

MOTOR CONTROL UNITS
USED WITH 14 AND 15 TELETYPEWRITERS
REQUIREMENTS AND ADJUSTMENTS

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H Contact Mechanism		A. Built-in Mechanical Motor Control (15 Teletypewriter) (FIGS H)	
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pawl latching surface should over-travel the rearmost surface of the motor-stop pawl latch minimum 0.010 inch, maximum 0.025 inch when (1) the platen is in the FIGS position, (2) the motor-stop combination is set up, (3) the main-shaft is rotated slowly until the motor-stop function-lever is completely selected, and (4) the armature is in its operated position. (See Figure 1.)

To Adjust: Position the motor-stop-lever bracket, keeping the motor-stop-pawl backstop clear of the inner pawl. (See Figure 2.)

2.02 The Motor-stop-lever Eccentric should be in contact with the lower arm of the motor-stop release-lever when (1) the main-shaft is rotated until the printing bail is in its extreme rear position and the locking-lever is on the high part of its cam, (2) the armature is in its operated position, (3) the inner motor-stop pawl is engaged with the pawl latch, and (4) the motor-stop release-lever stud is touching the locking-lever. Gauge by eye and feel. (See Figure 2.)

To Adjust: Position the motor-stop-lever eccentric.

2.03 The Motor-stop-lever lower edge should clear the motor-stop function-lever rear extension by not more than 0.002 inch when (1) the platen is in the LTRS position, (2) the motor-stop combination is set up, (3) the main-shaft is rotated until the printing bail is in its extreme forward position, and (4) the motor-stop pawls are released from the latch. (See Figure 2.)

To Adjust: Position the motor-stop-lever backstop-screw.

2.04 The Motor-stop Pawls should clear their latches by approximately equal amounts, not less than 0.010 inch, when the armature is moved from its operated to unoperated position with the printing bail in its extreme rear position and the motor-stop release-lever eccentric moved away from the outer-stop pawl. Gauge by eye. (See Figure 3.)

To Adjust: Position the motor-stop pawl backstop. (See Figure 1.)

2.05 The Motor-stop Release-lever Eccentric should just touch the outer motor-stop pawl when (1) the main-shaft is rotated until the printing bail is in its extreme rear position and the locking-lever is on the high part of its cam, (2) the armature is held in its operated position, (3) the inner motor-stop pawl is engaged with the motor-stop pawl latch, (4) the lower arm of the motor-stop release-lever is in contact with the motor-stop-lever eccentric, and (5) the outer pawl is against the motor-stop-pawl backstop. Gauge by eye and feel. (See Figure 2.)

To Adjust: Position the motor-stop release-lever eccentric.

2.06 The Motor-stop-pawl Spring should have a tension of minimum 1/2 ounce, maximum 1 ounce measured when the printing bail is in its extreme rear position. (See Figure 3.)

2.07 The Motor-stop-lever Spring should have a tension of minimum 1 ounce, maximum 1-1/2 ounces measured on the head of the motor-stop-lever eccentric when the motor-stop-contact-lever spring is unhooked and the motor-stop lever is in the unoperated position. (See Figure 2.)

