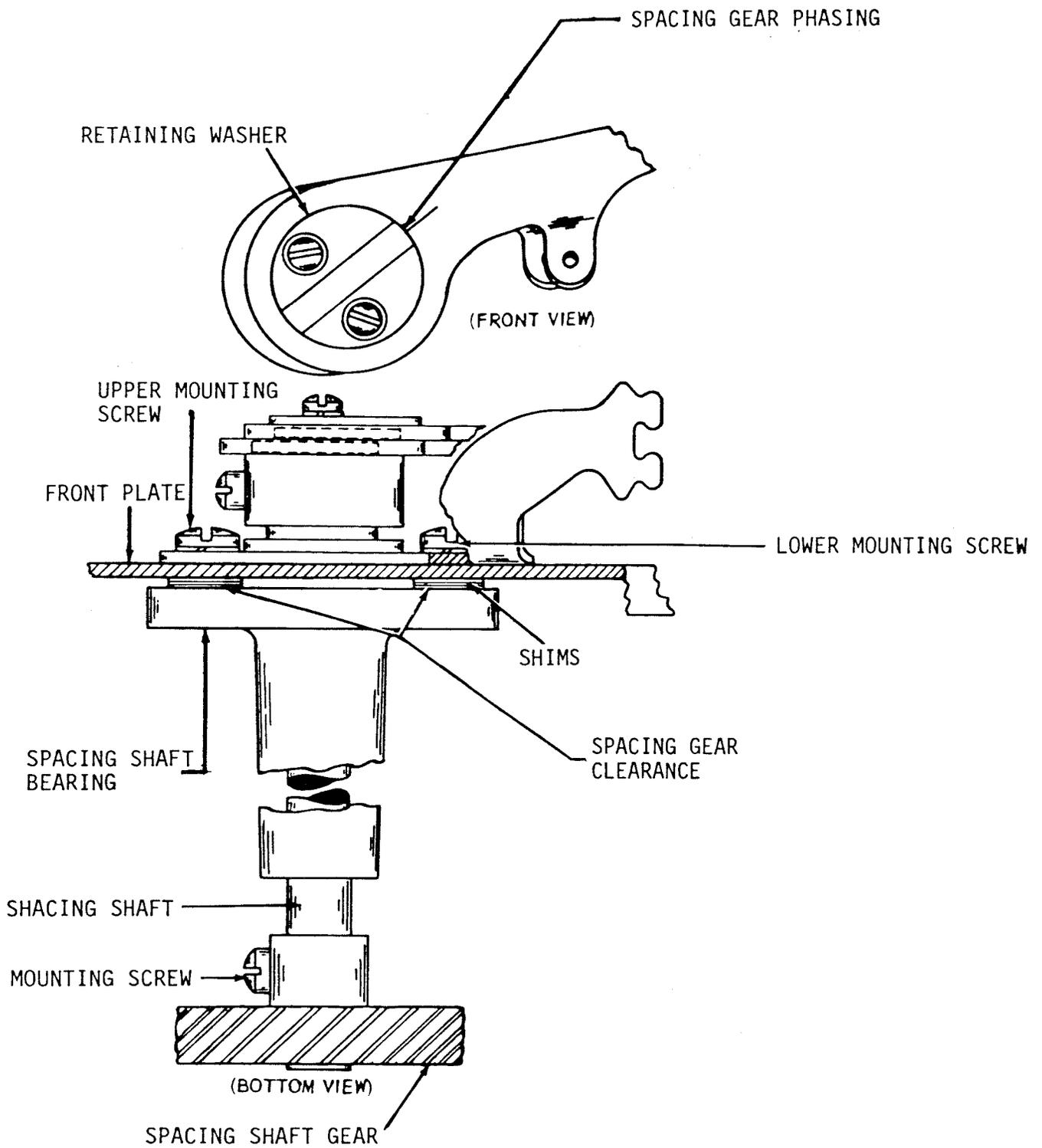


Figure 6-94. Spacing Gear Clearance and Spacing Gear Phasing

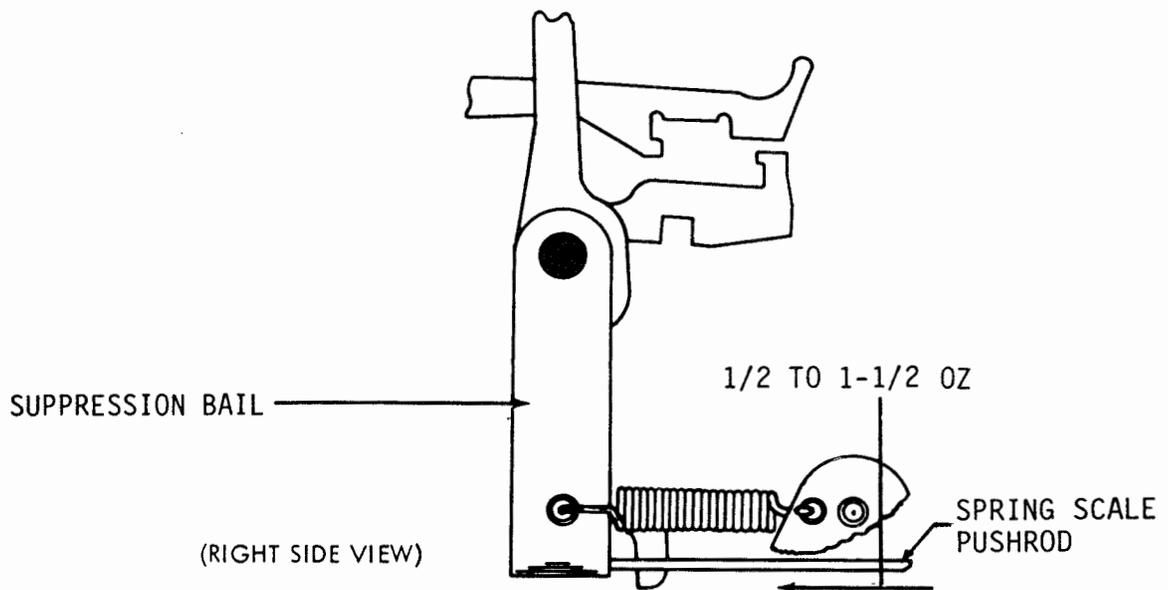


Figure 6-95. Spacing Suppression Bail Spring

(d) Force required to start bail moving should be between 1/2 and 1-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(21) Spacing Trip Lever Bail Cam Plate. Adjust spacing trip lever bail cam plate as follows:

(a) Refer to figure 6-96.

(b) Place spacing trip lever arm in upward position.

(c) Rotate type box clutch through approximately one-half of its cycle.

(d) Disengage all function pawls from function bar.

(e) Measure clearance between top surface of trip lever arm extension and spacing trip lever shoulder. Clearance should be between 0.010 and 0.040 inch.

(f) Loosen mounting screws and position cam plate on rocker shaft to obtain specified clearance, keeping forward edge of cam plate parallel to shaft.

(g) Tighten mounting screws.

(22) Spacing Trip Lever Bail Spring. Adjust spacing trip lever bail spring as follows:

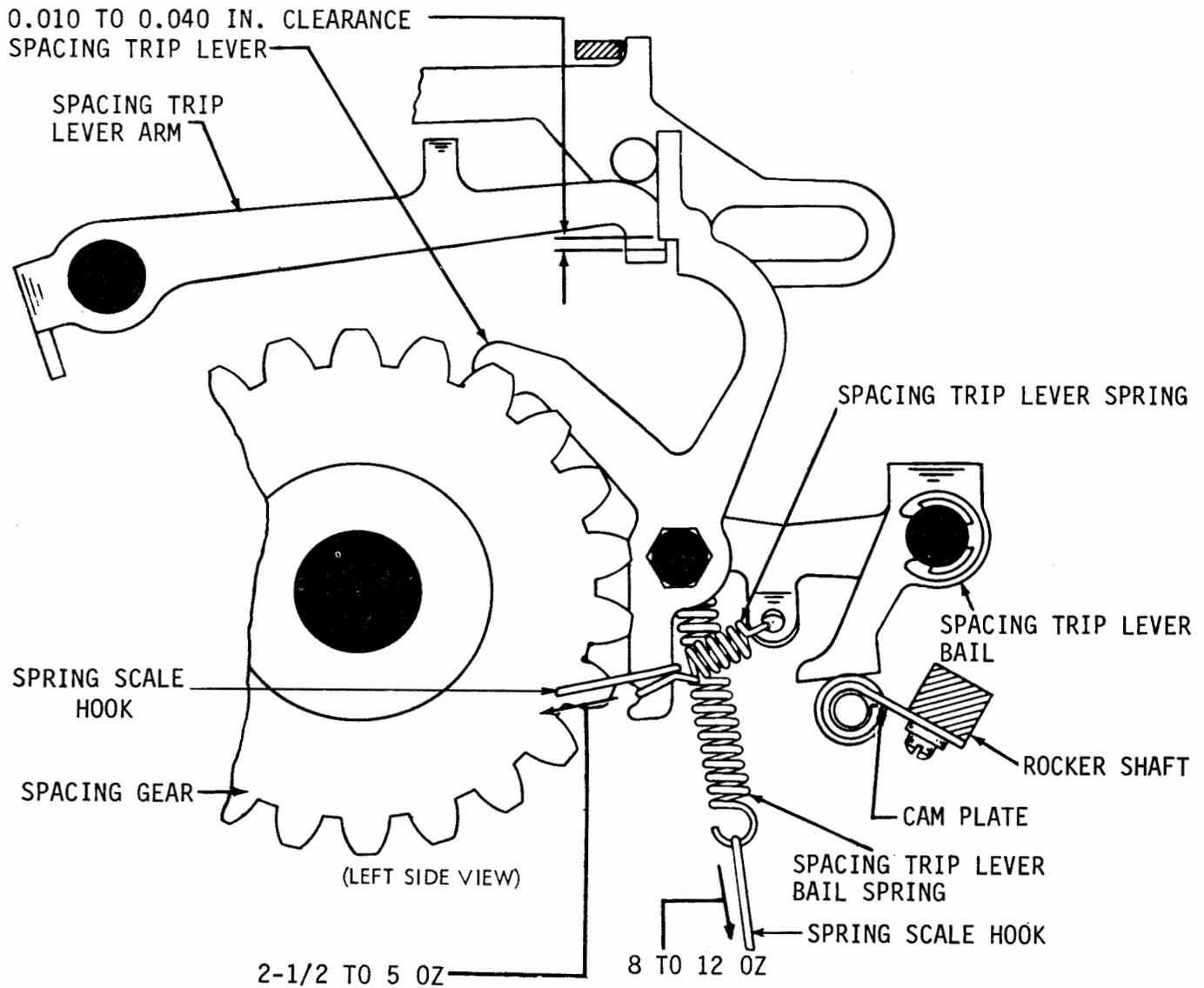


Figure 6-96. Spacing Trip Lever Bail Cam Plate, Spacing Trip Lever Bail Spring, and Spacing Trip Lever Spring

(a) Refer to figure 6-96.

(b) Position spacing trip lever bail against stop.

(c) Unhook spacing trip lever bail spring.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to its installed length should be between 8 and 12 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise reconnect free end of spring.

(23) Spacing Trip Lever Spring. Adjust spacing trip lever as follows:

(a) Refer to figure 6-96.

(b) Disengage type box clutch.

(c) Attach spring scale hook to spacing trip lever at point of spring attachment.

(d) Force required to start lever moving should be between 2-1/2 and 5 ounces.

(e) If scale reading exceeds specified limits, install new spring.

6-3.2 TYPING UNIT ADJUSTMENTS (LOW-LEVEL). Perform selector mechanisms adjustments in accordance with the following paragraphs.

a. Selector Armature. Adjust selector armature as follows:

(1) Refer to figure 6-97.

(2) De-energize magnet assembly and remove from base.

(3) Loosen down-stop mounting screw friction tight.

(4) With armature resting against downstop, measure clearance between end of armature and left edge of left pole piece: clearance should be between 0.025 inch (minimum) and 0.030 inch (maximum).

(5) Position down-stop to meet requirement, and tighten mounting screw.

(6) Loosen armature mounting screws, and position armature so that its left edge should be flush within 0.010 inch with left edge of left pole piece.

(7) Tighten screws.

b. Selector Armature Alignment. Adjust selector armature alignment as follows:

(1) Refer to figure 6-98.

(2) Ensure rear edge of armature is flush with rear edge of pole piece within 0.010 inch.

(3) Ensure there is some clearance not exceeding 0.020 inch between front edge of armature and pole

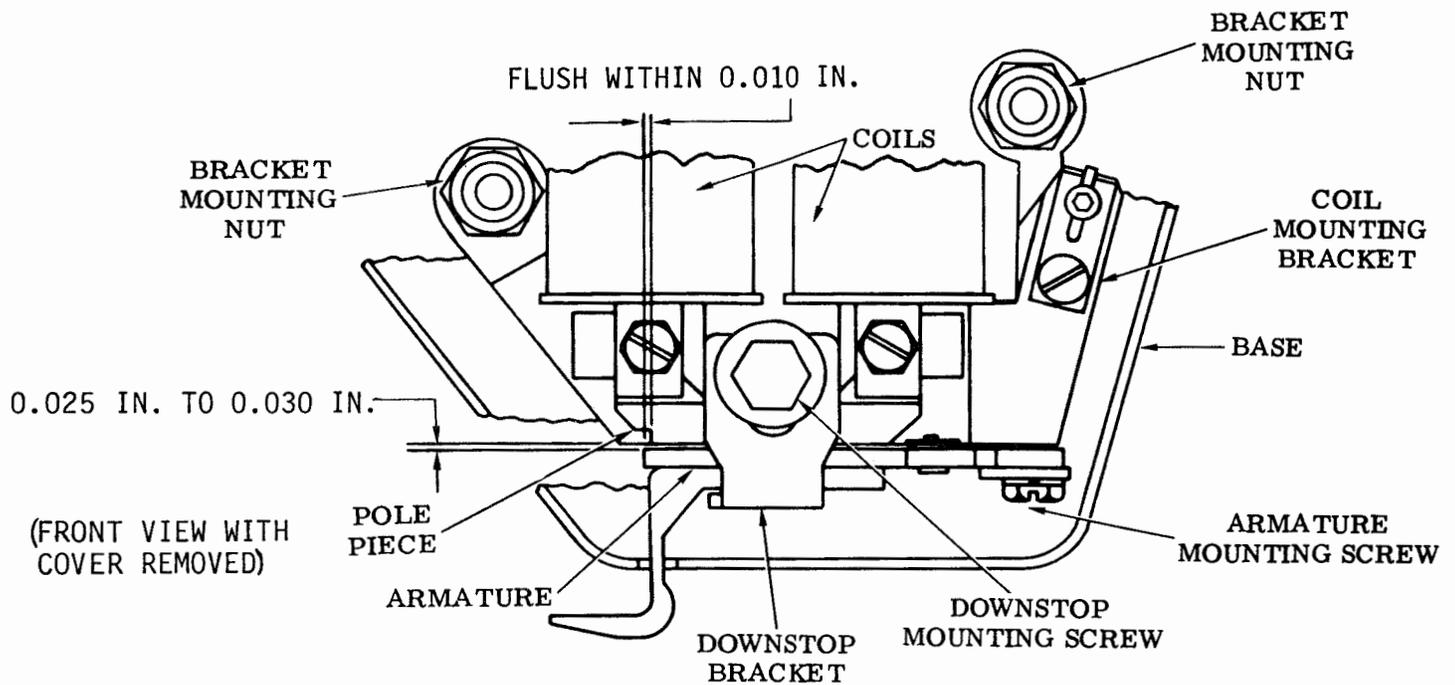


Figure 6-97. Selector Armature

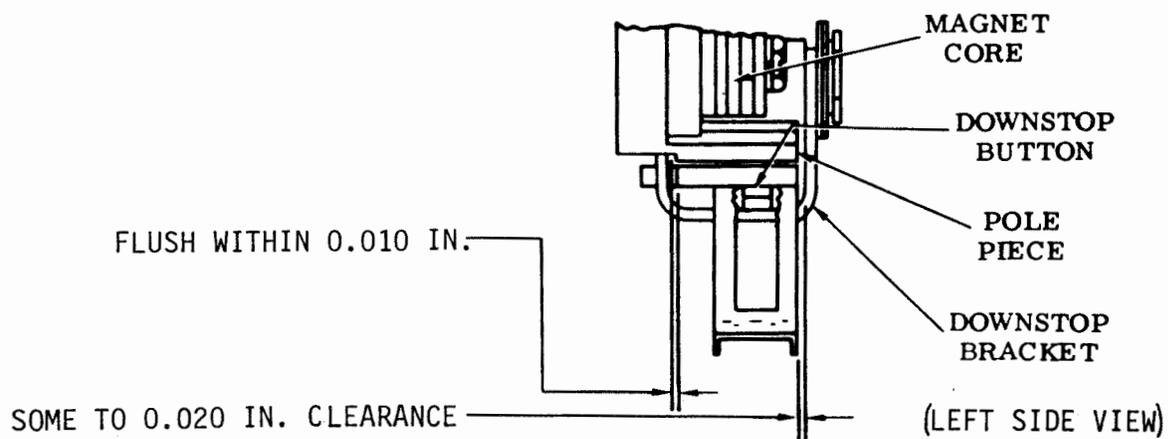


Figure 6-98. Selector Armature Alignment

piece and inside of downstop bracket.

(4) Loosen mounting screws.

(5) Position armature so that armature spring has enough tension to hold armature firmly against pivot edge of casting.

(6) Tighten mounting screws.

c. Selector Armature Spring. Adjust selector armature spring as follows:

(1) Refer to figure 6-99.

(2) Attach spring scale hook as nearly vertical as possible to end of armature extension. Force required to pull armature marking position should be between 1-3/4 and 2-1/4 ounces.

(3) If scale reading exceeds specified limits, turn adjusting screw clockwise to increase spring tension or counterclockwise to decrease spring tension.

#### NOTE

Spring tensions given will permit operation of printer prior to measurement of receiving margins. Refine spring tension for maximum selector performance with unit connected to specific circuit in which it is to function (operating at desired speed and line current). See Selector Receiving Margin, paragraph 6-3.1g(9).

d. Selector Base (Magnets Energized). Adjust selector base as follows:

#### NOTE

Before making this adjustment, reassemble the magnet assembly by reversing the disassembly procedure. Reassemble and install the cam-clutch assembly, the metallic container, and the range finder on the typing unit. Then proceed with the following adjustment.

(1) Refer to figure 6-100.

(2) Position spacing lock-lever on high part of cam.

(3) Place armature in contact with left pole piece.

(4) Measure clearance between end of armature extension and shoulder of spacing locklever. Clearance should be between 0.020 and 0.035 inch.

(5) Measure clearance between upper surface of armature extension and upper step of spacing locklever with locklever held downward. There should be some clearance not exceeding 0.003 inch.

(6) If either clearance exceeds specified limits, use a 1/16-inch hex wrench to loosen two magnet and base mounting posts to point of friction tightness.

(7) Adjust lower lower right eccentric to obtain specified clearance between end

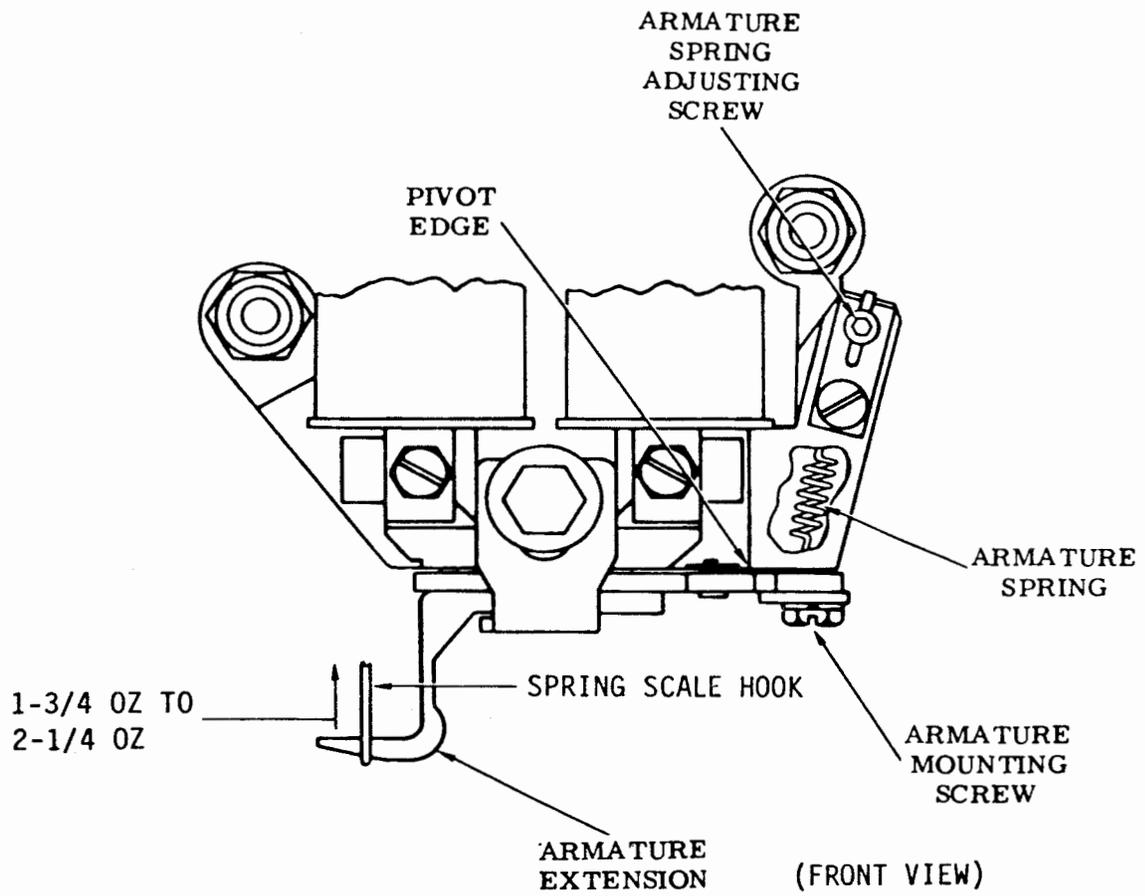


Figure 6-99. Selector Armature Spring

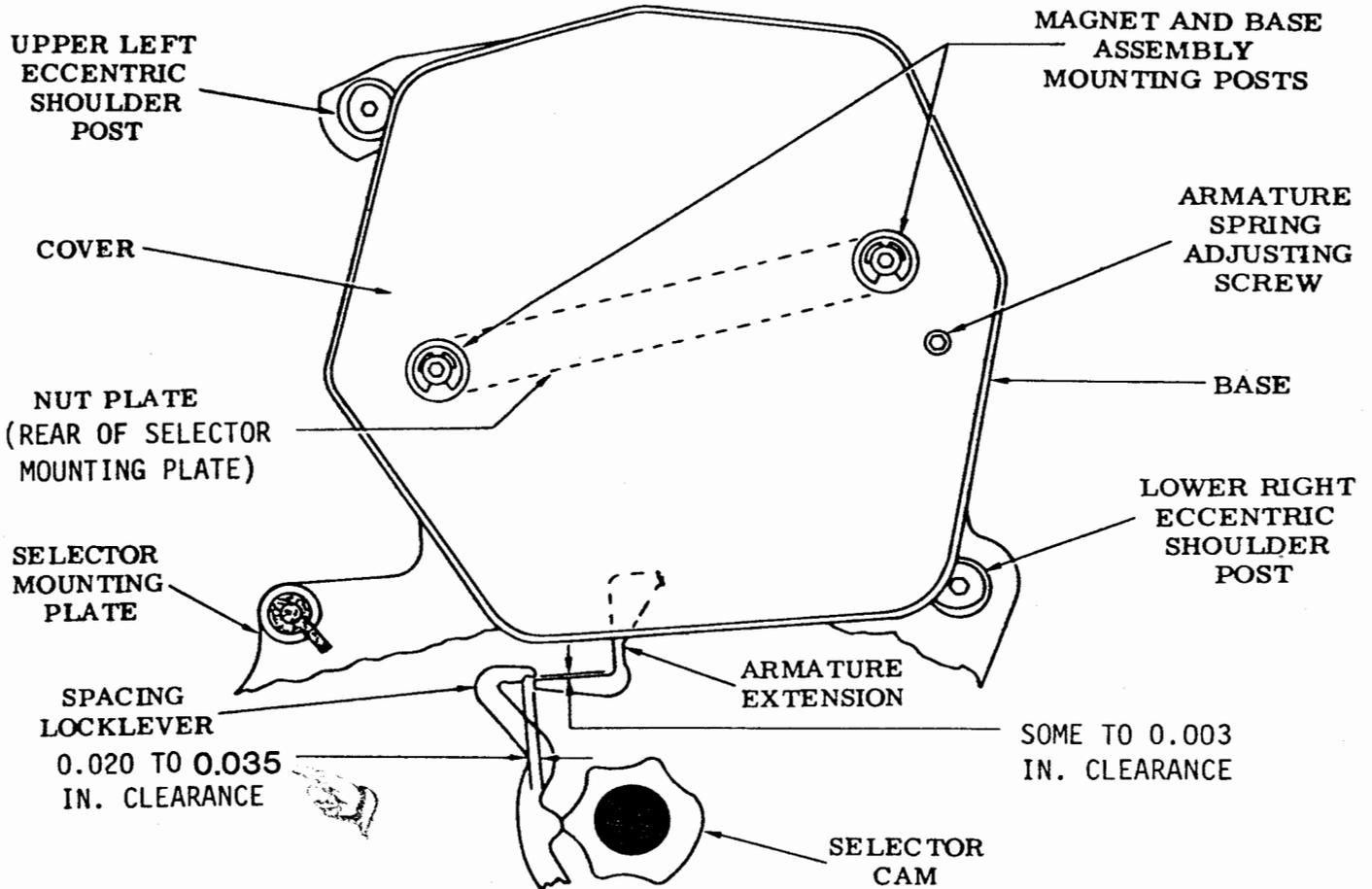


Figure 6-100. Selector Base (Magnets Energized)

of armature extension and shoulder of spacing locklever.

(8) Adjust upper left eccentric to obtain specified clearance between upper surface of armature extension and upper step of spacing locklever.

(9) Using a 1/16-inch hex wrench, tighten two magnet and base mounting posts.

6-4. KEYBOARD UNIT ADJUSTMENTS. The following paragraphs describe keyboard unit adjustment procedures for Model 28 Compact Page Printer (CPP) Keyboard Send-Receive (KSR) and Receive-Only (RO) Teletypewriter Sets.

6-4.1 KEYBOARD UNIT ADJUSTMENTS (HIGH-LEVEL).

a. Keyboard Transmitter Mechanism Adjustments. Perform keyboard transmitter adjustments in accordance with the following paragraphs.

NOTE

Disconnect power and remove keyboard from subbase.

(1) Universal Link. Adjust universal link as follows:

(a) Refer to figure 6-101.

(b) With keyboard transmitter in reset condition, there should be from 0.089 inch (minimum) to 0.103 inch (maximum) clearance between universal link and keyboard frame.

(c) To adjust, insert screwdriver through opening and bend tab on frame.

(2) Contact Wires. Adjust contact wires as follows:

(a) Refer to figure 6-102.

(b) Latch universal lever; take up play (downward) in contact block and release; place "T" levers to marking position; take up play (upward) of contact wires and release.

(c) Measure clearance between contact wires and terminal: clearance should be from 0.018 inch (minimum) to 0.027 inch (maximum).

(d) Place "T" levers in spacing position; unlatch universal lever; take up play (downward) of contact block and release.

(e) Measure clearance between contact wires and terminal: this should be from 0.020 inch (minimum) to 0.040 inch (maximum).

(f) To adjust, bend wires to requirements.

(3) Spacebar Spring. Adjust spacebar spring as follows:

(a) Refer to figure 6-103.

(b) With spacebar depressed and then released, use spring scale to measure force required to start spacebar moving: this should be from 5 grams (minimum) to 25 grams (maximum).

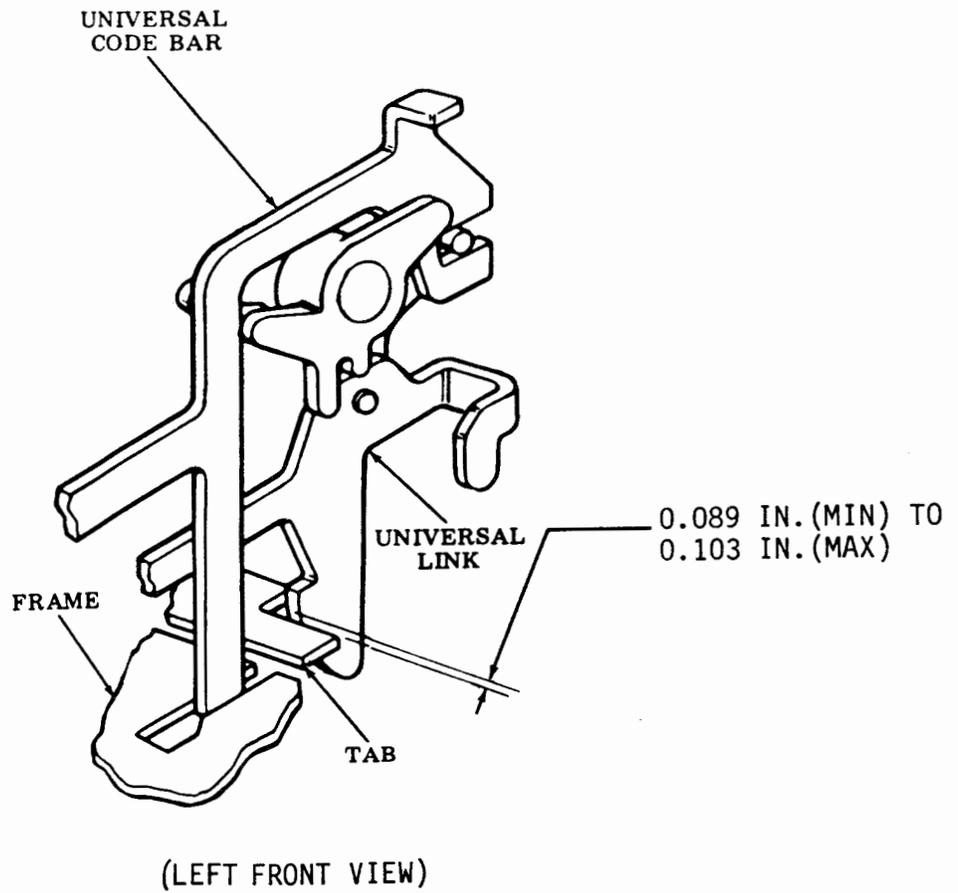


Figure 6-101. Universal Link

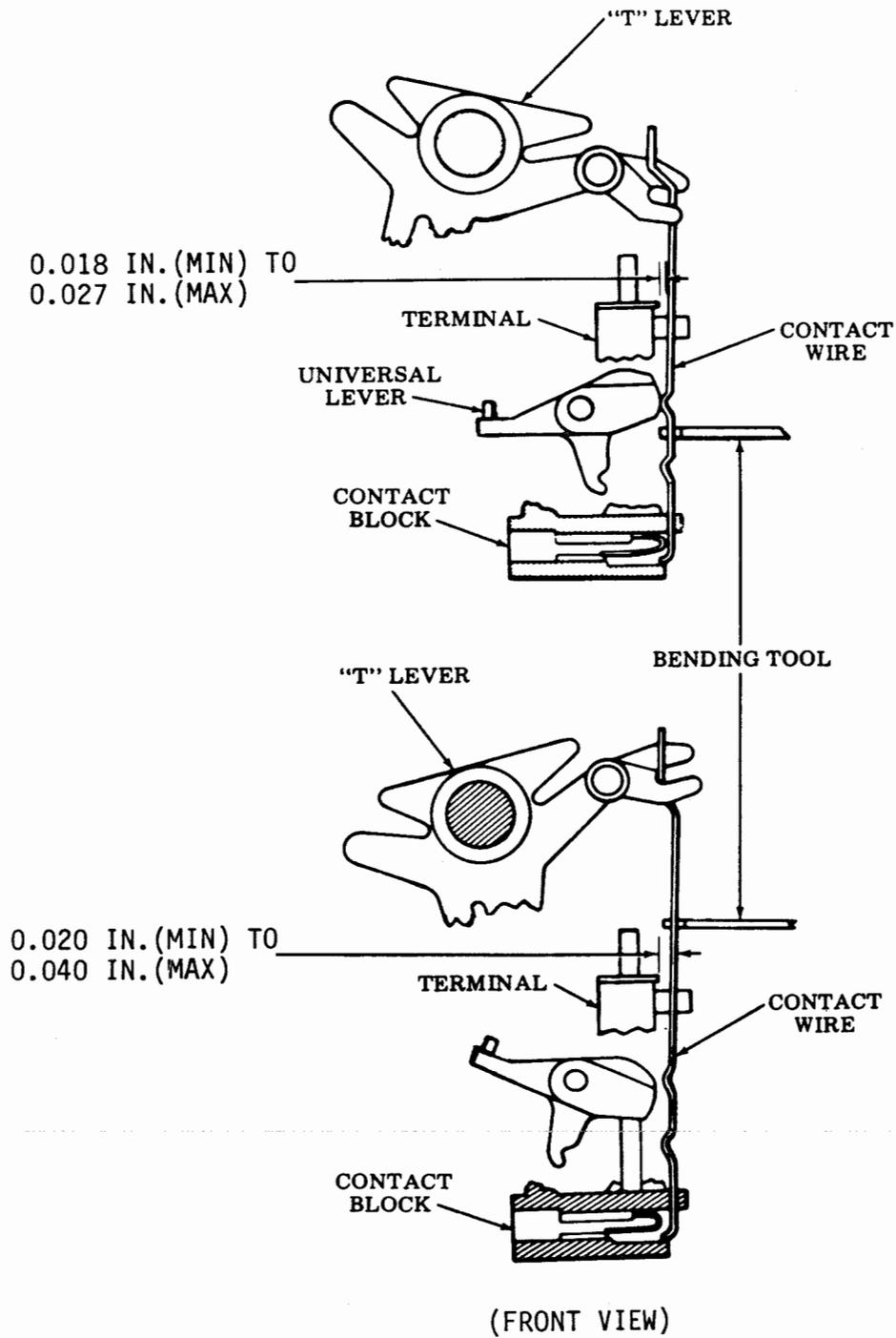


Figure 6-102. Contact Wires

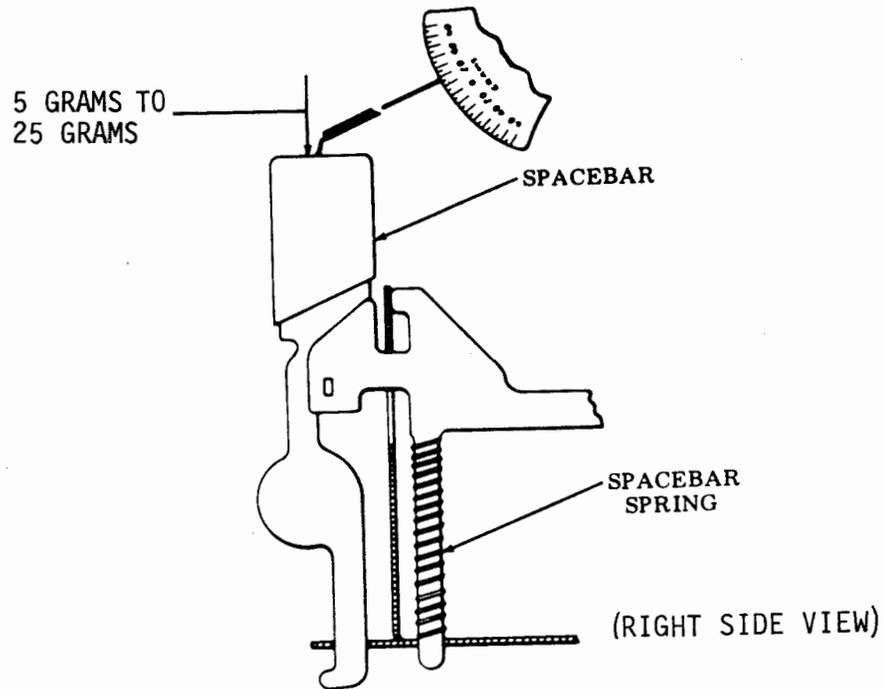


Figure 6-103. Spacebar Spring

(c) If force required does not meet specifications, replace spring.

(4) Keylever Spring.  
Adjust keylever spring as follows:

(a) Refer to figure 6-104.

(b) With key depressed (except REPT key) and then released, use spring scale to measure force required to start key moving: this should be between 5 grams (minimum) and 30 grams (maximum).

(c) If force required does not meet specifications, replace spring.

(5) Non-repeat Lever Spring. Adjust non-repeat lever spring as follows:

(a) Refer to figure 6-105.

(b) Use spring scale to measure force necessary to start non-repeat lever moving (keyboard transmitter in reset condition): force should be from 1/4 ounce (minimum) to 3/4 ounce (maximum).

(c) If force does not meet specifications, replace spring.

(6) Latchlever Spring. Adjust latchlever spring as follows:

(a) Refer to figure 6-105.

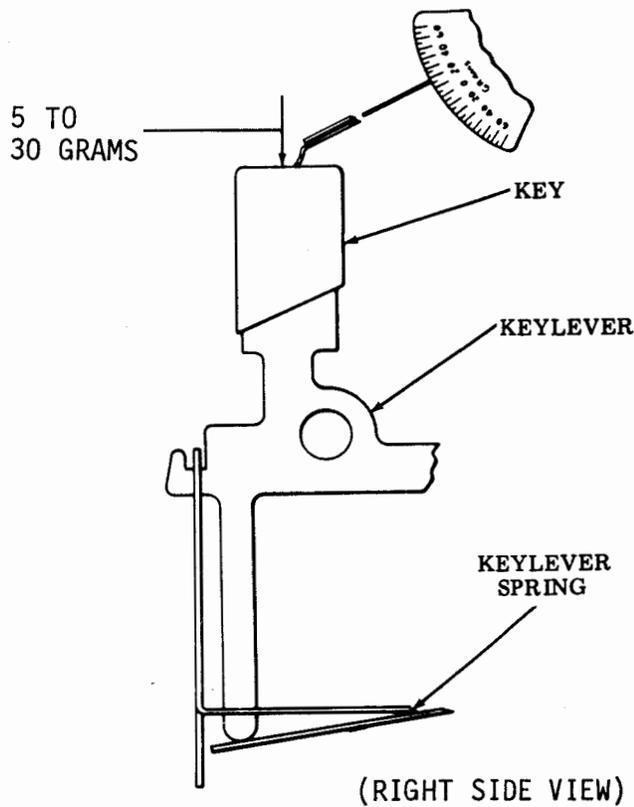


Figure 6-104. Keylever Spring

(b) With universal lever held away, use spring scale to measure force required to start latchlever moving: force should measure from 1/2 ounce (minimum) to 1 ounce (maximum).

(c) If force required does not meet specifications, replace spring.

(7) Contact Block Spring. Adjust contact block spring as follows:

(a) Refer to figure 6-106.

(b) Use spring scale to measure force necessary to start both sides of contact block moving: force should measure from 18 ounces (minimum) to 42 ounces (maximum).

(c) If force required does not match specifications, replace spring.

(8) Contact Wire Spring. Adjust contact wire spring as follows:

(a) Refer to figure 6-107.

(b) Place "T" levers in marking (clockwise) positions; trip contact wire reset bail by depressing universal code bar.

(c) Use spring scale to measure force required to start contact wire moving away from terminal; this should be from 3/4 ounce (minimum to 1-1/2 ounces (maximum)).

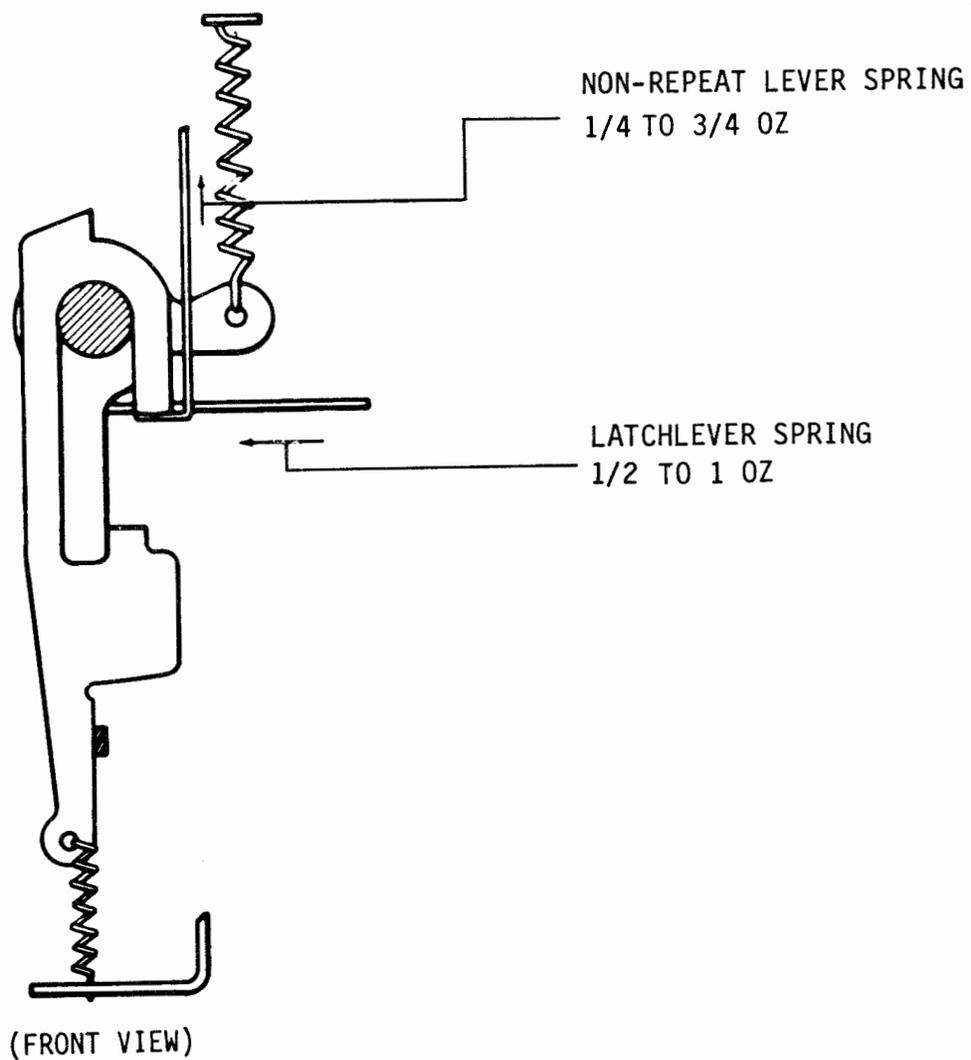


Figure 6-105. Non-Repeat and Latchlever Spring

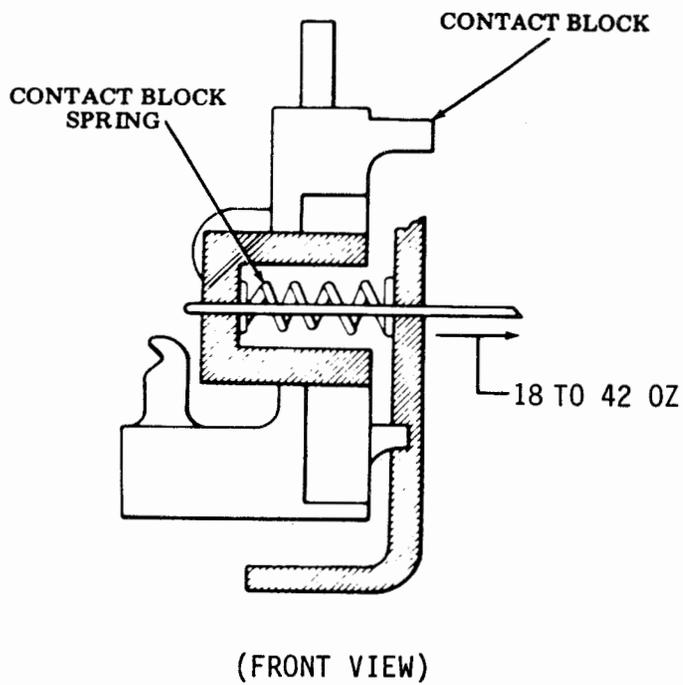


Figure 6-106. Contact Block Spring

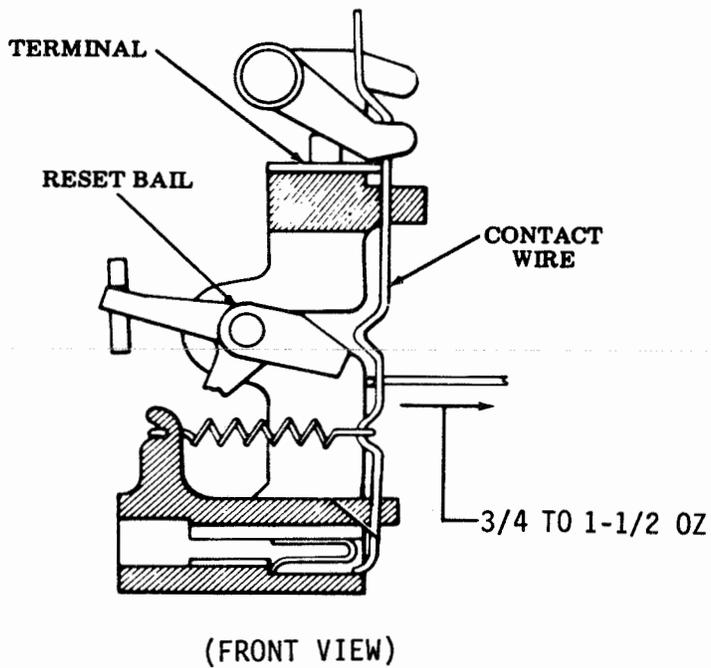


Figure 6-107. Contact Wire Spring

(d) If force does not meet specifications, replace spring.

(9) Repeat Keylever Spring. Adjust repeat keylever spring as follows:

(a) Refer to figure 6-108.

(b) Apply spring scale to key: it should require from 15 grams (minimum) to 30 grams (maximum) to start keylever moving.

(c) If force required does not match specifications, replace spring.

(10) Break Keylever Spring. Adjust break keylever spring as follows:

(a) Refer to figure 6-108.

(b) Apply spring scale to key: it should require from 12 ounces (minimum) to 18 ounces (maximum) to start lever moving.

(c) If force required does not match specifications, replace spring.

(11) Reset Bail Spring. Adjust reset bail spring as follows:

(a) Refer to figure 6-109.

NOTE

Remove keyboard from base.

(b) With "LTRS" keylever tripped, it should require from 1-1/4 ounces (minimum) to 2-1/2 ounces (maximum) to start reset bail moving.

(c) If force does not match requirements, replace spring.

(12) Universal Link Spring. Adjust universal link spring as follows:

(a) Refer to figure 6-110.

(b) With keyboard tripped, use spring scale to measure force required to start universal link moving: force should be from 1/2 ounce (minimum) to 1-1/4 ounces (maximum).

(c) If force required does not meet specification, replace spring.

(13) Universal Lever Spring. Adjust universal lever spring as follows:

(a) Refer to figure 6-111.

(b) Use spring scale to extend spring to installed length: this should require from 15 ounces (minimum) to 17 ounces (maximum).

(c) If force required does not meet specifications, replace spring.

(14) Reset Solenoid Position. Adjust reset solenoid position as follows:

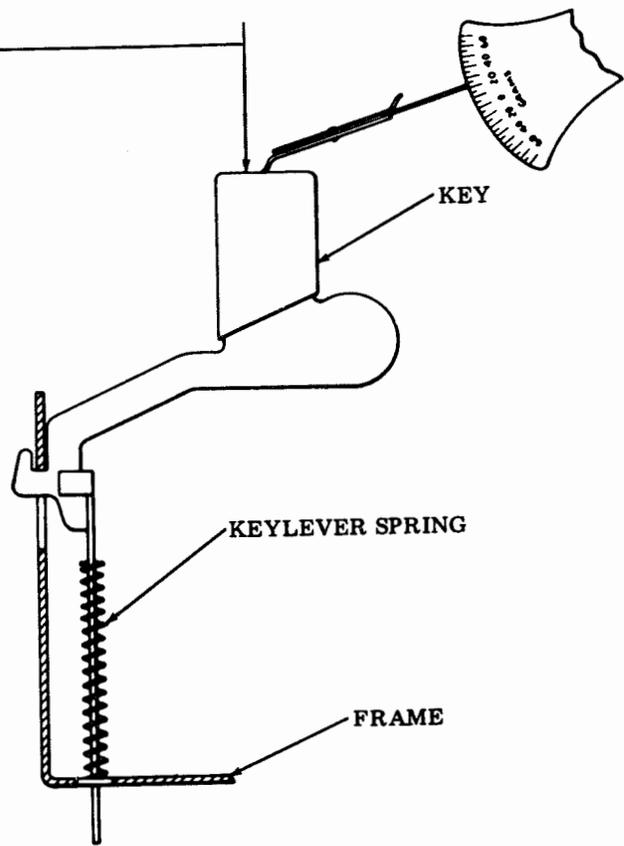
(a) Refer to figure 6-112.

(b) Check plunger movement; it should move freely in solenoid core.

(c) If plunger binds, adjust by loosening mounting screws and re-positioning solenoid.

REPEAT KEYLEVER SPRING  
15 TO 30 GRAMS

BREAK KEYLEVER SPRING  
12 TO 18 OZ



(RIGHT SIDE VIEW)

Figure 6-108. Repeat Keylever and Break Keylever Springs

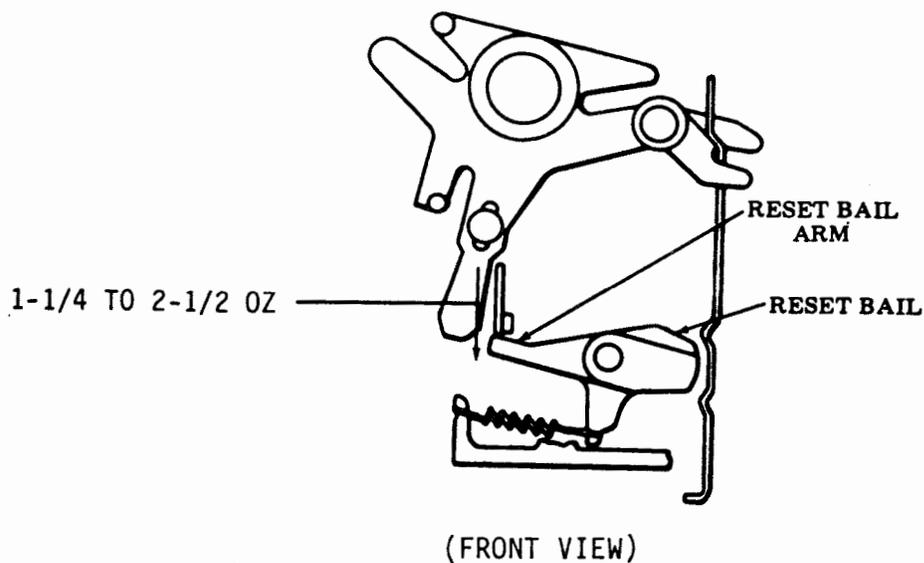


Figure 6-109. Reset Bail Spring

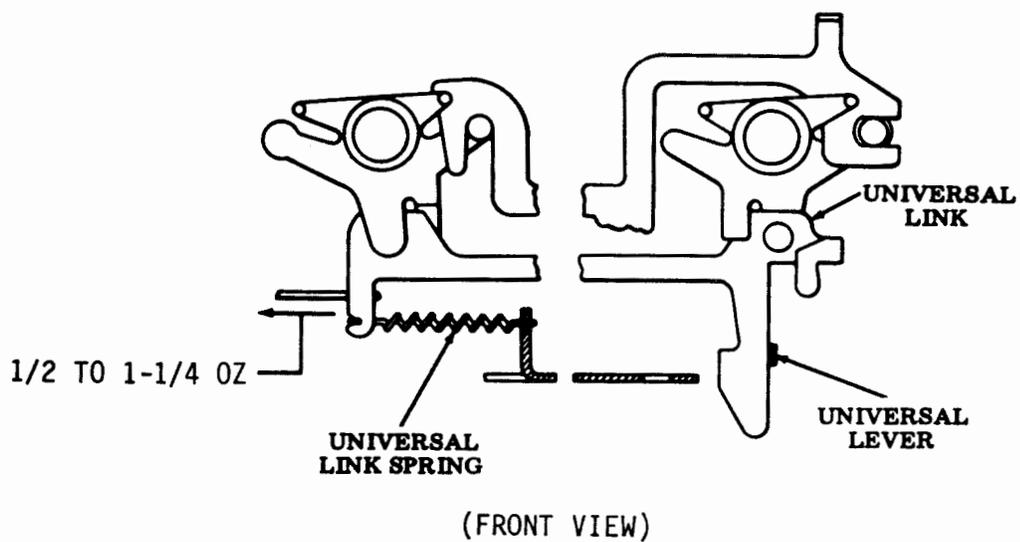
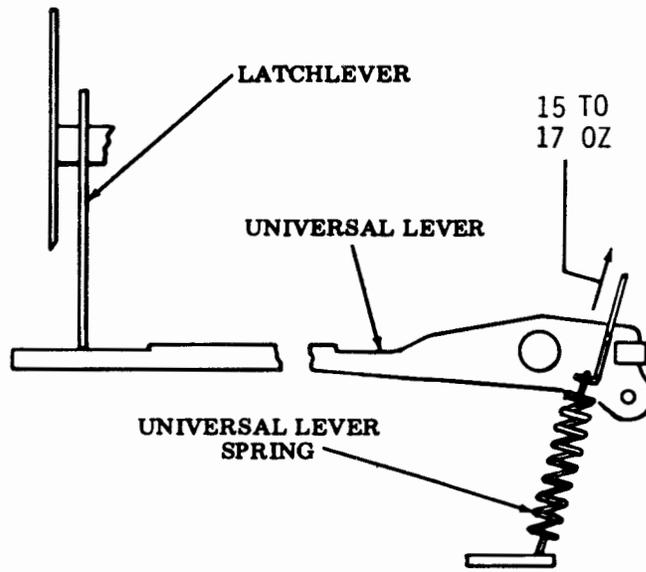


Figure 6-110. Universal Link Spring



(RIGHT SIDE VIEW)

Figure 6-111. Universal Lever Spring

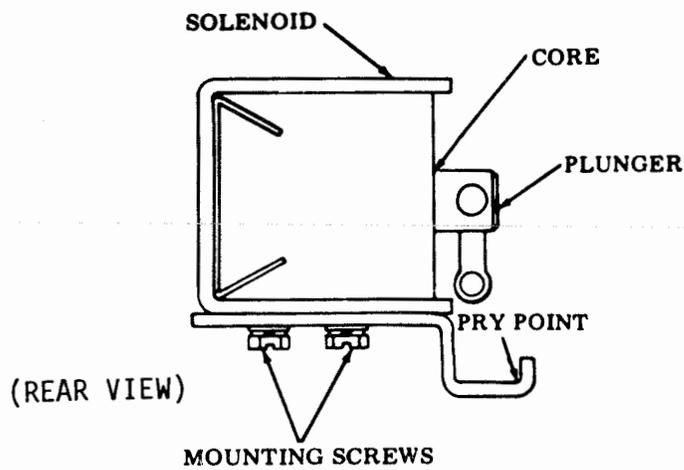


Figure 6-112. Reset Solenoid Position

(d) Tighten mounting screws.

(d) Position reset arm to clearance requirement.

(15) Reset Arm.

Adjust reset arm as follows:

(a) Refer to figure 6-113.

(b) Hold plunger in fully operated position with screwdriver in pry point and against plunger. In this position, there should be from 0.020 inch (minimum) to 0.045 inch (maximum) clearance between universal lever and latchlever.

(c) To adjust, loosen reset arm clamp screw, using screwdriver to hold plunger in fully operated position.

NOTE

Do not bind reset arm against mounting bracket when tightening clamp screw.

(16) Universal Contact. Adjust universal contact as follows:

(a) Refer to figure 6-114.

(b) With keyboard in reset condition, and contact wire moved out of fiberboard guide slot, clearance between contact wire and metal contact strap should be between

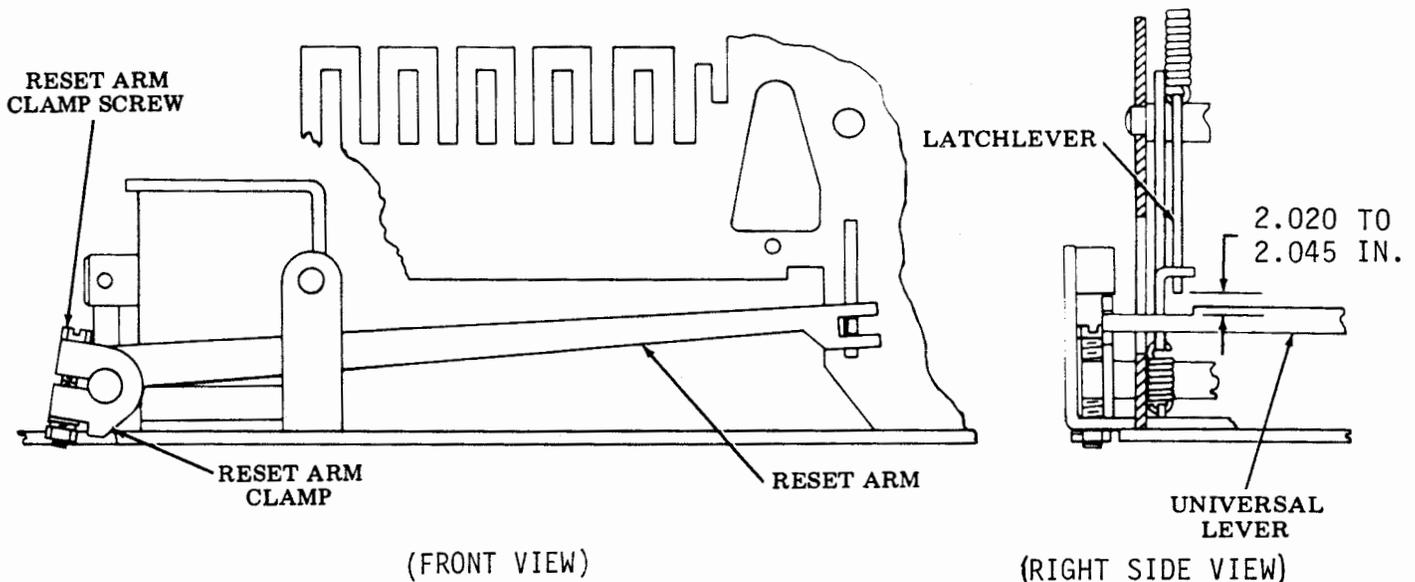


Figure 6-113. Reset Arm

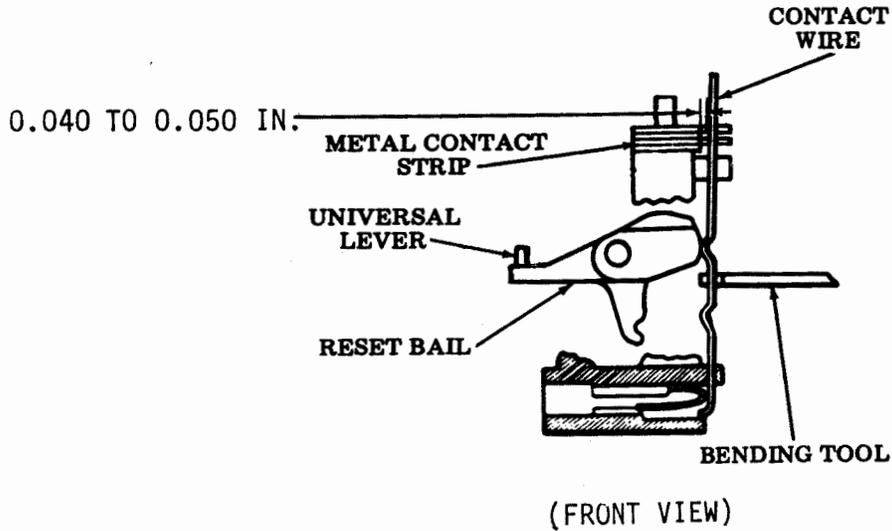


Figure 6-114. Universal Contact

0.040 inch (minimum) and  
0.050 inch (maximum).

(c) Adjust by bending wire with TP98055 bending tool.

(d) Replace wire in guide slot.

(17) Keyboard Transmitter Positioning. Adjust transmitter positioning as follows:

(a) Refer to figure 6-115.

(b) Loosen mounting screws.

(c) Position assembly so that end of slots in left and right brackets are against rear mounting screws.

(d) Tighten mounting screws.

b. Distributor Mechanism Adjustments. Perform distributor mechanism adjustments as follows:

(1) Clutch Trip Armature Air Gap. Adjust armature air gap as follows:

(a) Refer to figure 6-116.

(b) Remove armature bail spring, and hold armature flush against magnet core.

(c) Measure clearance between armature and magnet bracket: it should be between 0.004 inch (minimum) and 0.008 inch (maximum).

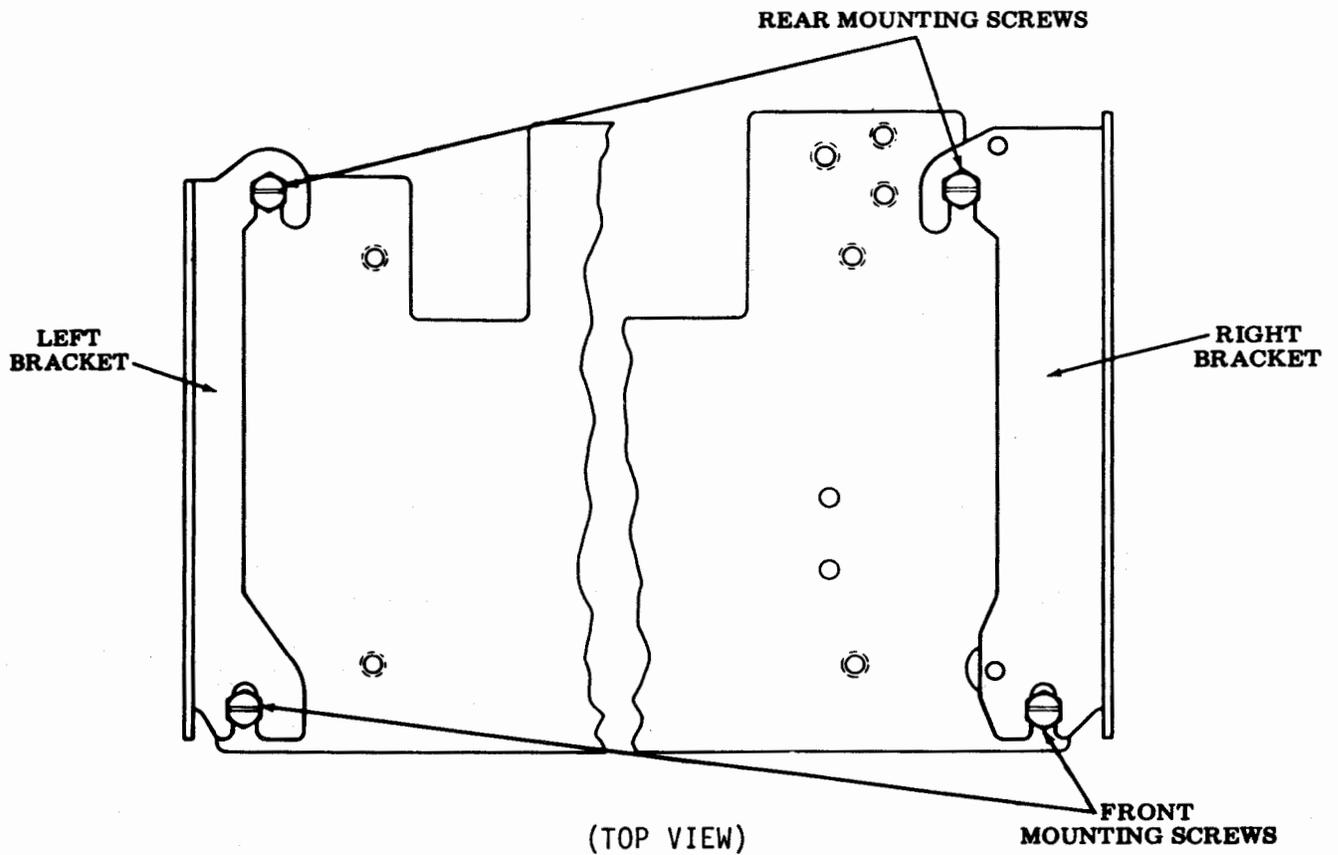


Figure 6-115. Keyboard Transmitter Positioning

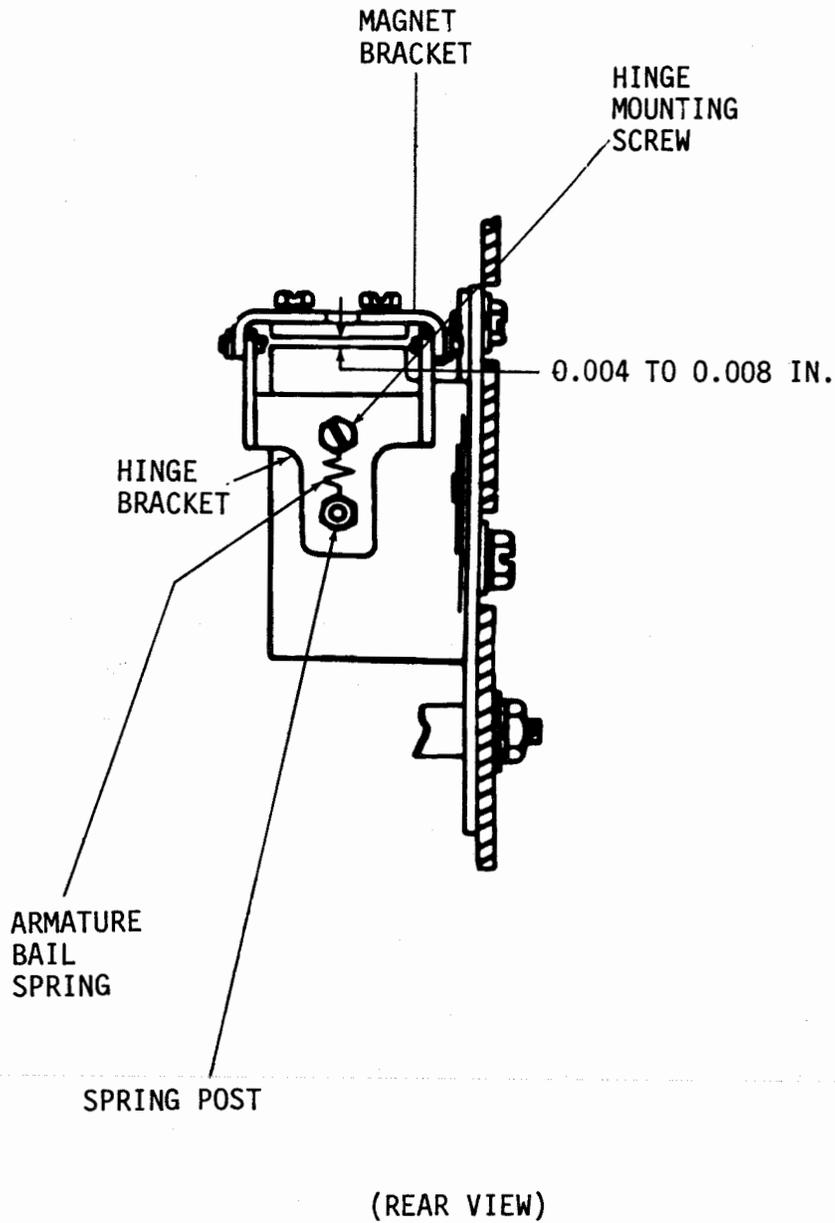


Figure 6-116. Clutch Trip Armature Air Gap

(d) To adjust, loosen spring post and hinge mounting screws. Position hinge to meet requirement.

(e) Tighten spring post and hinge mounting screw.

(2) Clutch Trip Lever. Adjust clutch trip lever as follows:

(a) Refer to figure 6-117.

(b) With clutch trip lever on high part of cam, measure clearance between latching surfaces of clutch trip lever and armature extension: clearance should be between 0.020 inch (minimum) and 0.030 inch (maximum).

(c) Loosen plate adjusting and plate mounting screws.

(d) Tighten screws.

(3) Armature Extension. Adjust armature extension as follows:

(a) Refer to figure 6-118.

(b) With clutch trip lever on high part of cam, and armature held flush against magnet core, measure clearance between armature extension lever and clutch trip lever: clearance should be between 0.030 inch (minimum) and 0.040 inch (maximum).

(c) To adjust, loosen bracket mounting and plate adjusting screws.

(d) Insert screwdriver into slot below bracket mounting screw, and

position bracket to meet requirement.

(e) Tighten screws.

(4) Clutch Stop Lug. Adjust clutch stop lug as follows:

(a) Refer to figure 6-119.

(b) Clutch trip lever in latched position should fully engage clutch shoe lever.

(c) To adjust, place clutch in stop position, loosen clutch trip lever clamping screw, and position clutch stop arm to obtain full bite with clutch shoe lever.

NOTE

When armature is in attracted position, clutch stop lug should clear trip lever (some).

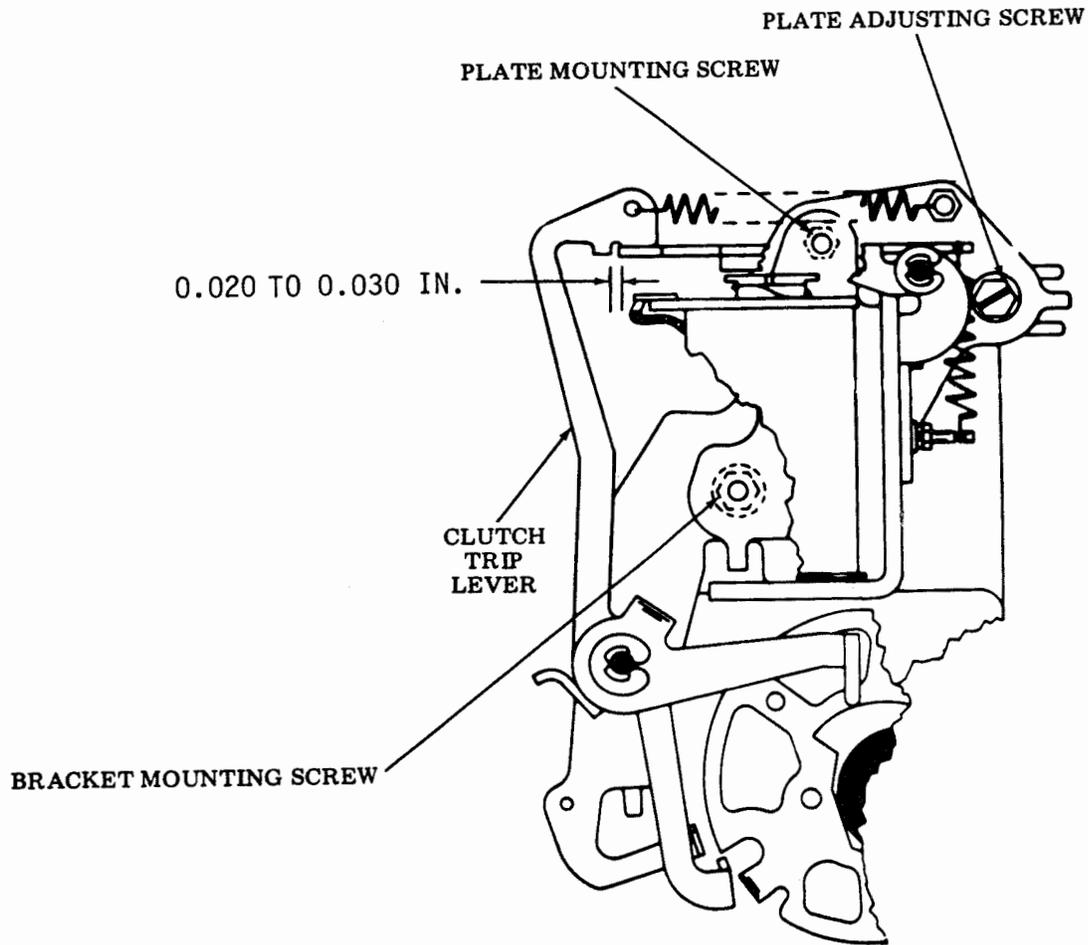
(5) Clutch Shoe Lever. Adjust clutch shoe lever as follows:

(a) Refer to figure 6-120.

(b) With clutch engaged, measure clearance between shoe lever and stop lug.

(c) Repeat same measurement with clutch disengaged: measurement in step (b) should be from 0.055 inch (minimum) to 0.085 inch (maximum) greater than measurement in step (c).

(d) To adjust, loosen two clamp screws in clutch disc: rotate adjusting



(RIGHT SIDE VIEW)

Figure 6-117. Clutch Trip Lever

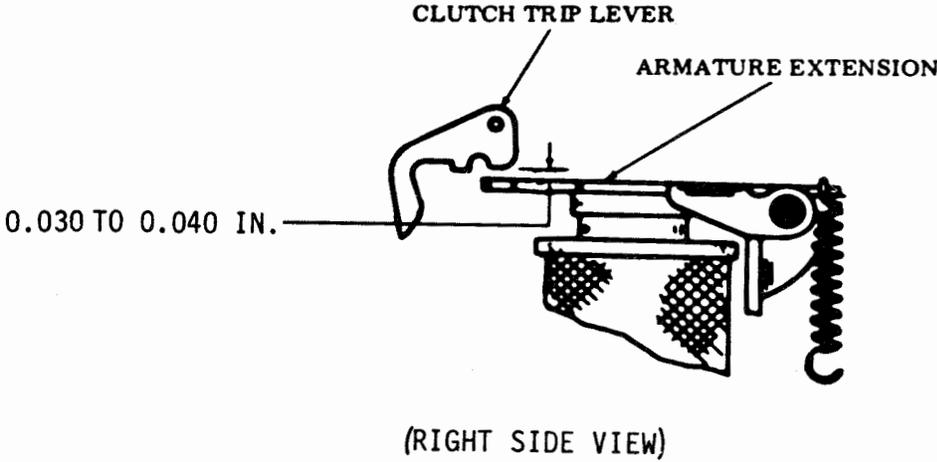


Figure 6-118. Armature Extension

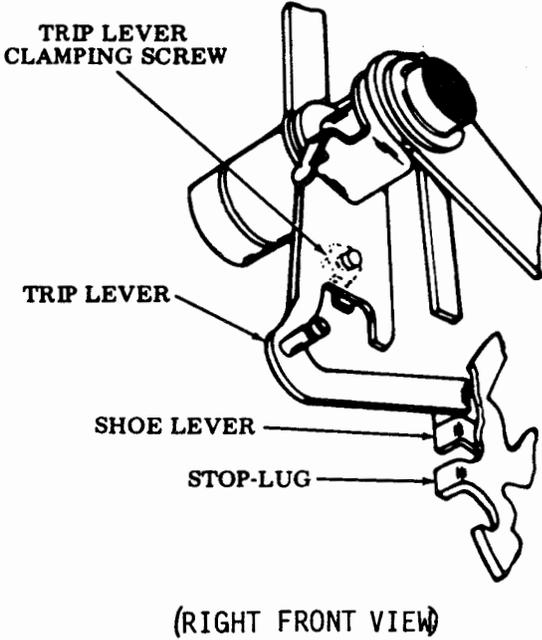


Figure 6-119. Clutch Stop Lug

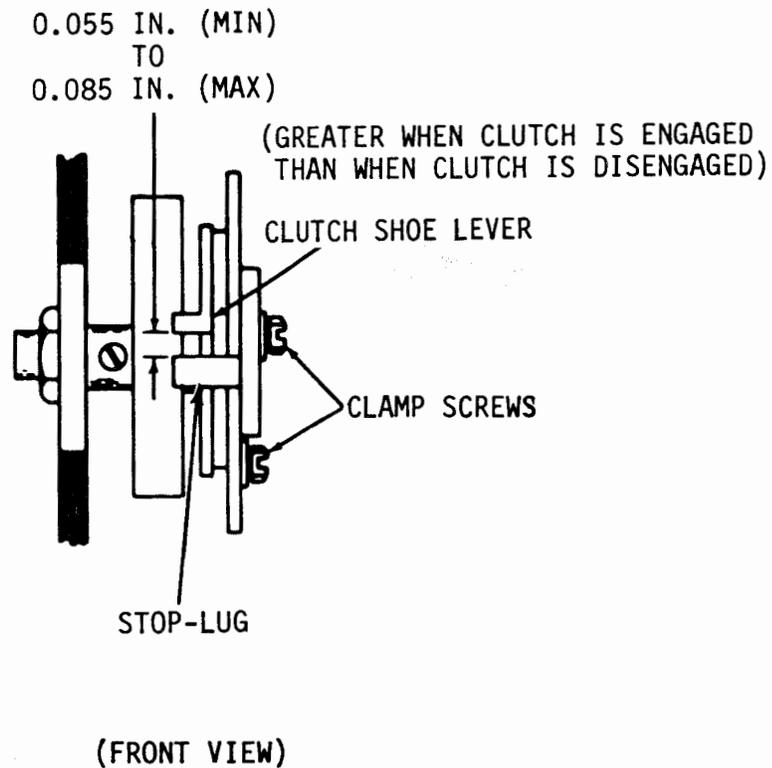


Figure 6-120. Clutch Shoe Lever

disc to obtain correct clearance differential.

(e) Tighten clamp screws.

NOTE

After adjustment, disengage clutch and rotate drum. If drum drags on shoes, refine adjustment.

(6) Cam Follower Guide. Adjust cam follower guide as follows:

NOTE

Remove typing unit from base before making adjustment.

(a) Refer to figure 6-121.

(b) Loosen mounting screws.

(c) Position guide so that center cam follower is fully on cam when follower is moved sideways in slot.

(d) Other followers must have at least 75 percent bite when moved in either direction, and be free in guide slots.

(e) Tighten mounting screws; check for dragging or binding.

(7) Mounting Typing Unit on Base. Mount typing unit as follows:

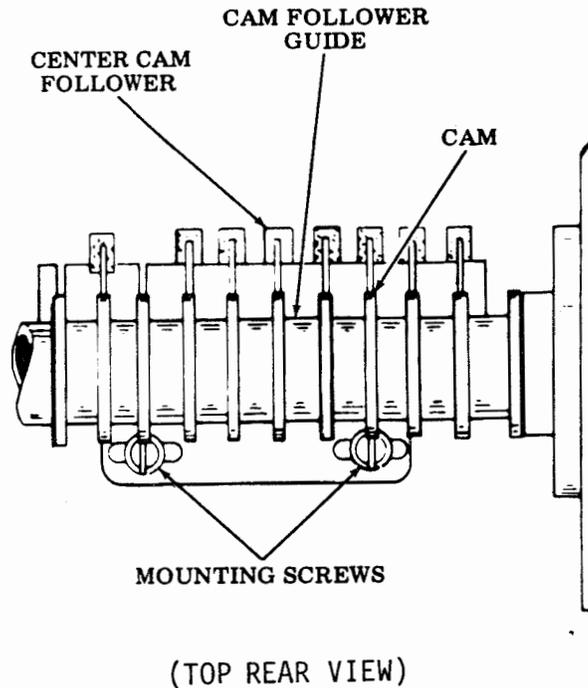


Figure 6-121. Cam Follower Guide

figure 6-122.

(b) When replacing typing unit on base, tilt it to the right, and engage the right end with the right locating stud.

(c) Rotate motor by hand to mesh gears properly.

(d) Secure with four mounting screws.

(8) Distributor Block. Adjust distributor block as follows:

NOTE

Remove insulator from terminal block to adjust distri-

buter contact assembly; replace after adjustments.

(a) Refer to figure 6-123.

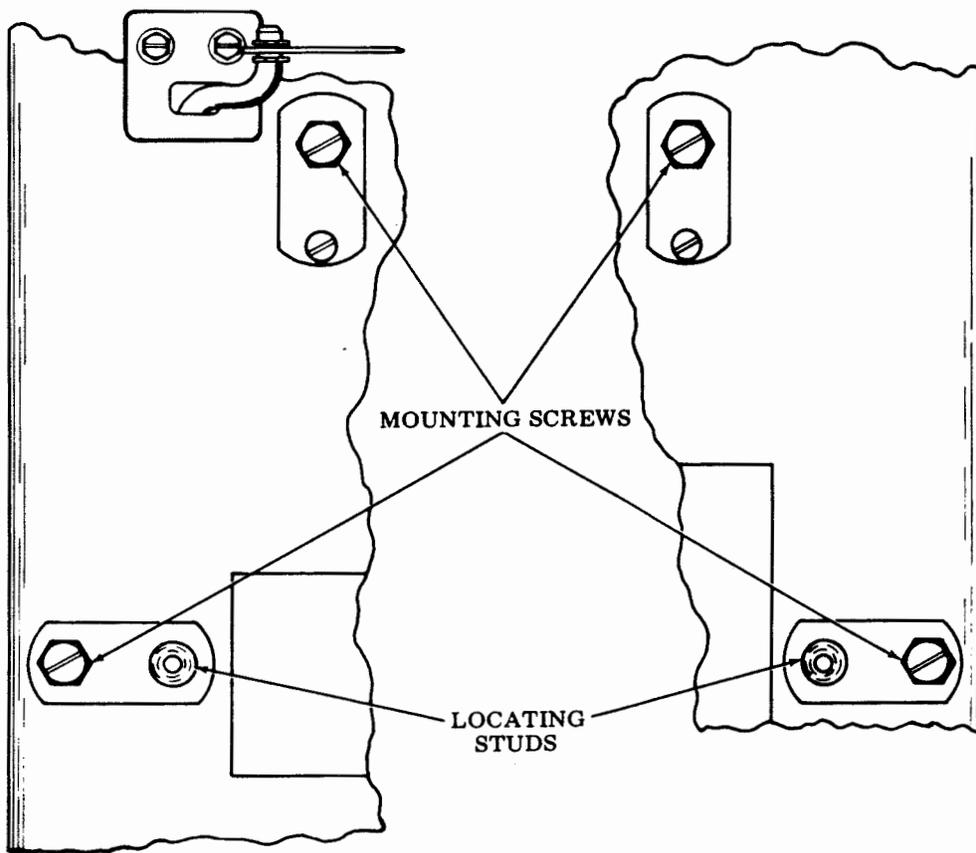
(b) Loosen mounting screws.

