



BULLETIN 250B

ADJUSTMENTS AND LUBRICATION

MODEL 28

PERFORATOR TRANSMITTER

LAK, LPE, LTPE, LAAC

TELETYPE[®]

CORPORATION

SUBSIDIARY OF *Western Electric Company* INC.

SKOKIE, ILLINOIS, U.S.A.



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LIST OF EFFECTIVE PAGES

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PAGE NUMBER	CHANGE IN EFFECT
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Title Page	Change 3
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F to I	Change 3
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1-14	Change 1
1-15 to 1-77	Change 3
2-1 to 2-55	Change 3
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3-3 to 3-9	Original
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The above list indicates the effective pages as of the date of issue. Upon receipt of change pages, insert them numerically and discard superseded pages.

The MODEL 28 AUTOMATIC SEND-RECEIVE SET (ASR) is made up of a group of basic component units in various combinations. These include a keyboard, page printer, perforator (typing or non-typing), reperforator (typing or non-typing), transmitter distributor, transmitter distributor base, electrical service unit, console cabinet and motor unit.

UNITS COVERED IN THIS BULLETIN

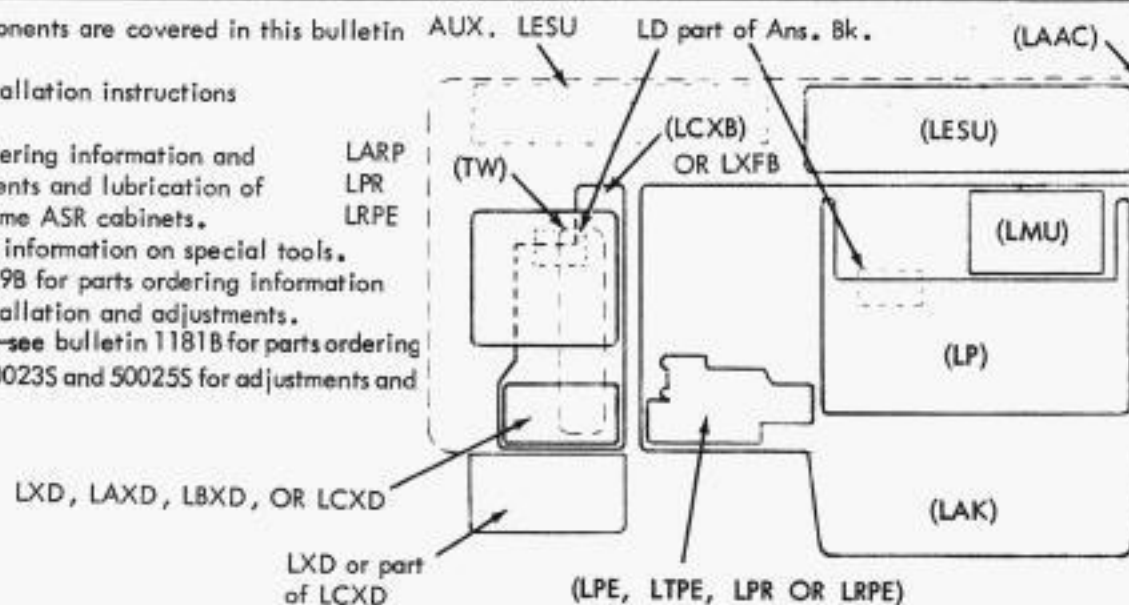
KEYBOARD	LAK1, 2, 3, 4, 6, 7, 9, 10, 17, 25 and 26
PERFORATOR (NON-TYPING)	LPE1, 2, 3, and 4
PERFORATOR (TYPING)	LTPE1 and 3
TRANS. DIST. BASE	LCXB1, 2, 3, 5, 6, 7, 8, 9, 12, 13, 14, and 16
ELECTRICAL SERVICE UNIT	LESU11, 13, 15, 21, 22, 56, 57, 60, and 66
MOTOR UNIT	LMU3, 12, 19, and 20
CABINET	LAAC200**, 201**, 202**, 205**, 207**, 209**, 210**, 213**, 214**, 222**, 223**, 225**, and 226**

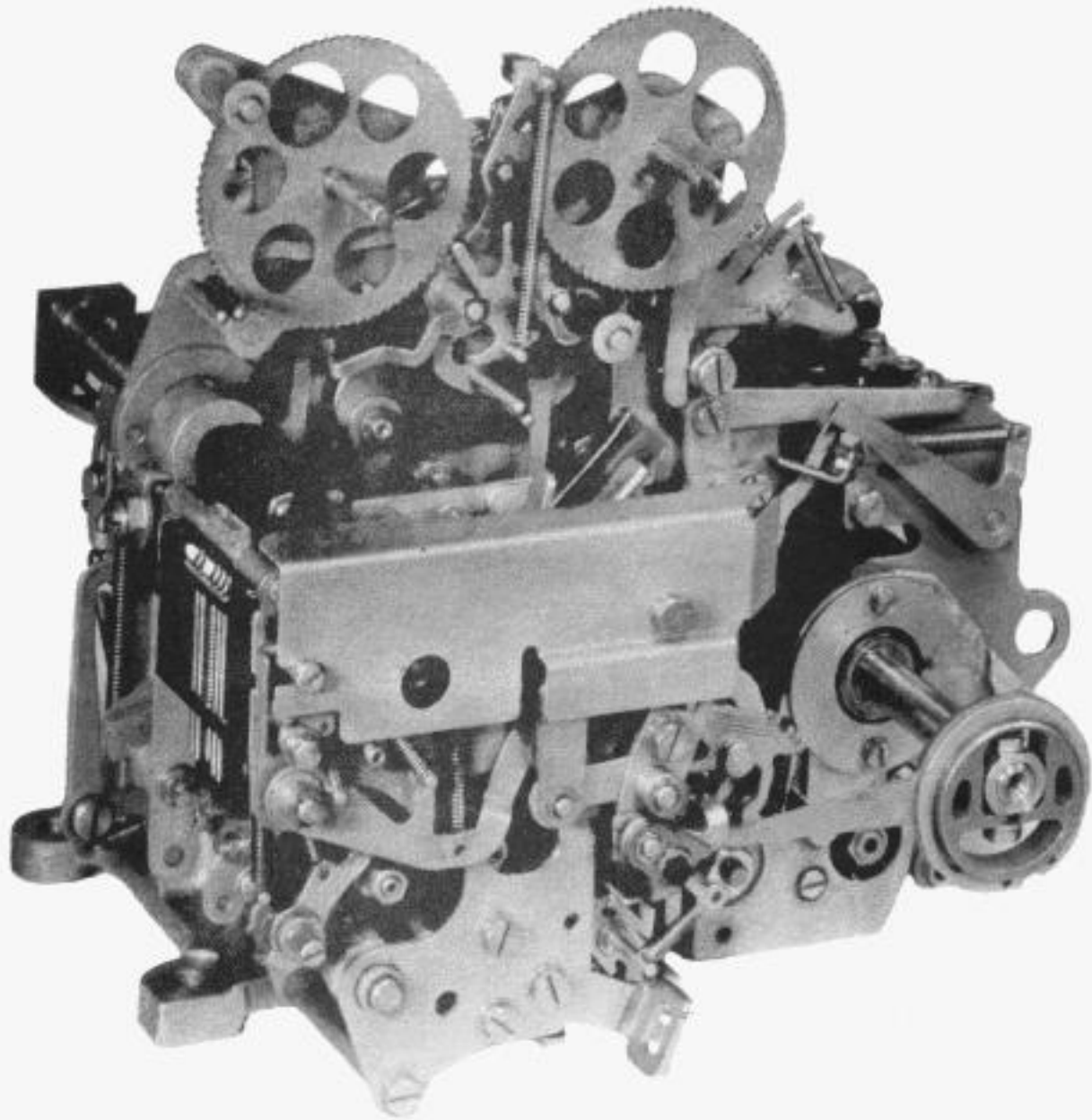
The following chart lists the numbers of bulletins covering components of the ASR set, such as, parts ordering (P), adjustments and lubrication (A & L), description and theory of operation (D & T). (Bell System refer to standardized A & L information).

		(P)	(D & T)	(A & L)
PAGE PRINTER	LP Typing Unit	1149B	216B	217B
KEYBOARD	LAK Perforator Transmitter Base	1169B	249B	250B
PERFORATOR OR REPERFORATOR	LPE Non-typing Perforator			
	LTPE Typing Perforator	1169B	246B	250B
	LRPE Non-typing Reperforator	1172B	255B	256B
	LPR Typing Reperforator	1167B	246B	247B
BASE	LARP Multi-Magnet Reperforator	1166B	244B	245B
	LCXB Transmitter Distributor Base	1169B	249B	250B
TRANSMITTER DISTRIBUTOR	LFXB Transmitter Distributor Base	1182B	50024S	
	LX Fixed Head Multiple Wire Trans.	1161B	258B	235B
	LXD Fixed Head, Single Contact Trans., Dist.			
	LAXD Pivoted Head, Multi-contact Trans., Dist.	1170B	251B	252B
	LBXD Fixed Head, Multi-contact Trans., Dist.	1165B	242B	243B
	LCXD Fixed Head and Pivoted Head, Multi-contact Trans., Dist.	1171B	253B	254B
	LFXD Tape Pull-Back Transmitter Dist.	1182B	50024S	
	LGXD			
MOTOR	LD Multiple wire dist.	1159B	234B	
ELECTRICAL SERVICE UNIT	LMU Motor			
CABINET	LESU Electrical Service Unit	1169B	249B	250B
	LAAC Automatic Send-Receive Cabinet			
KEYTOP WITH LEVER AND TYPEPALLETS	Murray, Gothic, Long Gothic and Large Gothic Styles	1164B		
(For gears used with the LPR or LPRE see appropriate bulletin)	164583 Gear Set for 60 W.P.M. Speed Includes: 161293 Gear Set for Keyboard (LAK) and 158029 Gear Set for Base (LCXB)			
	164584 Gear Set for 75 W.P.M. Speed Includes: 161294 Gear Set for Keyboard (LAK) and 158028 Gear Set for Base (LCXB)	1164B		250B
	164585 Gear Set for 100 W.P.M. Speed Includes: 161295 Gear Set for Keyboard (LAK) and 158027 Gear Set for Base (LCXB)			

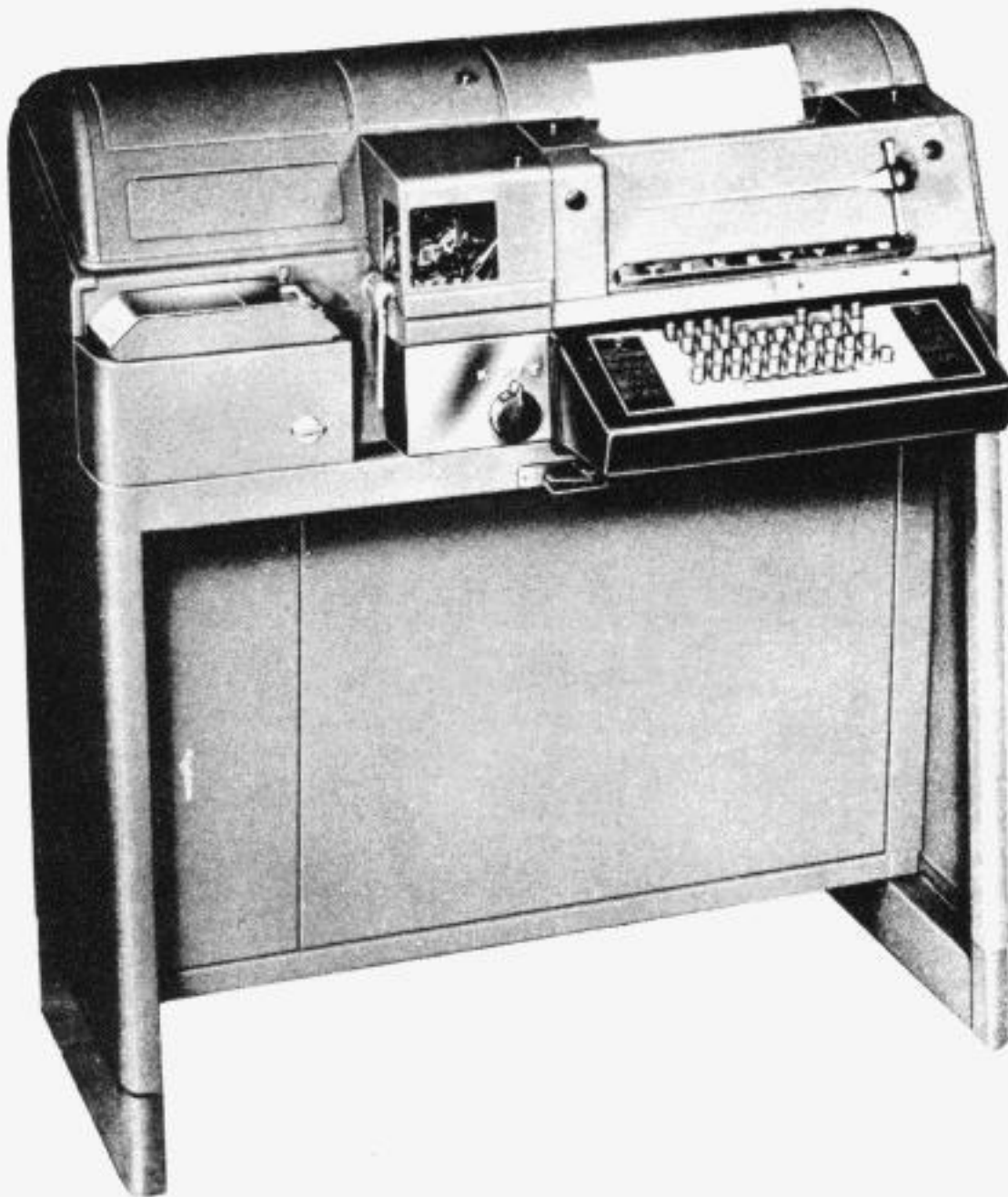
Adjustments and lubrication of these components are covered in this bulletin AUX. LESU LD part of Ans. Bk. (LAAC)

- NOTES:
1. See specification 5873S for installation instructions covering typical ASR sets.
 2. See bulletin 1075B for parts ordering information and specification 5884S for adjustments and lubrication of TW13 Tape Winder used with some ASR cabinets.
 3. See bulletin 1124B for ordering information on special tools.
 4. Paper winder - see bulletin 1129B for parts ordering information and specification 5148S for installation and adjustments.
 5. Codomat used with some ASR sets-see bulletin 1181B for parts ordering information and specifications 50023S and 50025S for adjustments and lubrication.

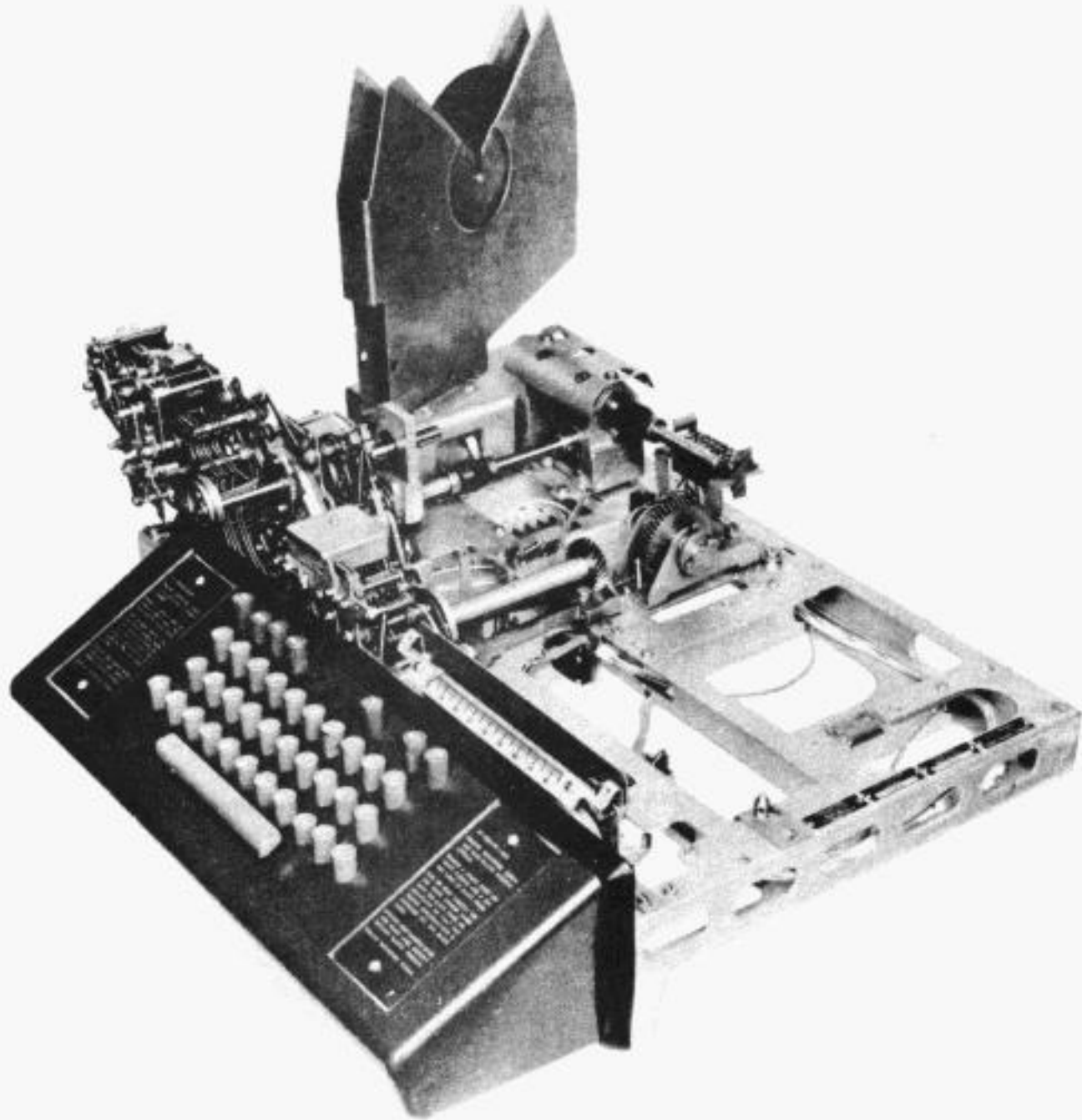




MODEL 28 TYPING PERFORATOR
LTPE



MODEL 28 PERFORATOR TRANSMITTER
Mounted in
AUTOMATIC SEND-RECEIVE SET



MODEL 28 PERFORATOR TRANSMITTER
(LAK with LPE)

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SECTION 1 - STANDARD FEATURE ADJUSTMENTS

1. GENERAL

a. 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 Teletype Bulletin 1124B, but are not supplied as part of the equipment. 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 that is 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.

b. The spring tensions given in this bulletin are indicated values and should be checked with proper spring scales in the positions indicated.

c. References 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.

d. 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 (Figure 1-3) 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 main shaft of the perforator 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 disk (Figure 1-3) with a screwdriver to cause it to engage its latch lever and fully disengage the clutch.

e. K, K-T and T refer to corresponding positions of the keyboard control knob. Unless otherwise specified, adjustments are made in K-T position.

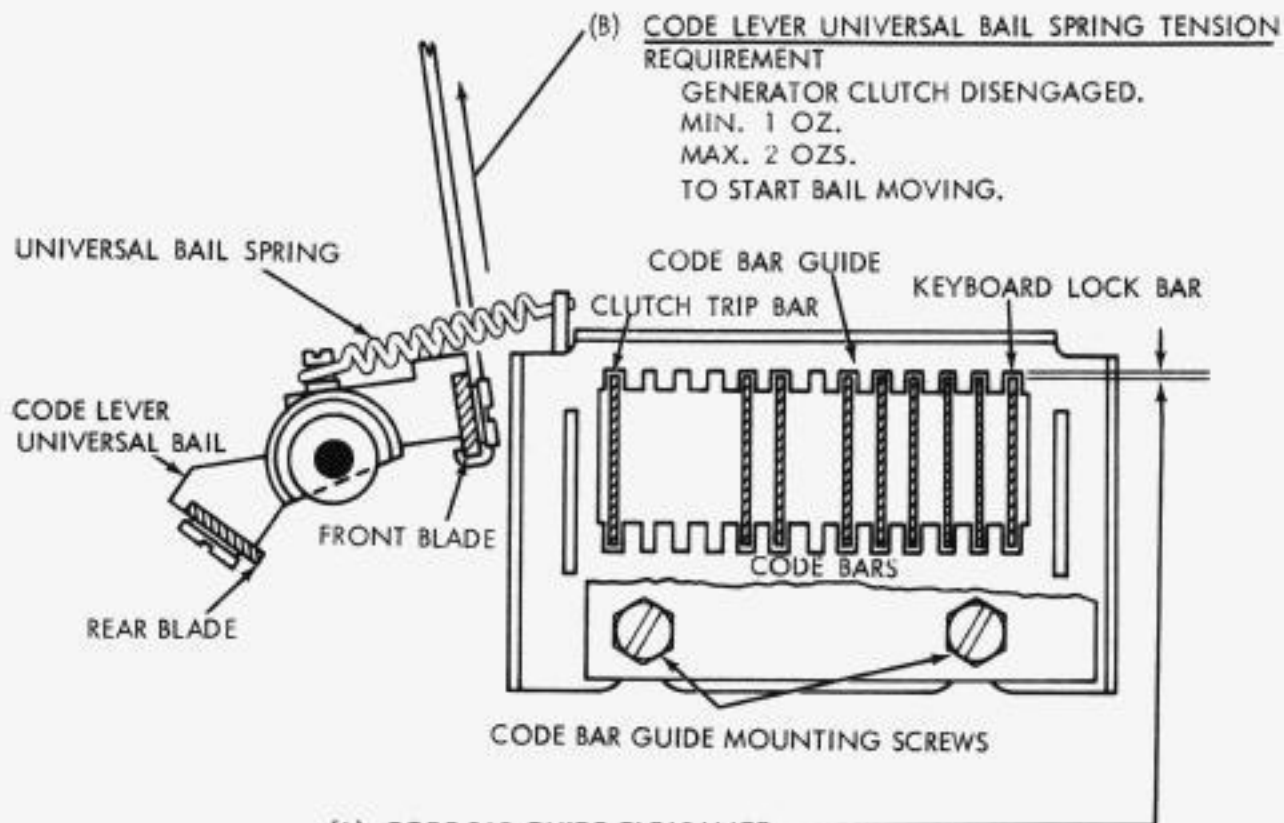
f. When instructions call for the removal of parts or subassemblies, refer to Disassembly or Reassembly, Paragraph 6, Page 1-44.

g. To manually operate perforator, proceed as follows: Rotate the main shaft counterclockwise until the clutch disengages. Trip the clutch by pivoting the main trip lever counterclockwise (see Figure 1-57). Unlatch the punch slides (see Figure 1-23) corresponding to the marking elements of the code combination to be processed (The slides are numbered 1 to 5 from rear to front). Rotate the main shaft counterclockwise until the required condition is set up or the code combination is processed through the unit.

h. In addition to the standard adjustments in Section 1, Variable Feature adjustments are covered in Section 2 of this bulletin. When these adjustments affect normal adjusting sequence, cross reference information has been included in Section 1. Variable Feature adjustments that do not affect the adjusting sequence may be made at any time.

i. Section 1 contains illustrations and adjusting procedure for mechanism currently being manufactured. Illustrations and adjusting procedure for mechanisms of earlier design are located in section 5. Where a new mechanism has replaced one of earlier design, reference has been made in section 1 to the corresponding mechanism in section 5.

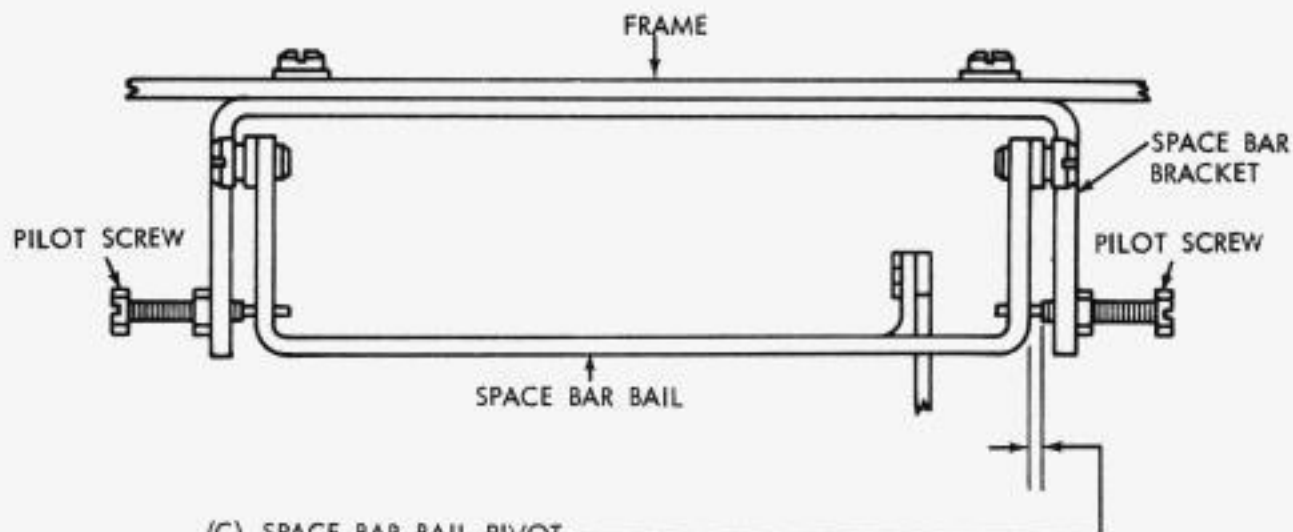
2. KEYBOARD MECHANISM



- (A) CODE BAR GUIDE CLEARANCE REQUIREMENT
 MIN. SOME CLEARANCE.
 MAX. 0.010 INCH
 ALL CODE BARS SHOULD MOVE FREELY WITHOUT BIND.
 TO ADJUST
 LOOSEN MOUNTING SCREWS AND POSITION CODE BAR GUIDE.

NOTE: REMOVE PERFORATOR TRANSMITTER FROM CABINET BEFORE ADJUSTING CODE BARS.

NOTE: KEYLEVER COVER MUST BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY.



- (C) SPACE BAR BAIL PIVOT REQUIREMENT
 MIN. SOME END PLAY.
 MAX. 0.010 INCH.
 SPACE BAR FREE FROM BIND.
 TO ADJUST
 POSITION SPACE BAR WITH PILOT SCREWS LOOSENED.

FIGURE 1-1. CODE BAR AND SPACE BAR MECHANISMS

SECTION 1 - STANDARD FEATURE ADJUSTMENTS

1. GENERAL

a. 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 Teletype Bulletin 1124B, but are not supplied as part of the equipment. 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 that is 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.

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d. 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 (Figure 1-3) 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 main shaft of the perforator 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

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e. K, K-T and T refer to corresponding positions of the keyboard control knob. Unless otherwise specified, adjustments are made in K-T position.

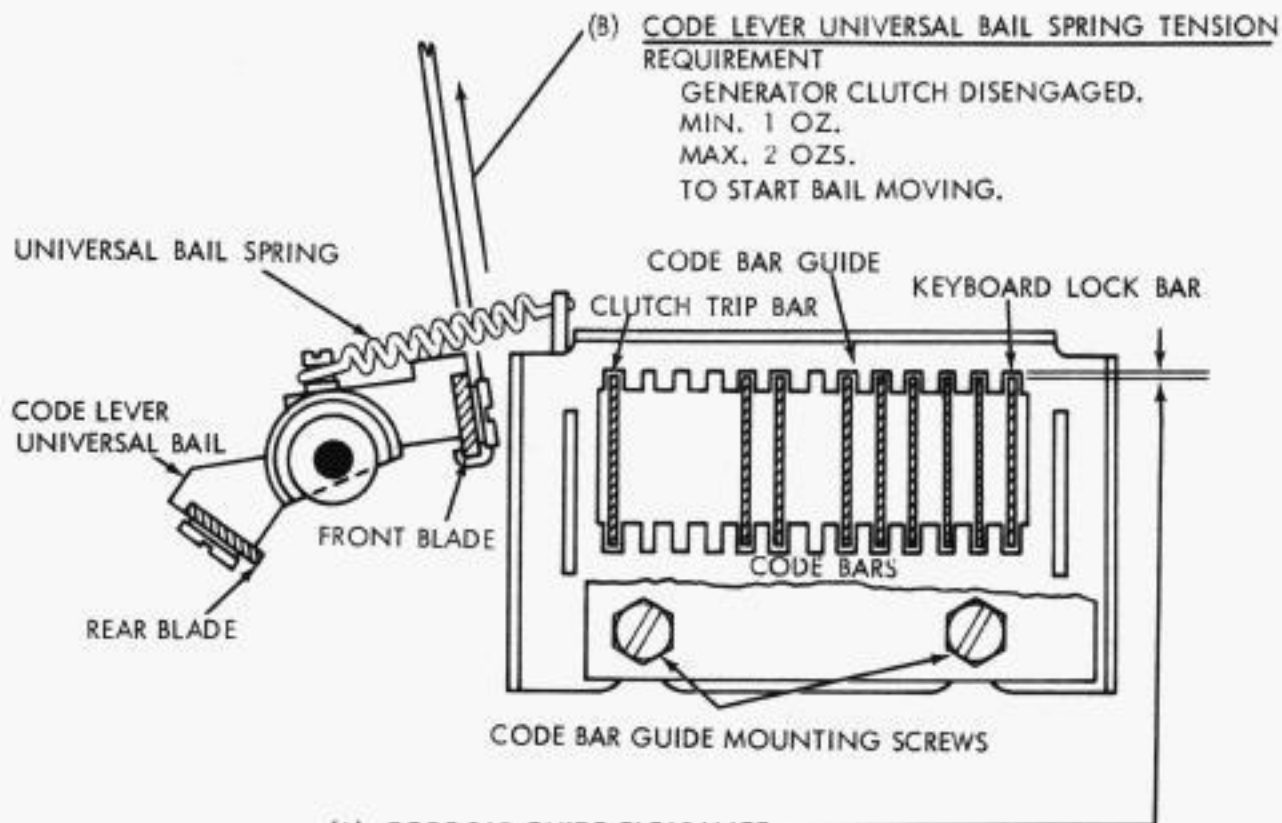
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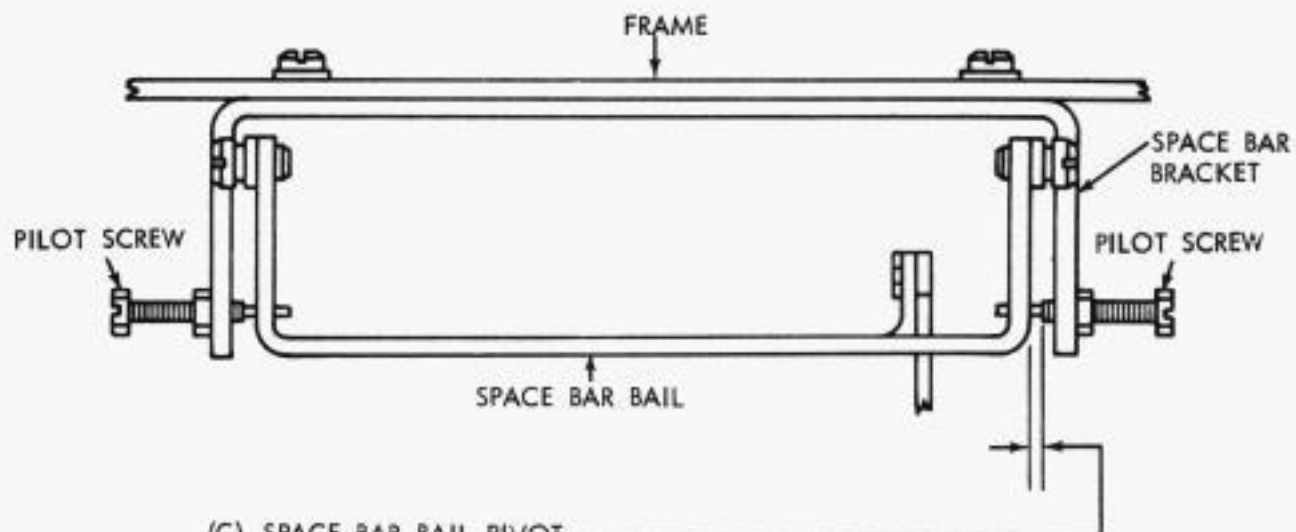
2. KEYBOARD MECHANISM



- (A) CODE BAR GUIDE CLEARANCE REQUIREMENT
 MIN. SOME CLEARANCE,
 MAX. 0.010 INCH
 ALL CODE BARS SHOULD MOVE FREELY WITHOUT BIND.
 TO ADJUST
 LOOSEN MOUNTING SCREWS AND POSITION CODE BAR GUIDE.

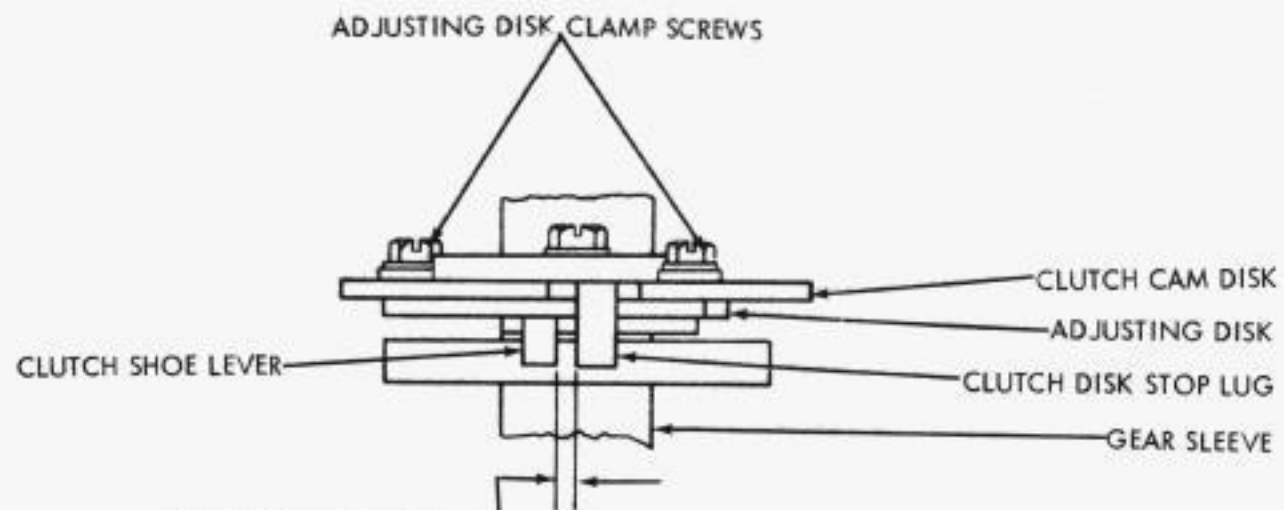
NOTE: REMOVE PERFORATOR TRANSMITTER FROM CABINET BEFORE ADJUSTING CODE BARS.

NOTE: KEYLEVER COVER MUST BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY.



- (C) SPACE BAR BAIL PIVOT REQUIREMENT
 MIN. SOME END PLAY.
 MAX. 0.010 INCH.
 SPACE BAR FREE FROM BIND.
 TO ADJUST
 POSITION SPACE BAR WITH PILOT SCREWS LOOSENED.

FIGURE 1-1. CODE BAR AND SPACE BAR MECHANISMS



**CLUTCH SHOE LEVER
REQUIREMENT**

CLEARANCE WHEN CLUTCH IS DISENGAGED SHOULD BE 0.055
INCH TO 0.085 INCH LESS THAN WHEN CLUTCH IS ENGAGED.

TO CHECK

LATCH CLUTCH IN DISENGAGED POSITION AND MEASURE
CLEARANCE. ROTATE GEAR UNTIL OIL HOLE IS UPWARD.
ENGAGE CLUTCH AND MEASURE CLEARANCE.

TO ADJUST

LOOSEN THE TWO ADJUSTING DISK CLAMP SCREWS TO PO-
SITION DISK.

FIGURE 1-2. SIGNAL GENERATOR CLUTCH AND GEAR MECHANISM

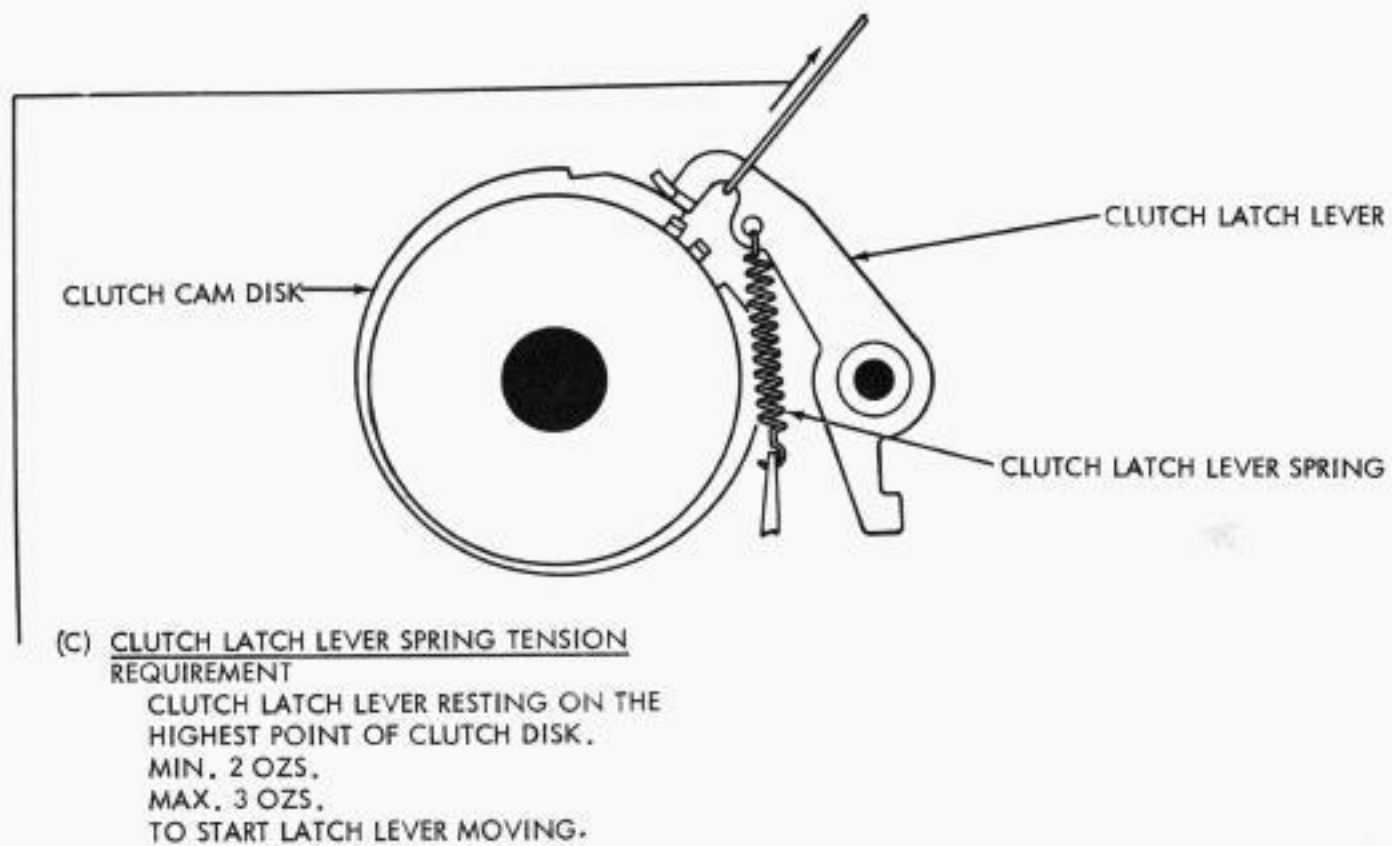
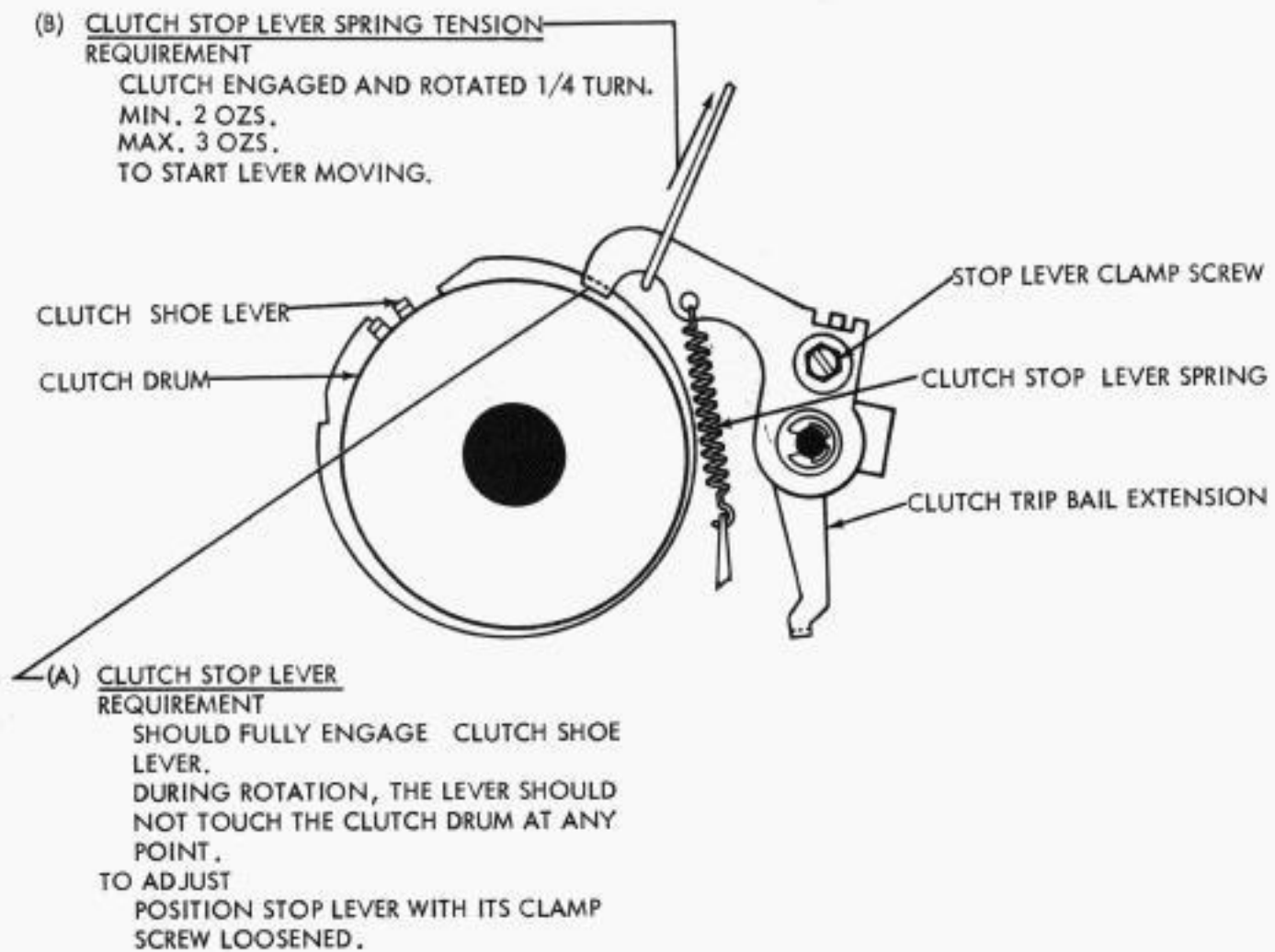
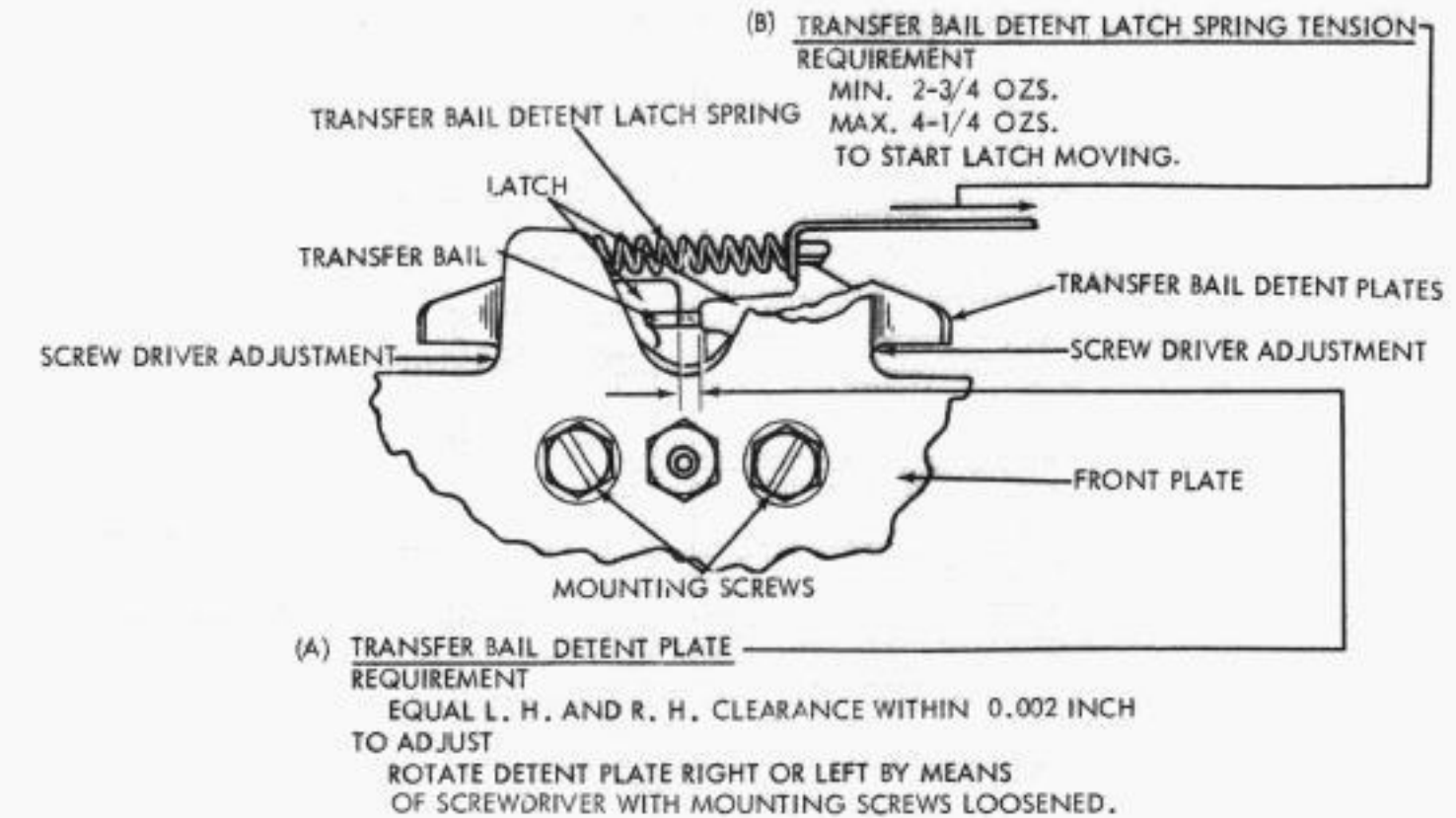
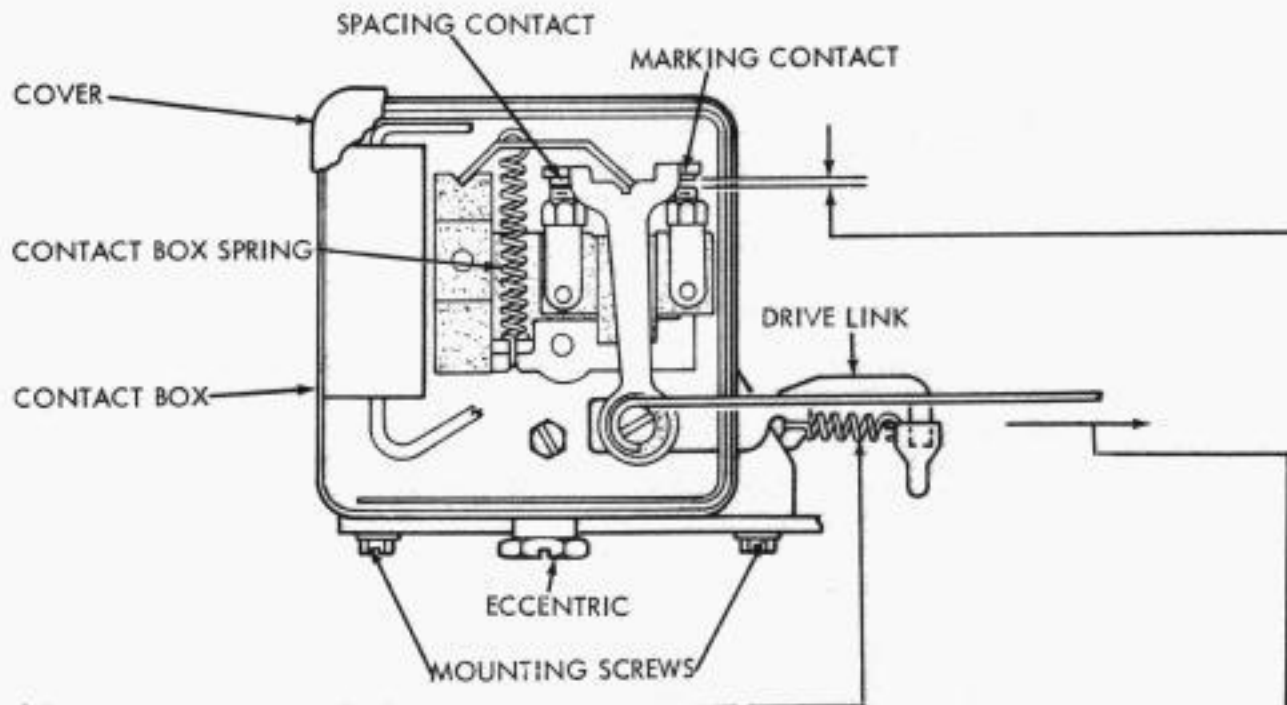


FIGURE 1-3. SIGNAL GENERATOR CLUTCH AND LEVER MECHANISM

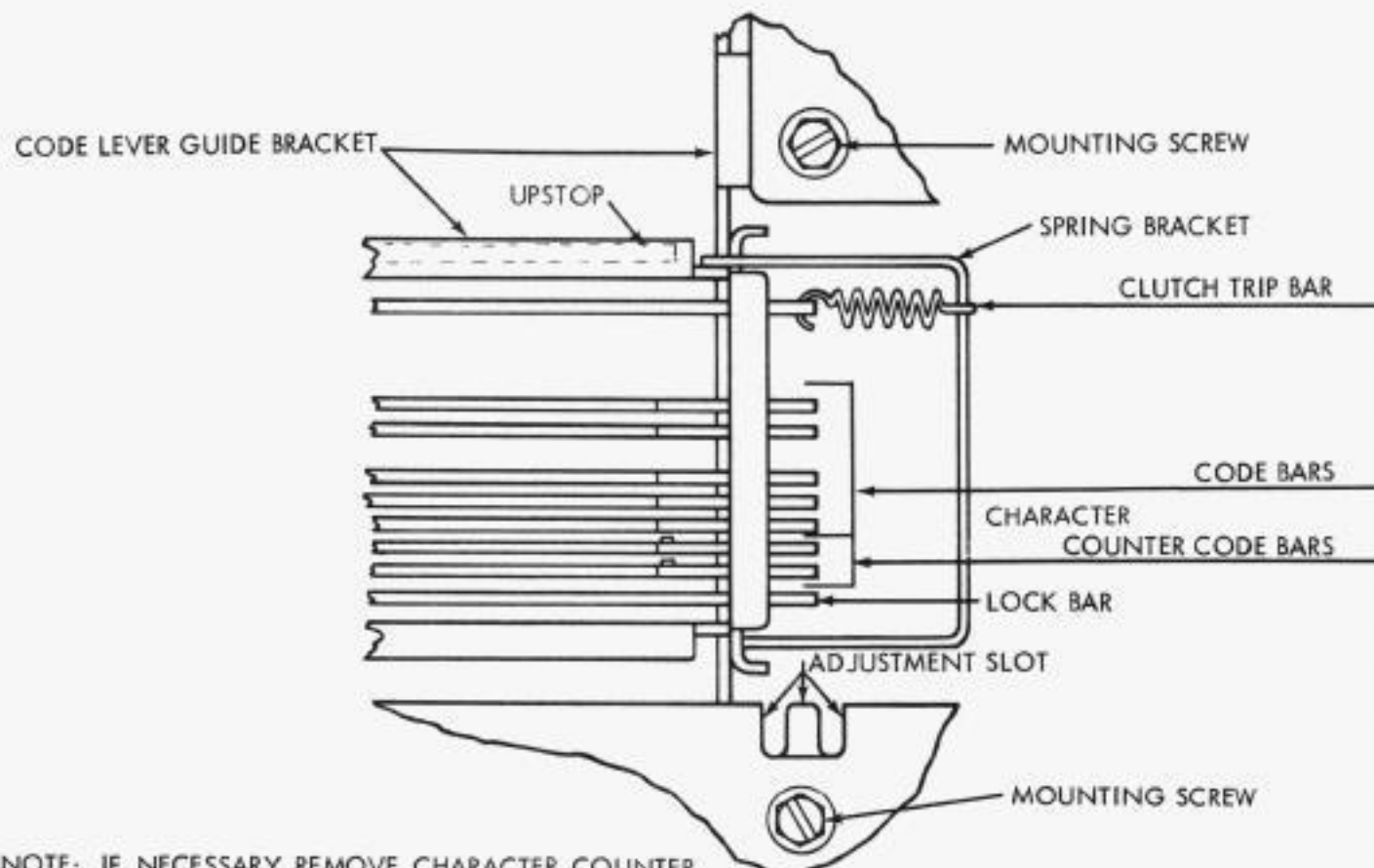


- (C) CONTACT BOX CONTACT CLEARANCE REQUIREMENT
 MARKING AND SPACING GAPS SHOULD BE EQUAL WITHIN 0.001 INCH.
 TO CHECK
 DEPRESS Y KEYLEVER AND ROTATE SIGNAL GENERATOR CAM SLEEVE UNTIL EACH CONTACT HAS FULLY OPENED.
 TO ADJUST
 LOOSEN MOUNTING SCREWS AND MOVE CONTACT BOX BY MEANS OF ECCENTRIC.
- NOTE
 CHECK BY MEANS OF SIGNAL CHECKING DEVICE WHERE POSSIBLE, AND CAREFULLY RE-FINE THE ADJUSTMENT TO ELIMINATE ALL BIAS FROM THE SIGNALS BY EQUALIZING THE CURRENT-ON AND CURRENT-OFF INTERVALS.

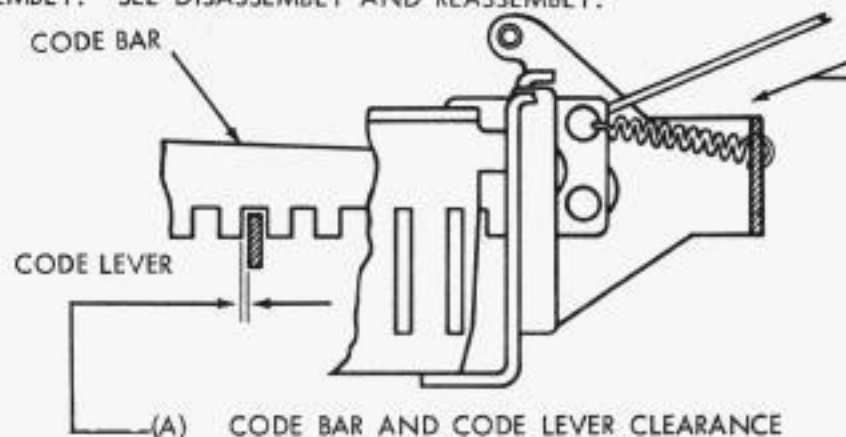


- (D) SIGNAL CONTACT DRIVE LINK REQUIREMENT
 WITH MAINSHAFT IN STOP POSITION AND TRANSFER BAIL DETENT LATCH SPRING UNHOOKED (SEE FIG. ABOVE), MOVE LATCHES AWAY FROM TRANSFER BAIL EXTENSION. HOLD THE TOGGLE FIRMLY AGAINST CONTACTS. MIN. 6 OZS. --- MAX. 9 OZS.
 TO START TRANSFER BAIL EXTENSION MOVING.
- (E) CONTACT BOX SPRING TENSION REQUIREMENT
 TRANSFER BAIL HELD CLEAR OF DRIVE LINK.
 MIN. 2 OZS.
 MAX. 3 OZS.
 TO START LINK MOVING.

FIGURE 1-4. TRANSFER BAIL AND CONTACT BOX MECHANISMS



NOTE: IF NECESSARY REMOVE CHARACTER COUNTER ASSEMBLY. SEE DISASSEMBLY AND REASSEMBLY.



(A) CODE BAR AND CODE LEVER CLEARANCE REQUIREMENT

CARRIAGE RETURN KEY DEPRESSED BUT NOT ENOUGH TO TRIP OFF UNIVERSAL BAIL LATCH OR CLUTCH BAR.

MIN. 0.006 INCH

MAX. 0.017 INCH

MEASURE AT CODE BAR #3

TO ADJUST

POSITION GUIDE BY ADJUSTING SLOT WITH FOUR MOUNTING SCREWS LOOSENED.

(B) CLUTCH TRIP BAR SPRING TENSION

REQUIREMENT

BLANK KEY DEPRESSED TO ALLOW THE CLUTCH TRIP BAR TO FALL TO RIGHT.

SPRING UNHOOKED FROM BRACKET

MIN. 8 OZS.

MAX. 12 OZS.

TO PULL SPRING TO INSTALLED LENGTH

(C) CODE BAR SPRING TENSION

REQUIREMENT

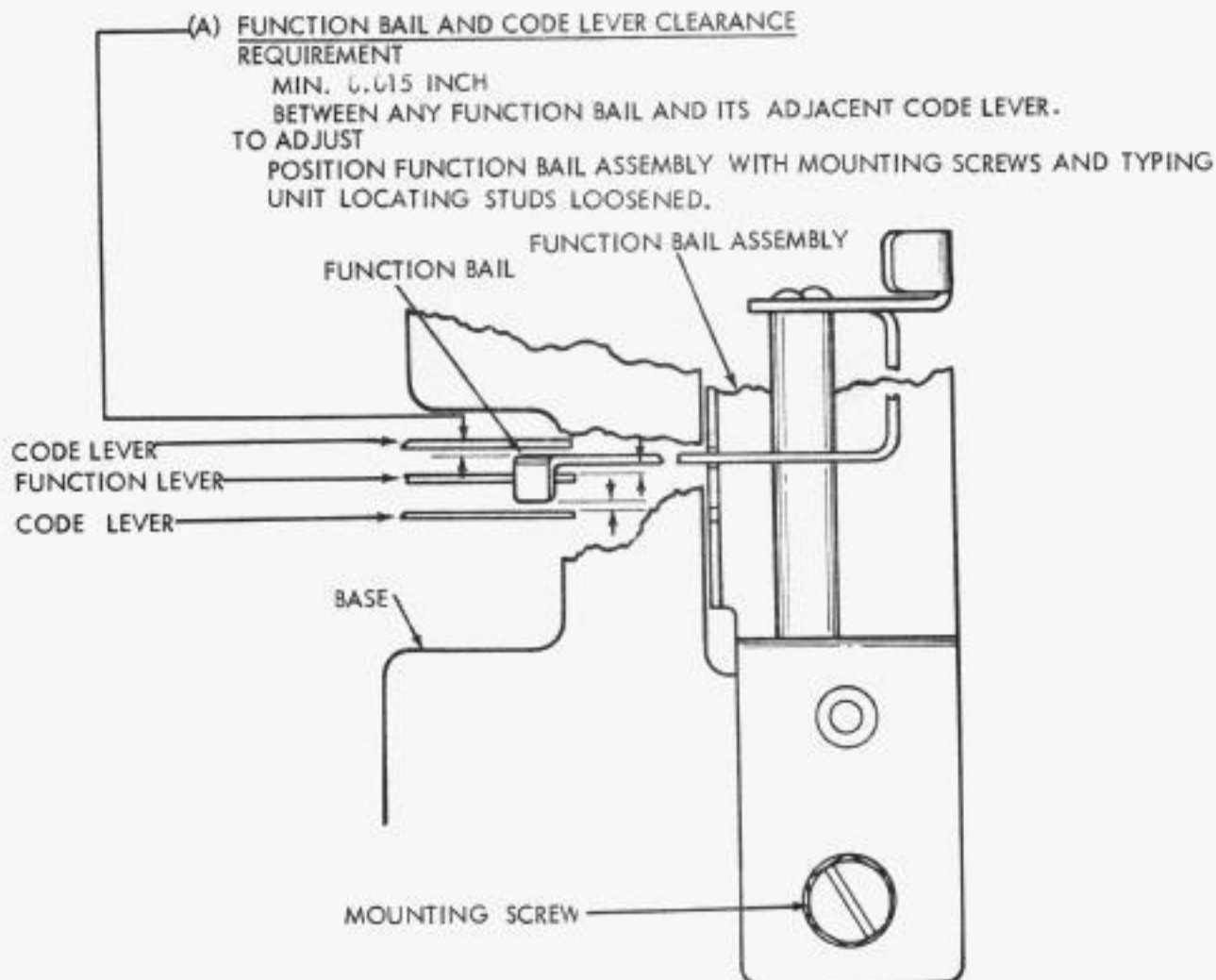
KEYBOARD IN K POSITION, LETTERS KEYLEVER DEPRESSED (POWER OFF) HOLD TRANSFER LEVERS (REF. FIGURE 1-15) TO THE RIGHT SO THEY DO NOT AFFECT THE CODE BARS.

MIN. 3 OZS.

MAX. 5 OZS.

TO START CODE BAR MOVING.

FIGURE 1-5. CODE BAR AND CODE LEVER MECHANISM

NOTE

THIS ADJUSTMENT SHOULD NOT BE MADE UNLESS THE LOCK BALL CHANNEL HAS BEEN DISASSEMBLED.

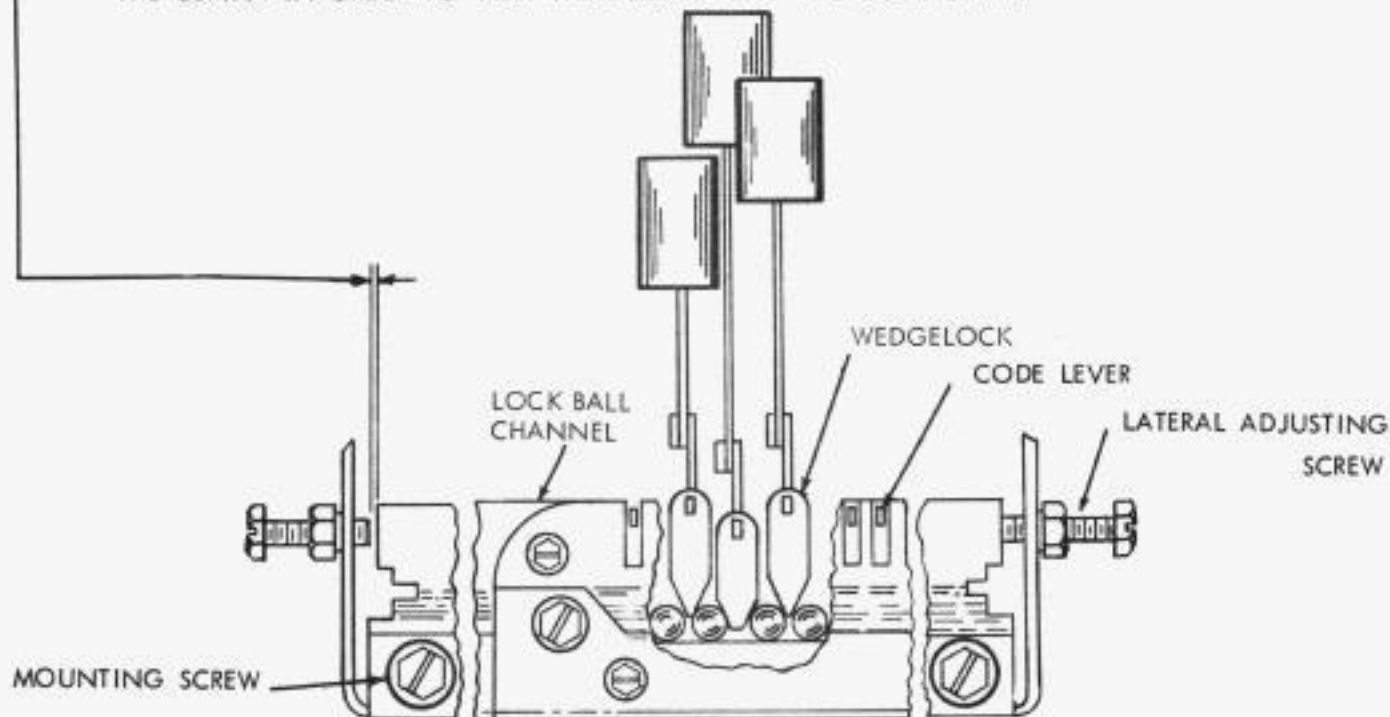
(B) LOCK BALL CHANNEL

REQUIREMENT

THERE SHOULD BE SOME TO 0.006 INCH CLEARANCE BETWEEN END OF LOCK BALL CHANNEL AND ADJUSTING SCREW WHEN MOST OF THE CODE LEVERS ARE CENTRALLY LOCATED IN THE LOCK BALL CHANNEL SLOTS.

TO CHECK

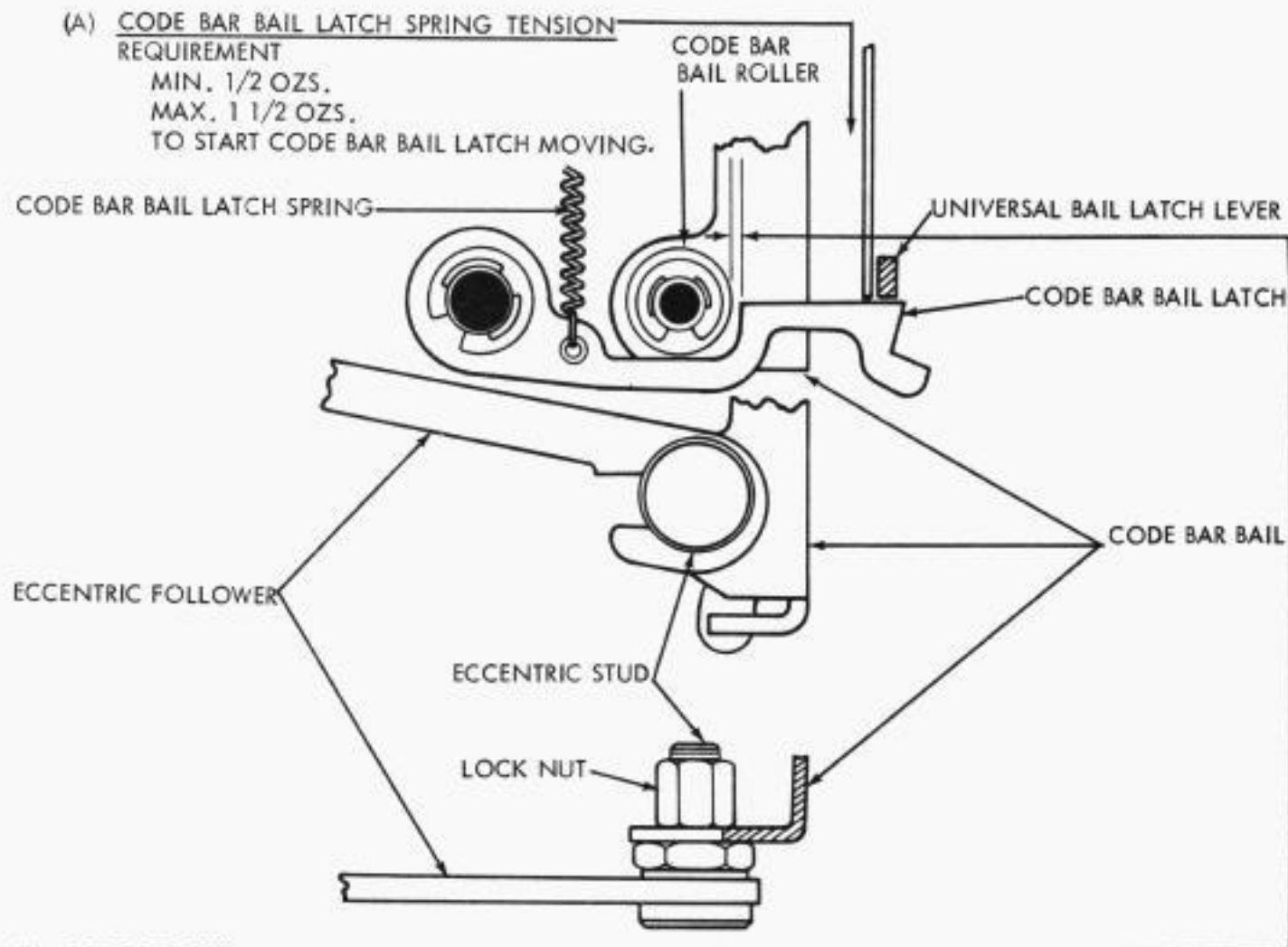
REMOVE THE LOCK BALL RETAINER. REMOVE A WEDGE FROM EACH END AND ONE FROM THE CENTER IN ORDER TO VIEW THE POSITION OF THE CODE LEVER.



TO ADJUST

LOOSEN THE LOCK BALL CHANNEL MOUNTING SCREWS. BACK OFF LATERAL ADJUSTING SCREWS AND POSITION CHANNEL. TURN ONE ADJUSTING SCREW IN AGAINST THE END OF THE CHANNEL AND LOCK IT. TURN THE OTHER ADJUSTING SCREW IN TO THE END OF THE CHANNEL AND BACK IT OFF 1/4 TURN. LOCK THE SCREW. REPLACE THE WEDGES AND CHECK THEIR POSITION WITH RESPECT TO THE BALLS. PULL CHANNEL ASSEMBLY DOWNWARD UNTIL ALL CODE LEVERS STRIKE THEIR UPSTOP WITHOUT WEDGES JUMPING OUT OF POSITION. REPLACE LOCK BALL RETAINER. BACK OFF BALL ENDPLAY ADJUSTING SCREW.

FIGURE 1-6. FUNCTION BAIL, WEDGELOCK AND BALL TRACK MECHANISM

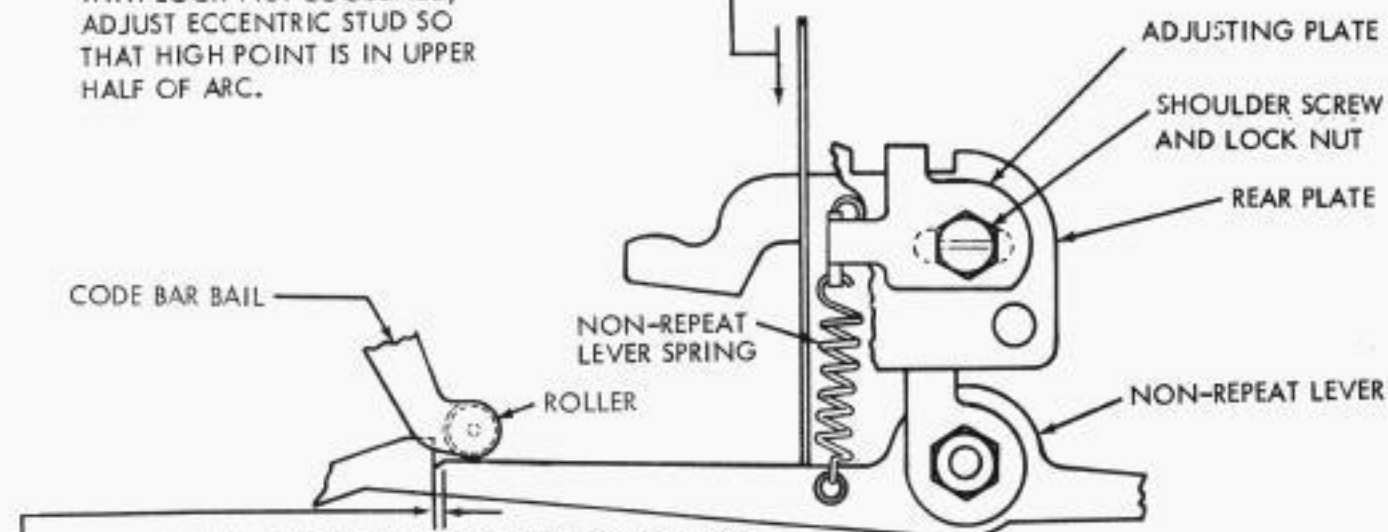


(B) CODE BAR BAIL REQUIREMENT

CAM ECCENTRIC AND ARM WHICH HOLD THE BAIL IN EXTREME RESET POSITION TO THE LEFT.
 MIN. SOME
 MAX. 0.006 INCH
 BETWEEN CODE BAR BAIL ROLLER AND CODE BAR BAIL LATCH
 TO ADJUST
 WITH LOCK NUT LOOSENED, ADJUST ECCENTRIC STUD SO THAT HIGH POINT IS IN UPPER HALF OF ARC.

(C) NON-REPEAT LEVER SPRING TENSION REQUIREMENT

ANY KEYLEVER DEPRESSED
 MIN. 2 OZS.
 MAX. 3-1/4 OZS.
 TO START NON-REPEAT LEVER MOVING DOWNWARD.



(D) CODE BAR BAIL AND NON-REPEAT LEVER CLEARANCE REQUIREMENT

MECHANISM IN INITIAL TRIP-OFF POSITION, ANY KEY DEPRESSED, NO POWER.
 MIN. 0.010 INCH
 MAX. 0.020 INCH
 BETWEEN ROLLER OF CODE BAR BAIL AND NON-REPEAT LEVER PICK-UP STEP.
 TO ADJUST
 LOOSEN LOCK NUT AND SHOULDER SCREW AND MOVE MECHANISM LEFT OR RIGHT

FIGURE 1-7. CODE BAR BAIL AND NON-REPEAT LEVER MECHANISMS

NOTE: REMOVE KEYBOARD HOOD IN ORDER TO MAKE THIS ADJUSTMENT. SEE DISASSEMBLY AND REASSEMBLY

(A) BALL WEDGELOCK AND BALL TRACK CLEARANCE (PRELIMINARY)

REQUIREMENT

CLEARANCE BETWEEN TIP OF WEDGE AND THE TRACK
MIN. 0.005 INCH---MAX. 0.015 INCH AND EQUAL WITHIN 0.005 INCH.

TO CHECK

DEPRESS "Q" AND "P" KEYLEVER ALTERNATELY WITH 32 OZS. PRESSURE AND MEASURE CLEARANCE IN EACH INSTANCE. THERE SHOULD BE NO CLEARANCE BETWEEN LOWER EDGE OF CODE LEVER EXTENSIONS AND BOTTOM OF SLOTS IN WEDGES.

TO ADJUST

POSITION BALL TRACK UP OR DOWN WITH THE TWO MOUNTING SCREWS LOOSENED.

(B) LOCK BALL END PLAY (PRELIMINARY)

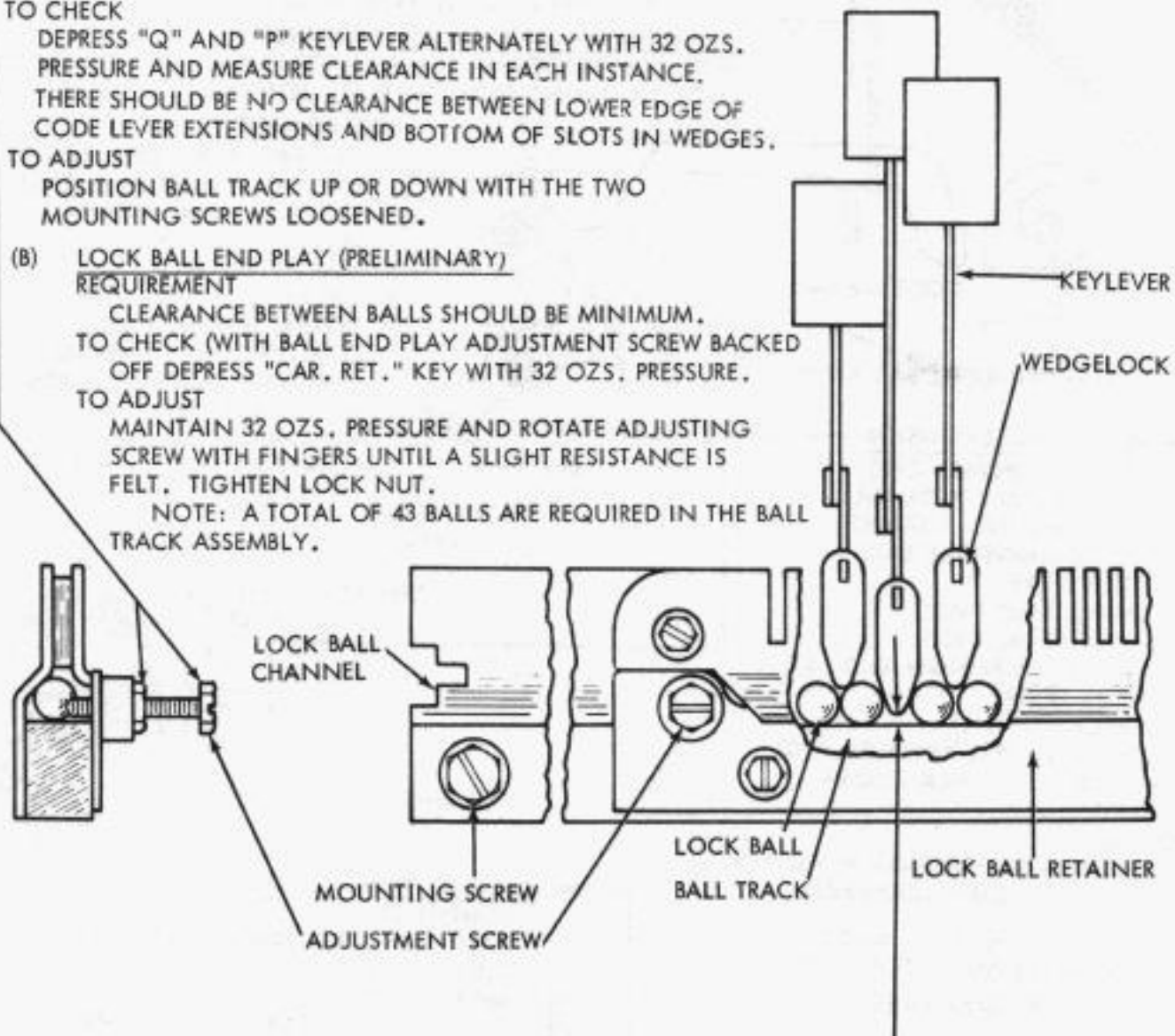
REQUIREMENT

CLEARANCE BETWEEN BALLS SHOULD BE MINIMUM.
TO CHECK (WITH BALL END PLAY ADJUSTMENT SCREW BACKED OFF DEPRESS "CAR. RET." KEY WITH 32 OZS. PRESSURE.

TO ADJUST

MAINTAIN 32 OZS. PRESSURE AND ROTATE ADJUSTING SCREW WITH FINGERS UNTIL A SLIGHT RESISTANCE IS FELT. TIGHTEN LOCK NUT.

NOTE: A TOTAL OF 43 BALLS ARE REQUIRED IN THE BALL TRACK ASSEMBLY.



(F) BALL WEDGELOCK, BALL END-PLAY AND UNIVERSAL BAIL LATCH (FINAL) PERFORM THIS ADJUSTMENT

FOLLOWING (E) ON PAGE 1-10
REQUIREMENT (UNDER POWER)

1. TRIP-OFF PRESSURE OF ANY CENTER ROW KEY SHOULD BE MIN. 2 OZS.---MAX. 5 OZS.
 2. APPLY 5-1/2 OZS. PRESSURE PERPENDICULAR TO "A" KEY, DEPRESS EACH KEY IN THIRD ROW. THE "A" KEY SHOULD TRIP EACH TIME A KEY IS RELEASED.
 3. REPEAT 2 WITH THE 5-1/2 OZS. PRESSURE ON "CAR. RET." KEY.
 4. THE CLUTCH SHOULD NOT TRIP WHEN TWO KEYS ARE DEPRESSED SIMULTANEOUSLY.
 5. APPLY 4-1/4 OZS. TO "SPACE BAR," DEPRESS "CAR. RET." KEY AND LIFT FINGER FROM KEY HORIZONTALLY. THE "SPACE BAR" SHOULD TRIP EACH TIME "CAR. RET." IS RELEASED.
- NOTE---IF UNIT IS EQUIPPED FOR REPEAT-SPACE OPERATION, DISREGARD MULTIPLE SPACE OPERATIONS.

TO ADJUST

IF NECESSARY, REFINE BALL WEDGE LOCK AND BALL TRACK CLEARANCE (PRELIMINARY), LOCK BALL END PLAY (PRELIMINARY), UNIVERSAL BAIL LATCH LEVER (PRELIMINARY) AND UNIVERSAL BAIL EXTENSION.

FIGURE 1-8. KEYBOARD, WEDGELOCK AND BALL TRACK MECHANISM

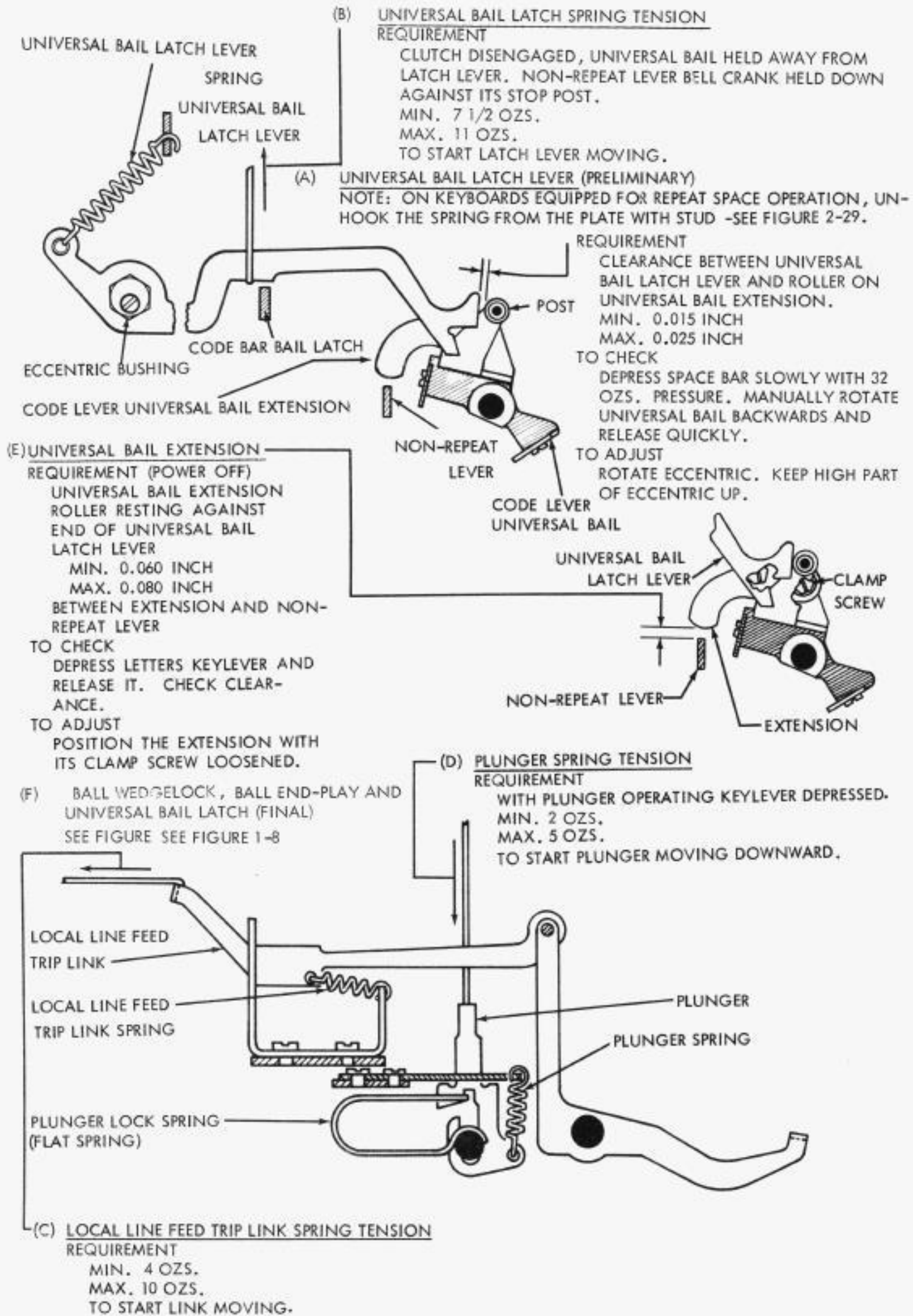


FIGURE 1-9. UNIVERSAL BAIL LATCH LEVER AND LOCAL LINE FEED TRIP LINK MECHANISMS

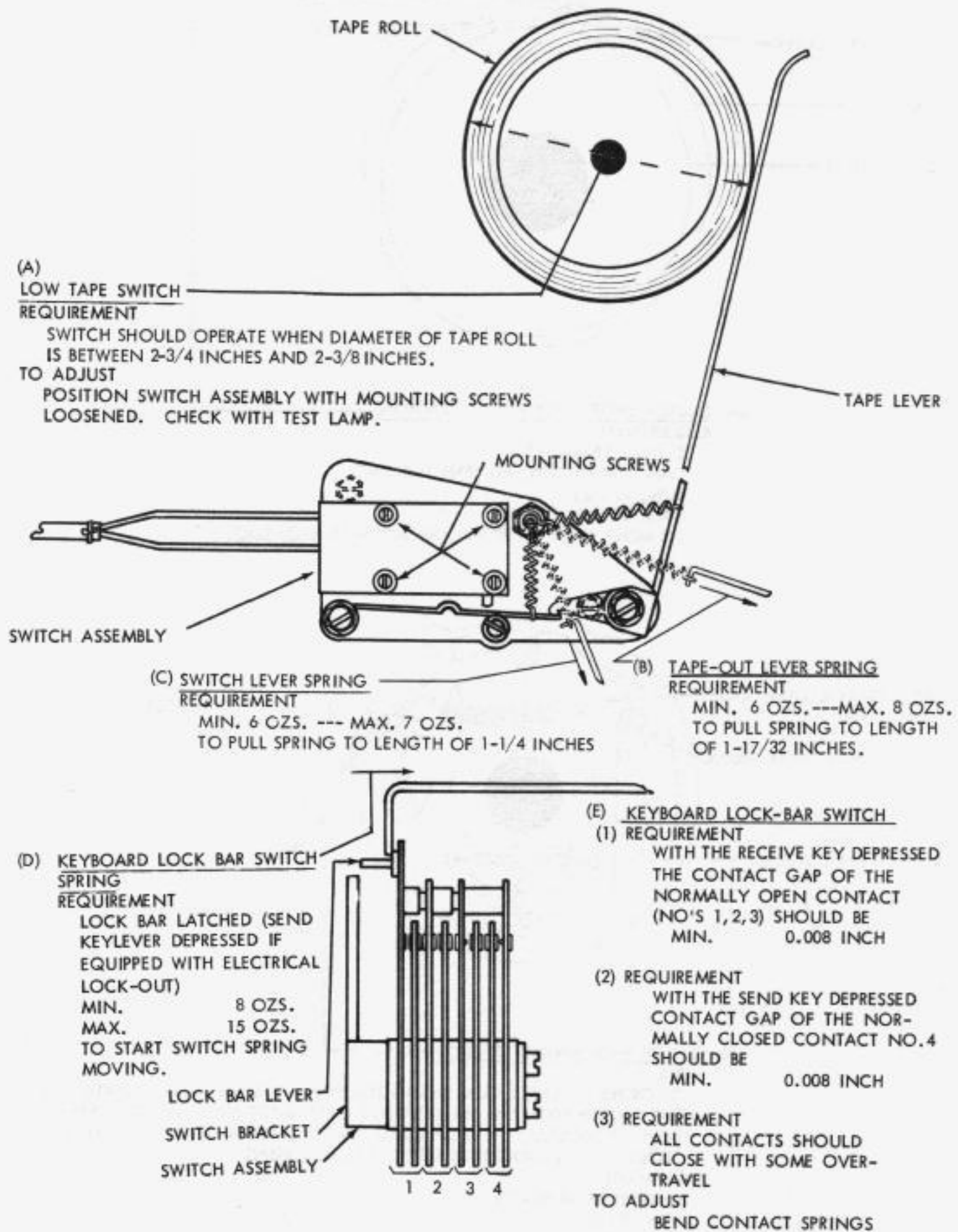
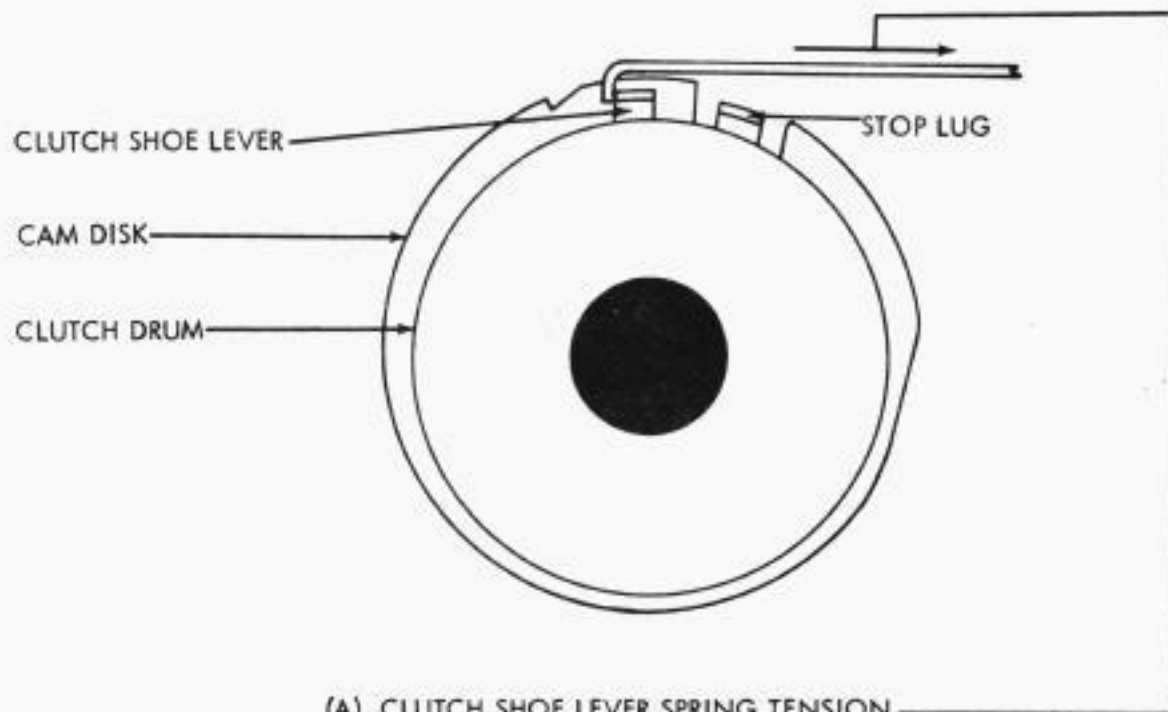
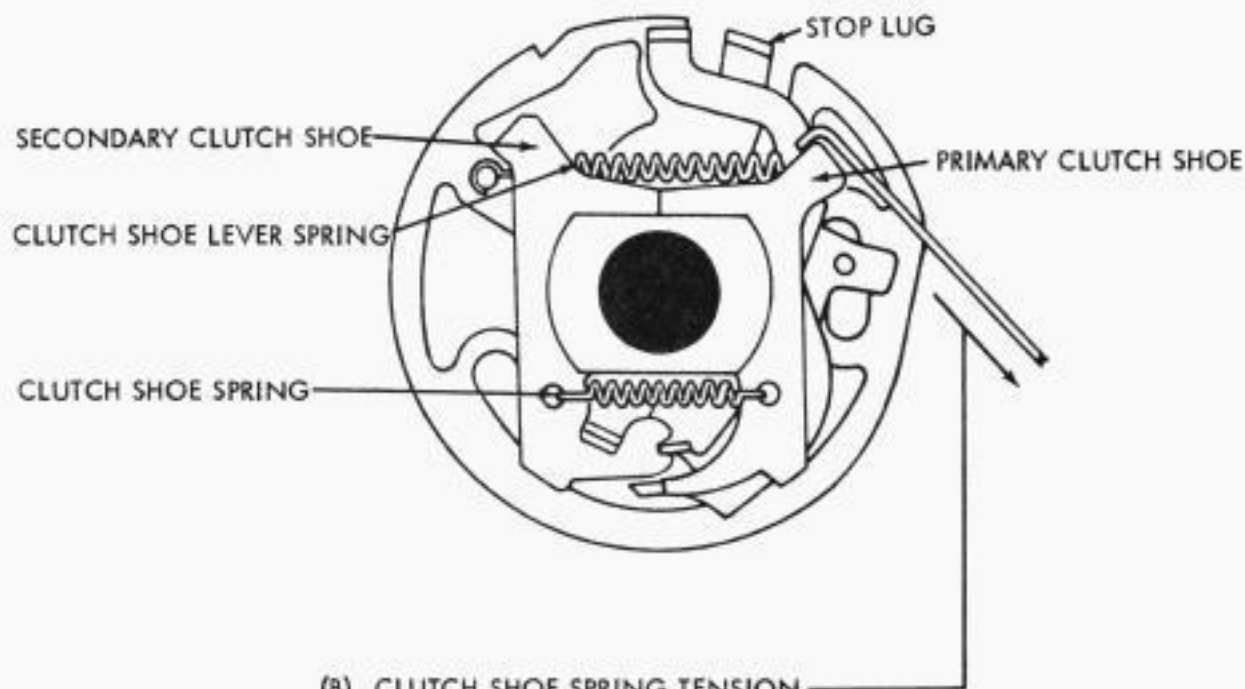


FIGURE 1-10. TAPE-OUT SWITCH AND KEYBOARD LOCK-BAR SWITCH



(A) CLUTCH SHOE LEVER SPRING TENSION
REQUIREMENT

CLUTCH ENGAGED.
CAM DISK HELD TO PREVENT TURNING.
MIN. 15 OZS.
MAX. 20 OZS.
TO MOVE SHOE LEVER IN CONTACT WITH STOP LUG.



(B) CLUTCH SHOE SPRING TENSION
NOTE

IN ORDER TO CHECK THIS SPRING TENSION, IT IS NECESSARY TO REMOVE THE CLUTCH FROM THE MAIN SIGNAL GENERATOR DRIVE SHAFT. THEREFORE, IT SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO BELIEVE THAT IT DOES NOT MEET ITS REQUIREMENT.

REQUIREMENT

CLUTCH DRUM REMOVED.
MIN. 3 OZS.
MAX. 5 OZS.
TO START PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE AT POINT OF CONTACT.

FIGURE 1-11. SIGNAL GENERATOR CLUTCH MECHANISM

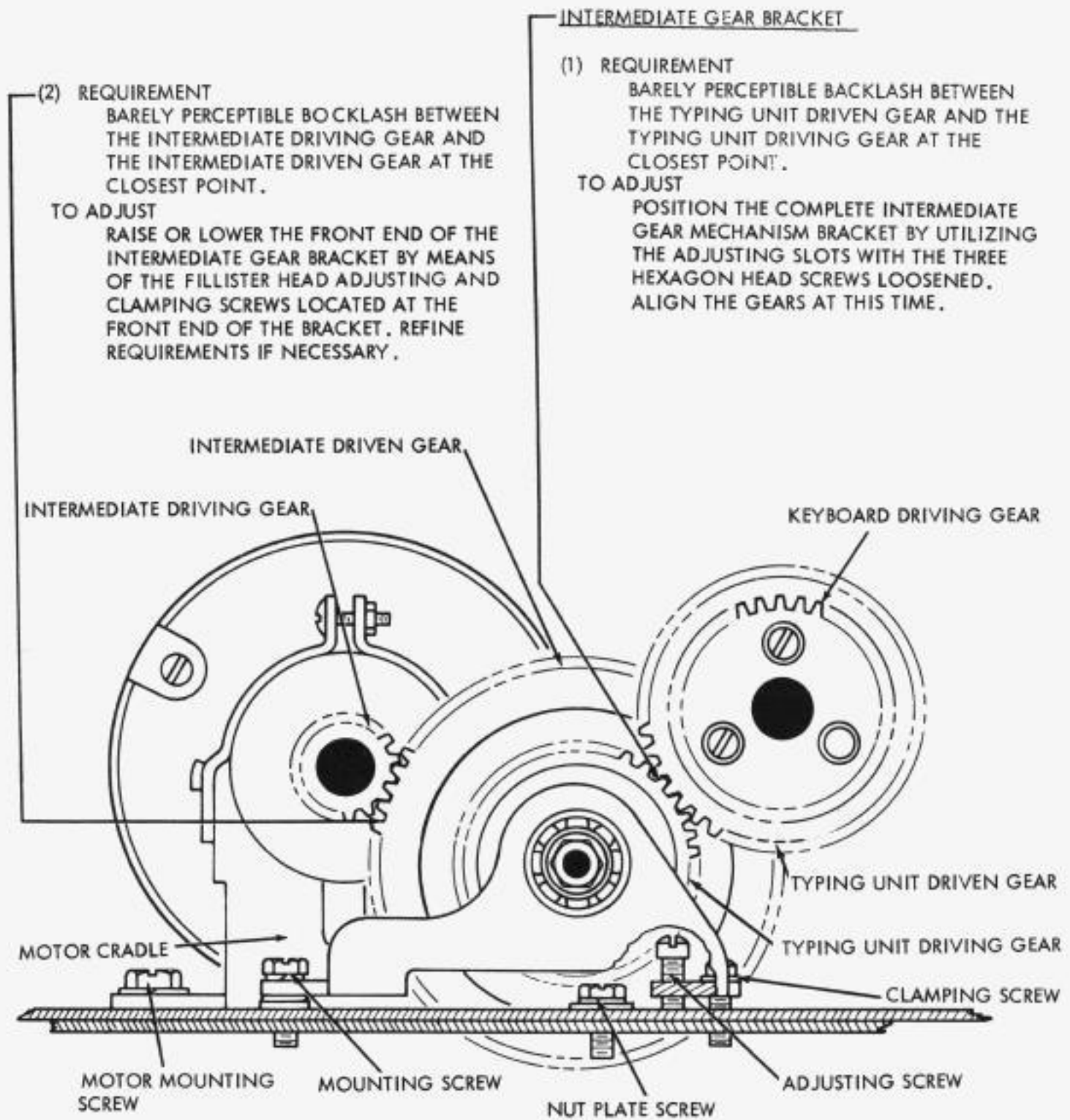


FIGURE 1-12. TYPING UNIT AND MOTOR PINION INTERMEDIATE GEAR ASSEMBLY

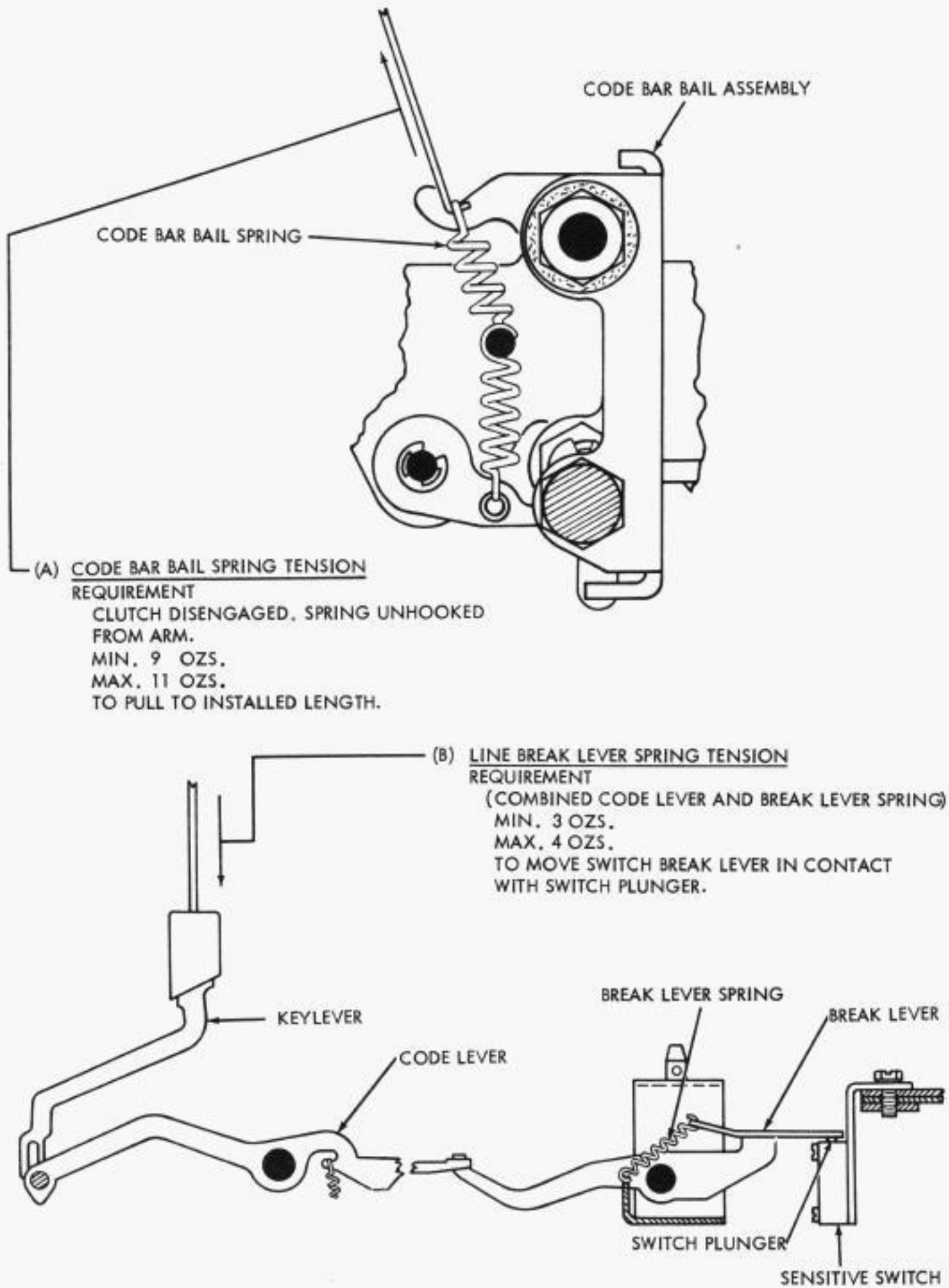


FIGURE 1-13 CODE BAR BAIL AND LINE BREAK LEVER

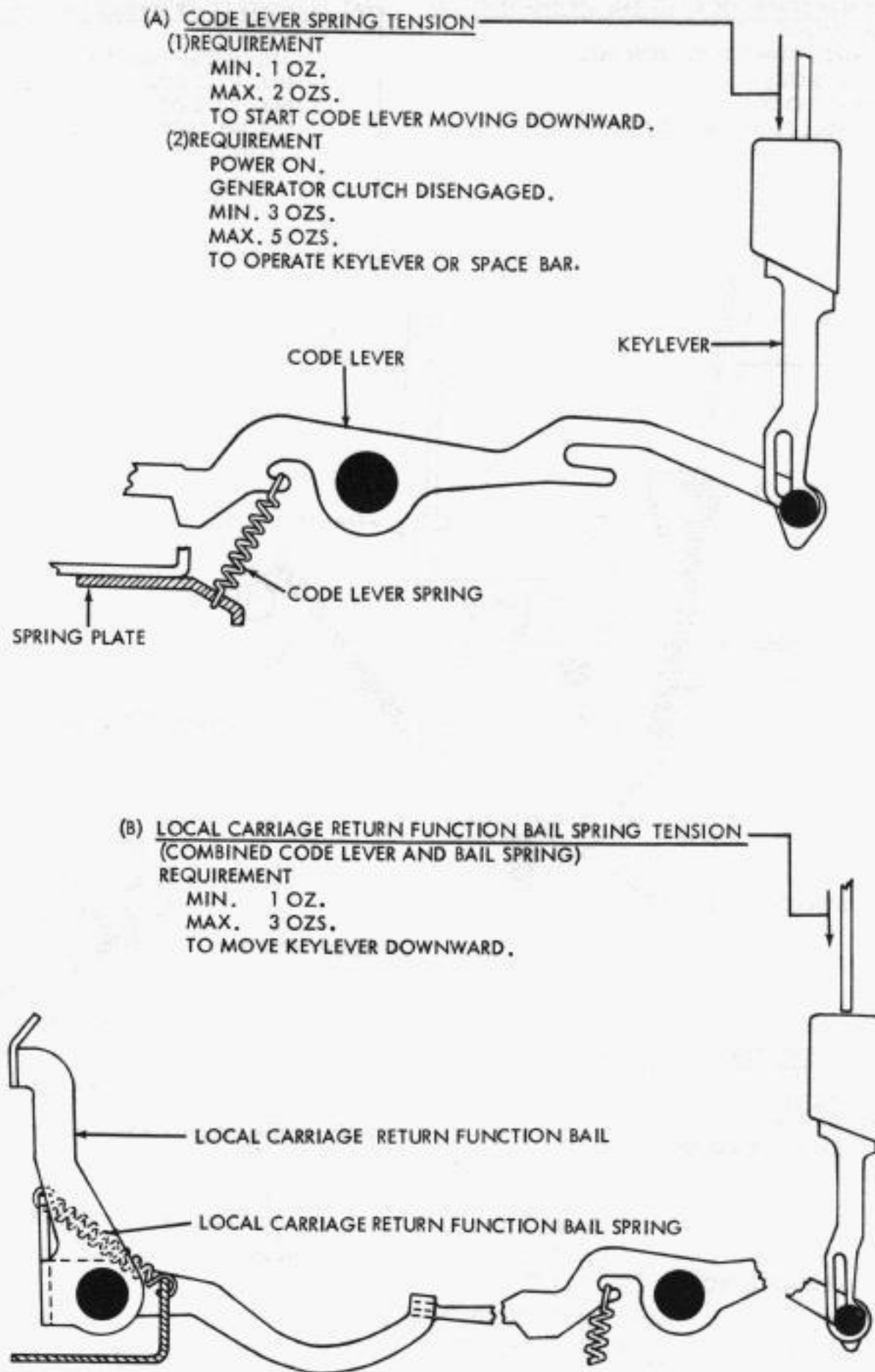


FIGURE 1-14 CODE LEVER AND LOCAL CARRIAGE RETURN FUNCTION BAIL MECHANISM.

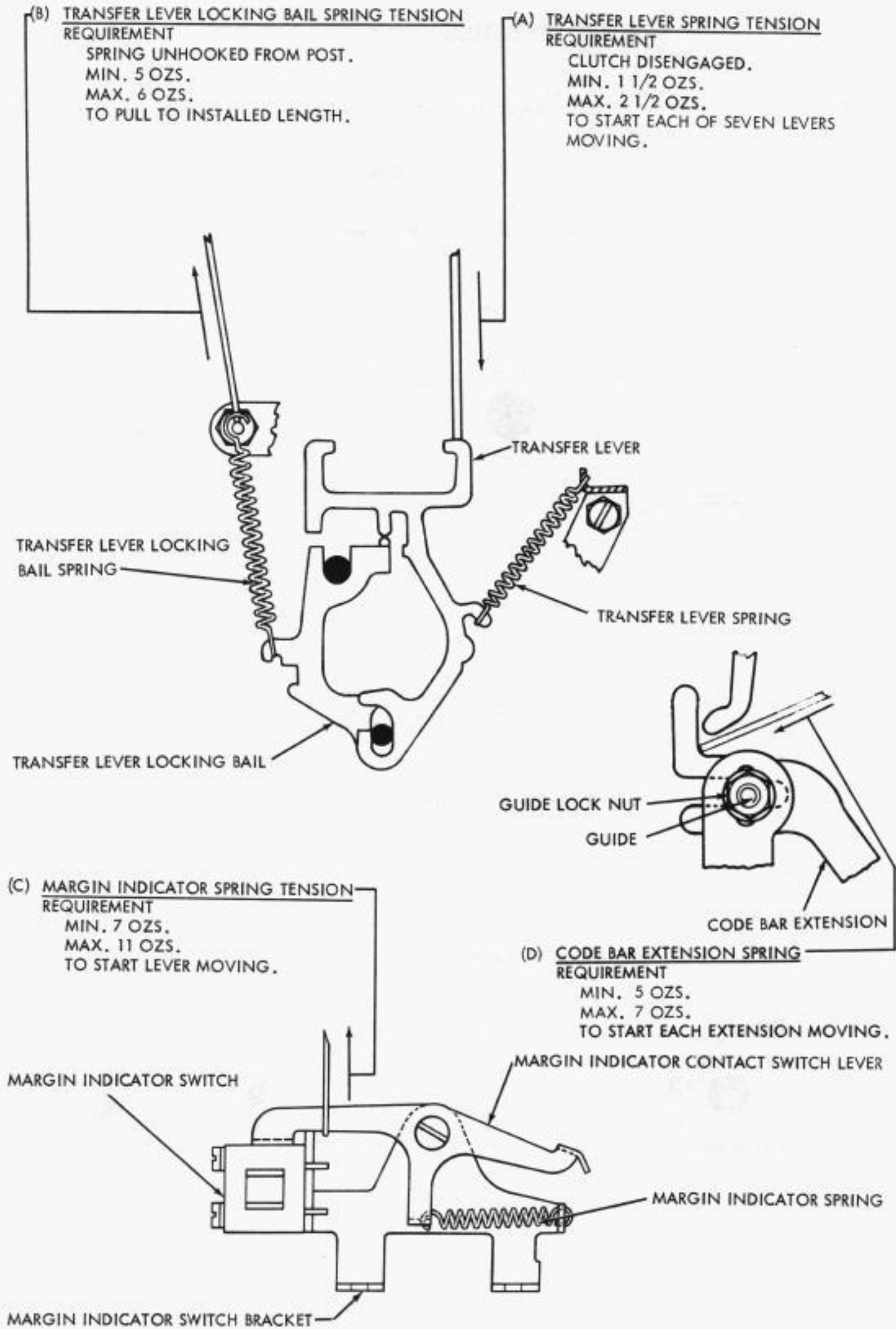


FIGURE 1-15 TRANSFER LEVER AND MARGIN INDICATOR MECHANISMS

3. PERFORATOR UNIT (TYPING OR NON-TYPING)

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

(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.

NOTE:

AFTER MAKING ADJUSTMENT, DISENGAGE CLUTCH. REMOVE DRUM MOUNTING SCREW. ROTATE DRUM IN NORMAL DIRECTION AND CHECK TO SEE IF IT DRAGS ON SHOE. IF IT DOES REFINE ADJUSTMENT.