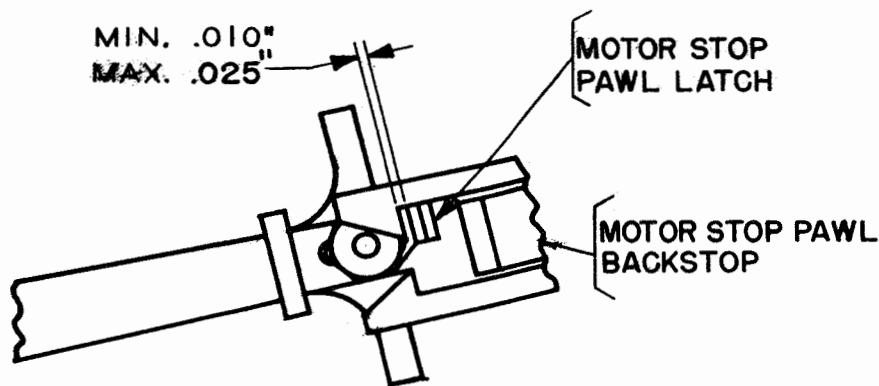


Figure 1

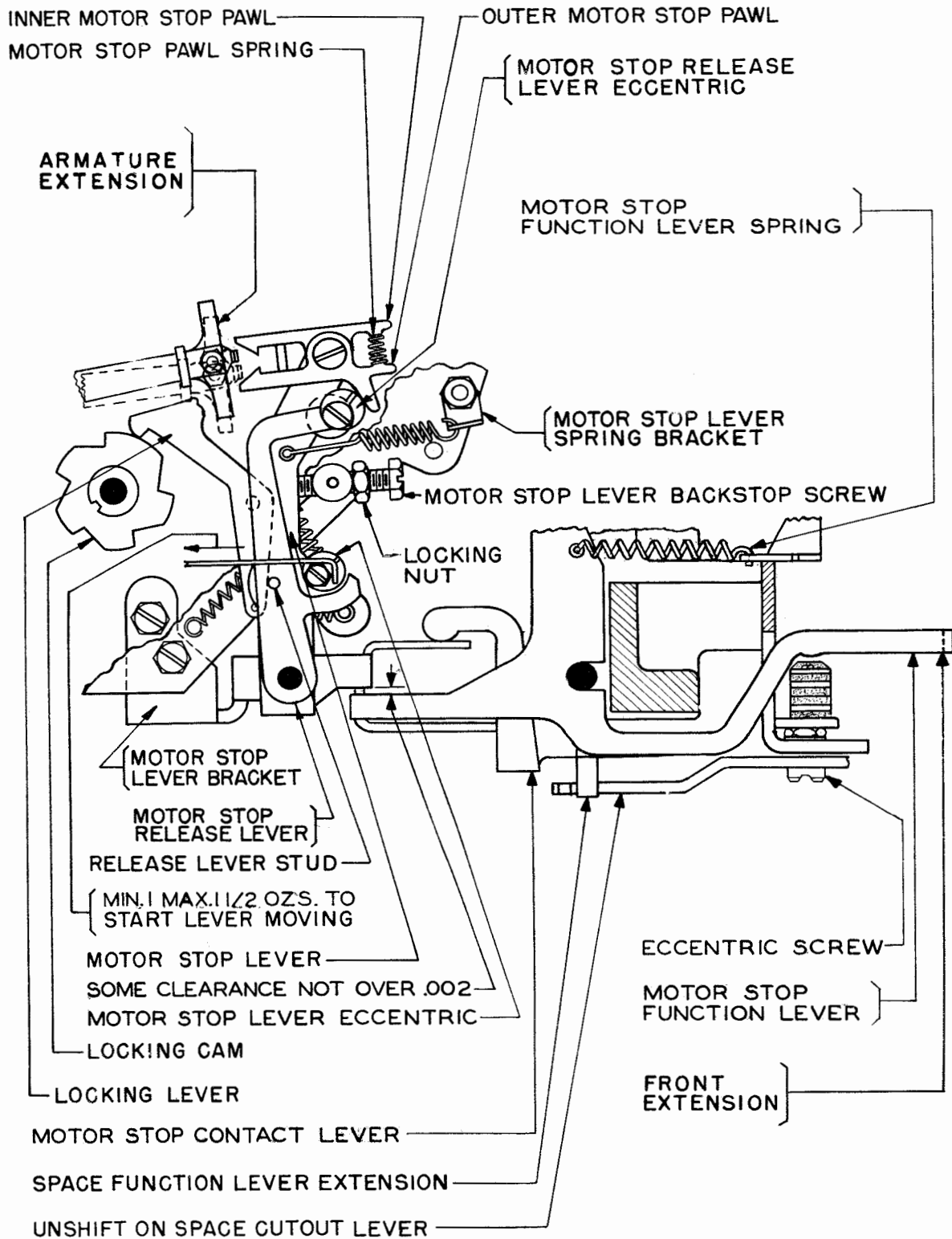


Figure 2

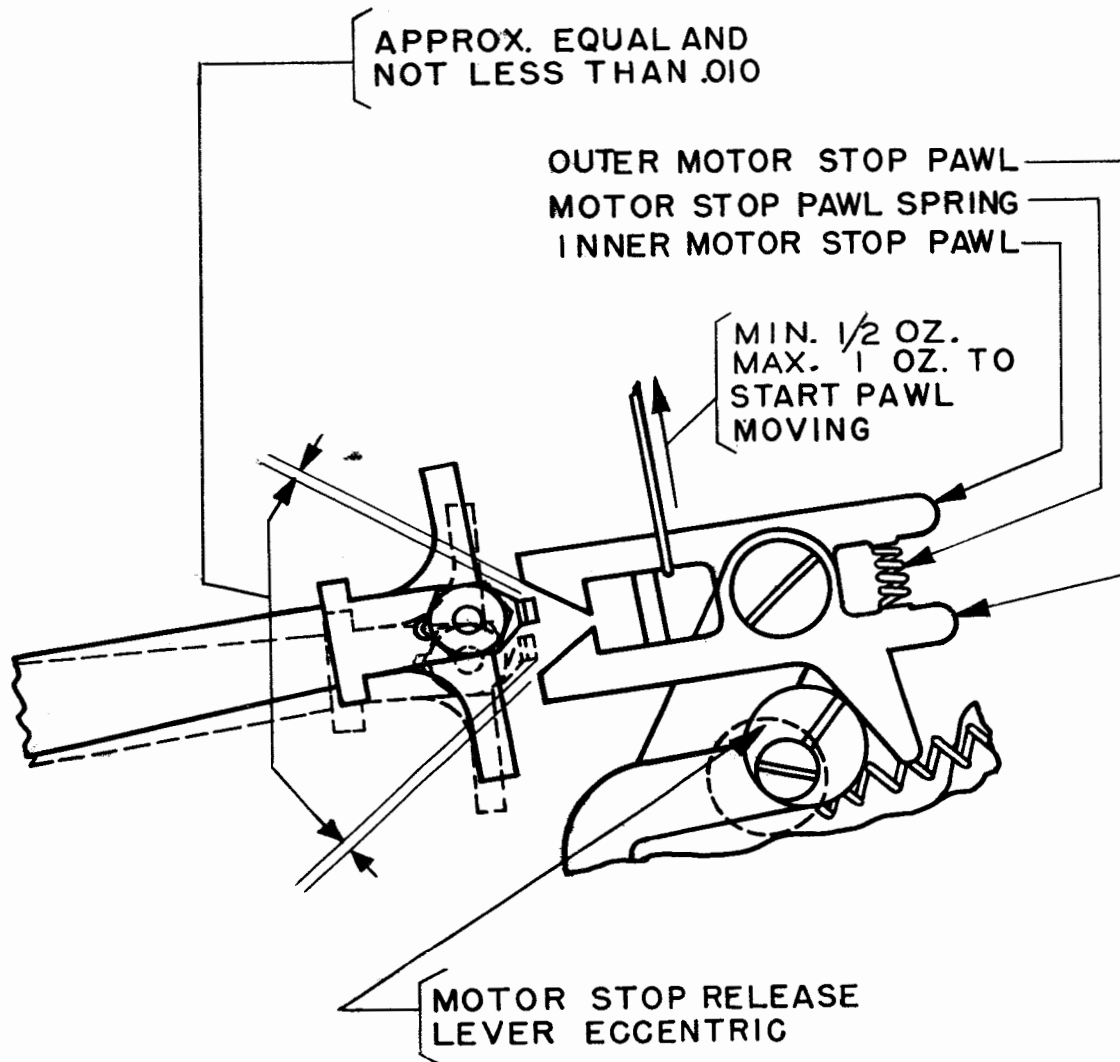


Figure 3

To Adjust: Position the spring-bracket on the post of the selector unit.

2.08 The Motor-stop Contact-lever Spring should have a tension of minimum 4-1/4 ounces, maximum 5-1/4 ounces when the contact-spring is held away from the lever. (See Figure 4.)

2.09 The Motor-stop Function-lever Spring should have a tension of minimum 5 pounds, maximum 6 pounds when the motor-stop function-lever is resting against the rear edges of its vanes but not selected. (See Figure 5.)

2.10 The Motor-stop Right Contact-spring Assembly closed by the motor-stop contact-lever should meet the following requirements. (See Figure 5.)

(a) The fibre insulator on the light contact-spring should clear the motor-stop contact-lever by not more than 0.006 inch when the printing bail is in its extreme rear position, the selector-armature is held operated, and the inner motor-stop pawl is engaged with its latch. (See Figures 3 and 5.)

To Adjust: Position the contact-spring bracket so that the contact-spring mounting surface is approximately parallel to the top edge of the send-receive mechanism plate. Then bend the light contact-spring if necessary, making sure it is not touching the upper (heavy) contact-spring.

(b) The gap between the contacts should be minimum 0.012 inch, maximum 0.020 inch

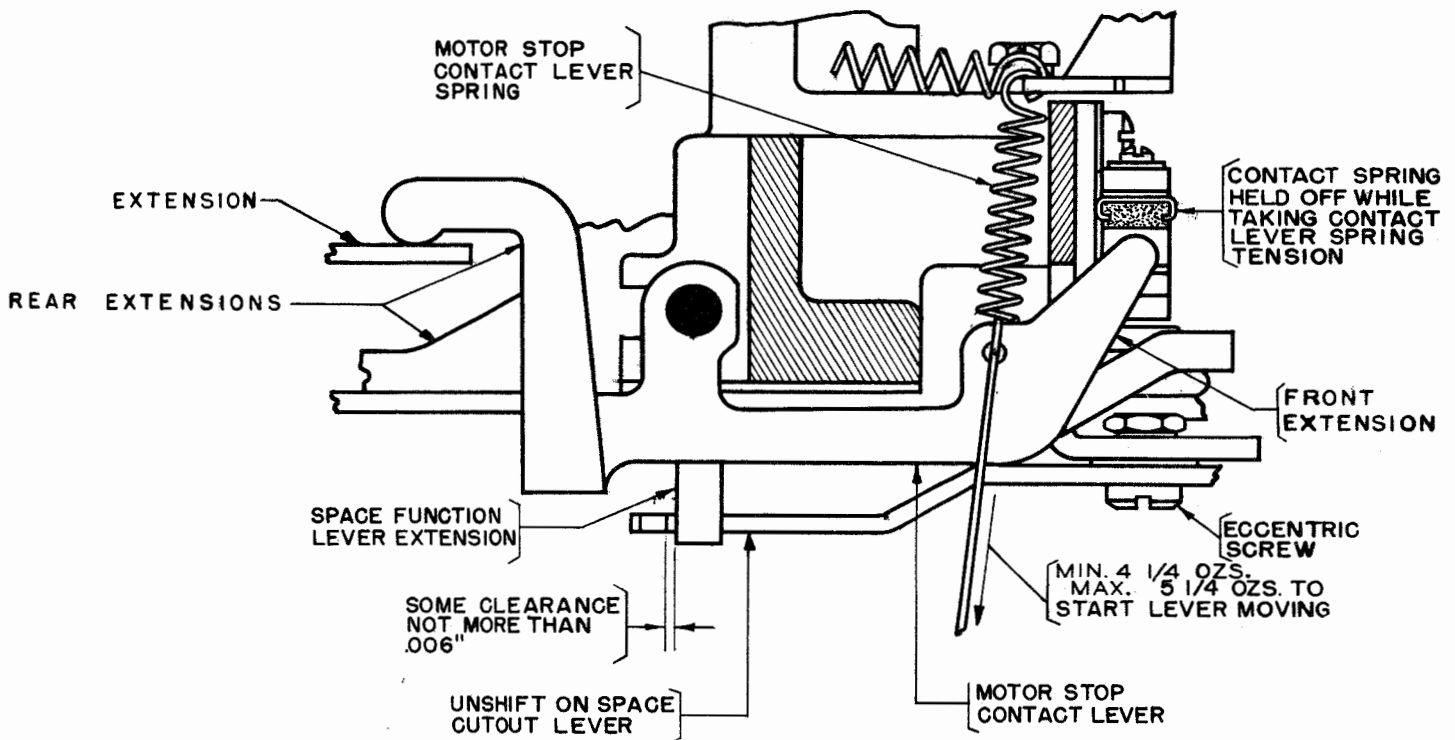


Figure 4

when the selector-armature is in an unoperated position and the outer motor-stop pawl is engaged with its latch.

To Adjust: Bend the upper (heavy) contact-spring. Recheck (a). (See Figure 5.)

2.11 The Motor-stop Left Contact-spring Assembly closed by the motor-stop function-lever should meet the following requirements: (See Figure 5.)

(a) The fibre insulator on the upper (light) spring should clear the lobe of the motor-stop function-lever by not more than 0.006 inch when the printing-bail is in its extreme rear position. (See Figure 5.)

To Adjust: Bend the upper (light) contact-spring making sure the lower (heavy) contact-spring is not bearing against the light spring.

(b) The left motor-stop contacts should just close, as gauged by eye, when the motor-stop function-lever is selected and the main-shaft is rotated until the right motor-stop contacts are about to open.

To Adjust: Bend the lower (heavy) contact-spring. Recheck (a).

Note: On units using electrical motor control and so not equipped with a right motor-stop contact-spring assembly, this requirement should be disregarded and the gap between the contacts of the left spring assembly should be minimum 0.010 inch, maximum 0.015 inch when the platen is in the LTRS position, STOP combination is set up, and the main-shaft is rotated until the function-levers rest against the vanes.

B. Built-in Mechanical Motor Control (15 Teletypewriter) (FIGS Blank H)

Note 1: Place the typing unit on a base.

Note 2: For identification of parts see Figures 5 and 6.

Note 3: The requirements and adjustments for the FIGS H mechanism also apply to this mechanism.

