15 PERFORATOR-TRANSMITTER

REQUIREMENTS AND ADJUSTMENTS

CONTENTS PAGE

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1. GENERAL

1.01 This section contains the requirements and adjustments for the 15 perforator-transmitter. This section and the section covering teletypewriter general requirements and adjustments provide the instructions for the maintenance of the 15 perforator-transmitter.

1.02 This section is reissued to revise Figure 53 and to delete the punch-magnet contact-bracket adjustment that was covered in 3. of this section. Also Figure 17 has been added to clarify 2.22.

1.03 Auxiliary Features

(a) The following features may be applied:

(1) TP91631 modification kit to apply full-length spacebar to units equipped with space mechanism having centrally located space keylever. See 2.22.

(2) TP122264 modification kit to provide a repeat feature of any signal when a repeat lever is held depressed following the actuation of the appropriate keylever. See 9.

(3) TP112008 modification kit to provide a tape buzz-out feature when the tape lever of the 15 perforator-transmitter is set to perforate tape for automatic transmission. Repeat operation is obtained at a very high speed by holding depressed the keylever for the character to be repeated and at the same time holding depressed an added supplementary keylever marked TAPE. See 10.

(4) TP99880 modification kit to move the character counter from the right to the left of the keyboard.

(b) The following features, which are optional auxiliary features with respect to old-style machines, are now incorporated in all current standard models.

(1) TP91624 modification kit to apply counter-control mechanism mounted on keyboard. See Figures 44 and 45.

(2) TP91625 modification kit to apply lower punch operating contacts and adjustable key-pressure mechanism with a knurled thumbscrew to permit adjustment of touch by operator. See Figure 37.

(3) TP91626 modification kit to apply two-piece armature lever and follow-through feature including adjustable feed-punch selector lever. In these perforator-transmitters the selector-finger guide is attached to the armature lever by two screws.

(4) TP91627 modification kit to apply space mechanism with centrally located space keylever.

(5) TP89069 modification kit has keyboard control operating lever extension to hold universal bar depressed. See Figures 22 and 23.

(6) TP99037 modification kit to provide easier backspacing and less abrupt tape feeding. The feed pawl is not attached to the armature. See Figures 35 and 43.

(7) TP94494 modification kit to provide reduced friction of repeat-space rod when sending from the keyboard.

(8) TP99987 punch-selector-finger retaining bracket used instead of the retaining fork roller. See Figure 35.

(9) Adjustable universal bar link. See Figure 42.

(10) TP102896 modification kit has punch-contact latch to hold contact closed until armature has completely operated to provide positive action of the perforating mechanism with improved antichatter feature. Also has adjustable universal bar link. See Figures 38 and 42.

2. KEYBOARD MECHANISM

2.01 Shaft Mounting

Requirement: Shaft should turn freely in its bearings without bind when the contact lever and lock loop are held away from the cam shaft and the throwout lever is held released. See Figure 1.

Adjust by shifting rear bearing bracket.

2.02 Shaft Front Bearing

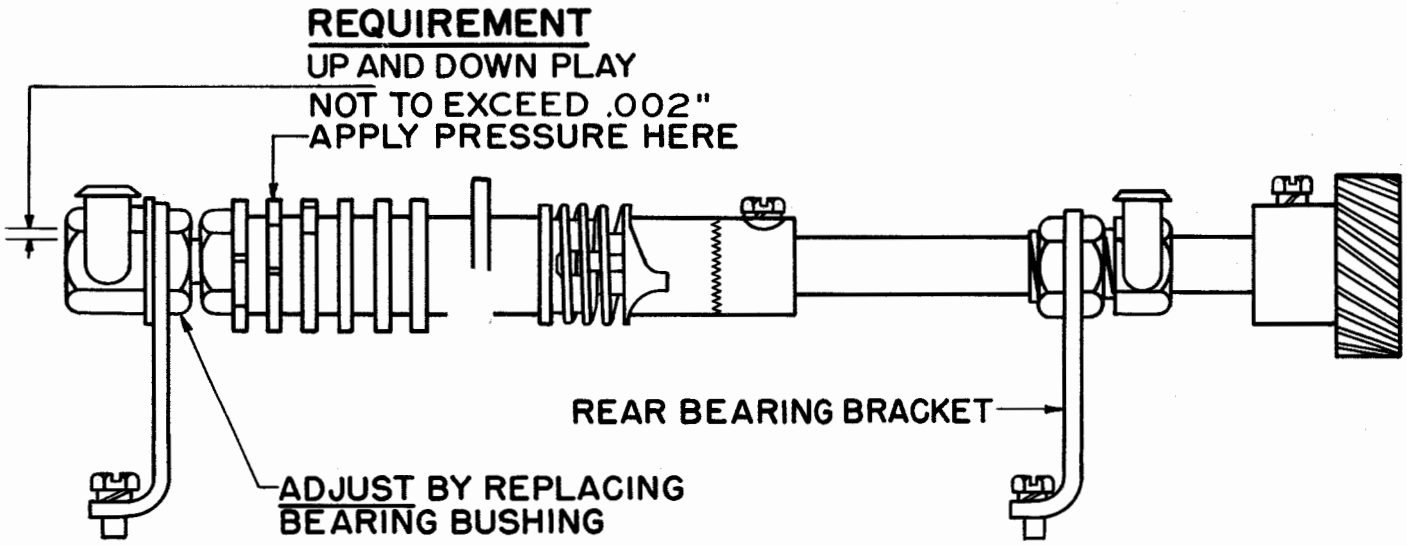

Figure 1

2.03 Transmitting Cam-sleeve Endplay

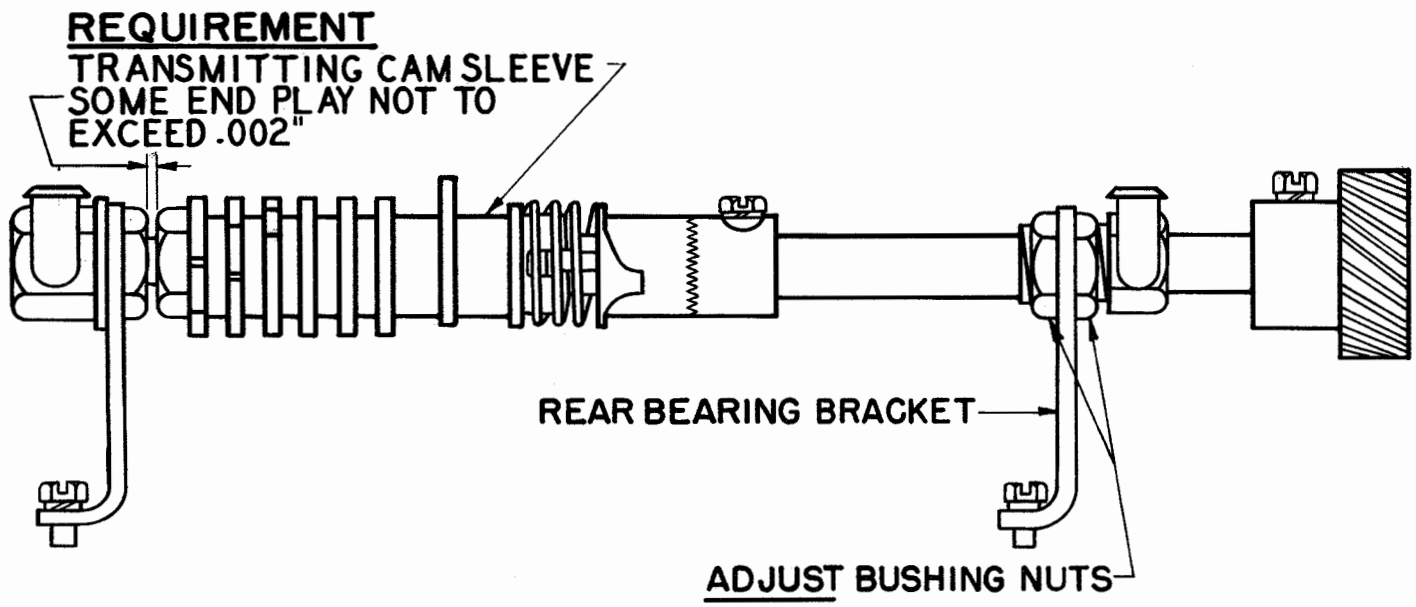

Figure 2

2.04 Lock-loop Spring

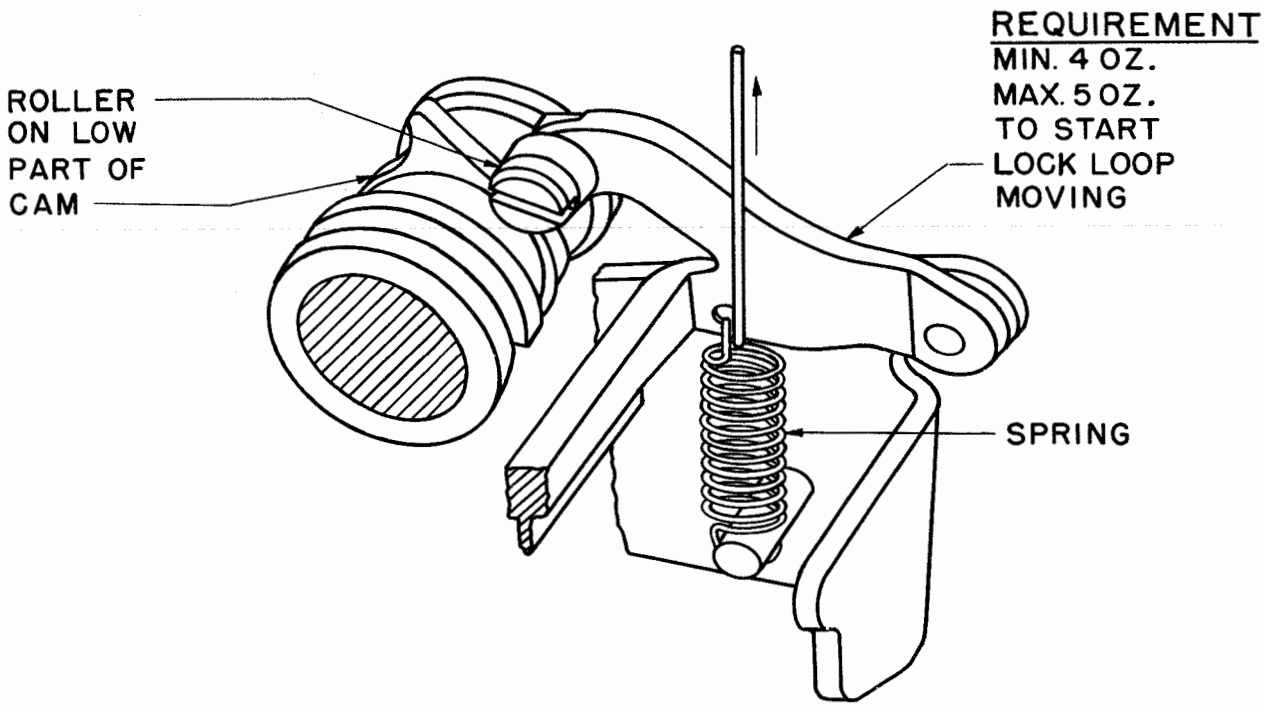

Figure 3

2.05 Locking-lever Clearance

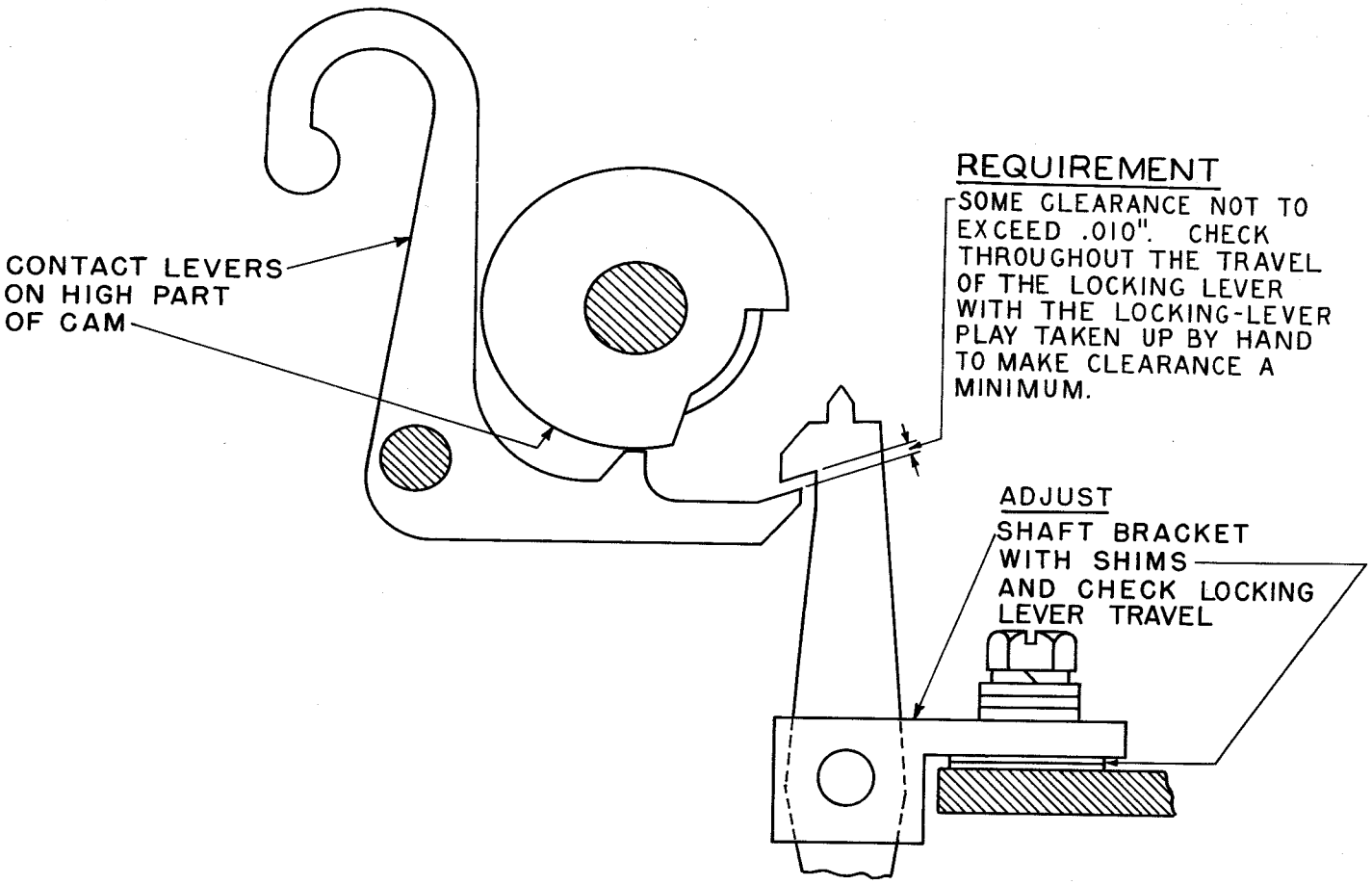

Figure 4

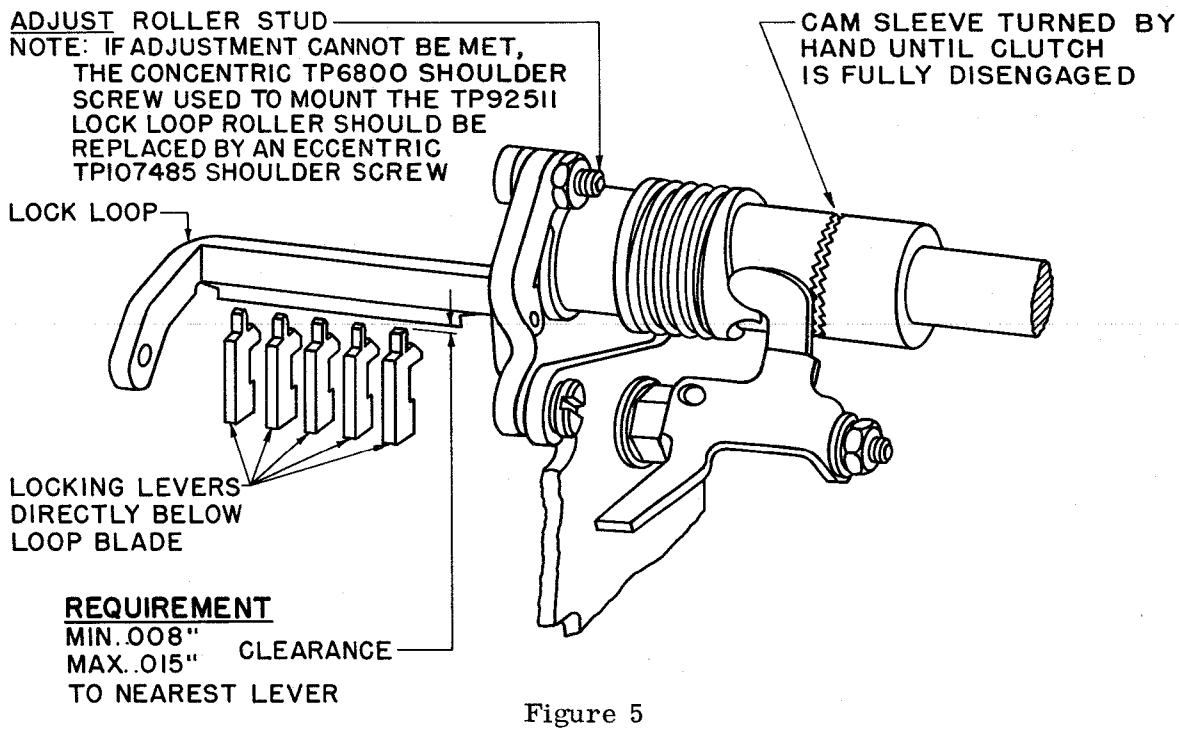

Figure 5

Note: The following three requirements, 2.07, 2.08, and 2.09, need be checked only when a new selector-bar assembly is being installed or when the number of selector-bar-assembly bracket shims has been changed. Remove right and left slide plates, disconnect Y-lever connecting link extensions from Y-lever connecting links, and remove selector-bar-assembly bracket. Hold Y-lever connecting link extensions in position by passing a piece of string under extension and attaching each end to the perforator extension casting. See Figures 6 and 7 for identification of parts.

2.07 Keylevers

Requirement 1: (Factory Adjustment) All keylevers should have some play between the upstop and the selector bars. Levers in line with the high portions of the front selector bar A1 should clear the bar by not more than 0.030 inch when the bars are locked in position by the depression of either (1) the Q keylever, (2) the P keylever, or (3) the B keylever. See Figure 7.

To Gauge: Hold the Q keylever fully depressed and check all of the other keylevers in turn by feel, gauging the clearance by eye while observing the vertical play of each keylever in its guide slot. Release the Q keylever, hold down the P keylever, and repeat the check. Finally, repeat it again with the B keylever held down.

To Adjust: Add or remove shims between the selector-bar-assembly bracket and the keyboard casting at the front corners.

Requirement 2: (Factory Adjustment) There should be some clearance, not more than 0.020 inch, between the rear selector bar (E2) and the unoperated keylever which has the least clearance, when the T keylever is held fully depressed. See Figure 7 for identification of parts.

To Gauge:

(1) Lock the T keylever in its fully depressed position. This may be done with a wedge in a comb slot at the front of the keyboard. Care should be taken not to bend the comb.

(2) Turn the keyboard over so that the bottom is accessible.

(3) With a spring hook, hold the E2 selector bar as far away from the keylevers as the slack in its supporting parts will permit.

(4) Check the clearances between the E2 selector bar and the keylevers to find the lever with the minimum clearance. By gauge determine that this clearance is not more than 0.020 inch.

To Adjust: Add or remove shims between the selector-bar-assembly bracket and the keyboard casting at the rear corners.

Note: Excessive clearance may result in deep touch. Should clearance be excessive only at some keylevers, check selector bars and leather upstops for wear. Replace if necessary.

2.08 Y-lever Connecting Links of perforator-transmitters having counter-control contacts mounted on the perforator units should have a travel (longitudinal movement) of not less than 5/32 inch when the CAR RET keylever is depressed alternately with the FIGS, LTRS, and LINE FEED keylevers in turn. Gauge by eye. See Figure 6.

To Adjust: Change number of shims under the two rear corners of the selector-bar-assembly bracket and recheck 2.07. See Figure 7 for identification of parts.

Note: Check for clearance between the left keyboard slide plate and the Y-lever connecting links when the play is taken up to make these clearances a minimum.

2.09 Locking Levers should clear adjacent selector bars and their lower ends should have at least 50 per cent engagement with the locking lever forks. Gauge by eye.

To Adjust: Reposition selector-bar-assembly bracket, keeping bracket parallel to the rear keylever guide and recheck 2.05. See Figure 7 for identification of parts.

Note: Reconnect the Y-lever connecting link extensions.

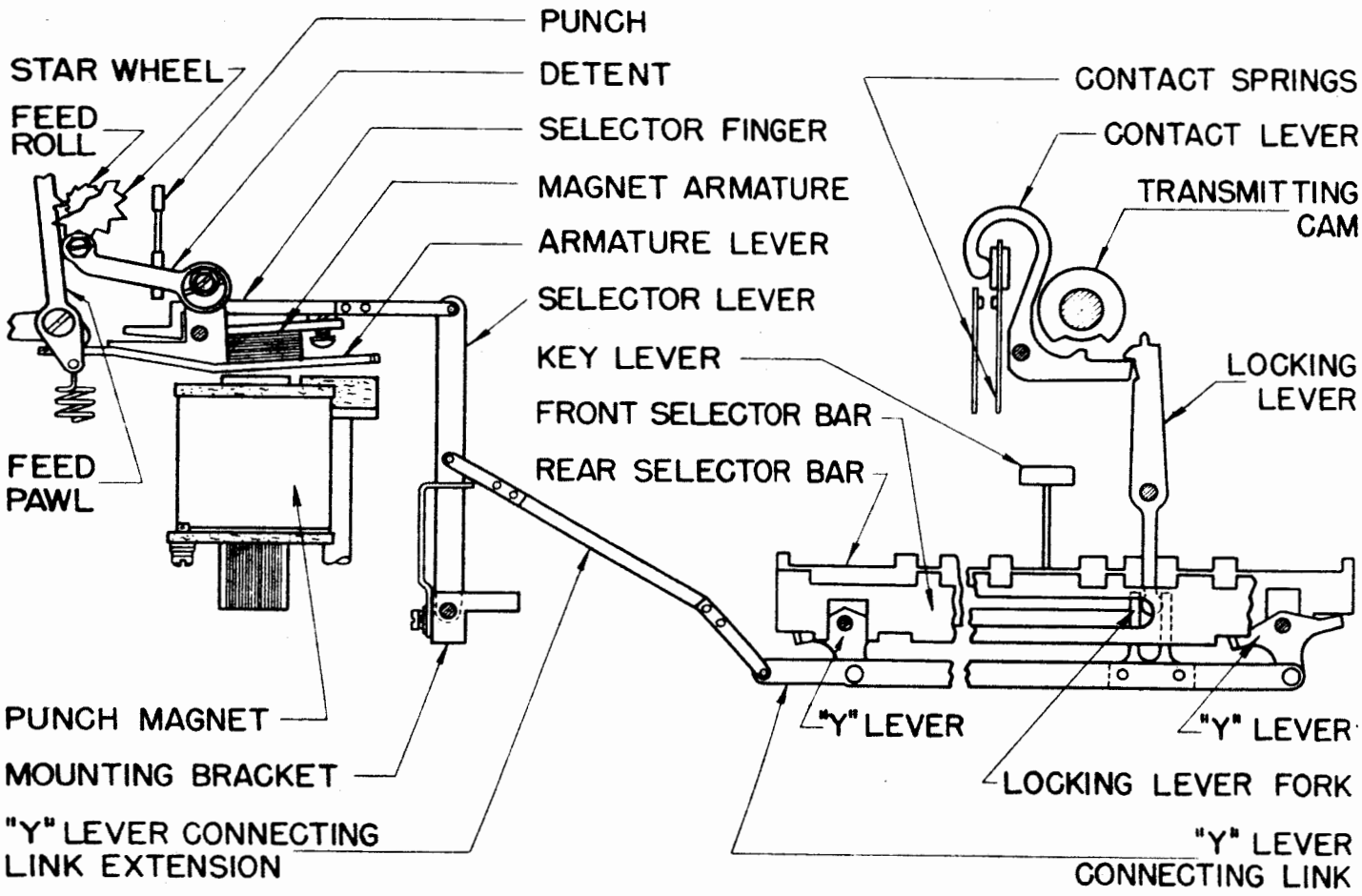

Figure 6

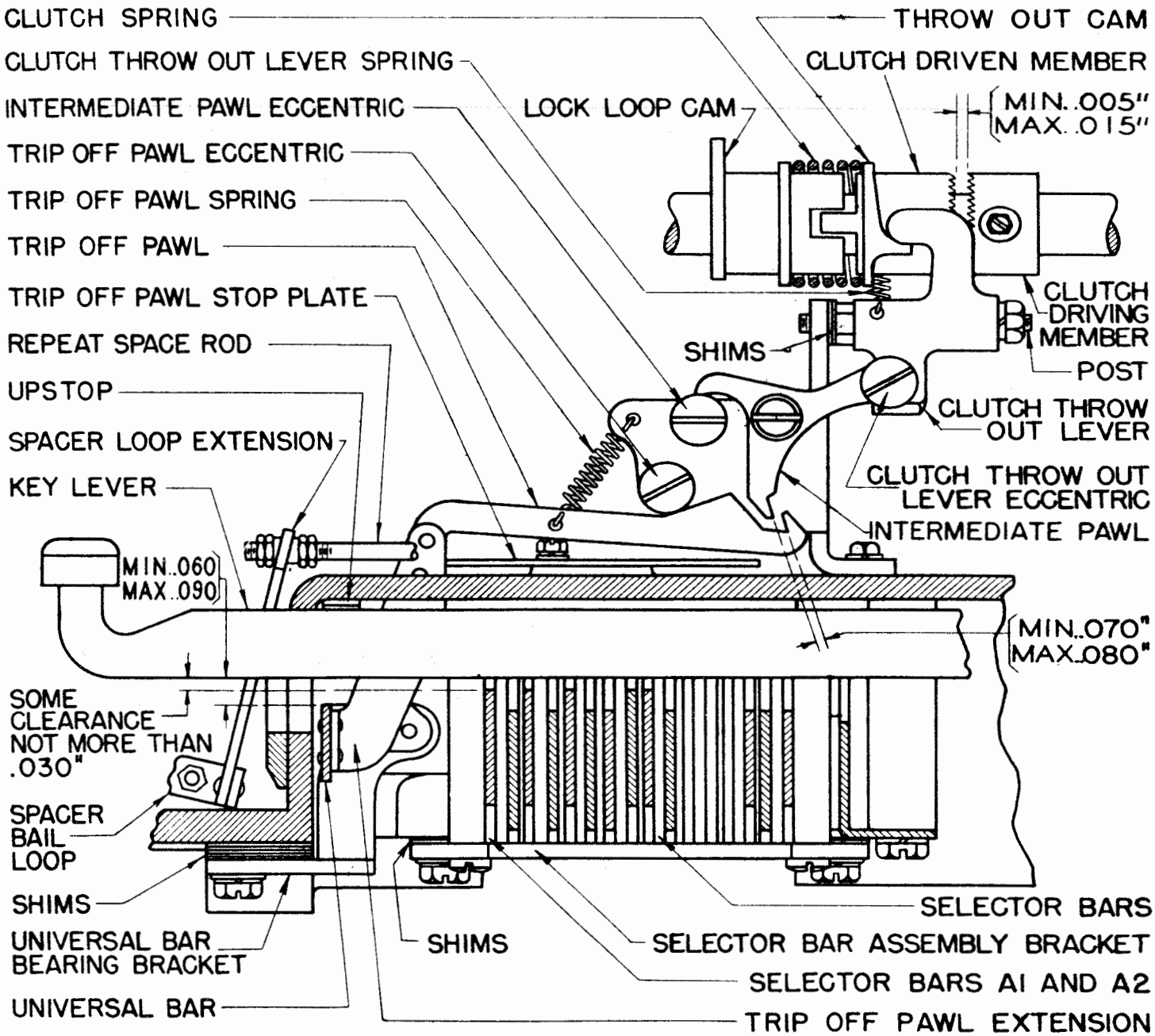
CLUTCH SPRING
CLUTCH THROW OUT LEVER SPRING
INTERMEDIATE PAWL ECCENTRIC
TRIP OFF PAWL ECCENTRIC
TRIP OFF PAWL SPRING
TRIP OFF PAWL
TRIP OFF PAWL STOP PLATE
REPEAT SPACE ROD
UPSTOP
SPACER LOOP EXTENSION
KEY LEVER
MIN..060
MAX..090
SOME CLEARANCE NOT MORE THAN .030"
SPACER BAIL LOOP
SHIMS
UNIVERSAL BAR BEARING BRACKET
UNIVERSAL BAR
SHIMS
LOCK LOOP CAM
THROW OUT CAM
CLUTCH DRIVEN MEMBER
MIN..005"
MAX..015"
CLUTCH DRIVING MEMBER
POST
SHIMS
CLUTCH THROW OUT LEVER
CLUTCH THROW OUT LEVER ECCENTRIC
INTERMEDIATE PAWL
MIN..070"
MAX..080"
SELECTOR BARS
SELECTOR BAR ASSEMBLY BRACKET
SELECTOR BARS A1 AND A2
TRIP OFF PAWL EXTENSION

