

35 KEYBOARD FOR AUTOMATIC SEND-RECEIVE SETS
 ADJUSTMENTS

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1. GENERAL

1.01 This section is reissued to add recent engineering changes and strobing requirements. Since this is a general revision, marginal arrows, used to indicate changes, have been omitted.

1.02 The adjustments of each unit are arranged in a sequence that should be followed if a complete readjustment of the unit were undertaken. The tools and spring scales required to perform these adjustments are listed in the applicable section. After an adjustment is completed, be sure to tighten any nuts or screws that are loosened. The adjusting illustrations indicate tolerances, positions of moving parts, spring tensions, and the angles at which scales should be applied when measuring spring tensions. If a part that is mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same number is replaced when the part is remounted.

1.03 The spring tensions given in this bulletin are indicated values and should be checked with proper spring scales in the positions indicated. Replace springs that do not meet requirements, unless otherwise indicated.

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 front.

1.05 When a requirement calls for a clutch to be disengaged, the clutch shoe lever must be fully latched between its trip lever and latch-lever so that the clutch shoes (Par. 2.04) 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.

1.06 All electrical contact points should meet squarely. Contacts with the same diameter should not be out of alignment more than 25 percent of the contact diameter. Check contacts for pitting and corrosion and clean or bur-nish them before making specified adjustment or tolerance measurement. Avoid sharp kinks or bends in the contact springs.

Note: Keep all electrical contacts free of oil and grease.

GOLD-PLATED SIGNAL CONTACTS

1.07 All units now being manufactured have signal contacts made of gold-plated tungsten. Older units may have unplated tungsten contacts. If in doubt as to the type of contacts, remove signal generator cover and inspect contacts for gold plating.

(a) Servicing: For standard applications including those with data sets, observe standard maintenance intervals. For special low current applications, see below.

(b) Cleaning

- (1) Use twill jean cloth (KS2423) to clean gold-plated contacts.
- (2) Open contacts. Drop strip of twill jean between them.
- (3) Close contacts. Draw twill jean part way through. Open contacts and withdraw twill jean.
- (4) This procedure prevents small fibers at edges of twill jean strip from becoming lodged between contacts.
- (5) Clean unplated tungsten contacts in accordance with standard procedures.

(c) Special Low Voltage Applications

Note: Following does not apply to standard applications.

(1) The recommended cleaning interval for gold-plated contacts in special low level applications (less than 250 micro-watts) having an average weekly use of 60 hours should not exceed 90 days. This interval may be reduced, dependent on the circuit configuration, usage, and environment. Contacts should be cleaned as described in 1.07 (b).

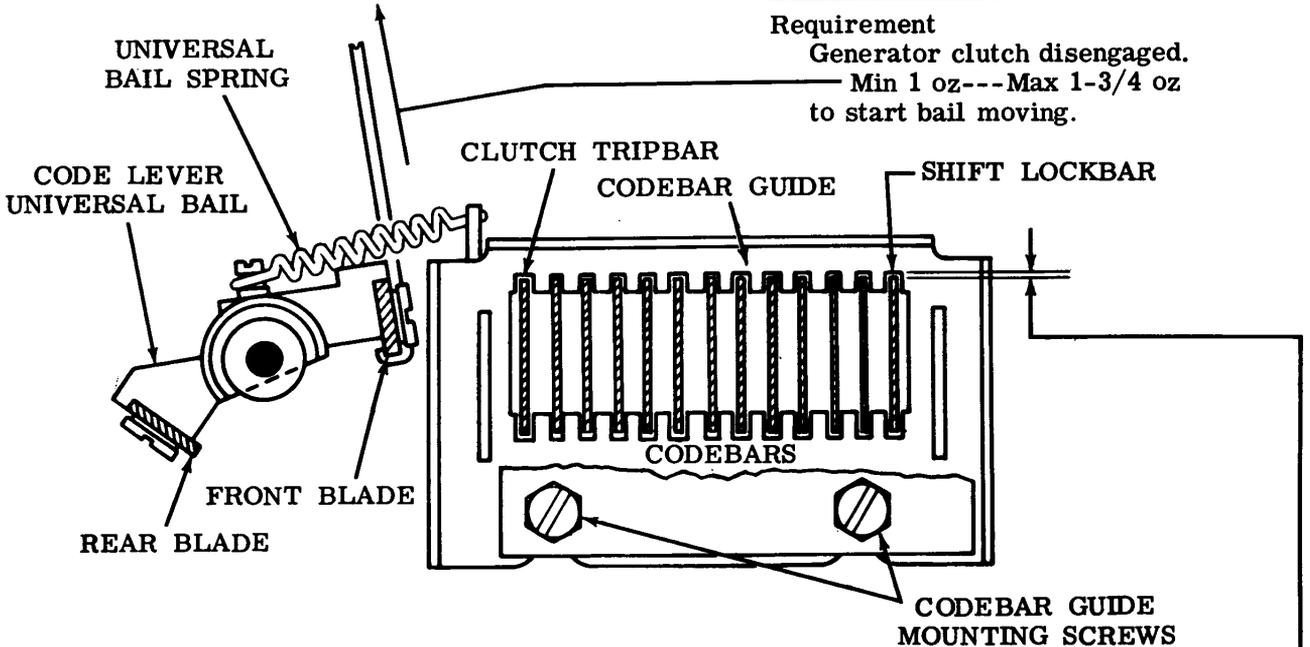
Note 1: Applying operating voltage of standard Distortion Test Set directly to contacts may damage gold plating and impair low voltage operation. When electrically adjusting or testing contacts (Par. 2.17), use an intermediate device, keyed by the contacts, to interrupt current to stroboscopic lamp of 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 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 that it does not exceed a 120 milliwatt power level. The contacts are not normally intended for use on voltages above 70 volts dc. Exceeding these levels for an appreciable length of time may result in damage to the gold plating and make them unfit for low voltage applications.

2. BASIC UNIT

2.01 Codebar Assembly

(B) CODE LEVER UNIVERSAL BAIL SPRING



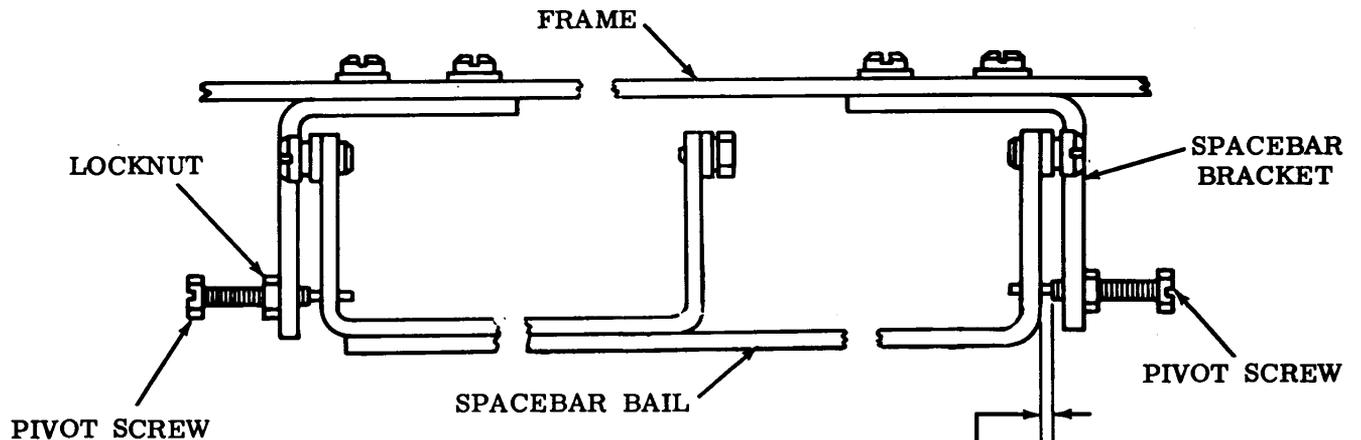
(A) CODEBAR GUIDE CLEARANCE

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

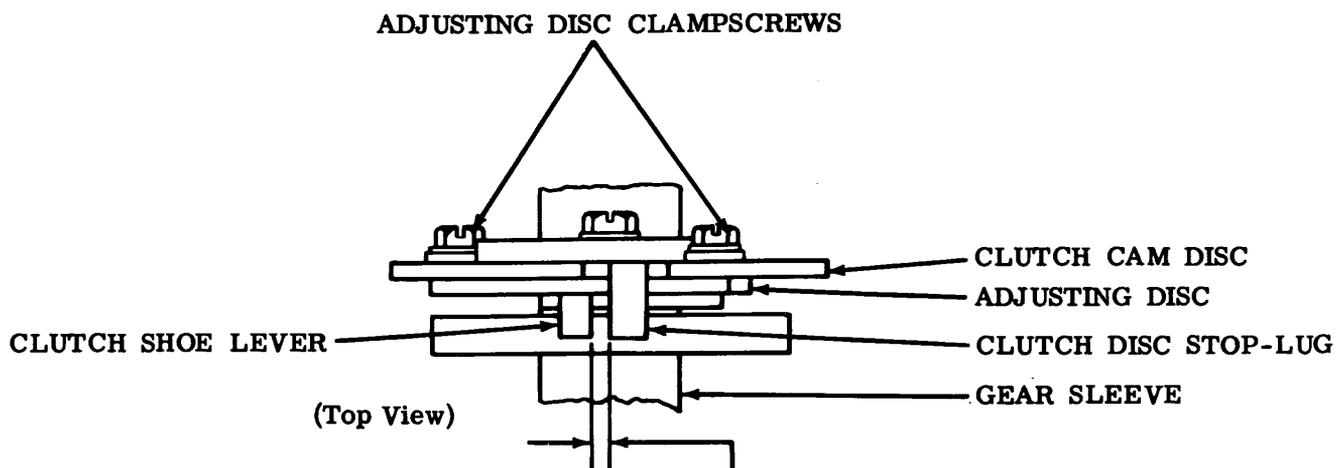
Requirement

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

To Adjust

Position spacebar with pivot screws.

2.02 Signal Generator 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.

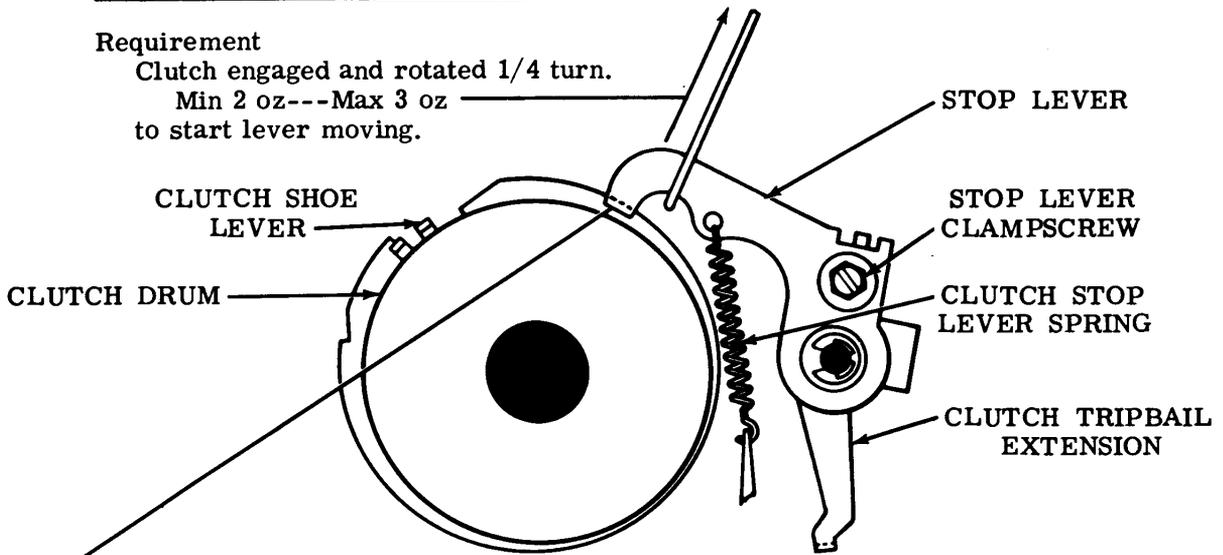
2.03 Signal Generator Mechanism (continued)

(B) CLUTCH STOP LEVER SPRING

Requirement

Clutch engaged and rotated 1/4 turn.

Min 2 oz---Max 3 oz
to start lever moving.



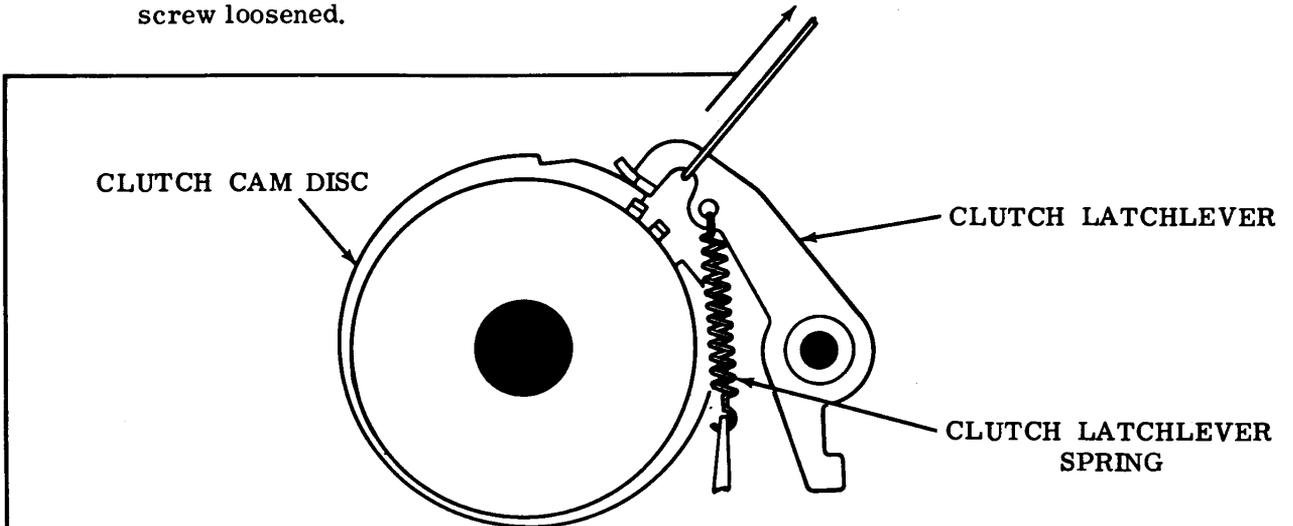
(A) CLUTCH STOP LEVER

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

Requirement

Clutch latchlever resting on the
highest point of clutch disc.

Min 2 oz---Max 3 oz
to start latchlever moving.

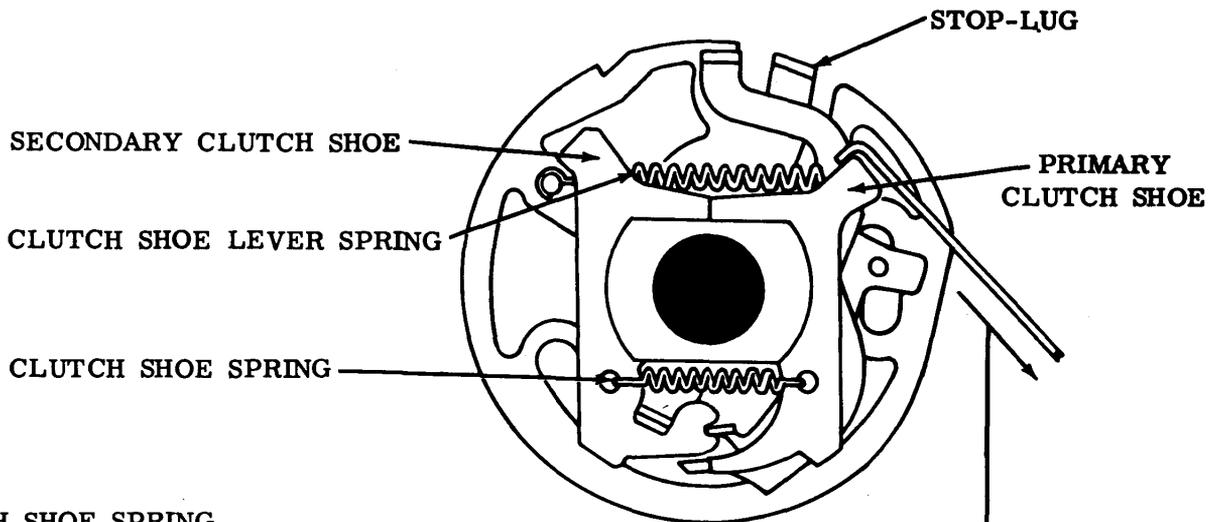
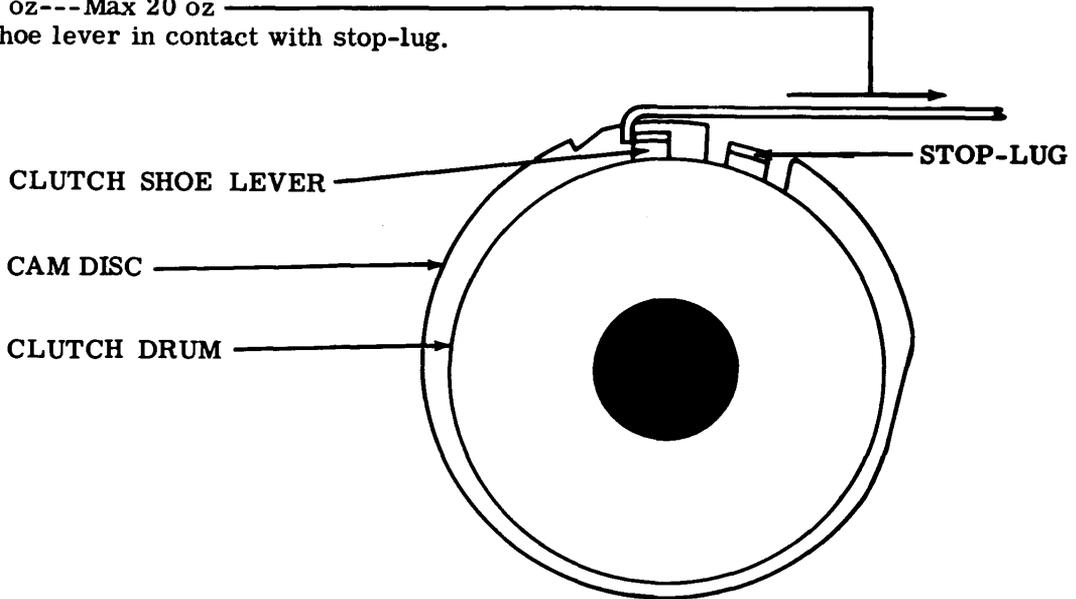
2.04 Signal Generator Mechanism (continued)

CLUTCH SHOE LEVER SPRING

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

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

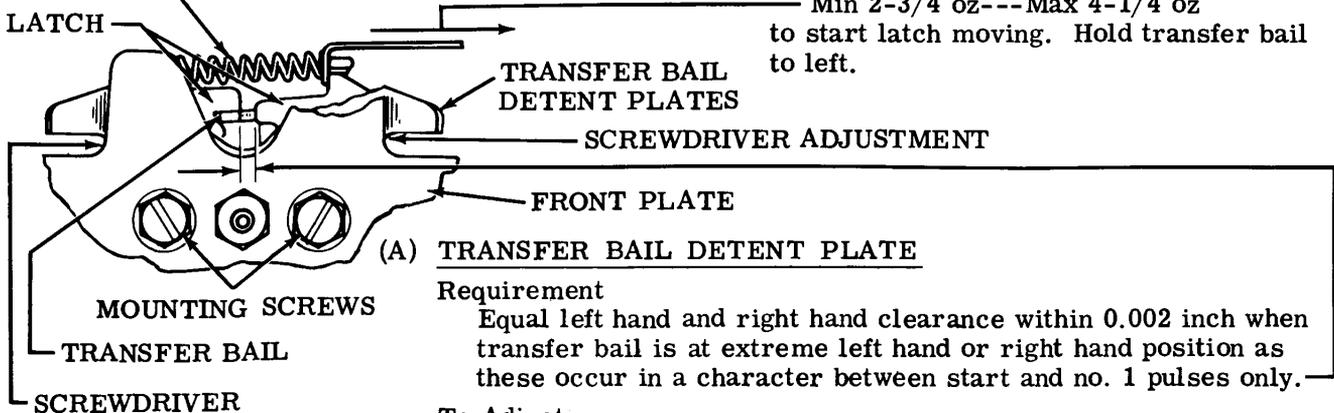
Clutch drum removed.