(c) Position distributor block so that rocker levers are fully engaged with bakelite on follower levers.

(d) Tighten mounting screws.

(9) Code Level Contact Gaps. Adjust code level contact gaps as follows:

(a) Refer to figure 6-124.



(TOP VIEW)

Figure 6-122. Mounting Typing Unit

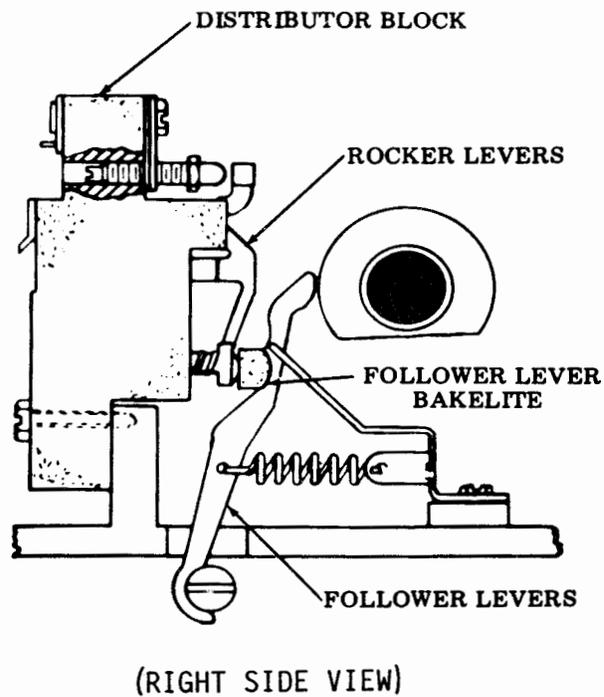
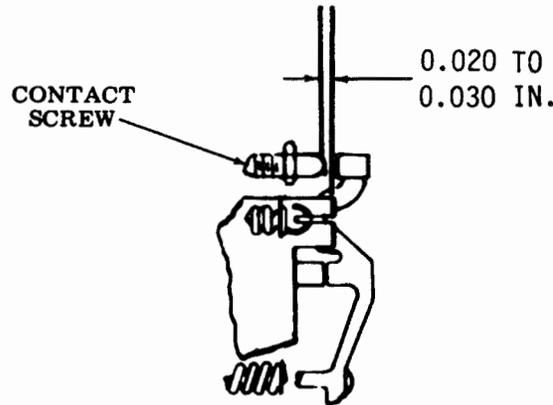


Figure 6-123. Distributor Block



(RIGHT SIDE VIEW)

Figure 6-124. Code Level Contact Gaps

(b) Trip clutch manually and rotate shaft, to position cam follower lever on high part of cam. At this point, measure contact gap: it should measure from 0.020 inch (minimum) to 0.030 oinch (maximum).

(c) To adjust, turn contact screw at socket end.

(d) Check first six contact gaps from clutch end of shaft.

(10) Clutch Timing Contact Gap. Adjust clutch timing contact gap as follows:

(a) Refer to figure 6-125.

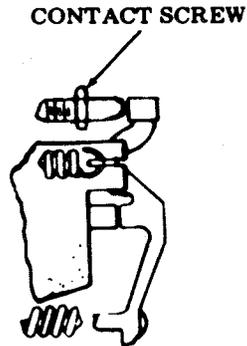
(b) Disengage distributor clutch and back off timing contact screw until gap is visible.

(c) Apply power to unit and depress any keytop except REPT: distributor clutch should engage.

(d) If clutch does not engage, turn contact screw until clutch engages; then give contact screw an additional 1/16th to 1/8th turn.

(e) Depress another keytop (except REPT): refine adjustment if necessary.

(11) Solenoid Contact Gap. Adjust solenoid contact gap as follows:



(RIGHT SIDE VIEW)

Figure 6-125. Clutch Timing Contact Gap

- figure 6-126.
- (a) Refer to distributor clutch.
  - (b) Disengage distributor clutch.
  - (c) Measure gap at No. 10 contact (10th from clutch end): this should be between 0.025 inch (minimum) and 0.030 inch (maximum).
  - (d) Use contact screw to adjust.

NOTE

This adjustment applies to units with cams marked "XX" after part no. TP198579, and serial numbers above 734.

(12) Clutch Shoe Lever Spring. Adjust clutch shoe lever spring as follows:

- (a) Refer to figure 6-127.
- (b) Remove cover and top plate. Engage distributor clutch and hold disc to prevent it turning.
- (c) Use spring scale to measure force necessary to pull shoe lever into contact with stop lug. Force should range from 15 ounces (minimum) to 20 ounces (maximum).
- (d) If force does not match requirements, replace spring.

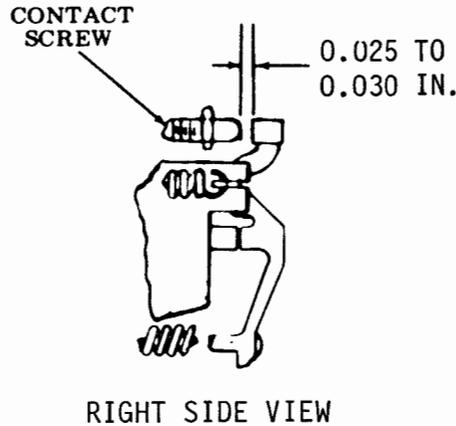


Figure 6-126. Solenoid Contact Gap

(13) Clutch Shoe Spring. Adjust clutch shoe spring as follows:

(a) Refer to figure 6-128.

NOTE

This adjustment requires removal of clutch from shaft. Do not perform unless spring tension is definitely suspect.

(b) Use spring scale to measure tension: it should require between 3 ounces (minimum) to 5 ounces (maximum) to start primary shoe away from secondary shoe.

(c) If required force does not meet specifications, replace spring.

(14) Cam Follower Spring. Adjust cam follower spring as follows:

(a) Refer to figure 6-129.

(b) Remove distributor block.

(c) Use spring scale to measure force necessary to start cam follower lever moving when lever is on high point of cam. This should require from 1/2 ounce (minimum) to 1-1/2 ounces (maximum).

(d) If force required does not match requirements, replace spring.

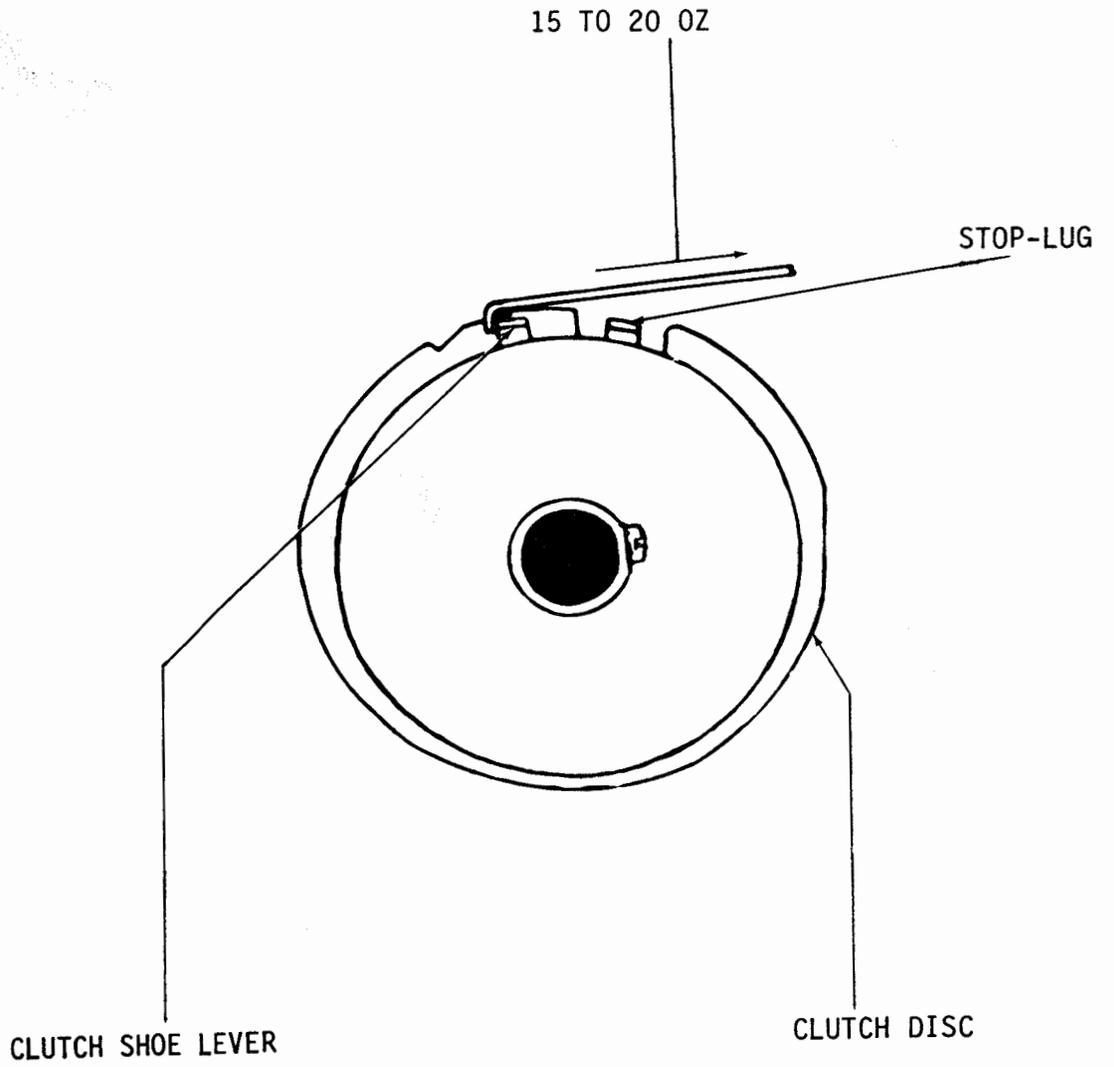


Figure 6-127. Clutch Shoe Lever Spring

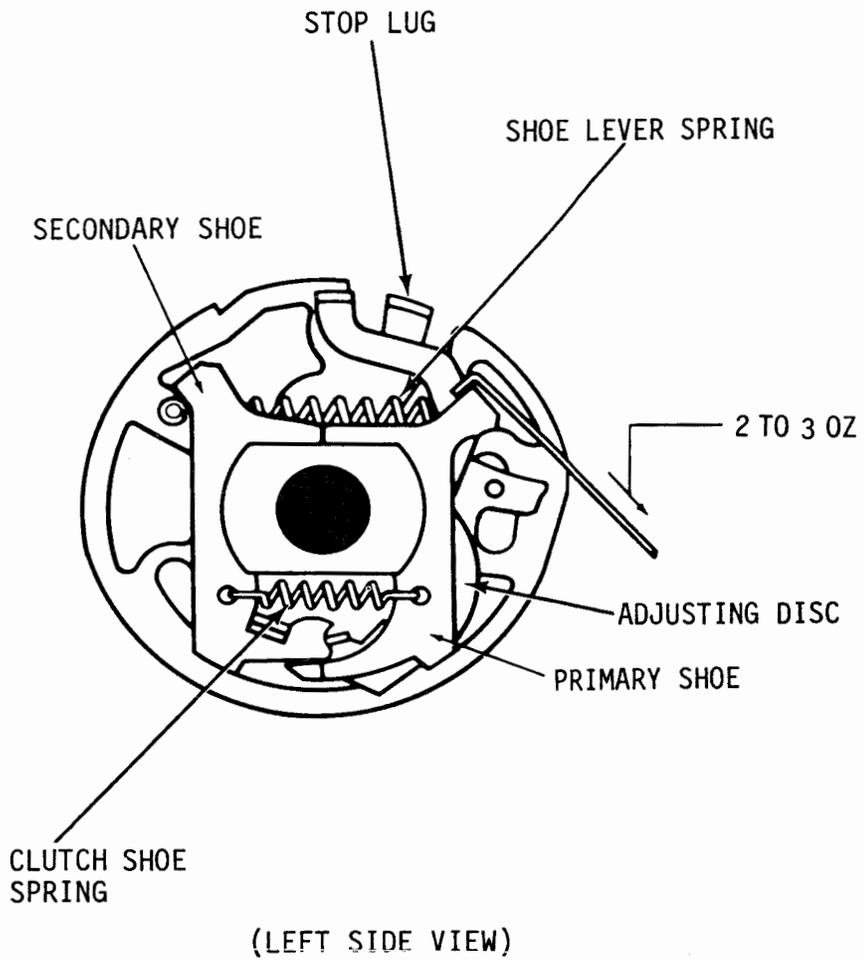


Figure 6-128. Clutch Shoe Spring

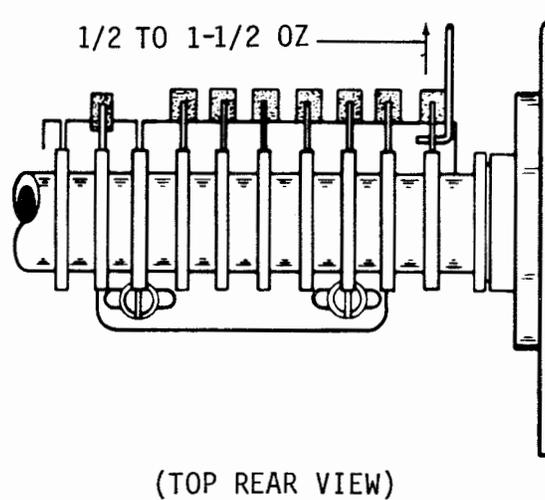


Figure 6-129. Cam Follower Spring

(15) Rocker Spring.  
Adjust rocker spring as follows:

- (a) Refer to figure 6-130.
- (b) Remove compression springs.
- (c) Adjust contacts so that contact surface is approximately  $1/32$  inch below outer surface of contact block.
- (d) Use a spring scale to separate contacts: this should require from 3 ounces (minimum) to 4 ounces (maximum).
- (e) If required force does not match specifications, replace spring.

(16) Rocker Compression Spring. Adjust rocker compression spring as follows:

- (a) Refer to figure 6-130.
- (b) Install compression springs.
- (c) Use spring scale to measure force required to just separate contacts: this should require from 6-1/2 ounces (minimum) to 9-1/2 ounces (maximum)
- (d) If force required does not match specifications, replace spring.

(17) Clutch Latchlever Spring. Adjust clutch latchlever spring as follows:

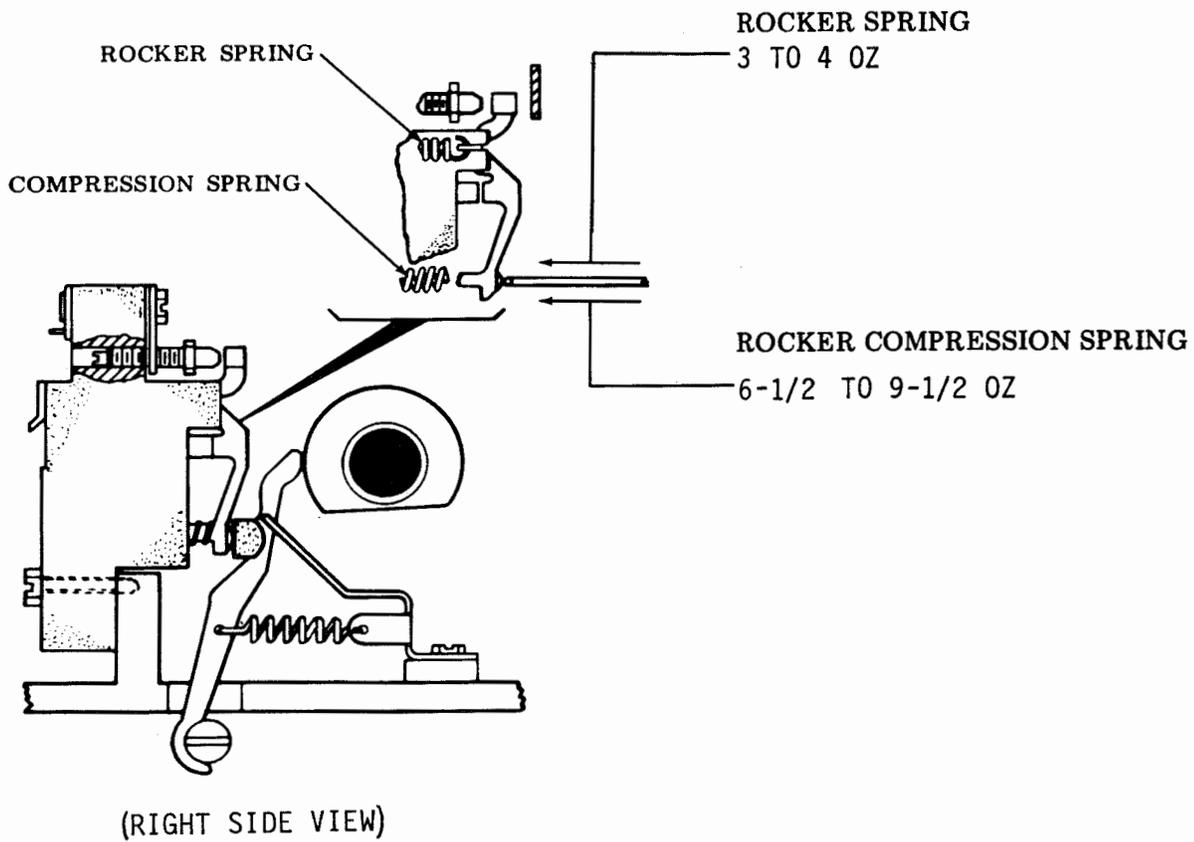


Figure 6-130. Rocker Spring and Rocker Compression Springs

(a) Refer to figure 6-131.

(b) Position latchlever on low part of clutch disc (without latching).

(c) Apply pull end of scale to latchlever, and extend diagonally: it should require from 2-1/2 ounces (minimum) to 4-1/2 ounces (maximum) to start latchlever moving.

(d) If force required does not match specifications, replace spring.

(18) Clutch Trip Lever Spring. Adjust clutch trip lever spring as follows:

(a) Refer to figure 6-132.

(b) Engage distributor clutch, and hold armature against magnet core.

(c) Use spring scale to measure force necessary to start trip lever moving: this should require from 2 ounces (minimum) to 3-1/2 ounces (maximum).

(d) If force does not match requirements, replace spring.

(19) Clutch Magnet Armature Bail Spring. Adjust spring as follows:

(a) Refer to figure 6-133.

(b) Trip clutch magnet armature lever, and rotate main shaft until trip follower arm is on high part of cam.

(c) Use spring scale to measure force necessary to start armature extension lever moving: this should be

between 3 ounces (minimum) to 4-1/2 ounces (maximum).

(d) If force does not match requirements, replace spring.

c. Gear Shift Assembly Adjustments. Perform gear shift assembly adjustments in accordance with the following paragraphs.

(1) Typing Unit Gear Backlash. Adjust typing unit gear backlash as follows:

(a) Refer to figure 6-134.

NOTE

Replace typing unit in base, and insulator on distributor terminal block.

(b) There should be perceptible backlash between the typing unit gear and the associated gear shift pinion at their closest point.

(c) If not, remove typing unit from base, and terminal block bracket from gear shift casting.

(d) Loosen three clamp screw locknuts on gear shift casting.

(e) Replace printer.

(f) Slide gear shift casting forward or backward to obtain proper gear tooth engagement.

(g) Replace terminal block bracket.

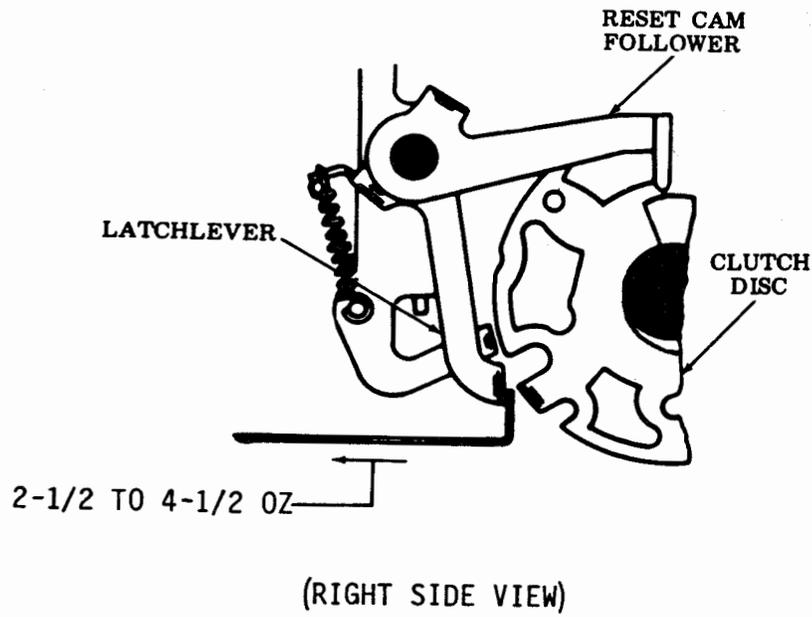


Figure 6-131. Clutch Latchlever Spring

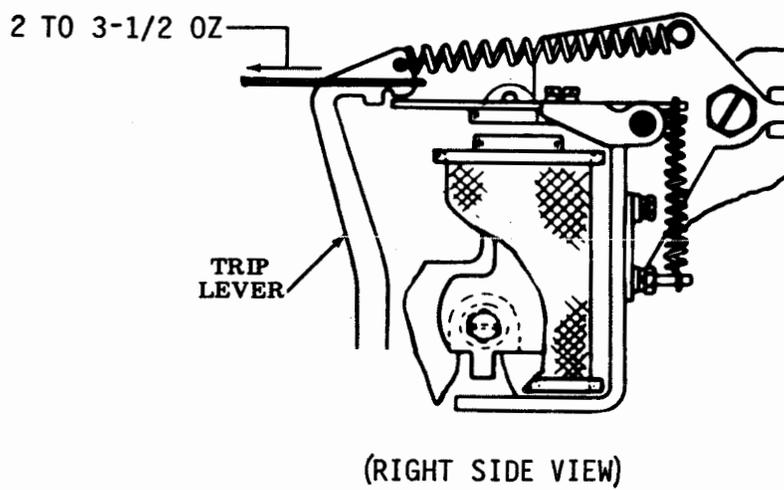


Figure 6-132. Clutch Trip Lever Spring

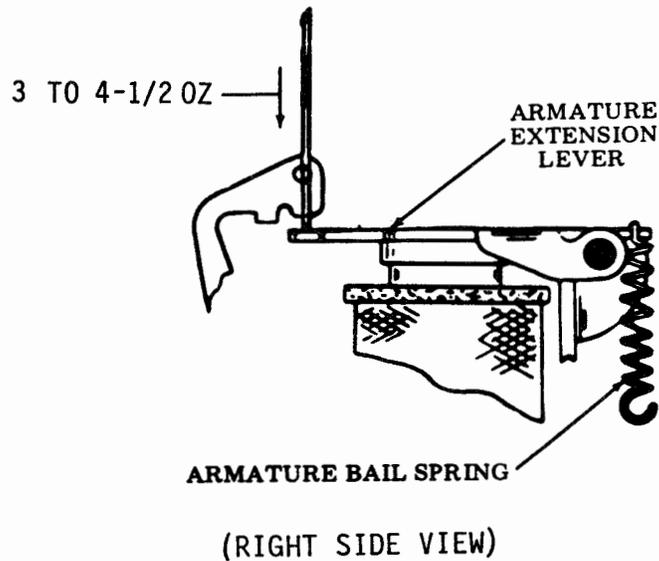


Figure 6-133. Clutch Magnet Armature Bail Spring

(2) Motor Pinion

Backlash. Adjust motor pinion backlash as follows:

- (a) Refer to figure 6-134.
- (b) There should be perceptible backlash between the motor pinion and the associated driver gear at their closest point.
- (c) If not, loosen the two bushing locknuts, and raise or lower the two adjustable bushings to obtain proper gear tooth engagement.
- (d) Tighten bushing locknuts.

NOTE

After making this adjustment, check the typing unit gear backlash. Refine both backlash adjustments, if necessary.

(3) Baud Selector Stop Plate. Adjust Baud selector stop plate as follows:

- (a) Refer to figure 6-135.
- (b) Apply power to unit, and rotate Baud selector knob to engage all three variable gear speeds.
- (c) Highest and lowest gear speed should engage variable speed shaft without binding or locking out.

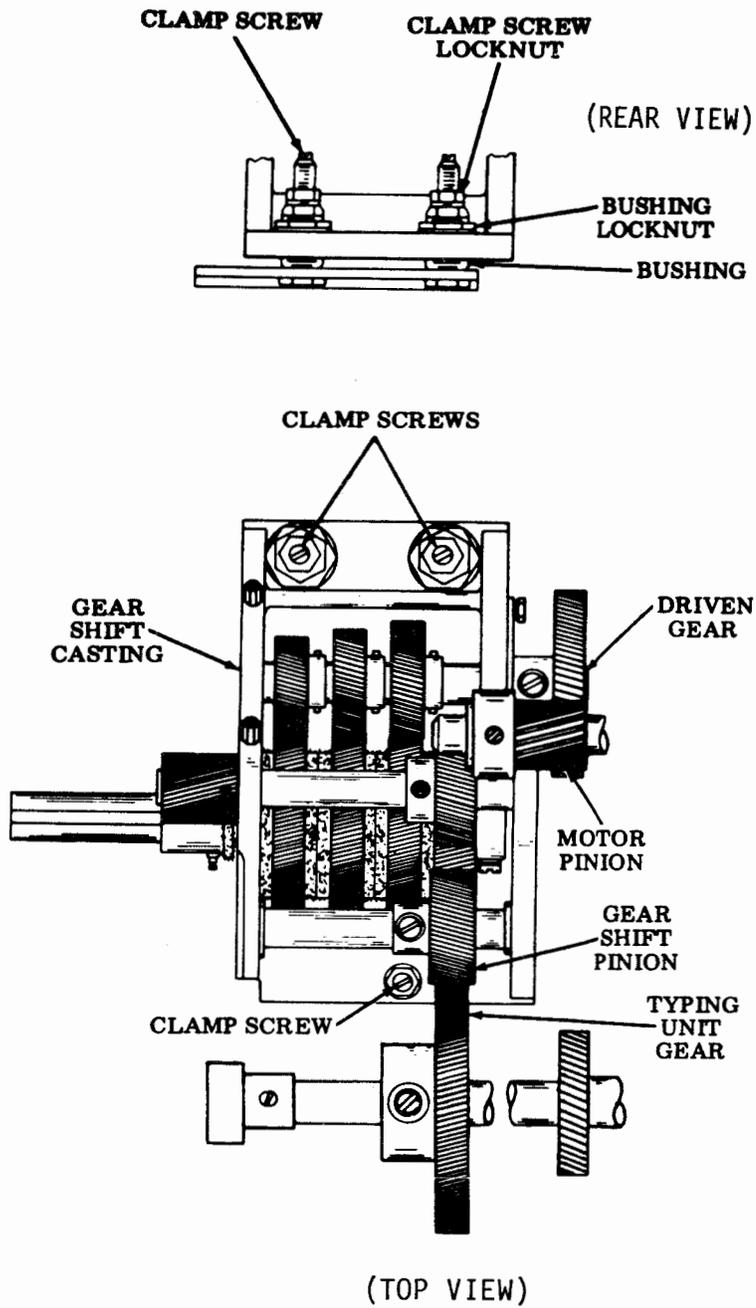


Figure 6-134. Typing Unit Gear Backlash and Motor Pinion Backlash

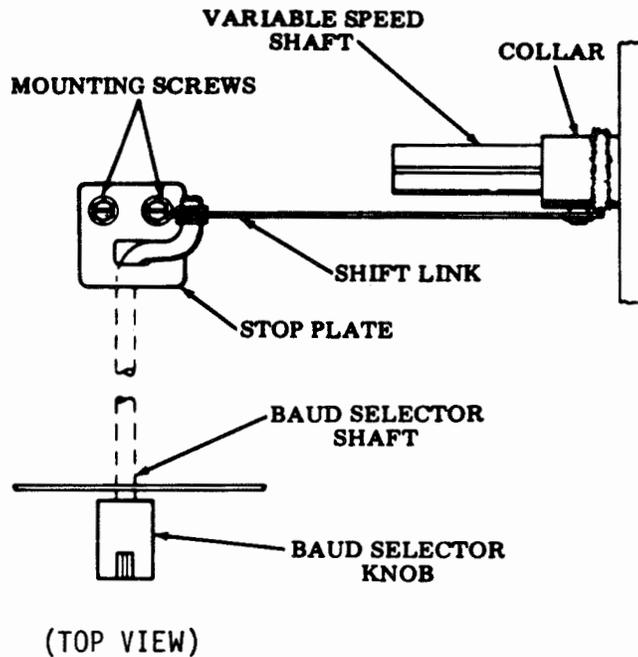


Figure 6-135. Baud Selector Stop Plate

(d) If not, loosen mounting screws, and position stop plate left or right for full range.

it emerges until completely out of collar.

(4) Gear Shift Spring. Adjust gear shift spring as follows:

(d) Use spring scale to measure force necessary to depress key to lowermost position: this should require from 25 ounces (minimum) to 40 ounces (maximum) pressure.

(a) Refer to figure 6-136.

(b) Disconnect shift link from collar by removing retainer ring.

(e) If force required does not match specifications, replace spring.

(c) Slide key out from under gears.

(5) Distributor Gear Backlash. Adjust distributor gear backlash as follows:

CAUTION

(a) Refer to figure 6-137.

To avoid loss of pin and spring, pull key slowly to left and hold head of pin as

(b) There should be perceptible backlash between the distributor idler

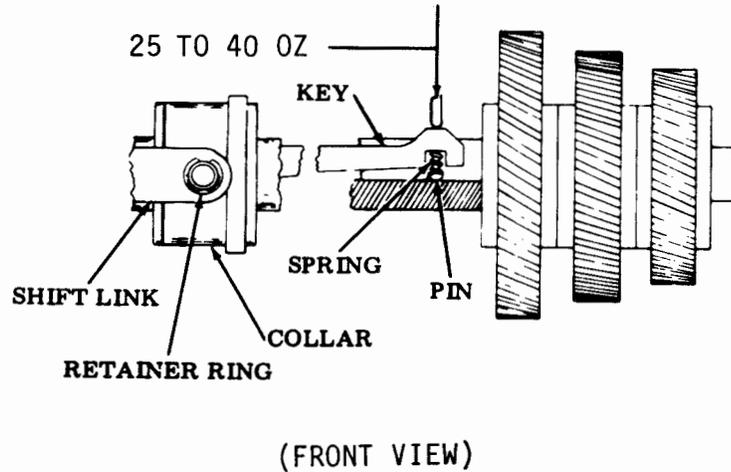


Figure 6-136. Gear Shift Spring

gear and associated gear shift pinion at their closest point.

(c) If not, loosen four distributor mounting screws, and move distributor forward or backward to obtain proper gear tooth engagement.

(d) Tighten mounting screws.

(6) Margin Indicator Spring. Adjust margin indicator spring as follows:

(a) Refer to figure 6-138.

(b) Use spring scale to measure force required to start lever moving: this should be from 7 ounces (minimum) to 11 ounces (maximum).

(c) If force does not match requirement, replace spring.

d. Local Function Mechanism Adjustments. Perform local function mechanism adjustments in accordance with the following paragraph.

(1) Local Carriage Return Spring. Adjust local carriage return spring as follows:

(a) Refer to figure 6-139.

(b) Unhook free end of spring.

(c) Use spring scale to extend spring to full length: force required should

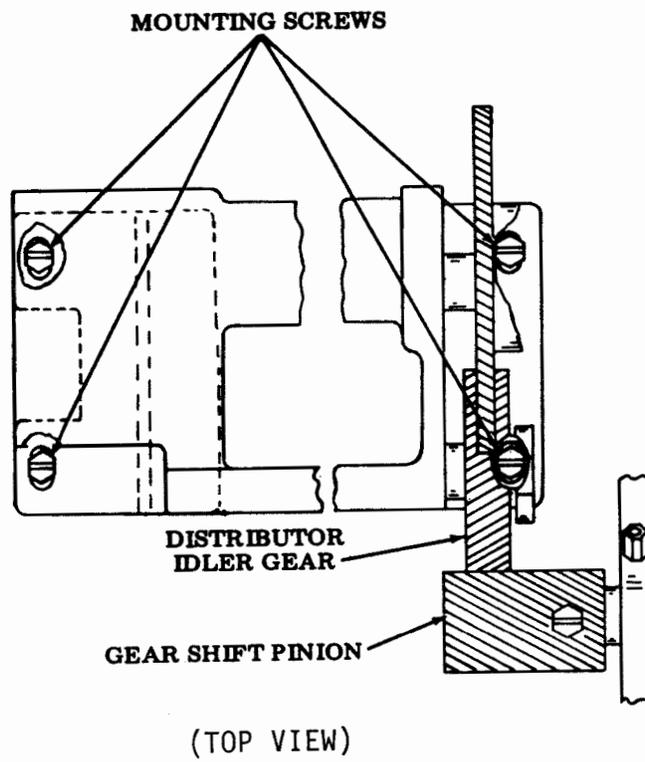


Figure 6-137. Distributor Gear Backlash

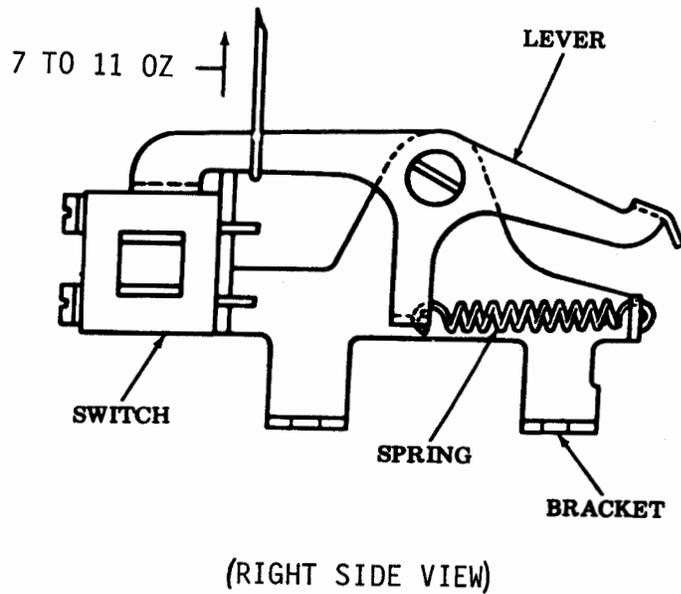


Figure 6-138. Margin Indicator Spring

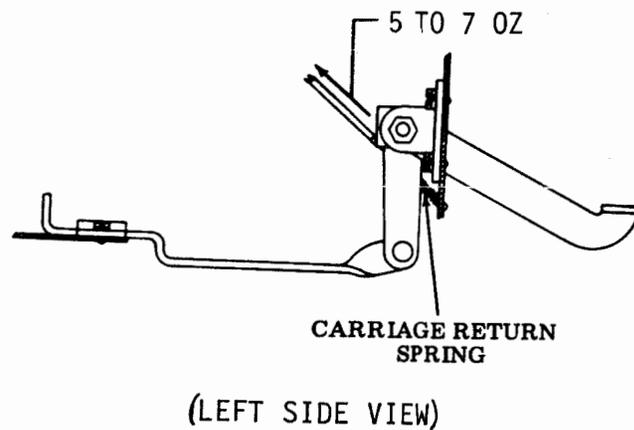


Figure 6-139. Local Carriage Return Spring

measure from 5 ounces (minimum) to 7 ounces (maximum).

(d) If force does not meet requirements, replace spring.

(2) Local Line Feed Spring. Adjust local line feed spring as follows:

(a) Refer to figure 6-140.

(b) Use spring scale to measure force necessary to start trip link moving toward rear: this should require from 1 ounce (minimum) to 3 ounces (maximum).

(c) If force does not match requirements, replace spring.

(3) Line Break Key. Adjust line break key as follows:

(a) Refer to figure 6-141.

NOTE

The adjustments and spring tensions listed below are pertinent to the receive-only base. When making a complete readjustment of the base, they should precede the adjustments in this part.

Typing Unit Gear Backlash, paragraph 6-4.1c(1)

Motor Pinion Backlash, paragraph 6-4.1c(2)

Mounting Typing Unit on Base, paragraph 6-4.1b(7)

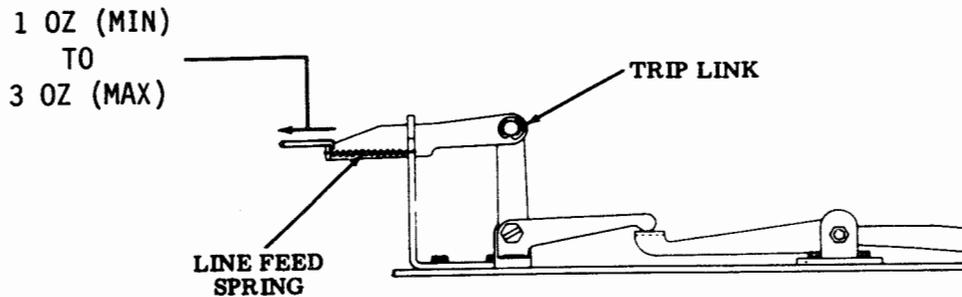


Figure 6-140. Local Line Feed Spring

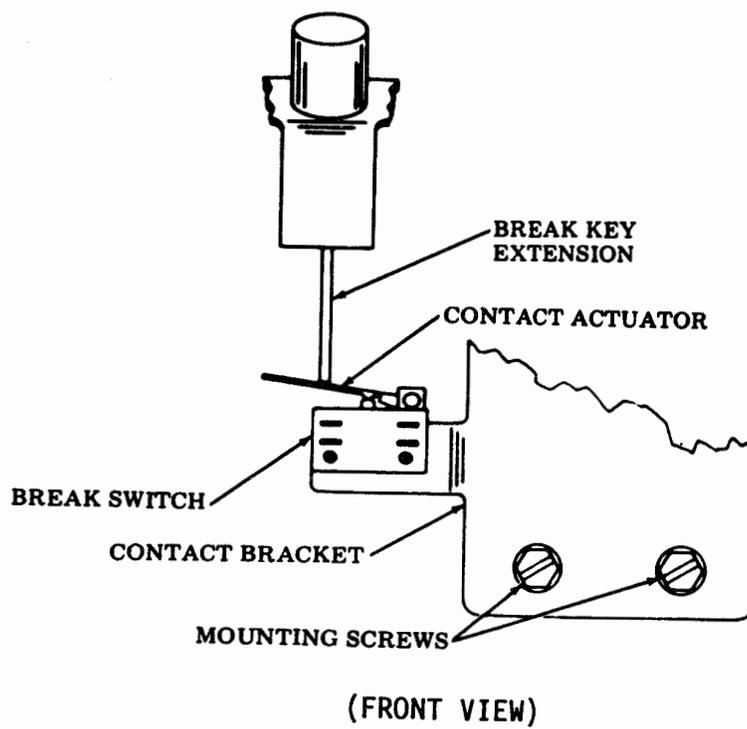


Figure 6-141. Line Break Key

Baud Selector Stop Plate,  
paragraph 6-4.1c(3)

Gear Shift Spring,  
paragraph 6-4.1c(4)

Local Carriage Return Spring,  
paragraph 6-4.1d(1)

Local Line Feed Spring,  
paragraph 6-4.1e(2)

(b) Depress  
BREAK key; typing unit should  
run open, and break key  
extension should fully engage  
actuator.

(c) To adjust,  
loosen mounting screws and  
position contact bracket to meet  
requirements.

(4) Local Line Feed.  
Adjust local line feed as  
follows:

(a) Refer to  
figure 6-142.

(b) With cover  
in place, advance platen by  
depressing LOC LF key.

(c) Keylever  
extension must fully engage the  
local line feed adjusting screw:  
this releases the line feed  
clutch, allowing the platen to  
advance.

(d) To adjust,  
loosen the locknut and turn the  
adjusting screw.

(e) Tighten  
locknut.

NOTE

Leave slot in adjusting screw  
perpendicular to keylever  
extensions.

(5) Local Carriage  
Return. Adjust local carriage  
return as follows:

(a) Refer to  
figure 6-143.

(b) With cover  
in place and type box to the  
right, depress LOC CR key:  
type box should return to the  
left margin.

(c) To release  
the carriage return clutch,  
keylever extension should engage  
the adjusting screw by at least  
half the width of the keylever  
extension.

(d) To adjust,  
loosen the locknut and turn the  
adjusting screw.

(e) Tighten  
locknut.

NOTE

Leave slot in adjusting screw  
perpendicular to keylever  
extension.

e. Latch and Hinge  
Mechanism Adjustments. Perform  
latch and hinge mechanism  
adjustments in accordance with  
the following paragraphs.

(1) Cover Latch.  
Adjust cover latch as follows:

(a) Refer to  
figure 6-144.

(b) Remove  
typing unit, and place cover on  
base.

(c) Latches  
should hold cover snugly in  
place by tight fit against  
latching posts.

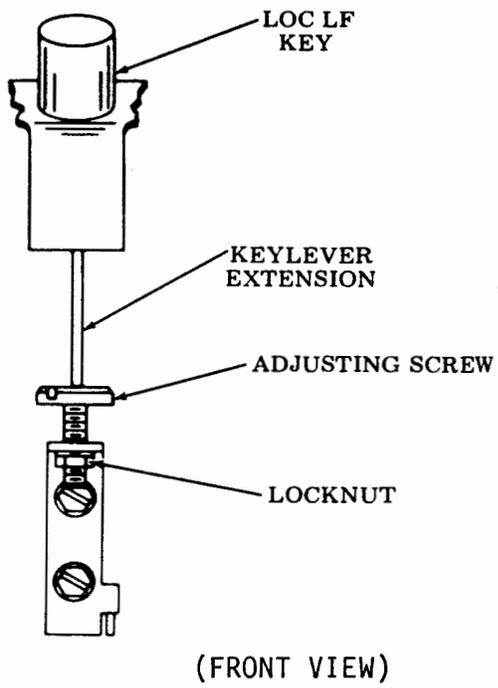
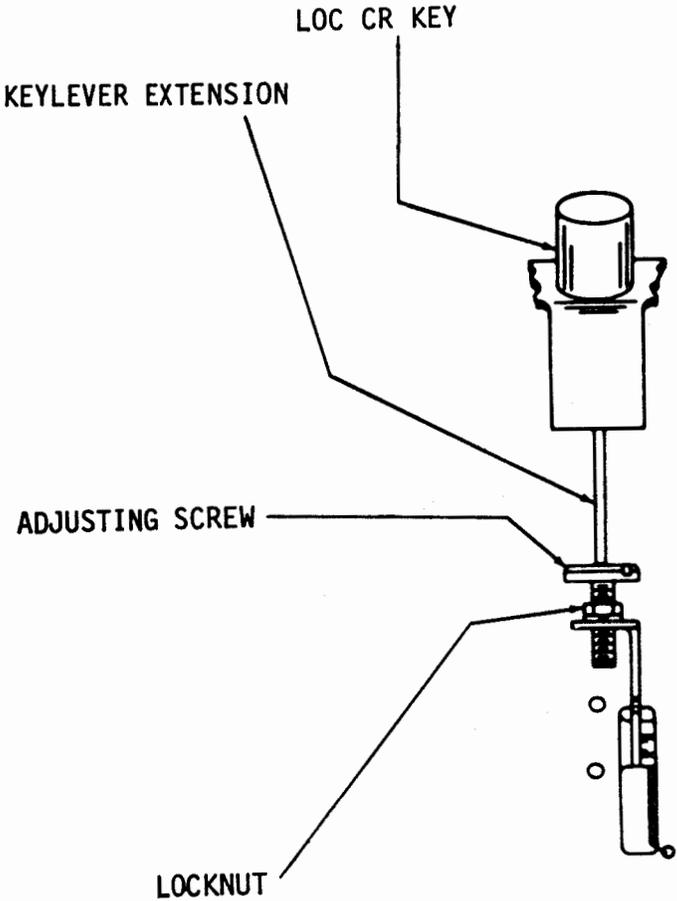


Figure 6-142. Local Line Feed



(FRONT VIEW)

Figure 6-143. Local Carriage Return

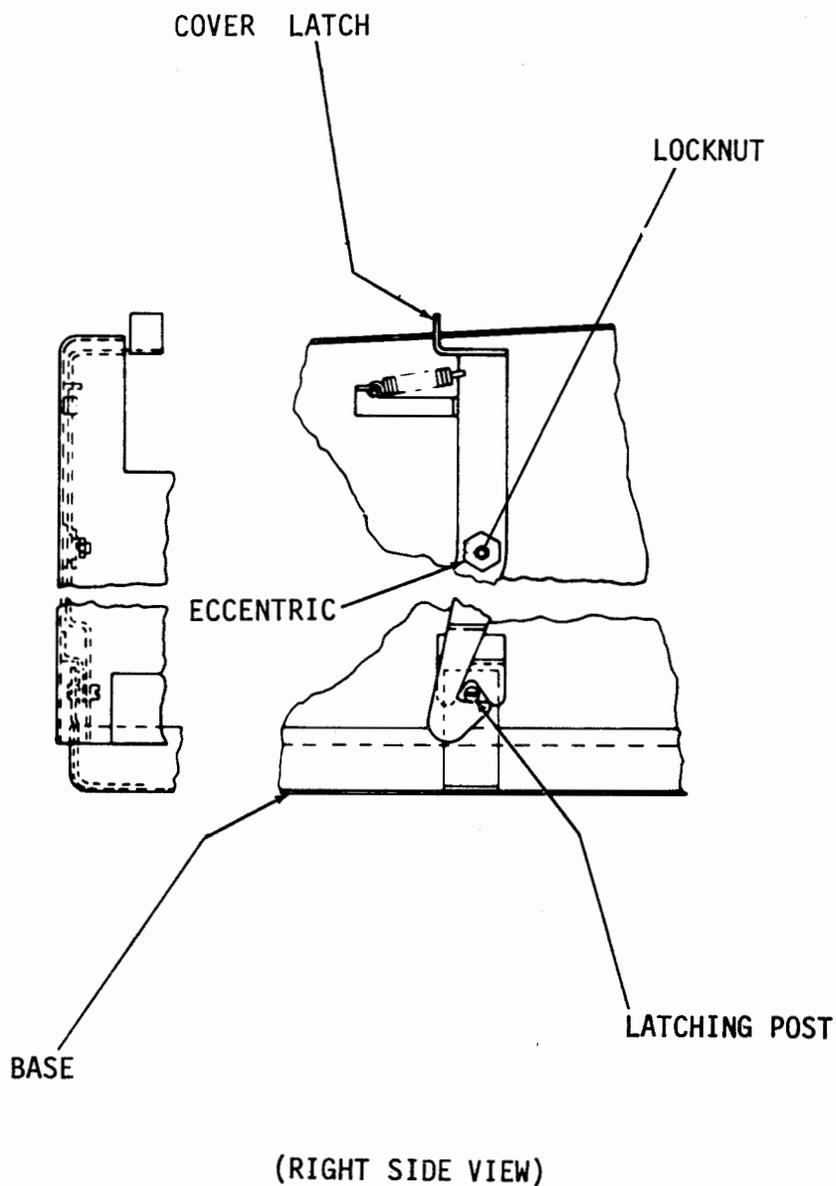


Figure 6-144. Cover Latch

(d) If not, loosen locknuts which hold eccentrics in place.

(e) Adjust eccentrics for correct fit.

(f) Tighten locknuts.

(2) Window Door Hinge. Adjust window door hinge as follows:

(a) Refer to figure 6-145.

(b) Loosen mounting nuts.

(c) Position hinge brackets so that window door conforms with curvature of cover when dome is latched.

(d) Tighten mounting nuts.

(3) Dome Hinge Clearance. Adjust dome hinge clearance as follows:

(a) Refer to figure 6-146.

(b) With dome closed, measure clearance between dome and cover: it should be 0.010 inch (minimum) to 0.062 inch (maximum).

(c) Loosen cover mounting nuts.

(d) Raise or lower hinges to match specifications.

(e) Tighten mounting nuts.

(4) Dome Centering. Adjust dome centering as follows:

(a) Refer to figure 6-146.

(b) With dome closed, clearance between dome and cover should measure from 5/32 inch (minimum) to 1/4 inch (maximum), and sides of dome should be approximately centered and parallel on cover.

(c) To adjust, loosen mounting nuts and position dome.

(d) Tighten mounting nuts.

(5) Dome Latch. Adjust dome latch as follows:

(a) Refer to figure 6-147.

(b) With dome closed, latch should engage cover by 0.031 inch (minimum) to 0.085 inch (maximum). Latches should be parallel, and freely engage underside of cover.

(c) Loosen mounting screws, and position mounting brackets to meet requirements.

(d) Tighten mounting screws.

(6) Paper Guide. Adjust paper guide as follows:

(a) Refer to figure 6-148.

(b) Measure clearance between lower edges of paper guide and dome: this should be 3/8 inch (minimum) to 15/32 inch (maximum).

(c) To adjust, loosen mounting nuts and position paper guide parallel with lower edge of dome.

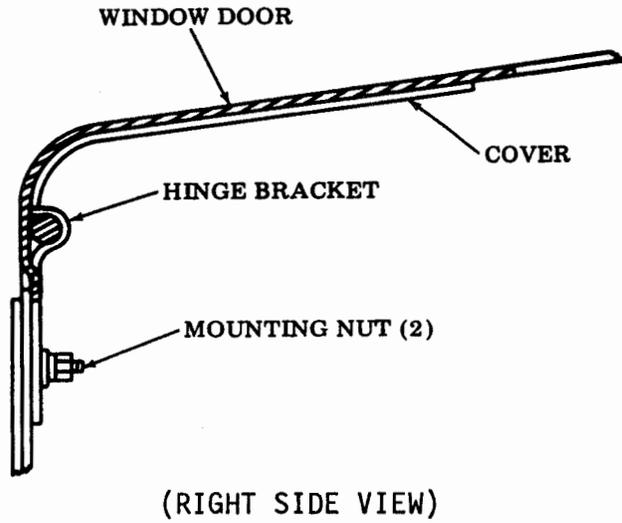


Figure 6-145. Window Door Hinge

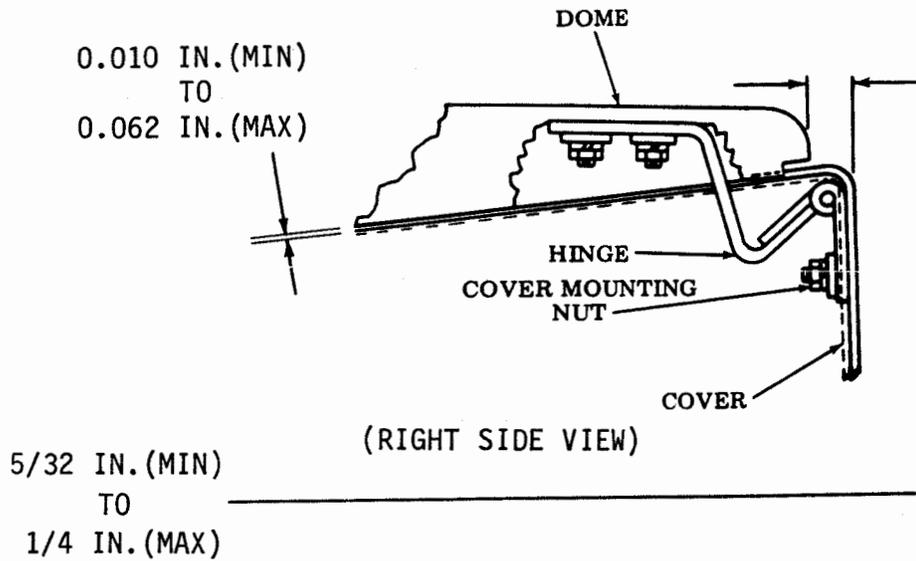


Figure 6-146. Dome Hinge Clearance and Dome Centering

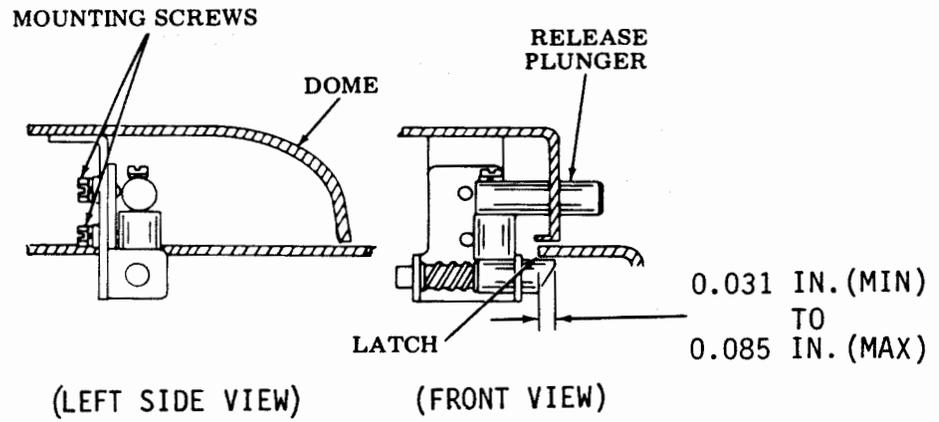


Figure 6-147. Dome Latch

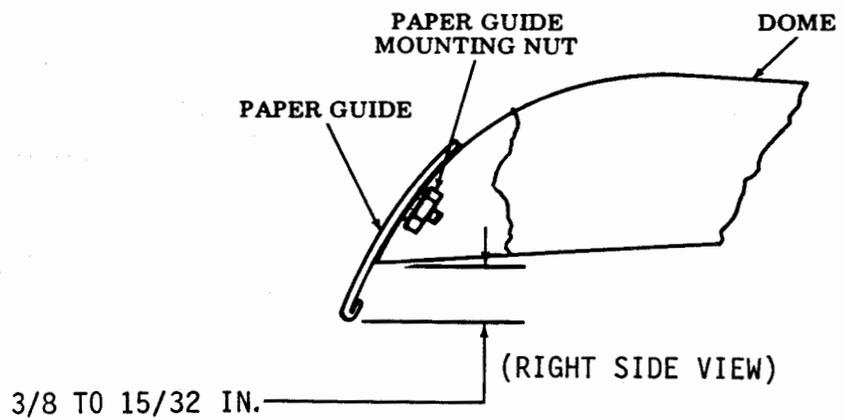


Figure 6-148. Paper Guide

(d) Tighten mounting nuts.

(7) Window. Adjust window as follows:

(a) Refer to figure 6-149.

(b) With window door closed and dome latched, measure clearance between window edge and paper guide: this should be 0.187 inch (minimum) and 0.218 inch (maximum).

(c) Loosen clamp screws and position window to meet requirements.

(d) Tighten clamp screws.

NOTE

Paper guide should clear window when dome is opened. If not, refine Paper Guide adjustment, paragraph 6-4.1b(6).

(8) Keyboard Hood (KSR Only). Adjust keyboard hood as follows:

(a) Refer to figure 6-150.

(b) As gauged by eye, bottom of keyboard hood should be within 1/16 inch of cover bottom.

(c) Loosen mounting nuts, and position hood (cover removed from base).

(d) Tighten mounting nuts.

(9) Base Hood (RO Only). Adjust base hood as follows:

(a) Refer to figure 6-151.

(b) As gaged by eye, bottom of base hood should be within 1/16 inch of cover bottom.

(c) Loosen mounting nuts and position base hood (cover removed from base).

(d) Tighten mounting screws.

(10) Line Guide. Adjust line guide as follows:

(a) Refer to figure 6-152.

(b) As gauged by eye, line guide should be parallel with bottom of window door.

(c) Loosen mounting screws and position line guide mounting bracket.

(d) Tighten mounting screws.

6-4.2 KEYBOARD UNIT ADJUSTMENT (LOW-LEVEL).

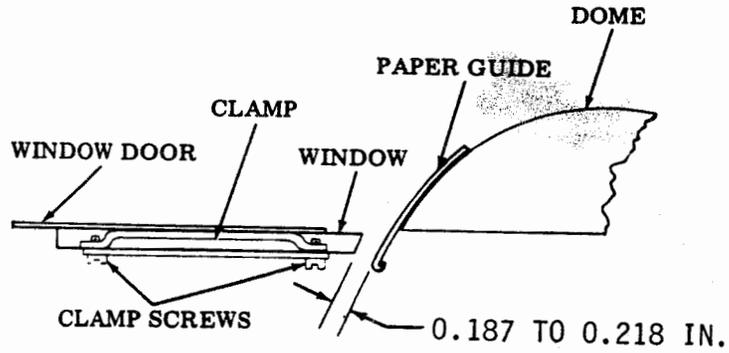
a. Keyboard Transmitting Mechanism Adjustments. Perform keyboard transmitting mechanism adjustments in accordance with the following paragraphs.

(1) Shutter Window Gap. Adjust shutter window gap as follows:

(a) Refer to figure 6-153.

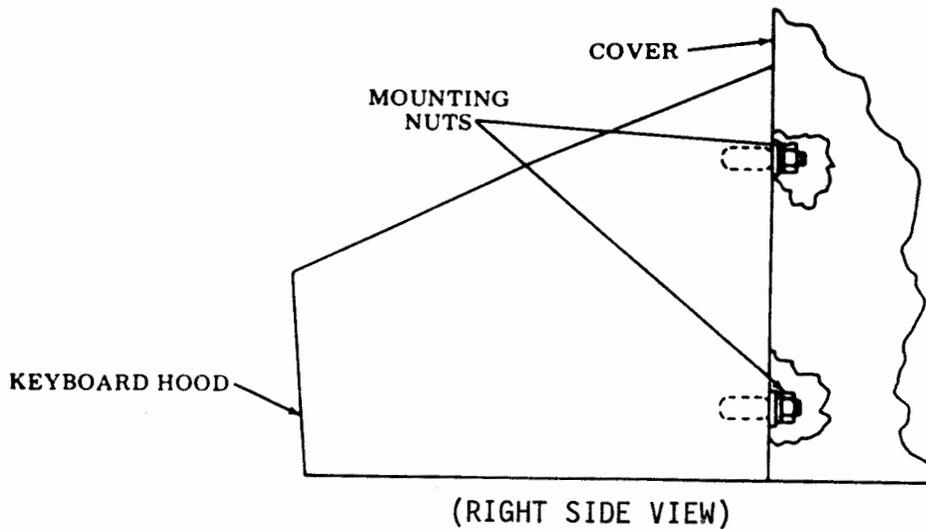
(b) Depress ITRS key to move all T levers to their lowermost position

(c) Lift up first and last shutter with approximately 1 ounce of force.



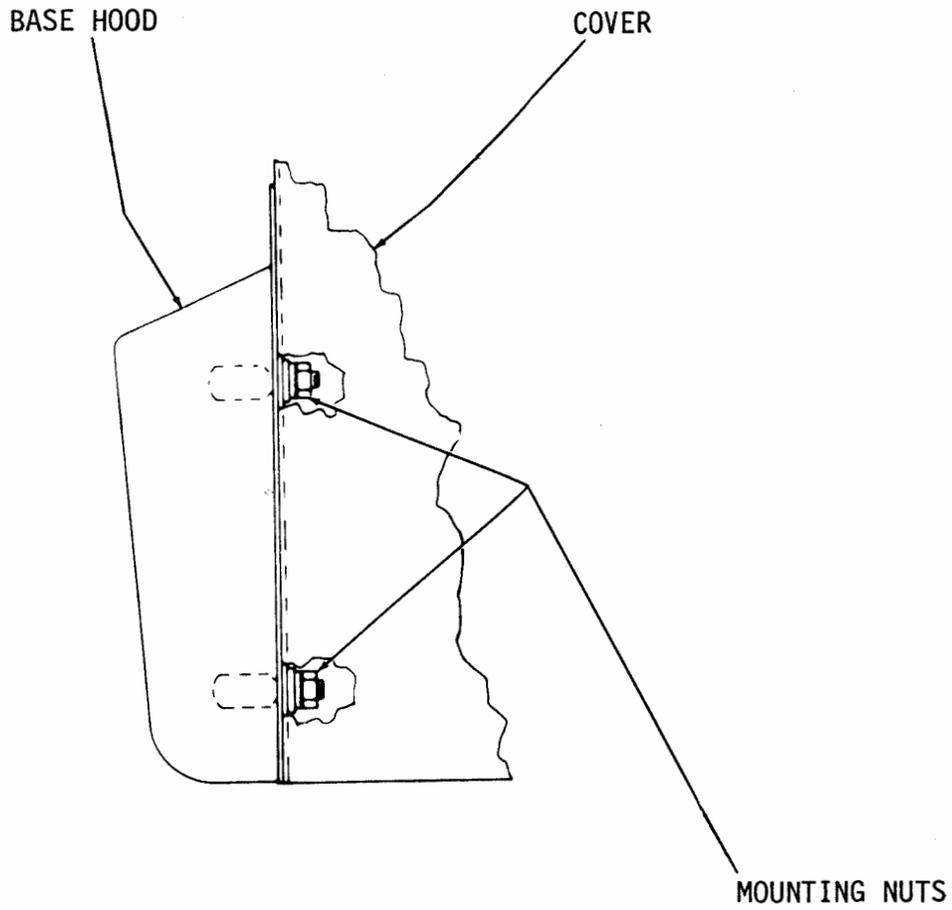
(RIGHT SIDE VIEW)

Figure 6-149. Window



(RIGHT SIDE VIEW)

Figure 6-150. Keyboard Hood (KSR Set Only)



(RIGHT SIDE VIEW)

Figure 6-151. Base Hood (RO Set Only)

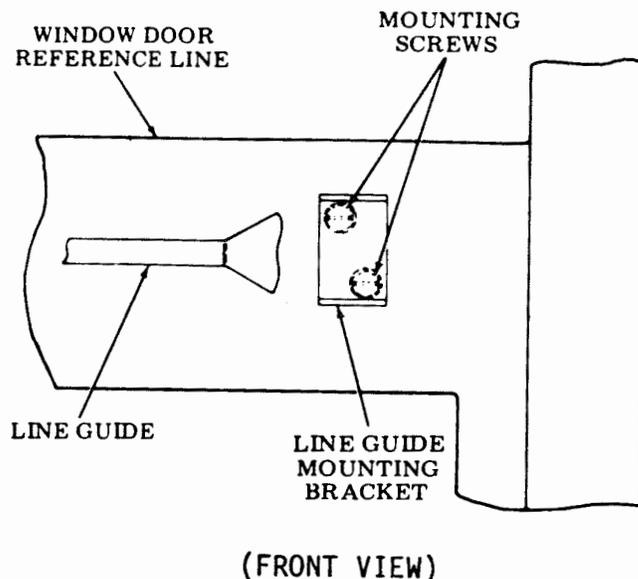


Figure 6-152. Line Guide

(d) Loosen adjusting screws and position lamp assembly to meet requirement: there should be from 0.065 inch (minimum) to 0.075 inch (maximum) gap between upper end of shutter window and shutter gate.

(2) Universal Link.  
Adjust universal link as follows:

(a) Refer to figure 6-154.

(b) Push universal lever down until latched by latchlever.

(c) Measure clearance between universal link and frame: it should be between 0.089 inch (minimum) and 0.013 inch (maximum).

(d) Insert screwdriver through front and bend tab to adjust.

(3) Universal Link Spring. Adjust universal link spring as follows:

(a) Refer to figure 6-154.

(b) With keyboard tripped, use spring scale to measure force required to start universal link moving: force should be 1/2 ounce (minimum) to 1-1/4 ounce (maximum).

(c) If force required does not match specifications, replace spring.

(4) Keyboard Reset Lever Spring. Adjust keyboard reset lever spring as follows:

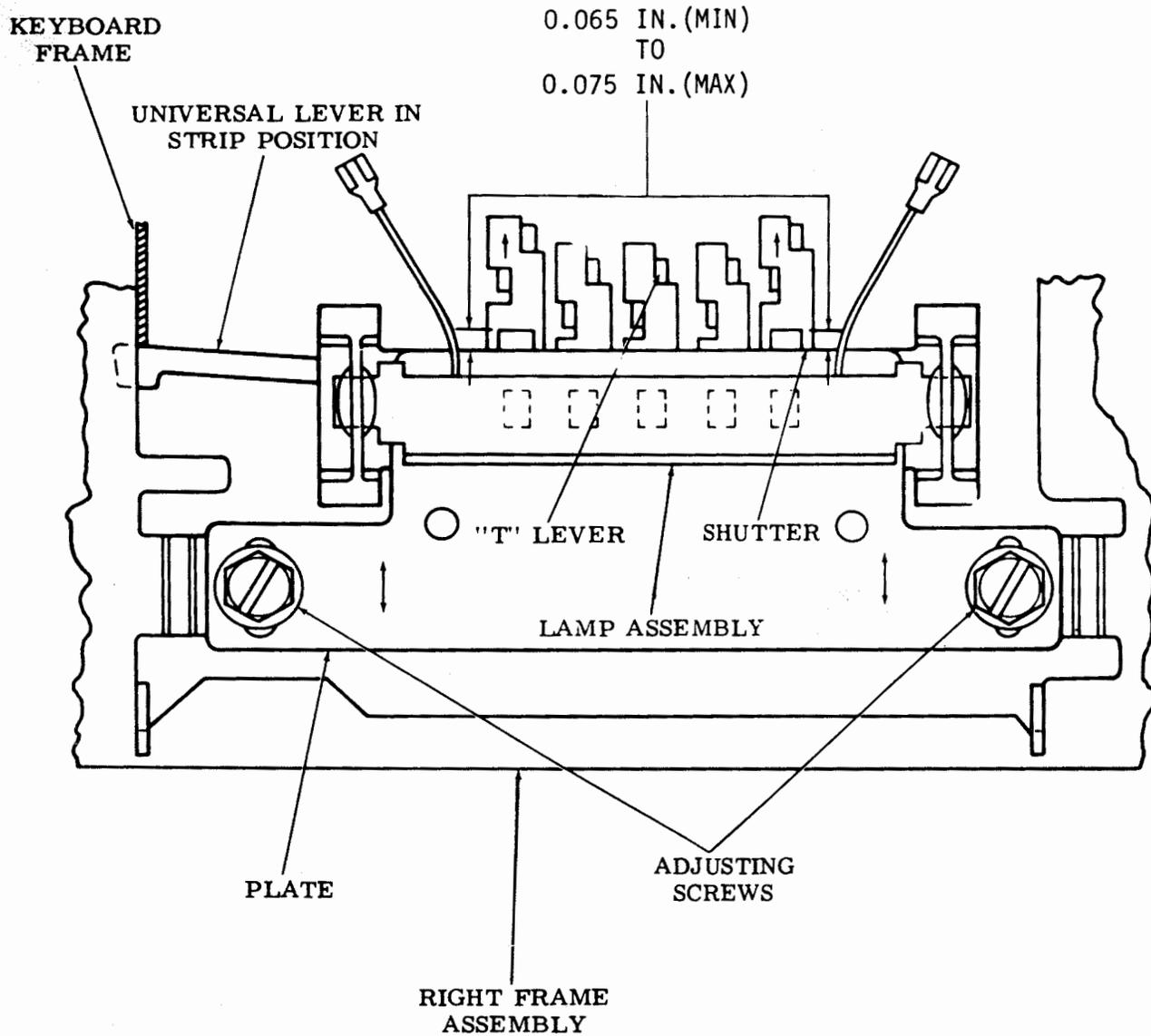


Figure 6-153. Shutter Window Gap

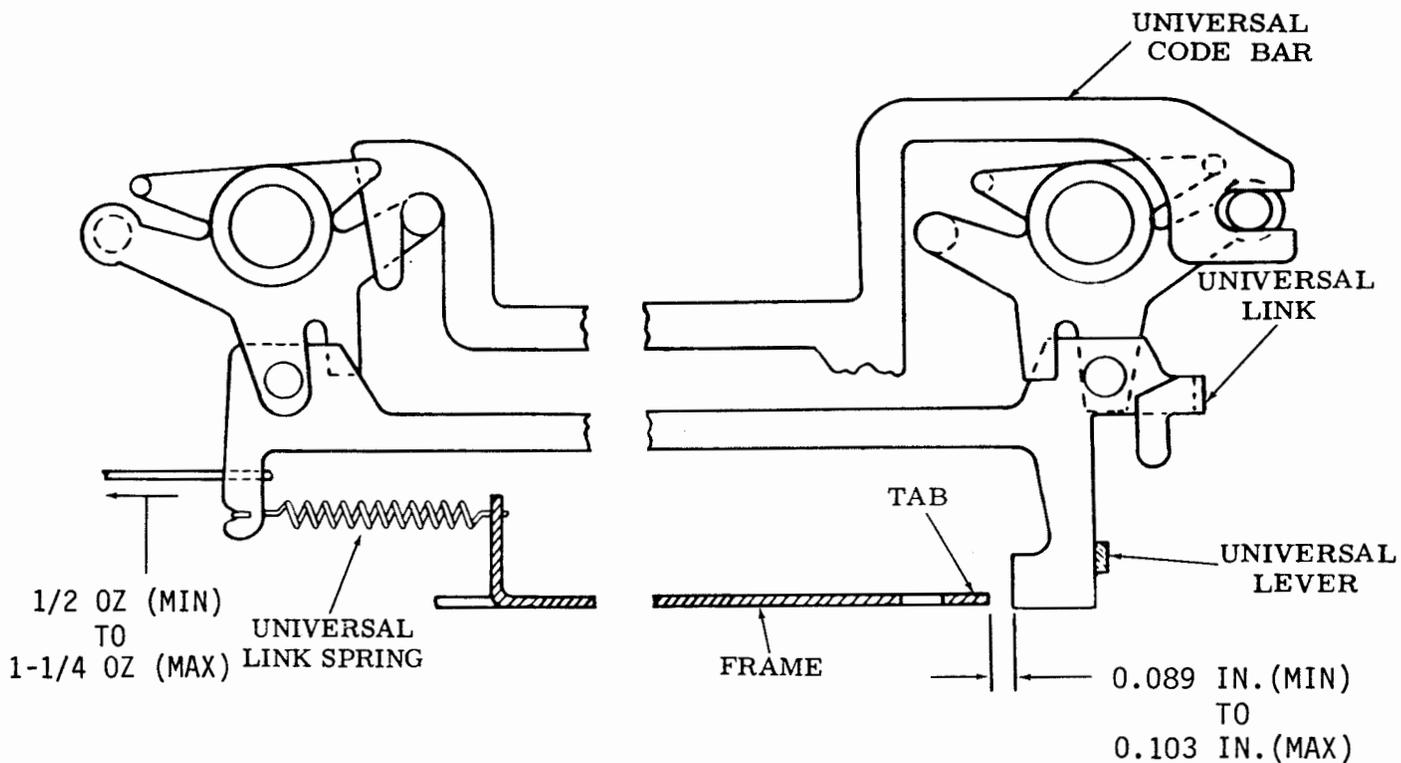


Figure 6-154. Universal Link and Universal Link Spring

(a) Refer to figure 6-155.

(b) With lever latched, use spring scale to measure force required to start lever moving downward: force should be between 24 ounces (minimum) and 28 ounces (maximum).

(c) If force required does not match specifications, replace spring.

b. Distributor Mechanism Adjustments. Perform distributor mechanism adjustments in accordance with the following paragraphs.

(1) Clutch Drum  
Adjust clutch drum as follows:

(a) Refer to figure 6-156.

(b) With clutch manually disengaged and pressed against clutch drum, measure distance between ring and hub protrusion: this should be between 0.005 inch (minimum) and 0.010 inch (maximum).

(c) To adjust, loosen clutch drum mounting screw and position drum on its shaft.

NOTE

Do not distort ring when measuring clearance.

(d) Gauge (by eye) to see that drive arm is parallel to surface of drum assembly.

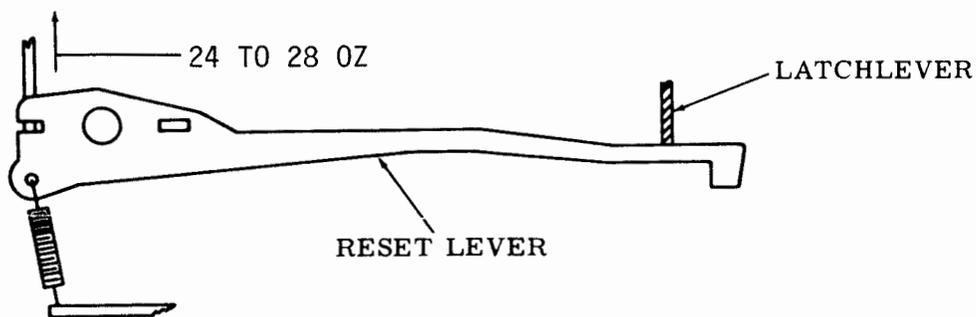


Figure 6-155. Keyboard Reset Lever Spring

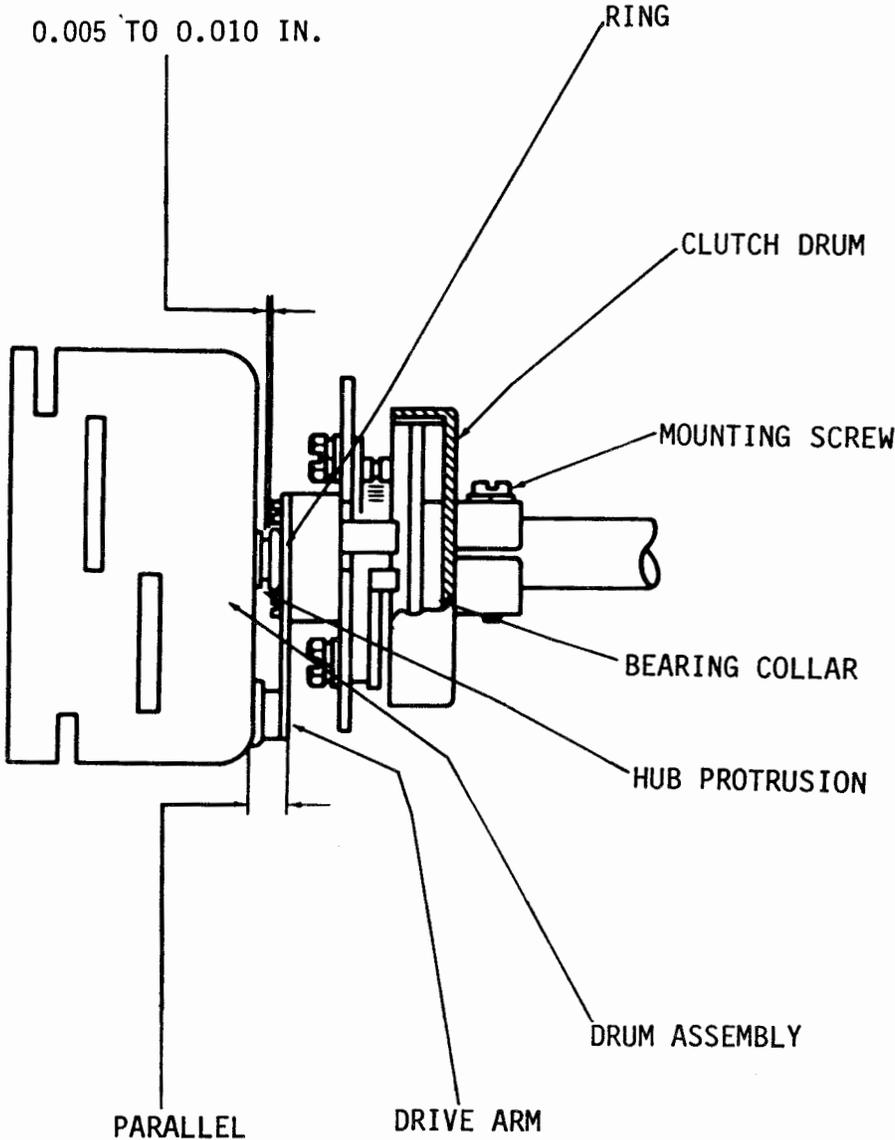


Figure 6-156. Clutch Drum

(e) If not, bend drive arm by hand to meet requirement.

NOTE

Clutch shoes should fully engage drum after adjustment.

(2) Clutch Shoe Lever. Adjust clutch shoe lever as follows:

(a) Refer to figure 6-157.

(b) With clutch engaged, measure clearance between clutch shoe lever and its stop lug.

(c) Repeat same measurement with clutch disengaged.

(d) Measurement b. (clutch engaged) should be from 0.055 inch (minimum) to 0.085 inch (maximum) greater than measurement c.

(e) To adjust, loosen adjusting screws and rotate disc.

(f) Tighten screws.

(3) Clutch Trip Lever. Adjust clutch trip lever as follows:

(a) Refer to figure 6-158.

(b) Clutch trip lever should engage clutch shoe lever by full thickness of the shoe lever.

(c) To adjust, disengage distributor clutch and rotate eccentric post to meet requirement.

(4) Magnet Plate. Adjust magnet plate as follows:

(a) Refer to figure 6-159.

(b) Place distributor in stop position, control lever in remote, and latch bail against armature.

(c) Measure clearance between latch bail and trip lever: it should be from 0.020 inch (minimum) and 0.040 (maximum).

(d) To adjust, loosen both mounting screws and adjust gap by moving pry points.

(e) Tighten mounting screws.

NOTE

If distributor is mounted to keyboard base and mechanically linked to keyboard, depress key to trip keyboard.

(5) Distributor Gear. Adjust distributor gear as follows:

(a) Refer to figure 6-160.

(b) There should be from 0.002 inch (minimum) and 0.005 inch (maximum) backlash between pinion and driven gear.

(c) To adjust, loosen four adjusting screws and position distributor assembly to meet requirement.

(d) Tighten adjusting screws.