Figure 7

2. 10 Locking-lever Travel

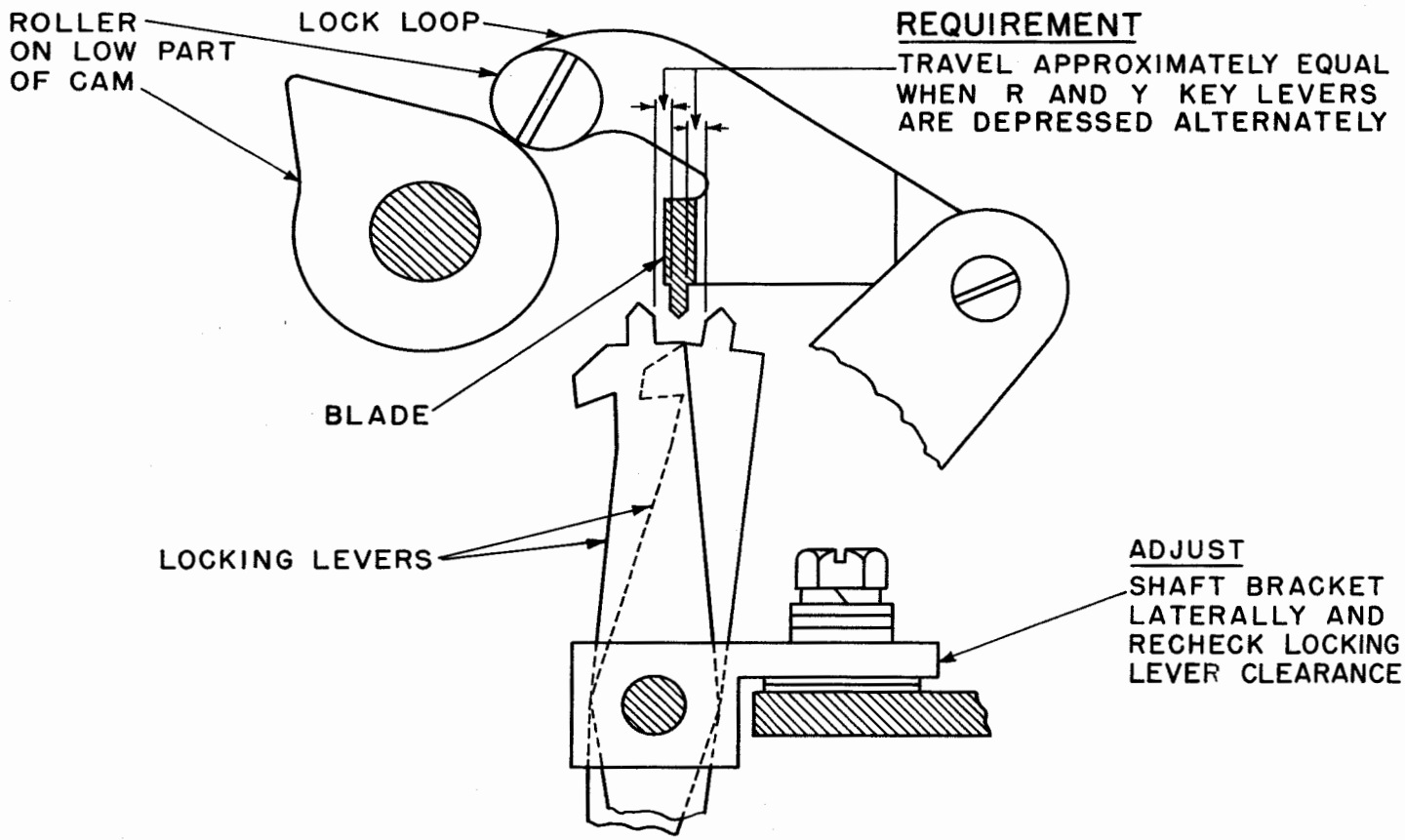

Figure 8

2.11 Clutch Teeth

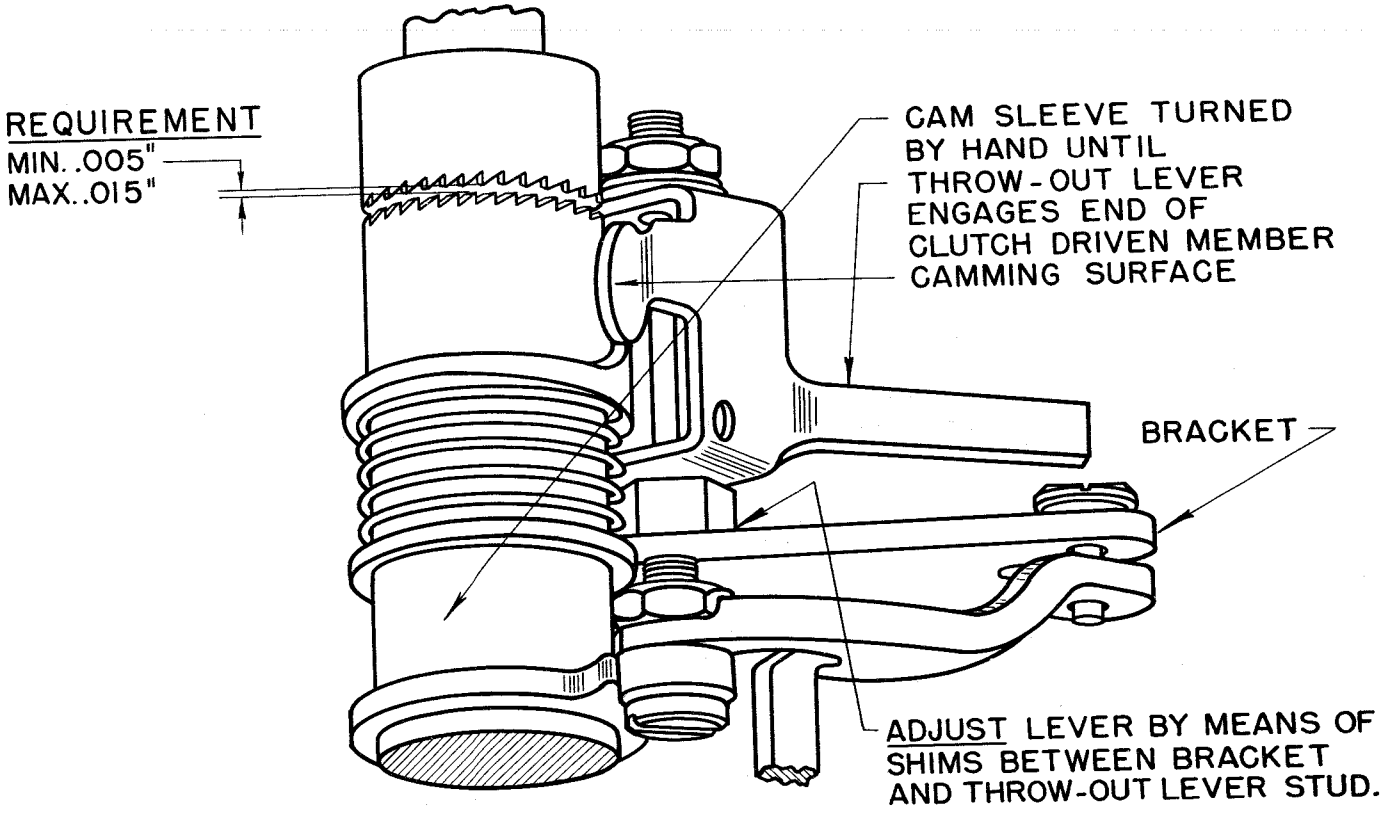

Figure 9

2.12 Clutch Spring

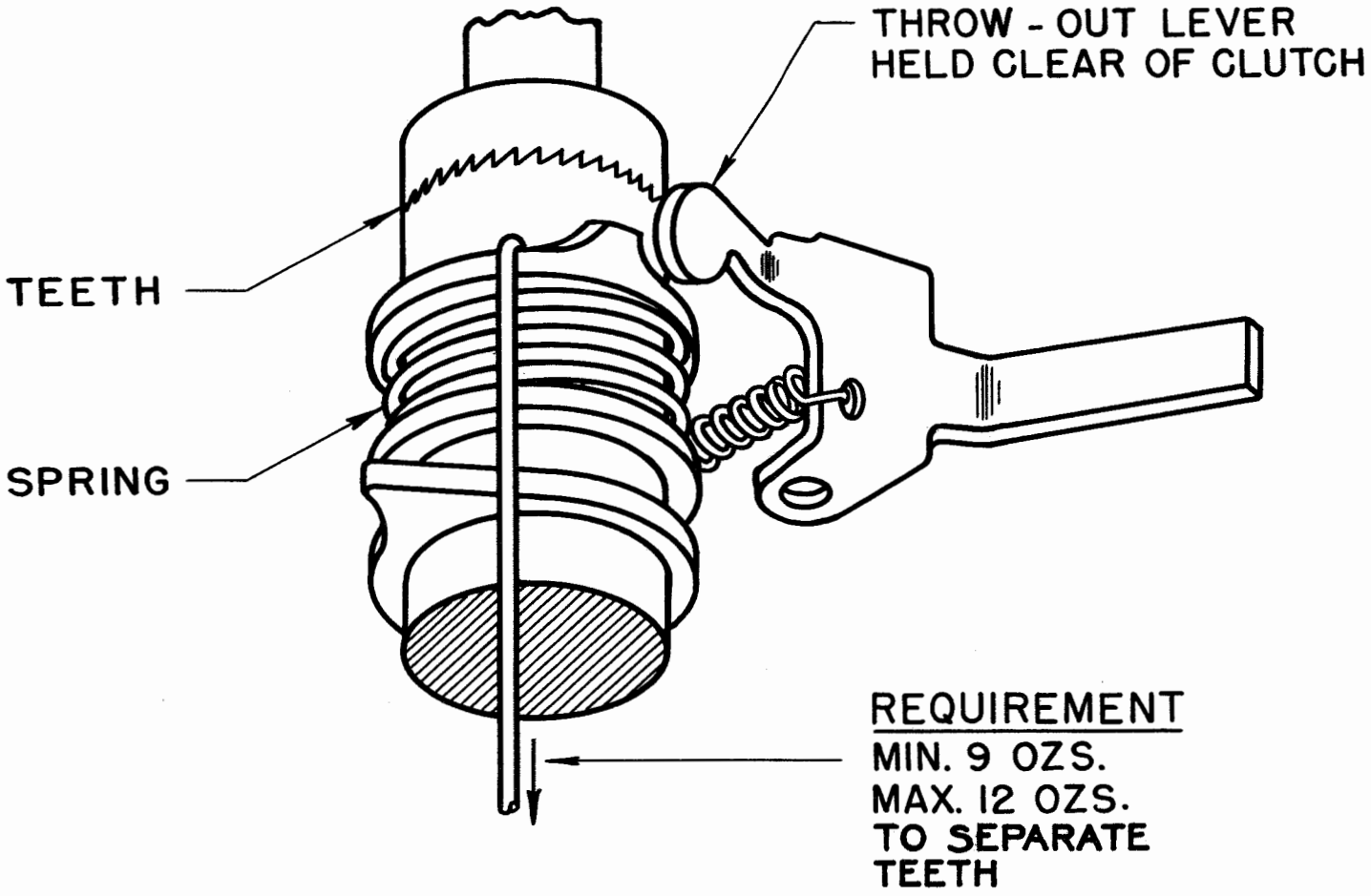

Figure 10

2.13 Tripoff-pawl Stop Plate should be positioned so that the tripoff pawl clears the intermediate pawl by minimum 0.070 inch, maximum 0.080 inch when the tripoff pawl is resting against the front end of the stop plate, and when the intermediate pawl eccentric is positioned with the high part of the eccentric toward the front and its screwdriver slot is horizontal. See Figure 7.

Note: Horizontal position of slot is a preliminary adjustment to be modified as called for subsequently.

2.14 Universal Bar should have endplay not to exceed 0.008 inch when the tripoff-pawl extension is approximately midway between adjacent keylevers and should clear the bottom of the keylevers by minimum 0.060 inch, maximum 0.090 inch when the levers are in their normal unoperated position. See Figure 7.

Adjust Endplay: By shifting bearing brackets, keeping the brackets in their rearmost position (toward the selector bars), parallel to the front edge of the selector-bar-assembly bracket.

Adjust Clearance: By adding or removing shims under universal bar bearing brackets.

2.15 Intermediate Pawl

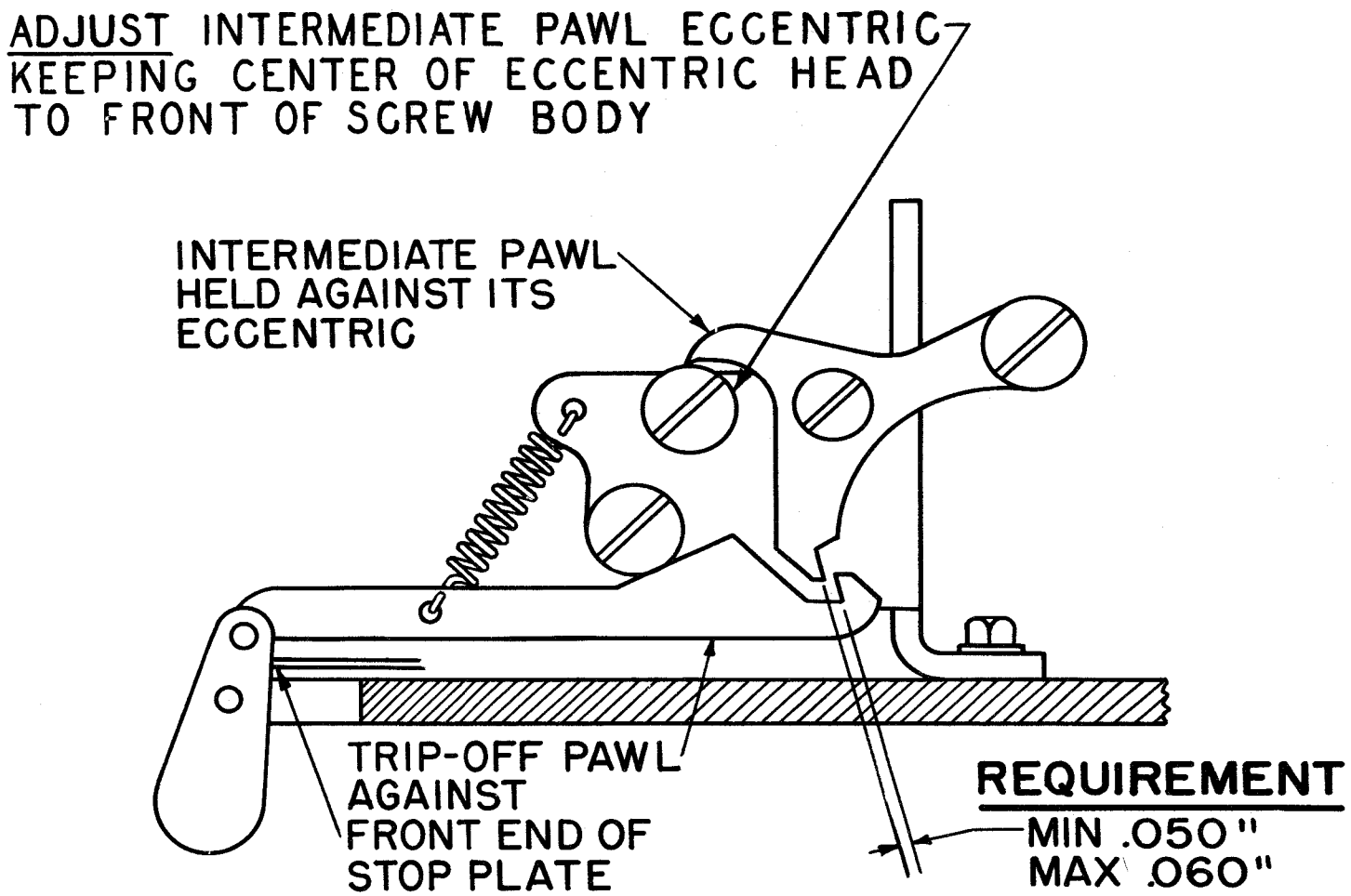

Figure 11

2.16 Intermediate Pawl should be held firmly between the clutch-throwout-lever eccentric and the intermediate pawl eccentric when the transmitter shaft is in the stop position and the clutch fully disengaged. Gauge by eye and feel. See Figure 7.

To Adjust: Position clutch-throwout-lever eccentric.

2.17 Tripoff Pawl

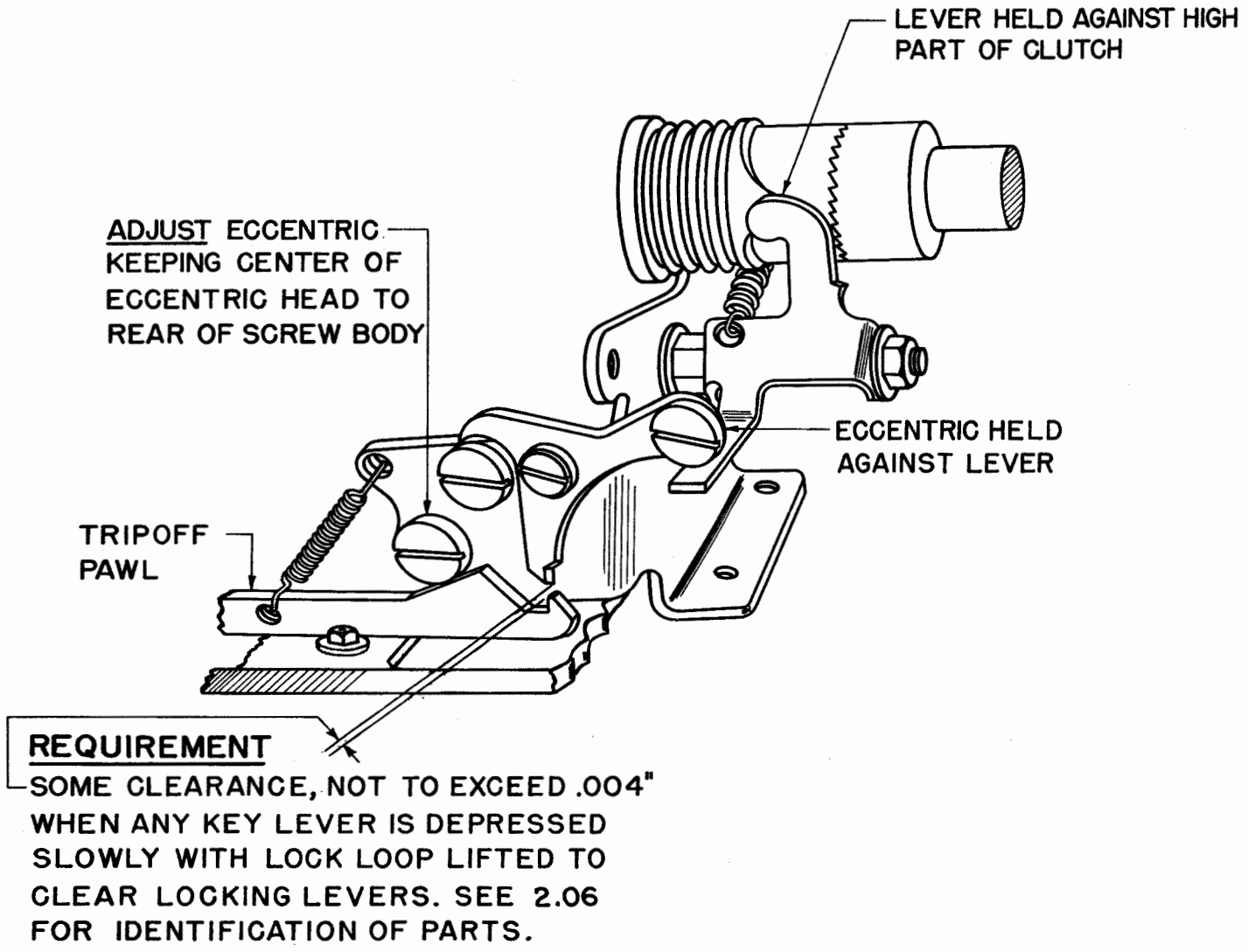

Figure 12

2.18 Tripoff Pawl Spring

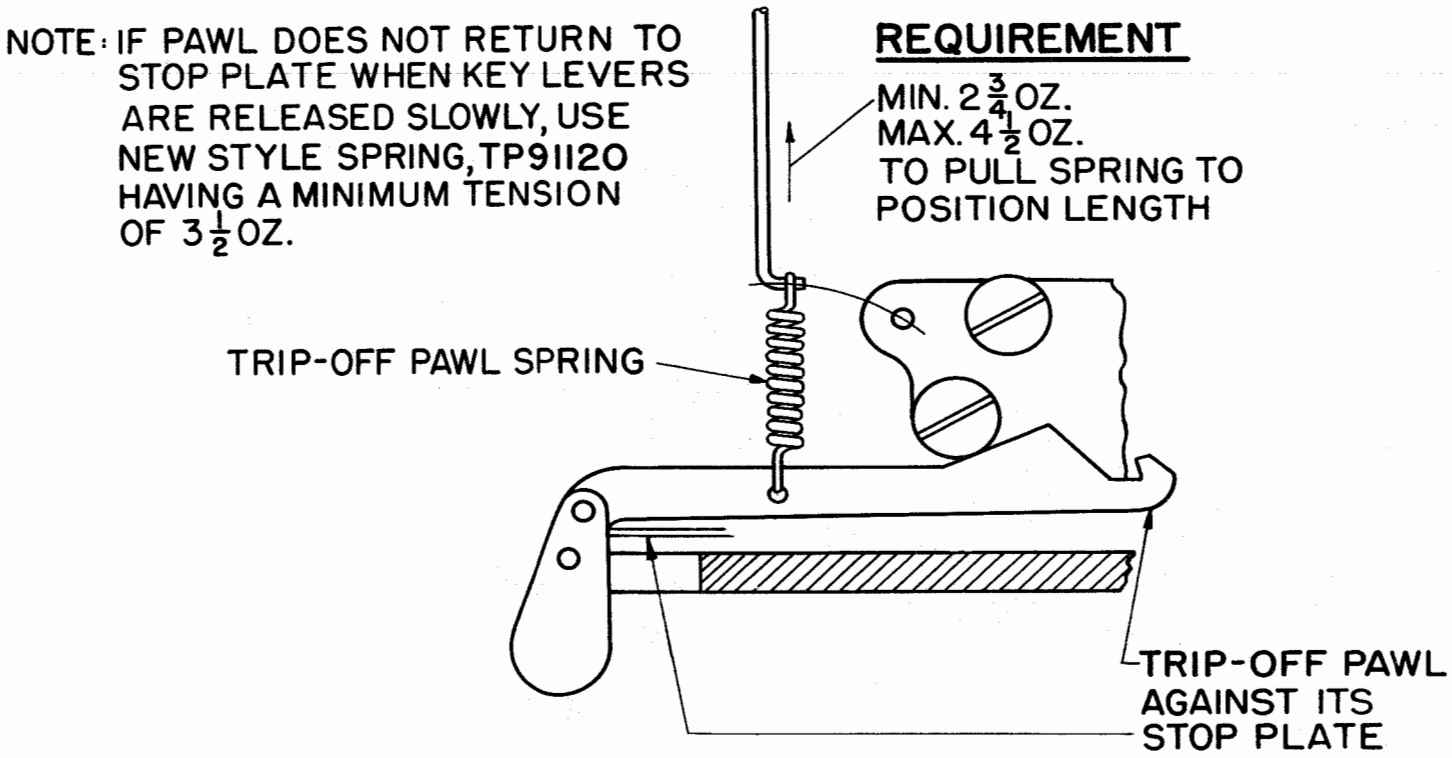

Figure 13

2. 19 Clutch Throwout Lever Spring

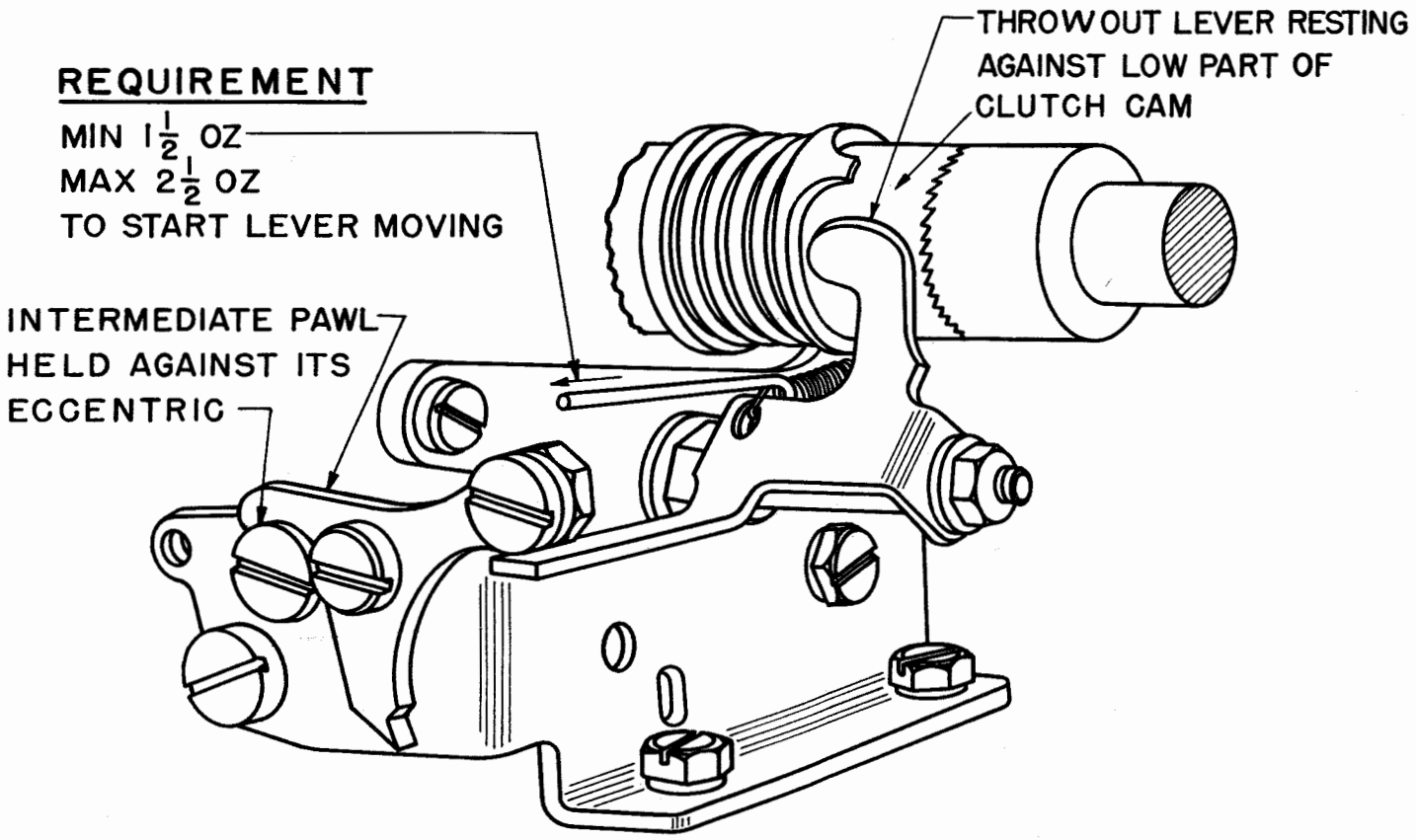

Figure 14

2.20 Transmitting Contact Spring Gap

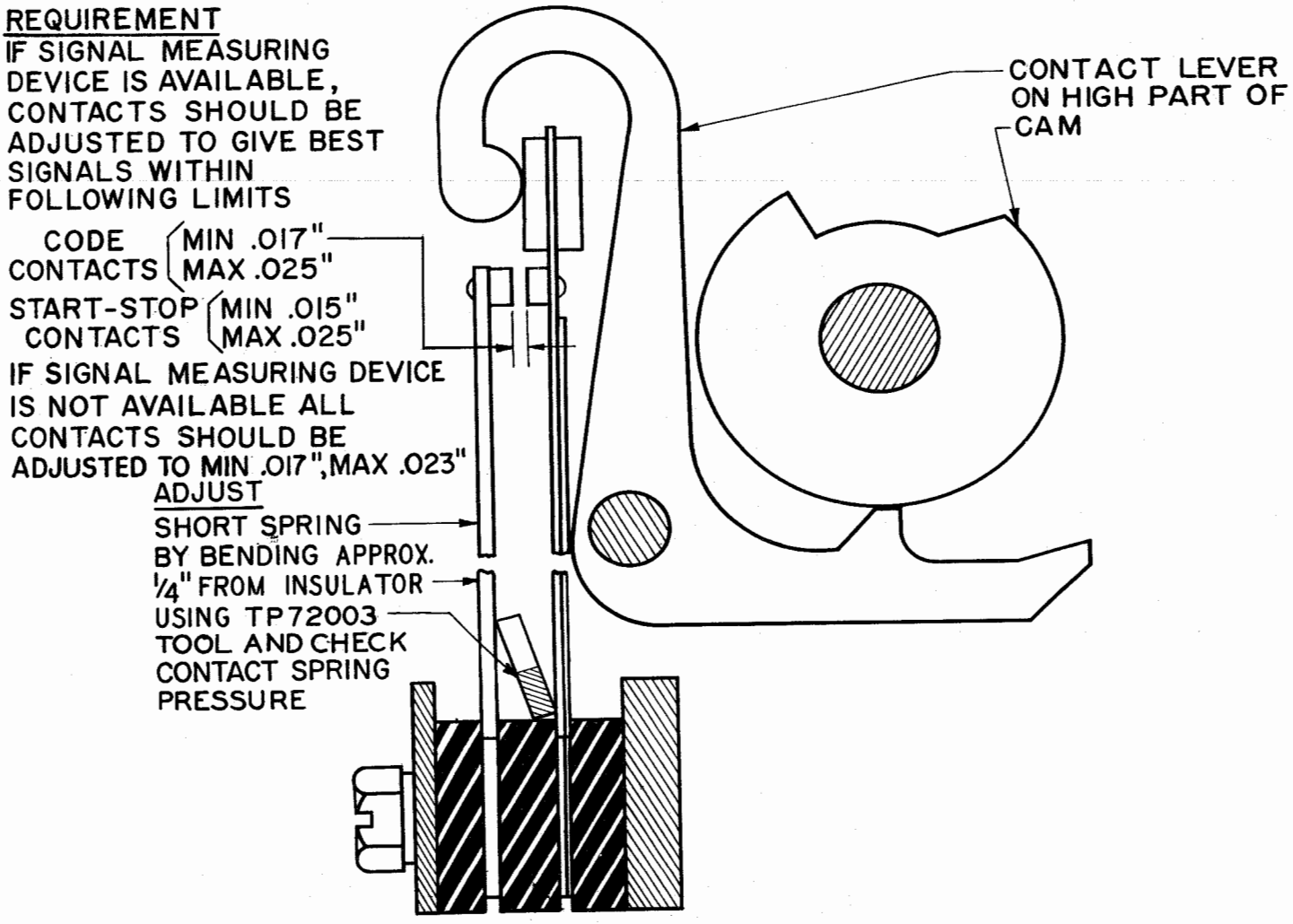

Figure 15

2. 21 Transmitting Contact Spring Pressure

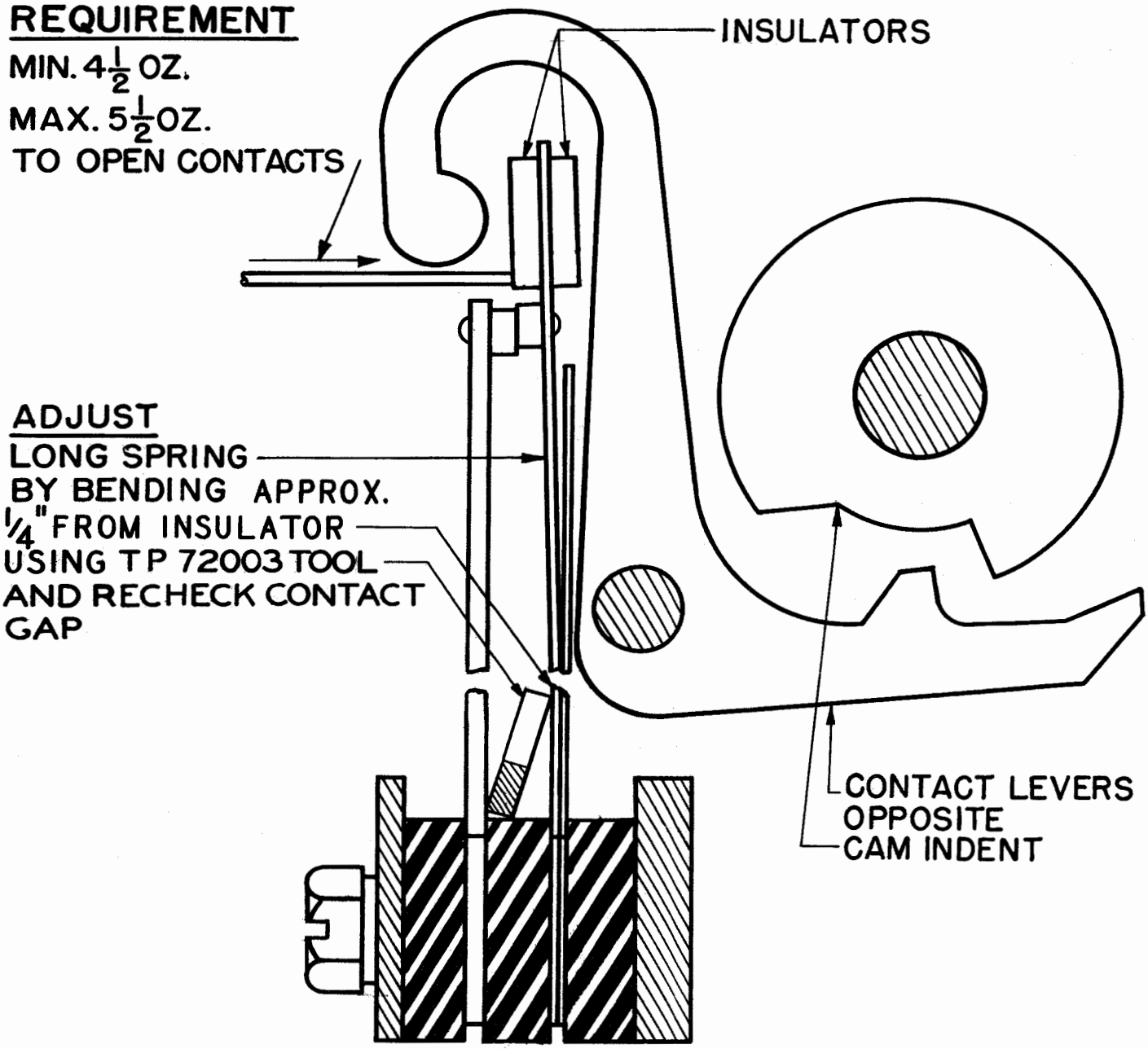

Figure 16

2.22 Keylever Springs: The opening of the keylever springs when removed from the keyboard should be:

Keylever Spring	When Space Keylever Location Is	
	At Left End	Central
Character	1-3/16 inches	1-3/16 inches
Function	1-3/16 inches	1-9/16 inches
Space—Long Bar	1-15/16 inches	1-5/8 inches
Space—Short Bar	-	1-5/8 inches

To Adjust: Bend spring. See Figure 17.