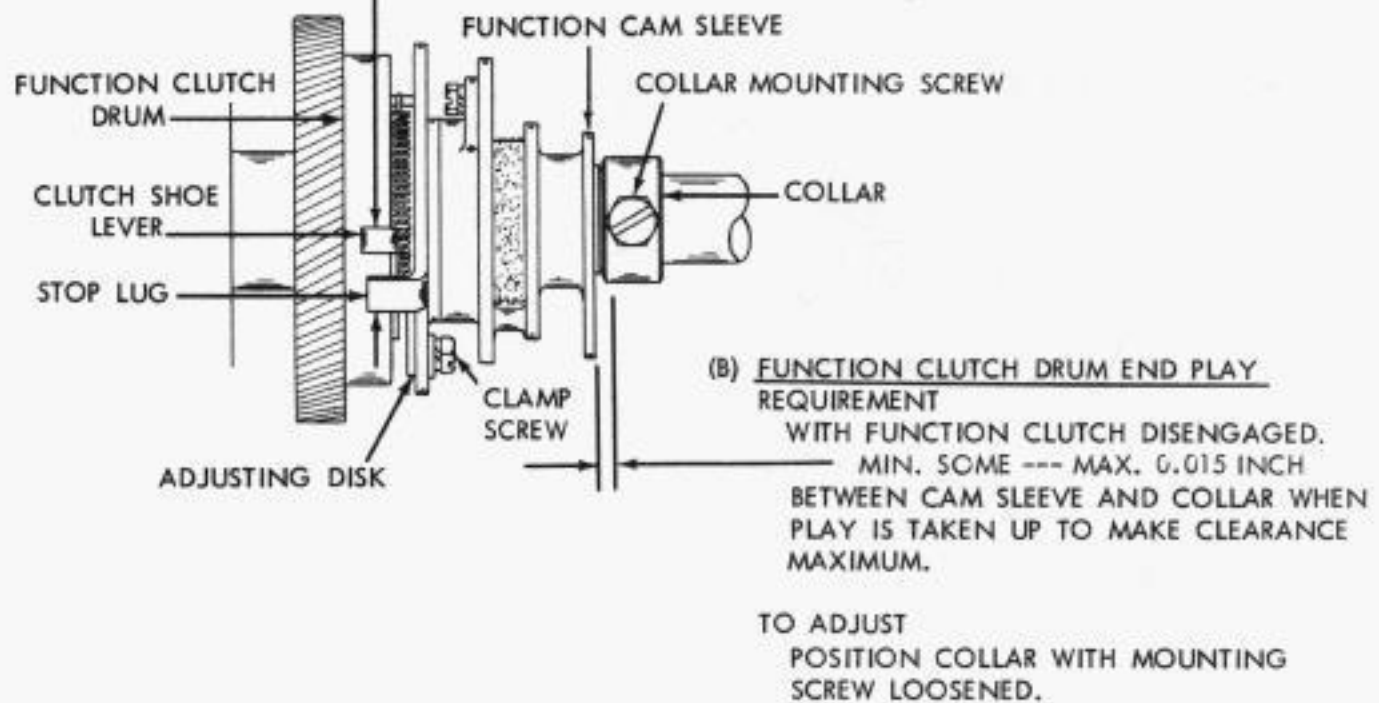


FIGURE 1-16. FUNCTION CLUTCH

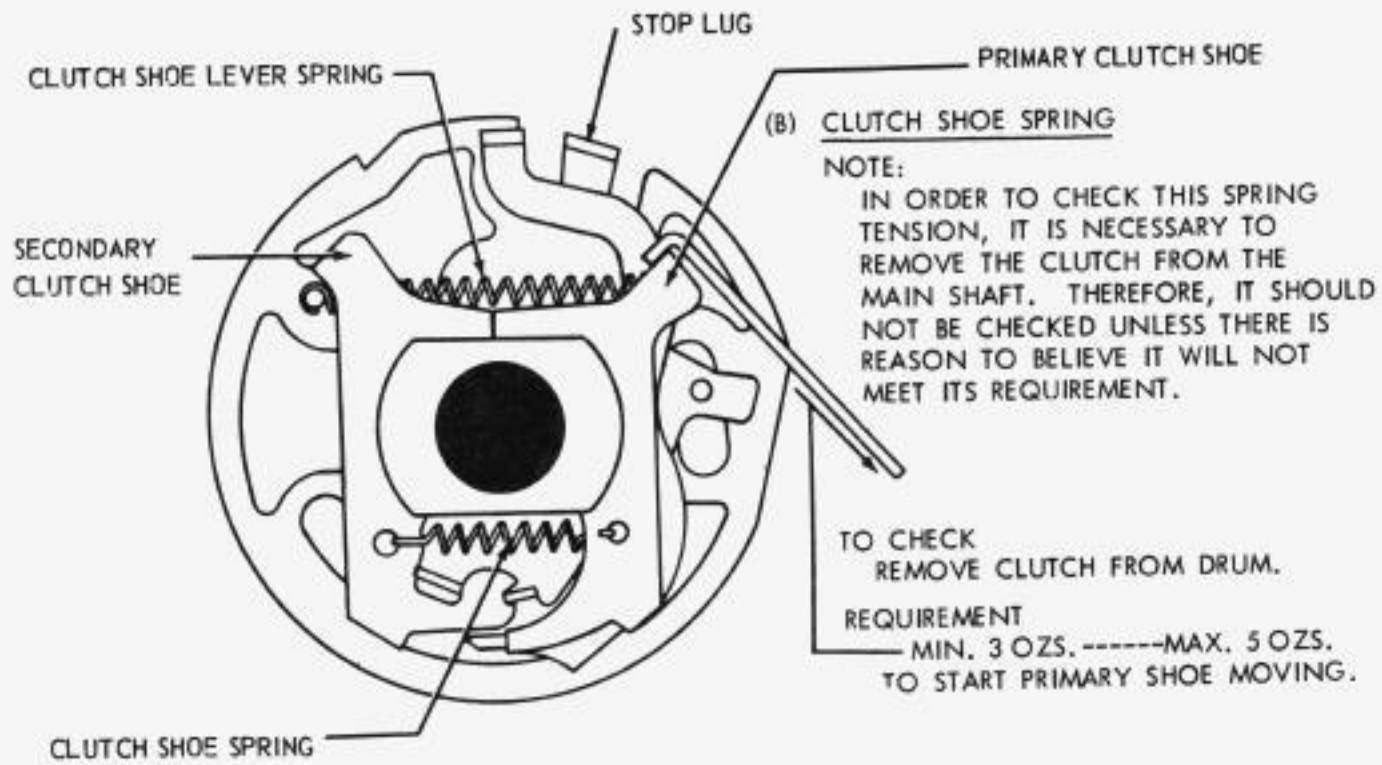
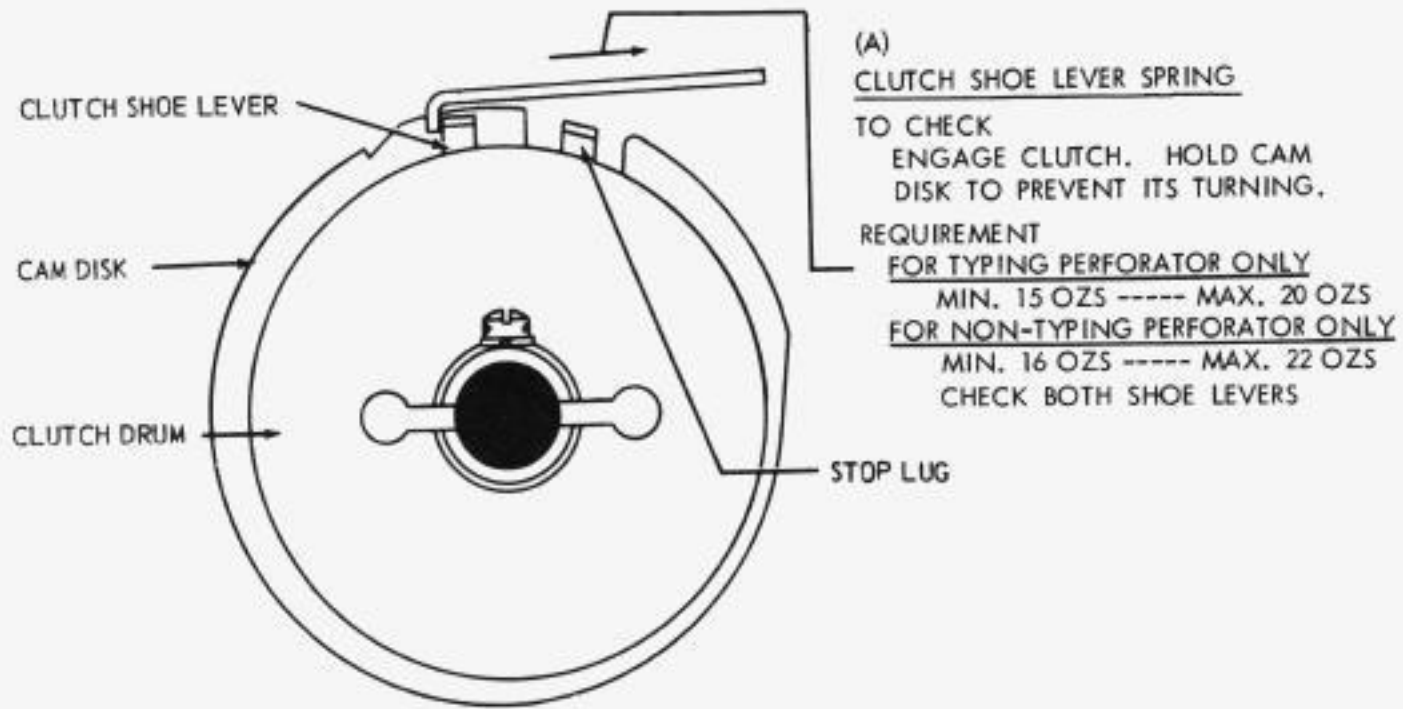


FIGURE 1-17 CLUTCH ASSEMBLIES

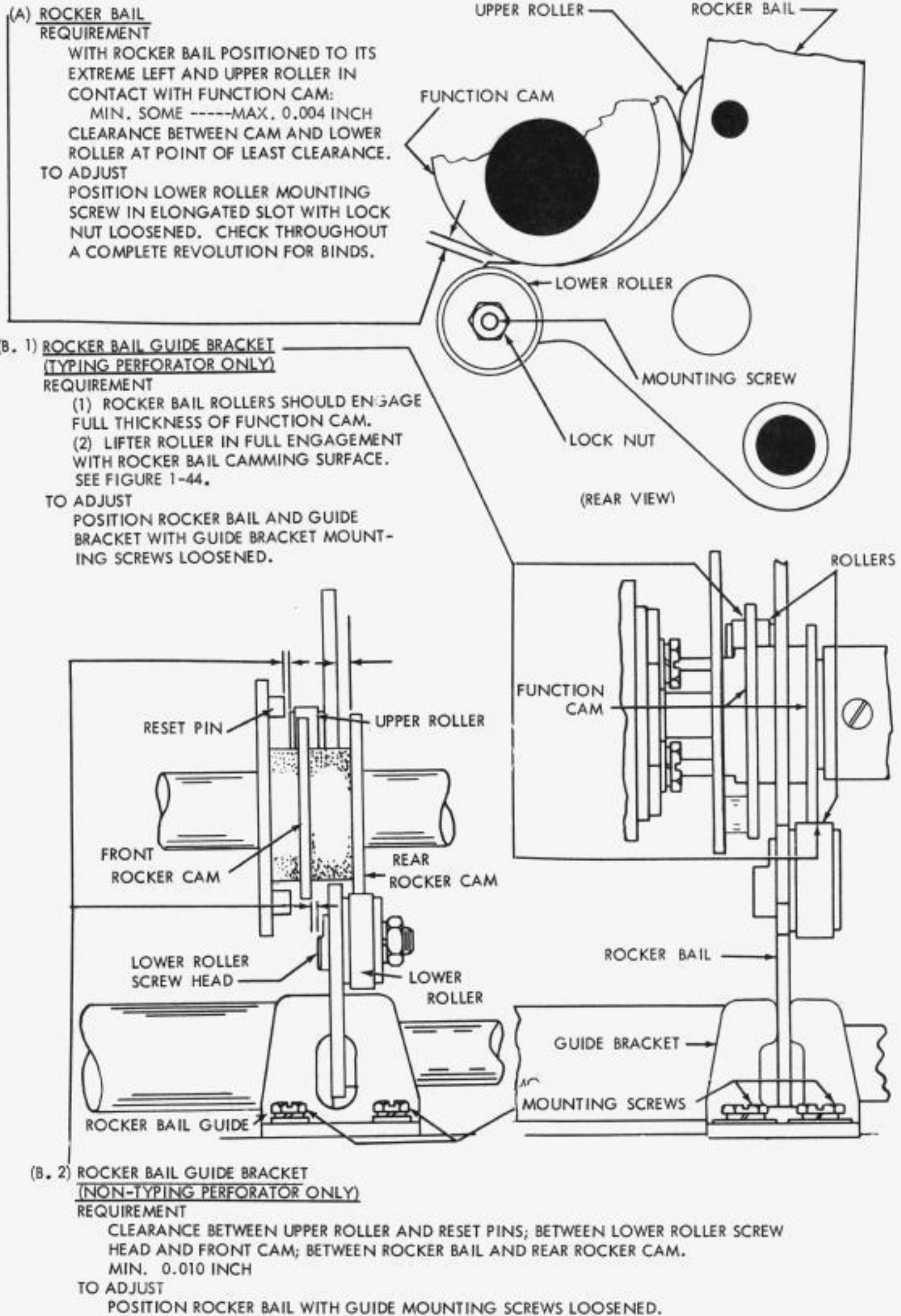


FIGURE 1-18 FUNCTION MECHANISM

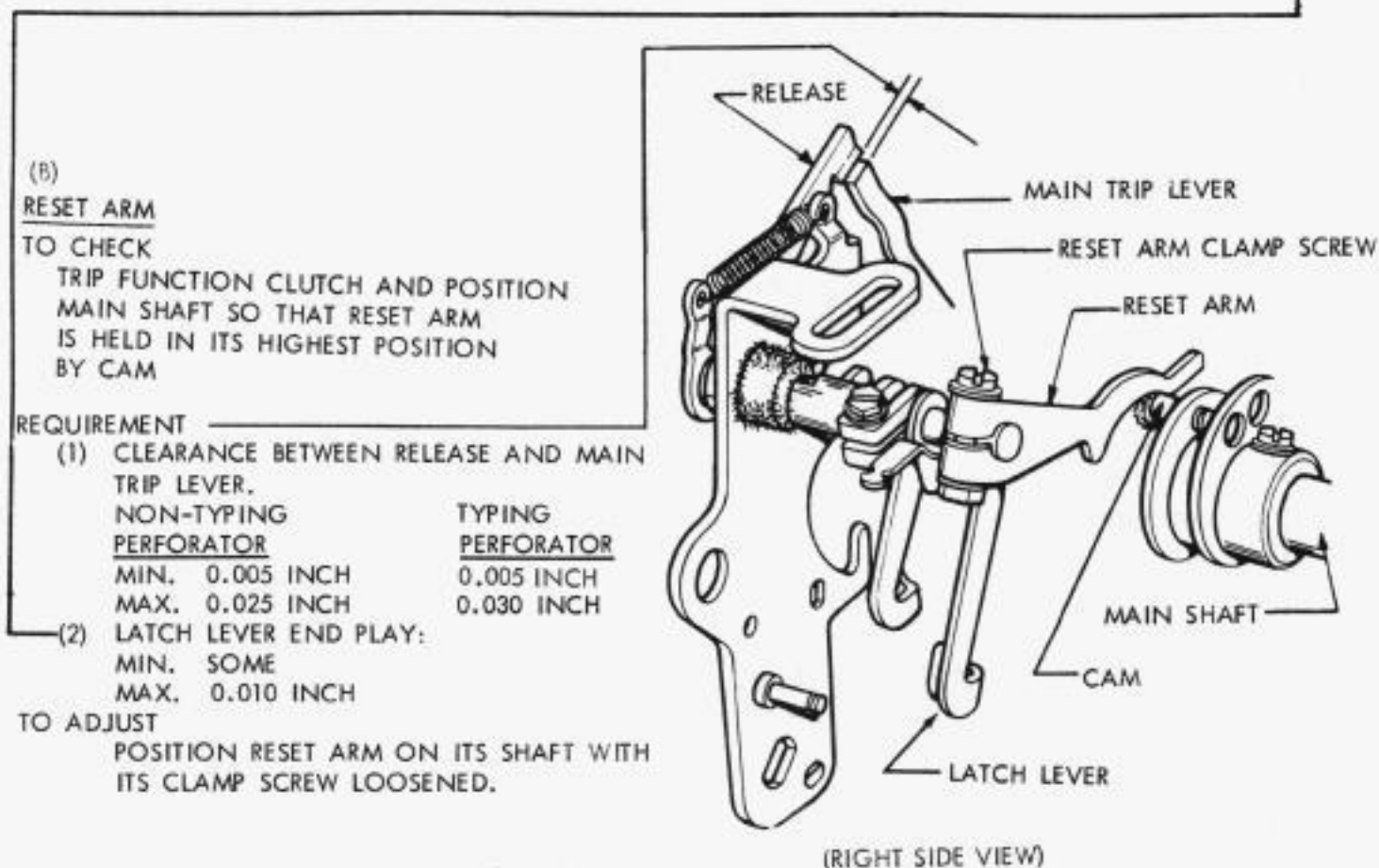
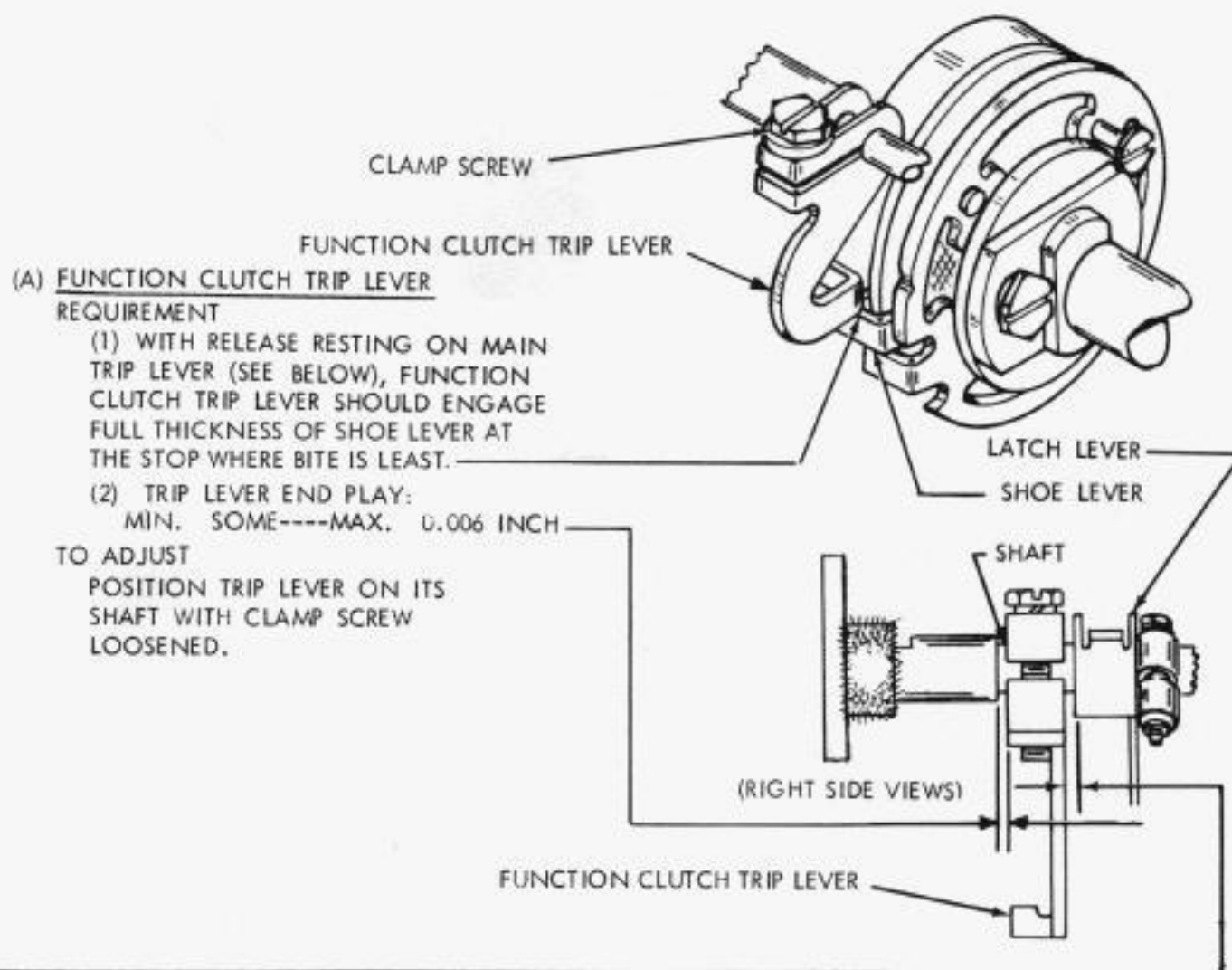


FIGURE 1-19 FUNCTION MECHANISM

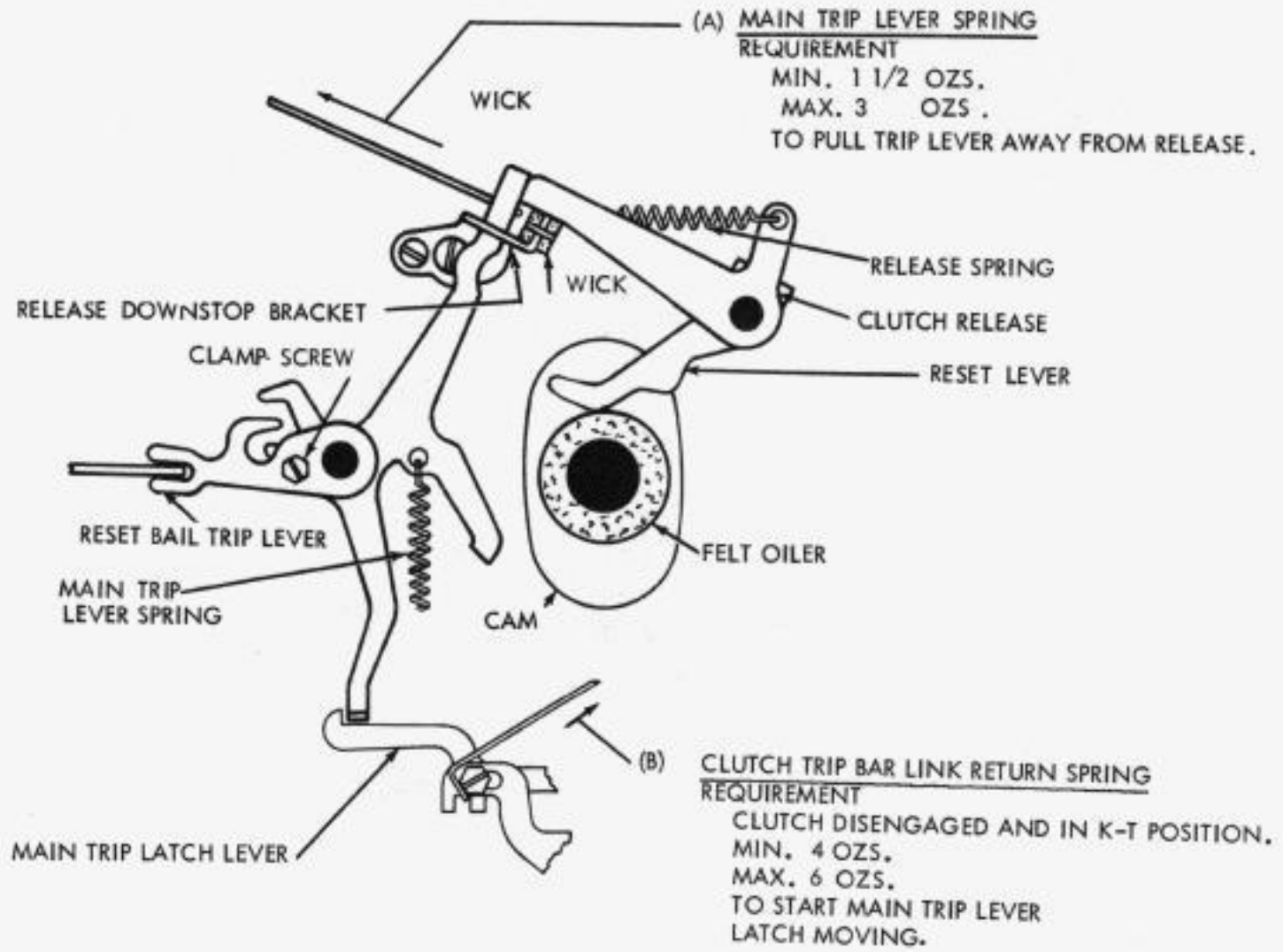


FIGURE 1-20. PERFORATOR TRIP LEVER MECHANISM

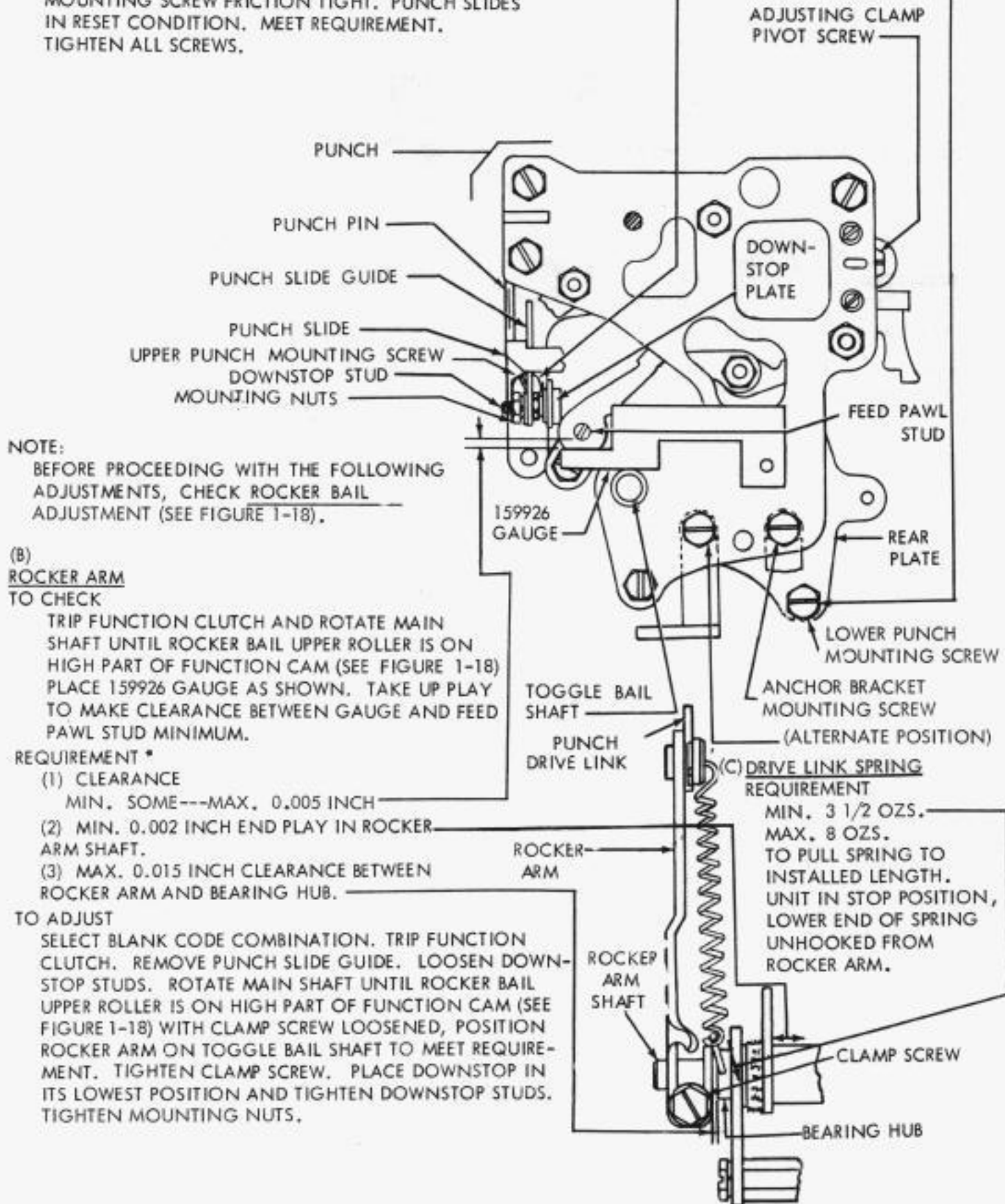
(A) PUNCH POSITION

REQUIREMENT

PUNCH MOUNTING SCREWS CENTRALLY LOCATED IN ELONGATED MOUNTING HOLES
 PUNCH SLIDE LATCHES SHALL BE VISUALLY HORIZONTAL WHEN ENGAGED WITH THE PUNCH SLIDES.

TO ADJUST

REMOVE THE MOUNTING SCREW AT THE LOWER EDGE OF THE PUNCH MECHANISM BACKPLATE. REMAINING BACKPLATE MOUNTING SCREWS AND BRACKET MOUNTING SCREW FRICTION TIGHT. PUNCH SLIDES IN RESET CONDITION. MEET REQUIREMENT. TIGHTEN ALL SCREWS.



NOTE:

BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK ROCKER BAIL ADJUSTMENT (SEE FIGURE 1-18).

(B) ROCKER ARM
TO CHECK

TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROCKER BAIL UPPER ROLLER IS ON HIGH PART OF FUNCTION CAM (SEE FIGURE 1-18) PLACE 159926 GAUGE AS SHOWN. TAKE UP PLAY TO MAKE CLEARANCE BETWEEN GAUGE AND FEED PAWL STUD MINIMUM.

REQUIREMENT *

- (1) CLEARANCE
MIN. SOME---MAX. 0.005 INCH
- (2) MIN. 0.002 INCH END PLAY IN ROCKER ARM SHAFT.
- (3) MAX. 0.015 INCH CLEARANCE BETWEEN ROCKER ARM AND BEARING HUB.

TO ADJUST

SELECT BLANK CODE COMBINATION. TRIP FUNCTION CLUTCH. REMOVE PUNCH SLIDE GUIDE. LOOSEN DOWNSTOP STUDS. ROTATE MAIN SHAFT UNTIL ROCKER BAIL UPPER ROLLER IS ON HIGH PART OF FUNCTION CAM (SEE FIGURE 1-18) WITH CLAMP SCREW LOOSENED, POSITION ROCKER ARM ON TOGGLE BAIL SHAFT TO MEET REQUIREMENT. TIGHTEN CLAMP SCREW. PLACE DOWNSTOP IN ITS LOWEST POSITION AND TIGHTEN DOWNSTOP STUDS. TIGHTEN MOUNTING NUTS.

(C) DRIVE LINK SPRING
REQUIREMENT

MIN. 3 1/2 OZS.
 MAX. 8 OZS.
 TO PULL SPRING TO INSTALLED LENGTH. UNIT IN STOP POSITION, LOWER END OF SPRING UNHOOKED FROM ROCKER ARM.

*AFTER FEED PAWL ADJUSTMENT (FIGURE 1-24) HAS BEEN MADE, IF PUNCH PIN PENETRATION (FIGURE 1-22) AND FEED PAWL REQUIREMENTS ARE MET, THIS REQUIREMENT SHOULD BE CONSIDERED FULFILLED.

FIGURE 1-21 PUNCH MECHANISM

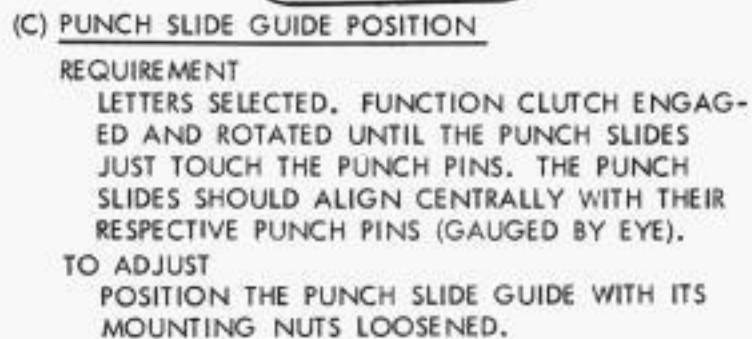
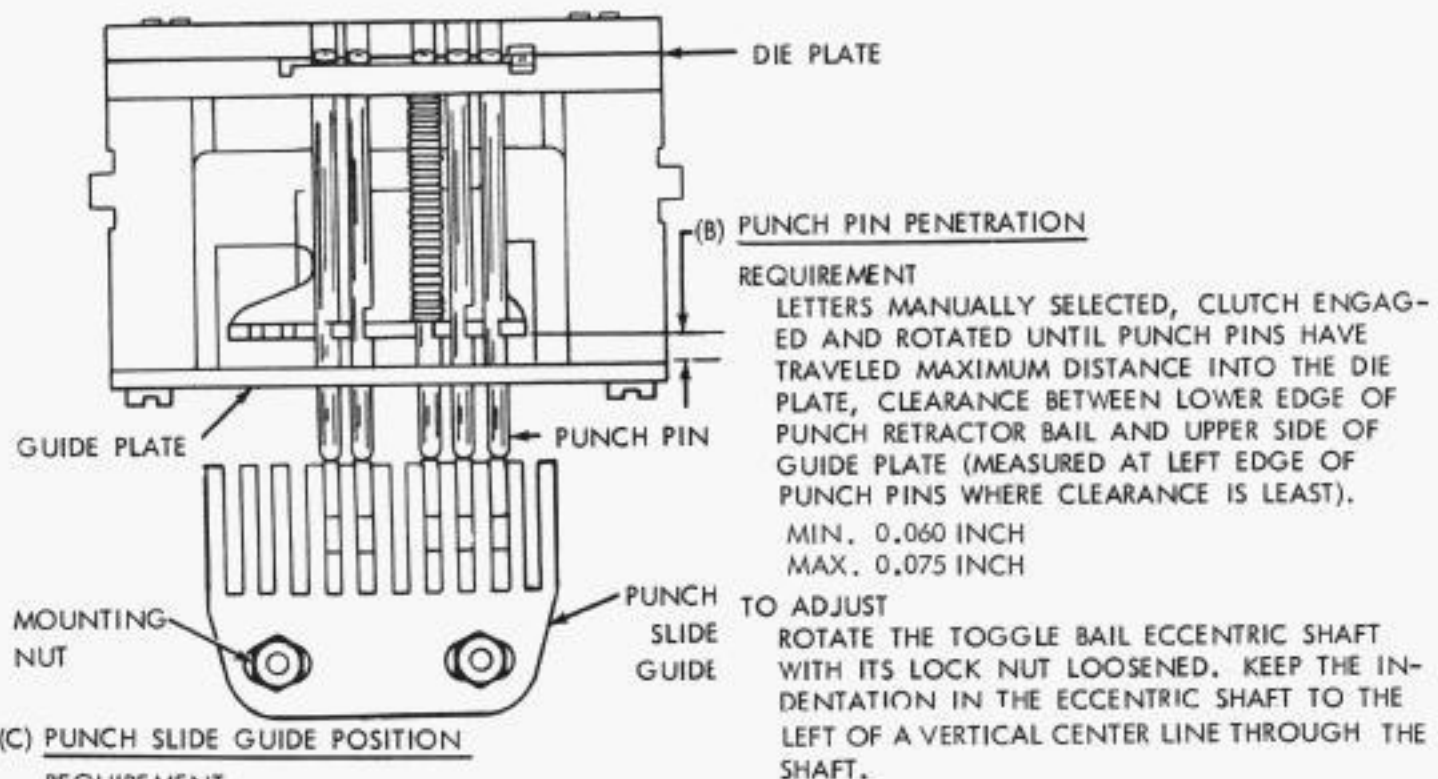
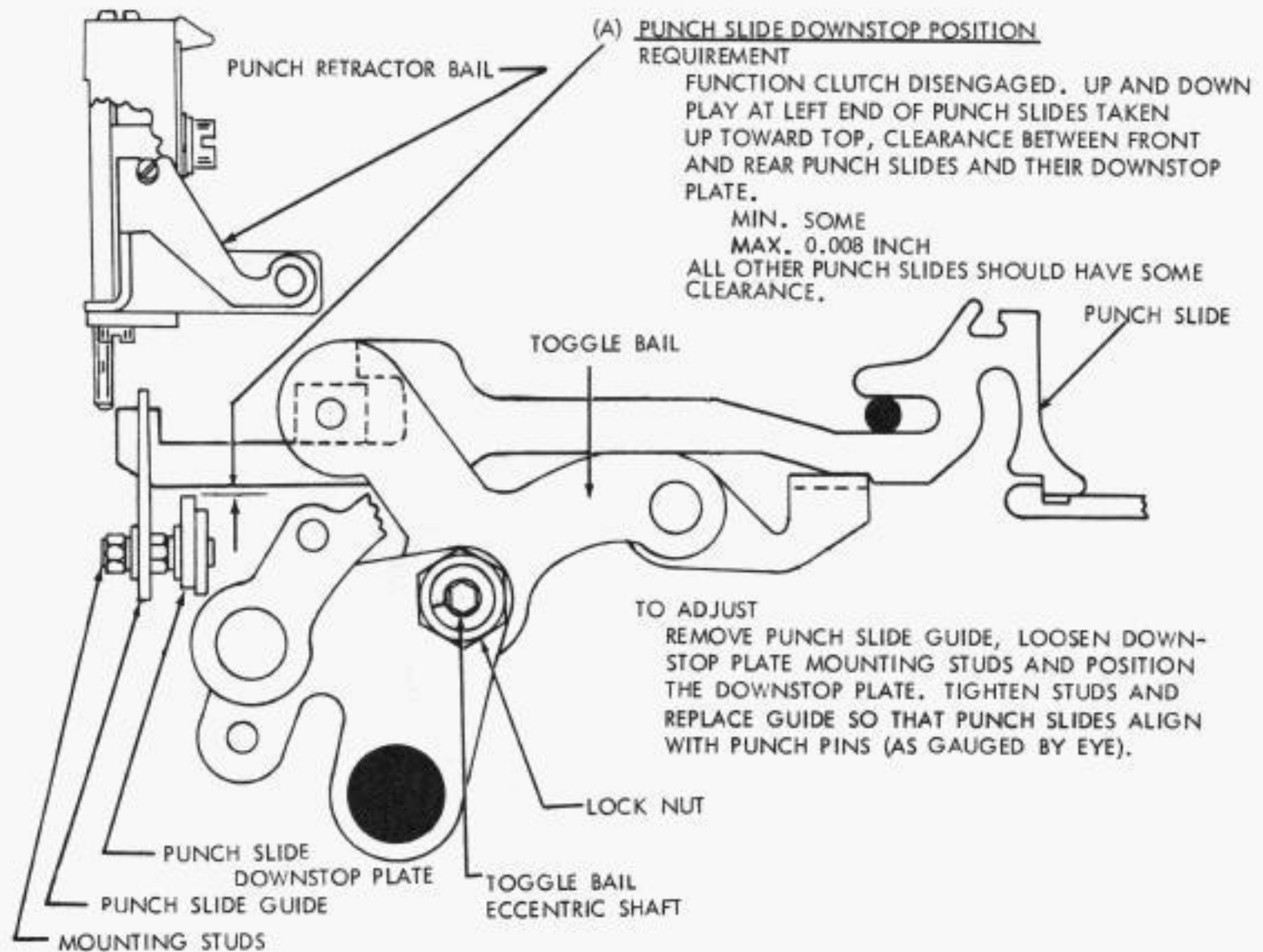


FIGURE 1-22. PERFORATOR MECHANISM FOR CHADLESS TAPE

NOTE: THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM. REFER TO FIGURE 1-22 FOR SIMILAR CHADLESS TAPE MECHANISM ADJUSTMENTS.

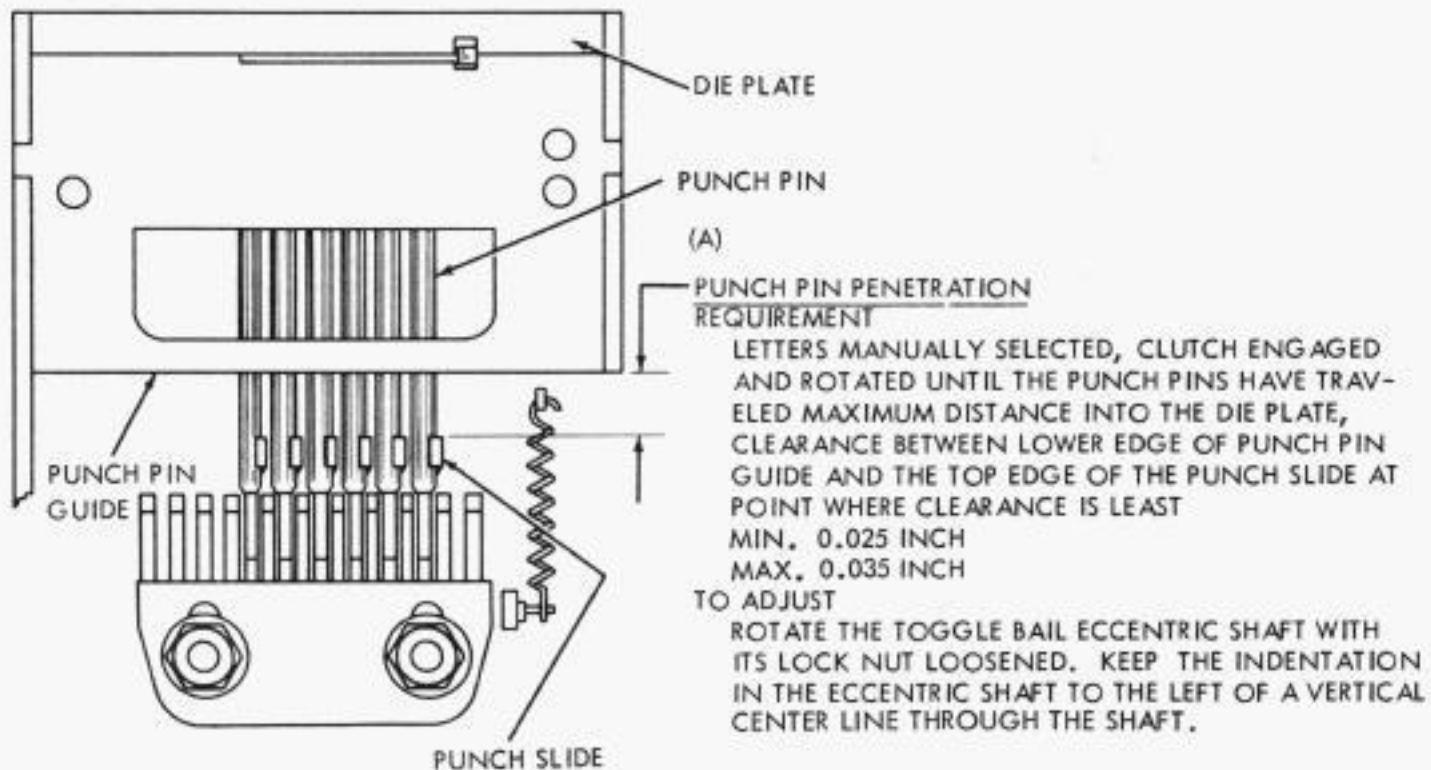
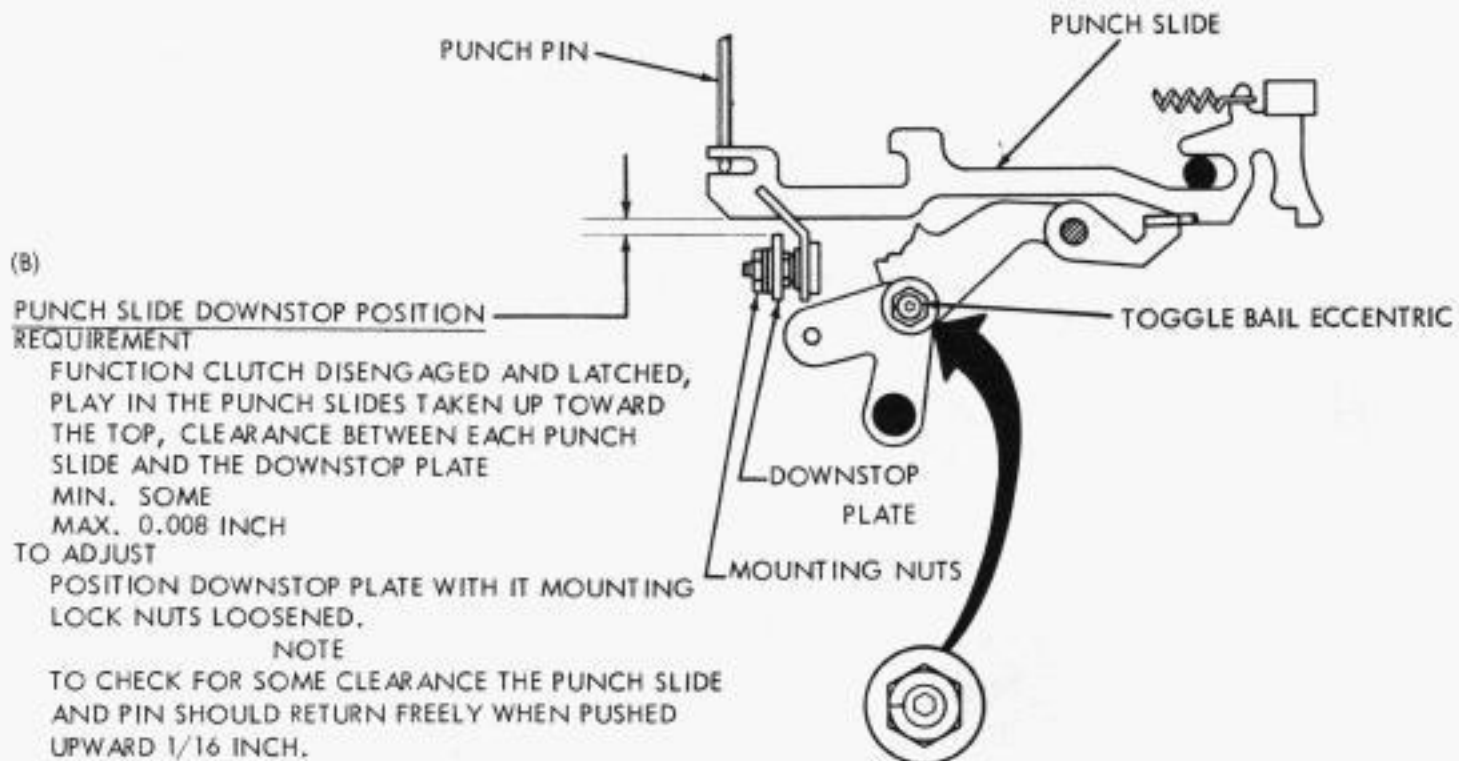
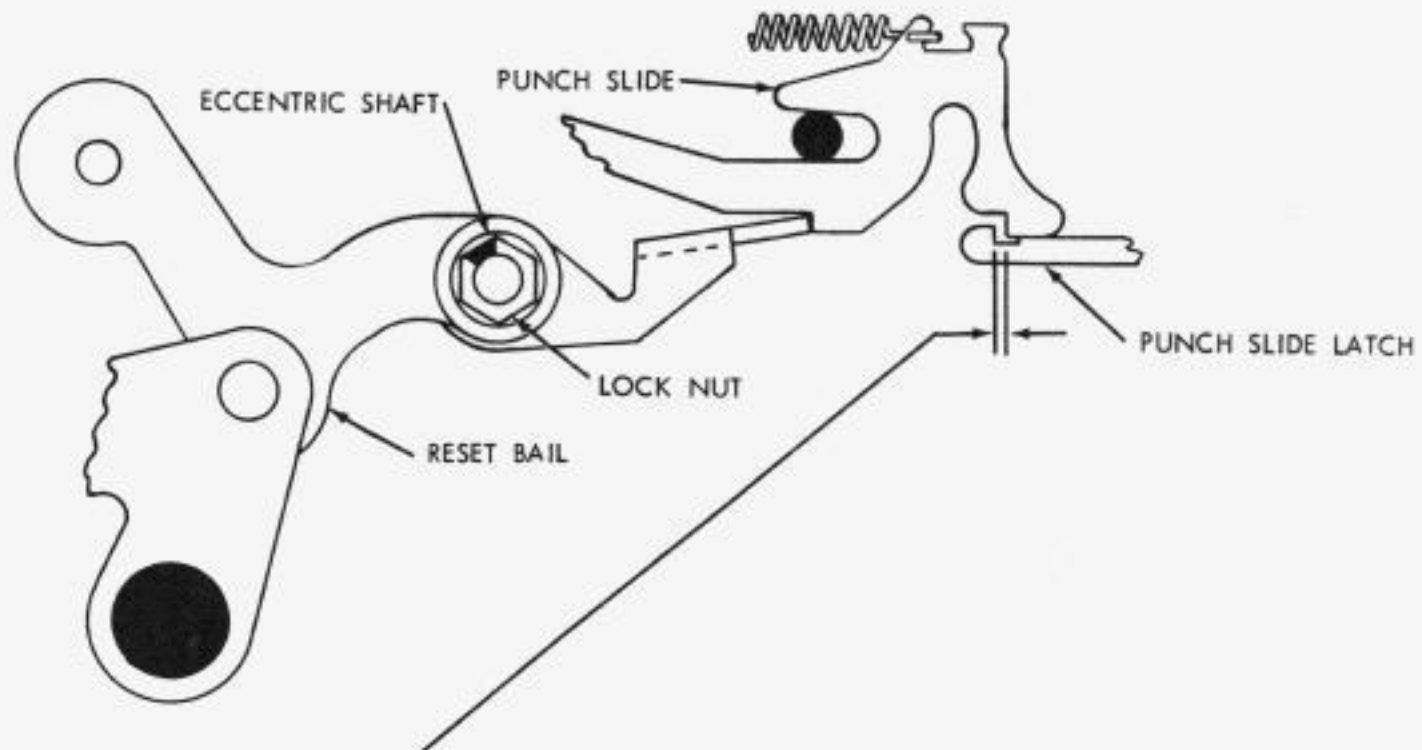


FIGURE 1-23. PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE



PUNCH SLIDE RESET BAIL

(1) REQUIREMENT

FUNCTION CLUTCH DISENGAGED AND LATCHED. CLEARANCE AT PUNCH SLIDE LATCH CLOSEST TO PUNCH SLIDE:

(A) FOR NON-TYPING PERFORATOR ONLY

MIN. 0.015 INCH

MAX. 0.025 INCH

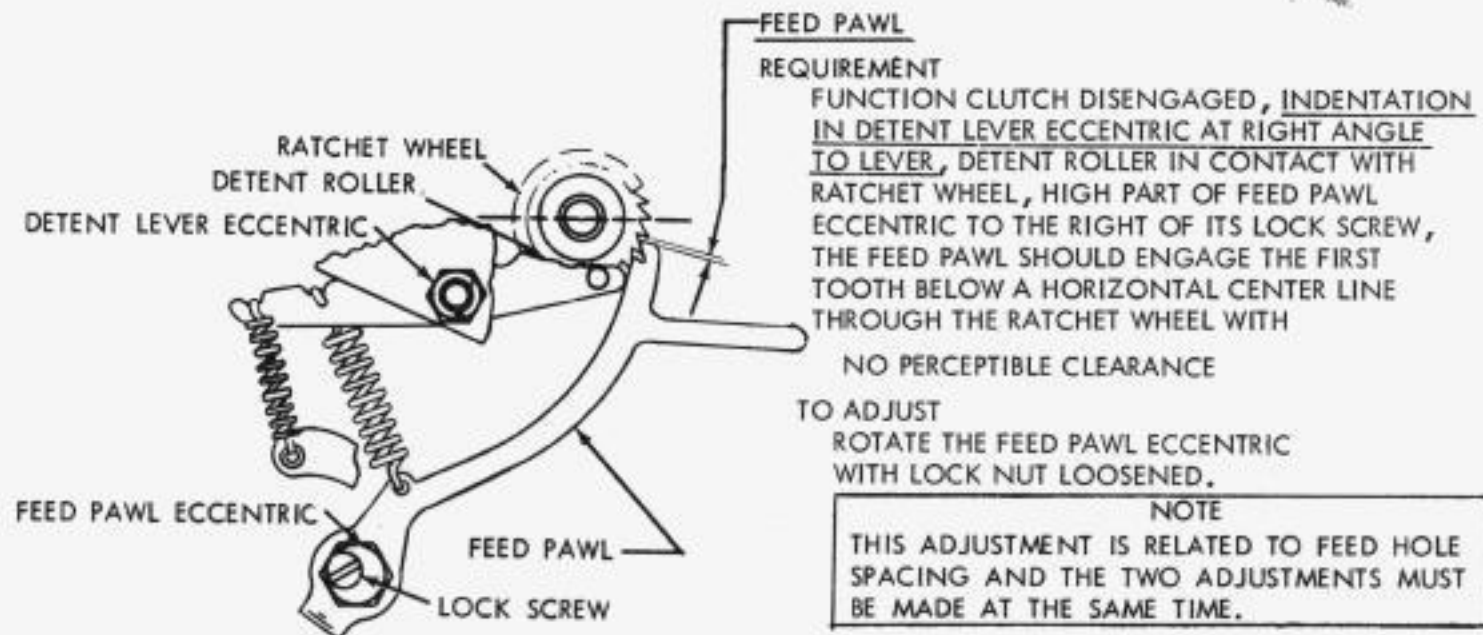
(B) FOR TYPING PERFORATOR ONLY

MIN. 0.005 INCH

MAX. 0.015 INCH

TO ADJUST

ROTATE THE RESET BAIL ECCENTRIC SHAFT WITH ITS LOCK NUT LOOSENED. KEEP THE INDENTATION IN THE ECCENTRIC SHAFT HIGH AND TO THE LEFT OF A VERTICAL CENTERLINE THROUGH THE SHAFT.



FEED PAWL

REQUIREMENT

FUNCTION CLUTCH DISENGAGED, INDENTATION IN DETENT LEVER ECCENTRIC AT RIGHT ANGLE TO LEVER, DETENT ROLLER IN CONTACT WITH RATCHET WHEEL, HIGH PART OF FEED PAWL ECCENTRIC TO THE RIGHT OF ITS LOCK SCREW, THE FEED PAWL SHOULD ENGAGE THE FIRST TOOTH BELOW A HORIZONTAL CENTER LINE THROUGH THE RATCHET WHEEL WITH

NO PERCEPTIBLE CLEARANCE

TO ADJUST

ROTATE THE FEED PAWL ECCENTRIC WITH LOCK NUT LOOSENED.

NOTE

THIS ADJUSTMENT IS RELATED TO FEED HOLE SPACING AND THE TWO ADJUSTMENTS MUST BE MADE AT THE SAME TIME.

FIGURE 1-24 PUNCH UNIT RESET AND FEEDING MECHANISM

FEED HOLE SPACING (PRELIMINARY)

REQUIREMENT

WITH INDENT OF DIE WHEEL ECCENTRIC STUD POINTING DOWNWARD, CLEARANCE BETWEEN DIE WHEEL AND FEED WHEEL:

MIN. 0.002 INCH-----MAX. 0.004 INCH

TO ADJUST

POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED.

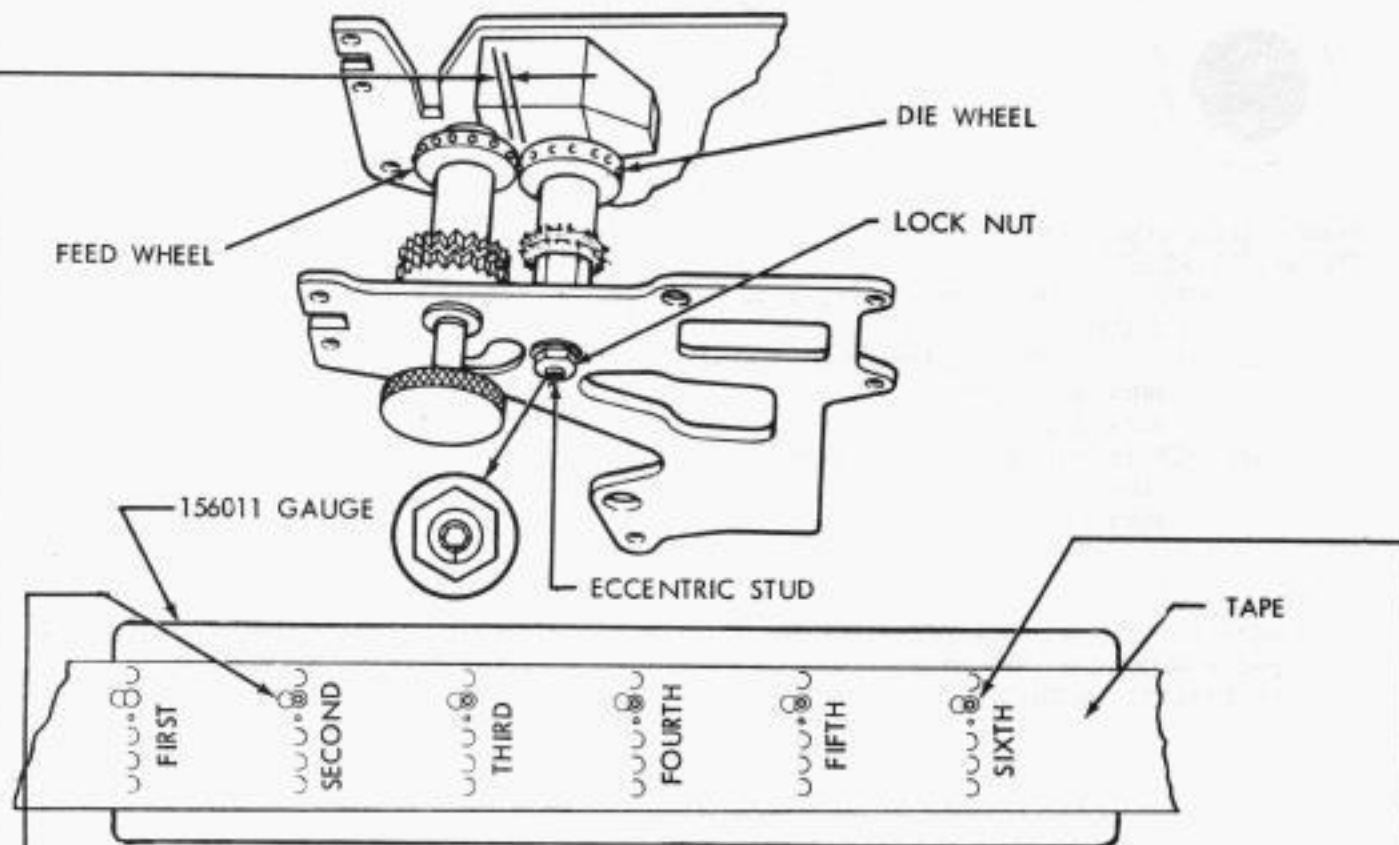
NOTE:

BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS (FIGURE 1-33)

FEED HOLE SPACING (FINAL)

(1) REQUIREMENT

WITH TAPE REMOVED, MIN. OF 0.002 INCH CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL.



TO CHECK

PERFORATE IN ORDER SIX SEQUENCES MADE UP OF NINE BLANK CODE COMBINATIONS FOLLOWED BY A LETTERS COMBINATION. OPEN CHADS SO THAT CODE HOLES ARE VISIBLE. PLACE TAPE OVER SMOOTH SIDE OF 156011 TAPE GAUGE SO THAT FIRST NO. 2 CODE HOLE IS CONCENTRIC WITH FIRST (0.072 INCH) HOLE IN GAUGE (SEE NOTE BELOW).

(2) REQUIREMENT

SECOND THROUGH FIFTH HOLE IN GAUGE VISIBLE THROUGH NO. 2 CODE HOLES IN TAPE. CIRCULAR PORTION OF SIXTH NO. 2 CODE HOLE ENTIRELY WITHIN CORRESPONDING (0.086 INCH) HOLE IN GAUGE.

(3) REQUIREMENT

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

TO ADJUST

(1) WITH TAPE REMOVED, KEEPING INDENT BELOW CENTER OF STUD, POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED SO THAT CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL IS

MIN. 0.002 INCH-----MAX. 0.004 INCH.

(2) REFINE THE ABOVE ADJUSTMENT TO MEET REQUIREMENT (2). MOVE INDENT IN ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE AND AWAY FROM FEED WHEEL TO INCREASE FEED HOLE SPACING. CAUTION: WITH TAPE REMOVED, MAKE SURE FEED WHEEL-DIE WHEEL CLEARANCE IS A MIN. OF 0.002 INCH.

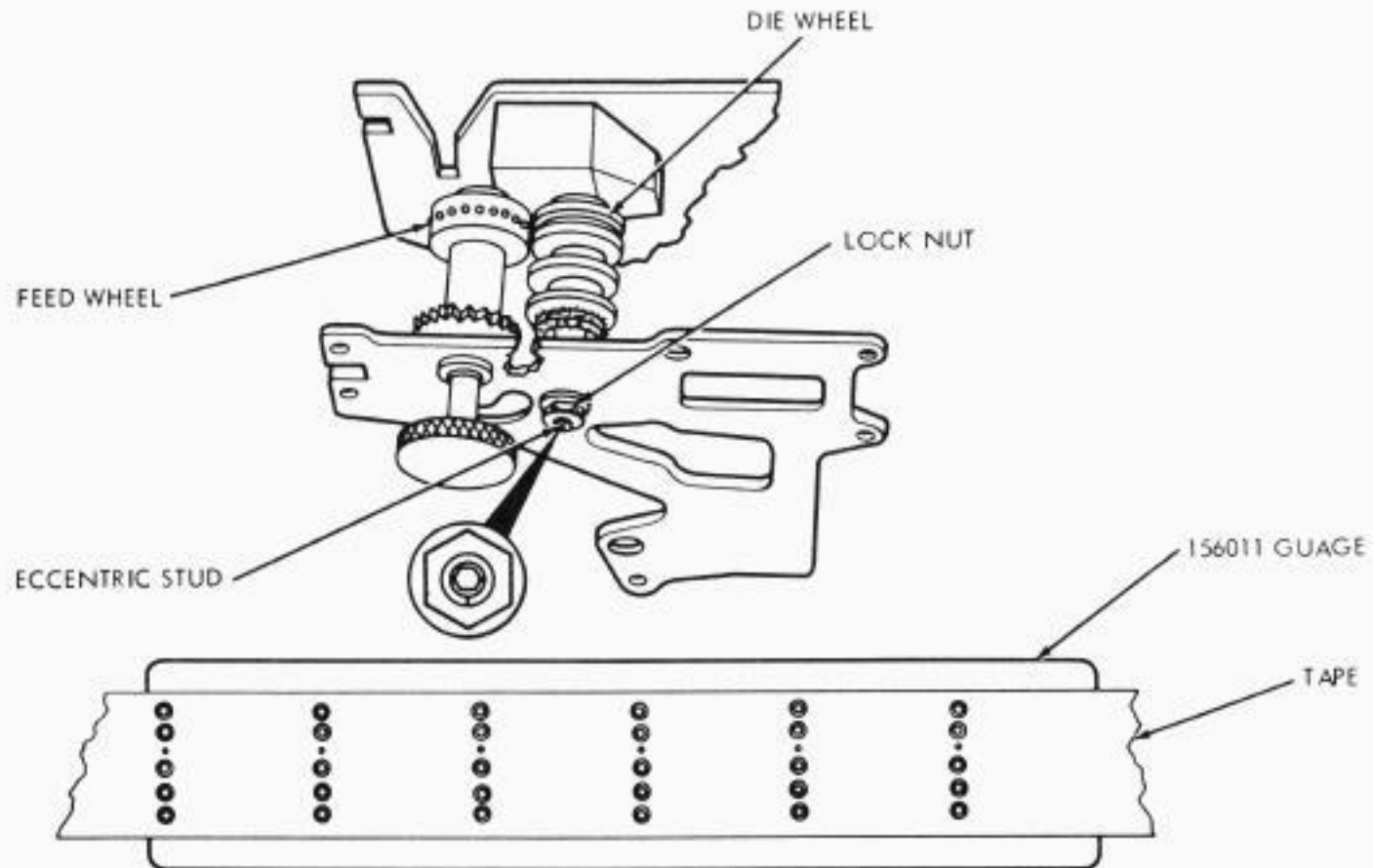
(3) FAILURE TO MEET REQUIREMENT (3) INDICATES DIE WHEEL ECCENTRIC STUD HAS BEEN OVER ADJUSTED. REFINE.

NOTE:

FIRST THROUGH FIFTH HOLES IN GAUGE ARE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER). BUT SIXTH HOLE IN GAUGE IS LARGER (0.086 INCH). THIS ARRANGEMENT ALLOWS 0.007 INCH VARIATION IN 5 INCHES.

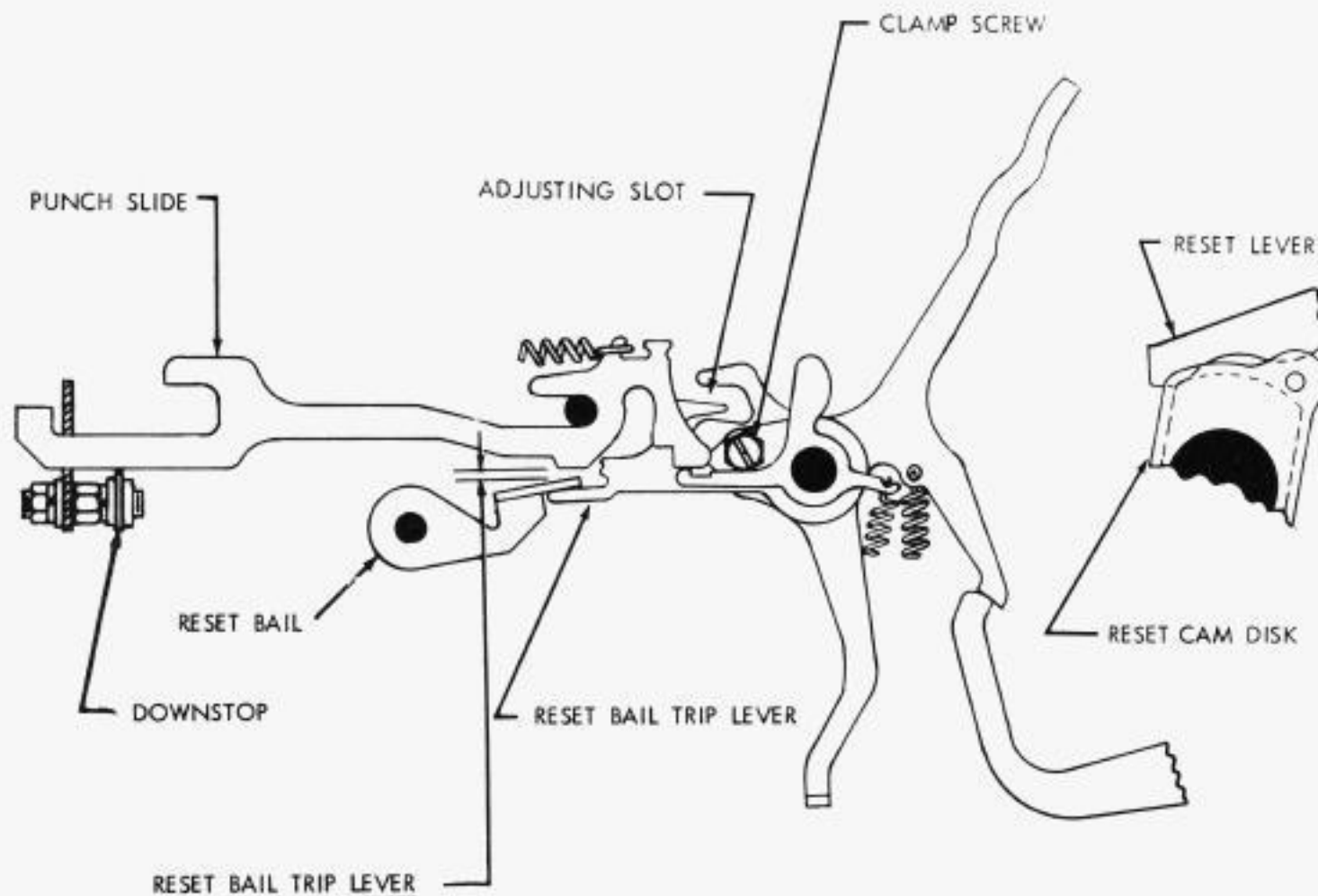
FIGURE 1-25. PERFORATOR MECHANISM FOR CHADLESS TAPE

NOTE
THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM. REFER TO FIGURE 1-25 FOR SIMILAR CHADLESS TAPE MECHANISM ADJUSTMENTS.



- NOTE
BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENT CHECK BOTH TAPE GUIDE SPRING TENSIONS (FIGURE 5-21).
- 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.

FIGURE 1-26. PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE



- (1) REQUIREMENT
LETTERS COMBINATION SELECTED, FUNCTION CLUTCH TRIPPED, PUNCH SLIDES AGAINST THEIR DOWNSTOP. RESET LEVER AT HIGHEST POINT OF ITS TRAVEL. CLEARANCE BETWEEN LOWER EDGE OF SLIDE AND UPPER EDGE OF RESET BAIL MIN. SOME MAX. 0.007 INCH WHEN PLAY IS TAKEN UP FOR MINIMUM

- (2) REQUIREMENT
CLUTCH DISENGAGED AND LATCHED, PUNCH SLIDE RESET BAIL SHOULD FULLY ENGAGE THE NOTCHES IN THE PUNCH SLIDES.

TO ADJUST
POSITION RESET BAIL TRIP LEVER BY MEANS OF ITS ADJUSTING SLOT, WITH ITS CLAMP SCREW LOOSENED.

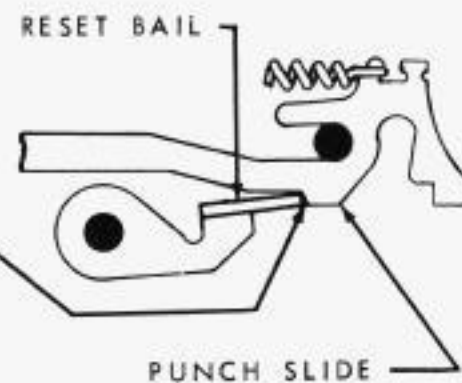
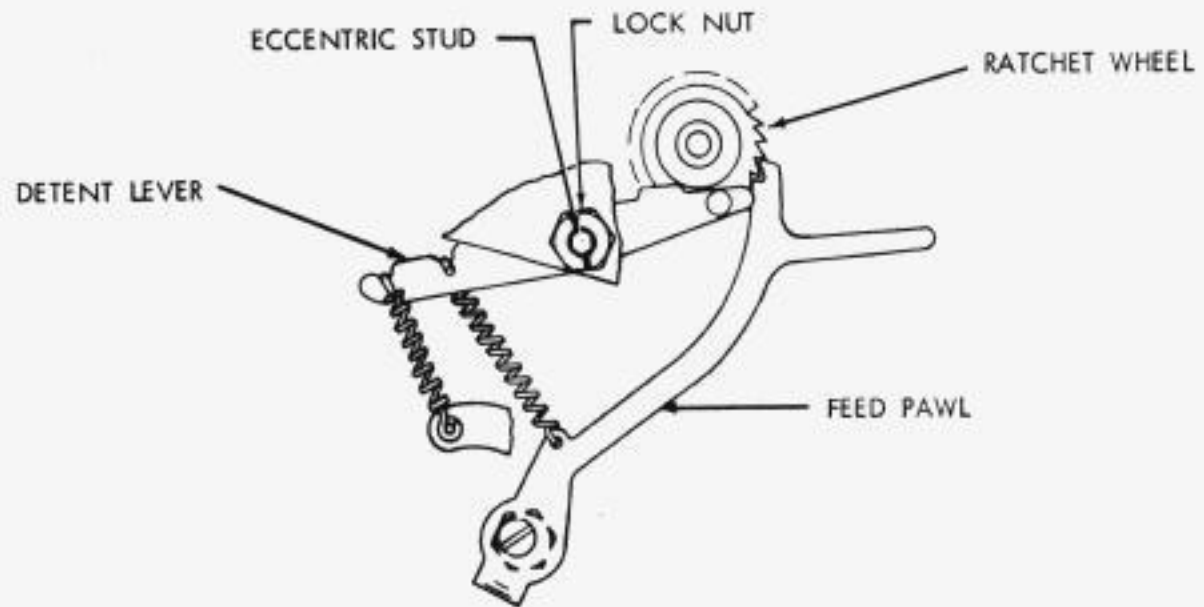


FIGURE 1-27. PUNCH SLIDE TRIP MECHANISM

DETENTREQUIREMENT

A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION PERFORATED ON THE PERFORATOR MUST CONFORM TO THE 156011 TAPE GAUGE.

THE LATERAL CENTER LINE THROUGH THE CODE HOLES IN THE TAPE SHOULD COINCIDE WITH A LATERAL CENTER LINE 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.

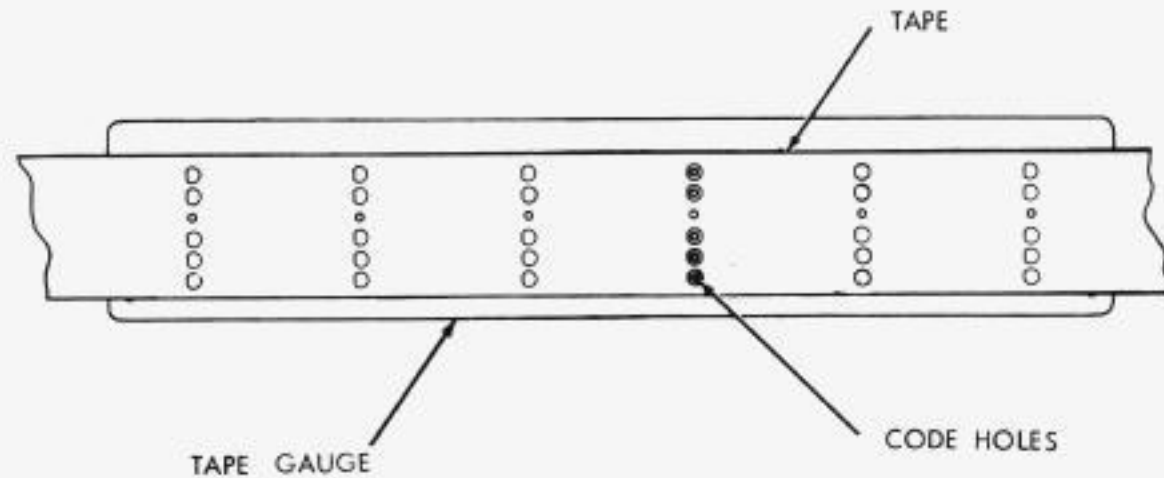
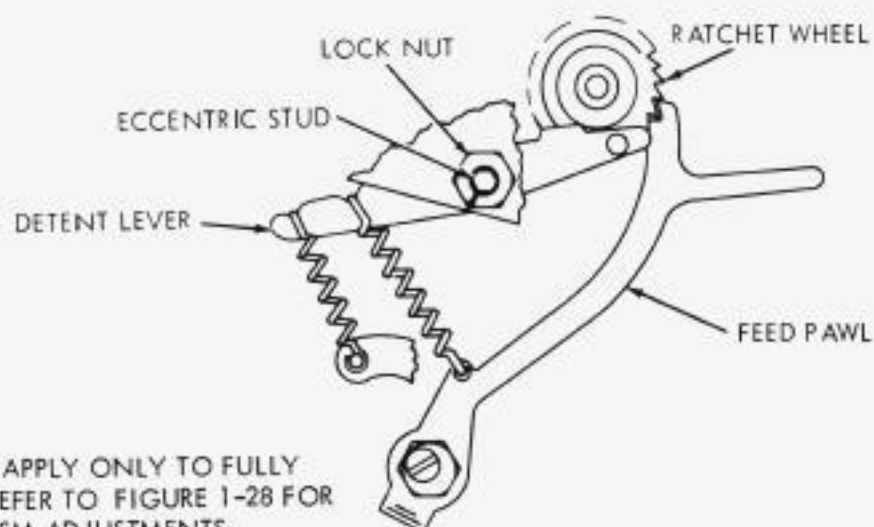
RECHECK FEED PAWL ADJUSTMENT

FIGURE 1-28. PERFORATOR MECHANISM FOR CHADLESS TAPE



NOTE
THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY PERFORATED TAPE MECHANISM. REFER TO FIGURE 1-28 FOR SIMILAR CHADLESS TAPE MECHANISM ADJUSTMENTS.

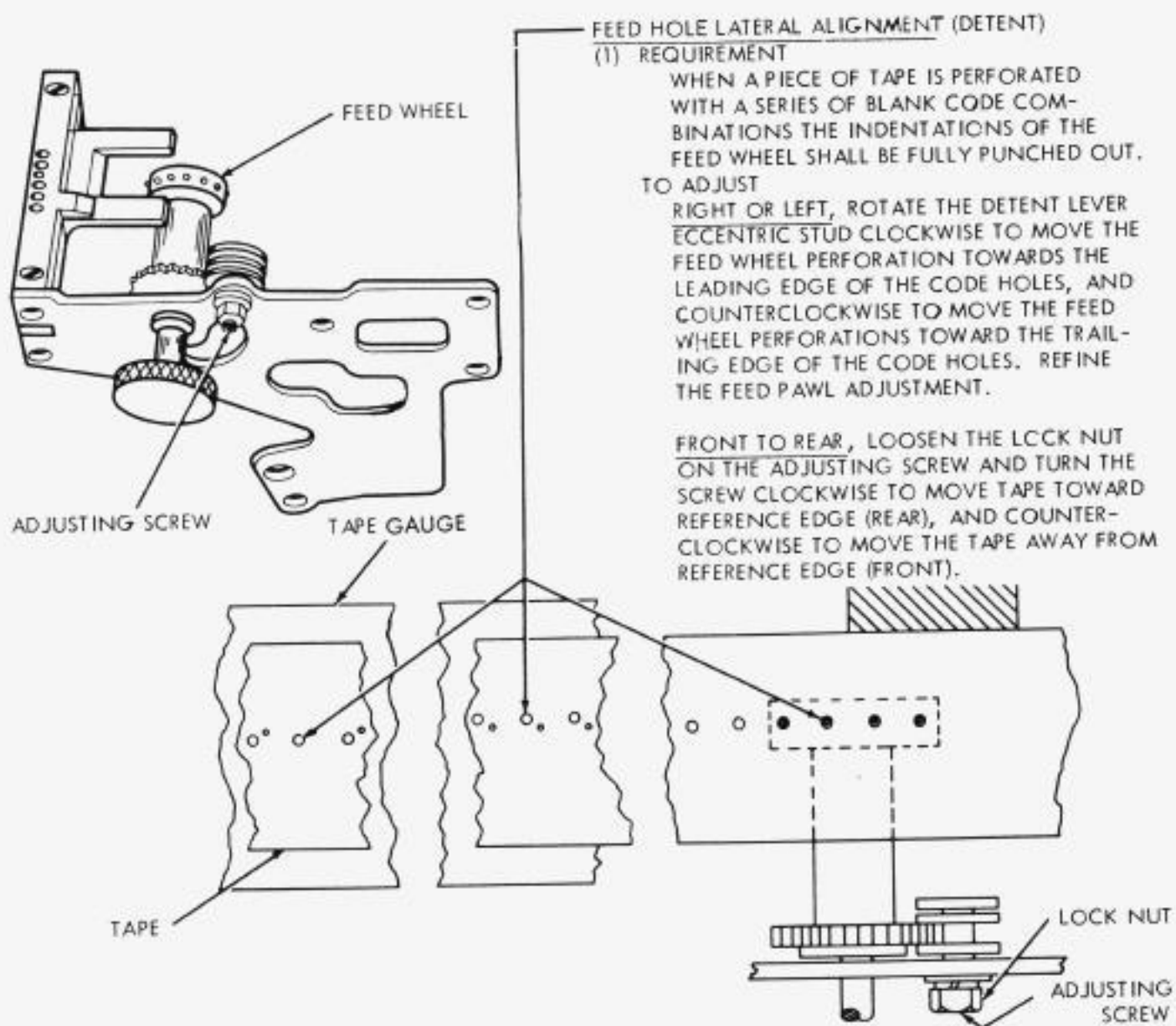
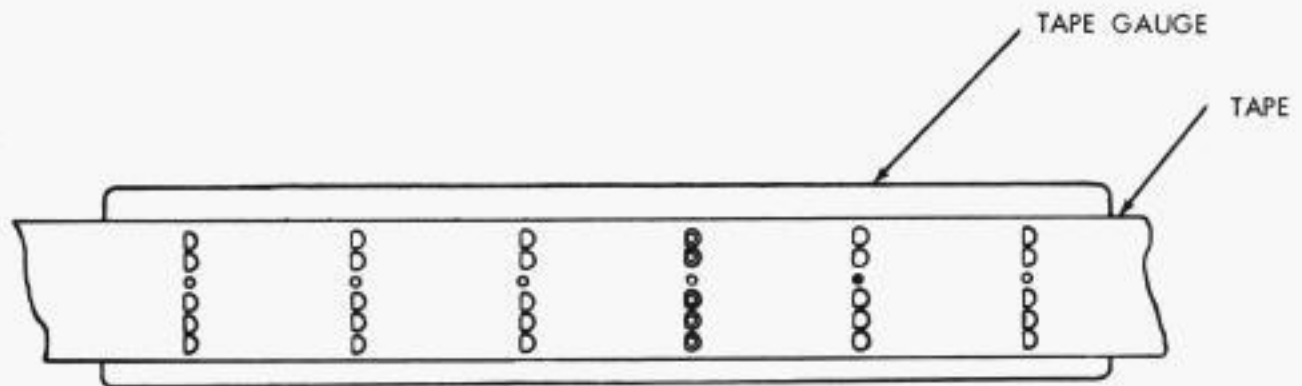
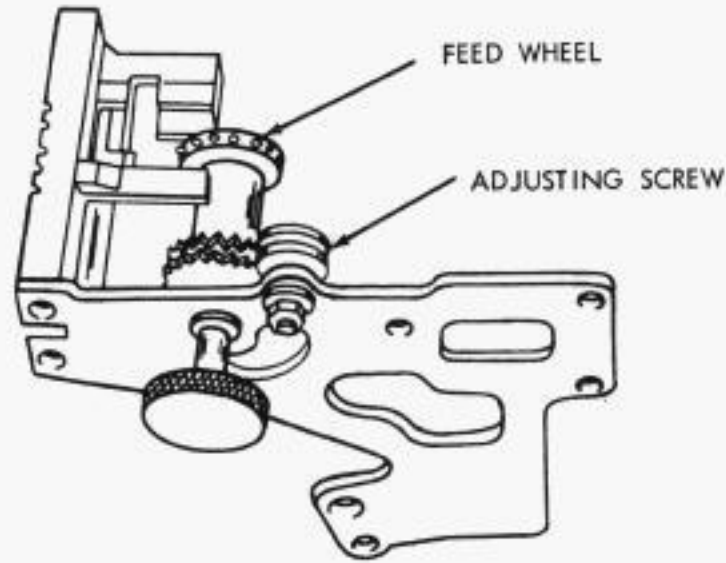


FIGURE 1-29. PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE



FEED HOLE LATERAL ALIGNMENT

REQUIREMENT

WHEN A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION IS PERFORATED BY THE PERFORATOR AND CHECKED BY THE TAPE GAUGE, THE CODE HOLES IN THE TAPE SHOULD BE

CONCENTRIC WITH THE HOLES IN THE GAUGE

TO ADJUST

TURN THE FEED WHEEL ADJUSTING SCREW IN OR OUT WITH ITS LOCK NUT LOOSENED.

REFINE DETENT ADJUSTMENT IF NECESSARY. SEE FIGURE 1-28

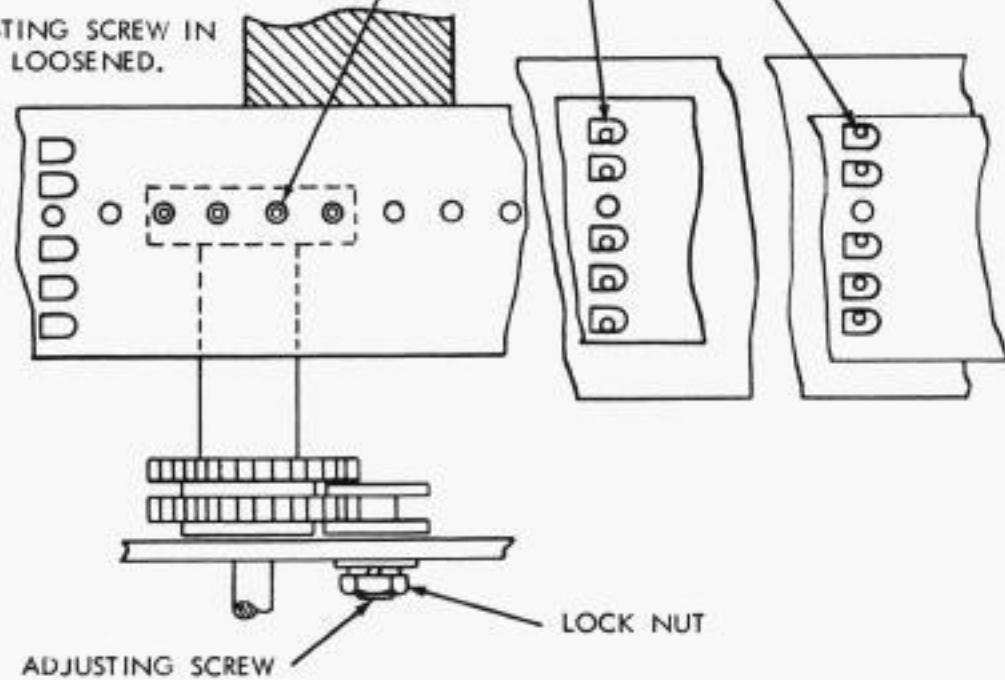
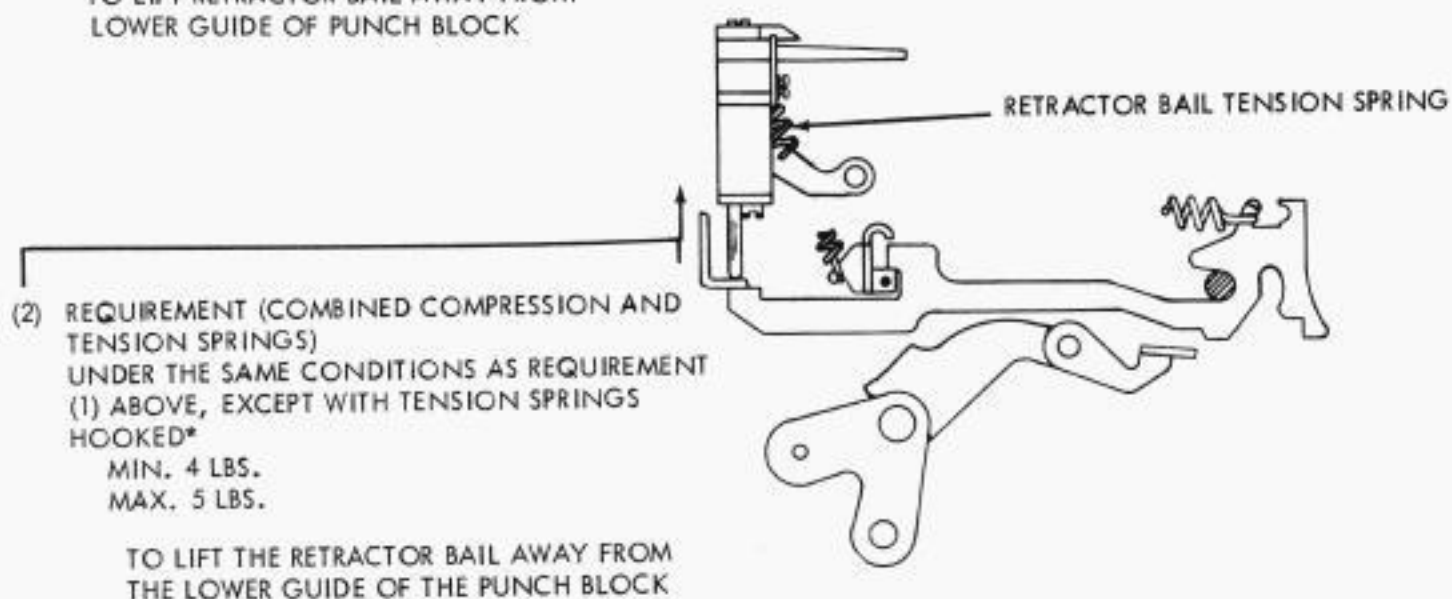
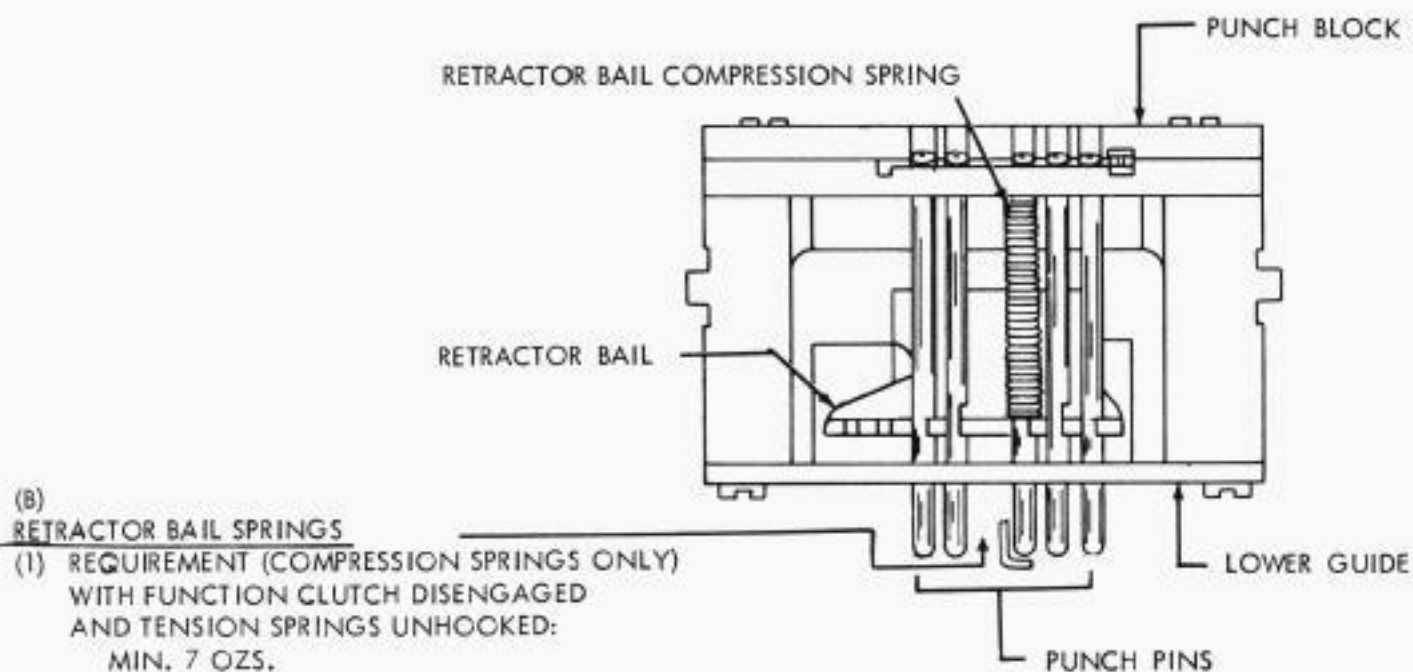
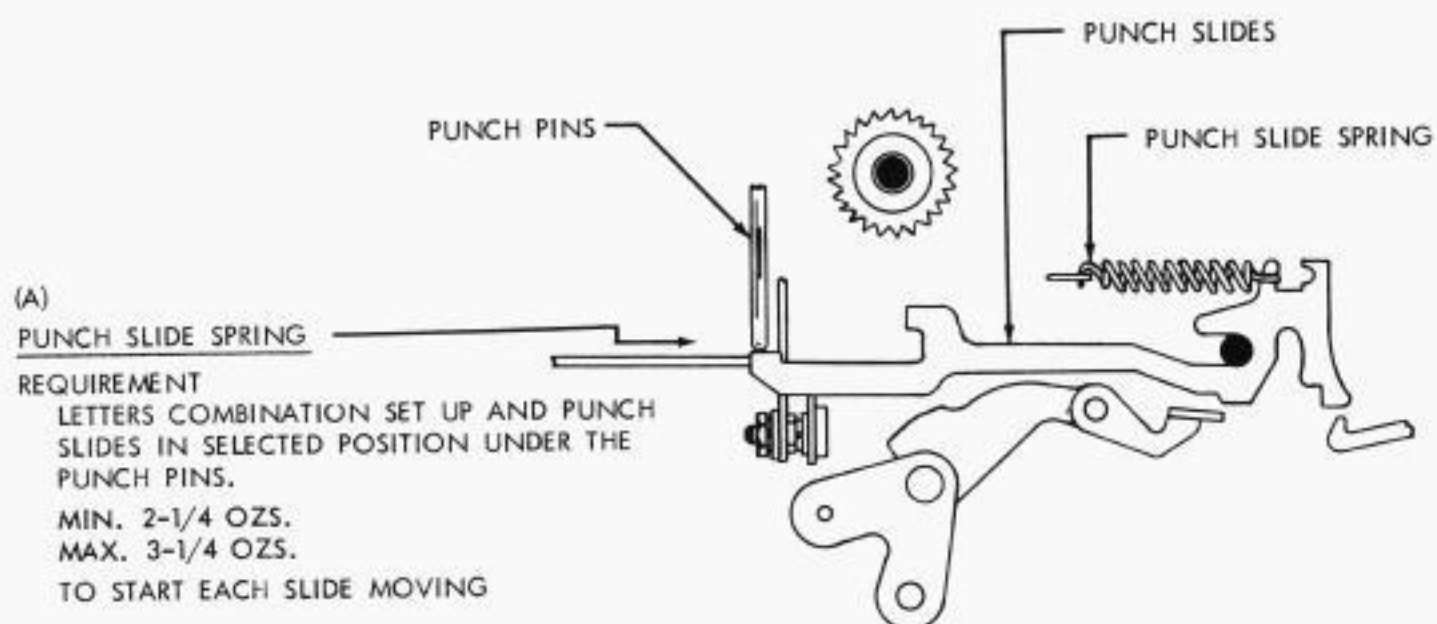


FIGURE 1-30. TAPE FEED MECHANISM



*TO FACILITATE REHOOKING TENSION SPRINGS, PLACE PUNCH PINS IN UPPERMOST POSITION.

FIGURE 1-31. PERFORATOR MECHANISM FOR CHADLESS TAPE

NOTE
THE ADJUSTMENTS ON THIS PAGE APPLY ONLY TO FULLY
PERFORATED TAPE MECHANISM, FIGURE 1-31 AND 1-33.
SIMILAR CHADLESS TAPE MECHANISM ADJUSTMENTS.

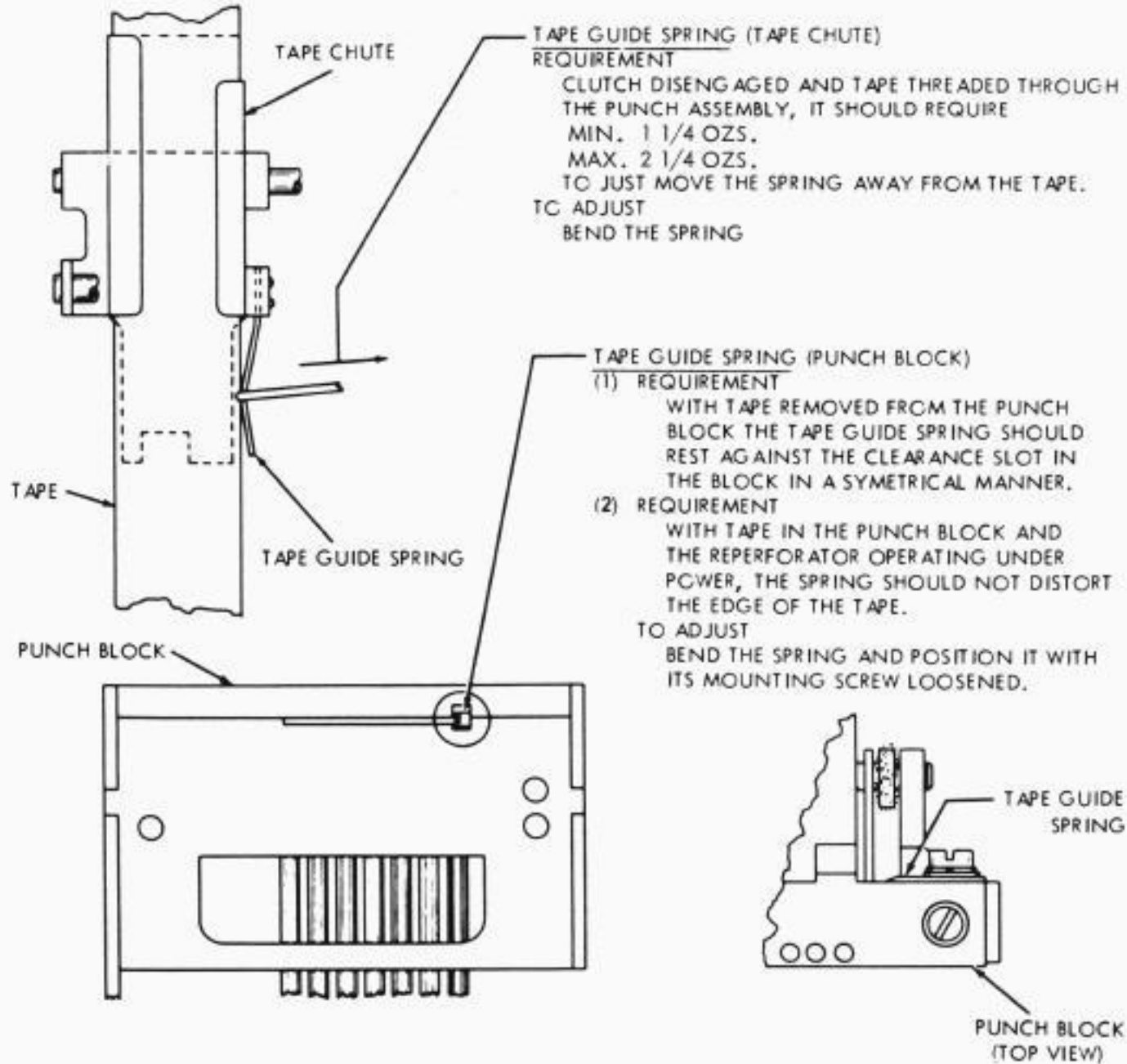
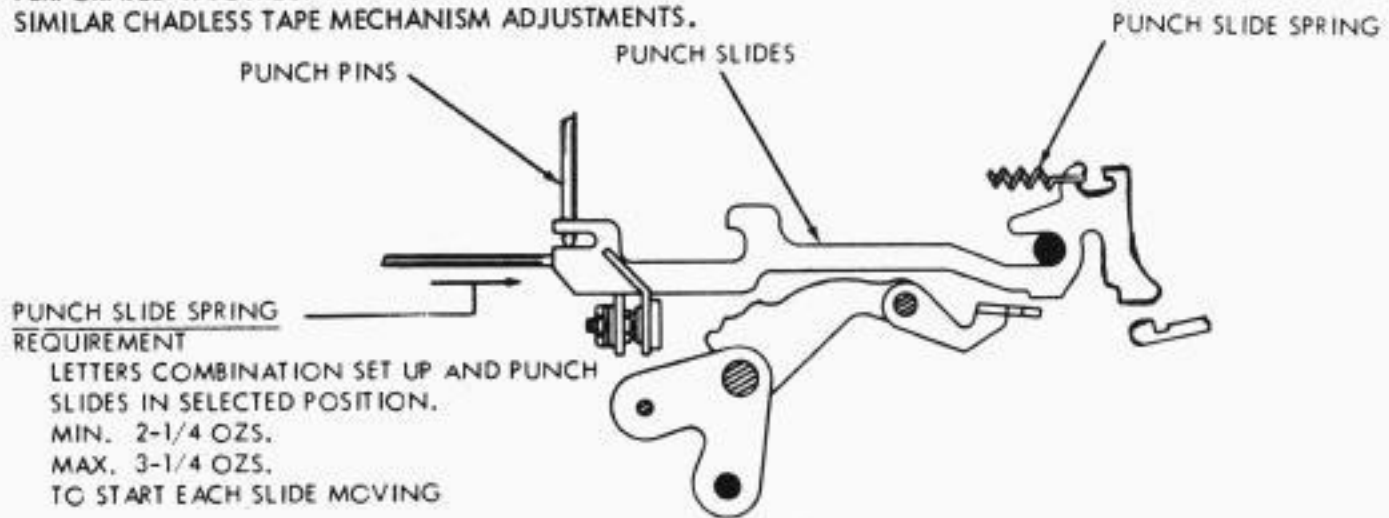


FIGURE 1-32. PERFORATOR MECHANISM FOR FULLY PERFORATED TAPE

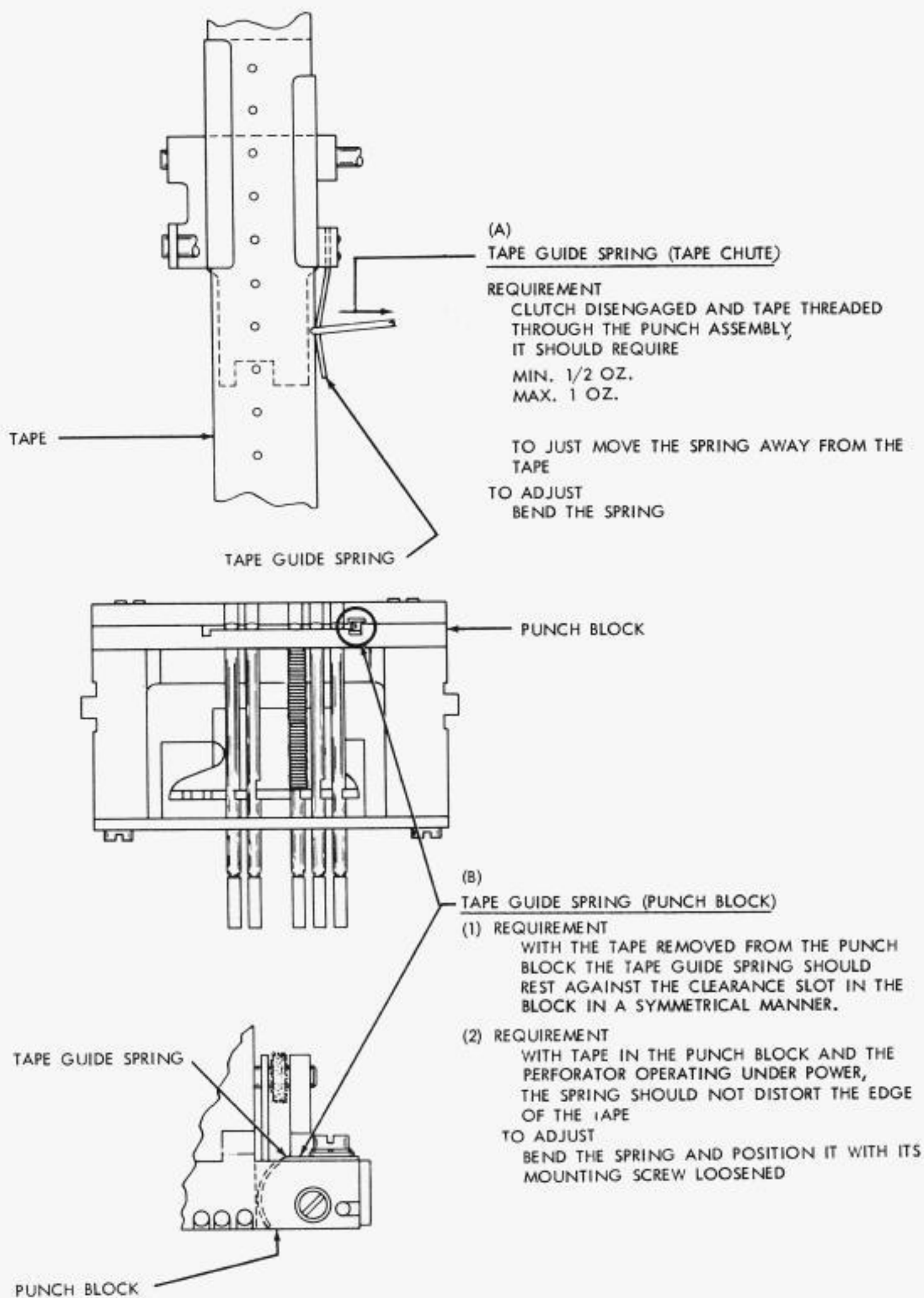


FIGURE 1-33. TAPE FEED MECHANISM FOR CHADLESS TAPE.

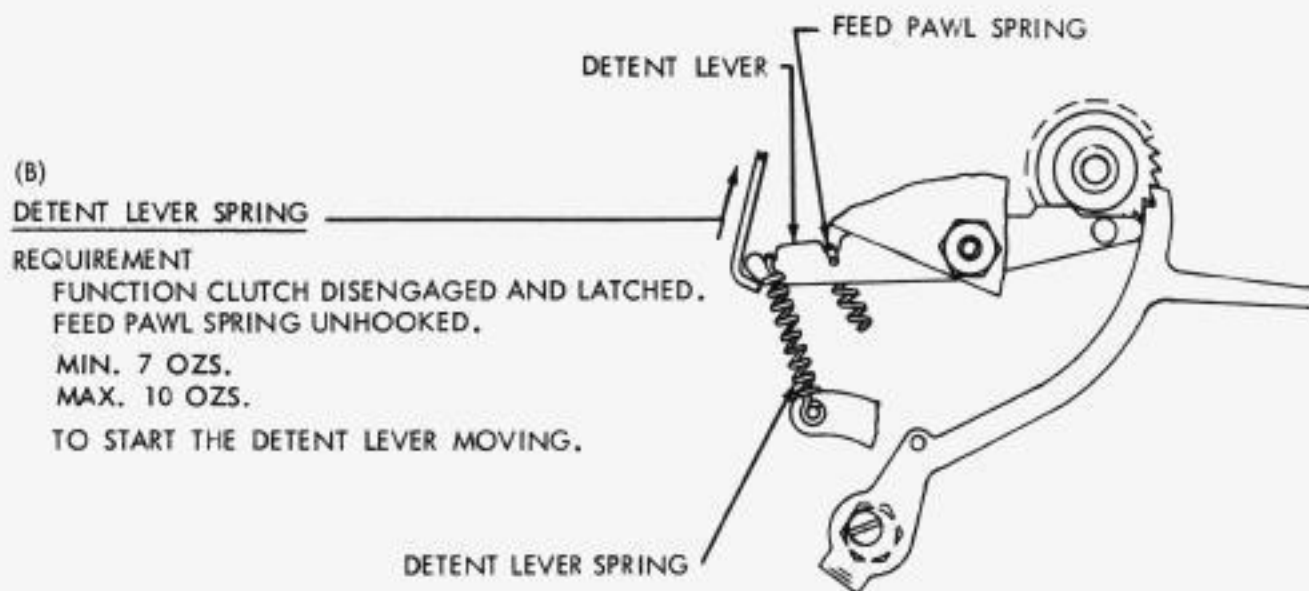
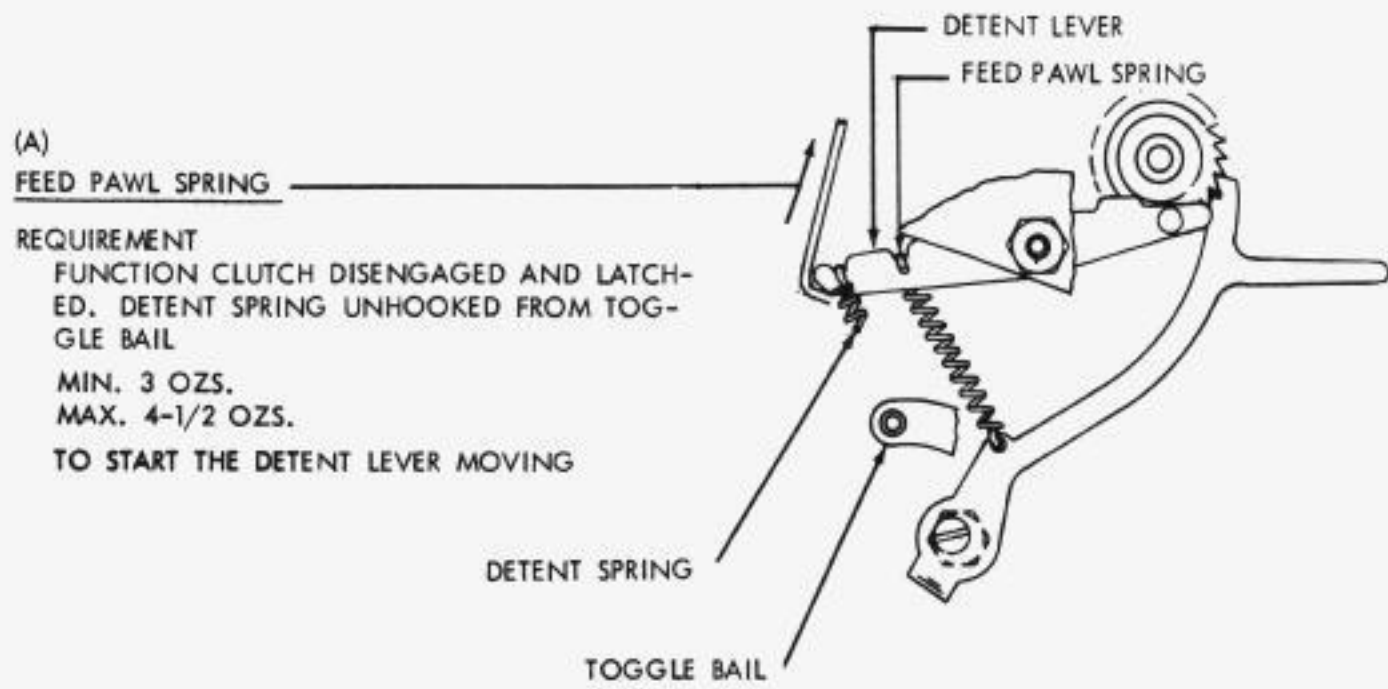


FIGURE 1-34. TAPE FEED MECHANISM

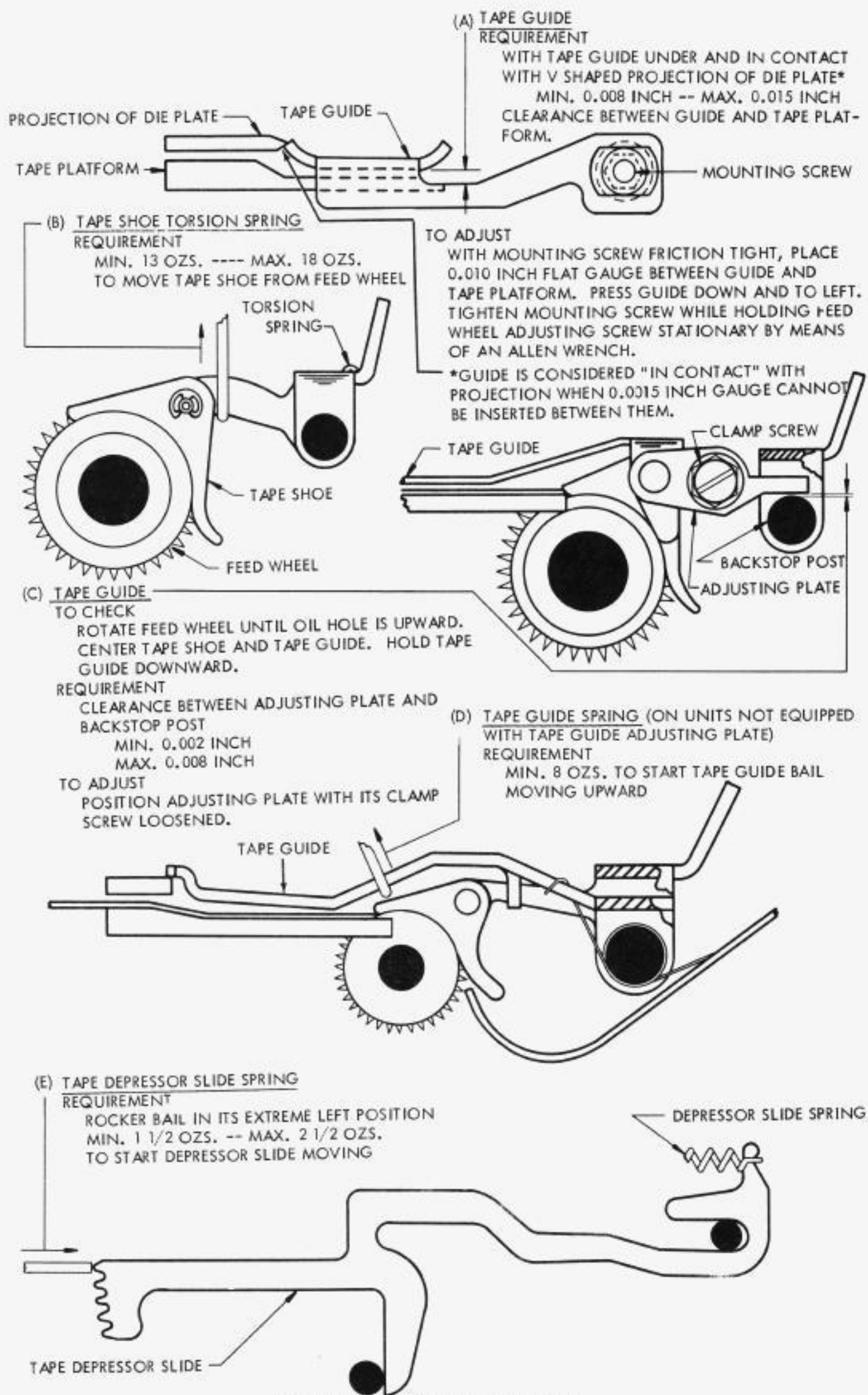
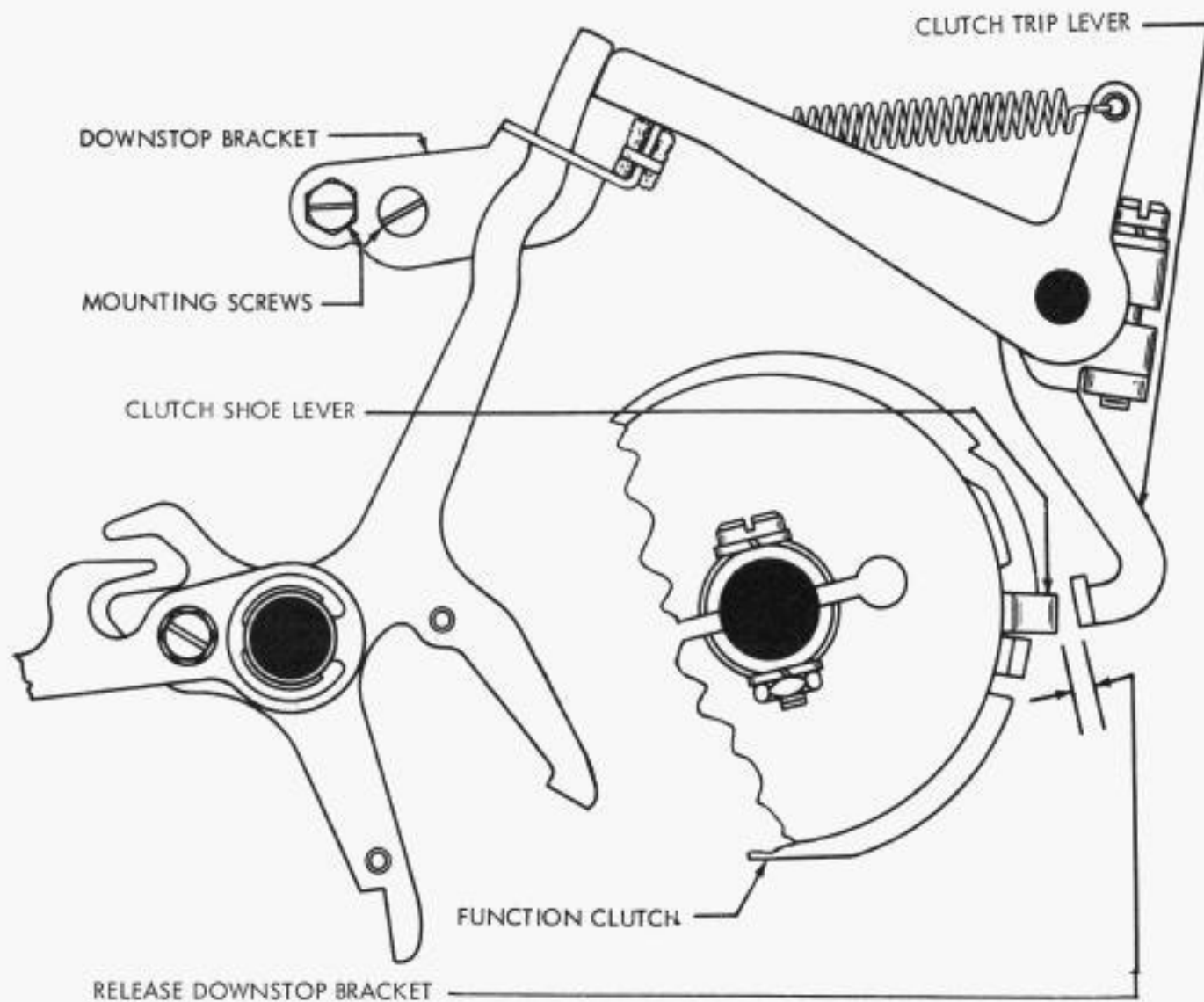


FIGURE 1-35. TAPE FEED MECHANISM



RELEASE DOWNSTOP BRACKET
REQUIREMENT

FUNCTION CLUTCH TRIPPED AND SHAFT ROTATED UNTIL CLEARANCE BETWEEN FUNCTION CLUTCH DISK STOP LUG AND CLUTCH TRIP LEVER IS AT MINIMUM. RELEASE LEVER RESTING AGAINST DOWNSTOP BRACKET.

MIN. 0.002 INCH---MAX. 0.045 INCH

BETWEEN FUNCTION CLUTCH DISK STOP LUG AND CLUTCH TRIP LEVER.

NOTE

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

NOTE: FIGURES 1-37 THROUGH 1-60 APPLY TO TYPING PERFORATORS ONLY

FIGURE 1-36. FUNCTION MECHANISM

PERFORATOR POSITION(1) TO CHECK

SELECT "V" CODE COMBINATION (-2345). TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT.

REQUIREMENT

CLEARANCE BETWEEN STRIPPER PLATE AND TYPEWHEEL CHARACTER "M":

MIN. 0.075 INCH----MAX. 0.095 INCH

TO ADJUST

REMOVE RIBBON FROM CARRIER (FIGURE 1-54), POSITION PUNCH WITH TWO MOUNTING SCREWS, ADJUSTING CLAMP PIVOT SCREW AND ANCHOR BRACKET SCREW LOOSENED. CHECK RESET BAIL TRIP LEVER REQUIREMENT (FIGURE 1-27) FOR SOME CLEARANCE AND ADJUST IF NECESSARY.

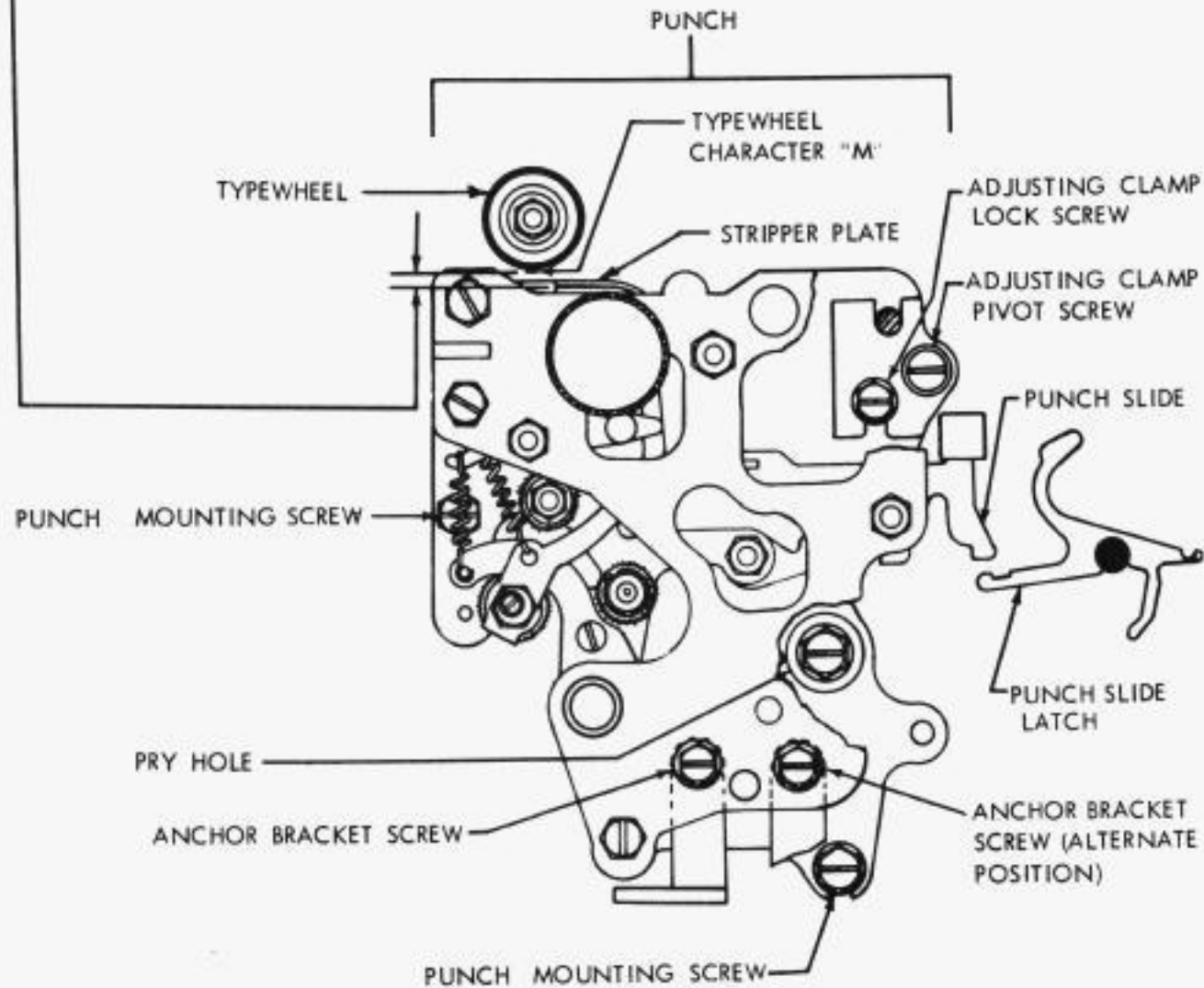


FIGURE 1-37. PUNCH MECHANISM

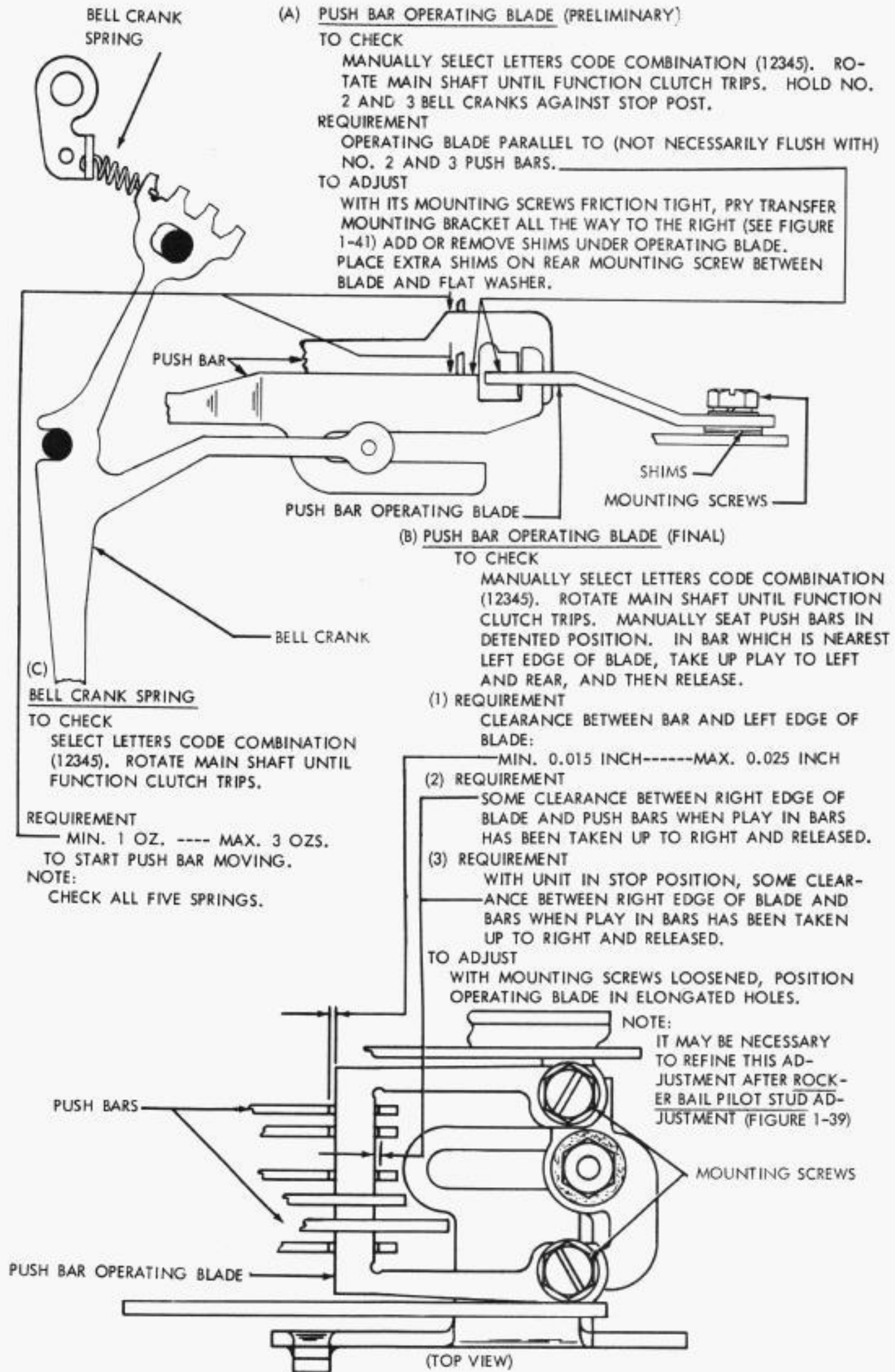
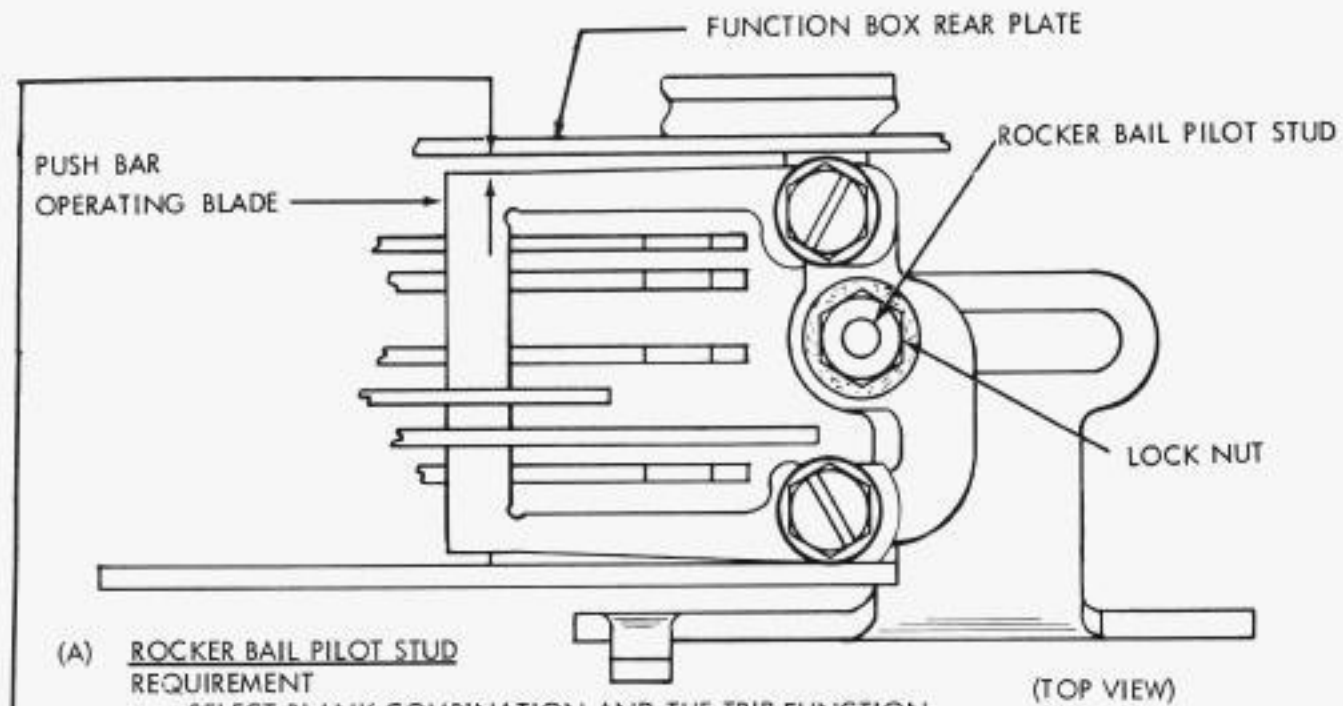


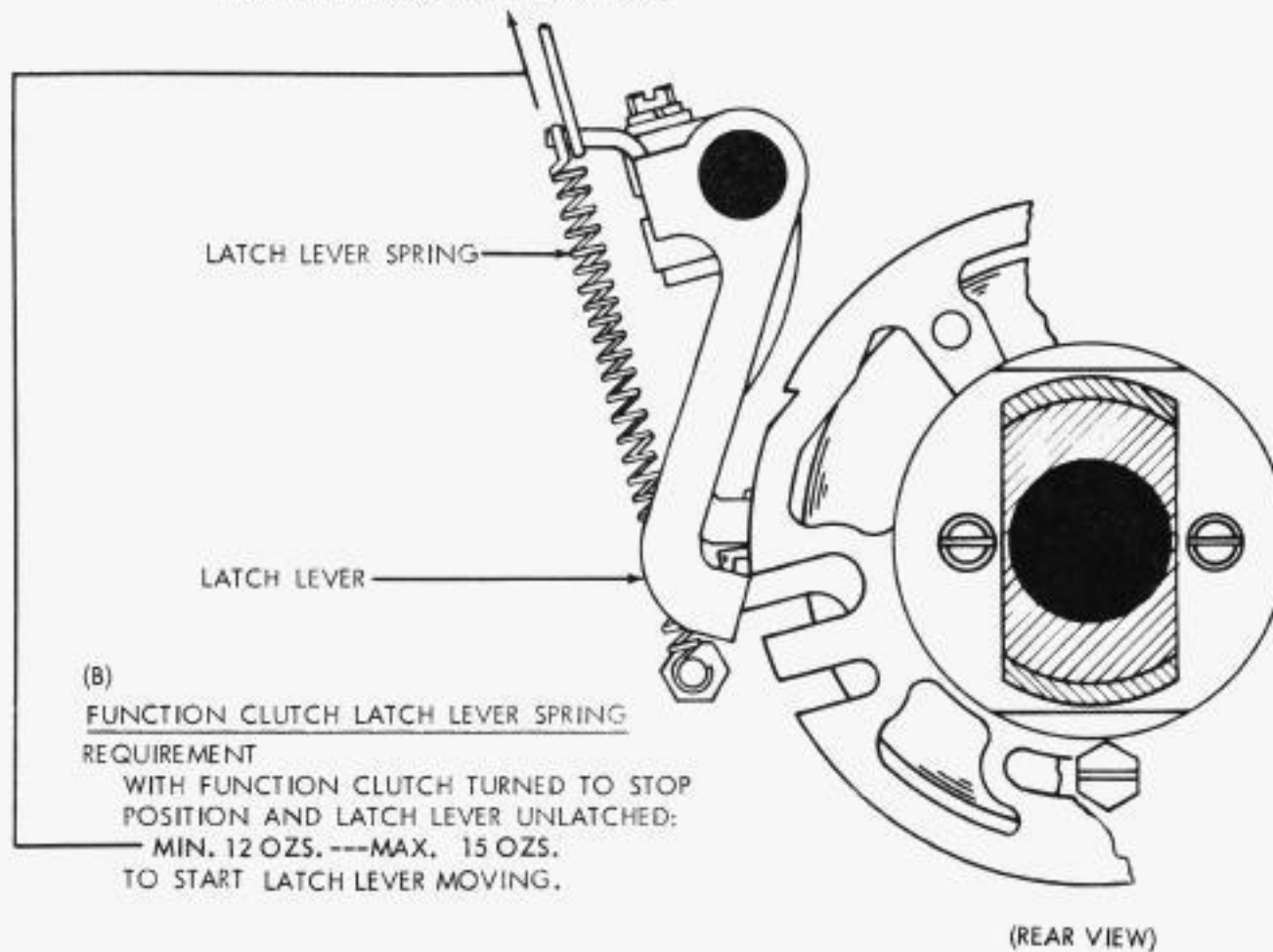
FIGURE 1-38. FUNCTION MECHANISM



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.

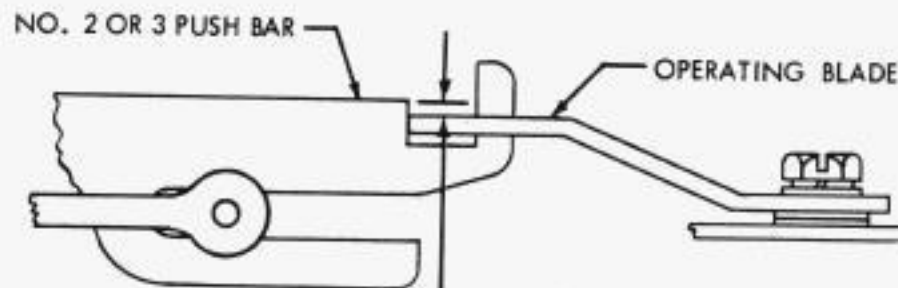
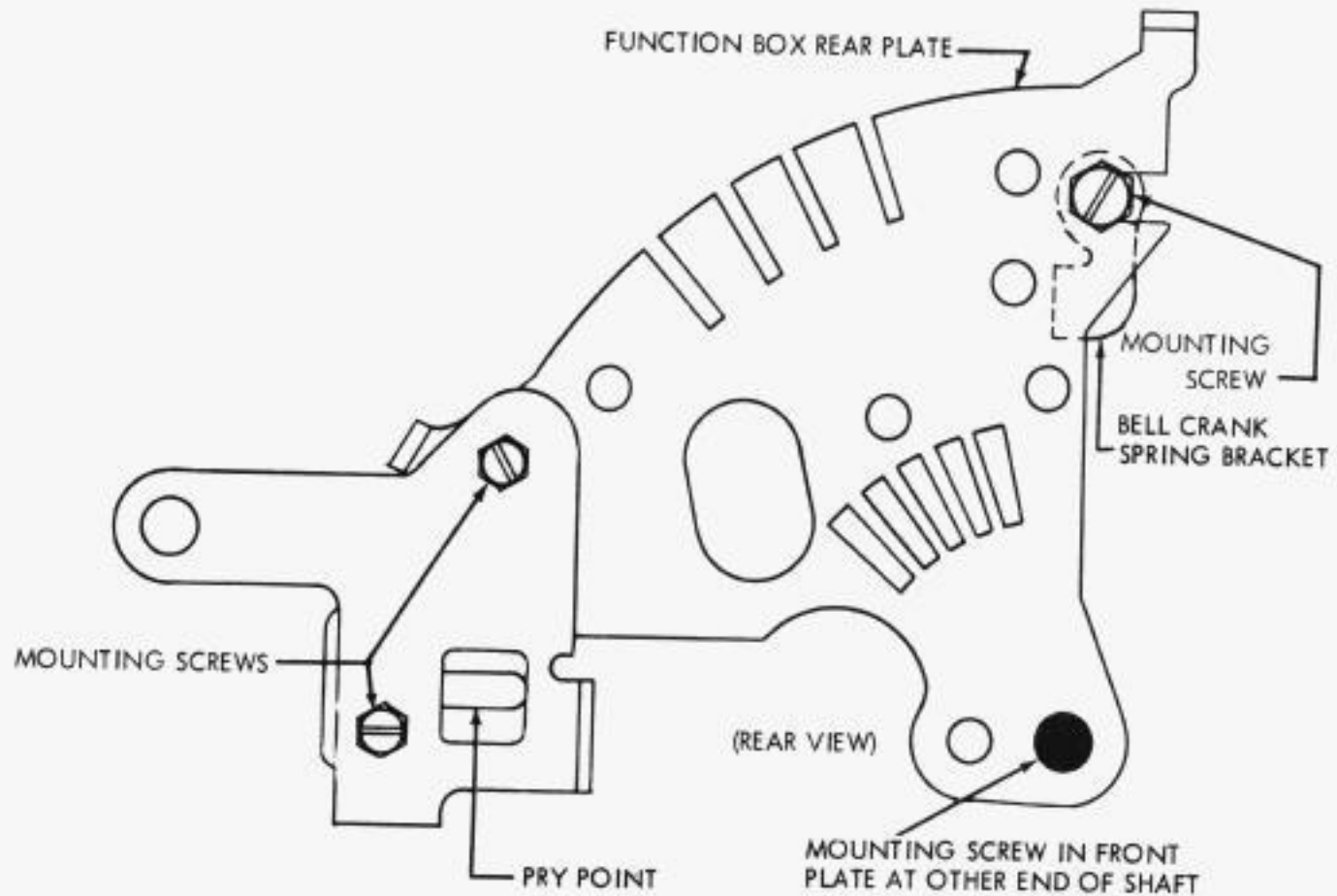
REQUIREMENT
 CLEARANCE BETWEEN FUNCTION BOX REAR PLATE AND REAR EDGE OF PUSH BAR OPERATING BLADE.
 MIN. 0.005 INCH---MAX. 0.020 INCH
 AT POINT IN THE CYCLE WHERE CLEARANCE IS MINIMUM.