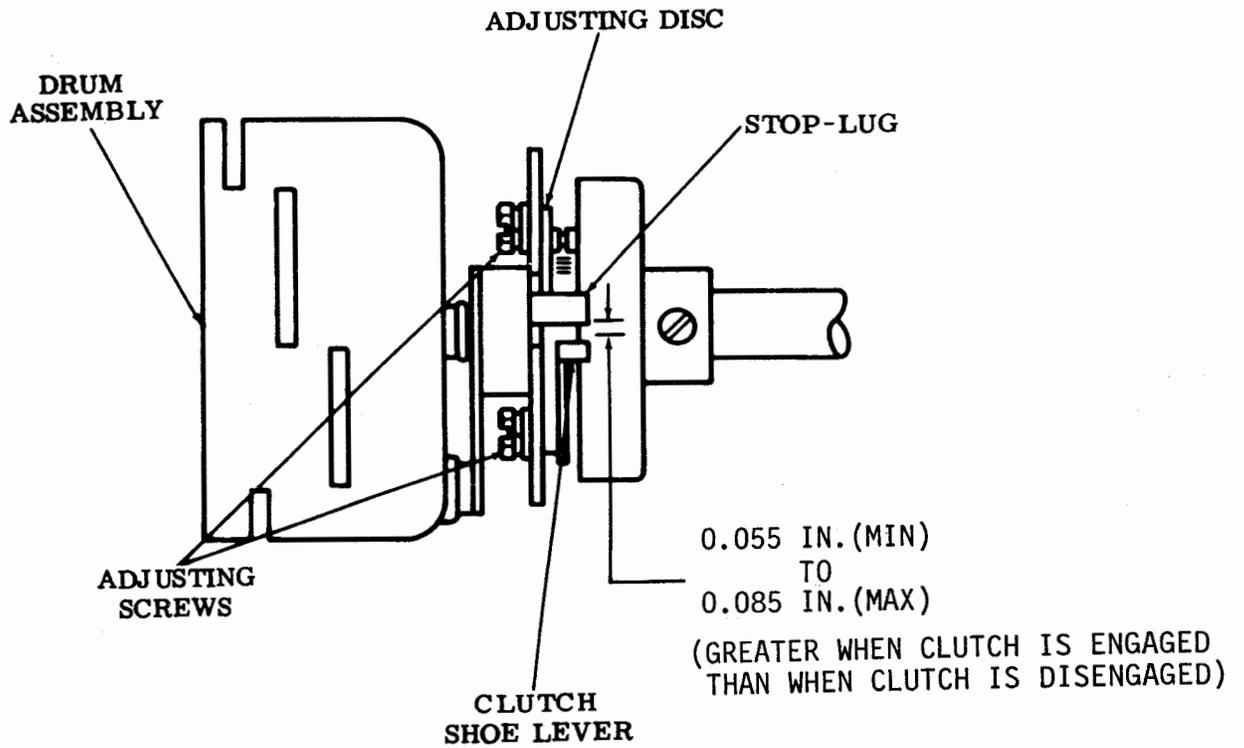


Figure 6-157. Clutch Shoe Lever

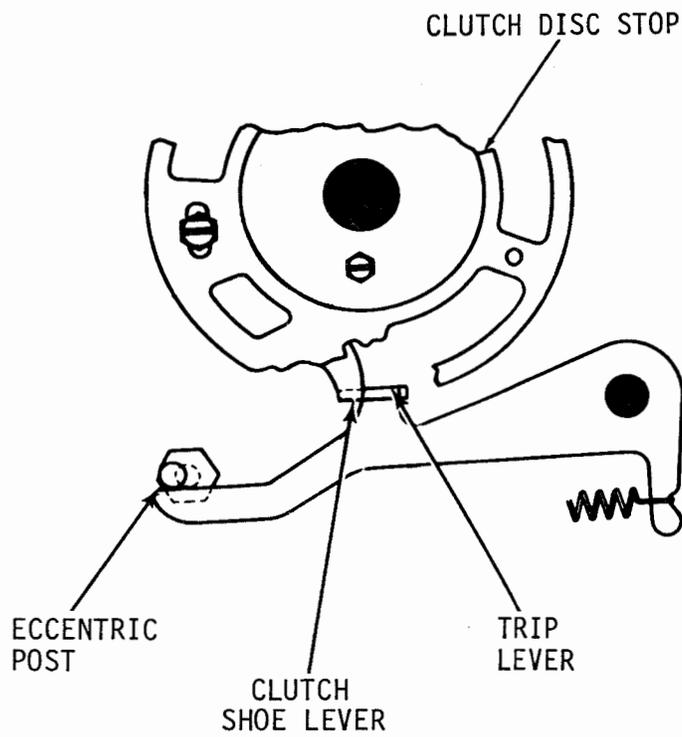


Figure 6-158. Clutch Trip Lever

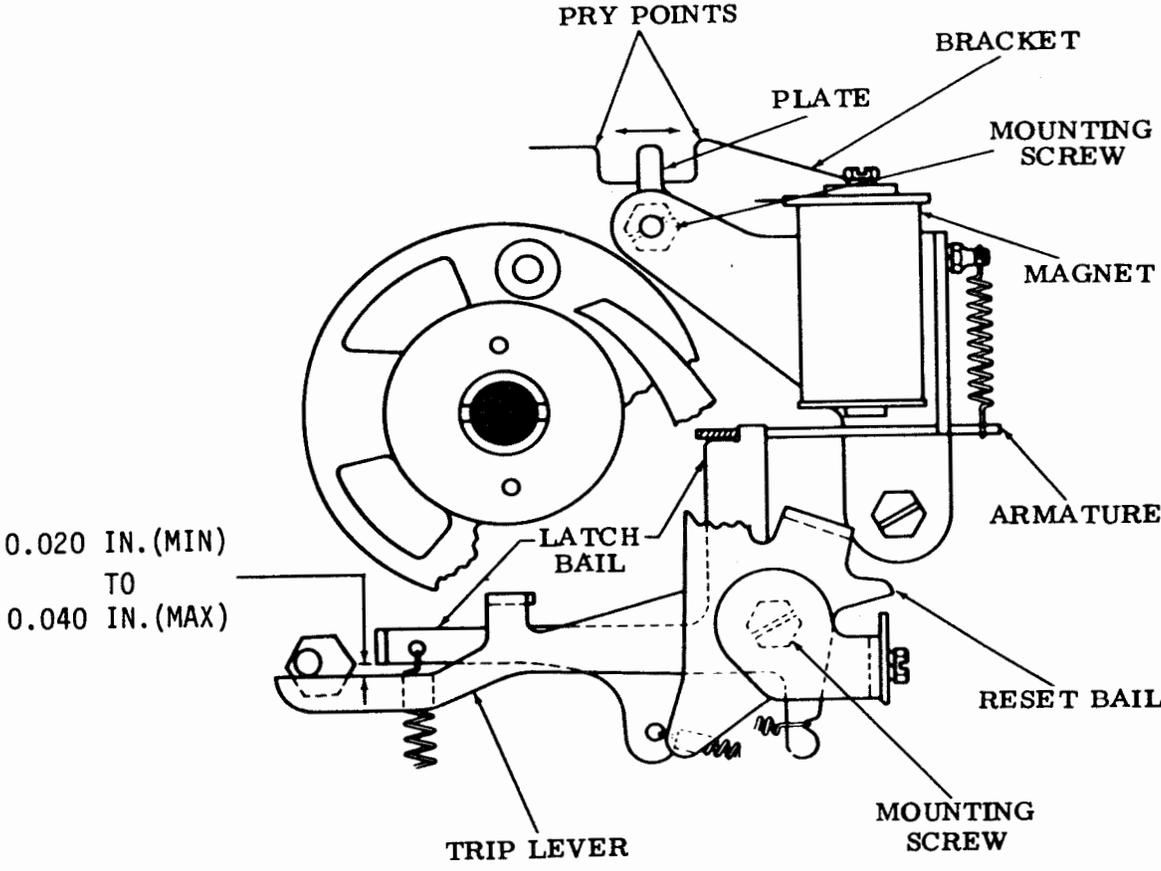


Figure 6-159. Magnet Plate

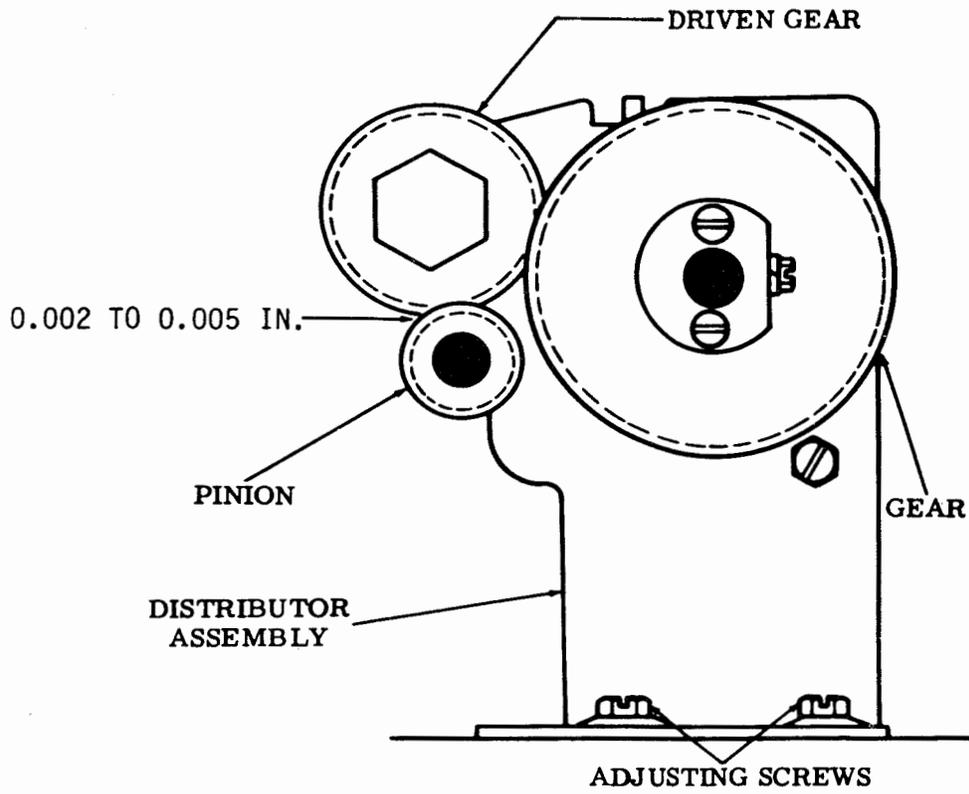


Figure 6-160. Distributor Gear

NOTE

Distributor shaft and pinion gear shaft should remain parallel.

(6) Reset Lever.

Adjust reset lever as follows:

(a) Refer to figure 6-161.

(b) Rotate distributor so that roller contacts reset bail at high point of travel.

(c) Measure clearance between latchlever and reset lever: this should be from 0.030 inch (minimum) and 0.045 inch (maximum).

(d) Measure clearance between base and links: this should be from 0.050 inch (minimum) to 0.090 inch (maximum).

(e) To adjust, loosen adjusting screws and position link.

(f) Tighten screws.

(7) Latch Bail.

Adjust latch bail as follows:

(a) Refer to figure 6-162.

(b) Place distributor in stop position, keyboard in reset position, and control lever in remote position.

(c) Measure clearance between latch bail and the armature: this should be between 0.010 inch (minimum) and 0.018 inch (maximum).

(d) Loosen mounting screw and move adjusting plate so that it contacts reset bail.

(e) Tighten screw.

(8) Clutch Shoe Lever Spring. Adjust clutch shoe lever spring as follows:

(a) Refer to figure 6-163.

(b) With clutch engaged and cam disc held to prevent turning, use spring scale to pull shoe lever tangent to clutch: it should require a force of from 15 ounces (minimum) to 20 ounces (maximum) to pull lever into contact with stop lug.

(9) Clutch Shoe Spring. Adjust clutch shoe spring as follows:

(a) Refer to figure 6-164.

NOTE

This adjustment should not be performed unless spring tension is suspect, since adjustment necessitates removal of clutch from shaft.

(b) Remove drum; apply spring scale to primary shoe tangent to friction surface.

(c) It should require from 3 ounces (minimum) to 5 ounces (maximum) to start primary shoe moving away from secondary shoe.

(10) Armature Spring. Adjust armature spring as follows:

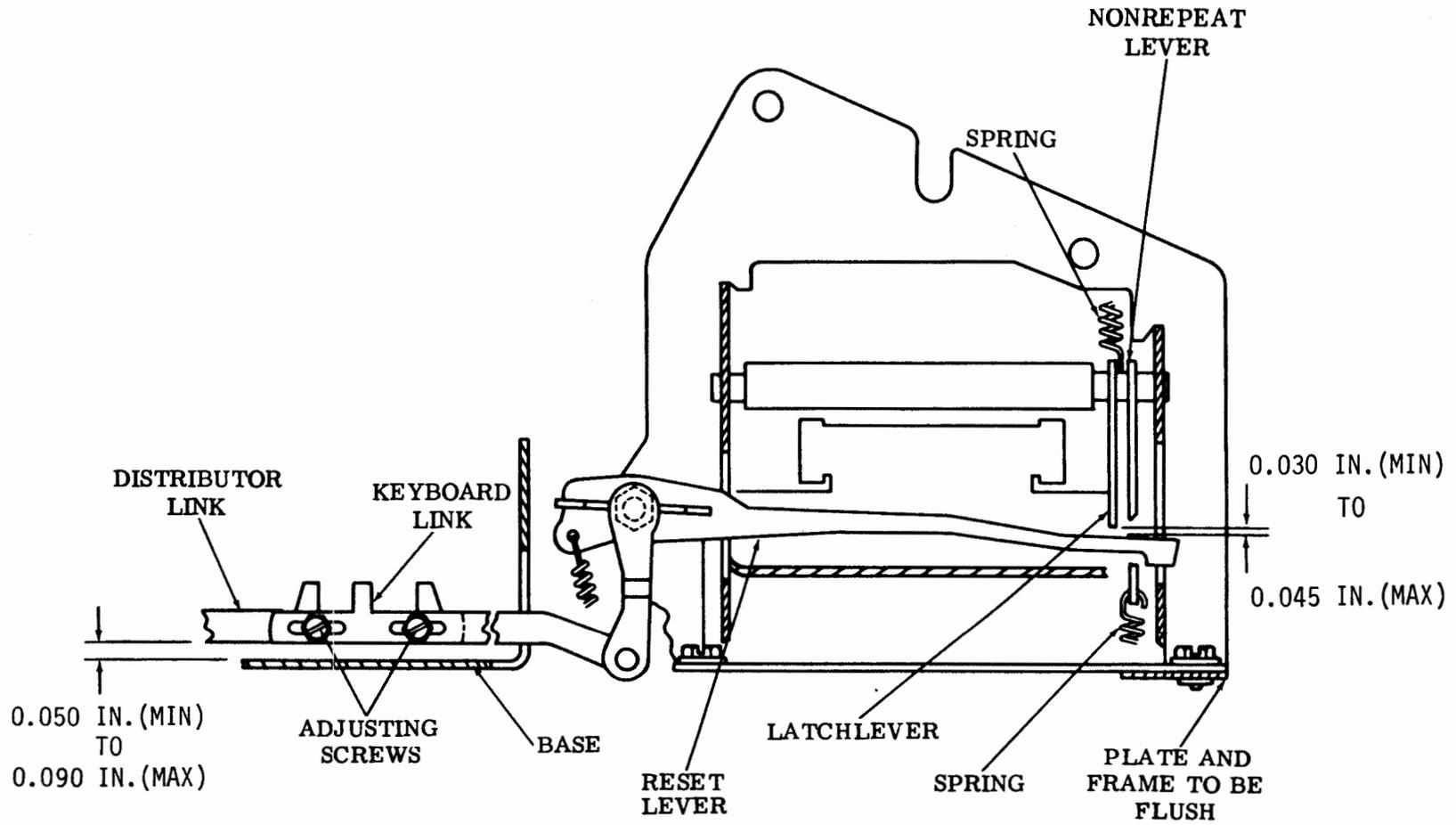


Figure 6-161. Reset Lever

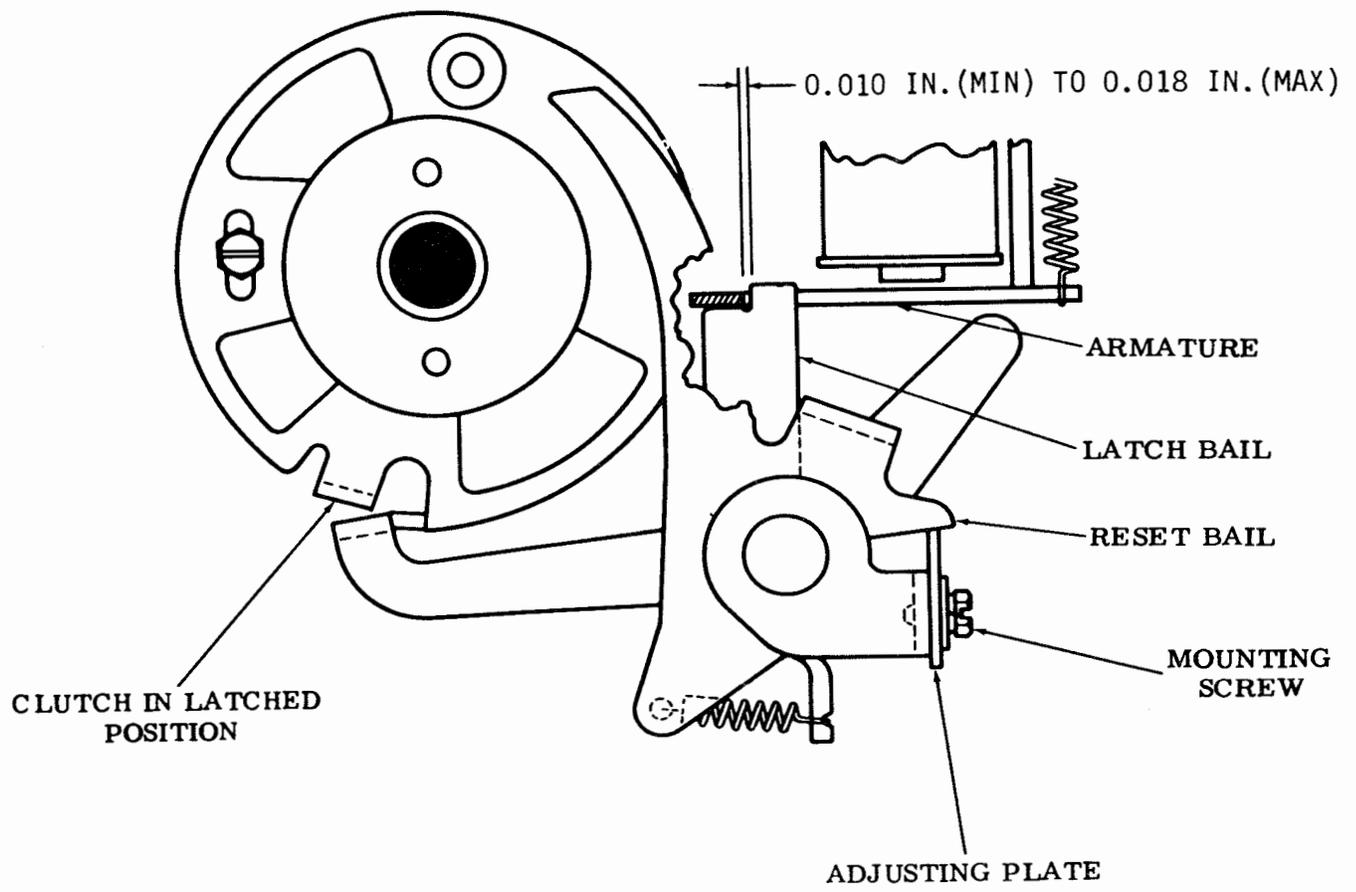


Figure 6-162. Latch Bail

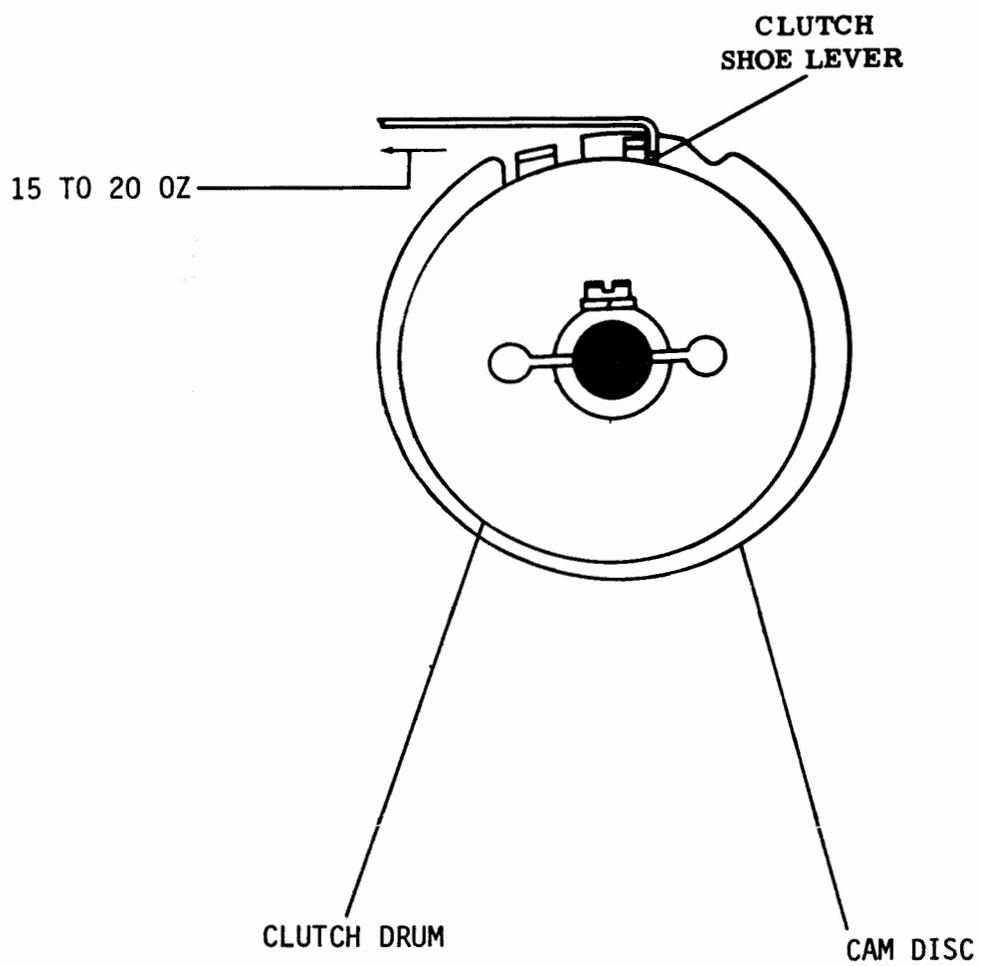


Figure 6-163. Clutch Shoe Lever Spring

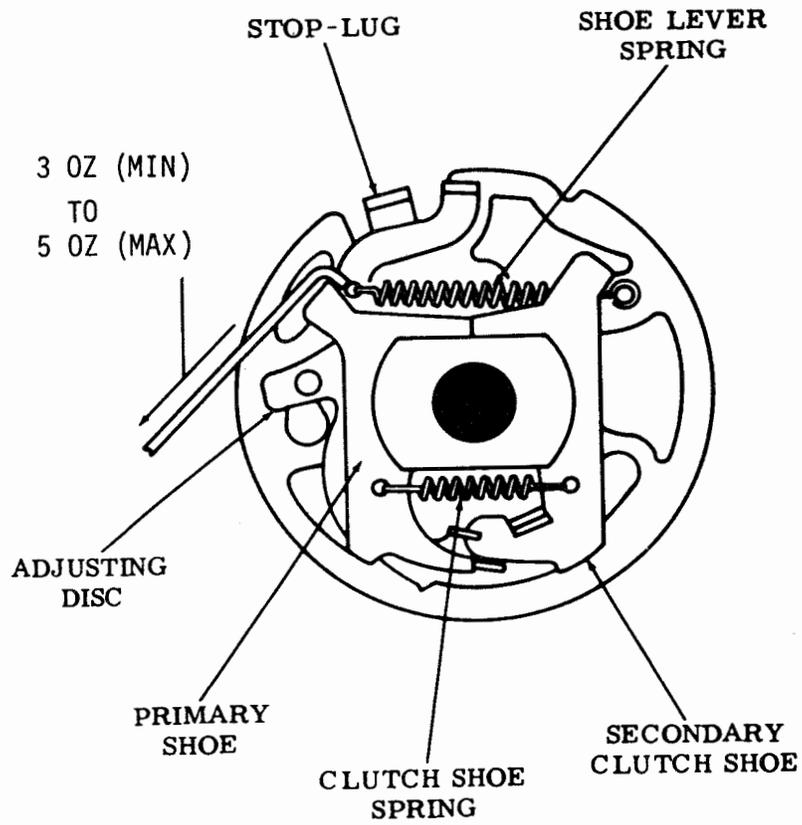


Figure 6-164. Clutch Shoe Spring

(a) Refer to figure 6-165.

(b) Unhook spring from post.

(c) Use spring scale to pull spring to installed length: this should require from 6 ounces (minimum) to 7-1/2 ounces (maximum).

(11) Latch Bail Spring. Adjust latch bail spring as follows:

(a) Refer to figure 6-165.

(b) Use spring scale to measure force required to start latch bail moving: this should be from 3 ounces (minimum) to 4 ounces (maximum).

(12) Latchlever Spring. Adjust latchlever spring as follows:

(a) Refer to figure 6-165.

(b) Use spring scale to measure force required to start latchlever moving: this should be from 2-1/2 ounces (minimum) to 4 ounces (maximum).

(13) Magnet Blocking Lever Spring. Adjust magnet blocking lever spring as follows:

(a) Refer to figure 6-165.

(b) Use spring scale to measure force required to start blocking lever moving: this should be between 20 ounces (minimum) to 26 ounces (maximum).

(14) Trip Lever Spring. Adjust top lever spring as follows:

(a) Refer to figure 6-165.

(b) Use spring scale to measure force necessary to start trip lever moving: this should be from 3 ounces (minimum) to 5 ounces (maximum).

NOTE

Failure to meet requirements in Items (10 through (14) warrants replacement of specific springs.

SECTION II - ADJUSTMENTS  
(VARIABLE FEATURES)

6-5. TYPING UNIT ADJUSTMENTS. The following paragraphs describe typing unit adjustments: Variable Feature CPP Teletypewriter sets. (Low-level adjustments apply only to Basic Units).

a. Answer-Back Mechanism Adjustment. Perform answer-back mechanism adjustment in accordance with the following paragraph. Adjust "figures" stunt box contact as follows:

(1) Refer to figure 6-166.

(2) With stunt box mounted on typing unit, manually set up letters combination on typing unit selector.

(3) Rotate typing unit main shaft until function lever is in extreme forward position toward contact insulator.

(4) Rotate typing unit main shaft until function

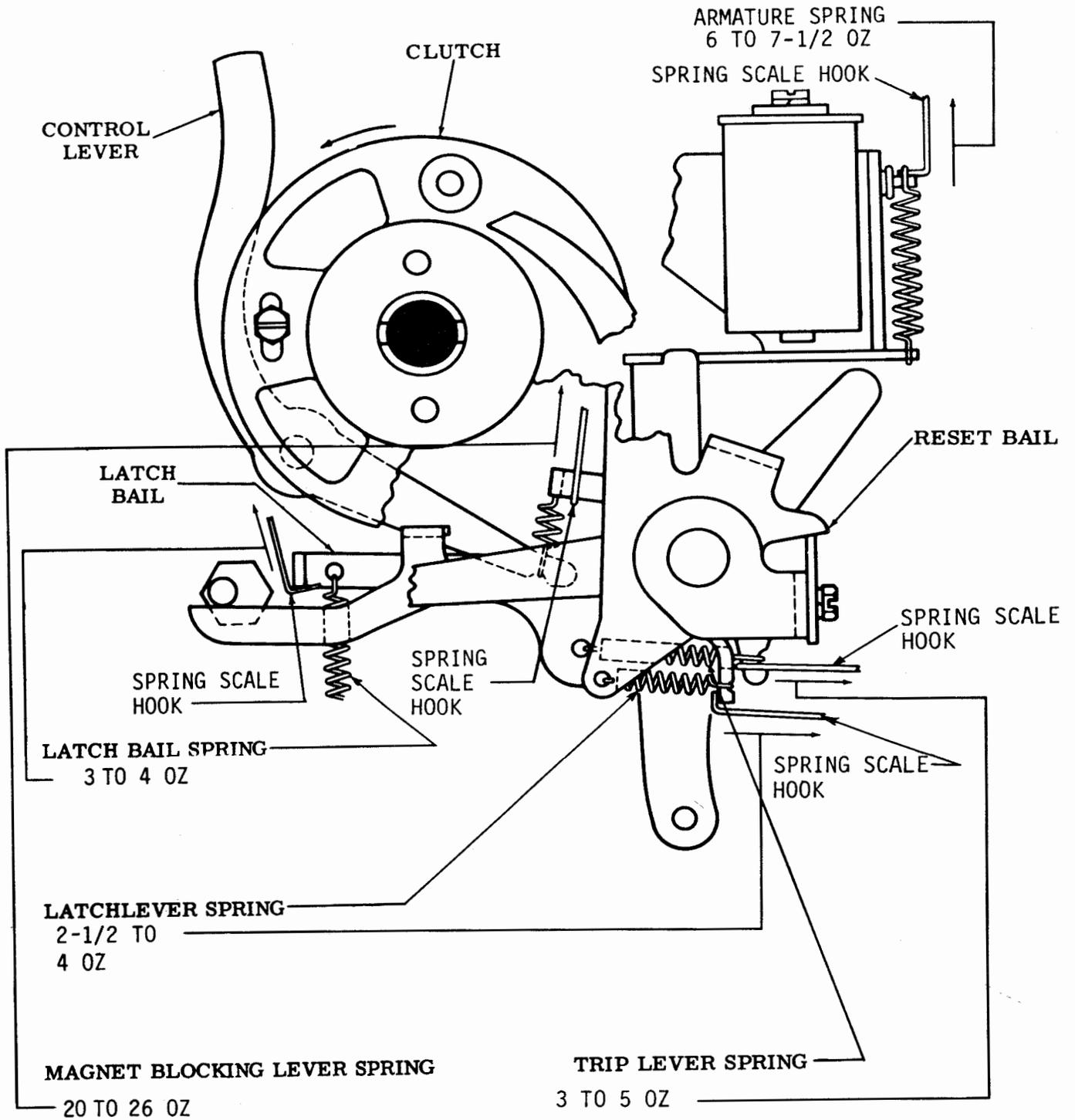


Figure 6-165. Armature, Latch Bail, Latchlever, Magnet Blocking Lever, and Trip Lever Springs

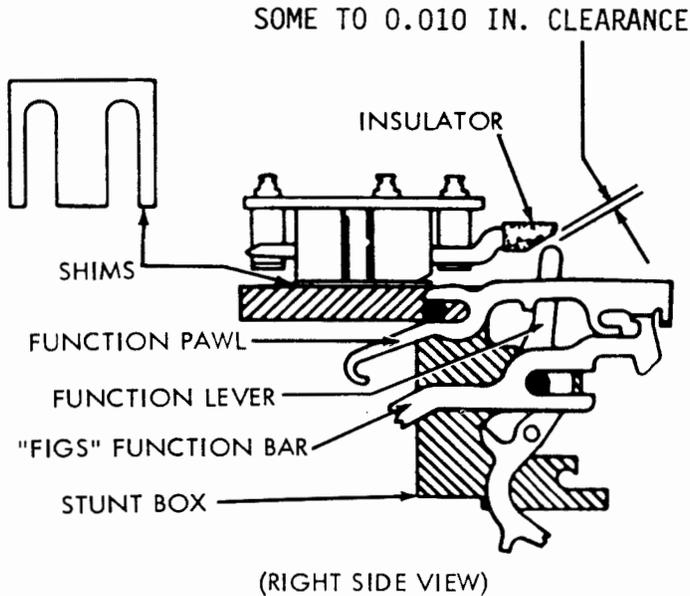


Figure 6-166. "Figures" Stunt Box Contact

lever is in extreme forward position toward contact insulator.

(5) Measure clearance between contact insulator and function lever. There should be some clearance not exceeding 0.010 inch.

(6) If clearance exceeds specified limits, loosen contact mounting screws and add or remove shims to obtain specified clearance.

(7) Tighten mounting screws.

b. Continuous Spacing Mechanism Adjustments. Perform continuous spacing mechanism

adjustments in accordance with the following paragraphs.

(1) Carriage Return Lever. Adjust carriage return lever as follows:

NOTE

Before making the following adjustment, check the carriage return lever adjustment. With the stunt box removed, the standard adjusting procedure cannot be followed. Refer to paragraph 6-3.1h(7) and use the procedures described in the following steps.

(a) Refer to figure 6-87.

(b) Place printing carriage on returned position.

(c) Trip function clutch and rotate main shaft until suppression bail is in extreme forward position.

(d) Locate spacing drum so carriage return bail rests against carriage return lever extension.

(e) Measure clearance between carriage return latch bail and carriage return lever. Clearance should be between 0.006 and 0.040 inch.

(f) If clearance exceeds specified limits, loosen clamp screw and position carriage return lever on carriage return latch bail to obtain specified clearance.

(g) Tighten clamp screw.

(2) Reset Bail Operating Spring. Adjust reset bail operating spring as follows:

(a) Refer to figure 6-167.

(b) Place function reset bail in forward position.

(c) Apply spring scale hook to connecting link.

(d) Force required to start bail moving should be between 2-1/4 and 3-1/2 pounds.

(e) If scale reading exceeds specified limits, install new spring.

(3) Suppression Bail Adjusting Bracket. Adjust suppression bail adjusting bracket as follows:

(a) Refer to figure 6-168.

(b) Rotate function clutch until suppression bail is in extreme forward position.

(c) Push carriage return and line feed function slide arms forward manually until carriage return and line feed levers are tripped.

(d) Ensure slide arms rest against slide arm brackets.

(e) Measure clearance between projection on carriage return slide arm and guide bars should be between 0.070 inch and 0.095 inch.

(f) If clearance exceed specified limits, loosen adjusting bracket clamp screw and adjust bracket to obtain specified clearance.

(g) Tighten clamp screw.

(h) Repeat steps (e), (f), and (g).

NOTE

When checking two stop clutches, check clearance with clutch in each position.

(4) Function Clutch Trip Lever. Adjust function clutch trip lever as follows:

(a) Refer to figure 6-169.

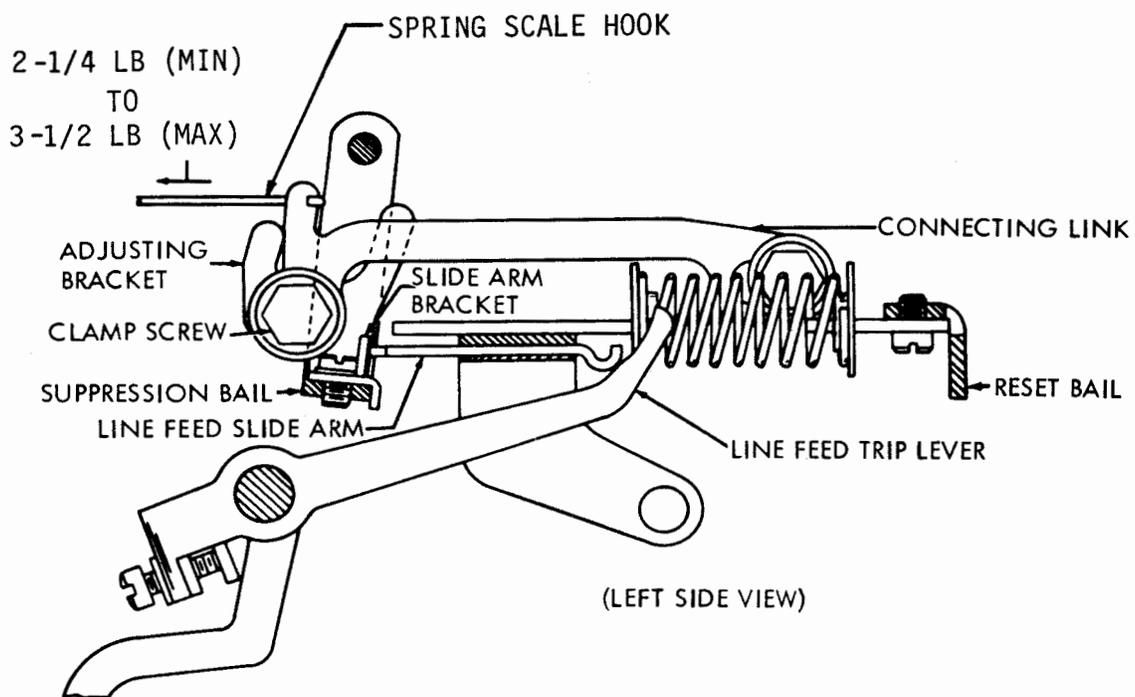


Figure 6-167. Reset Bail Operating Spring

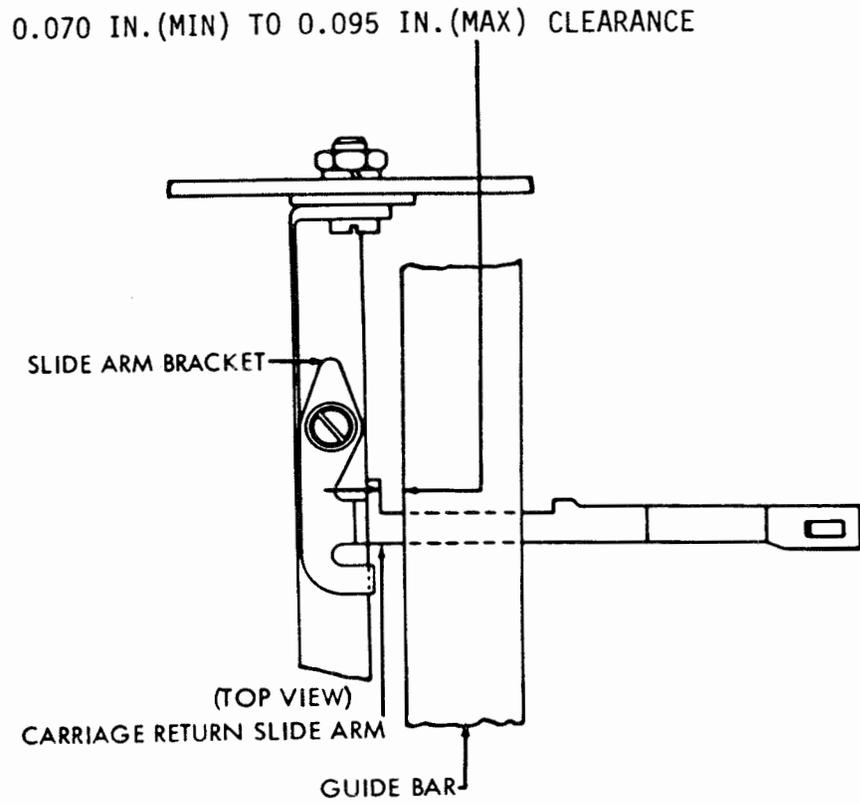


Figure 6-168. Suppression Bail Adjusting Bracket

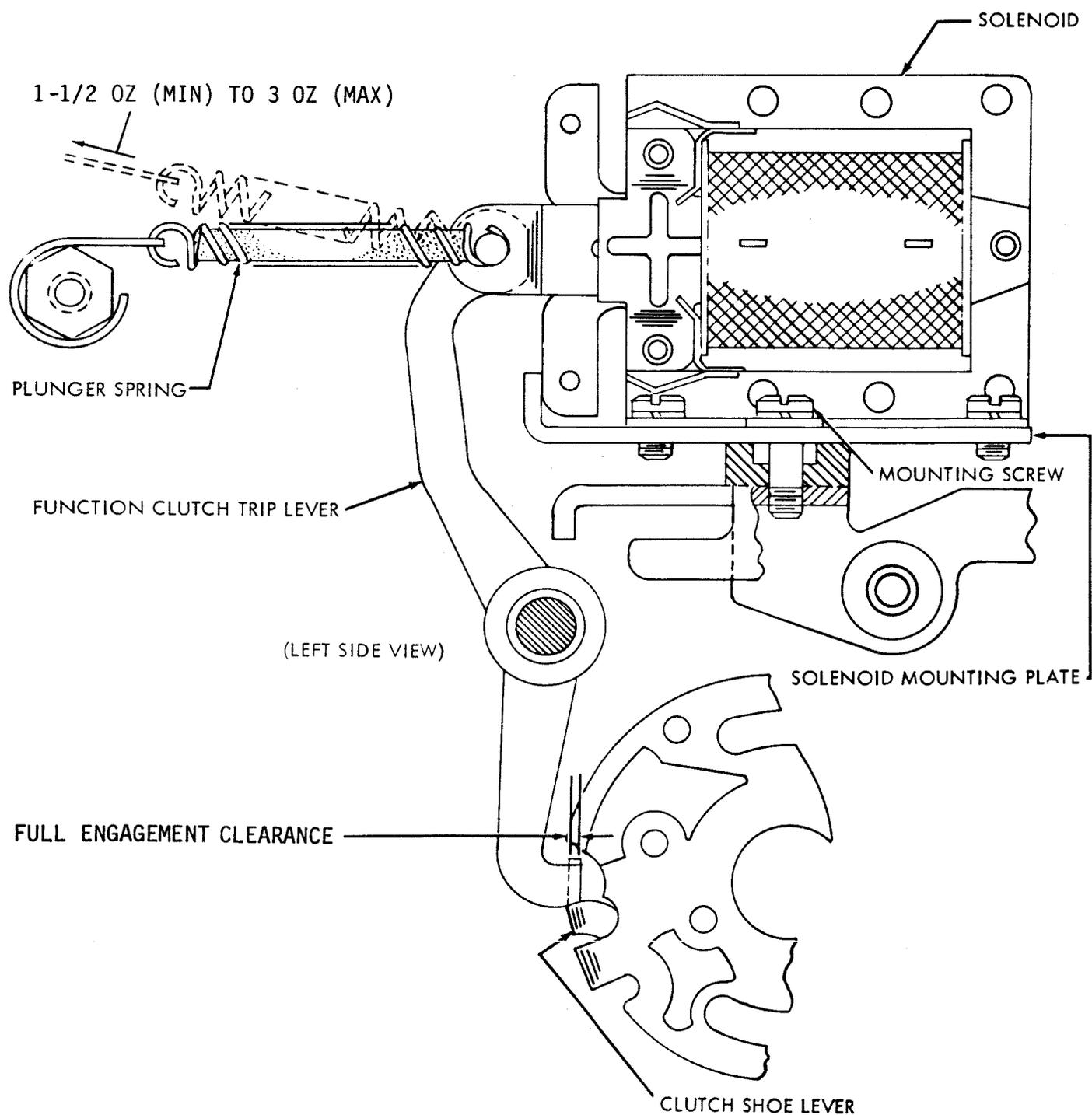


Figure 6-169. Function Clutch Trip Lever and Solenoid Plunger Spring

(b) De-energize solenoid.

(c) Disengage function clutch.

(d) Function clutch trip lever should engage clutch shoe lever by full thickness of shoe lever. When checking two-stop clutches, check at lug with least bite.

(e) If engagement is not as specified, loosen mounting screws and position solenoid mounting plate to obtain specified engagement.

NOTE

When positioning the solenoid mounting plate, move each end equally to avoid binding between solenoid plunger and function clutch trip lever.

(f) Tighten mounting screws.

(5) Solenoid Plunger Spring. Adjust solenoid plunger spring as follows:

(a) Refer to figure 6-169.

(b) De-energize solenoid.

(c) Unhook spring end farthest from function clutch trip lever.

(d) Attach spring scale hook to free end of spring.

(e) Force required to pull spring to position length should be between 1-1/2 and 3 ounces.

(f) If scale reading exceeds specified limits, install new spring.

c. DC Magnet Operated Print Suppression Adjustments. Perform DC Magnet operated print suppression adjustments in accordance with the following paragraphs.

(1) Armature Extension Clearance. Adjust armature extension as follows:

(a) Refer to figure 6-170.

(b) Release armature.

(c) Measure clearance between end of armature extension and suppression arm. Clearance should be between 0.012 and 0.030 inch.

(d) If clearance exceeds specified limits loosen armature stop screw clamp nut. Position armature with armature stop screw to obtain specified clearance.

(e) Tighten nut.

(f) Perform the adjustment procedure of paragraph 6-5.c.

(2) Blocking Bail Extension Clearance. Adjust blocking bail extension clearance as follows:

(a) Refer to figure 6-170.

(b) Ensure there is no interference between armature extension and blocking bail extension.

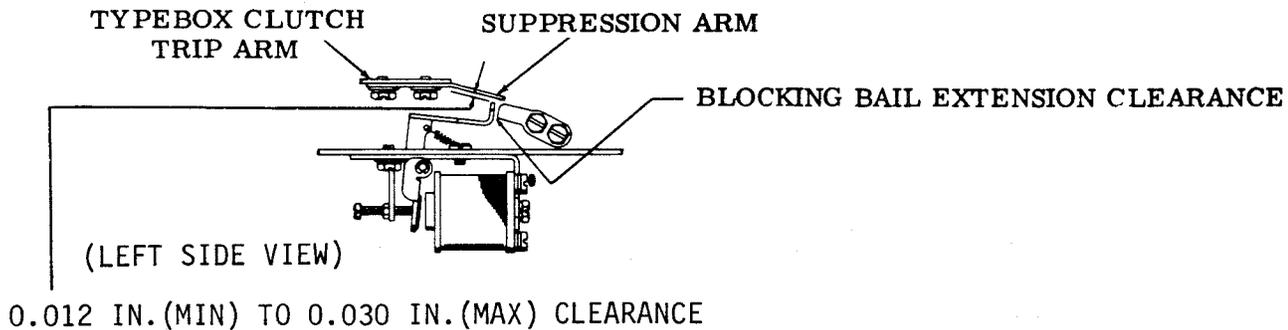


Figure 6-170. Armature Extension Clearance Blocking Bail Extension Clearance

(c) If there is interference, refine the adjustments of 6-5.c(1) and (2).

(3) Armature Extension Overtravel. Adjust armature extension overtravel as follows:

(a) Refer to figure 6-171.

(b) Place blocking bail extension in position block suppression arm.

(c) Hold armature against magnet pole face.

(d) Measure overtravel of armature extension. Overtravel should be between 0.010 and 0.015 inch.

(e) Ensure there is no clearance between blocking surface of armature extension and bottom surface of suppression arm.

(f) With suppression arm blocked by armature extension, rotate blocking bail extension.

(g) Ensure blocking bail extension slides under suppression arm with no perceptible clearance.

(h) If armature extension overtravel exceeds specified limits, loosen magnet bracket mounting screws.

(i) Using an eccentric adjusting tool, pivot magnet up or down and front or rear to obtain specified

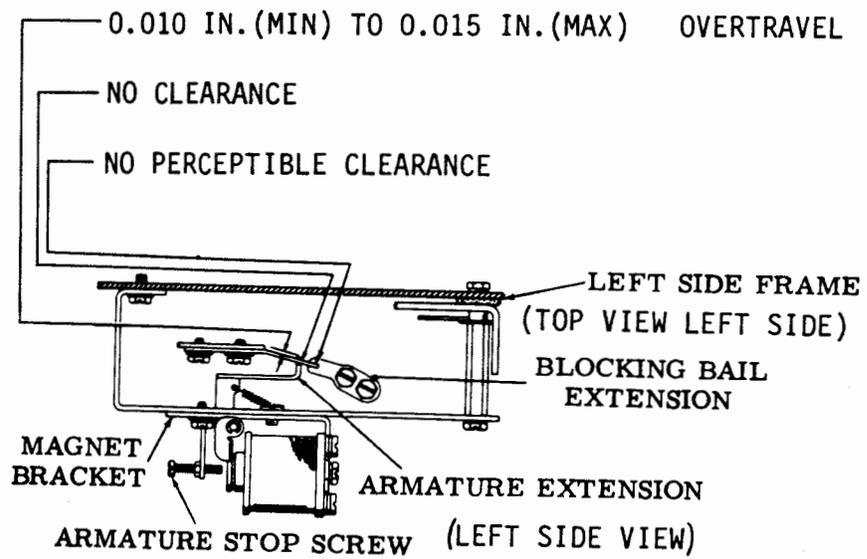


Figure 6-171. Armature Extension Overtravel

overtravel of armature extension.

(j) Tighten magnet bracket mounting screws.

(k) Press armature extension firmly against bottom of suppression arm. If necessary, add or remove shims between suppression arm and type box clutch trip arm. Recheck paragraph 6-5.c.

(4) Type Box Clutch Trip Lever. Adjust type box clutch trip lever as follows:

(a) Refer to figure 6-172.

(b) Position tripshaft cam follower roller on lowest surface of cam (located on code bar clutch).

(c) Measure clearance between inner face of type box clutch trip lever and clutch disc stop lug. Clearance should be between 0.025 and 0.045 inch.

(d) If clearance exceeds specified limits, loosen clamp screw and position stop to obtain specified clearance.

d. Form Alignment Switch Mechanism Adjustments. Perform alignment switch mechanism in accordance with the following paragraphs.

(1) Form Alignment Switch. Adjust form alignment switch as follows:

CAUTION

Remove power from form alignment switch before performing this adjustment.

(a) Refer to figure 6-173.

(b) Rotate form-out disc until form alignment lever falls into notch.

(c) Lift lever just enough to place a 0.010 inch feeler gauge in notch. Then allow lever to rest on feeler gauge. Switch should be activated.

(d) If switch is not activated, loosen mounting screws.

(e) Position switch at pry points so switch is activated.

(f) Tighten mounting screws.

(g) Rotate disc until lever rests on outer edge. Switch should not be activated.

(h) If switch is activated, loosen mounting screws.

(i) Position switch at pry points so switch is not activated.

(j) Tighten mounting screws.

(k) If steps (b) through (j) were performed, repeat steps (b) through (d).

(2) Form Alignment Switch Spring. Adjust form alignment switch spring as follows:

(a) Refer to figure 6-173.

(b) Rotate form-out disc so form alignment

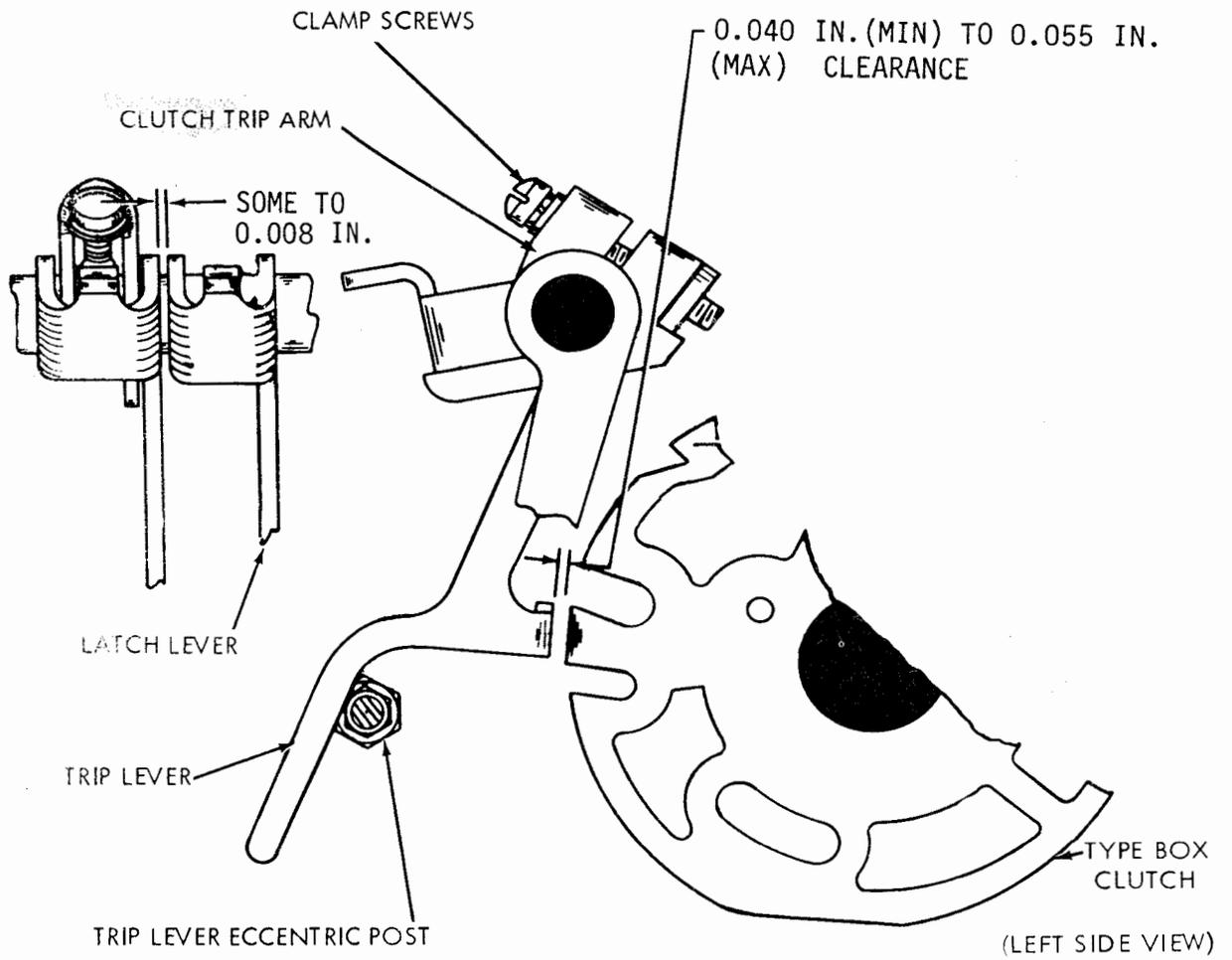


Figure 6-172. Type Box Clutch Trip Lever

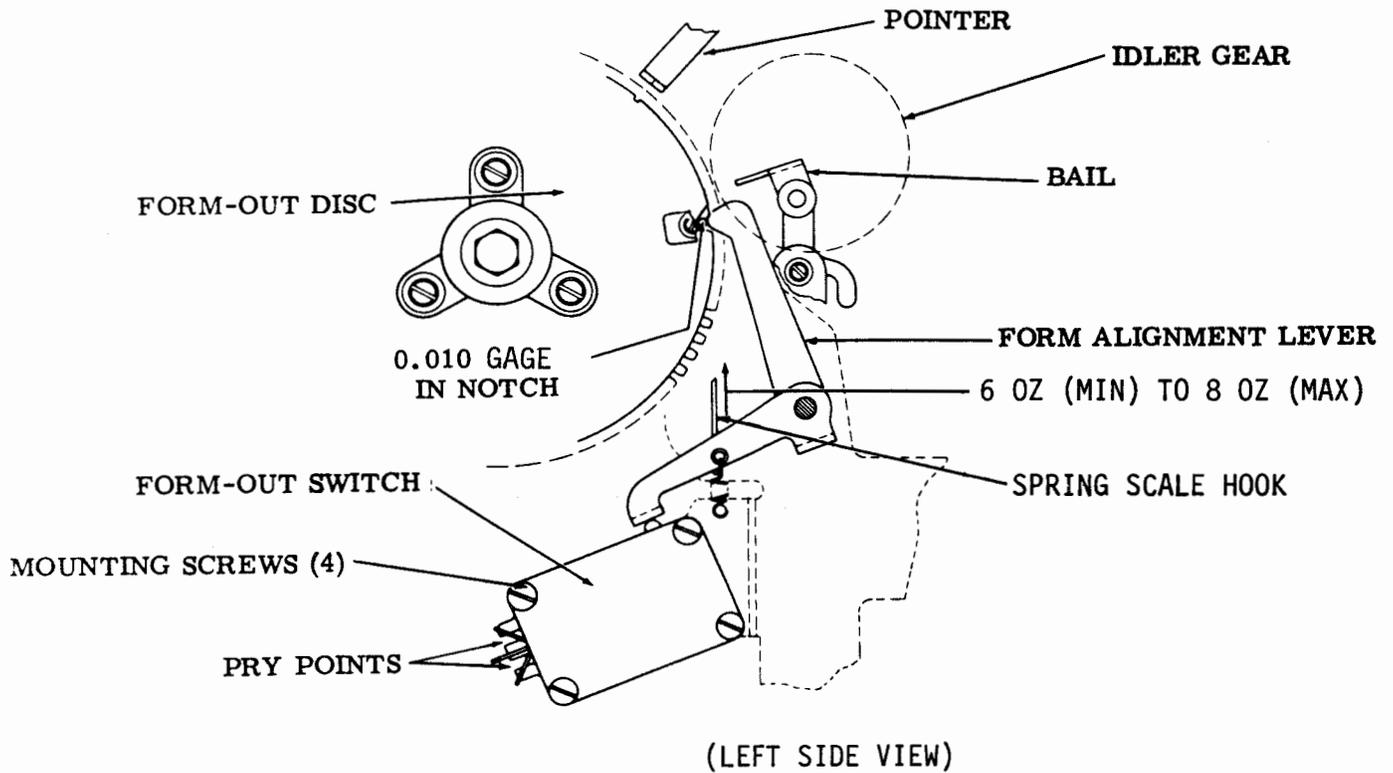


Figure 6-173. Form Alignment Switch and Form Alignment Switch Spring

lever rests on outer edge of disc (not in notch).

(c) Attach spring scale hook to switch operating lever at point of spring attachment.

(d) Force required to move lever from outer edge of disc should be between 6 and 8 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(3) Form Feed-Out Adjustment. The form feed-out adjustment consists of the page feed-out mechanism adjustment procedures described in paragraph 6-5.i.

e. Form Feed-Out Mechanism Adjustment. Perform form feed-out adjustment in accordance with the following paragraph. Adjust form feed-out torsion spring as follows:

(1) Refer to figure 6-174.

(2) Disengage line line feed clutch trip lever.

(3) Attach spring scale hook at lower end of bail.

(4) Force required to start bail moving should be between 1/8 and 1-1/4 ounces for KSR units or between 2 and 6 ounces for RO units.

(5) If spring scale reading exceeds specified limits, install new spring.

f. Horizontal Tabulator Mechanism Adjustments. Perform horizontal tabulator mechanism adjustments in accordance with the following paragraphs.

(1) Blocking Lever Return Spring. Adjust blocking lever return spring as follows:

(a) Refer to figure 6-175.

(b) Hold 6-extension link to rear.

(c) Attach spring scale hook to blocking lever at junction between blocking and tabulator pawl.

(d) Force required to start blocking lever moving should be between 2-1/2 and 4-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(2) Tabulator Pawl-Vertical (Final). Adjust tabulator pawl as follows:

(a) Refer to figure 6-175.

(b) Position spacing drum so reference tabulator stop as determined by preliminary tabulator pawl adjustment, paragraph 6-5.f(19) is opposite shoulder on pawl.

(c) Block extension link with blocking lever.

(d) Measure clearance between tabulator pawl and stop. Clearance should be between 0.055 and 0.075 inch.

(e) If clearance is not within

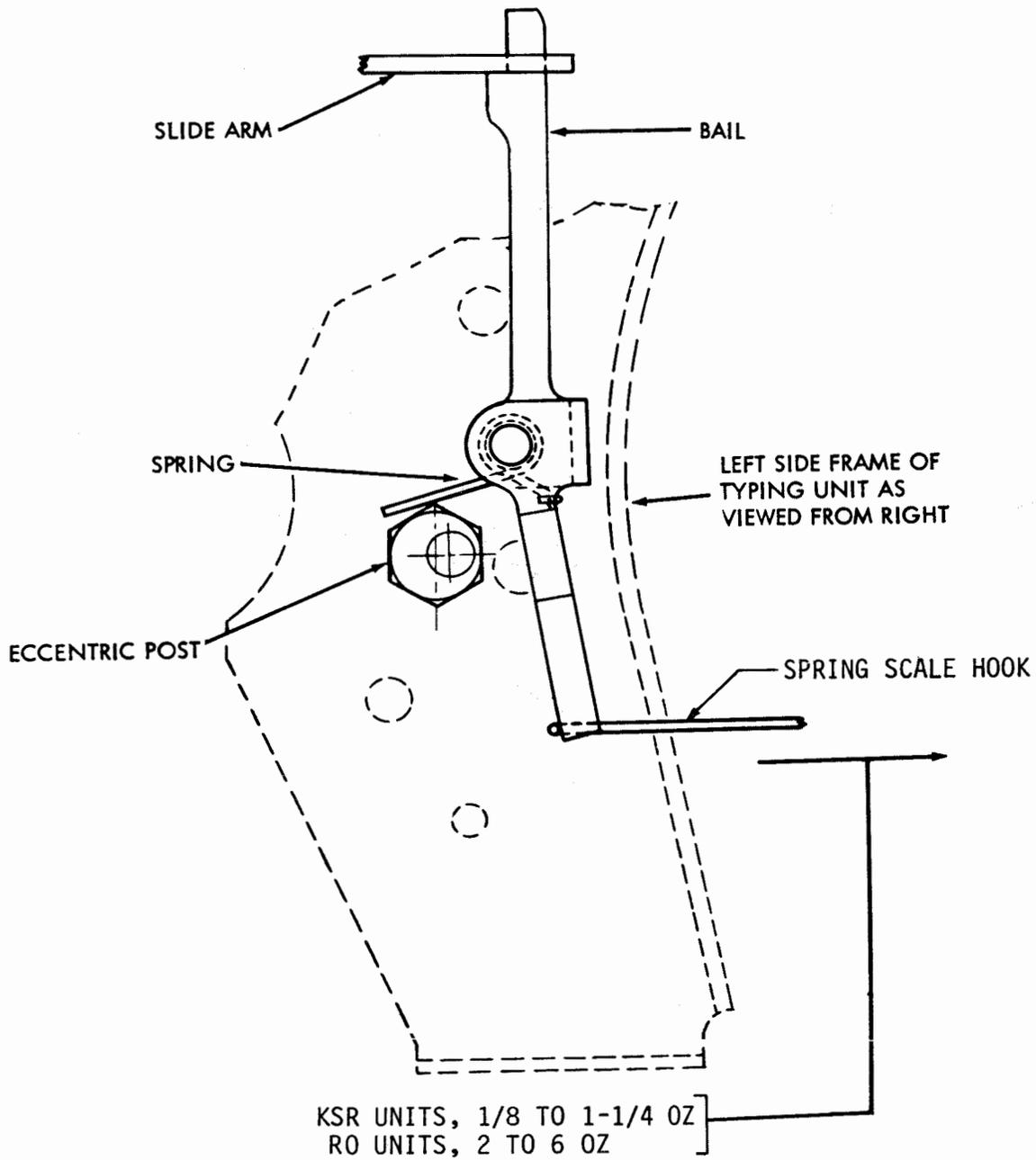


Figure 6-174. Form Feed-Out Torsion Spring

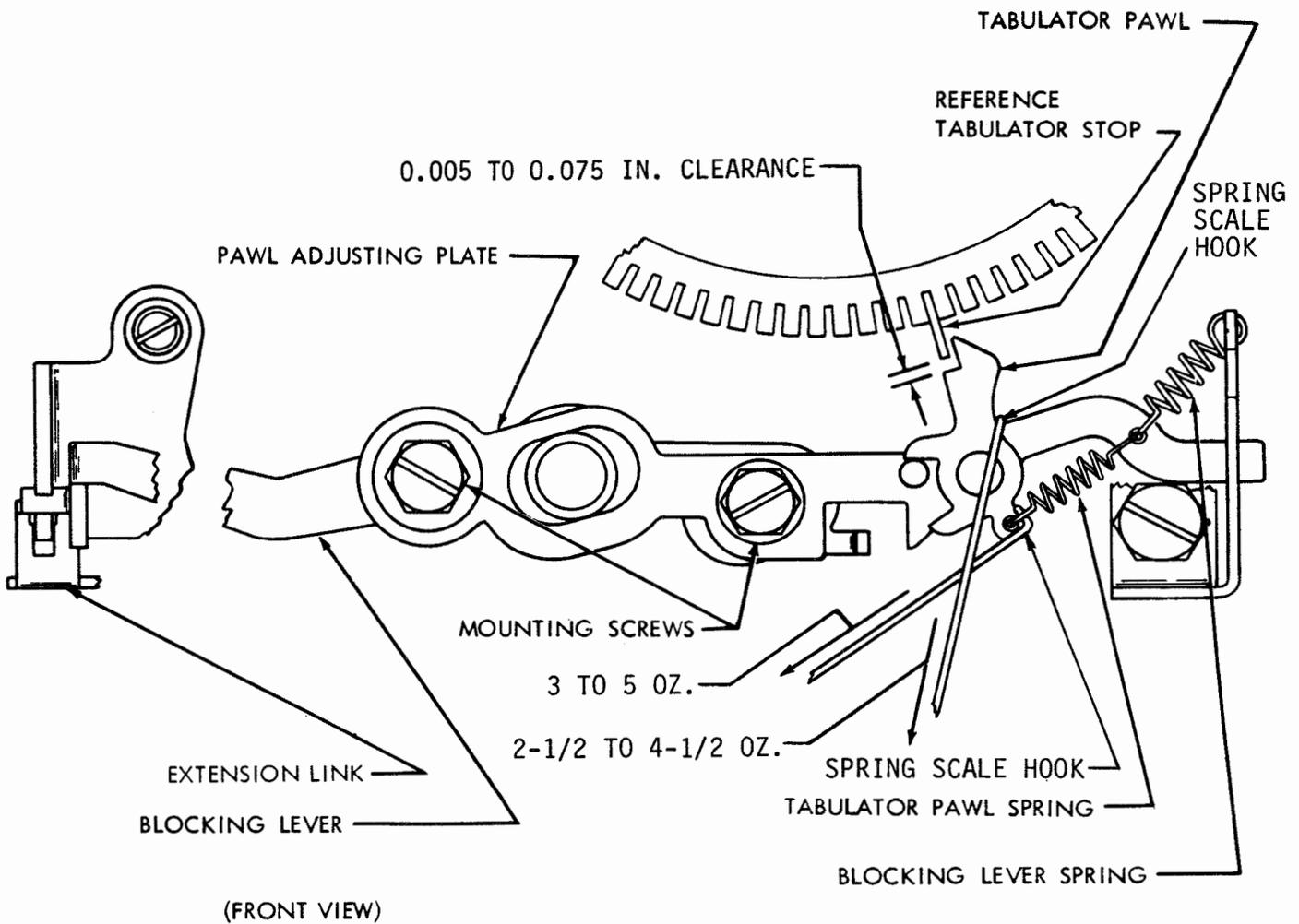


Figure 6-175. Blocking Lever Return Spring, Tabulator Pawl-Vertical (Final) and Tabulator Pawl Spring

specified limits loosen two mounting screws.

(f) Position pawl adjusting plate.

(g) Tighten right screw only, using wrench to prevent bushing from turning.

(3) Tabulator Pawl Spring. Adjust tabulator pawl spring as follows:

(a) Refer to figure 6-175.

(b) Apply spring scale hook to tabulator pawl at point of spring attachment.

(c) Force required to start tabulator pawl moving should be between 3 and 5 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(4) Cam Plate Stripper Bail. Adjust cam plate stripper bail as follows:

(a) Refer to figure 6-176.

(b) Place operating lever and tabulator slide arm in unoperated position.

(c) Rotate spacing clutch until high part of restoring cam is opposite stripper bail.

(d) Measure clearance between restoring cam and stripper bail. Clearance should be between 0.010 and 0.025 inch.

(e) If clearance exceeds specified

limits, loosen stripper bail arm so it is friction tight.

(f) Position stripper bail plate on stripper bail to obtain specified clearance.

(g) Tighten screw.

(5) Horizontal Tabulator Slide Arm Spring. Adjust horizontal tabulator slide arm spring as follows:

(a) Refer to figure 6-176.

(b) Place operating lever in operated position.

(c) Place slide arm in unoperated position.

(d) Apply spring scale pushrod to horizontal tabulator slide arm.

(e) Force required to start slide arm moving should be between 1-1/2 and 4-1/2 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(6) Operating Lever Cam Arm Spring. Adjust operating lever cam arm spring as follows:

(a) Refer to figure 6-176.

(b) Place operating lever in unoperated position.

(c) Unlatch horizontal tabulator function pawl.

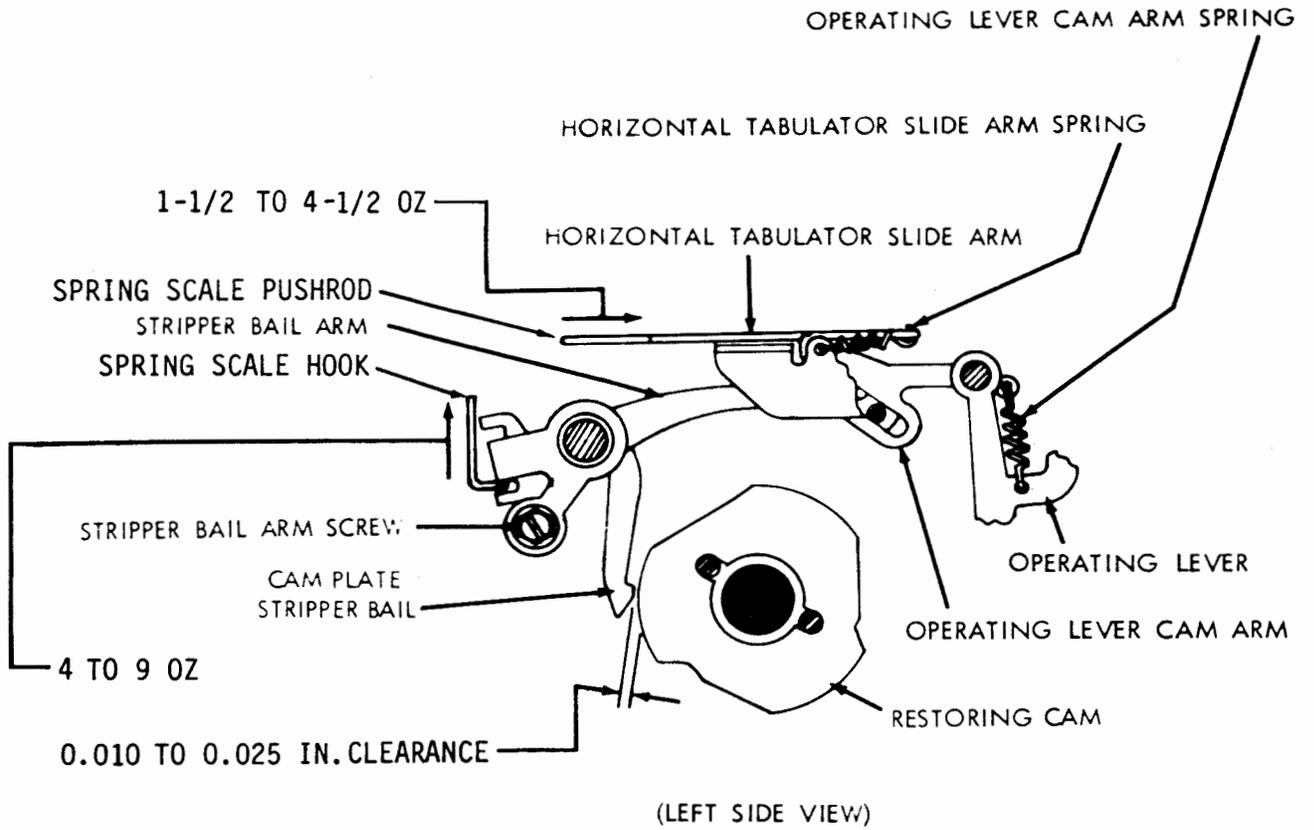


Figure 6-176. Cam Plate Stripper Bail, Horizontal Tabulator Slide Arm Spring, and Operating Lever Cam Arm Spring

(d) Apply spring scale hook to stripper bail arm.

(e) Force required to start stripper bail moving should be between 4 and 9 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(7) Spacing Cutout Transfer Bail Set Collar.  
Adjust spacing cutout transfer bail set collar as follows:

(a) Refer to figure 6-177.

(b) Measure spacing cutout transfer bail set collar end play.

(8) Clutch Trip Lever Spring. Adjust clutch trip lever spring as follows:

(a) Refer to figure 6-178.

(b) Engage spacing clutch.

(c) Rotate clutch until trip lever rest on stop lug.

(d) Attach spring scale hook to clutch trip lever at point of spring attachment.

(e) Force required to move trip lever away from stop lug should be between 11-1/2 and 14-1/4 ounces.

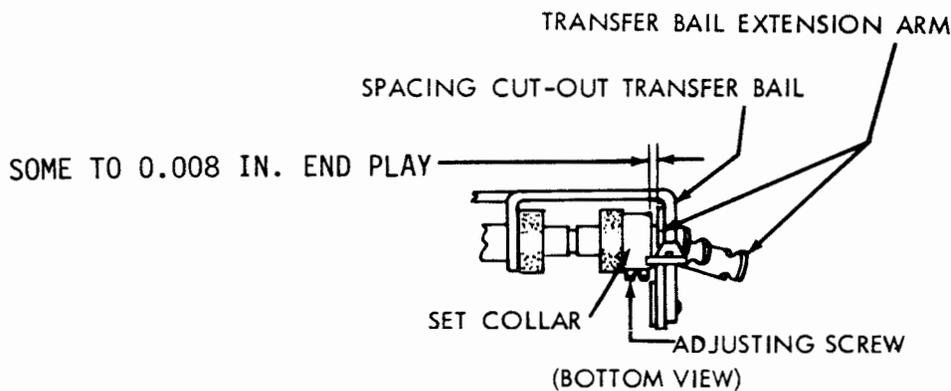


Figure 6-177. Spacing Cut-Out Transfer Bail Set Collar

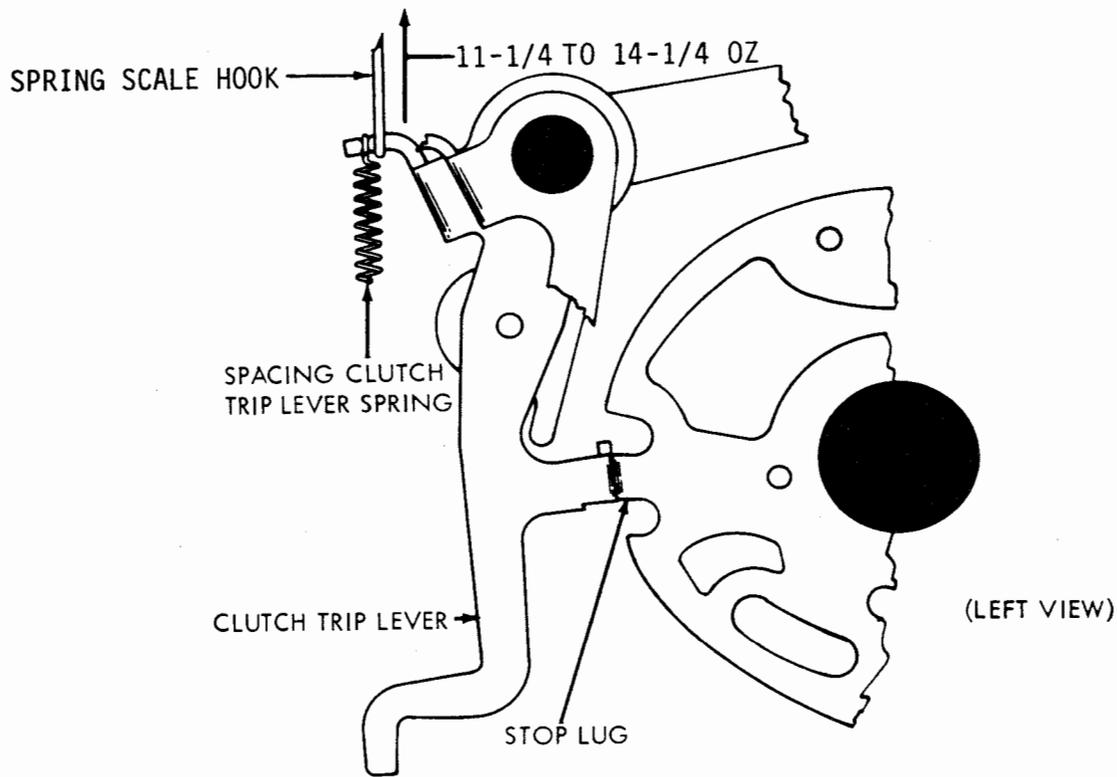


Figure 6-178. Clutch Trip Lever Spring

(f) If scale reading exceeds specified limits, install new spring.

(9) Spacing Clutch Stop Lever. Adjust spacing clutch stop lever as follows:

(a) Refer to figure 6-179.

(b) Disengage spacing clutch.

(c) Place trip lever arm and intermediate bail in their upward position.

(d) Outer surface of trip lever should be flush with outer surface of shoe lever or under-flush to 0.010 inch when checked at stop lug with least bite.

(e) If surfaces are not flush within specified limits, loosen adjusting screw until it becomes friction tight and position spacing clutch stop lever.

(f) Tighten screw. Repeat adjustment of latch bail adjusting plate, paragraph 6-5.f(11).

(10) Intermediate Bail Spring. Adjust intermediate bail spring as follows:

(a) Refer to figure 6-180.

(b) Place stop arm and intermediate bail in unoperated position.

(c) Unhook one end of spring.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to installed length should be between 1-1/2 to 3-1/2 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise, reconnect free end of spring.

(11) Latch Bail Adjusting Plate. Adjust latch bail adjusting plate as follows:

(a) Refer to figure 6-180.

(b) Position operating lever extension link to rear and latch it on blocking lever.

(c) Place latch bail in fully latched position.

(d) Push forward on space suppression bail to disengage spacing trip lever from intermediate bail.

(e) Measure clearance between clutch stop arm and clutch shoe lever having least clearance. There should be some clearance not to exceed 0.008 inch.

(f) If clearance exceeds specified limits, loosen mounting screws.

(g) Position latch bail adjusting plate to obtain specified clearance.

(h) Tighten mounting screws.

(12) Trip Lever Arm Latch Bail. Adjust trip lever arm latch bail as follows:

(a) Refer to figure 6-181.

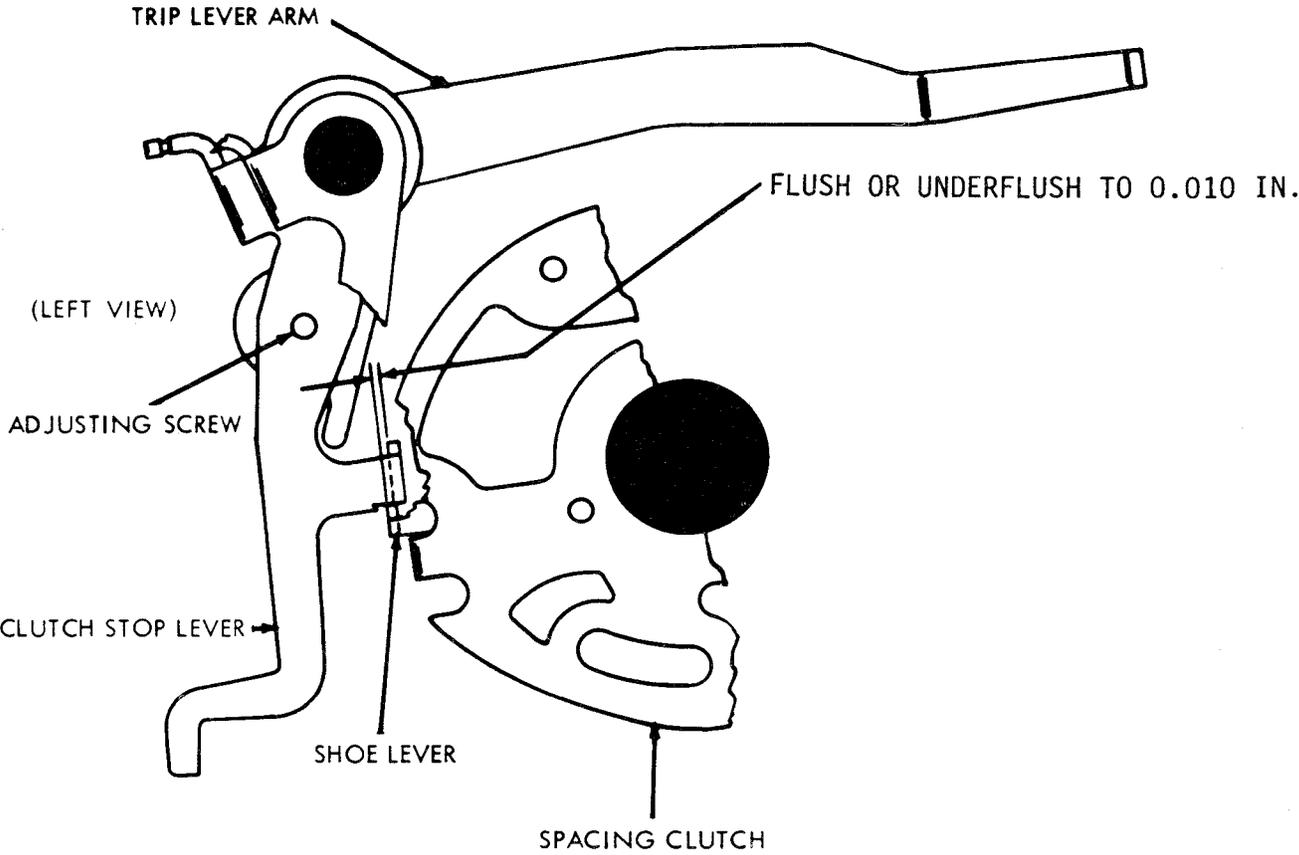


Figure 6-179. Spacing Clutch Stop Lever

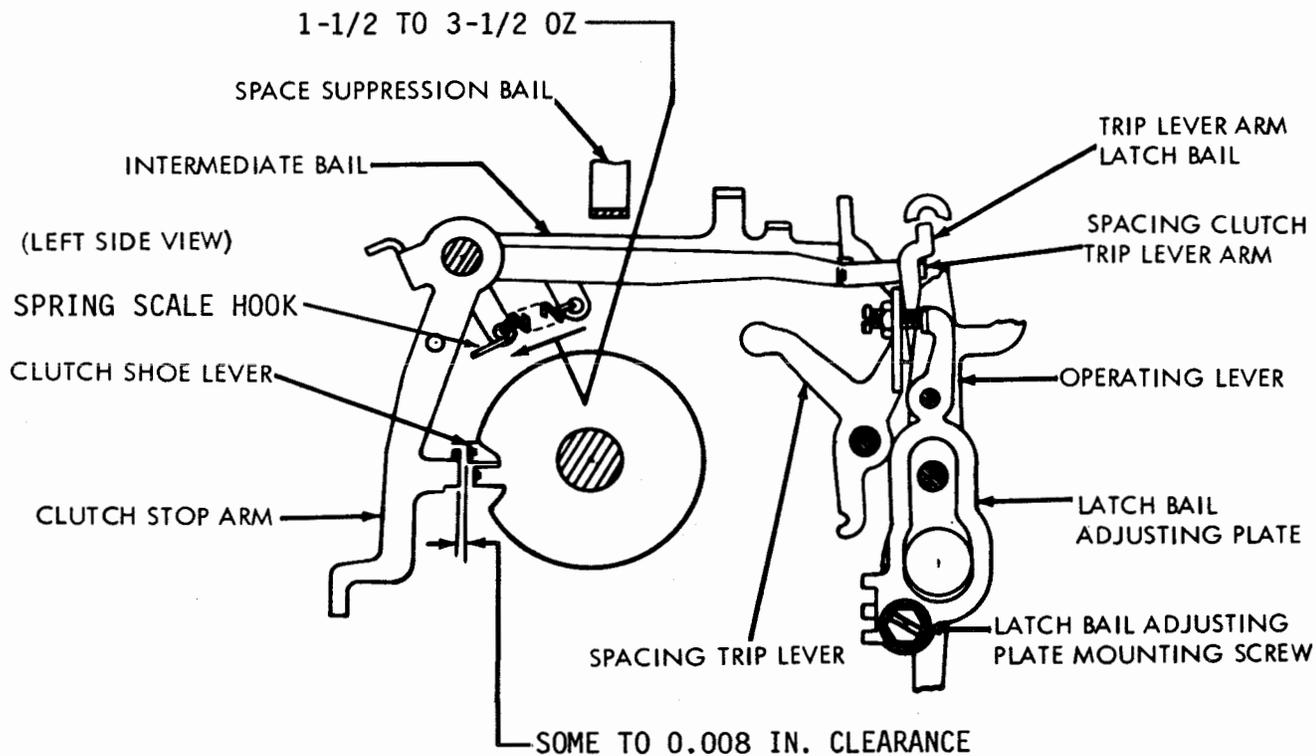


Figure 6-180. Intermediate Bail Spring and Latch Bail Adjusting Plate

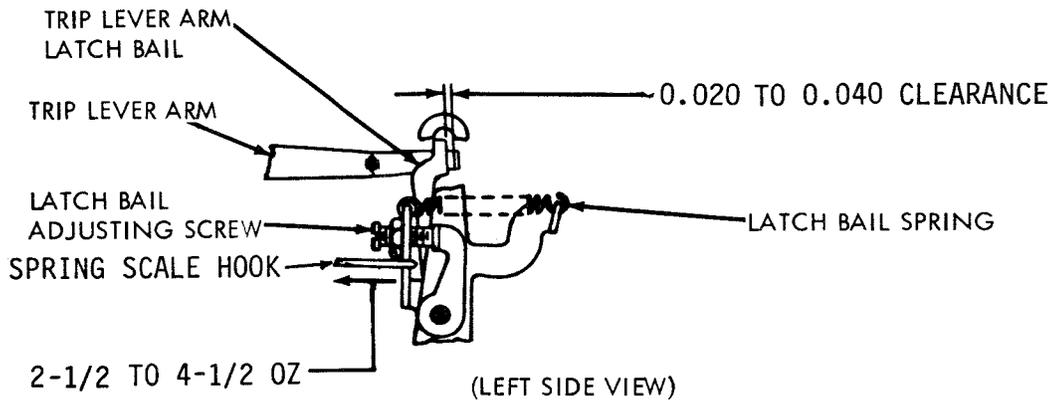


Figure 6-181. Trip Lever Arm Latch Bail and Trip Lever Arm Latch Bail Spring

(b) Place operating lever in operated position.

