

28 TYPING AND NONTYPING PERFORATORS

ADJUSTMENTS

1. GENERAL

1.001 This addendum supplements Section 573-139-700, Issue 1, and is issued to incorporate engineering changes to the backspace mechanism, and to change the requirement tolerance for the LATCH LEVER CLEARANCE adjustment of the punch mechanism. Arrows in the margins indicate changes.

1.002 Insert the attached pages in accordance with the filing instructions above.

Attached:

Page 1 dated May 1966, reissued; April 1968, reissued  
Page 2 dated May 1966, revised; April 1968, reissued  
Page 17 dated April 1968, revised  
Page 18 dated April 1968, reissued  
Page 57 dated May 1966, revised; April 1968, reissued  
Page 58 dated May 1966, revised; April 1968, reissued  
Page 61 dated May 1966, reissued; April 1968, reissued  
Page 62 dated May 1966, revised; April 1968, reissued

28 TYPING AND NONTYPING PERFORATORS

ADJUSTMENTS

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1. GENERAL

1.01 This section has been revised to include recent engineering changes and additions, and to rearrange the text, so as to bring the section generally up-to-date. Since this is an extensive revision, marginal arrows ordinarily used to indicate changes have been omitted.

1.02 This section contains the specific requirements and adjustments for the 28 typing and non-typing perforators.

1.03 Maintenance procedures which apply only to mechanisms of a particular design, or to certain models of 28 typing or non-typing perforators are so indicated in the titles of the paragraphs which contain these particular adjustment requirements.

1.04 The adjustments of each unit are arranged in a sequence that should be followed if a complete readjustment of the unit were undertaken. The tools and spring scales required to perform these adjustments are listed in the applicable section. After an adjustment is completed, be sure to tighten any nuts or screws that are loosened. The adjusting illustrations indicate tolerances, positions of moving parts, spring tensions and the angles at which scales should be applied when measuring spring tensions. If a part mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same number is replaced when the part is remounted.

1.05 Reference made to left or right, up or down, front or rear, etc apply to the unit in its normal operating position as viewed from the front.

1.06 When a requirement calls for a clutch to be disengaged, the clutch shoe lever must be fully latched between its trip lever and latch lever so that the clutch shoes release their tension on the clutch drum. When engaged, the clutch shoe lever is unlatched and the clutch shoes are wedged firmly against the clutch drum.

Note: When the signal generator shaft is rotated by hand, the clutch does not fully disengage upon reaching its stop position. In order to relieve drag and permit the main shaft to rotate freely, apply pressure on the lug of the clutch disc with a screwdriver to cause it to engage its latch lever and fully disengage the clutch.

1.07 All electrical contact points should meet squarely. Contacts with the same diameter should not be out of alignment more than 25 per cent of the contact diameter. Check contacts for pitting and corrosion and clean or burnish them before making specified adjustments or tolerance measurement. Avoid sharp kinks or bends in the contact springs.

CAUTION: KEEP ALL ELECTRICAL CONTACTS FREE OF OIL AND GREASE.

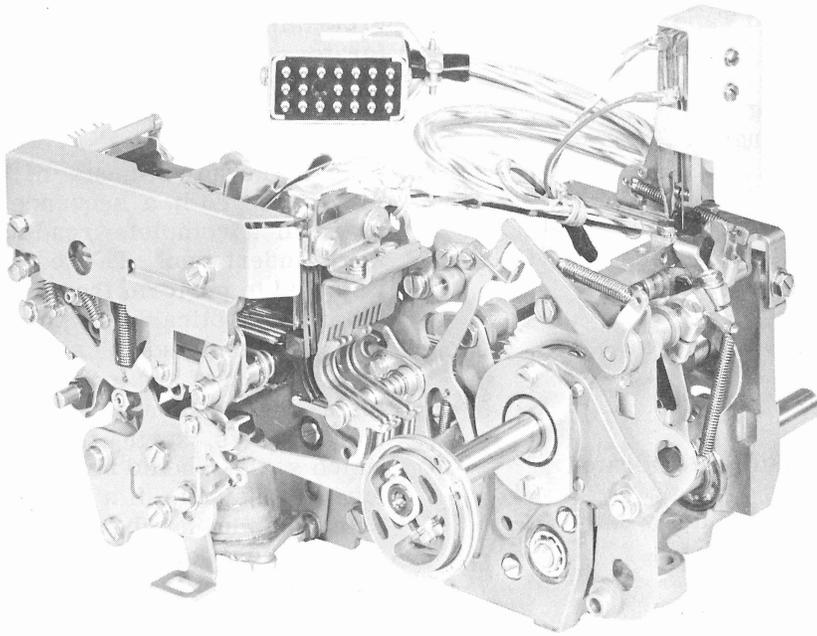


Figure 1 - 28 Non-Typing Perforator - Chadless Tape (With Code Reading Contacts, Timing Contacts and Backspace Mechanism)

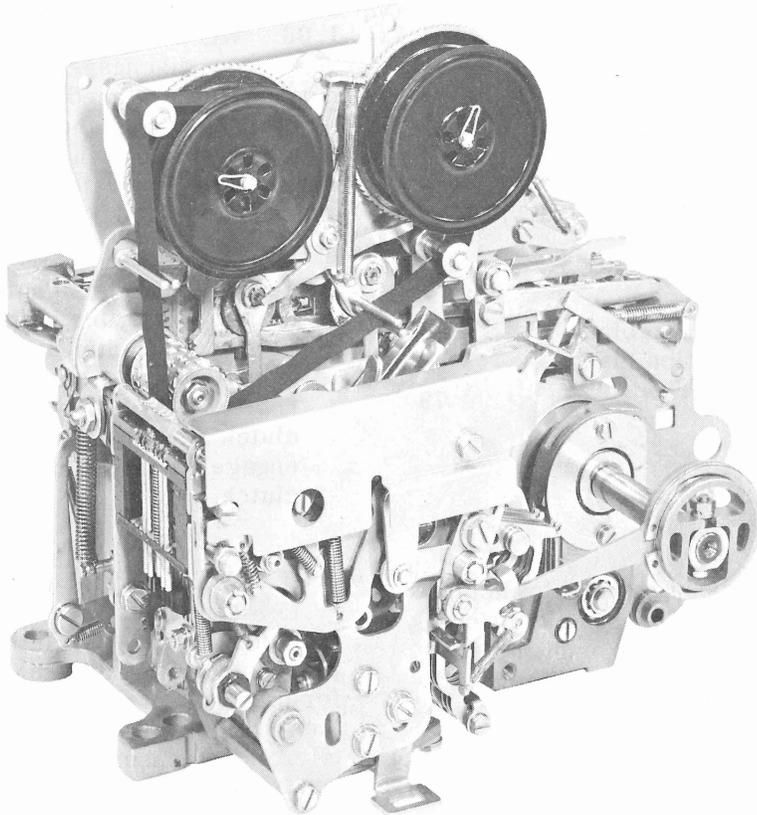


Figure 2 - 28 Typing Perforator - Chadless Tape (With Backspace Mechanism)

2. BASIC UNIT

2.01 Function Mechanism

NOTE: UNLESS OTHERWISE SPECIFIED, THESE ADJUSTMENTS APPLY TO BOTH TYPING AND NON-TYPING PERFORATORS.

(A) FUNCTION CLUTCH SHOE LEVER TO CHECK

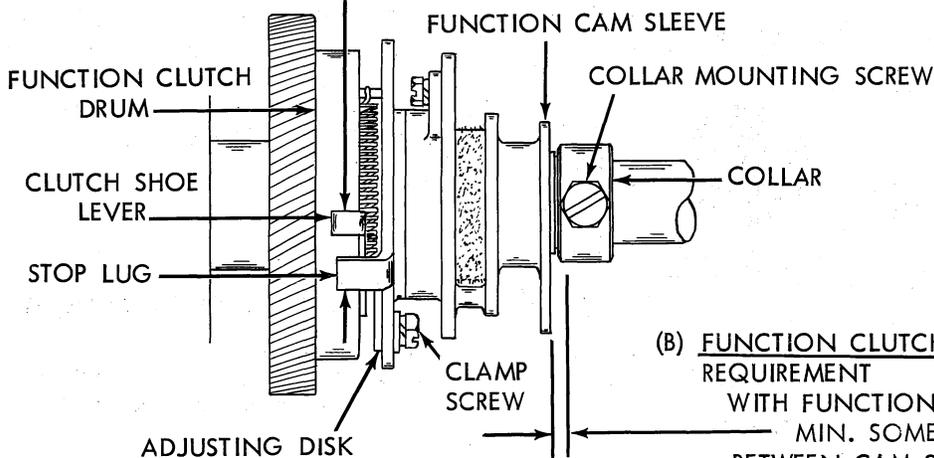
- (1) DISENGAGE CLUTCH. MEASURE CLEARANCE.
- (2) ALIGN HEAD OF CLUTCH DRUM MOUNTING SCREW WITH STOP LUG. ENGAGE CLUTCH. MANUALLY PRESS SHOE LEVER AND STOP LUG TOGETHER AND ALLOW TO SNAP APART. MEASURE CLEARANCE.

REQUIREMENT

CLEARANCE BETWEEN SHOE LEVER AND STOP LUG.  
 MIN. 0.055 INCH --- MAX. 0.085 INCH  
 GREATER WHEN CLUTCH IS ENGAGED (2) THAN WHEN DISENGAGED (1).

TO ADJUST

ENGAGE WRENCH OR SCREWDRIVER WITH LUG ON ADJUSTING DISK. ROTATE DISK WITH CLAMP SCREWS LOOSENED.



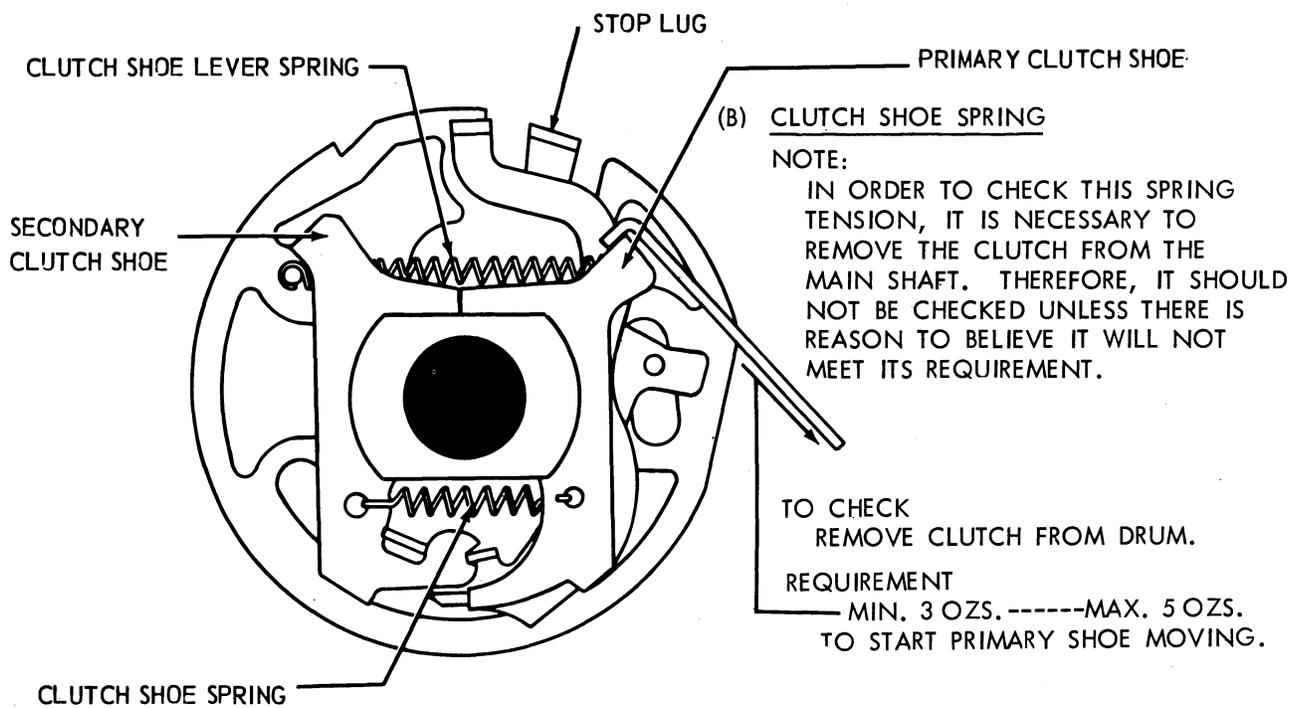
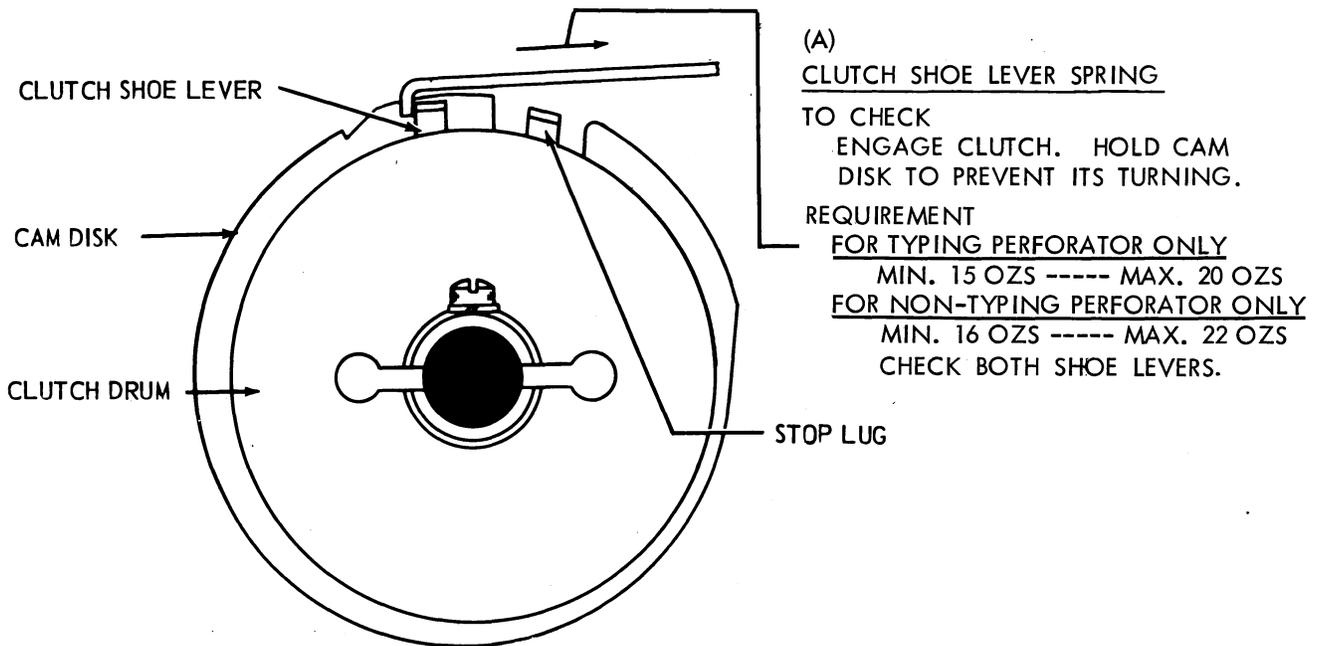
(B) FUNCTION CLUTCH DRUM END PLAY REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED.  
 MIN. SOME --- MAX. 0.015 INCH  
 BETWEEN CAM SLEEVE AND COLLAR WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE MAXIMUM.

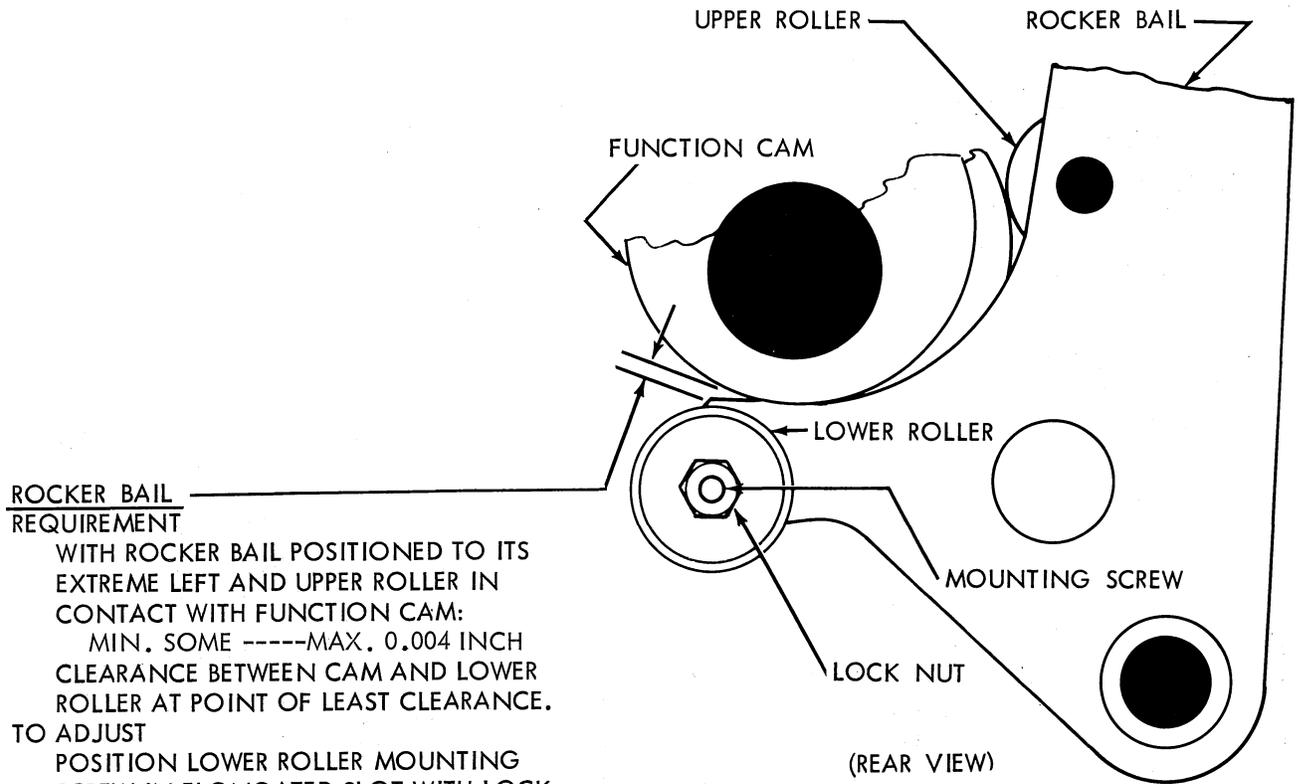
TO ADJUST

POSITION COLLAR WITH MOUNTING SCREW LOOSENED.

2.02 Function Mechanism continued



2.03 Function Mechanism continued



2.04 Function Mechanism continued

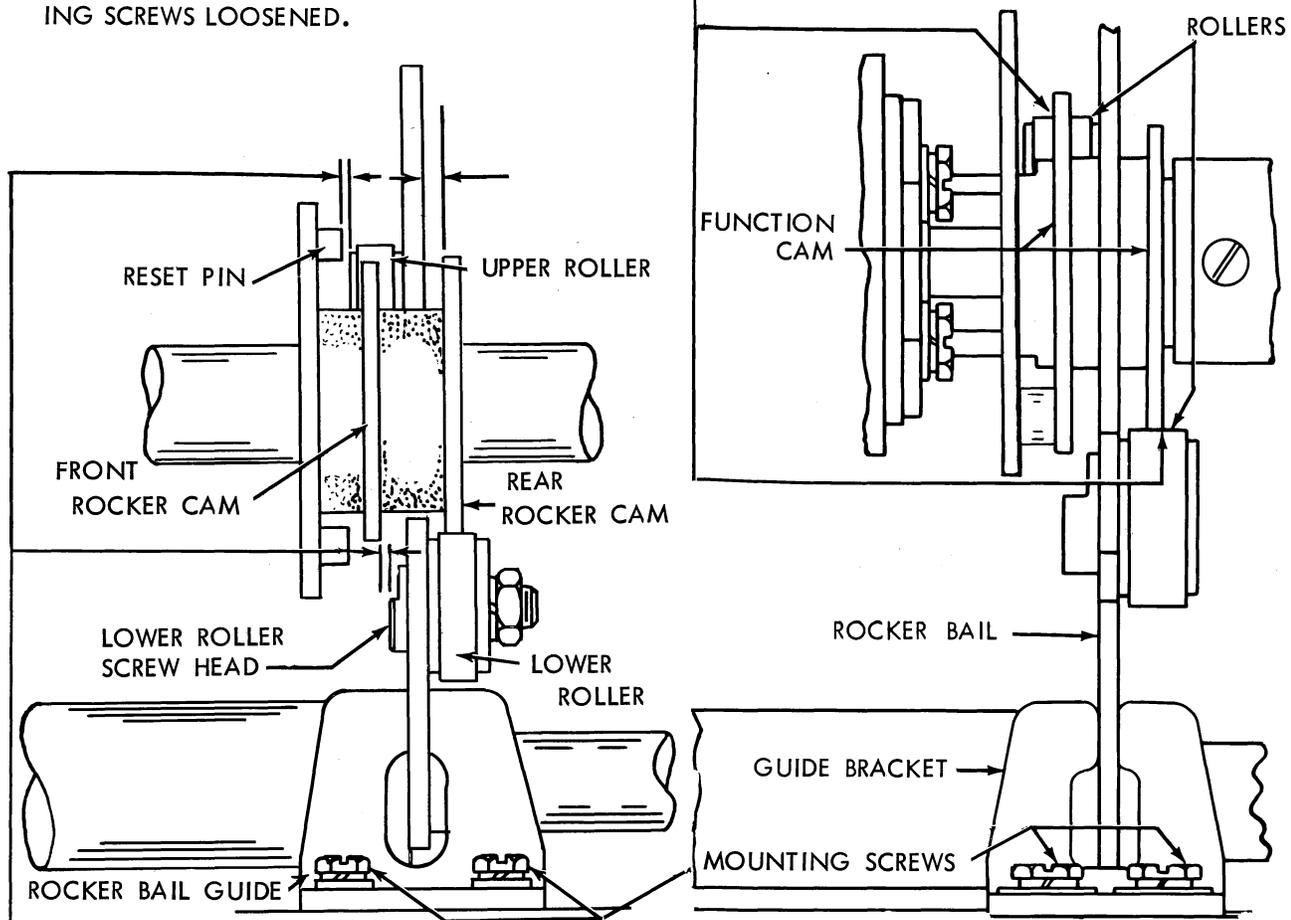
ROCKER BAIL GUIDE BRACKET  
(TYPING PERFORATOR ONLY)

REQUIREMENT

- (1) ROCKER BAIL ROLLERS SHOULD ENGAGE FULL THICKNESS OF FUNCTION CAM.
- (2) LIFTER ROLLER IN FULL ENGAGEMENT WITH ROCKER BAIL CAMMING SURFACE. SEE PARAGRAPH 2.36.

TO ADJUST

POSITION ROCKER BAIL AND GUIDE BRACKET WITH GUIDE BRACKET MOUNTING SCREWS LOOSENED.



ROCKER BAIL GUIDE BRACKET  
(NON-TYPING PERFORATOR ONLY)

REQUIREMENT

CLEARANCE BETWEEN UPPER ROLLER AND RESET PINS; BETWEEN LOWER ROLLER SCREW HEAD AND FRONT CAM; BETWEEN ROCKER BAIL AND REAR ROCKER CAM.  
MIN. 0.010 INCH

TO ADJUST

POSITION ROCKER BAIL WITH GUIDE MOUNTING SCREWS LOOSENED.

2.05 Function Mechanism continued

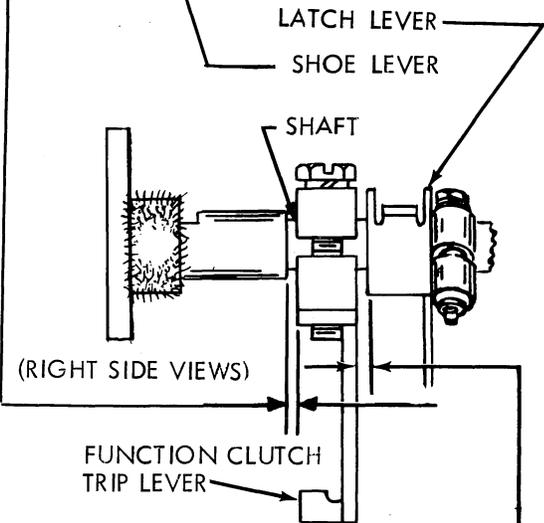
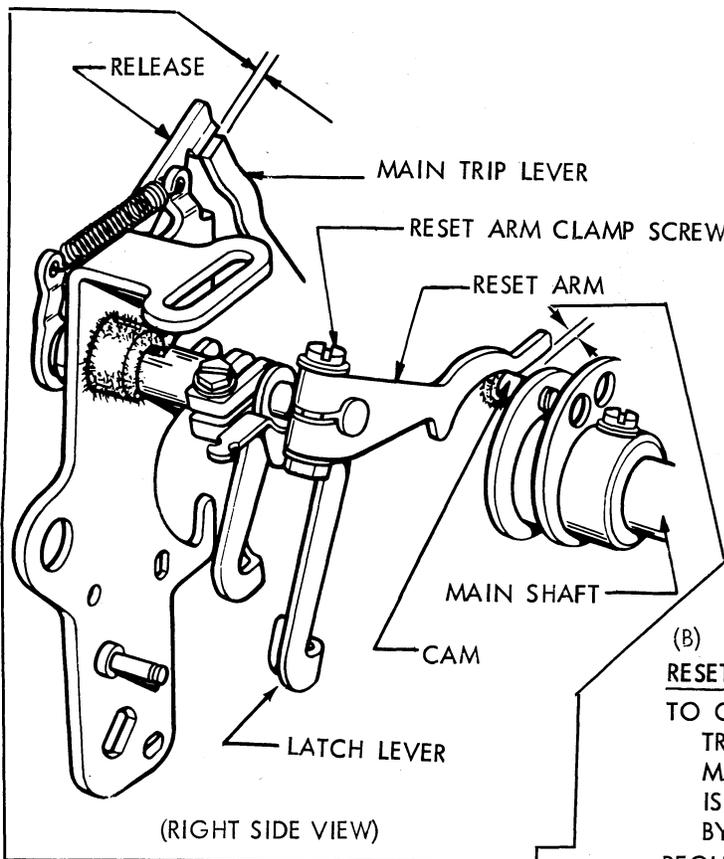
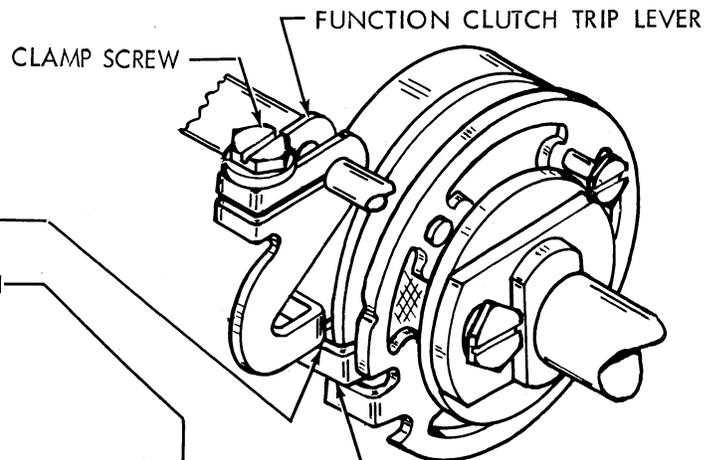
(A) FUNCTION CLUTCH TRIP LEVER

REQUIREMENT

(1) WITH RELEASE RESTING ON MAIN TRIP LEVER (SEE BELOW), FUNCTION CLUTCH TRIP LEVER SHOULD ENGAGE FULL THICKNESS OF SHOE LEVER AT THE STOP WHERE BITE IS LEAST.

(2) TRIP LEVER END PLAY:  
MIN. SOME --- MAX. 0.010 INCH

TO ADJUST POSITION TRIP LEVER ON ITS SHAFT WITH CLAMP SCREW LOOSENED.



(3) CLEARANCE BETWEEN RELEASE LEVER AND FUNCTION CAM:  
MIN. SOME

(B) RESET ARM

TO CHECK TRIP FUNCTION CLUTCH AND POSITION MAIN SHAFT SO THAT RESET ARM IS HELD IN ITS HIGHEST POSITION BY CAM

REQUIREMENT

- (1) CLEARANCE BETWEEN RELEASE AND MAIN TRIP LEVER.
- |      | <u>NON-TYPING PERFORATOR</u> | <u>TYPING PERFORATOR</u> |
|------|------------------------------|--------------------------|
| MIN. | 0.005 INCH                   | 0.005 INCH               |
| MAX. | 0.030 INCH                   | 0.030 INCH               |
- (2) LATCH LEVER END PLAY:  
MIN. SOME  
MAX. 0.010 INCH

TO ADJUST POSITION RESET ARM ON ITS SHAFT WITH ITS CLAMP SCREW LOOSENED.

2.06 Function Mechanism continued

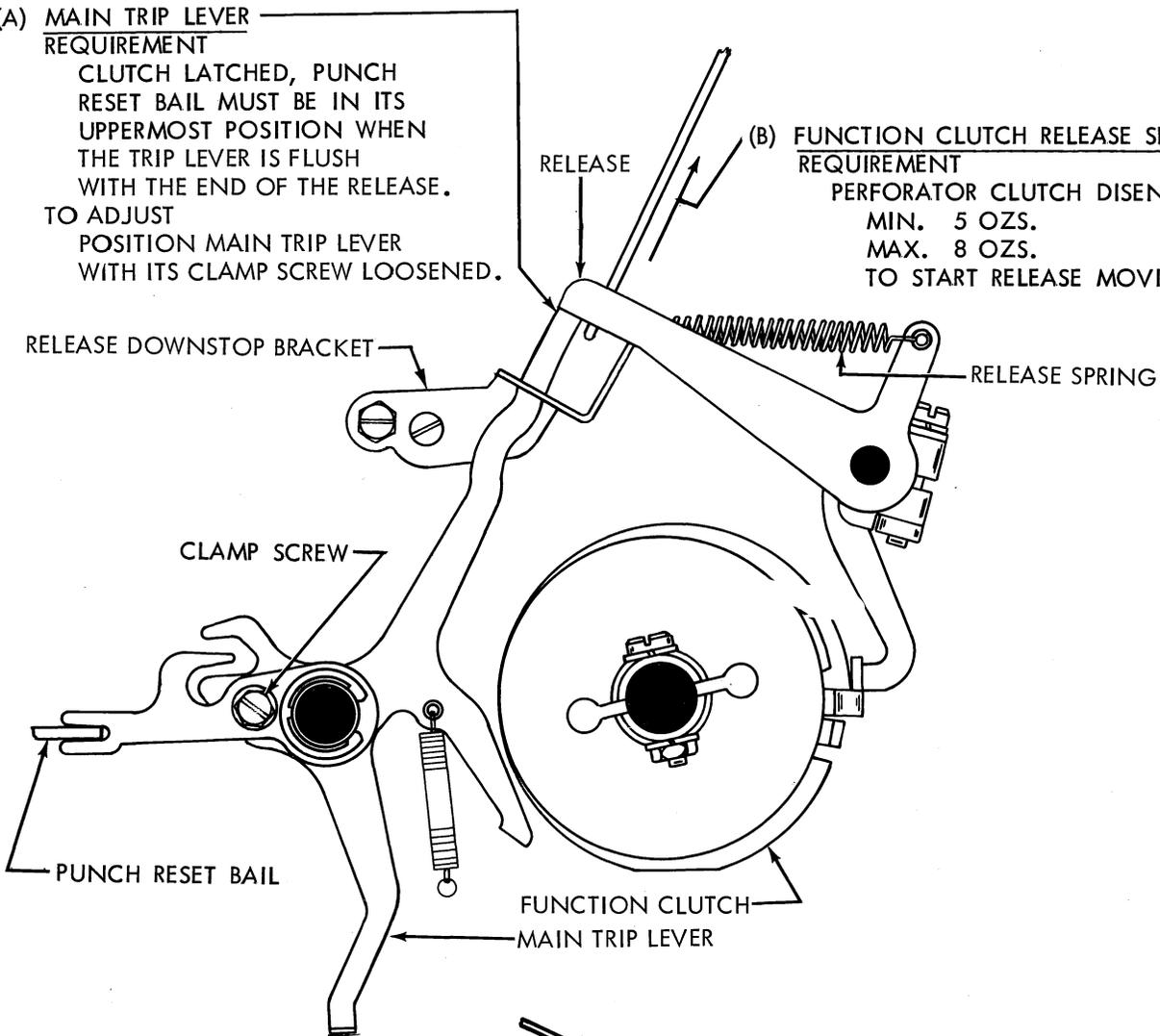
(A) MAIN TRIP LEVER  
REQUIREMENT

CLUTCH LATCHED, PUNCH  
RESET BAIL MUST BE IN ITS  
UPPERMOST POSITION WHEN  
THE TRIP LEVER IS FLUSH  
WITH THE END OF THE RELEASE.

TO ADJUST  
POSITION MAIN TRIP LEVER  
WITH ITS CLAMP SCREW LOOSENED.

(B) FUNCTION CLUTCH RELEASE SPRING  
REQUIREMENT

PERFORATOR CLUTCH DISENGAGED.  
MIN. 5 OZS.  
MAX. 8 OZS.  
TO START RELEASE MOVING.

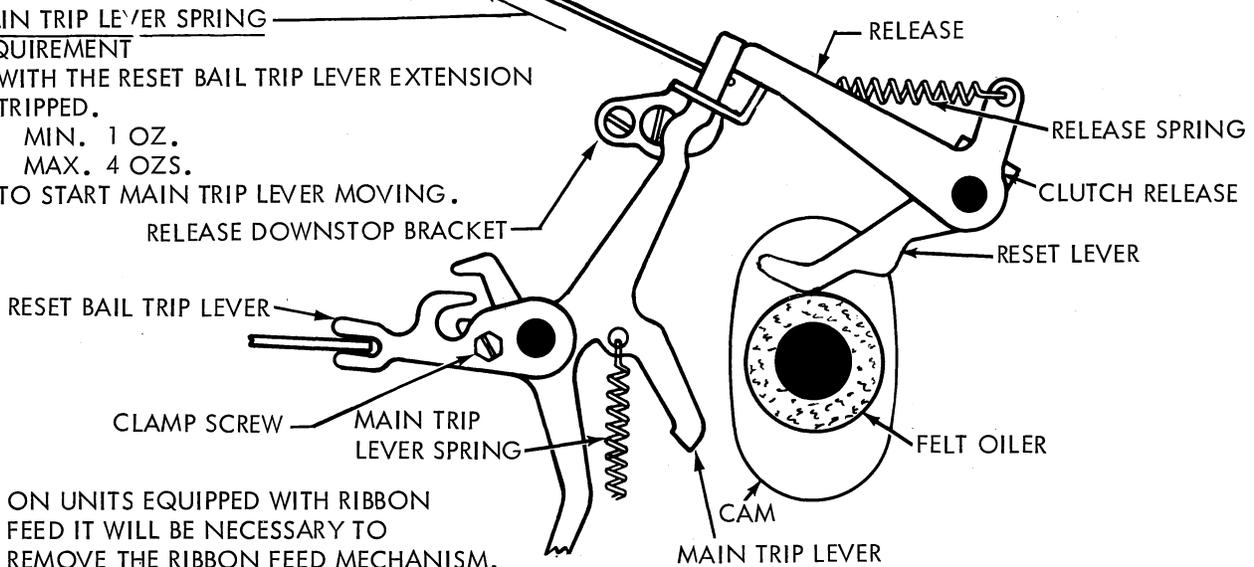


(C) MAIN TRIP LEVER SPRING  
REQUIREMENT

WITH THE RESET BAIL TRIP LEVER EXTENSION  
TRIPPED.

MIN. 1 OZ.  
MAX. 4 OZS.

TO START MAIN TRIP LEVER MOVING.



NOTE: ON UNITS EQUIPPED WITH RIBBON  
FEED IT WILL BE NECESSARY TO  
REMOVE THE RIBBON FEED MECHANISM.

## 2.07 Punch Mechanism

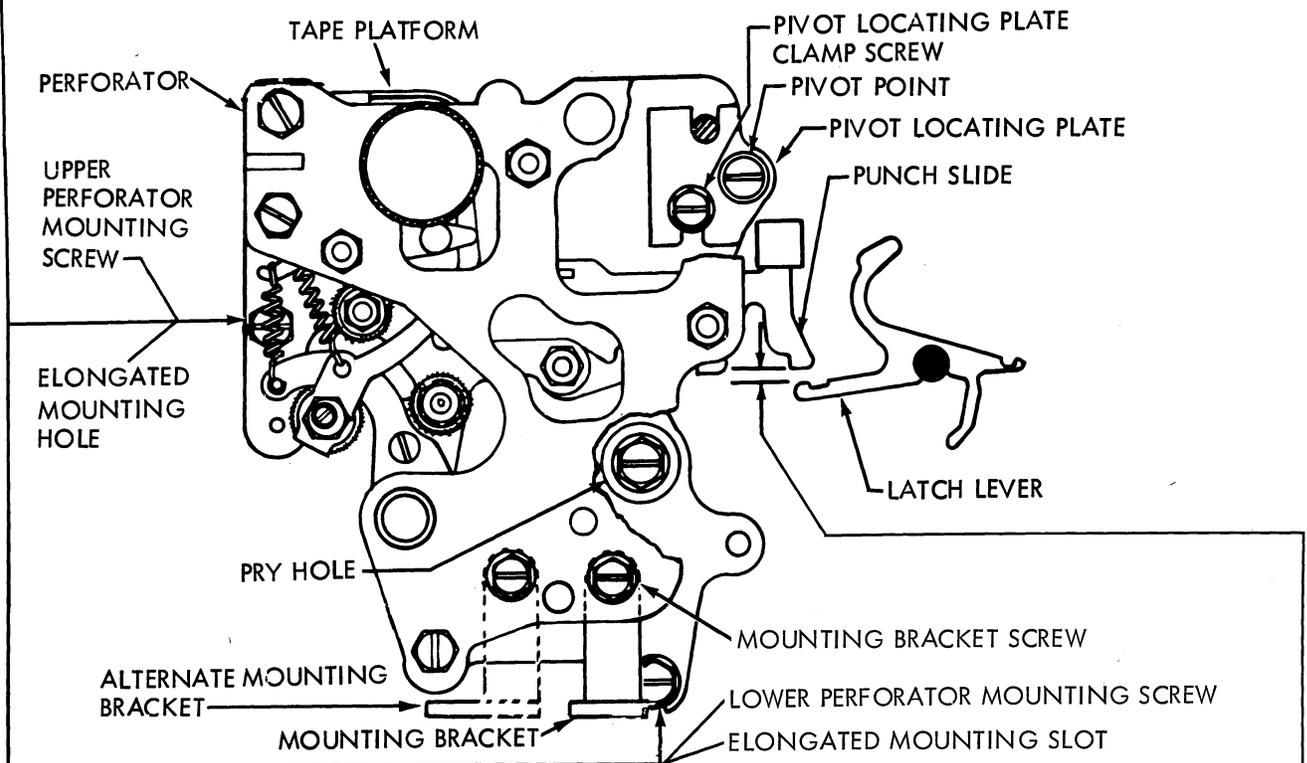
PERFORATOR POSITION -PRELIMINARY - (FOR NON-TYPING PERFORATOR ONLY)REQUIREMENT

THE PERFORATOR MECHANISM MOUNTING SCREW BENEATH PUNCH BLOCK AND MOUNTING SCREW AT LOWER EDGE OF PERFORATOR MECHANISM BACKPLATE SHALL BE LOCATED CENTRALLY WITHIN THEIR RESPECTIVE MOUNTING HOLES.

NOTE: THE MOUNTING HOLES ARE OVERSIZE TO FACILITATE USE OF PERFORATOR MECHANISM ON THE TYPING REPERFORATOR.

TO ADJUST

REMOVE MOUNTING SCREW AT THE LOWER EDGE OF PERFORATOR MECHANISM BACKPLATE, WITH THE TWO REMAINING BACKPLATE MOUNTING SCREWS AND MOUNTING BRACKET SCREW FRICTION TIGHT, POSITION PERFORATOR MECHANISM SO THAT THE TAPPED HOLE OF THE FRAME IS CENTRALLY LOCATED (AS GAUGED BY EYE) WITHIN LARGE BODY HOLE OF PUNCH MECHANISM BACKPLATE. TIGHTEN THE TWO BACKPLATE MOUNTING SCREWS AND RECHECK TO SEE THAT REQUIREMENT IS MET. REPLACE AND TIGHTEN THE LOWER BACKPLATE MOUNTING SCREW. TIGHTEN THE BRACKET MOUNTING SCREW.

PERFORATOR POSITION -FINAL - (FOR NON-TYPING PERFORATOR ONLY)REQUIREMENT

WITH LETTERS COMBINATION SELECTED AND FUNCTION CLUTCH JUST TRIPPED.

MIN. 0.015 INCH --- MAX. 0.045 INCH

CLEARANCE BETWEEN THE CLOSEST LATCH LEVER AND ASSOCIATED PUNCH SLIDE.

TO ADJUST

LOOSEN (FRICTION TIGHT) REAR FRAME MOUNTING SCREWS (AND PIVOT LOCATING PLATE CLAMP SCREW IF THE TYPING UNIT IS USED ON THE PUNCH), THE FRONT MOUNTING BRACKET SCREWS, PLACE TIP OF SCREWDRIVER BETWEEN HEX HEAD SCREW AND ITS CLEARANCE HOLE RIM AND PRY UP OR DOWN. TIGHTEN SCREWS. (IF THE TYPING UNIT IS BEING USED, TIGHTEN PIVOT LOCATING PLATE CLAMP SCREW ONLY, AS THE NEXT ADJUSTMENT WILL BE TO OBTAIN CLEARANCE BETWEEN TYPEWHEEL AND PUNCH.

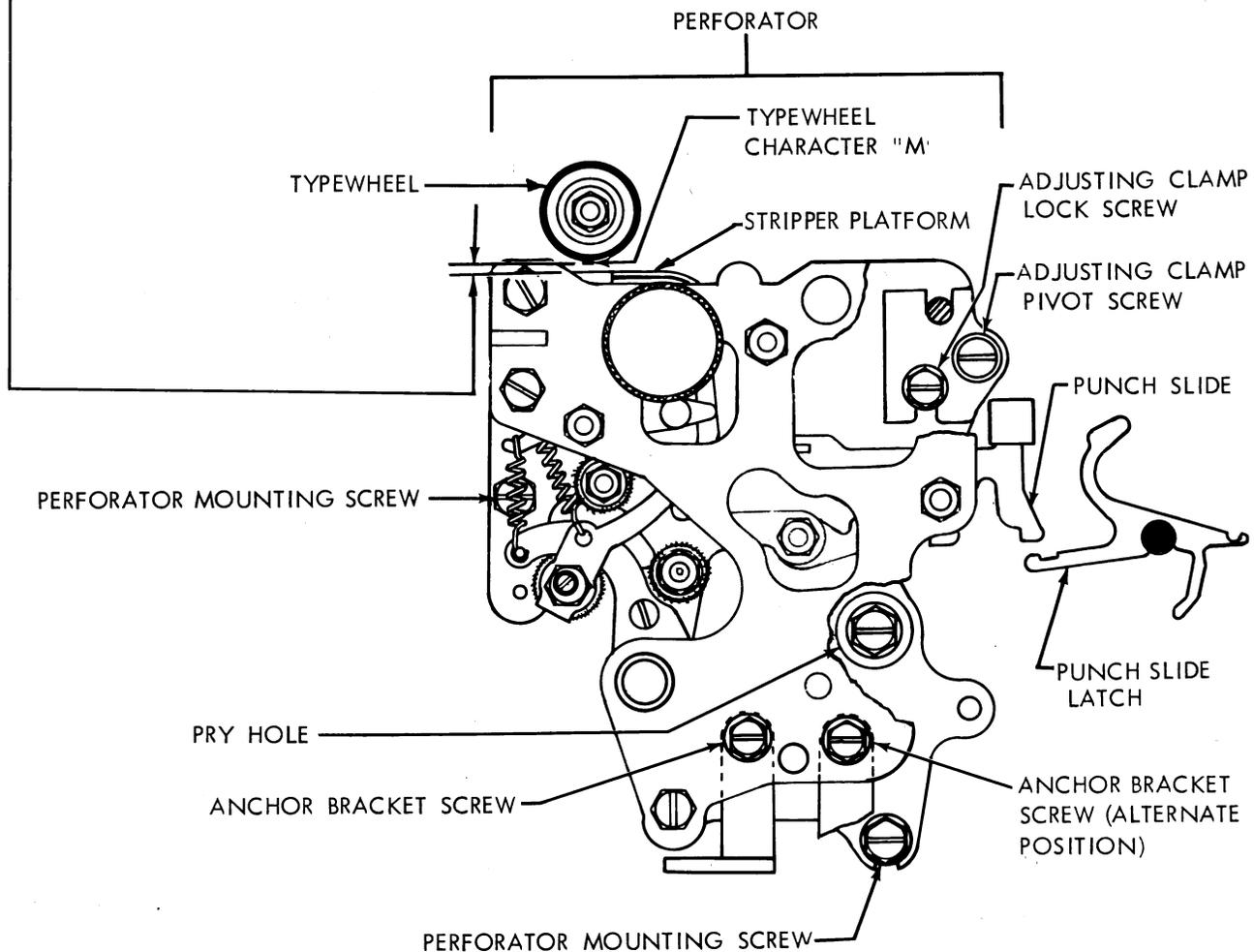
2.08 Punch Mechanism continued

PERFORATOR POSITION (FOR TYPING PERFORATOR ONLY)

- (1) REQUIREMENT - (FOR TYPING PERFORATOR WITH SPRING RETRACTED PUNCH UNIT) WITH UNIT IN STOP POSITION AND TYPEWHEEL IN THE LETTERS FIELD. CLEARANCE BETWEEN THE LETTER "Z" ON THE TYPEWHEEL AND THE TOP OF THE STRIPPER PLATFORM. MIN. 0.090 INCH --- MAX. 0.110 INCH
- (2) REQUIREMENT - (FOR TYPING PERFORATOR WITH POWER RETRACTED PUNCH UNIT) WITH UNIT IN STOP POSITION AND TYPEWHEEL IN THE FIGURES FIELD. CLEARANCE BETWEEN THE FIGURE "5" ON THE TYPEWHEEL AND THE TOP OF THE STRIPPER PLATFORM. MIN. 0.075 INCH --- MAX. 0.095 INCH

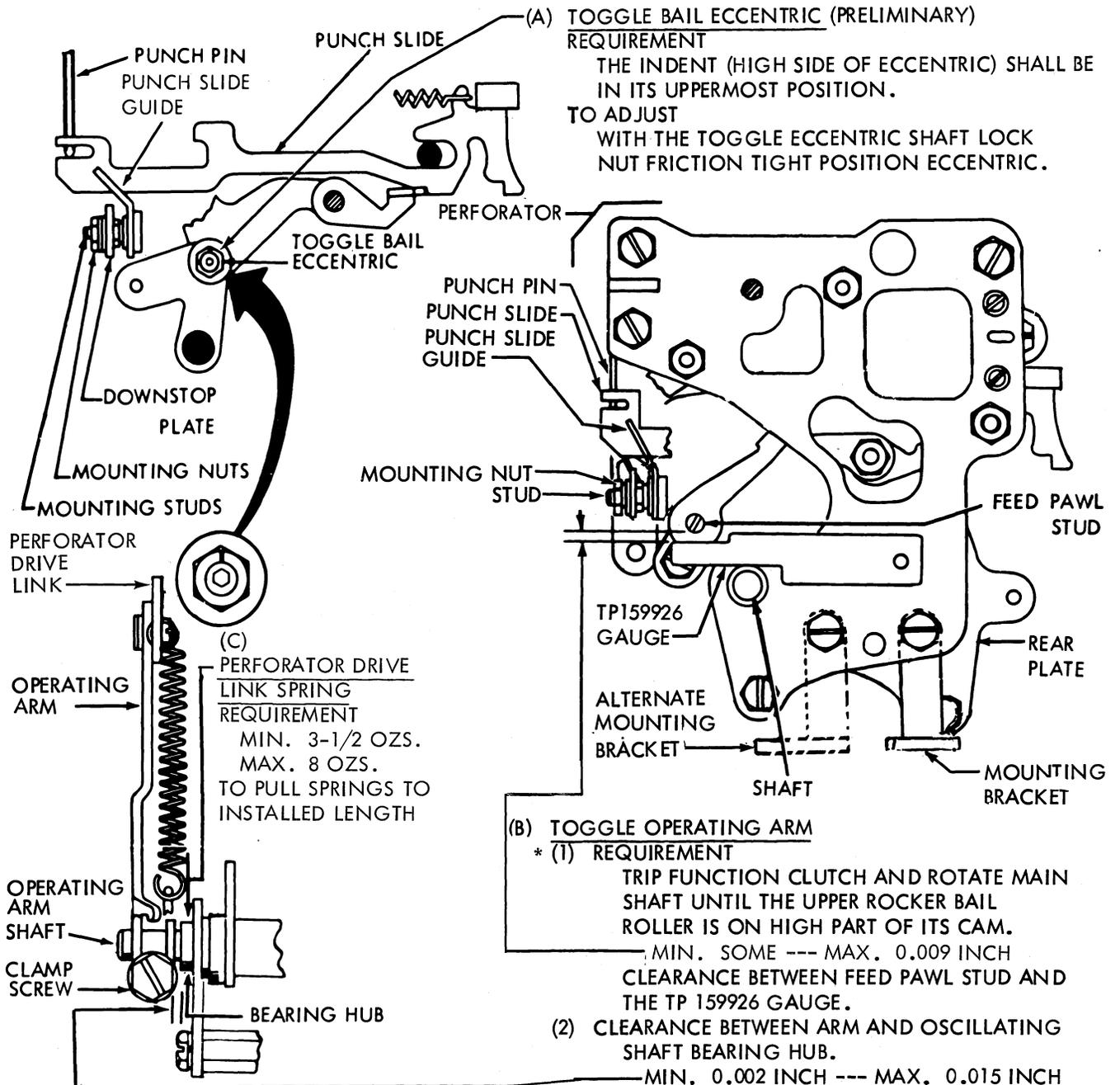
TO ADJUST

REMOVE RIBBON FROM CARRIER. POSITION PERFORATOR WITH TWO MOUNTING SCREWS, ADJUSTING CLAMP PIVOT SCREW AND ANCHOR BRACKET SCREW LOOSENED. CHECK RESET BAIL TRIP LEVER REQUIREMENT FOR SOME CLEARANCE AND ADJUST IF NECESSARY.



