35 KEYBOARD AND BASE FOR KEYBOARD SEND-RECEIVE AND RECEIVE-ONLY SETS

ADJUSTMENTS

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1. GENERAL

1.01 This section covers adjustments for the 35 keyboard and base for keyboard send-receive and receive-only sets. It is reissued to incorporate recent engineering changes. Arrows in the margins indicate changes and additions.

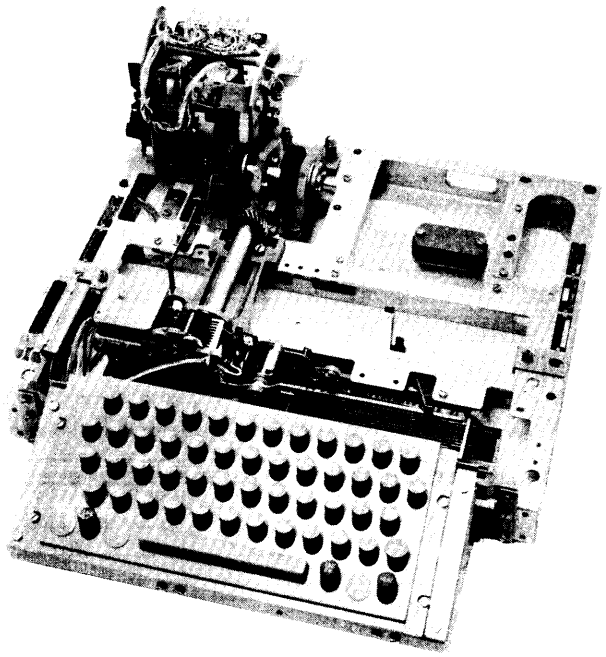


Figure 1 - 35 Keyboard for Send-Receive Sets with Answer-Back

1.02 The adjustments of each unit are arranged in a sequence that would be followed if a complete readjustment of the unit were undertaken. Tools and spring scales required to perform the adjustments are listed in Section 570-005-800TC. After an adjustment has been completed, be sure to tighten any nuts or screws that may have been loosened. The adjusting illustrations, in addition to indicating the adjusting tolerances, positions of moving parts, and spring tension, also show the angle at which the scale should be applied when measuring spring tensions. If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

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

Note 1: After a few weeks (300 to 500 hours) of operation of a new unit, the unit should be relubricated to make sure all operating points have been properly lubricated.

Note 2: Recheck all clutch gaps to insure that the parts, after seating themselves, have not caused the clutch gaps to open up. Reset if necessary. Standard readjustment periods are to be maintained thereafter.

1.04 References made to left or right, up or down, front or rear, etc apply to the unit in its normal operating position as viewed from the operator's position in front of the unit.

1.05 The spring tensions given in this section are indicated values and should be checked with proper spring scales in the position indicated.

1.06 When cleaning plastic parts, use soap or detergent and water. Do not use solvents containing alcohol or chlorinated components.

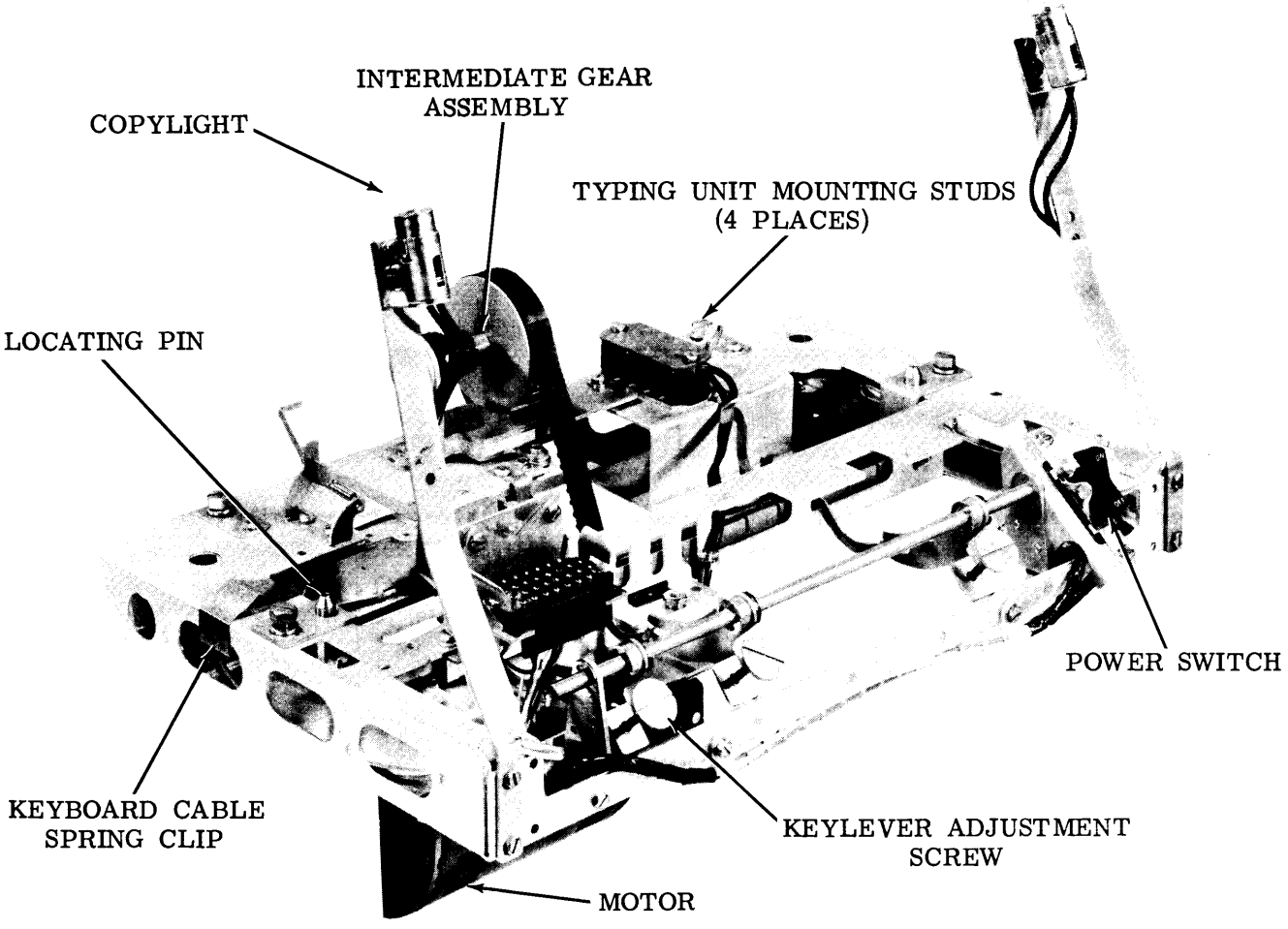


Figure 2 - Wall Mounted Printer Base

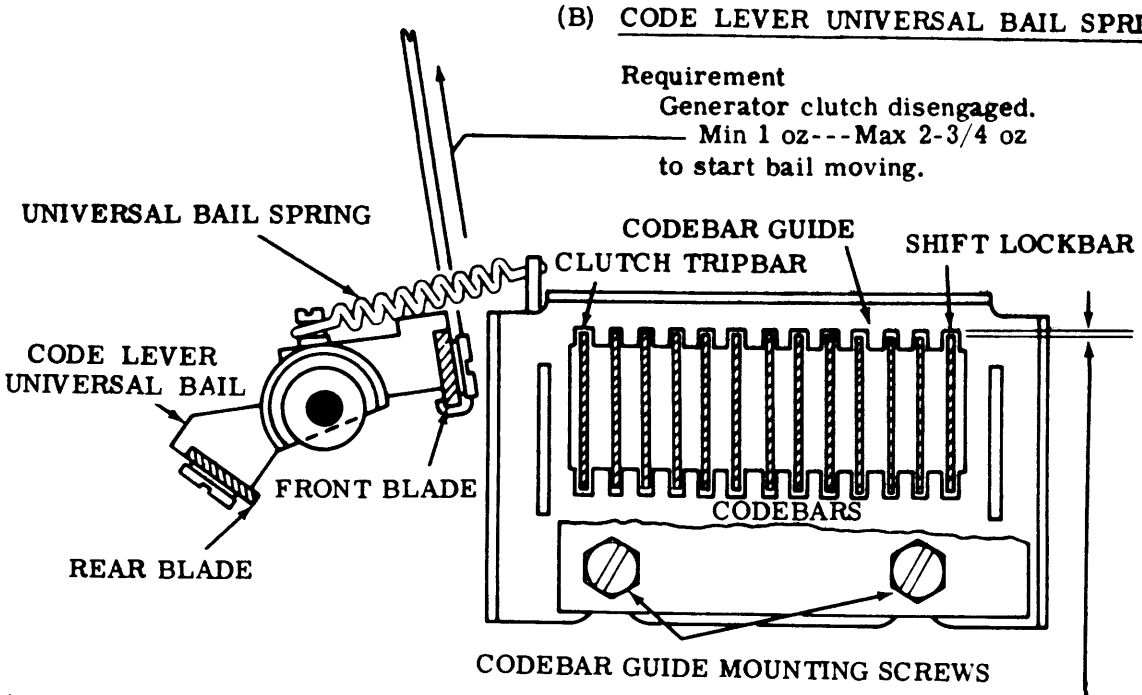
2. BASIC UNITS

Keyboard

2.01 Codebar and Spacebar Mechanisms

(B) CODE LEVER UNIVERSAL BAIL SPRING

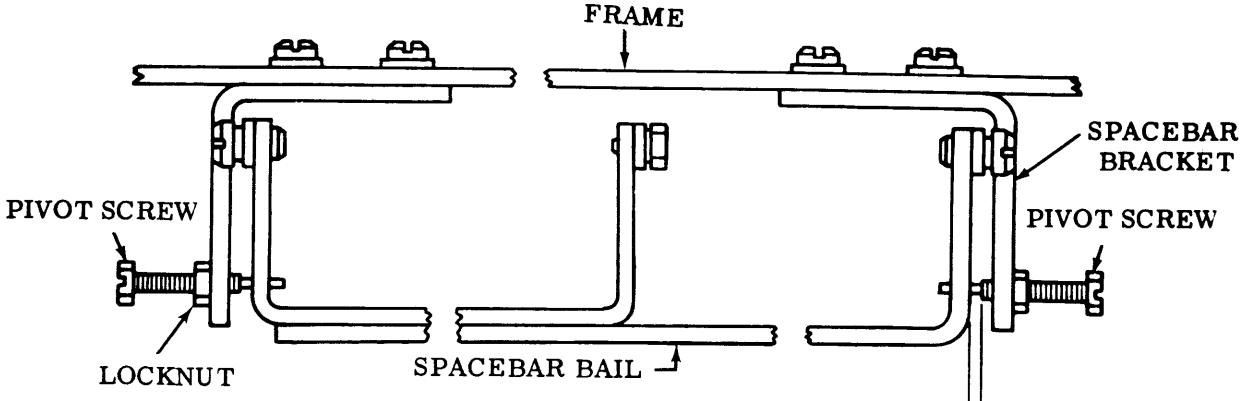
Requirement
Generator clutch disengaged.
Min 1 oz---Max 2-3/4 oz
to start bail moving.



(A) CODEBAR GUIDE CLEARANCE

Requirement
Clearance between the top of no. 1 and no. 8 codebars should be
Min some---Max 0.006 inch
All codebars should move freely.

To Adjust
With mounting screws for either the left or right codebar guides friction tight, position guides. Tighten screws.

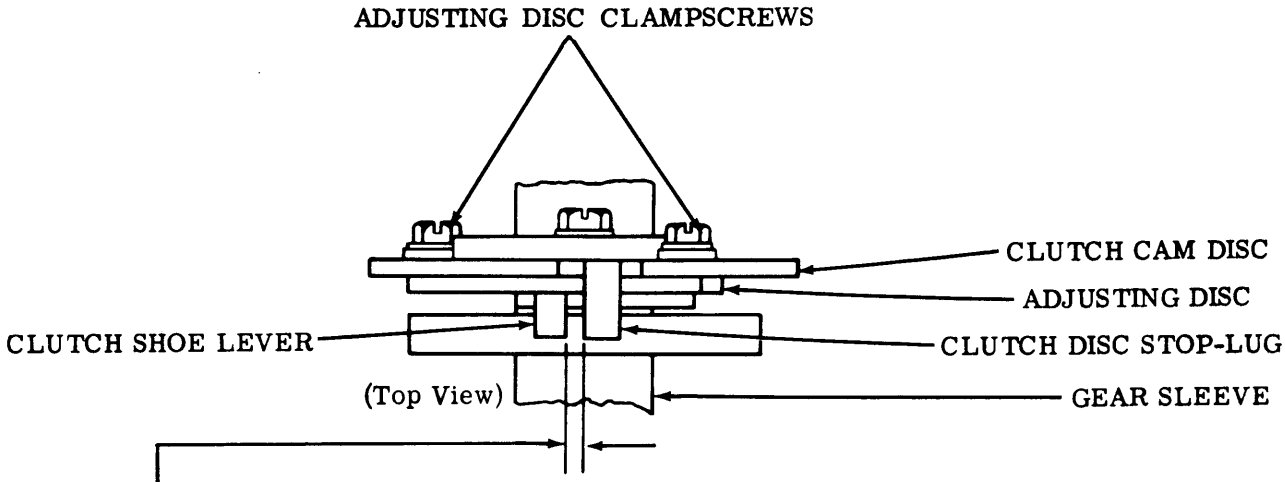


(C) SPACEBAR BAIL PIVOT

Requirement
Min some---Max 0.010 inch
Spacebar free from bind.

To Adjust
Position spacebar with pivot screws.

2.02 Signal Generator Clutch and Gear Mechanism



CLUTCH SHOE LEVER

Requirement

Clearance when clutch is disengaged should be Min 0.055 inch---Max 0.085 inch less than when clutch is engaged.

To Check

Latch clutch in disengaged position and measure clearance. Rotate gear until oil hole is upward. Engage clutch and measure clearance.

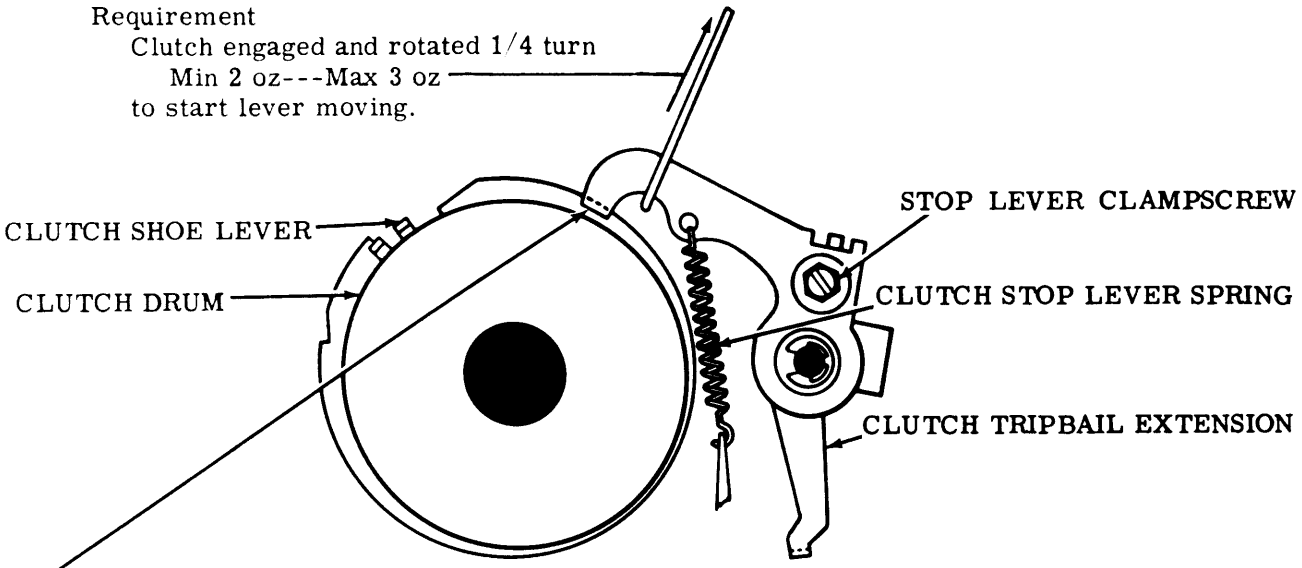
To Adjust

Loosen the two adjusting disc clampscrews to position disc.

2.03 Signal Generator Clutch Mechanism

(B) CLUTCH STOP LEVER SPRING TENSION

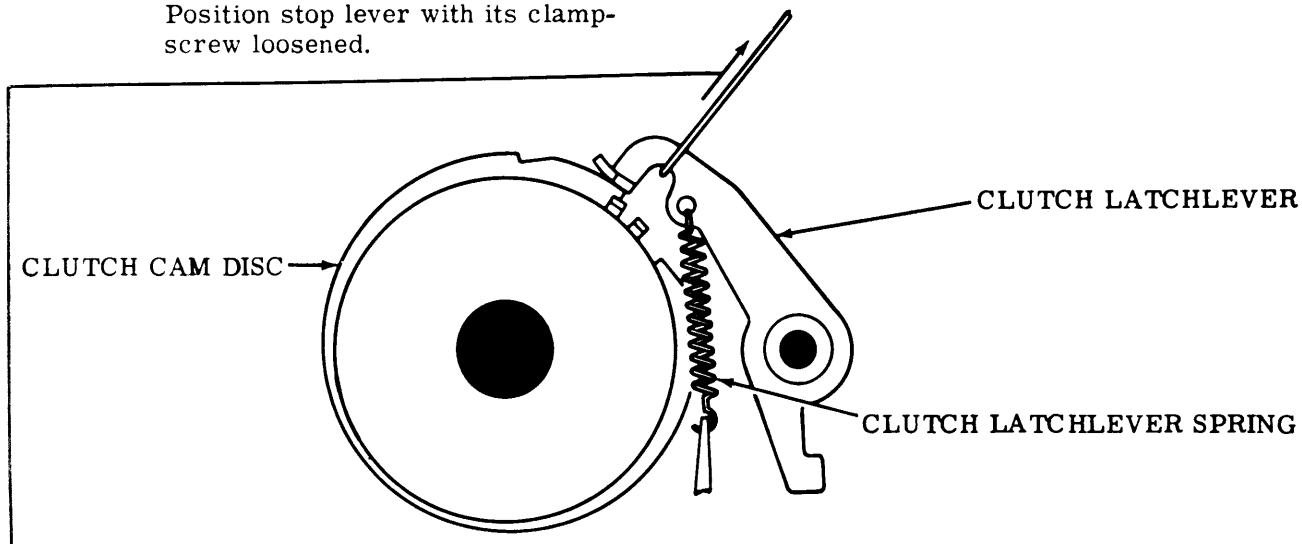
Requirement
Clutch engaged and rotated 1/4 turn
Min 2 oz---Max 3 oz
to start lever moving.



(A) CLUTCH STOP LEVER

Requirement
Should fully engage clutch shoe lever.
During rotation, the lever should not touch the clutch drum at any point.

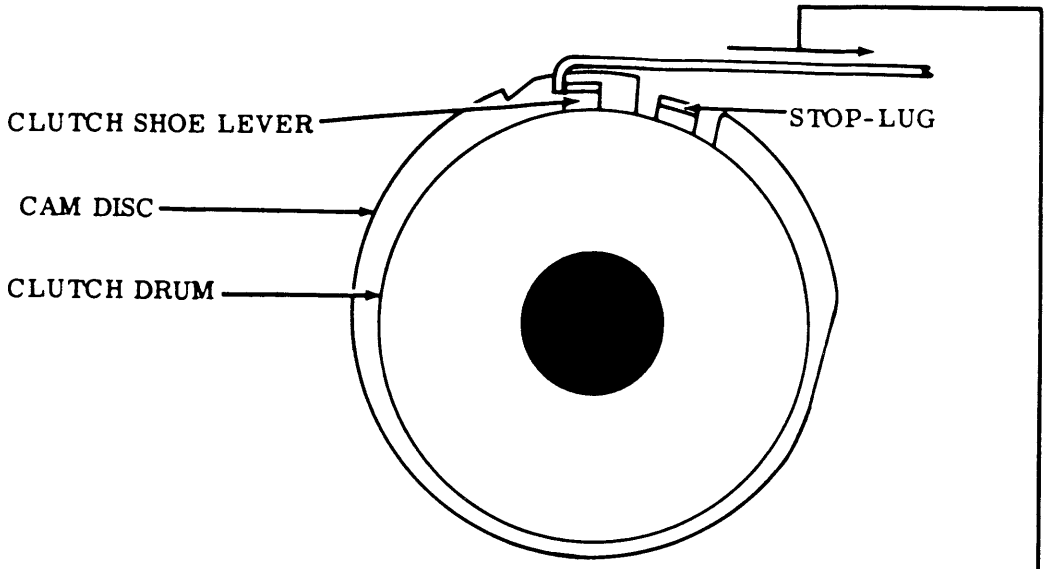
To Adjust
Position stop lever with its clamp-screw loosened.



(C) CLUTCH LATCHLEVER SPRING TENSION

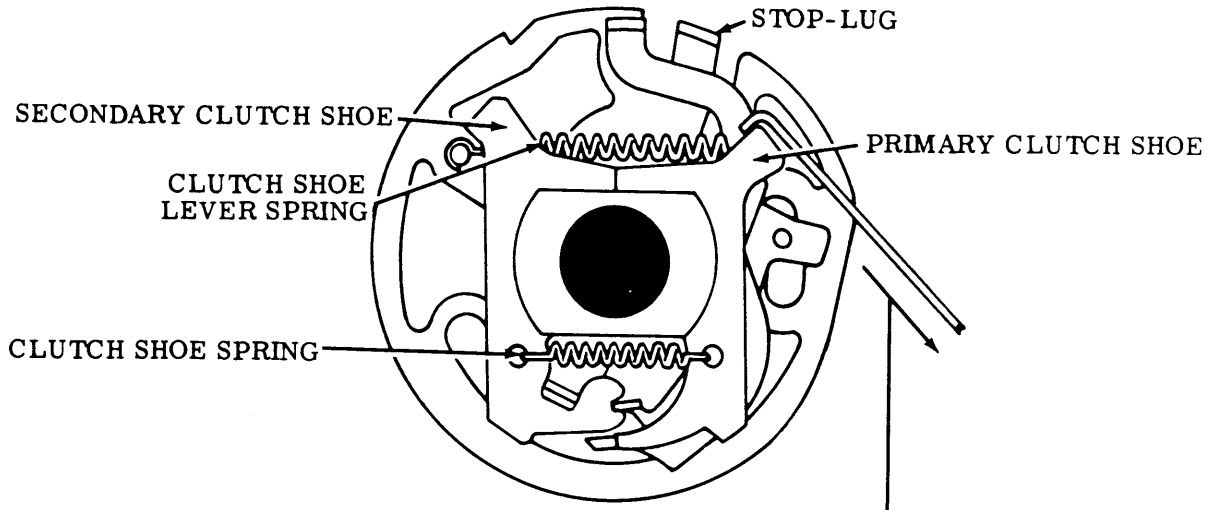
Requirement
Clutch latchlever resting on the highest point of clutch disc.
Min 2 oz---Max 3 oz
to start latchlever moving.

2.04 Signal Generator Clutch Mechanism (continued)



CLUTCH SHOE LEVER SPRING TENSION

Requirement
Clutch engaged.
Cam disc held to prevent turning
Min 15 oz---Max 20 oz
to move shoe lever in contact with stop-lug.