(c) Position trip lever upward.

(d) Measure clearance between trip lever arm and trip lever arm latch bail. Clearance should be between 0.020 and 0.040 inch.

(e) If clearance exceeds specified limits, loosen latch bail adjusting screw locknut and position adjusting screw to obtain specified clearance between trip lever arm and trip lever arm latch bail.

(f) Tighten locknut.

(13) Trip Lever Arm Latch Bail Spring. Adjust trip lever arm latch bail spring as follows:

(a) Refer to figure 6-181.

(b) Place operating lever in unoperated condition.

(c) Attach spring scale hook.

(d) Force required to start latch bail moving should be between 2-1/2 and 4-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(14) Operating Lever Adjusting Plate. Adjust operating lever adjusting plate as follows:

- (a) Refer to figure 6-182.
- (b) Place operating lever in unoperated position.
- (c) Take up play in extension link and blocking lever to minimize clearance between front end of extension link and lower projection of blocking lever.
- (d) Measure clearance. Clearance should be between 0.020 and 0.045 inch.
- (e) If clearance exceeds specified limits, loosen mounting screws. Position adjusting plate on bracket to obtain specified clearance.
- (f) Tighten mounting screws.

NOTE

If unit is equipped with a transmitter control contact, check transmitter control contact gap adjustment, paragraph 6-3.2f(22), and readjust gap, if necessary.

(15) Operating Lever Eccentric Link. Adjust operating lever extension link as follows:

NOTE

Prior to this adjustment, check the function reset bail blade adjustment, paragraph 6-3b(6).

(a) Refer to figure 6-183.

(b) If unit has two-stop function clutch, disengage function clutch, rotate type box clutch 1/2 revolution past stop position. If unit has one-stop function clutch, rotate function clutch until function pawl stripper blade is in its lower position and function reset bail roller is on high part of its cam.

(c) Pull horizontal tabulator function pawl to rear until it latches on its function bar.

NOTE

When pulling function pawl to rear, if the operating lever cam arm should strip off the tabulator slide arm before the function pawl is latched on the function bar, temporarily disable cam plate stripper bail arm by loosening its adjusting screw.

(d) Measure clearance between front end of operating lever extension link and blocking surface of blocking lever. Clearance should be between 0.015 and 0.035 inch.

(e) If clearance exceeds specified limits, loosen mounting stud so it is friction tight.

(f) Position extension link on operating lever to obtain clearance within specified limits.

(g) Tighten mounting stud.

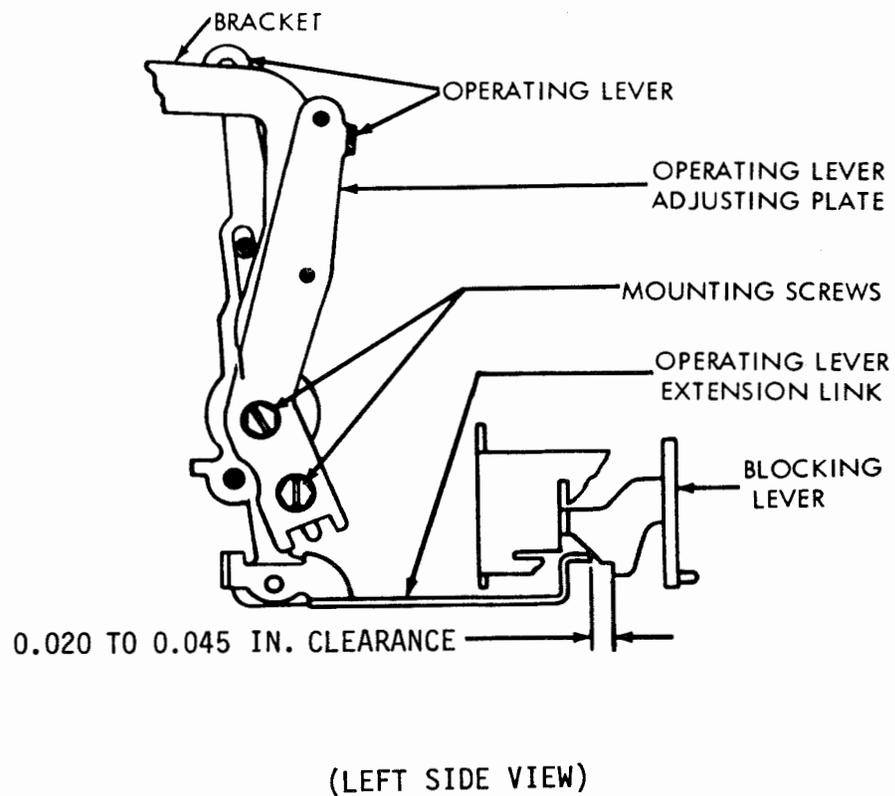


Figure 6-182. Operating Lever Adjusting Plate

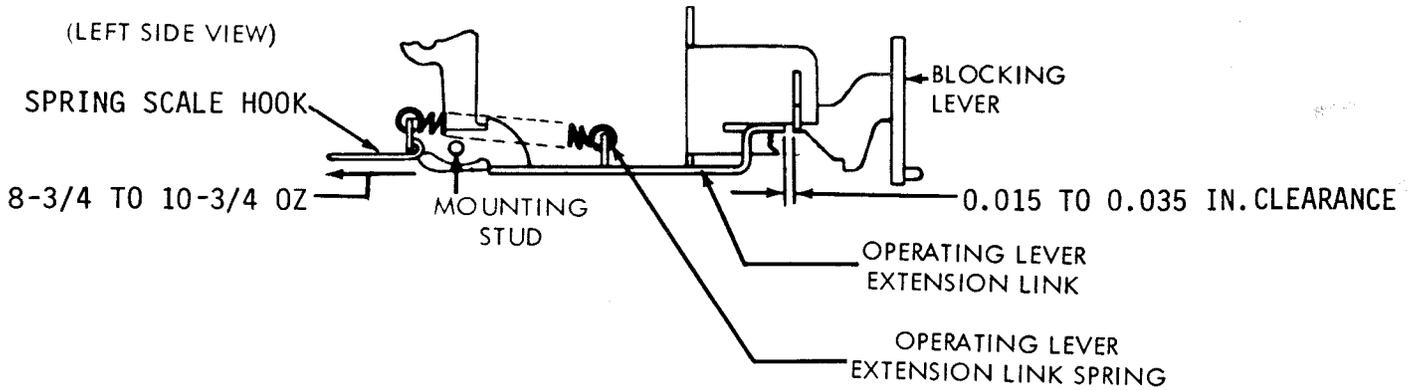


Figure 6-183. Operating Lever Extension Link and Operating Lever Extension Link Spring

NOTE

If unit is equipped with a transmitter control contact, check transmitter control contact gap adjustment, paragraph 6-5.f(22) and readjust gap, if necessary.

(d) Attach spring scale hook as shown in figure 6-111.

(e) Force required to start operating lever extension link moving should be between 8-3/4 and 10-3/4 ounces.

(16) Operating Lever Extension Link Spring. Adjust operating lever extension link spring as follows:

- (a) Refer to figure 6-183.
- (b) Unhook trip arm latchlever spring.
- (c) Place operating lever in operated position with extension link against blocking lever.

NOTE

If unit is equipped with transmitter control contact, hold contact spring away from stud when measuring tension.

(f) If scale reading exceeds specified limits, install new spring.

(g) Reconnect trip arm latchlever spring.

(17) Right Margin.  
Adjust right margin as follows:

- (a) Refer to figure 6-184.
- (b) Place type box in position to print character on which spring cutout is desired.
- (c) Pull forward on part of transfer bail extending below mounting shaft until it is in fully opened position.
- (d) Measure clearance between spacing cutout lever on spacing drum and bail extension arm. Clearance should be between 0.006 and 0.025 inch.
- (e) If clearance exceeds specified limits, loosen clamp screw and position to obtain specified clearance.
- (f) Tighten clamp screw.

(18) Space Suppression Bypass Spring.  
Adjust space suppression bypass spring as follows:

- (a) Refer to figure 6-184.
- (b) Detach end of spring opposite bail extension pawl.
- (c) Attach spring scale hook to free end of spring.
- (d) Force required to start bail extension pawl moving should be between 20 and 26 ounces.
- (e) If scale reading exceeds specified limits, install new spring.

Otherwise, reconnect free end of spring.

(19) Tabulator Pawl (Preliminary). The purpose of this preliminary adjustment is to select tabulator stop to be used as reference in making final tabulator pawl horizontal and vertical adjustments.

**NOTE**

Before making this adjustment, check left margin, paragraph 6-3.1h(2) and spacing gear phasing, paragraph 6-3.1h(19).

- (a) Refer to figure 6-185.
- (b) Beginning with fifteenth slot counterclockwise from roller on tabulator ring, place tabulator stops on approximately equal number of slots apart around the periphery of ring corresponding to length of printed line.
- (c) To move stops, hook small spring hook in hole and pull out radially from drum. Holding stop away from drum, slide it on garter spring to desired position and insert in slot. Spacing drum may have to be rotated to make some slots accessible.

**CAUTION**

Make sure all stops are firmly seated and not turned sideways. Do not use pliers to move stops.

- (d) Disengage all clutches so front facing feed pawl is in lower position. Position pawl adjusting plate at center of horizontal and

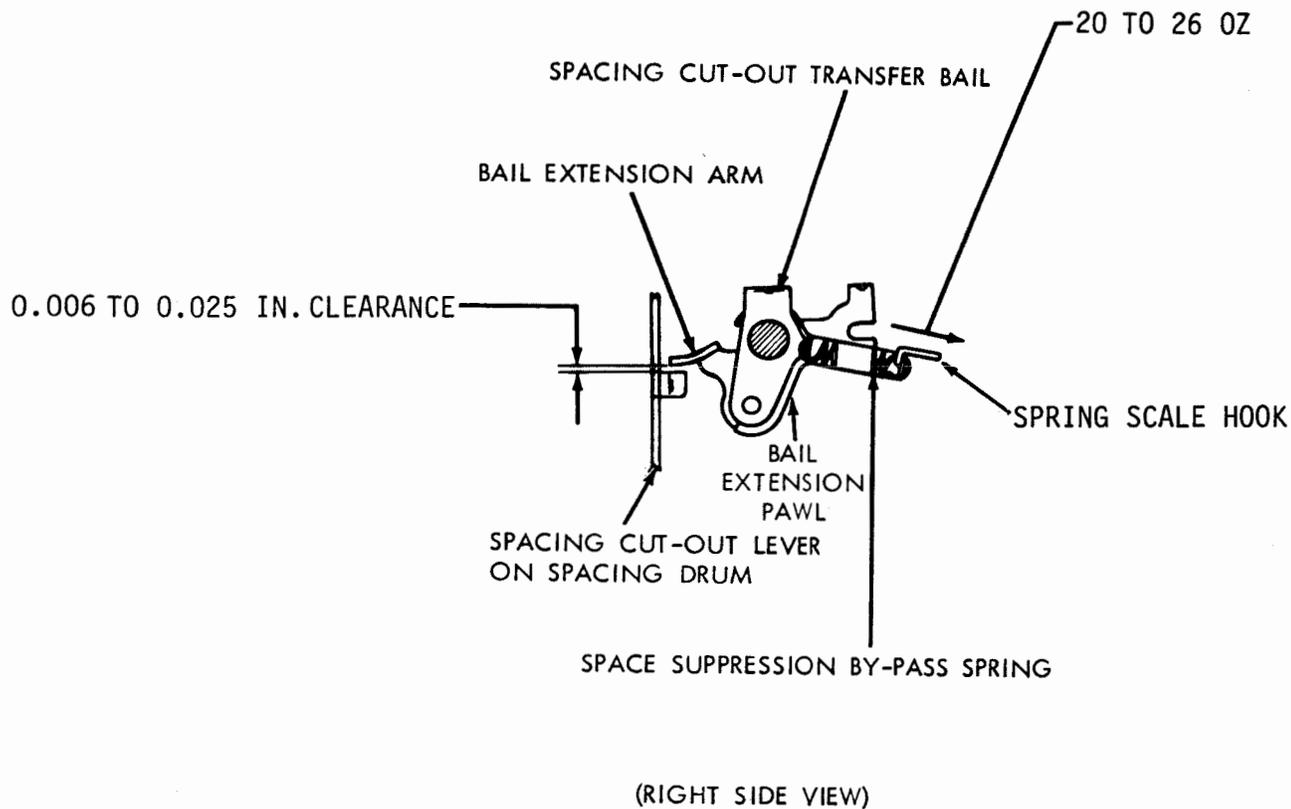


Figure 6-184. Right Margin and Space Suppression Bypass Spring

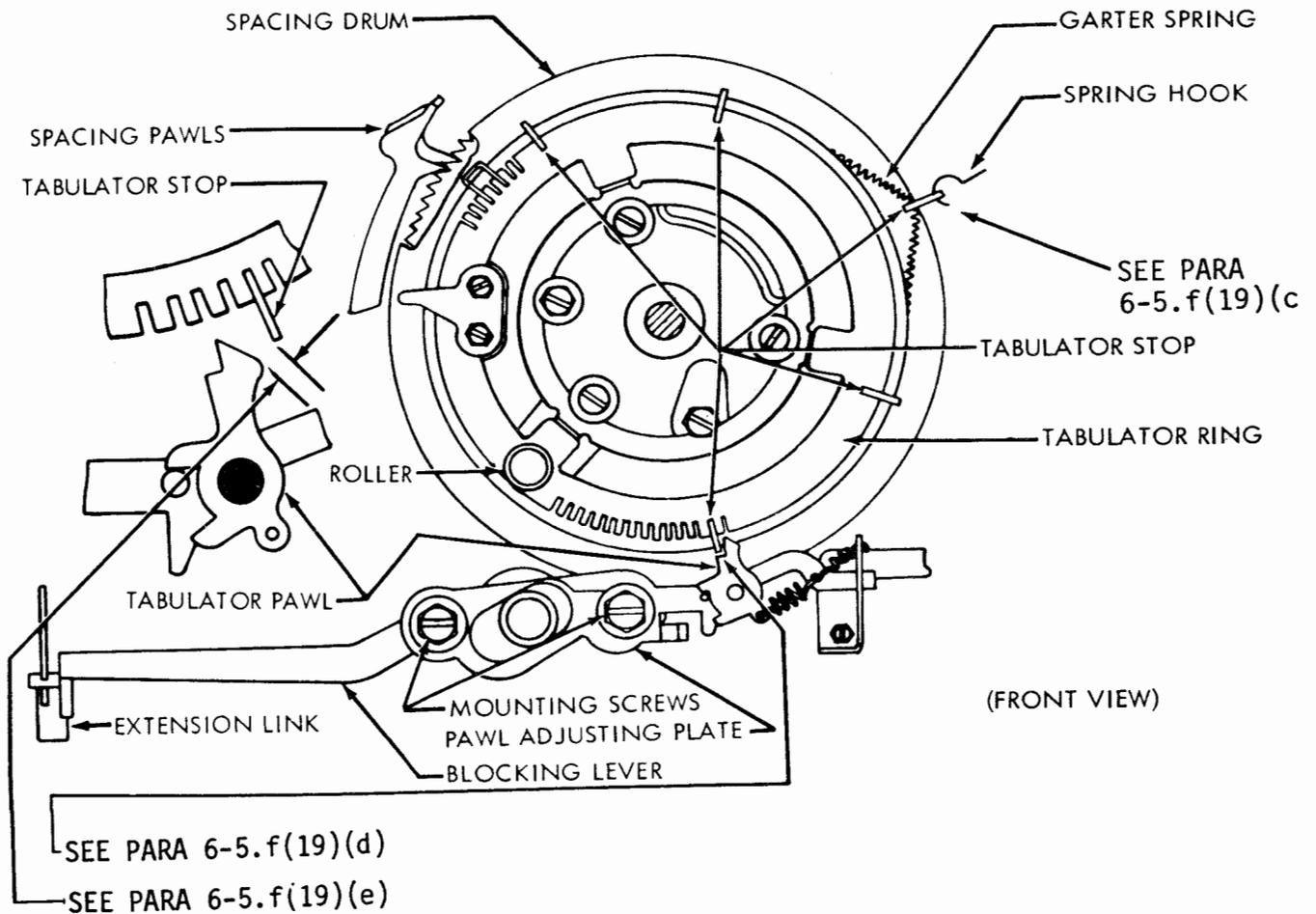


Figure 6-185. Tabulator Pawl (Preliminary)

vertical adjustments. To adjust vertically, loosen both mounting screws. To adjust horizontally, loosen left screw only. Vertical adjustment should be made before horizontal adjustment. Disengage spacing feed pawls and allow drum to rotate to extreme counterclockwise position. Keeping spacing clutch disengaged; manually advance drum until first stop is to immediate left of pawl. Position adjusting plate horizontally so stop is aligned with left edge of pawl shoulder.

(e) Place blocking lever and operating lever slide arm in unblocked position. Disengage feed pawls and let drum rotate two spaces counterclockwise. Both feed pawls should be fully engaged. Block extension link with blocking lever. Measure and note clearance between stop and slope on pawl.

(f) Rotate drum clockwise until next stop is just to left of pawl. Repeat procedure described in step (e) for this and all remaining stops.

(g) Use stop having greatest clearance as reference in making final horizontal and vertical pawl adjustments.

(20) Tabulator Pawl-Horizontal (Final). Adjust tabulator pawl-horizontal as follows:

(a) Refer to figure 6-186.

(b) Disengage all clutches so that front spacing feed pawl is in lower position as shown in figure 6-185.

(c) Position spacing drum so that reference tabulator stop determined in paragraph 6-5.f(19) is immediately to left of pawl. Operating lever slide arm should be forward in unblocked position.

(d) Disengage feed pawls and allow drum to rotate one space counterclockwise. Both feed pawls should be fully engaged.

(e) Move extension link rearward to blocked position.

(f) Take up play in spacing shaft toward rear.

(g) Ensure some portion of clutch disc stop lug is aligned with rear surface of gear.

(h) If alignment does not occur, repeat step (a) through (e).

(i) Trip spacing clutch and rotate shaft until middle of stop lug is in line with rear surface of gear.

(j) If blocking lever trips too soon, loosen left mounting screw.

(k) Move pawl adjusting plate to left until extension link can be blocked.

(l) Slowly move plate to right until blocking lever just trips.

(m) When adjusting trip-off point, care should be taken that blocking lever is cammed down by stop and not manually moved out of blocked position.

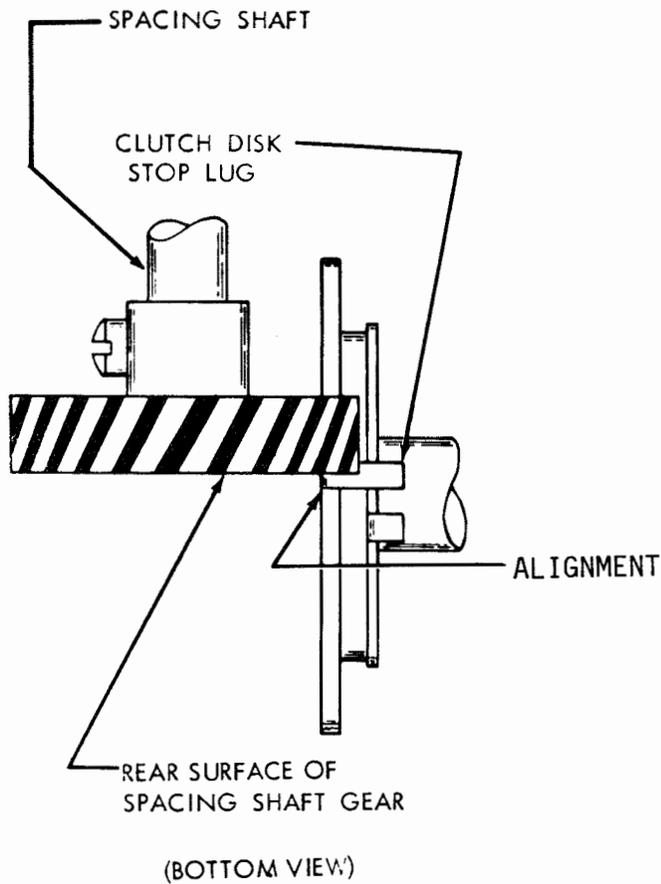
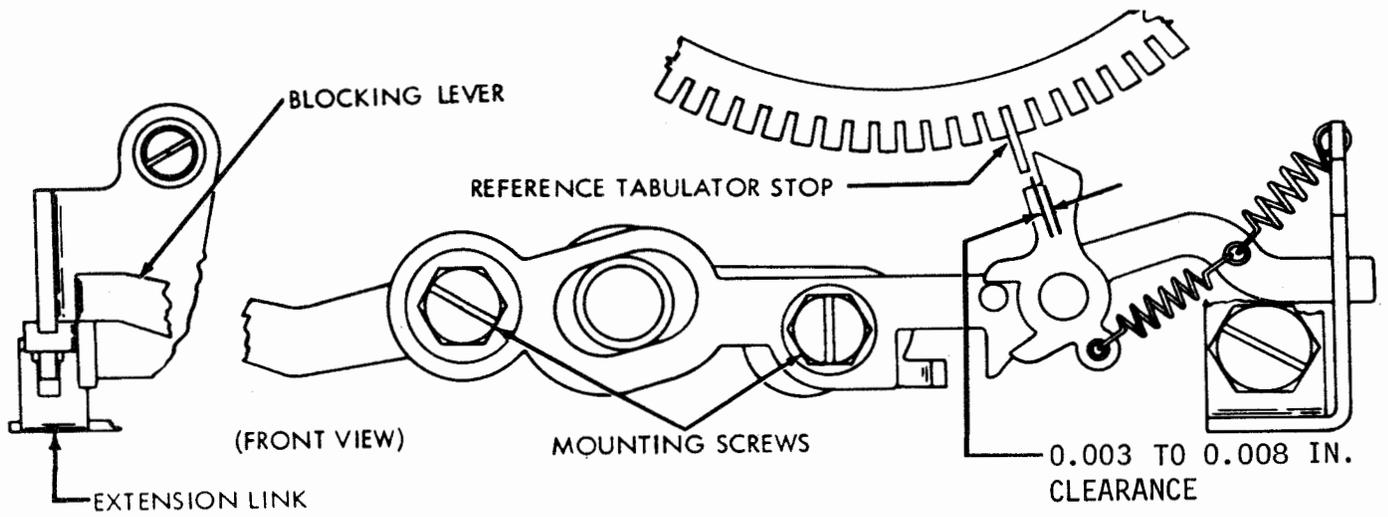


Figure 6-186. Tabulator Pawl - Horizontal (Final)

(n) Reensure that some portion of clutch disc stop lug is aligned with rear surface of spacing shaft gear.

(o) After obtaining trip-off point, continue rotating main shaft until spacing clutch is disengaged. Pawl should be to right of stop. When extension link is moved to rear, blocking lever should move to blocked position.

(p) If tip of pawl rests on end of stop, readjust plate to right so that clearance between pawl and stop is between 0.003 and 0.008 inch.

(q) Tighten left mounting screw.

(21) Tabulator Stop Settings. Adjust tabulator stop settings as follows:

(a) Refer to figure 6-187.

(b) To adjust columnar tabulator stop place carriage in position to print first character in column.

(c) Place stop in slot immediately to left of pawl.

NOTE

For instructions on how to move stops, see paragraph 6-5.f(19).

(d) To facilitate inserting stops, mark desired slot and rotate drum to more accessible position.

(e) For setting near left margin, count number of spacing operations from left

margin and place stop corresponding number of slots counterclockwise from roller.

NOTE

When printing forms, check stop settings in relation to columns. Corresponding stops on all machines on a circuit must be the same number of slots from left margin.

(f) To adjust right margin tabulator stop (with wide shelf), position printing carriage at right margin (spacing cutout operated).

NOTE

Before making this adjustment, check right margin and tabulator pawl adjustments.

(g) Insert stop with wide shelf in slot immediately to left of pawl. Shelf should extend to right so pawl rests on it.

(22) Transmitter Control Contact Gap. Adjust transmitter control contact gap as follows:

(a) Refer to figure 6-188.

(b) Pull operating lever extension link to rear until it is blocked by blocking lever.

(c) Measure gap between contacts. Gap should be between 0.010 and 0.020 inch.

(d) If contact gap exceeds specified limits, loosen mounting screw and

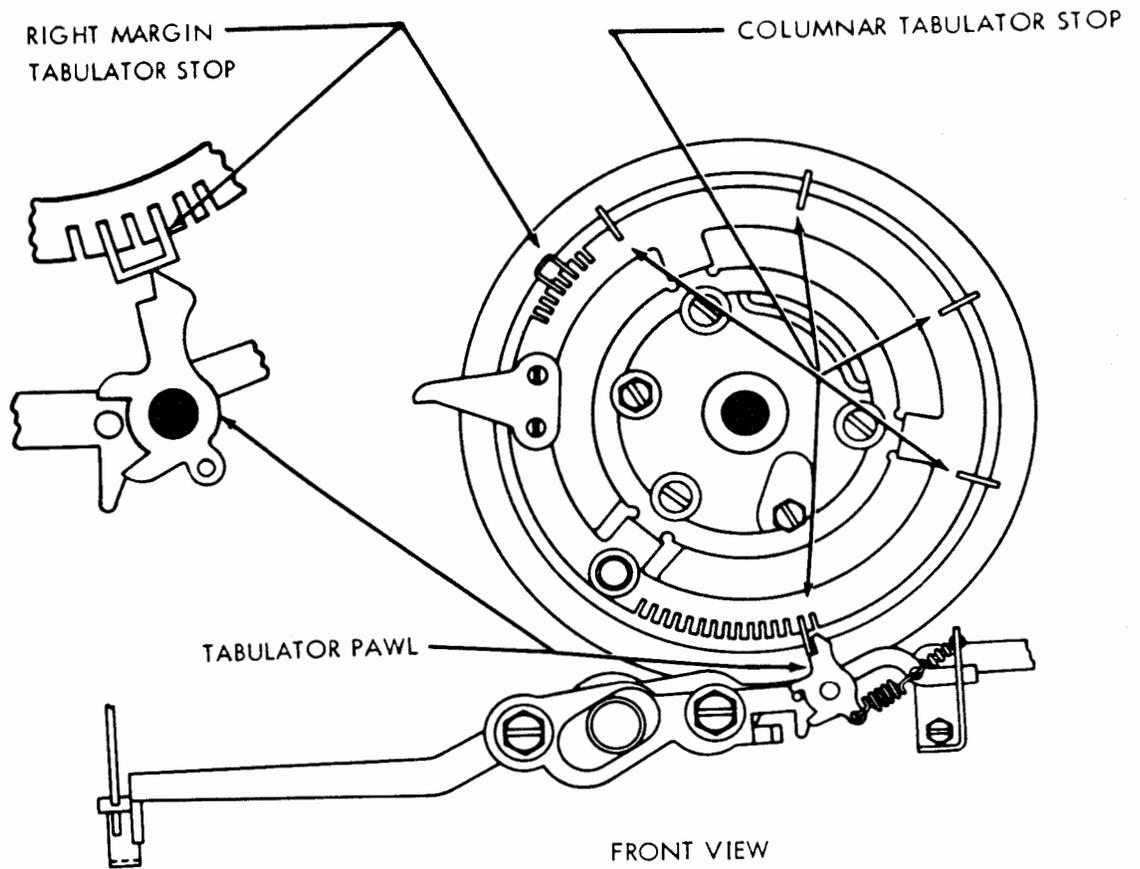


Figure 6-187. Tabulator Stop Settings

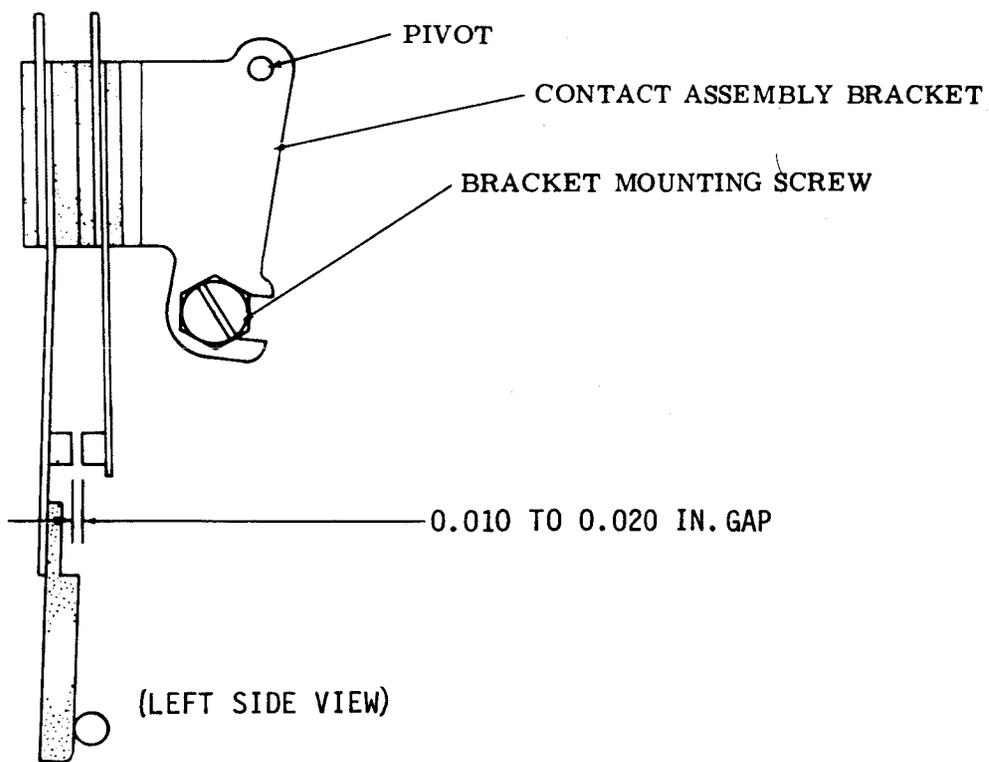


Figure 6-188. Transmitter Control Contact Gap

position contact assembly bracket to obtain specified contact gap. Bracket pivots about pin at upper end of bracket.

## NOTE

If slack in switch cable assembly is insufficient to permit access to mounting screws, loosen cable ties and reposition cable to obtain a slight amount of slack at switch end.

(23) Transmitter Control Contact Spring. Adjust transmitter control contact springs as follows:

- (a) Refer to figure 6-189.
- (b) Place operating lever in unoperated position.
- (c) Attach spring scale hook to long contact spring.
- (d) Force required to barely open contacts should be between 3-1/2 and 4-1/2 ounces.
- (e) If scale reading exceeds specified limits, loosen mounting screw.
- (f) Pivot contact bracket toward rear until it clears mounting screw. Slide bracket to left of pin in upper end of bracket mounting plate and lift switch out to a more accessible position.
- (g) Adjust spring tension by bending long contact spring.

(h) Install contact bracket assembly by following reverse procedure in step (f).

(i) Tighten mounting screw.

g. Letters-Figures Code Bar Shift Magnet Mechanism Adjustments. Perform letters-figures code bar shift magnet mechanism adjustments in accordance with the following paragraphs.

(1) Shift Magnet Yoke. Adjust as follows:

- (a) Refer to figure 6-190.
- (b) Hold magnet armature against core.
- (c) Measure clearance between armature and end of heel piece. There should be some clearance not exceeding 0.003 inch.
- (d) If clearance exceeds specified limits, loosen clamp screw and position clamp screw to obtain specified clearance.
- (e) Tighten clamp screw.

## NOTE

Keep pole face free of oil and grease.

(2) Shift Magnet Armature. Adjust shift magnet armature as follows:

- (a) Refer to figure 6-190.
- (b) Operate magnet armature and place shift

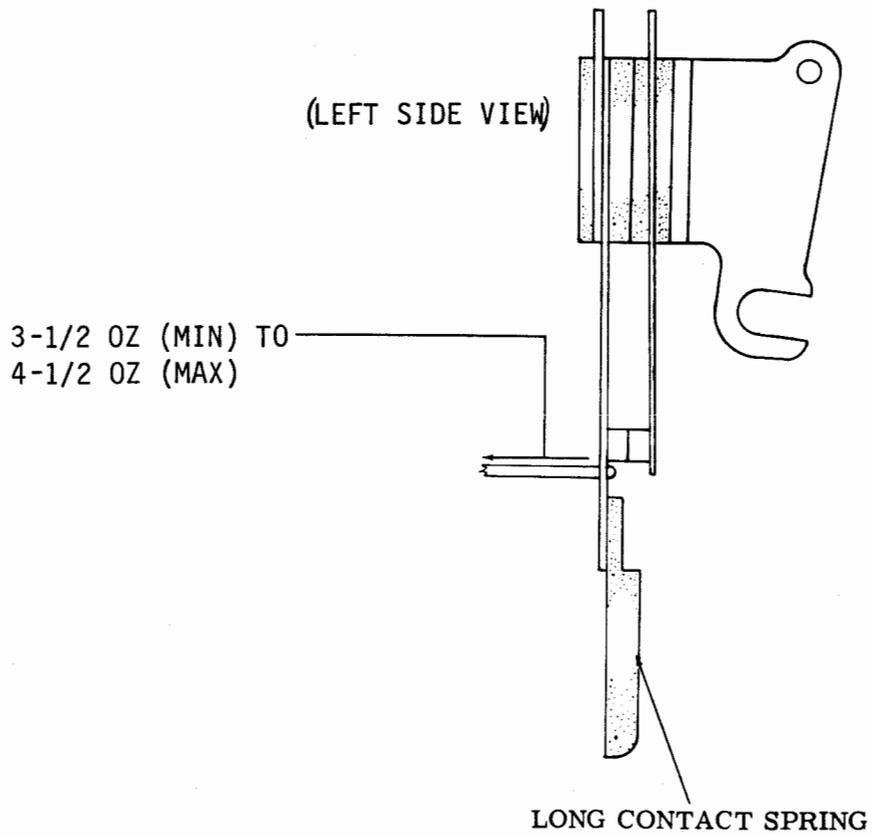


Figure 6-189. Transmitter Control Contact Spring

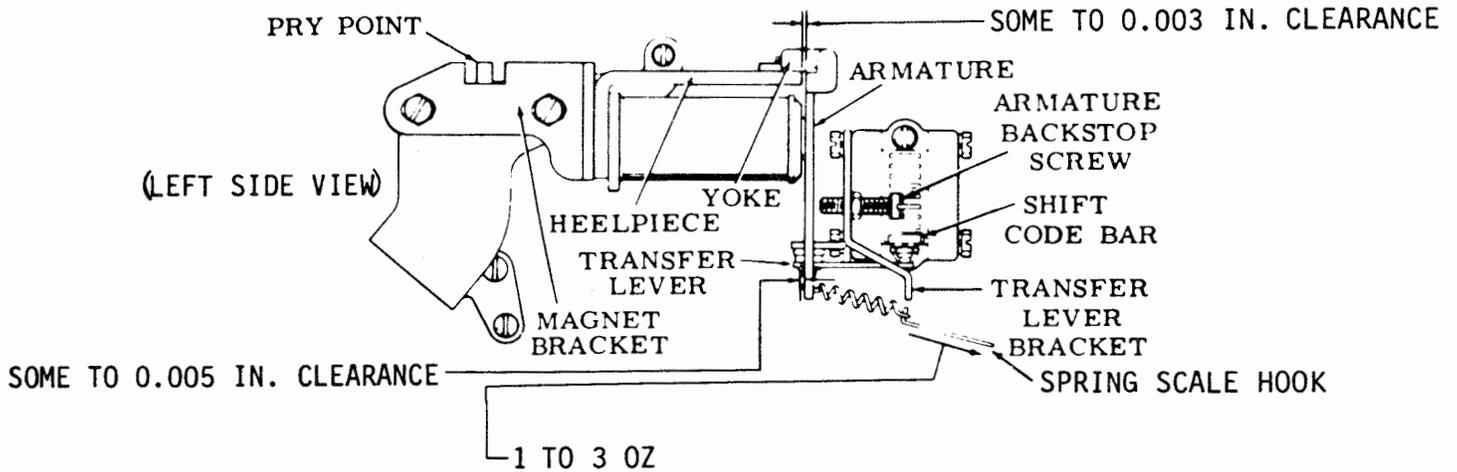


Figure 6-190. Shift Magnet Yoke, Shift Magnet Armature, and Shift Magnet Armature Return Spring

code bar in full marking position.

(c) Measure clearance between armature and transfer lever. There should be some clearance not exceeding 0.005 inch.

(d) If clearance exceeds specified limits, loosen bracket mounting screws and position magnet forward or backward.

(e) Tighten bracket mounting screw.

(f) Place magnet armature in unoperated position and place shift code bar in full spacing condition.

(g) Measure clearance between armature and

transfer lever. There should be some clearance not to exceed 0.010 inch.

(h) Loosen locknut and position armature backstop screw to obtain specified clearance.

(i) Tighten locknut.

(3) Shift Magnet Armature Return Spring. Adjust shift magnet armature return spring as follows:

(a) Refer to figure 6-190.

(b) Unhook one end of shift magnet armature return spring. Attach spring scale hook to free end of spring.

(c) Force required to extend spring to its installed length should be between 1 and 3 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(4) Shift Code Bar Return Spring. Adjust shift code bar return spring as follows:

(a) Refer to figure 6-191.

(b) Trip type box clutch and rotate main shaft until printing track is in lowest position.

(c) Attach spring scale hook to pilot pin.

(d) Force required to start code bar moving should be between 3 and 7 ounces.

(e) If scale reading exceeds specified limits, install new spring.

h. Local Backspace Mechanism Adjustments. Perform local backspace mechanism adjustments in accordance with the following paragraphs.

(1) Camming Bail Spring. Adjust camming bail spring as follows:

(a) Refer to figure 6-192.

(b) Apply spring scale pushrod to backspace camming bail.

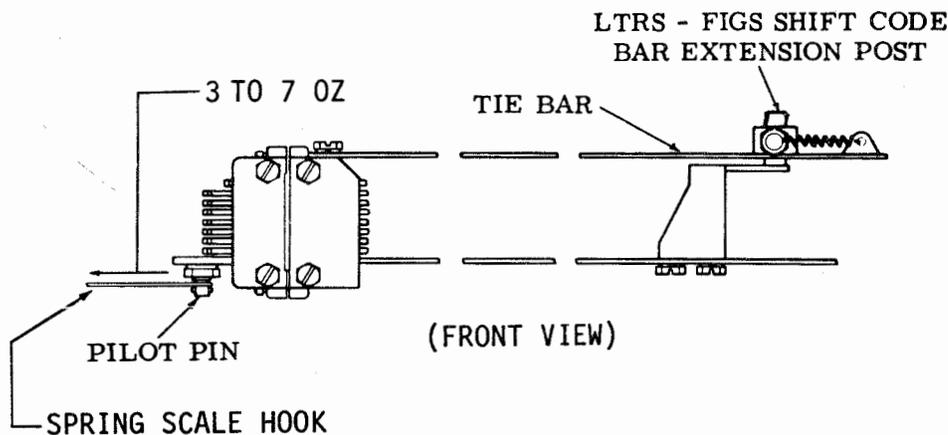


Figure 6-191. Shift Code Bar Return Spring

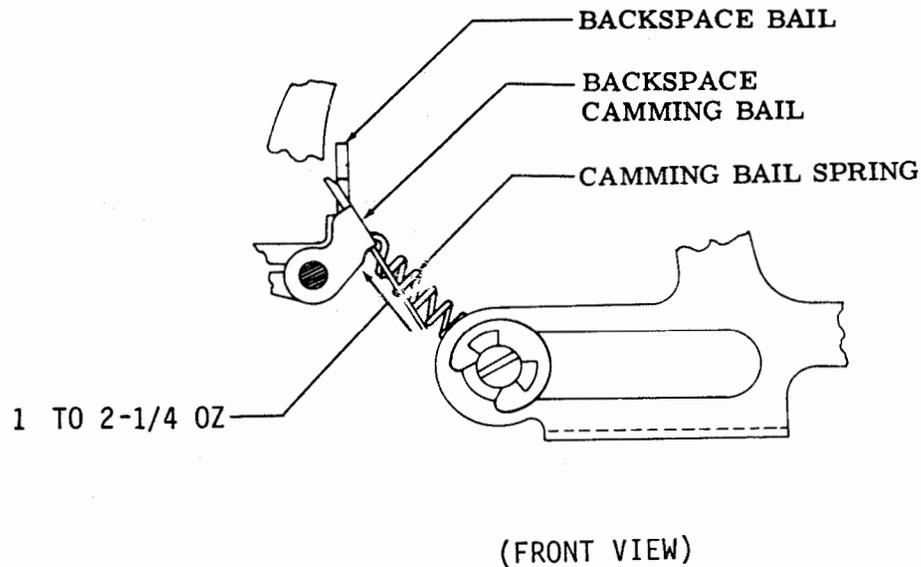


Figure 6-192. Camming Bail Spring

(c) Force required to start bail moving should be between 1 and 2-1/2 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(2) Camming Bail Stop Arm. Adjust camming bail stop arm as follows:

(a) Refer to figure 6-193.

(b) Disengage spacing clutch.

(c) Place front feed pawl in lower position.

(d) Hold backspace bail in operated position.

(e) Trip clutch and rotate main shaft until front and rear feed pawl teeth are in line.

(f) Measure clearance between pawl and tooth on spacing drum ratchet wheel. Clearance should be between 0.015 and 0.035 inch.

(g) If clearance exceeds specified limits, position adjusting plate on intermediate arm in center of its adjusting range.

(h) Loosen stop arm mounting screw and make it friction tight. Position camming bail stop arm to obtain specified clearance.

(i) Tighten mounting screw.

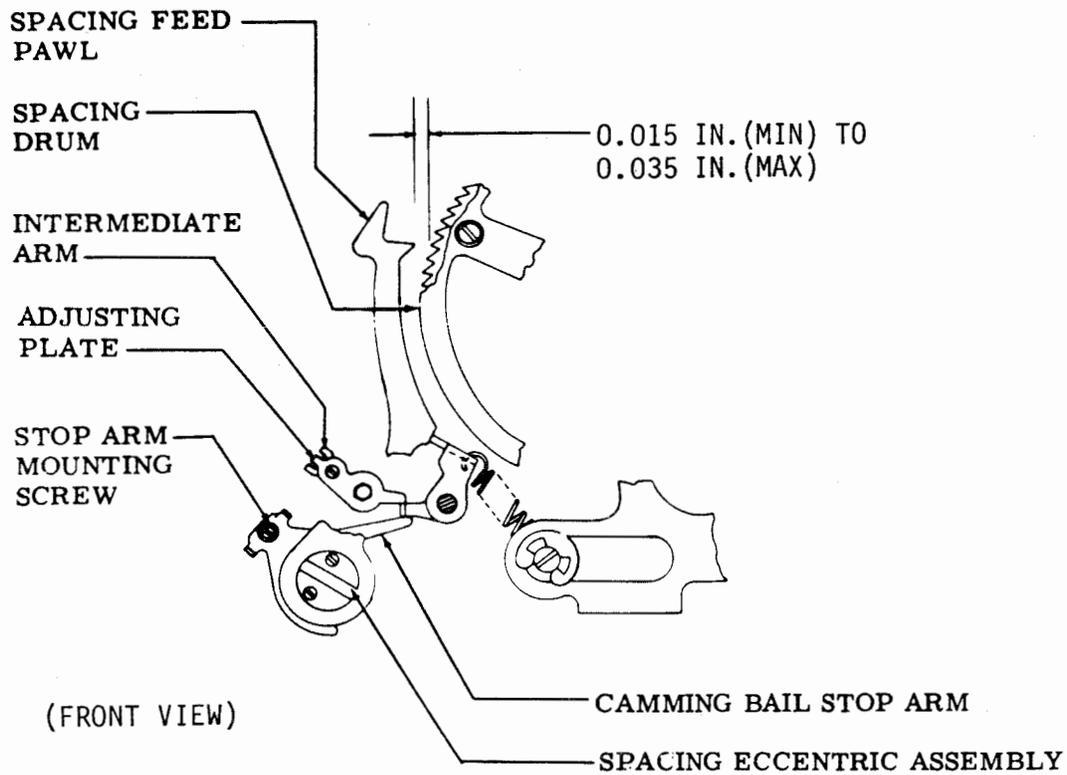


Figure 6-193. Camming Bail Stop Arm

(j) There should be some clearance between feed pawl teeth and ratchet throughout travel of carriage from left to right.

(k) Refine adjustment described in steps (g) through (i).

i. Page Feed-Out Mechanism Adjustments. Perform page feed-out mechanism adjustments in accordance with the following paragraphs.

(1) Pointer. Adjust pointer as follows:

(a) Refer to figure 6-194.

(b) Disengage line feed clutch.

(c) Position index plate adjacent to bail.

(d) Ensure pointer is aligned with notch in indexing disc and clears disc by approximately 1/16 inch.

(e) If pointer is misaligned or clearance exceeds specified limit, loosen mounting screws.

(f) Position pointer to obtain proper alignment and clearance.

(2) Blocking Arm. Adjust blocking arm as follows:

(a) Refer to figure 6-194.

(b) Set bail on peak of index plate.

(c) Measure clearance between blocking arm and upper surface of page feed-out slide. Clearance should be between 0.005 and 0.045 inch.

(d) If clearance is not within specified limits loosen mounting screws.

(e) Position adjustable arm to obtain specified clearance between blocking arm and upper surface of page feed-out slide.

NOTE

If requirement cannot be met for each plate, reposition plate with mounting screw loosened.

(3) Blocking Arm Spring. Adjust blocking arm spring as follows:

(a) Refer to figure 6-194.

(b) Place blocking arm in unblocked position.

(c) Unhook end of spring from blocking arm.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to its operating length should be between 3 and 5 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(4) Page Feed-Out Gear Play. Adjust page feed-out gear play as follows:

(a) Refer to figure 6-195.

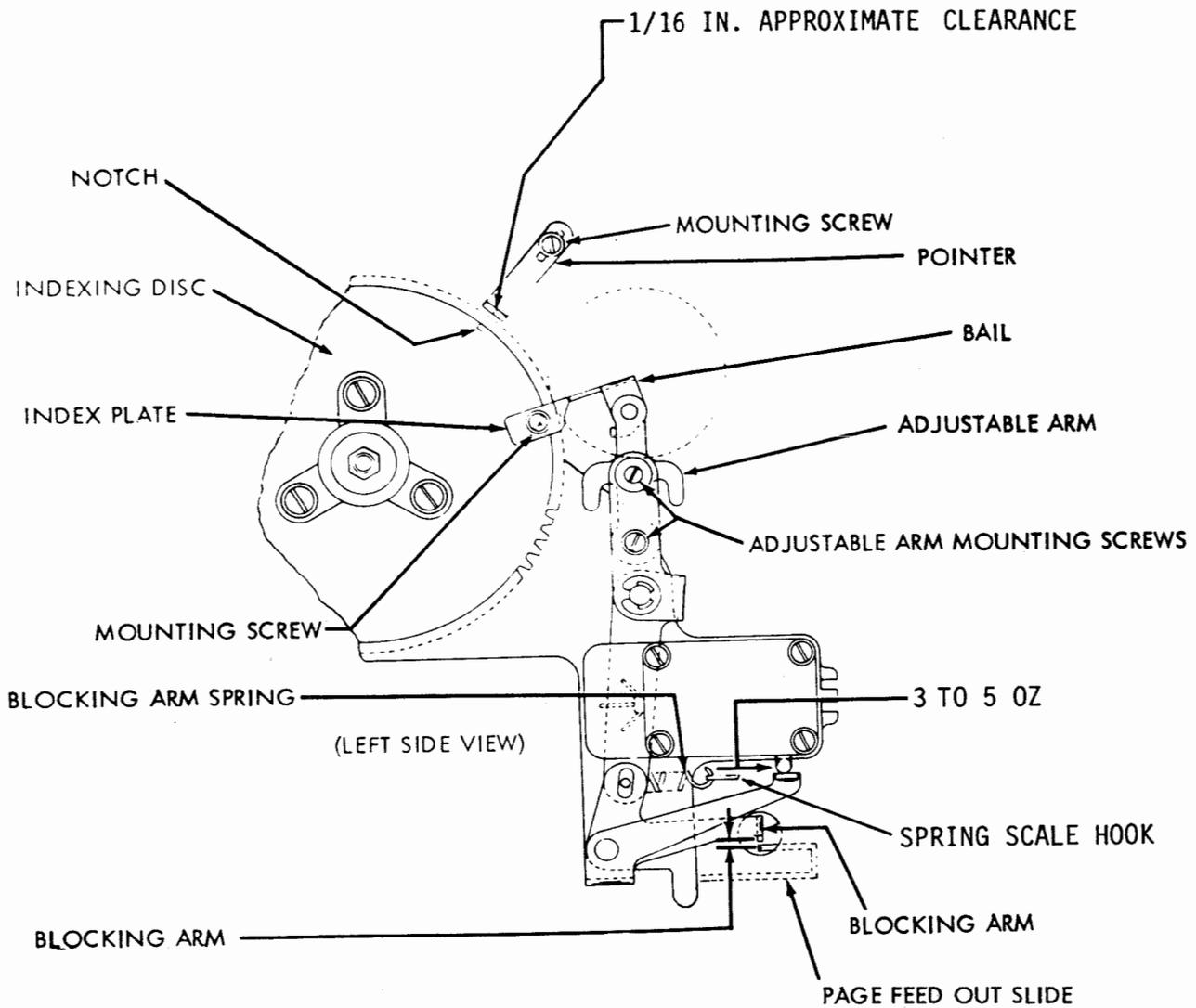
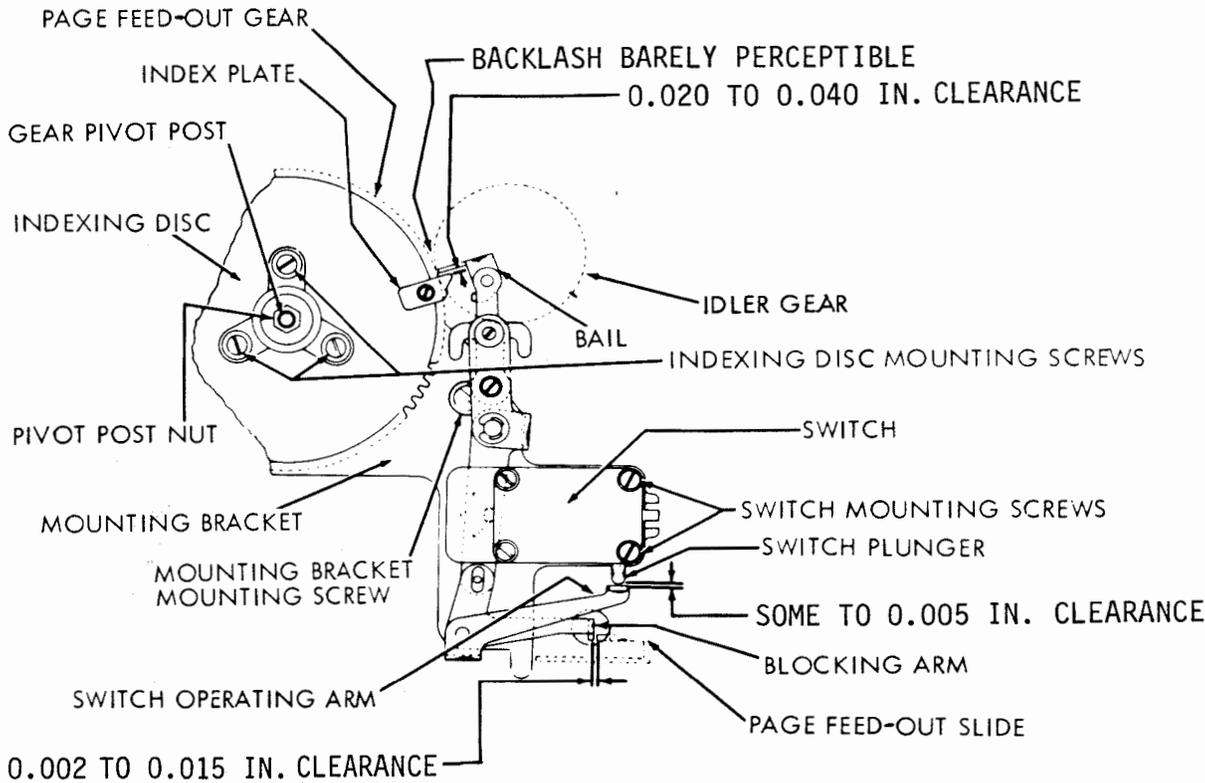


Figure 6-194. Pointer, Blocking Arm, and Blocking Arm Spring



(LEFT SIDE VIEW)

Figure 6-195. Page Feed-Out Gear Play, Mounting Bracket, Indexing Disc, and Switch Operating Arm (Transmitter Control)

(b) Ensure page feed-out gear backlash is barely perceptible.

(c) If backlash is excessive, loosen nut on gear pivot post.

(d) Position gear pivot post to reduce backlash to point where it is barely perceptible.

(e) Tighten nut on gear pivot post.

(5) Mounting Bracket. Adjust mounting bracket as follows:

(a) Refer to figure 6-195.

(b) Disengage select feed-out sequence code bar clutch.

(c) Take up play in blocking arm and feed-out slide to make clearance minimum.

(d) Measure clearance between blocking arm and page feed-out slide. Clearance should be between 0.002 and 0.015 inch.

(e) If clearance exceeds specified limits, loosen mounting screws.

(f) Position lower part of blocking arm to obtain specified clearance between blocking arm and page feed-out slide.

(g) Tighten mounting screws.

(6) Indexing Disc. Adjust indexing disc as follows:

(a) Refer to figure 6-195.

(b) Disengage line feed clutch.

(c) Position index plate adjacent to bail.

(d) Take up play between gears to minimize clearance.

(e) Measure clearance between highest numbered index plate and bail. Clearance should be between 0.020 and 0.040 inch.

(f) If clearance exceeds specified limits, disengage gear from idler.

(g) Turn handwheel clockwise until index plate just operates bail.

(h) Engage first tooth on idler.

NOTE

If page feed-out gear has uneven number of teeth, rotate platen until screw head in platen spur gear is up and platen is detented. Then proceed with adjustment.

(i) Loosen three mounting screws.

(j) Position indexing disc to obtain specified clearance between highest numbered index plate and bail.

(k) Tighten three mounting screws.

(7) Switch Operating Arm (Transmitter Control). Adjust as follows:

(a) Refer to figure 6-195.

(b) Place blocking arm in position to block slide.

(c) Measure clearance between switch operating arm and switch plunger. There should be some clearance not exceeding 0.005 inch.

(d) If clearance exceeds specified limits, loosen two mounting screws.

(e) Position switch to obtain specified clearance between switch operating arm and switch plunger.

(f) Tighten two mounting screws.

j. Paper Jam Alarm (Sprocket Feed) Adjustments.  
Perform paper jam alarm (sprocket feed) adjustments in accordance with the following paragraphs.

(1) Bail Spring.  
Adjust bail spring as follows:

(a) Refer to figure 6-196.

(b) Attach spring scale hook to center of wire bail and pull vertically.

(c) Force required to lift wire bail high enough to release operating lever and operate switches should be between 1/2 and 1-1/2 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(2) Wire Bail.  
Adjust wire bail as follows:

(a) Refer to figure 6-197.

NOTE

Before proceeding with adjustment of wire bail, loosen switch plate mounting screws and rotate both switch and latch to a position where they do not interfere with bail. Position spring post by means of set collar so spring has some initial tension. Spring post should be approximately 30 degrees from vertical as indexed in figure 6-198.

(b) Ensure wire bail rests on paper fingers approximately in radius of fingers. Wire bail should touch at least one finger with not more than 0.015 inch clearance between other finger and wire bail.

(c) If clearance exceeds specified limit, bend wire bail to meet requirement specified in step (b).

NOTE

Ensure there is no bind in bail after making adjustment.

(3) Switch Position.  
Adjust switch position as follows:

(a) Refer to figure 6-198.

(b) Hold wire bail against paper fingers and operating lever latched behind operating bail.

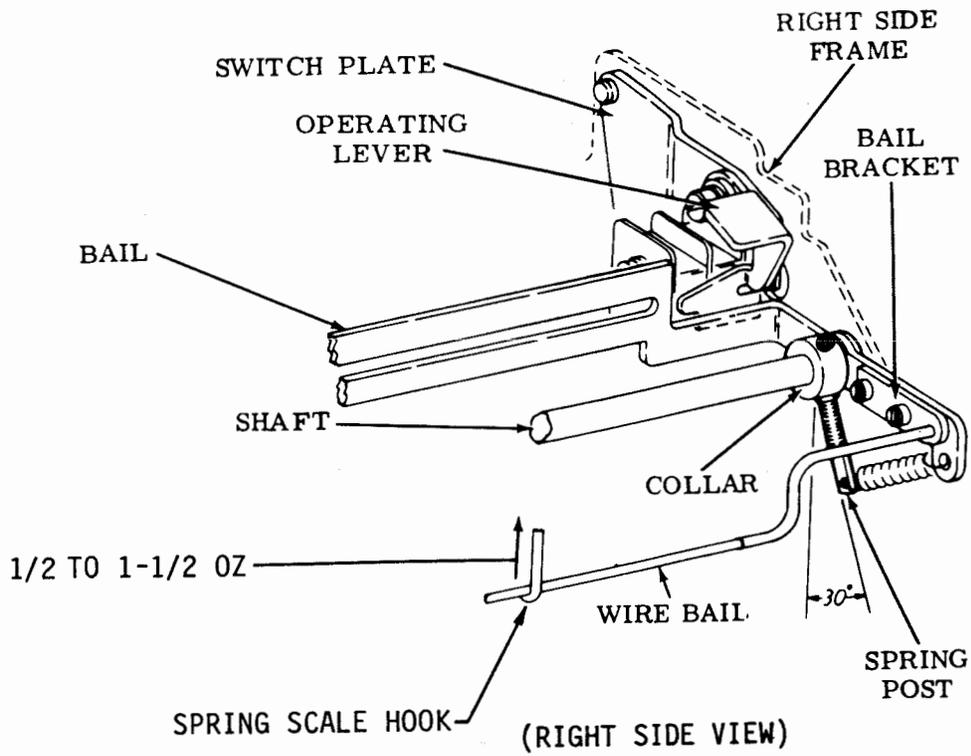


Figure 6-196. Bail Spring

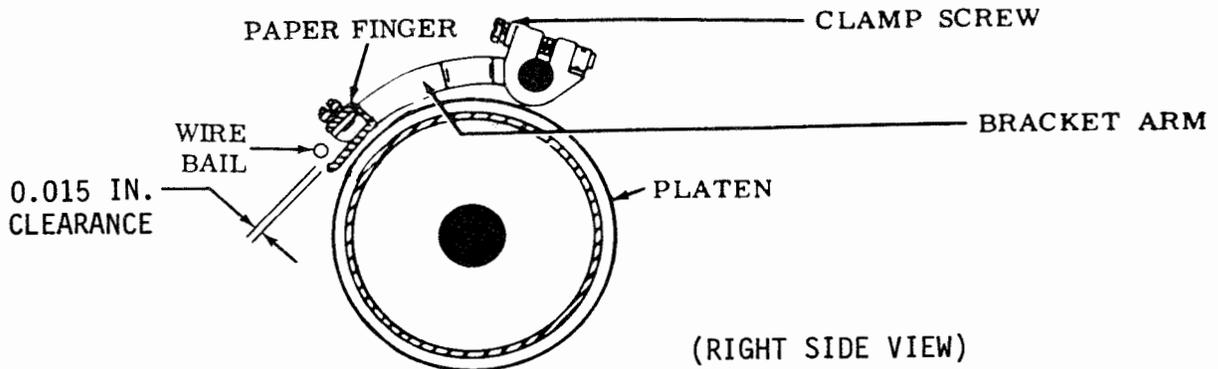


Figure 6-197. Wire Bail

(c) Measure clearance between top of bail and bottom of step in lever. Clearance should be between 0.035 and 0.065 inch and lever should depress switch plungers sufficiently to operate switches.

(d) If clearance is not within specified limits or lever does not depress plungers sufficiently to operate switches, loosen screws.

(e) Position switch plate to obtain specified clearance between top of bail and bottom of step in lever and ensure that lever depresses switch plungers sufficiently to operate switches.

(f) Tighten screws.

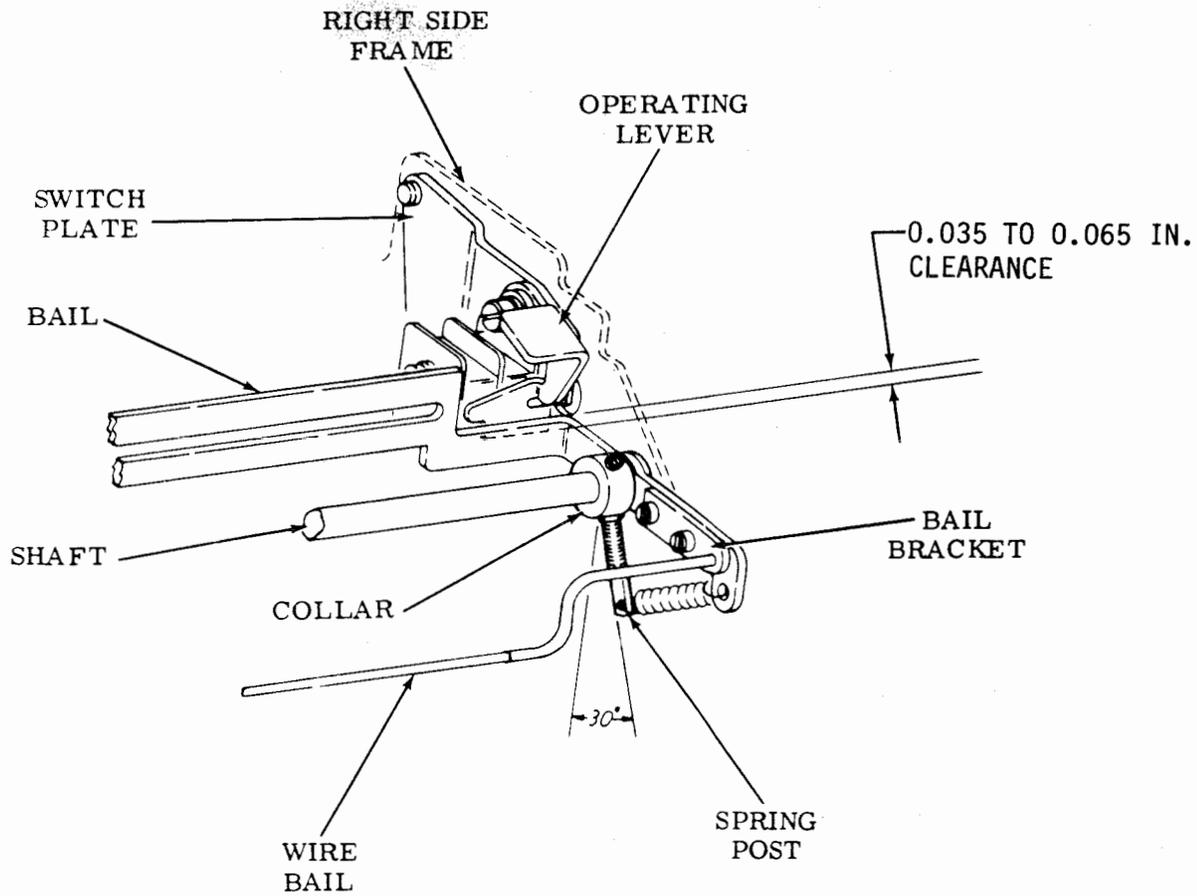
k. Paper-Out Alarm Mechanism Adjustments. Perform paper-out alarm mechanism adjustments in accordance with the following paragraphs.

(1) Switch Position. Adjust switch position as follows:

(a) Refer to figure 6-199.

(b) Move switch toward upper limit of its travel in mounting holes.

(c) Ensure horizontal axis of switch lies in a plane parallel to switch bracket.



(RIGHT FRONT VIEW)

Figure 6-198. Switch Position

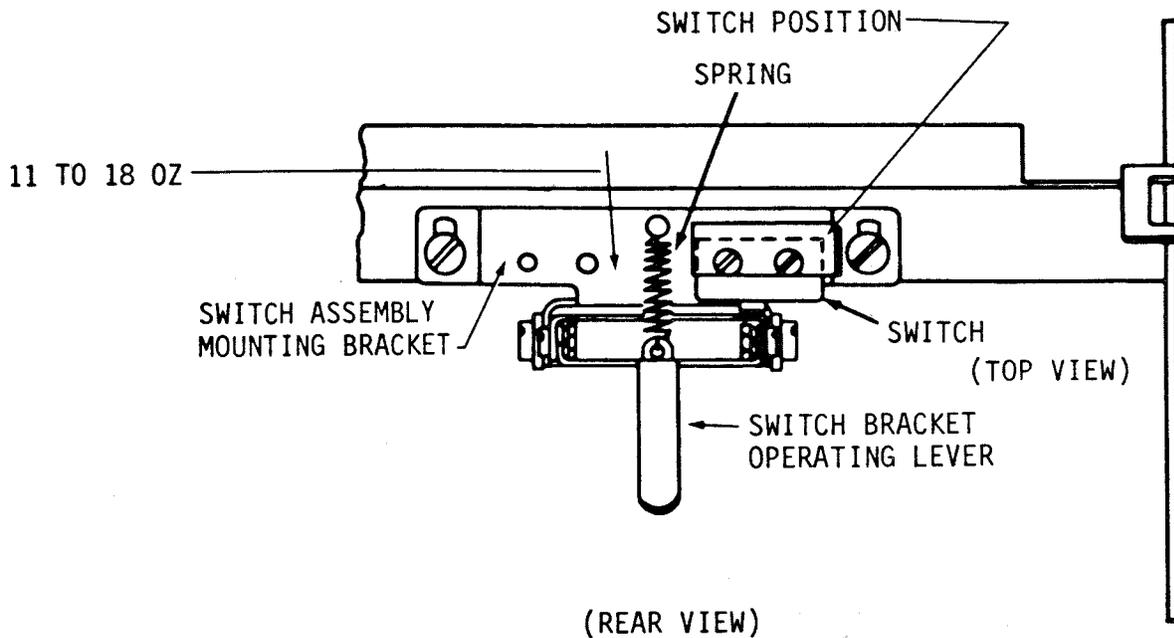


Figure 6-199. Switch Position and Switch Bracket Spring

(d) If not, loosen two mounting screws.

(e) Position and align switch so its horizontal axis is parallel to switch bracket.

(f) Tighten two mounting screws.

(2) Switch Bracket Spring. Adjust switch bracket spring as follows:

(a) Refer to figure 6-199.

(b) Apply spring scale pushrod to top of switch bracket operating lever near spring.

(c) Force required to move switch bracket

clear of switch plunger should be between 11 and 18 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(3) Switch Operating Lever. Adjust switch operating lever as follows:

(a) Refer to figure 6-200.

(b) Remove paper roll.

(c) Ensure upper surface lies in a plane parallel with underside of hexagonal paper spindle and resets approximately 1/4 inch from spindle.

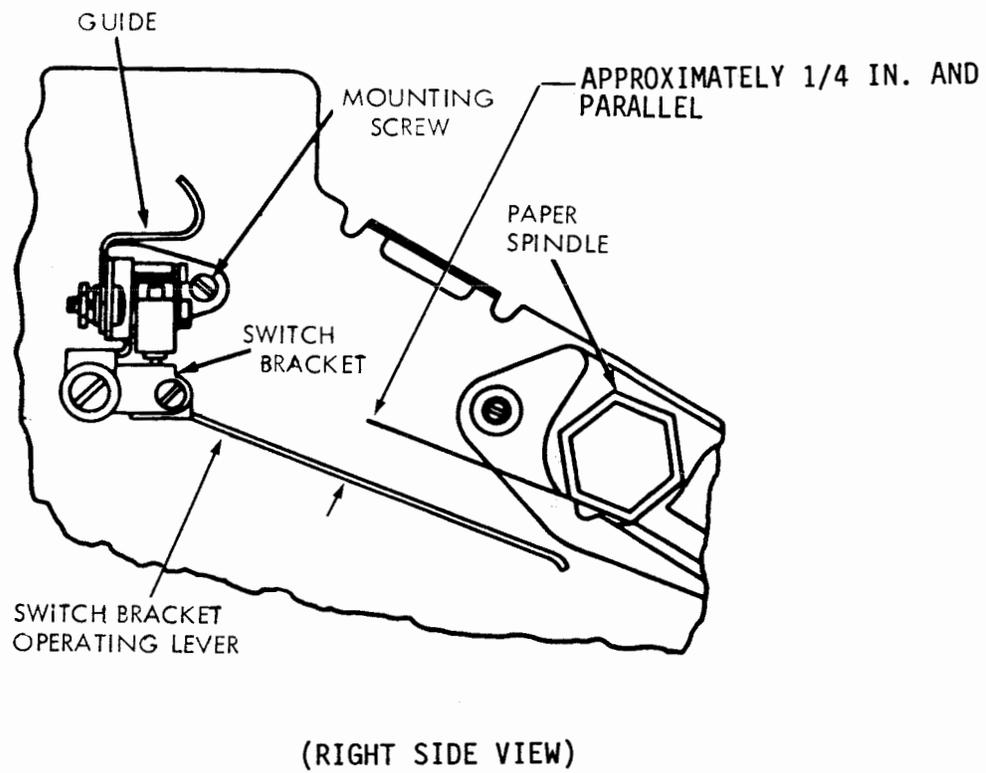


Figure 6-200. Switch Operating Lever

(d) If not, loosen switch assembly mounting screws.

(e) Position switch assembly upward or downward to obtain parallelism and specified distance between upper surface of switch bracket operating lever and underside of hexagonal paper spindle.

(f) Tighten switch assembly mounting screw.

1. Print Suppression Mechanism Adjustments. Perform print suppression mechanism adjustments in accordance with the following paragraphs.

(1) Suppression Code Bar Mechanism. Adjust suppression code bar mechanism as follows:

(a) Refer to figure 6-201.

(b) Place function bars in rear position.

(c) Hook call-directing function pawl over its function bar and strip it.

(d) Ensure notch in suppression code bar lines up vertically with notches in 4, 1, 5, 2, 3, code bars although it may be out of alignment 0.010 inch maximum in marking direction.

(e) Measure clearance between guide plate extension and slide. Clearance should be 0.002 inch maximum.

(f) If clearance exceeds specified limits, loosen guide plate clamp nuts and position guide plate by its lower adjusting slot to obtain specified clearance.

(g) Alternately hook line feed function pawl and call directing function pawl over their respective function bars.

(h) Ensure there is some clearance between rear end of function bar and face of notch on function pawl.

(i) If not, refine adjustments made in steps (d) and (c).

(2) Zero Code Bar Shift Mechanism. Adjust zero code bar shift mechanism as follows:

(a) Refer to figure 6-201.

(b) Rotate function clutch until function bars are in extreme rear position.

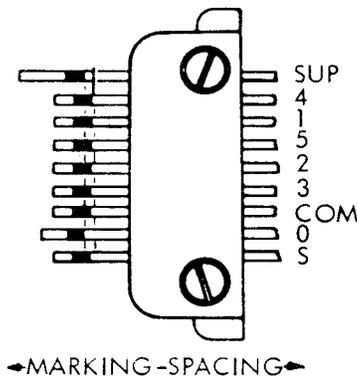
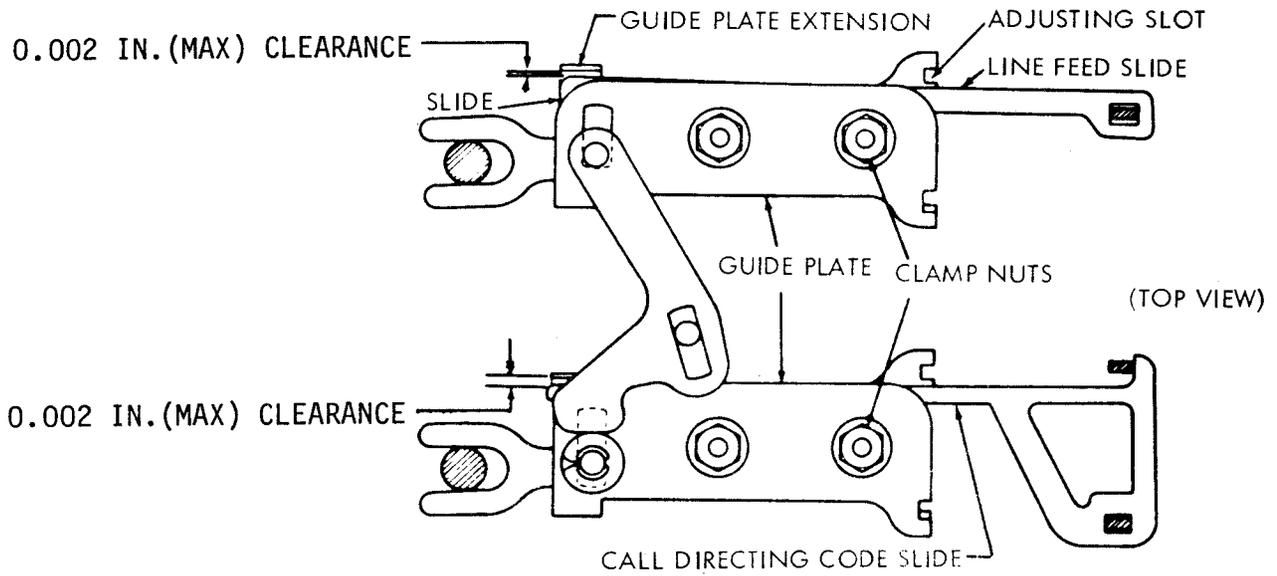
(c) Hook line feed function pawl over its function bar and strip it.

(d) Notch in zero code bar should line up vertically with notches in 4, 1, 5, 2, 3 code bars, although it may be out of alignment 0.010 inch maximum in marking direction.

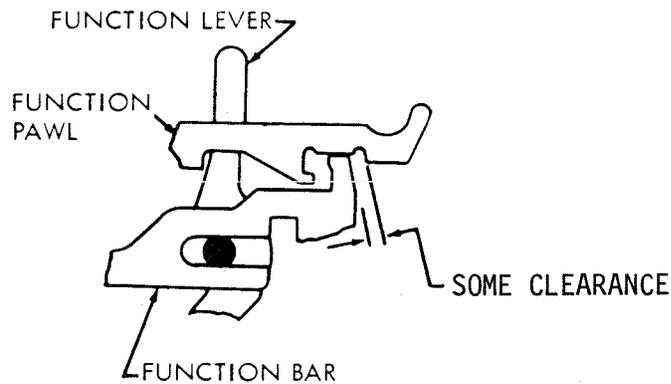
m. Print Suppression and Off-Line Stunt Shift Control Mechanism Adjustments. Perform print suppression and off-line stunt shift control mechanism adjustments in accordance with the following paragraphs.

(1) Suppression Code Bar Position. Adjust suppression code bar position as follows:

(a) Refer to figure 6-202.



(FRONT VIEW)



(RIGHT SIDE VIEW)

Figure 6-201. Suppression Code Bar Mechanism and Zero Code Bar Shift Mechanism

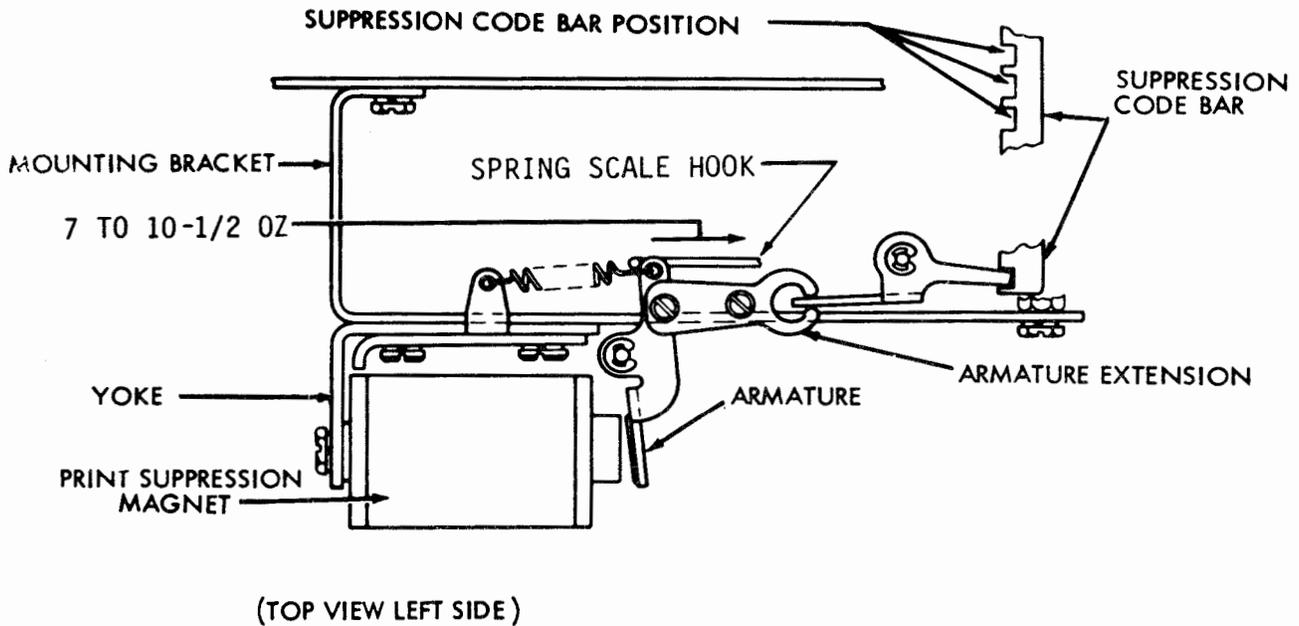


Figure 6-202. Suppression Code Bar Position and Suppression Magnet Armature Return Spring

(b) Energize print suppression magnet and place all code bars in spacing position.

(c) Viewing from rear of unit above stunt box, ensure notches in suppression code bar align with notches in other code bars.

(d) If notches do not align properly, loosen mounting screws.

(e) Operate magnet armature either manually or electrically.

(f) Place all code bars in spacing position.

(g) Pivot armature extension in its

elongated mounting hole to obtain alignment of notches.

(h) Tighten mounting screws.

(2) Print Suppression Magnet Armature Return Spring. Adjust print suppression magnet armature spring as follows:

(a) Refer to figure 6-202.

(b) Deenergize print suppression magnet.

(c) Attach spring scale hook to armature at point of return spring attachment.

(d) Force required to start armature

moving toward magnet core should be between 7 and 10-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(3) Type Box Clutch Trip Lever. Adjust type box clutch trip lever as follows:

(a) Refer to figure 6-36.

(b) Position trip shaft cam follower roller on lowest surface of cam (located on code bar clutch).

(c) Measure clearance between inner face of type box clutch trip lever and clutch disc stop lug. Clearance should be between 0.040 and 0.055 inch.

(d) If clearance exceeds specified limits, loosen clamp screw and position stop to obtain specified clearance.

n. Reverse Line Feed Mechanism Adjustments. Perform reverse line feed mechanism adjustments in accordance with the following paragraphs.

(1) Line Feed Bar Bell Crank Spring. Adjust line feed bar bell crank spring as follows:

(a) Refer to figure 6-203.

(b) Place line feed bar in rear position with line feed bar springs in place.

(c) Place slide link in unoperated position.

(d) Attach spring scale hook to top end of line feed bar.

(e) Force required to start line feed bar moving should be between 19 and 24 ounces.

(f) If scale reading exceeds specified limits install new spring.

(2) Line Feed Bar Release Lever Spring. Adjust line feed bar release lever spring as follows:

(a) Refer to figure 6-204.

(b) Apply spring scale pushrod to top end of line feed bar release lever.

(c) Force required to start lever moving should be between 3 and 8 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(3) Platen Detent Bail Spring. Adjust platen detent bail spring as follows:

(a) Refer to figure 6-204.

(b) Seat detent between two teeth on line feed spur gear.

(c) Attach spring scale hook to platen detent bail at detent stud.

