

14 TYPING REPERFORATOR (AUXILIARY FEATURES)  
REQUIREMENTS AND ADJUSTMENTS

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2.02 Ribbon-lift-lever Spring:

REQUIREMENT  
MIN. 28 OZ.  
TO START LIFT  
LEVER MOVING

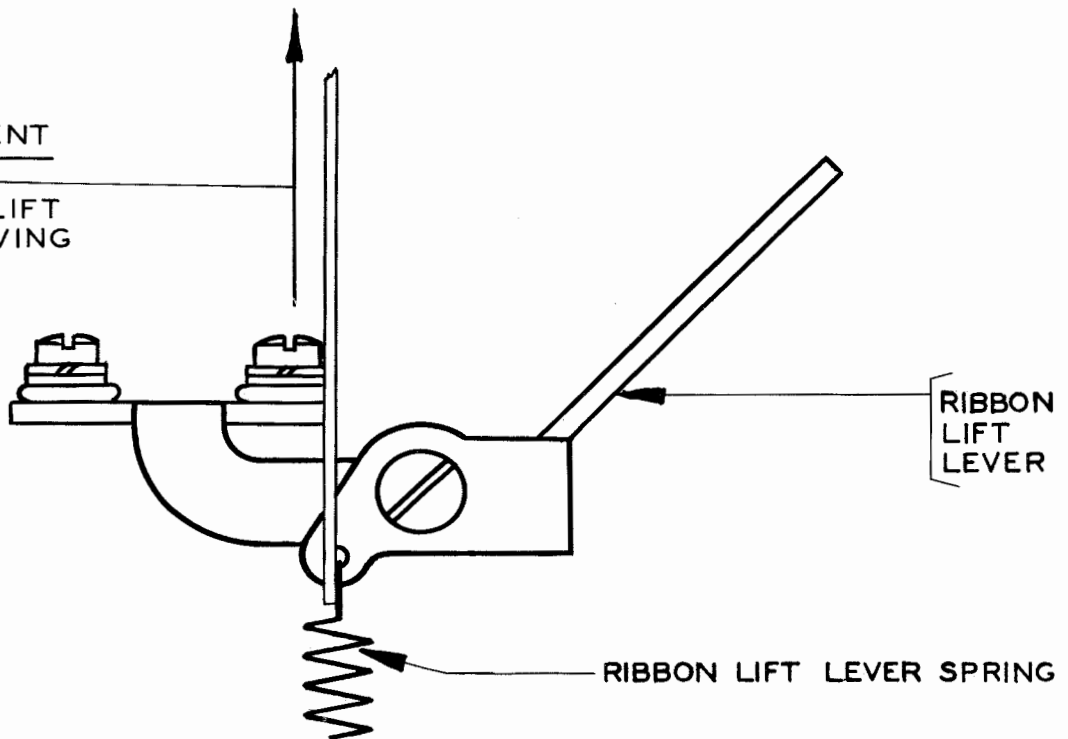


Figure 1

2.03 Back-space-lever Spring:

REQUIREMENT  
MIN. 1 OZ. MAX. 2 1/2 OZ.  
TO START BACK SPACE  
LEVER MOVING

BACK SPACE  
FEED PAWL SPRING

BACK SPACE FEED PAWL

REQUIREMENT  
MIN. 1/2 OZ., MAX. 1 1/2 OZ.  
TO START FEED PAWL  
MOVING

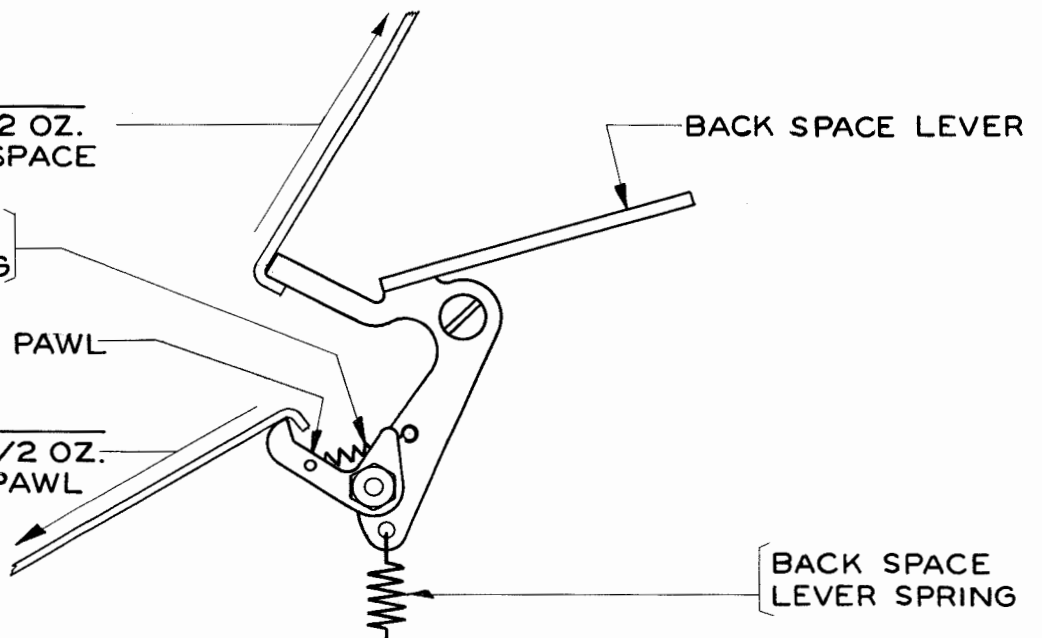


Figure 2

2.04 Back-space Feed-pawl Spring (See Figure 2): The feed-pawl spring tension requirement is that for the new-type feed pawl shown in the section covering the requirements and adjustments for the 14 typing reperforator unit.

Note: All units equipped with the back-space mechanism should be capable of back-spacing a section of tape about 6 inches long punched with miscellaneous material by repeated depression of the back-space lever. The tape should not buckle or be damaged by the back-space operation. If trouble is experienced it may be necessary to refine the punch travel and other related adjustments given in the section covering the requirements and adjustments for the 14 typing reperforator unit and to remove any dirt or roughness from the parts.

2.05 Mechanical End-of-line Indicator: This set of parts (TP89960) provides visual indication, on a typing reperforator, that a full line for a page teletypewriter has been transmitted and that the CAR RET key must be operated.

2.06 Worm Shaft: The worm shaft should be free to rotate, with a minimum amount of endplay, when the worm-shaft spring is detached from the contact bracket. (See Figure 3.)

To Adjust: Position the worm-shaft collar by means of the set-screws.

2.07 Worm-shaft Spring: The worm-shaft spring should have sufficient drag to prevent backlash of the worm-shaft.

2.08 Lamp-contact Springs: The front lamp contact spring (left hand in Figure 3) should press against its stiffener. If the mechanism is removed for any reason the tension of the spring against the stiffener should be adjusted to minimum 3 ounces, maximum 4 ounces. (See Figure 3.)

To Gauge: Using an 8-ounce scale, push perpendicular to the spring at the contact point when the contacts are in the unoperated position.

To Adjust: Remove the spring from the pile-up and bend it.

With the front contact spring in the unoperated position, there should be minimum 0.015 inch, maximum 0.025 inch clearance between the front and rear contacts. (See Figure 3.)

To Adjust: Bend the rear spring.

2.09 Contact Bracket: The front lamp-contact spring should clear the lower edge of its stiffener by not more than 0.010 inch with the lamp contacts closed and the worm-follower resting in the groove at the front of the worm. (See Figure 4.)

To Adjust: Position the contact bracket.

2.10 Worm-follower Release Bail: The bail should have perceptible endplay and should close the lamp contacts when minimum 62, maximum 66 characters have been received.

To Adjust (Old Arrangement): Position the contact bracket. (New arrangement) Position the collar on the ribbon-reverse shaft and the contact bracket. Recheck the contact-bracket adjustment.

