

28 TELETYPEWRITER KEYBOARD AND BASE (KSR AND RO)

ADJUSTMENTS

CONTENTS	PAGE	CONTENTS	PAGE
1. GENERAL	4	Codelever spring	19
A. Cleaning	4	Local carriage return function bail spring	19
B. Servicing for Special Low- Voltage Applications	4	Local line feed trip link spring	20
2. BASIC UNITS	7	Lock ball channel	13
Codebar Assembly		Lock ball endplay	15
Clutch tripbar	12	Plastic window	28
Clutch tripbar spring	11	Plunger spring	20
Codebar and codelever clearance	11	Signal Generator Mechanism	
Codebar bail	14	Clutch latchlever spring	8
Codebar bail and nonrepeat lever clearance	14	Clutch shoe lever	8
Codebar bail latch spring	14	Clutch shoe lever spring	9
Codebar bail spring	18	Clutch shoe spring	9
Codebar guide clearance	7	Clutch stop lever	8
Codebar spring	12	Clutch stop lever spring	8
Codelever universal bail spring	7	Signal contact clearance	10
Function bail and codelever clearance	13	Signal contact clearance (using signal test set — such as 1A or 28-type test sets) preliminary	26
Line break lever spring	18	Signal contact drive link	10
Lockbar spring	12	Signal contact spring	10
Nonrepeat lever spring	14	Transfer bail detent latch spring	10
Spacebar bail pivot	7	Transfer bail detent plate	10
Transfer lever locking bail spring	21	Transfer lever locking bail spring	21
Transfer lever spring	21	Transfer lever spring	21
Universal bail extension	16	Units with spacing contacts of signal generator wired for polar operation	27
Universal bail latchlever (preliminary)	16	Wall Mounted Keyboard	
Universal bail latch spring	16	Intermediate gear assembly	25
Universal bail - rear blade	16	Keylock latch spring	24
Universal codebar	12	Keytop mechanism	24
Interrelated Features		Timing belt	25
Intermediate gear bracket	22	3. VARIABLE FEATURES	29
Margin indicator spring	21	Answer-Back Mechanism ("FIGS C")	
Mounting typing unit on keyboard or base	23	Armature latch spring	47
Signal generator frame	23	Blocking lever spring	47
Keyboard Mechanism		Character generator mounting plate	44
Ball wedgelock and ball track clearance	15	Coding the message drum	48
Ball wedgelock, ball endplay and universal bail latch adjustments - (final)	17	Detent lever spring	44
		Drive link	45
		Drive link spring	45
		Latch operating lever adjusting screw	46

CONTENTS	PAGE
Latch operating lever spring	46
Magnet yoke	43
Motor control relay switch.	47
Sensing lever springs	44
Stepping pawl.	46
Stepping pawl spring.	46
Stop lever latch	43
Answer-Back Mechanism ("FIGS D")	
Keyboard lock bail eccentric	49
Blinding Contact (Pulsing Contact) Mechanism	
Cam follower arm (lower extension) .	41
Cam follower arm (upper extension) .	40
Contact alignment.	40
Contact gap.	40
Contact guard	41
Contact spring.	40
Special requirements	42
Strobe requirements.	42
Form Feed-Out Mechanism	
Form feed-out link spring	54
Form feed-out solenoid.	54
Solenoid spring	54
Local Backspace Mechanism	
Backspace transfer bail spring.	34
Backspace trip link horizontal spring .	34
Backspace trip link vertical spring . .	34
Transfer bail adjusting lever	35
Local Paper Feed-Out Mechanism	
Switch lever spring.	33
Lockbar Contacts (Electrical Send-Receive Break Mechanism)	
Lockbar contacts	42
Lockbar contact tension.	42
Offline Contact	
Backspace keylever operated switch position.	38
Codebar spring	38
Contact bracket	37
Contact spring.	38
Solenoid bail spring	37
Solenoid mounting bracket position . .	37
Solenoid operated switch plate position	38
Switch operating lever spring.	38

CONTENTS	PAGE
Remote Control Gear Shift Mechanism	
Armature stop.	53
Clutch stop lever	53
Gear shift magnet.	53
Gear shift magnet armature spring . .	52
Gear shift mechanism.	52
Repeat on Space Mechanism	
Spacebar.	29
Space repeat lever spring	29
Stop.	29
Travel screw.	29
Reverse Line Feed Mechanism	
Reverse line feed trip link horizontal spring	36
Reverse line feed trip link vertical spring.	36
Synchronous Pulse Mechanism	
Armature clamp.	56
Armature hinge	55
Contact gap.	56
Magnet armature	55
Mounting bracket	55
Universal codebar contact	57
Time Delay Mechanism	
Contact latch pawl spring.	30
Contact pawl spring	30
Eccentric follower pawl spring.	32
Time delay disabling device.	32
Time delay mechanism position	31
Time delay ratchet wheel.	30
Time delay switch position.	30
Universal Keyboard Switch	
Keyboard universal switch horizontal.	39
Keyboard universal switch preliminary.	39
Keyboard universal switch vertical . .	39
Variable Speed Drive Mechanism	
Gear bracket.	50
Hub position	51
Selector lever	50
Shoulder screw	50
Spreader post	51

CONTENTS	PAGE	CONTENTS	PAGE
4. BASE (RECEIVE-ONLY)	58	Overload mechanism spring	79
Intermediate gear bracket	22	Keyboard Assembly	
Local carriage return bail spring . . .	23	Codelever bail	78
Local line feed trip link spring	20	Local carriage return bail spring . . .	80
Margin indicator spring	19	Local line feed trip link spring	80
Mounting typing unit on keyboard or base	21	Lock bail spring	80
Signal Line Break Mechanism		Margin indicator spring	81
Break keylever spring	58	Paper feed-out motor start mechanism spring (keyboard)	81
Lever extension	58	Spacebar pivot	78
5. EARLIER DESIGN	59	Keyboard Mechanism	
Answer-Back Mechanism ("FIGS C")		Keylever lock ball channel and lock ball endplay	73
Character generator mounting plate . .	89	Nonrepeat Lever Mechanism	
Contact assembly	88	Codebar bail and nonrepeat lever clearance	72
Contact assembly bracket mounting screws	88	Nonrepeat lever spring	72
Drive link	90	Signal Generator Mechanism	
Drive link spring	90	Clutch latchlever spring	66
Keyboard universal switch - vertical .	87	Clutch stop lever	65
Pulsing contacts	89	Clutch stop lever spring	65
Stepping pawl	91	Contact box spring	67
Stepping pawl spring	91	Detent lever spring	63
Stop lever spring	91	Detent toggle stop bracket	62
Stop screw	88	Flutter lever	64
Swinger contact leaf	88	Flutter lever spring	64
Codebar Assembly		Generator contact	67
Clutch tripbar spring	76	Intermediate lever spring	61
Codebar bail	71	Intermediate lever stop plate	63
Codebar bail adjusting screw	68	Locking bail spring	59
Codebar bail bumper	76	Rocker bail detent	60
Codebar bail latch spring	69, 71	Rocker bail pivot screw	59
Codebar bail spring	69	Rocker extension	61
Codebar bounce suppressor bracket support screw	77	Selector lever guide	59
Codebar guides	74	Selector lever spring	59
Codebar latch	77	Transfer lever spring	60
Codebar latch spring	77	Variable Features	
Codebar spring	76	Backspace transfer bail adjusting lever	85
Codelever bail latchlever eccentric . .	74	Backspace transfer bail adjusting lever horizontal	86
Codelever bail latchlever spring . . .	70	Backspace transfer bail spring	85
Codelever bail nonrepeat extension . .	75	Backspace trip link horizontal spring	85
Codelever bail spring	74	Backspace trip link vertical spring . .	85
Codelever guide	77	Break keylever spring	84
Codelever spring	75	Break lever spring	84
Lockbar spring	76		
Nonrepeat lever	70		
Nonrepeat spring	70		
Reset lever spring	68		
Interrelated Features			
Intermediate gear bracket	79		