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



WITH FUNCTION CLUTCH TURNED TO STOP POSITION AND LATCH LEVER UNLATCHED:
 MIN. 12 OZS. ---MAX. 15 OZS.
 TO START LATCH LEVER MOVING.

FIGURE 1-39. FUNCTION MECHANISM



FUNCTION BOX

TO CHECK

MANUALLY SELECT LETTERS CODE COMBINATION (12345). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS, PUNCH SLIDES ARE DISENGAGED FROM LATCHES (FIGURE 1-24) AND BLADE JUST TOUCHES PUSH BARS. IN NO. 2 AND 3 PUSH BARS, TAKE UP PLAY DOWNWARD AND RELEASE.

REQUIREMENT

TOP SURFACE OF OPERATING BLADE

FLUSH TO 0.020 INCH

BELOW TOP SURFACE OF NO. 2 AND 3 PUSH BARS.

TO ADJUST

USING PRY POINT, POSITION FUNCTION BOX WITH THREE MOUNTING SCREWS IN REAR PLATE AND ONE MOUNTING SCREW IN FRONT PLATE LOOSENED. CHECK POSITION OF BELL CRANK SPRING BRACKET AFTER MAKING THIS ADJUSTMENT.

FIGURE 1-40. FUNCTION MECHANISM

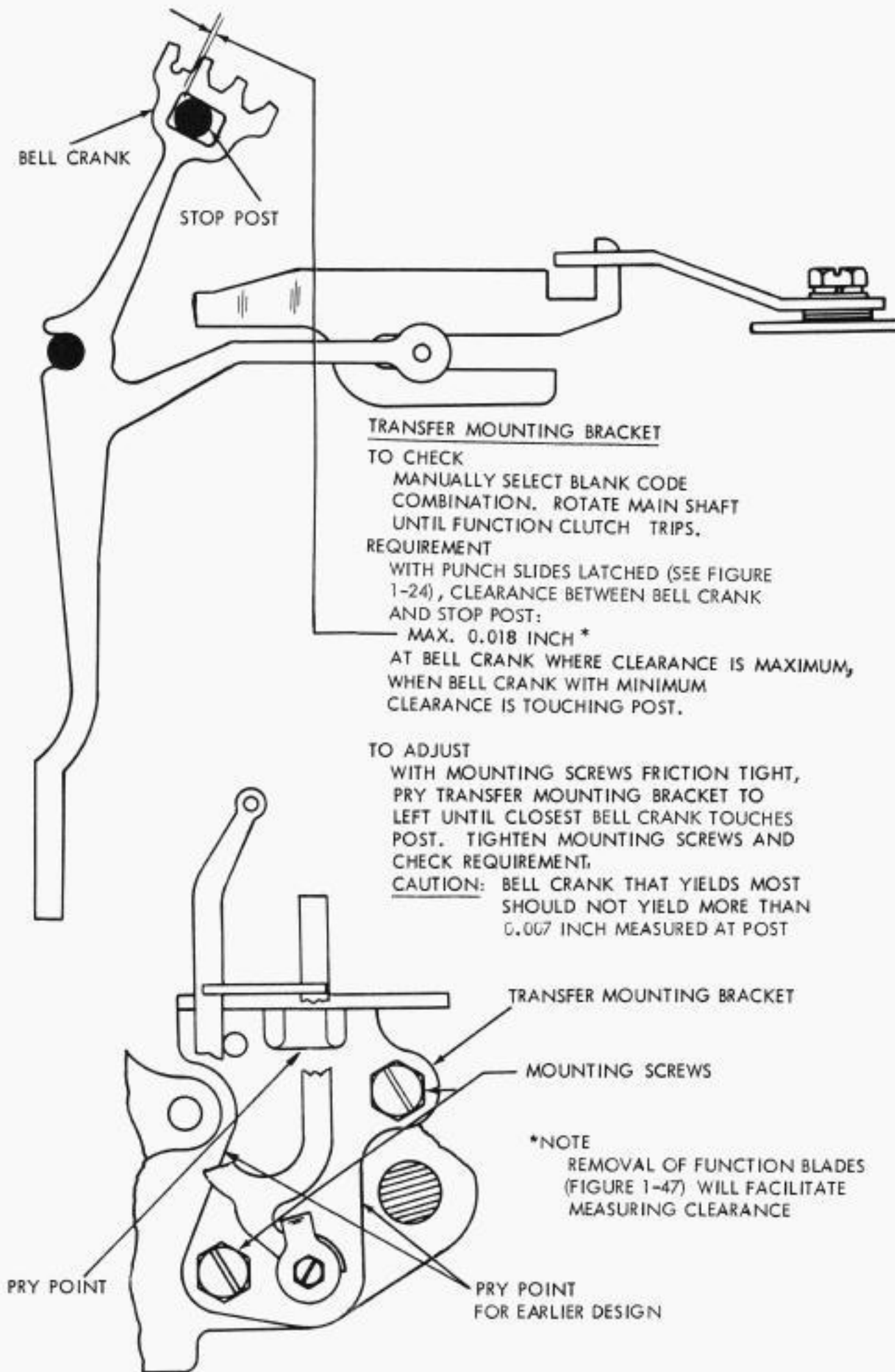


FIGURE 1-41. TRANSFER MECHANISM

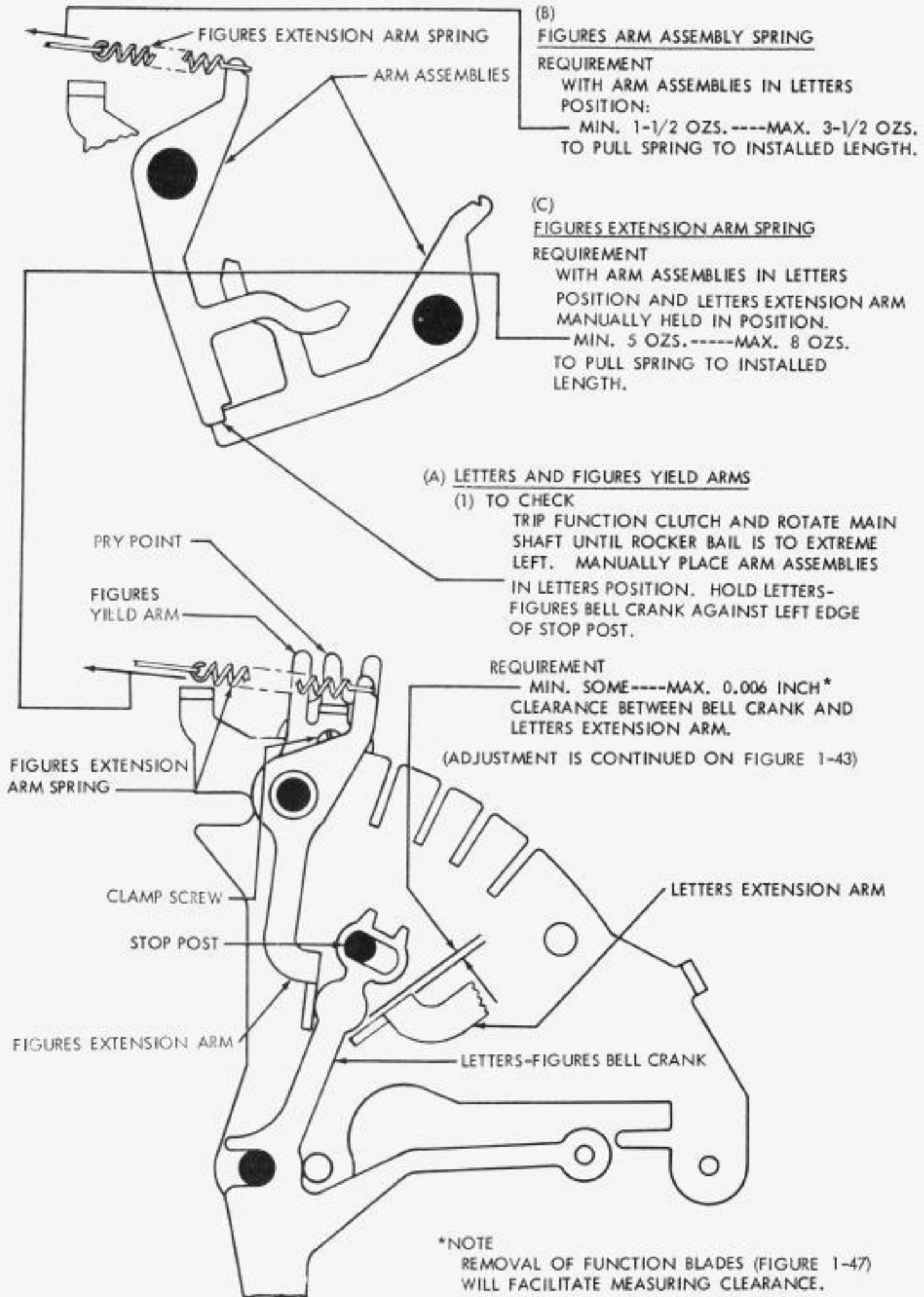


FIGURE 1-42. FUNCTION BOX MECHANISM

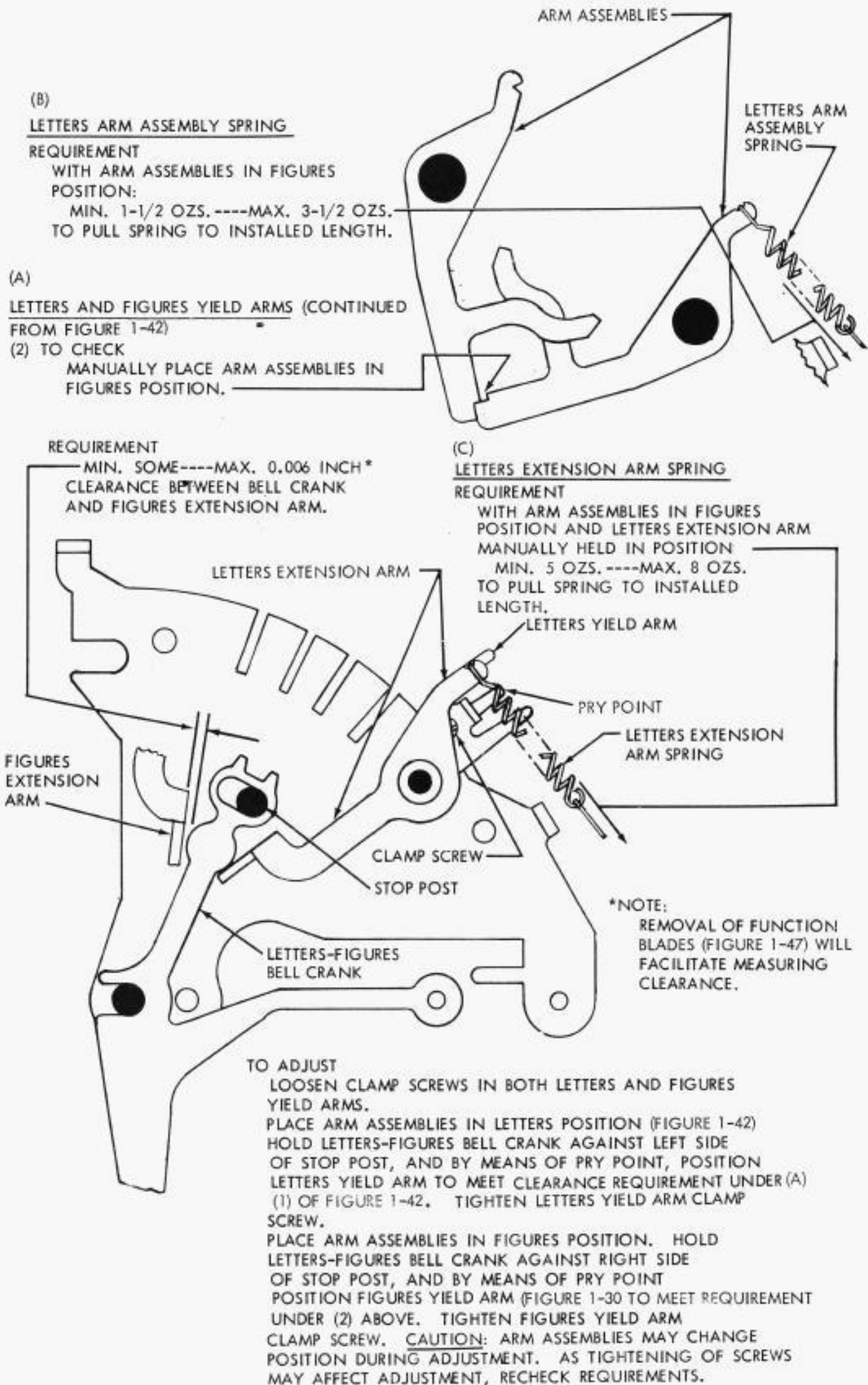
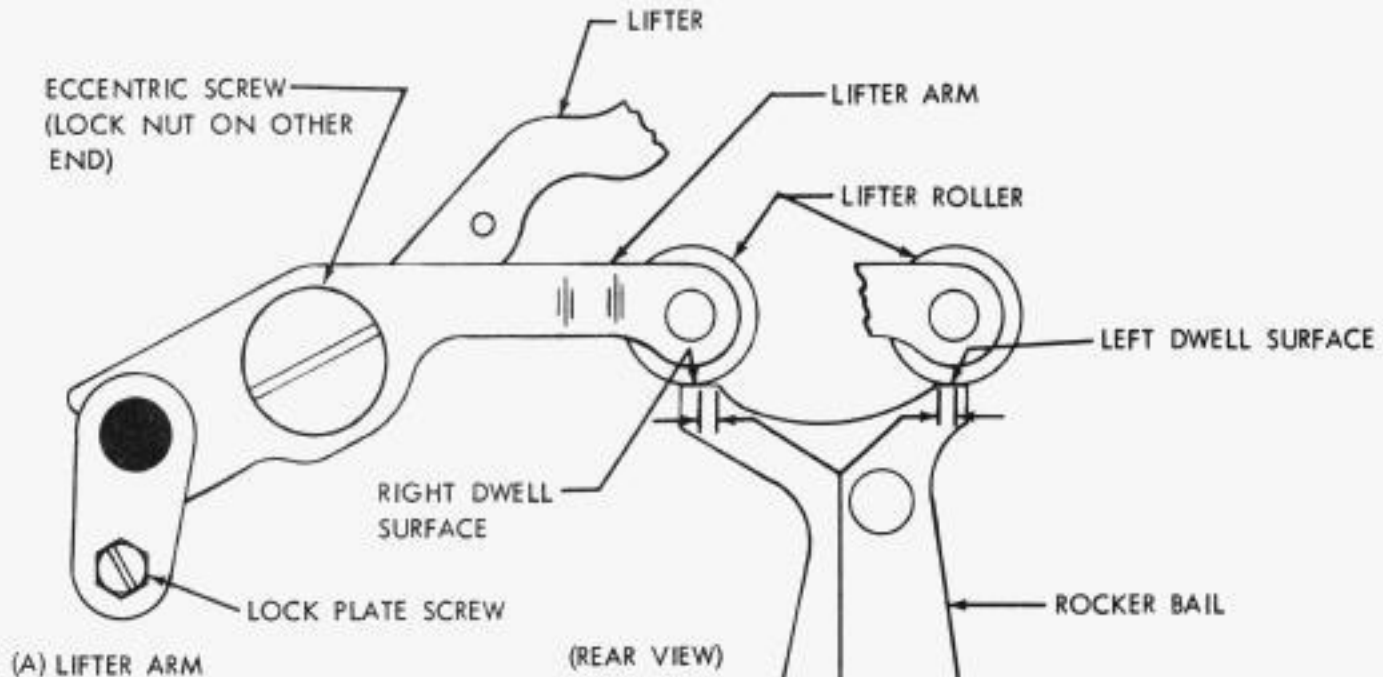


FIGURE 1-43. FUNCTION BOX MECHANISM



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.

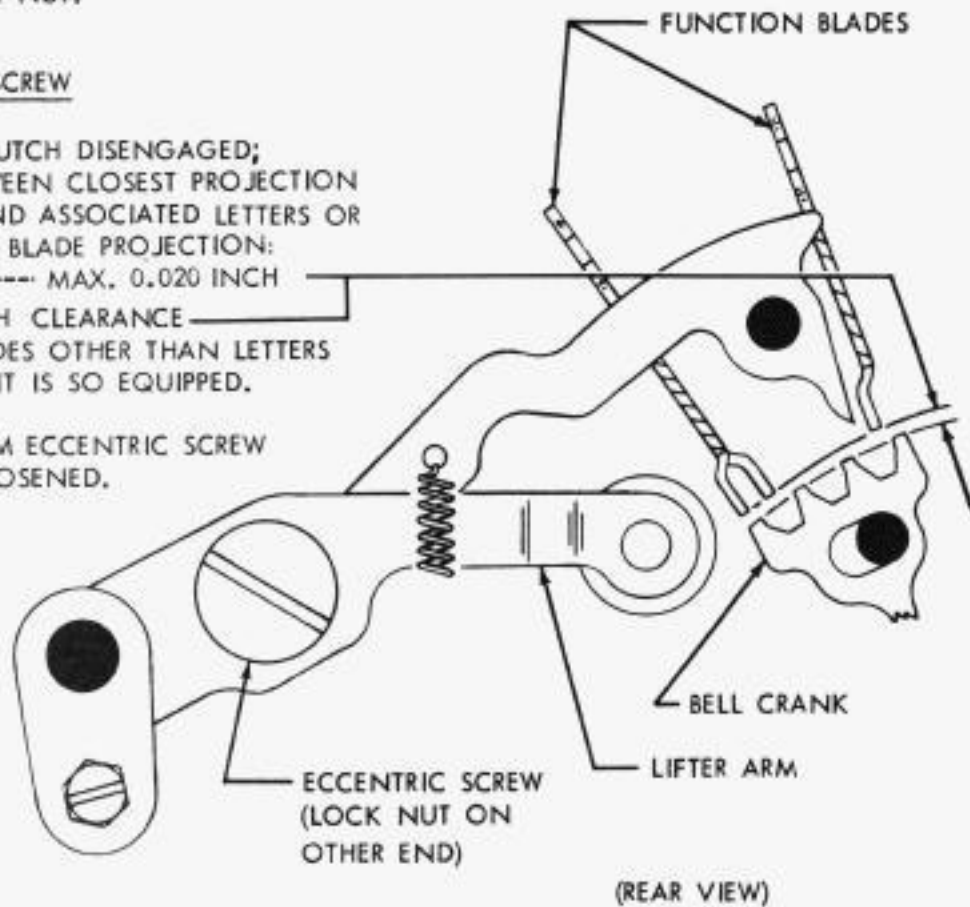
TO ADJUST *
LOOSEN LOCK PLATE SCREW UNTIL FRICTION TIGHT. WITH ECCENTRIC SCREW LOCK NUT FRICTION TIGHT, POSITION LIFTER ARM ON LIFTER. TIGHTEN LOCK PLATE SCREW. DO NOT TIGHTEN LOCK NUT.

(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

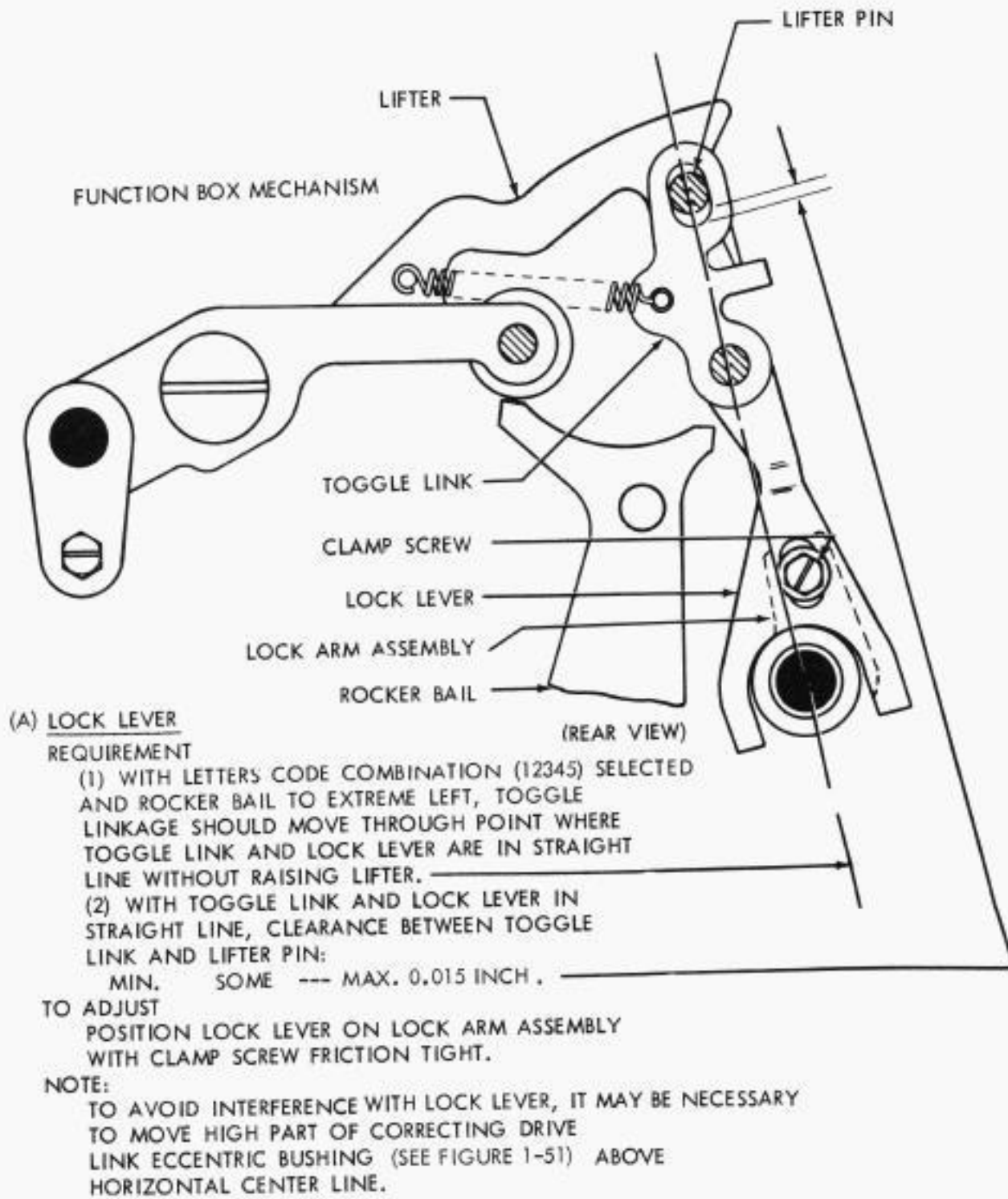
FOR FUNCTION BLADES OTHER THAN LETTERS AND FIGURES IF UNIT IS SO EQUIPPED.

TO ADJUST
POSITION LIFTER ARM ECCENTRIC SCREW WITH LOCK NUT LOOSENED.



*NOTE
REMOVE TIMING CONTACTS (FIGURE 2-23) IF UNIT IS SO EQUIPPED.

FIGURE 1-44. FUNCTION BOX MECHANISM

(B) NO. 5 PULSE BEAM SPRING

REQUIREMENT

MIN. 10 OZS. --- MAX. 15 OZS.
 TO PULL SPRING TO LENGTH OF 7/16 INCH.

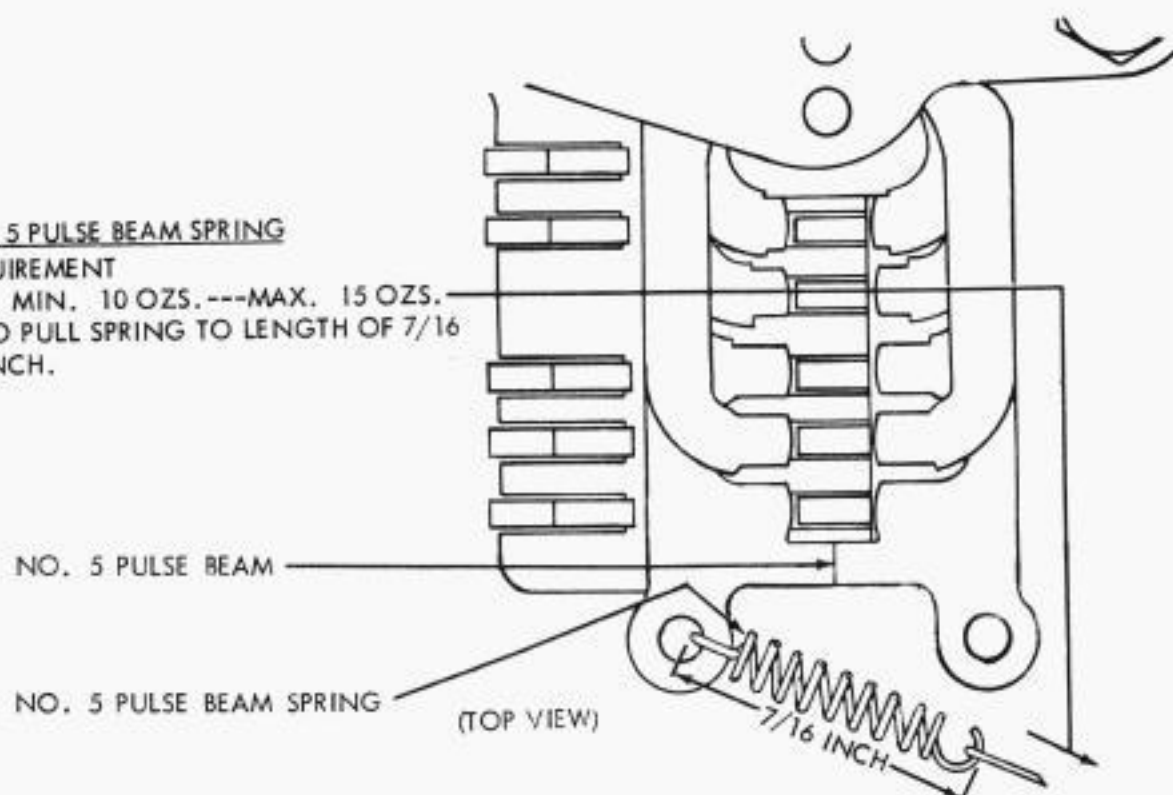


FIGURE 1-45. PERFORATOR AND TRANSFER MECHANISMS

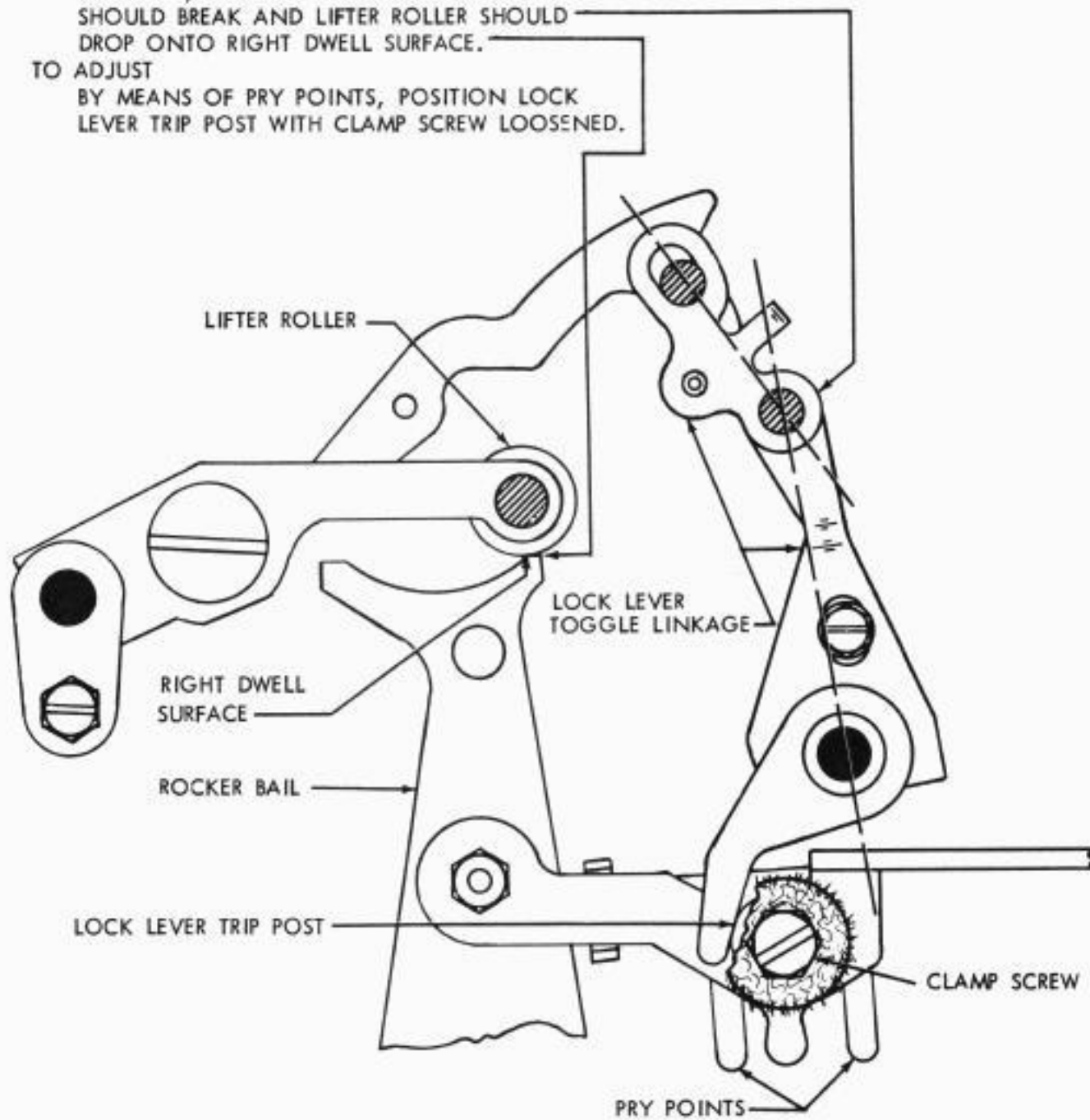
LOCK LEVER TRIP POST

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.



(REAR VIEW)

FIGURE 1-46. FUNCTION BOX MECHANISM

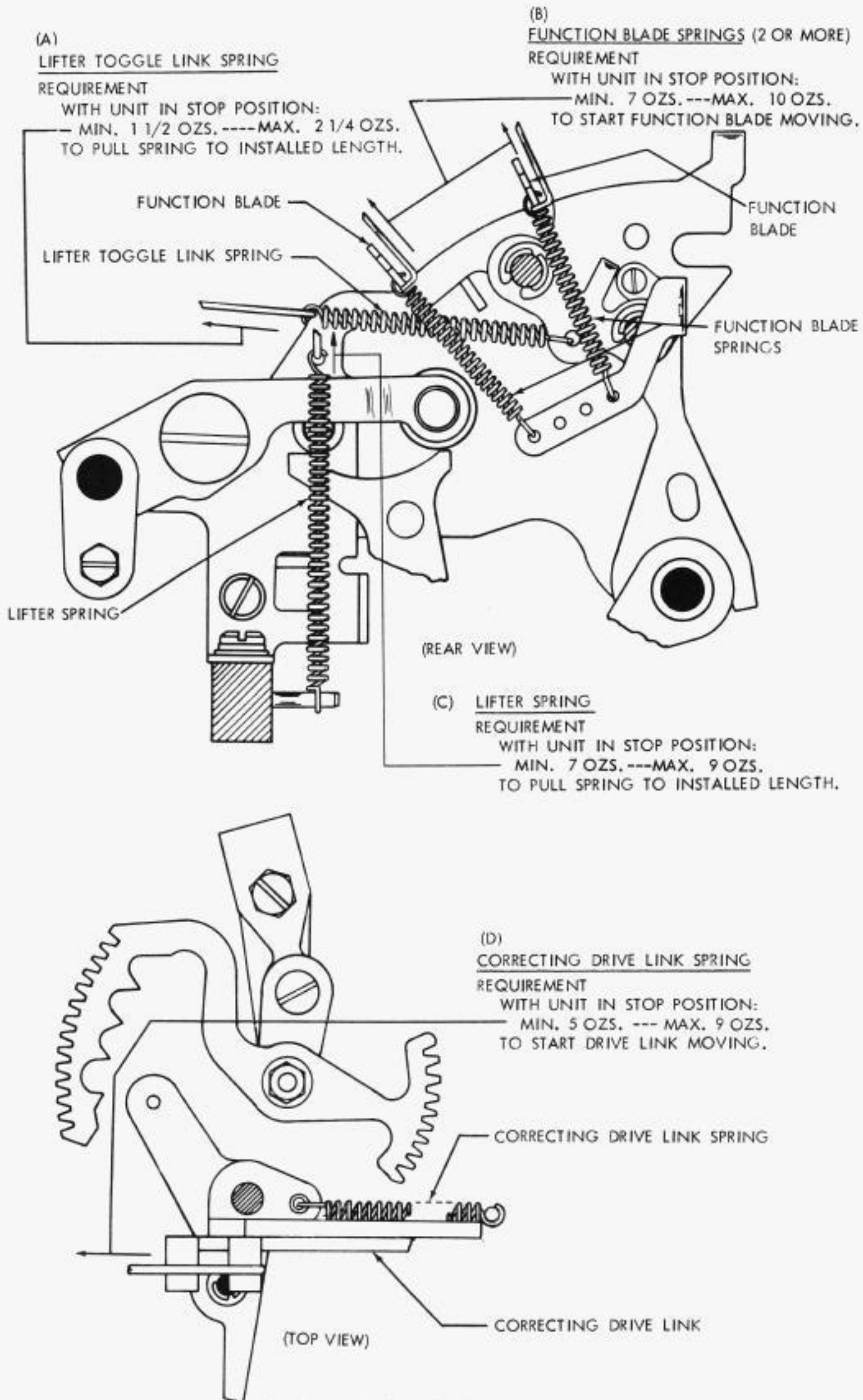


FIGURE 1-47. FUNCTION BOX AND CORRECTING MECHANISMS

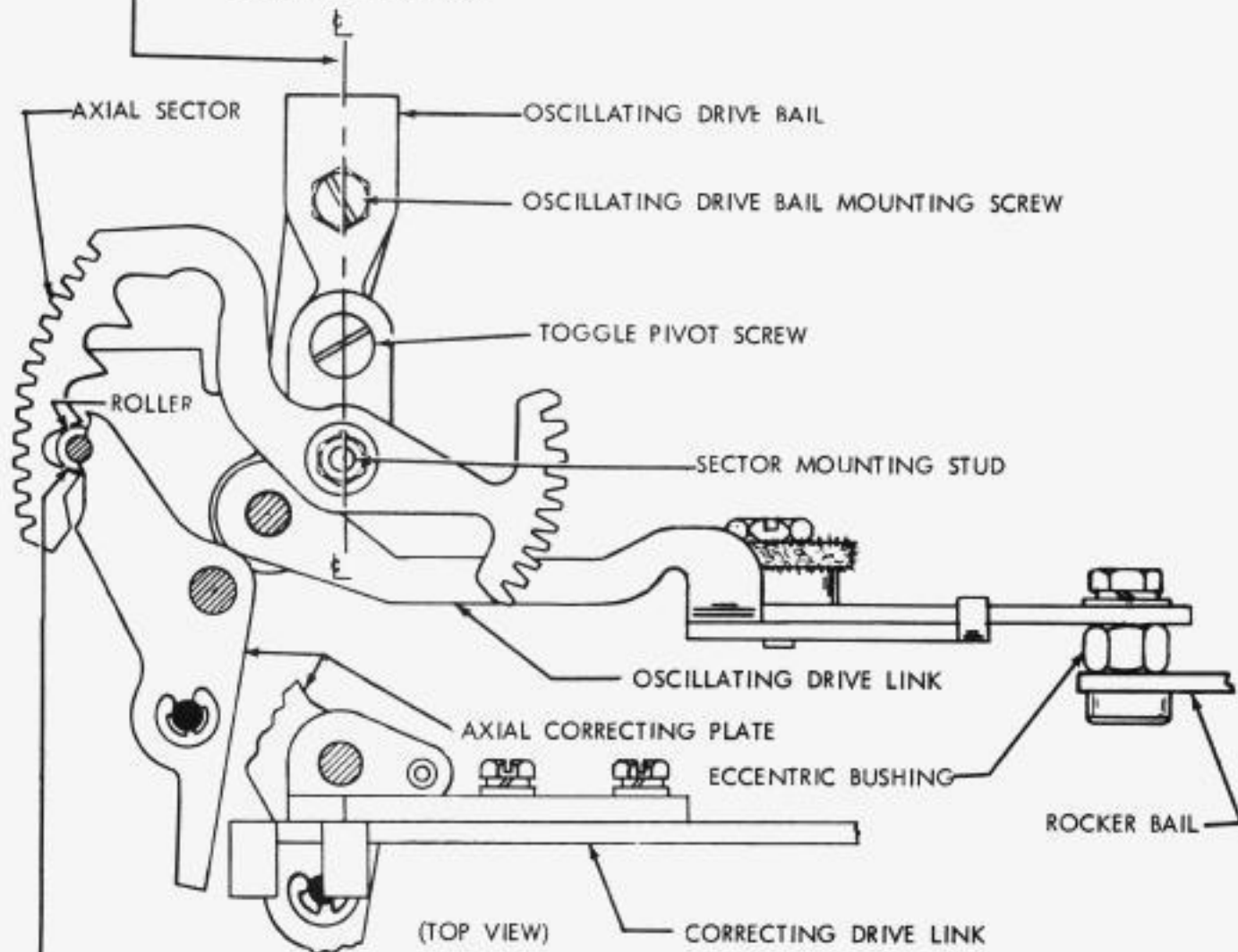
(A) OSCILLATING DRIVE LINK

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.

(B) OSCILLATING DRIVE BAIL

TO CHECK
MANUALLY SELECT BLANK CODE COMBINATION.
ROTATE MAIN SHAFT UNTIL ROCKER BAIL IS TO
EXTREME LEFT.

REQUIREMENT

(1) ROLLER ON AXIAL CORRECTING PLATE SEATED
FIRMLY IN CENTER OF FIRST NOTCH OF AXIAL
SECTOR.

TO ADJUST

WITH OSCILLATING DRIVE BAIL MOUNTING SCREW LOOSENED,
POSITION CORRECTING DRIVE LINK SO THAT ROLLER FITS SNUGLY IN FIRST NOTCH.
ROLLER SHOULD RIDE CENTRALIZED IN NOTCH WITH NOTCH TOUCHING BOTH SIDES,
AND DRIVE BAIL SHOULD BE LOOSE AND IN POSITION CORRESPONDING TO THAT
OF CORRECTING PLATE.

FIGURE 1-48. AXIAL POSITIONING MECHANISM

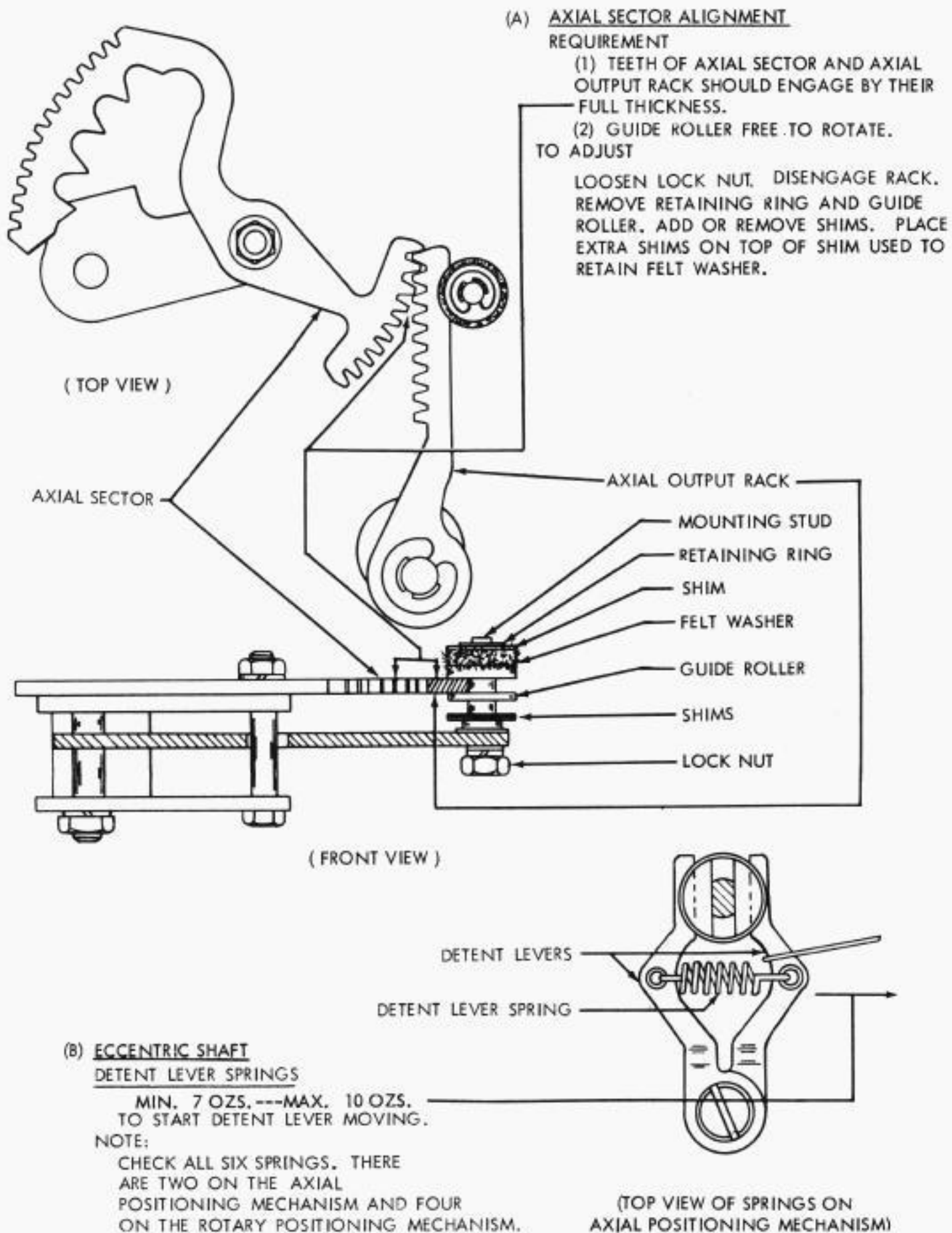


FIGURE 1-49. AXIAL POSITIONING MECHANISM

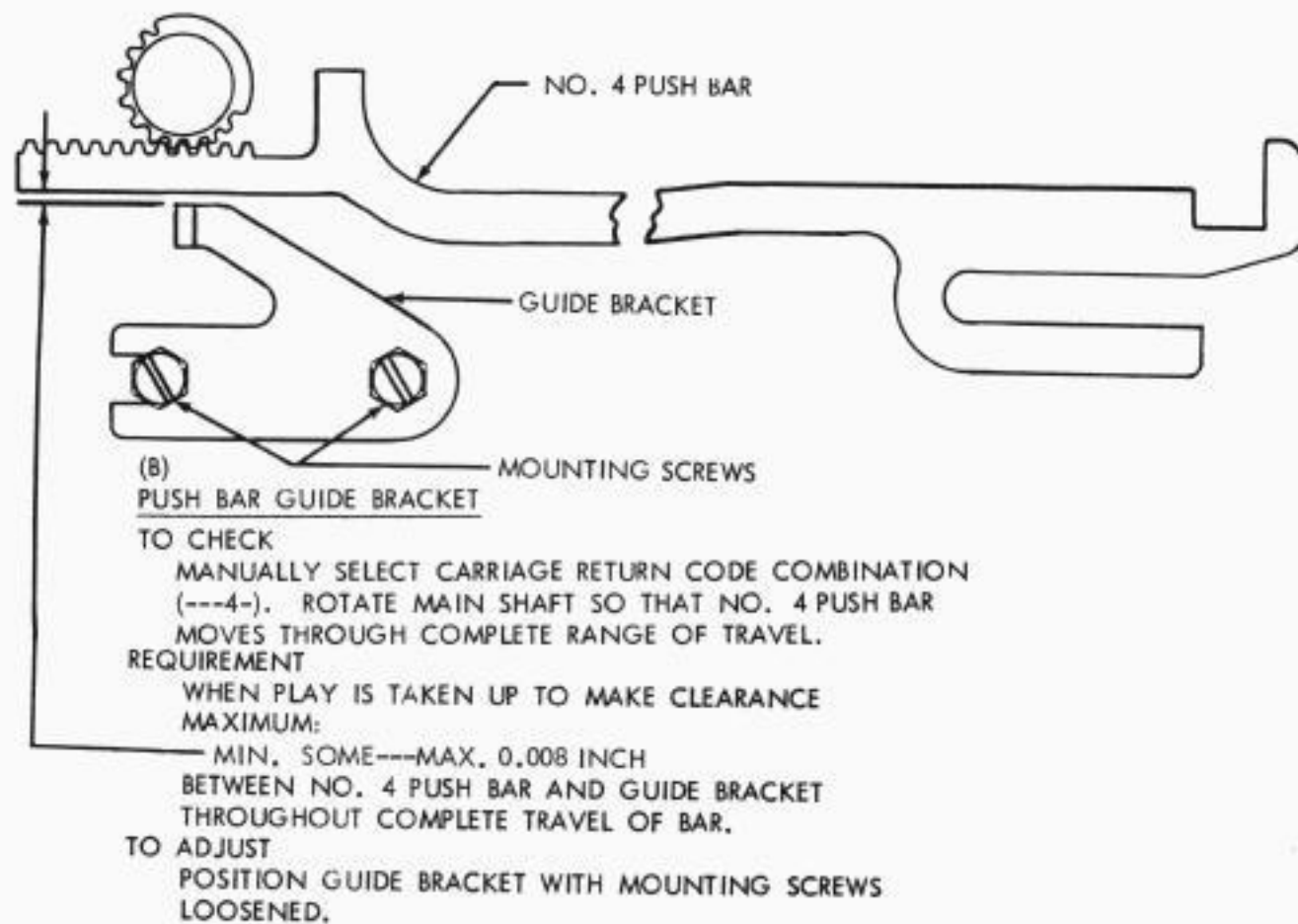
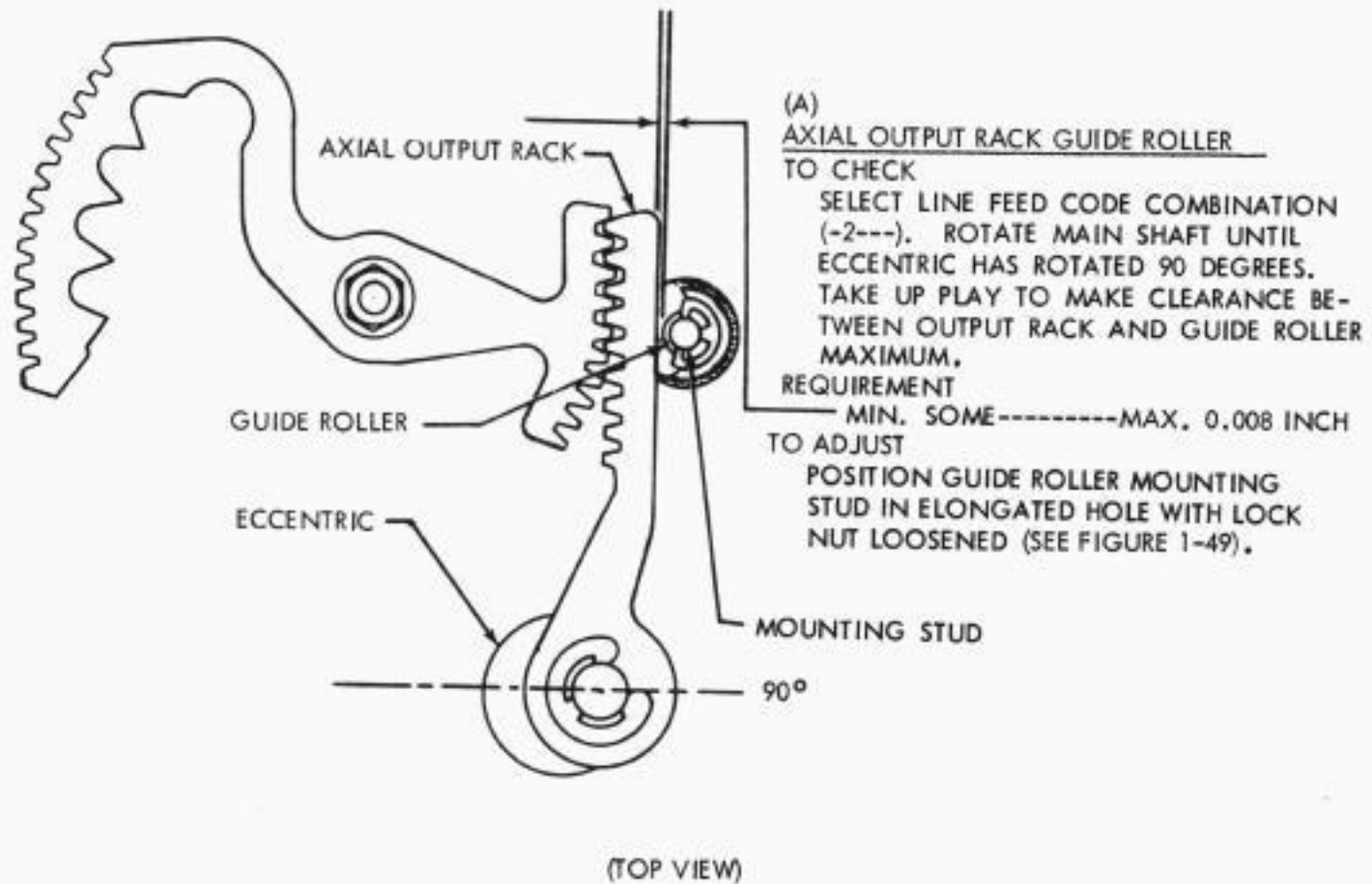


FIGURE 1-50. AXIAL AND ROTARY POSITIONING MECHANISMS

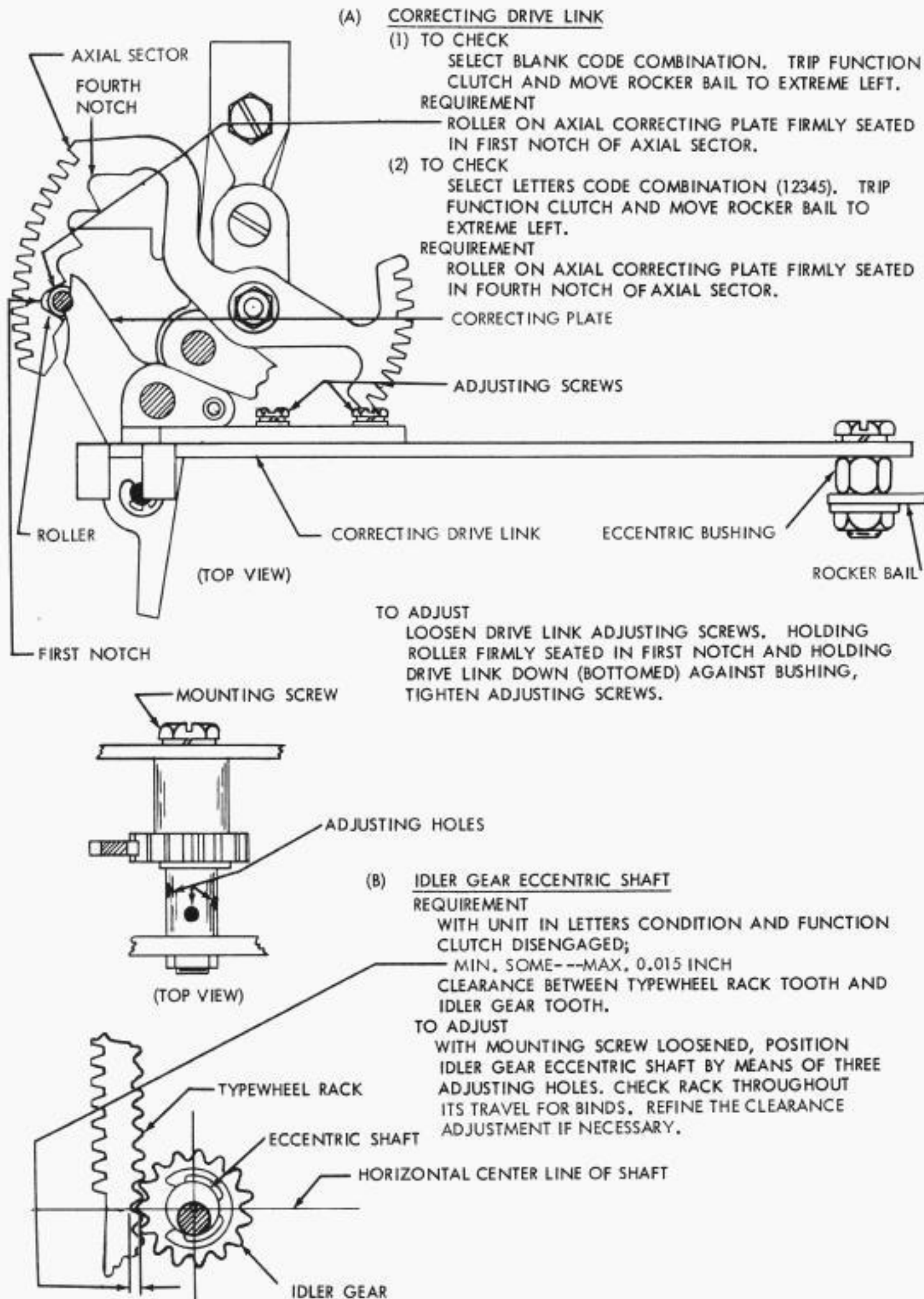


FIGURE 1-51. CORRECTING MECHANISM

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.

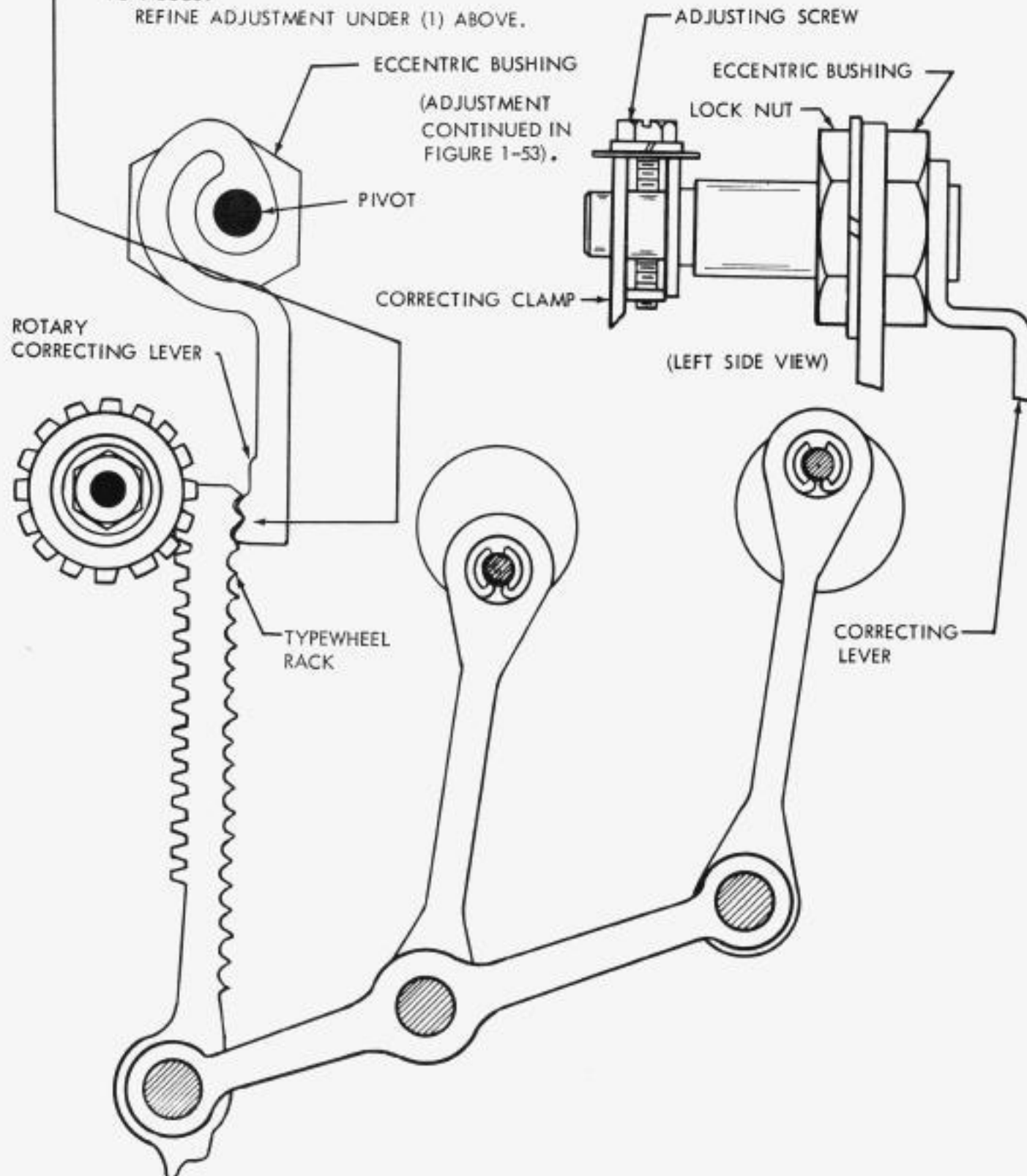


FIGURE 1-52. CORRECTING MECHANISM

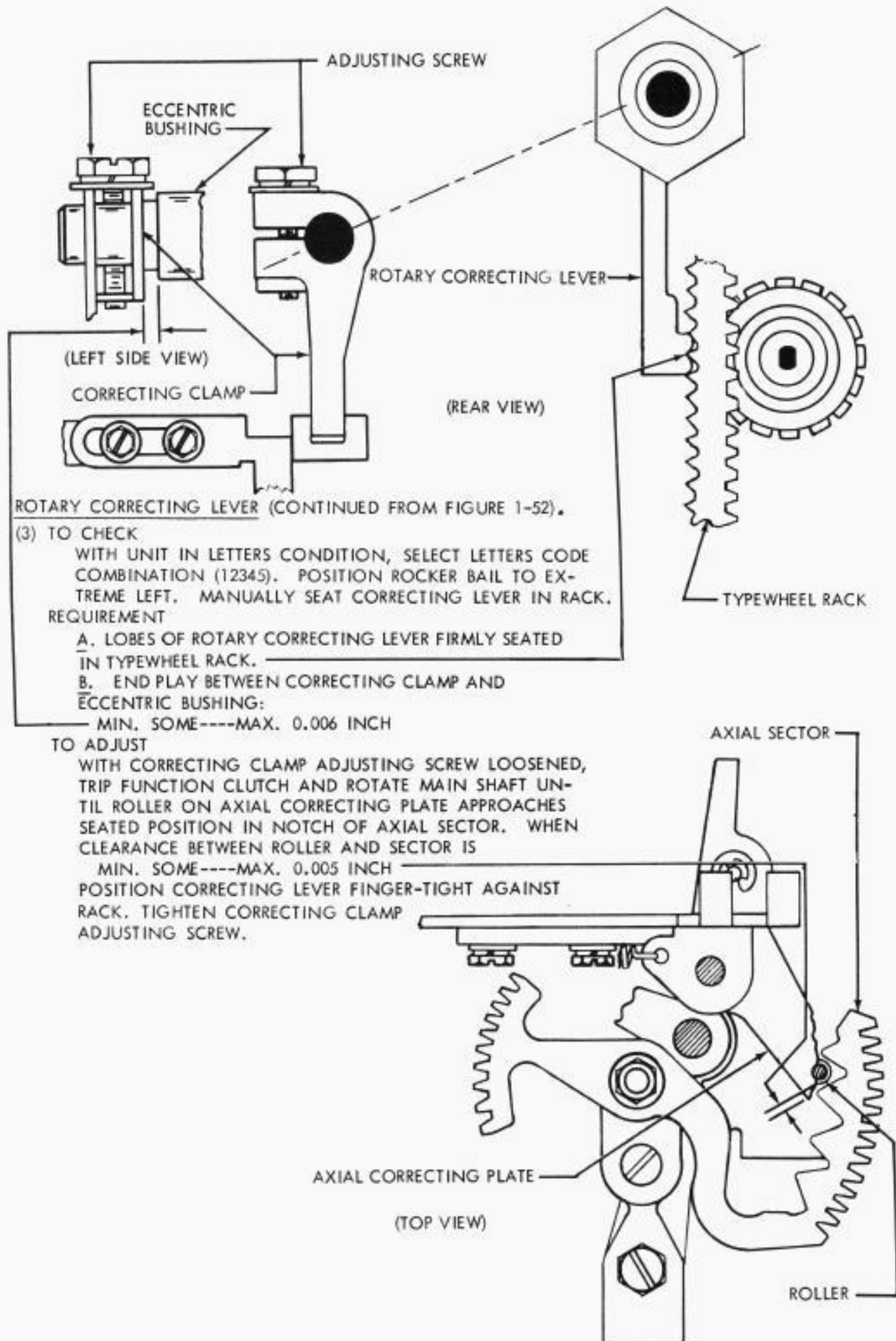


FIGURE 1-53. CORRECTING MECHANISM

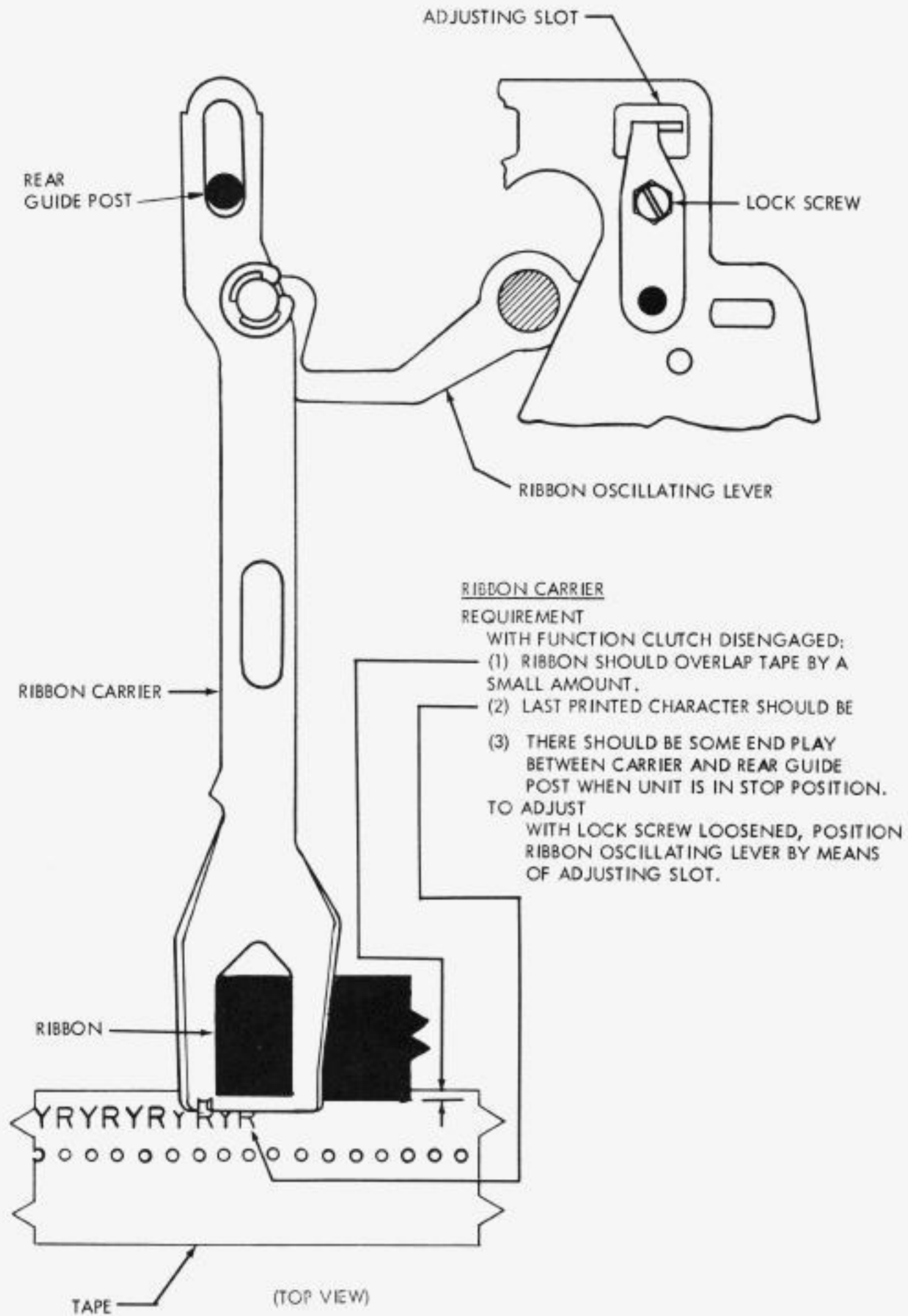


FIGURE 1-54. RIBBON OSCILLATING MECHANISM FOR CHADLESS TAPE

NOTE
THE ADJUSTMENTS ON THIS PAGE ARE FOR FULLY
PERFORATED TAPE. REFER TO FIGURE 1-54 FOR
CHADLESS TAPE ADJUSTMENTS.

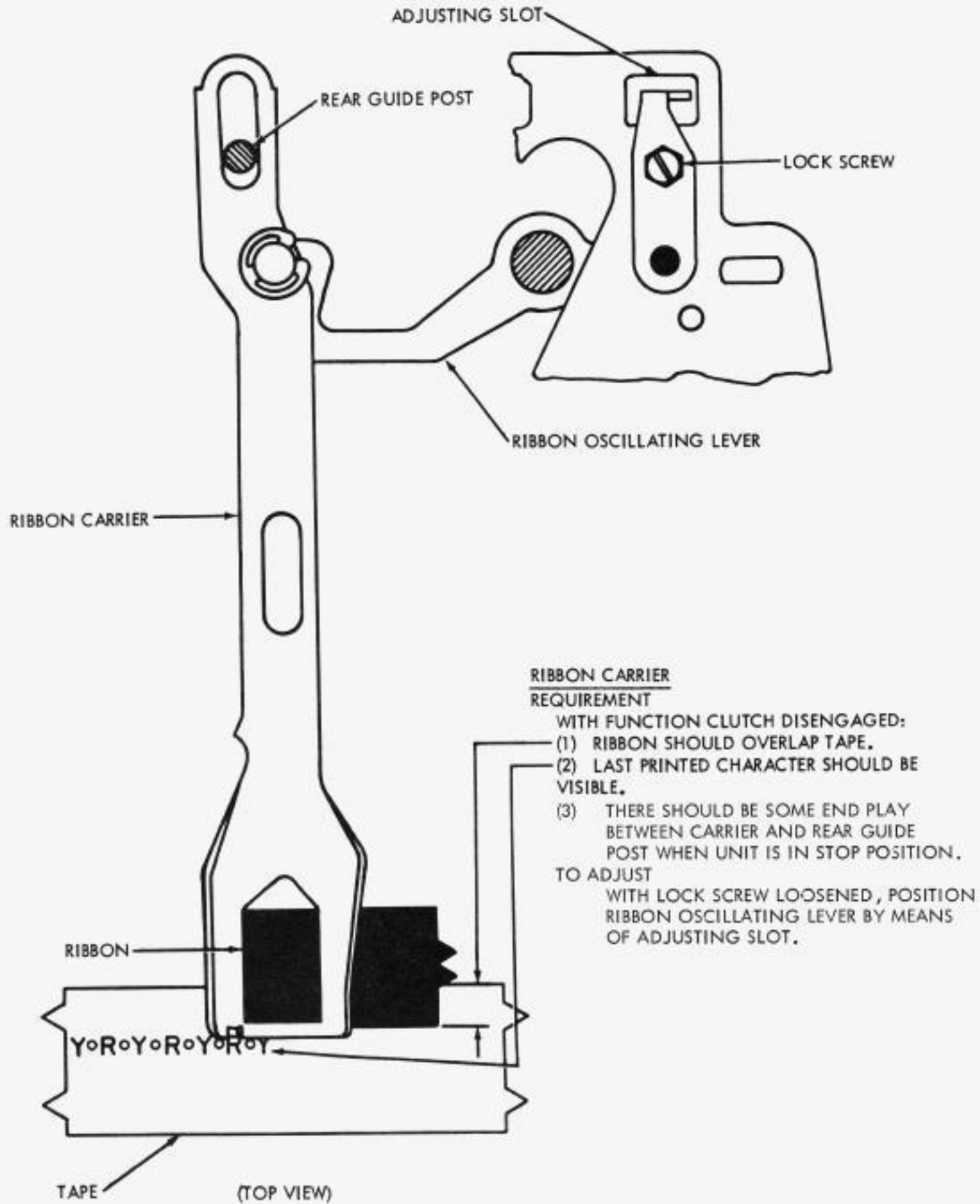


FIGURE 1-55. RIBBON OSCILLATING MECHANISM FOR FULLY PERFORATED TAPE

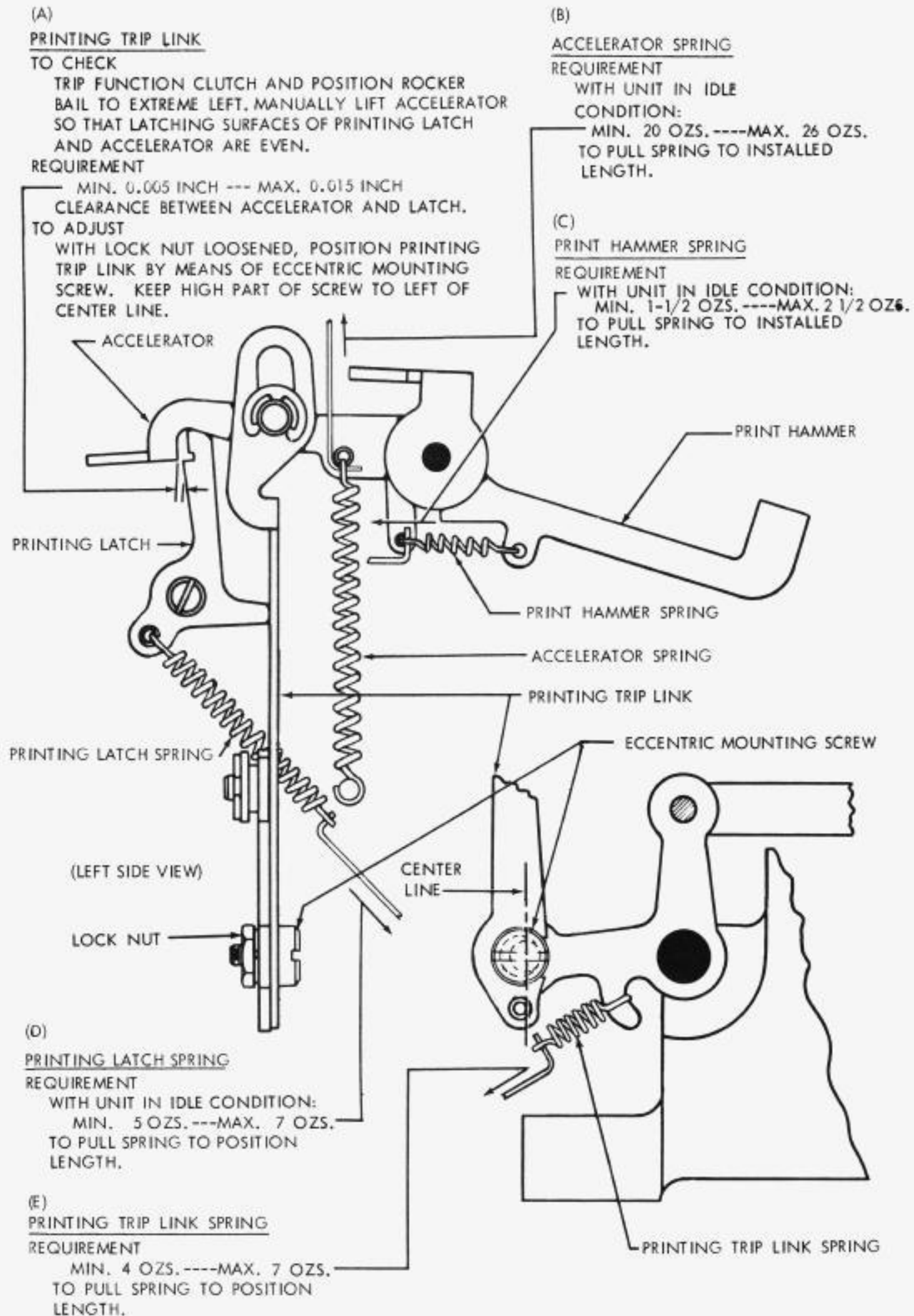


FIGURE 1-56. PRINTING MECHANISM FOR CHADLESS TAPE

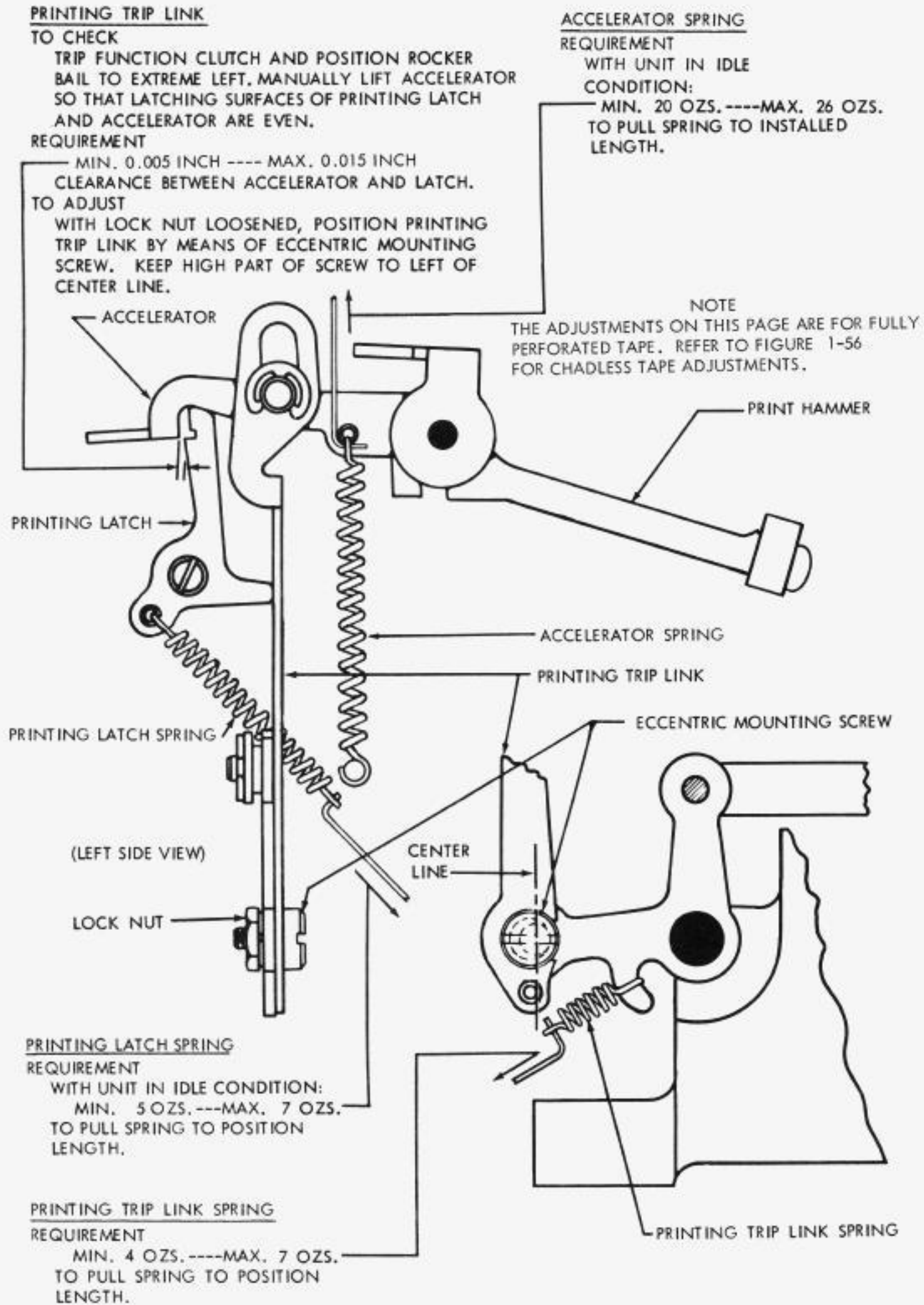


FIGURE 1-57. PRINTING MECHANISM FOR FULLY PERFORATED TAPE

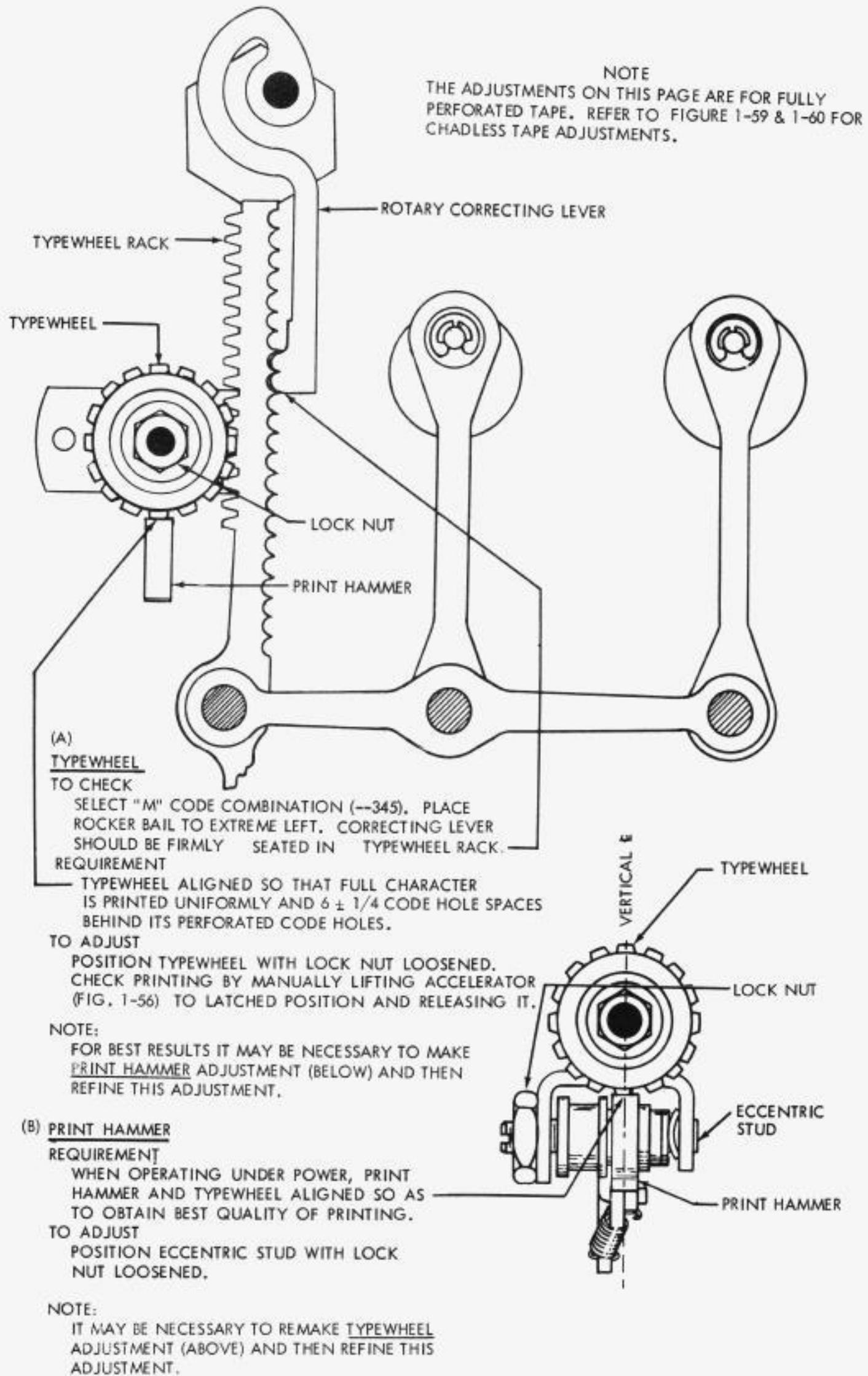
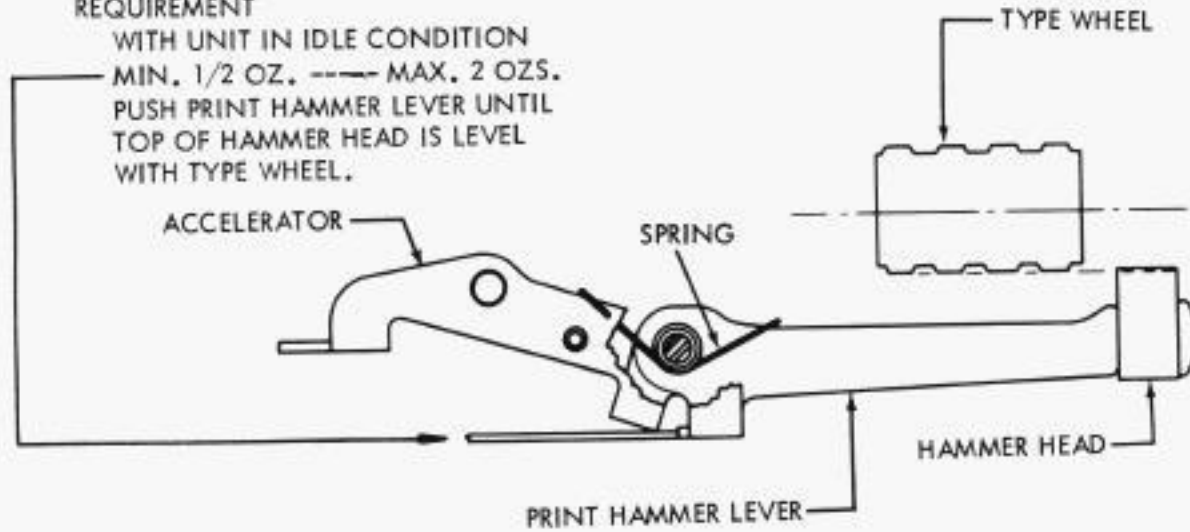


FIGURE 1-58. PRINTING MECHANISM FOR CHADLESS TAPE

PRINT HAMMER SPRING
REQUIREMENT

WITH UNIT IN IDLE CONDITION
MIN. 1/2 OZ. --- MAX. 2 OZS.
PUSH PRINT HAMMER LEVER UNTIL
TOP OF HAMMER HEAD IS LEVEL
WITH TYPE WHEEL.

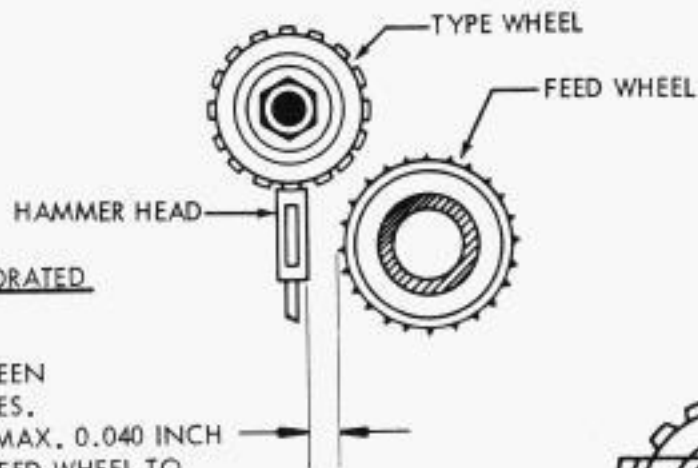


PRINTING BETWEEN PERFORATED
FEED HOLES
REQUIREMENT

CLEAR PRINTING BETWEEN
PERFORATED FEED HOLES.
MIN. 0.030 INCH --- MAX. 0.040 INCH
FROM PIN POINT OF FEED WHEEL TO
SIDE OF PRINT HAMMER.

TO ADJUST
POSITION ECCENTRIC STUD WITH
LOCK NUT LOOSENED. REPEAT
PROCEDURE IF NECESSARY.

NOTE
IT MAY BE NECESSARY TO
REMAKE TYPE WHEEL
ADJUSTMENT.



FRONT VIEW

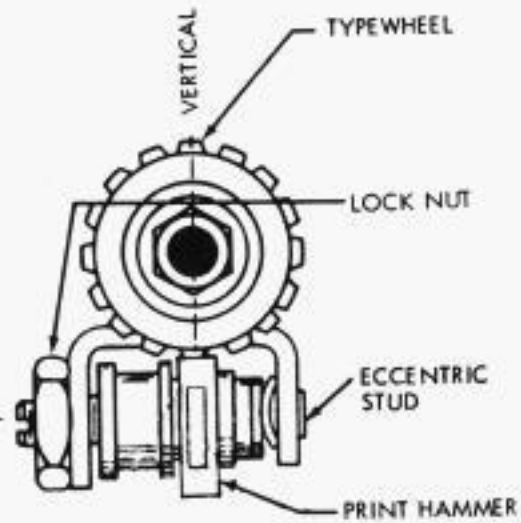


FIGURE 1-59. PRINTING MECHANISM FOR FULLY PERFORATED TAPE

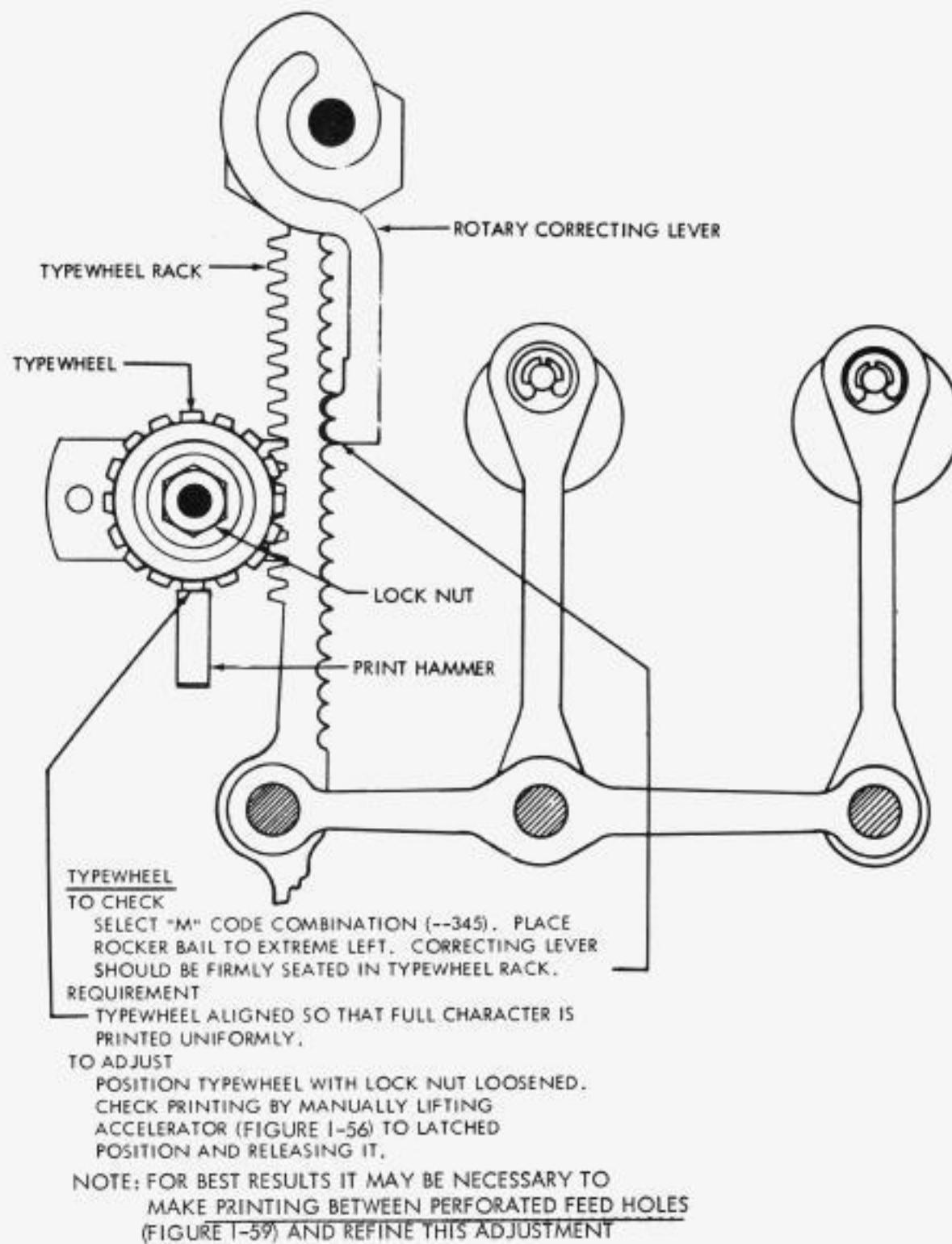


FIGURE 1-60. PRINTING MECHANISM FOR FULLY PERFORATED TAPE

SEE SECTION 5 FOR EARLY DESIGN

FEED PAWL SPRING

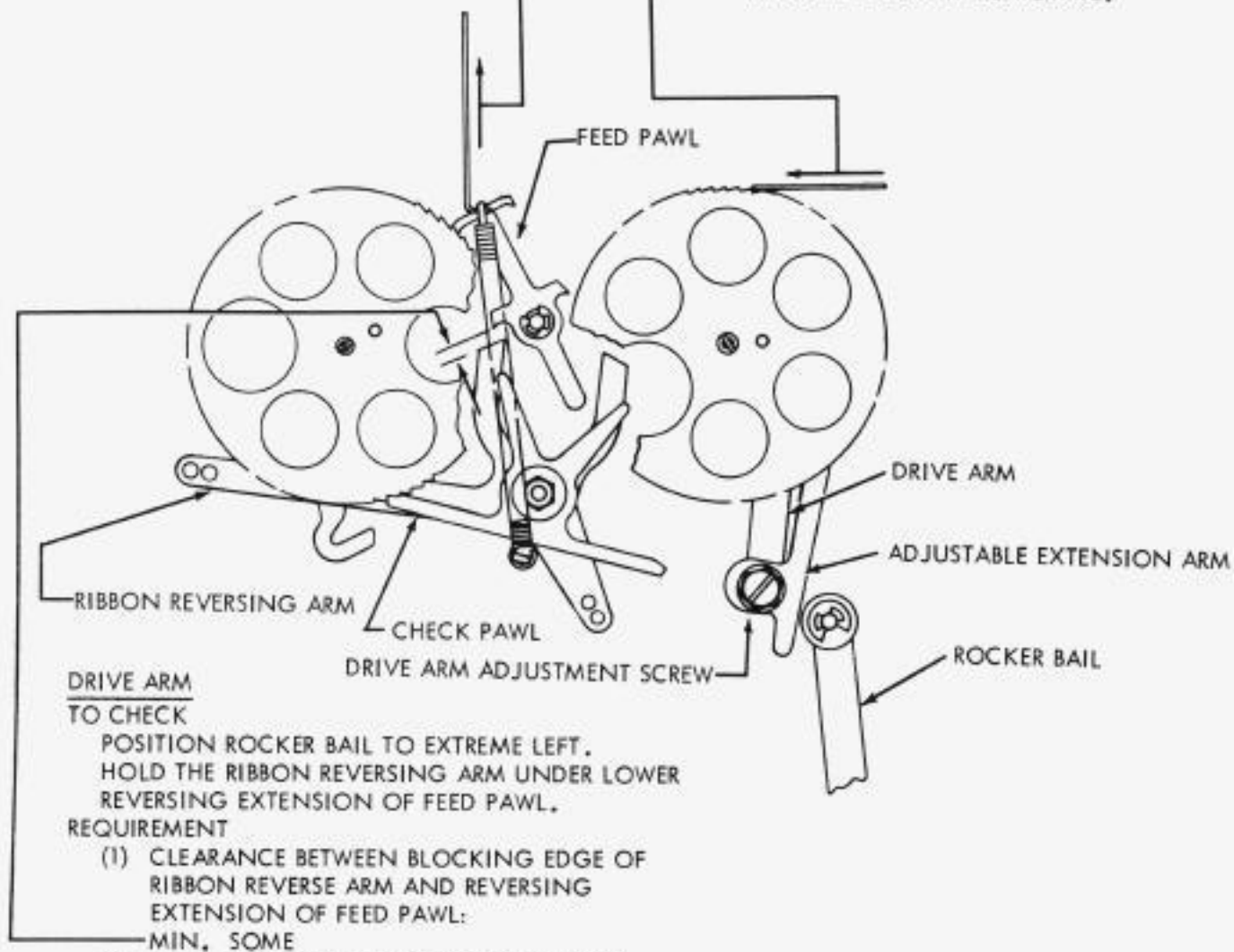
REQUIREMENT

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.

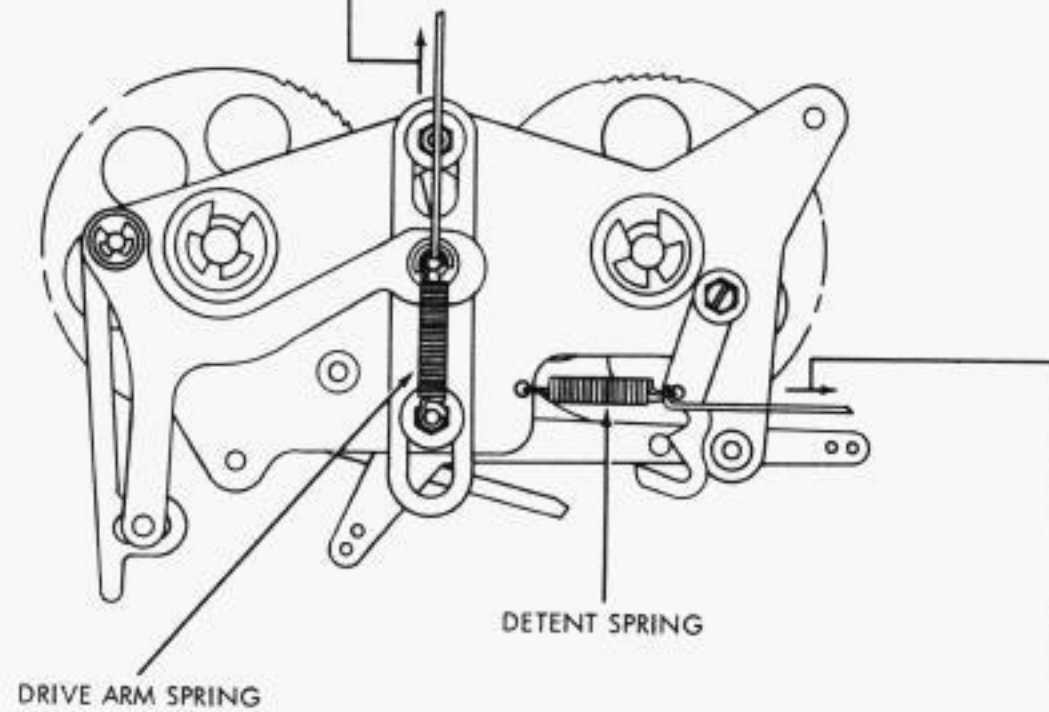
TO ADJUST

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

FIGURE 1-61. RIBBON FEED MECHANISM

DRIVE ARM SPRINGREQUIREMENT

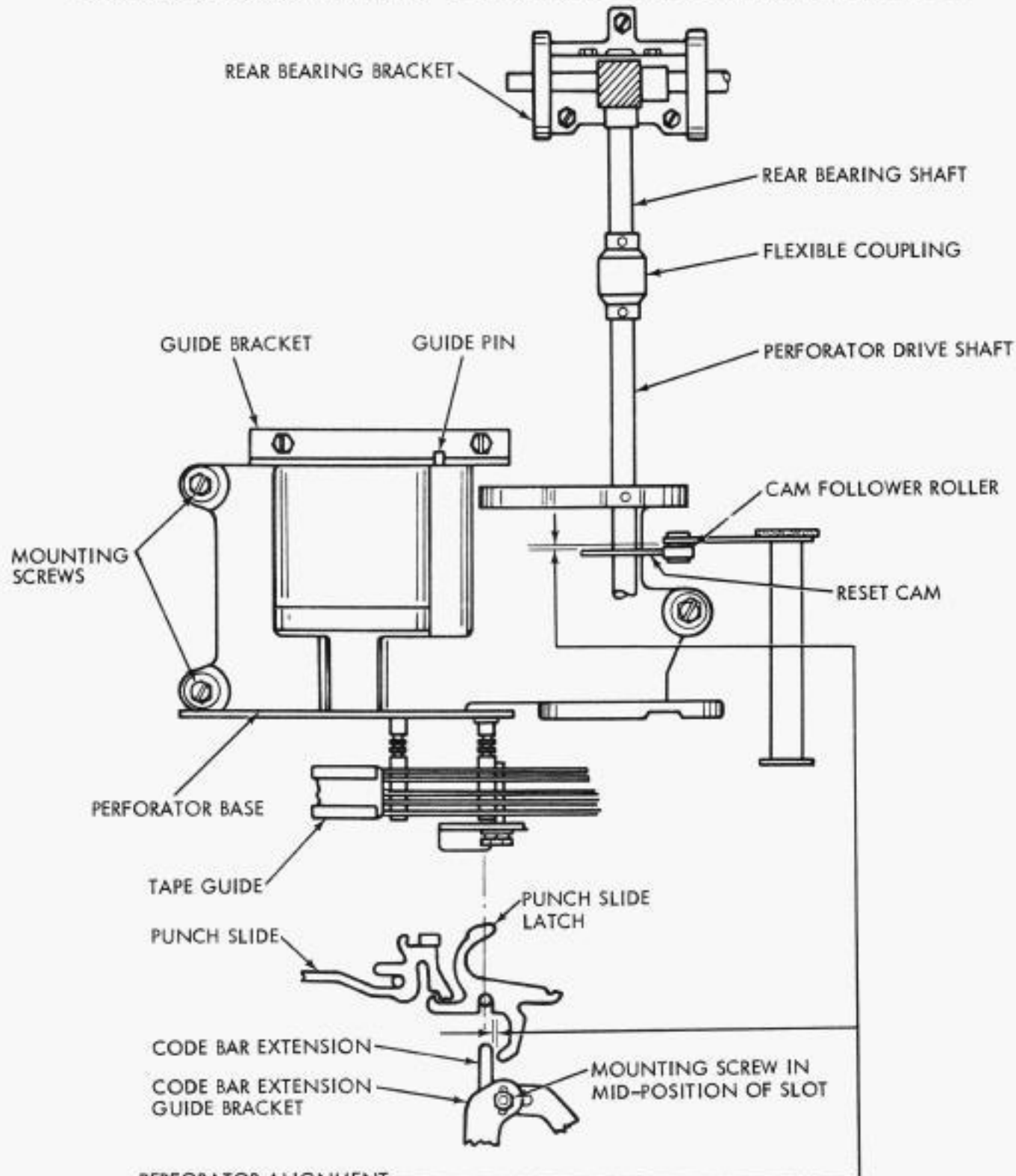
WITH ROCKER BAIL TO EXTREME RIGHT:
 MIN. 9 OZS. --- MAX. 14 OZS.
 TO PULL DRIVE ARM SPRING TO
 INSTALLED LENGTH.

DETENT SPRINGREQUIREMENT

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

FIGURE 1-62. RIBBON FEED MECHANISM

FIGURES 1-63 THROUGH 1-69 APPLY TO BOTH TYPING AND NON-TYPING PERFORATORS



PERFORATOR ALIGNMENT

(1) REQUIREMENT

PUNCH SLIDE LATCHES SHOULD ALIGN WITH CODE BAR EXTENSIONS
MIN. 0.010 -- MAX. 0.020 INCH TO RIGHT OF CODE BAR EXTENSION.

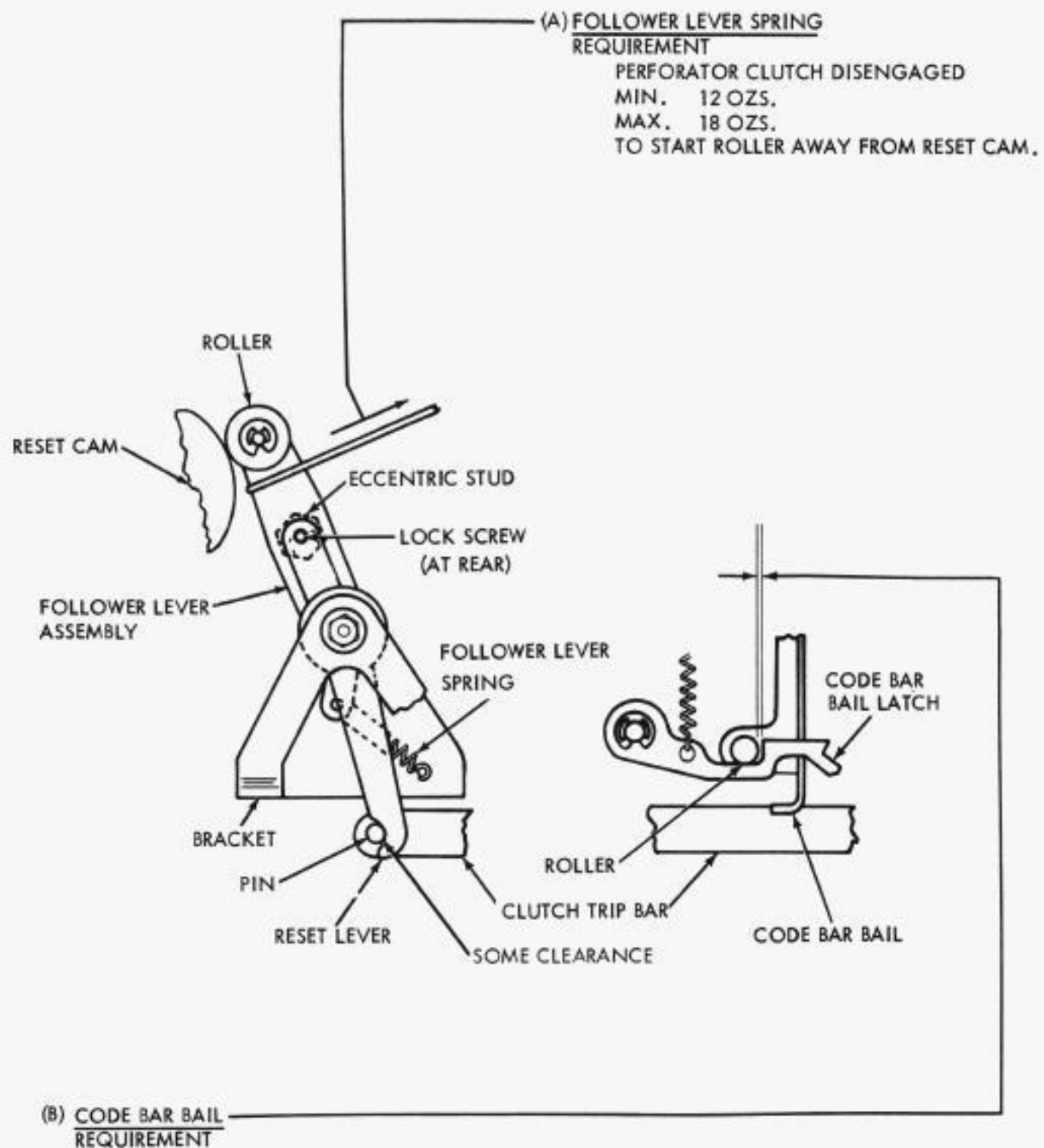
(2) REQUIREMENT

RESET CAM SHOULD ALIGN WITH ITS CAM FOLLOWER ROLLER
APPROXIMATELY 0.030 INCH FORWARD OF THE REAR EDGE OF THE ROLLER.

TO ADJUST

LOOSEN SET SCREWS AND DISENGAGE FLEXIBLE COUPLINGS. LOOSEN TWO ALIGNMENT BRACKET SCREWS AND THREE PERFORATOR MOUNTING SCREWS. SET EXTENSION GUIDE PIN IN MIDDLE OF GUIDE BRACKET SLOT AND ALIGN PERFORATOR AND RESET CAM. TIGHTEN PERFORATOR MOUNTING SCREWS. POSITION ALIGNMENT BRACKET SO THAT IT CONTACTS PERFORATOR CASTING FOR ITS FULL LENGTH, AND TIGHTEN SCREWS. POSITION REAR BEARING BRACKET UNTIL PERFORATOR DRIVE SHAFT LINES UP WITH BEARING BRACKET SHAFT. A STRAIGHT-EDGE RULE APPLIED TO THE CENTER OF THE BEARING BRACKET SHAFT SHOULD ALSO EXTEND THROUGH THE CENTER OF THE PERFORATOR DRIVE SHAFT. TIGHTEN SCREWS, AND ENGAGE THE COUPLING, IF NECESSARY, REFINE LINE UP OF PUNCH SLIDE LATCHES AND CODE BAR EXTENSIONS BY ADJUSTING THE CODE BAR EXTENSION GUIDE BRACKET IN ITS MOUNTING HOLES.

FIGURE 1-63. PERFORATOR SHAFT AND PUNCH MECHANISM



CONTROL KNOB IN T POSITION. CODE BAR BAIL AT EXTREME LEFT. SOME CLEARANCE BETWEEN CODE BAR BAIL LATCH LEVER AND ROLLER.

TO ADJUST
 POSITION ECCENTRIC STUD WITH LOCK SCREW LOOSENED TO MEET REQUIREMENT.
 RECHECK AFTER TIGHTENING LOCK SCREW.

TO CHECK
 WITH ALL CLUTCHES LATCHED, DEPRESS LTRS KEY. AFTER CODE BARS HAVE MOVED TO RIGHT, THERE MUST BE SOME CLEARANCE BETWEEN FOLLOWER RESET LEVER AND CLUTCH TRIP BAR PIN.

FIGURE 1-64. CODE BAR BAIL AND CAM FOLLOWER MECHANISMS

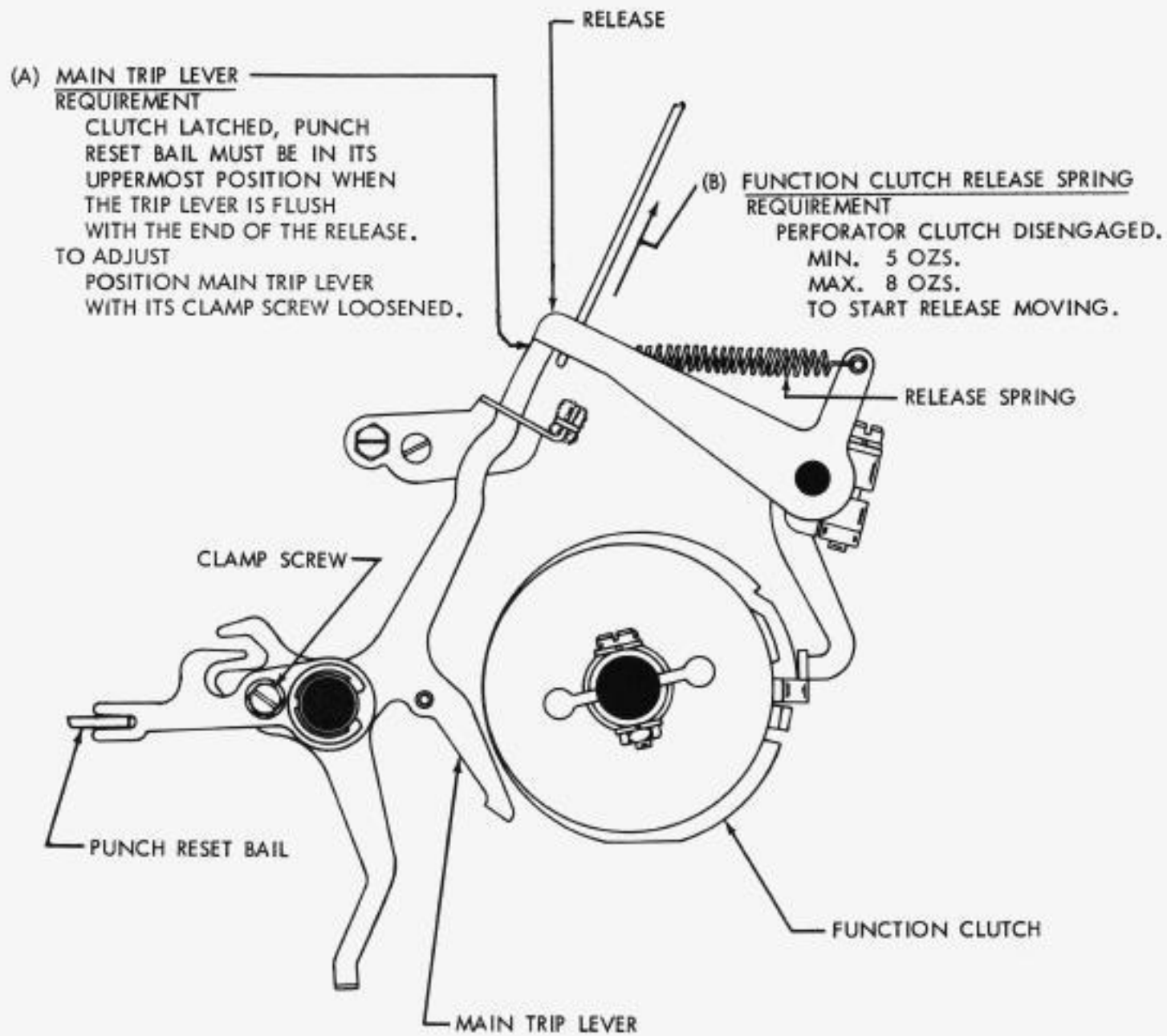


FIGURE 1-65. PERFORATOR TRIP LEVER MECHANISM

(C) CODE BAR EXTENSION AND PUNCH SLIDE LATCH

(1) REQUIREMENT

CONTROL KNOB IN T POSITION, BLANK KEYLEVER DEPRESSED, PUNCH SLIDE LATCHED. PLAY BETWEEN CODE BAR EXTENSIONS AND CODE BARS TAKEN UP BY MOVING AND HOLDING EXTENSIONS AT ENGAGEMENT WITH CODE BARS. CLEARANCE SHOULD BE MIN. SOME---MAX. 0.010 INCH BETWEEN CODE BAR EXTENSIONS AND CLOSEST PUNCH SLIDE LATCH.

(2) REQUIREMENT

LTRS KEYLEVER DEPRESSED. CODE BAR EXTENSIONS SHOULD ROTATE PUNCH SLIDE LATCHES TO RELEASE ALL PUNCH SLIDES.

TO ADJUST

POSITION GUIDE VERTICALLY WITH GUIDE LOCK NUT LOOSENED TO OBTAIN REQUIRED CLEARANCE. TIGHTEN LOCK NUT.

(A) PUNCH SLIDE LATCH SPRING REQUIREMENT

MIN. 3/4 OZS.
MAX. 2 OZS.
TO START LATCH MOVING.

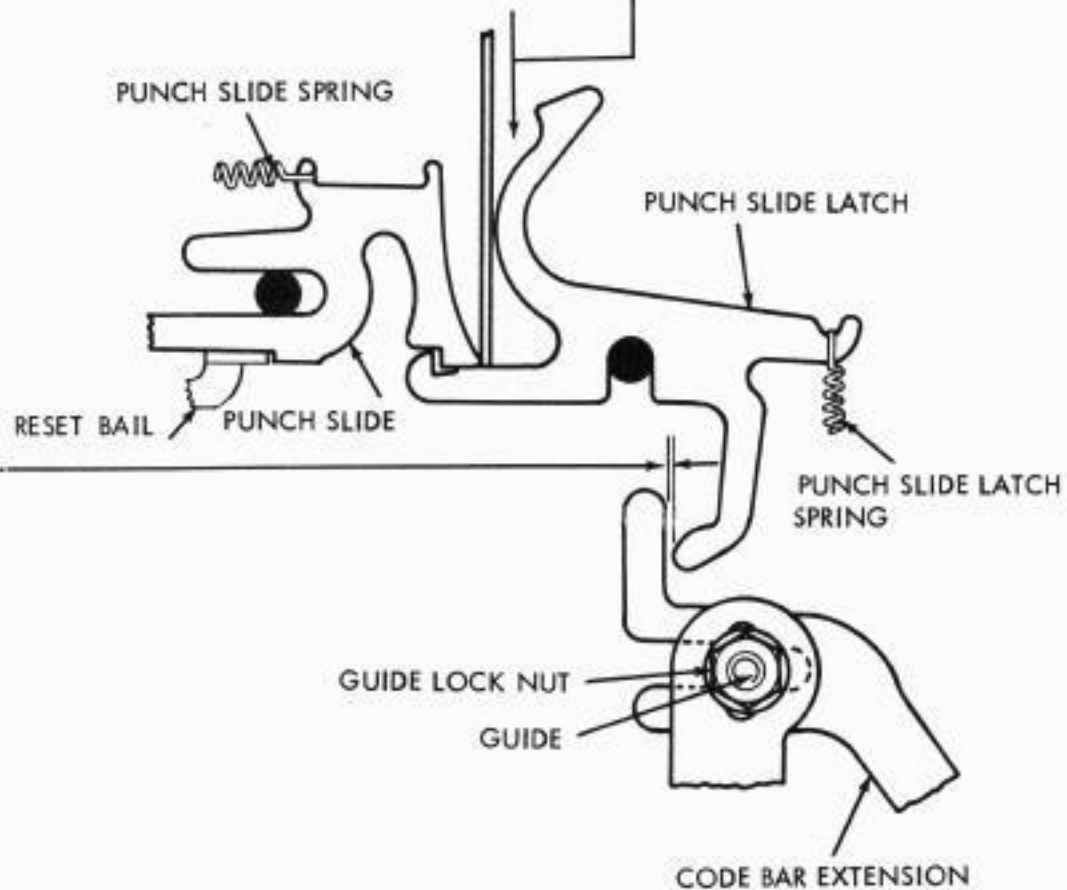


FIGURE 1-66. CODE BAR EXTENSION AND PUNCH LATCH MECHANISMS

PERFORATOR CLUTCH RELEASE TRIP

REQUIREMENT

PERFORATOR CLUTCH SHOULD TRIP CONSISTENTLY IN T AND K-T POSITIONS WHEN BLANK AND REPEAT KEYLEVERS ARE DEPRESSED SIMULTANEOUSLY. WHEN THE CONTROL KNOB IS TURNED FROM K POSITION TO K-T POSITION, THE PERFORATOR CLUTCH SHOULD TRIP WHEN THE FIRST KEYLEVER IS DEPRESSED.

CLEARANCE BETWEEN MAIN TRIP LEVER AND CLUTCH RELEASE

MIN. 0.015 INCH

MAX. 0.025 INCH

TO ADJUST

PLACE CONTROL KNOB IN T POSITION. LOOSEN MAIN TRIP LEVER LATCH CLAMP SCREWS AND MOVE LATCH TO EXTREME LEFT. WITH CODE BARS TO RIGHT, STRIKE BLANK KEYLEVER AND MOVE STOP BRACKET TO LEFT UNTIL THE LATCH JUST TRIPS. MOVE CLUTCH TRIP BAR EXTENSION TO RIGHT UNTIL IT LATCHES. POSITION MAIN TRIP LEVER LATCH TO RIGHT TO OBTAIN REQUIRED CLEARANCE. TIGHTEN SCREWS.

TO CHECK

WITH THE STOP BRACKET SCREWS FRICTION TIGHT, MOVE THE STOP BRACKET SLOWLY TO THE LEFT UNTIL THE LATCH JUST TRIPS. TURN ON MOTOR. DEPRESS BLANK AND REPEAT KEYLEVERS SIMULTANEOUSLY. IF OPERATION IS SATISFACTORY, TURN TO K-T POSITION AND REPEAT. TURN TO K POSITION AND BACK TO K-T POSITION. DEPRESS A KEYLEVER. PERFORATOR CLUTCH SHOULD TRIP. IF IT DOES NOT, MOVE STOP BRACKET SLIGHTLY TO THE RIGHT AND REPEAT THE ABOVE ADJUSTMENT.

NOTE: CHECK FOR CLEARANCE BETWEEN RESET BAIL AND SLIDES WHEN THE RESET LEVER IS TRIPPED. REFINE ADJUSTMENT IF NECESSARY TO OBTAIN OPERATIONAL CLEARANCE.

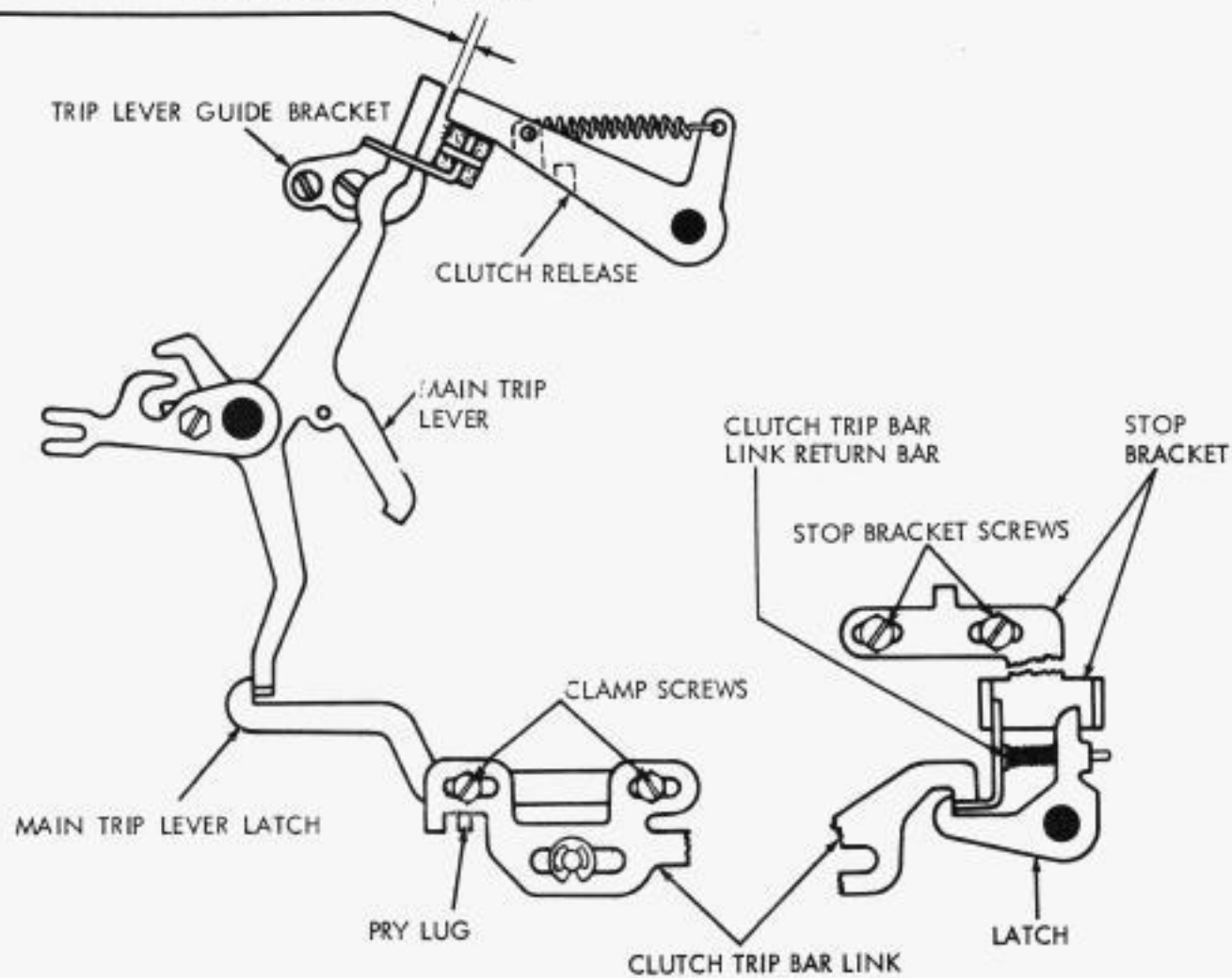


FIGURE 1-67. PERFORATOR CLUTCH RELEASE MECHANISM

CODE BAR EXTENSION BAIL SPRING REQUIREMENT

CONTROL KNOB IN K-T POSITION,
MIN. 7 OZS.

TO START EXTENSION BAIL MOVING.