2.09 Punch Mechanism continued

NOTE: BEFORE PROCEEDING WITH THE PUNCH MECHANISM ADJUSTMENTS, CHECK THE ROCKER BAIL CAM FOLLOWER ROLLER ADJUSTMENT AND LOOSEN THE PUNCH SLIDE DOWNSTOP MOUNTING NUT AND GUIDE MOUNTING STUD.



\*AFTER FEED PAWL ADJUSTMENT HAS BEEN MADE, IF PUNCH PIN PENETRATION AND FEED PAWL REQUIREMENTS ARE MET, THIS REQUIREMENT SHOULD BE CONSIDERED FULFILLED.

2.10 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.

(A) PUNCH SLIDE DOWNSTOP POSITION

REQUIREMENT

FUNCTION CLUTCH DISENGAGED. UP AND DOWN PLAY AT LEFT END OF PUNCH SLIDES TAKEN UP TOWARD TOP, CLEARANCE BETWEEN FRONT AND REAR PUNCH SLIDES AND THEIR DOWNSTOP PLATE.

MIN. SOME --- MAX. 0.008 INCH  
ALL OTHER PUNCHES SHOULD HAVE SOME CLEARANCE.

TO ADJUST

REMOVE PUNCH SLIDE GUIDE, LOOSEN DOWNSTOP PLATE MOUNTING STUDS AND POSITION THE DOWNSTOP PLATE. TIGHTEN STUDS AND REPLACE GUIDE SO THAT PUNCH SLIDES ALIGN WITH PUNCH PINS (AS GAUGED BY EYE).

NOTE: TO CHECK FOR SOME CLEARANCE PLACE UNIT IN THE STOP POSITION, TRIP FUNCTION TRIP MECHANISM AND LATCHES, THE PUNCH SLIDES SHALL MOVE FREELY TO THEIR OPERATED POSITION.

(B) PUNCH PIN PENETRATION

REQUIREMENT

LETTERS MANUALLY SELECTED, CLUTCH ENGAGED AND ROTATED UNTIL PUNCH PINS HAVE TRAVELED MAXIMUM DISTANCE INTO THE DIE PLATE, CLEARANCE BETWEEN LOWER EDGE OF PUNCH RETRACTOR BAIL AND UPPER SIDE OF GUIDE PLATE (MEASURED AT LEFT EDGE OF PUNCH PINS WHERE CLEARANCE IS LEAST). THE CODE PUNCHES SHOULD PUNCH A FULL LID WITH A MINIMUM AMOUNT OF TEAR. (REFINE ADJUSTMENT).

MIN. 0.060 INCH --- MAX. 0.075 INCH

TO ADJUST

ROTATE THE TOGGLE BAIL ECCENTRIC SHAFT WITH ITS LOCK NUT LOOSENED. KEEP THE INDENTATION IN THE ECCENTRIC SHAFT TO THE LEFT OF A VERTICAL CENTER LINE THROUGH THE SHAFT.

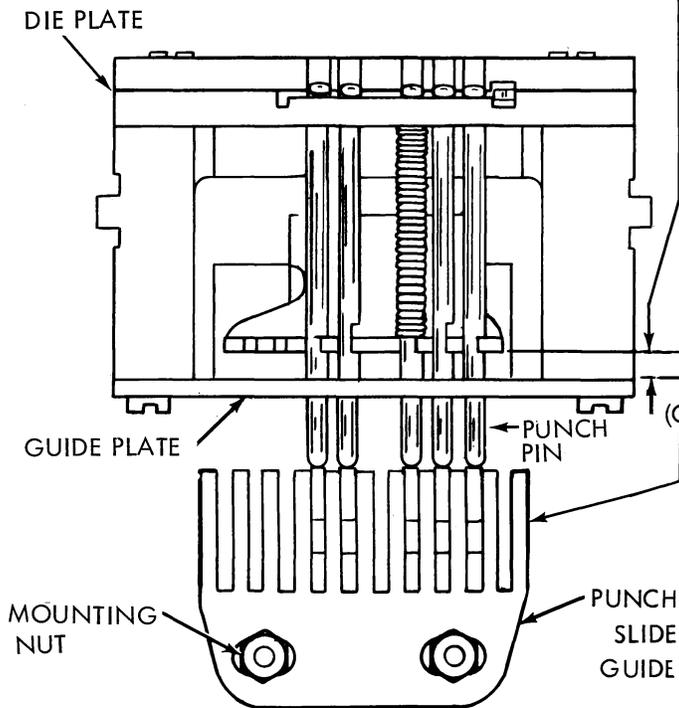
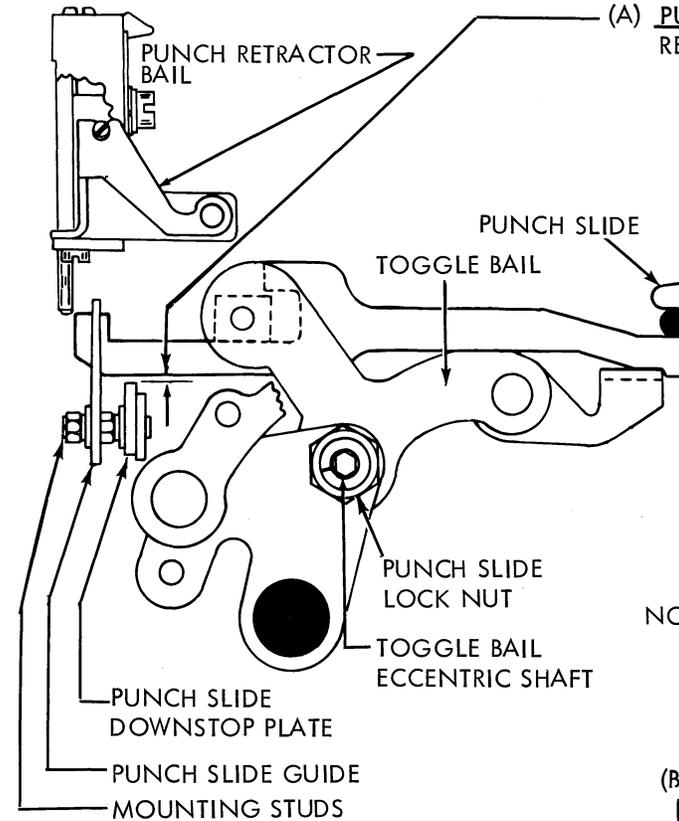
(C) PUNCH SLIDE GUIDE POSITION

REQUIREMENT

LETTERS SELECTED. FUNCTION CLUTCH ENGAGED AND ROTATED UNTIL THE PUNCH SLIDES JUST TOUCH THE PUNCH PINS. THE PUNCH SLIDES SHOULD ALIGN CENTRALLY WITH THEIR RESPECTIVE PUNCH PINS (GAUGED BY EYE).

TO ADJUST

POSITION THE PUNCH SLIDE GUIDE WITH ITS MOUNTING NUTS LOOSENED.



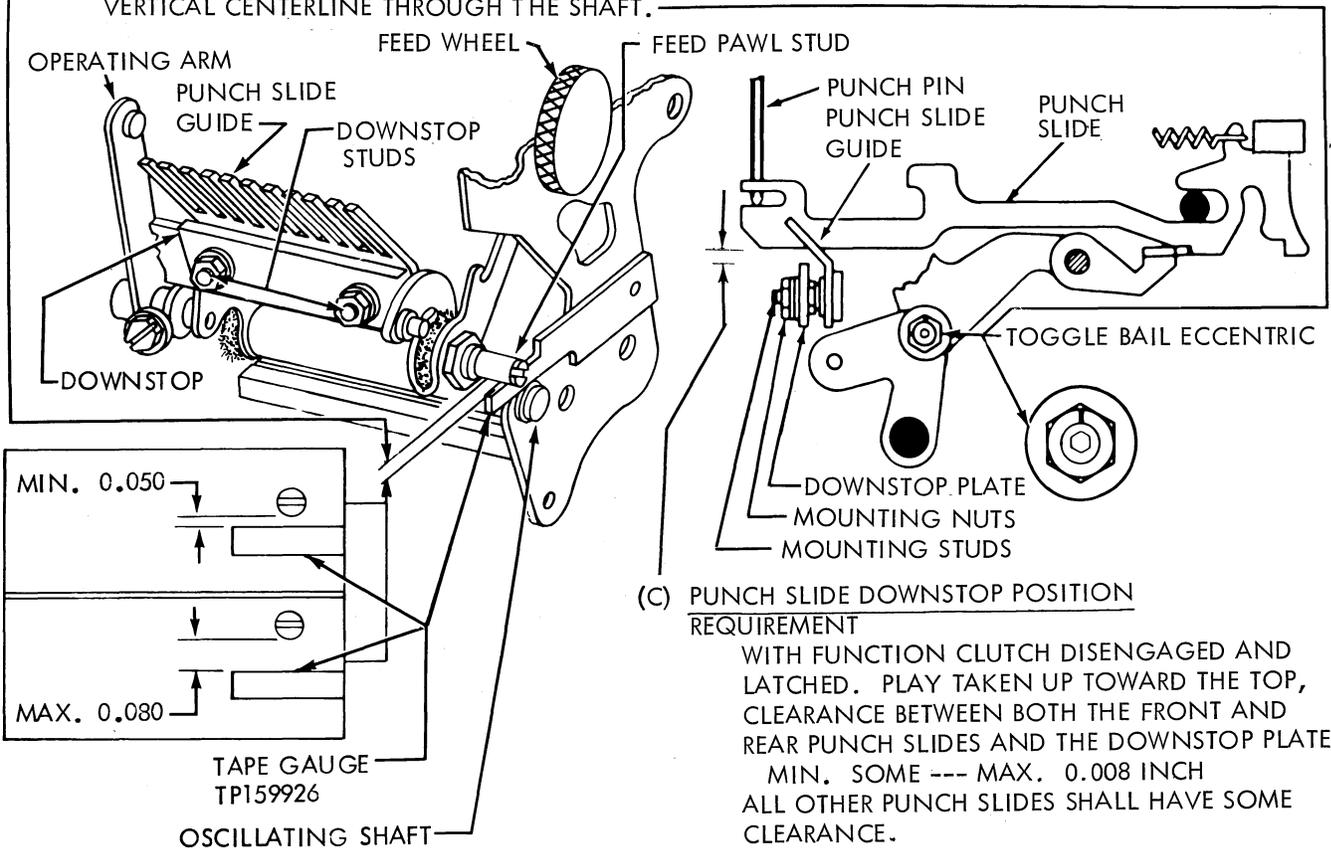
2.11 Punch Mechanism continued

(A) PUNCH PIN PENETRATION  
REQUIREMENT

- (1) WITH THE LETTERS COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS ARE INTO OR ABOVE THE TAPE APERTURE IN PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION  
MIN. 0.050 INCH  
CLEARANCE BETWEEN FEED PAWL STUD AND THE GAUGE.
- (2) WITH LETTERS COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS HAVE CLEARED THE PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION  
MAX. 0.080 INCH  
CLEARANCE BETWEEN FEED PAWL STUD AND GAUGE.

TO ADJUST

REFINE THE TOGGLE BAIL ECCENTRIC ADJUSTMENT KEEPING THE INDENT TO THE RIGHT OF A VERTICAL CENTERLINE THROUGH THE SHAFT.



NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM.

(C) PUNCH SLIDE DOWNSTOP POSITION  
REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED AND LATCHED. PLAY TAKEN UP TOWARD THE TOP, CLEARANCE BETWEEN BOTH THE FRONT AND REAR PUNCH SLIDES AND THE DOWNSTOP PLATE  
MIN. SOME --- MAX. 0.008 INCH  
ALL OTHER PUNCH SLIDES SHALL HAVE SOME CLEARANCE.

(B) PUNCH SLIDE GUIDE  
REQUIREMENT

THE PUNCH SLIDES SHOULD ALIGN WITH THEIR CORRESPONDING PUNCH PINS AND BE FREE OF BINDS AFTER TIGHTENING THE GUIDE MOUNTING STUDS. EACH PUNCH SLIDE SHOULD RETURN FREELY AFTER BEING PUSHED IN NOT MORE THAN 1/16 INCH.

TO ADJUST

POSITION THE GUIDE WITH ITS MOUNTING STUDS FRICTION TIGHT.

NOTE: TO CHECK FOR SOME CLEARANCE, PLACE UNIT IN STOP POSITION, TRIP FUNCTION TRIP MECHANISM AND LATCHES, THE PUNCH SLIDES SHALL MOVE FULLY TO THEIR OPERATED POSITION.

TO ADJUST

WITH UNIT IN STOP POSITION, LOOSEN THE TWO DOWNSTOP PLATE MOUNTING LOCK NUTS AND LOCATE THE DOWNSTOP PLATE TO MEET THE REQUIREMENT.

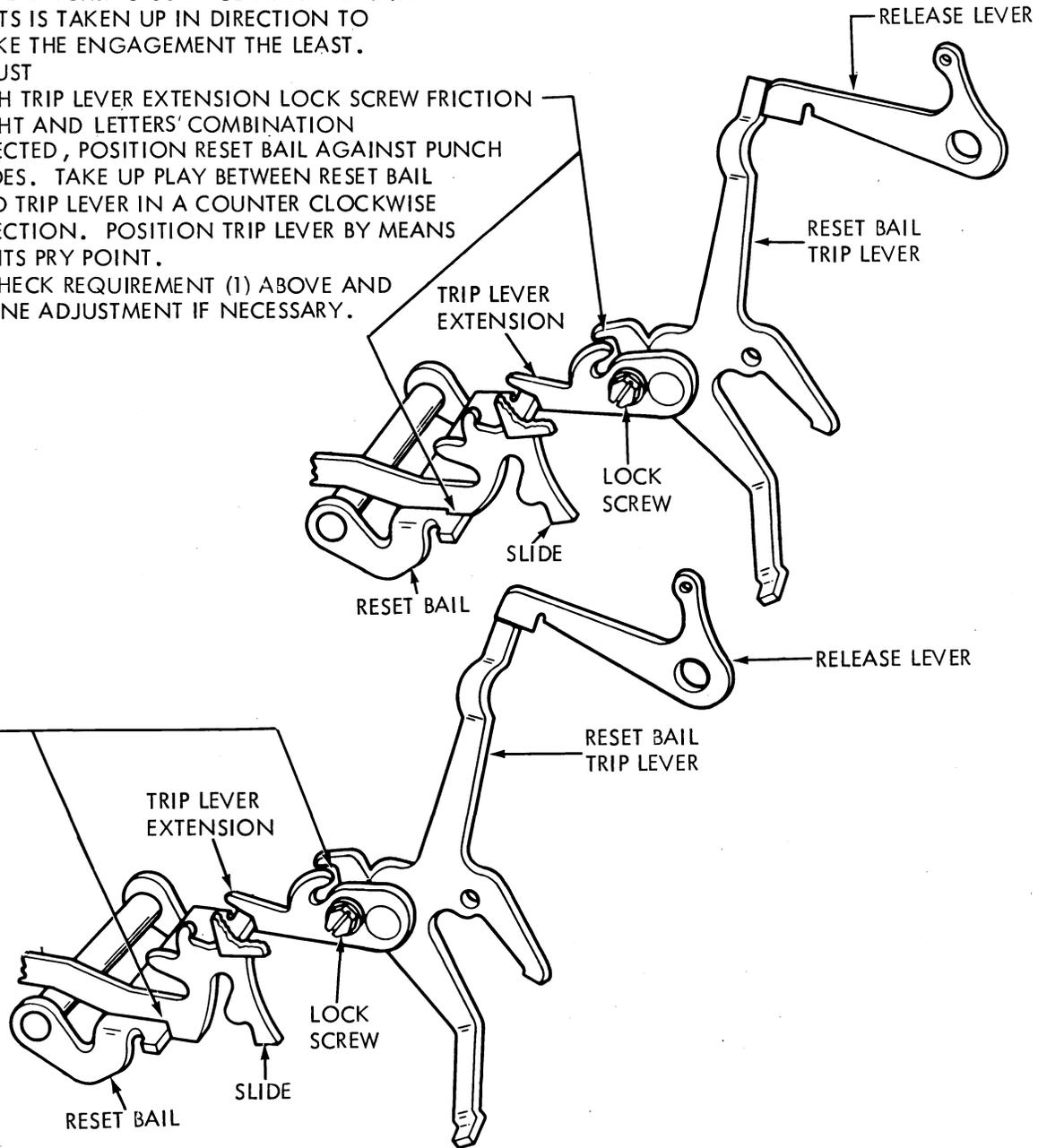
2.12 Punch Mechanism continued

RESET BAIL TRIP LEVER  
REQUIREMENT

- (1) MANUALLY SELECT BLANK COMBINATION. MANUALLY ROTATE RESET BAIL TRIP LEVER. THE PUNCH SLIDE RESET BAIL SHALL TRIP BEFORE THE FUNCTION CLUTCH IS TRIPPED.
- (2) WITH FUNCTION AND SELECTOR CLUTCHES DIS-ENGAGED AND LATCHED, THE PUNCH SLIDE RESET BAIL SHALL FULLY ENGAGE THE PUNCH SLIDE LATCHING SURFACE WHEN PLAY IN PARTS IS TAKEN UP IN DIRECTION TO MAKE THE ENGAGEMENT THE LEAST.

TO ADJUST

- (1) WITH TRIP LEVER EXTENSION LOCK SCREW FRICTION TIGHT AND LETTERS' COMBINATION SELECTED, POSITION RESET BAIL AGAINST PUNCH SLIDES. TAKE UP PLAY BETWEEN RESET BAIL AND TRIP LEVER IN A COUNTER CLOCKWISE DIRECTION. POSITION TRIP LEVER BY MEANS OF ITS PRY POINT.
- (2) RECHECK REQUIREMENT (1) ABOVE AND REFINE ADJUSTMENT IF NECESSARY.



2.13 Punch Mechanism continued

LATCH LEVER CLEARANCE

REQUIREMENT (FOR BOTH TYPING AND NON-TYPING PERFORATORS)

WITH "BLANK" COMBINATION SELECTED, THE FUNCTION CLUTCH DISENGAGED AND LATCHED. CLEARANCE BETWEEN THE PUNCH SLIDE AND ITS ASSOCIATED LATCH LEVER.

MIN. 0.015 INCH

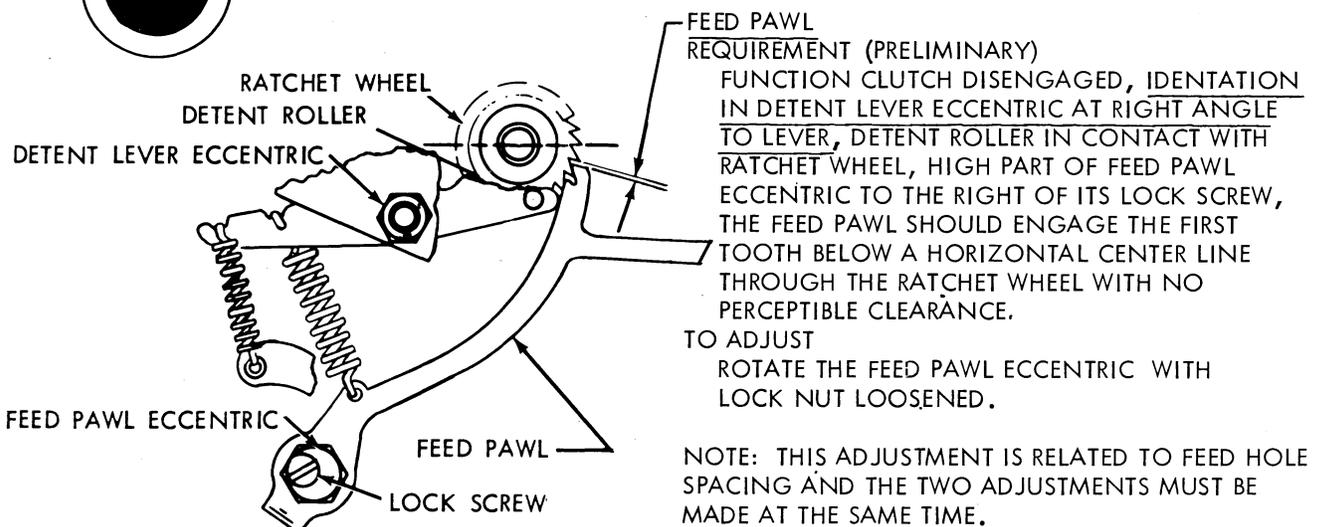
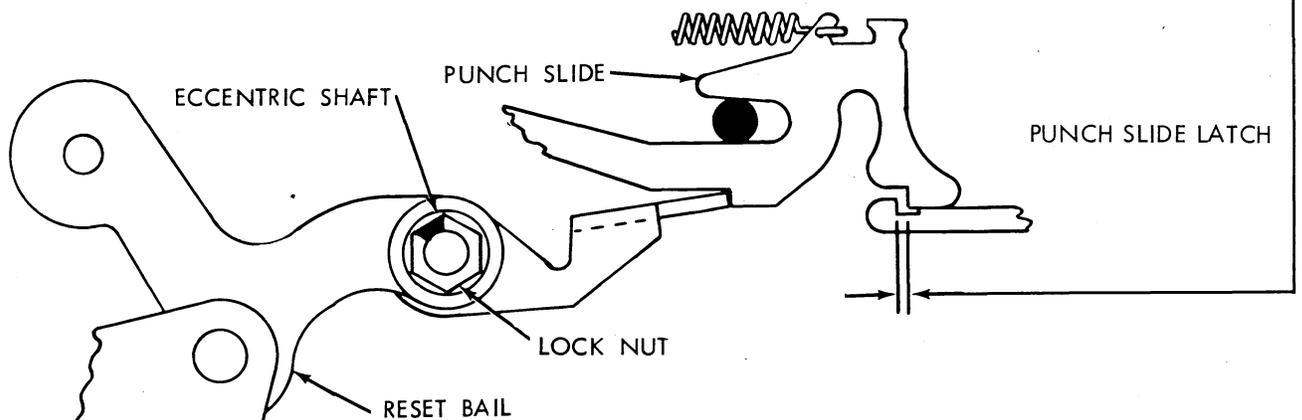
MAX. 0.025 INCH

FOR THE SLIDE HAVING THE LEAST CLEARANCE.

TO ADJUST

LOOSEN THE LOCK NUT ON THE RESET BAIL ECCENTRIC SHAFT AND POSITION THE RESET BAIL BY ROTATING THE ECCENTRIC SHAFT TO MEET THE REQUIREMENT; THE INDENT SHALL BE KEPT ABOVE THE HORIZONTAL CENTER LINE OF THE ECCENTRIC.

NOTE: ON KEYBOARD PERFORATORS NOT HAVING A "BLANK" KEY, SUBSTITUTE USE OF THE "T" KEY WHENEVER USE OF THE "BLANK" KEY IS REQUIRED.



## 2.14 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.

FEED HOLE SPACING (PRELIMINARY)  
REQUIREMENT

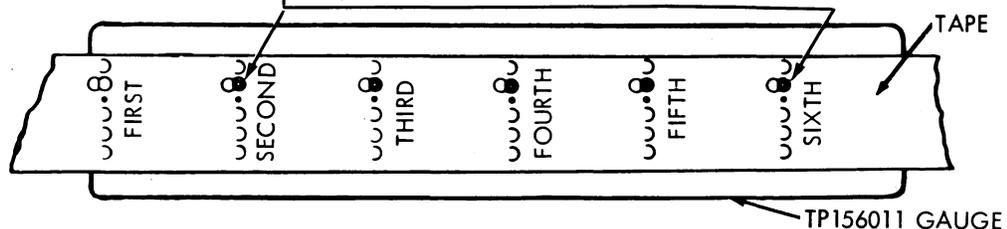
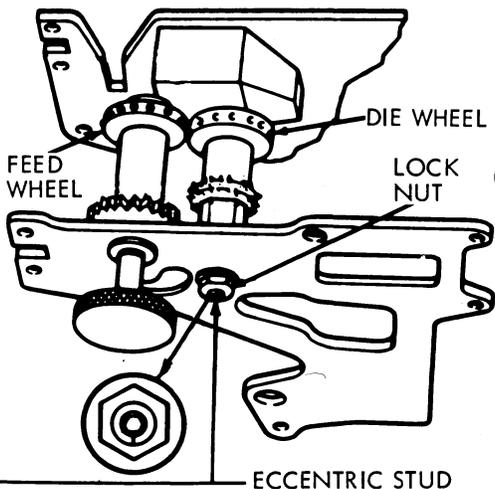
THE INDENT OF DIE WHEEL ECCENTRIC STUD SHALL BE POINTING DOWNWARD.  
TO ADJUST  
POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED.

## NOTE

BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE  
SPRING TENSIONS.

FEED HOLE SPACING (FINAL)  
REQUIREMENT

- (1) WITH TAPE SHOE BLOCKED AWAY FROM THE FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHALL ROTATE FREELY. (CHECK THROUGH 3 OR 4 ROTATIONS).
- (2) PERFORATE SIX SERIES OF (9) "BLANK" COMBINATIONS FOLLOWED BY (1) "LETTERS" COMBINATION. OPEN CHADS SO CODE HOLES ARE VISIBLE. PLACE TAPE OVER SMOOTH SIDE OF THE TP156011 TAPE GAUGE SO CIRCULAR PORTION OF THE FIRST NUMBER TWO CODE HOLE IN TAPE IS CONCENTRIC WITH THE FIRST (0.072) HOLE OF TAPE GAUGE. (SEE NOTE). THE NEXT FOUR 0.072 HOLES IN TAPE GAUGE SHALL BE VISIBLE THROUGH THE NUMBER TWO CODE HOLES IN TAPE AND CIRCULAR PORTION OF THE LAST (SIXTH) NUMBER TWO CODE HOLE IN TAPE SHALL BE ENTIRELY WITHIN THE 0.086 DIA. HOLE OF TAPE GAUGE.



NOTE: THE FIRST FIVE HOLES IN GAUGE ARE THE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER) BUT THE SIXTH HOLE IN GAUGE IS LARGER THAN THE FIRST FIVE (0.086 INCH DIAMETER). THIS ARRANGEMENT ALLOWS  $\pm 0.007$  INCH VARIATION IN FIVE (5) INCHES.

## TO ADJUST

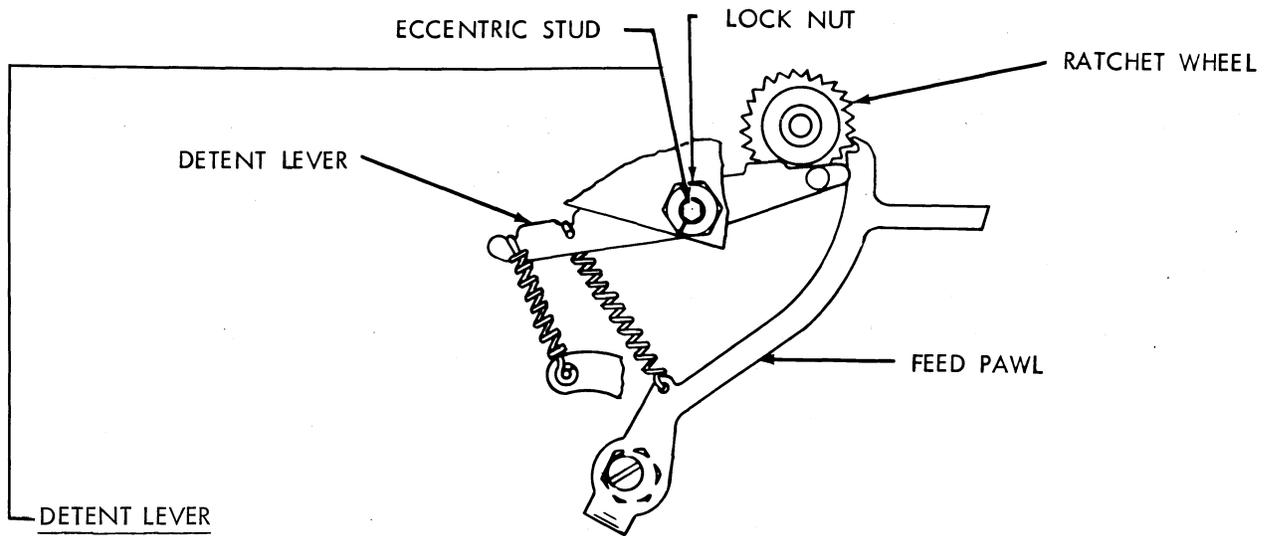
- (1) WITH TAPE REMOVED FROM PUNCH MECHANISM, LOOSEN DIE WHEEL ECCENTRIC STUD LOCK NUT AND ADJUST DIE WHEEL SO THAT IT JUST BINDS ON FEED WHEEL, BACK OFF ECCENTRIC SO DIE WHEEL IS JUST FREE (CHECK FREENESS THROUGH 3 OR 4 ROTATIONS). KEEP INDENT OF ECCENTRIC STUD BELOW THE HORIZONTAL CENTER LINE OF STUD.
- (2) CHECK TEN CHARACTERS PER INCH REQUIREMENT AND REFINE FEED WHEEL DIE WHEEL CLEARANCE ADJUSTMENT TO MEET THE REQUIREMENT BY MOVING INDENT OF DIE WHEEL ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE CHARACTER SPACING AND AWAY FROM FEED WHEEL TO INCREASE THE CHARACTER SPACING.

CAUTION: WITH THE TAPE REMOVED FROM THE PUNCH MECHANISM, BE SURE THE DIE WHEEL DOES NOT BIND.

- (3) WITH THE TAPE SHOE AWAY FROM THE FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND THE TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHALL ROTATE FREELY. FAILURE TO MEET THIS REQUIREMENT INDICATES THE DIE WHEEL ECCENTRIC HAS BEEN OVER-ADJUSTED. TO MEET THIS REQUIREMENT, REFINE THE ADJUSTMENT.

2.15 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.



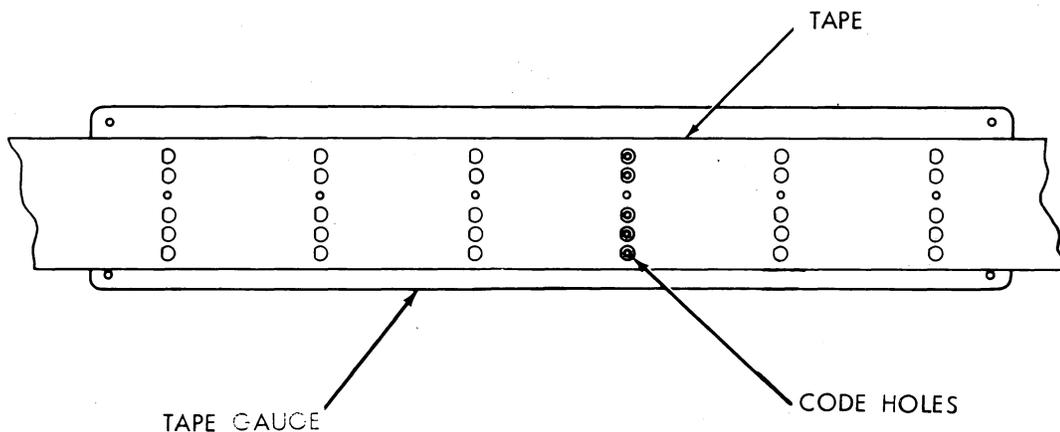
REQUIREMENT

A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION PERFORATED ON THE PERFORATOR MUST CONFORM TO THE TP156011 TAPE GAUGE. THE LATERAL CENTERLINE THROUGH THE CODE HOLES IN THE TAPE SHOULD COINCIDE WITH A LATERAL CENTERLINE THROUGH THE HOLES IN THE GAUGE.

TO ADJUST

ROTATE THE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED HOLES TOWARD THE HINGED EDGE OF THE CODE HOLES AND COUNTERCLOCKWISE TO MOVE THE FEED HOLES TOWARD THE TRAILING EDGE OF THE CODE HOLES. TIGHTEN THE ECCENTRIC LOCK NUT AND REFINISH THE FEED PAWL ADJUSTMENT.

RECHECK FEED PAWL ADJUSTMENT.



2.16 Punch Mechanism continued

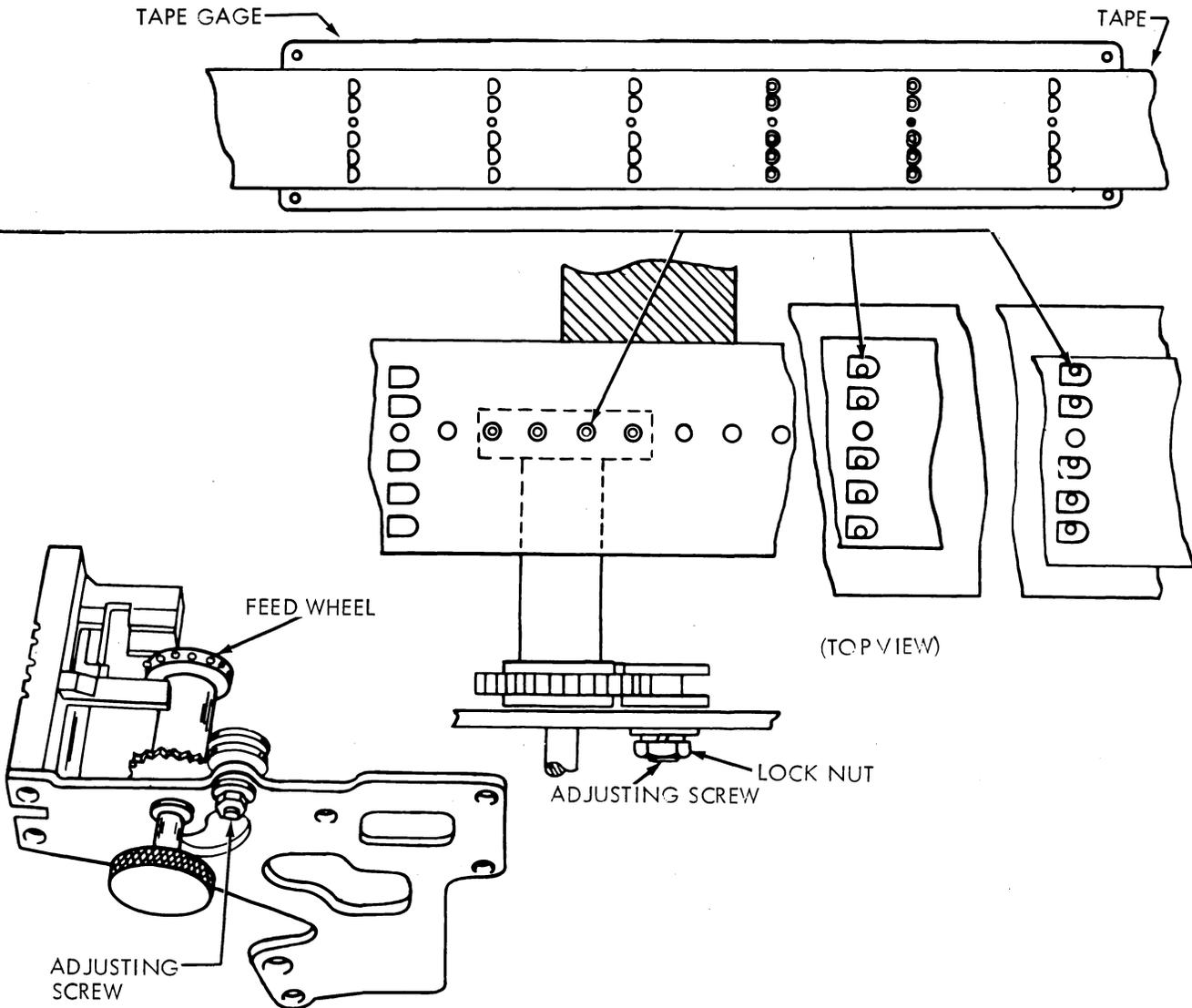
FEED HOLE LATERAL ALIGNMENT  
REQUIREMENT

WITH MACHINE OPERATING UNDER POWER, OBTAIN A TAPE CONSISTING OF A SERIES OF NINE "BLANKS" FOLLOWED BY A "LETTERS" COMBINATION. OPEN CHADS SO CODE HOLES ARE VISIBLE AND PLACE TAPE OVER THE TP156011 TAPE GAUGE WITH "LETTERS" COMBINATION FEED HOLES ENGAGING FEED PINS. THE LARGE HOLES IN GAUGE ARE THE SAME DIAMETER AS THE CIRCULAR PORTION OF CODE HOLES IN TAPE. THE SMALL HOLES IN GAUGE SERVE AS A GUIDE FOR GAUGING. THE CIRCULAR PORTION OF CODE HOLES IN TAPE SHALL BE CONCENTRIC WITH HOLES IN TAPE GAUGE.

TO ADJUST

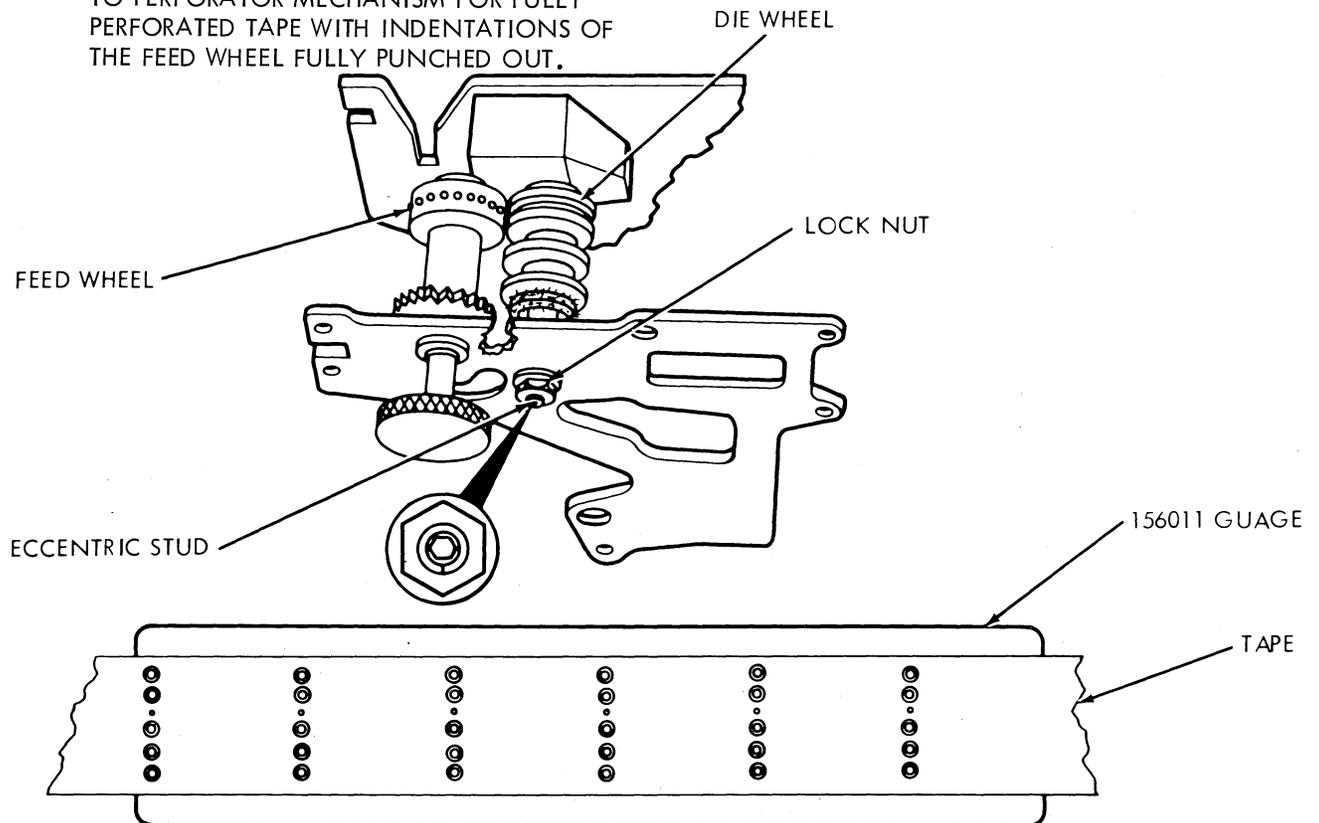
LOOSEN ADJUSTING SCREW LOCK NUT AND POSITION ADJUSTING SCREW. TO MOVE HOLES OF GAUGE AWAY FROM REFERENCE EDGE OF TAPE, MOVE FEED WHEEL TOWARDS FRONT PLATE OF PUNCH MECHANISM BY ROTATING ADJUSTING SCREW COUNTER CLOCKWISE. TO MOVE HOLES OF GAUGE TOWARD THE REFERENCE EDGE OF TAPE, MOVE FEED WHEEL TOWARD BACKPLATE OF PUNCH MECHANISM BY ROTATING ADJUSTING SCREW CLOCKWISE. TIGHTEN THE LOCK NUT. REFINE DETENT ADJUSTMENT TO ALIGN LATERAL CENTER LINES OF CODE HOLES AND FEED HOLE IF REQUIRED.

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.



## 2.17 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE WITH INDENTATIONS OF THE FEED WHEEL FULLY PUNCHED OUT.



NOTE: BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENT CHECK BOTH TAPE GUIDE SPRING TENSIONS

#### FEED HOLE SPACING

##### (1) REQUIREMENT

WITH A PIECE OF TAPE PERFORATED WITH SIX SERIES OF 9 BLANK CODE COMBINATIONS FOLLOWED BY A LETTERS COMBINATION PLACED OVER THE SMOOTH SIDE OF THE 156011 TAPE GAUGE SO THAT THE CIRCULAR PORTION OF THE FIRST NUMBER 2 CODE HOLE IN THE TAPE IS CONCENTRIC WITH THE FIRST HOLE OF THE TAPE GAUGE, THE NEXT FOUR HOLES IN THE TAPE GAUGE SHOULD BE VISIBLE THROUGH THE NUMBER 2 CODE HOLES IN THE TAPE AND THE CIRCULAR PORTION OF THE LAST (SIXTH) NUMBER 2 CODE HOLE IN THE TAPE SHALL BE ENTIRELY WITHIN THE 0.086 DIAMETER HOLE OF THE TAPE GAUGE.

##### (2) REQUIREMENT

WITH TAPE SHOE HELD AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DIS-ENGAGED AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY.

##### TO ADJUST

WITH TAPE REMOVED FROM THE PUNCH MECHANISM, LOOSEN THE ECCENTRIC LOCK NUT AND ROTATE THE DIE WHEEL ECCENTRIC SHAFT UNTIL IT BINDS AGAINST THE FEED WHEEL. BACK OFF THE ECCENTRIC UNTIL THE DIE WHEEL IS JUST FREE. KEEP THE INDENT OF THE ECCENTRIC BELOW THE HORIZONTAL CENTERLINE OF THE STUD. REFINE ADJUSTMENT FOR REQUIREMENT (1), IF NECESSARY, BY MOVING THE DIE WHEEL TOWARD THE FEED WHEEL TO DECREASE THE CHARACTER SPACING AND AWAY FROM THE FEED WHEEL TO INCREASE THE CHARACTER SPACING.

2.18 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE WITH INDENTATIONS OF THE FEED WHEEL FULLY PUNCHED OUT.