CONTENTS	PAGE
Eccentric follower pawl spring	83
Repeat on space lever	82
Repeat on space lever spring	82
Repeat space lever spring	83
Time delay disabling device	83

Note: When the signal generator shaft is rotated by hand, the clutch does not fully disengage upon reaching its stop position. In order to relieve drag and permit the main shaft to rotate freely, apply pressure on the lug of the clutch disc with a screwdriver to cause it to engage its latchlever and fully disengage the clutch.

1. GENERAL

1.01 This section has been revised to include recent engineering changes and additions, and to make it a standard publication. It also contains the specific requirements and adjustments for the 28 keyboard and base. Since it is a general revision, marginal arrows ordinarily used to indicate changes and additions are omitted.

1.02 Maintenance procedures which apply only to mechanisms of a particular design, or to certain models of 28 keyboards and bases are so indicated in the titles of the paragraphs which contain these particular adjustment requirements.

Note: Remove power from unit before making adjustments.

1.03 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. Where an illustration shows interrelated parts, the sequence that should be followed in checking the requirements and making the adjustments shown, is indicated by letters (A), (B), (C), etc.

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 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.

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 burnish them before making specified adjustment or tolerance measurement. Avoid sharp kinks or bends in the contact spring.

CAUTION: KEEP ALL ELECTRICAL CONTACTS FREE OF OIL AND GREASE.

1.07 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 (Par. 2.04) and inspect contacts for gold plating.

A. Cleaning

1.08 Use twill jean cloth (KS2423) (TP107162) to clean gold-plated contacts.

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

1.10 This procedure prevents small fibers at edges of twill jean strip from becoming lodged between contacts.

1.11 Clean unplated tungsten contacts in accordance with standard procedures.

B. Servicing for Special Low-Voltage Applications.

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

1.13 For optimum reliable operation in special low-voltage applications, clean gold-plated contacts with twill jean, as instructed above, at intervals of approximately 50 hours of

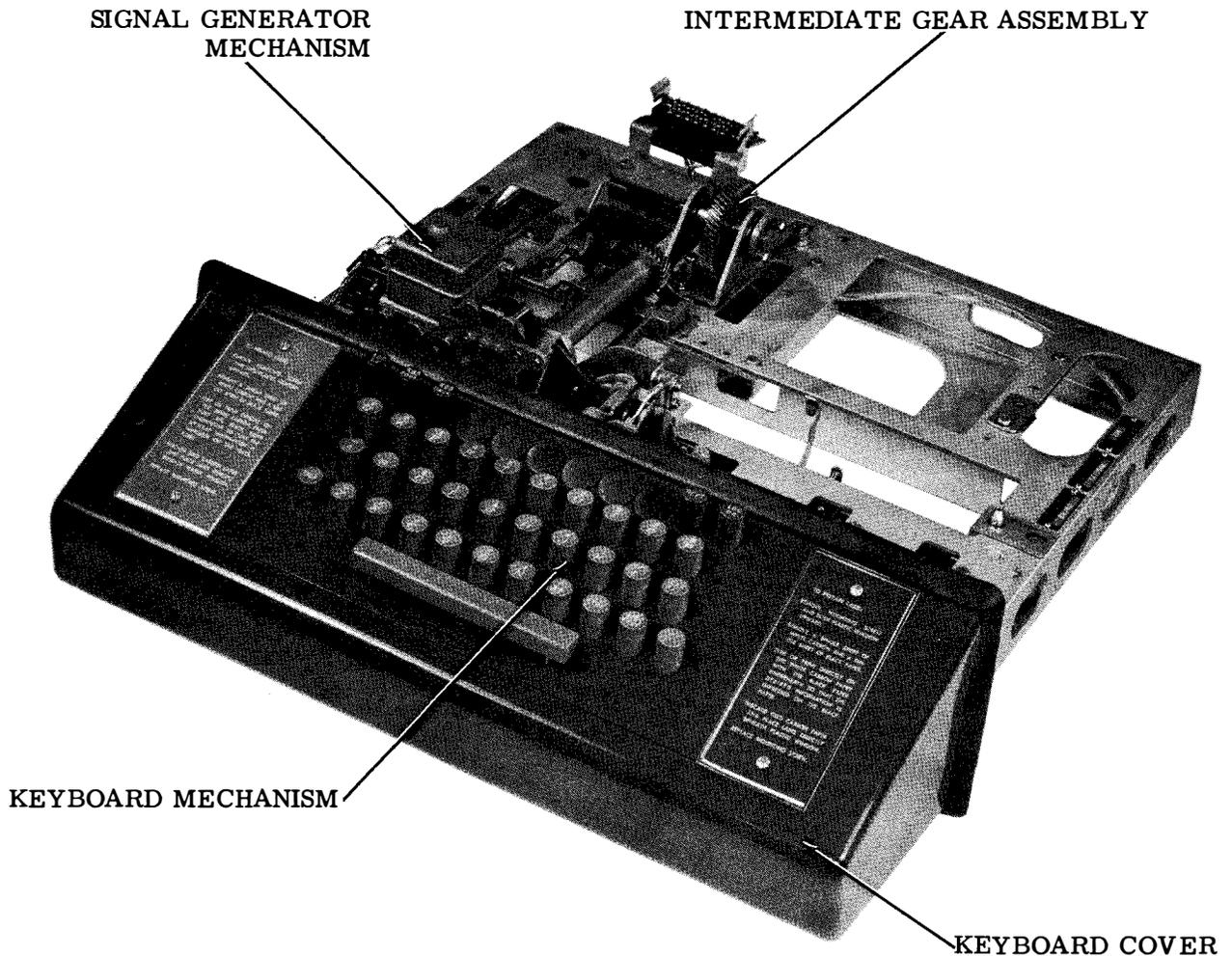


Figure 1 - 28 Teletypewriter Base (KSR)

actual contact operation. Since maintenance interval and life expectancy of the contacts are dependent on the signal circuit, maintenance interval may be lengthened for specific applications.

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 (Par. 2.21), 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 with 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.