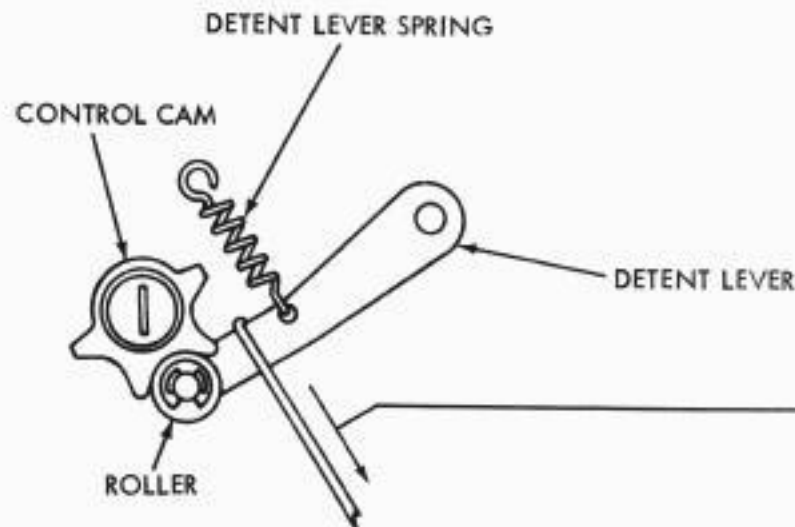
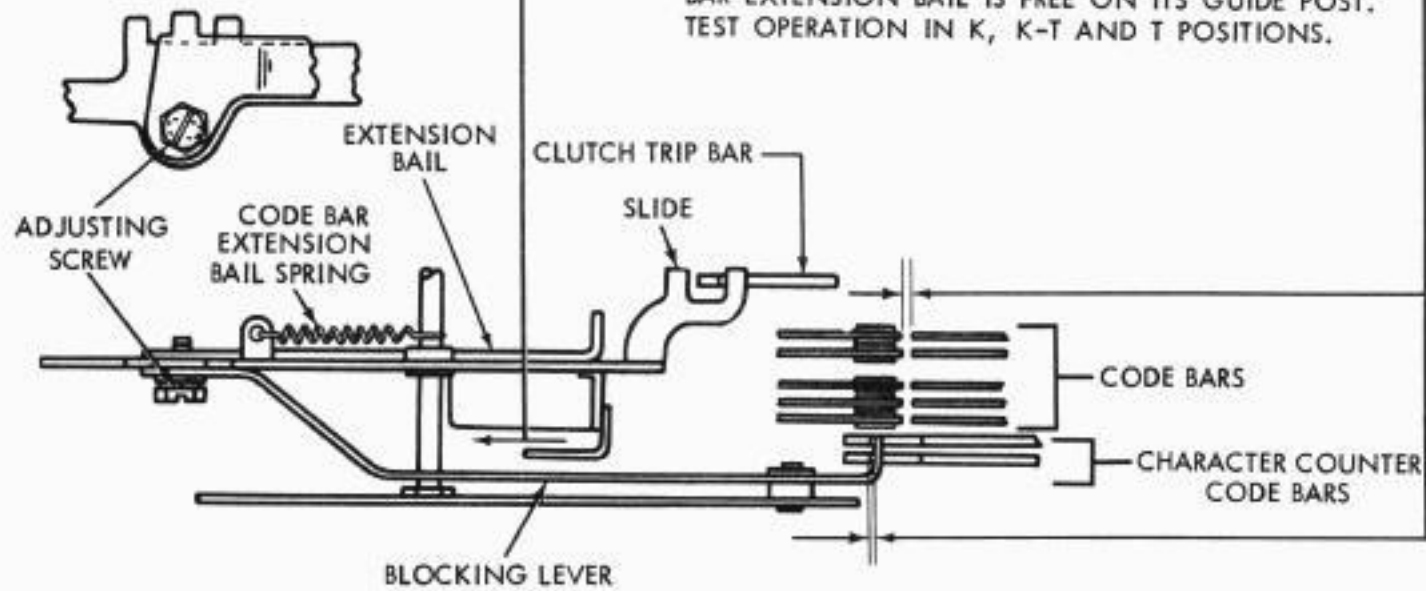
CODE BAR EXTENSION BLOCKING ASSEMBLY REQUIREMENT

SELECTOR SWITCH IN K POSITION. CODE BAR EXTENSIONS AND CHARACTER COUNTER BARS SHOULD NOT OPERATE.

- (1) CLEARANCE BETWEEN RIGHT END AT CODE BAR EXTENSIONS AND CODE BARS.
MIN. SOME
MAX. 0.015 INCH
- (2) CLEARANCE BETWEEN BLOCKING LEVER AND SIDE OF NOTCH IN CHARACTER COUNTER CODE BARS. BAR WITH CLOSEST GAP
MIN. SOME
MAX. 0.008 INCH

TO ADJUST

WITH CLUTCH LATCHED, TURN CONTROL KNOB TO THE K POSITION. STRIKE LTRS KEYLEVER AND ROTATE SIGNAL GENERATOR SHAFT TO RETURN CODE BARS TO EXTREME LEFT. WITH ADJUSTING SCREW FRICTION TIGHT, POSITION EXTENSION BAIL TO OBTAIN REQUIREMENT (1) AND POSITION BLOCKING LEVER TO OBTAIN REQUIREMENT (2) MAKE CERTAIN THAT THE CODE BAR EXTENSION BAIL IS FREE ON ITS GUIDE POST. TEST OPERATION IN K, K-T AND T POSITIONS.



DETENT LEVER SPRING REQUIREMENT

MIN. 4 LBS.
MAX. 5 LBS.
TO START LEVER MOVING.

FIGURE 1-68. CODE BAR EXTENSION AND DETENT LEVER MECHANISMS

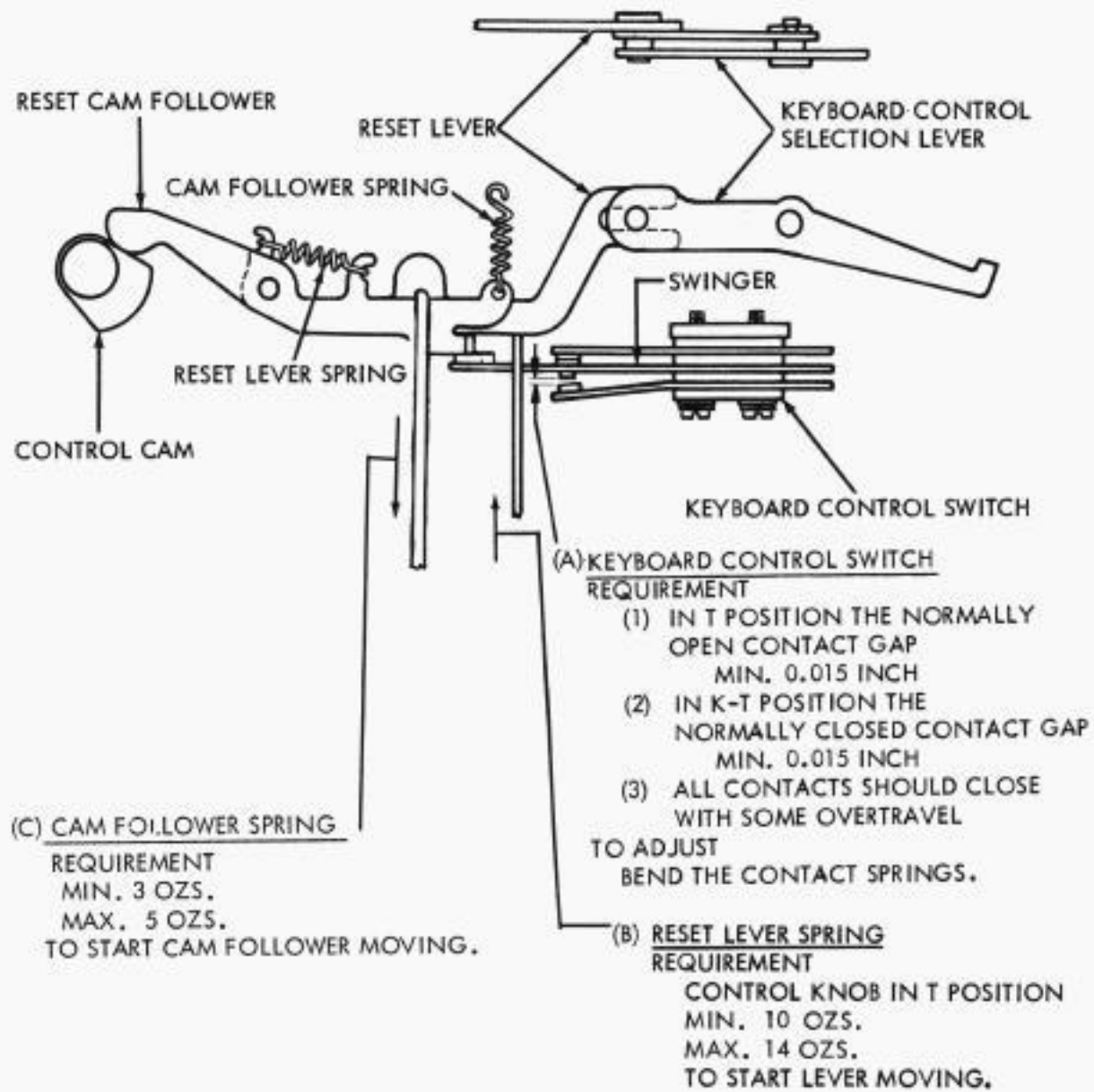
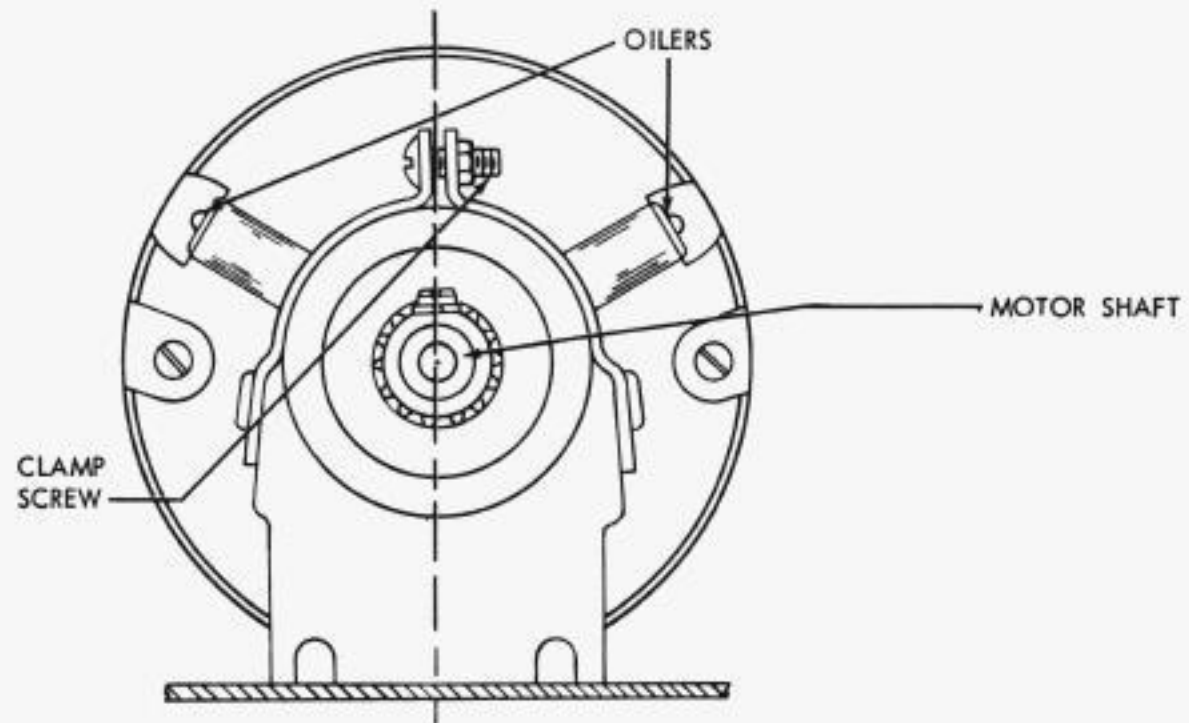


FIGURE 1-69. RESET CAM FOLLOWER AND KEYBOARD CONTROL SWITCH MECHANISM

4. MOTOR

CAUTION

IF THE MOTOR SHOULD BECOME BLOCKED FOR SEVERAL SECONDS, THE THERMAL CUT-OUT SWITCH WILL BREAK THE CIRCUIT. SHOULD THIS HAPPEN, ALLOW THE MOTOR TO COOL AT LEAST 5 MINUTES BEFORE MANUALLY DEPRESSING THE RED BUTTON. AVOID REPEATED DEPRESSION.

SYNCHRONOUS MOTOR POSITIONINGREQUIREMENT

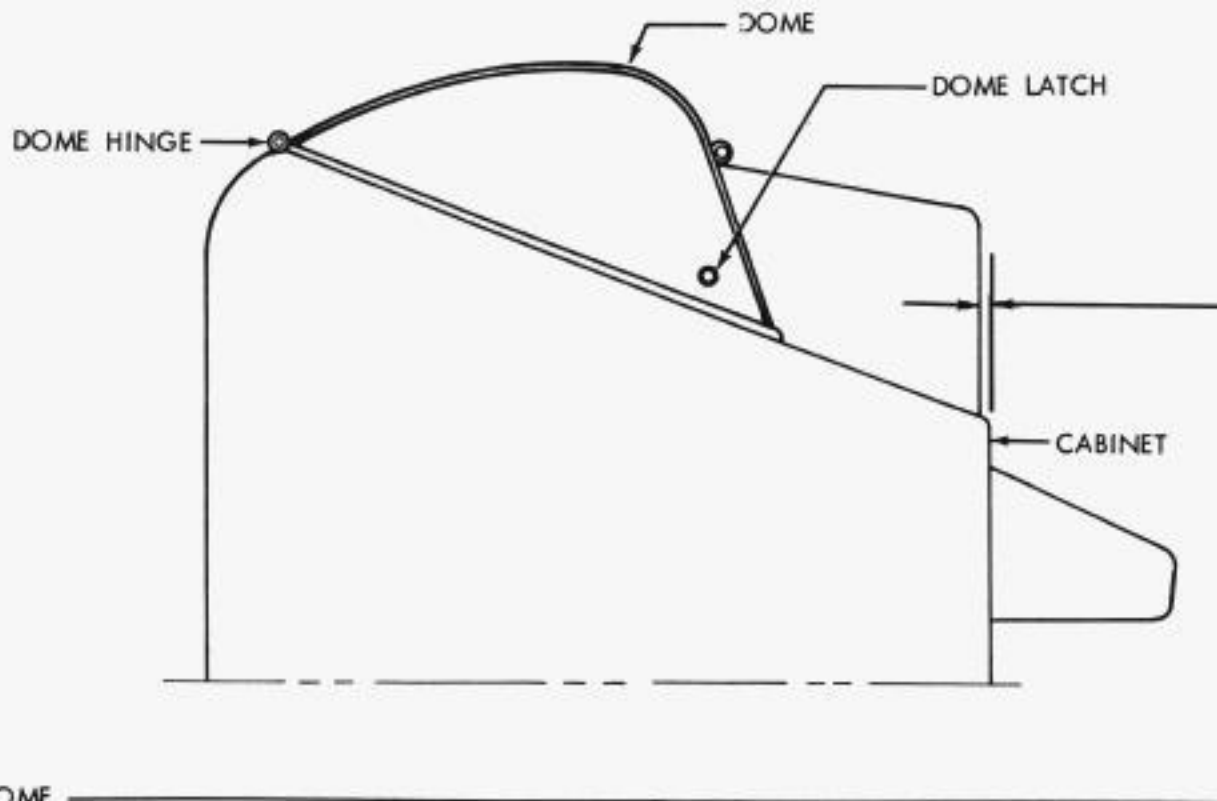
TWO OILERS SHOULD BE UPWARD AND APPROXIMATELY EQUIDISTANT FROM A VERTICAL LINE THROUGH THE MOTOR SHAFT.

TO ADJUST

POSITION THE MOTOR WITH BOTH CLAMP SCREWS LOOSENED.

FIGURE 1-70. SYNCHRONOUS MOTOR

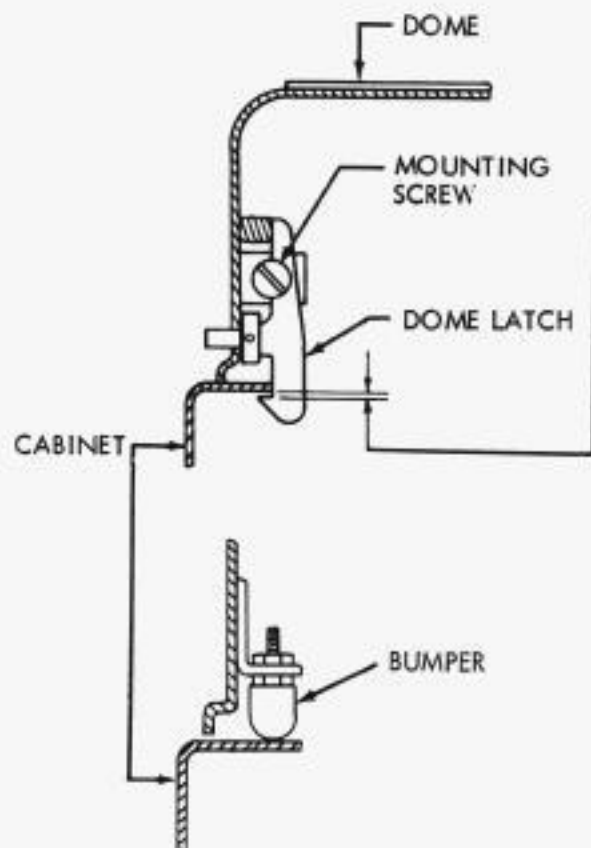
5. CABINET

DOMEREQUIREMENT

THE TORSION BARS SHOULD PREVENT THE DOME FROM LATCHING IN A "FREE FALL" AND SHOULD HOLD THE DOME AT REST MAX. 9 INCHES ABOVE THE RIGHT FRONT EDGE OF THE CABINET.

TO ADJUST

POSITION THE DOME WITH THE SCREWS, WHICH SECURE THE DOME HINGE TO THE CABINET, LOOSENED.



NOTE: IF NECESSARY TO CHECK REQUIREMENT, REMOVE BLANK CONTROL PANEL.

DOME LATCH(1) REQUIREMENT

WITH THE DOME LATCHED THERE SHOULD BE A SLIGHT PRESSURE ON THE RUBBER BUMPER.

TO ADJUST

LOOSEN PIVOT SCREWS ON BOTH RIGHT AND LEFT LATCHES. POSITION LATCHES TO PROVIDE SOME TO 0.032 INCH BETWEEN EACH LATCH AND ITS LATCHING SURFACE AND LOCK THE SCREWS. POSITION RUBBER BUMPER TO PROVIDE 0.030 TO 0.045 INCH BETWEEN DOME AND CABINET AND SECURE THE BUMPERS. A SLIGHT PRESSURE SHOULD LATCH THE DOME.

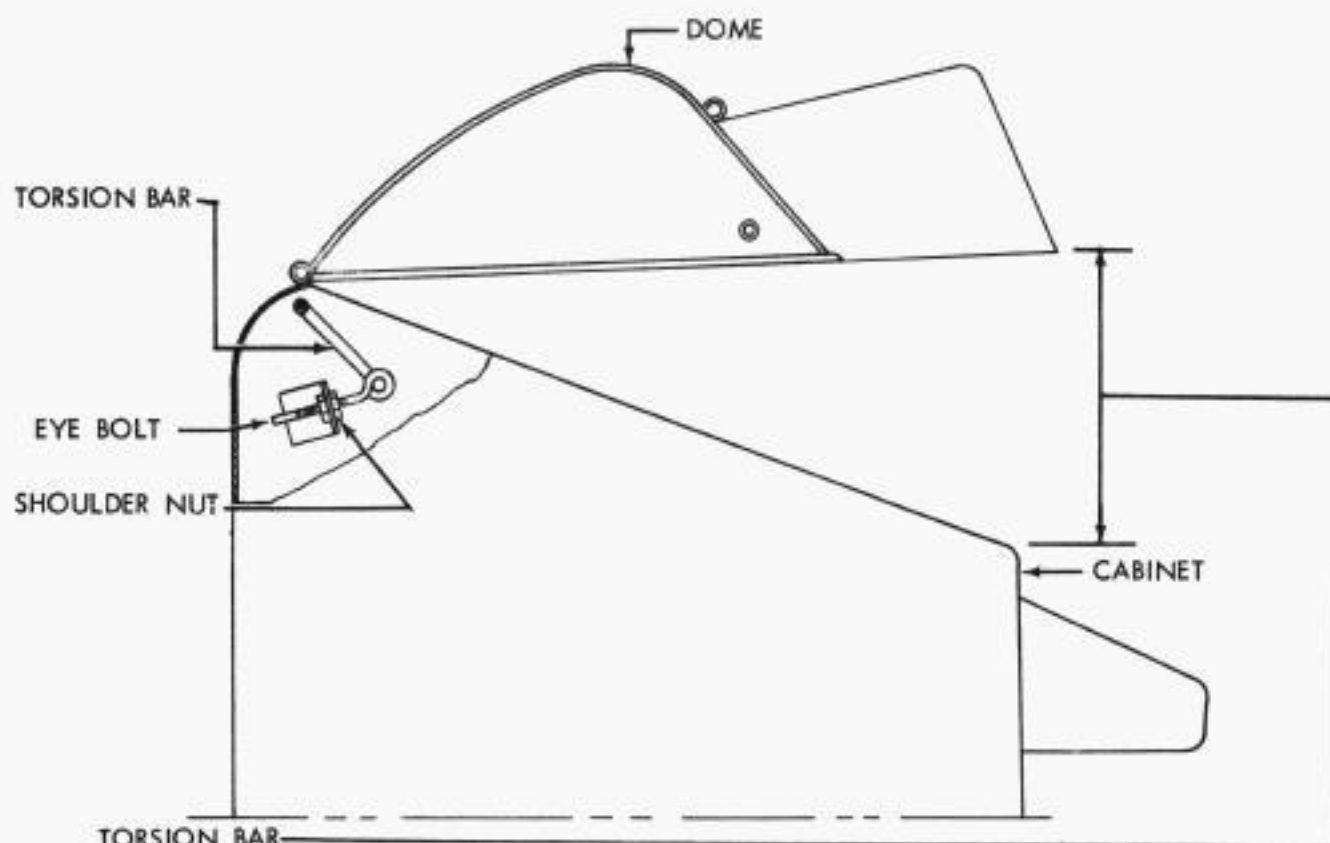
(2) REQUIREMENT

IT SHOULD NOT BE POSSIBLE TO DEPRESS THE DOME LATCH BUTTON COMPLETELY INTO THE DOME.

TO ADJUST

POSITION THE LATCH TOWARD THE OUTSIDE SURFACE OF DOME WITH MOUNTING SCREWS LOOSENED.

FIGURE 1-71. CABINET DOME

**TORSION BAR**

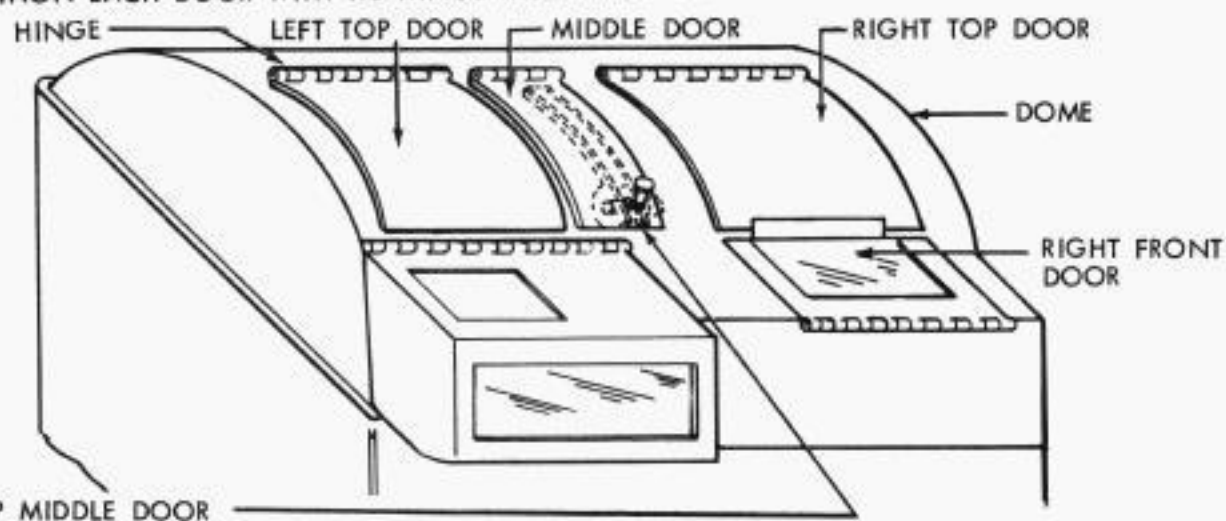
- (1) REQUIREMENT—WHEN THE CLOSED DOME IS RELEASED FROM ITS LATCHES THE TORSION BARS SHOULD LIFT THE DOME ABOVE THE FRONT EDGE OF CABINET
MIN. 7 INCHES—MAX. 9 INCHES
- (2) REQUIREMENT—WHEN DOME IS STARTED DOWN BY SLIGHT PUSH FROM ITS FULLY OPENED POSITION IT SHOULD NOT CLOSE OR LATCH. NOTE: READJUST DOME IF MORE APPARATUS IS ADDED.
- TO ADJUST
TURN THE SHOULDER NUTS ON THE EYE BOLTS CLOCKWISE TO INCREASE THE SPRING TORQUE, AND COUNTERCLOCKWISE TO DECREASE THE SPRING TORQUE.

TOP DOORS (RIGHT AND LEFT)**REQUIREMENT**

THE DOORS SHOULD SET SQUARELY AND UNIFORMLY ON THE CONTOUR OF THE DOME.

TO ADJUST

POSITION EACH DOOR WITH ITS HINGE MOUNTING SCREWS LOOSENED.

**TOP MIDDLE DOOR****REQUIREMENT**

THE DOOR SHOULD REST FLAT AND SQUARELY ON THE DOME. THE REINFORCEMENT CHANNEL SHOULD FIT OVER ITS GUIDE BRACKET IN THE DOME.

TO ADJUST

REMOVE THE SPRING DETENT FROM CENTER OF DOME AND POSITION THE DOOR WITH ITS HINGE MOUNTING SCREWS AND BRACKET MOUNTING SCREWS LOOSENED.

RIGHT FRONT DOOR**REQUIREMENT**

THE RIGHT AND LEFT EDGES OF THE RIGHT FRONT DOOR SHOULD BE EVEN WITH THE RIGHT TOP DOOR. WITH THE DOOR CLOSED IT SHOULD REST FLAT ON THE HORIZONTAL SURFACE OF THE DOME.

TO ADJUST

REMOVE THE THUMB SCREWS, LATCHES, AND SPRINGS FROM THE DOOR, AND POSITION THE DOOR WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 1-72. CABINET DOME

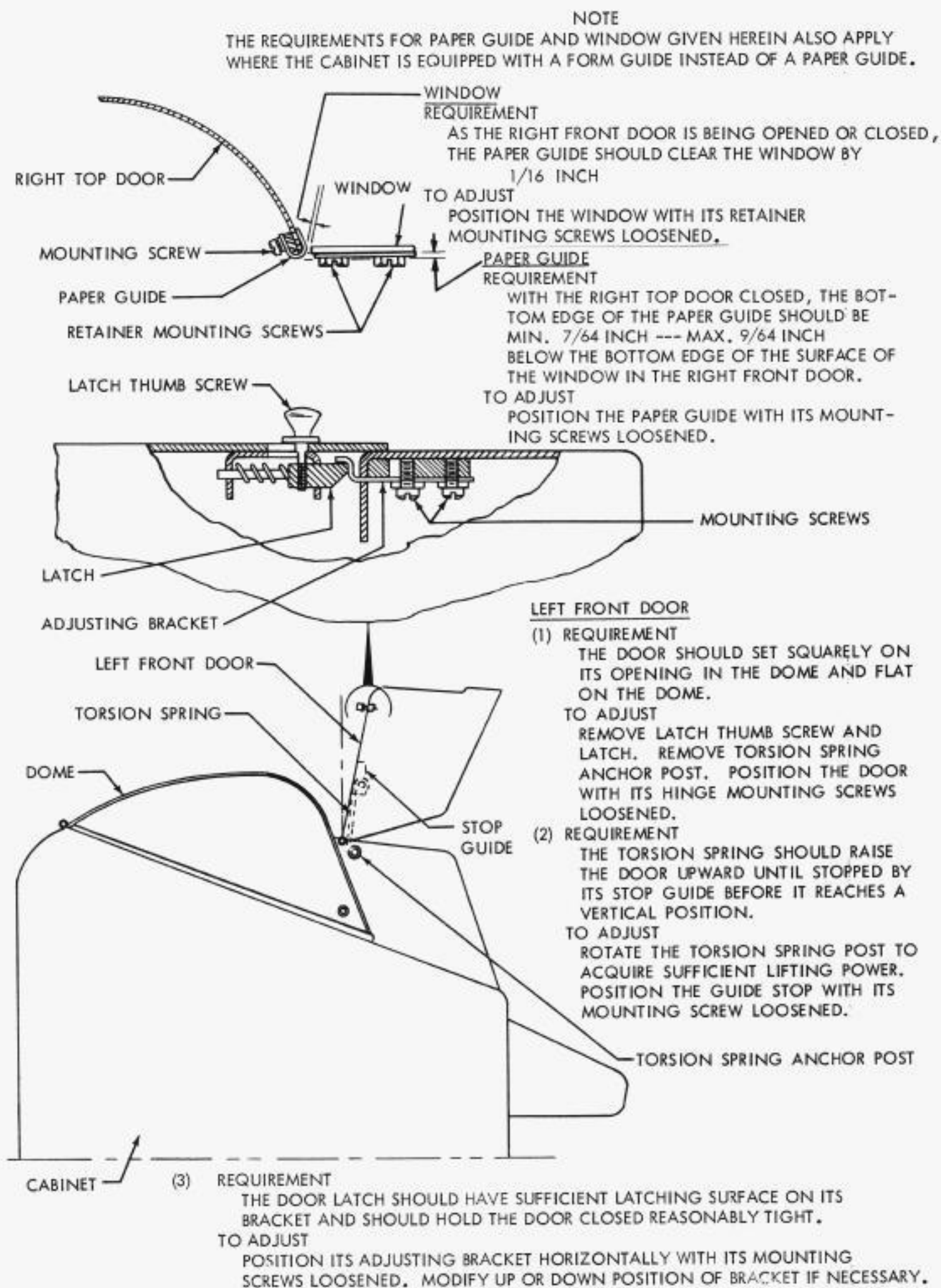
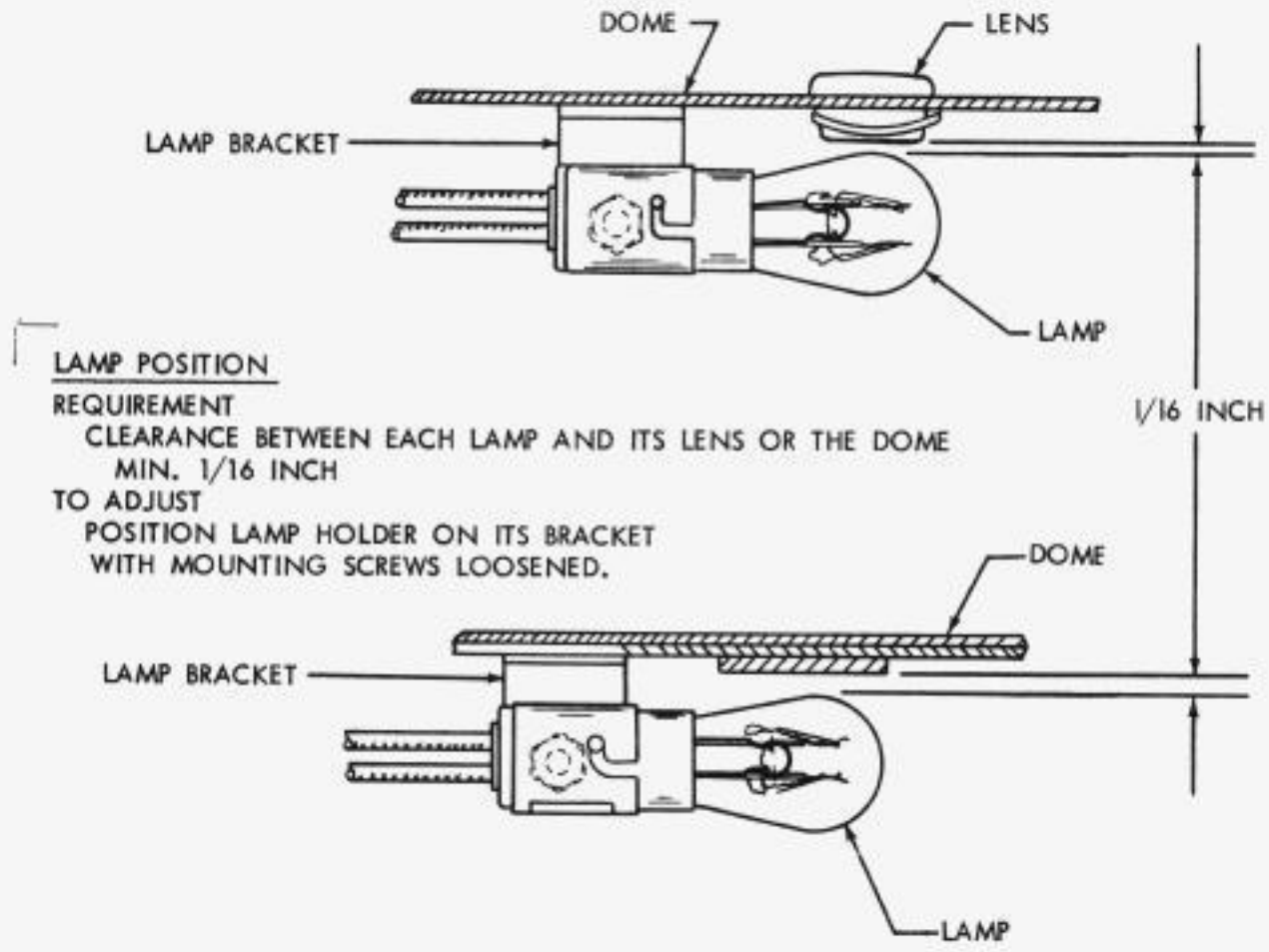


FIGURE 1-73. CABINET DOME



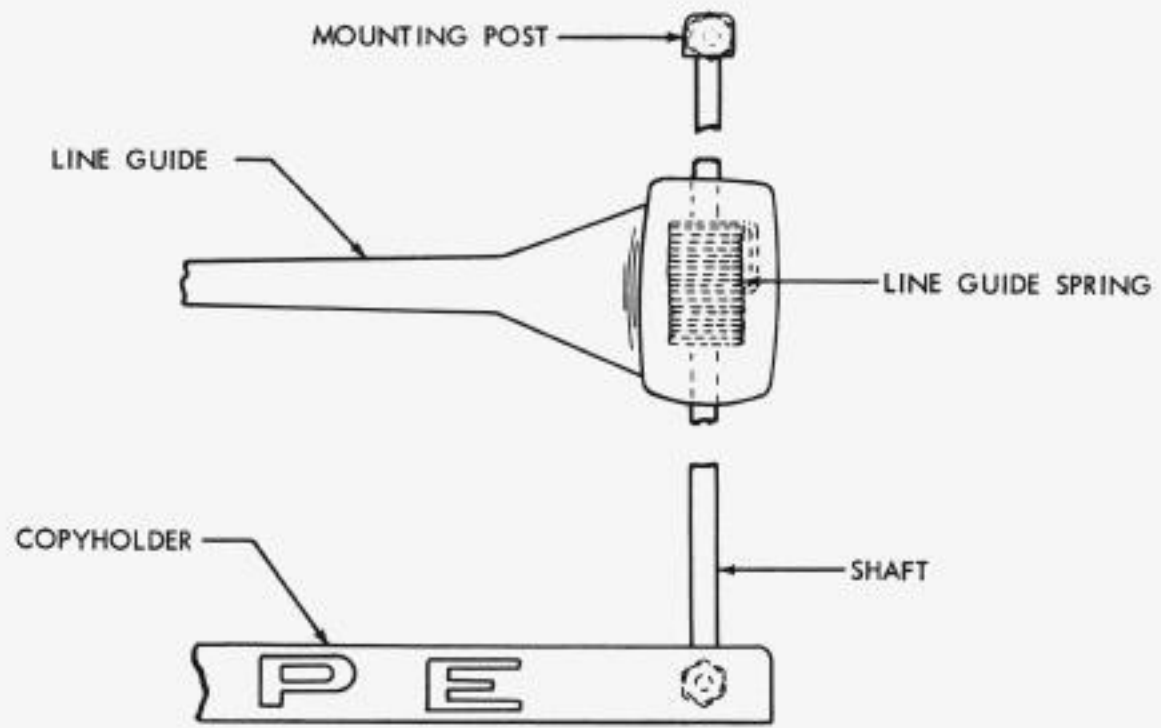
LAMP POSITION

REQUIREMENT

CLEARANCE BETWEEN EACH LAMP AND ITS LENS OR THE DOME
MIN. 1/16 INCH

TO ADJUST

POSITION LAMP HOLDER ON ITS BRACKET
WITH MOUNTING SCREWS LOOSENED.



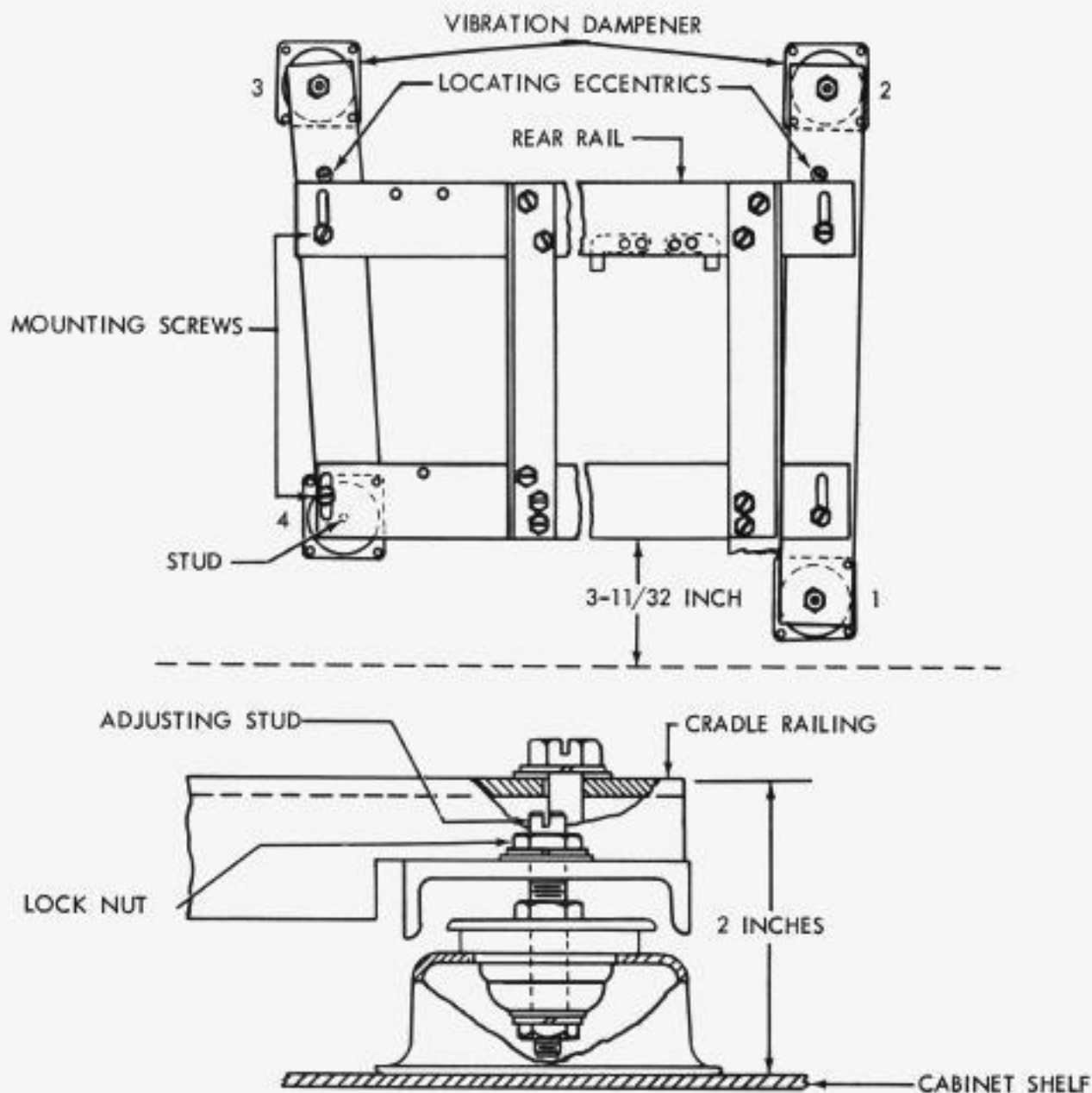
**COPYHOLDER
REQUIREMENT**

THERE SHOULD BE SUFFICIENT TENSION ON THE LINE
GUIDE TO PREVENT IT FROM SLIPPING DOWN ITS SHAFT.
IT SHOULD ALSO HOLD THE COPY IN PLACE.

TO ADJUST

REMOVE THE MOUNTING SCREWS OR NUTS FROM THE
SHAFT AND TURN THE SHAFT SO AS TO INCREASE THE
SPRING TENSION. REPLACE THE SHAFT MOUNTING
POST.

FIGURE 1-74. COPYLIGHT; PAPER GUIDE

**CRADLE****(1) REQUIREMENT**

UNDER NORMAL LOAD, THE TOP OF THE CRADLE RAILING SHOULD BE 2 INCHES

FROM THE SHELF OF THE CABINET

TO ADJUST

LOOSEN THE LOCK NUTS ON VIBRATION DAMPENER NO. 1, 2, AND 3 ON TOP OF THE LEFT AND RIGHT RAILS. LOOSEN THE NUT ON THE LOWER END OF STUD IN MOUNT NO. 4. ROTATE THE ADJUSTING STUDS UNTIL THE RAILS HAVE REACHED THE DESIRED HEIGHT. TIGHTEN ALL NUTS PREVIOUSLY LOOSENED.

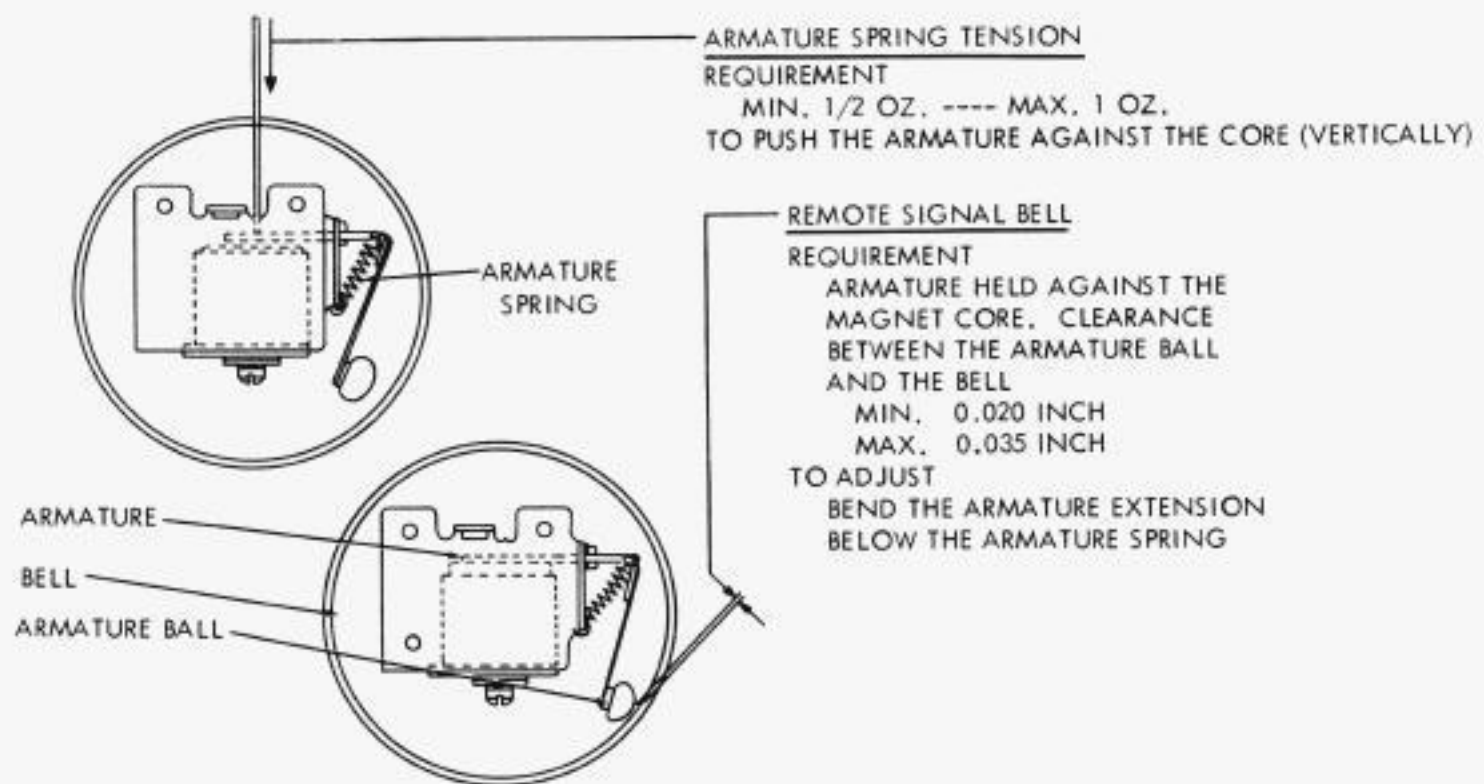
(2) REQUIREMENT

THE FRONT RAIL SHOULD BE POSITIONED APPROXIMATELY 3-11/32 INCH FROM AND PARALLEL TO THE FRONT OF THE CABINET.

TO ADJUST

POSITION THE BASE RAIL ASSEMBLY WITH ITS FOUR MOUNTING SCREWS AND TWO LOCATING ECCENTRICS LOOSENED AFTER POSITIONING THE RAIL ASSEMBLY TO DESIRED POSITION, ROTATE THE ECCENTRICS AGAINST THE REAR RAIL AND LOCK IN POSITION.

FIGURE 1-75. CRADLE

LEFT FRONT CROSS BAR

NOTE

THE FRONT CROSS BAR BRACKETS ARE LOCATED AT THE FACTORY AND SHOULD NOT BE DISTURBED UNLESS IT IS NECESSARY TO REMOVE FOR REPLACEMENT. SHOULD THEY HOWEVER BE REMOVED REPLACE AS FOLLOWS:

REQUIREMENT

THE ADJUSTABLE CROSS BAR BRACKETS SHOULD BE POSITIONED 0.050 FROM THE FRONT EDGE OF THE CABINET BODY CROSS BAR

TRANSMITTER HOUSING

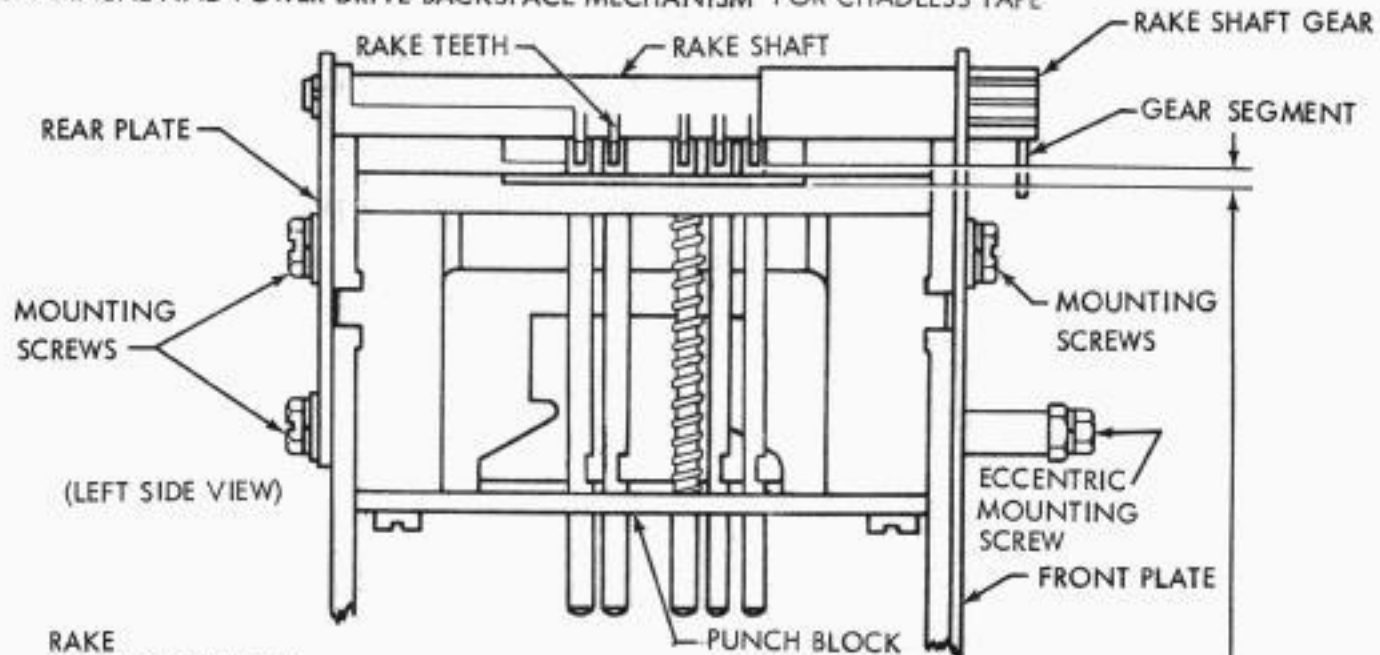
REQUIREMENT

THE HOUSING MOUNTING BRACKET ON THE LEFT FRONT CROSS BAR SHOULD BE POSITIONED TO PROVIDE A MINIMUM OF 0.020 INCH BETWEEN THE HOUSING AND THE TRANSMITTER UNIT.

FIGURE 1-76. SIGNAL BELL

SECTION 2-VARIABLE FEATURE ADJUSTMENTS

1. MANUAL AND POWER DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE

RAKE
(1) REQUIREMENT

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

TO ADJUST

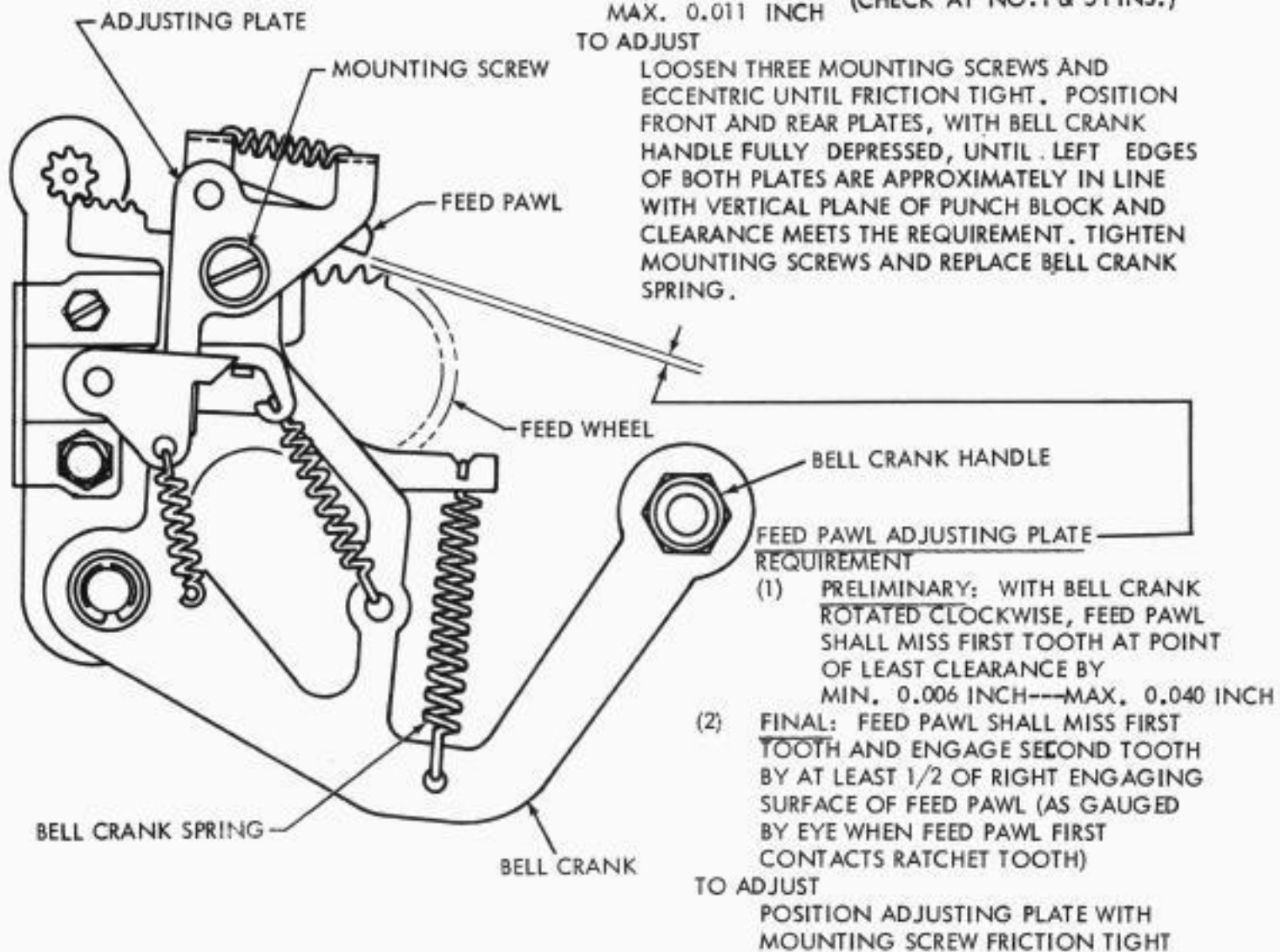
REMOVE TWO MOUNTING SCREWS FROM REAR PLATE. POSITION RAKE SHAFT GEAR IN RELATION TO GEAR SEGMENT. REPLACE MOUNTING SCREWS.

(2) REQUIREMENT

WITH BELLCRANK 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 THREE MOUNTING SCREWS AND ECCENTRIC UNTIL FRICTION TIGHT. POSITION FRONT AND REAR PLATES, WITH BELL CRANK HANDLE FULLY DEPRESSED, UNTIL LEFT EDGES OF BOTH PLATES ARE APPROXIMATELY IN LINE WITH VERTICAL PLANE OF PUNCH BLOCK AND CLEARANCE MEETS THE REQUIREMENT. TIGHTEN MOUNTING SCREWS AND REPLACE BELL CRANK SPRING.

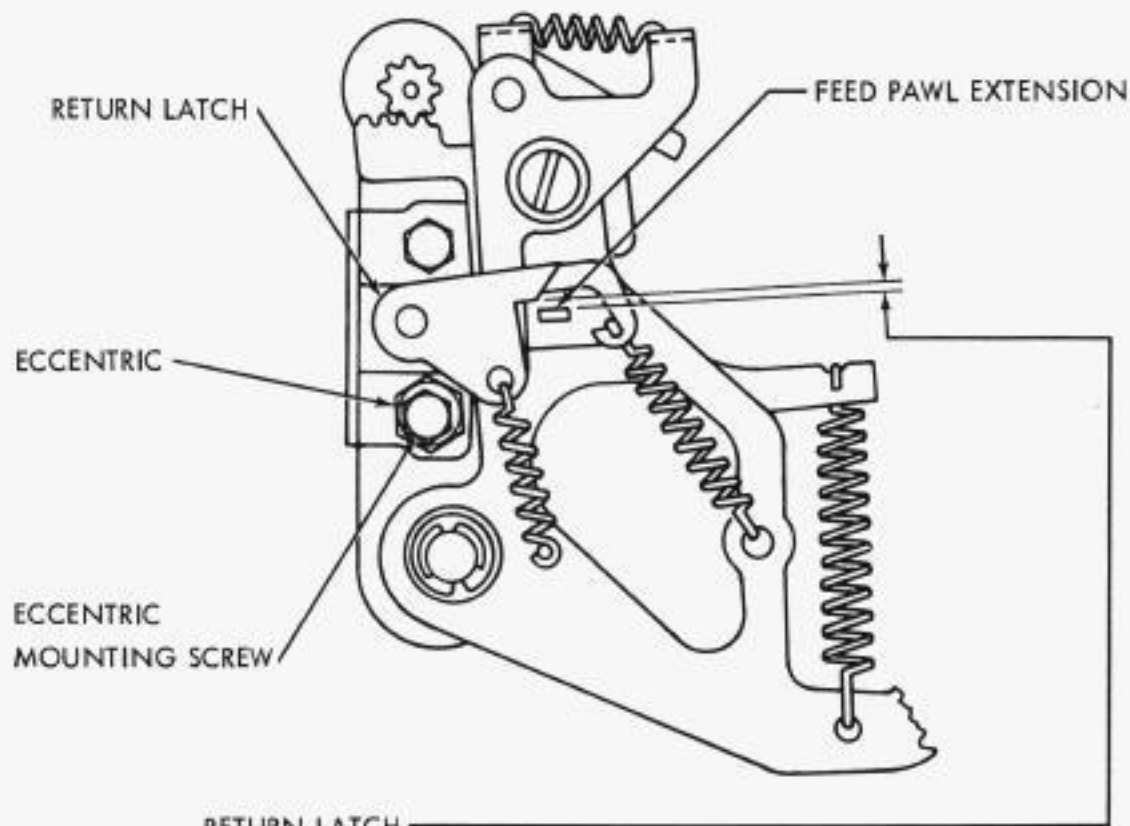
FEED PAWL ADJUSTING PLATE
REQUIREMENT

- (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

FIGURE 2-1. MANUAL AND POWER-DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE

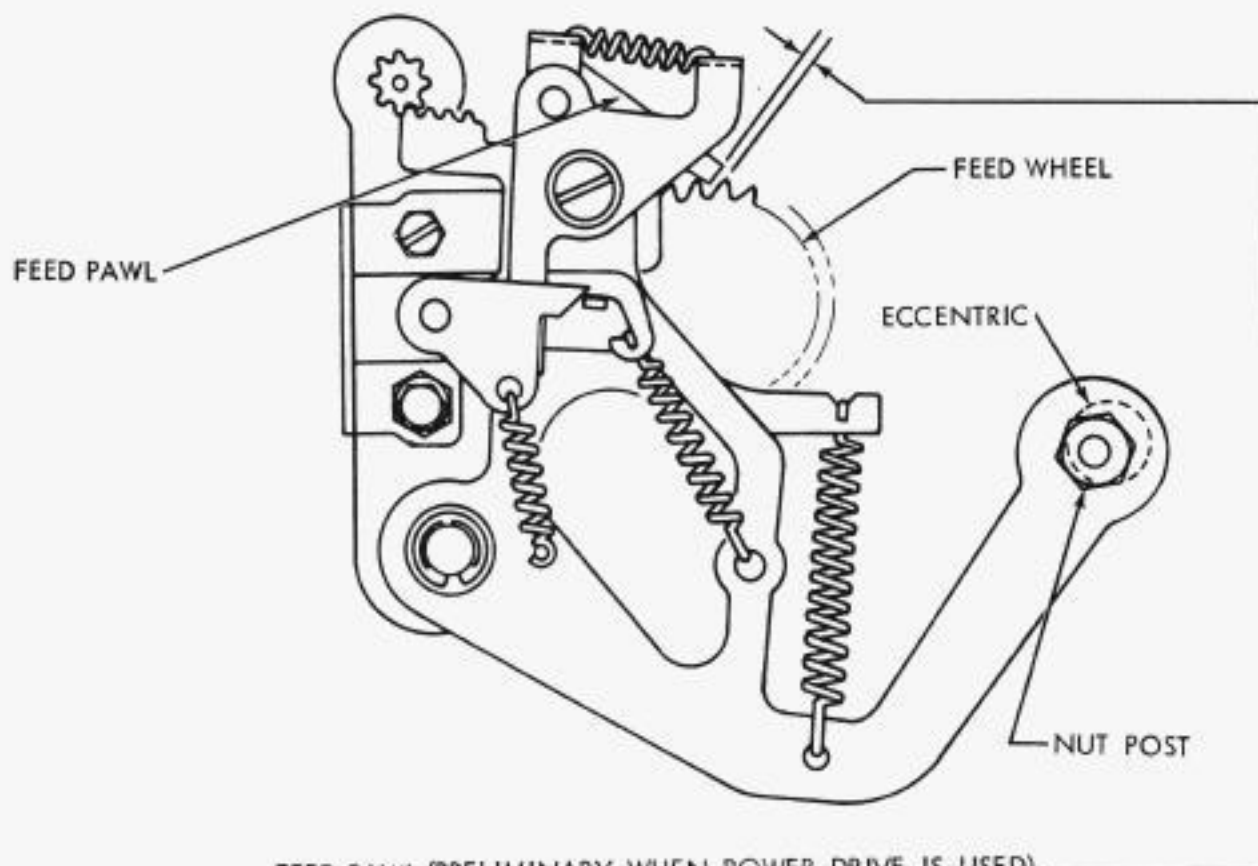


RETURN LATCH
REQUIREMENT

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.



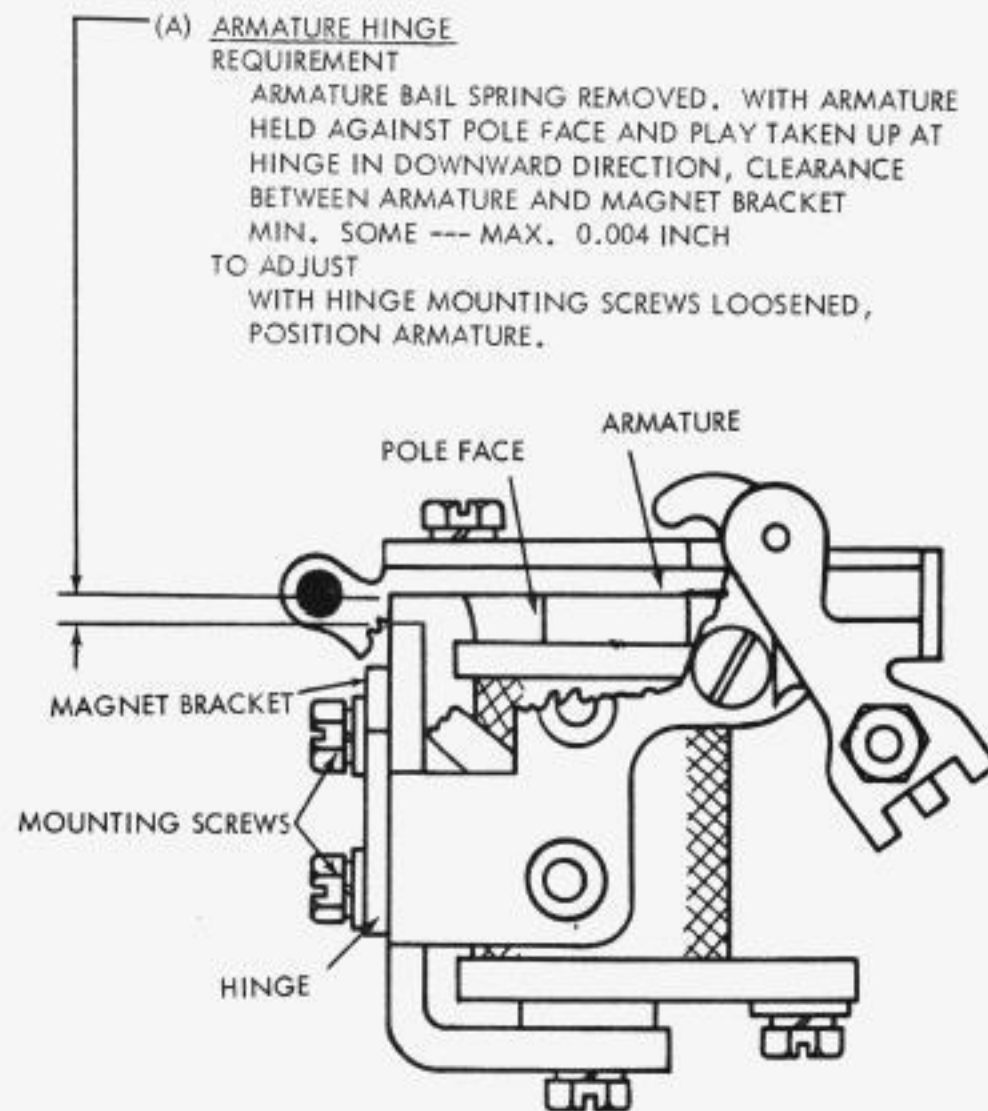
FEED PAWL (PRELIMINARY WHEN POWER DRIVE IS USED)
REQUIREMENT

BACKSPACE MECHANISM IN OPERATED POSITION, FEED WHEEL
DETENTED BACKWARD ONE SPACE. CLEARANCE BETWEEN FEED
WHEEL RATCHET TOOTH AND FEED PAWL.
MIN. SOME
MAX. 0.003 INCH

TO ADJUST

BY MEANS OF 0.060 INCH ALLEN WRENCH, ROTATE
ECCENTRIC WITH NUT POST FRICTION TIGHT. CHECK EACH 90 DEGREES.

FIGURE 2-2. MANUAL AND POWER-DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE



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.

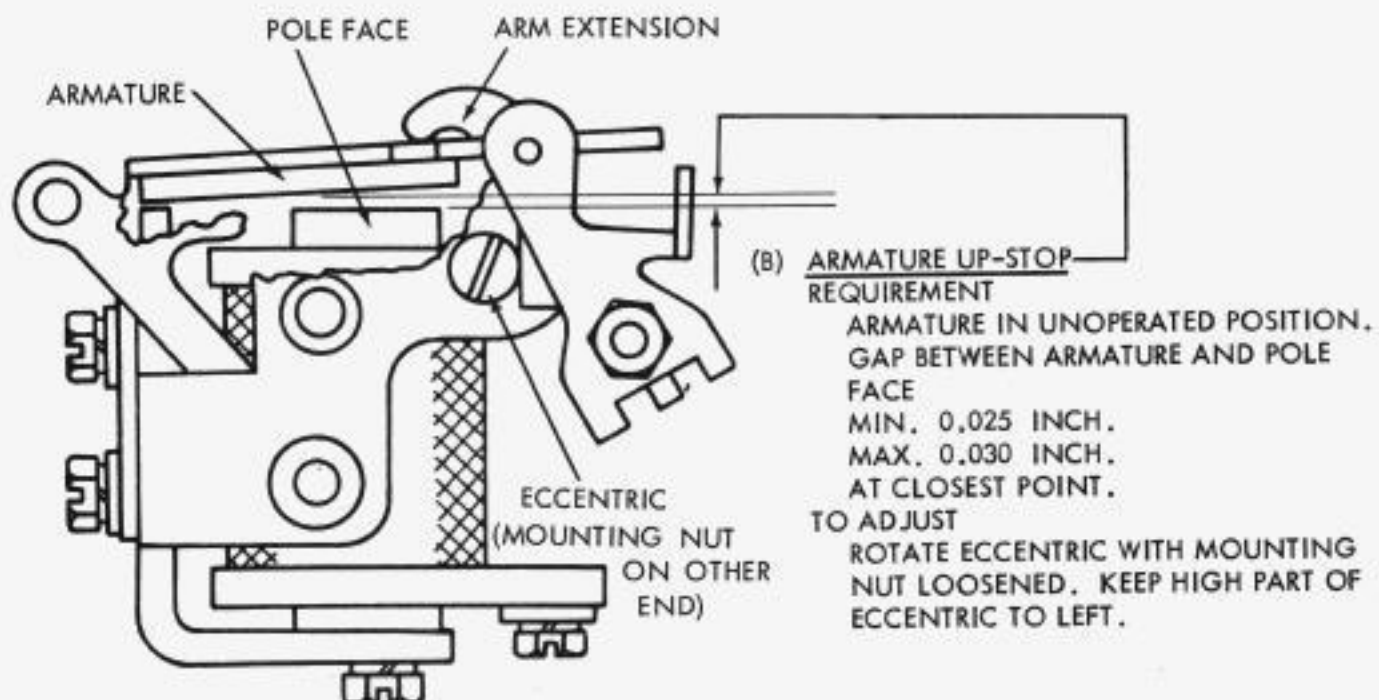
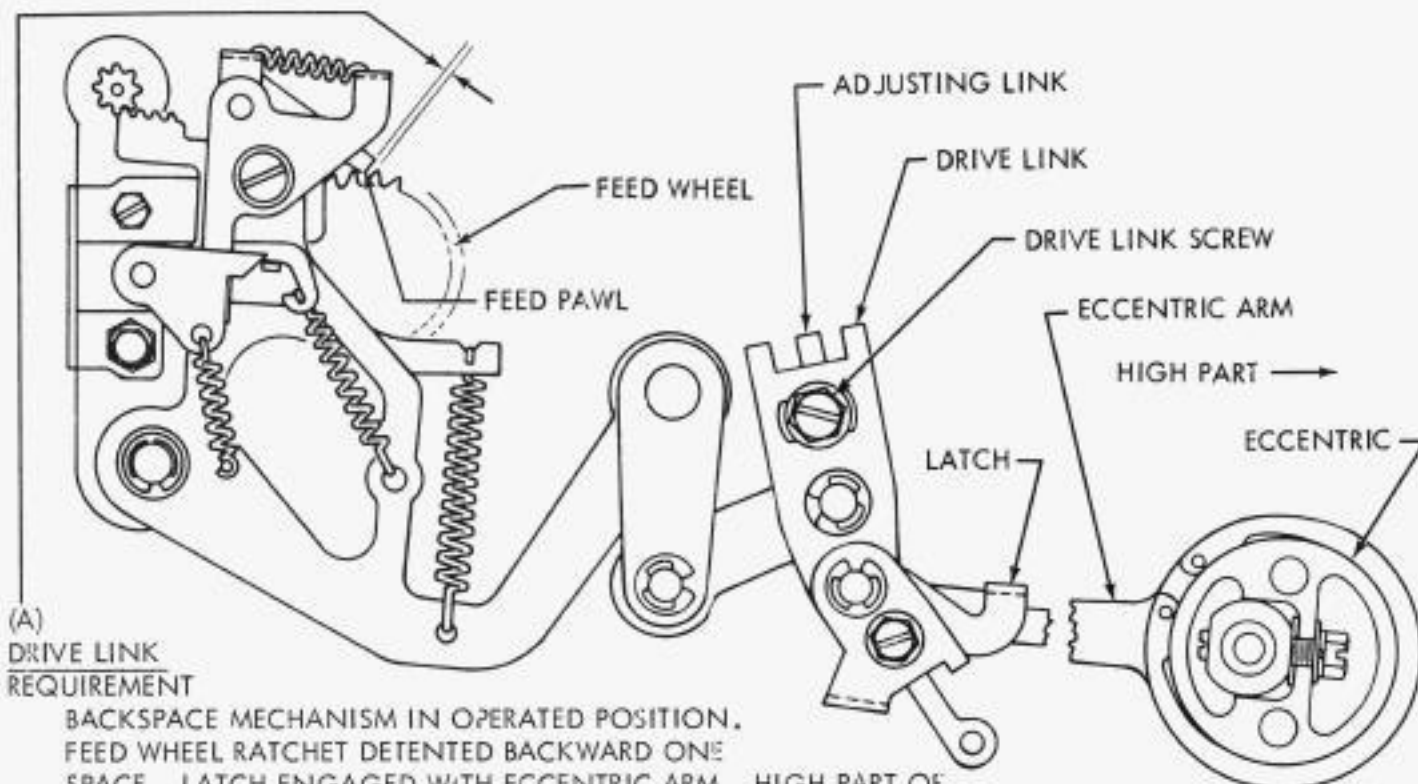


FIGURE 2-3. POWER-DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE



(A)
DRIVE LINK
REQUIREMENT

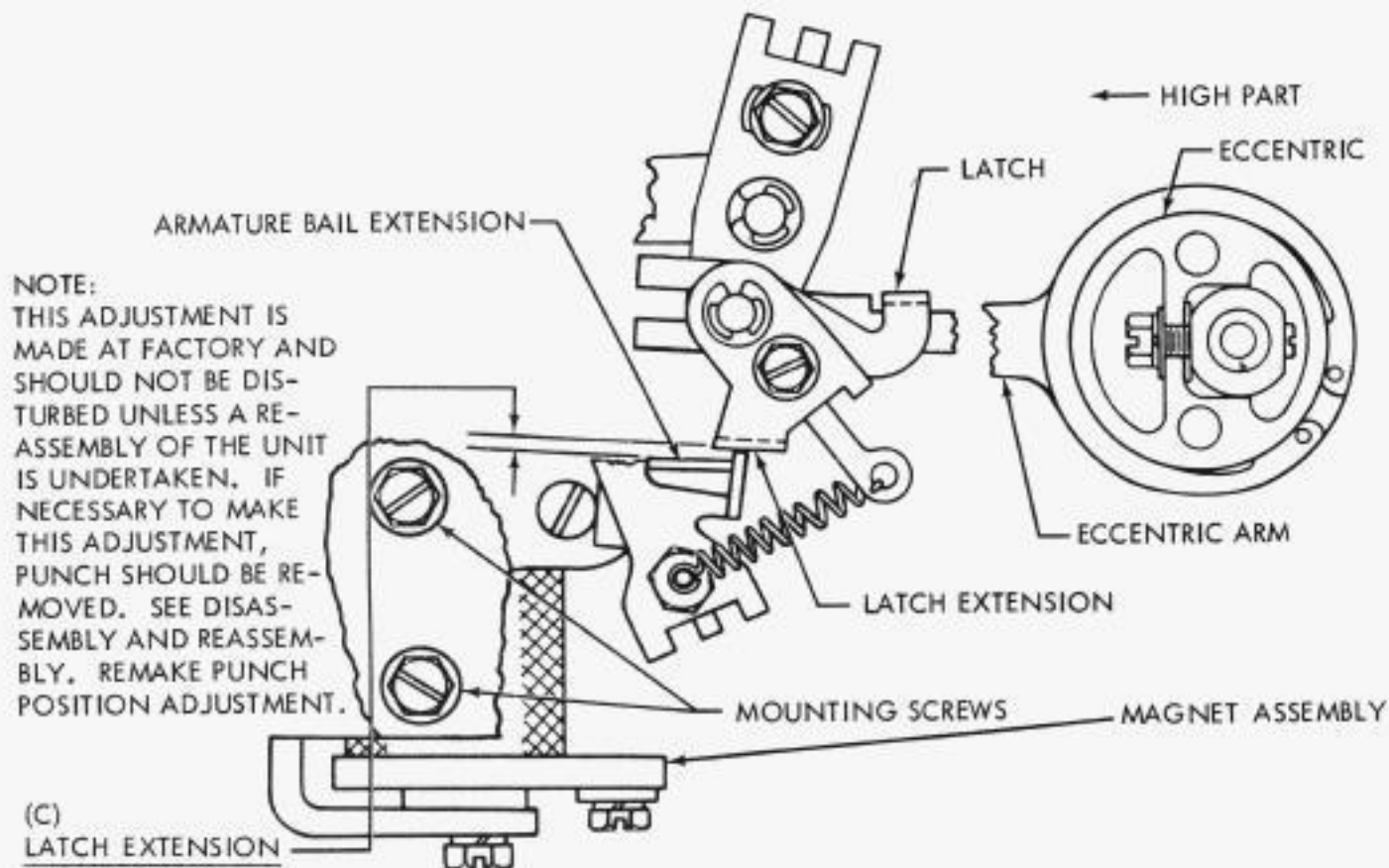
BACKSPACE MECHANISM IN OPERATED POSITION. FEED WHEEL RATCHET DETENTED BACKWARD ONE SPACE. LATCH ENGAGED WITH ECCENTRIC ARM. HIGH PART OF ECCENTRIC TO THE RIGHT. CLEARANCE BETWEEN FEED PAWL AND FEED WHEEL RATCHET TOOTH CHECKED AT EACH 10 DEGREES.

MIN. -SOME---MAX. 0.003 INCH

TO ADJUST

BY MEANS OF PRY POINT, POSITION ADJUSTING LINK WITH DRIVE LINK SCREW FRICTION TIGHT.

NOTE: (EXTREME CAUTION MUST BE USED TO AVOID BINDS) BACK OFF ON THE BELL CRANK ECCENTRIC TO MAINTAIN NOT MORE THAN 0.020 INCH BETWEEN ECCENTRIC AND BOTTOM OF HOLE IN FRAME. REMOVE TAPE WHILE MAKING ADJUSTMENT.



NOTE:

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

(C)
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

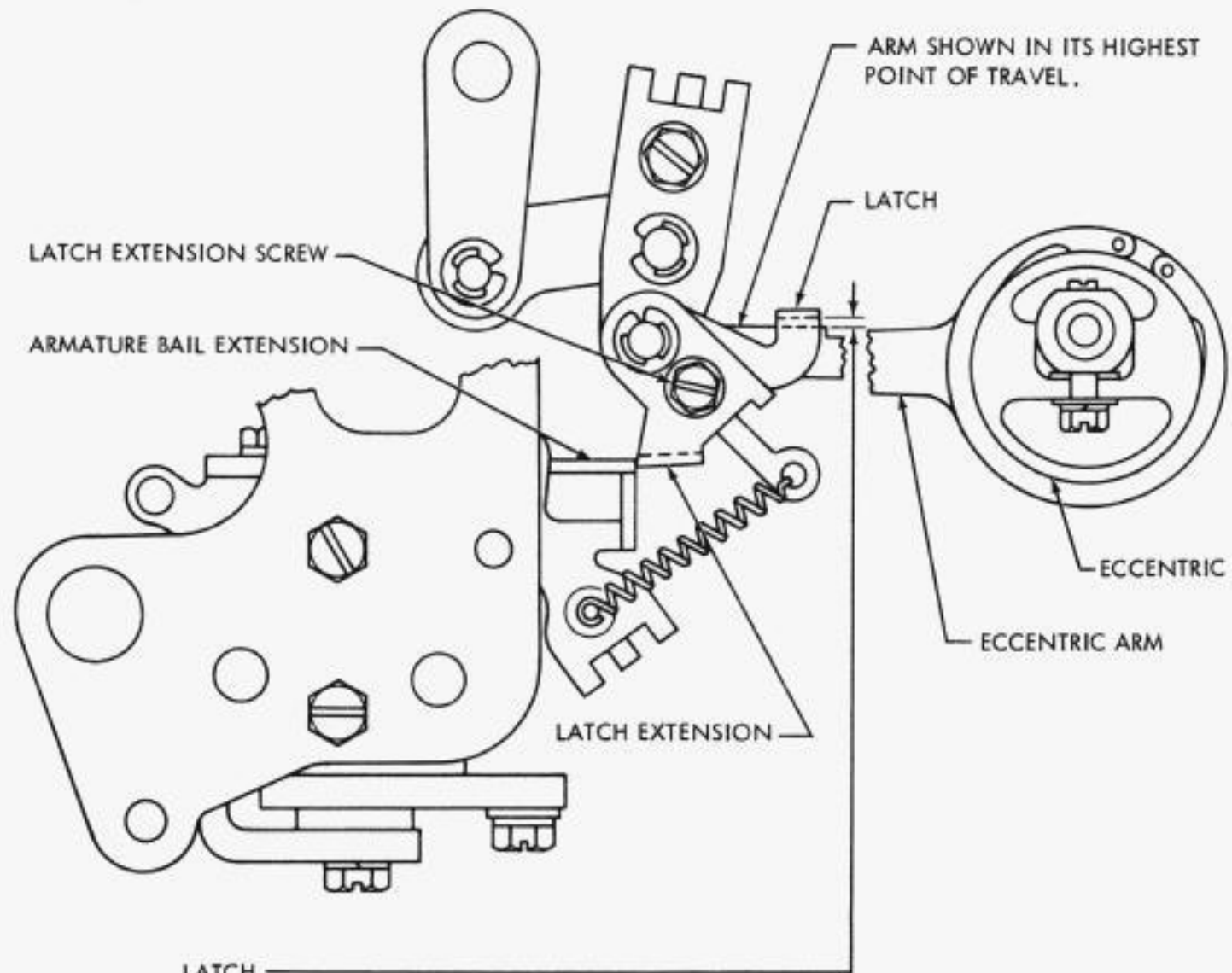
MIN. 0.005 INCH

MAX. 0.020 INCH

TO ADJUST

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

FIGURE 2-4. MANUAL AND POWER-DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE



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.

FIGURE 2-5. POWER DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE

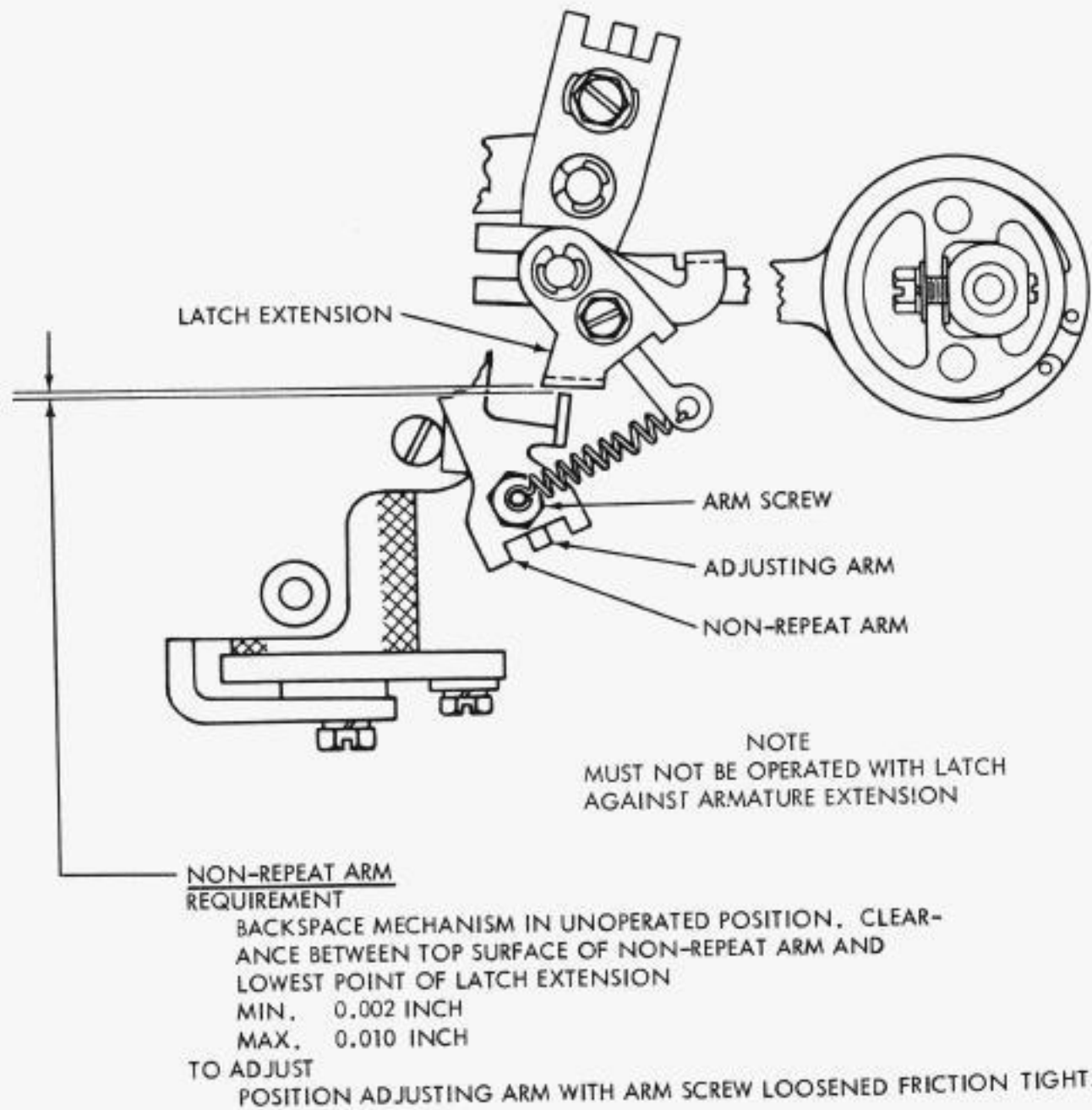


FIGURE 2-6. POWER DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE

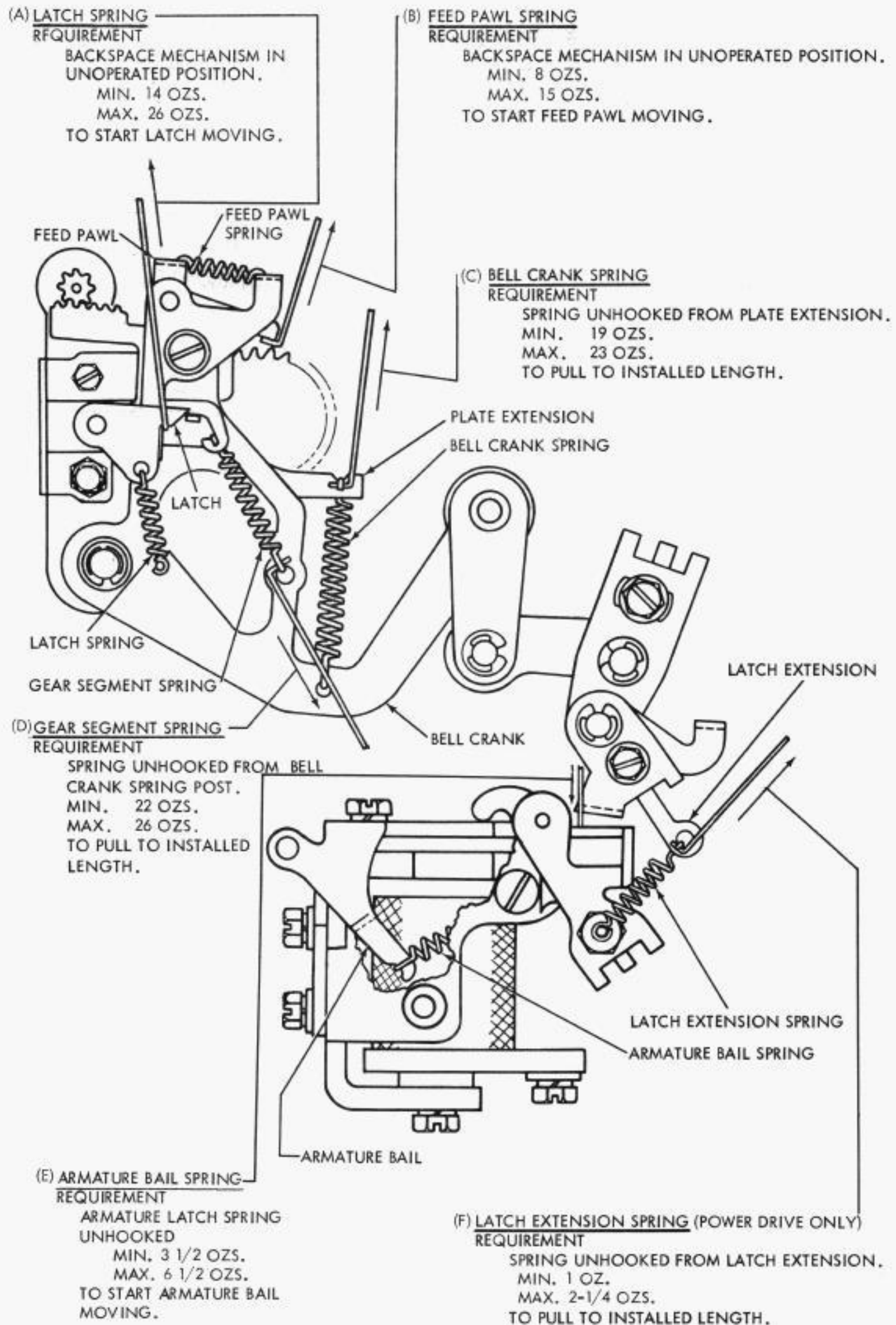


FIGURE 2-7. MANUAL AND POWER-DRIVE BACKSPACE MECHANISM FOR CHADLESS TAPE

2. POWER DRIVE BACKSPACE MECHANISM
FOR FULLY PERFORATED TAPE.

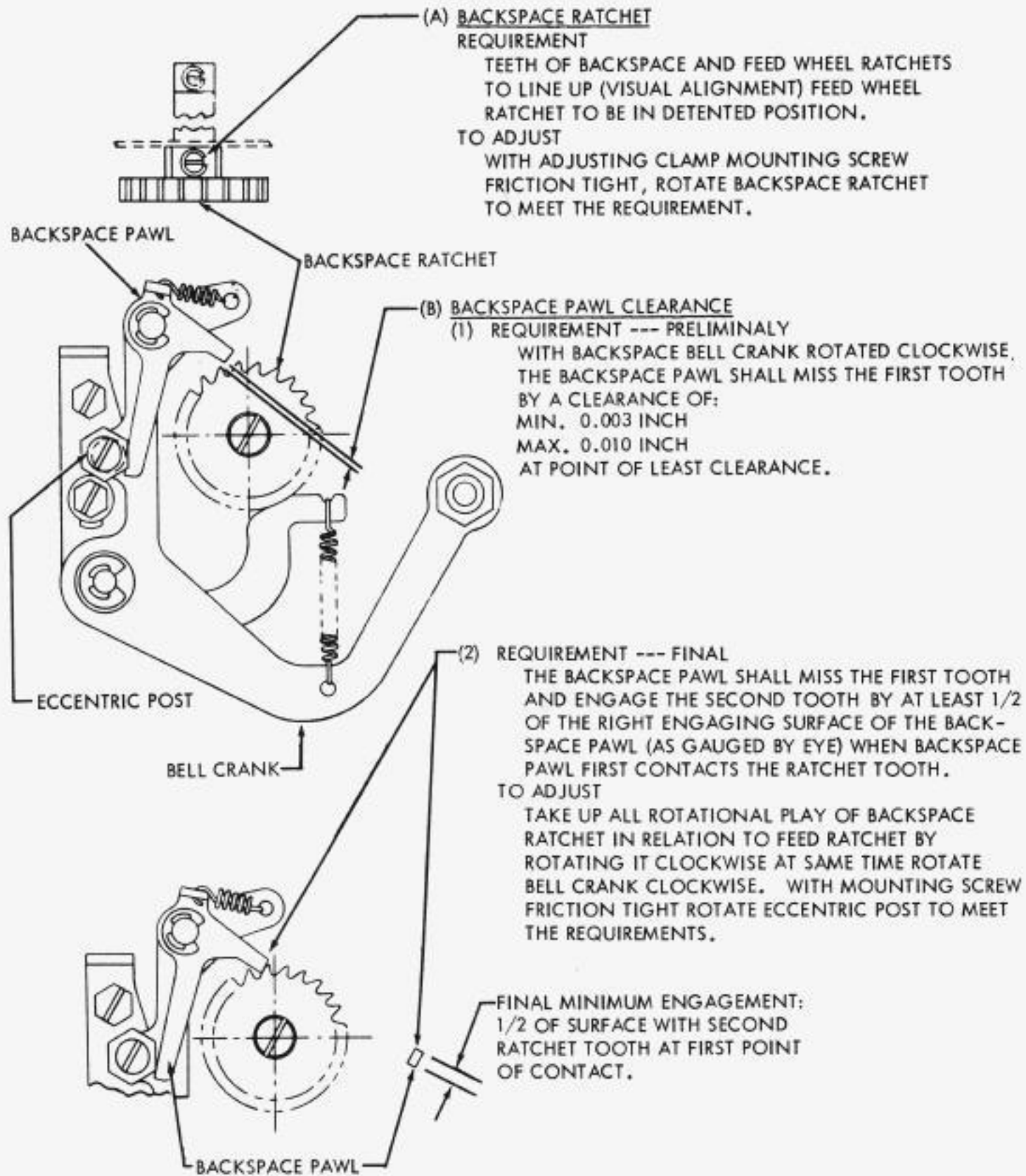


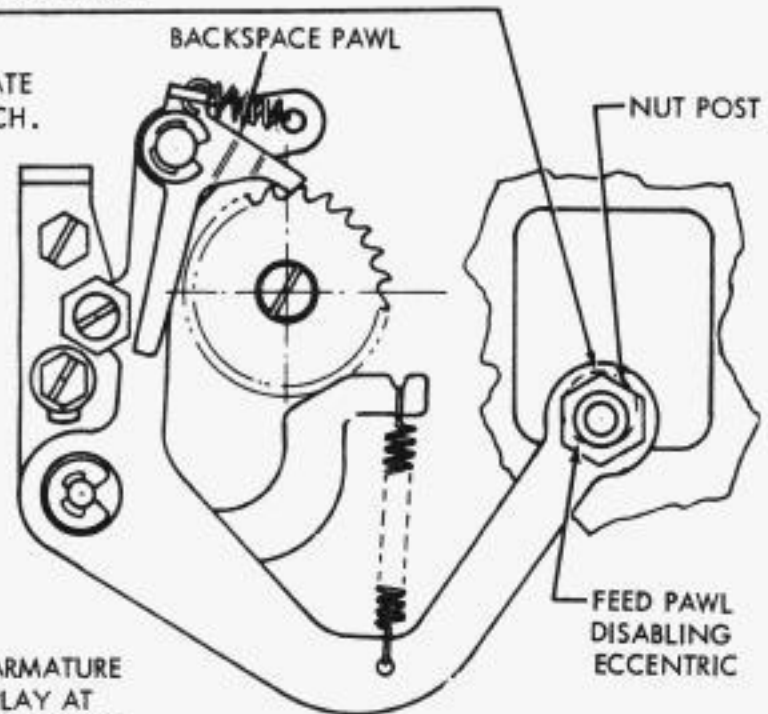
FIGURE 2-8. POWER-DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE

(A) FEED PAWL DISABLINGREQUIREMENT

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.

(B) ARMATURE HINGEREQUIREMENT

WITH ARMATURE BAIL SPRING REMOVED, ARMATURE HELD AGAINST THE POLE FACE, TAKE UP PLAY AT HINGE IN A DOWNWARD DIRECTION. CLEARANCE BETWEEN THE ARMATURE AND MAGNET BRACKET, MIN. SOME

MAX. 0.004 INCH

TO ADJUST

WITH HINGE MOUNTING SCREWS FRICTION TIGHT, POSITION HINGE. ARMATURE SHOULD TOUCH FRONT AND REAR OF POLE FACE. TIGHTEN SCREWS AND RECHECK ADJUSTMENT.

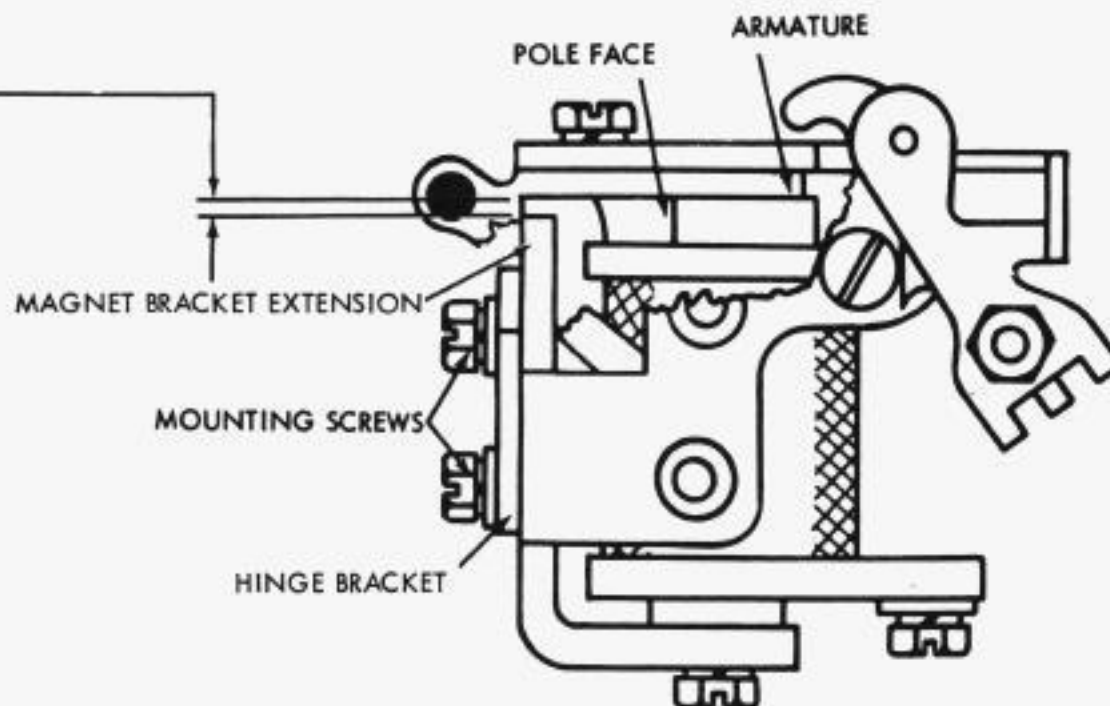


FIGURE 2-9. POWER-DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE

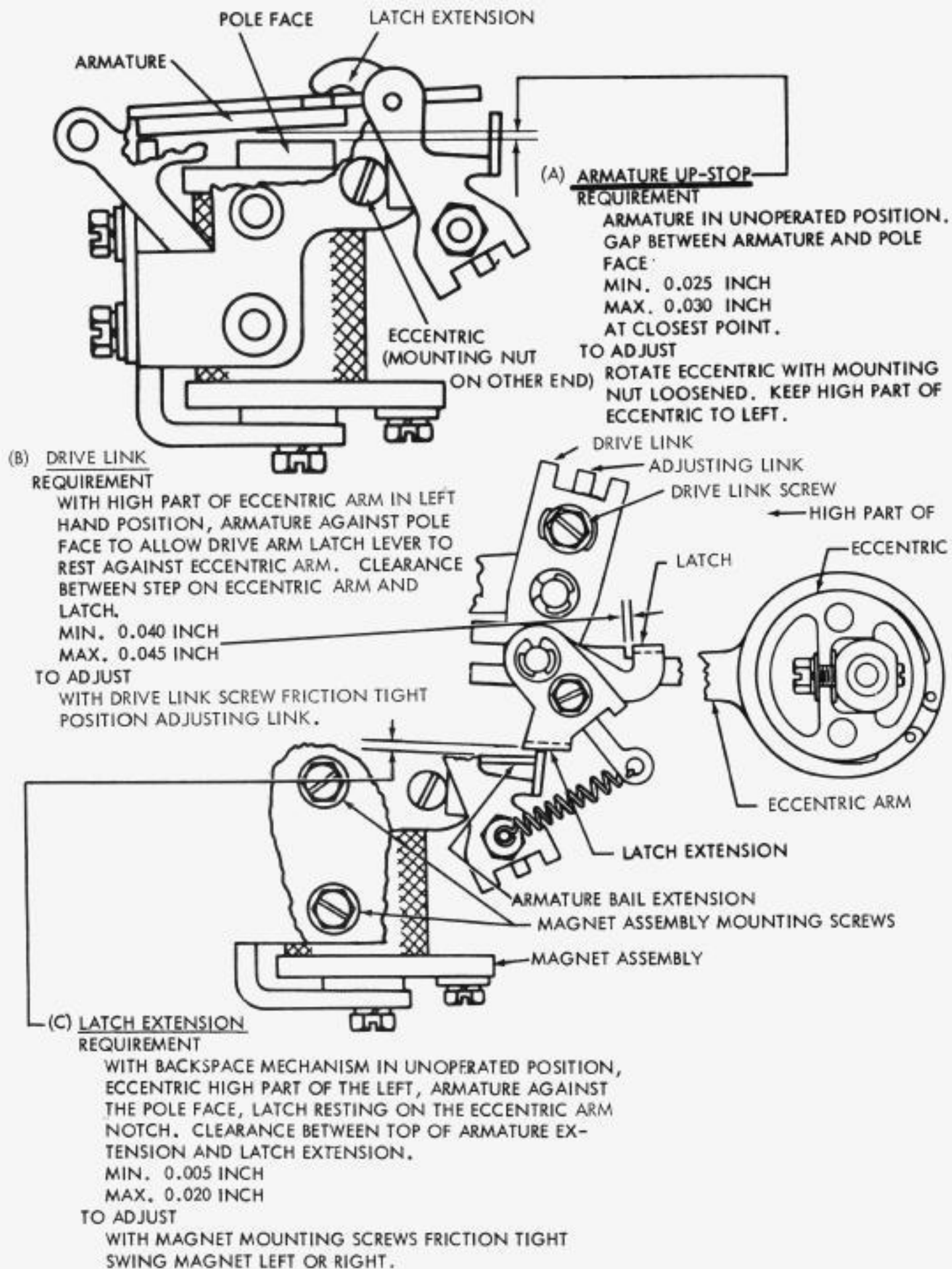


FIGURE 2-10. POWER-DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE

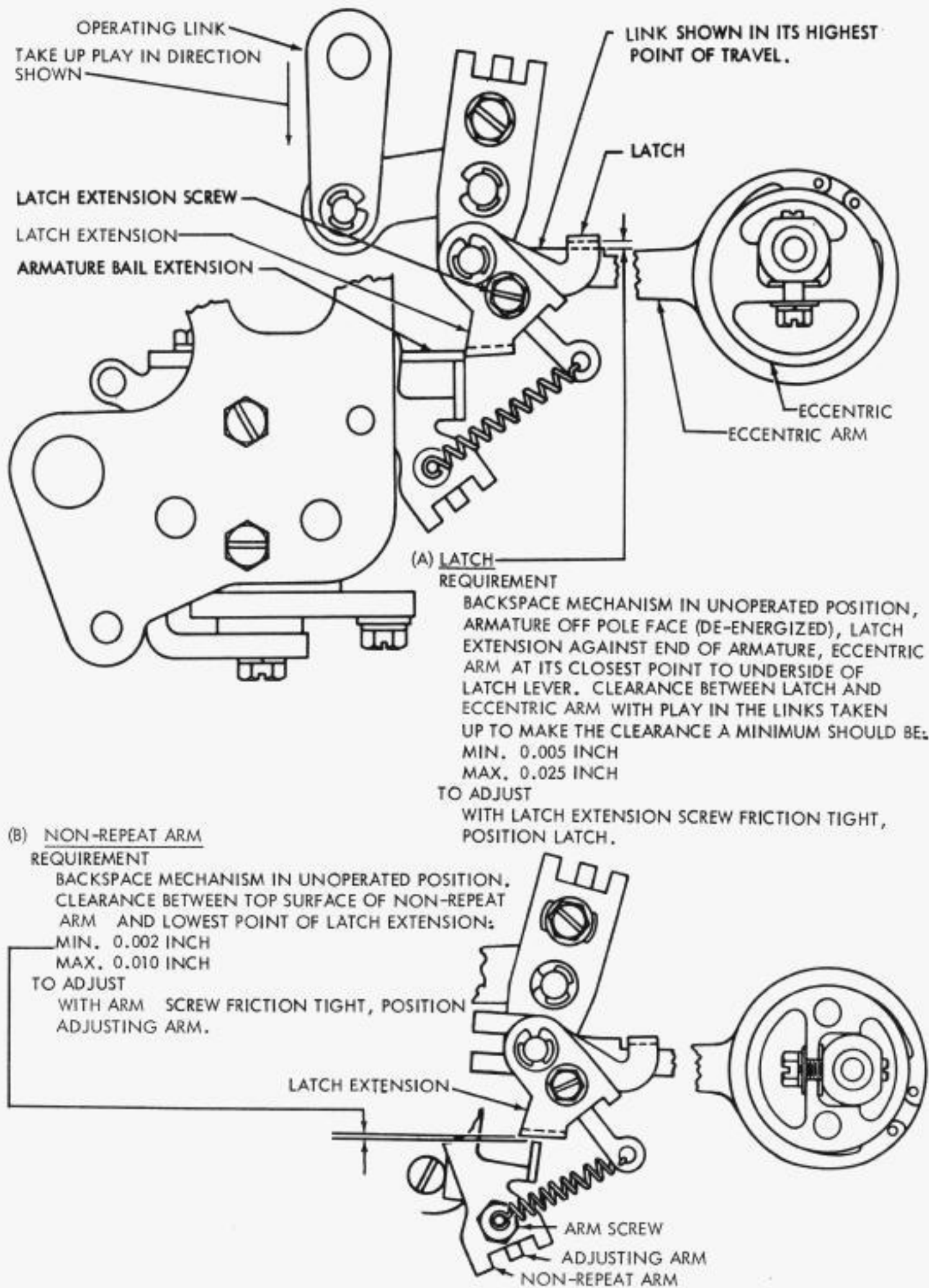


FIGURE 2-11. POWER-DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE

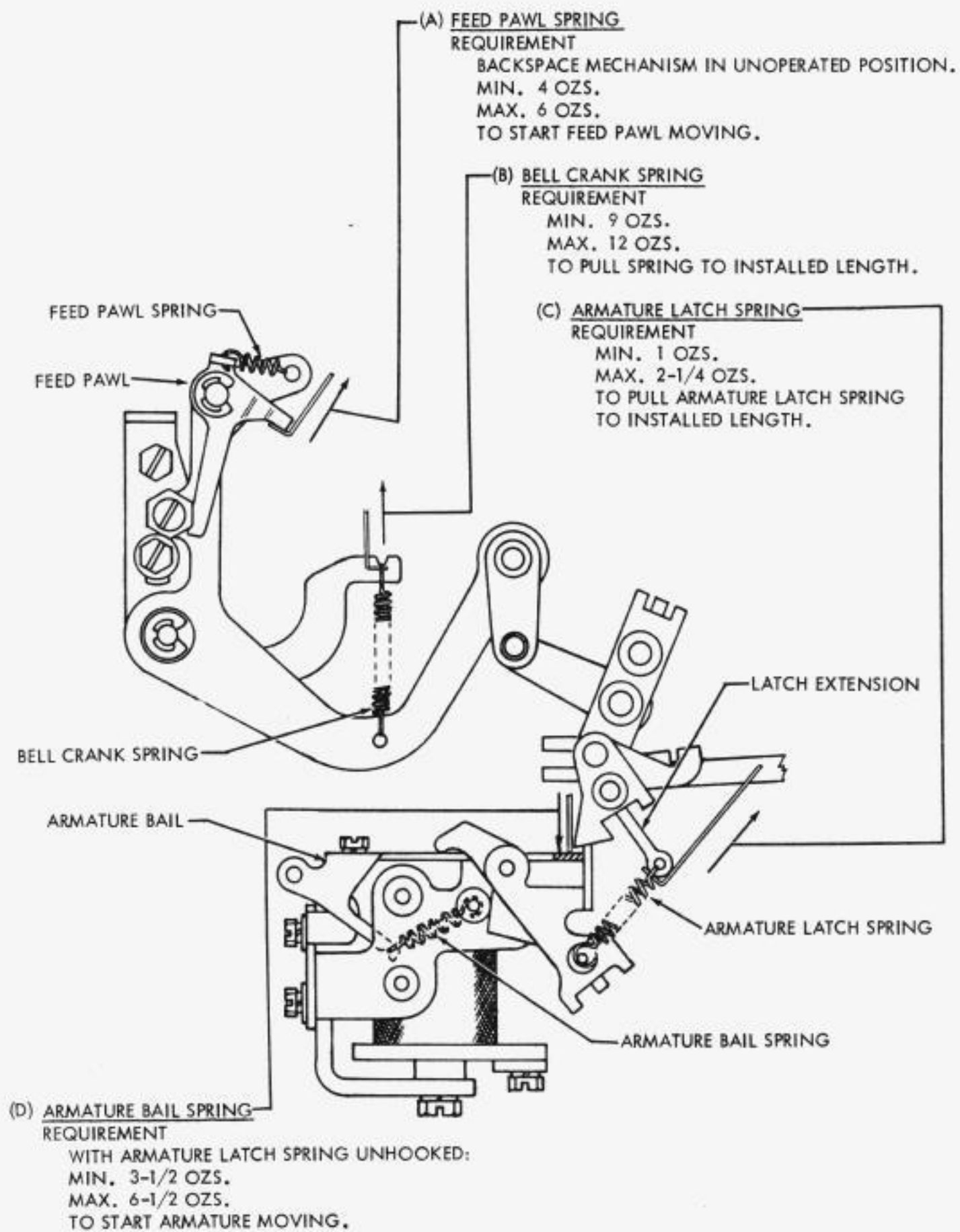


FIGURE 2-12. POWER-DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE

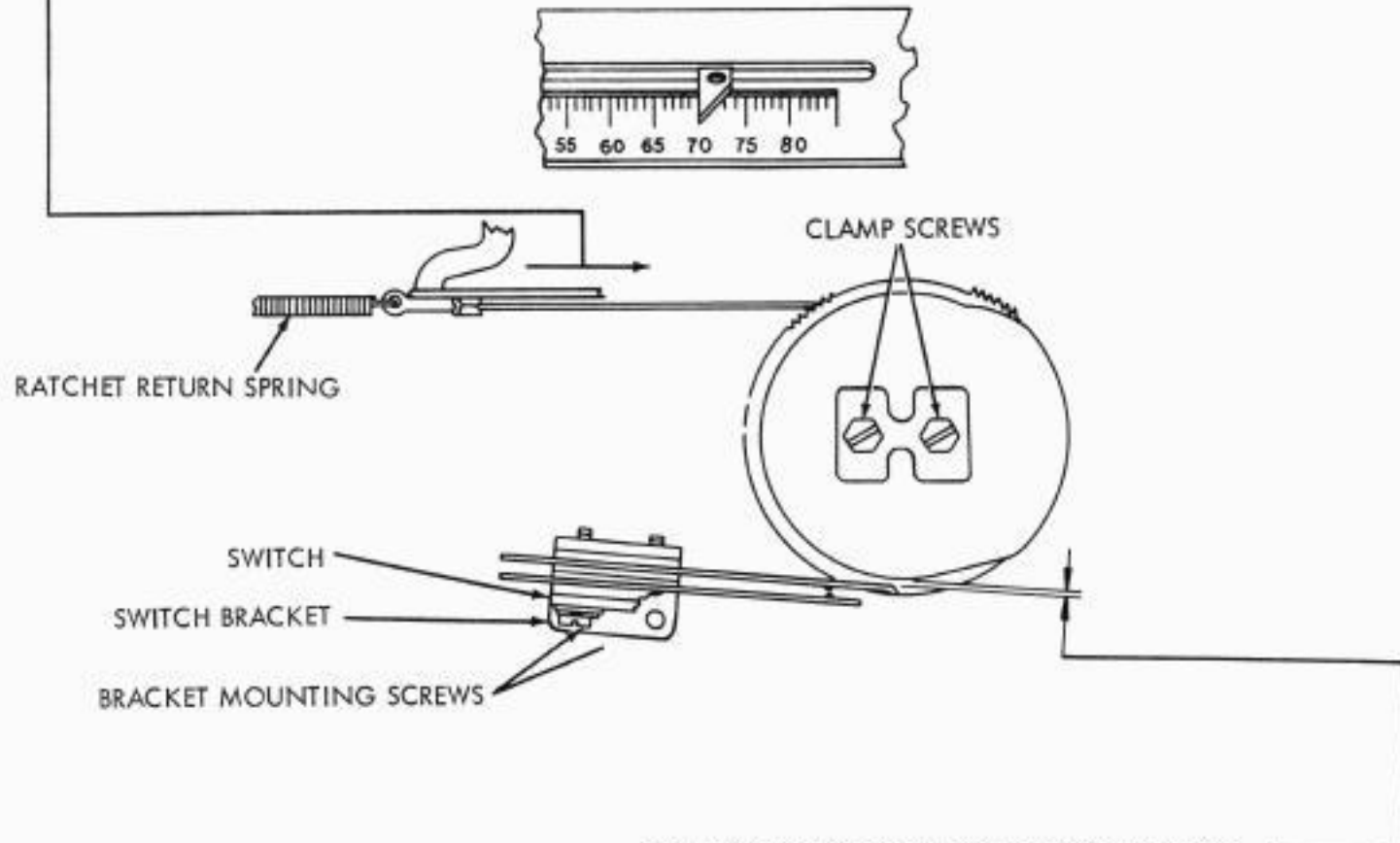
3. CHARACTER COUNTER MECHANISM (NEW DESIGN) SEE SECTION 5 FOR EARLY DESIGN

RATCHET DRUM ASSEMBLY RETURN SPRING

REQUIREMENT

1/2 TO 1 1/2 OZS. WHEN INDICATOR POINTS
TO 35 ON THE SCALE.

1 1/2 TO 2 1/2 OZS. WHEN INDICATOR POINTS
TO 70 ON THE SCALE.

CHARACTER COUNTER END-OF-LINE-SWITCH

(1) REQUIREMENT (CHARACTER COUNTER REMOVED)
THE SWITCH SHOULD CLOSE AT A PRESET
NUMBER OF CHARACTERS WITH A SMALL
AMOUNT OF OVERTRAVEL BY BOTH CON-
TACT SPRINGS.

(2) REQUIREMENT
CLEARANCE BETWEEN LONG CONTACT
SPRING AND LOW PART OF CAM,
MIN. 0.012---MAX. 0.025 INCH

TO ADJUST

POSITION SWITCH BRACKET WITH ITS
MOUNTING SCREWS LOOSENED. THEN
SET COUNTER TO THE DESIRED COUNT.
LOOSEN CAM CLAMP SCREWS AND POSITION
CAM UNTIL CONTACT CLOSES WITH
SOME OVERTRAVEL. REPLACE UNIT.

FIGURE 2-13. CHARACTER COUNTER MECHANISM

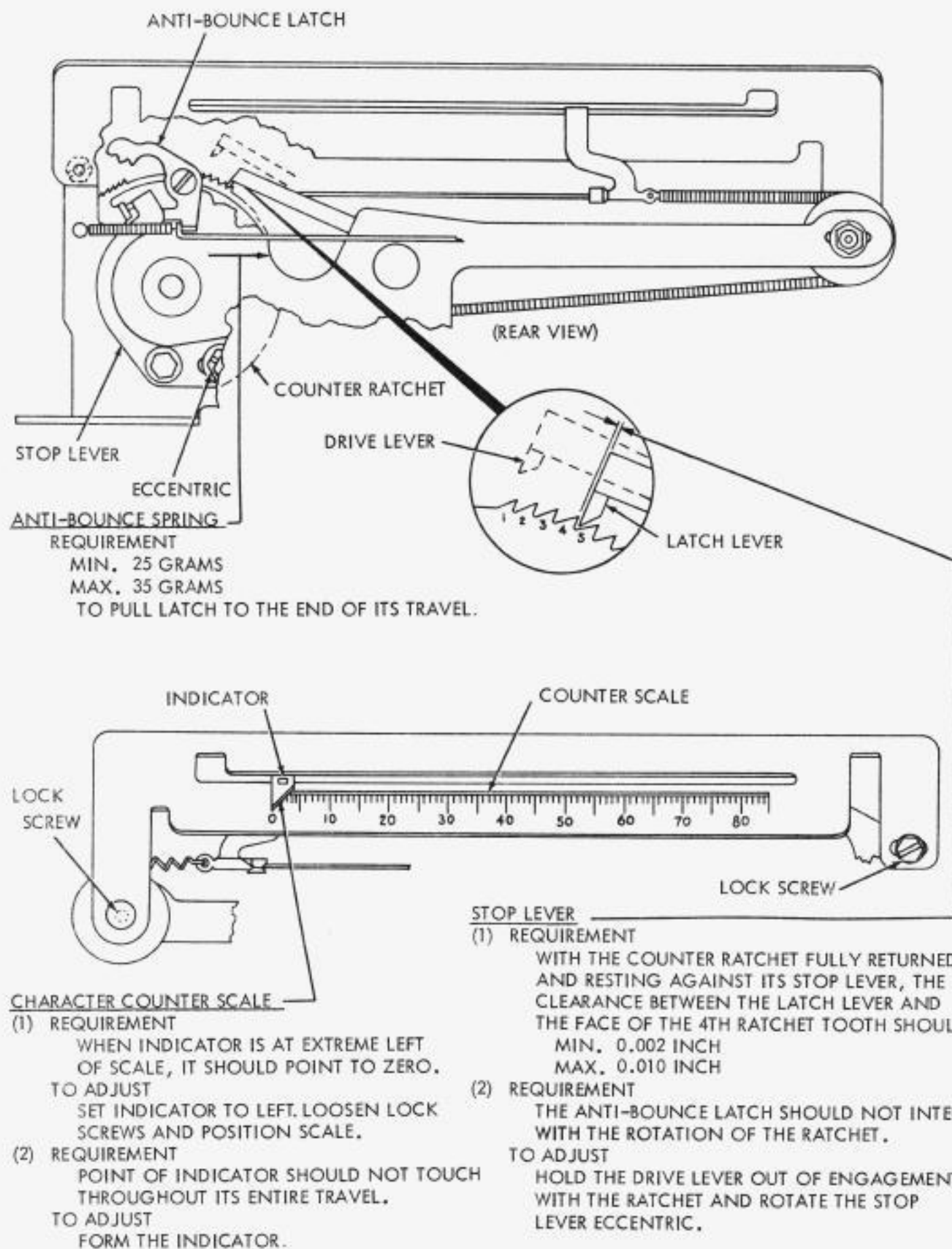


FIGURE 2-14. CHARACTER COUNTER MECHANISM

CHARACTER COUNTER STROKE

REQUIREMENT

WHEN CHARACTER AND REPEAT KEYS ARE DEPRESSED, THE COUNTER SHOULD OPERATE CONSISTENTLY IN T OR K-T POSITION. WHEN CARRIAGE RETURN KEY IS DEPRESSED, THE COUNTER SHOULD RESET WITHOUT BINDING. THE MECHANISM SHOULD COUNT THE FIRST CHARACTER ON A RESTART AFTER RESET CONDITION.

MIN. 0.006---MAX. 0.015 INCH

BETWEEN DRIVE LEVER AND RATCHET TOOTH, WHEN COUNTER IS SET NEAR MID-POINT OF ITS RANGE.

TO ADJUST

LOOSEN MOUNTING SCREWS. WITH KEYBOARD IN T POSITION, START MOTOR AND STRIKE CARRIAGE RETURN KEY, AND THEN E KEY. TURN OFF MOTOR. DEPRESS E KEY. POSITION CHARACTER COUNTER FRAME FOR CLEARANCE. TURN CONTROL KNOB TO K-T POSITION AND RECHECK. REFINE IF NECESSARY.

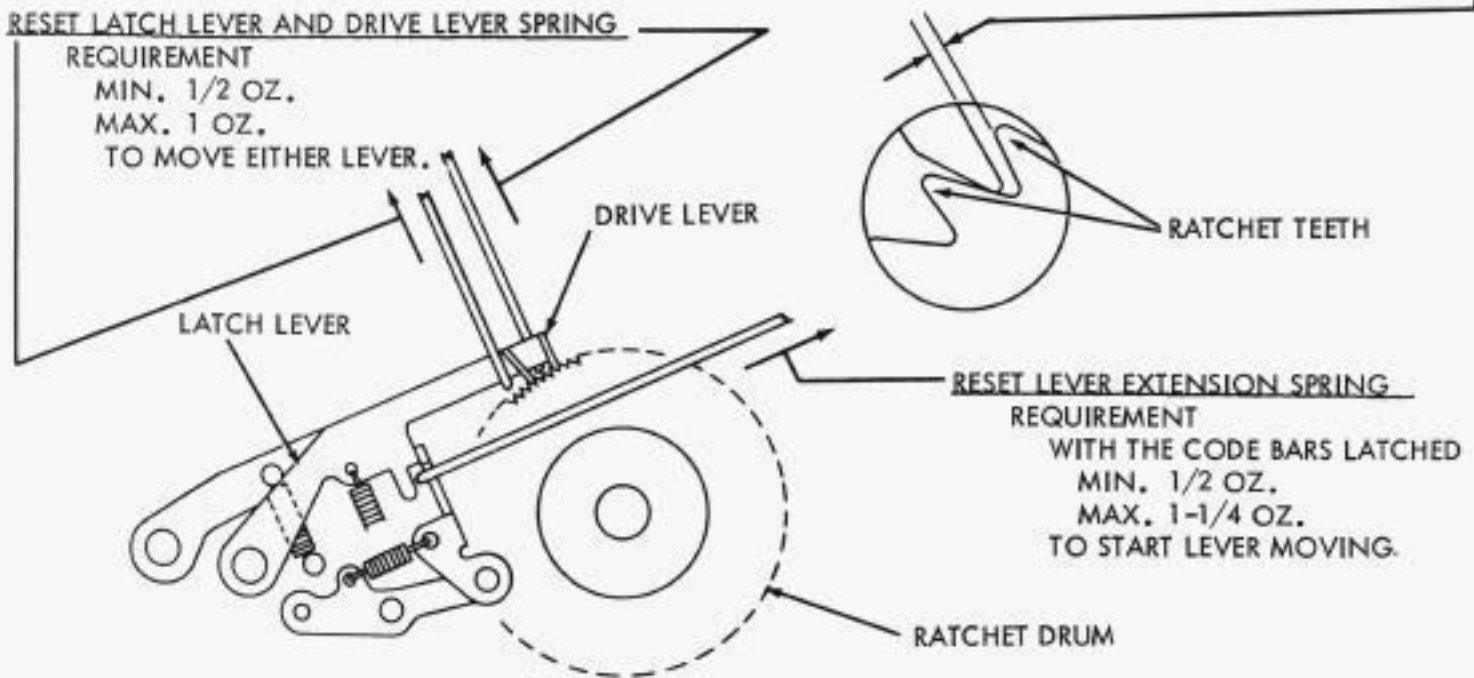
RESET LATCH LEVER AND DRIVE LEVER SPRING

REQUIREMENT

MIN. 1/2 OZ.

MAX. 1 OZ.

TO MOVE EITHER LEVER.

RESET LEVER EXTENSION SPRING

REQUIREMENT

WITH THE CODE BARS LATCHED

MIN. 1/2 OZ.

MAX. 1-1/4 OZ.

TO START LEVER MOVING.