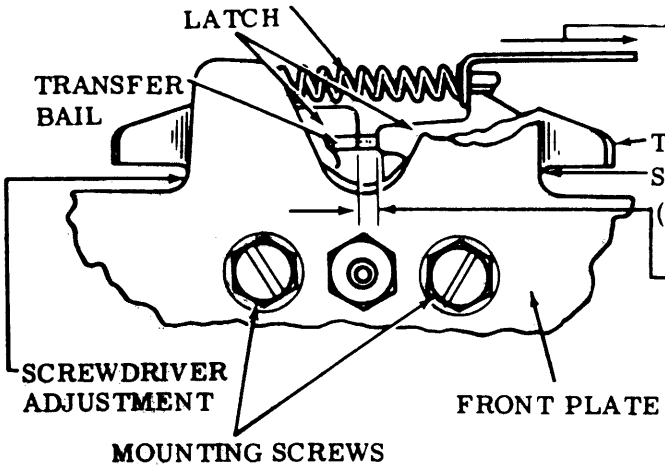


CLUTCH SHOE SPRING TENSION

Note: In order to check this spring tension, it is necessary to remove the clutch from the main signal generator drive shaft. Therefore, it should not be checked unless there is good reason to believe that it does not meet its requirement.

Requirement
Clutch drum removed.
Min 3 oz---Max 5 oz
to start primary shoe moving away from secondary shoe at point of contact.

2.05 Transfer Bail and Contact Box Mechanism



(B) TRANSFER BAIL DETENT LATCH SPRING

Requirement
Min 2-3/4 oz---Max 4-1/4 oz
to start latch moving.
Hold transfer bail to left.

TRANSFER BAIL DETENT PLATES
SCREWDRIVER ADJUSTMENT

(A) TRANSFER BAIL DETENT PLATE

Requirement
Equal left and right clearance within 0.002 inch when transfer bail is at extreme left or right position as these occur in a character between start and no. 1 pulses only.

To Adjust
Rotate detent plate right or left by means of screwdriver with detent plate mounting screws loosened.

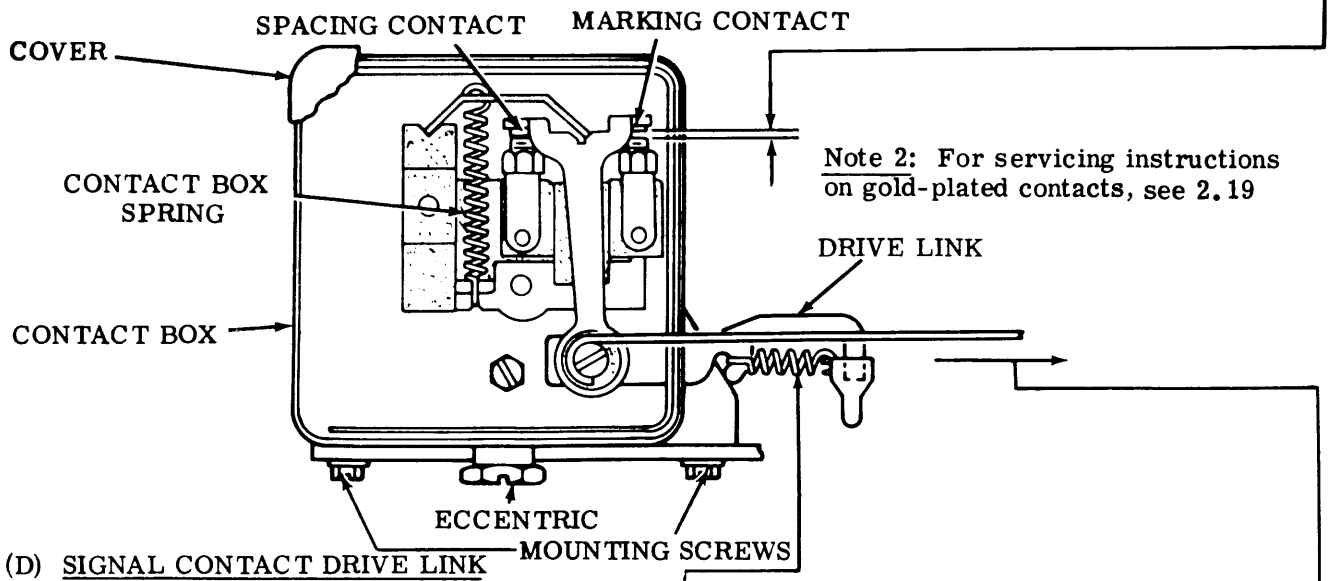
(C) SIGNAL CONTACT CLEARANCE

To Check
Depress Y keylever and rotate signal generator cam sleeve until each contact has fully opened.

Requirement
Marking and spacing gaps should be equal within 0.001 inch.

To Adjust
Loosen mounting screws and move contact box by means of eccentric.

Note 1: Check by means of signal checking device if available, and carefully refine the adjustment to eliminate all bias from the signals by equalizing the current-on and current-off intervals (2.17).



Note 2: For servicing instructions on gold-plated contacts, see 2.19

(D) SIGNAL CONTACT DRIVE LINK

Requirement
With main shaft in stop position and transfer bail detent latch spring unhooked (see figure above), move latches away from transfer bail extension. Hold the toggle firmly against contacts
Min 6 oz---Max 9 oz
to start transfer bail extension moving.

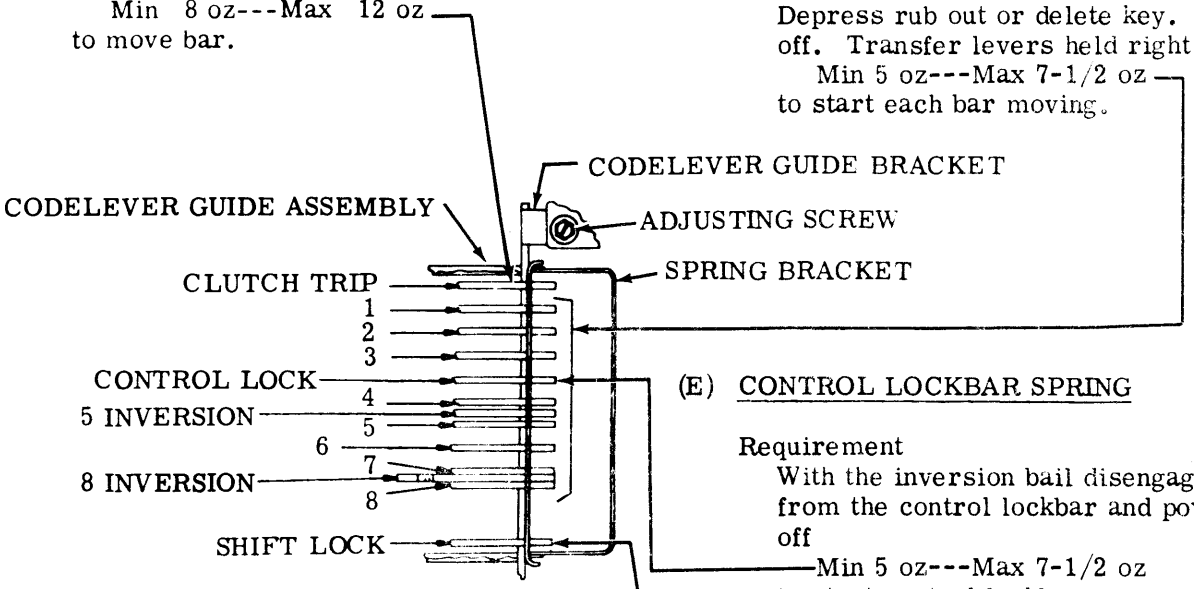
(E) SIGNAL CONTACT SPRING

Requirement
Remove drive link spring.
Transfer bail held clear of drive link.
Min 2 oz---Max 3 oz
to start link moving.

2.06 Codebar and Codelever Mechanism

(B) CLUTCH TRIPBAR SPRING TENSION

Requirement
Clutch disengaged. Power off
Min 8 oz---Max 12 oz
to move bar.



(C) CODEBAR SPRINGS (No. 1, 2, 3, 4, 5, 6, 7 and 8)

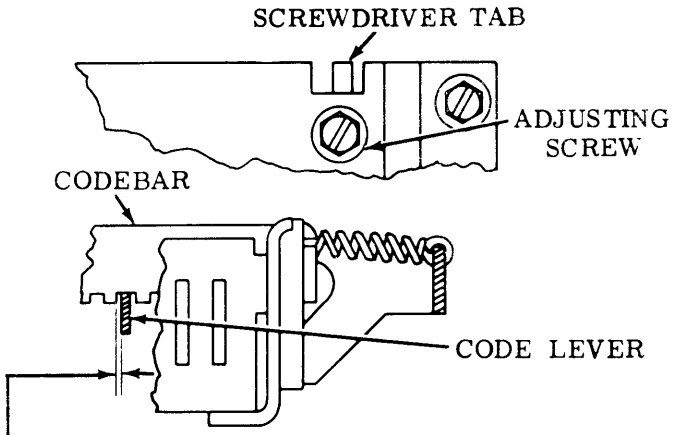
Requirement
Depress rub out or delete key. Power off. Transfer levers held right.
Min 5 oz---Max 7-1/2 oz
to start each bar moving.

(E) CONTROL LOCKBAR SPRING

Requirement
With the inversion bail disengaged from the control lockbar and power off
Min 5 oz---Max 7-1/2 oz
to start control lockbar moving.

(D) SHIFT LOCKBAR SPRING

Requirement
With the inversion bail disengaged from the shift lockbar and power off
Min 2 oz---Max 4 oz
to start shift lockbar moving.



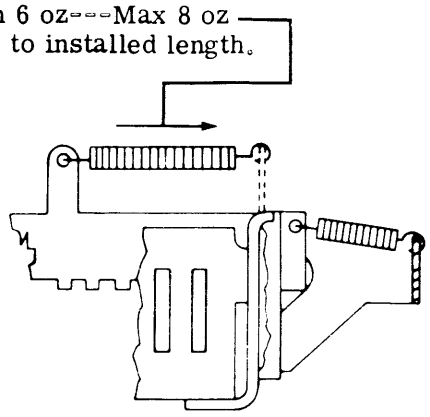
(A) CODEBAR AND CODE LEVER CLEARANCE

Requirement
Permutation must be such that the highest level (no. 8 level in an 8-level code) is spacing. The key code lever located furthest to the right should meet the requirement. While key is held down and cam cycled to stop position, gap between left side of key code lever and codebar blocked.
Min 0.006 inch---Max 0.017 inch

To Adjust
Position guide by adjusting slot with four mounting screws loosened. Tighten screws.

(F) NO. 5, 8 INVERSION CODEBAR SPRINGS

Requirement
Codebar in latched position.
Unhook spring at guide
Min 6 oz---Max 8 oz
to pull to installed length.



2.07 Function Bail and Lock Ball Track Mechanism

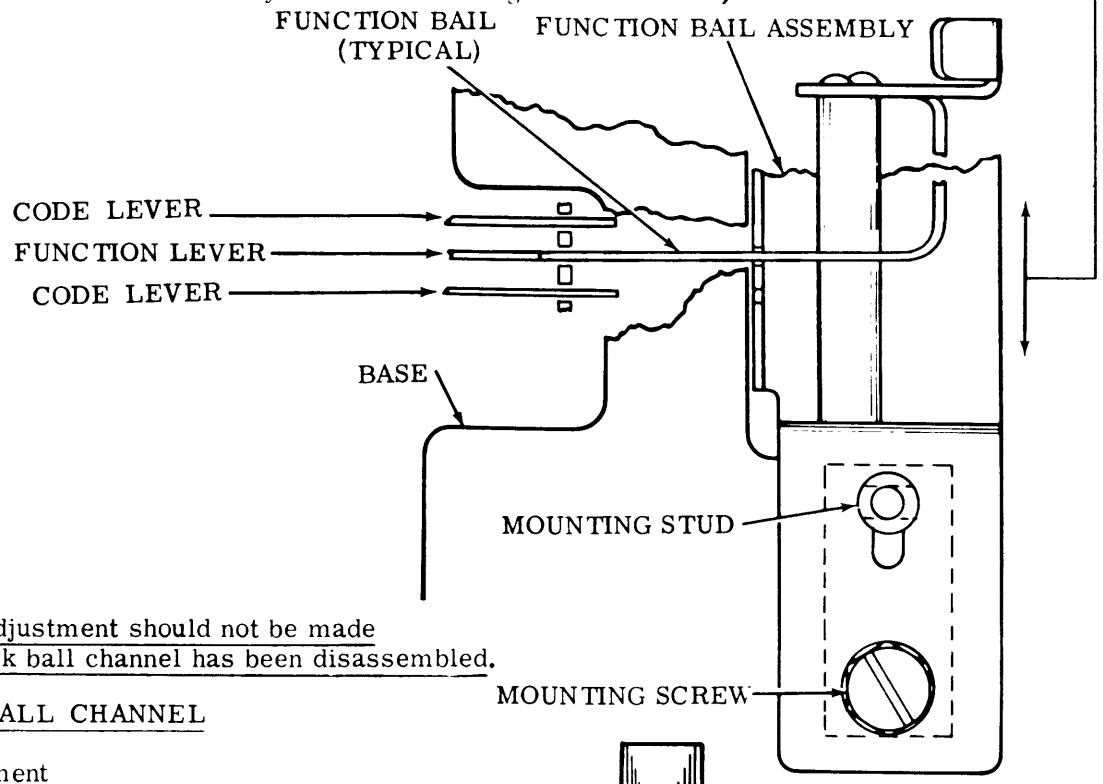
(A) FUNCTION BAIL LEVERS AND CODE LEVER CLEARANCE

Requirement

Function bails should operate within their guides without binding.

To Adjust

Position function bail assembly with two mounting studs loosened, one at each end.



Note: This adjustment should not be made unless the lock ball channel has been disassembled.

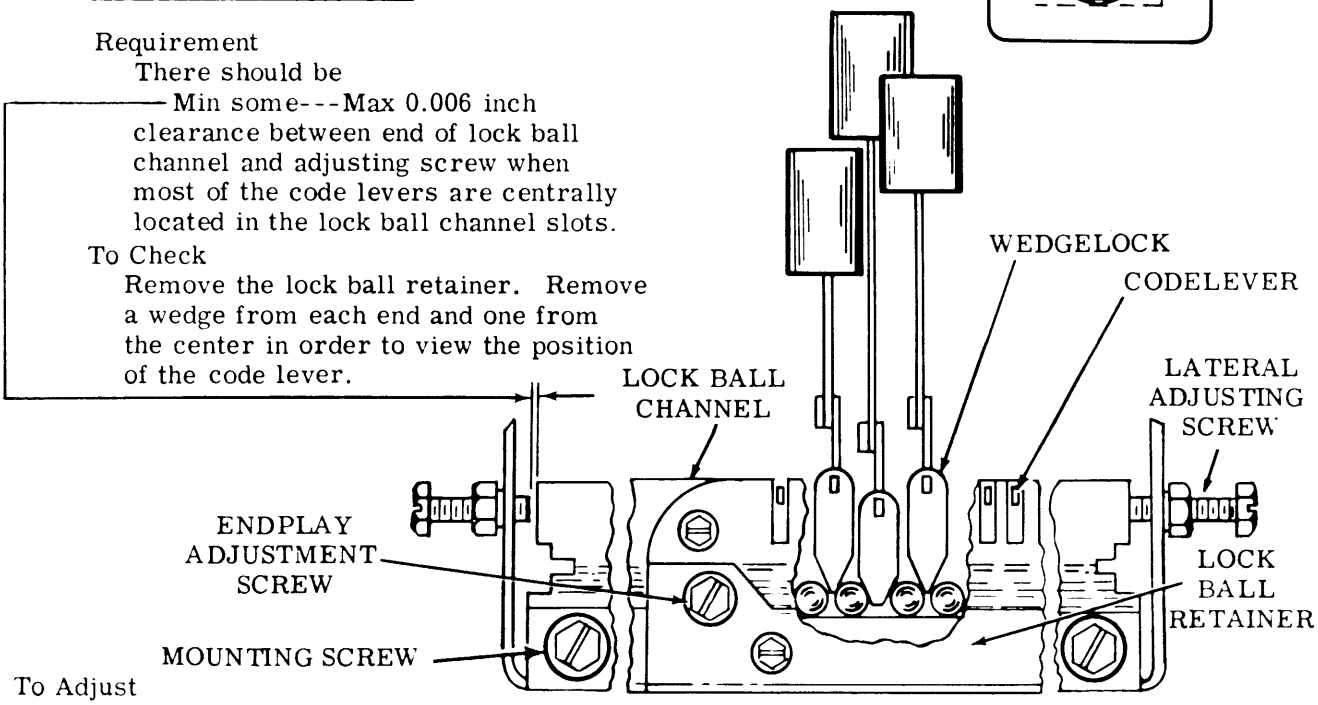
(B) LOCK BALL CHANNEL

Requirement

There should be Min some---Max 0.006 inch clearance between end of lock ball channel and adjusting screw when most of the code levers are centrally located in the lock ball channel slots.

To Check

Remove the lock ball retainer. Remove a wedge from each end and one from the center in order to view the position of the code lever.



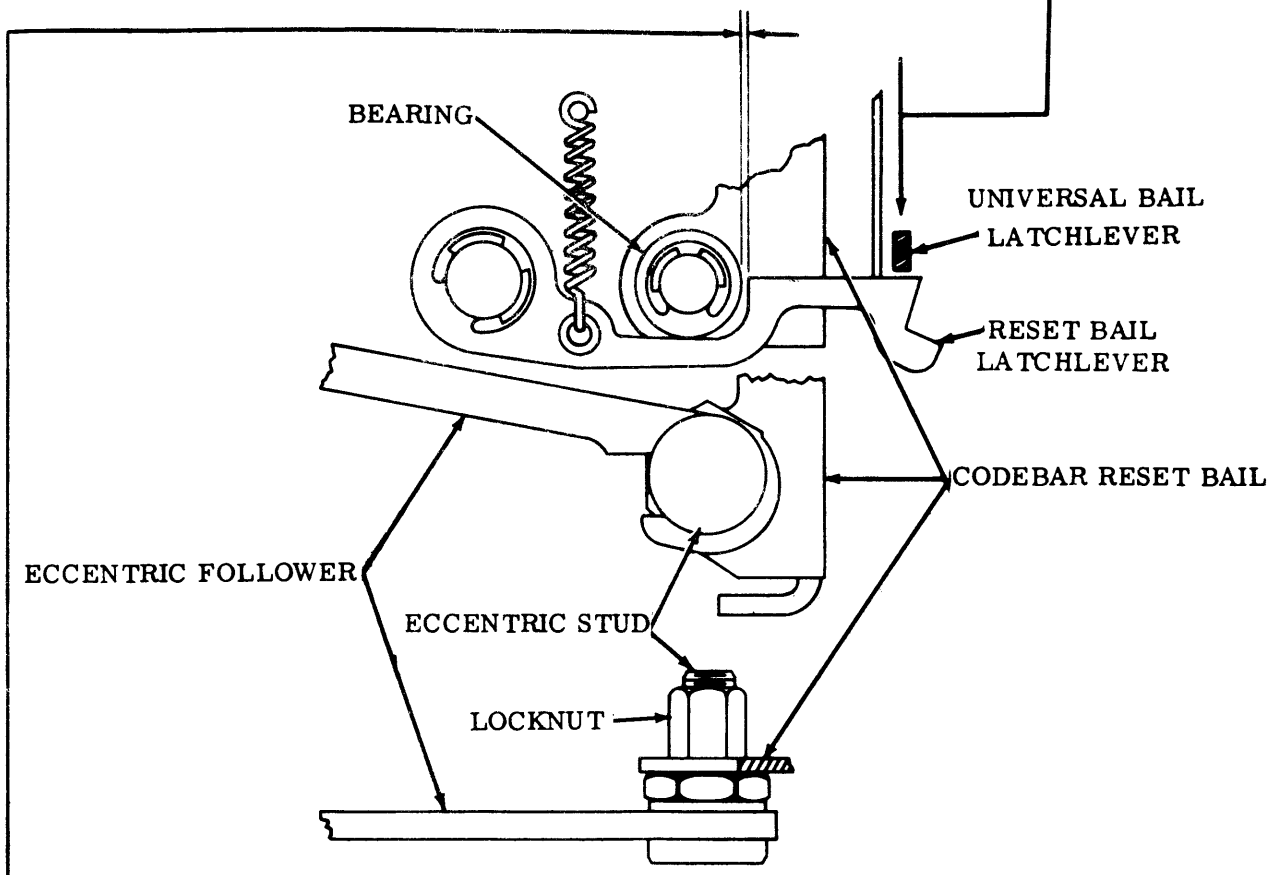
To Adjust

Loosen the lock ball channel mounting screws. Back off lateral adjusting screws and position channel. Turn one adjusting screw in against the end of the channel and lock it. Turn the other adjusting screw in to the end of the channel and back it off 1/4 turn. Lock the screw. Replace the wedges and check their position with respect to the balls. Pull channel assembly downward until all code levers strike their upstop without wedges jumping out of position. Replace lock ball retainer. Back off ball endplay adjusting screw.

2.08 Codebar Bail Mechanism

CODEBAR RESET BAIL LATCH SPRING

Requirement
Min 1/2 oz---Max 1-1/2 oz
to start codebar reset bail latch moving.

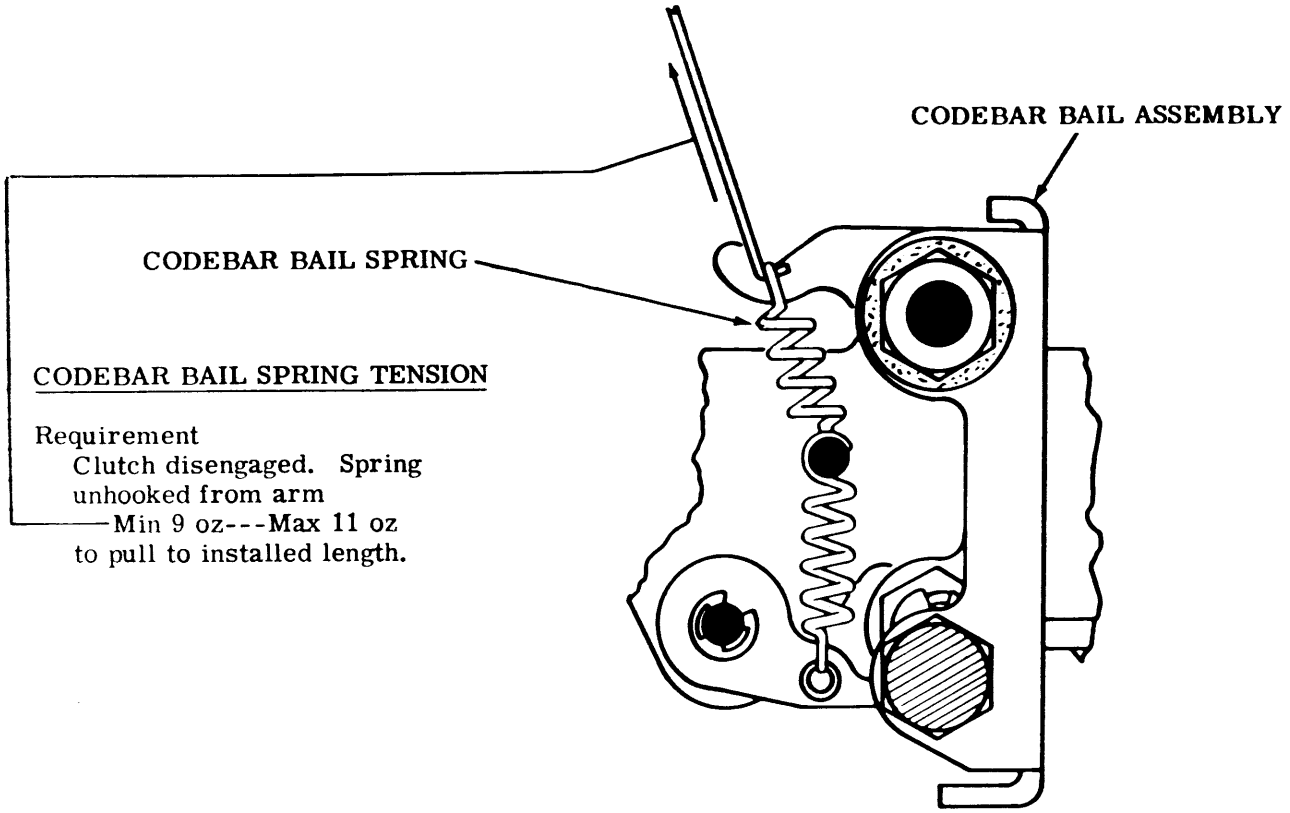


(A) CODEBAR RESET BAIL

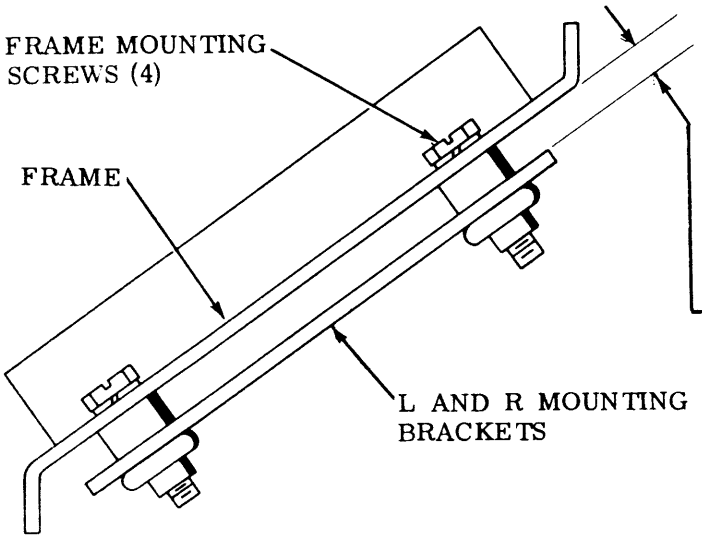
Requirement
Cam eccentric and arm holding bail in extreme reset position to left
Min some---Max 0.006 inch
between roller bearing mounted on reset bail and reset bail latch.