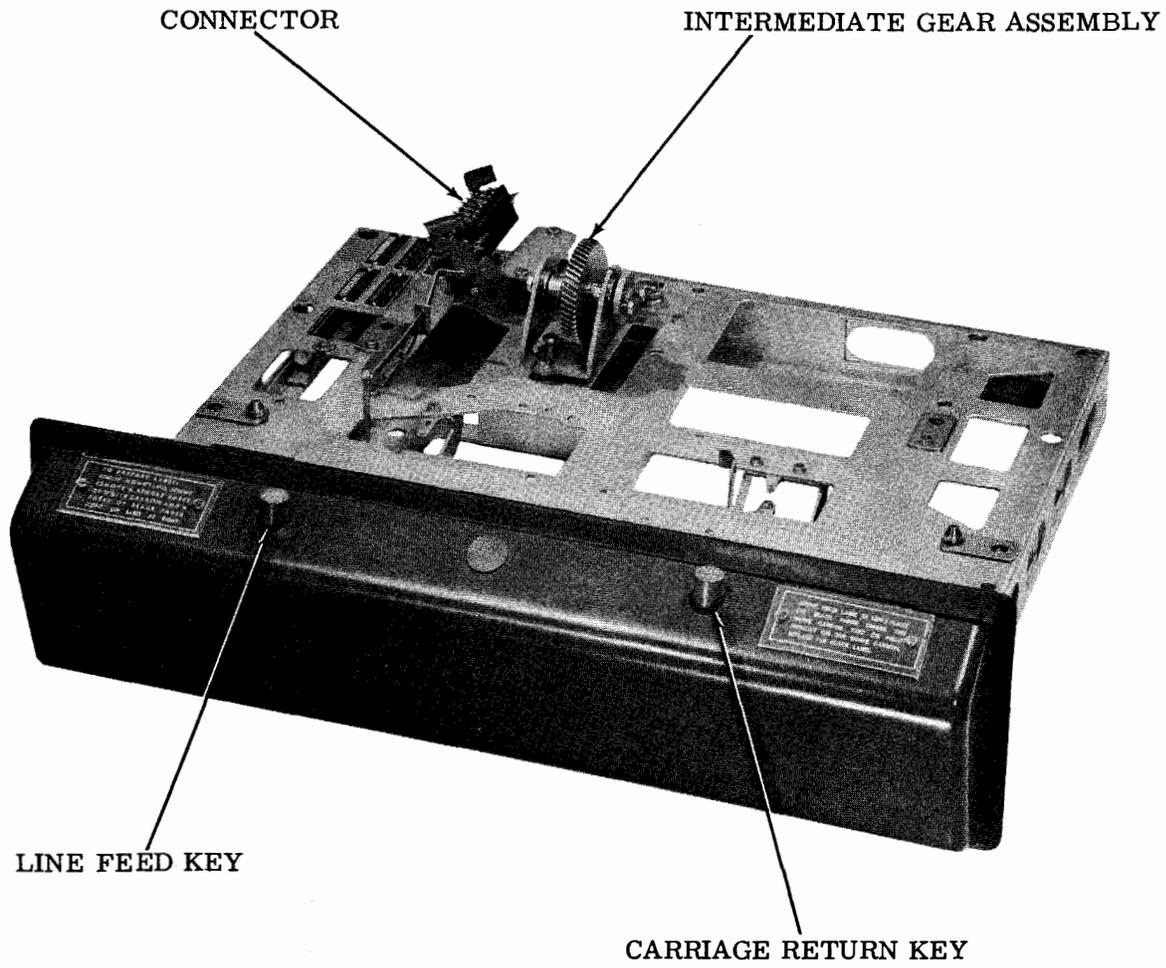


Figure 2 - 28 Teletypewriter Base (Receiving-Only)

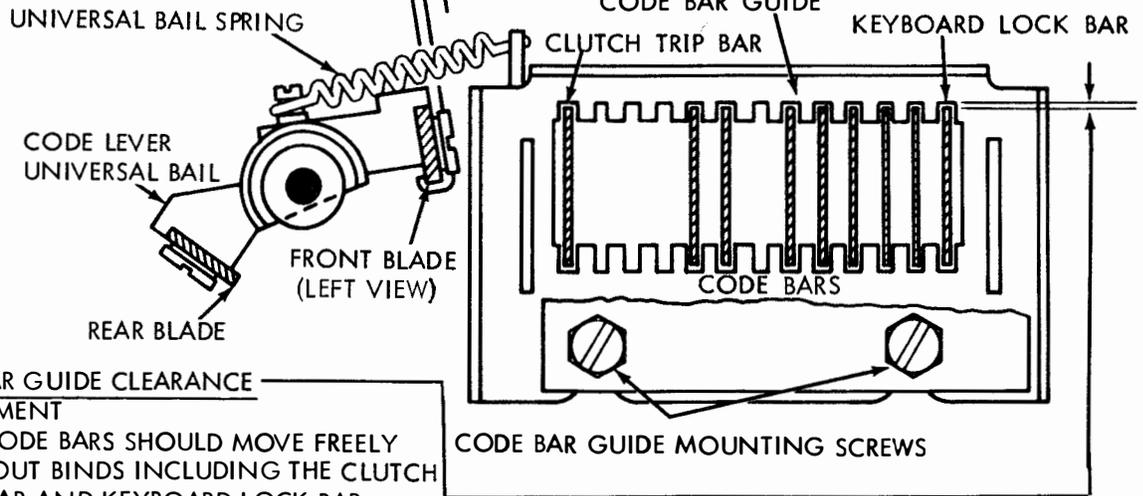
2. BASIC UNIT

2.01 Codebar Assembly

NOTE: REMOVE PERFORATOR TRANSMITTER BASE FROM CABINET BEFORE ADJUSTING CODE BARS.

(B) CODE LEVER UNIVERSAL BAIL SPRING REQUIREMENT

GENERATOR CLUTCH DISENGAGED. UNIVERSAL BAIL LATCH IS HELD OUT OF CONTACT WITH THE BAIL.
 MIN 1 OZ
 MAX 2 OZ
 TO START BAIL MOVING.

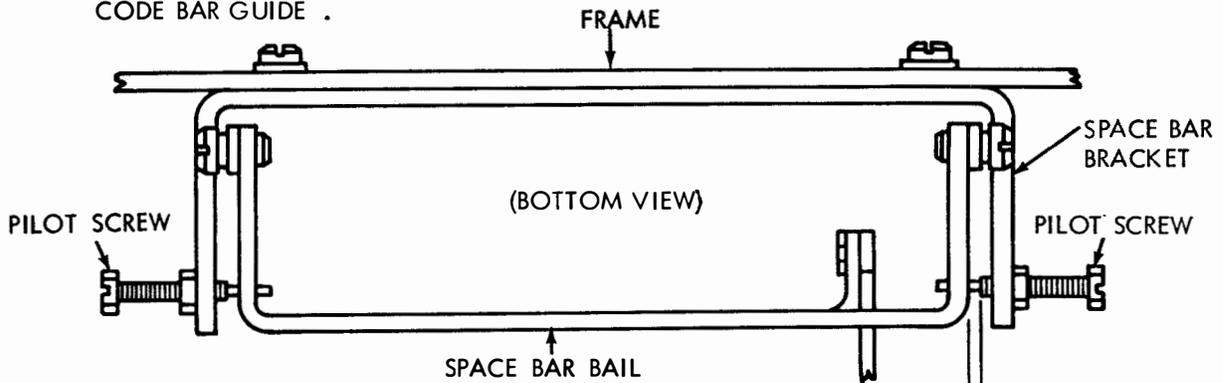


(A) CODE BAR GUIDE CLEARANCE REQUIREMENT

ALL CODE BARS SHOULD MOVE FREELY WITHOUT BINDS INCLUDING THE CLUTCH TRIP BAR AND KEYBOARD LOCK BAR.