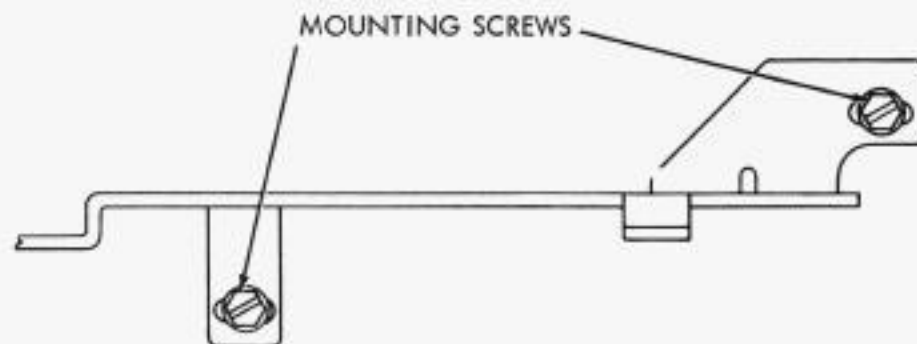


FIGURE 2-15. CHARACTER COUNTER MECHANISM

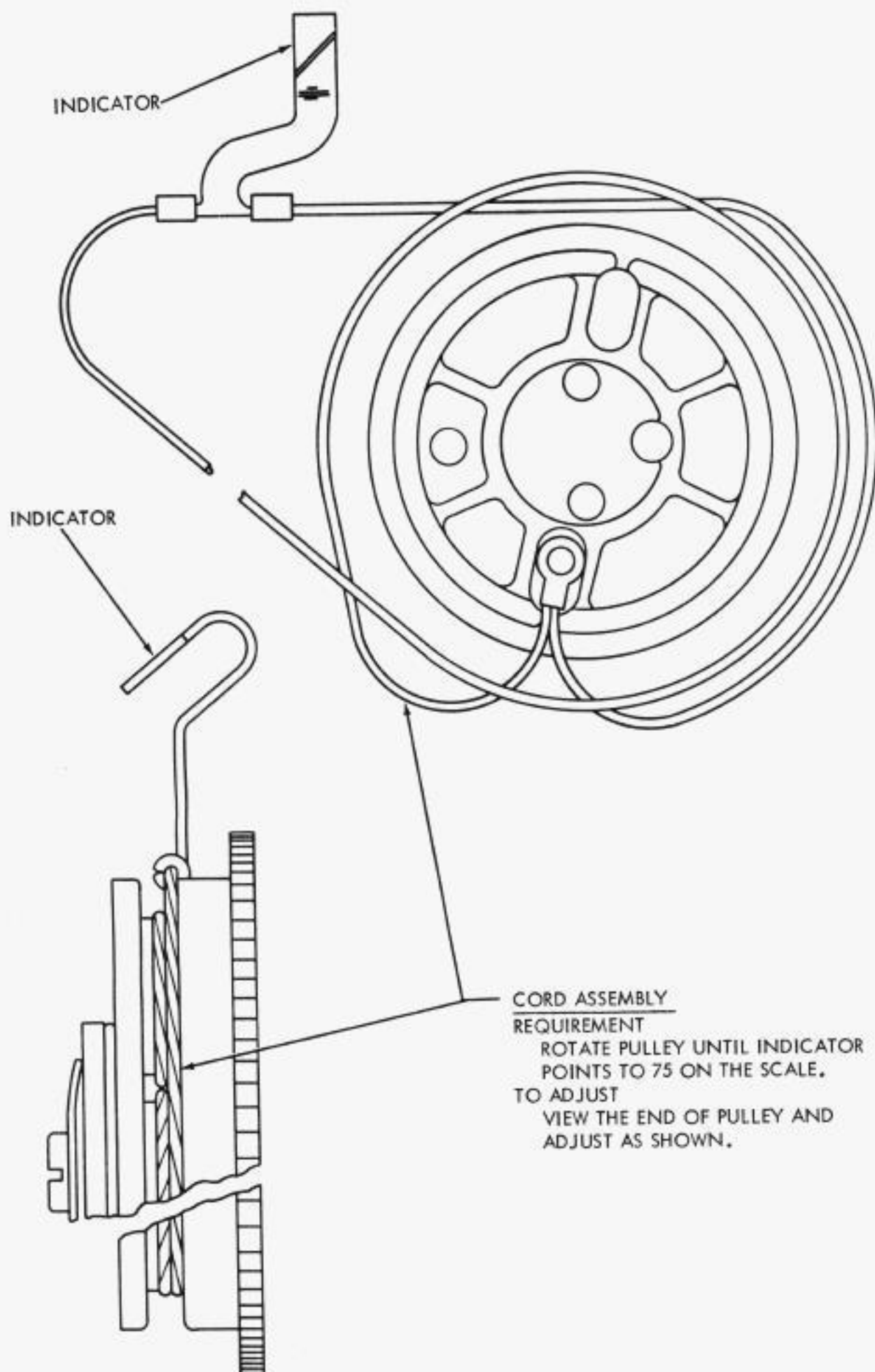
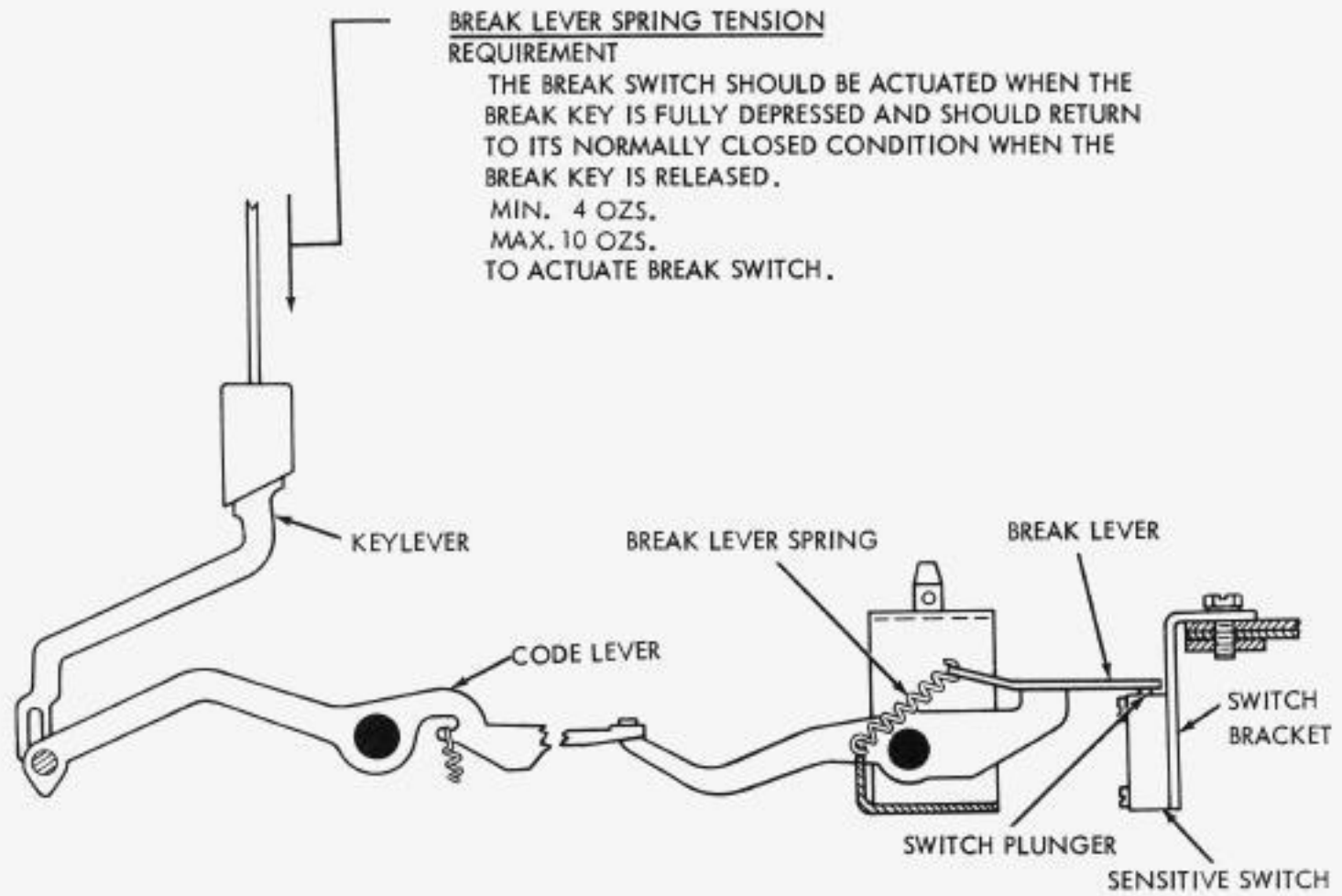


FIGURE 2-16. CHARACTER COUNTER MECHANISM

4. ELECTRICAL LINE BREAK MECHANISM



5. LOCAL PAPER FEED-OUT MECHANISM

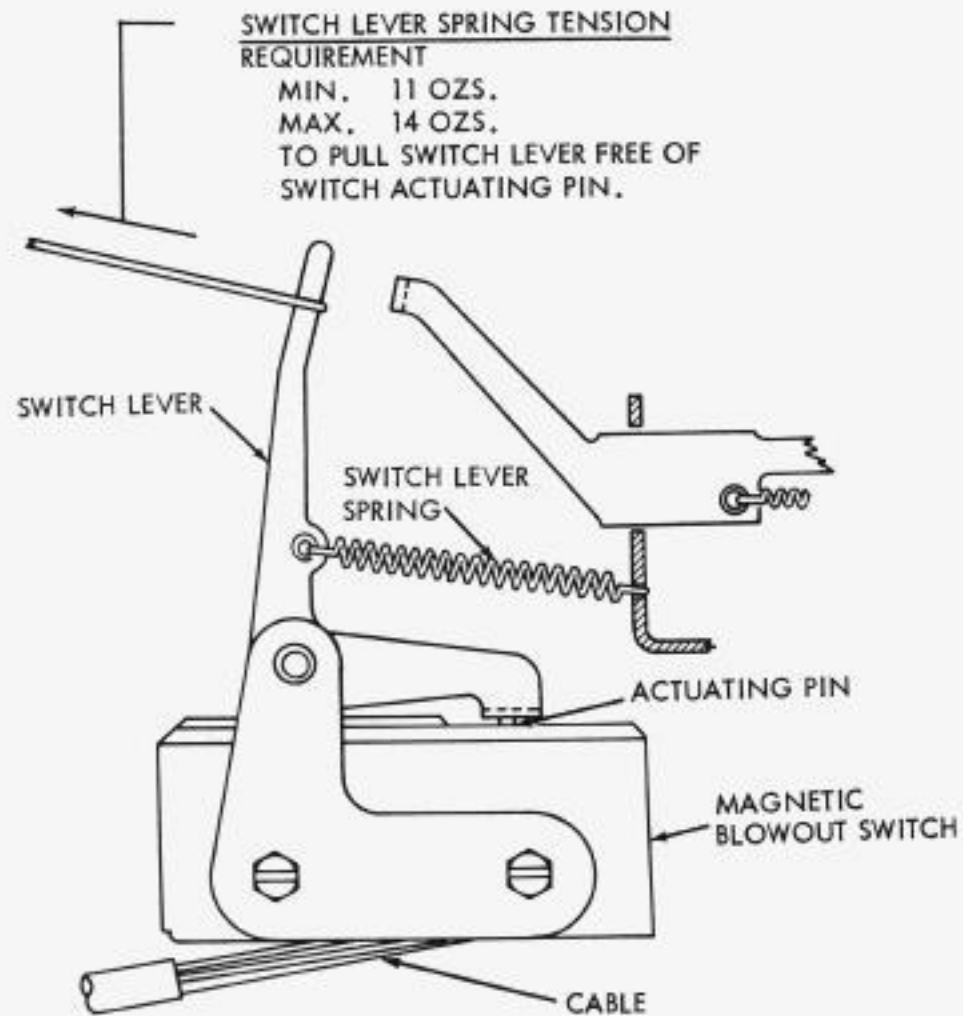


FIGURE 2-17. ELECTRICAL LINE BREAK AND LOCAL PAPER FEED-OUT MECHANISM

6. AND 7. CODE READING AND TIMING 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.

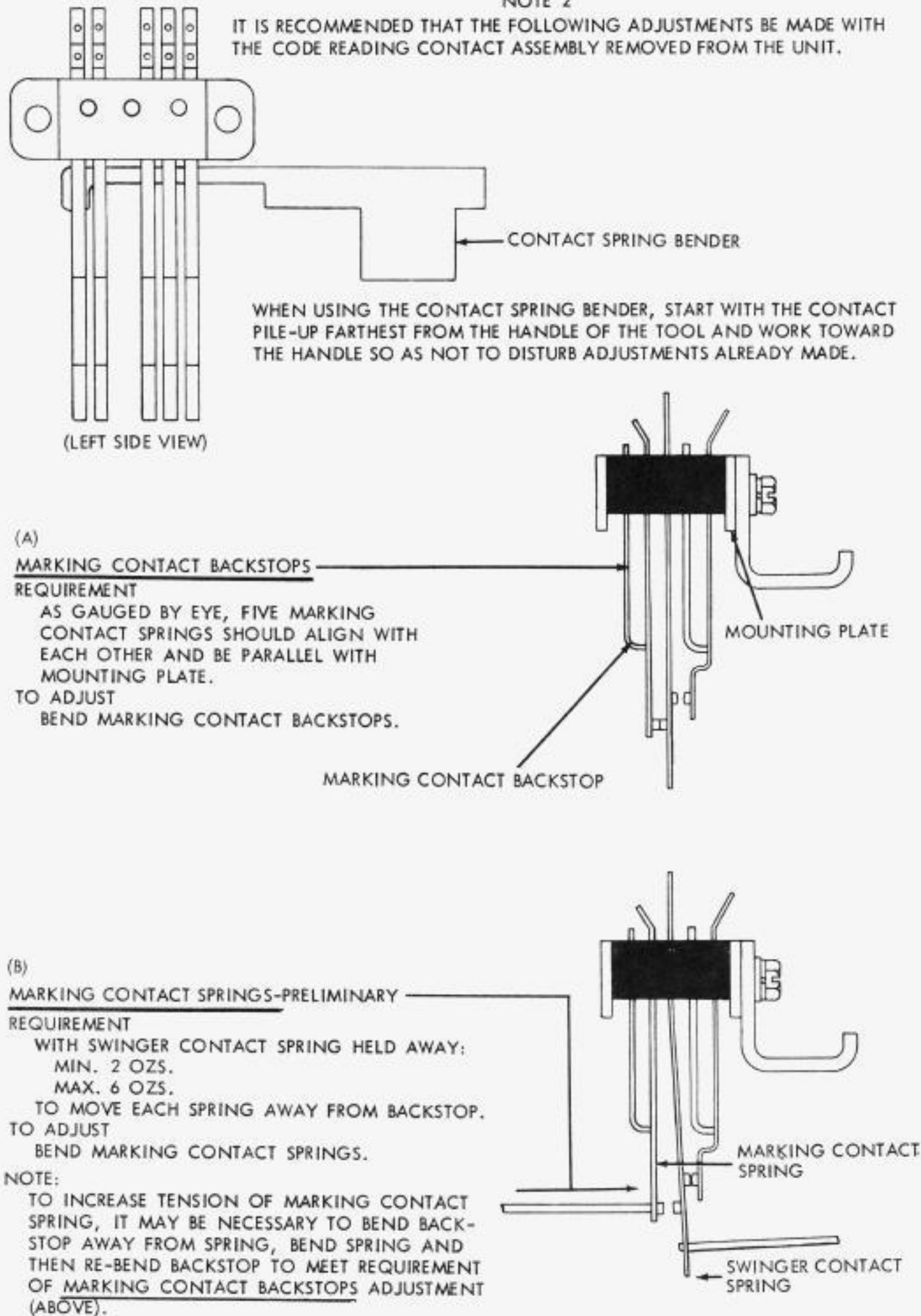


FIGURE 2-18. CODE READING CONTACTS

(A) SWINGER CONTACT SPRINGS-PRELIMINARY

REQUIREMENT

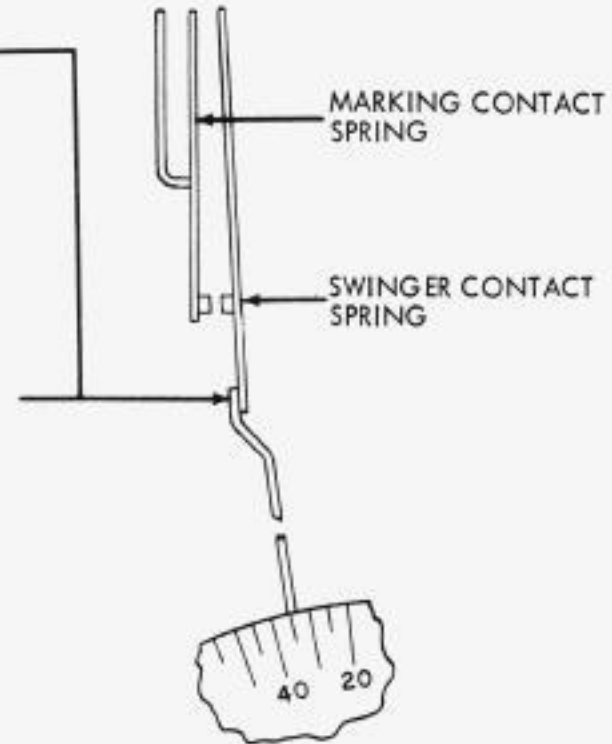
MIN. 35 GRAMS

MAX. 50 GRAMS

TO OPEN MARKING CONTACTS.

TO ADJUST

BEND SWINGER CONTACT SPRINGS.



NOTE:

SPACING CONTACTS (ON TRANSFER TYPE CONTACT ASSEMBLIES ONLY)
ARE NORMALLY OPEN WHEN CONTACT ASSEMBLY IS REMOVED FROM UNIT.

(B) SPACING CONTACT BACKSTOPS - PRELIMINARY
(APPLIES TO TRANSFER TYPE CONTACTS ONLY)

REQUIREMENT

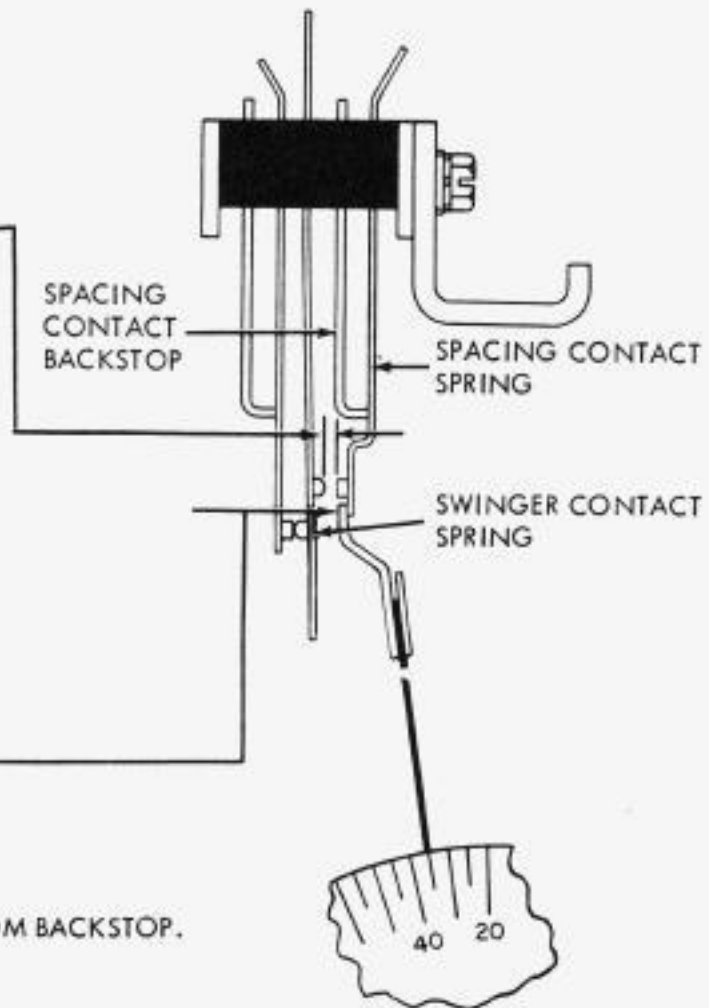
GAP BETWEEN SPACING CONTACTS

MIN. 0.010 INCH

MAX. 0.015 INCH

TO ADJUST

BEND SPACING CONTACT BACKSTOPS.

(C) SPACING CONTACT SPRINGS-PRELIMINARY
(APPLIES TO TRANSFER TYPE CONTACTS ONLY)

REQUIREMENT

MIN. 35 GRAMS

MAX. 50 GRAMS

TO MOVE EACH CONTACT SPRING AWAY FROM BACKSTOP.

TO ADJUST

BEND SPACING CONTACT SPRINGS.

NOTE:

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.

FIGURE 2-19. CODE READING CONTACTS

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

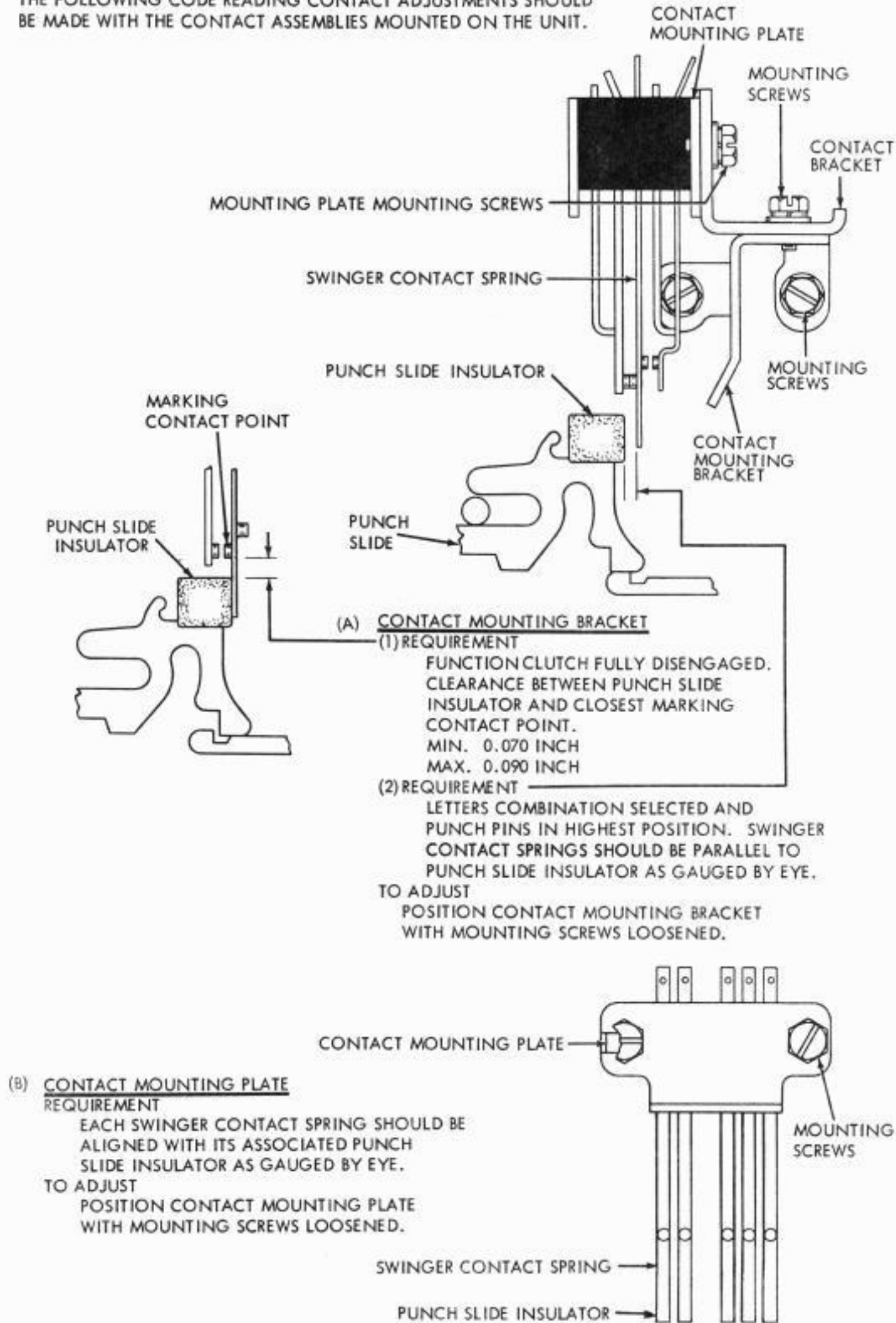
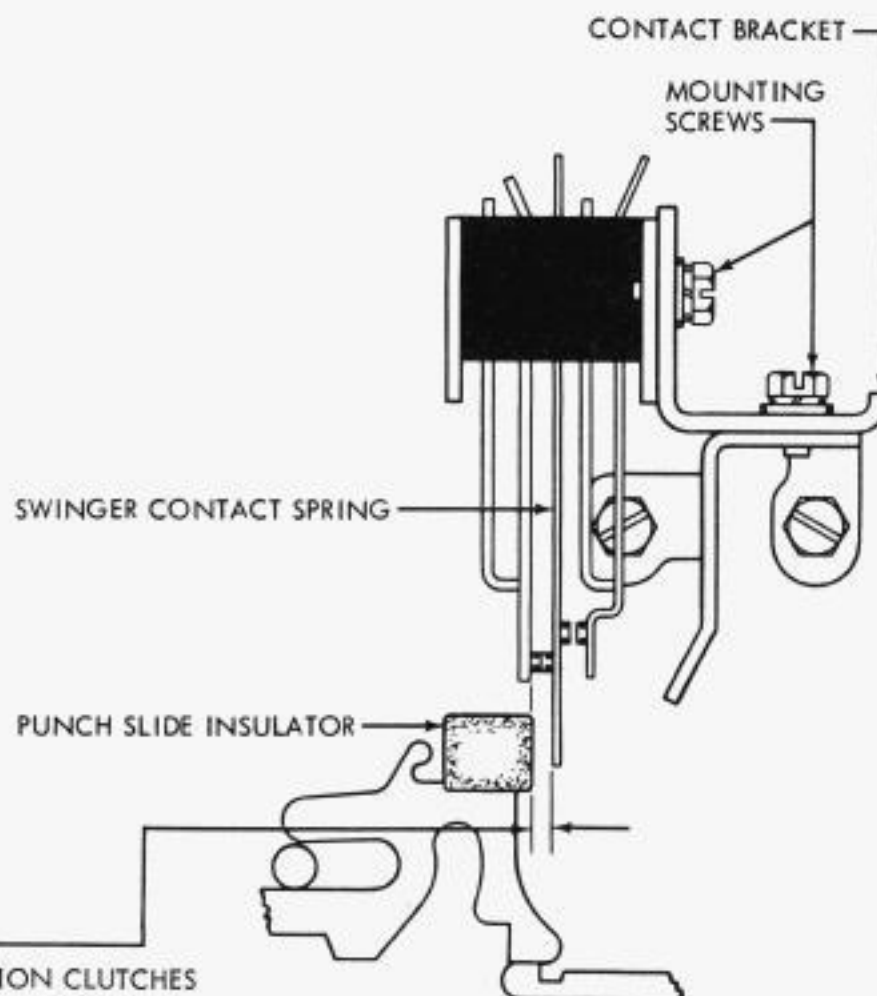
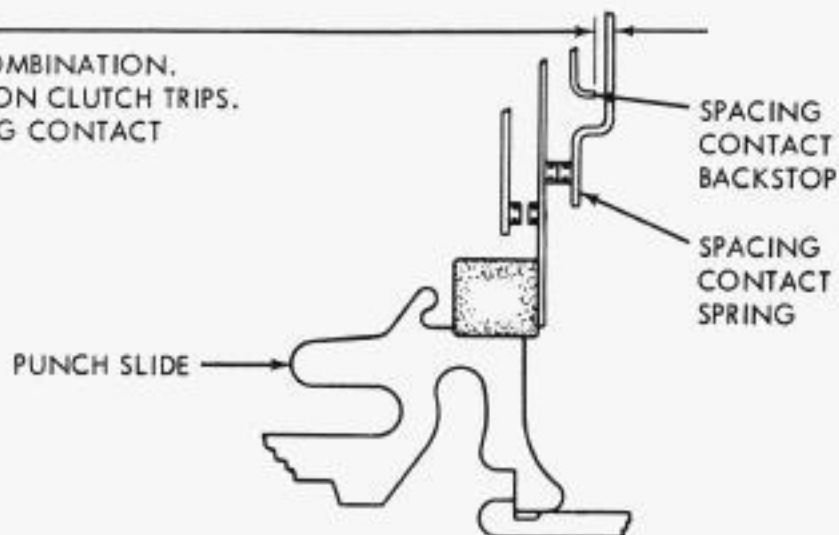


FIGURE 2-20. CODE READING CONTACTS

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. 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

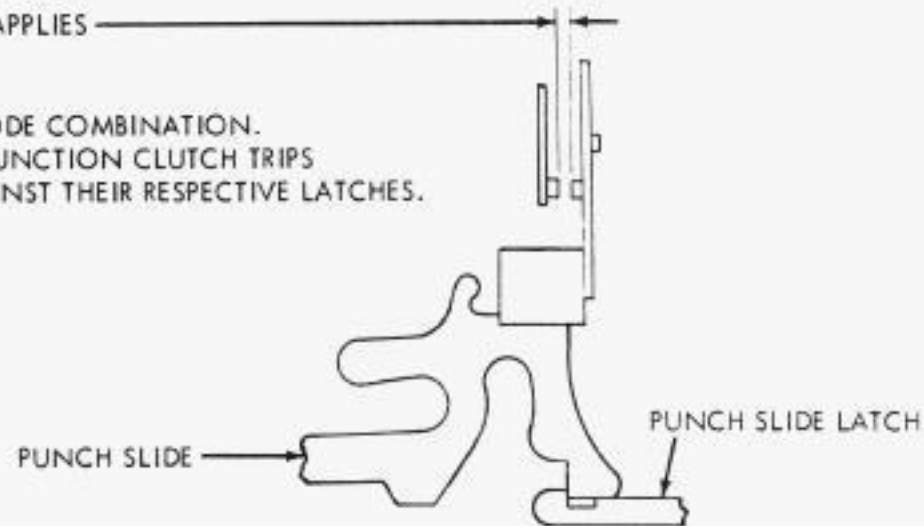
POSITION CONTACT BRACKET WITH ITS MOUNTING SCREWS. LOOSENED TO MEET REQUIREMENT (1). TO PRY BRACKET TO LEFT, INSERT SCREWDRIVER BETWEEN BRACKET AND LEFT EDGE OF MOUNTING SCREWS; TO PRY BRACKET TO RIGHT, INSERT SCREWDRIVER BETWEEN BRACKET AND RIGHT EDGE OF MOUNTING SCREWS. CHECK REQUIREMENT (2). IF NOT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

FIGURE 2-21. CODE READING CONTACTS

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

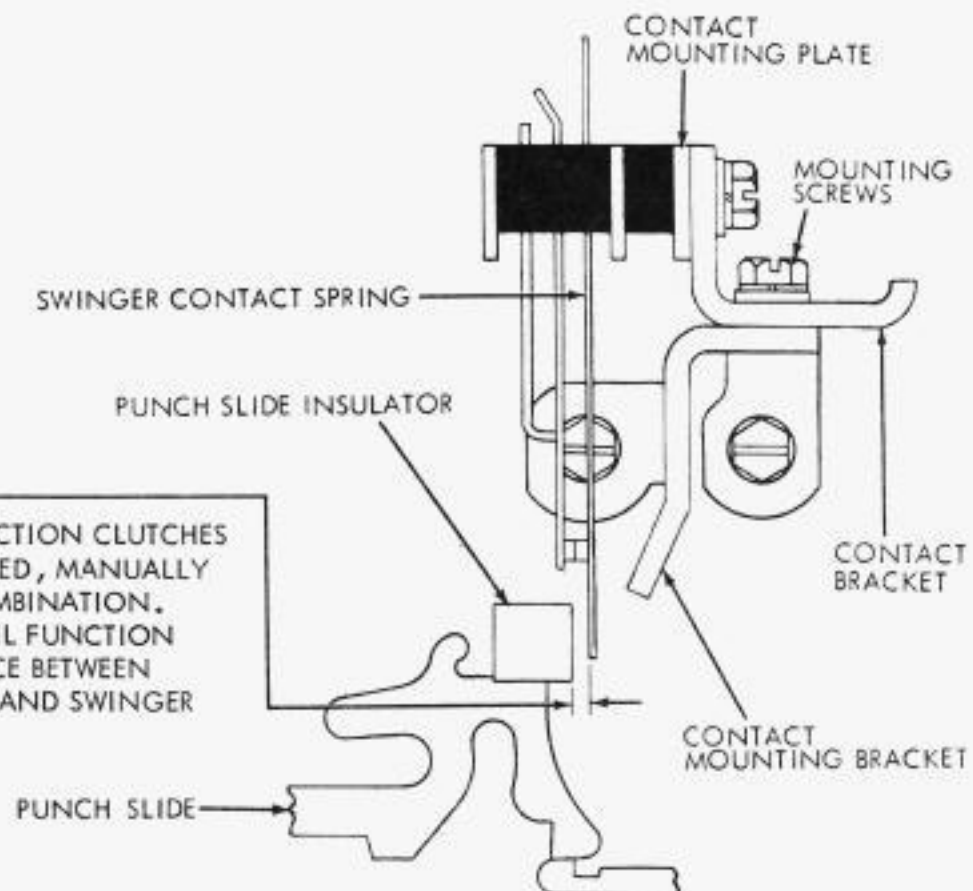
(1) REQUIREMENT

MANUALLY SELECT BLANK CODE COMBINATION.
 ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS
 AND PUNCH SLIDES ARE AGAINST THEIR RESPECTIVE LATCHES.
 GAP BETWEEN CONTACTS.
 MIN. 0.010 INCH
 MAX. 0.015 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.

FIGURE 2-22. CODE READING CONTACTS

NOTE:

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:

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

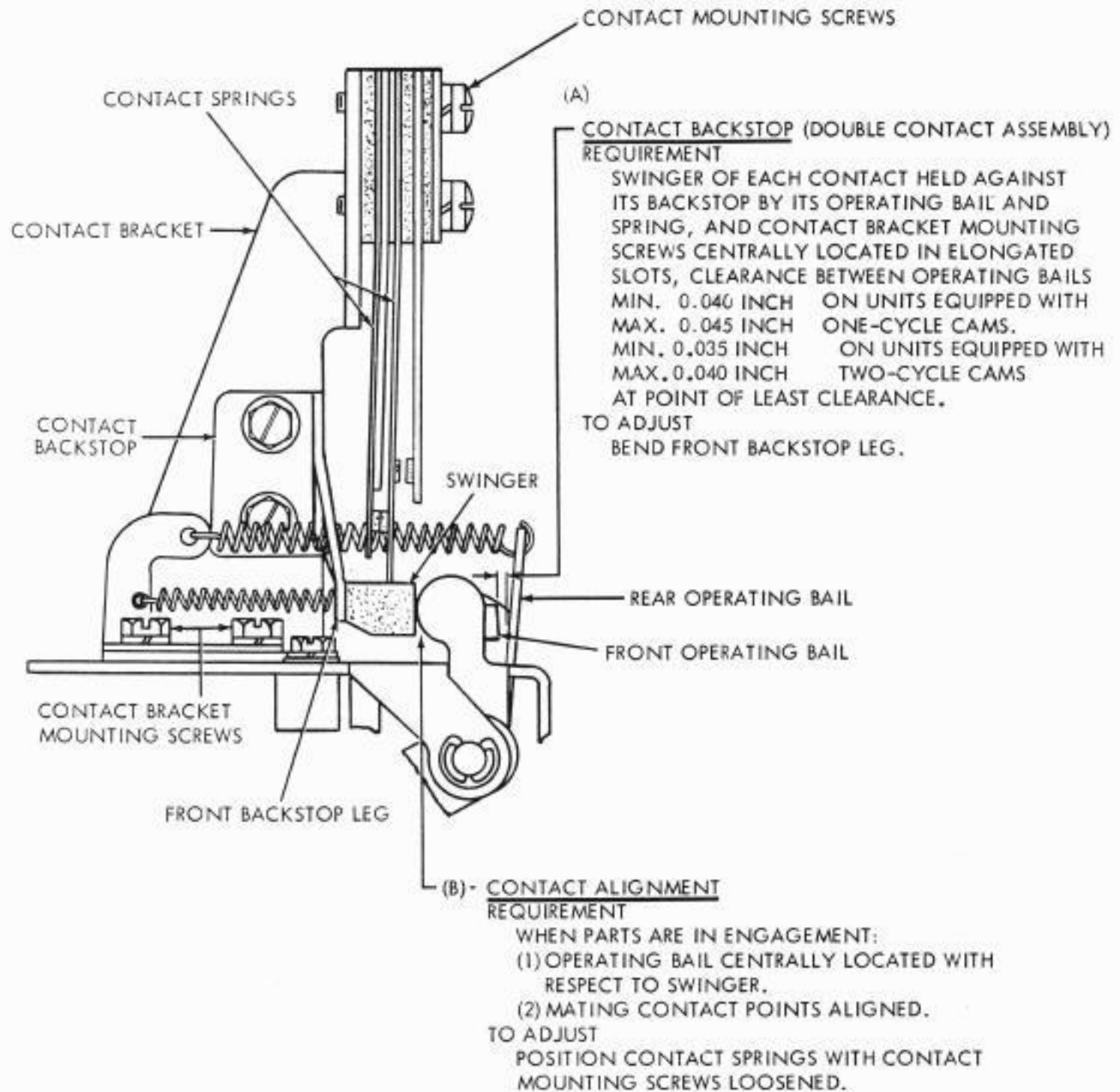


FIGURE 2-23. TIMING CONTACTS

NOTE:

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

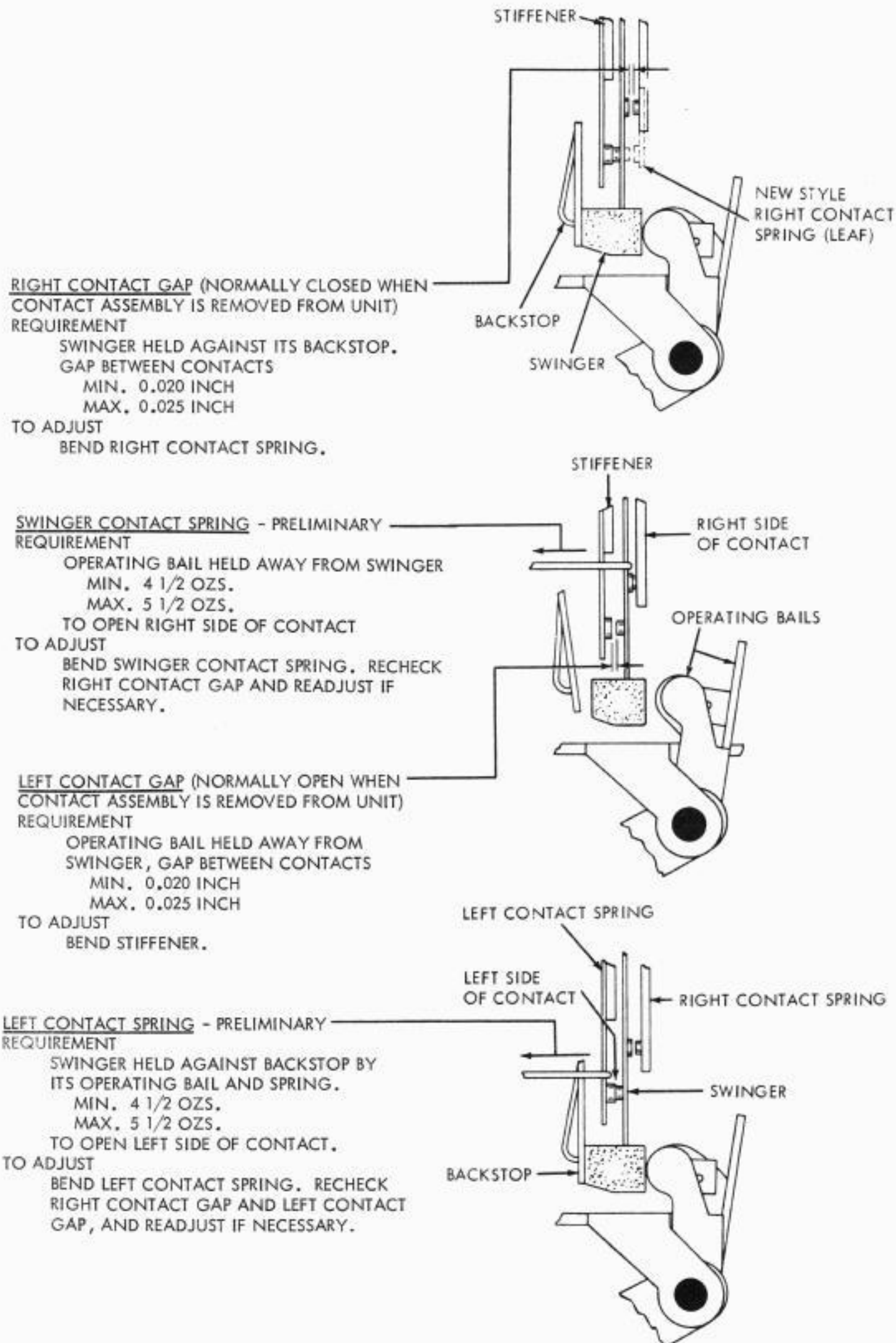
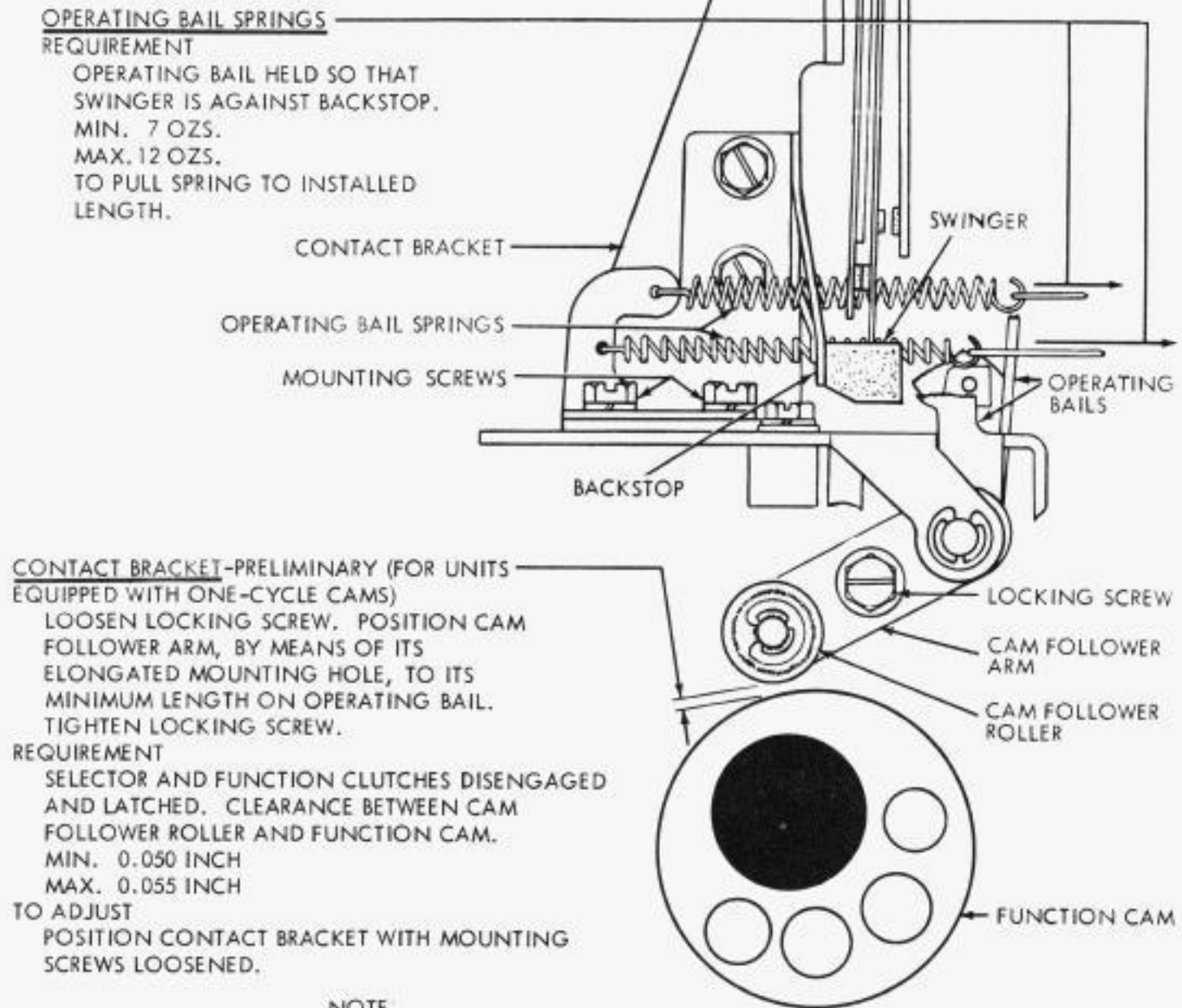


FIGURE 2-24. TIMING CONTACTS

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



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

**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
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.

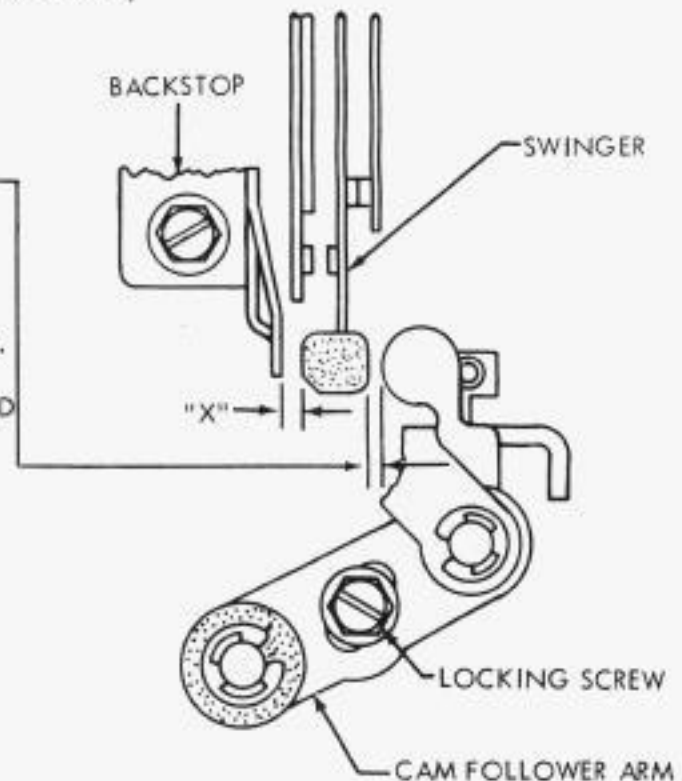
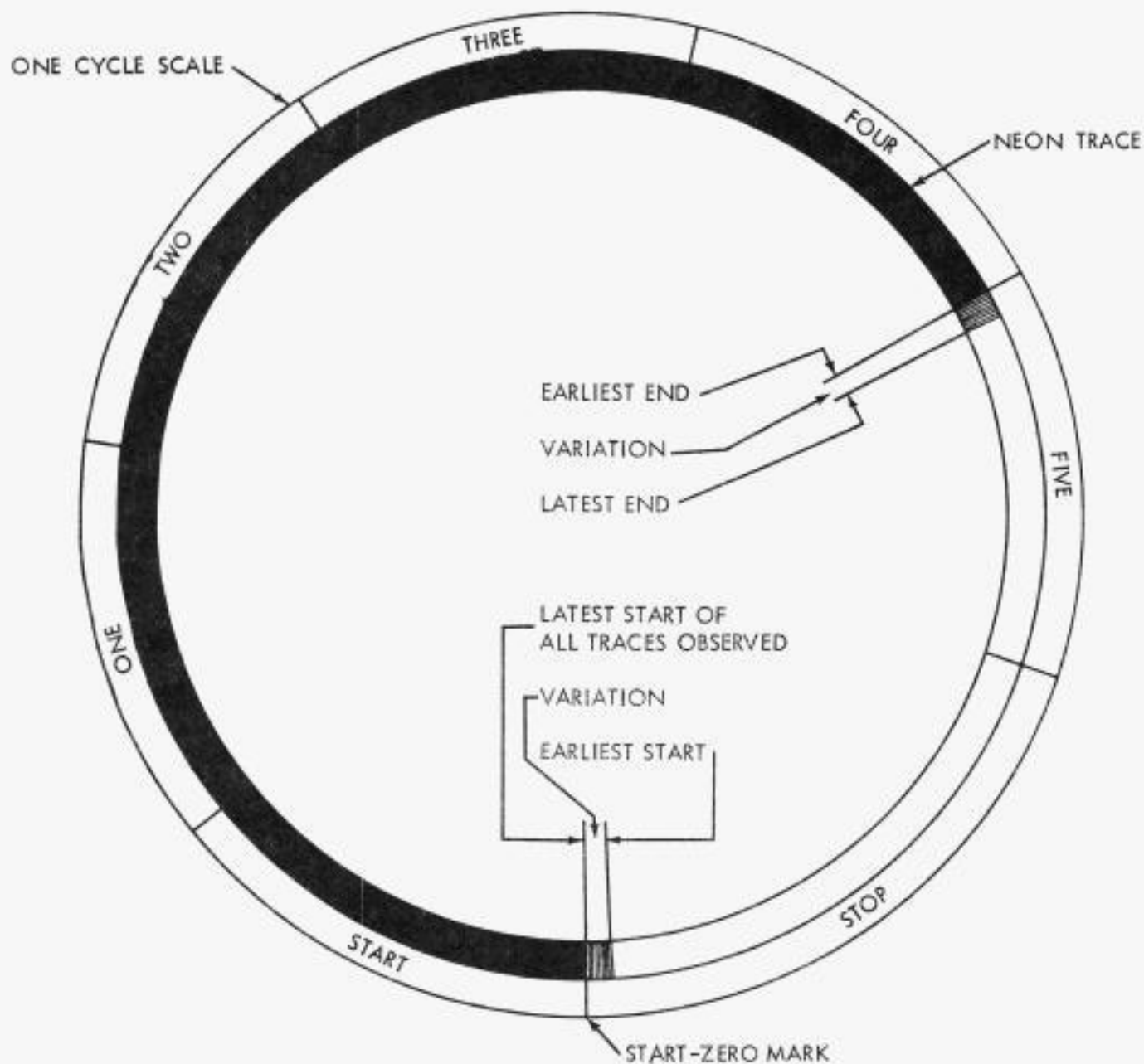


FIGURE 2-25. TIMING CONTACTS

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 DISK 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.

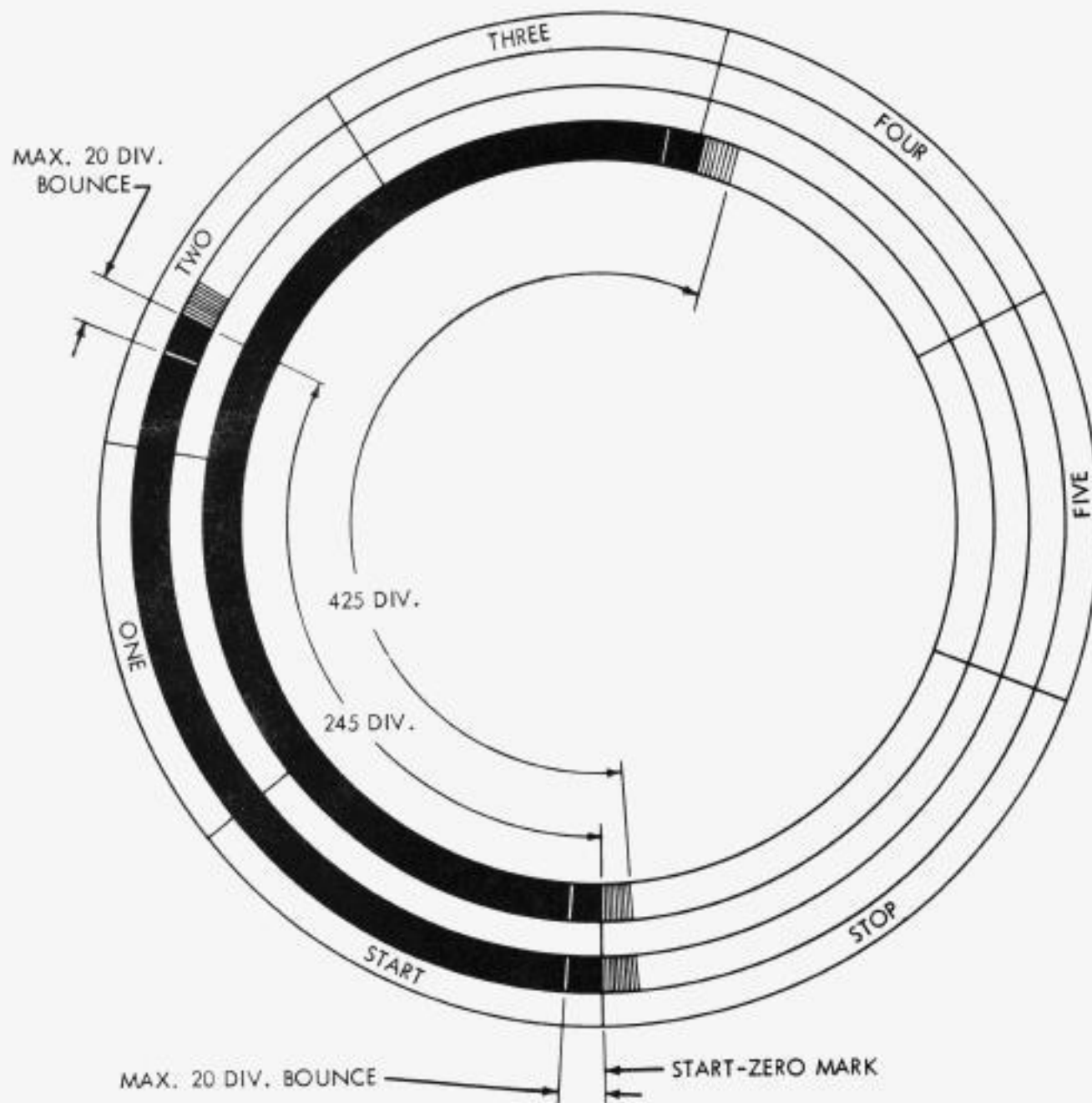


TO ZERO TEST SET

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.

FIGURE 2-26. SIGNAL DISTORTION TEST SET

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

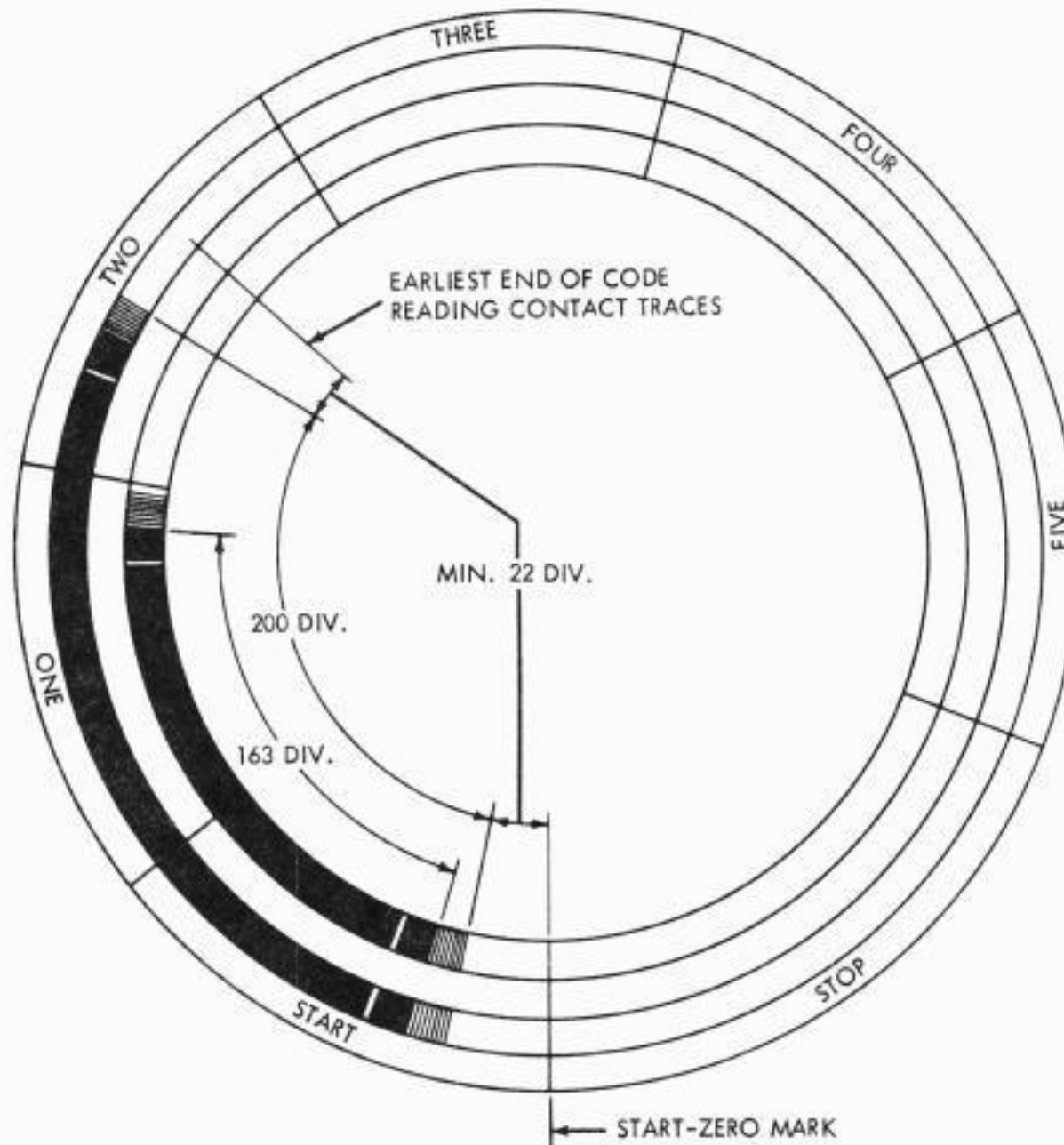


CODE READING CONTACTS

- (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.

FIGURE 2-27. SIGNAL DISTORTION TEST SET

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



TIMING CONTACTS

- (1) ZERO TEST SET AS PREVIOUSLY DESCRIBED.
- (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

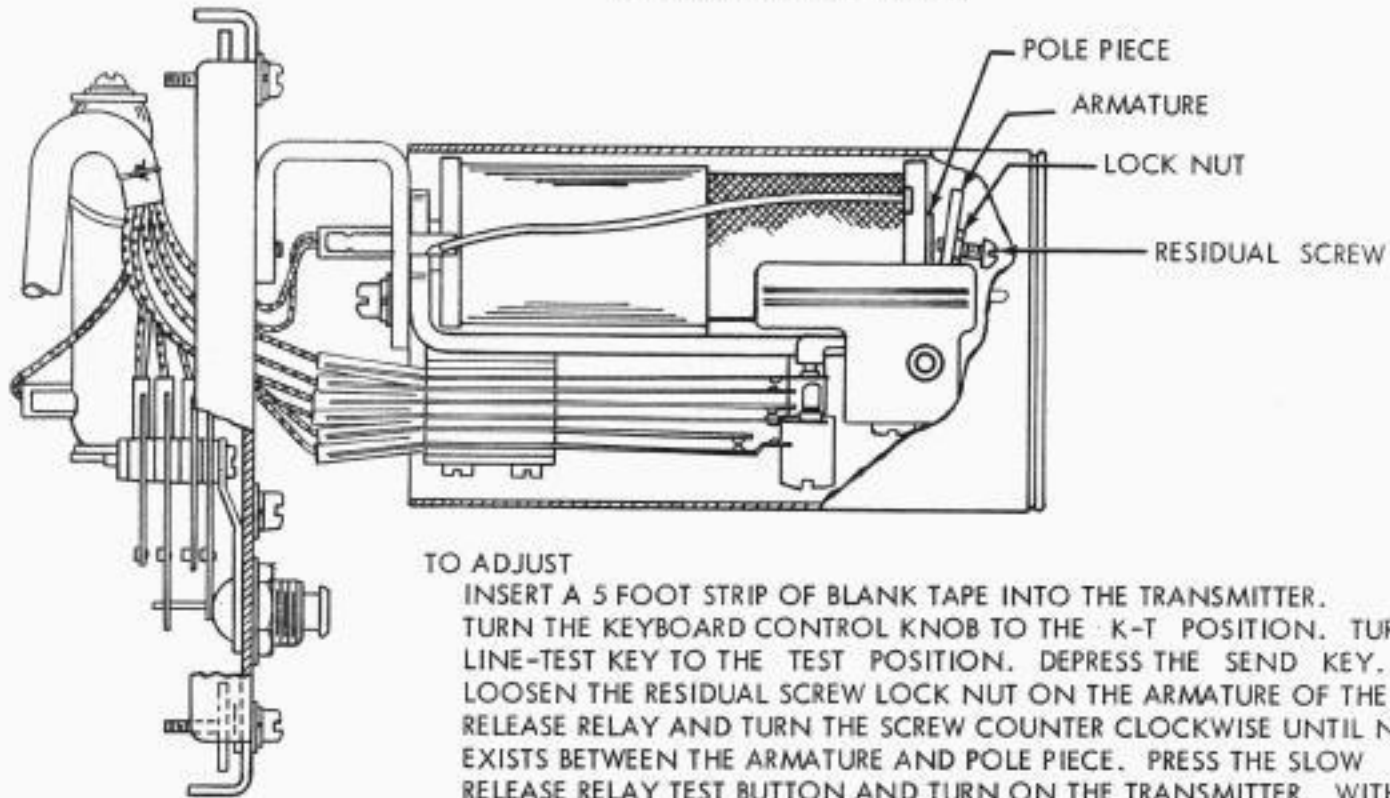
 - A. EARLIEST START MIN. 22 DIVISIONS AFTER START-ZERO MARK.
 - B. LATEST END MIN. 22 DIVISIONS BEFORE EARLIEST END OF CODE READING CONTACT TRACES.
 - C. TRACE LENGTH
MIN. 163 DIVISIONS
MAX. 200 DIVISIONS
 - D. BOUNCE SHOULD END WITHIN MAX. OF 5 DIVISIONS OF EARLIEST START OR LATEST END OF TRACE
- (3) 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.

FIGURE 2-28. SIGNAL DISTORTION TEST SET

8. ELECTRICAL SERVICE UNIT

SLOW RELEASE RELAY
REQUIREMENT

THE RELAY SHOULD NOT DE-ENERGIZE WHILE RECEIVING A SERIES OF BLANK CODE COMBINATIONS. THE TIME REQUIRED TO STOP AN ASSOCIATED TRANSMITTER AFTER RECEIPT OF LINE BREAK SIGNAL SHALL NOT EXCEED
MAX. 800 MILLISECONDS.

TO ADJUST

INSERT A 5 FOOT STRIP OF BLANK TAPE INTO THE TRANSMITTER. TURN THE KEYBOARD CONTROL KNOB TO THE K-T POSITION. TURN THE LINE-TEST KEY TO THE TEST POSITION. DEPRESS THE SEND KEY. LOOSEN THE RESIDUAL SCREW LOCK NUT ON THE ARMATURE OF THE SLOW RELEASE RELAY AND TURN THE SCREW COUNTER CLOCKWISE UNTIL NO GAP EXISTS BETWEEN THE ARMATURE AND POLE PIECE. PRESS THE SLOW RELEASE RELAY TEST BUTTON AND TURN ON THE TRANSMITTER. WITH THE TAPE RUNNING THROUGH THE TRANSMITTER TURN THE RESIDUAL SCREWS CLOCKWISE UNTIL THE SLOW RELEASE RELAY ARMATURE BEGINS TO VIBRATE. THEN TURN THE RESIDUAL SCREW COUNTER CLOCKWISE SLOWLY UNTIL THE ARMATURE STOPS VIBRATING. TIGHTEN THE LOCK NUT RERUN THE ENTIRE 5 FOOT STRIP OF TAPE THROUGH THE TRANSMITTER, WHILE THE SLOW RELEASE RELAY TEST KEY IS HELD DEPRESSED; THE SLOW RELEASE RELAY ARMATURE MUST NOT DROP OUT.

INSERT A 5 FOOT STRIP OF LETTERS TAPE INTO THE TRANSMITTER. PLAINLY MARK A ROW OF PERFORATIONS APPROXIMATELY THREE INCHES BACK FROM THE SENSING PINS ON THE TRANSMITTER. HOLD THE SLOW RELEASE RELAY TEST BUTTON DEPRESSED, AND START THE TRANSMITTER. WHEN THE PREVIOUSLY MARKED ROW OF PERFORATIONS REACH THE SENSING PINS, DEPRESS THE LINE-BREAK KEY AND HOLD DEPRESSED UNTIL THE TRANSMITTER STOPS. MARK THE ROW OF PERFORATIONS IMMEDIATELY OVER THE SENSING PINS, REMOVE THE TAPE FROM THE TRANSMITTER AND COUNT THE NUMBER OF PERFORATIONS BETWEEN THE TWO MARKED LINES. THE NUMBER OF PERFORATIONS BETWEEN THESE LINES SHOULD BE NO GREATER THAN,

1. EIGHT FOR 100 WPM OPERATION.
2. SIX FOR 75 WPM OPERATION.
3. FIVE FOR 60 WPM OPERATION.

SHOULD THE NUMBER OF PERFORATIONS BE GREATER THAN THAT SPECIFIED ABOVE, TURN THE RESIDUAL SCREW CLOCKWISE APPROXIMATELY 1/8 TURN AND REPEAT THE ABOVE TEST.

FIGURE 2-29. SIGNAL DISTORTION TEST SET

9. REPEAT-ON-SPACE

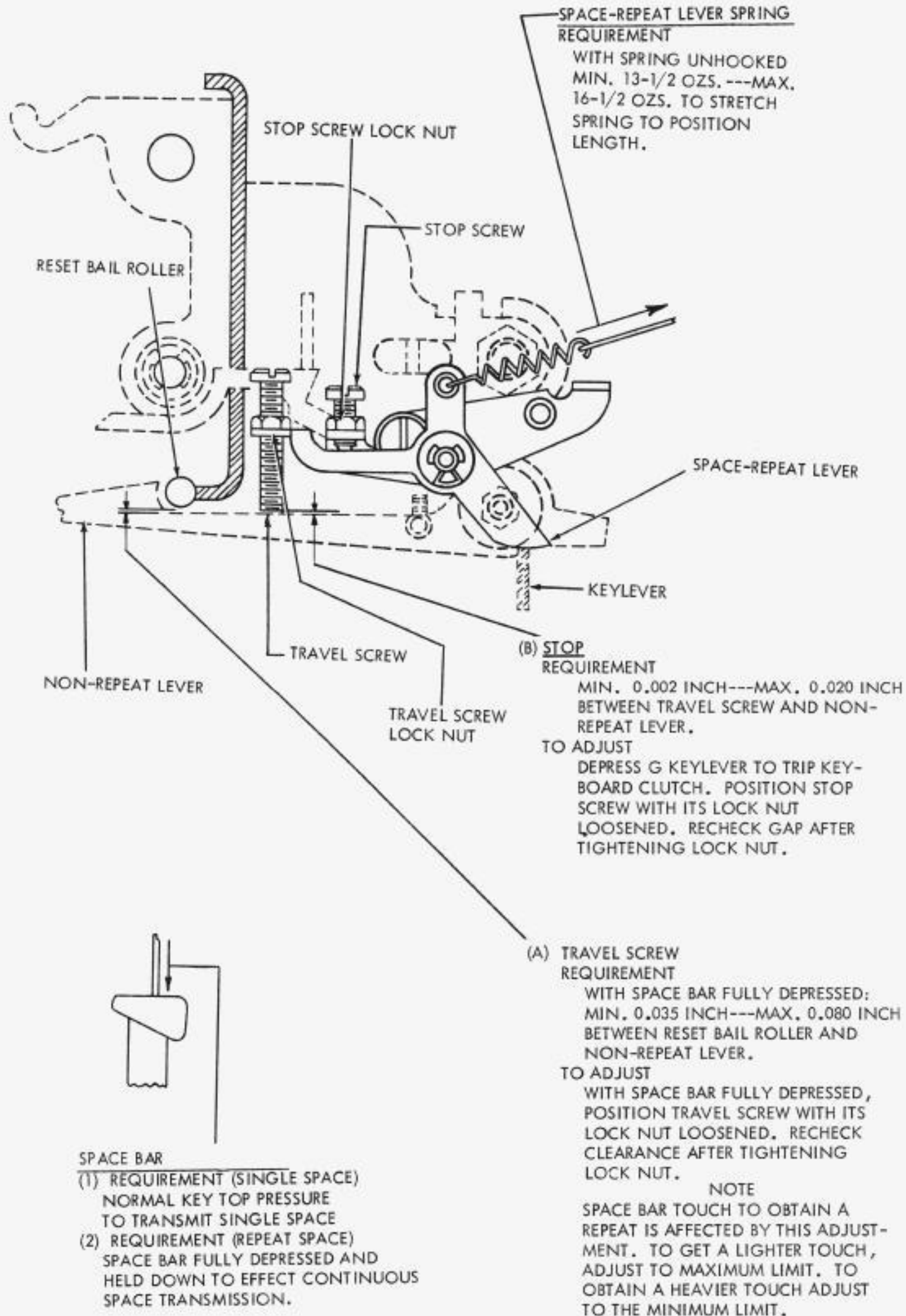


FIGURE 2-30. REPEAT-ON-SPACE MECHANISM

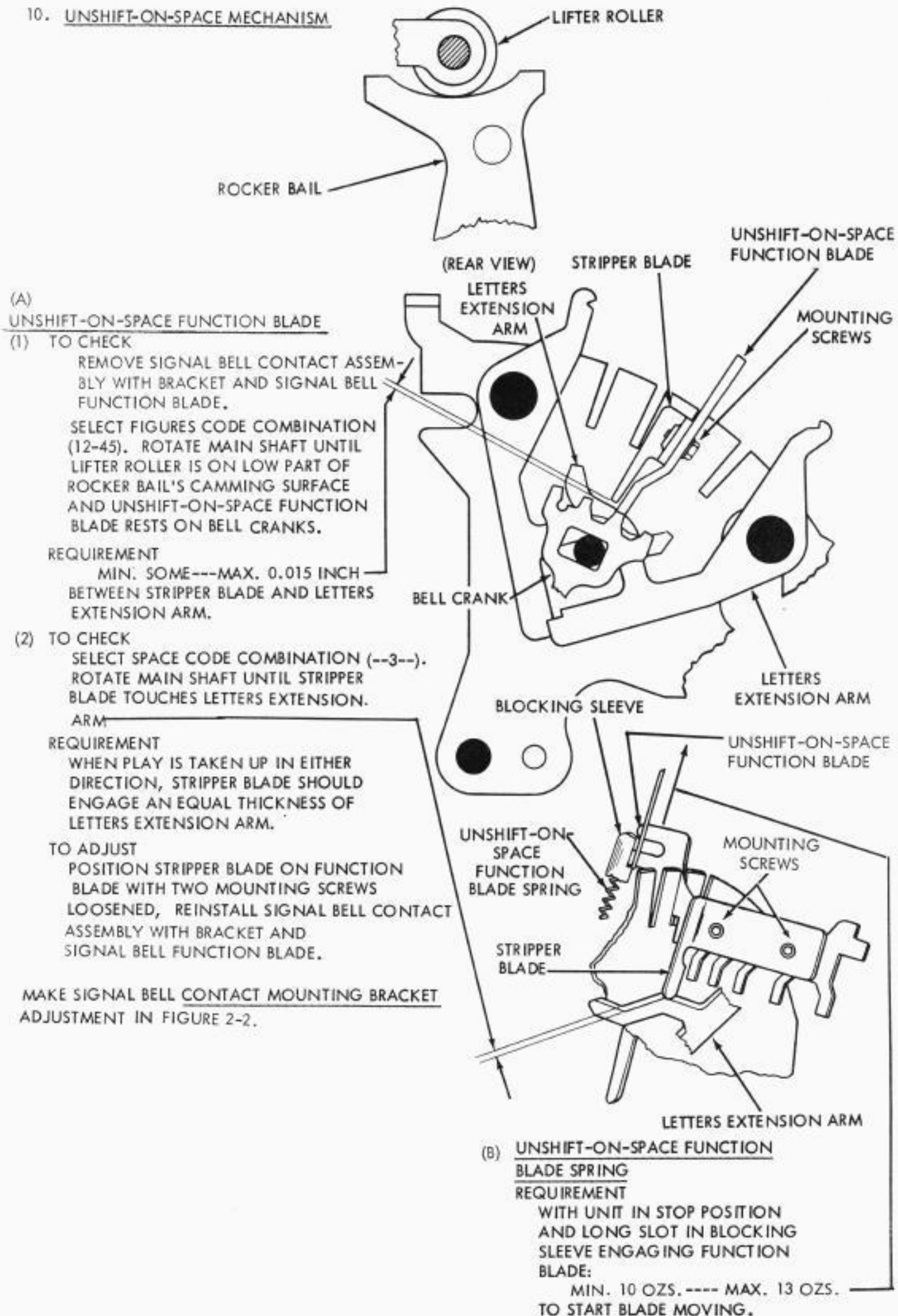
10. UNSHIFT-ON-SPACE MECHANISM

FIGURE 2-31. UNSHIFT-ON-SPACE MECHANISM

11. TIME DELAY MECHANISM

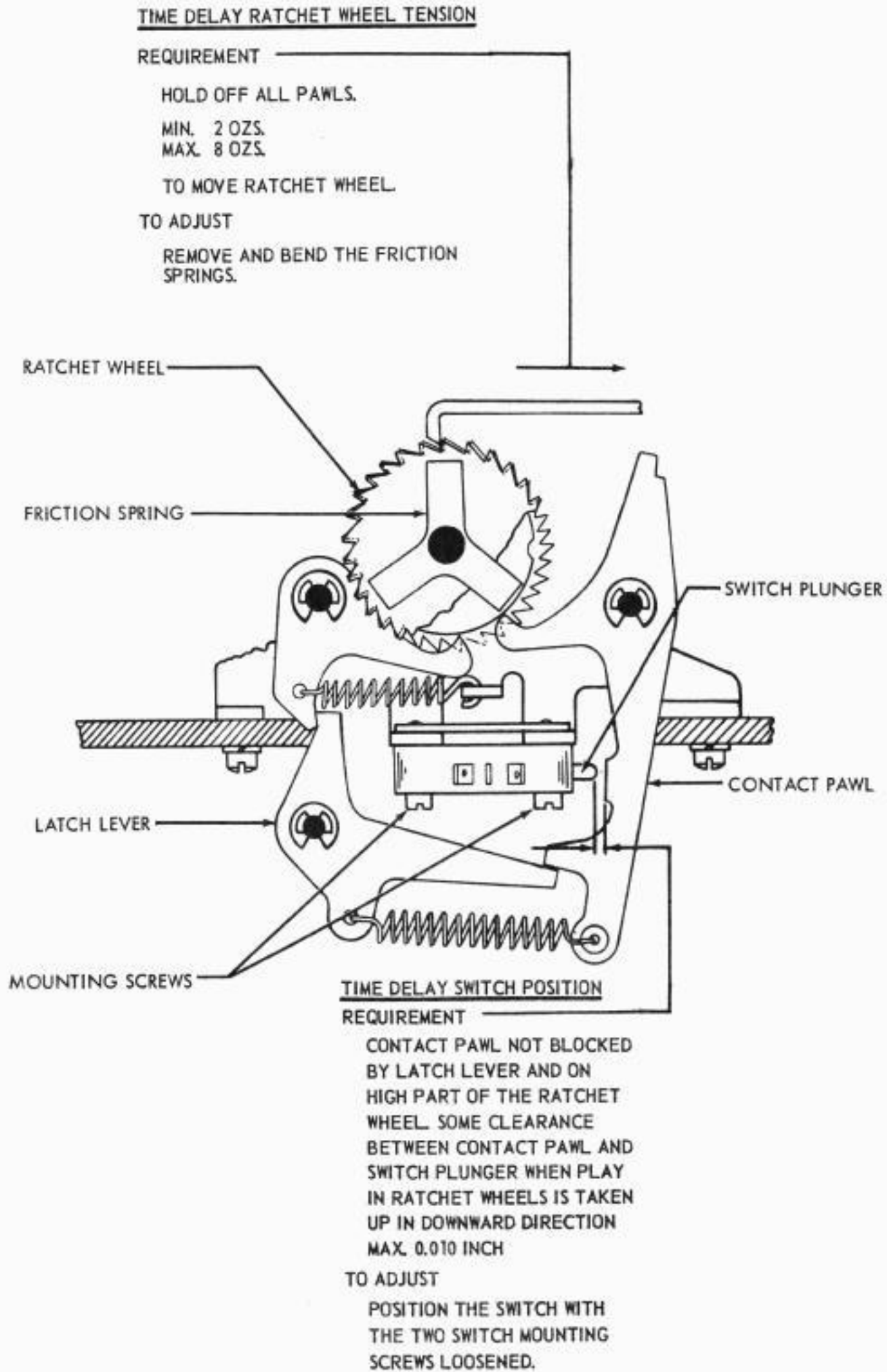


FIGURE 2-32. KEYBOARD OR BASE, TIME DELAY MECHANISM

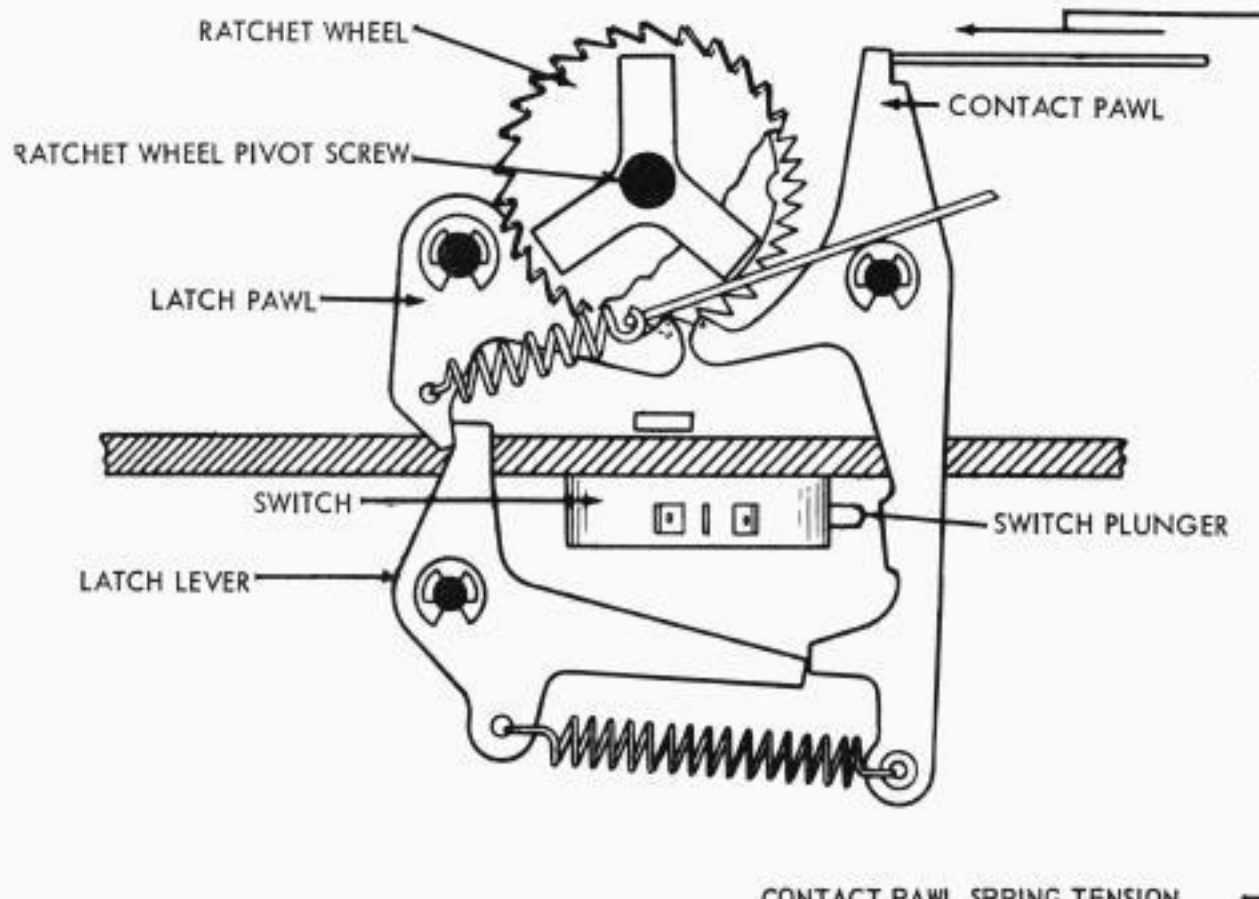
CONTACT LATCH PAWL SPRING TENSION
REQUIREMENT

LATCH PAWL SPRING UNHOOKED AT ANCHOR

MIN. 12 OZS.

MAX. 15 OZS.

TO STRETCH SPRING TO INSTALLED LENGTH AS SHOWN.



CONTACT PAWL SPRING TENSION
REQUIREMENT

CONTACT PAWL LATCHED ON END OF LATCH LEVER.

MIN. 8 OZS.

MAX. 12 OZS.

TO START THE PAWL MOVING.

FIGURE 2-33. KEYBOARD OR BASE, TIME DELAY MECHANISM, LEFT SIDE VIEW

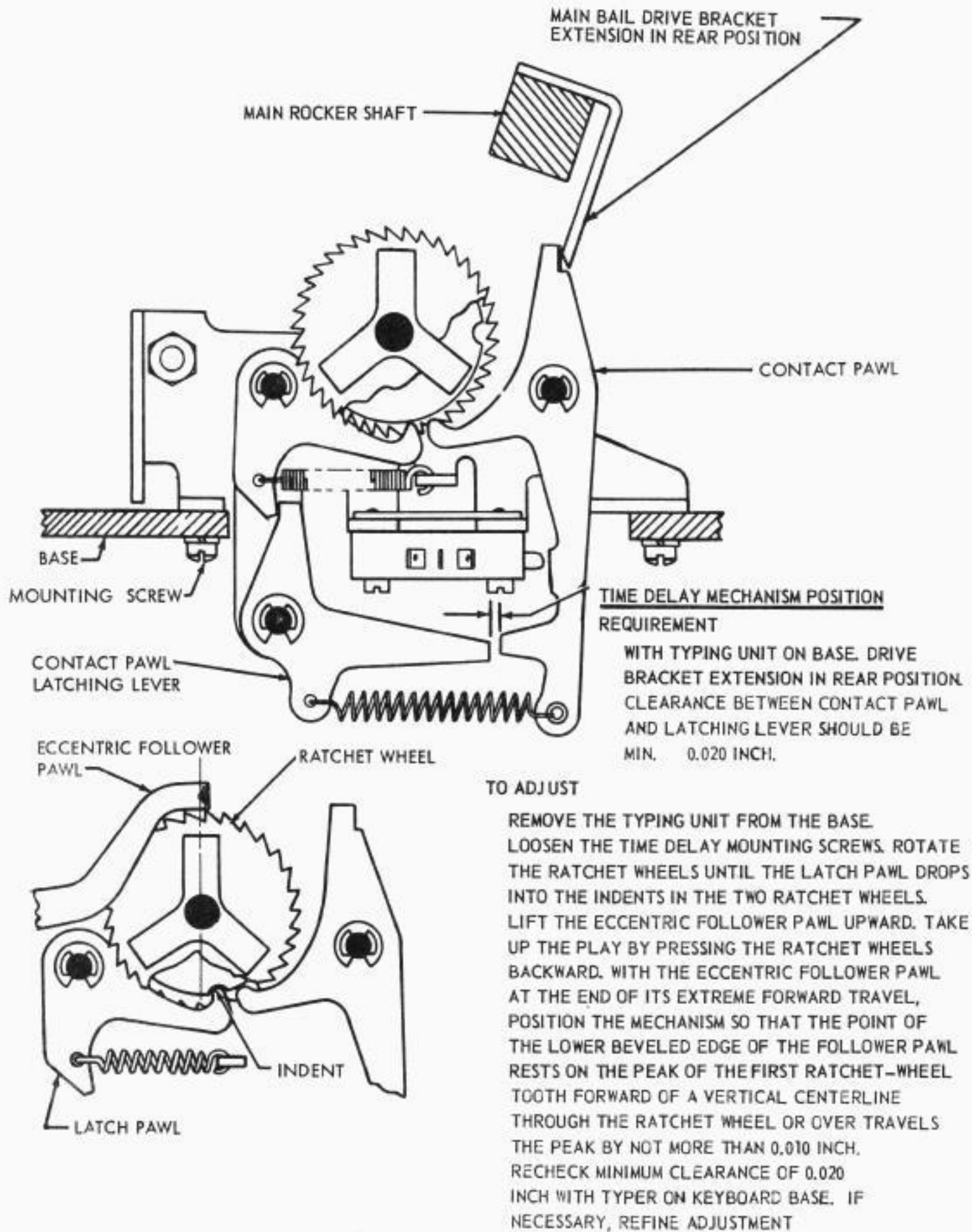
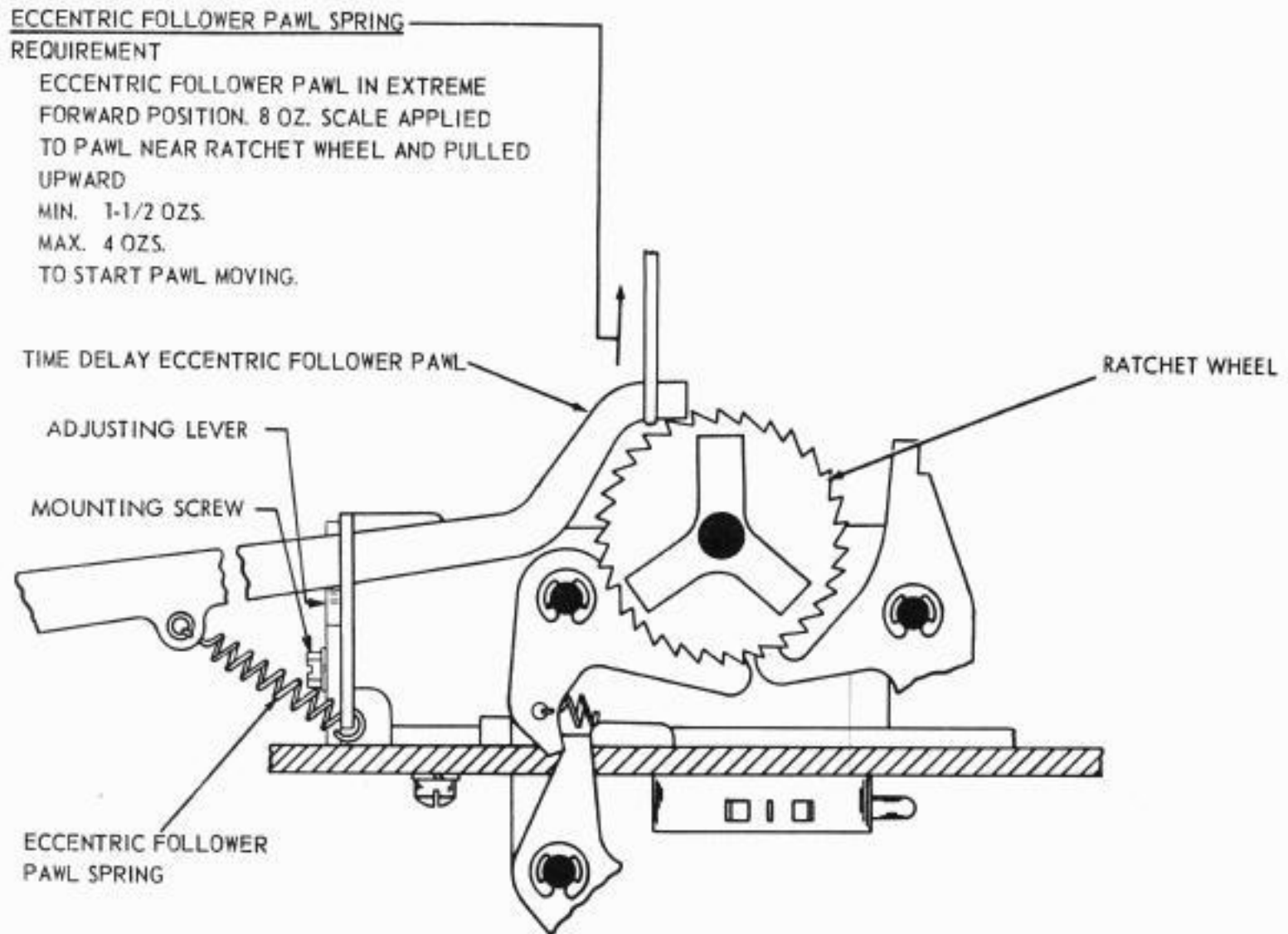


FIGURE 2-34. KEYBOARD OR BASE, TIME DELAY MECHANISM, LEFT SIDE VIEW

TIME DELAY DISABLING DEVICE

REQUIREMENT

DISABLE THE TIME DELAY MECHANISM WHEN NOT REQUIRED.

TO ADJUST

LOOSEN THE ADJUSTING LEVER MOUNTING SCREW AND PRESS DOWNWARD ON THE LEVER TO RAISE ECCENTRIC FOLLOWER OUT OF ENGAGEMENT WITH ITS RATCHET WHEEL.

FIGURE 2-35. KEYBOARD OR BASE, TIME DELAY DISABLING DEVICE

12. SYNCHRONOUS PULSE

MOUNTING BRACKET (A)

TO CHECK

WITH MAGNET NOT ATTRACTED AND CLUTCH TRIP BAR IN FURTHEST LEFT POSITION.

REQUIREMENT

MIN. 0.005 INCH --- MAX. 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST

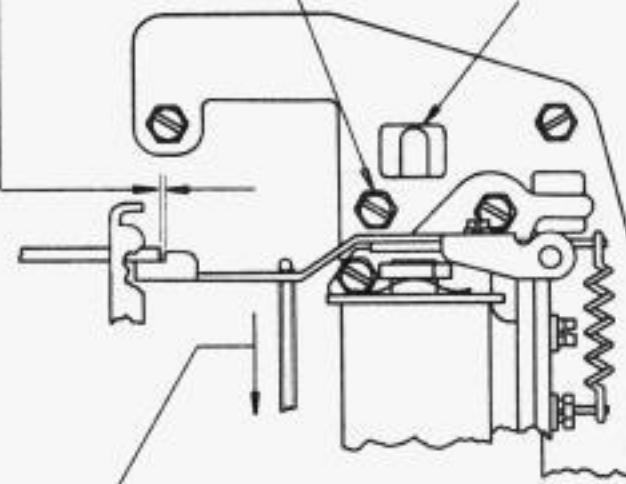
POSITION MOUNTING BRACKET WITH THREE MOUNTING SCREWS LOOSE BY MEANS OF PRY POINT.

NOTE

TIGHTEN REAR LEFT MOUNTING SCREW AND MAKE MOUNTING BRACKET ADJUSTMENT (B).

REAR LEFT MOUNTING SCREW

PRY POINT

MAGNET ARMATURE

TO CHECK

CLUTCH TRIP BAR IN EXTREME LEFT POSITION. HOOK 32 OZ. SCALE TO ARMATURE LEVER AS SHOWN. MEASURE AT RIGHT ANGLE TO ARMATURE LEVER AS INDICATED.

REQUIREMENT

MIN. 3 OZS. --- MAX. 5 OZS.

TO PULL ARMATURE LEVER FROM CLUTCH TRIP BAR.

ARMATURE HINGE

REQUIREMENT

WITH ARMATURE IN ATTRACTED POSITION ARMATURE FLUSH WITH POLE FACE AND MAGNET BRACKET EXTENSION.

TO ADJUST

POSITION ARMATURE WITH HINGE BRACKET MOUNTING SCREW AND SPRING POST LOOSE.

MOUNTING BRACKET (B)

TO CHECK

WITH ARMATURE LEVER HELD AGAINST MAGNET POLE FACE AND CLUTCH TRIP BAR IN FURTHEST RIGHT POSITION.

REQUIREMENT

MIN. 0.005 INCH --- MAX. 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST

WITH RIGHT REAR AND LEFT FRONT MOUNTING BRACKET SCREWS LOOSE POSITION MOUNTING BRACKET BY MEANS OF PRY POINT.

MOUNTING SCREWS

PRY POINT

CLUTCH TRIP BAR

ARMATURE LEVER

SPRING POST

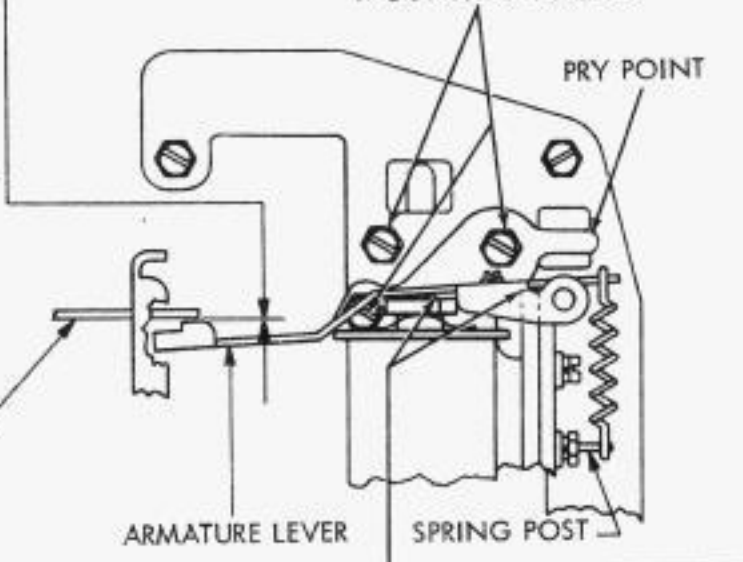
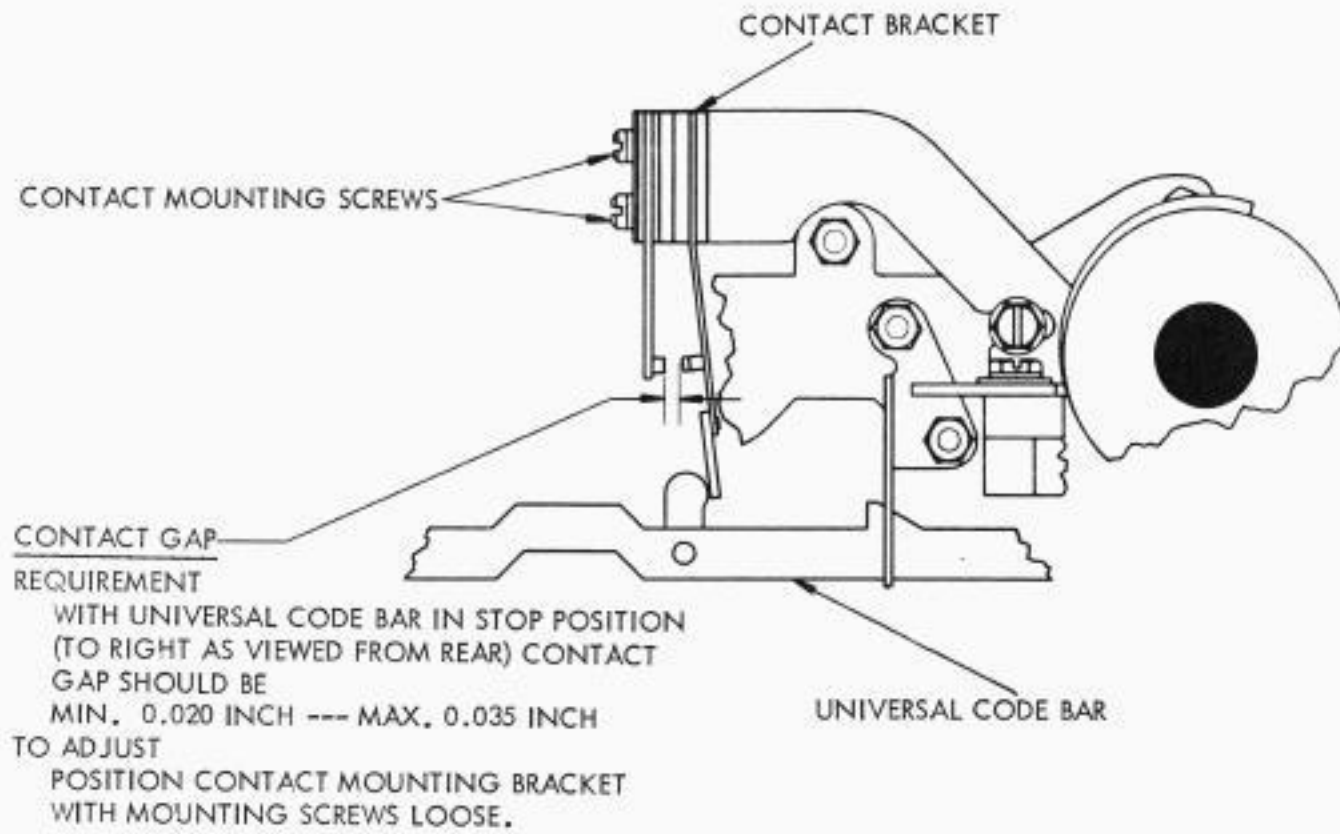


FIGURE 2-36. KEYBOARD, SYNCHRONOUS PULSE MAGNET MECHANISM



UNIVERSAL CODE BAR CONTACT
 REQUIREMENT
 WITH UNIVERSAL CODE BAR IN OPERATED
 POSITION (TO THE LEFT AS VIEWED FROM REAR)
 MIN. 3-1/2 OZS. --- MAX. 4-1/2 OZS.
 TO OPEN CONTACTS.
 TO ADJUST
 BEND CONTACT SWINGER.

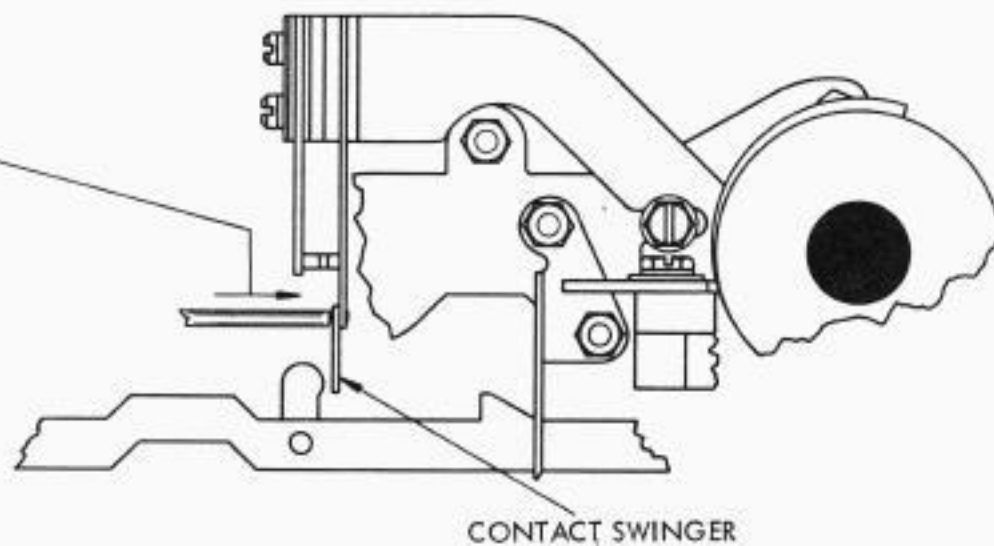
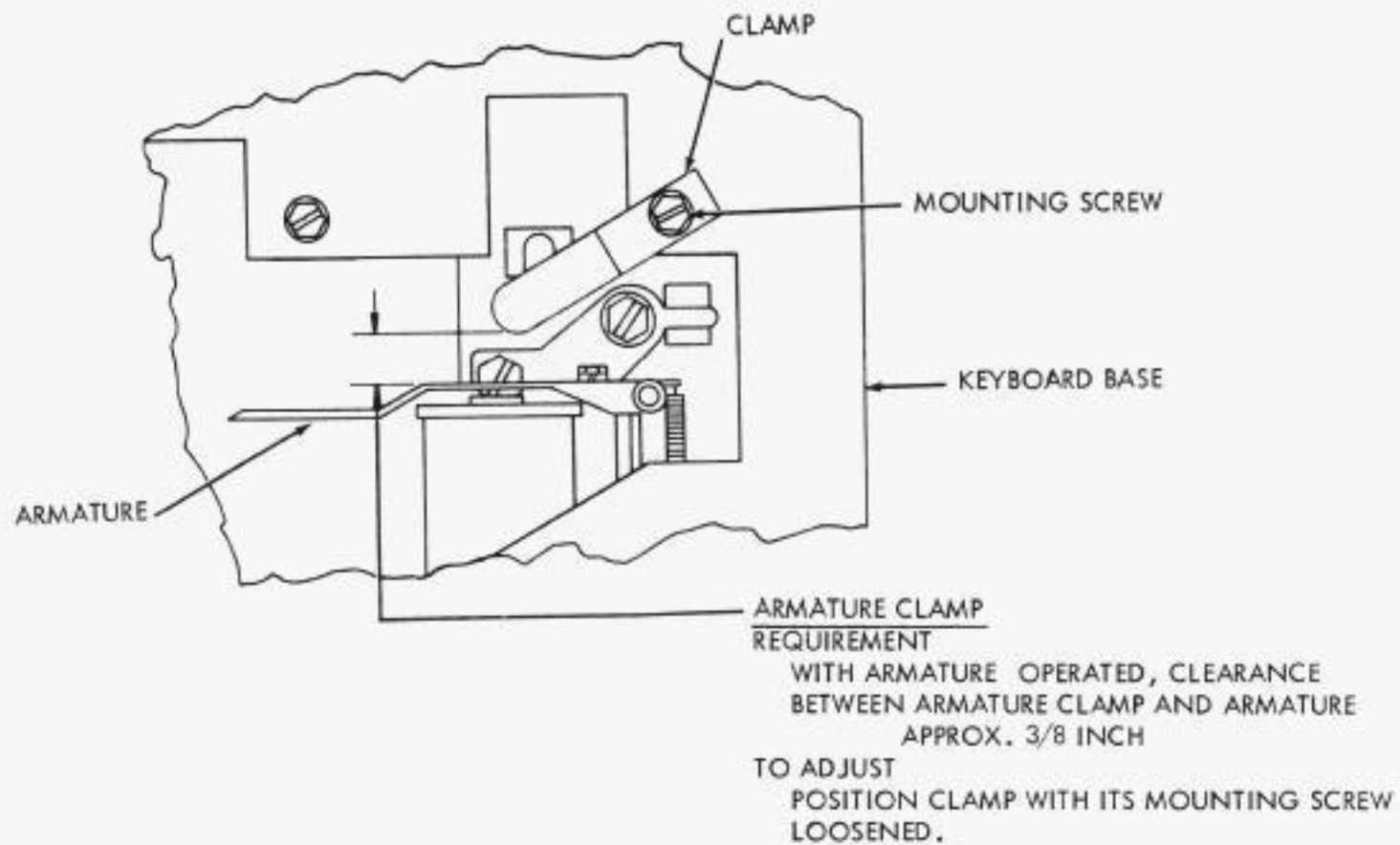


FIGURE 2-37. KEYBOARD, SYNCHRONOUS PULSE CONDITIONING CONTACT



13. LOW PAPER AND PAPER-OUT MECHANISM

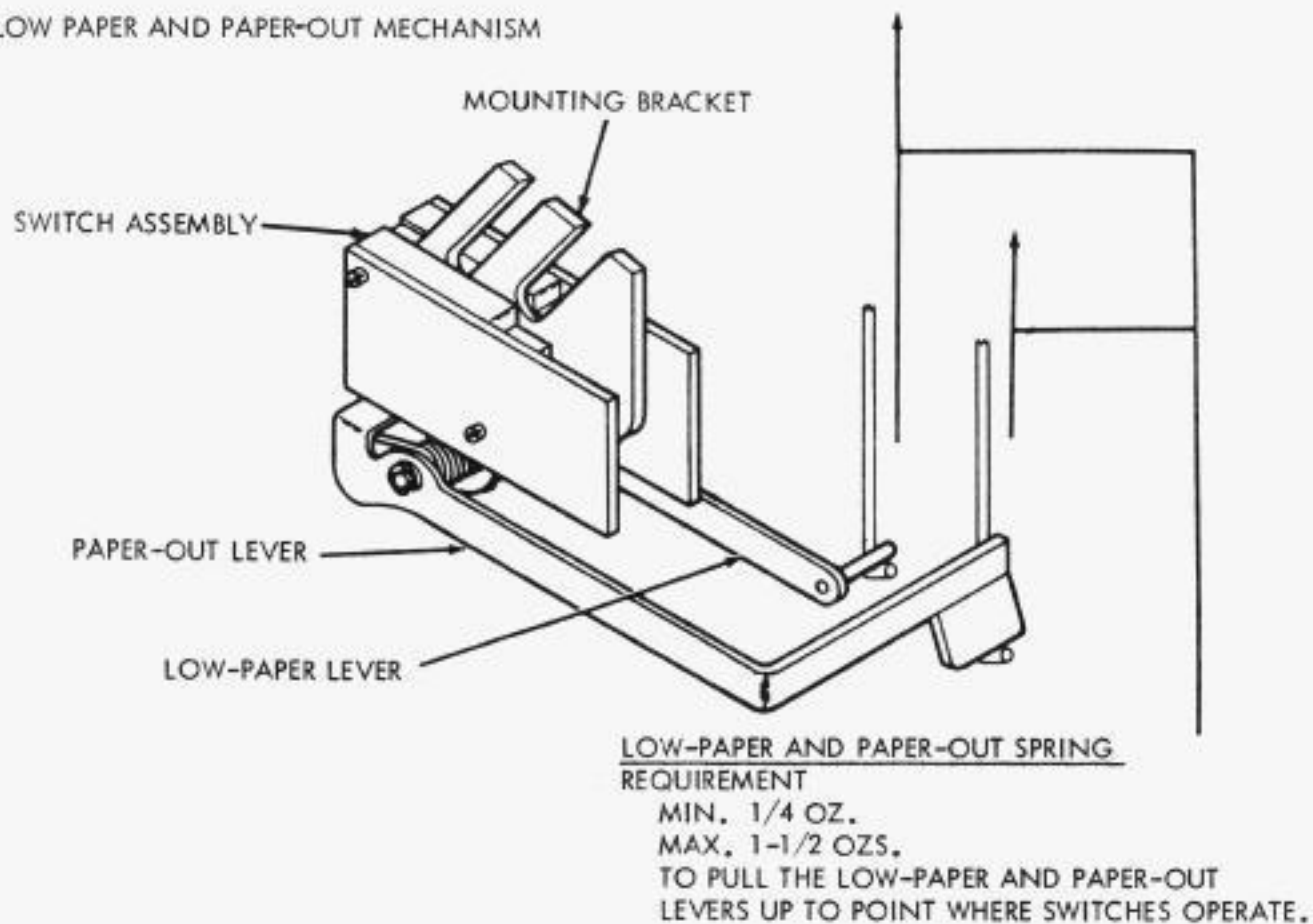


FIGURE 2-38. SYNCHRONOUS PULSE MAGNET AND LOW-PAPER PAPER-OUT MECHANISM

14. POWER BACKSPACE SWITCH

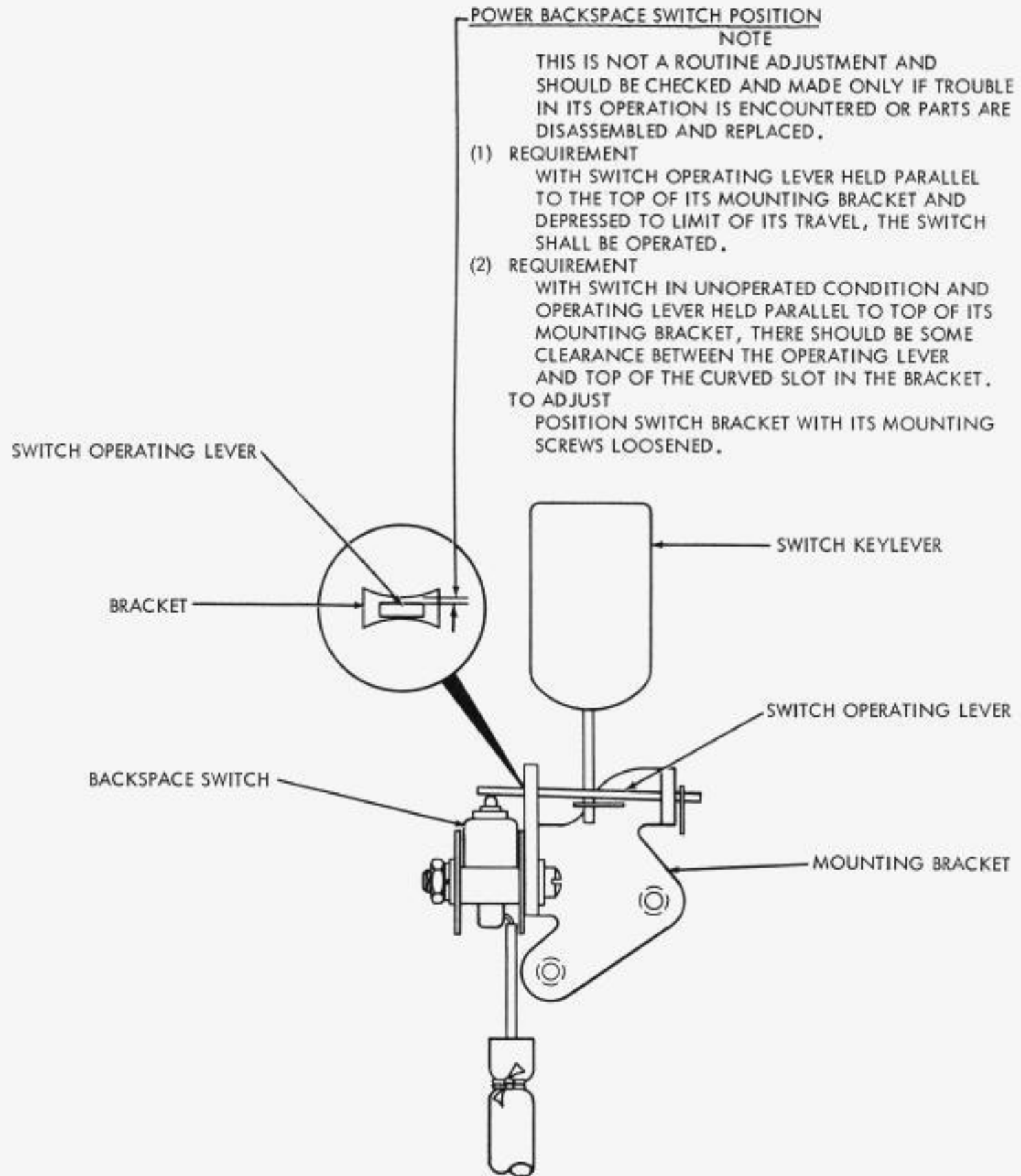


FIGURE 2-39. KEYBOARD, POWER BACKSPACE SWITCH

15. CABINET MESSAGE TRAY

MESSAGE TRAY POSITION
REQUIREMENT

THE THREE-SHELF MESSAGE TRAY SHOULD
BE POSITIONED SO AS NOT TO INTERFERE
WITH THE CABINET DOME TORSION BARS.

TO ADJUST
POSITION THE SHELVES WITH THEIR MOUNTING
SCREWS LOOSENED.

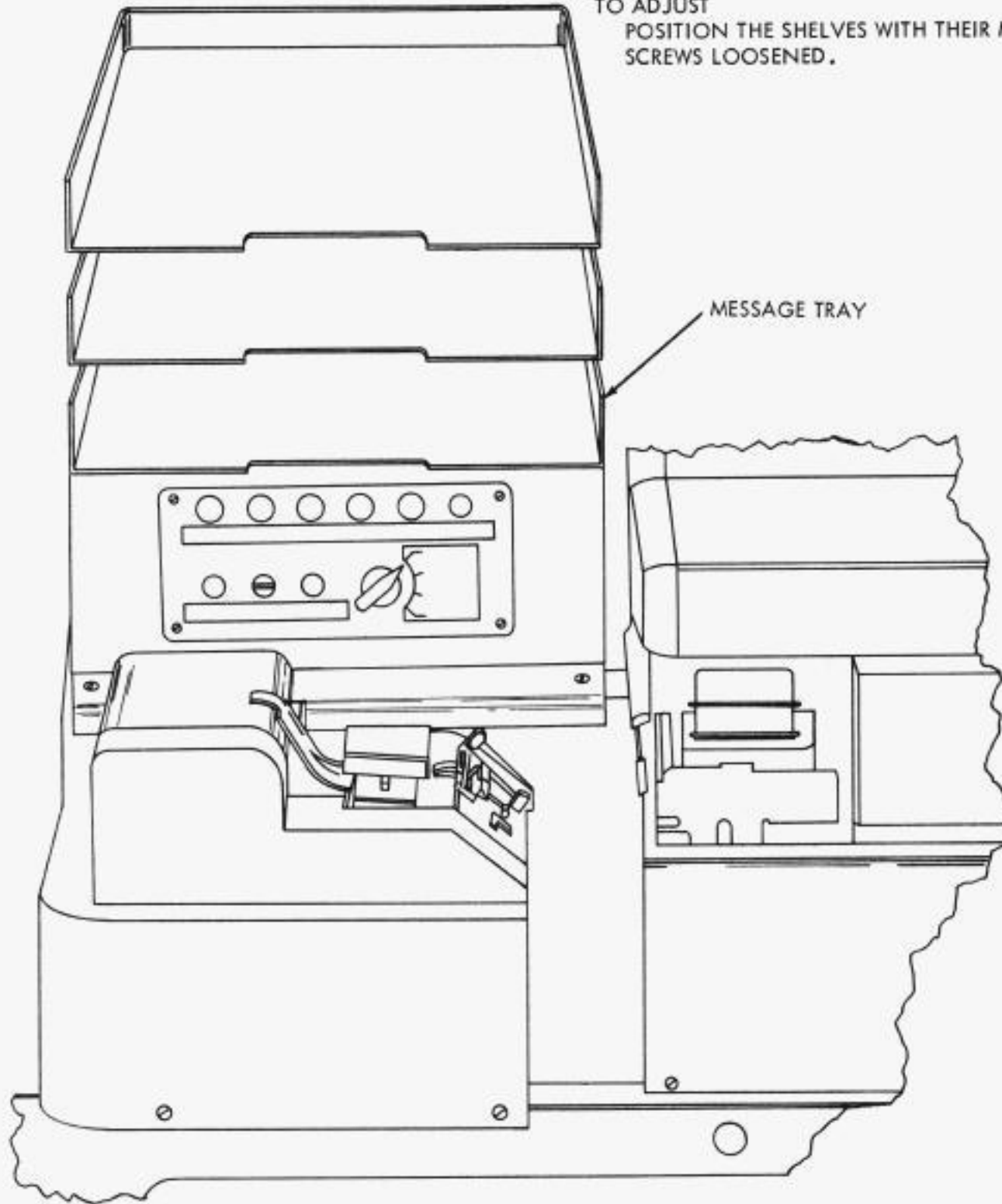


FIGURE 2-40. CABINET, MESSAGE TRAY

16. REMOTE CONTROL GEAR SHIFT

GEAR SHIFT MECHANISMREQUIREMENT

THE BACKLASH BETWEEN THE MOTOR PINION AND ITS DRIVEN GEAR AND BETWEEN THE TYPING UNIT DRIVEN GEAR AND ITS DRIVING GEAR SHOULD BE SOME --- MAX. 0.005 INCH

TO ADJUST

LOOSEN THE FOUR SCREWS WHICH MOUNT THE ASSEMBLY BRACKET TO BASE. LOOSEN THE NUT-PLATE MOUNTING SCREW AT FRONT OF ASSEMBLY BRACKET. LOOSEN LOCK NUTS ON ADJUSTING BUSHINGS. POSITION GEAR SHIFT BRACKET ASSEMBLY FRONT TO REAR, RAISE OR LOWER REAR OF ASSEMBLY BY ROTATING ADJUSTING BUSHING NEAREST THE MOTOR. POSITION OTHER BUSHING AGAINST BASE PLATE AND TIGHTEN ALL SCREWS AND LOCK NUT.

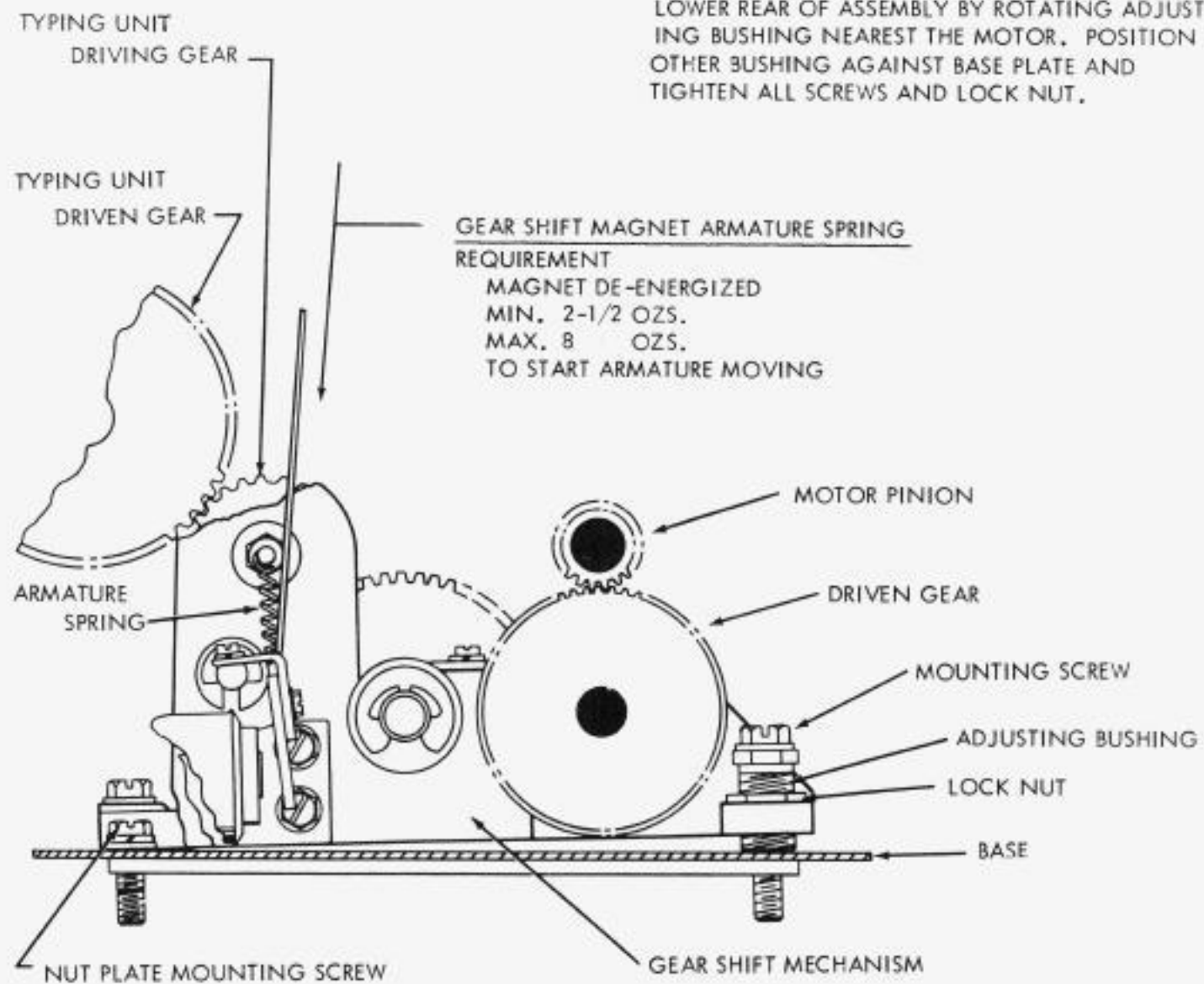


FIGURE 2-41. REMOTE CONTROL GEAR SHIFT MECHANISM

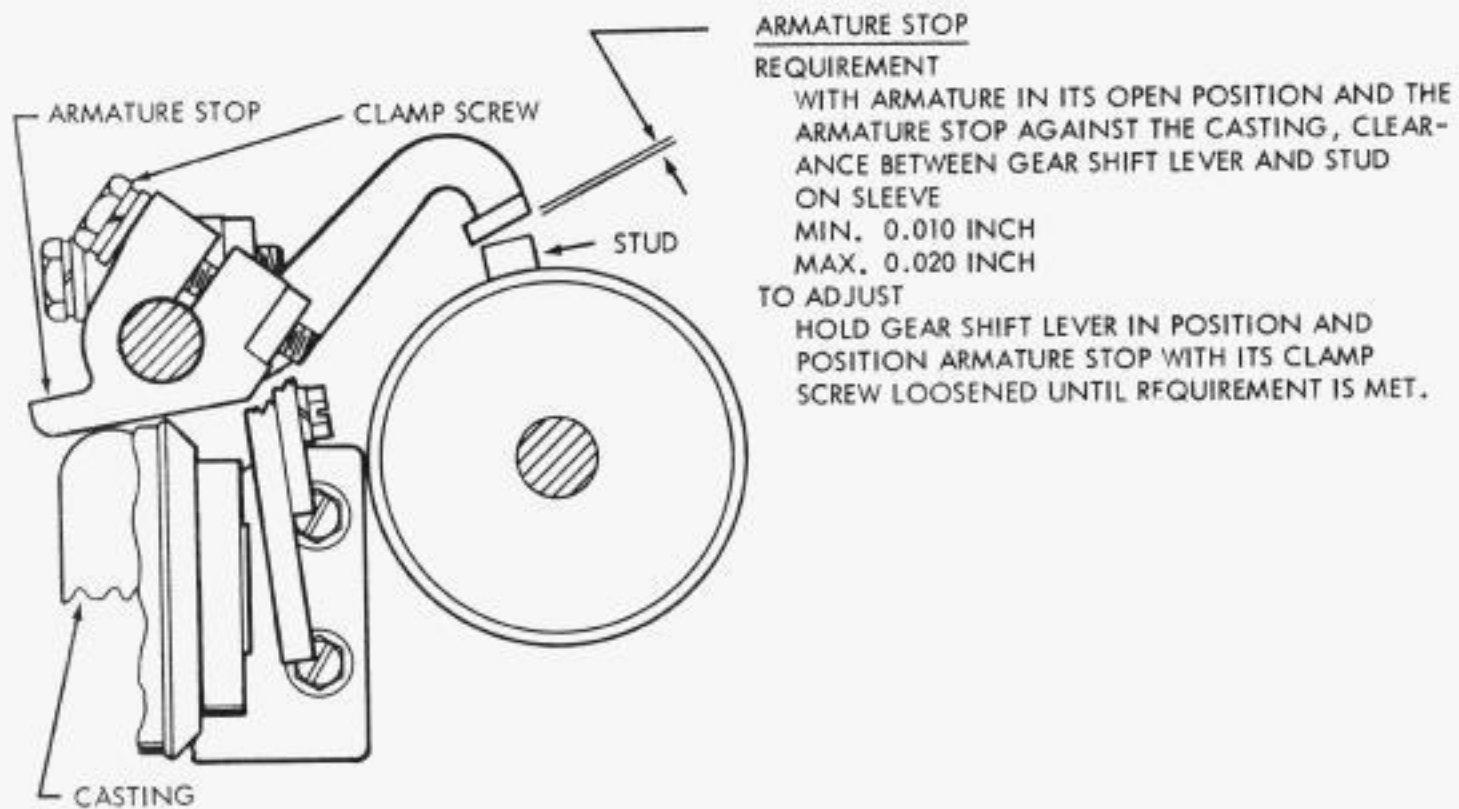
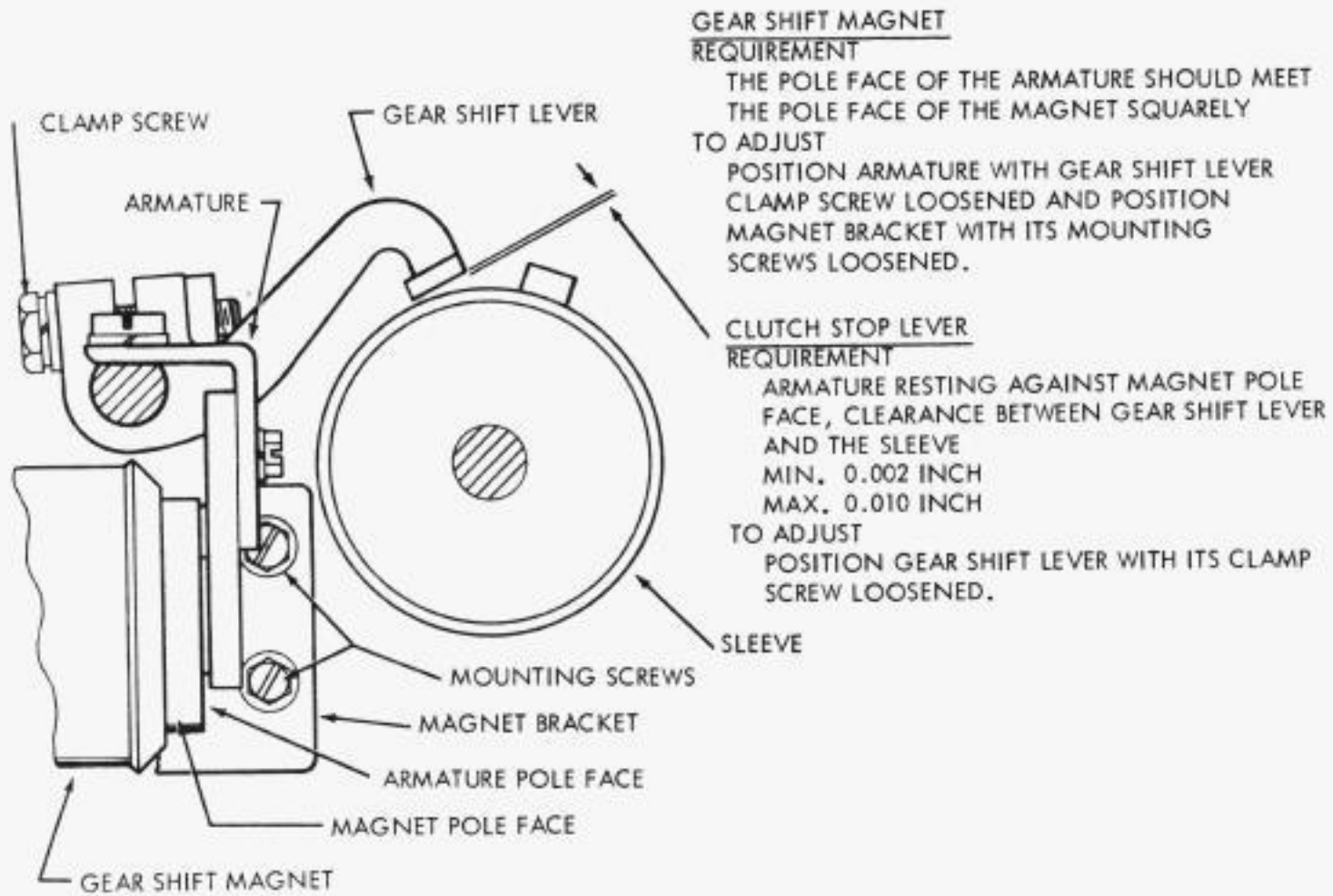


FIGURE 2-42. REMOTE CONTROL GEAR SHIFT MECHANISM

17. PERFORATOR MOTOR

PERFORATOR MOTOR PINION AND DRIVEN GEAR MESH

REQUIREMENT

MIN. 0.004 INCH

MAX. 0.008 INCH

BACKLASH BETWEEN MOTOR PINION AND DRIVEN GEAR AT POINT OF MINIMUM BACKLASH.