To Adjust
Adjust eccentric stud so that the high point is in the upper half of its adjustment arc.

2.09 Codebar Bail Mechanism (continued)



2.10 Keytop Guide Mechanism



KEYTOP GUIDE SPACING

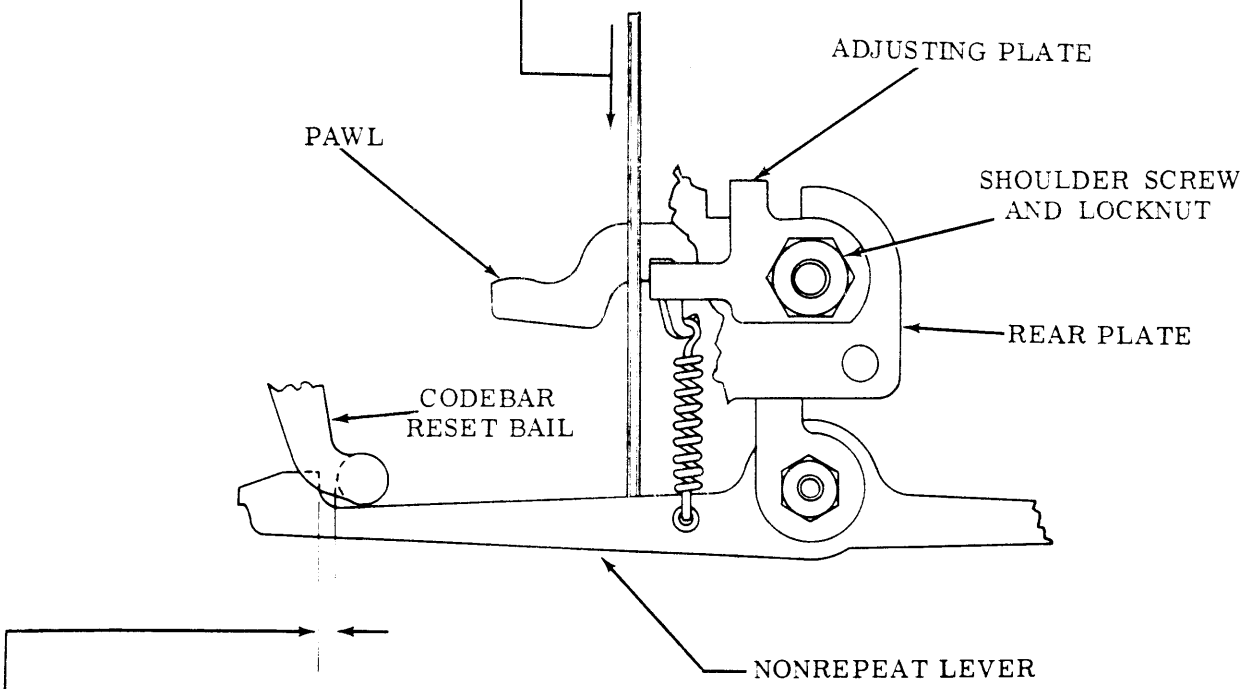
Requirement
Gap between frame and left and right mounting bracket should be
Min 0.141 inch---Max 0.171 inch

To Adjust
Tighten or loosen as required the four frame mounting screws.

2.11 Nonrepeat Lever Mechanism

(B) NONREPEAT LEVER SPRING TENSION

Requirement
Clutch disengaged, any keylever depressed
Min 2-1/4 oz---Max 3-1/4 oz
to start nonrepeat lever moving downward.



(A) CODEBAR RESET BAIL AND NONREPEAT LEVER

Requirement
Mechanism in initial trip-off condition, any key depressed, no power
Min some---Max 0.010 inch
between roller of reset bail and nonrepeat lever pick-up step.

To Adjust
Loosen locknut and shoulder screw and move mechanism left or right.

Note: Do not permit clutch to rotate when tripping off.

2.12 Wedge Lock and Ball Track Mechanism

Note: Remove keyboard hood in order to make this adjustment. See disassembly and reassembly.

(A) BALL WEDGE LOCK AND BALL TRACK CLEARANCE (PRELIMINARY)

To Check

Depress Q and P keylever alternately with 32 oz pressure and measure clearance in each instance. There should be no clearance between lower edge of code lever extensions and bottom of slots in wedges.

Requirement

Clearance between tip of wedge and the ball track

Min 0.005 inch---Max 0.015 inch

and equal within 0.005 inch.

To Adjust

Position ball track up or down with the two mounting screws loosened.

(B) LOCK BALL ENDPLAY (PRELIMINARY)

To Check (with ball endplay adjustment screw backed off)

Depress key at extreme right end of the A row with 32 oz pressure.

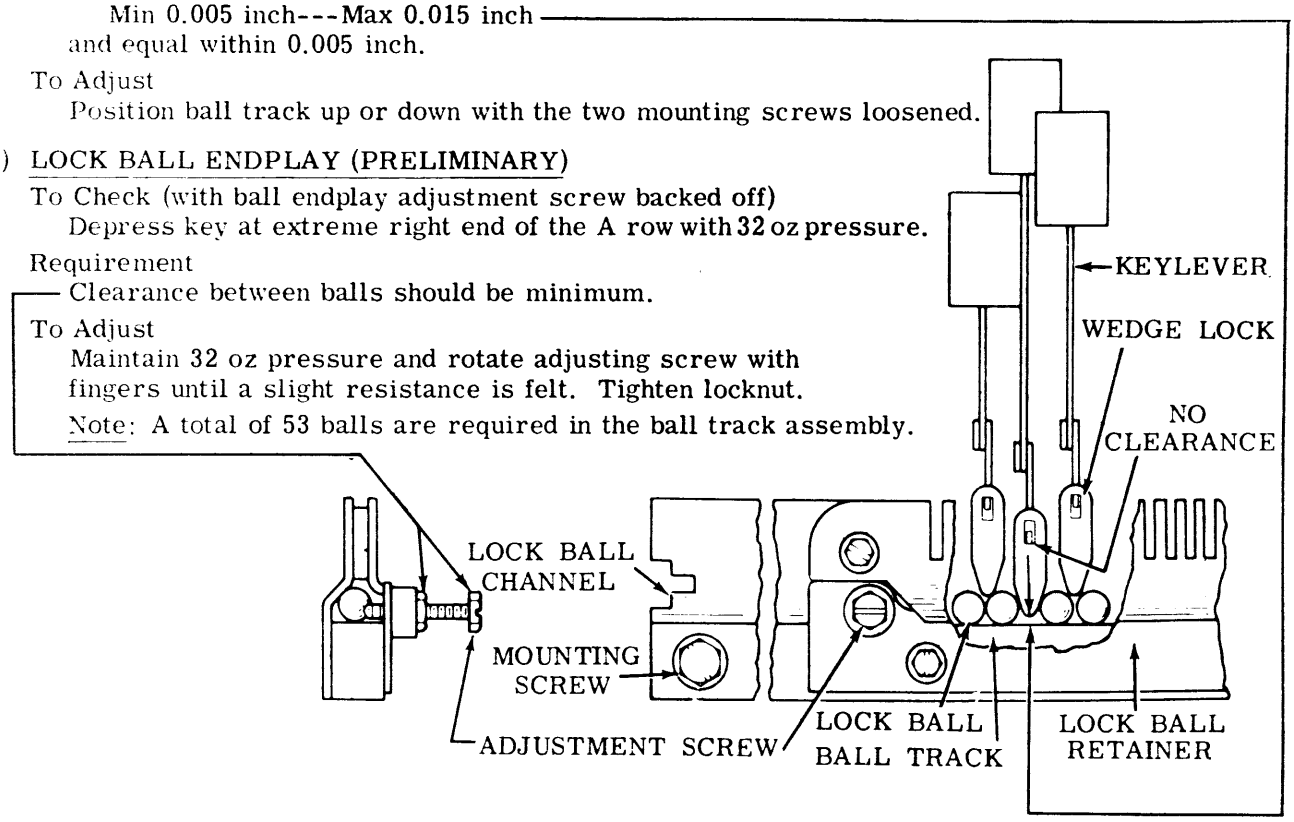
Requirement

Clearance between balls should be minimum.

To Adjust

Maintain 32 oz pressure and rotate adjusting screw with fingers until a slight resistance is felt. Tighten locknut.

Note: A total of 53 balls are required in the ball track assembly.



(C) BALL WEDGE LOCK, BALL ENDPLAY AND UNIVERSAL BAIL LATCH (FINAL)

Note: Perform this adjustment following UNIVERSAL BAIL EXTENSION (2.13) (Universal Bail Latchlever).

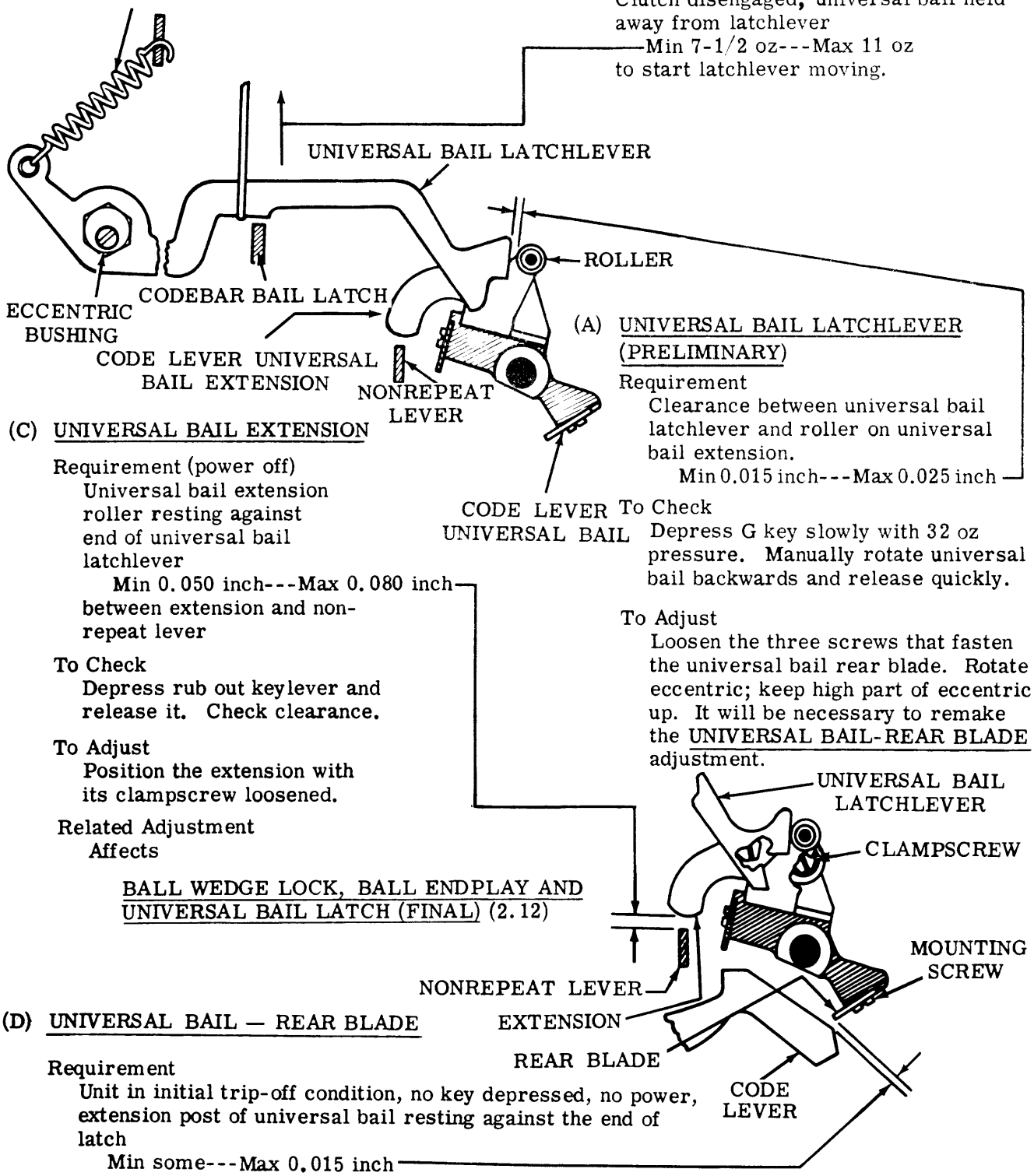
Requirement (under power)

(1) Trip-off pressure of any key in row A should be
Min 2 oz---Max 6 oz
(2) Apply 6-1 2 oz pressure perpendicular to A key, depress each key in that row. The A key should trip each time a key is released.
(3) Repeat (2) with the 6-1 2 oz pressure on extreme right key in that row.
(4) The clutch should not trip when two keys are depressed simultaneously.
(5) With 5-1 4 ± 1 4 oz applied to the spacebar, depress carriage return key. The spacebar should trip each time the carriage return key is released (by moving the finger off the key in a horizontal direction).

To Adjust

If necessary, refine BALL WEDGE LOCK AND BALL TRACK CLEARANCE (PRELIMINARY) (2.12), LOCK BALL ENDPLAY (PRELIMINARY) (2.12), UNIVERSAL BAIL LATCHLEVER (PRELIMINARY) (2.13), and UNIVERSAL BAIL EXTENSION (2.13).

2.13 Universal Bail Latchlever



(B) UNIVERSAL BAIL LATCH SPRING

Requirement
Clutch disengaged, universal bail held away from latchlever
—Min 7-1/2 oz---Max 11 oz
to start latchlever moving.

(A) UNIVERSAL BAIL LATCHLEVER (PRELIMINARY)

Requirement
Clearance between universal bail latchlever and roller on universal bail extension.
Min 0.015 inch---Max 0.025 inch

To Check
Depress G key slowly with 32 oz pressure. Manually rotate universal bail backwards and release quickly.

To Adjust
Loosen the three screws that fasten the universal bail rear blade. Rotate eccentric; keep high part of eccentric up. It will be necessary to remake the UNIVERSAL BAIL-REAR BLADE adjustment.

(C) UNIVERSAL BAIL EXTENSION

Requirement (power off)
Universal bail extension roller resting against end of universal bail latchlever
Min 0.050 inch---Max 0.080 inch
between extension and non-repeat lever

To Check
Depress rub out keylever and release it. Check clearance.

To Adjust
Position the extension with its clampscrew loosened.

Related Adjustment
Affects

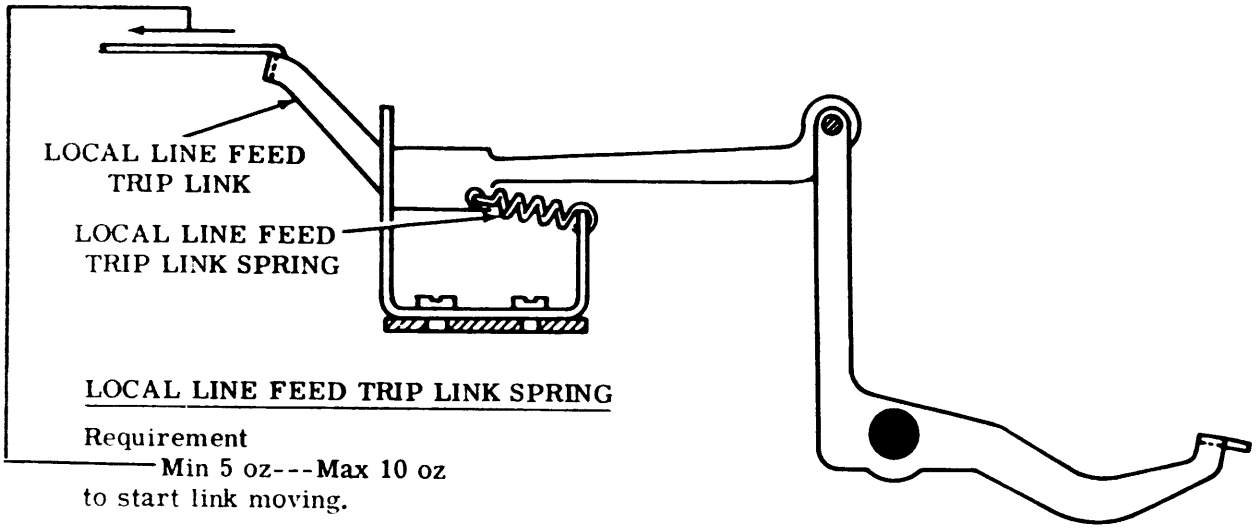
BALL WEDGE LOCK, BALL ENDPLAY AND UNIVERSAL BAIL LATCH (FINAL) (2.12)

(D) UNIVERSAL BAIL — REAR BLADE

Requirement
Unit in initial trip-off condition, no key depressed, no power, extension post of universal bail resting against the end of latch
Min some---Max 0.015 inch
between universal bail rear blade and any code lever.

To Adjust
Position rear blade with mounting screws loosened.

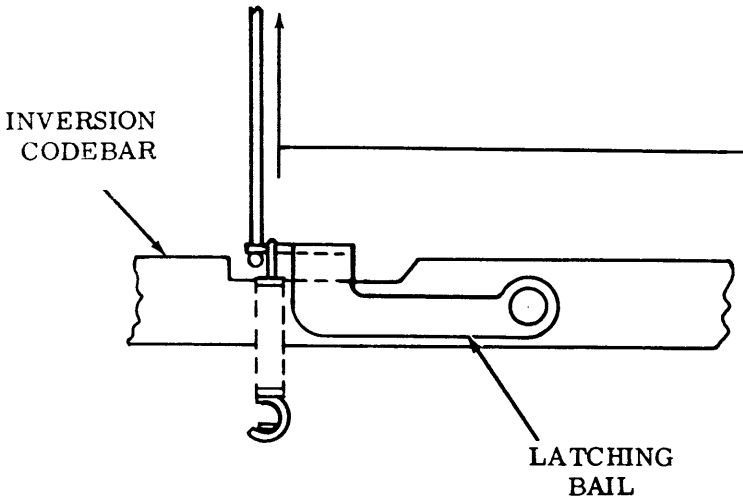
2.14 Local Line Feed Trip Link Mechanism



LOCAL LINE FEED TRIP LINK SPRING

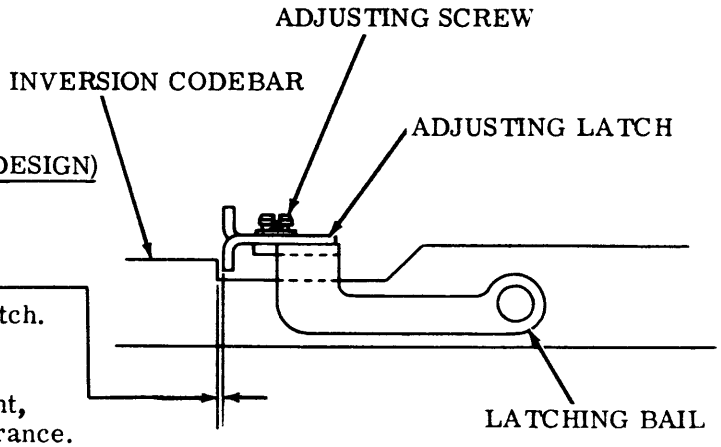
Requirement
Min 5 oz---Max 10 oz
to start link moving.

2.15 Inversion Codebar Latch Mechanism (Earlier Design)



INVERSION LATCH SPRING TENSION

Requirement
Min 3-1/2 oz---Max 4-1/2 oz
to move bail on parity keyboards.
Min 3/4 oz---Max 1-1/2 oz
to move bail on nonparity keyboards.

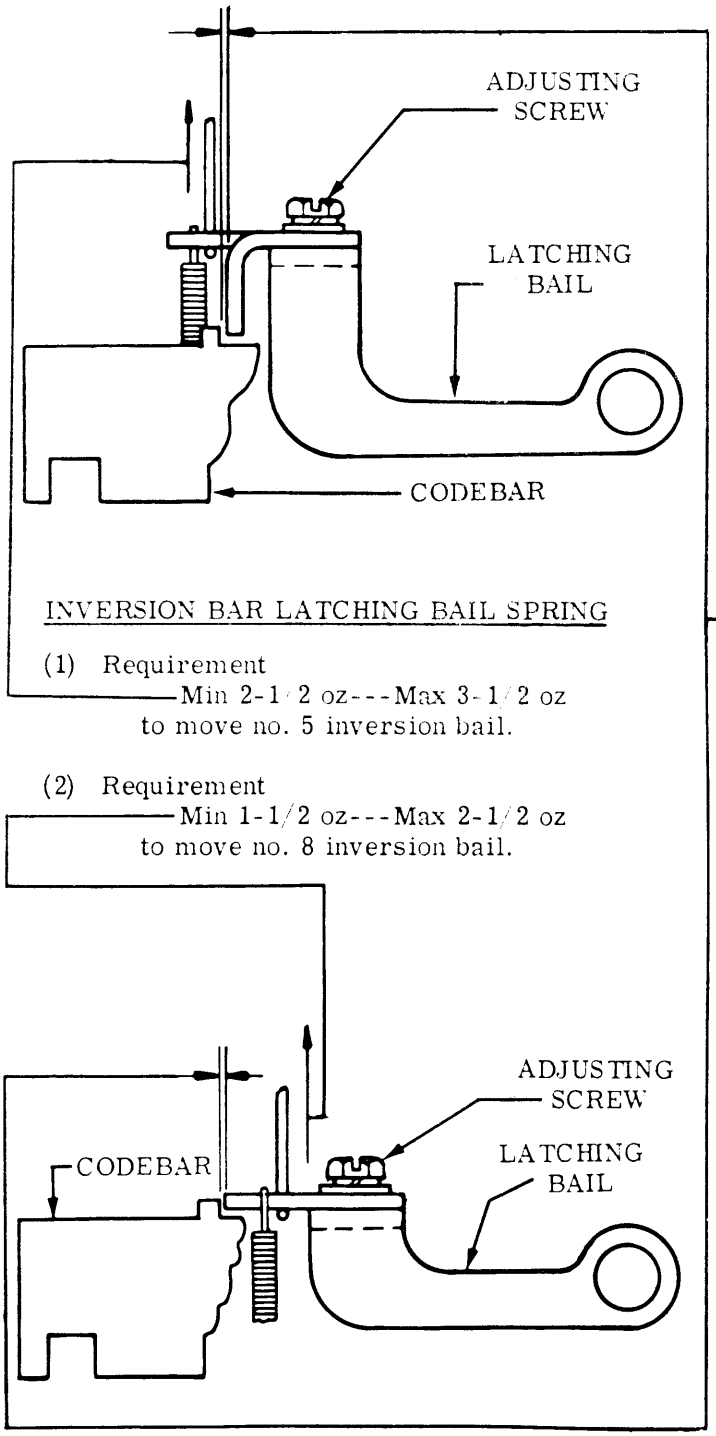


INVERSION CODEBAR LATCH (EARLIER DESIGN)

Requirement
Signal generator disengaged
Min 0.002 inch---Max 0.012 inch
gap between inversion codebar and its latch.