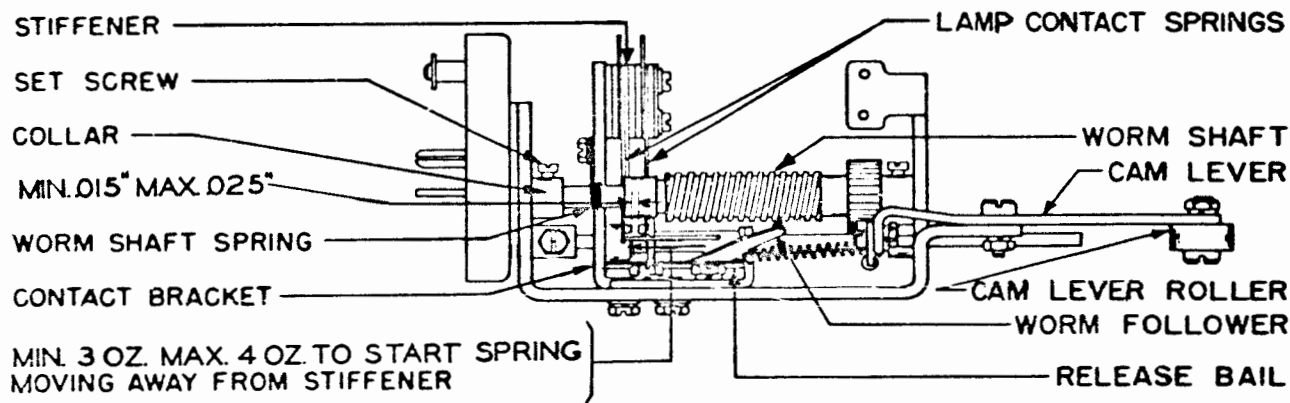


Figure 3

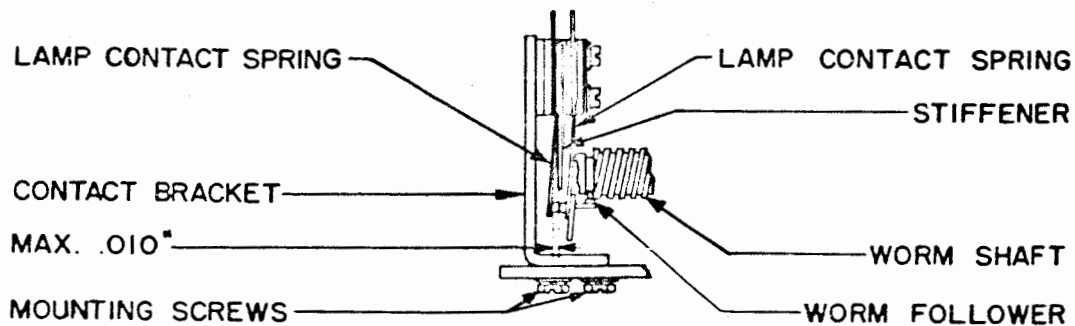


Figure 4

2.11 Worm-follower Spring: The spring should have a tension of minimum 1-1/2 ounces, maximum 3-1/2 ounces at a point where the worm-follower just touches the rear contact-spring insulator. (See Figure 5.)

To Gauge: Hook the pull end of an 8-ounce scale over the end of the worm-follower and pull parallel to the spring, holding the release bail so that the follower-pin clears the worm.

2.12 Release-bail Spring: It should require a tension of minimum 7 ounces, maximum 11 ounces to start the release bail moving from its unoperated position. (See Figure 6.)

To Gauge: Hook the pull end of a 32-ounce scale under the edge of the release-bail near the spring hole and pull vertically upward.

2.13 Feed-pawl Spring: It should require minimum 3 ounces, maximum 5-1/2 ounces to start the feed-pawl moving. (See Figure 7.)

To Gauge: Hook the pull end of an 8-ounce scale around the feed-pawl at the spring-hole and pull in line with the spring, keeping the cam-lever roller on the low part of its cam.

2.14 Cam-lever Spring: It should require minimum 28 ounces, maximum 38 ounces to move the cam lever. (See Figure 8.)

To Gauge: Hook the pull end of a 64-ounce scale under the cam lever at the spring-hole and pull in line with the spring, keeping the cam-lever roller on the low part of its cam.

2.15 Platen-shift Contact Mechanism: (LTRS Make, TP99342; FIGS Make, TP99343.) This feature is provided by a set of parts designed to operate with movement of the platen, and located at the base of the unit in front of the type-bar segment. The LTRS make-contacts close when the platen is in the LTRS position and open when the platen is shifted to the FIGS position. The FIGS make-contacts close when the platen is in the FIGS position and open in the LTRS position.

2.16 Contact-operating Lever: The lever should engage the bakelite tip on the long spring approximately in its center.

To Adjust: Position the contact bracket.

2.17 Platen-shift Contact Assembly (LTRS-Make Type) (See Figure 9).

Note: The following adjustments of Figure 9 and 2.17(a) and (b) should be made only when the mechanism is obviously out of adjustment. Remove the contact and bracket assembly except for the adjustments involving the operating lever. (See Figure 9.)

(a) The contact pressure should be minimum 1 ounce, maximum 2 ounces when the long contact spring is in its operated position. (See Figure 9.)

To Gauge: Insert a 0.040 inch wire gauge between the insulator cover and the long contact spring and press it toward the mounting-screws until the short contact spring is separated from its stiffener by minimum 0.004 inch, maximum 0.010 inch. Hook the pull end of an 8-ounce scale over the short contact spring at the contact and pull at right angles to the spring.