TO CHECK

- (1) LOOSEN THE FOUR MOTOR MOUNTING SCREWS.
- (2) LOOSEN THE TWO NUTS WHICH LOCK THE ADJUSTING BUSHINGS AT THE RIGHT END OF THE MOTOR (REAR VIEW)

TO ADJUST

- (1) BACK OFF A FEW TURNS ON THE REAR ADJUSTING BUSHING TO PROVIDE ENOUGH CLEARANCE TO MAKE THE ADJUSTMENT.
- (2) BY MEANS OF THE FRONT ADJUSTING BUSHING, ADJUST THE MOTOR HEIGHT TO MEET REQUIREMENT AT THE PINION AND DRIVEN GEARS. TIGHTEN THE LOCK NUT.
- (3) TURN THE REAR ADJUSTING BUSHING UNTIL IT TOUCHES THE MOUNTING PLATE. TIGHTEN THE LOCK NUT.

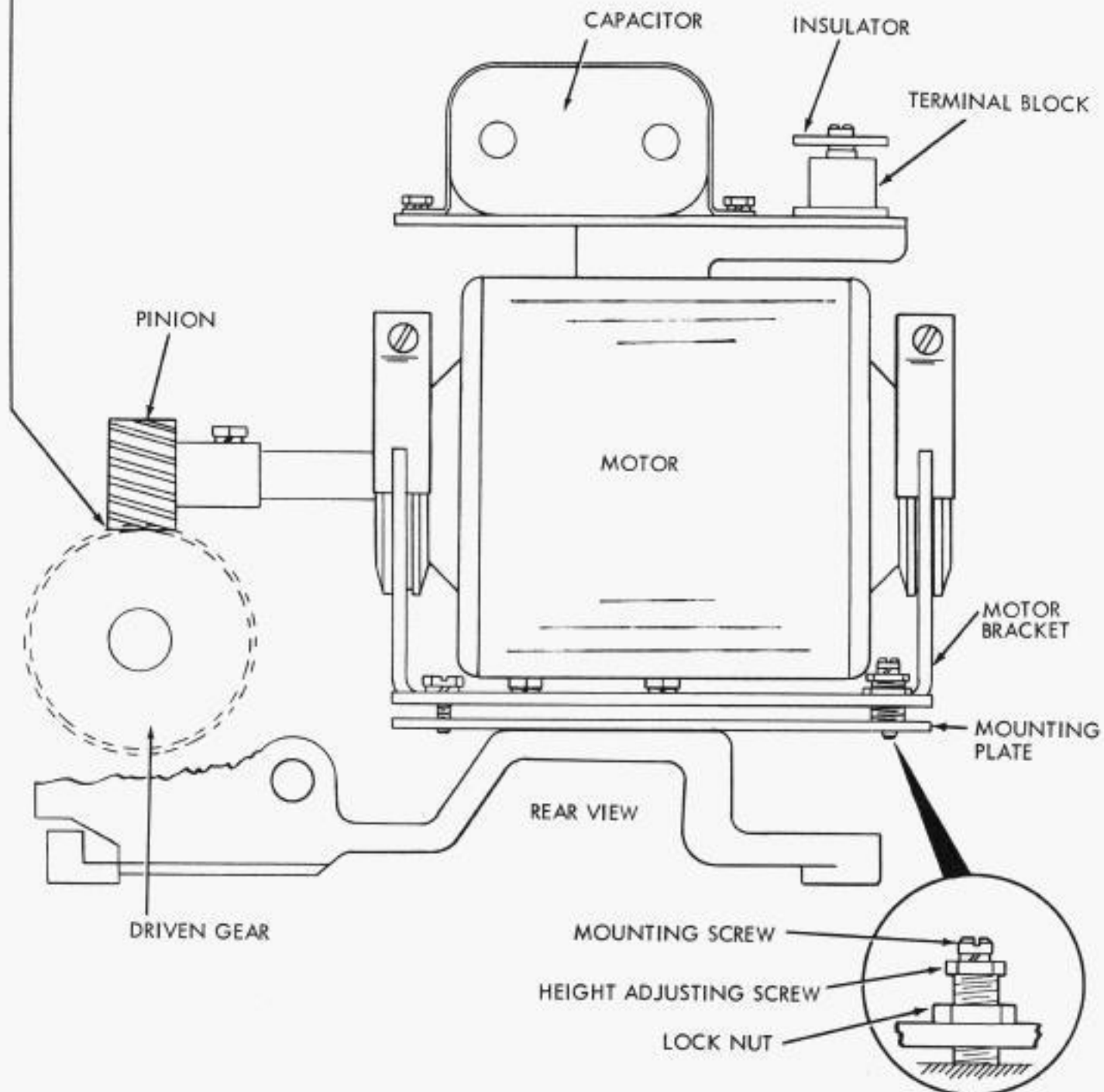


FIGURE 2-43. KEYBOARD, PERFORATOR TRANSMITTER MOTOR

18. ANSWER-BACK MECHANISM

CLUTCH TRIP ARMATURE AIR GAP

REQUIREMENT

AIR GAP BETWEEN ARMATURE AND MAGNET ASSEMBLY BRACKET:
MIN. 0.004 INCH --- MAX. 0.008 INCH
WHEN ARMATURE IS HELD FLUSH AGAINST MAGNET CORE.

TO ADJUST

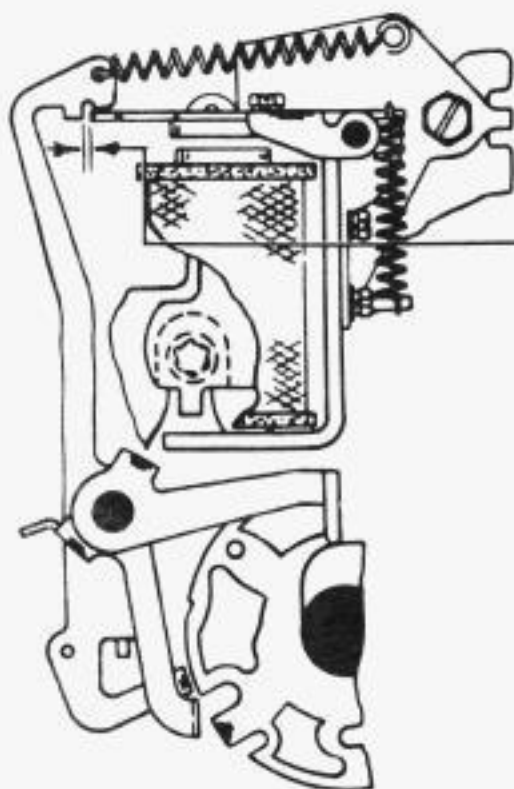
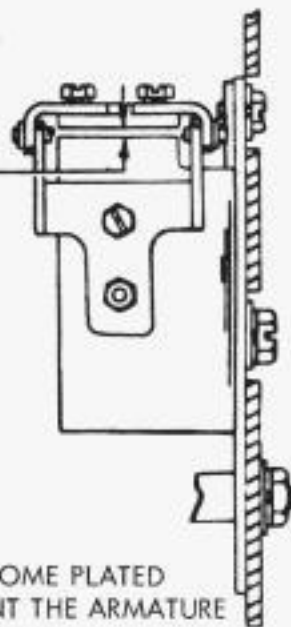
REMOVE ARMATURE EXTENSION SPRING, LOOSEN SPRING POST AND HINGE MOUNTING SCREW AND POSITION HINGE.

TO CHECK:

APPLY AC POWER. IF EXCESS CHATTER IS PRESENT, REFINE THE ADJUSTMENT BY INCREASING OR DECREASING THE AIR GAP UNTIL THE CHATTER IS ELIMINATED.

NOTE

THIS IS A REVERSIBLE ARMATURE. FOR USE WITH DC CURRENT, THE HEAVY CHROME PLATED SIDE STAMPED C MUST BE FACING THE MAGNET CORE. FOR USE WITH AC CURRENT THE ARMATURE MUST BE REVERSED SO THAT THE SIDE STAMPED C IS AWAY FROM THE MAGNET CORE.

CLUTCH TRIP LEVER

REQUIREMENT

CLEARANCE BETWEEN ARMATURE EXTENSION LEVER AND LATCHING SURFACES OF CLUTCH TRIP LEVER:
MIN. 0.020 INCH --- MAX. 0.030 INCH
WHEN CLUTCH TRIP LEVER IS ON HIGH PART OF CAM.

TO ADJUST

LOOSEN PLATE ADJUSTING SCREW AND PLATE MOUNTING SCREW. INSERT SCREWDRIVER IN SLOT ADJACENT TO ADJUSTING SCREW AND POSITION PLATE FOR REQUIRED CLEARANCE.

ARMATURE EXTENSION

REQUIREMENT

CLEARANCE BETWEEN ARMATURE EXTENSION LEVER AND CLUTCH TRIP LEVER
MIN. 0.030 INCH --- MAX. 0.040 INCH
WHEN CLUTCH TRIP LEVER IS ON HIGH PART OF CAM AND ARMATURE IS FLUSH AGAINST CORE (PLAY TAKEN UP WITH SPRING).

TO ADJUST

LOOSEN BRACKET MOUNTING SCREW AND BRACKET ADJUSTING SCREW AND INSERT SCREWDRIVER INTO SLOT BELOW ADJUSTING SCREW, AND ADJUST BRACKET.

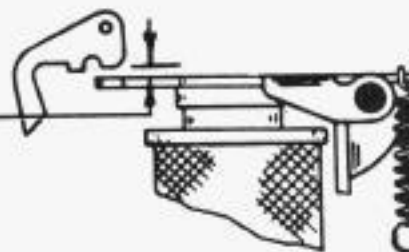


FIGURE 2-44. ANSWER-BACK MECHANISM

CLUTCH TRIP CLAMPING SCREW

CLUTCH STOP ARM

REQUIREMENT

WITH CLUTCH TRIP LEVER IN LATCHED POSITION, CLUTCH LEVER SHOULD FULLY ENGAGE CLUTCH SHOE LEVER.

TO ADJUST

WITH CLUTCH IN STOP POSITION, LOOSEN CLUTCH TRIP CLAMPING SCREW AND ADJUST CLUTCH STOP LEVER TO OBTAIN FULL BITE WITH CLUTCH SHOE LEVER.

NOTE: WHEN ARMATURE IS IN ATTRACTED POSITION, CLUTCH STOP ARM SHOULD CLEAR STOP LEVER AND STOP LUG BY AT LEAST SOME CLEARANCE.

CLUTCH SHOE LEVER

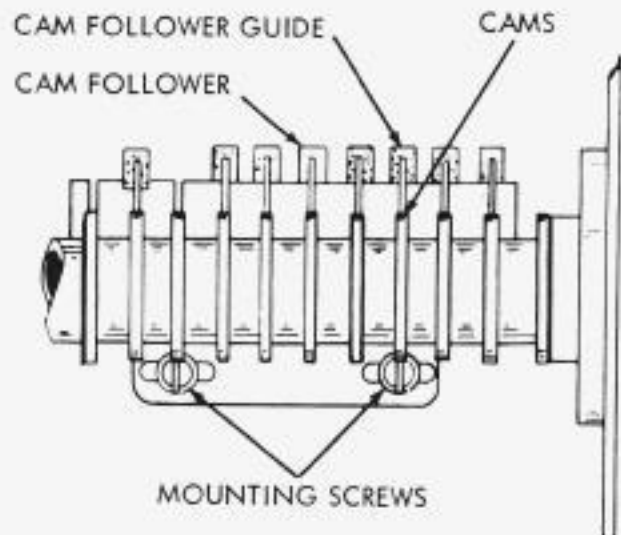
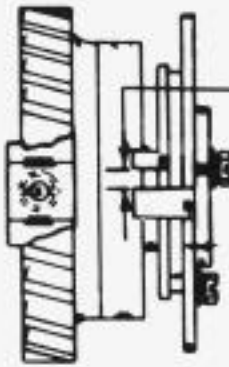
REQUIREMENT

CLEARANCE BETWEEN CLUTCH SHOE LEVER AND EXTENSION SHOULD BE MIN. 0.055 INCH --- MAX. 0.085 INCH
GREATER WHEN CLUTCH IS ENGAGED THAN WHEN DISENGAGED.

TO ADJUST

LOOSEN TWO CLAMP SCREWS IN CLUTCH DISK. ROTATE ADJUSTING DISK TO OBTAIN PROPER CLEARANCE.

NOTE: AFTER ABOVE ADJUSTMENT IS MADE, DISENGAGE CLUTCH AND ROTATE DRUM IN NORMAL ROTATION TO MAKE CERTAIN IT DOES NOT DRAG ON SHOES. IF DRUM DRAGS, REFINE ADJUSTMENT.

CAM FOLLOWER GUIDE

REQUIREMENT

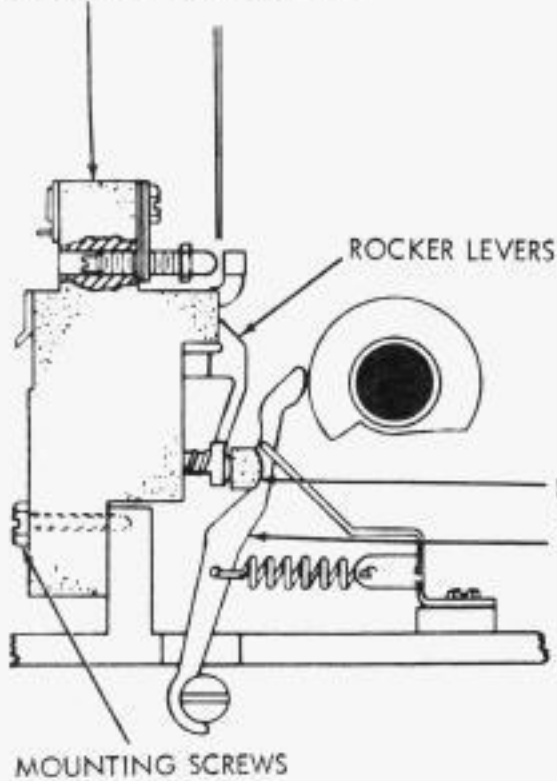
CAM FOLLOWER GUIDE ORIENTED SO CENTER CAM FOLLOWER IS FULLY ON CAM WHEN FOLLOWER IS MOVED SIDWAYS IN GUIDE SLOT. OTHER MUST HAVE AT LEAST 75% BITE WHEN MOVED IN EITHER DIRECTION, AND BE FREE IN THEIR GUIDE SLOTS.

TO ADJUST

POSITION CAM FOLLOWER GUIDE WITH ITS MOUNTING SCREWS LOOSENED. AFTER TIGHTENING, CHECK FOR FREENESS.

FIGURE 2-45. ANSWER-BACK MECHANISM

DISTRIBUTOR BLOCK ASSEMBLY



DISTRIBUTOR BLOCK ASSEMBLY

REQUIREMENT

DISTRIBUTOR BLOCK ASSEMBLY POSITIONED ON CASTING SO THAT ROCKER LEVERS ARE FULLY ENGAGED WITH THE BAKELITE ON THE FOLLOWER LEVERS.

TO ADJUST

LOOSEN DISTRIBUTOR BLOCK ASSEMBLY MOUNTING SCREWS AND POSITION BLOCK LEFT OR RIGHT TO OBTAIN REQUIREMENT.

DISTRIBUTOR CONTACT GAP

REQUIREMENT

CONTACT GAP SHOULD BE MIN. 0.020 INCH --- MAX. 0.030 INCH WITH CAM FOLLOWER LEVER ON HIGH PART OF CAM.

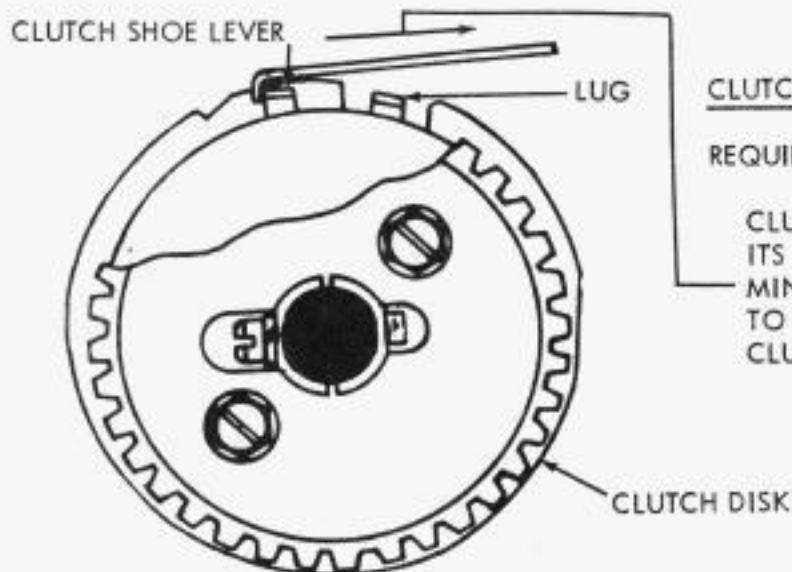
TO ADJUST

TURN CONTACT SCREW AT SOCKET END UNTIL DESIRED GAP IS OBTAINED. CHECK ALL CONTACT GAPS.

NOTE: POSITION FOLLOWER ON HIGH OF CAM BY TRIPPING CLUTCH MANUALLY AND ROTATING DISTRIBUTOR SHAFT.



CONTACT SCREW



CLUTCH SHOE LEVER SPRING

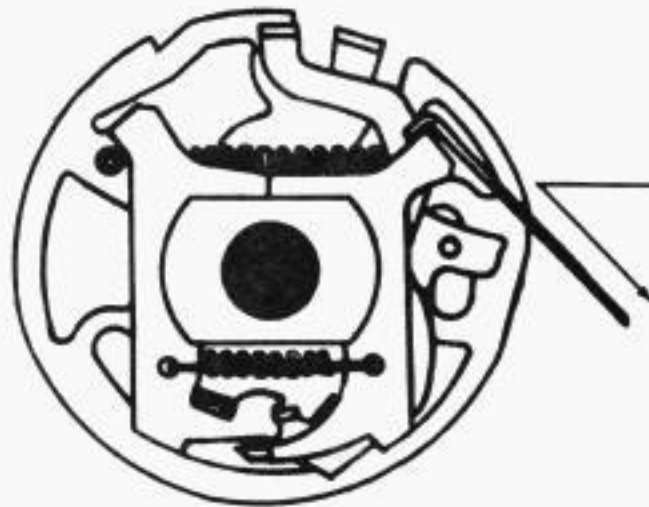
REQUIREMENT

CLUTCH ENGAGED. CLUTCH DISK HELD TO PREVENT ITS TURNING:
MIN. 15 OZS. --- MAX. 20 OZS.
TO PULL SHOE LEVER IN CONTACT WITH LUG ON CLUTCH DISK.

FIGURE 2-46. ANSWER-BACK MECHANISM

NOTE

AS IT REQUIRES REMOVAL OF CLUTCH FROM SHAFT, THIS SPRING TENSION SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO SUSPECT THAT IT WILL NOT MEET ITS REQUIREMENT.

CLUTCH SHOE SPRING

REQUIREMENT

CLUTCH DRUM REMOVED.
 MIN. 3 OZS. --- MAX. 5 OZS.
 TO START PRIMARY SHOE MOVING AWAY FROM
 SECONDARY SHOE.

DISTRIBUTOR CAM FOLLOWER SPRING

REQUIREMENT

DISTRIBUTOR BLOCK REMOVED
 MIN. 1/2 OZ. --- MAX. 1-1/2 OZ.
 TO START CAM FOLLOWER LEVER MOVING WHEN
 LEVER IS ON HIGH OF CAM.

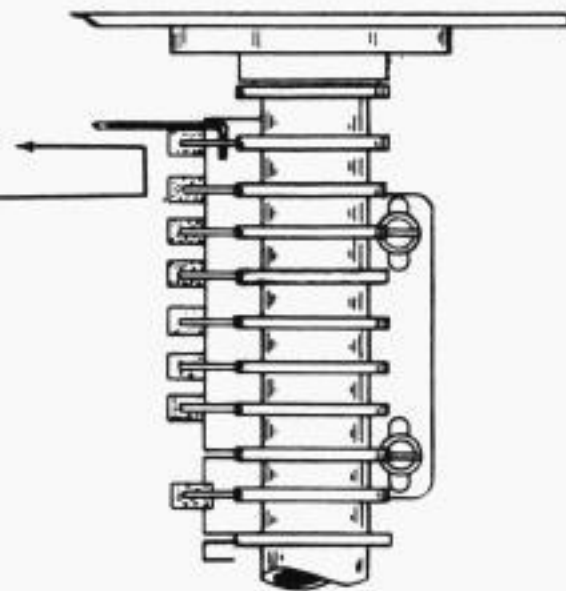


FIGURE 2-47. ANSWER-BACK MECHANISM

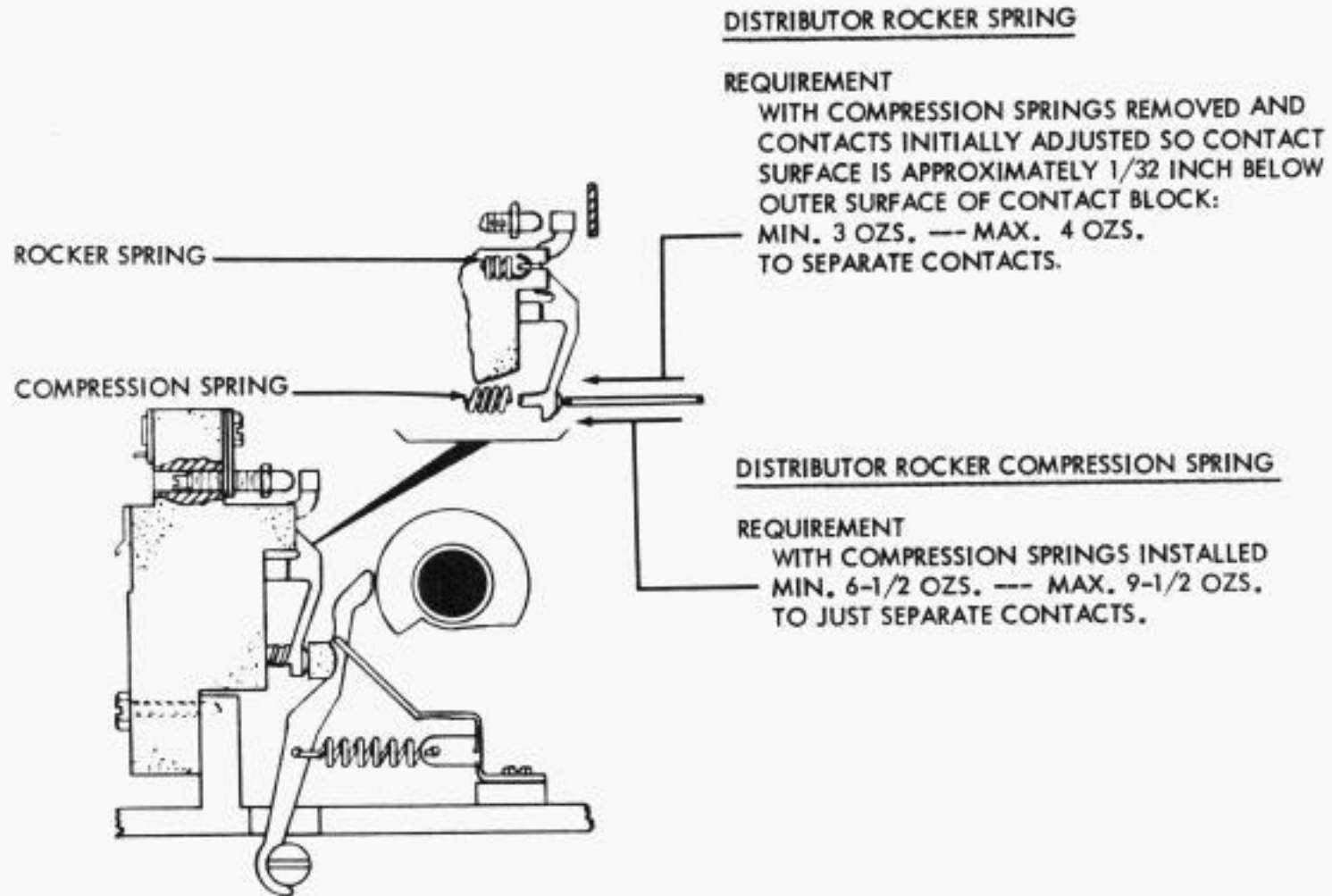


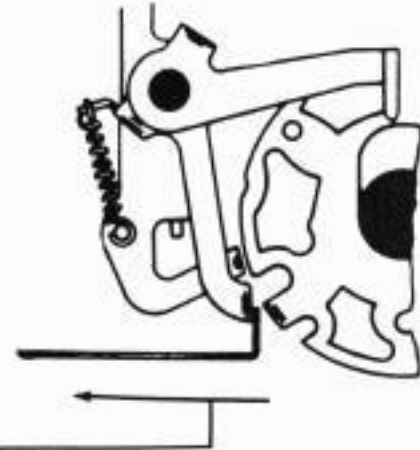
FIGURE 2-48. ANSWER-BACK MECHANISM

CLUTCH LATCH LEVER SPRING

REQUIREMENT

CLUTCH LATCH LEVER ON LOW OF CLUTCH DISK (BUT NOT LATCHED)

MIN. 2-1/2 OZS. --- MAX. 4-1/2 OZS. TO START LATCH LEVER MOVING.

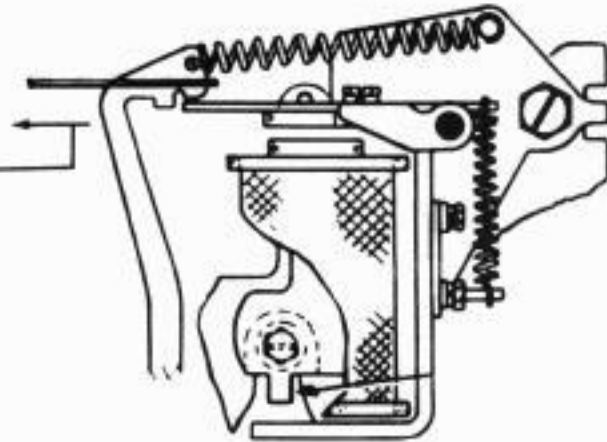


CLUTCH TRIP LEVER SPRING

REQUIREMENT

CLUTCH TRIPPED AND ARMATURE HELD AGAINST MAGNET CORE.

MIN. 2 OZS. --- MAX. 3-1/2 OZS. TO START TRIP LEVER MOVING.

CLUTCH MAGNET ARMATURE BAIL SPRING

REQUIREMENT

CLUTCH MAGNET TRIPPED AND SHAFT ROTATED MANUALLY UNTIL TRIP FOLLOWER IS ON HIGH OF CAM.

MIN. 2 OZS. -- MAX. 4-1/2 OZS. TO START ARMATURE EXTENSION LEVER MOVING.

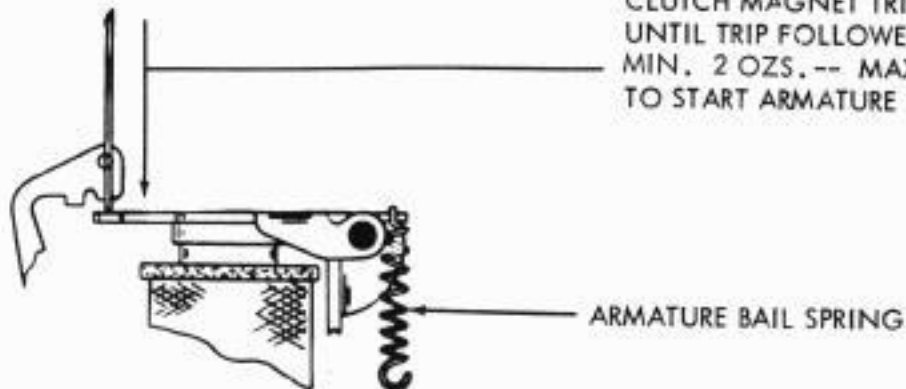


FIGURE 2-49. ANSWER-BACK MECHANISM

NOTE: TO CHECK TENSIONS (A) AND (B), REMOVE ENTIRE ANSWER BACK MECHANISM FROM ITS BRACKET, REMOVE MESSAGE DRUM AND TAKE OFF THE CONTACT BLOCK.

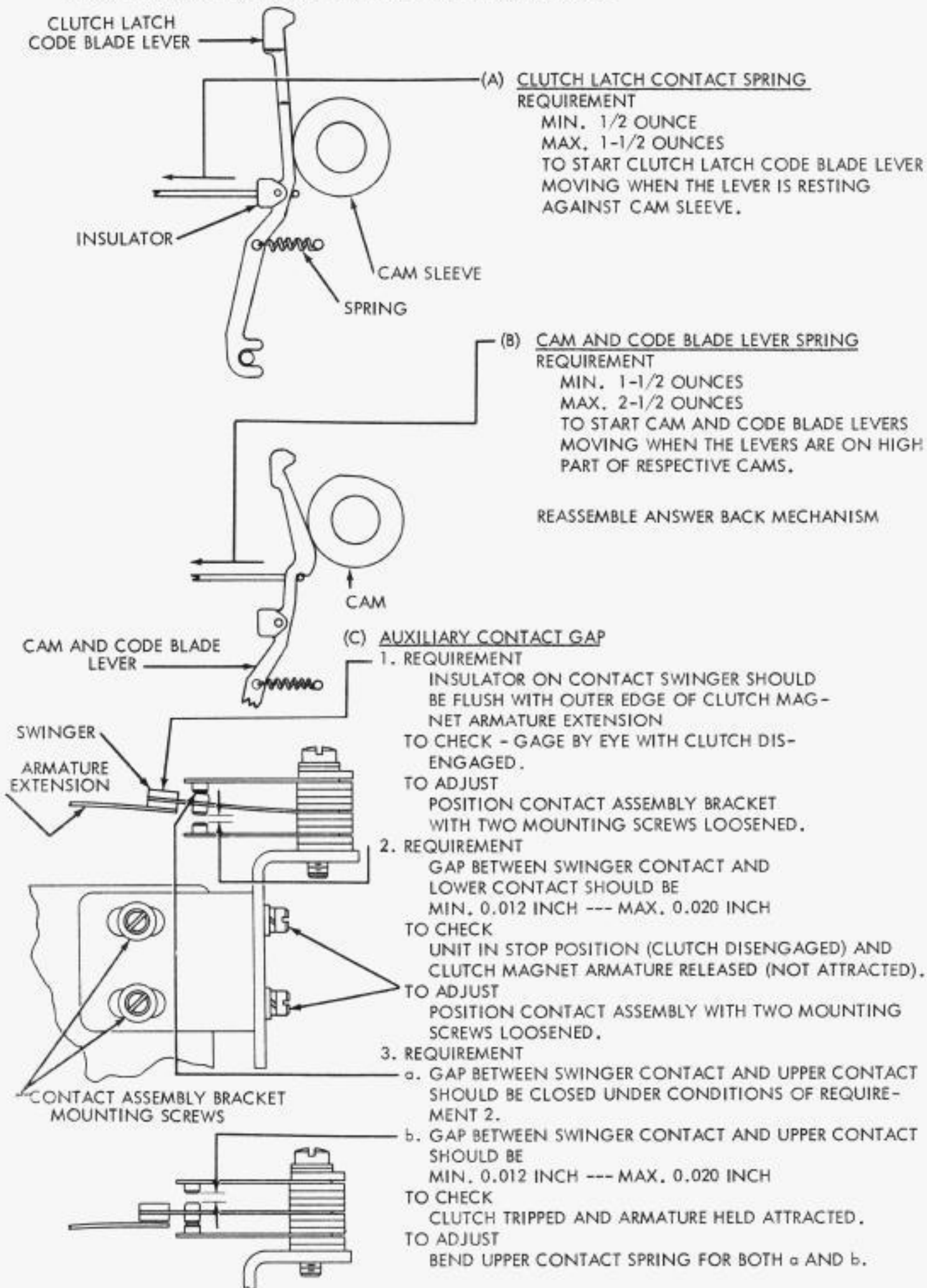


FIGURE 2-50. ANSWER-BACK MECHANISM

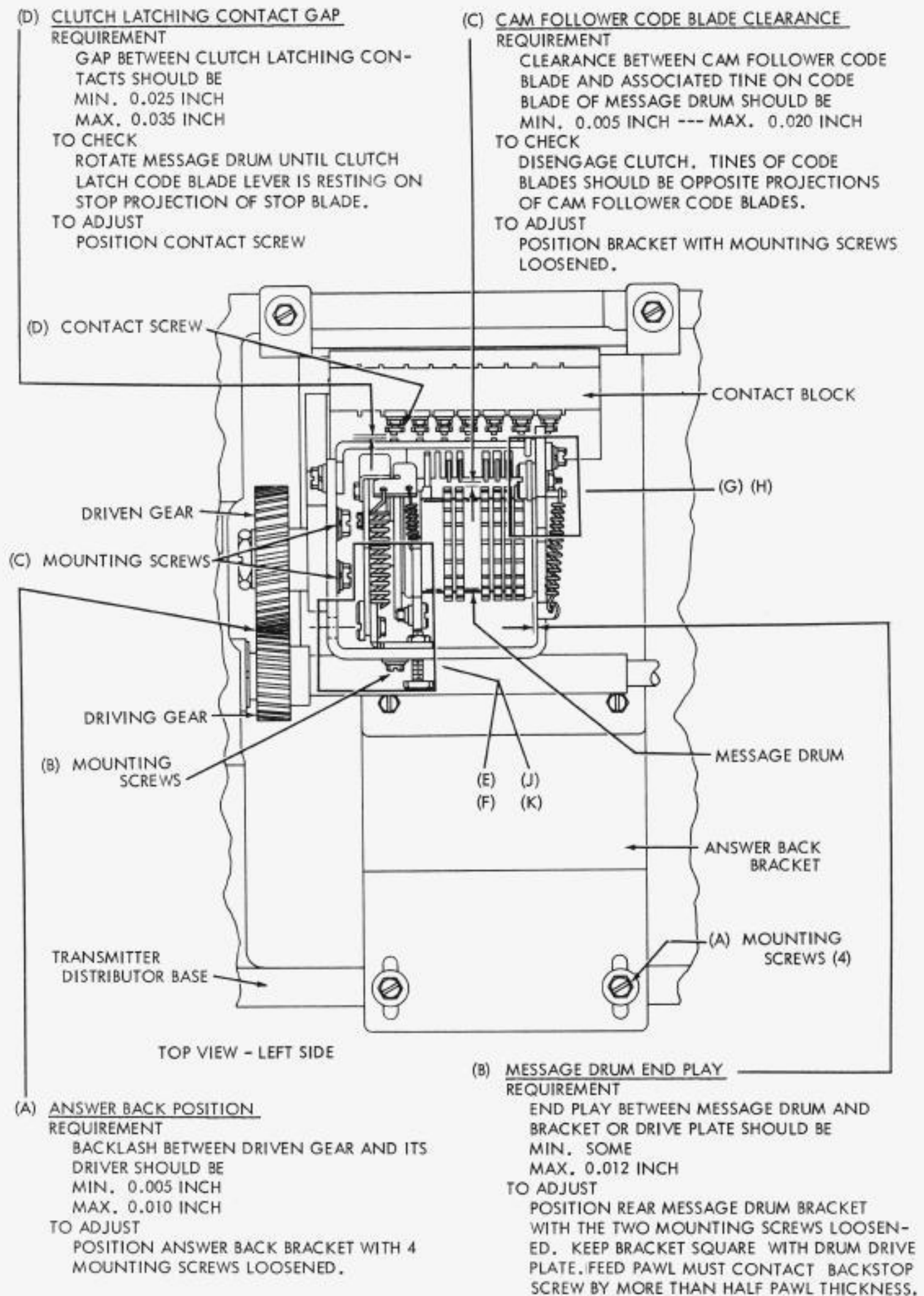


FIGURE 2-51. ANSWER-BACK MECHANISM

NOTE: REMOVE SHOULDER SCREW AND TAKE OFF ANSWER-BACK DRIVEN GEAR

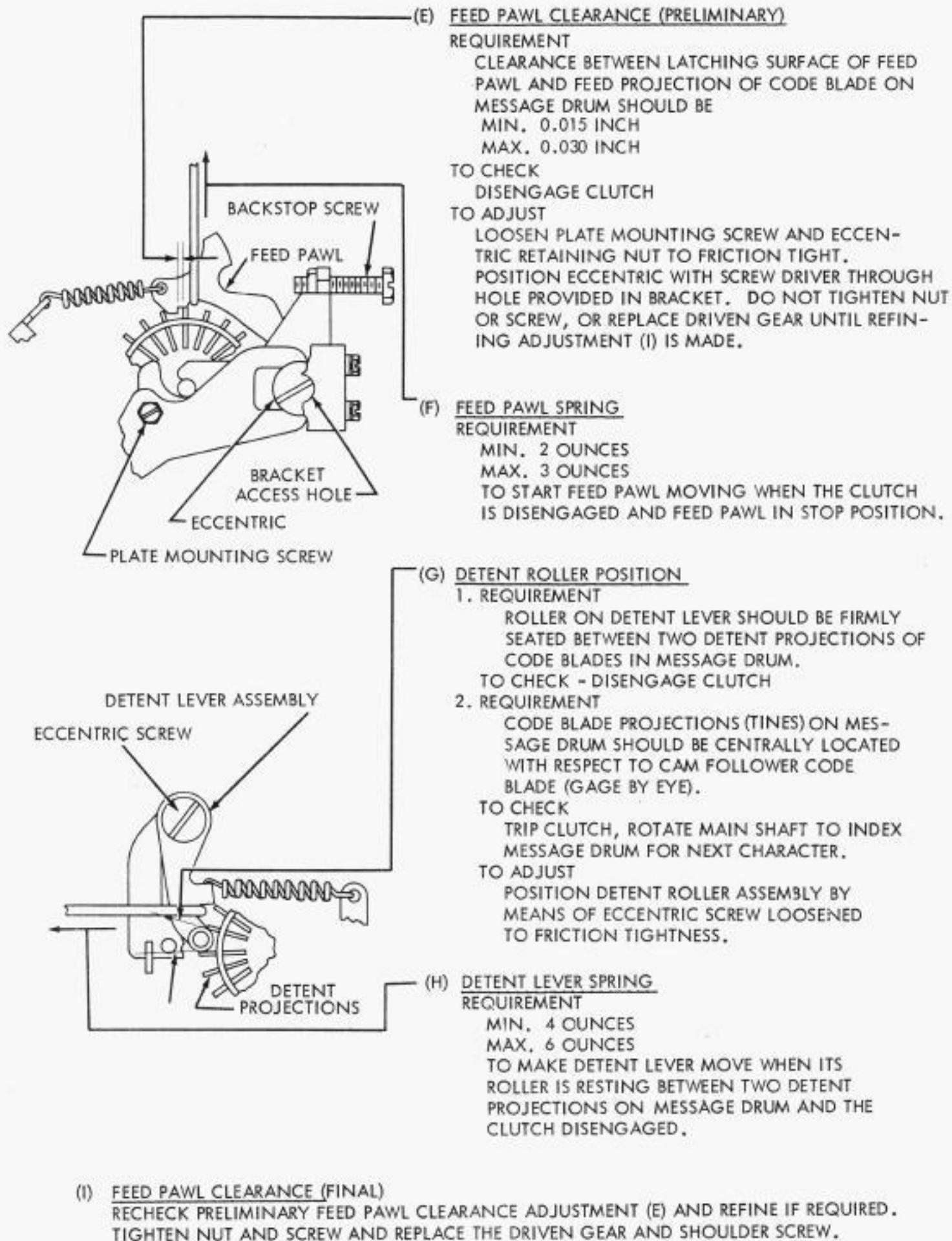
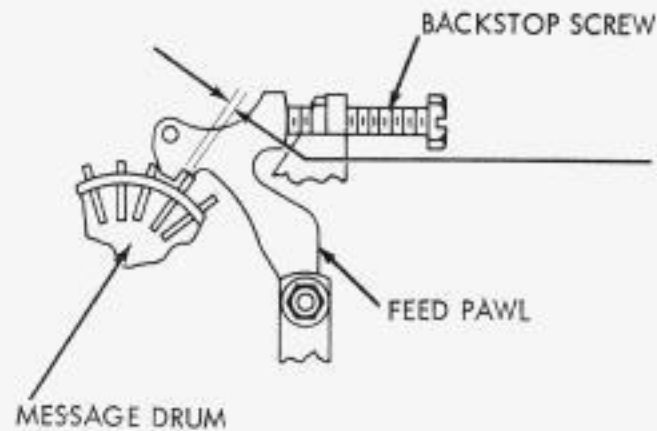


FIGURE 2-52. ANSWER-BACK MECHANISM

(J) FEED PAWL BACKSTOP REQUIREMENT

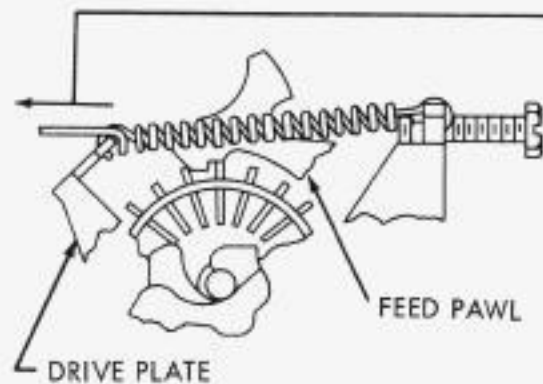
CLEARANCE BETWEEN LATCHING SURFACE OF FEED PAWL AND ADJACENT FEED PROJECTION ON MESSAGE DRUM SHOULD BE
 MIN. 0.010 INCH
 MAX. 0.020 INCH

TO CHECK

TRIP CLUTCH, ROTATE MAIN SHAFT SLOWLY UNTIL FEED PAWL REACHES MAXIMUM REARWARD TRAVEL.

TO ADJUST

LOOSEN LOCK NUT AND POSITION BACKSTOP SCREW.

(K) DRIVE PLATE SPRING REQUIREMENT

MIN. 18 OUNCES
 MAX. 24 OUNCES

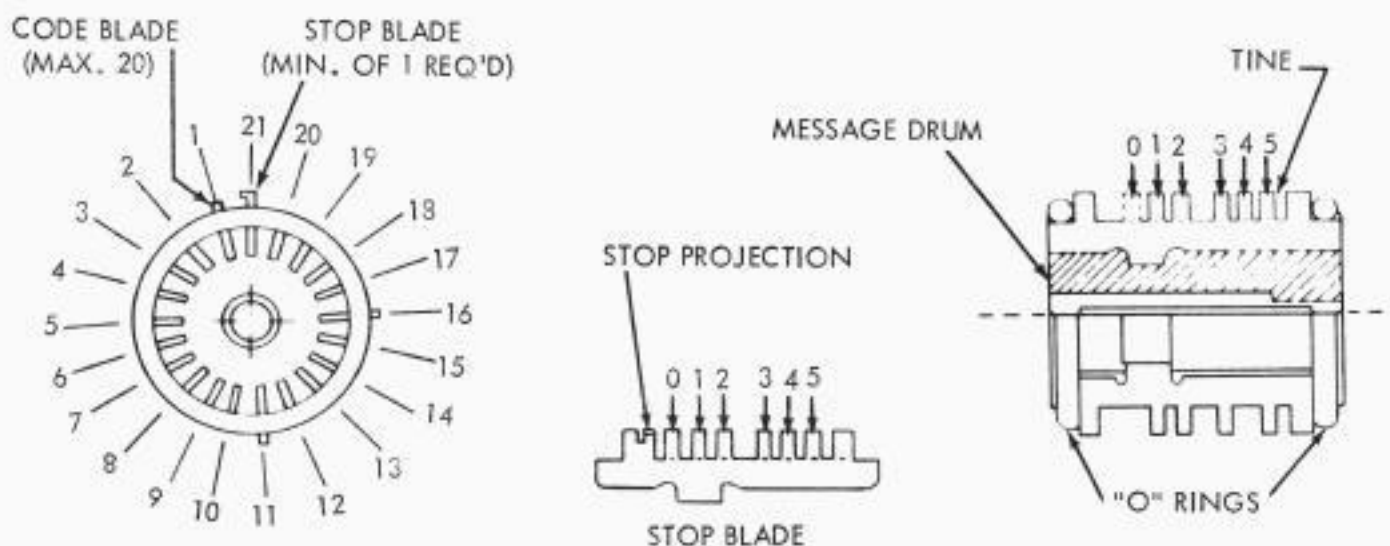
TO MOVE FEED PAWL FROM STOP POSITION (CLUTCH DISENGAGED).

CODING THE ANSWER-BACK FEATURE OF THE TELETYPE TRANSMITTER DISTRIBUTOR BASE LCXB16

1. THE MESSAGE DRUM HAS A CAPACITY OF 21 CHARACTERS. THE FIRST CHARACTER TRANSMITTED MUST BE A "LETTERS" COMBINATION; THE REMAINING 20 MAY BE ANY CHARACTER DESIRED. CHARACTERS ARE DETERMINED BY DETACHABLE CODE BLADES SET IN THE MESSAGE DRUM. SINCE PROJECTIONS ON THE CODE BLADES ARE USED TO ROTATE THE DRUM, ALL OF ITS 21 SLOTS MUST BE OCCUPIED BY A BLADE.
2. THE LAST CHARACTER TRANSMITTED IS DETERMINED BY A SPECIAL STOP CODE BLADE. THREE STOP BLADES ARE INCLUDED, SO THAT, EQUALLY SPACED ABOUT THE CODE DRUM IT WOULD RESULT IN 3 UNIFORM MESSAGES OF SIX CHARACTERS EACH, PRECEDED BY A "LETTERS" COMBINATION.
3. CODE A BLADE BY BREAKING OFF THE UNWANTED TINES AT THE SCORED LINE AT THE BASE OF THE TINE. FIGURE 11 INDICATES WHICH TINES ARE TO BE REMOVED FOR A PARTICULAR CHARACTER. TO PREVENT DISTORTION OF A CODE BLADE, EACH BLADE SHOULD BE HELD SECURELY NEAR THE SCORE MARK OF THE TINE TO BE REMOVED.

FIGURE 2-53. ANSWER-BACK MECHANISM

CODING ANSWER-BACK (CONT'D)



4. PLACE AN "O" RING IN THE GROOVE ON THE RIM OF THE MESSAGE DRUM WHICH IS FURTHEST FROM THE SLOT IN THE CENTER PORTION OF THE DRUM. INSTALL A STOP BLADE IN ANY SLOT POSITION IN THE DRUM BY FIRST INSERTING THE BLADE UNDER THE "O" RING AND THEN ROTATING THE BLADE TOWARD THE CENTER OF THE DRUM UNTIL IT IS FULLY SEATED.

5. CODE THE DRUM IN A COUNTER-CLOCKWISE DIRECTION BEGINNING WITH THE NO. 1 BLADE ADJACENT TO THE STOP BLADE. INSTALL EACH CODED BLADE IN THE PROPER SLOT POSITION INSERTING THE BLADE UNDER THE "O" RING AS IN PARAGRAPH 4.

- — LEAVE TINE
- — REMOVE TINE

6. AFTER FILLING THE DRUM, ENCIRCLE THE BLADES BY PLACING ANOTHER "O" RING IN THE GROOVE ON THE OPPOSITE RIM OF THE DRUM.

7. PLACE A THIN COAT OF GREASE ON THE SHAFT AND STUD OF THE DRIVE PLATE. INSERT THE SHAFT PORTION OF THE DRIVE PLATE INTO THE MESSAGE DRUM (NOTE THAT DUE TO A DIFFERENCE IN HOLE DIAMETERS IN THE MESSAGE DRUM, THE SHAFT CAN BE INSERTED ONLY ONE WAY). HOOK THE SPRING BETWEEN THE DRIVE PLATE AND THE FEED PAWL. OIL BOTH ENDS OF THE SPRING.

8. TO INSERT THE MESSAGE DRUM ASSEMBLY INTO THE DISTRIBUTOR ASSEMBLY, TRIP THE CLUTCH AND ROTATE THE DISTRIBUTOR MAIN SHAFT UNTIL THE DRIVE LEVER ASSEMBLY IS ON THE HIGH PART OF THE CAM, THEN INSERT THE MESSAGE DRUM ASSEMBLY BETWEEN THE MOUNTING BRACKETS. NOTE THAT THE DRIVE PLATE HAS A STUD WELDED ON TO IT; THIS STUD MUST GO UNDER THE DRIVE LEVER ASSEMBLY. THEN ROTATE THE MAIN SHAFT TO LATCH THE CLUTCH. NEXT HOOK THE DRIVE PLATE SPRING BETWEEN THE DRIVE PLATE AND THE SPRING POST PROJECTION ON THE BRACKET. THE DETENT LEVER SPRING SHOULD BE HOOKED ON TO THE SPRING POST PROJECTION OF THE BRACKET, AND THE DETENT LEVER. LUBRICATE THE MECHANISM ACCORDING TO THE LUBRICATION FIGURES.

LETTERS	TYPICAL FIG. ARRGT	CODE				
		1	2	3	4	5
A	—	■	■	■	■	■
B	2	■	■	■	■	■
C	3	■	■	■	■	■
D	4	■	■	■	■	■
E	5	■	■	■	■	■
F	6	■	■	■	■	■
G	7	■	■	■	■	■
H	8	■	■	■	■	■
I	9	■	■	■	■	■
J	0	■	■	■	■	■
K	1	■	■	■	■	■
L	2	■	■	■	■	■
M	3	■	■	■	■	■
N	4	■	■	■	■	■
O	5	■	■	■	■	■
P	6	■	■	■	■	■
Q	7	■	■	■	■	■
R	8	■	■	■	■	■
S	BELL	■	■	■	■	■
T	9	■	■	■	■	■
U	0	■	■	■	■	■
V	1	■	■	■	■	■
W	2	■	■	■	■	■
X	3	■	■	■	■	■
Y	4	■	■	■	■	■
Z	5	■	■	■	■	■
CARRIAGE RETURN		■	■	■	■	■
LINE FEED		■	■	■	■	■
LETTERS SHIFT		■	■	■	■	■
FIGURES SHIFT		■	■	■	■	■
SPACE		■	■	■	■	■
BLANK		■	■	■	■	■

NOTE:

1. STOP BLADE HAS SAME PROVISIONS FOR INDIVIDUAL CODING AS STANDARD CODE BLADE.
2. WHEN CODING THE BLADES REMOVE THE "O" POSITION TINE ON ALL STOP AND CODE BLADES.

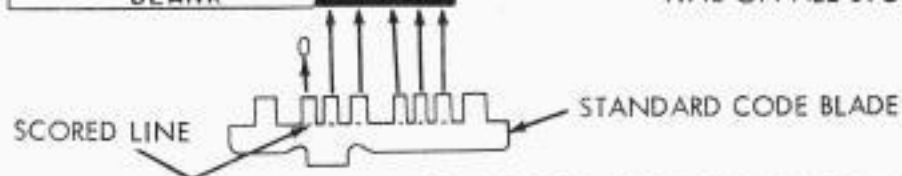
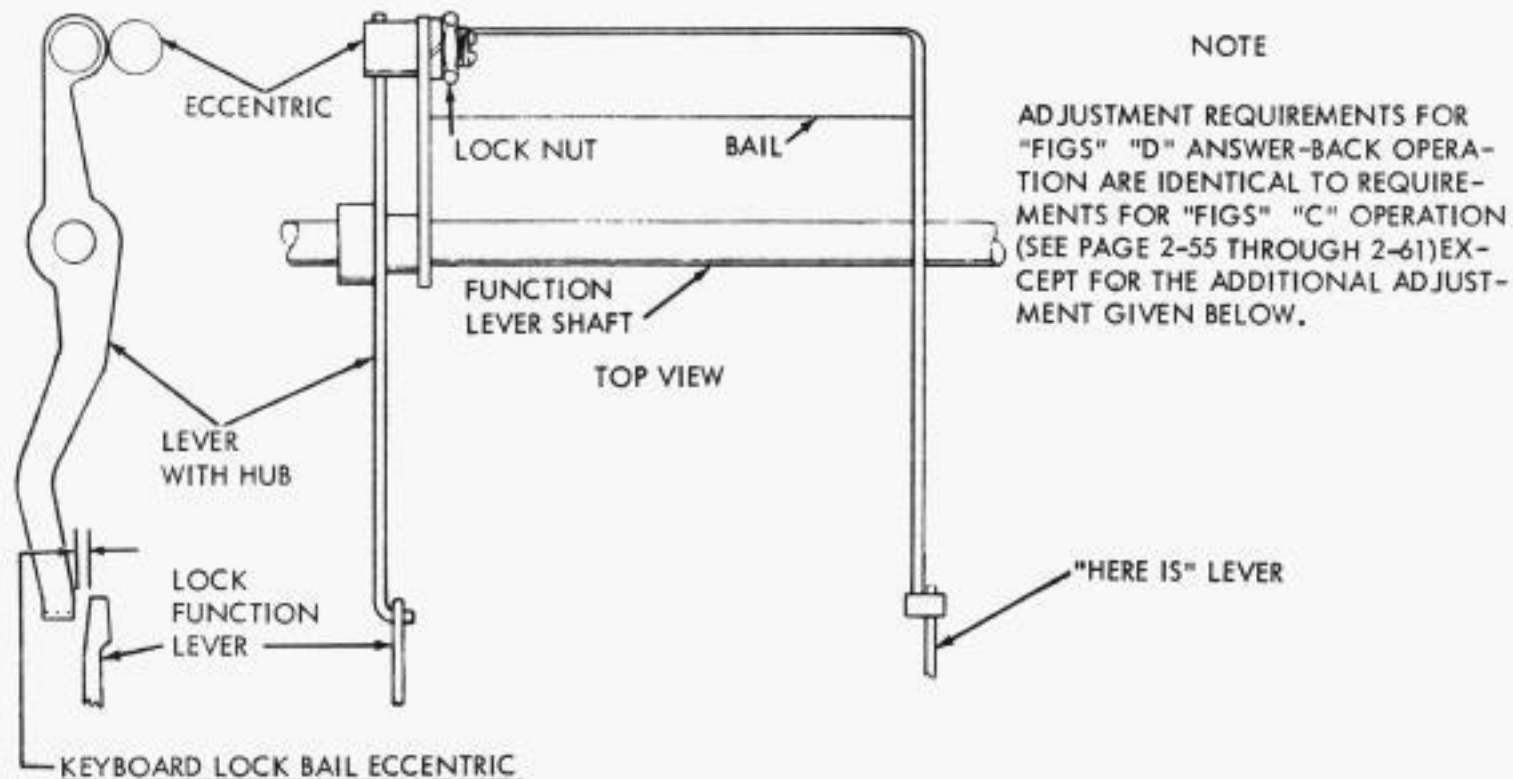


FIGURE 2-54. ANSWER-BACK MECHANISM

25. ANSWER-BACK MECHANISM ("FIGS" "D")
KEYBOARDS LK6 AND UP



NOTE

ADJUSTMENT REQUIREMENTS FOR "FIGS" "D" ANSWER-BACK OPERATION ARE IDENTICAL TO REQUIREMENTS FOR "FIGS" "C" OPERATION (SEE PAGE 2-55 THROUGH 2-61) EXCEPT FOR THE ADDITIONAL ADJUSTMENT GIVEN BELOW.

KEYBOARD LOCK BAIL ECCENTRIC

REQUIREMENT

CLEARANCE BETWEEN KEYBOARD LOCK LEVER W/HUB AND KEYBOARD LOCK FUNCTION LEVER SHOULD BE
MIN. SOME --- MAX. 0.006 INCH

TO CHECK

FULLY DEPRESS BOTH "KYBD LOCK" AND "HERE IS" KEYS (HOLD LIGHTLY).

TO ADJUST

LOOSEN LOCK NUT AND POSITION ECCENTRIC WITH ITS HIGH POINT TOWARD FRONT OF KEYBOARD.

FIGURE 2-55. ANSWER-BACK MECHANISM

SECTION 3 - LUBRICATION

1. GENERAL

1.01 The perforator transmitter should be lubricated as directed in this section. The figures indicate points to be lubricated and the kind and quantity of lubricant to be used. Lubricate the perforator just prior to placing it in service. After a few weeks in service, re-lubricate to make certain that all points receive lubrication. The following lubrication schedule should be followed thereafter.

OPERATING SPEED (WPM)*	LUBRICATING INTERVAL	
60	3000 hrs. or 1 yr.	} Which- ever Occurs First
75	2400 hrs. or 9 mo.	
100	1500 hrs. or 6 mo.	
150	1000 hrs. or 6 mo.	

*Words per minute

1.02 Use Teletype KS-7470 oil at all locations where the use of oil is indicated. Use KS-7471 grease on all surfaces where grease is indicated, except the motor bearings. Apply two drops of KS-7470 oil to motor bearings every four months (depress oiler with metal object). If the motor is disassembled at any time, repack the bearings with KS-7471 grease.

1.03 All spring wicks and felt oilers should be saturated. The friction surfaces of all moving parts should be thoroughly lubricated. Over-lubrication, however, which will permit oil or grease to drip or be thrown on other parts, should be avoided. Special care must be taken to prevent any oil or grease from getting between the power backspace armature and its magnet pole face or between electrical contacts.

1.04 Apply a thick film of grease to all gears.

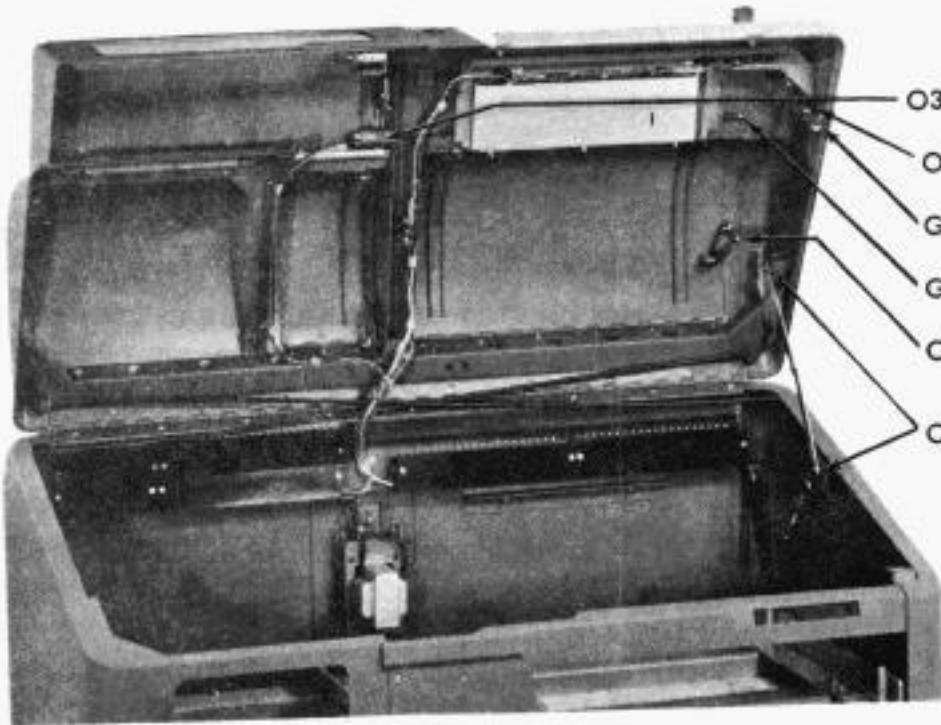
1.05 Apply oil to all cams, including the camming surfaces of each clutch disk.

1.06 The photographs show the paragraph numbers referring to particular line drawings of mechanisms and where these mechanisms are located on the unit. Parts in the line drawings are shown in an upright position unless otherwise specified.

1.07 The illustration symbols indicate the following lubrication directions:

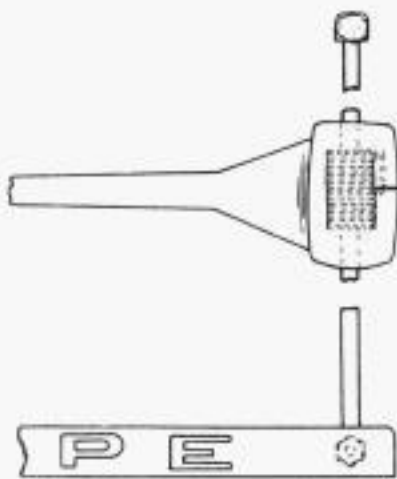
- 0 Apply 1 drop of oil.
- 02 Apply 2 drops of oil.
- 03 Apply 3 drops of oil.
- 020 Apply 20 drops of oil, etc.
- G Apply thin film of grease.
- SAT Saturate (Felt oilers, washer, wicks) with oil.

2. CABINET



- O3 SLIDING SURFACE - SPRING
- O BEARING SURFACE (2 PLACES)
- G LATCHING SURFACE (2 PLACES)
- G LATCHING SURFACE (ALL LATCHES)
- O BEARING SURFACES AND SPRING
- O BEARING SURFACE (2 PLACES)

- TORSION SPRING - UPSTOP
- DOMELATCH
- DOMELATCH
- ALL DOORS
- RIGHT TOP DOOR UPSTOP ARM
- DOMELATCH ARM



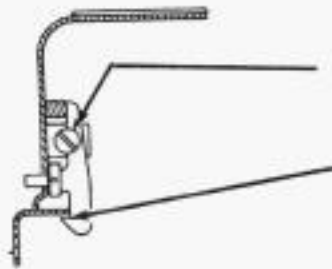
O BUSHING

LINE GUIDE



O PIVOT POINT

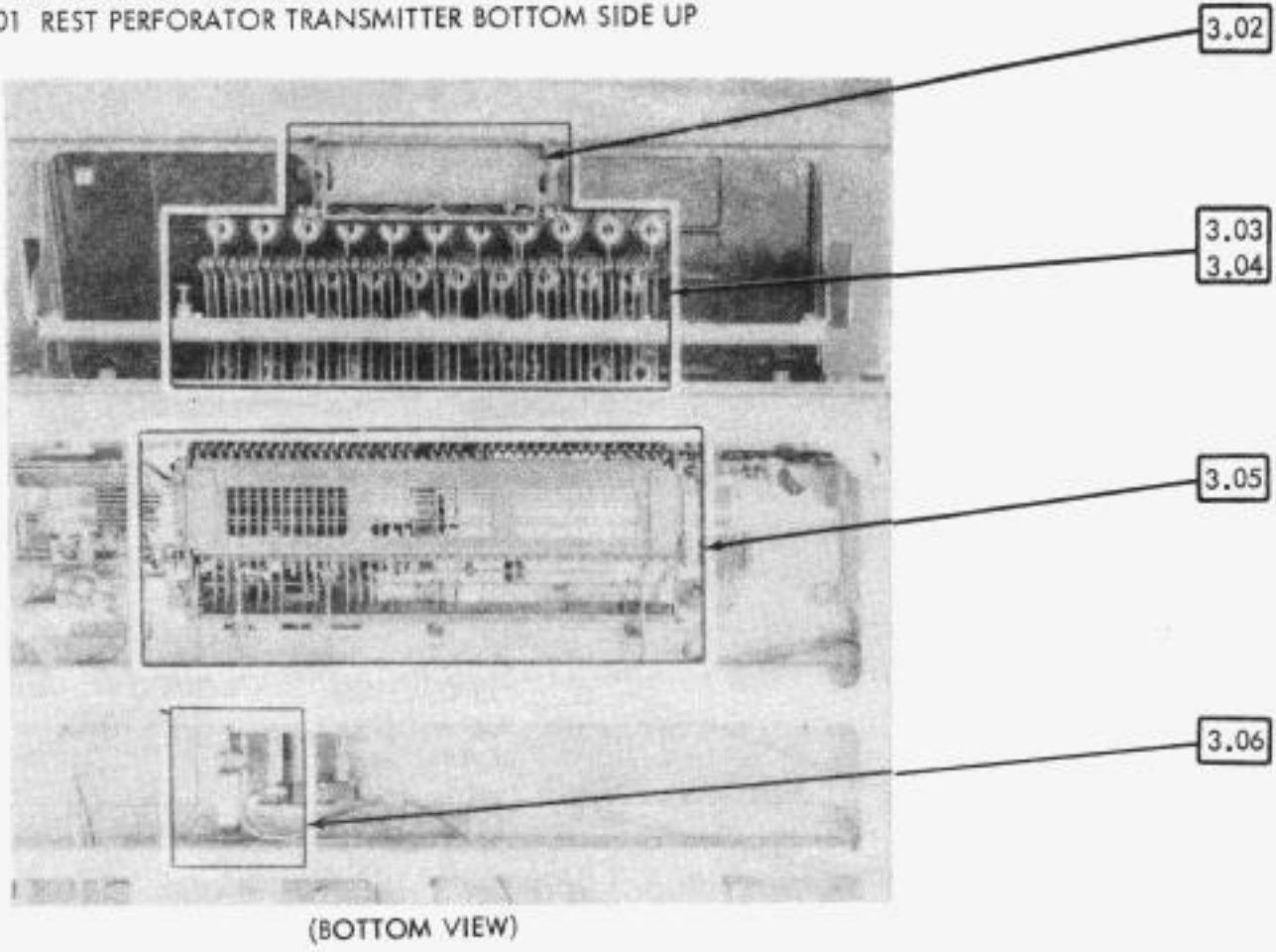
DOMELATCH



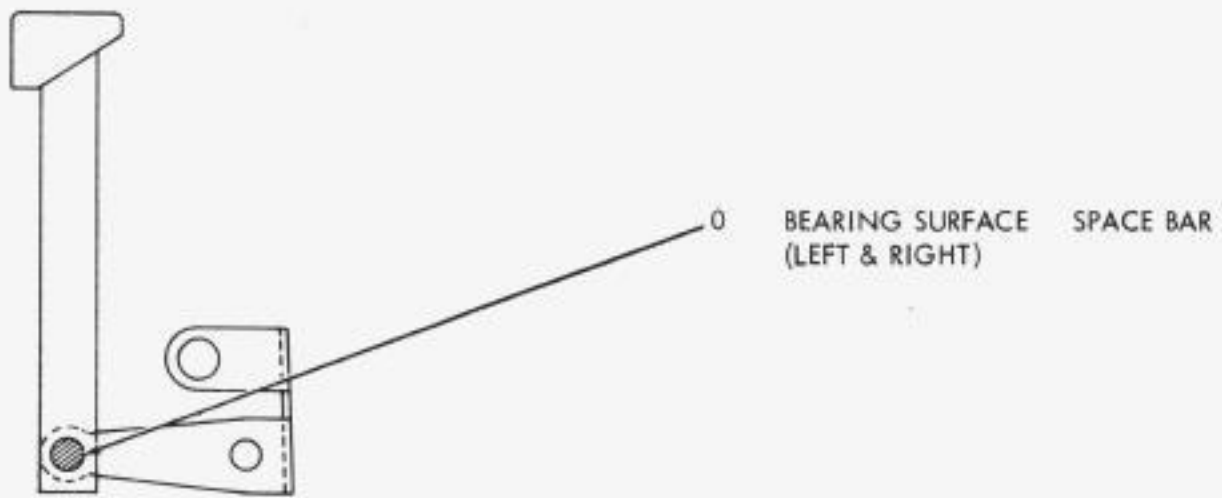
G ENGAGING SURFACE

DOMELATCH

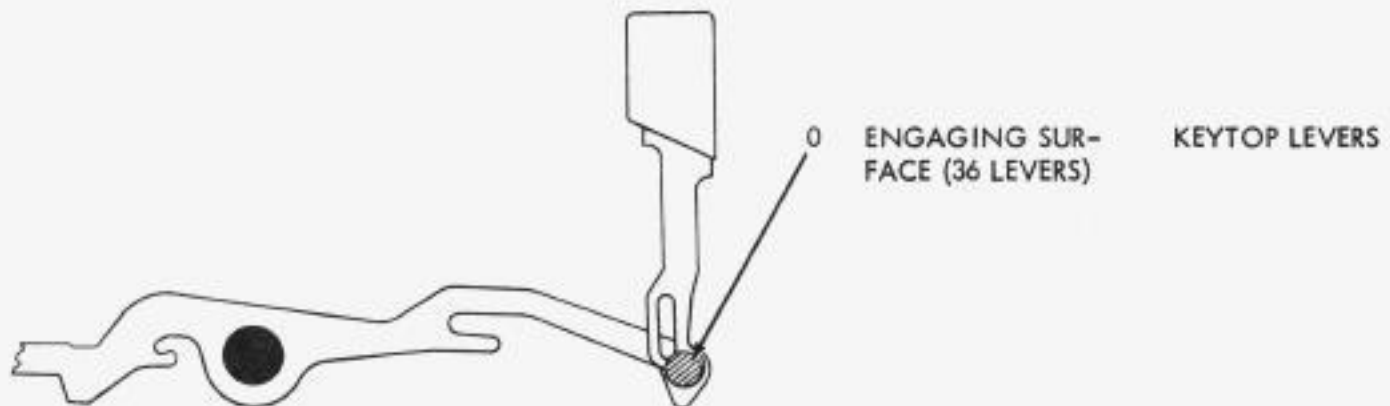
3. PERFORATOR TRANSMITTER
3.01 REST PERFORATOR TRANSMITTER BOTTOM SIDE UP



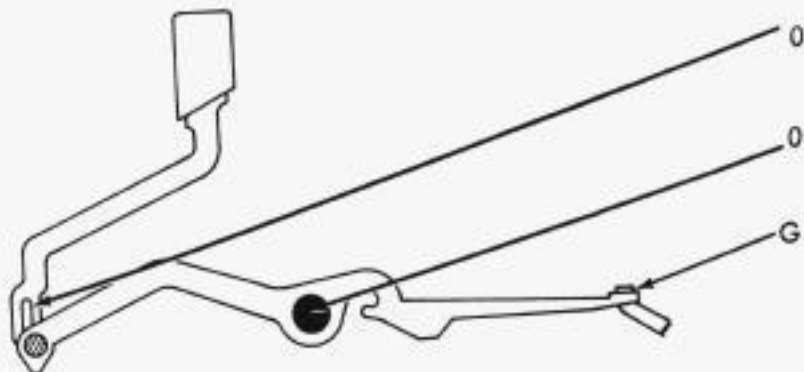
3.02 SPACE BAR MECHANISM



3.03 KEYLEVER MECHANISM

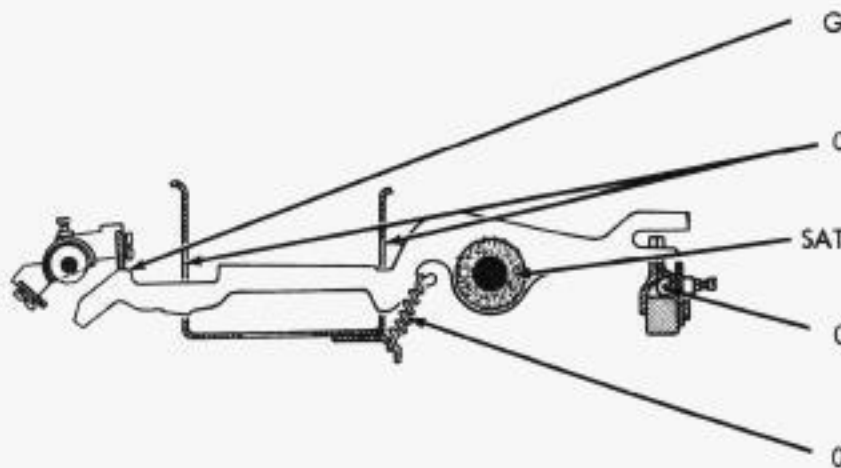


3.04 BREAK LEVER MECHANISM



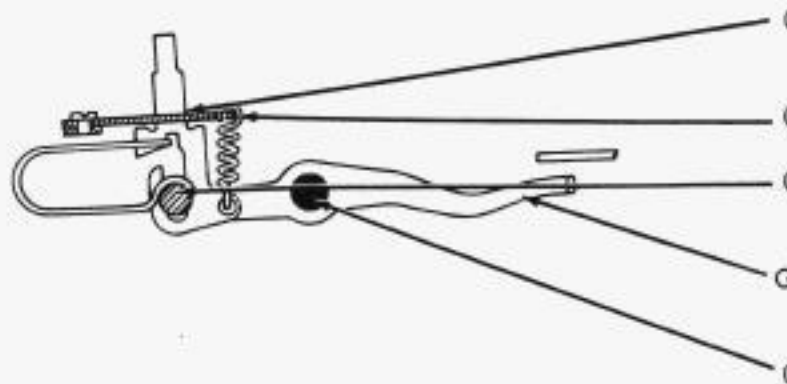
- 0 ENGAGING SURFACE BREAK KEYLEVER
- 0 BEARING SURFACE FUNCTION LEVER
- G CONTACT SURFACE BREAK LEVER

3.05 CODE LEVER MECHANISM



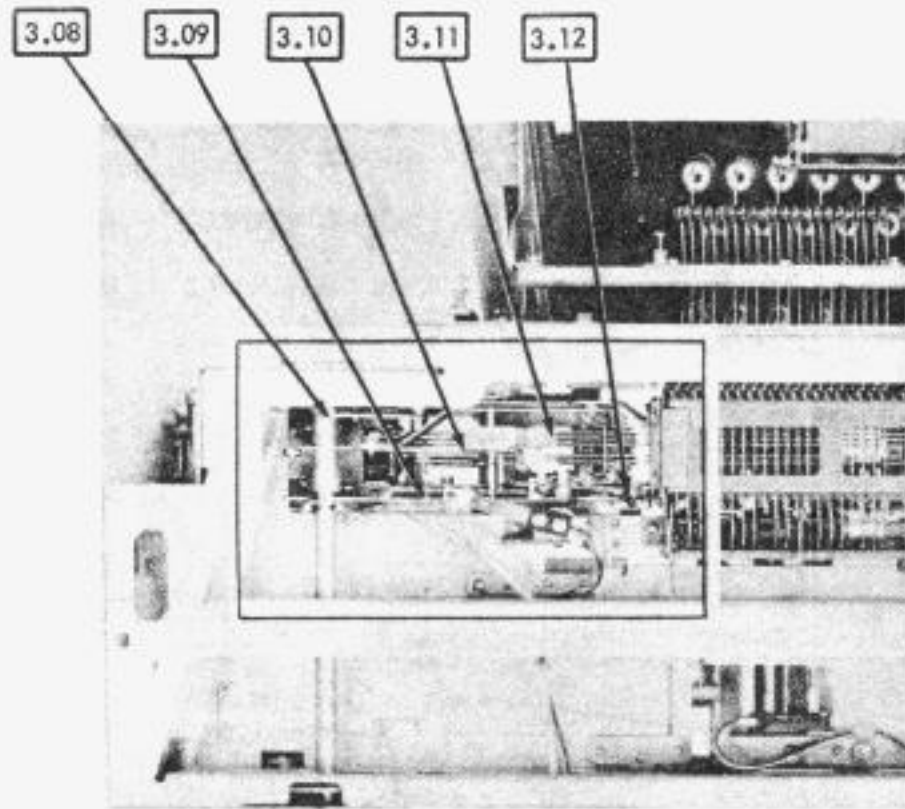
- G CONTACTING SURFACE (32 LEVERS) CODE LEVER UNIVERSAL BAIL
- 0 GUIDE SLOTS (32 LEVERS) CODE LEVERS
- SAT FELT WASHERS (6 WASHERS) CODE LEVER SHAFT
- 0 BEARING SURFACES (32 WEDGES) LOCK BALL TRACK
- 0 HOOKS-EACH END (40 SPRINGS) SPRING

3.06 KEYBOARD LOCK MECHANISM



- 0 GUIDE SLOT KEYBOARD LOCK PLUNGER
- 0 HOOKS-EACH END SPRING
- 0 BEARING SURFACE KEYBOARD LOCK LEVER
- G ENGAGING SURFACE KEYBOARD LOCK FUNCTION LEVER
- 0 BEARING SURFACE FUNCTION BAIL

3.07 EXTENSION BASKET MECHANISM
 REST PERFORATOR TRANSMITTER BOTTOM SIDE UP

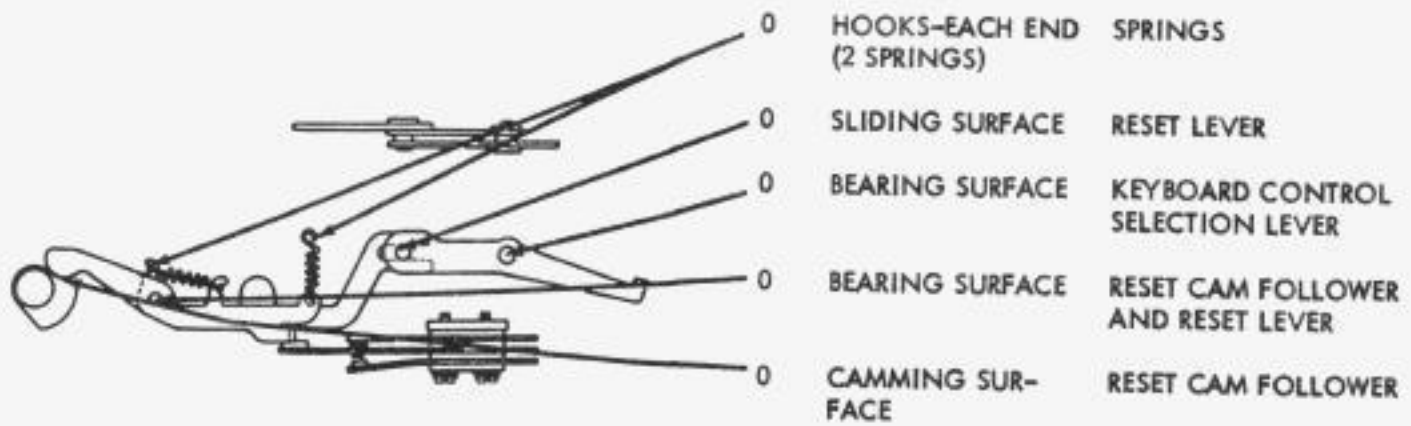


(BOTTOM VIEW)

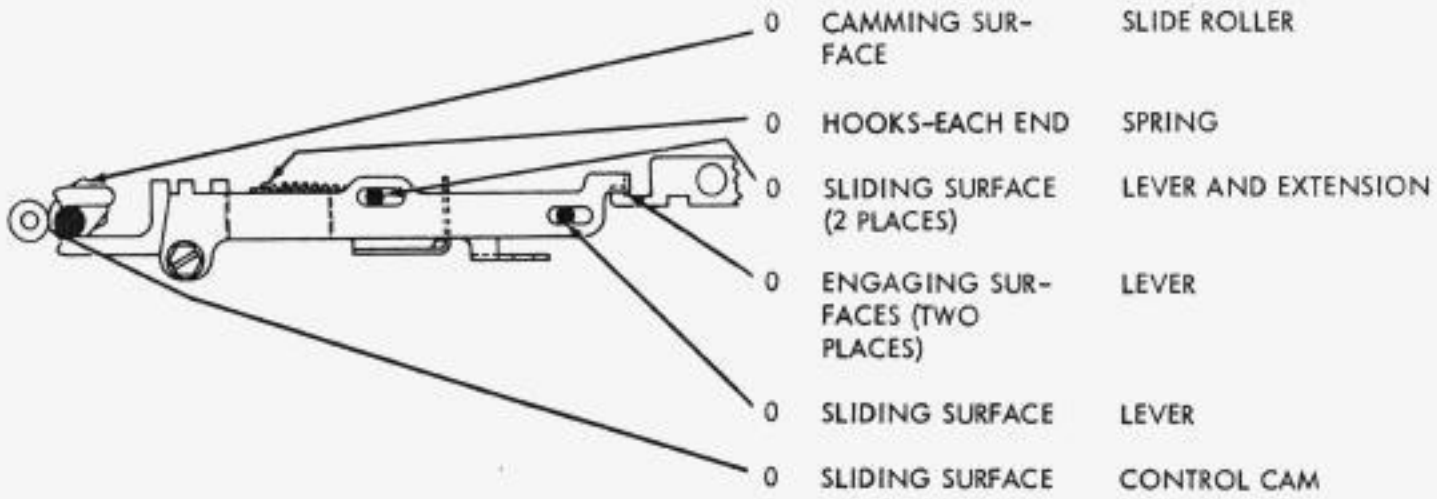
3.08 DETENT LEVER MECHANISM



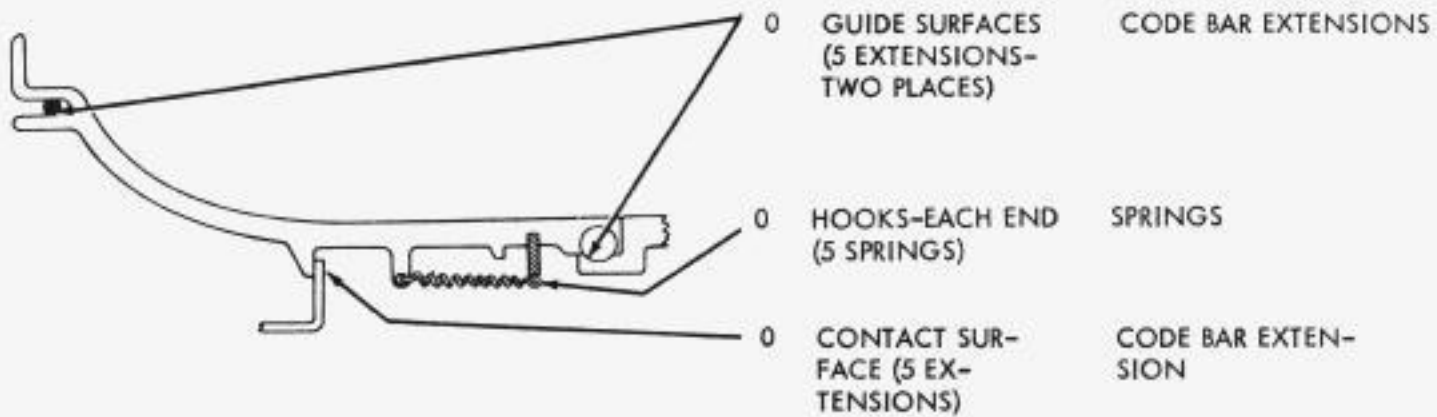
3.09 SELECTION LEVER MECHANISM



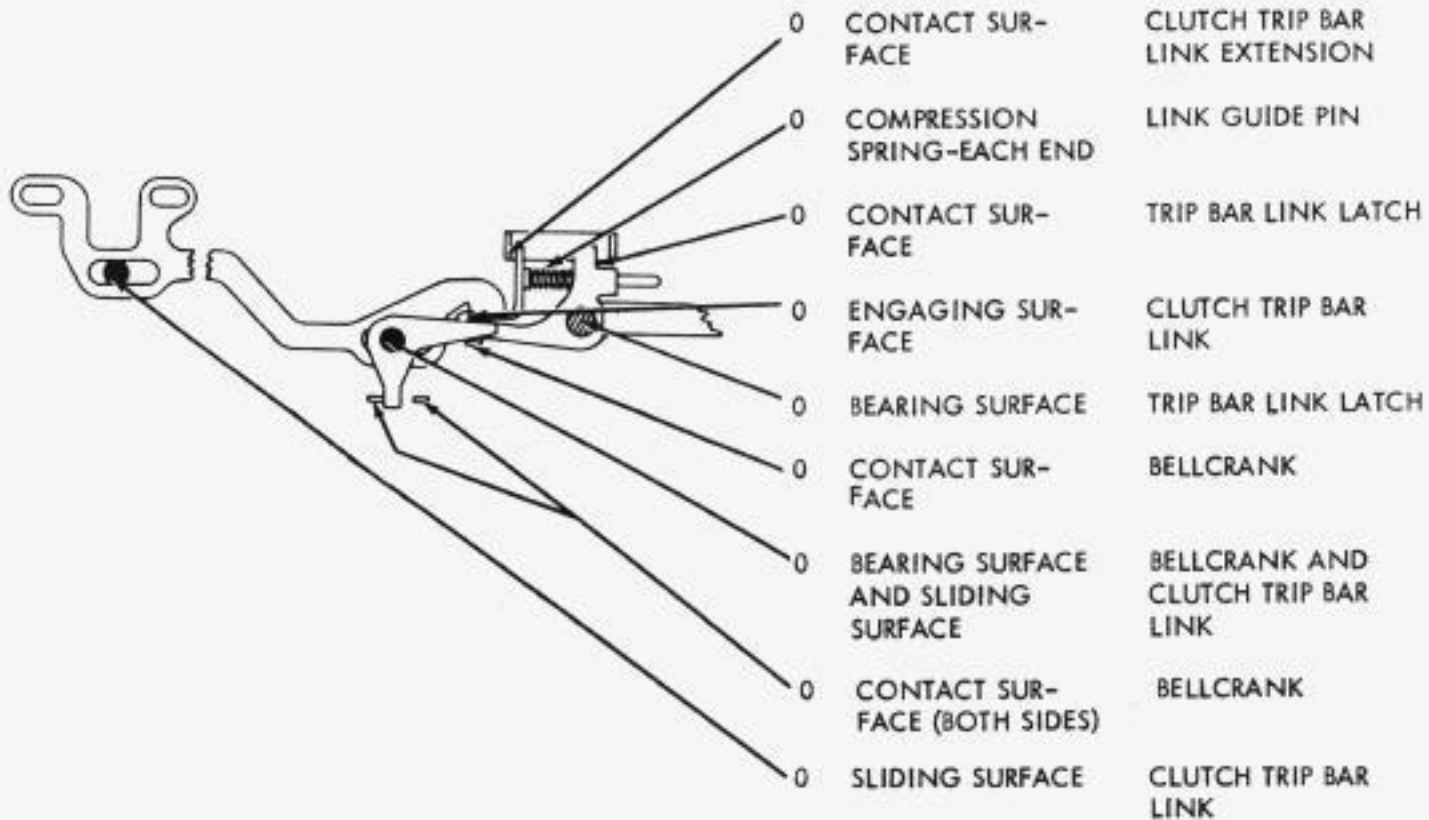
3.10 CODE BAR EXTENSION BAIL MECHANISM



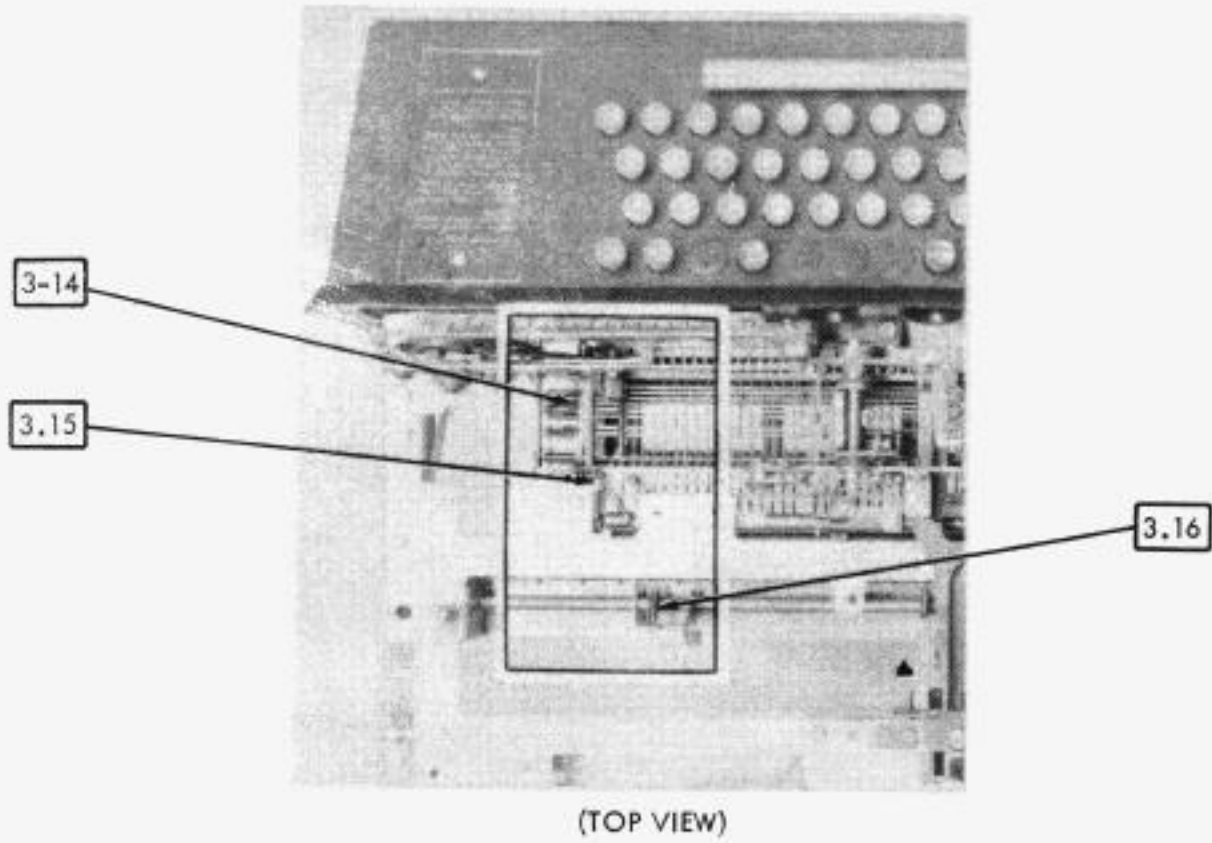
3.11 CODE BAR EXTENSION MECHANISM



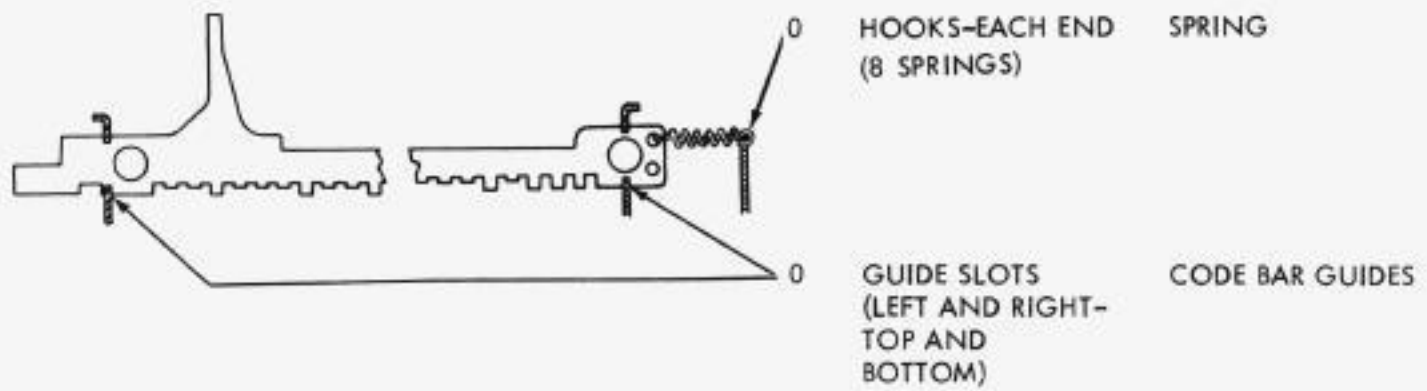
3.12 CLUTCH TRIP BAR LINK MECHANISM



3.13 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION



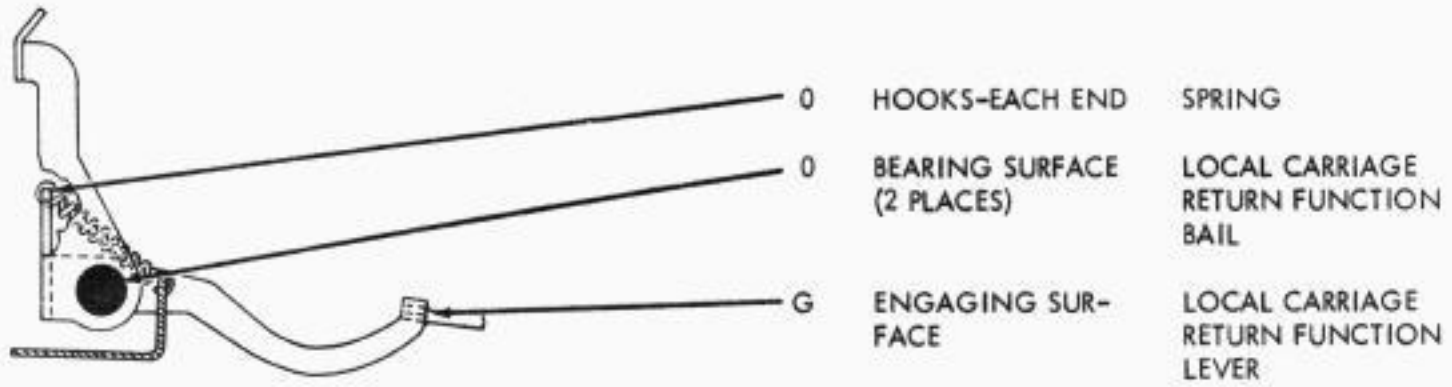
3.14 CODE BAR MECHANISM



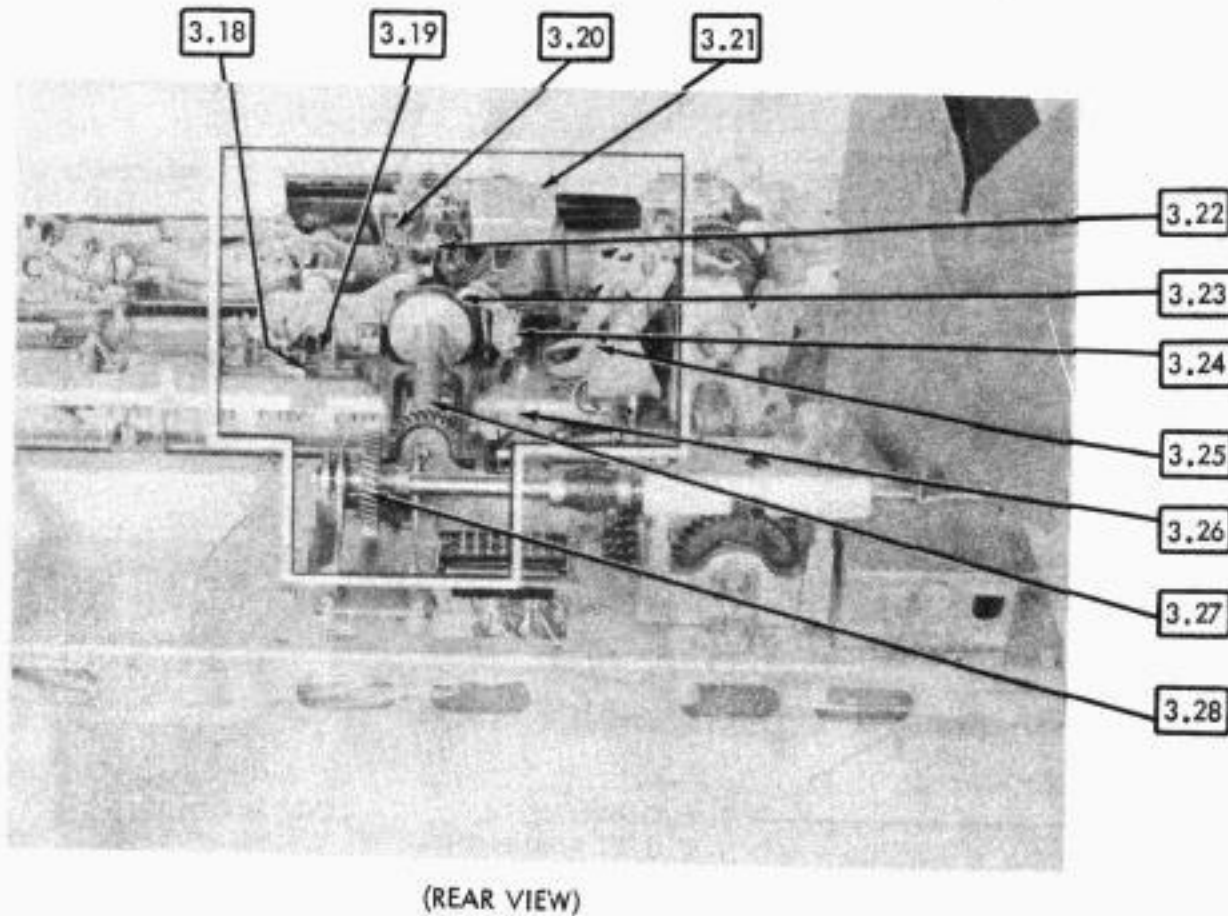
3.15 CODE LEVER UNIVERSAL BAIL MECHANISM



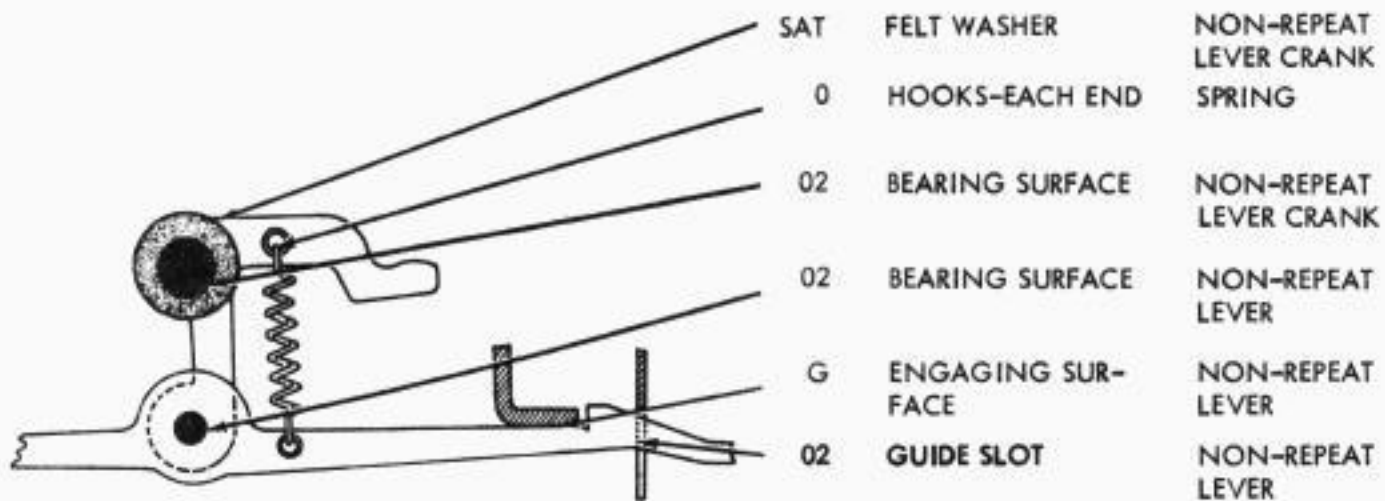
3.16 LOCAL CARRIAGE RETURN MECHANISM



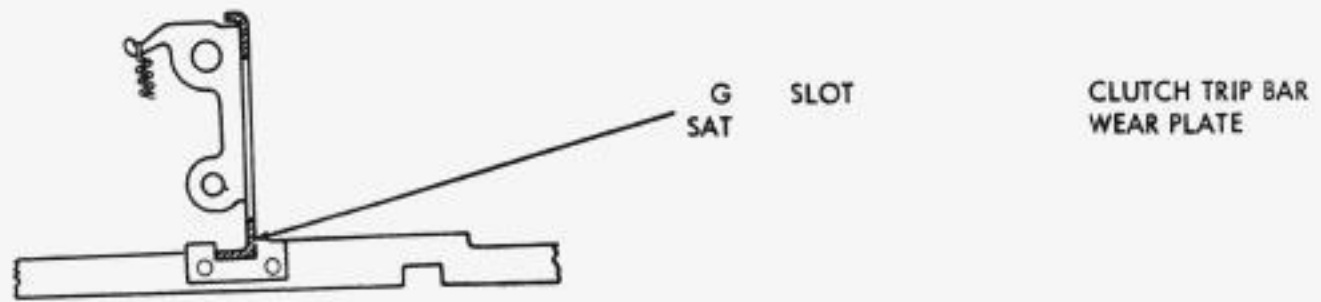
3.17 SIGNAL GENERATOR MECHANISM
REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION



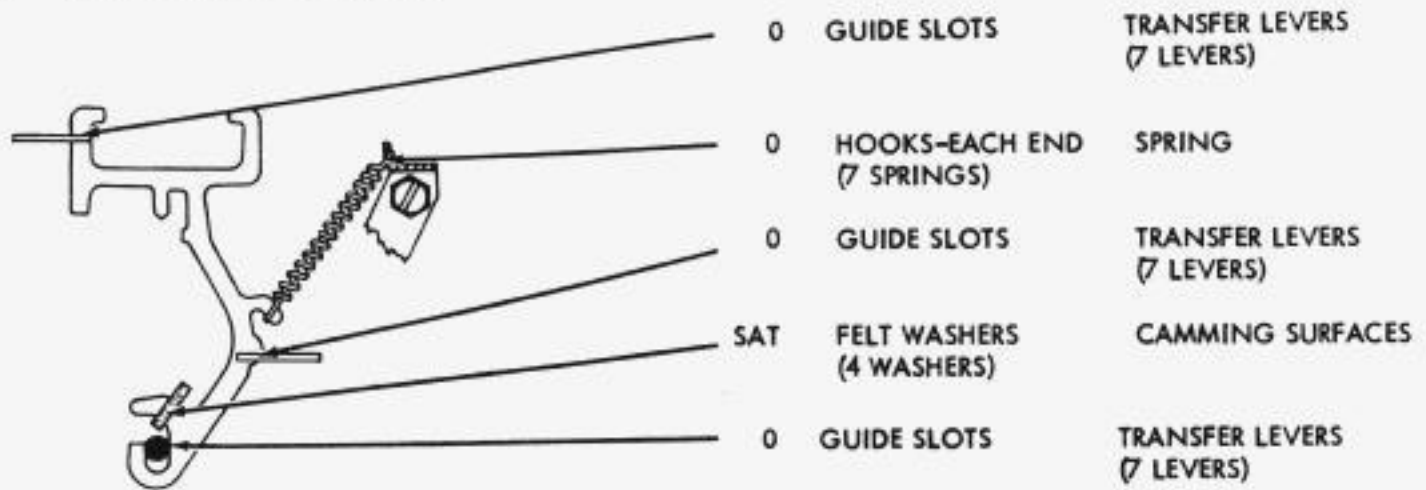
3.18 NON-REPEAT LEVER MECHANISM



3.19 CLUTCH TRIP BAR MECHANISM

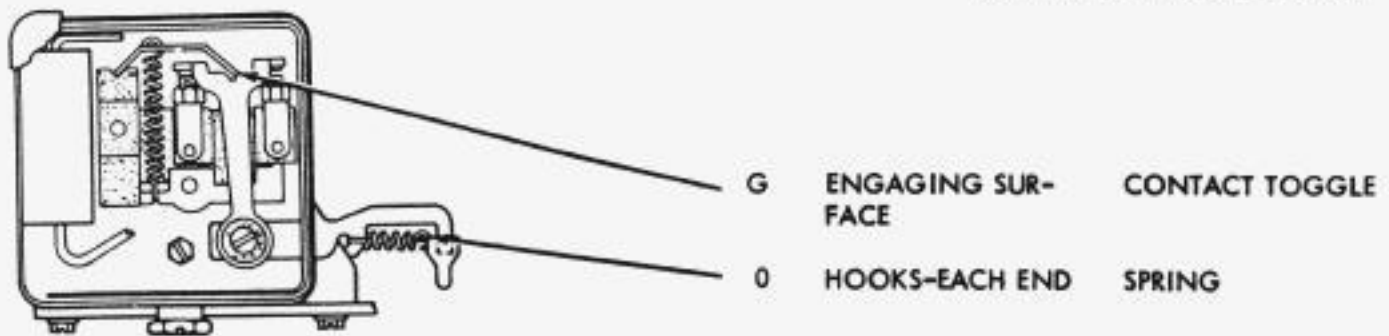


3.20 TRANSFER LEVER MECHANISM

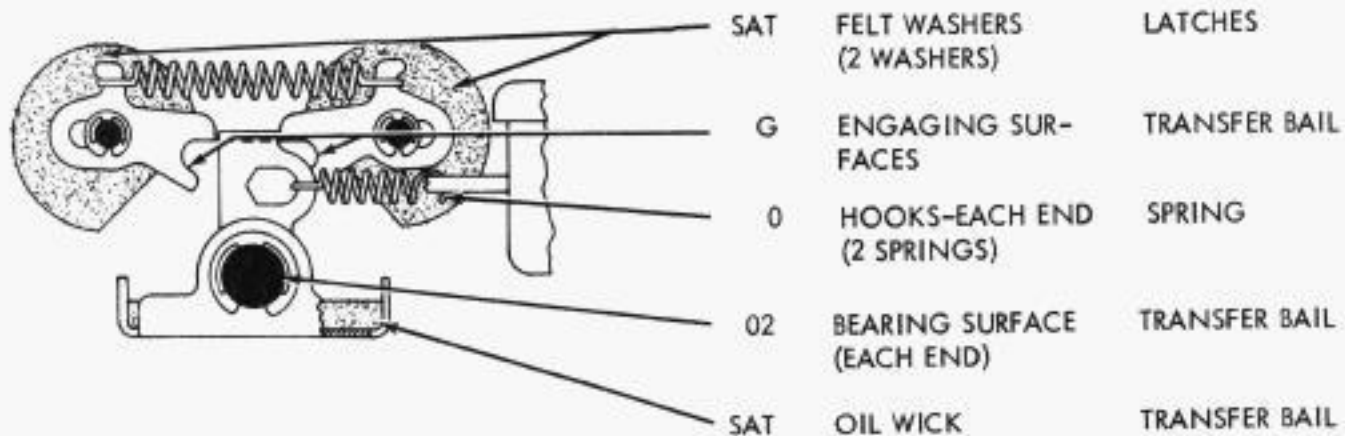


3.21 CONTACT BOX

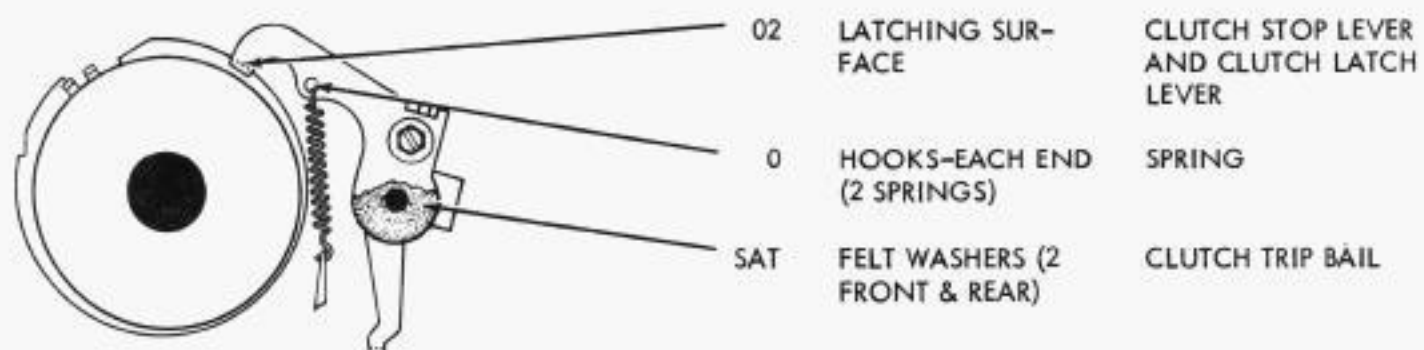
DISASSEMBLY: REMOVE NUT AND LOCK WASHER SECURING CONTACT BOX COVER AND REMOVE COVER.