To Adjust
With screw on inversion bail friction tight,
move adjustable extension to obtain clearance.

2.15 Inversion Codebar Latch Mechanism (Later Design)



INVERSION BAR LATCHING BAIL SPRING

(1) Requirement
Min 2-1/2 oz---Max 3-1/2 oz to move no. 5 inversion bail.

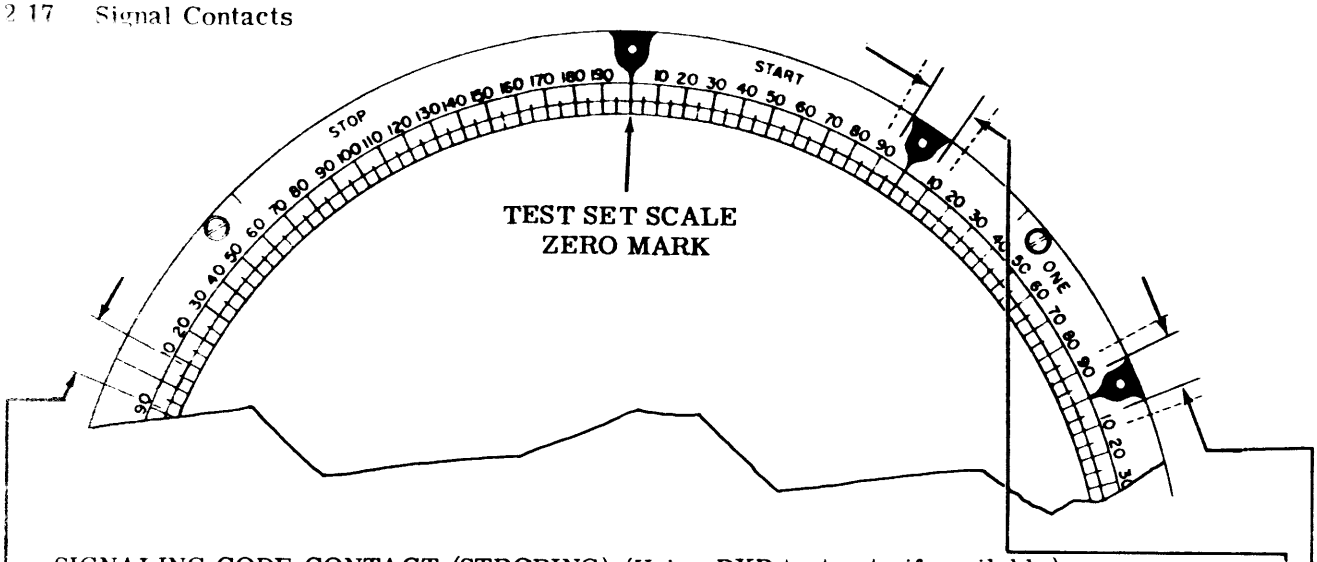
(2) Requirement
Min 1-1/2 oz---Max 2-1/2 oz to move no. 8 inversion bail.

INVERSION CODEBAR LATCH (LATER DESIGN)

Requirement
Signal generator clutch disengaged.
Min 0.002 inch---Max 0.012 inch gap between number 5 and 8 inversion codebars and their respective latches. Check clearance at both the number 5 and 8 inversion codebars and adjust to whichever is closest.

To Adjust
With respective screws on inversion bail latch friction tight, move adjustable extension to obtain clearance. Tighten screws and recheck clearance.

2.17 Signal Contacts



SIGNALING CODE CONTACT (STROBING) (Using DXD test set, if available)

Procedure

(1) Disconnect arc suppressor or rf filter. Reconnect signal generator contacts so current to stroboscope lamp of DXD test set is interrupted. Synchronize signal generator with DXD so end of stop pulse image is in line with 0 mark of start pulse on DXD scale when transmission is continuous and both units are operating at 100 speed (600 rpm).

Note 1: End of stop pulse image not to vary from 0 mark more than 1/2 division. If variation occurs, adjust scale so variation extends equally to either side of 0 mark.

Note 2: For units equipped with signal regenerators, remove regenerator circuit card before applying test set probes to signal contacts.

CAUTION: APPLYING OPERATING VOLTAGE OF SIGNAL DISTORTION TEST SET DIRECTLY TO GOLD-PLATED SIGNAL CONTACTS MAY MAKE THEM UNSUITABLE FOR SPECIAL LOW-VOLTAGE APPLICATIONS. SEE 2.19 FOR SERVICING INSTRUCTIONS.

Note 3: Numbers in parenthesis ( ) are for units using timing contacts for signal regenerators.

(2) Nominal length of intelligence pulses is 100 divisions. If adjustment to feeler gauges does not permit pulse lengths within tolerance, refine contact box adjustment. Favor intelligence pulses by using up the designated tolerances of stop pulse so each is near as possible to 100 divisions in length.

Requirements

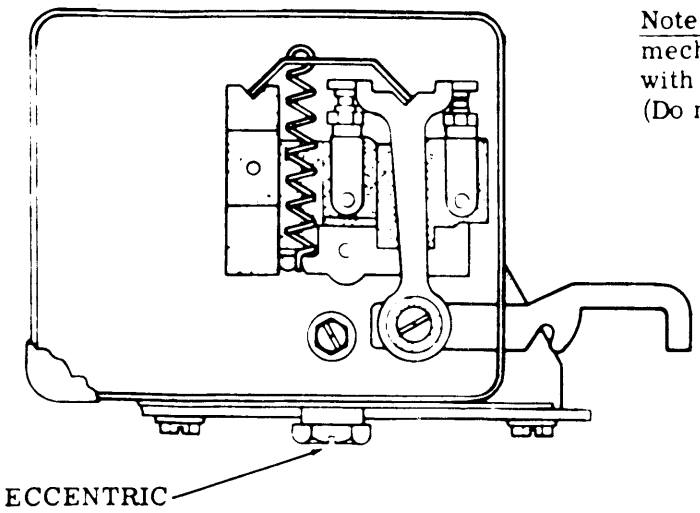
(1) Each marking code pulse to begin not later than 8 (12) mark and no earlier than 92 (88) mark of previous pulse.

(2) Each marking code pulse to end not earlier than 92 (88) mark or later than 8 (12) mark in pulse following one being observed.

(3) Marking code pulses may have break not more than three divisions wide and occurs only at end of code pulse image between the 92 (88) mark and end of image.

(4) Stop image should not change in length or position more than one division while changing from R to Y selector (or equivalent permutations for other codes).

2.18 Signal Contacts (continued)



Note 4: If necessary, reposition stabilizer mechanism so end of stop image coincides with 0 mark of start pulse on scale. (Do not remove scale.)

(5) DXD strobing should yield allowable spacing signal distortion of ±12%.

To Adjust

Loosen mounting screws and move contact box by means of eccentric.

2.19 Gold-Plated Signal Contacts

(a) Units may have signal contacts made of either unplated or gold-plated tungsten. If in doubt as to the type of contacts, remove signal generator cover and inspect contacts for gold plating.

(b) Cleaning

(1) Use twill jean cloth (KS2423) to clean gold-plated contacts.

(2) Open contacts. Drop strip of twill jean between them. Close contacts. Draw twill jean part way through. Open contacts and withdraw twill jean.

(3) This procedure prevents small fibres at edges of twill jean strip from becoming lodged between contacts.

(4) Clean unplated tungsten contacts in accordance with standard procedures.

(c) Servicing for special low-voltage applications.

(1) For standard applications including those with data sets, observe standard maintenance procedures and intervals. Special low-voltage applications are covered below.

(2) For optimum reliable operation in special low-voltage applications, clean gold-plated contacts with twill jean, as instructed above. The recommended cleaning interval for gold-plated contacts in special low-level applications (less than 250 microwatts) and having an average weekly use of 60 hours should not exceed 90 days. This interval may be reduced, dependent on the signal circuit configuration, usage, and environment.

Note 1: Applying operating voltage of standard distortion test set directly to contacts may damage gold plating and impair special low-voltage operation. When electrically adjusting or testing contacts (2.17) use an intermediate device, keyed by the contacts, to interrupt current to stroboscopic lamp of test set. This intermediate device must be capable of being keyed by a 3 to 20 volt change at maximum of 20 milliamperes.

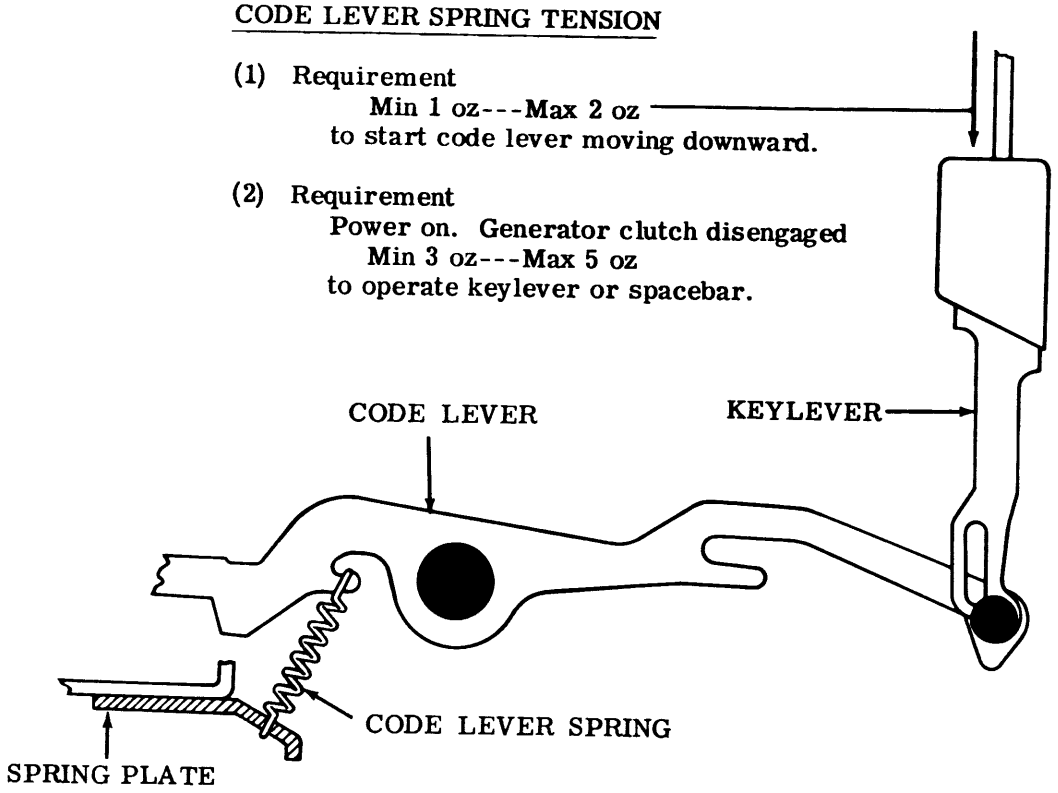
Note 2: Normally for special low-voltage applications, contacts should be used in circuits operating between 3 and 20 volts dc at a current level not to exceed 60 milliamperes. Between 20 and 70 volts dc the current should be adjusted so as not to exceed a 120 milliwatt power level. The contacts are not normally intended for use on voltages above 70 volts dc. Exceeding this level for an appreciable length of time may result in damage to the gold plating and make them unfit for special low-voltage applications.

2.20 Code Lever and Local Carriage Return Function Bail Mechanism

CODE LEVER SPRING TENSION

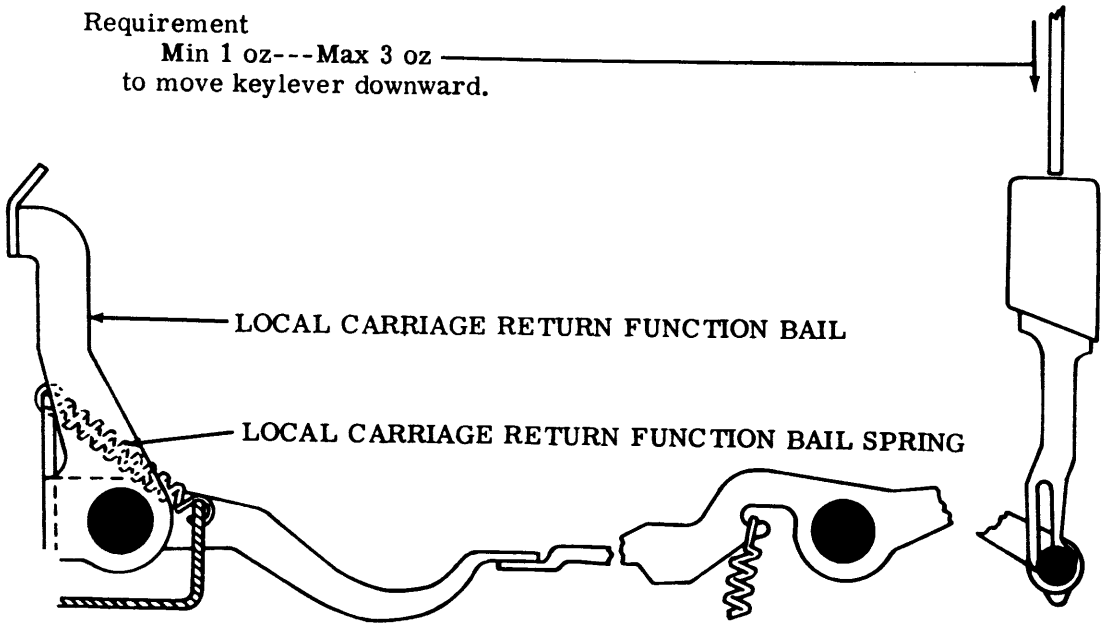
(1) Requirement
Min 1 oz---Max 2 oz
to start code lever moving downward.

(2) Requirement
Power on. Generator clutch disengaged
Min 3 oz---Max 5 oz
to operate keylever or spacebar.

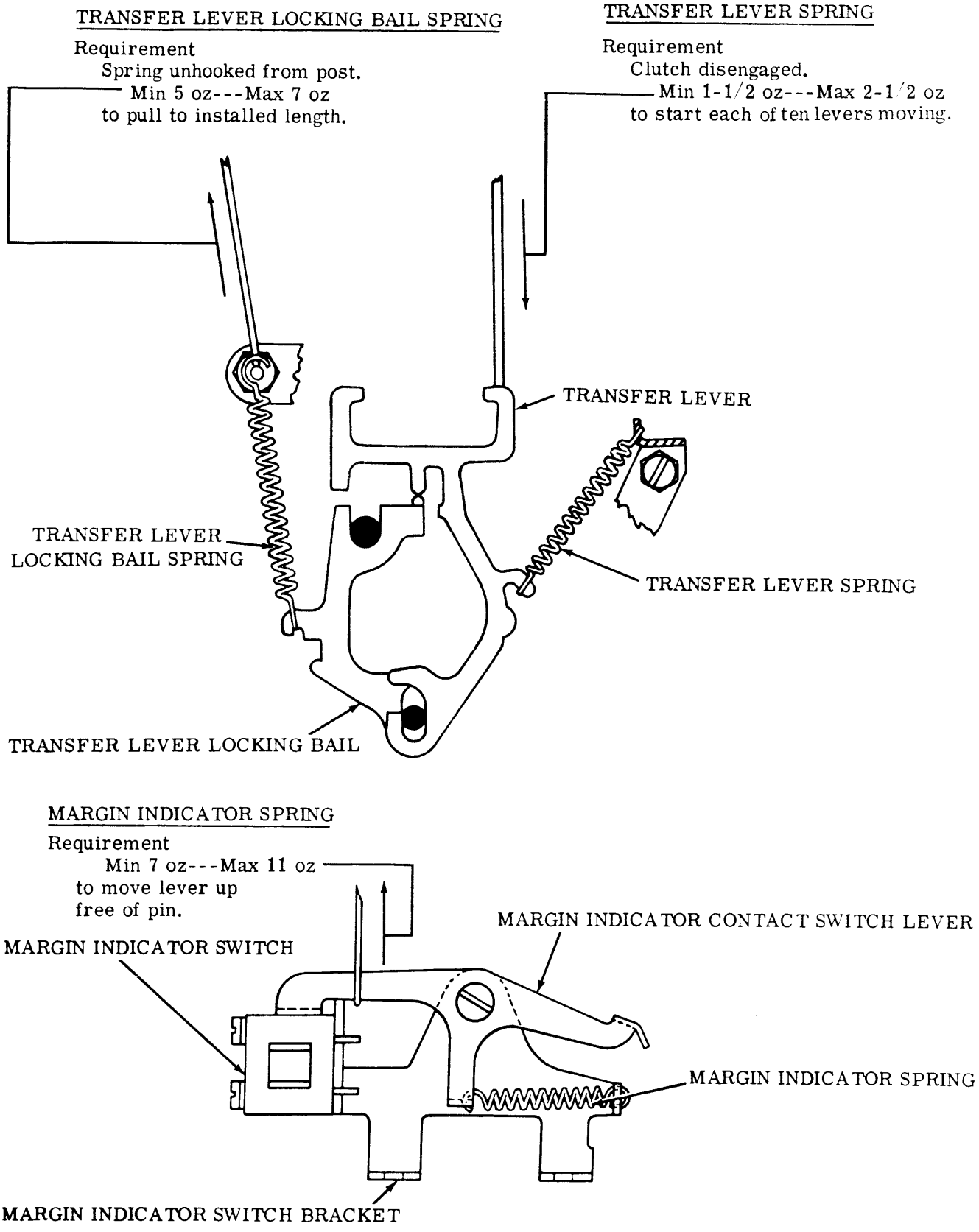


LOCAL CARRIAGE RETURN FUNCTION BAIL SPRING TENSION
(COMBINED CODE LEVER AND BAIL SPRING)

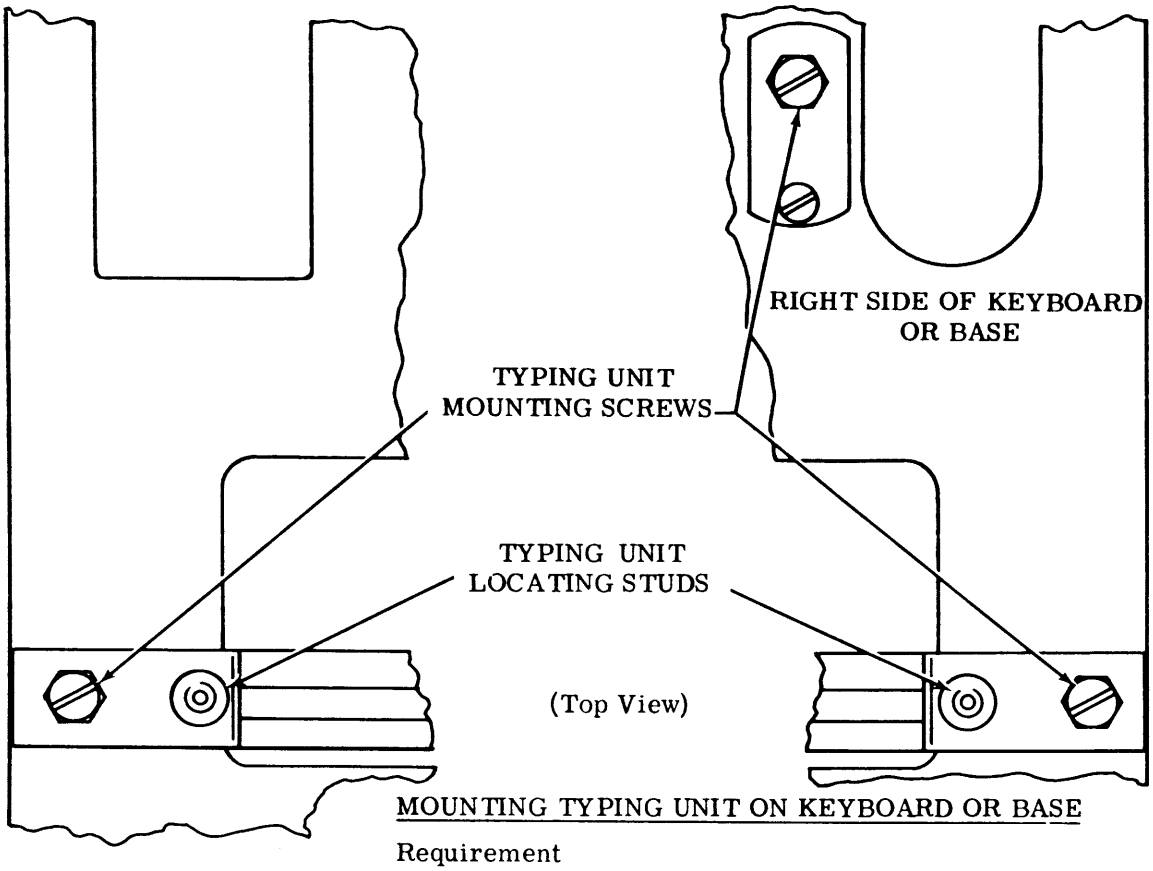
Requirement
Min 1 oz---Max 3 oz
to move keylever downward.



2.21 Transfer Lever and Margin Indicator Mechanism



2.22 Mounting Typing Unit on Keyboard or Base



MOUNTING TYPING UNIT ON KEYBOARD OR BASE

Requirement

When placing the typing unit on the base, hold it tilted slightly to the right and lower the right end into engagement with the right locating stud. While easing the left end downward, rotate the motor by hand to properly mesh the gears. Secure by four mounting screws. Rotate the motor by hand to insure proper meshing of gears.

Note: Similar requirement for wall mounted printer. See 2.24 and Figure 2.

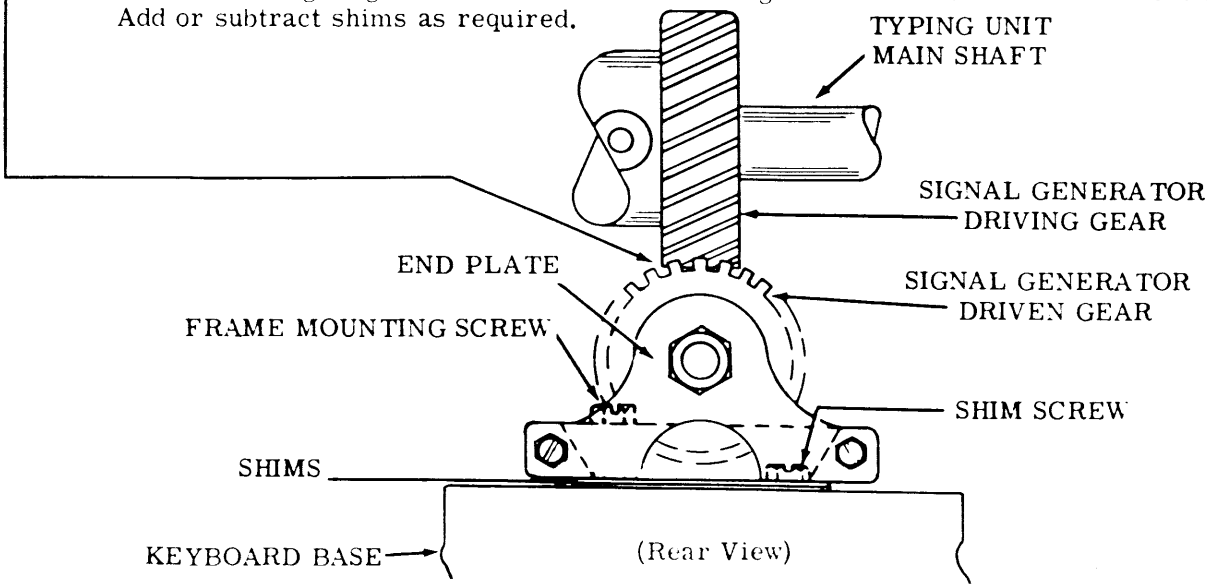
SIGNAL GENERATOR FRAME

Requirement

With typing unit mounted in position, there should be a perceptible amount of backlash between the signal generator driven gear and the signal generator driving gear at the point where backlash is the least.