FEED WHEEL INDENTATION ALIGNMENT

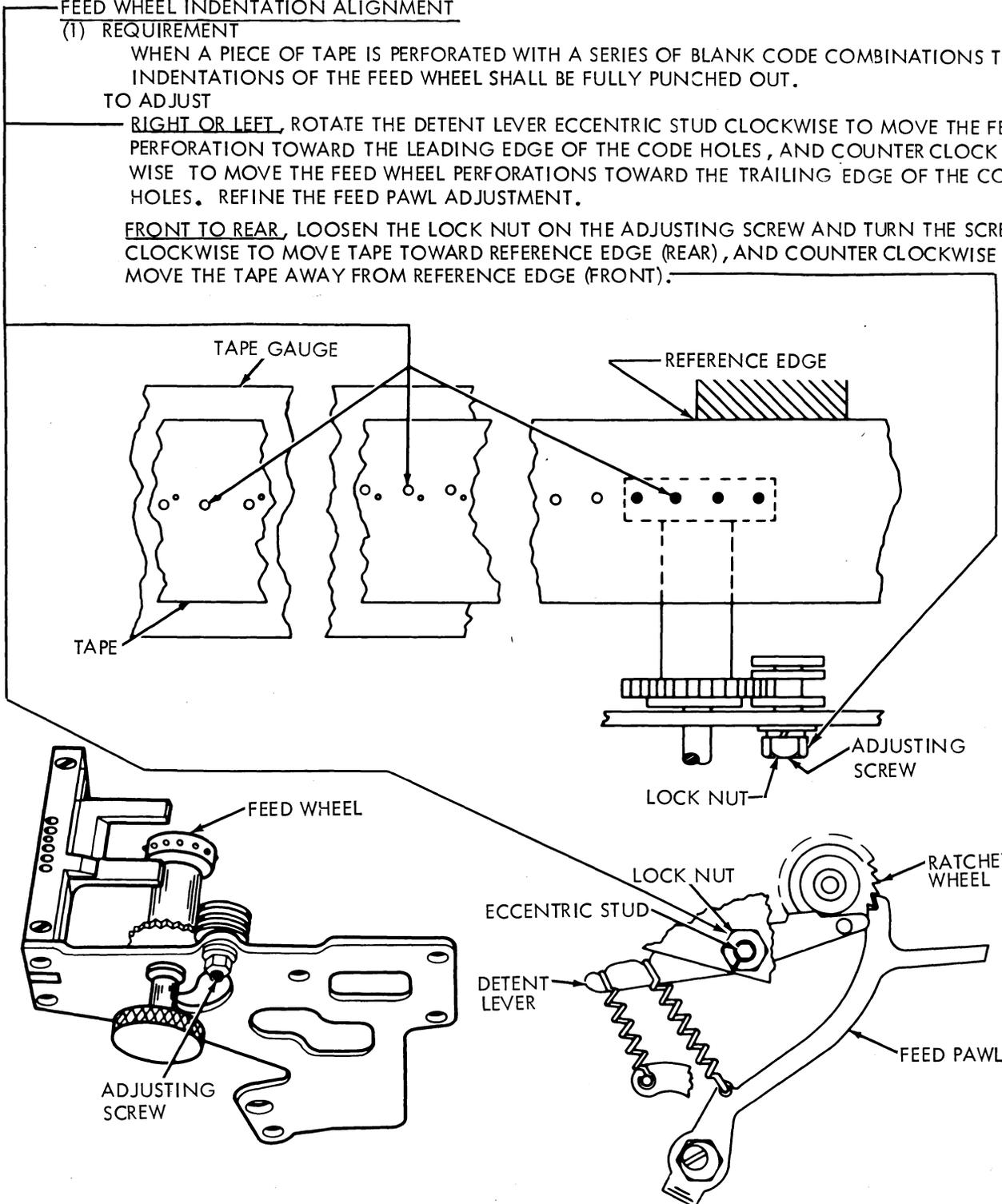
(1) REQUIREMENT

WHEN A PIECE OF TAPE IS PERFORATED WITH A SERIES OF BLANK CODE COMBINATIONS THE INDENTATIONS OF THE FEED WHEEL SHALL BE FULLY PUNCHED OUT.

TO ADJUST

RIGHT OR LEFT, ROTATE THE DETENT LEVER ECCENTRIC STUD CLOCKWISE TO MOVE THE FEED PERFORATION TOWARD THE LEADING EDGE OF THE CODE HOLES, AND COUNTER CLOCKWISE TO MOVE THE FEED WHEEL PERFORATIONS TOWARD THE TRAILING EDGE OF THE CODE HOLES. REFINE THE FEED PAWL ADJUSTMENT.

FRONT TO REAR, LOOSEN THE LOCK NUT ON THE ADJUSTING SCREW AND TURN THE SCREW CLOCKWISE TO MOVE TAPE TOWARD REFERENCE EDGE (REAR), AND COUNTER CLOCKWISE TO MOVE THE TAPE AWAY FROM REFERENCE EDGE (FRONT).



2.19 Punch Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE WITH INDENTATIONS OF THE FEED WHEEL BETWEEN THE FEED HOLES.

NOTE: BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS.

FEED HOLE SPACING (FINAL)  
REQUIREMENT

- (1) WITH TAPE SHOE BLOCKED AWAY FROM THE FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHALL ROTATE FREELY. (CHECK THROUGH 3 OR 4 ROTATIONS).
- (2) PERFORM SIX SERIES OF (9) "BLANK" COMBINATIONS FOLLOWED BY (1) "LETTERS" COMBINATION. PLACE TAPE OVER SMOOTH SIDE OF THE TP156011 TAPE GAUGE SO CIRCULAR PORTION OF THE FIRST NUMBER TWO CODE HOLE IN TAPE IS CONCENTRIC WITH THE FIRST (0.072) HOLE OF TAPE GAUGE. (SEE NOTE). THE NEXT FOUR 0.072 HOLES IN TAPE GAUGE SHALL BE VISIBLE THROUGH THE NUMBER TWO CODE HOLES IN TAPE AND CIRCULAR PORTION OF THE LAST (SIXTH) NUMBER TWO CODE HOLE IN TAPE SHALL BE ENTIRELY WITHIN THE 0.086 DIA. HOLE OF TAPE GAUGE.

NOTE:

THE FIRST FIVE HOLES IN GAUGE ARE THE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER) BUT THE SIXTH HOLE IN GAUGE IS LARGER THAN THE FIRST FIVE (0.086 INCH DIAMETER). THIS ARRANGEMENT ALLOWS  $\pm 0.007$  INCH VARIATION IN FIVE (5) INCHES.

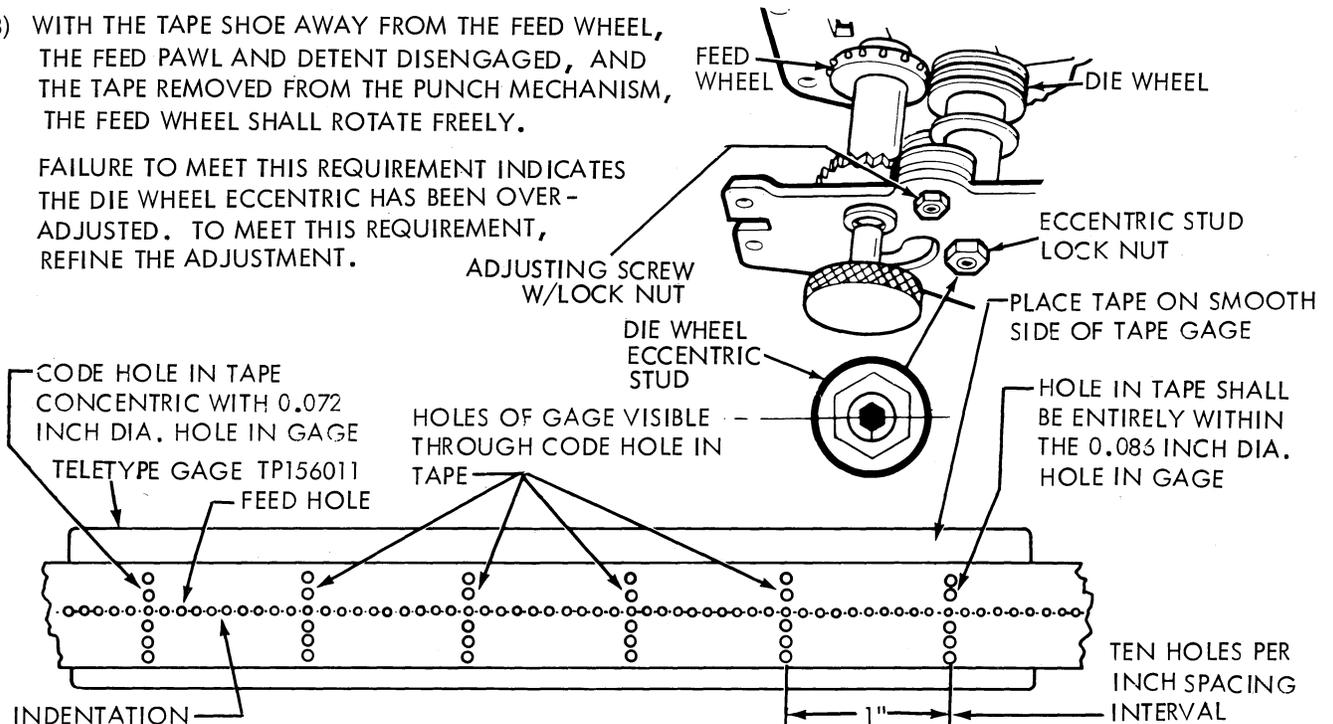
TO ADJUST

- (1) WITH TAPE REMOVED FROM PUNCH MECHANISM, LOOSEN DIE WHEEL ECCENTRIC STUD LOCK NUT AND ADJUST DIE WHEEL SO THAT IT JUST BINDS ON FEED WHEEL, BACK OFF ECCENTRIC SO DIE WHEEL IS JUST FREE (CHECK FREENESS THROUGH 3 OR 4 ROTATIONS). KEEP INDENT OFF ECCENTRIC STUD BELOW THE HORIZONTAL CENTER LINE OF STUD.
- (2) CHECK TEN CHARACTERS PER INCH REQUIREMENT AND REFINE FEED WHEEL DIE WHEEL CLEARANCE ADJUSTMENT TO MEET THE REQUIREMENT BY MOVING INDENT OF DIE WHEEL ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE CHARACTER SPACING AND AWAY FROM FEED WHEEL TO INCREASE THE CHARACTER SPACING.

CAUTION: WITH THE TAPE REMOVED FROM THE PUNCH MECHANISM, BE SURE THE DIE WHEEL DOES NOT BIND.

- (3) WITH THE TAPE SHOE AWAY FROM THE FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND THE TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHALL ROTATE FREELY.

FAILURE TO MEET THIS REQUIREMENT INDICATES THE DIE WHEEL ECCENTRIC HAS BEEN OVER-ADJUSTED. TO MEET THIS REQUIREMENT, REFINE THE ADJUSTMENT.



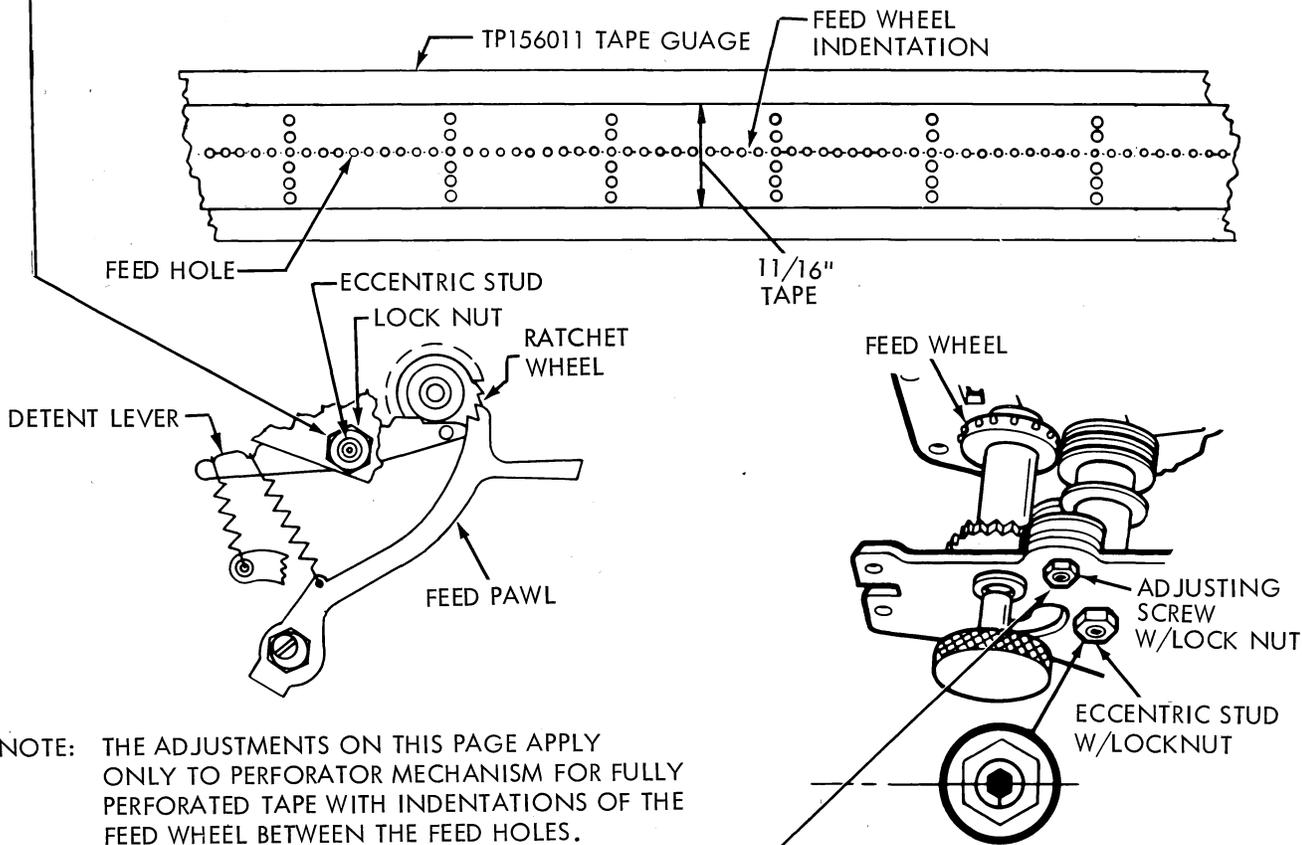
2.20 Punch Mechanism continued

**DETENT (FOR FULLY PERFORATED TAPE WITH INDENTATION OF FEED WHEEL BETWEEN THE FEED HOLES) REQUIREMENT**

WITH THE UNIT OPERATING UNDER POWER, THE INDENTATIONS OF THE FEED WHEEL SHALL BE CENTRALLY LOCATED BETWEEN TWO FULLY PERFORATED FEED HOLES, AS GAUGED BY EYE.

**TO ADJUST**

LOOSEN THE DETENT LEVER ECCENTRIC STUD LOCK NUT AND TURN THE ECCENTRIC STUD CLOCKWISE TO MOVE THE INDENTATION TOWARD THE LEADING EDGE OF THE FEED HOLE AND COUNTERCLOCKWISE TO MOVE THE INDENTATION TOWARD THE TRAILING EDGE. TIGHTEN THE LOCK NUT AND RE-CHECK THE FEED PAWL ADJUSTMENT.



NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE WITH INDENTATIONS OF THE FEED WHEEL BETWEEN THE FEED HOLES.

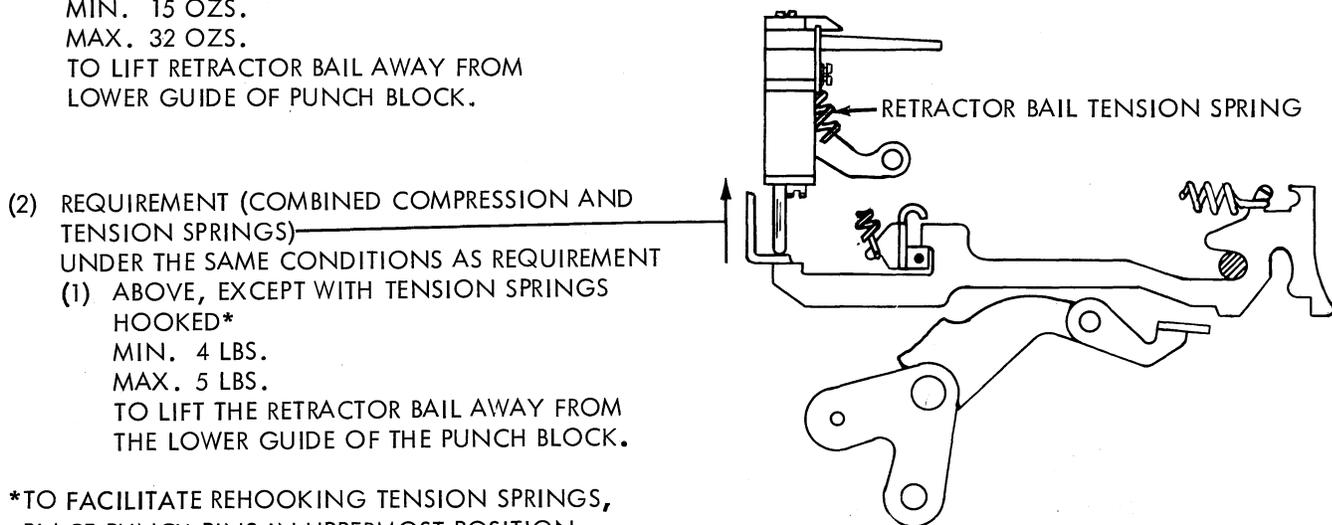
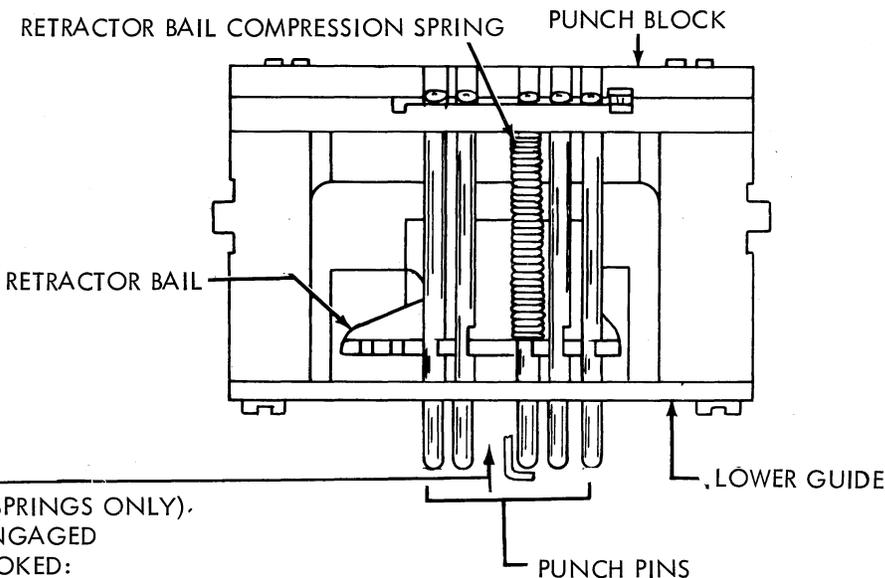
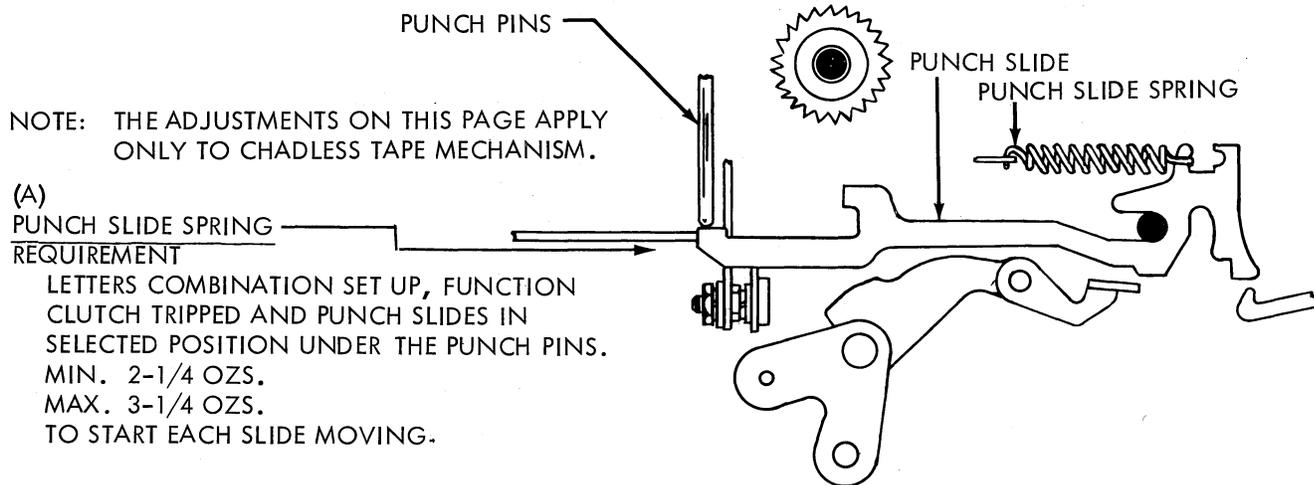
**FEED HOLE LATERAL ALIGNMENT REQUIREMENT**

WITH THE UNIT OPERATING UNDER POWER, THE INDENTATIONS OF THE FEED WHEEL SHOULD BE ON A CENTERLINE BETWEEN THE FULLY PERFORATED FEED HOLES, AS GAUGED BY EYE.

**TO ADJUST**

WITH THE ADJUSTING SCREW LOCK NUT LOOSE TURN THE ADJUSTING SCREW CLOCKWISE TO MOVE THE INDENTATION TOWARD THE REAR AND COUNTERCLOCKWISE TO MOVE THE INDENTATIONS TOWARD THE FRONT.

2.21 Punch Mechanism continued



2.22 Punch Mechanism continued

(B) TAPE GUIDE ASSEMBLY SPRING

REQUIREMENT

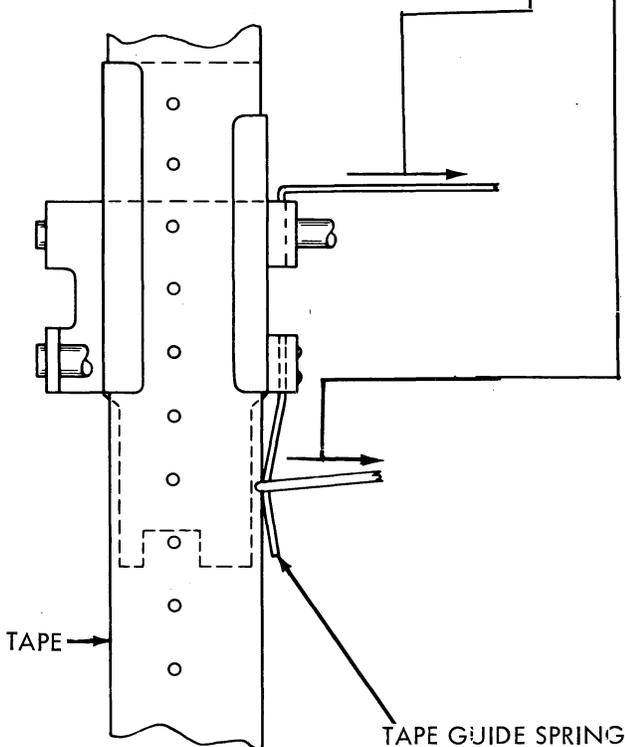
THE TAPE GUIDE ASSEMBLY SHOULD BE FREE TO RETURN TO REST AGAINST THE TAPE GUIDE BLOCK AFTER A MIN. 16 OZS.

IS USED TO PULL THE TAPE GUIDE ASSEMBLY AWAY FROM THE BLOCK.

TO ADJUST

REPLACE SPRING IF REQUIREMENT IS NOT MET.

IF THE TAPE GUIDE ASSEMBLY IS NOT FREE TO RETURN, REPOSITION THE TAPE GUIDE ASSEMBLY MOUNTING POST TO FREE THE TAPE GUIDE ASSEMBLY.



(A)

TAPE GUIDE SPRING (TAPE CHUTE)

REQUIREMENT

CLUTCH DISENGAGED AND TAPE THREADED THROUGH THE PUNCH ASSEMBLY, IT SHOULD REQUIRE

MIN. 1-1/4 OZS.

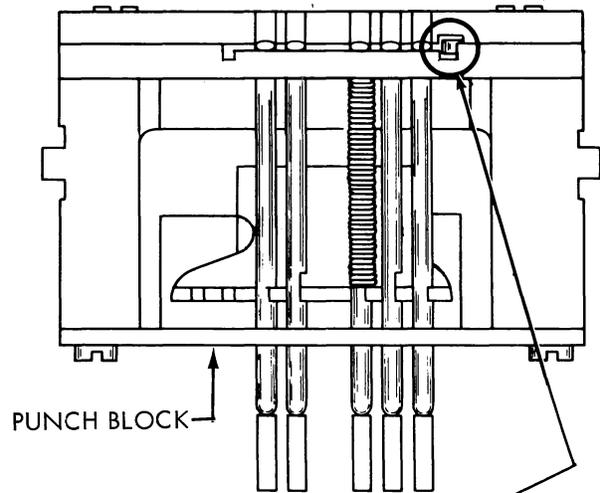
MAX. 2-1/4 OZS.

TO JUST MOVE THE SPRING AWAY FROM THE TAPE.

TO ADJUST

BEND THE SPRING.

NOTE: IN ORDER TO CHECK THIS SPRING TENSION ON UNITS EQUIPPED WITH BACKSPACE MECHANISM, IT IS NECESSARY TO REMOVE SEVERAL PARTS. IT SHOULD NOT BE CHECKED UNLESS THERE IS REASON TO BELIEVE THAT REQUIREMENTS CANNOT BE MET.



(C) TAPE GUIDE SPRING PUNCH BLOCK (FOR CHADLESS TAPE MECHANISM)

(1) REQUIREMENT

WITH THE TAPE REMOVED FROM THE PUNCH BLOCK THE TAPE GUIDE SPRING SHOULD REST AGAINST THE CLEARANCE SLOT IN THE BLOCK IN A SYMMETRICAL MANNER.

(2) REQUIREMENT

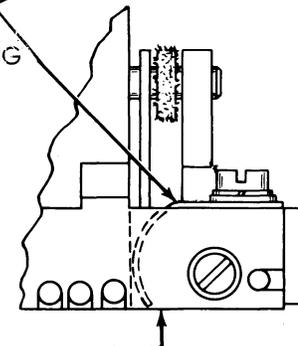
WITH TAPE IN THE PUNCH BLOCK AND THE PERFORATOR OPERATING UNDER POWER, THE SPRING SHOULD NOT DISTORT THE EDGE OF THE TAPE.

TO ADJUST

BEND THE SPRING AND POSITION IT WITH ITS MOUNTING SCREW LOOSENED.

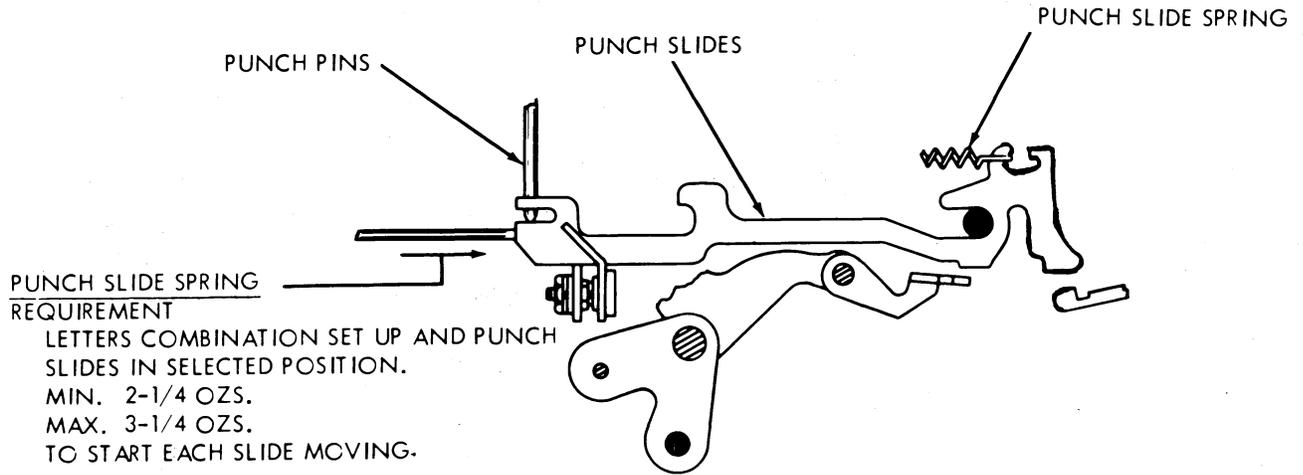
TAPE GUIDE SPRING

PUNCH BLOCK

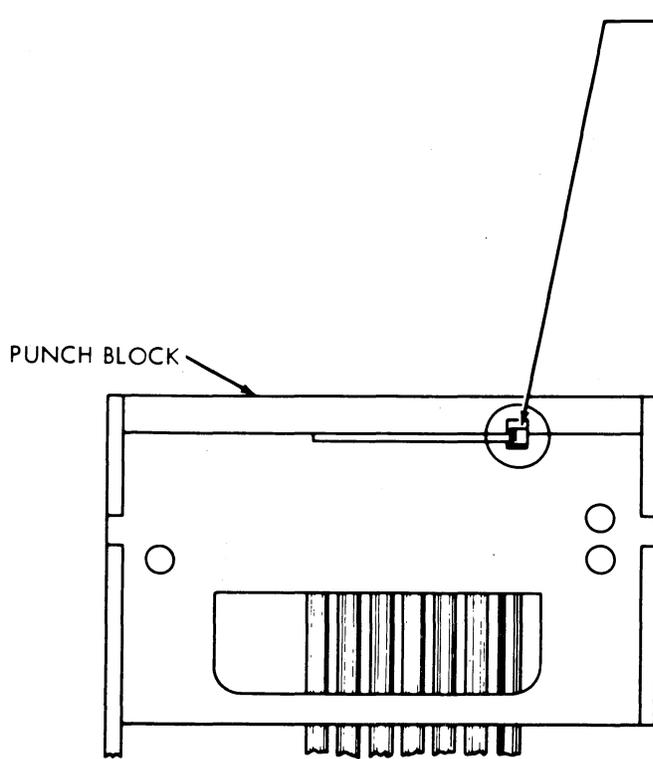


2.23 Punch Mechanism continued

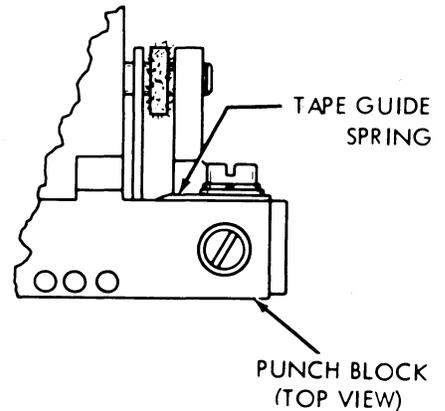
NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM.



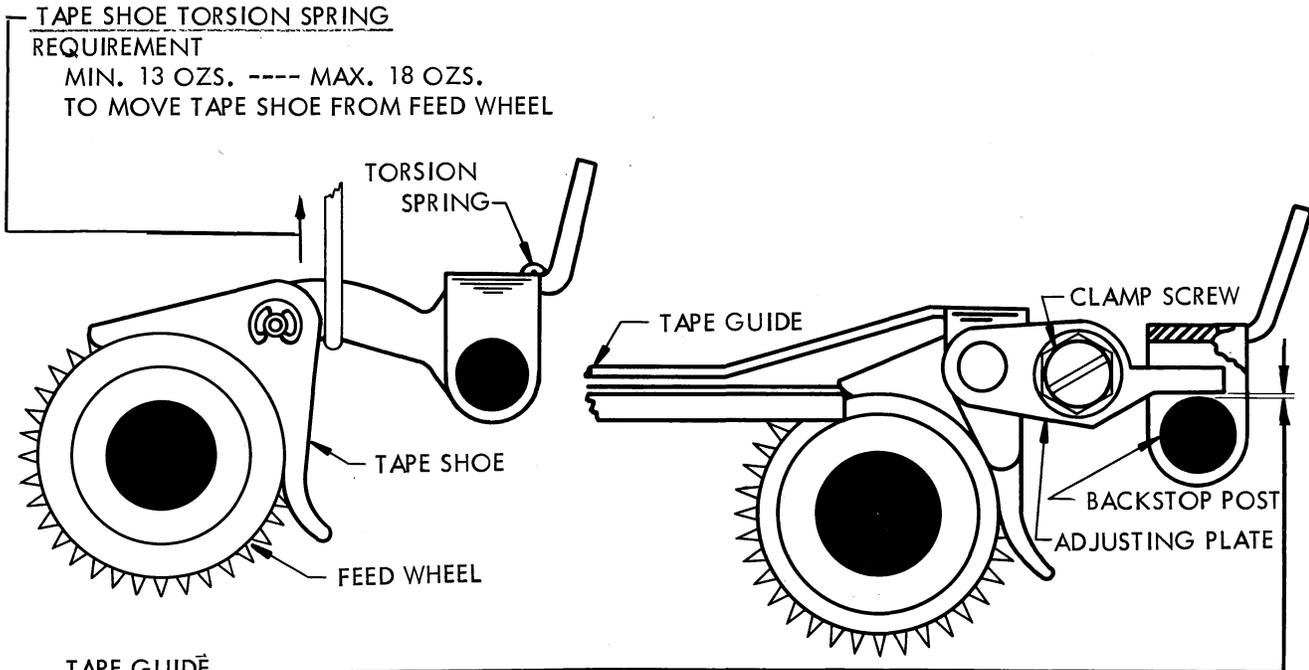
PUNCH SLIDE SPRING REQUIREMENT  
 LETTERS COMBINATION SET UP AND PUNCH SLIDES IN SELECTED POSITION.  
 MIN. 2-1/4 OZS.  
 MAX. 3-1/4 OZS.  
 TO START EACH SLIDE MOVING.



TAPE GUIDE SPRING (PUNCH BLOCK)  
 (1) REQUIREMENT  
 WITH TAPE REMOVED FROM THE PUNCH BLOCK THE TAPE GUIDE SPRING SHOULD REST AGAINST THE CLEARANCE SLOT IN THE BLOCK IN A SYMETRICAL MANNER.  
 (2) REQUIREMENT  
 WITH TAPE IN THE PUNCH BLOCK AND THE REPERFORATOR OPERATING UNDER POWER, THE SPRING SHOULD NOT DISTORT THE EDGE OF THE TAPE.  
 TO ADJUST  
 BEND THE SPRING AND POSITION IT WITH ITS MOUNTING SCREW LOOSENED.



2.24 Punch Mechanism continued



TAPE GUIDE

TO CHECK

ROTATE FEED WHEEL UNTIL OIL HOLE IS UPWARD.  
 CENTER TAPE SHOE AND TAPE GUIDE. HOLD TAPE  
 GUIDE DOWNWARD.

REQUIREMENT

CLEARANCE BETWEEN ADJUSTING PLATE AND  
 BACKSTOP POST.

MIN. 0.002 INCH  
 MAX. 0.008 INCH

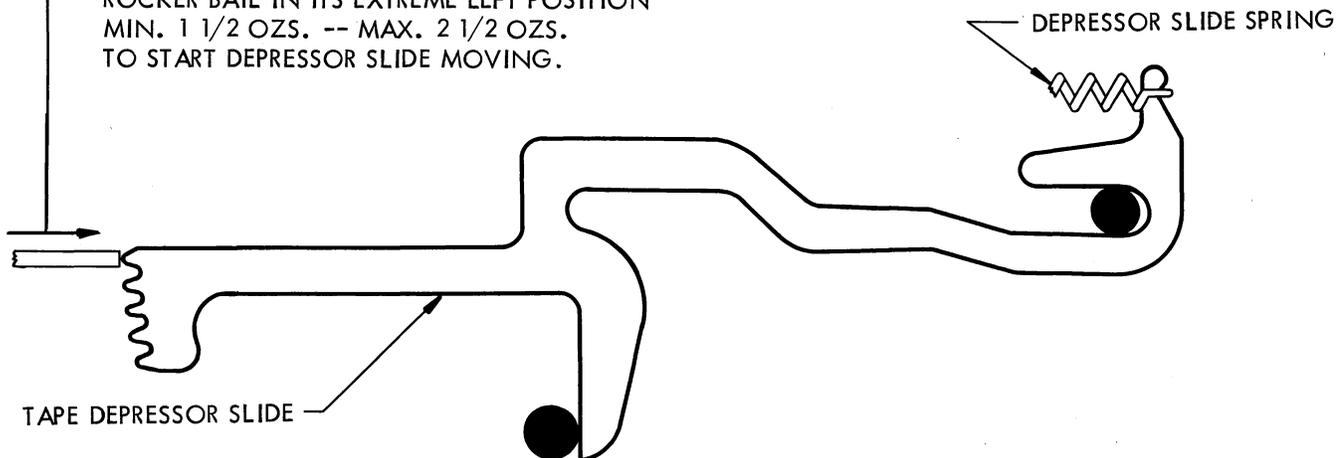
TO ADJUST

POSITION ADJUSTING PLATE WITH ITS CLAMP  
 SCREW LOOSENED.

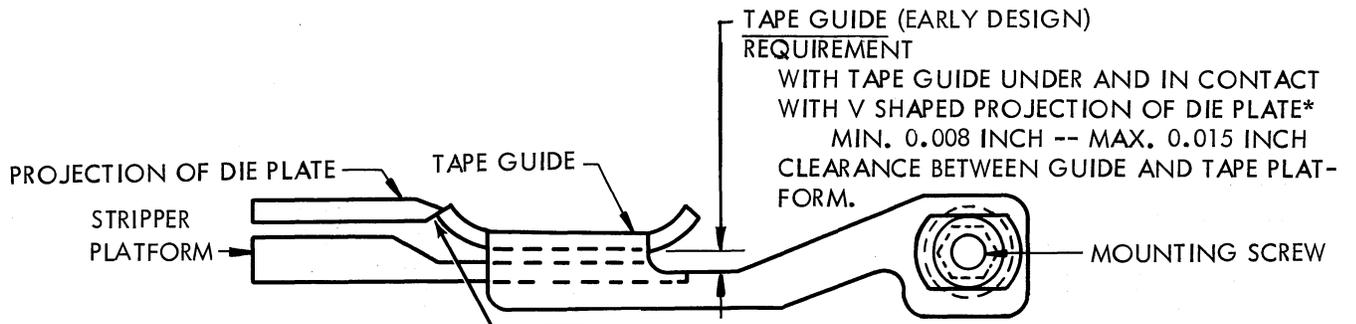
TAPE DEPRESSOR SLIDE SPRING

REQUIREMENT

ROCKER BAIL IN ITS EXTREME LEFT POSITION  
 MIN. 1 1/2 OZS. -- MAX. 2 1/2 OZS.  
 TO START DEPRESSOR SLIDE MOVING.



2.25 Punch Mechanism continued



TAPE GUIDE (EARLY DESIGN)

REQUIREMENT

WITH TAPE GUIDE UNDER AND IN CONTACT WITH V SHAPED PROJECTION OF DIE PLATE\*  
MIN. 0.008 INCH -- MAX. 0.015 INCH  
CLEARANCE BETWEEN GUIDE AND TAPE PLATFORM.

TO ADJUST

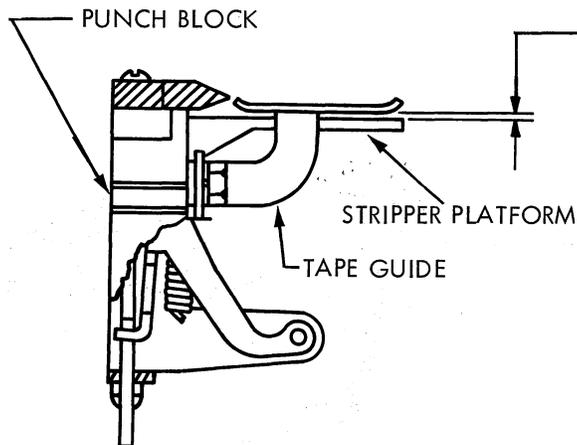
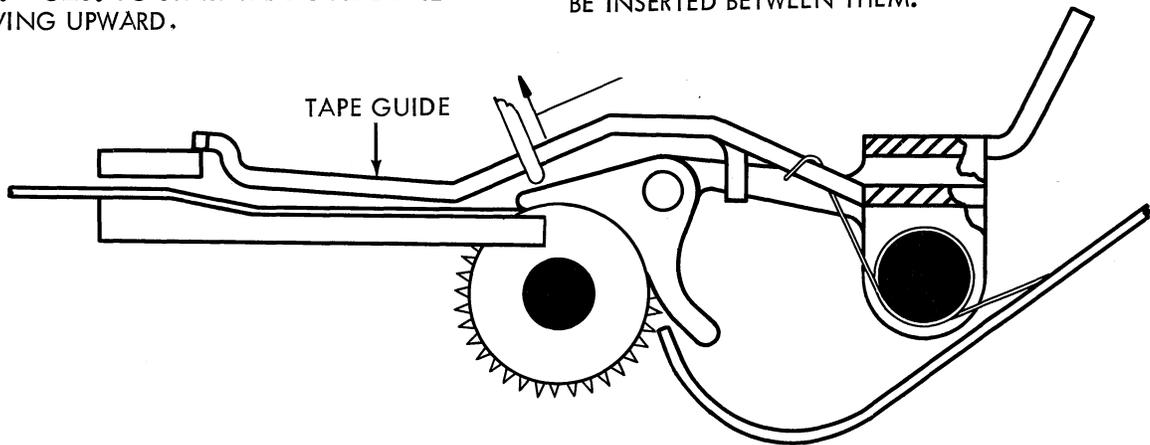
WITH MOUNTING SCREW FRICTION TIGHT, PLACE 0.010 INCH FLAT GAUGE BETWEEN GUIDE AND TAPE PLATFORM. PRESS GUIDE DOWN AND TO LEFT. TIGHTEN MOUNTING SCREW WHILE HOLDING FEED WHEEL ADJUSTING SCREW STATIONARY BY MEANS OF AN ALLEN WRENCH.

\*GUIDE IS CONSIDERED "IN CONTACT" WITH PROJECTION WHEN 0.0015 INCH GAUGE CANNOT BE INSERTED BETWEEN THEM.

TAPE GUIDE SPRING (ON UNITS NOT EQUIPPED WITH TAPE GUIDE ADJUSTING PLATE)

REQUIREMENT

MIN. 8 OZS. TO START TAPE GUIDE BAIL MOVING UPWARD.



TAPE GUIDE (LATEST DESIGN)

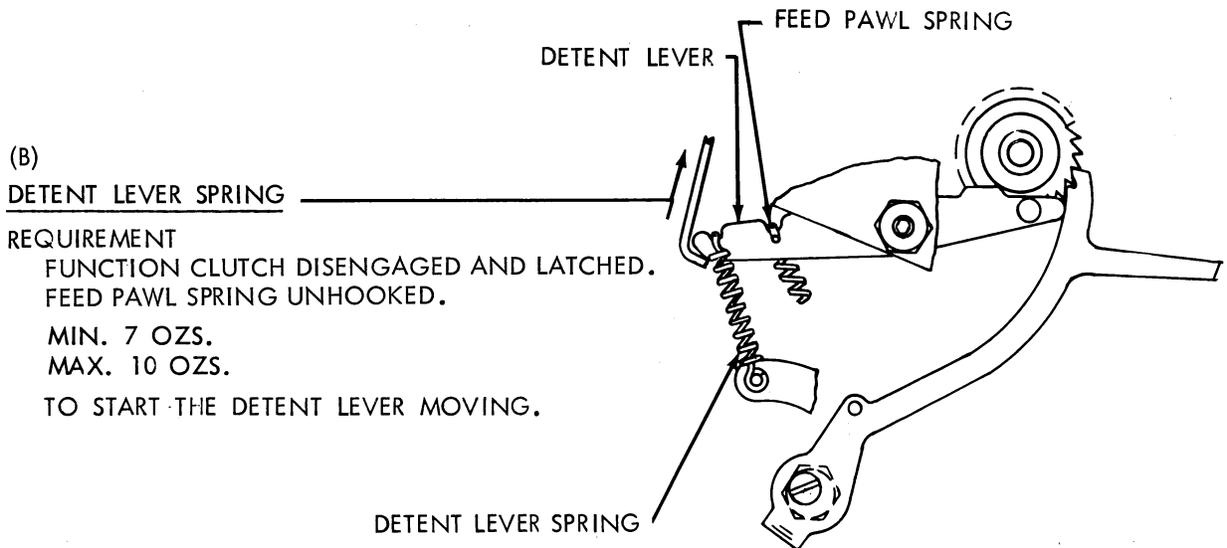
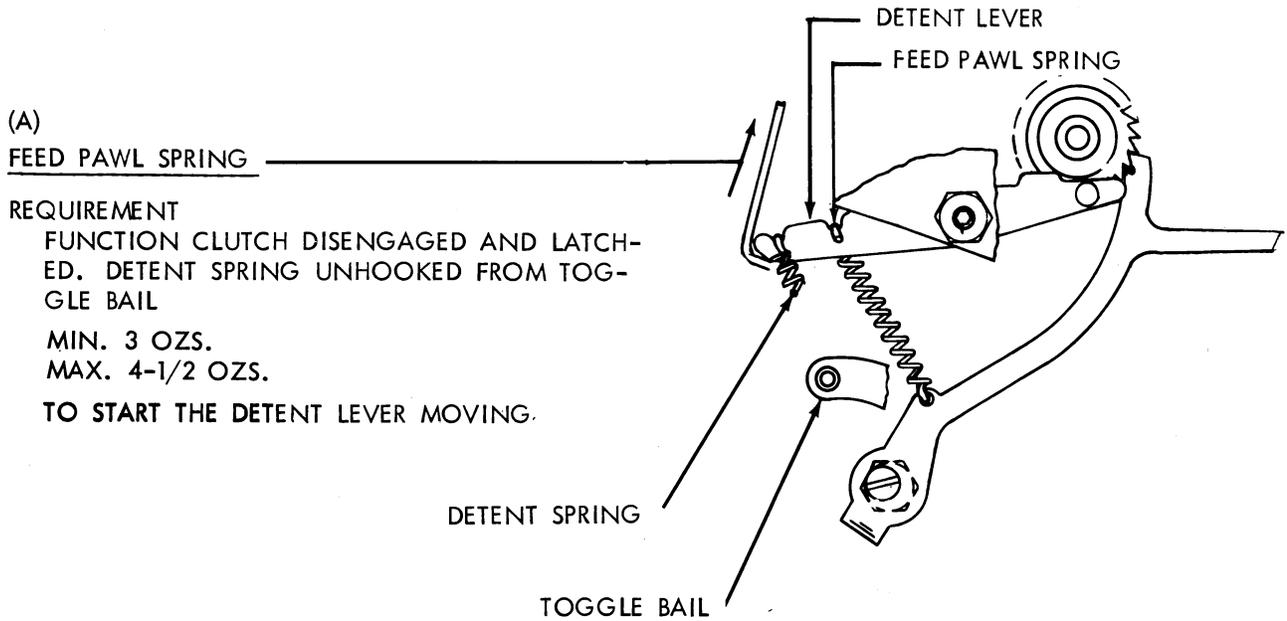
REQUIREMENT

CLEARANCE UNDER THE TAPE GUIDE.  
MIN. 0.008 INCH  
MAX. 0.015 INCH

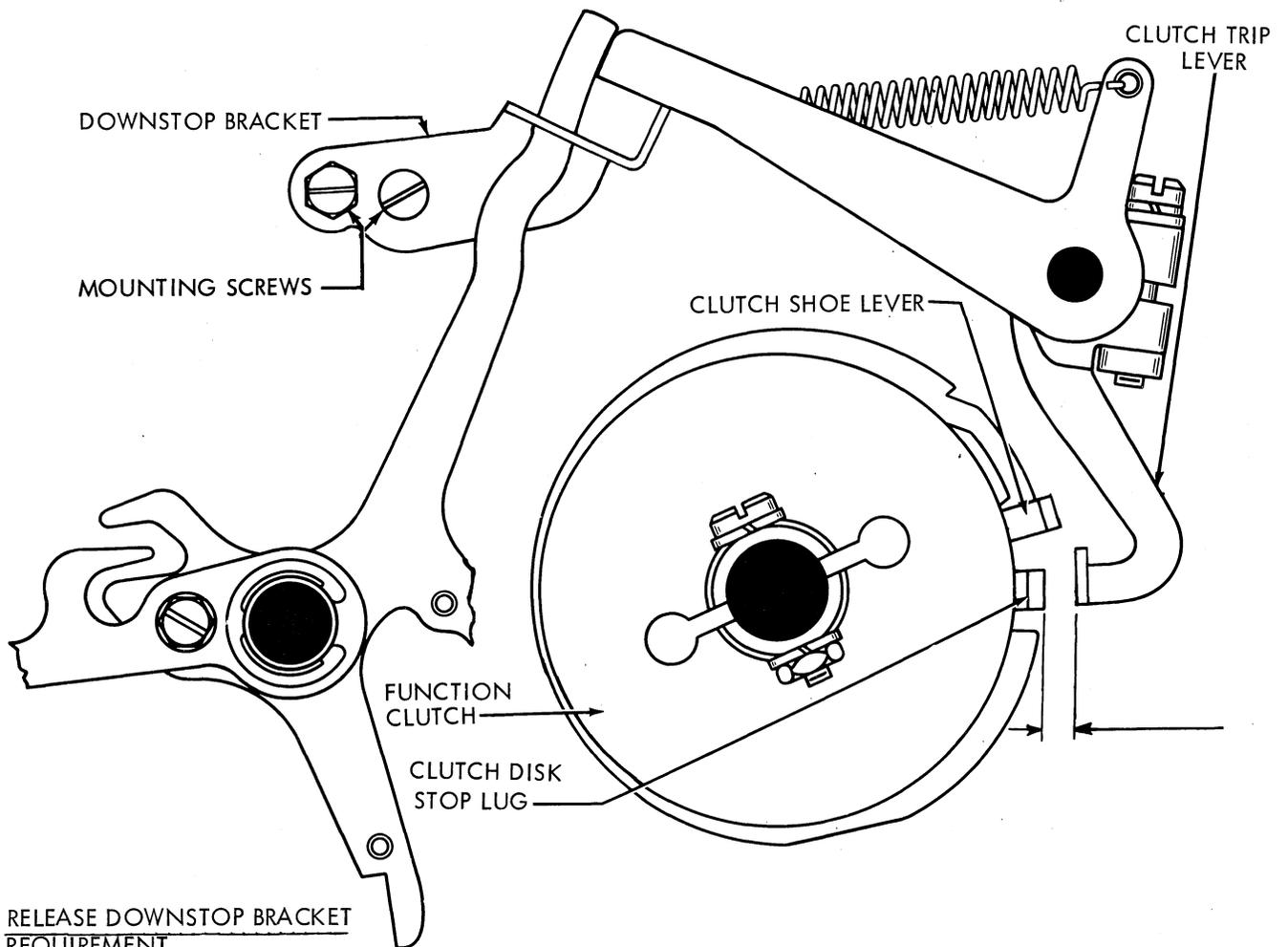
TO ADJUST

WITH MOUNTING SCREW FRICTION TIGHT, POSITION THE TAPE GUIDE, KEEPING THE GUIDE AGAINST THE FRONT PLATE OF THE PUNCH.