2.23 Spacebar Repeat-space Extension horizontal portion should be approximately parallel to the spacebar. Its vertical portion should be approximately centrally located between adjacent keylevers. Gauge by eye.

To Adjust Horizontal Extension: Bend extension until parallel with spacebar. To adjust vertical extension of units having space keylever at left end, bend vertical extension. If unit has space keylever at center, position extension on mounting screws.

2.24 Repeat-space Rod should clear the transmitter rear bracket by not more than 0.008 inch when the keyboard-control operating lever is in its upper KEYBOARD position. See Figure 18.

(1) On units equipped with one-piece repeat-space-rod bracket, the spacebar is depressed until its keylever bottoms lightly in the two front selector bars and the upper portion of the repeat-space rod is resting against its bracket. See Figure 18A.

(2) On units having the two-piece repeat-space-rod bracket, the spacebar should be fully depressed. See Figure 18B.

Note: Check clearance along entire flat surface of bracket where rod travels.

To Adjust: Position repeat-space-rod mounting bracket keeping its front face parallel to the rear surface of the transmitter.

2.25 Repeat-space-rod Spring should have a tension of minimum 1 ounce, maximum 2 ounces, measured by pulling in line with the spring on the repeat-space rod just in front of the spring hole as the rod starts to move.

Note: If the spacebar does not return to normal when released slowly, the repeat-space-rod spring may be replaced by a TP72473 spring having a tension of minimum 1/4 ounce, maximum 1 ounce.

2.26 Clutch Throwout Lever should clear the high part of its cam by minimum 0.010 inch, maximum 0.020 inch when the keyboard-control operating lever is in its upper KEYBOARD position and the spacebar is depressed until its lever bottoms lightly in the two front selector bars. See Figure 19.

To Adjust: Position repeat-space-rod adjusting nuts.

2.27 Keyboard-control Operating Lever should require minimum 20 ounces to move the lever from its upper KEYBOARD position to its middle KBD & TAPE position. See Figure 20.

To Adjust: Position detent bracket.

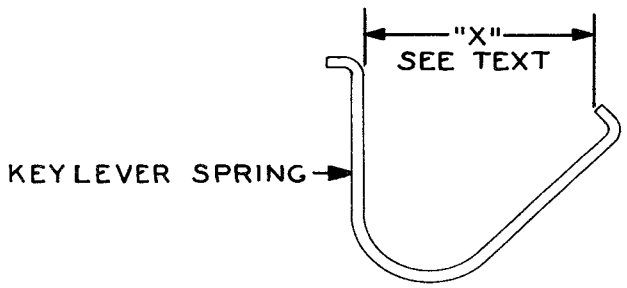

Figure 17

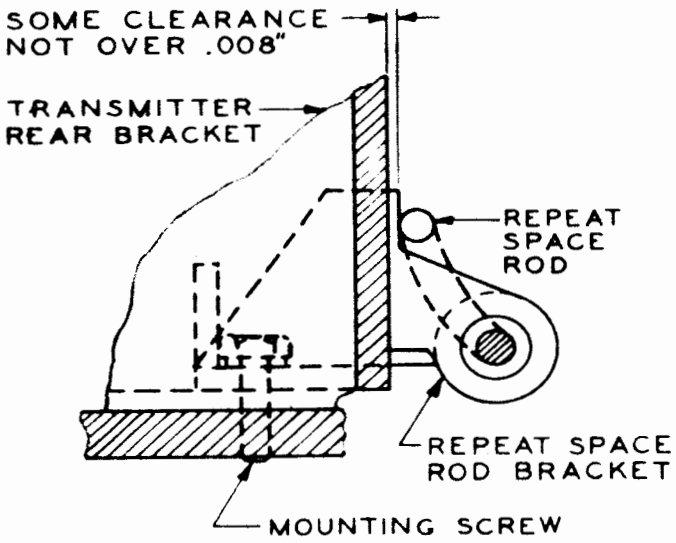

Figure 18A — One-piece Repeat-space-rod Bracket

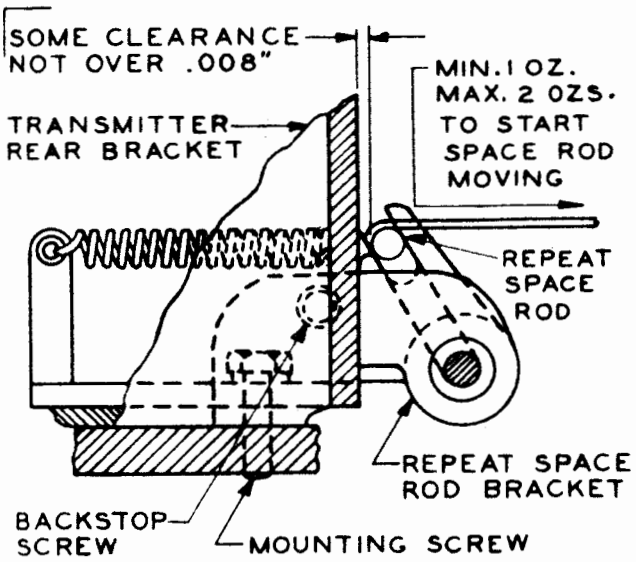

Figure 18B — Two-piece Repeat-space-rod Bracket

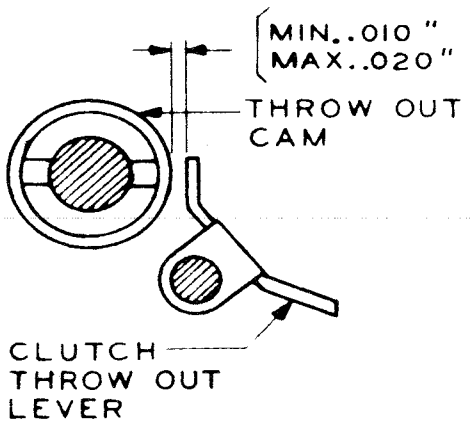

Figure 19

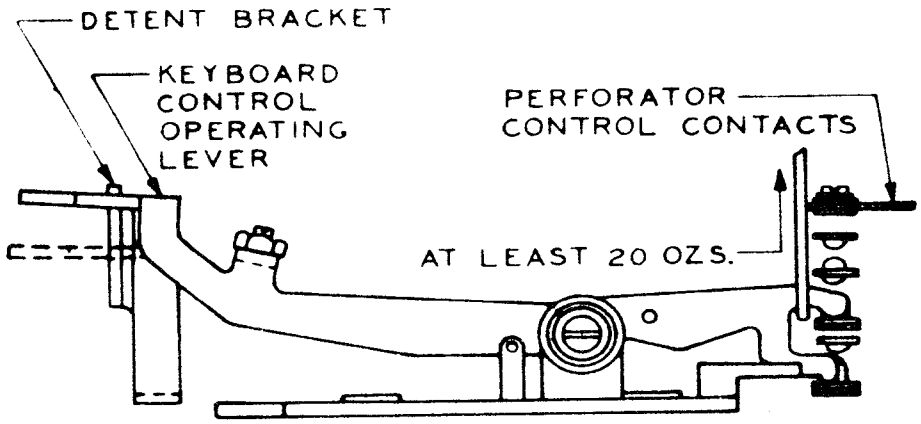

Figure 20

2.28 Repeat-space Rod Cutout Bracket: Repeat-space rod should clear the intermediate pawl by minimum 0.010 inch, maximum 0.020 inch when the keyboard-control operating lever is in its lower TAPE position and the spacebar is depressed until its lever bottoms lightly in the two front selector bars. See Figure 21.

To Adjust: Position repeat-space-rod cutout bracket.

Note: Requirements 2.29, 2.30, and 2.31 apply to perforator-transmitters equipped with TP89069 modification kit for holding the universal bar depressed when the keyboard-control operating lever is in the lower TAPE position.

2.29 Universal Bar should clear any fully depressed keylever by not more than 0.025 inch when the keyboard-control operating lever is in its lower TAPE position. See Figure 22.

To Adjust: Position universal bar cutout lever eccentric stud.

2.30 Tripoff Pawl should clear the intermediate pawl by minimum 0.015 inch, maximum 0.030 inch at the point of minimum clearance when the keyboard-control operating lever is moved slowly from the middle KBD & TAPE position to lower TAPE position. See Figure 22.

To Adjust: Bend the keyboard-control operating lever extension.

CAUTION: DO NOT BEND SUFFICIENTLY TO CAUSE THE TRIPOFF PAWL TO BE JAMMED BETWEEN THE OPERATING-LEVER EXTENSION AND THE CASTING WHEN THE OPERATING LEVER IS IN THE LOWER TAPE POSITION.

2.31 Universal Bar Cutout Lever should clear the universal bar by not more than 1/16 inch when the keyboard-control operating lever is in the middle KBD & TAPE position. See Figure 23.

Gauge: By observing the travel of the cutout lever when it is depressed until it touches the universal bar.

To Adjust: Bend universal bar cutout lever return spring.

2.32 Tripoff Pawl on units equipped with tripoff-pawl cutout screw should clear the intermediate pawl by at least 0.010 inch when the keyboard-control operating lever is in the lower TAPE position, the clutch-throwout lever is on the low part of its cam and any keylever is depressed slowly. See Figure 24.

To Adjust: Position tripoff pawl cutout screw.

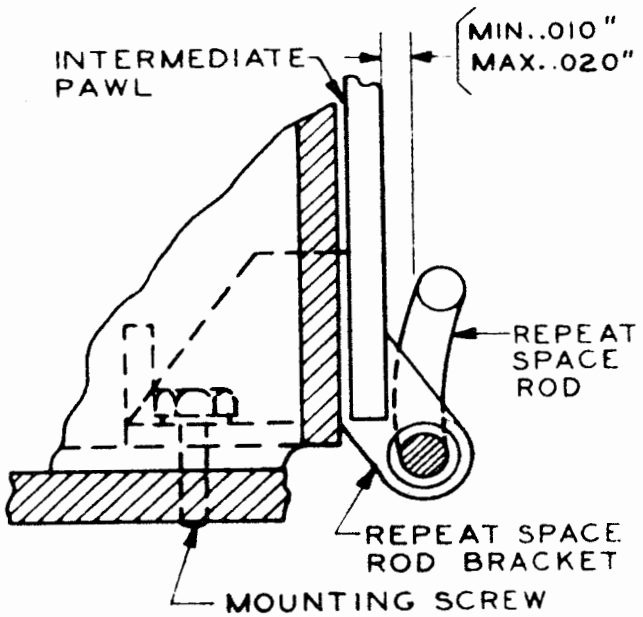

Figure 21

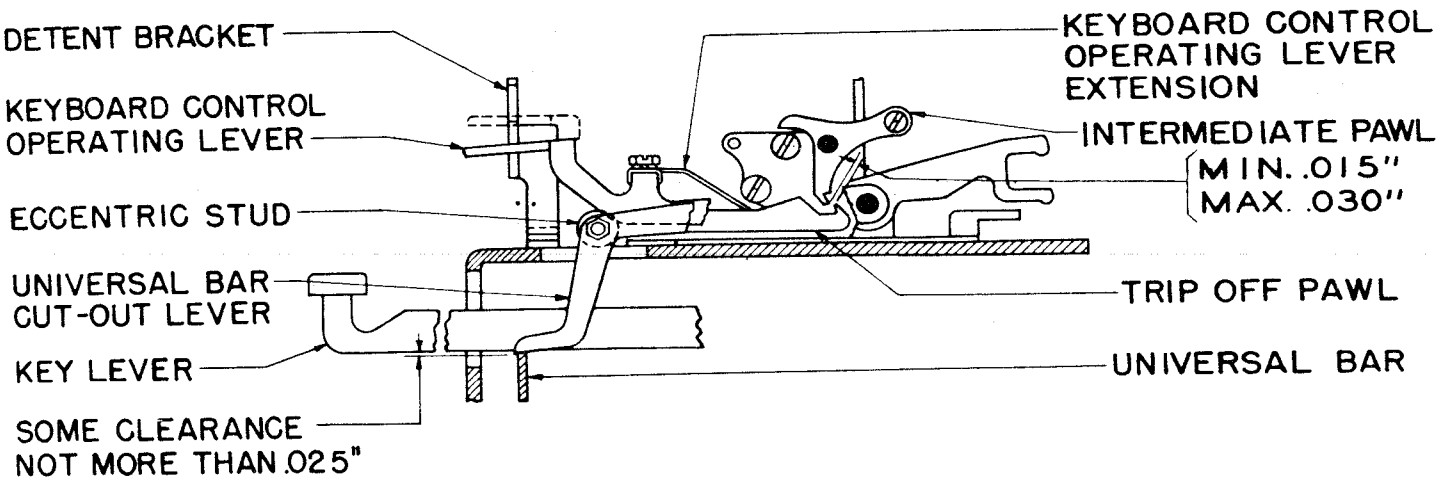

Figure 22

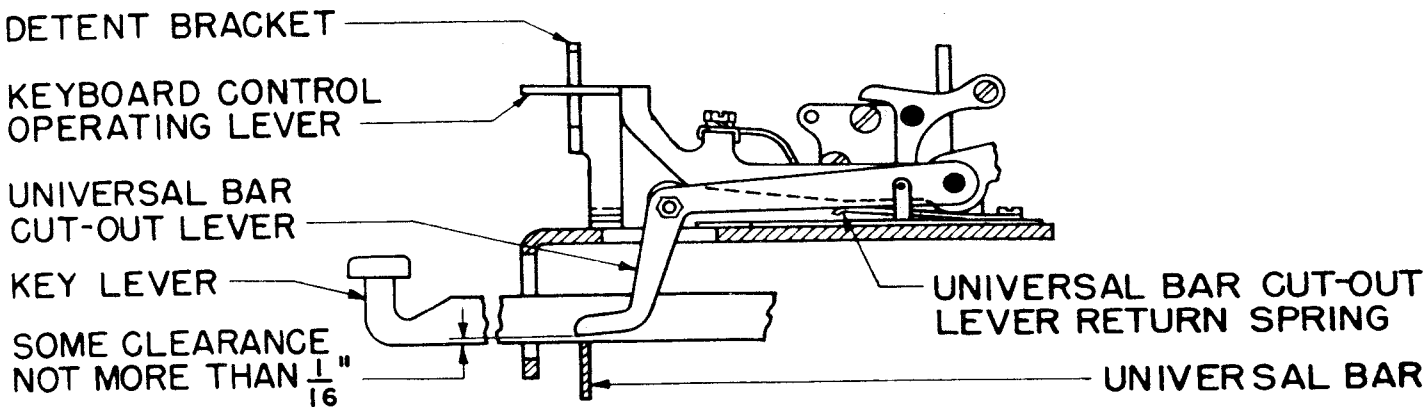

Figure 23

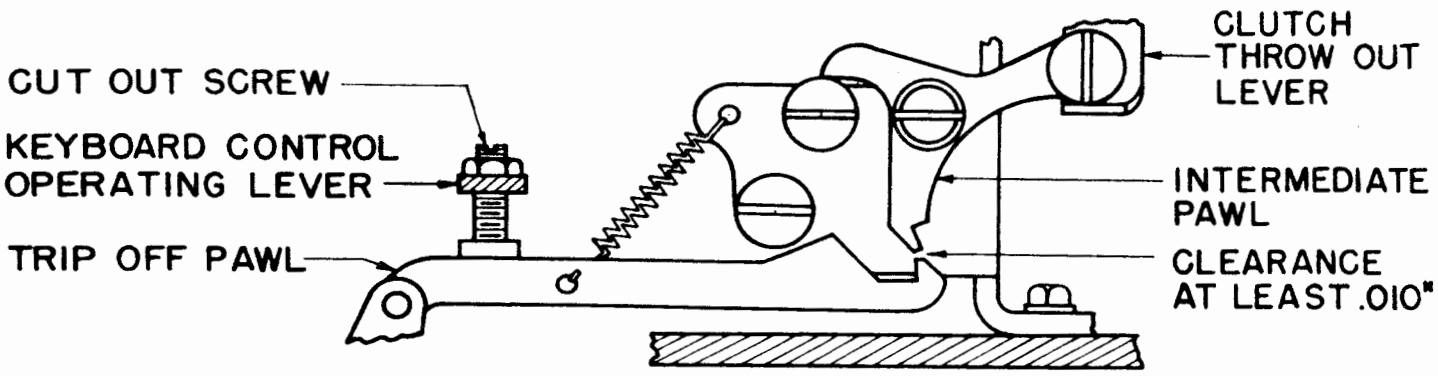

Figure 24

3. PERFORATOR MECHANISM

Note: Remove keyboard control contact cover.

3.01 Keyboard-control Contact Springs: Perforator-control contact springs should meet the following requirements when the keyboard-control operating lever is in the upper KEYBOARD position. See Figure 25.

(1) Both prongs of the keyboard-control operating lever should rest fully on the insulating tips of contact springs No. 3 and No. 5 and neither prong shall touch the insulator rivets. Gauge by eye.

(2) No. 5 springs should clear the keyboard casting by not less than 0.010 inch. Gauge by eye.

(3) Gap between contacts on the No. 4 and No. 5 springs should be minimum 0.015 inch, maximum 0.040 inch.

Adjust: (1) by positioning contact assembly bracket, (2) by bending No. 5 spring between contact and insulating tip, and (3) by bending No. 4 spring.

3.02 Keyboard-control Contact Springs should meet the following requirements when the keyboard-control operating lever is in the middle KBD & TAPE position. See Figure 26.

(1) Insulating tip of No. 5 spring should clear the lower prong of the keyboard-control operating lever by not less than 0.015 inch.

(2) Gap between contacts of the No. 2 and No. 3 springs should be minimum 0.015 inch, maximum 0.040 inch.

Note: The No. 3 spring should be resting against the upper prong of the lever when measuring this gap [see 3.03(2)].

(3) Gap between contacts of the No. 1 and No. 2 springs should be minimum 0.015 inch, maximum 0.025 inch.

(4) Contacts on No. 1 and No. 2 springs should make contact when a vertical pull of not more than 1-1/2 ounces is applied at the end of the No. 2 spring.

Adjust: (1) by bending No. 4 spring, (2) by bending stiffener of No. 2 spring, (3) by bending the No. 1 spring, and (4) by bending No. 2 spring.

Note: If it is necessary to readjust the No. 2 or No. 4 springs, recheck 3.02(2) and 3.01(3), respectively.

3.03 Keyboard-control Contact Springs should meet the following requirements when the keyboard-control operating lever is in the lower TAPE position. See Figure 27.

(1) Contacts on the No. 4 and No. 5 springs should separate when a push of minimum 2 ounces, maximum 3 ounces is applied on the No. 5 spring adjacent to the contact.

(2) Contacts on the No. 2 and No. 3 springs should separate when a push of minimum 3 ounces, maximum 4-1/2 ounces is applied on the No. 3 spring adjacent to the contact and the No. 2 spring is held to prevent follow.

(3) Contacts on the No. 1 and No. 2 springs should separate when a push of minimum 1/4 ounce is applied on the No. 2 spring adjacent to the contact and the No. 3 spring contact is bearing freely against the No. 2 spring contact.

Adjust: (1) by bending No. 5 spring, (2) by bending No. 3 spring, and (3) by bending No. 2 spring.

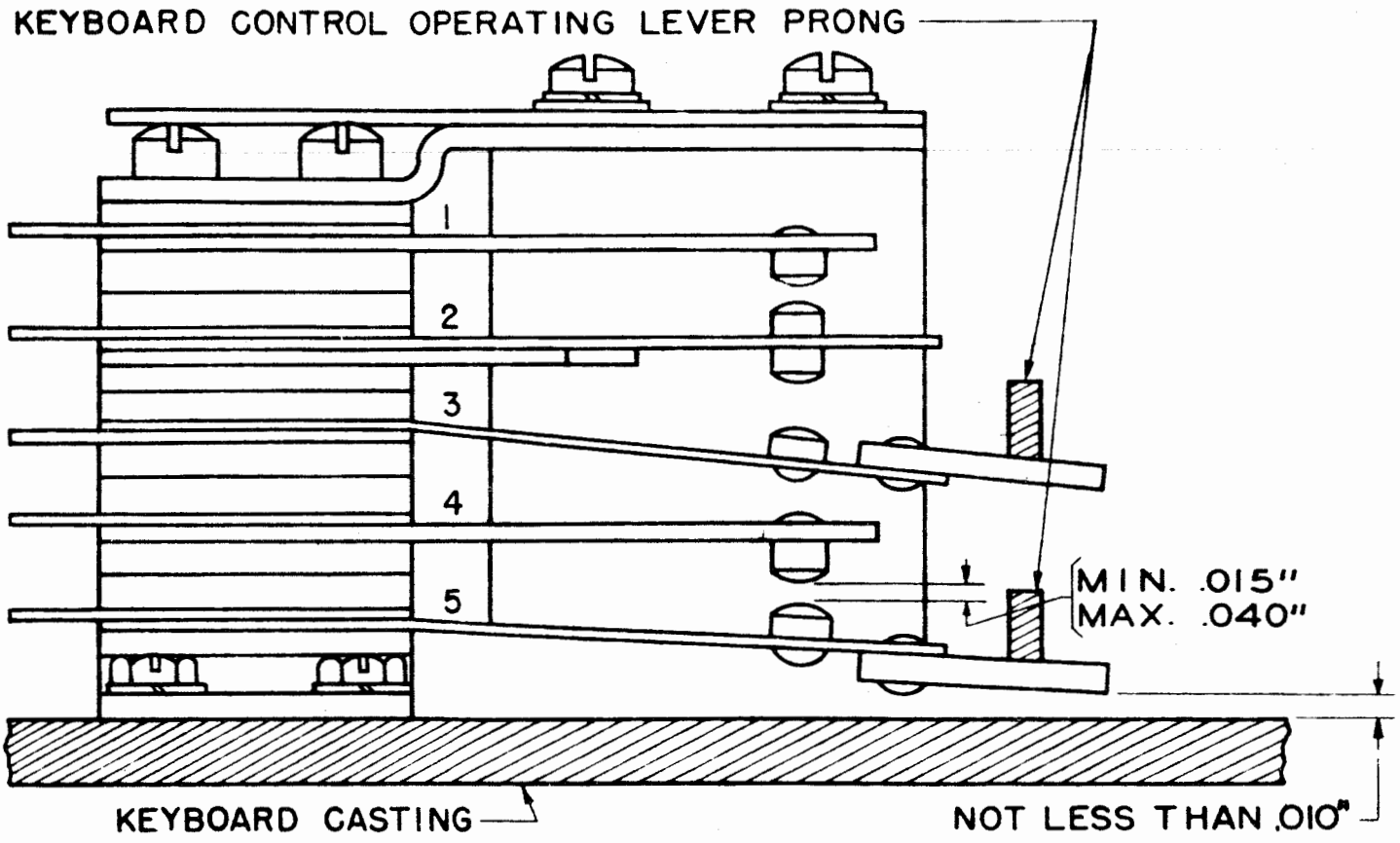
KEYBOARD CONTROL OPERATING LEVER PRONG
1
2
3
4
5
MIN. .015"
MAX. .040"
KEYBOARD CASTING
NOT LESS THAN .010"

Figure 25

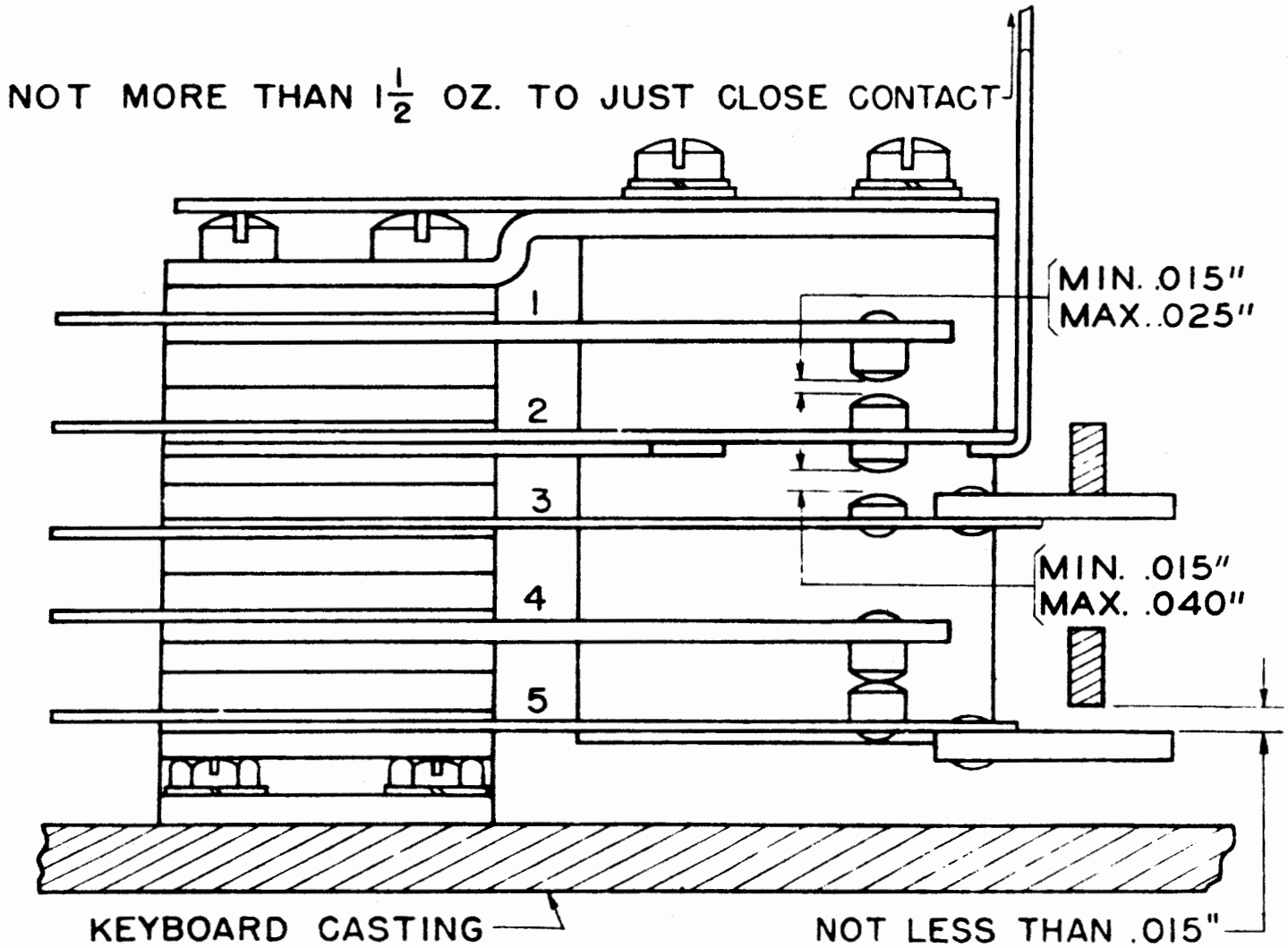
NOT MORE THAN 1½ OZ. TO JUST CLOSE CONTACT
MIN. .015"
MAX. .025"
1
2
3
MIN. .015"
MAX. .040"
4
5
KEYBOARD CASTING
NOT LESS THAN .015"

Figure 26

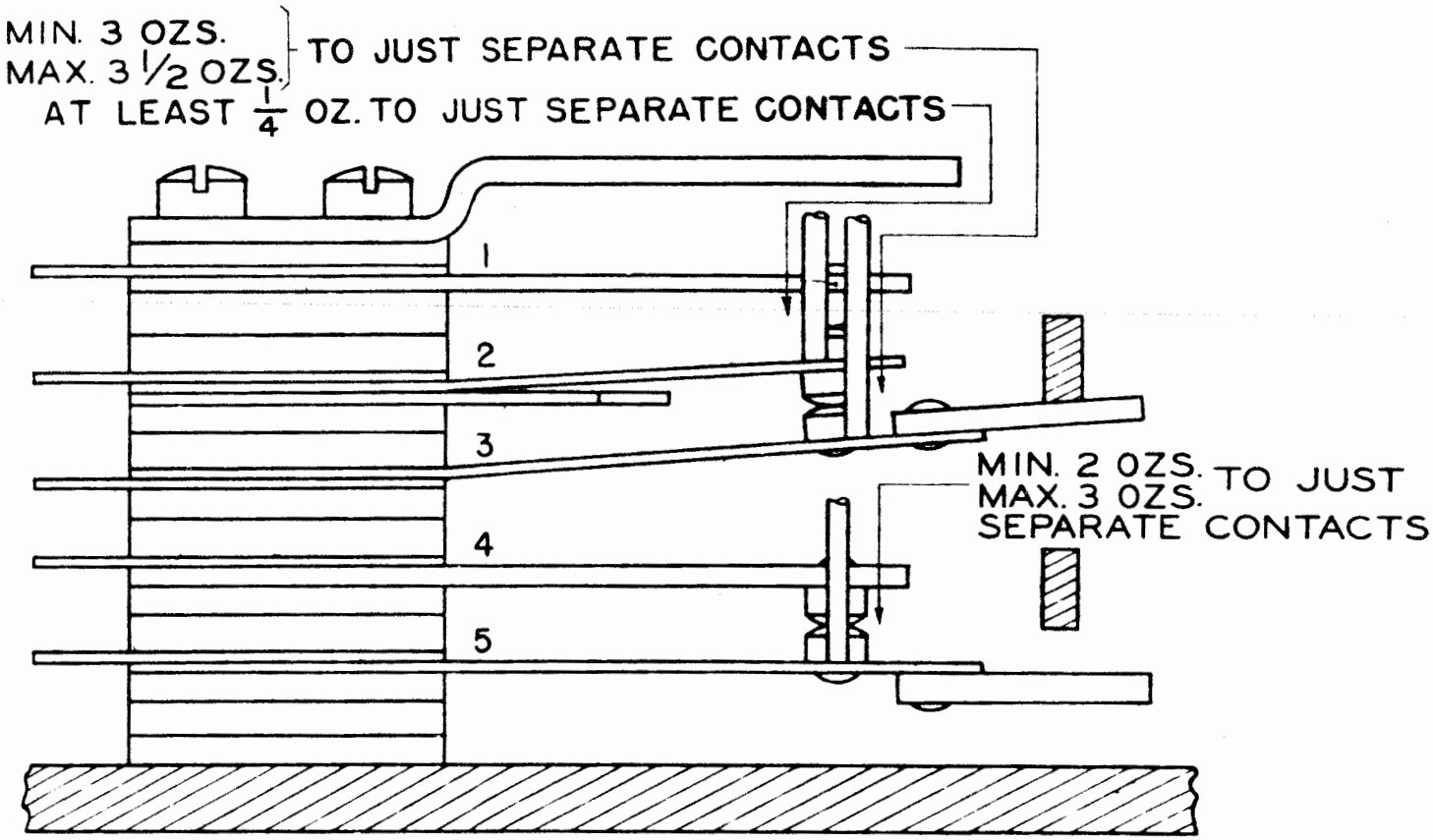

Figure 27

Note 1: If it is necessary to readjust the No. 2 or No. 3 springs, recheck 3.02(2) and (3). If necessary to readjust the No. 5 spring recheck 3.01(2) and (3) and 3.02(1).

Note 2: The spring tensions may require a slight increase in the requirement on the keyboard-control operating lever. See 2.27.

3.04 Cam-pulsing Contact Springs

Note: Except as indicated below, the requirements and adjustments are the same for the old-style nonhinged camfollower (operating spring) and the new-style hinged camfollower.

(1) Tip of Camfollower on High Part of Cam: See Figure 28A.

(a) Tips of camfollowers should ride centrally on the cams. Gauge by eye.

Adjust by positioning pile-up.

(b) Gap between contacts of upper and lower contact springs should be minimum 0.010 inch, maximum 0.020 inch.