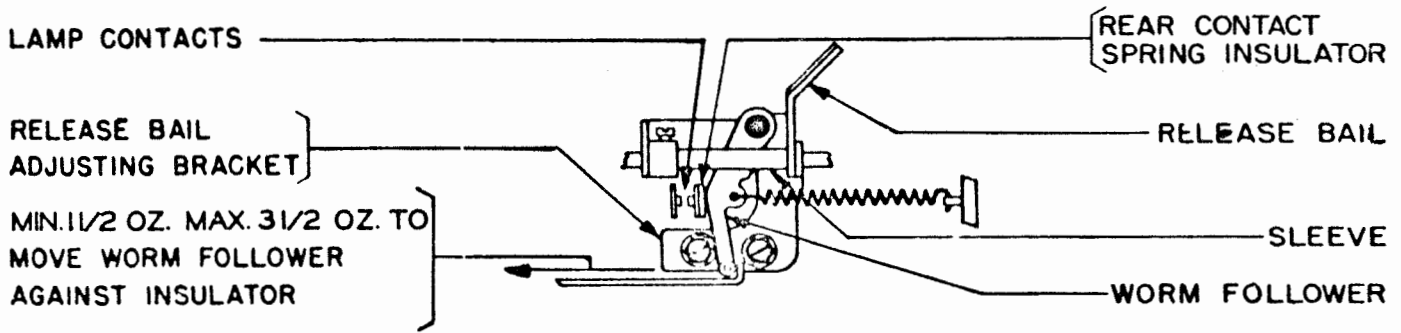


Figure 5

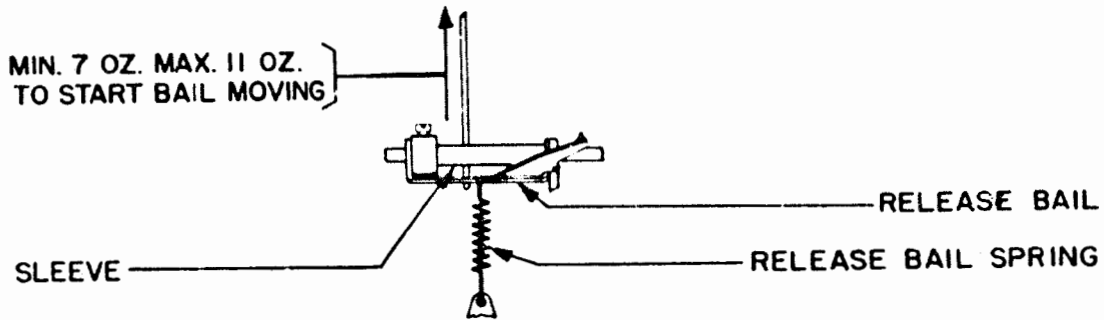


Figure 6

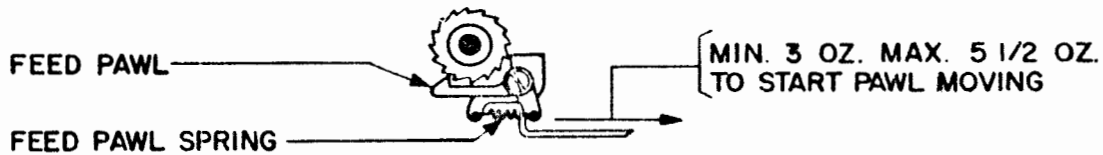


Figure 7

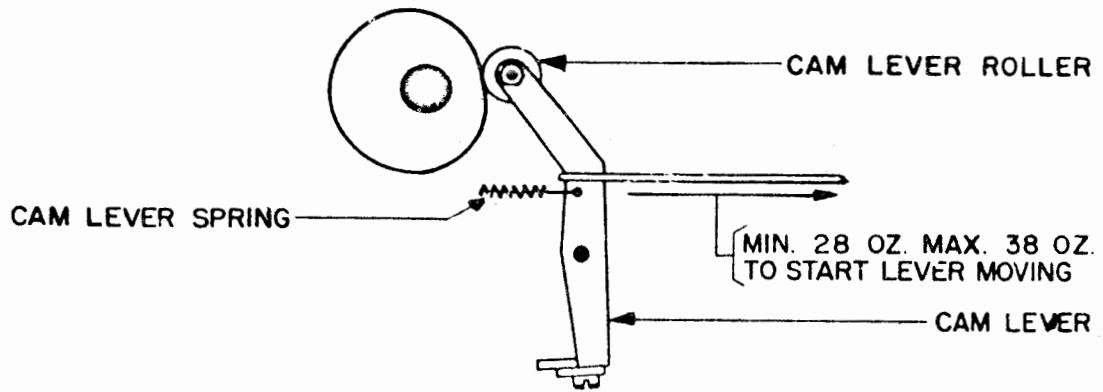


Figure 8

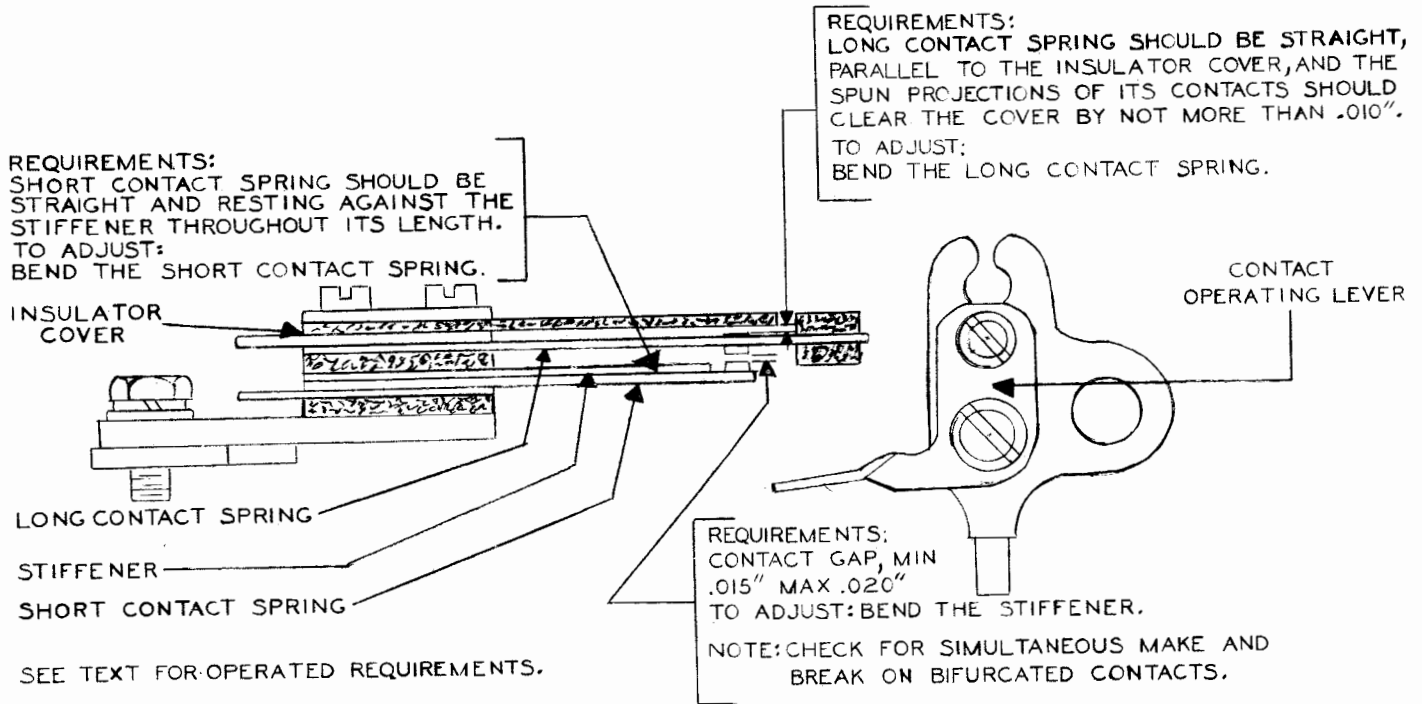


Figure 9

To Adjust: Bend the short contact spring.  
Note: Remount the contact assembly and recheck 2.16.

(b) Clearance between the lower contact springs and their stiffeners should

be maximum 0.004 inch with the platen in the LTRS (rear) position. (See Figure 9.)

To Adjust: Position the operating lever.

2.18 Platen-shift Contact Assembly (FIGS-Make Type) (See Figure 10)

Note: The adjustments of Figure 10 and 2.17 (a) should be made only when the mechanism is obviously out of adjustment. Remove the contact and bracket assembly except for the adjustments involving the operating lever. (See Figure 10.)

Note: Remount the contact-spring assembly and bracket and recheck 2.16.

There should be a gap of minimum 0.015 inch, maximum 0.020 inch between the upper and lower contacts with the platen in the LTRS (rear) position. (See Figure 10.)

To Adjust: Position the operating lever.

2.19 Pullbar Contact Mechanism, TP97125 (Any position except 25-26); TP97140 (Only positions 25-26). The pullbar contacts are located on a bracket above the pullbars and are operated by pullbars having a hooked extension which engages the long contact spring of the break-make spring combination. The contacts are designed for momentary operation.

2.20 Pullbar-contact Mounting-plate: The following requirements should be met with the pullbars resting against the code-bars but not selected.

(a) The toes of the pullbar hooks should be as close as possible to 0.442 inch above the contact mounting-plate. (See Figure 11.)

Gauge: With the TP99391 gauge.

To Adjust: Add or remove shims between the pullbar contact mounting-plate and the mounting posts.

(b) The toes of the two end pullbar hooks and one middle hook should be as close as possible to 0.620 inch in front of the contact mounting-plate. (See Figure 12.)

Gauge: With the TP99391 gauge.

To Adjust: Loosen the nuts securing the mounting-plate and position the plate. Tighten the nuts.

2.21 Pullbar Guard: The pullbar guard should meet the following requirements with the main bail in its lowest position. (See Figure 12.)

(a) With the typebars resting against the back-stop, it should not be possible to manually disengage the pullbars from their guide slots.