Min 3 oz---Max 5 oz _____
To start primary shoe moving away from secondary shoe at point of contact.

2.05 Signal Generator Mechanism (continued)

TRANSFER BAIL DETENT LATCH SPRING

(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.

(A) TRANSFER BAIL DETENT PLATE

Requirement

Equal left hand and right hand clearance within 0.002 inch when transfer bail is at extreme left hand or right hand 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

Requirement

Marking and spacing gaps should be equal within 0.001 inch.

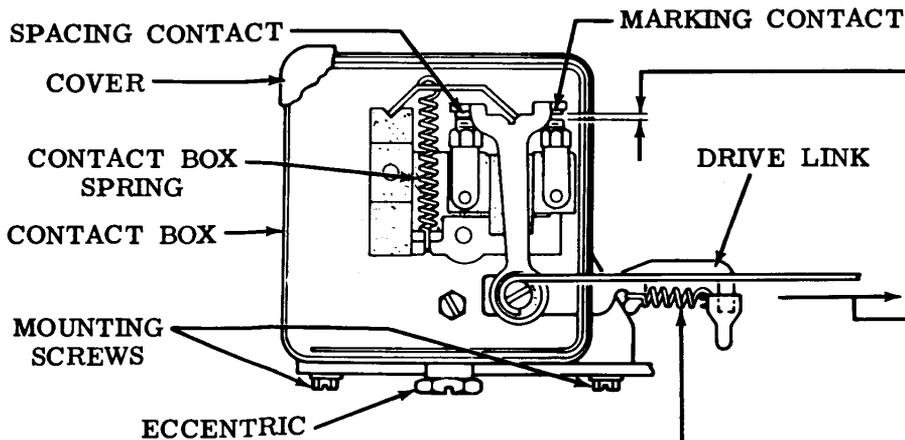
To Check

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

To Adjust

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

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



Note: For servicing instructions on gold-plated contacts, see 1.07 on page 3.

(D) SIGNAL CONTACT DRIVE LINK

Requirement

With main shaft in stop position and transfer bail detent latch spring unhooked, 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.

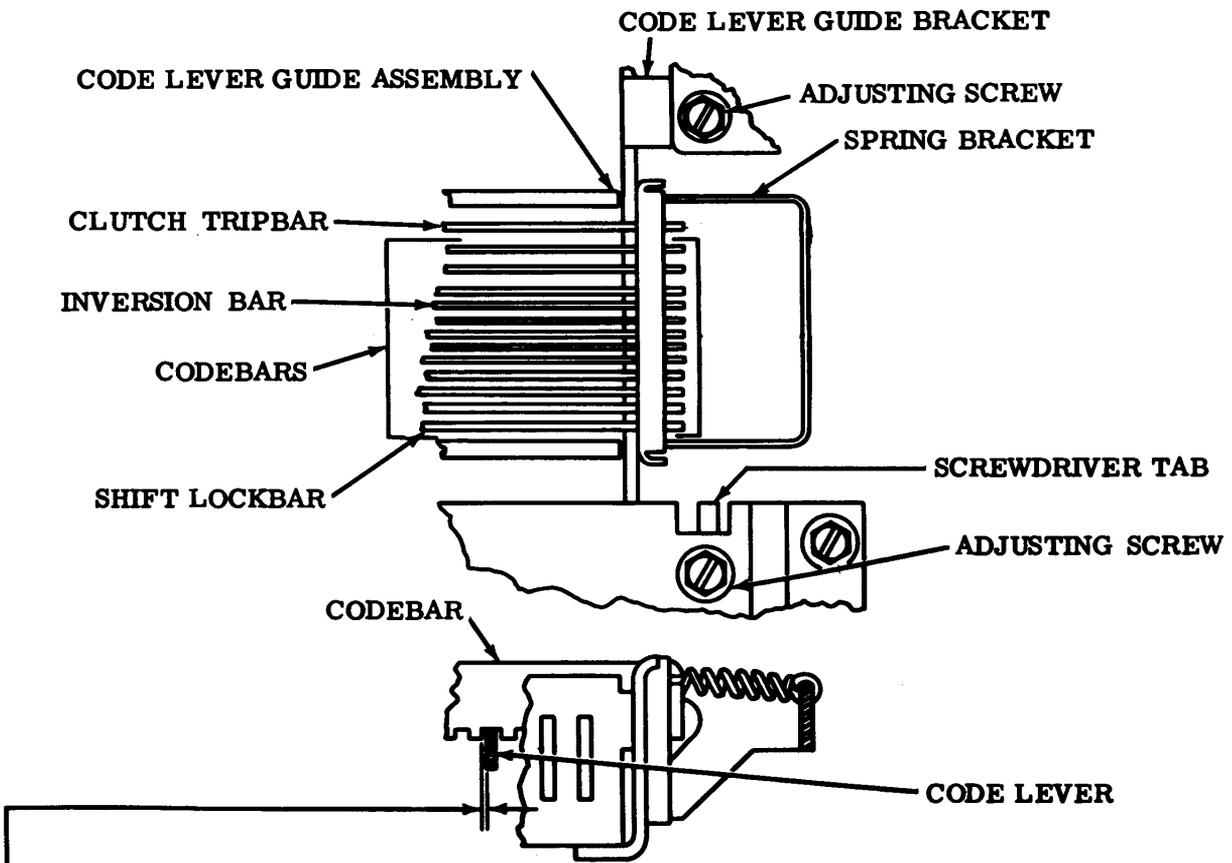
(E) SIGNAL CONTACT SPRING

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 Assembly (continued)



CODEBAR AND CODE LEVER CLEARANCE

Requirement

Permutation must be such that highest level is spacing and located furthest right. While key is held down and cam cycled to stop position, gap between left hand 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.

2.07 Codebar Assembly (continued)

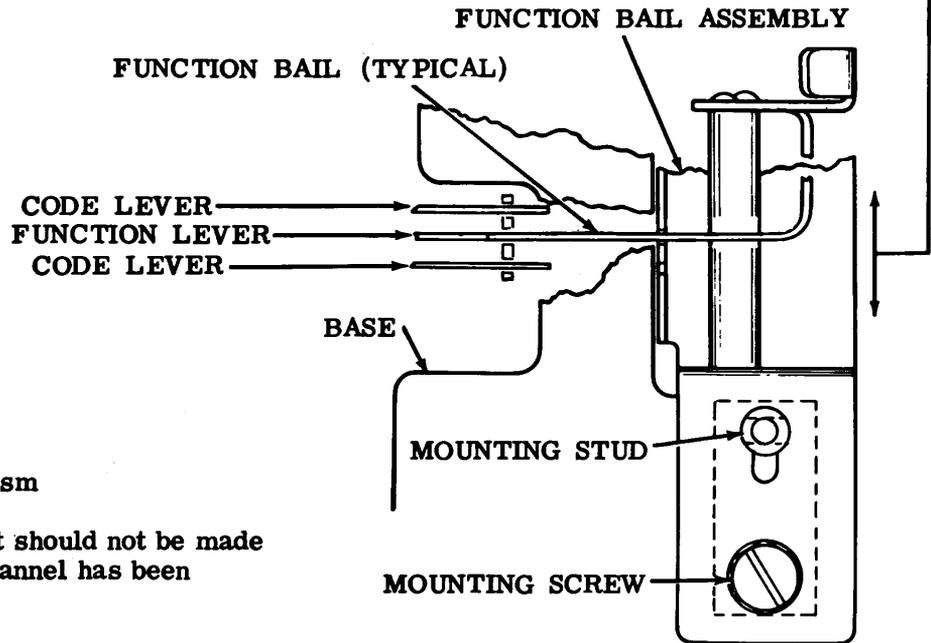
(A) FUNCTION BAIL LEVERS AND CODE LEVER CLEARANCE

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.



2.08 Keyboard Mechanism

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

(B) LOCK BALL CHANNEL

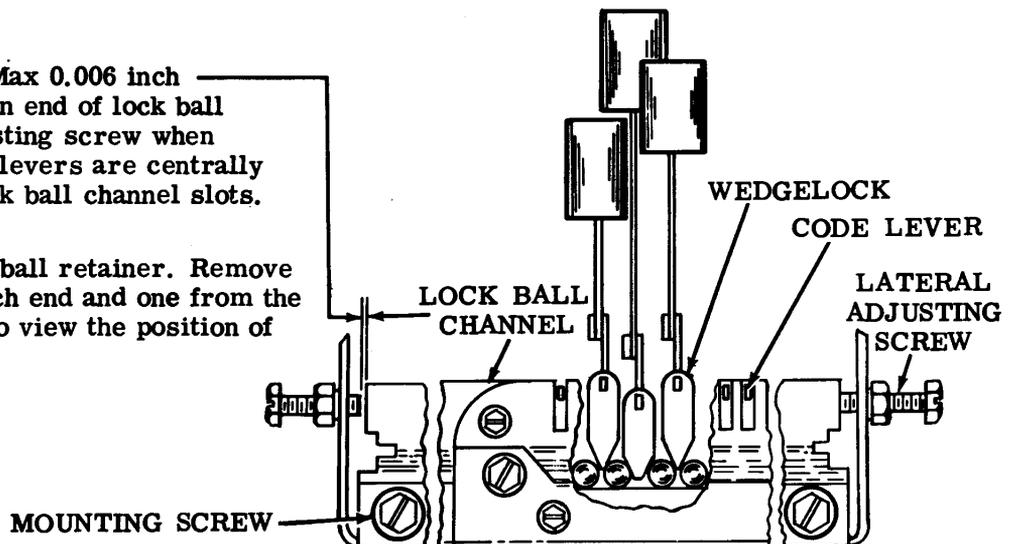
Requirement

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

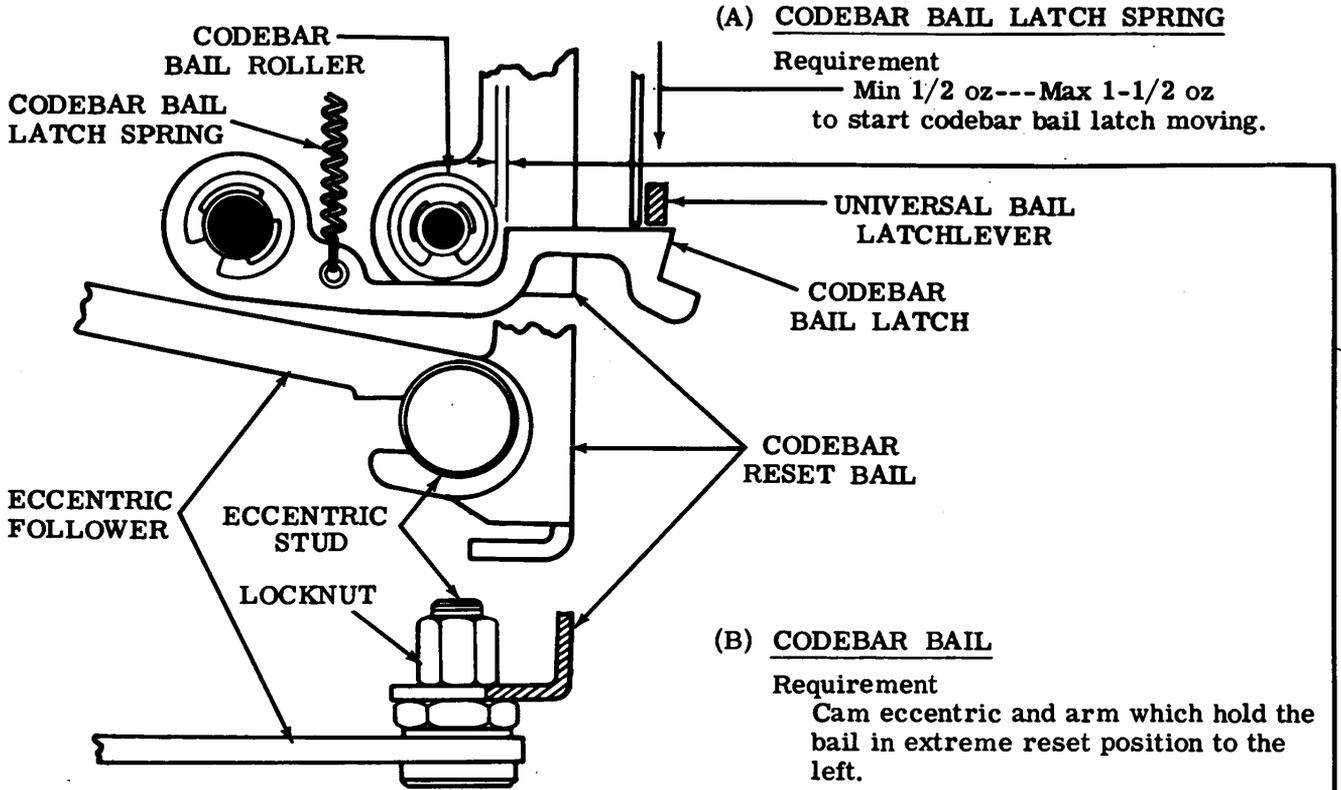
Remove the lock ball retainer. Remove a wedge from each end and one from the center in order to view the position of the code lever.



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.

2.09 Codebar Assembly (continued)



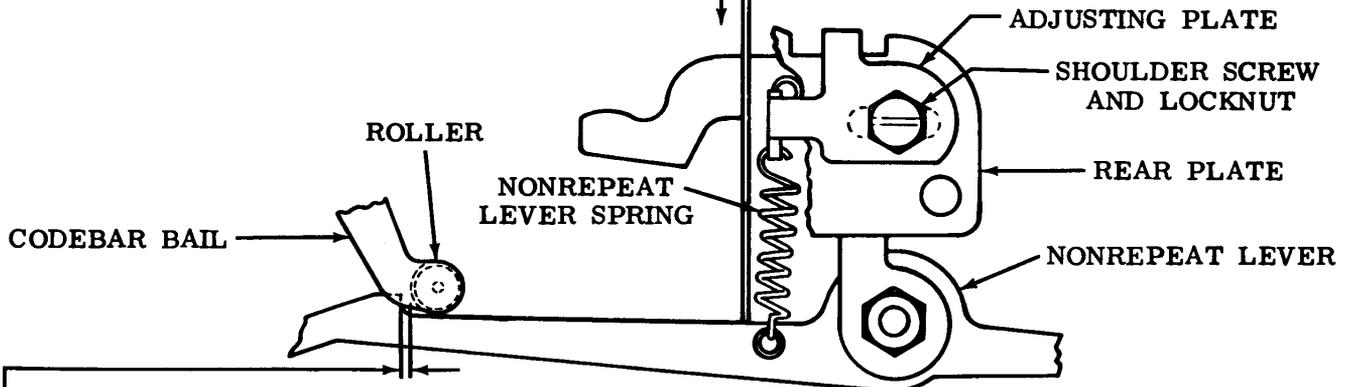
(B) CODEBAR BAIL

Requirement
Cam eccentric and arm which hold the bail in extreme reset position to the left.
Min some---Max 0.006 inch
between codebar bail roller and codebar bail latch.

(C) NONREPEAT LEVER SPRING

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

To Adjust
With locknut loosened, adjust eccentric stud so that high point is in upper half of arc.



(D) CODEBAR BAIL AND NONREPEAT LEVER CLEARANCE

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

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

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

2.10 Keyboard Mechanism (continued)

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

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

Clearance between tip of wedge and the track should be
Min 0.005 inch---Max 0.015 inch and equal within 0.005 inch.

To Check

Depress Q and P keylevers 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.

To Adjust

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

(B) LOCK BALL ENDPLAY (PRELIMINARY)**Requirement**

Clearance between balls should be minimum.

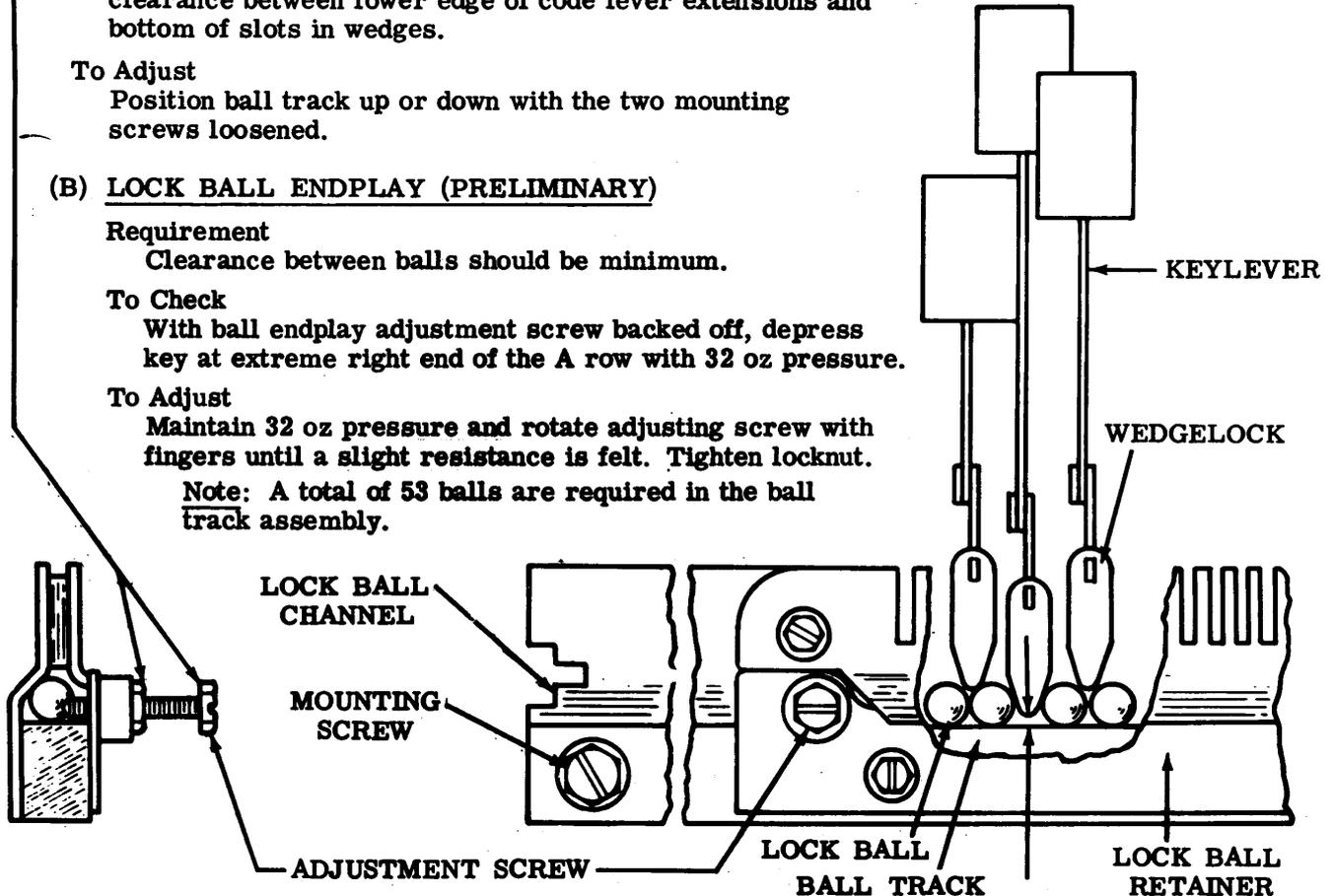
To Check

With ball endplay adjustment screw backed off, depress key at extreme right end of the A row with 32 oz pressure.

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 WEDGELOCK, BALL ENDPLAY, AND UNIVERSAL BAIL LATCH (FINAL)**

Note: Perform this adjustment following (C) in Par. 2.11.