Adjust by bending the lower spring.

(c) (Old style only) Camfollower should clear the lower contact springs by at least 0.015 inch.

Adjust by bending the lower spring.

(2) Tip of Camfollower in Cam-indent: See Figure 28B.

(a) Contacts should meet squarely. Gauge by eye.

Adjust by positioning springs in pile-up.

(b) Contacts on the upper and lower contact springs should separate with a vertical pull of minimum 3-1/2 ounces, maximum 4-1/2 ounces.

Adjust by bending upper contact spring.

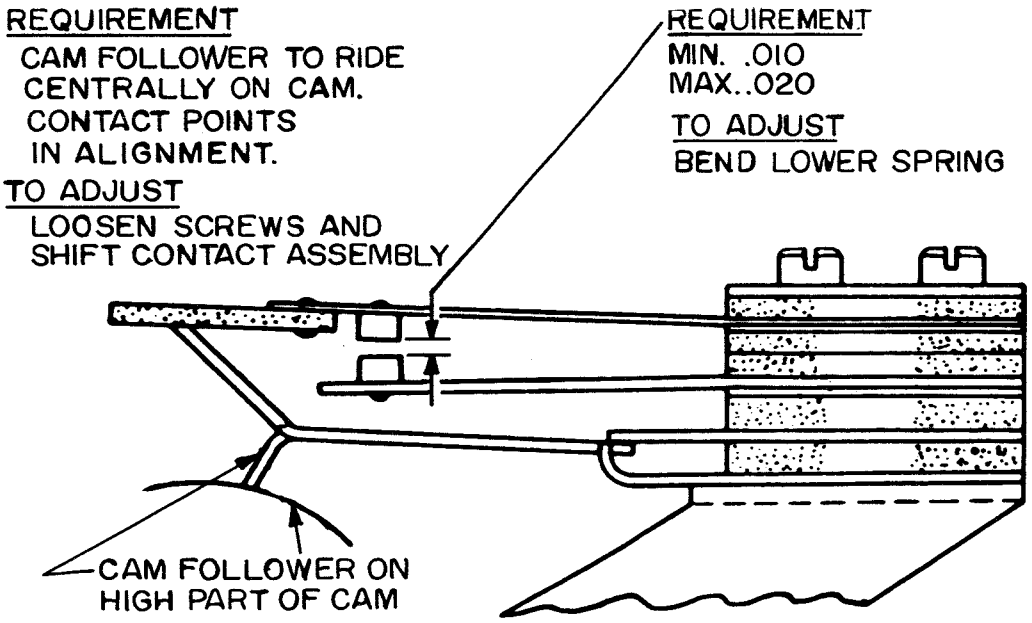

Figure 28A

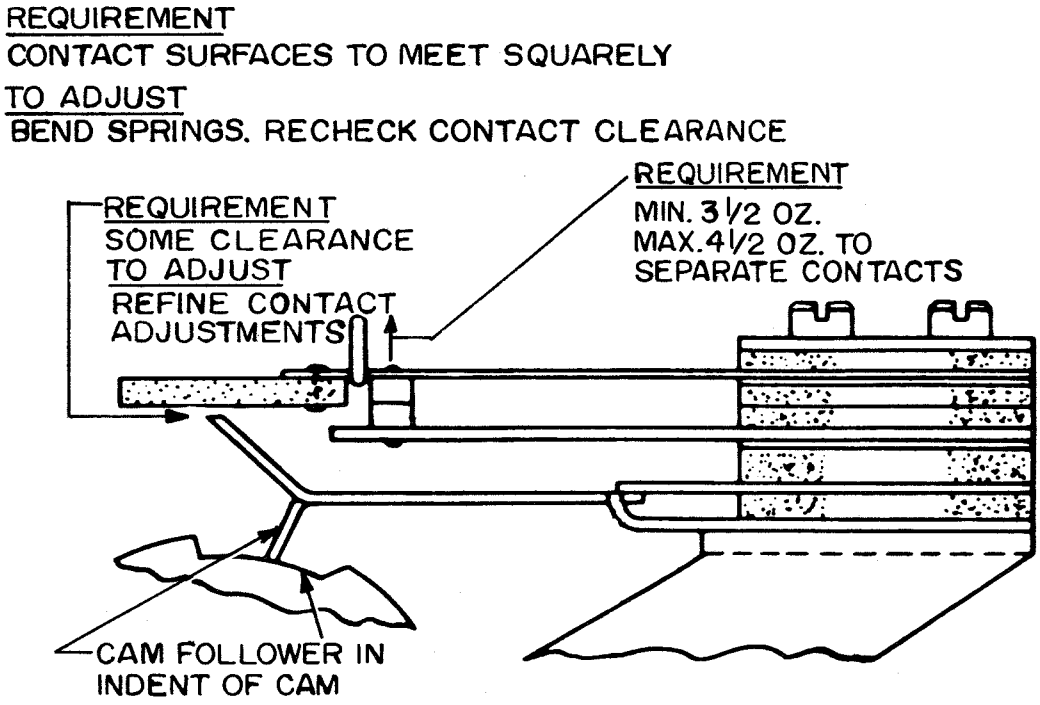

Figure 28B

(c) (New style only) There should be some clearance between the upper edge of the camfollower and the insulator on tip of upper contact.

To Adjust: Refine contact adjustment.

(d) (Old style only) Curved tip of camfollower should clear insulator on tip of upper contact by minimum 0.010 inch, maximum 0.025 inch.

Adjust by bending camfollower stiffener.

(e) (Old style only) Operating spring should separate from the end of its stiffener with a vertical pull of minimum 2 ounces, maximum 3 ounces.

Adjust by bending camfollower

(f) (Old style only) Tip of camfollower should clear low part of cam-indent by at least 0.020 inch.

Adjust by bending camfollower stiffener.

Note: If necessary to bend upper contact spring, recheck 3.04(b) and (c).

3.05 Feed Roll should rotate freely and have endplay not to exceed 0.003 inch when its detent feed pawl and tape-tension lever are held clear of the roll.

To Adjust: Position rear bearing bracket using shims between bracket and punch casting.

3.06 Tape-tension Lever should be centrally located with respect to the feed-roll pins. See Figure 29.

To Gauge:

(a) Take up the feed-roll endplay towards the ratchet and the tension-lever endplay towards its adjusting nut. The edge of the lever slot may touch the feed-roll pins on the side of the pins nearest the ratchet but there must be clearance on the other side.

(b) Take up the feed-roll endplay away from the ratchet and the tension-lever endplay away from the tension adjusting nut. The edge of the lever slot may touch the feed-roll pins on the side farthest away from the ratchet but there must be clearance on the other side.

To Adjust: Add or remove shims between the shoulder on the tape-tension-lever stud and its mounting bracket.

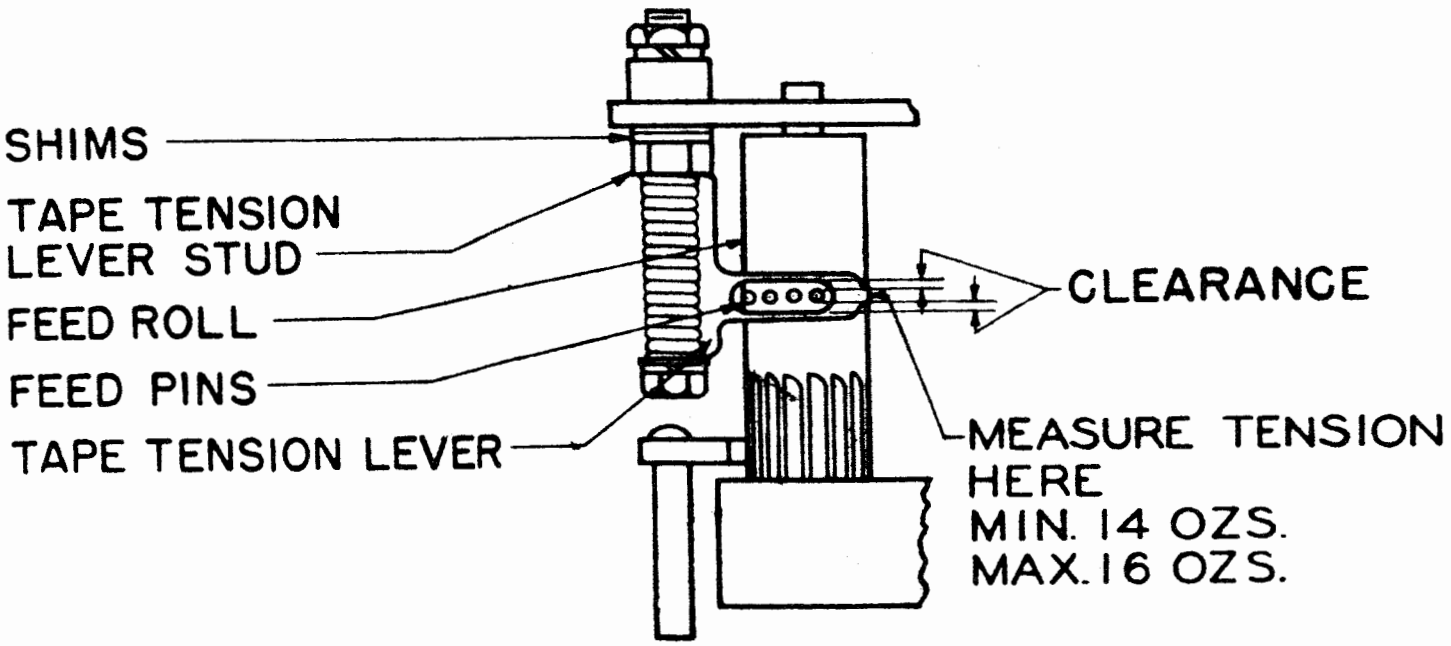

Figure 29

3.07 Tape-tension-lever Spring on units having TP110974 spring (15 turns) should have a tension of minimum 14 ounces, maximum 16 ounces measured at the end of the tape tension lever, pulling perpendicularly to a plane passing through center of tension lever stud and the end of the lever, as the lever starts to move from the feed roll. See Figure 29.

To Adjust: Rotate tape-tension-lever stud clockwise or counterclockwise to increase or decrease tension respectively.

3.08 Tape-tension-lever Spring (old style) on units having TP84023 spring (18 turns) should have a tension of minimum 5 ounces, maximum 5-1/2 ounces measured and adjusted as in 3.07.

3.09 Selector-finger Retaining-fork Spring on units equipped with a retaining roller should have a tension of minimum 3 ounces, maximum 3-1/2 ounces. See Figure 30.

To Adjust: Rotate retaining-fork bearing shaft clockwise or counterclockwise.

3.10 Tape-feed-pawl Release-cam Spring on units having feed pawl attached to the armature lever should have a tension of minimum 3-1/2 ounces, maximum 4-1/2 ounces when the backspace lever is in its unoperated position. See Figure 30.

3.11 Backspace-pawl Spring on all units should have a tension of minimum 1 ounce, maximum 2 ounces. See Figure 30.

3.12 Feed-roll Detent - Preliminary Setting: Centers of feed punch and feed-roll pin should be approximately 0.600 inch apart when the punch-operating lever is in its operated position.

Note: For Final setting see 3.51.

To Adjust: Position feed-roll-detent eccentric so that the feed pin centers in the middle hole of a TP73517 gauge when the latter is inserted in the punch block with its projection against the feed punch. See Figure 31.

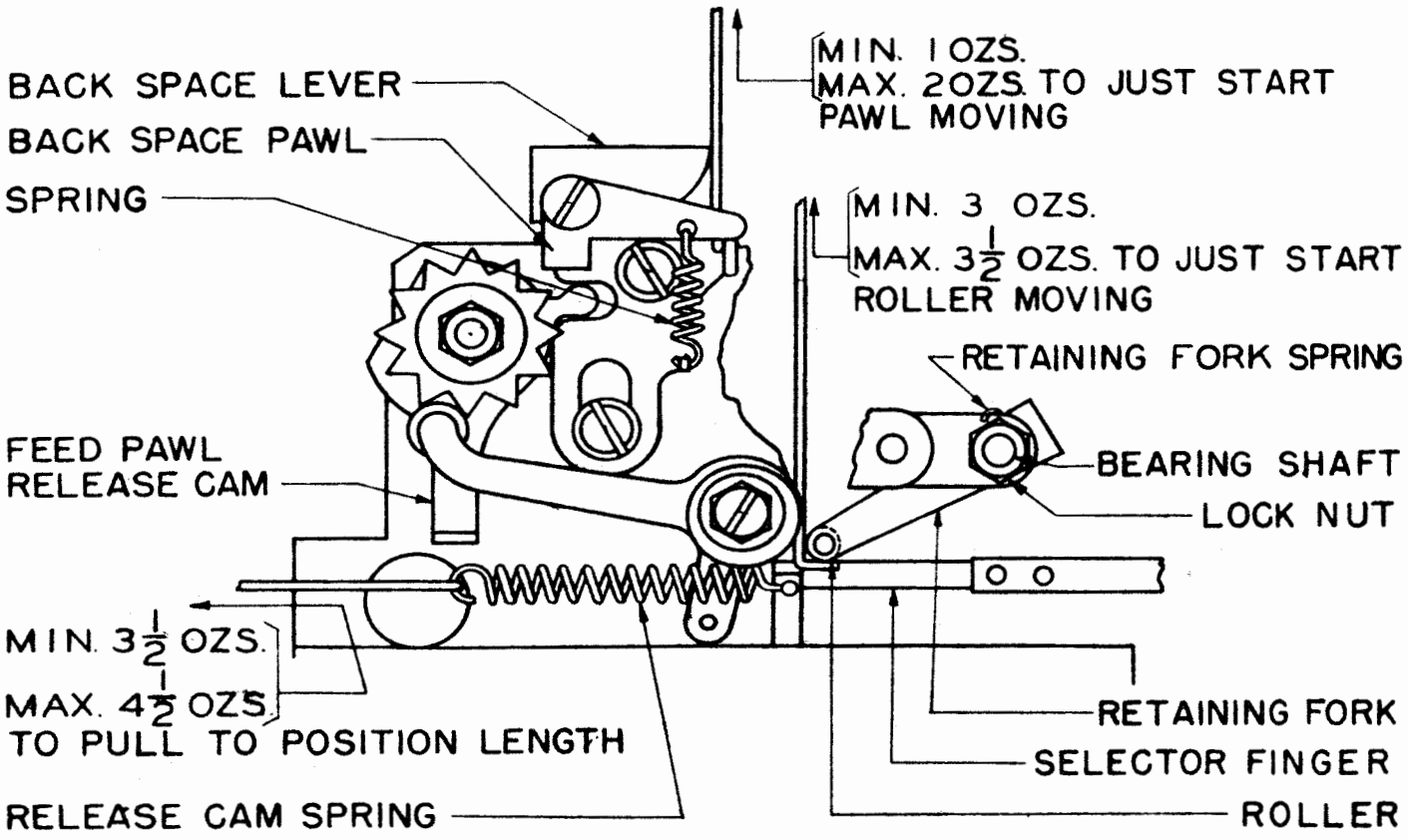

Figure 30

CAUTION: TO AVOID DAMAGING THE TP73517 GAUGE BY ACCIDENTAL OPERATION OF THE PUNCH PINS, HOLD THE ARMATURE OPERATED BY WEDGING A KS-6320 ORANGE STICK BETWEEN THE ARMATURE AND THE LEFT-STOP ADJUSTING SCREW BEFORE INSERTING THE TP73517 GAUGE.

(a) If adjustment above cannot readily be obtained with the greater portion of the eccentric below its mounting screw, turn it until the greater portion is above its mounting screw to make this adjustment.

(b) On units equipped with the TP99037 modification kit, the adjustment above must be made with the greater portion of the eccentric below its mounting screw if there is interference between the locknut, on the post supporting the backspace-lever spring, and the feed-roll-detent lever.

Note: Interference is likely to occur only when a corner of the nut is downward in its tightened position.

3.13 Feed-roll-detent Spring (when not equipped with TP99037 modification kit) should

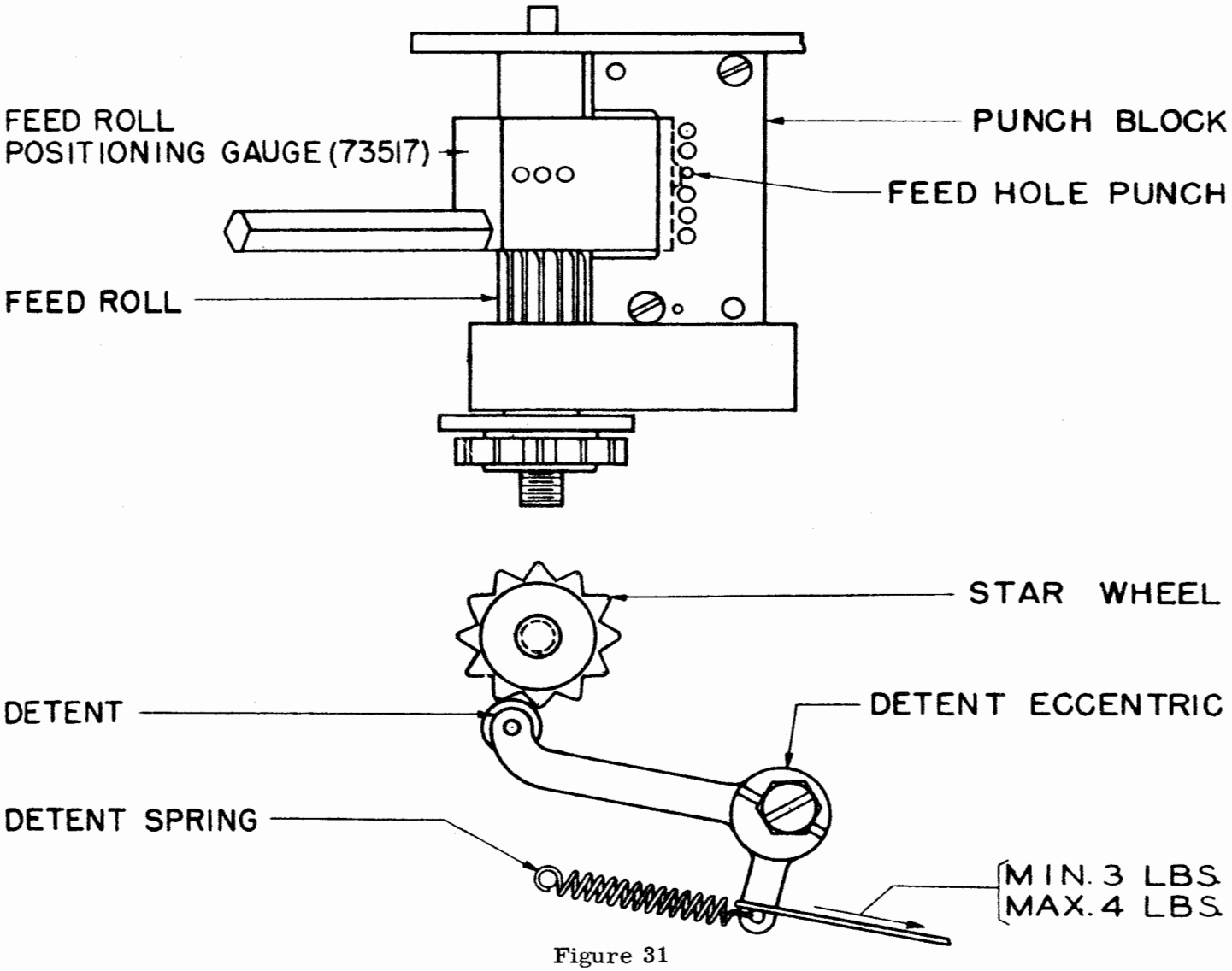

Figure 31

have a tension of minimum 3 pounds, maximum 4 pounds, measured when the detent roller starts moving from the star wheel. See Figure 31.

Note: If irregular spacing occurs when the unit is operated at high speed, replace the punch-operating-lever spring with one which exerts a tension nearer the minimum limit or replace the feed-roll-detent spring with one which exerts a tension nearer the maximum limit, or if necessary replace both springs.

3.14 Feed-roll-detent Spring (when equipped with TP99037 modification kit) should be tensioned to require a downward pull applied to the head of the detent-roller bearing screw, of minimum 15 ounces, maximum 17 ounces to start the roller away from the star wheel.

To Adjust: Loosen locknut, turn thumbnut on adjusting screw and retighten locknut.

Note: Remove chad chute and tape-stripper plate for requirement 3.15.

3.15 Punch-selector Fingers, except those for feed punch, should move freely in their guide slots, should line up with each other within 1/2 the diameter of the punch pins, and the ends of the uppermost sections of the fingers should line up as shown in Figure 31(A), when the M, LINE FEED, and LTRS keylevers are depressed simultaneously until stopped by the code bars. The limiting range of positions at which any of the code-punch-selector fingers should stop is shown in Figure 32(A). Gauge by eye. When checking this adjustment, hold the three keylevers depressed and take up the play of the selector levers and fingers in a direction to make the engagement with the punches a maximum.

To Adjust: Position selector-lever bearing and guide brackets. See Figure 33 for identification of parts.

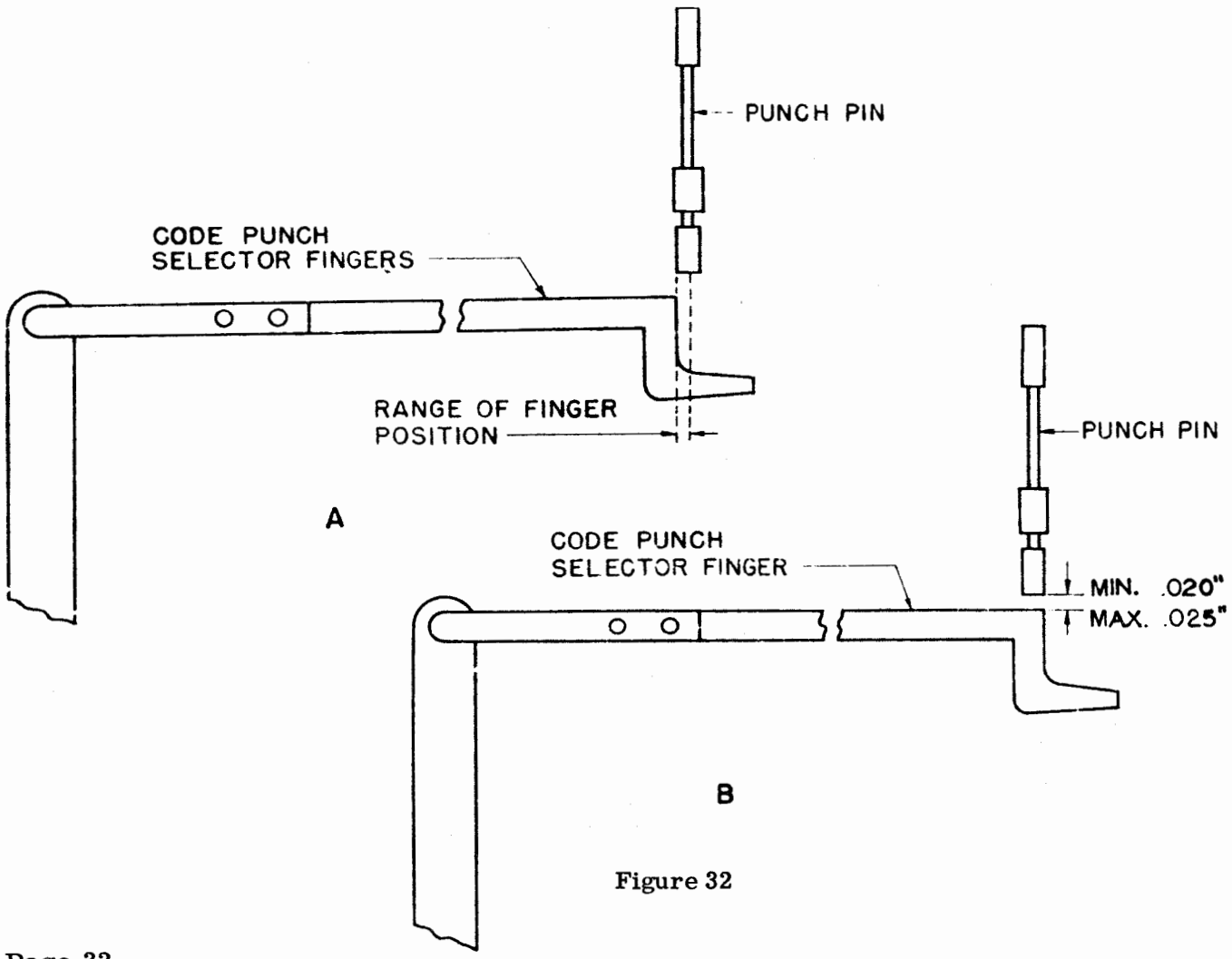

Figure 32

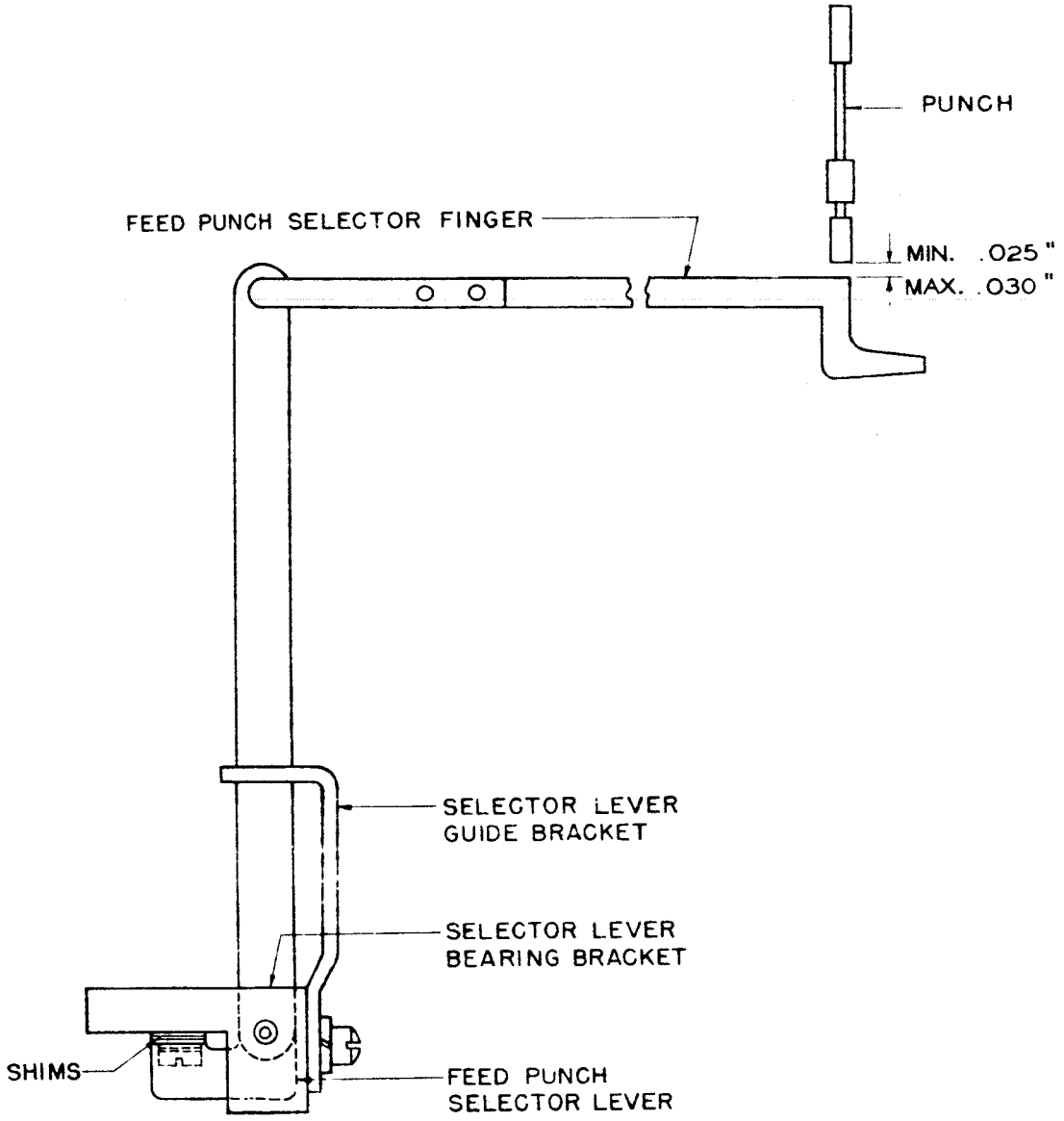

Figure 33

3.16 Tape-guide Spring should hold tape securely against side of the guide adjacent to No. 1 punch with the maximum pressure which will not buckle the tape, and the spring should be parallel to the edge of the casting on which it is mounted or inclined slightly to the rear. Gauge by eye and feel.

To Adjust: Bend spring and recheck requirement with the cover in place.

3.17 Feed-punch-selector Finger, on units equipped with an adjustable feed-punch-selector lever, should have the end of the uppermost section in line with the edge of the feed punch pin. Gauge by eye. See Figure 33.

To Adjust: Add or remove shims TP84592 between the formed-over ear on the bottom of the selector lever and the selector lever bracket.

3.18 Left Armature Stop on units not equipped with TP99037 modification kit should be so positioned that each code-punch-selector finger clears its associated punch pin by minimum 0.020 inch, maximum 0.025 inch, when the ends of the uppermost section of the fingers line up with the edges of the punches, and when the armature lever is against its left stop. See Figure 32B.

To Adjust: Position left-stop adjusting screw and recheck after tightening locknut.

3.19 Left Armature Stop on units equipped with TP99037 modification kit should be so positioned that the feed-punch-selector finger clears the feed punch by minimum 0.025 inch, maximum 0.030 inch, when the end of the uppermost section of the finger lines up with the edge of the punch and when the armature lever is against its left stop. See Figure 33.

To Adjust: Position left-stop adjusting screw and recheck after tightening locknut.

3.20 Armature-lever Spring on units not equipped with TP99037 modification kit should have a tension of minimum 4-1/2 pounds, maximum 5-1/2 pounds when the lever starts to move from its left stop. See Figure 34.

Note: See Note under 3.13.

3.21 Feed-pawl Tension Spring: When unit is equipped with TP99037 modification kit feed-pawl tension spring should require from 3 to 4 pounds to stretch it into the post while its other end is hooked in place at the lower end of the feed pawl and the armature lever is in its unoperated position. See Figure 35.

3.22 Punch-selector-finger Retainer:

(a) On units equipped with a selector-finger retaining roller the roller should be approximately parallel to the plane of the tops of the selector fingers when the fingers are as far to the right as possible.

To Adjust: Twist the side pieces vertically.

(b) On units equipped as in (a) and also with a selector-finger guide attached to armature lever with two screws, the roller should clear all punch-selector fingers except the feed-punch-selector finger. Check to see that the retainer does not bind against any of the punch-selector fingers in either the operated or unoperated position of the armature by moving all the code-selector fingers from right to left.

To Adjust: Stone down the high points or burrs on the selector fingers or replace with new fingers.