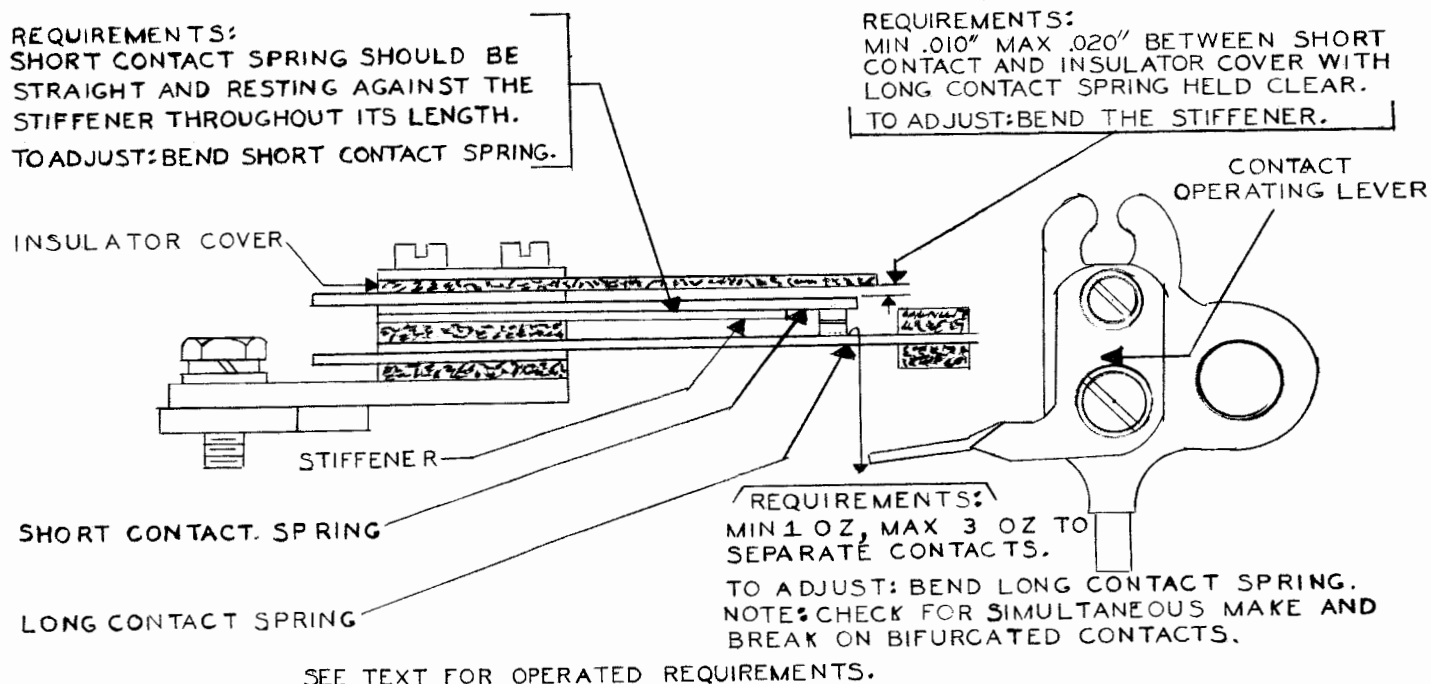


Figure 10

PULL BAR IN BLOCKED POSITION

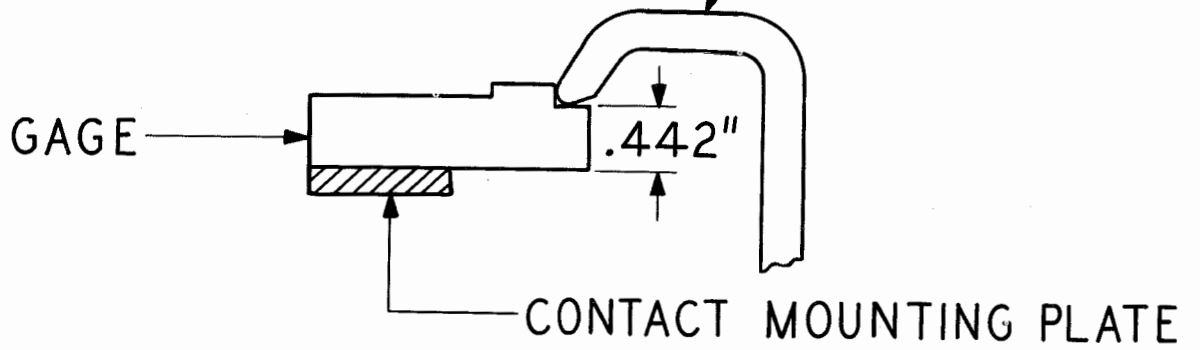


Figure 11

PULL-BAR IN BLOCKED POSITION

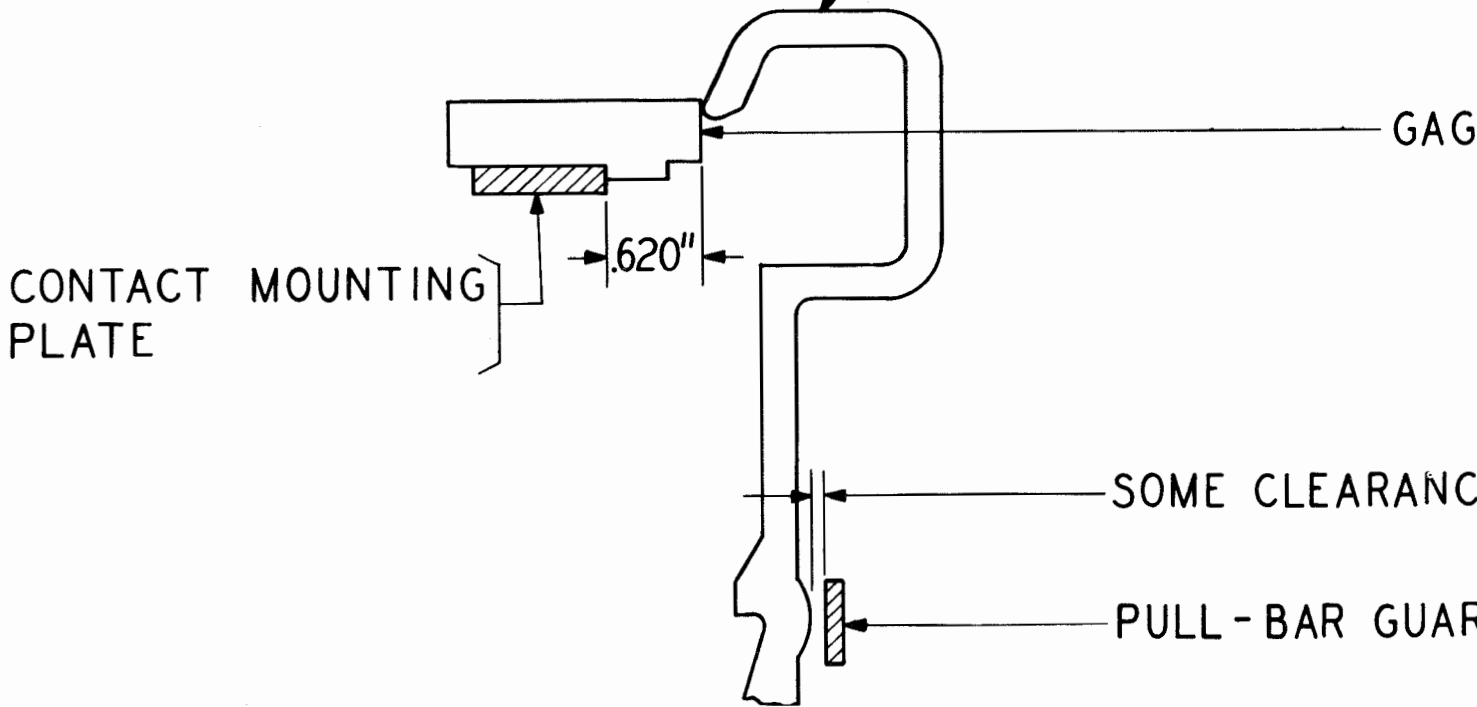


Figure 12



(b) With the typebars held against the platen, there should be some clearance between the pullbars and the pullbar guard.

Note: For pullbars not having associated typebars, the clearance in (b) is checked by raising the pullbar by hand to a point where there is minimum clearance between the pullbar and the pullbar guard, the pullbar being in contact with the main-bail. (Shift the platen to permit raising of the pullbar.)

To Adjust the End Pullbars: When the guard does not meet the requirements in (a) and (b), add or remove washers or shims between the guard and the frame on the side not meeting the requirement. (The correct washers and shims measure 0.028 inch and 0.004 inch in thickness, respectively.)

To Adjust the Middle Pullbars: When the guard does not meet the requirements in (a) and (b), loosen one guard mounting-screw and push or pull the guard until the requirement is met.

2.22 Pullbar Contact-assembly:

Note: To insure uniformity in checking adjustments where pullbars are to be placed in the nonselected position, select the pullbar and, by manually holding it out of selection, create the nonselected condition by moving the No. 1 codebar into its path.

(a) With the pullbar in the selected position and with some clearance between it and the main bail, there should be a preliminary clearance of approximately 0.020 inch between the tip of the pullbar hook and the low flat surface of the long-contact-spring insulator. (See Figure 13.)

Note: This clearance may be affected by subsequent adjustments in this paragraph. There is no fixed requirement for the final clearance.

To Adjust: Bend the long contact spring for minimum clearance at this point and then obtain the 0.020 inch by bending the upper contact spring.

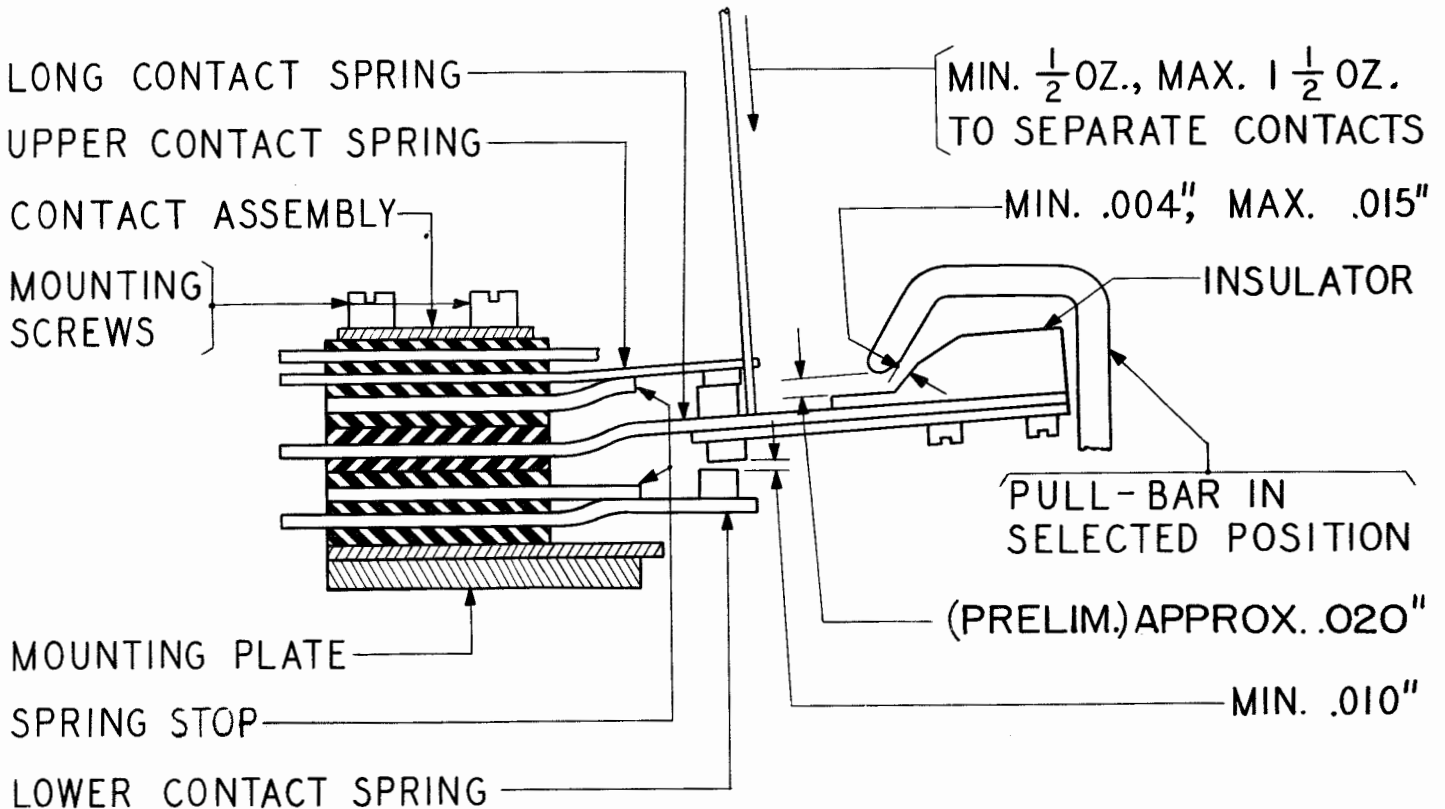


Figure 13

(b) With the pullbar in a selected position and play taken up by pressing lightly downward on the pullbar, there should be minimum 0.004 inch, maximum 0.015 inch clearance between the lower sloping surface of the long-contact-spring insulator and the adjacent surface of the pullbar hook. (See Figure 13.)

To Adjust: Position the contact assembly.

Note: To reduce bounce or chatter of the H pullbar contact, adjust the clearance in (c) and the tension in (d) toward their maximum limits.

(c) With the pullbar in its nonselected position and the upper contact spring against its stop, there should be minimum 0.015 inch, maximum 0.025 inch clearance between the long spring contact and the upper spring contact. (See Figure 14.)