2.26 Punch Mechanism continued



## 2.27 Function Mechanism continued

**RELEASE DOWNSTOP BRACKET REQUIREMENT**

WITH FUNCTION CLUTCH TRIPPED, ROTATE SHAFT UNTIL CLEARANCE BETWEEN FUNCTION CLUTCH DISK STOP LUG AND CLUTCH STOP LEVER IS AT A MINIMUM. RELEASE RESTING AGAINST DOWNSTOP BRACKET. CLEARANCE BETWEEN FUNCTION CLUTCH DISK STOP LUG AND STOP LEVER:

MIN. 0.002 INCH---MAX. 0.045 INCH

**TO ADJUST**

REMOVE TAPE GUARD. WITH DOWNSTOP BRACKET MOUNTING SCREWS FRICTION TIGHT POSITION BRACKET. RECHECK FOR SOME CLEARANCE BETWEEN TRIP LEVER EXTENSION AND LEFT END OF SLOT IN RELEASE LEVER DOWNSTOP BRACKET.

**NOTE:** ON NON-TYPING PERFORATORS WITH 2-STOP FUNCTION CLUTCH, GAUGE AT STOP HAVING LEAST CLEARANCE.

2.28 Typing Mechanism

PUSH BAR OPERATING BLADE (PRELIMINARY)

TO CHECK

MANUALLY SELECT LETTERS CODE COMBINATION (12345). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. HOLD NO. 2 AND 3 BELL CRANKS AGAINST STOP POST.

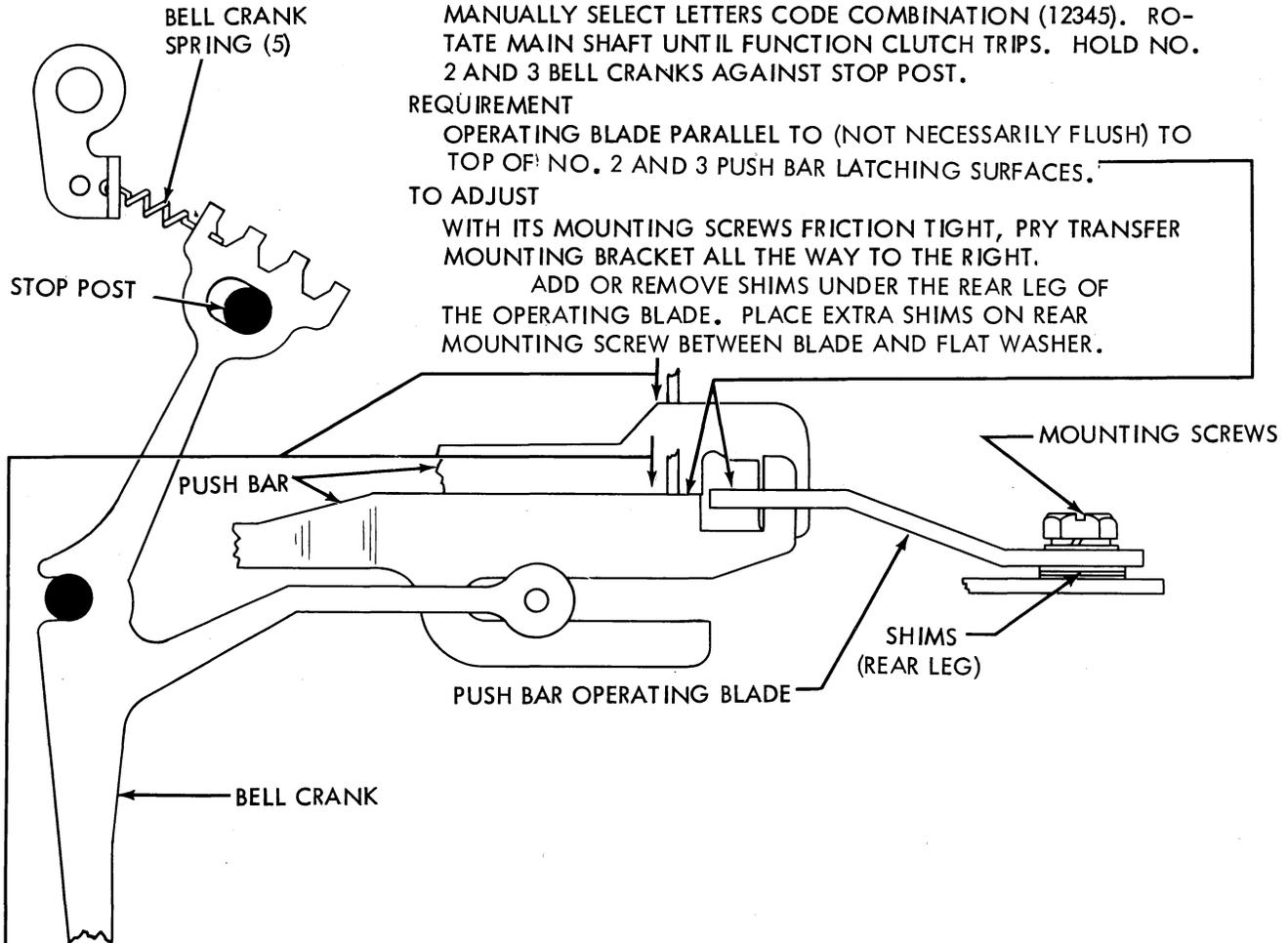
REQUIREMENT

OPERATING BLADE PARALLEL TO (NOT NECESSARILY FLUSH) TO TOP OF NO. 2 AND 3 PUSH BAR LATCHING SURFACES.

TO ADJUST

WITH ITS MOUNTING SCREWS FRICTION TIGHT, PRY TRANSFER MOUNTING BRACKET ALL THE WAY TO THE RIGHT.

ADD OR REMOVE SHIMS UNDER THE REAR LEG OF THE OPERATING BLADE. PLACE EXTRA SHIMS ON REAR MOUNTING SCREW BETWEEN BLADE AND FLAT WASHER.



BELL CRANK SPRINGS (5)

TO CHECK

SELECT LETTERS CODE COMBINATION (12345). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS.

REQUIREMENT

MIN. 1 OZ. ---MAX. 3 OZS.

TO START PUSH BAR MOVING

NOTE:

CHECK ALL FIVE SPRINGS.

2.29 Typing Mechanism continued

PUSH BAR OPERATING BLADE (FINAL)

(1) TO CHECK

MANUALLY SELECT LETTERS CODE COMBINATION (12345). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. MANUALLY SEAT PUSH BARS IN DETENTED POSITION. IN BAR WHICH IS NEAREST LEFT EDGE OF BLADE, TAKE UP PLAY TO LEFT AND REAR, AND THEN RELEASE.

REQUIREMENT

CLEARANCE BETWEEN BAR AND LEFT EDGE OF BLADE:

MIN. 0.015 INCH --- MAX. 0.030 INCH

(2) REQUIREMENT

SOME CLEARANCE BETWEEN RIGHT EDGE OF BLADE AND PUSH BARS WHEN PLAY IN BARS HAS BEEN TAKEN UP TO RIGHT AND RELEASED.

(3) REQUIREMENT

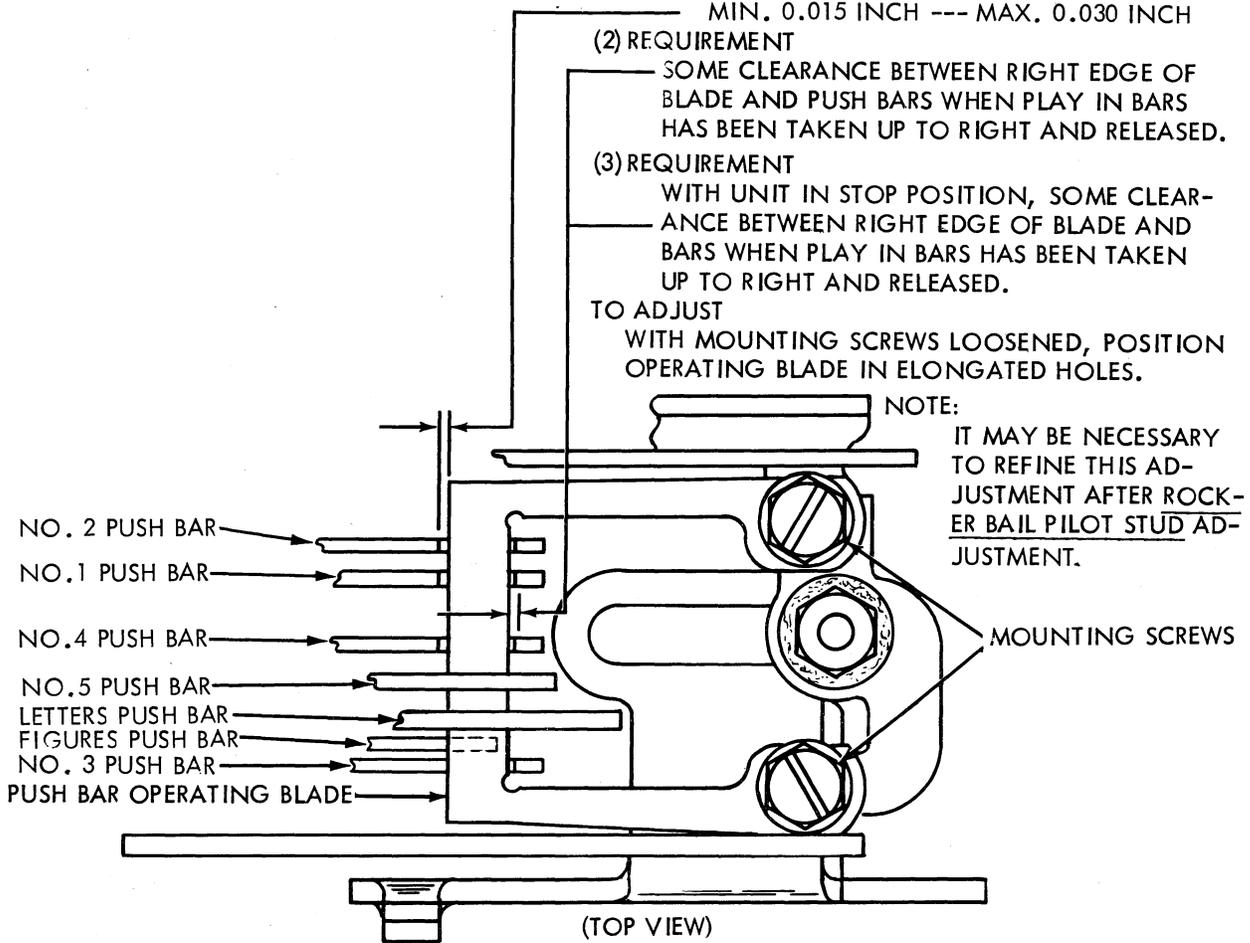
WITH UNIT IN STOP POSITION, SOME CLEARANCE BETWEEN RIGHT EDGE OF BLADE AND BARS WHEN PLAY IN BARS HAS BEEN TAKEN UP TO RIGHT AND RELEASED.

TO ADJUST

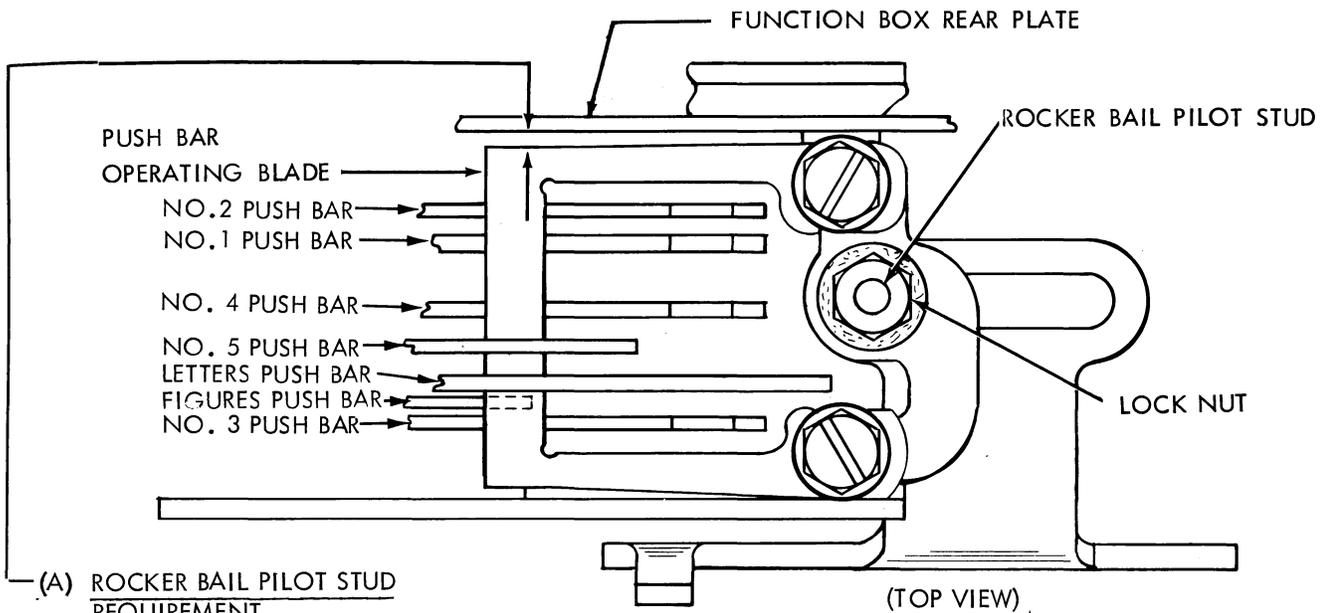
WITH MOUNTING SCREWS LOOSENED, POSITION OPERATING BLADE IN ELONGATED HOLES.

NOTE:

IT MAY BE NECESSARY TO REFINE THIS ADJUSTMENT AFTER ROCKER BAIL PILOT STUD ADJUSTMENT.



2.30 Typing Mechanism continued



(A) ROCKER BAIL PILOT STUD REQUIREMENT

SELECT BLANK COMBINATION AND THE TRIP FUNCTION CLUTCH. POSITION ROCKER BAIL THROUGH A COMPLETE CYCLE, TAKING UP PLAY BETWEEN ROCKER BAIL AND FUNCTION BOX REAR PLATE FOR MINIMUM CLEARANCE.

REQUIREMENT

CLEARANCE BETWEEN FUNCTION BOX REAR PLATE AND REAR EDGE OF PUSH BAR OPERATING BLADE.

MIN. 0.005 INCH

MAX. 0.020 INCH

AT POINT IN THE CYCLE WHERE CLEARANCE IS MINIMUM.

TO ADJUST POSITION ROCKER BAIL PILOT STUD IN ELONGATED HOLE WITH LOCK NUT LOOSENED.

2.31 Function Mechanism continued

(B) FUNCTION CLUTCH LATCH LEVER SPRING REQUIREMENT

WITH FUNCTION CLUTCH TURNED TO STOP POSITION AND LATCH LEVER UNLATCHED:

MIN. 12 OZS. --- MAX. 15 OZS.

TO START LATCH LEVER MOVING.

LATCH LEVER SPRING

LATCH LEVER

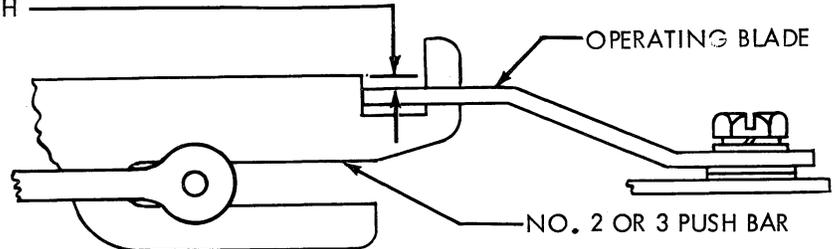
(REAR VIEW)

2.32 Typing Mechanism continued

FUNCTION BOX  
REQUIREMENT

MANUALLY SELECT LETTERS CODE COMBINATION (12345). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS, AND PUNCH SLIDES ARE DISENGAGED FROM LATCHES THE TOP OF THE OPERATING BLADE SHALL BE:

FLUSH --- MAX. 0.020 INCH

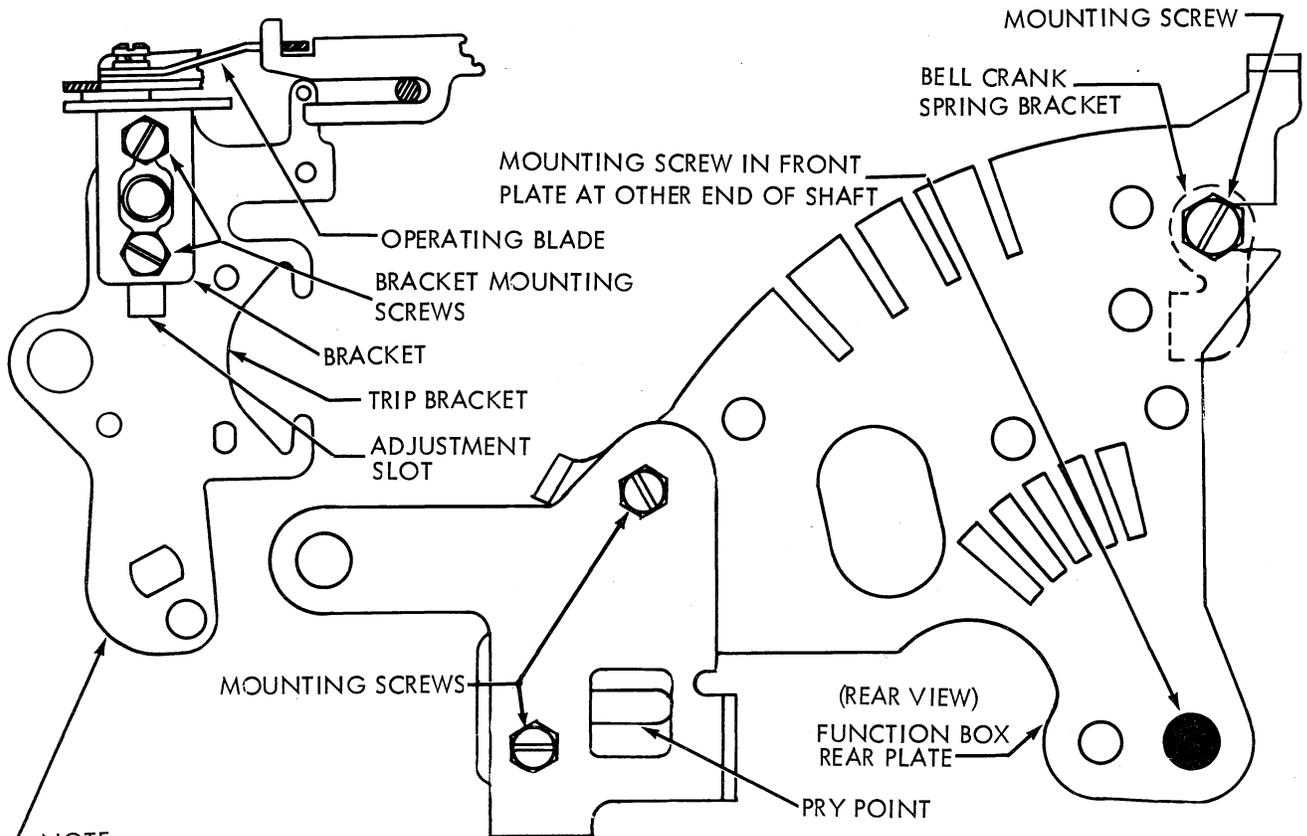


BELOW THE TOPS OF THE NO. 2 AND 3 PUSH BARS. TAKE UP PLAY IN PUSHBARS IN A DOWNWARD DIRECTION THEN RELEASE.

NOTE: WHEN UNIT IS MOUNTED AS PART OF THE KEYBOARD PERFORATOR TRANSMITTER, IT MAY BE NECESSARY TO REFINE THE ADJUSTMENT WITHIN ITS LIMITS TO INCREASE OPERATING MARGINS OF THE UNIT.

TO ADJUST

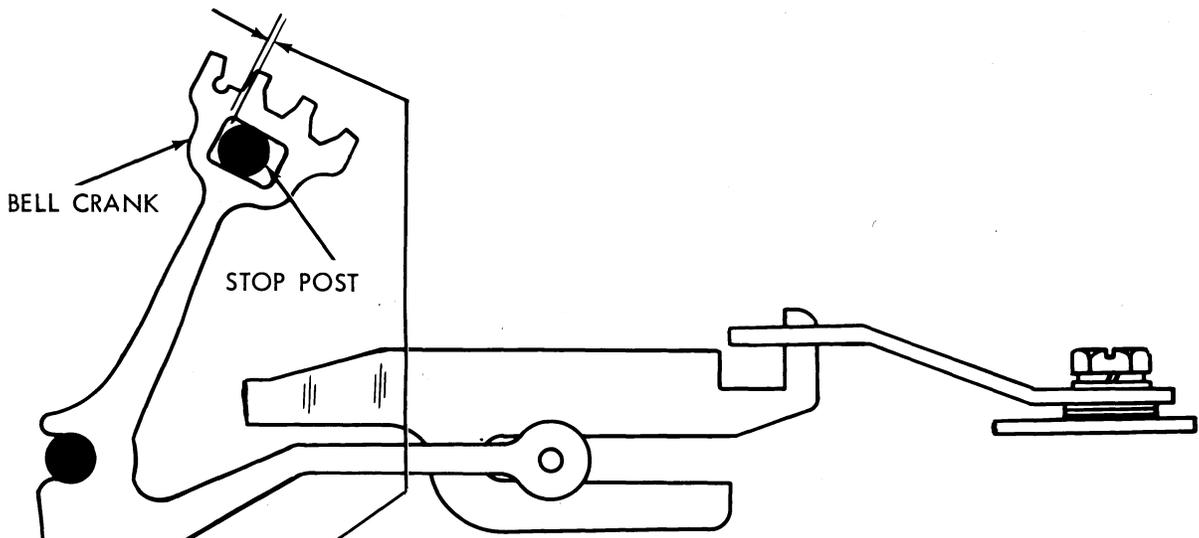
WITH THREE MOUNTING SCREWS IN REAR PLATE AND ONE MOUNTING SCREW IN FRONT PLATE LOOSENED, POSITION FUNCTION BOX BY MEANS OF PRY POINT. CHECK POSITION OF BELL CRANK SPRING BRACKET.



NOTE:

ON UNITS EQUIPPED WITH TWO-PIECE TRIP BRACKET, SET ABOVE ADJUSTMENT IN CENTER OF ITS RANGE AND TIGHTEN SCREWS. LOOSEN TWO SCREWS WHICH MOUNT GUIDE TO BRACKET AND POSITION GUIDE TO MEET ABOVE REQUIREMENT.

2.33 Typing Mechanism continued



BELL CRANK

STOP POST

TRANSFER MOUNTING BRACKET  
TO CHECK

MANUALLY SELECT BLANK CODE COMBINATION. ROTATE MAIN SHAFT  
UNTIL FUNCTION CLUTCH TRIPS.

REQUIREMENT

WITH PUNCH SLIDES LATCHED, CLEARANCE BETWEEN BELL CRANK AND STOP  
POST:

MA. 0.018 INCH\*

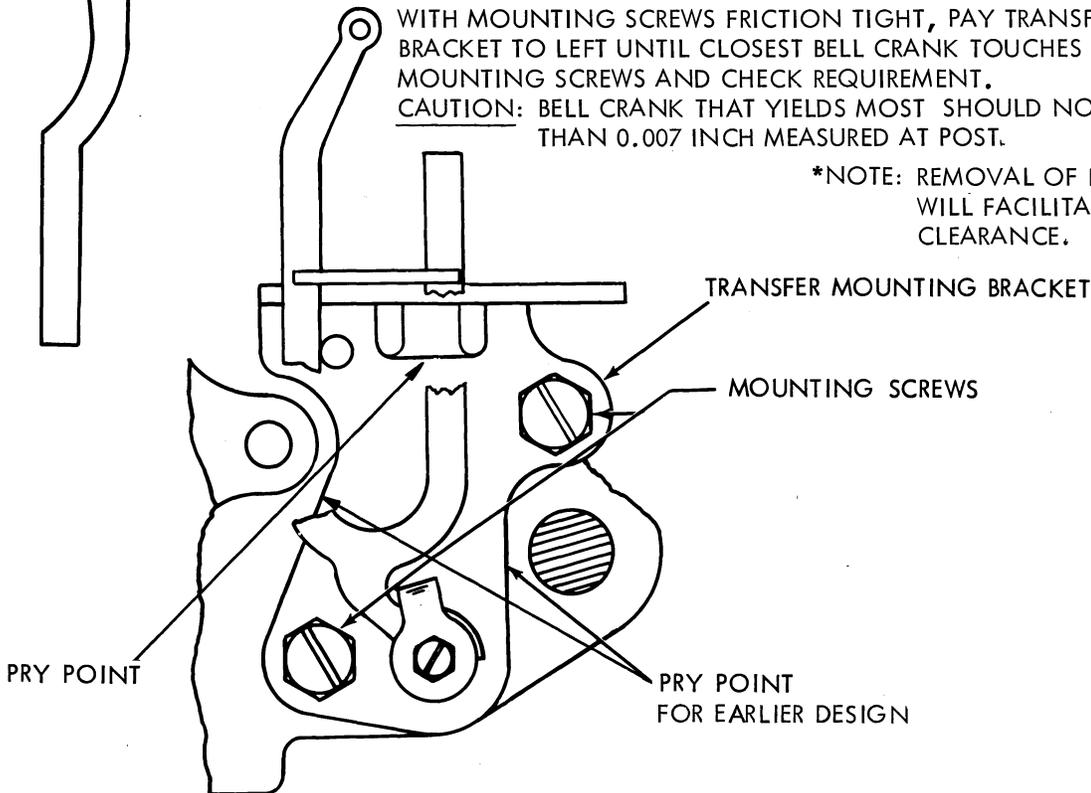
AT BELL CRANK WHERE CLEARANCE IS MAXIMUM, WHEN BELL CRANK WITH  
MINIMUM CLEARANCE IS TOUCHING POST.

TO ADJUST

WITH MOUNTING SCREWS FRICTION TIGHT, PLY TRANSFER MOUNTING  
BRACKET TO LEFT UNTIL CLOSEST BELL CRANK TOUCHES POST. TIGHTEN  
MOUNTING SCREWS AND CHECK REQUIREMENT.

CAUTION: BELL CRANK THAT YIELDS MOST SHOULD NOT YIELD MORE  
THAN 0.007 INCH MEASURED AT POST.

\*NOTE: REMOVAL OF FUNCTION BLADES  
WILL FACILITATE MEASURING  
CLEARANCE.



TRANSFER MOUNTING BRACKET

MOUNTING SCREWS

PRY POINT

PRY POINT  
FOR EARLIER DESIGN

2.34 Typing Mechanism continued

(A) LETTERS AND FIGURES YIELD ARMS

(1) TO CHECK

TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROCKER BAIL IS TO EXTREME LEFT. MANUALLY PLACE ARM ASSEMBLIES IN LETTERS POSITION. HOLD LETTERS-FIGURES BELL CRANK AGAINST LEFT EDGE OF STOP POST.

REQUIREMENT

MIN. SOME-----MAX. 0.006 INCH\*  
CLEARANCE BETWEEN BELL CRANK AND LETTERS EXTENSION ARM.

(CONTINUED ON FOLLOWING PAGE)

(B)

FIGURES ARM ASSEMBLY SPRING

REQUIREMENT

WITH ARM ASSEMBLIES IN LETTERS POSITION:

MIN. 1-1/2 OZS.-----MAX. 3-1/2 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.

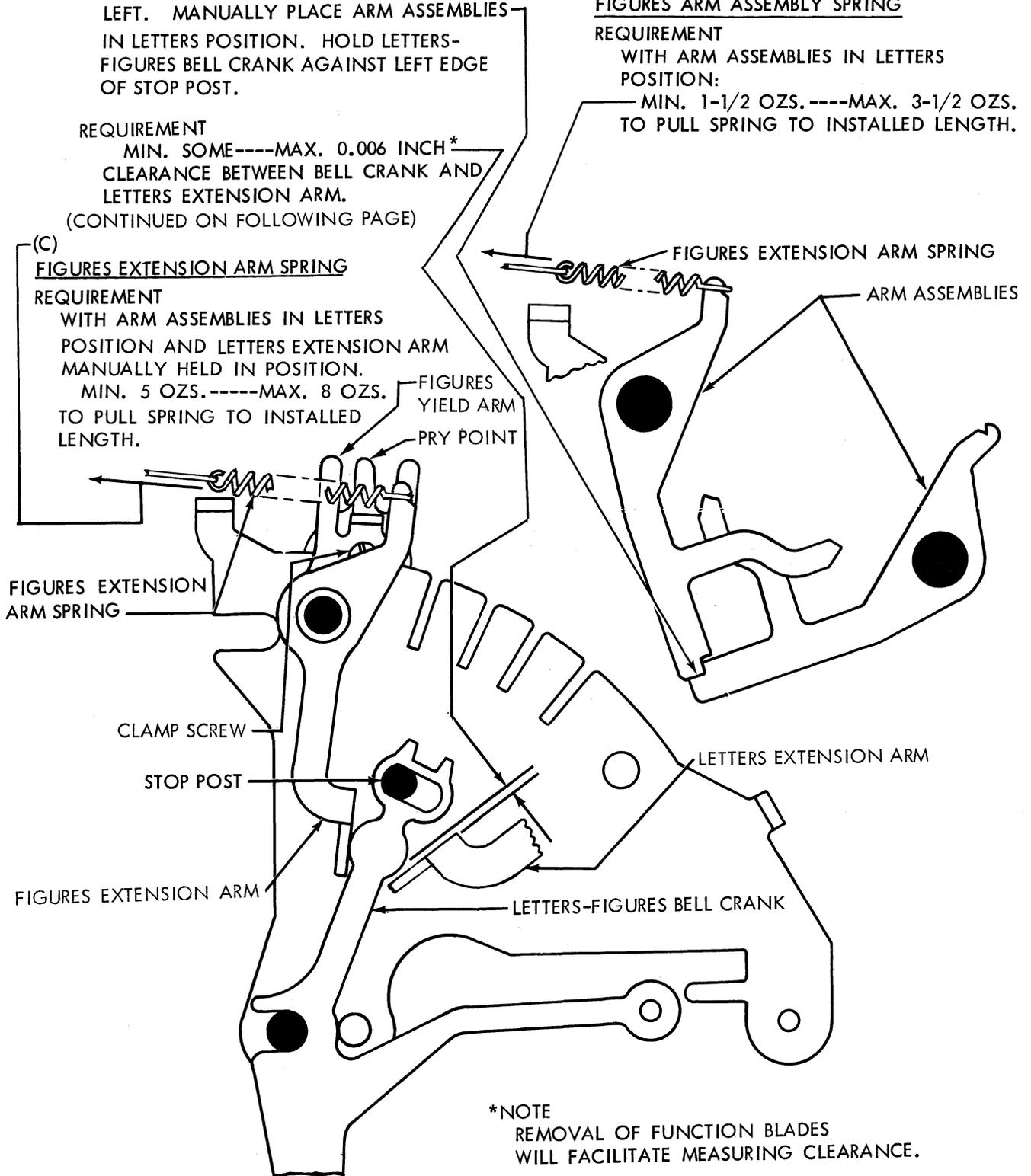
(C)

FIGURES EXTENSION ARM SPRING

REQUIREMENT

WITH ARM ASSEMBLIES IN LETTERS POSITION AND LETTERS EXTENSION ARM MANUALLY HELD IN POSITION.

MIN. 5 OZS.-----MAX. 8 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.

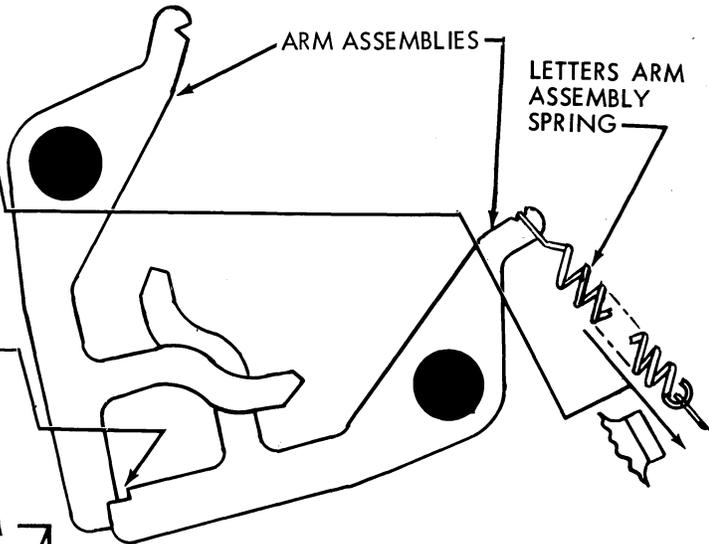


\*NOTE  
REMOVAL OF FUNCTION BLADES  
WILL FACILITATE MEASURING CLEARANCE.

2.35 Typing Mechanism continued

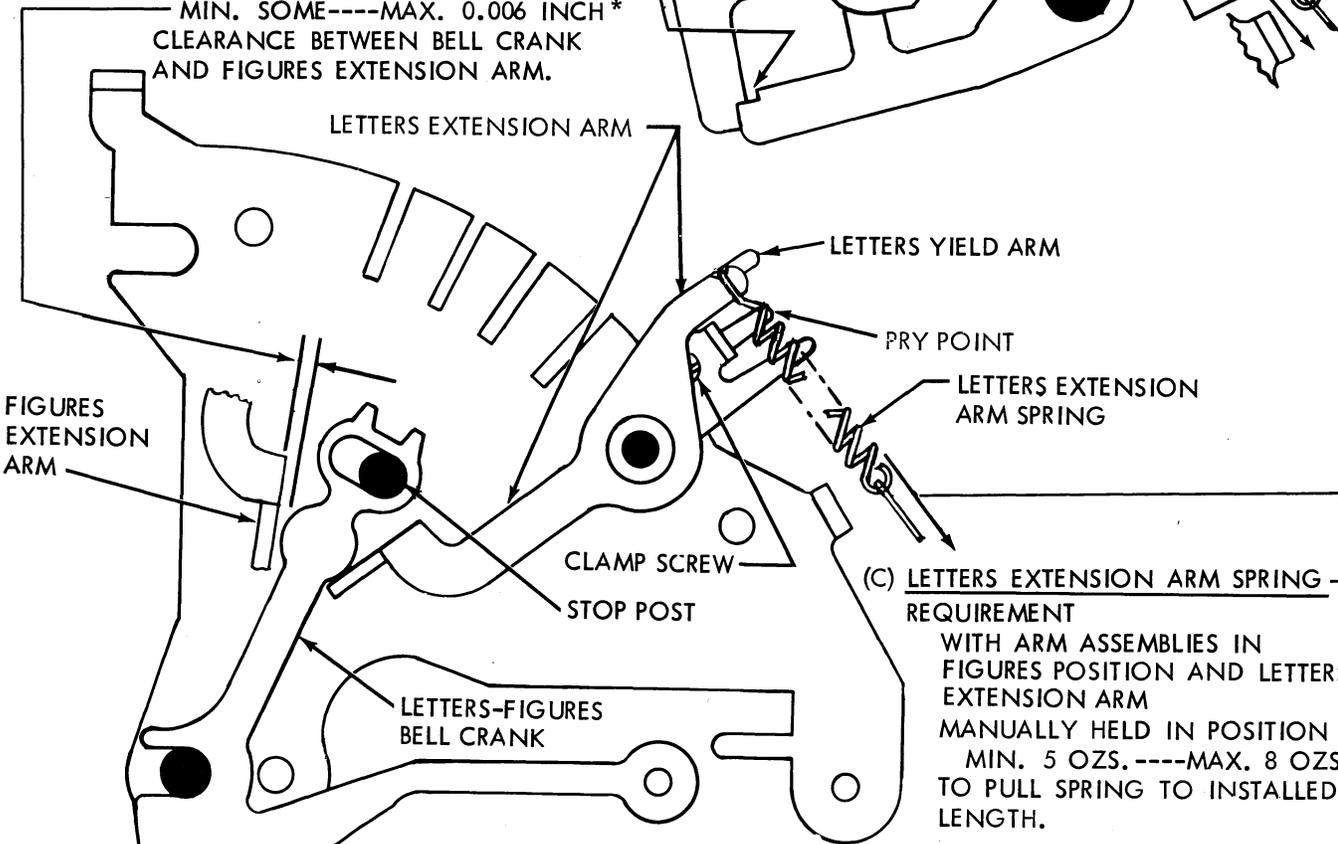
(B) LETTERS ARM ASSEMBLY SPRING

REQUIREMENT  
WITH ARM ASSEMBLIES IN FIGURES POSITION:  
MIN. 1-1/2 OZS. ----MAX. 3-1/2 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.



(A) LETTERS AND FIGURES YIELD ARMS  
(CONTINUED FROM PRECEDING PAGE)

(2) TO CHECK  
MANUALLY PLACE ARM ASSEMBLIES IN FIGURES POSITION.  
REQUIREMENT  
MIN. SOME ----MAX. 0.006 INCH\*  
CLEARANCE BETWEEN BELL CRANK AND FIGURES EXTENSION ARM.

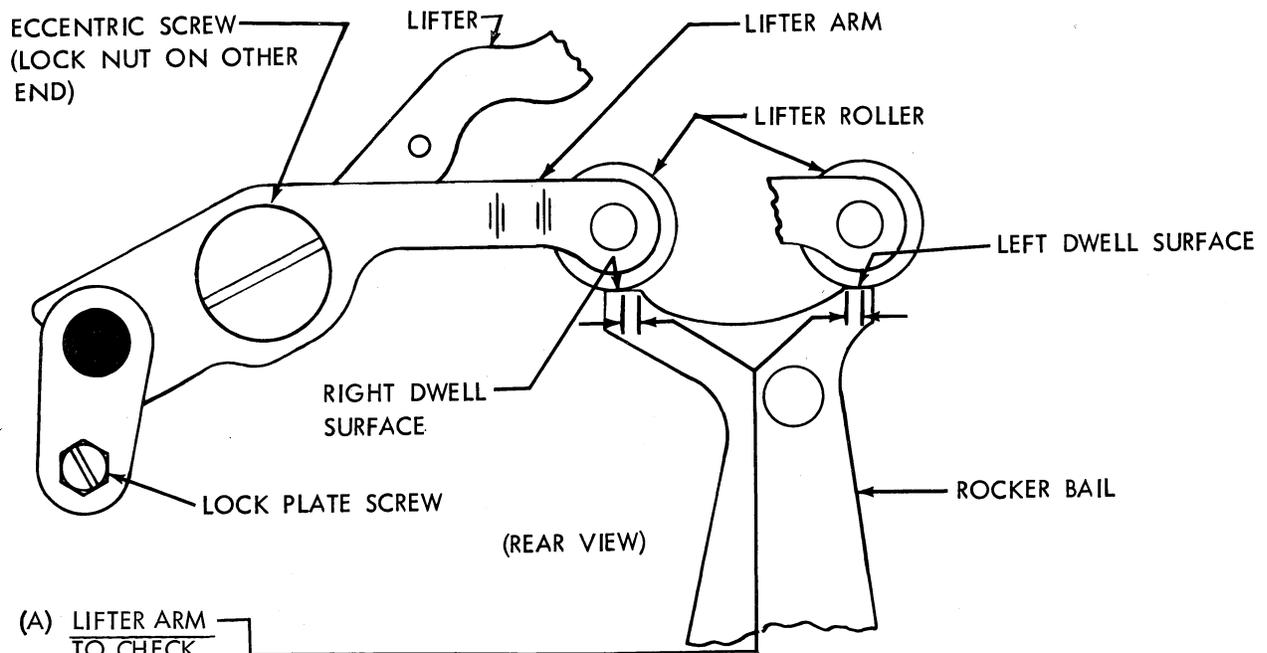


(C) LETTERS EXTENSION ARM SPRING  
REQUIREMENT  
WITH ARM ASSEMBLIES IN FIGURES POSITION AND LETTERS EXTENSION ARM MANUALLY HELD IN POSITION  
MIN. 5 OZS. ----MAX. 8 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.

TO ADJUST  
LOOSEN CLAMP SCREWS IN BOTH LETTERS AND FIGURES YIELD ARMS. PLACE ARM ASSEMBLIES IN LETTERS POSITION HOLD LETTERS-FIGURES BELL CRANK AGAINST LEFT SIDE OF STOP POST, AND BY MEANS OF PRY POINT, POSITION LETTERS YIELD ARM TO MEET CLEARANCE REQUIREMENT UNDER (A)(1) ON PREVIOUS PAGE. TIGHTEN LETTERS YIELD ARM CLAMP SCREW. PLACE ARM ASSEMBLIES IN FIGURES POSITION. HOLD LETTERS-FIGURES BELL CRANK AGAINST RIGHT SIDE OF STOP POST, AND BY MEANS OF PRY POINT POSITION FIGURES YIELD ARM TO MEET REQUIREMENT UNDER (2) ABOVE. TIGHTEN FIGURES YIELD ARM CLAMP SCREW. CAUTION: ARM ASSEMBLIES MAY CHANGE POSITION DURING ADJUSTMENT. AS TIGHTENING OF SCREWS MAY AFFECT ADJUSTMENT, RECHECK REQUIREMENTS.

\*NOTE: REMOVAL OF FUNCTION BLADES WILL FACILITATE MEASURING CLEARANCE.

2.36 Typing Mechanism continued



(A) LIFTER ARM TO CHECK

TRIP FUNCTION CLUTCH. MOVE ROCKER BAIL TO EXTREME LEFT POSITION AND OBSERVE TRAVEL OF LIFTER ROLLER ON RIGHT DWELL SURFACE. MOVE ROCKER BAIL TO EXTREME RIGHT POSITION AND OBSERVE TRAVEL OF ROLLER ON LEFT DWELL SURFACE.

REQUIREMENT

APPROXIMATELY EQUAL TRAVEL ON EACH DWELL SURFACE.

TO ADJUST\*

LOOSEN LOCK PLATE SCREW UNTIL FRICTION TIGHT. WITH ECCENTRIC SCREW LOCK NUT FRICTION TIGHT, POSITION LIFTER ARM ON LIFTER. TIGHTEN LOCK PLATE SCREW. DO NOT TIGHTEN LOCK NUT.

\*NOTE: REMOVE TIMING CONTACTS IF UNIT IS SO EQUIPPED.

(B) LIFTER ARM ECCENTRIC SCREW

REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED:

- (1) CLEARANCE BETWEEN CLOSEST PROJECTION OF BELL CRANKS AND ASSOCIATED LETTERS OR FIGURES FUNCTION BLADE PROJECTION:

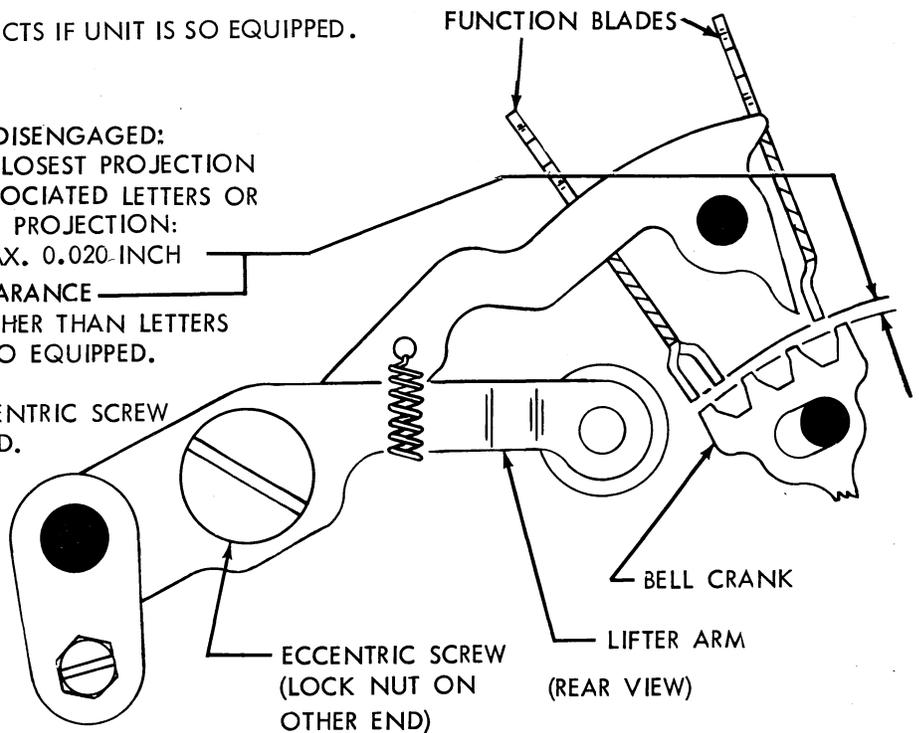
MIN. 0.008 INCH---- MAX. 0.020-INCH

- (2) MIN. 0.005 INCH CLEARANCE

FOR FUNCTION BLADES OTHER THAN LETTERS AND FIGURES IF UNIT IS SO EQUIPPED.

TO ADJUST

POSITION LIFTER ARM ECCENTRIC SCREW WITH LOCK NUT LOOSE.