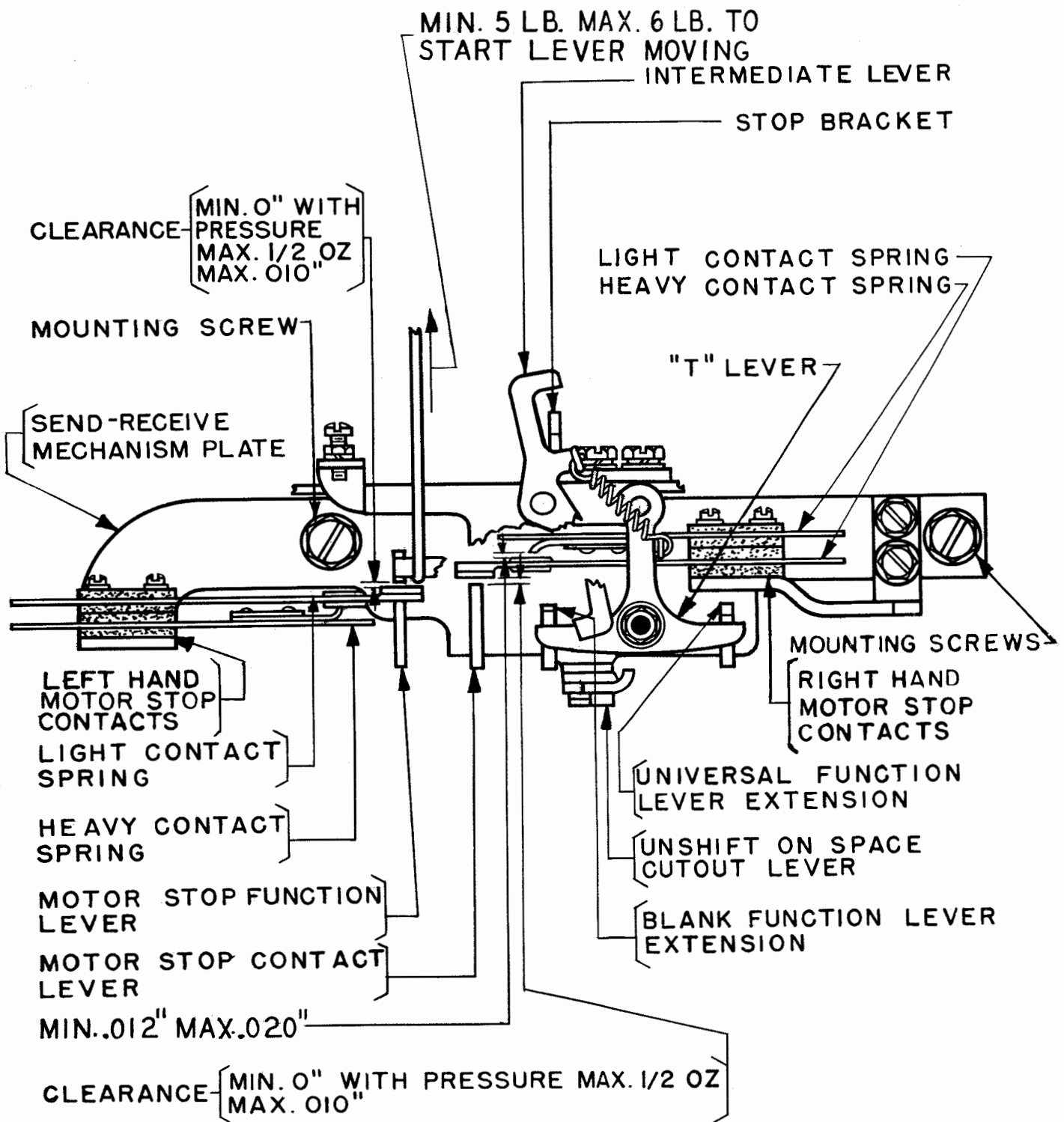


Figure 5

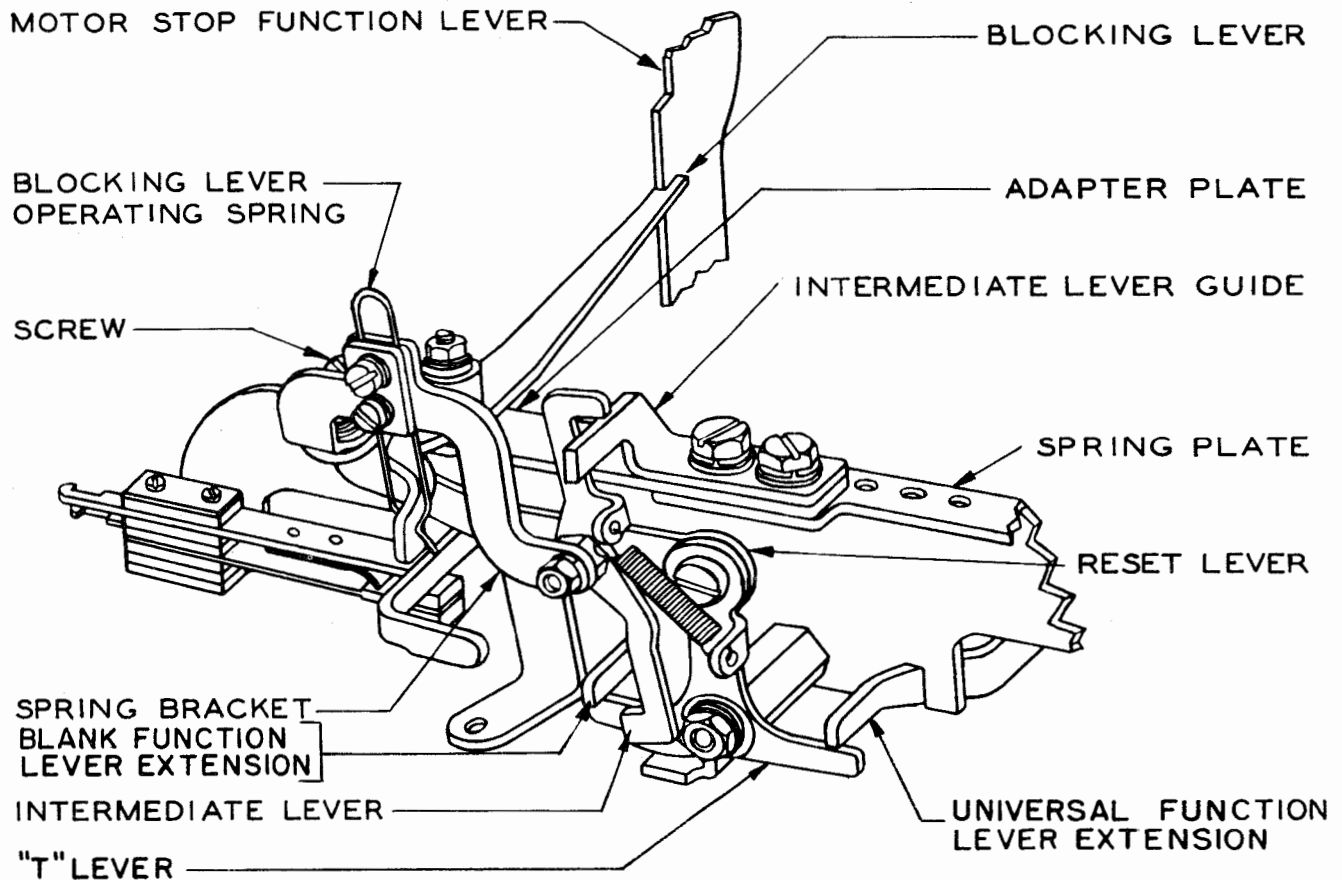


Figure 6

2.12 Blocking Lever: The edge of the blocking lever should clear the front edge of the motor-stop function lever by not more than 0.002 inch and its rear projection should be in contact with the motor-stop function lever's right side when the space combination is set up on the vanes and the main-shaft is rotated until the function levers rest against the vanes. Gauge by eye and feel.

To Adjust: Loosen the adapter plate or trigger assembly mounting-screws (the trigger assembly is part of the automatic carriage-return and line-feed assembly) and rotate the assembly around the right screw.

Note 1: If the motor-stop function lever blocks the travel of the printing bail when the FIGS H combination is selected and the motor-stop function lever is blocked by its blocking lever, recheck requirement 2.12.

Note 2: Requirements 2.13 and 2.14 should be met simultaneously. They apply only when unit is equipped with automatic carriage-return and line-feed mechanism.

2.13 Carriage-return Latch-bar: There should be some clearance, maximum 0.010 inch, between the carriage-return latch-bar and the lobe on the carriage-return extension of the bail assembly when O is selected and the main shaft is rotated until the printing bail is in its extreme forward position.

To Adjust: Position the trigger guide by means of its elongated mounting-holes.

2.14 Trigger Extension: There should be minimum 0.005 inch clearance between the blocking edge of the trigger extension and the front edge of the automatic carriage-return and line-feed function lever, when the play is taken up to make this clearance a minimum and the main shaft is in the stop position.

To Adjust: Position the trigger guide by means of its elongated mounting holes and recheck 2.13.

2.15 The Blocking-lever Operating-spring Humps should travel approximately equal amounts above and below the center of the blocking-lever's forward extension as send-receive key is moved from send to receive position and vice versa. Gauge by eye.

To Adjust: Position the spring.