MIN SOME
 MAX 0.010 INCH

TO ADJUST
 LOOSEN MOUNTING SCREWS AND POSITION CODE BAR GUIDE .



(C) SPACE BAR BAIL PIVOT REQUIREMENT

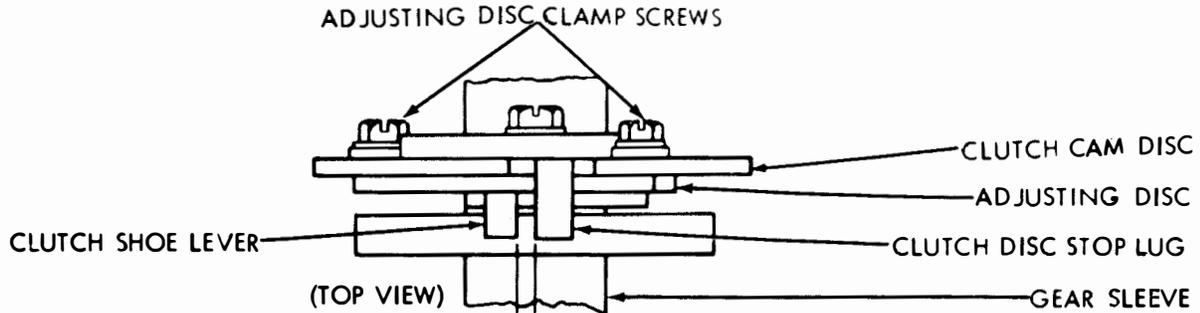
MIN SOME END PLAY.
 MAX 0.010 INCH
 SPACE BAR FREE FROM BIND.

TO ADJUST
 POSITION SPACE BAR WITH PILOT SCREWS LOOSENED.

NOTE: KEYLEVER COVER MUST BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY.

NOTE: THE BAIL SHOULD BE SO ADJUSTED THAT THE SPACE BAR CAN BE OPERATED WITHOUT BINDING IN THE HOLES IN THE GUIDE PLATE AND THE FRAME.

2.02 Signal Generator Mechanism

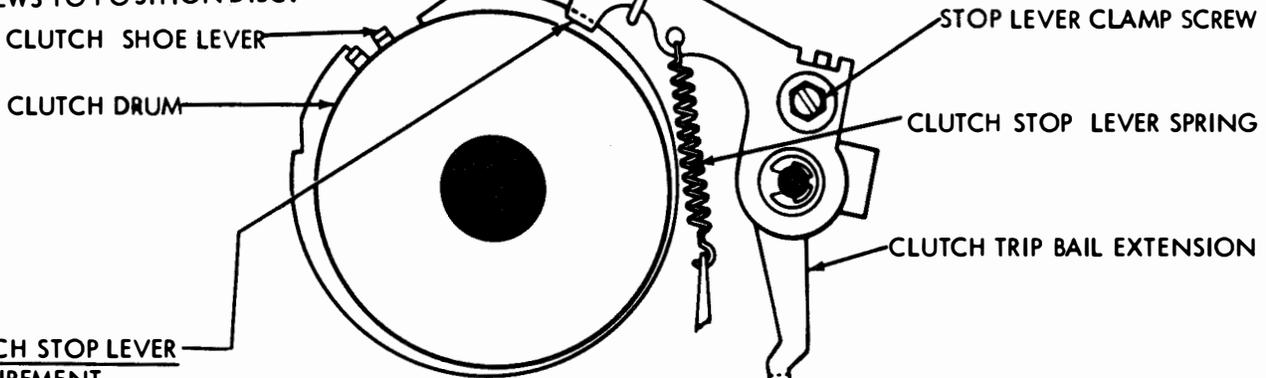


(A) CLUTCH SHOE LEVER REQUIREMENT
 CLEARANCE WHEN CLUTCH IS DISENGAGED SHOULD BE 0.055 INCH TO 0.085 INCH LESS THAN WHEN CLUTCH IS ENGAGED.

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 CLAMP SCREWS TO POSITION DISC.

(C) CLUTCH STOP LEVER SPRING REQUIREMENT
 CLUTCH ENGAGED AND ROTATED 1/4 TURN.
 MIN 2 OZ
 MAX 3 OZ
 TO START LEVER MOVING.

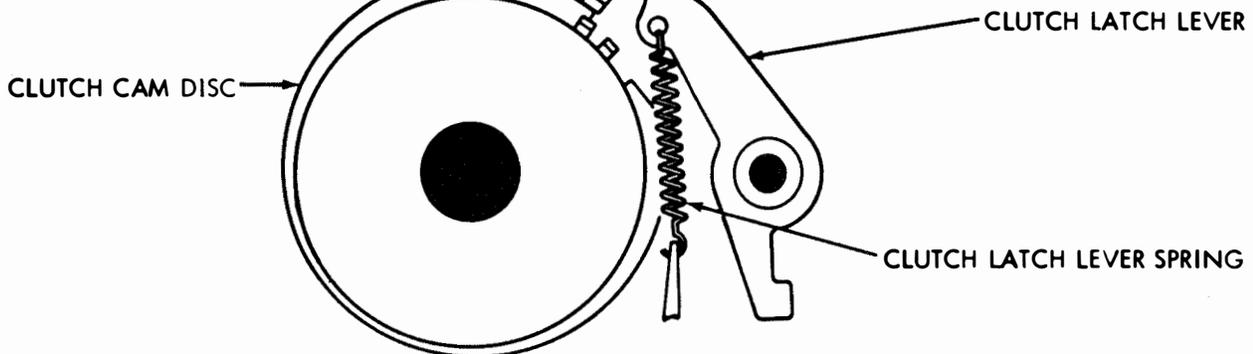


(B) CLUTCH STOP LEVER REQUIREMENT
 SHOULD FULLY ENGAGE CLUTCH SHOE LEVER.

DURING ROTATION, THE LEVER SHOULD NOT TOUCH THE CLUTCH DRUM AT ANY POINT.

TO ADJUST
 POSITION STOP LEVER WITH ITS CLAMP SCREW LOOSENED.

(D) CLUTCH LATCH LEVER SPRING REQUIREMENT
 CLUTCH LATCH LEVER RESTING ON THE HIGHEST POINT OF CLUTCH DISC.
 MIN 2 OZ
 MAX 3 OZ
 TO START LATCH LEVER MOVING.