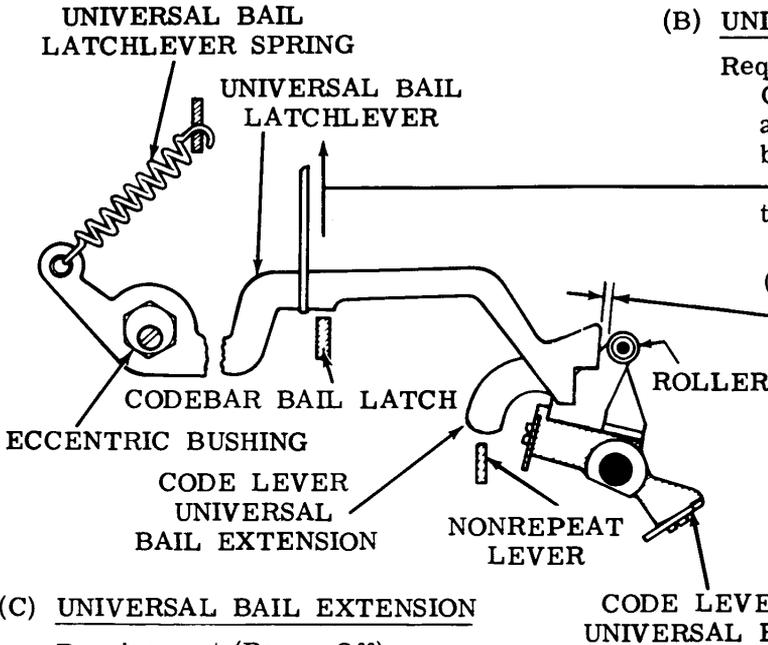
Requirement (Under Power)

- (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.

To Adjust

If necessary, refine BALL WEDGELOCK AND BALL TRACK CLEARANCE (PRELIMINARY) Par. 2.10, LOCK BALL ENDPLAY (PRELIMINARY) Par. 2.10, UNIVERSAL BAIL LATCH-LEVER (PRELIMINARY) Par. 2.11, and UNIVERSAL BAIL EXTENSION Par. 2.11 adjustments.

2.11 Codebar Assembly (continued)



(B) UNIVERSAL BAIL LATCHLEVER SPRING

Requirement

Clutch disengaged, universal bail held away from latchlever. Nonrepeat lever bellcrank held down against its stop post.
 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 should be
 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

Rotate eccentric. Keep high part of eccentric up.

Note: It will be necessary to remake UNIVERSAL BAIL - REAR BLADE Par. 2.11 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 nonrepeat lever

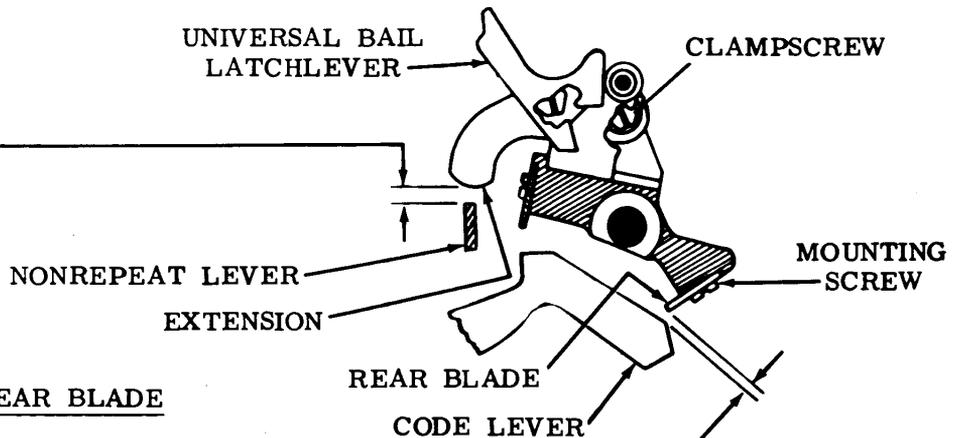
To Check

Depress rubout keylever and release it. Check clearance.

To Adjust

Position the extension with its clamp-screw loosened.

(E) BALL WEDGELOCK, BALL ENDPLAY, AND UNIVERSAL BAIL LATCH (FINAL)
 see Par. 2.10



(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 0.025 inch
 between universal bail rear blade and any code lever.

To Adjust

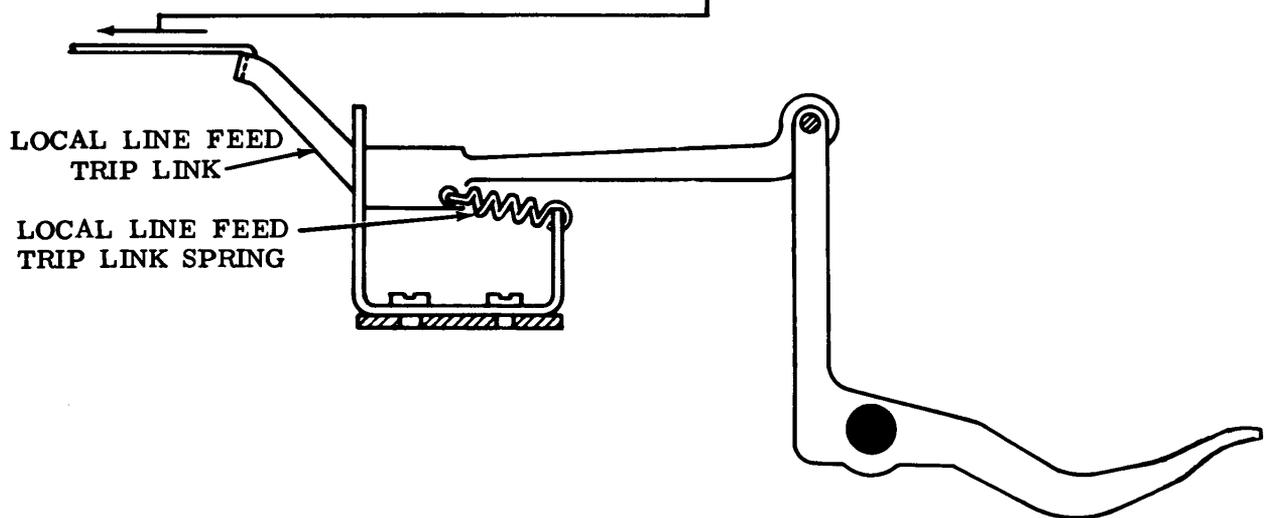
Position rear blade with mounting screws loosened.

2.12 Keyboard Mechanism (continued)

LOCAL LINE FEED TRIP LINK SPRING

Requirement

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



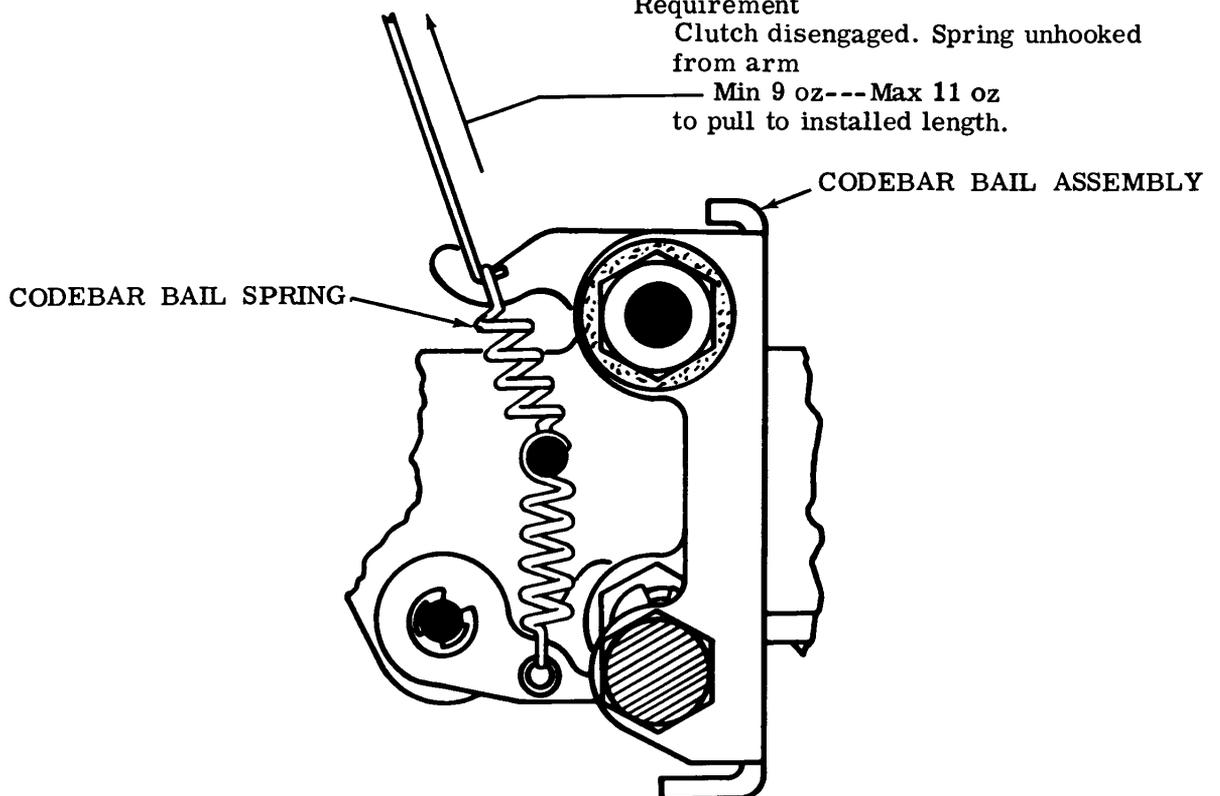
2.13 Codebar Assembly (continued)

CODEBAR BAIL SPRING

Requirement

Clutch disengaged. Spring unhooked
from arm

Min 9 oz---Max 11 oz
to pull to installed length.



2.14 Keyboard Mechanism (continued)

KEYTOP GUIDE SPACING

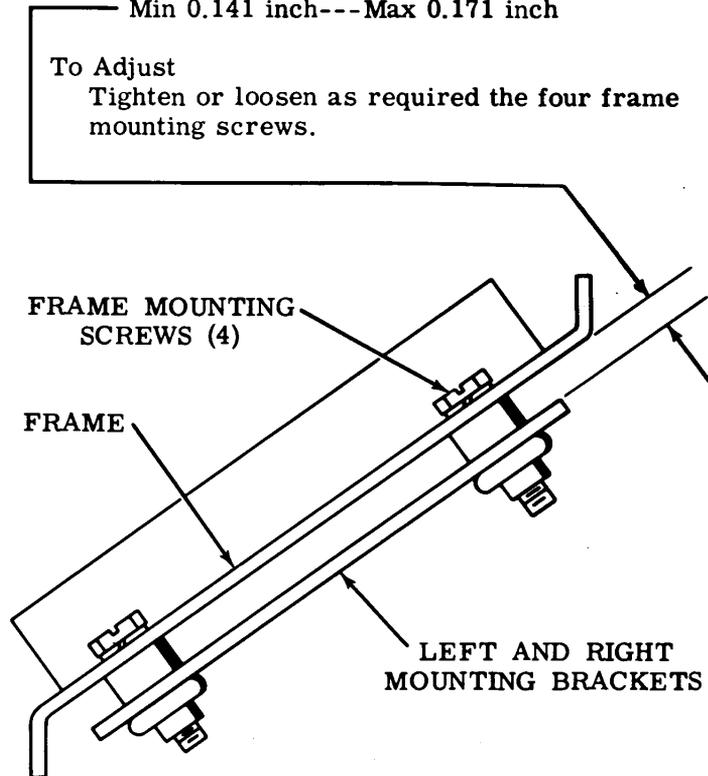
Requirement

Gap between frame and left and right mounting bracket should be

Min 0.141 inch---Max 0.171 inch

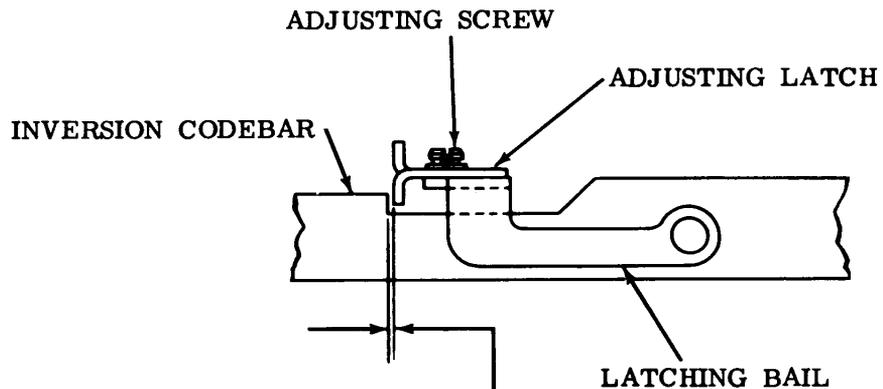
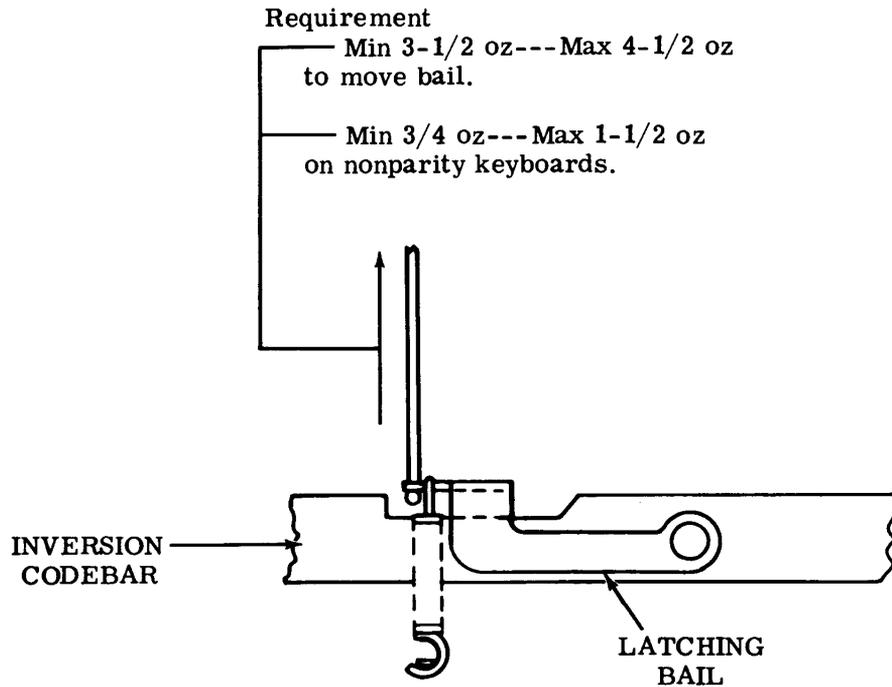
To Adjust

Tighten or loosen as required the four frame mounting screws.



2.15 Codebar Assembly (continued)

(A) INVERSION LATCH SPRING TENSION (EARLY DESIGN)



(B) INVERSION CODEBAR LATCH (EARLY DESIGN)

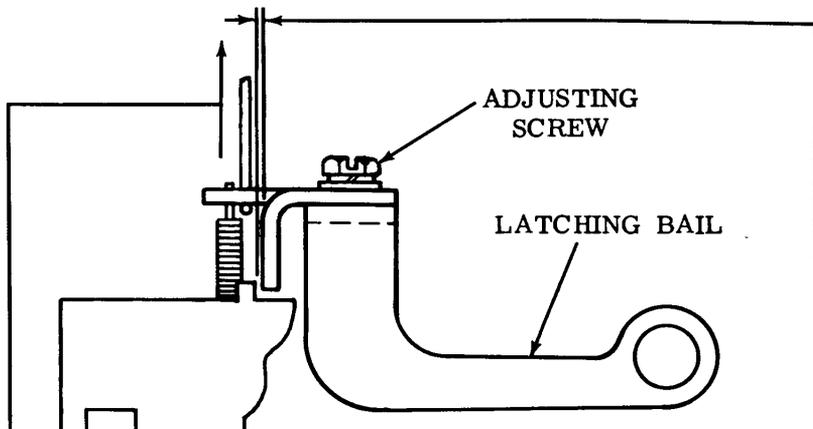
Requirement

- Signal generator disengaged
- Min 0.002 inch---Max 0.012 inch gap between inversion codebar and its latch.
- Latch should align with inversion codebar.

To Adjust

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

2.16 Codebar Assembly (continued)



CODEBAR

ADJUSTING
SCREW

LATCHING BAIL

INVERSION BAR LATCHING BAIL SPRING
(LATER DESIGN)

(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

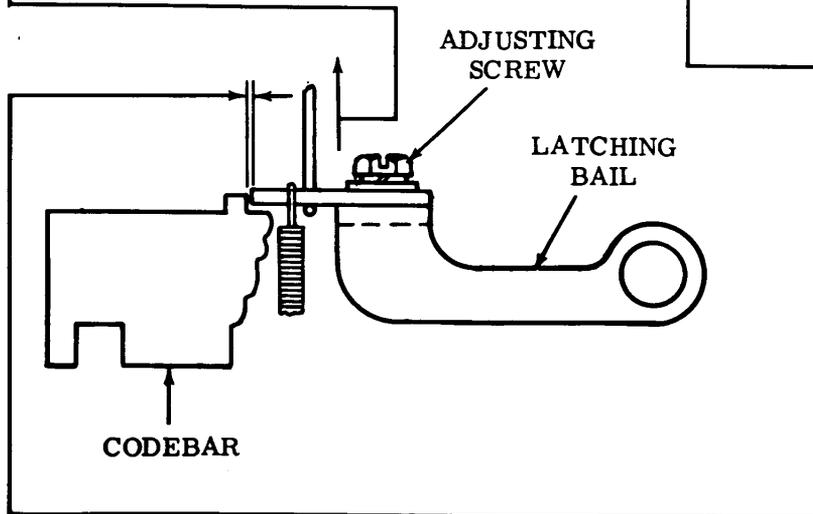
Signal generator clutch disengaged.

Min 0.002 inch---Max 0.012 inch

Gap between number 5 and 8 inversion code-
bars and their respective latches. Check
clearance at both the number 5 and 8 inver-
sion codebars and adjust to whichever is
closest.

To Adjust

With respective screws on inversion bail
latch friction tight, move adjustable exten-
sion to obtain clearance. Tighten screws
and recheck clearance.



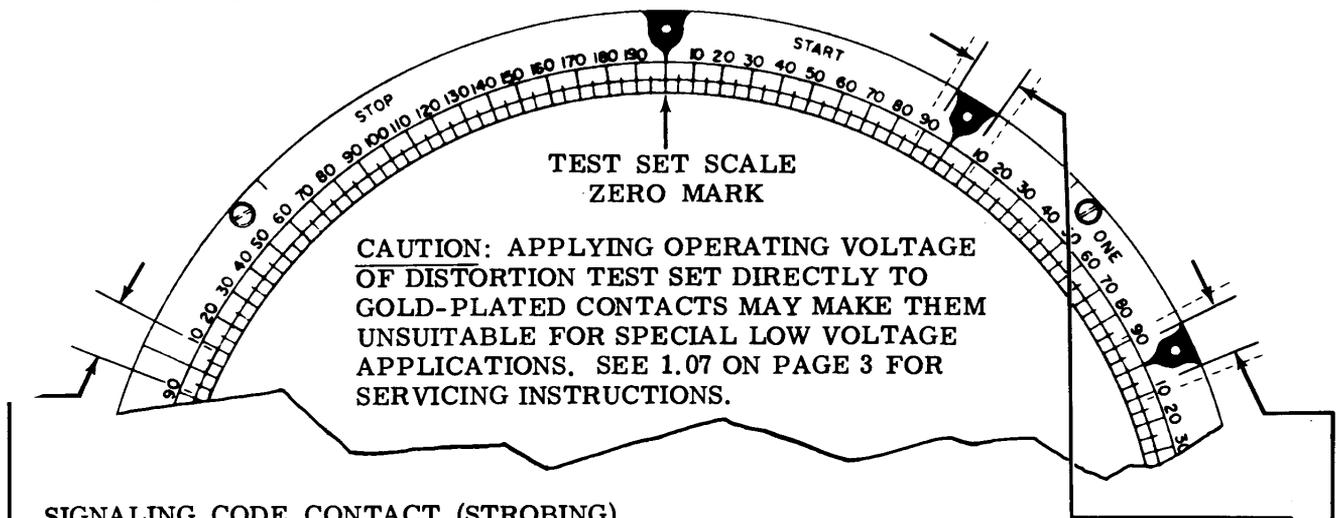
CODEBAR

ADJUSTING
SCREW

LATCHING
BAIL

2.17 Signal Generator Mechanism (continued)

Note: On units equipped with signal regenerators, remove regenerator circuit card before applying test set probes to contact access terminals.

SIGNALING CODE CONTACT (STROBING)

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 or start pulse on DXD scale when transmission is continuous and both units are operating at 100 wpm (600 rpm).