2.37 Typing Mechanism continued

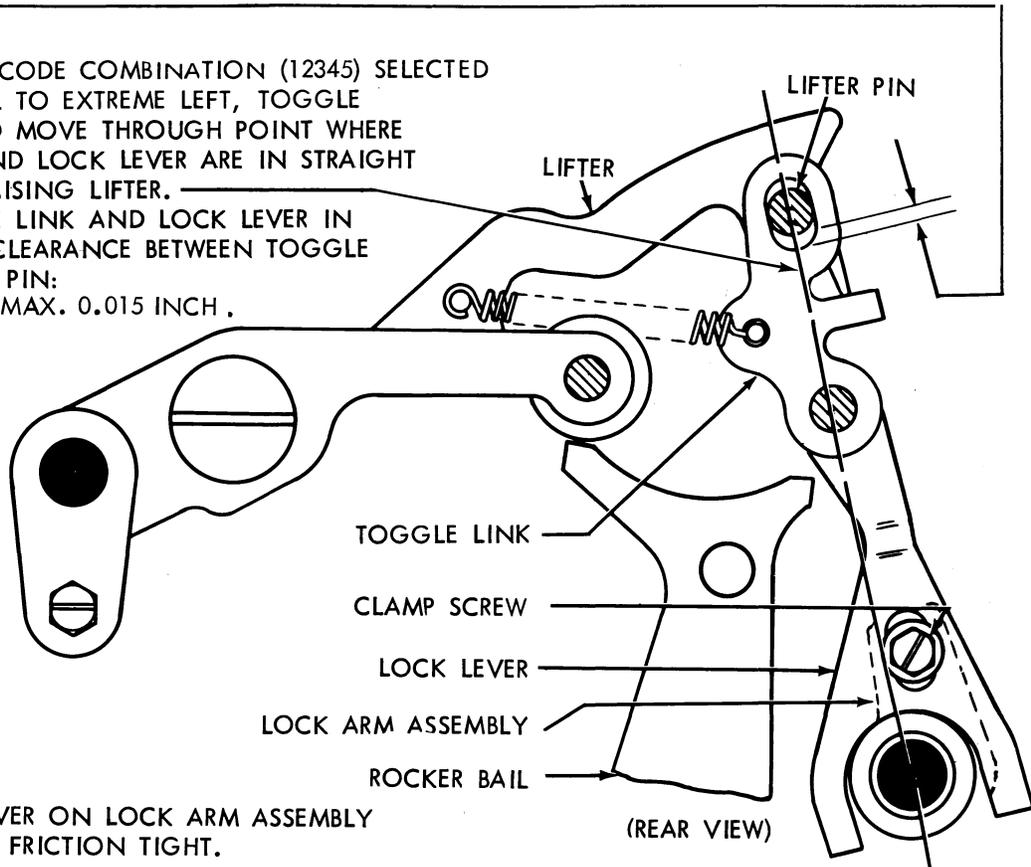
(A) LOCK LEVER

REQUIREMENT

(1) WITH LETTERS CODE COMBINATION (12345) SELECTED AND ROCKER BAIL TO EXTREME LEFT, TOGGLE LINKAGE SHOULD MOVE THROUGH POINT WHERE TOGGLE LINK AND LOCK LEVER ARE IN STRAIGHT LINE WITHOUT RAISING LIFTER.

(2) WITH TOGGLE LINK AND LOCK LEVER IN STRAIGHT LINE, CLEARANCE BETWEEN TOGGLE LINK AND LIFTER PIN:

MIN. SOME --- MAX. 0.015 INCH.



TO ADJUST

POSITION LOCK LEVER ON LOCK ARM ASSEMBLY WITH CLAMP SCREW FRICTION TIGHT.

NOTE:

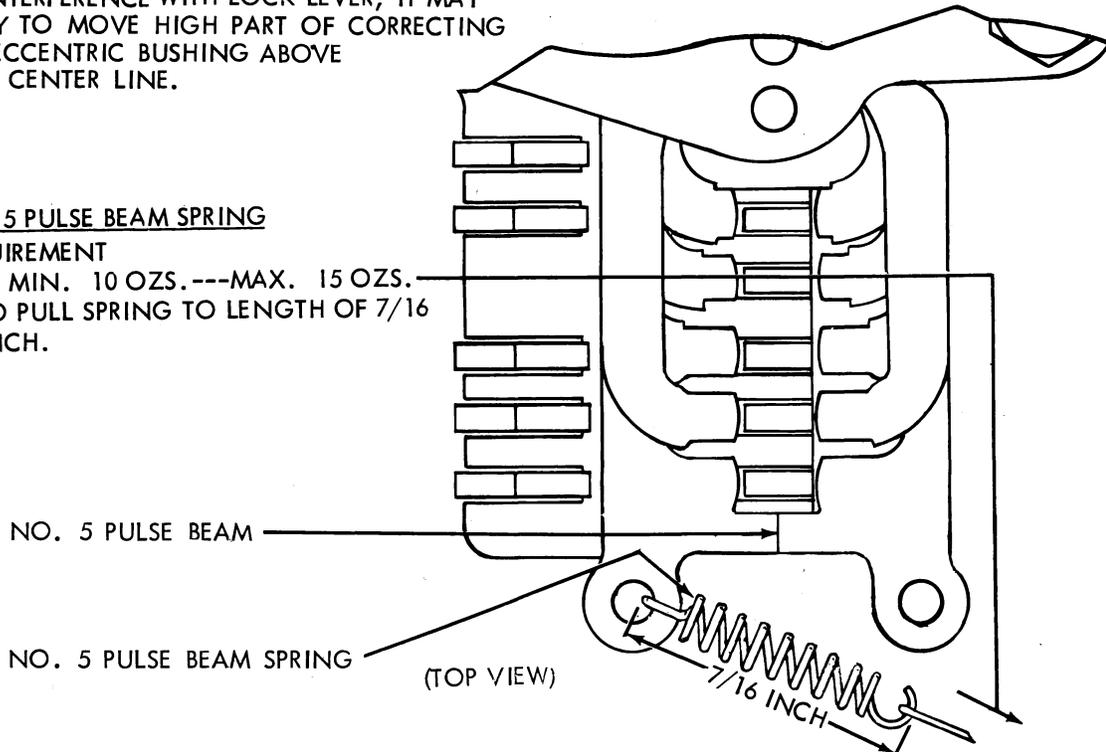
TO AVOID INTERFERENCE WITH LOCK LEVER, IT MAY BE NECESSARY TO MOVE HIGH PART OF CORRECTING DRIVE LINK ECCENTRIC BUSHING ABOVE HORIZONTAL CENTER LINE.

(B) NO. 5 PULSE BEAM SPRING

REQUIREMENT

MIN. 10 OZS. --- MAX. 15 OZS.

TO PULL SPRING TO LENGTH OF 7/16 INCH.



2.38 Typing Mechanism continued

*see TC N 933 iss 1*

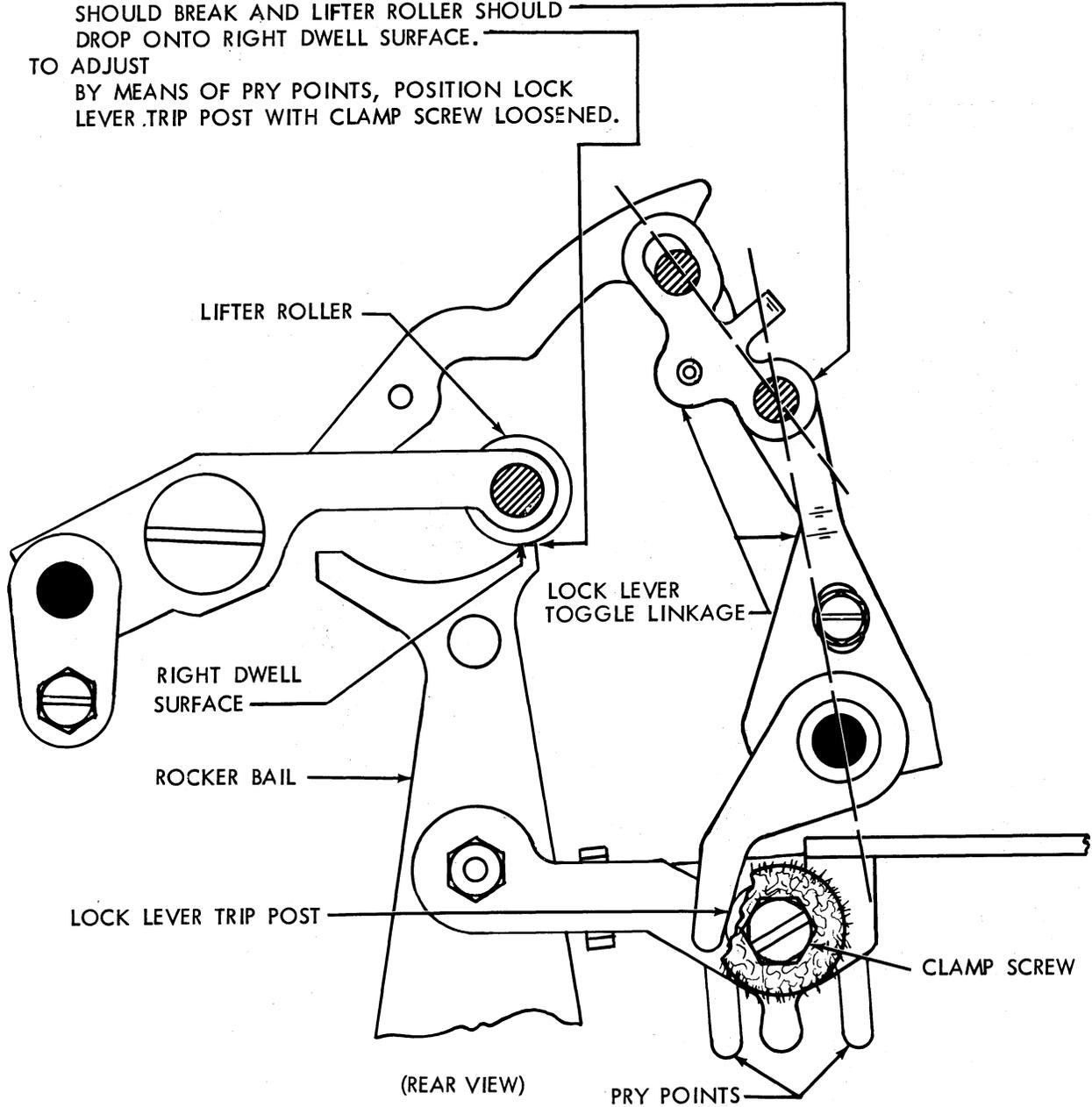
LOCK LEVER TRIP POST

REQUIREMENT

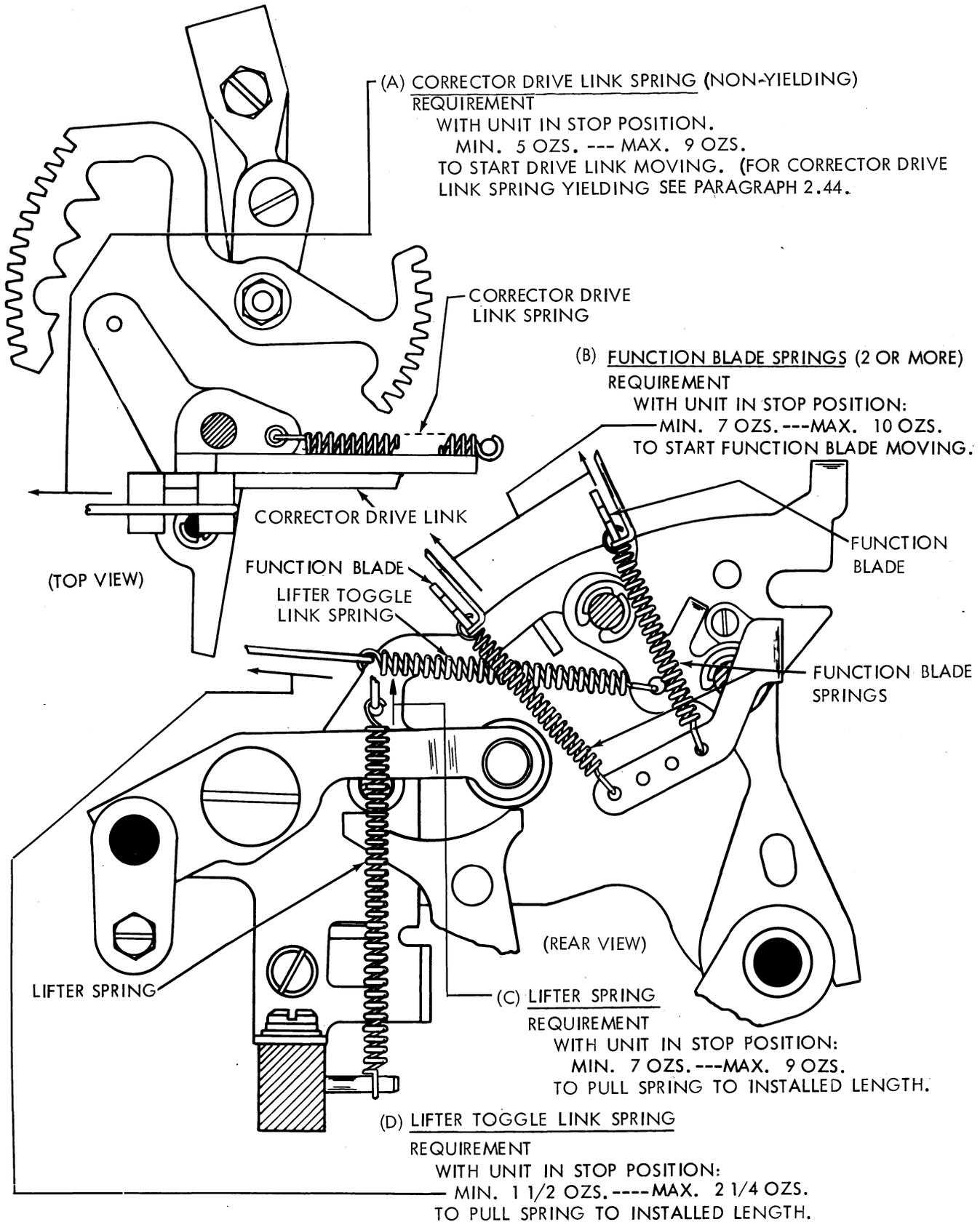
AS ROCKER BAIL APPROACHES EXTREME RIGHT POSITION, LOCK LEVER TOGGLE LINKAGE SHOULD BREAK AND LIFTER ROLLER SHOULD DROP ONTO RIGHT DWELL SURFACE.

TO ADJUST

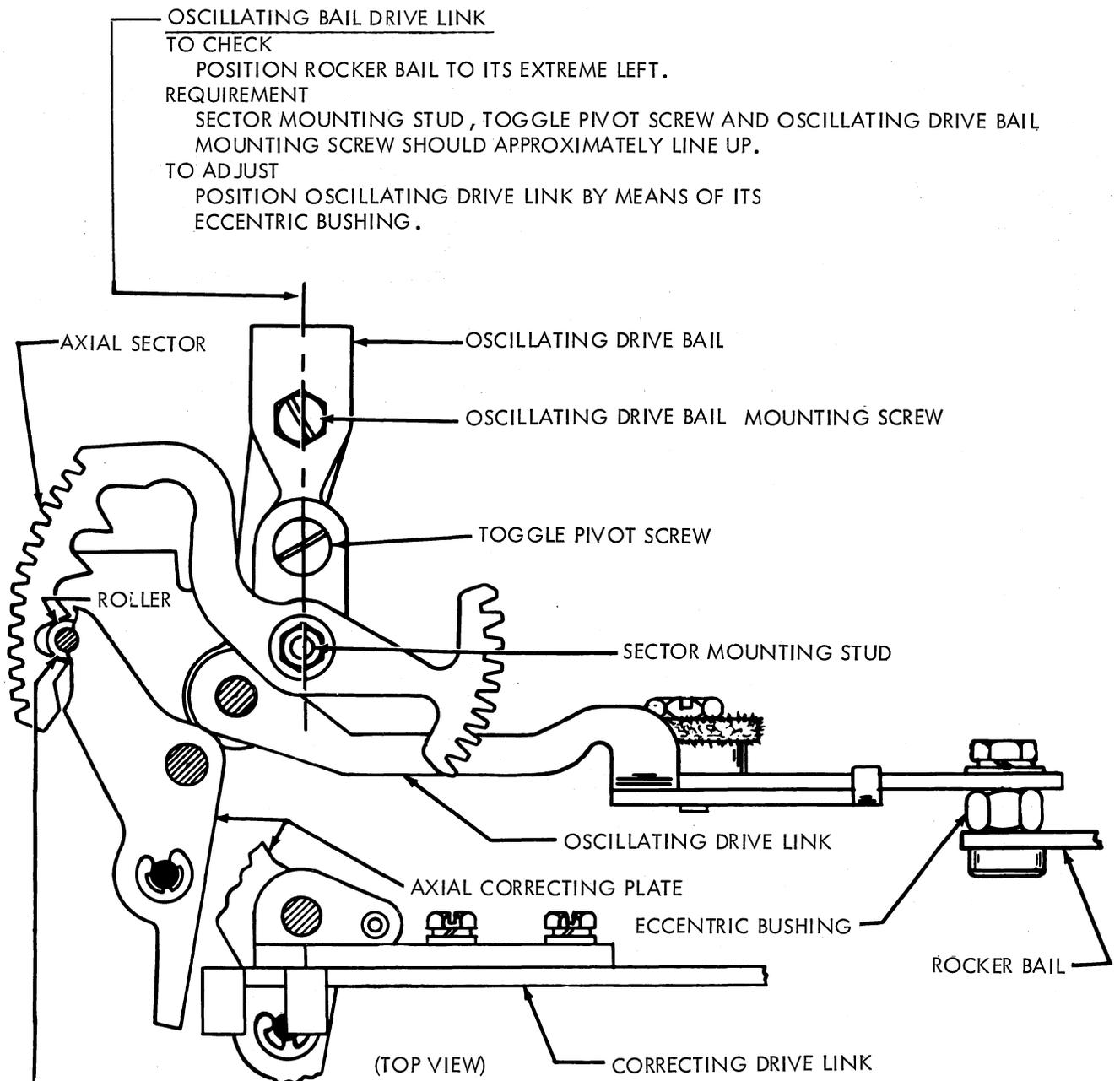
BY MEANS OF PRY POINTS, POSITION LOCK LEVER TRIP POST WITH CLAMP SCREW LOOSENED.



2.39 Typing Mechanism continued



2. 40 Typing Mechanism continued



OSCILLATING BAIL DRIVE LINK  
 TO CHECK  
 POSITION ROCKER BAIL TO ITS EXTREME LEFT.  
 REQUIREMENT  
 SECTOR MOUNTING STUD, TOGGLE PIVOT SCREW AND OSCILLATING DRIVE BAIL MOUNTING SCREW SHOULD APPROXIMATELY LINE UP.  
 TO ADJUST  
 POSITION OSCILLATING DRIVE LINK BY MEANS OF ITS ECCENTRIC BUSHING.

OSCILLATING BAIL PIVOT  
 REQUIREMENT

WITH "BLANK" COMBINATION SELECTED, ROTATE MAIN SHAFT, TAKING UP AXIAL PLAY IN TYPE WHEEL SHAFT TOWARD FRONT OF UNIT, THE AXIAL CORRECTOR ROLLER SHALL ENTER THE FIRST NOTCH OF THE SECTOR CENTRALLY.

TO ADJUST

LOOSEN OSCILLATING BAIL ADJUSTING SCREW. SELECT "BLANK" COMBINATION. POSITION OSCILLATING BAIL BY MEANS OF ITS ELONGATED MOUNTING HOLE SO CORRECTOR ROLLER ENTERS FIRST NOTCH OF SECTOR WHEN ROCKER BAIL MOVES TO ITS EXTREME LEFT POSITION. HOLD CORRECTOR ROLLER FIRMLY IN FIRST NOTCH AND TAKE UP PLAY IN OSCILLATING BAIL LINKAGE BY APPLYING A FORCE TO OSCILLATING BAIL TOWARD REAR OF UNIT. TIGHTEN THE OSCILLATING BAIL ADJUSTING SCREW.

2. 41 Typing Mechanism continued

(A) AXIAL SECTOR ALIGNMENT

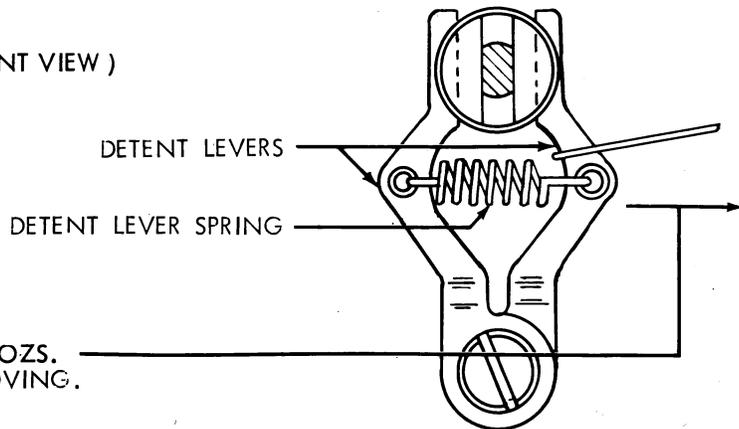
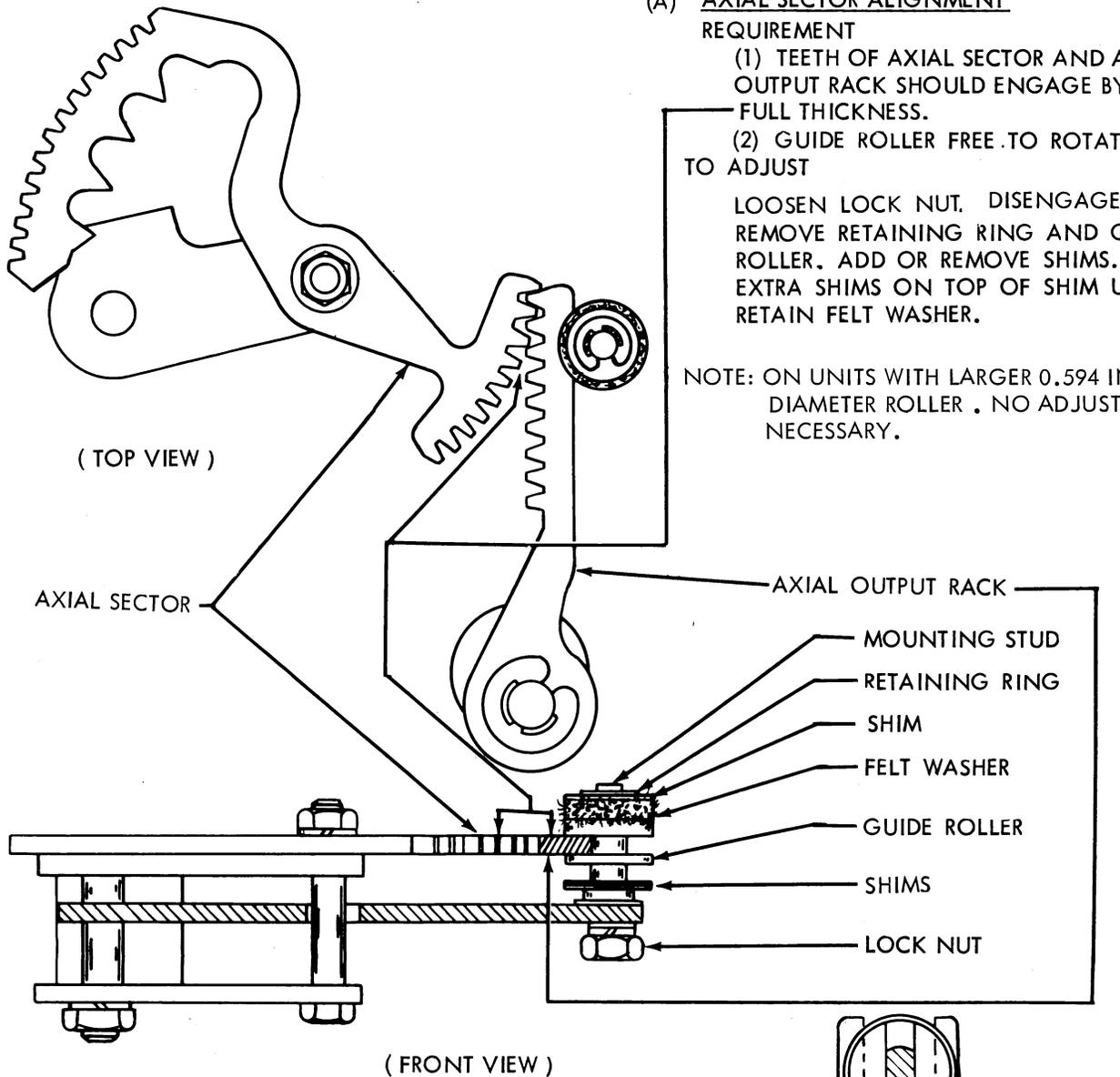
REQUIREMENT

(1) TEETH OF AXIAL SECTOR AND AXIAL OUTPUT RACK SHOULD ENGAGE BY THEIR FULL THICKNESS.

(2) GUIDE ROLLER FREE TO ROTATE. TO ADJUST

LOOSEN LOCK NUT. DISENGAGE RACK. REMOVE RETAINING RING AND GUIDE ROLLER. ADD OR REMOVE SHIMS. PLACE EXTRA SHIMS ON TOP OF SHIM USED TO RETAIN FELT WASHER.

NOTE: ON UNITS WITH LARGER 0.594 INCH DIAMETER ROLLER, NO ADJUSTMENT IS NECESSARY.



(B) ECCENTRIC SHAFT  
DETENT LEVER SPRINGS

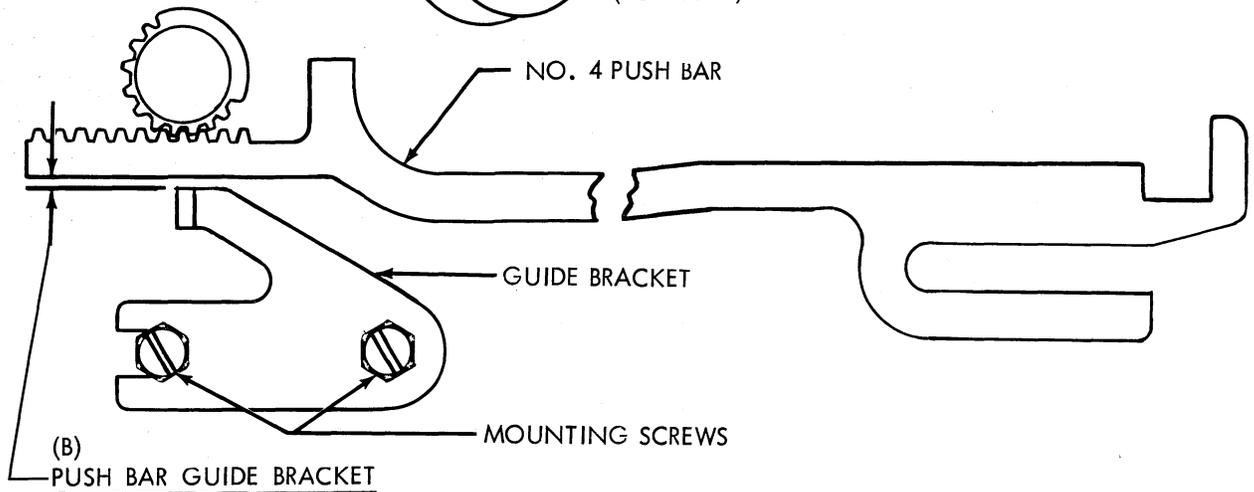
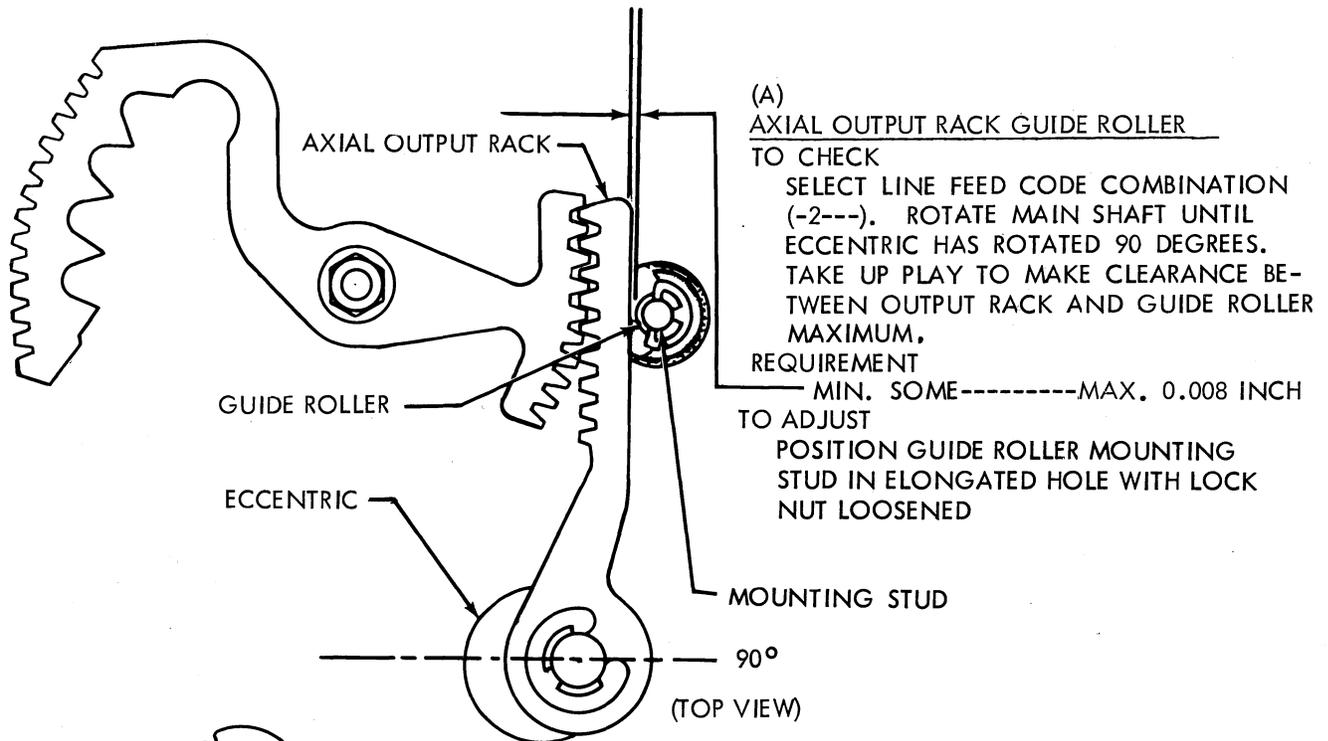
MIN. 7 OZS. ---MAX. 10 OZS.  
TO START DETENT LEVER MOVING.

NOTE:

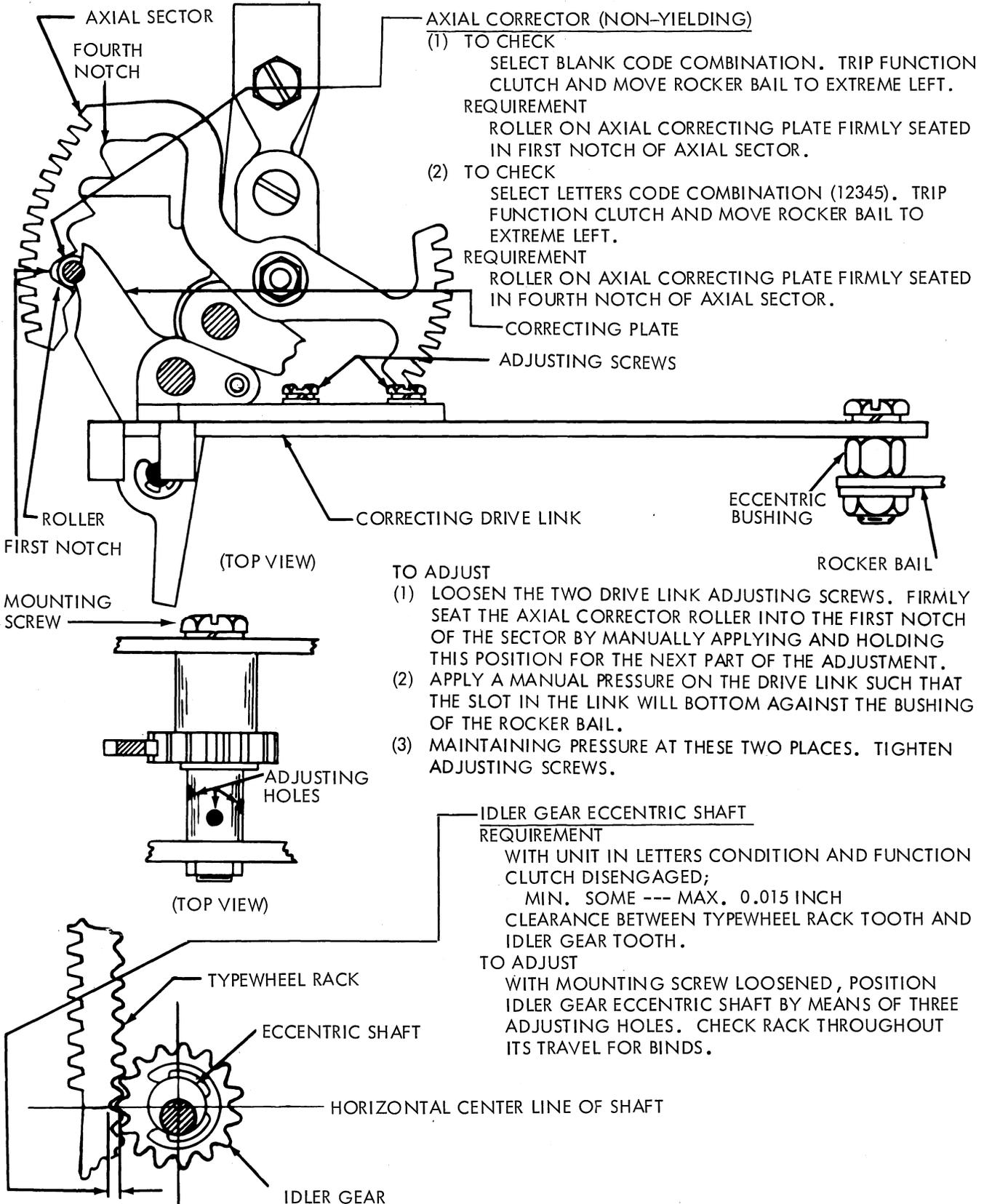
CHECK ALL SIX SPRINGS. THERE ARE TWO ON THE AXIAL POSITIONING MECHANISM AND FOUR ON THE ROTARY POSITIONING MECHANISM.

(TOP VIEW OF SPRINGS ON AXIAL POSITIONING MECHANISM)

2.42 Typing Mechanism continued



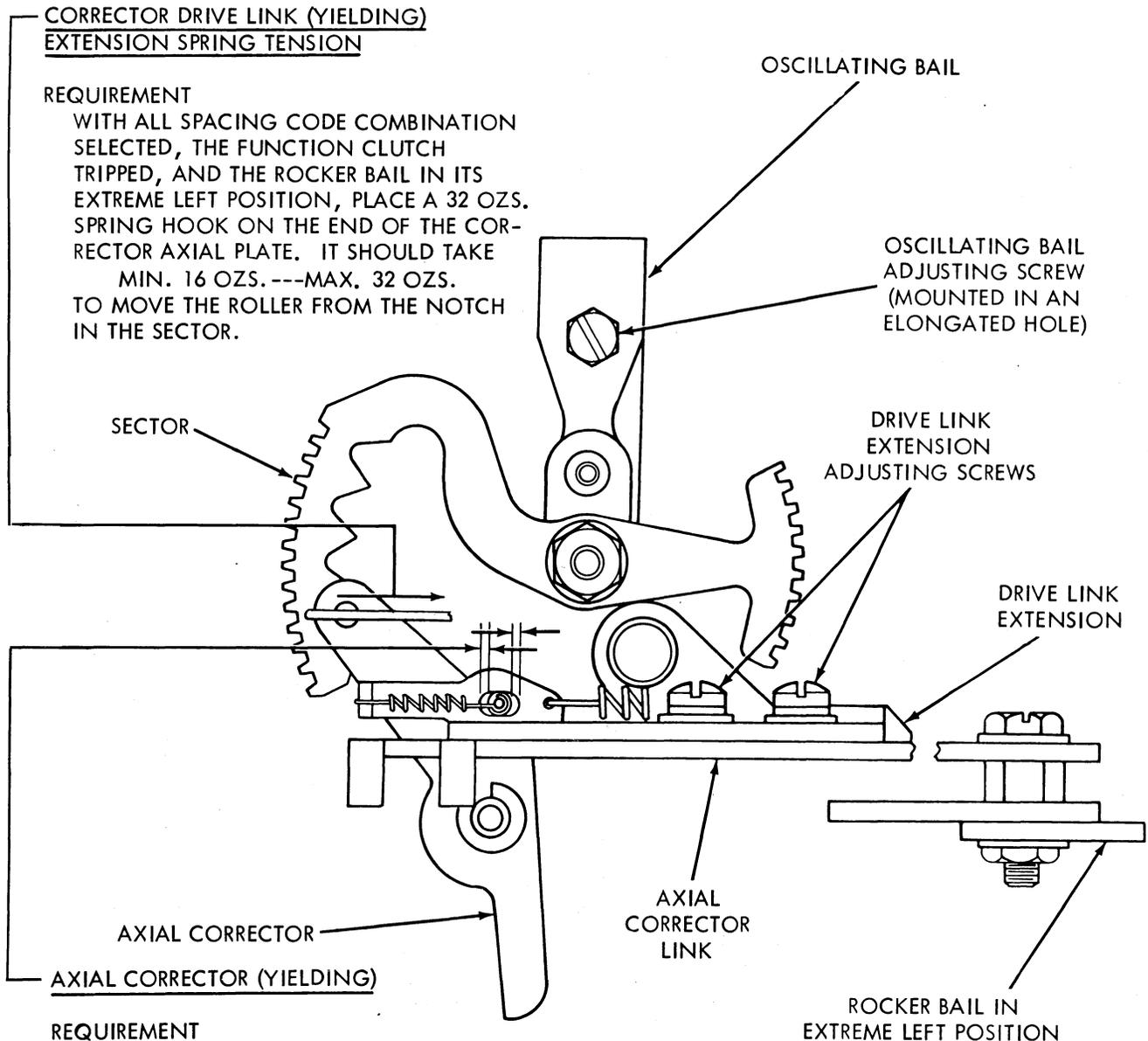
2.43 Typing Mechanism continued



## 2.44 Typing Mechanism continued

CORRECTOR DRIVE LINK (YIELDING)  
EXTENSION SPRING TENSION**REQUIREMENT**

WITH ALL SPACING CODE COMBINATION SELECTED, THE FUNCTION CLUTCH TRIPPED, AND THE ROCKER BAIL IN ITS EXTREME LEFT POSITION, PLACE A 32 OZS. SPRING HOOK ON THE END OF THE CORRECTOR AXIAL PLATE. IT SHOULD TAKE MIN. 16 OZS. ---MAX. 32 OZS. TO MOVE THE ROLLER FROM THE NOTCH IN THE SECTOR.

AXIAL CORRECTOR (YIELDING)**REQUIREMENT**

WITH ALL SPACING CODE COMBINATION SELECTED, FUNCTION CLUTCH TRIPPED AND ROCKER BAIL IN ITS EXTREME LEFT POSITION, THE AXIAL CORRECTOR ROLLER SHOULD SEAT IN THE FIRST SECTOR NOTCH AND THERE SHOULD BE MIN. 0.005 INCH

BETWEEN THE ENDS OF THE SLOT AND THE SPRING POST. CHECK BOTH SIDES AND CHECK SEATING IN FOURTH NOTCH (LETTERS SELECTION). TURN THE TRU ARC FASTENING THE DRIVE LINK EXTENSION TO THE CORRECTOR PLATE TO CHECK THE MINIMUM REQUIREMENT.

**TO ADJUST**

LOOSEN TWO DRIVE LINK ADJUSTING SCREWS. POSITION DRIVE LINK TO MEET THE REQUIREMENT AND RETIGHTEN THE SCREWS.

2.45 Typing Mechanism continued

ROTARY CORRECTING LEVER

(1) TO CHECK

LOOSEN CORRECTING CLAMP ADJUSTING SCREW. WITH UNIT IN FIGURES CONDITION, SELECT NO. 9 CODE COMBINATION (---45). TRIP FUNCTION CLUTCH AND POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY SEAT ROTARY CORRECTING LEVER IN TYPE WHEEL RACK.

REQUIREMENT

SECOND TOOTH FROM TOP OF RACK SEATED BETWEEN LOBES OF CORRECTING LEVER.

TO ADJUST

LOOSEN ECCENTRIC BUSHING LOCK NUT. WITH CLAMP ADJUSTING SCREW LOOSENED AND CORRECTING LEVER PIVOT TO RIGHT OF CENTER LINE, POSITION CORRECTING LEVER. TIGHTEN BUSHING LOCK NUT. DO NOT TIGHTEN CLAMP ADJUSTING SCREW AT THIS TIME.

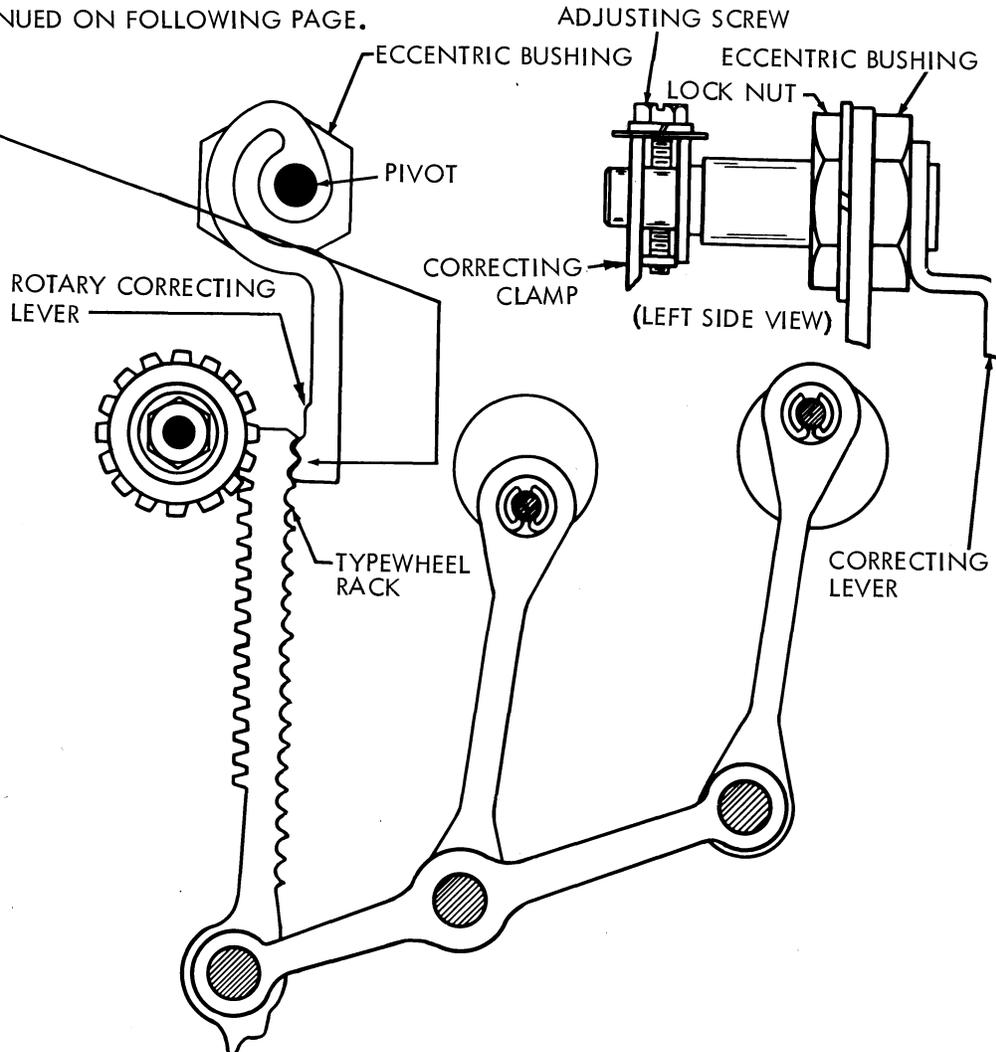
(2) TO CHECK

IN A MANNER SIMILAR TO THAT DESCRIBED ABOVE CHECK ENGAGEMENT OF FIFTH TOOTH (--34- CODE COMBINATION SELECTED IN FIGURES CONDITION), NINTH TOOTH (---4- CODE COMBINATION SELECTED IN LETTERS CONDITION) AND SIXTEENTH TOOTH (--3-5 CODE COMBINATION SELECTED IN LETTERS CONDITION).

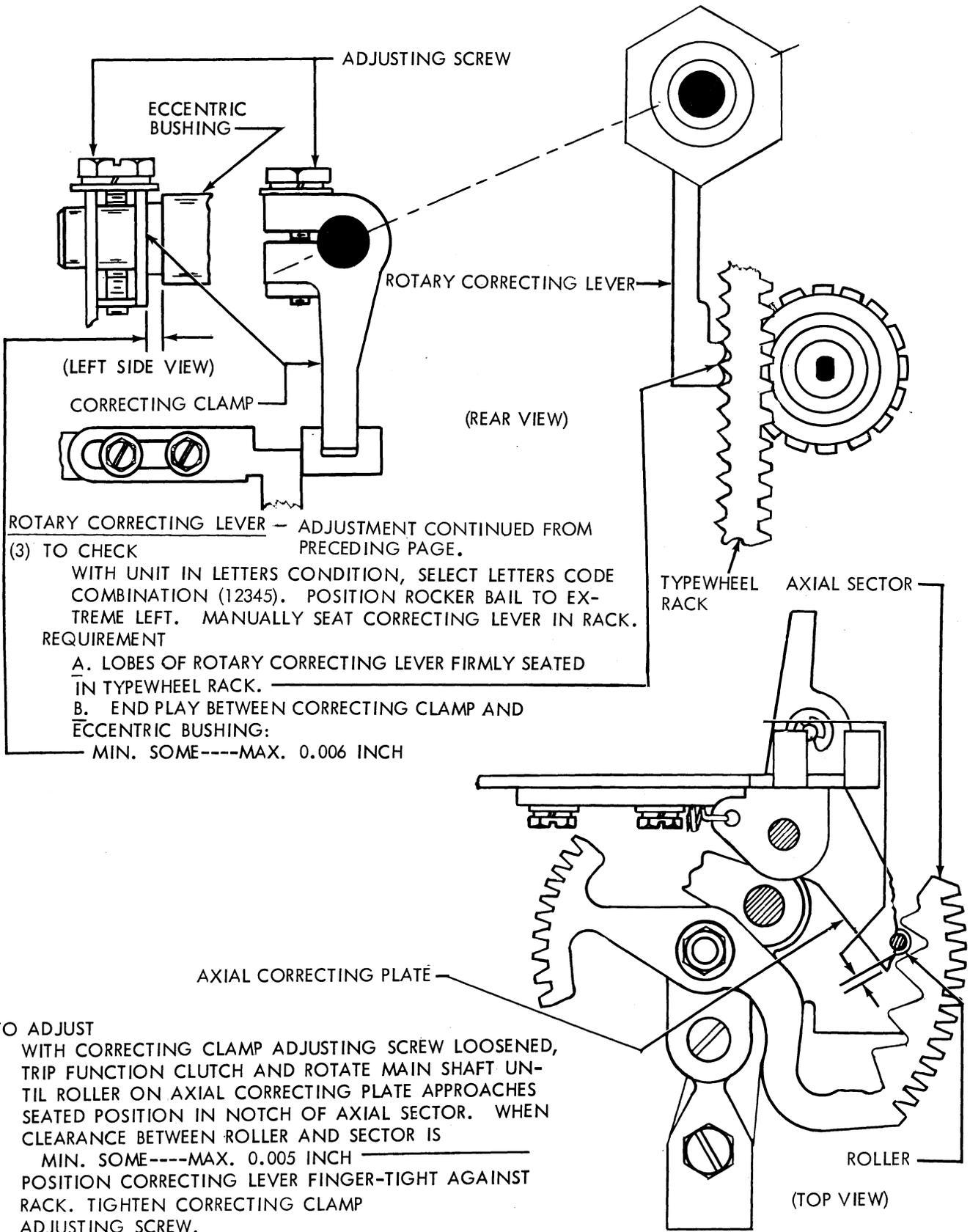
TO ADJUST

REFINE ADJUSTMENT UNDER (1) ABOVE.