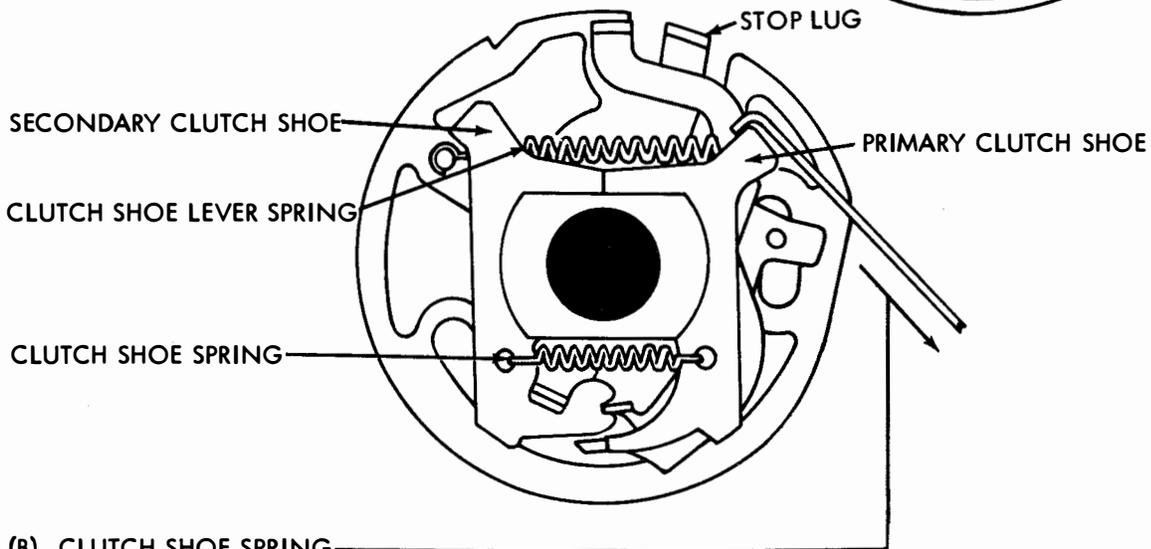
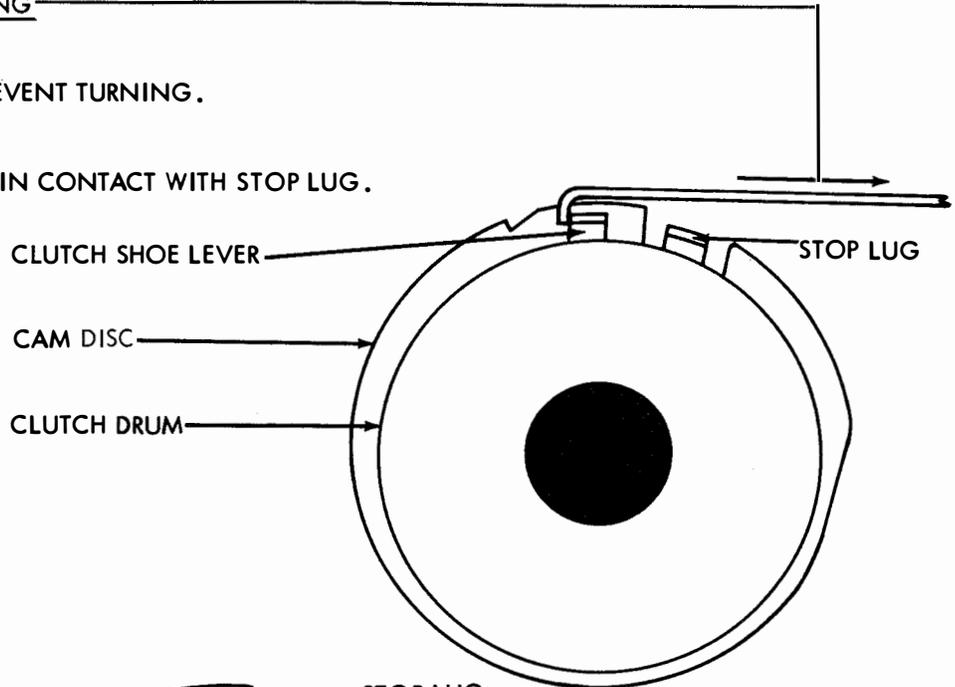


2.03 Signal Generator Mechanism continued

(A) 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.



(B) CLUTCH SHOE SPRING

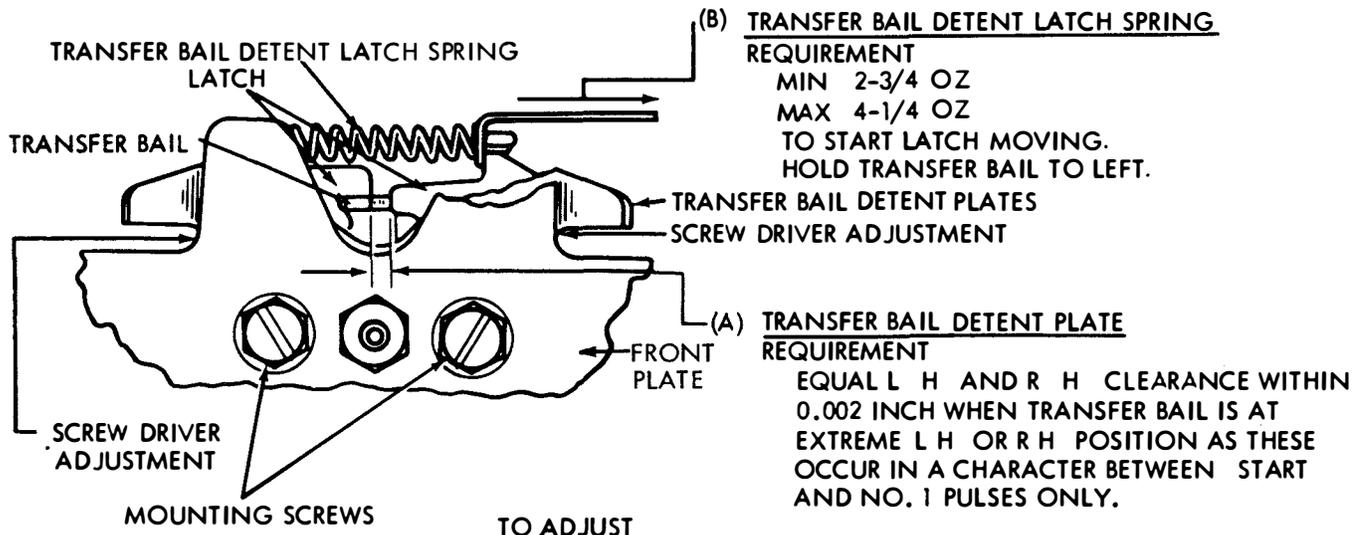
NOTE

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.