(d) Force required to start detent moving should be between 16 and 32 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(4) Line Feed Spur Gear Detent Eccentric. Adjust

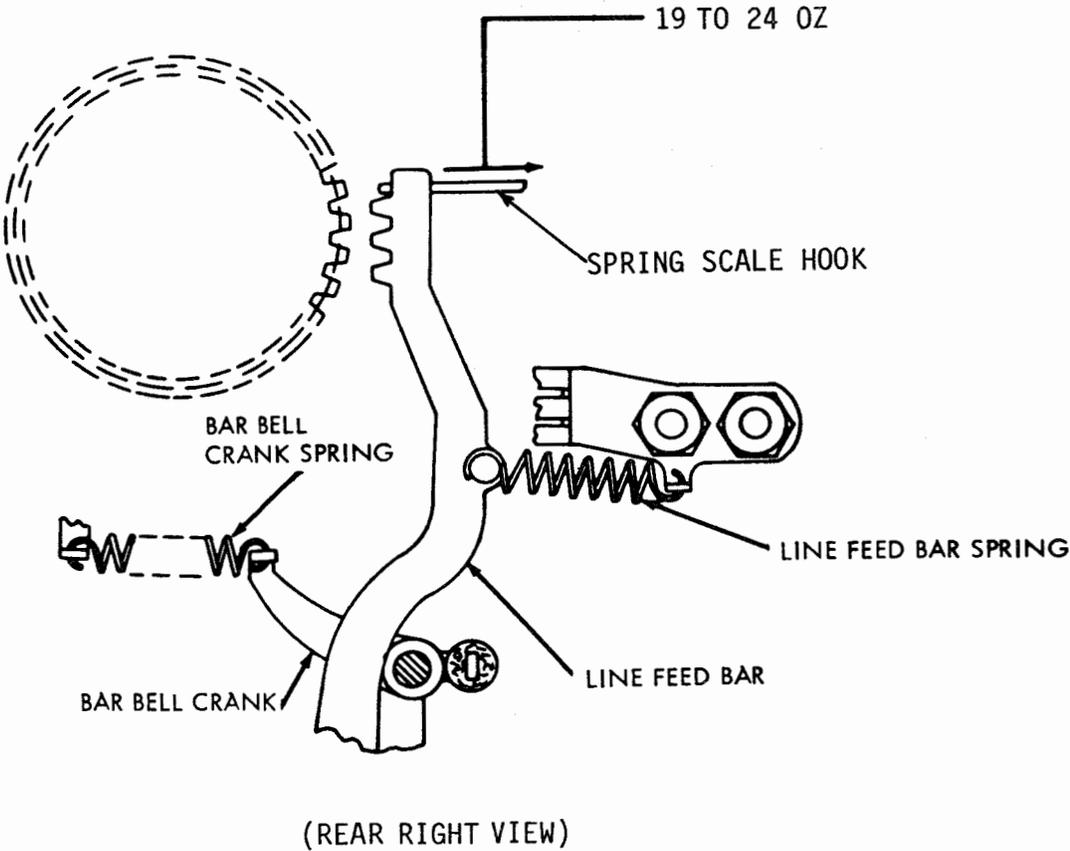


Figure 6-203. Line Feed Bar Bell Crank Spring

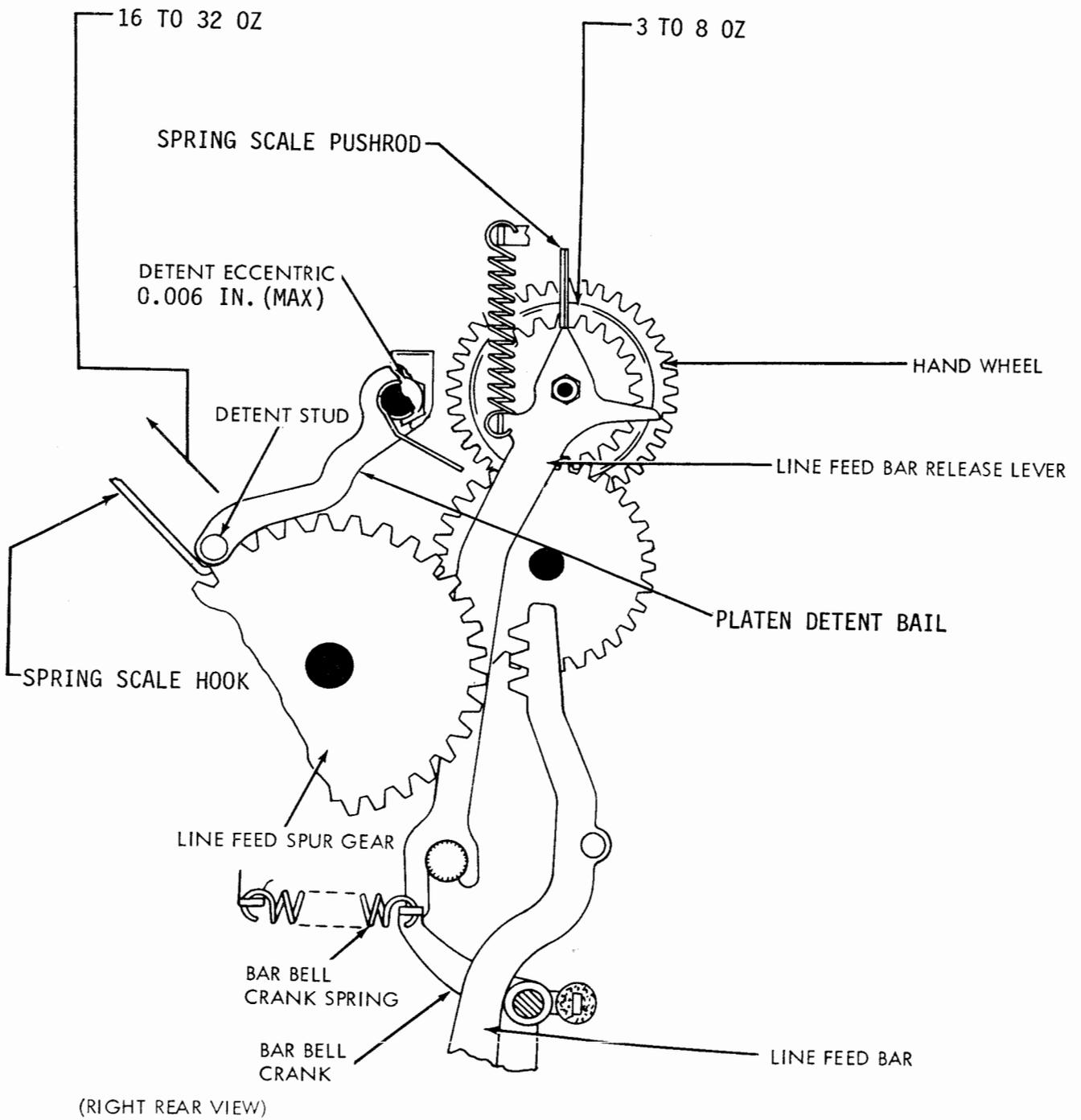


Figure 6-204. Line Feed Bar Release Lever Spring and Platen Detent Bail Spring, and Line Feed Spur Gear Detent Eccentric

line feed spur gear detent eccentric as follows:

- (a) Refer to figure 6-204.
- (b) Disengage line feed clutch.
- (c) Rotate platen until detent stud is seated between two teeth on line feed spur gear.
- (d) With handwheel released, manually set teeth on feed bars into engagement with teeth on line feed spur gear.

(e) Ensure detent stud contacts one gear tooth and is not more than 0.006 inch from other tooth.

(f) If not, loosen detent eccentric mounting screws.

(g) Keeping high part of eccentric upward, rotate detent eccentric to obtain specified spacing of detent stud and gear teeth.

(h) Tighten detent stud mounting screws.

(5) Line Feed Bar Springs. Adjust line feed bar springs as follows:

- (a) Refer to figure 6-205.
- (b) Engage line feed bar with platen gear.
- (c) Unhook both springs at end opposite from line feed bars.
- (d) Attach spring scale hook to free end of either spring.

(e) Force required to extend spring to installed length should be between 2-1/2 and 5 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise reconnect free end of spring.

(g) Attach spring scale hook to free end of remaining spring.

(h) Repeat steps (d), (e), and (f).

(6) Line Feed Clutch Spur Gear. Adjust line feed clutch spur gear as follows:

- (a) Refer to figure 6-206.
- (b) Disengage line feed clutch.
- (c) Raise slide link upward so as to fully engage end of lower line feed bar, slide held forward by its spring.
- (d) Measure clearance between slide link and lower line feed bar. Clearance should be between 0.005 and 0.040 inch.

(e) If clearance exceeds specified limits, set line feed clutch spur gear at center of adjusting range.

(f) Disengage line feed clutch.

(g) Loosen eccentric assembly bearing post.

(h) Mesh the two gears so forward edge of lower ends of line feed bars are

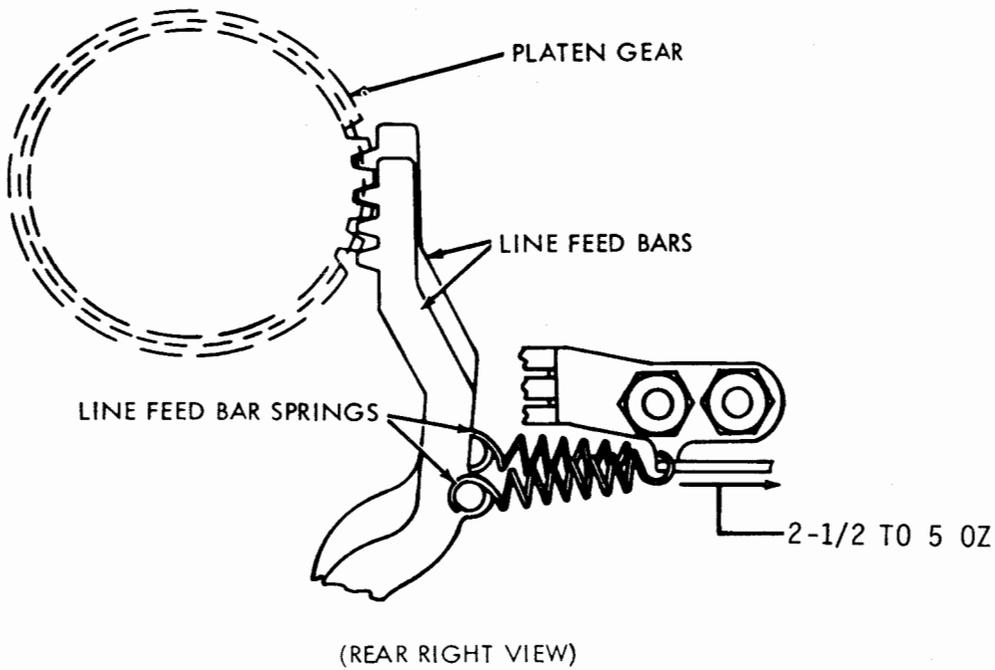


Figure 6-205. Line Feed Bar Springs

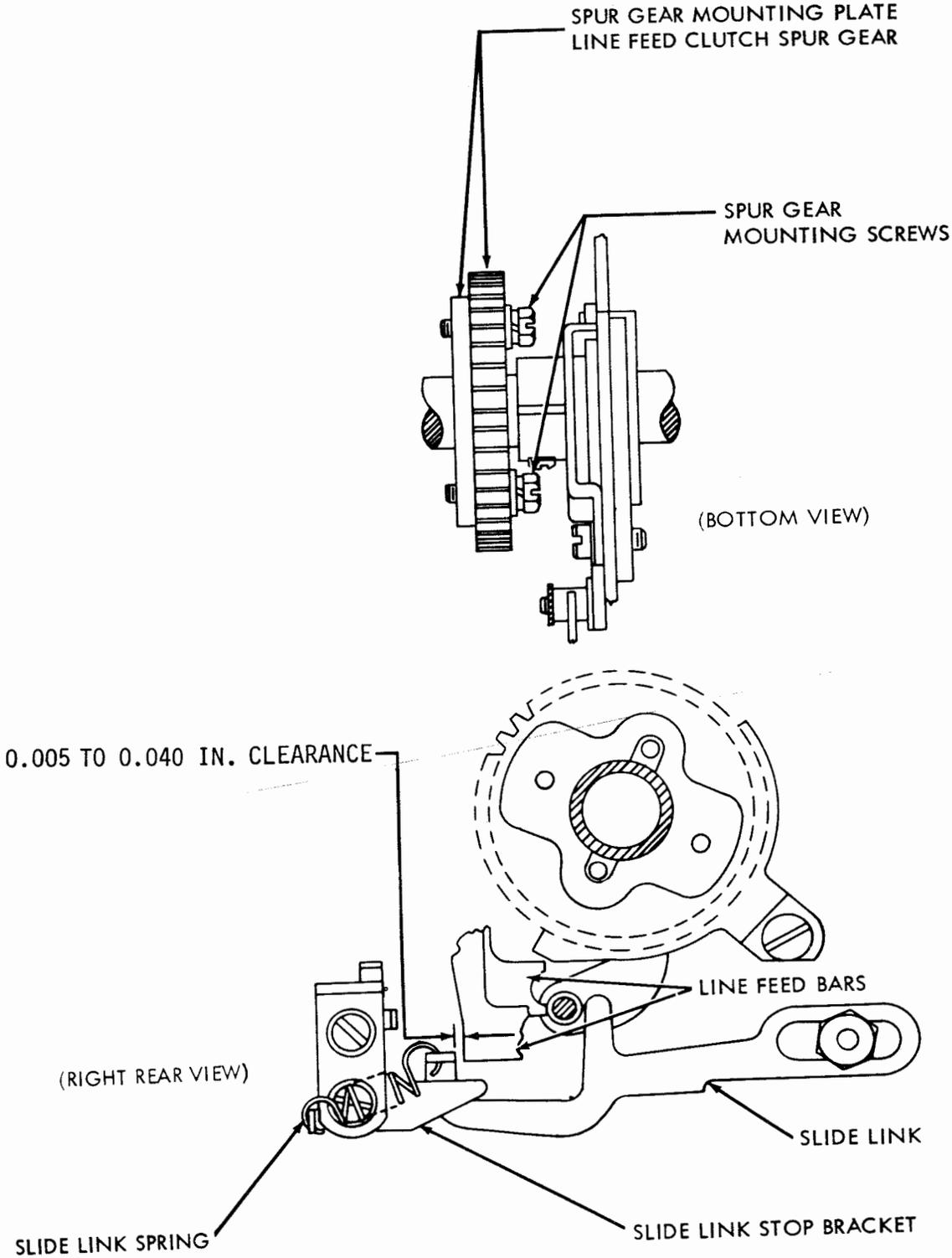


Figure 6-206. Line Feed Clutch Spur Gear

aligned with each other within 0.040 inch.

(i) Loosen spur gear mounting screws.

(j) Rotate line feed clutch spur gear relative to its mounting plate.

(k) At each adjust clearance for both line feed bars to obtain specified clearance.

(l) Tighten spur gear mounting screws.

(7) Reverse Line Feed Slide Link Spring. Adjust reverse line feed slide link spring as follows:

(a) Refer to figure 6-207.

(b) Position slide link so it rests on its stop bracket.

(c) Disengage line feed clutch.

(d) Unhook end of spring farthest from slide link.

(e) Attach spring scale hook to free end of spring.

(f) Force required to extend spring to its installed length should be between 1-1/2 and 3-1/2 ounces.

(g) If scale reading exceeds specified limits, install new spring. Otherwise, reconnect free end of spring.

(8) Reverse Line Feed Slide Link Stop Bracket. Adjust reverse line feed slide link stop bracket as follows:

(a) Refer to figure 6-207.

(b) Operate forward line feed to position line feed bar near as possible to slide link stop bracket.

(c) Measure clearance between top surface of slide link and lower edge of closest line feed bar. Clearance should be 0.045 inch minimum.

(d) If clearance is less than specified minimum value, loosen slide link stop bracket screws and position bracket.

(e) Tighten mounting screws.

o. Selective Calling Mechanism Adjustments. Perform selective calling mechanism adjustments in accordance with the following paragraphs.

(1) Automatic Carriage Return-Line Feed Blocking Slide Spring. Adjust spring as follows:

(a) Refer to figure 6-208.

(b) Unhook spring end opposite from condition code shift fork.

(c) Attach spring scale hook to free end of spring.

(d) Force required to extend spring to its between 1 and 3 ounces.

(e) If scale reading exceeds specified

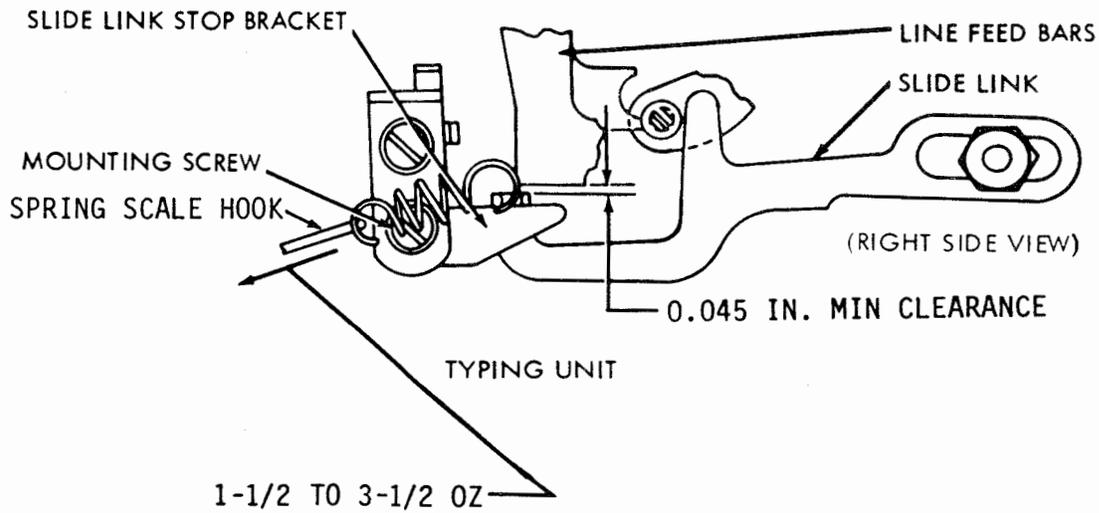


Figure 6-207. Reverse Line Feed Slide Link Spring and Reverse Line Feed Slide Link Stop Bracket

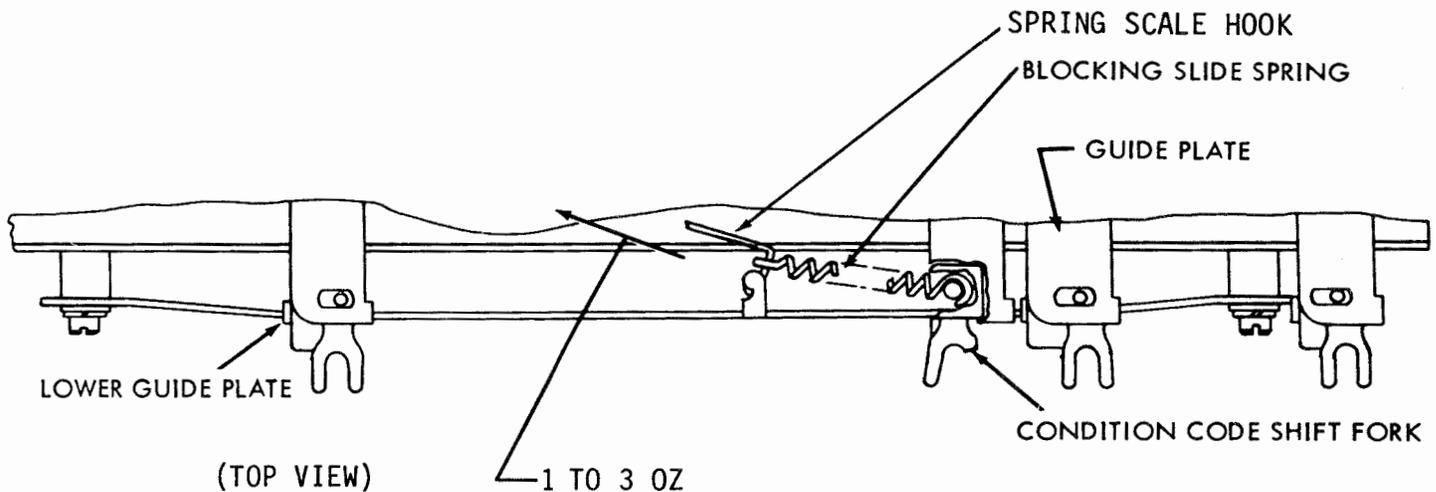


Figure 6-208. Automatic Carriage Return-Line Feed Blocking Slide Spring

limits, install new spring. Otherwise, reconnect free end of spring.

(2) Condition Code Shift Fork Spring. Adjust condition code shift fork spring as follows:

(a) Refer to figure 6-209.

(b) Unhook one end of spring.

(c) Attach spring scale hook to free end of spring.

(d) Force required to extend spring to its installed length should be between 1 and 3 ounces.

(e) If scale reading exceeds specified limits, install new spring. Otherwise, reconnect free end of spring.

(3) Blocking Bail. Adjust blocking bail as follows:

(a) Refer to figure 6-210.

(b) Latch function lever of any stunt case code bar shift mechanism and rotate main shaft until lower surface of suppression arm is in approximate alignment with bottom surface of blocking bail extension.

(c) Measure clearance between suppression arm and blocking bail extension with play taken up to produce minimum clearance. Clearance should be between 0.008 and 0.055 inch.

(d) If clearance exceeds specified limits, loosen mounting screw.

(e) Position extension to obtain specified clearance.

(f) Tighten mounting screw.

(g) Refine adjustment if necessary and recheck each shift mechanism.

(h) Refine stunt case code bar shift mechanism adjustment of any shift mechanism that does not meet the above requirements.

(4) Off-Line Stunt Shift Solenoid Spring. Adjust off-line stunt shift solenoid spring as follows:

(a) Refer to figure 6-210.

(b) Place solenoid in unoperated position.

(c) Unhook one end of spring.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to its installed length should be between 2 and 4-1/2 ounces.

(f) If scale reading exceeds specified limits, install new springs. Otherwise, reconnect free end of spring.

(5) Type Box Clutch Suppression Arm. Adjust type box clutch suppression arm as follows:

(a) Refer to figure 6-210.

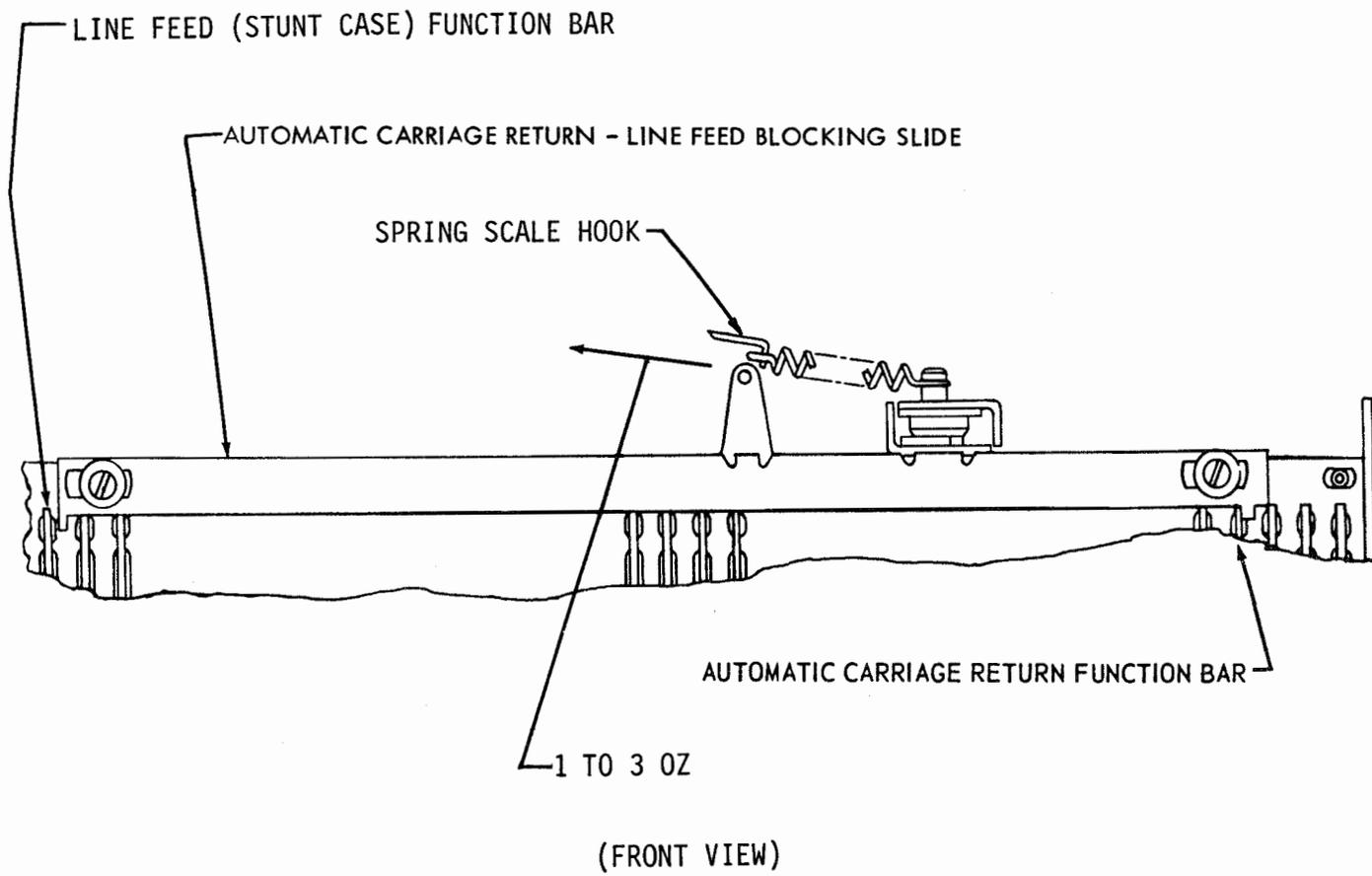


Figure 6-209. Condition Code Shift Fork Spring

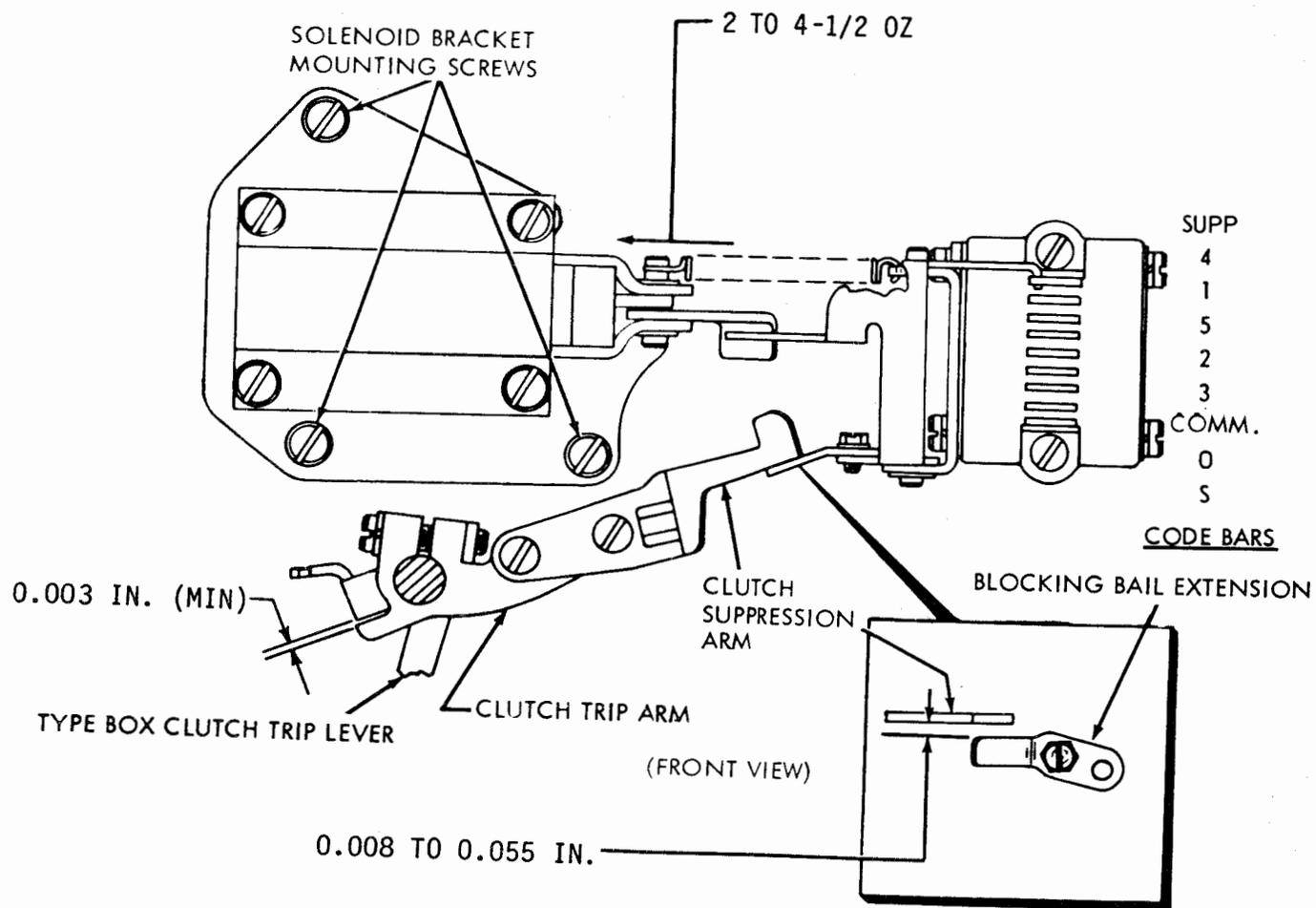


Figure 6-210. Blocking Bail, Off-Line Stunt Shift Solenoid Spring, and Type Box Clutch Suppression Arm

(b) Place suppression arm in blocking position.

(c) Rotate shaft until function clutch shoe lever is opposite function clutch trip lever.

(d) Measure clearance between trip arm extension and clutch trip lever. Clearance should be 0.006 inch minimum.

(e) Measure clearance between function clutch shoe lever and function clutch trip lever. Clearance should be 0.006 inch minimum.

(f) If clearance in either step (d) or step (e) exceeds specified limit, loosen suppression arm mounting screw.

(g) Position suppression arm to obtain specified clearances.

(h) Tighten mounting screw.

(6) Type Box Clutch Trip Lever (Selective Calling Units With or Without Off-Line Shift Solenoid). Adjust type box clutch trip lever as follows:

(a) Refer to figure 6-211.

(b) Position trip shaft cam follower roller on lowest surface of cam (located on code bar clutch).

(c) Measure clearance between inner face of type box clutch trip lever and clutch disc stop lug. Clearance should be between 0.025 and 0.045 inch.

(d) If clearance exceeds specified limits, loosen clamp screw and position stop to obtain specified clearance.

(7) Print Suppressor Code Bar Spring. Adjust print suppressor code bar spring as follows:

(a) Refer to figure 6-212.

(b) Move suppressor code bar to left.

(c) Apply spring scale pushrod to code bar.

(d) Force required to start code bar moving should be between 4-1/2 and 7-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(8) Code Bar Shift Mechanism. Adjust code bar shift mechanism as follows:

(a) Refer to figure 6-213.

(b) Place function clutch in stop position.

(c) Latch function lever (shift mechanism) on its lower releasing latch.

(d) Shift all code bars to right.

(e) Ensure notch in suppressor code bar should be in alignment with notches in other code bars.

(f) If suppressor code bar is not in alignment with all other code

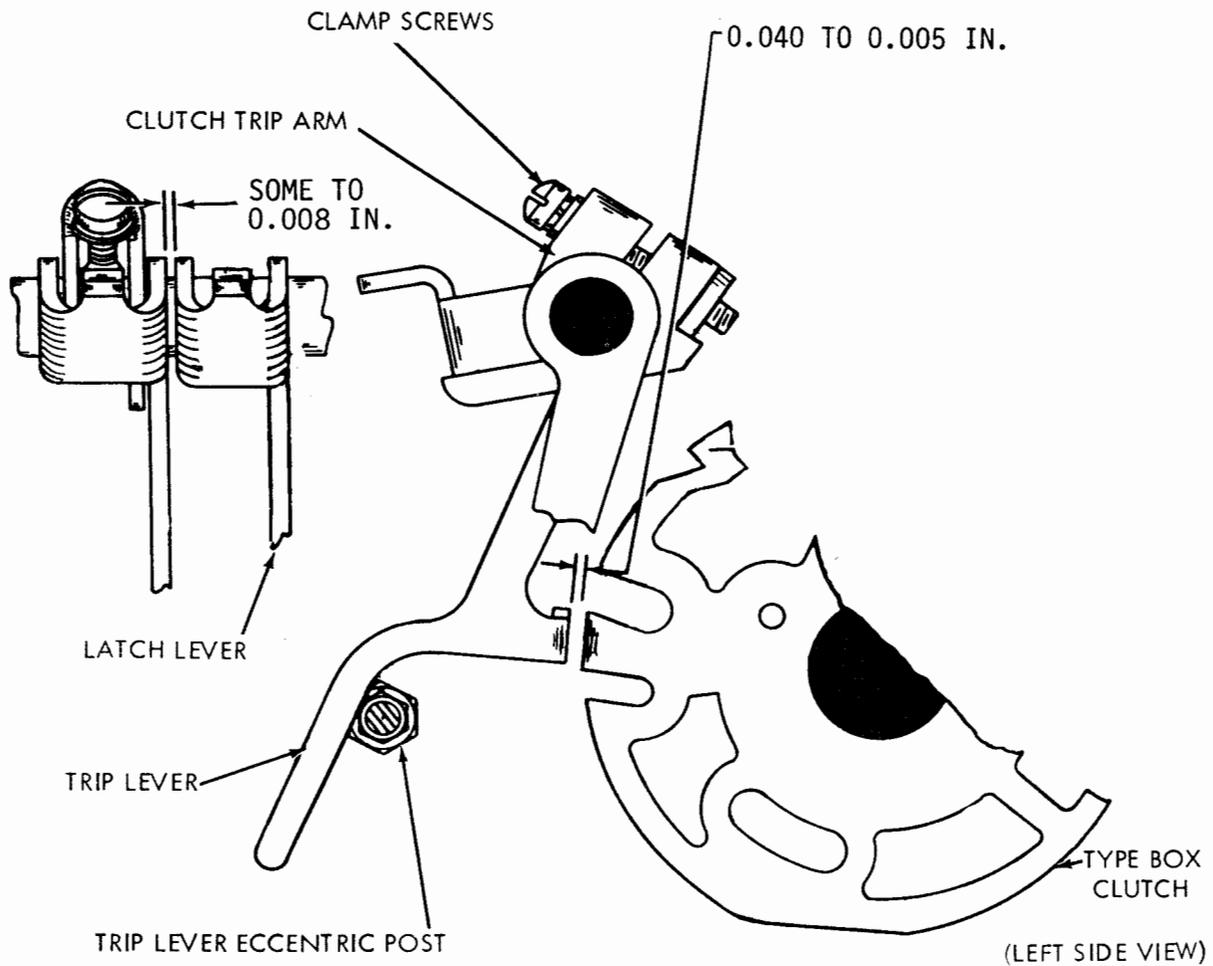


Figure 6-211. Type Box Clutch Trip Lever  
(Selective Calling Units)

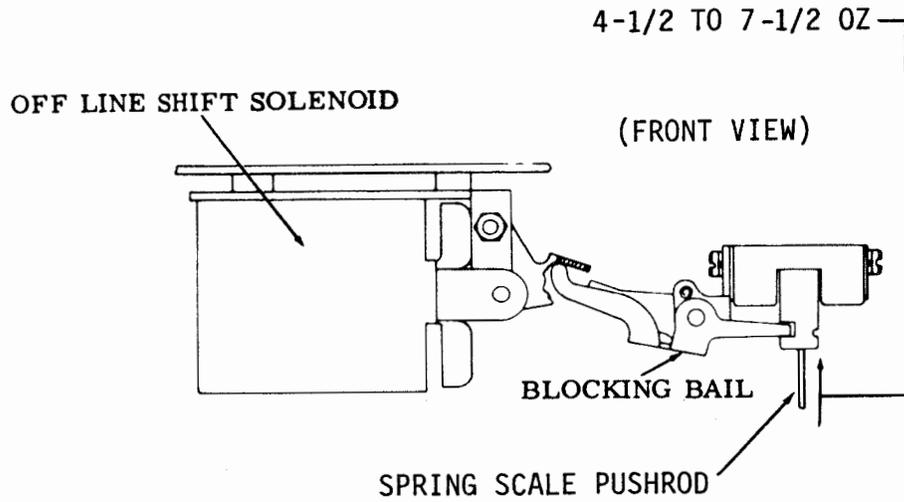


Figure 6-212. Print Suppressor Code Bar Spring

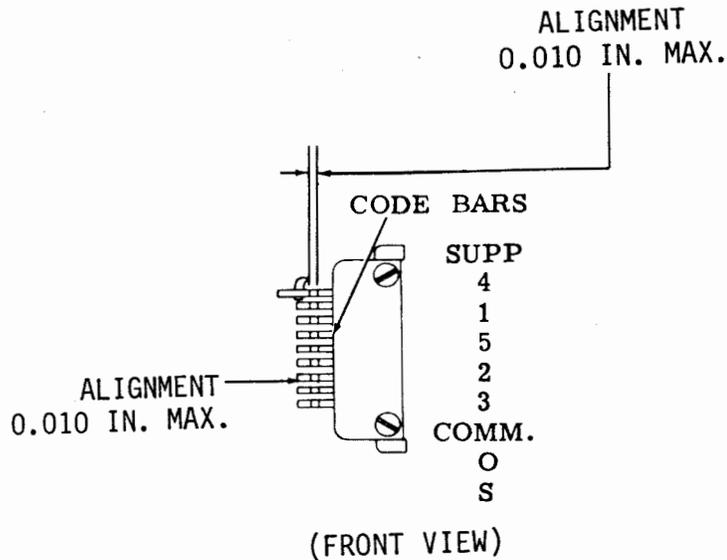


Figure 6-213. Code Bar Shift Mechanism, Condition Code (Zero) Code Bar Shift Mechanism, and Off-Line Shift Solenoid Bracket Assembly

bars, loosen guide plate clamp nuts.

(g) Position upper or lower guideplate to align notches. Position guide plate so movement of fork is not restricted within range of adjustment.

(h) Tighten clamp nuts.

(i) Repeat steps (d) through (g) for each stunt.

(9) Condition Code (Zero) Code Bar Shift Mechanism. Adjust condition code (zero) code bar shift mechanism as follows:

(a) Refer to figure 6-213.

(b) Place function clutch in stop position.

(c) Latch function lever (shift mechanism).

(d) Shift all code bars to right.

(e) Ensure notch in suppressor code bar should be in alignment with notches in other code bars within 0.010 inch maximum.

(f) If suppressor code bar is not in alignment with all other code bars, loosen guide plate clamp nuts.

(g) Position upper or lower guide plate to align notches. Position associated guide plate so movement of fork is not restricted.

(h) Tighten clamp nuts.

(i) Repeat steps (d) through (g) for each stunt case code bar shift mechanism.

(10) Off-Line Shift Solenoid Bracket Assembly (Off-Line Only). Adjust off-line shift solenoid bracket assembly as follows:

(a) Refer to figure 6-213.

(b) Ensure notch in suppression code bars are in alignment with notches in other code bars when code bars are shifted to right.

(c) If alignment of notches is not as specified, loosen mounting screws.

(d) Position solenoid bracket to align notch in suppression code bar with notches in other side bars when code bars are shifted to right.

(e) Tighten mounting screws.

p. Two-Color Ribbon Mechanism Adjustments. Perform two-color ribbon mechanism adjustments in accordance with the following paragraph.

(1) Armature Spring, Left and Right. Adjust armature spring as follows:

(a) Refer to figure 6-214.

(b) Attach spring scale hook as shown.

(c) Force required to seat armature

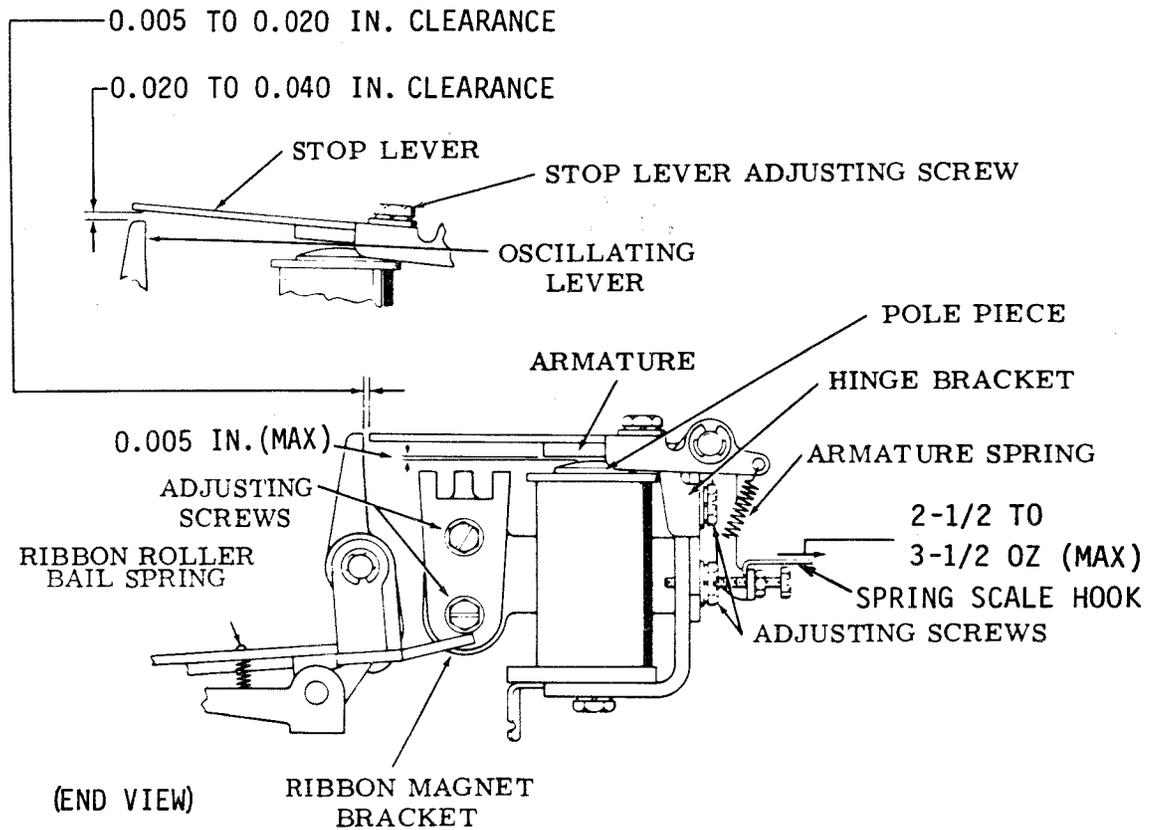


Figure 6-214. Armature Spring, Left and Right; Ribbon Magnet Hinge Bracket, Left and Right (Preliminary); Ribbon Magnet Hinge Bracket, Left and Right (Final); Ribbon Magnet Bracket, Left and Right (Preliminary); Operational Requirement for Ribbon Magnet Bracket (Final)

against pole piece should be between 2-1/2 and 3-1/2 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(2) Ribbon Magnet Hinge Bracket, Left and Right (Preliminary). Adjust ribbon magnet hinge bracket as follows:

(a) Refer to figure 6-214.

(b) Position armature against pole piece in energized position.

(c) Measure clearance between armature and pole piece. Clearance should be not more than 0.005 inch.

(d) If clearance exceeds specified limit, loosen mounting screws.

(e) Position hinge bracket to obtain specified clearance.

(3) Ribbon Magnet Hinge Bracket, Left and Right (Final). Adjust ribbon magnet hinge bracket as follows:

(a) Refer to figure 6-214.

(b) Position armature in deenergized position.

(c) Rotate main shaft until oscillating lever is fully under stop lever.

(d) Measure clearance between oscillating lever and stop lever. Clearance should be between 0.020 and 0.040 inch.

(e) If clearance exceeds specified

limits loosen locknut and use stop lever adjusting screw to obtain specified clearance.

(f) Tighten locknut.

(4) Ribbon Magnet Bracket, Left and Right (Preliminary). Adjust ribbon magnet bracket as follows:

(a) Refer to figure 6-214.

(b) Set adjusting screw to lowest position.

(c) Disengage all clutches.

(d) Hold magnet armature stop lever against magnet core.

(e) Lever should be parallel to oscillating lever top surface and engage oscillating lever by at least half of stop lever thickness as gauged by eye.

(f) Hold stop lever against magnet core.

(g) Measure clearance between stop lever and oscillating lever. Clearance should be between 0.005 and 0.020 inch.

(h) If clearance exceeds specified limits, loosen ribbon magnet bracket adjusting screws.

(i) Position ribbon magnet bracket to obtain specified clearance.

(j) Tighten ribbon magnet bracket adjusting screws.

(5) Operational Requirement for Ribbon Magnet Bracket (Final). Adjust ribbon magnet bracket as follows:

- (a) Refer to figure 6-214.
- (b) Operate printer at 60, 75, or 100 word per minute while printing a test message.
- (c) Energize ribbon magnets.
- (d) Printer should print in red color.
- (e) If printer prints in black color, turn left and right ribbon bracket roller bail adjusting screws one-half turn up. Refine ribbon and ribbon hinge bracket adjustments.
- (f) Repeat steps (b) through (e) if black is printed.

(6) Ribbon Guide Lever Spring, Left and Right. Adjust as follows:

- (a) Refer to figure 6-215.
- (b) Attach spring scale hook to ribbon guide lever.
- (c) Force required to start lever moving should be between 1 and 2 ounces.
- (d) If scale reading exceeds specified limits, install new spring.

(7) Ribbon Reversing Lever Spring, Right and Left. Adjust ribbon reversing lever spring as follows:

- (a) Refer to figure 6-215.
- (b) Attach spring scale hook to ribbon reversing lever as shown.
- (c) Force required to start ribbon reversing lever moving should be between 1/2 and 1-1/2 ounces.
- (d) If scale reading exceeds specified limits install new spring.

(8) Ribbon Roller Bail Spring, Left and Right. Adjust ribbon roller bail spring as follows:

- (a) Refer to figure 6-215.
- (b) Disengage all clutches.
- (c) Set adjusting screw in lowest position.
- (d) Attach spring scale hook as shown.
- (e) Force required to start lifter bail moving should be between 4 and 6 ounces.
- (f) If scale reading exceeds specified limits, install new spring.

q. Universal Contact (Selector) Mechanism Adjustments. Adjust universal contact (selector mechanism in accordance with the following paragraphs.

- (1) Contact Mounting Bracket. Adjust contact mounting bracket as follows:
  - (a) Refer to figure 6-216.

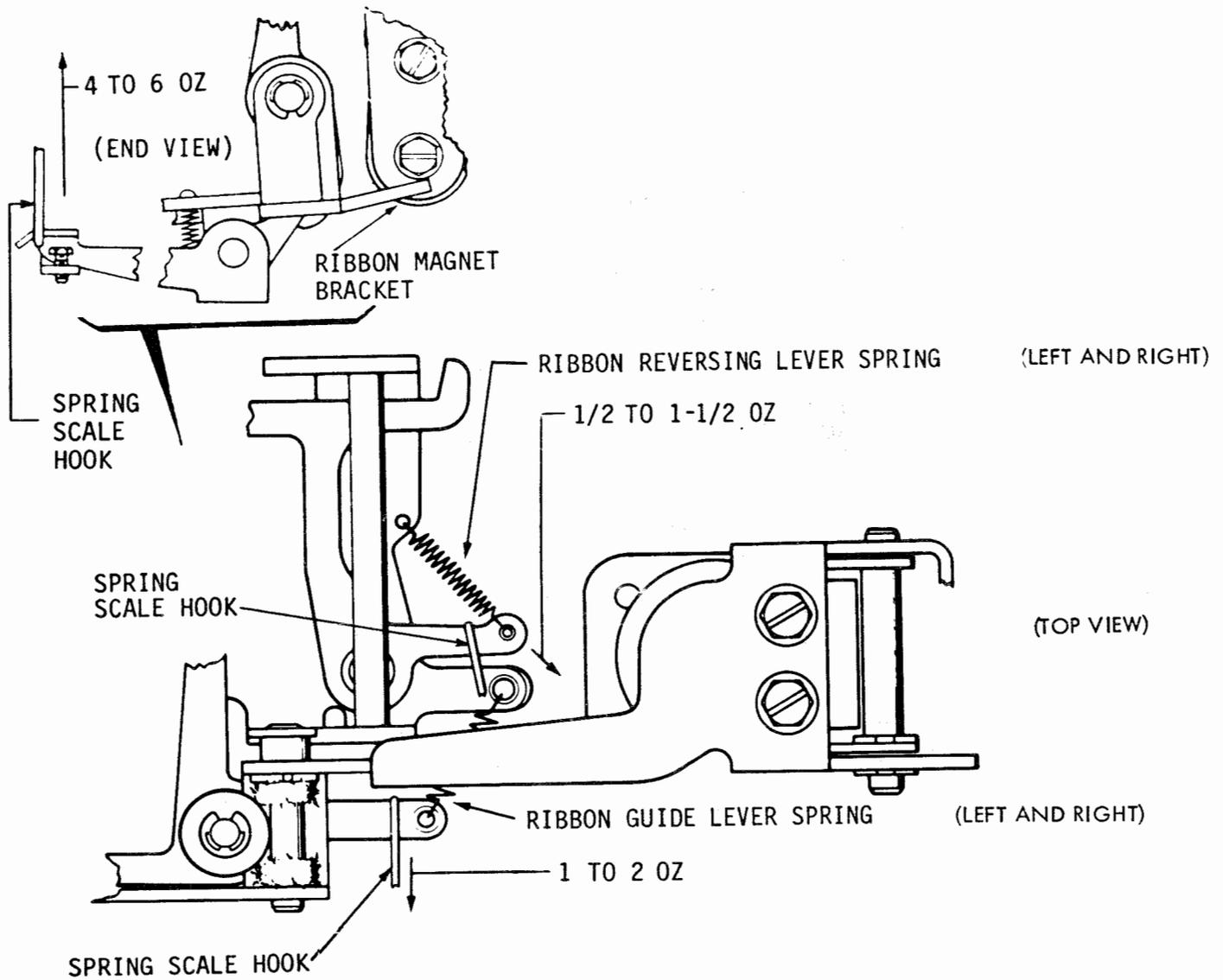


Figure 6-215. Ribbon Guided Lever Spring, Left and Right; Ribbon Reversing Lever Spring, Left and Right; and Ribbon Roller Bail Spring, Left and Right

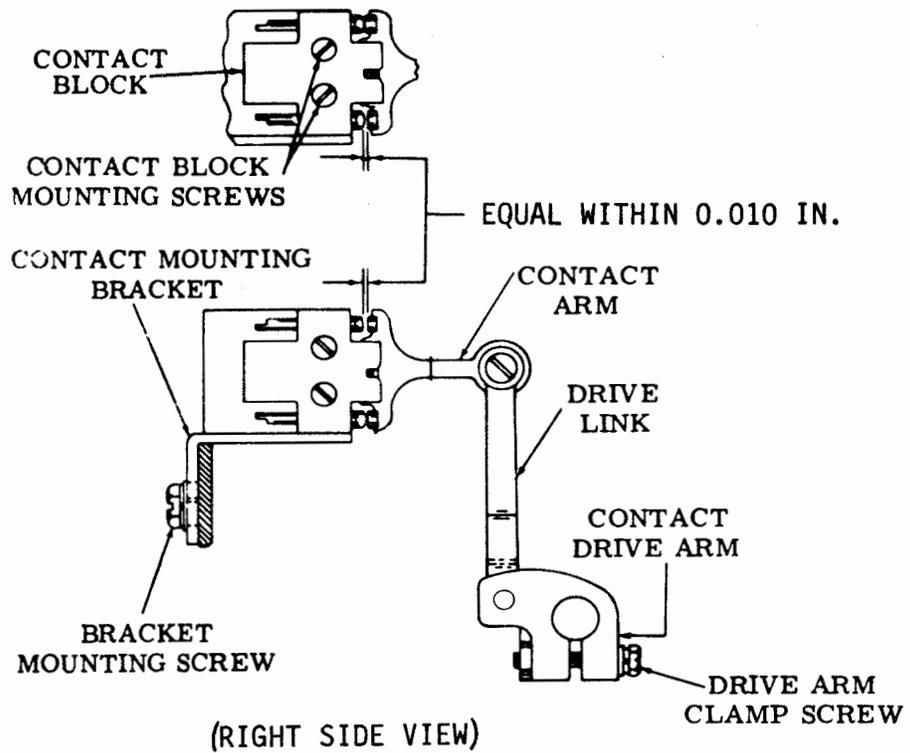


Figure 6-216. Contact Mounting Bracket, Contact Block, and Contact Drive Arm Position

(b) Ensure drive arm linkage is vertically aligned.

(c) If linkage is not vertically aligned, loosen contact mounting bracket mounting screws and position bracket to align drive arm linkage.

(d) Tighten mounting screws.

(2) Contact Block. Adjust contact block as follows:

(a) Refer to figure 6-216.

(b) Ensure contact faces are in a vertical straight line.

(c) If contact faces are not vertically aligned, loosen two contact mounting screws and press contact block toward rear of typing unit firmly against screws.

(d) Tighten mounting screws.

(3) Contact Drive Arm Position. Adjust contact drive arm position as follows:

(a) Refer to figure 6-216.

(b) Rotate code bar clutch until it is disengaged and latched in stop position.

(c) Measure upper contact gap and note measurement.

(d) Trip code bar clutch. Rotate clutch 180 degrees or until lower contacts reach maximum opening.

(e) Measure lower contact gap and note measurement.

(f) Upper and lower contact gaps should be equal within 0.010 inch.

(g) If contact gaps are not equal within specified limits, loosen contact drive arm clamp screw.

(h) Position contact drive arm to equalize upper and lower contact gaps within specified limits.

(4) Contact Arm Spring. Adjust contact arm spring as follows:

(a) Refer to figure 6-217.

(b) Remove shoulder screw connecting contact arm to drive link.

(c) Attach spring scale hook to contact arm as shown.

(d) Force required to open contact either by pulling upward or pushing downward should be between 2 and 5 ounces.

(e) If scale reading exceeds specified limit in either upward or downward direction, install new spring.

r. Universal Contact (Stunt Box) Mechanism Adjustments. Perform universal contact (stunt box) mechanism adjustments in accordance with the following paragraphs.

(1) Contact. Adjust contact as follows:

(a) Refer to figure 6-218.

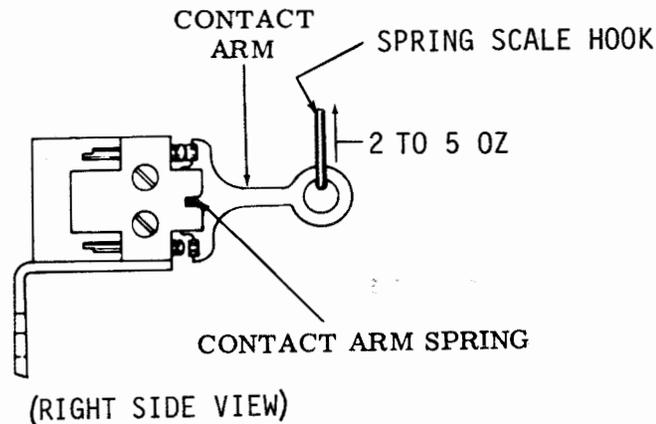


Figure 6-217. Contact Arm Spring

(b) Remove contact bracket assembly.

(c) Ensure contact springs and stiffeners are mounted vertically and contact prints are aligned as gauged by eye.

(d) If contact points are misaligned, loosen assembly screws and position contact springs and stiffeners.

(e) Tighten screws.

(f) Ensure stiffeners are parallel with contact brackets. If not, form stiffeners.

CAUTION

Use care in forming stiffeners to avoid damage to contact springs.

(g) Reinstall contact bracket assembly.

(2) Normally Open Contact Gap. Adjust normally open contact gap as follows:

(a) Refer to figure 6-218.

(b) Remove contact bracket assembly.

(c) Close normally closed contacts.

(d) Measure normally open contact gap. Gaps

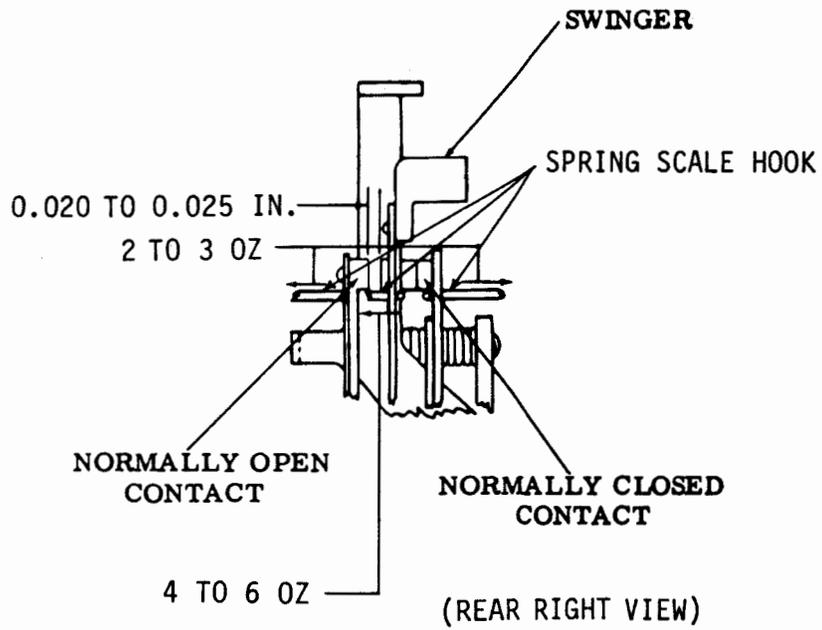


Figure 6-218. Contact, Normally Open Contact Gap, Contact Spring, and Swinger Spring

should be between 0.020 and 0.025 inch.

(e) If contact gap exceeds specified limits, bend stiffener to obtain specified contact gap.

CAUTION

Use care in forming stiffener to avoid damage to contact spring.

(f) Reinstall contact bracket assembly.

(3) Contact Springs (Two Springs). Adjust contact springs as follows:

(a) Refer to figure 6-218.

(b) Remove contact bracket assembly.

(c) Apply spring hook to either contact spring.

(d) With swinger held away, force required to move contact spring away from its stiffener should be between 2 and 3 ounces.

(e) Repeat steps (c) and (d) for remaining contact spring.

(f) If scale reading for either contact spring exceeds specified limits, remove and reform contact springs.

(g) Repeat adjustment at 6-5.r(1) and (2).

(h) Reinstall contact bracket assembly.

(4) Swinger Spring. Adjust swinger spring as follows:

(a) Refer to figure 6-218.

(b) Remove contact bracket assembly.

(c) Attach spring scale hook to swinger.

(d) Force required to move swinger from normally closed contact should be between 4 and 6 ounces.

(e) If scale reading exceeds specified limits bend swinger to obtain specified scale reading.

(f) Reinstall contact bracket assembly.

(5) Contact Bracket and Drive Cam. Adjust contact bracket and drive cam as follows:

(a) Refer to figure 6-219.

NOTE

Make the contact bracket and drive cam adjustment with contact assembly installed on stunt box.

(b) Place drive link in its uppermost position.

(c) Measure clearance between top of latchlever and latch cam. Clearance should be between 0.003 and 0.008 inch.

(d) Rotate main shaft until latch lever rests firmly on latch cam.

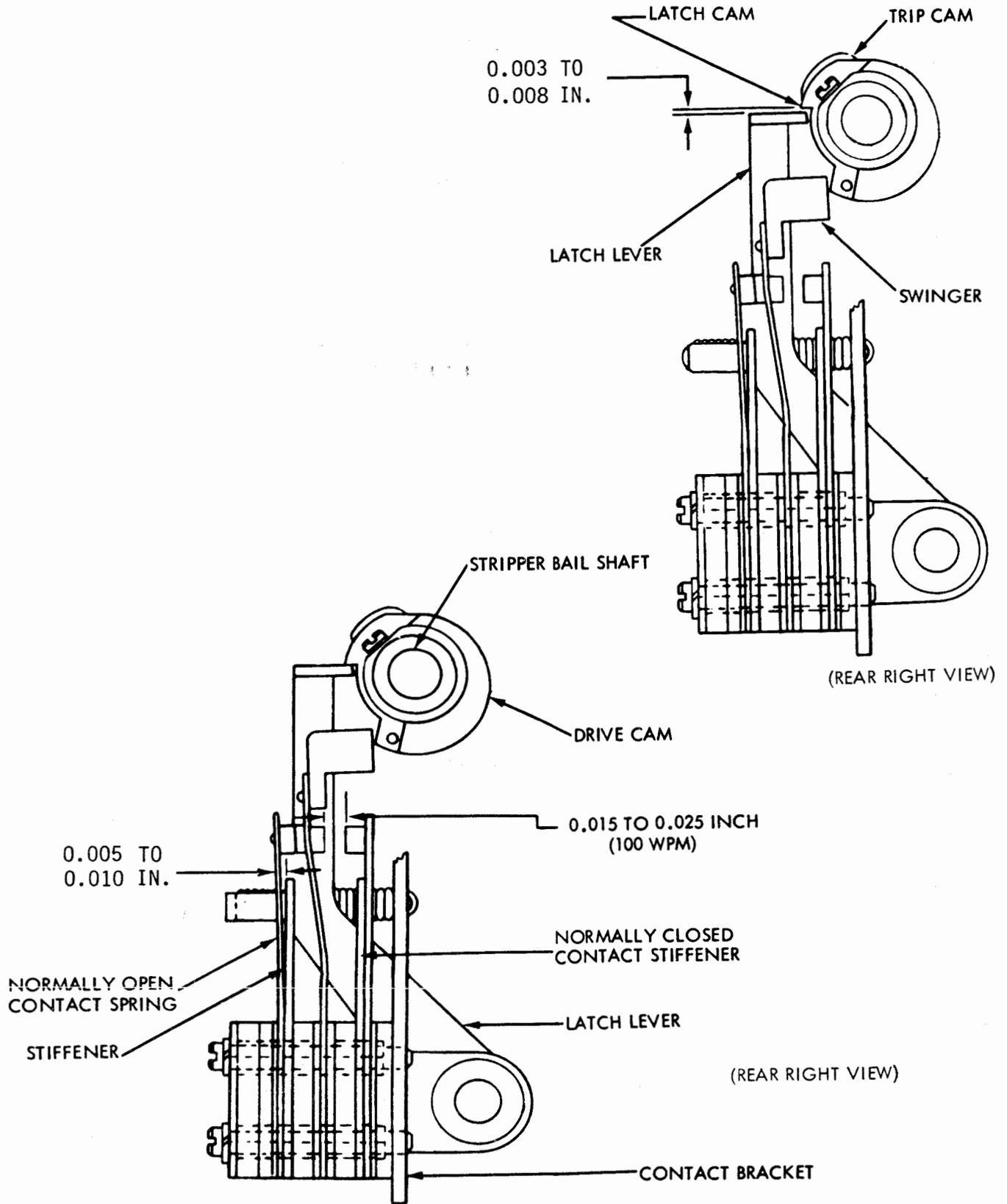


Figure 6-219. Contact Bracket and Drive Cam Position

(e) Measure clearance between normally open contact spring and upper end of its stiffener. Clearance should be between 0.005 and 0.010.

(f) If clearance exceeds specified limits in either step (c) or step (e), loosen screws and reposition contact bracket and, if necessary, drive cam.

(g) Tighten screws.

(6) Latch Lever Spring. Adjust latch lever spring as follows:

(a) Refer to figure 6-220.

(b) Rotate stripper bail shaft until latch lever rests on high part of trip cam.

(c) Attach spring scale hook to latch lever as shown.

(d) Force required to move latch lever away from trip cam should be between 1/2 and 2 ounces.

(e) If scale reading exceeds specified limits, install new latch lever spring.

(7) Trip Cam. Adjust trip cam as follows:

(a) Refer to figure 6-220.

(b) Rotate stripper bail shaft to locate drive link at its lowest point.

(c) Measure clearance between latchlever and latch cam. Clearance should be not less than 0.003 inch.

(d) If clearance exceeds specified limit, loosen trip cam mounting screws.

(e) Rotate trip cam to obtain specified clearance between latchlever and latch cam.

NOTE

As a check to ensure trip cam is not installed 180 degrees out of place, rotate main shaft so that stripper shaft drive link moves downward.

(f) Tighten trip cam mounting screws.

(8) Contact Bracket and Drive Cam Position. The following adjustment should be used for general application final timing using distortion test set or similar equipment.

(a) Refer to figure 6-219.

(b) The normally open universal contacts should close within plus or minus 5 milliseconds of closure of normally open stunt box contact.

(c) To adjust, refine drive cam adjustment and, if necessary, contact bracket adjustment of 6-5.1r(5) by rotating drive cam within specified limits.

(9) Trip Cam Position. The following adjustment should be used for general application final timing using distortion test set or similar equipment.

(a) Refer to figure 6-220.

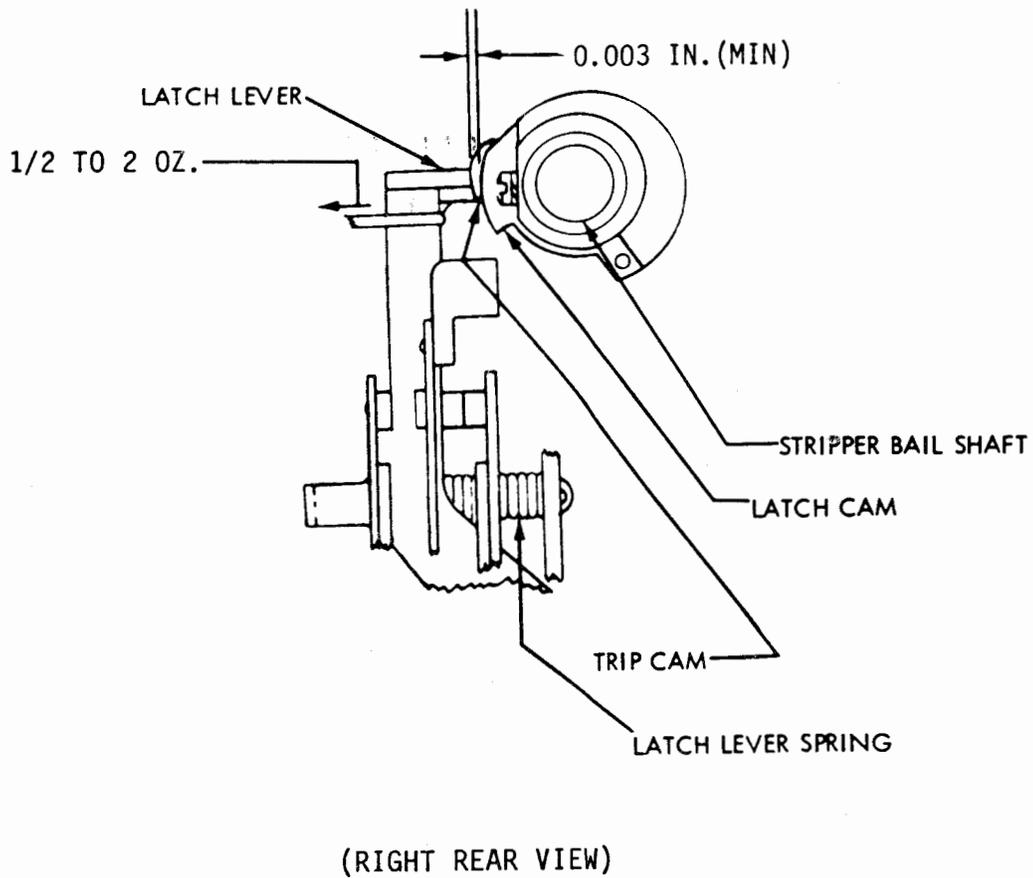


Figure 6-220. Latch Lever Spring and Trip Cam

(b) Normally open universal contacts should open between -5 and +0 milliseconds before the opening of normally open stunt box contact.

(c) To adjust, refine trip cam adjustment of 6-5.r(7) by rotating trip cam on its shaft within specified limits.

(10) Normally Closed Contact (100 WPM for 83B2 Switching System). The following adjustment should be used for special application timing using distortion test set or similar equipment.

(a) Refer to figure 6-219.

(b) Normally closed contacts should close within 50 to 80 divisions after start of stop pulse.

(c) Normally open contact should close prior to end of number 3 pulse.

(d) Normally open contact should remain closed for at least 238 divisions (100 words per minute DXD with 742 scale divisions).

s. Vertical Tabulation and Transmitter-Distributor Control Mechanism Adjustments. Perform vertical tabulation and transmitter-distributor control mechanism adjustments in accordance with the following paragraphs.

(1) Blocking Lever. Adjust blocking lever as follows:

(a) Refer to figure 6-221.

(b) Position index plate so pawl is at peak of index plate.

(c) Measure clearance between bottom of blocking lever and top of slide. Clearance should be between 0.005 and 0.045 inch.

(d) If clearance exceeds specified limits, loosen mounting screws.

(e) Position adjustable arm to obtain specified clearance between bottom of blocking lever and top of slide.

(f) Tighten mounting screws.

(g) Repeat for each remaining blocking lever.

(2) Pointer. Adjust pointer as follows:

(a) Refer to figure 6-221.

(b) Disengage line feed clutch.

(c) Move index plate adjacent to pawl.

(d) Ensure pointer is aligned with notch in indexing disc and clears all index plates by 1/16 inch.

(e) If clearance is insufficient, loosen mounting screw.

(f) Position pointer on side frame to obtain specified clearance.

(g) Tighten mounting screws.

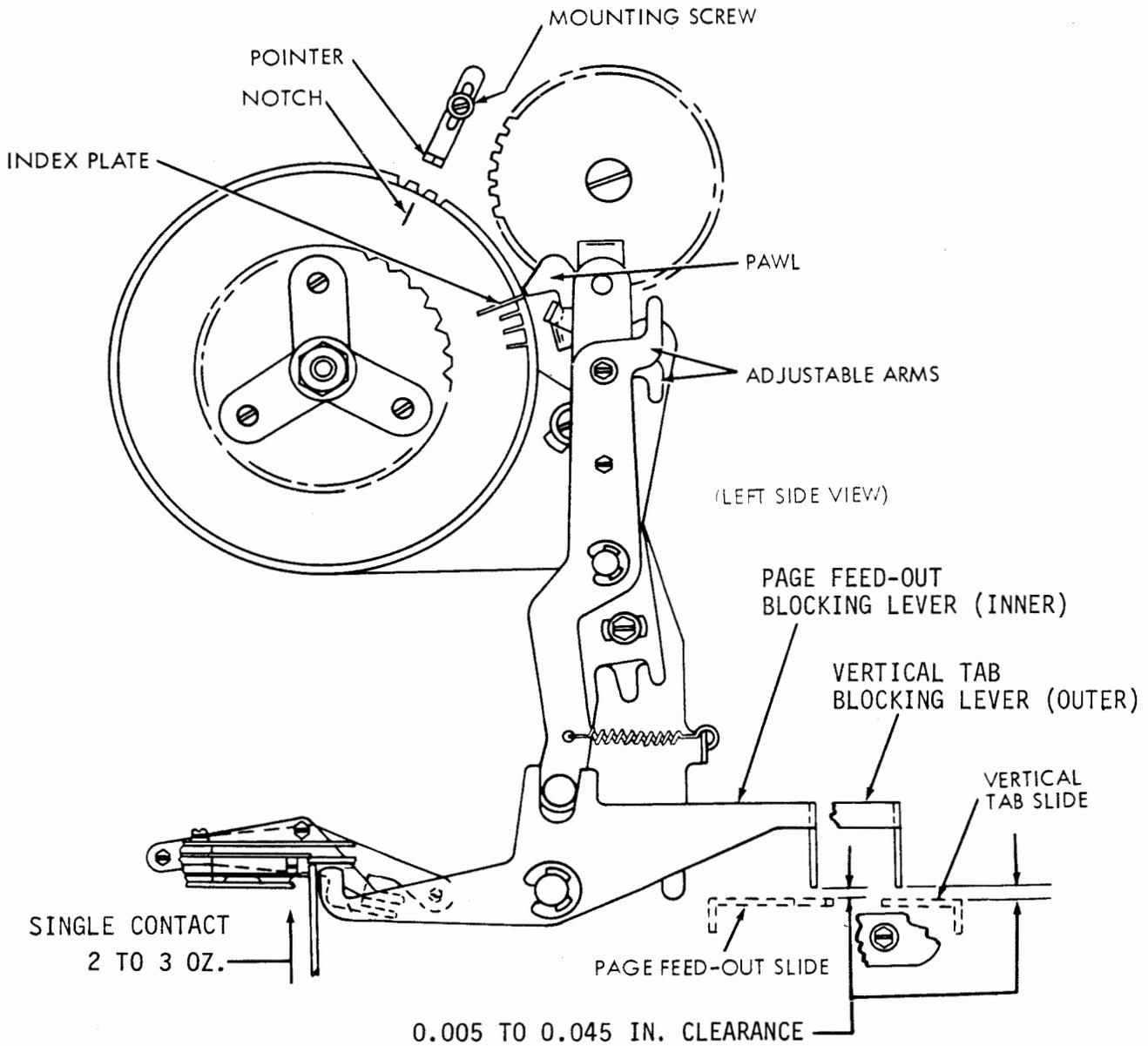


Figure 6-221. Blocking Lever, Pointer, and Switch Contact Pressure

(3) Switch Contact Pressure (Transmitter Control Only). Adjust switch contact pressure as follows:

- (a) Refer to figure 6-221.
- (b) With contacts closed, apply spring scale pushrod to contact swinger.
- (c) Force required to move contact swinger away from its mating contact should be between 2 and 3 ounces.
- (d) If scale reading exceeds specified limits, bend swinger to obtain proper contact pressure.

(4) Transmitter Control Switch for Single-Contact Type Control (Transmitter Control Only). Adjust transmitter control switch as follows:

- (a) Refer to figure 6-222.
- (b) Rotate main shaft until feed-out and vertical tabulation blocking levers are resting on top of slides.
- (c) With transmitter control contacts closed, there should be some clearance between insulated extension of swinger and lobe of feed-out and vertical tabulator blocking levers.
- (d) If there is no clearance, loosen contact assembly mounting screws.
- (e) Position contact assembly to obtain some clearance and tighten mounting screws.

(f) Select feed-out code combination.

(g) Rotate main shaft until feed-out slide is in its extreme forward position and feed-out blocking lever drops behind its slide to open contacts.

(h) Clearance between switch contacts should be between 0.010 and 0.020 inch.

(i) If clearance exceeds specified limits, refine adjustment of steps (b) through (d).

(j) Select vertical tabulator code combination.

(k) Rotate main shaft until vertical tabulator slide is in its extreme forward position and vertical tabulator blocking lever drops behind its slide to open contacts.

(l) Clearance between switch contacts should be between 0.010 and 0.020 inch.

(m) If clearance exceeds specified limits, refine adjustment of steps (b) through (d).

(5) Tabulation Index Plate Position. Adjust tabulation index plate position as follows:

(a) Refer to figure 6-222.

(b) Rotate main shaft until feed-out and vertical tabulation blocking levers are resting on top of slides.

(c) With transmitter control contacts closed, there should be some

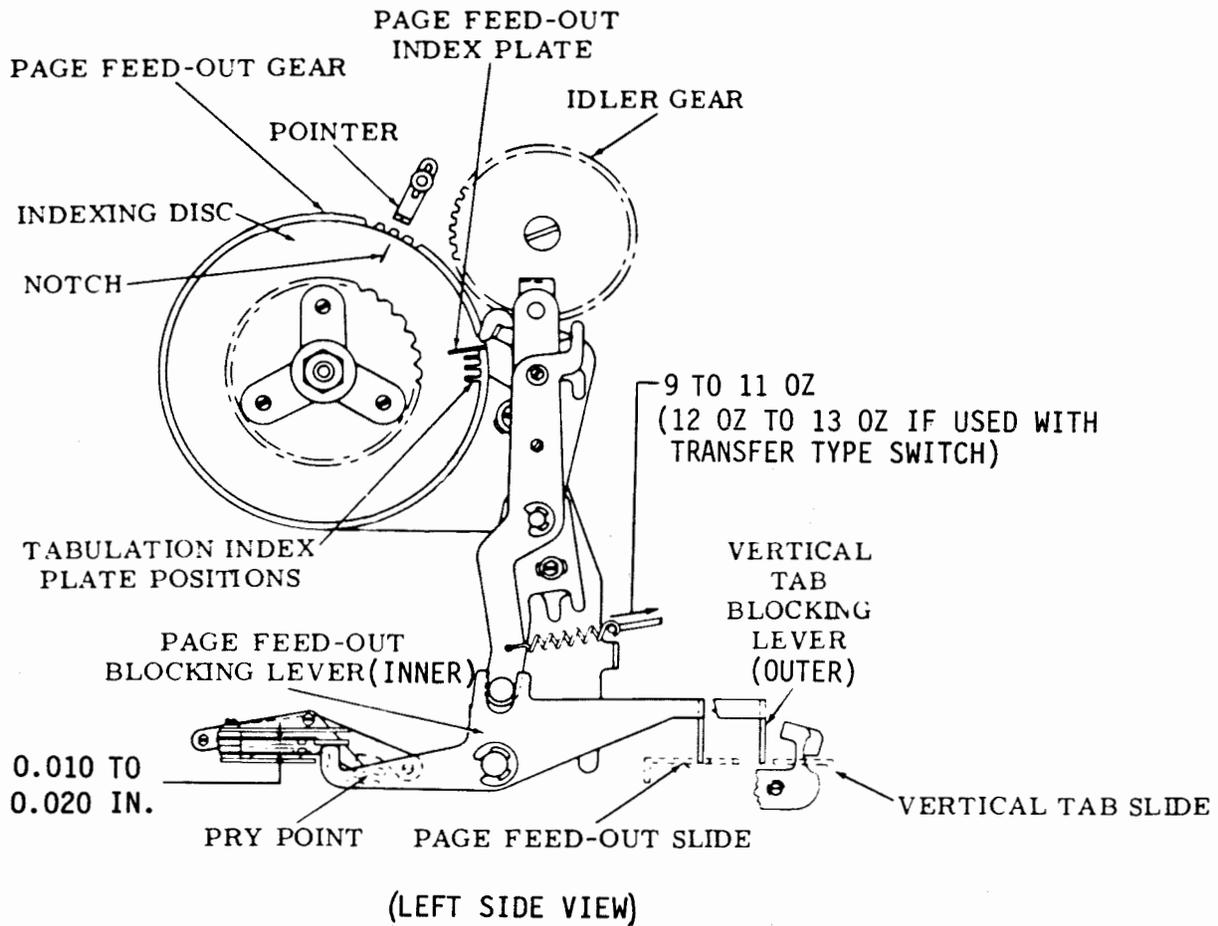


Figure 6-222. Transmitter Control Switch for Signal-Contact Type Control, Tabulation Index Plate Position, and Blocking Lever Spring

clearance between insulated extension of swinger and lobe of feed-out and vertical tabulator blocking levers.

(d) If there is no clearance, loosen contact assembly mounting screws.

(e) Position contact assembly to obtain some clearance and tighten mounting screws.

(f) Line-feed platen to desired first line of printing in that form.

(g) Place tabulation index plate in alignment with pointer on side of printer.

(h) Install additional tab index plates of succeeding desired printing lines within the form.

(i) When tabulation at a given point is not needed rotate tabulation index plates one-quarter turn on their sides.

(6) Blocking Lever Spring. Adjust blocking lever as follows:

(a) Refer to figure 6-222.

(b) Unhook blocking lever spring at end opposite from blocking lever.

(c) Position blocking lever on top of slide.

(d) Attach spring scale hook to free end of spring.

(e) Force required to extend spring to position length should be between 9 and 11 ounces. If

blocking lever spring is used with transfer type switch, force required to extend spring should be between 12 and 13-1/2 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise, reconnect free end of spring.

(7) Form-Out Pawl Spring. Adjust form-out pawl spring as follows:

(a) Refer to figure 6-223.

(b) Attach spring scale hook to form-out pawl as shown in figure.

(c) Force required to pull pawl away from its backstop lever should be between 3 and 8 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(8) Tabulator Bail Spring. Adjust tabulator bail spring as follows:

(a) Refer to figure 6-224.

(b) Attach spring scale hook to tabulator bail as shown in figure.