Note: If end of stop pulse varies, adjust the scale so the variation extends equally to either side of "0" mark of start pulse on scale. Numbers in parenthesis () are for units using timing contacts.

- (2) Nominal length of intelligence pulses is 100 divisions. If adjustment to feeler gauges does not permit pulse lengths within tolerance, refine SIGNAL CONTACT CLEARANCE Par. 2.05 adjustment. Favor intelligence pulses by using up to ± 8 divisions tolerance on beginning of stop pulse, so each is near as possible to 100 divisions in length.

Requirement

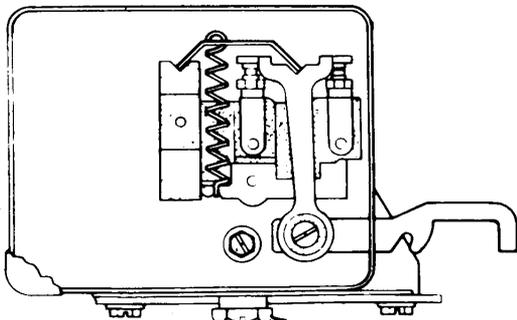
- (1) Each marking code pulse to begin not later than 8 (12) mark and no earlier than 92 (88) mark of previous pulse.
- (2) Each marking code pulse to end not earlier than 92 (88) mark or later than 8 (12) mark in pulse following one being observed.
- (3) Marking code pulses may have break not more than 3 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 1 division while changing from R to Y selection (or equivalent permutations for other codes).

Note: 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 $\pm 12\%$.

To Adjust

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

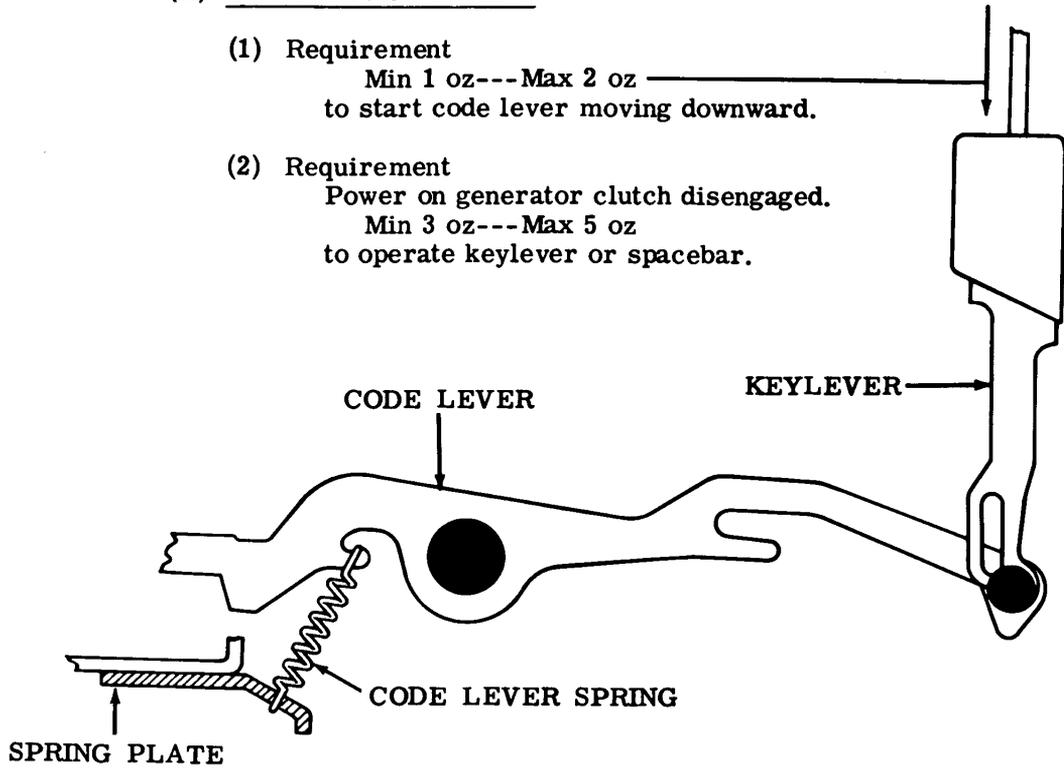


ECCENTRIC

2.18 Keyboard Mechanism (continued)

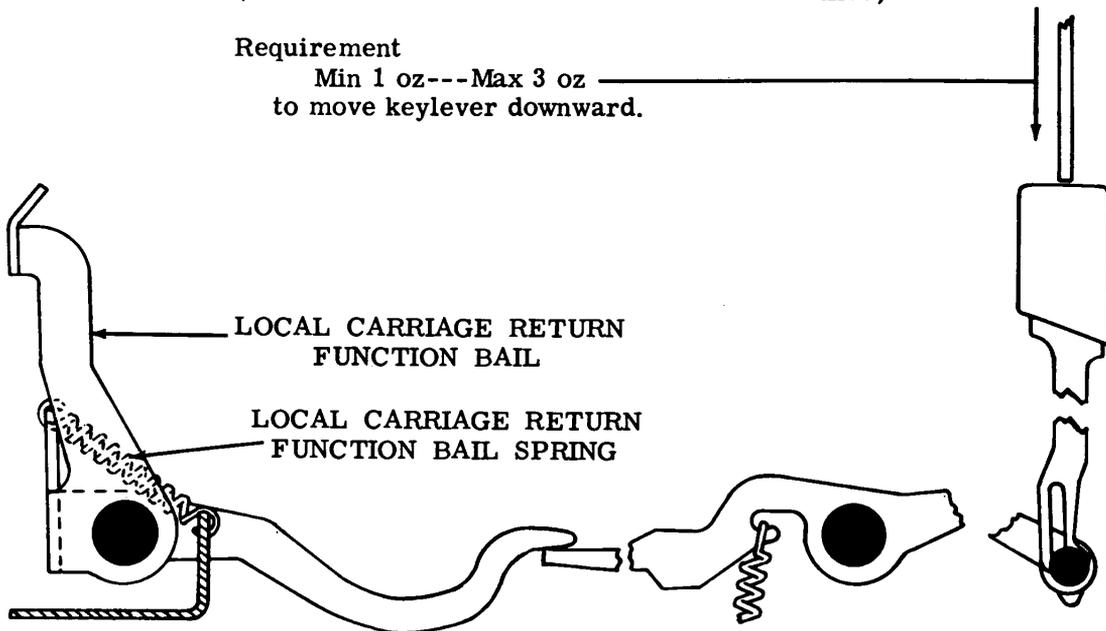
(A) CODE LEVER SPRING

- (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.



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

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



2.19 Codebar Assembly (continued)

(B) TRANSFER LEVER LOCKING BAIL SPRING

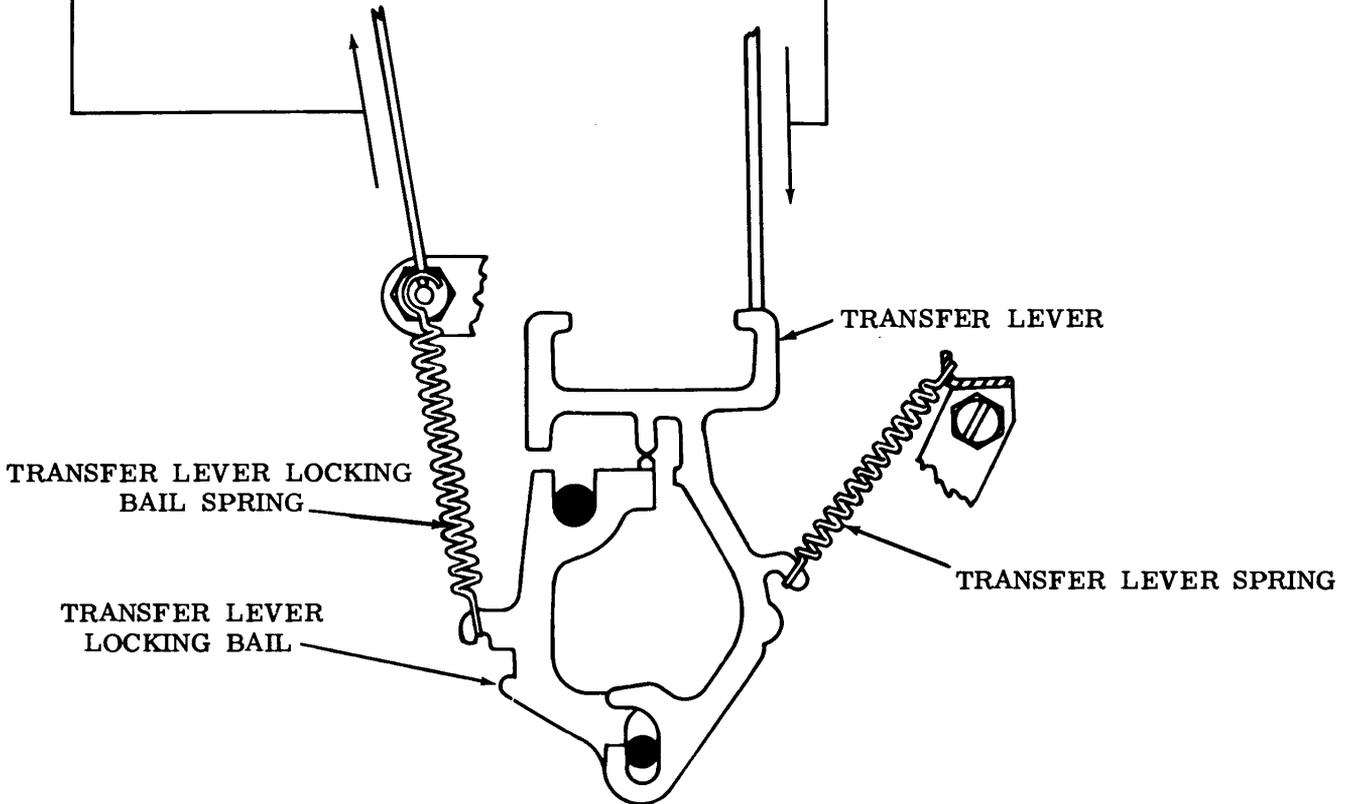
Requirement

Spring unhooked from post
Min 5 oz---Max 7 oz
to pull to installed length.

(A) TRANSFER LEVER SPRING

Requirement

Clutch disengaged
Min 1-1/2 oz---Max 2-1/2 oz
to start each of 10 levers moving.

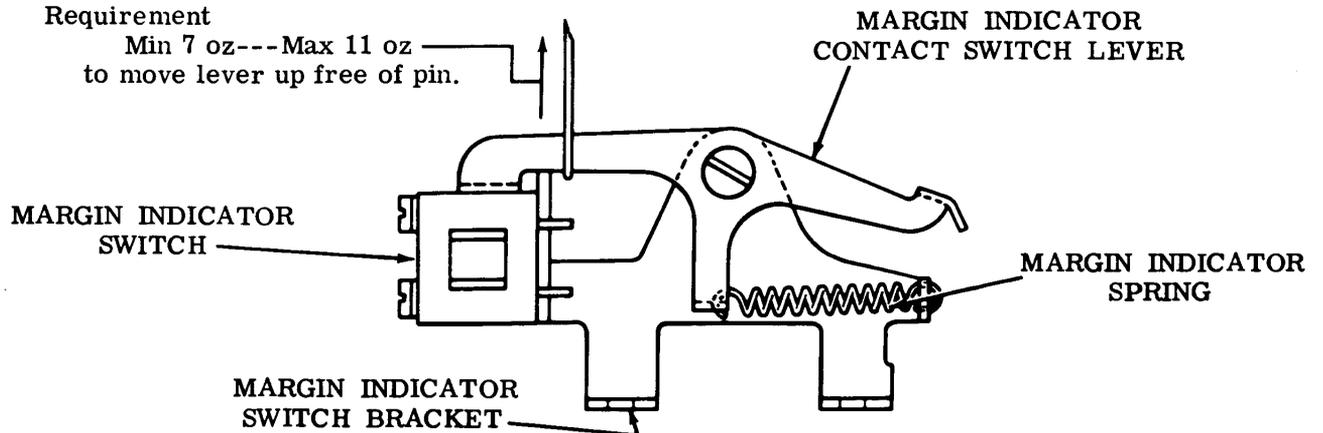


2.20 Interrelated Features

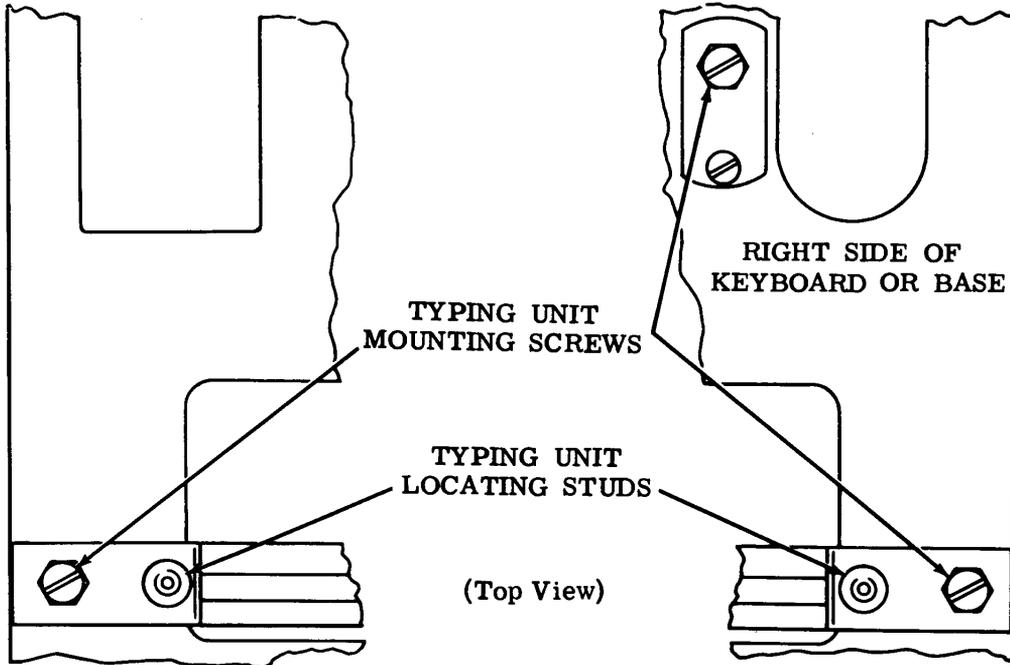
MARGIN INDICATOR SPRING

Requirement

Min 7 oz---Max 11 oz
to move lever up free of pin.



2.21 Interrelated Features (continued)



MOUNTING TYPING UNIT ON KEYBOARD

Requirement

When placing the typing unit on the base, hold it tilted slightly to the right. 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.

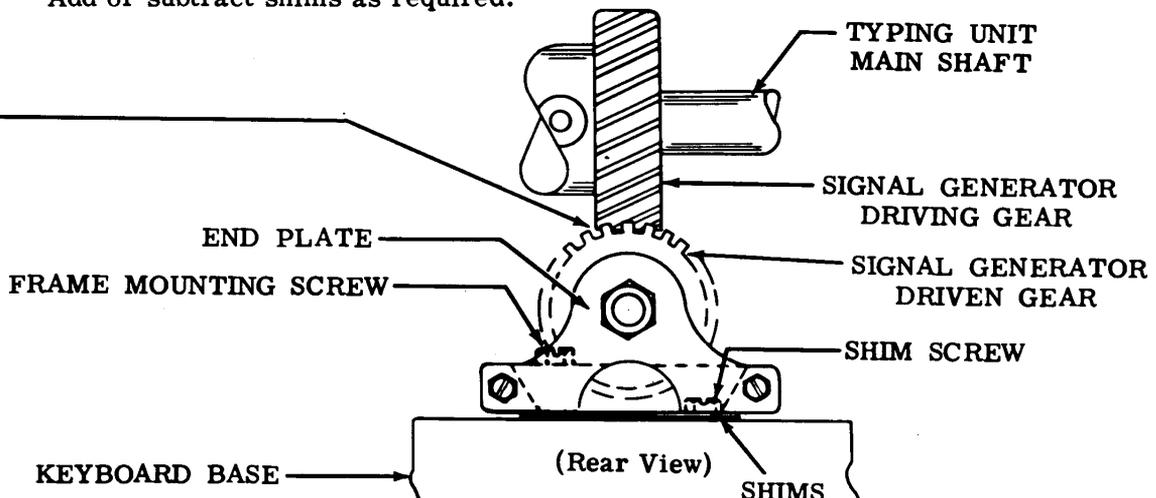
SIGNAL GENERATOR FRAME

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.



2.22 Interrelated Features (continued)

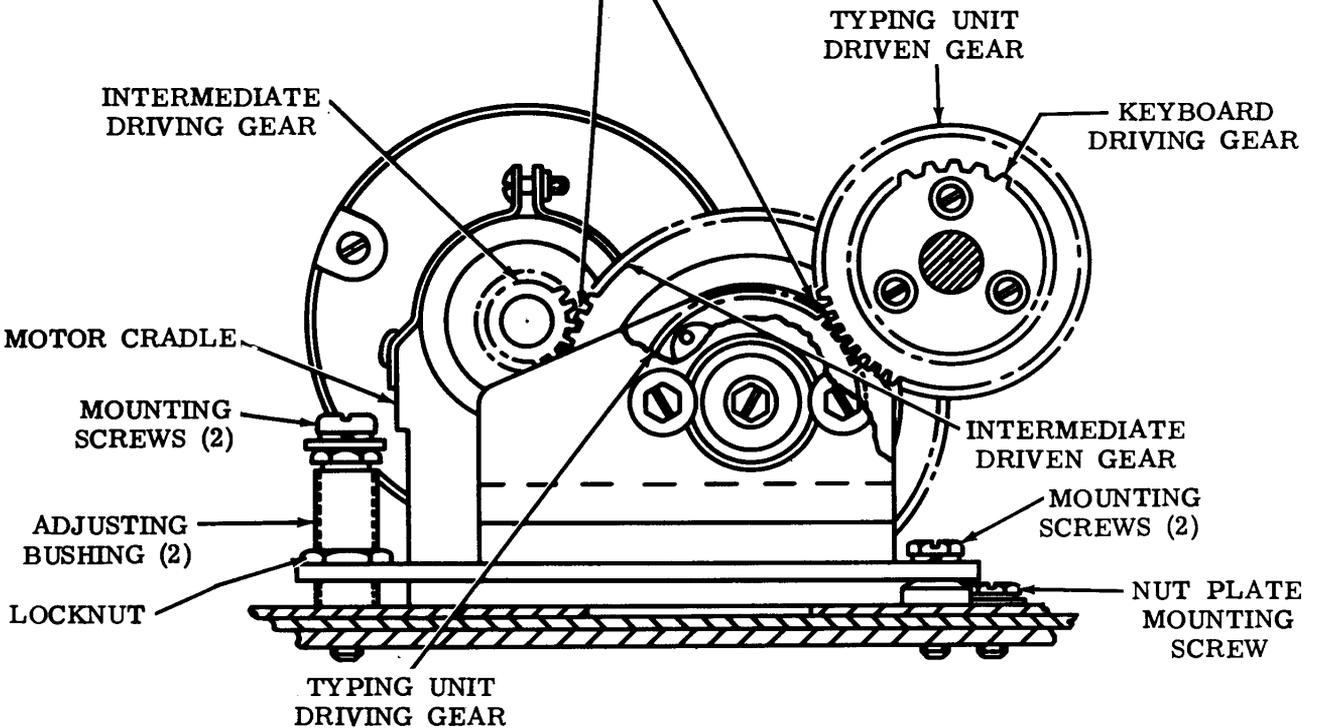
INTERMEDIATE GEAR ASSEMBLY

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.



MOUNTING REPERFORATOR UNIT ON KEYBOARD (NOT ILLUSTRATED)

Requirement

The reperforator should be mounted so that the jack shaft is in alignment with rear bearing bracket shaft end and is perpendicular to rear motor shaft.

To Adjust

Loosen setscrews in flexible coupling and slide coupling out of engagement with rear bearing bracket shaft. Loosen two screws on alignment bracket. Loosen four reperforator mounting screws. Align reperforator jack shaft with rear bearing bracket shaft and tighten reperforator mounting screws. Snub alignment bracket against reperforator casting and tighten two screws. If the shafts are not in alignment at this point, adjust rear bearing bracket to left or right until shafts are in alignment. Position and fasten flexible coupling.