2.16 The Blocking-lever Operating-spring Left-arm Hump should clear the blocking-lever by maximum 0.004 inch when, (1) the send-receive mechanism is in the send position, (2) Blank selection is set up on the vanes, (3) the main-shaft is rotated until the blank function lever rests against the vanes, (4) the intermediate lever is not under the blank function-lever, (5) the T-lever is rotated clockwise until it touches the blank function-lever, and (6) the blocking-lever rear projection is resting against the line-feed function-lever.

To Adjust: Bend the left arm of the spring.

2.17 The Blocking-lever Operating-spring Right-arm Hump should clear the blocking-lever by maximum 0.004 inch after rotating the

T-lever clockwise with the printing bail in its extreme rear position when (1) the send-receive mechanism is in the send position, (2) the T selection is set up on the vanes, (3) the main-shaft is rotated until the printing bail is in its extreme forward position, (4) the blocking-lever's blocking-edge and rear projection is in contact with the motor-stop function-lever's front and right sides, respectively, and (5) the T-lever is in contact with universal function-lever.

To Adjust: Bend the right arm of the spring.

C. Built-in Mechanical Motor Control (15 Teletypewriter) (FIGS M)

2.18 This mechanism has the same requirements and adjustments as the FIGS H mechanism. See 2.01 through 2.11. Except for the TP74038 FIGS M motor-stop function lever and the TP82994 name-plate, the operating components are the same.

D. Electrical Motor Control (14 Teletypewriter) (FIGS H)

2.19 For the H-contact mechanism on the typing unit, the requirements and adjustments are given in 2.20 through 2.25 and associated

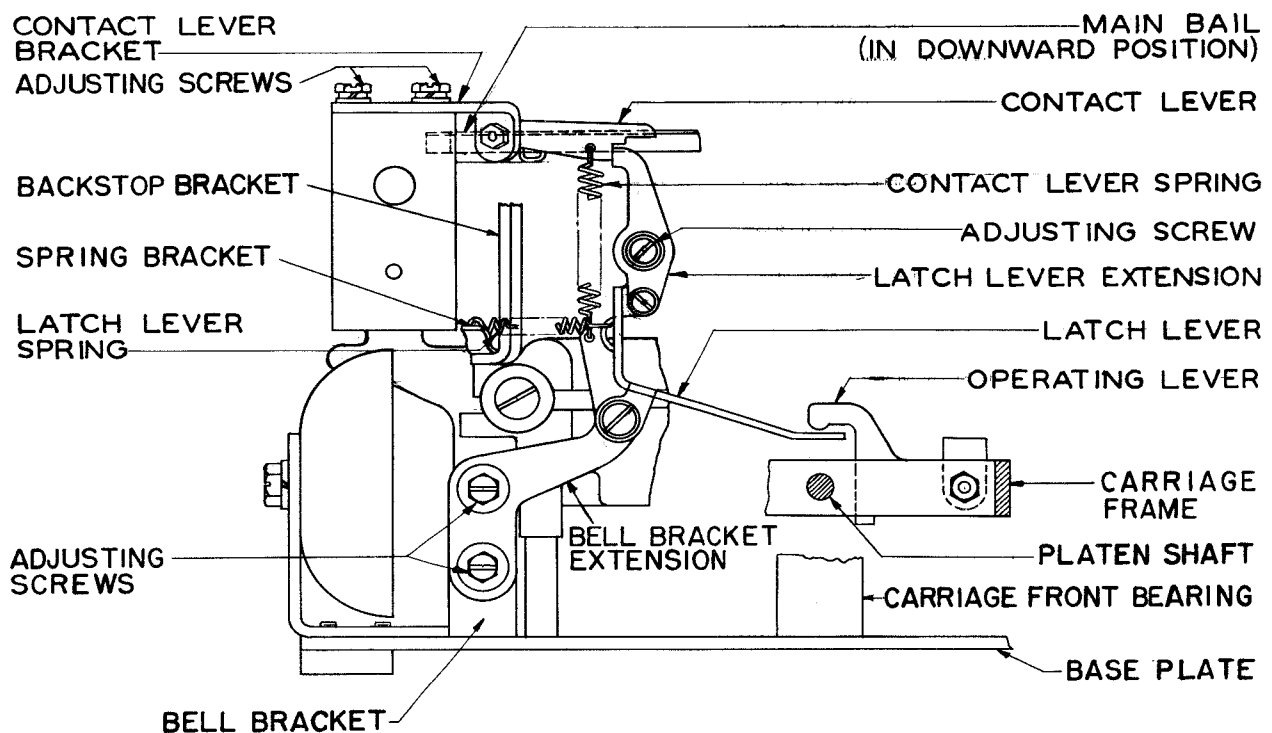


Figure 7

Figures 8 through 13. Figure 7 shows the relation of the parts, while Figures 8 through 13, inclusive, show the adjustments.

2.20 Relay Unit: For the relay unit in the base, the requirements and adjustments

are the same as those given for the relay unit of the 15 teletypewriter in 2.28 to 2.39, inclusive. However for the 14-type base, the base plate has to be removed to get at the relays.

2.21 Contact Lever Bracket

REQUIREMENT:

MAIN BAIL IN DOWNWARD POSITION.

- (a) MIN. .010", MAX. .045" CLEARANCE.
BETWEEN SIDE OF CONTACT LEVER
AND SIDE OF SPACE RELEASE PULL-BAR
- (b) CONTACT LEVER SHOULD REST
APPROXIMATELY IN MIDDLE OF UPPER END OF
LATCH LEVER EXTENSION

TO ADJUST:

POSITION CONTACT LEVER BRACKET

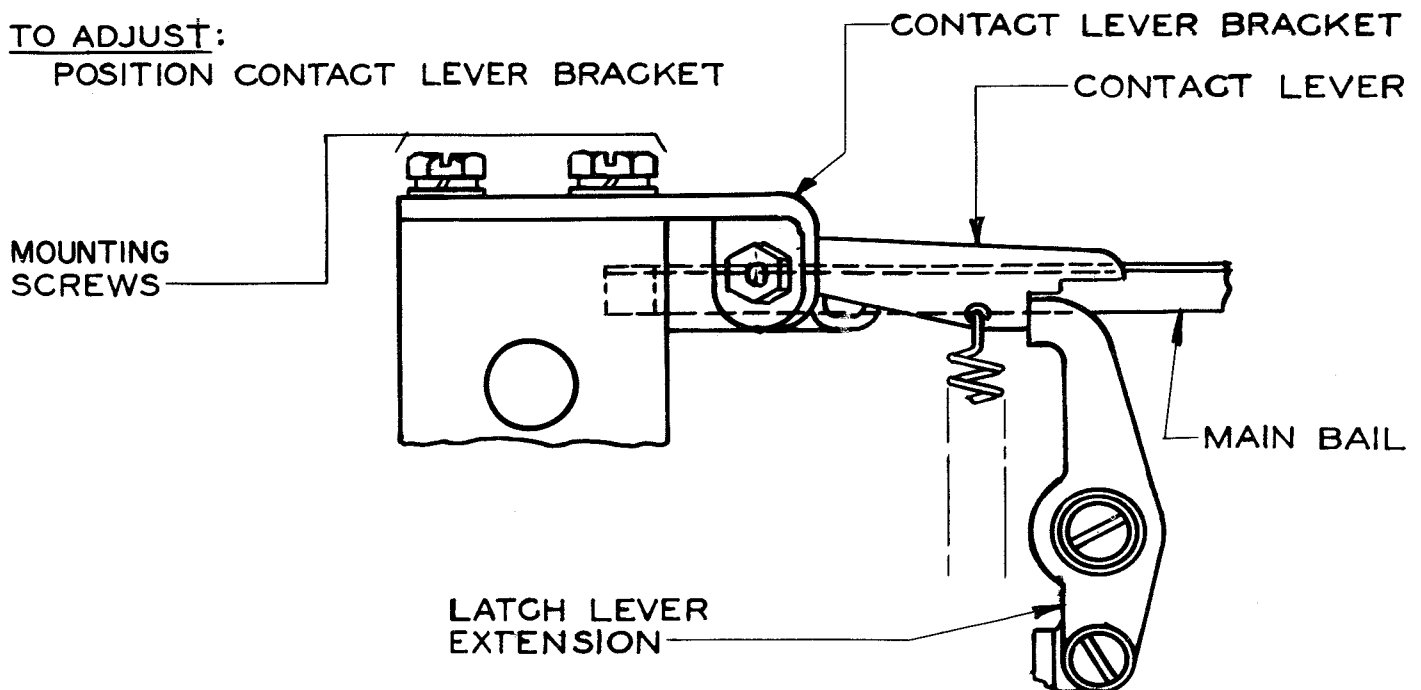


Figure 8

2.22 Bell Bracket Extension

REQUIREMENT

MIN. .015" MAX. .030"