(c) On units equipped with a selector-finger retaining bracket TP99987 there should be some clearance, less than 0.005 inch, between the lowest edge of the retainer and the

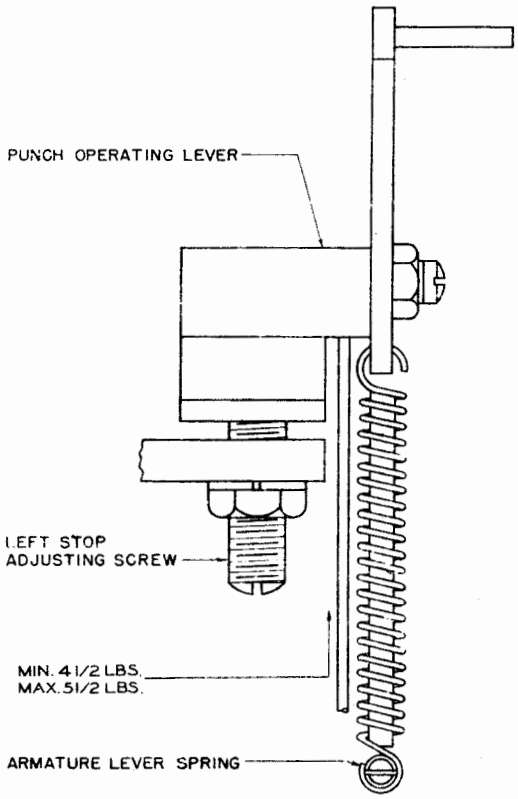

Figure 34

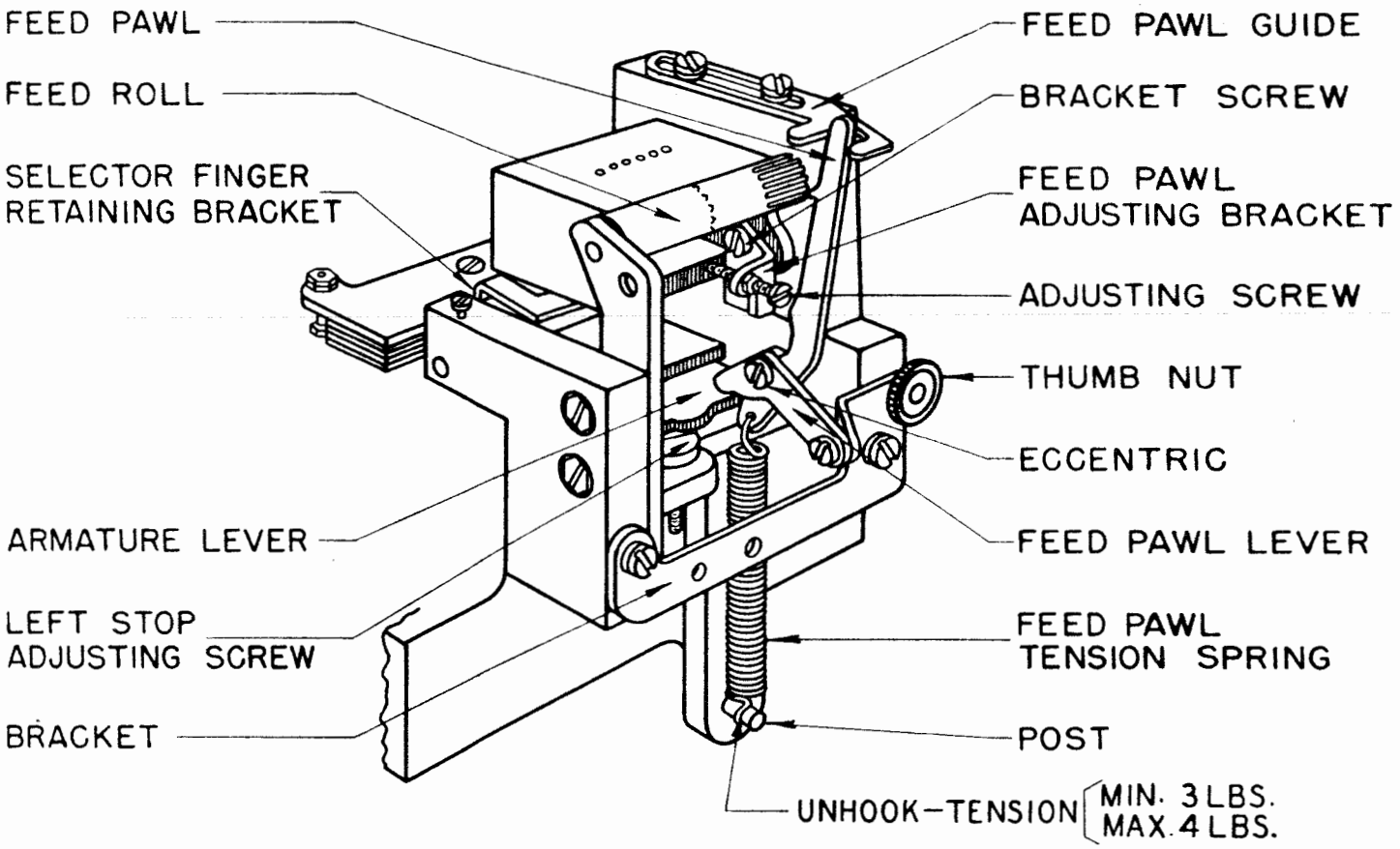

Figure 35

top of the feed-punch-selector finger with the punch magnet operated electrically. At the same time the clearance between the retainer and the No. 1 and No. 5 movable code-punch-selector fingers should be equal, within 0.005 inch, when the ends of the code-selector fingers are in line with the feed-punch-selector finger.

To Adjust: Position selector-finger retainer.

3.23 Punch Travel should be such that all punches are driven through tape sufficiently to punch holes cleanly each time magnet is operated electrically by depressing the LTRS key when the play in the selector fingers is taken up to the left by pressing on the right end of the fingers.

To Adjust: Turn punch right-stop adjusting screw until punches fail to perforate tape when operated electrically, back off screw until all holes are just punched clean when all the selector fingers play is taken up to the left and then give screw an additional 1/4 turn. Make sure the magnet cores do not touch the armature. See 3.24.

CAUTION: DO NOT TAKE DEFECTIVE PUNCH BLOCKS APART. IF SATISFACTORY PUNCHING CANNOT BE OBTAINED, REPLACE BLOCK ASSEMBLY.

3.24 Punch Magnet cores should clear the armature by minimum 0.004 inch, maximum 0.008 inch when the punch-operating lever is in its operated position.

Note: Adjustment is correct when one thickness of fresh-cut perforator tape is free to move over both core ends and two thicknesses are clamped tightly between the armature and both cores when the magnet is energized.

To Adjust: Position magnet cores and the two magnet-core locating eccentrics. (If eccentrics do not provide sufficient adjustment, replace with eccentrics TP89963 having a 0.390 inch outside diameter with hole located 0.086 inch off center.)

Note 1: Requirements 3.25 through 3.30 apply to units not equipped with positive-action perforating feature. (TP102896 modification kit.)

Note 2: Before making the following adjustments back off the contact-control operating-lever backstop screw.

3.25 Antichatter Contact Lever upper surface should be approximately horizontal when the punch-magnet armature lever is resting on the left stop. See Figure 36.

Note: Figures 36 and 37 show new-style antichatter contact mechanism used with adjustable key-pressure mechanism. Old—style mechanism is essentially the same except the antichatter contact-lever spring is vertical and contact-operating-lever backstop is a bracket instead of a screw.

To Adjust: Position adjusting screw on punch-magnet armature and check that, with the armature lever resting firmly against its right-hand stop by electrical operation of the magnet and the antichatter contact lever held manually against the magnet spool head, there is minimum 0.005 inch clearance between the antichatter contact lever and its operating screw. See Figure 37.

3.26 Antichatter Contact-lever Spring should have the following requirements:

(a) On units equipped with the adjustable key-pressure mechanism the tension should be minimum 2 ounces, maximum 3 ounces when the punch-magnet armature is in its unoperated position. See Figure 36.

(b) On units without the adjustable key-pressure mechanism the tension should be minimum 1/4 ounce, maximum 1-1/4 ounces as measured on the lever to the left of the spring as the lever starts to move, when the left punch-magnet control-contact spring is held clear of the lever.

3.27 Punch - magnet Control - contact Right Spring should clear the operating lever by minimum 0.015 inch, maximum 0.030 inch when the punch-magnet armature is in its unoperated position and the keylever (including space keylever) which gives the punch-magnet control-contact operating lever the least amount of travel is fully depressed. See Figure 36.

To Adjust: On units not having an adjustable link, reposition punch-magnet control-contact bracket. Check 3.25.

To Adjust: On units having an adjustable link, first center the punch-contact bracket approximately in its elongated mounting holes and shorten or lengthen the adjustable link by slightly loosening the two clamping screws and prying the link sections. See Figure 36.

Note: This adjustment provides the minimum safe overtravel of the punch-magnet control-contact operating lever together with the greatest depth of touch (keylever travel). If less depth of touch is desired on units equipped with the adjustable key-pressure mechanism, move the punch-magnet control-contact assembly toward the right. The limiting right position is that at which the left end of the antichatter lever is at least 1/32 inch to the left of the center line of the adjusting screw on the punch magnet armature and at which, as the LTRS key is depressed, the punch selector fingers just cover the full face of the punch pins when the contact points close. Both these limits must be met.

3.28 Punch-magnet Control-contact Left Spring should press against the antichatter contact lever with a force of minimum 2 ounces, maximum 3 ounces when the punch-magnet armature is in its unoperated position. See Figure 36.

To Gauge: Pull at right angles to the spring adjacent to the insulator.

To Adjust: Bend the contact spring.

3.29 Punch-magnet Control-contact Operating-lever Return-spring Adjusting Lever (on units equipped with key-pressure adjusting mechanism) should be free from bind over the entire range of the adjusting screw, which bears against the other end of the operating-lever return-spring adjusting lever shown in Figure 37. The operating lever backstop screw should line up approximately centrally with the contact operating lever. Gauge by eye.

To Adjust: Position return-spring adjusting assembly.

3.30 Punch-magnet-control Right Spring should require a pull of minimum 3-1/2 ounces, maximum 4 ounces to separate its contact from that of the left spring when the punch magnet is energized. See Figure 37.

To Gauge: Block punch-magnet armature in its operated position and pull at right angles to the spring, just to the rear of the contact, until the contacts separate. Test electrically.

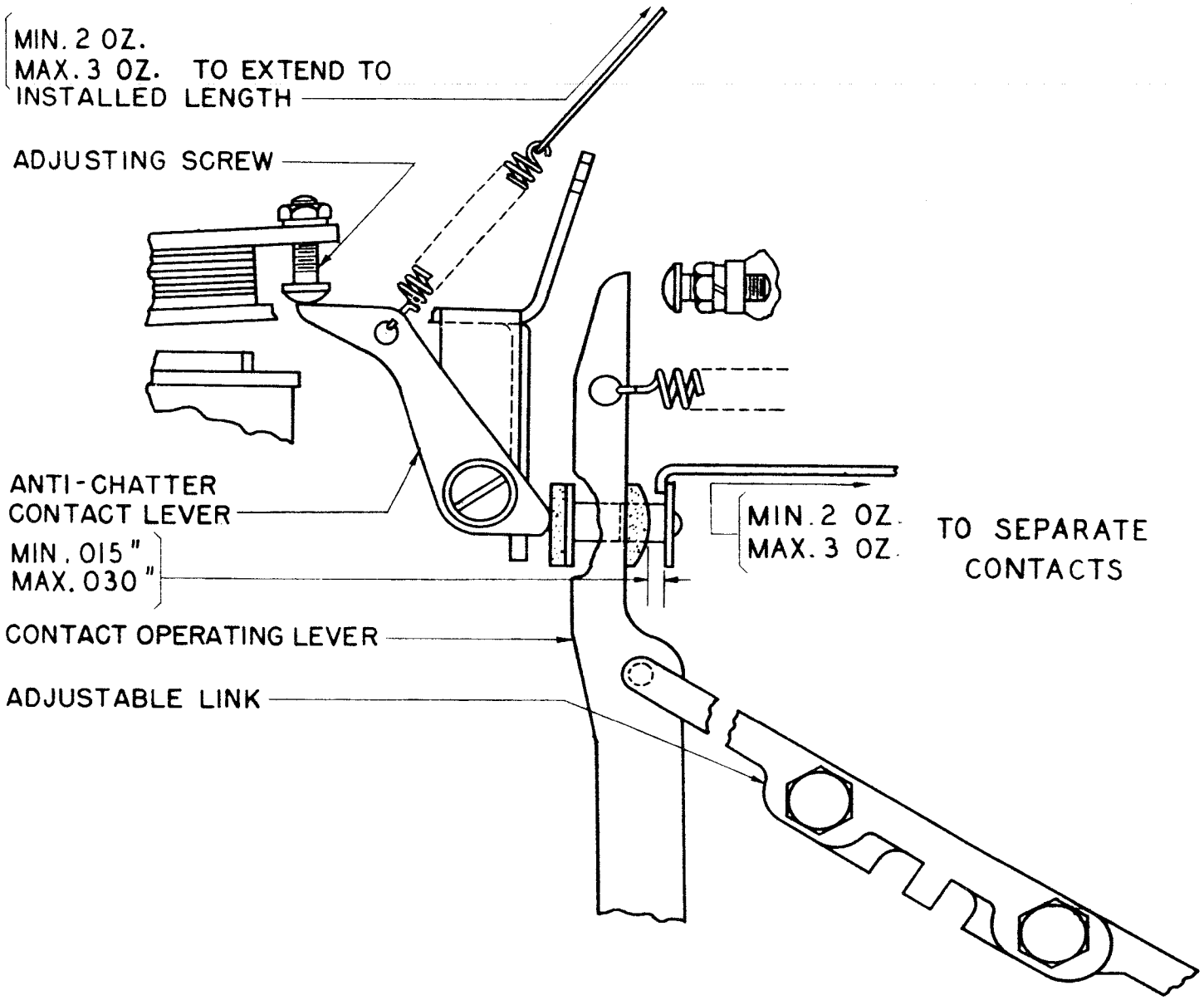
MIN. 2 OZ.
MAX. 3 OZ. TO EXTEND TO
INSTALLED LENGTH
ADJUSTING SCREW
ANTI-CHATTER
CONTACT LEVER
MIN. 015"
MAX. 030"
CONTACT OPERATING LEVER
ADJUSTABLE LINK
MIN. 2 OZ.
MAX. 3 OZ.
TO SEPARATE
CONTACTS

Figure 36

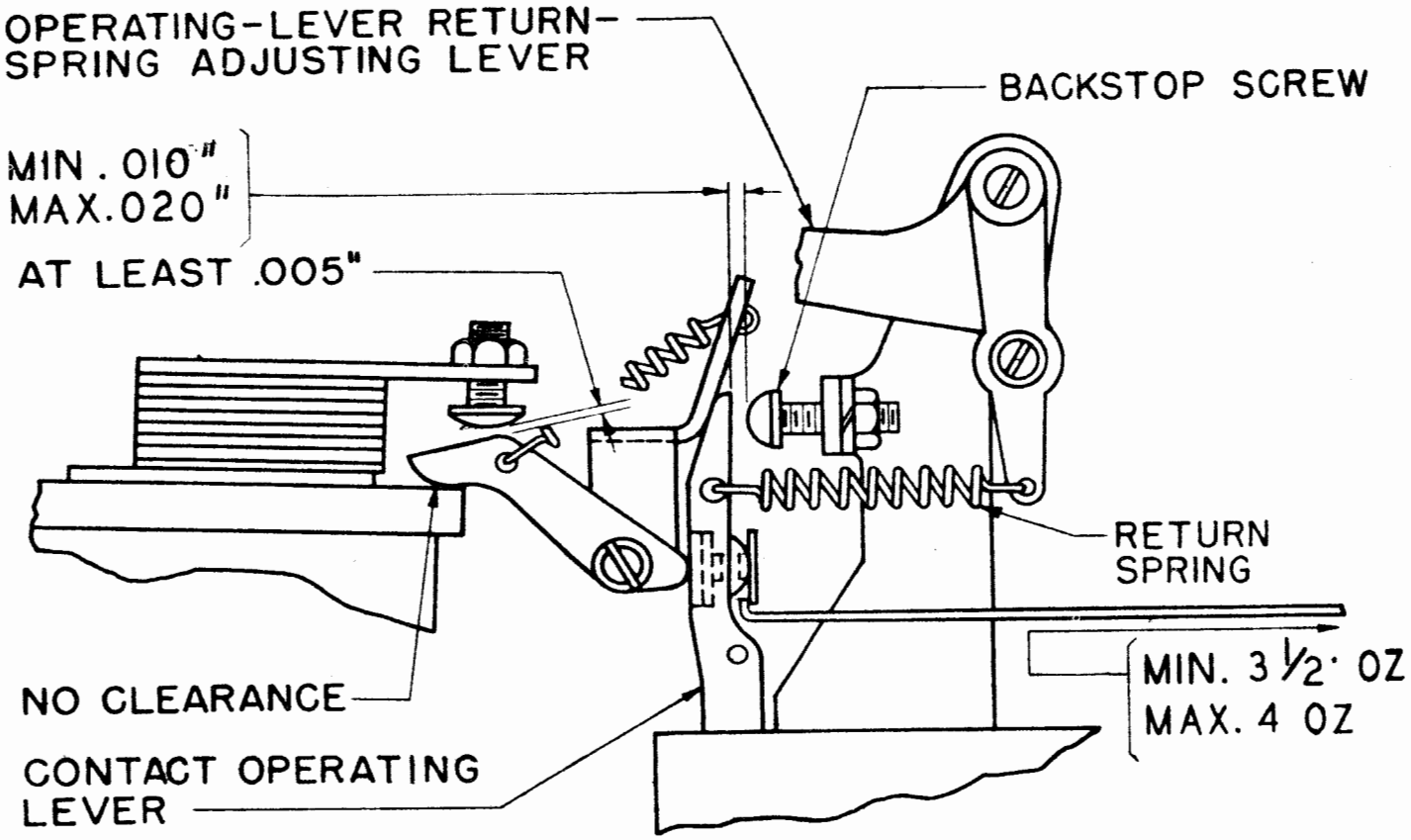

Figure 37

To Adjust: Bend right contact spring adjacent to the insulators and check 3.43.

Note: 3.31 through 3.41 apply to units equipped with positive action perforating feature (TP102896 modification kit).

3.31 Punch-magnet Control-contact Springs should be straight without sharp bends and the contact points should meet squarely in line. The left (short) contact spring stiffener should extend approximately parallel with the face of the contact bracket. Gauge by eye.

To Adjust: Bend stiffener.

3.32 Punch-magnet-control Left Contact Spring: It should require minimum 2 ounces, maximum 3 ounces to just start the punch-magnet control left contact spring moving away from its stiffener when the antichatter lever is held away from the insulator on the left contact spring. See Figure 38.

To Gauge: Hook scale over the left contact spring just to the rear of the contact point and pull at right angles to the contact spring.

To Adjust: Bend the left contact spring.

3.33 Punch-magnet Control Right Contact Spring Tension: With a keylever depressed, the punch-magnet control right-contact spring tension should be minimum 3 ounces, maximum 4 ounces to just separate the contact points when there is some clearance between the antichatter lever and the insulator on the (short) left contact spring, and clearance between the insulator on the punch-contact operating lever and the right contact spring. See Figure 42.

To Gauge: Hook the scale over the right contact spring at the contact point and pull at right angles to the contact spring.

To Adjust: Bend the right contact spring.

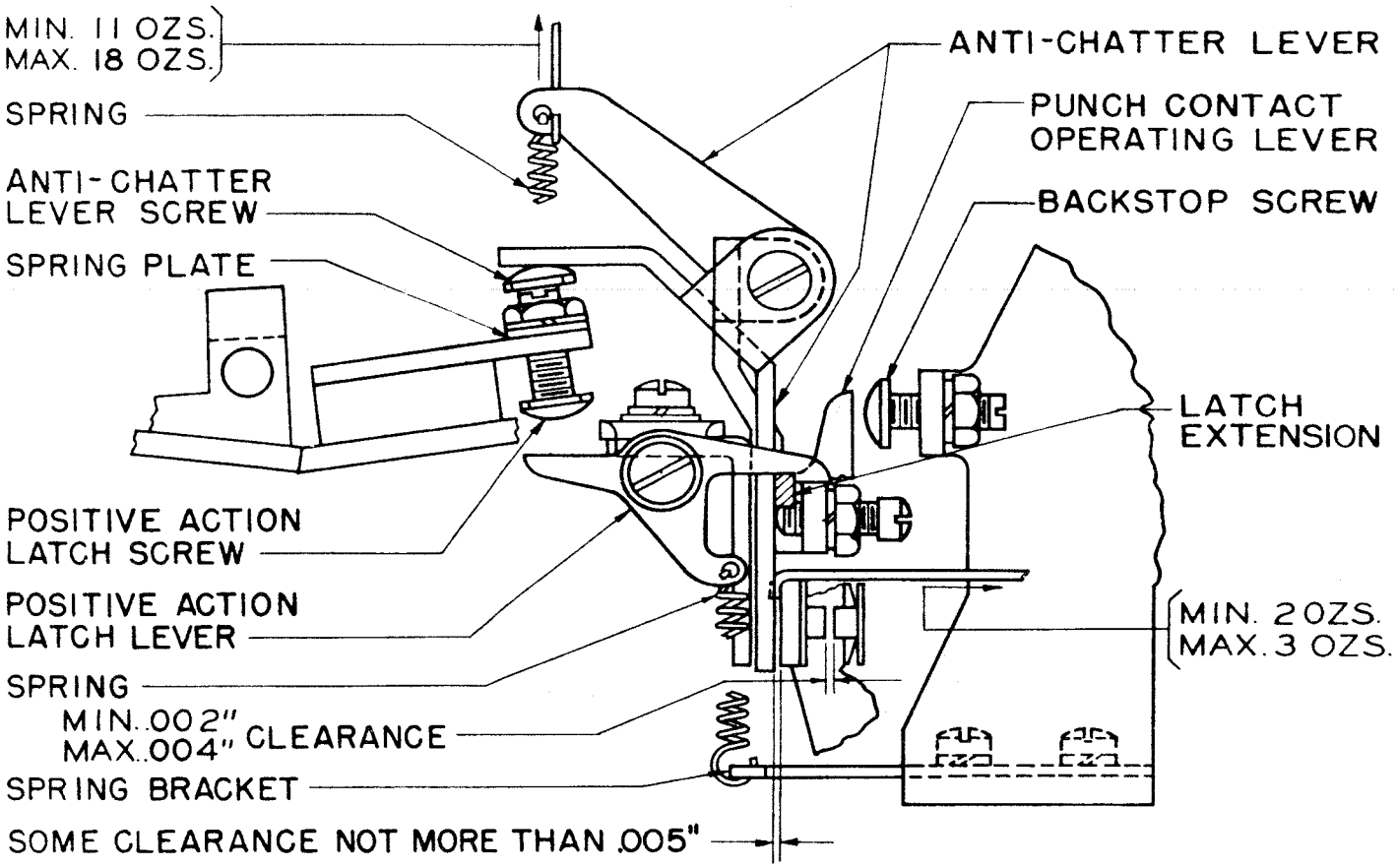

Figure 38

3.34 Punch-operating Contacts: There should be minimum 0.002 inch, maximum 0.004 inch clearance between the punch-operating contacts when there is some clearance between the antichatter lever and the insulator on the left (short) punch-operating contact spring, and the punch-contact operating lever is held in its latched position by the positive action latch. See Figure 38.

To Adjust: Position the latch by moving its bracket under its mounting screws.

3.35 Antichatter Lever: There should be some clearance, not more than 0.005 inch, between the antichatter lever and the insulator on the left (short) contact spring when the punch-magnet armature lever is resting firmly against its left (unoperated) stop and the antichatter lever is resting firmly on its operating screw in the armature. See Figure 38.

To Adjust: Position the screw in the armature.

3.36 Punch-contact Operating Lever: There should be some clearance, not more than 0.004 inch, between the insulator on the punch-contact operating lever and the right (long) contact spring when the antichatter lever is resting firmly against its backstop screw and the punch-contact operating lever is held in its latched position by the positive-action latch and the armature is lifted off its left stop approximately 1/16 inch so as to provide clearance. See Figure 39.

To Adjust: Position the antichatter lever backstop screw in its mounting bracket.

3.37 Latch and Latch Extension: There should be some clearance, not more than 0.005 inch, between the latch and the latch extension on the punch-contact operating lever with the magnet energized and the punch-operating contacts closed, and the punch-contact operating lever held so that the latch extension on the lever is in line with the low surface of the latching tip on the latch. See Figure 40.

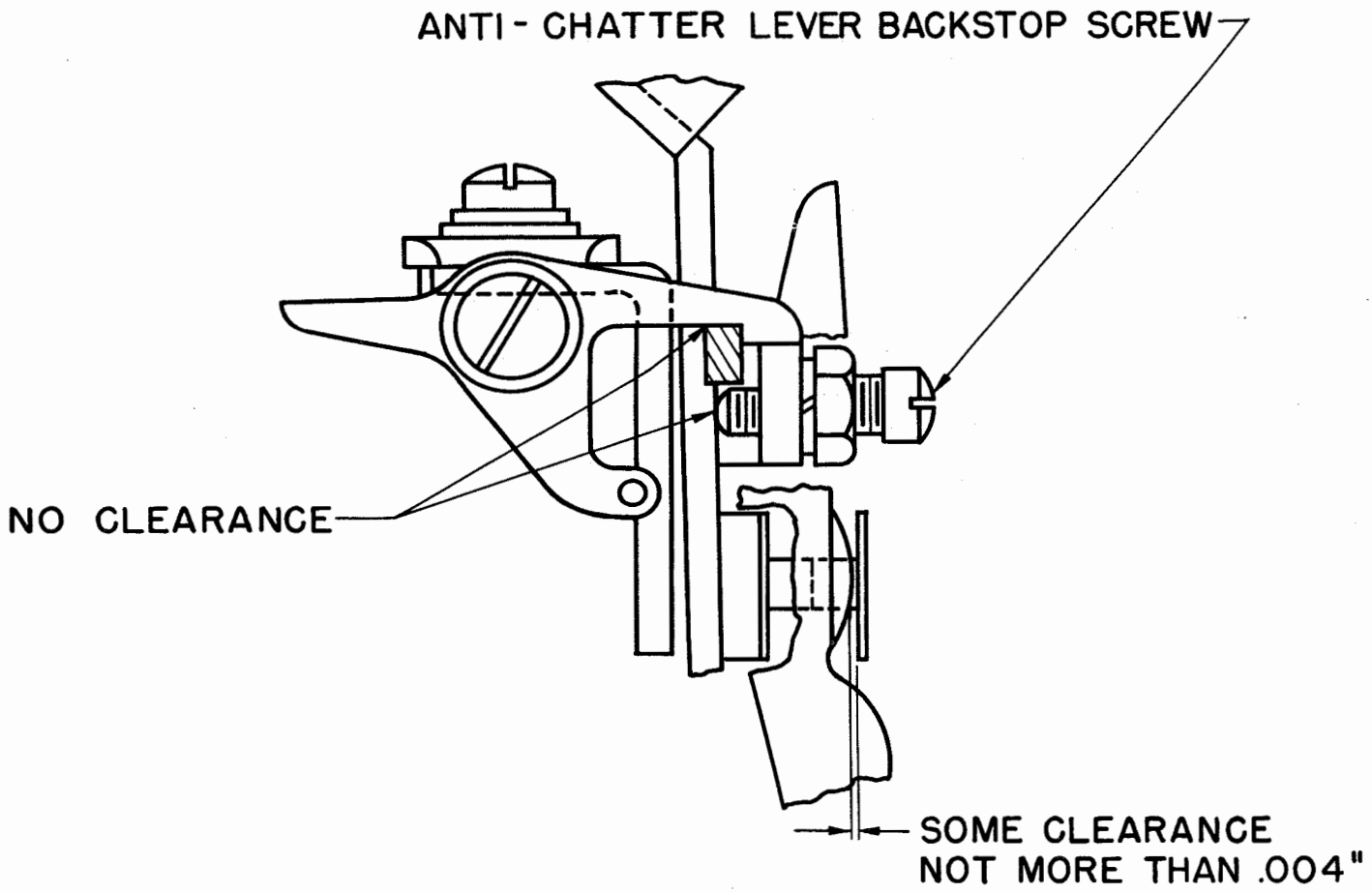

Figure 39

To Adjust: Position the latch-operating screw in the magnet armature.

3.38 Latch Spring should have a tension so that it requires minimum 1/2 ounce, maximum 1-1/2 ounces to just start the latch moving away from the latch extension, when the punch-contact operating lever is resting against its backstop screw and the positive action latch is resting against the latch extension on the lever. See Figure 41.

To Gauge: Hook the scale over the tip of the latch and pull parallel with the latch spring.

3.39 Antichatter Lever Spring should have a tension so that it requires minimum 11 ounces, maximum 18 ounces to just start the antichatter lever moving away from its operating screw in the armature when the punch-magnet armature lever is resting firmly against its left stop and the antichatter lever operating screw is adjusted as in 3.35. See Figure 38.

To Gauge: Hook the scale under the antichatter lever and pull in line with the spring.

Note: 3.40 and 3.41 specify minimum and maximum limits for shallow and deep touch. Intermediate points may be selected to suit the attendant.

3.40 Punch - magnet Control Contacts: For early closure and shallow touch the contact points should close when all punch-selector fingers just cover the full face of the punch pins.

To Gauge: Move the punch-selector fingers slowly under the punches, from their extreme right (spacing) position, by depressing the LTRS keylever. Gauge by eye.

To Adjust: Shorten or lengthen the two-part adjustable punch-contact operating-lever link by means of its elongated holes and clamping screws.

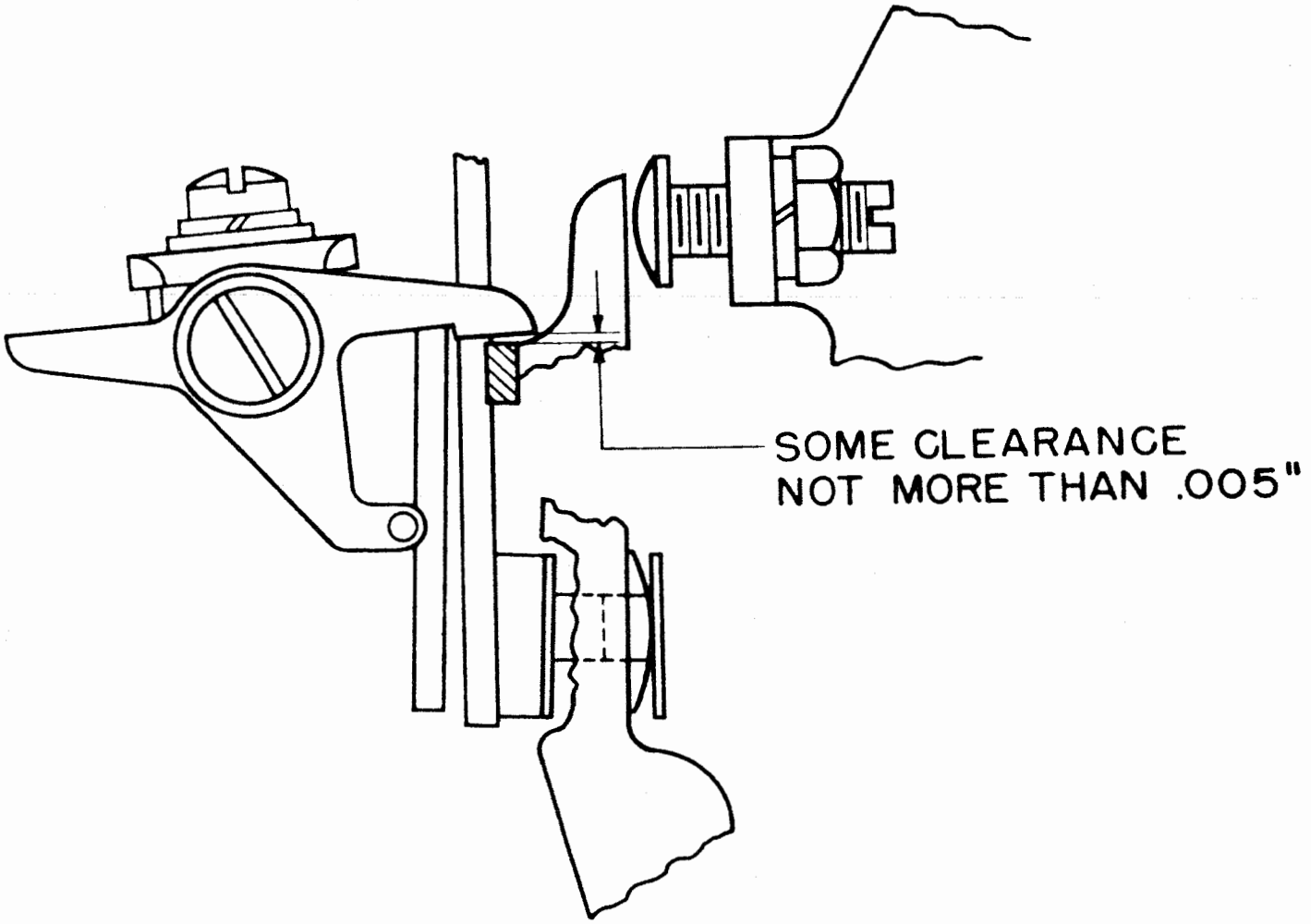

Figure 40

3.41 Punch-magnet Control Contacts: For late closure and deep touch the punch-magnet control contacts should close so that there is not less than 0.015 inch clearance between the insulator on the punch-contact operating lever and the right (long) contact spring when any keylever is fully depressed until blocked by the A1 and A2 pair of code selector bars. For identification of parts see Figures 7 and 42.