3.22 TRANSFER BAIL MECHANISM



3.23 KEYBOARD CLUTCH MECHANISM



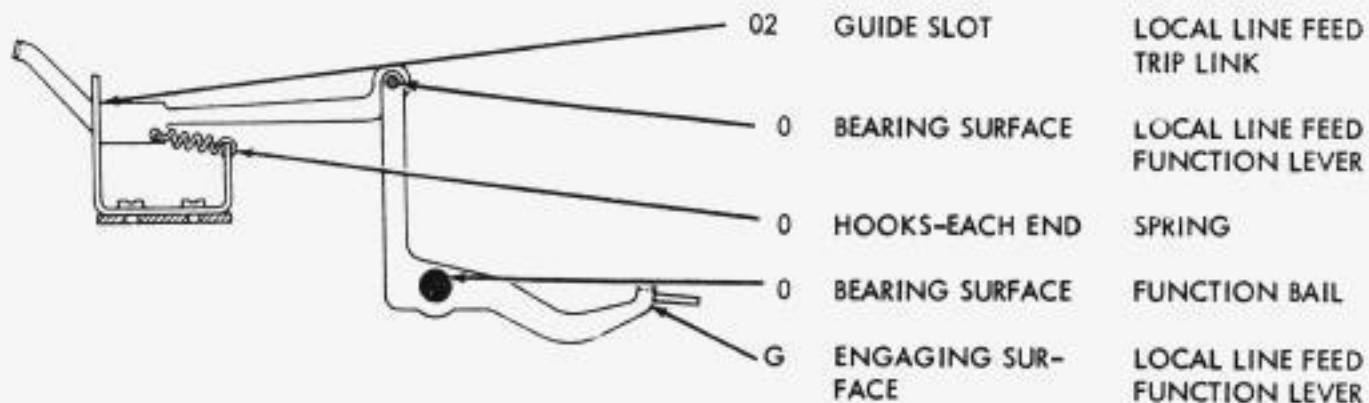
3.24 LOCK BAR LATCH MECHANISM



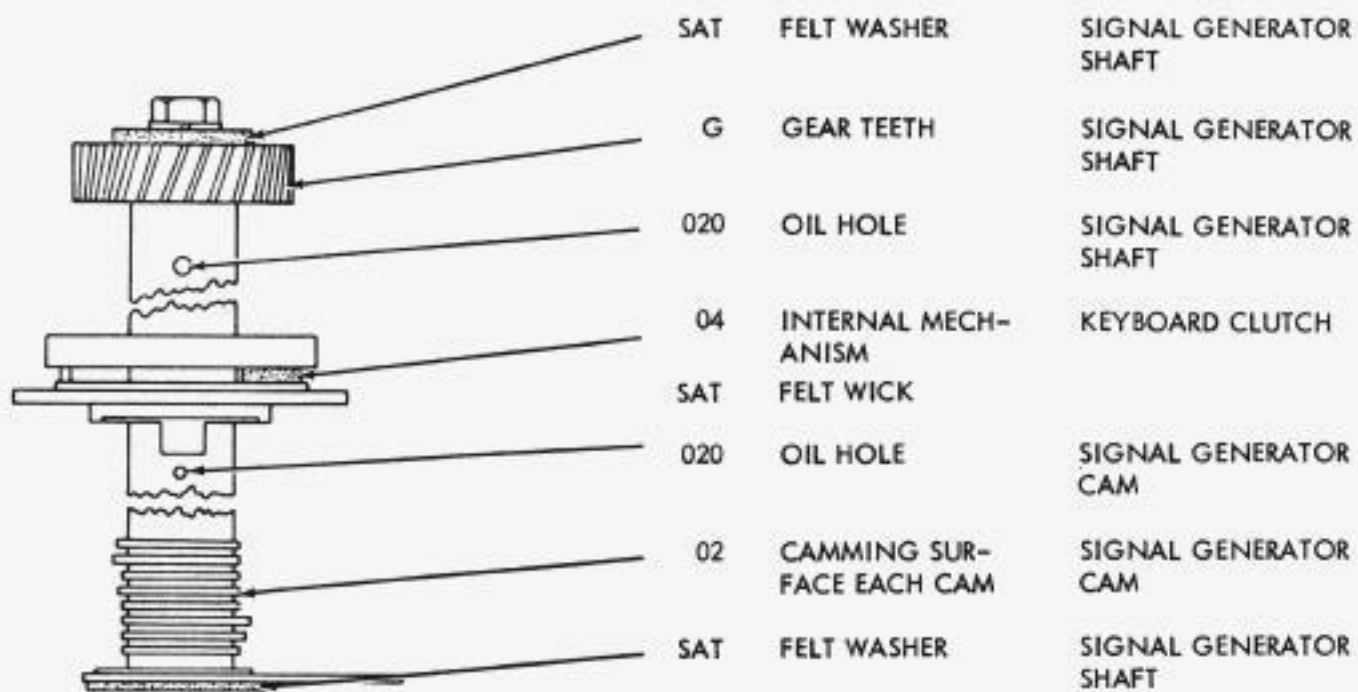
3.25 MARGIN INDICATING MECHANISM



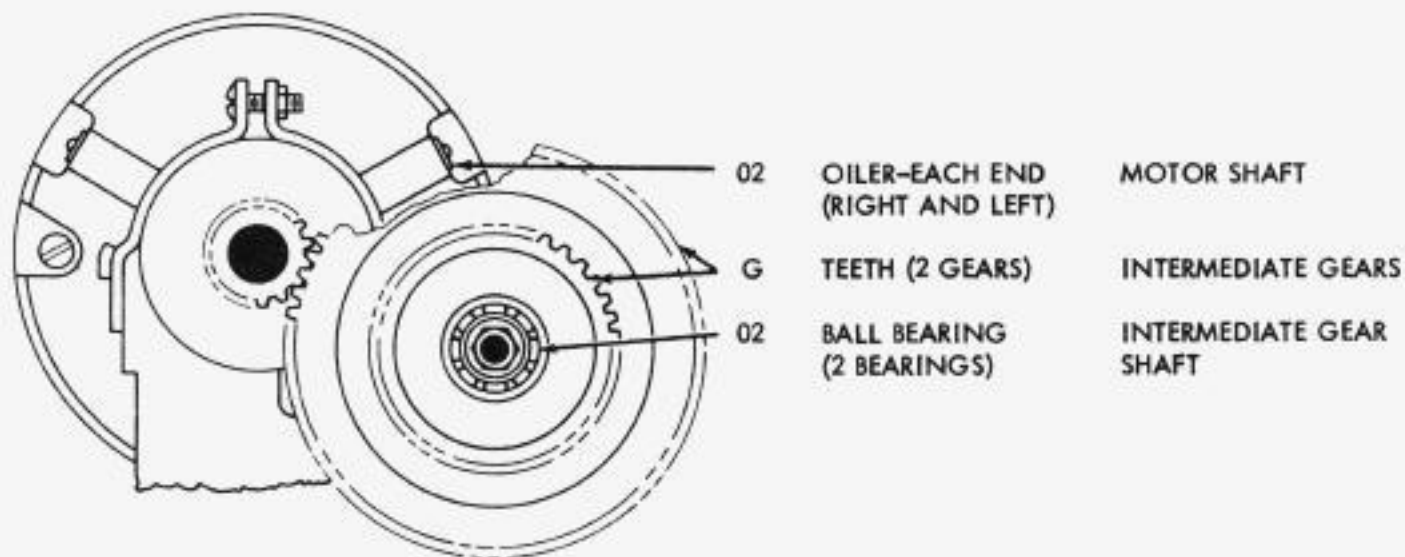
3.26 LOCAL LINE FEED MECHANISM



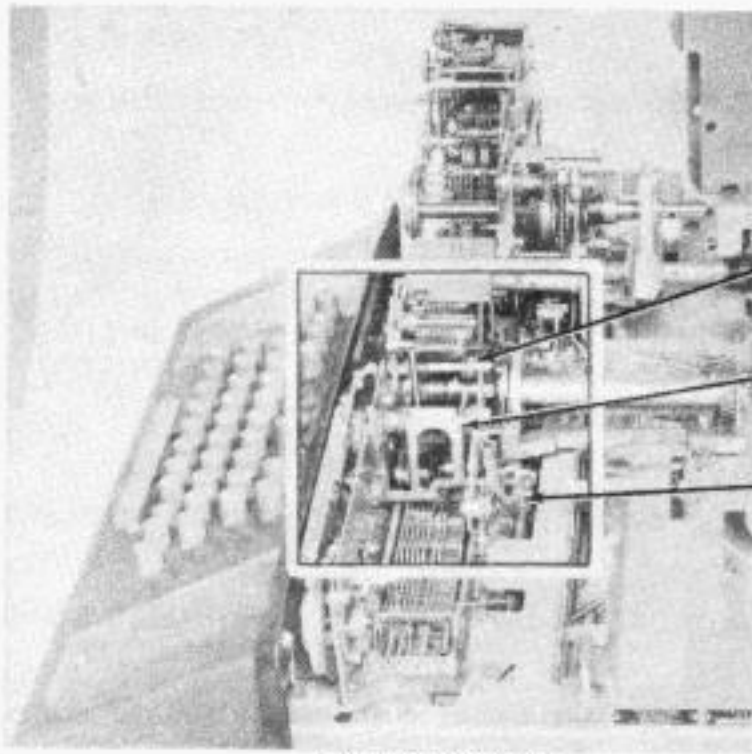
3.27 KEYBOARD SHAFT MECHANISM



3.28 INTERMEDIATE GEAR MECHANISM



3.29 SIGNAL GENERATOR MECHANISM (continued) REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION



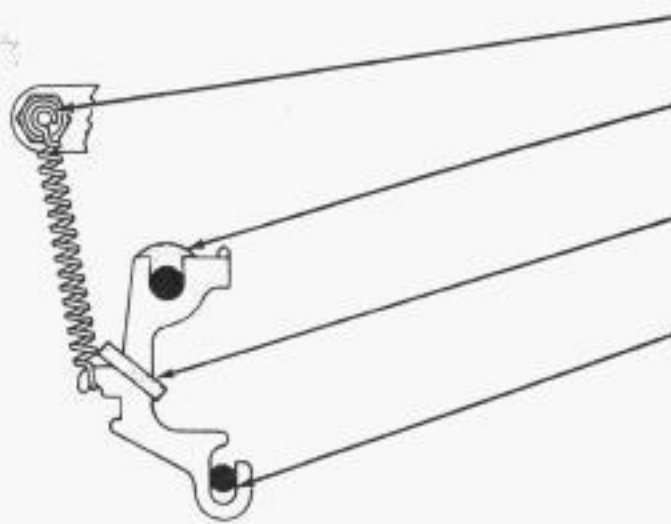
(RIGHT SIDE VIEW)

3.30

3.31

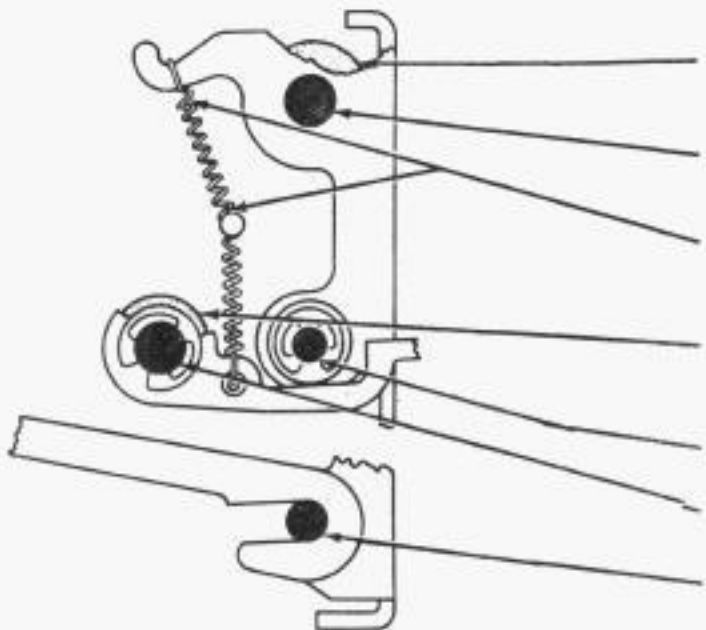
3.32

3.30 LOCKING BAIL MECHANISM



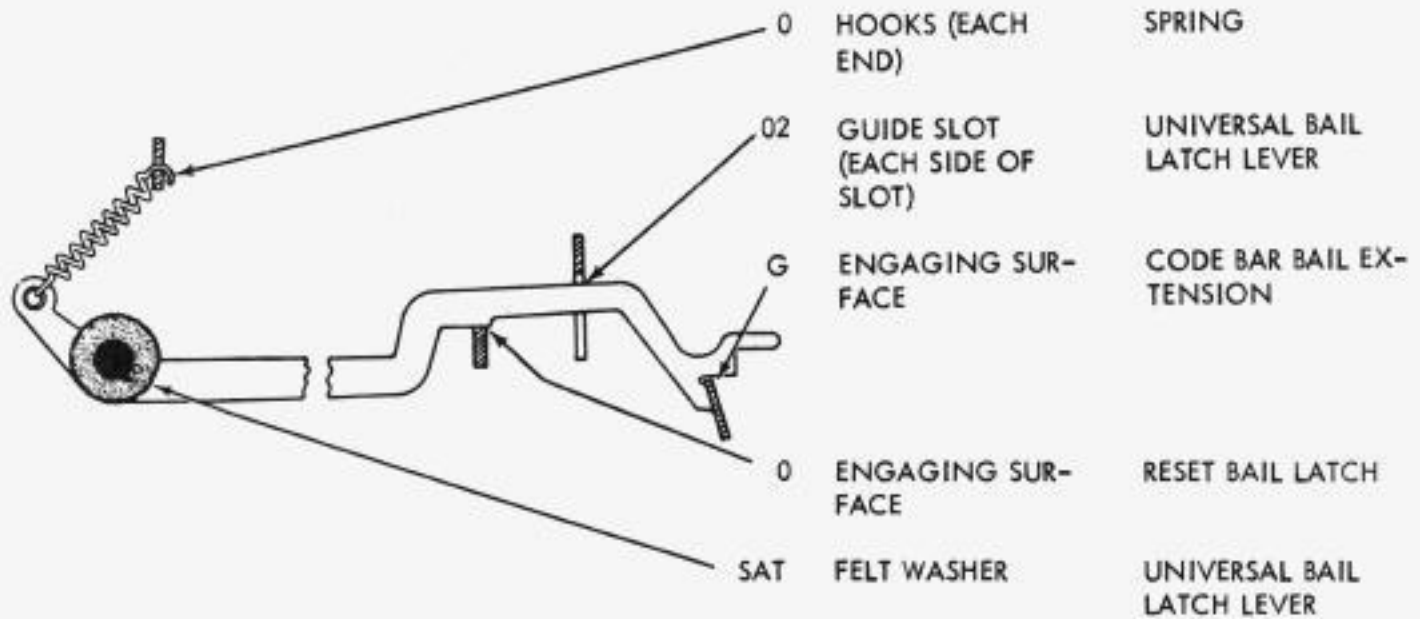
- 0 HOOKS-EACH END SPRING
- SAT FELT WASHERS (2 WASHERS - FRONT AND REAR) LOCKING BAIL POST
- SAT FELT WICK CAMMING SURFACES
- 0 GUIDE SLOTS (3 SLOTS) LOCKING BAIL

3.31 CODE BAR BAIL MECHANISM

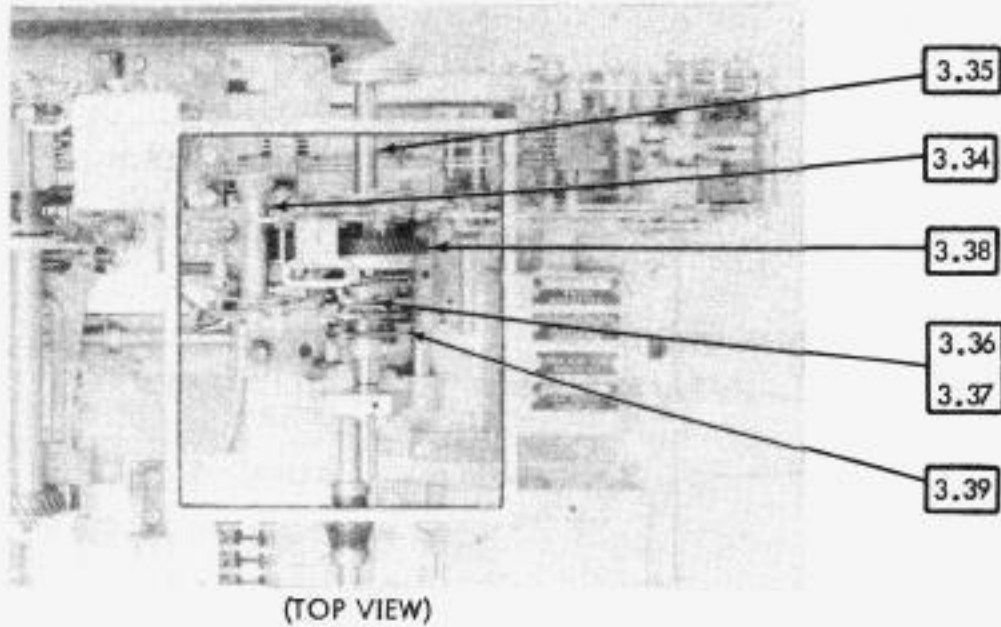


- SAT FELT WASHERS (TWO WASHERS) CODE BAR BAIL
- 0 BEARING SURFACE (2 PLACES) CODE BAR BAIL
- 0 HOOKS-EACH END (2 SPRINGS) SPRING
- SAT FELT WASHER CODE BAR BAIL LATCH
- 04 BEARING CODE BAR BAIL
- 02 BEARING SURFACE CODE BAR BAIL LATCH
- 02 ENGAGING SURFACE ECCENTRIC FOLLOWER FACE

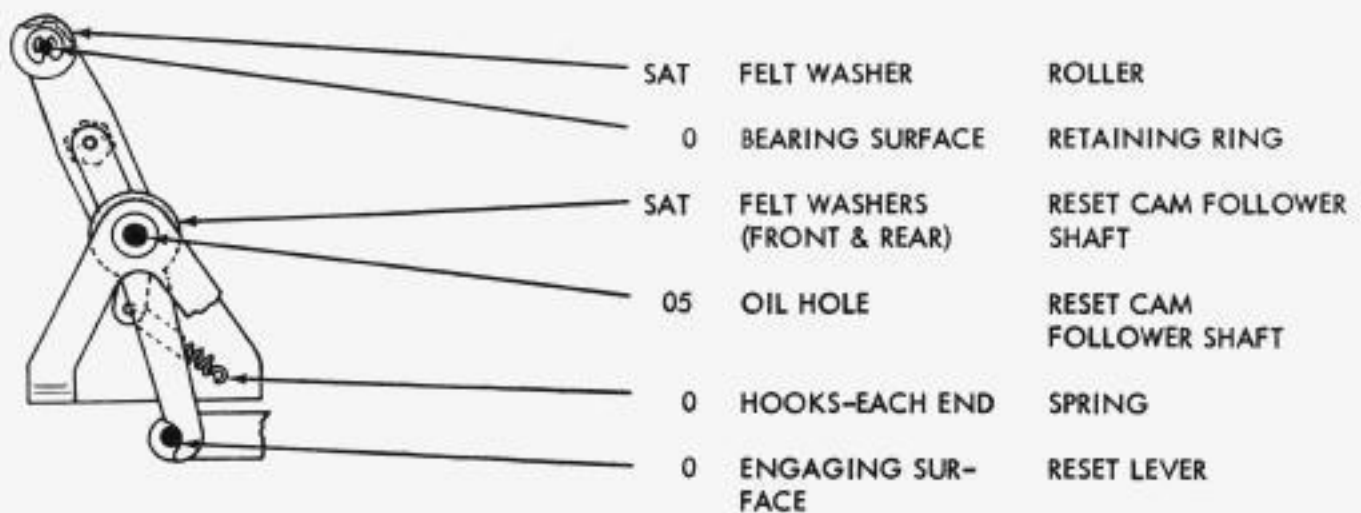
3.32 UNIVERSAL BAIL LATCH LEVER MECHANISM



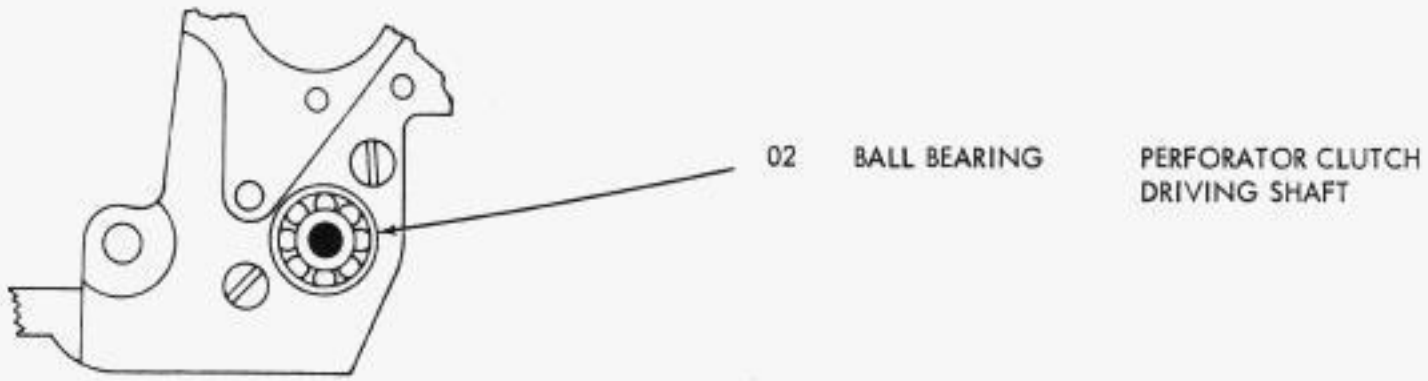
3.33 PERFORATOR MECHANISM RESET PERFORATOR MECHANISM IN UPRIGHT POSITION



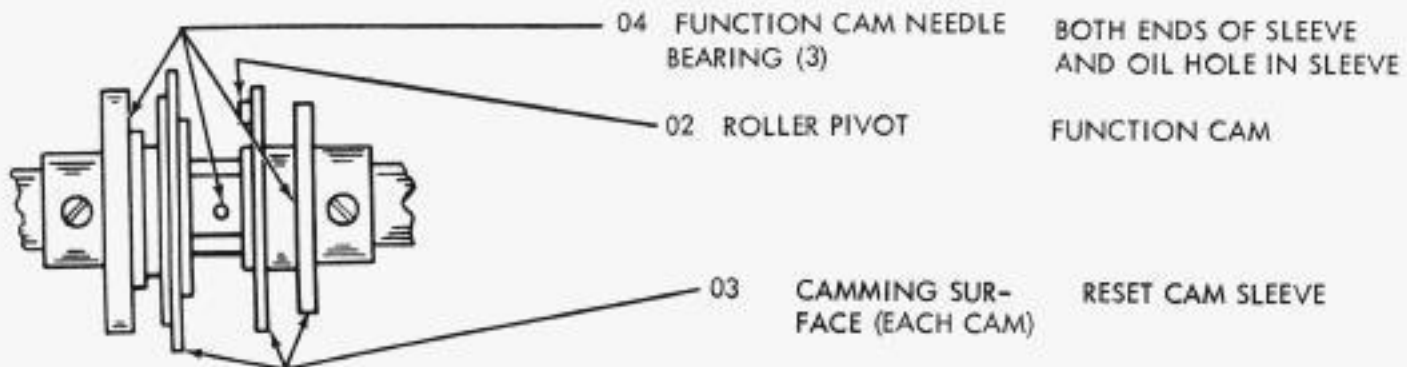
3.34 RESET CAM FOLLOWER MECHANISM



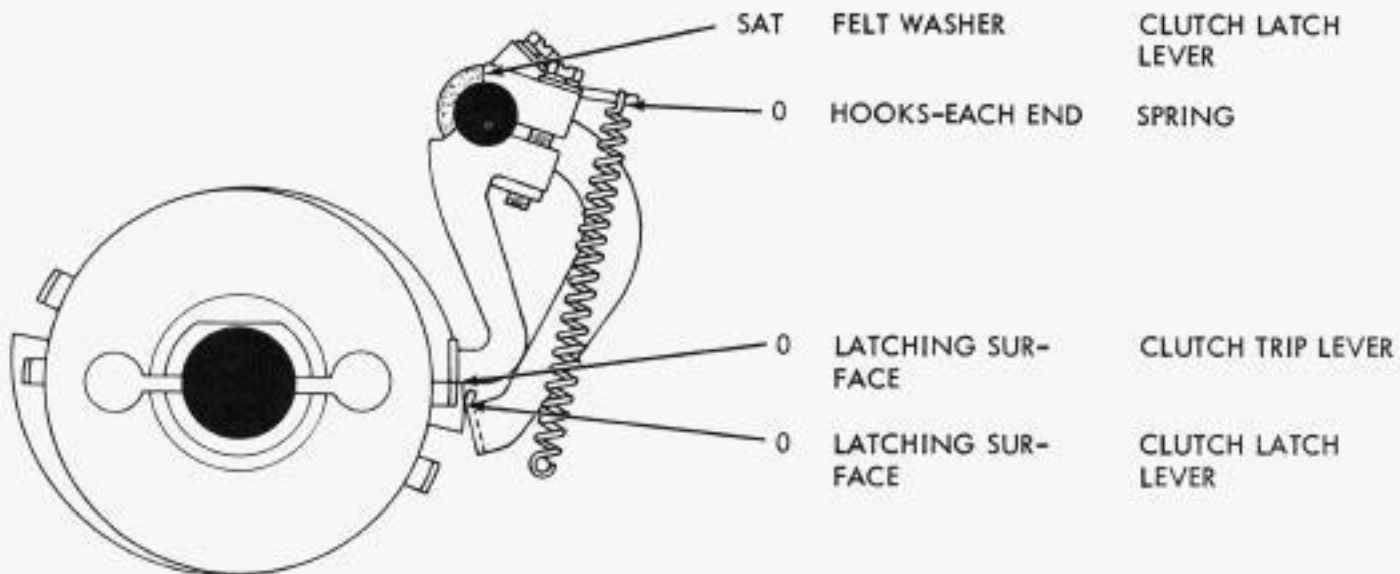
3.35 PERFORATOR CLUTCH DRIVING SHAFT MECHANISM (NON-TYPING ONLY)



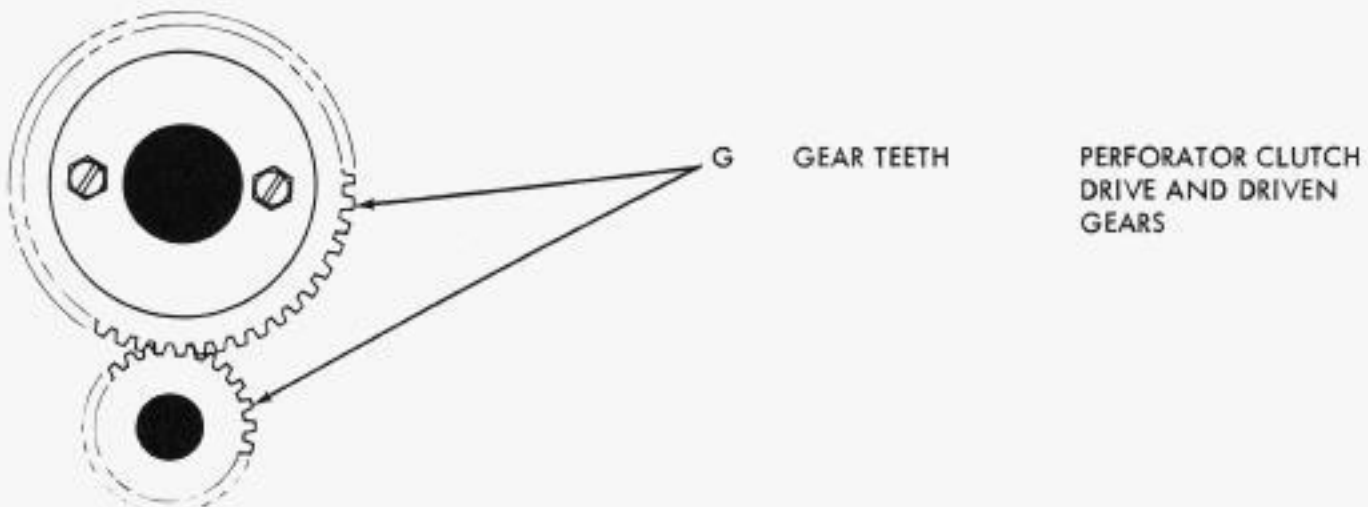
3.36 PERFORATOR CLUTCH AND RESET CAM MECHANISM



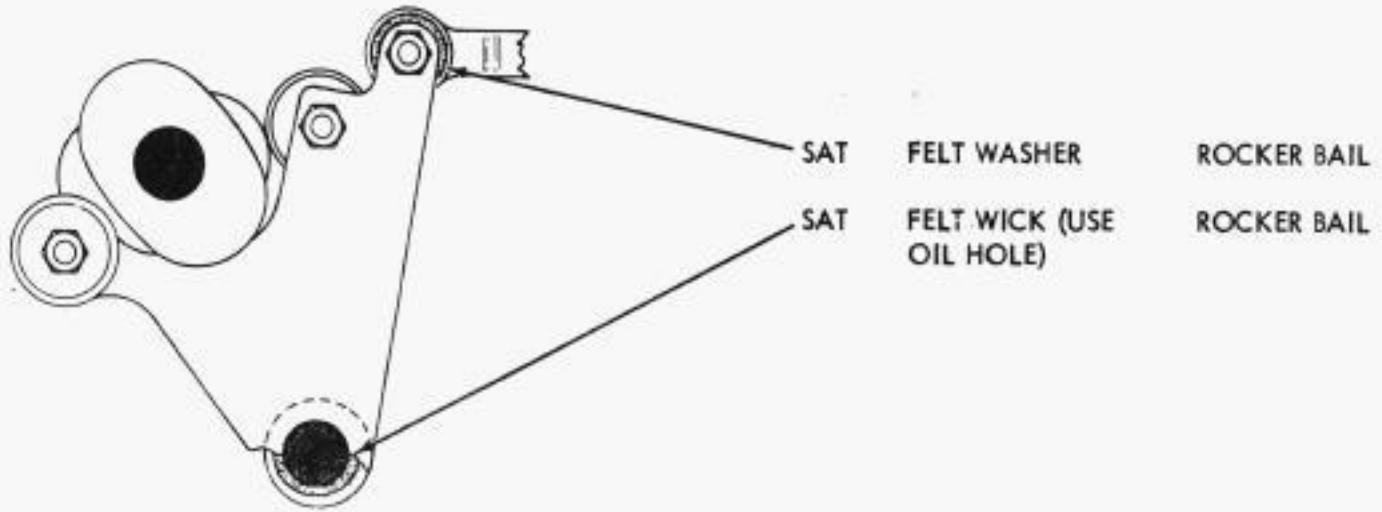
3.37 PERFORATOR CLUTCH MECHANISM (NON-TYPING ONLY)



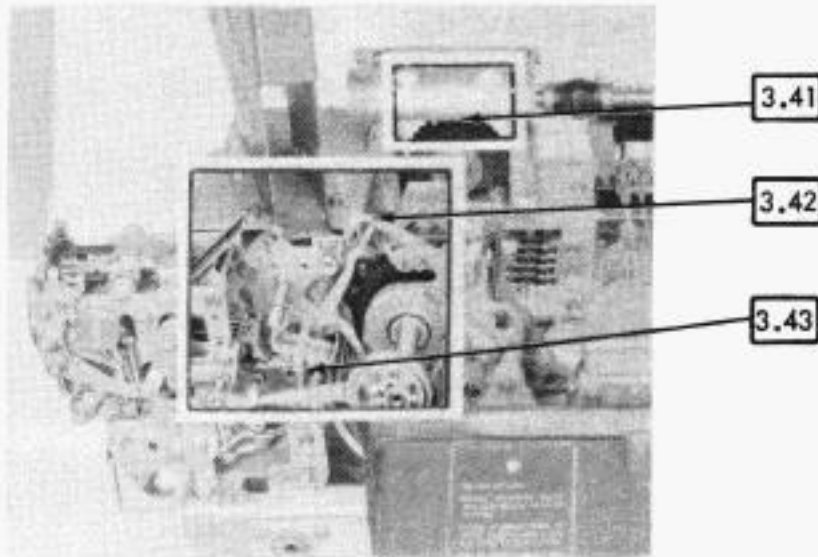
3.38 PERFORATOR CLUTCH GEAR MECHANISM (NON-TYPING ONLY)



3.39 ROCKER BAIL MECHANISM (NON-TYPING ONLY)

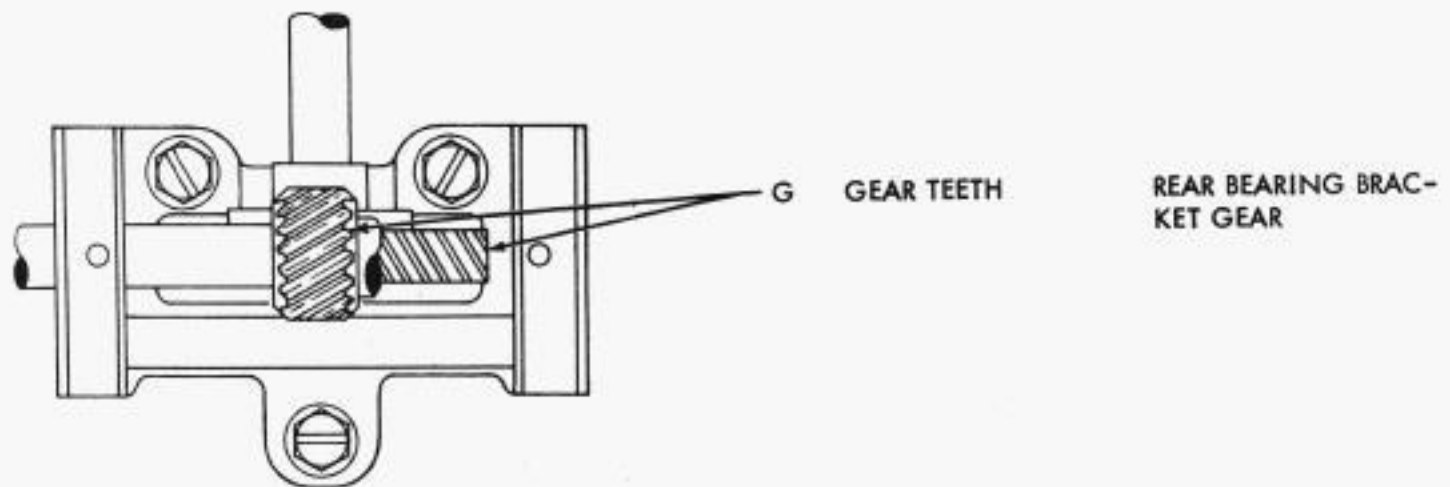


3.40 PERFORATOR MECHANISM (continued) REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

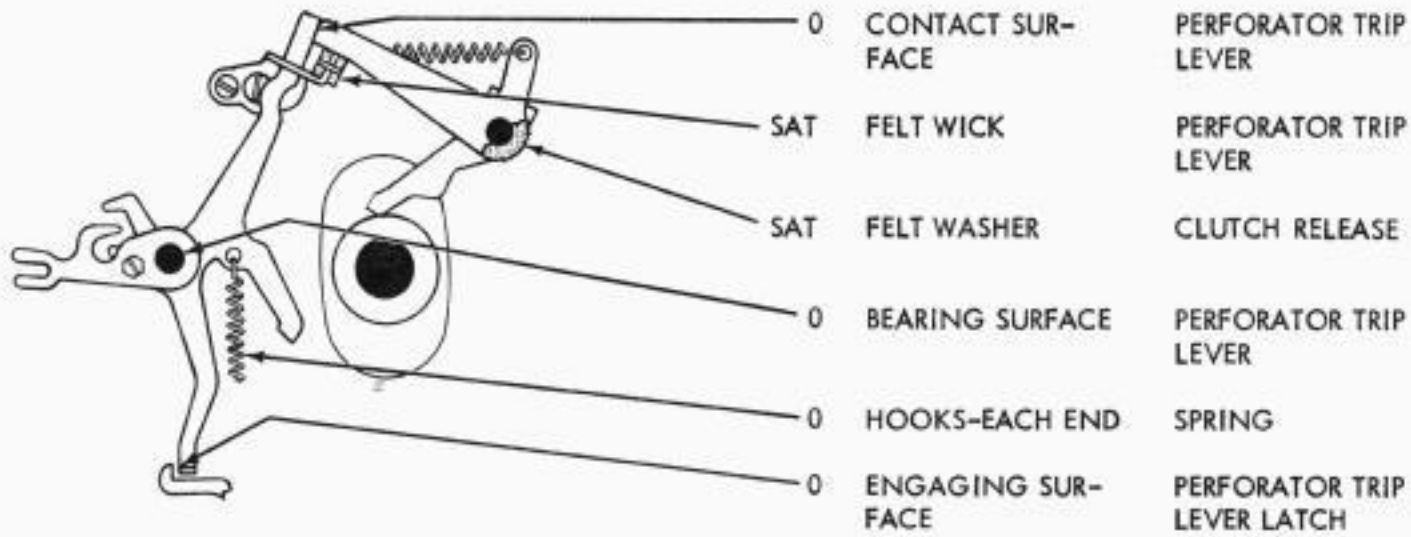


(FRONT VIEW)

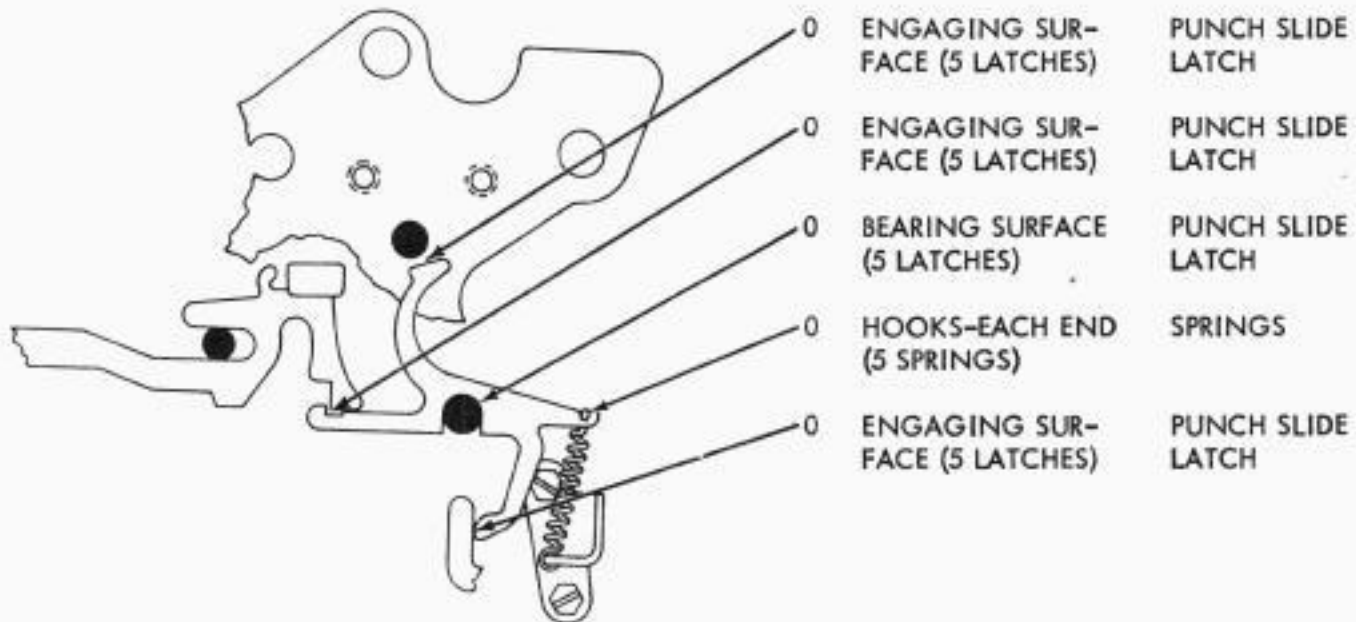
3.41 REAR BEARING BRACKET GEAR MECHANISM



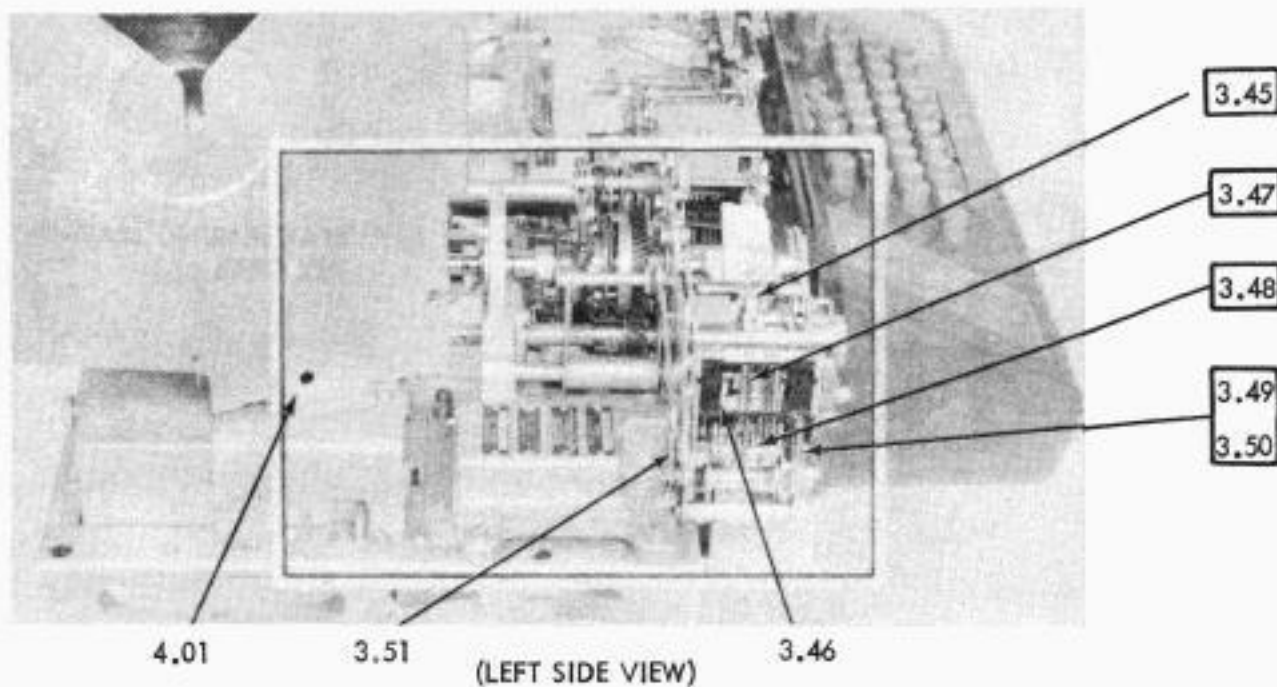
3.42 PERFORATOR TRIP LEVER MECHANISM (NON-TYPING ONLY)



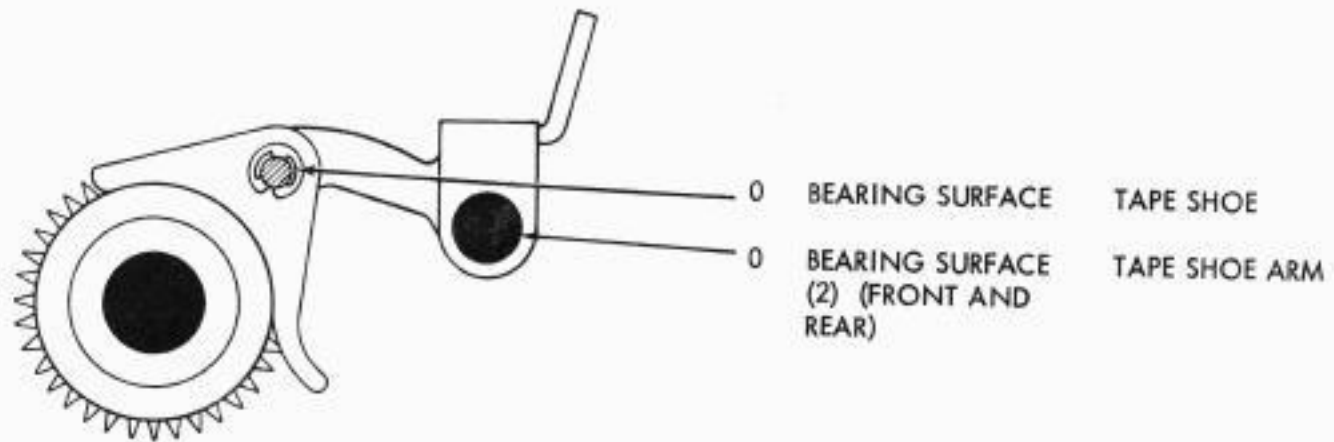
3.43 PUNCH SLIDE LATCH MECHANISM



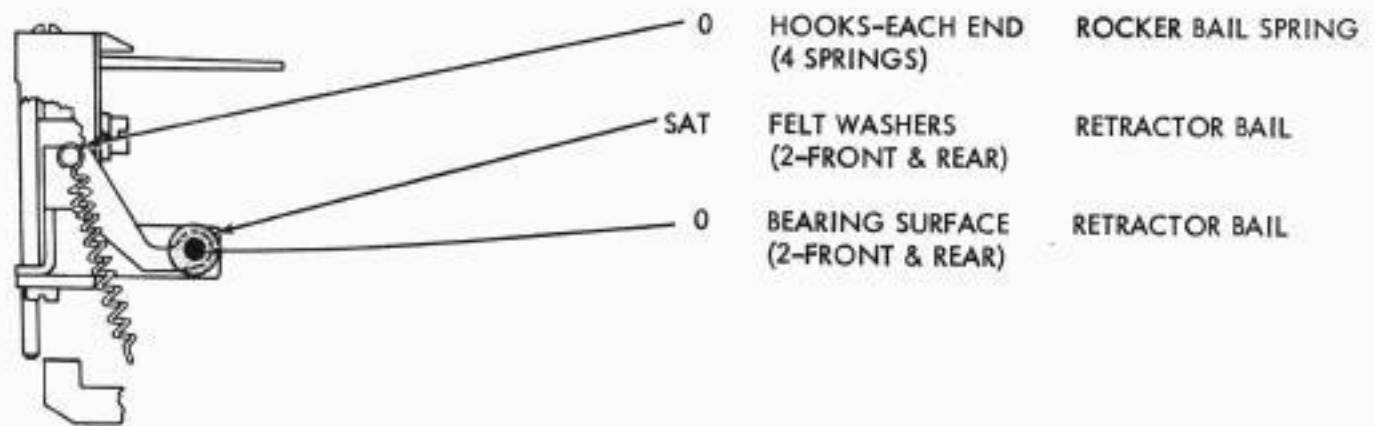
3.44 PUNCH MECHANISM REST- REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION



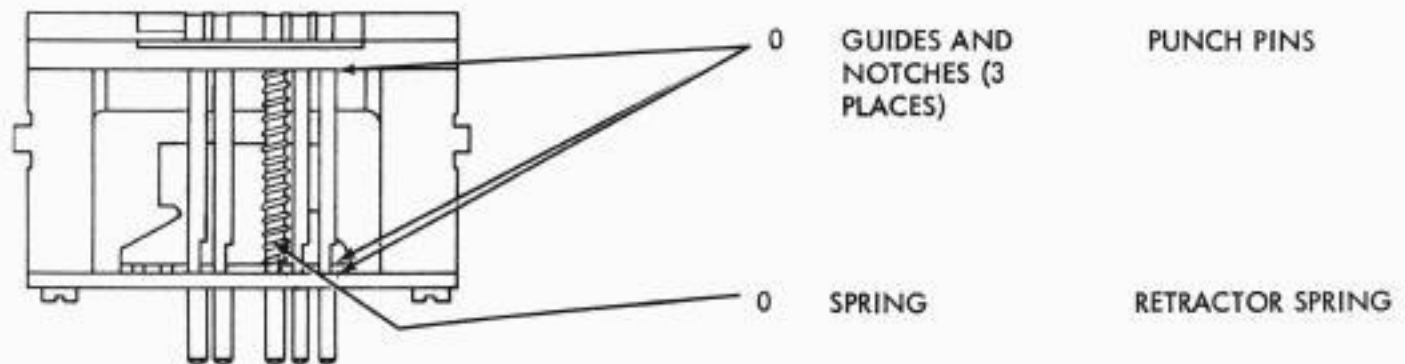
3.45 TAPE SHOE ARM MECHANISM



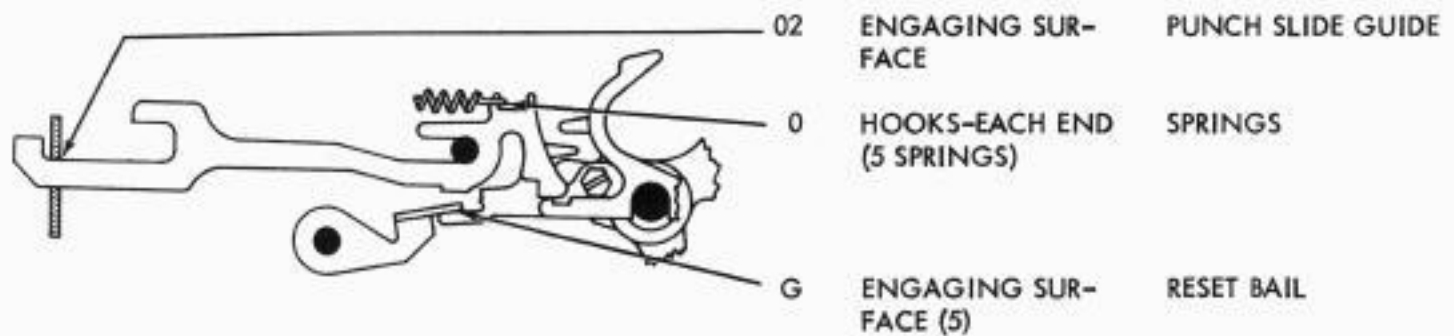
3.46 RETRACTOR BAIL MECHANISM



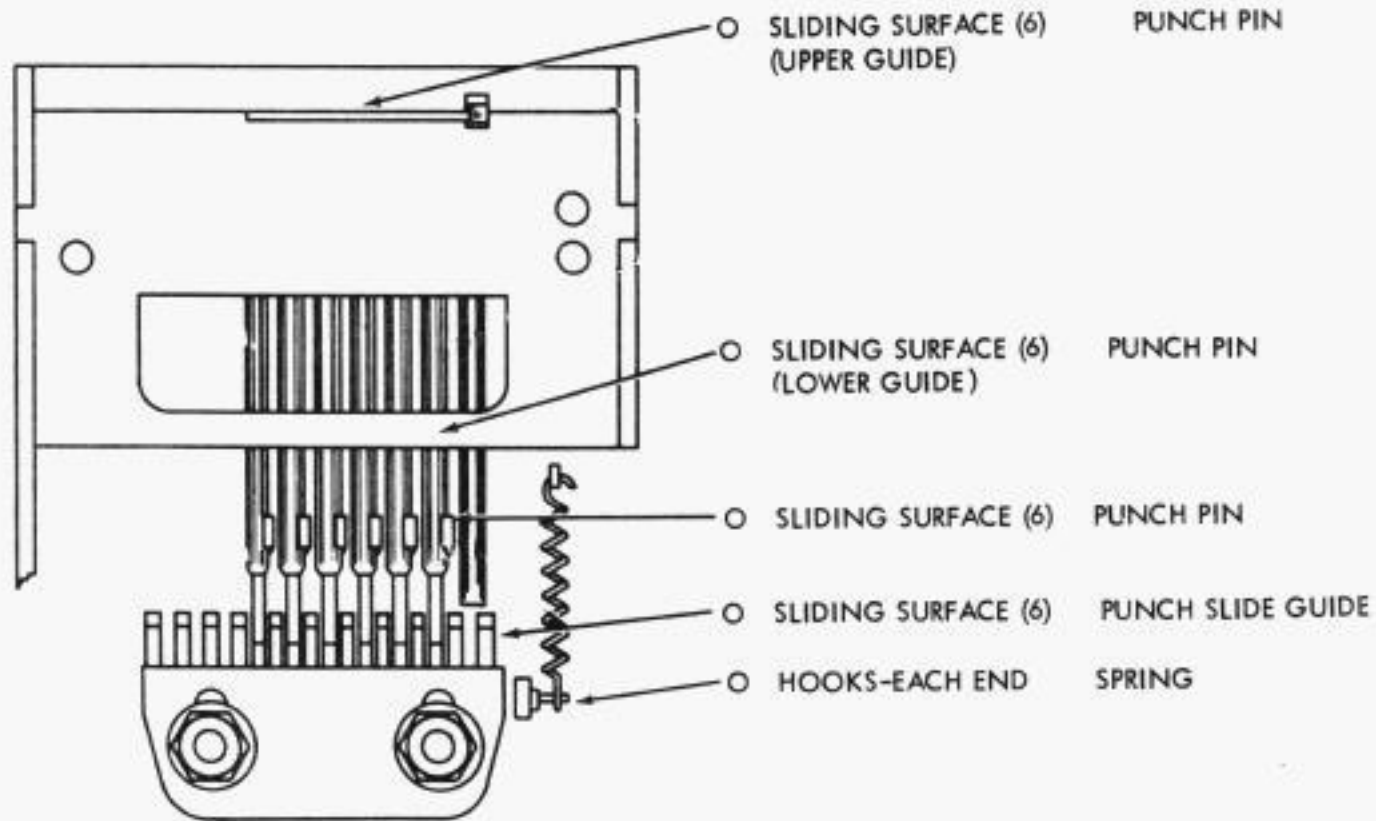
3.47 PUNCH PIN MECHANISM



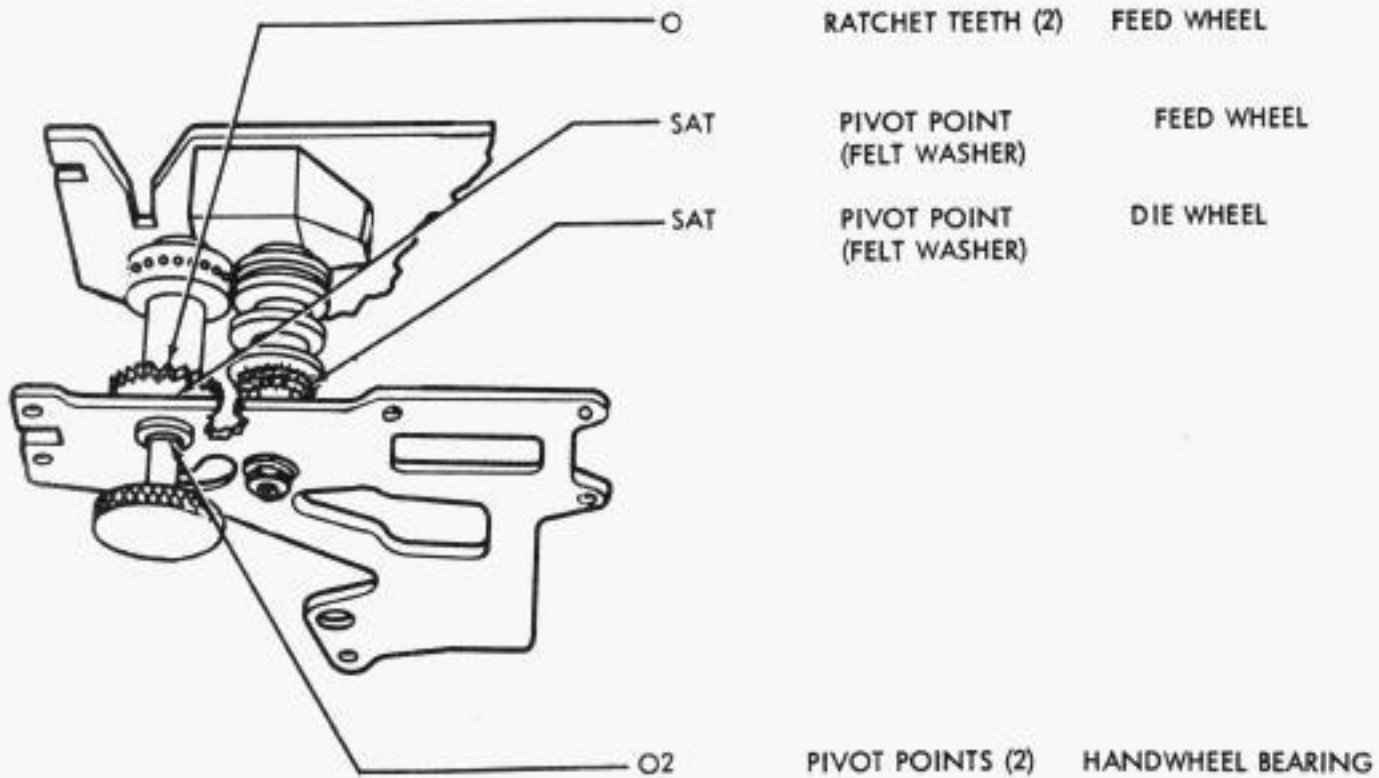
3.48 PUNCH SLIDE MECHANISM



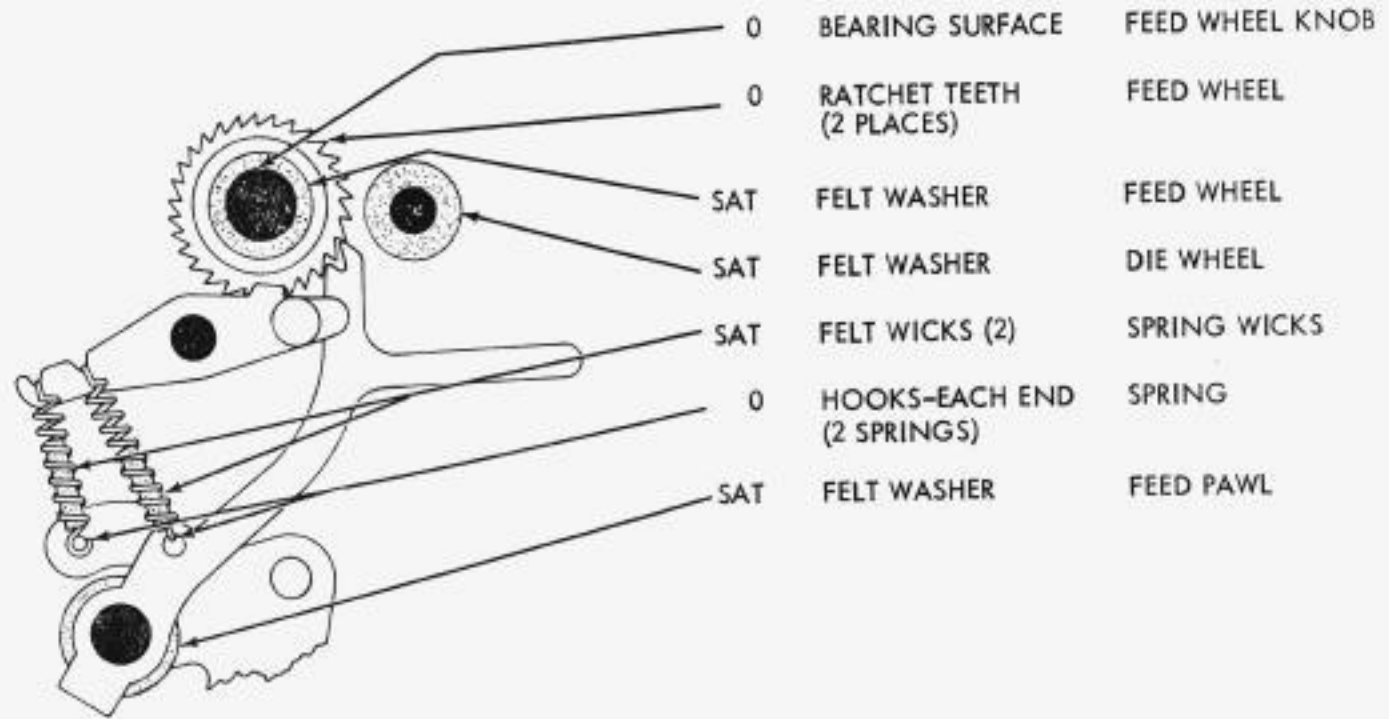
3.48 PERFORATED MECHANISM FOR FULLY PERFORATED TAPE



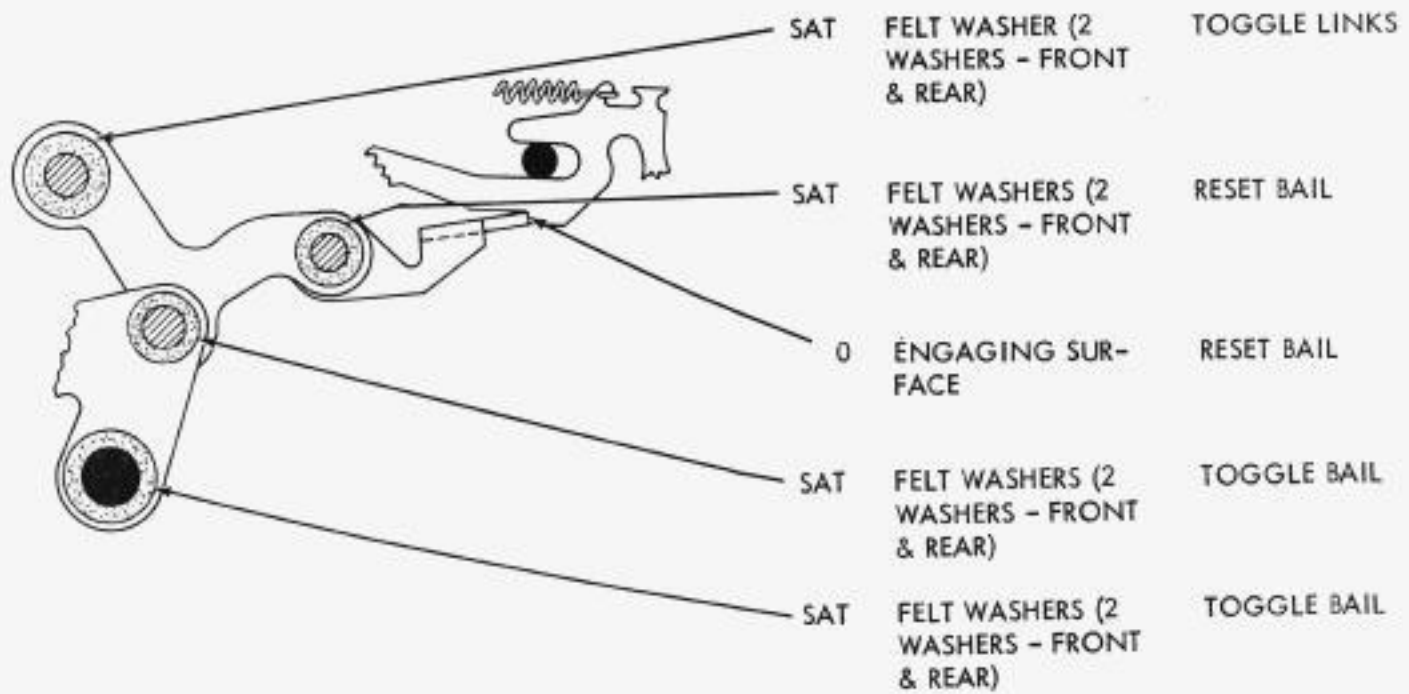
3.45 PERFORATOR MECHANISM



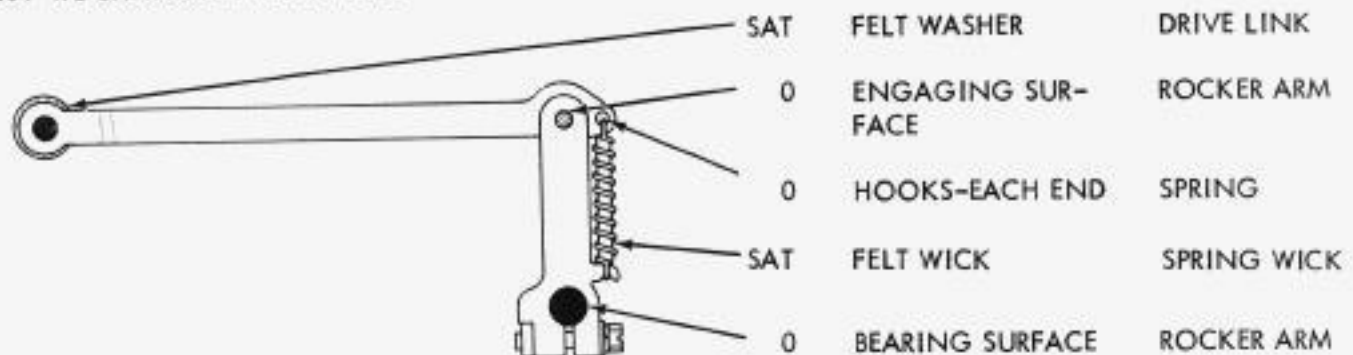
3.49 FEED WHEEL MECHANISM



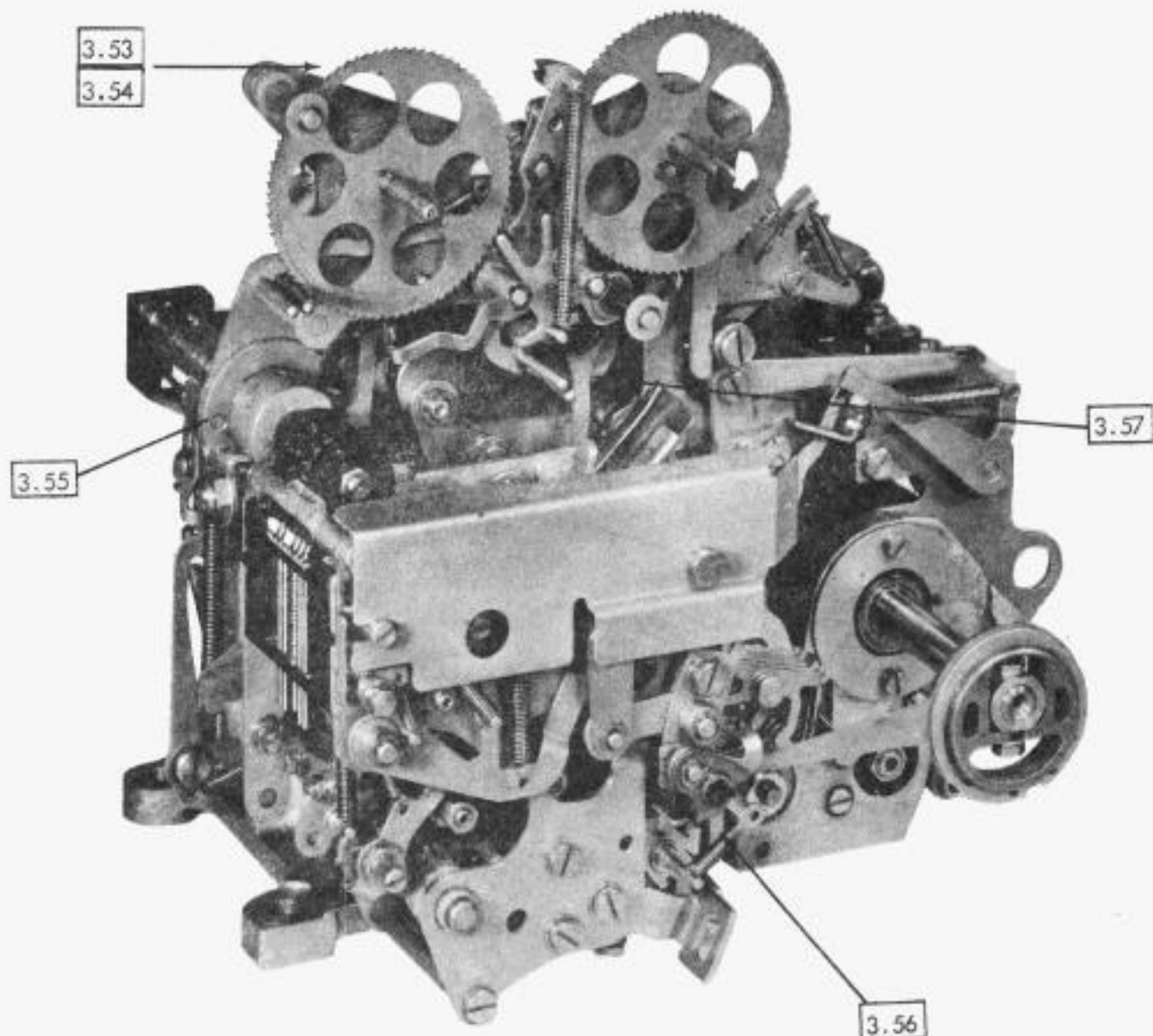
3.50 RESET BAIL MECHANISM



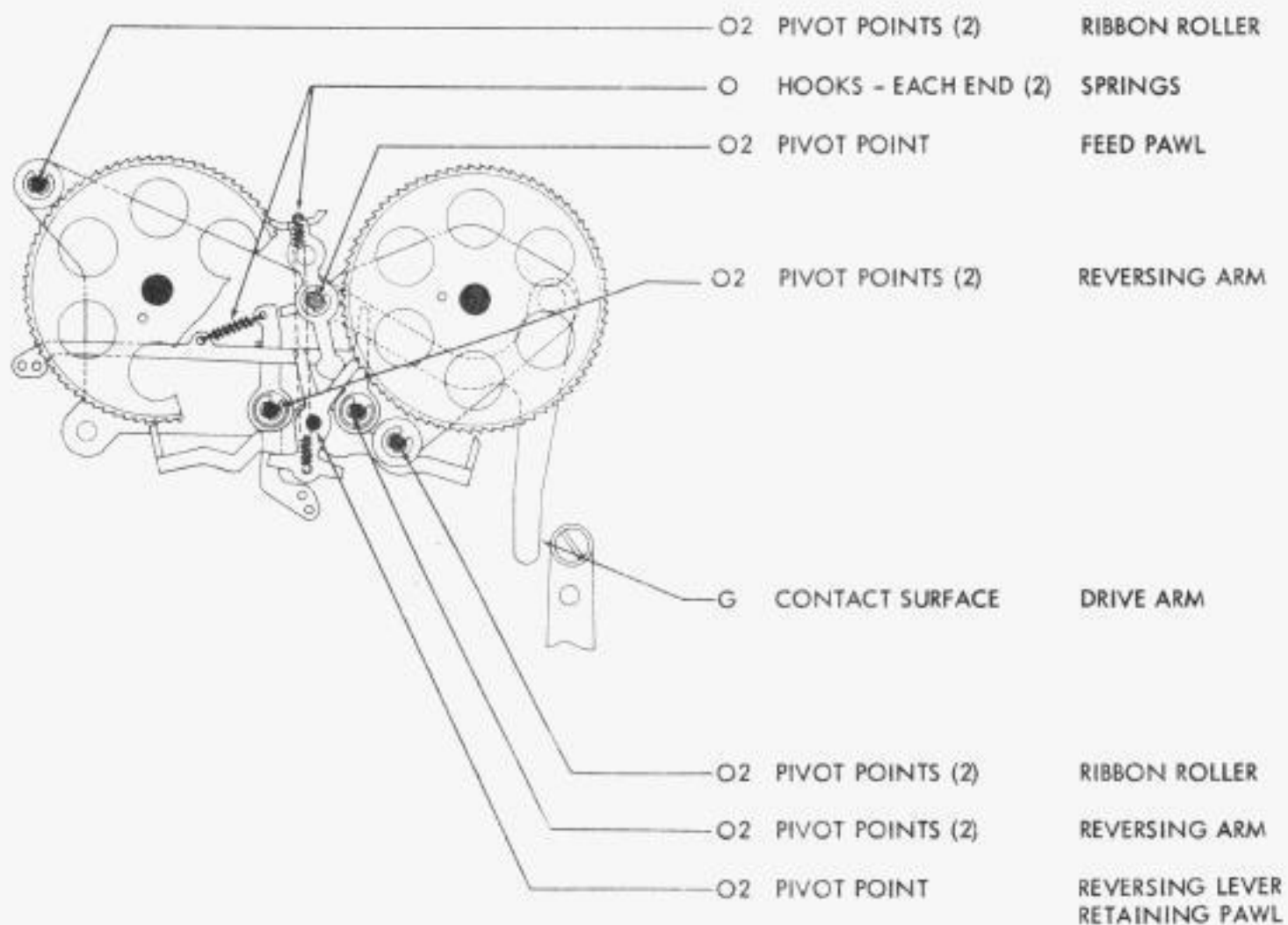
3.51 ROCKER ARM MECHANISM



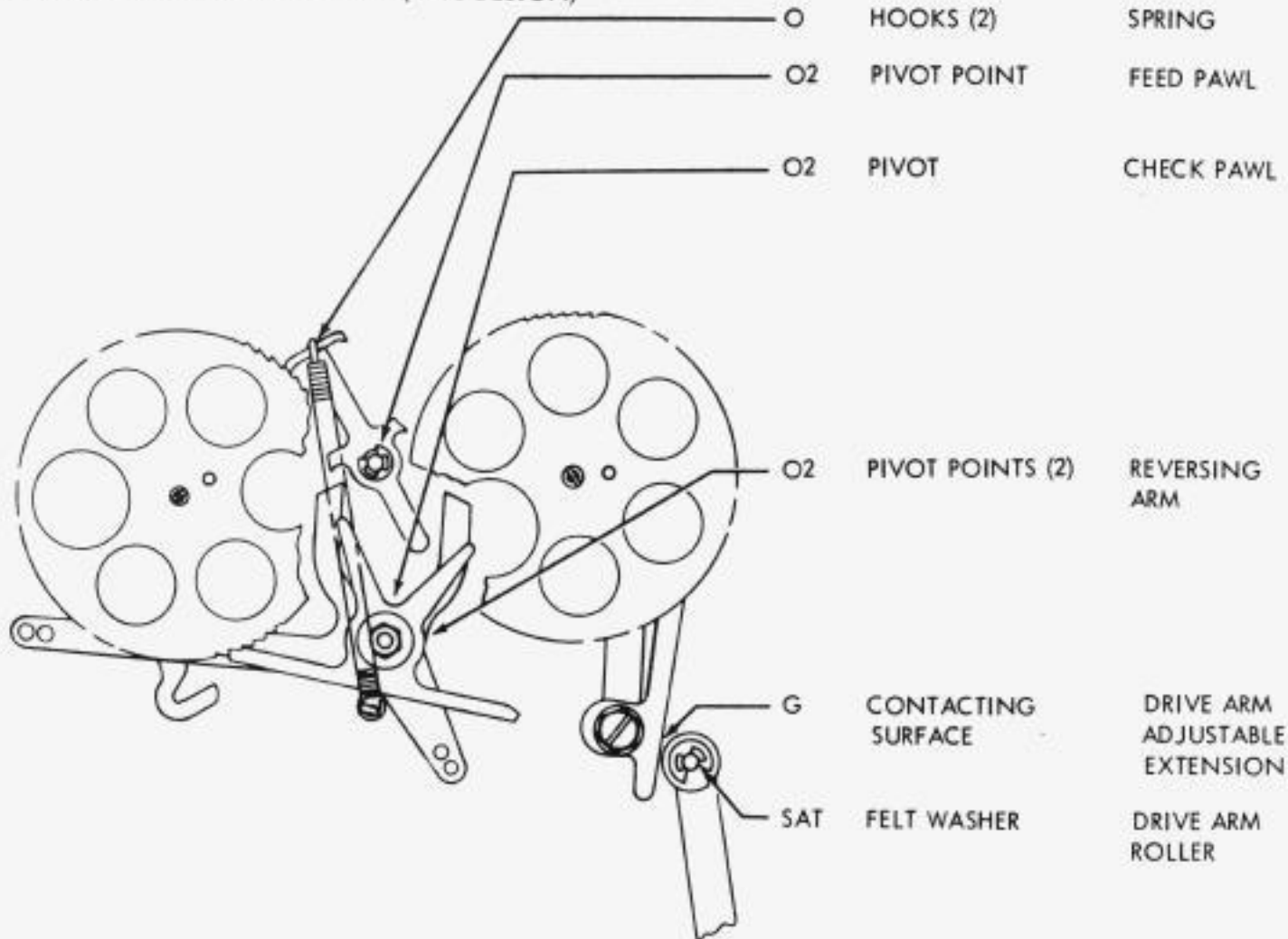
3.52 TYPING PERFORATOR - PLACE PERFORATOR IN UPRIGHT POSITION.



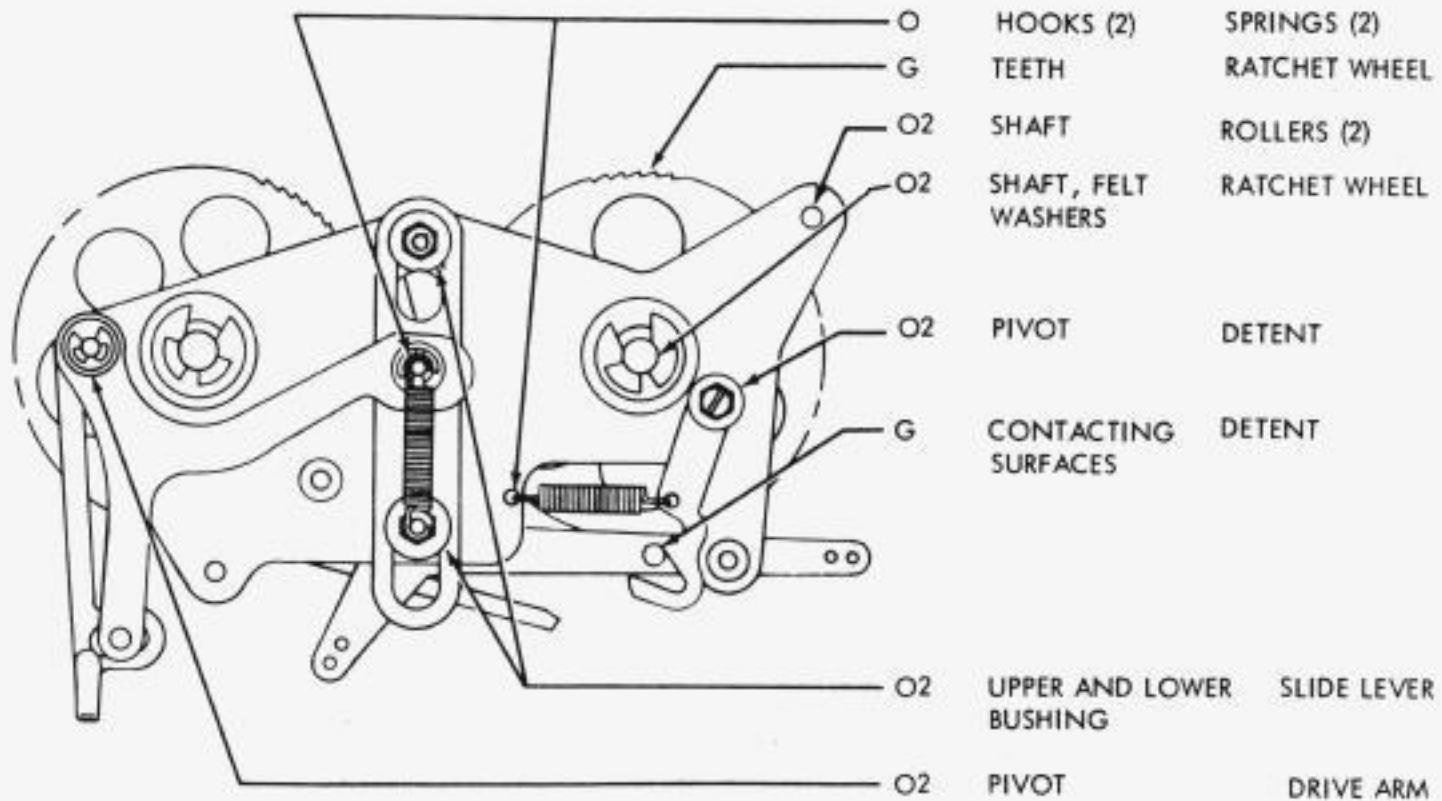
3.53 RIBBON FEED MECHANISM (TYPING PERFORATOR ONLY) - EARLY DESIGN



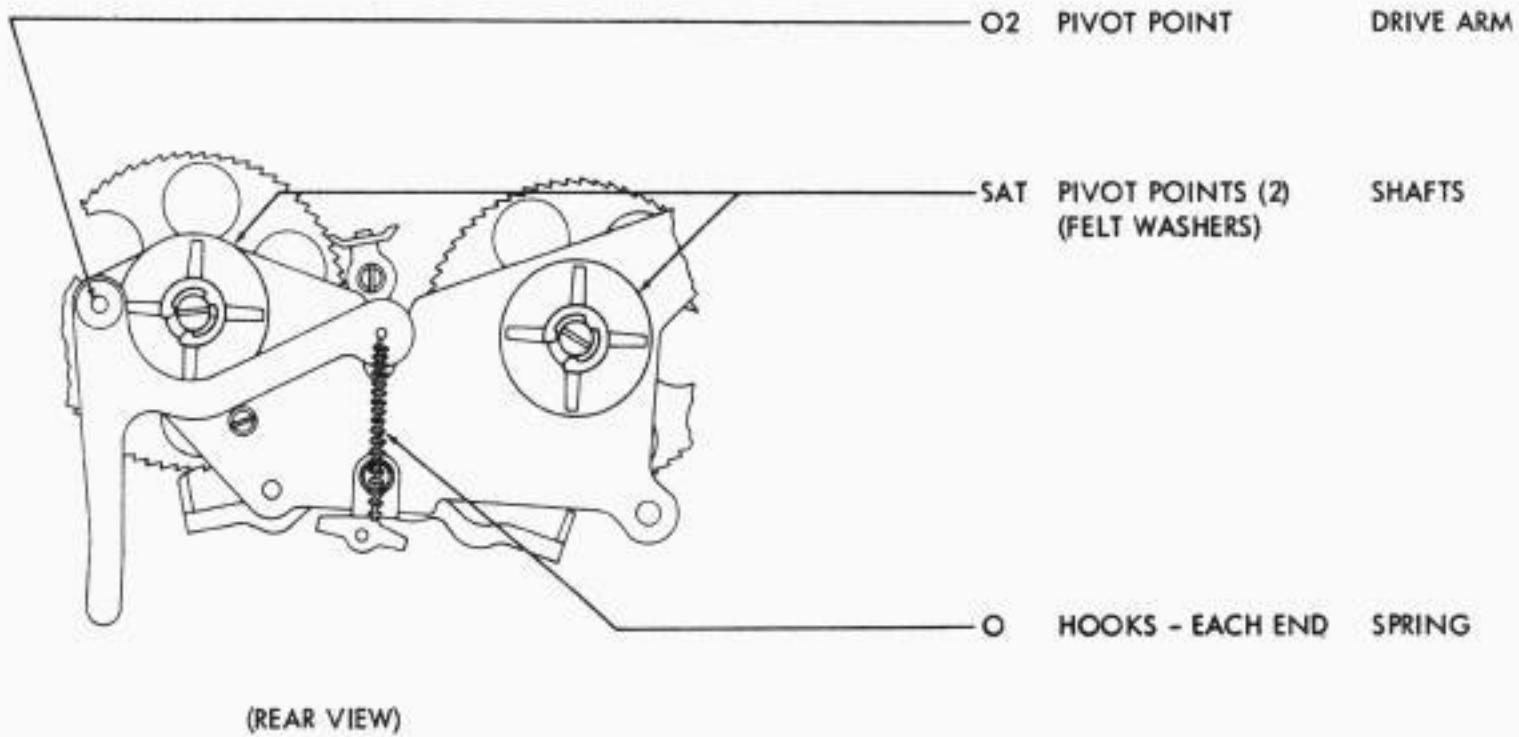
3.53 RIBBON FEED MECHANISM (LATE DESIGN)



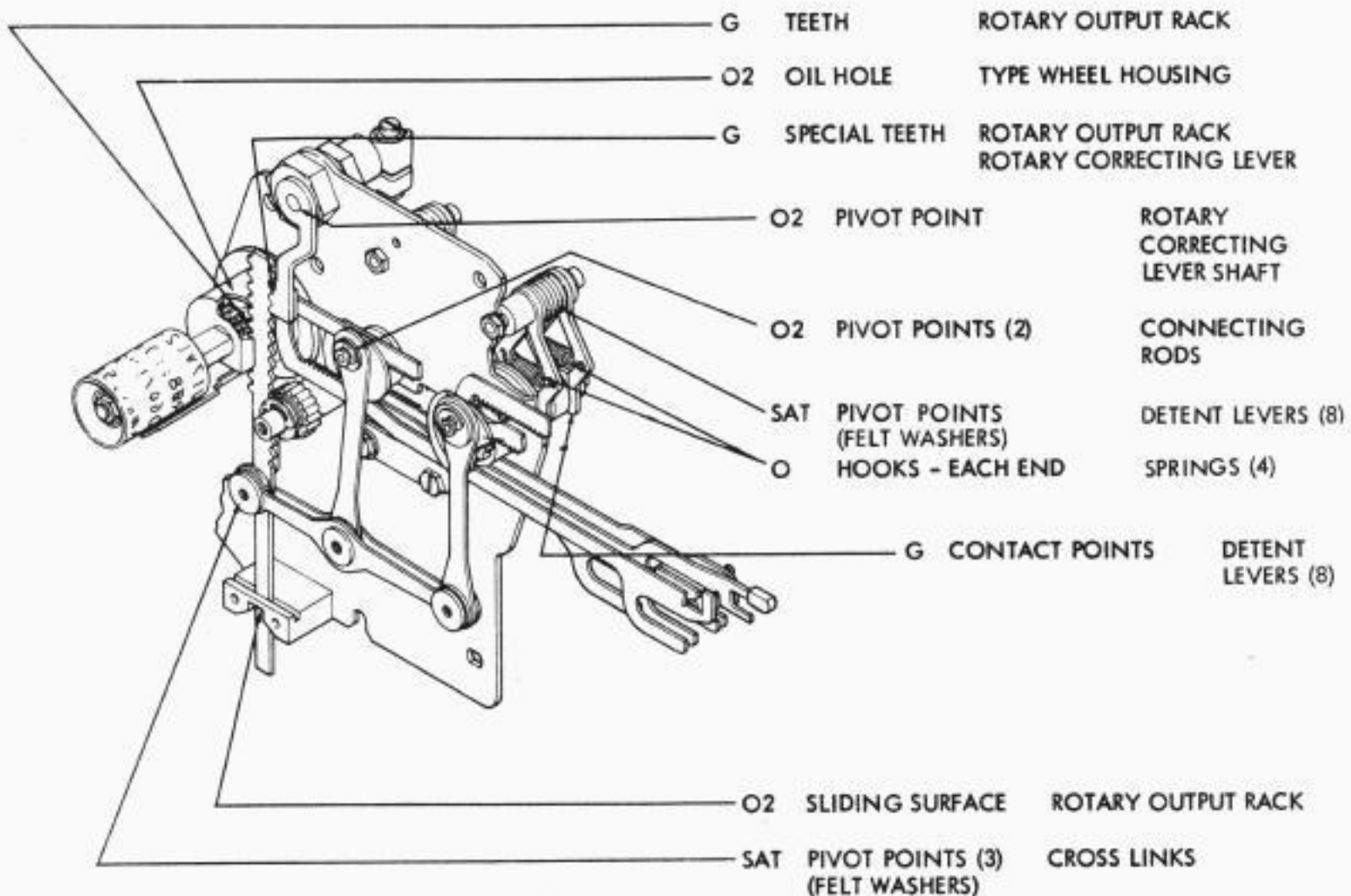
3.54 RIBBON FEED MECHANISM (LATE DESIGN)



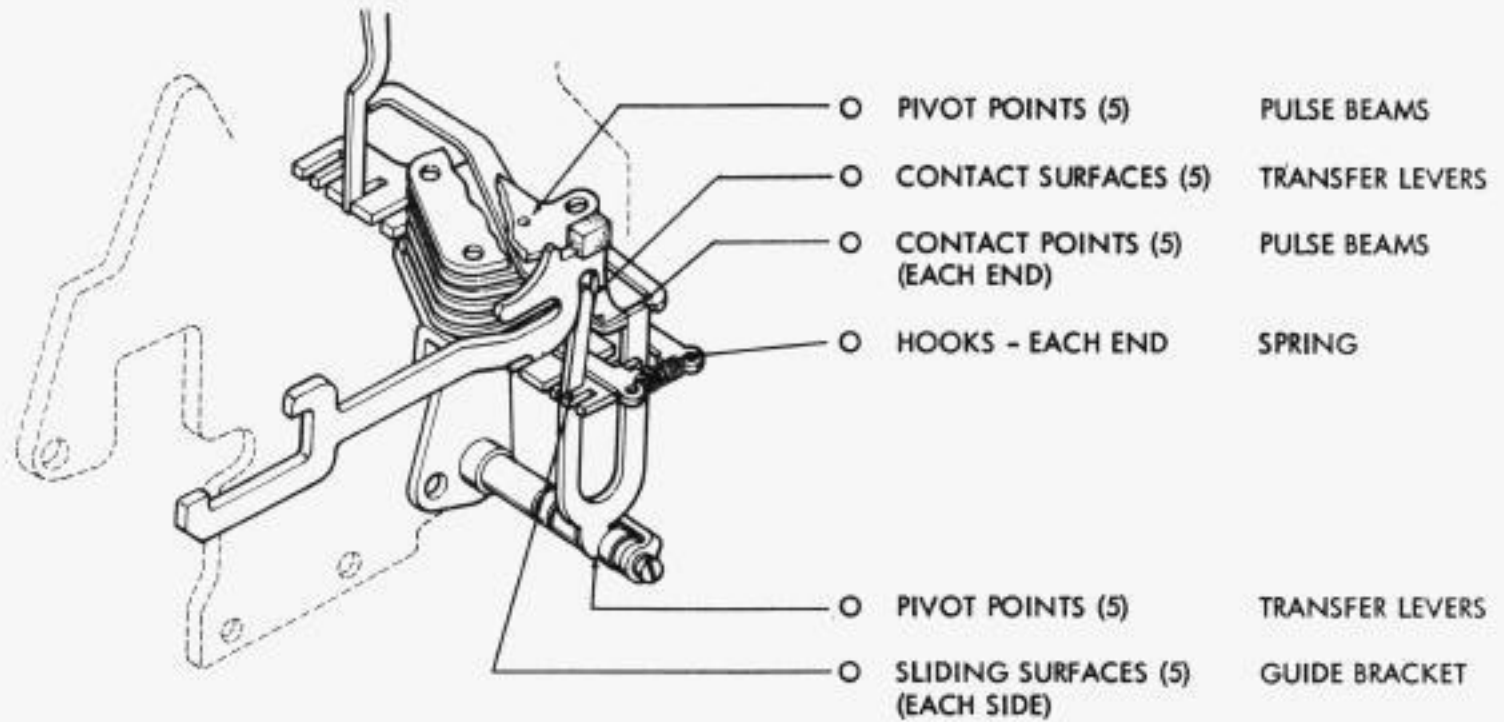
3.54 RIBBON FEED MECHANISM (TYPING PERFORATOR ONLY) - EARLY DESIGN



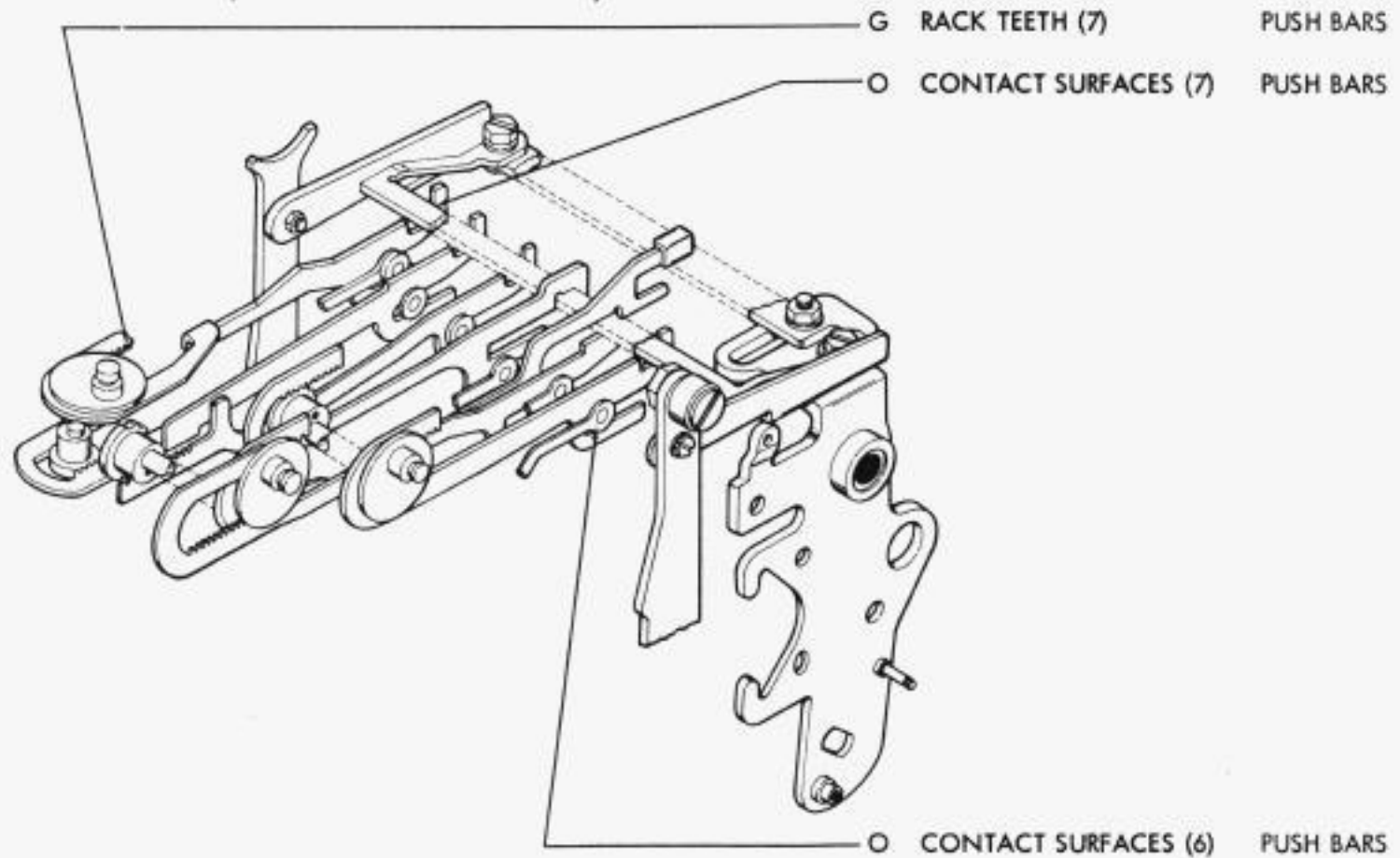
3.55 ROTARY POSITIONING MECHANISM (TYPING PERFORATOR ONLY)



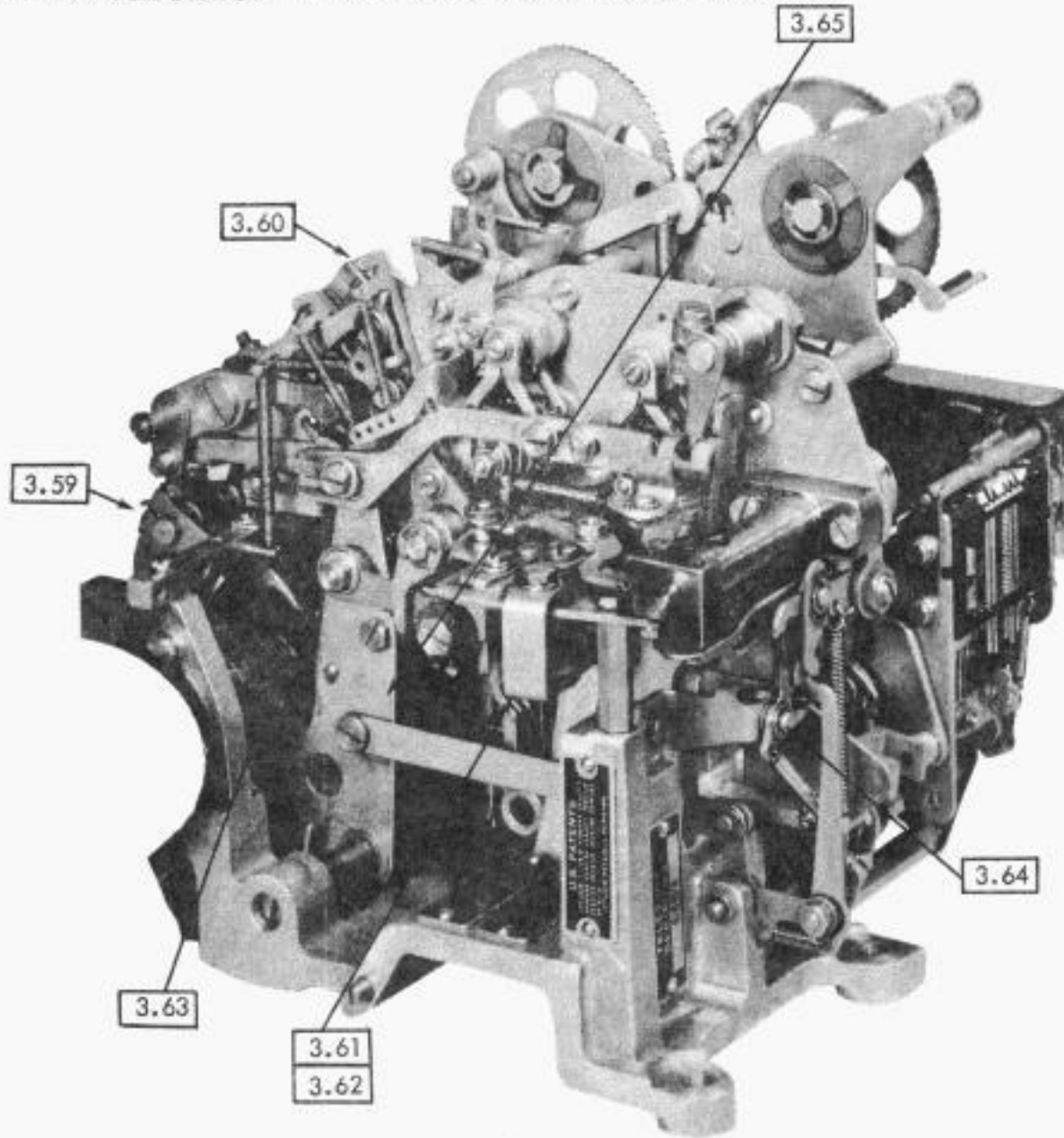
3.56 TRANSFER MECHANISM (TYPING PERFORATOR ONLY)



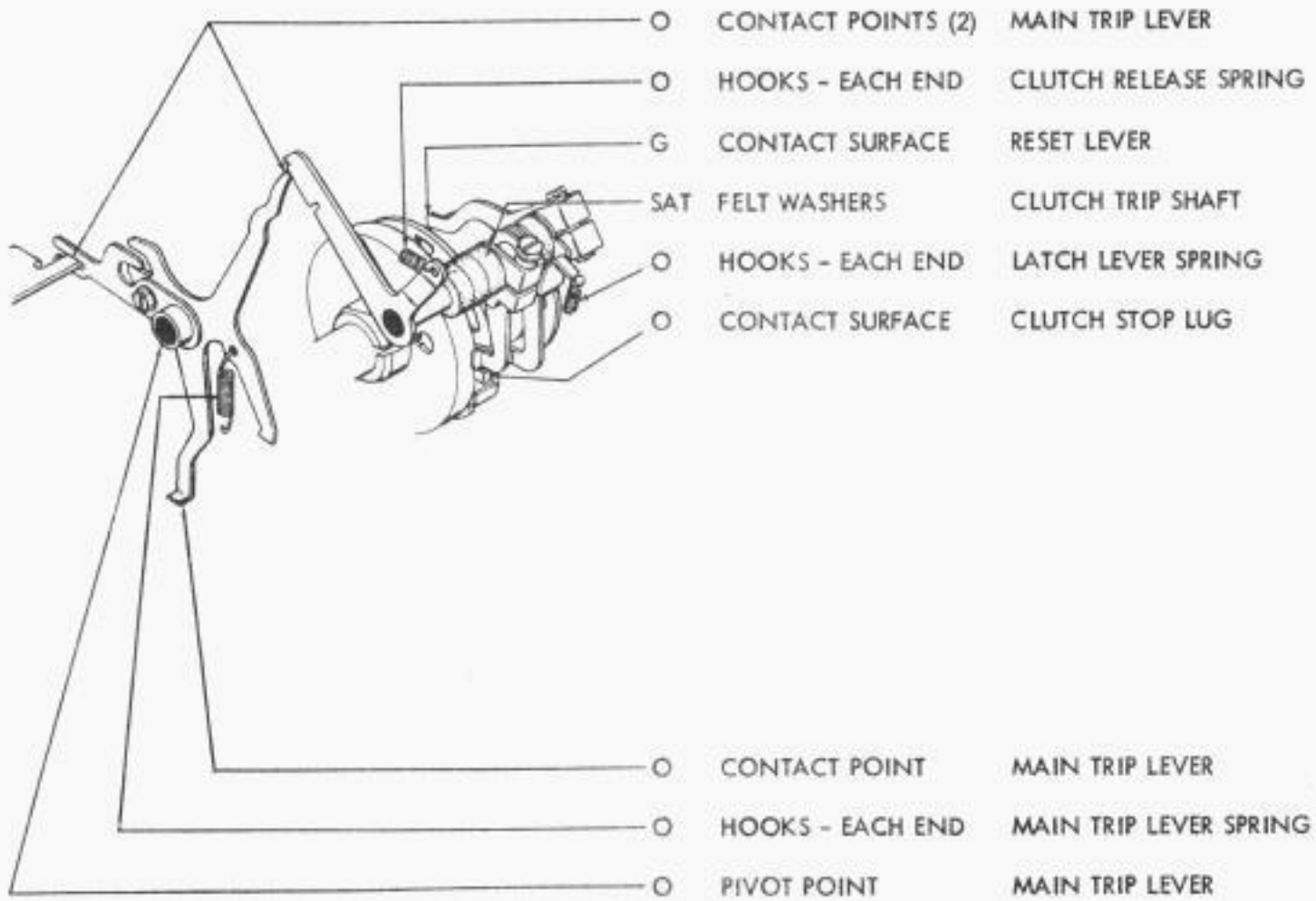
3.57 PUSH BARS (TYPING PERFORATOR ONLY)



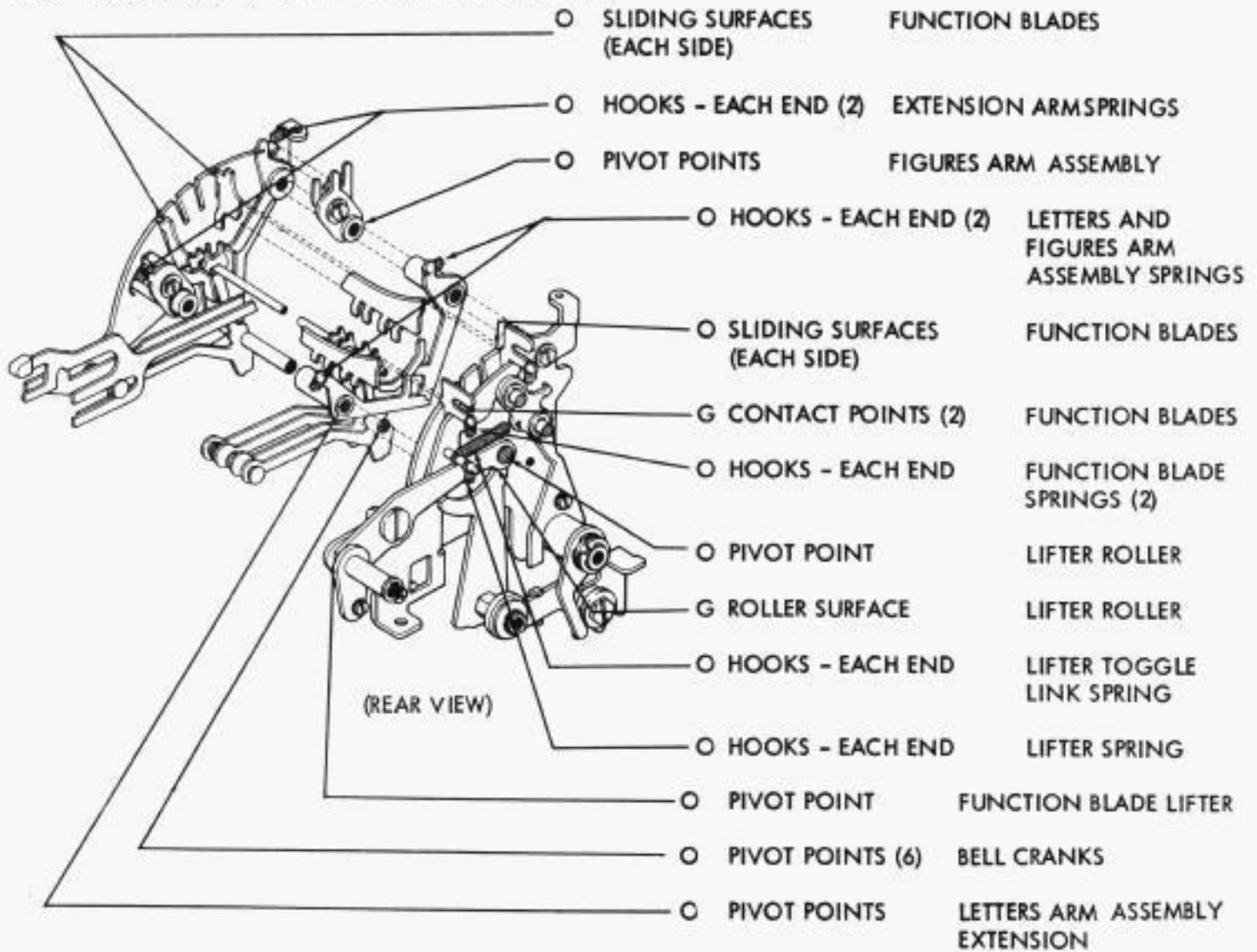
3.58 TYPING PERFORATOR - PLACE PERFORATOR IN UPRIGHT POSITION.



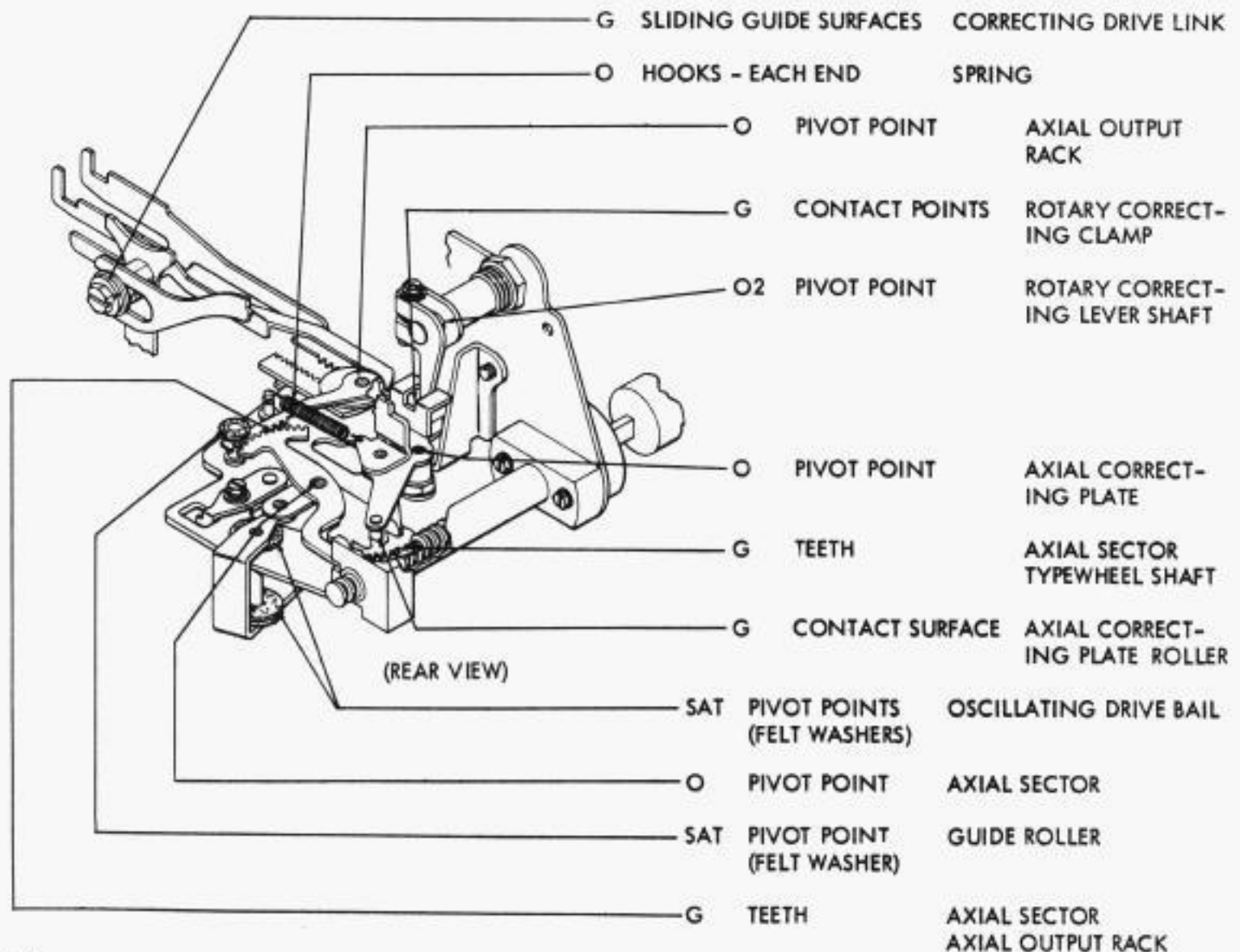
3.59 FUNCTION CAM - CLUTCH TRIP MECHANISM



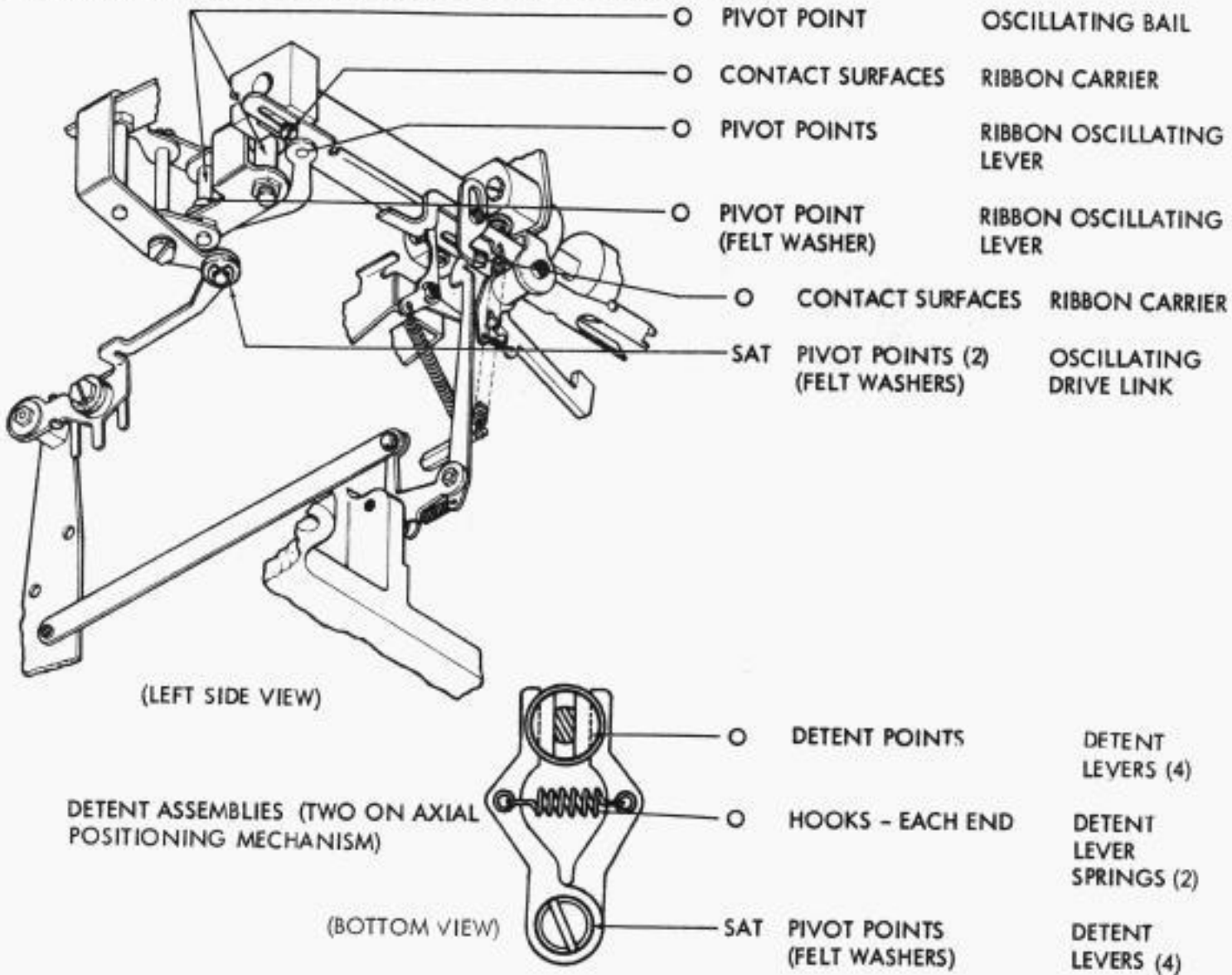
3.60 FUNCTION BOX (TYPING PERFORATOR ONLY)



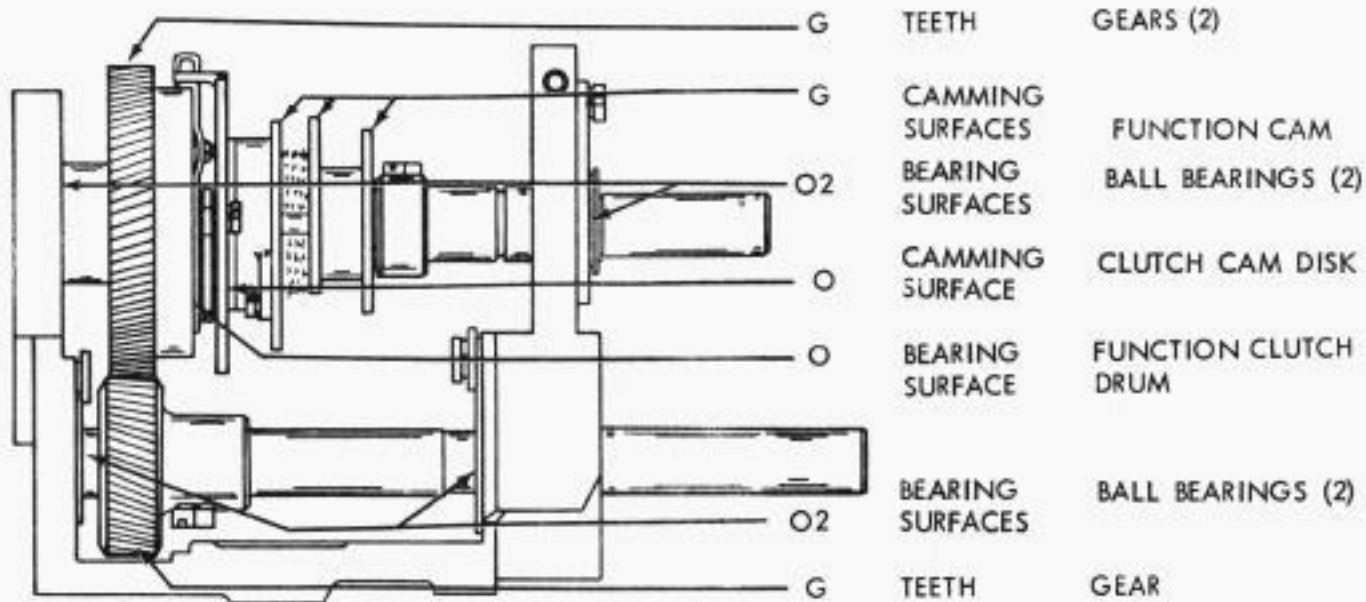
3.61 AXIAL POSITIONING MECHANISM (TYPING PERFORATOR ONLY)



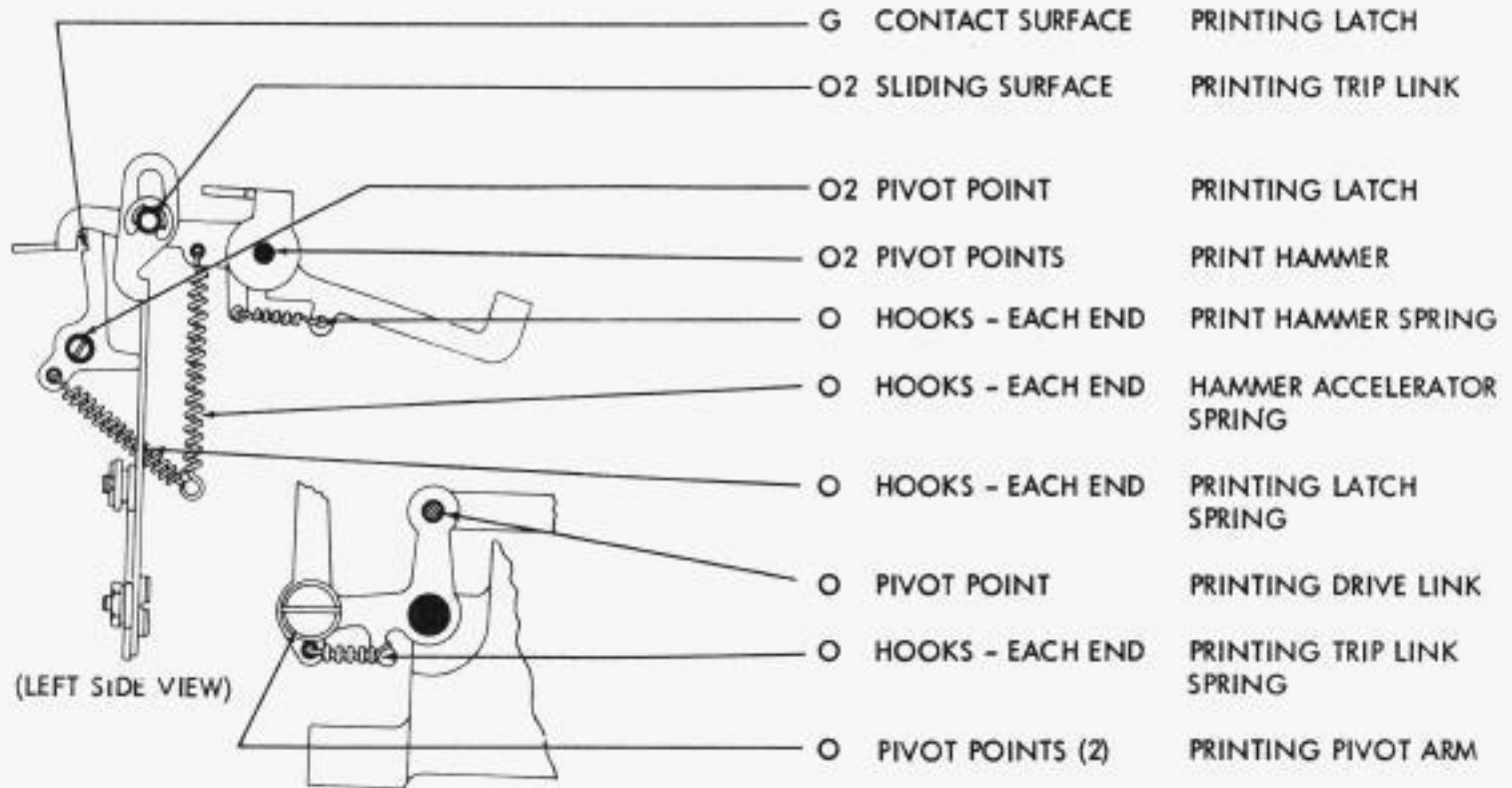
3.62 AXIAL POSITIONING MECHANISM (TYPING PERFORATOR ONLY)



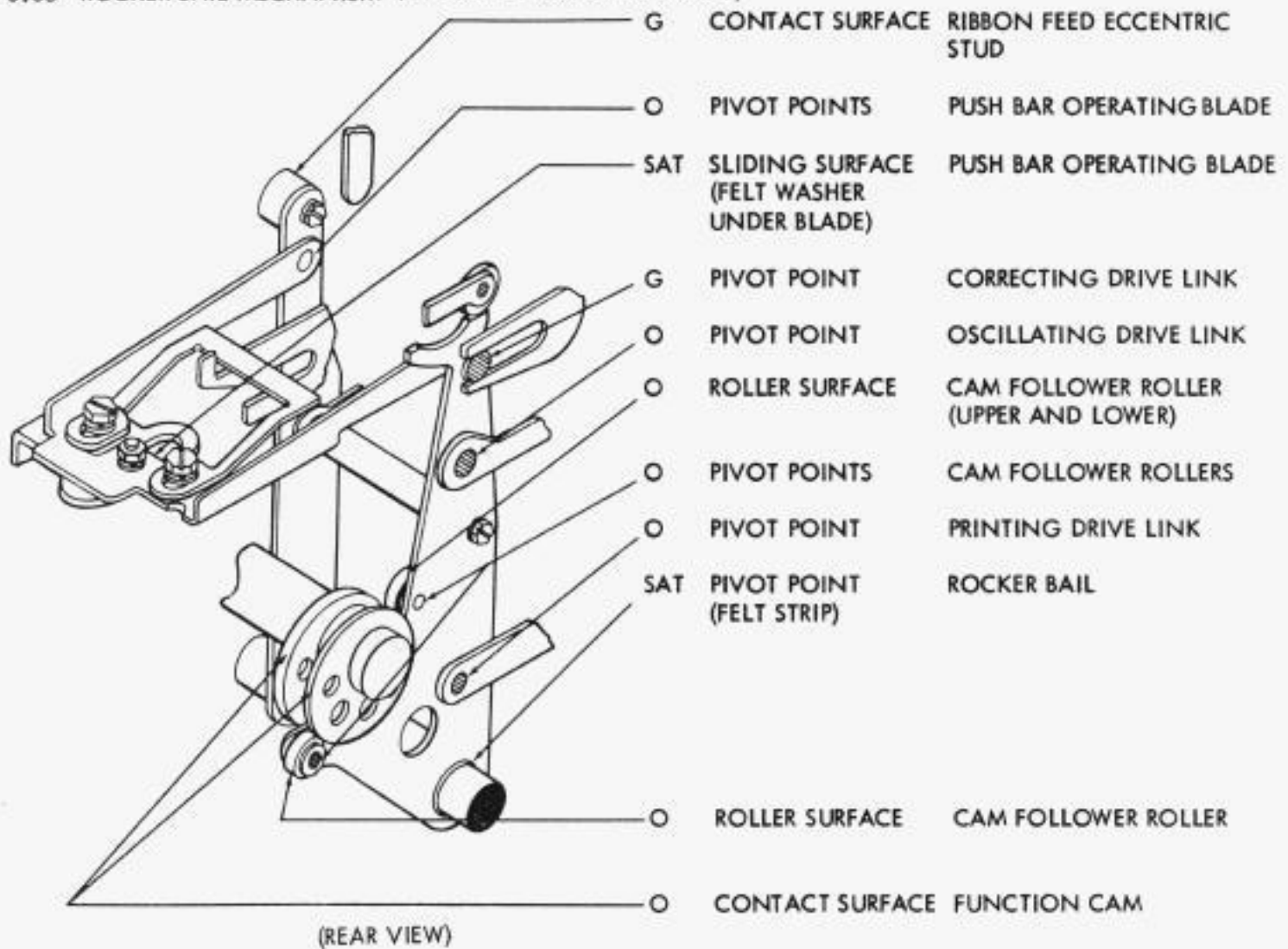
3.63 SHAFT MECHANISMS (TYPING PERFORATOR ONLY)



3.64 PRINTING MECHANISM (TYPING PERFORATOR ONLY)

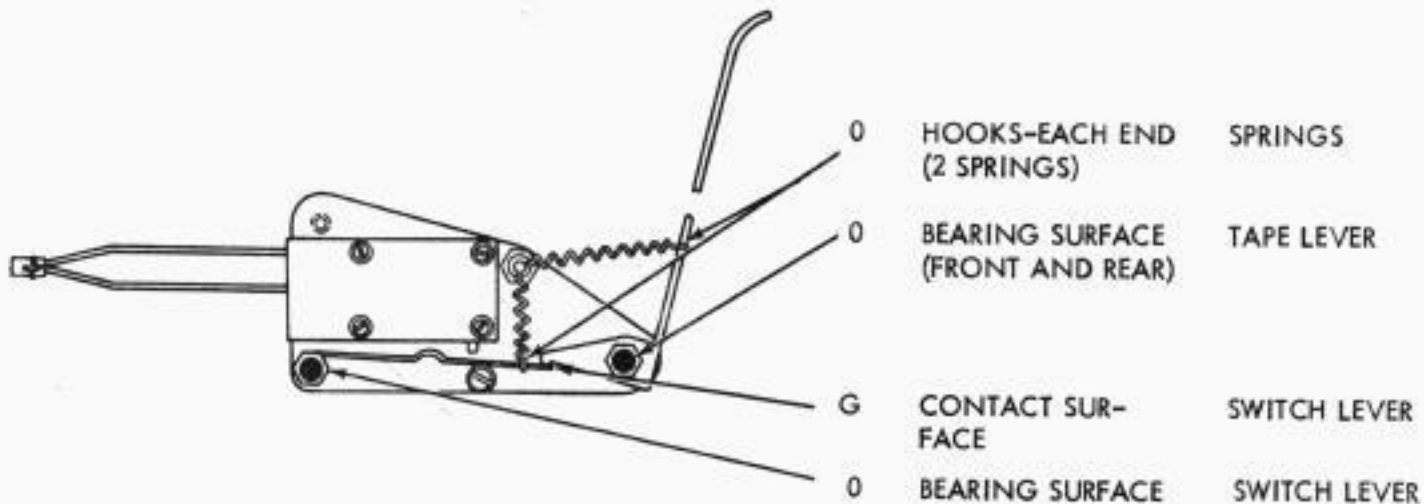


3.65 ROCKER BAIL MECHANISM (TYPING PERFORATOR ONLY)

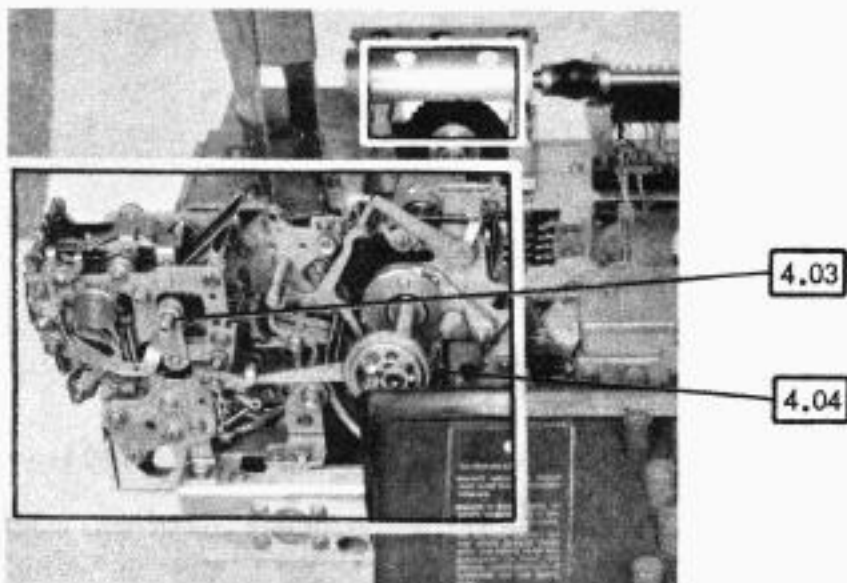


4. VARIABLE FEATURES

4.01 TAPE-OUT SWITCH MECHANISM (SEE PARAGRAPH 3.44 FOR LOCATION)

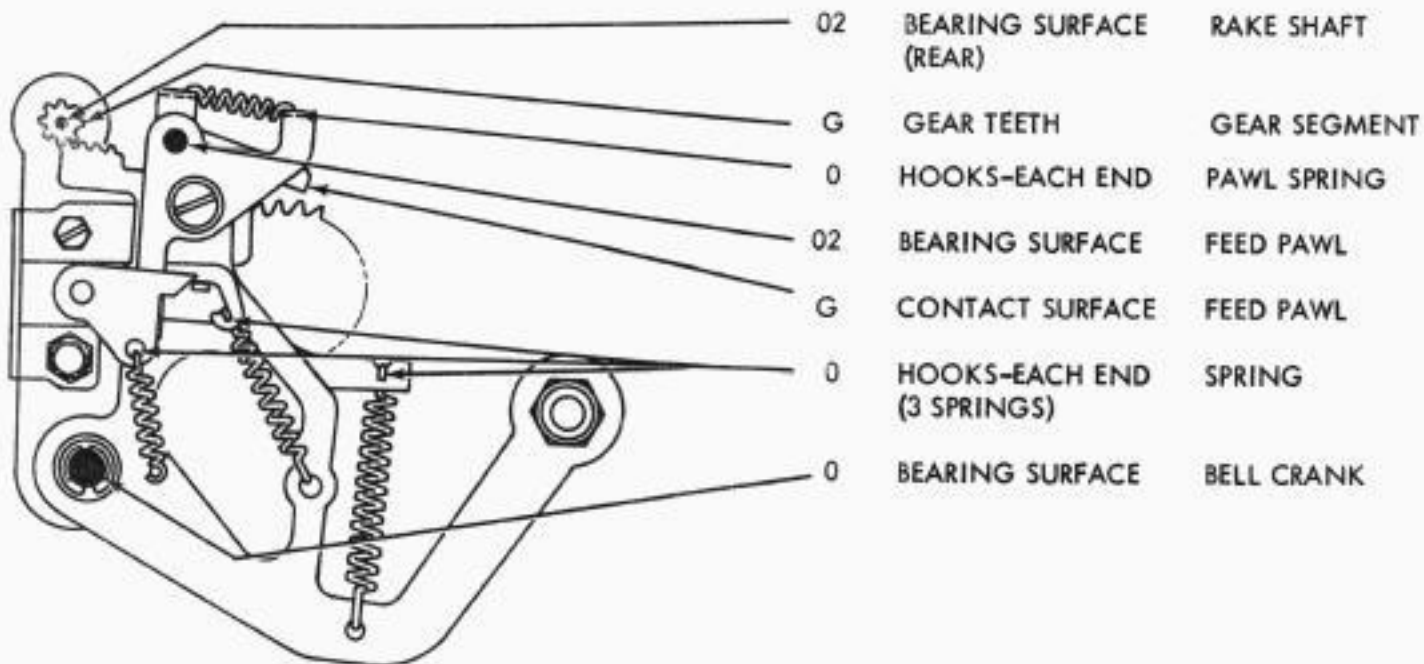


4.02 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

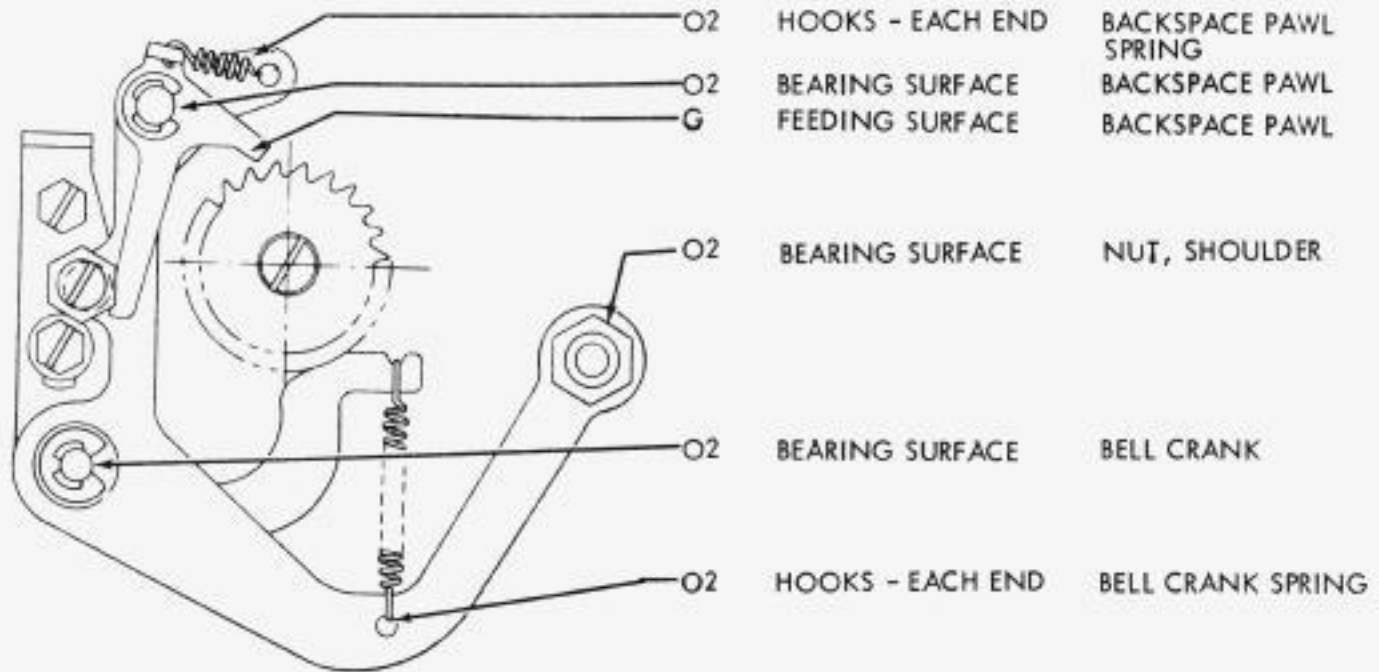


(FRONT VIEW)

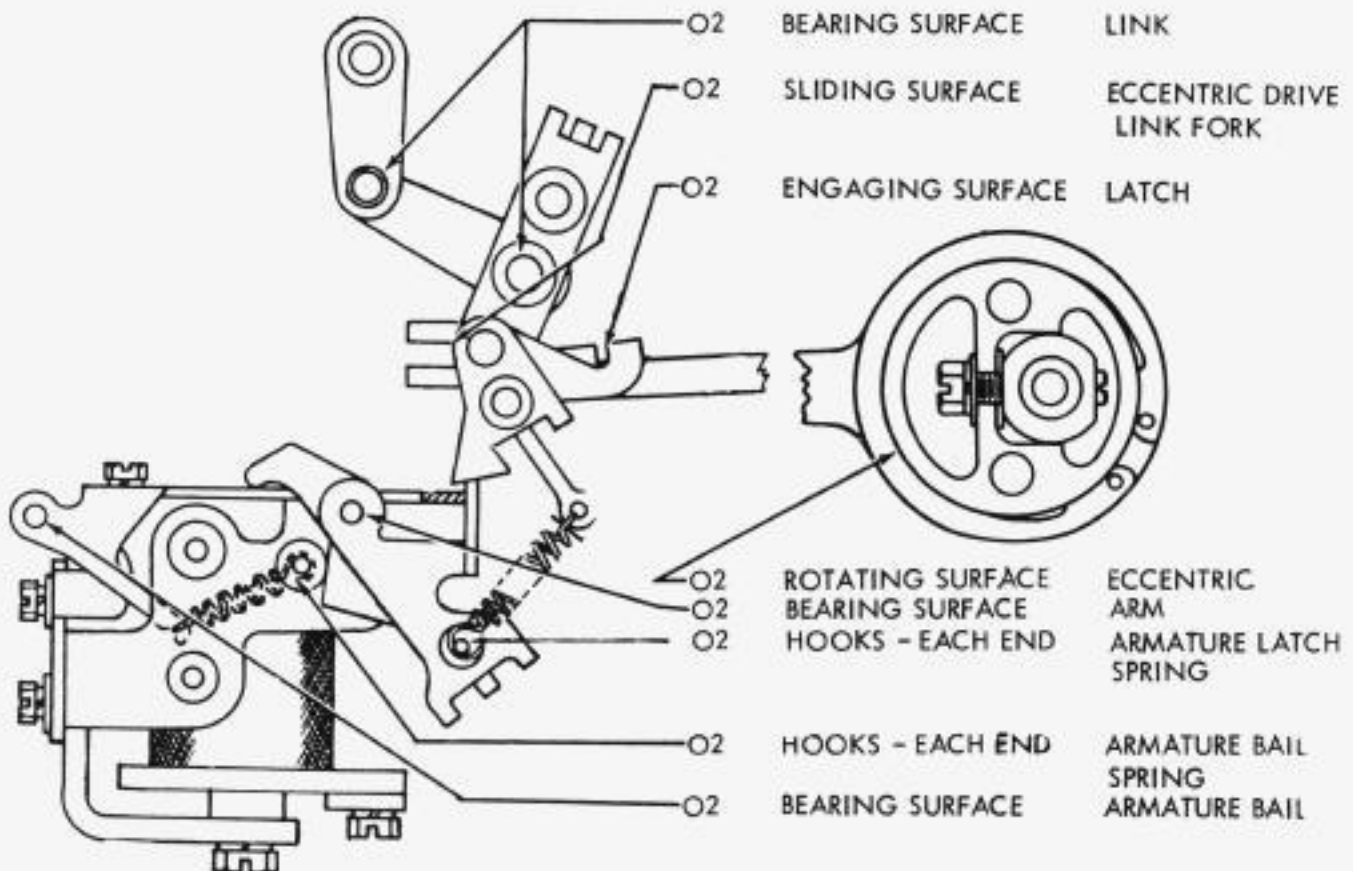
4.03 MANUAL BACKSPACE MECHANISM



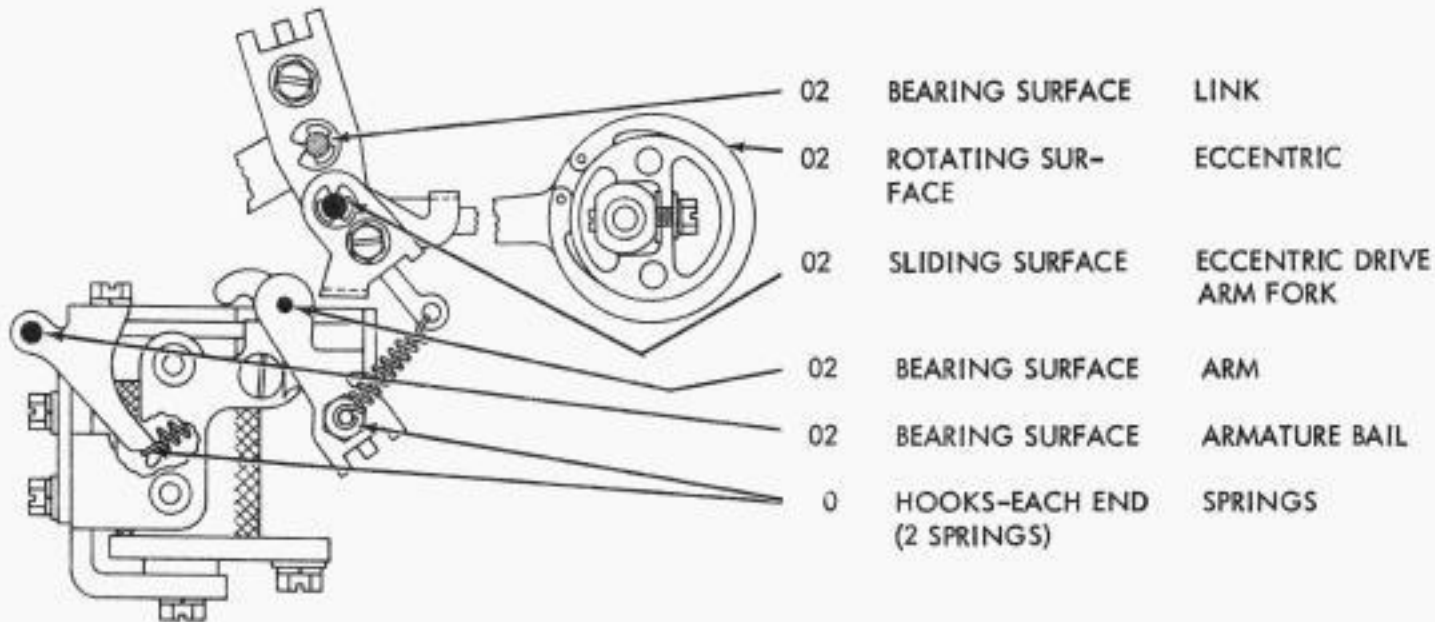
4.03 POWER DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE



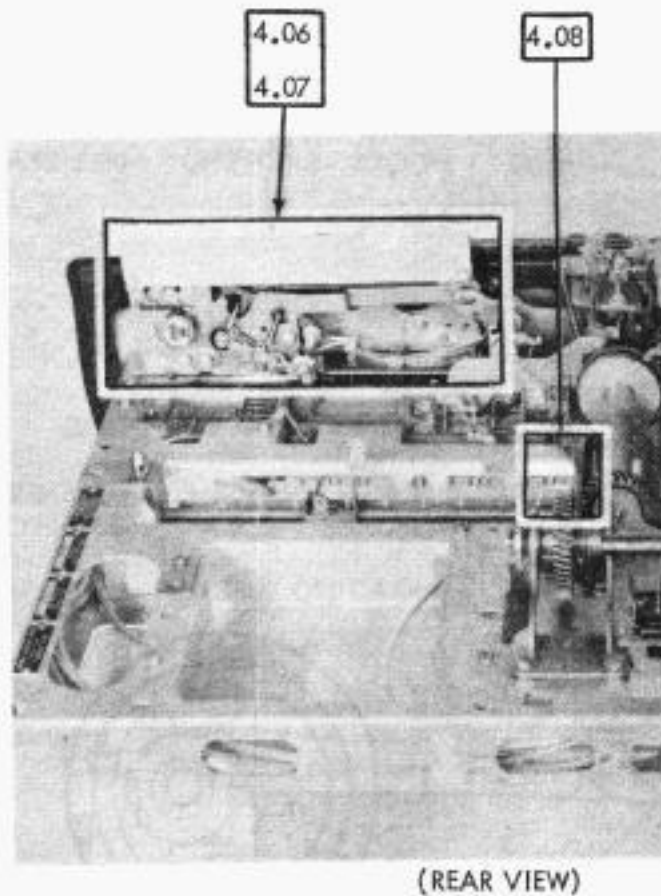
4.04 POWER DRIVE BACKSPACE MECHANISM FOR FULLY PERFORATED TAPE



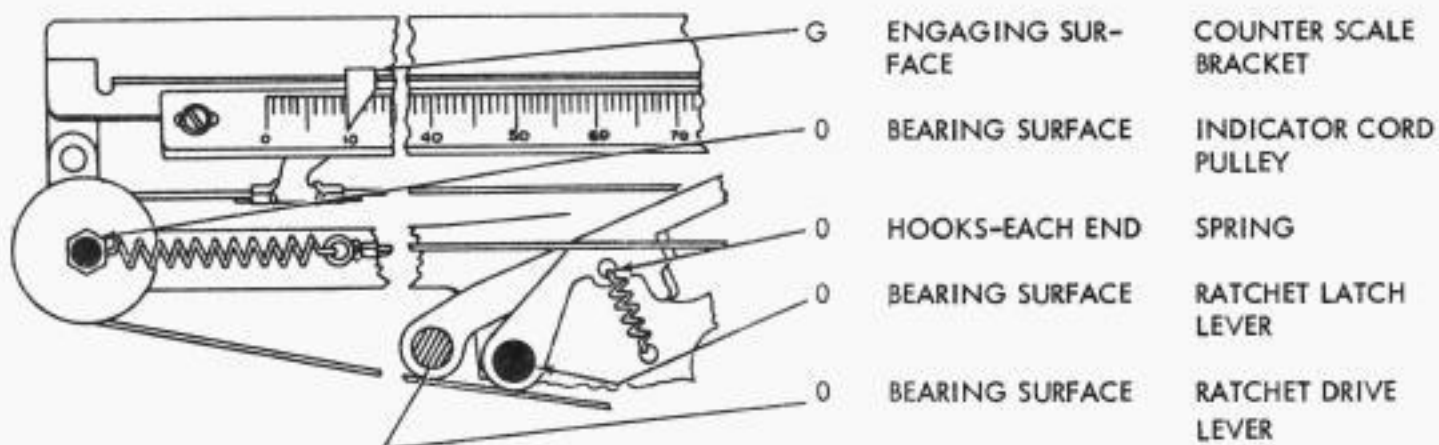
4.04 POWER DRIVE BACKSPACE MECHANISM



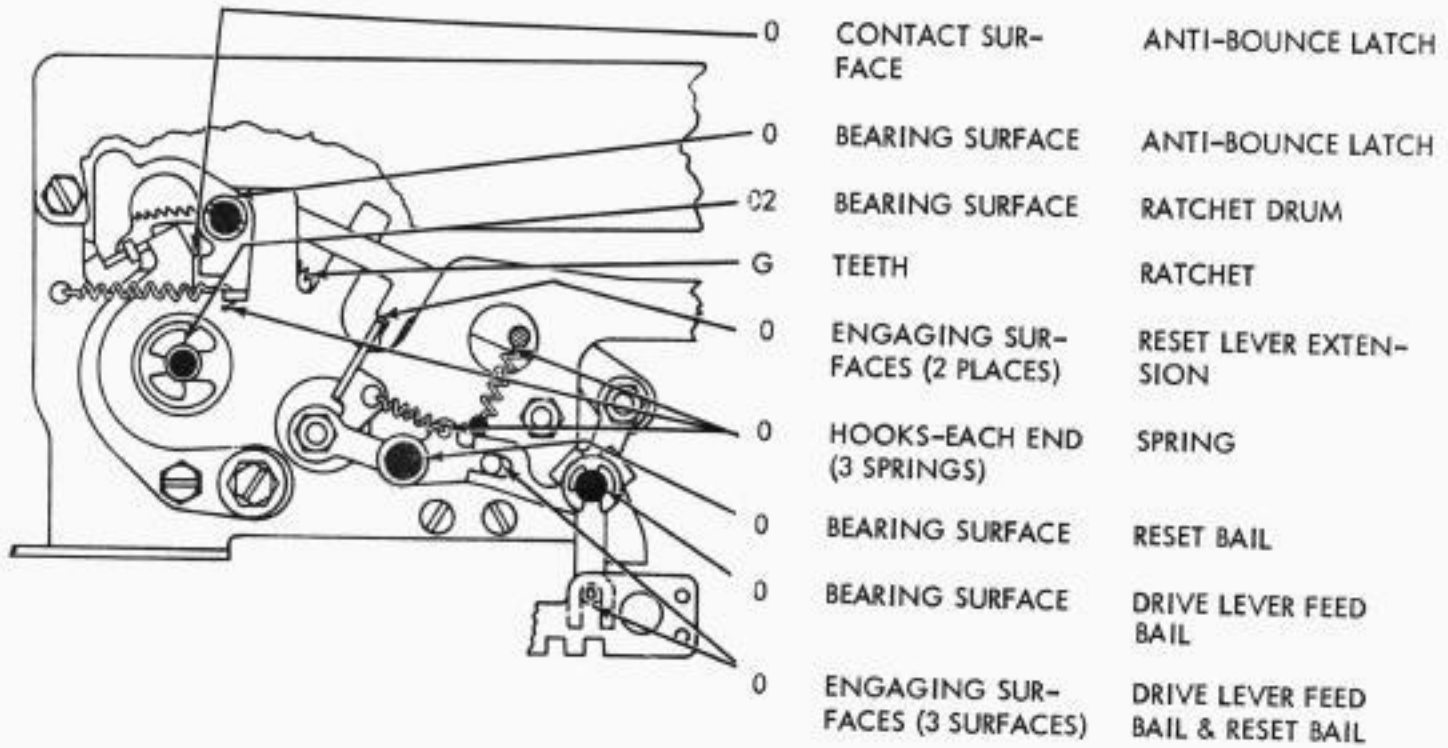
4.05 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION



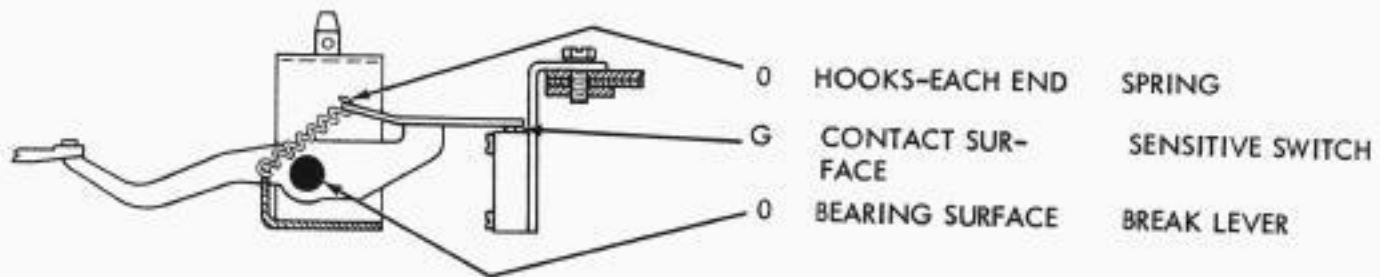
4.06 CHARACTER COUNTER MECHANISM



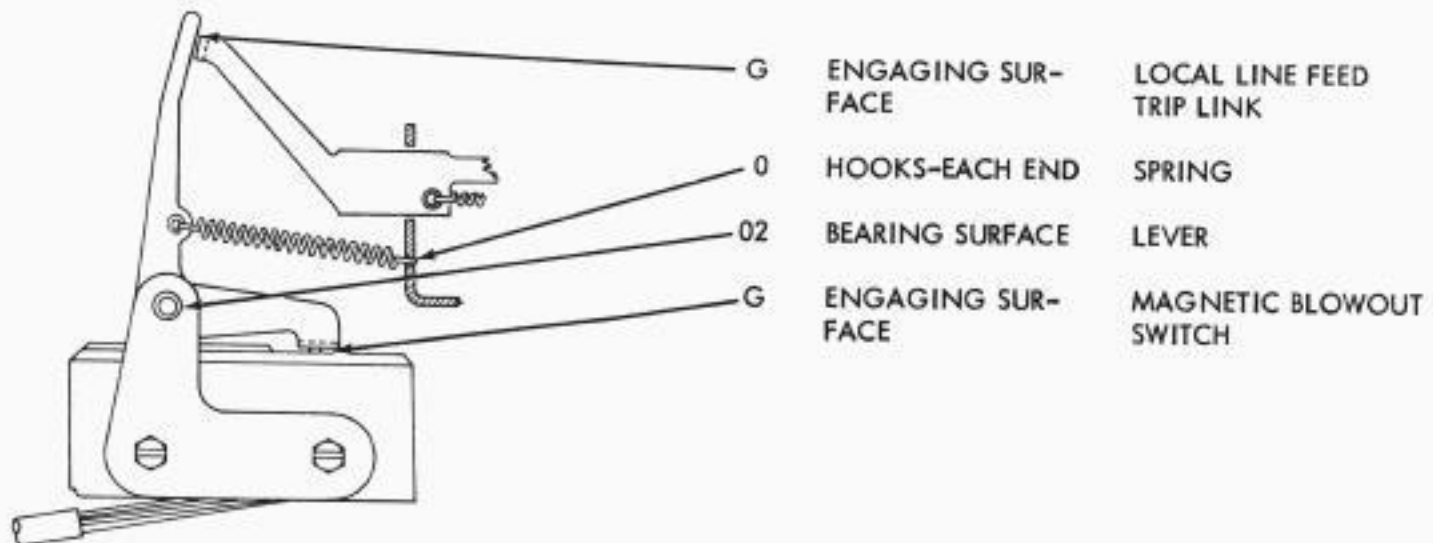
4.07 CHARACTER COUNTER MECHANISM (continued)



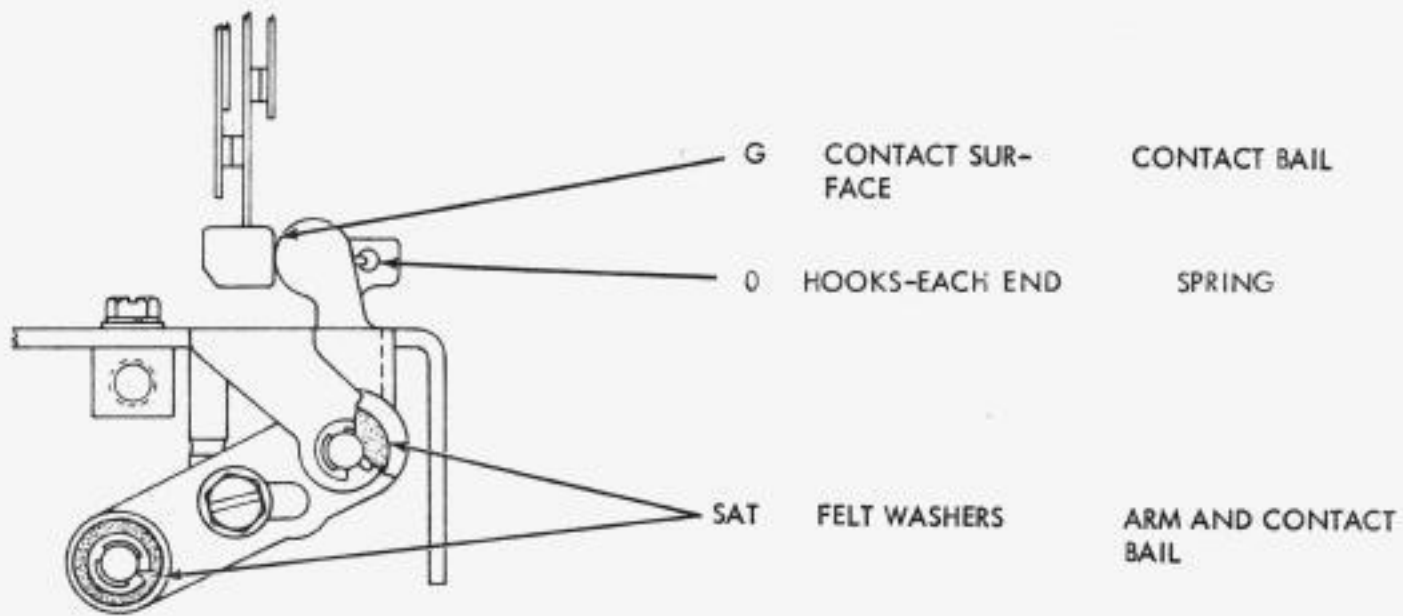
4.08 ELECTRICAL LINE BREAK MECHANISM



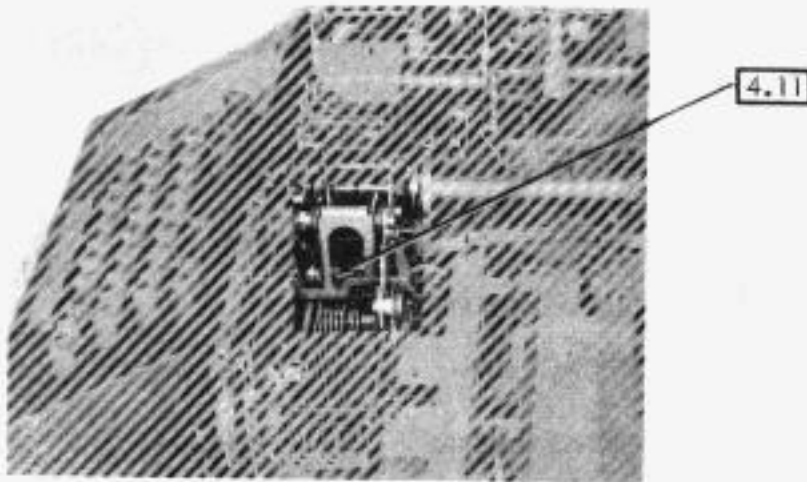
4.09 LOCAL PAPER FEED-OUT MECHANISM



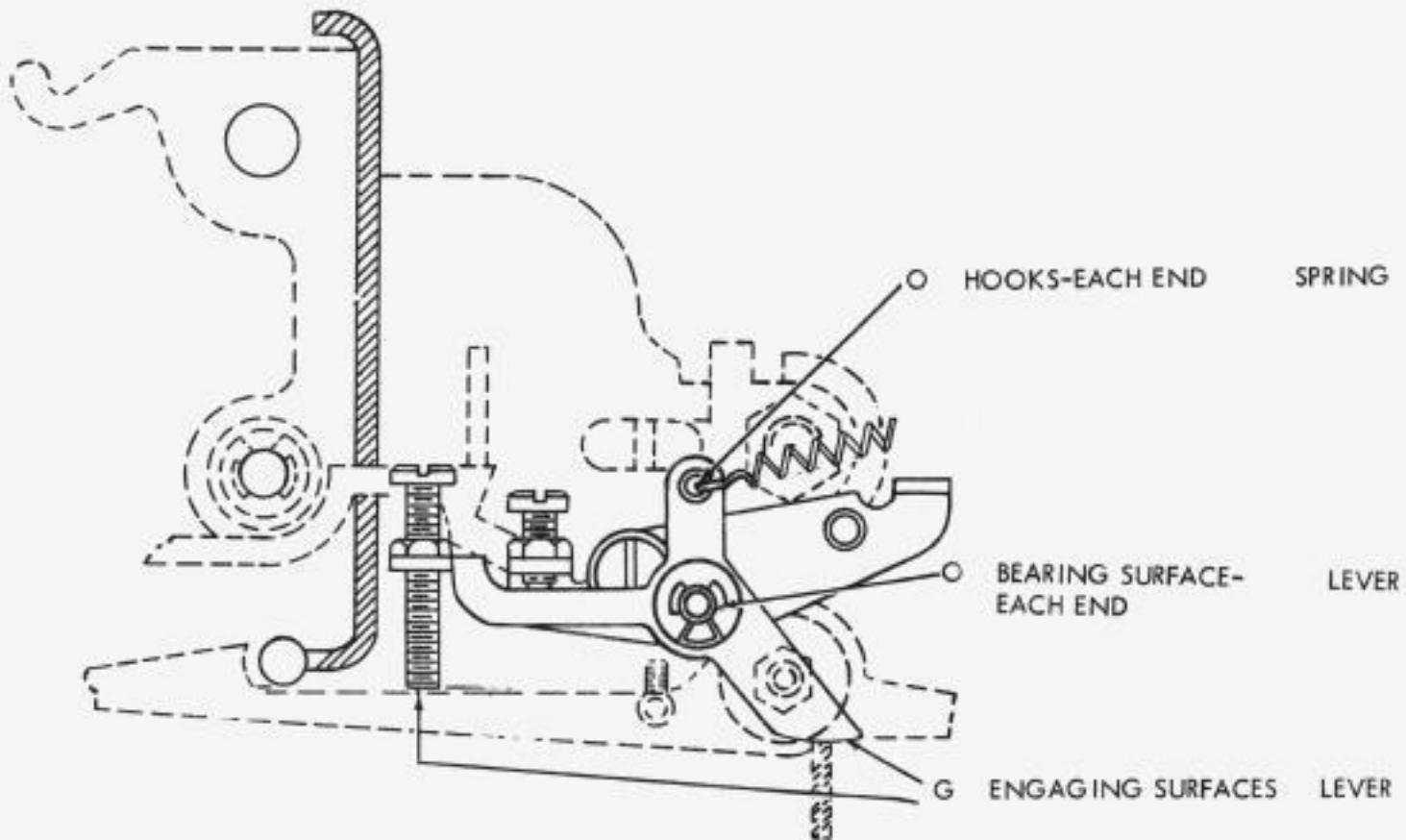
4.10 SINGLE AUXILIARY TIMING CONTACTS MECHANISM



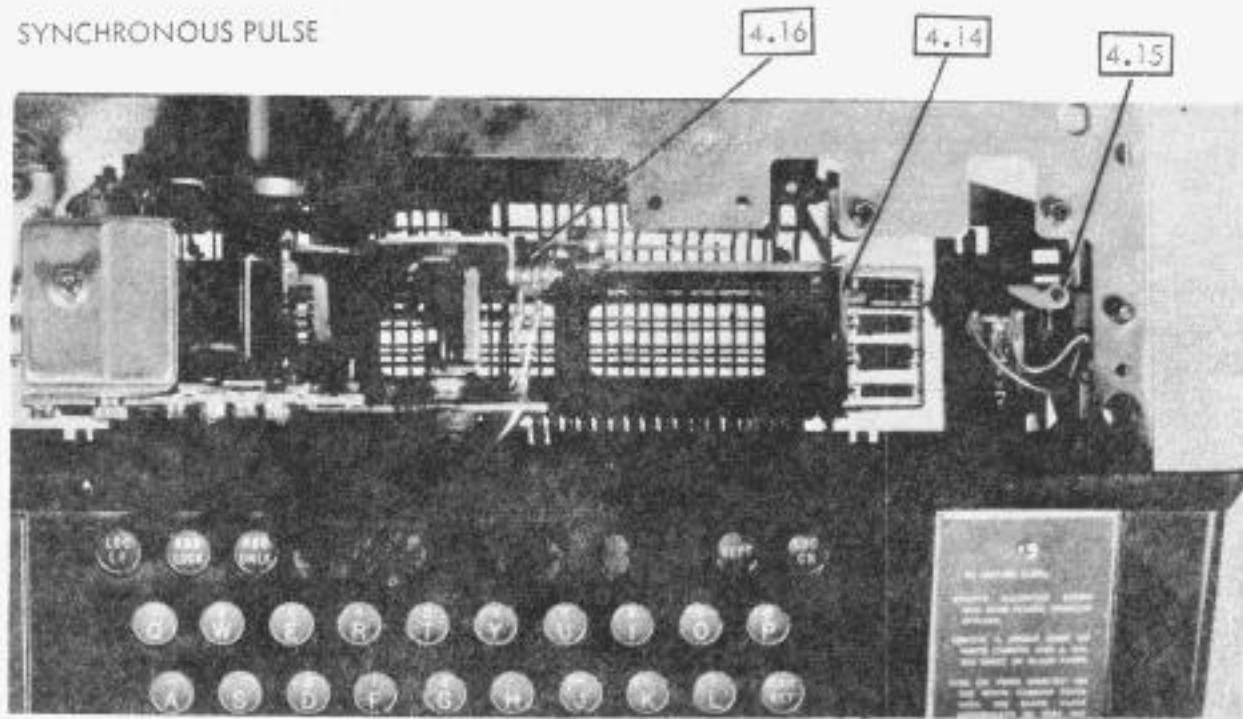
4-11 REPEAT-ON-SPACE MECHANISM - REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION.



4-12 REPEAT-ON-SPACE



4.13 SYNCHRONOUS PULSE



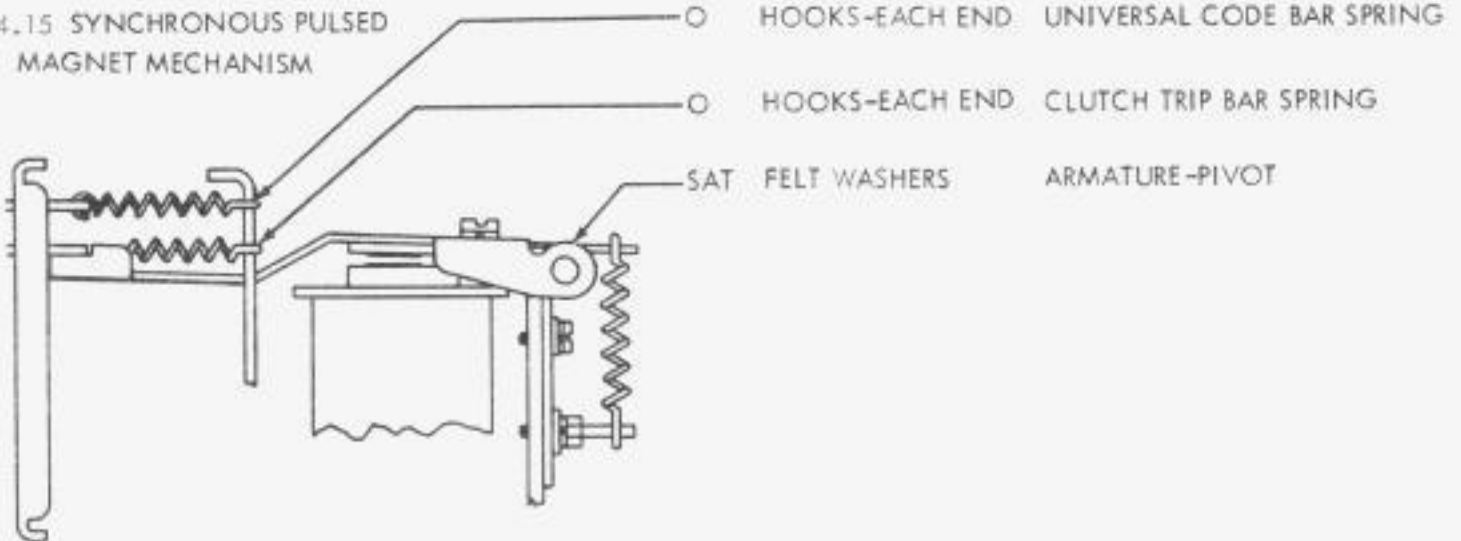
FRONT

4.14 CODE BAR GUIDE



○ GUIDE SLOTS (LEFT, RIGHT, TOP AND BOTTOM)

4.15 SYNCHRONOUS PULSED
MAGNET MECHANISM

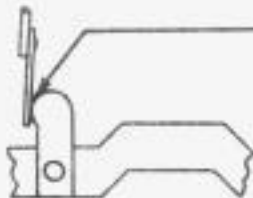


○ HOOKS-EACH END UNIVERSAL CODE BAR SPRING

○ HOOKS-EACH END CLUTCH TRIP BAR SPRING

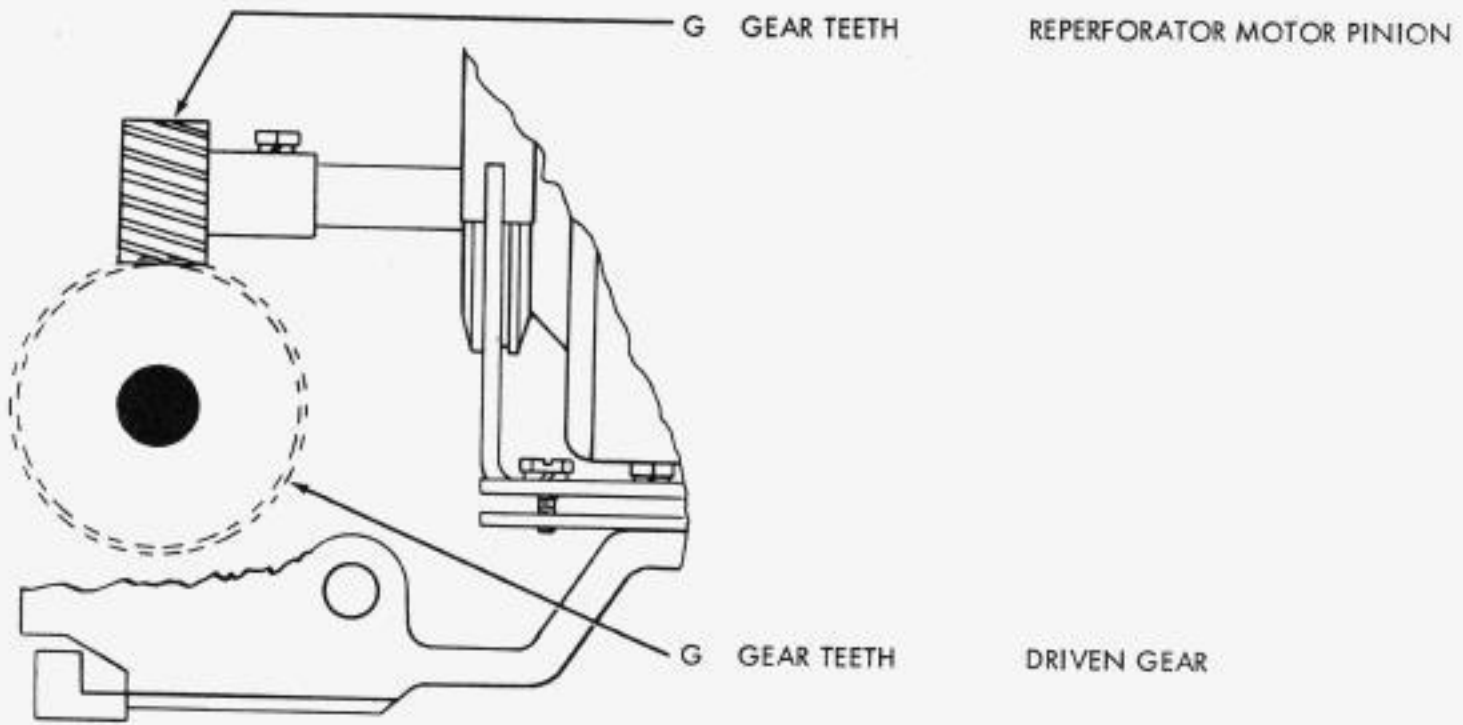
SAT FELT WASHERS ARMATURE-PIVOT

4.16 CONTACT SWINGER

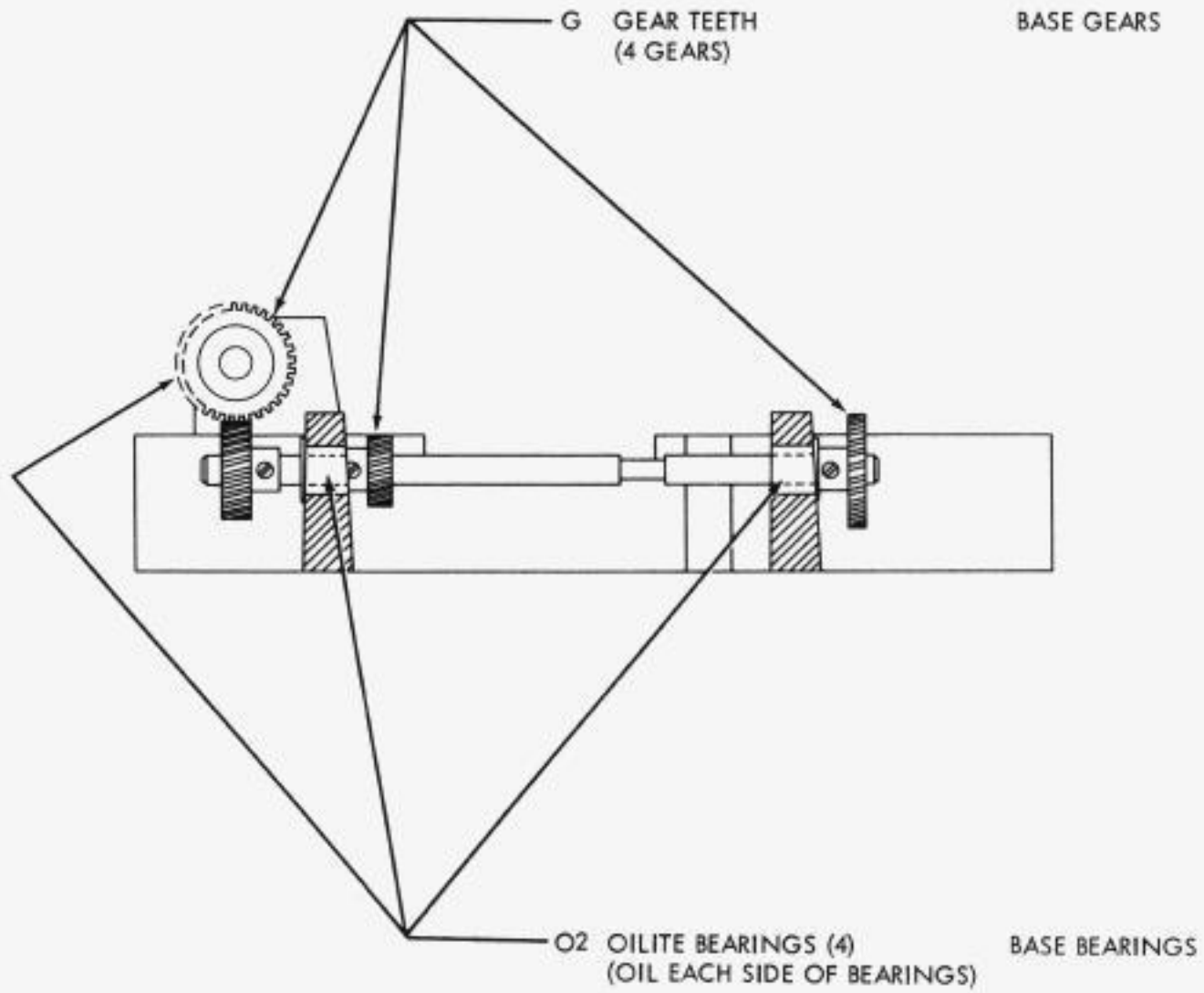


G ENGAGING SURFACE

4.17 PERFORATOR MOTOR.



4.18 TRANSMITTER DISTRIBUTOR BASE.



4.19 REMOTE CONTROL GEAR SHIFT

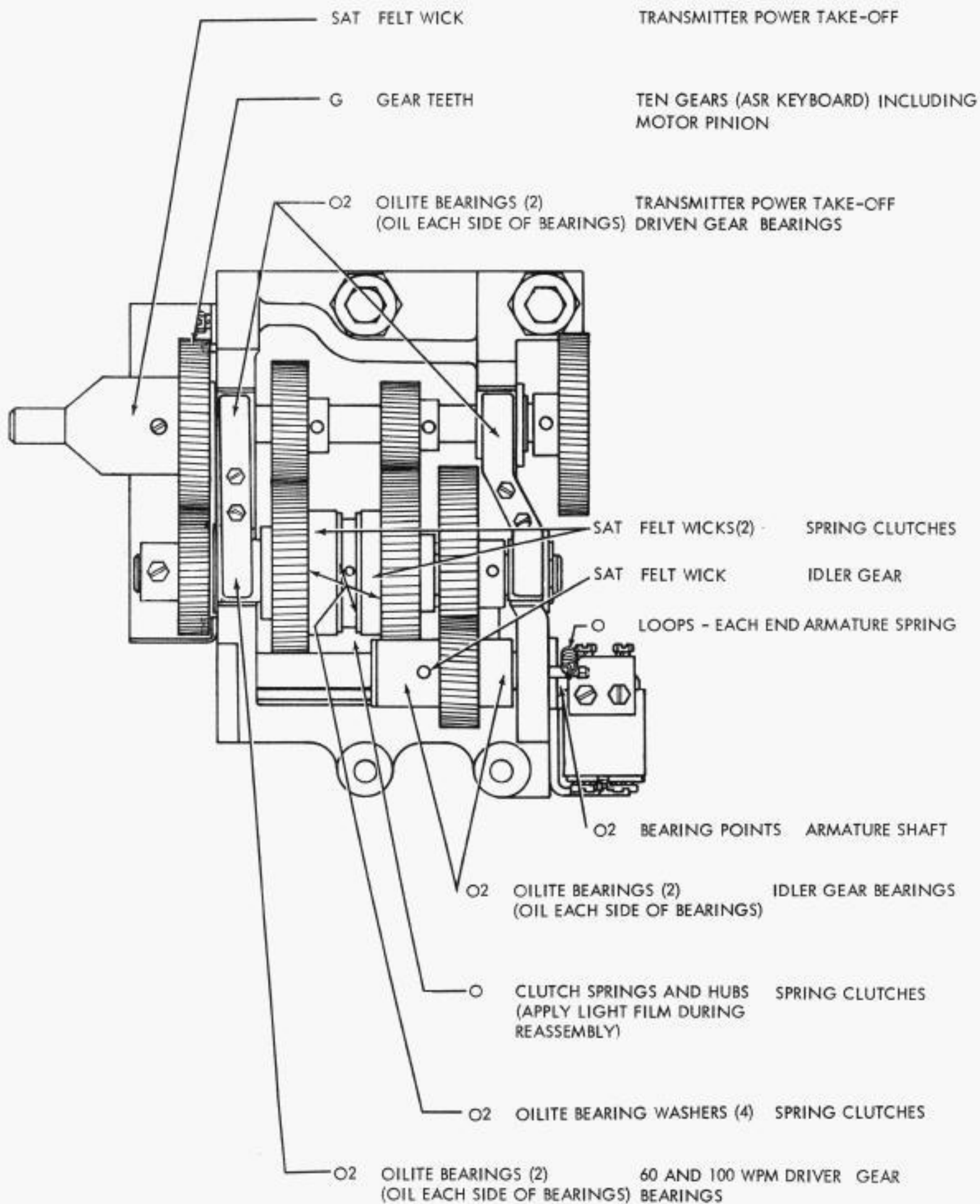
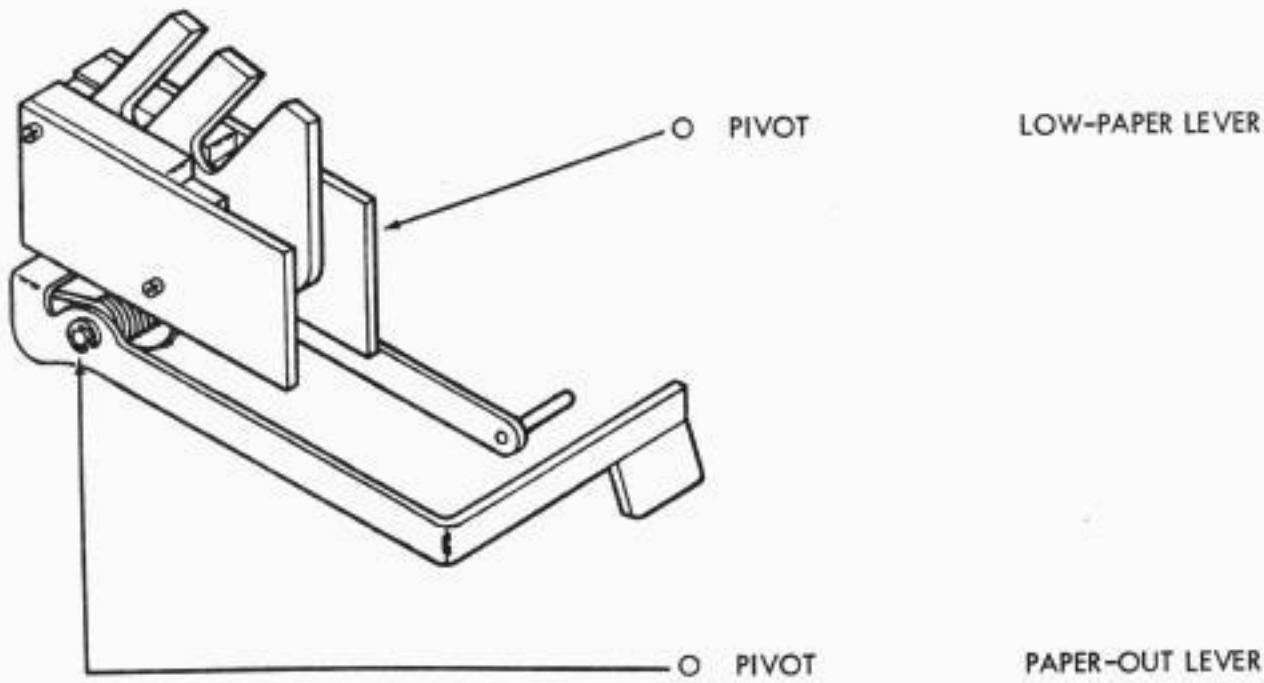
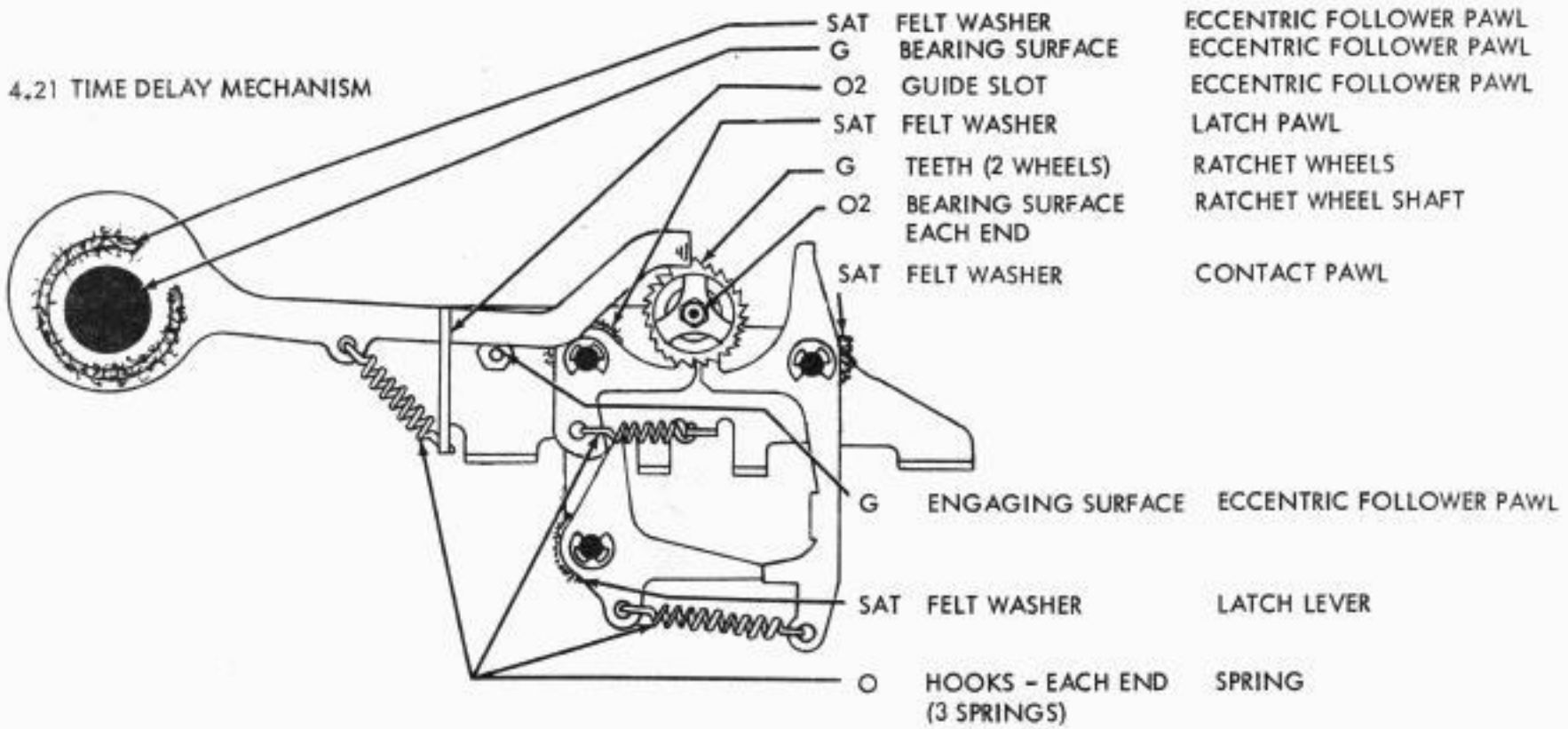


FIGURE 4. REMOTE CONTROL GEARSHIFT - LUBRICATION (LK26 AND LAK27)

4.20 LOW PAPER AND PAPER-OUT SWITCH MECHANISM

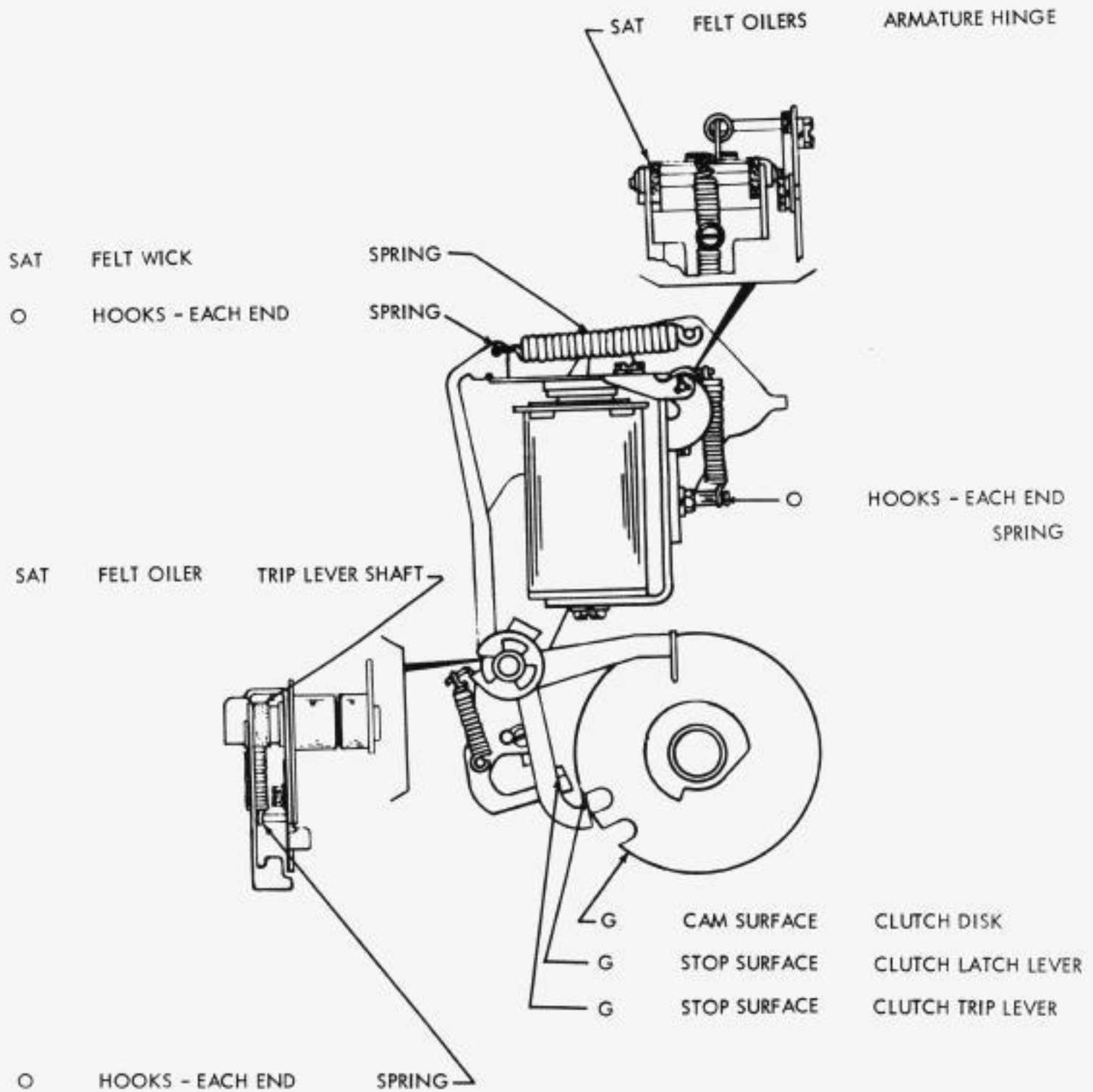


4.21 TIME DELAY MECHANISM

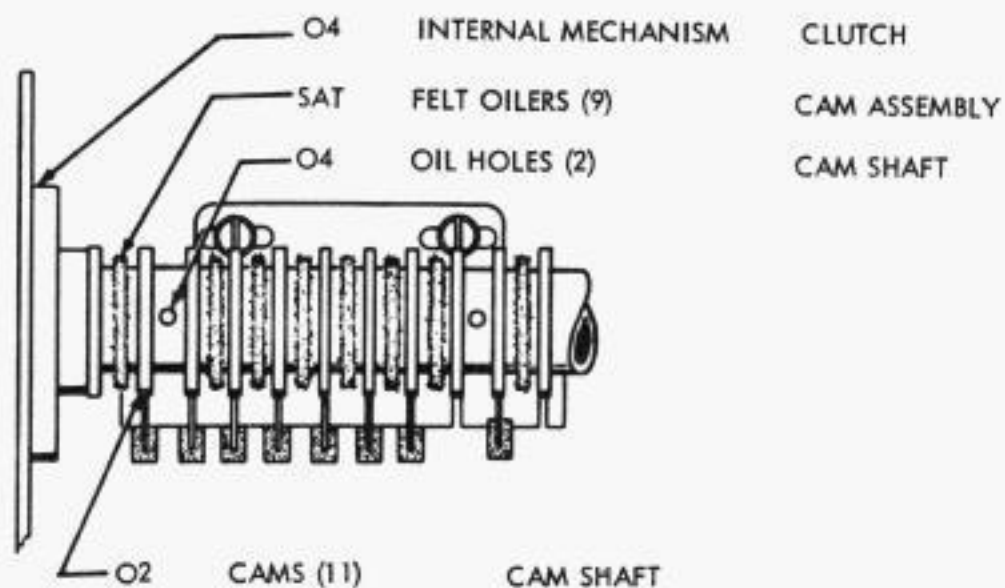
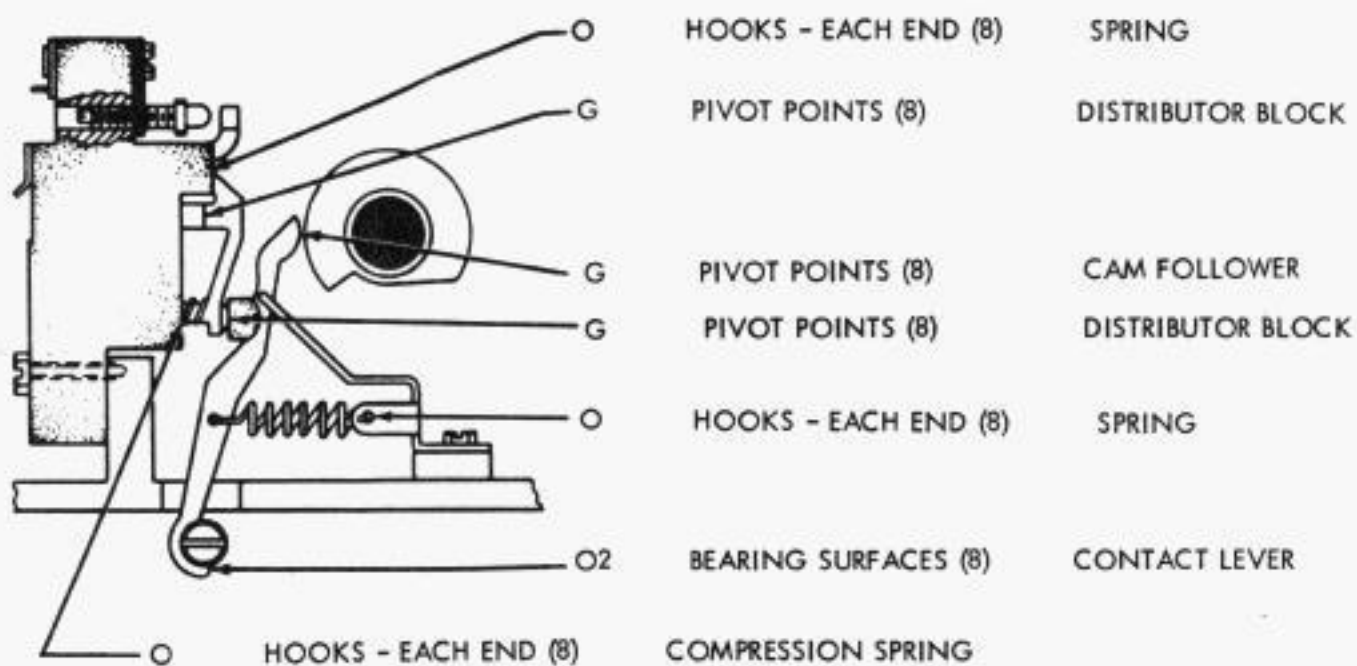


ANSWER-BACK MECHANISM

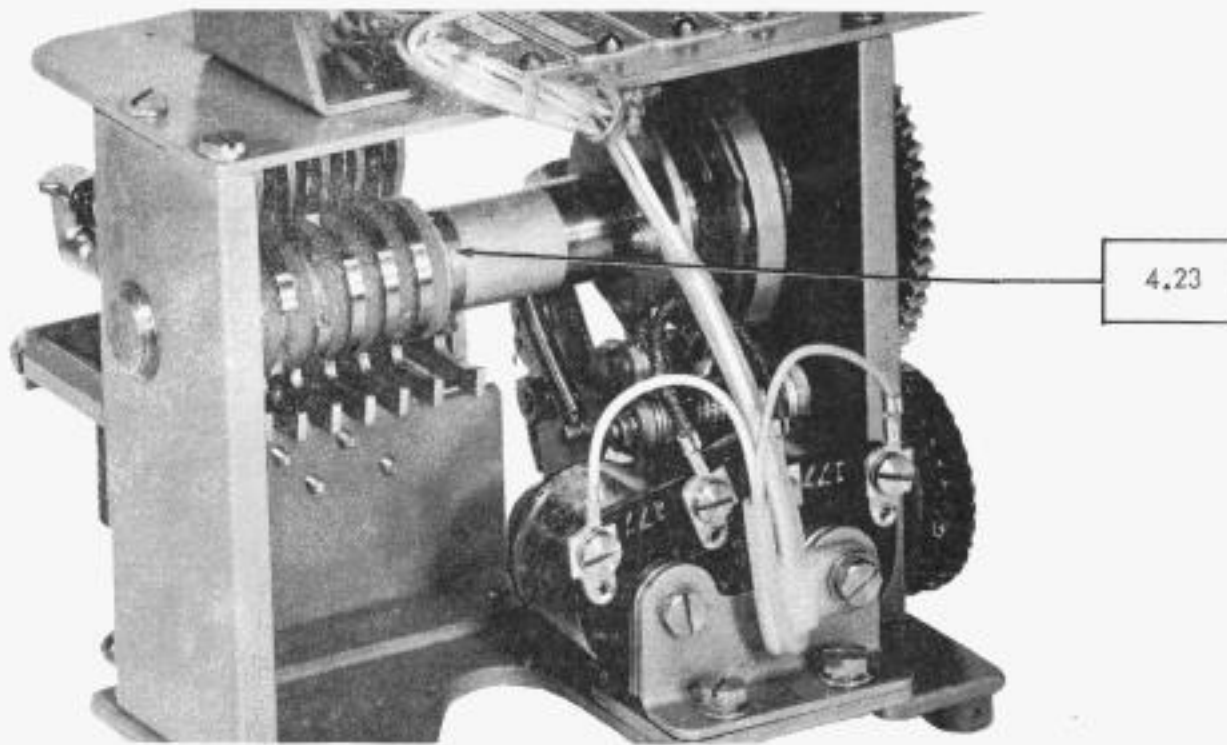
4-22. CLUTCH TRIP - MAGNET MECHANISM (SEE 4.26 FOR LOCATION)



4-23 CONTACT LEVER AND CAM SLEEVE ASSEMBLIES (SEE 4.24 FOR LOCATION)

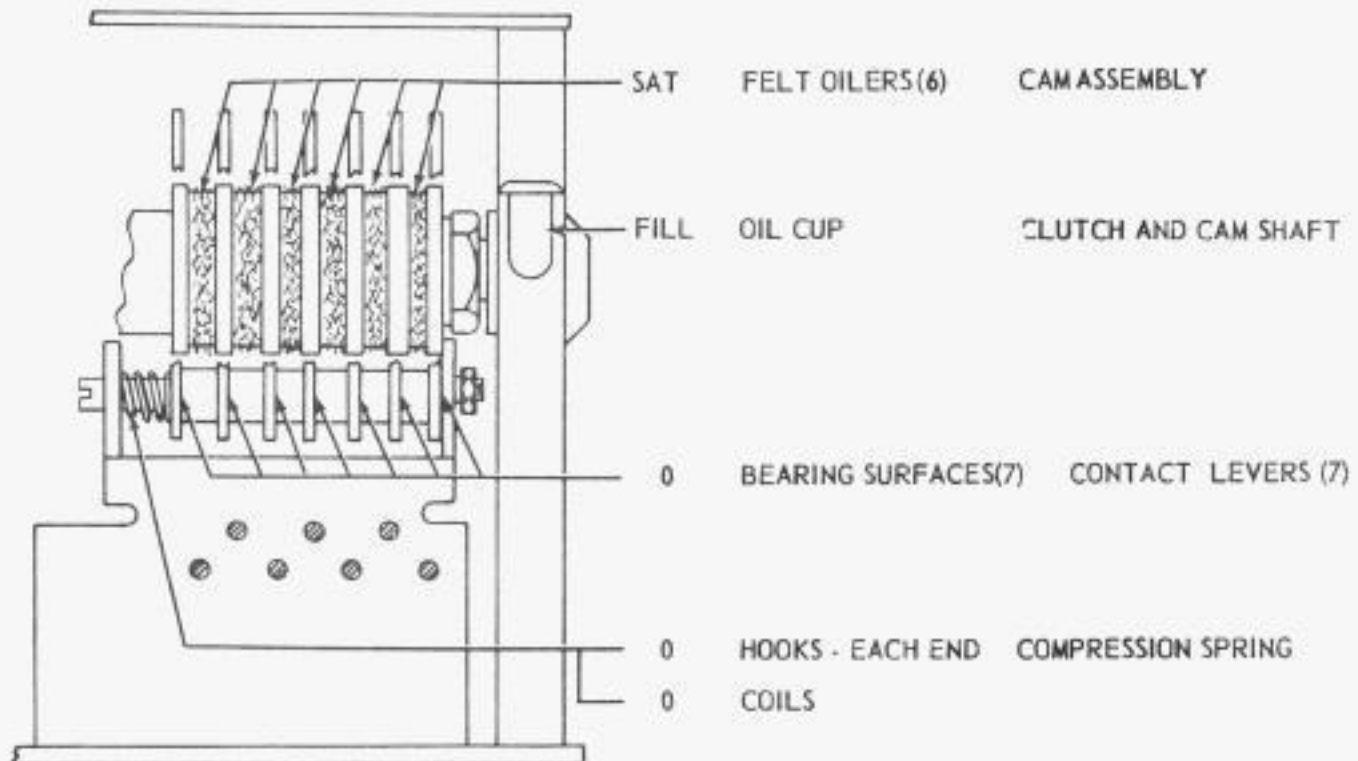


4.24 REST ANSWER-BACK MECHANISM IN UPRIGHT POSITION.



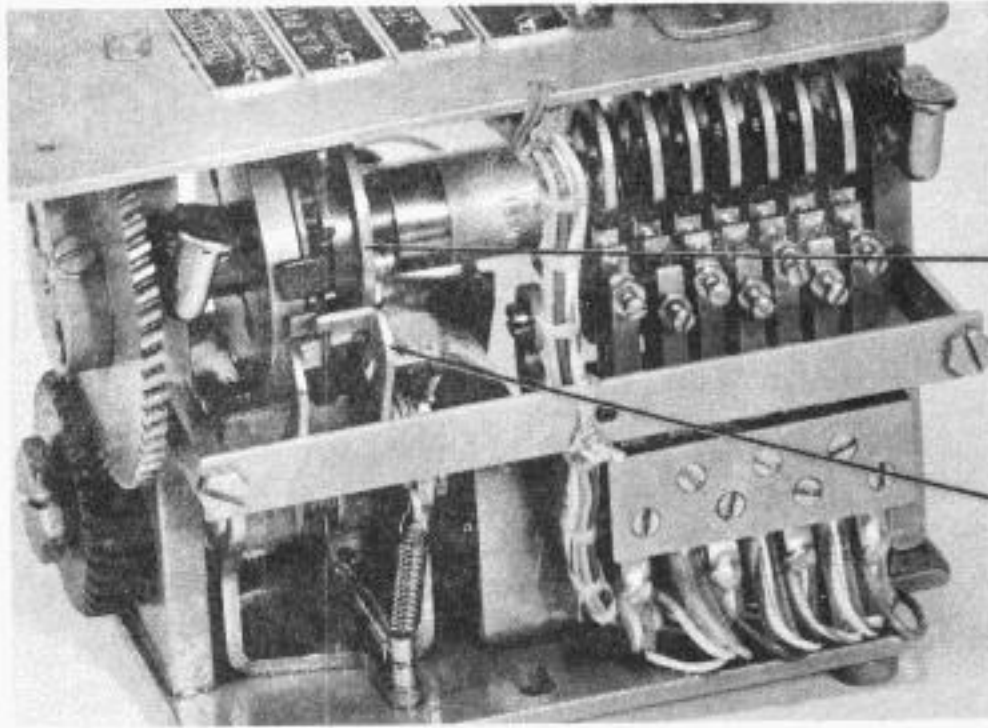
(FRONT VIEW)

4.25 CONTACT LEVER AND CAM SLEEVE ASSEMBLIES



(REAR VIEW)

4.26 REST ANSWER-BACK MECHANISM IN UPRIGHT POSITION

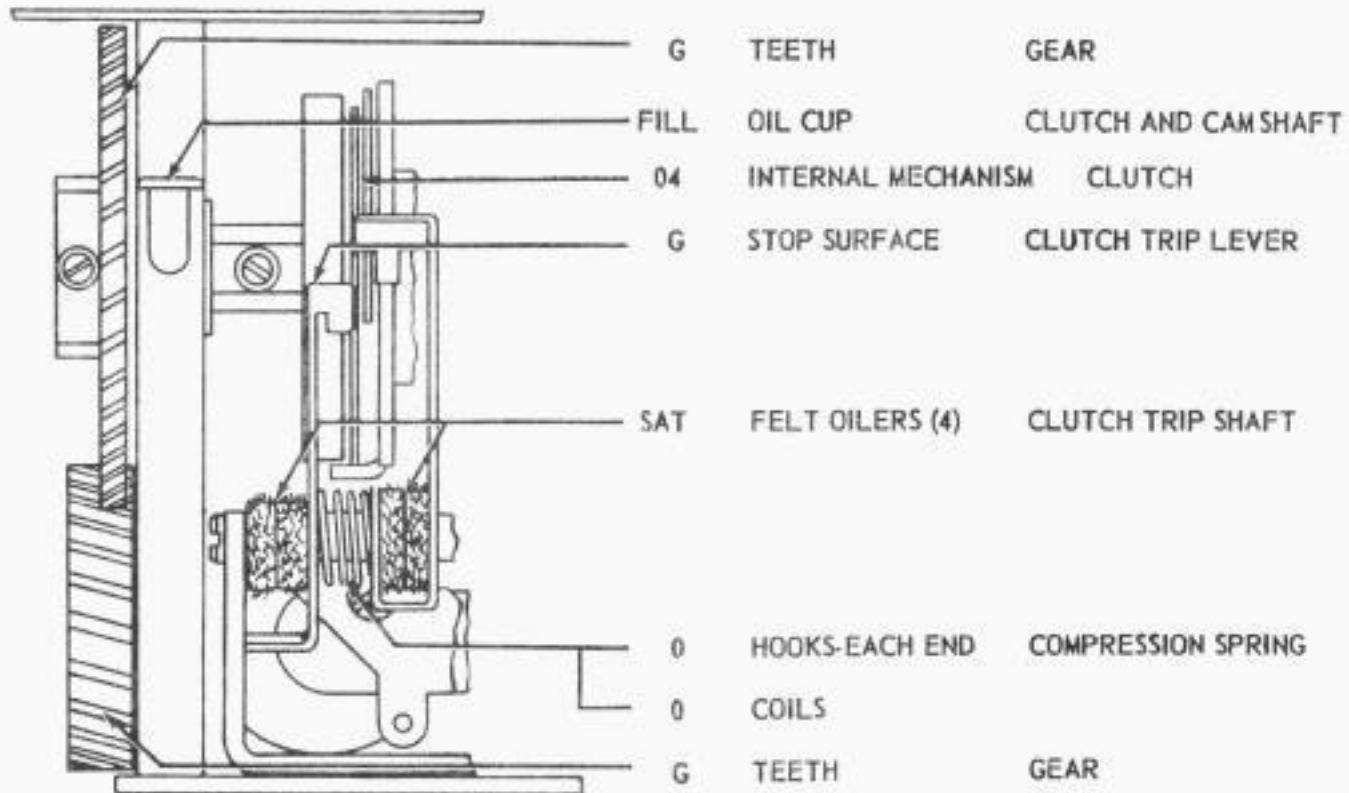


4.22

4-23

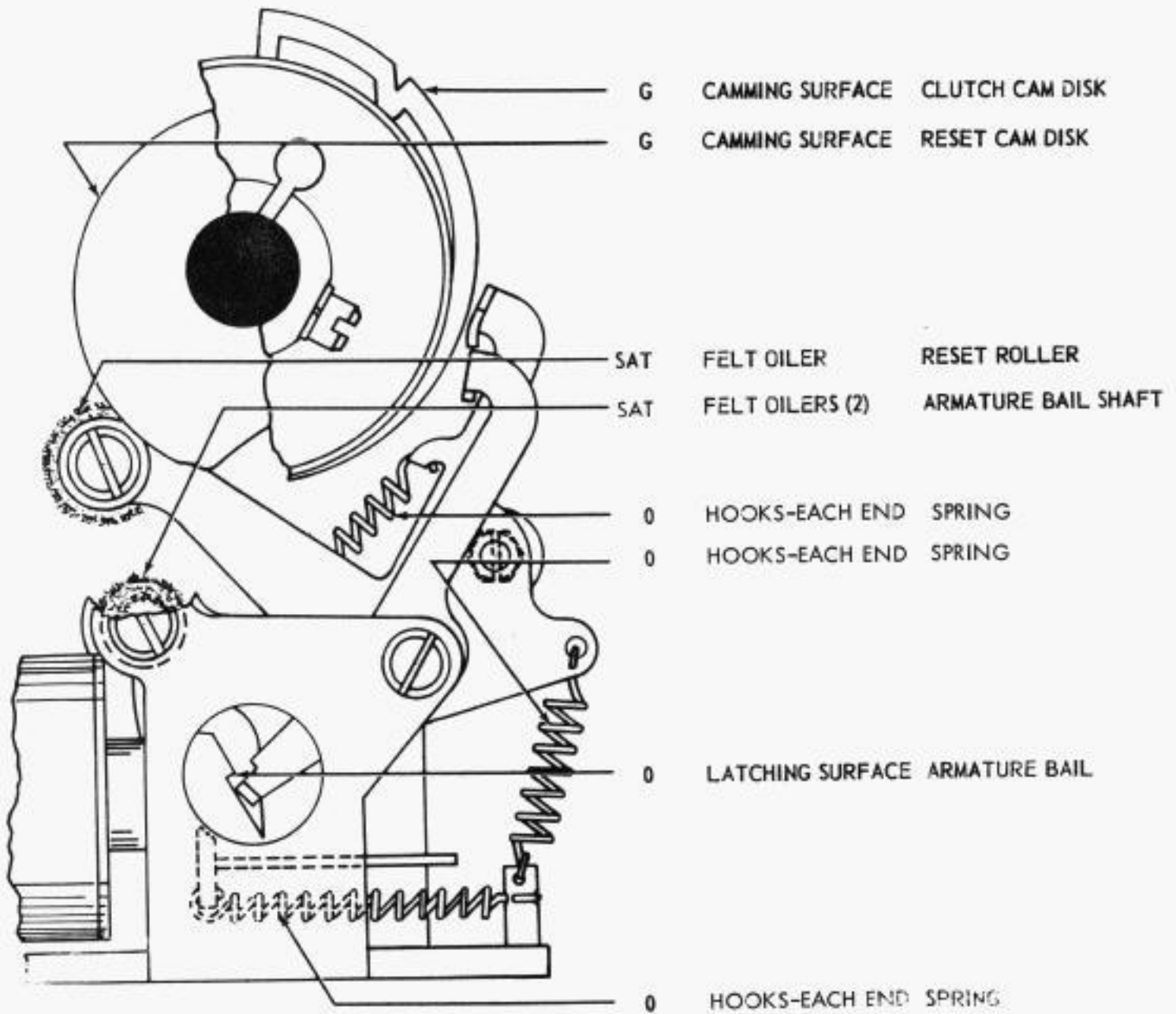
(REAR VIEW)

4.27 CLUTCH AND GEAR ASSEMBLIES



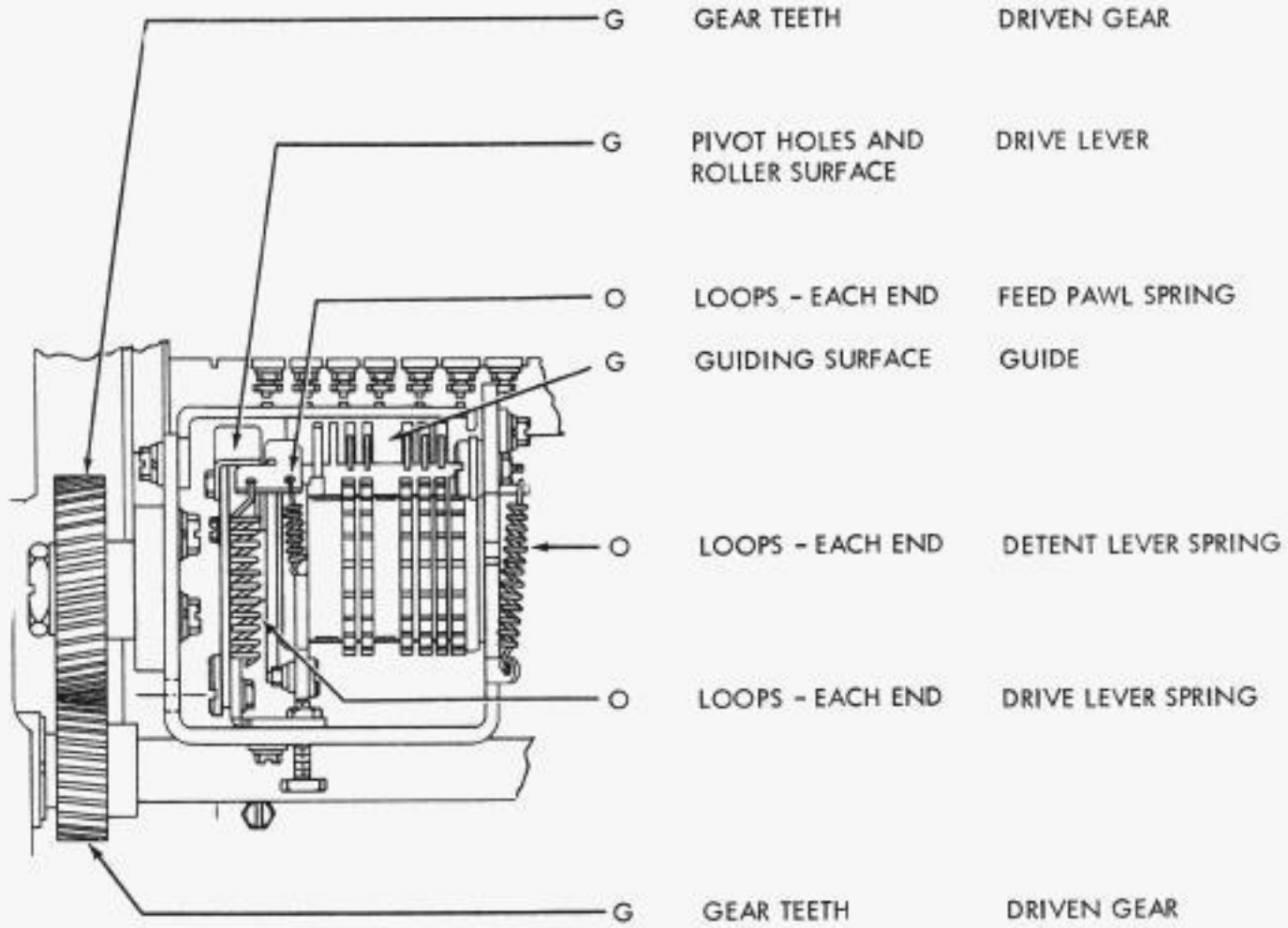
(REAR VIEW)

4.28 CLUTCH TRIP-MAGNET MECHANISM (SEE 4.26 FOR LOCATION)

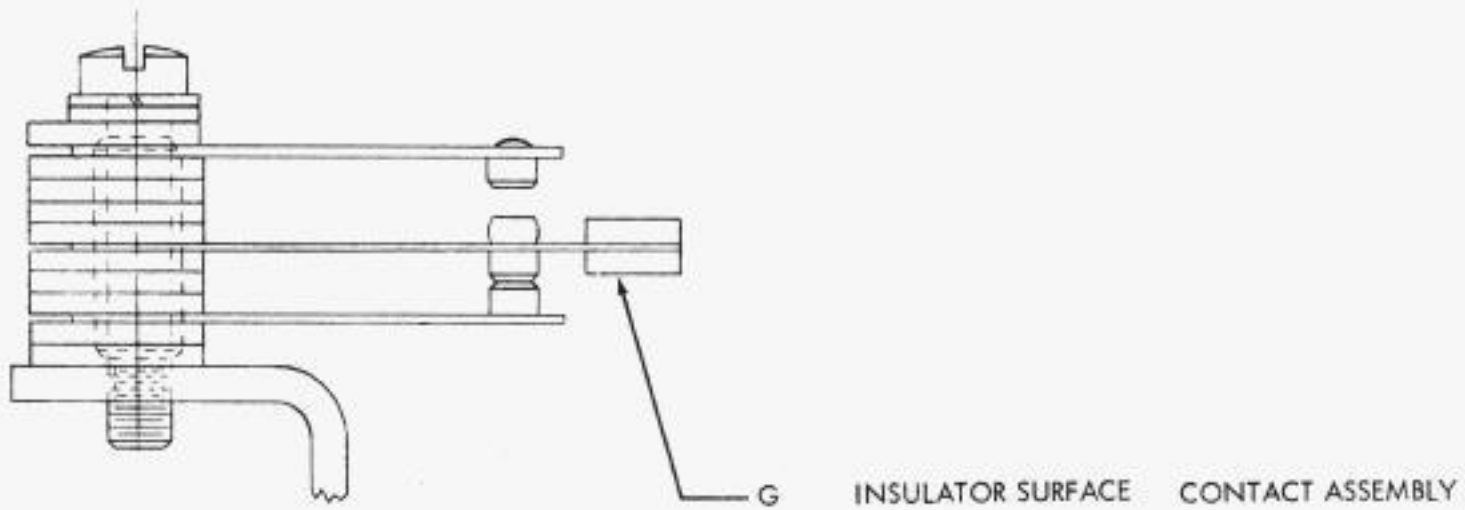


(RIGHT SIDE VIEW)

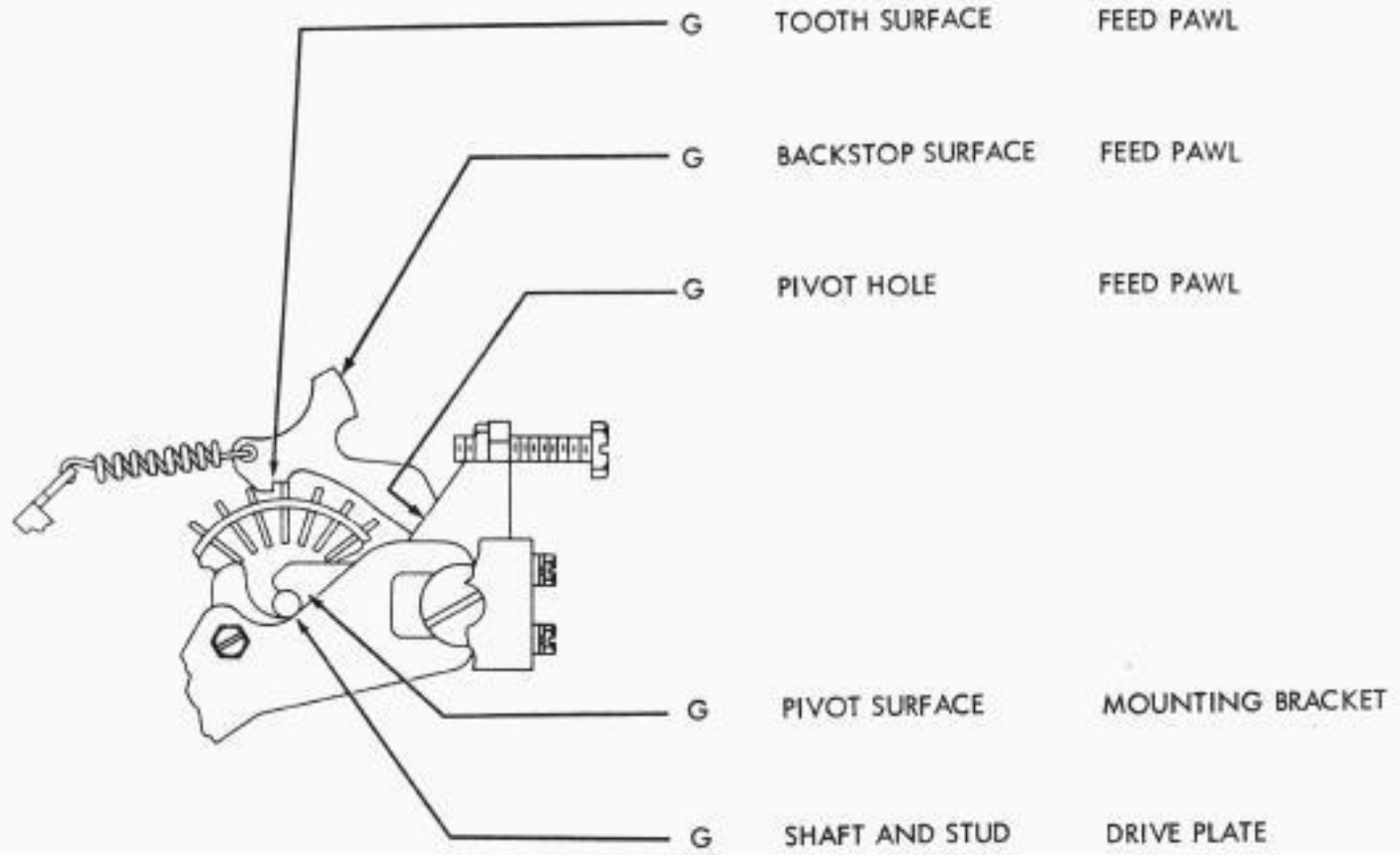
4.29 ANSWER-BACK DRUM



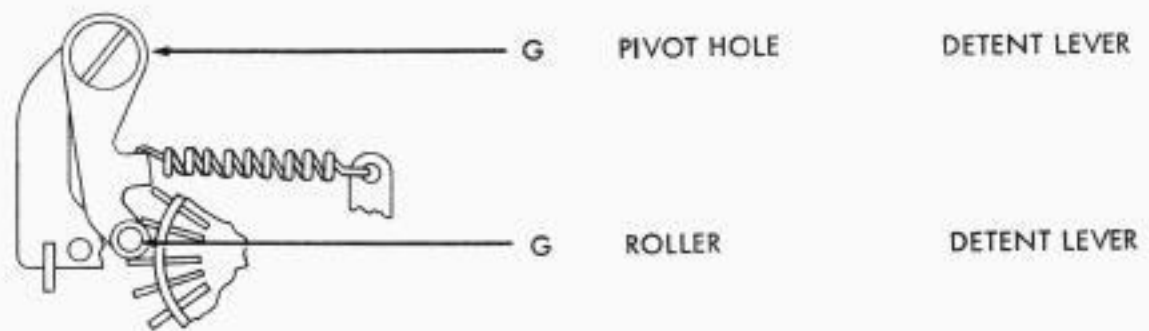
4.30 AUXILIARY CONTACT



4.31 ANSWER-BACK DRUM FEED PAWL



4.32 ANSWER-BACK DRUM DETENT



SECTION 4

DISASSEMBLY AND REASSEMBLY

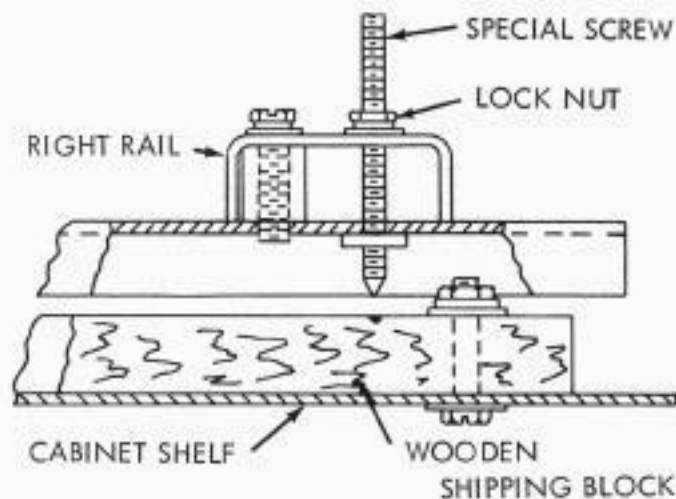
1. GENERAL

a. Most shipments of this equipment are made with the individual units packed separately in cartons or crates and must be installed at the location of the station. Installation instructions accompany the equipment.

b. Some ASR sets are shipped assembled in the cabinet. These sets are equipped with special parts to immobilize the cradle assembly during shipment. After the equipment is placed on location, the cradle again must be mobilized by disabling the special parts as shown in the figure below.

c. The wooden shipping blocks and special screws may remain in the set since they will not impair its operation. If they are left in the set, the special screws should be locked in their uppermost position as shown in figure by retightening the four lock nuts.

d. These shipping parts may be removed from the equipment during the first maintenance routine. To remove the blocks and screws, it is necessary to remove the unit and cradle assembly. If the equipment is to be reshipped at a later date, these parts should be replaced before reshipping.



2. DISASSEMBLY

a. INTRODUCTION - The following instructions are given for the disassembly of the major components and subassemblies. For further disassembly of parts not herein described, refer to the exploded views in parts bulletin 1169B. To reassemble the unit, be sure to check all adjustments, clearances, and spring tensions.

NOTE

When removing a part which is mounted on shims, the number of shims used at each

mounting screw should be noted so that the same shim pile-up can be replaced when the part is remounted. Retaining rings (tru-arcs) are of spring steel and have a tendency to release suddenly. Loss of these can be minimized as follows: Hold retaining ring with the left hand to prevent rotation. Place the blade of a suitable screwdriver in one of the slots of the retaining ring. Rotate the screwdriver in a direction to increase the diameter of the retaining ring. It will come off easily without springing.

b. Assemblies

(1) Character Counter

(a) To remove the character counter assembly, proceed as follows:

1. Remove the two 151631 screws which hold the 155969 character counter bracket to the keyboard base.

2. Raise the character counter and remove the two 151685 screws which hold the 158050 switch to its 158021 bracket.

(2) Tape Container

(a) To remove the tape container assembly, proceed as follows:

1. Remove the four 151632 screws which hold the 158233 panel mounting bracket to the base.

(3) Perforator

(a) To remove the perforator assembly, proceed as follows:

1. Loosen the two set screws on the 158020 coupling located on the 158073 rear shaft and slide the coupling to the rear to disengage it.

2. Remove the three 74014 screws which hold the 158169 perforator frame to the base, and remove the 151631 screw which holds the 156184 bracket to the base.

* 3. Raise the perforator slightly from the base being careful not to injure the code bar extension or associated springs.

4. If unit is equipped with power backspace, unscrew the leads from under the 224M magnet assembly before removing the perforator entirely.

(4) Punch Assembly

(a) To remove the punch assembly, magnet assembly, and backspace mechanism, proceed as follows:

1. Unhook the 151736 perforator drive link spring, and disengage the 156412 link.

* 2. Remove the three 151631 screws which hold the 159473 perforator main plate to the 158169 perforator frame, and one that anchors unit to base.

3. Disengage the 159961 eccentric arm and the assemblies will come free as a unit.

(5) Ribbon Feed Mechanism (Typing Perforator Only)

(a) Remove the ribbon. Remove the two 151632 mounting screws and 2191 lockwashers. Remove the ribbon feed mechanism.

(b) To replace the ribbon feed mechanism, reverse the procedure used to remove it.

(6) Transfer Mechanism (Typing Perforator Only)

(a) Remove the 49084 main trip lever spring. Remove the 151631 and 151632 mounting screws, 2191 lock washer and 7002 flat washers. Remove the transfer mechanism.

(b) To remount the transfer mechanism, reverse the procedure used to remove it.

(7) Typing Mechanism (Typing Perforator Only)

(a) To Remove Typing Mechanism:

1. Remove the 156872 operating blade from the rocker bail assembly by removing the two 151657 mounting screws, 2191 lock washers, 8330 washers, 3649 washer and 82392 shims. Remove the 119651 retaining ring and disconnect the 159512 printing trip link. Remove the 3598 nut, 2191 lock washer and 125015 flat washer from the 156396 eccentric on the rocker bail assembly, and disconnect the 159526 oscillating drive link. Remove 33828 spring from the 156478 accelerator and the 90606 spring from the 156252 lifter.

2. Remove the 110017 screw and 92260 washer that fastens the 159434 lifter plate to the 156474 bar on the frame. Remove the 151630 screw and 2191 lock washer that secure the 159525 axial bracket to the 159404 post on the frame. Remove the 151631 screw, 2191 lock washer, and 7002 flat washer that fasten the 159487 function box front plate to the 159472 main plate. Remove the 119653 retaining ring from the 159659 eccentric shaft; and remove the 151629 nut, 159536 idler gear, 159659 shaft and 2191 lock washer by removing the 159658 mounting screw.

Remove the three 151631 screws, 2191 lock washers and 7002 flat washers that secure the 159535 front plate to the frame. Remove the typing mechanism from the frame assembly.

3. To remount the typing mechanism, reverse the procedure used to remove it.

(b) To Remove Function Box Mechanism:

1. Remove the 151631 mounting screw, 2191 lock washer and 7002 flat washer from the 159535 front plate. Remove the function box from the typing mechanism.

2. To remount the function box, reverse the procedure used to remove it.

(c) To Remove Axial Plate Assembly:

1. Remove the 3870 correcting drive link spring. Remove the 156413 correcting drive link by removing the 119651 retaining ring. Remove the 119649 retaining ring and disconnect 156869 ribbon guide from the 156870 ribbon oscillating lever.

2. Remove the three 151630 mounting screws and 2191 lock washers from the axial plate. Remove the axial plate assembly.

3. To remount the axial plate assembly, reverse the procedure used to remove it. The rear-most tooth of the rack on the 156332 typewheel shaft must mesh with the rearmost tooth space in the 156294 axial sector, and the forward tooth on the sector must mesh with the second tooth space on the shaft: there is an extra tooth space on the forward portion of the shaft's rack.

(d) After the function box mechanism and axial plate assembly have been removed, the remainder of the typing mechanism is the front plate assembly.

(8) After the typing mechanism has been removed, the following remain on the frame assembly: the function clutch trip assembly, the two shaft assemblies and the rocker bail assembly (Typing Perforator Only).

(9) To Remove Pushbars:

Remove the typing mechanism. Remove the function box mechanism from the typing mechanism. Remove the pushbar by disengaging the pushbar rack from its associated pinion.

(a) Correct gear tooth engagement of racks

1. Correct #1 - #5 Inclusive

a. In assembling the pushbars to the various eccentric assemblies, great care must be exercised to assure the correct rack - pinion

gear mesh. The correct mesh is such that the first tooth on the pinion and the first tooth space on the rack are meshed. The last tooth on the pinion and the last tooth space on the rack should therefore also mesh. Misalignment of the mesh by as little as one tooth will produce a jam in the machine and cause part breakage if the machine is put under power while this condition exists.

2. Letters and Figures Pushbars

a. The assembly of these two pushbars to the left eccentric assembly must follow the assembly of the detents on the same eccentric. Starting with the left eccentric in the lower detented position, locate the gear tooth of the pinion which is at top dead center. (Using the oil hole in the eccentric housing as a reference may help since it is located at top dead center). The first tooth space of the rack of the "Letters" pushbar must engage the tooth located directly below. This requirement is met when the indicating mark on the pushbar and eccentric shaft are in the line. Pull the letters pushbar all the way on the pinion. The eccentric shaft should now be in the upper detent position. Now locate the tooth at bottom dead center. The first tooth space of the "Figures" pushbar should engage the tooth just located. The full travel of either pushbar should result in the eccentric shaft being rotated from one detented position to the other without jamming. As before, a misalignment of the mesh by one tooth will cause a jam and parts breakage if the machine is put under power while this condition exists.

(10) Margin Indicator

(a) To remove the margin indicator assembly, proceed as follows:

1. Remove the two 151637 screws which hold the 158162 switch mounting bracket to the 158160 reset cam follower lever assembly bracket.

(11) Reset Cam Follower

(a) To remove the reset cam follower lever assembly, proceed as follows:

1. Remove the two 151631 screws which hold the 158160 reset cam follower lever assembly bracket to the 158113 basket frame.

2. Remove the five 151442 screws which hold the bracket to the base.

3. Disengage the follower lever assembly from the selector lever assembly.

(12) Auxiliary Electrical Switch

(a) To remove the auxiliary electrical switch and housing assembly, proceed as follows:

1. Disconnect the (6) switch cable leads from the 158250 terminal board located just to the right of the perforator drive shafting.

2. Remove the three 151631 screws which hold the 158202 auxiliary switch housing to the base.

3. Slide the housing to the rear and disengage the 158208 gear from the 158210 shaft and lift the housing out.

4. Disengage the drive shaft from the 158114 extension basket control cam.

(13) Code Bar Extension Basket

(a) To remove the code bar extension basket assembly, proceed as follows:

NOTE

For reassembly purposes, observe how the 158061 link guide pin and the 158060 trip bar link latch spring which encases it are engaged between the 158135 clutch trip bar link and the 158103 trip bar link latch.

1. Remove the 151631 screw which holds the left end of the extension basket to the base.

2. Slide the extension basket to the left and disengage the 158116 reset lever from the 158099 keyboard control selection lever assembly. Note: When reassembling, be sure that the selection lever assembly straddles the clutch trip bar extension lever, and that the selection lever fork engages its mating pin.

(14) Signal Generator

(a) To remove the signal generator assembly, proceed as follows:

1. Remove the typing unit if it is present.

2. Remove the 154131 contact box cover, and disconnect the signal line leads from the 154042, 154043 contact terminals.

3. Remove the two 153841 hold down screws at the front of the 154200 signal generator frame, and the 74805 screw at the right rear of the frame.

4. Lift the signal generator carefully, while holding the universal bail back so that the non-repeat lever clears and its spring will not be excessively stretched.

CAUTION

If the non-repeat lever is pulled down approximately 90 degrees from normal po-

sition, its spring might be stretched beyond elastic limits which will result in assembly malfunction.

(15) Keyboard

(a) To remove the keyboard assembly, proceed as follows:

1. Remove the typing unit and signal generator assembly as specified in paragraph (14).
2. Remove the plastic windows and labels, hood, seal, and seal plates as specified in paragraph (16).
3. Remove the four 151631 screws which hold the 154210, 154211 front frames to the front of the 158000 base.
4. Remove the two 151632 screws which hold the 154068, 154069 right and left code lever guide brackets on the top of the base, and the two 151632 screws at the extreme right and left of the 154055 front bracket which hold it on the base.
5. When these four screws in front and four on top of the base have been removed, tip up the front of the keyboard assembly and pull it forward, disengaging the function levers.
6. Note that all function levers are under their corresponding function bails - except the keyboard lock function lever - which fits on top of its function bail.
7. When reassembling, depress the keyboard lock keylever so that the lock function lever will go in over its bail instead of under as the other function levers should.

NOTE

It is easier to disassemble and reassemble the keyboard assembly with the base standing on its rear.

(16) Keyboard Labels

(a) To remove the plastic windows and labels, hood, seal, and seal plates, proceed as follows:

1. Remove the four 154202 screws which secure the 154198 windows and labels.
2. Remove the two 151632 screws underneath the 154110 hood which hold the hood to the 154203 hood mounting bracket; and remove the four 151659 screws on top of the hood which hold it to the 154210, 154211 left and right frame mounting brackets.
3. Pull the hood forward to remove.

4. Stretch the 154020 rubber keyboard seal off its 154057, 154058 plates.

5. Remove the four 151442 screws and two 154203 hood mounting brackets.

6. Remove the 154058 upper seal plate by unscrewing the three 151722 screws at its rear.

7. Remove the 154057 lower seal plate by unscrewing the 151632 screws at its front.

(17) Contact Box

(a) To remove the contact box assembly, proceed as follows:

1. Remove the 154131 contact box cover and disconnect the signal line leads.
2. Unhook the 86304 drive link spring.
3. Unscrew the two 151632 screws at the front of the 154009 front plate which hold the contact box assembly.
4. Disengage the 156644 drive link from the transfer bail and lift off the assembly. It is more economical to replace the entire contact assembly if the contacts need replacement.

(18) Transfer Lever Locking Bail

(a) To remove the transfer lever locking bail, proceed as follows:

1. Remove the signal generator assembly from the keyboard as specified in paragraph (14).
2. Remove the contact box assembly as specified in paragraph (17).
3. Remove the 70388 transfer lever locking bail spring.
4. To remove the 154140 locking bail, trip the clutch and rotate the shaft until the cam is positioned so that the bail can be unhooked and dropped from its guide post. Turn the locking bail clockwise until it is at right angles to the guide, and extract it from the bottom of the frame.

NOTE

It may be necessary to move the shaft back and forth to position the cam for maximum clearance.

(19) Signal Generator Shaft

(a) To remove the cam, clutch, and shaft assembly, proceed as follows:

1. Remove the transfer lever locking bail as specified in paragraph (18).

2. Remove the two 151631 screws which mount the 154101 clutch shaft rear mounting plate to the 154200 signal generator frame, and remove the 112626 nut which locks the shaft to the front of the frame.

3. Hold the 154033 clutch latch lever and the 154034 clutch stop lever away and pull back on the shaft rear mounting plate to disengage the shaft from the front plate.

4. Remove the entire cam, clutch, and shaft assembly by rotating it to clear the various transfer levers. The 154019 code bar bail eccentric follower, the 154138 felt washer and the 154083 cam spacer will fall free. These must be repositioned before reassembly.

5. To take the cam (with clutch assembly) off the shaft, disengage the clutch by holding the clutch shoe lever against the stop lug and slide the cam and clutch off.

(20) Keylever Guide Plate

(a) To remove the keylever guide plate, proceed as follows:

1. Remove the plastic windows and labels, and hood as specified in paragraph (16).

2. Remove the 151045 space bar by unscrewing the two 151223 shoulder screws that fasten it to the 154117 space bar bail.

3. Remove the 151659 screw on the keylever guide plate under the space bar and the two 151659 screws in the upper corners of the plate which hold the plate to the frame.

4. Work the guide plate off the keytops and let them fall free.

5. To replace the guide plate over the keylevers, flip all levers to the rear. Place the front end of the guide plate down on the frame; and push the keylevers into their respective holes, starting with the bottom row and proceeding upward to the top row.

(21) Power Drive Backspace

(a) To remove the power drive backspace mechanism, proceed as follows:

1. Unhook the 84575 spring from the 159958 drive link latch.

2. Loosen the 151632 screw on the 159960 eccentric and pull the 159961 eccentric arm off the 159963 hub.

3. Disengage the eccentric arm from its guide between the 159958 latch and 159955 drive link.

4. Unscrew the 159956 post from between the 159954 adjusting link and the front punch frame, and remove the link and latch assembly.

5. Remove the two 156632 screws on the front punch frame and extract the magnet assembly.

(22) Manual Backspace

(a) To remove the manual backspace mechanism, proceed as follows:

1. Unscrew the two 153817 screws which hold the 159900 plate to the rear punch frame and remove the 159902 rake shaft.

2. Remove the 153817 screw, the 122149 screw and 159916 eccentric from the 159987 bracket on the left side of the punch front plate. Remove the 159903 crank assembly.

SECTION 5-EARLY DESIGN MECHANISM ADJUSTMENTS

1. RIBBON FEED MECHANISM

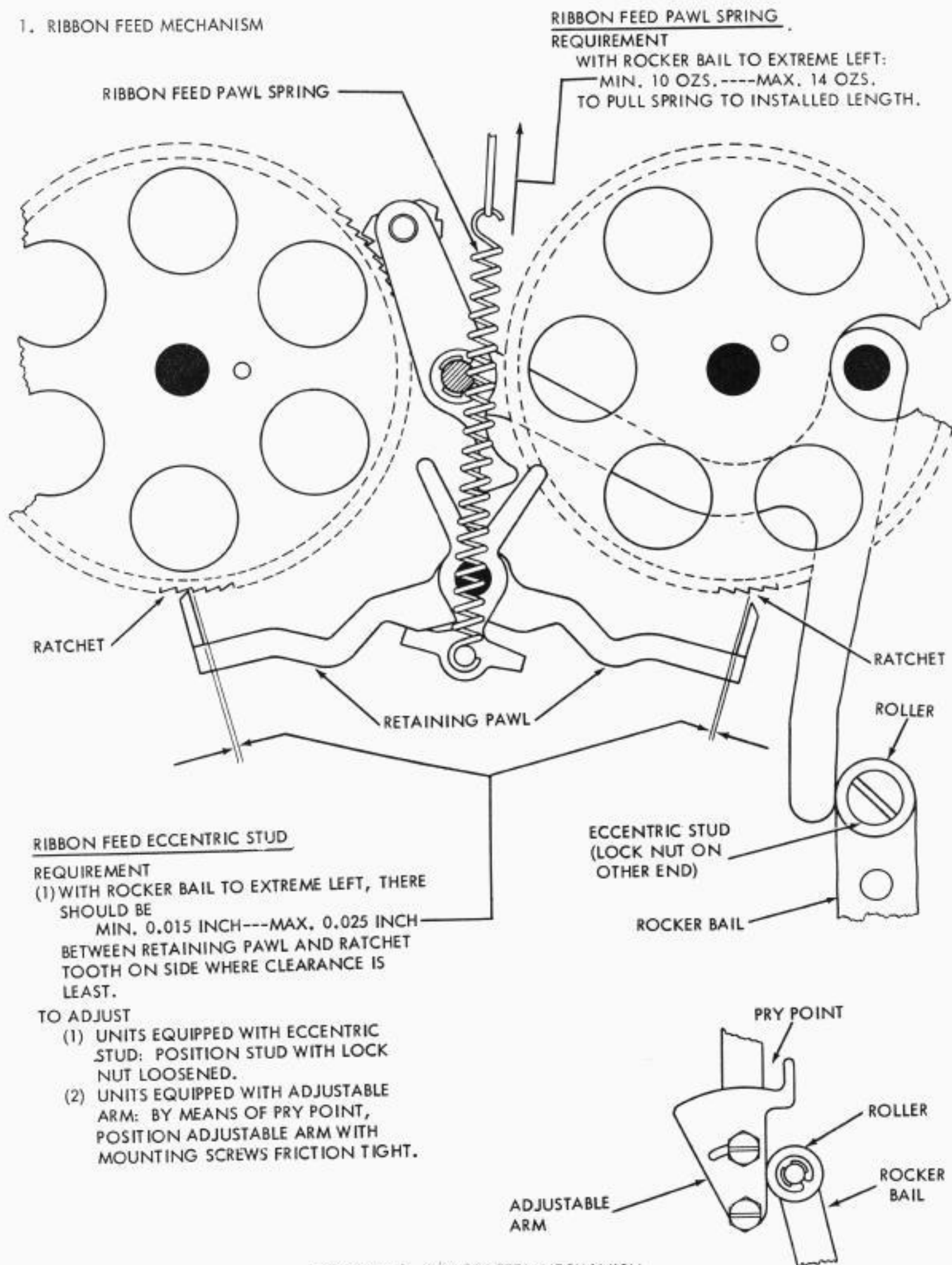


FIGURE 5-1. RIBBON FEED MECHANISM

RIBBON FEED DRIVE ARM SPRING

REQUIREMENT

WITH UNIT IN STOP POSITION:
 MIN. 3 OZS. ----MAX. 5 OZS.
 TO PULL SPRING TO INSTALLED LENGTH.

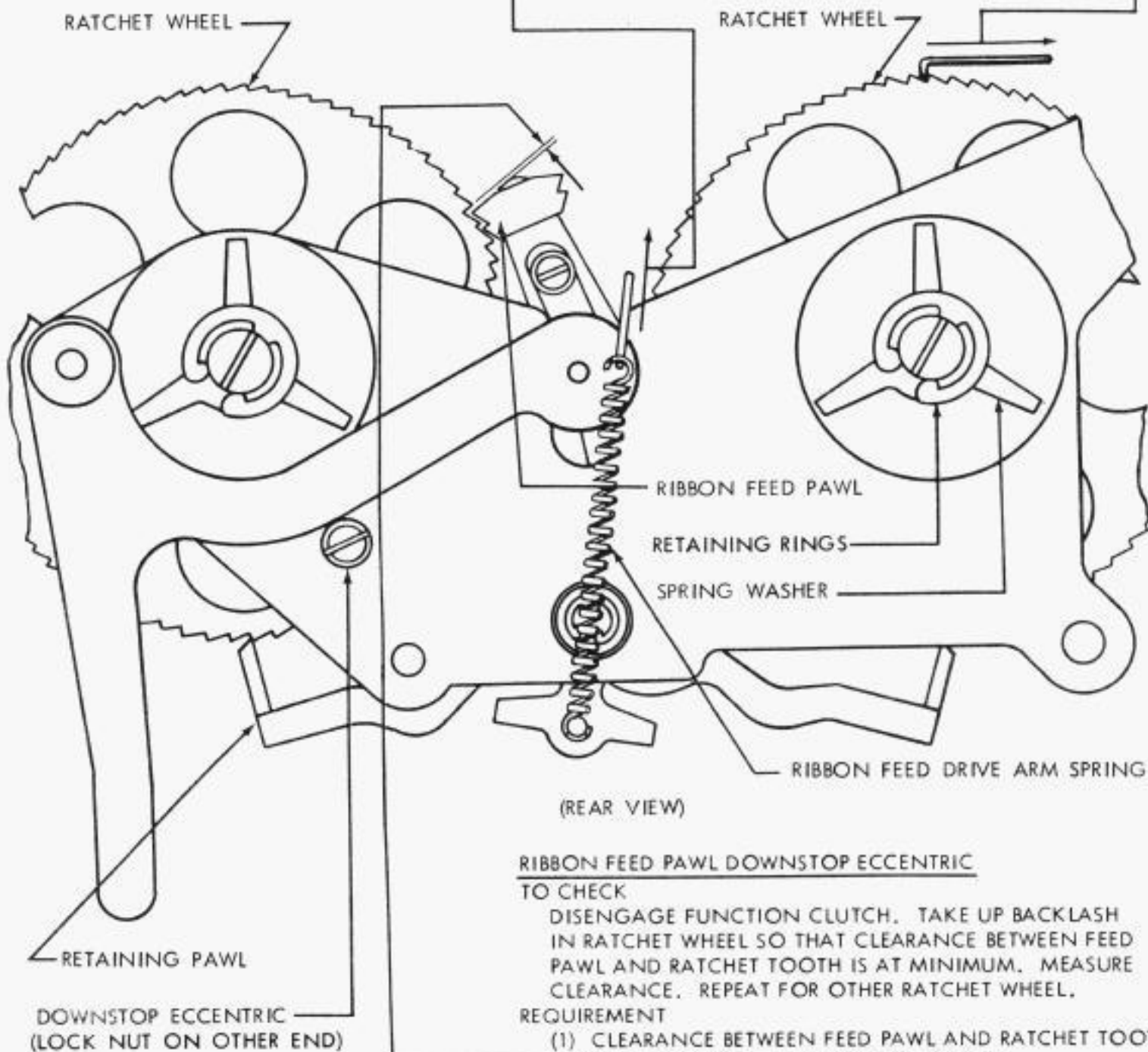
RIBBON RATCHET WHEEL SPRING WASHERS

REQUIREMENT

WITH FEED PAWL AND RETAINING PAWL
 SHIFTED TO OPPOSITE RATCHET WHEEL:
 MIN. 1 OZ. ----MAX. 2 1/2 OZS.
 TO START WHEEL TURNING.

TO ADJUST
 REMOVE RETAINING RING AND BEND SPRING
 WASHER.

NOTE:
 MAKE THIS ADJUSTMENT FOR BOTH RATCHET
 WHEELS.

RIBBON FEED PAWL DOWNSTOP ECCENTRIC

TO CHECK

DISENGAGE FUNCTION CLUTCH. TAKE UP BACKLASH
 IN RATCHET WHEEL SO THAT CLEARANCE BETWEEN FEED
 PAWL AND RATCHET TOOTH IS AT MINIMUM. MEASURE
 CLEARANCE. REPEAT FOR OTHER RATCHET WHEEL.

REQUIREMENT

(1) CLEARANCE BETWEEN FEED PAWL AND RATCHET TOOTH:
 MIN. .020 INCH ---- MAX. .040 INCH
 ON SIDE WHERE CLEARANCE IS LEAST.

(2) PAWL SHOULD FEED ONE TOOTH AT A TIME.

TO ADJUST
 POSITION DOWNSTOP ECCENTRIC WITH LOCK NUT
 LOOSENED

FIGURE 5-2. RIBBON FEED MECHANISM

RIBBON REVERSING PLATE

TO CHECK

POSITION ROCKER BAIL TO EXTREME LEFT.
HOLD REVERSING ARM UNDER REVERSING PLATE
AND MEASURE CLEARANCE.

WITH FEED PAWL AGAINST OTHER RATCHET,
REPEAT PROCEDURE FOR OTHER REVERSING ARM,

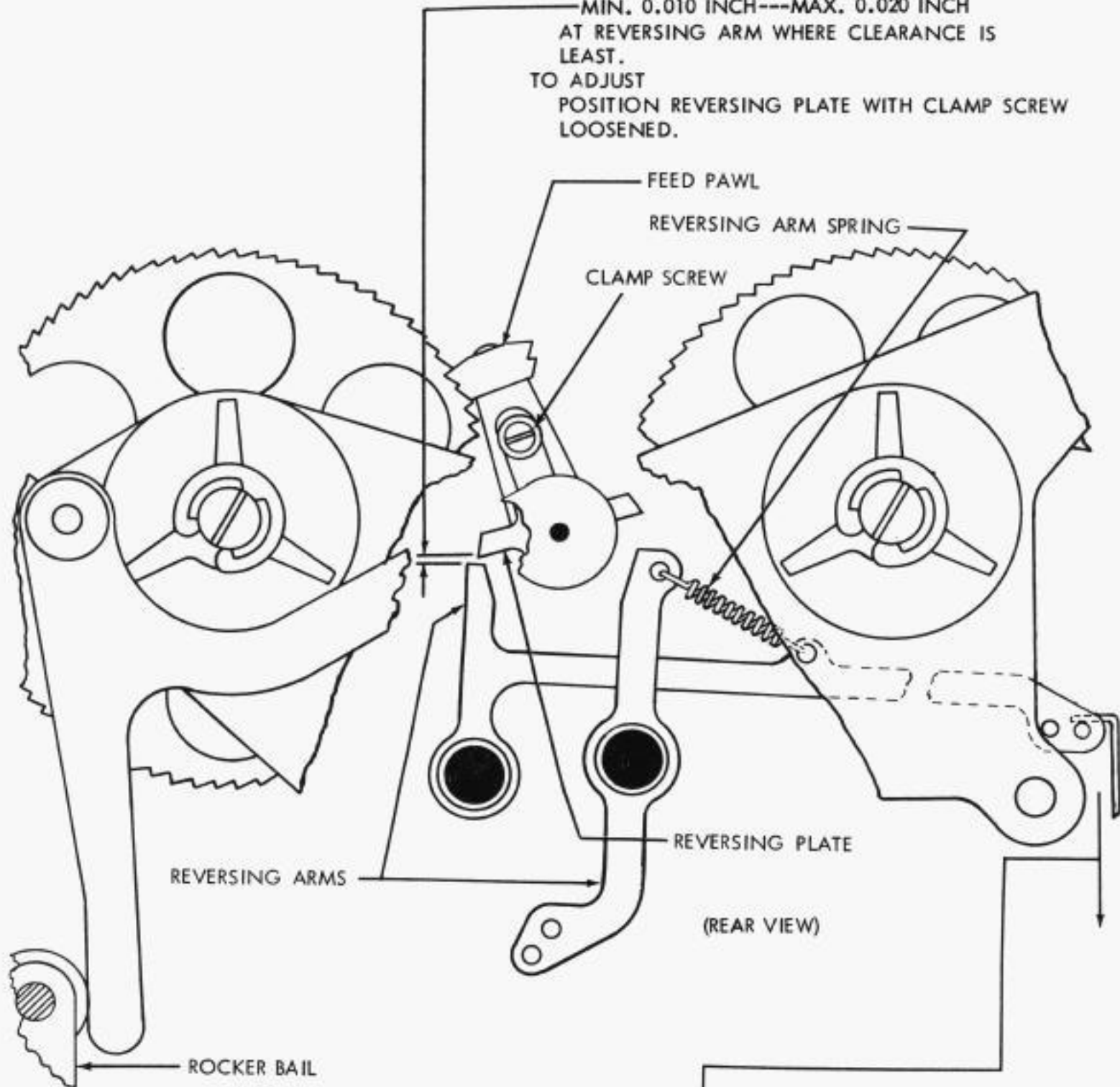
REQUIREMENT

CLEARANCE BETWEEN REVERSING ARM AND
REVERSING PLATE:

MIN. 0.010 INCH---MAX. 0.020 INCH
AT REVERSING ARM WHERE CLEARANCE IS
LEAST.

TO ADJUST

POSITION REVERSING PLATE WITH CLAMP SCREW
LOOSENED.

RIBBON FEED REVERSING ARM SPRING

REQUIREMENT

WITH FEED PAWL IN HIGHEST POSITION:

MIN. 10 OZS. ---MAX. 30 OZS
TO START REVERSING ARM MOVING.

FIGURE 5-3. RIBBON FEED MECHANISM

2. CHARACTER COUNTER MECHANISM

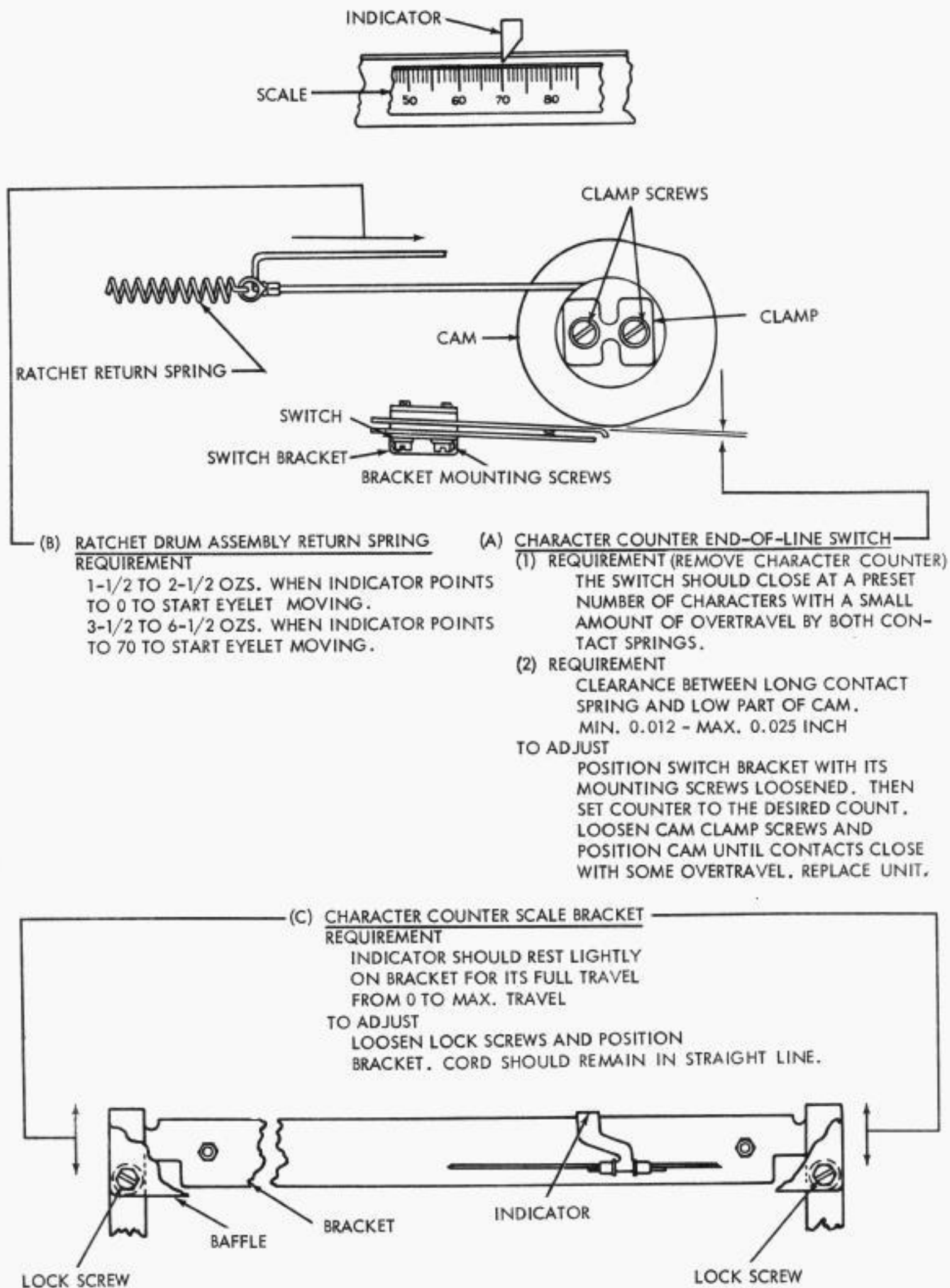
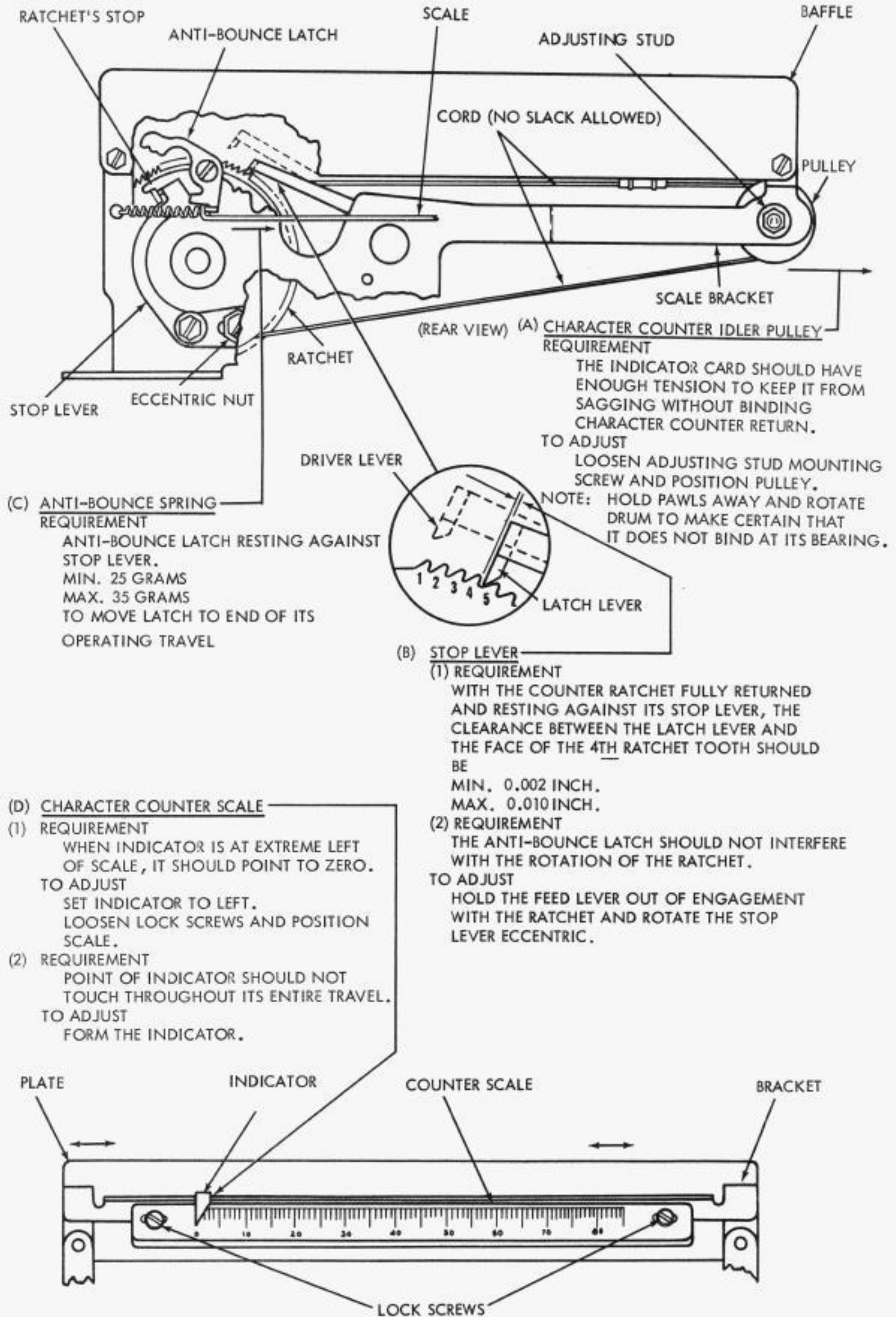


FIGURE 5-4. CHARACTER COUNTER MECHANISM



(A) CHARACTER COUNTER STROKE
REQUIREMENT

WHEN CHARACTER AND REPEAT KEYS ARE DEPRESSED, THE COUNTER SHOULD OPERATE CONSISTENTLY IN T OR K-T POSITION. WHEN CARRIAGE RETURN KEY IS DEPRESSED, THE COUNTER SHOULD RESET WITHOUT BINDING. THE COUNTER MECHANISM SHOULD COUNT THE FIRST CHARACTER ON A RESTART AFTER RESET CONDITION.

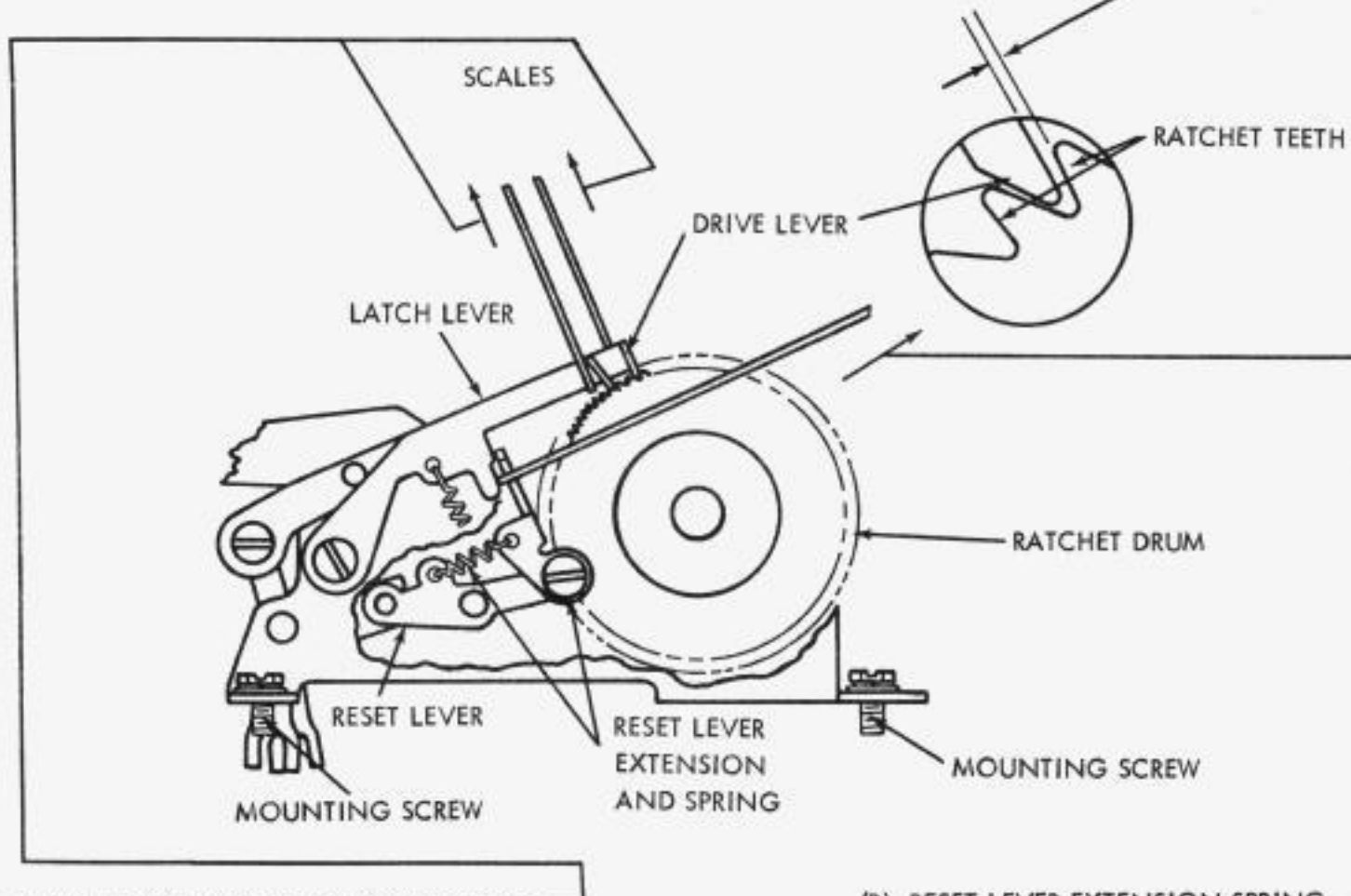
MIN. 0.006 INCH

MAX. 0.015 INCH

BETWEEN DRIVE LEVER AND RATCHET TOOTH, WHEN COUNTER IS SET NEAR MID-POINT OF ITS RANGE.

TO ADJUST

LOOSEN MOUNTING SCREWS. WITH KEYBOARD IN T POSITION, START MOTOR AND STRIKE "CARRIAGE RETURN" KEY, AND THEN E KEY. TURN OFF MOTOR. DEPRESS E KEY. POSITION CHARACTER COUNTER FRAME FOR CLEARANCE. TURN CONTROL KNOB TO K-T POSITION AND RECHECK. REFINE IF NECESSARY.

**(C) LATCH LEVER AND DRIVE LEVER SPRING**
REQUIREMENT

MIN. 1/2 OZ.

MAX. 1 OZ.

TO MOVE EITHER LEVER.

(B) RESET LEVER EXTENSION SPRING
REQUIREMENT

WITH THE CODE BARS LATCHED

MIN. 1/2 OZ.

MAX. 1-1/4 OZ.

TO START LEVER MOVING.

FIGURE 5-6. CHARACTER COUNTER MECHANISM