ADJUSTMENT CONTINUED ON FOLLOWING PAGE.



2.46 Typing Mechanism continued



ROTARY CORRECTING LEVER — ADJUSTMENT CONTINUED FROM PRECEDING PAGE.

(3) TO CHECK WITH UNIT IN LETTERS CONDITION, SELECT LETTERS CODE COMBINATION (12345). POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY SEAT CORRECTING LEVER IN RACK.

REQUIREMENT

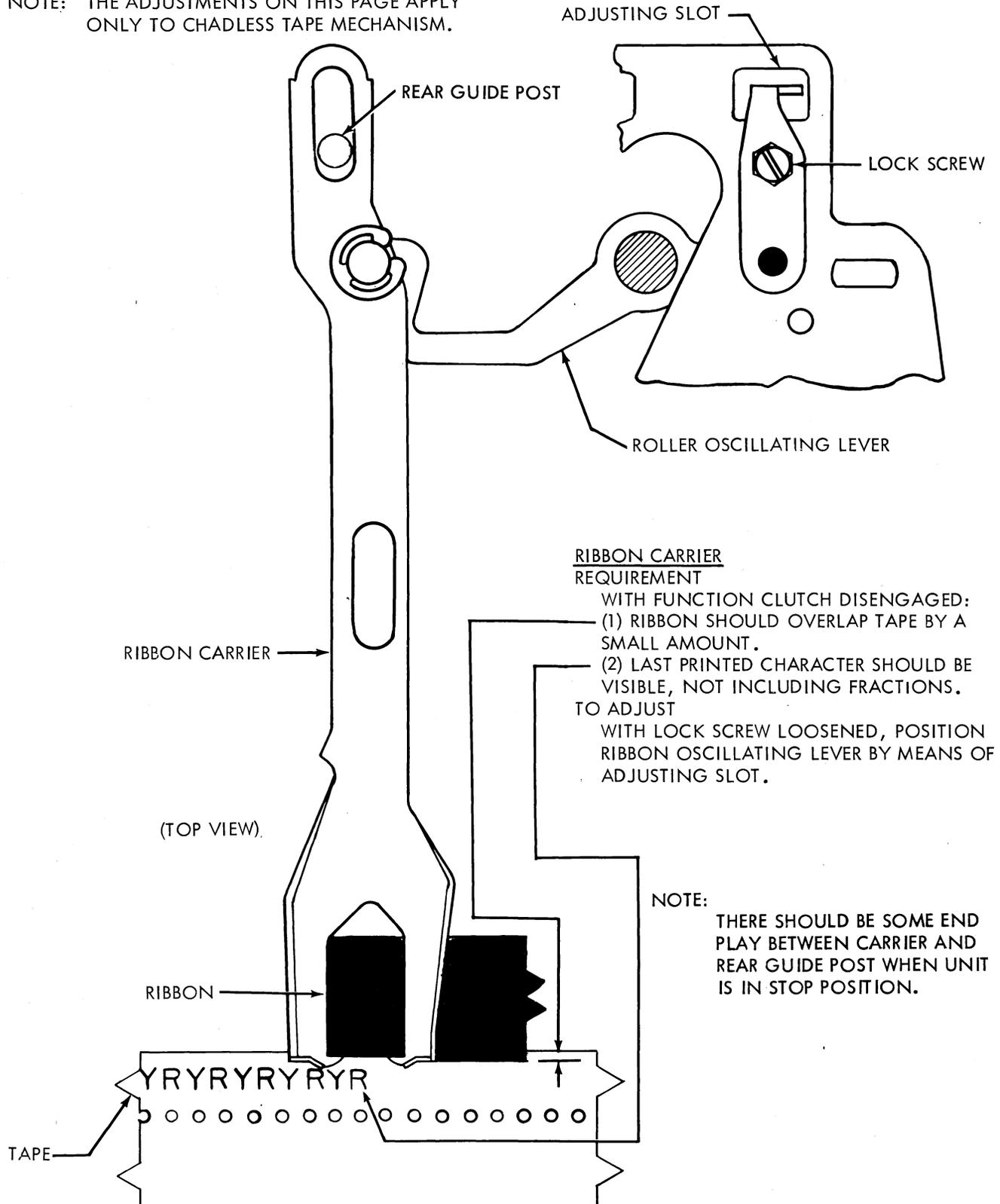
A. LOBES OF ROTARY CORRECTING LEVER FIRMLY SEATED IN TYPEWHEEL RACK.

B. END PLAY BETWEEN CORRECTING CLAMP AND ECCENTRIC BUSHING:  
 MIN. SOME----MAX. 0.006 INCH

TO ADJUST WITH CORRECTING CLAMP ADJUSTING SCREW LOOSENED, TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROLLER ON AXIAL CORRECTING PLATE APPROACHES SEATED POSITION IN NOTCH OF AXIAL SECTOR. WHEN CLEARANCE BETWEEN ROLLER AND SECTOR IS  
 MIN. SOME----MAX. 0.005 INCH  
 POSITION CORRECTING LEVER FINGER-TIGHT AGAINST RACK. TIGHTEN CORRECTING CLAMP ADJUSTING SCREW.

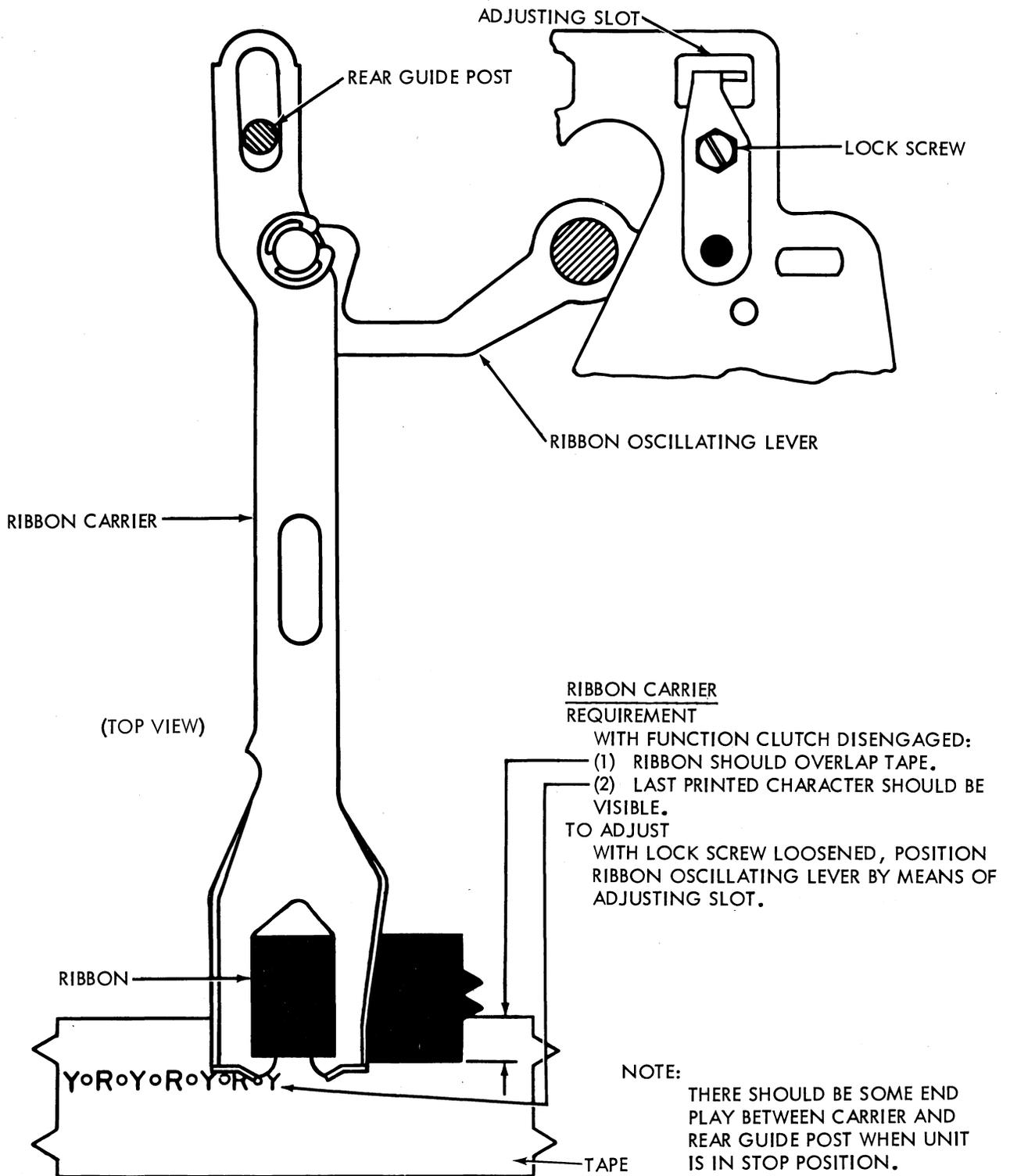
2.47 Typing Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.



2.48 Typing Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM.



2.49 Typing Mechanism continued

PRINTING TRIP LINK  
TO CHECK

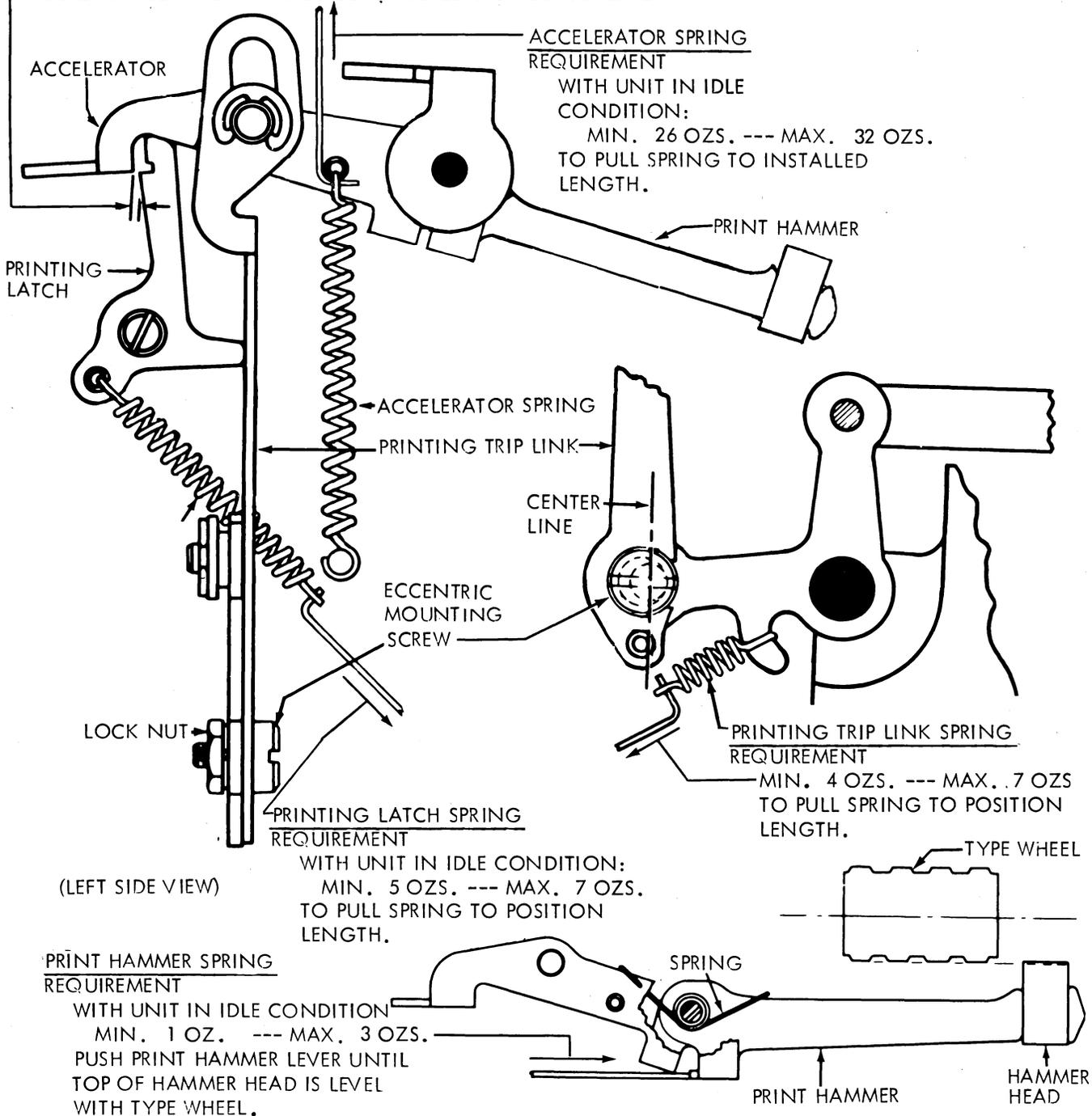
TRIP FUNCTION CLUTCH AND POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY LIFT ACCELERATOR SO THAT LATCHING SURFACES OF PRINTING LATCH AND ACCELERATOR ARE EVEN.

REQUIREMENT

MIN. SOME --- MAX. 0.015 INCH  
CLEARANCE BETWEEN ACCELERATOR AND LATCH.

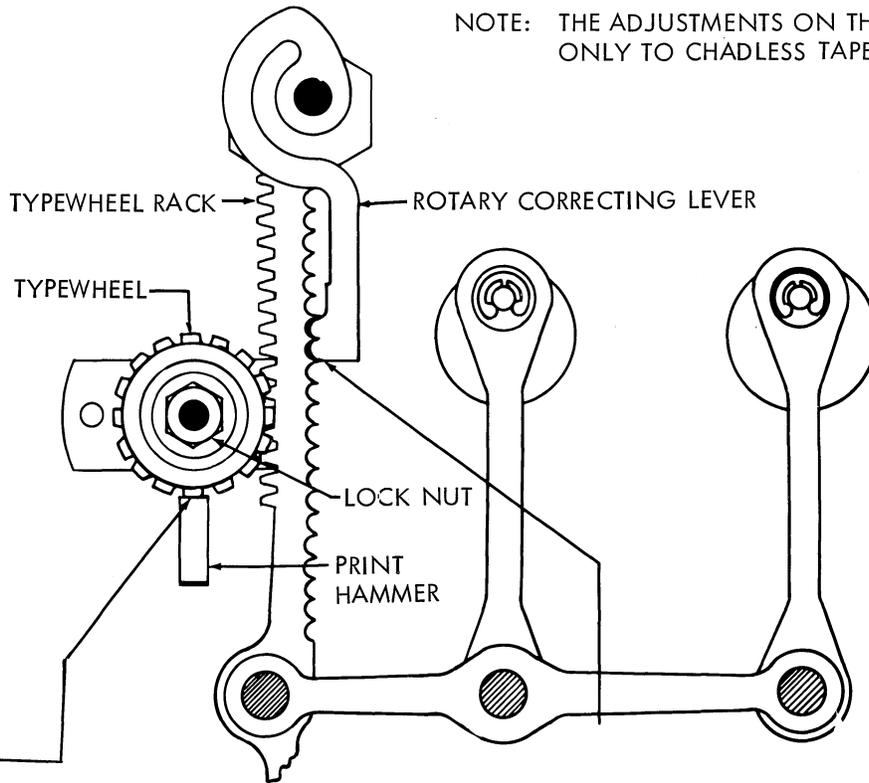
TO ADJUST

WITH LOCK NUT LOOSENED, POSITION PRINTING TRIP LINK BY MEANS OF ECCENTRIC MOUNTING SCREW. KEEP HIGH PART OF SCREW TO LEFT OF CENTER LINE.



2.50 Typing Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO CHADLESS TAPE MECHANISM.



(A)  
TYPEWHEEL  
TO CHECK

SELECT "M" CODE COMBINATION (--345). PLACE ROCKER BAIL TO EXTREME LEFT. CORRECTING LEVER SHOULD BE FIRMLY SEATED IN TYPEWHEEL RACK.

REQUIREMENT

TYPEWHEEL ALIGNED SO THAT FULL CHARACTER IS PRINTED UNIFORMLY AND  $6\frac{1}{4}$  CODE HOLE SPACES BEHIND ITS PERFORATED CODE HOLES.

TO ADJUST

POSITION TYPEWHEEL WITH LOCK NUT LOOSENED. CHECK PRINTING BY MANUALLY LIFTING ACCELERATOR TO LATCHED POSITION AND RELEASING IT.

NOTE:

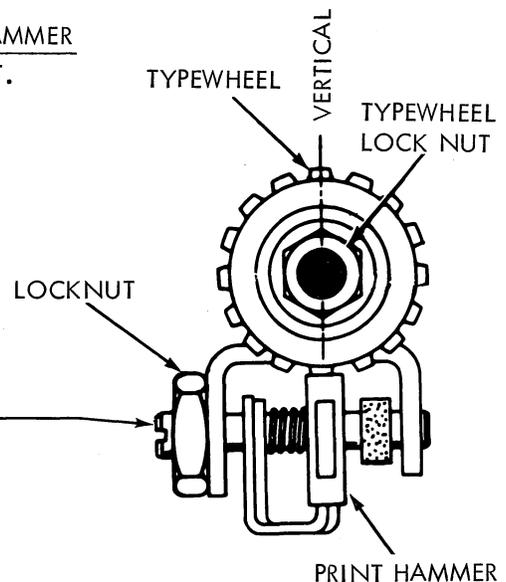
FOR BEST RESULTS IT MAY BE NECESSARY TO MAKE PRINT HAMMER ADJUSTMENT (BELOW) AND THEN REFINE THIS ADJUSTMENT.

(B)  
PRINT HAMMER  
REQUIREMENT

WHEN OPERATING UNDER POWER, PRINT HAMMER AND TYPEWHEEL ALIGNED SO AS TO OBTAIN BEST QUALITY OF PRINTING.

TO ADJUST

POSITION PRINT HAMMER SHAFT WITH LOCK NUT LOOSENED.



NOTE:

IT MAY BE NECESSARY TO REMAKE TYPEWHEEL ADJUSTMENT (ABOVE) AND THEN REFINE THIS ADJUSTMENT.

2.51 Typing Mechanism continued

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM.

PRINT HAMMER (PRELIMINARY)

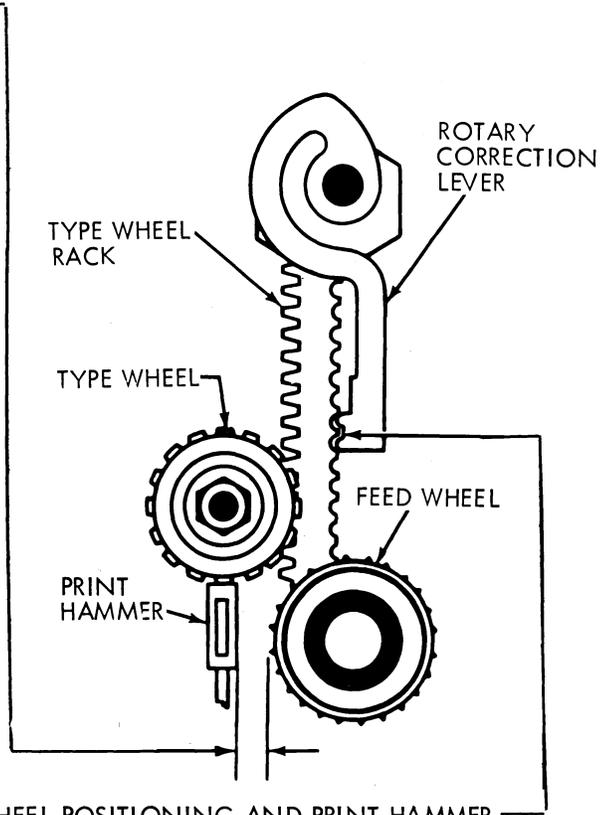
REQUIREMENT

POSITION PRINT HAMMER

MIN. 0.030 INCH --- MAX. 0.040 INCH FROM THE PIN POINTS ON THE FEED WHEEL.

TO ADJUST

WITH THE PRINT HAMMER SHAFT LOCK NUT LOOSE POSITION THE PRINT HAMMER BY TURNING THE SHAFT CLOCKWISE TO MOVE PRINT HAMMER TOWARD THE FEED WHEEL AND COUNTER CLOCKWISE TO MOVE THE PRINT HAMMER AWAY FROM THE FEED WHEEL.



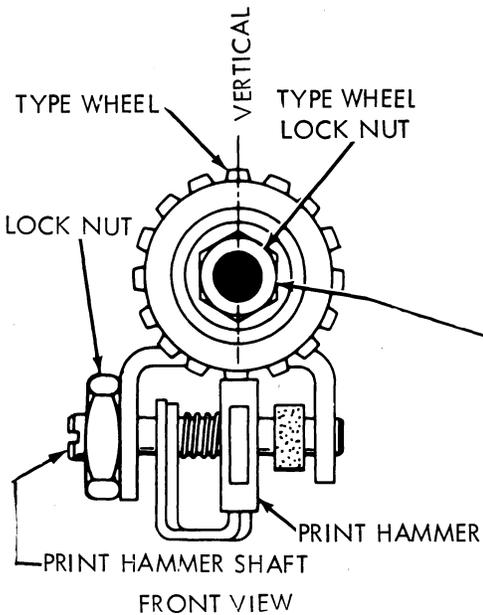
TYPE WHEEL POSITIONING AND PRINT HAMMER (FINAL)

REQUIREMENT

WITH "M" CODE COMBINATION (--345) SELECTED, AND ROCKER BAIL IN ITS EXTREME LEFT POSITION CHECK THAT THE ROTARY CORRECTOR IS FIRMLY SEATED IN THE TYPE WHEEL RACK. THE TYPE WHEEL AND PRINT HAMMER ALIGNMENT COULD BE SUCH THAT A FULL CHARACTER IS PRINTED UNIFORMLY BETWEEN THE FEED HOLES.

TO ADJUST

WITH TYPEWHEEL LOCK NUT LOOSE POSITION THE TYPE WHEEL. IF NECESSARY, REFINE THE PRINT HAMMER ADJUSTMENT MAKING CERTAIN THE PRINT HAMMER HEAD DOES NOT COME IN CONTACT WITH THE FEED WHEEL.



2.52 Ribbon Mechanism

FEED PAWL SPRING

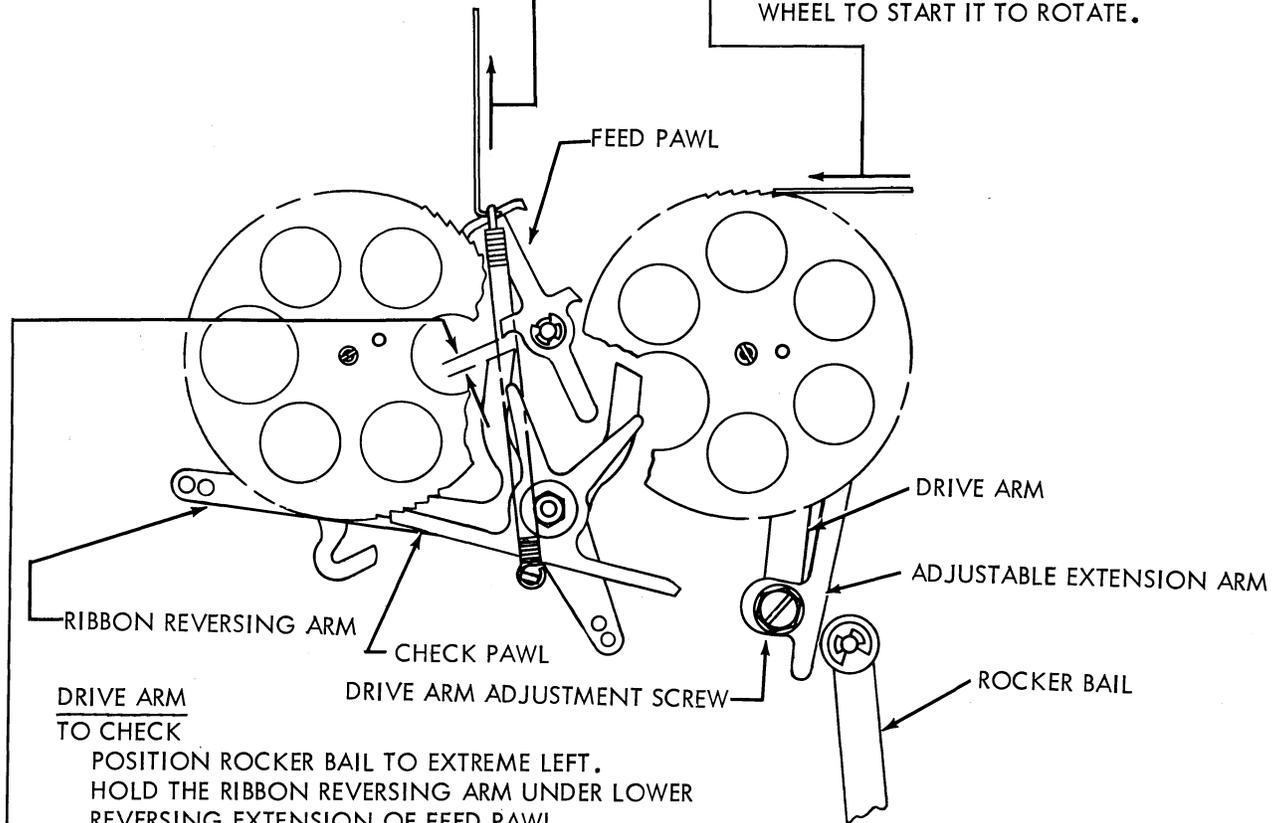
REQUIREMENT

WITH ROCKER BAIL TO EXTREME RIGHT:  
MIN. 4 OZS. --- MAX. 6 OZS.  
TO PULL FEED PAWL SPRING TO  
INSTALLED LENGTH.

RATCHET WHEEL TORQUE SPRING

REQUIREMENT

MIN. 1 OZS. --- MAX. 3 OZS.  
APPLIED TANGENTIALLY TO THE RATCHET  
WHEEL TO START IT TO ROTATE.



DRIVE ARM  
TO CHECK

POSITION ROCKER BAIL TO EXTREME LEFT.  
HOLD THE RIBBON REVERSING ARM UNDER LOWER  
REVERSING EXTENSION OF FEED PAWL.

REQUIREMENT

- (1) CLEARANCE BETWEEN BLOCKING EDGE OF  
RIBBON REVERSE ARM AND REVERSING  
EXTENSION OF FEED PAWL:  
MIN. SOME
- (2) CLEARANCE SHALL NOT BE SO GREAT AS  
TO ALLOW FEED PAWL TO FEED MORE  
THAN TWO TEETH AT A TIME.
- (3) FEED PAWL DETENTED IN BOTH ITS RIGHT  
AND LEFT POSITION.

TO ADJUST

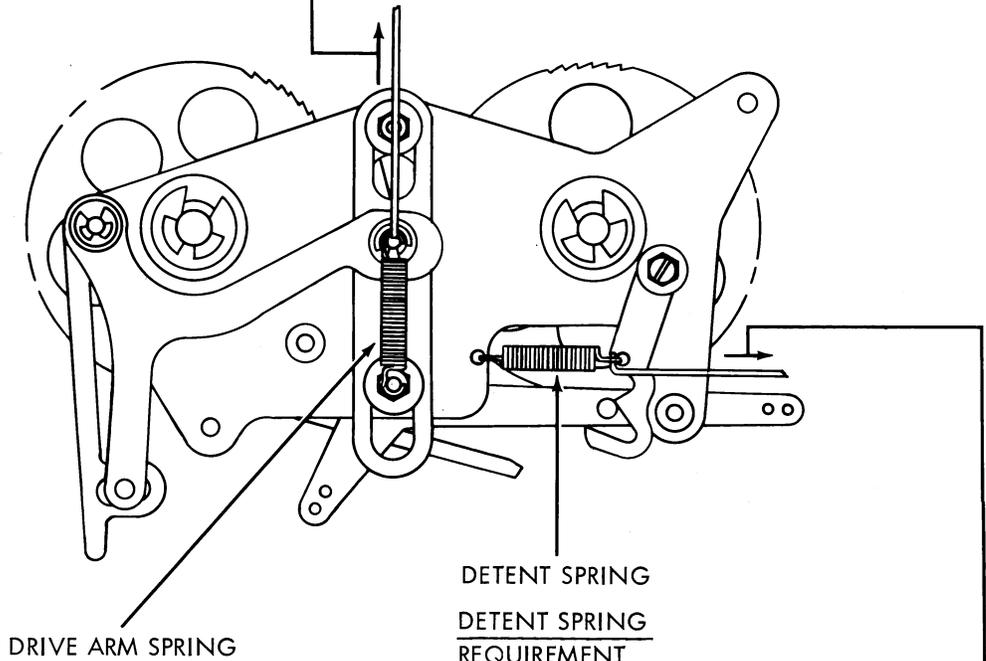
POSITION DRIVE ARM ADJUSTABLE EXTENSION  
LEVER WITH ITS MOUNTING SCREW LOOSENED.

2.53 Ribbon Mechanism continued

DRIVE ARM SPRING

REQUIREMENT

WITH ROCKER BAIL TO EXTREME RIGHT:  
MIN. 9 OZS. --- MAX. 14 OZS.  
TO PULL DRIVE ARM SPRING TO  
INSTALLED LENGTH.



DETENT SPRING

DETENT SPRING

REQUIREMENT

WITH REVERSING ARM IN ITS EXTREME  
RIGHT OR LEFT POSITION:  
MIN. 2 OZS. --- MAX. 4 OZS.  
TO PULL DETENT SPRING TO ITS  
INSTALLED LENGTH.

3. VARIABLE FEATURES.

NOTE: UNLESS OTHERWISE SPECIFIED, THE FOLLOWING BACKSPACE ADJUSTMENTS APPLY TO BOTH THE CHADLESS AND FULLY PERFORATED TAPE MECHANISMS.

3.01 Manual and Power Drive Backspace Mechanism (For Chadless Tape)

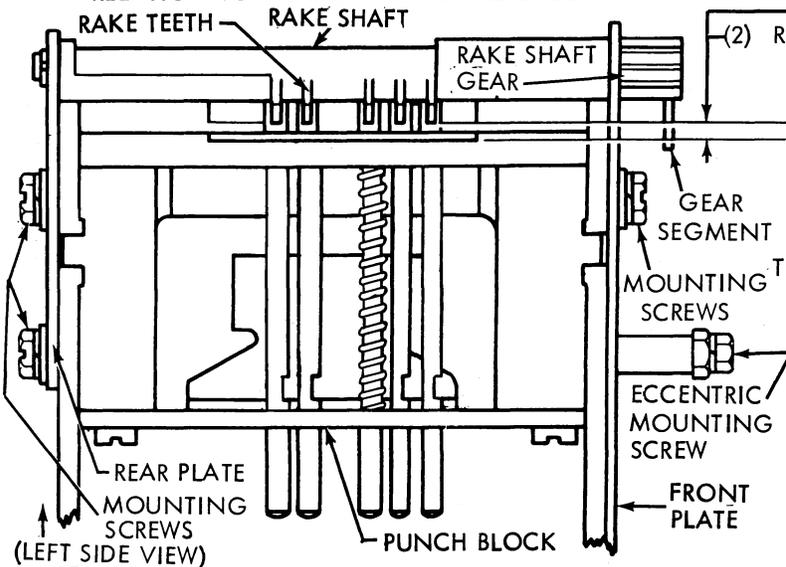
**RAKE (A)**

(1) REQUIREMENT

WITH ROTATIONAL PLAY IN RAKE TAKEN UP TO LEFT, BOTTOM SURFACE OF RAKE TEETH SHOULD BE WITHIN 0.040 INCH OF THE SAME VERTICAL PLANE AS LEFT SIDE OF PUNCH BLOCK OR SLIGHTLY TO THE RIGHT.

TO ADJUST

REMOVE TWO MOUNTING SCREWS FROM REAR PLATE. POSITION RAKE SHAFT GEAR IN RELATION TO GEAR SEGMENT. REPLACE MOUNTING SCREWS.



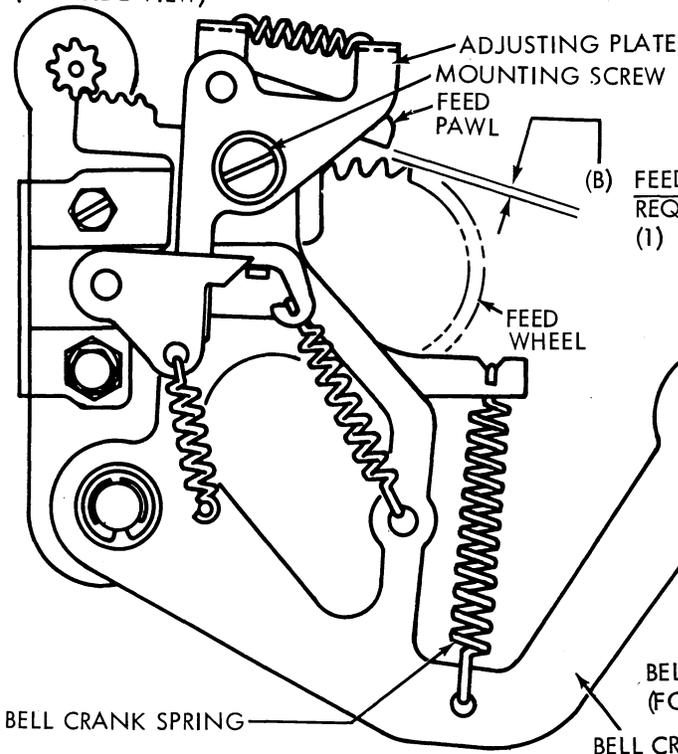
(2) REQUIREMENT

WITH BELL CRANK SPRING UNHOOKED AND RAKE IN OPERATED POSITION, CLEARANCE BETWEEN BOTTOM OF RAKE TEETH AND LOWER SURFACE OF TAPE SLOT:

MIN. 0.007 INCH---MAX. 0.011 INCH (CHECK AT NO. 1 & 5 PINS.)

TO ADJUST

LOOSEN THE FOUR PUNCH BLOCK MOUNTING SCREWS FRICTION TIGHT, POSITION THE RAKE MOUNTING PLATE AND BELL CRANK MOUNTING PLATE SO THAT THE FRONT EDGE OF BOTH PLATES IS APPROXIMATELY IN LINE WITH THE VERTICAL PLANE OF THE PUNCH BLOCK. WITH THE RAKE IN THE OPERATED POSITION (BELL CRANK IN MAXIMUM DOWNWARD POSITION) MOVE THE RAKE UP OR DOWN TO MEET CLEARANCE REQUIREMENT. TIGHTEN SCREWS AND REPLACE THE BELL CRANK SPRING.



(B) FEED PAWL ADJUSTING PLATE REQUIREMENT

(1) PRELIMINARY: WITH BELL CRANK ROTATED CLOCKWISE, FEED PAWL SHALL MISS FIRST TOOTH AT POINT OF LEAST CLEARANCE BY

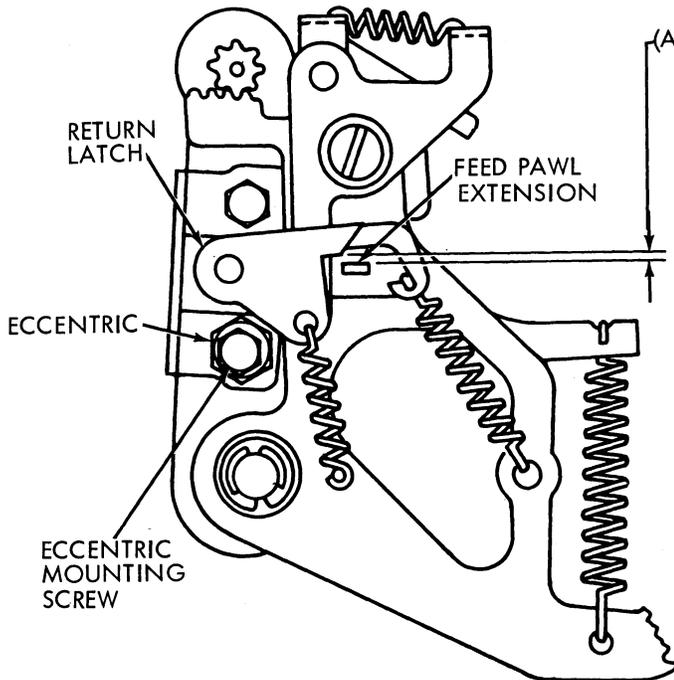
MIN. 0.006 INCH---MAX. 0.040 INCH

(2) FINAL: FEED PAWL SHALL MISS FIRST TOOTH AND ENGAGE SECOND TOOTH BY AT LEAST 1/2 OF RIGHT ENGAGING SURFACE OF FEED PAWL (AS GAUGED BY EYE WHEN FEED PAWL FIRST CONTACTS RATCHET TOOTH).

TO ADJUST

POSITION ADJUSTING PLATE WITH MOUNTING SCREW FRICTION TIGHT.

3.02 Manual and Power Drive Backspace Mechanism (For Chadless Tape) continued



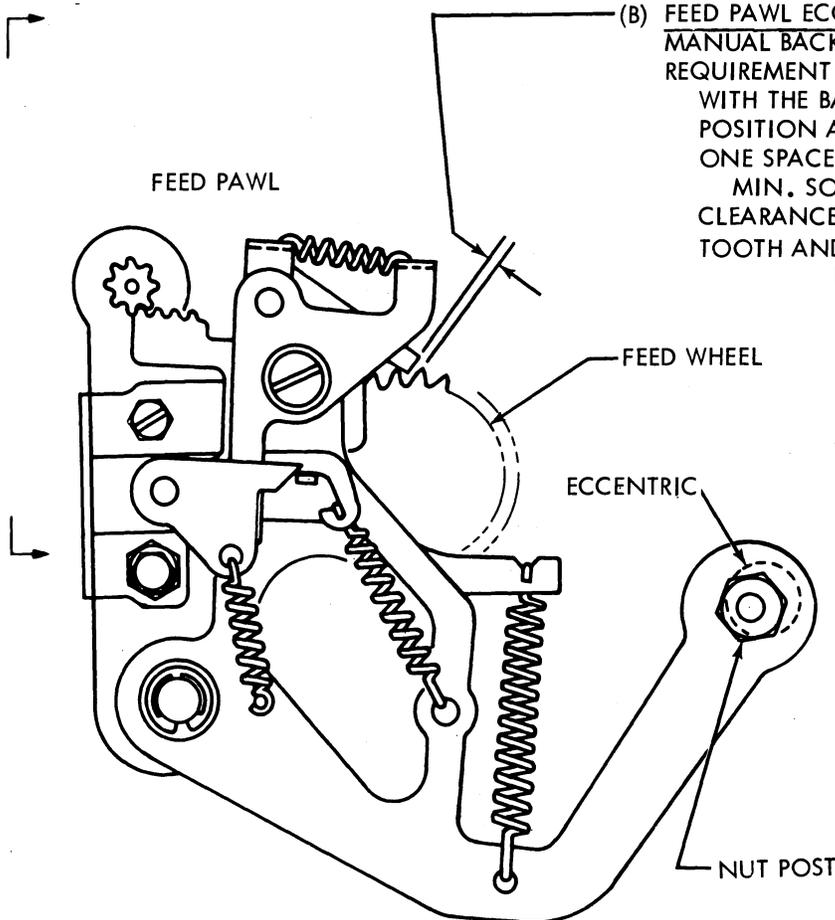
(A) RETURN LATCH REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. CLEARANCE BETWEEN RETURN LATCH AND FEED PAWL EXTENSION

MIN. 0.004 INCH  
MAX. 0.020 INCH

TO ADJUST

ADJUST ECCENTRIC WITH MOUNTING SCREW FRICTION TIGHT.



(B) FEED PAWL ECCENTRIC MANUAL BACKSPACE (PRELIMINARY) REQUIREMENT

WITH THE BACKSPACE BELL CRANK IN ITS OPERATED POSITION AND THE FEED WHEEL DETENTED BACK ONE SPACE!

MIN. SOME---MAX. 0.003 INCH  
CLEARANCE BETWEEN THE FEED WHEEL RATCHET TOOTH AND THE BACKSPACE FEED PAWL.

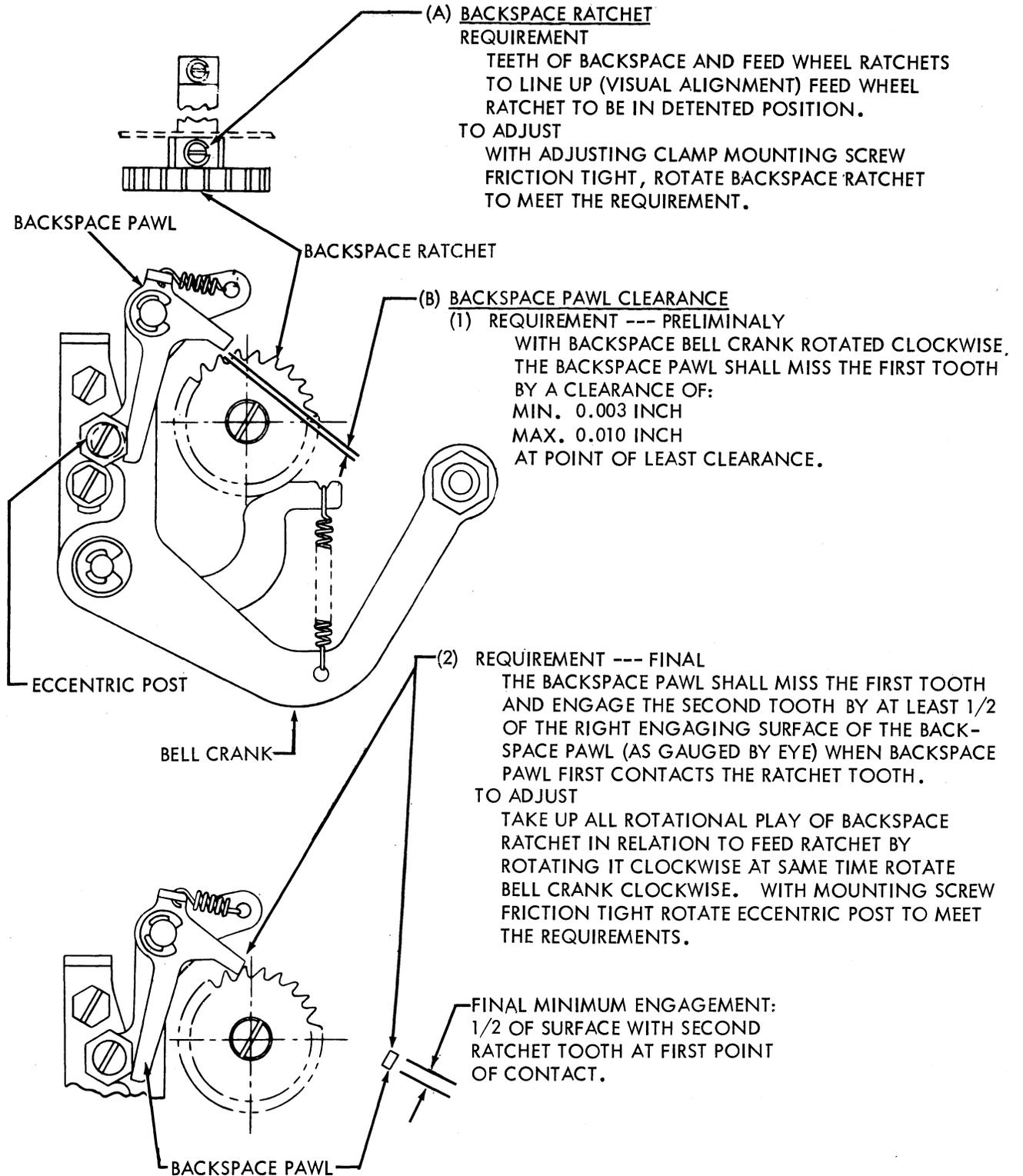
POWER DRIVE BACKSPACE

WITH THE BACKSPACE BELL CRANK IN ITS OPERATED POSITION, THE HIGH SIDE OF THE ECCENTRIC SHOULD BE IN ITS UPPERMOST POSITION.

TO ADJUST

LOOSEN THE NUT POST (FRICTION TIGHT) AND ROTATE ECCENTRIC WITH AN ALLEN WRENCH. TIGHTEN THE NUT POST.

3.03 Manual and Power Drive Backspace Mechanism (For Fully Perforated Tape)



3.04 Manual and Power Drive Backspace Mechanism (For Fully Perforated Tape) continued

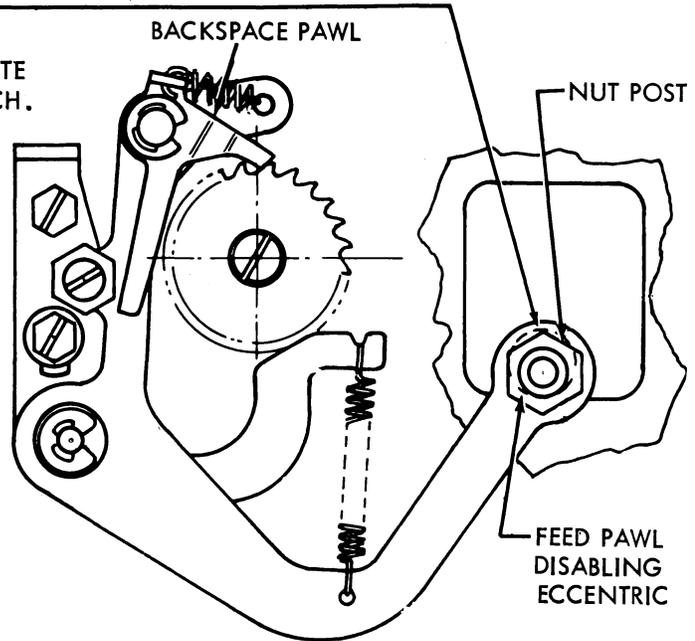
(A) FEED PAWL DISABLING

REQUIREMENT

WHEN BELL CRANK IS IN OPERATED POSITION HIGH SIDE OF FEED PAWL DISABLING ECCENTRIC SHOULD BE IN UPPERMOST POSITION.

TO ADJUST

WITH NUT POST FRICTION TIGHT, ROTATE ECCENTRIC WITH A 0.060" ALLEN WRENCH.