(c) Force required to pull bail away from its backstop lever should be between 3 and 8 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(9) Line Feed Clutch Trip Lever Spring. Adjust line feed clutch trip lever spring as follows:

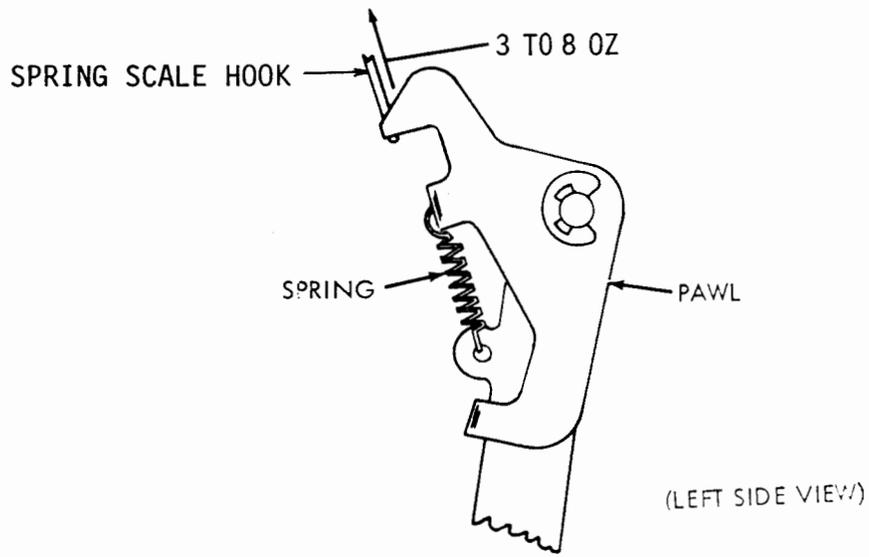


Figure 6-223. Form-Out Pawl Spring

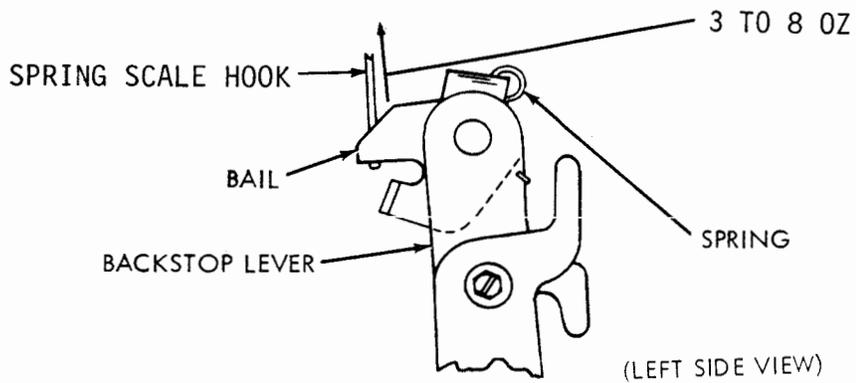


Figure 6-224. Tabulator Bail Spring

(a) Refer to figure 6-37.

(b) Engage and rotate clutch until trip lever rests on stop lug.

(c) Apply spring scale hook to trip lever.

(d) Force required to move lever away from stop lug should be between 9 and 12 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(10) Stunt Box Switch Spring. Adjust stunt box switch spring as follows:

(a) Refer to figure 6-225.

(b) Close switch contacts.

(c) Attach spring scale hook to contact arm. The force required to open switch contact should be between 1 and 2 ounces. If the required force exceeds the limits, replace spring.

(d) If switch is removed from stunt box, perform the following adjustments:

1. Measure clearance between contact arm and vertical portion of contact slip. Clearance should be 0.006 inch minimum. If switch has contacts both front and rear the same limit is applicable. If clearance is less than 0.006 inch, loosen contact plate screws, and position contact plate. Then tighten contact plate screws. Contact must be made before

function lever touches top plate.

2. On switches with front and rear, check gap between formed-over end of front contact clip and bottom of contact arm when rear contact is closed. Gap should be between 0.008 and 0.028 inch.

(11) Page Feed-Out Gear Play. Adjust page feed-out gear play as follows:

(a) Refer to figure 6-226.

(b) Ensure backlash between idler gear and feed-out gear is barely perceptible.

(c) If backlash appears excessive, loosen nut.

(d) Position gear pivot post to reduce backlash to barely perceptible level.

(e) Tighten nut.

(f) Ensure gears mesh accurately when checked at three equal distances around circumference of gear.

(12) Mounting Bracket. Adjust as follows:

(a) Refer to figure 6-226.

(b) Select upper case letter Z.

(c) Hold stripper blade and rotate main shaft until page feed-out slide is in its most forward position.

(d) Take up play in page feed-out blocking to minimize clearance.

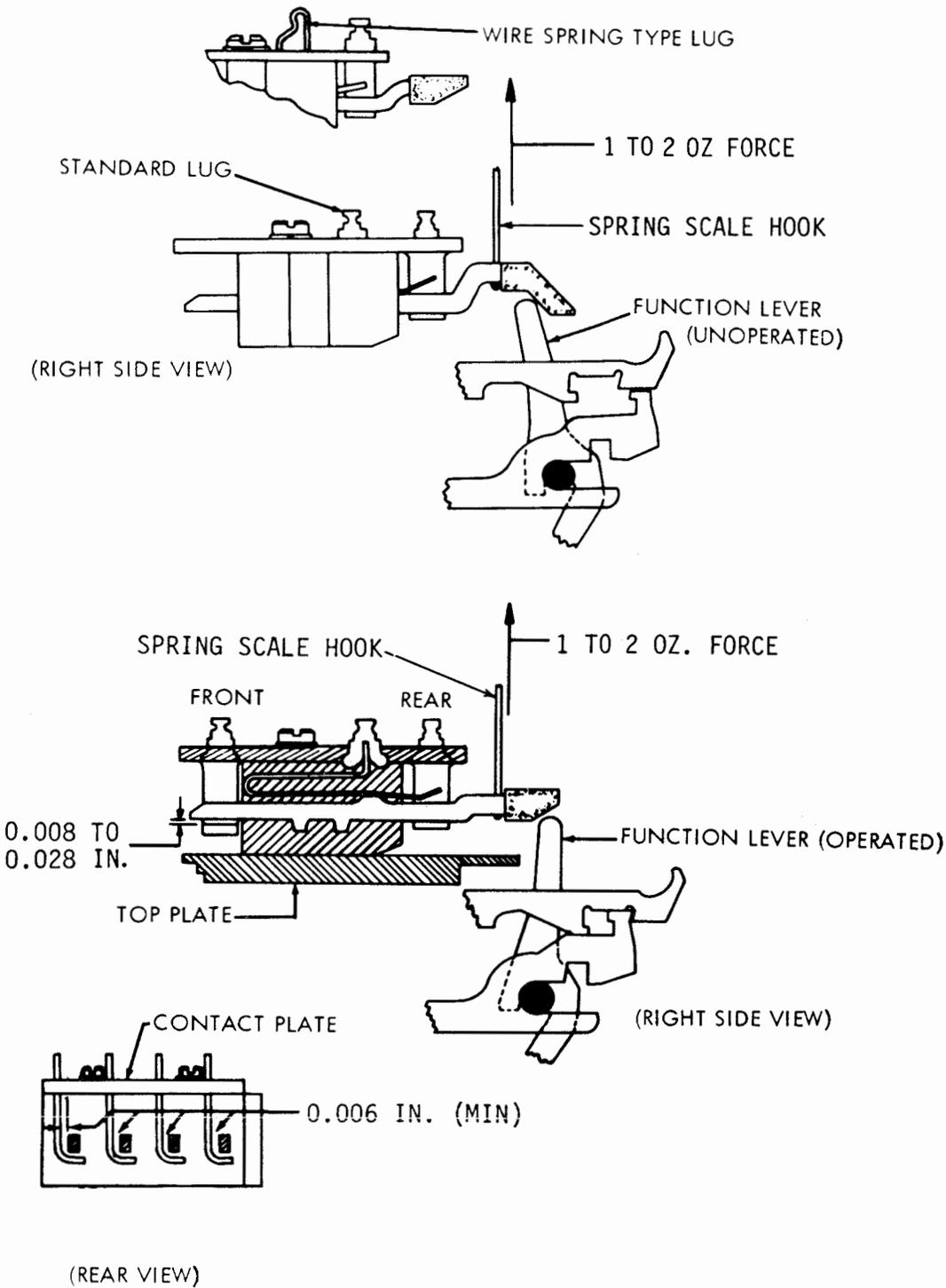


Figure 6-225. Stunt Box Switch Spring

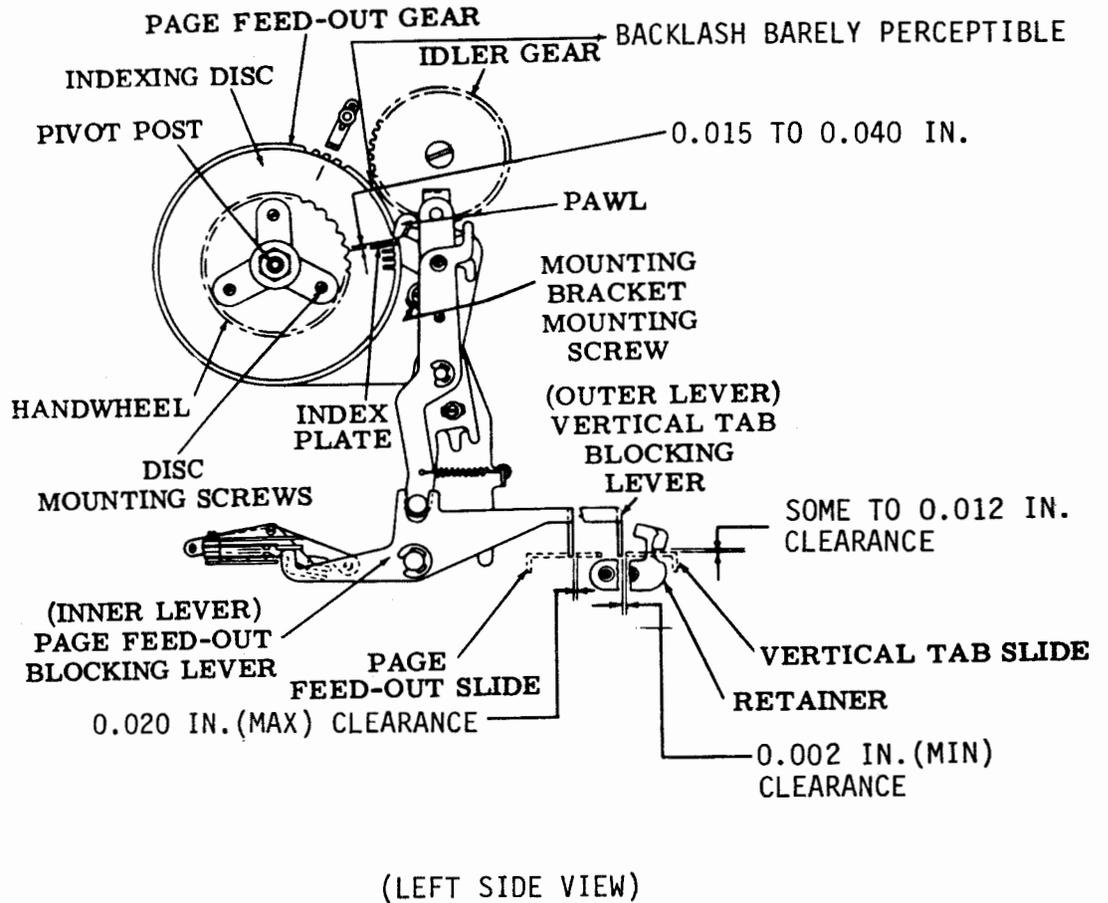


Figure 6-226. Page Feed-Out Gear Play, Mounting Bracket, Indexing Disc, Page Feed-Out Index Plate Position, and Vertical Tabulator Slide Retainer

(e) Measure clearance between vertical tab slide and vertical tab blocking lever (outer lever). There should be some clearance not to exceed 0.020 inch.

(f) Select upper case letter J and rotate main shaft until vertical tab slide is in its most forward position.

(g) Take up play in vertical tab blocking lever to minimize clearance.

(h) Measure clearance between vertical tab slide and vertical tab blocking lever (outer lever). Clearance should be not less than 0.002 inch.

(i) If clearance in either step (e) or step (h) exceeds specified limits, loosen bracket mounting screws.

(j) Position lower portion of mounting bracket to obtain specified clearance.

(k) Tighten mounting screws.

(13) Indexing Disc.  
Adjust indexing disc as follows:

(a) Refer to figure 6-226.

(b) Disengage line feed clutch.

(c) Position index plate adjacent to pawl.

(d) Take up slack in gears to minimize gap.

(e) Measure clearance between index plate

and pawl. Clearance should be 0.015 and 0.040 inch.

(f) If clearance exceeds specified limits, pull feed-out gear out of engagement with idler gear.

(g) Turn feed-out gear handwheel clockwise until index plate just operates pawl, then engage first tooth on idler.

(h) Loosen three index disc mounting screws and position disc to obtain specified clearance.

(i) Tighten three mounting screws.

(14) Page Feed-Out Index Plate Position. Adjust page feed-out index plate position as follows:

(a) Refer to figure 6-226.

(b) Place an index plate in numbered slots on disc corresponding to length of page form to be used.

(c) Synchronize page feed-out with a form by positioning form so typing unit will print in first typing line of form.

(d) When typing unit is in stop position, top of ribbon guide should be in alignment with bottom of printing lines.

(e) If top of ribbon guide is not in alignment with bottom of printing line, place page form in desired position and disengage page feed-out gear from its idler gear.

(f) Rotate feed-out gear until notch in indexing disc is in alignment with pointer on side of printer.

(g) Reengage page feed-out gear with its idler gear.

(15) Vertical Tabulator Slide Retainer. Adjust vertical tabulator slide retainer as follows:

(a) Refer to figure 6-226.

(b) Measure clearance between vertical tabulator slide and retaining edge of retainer. There should be some clearance not exceeding 0.012 inch.

(c) If clearance exceeds limit, loosen mounting screws.

(d) Position retainer forward and locate it up or down to obtain specified clearance.

(e) Tighten mounting screw.

(16) Switch Contacts for Transfer Type Control Switch (Transmitter Control Only). Adjust switch contacts as follows:

(a) Refer to figure 6-227.

(b) Close normally closed (lower) contacts.

(c) Lift swinger free of mating contact with gram scale.

(d) Force required to move lower contact spring away from its stiffener

should be not less than 30 grams.

(e) If scale reading is less than specified limits, form lower contact to increase scale reading.

(f) With lower contact closed, move swinger away from its mating contacts with gram scale.

(g) Force required should be between 30 and 45 grams.

(h) If scale reading exceeds specified limits, form swinger by bending.

(i) With lower contact closed, measure gap between upper contact and mating contact of swinger. Gap should be between 0.008 and 0.015 inch.

(j) If gap exceeds specified limits, position stiffener of normally closed contact to obtain specified gap.

(k) Pull upper contact away from its stiffener with gram scale.

(l) Force required should be between 25 and 35 grams.

(m) If scale reading exceeds specified limits, form upper contact by bending and repeat steps (i) and (j).

(17) Transmitter Control Switch for Transfer Type Contacts (Transmitter Control Only). Adjust transmitter control switch as follows:

(a) Refer to figure 6-228.

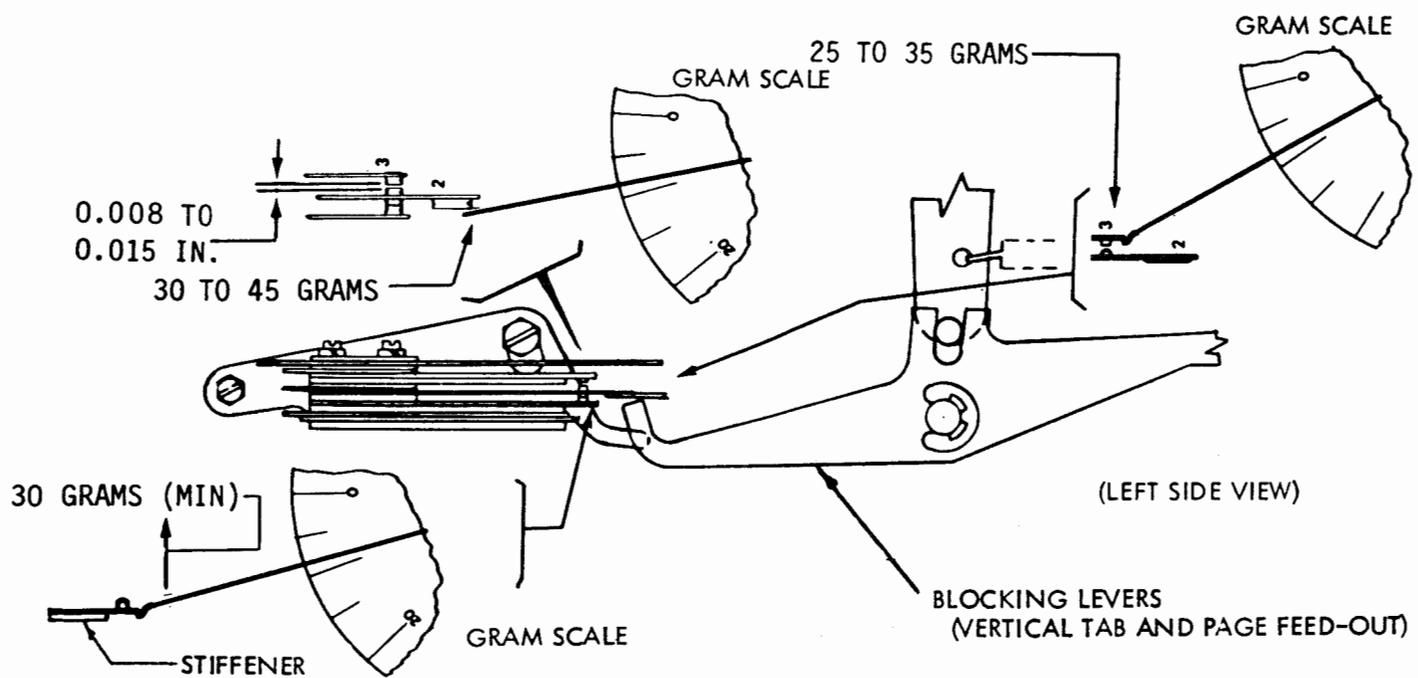


Figure 6-227. Switch Contacts for Transfer Type Control Switch (Transmitter Control Only)

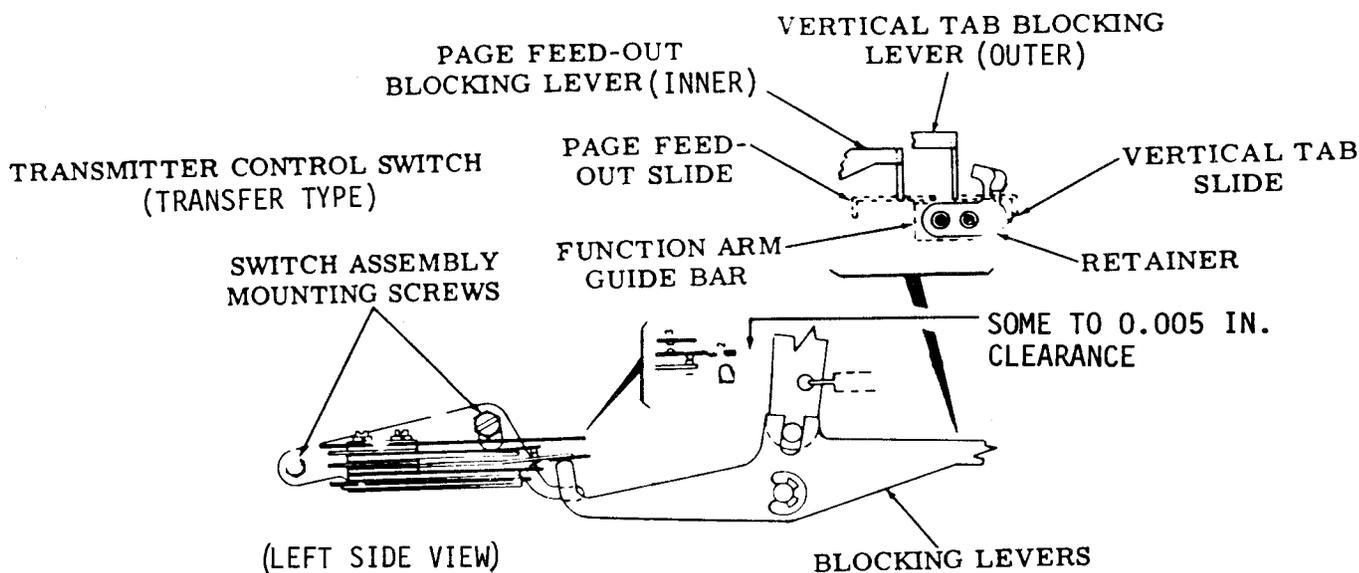


Figure 6-228. Transmitter Control Switch for Transfer Type Contacts (Transmitter Control Only)

(b) Rotate main shaft until feed-out and vertical tabulator blocking levers are unoperated (blocking levers resting on slides).

(c) Close normally closed (lower) contacts.

(d) Measure clearance between insulated extension of swinger and lobes of feed-out and vertical tabulator blocking levers. There should be some clearance not exceeding 0.005 inch.

(e) If clearance exceeds specified limit, loosen transmitter control switch mounting screws.

(f) Position contact assembly to obtain specified clearance.

(g) Tighten mounting screws.

(h) Select feed-out code combination.

(i) Rotate main shaft until feed-out slide is in its extreme forward position and feed-out blocking lever drops behind its slide to close normally opened contacts.

(j) Ensure lobe of feed-out blocking lever (inner lever) fully engages insulated extension of contact swinger.

(k) Ensure feed-out blocking lever rests firmly on function arm guide bar. Check by lifting lever lightly at contact end.

(l) Ensure feed-out blocking lever separates normally open contact

spring from its stiffener as upper contact closes.

(m) To adjust, loosen contact pile-up mounting screws and position assembly.

(n) Tighten contact pile-up mounting screws.

(o) Select vertical tabulator combination. Rotate main shaft until feed-out slide is in its extreme forward position and feed-out blocking lever drops behind its slide to close normally opened contacts.

(p) Ensure lobe of vertical tabulator blocking lever (outer) fully engages insulated extension of swinger.

(q) Ensure vertical tabulator blocking lever rests firmly on function arm guide bar. Check by lifting lever lightly at contact end.

(r) Ensure vertical tabulator blocking lever separates normally open contact spring from its stiffener as upper contact closes.

(s) To adjust, loosen contact pile-up mounting screws and position assembly.

(t) Tighten mounting screws.

6-6. KEYBOARD UNIT ADJUSTMENTS (VARIABLE FEATURES). There are no keyboard unit variable features.

### SECTION III - ADJUSTMENTS (EARLIER DESIGN BASIC UNITS)

6-7. TYPING UNIT.

6-7.1 TYPING UNIT (HIGH-LEVEL).

a. Code Bar Mechanism Adjustments. Perform code bar mechanism adjustments in accordance with the following paragraphs.

(1) Code Bar Shift Lever Drive Arm. Adjust code bar shift lever drive arm as follows:

(a) Refer to figure 6-229.

(b) Place code bar shift lever link in uppermost position.

(c) Measure clearance between tops of rollers and tops of cam slots in code box shift levers. There should be some clearance not exceeding 0.025 inch on the close lever.

(d) If clearance exceed specified limit, loosen clamp screw.

(e) Position code bar shift lever drive arm on its shaft to obtain specified clearance and to provide some end play not exceeding 0.006 inch.

(f) Tighten clamp screw.

(2) Code Bar Shift Lever Link Guide Bracket. Adjust Code Bar Shift Lever Link Guide Bracket as follows.

(a) Refer to figure 6-230.

(b) Select blank combination.

(c) Rotate main shaft until code bar shift lever link reaches highest travel. Then take up play to maximize clearance.

(d) Measure clearance between front code bar shift lever and shoulder on nearest code bar shift bar. Clearance should be between 0.002 and 0.025 inch.

(e) If clearance exceeds specified limits, loosen three code bar shift lever link guide bracket mounting screws.

(f) Select letters combination.

(g) Rotate main shaft until code bar shift lever link reaches highest travel. Then take up play to maximize clearance.

(h) Measure clearance between rear code bar shift lever and shoulder of code bar shift bar. Clearance should be between 0.002 and 0.025 inch.

(i) If clearance exceeds specified limits, loosen three code bar shift lever link guide bracket mounting screws.

(j) Position guide bracket to obtain specified clearance and tighten three mounting screws.

b. Function Mechanism Adjustments. Perform function mechanism adjustments in accordance with the following paragraphs.

(1) Bell or Motor Stop Function Contact. Adjust bell or motor stop function contact as follows:

(a) Refer to figure 6-231.

(b) Position function lever so normally closed contacts are open.

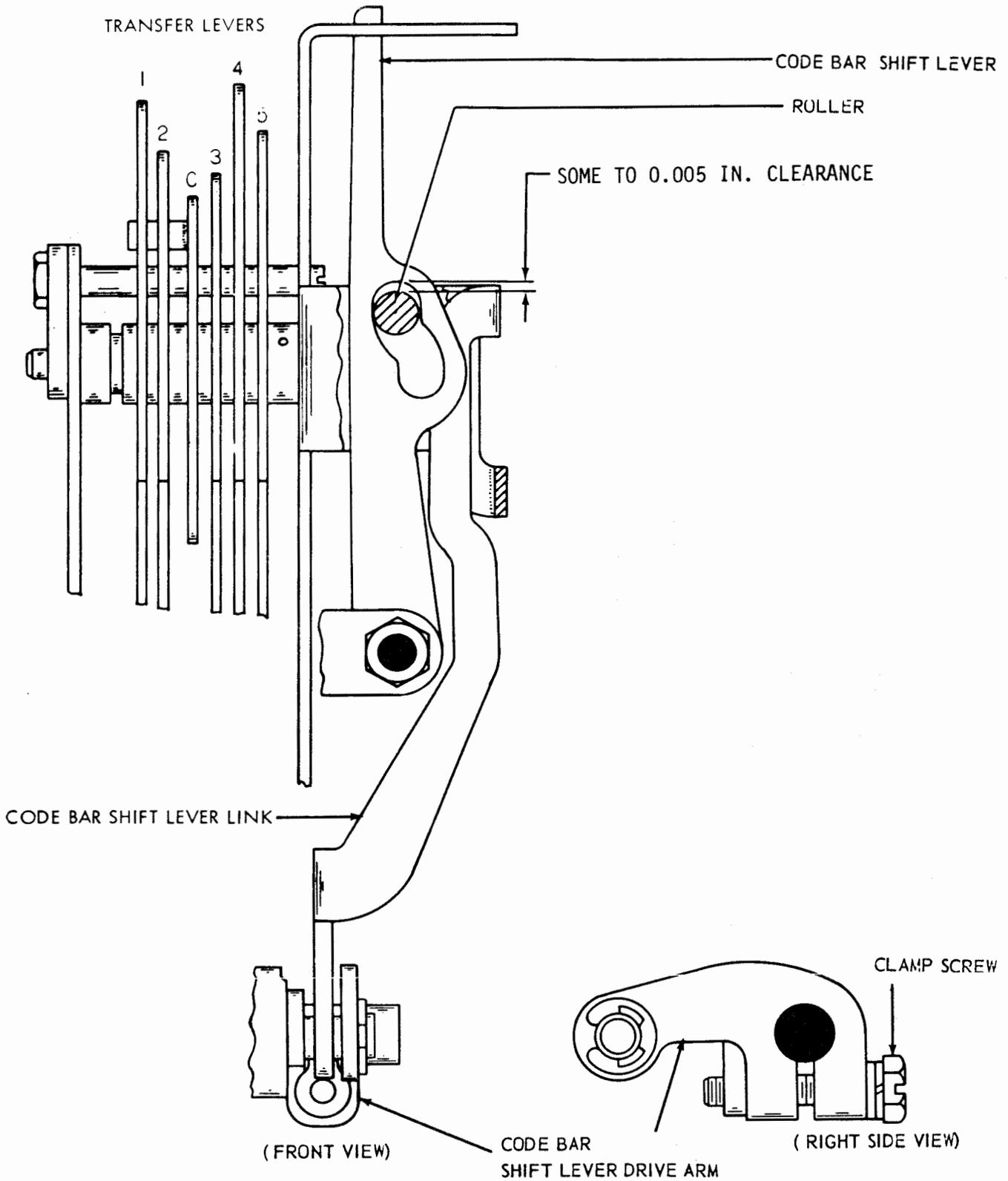


Figure 6-229. Code Bar Shift Lever Drive Arm

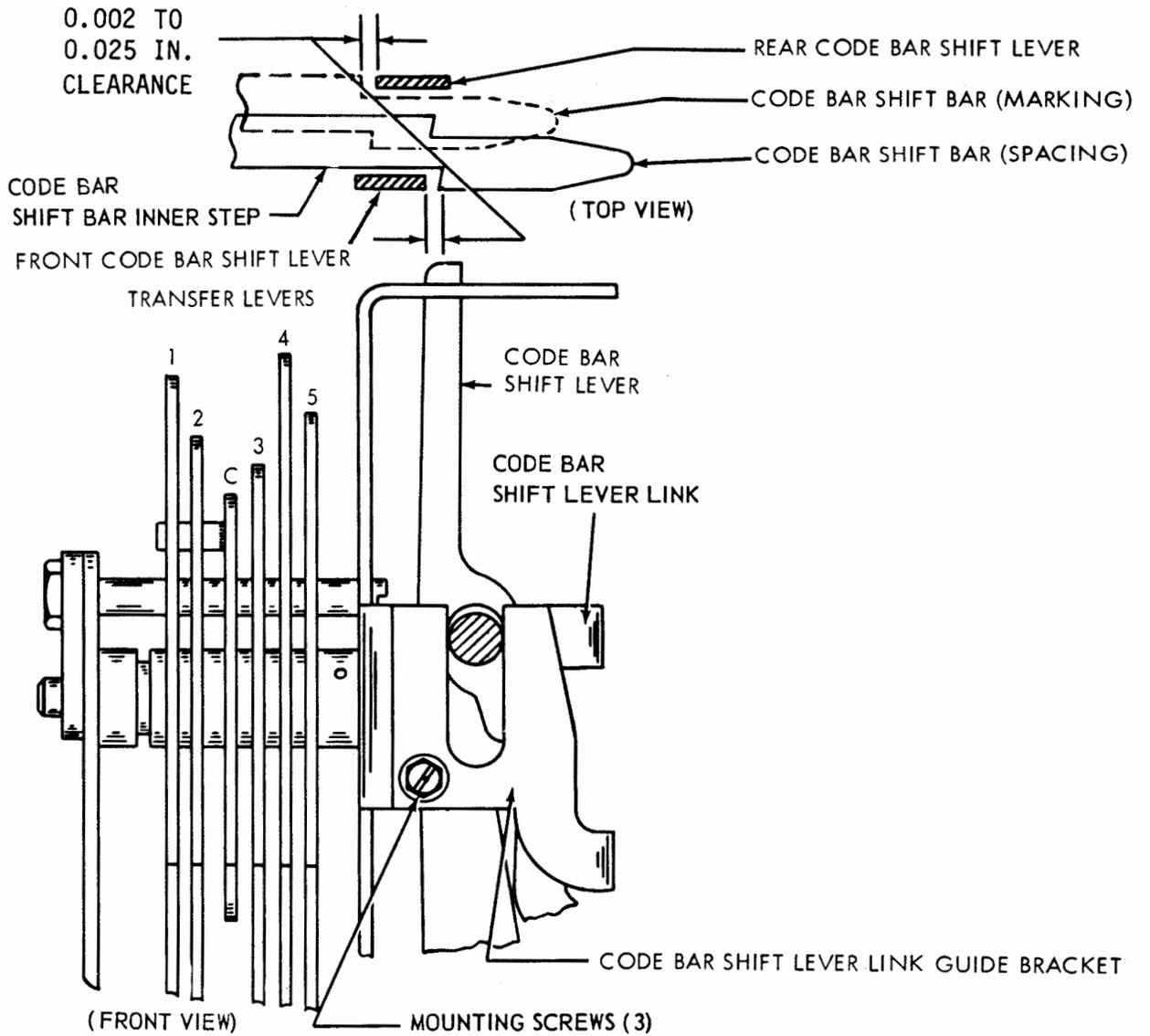


Figure 6-230. Code Bar Shift Lever Link Guide Bracket

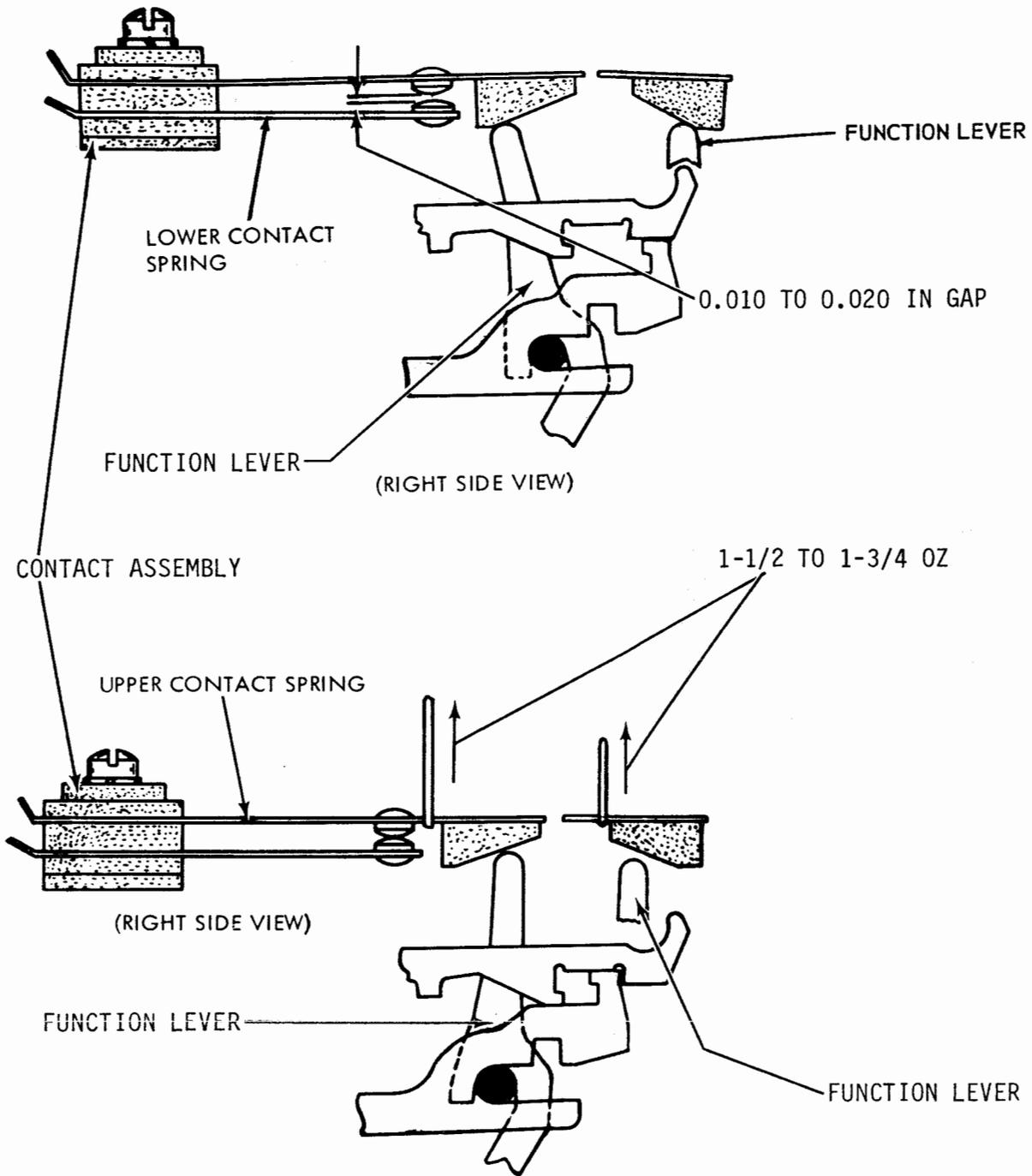


Figure 6-231. Bell or Motor Stop Function Contact

(c) Measure contact gap. Gap should be between 0.010 and 0.020 inch.

(d) If gap exceeds specified limits, bend lower contact spring to obtain specified contact gap.

(e) Position function lever so normally closed contacts are closed.

(f) Attach spring scale hook to upper contact spring as shown in figure.

(g) Force required to open contacts should be between 1 1/2 and 1 3/4 ounces.

(h) If scale reading exceeds specified limits bend upper contact spring to obtain specified scale reading and repeat steps (b) through (d)

(2) Figures-Letters Shift Code Bar Operating Mechanism. Adjust figures-letters shift code bar operating mechanism with two-stop function clutch as follows:

(a) Refer to figure 6-232

(b) Disengage function clutch at position giving least clearance.

(c) Rotate type box clutch 1/2 revolution.

(d) Hold figures function lever in rearward position with tension of 32 ounces.

(e) Take up play in pawl to maximize clearance and measure clearance between function pawl shoulder and face of function bar.

Clearance should be between 0.002 and 0.015 inch.

(f) If clearance exceeds specified limits, loosen elements.

(g) Position shift assembly to obtain specified clearance. Take up play in mounting holes to rear.

(h) Tighten clamp nuts.

(i) Disengage figures function pawl.

(j) Repeat steps (d) through (h) for letters function pawl.

(3) Function Contact Spring. Adjust function contact spring as follows:

(a) Refer to figure 6-233.

(b) Close contacts.

(c) Attach spring scale hook as shown in figure.

(d) Force required to open switch contact should be between 1 and 2 ounces.

(e) If the required force exceeds the specified limits, replace spring.

CAUTION

When soldering to contact springs, exercise care to prevent excessive heating to avoid annealing the springs.

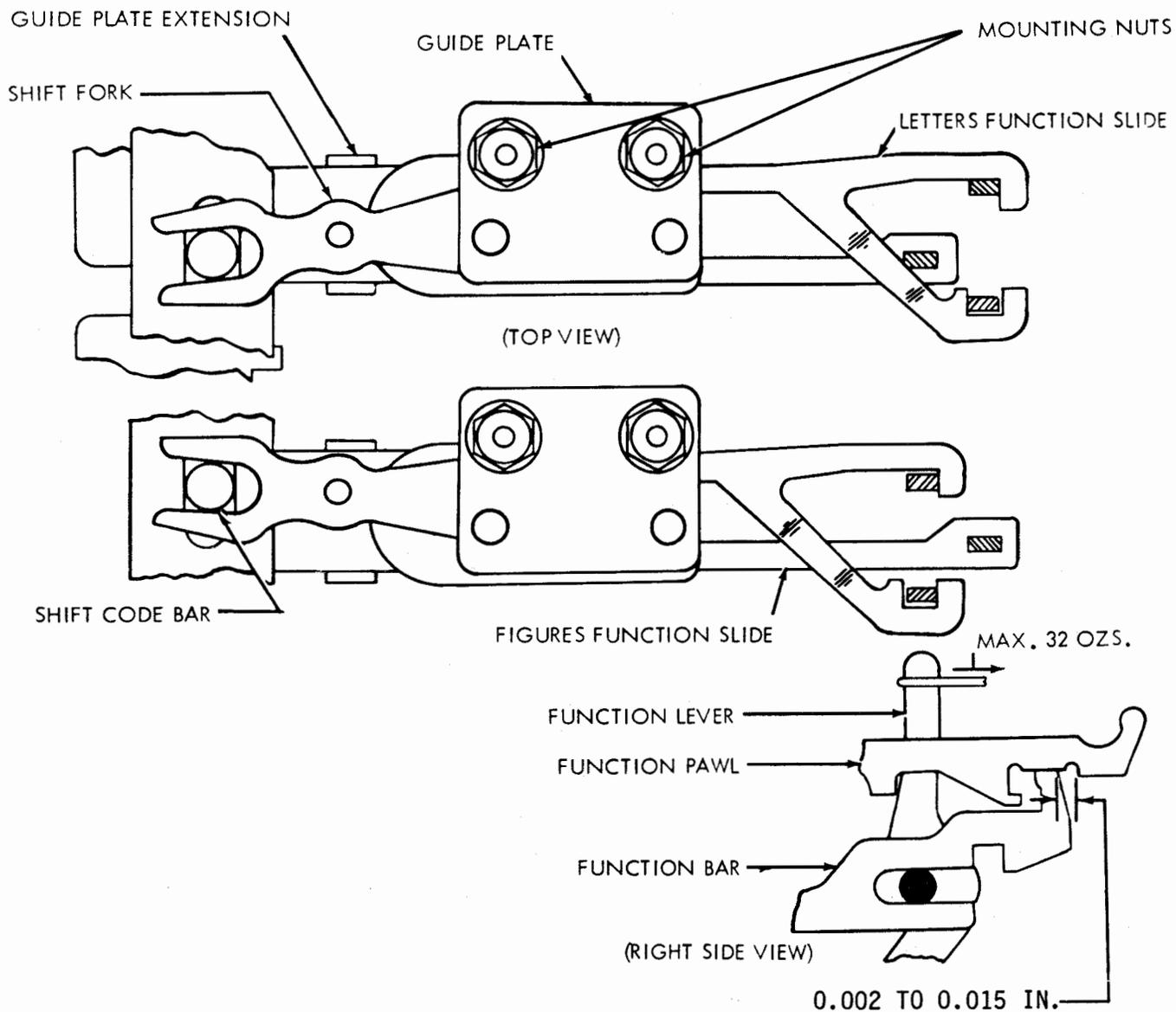


Figure 6-232. Figures-Letters Shift Code Bar Operating Mechanism

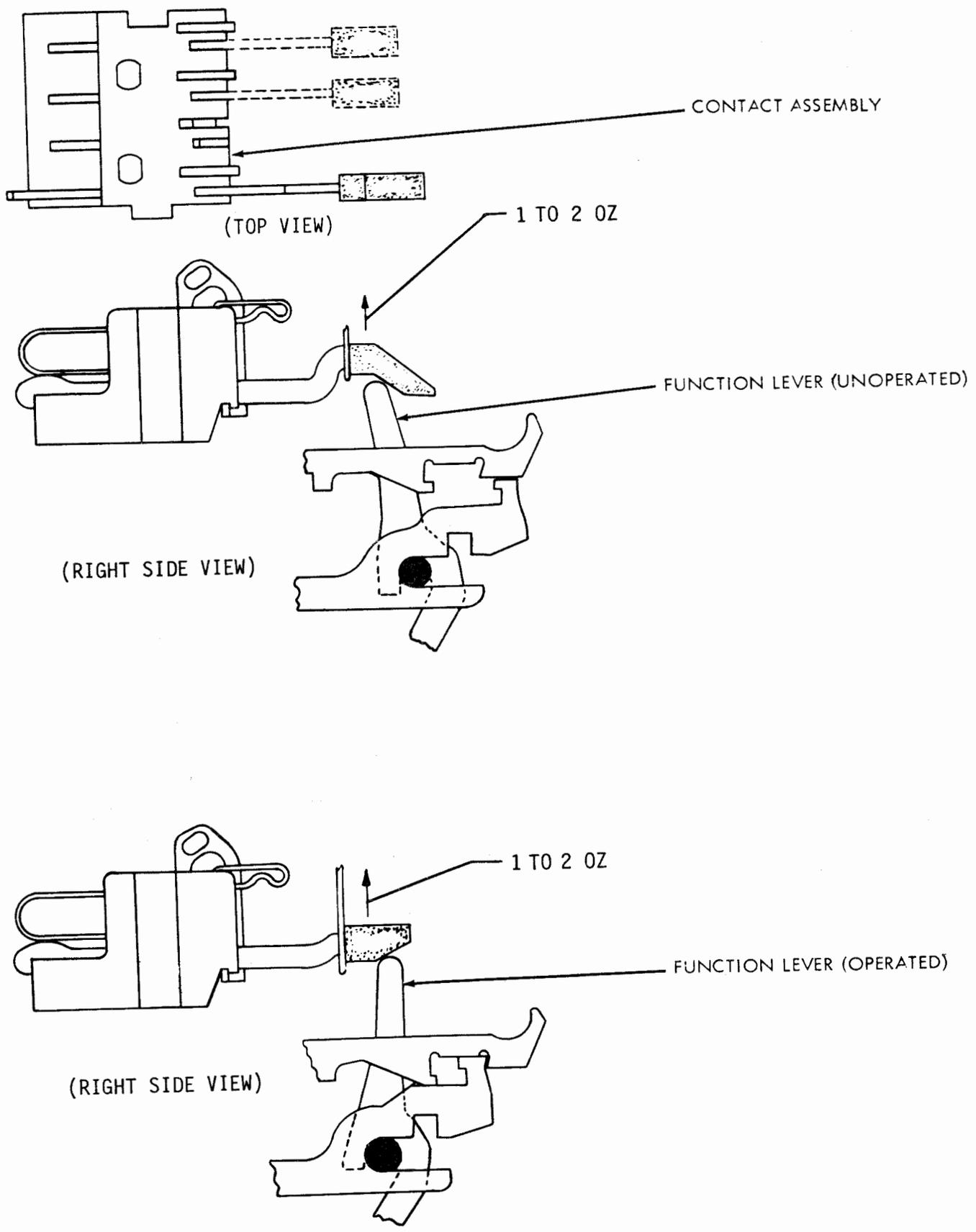


Figure 6-233. Function Contact Spring

(4) Function Reset Bail Blade. Adjust function reset bail blade as follows:

(a) Refer to figure 6-234.

NOTE

This adjustment applies only to units with a two-step function clutch. If unit has a one-stop function clutch, refer to 6-3.1 b. (b)

(b) Disengage function clutch at stop position which yields least clearance.

(c) Disengage type box clutch.

(d) Unlatch all function pawls from their function bars.

(e) Holding each function bar in maximum rearward position, measure clearance between bars located in stunt box slot 1, 4, 11, 18, 28, 33, 38 and 41, and reset bail blade.

NOTE

If there is no bar in a designated slot use nearest bar. If there is a bar on each side of a designated vacant slot, use bar in higher numbered slot. Slots are numbered from left to right facing rear of unit.

Clearance between each function bar and reset bail blade should be between 0.018 and 0.035 inch.

(f) If clearance exceeds specified limits, loosen reset bail blade

mounting screw so they are friction tight.

(g) Position blade on reset bail to obtain specified clearance.

(h) Tighten mounting screws.

(i) Rotate type box clutch and function revolution.

(j) Hold each function lever on at a time in rearmost position with a maximum of 2 pounds tension. Latch associated pawl.

(k) Attach spring scale hook to function pawl and apply 32 ounces tension. The function pawl should overtravel its bar a minimum of 0.002 inch.

(l) If overtravel is less than specified amount, refine the adjustment performed in steps (b) through (h).

(5) Function Stripper Blade Arms. Adjust function stripper blade arms as follows:

(a) Refer to figure 6-235.

(b) Place single-double line feed lever in double line feed position.

(c) Disengage type box clutch one-half clutch.

(d) Hold left line feed function pawl in its rear position resting on upper edge of stripper blade.

(e) Measure clearance between upper edge of

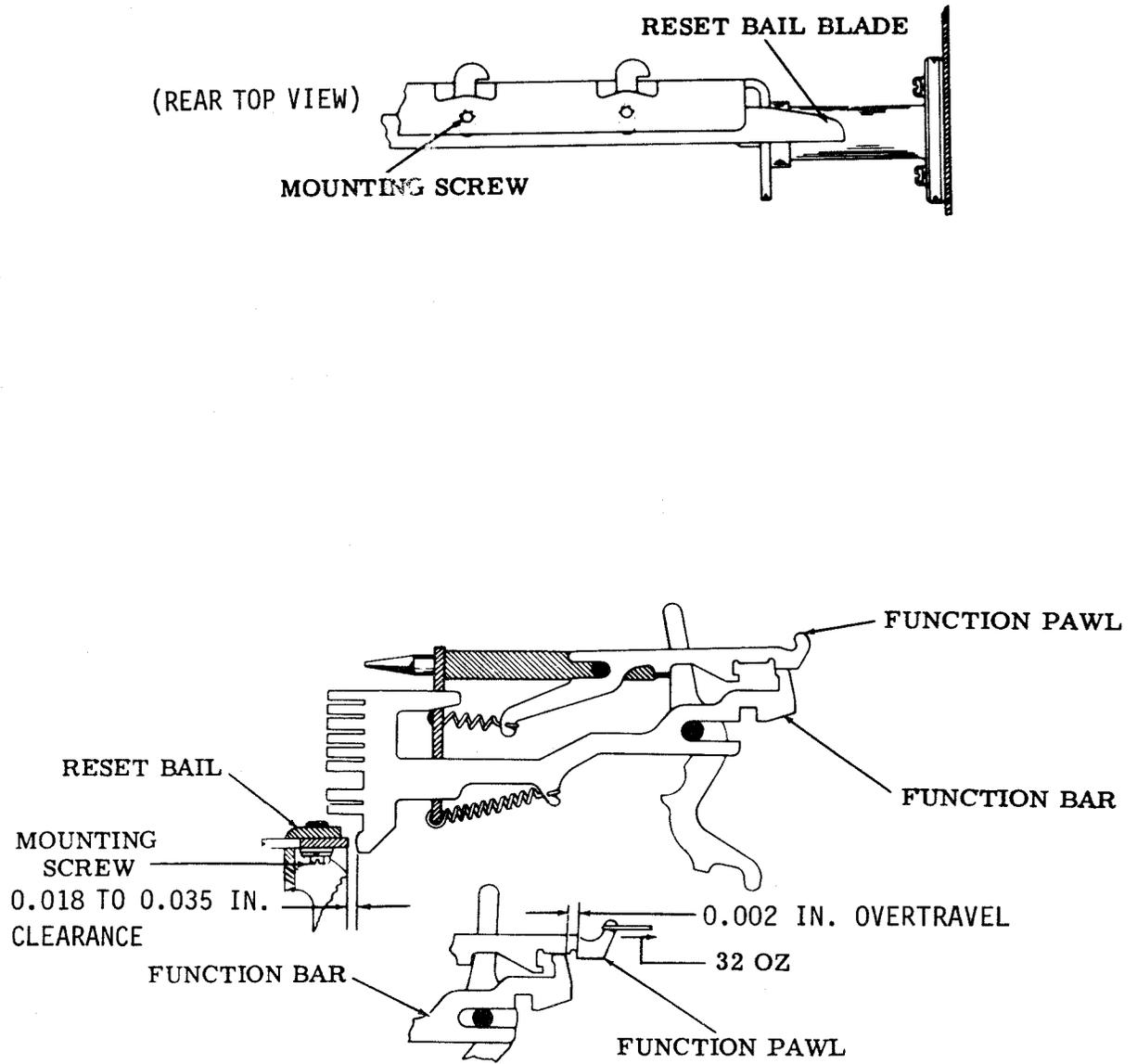


Figure 6-234. Function Reset Bail Blade

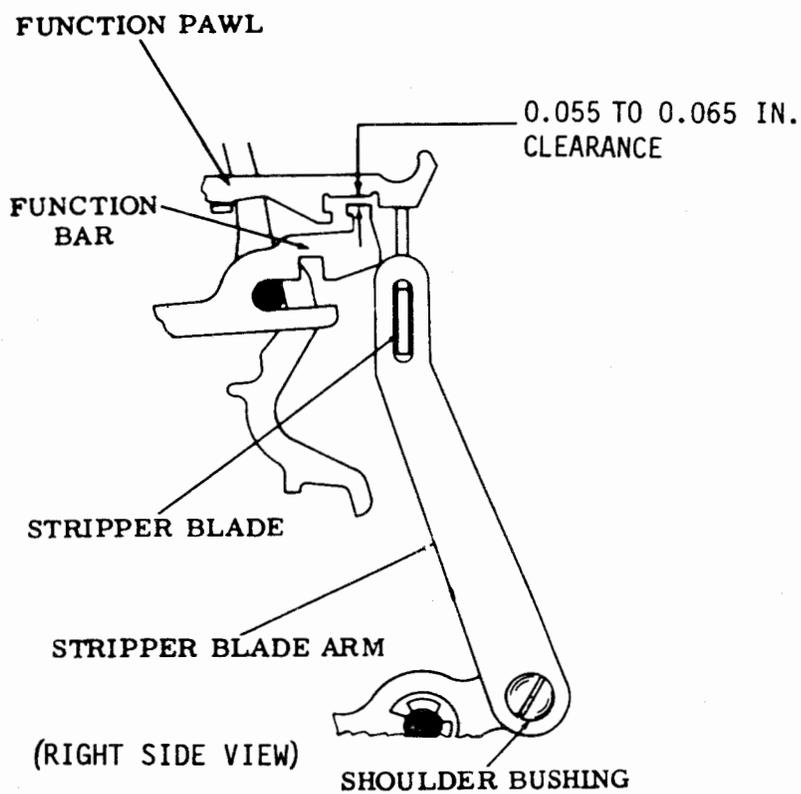


Figure 6-235. Function Stripper Blade Arms

function bar and lower surface of notched section of function pawl. Clearance should be between 0.005 and 0.065 inch.

(f) Measure clearance for letters function pawl near opposite end of stripper blade. Clearance should be between 0.055 and 0.065 inch.

(g) If either clearance measured in (e) or (f) exceeds specified limits, loosen locknut.

(h) Position shoulder bushing at lower end at right and left stripper blade arm to obtain specified clearance.

(i) Tighten locknut.

c. Line Feed Mechanism and Platen Mechanism Adjustments. Perform line feed and platen mechanisms adjustments in accordance with the following paragraphs.

(1) Single-Double Line Feed Lever. Adjust single-double line feed lever as follows:

(a) Refer to figure 6-236.

NOTE

This adjustment applies only to units with a two-step function clutch.

(b) Place single-double line feed lever in single line feed position.

(c) Set up line feed combination.

(d) Rotate main shaft until line feed function pawl stopper is in contact with line feed function pawl.

(e) When play is taken up in a direction to make overlap a minimum, pawl should overlap stripper by at least one-half the pawl thickness.

(f) If adjustment is necessary to obtain specified overlap, loosen locking nut and turn the lever adjusting screw.

(g) Tighten locking nut.

(2) Line Feed Stripper Bail Spring. Adjust line feed stripper bail spring as follows:

(a) Refer to figure 6-237.

(b) Disengage line feed clutch.

(c) Attach spring scale hook to end at line feed stripper bail.

(d) Force required to start stripper bail moving upward should be between 1/2 and 2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

d. Main Shaft and Trip Shaft Mechanisms Adjustments. Perform main shaft and trip shaft mechanisms adjustments in accordance with the following paragraphs.

(1) Antideflexion Plates. Adjust antideflexion plate as follows:

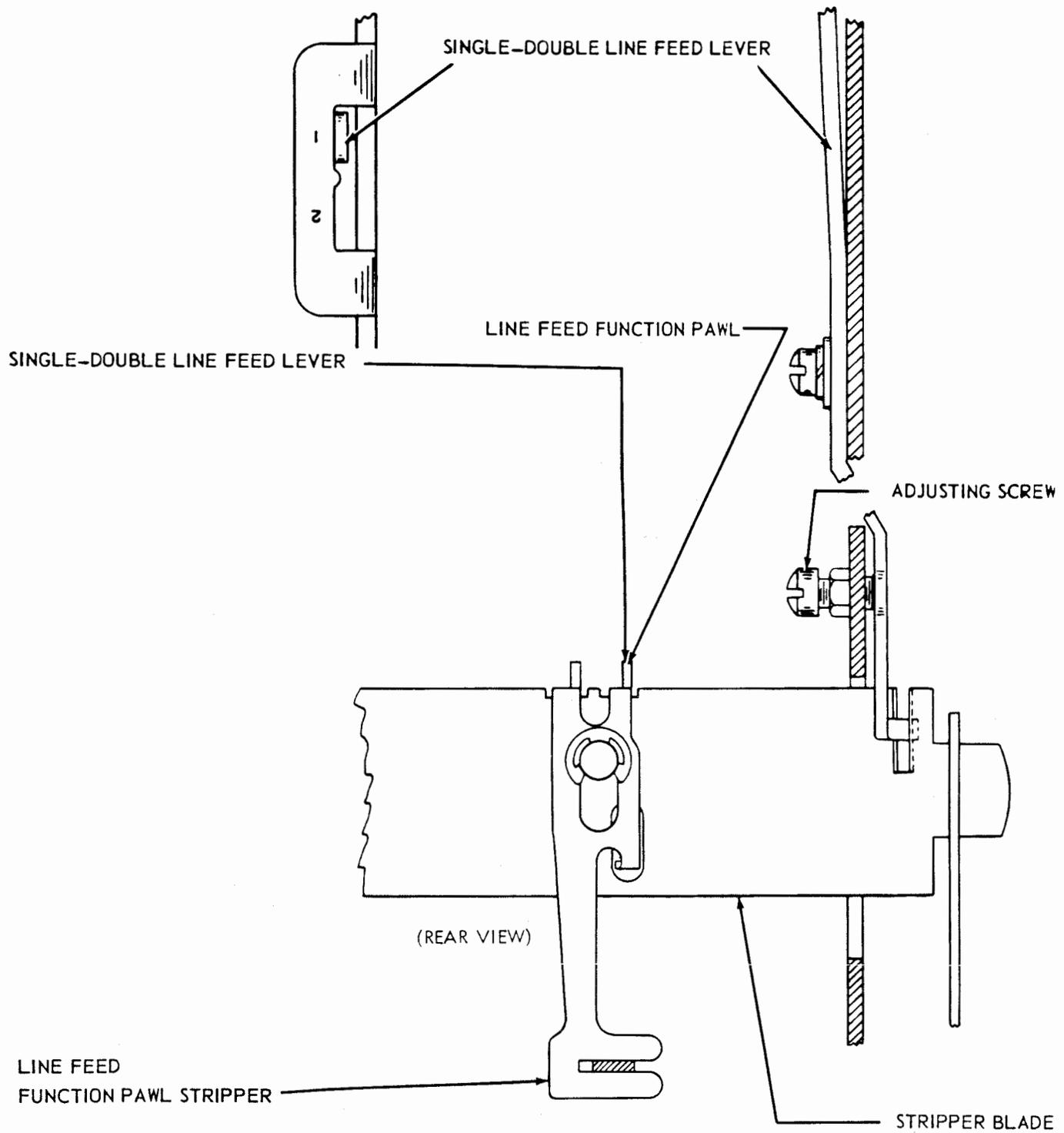


Figure 6-236. Single-Double Line Feed Lever

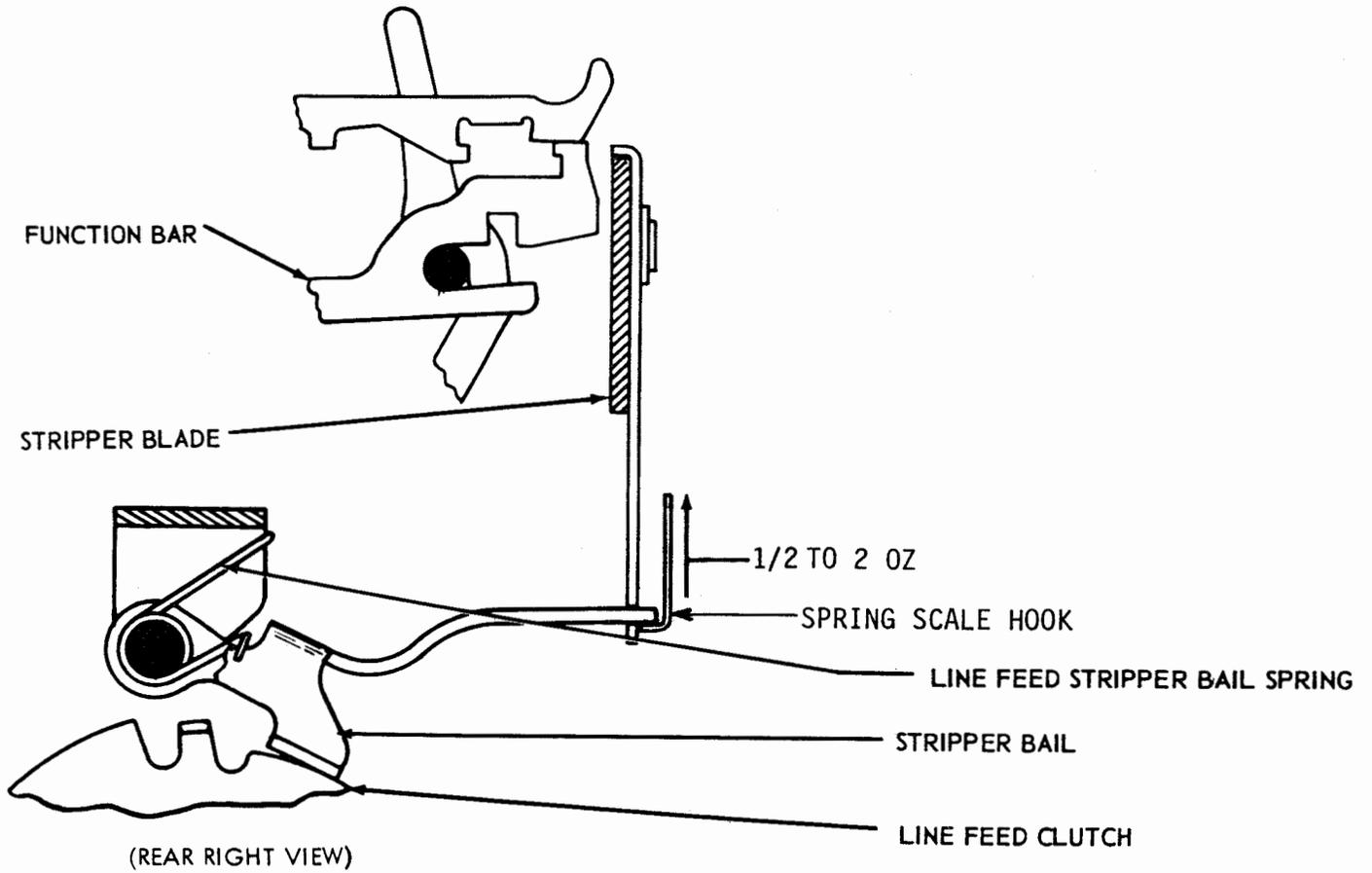


Figure 6-237. Line Feed Stripper Bail Spring

- figure 6-238.
- (a) Refer to figure 6-238.
  - (b) Place typing unit upside down on bench.
  - (c) Latch function, spacing, line feed, and type box clutch disengaged.
  - (d) Attach spring scale hook to trip shaft as shown in figure.
  - (e) Force required to pull trip shaft away from antideflection plate should be between 1 and 5 pounds.
  - (f) If scale reading exceeds specified limits, loosen antideflection plate mounting screws.

(g) Position plate to obtain specified scale reading.

(2) Clutch Trip Shaft Set Collars. Adjust clutch trip shaft set collars as follows:

- (a) Refer to figure 6-239.
- (b) Measure spacing clutch latchlever side play. There should be some side play not exceeding 0.008 inches.
- (c) If side play exceeds specified limit, loosen set screw in set collar.
- (d) Position spacing clutch latchlever set collar to obtain specified side play.

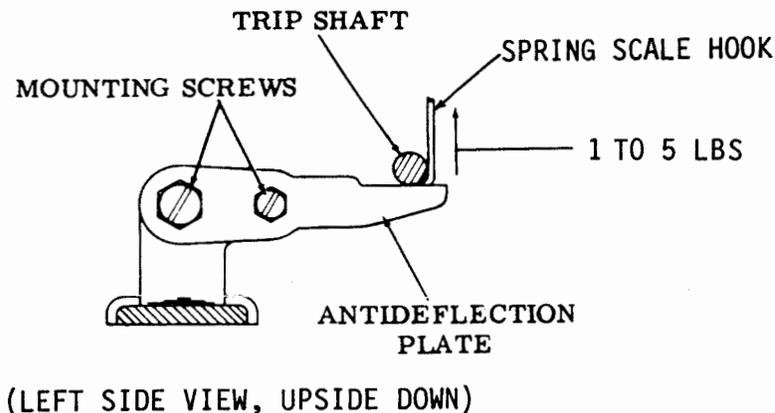


Figure 6-238. Antideflection Plate

(e) Tighten set screw.

(f) Ensure approximate alignment of right end of stop extension on trip lever with right end of stop extension on shoe lever.

(g) If adjustment is necessary, loosen set screw in line feed clutch trip lever set collar.

(h) Position set collar to align stop extension ends.

(i) Tighten set screw.

(j) Measure line feed clutch latchlever side play.

(k) There should be some side play not exceeding 0.008 inch.

(l) If side play exceeds specified limit, loosen set screw in line feed clutch latchlever set collar.

(m) Position set collar to obtain specified side play.

(n) Tighten set screw.

(3) Clutch Trip Lever Spring. Adjust clutch trip lever spring as follows:

(a) Refer to figure 6-240.

(b) Engage and rotate clutch until trip lever rests on stop lug.

(c) Attach spring scale hook as shown in figure.

(d) Force required to move lever away from stop lug shall be as follows:

For spacing clutch spring, between 11 and 16 ounces.

For line feed clutch spring, between 5 and 7-1/4 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(4) Spacing Clutch Trip Lever.

(a) Refer to figure 6-241.

(b) Disengage spacing and type box clutches

(c) Place trip lever arm in upward position.

(d) If unit does not have U-shaped line feed clutch trip lever, spacing clutch trip lever should be flush or underflush by one-half thickness of shoe lever with outer surface of shoe lever. Check at stop lug with least bite.

(e) If unit does have U-shaped line feed clutch trip lever, spacing clutch trip lever should engage shoe lever by full thickness of shoe lever. Check at stop lug with least bite.

(f) Loosen adjusting screw locking nut and turn adjusting screw to position spacing clutch trip arm.

(g) Tighten locking nut.

e. Positioning Mechanism Adjustments. Perform positioning mechanism

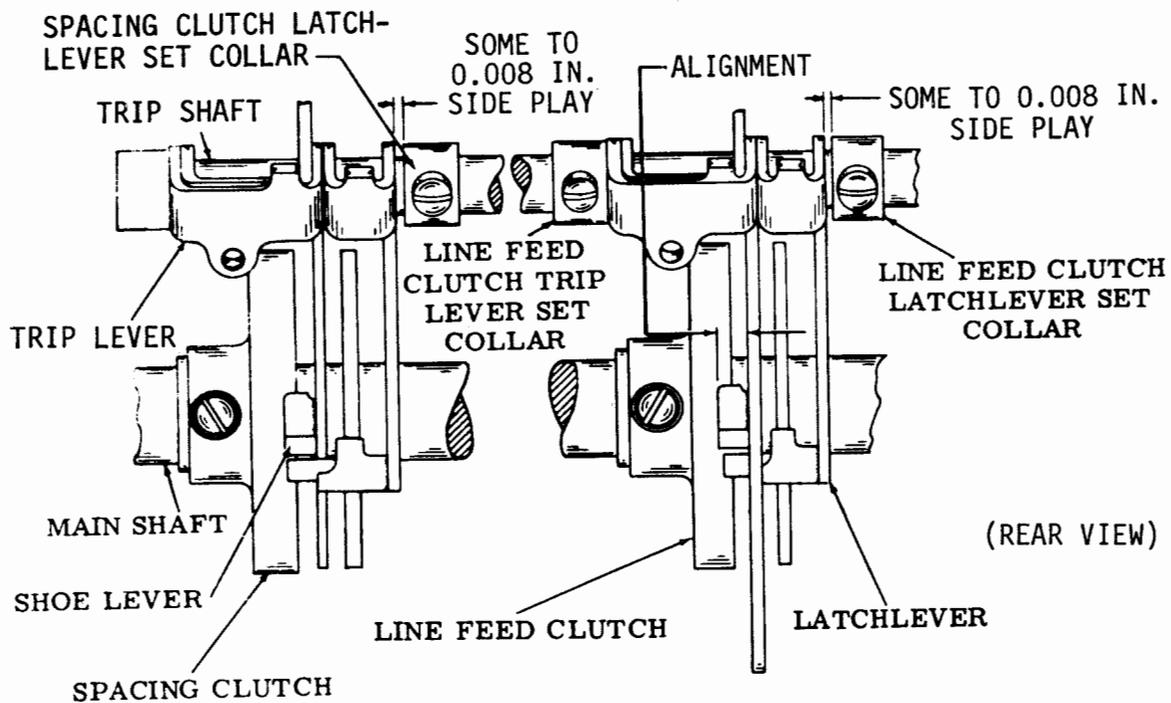


Figure 6-239. Clutch Trip Shaft Set Collars

11 OZ (MIN) TO 16 OZ (MAX) FOR SPACING CLUTCH SPRING  
 9 OZ (MIN) TO 12 OZ (MAX) FOR LINE FEED CLUTCH SPRING  
 5 OZ (MIN) TO 7-1/4 OZ (MAX) FOR TYPE BOX CLUTCH SPRING

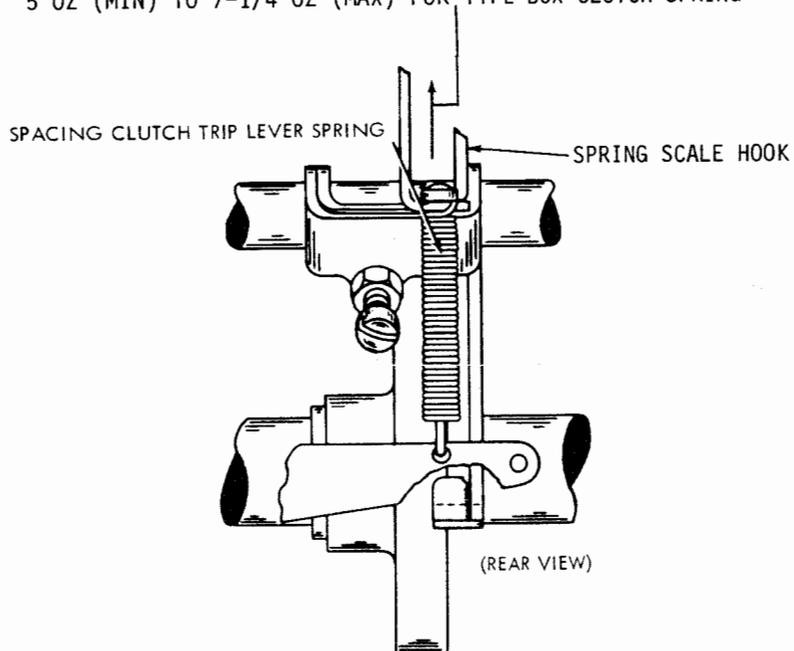


Figure 6-240. Clutch Trip Lever Spring

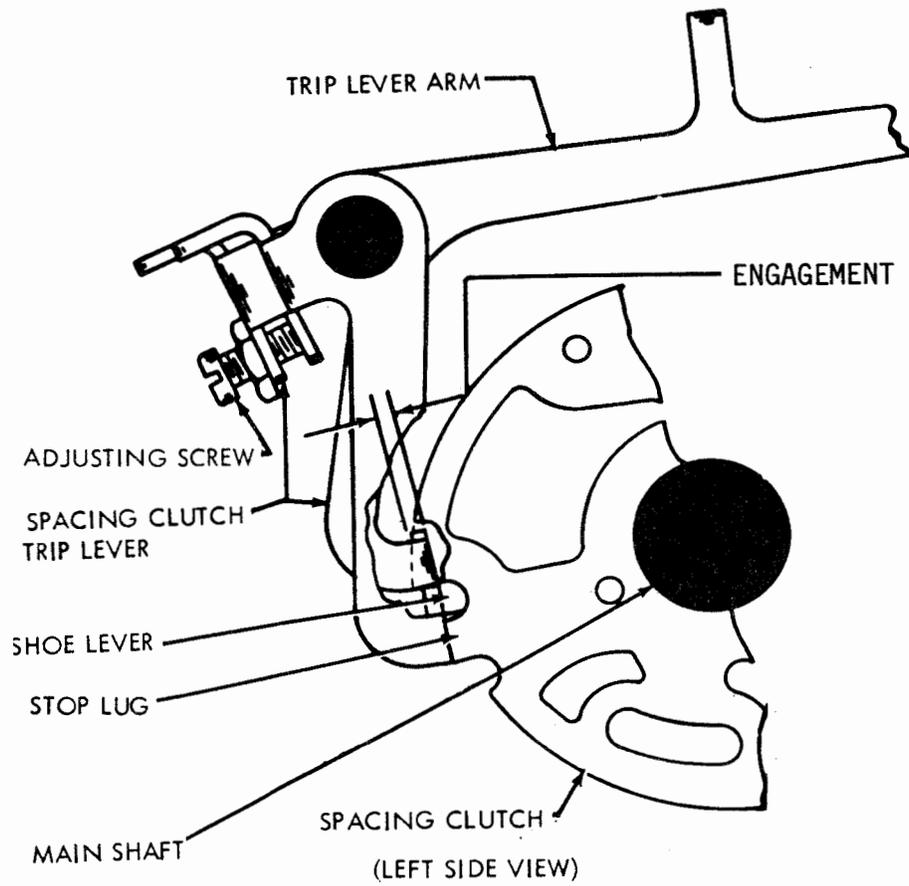


Figure 6-241. Spacing Clutch Trip Lever

adjustments in accordance with the following paragraphs.

(1) Horizontal Positioning Drive Linkage with Earlier Design Drive Linkage and Tension Springs. Adjust horizontal positioning drive linkage as follows:

- (a) Refer to figure 6-242.
- (b) Disengage type box clutch.
- (c) Position code bars 4 and 5 for spacing (right).
- (d) Measure clearance between each side of center horizontal stop slide and decelerating slides on side where knee link is straight. Both clearances should be between 0.015 and 0.040 inch and they should be equal within 0.005 inch.

(e) If clearances exceed specified limits, loosen bearing stud screws and strip mounting screws until they are friction tight.

(f) Position one or both bearing studs on connecting strip to provide from 0.025 to 0.035 inch clearance between center horizontal slide and decelerating slide on side where linkage is not buckled. Tighten two inner mounting screws.

(g) Check linkage for freeness throughout a complete cycle.

(h) Type box clutch disc should have some movement in normal direction of rotation in stop position.

(2) Horizontal Positioning Drive Linkage Spring (Tension Spring). Adjust horizontal positioning drive linkage spring (tension spring) as follows.

- (a) Refer to figure 6-242.
- (b) Unhook spring from its post.
- (c) Place linkage in its unbuckled position.
- (d) Attach spring scale hook to free end of spring.
- (e) Force required to extend spring to its installed length should be between 14 and 15 ounces.

(f) If scale reading exceeds specified limits, install new spring. Otherwise, hook free end of spring to its post.

(3) Horizontal Positioning Drive Linkage with Earlier Design Drive Linkage and Torsion Springs. Adjust horizontal positioning drive linkage as follows:

- (a) Refer to figure 6-243.
- (b) Disengage type box clutch.
- (c) Position code bars 4 and 5 for spacing (right).

(d) Measure clearance between each side of center horizontal stop slide and decelerating slides on side where knee link is straight. Both clearances should be between 0.015 and 0.040 inch and

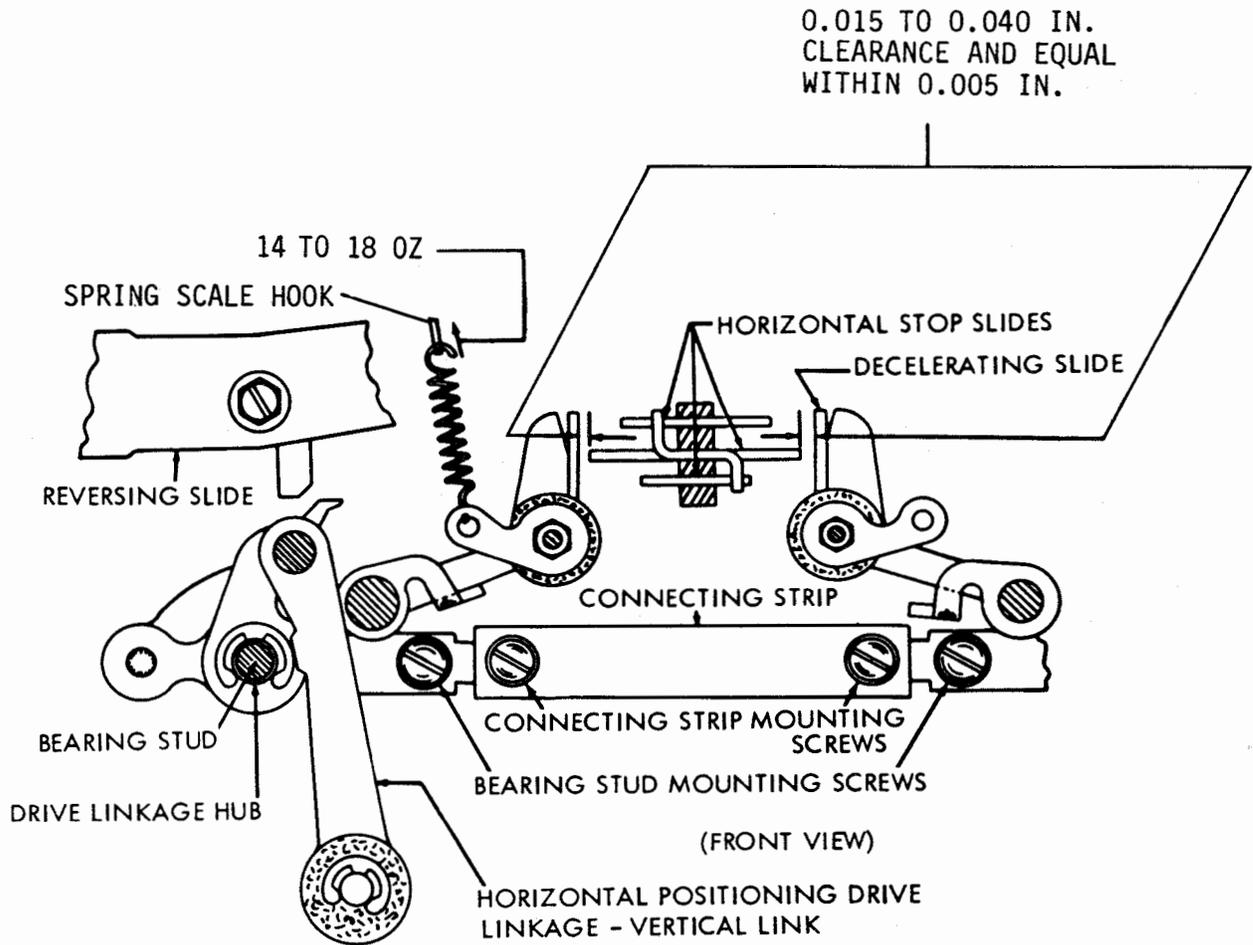


Figure 6-242. Horizontal Positioning Drive Linkage With Earlier Design Drive Linkage and Tension Springs, and Horizontal Positioning Drive Linkage Spring (Tension Spring)

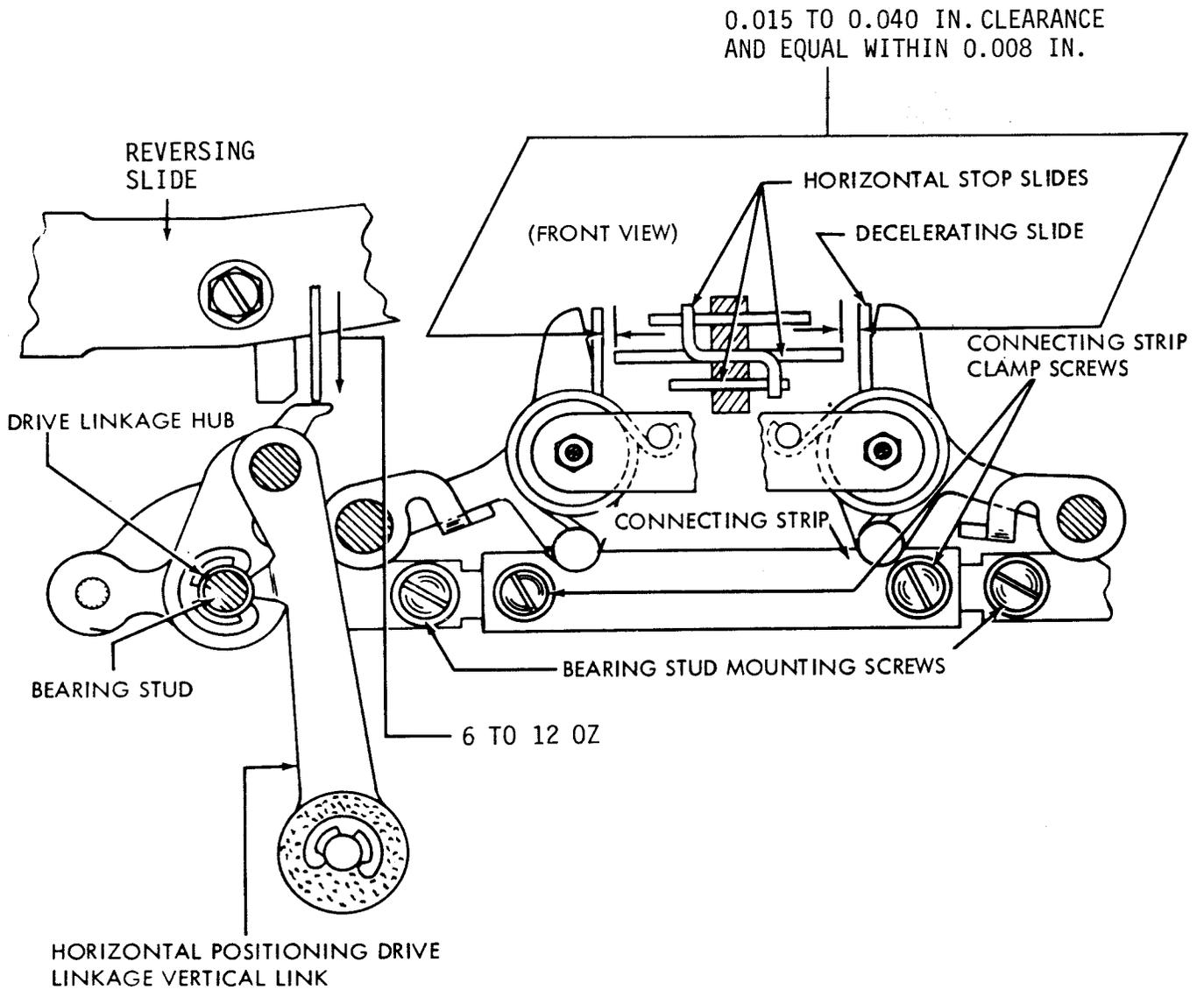


Figure 6-243. Horizontal Positioning Drive Linkage With Earlier Design Drive Linkage and Torsion Springs, and Horizontal Positioning Drive Linkage (Torsion Spring)

they should be equal within 0.008 inch.

(e) If clearances exceed specified limits, loosen bearing stud screws and strip mounting screws until they are friction tight.