CONTACT LEVER
RESTING AGAINST
MAIN BAIL

TO ADJUST
POSITION BELL
BRACKET EXTENSION

MAIN BAIL IN
DOWNWARD POSITION

LATCH LEVER EXTENSION
SET APPROXIMATELY
AT THE MID-POINT ON
ITS ADJUSTABLE LIMITS

CLAMPING
SCREWS

MOUNTING
SCREWS

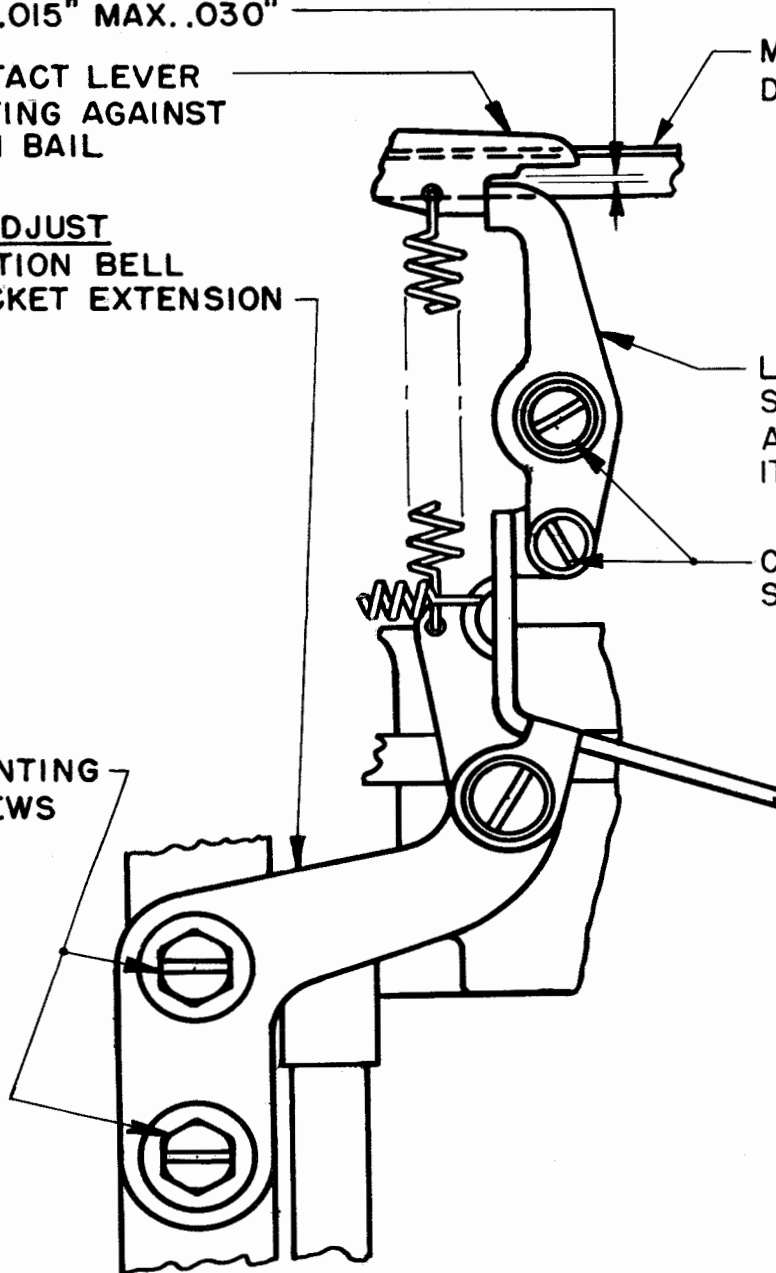
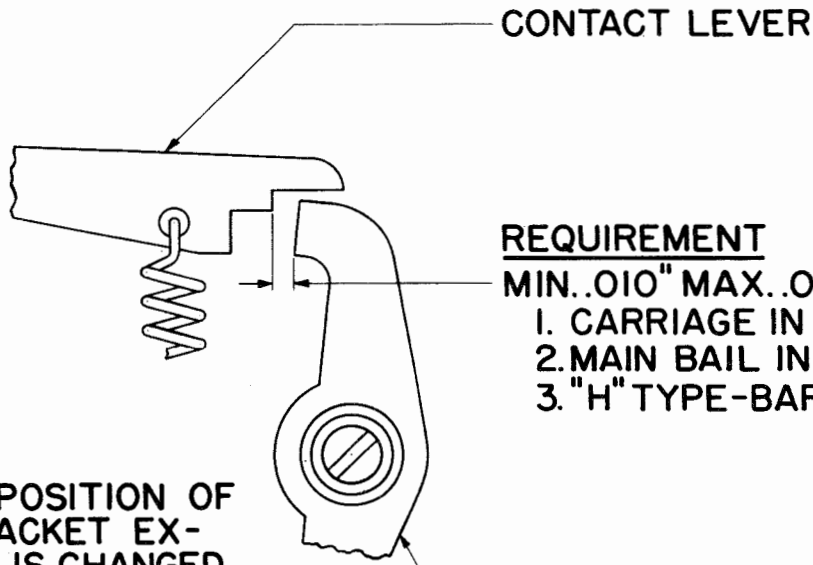


Figure 9

2.23 Latch Lever Extension



REQUIREMENT

MIN. .010" MAX. .025" WITH:

1. CARRIAGE IN FIGS. POSITION
2. MAIN BAIL IN DOWNWARD POSITION
3. "H" TYPE-BAR RESTING AGAINST PLATEN

NOTE: IF POSITION OF BELL BRACKET EXTENSION IS CHANGED AFTER MAKING THIS ADJUSTMENT RECHECK THE ABOVE CLEARANCE

TO ADJUST

REPOSITION LATCH LEVER EXTENSION AND RECHECK BELL BRACKET EXTENSION

Figure 10

2.24 Springs

REQUIREMENT

(a) CONTACT LEVER SPRING
MIN. 9 OZ. MAX. 12 OZ.
TO START LEVER MOVING
WHEN MAIN BAIL IS IN
DOWNWARD POSITION.

REQUIREMENT

(b) LATCH LEVER SPRING
MIN. 1 OZ., MAX. 2 OZ.
TO START LATCH LEVER
MOVING WHEN MAIN
BAIL IS IN DOWNWARD
POSITION.

REQUIREMENT

(c) OPERATING LEVER SPRING
MIN. 1/2 OZ., MAX. 1 1/2 OZ.
TO START LEVER MOVING

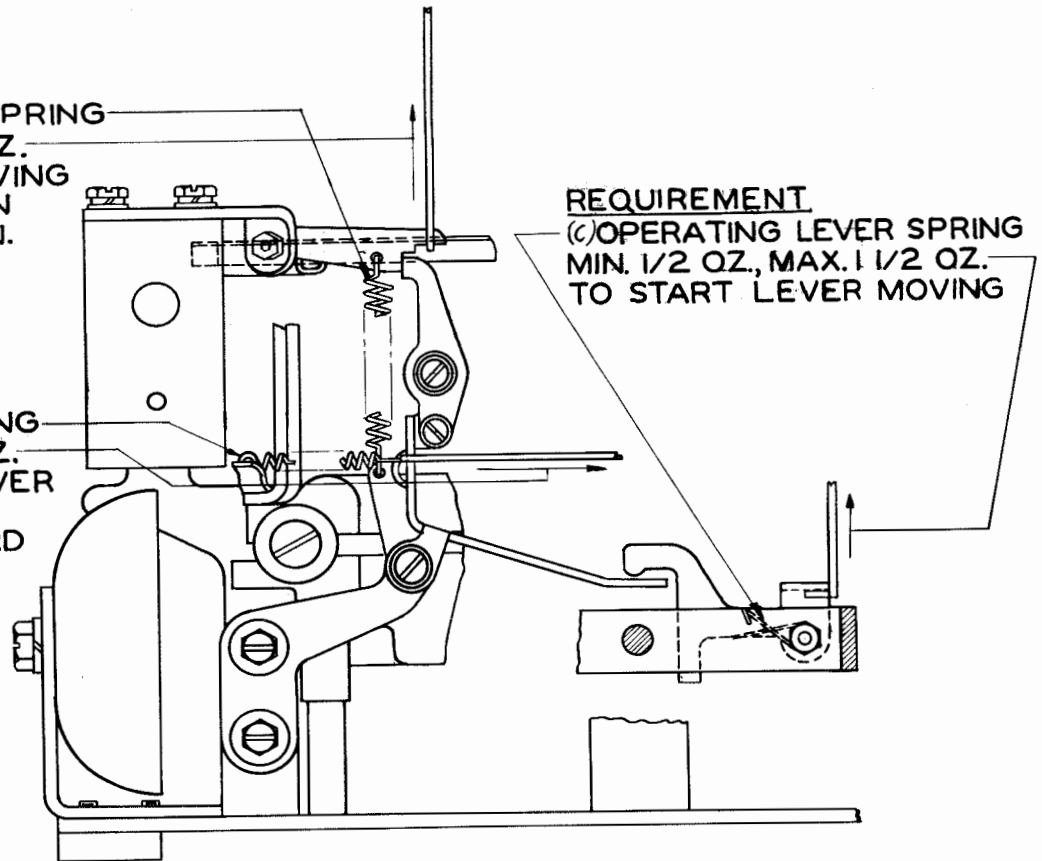


Figure 11

2.25 Contacts

REQUIREMENT

REMOVE CONTACT GUARD. MAIN BAIL IN DOWNWARD POSITION

- (a) SPRING NO. 1 PERCEPTIBLE PRESSURE AGAINST STIFFENER WITH OTHER SPRINGS HELD AWAY
- (b) SPRING NO. 2 MIN. 3/4 OZ. MAX. 1 1/2 OZ. WITH NO. 3 SPRING HELD AWAY.
- (c) SPRING NO. 3 MIN. 1/2 OZ. MAX. 1 OZ. WITH NO. 4 SPRING HELD AWAY.
- (d) SPRING NO. 4 MIN. 1 OZ. MAX. 2 OZ.