To Check: See that there is clearance between the insulator on the left (short) contact spring and the antichatter lever. Try all keylevers including the spacebar keylever. See Figure 42.

To Adjust: Shorten or lengthen the two-part adjustable punch-contact operating-lever link by means of its elongated holes and clamping screws.

3.42 Punch-magnet Control-contact Operating Lever should clear its backstop by minimum 0.010 inch, maximum 0.020 inch when the pressure on any keylever is released until the lever just separates the spring contacts. See Figure 37.

To Gauge: Energize punch magnet by depressing any keylever; then with a 0.010 inch gauge held between backstop and backstop screws, release keylever and note that contact opens. Repeat with 0.020 inch gauge and note that contact does not open.

To Adjust: Position backstop screw on units equipped with the adjustable key-pressure mechanism; position backstop bracket on others.

3.43 Punch-magnet Control-contact Operating-lever Return Spring: On units equipped with adjustable key-pressure mechanism minimum 1/2 ounce, maximum 1 ounce tension should be required to just start the contact-operating lever moving away from the backstop screw when the right contact spring is allowed to bear freely against the fiber on the contact-operating lever.

To Gauge: Apply the push end of the scale to the right contact spring at the contact point and push in a horizontal direction.

To Adjust: Turn key-pressure adjusting screw to its highest position and position the spring-adjusting-lever extension.

3.44 Punch-magnet Control-contact Operating-lever Return Spring: On units not equipped with the adjustable key-pressure mechanism, the spring tension should be minimum 7 ounces, maximum 8 ounces, measured by stretching the spring to position length when the operating lever is resting against the bracket at the bottom of the guide slot.

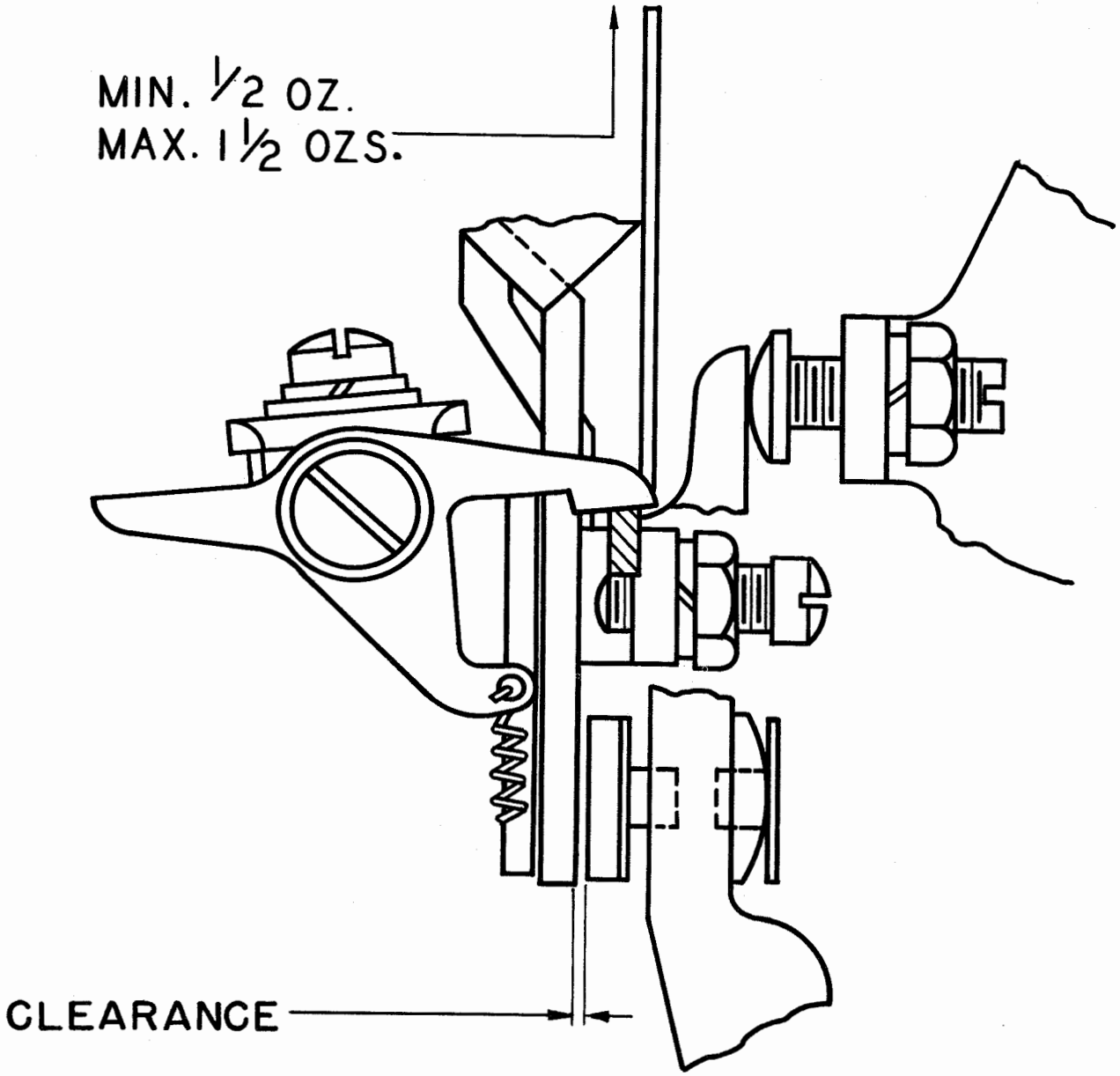

Figure 41

To Adjust: Replace the spring.

Note: Remove tape stripper plate for 3.45 to 3.52 inclusive.

3.45 Feed Pawl — Preliminary Adjustment: (For Final Adjustment See 3.52.) On machines having feed pawl attached to the armature lever, feed pawl should bottom in the next feed-roll ratchet tooth without overtravel at the same time the nearest selector finger (except that of the feed punch) touches its punch pin when the uppermost section of the selector fingers are in line with the left edge of the punch pins and the armature is moved slowly from its left stop by pressing on its right end. Gauge by eye.

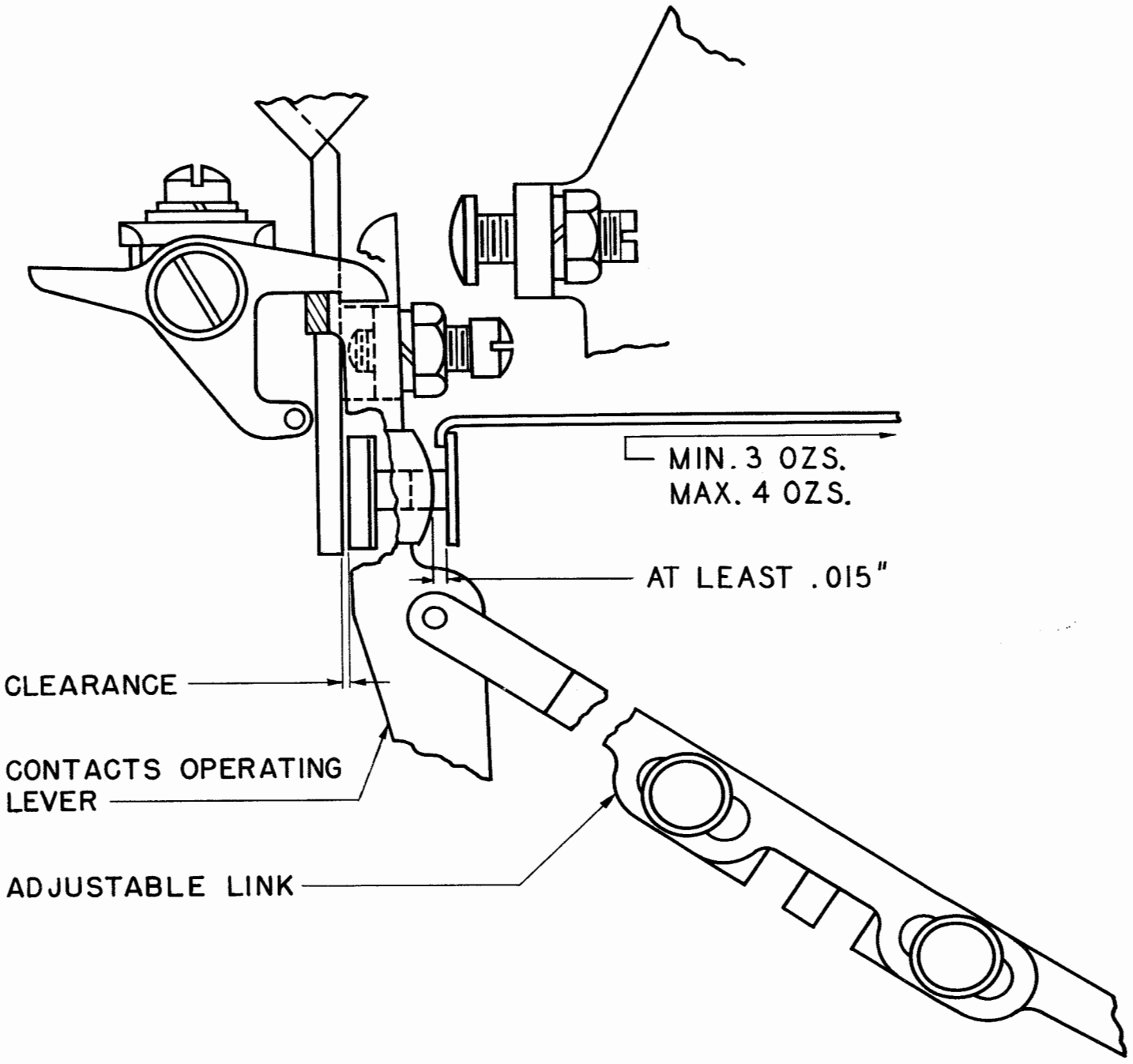

Figure 42

To Adjust: Position feed-pawl eccentric with high part to left.

Note: Requirements 3.46 to 3.49, inclusive, apply to machines where the feed pawl is not attached to the armature lever (TP99037 modification kit).

3.46 Feed Pawl - Preliminary Adjustment: (For Final Adjustment See 3.52.) Feed pawl should be adjusted so that as the armature lever is raised until the feed-punch-selector finger just touches the feed punch, the tooth on the feed pawl just engages the tooth on the roller without overtravel. See Figure 35 for identification of parts.

To Adjust: Turn eccentric bushing.

3.47 Backspace-lever Spring should require a tension of minimum 3 ounces, maximum 6 ounces to start the backspace lever moving downward. See Figure 43.

To Gauge: Apply the push end of the scale to the top of the backspace lever.

3.48 Feed-pawl Adjusting Bracket should be adjusted so that when the armature lever is firmly against its left stop, the tip of the tooth on the feed pawl clears the tip of the teeth on the feed roll by minimum 0.005 inch, maximum 0.015 inch. Try one full revolution of the feed roll, holding the detent roller away from the star wheel. See Figure 35 for identification of parts.

To Adjust: Loosen bracket screw and locknut, then turn adjusting screw and recheck requirements after locknut and screw have been retightened.

3.49 Feed Pawl should clear by maximum 0.005 inch the teeth of the feed roll while the armature is in its fully operated position. Check one full revolution of feed roll while holding the detent roller away from the star wheel.

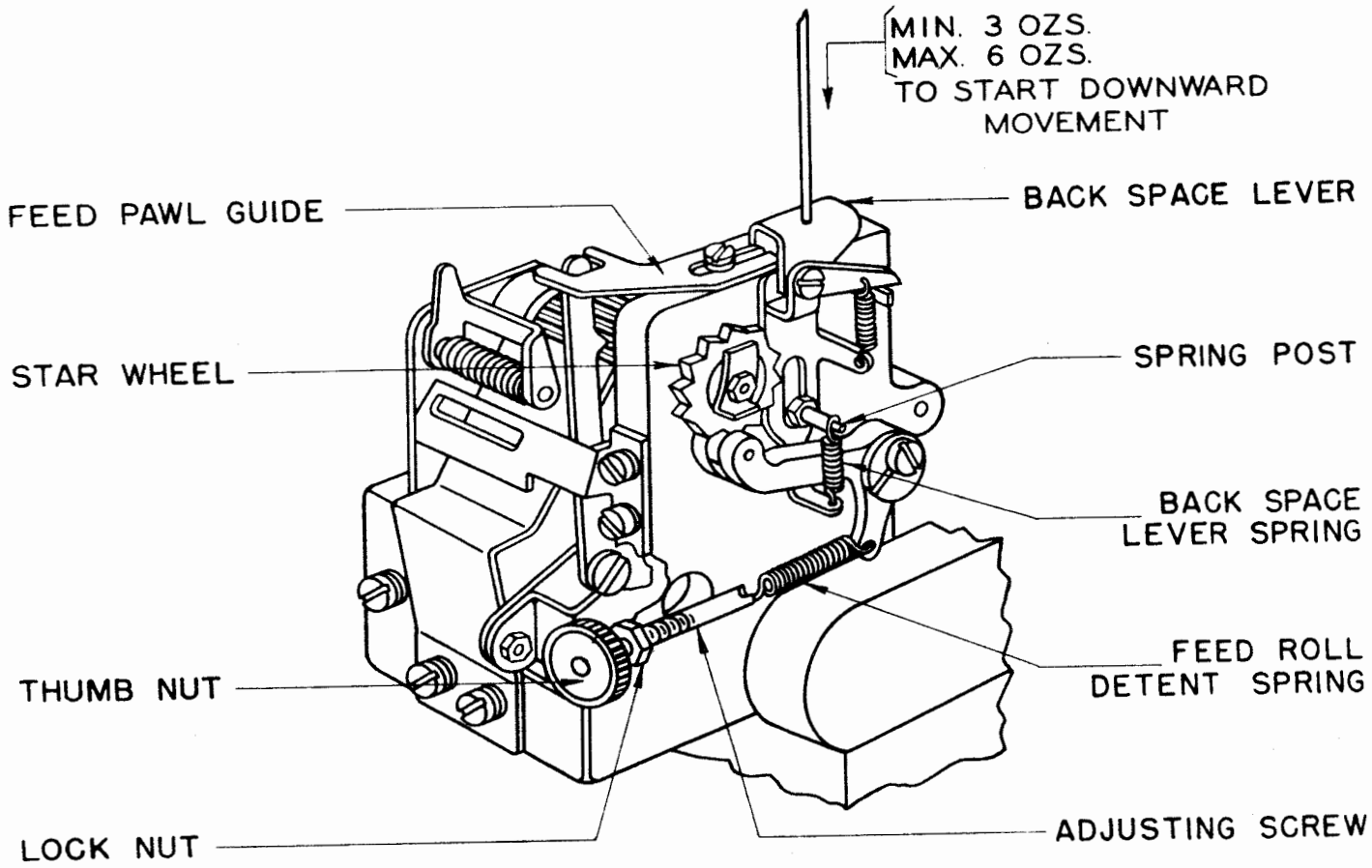

Figure 43

To Adjust: Loosen screws, slide feed-pawl guide to proper position and recheck after retightening screws.

Note: Connect power.

3.50 Feed-roll Detent - Final Setting: (For Preliminary Setting See 3.12.) Perforations in tape should be evenly spaced, 10 to the inch with an allowable variation of ±0.007 inch in a 4-inch length.

To Check: Perforate a series of nine Blank and one LTRS combinations seven or eight times, place the tape on top of a TP95960 gauge, then hold tape and gauge up to a light background and align a No. 3 code hole in the tape with the hole 1-1/2 inches from the left end of the gauge. Gauge holes should be visible through all No. 3 code holes to the right of the point of alignment and the code hole above the large hole at the right end of the gauge should fall entirely within the circumference of the gauge hole.

To Adjust: Position feed-roll-detent eccentric. If irregular spacing is experienced it may be necessary to position the greater portion of the eccentric above its mounting screw. See Figure 31.

Note: If eccentric is positioned, check tape feed pawl. See 3.48, 3.49, and 3.52.

3.51 Tape Knife: There should be some clearance between the side of the feed pawl and the end of the tape knife when the clearance is taken up to be a minimum. Gauge by eye.

To Adjust: Loosen mounting screws, shift position of tape knife, and retighten screws.

3.52 Feed Pawl - Final Adjustment: (For Preliminary Adjustment See 3.45 or 3.46.) Tape should be fed without skipping (feeding without perforating) and without distorting feed holes (feeding before the punch pins have been withdrawn from the tape) when the LTRS and any other key are struck alternately in rapid succession. If feeding is satisfactory no changes will be required. If feeding is not satisfactory:

(a) Either make the following final adjustments:

(1) Skipping may occur due to the feed-wheel detent overriding its tooth (feeding past two teeth). This indicates that the feed pawl is set too low (feeding takes place early in the downward stroke). With the feed pawl set too low, there is also liability to pulling of feed holes due to feeding before the pins are withdrawn from the tape. To adjust, raise the feed pawl by positioning its eccentric in small increments until proper feeding occurs.

(2) Skipping may also occur due to incomplete travel of the armature indicating that the feed pawl is set too high. To adjust, lower the feed pawl by positioning its eccentric in small increments until proper feeding occurs.

(b) Or install the TP102896 modification kit having the positive-action perforating feature.

Note 1: Replace tape-stripper plate for 3.53 and check 3.48.

Note 2: Disconnect power for 3.53 through 5.06.

3.53 Tape-stripper Plate upper edge should clear the feed roll by not more than 0.010 inch throughout a complete revolution of the roll. Gauge by eye.

To Adjust: Position stripper plate.

4. COUNTER-CONTROL-CONTACT OPERATING MECHANISM MOUNTED ON KEYBOARD

4.01 Counter-control-contact Operating Cam Levers should be just completely displaced when the associated keylevers are depressed to the neutral position (half way down). See Figure 43 for identification of parts.

Gauge: By observing that full displacement of the counter-control operating fiber extension is not reached until the FIGS keylever and any two other keylevers are simultaneously depressed until stopped by the selector bars (neutral position), and that there is very little or no further displacement when the FIGS keylever is further depressed to the full depth of its stroke. Repeat this check with the CAR RET keylever instead of the FIGS keylever.

To Adjust: Add or remove shims between counter-control-contact operating-mechanism mounting bracket and casting.

Note: Shims extend under the condenser mounting lugs.

4.02 Counter-control-contact Operating Cam Levers associated with the CAR RET and Line Feed keylevers should clear the keylevers by approximately equal amounts when the cam levers are held away from the keylevers against their backstops. Gauge by eye. See Figure 44B.

To Adjust: Position counter-control-contact operating mechanism to right or left.

4.03 Counter-control-contact Springs should meet squarely. Gauge by eye. See Figure 45.

To Adjust: Bend spring ends.

4.04 Counter-control Contacts on No. 1 and No. 2 springs should make contact with each other with a follow of minimum 0.005 inch, maximum 0.010 when in the normal unoperated position. Gauge by eye.

To Adjust: Bend stiffeners of No. 1 and No. 2 springs. (Stiffeners should be approximately at right angles to the insulator pile-up.)

4.05 Counter-control Contacts on No. 1 and No. 2 springs should separate when a force of minimum 1 ounce, maximum 1-1/2 ounces is applied to either the No. 1 or No. 2 springs. See Figure 45.

To Adjust: Bend No. 1 or No. 2 spring.

4.06 Counter-control-contact Operating Extensions should move freely in their guide slots and the rear extension should clear the No. 2 spring by not more than 0.004 inch when held to the right against its backstop.

To Adjust: Position counter-control-contact-assembly mounting bracket.

4.07 Counter-control Contacts on No. 2 and No. 3 springs should make contact with a follow of minimum 0.005 inch, maximum 0.010 inch when the CAR RET keylever is fully depressed. Gauge by eye.

To Adjust: Bend stiffener of No. 3 spring.

4.08 Counter-control Contacts on No. 2 and No. 3 springs should separate when a force of minimum 3/4 ounce, maximum 1 ounce is applied at the contact of the No. 3 spring when the CAR RET keylever is fully depressed.

To Adjust: Bend No. 3 spring and recheck 4.07.

4.09 Counter-control Contacts: Gap between contacts on No. 2 and No. 3 springs should be at least 0.015 inch when the contact operating extensions are in their normal unoperated position.

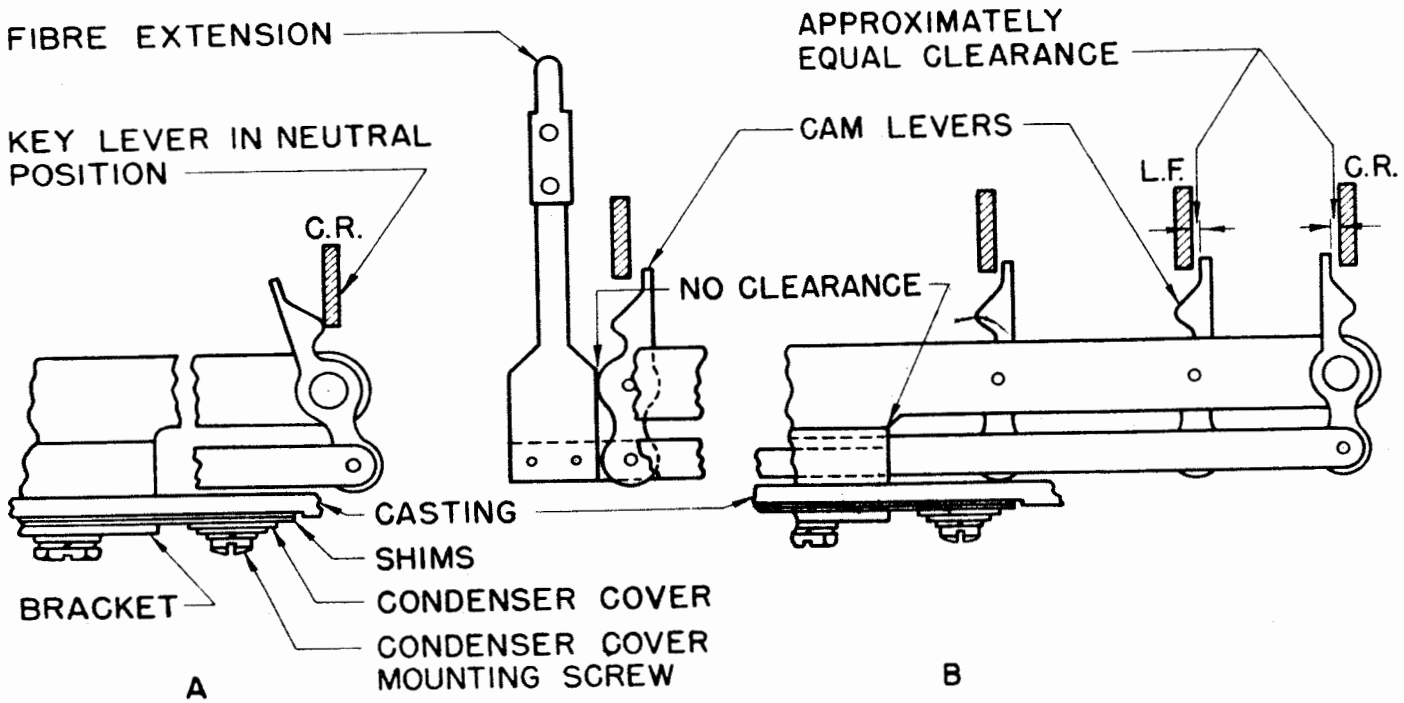

Figure 44

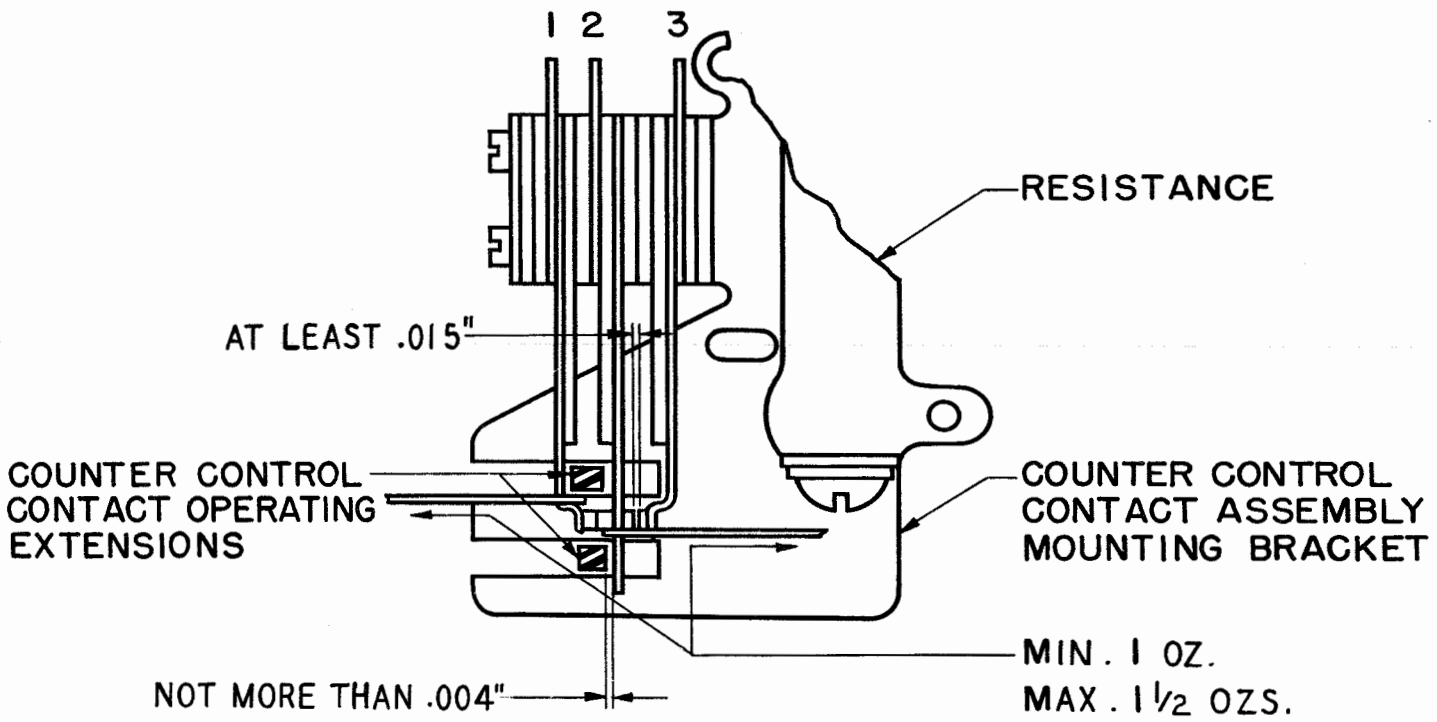

Figure 45

If Adjustment Is Necessary: Recheck 4.04 through 4.09, modifying adjustments so as to increase gap.

4.10 Counter-control Contacts on No. 1 and No. 2 springs should break contact before the contacts on the No. 2 and No. 3 springs make contact when the CAR RET keylever is depressed slowly. Gauge by eye.

If Adjustment Is Necessary: Recheck 4.02, modifying adjustments so as to give break before make of contacts.

5. COUNTER-CONTROL-CONTACT OPERATING MECHANISM MOUNTED ON PERFORATOR UNIT

5.01 Counter-control-contact Springs No. 1 and No. 2 should make contact with each other with not more than 0.005 inch follow. Gauge by eye. See Figure 46 for identification of parts.

To Adjust: Bend stiffener of No. 1 and No. 2 springs.

5.02 Counter-control Contacts on No. 1 and No. 2 springs should separate when a force of minimum 1-1/2 ounces, maximum 2-1/2 ounces is applied to either the No. 1 or No. 2 spring at the contact. See Figure 46.

To Adjust: Bend No. 1 and No. 2 springs.

5.03 Counter-control-contact Operating Lever should have not more than 0.010 inch play between the No. 1 and No. 2 springs. See Figure 46.

To Adjust: Bend tips of No. 1 and No. 2 springs.

5.04 Counter-control Contacts: Gap between contacts of No. 2 and No. 3 springs should be minimum 0.010 inch, maximum 0.020 inch. See Figure 46.

To Adjust: Bend stiffener of No. 3 spring.

5.05 Counter-control-contact Spring No. 3 should separate from the end of its stiffener when a pull of minimum 1 ounce, maximum 2 ounces is applied at the contact of the No. 3 spring. See Figure 46.

To Adjust: Bend No. 3 spring. Recheck 5.04.

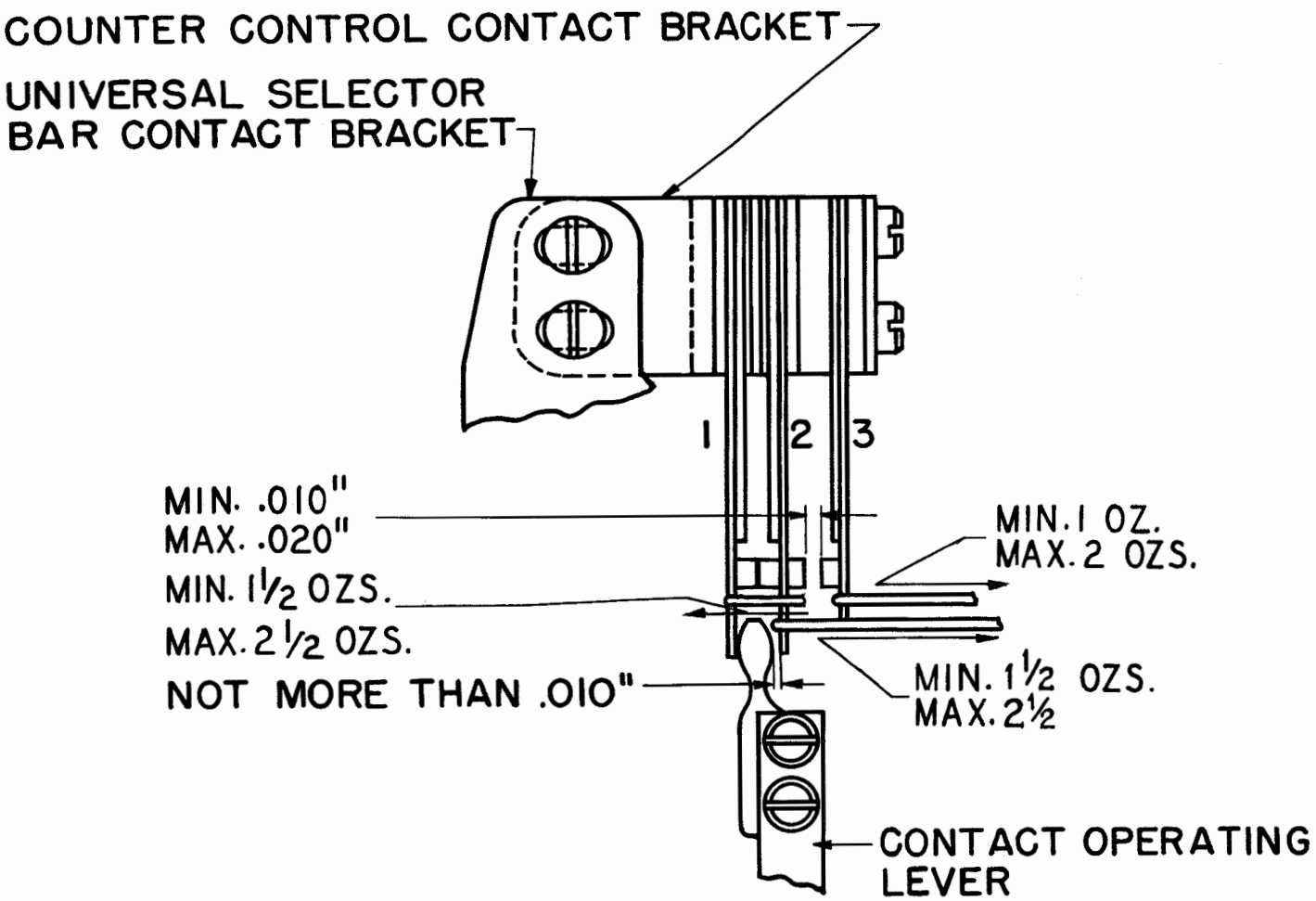

Figure 46

5.06 Counter-control-contact Operating Lever should move No. 1 and No. 2 springs approximately equal distances to the left and right respectively when the CAR RET and FIGS keylevers are fully depressed alternately, also when the LTRS and LINE FEED keylevers are fully depressed alternately. Gauge by eye.