2.04 Signal Generator Mechanism continued



(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

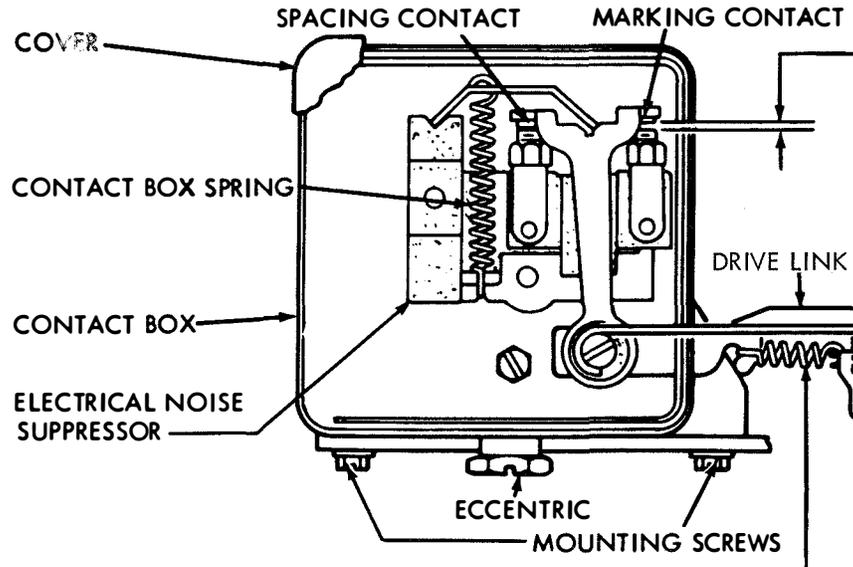
EQUAL L H AND R H CLEARANCE WITHIN
 0.002 INCH WHEN TRANSFER BAIL IS AT
 EXTREME L H OR R H POSITION AS THESE
 OCCUR IN A CHARACTER BETWEEN START
 AND NO. 1 PULSES ONLY.

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 RE-
 FINE THE ADJUSTMENT TO ELIMINATE ALL BIAS FROM THE SIGNALS BY EQUALIZING THE
 CURRENT-ON AND CURRENT-OFF INTERVALS



CAUTION: ON UNITS SO EQUIPPED -
 CLEAN GOLD CONTACTS BY PULLING
 TWILL JEAN HALF WAY THROUGH THE
 CLOSED CONTACTS, OPEN CONTACTS
 AND REMOVE TWILL JEAN.
 USE NO OTHER CLEANING OR
 BURNISHING METHODS. AVOID
 PITTING OR CHIPPING THE CONTACTS.

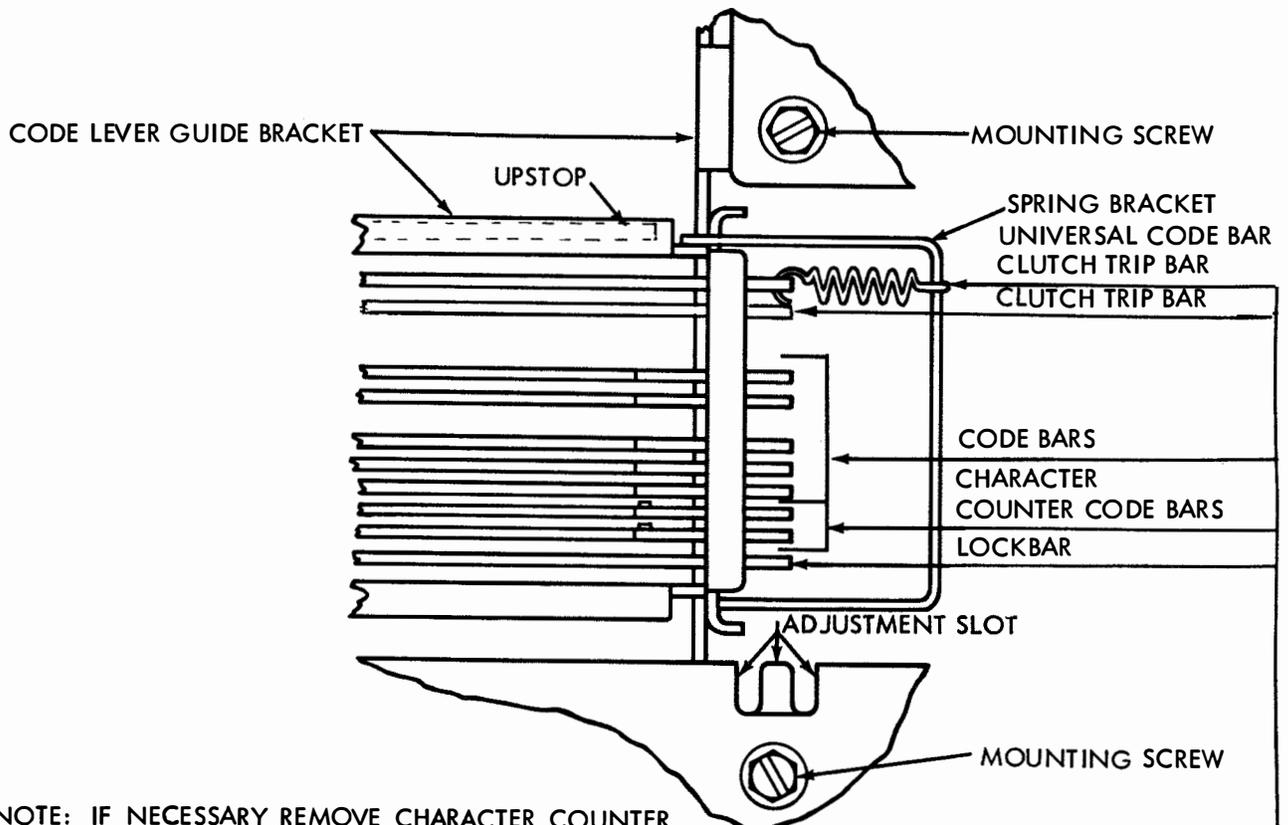
(E) SIGNAL CONTACT SPRING
REQUIREMENT

REMOVE DRIVE LINK SPRING
 TRANSFER BAIL HELD CLEAR OF
 DRIVE LINK.
 MIN 2 OZ --- MAX 3 OZ
 TO START LINK MOVING.

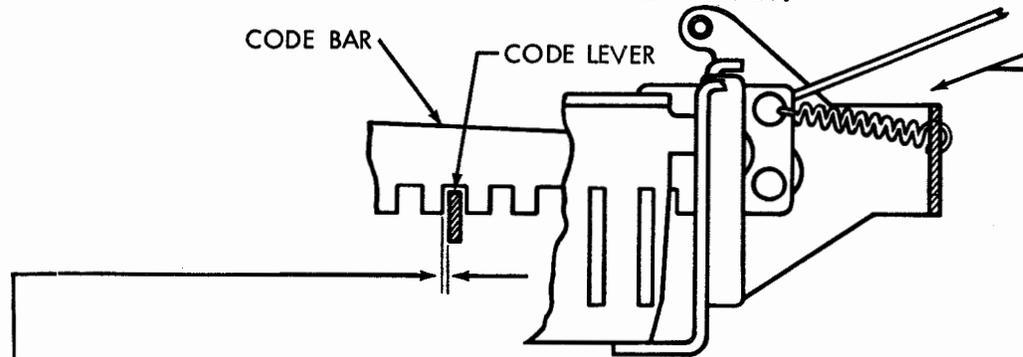
(D) SIGNAL CONTACT DRIVE LINK
REQUIREMENT

WITH MAINSHAFT IN STOP POSITION AND TRANSFER BAIL DETENT LATCH SPRING UNHOOKED
 (SEE FIG 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.