To Adjust

Remove the signal generator frame rear mounting screw and loosen the shim screw. Add or subtract shims as required.



2.23 Keyboard or Base, Motor and Typing Unit Gearing

Note 1: Not applicable to wall mounted printer. See 2 24.

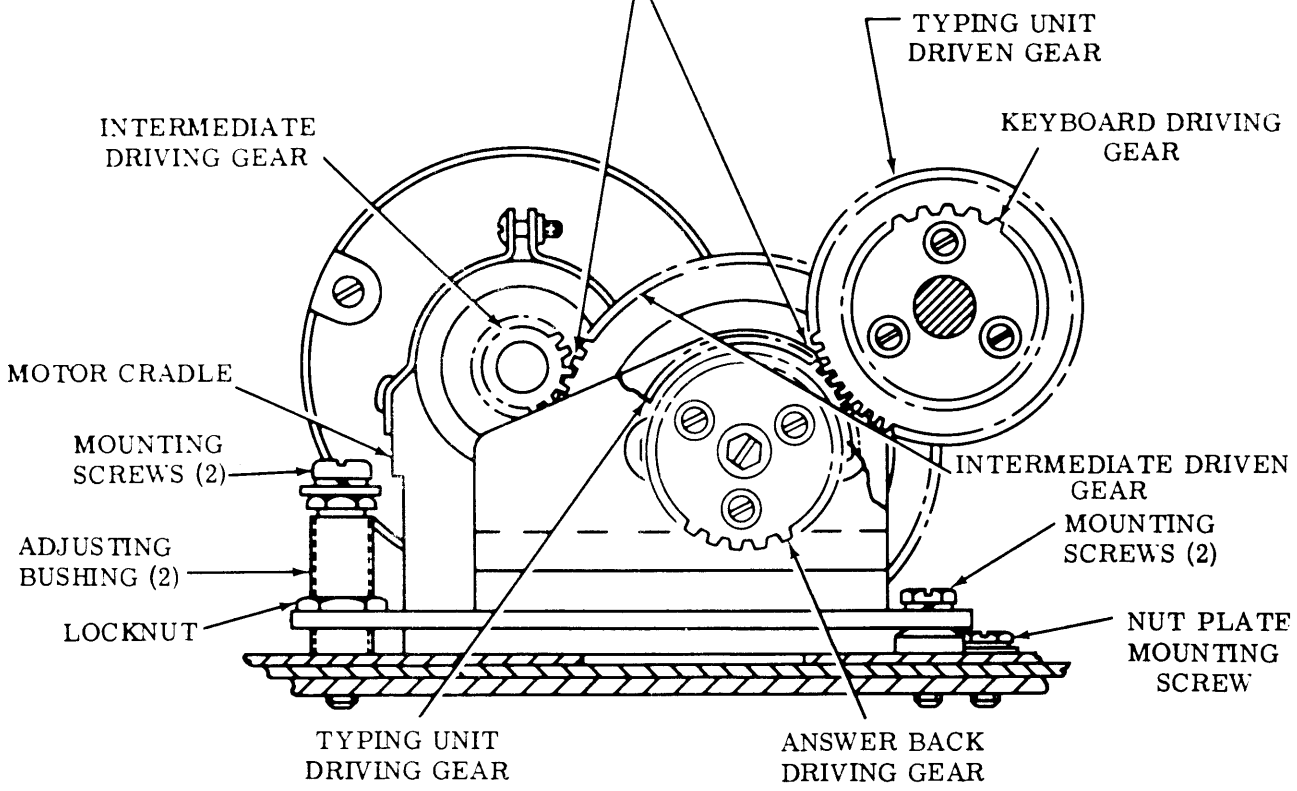
Note 2: This requirement should be checked with typing unit mounting screws tight.

INTERMEDIATE GEAR ASSEMBLY

Requirement

Backlash between motor pinion and its driven gear, and between typing unit main shaft gear and its driving gear

Min 0.004 inch---Max 0.008 inch as gauged by feel.



To Adjust

Loosen intermediate gear assembly mounting screws (4). Loosen two locknuts which lock adjusting bushings at rear of assembly. Loosen nut plate mounting screw just in front of gear bracket. Move assembly backward or forward and adjust height at rear by means of adjusting bushing nearest motor (back out other bushing for clearance after correct adjustment is obtained). Lock adjusting bushing nut, turn other bushing with fingers until it touches base, and tighten locknut.

2.24 Keyboard Wall Mounted Base, Motor and Typing Unit Gearing

WALL MOUNTED INTERMEDIATE GEAR ASSEMBLY

(1) Requirement

Clearance between driven gear on printer and intermediate gear should be Min 0.004 inch---Max 0.008 inch

To Adjust

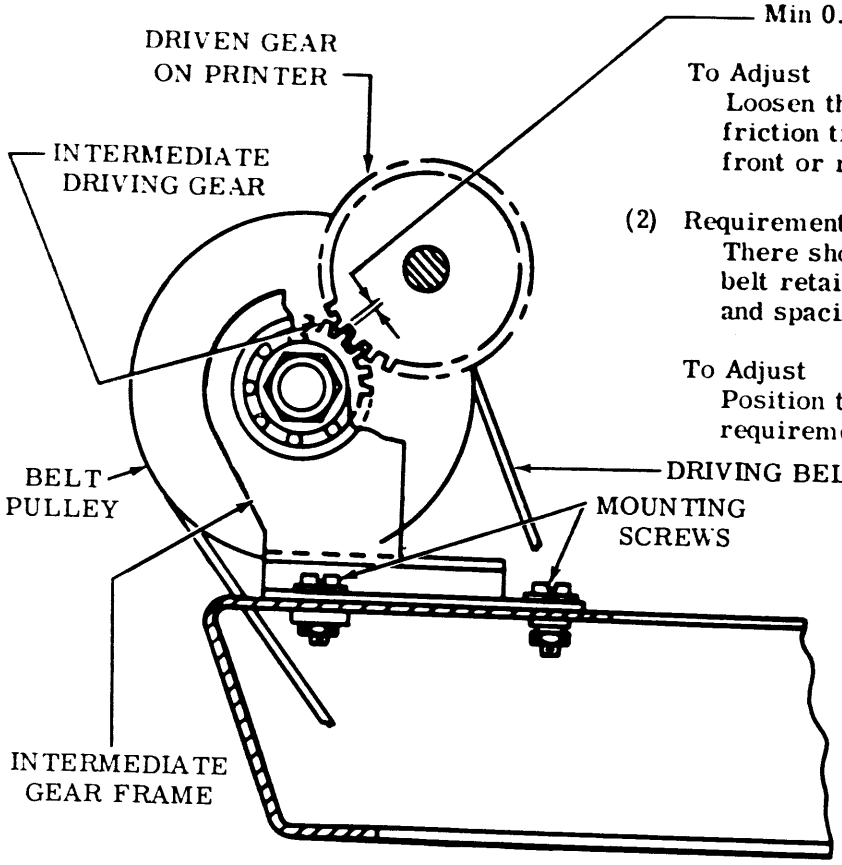
Loosen three mounting screws and make them friction tight. Position the assembly toward front or rear to meet requirement.

(2) Requirement

There should be some clearance between right belt retainer on intermediate gear assembly and spacing cutout lever on printer.

To Adjust

Position the assembly toward the left to meet requirement. Tighten screws.



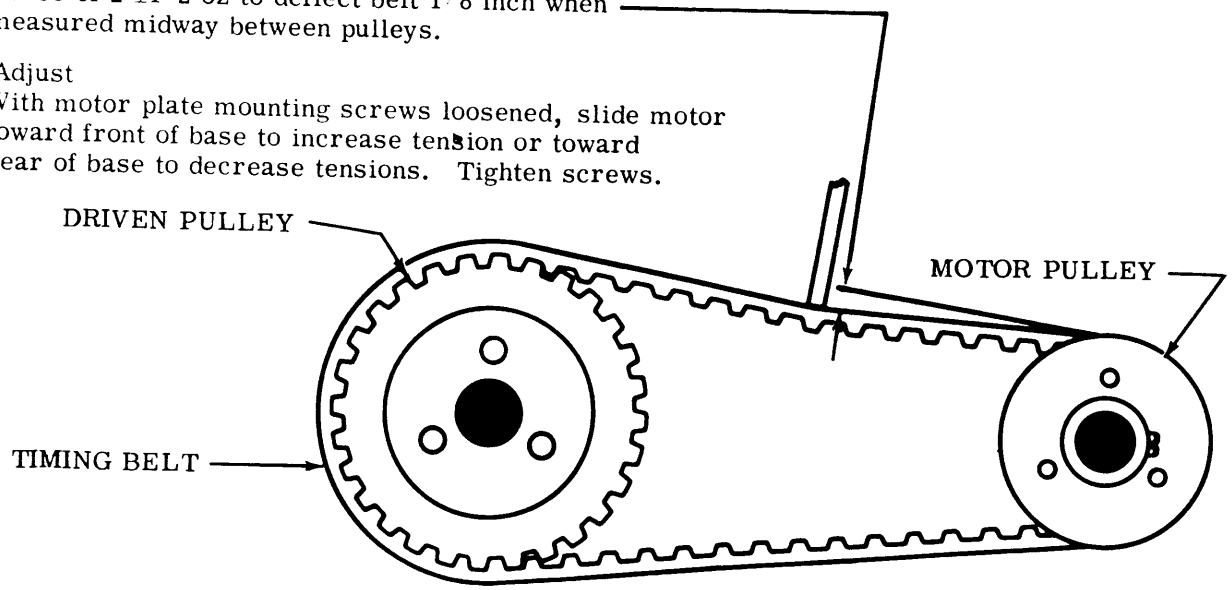
TIMING BELT

Requirement

Force of 2 ±1/2 oz to deflect belt 1/8 inch when measured midway between pulleys.

To Adjust

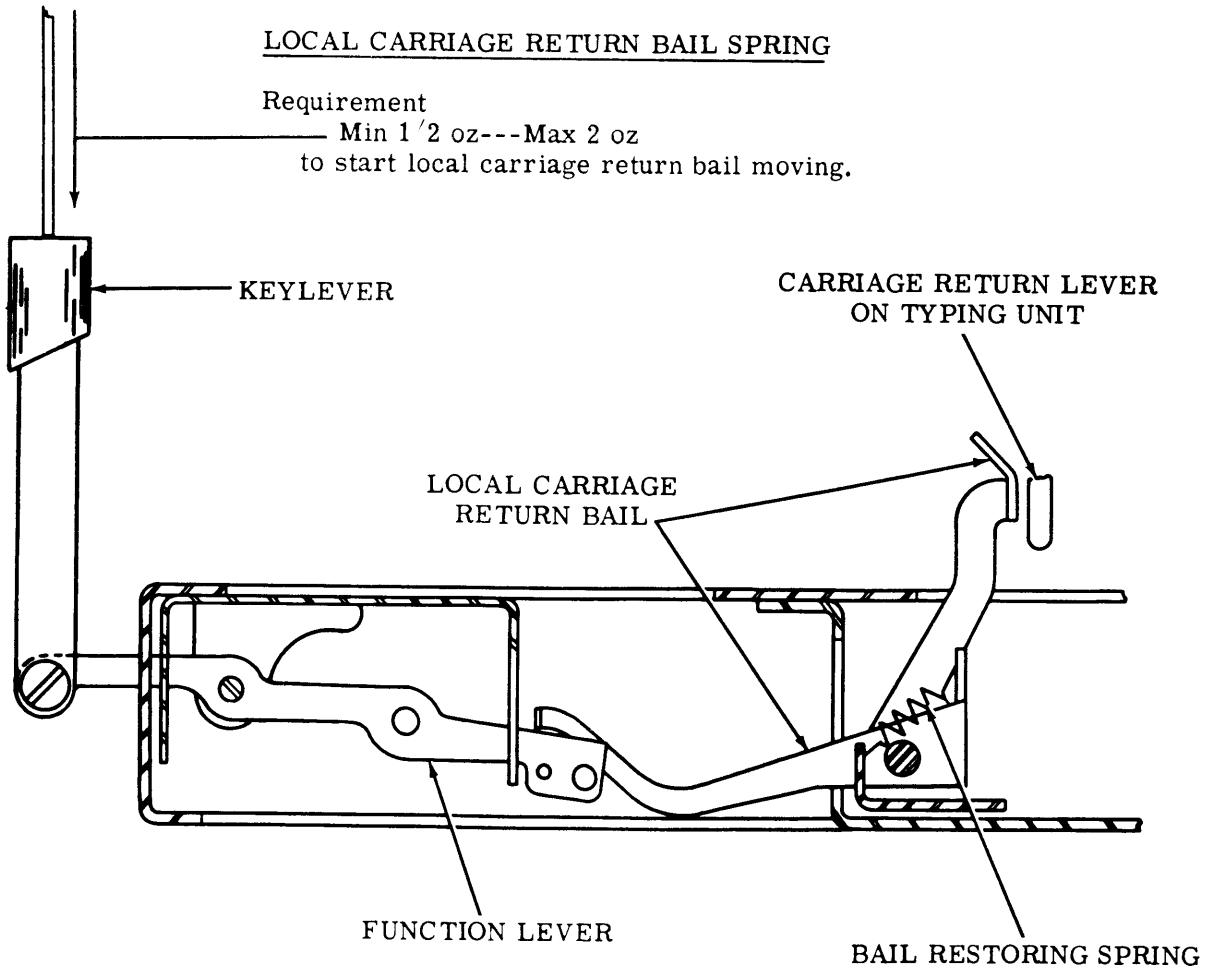
With motor plate mounting screws loosened, slide motor toward front of base to increase tension or toward rear of base to decrease tensions. Tighten screws.



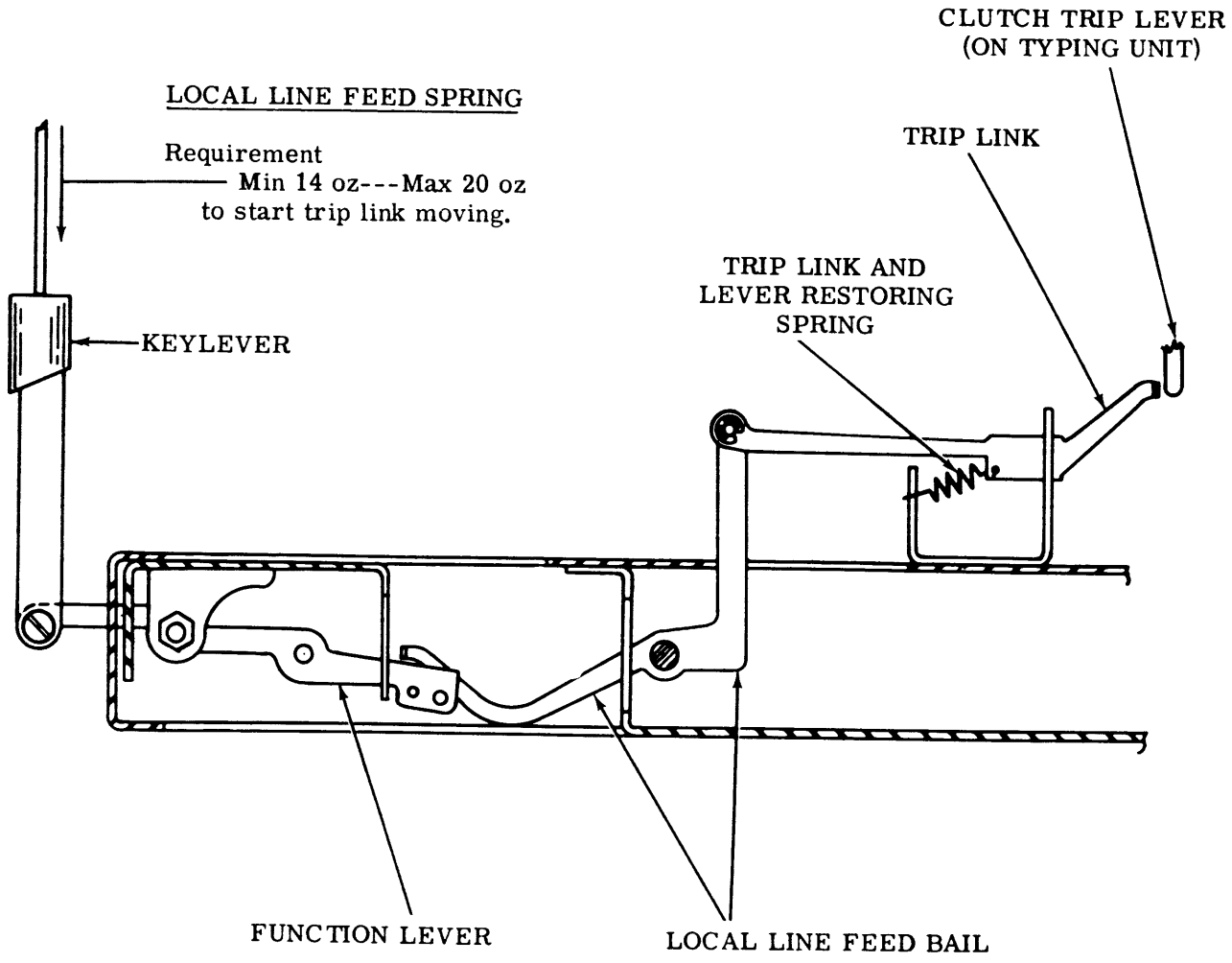
The following list of keyboard adjustments, plus those shown in Par. 2.25 and Par. 2.26 constitute the adjustments for an RO base.

ANSWER-BACK MAIN SHAFT GEAR (if so equipped)	Par. 3.01
INTERMEDIATE GEAR ASSEMBLY	Par. 2.23
WALL MOUNTED INTERMEDIATE GEAR ASSEMBLY	Par. 2.24
FUNCTION BAIL LEVERS AND CODE LEVER CLEARANCE	Par. 2.07
MARGIN INDICATOR SPRING	Par. 2.21
MOUNTING TYPING UNIT ON KEYBOARD OR BASE	Par. 2.22

2.25 Local Carriage Return Function Bail Mechanism



2.26 Local Line Feed Mechanism



3. VARIABLE FEATURES

3.01 Answer-Back Mechanism

Note 1: See appropriate section for adjustments of the answer-back mechanism. Not applicable to wall mounted printer.

ANSWER-BACK MAIN SHAFT GEAR

Requirement

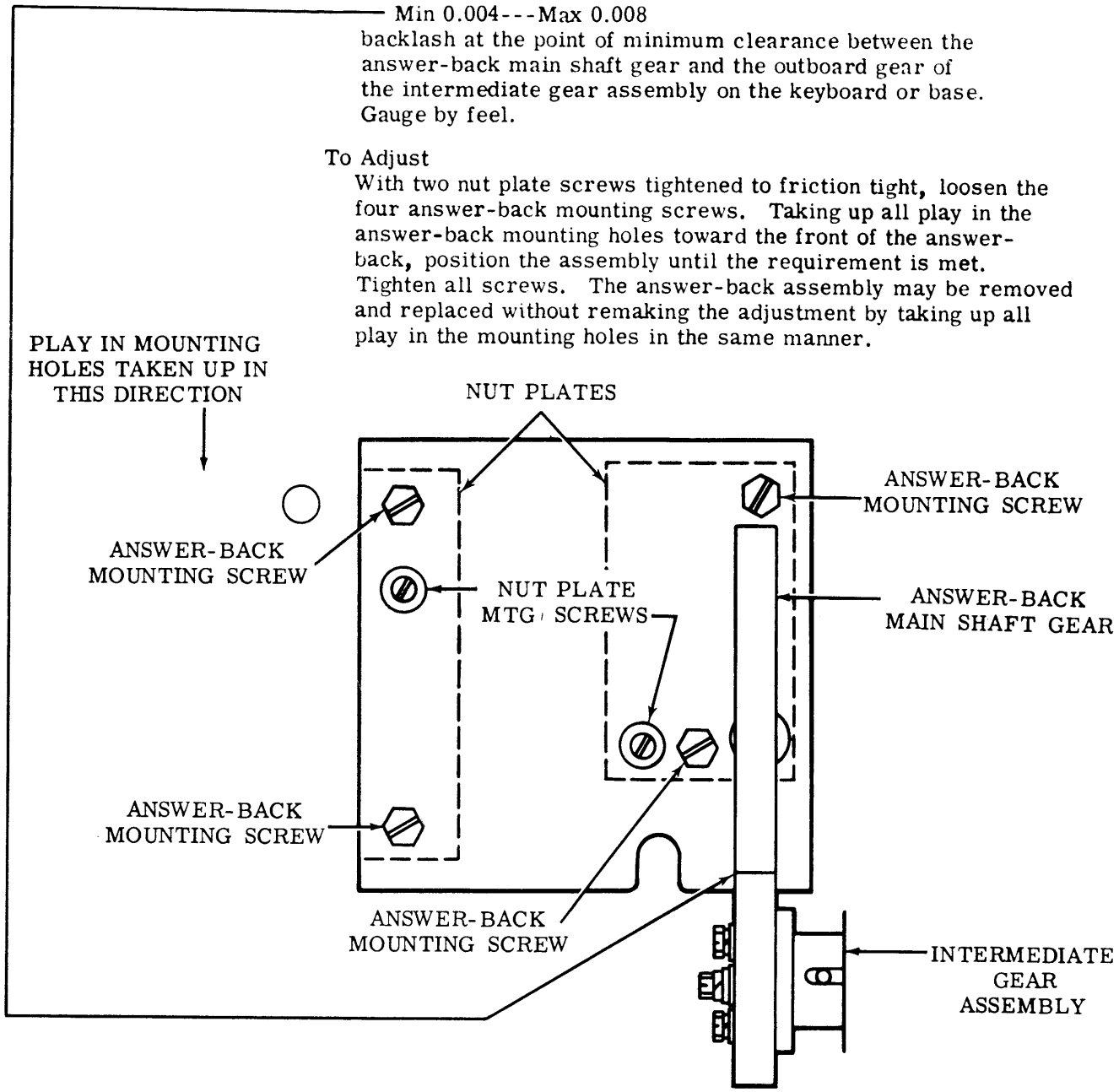
There should be

Min 0.004---Max 0.008

backlash at the point of minimum clearance between the answer-back main shaft gear and the outboard gear of the intermediate gear assembly on the keyboard or base. Gauge by feel.

To Adjust

With two nut plate screws tightened to friction tight, loosen the four answer-back mounting screws. Taking up all play in the answer-back mounting holes toward the front of the answer-back, position the assembly until the requirement is met. Tighten all screws. The answer-back assembly may be removed and replaced without remaking the adjustment by taking up all play in the mounting holes in the same manner.



Note 2: This adjustment is made after the intermediate gear assembly to typing unit gear adjustment and motor pinion gear adjustments have been made.