3. VARIABLE FEATURES

3.01 Timing Contact Mechanism (Early Design)

TIMING CONTACT

(1) Requirement

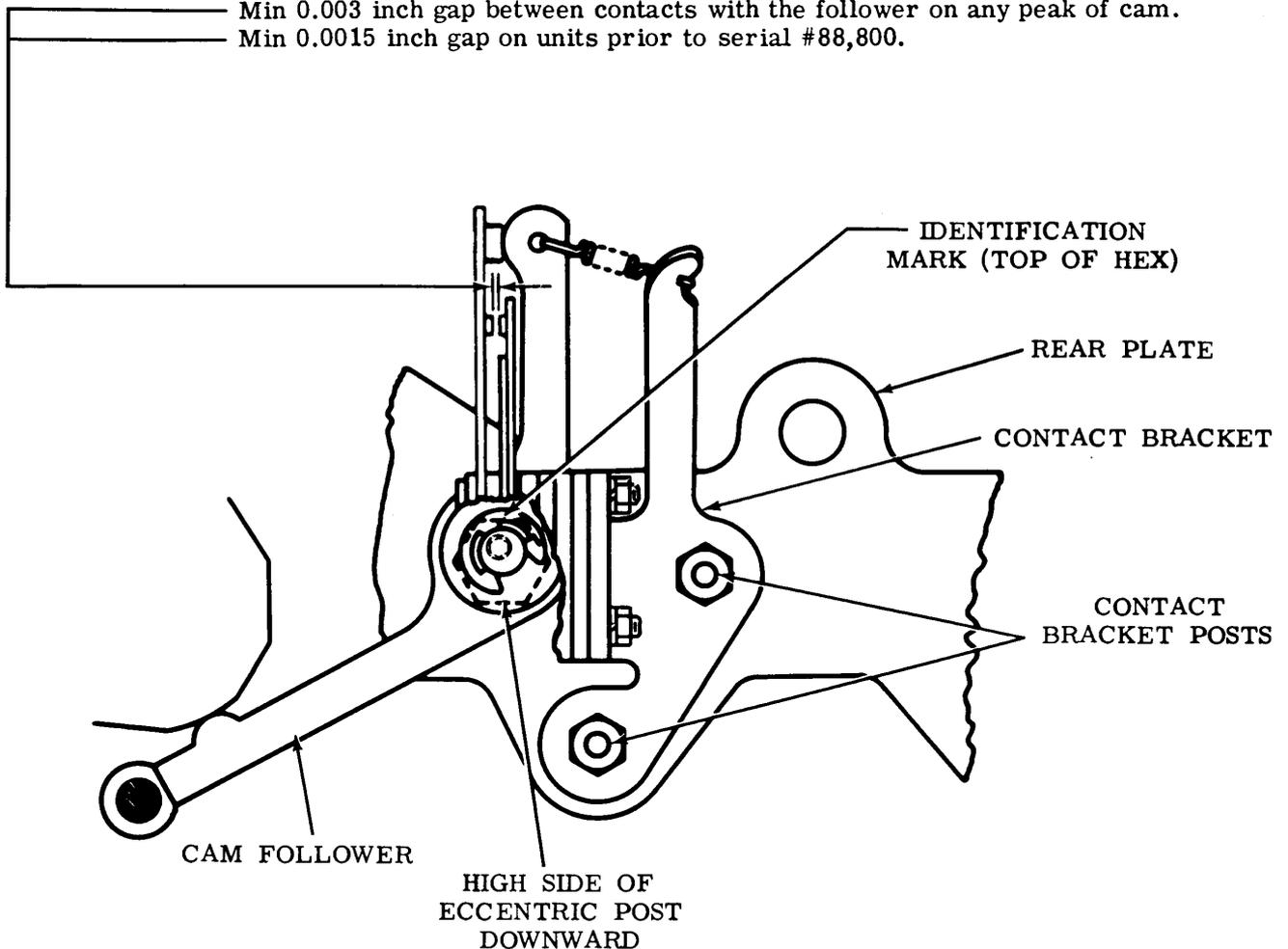
Contacts should be closed when nylon pad is raised 0.007 inch.
Contacts should be open when nylon pad is raised 0.015 inch.

To Check

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 0.0015 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 requirements.

Note: Use signal checking device to refine this adjustment.

3.02 Timing Contact Mechanism (Early Design) (continued)

(A) CONTACT SWINGER

Requirement

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

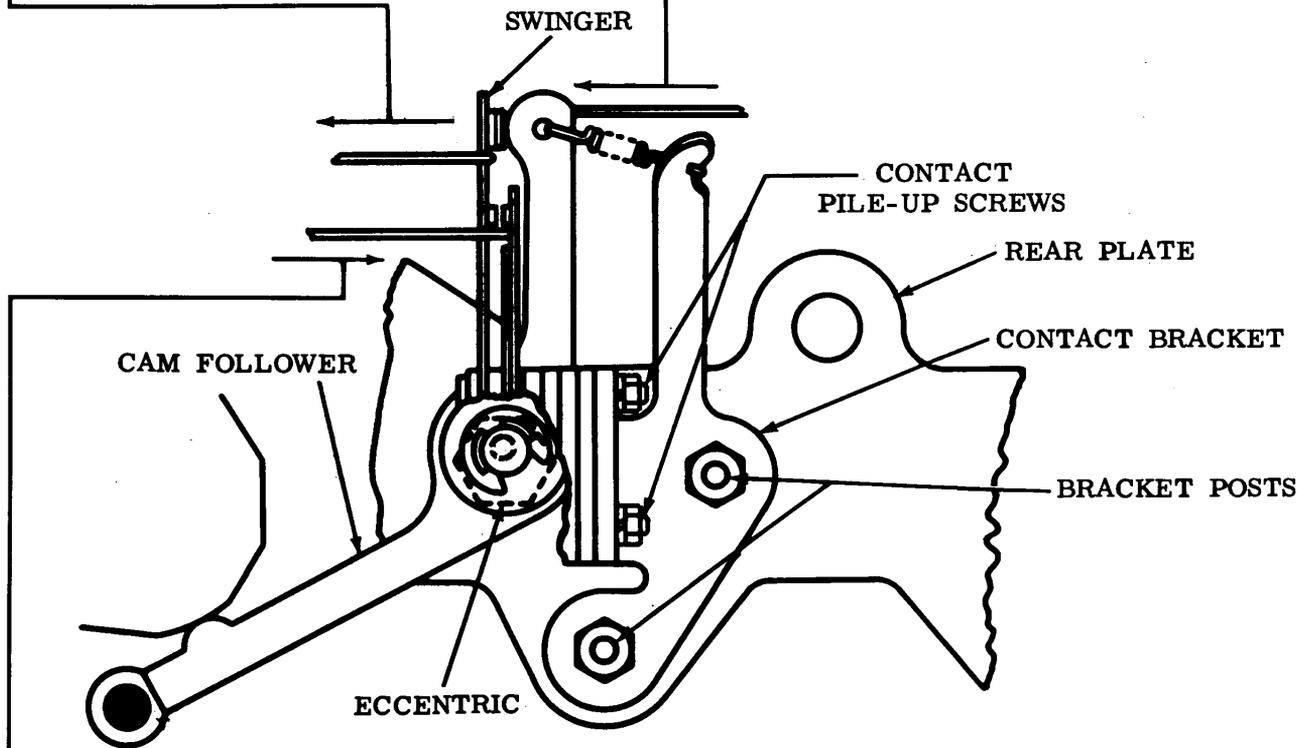
To Adjust

Use TP110455 spring bender.

(B) CAM FOLLOWER SPRING

Requirement

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



(C) CONTACT STIFFENER

Requirement

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

To Adjust

Remove transparent contact guard. Remove contact assembly from unit by removing two posts securing it to rear plate. Loosen two screws holding contact pile-up to contact bracket. Bend contact using TP110445 spring bender.

Note: Check CONTACT SWINGER Par. 3.02 and refine if necessary. Remake Par. 3.01 if necessary.

3.03 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

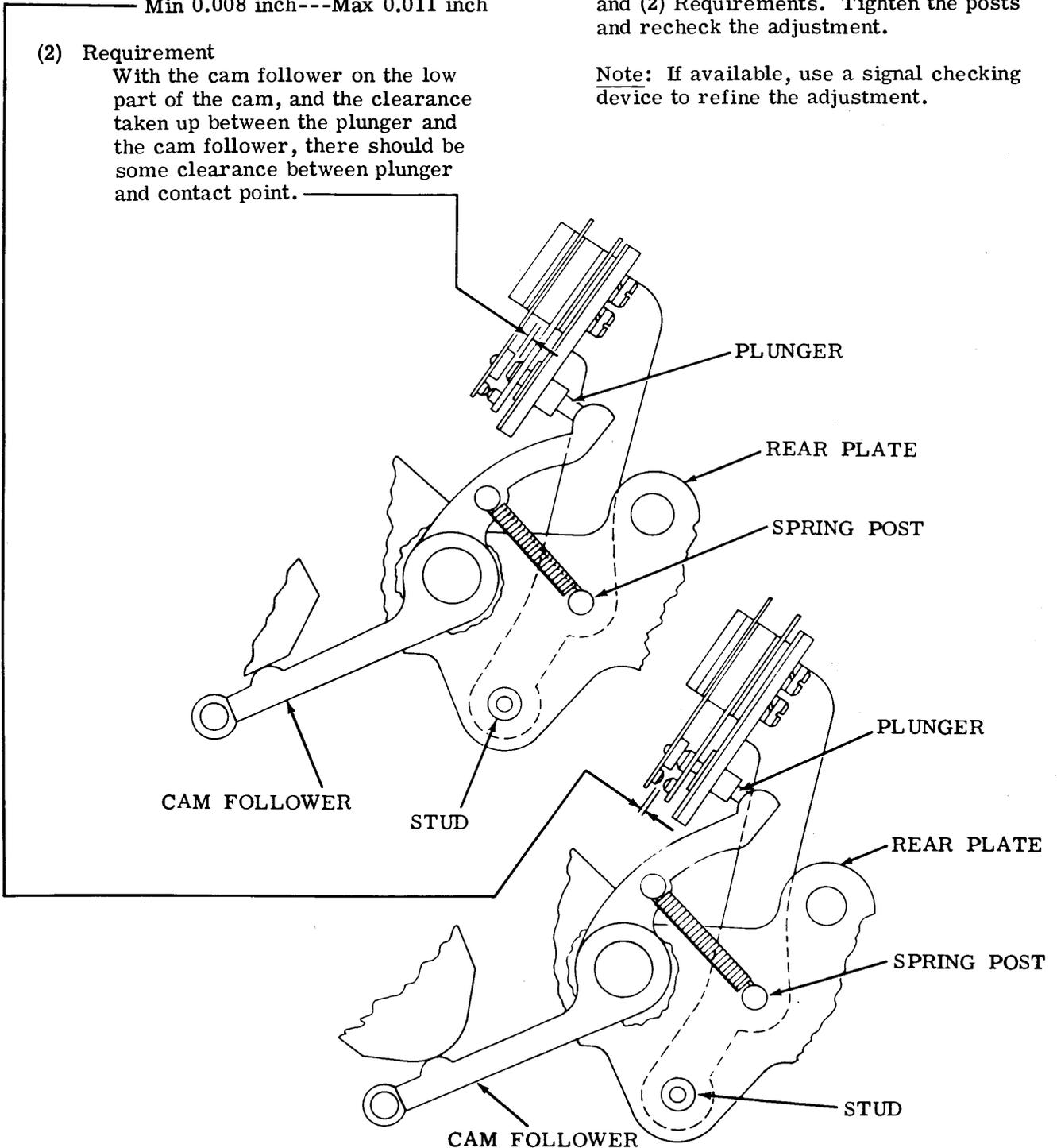
(2) Requirement

With the cam follower on the low part of the cam, and the clearance taken up between the plunger and the cam follower, there should be some clearance between plunger and contact point.

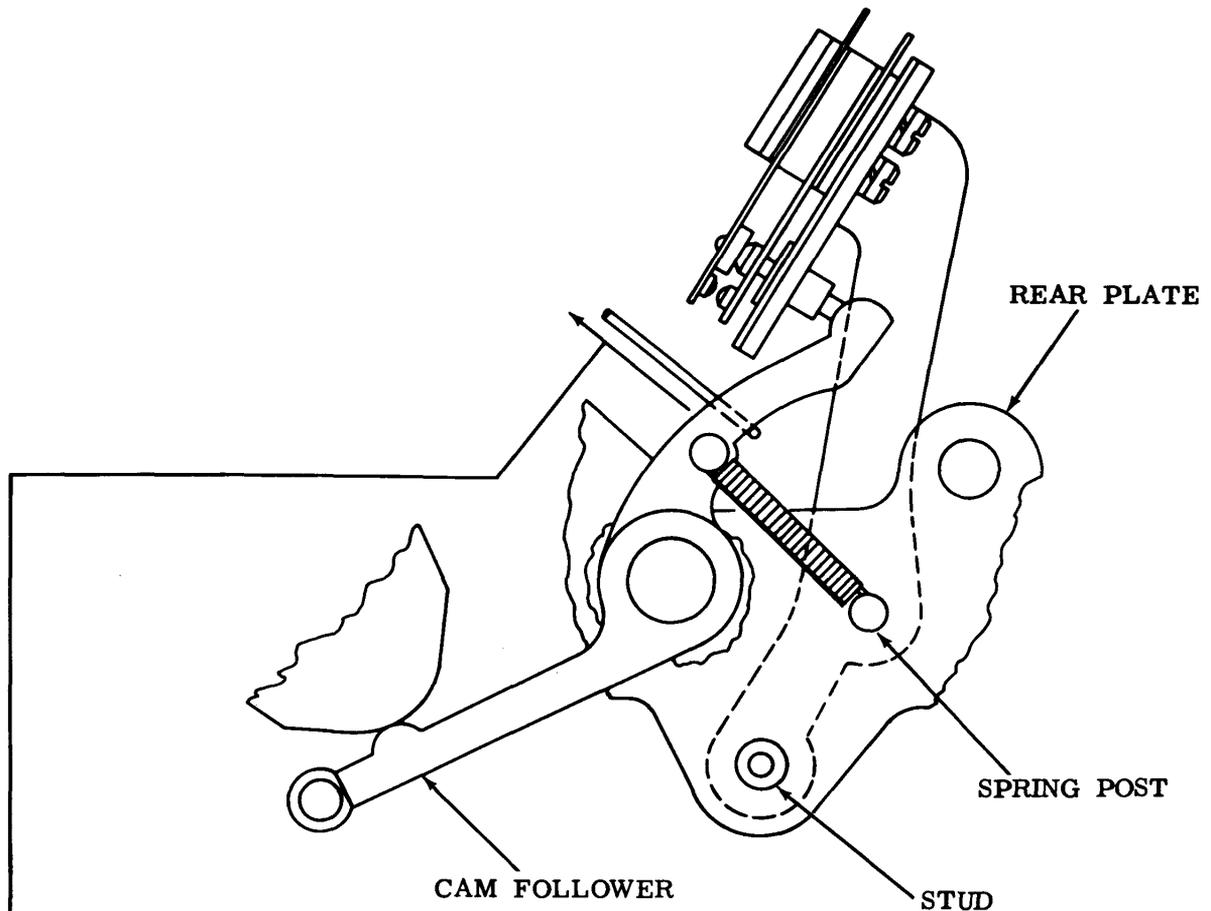
To Adjust

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: If available, use a signal checking device to refine the adjustment.



3.04 Timing Contact Mechanism (Later Design) (continued)



CAM FOLLOWER SPRING

To Check

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

Requirement

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

Min 6 oz---Max 9 oz
to start cam follower moving.

3.05 Timing Contact Mechanism (Later Design) (continued)

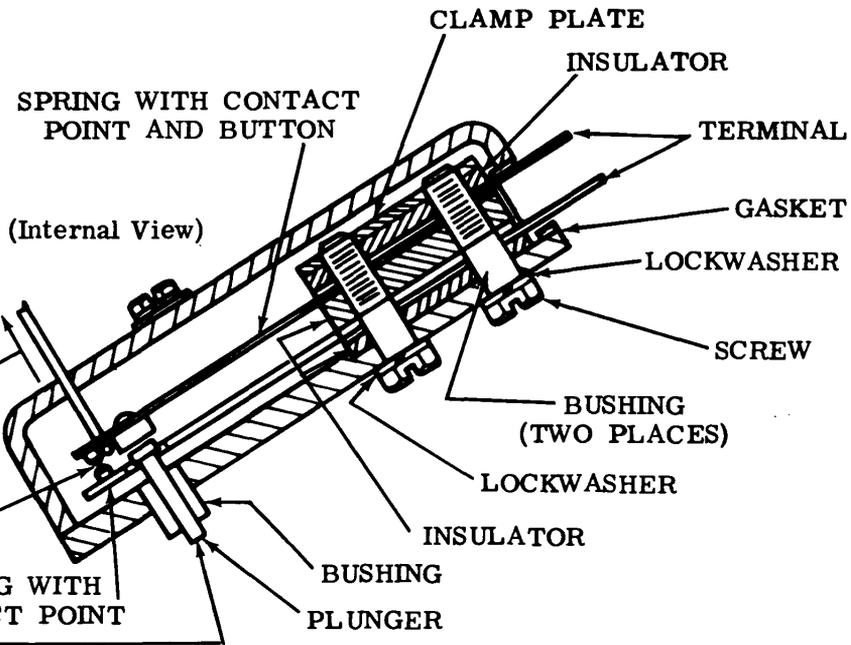
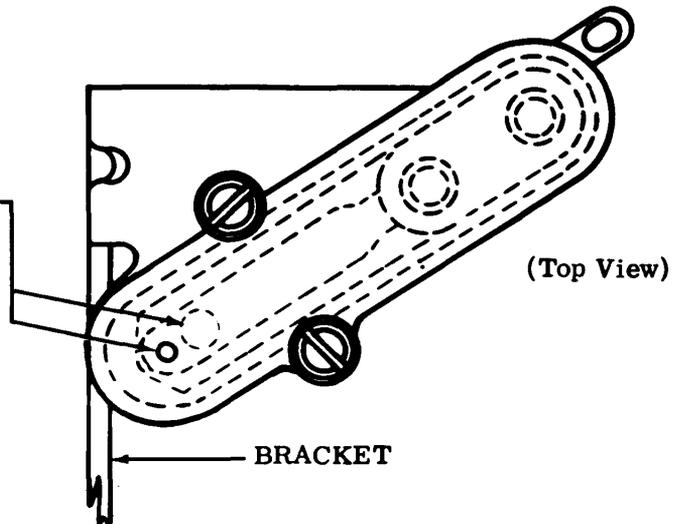
TIMING CONTACT SWINGER SPRING

(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.



(2) Requirement

With plunger depressed flush with its bushing, contact cap should be
 Min 0.045 inch---Max 0.065 inch

To Adjust

Bend spring.