2.05 Codebar Assembly continued



NOTE: IF NECESSARY REMOVE CHARACTER COUNTER ASSEMBLY. SEE DISASSEMBLY AND REASSEMBLY.



(A) CODE BAR AND CODE LEVER CLEARANCE REQUIREMENT

CARRIAGE RETURN KEY DEPRESSED BUT NOT ENOUGH TO TRIP OFF UNIVERSAL BAIL LATCH OR CLUTCH BAR.

MIN 0.006 INCH --- MAX 0.017 INCH

MEASURE AT CODE BAR #3

TO ADJUST

POSITION GUIDE BY ADJUSTING SLOT WITH FOUR MOUNTING SCREWS LOOSENED.

(B) CLUTCH TRIP BAR SPRING REQUIREMENT

BLANK KEY DEPRESSED TO ALLOW THE CLUTCH TRIP BAR TO FALL TO RIGHT.

SPRING UNHOOKED FROM BRACKET

MIN 8 OZ --- MAX 12 OZ

TO PULL SPRING TO INSTALLED LENGTH.

NOTE: SEE FOLLOWING PAGE FOR ADJUSTMENTS (C), (D), (E) AND (F).

Codebar Assembly continued

NOTE: ADJUSTMENTS CONTINUED FROM
PRECEDING PAGE.

(C) CLUTCH TRIP BAR (USED FOR SYNCHRONOUS PULSED TRANSMISSION)
REQUIREMENT

WITH THE CLUTCH DISENGAGED AND LATCHED, POWER OFF AND ARMATURE OF THE
MAGNET ASSEMBLY HELD AWAY FROM THE CLUTCH TRIP BAR. PUSH AT THE RIGHT
HAND END OF CLUTCH TRIP BAR.
MIN 9 OZ --- MAX 12 OZ
TO START CLUTCH TRIP BAR MOVING.

NOTE: HOLD THE SWINGER OF THE CONTACT ASSEMBLY AWAY FROM THE UNIVERSAL CODE BAR
WHEN MEASURING THE CLUTCH TRIP SPRING TENSION.

(D) UNIVERSAL CODE BAR (USED FOR SYNCHRONOUS PULSED TRANSMISSION)
REQUIREMENT

WITH THE CLUTCH DISENGAGED AND LATCHED, DEPRESS THE BLANK KEY TO
ALLOW THE UNIVERSAL CODE BAR TO FALL TO THE RIGHT. SPRING UNHOOKED FROM
THE BRACKET.
MIN 8 OZ --- MAX 12 OZ
TO PULL SPRING TO INSTALLED LENGTH.

(E) CODE BAR SPRING
REQUIREMENT

LETTERS KEYLEVER DEPRESSED (POWER OFF) HOLD TRANSFER
LEVERS TO THE RIGHT SO THEY DO NOT AFFECT THE CODE BARS.
MIN 3 OZ --- MAX 5 OZ
TO START CODE BAR MOVING.

(F) LOCK BAR SPRING
REQUIREMENT

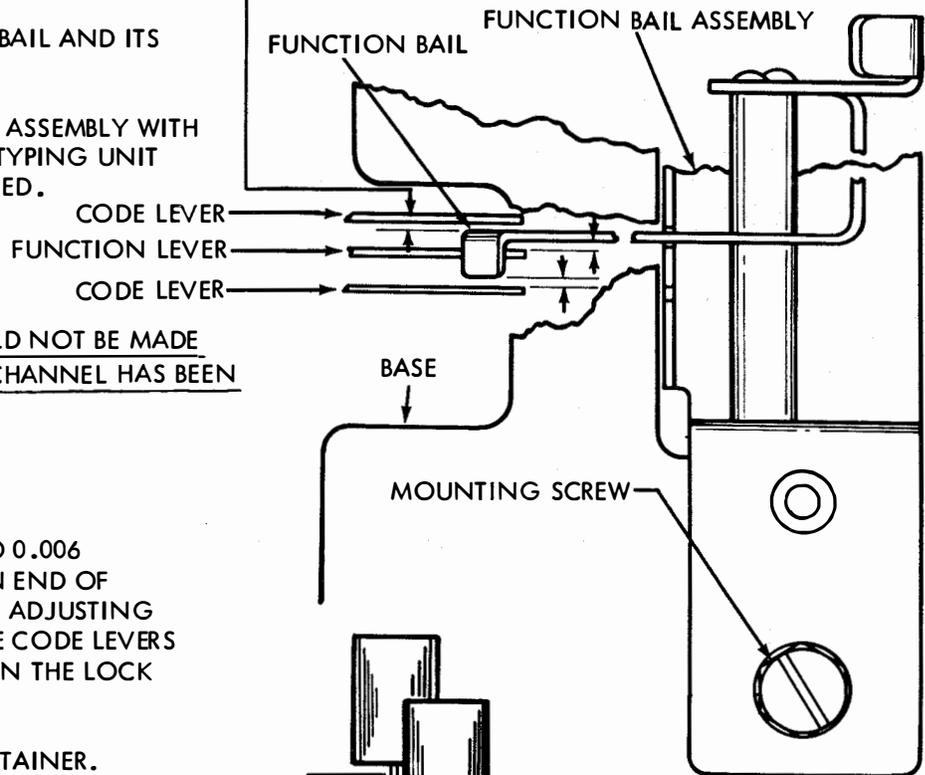
CLUTCH DISENGAGED, KEYBOARD LOCK KEYLEVER DEPRESSED. APPLY PUSH END
OF SCALE AGAINST R H END OF LOCK BAR.
MIN 2-1/2 OZ --- MAX 6 OZ
TO START LOCK BAR MOVING.

2.06 Codebar Assembly continued

(A) FUNCTION BAIL AND CODE LEVER CLEARANCE REQUIREMENT

MIN 0.015 INCH
BETWEEN ANY FUNCTION BAIL AND ITS
ADJACENT CODE LEVER.

TO ADJUST
POSITION FUNCTION BAIL ASSEMBLY WITH
MOUNTING SCREWS AND TYPING UNIT
LOCATING STUDS LOOSENED.



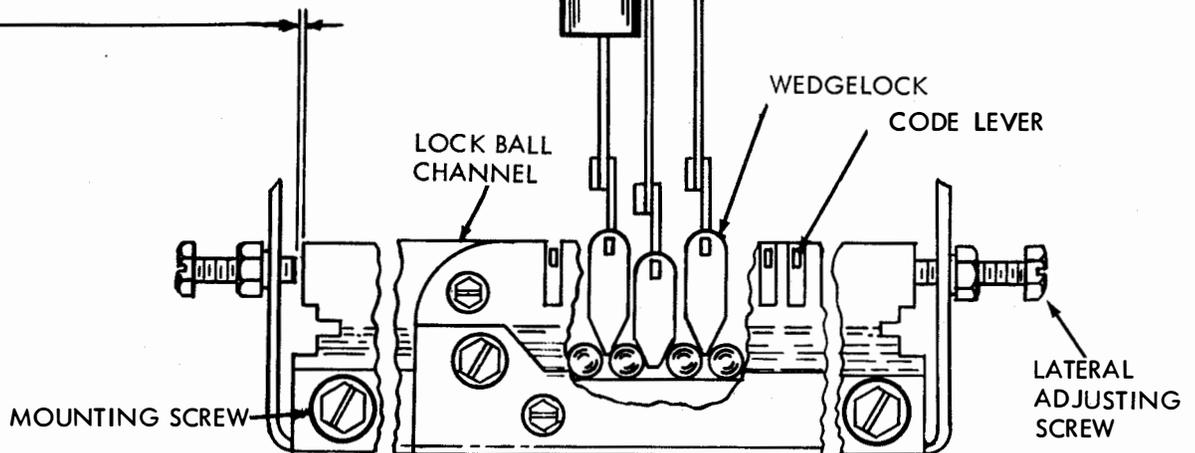
NOTE: THIS ADJUSTMENT SHOULD NOT BE MADE
UNLESS THE LOCK BALL CHANNEL HAS BEEN
DISASSEMBLED.