3.02 Timing Contact Mechanism (Early Design)

TIMING CONTACT

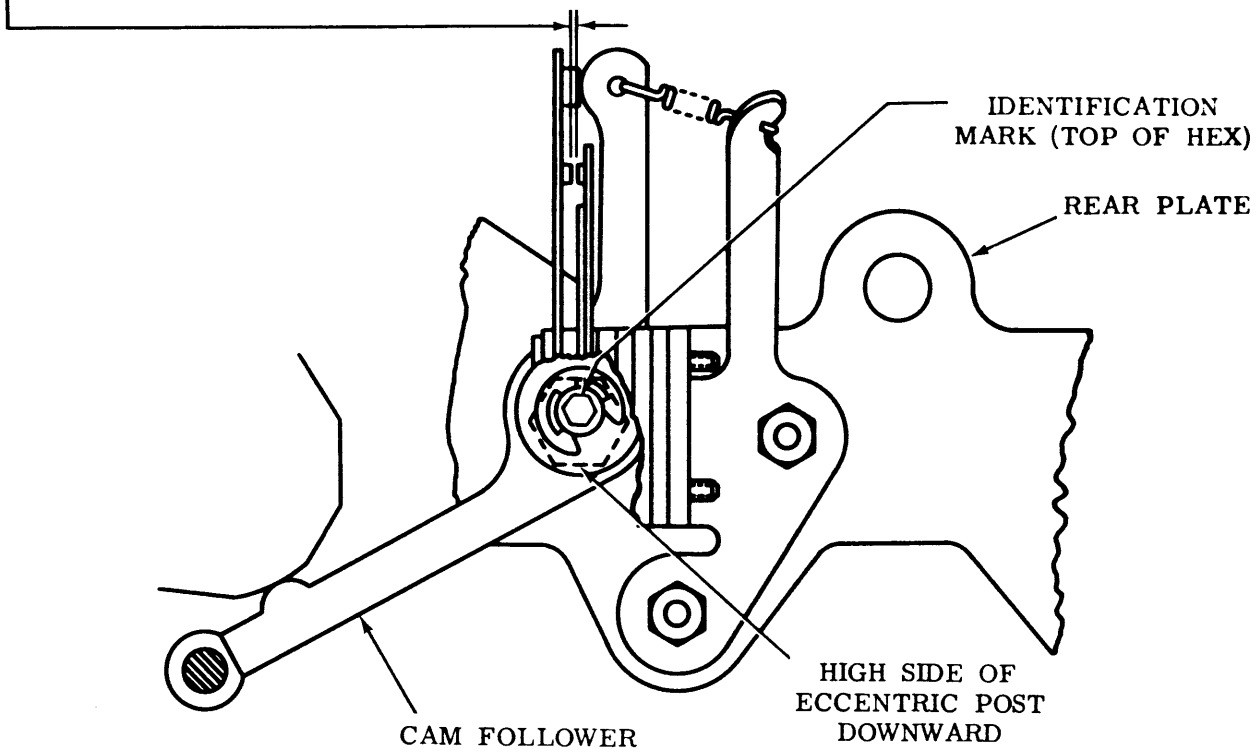
(1) Requirement

Contacts should be closed when nylon pad is raised 0.007 inch.
Contacts should be open when nylon pad is raised 0.015 inch.

Note 1: Identification mark viewed on top side of hex and follower on low part of cam.

(2) Requirement

Min 0.003 inch
gap between contacts with the follower on any peak of cam.
Min 0.002 inch
gap on units prior to serial #88,800.



To Adjust

Loosen two timing contact bracket posts. With screwdriver between bracket upright and rear plate adjust gap
Min some---Max 0.010 inch
Adjust eccentric screw to meet (2) Requirement.

Note 2: Use signal checking device to refine this adjustment.

3.03 Timing Contact Mechanism (Early Design) (continued)

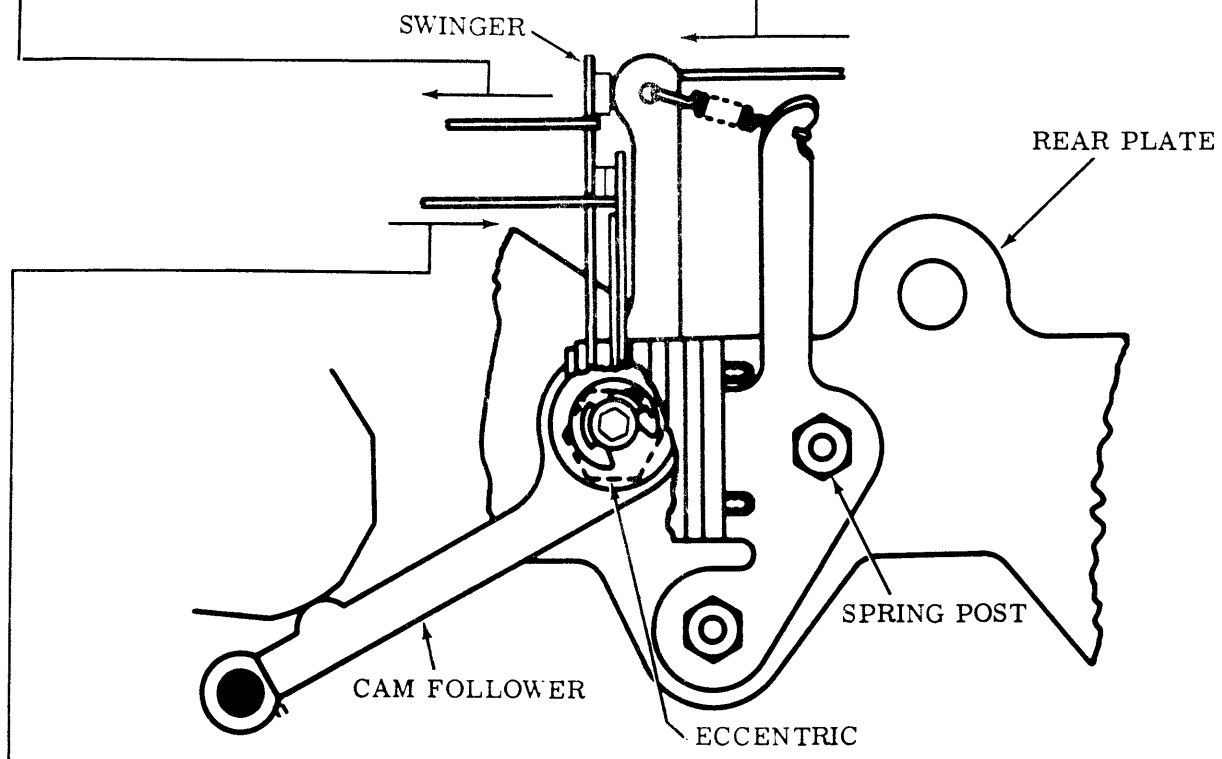
TIMING CONTACT SWINGER SPRING

Requirement
Contacts closed
Min 2 oz---Max 3-1/2 oz
to just open contacts.

To Adjust
Use spring bender TP110455.

TIMING CAM FOLLOWER SPRING

Requirement
Signal generator latched. Contact spring held back
Min 6 oz
to start cam follower moving.



TIMING CONTACT STIFFENER SPRING

Requirement
Contact open
Min 5 oz---Max 8 oz
to move contact.

To Adjust
Remove contact assembly from unit by removing two studs securing it to rear plate. Loosen two screws holding contact pile-up to contact assembly bracket and bend contact using spring bender TP110455 until requirement is met.

Note: Check timing contact swinger spring tension and refine if necessary.

3.04 Timing Contact Mechanism (Later Design)

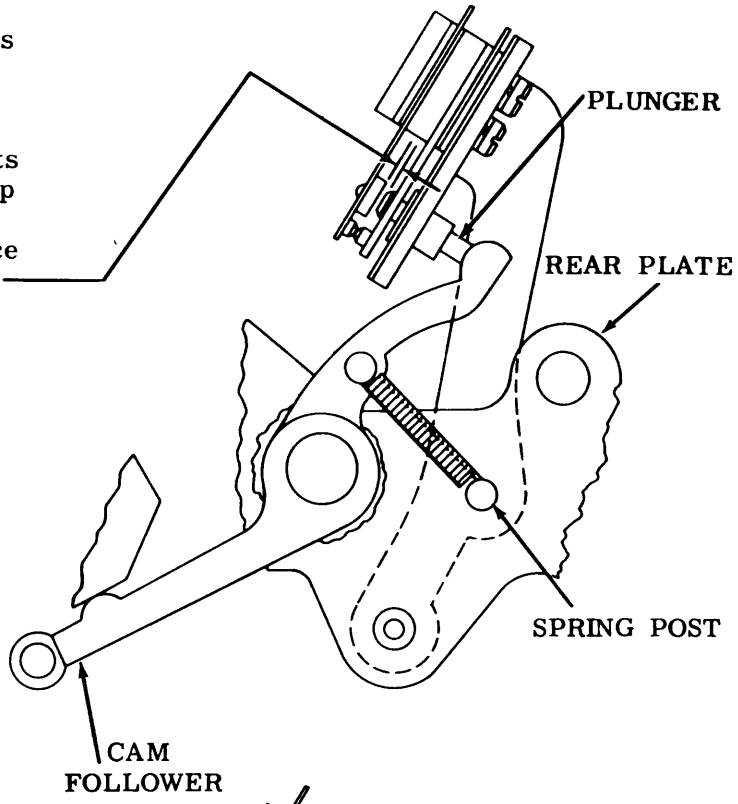
TIMING CONTACT

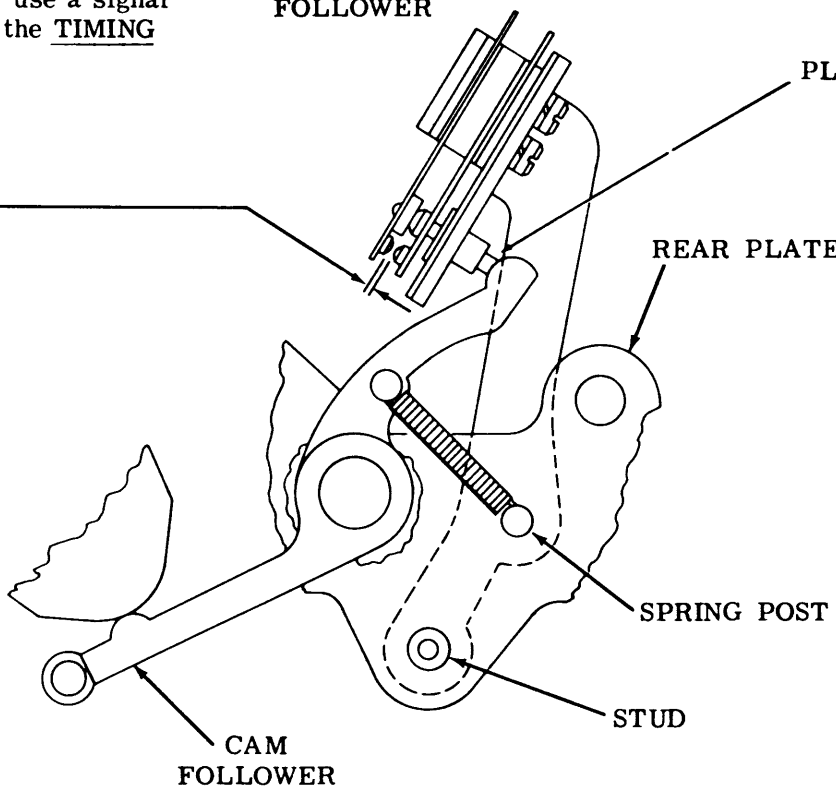
(1) Requirement
With unit in the stop position, there should be a gap between contact points
Min 0.008 inch---Max 0.011 inch

(2) Requirement
With the cam follower on the low parts of the cam, and the clearance taken up between the plunger and the cam follower, there should be some clearance between plunger and contact swinger.

To Adjust
Loosen the two posts holding the timing contact bracket to friction tightness. Position the bracket in order to meet (1) and (2) Requirements. Tighten the posts and recheck the adjustment.

Note: The TIMING CAM FOLLOWER SPRING (3.05) adjustment should be made before the TIMING CONTACT adjustment. If available, use a signal checking device to refine the TIMING CONTACT adjustment.





3.05 Timing Contact Mechanism (Later Design) (continued)

TIMING CAM FOLLOWER SPRING

To Check

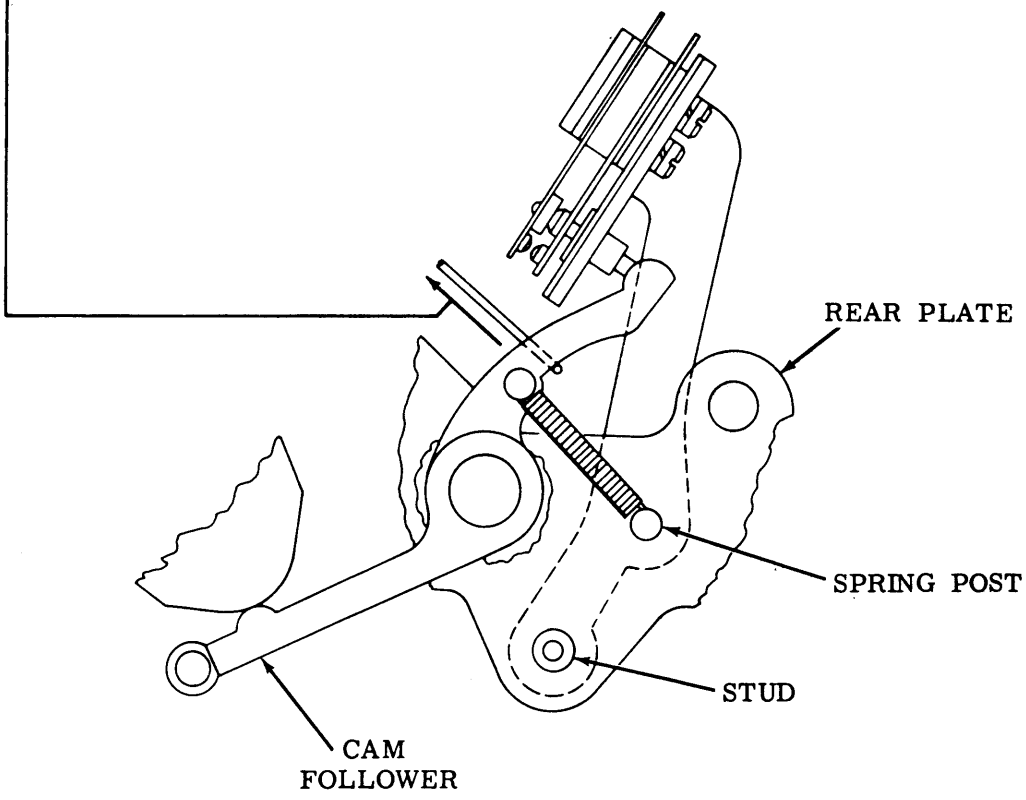
Timing contact assembly must be moved out of contact with the cam follower and spring post tightened to check this requirement and TIMING CONTACT SWINGER SPRING (3.06) adjustment.

Requirement

With the signal generator in the latched position, apply the pull end of scale to the cam follower

Min 6 oz---Max 9 oz

to start cam follower moving.

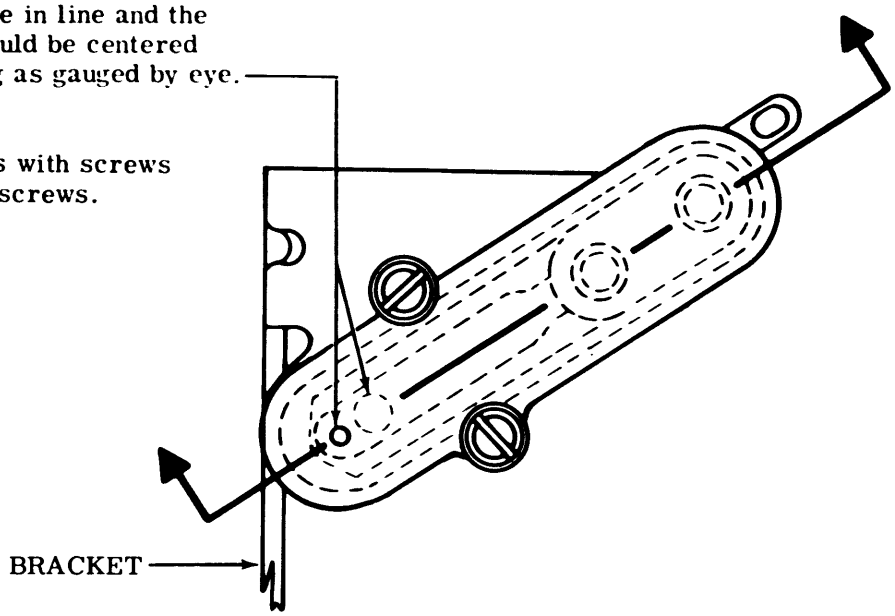


3.06 Timing Contact Mechanism (Later Design) (continued)

TIMING CONTACT SWINGER SPRING

(1) Requirement
Contact points should be in line and the head of the plunger should be centered in its hole in the spring as gauged by eye.

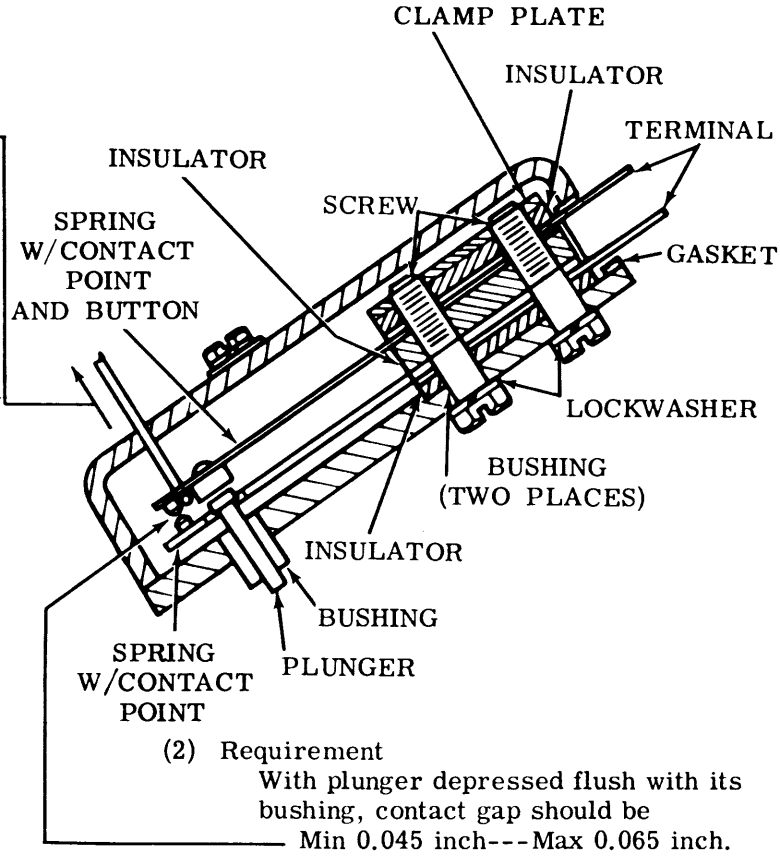
To Adjust
Position contact springs with screws friction tight. Tighten screws.



(3) Requirement
With contacts closed
Min 3-1/2 oz---Max 4-1/2 oz
to just open contacts.

To Adjust
Bend spring. Recheck timing contact adjustment.

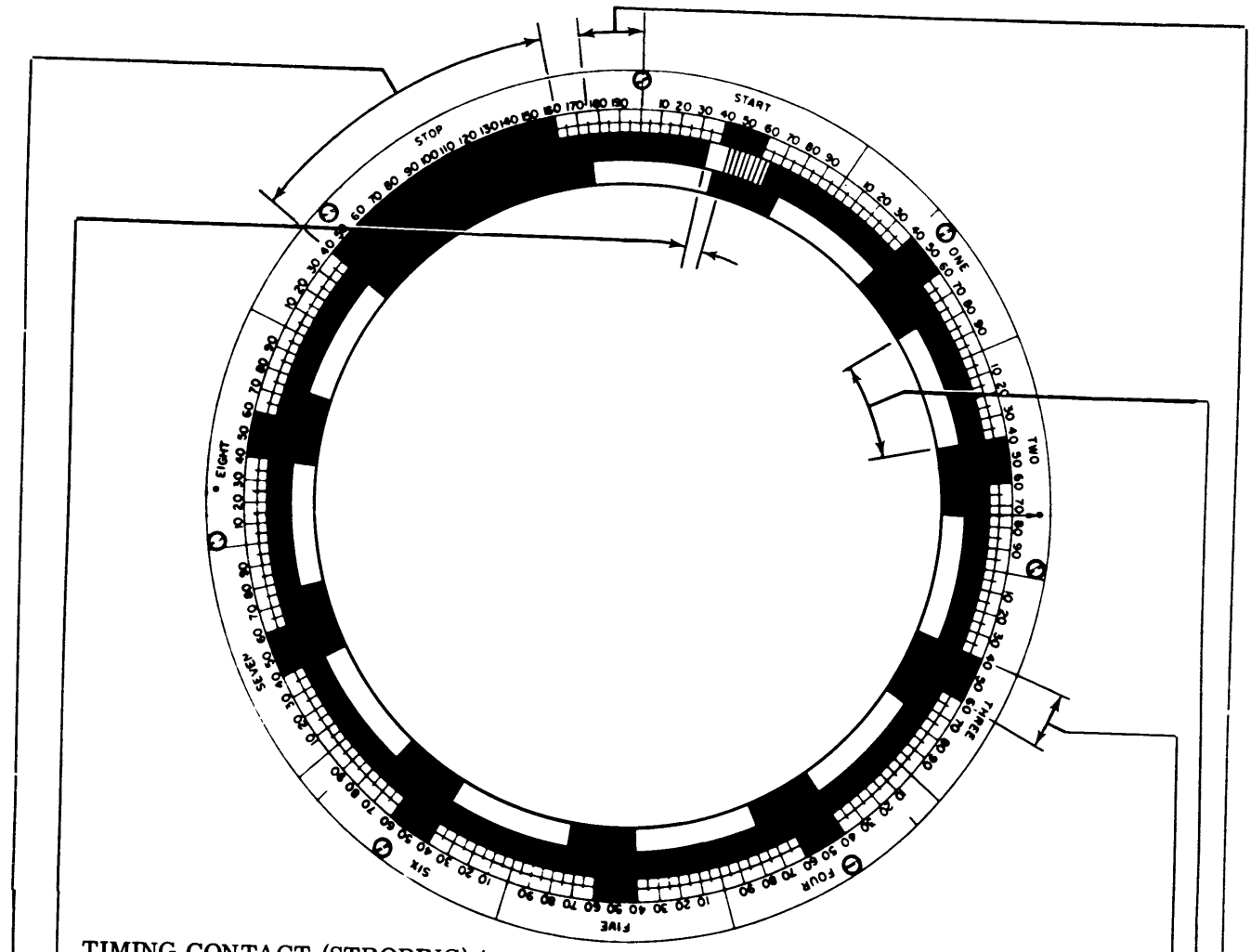
Note: Timing contact assembly must be moved out of contact with the cam follower and spring post tightened to check requirement (3). Refer to TIMING CAM FOLLOWER SPRING (3.05) adjustment.



(2) Requirement
With plunger depressed flush with its bushing, contact gap should be
Min 0.045 inch---Max 0.065 inch.

To Adjust
Bend spring.

3.07 Timing Contact Refinement



TIMING CONTACT (STROBING) (Using DXD test set, if available)

(1) Zero the test set as described in Procedure (1) of 2.17.

(2) The light image of the timing contacts should meet the following requirements for speeds up to and including 100 wpm.

(a) Open for a minimum of 20 divisions between the 25 division and 75 division points of each 100 division pulse.

(b) Open for a minimum of 120 divisions between the 25 division and 175 division points of the stop pulse.

(c) The close to open transitions should be in multiples of 100 divisions ±5 divisions of the start pulse.

(d) There should be no contact break between the zero division point and the close to open transition point, and no contact break between the 75 division point and the 100 division point of each pulse. There should be no contact break between the 175 division point and the 200 division point of the stop pulse.

To Adjust

Check and refine, if necessary, the TIMING CONTACT (3.04) adjustment.

Note: The timing contacts should be open when the clutch is disengaged.

3.08 Auxiliary Contact Mechanism

CONTACT SWINGER SPRING

Requirement
Contacts closed
Min 2 oz---Max 3-1/2 oz
to just open contacts.

To Adjust
Use spring bender TP110455.