3.05 Power Drive Backspace Mechanism (For Fully Perforated Tape) (Early Design)

(B) DRIVE LINK

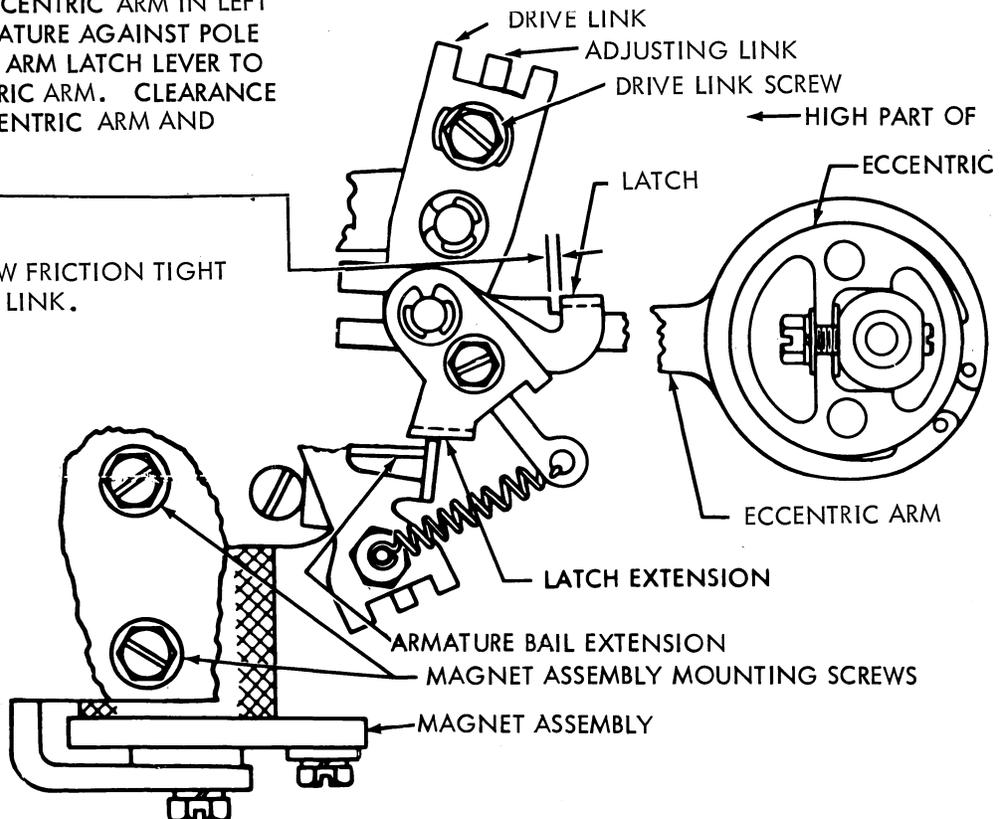
REQUIREMENT

WITH HIGH PART OF ECCENTRIC ARM IN LEFT HAND POSITION, ARMATURE AGAINST POLE FACE TO ALLOW DRIVE ARM LATCH LEVER TO REST AGAINST ECCENTRIC ARM. CLEARANCE BETWEEN STEP ON ECCENTRIC ARM AND LATCH.

MIN. 0.040 INCH  
MAX. 0.045 INCH

TO ADJUST

WITH DRIVE LINK SCREW FRICTION TIGHT POSITION ADJUSTING LINK.



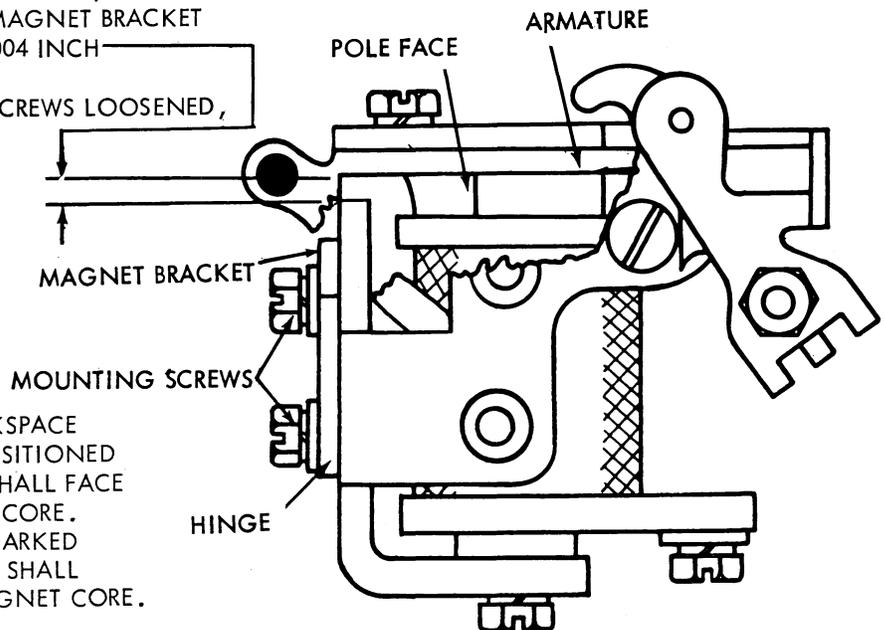
3.06 Power Drive Backspace Mechanism (Early Design) continued

(A) ARMATURE HINGE REQUIREMENT

ARMATURE BAIL SPRING REMOVED. WITH ARMATURE HELD AGAINST POLE FACE AND PLAY TAKEN UP AT HINGE IN DOWNWARD DIRECTION, CLEARANCE BETWEEN ARMATURE AND MAGNET BRACKET MIN. SOME --- MAX. 0.004 INCH

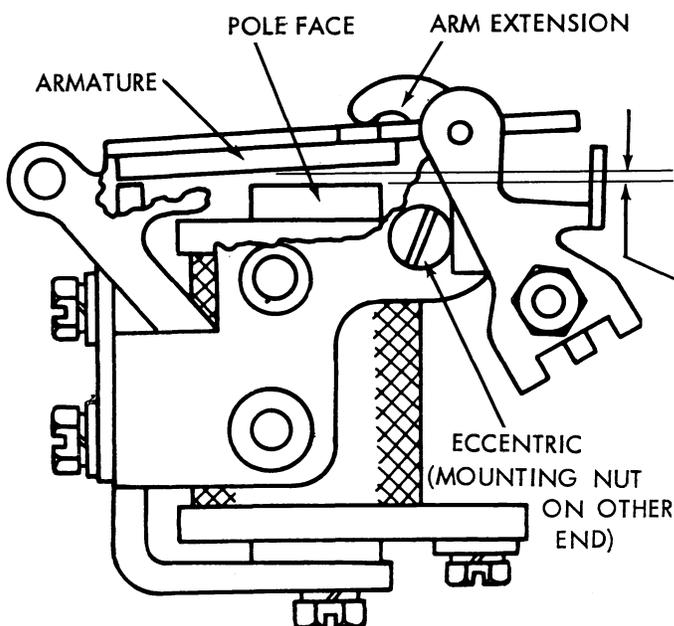
TO ADJUST WITH HINGE MOUNTING SCREWS LOOSENED, POSITION ARMATURE.

NOTE: THE FOLLOWING ADJUSTMENTS ARE FOR USE WITH THE EARLY DESIGN BACKSPACE MAGNET ASSEMBLY. LATER DESIGN USE A NON-ADJUSTABLE BACKSPACE MAGNET ASSEMBLY.



NOTE: FOR "DC" OPERATION, THE BACKSPACE MAGNET ARMATURE SHALL BE POSITIONED SO THAT THE SIDE MARKED "C" SHALL FACE THE POLE FACE OF THE MAGNET CORE. FOR "AC" OPERATION, THE UNMARKED SIDE OF THE MAGNET ARMATURE SHALL FACE THE POLE FACE OF THE MAGNET CORE.

NOTE: THIS ADJUSTMENT IS MADE AT FACTORY AND SHOULD NOT BE DISTURBED UNLESS A REASSEMBLY OF THE UNIT IS UNDERTAKEN. IF NECESSARY TO MAKE THIS ADJUSTMENT, THE PUNCH UNIT SHOULD BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY. REMAKE PUNCH UNIT POSITION ADJUSTMENT.

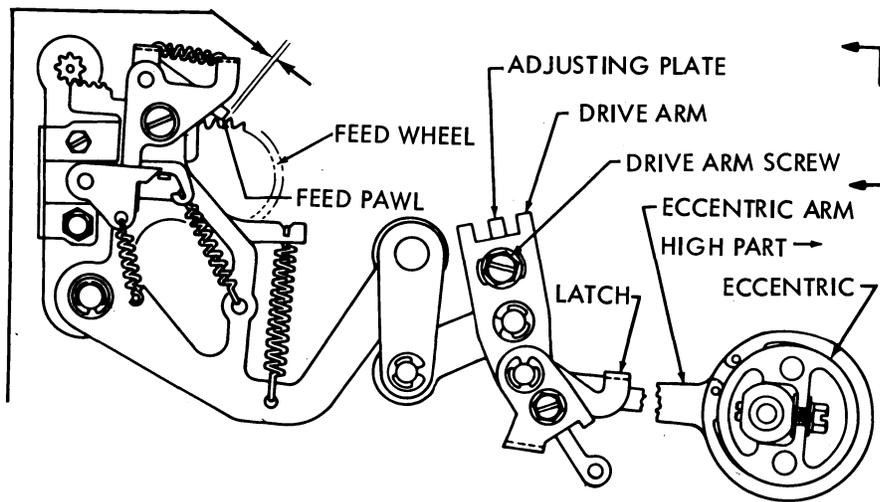


(B) ARMATURE UP-STOP REQUIREMENT

ARMATURE IN UNOPERATED POSITION. GAP BETWEEN ARMATURE AND POLE FACE MIN. 0.025 INCH. MAX. 0.030 INCH. AT CLOSEST POINT.

TO ADJUST ROTATE ECCENTRIC WITH MOUNTING NUT LOOSENED. KEEP HIGH PART OF ECCENTRIC TO LEFT.

→ 3.07 Power Drive Backspace Mechanism (For Chadless Tape) (Early Design) continued



(A) DRIVE ARM REQUIREMENT

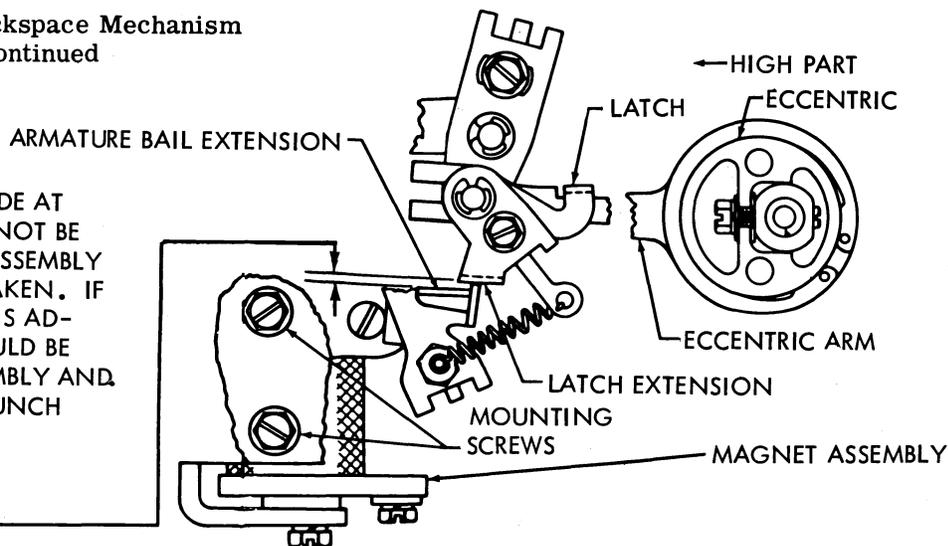
WITH DRIVE ARM LATCH LEVER ENGAGED WITH ECCENTRIC LINK, MAIN SHAFT ROTATED TO PLACE ECCENTRIC IN ITS EXTREME RIGHT HAND POSITION AND FEED WHEEL DETENTED BACK ONE SPACE:

MIN. SOME---MAX. 0.003 INCH  
CLEARANCE BETWEEN THE BACKSPACE FEED PAWL AND THE RATCHET TOOTH. CHECK WITH FEED WHEEL SHAFT OIL HOLE IN THE UPPERMOST POSITION AND RECHECK EACH 90 DEGREES ABOUT THE PERIPHERY OF THE FEED WHEEL.

TO ADJUST

LOOSEN DRIVE ARM SCREW (FRICTION TIGHT) AND POSITION ADJUSTING PLATE.

3.08 Power Drive Backspace Mechanism (Early Design) continued



NOTE:  
THIS ADJUSTMENT IS MADE AT FACTORY AND SHOULD NOT BE DISTURBED UNLESS A REASSEMBLY OF THE UNIT IS UNDERTAKEN. IF NECESSARY TO MAKE THIS ADJUSTMENT, PUNCH SHOULD BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY. REMAKE PUNCH POSITION ADJUSTMENT.

(B) LATCH EXTENSION REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. HIGH PART OF ECCENTRIC TO LEFT. ARMATURE AGAINST POLE FACE. LATCH RESTING ON ECCENTRIC ARM NOTCH. CLEARANCE BETWEEN TOP OF ARMATURE BAIL EXTENSION AND LATCH EXTENSION

MIN. 0.005 INCH  
MAX. 0.020 INCH

TO ADJUST

SWING MAGNET CLOCKWISE OR COUNTERCLOCKWISE, AS NECESSARY, WITH MOUNTING SCREWS FRICTION TIGHT.

3.09 Power Drive Backspace Mechanism (Early Design) continued

(A) LATCH

REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. ARMATURE OFF POLE FACE (DE-ENERGIZED). LATCH EXTENSION AGAINST END OF ARMATURE BAIL EXTENSION. ECCENTRIC ARM AT ITS CLOSEST POINT TO UNDERSIDE OF LATCH. CLEARANCE BETWEEN LATCH AND ECCENTRIC

ARM,  
MIN. 0.005 INCH  
MAX. 0.025 INCH

TO ADJUST

POSITION LATCH WITH LATCH EXTENSION SCREW LOOSENED.

NOTE 1:

ON UNITS EQUIPPED WITH ONE PIECE NON-ADJUSTABLE LATCH LEVER THE REQUIREMENTS IN THE "FINAL POWER OR MANUAL" MUST BE MET.

LATCH EXTENSION SCREW

ARMATURE BAIL EXTENSION

ARM SHOWN IN ITS HIGHEST POINT OF TRAVEL.

LATCH

ECCENTRIC

ECCENTRIC ARM

LATCH EXTENSION

(B) NON-REPEAT ARM  
REQUIREMENT

BACKSPACE MECHANISM IN UNOPERATED POSITION. CLEARANCE BETWEEN TOP SURFACE OF NON-REPEAT ARM AND LOWEST POINT OF LATCH EXTENSION

MIN. 0.002 INCH  
MAX. 0.010 INCH

TO ADJUST

POSITION ADJUSTING ARM WITH ARM SCREW LOOSENED FRICTION TIGHT.

LATCH EXTENSION

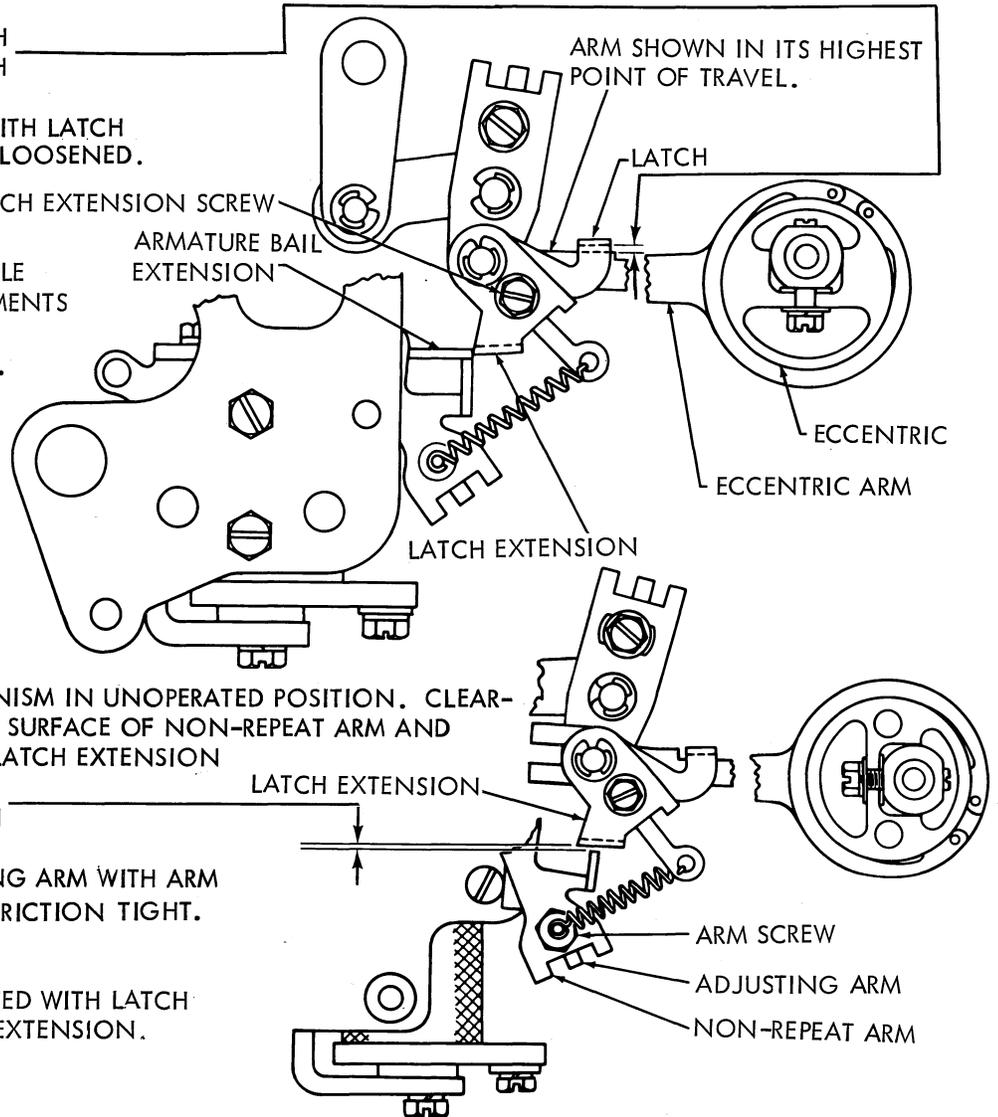
ARM SCREW

ADJUSTING ARM

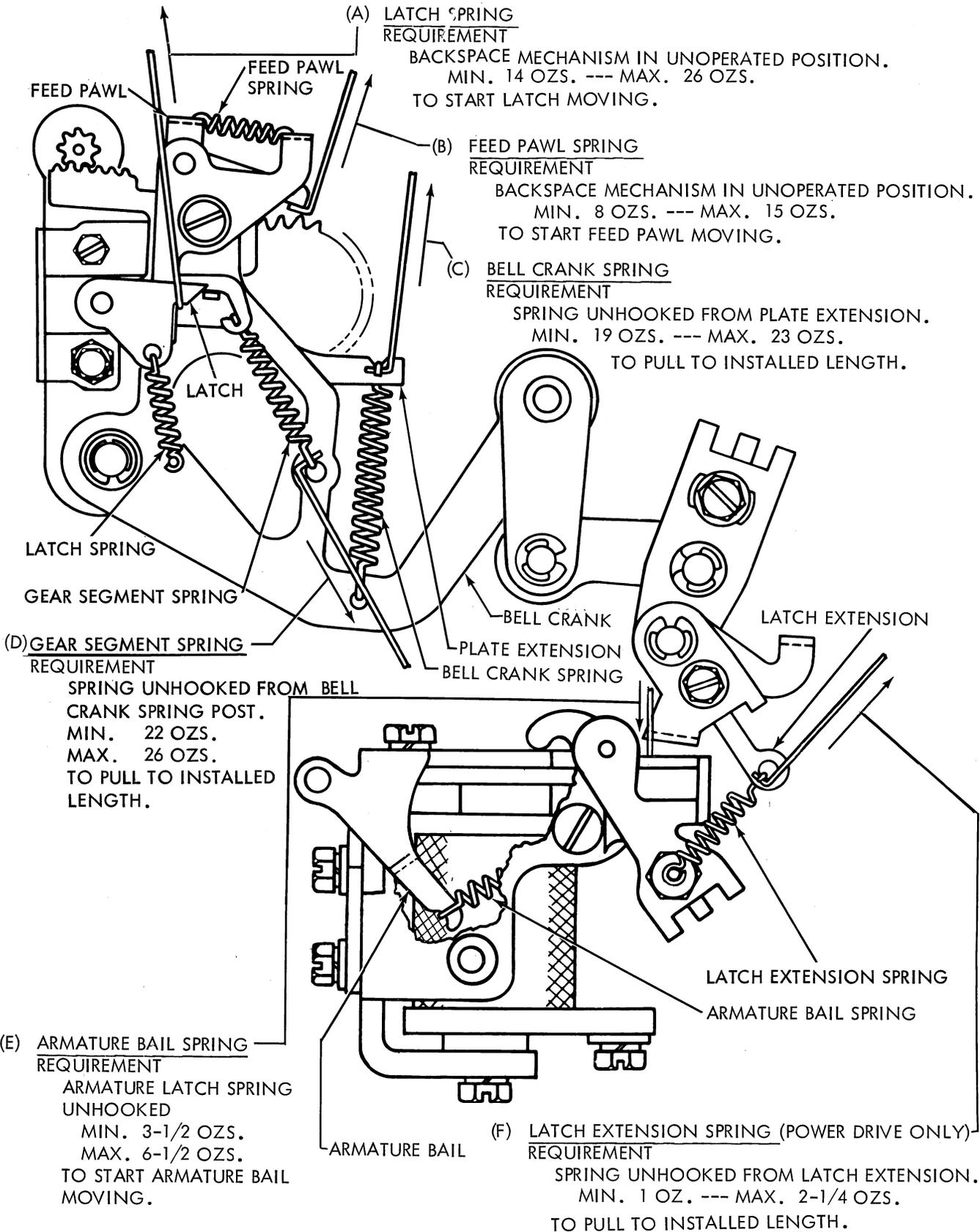
NON-REPEAT ARM

NOTE 2:

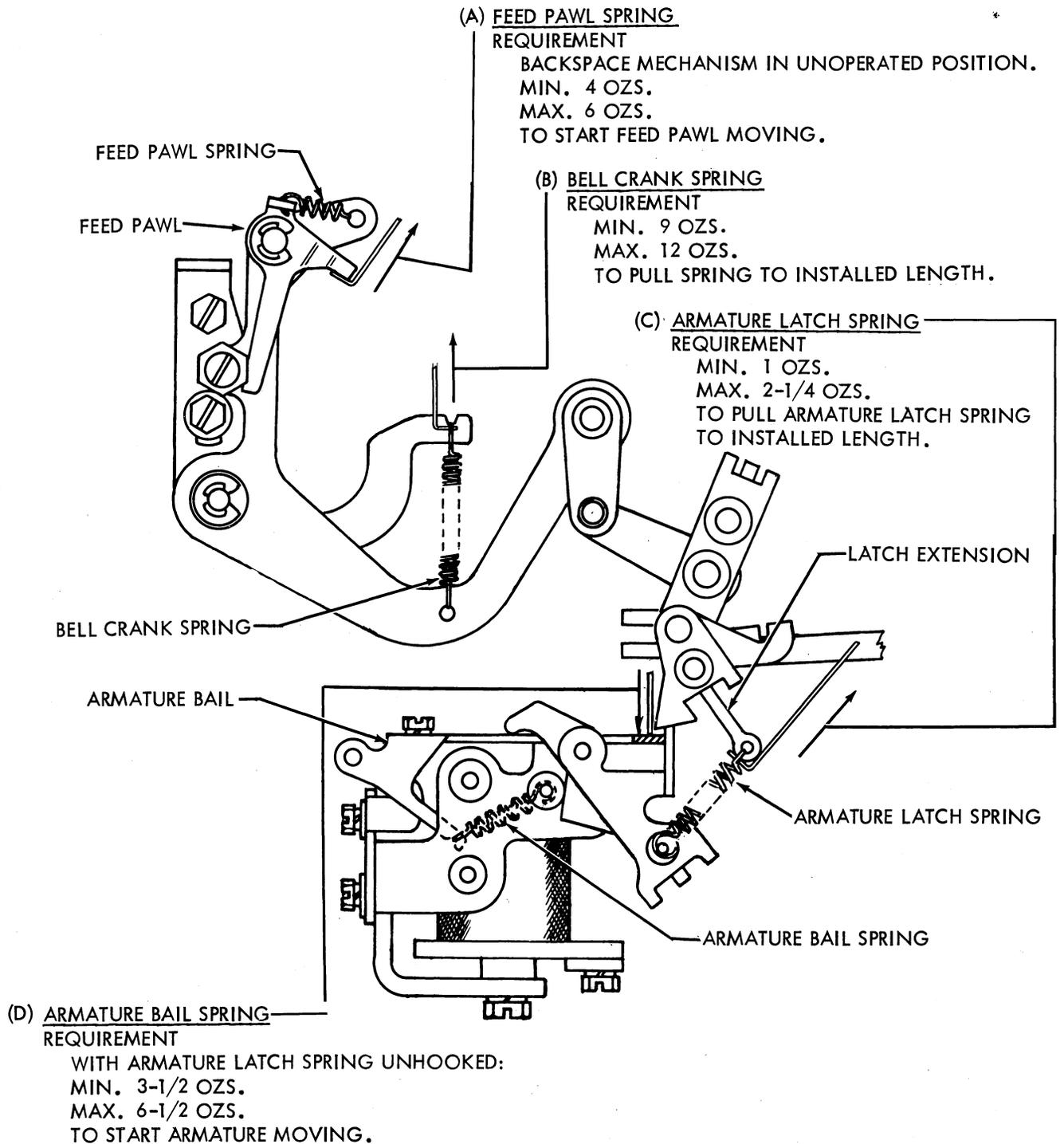
MUST NOT BE OPERATED WITH LATCH AGAINST ARMATURE EXTENSION.



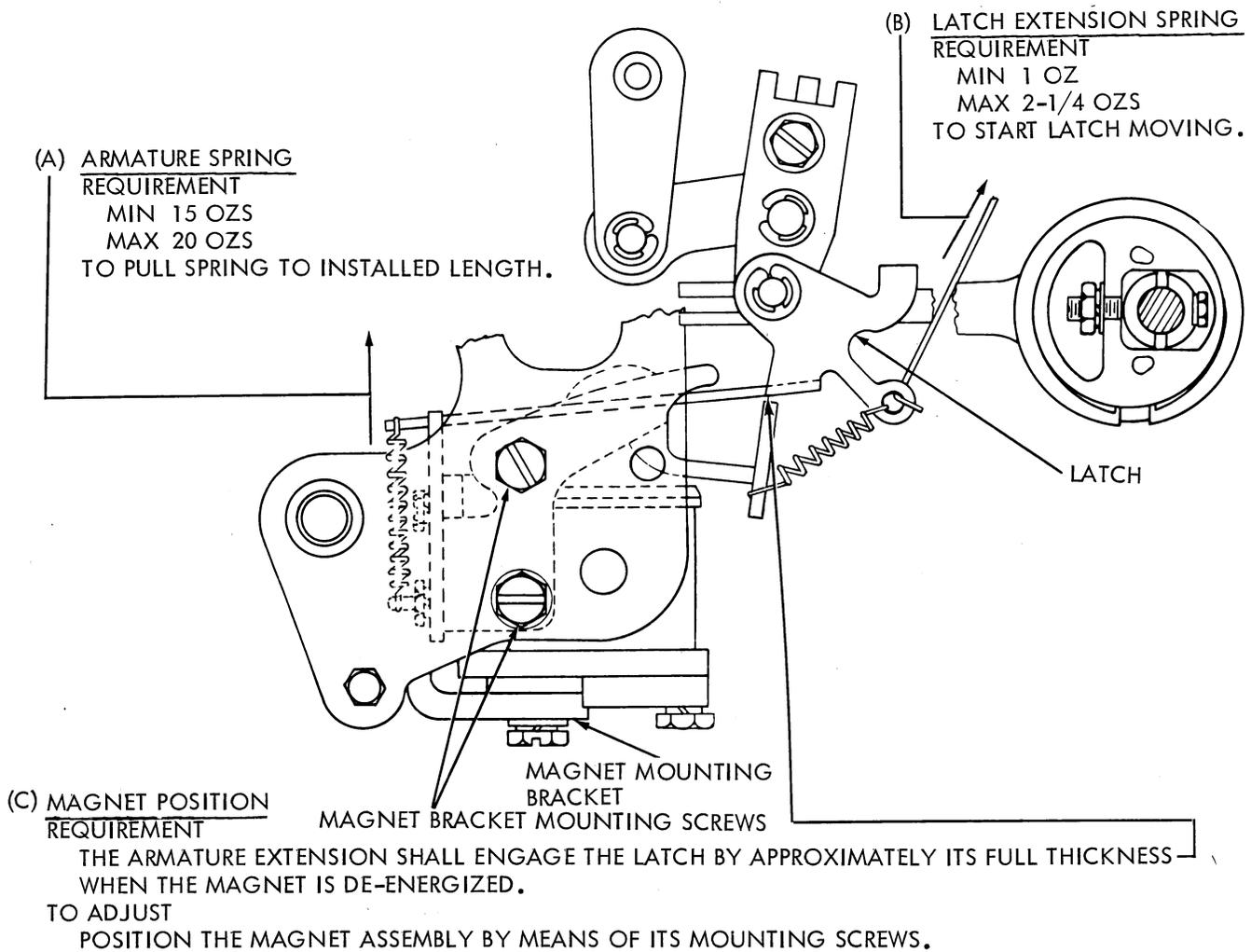
3.10 Manual and Power Drive Backspace Mechanism (For Chadless Tape) (Early Design) continued



3.11 Manual and Power Drive Backspace Mechanism (For Fully Perforated Tape)  
(Early Design) continued



3.12 Power Drive Backspace Mechanism (Latest Design)  
(Non-Adjustable Backspace Magnet Assembly)



3.13 Manual and Power Drive Backspace Mechanism (Chadless and Fully Perforated Tape)

(D) FINAL MANUAL OR POWER REQUIREMENT

UNIT OPERATING UNDER POWER AND TAPE IN THE PUNCH UNIT. PLACE THE FEED WHEEL SHAFT OIL HOLE IN ITS UPPERMOST POSITION AND OPERATE THE BACKSPACE MECHANISM ONCE. THE BACKSPACE RATCHET WHEEL SHALL BE BACKED ONE SPACE AND THE FEED WHEEL RATCHET TO A FULLY DETENTED POSITION. RECHECK EVERY 90° FOR ONE FULL REVOLUTION OF THE BACKSPACE RATCHET WHEEL.

NOTE 1: A FULLY DETENTED POSITION IS DEFINED AS: WITH THE DETENT ROLLER IN CONTACT WITH THE RATCHET WHEEL THE PUNCH UNIT FEED PAWL SHALL ENGAGE THE FIRST TOOTH BELOW THE HORIZONTAL CENTER LINE OF THE RATCHET FEED WHEEL WITH NO PERCEPTIBLE CLEARANCE.

TO ADJUST  
(FOR CHADLESS TAPE MECHANISM) REFINE FEED PAWL ADJUSTMENTS.  
(FOR FULLY PERFORATED TAPE MECHANISM) LOOSEN ARM ADJUSTING SCREW AND MOVE ADJUSTING PLATE.

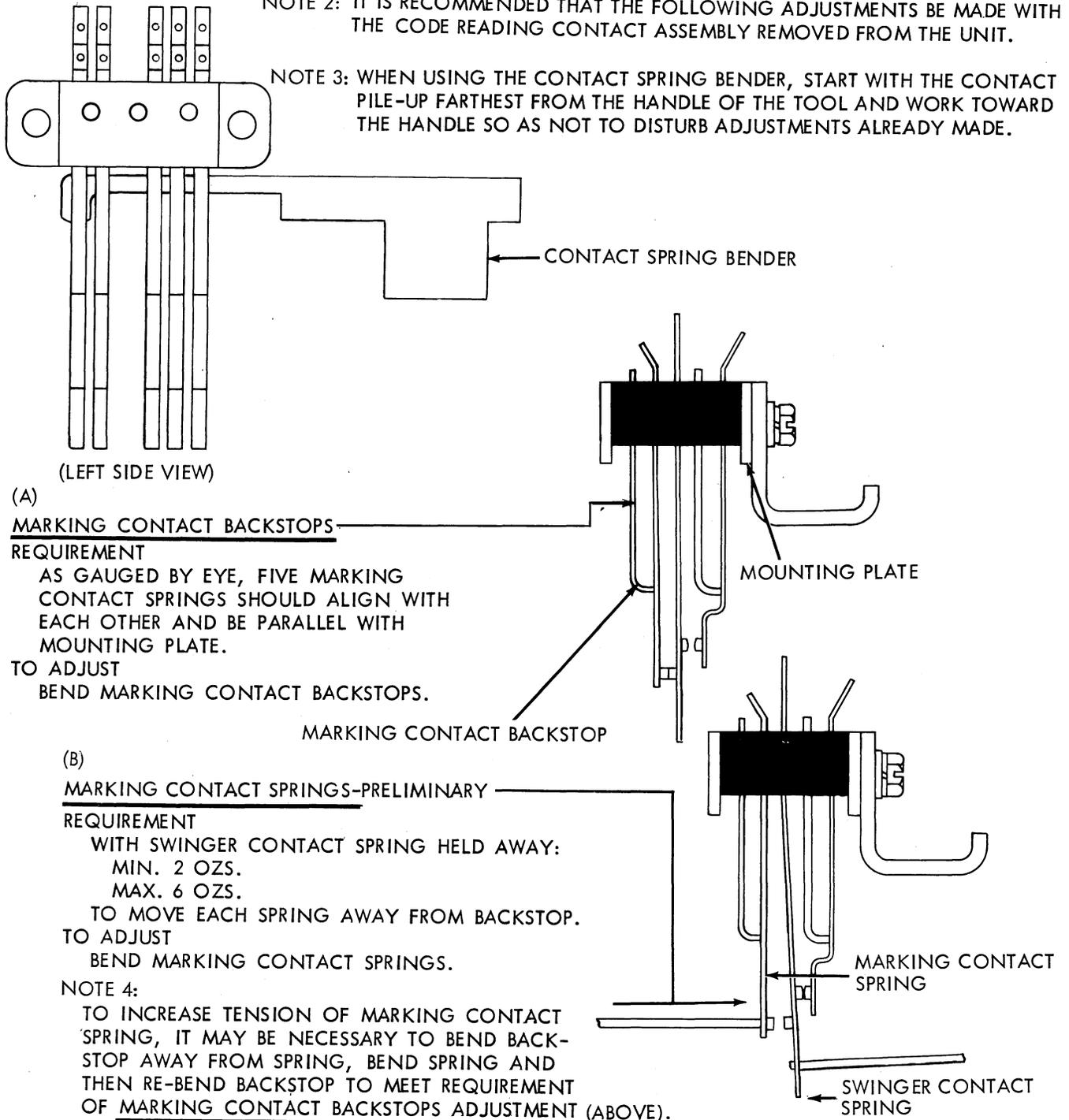
3.14 Code Reading Contacts

NOTE 1:

UNLESS SPECIFICALLY STATED OTHERWISE, THE FOLLOWING CODE READING CONTACT ADJUSTMENTS APPLY TO BOTH THE TRANSFER (BREAK BEFORE MAKE) TYPE AND MAKE TYPE CONTACTS. WHEN AN ADJUSTMENT IS APPLICABLE TO BOTH TYPES, THE TRANSFER TYPE CONTACTS ARE USED IN THE ILLUSTRATIONS. WHEN TESTING THESE CONTACTS ON ASR SETS THE CONTROL KNOB SHOULD BE IN THE K-T POSITION.

NOTE 2: IT IS RECOMMENDED THAT THE FOLLOWING ADJUSTMENTS BE MADE WITH THE CODE READING CONTACT ASSEMBLY REMOVED FROM THE UNIT.

NOTE 3: WHEN USING THE CONTACT SPRING BENDER, START WITH THE CONTACT PILE-UP FARTHEST FROM THE HANDLE OF THE TOOL AND WORK TOWARD THE HANDLE SO AS NOT TO DISTURB ADJUSTMENTS ALREADY MADE.



MARKING CONTACT BACKSTOPS  
REQUIREMENT

AS GAUGED BY EYE, FIVE MARKING CONTACT SPRINGS SHOULD ALIGN WITH EACH OTHER AND BE PARALLEL WITH MOUNTING PLATE.

TO ADJUST

BEND MARKING CONTACT BACKSTOPS.

(B)

MARKING CONTACT SPRINGS-PRELIMINARY  
REQUIREMENT

WITH SWINGER CONTACT SPRING HELD AWAY:  
MIN. 2 OZS.  
MAX. 6 OZS.

TO MOVE EACH SPRING AWAY FROM BACKSTOP.

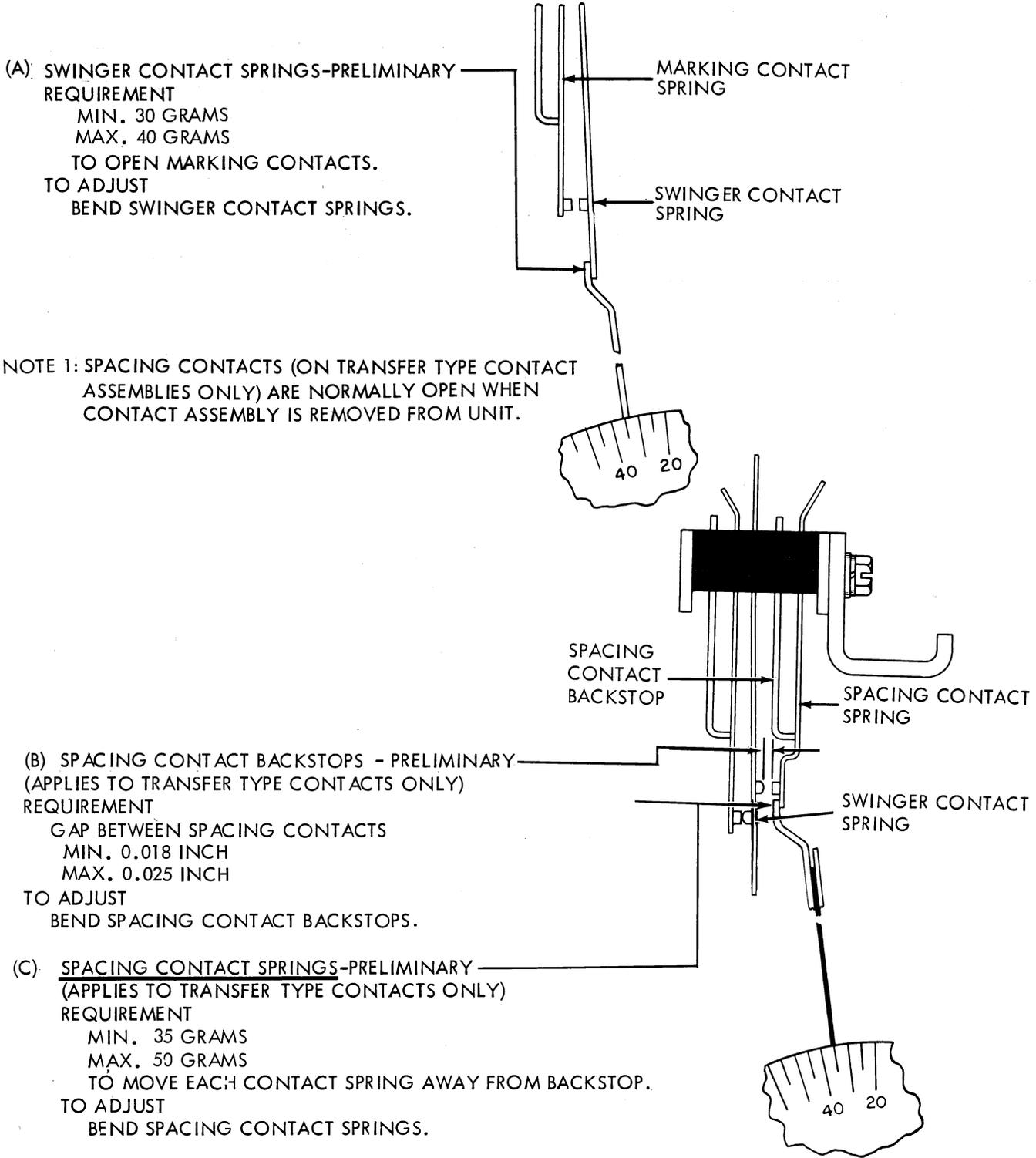
TO ADJUST

BEND MARKING CONTACT SPRINGS.

NOTE 4:

TO INCREASE TENSION OF MARKING CONTACT SPRING, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM SPRING, BEND SPRING AND THEN RE-BEND BACKSTOP TO MEET REQUIREMENT OF MARKING CONTACT BACKSTOPS ADJUSTMENT (ABOVE).

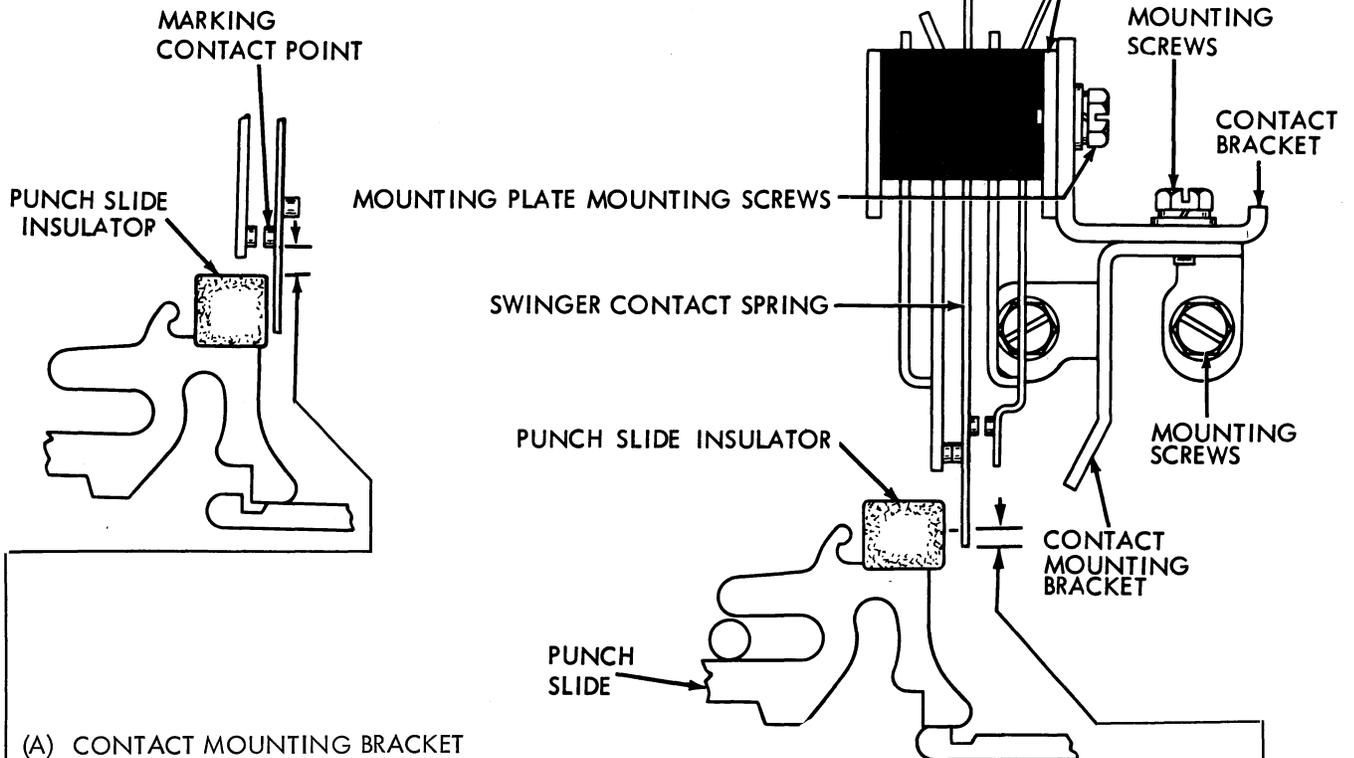
3.15 Code Reading Contacts continued



NOTE 2: TO INCREASE TENSION OF SPRING, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM SPRING, BEND SPRING, AND THEN RE-BEND BACKSTOP TO MEET REQUIREMENT OF SPACING CONTACT BACKSTOPS ADJUSTMENT ABOVE.

3.16 Code Reading Contacts continued

NOTE 1: THE FOLLOWING CODE READING CONTACT ADJUSTMENTS SHOULD BE MADE WITH THE CONTACT ASSEMBLIES MOUNTED ON THE UNIT.



(A) CONTACT MOUNTING BRACKET REQUIREMENT

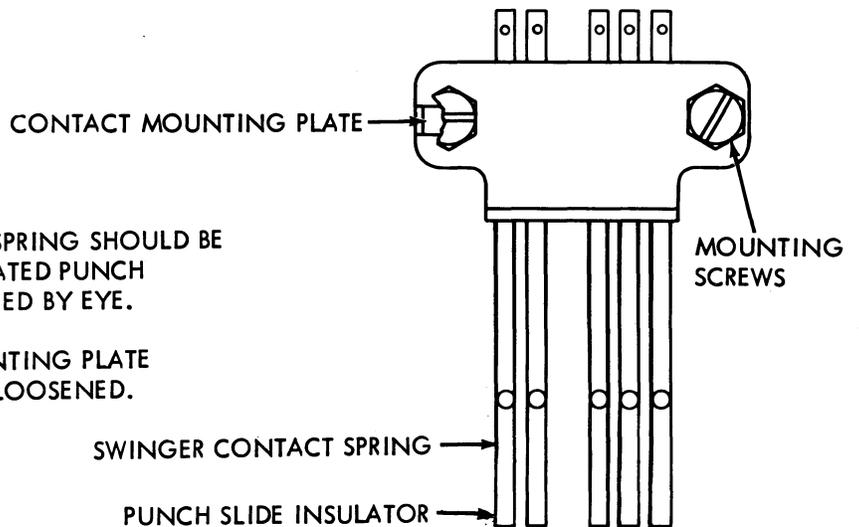
- (1) WITH FUNCTION CLUTCH DISENGAGED AND LATCHED, THERE SHALL BE MIN. 0.015 INCH CLEARANCE BETWEEN THE CLOSEST NORMALLY CLOSED CONTACT SPRING (MARKING CONTACT) AND PUNCH SLIDE INSULATOR.
- (2) WITH LETTERS COMBINATION SELECTED AND PUNCH PINS IN THEIR UPPERMOST POSITION, THE SWINGER SHALL BE PARALLEL TO RIGHT END OF PUNCH SLIDE AND EXTEND BELOW ITS CENTER, AS GAGED BY EYE.

TO ADJUST POSITION CONTACT MOUNTING BRACKET WITH MOUNTING SCREWS LOOSENED.

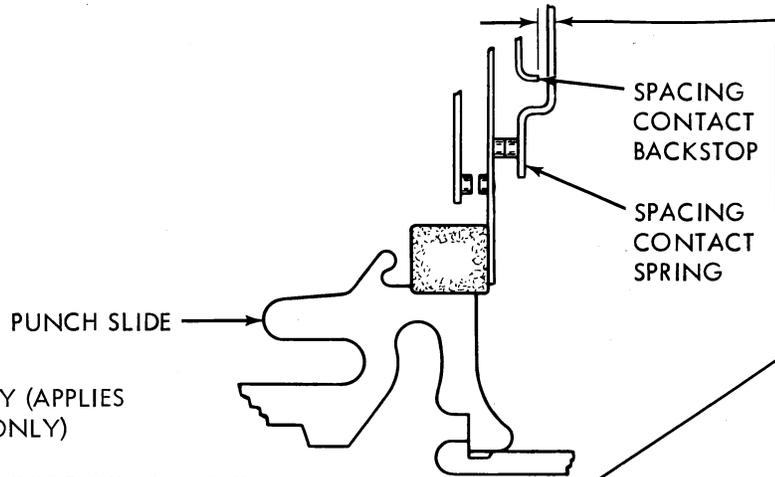
(B) CONTACT MOUNTING PLATE REQUIREMENT

EACH SWINGER CONTACT SPRING SHOULD BE ALIGNED WITH ITS ASSOCIATED PUNCH SLIDE INSULATOR AS GAUGED BY EYE.