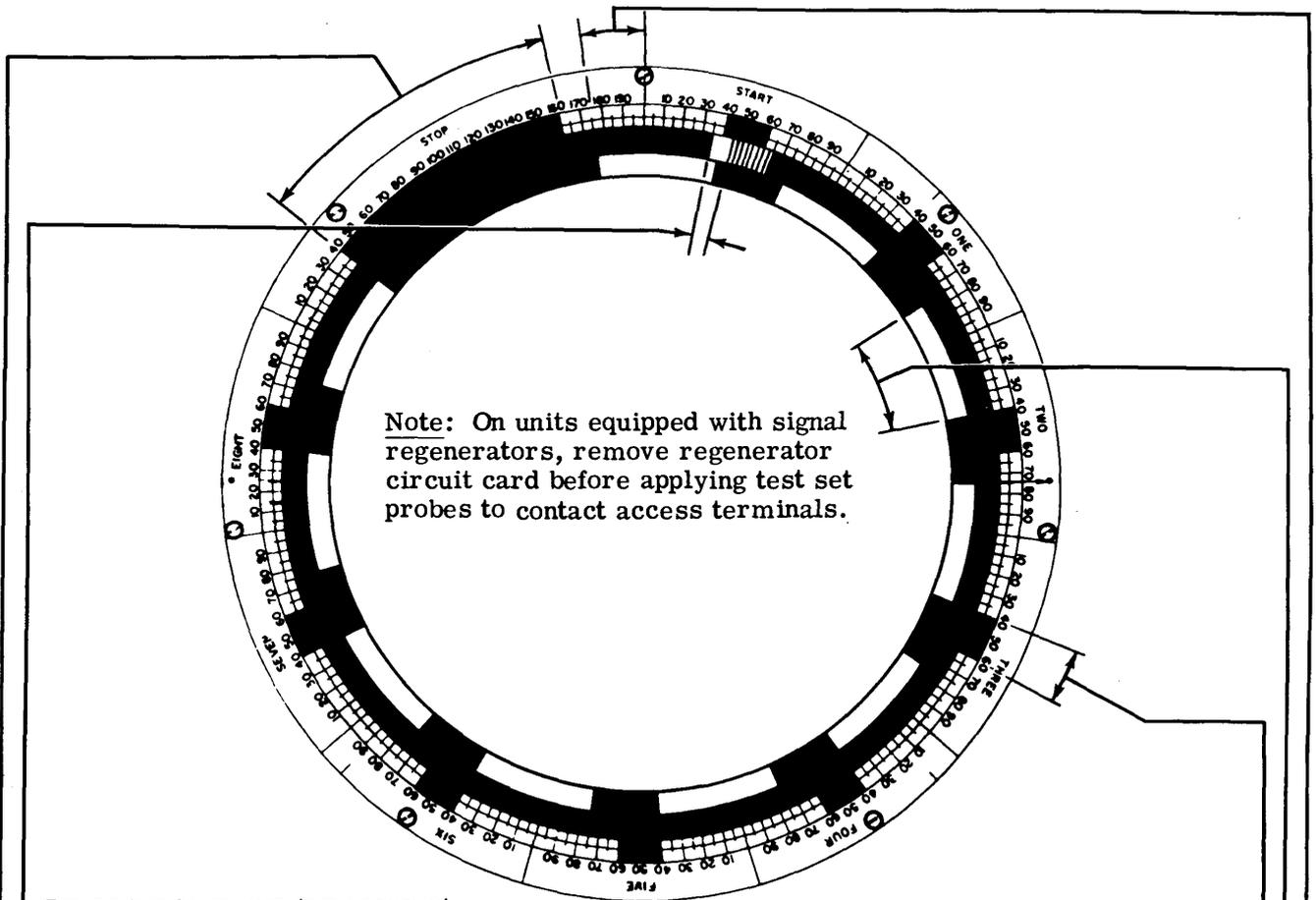
(3) Requirement

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.

3.06 Timing Contact Mechanism (continued)



TIMING CONTACT (STROBING)

- (1) Zero the test set as described in procedure (1) of Par. 2.17.
- (2) The light image of the timing contacts should meet the following requirements for speeds up to and including 100 words per minute.
 - (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, adjustment in Par. 3.01.

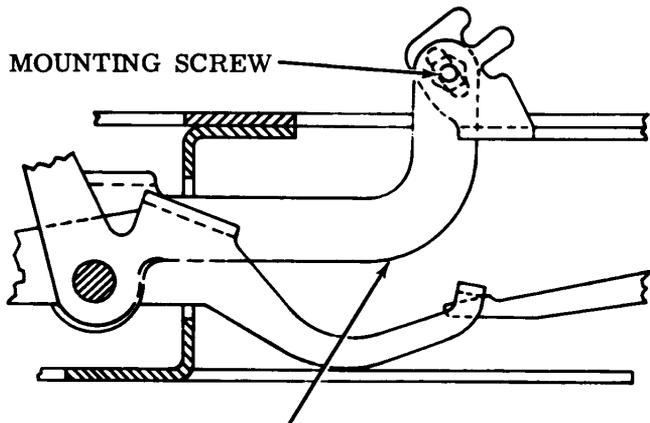
Note: The timing contacts should be open when the clutch is disengaged.

3.07 Local Backspace Mechanism

TRANSFER BAIL ADJUSTING LEVER

Requirement

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



TRANSFER BAIL
 ADJUSTING 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.

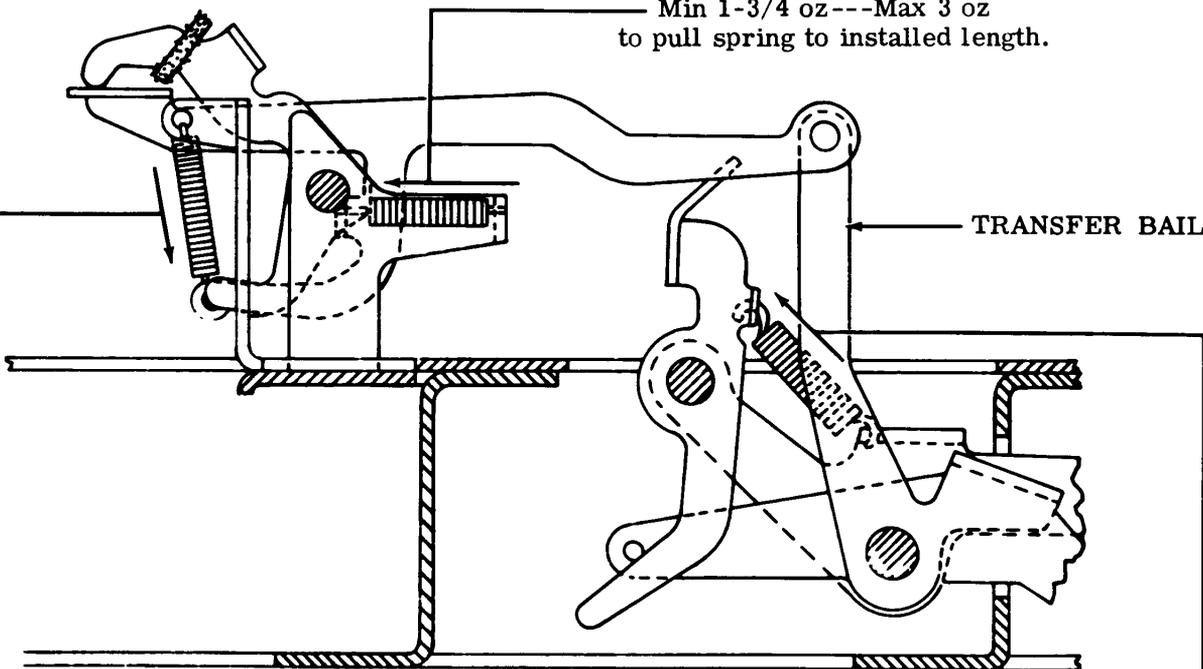
Note 1: This adjustment may require remaking when a different typing unit is used.

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

TRIP LINK HORIZONTAL SPRING

Requirement

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



TRIP LINK VERTICAL SPRING

Requirement

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

TRANSFER BAIL SPRING

Requirement

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

3.08 Receive-Break Switch Mechanism

RECEIVE-BREAK SWITCH

Requirement

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

To Check

Keyboard lock plunger in downward position. Function bail latched.

To Adjust

Loosen lock nut on adjusting screw and position screw. Recheck for overtravel.

RECEIVE-BREAK SWITCH TENSION

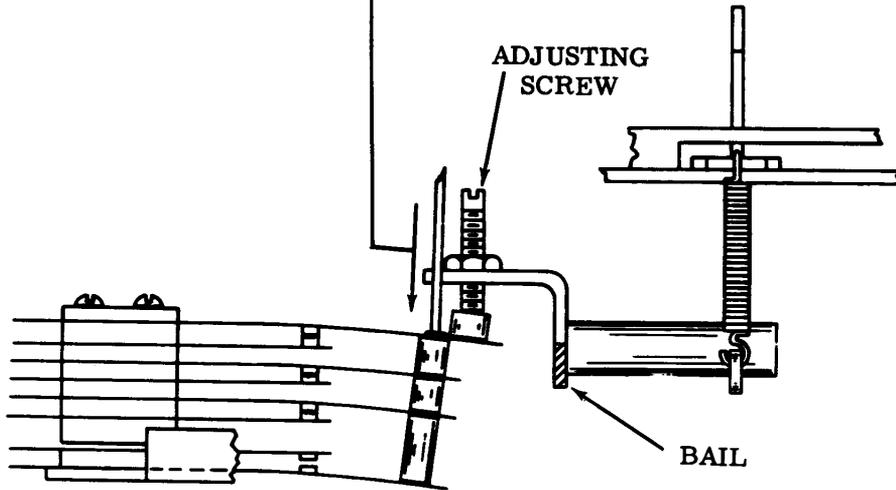
Requirement

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.

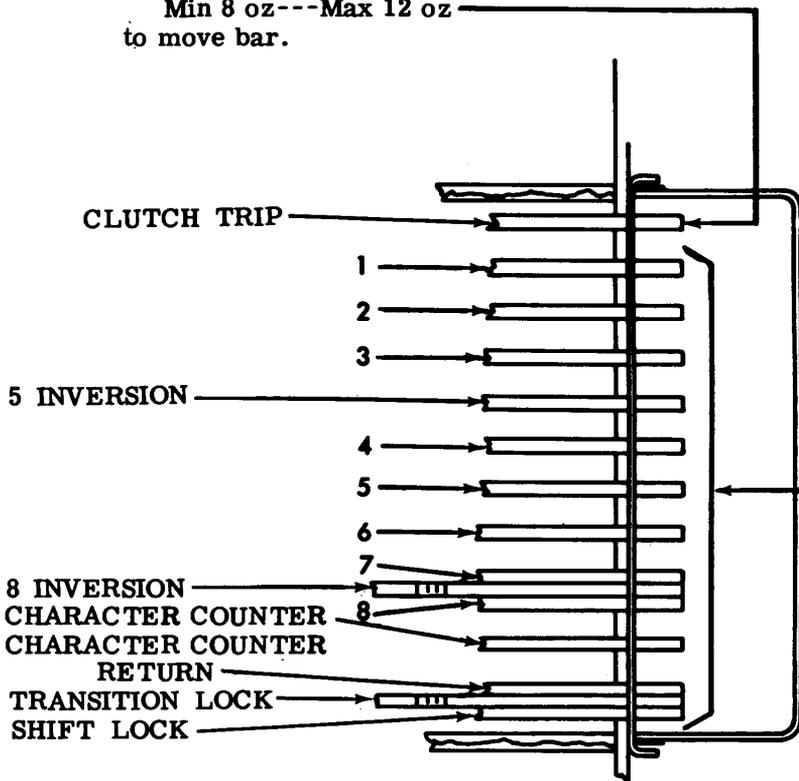


3.09 Codebar Arrangement for Even Parity

CLUTCH TRIPBAR SPRING

Requirement

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



CODEBARS, SHIFT AND CONTROL LOCKBAR, COUNTER AND RETURN BAR SPRINGS

Requirement

Depress rubout or delete key.
Power off. Transfer levers held right

Min 5 oz---Max 7-1/2 oz
(no. 4, 5, 7, and 8 codebars)

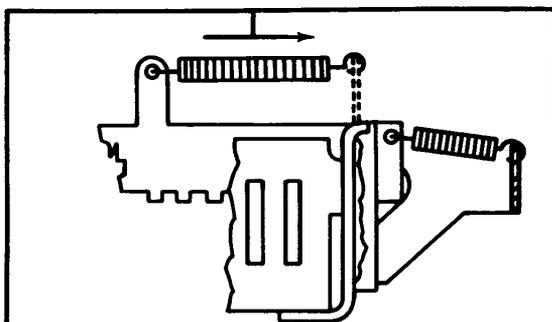
Min 2 oz---Max 4 oz
(all remaining bars)
to start bar moving.

NO. 5 AND NO. 8 INVERSION BAR SPRING

Requirement

Codebar in latched position.
Unhook spring at guide

Min 6 oz---Max 8 oz
to pull to installed length.



TRANSITION BAR SPRING

Requirement

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

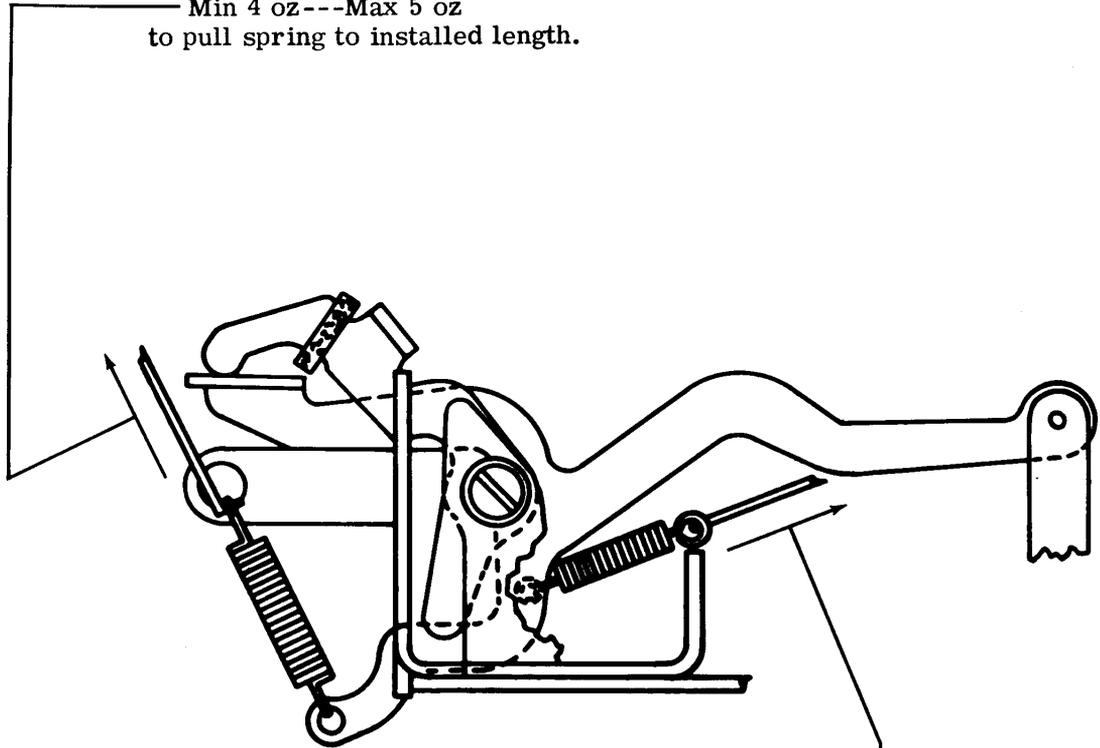
3.10 Local Single Line Feed Mechanism

TRIP LINK VERTICAL SPRING

Requirement

Unhook spring

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



(Left View)

TRIP LINK HORIZONTAL REAR SPRING

Requirement

Unhook spring

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

TRIP LINK FRONT SPRING

Requirement

Unhook spring

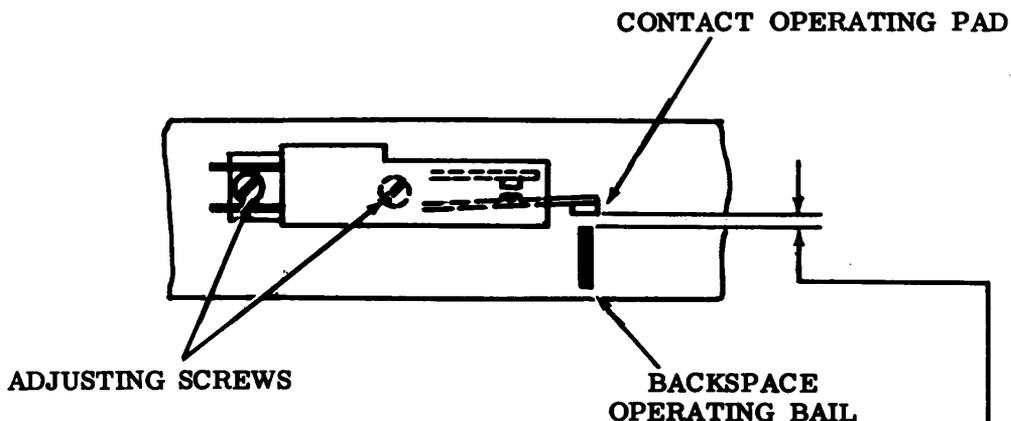
Min 1-1/2 oz---Max 2-1/2 oz
to pull spring to installed length.

3.11 Reperforator Backspace Actuating Switch Mechanism

OPERATING PAD GAP

Requirement

Depressing LOC BSP key should close normally open reperforator backspace actuating switch.

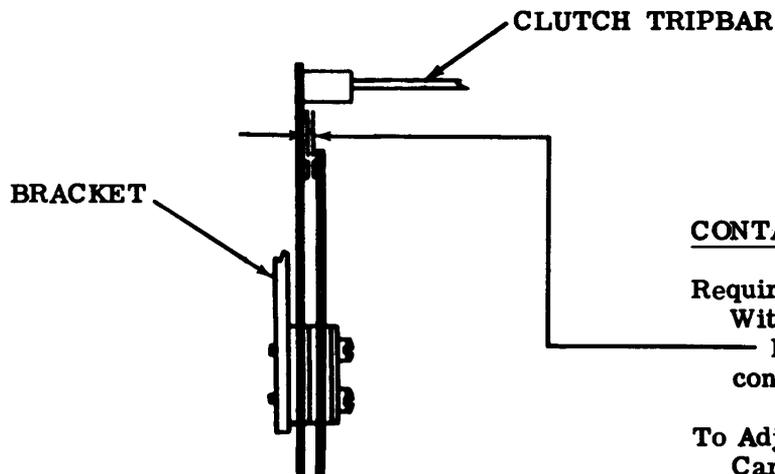


To Adjust

Check with ohmmeter, shift switch assembly on mounting holes.

Note: Ideal condition exists when printer and reperforator backspace simultaneously. To achieve, adjust by trial and error with printer and reperforator mounted. If reperforator backsplaces before printer, increase gap between contact operating pad and backspace operating bail. If printer backsplaces first, decrease gap.

3.12 Keyboard Universal Contact Mechanism



CONTACT GAP

Requirement

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

To Adjust

Carefully bend contact spring to meet requirement.

3.13 Tape Alarm

TAPE ALARM SWITCH

Requirement

Switch should operate when roll of tape is reduced in diameter
Min 2-3/8 inch---Max 2-1/2 inch

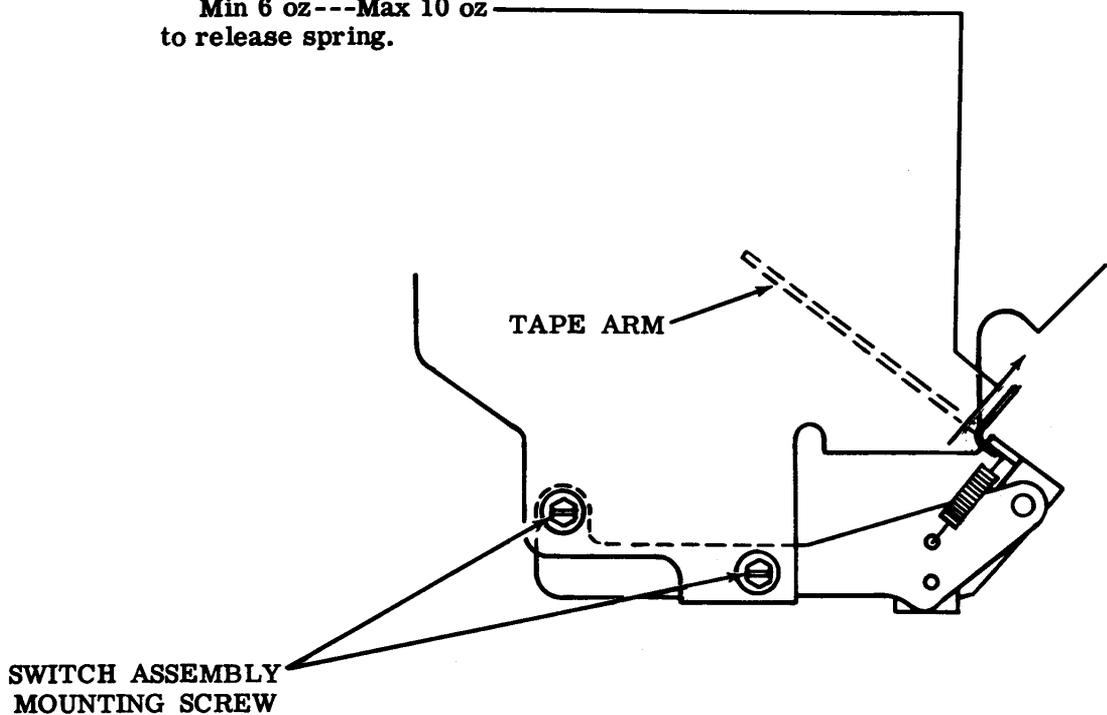
To Adjust

With switch assembly mounting screws loosened, position assembly
in tape container to meet requirement. Bend tape arm if necessary.