(f) Position one or both bearing studs on connecting strip to provide from 0.025 to 0.035 inch clearance between center horizontal slide and decelerating slide on side where linkage is not buckled. Tighten two inner mounting screws.

(g) Change position of reversing slide and check opposite clearance. Equalize by shifting both studs and connecting strip as a unit.

(h) Hold drive linkage hub against lower vertical link of the drive linkage.

(i) Tighten two outer bearing stud mounting screws.

(j) Check linkage for freeness throughout a complete cycle.

(k) Type box clutch disc should have some movement in normal direction of rotation in stop position.

(4) Horizontal Positioning Drive Linkage Spring (Torsion Spring). Adjust horizontal positioning drive linkage spring (torsion spring) as follows:

(a) Refer to figure 6-243.

(b) Place linkage in unbuckled position.

(c) Apply spring scale push rod near end of upper extension.

(d) Force required to start link buckling should be between 6 and 12 ounces.

(e) If scale reading exceeds specified limits install new spring.

(5) Shift Linkage Spring. Adjust shift linkage spring as follows:

(a) Refer to figure 6-244.

(b) Place link in straight position.

(c) Apply spring scale hook to linkage as shown in figure 6-244.

(d) Force required to start each link moving should be between 7 and 16 ounces.

(e) If scale reading exceeds specified limits, install new spring.

NOTE

This adjustment is for torsion type shift linkage springs.

f. Printing Mechanism Adjustments. Perform printing mechanism adjustments in accordance with the following paragraphs.

(1) Type Box Carriage Roller. Adjust as follows:

(a) Refer to figure 6-245.

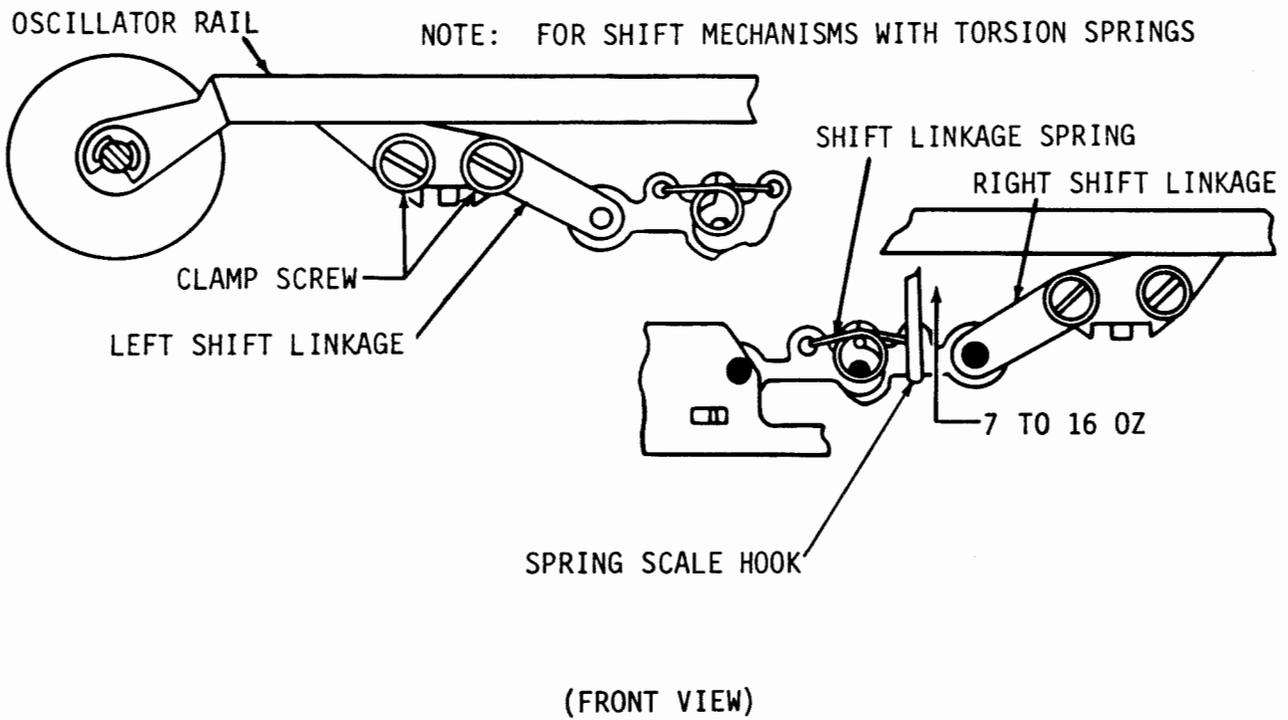


Figure 6-244. Shift Linkage Spring

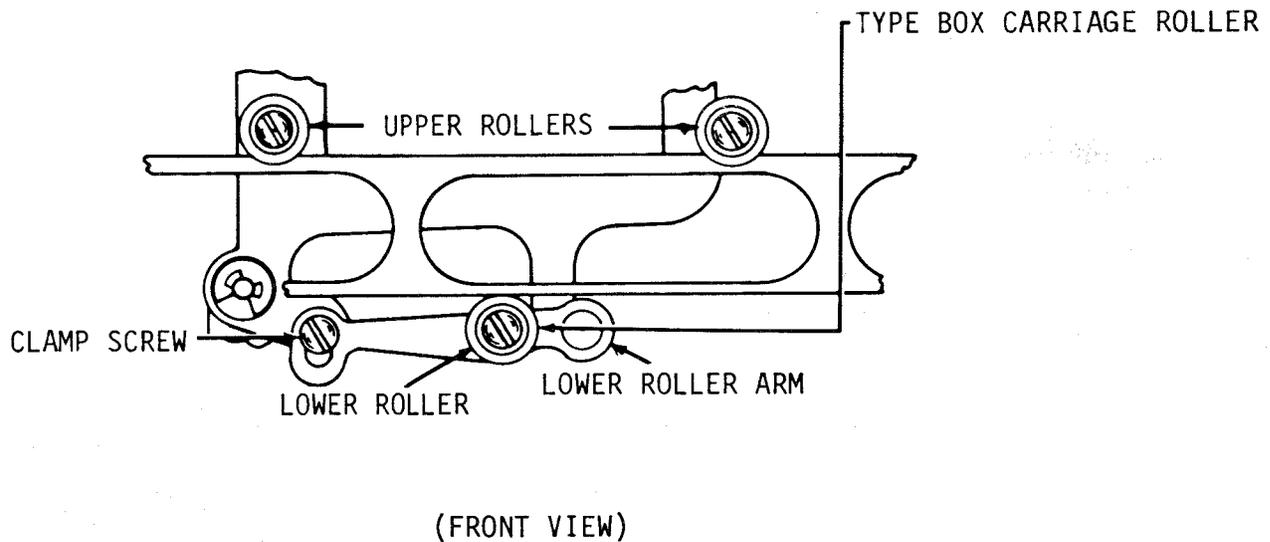


Figure 6-245. Type Box Carriage Roller

(b) Move carriage to right end of track. Place in upper position.

(c) Remove drive link.

(d) Throughout entire travel of carriage, there should be minimum vertical play without binding.

(e) If play is excessive or carriage binds, loosen clamp screw.

(f) Position lower roller arm to relieve binding or reduce play.

(g) Tighten clamp screw.

(2) Printing Hammer Stop Bracket (for Thick Type Box

with Dummy Pallets). Adjust printing hammer stop bracket as follows:

(a) Refer to figure 6-246.

(b) Place type box in blank or carriage return position (whichever does not print) and near center of platen.

(c) Place printing track in its downward position.

(d) Hold printing hammer against its stop with a force of 8 ounces.

(e) Measure clearance between printing hammer and dummy type pallet.

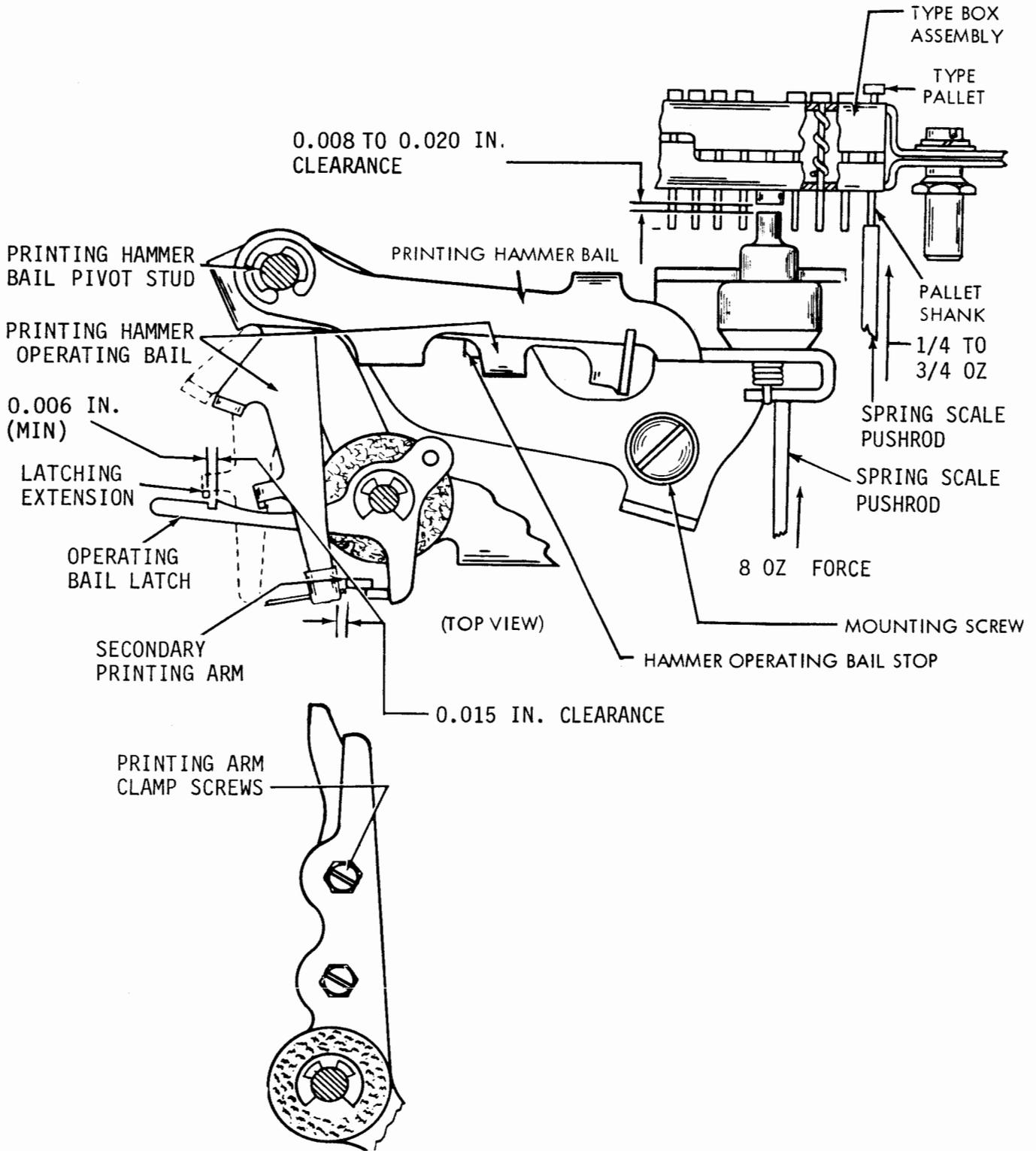


Figure 6-246. Printing Hammer Stop Bracket, Printing Arm, and Type Pallet Spring

Clearance should be between 0.008 and 0.020 inch.

(f) If clearance exceeds specified limits, loosen mounting screw and the hammer bail pivot stud.

(g) Position stop bracket to obtain specified clearance.

(h) Tighten screw and nut.

(3) Printing Arm. Adjust printing arm as follows:

(a) Refer to figure 6-246.

(b) Place printing track in maximum downward position.

(c) Position printing hammer operating bail against its stop.

(d) When printing arm slide is held downward over each printing track mounting screw to maximize clearance, there should be some clearance, not exceeding 0.015 inch between secondary printing arm and forward extension of hammer operating bail.

(e) Place printing track in uppermost position.

(f) Latching extension of printing hammer operating bail should overtravel latching surface of operating bail latch by not less than 0.006 inch. Check right and left positions.

(g) If clearance in step (d) or overtravel in step (f) exceeds

specified values, loosen clamp screws.

(h) Position secondary printing arm to obtain specified clearance or overtravel.

(i) Tighten clamp screws.

NOTE

The printing arm adjustment should always be made with the printing hammer operating bail spring bracket in the number 1 position.

(4) Type Pallet Spring. Adjust type pallet spring as follows:

(a) Refer to figure 6-246.

(b) Remove type box from unit.

(c) Apply spring scale pushrod to end of pallet shank.

(d) Force required to start pallet moving should be between 1/4 and 3/4 ounce.

(e) If scale reading exceeds specified limits, install new spring.

(5) Ribbon Reverse Spur Gear. Adjust ribbon reverse spur gear as follows:

(a) Refer to figure 6-247.

(b) Place right reversing lever in maximum downward position. Left reversing lever should be in its maximum upward position.

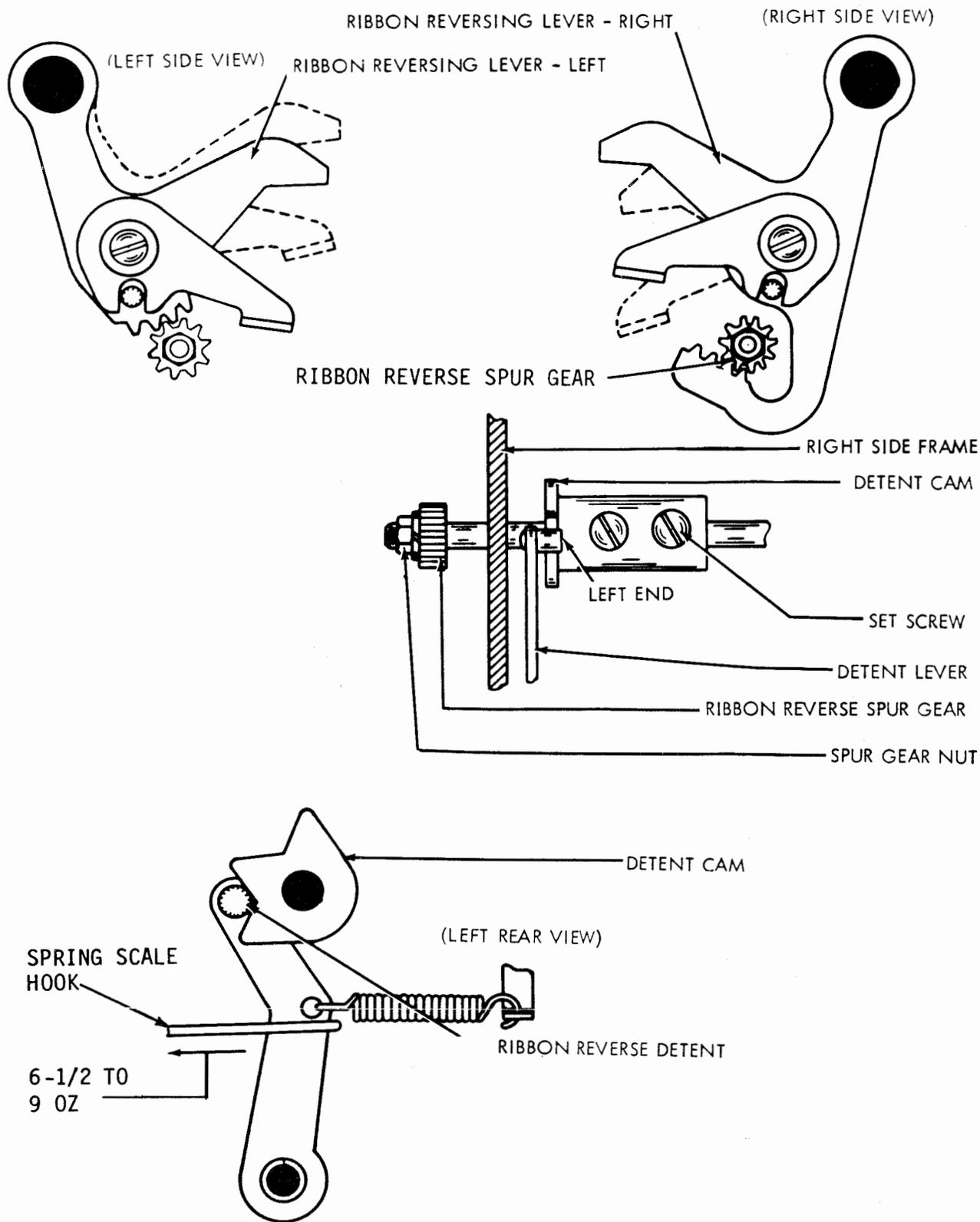


Figure 6-247. Ribbon Reverse Spur Gear, Ribbon Reverse Detent, and Ribbon Reverse Detent Lever Spring

(c) If left reversing lever is not in its maximum upward position, loosen detent cam set screws and left spur gear nut.

(d) Securely tighten right spur gear nut.

(e) Move right reversing lever to its maximum downward position and hold left reversing lever in its maximum upward position.

(f) Tighten left spur gear nut.

(g) Tighten detent cam set screws.

(6) Ribbon Reverse Detent. Adjust ribbon reverse detent as follows:

(a) Refer to figure 6-247.

(b) Ensure detent seats approximately equally in upper and lower portions of detent cam.

(c) Loosen set screws.

(d) Position cam on shaft.

(e) Allow left end of detent stud to be approximately flush with left face of cam (take up play in detent to right of printer).

(f) Tighten screws.

(7) Ribbon Reverse Detent Lever Spring. Adjust ribbon reverse detent lever spring as follows:

(a) Refer to figure 6-247.

(b) Seat detent in notch of cam.

(c) Hold right ribbon reversing lever downward.

(d) Attach spring scale hook to detent lever.

(e) Force required to start detent lever moving should be between 6-1/2 and 9 ounces.

(f) If scale reading exceeds specified limits, install new spring.

g. Selector Mechanism Adjustments. Perform selector mechanism adjustments in accordance with the following paragraphs.

(1) Bail Lever Guide. Adjust bail lever guide as follows:

NOTE

This adjustment applies only to units equipped with adjustable guides.

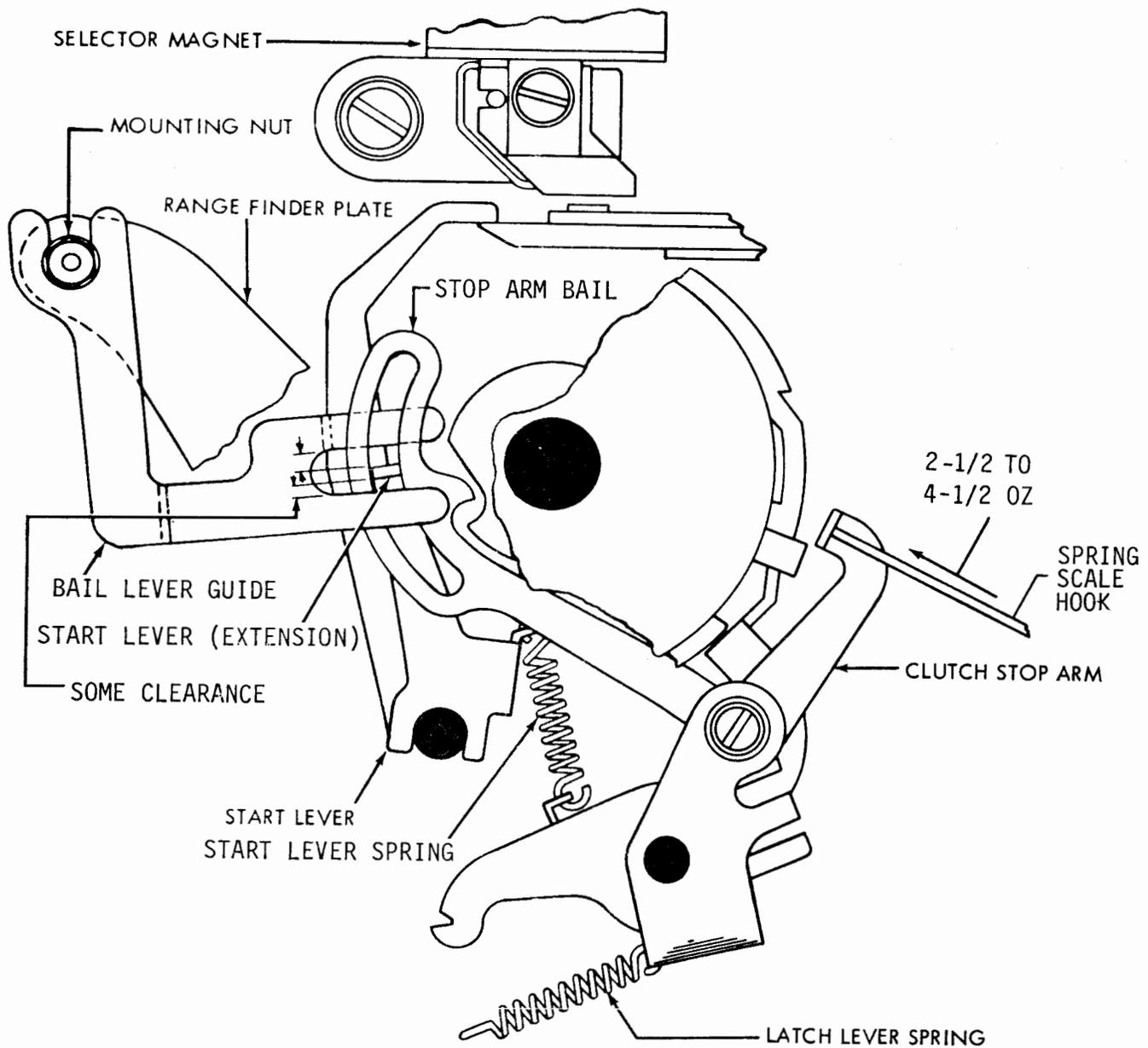
(a) Refer to figure 6-248.

(b) Ensure there is some clearance each side of guide fork and of start lever throughout its travel.

(c) If clearance is insufficient, loosen mounting nut and position bail lever guide.

(d) Tighten mounting nut.

(2) Start Lever Spring. Adjust start lever spring as follows:



(RIGHT SIDE VIEW)

Figure 6-248. Bail Lever Guide and Start Lever Spring

- figure 6-248.
- (a) Refer to
  - (b) Unhook end of latch lever spring.
  - (c) Position stop arm bail in indent of its cam.
  - (d) Set range scale at 60.
  - (e) Apply spring scale pushrod to clutch stop arm.
  - (f) Force required to start stop arm moving should be between 2 1/2 and 4-1/2 ounces.
  - (g) If scale reading exceeds specified limits, install new start lever spring.

(3) Armature Clamp Stop. Adjust armature clamp strip as follows:

NOTE

This adjustment need not be made if selector magnet bracket and receiving margin adjustments have been made. If necessary to make this adjustment, remove range finder and selector magnet assemblies. To insure better operation, put a piece of KS bond paper between armature and pole pieces to remove any oil or foreign matter that may be present. Ensure no lint or pieces of paper remain between pole pieces and armature.

(a) Refer to figure 6-249.

(b) Measure clearance between armature clamp strip and casting at their closest point. Clearance should be 0.010 inch minimum.

(c) If clearance is less than specified minimum, loosen mounting screws.

(d) Position armature spring firmly against pivot edge of casting. To obtain specified clearance between armature clamp strip and casting.

(e) Tighten mounting screws.

(4) Armature Alignment. Adjust armature alignment as follows:

NOTE

This adjustment need not be made if selector magnet bracket and receiving margin adjustments have been made. If necessary to make this adjustment, remove range finder and selector magnet assemblies. To insure better operation, put a piece of KS bond paper between armature and pole pieces to remove any oil or foreign matter that may be present. Ensure no lint or pieces of paper remain between pole pieces and armature.

(a) Refer to figure 6-249.

(b) Ensure outer edge of armature is flush with outer edge of both pole pieces within 0.015 inch.

(c) If not, loosen mounting screws and position armature spring

(RIGHT SIDE VIEW)

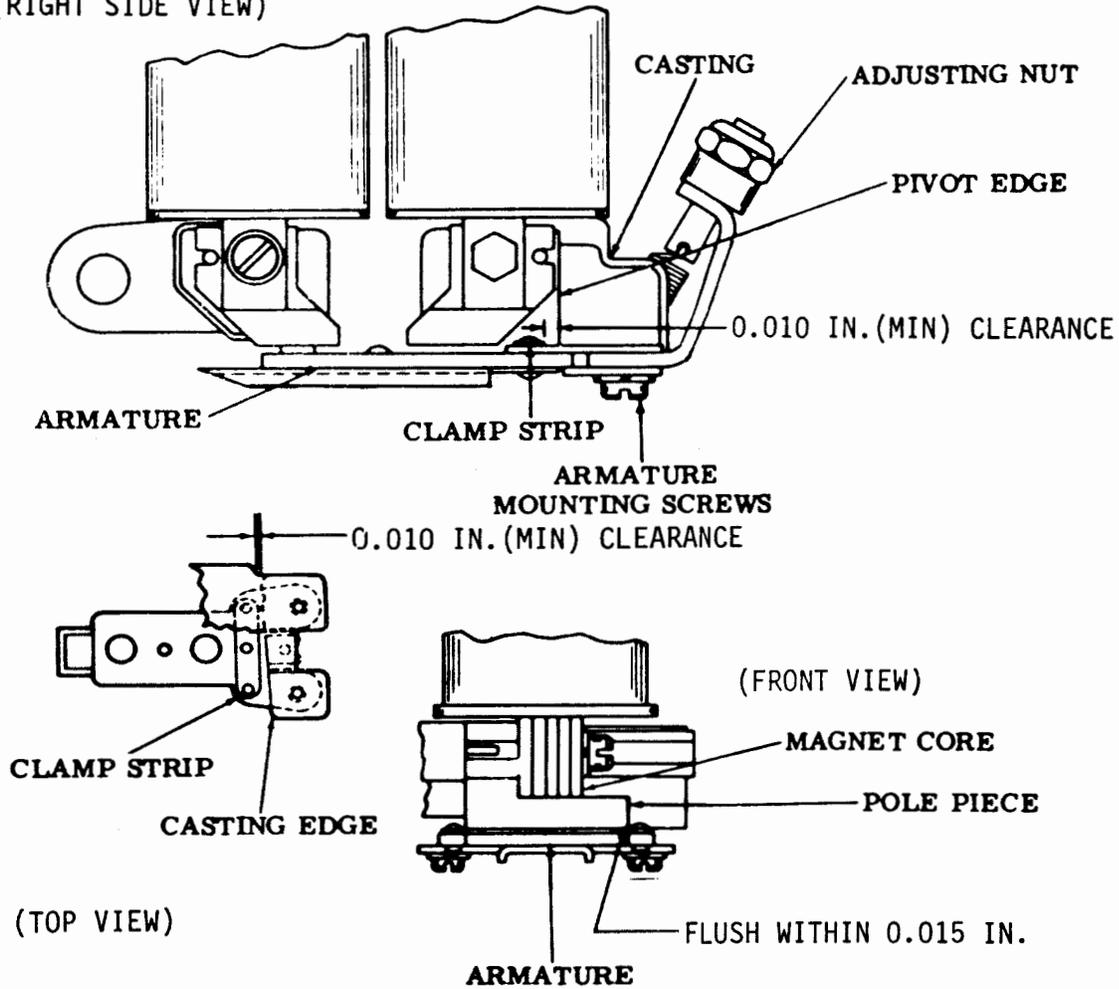


Figure 6-249. Armature Clamp Strip and Armature Alignment

adjusting nut to hold armature firmly against edge of casting.

(d) Tighten mounting screws.

(5) Armature Backstop Alignment (TP152424 Only). Adjust armature backstop alignment as follows:

NOTE  
If this adjustment is made, check the following related adjustments:

- 6-7.1h. (9)
- 6-3.1h. (8)
- 6-3.1h. (5)
- 6-3.1h. (6)
- 6-7.1h. (6)

NOTE

This adjustment need not be made if selector magnet bracket and receiving margin adjustments have been made.

(a) Refer to figure 6-250.

(b) Measure clearance between sides of backstop and sides of armature extension. Clearance should be 0.010 inch minimum.

(c) If clearance is less than specified minimum, loosen mounting screws.

(d) Position armature spring adjusting nut to hold armature firmly against pivot edge of casting.

(e) Position armature and backstop.

(f) Tighten mounting screws.

h. Spacing Mechanism Adjustments. Perform spacing mechanism adjustments in accordance with the following paragraphs.

(1) Printing Carriage Position. Adjust printing carriage position as follows:

(a) Refer to figure 6-251.

(b) Place type box in letters position.

(c) Select "M" type pallet.

(d) Place type box in printing position.

(e) "M" type pallet should be approximately in center of printing hammer when hammer is just touching "M" type pallet.

(f) Take up play in type box carriage in each direction and set hammer in center of play.

(g) If adjustment is required, loosen clamp screws and position printing carriage on wire rope.

(h) Tighten clamp screws.

(2) Left Margin. Adjust left margin as follows:

NOTE

The following adjustments are for a 72-character line. For other lengths of lines, ranging from 65 to 85 characters, the margin can be varied as desired.

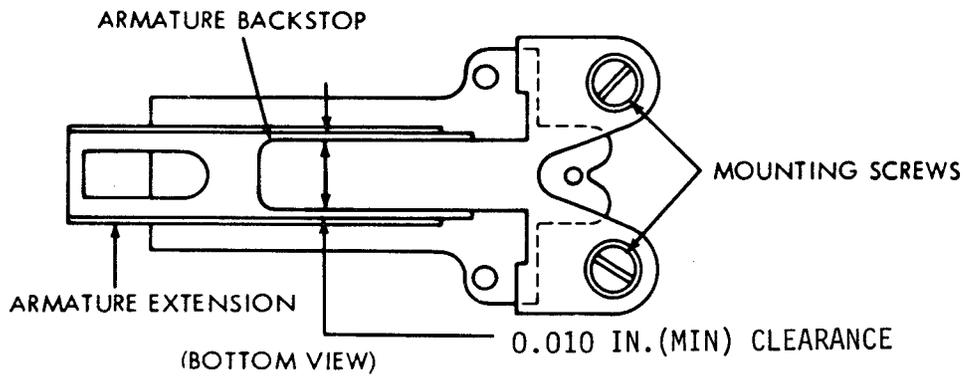


Figure 6-250. Armature Backstop Alignment

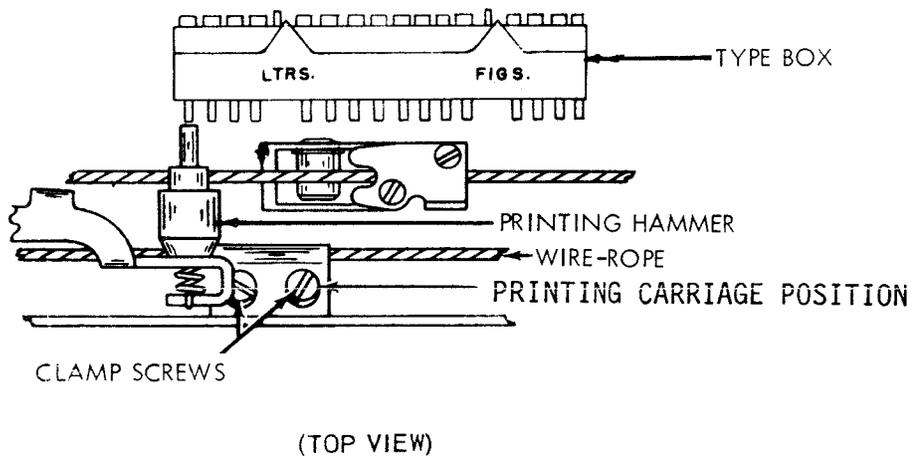


Figure 6-251. Printing Carriage Position

- figure 6-252.
- (a) Refer to type box.
- (b) Disengage spacing drum in returned position.
- (c) Place type box to letters position.
- (d) Center of LRTS print indicator on type box should be between 15/16 and 1-1/16 inch from left edge of platen.
- (e) Disengage spacing clutch.
- (f) Place front spacing feed pawl in farthest advanced position.
- (g) Take up play in spacing shaft gear in clockwise direction.
- (h) Measure clearance between pawl and shoulder of ratchet wheel tooth immediately ahead. Clearance should be between 0.002 and 0.015 inch.
- (i) Place rear pawl in farthest advanced position.
- (j) Ensure rear pawl rests at bottom of indentation between ratchet wheel teeth.
- (k) If clearance in step (e) exceeds specified limits or rear pawl does not rest between ratchet teeth as specified in step (k), loosen mounting screws.
- (l) Position stop arm on spacing drum to

- obtain specified clearance or pawl position.
- (n) Tighten mounting screws.

NOTE

If the above adjustment is made, check the following adjustment:

- 6-7.1h. (9)  
 6-7.1h. (6)  
 6-3.1f. (6)

(3) Automatic Carriage Return-Line Feed Bell Crank Spring. Adjust automatic carriage return-line feed bell crank spring as follows:

- (a) Refer to figure 6-252.
- (b) Disengage function clutch.
- (c) Attach spring scale hook to bell crank.
- (d) Force required to move bell crank should be between 6-1/2 ounces and 1 ounce.
- (e) If scale reading exceeds specified limits, install new spring.

(4) Automatic Carriage Return and Line Feed Arm. Adjust automatic carriage return and line feed arm as follows:

- (a) Refer to figure 6-253.
- (b) Place carriage in position (operating on base) to print two spaces before last desired characters.

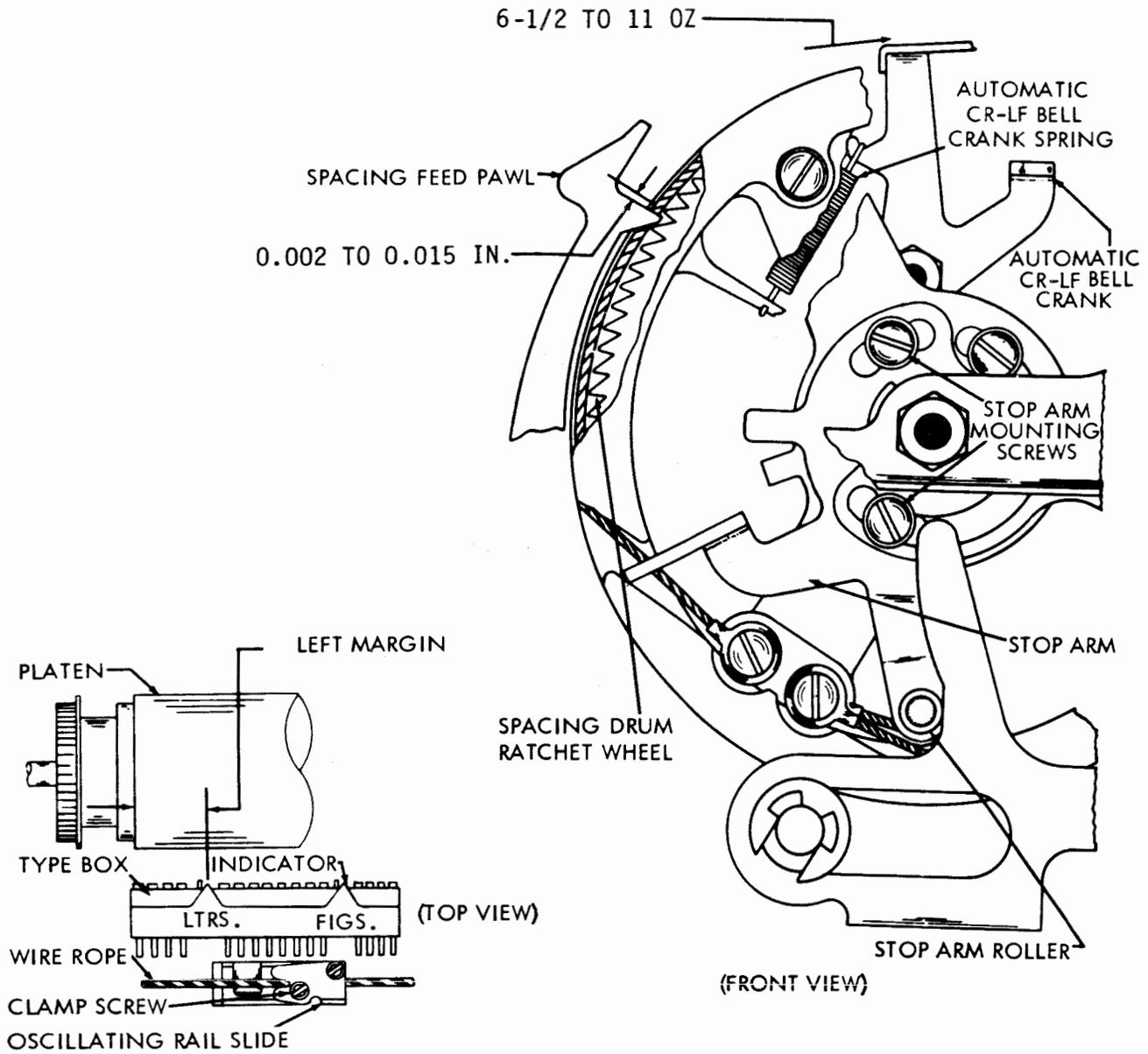


Figure 6-252. Left Margin and Automatic Carriage Return-Line Feed Bail Crank Spring

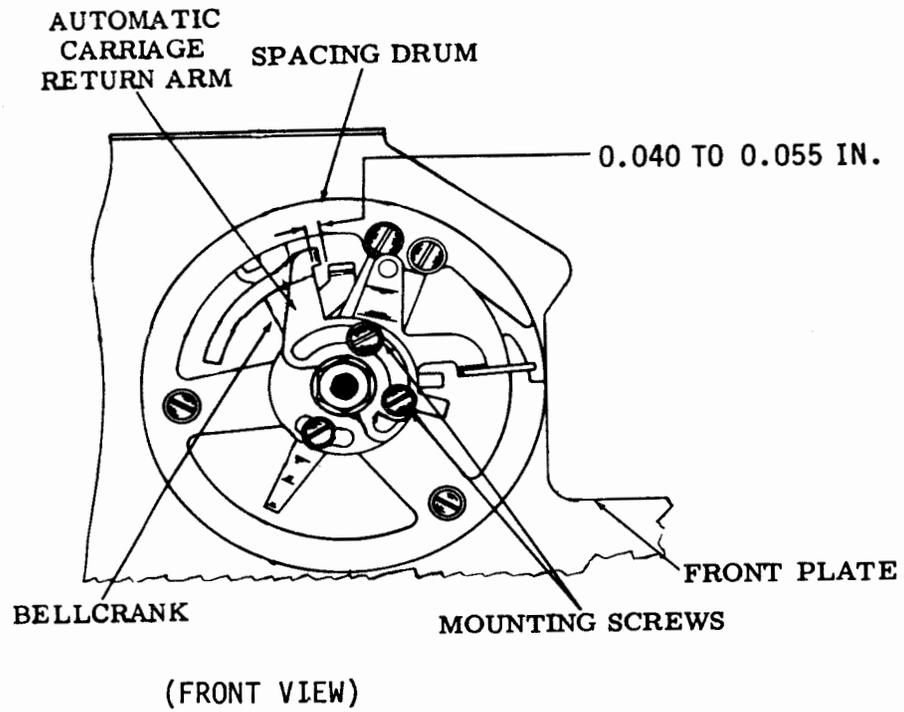


Figure 6-253. Automatic Carriage Return and Line Feed Arm

(c) Place front spacing pawl in farthest advanced position.

(d) Measure clearance between leading end of automatic carriage return arm and bellcrank. Clearance should be between 0.040 inch and 0.055.

(e) If clearance exceeds specified limits, loosen mounting screws.

(f) Position automatic return arm to obtain specified clearance.

(g) Tighten mounting screws.

NOTE

Range of adjustment is from 65th to 85th character. For units equipped with universal spacing drum, see 6-3.1h(16).

(5) Decelerating Slide Bell Crank Spring. Adjust decelerating slide bell crank spring as follows:

(a) Refer to figure 6-254.

(b) Attach spring scale hook to right decelerating slide bell crank spring.

(c) Force required to start bell crank moving should be between 3/4 and 1-3/4 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(e) Repeat steps (b) through (d) for left decelerating slide bell crank spring.

(6) Spacing Cutout Transfer Bail Spring. Adjust spacing cutout transfer bail spring as follows:

(a) Refer to figure 6-255.

(b) Apply spring scale pushrod to spacing extent transfer bail.

(c) Force required to start bail moving should be between 1 and 3-1/2 ounces.

(d) If spring scale reading exceeds specified limits, install new spring.

(7) Right Margin. Adjust right margin as follows:

(a) Refer to figure 6-255.

(b) Place type box carriage in position (operating on base) to print character on which spacing cutout is desired.

(c) Place front facing pawl in farthest advanced position.

(d) Hold spacing cutout transfer bail in its uppermost position and measure clearance between upper edge of spacing cutout lever and cutout transfer bail. Clearance should be between 0.006 and 0.025 inch.

(e) If clearance exceeds specified limits, loosen cutout lever clamp screw.

(f) Position cutout lever to obtain specified clearance.

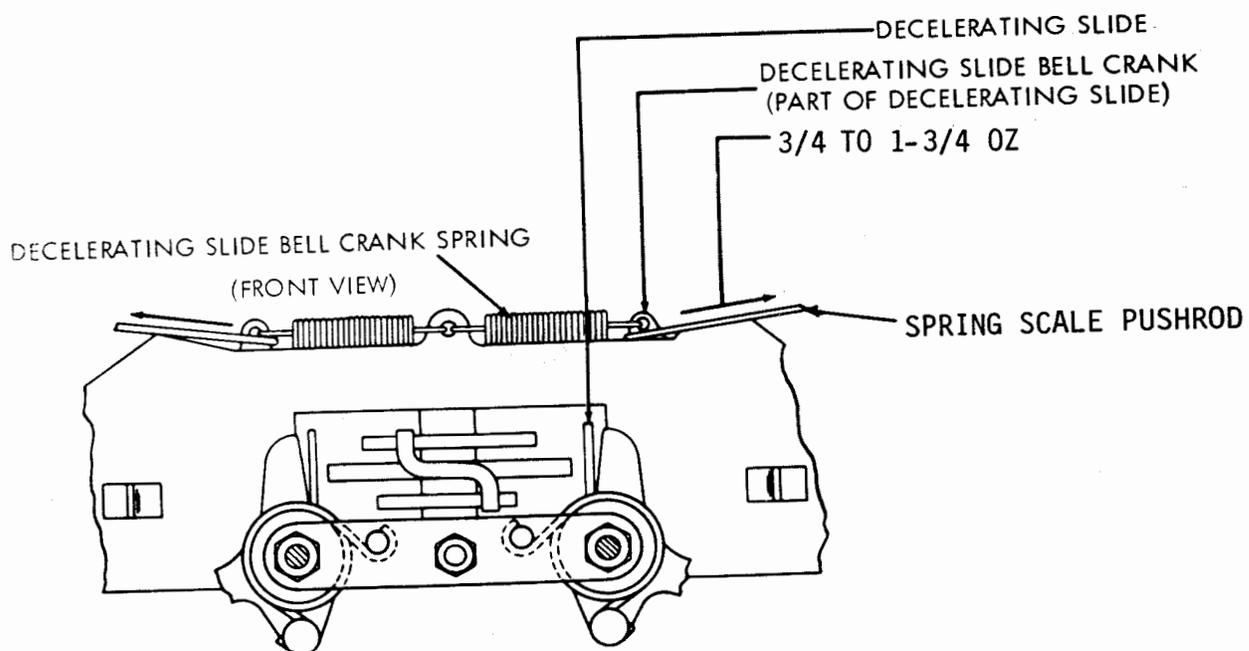


Figure 6-254. Decelerating Slide Bell Crank Spring

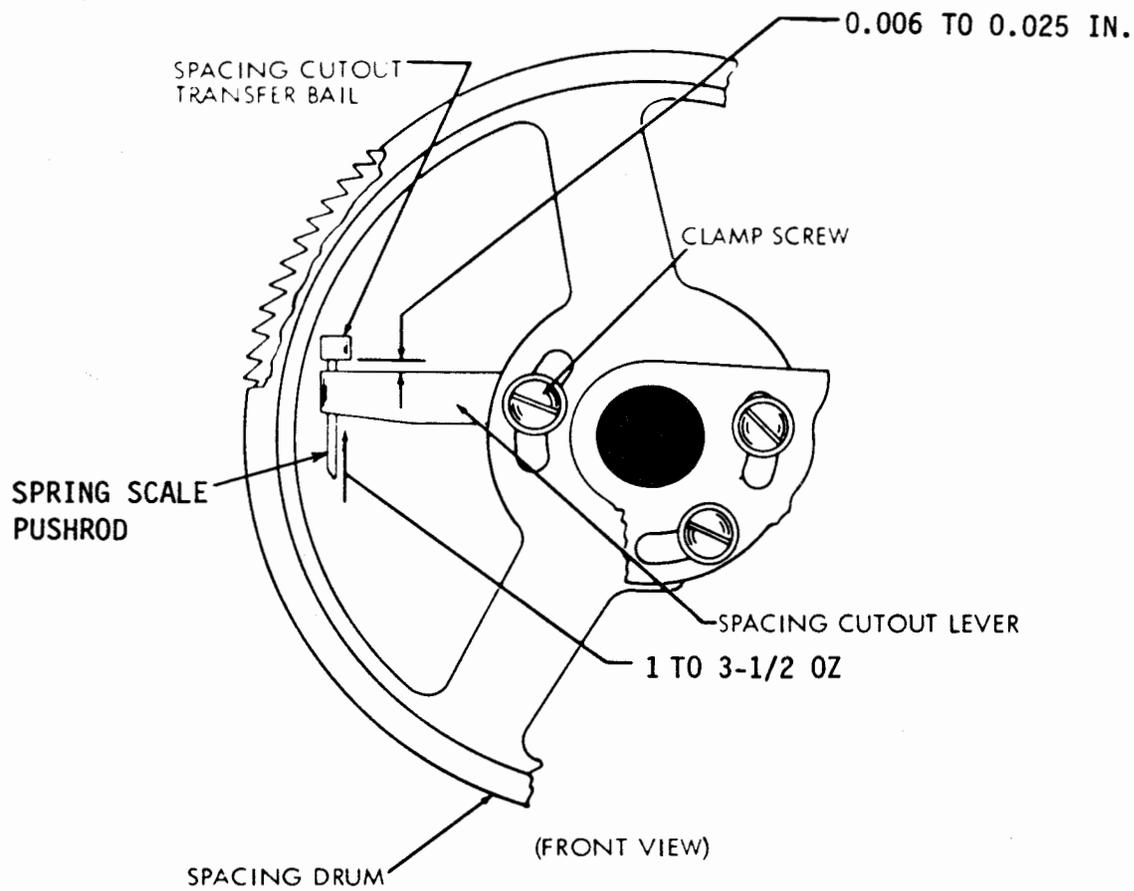


Figure 6-255. Spacing Cutout Transfer Bail Spring and Right Margin

(g) Tighten clamp screw.

## NOTE

If this adjustment is made, check the following related adjustments:

- 6-7.1h.(9)
- 6-3.1h.(8)
- 6-3.1h.(5)
- 6-3.1f.(6)
- 6-3.1f.(7)

(8) Margin Indicator Lamp. Adjust margin indicator lamp as follows:

- (a) Refer to figure 6-256.
- (b) Operate unit under power.
- (c) Margin indicator lamp should become illuminated on desired character.
- (d) If lamp does not become illuminated on desired character, loosen three cam disc mounting screws.
- (e) Set type box to print desired character.
- (f) Position cam disc counterclockwise on spring drum so switch just opens. If a line shorter than 72 characters is required and range of rotation in one slot is not sufficient, it may be necessary to remove cam disc mounting screws and insert them in adjacent slots of disc.
- (g) Tighten mounting screws.

(9) Oscillating Rail Slide Position.

- (a) Refer to figure 6-257.
- (b) Place spacing cutout lever and automatic carriage return-line feed arm in maximum counterclockwise position on spacing drum.
- (c) Disengage spacing clutch.
- (d) Position farthest advanced spacing pawl so it is engaged with tooth just above cutaway section in ratchet wheel.
- (e) Measure clearance between right end of oscillating rail slide and pulley. Clearance should be between 0.025 and 0.050 inch.
- (f) If clearance exceeds specified limits, loosen clamp screws.
- (g) Position slide on wire rope to obtain specified clearance.
- (h) Tighten screws.

## NOTE

If adjustment of steps (f), (g), and (b) was made, check the following related adjustments:

- 6-7.1h(1)
- 6-7.1h(6)
- 6-3.1f(6)

(10) Spacing Feed Pawl Spring. Adjust spacing feed pawl spring as follows:

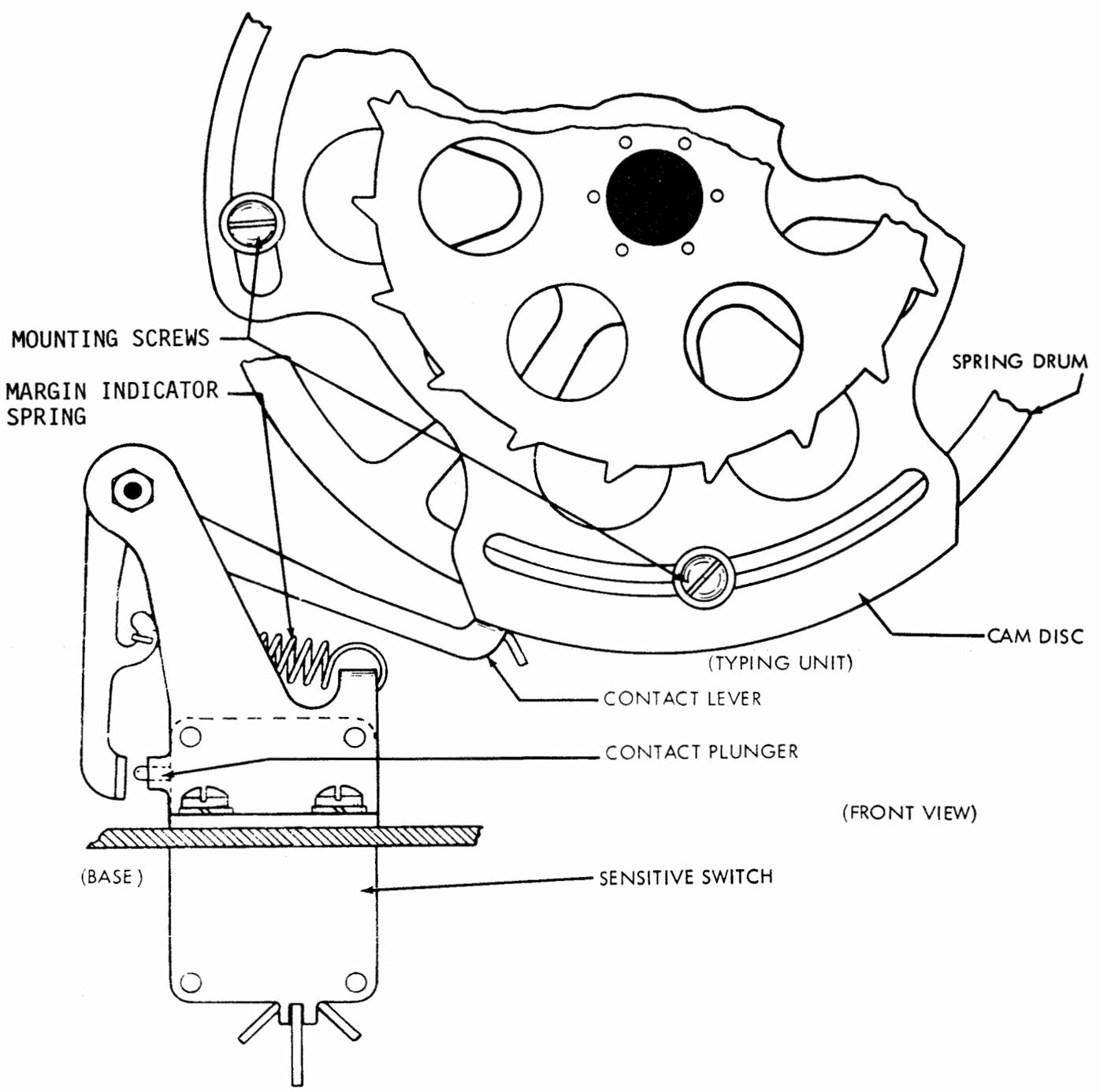


Figure 6-256. Margin Indicator Lamp

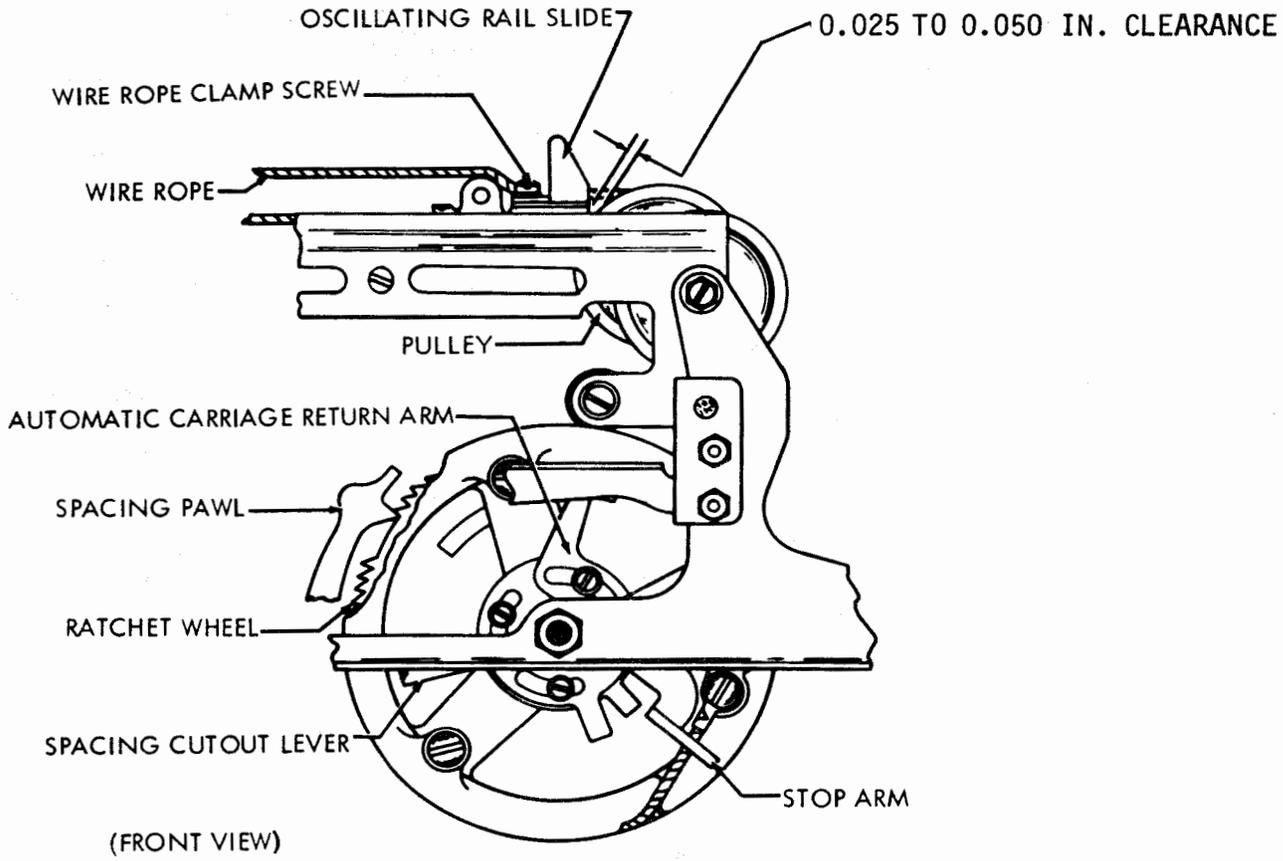


Figure 6-257. Oscillating Rail Slide Position

(a) Refer to figure 6-258.

(b) Place each spacing pawl in least advanced position, resting against ratchet wheel.

(c) Unhook each spring from its bracket.

(d) Attach spring scale hook to free end of each spring in turn.

(e) Force required to extend each spring to its installed length should be between 2-1/2 and 4 ounces. On units equipped for 6 spaces per inch, the force should be 8 to 10 ounces.

(f) If scale reading for any spring exceeds specified limits, install new spring.

6-8. KEYBOARD UNIT. The following paragraphs describe keyboard unit adjustments, Variable Features of basic CPP Teletypewriter Sets. (Low-level adjustments apply only to Basic Units).

6-8.1 KEYBOARD UNIT (HIGH-LEVEL). Perform time delay mechanism adjustments in accordance with the following paragraphs.

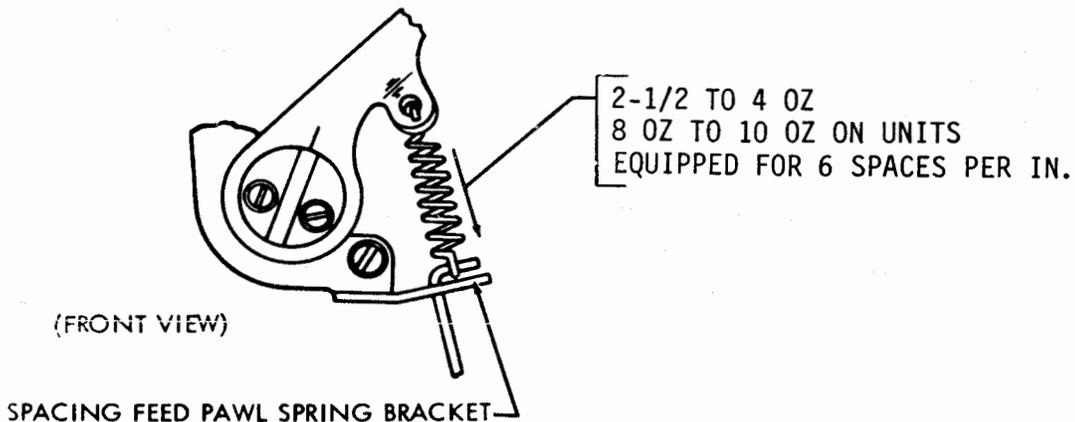


Figure 6-258. Spacing Feed Pawl Spring

NOTE

Time delay mechanism must be used with an external relay.

a. Ratchet Wheel Tension. Adjust ratchet wheel tension as follows:

- (1) Refer to figure 6-259.
- (2) With all pawls held away, use spring scale to measure force required to move ratchet wheel. This should require from 2 ounces (minimum) to 8 ounces (maximum).
- (3) To adjust, remove and bend friction springs.

b. Time Delay Switch Position. Adjust time delay switch position as follows:

- (1) Refer to figure 6-260.
- (2) Position contact pawl on high part of ratchet wheel, disengage latchlever; take up play (upward) in ratchet wheel.
- (3) Place a 0.020 inch feeler gauge between contact pawl and switch plunger. Contact should not close.
- (4) Place a 0.035 inch feeler gauge between contact pawl and switch plunger. Contacts should close.
- (5) To adjust, loosen two mounting screws, and position switch.
- (6) Tighten mounting screws.

c. Latch Pawl Spring. Adjust latch pawl spring as follows:

- (1) Refer to figure 6-261.
- (2) Unhook latch pawl spring; hold latch pawl down.
- (3) Use spring scale to measure force required to extend spring to full length: force should be from 12 ounces (minimum) to 15 ounces (maximum).
- (4) If force does not meet requirements, replace spring.

d. Feed Pawl Spring. Adjust feed pawl spring as follows:

- (1) Refer to figure 6-262.
- (2) Use spring scale to measure force necessary to move feed pawl from ratchet wheel: this should be from one ounce (minimum) to 2 ounces (maximum).
- (3) If force required does not meet specifications, replace spring.

e. Contact Pawl Spring. Adjust contact pawl spring as follows:

- (1) Refer to figure 6-263.
- (2) With contact pawl latched on end of latchlever, use spring scale to measure force needed to start pawl moving: this should require from 5 ounces (minimum) to 6 ounces (maximum).

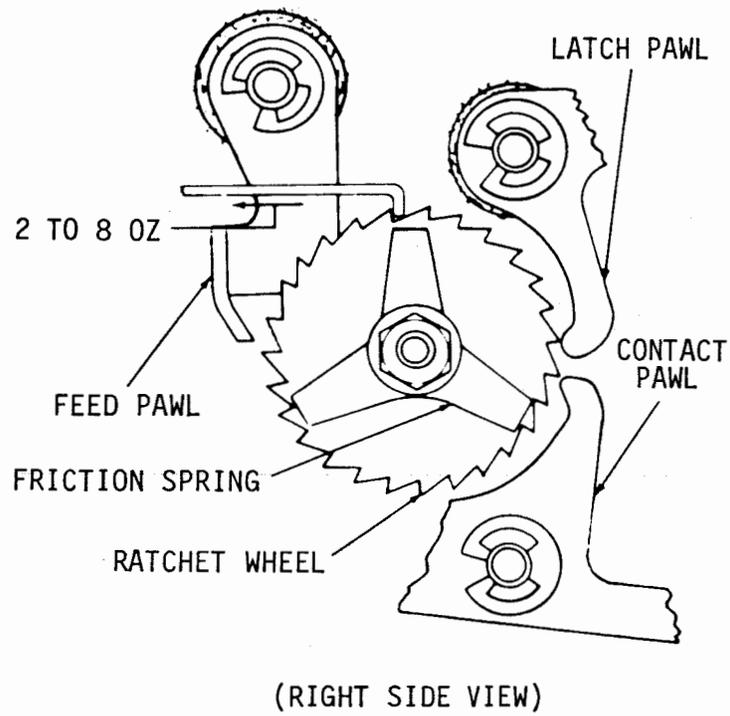


Figure 6-259. Ratchet Wheel Tension

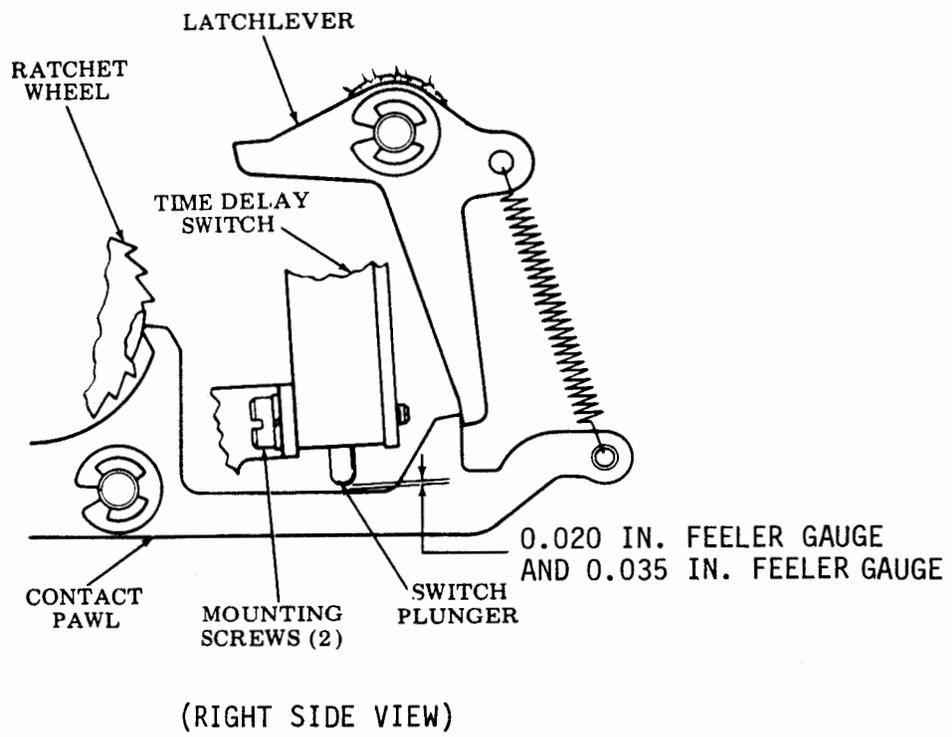
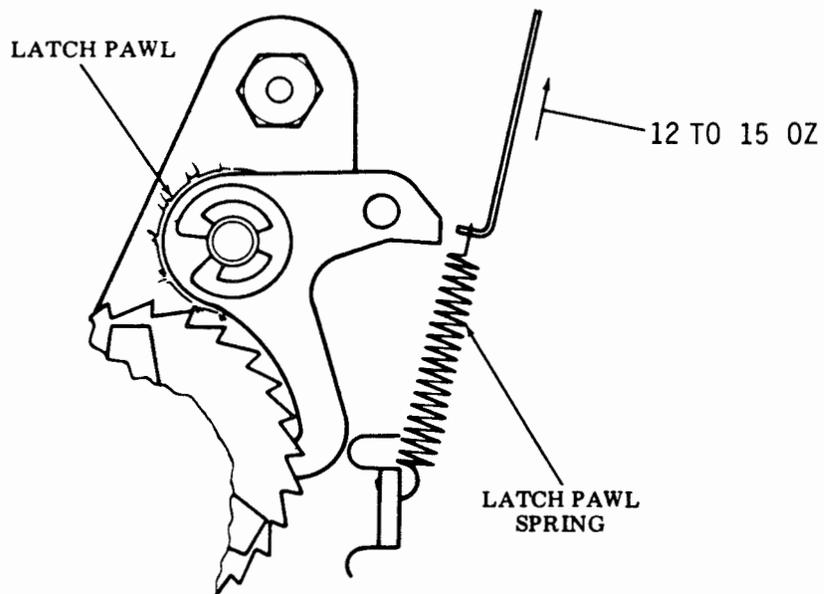
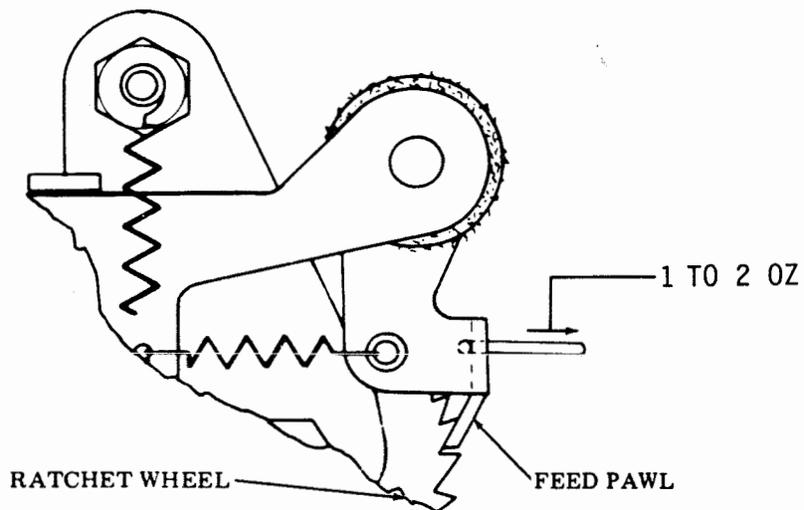


Figure 6-260. Time Delay Switch Position



(RIGHT SIDE VIEW)

Figure 6-261. Latch Pawl Spring



(LEFT SIDE VIEW)

Figure 6-262. Feed Pawl Spring

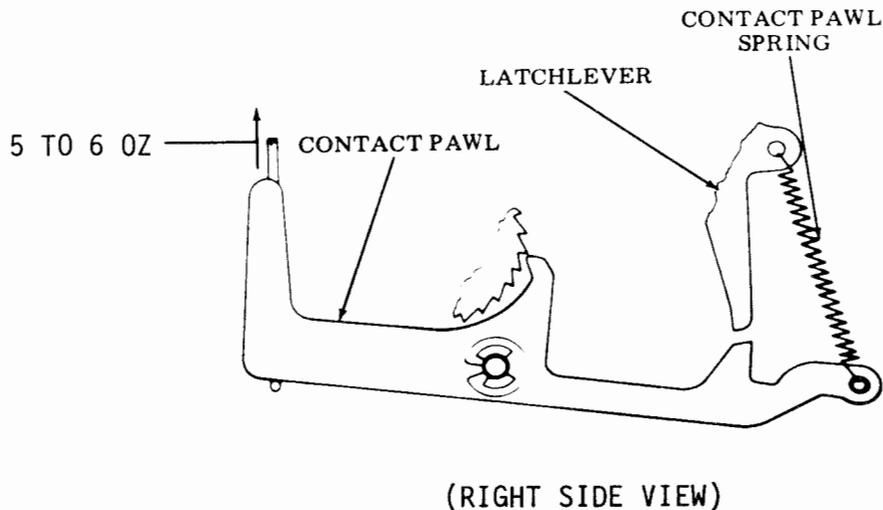


Figure 6-263. Contact Pawl Spring

(3) If force does not meet requirements, replace spring.

f. Disabling Device.  
Adjust disabling device as follows:

(1) Refer to figure 6-264.

(2) To disable, loosen two mounting screws on the upstop bracket and lower bracket to its bottom position.

(3) To enable, carry out procedure in (b), but raise bracket to upper position.

(4) Tighten screws.

g. Cam Follower Lever Spring. Adjust cam

follower lever spring as follows:

(1) Refer to figure 6-265.

(2) Place upstop bracket in lowest position, and unhook upper end of cam follower lever spring.

(3) Use spring scale to extend spring to installed length: this should require 9 ounces (minimum) to 11 ounces (maximum).

(4) If force required exceeds specifications, replace spring.

(5) Restore upstop bracket to original condition.

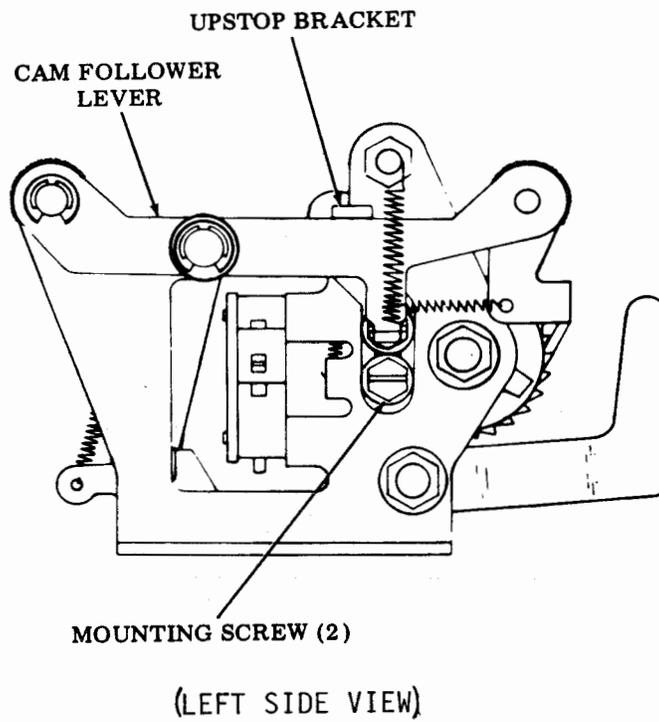


Figure 6-264. Disabling Device

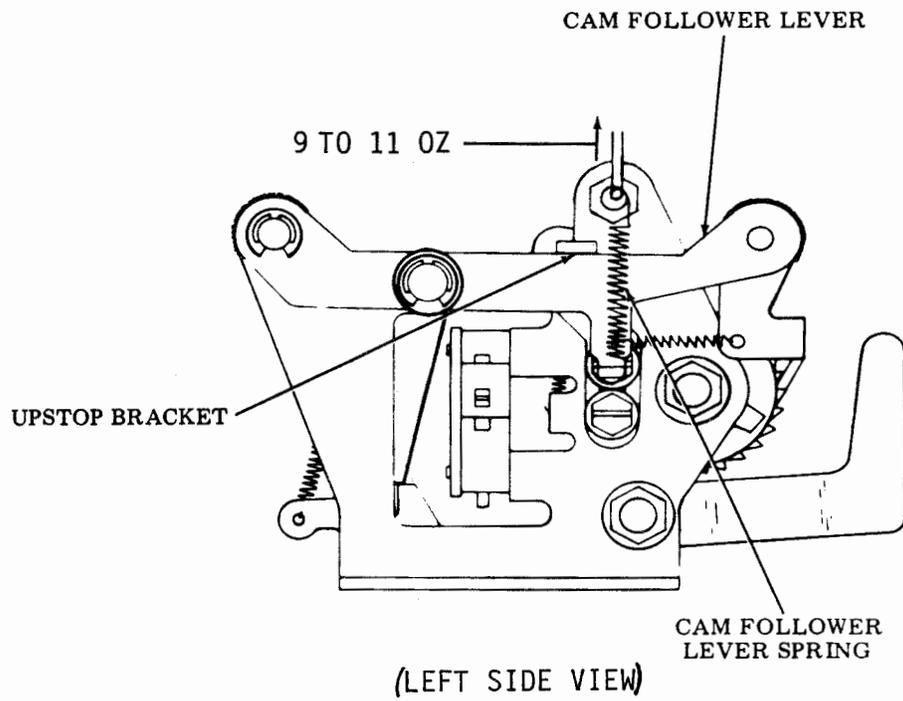


Figure 6-265. Cam Follower Lever Spring

h. Time Delay Mechanism Downstop. Adjust time delay mechanism position as follows:

- (1) Refer to figure 6-266.
- (2) Mount typing unit on base; place main drive bracket in rearmost position.
- (3) Measure clearance between contact panel and latching lever: it should be between 0.030 inch (minimum) and 0.060 inch (maximum).
- (4) To adjust, loosen adjusting screws friction tight: position mechanism to correct clearance.
- (5) Tighten screws.

SECTION IV - ADJUSTMENTS  
(EARLIER DESIGN VARIABLE  
FEATURES)

6-9. TYPING UNIT.

6-9.11 TYPING UNIT (HIGH-LEVEL).

a. Horizontal Tabulator Mechanism Adjustment.

(1) Operating Lever Slide Arm. Adjust as follows:

NOTE

Prior to making this adjustment, check function reset bail blade adjustment in paragraph 6-7.1b(4).

(a) Refer to figure 6-267.

(b) If unit has two-stop function clutches, disengage function clutch. Rotate type box clutch one-half revolution past stop function. If unit has one-stop-function clutch, rotate clutch until function pawl stripper blade is in its lower position and function reset bail roller is on high part of cam.

(c) Pull horizontal tabulator function pawl to rear and latch it over function bar.

(d) Measure clearance between blocking arm and operating lever slide arm. Clearance should be between 0.015 and 0.035 inch.

(e) If clearance exceeds specified limits, loosen mounting stud to point of friction tightness.

(f) Position slide arm on operating lever to obtain specified clearance.

(g) Tighten mounting stud.

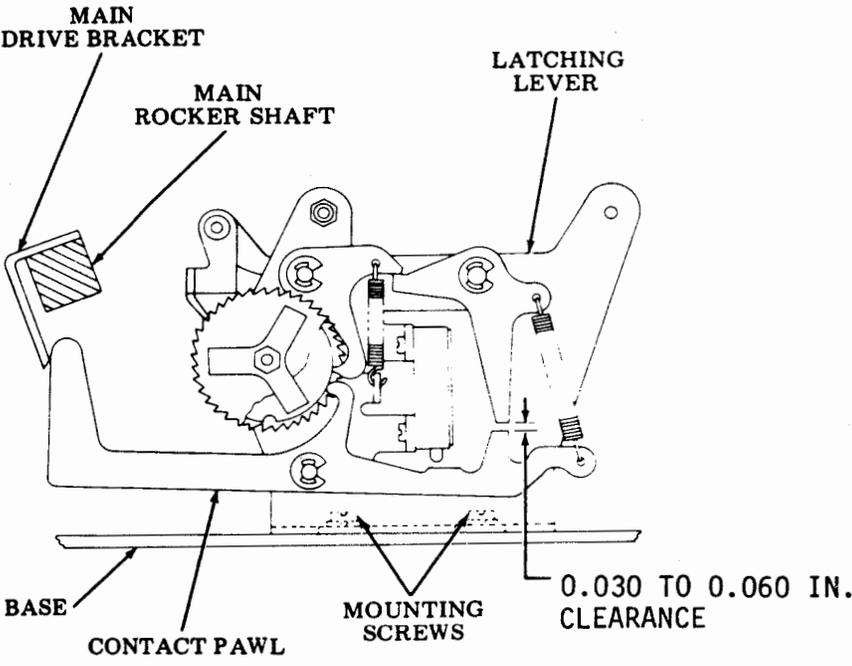
(2) Operating Lever Extension Link Spring. Adjust operating lever extension link spring as follows:

(a) Refer to figure 6-267.

(b) Unhook trip arm latch bail spring.

(c) Place operating lever in operated position.

(d) Place operating lever slide arm against blocking link.



(RIGHT SIDE VIEW)

Figure 6-266. Time Delay Mechanism Position

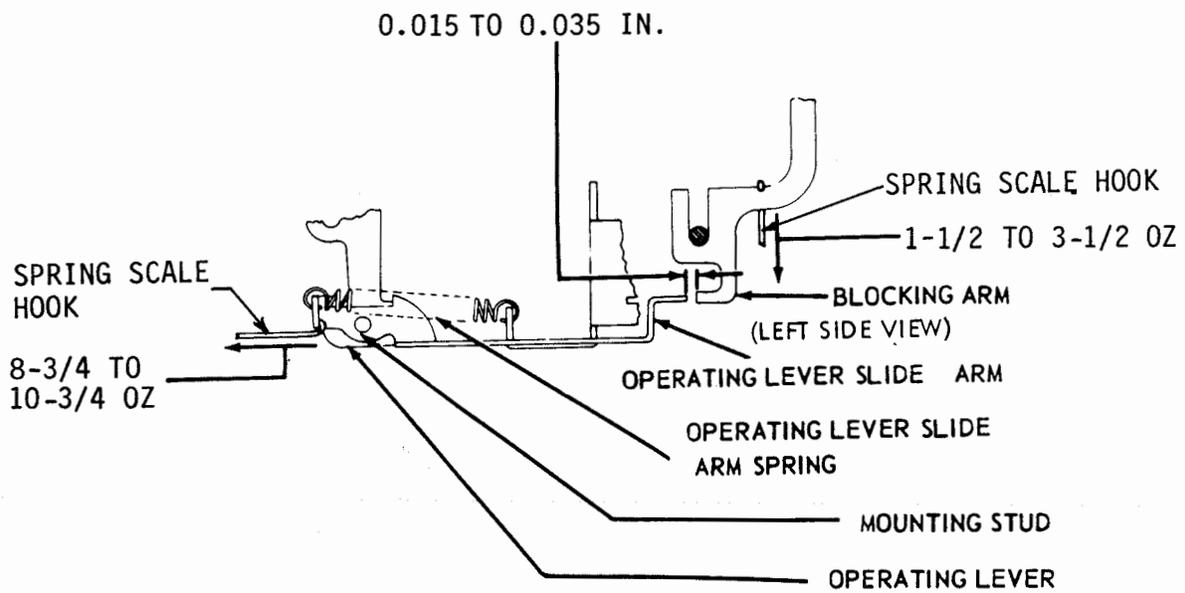


Figure 6-267. Operating Lever Slide Arm, Operating Lever Extension Link Spring, and Tabulator Shaft Spring (Torsion)

(e) Apply spring scale hook as shown in figure 6-267.

(f) Force required to start link moving should be between 8-3/4 and 10-3/4 ounces.

(g) If scale reading exceeds specified limit, install new spring.

(h) Reconnect trip arm latch bail spring.

(3) Tabulator Shaft Spring (Torsion). Adjust tabulator shaft spring as follows:

(a) Refer to figure 6-267.

(b) Place operating lever in unoperated position (as in figure 6-268).

(c) Attach spring scale hook to blocking arm as shown in figure 6-268.

(d) Force required to start slide arm moving should be between 1-1/2 and 3-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(4) Operating Lever Adjusting Plate. Adjust operating lever adjusting plate as follows:

(a) Refer to figure 6-268.

(b) Place operating lever in unoperated position.

(c) Measure clearance between blocking arm and operating lever slide arm as

shown in figure. Clearance should be between 0.020 and 0.085 inch.

(d) If clearance exceeds specified limits, loosen mounting screws.

(e) Position adjusting plate on bracket to obtain specified clearance.

(f) Tighten mounting screws.

(5) Trip Arm Latch Bail. Adjust trip arm latch bail as follows:

(a) Refer to figure 6-269.

(b) Place operating lever in unoperated position.

(c) Position spacing trip arm up.

(d) Measure clearance as shown in figure. Clearance should be between 0.020 and 0.040 inch.

(e) If clearance exceeds specified limits, loosen lock nuts.

(f) Position latch bail adjusting screw to obtain specified clearance.

(g) Tighten locknut.

(6) Trip Arm Latch Bail Spring. Adjust trip arm latch bail spring as follows:

(a) Refer to figure 6-269.

(b) Place operating lever in unoperated position.