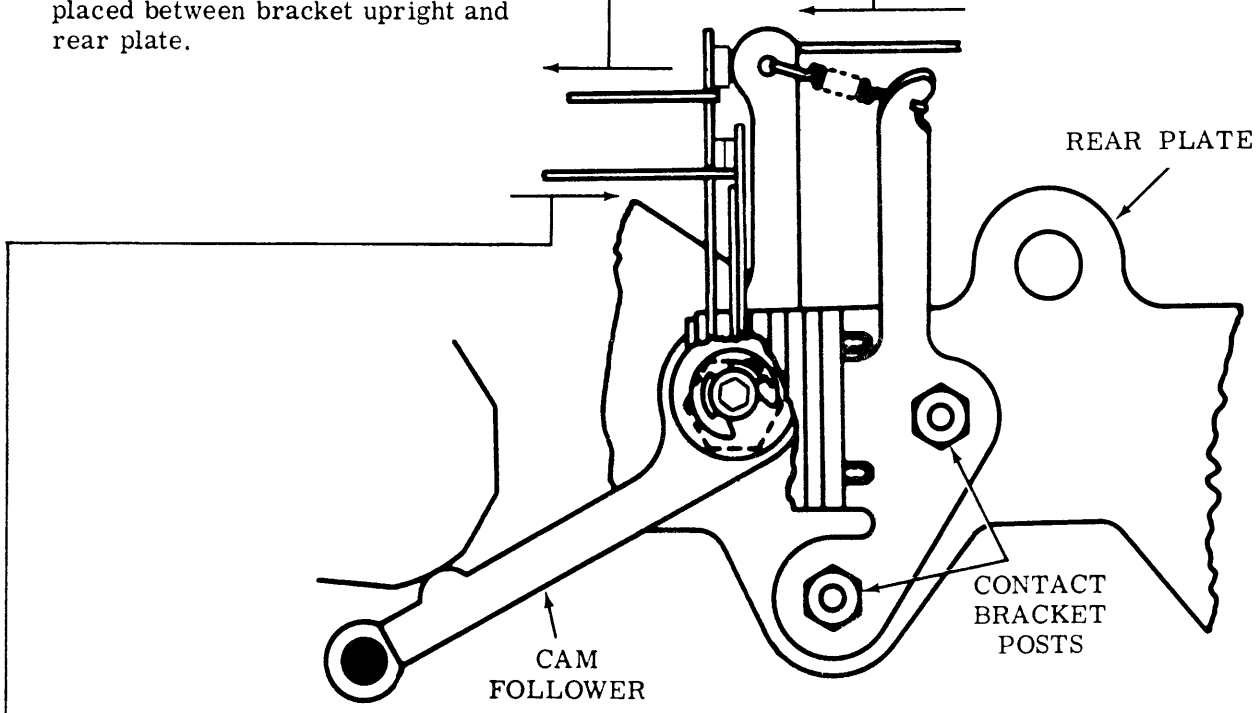
CONTACT GAP

Requirement
Clutch latched, cam follower on high part of cam. Contact gap should be
Min 0.005 inch---Max 0.015 inch

To Adjust
Loosen posts that hold contact bracket. Position bracket by use of screwdriver placed between bracket upright and rear plate.

CAM FOLLOWER SPRING

Requirement
Signal generator latched. Contact spring held back
Min 6 oz
to start cam follower moving.



CONTACT STIFFENER SPRING

Requirement
Contact open
Min 5 oz---Max 8 oz
to move contact.

To Adjust
Remove contact assembly from unit by removing two studs securing it to rear plate. Loosen two screws holding contact pile-up to contact assembly bracket and bend contact using TP110455 spring bender until requirement is met.

Note 1: Check timing contact swinger spring tension and refine if necessary.

Note 2: See Par. 3.14 for AUXILIARY CONTACT REFINEMENT (STROBING).

3.09 Code Reading Contact Mechanism

Note 1: Adjustments on this page should be made with the contact assembly removed from the keyboard.

Note 2: Each adjustment should start with the contact pile-up farthest from the handle of the bending tool (Par. 3.10).

(A) BACKSTOP - NORMALLY CLOSED CONTACT

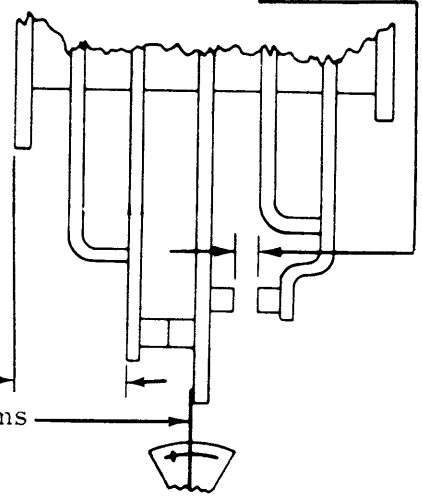
Requirement
Normally closed contact leaf should be parallel to mounting plate and align with each other by 0.010 inch.

To Adjust
Bend backstop.

(D) NORMALLY OPEN CONTACT GAP

Requirement
Min 0.018 inch---Max 0.030 inch normally open gap.

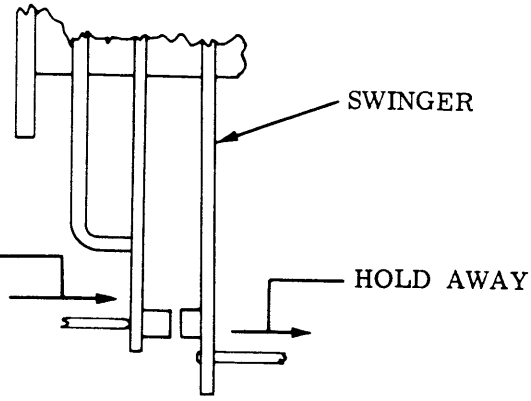
To Adjust
Bend backstop.



(C) CONTACT SWINGER SPRING

Requirement
Min 30 grams---Max 40 grams to open the closed contact.

To Adjust
Bend swinger.



(B) NORMALLY CLOSED CONTACT SPRING

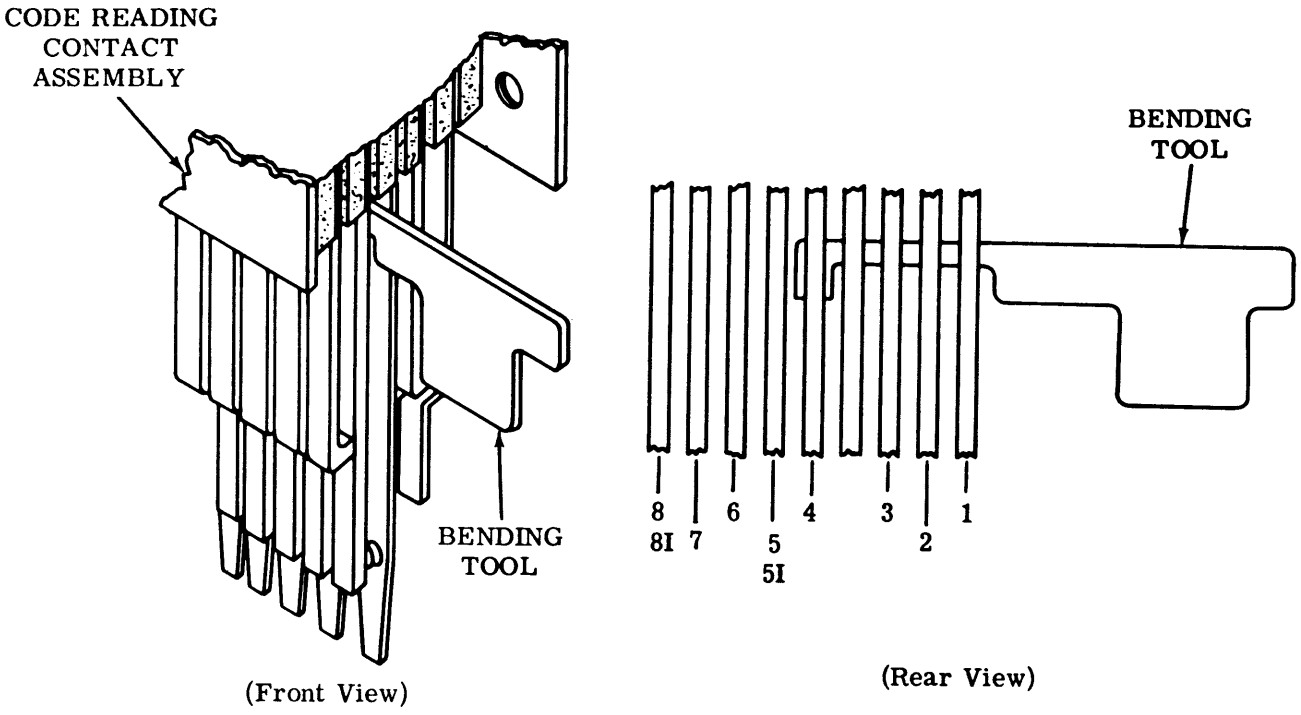
Requirement
Min 2 oz---Max 6 oz to move contact spring away from backstop. Hold swinger away from closed contact.

To Adjust
Bend spring. To increase tension against backstop, bend backstop away from spring leaf and form leaf toward backstop, then re-position BACKSTOP-NORMALLY CLOSED CONTACT.

3.10 Code Reading Contact Mechanism (continued)

ADJUSTING CODE READING CONTACTS

Note: The contact assembly should be removed from the keyboard to perform the adjustments of Par. 3.09. It is not necessary to remove the wires from the assembly.



Requirement

Each adjustment should start with the contact pile-up farthest from the handle of the bending tool.

To Adjust

After adjusting contact pile-ups 4, 3, 2, and 1, insert the bending tool in the opposite side of the assembly and adjust contact pile-ups 5, 6, 7, and 8 in the order given.

3.11 Code Reading Contact Mechanism (continued)

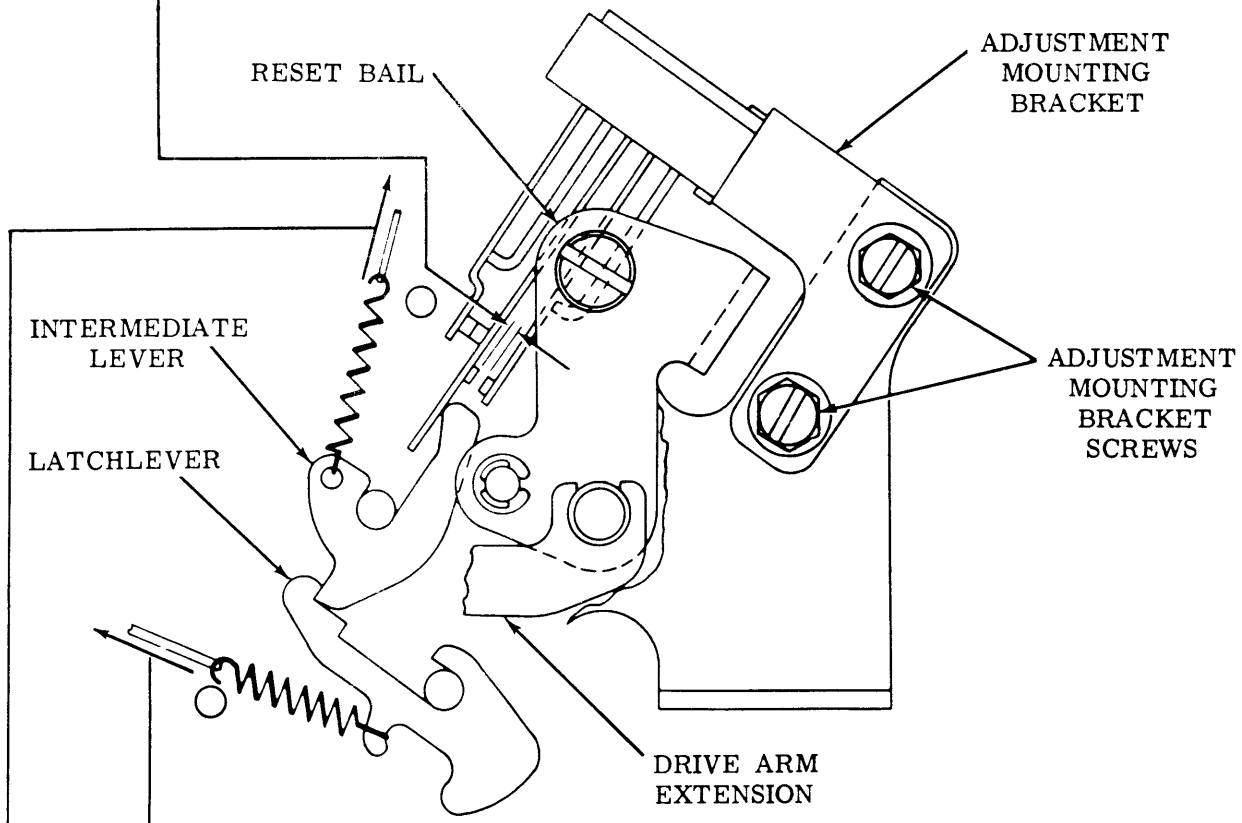
Note: Perform (A), then install contact assembly on the keyboard for the remaining code reading contact adjustments.

(B) MARKING CONTACT GAP

Requirement
With the clutch latched
Min 0.005 inch---Max 0.015 inch
contact gap. Check outside levels only.

To Adjust
Loosen four contact mounting bracket screws.
Position contact adjustment mounting bracket.

CAUTION: DO NOT APPLY FORCE TO CONTACT PILE-UP.



(C) INTERMEDIATE LEVER SPRING

Requirement
With the clutch latched
Min 1 oz---Max 2 oz
to pull spring to installed length.

(A) LATCHLEVER SPRING

Requirement
With the clutch latched
Min 2 oz---Max 4 oz
to pull spring to installed length.

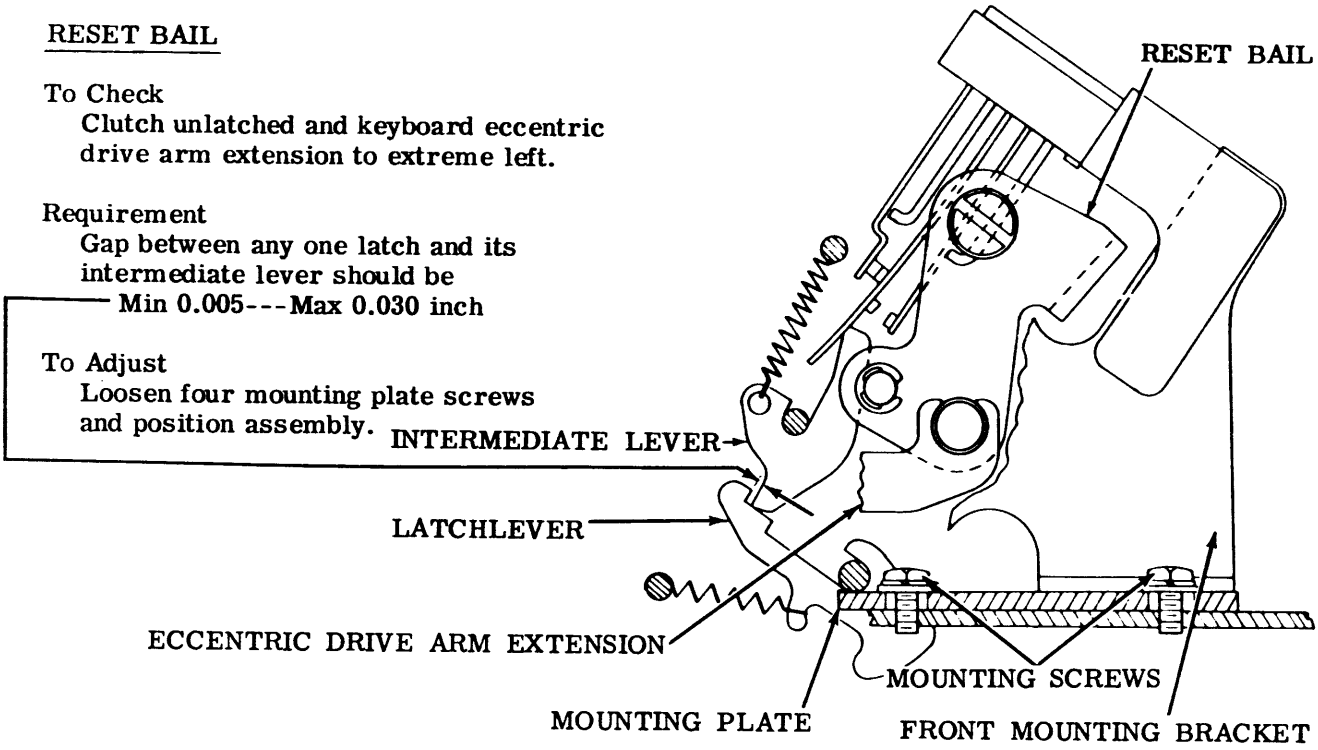
3.12 Code Reading Contact Mechanism (continued)

RESET BAIL

To Check
Clutch unlatched and keyboard eccentric drive arm extension to extreme left.

Requirement
Gap between any one latch and its intermediate lever should be
Min 0.005---Max 0.030 inch

To Adjust
Loosen four mounting plate screws and position assembly.

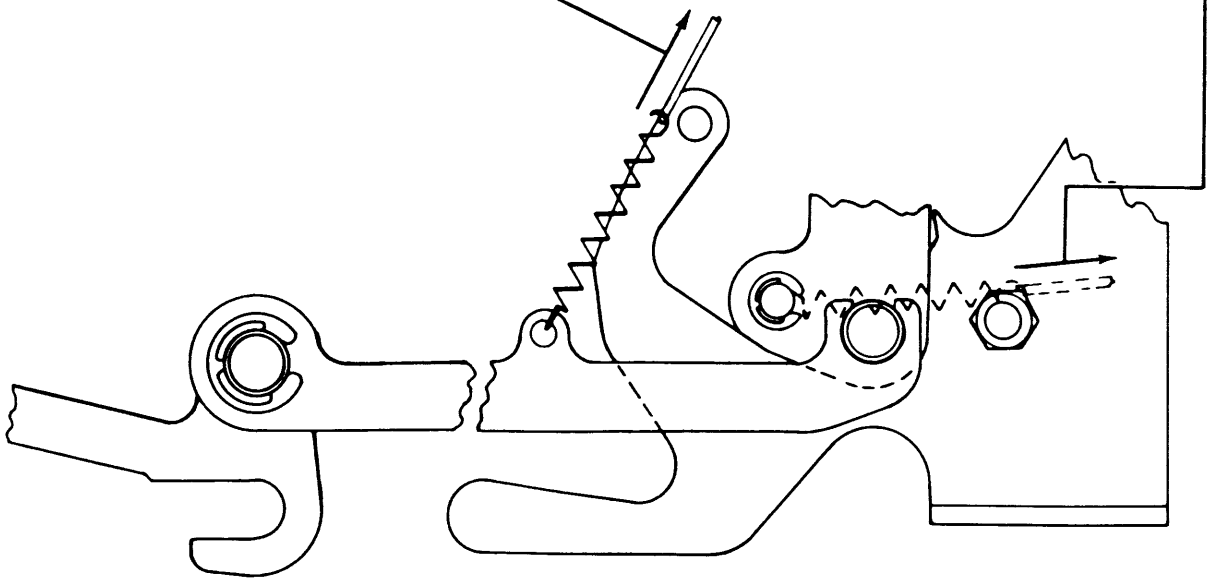


RESET BAIL SPRING

Requirement
Clutch latched
Min 1/2 oz---Max 1-1/2 oz
to pull spring to installed length.

DRIVE ARM EXTENSION SPRING

Requirement
Clutch latched
Min 4 oz---Max 5 oz
to pull spring to installed length.



3.13 Code Reading Contact Mechanism (continued)

Note 1: **The following tests should be performed using a DXD test set, if available, after the contact assembly has been installed and all adjustments have been made.**

Note 2: **Minimum signal lengths apply to time between latest start and earliest end of all contact traces.**

CODE READING CONTACT REFINEMENT (STROBING)

(1) Requirement

Zero the strobe unit (DXD) as follows:

(a) Connect strobe neon trace to code reading contact no. 1. Send rubout combination from keyboard. Note latest point at which trace begins.

(b) Repeat step (a) for all code reading contacts.

(c) Choose trace that starts latest and set "start-zero" mark of strobe scale to this point.

(d) Record earliest end of neon traces for future adjustment references.

(2) Requirement

Connect neon trace lamp to marking contact (contact that is normally open when keyboard is idle) of code reading contact assembly.

(a) Send rubout combination from keyboard.

(b) Combined code reading contact traces should have minimum signal length of 500 divisions (length between latest start and earliest end) and all bounce should end within 20 divisions of latest start of a contact trace. See Par. 3.14 for figure of strobe trace.

Repeat (2) Requirement for each code reading contact.

To Adjust

Refine BACKSTOP-NORMALLY CLOSED CONTACT (3.09) adjustment.
Refine NORMALLY CLOSED CONTACT SPRING (3.09) and CONTACT SWINGER SPRING (3.09) adjustments if there is excessive bounce.

3.14 Code Reading Contact Mechanism (continued)
Auxiliary Contact Mechanism (continued)

AUXILIARY CONTACT REFINEMENT (STROBING)

Note 1: The following tests should be performed using a DXD test set, if available, after the contact assembly has been installed and all adjustments have been made.

Note 2: Minimum signal lengths apply to time between latest start and earliest end of all contact traces.

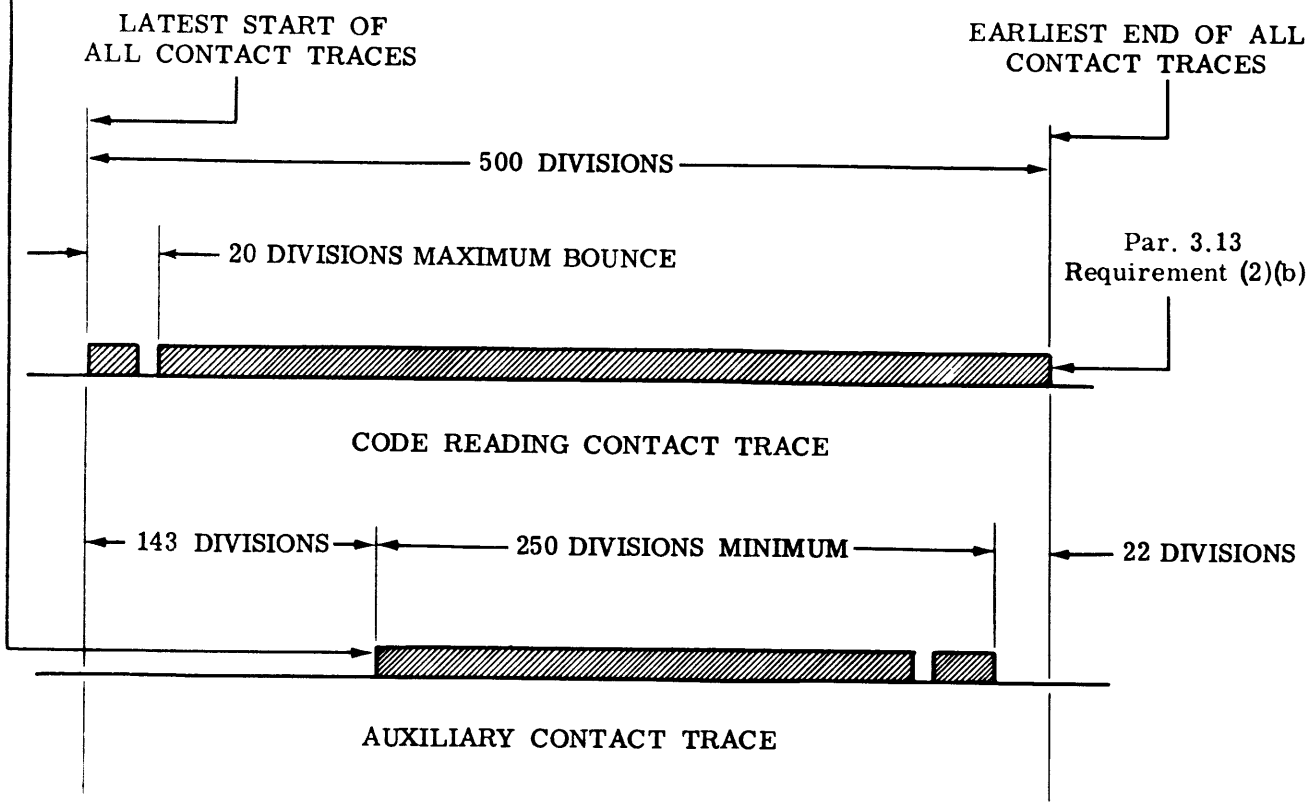
Note 3: Zero the strobe unit (DXD) as explained in (1) Requirement of Par. 3.13.