To Adjust: Bend the upper-contact-spring stop.

(d) With the pullbar in the nonselected position, it should require minimum 1-1/2 ounces, maximum 2-1/2 ounces to separate the upper contact spring from its stop. (See Figure 14.)

To Gauge: Hook an 8-ounce scale under the upper spring at the contact and pull vertically.

To Adjust: Bend the upper contact spring.

(e) With the pullbar in the selected position, it should require minimum 1/2 ounce, maximum 1-1/2 ounces to separate the long spring contact from the upper spring contact. (See Figure 13.)

To Gauge: Apply the push-end of an 8-ounce scale to the long contact spring at the contact and push downward.

To Adjust: Bend the long contact spring and recheck requirement (c).

(f) There should be minimum 0.002 inch, maximum 0.006 inch clearance between the lower contact spring and its stop when the pullbar is in its nonselected position. (See Figure 14.)

To Adjust: Bend the lower-contact-spring stop.

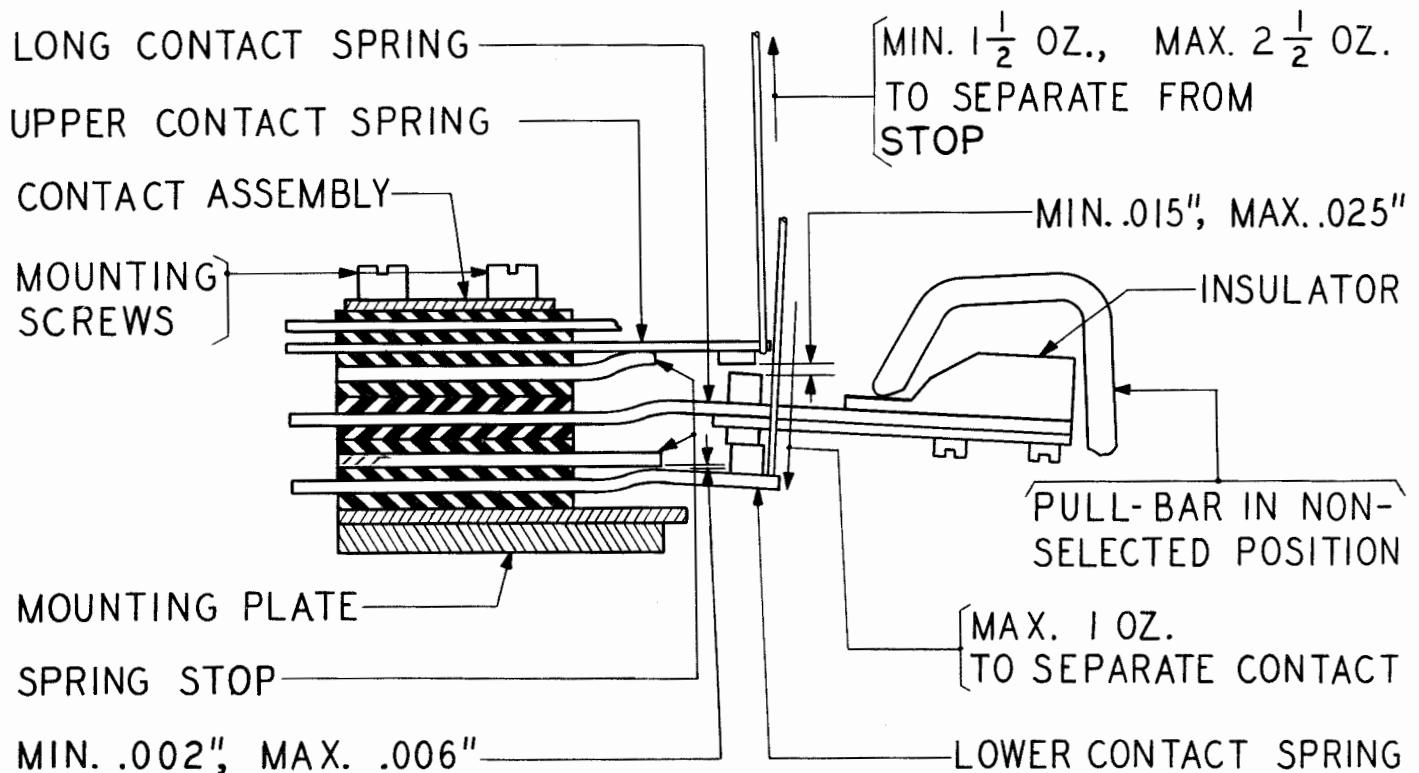


Figure 14

(g) It should require not more than 1 ounce to separate the lower spring contact from the long spring contact with the pullbar in the nonselected position. (See Figure 14.)

To Gauge: Apply the push-end of an 8-ounce scale to the lower contact spring at the contact and push downward.

To Adjust: Bend the lower contact spring and recheck (f).

(h) With the pullbar in its selected position, check that there is at least 0.010 inch clearance between the lower spring contact and the long spring contact. (See Figure 13.)

Gauge: By eye.

Note: The bending of springs and stops sets up stresses which tend to cause changes in permanent adjustments. To stabilize the adjustments, each pile-up of springs should be operated either manually or under power at least 20 times and then rechecked and readjusted as required.

2.33 Remote Signal Bell (Old) (TP88894): This set of parts is used where the regular (single stroke) bell is not sufficiently loud or where a bell is desired in another room. It consists of a set of contacts operated by a bell mechanism and wired to a remote bell and power source.

## 2.24 Remote Signal-bell Contacts:

(a) Contact-levers should fully engage the heel of the bell pullbar and clear its side by at least 0.010 inch when the BELL combination is set up and the motor has been rotated by hand until the pullbar bail is in its extreme upper position. See Figure 15 for location of parts.

Gauge: By eye.

To Adjust: Position the contact-bracket.

(b) Contact-levers should clear the insulator on the upper contact spring by not more than 0.006 inch when the contact-lever is held against the bell pullbar after the motor has been rotated by hand until the pullbar bail is in its extreme lower position. (See Figure 15.)

To Adjust: Bend the upper contact spring.

(c) The contact gap should be minimum 0.025 inch, maximum 0.035 inch when the contact-lever is held clear of the upper contact spring. (See Figure 15.)

To Adjust: Bend the stiffener.

(d) It should require minimum 1-1/2 ounces, maximum 2 ounces to move the lower contact spring from its stiffener. (See Figure 15.)

To Gauge: Hook the pull end of an 8-ounce scale at the end of the lower contact spring and pull vertically.

To Adjust: Bend the lower contact spring.

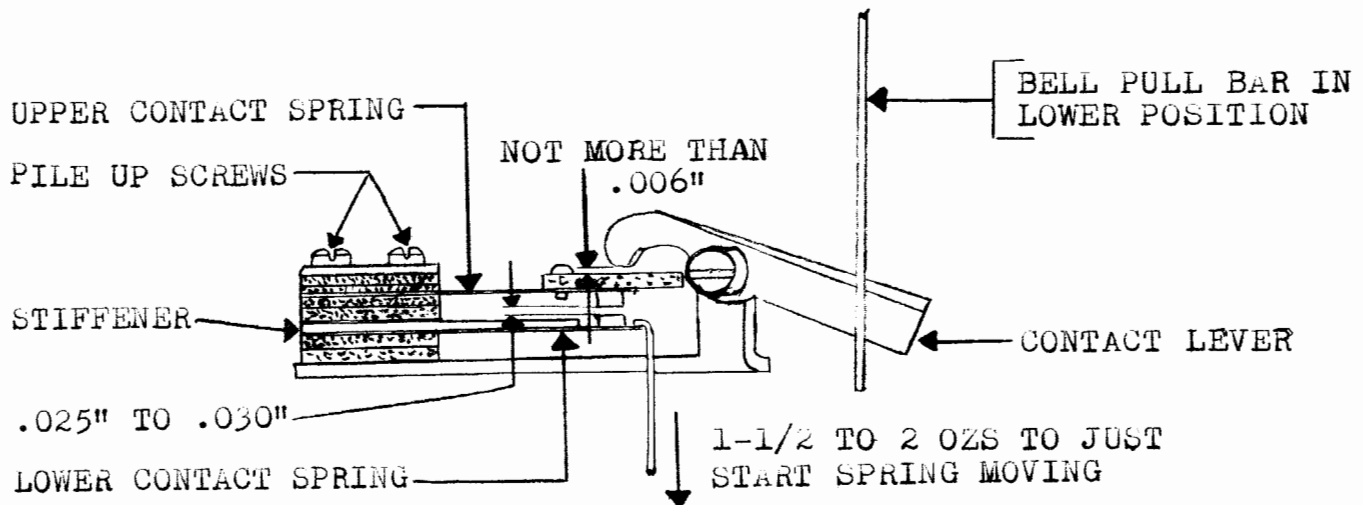


Figure 15

Note: It may be necessary to remove the contact assembly to make the adjustments in (c) and (d) above. In this case, contact adjustments may be checked with gauges before reassembling in the typing-unit.

2.25 Remote Signal Bell (New) (TP104479):

This set of parts serves the same purpose as the TP88894 remote signal bell but lengthens closure of the contacts permitting reliable operation of a low-voltage chime.