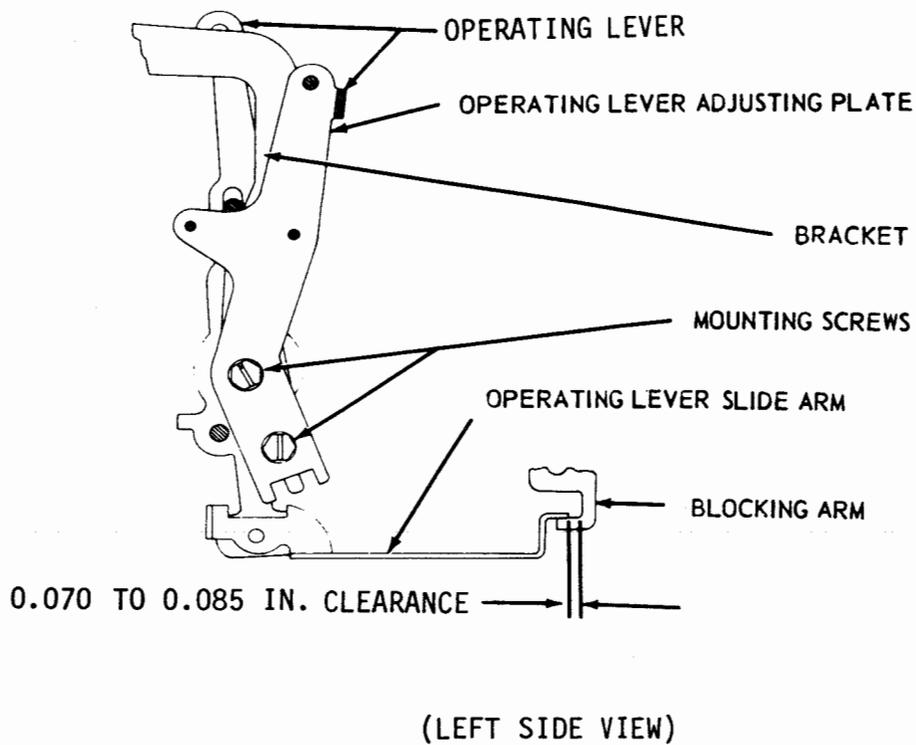


Figure 6-268. Operating Lever Adjusting Plate

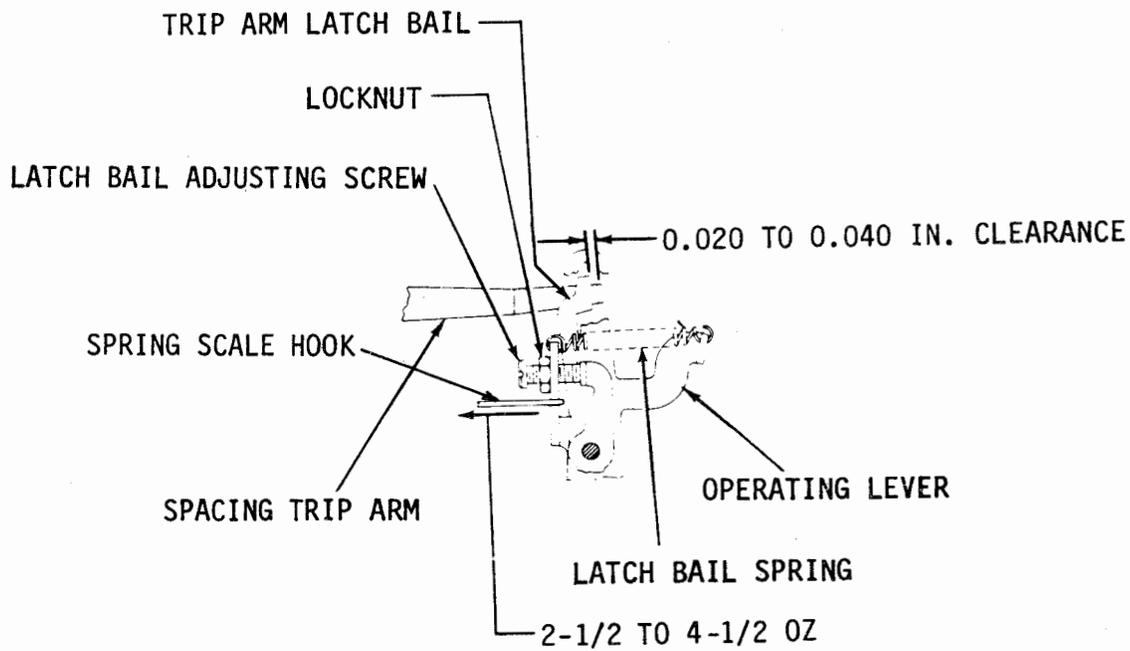


Figure 6-269. Trip Arm Latch Bail and Trip Arm Latch Bail Spring

(c) Attach spring scale hook as shown in figure.

(d) Force required to start trip arm latch bail moving should be between 2-1/2 and 4-1/2 ounces.

(e) If scale reading exceeds specified limits, install new spring.

(7) Trip Arm Latch Bail Adjusting Plate. Adjust trip arm latch bail adjusting plate as follows:

(a) Refer to figure 6-270.

(b) Disengage spacing clutch and type box clutch.

(c) Place operating lever slide arm to rear and latch it on blocking arm.

(d) Place latch bail in fully latched position.

(e) Position spacing trip arm down and bearing up against latching surface of latch bail.

(f) Measure clearance between spacing trip arm and spacing trip lever as shown in figure. There should be some clearance not exceeding 0.008 inch.

(g) If clearance exceeds specified limits, loosen mounting screw to point of friction tightness.

(h) Position latch bail adjusting plate to obtain specified clearance.

(i) Tighten mounting screw.

(8) Spacing Cutout Transfer Bail Set Collar. Adjust spacing cutout transfer bail set collar as follows:

(a) Refer to figure 6-271.

(b) Measure transfer bail end play. There should be some end play not exceeding 0.008 inch.

(c) If end play exceeds specified limit, loosen set collar adjusting screw.

(d) Position set collar to obtain specified end play.

(e) Tighten set collar adjusting screw.

(9) Cam Plate Stripper Bail. Adjust cam plate stripper bail as follows:

(a) Refer to figure 6-272.

(b) Place operating lever and tabulator slide arm in their unoperated position.

(c) Rotate spacing clutch until high part of spacing cam is opposite cam arm.

(d) Measure clearance between cam arm follower bail and high part of spacing cam. Clearance should be between 0.010 and 0.025 inch.

(e) If clearance exceeds specified limits, loosen stripper bail arm screw to point of friction tightness.

(f) Position stripper bail arm on cam arm

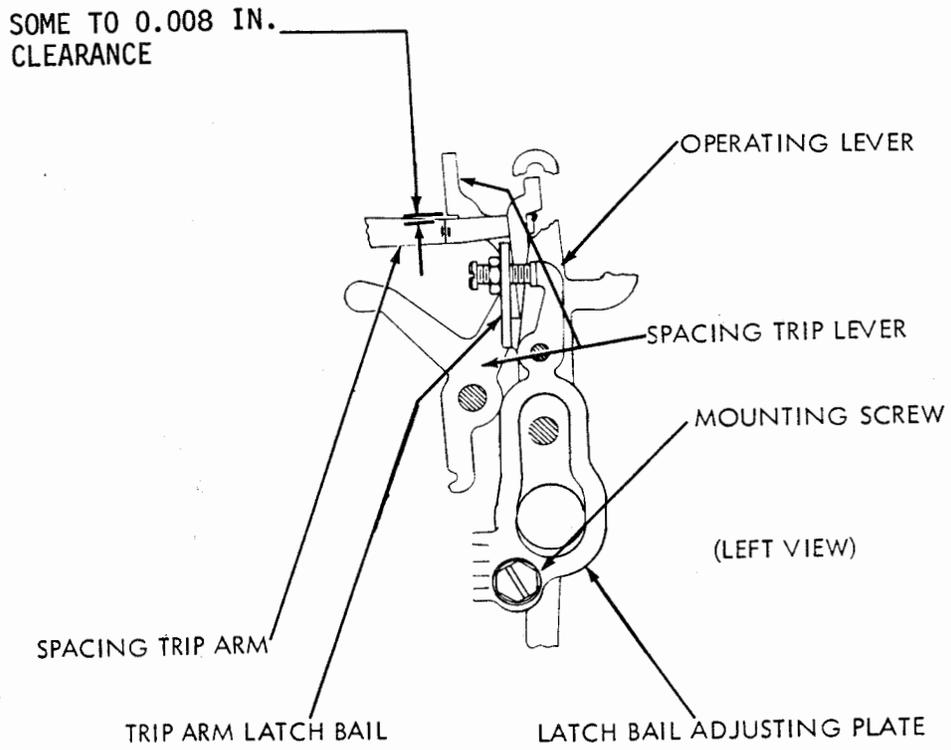


Figure 6-270. Trip Arm Latch Bail Adjusting Plate

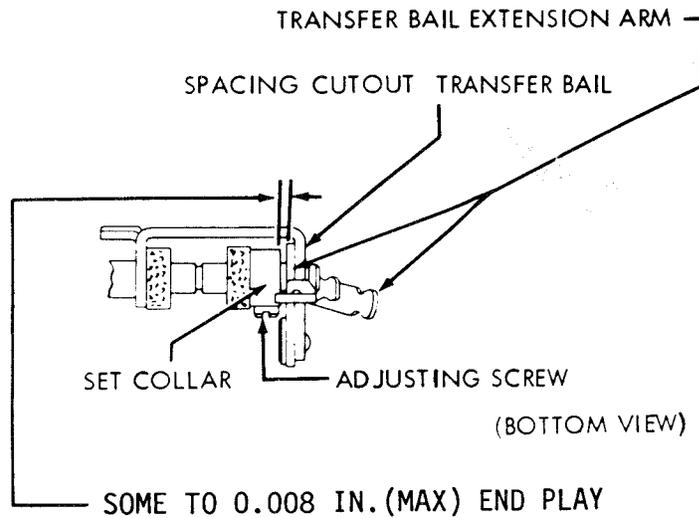


Figure 6-271. Spacing Cutout Transfer Bail Set Collar

follower bail to obtain specified clearance.

(g) Tighten screw.

(10) Horizontal Tabulator Slide Arm Spring. Adjust horizontal tabulator slide arm spring as follows:

(a) Refer to figure 6-272.

(b) Place operating lever in operated position.

(c) Place slide arm in unoperated position.

(d) Apply spring scale pushrod to horizontal tabulator slide arm as shown in figure.

(e) Force required to start slide arm moving should be between 1 and 4 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(11) Operating Lever Cam Plate Spring. Adjust operating lever cam plate spring as follows:

(a) Refer to figure 6-272.

(b) Place operating lever in unoperated position.

(c) Unlatch horizontal tabulator function pawl.

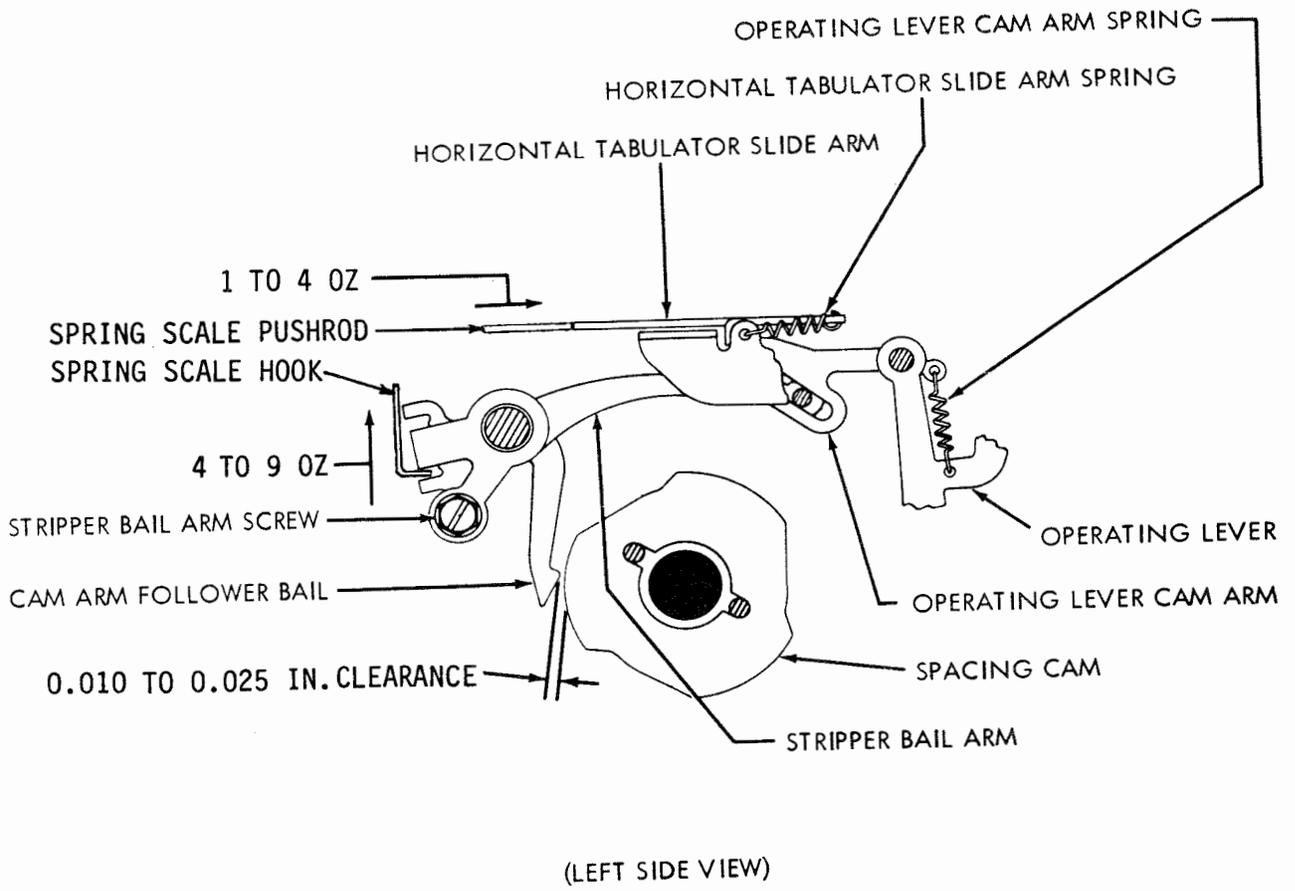


Figure 6-272. Cam Plate Stripper Bail, Horizontal Tabulator Slide Arm Spring, and Operating Lever Cam Plate Spring

(d) Attach spring scale hook to stripper bail arm as shown in figure.

(e) Force required to start stripper bail arm moving should be between 4 and 9 ounces.

(f) If scale reading exceeds specified limits, install new spring.

(12) Right Margin.  
Adjust right margin as follows:

(a) Refer to figure 6-273.

(b) Place type box in position to print character on which spacing cutout is desired.

(c) Pull forward on part of transfer bail extending below mounting shaft until bail is in fully operated position.

(d) Measure clearance between bail extension arm and spacing cutout lever on spacing drum. Clearance should be between 0.006 and 0.025 inch.

(e) If clearance exceeds specified limits loosen clamp screws.

(f) Position cutout lever to obtain specified clearance.

(g) Tighten clamp screws.

(13) Space Suppression Bypass Spring. Adjust

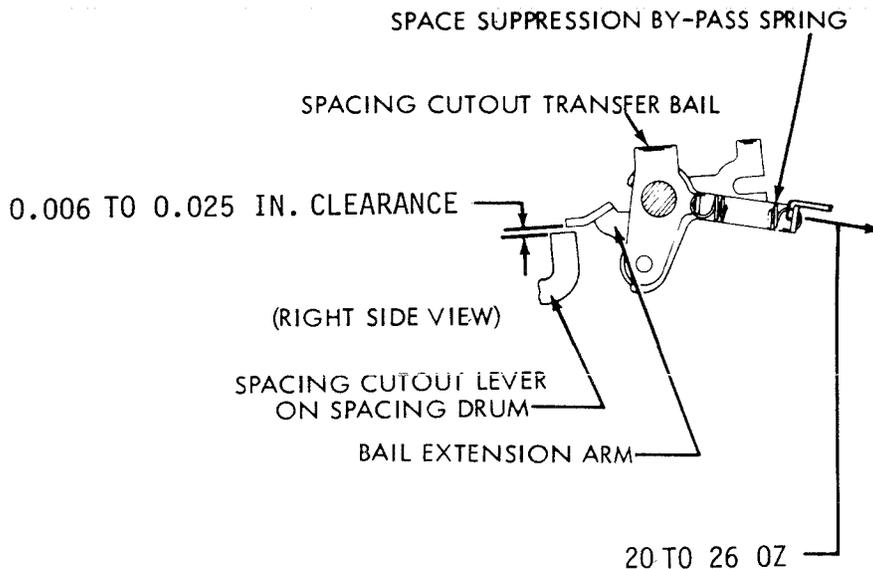


Figure 6-273. Right Margin and Space Suppression Bypass Spring

space suppression bypass spring as follows:

- (a) Refer to figure 6-273.
- (b) Attach spring scale hook to space suppression bypass lug as shown in figure.
- (c) Force required to start bail extension arm moving should be between 20 and 26 ounces.
- (d) If scale reading exceeds specified limits, install new spring.

(14) Tabulator Shaft Mounting Bracket. Adjust tabulator shaft mounting bracket as follows:

- (a) Refer to figure 6-274.
- (b) Move lever slide arm to rear so blocking arm and tabulator stop are in extreme upper position.
- (c) Measure clearance near left and right ends of tabulator shaft as shown in figure. Clearances should be between 0.050 and 0.065 inch and should be equal within 0.007 inch.
- (d) If clearances exceed specified limits or they are not equal within specified limit, loosen mounting screws.
- (e) Position mounting bracket to obtain specified clearance and

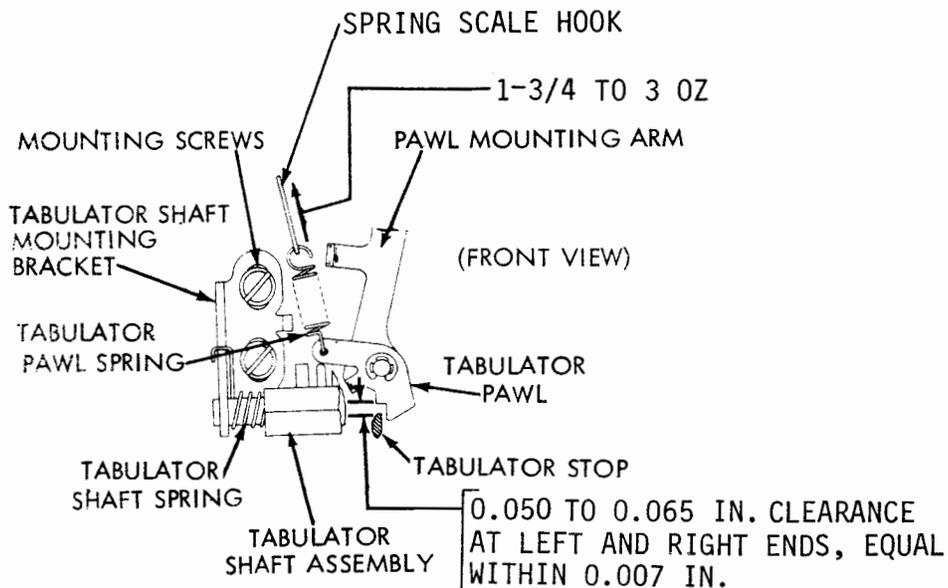


Figure 6-274. Tabular Shaft Mounting Bracket and Tabulator Pawl Springs

equality. Ensure shaft is free of binds.

(f) Tighten mounting screws.

(15) Tabulator Pawl Springs. Adjust tabulator pawl springs as follows:

(a) Refer to figure 6-274.

(b) Attach spring scale hook to tabulator pawl spring as shown in figure.

(c) Force required to extend spring to its installed length should be between 1-3/4 and 3 ounces.

(d) If scale reading exceeds specified limits, install new spring.

(16) Pawl Mounting Arm Operating Range (Preliminary). Adjust pawl mounting arm operating range as follows:

NOTE

Check the requirements in the following adjustments:

Oscillating Rail Slide 6-3.1h(13)

Printing Carriage Position 6-3.1f(6)

Printing Carriage Lower Roller 6-3.1f(4)

(a) Refer to figure 6-275.

(b) If unit has sprocket feed platen, position high part of eccentric toward lower roller mounting screw. If

unit has friction feed platen, perform following operations:

1. Disengage spacing clutch.

2. Ensure farthest advanced spacing pawl engages tooth immediately above cutaway section of ratchet.

3. Ensure tabulator pawl rides up on fixed stop and high part of eccentric is toward fork of pawl mounting arm.

(c) Measure clearance between tabulator pawl and fixed tabulator stop near right end of shaft as shown in figure. Clearance should be between 0.070 and 0.090 inch.

(d) If clearance exceeds specified limits, loosen nut.

(e) Position eccentric to obtain specified clearance.

(f) Tighten nut.

(17) Pawl Mounting Arm Operating Range (Final). Adjust pawl mounting arm operating range as follows:

(a) Refer to figure 6-276.

(b) Determine maximum limit of operating range as follows:

1. Set five tabulator stops as shown in figure.

2. Position pawl immediately to right of stop number 1.

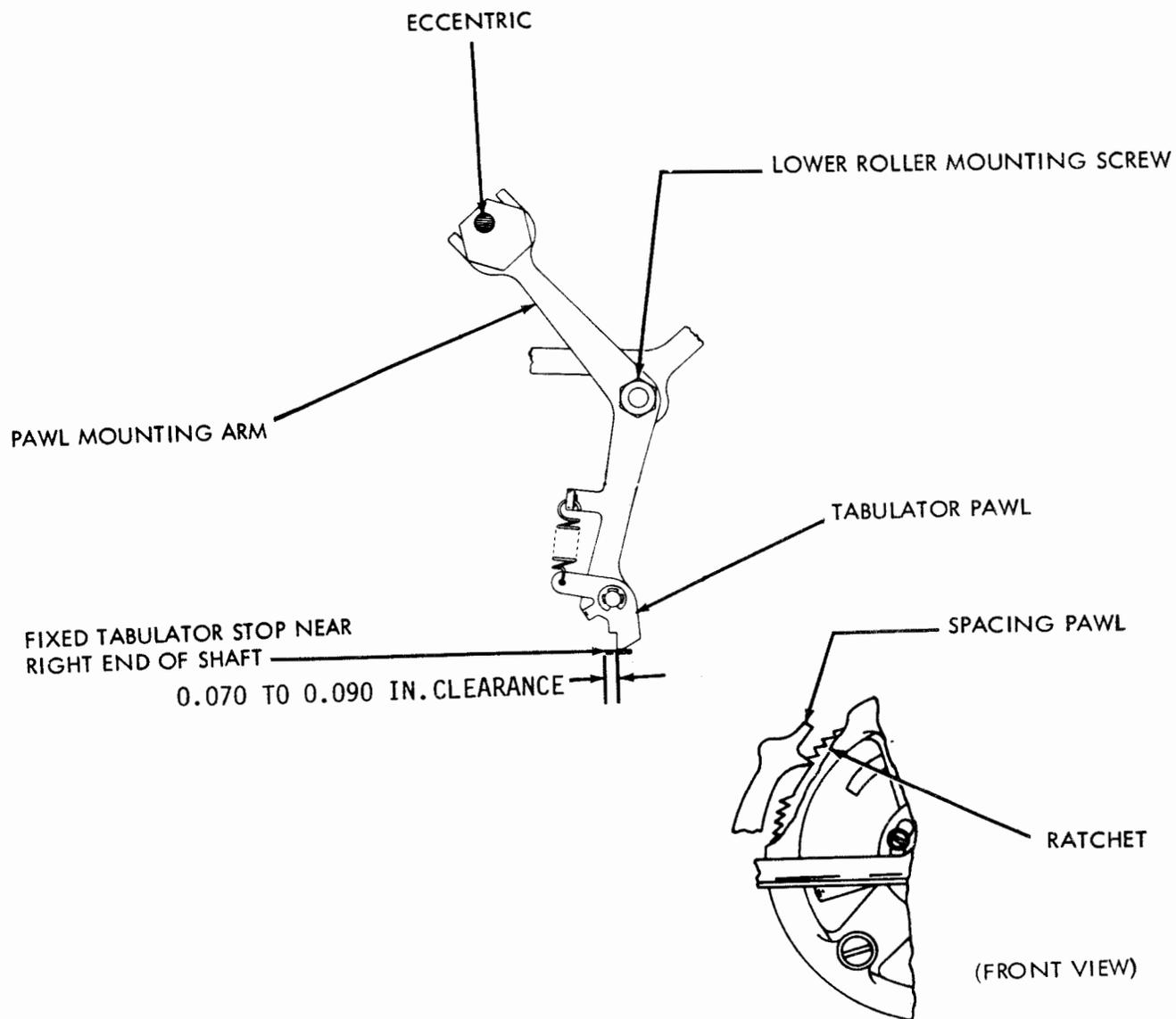


Figure 6-275. Pawl Mounting Arm Operating Range (Preliminary)

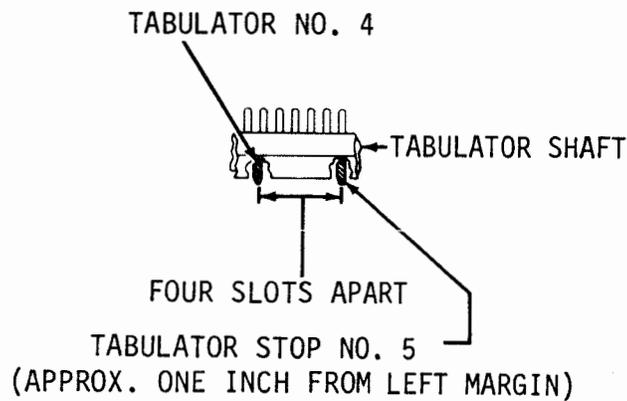
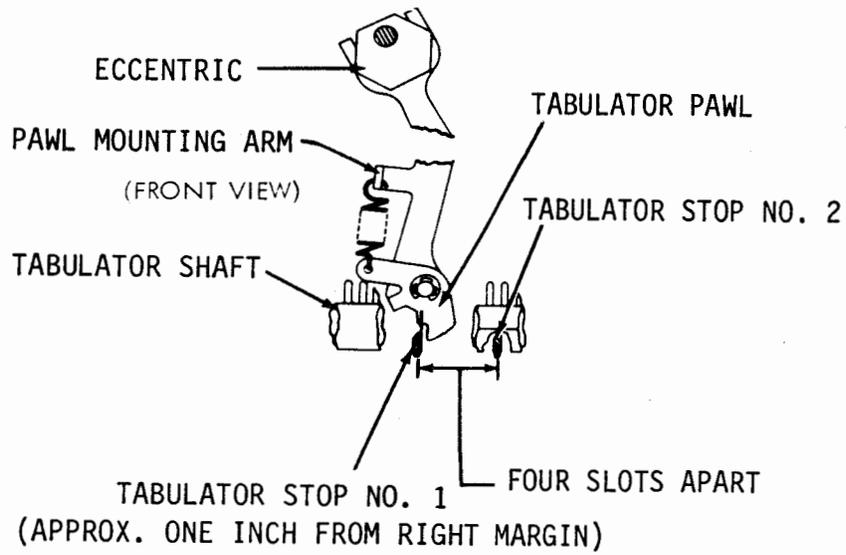


Figure 6-276. Pawl Mounting Arm Operating Range (Final), Columnar Tabulator Stops, and Tabulator Stop Setting-Right Margin Tabulator Stop

3. Position eccentric to set clearance at approximately 0.030 inch.

NOTE

Prior to this adjustment, Measure all clearances at stop number 1 with play taken up in carriage to minimize gap.

4. Mark column location by printing a character on paper.

5. Position pawl immediately to right of step number 2 and mark column location as in step 4 above.

6. Repeat step 5 for remaining three steps.

7. Gradually increase clearance until carriage stops one space before any column while receiving figures G letters X from transmitter distributor.

NOTE

If unit is not equipped with transmitter distributor control, put fill-in characters of letters or figures in tape to delay printing until carriage completes travel.

8. Decrease clearance until ten lines of tabulator operation can be made without error.

9. Gauge clearances and record values.

(c) Determine minimum limit of operating range as follows:

1. Place front feed pawl in farthest advanced position.

2. Repeat steps 1 and 2 in (b) above.

3. Gradually decrease clearance until carriage stops one space after any column.

4. Increase clearance until ten lines of tabular operation can be made without error.

5. Gauge clearances and record values.

(d) If adjustment is necessary, determine midpoint of range as follows:

1. If minimum limit is positive, add it to maximum limit and divide the sum by two. Use quotient as midpoint of range.

2. If minimum limit is zero or negative, use one-half the maximum limit as midpoint of range. The difference between limits is normally not less than 0.045 inch.

3. Tighten nut.

(18) Columnar Tabulator Stops. Adjust columnar tabulator stops as follows:

(a) Refer to figure 6-276.

(b) Place carriage in position to print first character to column.

(c) Insert stop in slot immediately to left of tabulator pawl.

(d) Store extra stops in slots beyond printing line of either end of shaft.

NOTE

When printing forms, check stop settings with relation to columns. Corresponding stops on all machines connected in the same circuit must be the same number of spacing operations from left margin.

(19) Tabulator Stop Setting-Right Margin Tabulator Stop (with Wide Shelf). Adjust right margin tabulator stop as follows:

NOTE

Prior to this adjustment, check the requirements in the following adjustments.

Right Margin 6-9.1a(12)

Pawl Mounting Arm Operating Range (Preliminary) 6-9.1a(16)

Pawl Mounting Arm Operating Range (Final) 6-9.1a(17)

(a) Refer to figure 6-276.

(b) Position printing carriage at right margin (spacing cutout operated).

(c) Insert stop with wide shelf in slot immediately to left of tabulator pawl.

b. Paper-Out Alarm Mechanism Adjustment.

(1) Bell Crank Follower. Adjust bell crank follower as follows:

(a) Refer to figure 6-277.

(b) Measure clearance between a flat side of paper spindle and bell crank follower. Clearance should be approximately 1/4 inch.

(c) To adjust, loosen mounting screws.

(d) Position switch to obtain specified clearance.

(e) Tighten mounting screws.

(2) Bell Crank Follower Spring. Adjust bell crank follower spring as follows:

(a) Refer to figure 6-277.

(b) Attach spring scale hook to bell crank follower at point of contact with paper roll.

(c) Force required to start bell crank moving should be between 2 and 3 ounces.

(d) If scale reading exceeds specified limits, install new spring.

6-10. KEYBOARD UNIT ADJUSTMENTS (EARLIER DESIGN VARIABLE FEATURES).

6-10.1 (There are no earlier design variable feature keyboard adjustments.)

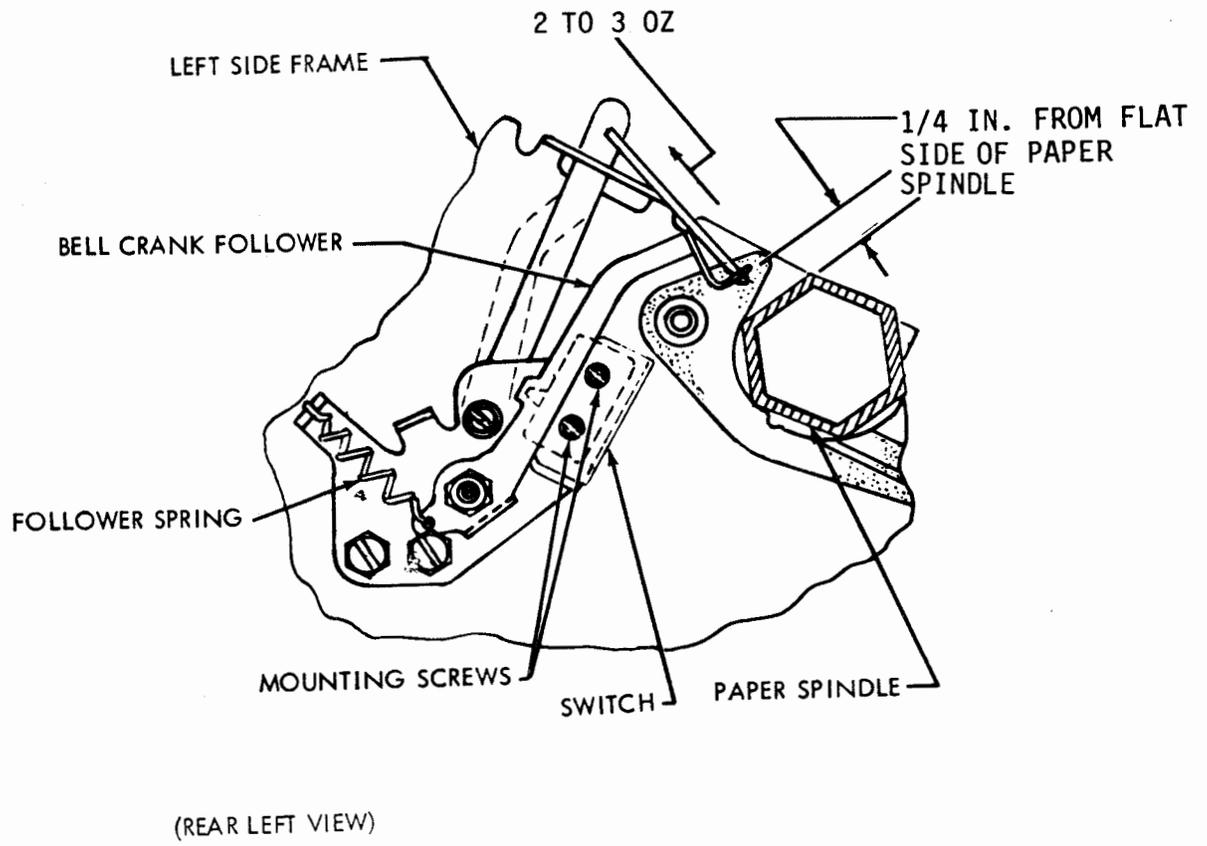


Figure 6-277. Bell Crank Follower and Bell Crank Follower Spring

SECTION V - REPAIR

6-11. GENERAL. After a fault has been isolated to a specific mechanical function, and the trouble cannot be corrected by performing an adjustment, a defective mechanical part is indicated. Repair action will then consist of removal and replacement of the defective component.

6-12. DISASSEMBLY AND REASSEMBLY PROCEDURES. The following procedures are provided to enable the technician to disassemble the teletypewriter set to gain access to a defective component and to reassemble the set after a defective component has been replaced. The procedures are also provided to aid the technician when disassembly is required for inspection, cleaning, and lubrication.

a. Removing Cover. To remove cover (figure 7-57), proceed as follows:

- (1) Depress plungers (198556) on both sides of dome.
- (2) Open window door by lifting in rear.
- (3) Disconnect copy light plug.
- (4) Push latches on sides of cover toward rear and lift cover from base.

b. Removing Typing Unit. To remove typing unit, proceed as follows:

- (1) Disconnect P103 from J103.
- (2) Spread spring clips which hold R plug by pushing clips together at

bottom; remove R plug from mounting unit.

(3) Remove four mounting screws which hold typing unit to base.

(4) Place left hand under rear of left frame and right hand under right side at front plate above dash pot; lift typing unit from base.

c. Removing Keyboard Transmitter. To remove keyboard transmitter, proceed as follows:

(1) Rotate LA plug clamp nut (low level only) counterclockwise and withdraw plug.

(2) Disconnect wires from P 2, P-4, K-1, S-4 (low-level only), and S-3.

(3) Remove screw which holds ground strap to base.

(4) Remove four screws which hold keyboard transmitter to pan.

(5) Retract reset lever H-bar and lift keyboard transmitter from pan.

d. Removing Distributor Mechanism. To remove distributor mechanism, proceed as follows (figures 7-47, 7-50, and 7-51):

(1) Remove four screws (151631) which hold distributor to base.

(2) Disconnect wires from P-6, P-5, H-1, H-2, H-3, and H-4.

(3) Remove two screws which hold L plug mounting bracket (low-level) to base.

(4) Rotate U plug clamp-nut (low-level only) counterclockwise and withdraw plug.

(5) Retract reset lever and lift distributor mechanism from base.

e. Removing Motor. To remove motor, proceed as follows (figure 7-55):

(1) Disconnect power leads from terminal block on gear shift assembly.

(2) Remove four screws which hold motor to base.

(3) Lift motor from base.

f. Removing Base from Pan. To remove base from pan, proceed as follows (figure 7-34 through 7-37):

(1) Remove four shock mounting screws (99082).

(2) Loosen two set screws (107256) in speed selector knob and remove knob.

(3) Remove three cover guide screws.

(4) Remove ground strap screw from pan.

(5) Loosen two screws which hold power switch mounting bracket to pan and remove bracket.

(6) Lift base from pan.

(7) Remove all wiring clamps.

(8) On RO only, remove two screws from fuseholder mounting bracket

(figure 7-36) and remove bracket.

(9) Remove wiring harness.

g. Removing Gear Assembly. To remove gear assembly, proceed as follows (figure 7-46):

(1) Remove retainer ring which holds shift link to speed selector shaft and disconnect link from shaft.

(2) Remove two screws which hold terminal block mounting bracket to gear shift assembly and remove bracket.

(3) Remove clamp nut from front adjusting screw.

(4) Remove two screws which hold gear assembly rear adjusting mechanism to base (access from bottom).

(5) Lift gear assembly from base.

h. Disassembling Gear Assembly. To disassemble gear assembly, proceed as follows (figure 7-46):

(1) Remove screw which holds distributor drive gear to shaft.

(2) Remove three screws which retain idler shaft right bearing.

(3) Remove screw which clamps idler gear to shaft.

(4) Remove bearing.

(5) Slide idler shaft out left side.

(6) Slide collar off shaft. Ensure pin and spring are retained.

(7) Remove three right bearing screws.

(8) Remove screw which holds variable-speed shaft gear to shaft.

(9) Slide variable-speed shaft out left side.

(10) Remove felts.

(11) Remove screw which holds assembly driven gear to assembly drive shaft.

i. Disassembling Motor Unit. To disassemble motor unit, proceed as follows (figure 7-56):

(1) Remove set screw which holds fan to shaft.

(2) Remove two screws which hold motor pinion to shaft and remove pinion.

(3) Loosen two resilient mount clamp screws and remove clamps.

(4) Lift motor from mount.

(5) Remove two nut-and-bolt sets which secure end shields to stator.

(6) Remove end shields, springs, and washers.

(7) Remove rotor from stator.

j. Disassembling Distributor Mechanism. To disassemble distributor mechanism, proceed as follows (figures 7-47 through 7-53):

(1) Remove screw (151659) which holds distributor shaft driven gear to shaft, and remove gear.

(2) Remove four screws from distributor drum cover plate (low-level only) and remove cover plate.

(3) Remove wires from H-1 and H-4.

(4) Remove three screws from photocell mounting bracket (low-level only) on left frame and remove mechanism.

(5) Remove two screws from clutch magnet bracket on right frame and remove bracket.

(6) Remove two screws, two washers, and two spacers from left bearing retainer.

(7) Remove screw from bearing retainer on right frame and remove retainer.

(8) Remove nut which holds left bearing to shaft and remove bearing.

(9) Remove screw from clutch drum.

(10) Slide shaft through right side of frame.

(11) Remove clutch and distributor drum.

(12) Disassemble clutch.

(13) Remove distributor shaft idler gear shaft by rotating clockwise.

CAUTION

Distributor shaft idler shaft has a left-hand thread.

k. Disassembling Keyboard Transmitter. To disassemble keyboard transmitter, proceed as follows (figure 7-40):

(1) Loosen Allen screw which holds power switch control knob (148157) to shaft.

(2) Remove nut (178839) which fastens power switch to top plate. Push switch out of top plate.

(3) Remove two retainer rings (119652) which hold top plate to side frames.

(4) Spread side frames and lift top plate.

(5) Unsolder three wires from fuseholder (116783).

(6) Remove retainers which hold wiring harness to top plate.

(7) Disconnect two photocell leads and withdraw cells.

l. Disassembling Typing Unit. The following paragraphs describe the procedure for disassembling the typing unit.

(1) Removing Paper. To remove paper, proceed as follows:

(a) Push paper release to rear.

(b) Push paper spindle holders to rear.

(c) Remove paper.

(2) Removing Ribbon. To remove ribbon, proceed as follows (figures 7-25 and 7-26):

(a) Move ribbon spool clips to upward position.

(b) Lift ribbon spools from machine.

(3) Removing Type Box. To remove type box, proceed as follows (figure 7-33):

(a) Trip type box latch to right.

(b) Lift right end of type box upwards approximately 45 degrees and pull toward right to disengage it from left-hand bearing stud.

(4) Disassembling Type Box. To disassemble the type box for replacing type pallet or spring, proceed as follows:

(a) Remove both screws and nuts that secure the front plate to the rear plate assembly. Separate the two plates.

(b) Remove the spring from the pallet by compressing it slightly and pulling the formed end out of the slot in the pallet.

## NOTE

This spring should be discarded once it has been removed from its assembly.

(c) When installing the new spring, make certain that the formed end

extends through the slot in the pallet.

(5) Disconnecting Type Box Carriage Link from Carriage. To disconnect type box link from carriage, proceed as follows (figure 7-11):

(a) Set up letters combination.

(b) Engage and rotate type box clutch 180 degrees.

(c) Move type box carriage to extreme right.

(d) Remove retainer ring from type box carriage link.

(6) Removing Front Plate. To remove front plate, proceed as follows (figures 7-16, 7-17 and 7-18):

(a) Remove two screws which hold main bail drive bracket to main rocker shaft.

(b) Remove screw which holds spacing shaft helical driven gear to spacing shaft and remove gear.

(c) Remove four screws (151723) which hold front plate assembly to left and right side frame and lift front plate.

(d) Set front plate aside to be disassembled later.

(7) Removing Code Bar Shift Bars. To remove code bar shift bars, proceed as follows (figure 7-29):

(a) Remove two screws (151152) from retaining plate and remove plate.

(b) Remove and discard three code bar shift bar springs (152257).

(c) Pull left end shift bars forward and work right end out of guide.

(8) Removing Code Bar Basket. To remove code bar basket, proceed as follows (figure 7-29):

(a) Remove four mounting screws which hold basket to right and left side frames.

(b) Pull code bar basket forward and remove.

(9) Removing Selector Clutch and Cam Sleeve Assembly. To remove selector clutch and cam sleeve assembly, proceed as follows (figure 7-13):

(a) Remove selector clutch drum clamp screw (151642) and locknut (3598).

(b) Lock push lever reset bail in raised position by lifting and pushing in.

(c) Pull marking lock lever toward machine front.

(d) Insert straightened paper clip in hole forward of guide plate.

(e) Rotate clutch cam disk counterclockwise and pull gently outward, using caution to clear the following items:

Selector clutch stop arm

Selector clutch latch lever

Stop arm bail

Push lever reset bail

Trip shaft lever

CAUTION

Use no more force than necessary.

(f) Remove drum from clutch.

(10) Removing Selector Mechanism. To remove selector mechanism, proceed as follows (figures 7-20, 7-22, and 7-23):

(a) Remove four nuts and lock washers which hold J103 receptacle to its mount. (low-level only.)

(b) Unhook common transfer lever spring at spring basket.

(c) Remove four selector unit assembly back plate mounting screws and remove assembly.

(11) Removing Type Box Clutch. To remove type box clutch, proceed as follows (figure 7-12):

(a) Remove retainer plate.

(b) Withdraw type box clutch drive link.

(c) Remove and discard trip and latch lever springs.

(d) Remove screw which holds clutch drum to main shaft.

(e) Pull clutch cam disk gently outward.

(12) Removing Main Shaft. To remove main shaft, proceed as follows (figures 7-12 and 7-13):

(a) Set the typing unit upside down.

(b) Return the carriage to its left hand position.

(c) Remove the screw that secures the spacing shaft in the spacing collar.

(d) Remove the spacing shaft with gear.

(e) Remove the screw that secures the collar and the clamp to the right end of the main shaft.

(f) Remove the TP152573 main shaft right hand bearing retainer plate.

(g) Remove the TP150010 retainer plate at the TP150046 clutch bearing and remove the TP150244 link.

(h) Remove the two screws from the TP152537 main shaft left hand bearing clamp.

(i) Unhook the springs from the trip levers and latch levers associated with all clutches. Position the code bar clutch so that the low part of the clutch cam clears the spring arm on the cam follower. Unhook the code bar clutch cam follower spring.

(j) Remove the TP153300 function clutch arm by removing two screws and retainer ring if present.

(k) Unhook the spring from the TP153573 function bar reset bail.

(l) Move the main shaft assembly toward the left to disengage the code bar clutch and function clutch links from their connecting pins.

(m) Lift the left end of the shaft assembly out of the side frame. Position the shaft so that the function clutch link passes the suppression assembly bracket, then remove the shaft assembly from the typing unit.

(13) Disassembling Main Shaft. To disassemble main shaft, proceed as follows (figures 7-12 and 7-13):

NOTE

Disassembly of the main shaft and clutch assemblies can be accomplished by referring to the exploded views contained in the applicable parts location diagram. It should be noted that, when assembling clutches having cams and discs marked "0" for identification, the marked side of the parts should face away from the clutch side of the assembly. Function and code bar clutches should have their driving links assembled so that the longer end of the hub faces away from the clutch side of the assembly.

(a) Remove all clutch and gear mounting screws.

(b) Slide clutches and gears from main shaft.

(c) Remove drums from clutches.

(14) Removing B-Plug Mounting Bracket, Signal Bell, and Signal Bell Contacts. To

remove B-plug mounting bracket, signal bell and signal bell contacts, proceed as follows (figures 7-3, 7-21 and 7-24):

(a) Remove two screws from signal bell contacts.

(b) Remove contact assembly.

(c) Remove two screws from signal bell mount.

(d) Remove signal bell mount.

(e) Remove two screws from B-plug receptacle mounting bracket and remove bracket.

(f) Remove two screws which hold copy light transformer (low-level only) to left frame and remove transformer. Transformer is mounted in cover on high level equipment.

(15) Removing Stunt Box. To remove the stunt box, proceed as follows (figures 7-31 and 7-32):

(a) Remove the TP151627 rear tie bar from the typing unit side frames.

(b) Remove the line feed function pawl stripper from the stripper blade.

(c) Remove the single-double line feed lever screw and disengage the lever from the notch in the stripper blade.

(d) The stripper blade is either removed or disengaged from the typing unit, depending on the design.

1. For earlier design: hold the stripper blade toward the right side of the typing unit and unhook the stripper blade left hand arm from the blade. Pull the stripper blade toward the left side of the typing unit to disengage the stripper blade from the right hand arm. Remove the stripper blade from the typing unit.

2. For later design: loosen the screw and remove the retaining ring from the TP153291 camshaft drive arm. Slide the drive arm out of engagement with the stripper blade drive arm.

3. Remove the screws which secure the stunt box assembly in the typing unit.

4. Lift the stunt box assembly upward to disengage it from its locating brackets and pull toward the rear to disengage all code bar forks from the code bars. Remove, if present, the contact assembly and cable clamp from the stunt box. Remove the stunt box.

(16) Removing Platen (Friction Feed). To remove platen (friction feed) proceed as follows (figure 7-9):

(a) Remove the line feed spur gear.

(b) Remove the TP150719 and TP150720 platen bearing retainers.

(c) Remove the TP152832 paper straghtener shaft.

(d) Hold off the detent and lift the platen out of the side frame.

(e) Insert the TP153673 shaft tool into the hub and fasten it with the TP151346 screw. Remove the TP157286 clamp and TP153699 cam from the assembly.

(f) Insert the hub into the TP153797 retaining tool.

NOTE

These tools must be used when disassembling the TP153700 platen hub in order to hold the spring loaded pins in place when the feed cam is replaced.

(17) Removing Code Bar Positioning Mechanism. To remove code bar positioning mechanism, proceed as follows (figure 7-19):

(a) Loosen clamp screw on shift lever drive arm.

(b) Remove two screws which hold mechanism and remove mechanism.

(18) Removing Left and Right Ribbon Feeding Mechanisms. To remove left and right ribbon feeding mechanisms, proceed as follows (figures 7-25 and 7-26):

(a) Remove retainer ring from mounting shaft.

(b) Remove lower retainer ring from drive link.

(c) Remove ribbon ratchet lever spring.

(d) Slide ribbon feed mechanism off shaft.

(e) Repeat steps (a) through (d) on remaining mechanism.

(19) Removing Trip Shaft. To remove trip shaft, proceed as follows (figure 7-14):

(a) Remove retainer ring which holds type box clutch latch lever on shaft.

(b) Loosen clamp screw from type box clutch trip arm.

(c) Remove trip lever, latch lever, and trip arm.

(d) Loosen three sets of collar clamp screws.

(e) Loosen three sets of collar clamp screws.

(f) Loosen function clutch trip lever clamp screw.

(g) Remove clamp nut from code bar clutch follower arm.

(h) Remove follower arm.

(i) Pull trip shaft to left and remove.

(20) Removing Vertical Positioning Levers and Type Box Carriage Track. To remove vertical positioning levers and type box carriage track, proceed as follows (figure 7-11):

(a) Slide type box carriage off track.

(b) Remove four nuts and screws which hold type

box carriage track to vertical positioning levers and remove track.

(c) Remove three nuts and guide screws from each lever.

(d) Remove and discard one vertical positioning lever spring from each lever.

(e) Disconnect levers from main side levers.

(f) Remove vertical positioning levers.

CAUTION

Do not use excessive force.

(g) Check levers for excessive play. If either lever is loose, replace both levers.

(21) Removing Main Rocker Shaft. To remove main rocker shaft, proceed as follows (figures 7-10 and 7-11):

(a) Remove retainer ring from left main rocker shaft and remove bracket.

(b) Remove mounting screws from right main rocker shaft bracket.

(c) Remove two screws from left bearing retainer and remove retainer.

(d) Pull shaft out to left.

CAUTION

Right bearing contains needle bearings which may fall out.

(e) Remove two screws from right bearing and remove bearing.

(22) Removing Spacing Suppression Mechanism. To remove spacing suppression mechanism, proceed as follows (figure 7-5):

(a) Remove screw (151657) from right end of shaft.

(b) Remove screw (151692) which holds bracket to crossbar.

(c) Work mechanism out gently.

CAUTION

Do not use excessive force.

(d) Use diagonal wire cutters to remove all felt washers from mechanism. Discard felt washers.

(23) Removing and Disassembling Code Bar Clutch Trip Shaft. To remove and disassemble code bar clutch trip shaft, proceed as follows (figure 7-14):

(a) Remove retainer ring from left end of shaft.

(b) Loosen code bar clutch trip lever clamp screw.

(c) Slide shaft out to right.

(24) Disassembling Selector Mechanism. To disassemble selector mechanism, proceed as follows (figures 7-20 through 7-24):

(a) Remove two mounting screws and two nuts from range finder.

(b) Lift off range finder.

(c) Remove range finder knob clamp nut.

(d) Remove knob, detent, and spring.

(e) Remove retainer ring from stop arm bail shaft.

(f) Remove shaft.

(g) Remove two retainer rings from rack.

(h) Remove rack.

(i) Remove two retainer rings, leaf springs, and four flat washers holding dust cover over magnets.

(j) Remove cover.

(25) Disassembling Front Plate. To disassemble front plate, proceed as follows (figures 7-15, 7-16, 7-17, and 7-18):

(a) Loosen clamp screws which hold printing carriage to upper draw-wire rope.

(b) Move carriage to left extremity, and disengage it from its track and draw-wire rope.

(c) Loosen carriage return spring drum lock nut 1-1/2 turns.

(d) Operate ratchet escapement lever to

unwind carriage return spring drum spring until all tension is released.

(e) Unhook tension roller spring.

(f) Unhook transfer slide spring.

(g) Remove screw which holds upper draw-wire rope to spacing drum.

(h) Loosen clamp screw which holds upper draw-wire rope to carriage return spring drum.

(i) Loosen rear clamp screw on oscillating rail slide.

(j) Remove front clamp screw on oscillating rail slide.

(k) Remove upper draw-wire rope.

(l) Remove screw on spacing drum securing lower draw-wire.

(m) Remove screw on carriage return spring drum which secures lower draw wire rope.

(n) Remove lower draw-wire rope.

(o) Remove tension pulley shaft mounting screw (on back).

(p) Remove pulley bracket and shaft.

(q) Remove two mounting screws from printing track and remove printing track.

(r) Remove one mounting screw from each front

upper draw-wire roller and remove rollers.

(s) Remove spacing drum clamp nut.

(t) Remove carriage return spring drum clamp nut.

(u) Lift off plate (150554).

(v) Remove three dashpot mounting screws (on back).

(w) Slide dashpot off transfer slide.

(x) Remove carriage return latch bail spring.

(y) Remove nut which screws transfer slide mounting post to front plate (on back).

(z) Remove transfer slide and spacer post.

(aa) Unhook two feed pawl springs.

(ab) Remove set screw from feed pawl eccentric.

(ac) Remove spacing shaft from rear.

(ad) Remove feed pawls.

(ae) Lift off spacing drum.

(af) Lift off carriage return spring drum.

(ag) Remove horizontal positioning lock lever spring.

(ah) Remove six printing carriage track mounting screws.

(ai) Lift and disengage printing carriage track from horizontal positioning lock lever.

(aj) Remove retainer ring which holds horizontal positioning lock lever.

(ak) Remove lock lever.

(al) Remove two oscillating rail shift link springs.

(am) Remove two guide arm clamp screws (on back).

(an) Remove two retainer rings from oscillating rail shift links (on back).

(ao) Lift off oscillating rail and guides.

(ap) Unhook two shift slide drive link springs.

(aq) Remove two plate mounting nuts from plate (153335) and remove plate.

(ar) Remove four shift slide drive link retainer rings (two on each link).

(as) Lift off links.

(at) Remove four screws from reversing slide mounting brackets.

(au) Remove brackets, reversing slide, and oscillating rail shift slide.

(av) Remove two top retainer rings from main bail drive links.

(aw) Remove main bail.

(ax) Remove two nuts from shift link breaker slide posts.

(ay) Lift off shift slide and breaker slides.

(az) Remove two connecting strip mounting screws and lift off strip.

(ba) Remove two bearing stud mounting screws and lift off studs.

(bb) Use diagonal wire cutters to remove remaining felt washers.

(26) Disassembling Stunt Box. To disassemble stunt box, proceed as follows (figures 7-31 and 7-32):

(a) Remove two retainer rings from stripper blade cam shaft.

(b) Remove two screws from stripper blade cams.

(c) Remove screw from stripper blade cam shaft drive arm.

(d) Slide shaft out through stunt box side frame.

(27) Disassembling Code Bar Detent Mechanism. To disassemble code bar detent mechanism, proceed as follows (figure 7-29):

(a) Remove two screws from front code bar detent plate.

(b) Remove plate and suppression code bar latch.

(c) Note all holes in detent have springs and balls (except top outside and bottom inside).

(d) Remove detent springs and balls.

(e) Remove two screws from rear code bar detent plate.

(f) Remove plate.

(g) Note all holes in detent have springs and balls (except top outside and bottom inside).

(h) Remove seven springs and balls.

m. Reassembling Gear Assembly. To reassemble gear assembly, proceed as follows (figure 7-46):

(1) Pack bearings.

(2) Position assembly driven gear; secure with lock washer and screw.

(3) Slide variable speed shaft in from left while mounting gears, felts, spacers, and bearings; secure with three flat washers, lock washers, and screws.

(4) Secure variable speed shaft gear to shaft with flat washer, lock washer, and screw.

(5) Position pin, spring, key, and collar on variable speed shaft.

(6) Install idler shaft from left side while mounting idler gear.

(7) Secure gear to idler shaft with lock washer end screw.

(8) Install right bearing and secure with three retaining mechanisms.

(9) Install distributor drive gear secure with lock washer and screw.

n. Mounting Gear Assembly on Base. To mount gear assembly on base, proceed as follows (figure 7-46):

(1) Position gear assembly on three adjusting mechanisms; secure with one flat washer, three lock washers, and three nuts.

(2) Connect shift link to speed selector shaft and secure with retainer ring.

o. Mounting Base on Pan. To mount base on pan, proceed as follows:

(1) Position base on pan; secure with four lock washers and screws.

(2) Install five pan mounting bolts (for shipping).

(3) Position ground on pan, secure with lock washer and screw.

(4) Replace three cover guide screws and rollers.

(5) Position speed selector knob and secure with two set screws.

(6) Grease and lubricate local carriage return and line feed mechanisms.

p. Reassembling Type Box. To reassemble type box after replacing type pallet or spring, proceed as follows:

(1) Line up the front plate with the rear plate assembly and draw the two plates together until the head of the pallet leaves the rear plate by approximately 1.16 inch.

NOTE

This may be accomplished by using two 6-40 screws (at least 11/32 inch long) and nuts in place of the two screws and nuts removed when disassembling, and tighten them only enough to hold the the pallets as specified above. Do not clamp the plates together until all pallets have been moved into their correct position.

(2) Manipulate the pallets until they fall into their respective openings in the front plate. Press the plates together.

(3) Replace the screw and nuts used in Note with screws and nuts removed in disassembly procedures (paragraph 6-121(4)).

q. Reassembling Motor Unit. To reassemble motor unit, proceed as follows:

(1) Replace two bearings on rotor shaft.

(2) Replace stator on rotor.

(3) Replace end shields, springs, and washer.

(4) Secure end shields to stator with two nuts and two bolts.

(5) Place motor on mounts.

(6) Replace clamps.

(7) Replace two resilient mount clamp screws.

(8) Replace two screws which hold motor pinion to shaft.

(9) Replace fan on shaft.

(10) Replace set screw which holds fan to shaft.

(11) Remove two screws which hold relay clamp to its bracket; lift clamp and relay off.

(12) Remove screw which holds relay cover to relay, and lift cover off.

(13) Inspect relay for cleanliness and burned contacts.

(14) Replace cover on relay, secure with lock washer and screw.

(15) Position relay and clamp, secure with two lock washers and two screws.

r. Mounting Motor on Base. To mount motor on base, proceed as follows:

(1) Position motor; secure with four lock washers and four screws.

(2) Mount typing unit on base.

(3) Adjust gear assembly backlash as described in paragraph 6-4.1c(5).

(4) Remove typing unit.

s. Reassembling Distributor Mechanism. To reassemble distributor mechanism, proceed as follows:

(1) Lubricate and reassemble clutch.

(2) Replace felt and two springs.

(3) Clean and unpack bearings.

(4) Position clutch and distributor drum.

(5) Insert shaft from right side.

(6) Replace spacer collar on left end of shaft.

(7) Replace left bearing on shaft and secure with lock washer and nut.

(8) Position clutch drum and secure with lock washer and screw.

(9) Secure left bearing with two retaining assemblies.

(10) Position right bearing retainer and secure with lock washer and screw.

(11) Position clutch magnet bracket, secure with flat washer, two lock washers, and two screws.

(12) Position distributor shaft driven gear, secure with lock washer and screw.

(13) Position photocell and mounting bracket; secure with three lock washers and screws.

(14) Route and connect two photocell wires as follows:

Black wire to H-4  
White wire to H-1

(15) Position cover plate over distributor drum; secure to side frames with flat washer, four lock washers, and four screws. Use left rear screw to hold wire clamp.

(16) Position distributor shaft idler gear on its shaft.

NOTE

Shaft has left-hand thread. Secure shaft to right side frame by screwing in counter-clockwise direction.

(17) Perform the following adjustment:

(a) Adjust clutch drum as described in paragraph 6-4.2n(1) (low-level only).

(b) Adjust clutch shoe lever as described in paragraph 6-4.1b(5), low-level - 6-4.2b(2).

(c) Adjust trip lever as described in paragraph 6-4.1b(2) (low-level - 6-4.2b(3)).

(d) Adjust magnet plate as described in paragraph 6-4.2b(4) (low-level only).

t. Mounting Distributor on Base. To mount distributor on base, proceed as follows:

- (1) Position distributor mechanism on base.
- (2) Connect UA plug and tighten clamp.
- (3) Position circuit card mounting bracket and L plug mounting bracket and secure with two screws. Position L plug.
- (4) Connect wires to terminal blocks H and P in accordance with applicable wiring diagram provided in Chapter 5.
- (5) Adjust distributor gear backlash as described in paragraph 6-4.1c(5).
- (6) Secure mounting bracket to base with four flat washers, four lock washers, and four screws.

u. Reassembling Keyboard Transmitter. To reassemble keyboard transmitter, proceed as follows:

- (1) Position photocells. Plug in two leads.
- (2) Position REPT key and its spring.
- (3) Position wiring harness on top plate, secure with retainers.
- (4) Solder three wires to fuseholder as shown in figure 5-8, Wiring Diagram.
- (5) Position top plate, push side frames in, and secure with two retainer rings.

(6) Position power switch on top plate and secure with nut.

(7) Tighten Allen screw which holds power switch control knob on shaft.

v. Mounting Keyboard Transmitter. To mount keyboard transmitter, proceed as follows:

- (1) Position keyboard transmitter on pan and secure with four screws.
- (2) Position ground strap on base and secure with screws.
- (3) Connect wires to terminal blocks S, K, and P in accordance with Applicable wiring diagram provided in Chapter 5.
- (4) Connect L plug to LA plug.
- (5) Adjust reset lever clearance as described in paragraph 6-4.2b(6), (low-level only).
- (6) Adjust latch bail clearance as described in paragraph 6-4.2b(7), (low-level only).

w. Reassembling Typing Unit. The following paragraphs describe the procedure for reassembling the typing unit.

(1) Replacing Felts and Parts Attached to Side Plates. To replace eleven felts in side plates and parts still attached to side plates, proceed as follows (figures 7-1 and 7-2):

(a) Remove lock nut from stud which holds follower arm to function rocker shaft.

stud. (b) Remove

nut from one rocker shaft bushing. (c) Remove lock

bushing until rocker shaft can be removed. (d) Unscrew

retainer ring which holds follower arm to roller. (e) Remove

follower arm. (f) Remove

retainer ring which holds roller guide arm to bracket. (g) Remove

guide arm. (h) Remove

felt washers while reassembling by reversing procedures in steps (1) through (8). (i) Install new

screws holding each pivot shaft in reset bail pivot studs. (j) Remove

back into studs. (k) Push shafts

felt washers. (l) Install

back into place. (m) Push shafts

screws. (n) Replace

nut from shoulder screw which holds left side of spacing suppression bail. (o) Remove lock

screw, install felt, and replace screw. (p) Remove

(q) Replace lock washer and nut.

(r) Remove lock nut from guide post on right side of spacing suppression bail.

(s) Remove guide post, install felt, and replace post.

(t) Replace lock washer and nut.

(u) Remove retainer rings from rear of each main side lever.

(v) Pull rear of lever out.

(w) Install two felts, reposition, and secure with retainer rings.

(2) Replacing Eight Felts on Space Suppression Mechanism. To replace eight felts on space suppression mechanism, proceed as follows (figure 7-5):

(a) Remove retainer ring which holds carriage return bail on shaft.

(b) Install felts; replace bail and retainer ring.

(c) Remove spacing cutout transfer bail spring.

(d) Remove spacing cutout bail spring.

(e) Remove retainer ring which holds spacing cutout transfer bail.

(f) Loosen clamp screws in set collar.

(g) Remove transfer bail, install two felts, and replace transfer bail.

(h) Position set collar and tighten screw.

(i) Replace retainer ring.

(j) Remove retainer ring which holds spacing cut-out bail on shaft.

(k) Remove bail, install felt, and replace bail. Ensure top of bail is to rear of tab on spacing suppression slide.

(l) Replace retainer ring.

(m) Replace two bail springs.

(n) Remove spacing trip lever bail spring.

(o) Remove retainer ring which holds spacing trip lever to bail.

(p) Remove trip lever from bail, install felt, replace lever on bail, and replace retainer ring.

(q) Remove retainer ring which holds spacing trip lever to bail shaft.

(r) Remove lever; install felt; replace lever and retainer ring.

(s) Replace bail springs.

(t) Install felt on front of plate.

### (3) Installing Space Suppression Mechanism on Typing

Unit. To install space suppression mechanism on typing unit, proceed as follows (figure 7-5):

#### CAUTION

Do not use excessive force when positioning space suppression mechanism on crossbar.

(a) Gently position space suppression mechanism on crossbar. Ensure carriage return bail is in slot in slide arm and spacing suppression bail is on bracket.

(b) Secure bracket to crossbar with screw and lock washer.

(c) Secure right end of shaft to side frame with screw and lock washer.

(4) Installing Code Bar Clutch Trip Shaft. To install code bar clutch trip shaft, proceed as follows (figure 7-14):

(a) Insert shaft through bushing in right side frame.

(b) Mount parts on shaft.

(c) Secure with retainer ring.

(5) Installing Trip Shaft Mechanism. To install trip shaft mechanism, proceed as follows (figure 7-14):

(a) Push shaft through bushing on left side frame while mounting parts between bushing and right shaft mounting bracket. Ensure line

feed function stripper bail arm is above shaft.

(b) Mount code bar clutch cam follower arm on right end of shaft, secure with flat washer, lock washer, and locknut.

(c) Position and secure set collars.

(d) Install parts on left end of shaft and secure with retainer ring.

(6) Reassembling Main Shaft. To reassemble main shaft, proceed as follows (figures 7-12 and 7-13):

NOTE

Prior to mounting any clutch on main shaft, perform the following:

1. Replace all springs and felts.
2. Inspect clutch drums, shoe levers, clutch shoes, bearings and cams, gear or eccentric assemblies, and replace as necessary.
3. Grease and lubricate all clutches during assembly.
4. Clutches having cams and disks marked 0 for identification should have marked side of parts face away from the clutch side of assembly.
5. Check clutch shoe spring adjustment as described in paragraph 6-3.1d(3) and clutch shoe lever spring adjustment as described in paragraph 6-3.1d(2).
6. While mounting each

clutch (except selector clutch) on main shaft, perform clutch drum end play adjustment as described in paragraph 6-3.1d(1).

(a) Pack left bearing.

(b) Position left bearing on shaft; secure with screw and lock washer.

(c) Mount line feed clutch drum on clutch.

(d) Lubricate fiber gear.

(e) Position clutch on shaft from right end; secure with screw and lock washer.

(f) Position time delay mechanism drive cam on shaft from right end; secure with screw and lock washer.

(g) Position main shaft drive gear on shaft from right end; secure with three screws and lock washers.

(h) Position collar on shaft from right end; secure with screw and lock washer.

(i) Remove two screws which hold spacing gear to clutch cam disk.

(j) Remove gear and check for wear.

(k) Replace gear, secure with two lock washers and two screws.

(l) Lubricate fiber gear.

(m) Mount spacing clutch drum on clutch.

(n) Position clutch on shaft from right end; secure with screw and lock washer.

(o) Place spacer (153323) on main shaft from right end.

(p) Check function clutch eccentric and its follower for wear; replace as necessary.

(q) Mount function clutch drum on clutch.

(r) Position clutch on shaft from right end; secure with screw and lock washer.

(s) Check code bar clutch eccentric and its follower for wear; replace as necessary.

(t) Mount code bar clutch drum on clutch.

(u) Position clutch on shaft from right end; secure with screw and lock washer.

(v) Pack right bearing.

(w) Position bearing on shaft from right end.

(x) Position driving link on function clutch eccentric, secure friction tight with two flat washers, two lock washers, and two screws.

(7) Installing Main Shaft. To install main shaft, proceed as follows (figures 7-12 and 7-13):

(a) Rotate function rocker shaft top to rear. Ensure all clutch trip and latch levers are to rear.

(b) Insert main shaft with right bearing slightly to left of right side frame and left bearing slightly to left side of left side frame.

(c) Align bearings with their holes in side frames. Position high part of function clutch eccentric follower towards bottom of unit.

(d) Slide main shaft to right to its proper position.

CAUTION

Do not use excessive force. Ensure that code bar clutch eccentric follower seats properly on its stud.

(e) Install right bearing retainer; secure with screw and lock washer.

(f) Install left bearing retainer; secure with two screws and two lock washers.

(g) Install two function reset bail springs.

(h) Position right bearing retainer; secure with screw and lock washer.

(8) Installing Vertical Positioning Levers and Type Box Carriage Track. To install vertical positioning levers and type box carriage track, proceed as follows (figures 7-10 and 7-11):

(a) Position levers; secure each with one

retainer ring, two guide mechanisms, three lock washers, and three screws.

NOTE

Ensure wider spacers are on right side.

(b) Position type box carriage track; secure with four screws and nuts.

(9) Reassembling Code Bar Detent Mechanism. To reassemble code bar detent mechanism, proceed as follows (figure 7-29):

(a) Replace seven balls and seven springs in holes in rear of detent mechanism (top outside and bottom inside holes should be empty).

(b) Lubricate each spring with one drop of oil.

(c) Replace and secure retaining plate with two screws and two lock washers.

(d) Repeat steps (a) through (i) on front detent mechanism.

(e) Lubricate code bar basket.

(10) Installing Code Bar Basket. To install code bar basket, proceed as follows (figure 7-29):

(a) Position basket between side frames.

(b) Secure with four mounting screws and four lock washers.

(11) Installing Main Rocker Shaft. To install main rocker shaft, proceed as follows (figures 7-10 and 7-11):

(a) Pack both bearings.

(b) Slide right end of main rocker shaft through left side frame.

(c) Install right bearing on shaft.

(d) Position shaft.

(e) Install left bearing.

(f) Secure right bearing with two lock washers and two screws.

(g) Position three left bearing retainers; secure with two lock washers and two screws.

(h) Position right rocker shaft bracket; secure with two flat washers, two lock washers, and two screws.

(i) Position left rocker shaft bracket, secure with two flat washers, two lock washers, two screws, and one retainer ring.

(j) Install vertical positioning lever springs.

(12) Installing Type Box Clutch. To install type box clutch, proceed as follows (figure 7-12):

(a) Mount clutch drum on clutch.

(b) Mount clutch on main shaft.

(c) Install type box clutch drive link.

(d) Position and secure retainer plate with lock washer and screws.

(13) Installing Ribbon Feed Mechanism. To install ribbon feed mechanism, proceed as follows (figures 7-25 and 7-26):

(a) Remove two retainer rings from bottom of ribbon spool shaft, to disassemble mechanism.

(b) Replace felt.

(c) Install 42661 Spring.

(d) Remove retainer ring from ribbon guide roller.

(e) Remove roller,, clean shaft, install roller and secure with retainer ring. Replace felt on ribbon drive link lower mounting post on main side lever and mount inner retainer ring.

(f) Slide ribbon feed mechanism on shaft. At the same time ensure ratchet lever is in proper engagement with detent lever, install two felt washers on shaft, and ensure bottom of ribbon drive link engages mounting post on main side lever.

(g) Secure feed mechanism with retainer ring.

(h) Secure drive link with retainer ring.

(i) Install ratchet feed lever spring.

(j) Repeat steps (a) through (i) on remaining feed mechanism.

(14) Installing Code Bar Positioning Mechanism. To install code bar positioning mechanism, proceed as follows (figure 7-19):

(a) Install two main side lever follower arm springs.

(b) Grease and lubricate positioning mechanism.

(c) Position mechanism; secure with two lock washers and two screws.

(d) Connect shift lever link to shift lever drive arm and secure with retainer ring.

(15) Installing Code Bar Shift Bars. To install code bar shift bars, proceed as follows (figure 7-29):

(a) Place right end of bars in guides and engage left end with code bars.

(b) Install three springs with long ends attached to code bar shift bars.

(c) Position retaining plate; secure with two lock washers and two screws.

(16) Reassembling Selector Mechanism. To reassemble selector mechanism, proceed as follows: (figures 7-20, 7-22, and 7-23):

NOTE

Visually inspect selector, marking and spacing lock levers, armature and associated springs for excessive

wear. If excessive wear is apparent, replace the worn part.

(a) Check armature down stop bracket as described in paragraph 6-3.1g(12). perform procedure described in paragraph 6-

(b) Position dust cover, secure with four flat washers, two spring washers, and two retainer rings.

(c) Position rack on range finder; secure with four flat washers, two spring washers, and two retainer rings.

(d) Position stop arm bail mechanism; secure with retainer ring.

(e) Mount range finder knob, spring, and detent; secure with lock washer and nut.

(f) Position range finder mechanism on selector mechanism; secure with three lock washers, one flat washer, two screws, and one nut.

(g) Install range finder knob.

(h) Perform range finder knob phasing adjustment described in paragraph 6-3.1g(6).

(17) Installing Selector Mechanism. To install selector mechanism, proceed as follows (figures 7-20, 7-22, and 7-23):

(a) Position selector mechanism on right side frame; secure friction tight with one flat washer, three lock washers, and three screws.

(b) Position wick holder; secure with flat washer, lock washer, and screw.

(c) Install wick in holder.

(d) Securely tighten screws left friction tight in step (a).

(e) Connect common transfer lever spring to spring bracket.

(18) Installing Selector Clutch and Cam Sleeve Assembly. To install selector clutch and cam sleeve assembly, proceed as follows (figure 7-13):

(a) Mount clutch drum on clutch.

(b) Position cam assembly on main shaft by rotating counterclockwise, pushing gently inward, using caution to clear the following items:

- Selector clutch stop arm
- Selector clutch latch lever
- Stop arm bail
- Push lever reset bail
- Code bar clutch trip shaft lever.

(c) Ensure clutch drum is aligned with main shaft to prevent its becoming disengaged from clutch.

(d) Perform selector clutch drum end play adjustment as described in paragraph 6-3.1g(17).

(e) Secure drum to main shaft with screw, nut, and two lock washers.

(f) Release marking lock lever.

(g) Release push lever reset bail.

(19) Installing Control Springs for Main Shaft.  
To install control springs for main shaft, proceed as follows (figure 7-13):

(a) Install code bar clutch cam follower arm spring.

(b) Install code bar clutch trip shaft lever spring.

(c) Install clutch trip, stop, and latch lever springs.

(20) Performing Typing Unit Adjustments.  
Perform typing unit adjustments described in the following paragraphs:

(a) Selector Clutch Stop Arm, 6-3.1g(7).

(b) Armature Extension and Spacing Locklever, 6-3.2c, (low-level only).

(c) Code Bar Clutch Trip Lever, 6-3.1d(5).

(d) Function Clutch Trip Lever, 6-3.1d(13), (variable feature - 6-5b(4)).

(e) Spacing Clutch Trip Lever, 6-3.1d(10), (earlier design - 6-7.1d(4)).

(f) Clutch Trip Shaft Set Collars, 6-3.1d(11), (earlier design - 6-7.1d(2)).

(g) Line Feed Clutch Trip Lever Eccentric Post, 6-3.1d(15)

(h) Line Feed Clutch Trip Lever Adjusting Screw, 6-3.1d(16)

(i) Type Box Clutch Trip Lever Eccentric Post, 6-3.1d(14)

(j) Type Box Clutch Trip Lever, 6-3.1d(8), (variable feature - 6-5c(4)).

(k) Line Feed Clutch Phasing, 6-3.1c(8).

(l) Clutch Shoe Levers, 6-3.1d(7)

(21) Reassembling Cover Unit Components. To install component (B-plug receptacle, printer connector mounting bracket, signal bell mounting bracket, and copy light transformer), proceed as follows (figure 7-39):

(a) Position B-Plug Receptacle; secure with two flat washers, two lock washers and two screws.

(b) Position signal bell mounting bracket; secure with two flat washers, two lock washers, and two screws.

(c) Position printer connector mounting bracket; secure with two lock washers and two screws.

(d) Position terminal end of ground strap; secure with screw, flat washer, lock washer, and nut.

(e) Position copy light transformer, secure with two flat washers, two lock washers and two screws.

(22) Installing Platen. To install platen, proceed as follows (figure 7-6):

(a) Hold detent up and position platen in side frames.

(b) Install paper guides and shaft.

(c) Position right retainer; secure with one spacer, one flat washer, two lock washers, and two set screws.

(d) Position left retainer; secure with two lock washers and two screws.

(e) Install paper guide spring.

(f) Position platen spur gear on shaft; secure with lock washer and screw.

(23) Reassembling Stunt Box. To reassemble stunt box, proceed as follows (figures 7-31 and 7-32):

(a) Slide shaft through stunt box side frames while mounting parts on shaft.

(b) Secure shaft and stripper blade cams with two screws and two lock washers.

(c) Position three felt washers around each cam; secure with retainer rings.

(d) Lubricate stunt box.

(24) Installing Signal Bell Contacts on Stunt Box. To install signal bell contacts on stunt box proceed as follows (figures 7-31 and 7-32):

(a) Assemble contact mechanism.

(b) Position contact mechanism over slot 28 in function box, secure with two flat washers, two lock washers, and two screws.

(25) Installing Stunt Box. To install stunt box, proceed as follows (figures 7-31 and 7-32):

(a) Using guides, slide stunt box into rear of typing unit.

(b) Apply slight pressure to ensure proper seating.

(c) Strip off all function pawls.

(d) Ensure carriage return and line feed slide arms are free.

(e) Ensure stripper bail is in slot of line feed function pawl stripper.

(f) Secure stunt box with two screws and two lock washers.

(g) Position cam shaft driving arm in engagement with driving link, secure with retainer ring, lock washer and screw.

(26) Reassembling Front Plate. To reassemble front plate, proceed as follows (figures 7-15, 7-16, 7-17, and 7-18):

(a) Unhook code bar bell crank springs.

(b) Remove retainer ring and bell cranks.

(c) Install new felt.

(d) Replace bell cranks; secure with retainer ring.

(e) Connect springs.

(f) Position left shift slide drive link mounting plate; secure friction tight with flat washer, lock washer, and screw.

(g) Position right shift slide drive link mounting plate; secure friction tight with flat washer, lock washer, and screw.

(h) Position connecting strip; secure friction tight with two flat washers, two lock washers, and two screws.

(i) Position shift link breaker slides, two springs, two spacers, and shift slide on their post.

(j) Secure breaker slides with two flat washers, two lock washers, and two locknuts (151880):

(k) Position bail (170062) and spacers; secure with two lock washers and two screws.

(l) Position main bail; secure with two retainer rings.

(m) Position studs through oscillating rail shift slide.

(n) Mount shift slide drive link mechanisms on oscillating rail shift slide.

(o) Position plate (153335), secure with two lock washers and two nuts.

(p) Position two reversing slide mounting brackets, reversing slide, oscillating rail shift slide, two shift slide drive links; secure with four lock washers and four screws. Ensure parts

are positioned on their mounting posts.

(q) Install four shift slide drive link felts; secure drive links to main bail and guide posts with four retainer rings.

(r) Position tension pulley shaft, bracket, and horizontal positioning lock lever arm; secure with lock washer and screw (from back).

(s) Install tension pulley spring.

(t) Install spacing shaft from rear.

(u) Install spacing feed pawls and eccentric on spacing shaft; secure with set screw and lock washer.

(v) Unhook automatic carriage return/line feed bell crank spring.

(w) Remove shoulder nut holding bell crank.

(x) Remove mounting shaft holding reversing slide shift lever.

(y) Replace two felts on shaft and reassemble by reversing procedures in steps (w) through (y).

(z) Secure oscillating rail shift links to oscillating rail shift slide with two retainer rings (on back).

(aa) Secure guide arms with two clamp screws and lock washers (on back).

(ab) Install and position carriage return spring drum.

(ac) Install and position spacing drum and bushing.

(ad) Install two feed pawl springs.

(ae) Remove two nuts holding printing track guide; lift off front guide and remove felt wick.

(af) Install new wick; reassemble and secure.

(ag) Repeat steps ae and af on other guide.

(ah) Install plate (150554); secure with two lock washers and two nuts.

(ai) Position horizontal positioning lock lever; secure with retainer ring.

(aj) Position printing carriage track, two spacers, and two pulleys; secure with six lock washers and six screws. Ensure track is in proper engagement with horizontal positioning lock lever.

(ak) Install horizontal positioning lock lever spring.

(al) Install oscillating rail shift link springs.

(am) Connect shift slide drive link springs.

(an) Position center of upper draw-wire rope on clamp screw on carriage return spring drum; secure screw friction tight.

(ao) Position rope; secure both ends to

spacing drum with lock washer and screw.

(ap) Secure one end of lower draw-wire rope to spacing drum with lock washer and screw.

(aq) Position rope; secure other end of carriage return spring drum with lock washer and screw.

(ar) Install transfer slide and mounting post; secure with lock washer and nut.

(as) Install carriage return latch bail spring.

(at) Position dashpot on transfer slide; secure with three clamp screws and three lock washers.

(au) Install transfer slide spring.

(av) Position printing track; secure friction tight with two flat washers, two lock washers, and two screws.

(aw) Replace eight felts on printing mechanism.

(ax) Position printing mechanism on its track; secure friction tight.

(ay) Position and secure oscillating rail slide with type box carriage link friction tight to upper draw-wire rope, with two locknuts and two screws.

(27) Installing Front Plate. To install front plate, proceed as follows (figures 7-16, 7-17, and 7-18):

(a) Mount type box carriage on its track.

(b) Position front plate while ensuring the following are in their proper connections:

Number three code bar projection.

Numbers four and five code bar bell cranks seated in notches in their code bars.

Projection on automatic carriage return-line feed bell crank engaged with notch on 0 code bar.

Carriage return lever positioned to left of carriage return latch bail.

Main bail drive bracket on top of rocker shaft.

Type box carriage link in type box carriage.

Space suppression frame in slot in front plate.

(c) Secure front plate with four lock washers and four screws.

(d) Secure type box carriage to its link with retainer ring.

(e) Secure main bail drive bracket to main rocker shaft with two lock washers and two screws.

(f) Mount spacing shaft helical driven gear on spacing shaft.

(g) Perform spacing gear clearance and phasing adjustment procedures as described in paragraphs 6-3.1h(18) and 6-3.1h(19).

(28) Installing Type Box. To install type box proceed as follows (figure 7-33):

(a) Hold type box left end down at approximately a 45-degree angle; then insert left end on bearing stud and lower right end into place.

(b) Latch type box into place.

#### CAUTION

To avoid springing the type box latch, the type box should be firmly seated on the bearing stud and the point of the latch should be placed in the notch of the type box plate before moving the latch to its locked position.

(29) Installing Ribbon. To install ribbon, proceed as follows (figure 7-25 and 7-26):

(a) Install new ribbon on either feed mechanism.

(b) Thread ribbon across front of unit and attach end to empty spool.

(c) Install spool on remaining feed mechanism.

(d) Lock spools in place with their slips.

x. Reinstalling Typing Unit.

(1) With left hand under rear of side frame and right hand under right side of front plate above dashpot, lift

NAVELEX 0967-LP-613-5010

typing unit from work bench and place on base.

(2) Install four mounting screws which hold typing unit to base.

(3) Connect B plug to typing unit.

(4) Connect P103 to J103.