TAPE ARM SPRING

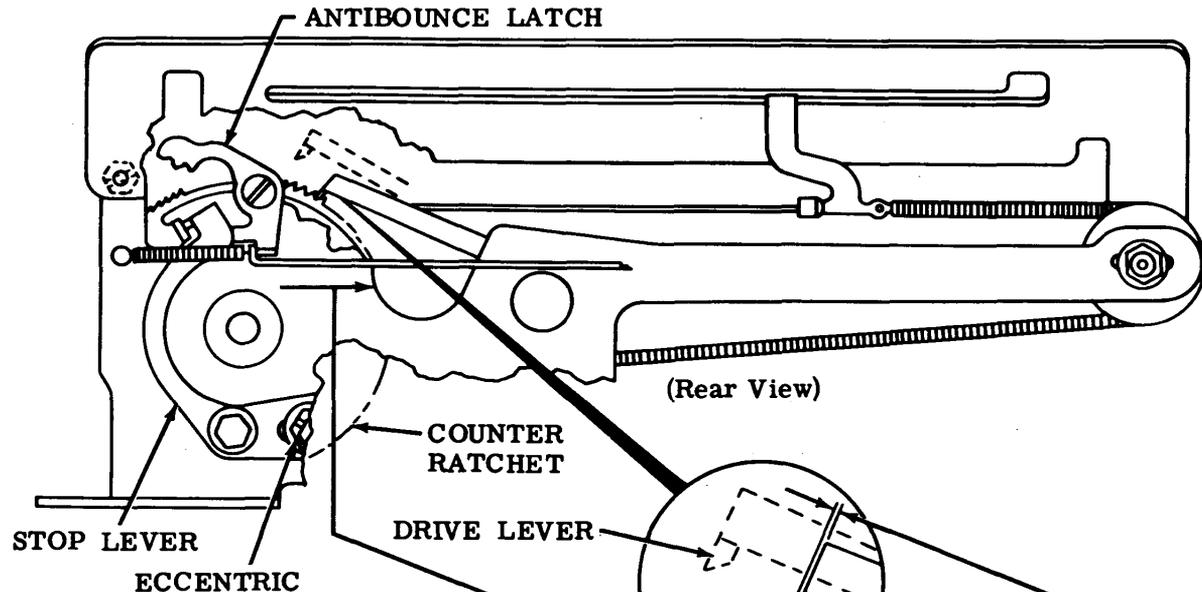
Requirement

Hook spring scale over tape lever and pull in line with spring
Min 6 oz---Max 10 oz
to release spring.



3.14 Character Counter Mechanism

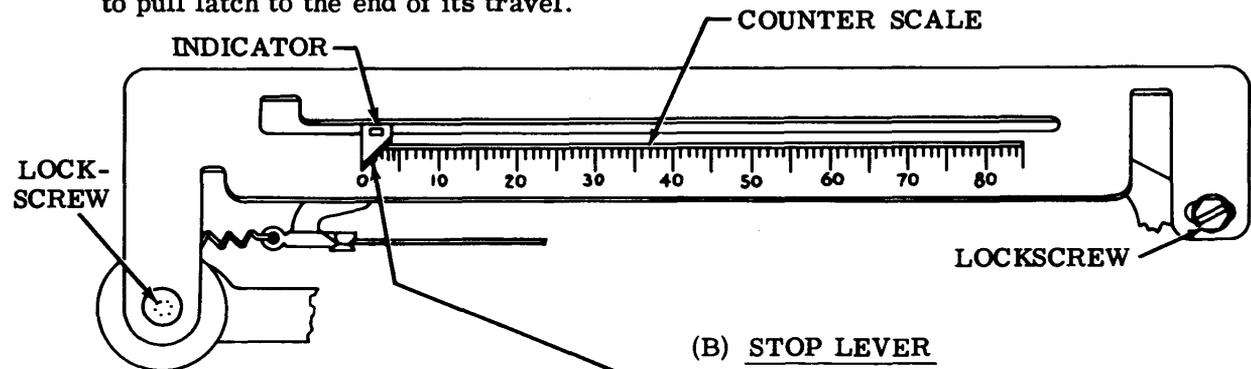
Note: Character counter adjustments may be facilitated by removing the assembly from the keyboard except for Par. 3.16, character counter stroke.



(A) ANTIBOUNCE SPRING

Requirement

Min 25 grams---Max 35 grams
to pull latch to the end of its travel.



(C) CHARACTER COUNTER SCALE

(1) Requirement

When indicator is at extreme left of scale, it should point to zero.

To Adjust

Set indicator to left. Loosen lock-screws and position scale.

(2) Requirement

Point of indicator should not touch throughout its entire travel.

To Adjust

Form the indicator.

(B) STOP LEVER

(1) Requirement

With the counter ratchet fully returned and resting against its stop lever, the clearance between the latchlever and the face of the fourth ratchet tooth should be

Min 0.002 inch---Max 0.010 inch

(2) Requirement

The antibounce latch should not interfere with the rotation of the ratchet.

To Adjust

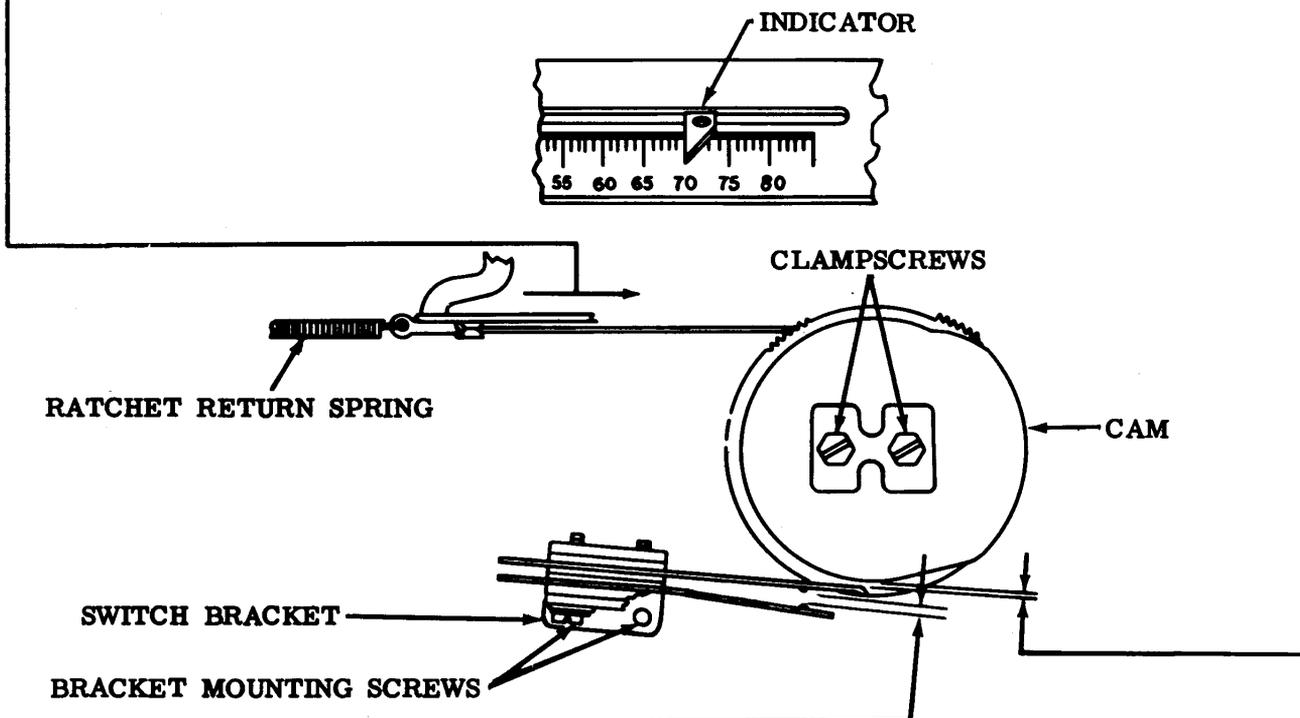
Hold the drive lever out of engagement with the ratchet and rotate the stop lever eccentric.

3.15 Character Counter Mechanism (continued)

(A) RATCHET DRUM ASSEMBLY RETURN SPRING

Requirement

- Min 1/2 oz---Max 1-1/2 oz
when indicator points to 35 on the scale.
- Min 1-1/2 oz---Max 2-1/2 oz
when indicator points to 70 on the scale.



(B) END-OF-LINE SWITCH

(1) Requirement

Switch leaves should be approximately parallel to switch mounting bracket as gauged by eye. Upper switch leaf should clear low part of cam
 Min some---Max 0.025 inch
 at closest point.

To Adjust

Loosen switch bracket mounting screws and position assembly.

(2) Requirement

Clearance between contacts of switch leaves should be
 Min 0.005 inch---Max 0.020 inch

To Adjust

Bend lower leaf of switch.

(3) Requirement

Switch should close at a preset number of characters with a small amount of overtravel by both contact leaves.

To Adjust

Set indicator to count desired. Loosen clampscrews and adjust cam until switch just closes. Tighten screws. Check operation and refine 1, 2, and 3 if necessary.

3.16 Character Counter Mechanism (continued)

(A) CHARACTER COUNTER STROKE

Requirement - Mount Assembly on Keyboard
When character and REPEAT keys are depressed, the counter should operate consistently in T or K-T position. When CARRIAGE RETURN key is depressed, the counter should reset without binding. The mechanism should count the first character on a restart after reset condition.

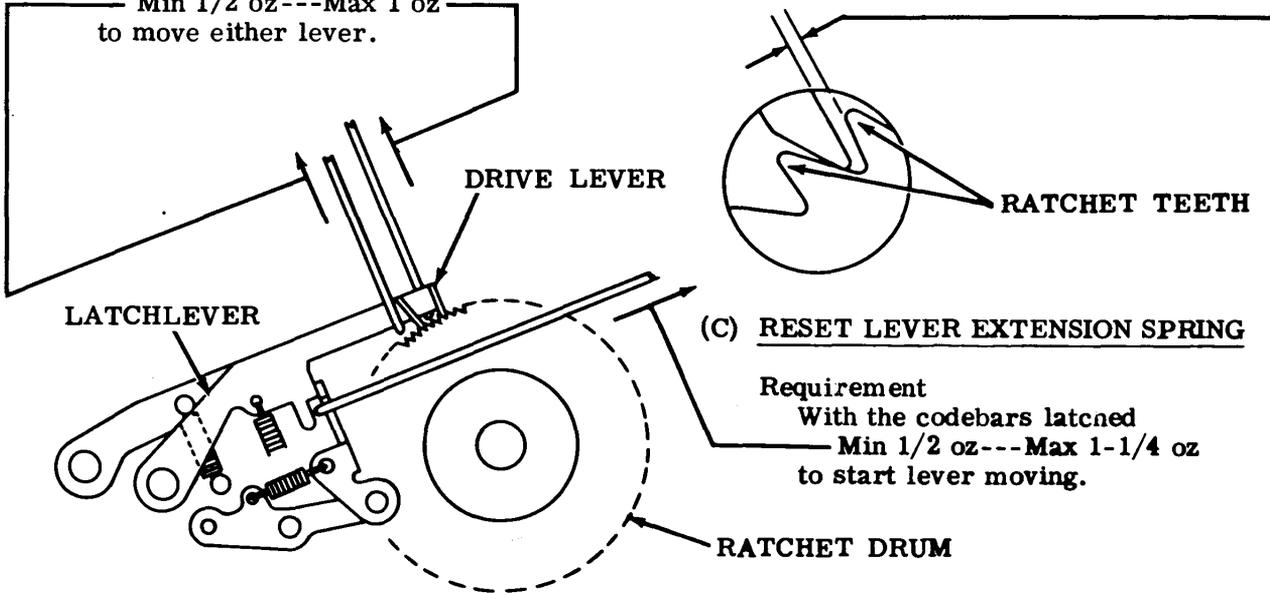
Min 0.006---Max 0.015 inch
between drive lever and ratchet tooth, when counter is set near midpoint of its range.

To Adjust

Loosen mounting screws. With keyboard in T position, start motor and strike CARRIAGE RETURN key, and then E key. Turn off motor. Depress E key. Position character counter frame for clearance. Turn control knob to K-T position and recheck. Refine if necessary.

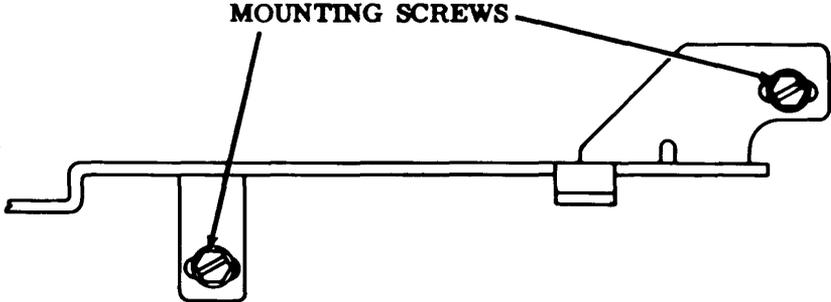
(B) RESET LATCHLEVER AND DRIVE LEVER SPRING

Requirement
Min 1/2 oz---Max 1 oz
to move either lever.



(C) RESET LEVER EXTENSION SPRING

Requirement
With the codebars latched
Min 1/2 oz---Max 1-1/4 oz
to start lever moving.



3.17 Auxiliary Contact Mechanism

CONTACT GAP

Requirement

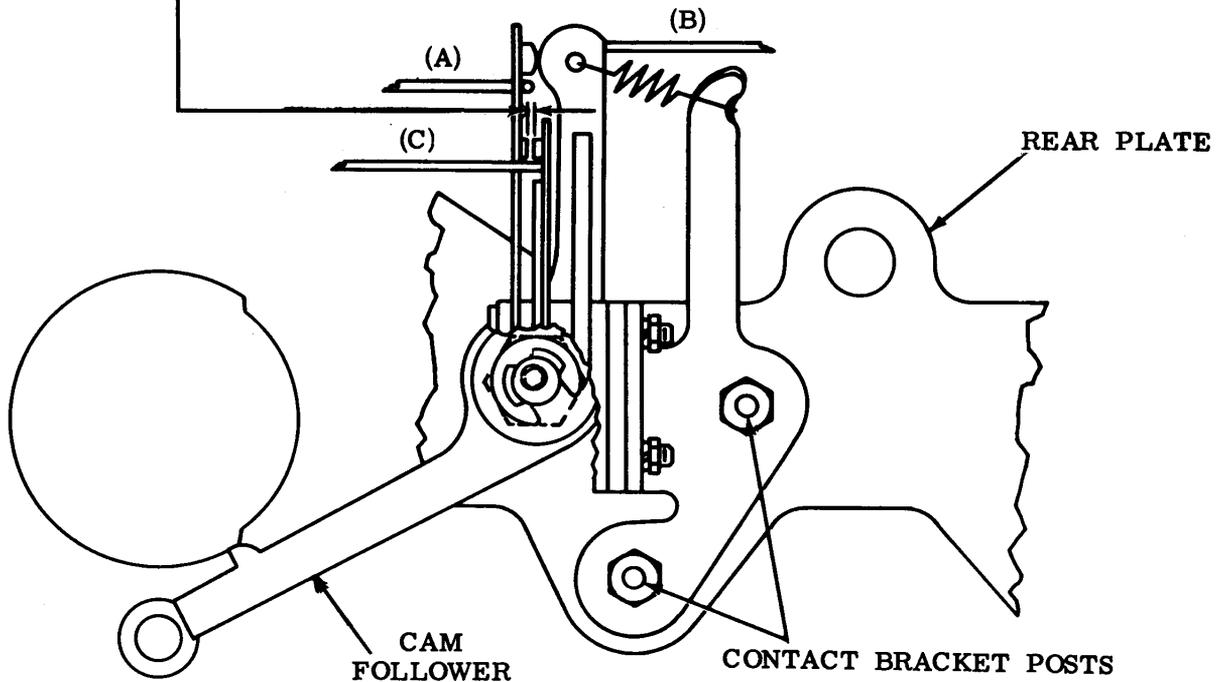
Clutch latched, cam follower on high part of cam.

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.



See Par. 3.02 for requirements of:

- (A) CONTACT SWINGER
- (B) CAM FOLLOWER SPRING
- (C) CONTACT STIFFENER

See Par. 3.23 for AUXILIARY CONTACT REFINEMENT (STROBING).

3.18 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. See Par. 3.19.

(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.

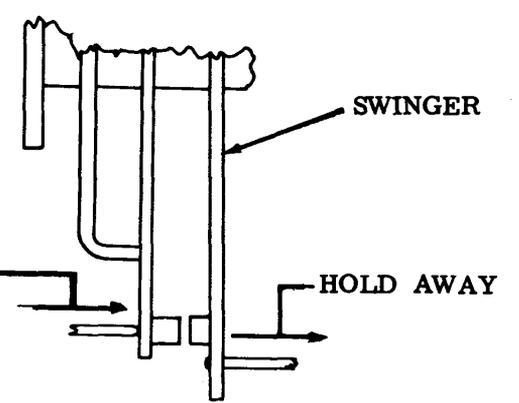
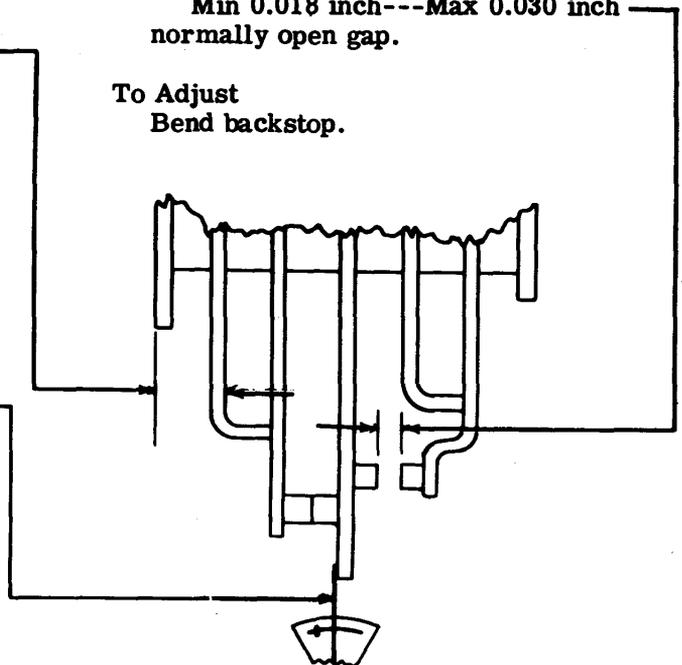
(B) NORMALLY CLOSED CONTACT SPRING

Requirement

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

To Adjust

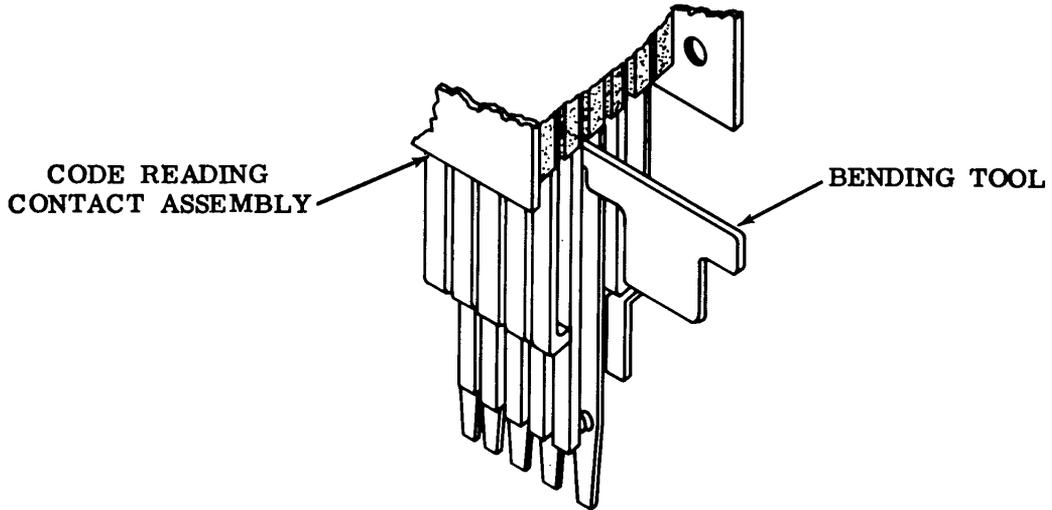
Bend spring. To increase tension against backstop, bend backstop away from spring leaf and form leaf toward backstop, then reposition backstop per BACKSTOP - NORMALLY CLOSED CONTACT Par. 3.18.