TO ADJUST
BEND SPRINGS OR
STIFFENERS

REQUIREMENT

(e) MIN. .010" MAX. .020"

TO ADJUST
BEND STIFFENER

UPPER
CONTACTS

LOWER
CONTACTS

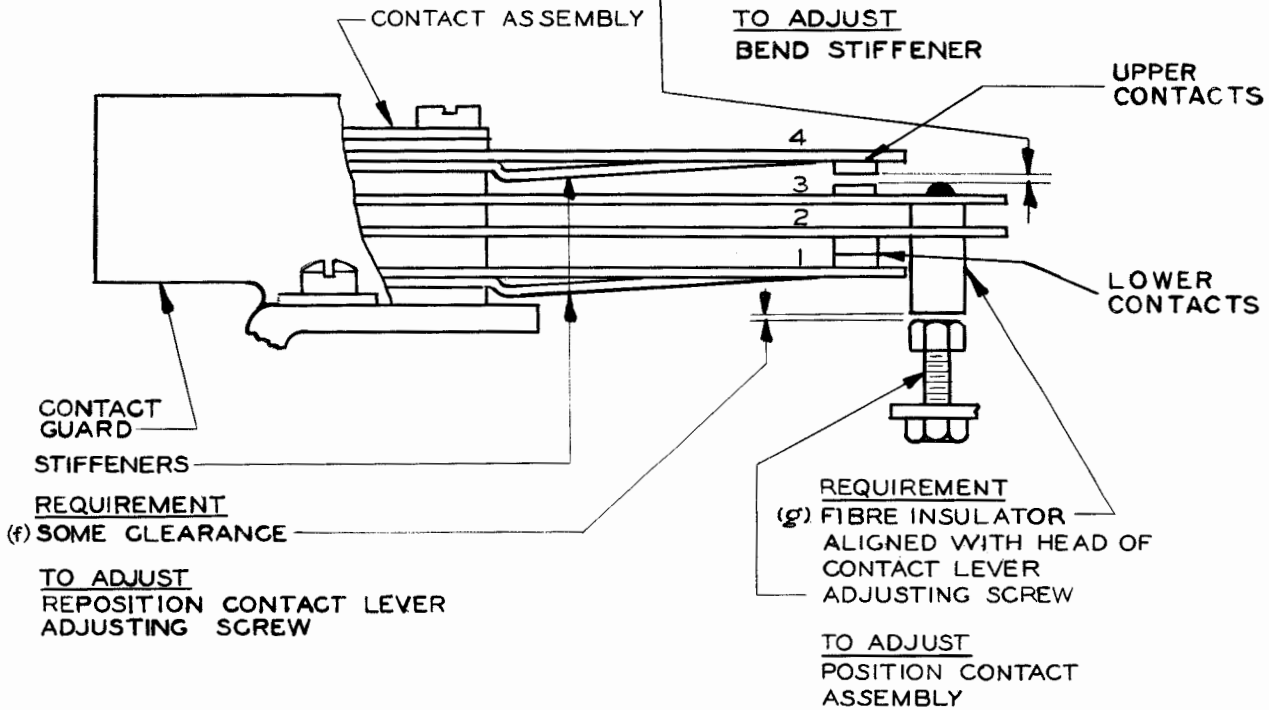


Figure 12

2.26 Contact Lever Adjusting Screw

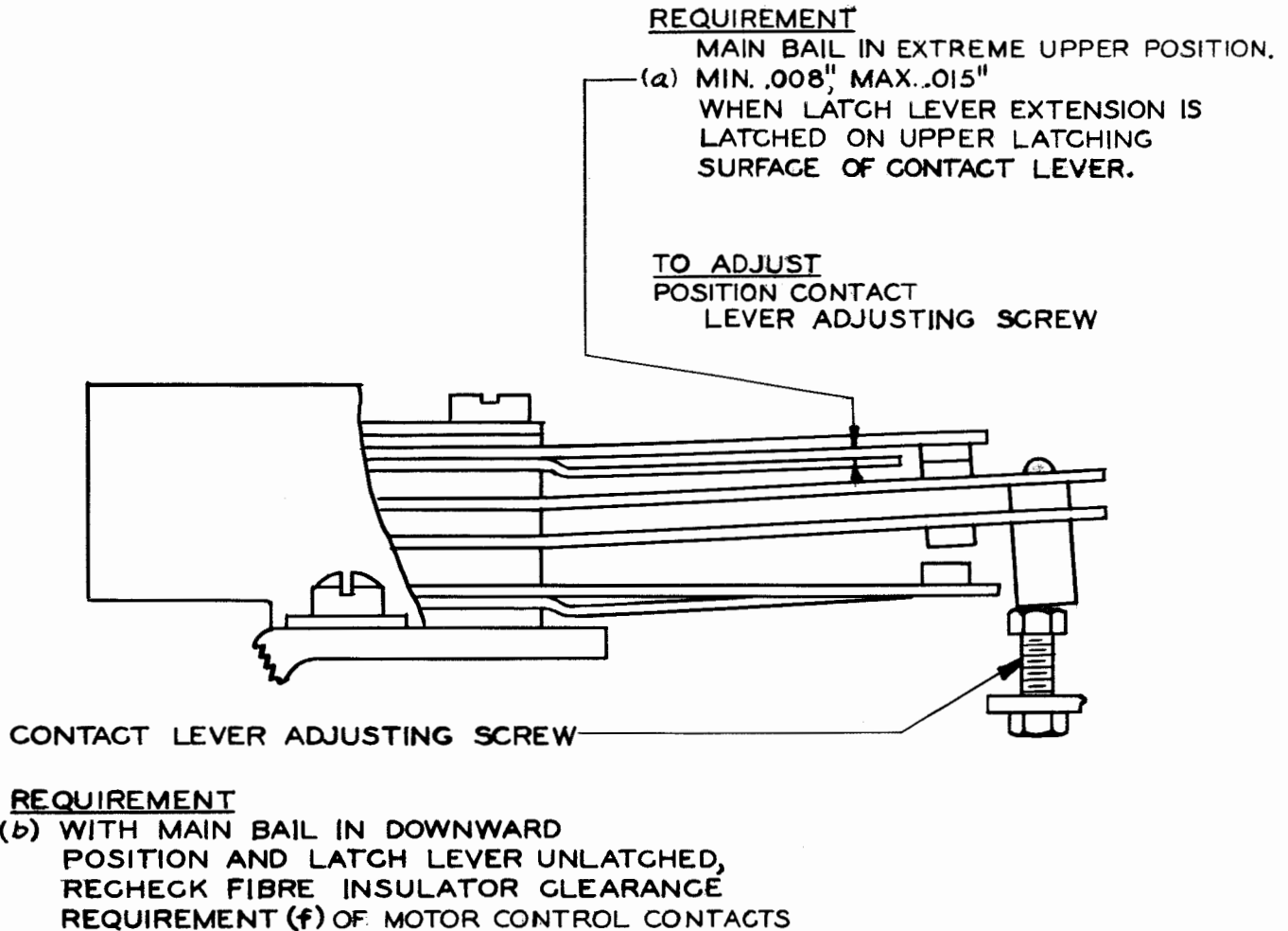


Figure 13

E. Electrical Motor Control (15 Teletypewriter) (FIGS H)

2.27 H Contacts: The H contacts on the 15 typing unit are adjusted like the left-hand motor-stop contacts of the built-in motor-control mechanism, shown in Figure 5.

2.28 Contact Spring Assembly: The requirements and adjustments for the contact spring assembly are given in 2.10 through 2.12.

2.29 Relay Unit: The requirements and adjustments for the relay unit in the base are covered in 2.30 through 2.41.

2.30 Start-magnet Core: With the start-magnet held in the operated position, there should

not be more than 0.004 inch clearance between the armature and the shortest core. See Figure 14 for location of parts.

To Adjust: Vary the number of TP82525 (0.004-inch) shims between the rear end of the start-magnet cores and the yoke.

2.31 Stop-magnet Core: With the stop-magnet armature held in the operated position, there should not be more than 0.004-inch clearance between the armature and the pole face. See Figure 15 for location of parts.

To Adjust: Vary the number of TP8896 (0.004-inch) shims between the rear end of the stop-magnet core and yoke.