2.26 Remote Signal-bell Contacts: (See Figure 16 for location of parts and requirements.)

2.27 Tape-feed-out Magnet: This set of parts (TP106987) provides a means for feeding tape through the reperforator die block. This may be accomplished from a remote source by energizing the tape-feed-out magnet or by manually operating the tape-feed-out lever. The selector armature of the reperforator is held energized during feed-out so that tape which is fed out is punched with the LTRS combination.

2.28 Tape-feed-out Magnet Yoke: The yoke should be in line with the magnet bracket and the clearance between the magnet-coil terminals and the magnet yoke should be equal on both sides. (See Figure 17.)

Align: By means of the magnet mounting-screw. Recheck after tightening the screw.

2.29 Armature Face: The face should be flush against the magnet core and yoke and in line with them when the tape feed-out lever is fully operated. (See Figure 17.)

Adjust: By means of the armature mounting-screws.

2.30 Spring Bracket: The base of the bracket should be parallel to the axis of the magnet coil. (See Figure 17.)

Align: By means of the mounting-screws.

2.31 Armature Spring: It should require minimum 3/4 ounce, maximum 1-1/4 ounces to stretch the spring to position length as measured with the scale held horizontally. (See Figure 17.)

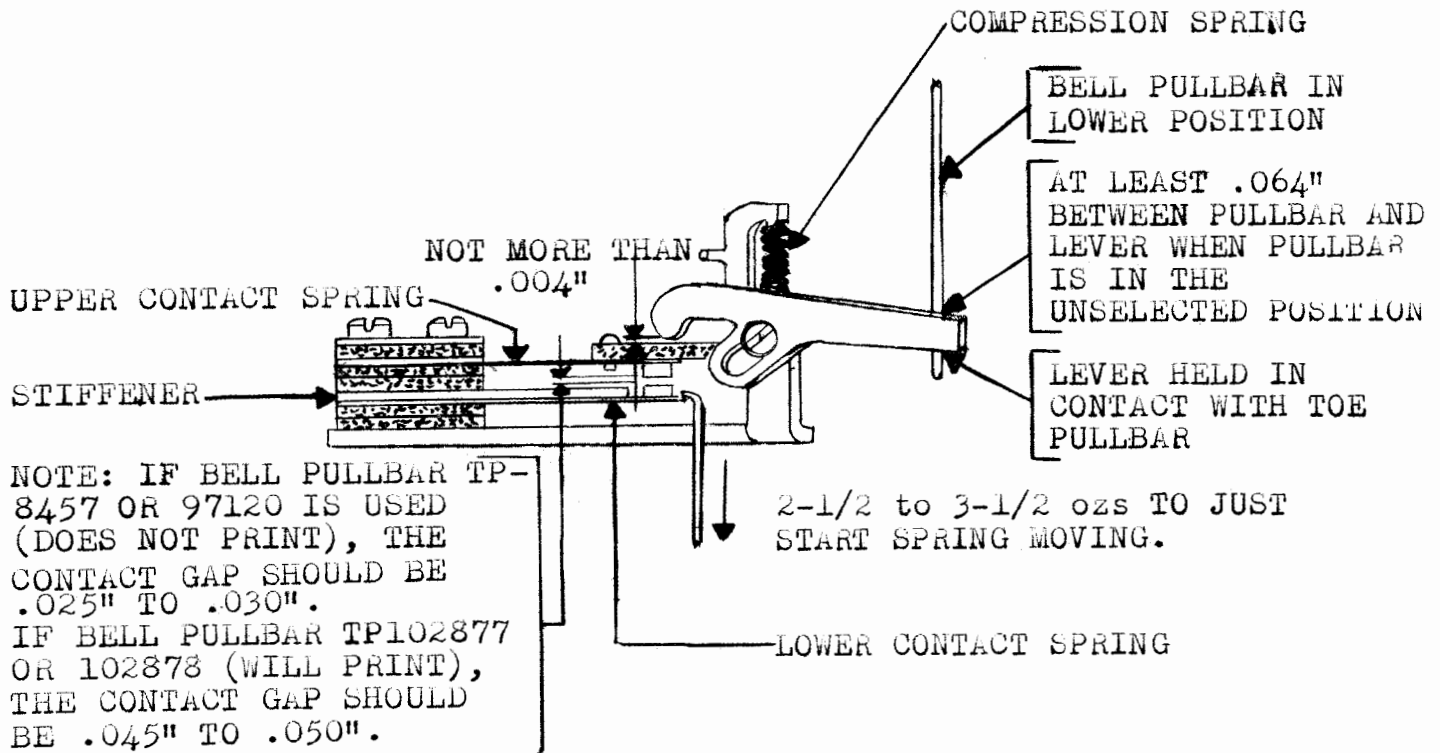


Figure 16

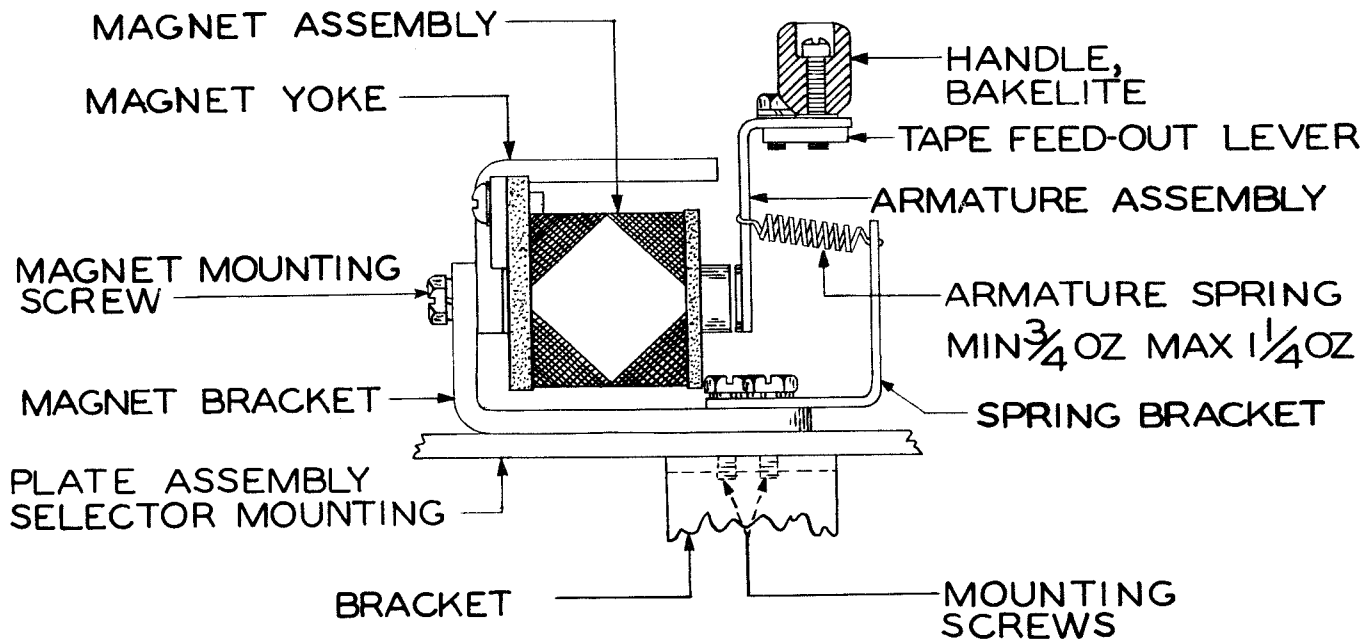


Figure 17

2.32 Tape-out-signal Contact Assembly: The electrical tape-out-signal contact assembly (TP114738) is in the base under the tape-out bell-hammer locking-pawl. When the tape reel is almost empty, pressure from the locking-pawl closes a contact to a light giving a visual signal as a warning in addition to the bell.

2.33 Contacts: With the bell-hammer locking-pawl fully engaged, the bell-hammer extension and the tape-out lever in the down or full position, the following requirements should be met.

- (a) The short contact spring and stiffener should be aligned approximately parallel to the mounting bracket. (See Figure 18.)

To Adjust: Bend the short contact spring and/or the stiffener.

- (b) The short contact spring should bear against its stiffener with not more than 1 ounce pressure. (See Figure 18.)

To Gauge: Hook the pull end of an 8-ounce scale on both legs of the bifurcated short contact spring and pull at right angles to the contact spring.

To Adjust: Bend the short contact spring.

- (c) There should be minimum 0.010 inch, maximum 0.020 inch clearance between the contacts. (See Figure 18.)

To Adjust: Bend the long contact spring.

- (d) There should be not more than 0.050 inch clearance between the contact bakelite extension and the tail of the bell-hammer locking-pawl. (See Figure 18.)

To Adjust: Position the contact assembly.

2.34 Contact Points: The contacts should just close when the bell-hammer locking-pawl is touching the front face of the bell-hammer extension.

To Adjust: Position the contact assembly and recheck 2.33(d).

2.35 Universal-contact Mechanism (Old-style Make) (TP99344): The universal-contact mechanism is located to the left of the pullbar contact mounting-bracket and operates from the main bail. The contacts make when the bail is in its highest position and break when the bail is in its lowest position.