(1) Requirement
Connect strobe neon trace to auxiliary contacts.

(2) Requirement
Send rubout combination from keyboard.

(3) Requirement
End of neon trace should occur at a minimum of 22 divisions before earliest end of code read contact traces (including any bounce). Start of trace should begin at a minimum of 143 divisions after the strobe "start-zero" mark. The pulse must be at least 250 divisions long.

To Adjust
Refine CONTACT GAP (3.08) adjustment.

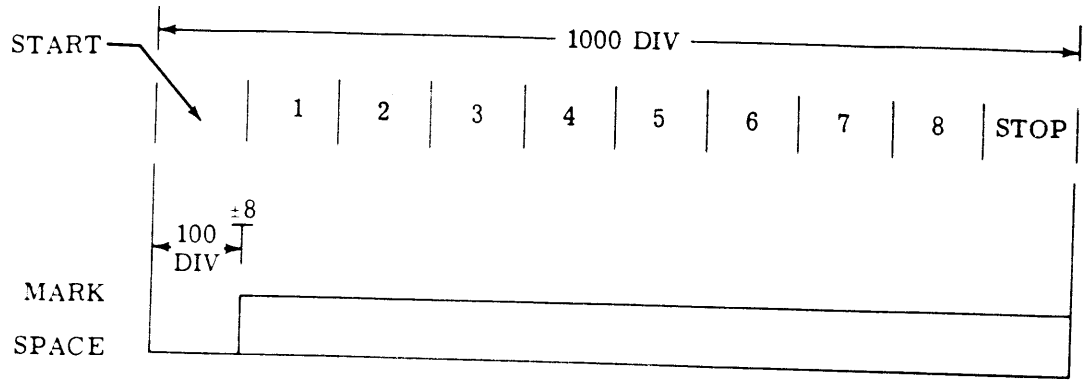


3.15 Strobing Requirement

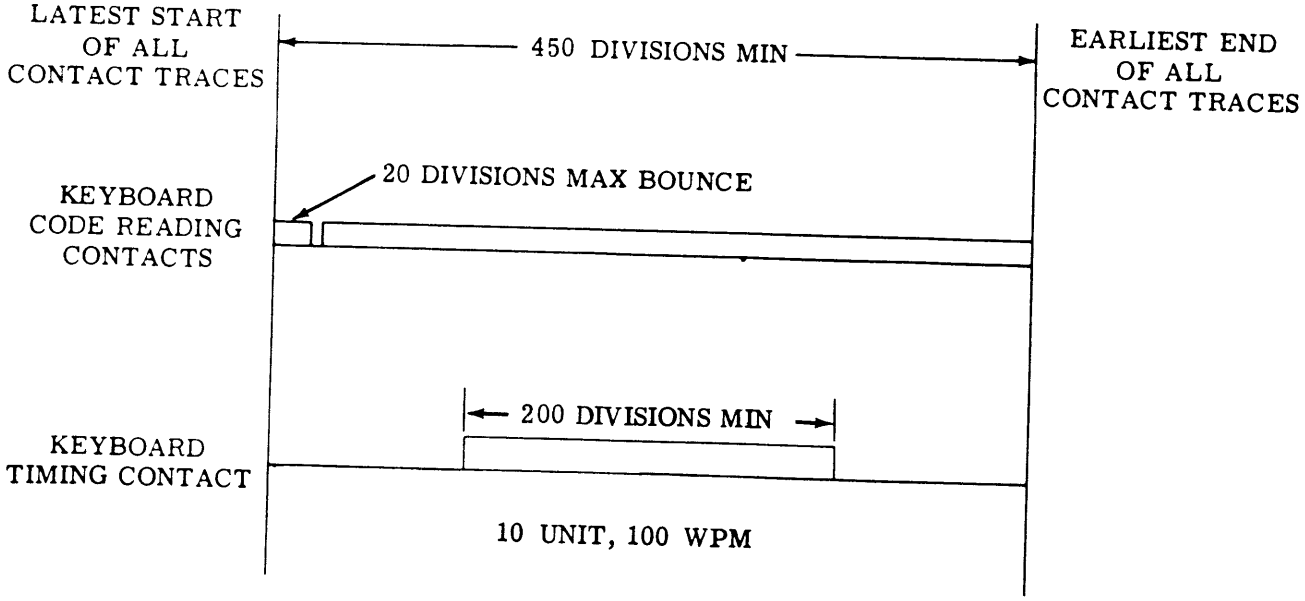
Note 1: The following tests should be performed using a DXD test set, if available.

Note 2: For units equipped with signal regenerators, remove regenerator circuit card before applying test set probes to signal contacts.

SIGNAL GENERATOR CONTACTS



CODE READING AND TIMING CONTACTS

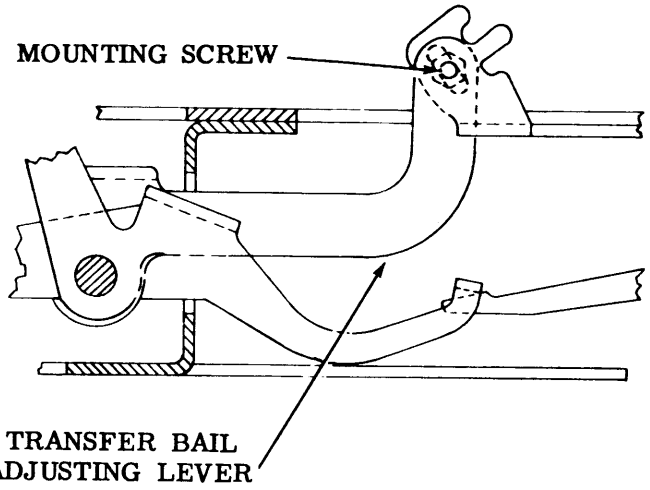


CAUTION: APPLYING OPERATING VOLTAGE OF SIGNAL DISTORTION TEST SET DIRECTLY TO GOLD-PLATED SIGNAL CONTACTS MAY MAKE THEM UNSUITABLE FOR LOW-VOLTAGE APPLICATIONS. SEE PAR. 2.19 FOR SERVICING INSTRUCTIONS.

3.16 Local Backspace Mechanism

BACKSPACE TRANSFER BAIL ADJUSTING LEVER

Requirement
Downward pressure on backspace key
Min 16 oz---Max 28 oz
to operate backspace lever.



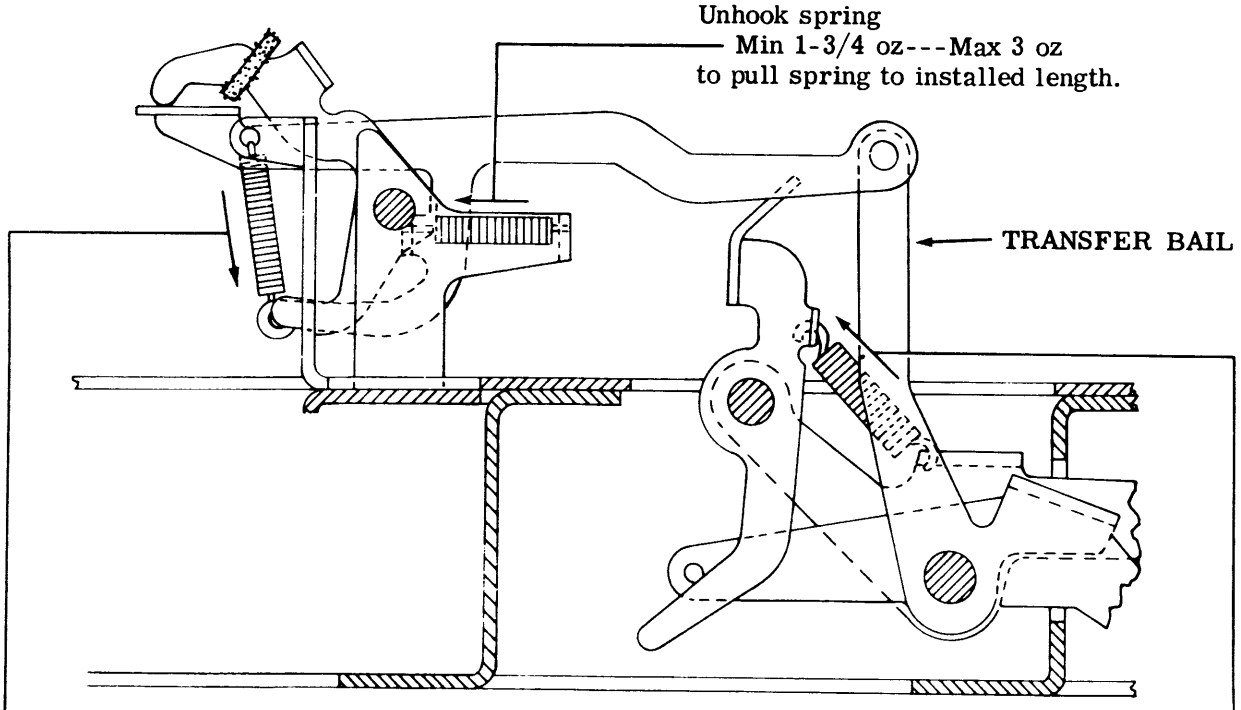
To Adjust
Position transfer bail adjusting lever with its mounting screw loosened. If unit is forward spacing, the adjusting lever must be raised until proper backspacing is accomplished.

Note 1: This adjustment may require remaking when a different typing unit is used.

Note 2: The camming bail should return to its unoperated position when the keylever is released. Refine adjustment if necessary.

BACKSPACE TRIP LINK HORIZONTAL SPRING

Requirement
Unhook spring
Min 1-3/4 oz---Max 3 oz
to pull spring to installed length.



BACKSPACE TRIP LINK VERTICAL SPRING

Requirement
Unhook spring
Min 1-1/2 oz---Max 3 oz
to pull spring to installed length.

BACKSPACE TRANSFER BAIL SPRING

Requirement
Unhook spring
Min 1/2 oz---Max 1 oz
to pull spring to installed length.

3.17 Receive-Break Switch Mechanism

RECEIVE-BREAK SWITCH

To Check
Keyboard lock plunger in downward position. Function bail latched.

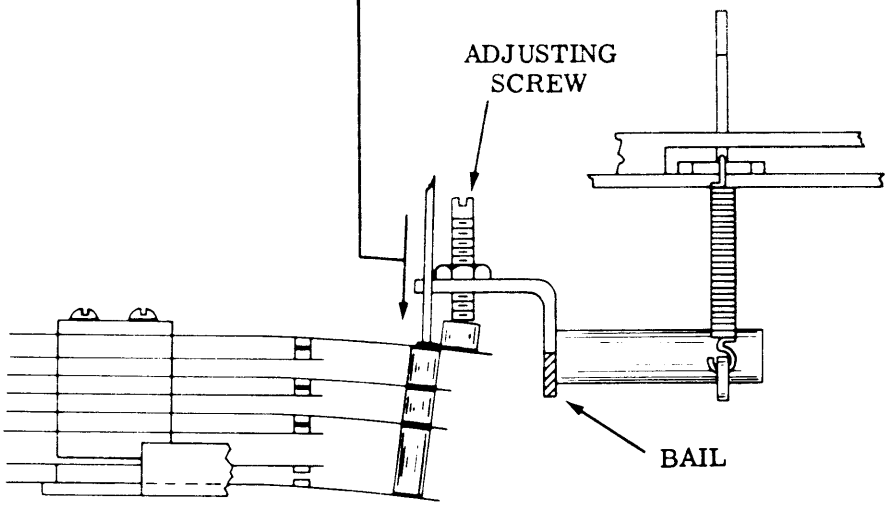
Requirement
The bail should operate the contact pile-up with some overtravel.

To Adjust
Loosen locknut on adjusting screw and position screw. Recheck for overtravel.

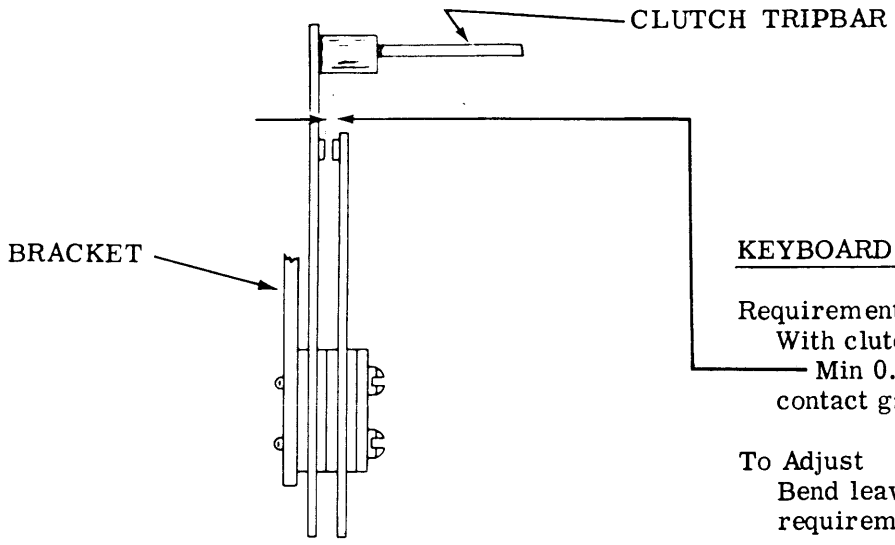
RECEIVE-BREAK SWITCH TENSION

Requirement
Normally open contacts should close and normally closed contacts should open
Min 10 oz---Max 16 oz

To Adjust
Bend leaves carefully to meet requirements.



3.18 Keyboard Universal Contact Mechanism

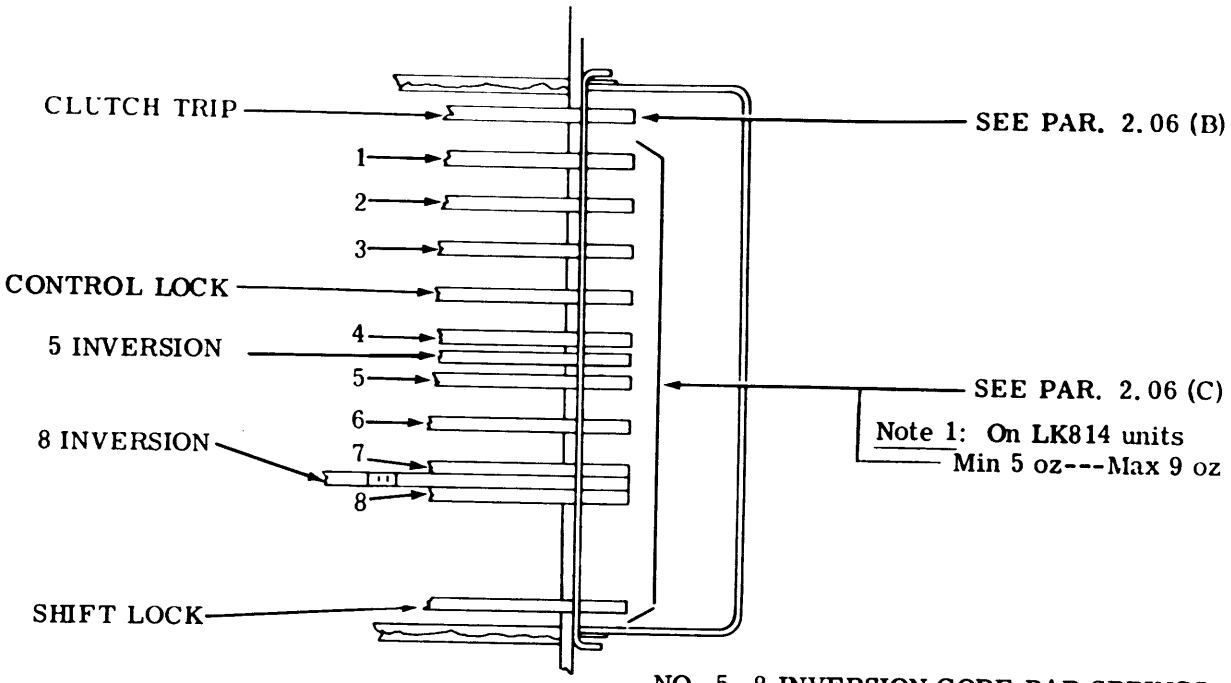


KEYBOARD UNIVERSAL CONTACT

Requirement
With clutch latched
Min 0.010 inch---Max 0.020 inch contact gap.

To Adjust
Bend leaves carefully to meet requirement.

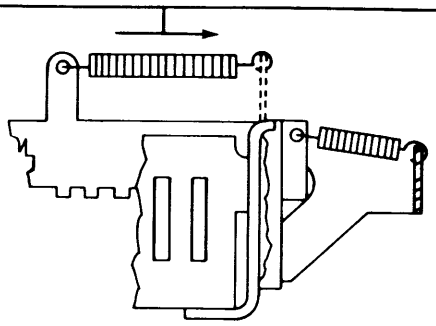
3.19 Codebar Arrangement for Even Parity



NO. 5, 8 INVERSION CODE BAR SPRINGS

Requirement
Codebar in latched position.
Unhook spring at guide
Min 6 oz---Max 8 oz
to pull to installed length.

Note 2: On LK814 units
Min 7-1/2 oz---Max 9-1/2 oz



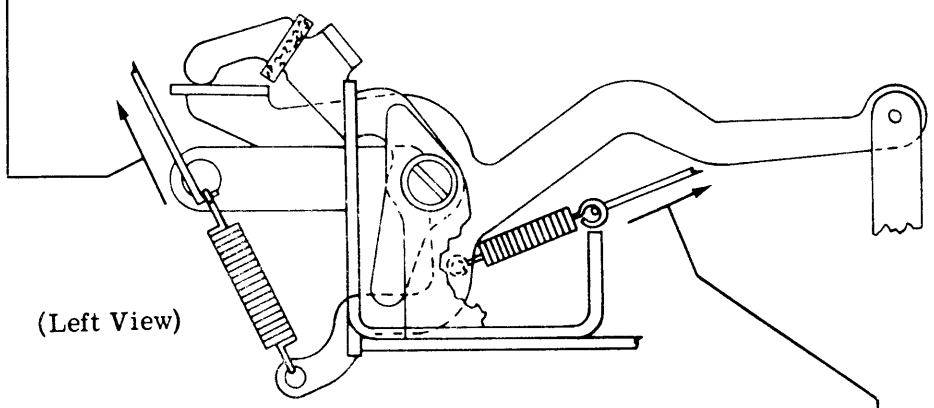
TRANSITION BAR SPRING

Requirement
Unhook spring at guide
Min 1/2 oz---Max 1-1/2 oz
to pull to installed length.

3.20 Local Single Line Feed Mechanism

LOCAL SINGLE LINE FEED TRIP LINK VERTICAL SPRING

Requirement
Unhook spring
Min 1-1/2 oz---Max 2-1/2 oz
to pull spring to installed length.



(Left View)

LOCAL SINGLE LINE FEED TRIP LINK HORIZONTAL REAR SPRING

Requirement
Unhook spring
Min 1-1/2 oz---Max 3-1/2 oz
to pull spring to installed iength.

LOCAL SINGLE LINE FEED TRIP LINK HORIZONTAL FRONT SPRING

Requirement
Unhook spring
Min 1-1/2 oz---Max 2-1/2 oz
to pull spring to installed length.

3.21 Universal Keyboard Switch Mechanism

Note: Suitable arc suppression should be provided when warranted.

KEYBOARD SWITCH (HORIZONTAL)

(1) Requirement

Align contact assembly, guide, and code lever assembly. There should be

Min some---Max 0.020 inch

clearance between the right edge of the contact swinger insulator and the extension of the code lever assembly in the unoperated position.

To Adjust

Loosen screw holding the contact assembly to the retainer bars and adjust. Tighten screw.

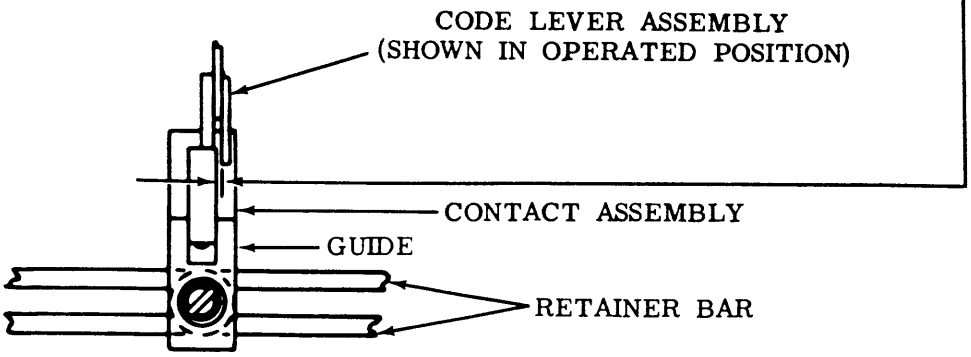
(2) Requirement

Clearance between the contact assembly spring and the keyboard wedge retainer should be

Min 0.062 inch

To Adjust

Bend the retainer bar if necessary.



3.22 Universal Keyboard Switch Mechanism (continued)

KEYLEVER SWITCH (VERTICAL)

(1) Requirement

With unit in stop position and keylever depressed to a point where clutch engages, center and lower contact should just close or have a maximum gap of 0.008 inch.

(2) Requirement

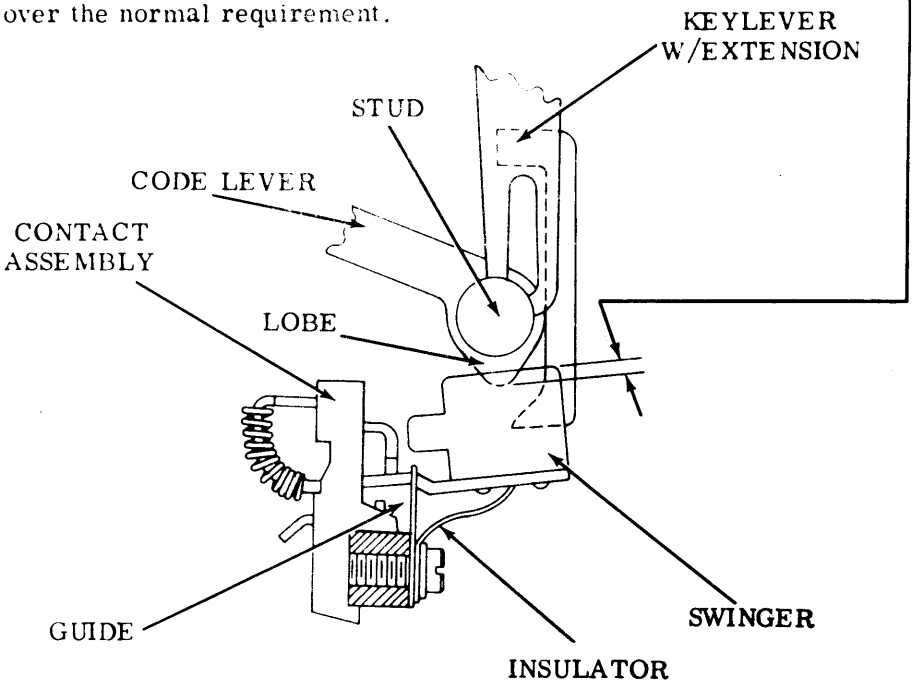
For keylevers which do not cause clutch engagements, and with keylever unoperated, tip of code lever lobe should overlap contact swinger by

Min some---Max 0.020 inch

To Adjust

Loosen two screws which fasten two brackets on the two studs and position complete mounting assembly.

Note: When switch is used, the keytop pressure may be increased up to 2 oz over the normal requirement.



3.23 Local Reverse Line Feed Mechanism

LOCAL REVERSE LINE FEED TRIP LINK VERTICAL SPRING

Requirement
Typing unit removed.
Min 1-1/2 ozs---Max 2-1/2 ozs
To pull spring to installed length.

LOCAL REVERSE LINE FEED TRIP LINK HORIZONTAL SPRING

Requirement
Typing unit removed.
Min 1-1/2 ozs---Max 3-1/2 ozs
To pull spring to installed length.