To Adjust: Position counter-control-contact-assembly mounting bracket.

Note: Reconnect power.

5.07 Counter-control-contact Springs No. 1 and No. 2 should break contact before contacts on No. 2 and No. 3 springs make and the latter should make contact before the contacts on the punch-magnet control-contact springs make contact when the CAR RET keylever is slowly depressed. Gauge by eye. See Note under 5.09.

5.08 Contacts on No. 2 and No. 3 Springs should not separate before the punch-magnet control contacts separate when the pressure on the CAR RET keylever is slowly released. Gauge by eye. See Note under 5.09.

5.09 Contacts of the No. 1 and No. 2 Springs should separate before the punch-magnet control contacts make contact when the FIGS, LTRS, and LINE FEED keylevers are slowly depressed in turn, and should not make contact until after the punch-magnet control contacts separate when the pressure on these keylevers is slowly released. Gauge by eye.

Note: If adjustment is required under 5.07, 5.08, or 5.09, recheck 5.01 through 5.06, and modify adjustments so as to give sequence required.

6. COUNTER MECHANISM

Note: Remove counter cover.

6.01 Counter Feed-pawl outer edge should not be more than 0.035 inch over flush or 0.015 inch under flush with the outer surface of the ratchet wheel when the play in the pawl is taken up so as to make these maximum. Gauge by eye.

To Adjust: Remove armature assembly from counter, loosen feed-pawl-bracket mounting screws slightly until bracket is friction tight, reassemble armature assembly in counter, shift bracket on armature so as to give pawl correct alignment, remove armature assembly, tighten bracket mounting screws, and reassemble armature assembly in counter.

6.02 Dashpot-plunger Spring should require minimum 1/2 ounce, maximum 1 ounce to move the plunger to its extreme inward position when the dashpot is removed from the counter and held vertical with the plunger downward and the air-vent screw removed.

CAUTION: WHEN REMOVING DASHPOT, TAKE CARE TO PREVENT THE RATCHET-WHEEL SPRING FROM UNWINDING RAPIDLY SO AS TO AVOID BREAKING THE SPRING.

6.03 Ratchet-wheel Spring should have a tension of minimum 1-1/2 ounces, maximum 3 ounces as the stop lug starts moving away from the end of the plunger when the release magnet is operated and the dashpot plunger is held depressed. See Figure 47.

To Adjust: Remove dashpot, taking care to prevent the ratchet-wheel spring from unwinding rapidly to avoid breaking it, turn ratchet wheel in counterclockwise direction until spring is wound tight, return wheel in clockwise direction not less than one nor more than two revolutions until stop lug is in the approximate location of 45 degrees in the lower left-hand quadrant as the ratchet is viewed from the rear, engage the latch pawl to hold the ratchet wheel in place and reassemble dashpot in place. Make sure the ratchet wheel can be rotated one full revolution in a counterclockwise direction.

6.04 Release-lever Extension should clear the feed pawl by minimum 0.010 inch, maximum 0.020 inch when the feed pawl is in full engagement with the ratchet-wheel teeth and the release-magnet armature is in its unoperated position. See Figure 48.

To Adjust: Position release-magnet-armature eccentric stop.

6.05 Counter Feed Pawl should overtravel the ratchet-wheel teeth minimum 0.008 inch, maximum 0.020 inch as shown in Figure 49 when the counting magnet armature is in its operated position (against magnet cores).

To Adjust: Back off release-lever-extension adjusting screw, hold check pawl in full engagement, and reposition check-pawl bracket.

6.06 Check-latch Pawl should clear the ratchet teeth by minimum 0.015 inch, maximum 0.025 inch when the release magnet is in the operated position. Pawl should clear the feed pawl and its spring when moved back from the ratchet as far as possible. See Figure 47.

To Adjust: Position release-lever-extension adjusting screw when ratchet is held so teeth on the ratchet wheel are opposite teeth on pawl.

6.07 Counter Feed Pawl should advance the ratchet wheel one tooth for each operation of the counting-magnet armature and cause the ratchet wheel teeth to overtravel the check pawl by not more than 0.010 inch. Gauge by eye. See Figure 50.

To Adjust: Position counting-magnet armature-eccentric stop.

6.08 Release-lever Extension should overtravel the notch in the release latch by minimum 0.004 inch, maximum 0.015 inch when the release magnet armature is in its operated position (against cores). See Figure 51.

To Adjust: Position release-latch bracket.

6.09 Indicator hub should be flush with the end of its shaft and the indicator pointer should point to Zero when the ratchet-wheel stop lug is resting against the dashpot plunger. Gauge by eye.

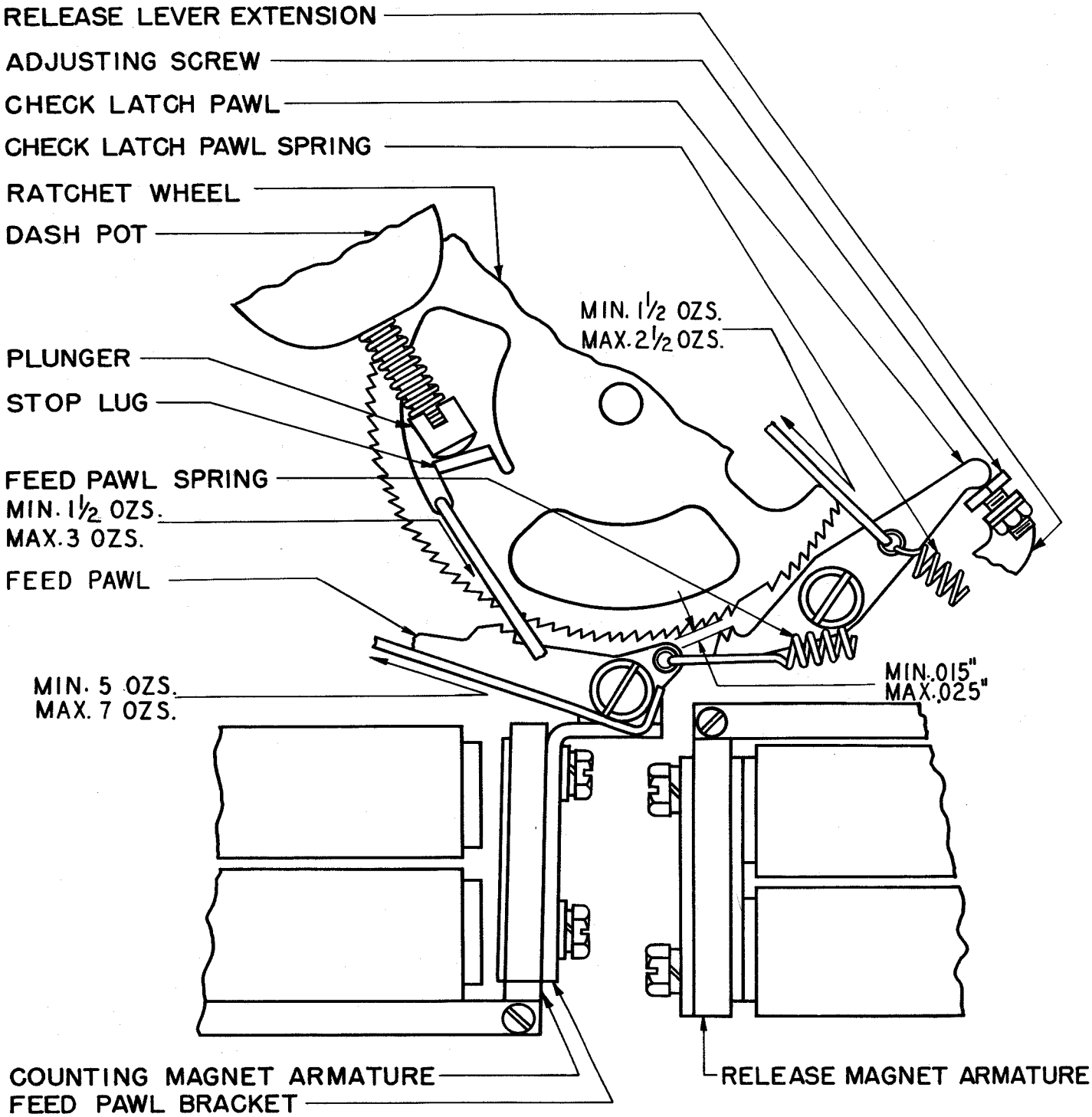
RELEASE LEVER EXTENSION
ADJUSTING SCREW
CHECK LATCH PAWL
CHECK LATCH PAWL SPRING
RATCHET WHEEL
DASH POT
MIN. 1½ OZS.
MAX. 2½ OZS.
PLUNGER
STOP LUG
FEED PAWL SPRING
MIN. 1½ OZS.
MAX. 3 OZS.
FEED PAWL
MIN. 5 OZS.
MAX. 7 OZS.
MIN. .015"
MAX. .025"
COUNTING MAGNET ARMATURE
FEED PAWL BRACKET
RELEASE MAGNET ARMATURE

Figure 47

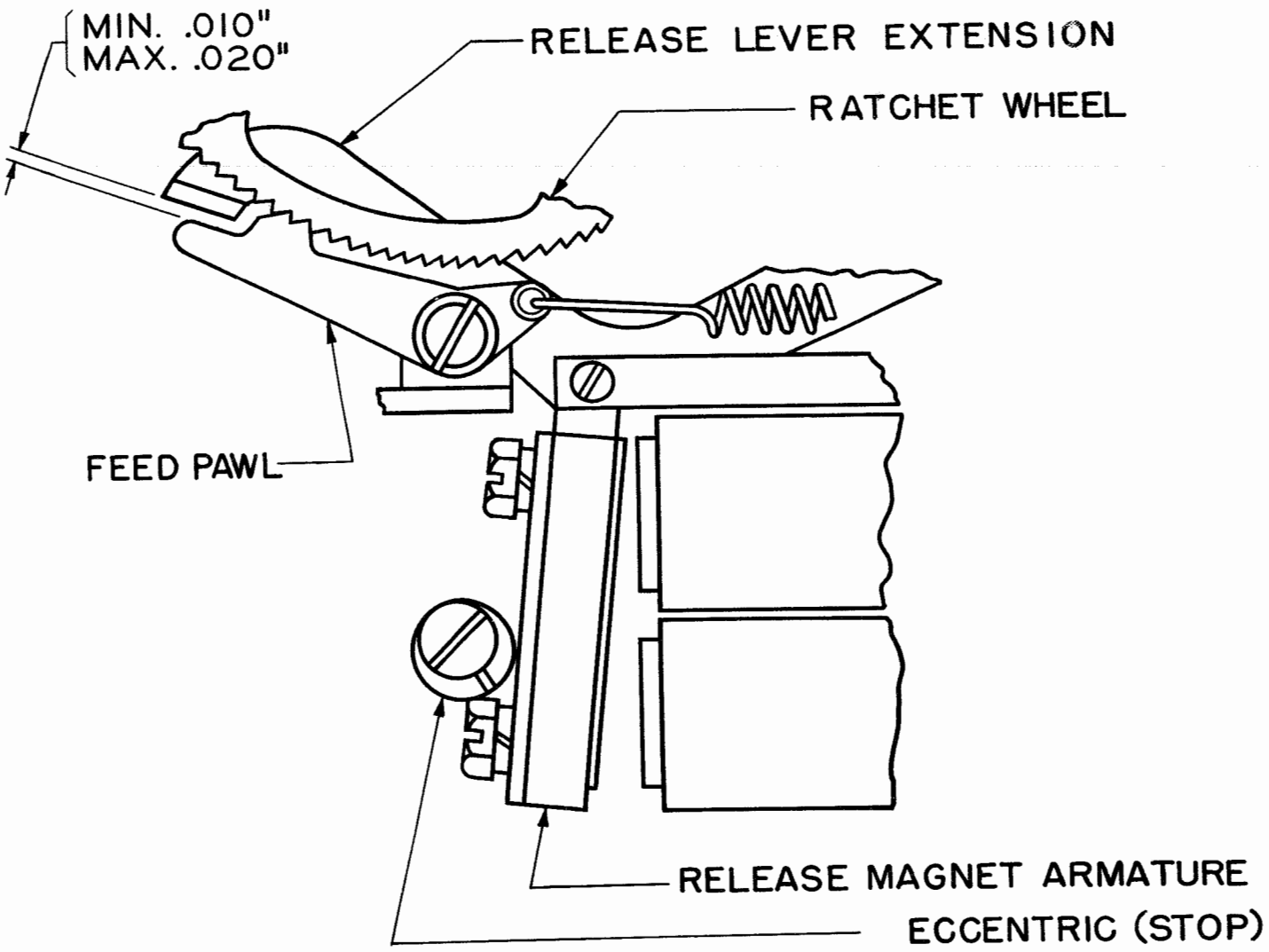
MIN. .010"
MAX. .020"
RELEASE LEVER EXTENSION
RATCHET WHEEL
FEED PAWL
RELEASE MAGNET ARMATURE
ECCENTRIC (STOP)

Figure 48

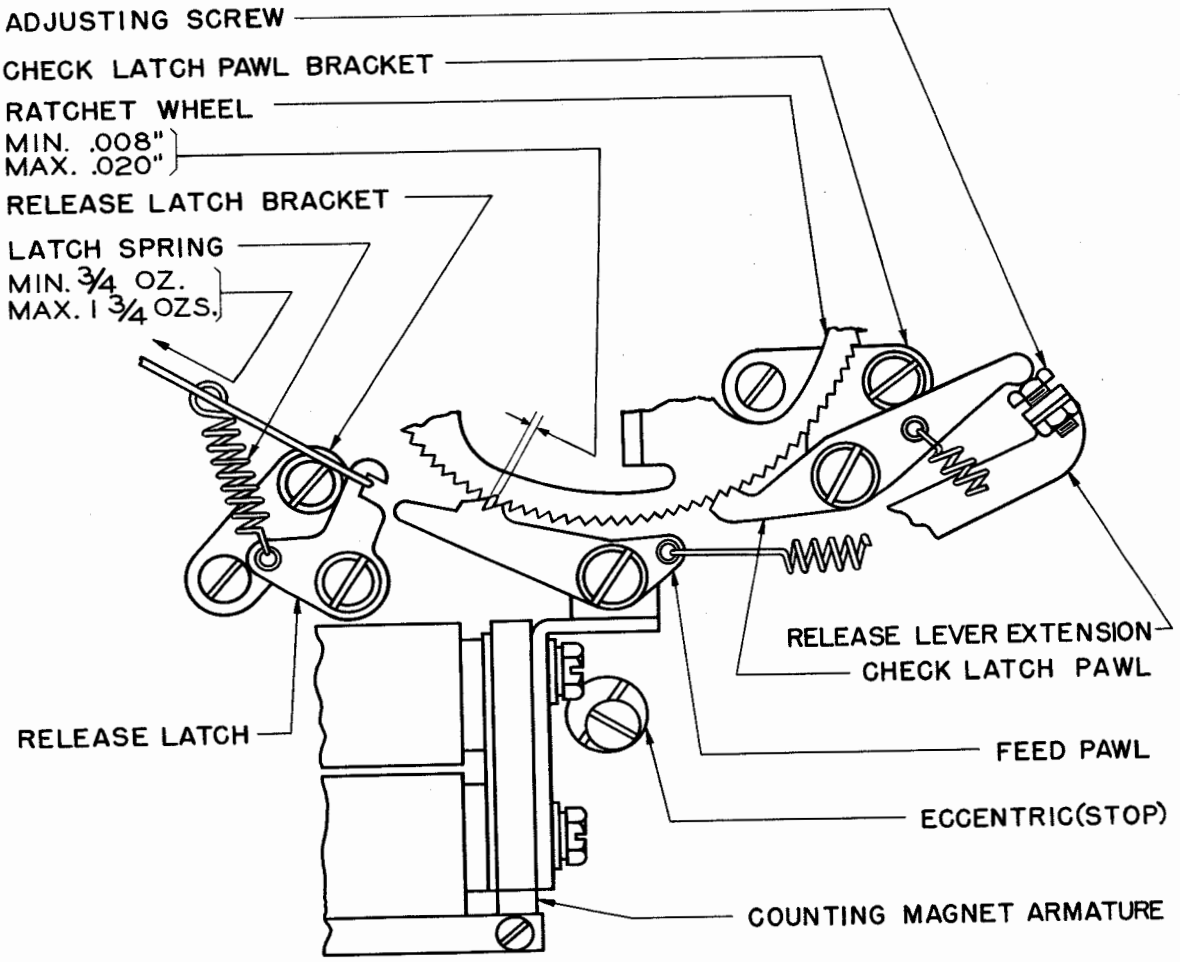

Figure 49

To Adjust: Loosen dashpot mounting screws, position ratchet wheel so first two teeth are in full engagement with both check-pawl teeth and hold in place, then position indicator on its shaft so that it points to 1. Operate the release-magnet armature and allow ratchet wheel to rotate slowly until stop lug rests against dashpot plunger and then position dashpot so the indicator points to Zero.

6.10 Check-latch-pawl Spring should have a tension of minimum 1-1/2 ounces, maximum 2-1/2 ounces as the pawl starts to move when release-magnet armature is in operated position. See Figure 47.

6.11 Counter Feed-pawl Spring should have a tension of minimum 5 ounces, maximum 7 ounces as pawl starts to move when the release-magnet armature is in operated position. See Figure 47.

6.12 Release-latch Spring should have a tension of minimum 3/4 ounce, maximum 1-3/4 ounces when the latch starts to move from its unlatched position. See Figure 49.

6.13 Signal-lamp Short Contact Spring should rest against its stiffener when the contact lever is on low part of its cam. Gauge by eye. See Figure 52.

Adjust by bending short spring.

6.14 Signal-lamp Contact Springs: When the contact lever is on the low part of its cam, the gap between contacts on long and short springs should be minimum 0.010 inch, maximum 0.015 inch. See Figure 52.

Adjust by bending long spring.

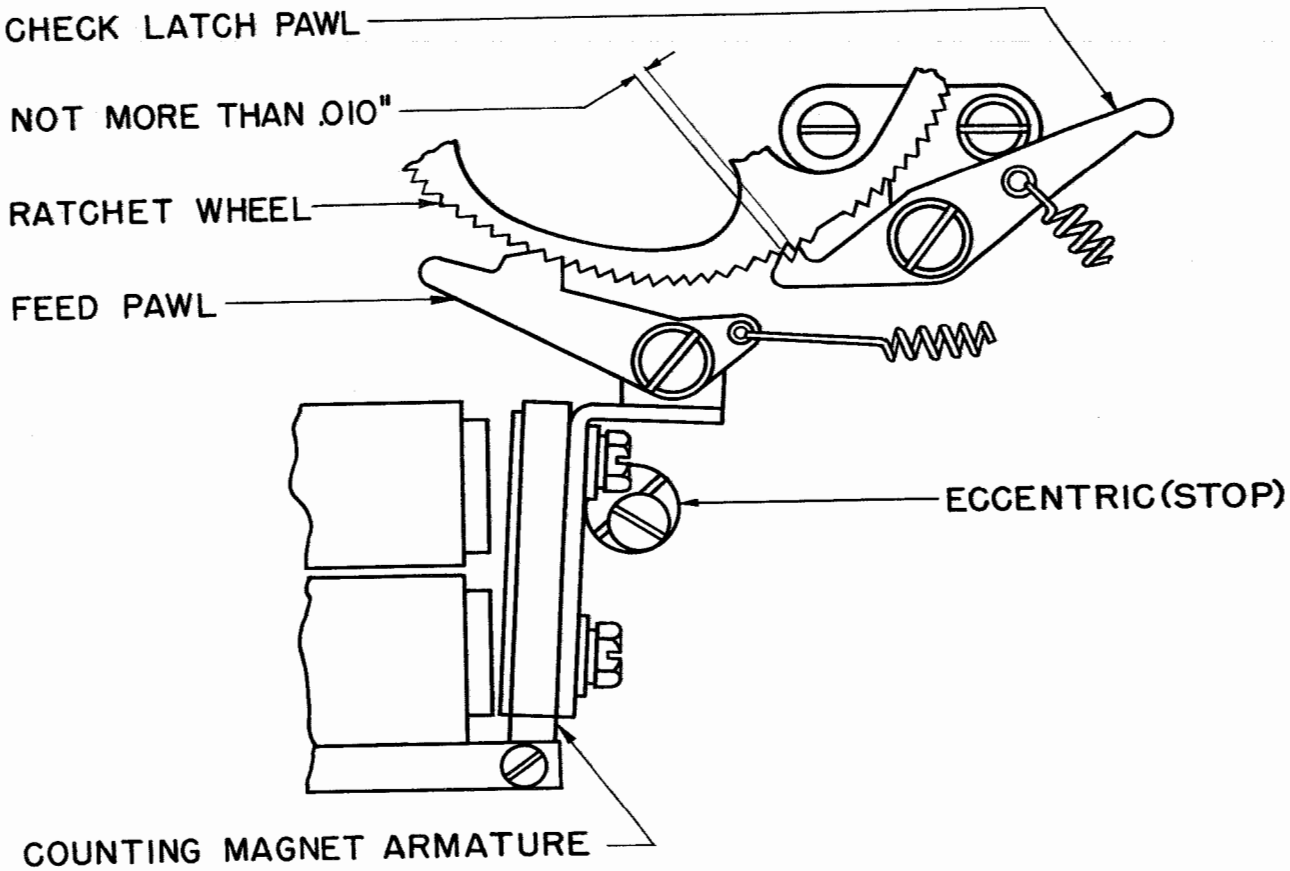
CHECK LATCH PAWL
NOT MORE THAN .010"
RATCHET WHEEL
FEED PAWL
ECCENTRIC (STOP)
COUNTING MAGNET ARMATURE

Figure 50

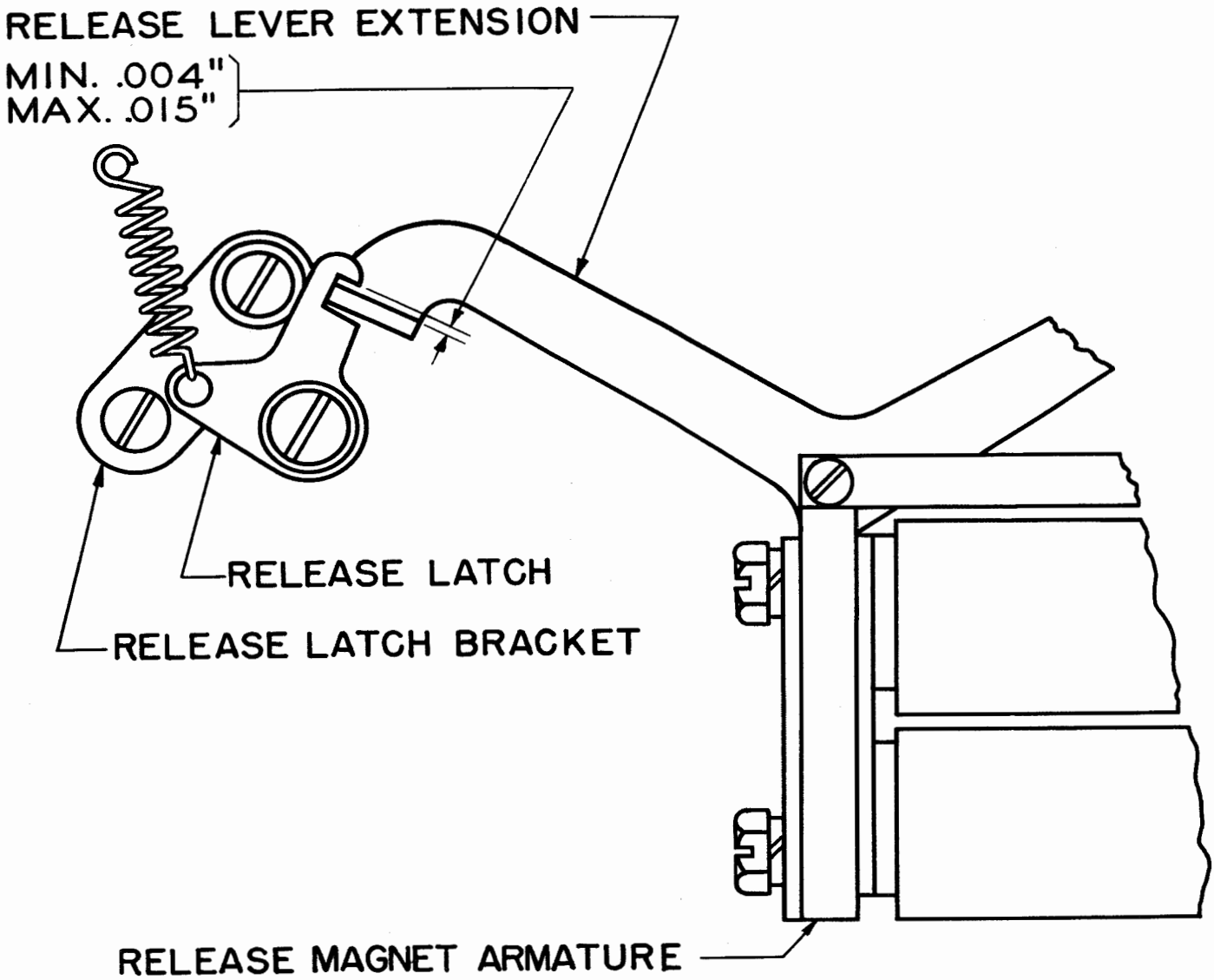

Figure 51

6.15 Signal-lamp Contact Springs: When the contact lever is on the low part of its cam, the insulator on end of long contact spring should clear contact lever by not more than 0.015 inch. See Figure 52.

Adjust by positioning contact bracket.

6.16 Signal-lamp Contact Springs should break contact when the contact lever is on the high part of its cam and a pull of minimum 2 ounces, maximum 3 ounces is applied. See Figure 53.

To Adjust: Bend short contact spring and recheck 6.13.

6.17 Signal-lamp Contacts should just close when the indicator arm points to 65 on the counter dial and the indicator shaft should have not more than 0.004 inch endplay. Gauge by eye and feel. See Figure 53.

To Adjust: Position contact cam.

6.18 Dashpot Vent Screw: Ratchet wheel should return to Zero position from the point of farthest travel without bouncing when operated under power and should return from the eighth position quickly enough to prevent feeding more than one space when a keylever is depressed immediately after the ratchet wheel has been released.

To Adjust: Position dashpot vent screw.

Note: Reassemble counter cover.

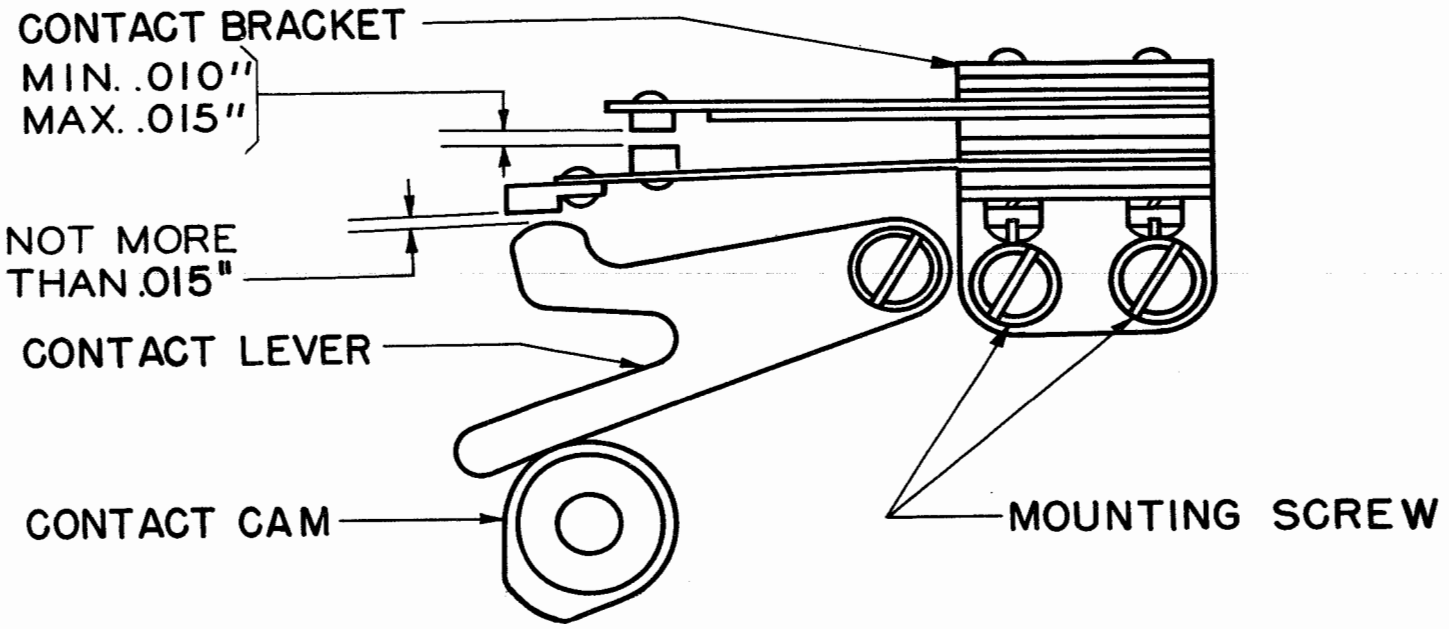

Figure 52

7. UNITS WHERE PUNCH CONTACTS ARE PUSHED CLOSED

7.01 These units are used principally by the United Press Association and should meet the applicable requirements of this section except the punch-magnet control-contact mechanism, counter-control contacts and signal-lamp contacts which should be adjusted as outlined below.

Note: Some units are not equipped with repeat-space antichatter contact mechanisms or with counter-control contacts on the keyboard.

7.02 Punch-magnet Contact Bracket should be so positioned that there is a clearance of minimum 0.002 inch, maximum 0.010 inch between the left-hand contact spring and the end of its stiffener when the keylever is depressed which imparts the least movement to the punch-contact operating lever. See Figure 54 for identification of parts.

To Adjust: Loosen both mounting screws of the punch-contact bracket and position the bracket.

Note 1: If counter-control-contact assembly is mounted on perforator casting, recheck the counter-control-contact assembly.

Note 2: If less depth of touch is desired, move the punch-magnet control-contact assembly toward the right. The limiting right position is that at which, as the LTRS key is depressed, the punch-selector fingers just cover the full face of the punch pins when the contact points close.

7.03 Punch-Magnet Contact Springs:

(a) Left-spring Stiffener should be parallel to that part of the contact bracket on which it is mounted. Gauge by eye.

To Adjust: Bend the stiffener and recheck 7.02.

(b) Left Contact Spring should be flat against the stiffener and press against its tip with a force of minimum 4 ounces, maximum 5 ounces. See Figure 54A.

To Adjust: Bend left spring, loosening pile-up if necessary.

(c) Right Spring should require a force of minimum 1 ounce, maximum 1-1/2 ounces to close the gap between the contacts on the right and left springs. See Figure 54A.

To Adjust: Bend right spring near pile-up insulators.