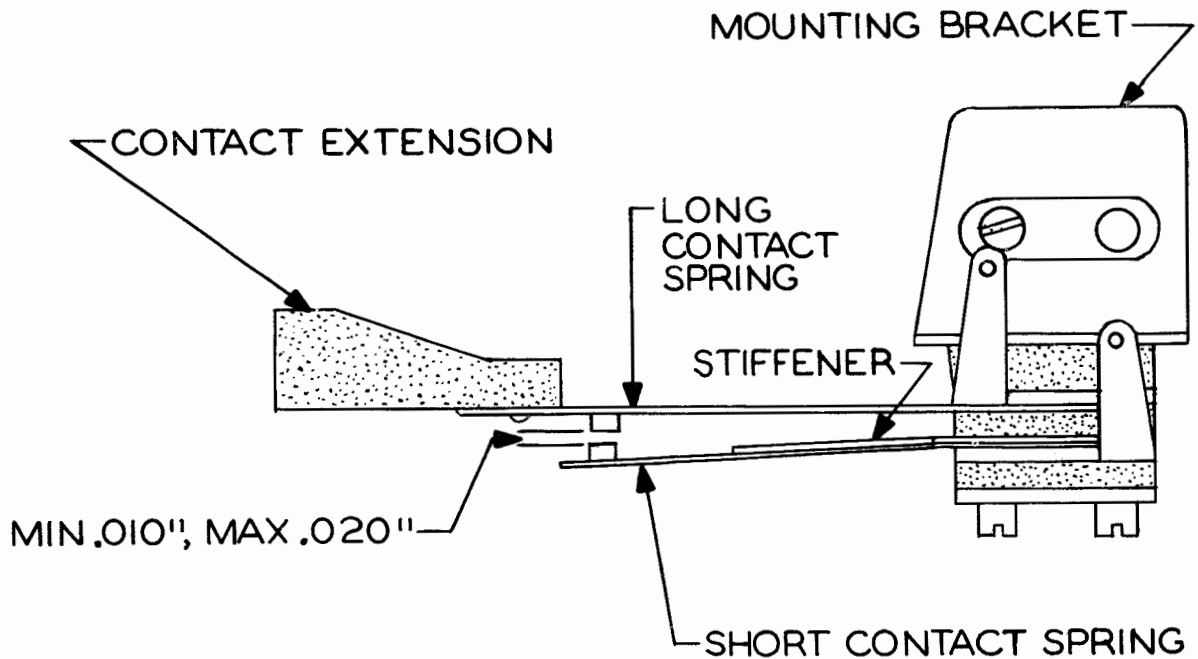


Figure 18

Note: Old-style make-contact springs are mounted horizontally and are used only on units having square bail guide-posts.

### 2.36 Contact-operating Lever:

(a) The contact operating lever should clear the fully selected Q pullbar by minimum 0.020 inch, maximum 0.060 inch when the lever is held in contact with the bail by its spring and the play in the lever is taken up in a direction to make this clearance a minimum. See Figure 19 for location of parts.

(b) The contact operating lever should clear the extension on the casting that mounts the square bail-guide post by not less than 0.020 inch when the main bail is in its lowest position and the play in the lever is taken up to make this clearance a minimum. See Figure 19 for location of parts.

To Adjust: Shift the contact-lever bracket.

### 2.37 Universal-contact Assembly:

(a) The upper contact springs and their stiffeners should be straight and the springs should be in contact with their stiffeners throughout their entire length. (See Figure 19.)

To Adjust: Bend the springs and stiffeners as required. Check that both sets of con-

tacts open and close simultaneously when the long spring is operated and released.

(b) With the main bail in its lowest position, there should be a gap of minimum 0.015 inch, maximum 0.020 inch between each set of contacts. (See Figure 19.)

To Adjust: Bend the lower contact spring.

(c) With the contact operating lever in contact with the main bail and the main shaft rotated until the main bail rises to within minimum 0.020, maximum 0.080 inch of the notches in all the pullbars, the contact operating lever should cause the contacts to just make. See Figure 19 for location of parts.

To Adjust: Position the contact-operating-lever pivot-screw.

(d) With the main-bail in its highest position, it should require minimum 1-1/2 ounces, maximum 2-1/2 ounces to separate the spring contacts. (See Figure 19.)

To Gauge: Apply the push-end of an 8-ounce scale to the bakelite tip of the lower contact and push downward.

To Adjust: Bend the lower contact spring.

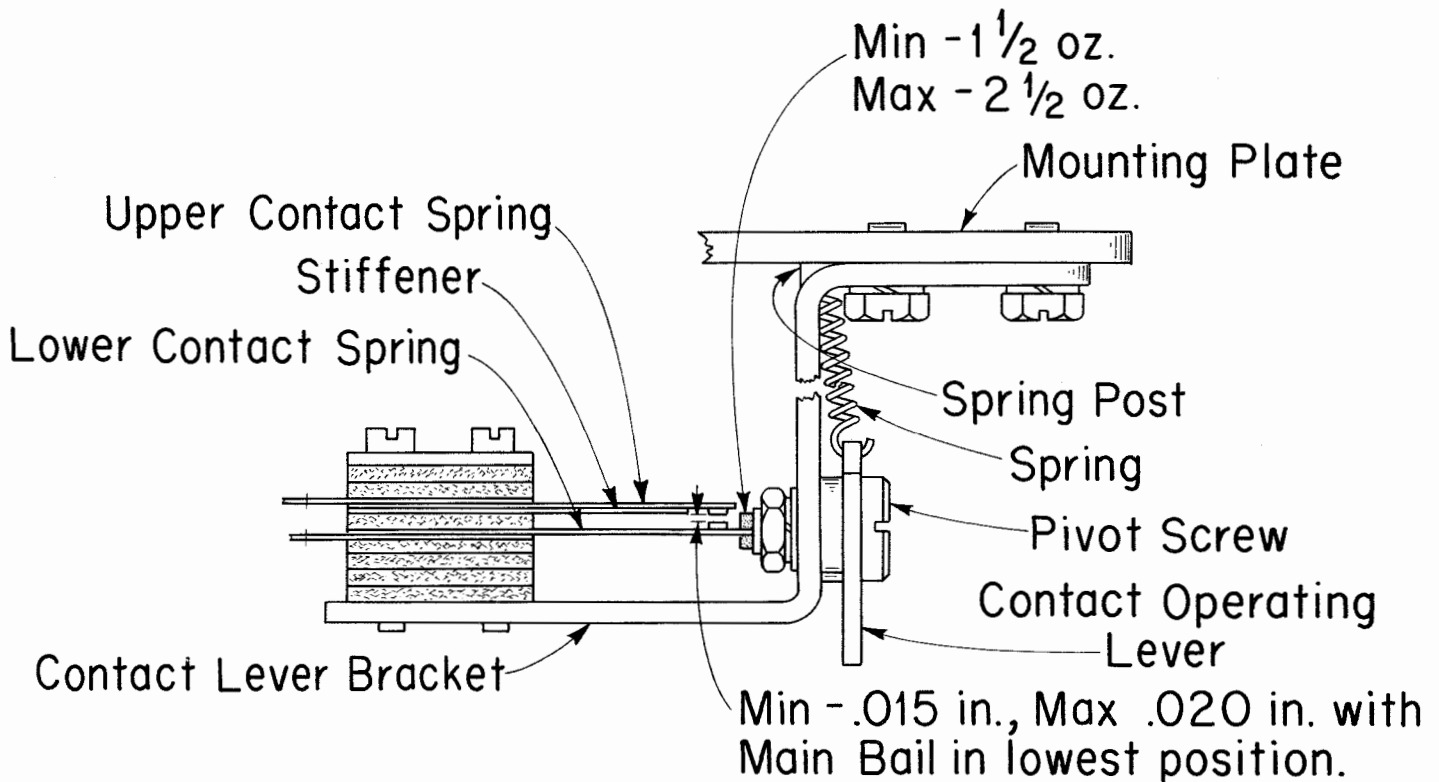


Figure 19

2.38 Universal-contact Mechanism (New-Style Make) (TP104771): The universal-contact mechanism is located to the left of the pullbar contact mounting bracket and operates from the main bail. The contacts make when the bail is in its highest position and break when the bail is in its lowest position.

Note: New style make-contact springs are mounted vertically on the unit and are used on units with square main-bail guide posts or those with main-bail roller guides.

#### 2.39 Contact-operating Lever:

(a) The contact-operating-lever extension should be located approximately midway between the No. 1 and No. 2 pullbars when the main-bail is in its highest and lowest positions. See Figure 20 for location of parts.

To Adjust: Position the universal assembly bracket.

(b) When a pullbar, having pullbar contacts, is selected and the main-shaft is rotated until the associated top pullbar contacts just

close, there should be a clearance of minimum 0.025 inch, maximum 0.035 inch between the tip of the contact operating-lever and the side of the insulator on the long contact-spring. On units without pullbar contacts, this clearance should be approximately 1/8 inch when the main-bail is in its lowest position. (See Figure 20.)

To Adjust: Position the contact-operating-lever block, keeping its top surface horizontal.

#### 2.40 Universal-contact Assembly

(a) The short contact springs and their stiffeners should be straight and the springs should be in contact with their stops throughout their entire length. (See Figure 20.)

To Adjust: Bend the springs and stiffeners as required. Check that both sets of contacts make and break at approximately the same time when the long contact spring is operated and released.

Universal Assembly Bracket

Min -.025 in., Max -.035 in.

Contact Operating Lever  
Coil Spring

Min 4oz. Max 6 oz. to pull  
to position length.