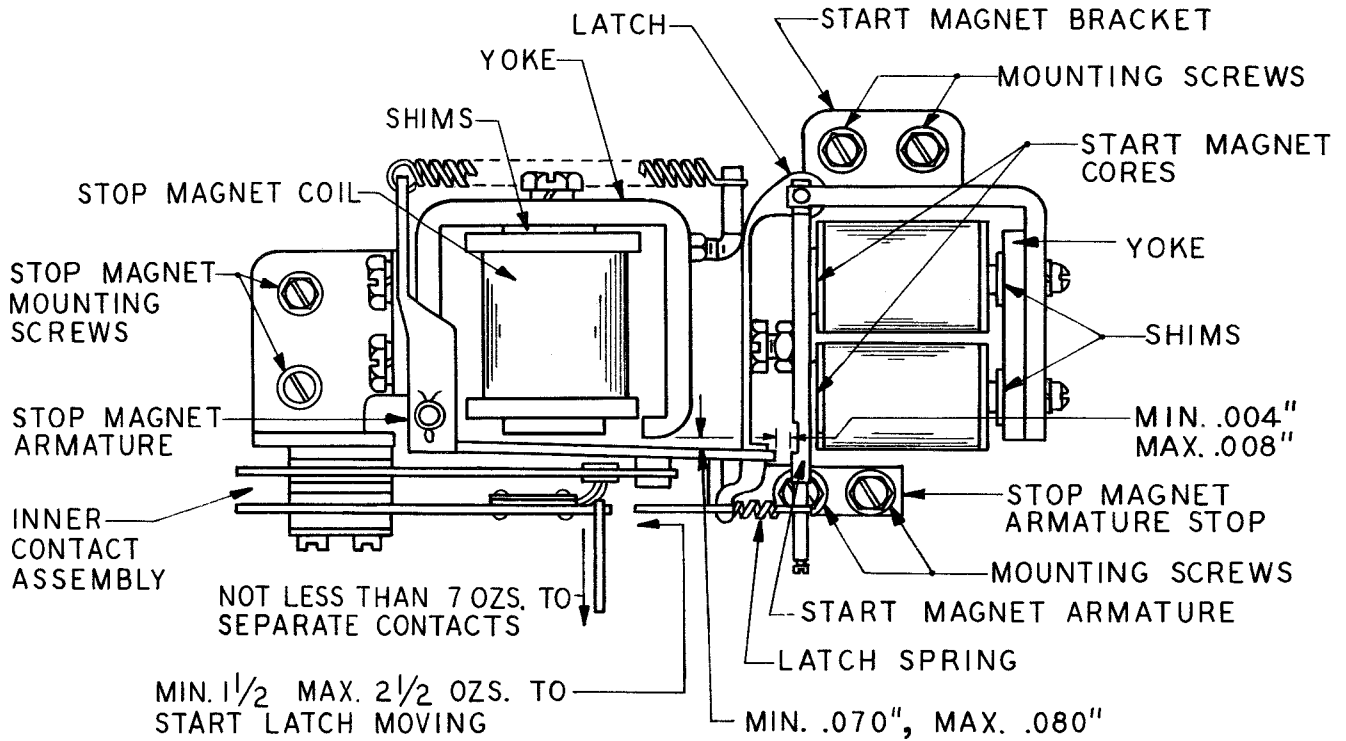


Figure 14

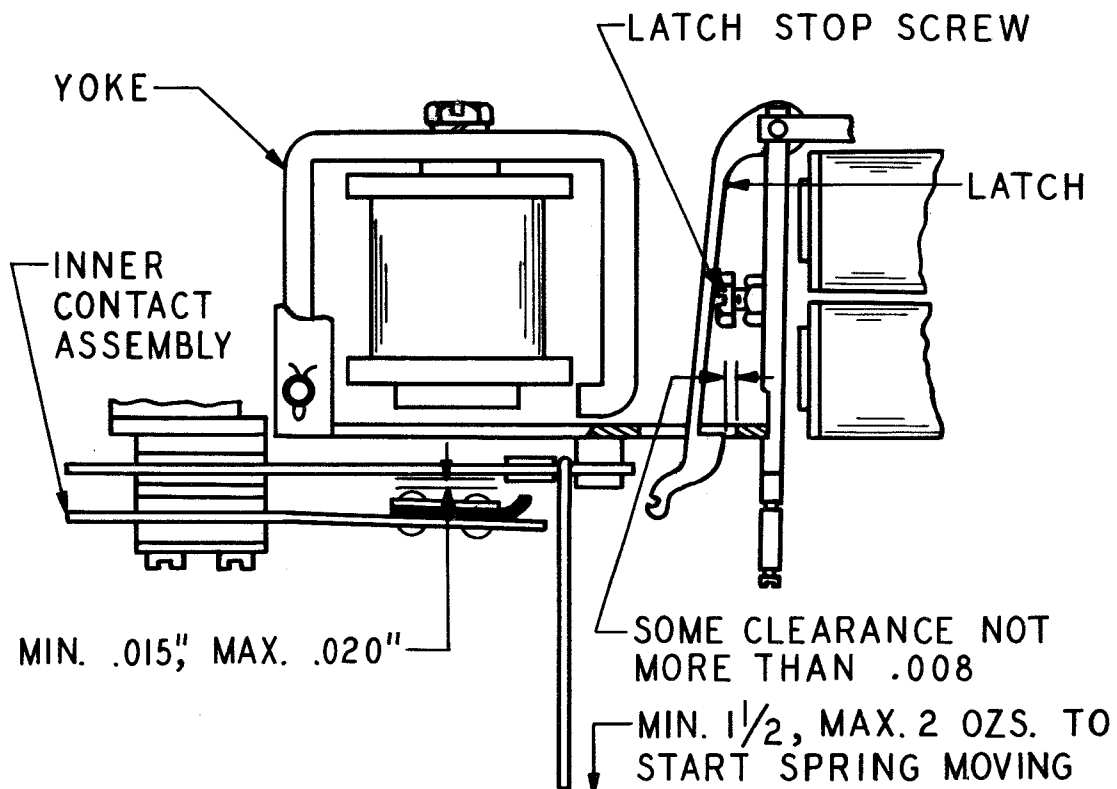


Figure 15

2.32 Start-magnet Bracket: With the stop-magnet armature held so that the inside edge lines up with the outer shoulder on the start-magnet armature, there should be minimum 0.004-inch, maximum 0.008-inch clearance between the end of the stop-magnet armature and the start-magnet armature at the closest point. (See Figure 14.)

To Adjust: Loosen the start-magnet bracket mounting-screws and shift the start-magnet bracket. Tighten the mounting-screws.

2.33 Stop-magnet Bracket: With the start-magnet armature held in its operated position and with the stop-magnet armature held in its operated position by the latch, there should be minimum 0.004 inch, maximum 0.008 inch between the stop-magnet armature and the outer face of the yoke at the closest point. (See Figure 16.)

To Adjust: Remove the porcelain resistor from its bracket, loosen the mounting-screws which mount the stop-magnet bracket

to the base plate, and shift the stop-magnet bracket. Tighten the mounting-screws and replace the porcelain resistor.

2.34 Stop-magnet Armature-stop: With the stop-magnet armature released against its stop, there should be minimum 0.070 inch, maximum 0.080 inch clearance between the stop-magnet armature and the outer face of the yoke. (See Figure 14.)

To Adjust: Loosen the stop-magnet armature-stop mounting-screws and shift the stop-magnet armature-stop. Tighten the mounting-screws.

2.35 Latch Stop-screw: With the stop-magnet armature held in the operated position by the notch in the start-magnet armature, there should be some clearance, not more than 0.008 inch, between the high part of the latching surface of the latch and the end of the slot in the stop-armature. (See Figure 15.)