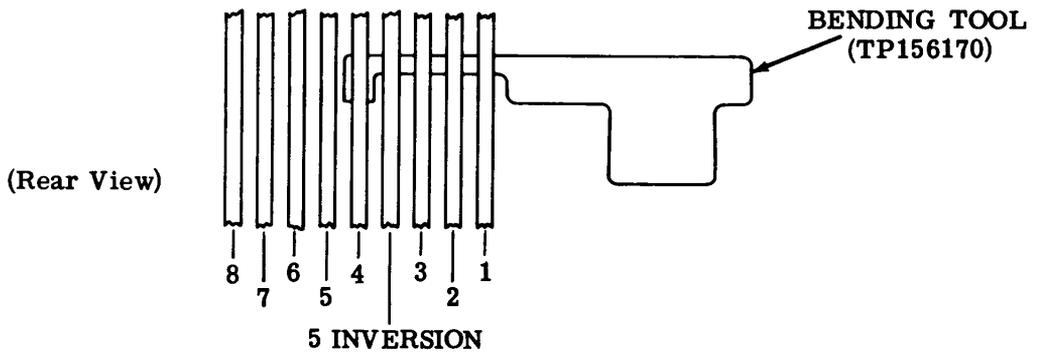
3.19 Code Reading Contact Mechanism (continued)

ADJUSTING CODE READING CONTACTS

- (1) The contact assembly should be removed from the keyboard to perform the adjustments of Par. 3.18. It is not necessary to remove the wires from the assembly.



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



- (3) After adjusting contact pile-ups 4, 5I, 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.

3.20 Code Reading Contact Mechanism (continued)

Note: Perform LATCHLEVER SPRING. Then install contact assembly on the keyboard for the remaining code reading contact adjustments.

(B) MARKING CONTACT GAP

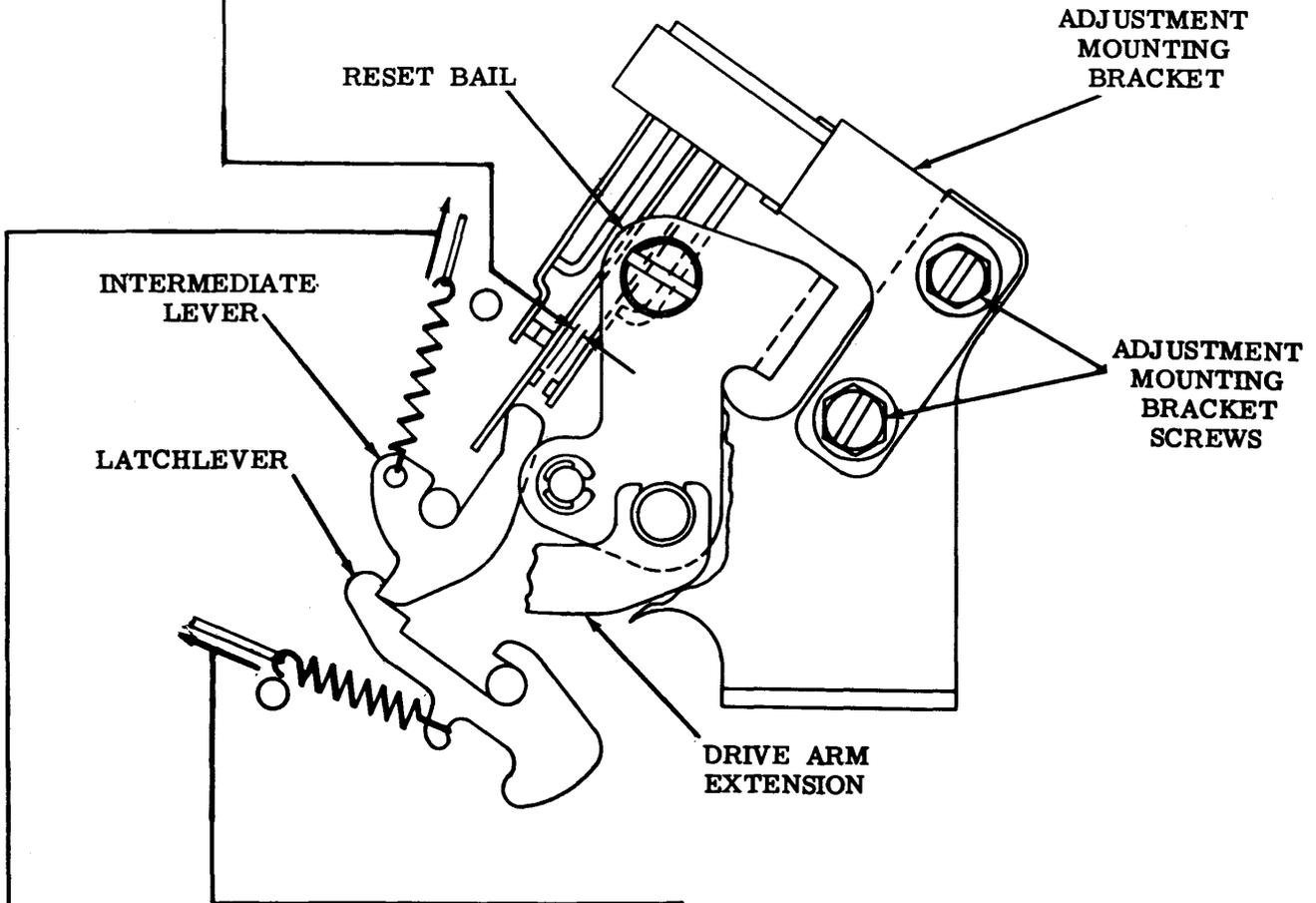
Requirement

With the clutch latched
 Min 0.005 inch---Max 0.015 inch
 contact gap.

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.

3.21 Code Reading Contact Mechanism (continued)

RESET BAIL

Requirement

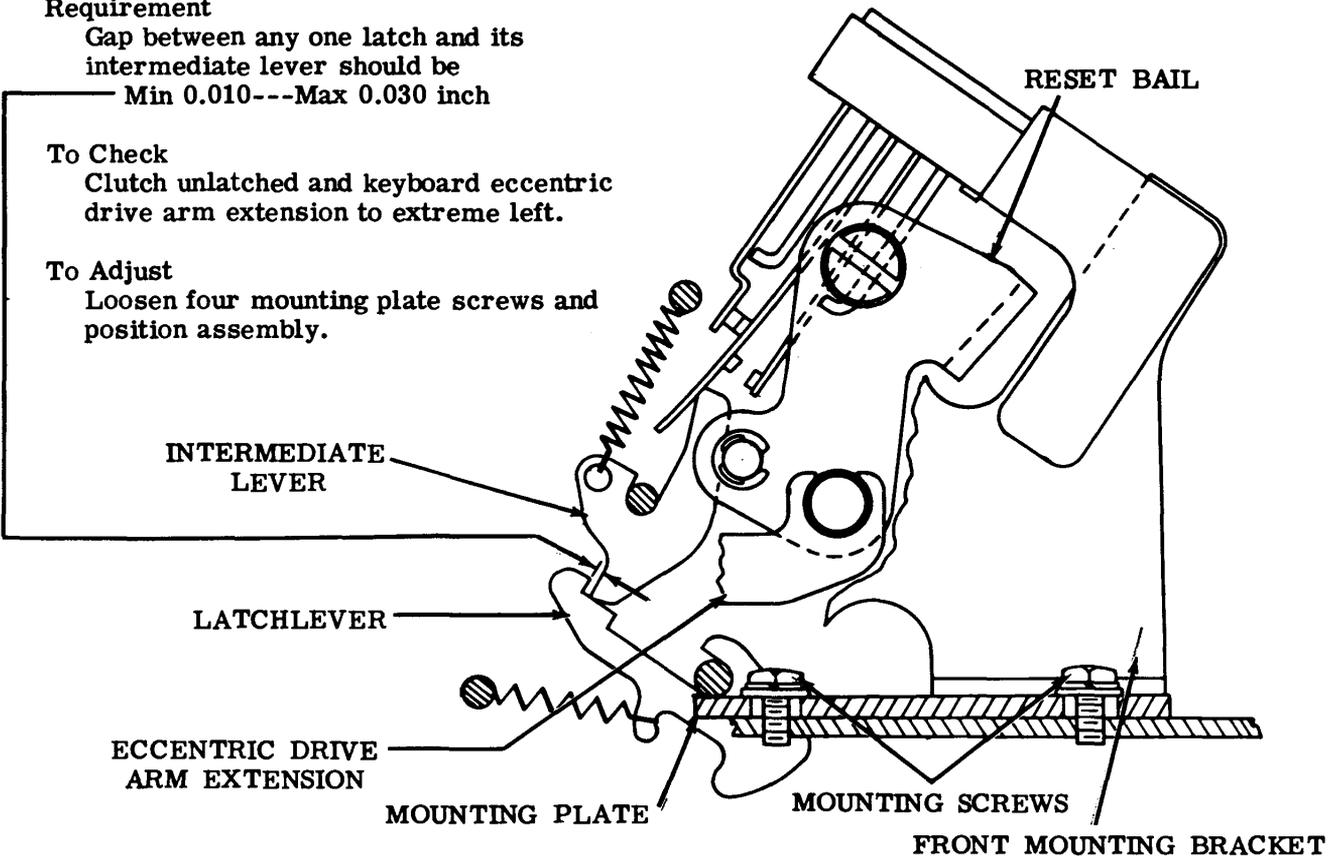
Gap between any one latch and its intermediate lever should be
Min 0.010---Max 0.030 inch

To Check

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

To Adjust

Loosen four mounting plate screws and position assembly.



DRIVE ARM EXTENSION SPRING

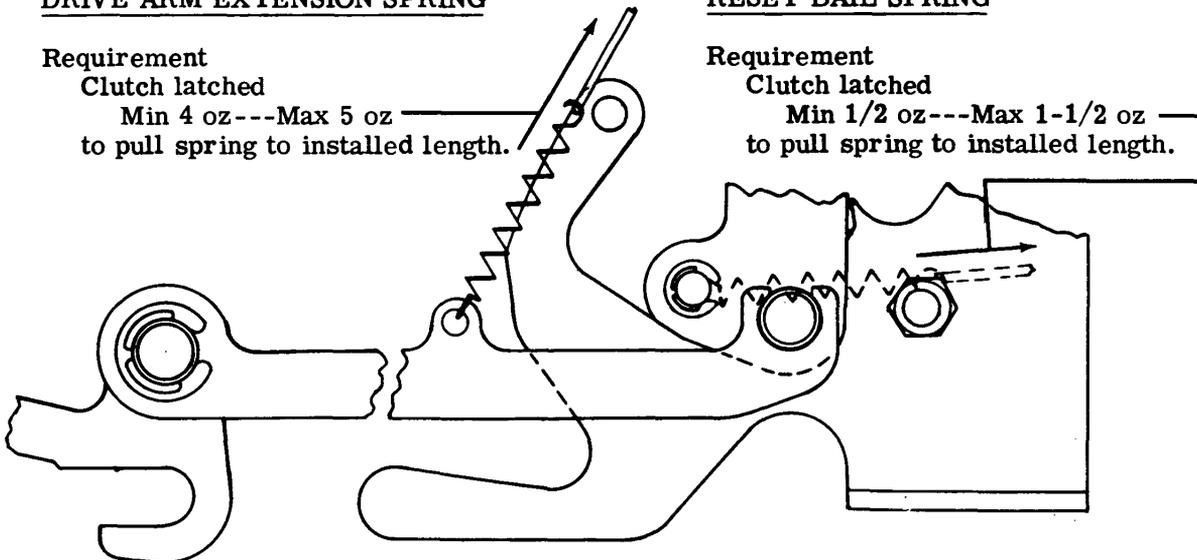
Requirement

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

RESET BAIL SPRING

Requirement

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



3.22 Code Reading Contact Mechanism (continued)

Note 1: The following tests should be performed 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. 3.23 for figure of strobe trace.
- (C) Repeat (A) and (B) for each code reading contact.

To Adjust

Refine Par. 3.18(A).

Refine Par. 3.18(B) and (C) if there is excessive bounce.

3.23 Auxiliary Contact Mechanism (continued)

AUXILIARY CONTACT REFINEMENT (STROBING)

Requirement (See Notes 1 and 2 in Par. 3.22)

Zero the strobe unit (DXD) as explained in (1) Requirement of Par. 3.22.

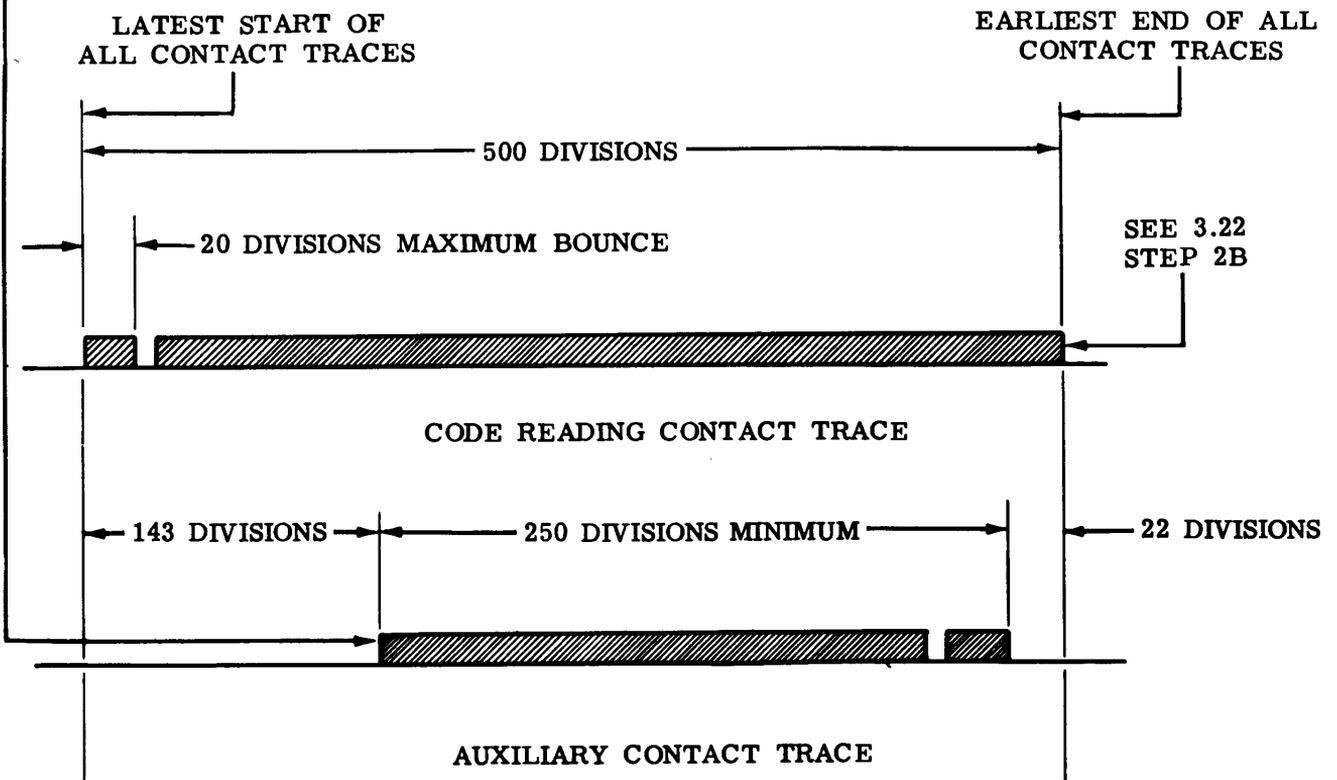
Connect strobe neon trace to auxiliary contacts.

(A) Send rubout combination from keyboard.

(B) 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.

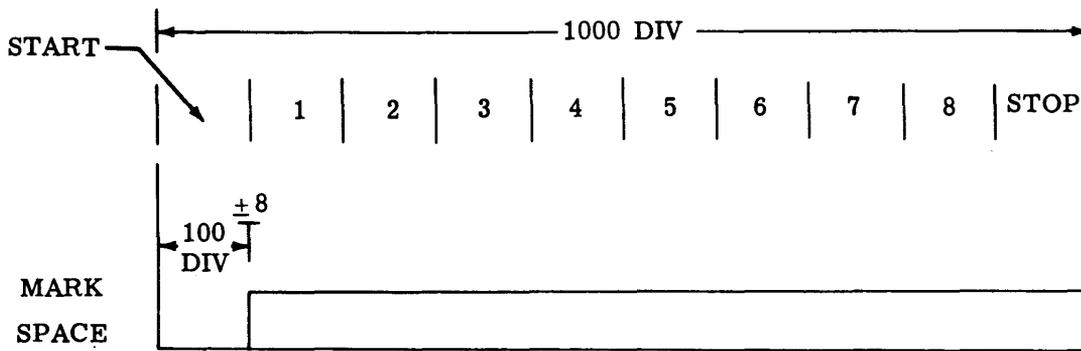
To Adjust

Refine adjustment in Par. 3.17.

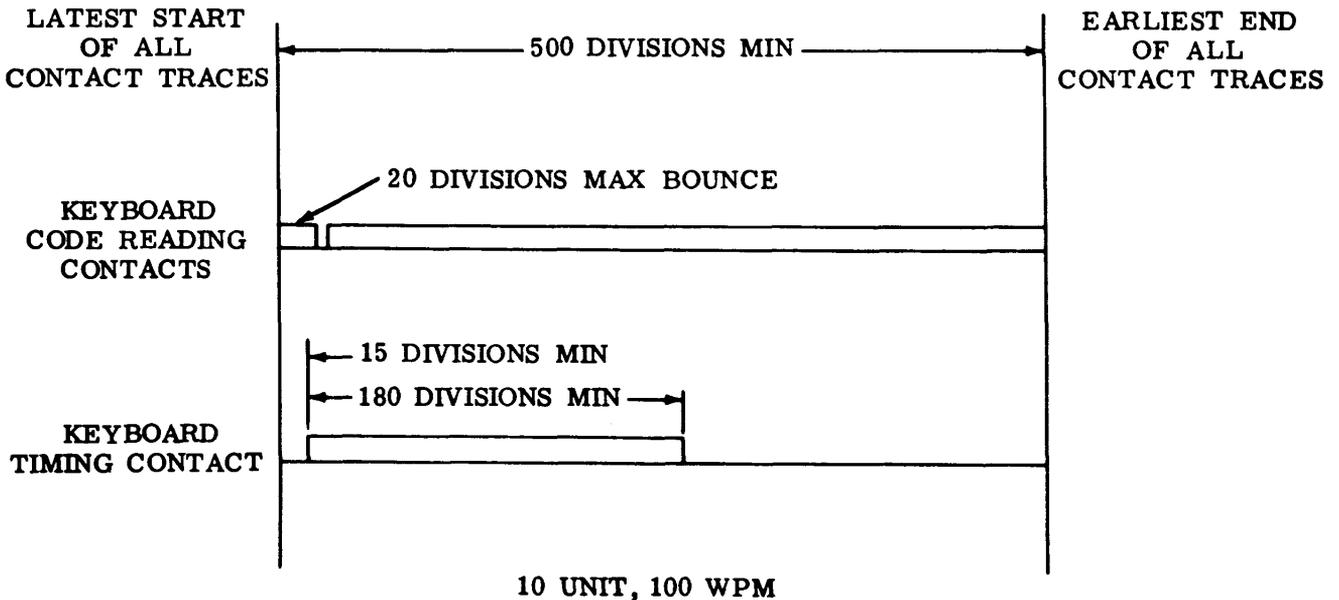


3.24 Strobing Requirements

SIGNAL GENERATOR CONTACTS



CODE READING AND TIMING CONTACTS



Note 1: For units equipped with signal regenerators, remove regenerator circuit card before applying test set probes to signal contacts.

Note 2: Applying operating voltage of signal distortion test set directly to gold-plated signal contacts may make them unsuitable for low-voltage applications. See Par. 1.07 for servicing instructions.