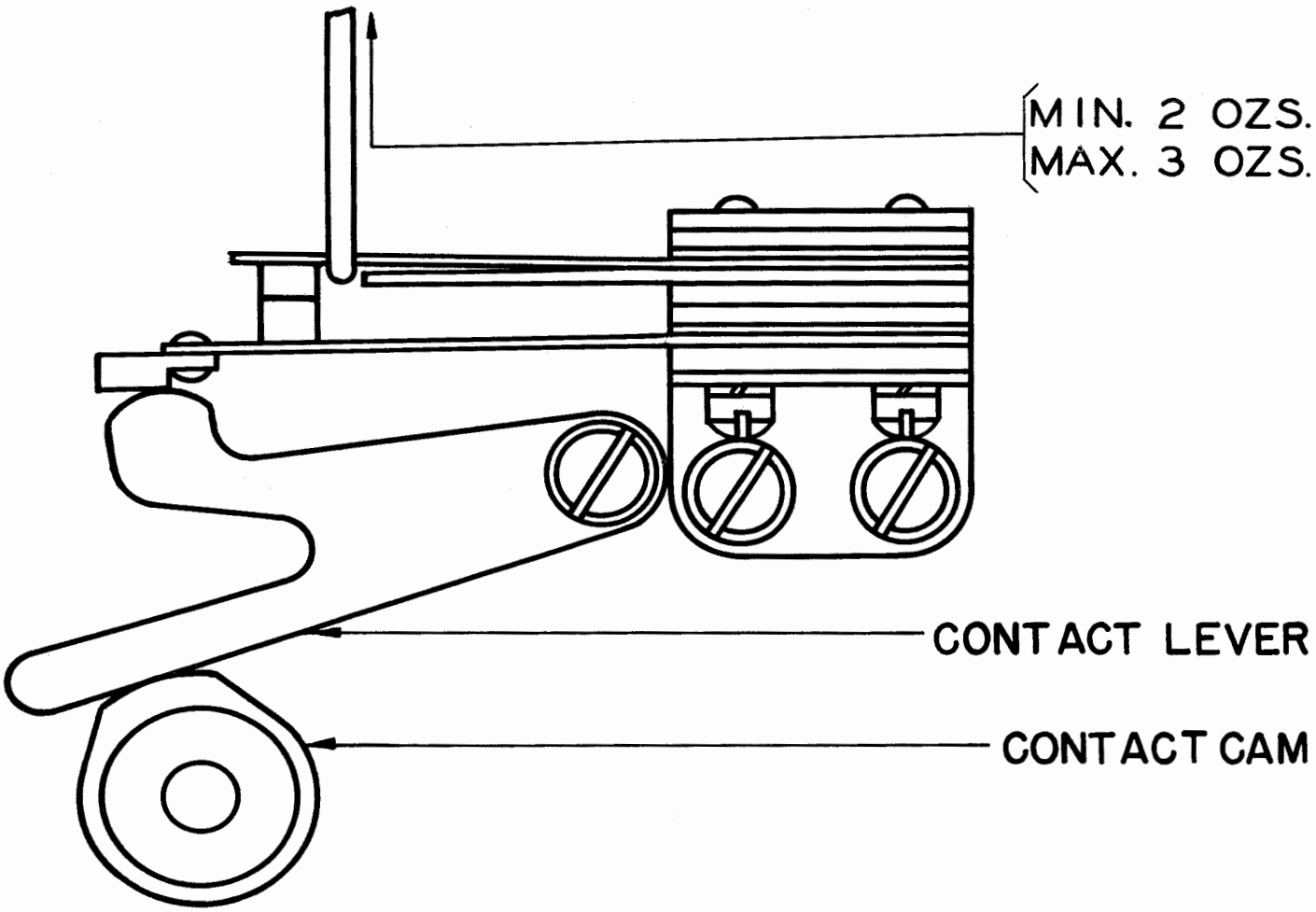

Figure 53

7.04 Punch-Contact Operating-lever Backstop: There should be minimum 0.015 inch, maximum 0.020 inch clearance between right and left punch-contact discs when the right spring is resting against the fiber tip on the punch-contact operating lever and the lever is resting against the bottom of the slot in the backstop bracket. See Figure 54A.

To Adjust: Position the backstop bracket and tighten the mounting screws. Check punch-contact spring-pressure requirement.

7.05 Punch-contact Operating-lever Spring should have a tension of minimum 1/2 ounce, maximum 1-1/2 ounces when stretched to position length when the operating lever is resting against the backstop bracket at the bottom of the guide slot.

Note: If touch is too heavy, this spring may be removed provided the tension of the right contact spring is sufficient to return the operating lever to its backstop.

7.06 Counter-control-contact Operating Mechanism mounted on the perforator unit should meet the requirements in 6.01 to 6.18 inclusive, except as noted below.

(a) Gap between contact of No. 2 and No. 3 springs should be minimum 0.010 inch, maximum 0.015 inch.

(b) Spring No. 3 should separate from the end of its stiffener when a force of not more than 1 ounce is applied at the contact of the No. 3 spring.

7.07 Feed-pawl Eccentric: The feed pawl should engage a tooth on the feed roll without overtravel with the high portion of the code-selector fingers under the code punches and just touching the lower ends of the code punches (the feed punch is engaged before the code punches).

To Adjust: Position the feed-pawl eccentric bushing and tighten bushing mounting screw.

7.08 Counter-unit Signal-lamp Contacts should just close when the indicator arm points to 63 on the counter dial and the indicator shaft should have not more than 0.004 inch endplay. Gauge by eye and feel. See Figure 53.

To Adjust: Position contact cam.

8. MODIFICATION OF PERFORATOR-TRANSMITTER FOR LIMITED USE OF KEYBOARD-CONTROL OPERATING LEVER

8.01 The following instructions cover a method of modifying perforator-transmitters for use in places where it is desired (a) only to perforate tape, (b) only to perforate tape and make home copy simultaneously, (c) either to perforate tape and make home copy, or to send directly from keyboard.

Note: When the perforator-transmitter is restored to normal the TP104749 blocking plate may be mounted on the rear of the bracket, with the fingers pointing downward and slightly toward the left to clear the bracket by one mounting screw through the upper hole in the bracket and the right-hand hole in the blocking plate, the other screw being secured in the left-hand hole in the blocking plate.

(a) To Provide for Perforate Only:

(1) Lock the keyboard-control operating lever in the TAPE position by means of a TP104749 blocking plate. This mounts on the back of the TP83349 detent bracket with the fingers to the right, using the screws and lockwashers furnished, the screws being inserted through the clearance holes in the bracket.

(2) With the sending shaft fully rotated to its stopped position to disengage the toothed clutch, using a strong unwaxed string, tie the clutch-throwout lever to the

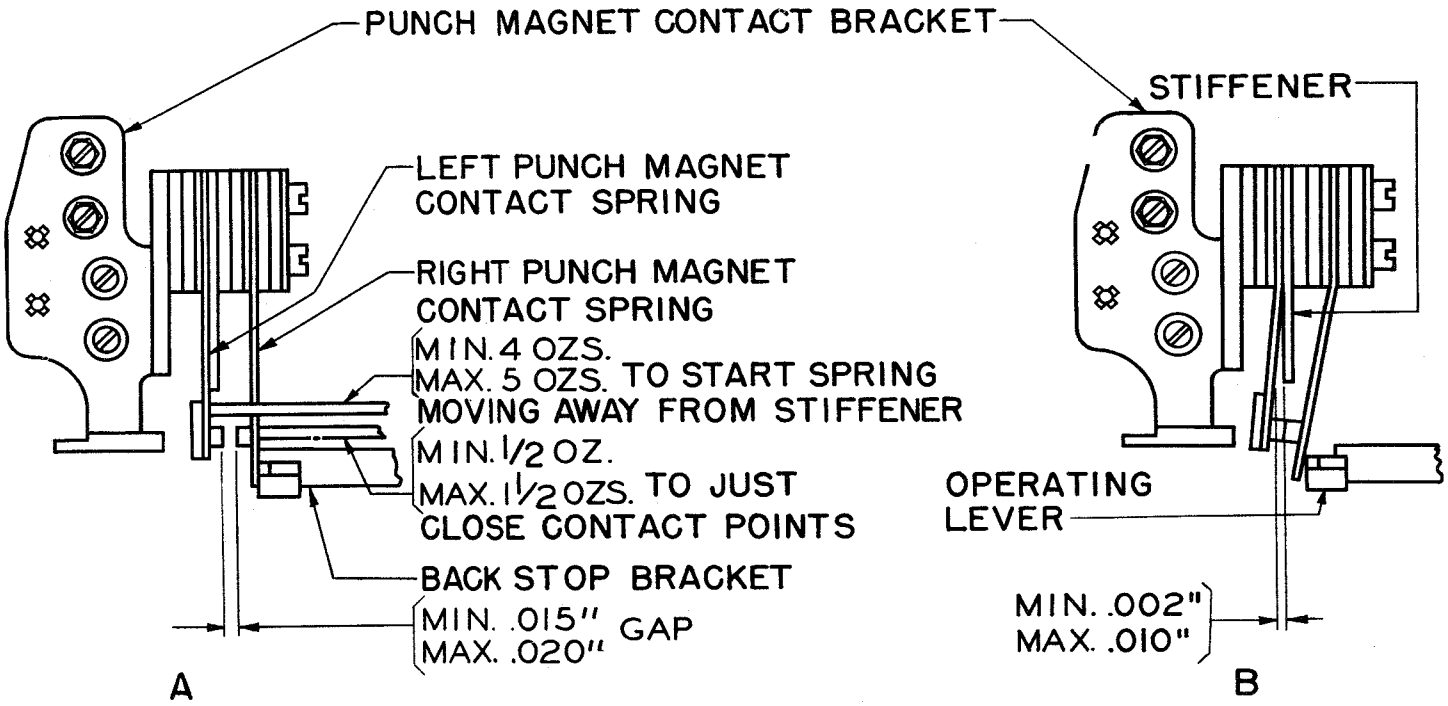

Figure 54

driven cam member and tie the lock loop against its projection so that the sending cam shaft will not be permitted to rotate either forward or backward. Both these members may be tied with the same string by passing a loop of the string around the roller on the lock loop, then passing the two ends over and under the driven cam member and around the clutch-throwout lever and tying securely. Leave ends of string about 3 inches long.

(3) Remove the gear from the shaft and tie it close to the clutch-throwout lever with the ends of the string used for securing the lever. Replace the gear mounting screw, with its washer, in the hole in the shaft.

(4) If the perforator-transmitter is not equipped with the TP94494 modification kit, unhook the TP112634 spring from the repeat-space rod, pass the free end of the spring upward to the right of the clutch-throwout lever and hook it to the right end of the clutch-throwout-lever spring. (Where the TP94494 modification kit is used, no change in the spring is required.)

(5) Check 2.29.

(b) To Provide Only for Perforating Tape and Making Home Copy: With the keyboard-control operating lever in its mid-position, mount the TP104749 blocking plate as in 8.01(a).

(c) To Provide Either for Perforating Tape and Making Home Copy or Sending Directly from Keyboard: Saw off one finger from the TP104749 blocking plate. With the operating lever in its middle position, mount the blocking plate with its remaining finger under the operating lever.

9. REPEAT-CHARACTER MECHANISM (TP122264 Modification Kit)

9.01 Repeat-lever Bracket should be parallel to the slots in the keylever guide. See Figure 55.

To Adjust: Position the repeat-lever bracket.

9.02 Repeat-space Extension: (See Figure 55)

(a) The lower edge of the extension should be parallel with the center line of the TP-89496 spacebar shaft.

(b) The vertical portion of the extension should engage securely behind the repeat-lever extension.

To Adjust (a) position repeat-space extension and to adjust (b) position repeat-lever extension.

9.03 Repeat-space Rod: Make adjustment per 2.24.

9.04 Torsion Spring should hold the repeat keylever against its backstop with minimum 1/2 ounce pressure. See Figure 55.

To Gauge: Hook the scale over the end of the repeat-lever extension above the repeat-space rod and pull horizontally outward. It should require minimum 1/2 ounce to start repeat-lever extension moving.

10. TAPE BUZZ-OUT MECHANISM (TP112008 Modification Kit)

10.01 Repeat-contact Bracket: There should be some clearance, minimum 0.002 inch, between the rear edge of the plate on the armature and the adjacent vertical edge of the forward cutout in the lever, when the parts are positioned to make that clearance a minimum. See Figure 56.

To Adjust: Utilize the play of the repeat-contact bracket.

10.02 Detent-lever-eccentric Screw: With the armature in its unoperated position and the lever held against the top of the plate, the detent point of the lever should be approximately as far below the apex of the detent lever as it is above the apex of the detent lever when the armature is in its operated position and the lever is held against the bottom of the plate. See Figure 57.

To Adjust: Position the detent-lever eccentric screw, utilizing the forward semicircle of adjustment.

10.03 Detent-lever Spring: It should require minimum 3 ounces, maximum 4 ounces to move the detent lever away from the lever when the armature is in the unoperated position and the lever held against the top of the plate. See Figure 57.

To Gauge: Hook scale over the top of the detent lever and pull horizontally rearward.

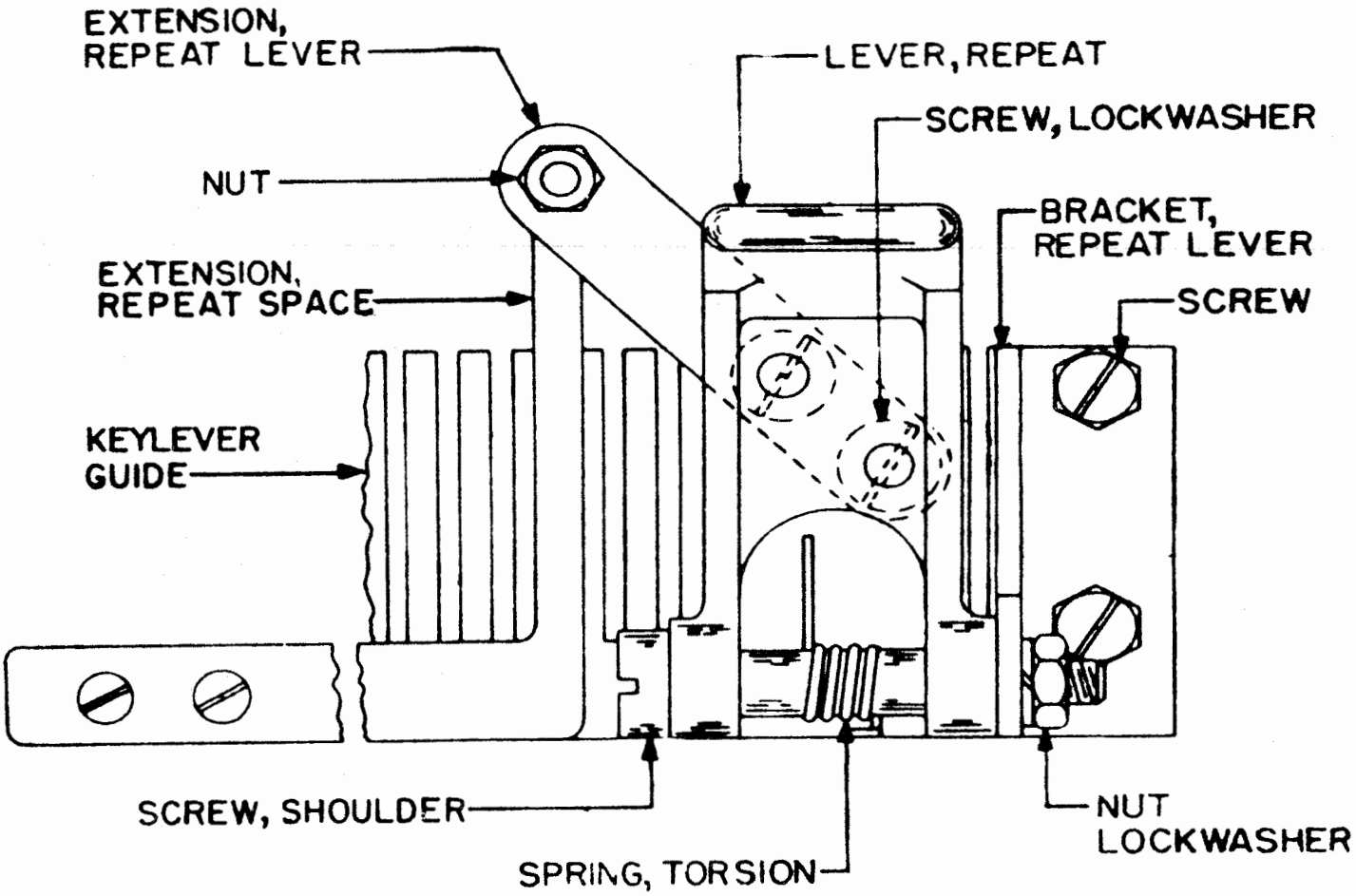

Figure 55

10.04 Repeat Contacts (Perforator):

(1) The contact points should be in line and there should be minimum 0.015 inch, maximum 0.045 inch clearance between the insulator on the long contact spring and the bottom of the upper cutout in the lever. See Figure 56.

To Adjust: Position the contact pile-up.

(2) It should require minimum 6 ounces, maximum 8 ounces, to separate the contact spring from the end of the stiffener. See Figure 57.

To Gauge: Hold long contact spring away from short contact spring, hook scale over the end of the short contact spring and pull horizontally.

To Adjust: Bend short contact spring.

(3) With the detent-lever spring removed from the detent lever and the armature held partially operated so that neither lobe of the lever is touching the plate, the contact points should meet squarely and it should require minimum 1 ounce, maximum 2 ounces to separate contact points. See Figure 56.

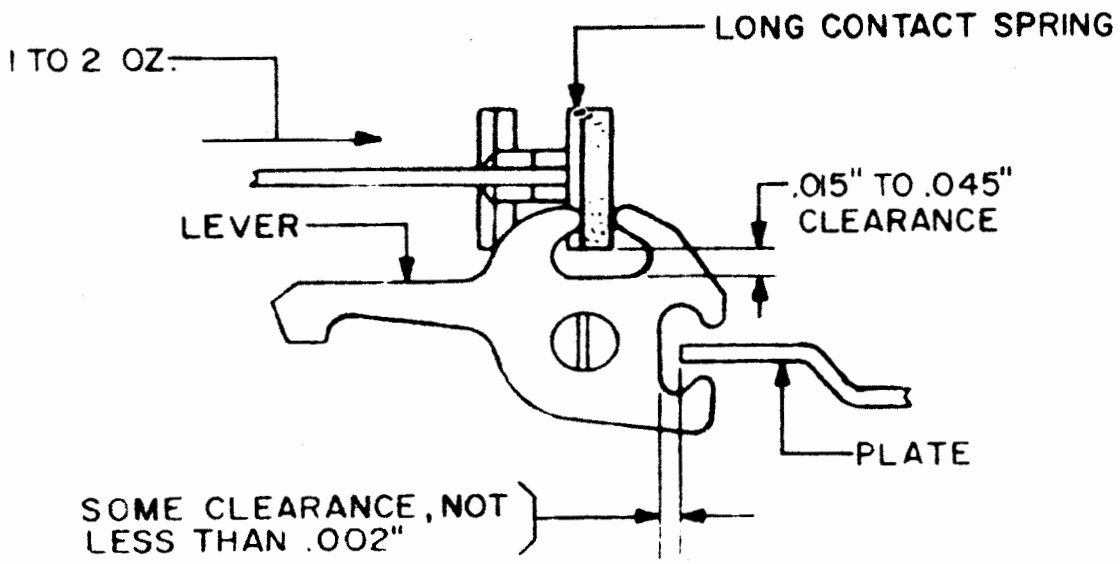

Figure 56

To Gauge: Apply push end of the scale to the long contact spring between the rivets.

To Adjust: Bend the long contact spring.

(4) There should be minimum 0.020 inch, maximum 0.025 inch clearance between the contacts when the armature is held in the operated position electrically. See Figure 57.

To Adjust: Bend the stiffener. Recheck (2) and (3).

10.05 Repeat Contact (Keyboard):

(1) There should be minimum 0.020 inch, maximum 0.040 inch clearance between contacts when the tape keylever is completely depressed and the long contact spring is in contact with the bottom of the key line extension. See Figure 58.

To Adjust: Bend the short contact spring.

(2) It should require minimum 2-1/2 ounces, maximum 3-1/2 ounces to separate the contacts. See Figure 59.

To Gauge: Place keyboard in a vertical position resting on its near edge, check that the keyboard repeat contacts are touching each other; then hook the scale over the long contact spring just above the contact, and pull horizontally at right angles to the contact spring.

To Adjust: Bend long contact spring.

10.06 Tape-keylever Eccentric Stud: With the contacts closed and the tape keylever held against its eccentric stud, there should be minimum 0.010 inch, maximum 0.030 inch clearance between the keylever extension and the insulator on the long contact spring. See Figure 59.

To Adjust: Position the eccentric stud.

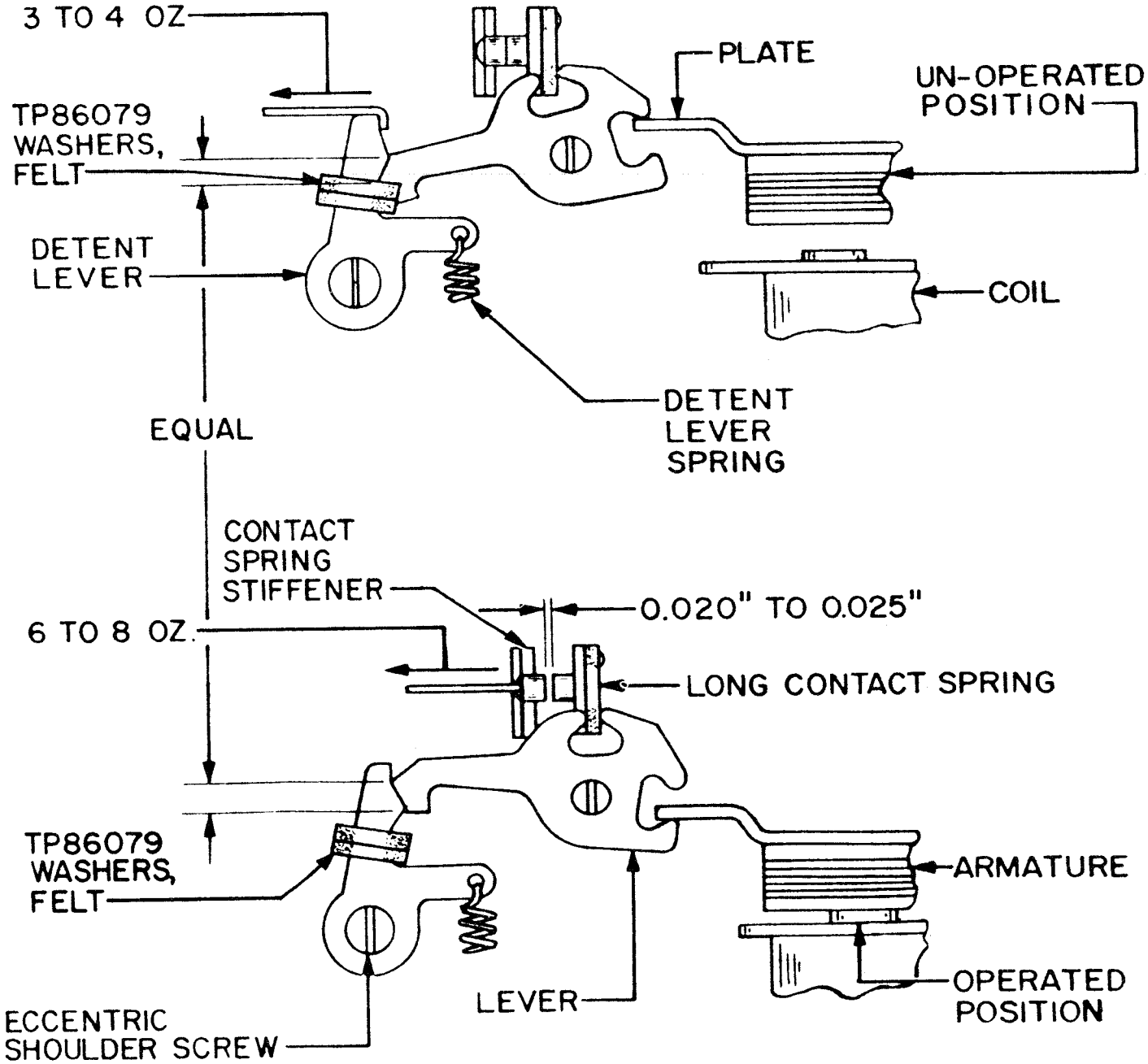
3 TO 4 OZ
PLATE
UN-OPERATED POSITION
TP86079 WASHERS, FELT
DETENT LEVER
COIL
DETENT LEVER SPRING
EQUAL
CONTACT SPRING STIFFENER
0.020" TO 0.025"
6 TO 8 OZ.
LONG CONTACT SPRING
TP86079 WASHERS, FELT
ARMATURE
OPERATED POSITION
LEVER
ECCENTRIC SHOULDER SCREW

Figure 57

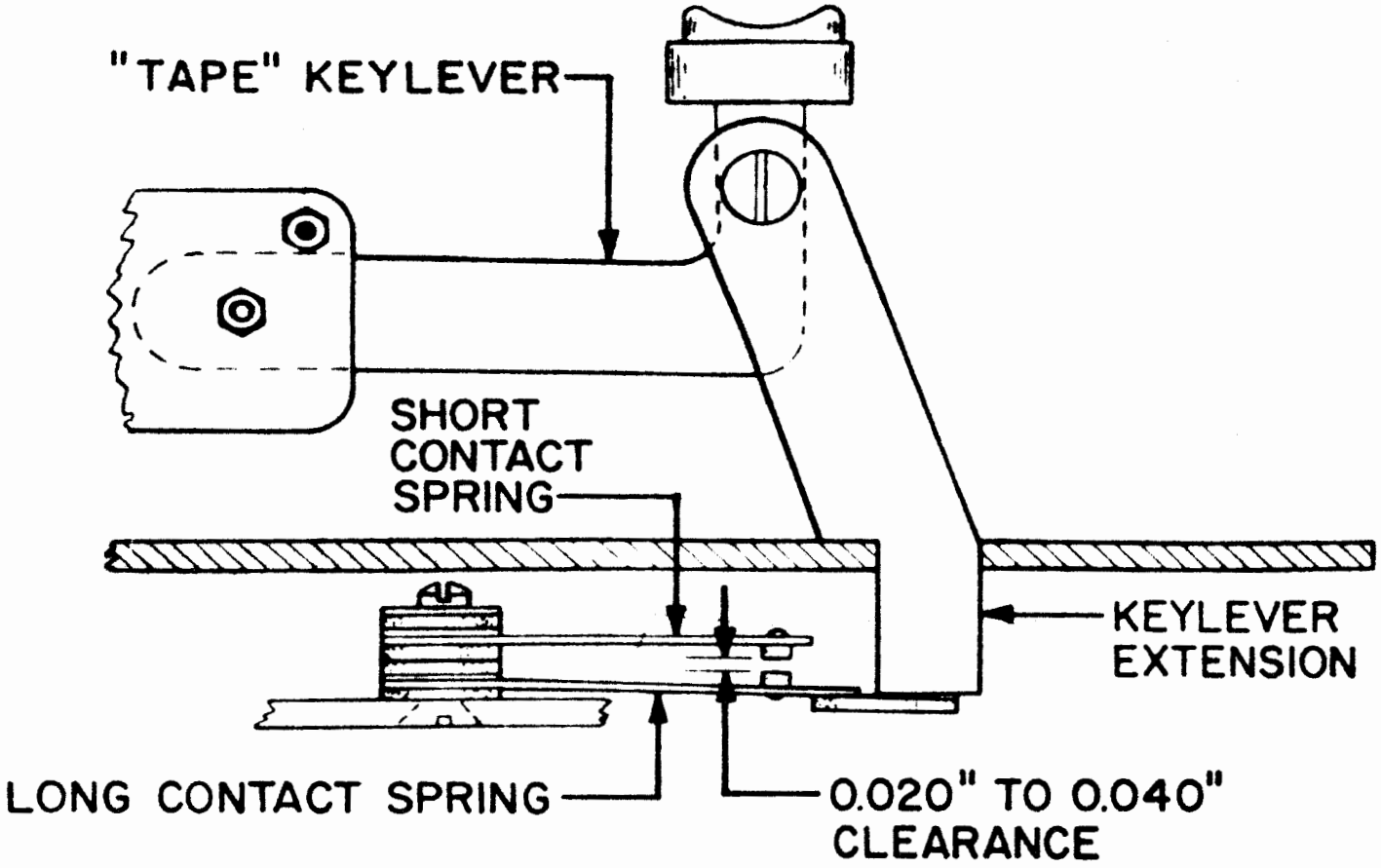
"TAPE" KEYLEVER
SHORT
CONTACT
SPRING
KEYLEVER
EXTENSION
LONG CONTACT SPRING
0.020" TO 0.040"
CLEARANCE

Figure 58

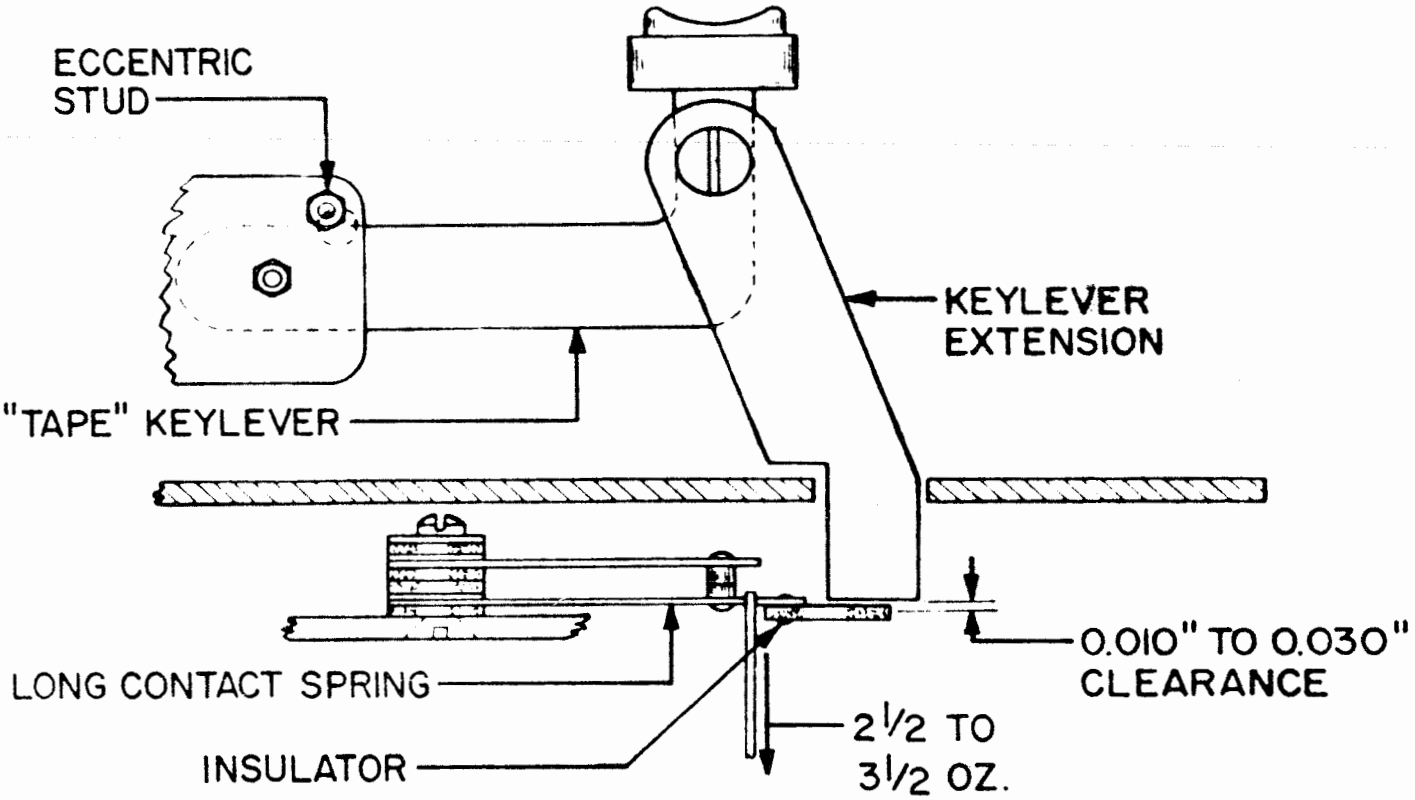
ECCENTRIC
STUD
KEYLEVER
EXTENSION
"TAPE" KEYLEVER
0.010" TO 0.030"
CLEARANCE
LONG CONTACT SPRING
2 1/2 TO
3 1/2 OZ.
INSULATOR

Figure 59