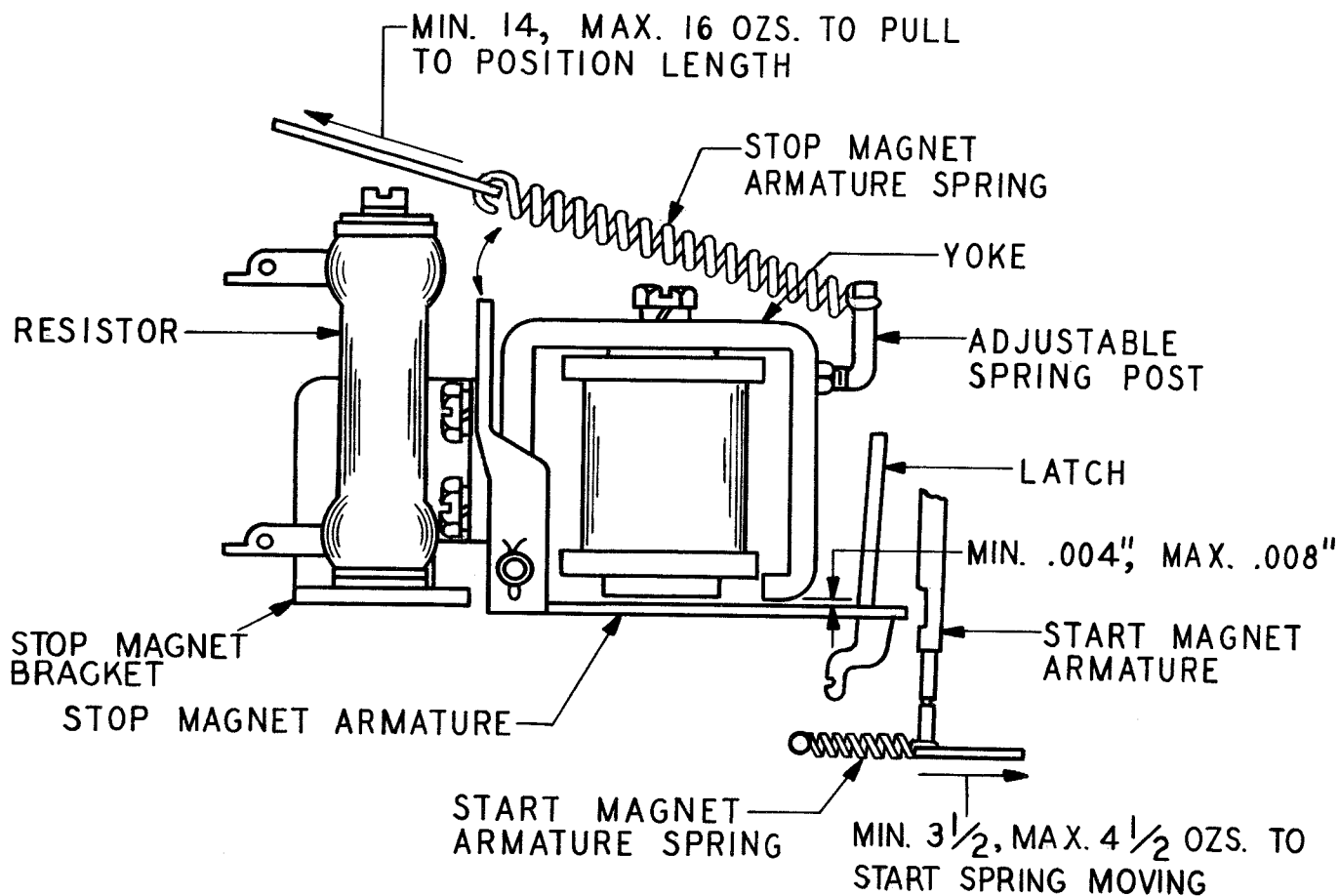


Figure 16

To Adjust: Loosen the latch stop-screw locknut and adjust the latch stop-screw. Tighten the locknut.

2.36 Stop- and Start-magnet Armatures and Latch should be free from bind.

To Check: Unhook the stop-magnet armature spring, the start-magnet armature spring, and the latch-spring. While checking the stop-magnet armature it will be necessary to hold the contact springs clear of the armature.

2.37 Stop-magnet Armature-spring: With the stop-magnet armature held in its operated position, hook the 32-ounce scale in the stop-magnet armature-spring eye. It should require minimum 14 ounces, maximum 16 ounces to pull the spring to its normal position length. (See Figure 16.)

To Adjust: Loosen the adjustable spring-post locknut and adjust the spring-post. Tighten the locknut. Rehook all springs.

2.38 Start-magnet Armature-spring: With the stop-magnet armature in its operated position, hook the 8-ounce scale over the end of the start-magnet armature spring-post and pull horizontally in line with the spring. It should require minimum 3-1/2 ounces, maximum 4-1/2 ounces to start the armature moving. (See Figure 16.)

2.39 Latch-spring: With both armatures released, hook the 8-ounce scale over the latch between the spring and the shoulder and pull horizontally. It should require minimum 1-1/2 ounces, maximum 2-1/2 ounces to start the latch moving. (See Figure 14.)

Note: To check the requirements in 2.38 remove the two screws directly above the outer-contact assembly pileup and move the assembly out of the way. Tighten the inner-contact pileup mounting-screws.

2.40 The Inner-contact Assembly should meet the following requirements with the stop-magnet armature held operated by the notch in the start-magnet armature: (See Figure 15.)

(a) Hook the 8-ounce scale over the long contact-spring between the bakelite insulator and the copper contact surface and pull at right angles to the spring. It should require minimum 1-1/2 ounces, maximum 2 ounces to

start the spring moving away from the armature.

To Adjust: Bend the long contact-spring.

(b) There should be clearance of minimum 0.015 inch, maximum 0.020 inch between the contact surfaces of the inner contact-springs.

To Adjust: Bend the short contact-spring.

Note: Replace the outer contact-spring assembly and tighten the pileup mounting-screws.

2.41 The Outer Contact-spring Assembly should meet the following requirements with the stop-magnet armature held operated by the notch in the start-magnet armature. (See Figure 17.)

(a) The fiber insulator of the long contact-spring nearest the stop-magnet armature should clear the armature by not more than 0.006 inch.

To Adjust: Bend the spring-stiffener nearest the armature.

(b) The short contact-spring nearest the armature should bear against its stiffener with a perceptible pressure when the other contact-springs are held off.

To Adjust: Bend the contact-spring.

(c) Hook the 8-ounce scale over the long contact-spring nearest the armature at the contact and pull at right angles to the spring. It should require minimum 1 ounce, maximum 1-1/2 ounces to separate the contacts when the other long spring is held away.

To Adjust: Bend the long contact-spring nearest the armature.

(d) The fiber insulator of the long contact-spring farthest from the armature should bear lightly against the long contact-spring closest to the armature.

To Adjust: Bend the long contact-spring farthest from the armature.

(e) There should be a clearance of minimum 0.015 inch, maximum 0.020 inch between the short contact-spring contact farthest from the armature and its adjacent long contact-spring contact.

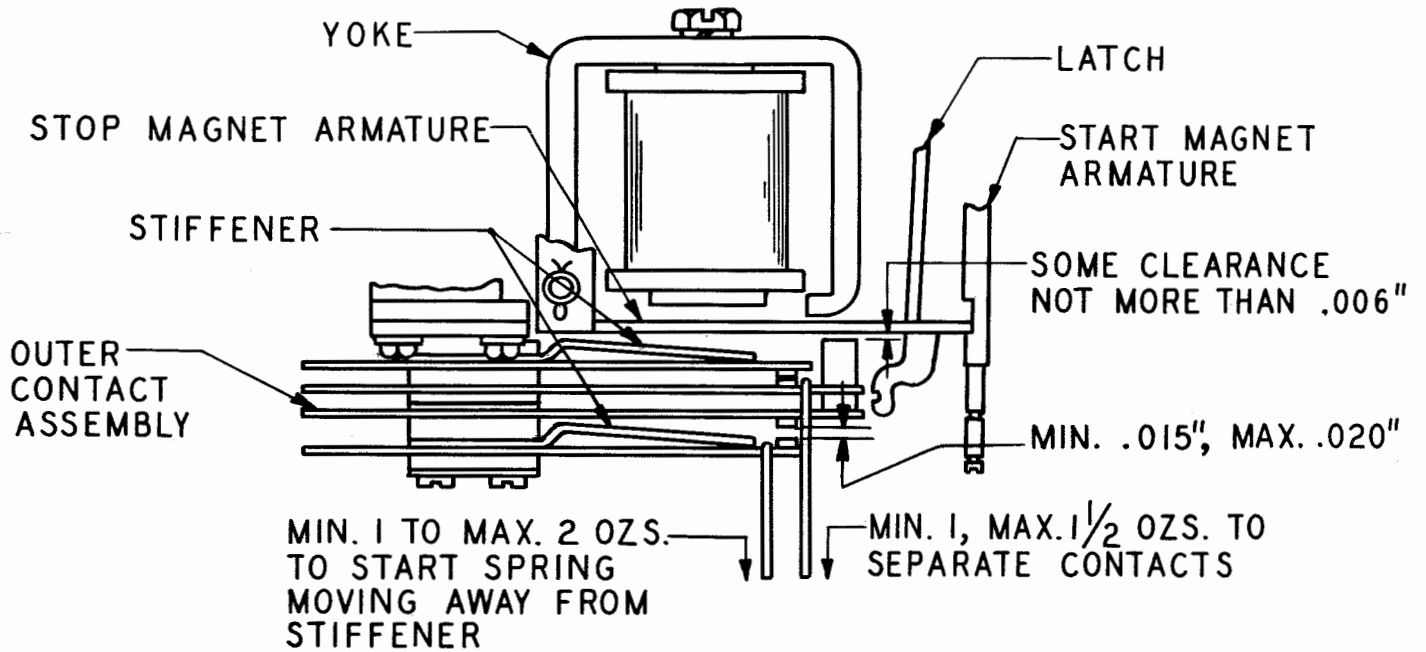


Figure 17

To Adjust: Bend the stiffener farthest from the armature.

- (f) Hook the 8-ounce scale over the short contact-spring farthest from the armature at the contact and pull at right angles to the spring. It should require minimum 1 ounce, maximum 2 ounces to start the spring moving away from its stiffener.

To Adjust: Bend the short contact-spring farthest from the armature.

F. Electrical Motor Control (15 Teletypewriter)
(FIGS Blank H)

2.42 The requirements and adjusting procedures for the FIGS Blank H mechanism are the same as for the FIGS H mechanism except for the special features associated with the added Blank character in the signal. These are described in 2.12 to 2.17 inclusive.