Contact Operating Lever

Min -.015 in., Max -.020 in. with  
Main Bail in lowest position

Long Contact Spring

Short Contact Spring

Stiffener

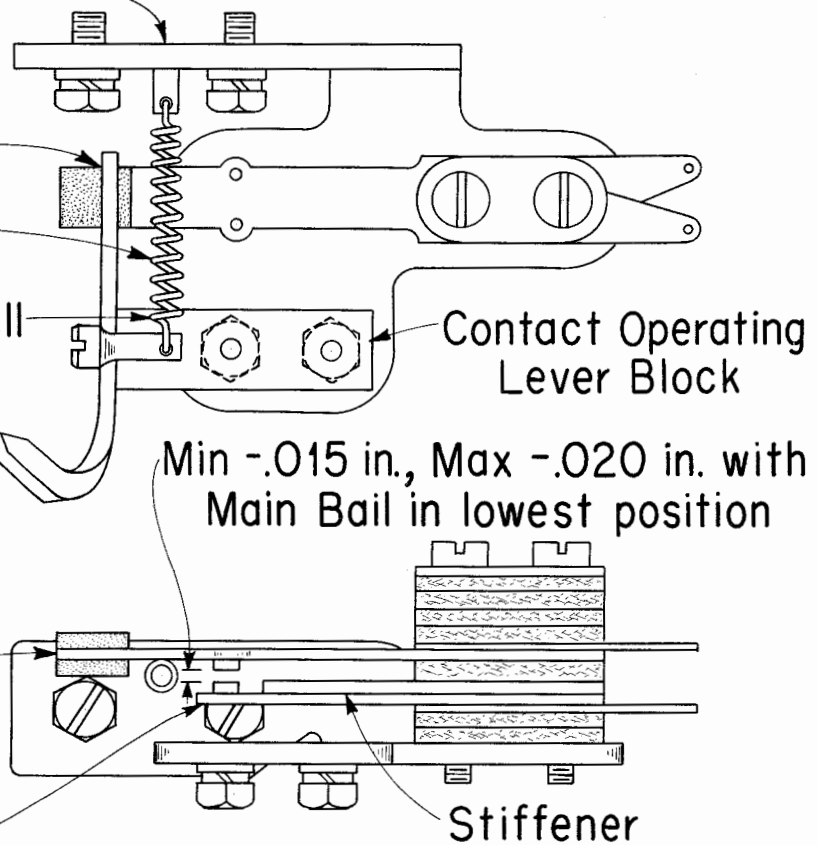


Figure 20

(b) With the main bail in its lowest position, there should be a gap of minimum 0.015 inch, maximum 0.020 inch between the contacts on the long and short springs. (See Figure 20.)

To Adjust: Bend the long contact-spring.

(c) With the main bail in its highest position, it should require minimum 1-1/2 ounces, maximum 2-1/2 ounces to separate each set of contacts of the long and short contact springs. (See Figure 20.)

To Gauge: Hook the pullend of an 8-ounce scale around the short spring at the contact and pull at right angles to the spring.

(d) With the contact-operating-lever coil-spring unhooked from the lever and the lever resting against the insulator tip of the long contact-spring, it should require minimum 4 ounces, maximum 6 ounces to pull the coil spring to position length. (See Figure 20.)

To Gauge: Hook the pull end of an 8-ounce scale through the loop end of the spring and pull in the direction of travel.

2.41 Universal-contact Mechanism (Transfer Type) (TP104682): The universal transfer-contact mechanism is located to the left of the pullbar-contact mounting bracket and operates from the main bail. The upper contacts make with the bail in its highest position and the lower contacts make with the bail in its lowest position.

2.42 Contact-operating Lever:

(a) The contact-operating-lever extension should be approximately midway between the No. 1 and No. 2 pullbars when the main bail is in its highest and lowest positions.

To Adjust: Position the universal-contact-assembly bracket.

2.43 Universal-contact assembly:

Note: Inner = Nearest to the mounting bracket.  
Outer = Farthest from the mounting bracket.



(a) The outer contact-spring stiffeners should be parallel to the side of the mounting bracket. (See Figure 21.)

To Adjust: Bend the outer stiffeners.

(b) It should require minimum 1/2 ounce, maximum 1 ounce to move each outer contact-spring away from its stiffener when the middle contact-spring is held clear of it. (See Figure 21.)

To Gauge: Hook the pullend of an 8-ounce scale over the end of the contact spring and pull at right angles to the spring.

To Adjust: Bend the outer contact spring. Check that both sets of contacts make and break at approximately the same time when the middle contact-spring is operated and released.

(c) The middle contact-spring should be so tensioned that the outer contact spring is separated from its stiffener by not more than 0.006 inch when the contact operating-lever is held away from the middle contact spring. See Figure 21 for location of parts.

To Adjust: Bend the middle contact-spring.

(d) With the middle-spring contacts making contact with the outer-spring contacts and the inner contact-springs resting against their stiffeners, there should be a clearance of minimum 0.015 inch, maximum 0.020 inch between the middle spring-contacts and the inner spring-contacts. (See Figure 21.)

To Adjust: Bend the spring stiffeners and check that both sets of contacts on the middle and inner springs make and break at approximately the same time when the middle contact-spring is operated and released.

(e) It should require minimum 1/2 ounce, maximum 1 ounce to move each inner contact spring away from its stiffener. (See Figure 21.)

To Gauge: Apply the push-end of an 8-ounce scale to the end of each inner spring and push at right angles to the spring.

To Adjust: Bend the inner contact springs.

(f) When a pullbar having pullbar contacts is selected and the main shaft is rotated until the associated top pullbar contacts just close, there should be a clearance of minimum 0.025 inch, maximum 0.035 inch between the contact

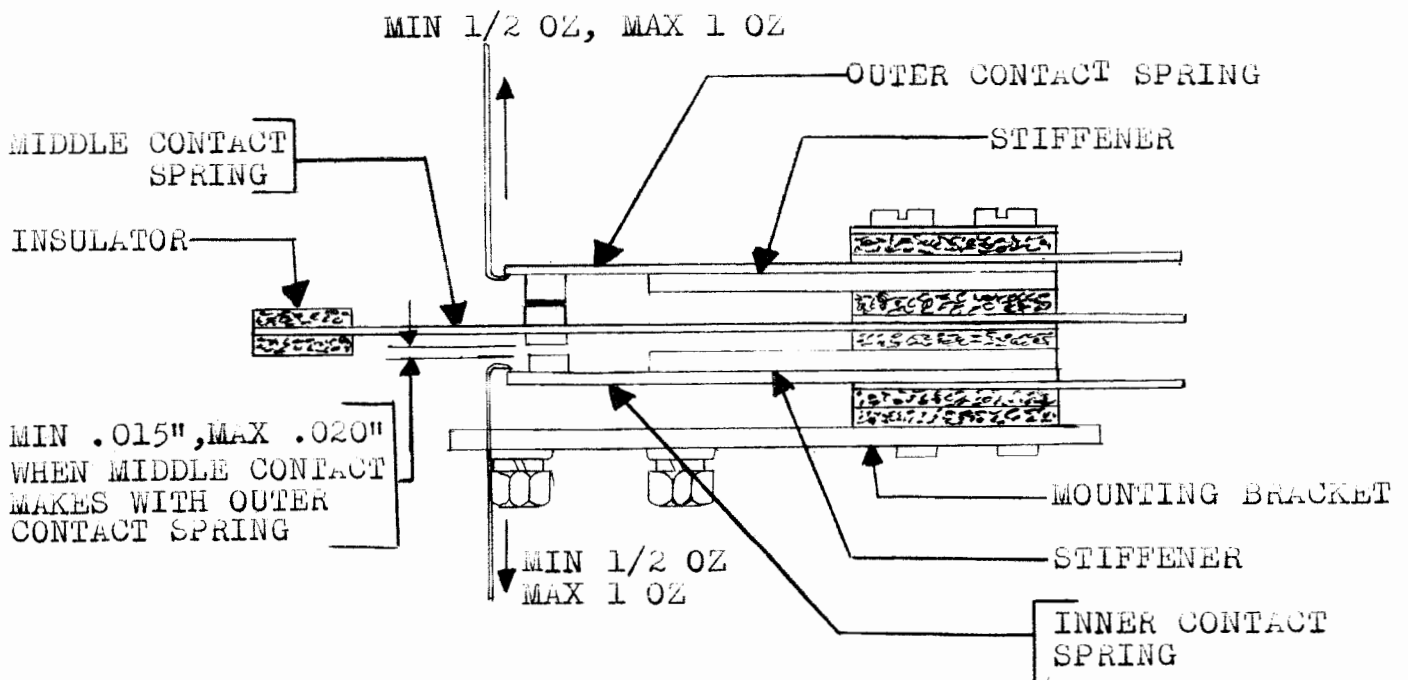


Figure 21

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operating-lever and the insulator tip on the middle contact spring. If the unit has no pull-bar contacts, this clearance should be 1/8 inch when the main bail is in its lowest position. See Figure 21 for location of parts.

To Adjust: Position the contact operating-lever block keeping its top surface horizontal.

(g) With the contact operating-lever coil-spring unhooked from the lever and the lever held against the insulator tip of the middle contact spring, it should require minimum 4 ounces, maximum 6 ounces to pull the coil-spring to position length. (See Figure 20.)

To Gauge: Hook the pullend of an 8-ounce scale through the loop end of the spring and pull in the direction of travel.