TO ADJUST POSITION CONTACT MOUNTING PLATE WITH MOUNTING SCREWS LOOSENED.



3.17 Code Reading Contacts continued



CONTACT BRACKET-PRELIMINARY (APPLIES TO TRANSFER TYPE CONTACTS ONLY)

(1) REQUIREMENT

MANUALLY SELECT BLANK CODE COMBINATION. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. SOME CLEARANCE BETWEEN SPACING CONTACT SPRING AND ITS BACKSTOP.

MIN. SOME  
MAX. 0.008 INCH

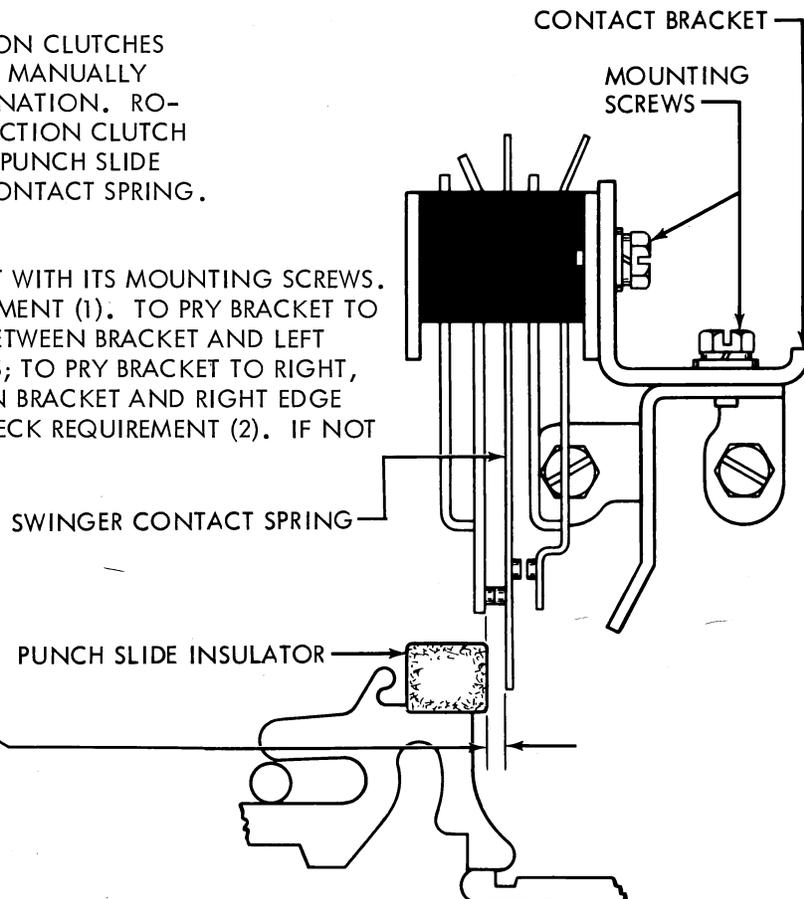
(2) REQUIREMENT

WITH SELECTOR AND FUNCTION CLUTCHES DISENGAGED AND LATCHED, MANUALLY SELECT LETTERS CODE COMBINATION. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. CLEARANCE BETWEEN PUNCH SLIDE INSULATOR AND SWINGER CONTACT SPRING.

MIN. 0.028 INCH

TO ADJUST

POSITION CONTACT BRACKET WITH ITS MOUNTING SCREWS. LOOSENED TO MEET REQUIREMENT (1). TO PRY BRACKET TO LEFT, INSERT SCREWDRIVER BETWEEN BRACKET AND LEFT EDGE OF MOUNTING SCREWS; TO PRY BRACKET TO RIGHT, INSERT SCREWDRIVER BETWEEN BRACKET AND RIGHT EDGE OF MOUNTING SCREWS. CHECK REQUIREMENT (2). IF NOT MET, REFINE ADJUSTMENT.

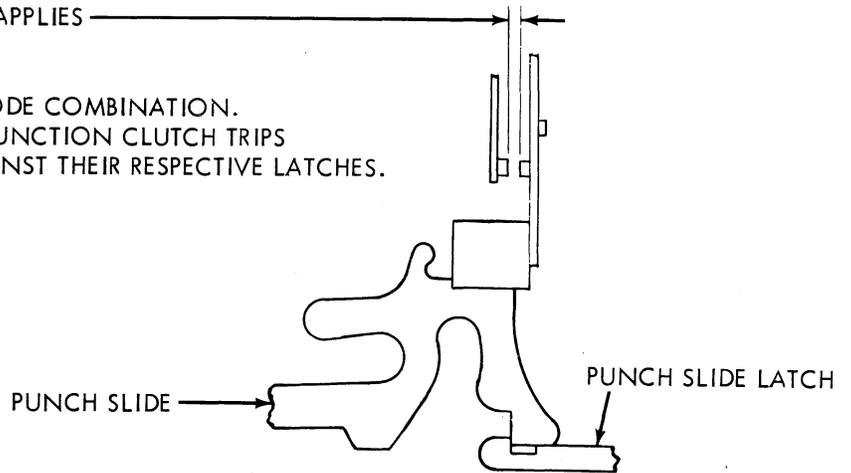


3.18 Code Reading Contacts continued

**CONTACT BRACKET-PRELIMINARY (APPLIES TO MAKE TYPE CONTACTS ONLY)**

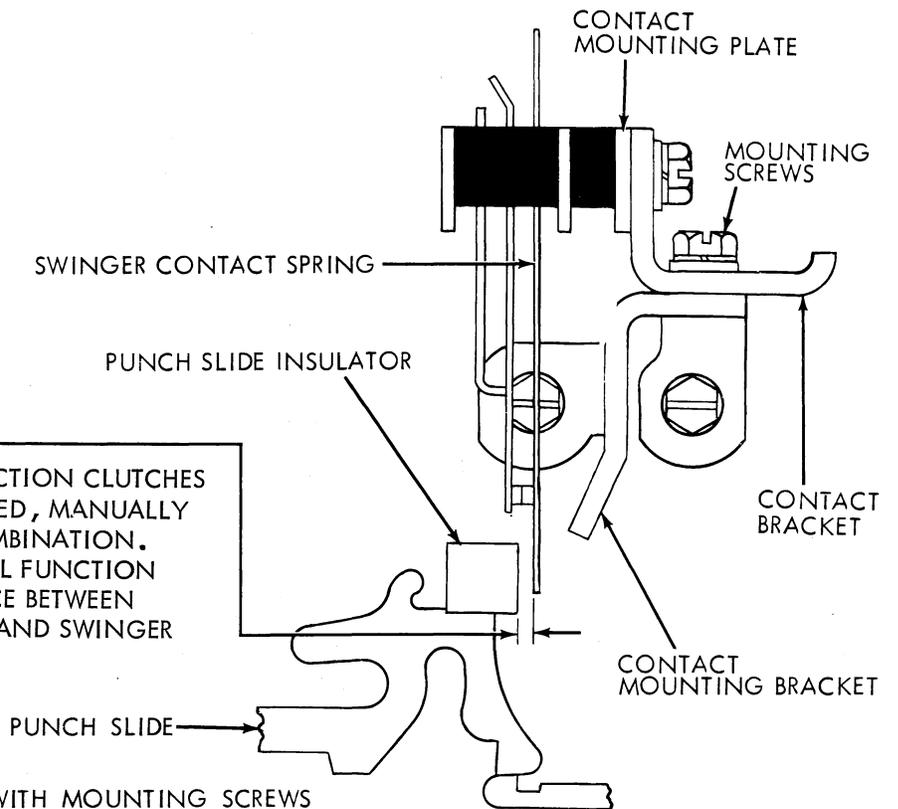
**(1) REQUIREMENT**

MANUALLY SELECT BLANK CODE COMBINATION.  
 ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS  
 AND PUNCH SLIDES ARE AGAINST THEIR RESPECTIVE LATCHES.  
 GAP BETWEEN CONTACTS.  
 MIN. 0.020 INCH  
 MAX. 0.025 INCH



**(2) REQUIREMENT**

WITH SELECTOR AND FUNCTION CLUTCHES  
 DISENGAGED AND LATCHED, MANUALLY  
 SELECT LETTERS CODE COMBINATION.  
 ROTATE MAIN SHAFT UNTIL FUNCTION  
 CLUTCH TRIPS. CLEARANCE BETWEEN  
 PUNCH SLIDE INSULATOR AND SWINGER  
 CONTACT SPRING.  
 MIN. 0.028 INCH



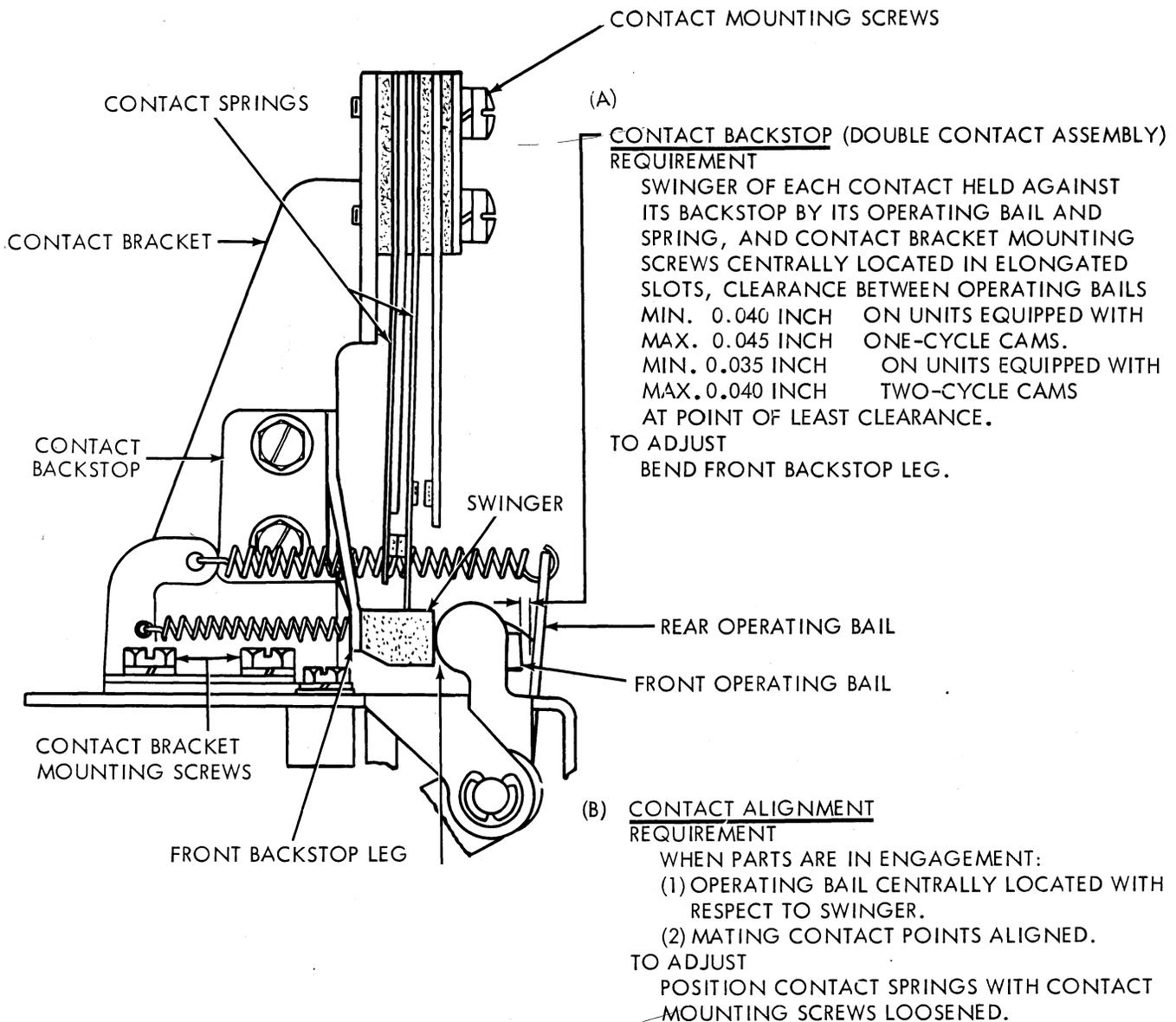
**TO ADJUST**

POSITION CONTACT BRACKET WITH MOUNTING SCREWS  
 FRICTION TIGHT. TO PRY BRACKET TO LEFT,  
 INSERT SCREW DRIVER BETWEEN BRACKET AND  
 LEFT EDGE OF MOUNTING SCREW; TO PRY BRACKET TO  
 RIGHT, INSERT SCREW DRIVER BETWEEN BRACKET  
 AND RIGHT EDGE OF MOUNTING SCREW.

3.19 Timing Contacts

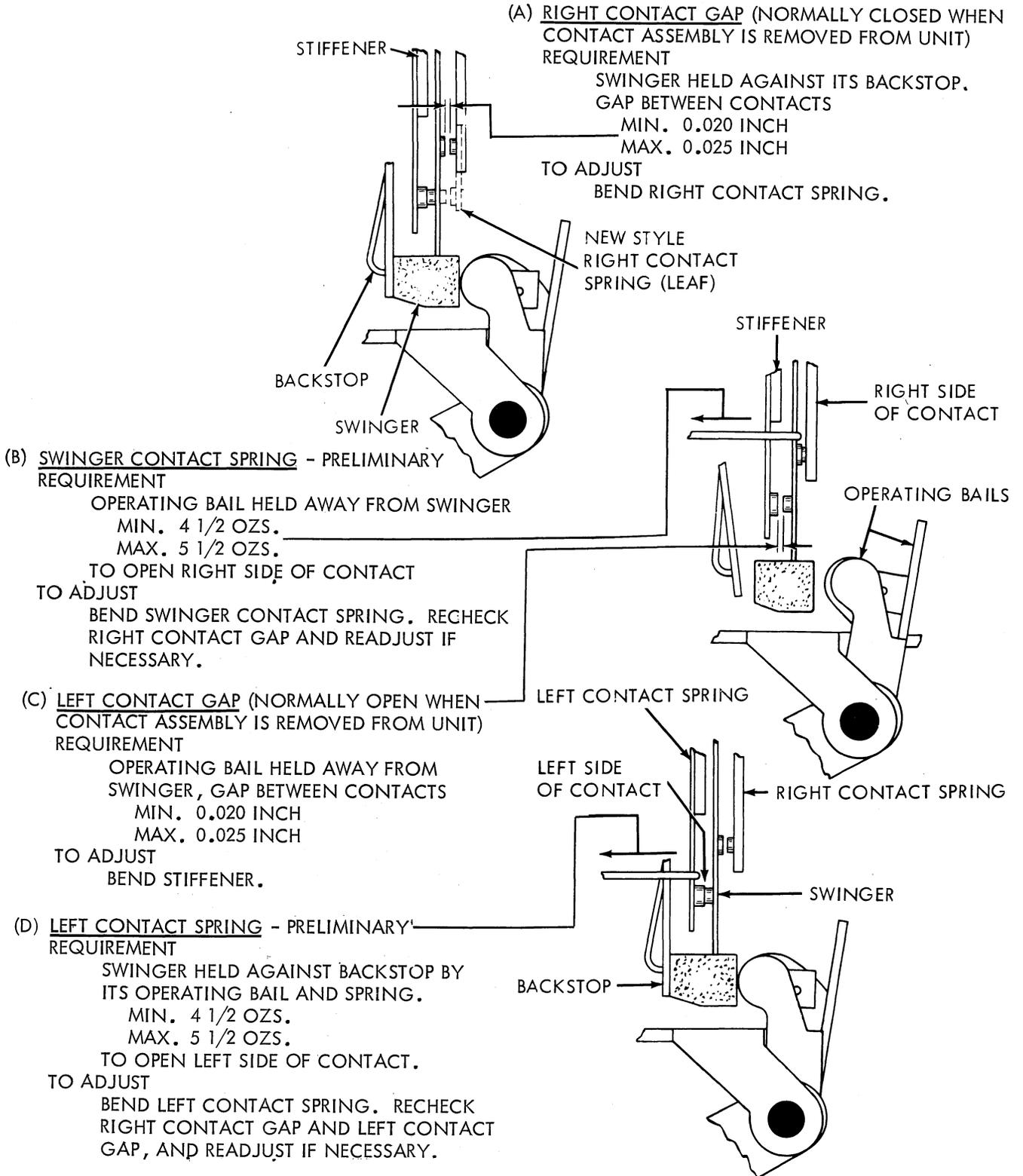
NOTE 1: THERE ARE TWO TYPES OF TIMING CONTACT ASSEMBLIES, SINGLE AND DOUBLE. SINGLE CONTACT ASSEMBLIES HAVE A FRONT CONTACT ONLY, NO REAR CONTACT. IF UNIT IS EQUIPPED WITH A DOUBLE CONTACT ASSEMBLY, THE FOLLOWING ADJUSTMENTS APPLY TO BOTH FRONT AND REAR CONTACTS.

NOTE 2: IN CASE OF SINGLE-CONTACT ASSEMBLY, MAKE CERTAIN CONTACT BRACKET MOUNTING SCREWS ARE CENTRALLY LOCATED IN ELONGATED SLOTS, AND PROCEED TO NEXT ADJUSTMENT.



3.20 Timing Contacts continued

NOTE 1: IT IS RECOMMENDED THAT THE FOLLOWING TIMING CONTACT ADJUSTMENTS BE MADE WITH CONTACT ASSEMBLIES REMOVED FROM THE UNIT.

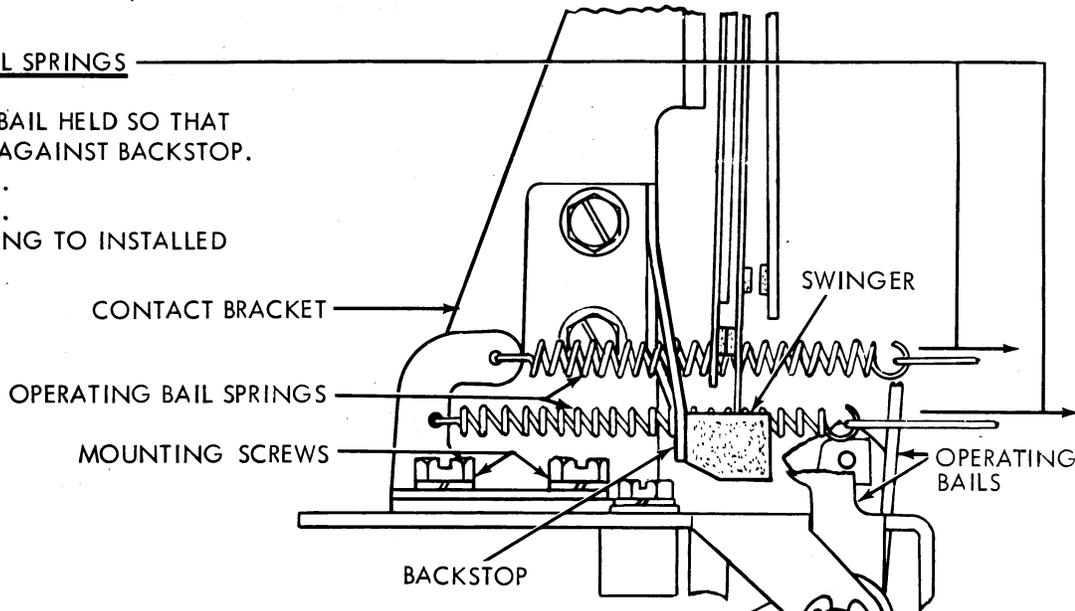


3.21 Timing Contacts continued

NOTE 1: THE FOLLOWING TIMING CONTACT ADJUSTMENTS SHOULD BE MADE WITH CONTACT ASSEMBLY MOUNTED ON UNIT.

(B) OPERATING BAIL SPRINGS  
REQUIREMENT

OPERATING BAIL HELD SO THAT SWINGER IS AGAINST BACKSTOP.  
MIN. 7 OZS.  
MAX. 12 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.



(A) CONTACT BRACKET-PRELIMINARY (FOR UNITS EQUIPPED WITH ONE-CYCLE CAMS)

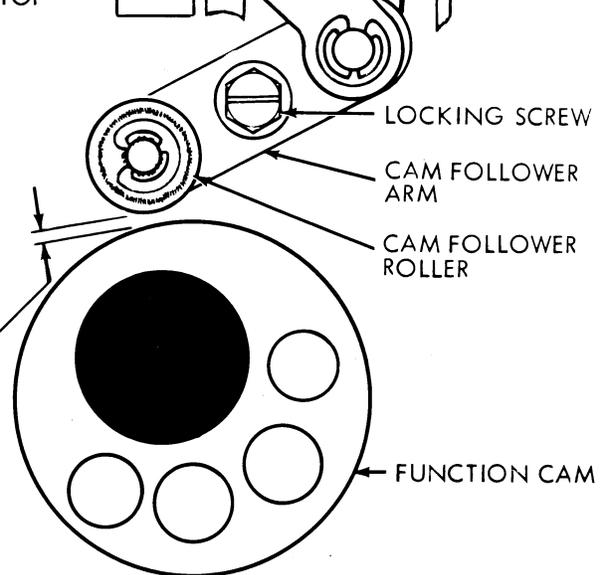
LOOSEN LOCKING SCREW. POSITION CAM FOLLOWER ARM, BY MEANS OF ITS ELONGATED MOUNTING HOLE, TO ITS MINIMUM LENGTH ON OPERATING BAIL. TIGHTEN LOCKING SCREW.

REQUIREMENT

SELECTOR AND FUNCTION CLUTCHES DISENGAGED AND LATCHED. CLEARANCE BETWEEN CAM FOLLOWER ROLLER AND FUNCTION CAM.  
MIN. 0.050 INCH  
MAX. 0.055 INCH

TO ADJUST

POSITION CONTACT BRACKET WITH MOUNTING SCREWS LOOSENED.



NOTE 2: ON UNITS EQUIPPED WITH DOUBLE CONTACT ASSEMBLIES, RECHECK CONTACT BACKSTOP ADJUSTMENT. IF REQUIREMENT IS NOT MET, REFINE CONTACT BRACKET ADJUSTMENT.

## 3.22 Code Reading Contacts continued

**CONTACT BRACKET-PRELIMINARY (FOR UNITS EQUIPPED WITH TWO-CYCLE CAMS)**

LOOSEN LOCKING SCREW. POSITION CAM FOLLOWER ARM, BY MEANS OF ITS ELONGATED MOUNTING HOLES, TO ITS MAXIMUM LENGTH ON OPERATING BAIL. TIGHTEN LOCKING SCREW.

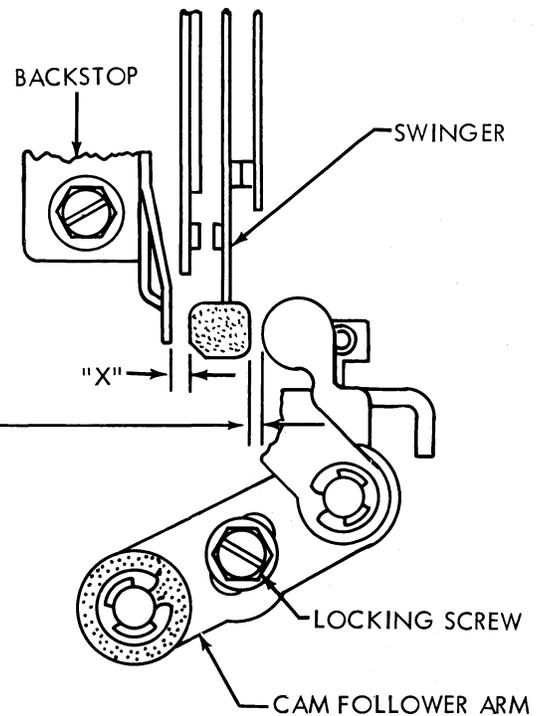
**REQUIREMENT**

SELECTOR AND FUNCTION CLUTCHES DISENGAGED AND LATCHED. CLEARANCE BETWEEN BAIL AND SWINGER INSULATOR OF PILE-UP HAVING LEAST CLEARANCE SHOULD BE 0.118 INCH MINUS CLEARANCE "X" BETWEEN BACKSTOP AND SWINGER INSULATOR.

**TO ADJUST**

POSITION CONTACT BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

NOTE 1: THE RANGE OF THIS ADJUSTMENT IS 0.005 INCH. FOR EXAMPLE; IF CLEARANCE "X" IS 0.080 INCH, THE NORMAL ADJUSTMENT IS 0.038 INCH AND THE RANGE OF ADJUSTMENT IS 0.035 INCH TO 0.040 INCH.

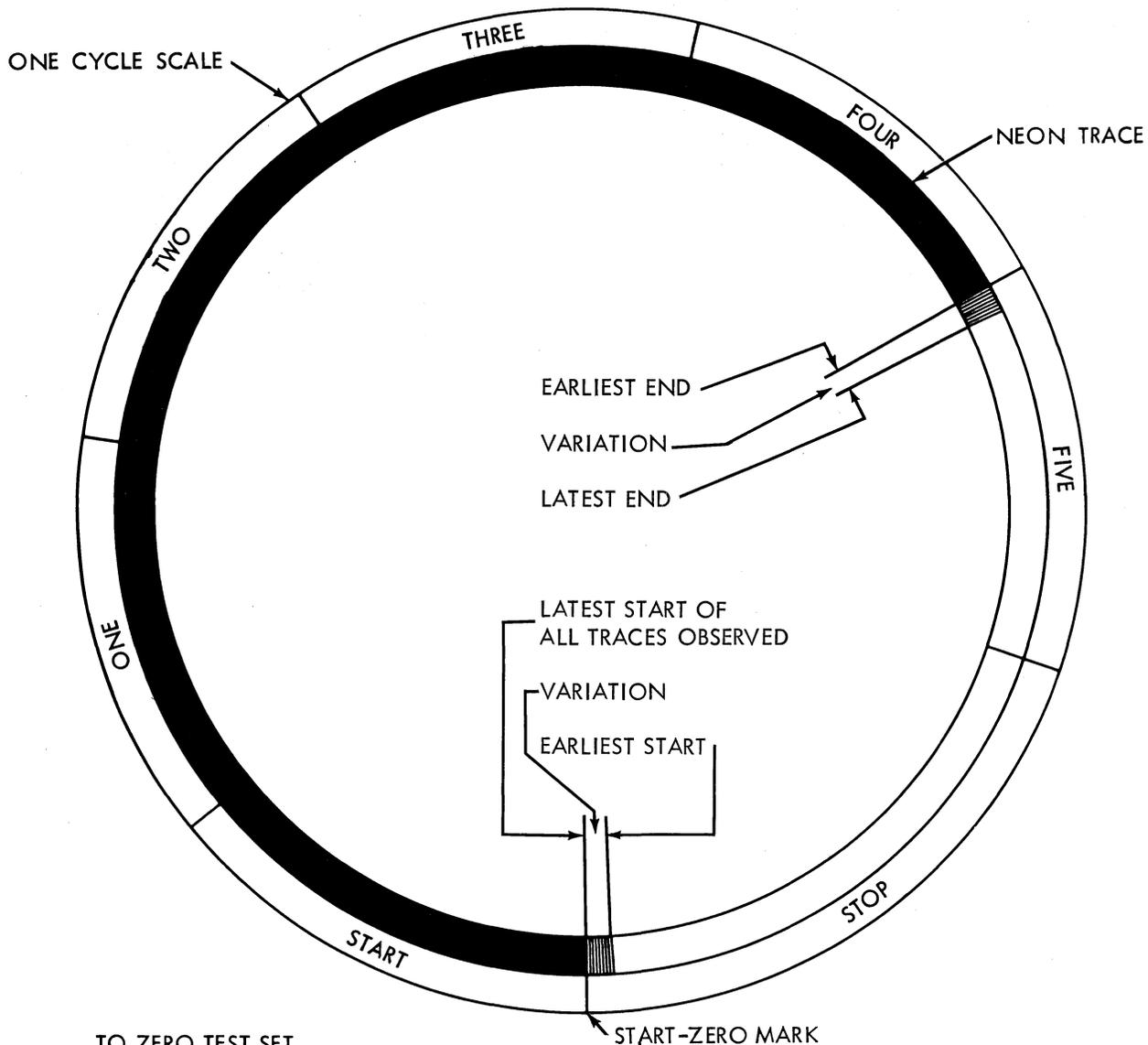


## 3.23 Code Reading Contacts Strobing (Using Signal Distortion Test Set)

THE FOLLOWING TESTS REQUIRE THE USE OF A TELETYPE SIGNAL DISTORTION TEST SET. THEY SHOULD BE MADE AFTER THE CONTACT ASSEMBLIES HAVE BEEN ADJUSTED AS INSTRUCTED ON THE PRECEDING PAGES. WHERE REQUIREMENTS ARE NOT MET, DESIGNATED ADJUSTMENTS MUST BE REFINED, AND/OR RELATED LENGTHS MAY HAVE TO BE CHANGED TO MEET TIMING REQUIREMENTS.

ALL TEST SHOULD BE MADE WITH THE CONTROL KNOB OF THE MODEL 28 ASR IN THE K-T POSITION AND WITH THE UNIT AND TEST SET OPERATING AT 600 O.P.M.

OBSERVATIONS ARE TO BE MADE OF A NEON TRACE ON THE GRADUATED DISC OF A TEST SET. TRACE WILL HAVE TENDENCY TO "JUMP"; THAT IS, IT WILL NOT BE STEADY ENOUGH TO BE ACCURATELY MEASURED. VARIATION MAY BE AS HIGH AS TEN DIVISIONS ON SCALE. MINIMUM SIGNAL LENGTH IS MEASURED BETWEEN LATEST START AND EARLIEST END OF ALL TRACES. MAXIMUM SIGNAL LENGTH IS MEASURED BETWEEN EARLIEST START AND LATEST END OF ALL TRACES.

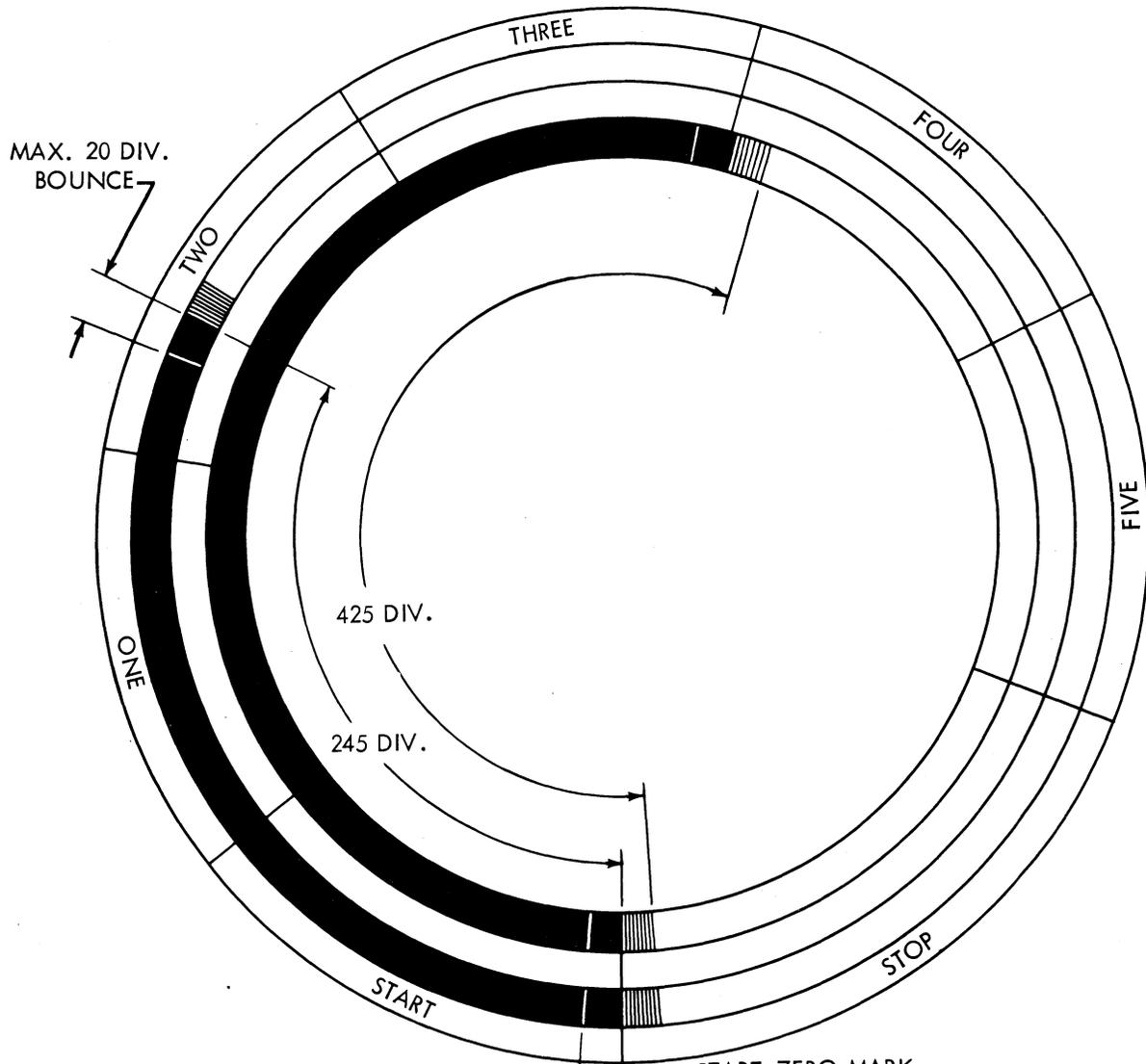


TO ZERO TEST SET

CONNECT NEON TRACE TO NO. 1 CODE READING CONTACT (REARMOST). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE AND NOTE POINT AT WHICH TRACE ENDS. TRACES WILL JUMP AS DESCRIBED ABOVE; NOTE EARLIEST END OF TRACES. REPEAT FOR REMAINING CONTACTS. OF ALL TRACES OBSERVED, CHOOSE ONE THAT STARTS THE LATEST. SET "START-ZERO" MARK OF SCALE AT LATEST START OF CHOSEN TRACE. RECORD EARLIEST END OF CHOSEN TRACE FOR FUTURE ADJUSTMENT REFERENCES.

## 3.24 Code Reading Contacts Strobing continued

NOTE 1: TEST PROCEDURES ON THIS PAGE APPLY TO A UNIT WITH 2-CYCLE CLUTCH

**CODE READING CONTACTS**

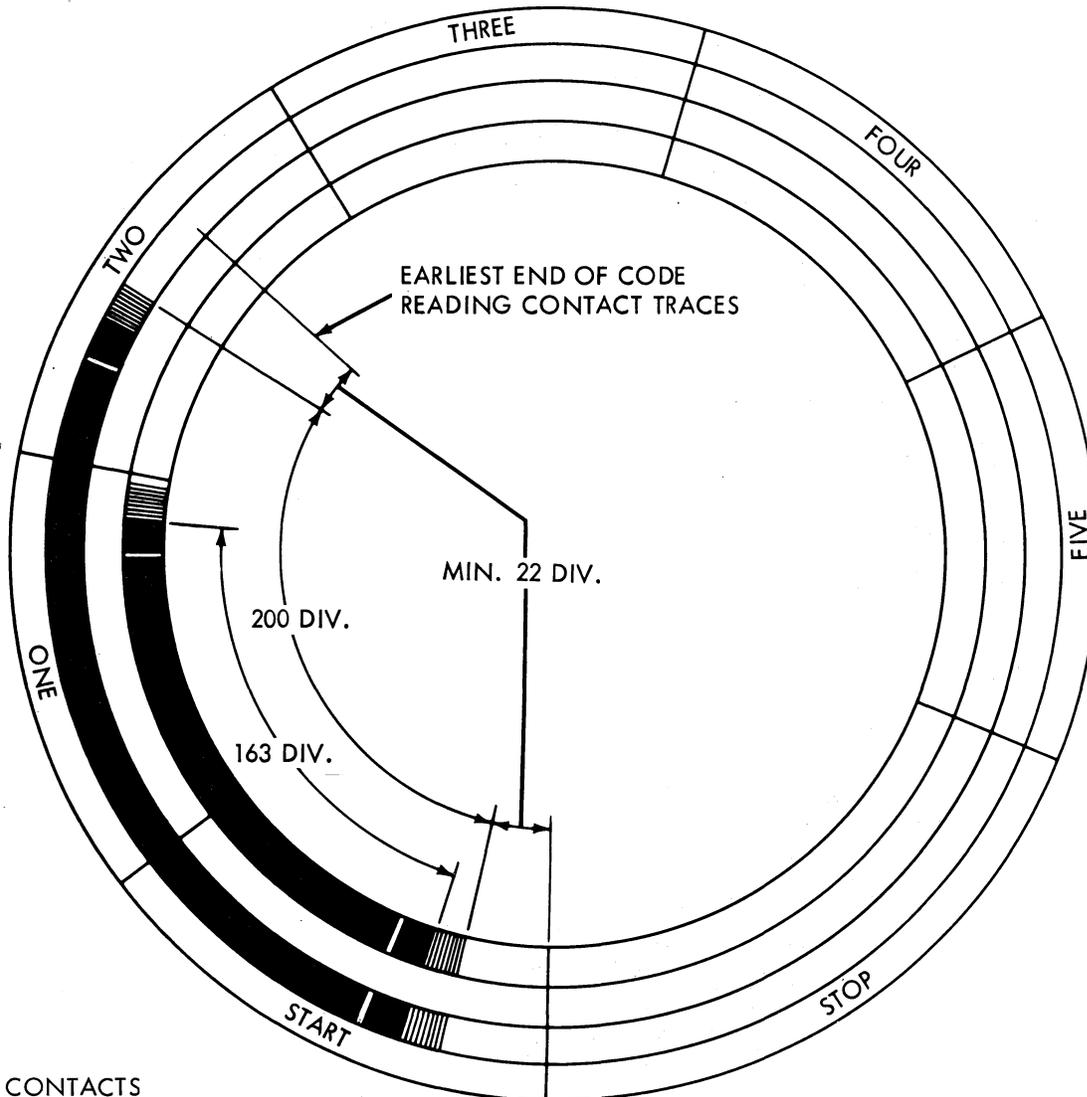
- (1) ZERO TEST SET AS PREVIOUSLY INSTRUCTED.
- (2) CONNECT NEON TRACE TO MARKING SIDE OF CODE READING CONTACT. (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE TRACE.

**REQUIREMENTS**

- A.** SIGNAL LENGTH
    - MIN. 245 DIVISIONS
    - MAX. 425 DIVISIONS
  - B.** BOUNCE SHOULD END WITHIN MAX. OF 20 DIVISIONS OF EARLIEST START AND EARLIEST END OF TRACE.
- (3) TO ADJUST
    - A.** IF REQUIREMENTS UNDER (2)A. ARE NOT MET, REFINE CONTACT BRACKET ADJUSTMENT. IF NECESSARY, REFINE CONTACT GAP TO MEET STROBE REQUIREMENTS. RECHECK CONTACT SPRING TENSIONS.
    - B.** IF BOUNCE REQUIREMENTS UNDER (2)B. ARE NOT MET, REFINE MARKING CONTACT SPRING AND SWINGER CONTROL SPRING TENSIONS.
    - C.** IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

3.25 Timing Contacts Strobing

NOTE 1: TEST PROCEDURES ON THIS PAGE APPLY TO A UNIT WITH 2-CYCLE CLUTCH



TIMING CONTACTS

- (1) ZERO TEST SET AS PREVIOUSLY DESCRIBED. ← START-ZERO MARK
- (2) CONNECT NEON TRACE TO RIGHT SIDE OF FRONT CONTACT (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). WITH UNIT RECEIVING LETTERS CODE COMBINATIONS FROM KEYBOARD TRANSMISSION, OBSERVE TRACE.
  - REQUIREMENTS
  - A. EARLIEST START MIN. 22 DIVISIONS AFTER START-ZERO MARK.
  - B. LATEST END MIN. 22 DIVISIONS BEFORE EARLIEST END OF CODE READING CONTACT TRACES.
  - C. TRACE LENGTH  
MIN. 163 DIVISIONS  
MAX. 200 DIVISIONS
  - D. BOUNCE SHOULD END WITHIN MAX. OF 5 DIVISIONS OF EARLIEST START OR LATEST END OF TRACE.
- (3) TO ADJUST
  - A. IF REQUIREMENTS UNDER (2)A., B., AND C. ARE NOT MET, REFINE RIGHT CONTACT GAP, LEFT CONTACT GAP, SWINGER CONTACT SPRING, AND LEFT CONTACT SPRING.
  - B. IF BOUNCE REQUIREMENTS UNDER (2)D. ARE NOT MET, REFINE SWINGER CONTACT SPRING AND LEFT CONTACT SPRING.
  - C. IF ANY REFINEMENTS ARE NECESSARY, REPEAT COMPLETE TEST PROCEDURE.

3.26 Unshift-On-Space Mechanism

(A) UNSHIFT-ON-SPACE FUNCTION BLADE

(1) TO CHECK

REMOVE SIGNAL BELL CONTACT ASSEMBLY WITH BRACKET AND SIGNAL BELL FUNCTION BLADE.

SELECT FIGURES CODE COMBINATION (12-45). ROTATE MAIN SHAFT UNTIL LIFTER ROLLER IS ON LOW PART OF ROCKER BAIL'S CAMMING SURFACE AND UNSHIFT-ON-SPACE FUNCTION BLADE RESTS ON BELL CRANKS.

REQUIREMENT

MIN. SOME---MAX. 0.015 INCH BETWEEN STRIPPER BLADE AND LETTERS EXTENSION ARM.

(2) TO CHECK

SELECT SPACE CODE COMBINATION (--3--). ROTATE MAIN SHAFT UNTIL STRIPPER BLADE TOUCHES LETTERS EXTENSION ARM.

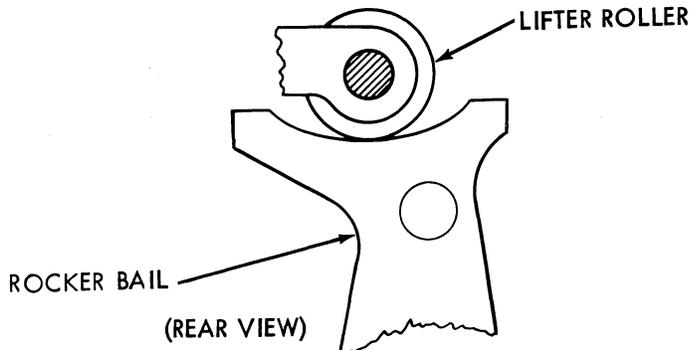
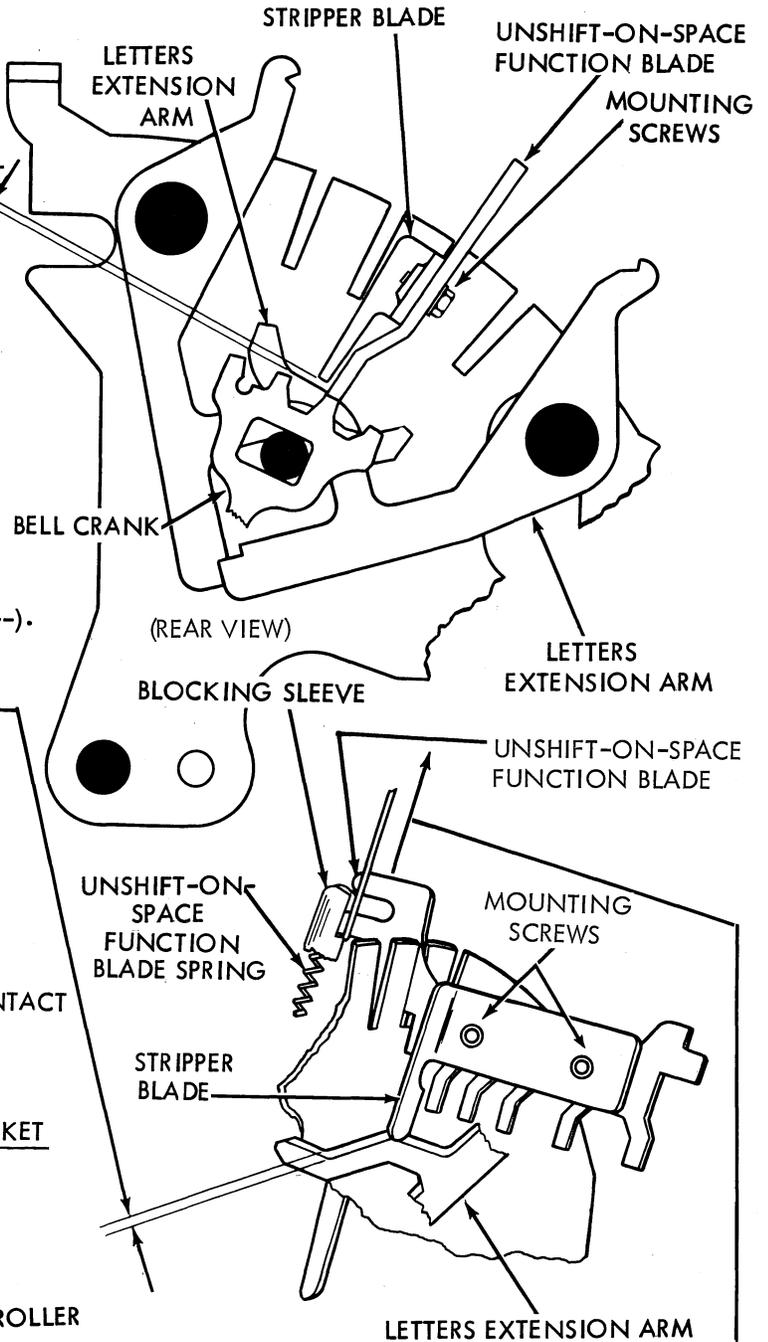
REQUIREMENT

WHEN PLAY IS TAKEN UP IN EITHER DIRECTION, STRIPPER BLADE SHOULD ENGAGE AN EQUAL THICKNESS OF LETTERS EXTENSION ARM.

TO ADJUST

POSITION STRIPPER BLADE ON FUNCTION BLADE WITH TWO MOUNTING SCREWS LOOSENED, REINSTALL SIGNAL BELL CONTACT ASSEMBLY WITH BRACKET AND SIGNAL BELL FUNCTION BLADE.

MAKE SIGNAL BELL CONTACT MOUNTING BRACKET ADJUSTMENT



(B) UNSHIFT-ON-SPACE FUNCTION BLADE SPRING

REQUIREMENT

WITH UNIT IN STOP POSITION AND LONG SLOT IN BLOCKING SLEEVE ENGAGING FUNCTION BLADE:

MIN. 10 OZS. ---- MAX. 13 OZS. TO START BLADE MOVING.

3.27 Chad Chute Assembly (Keyboard Perforator Typing or Non-Typing)

CHAD CHUTE ASSEMBLY (KEYBOARD PERFORATOR "TYPING OR NON-TYPING"  
AUTOMATIC SEND-RECEIVE SET)

REQUIREMENT

CLEARANCE BETWEEN EACH CHAD CHUTE AND  
ADJACENT UNITS SHOULD BE EQUAL IN ALL  
DIRECTIONS.

TO ADJUST

WITH MOUNTING SCREWS FRICION TIGHT POSITION  
EACH CHUTE BY MEANS OF THEIR ELONGATED  
SLOTS.