2.07 Keyboard Mechanism

(B) LOCK BALL CHANNEL REQUIREMENT

THERE SHOULD BE SOME TO 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.

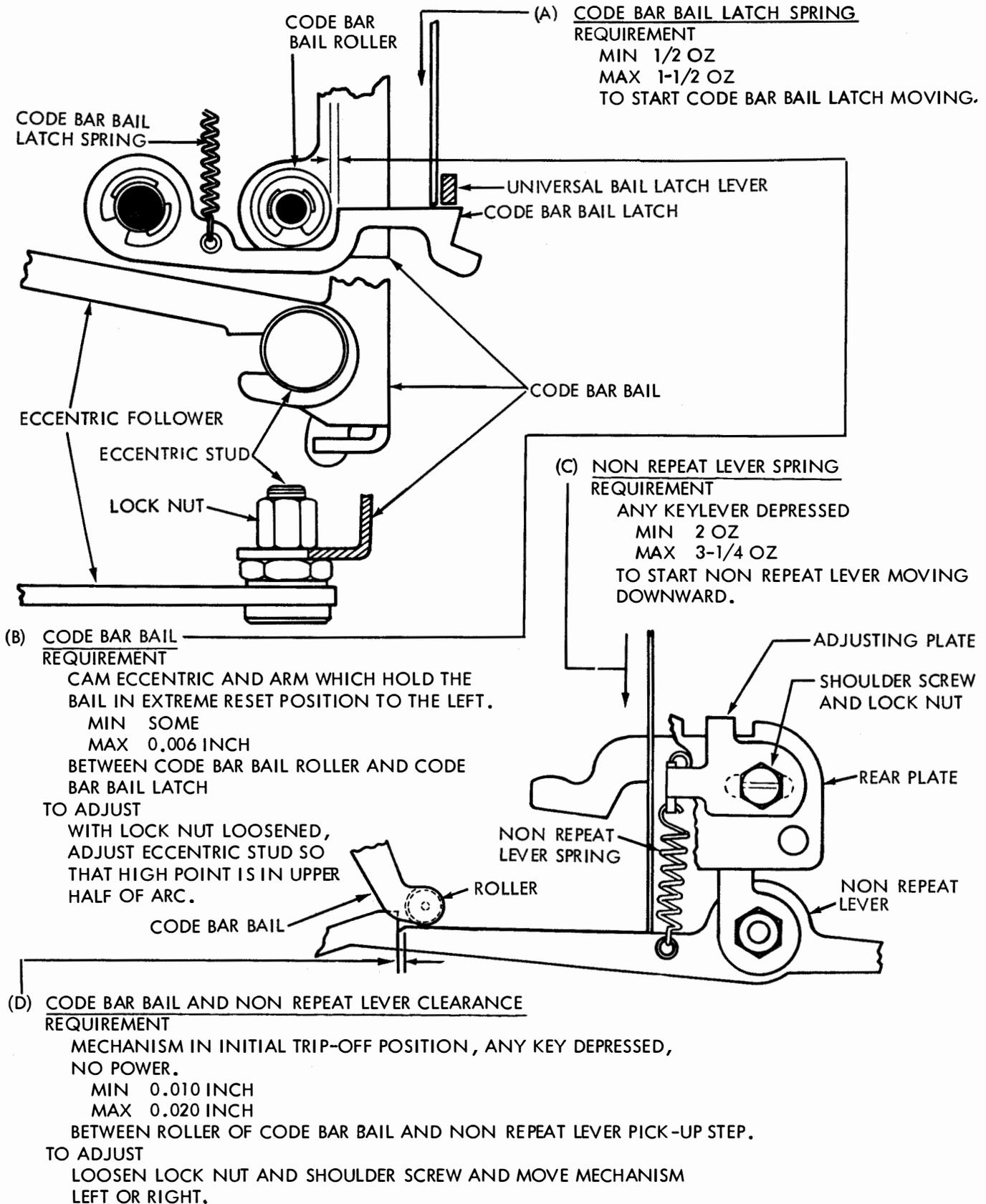
TO CHECK
REMOVE THE LOCK BALL RETAINER.
REMOVE A WEDGE FROM EACH END AND
ONE FROM THE CENTER IN ORDER TO
VIEW THE POSITION OF THE CODE LEVER.



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 Assembly continued



2.09 Keyboard Mechanism

(A) BALL WEDGELOCK AND BALL TRACK CLEARANCE
REQUIREMENT (PRELIMINARY)

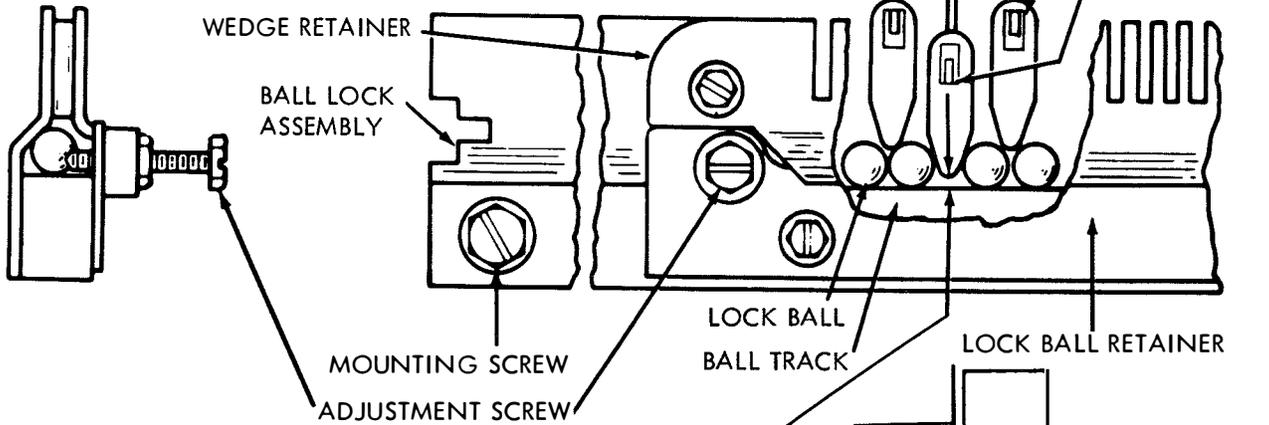
ADJUSTMENT SCREW BACKED OUT TO PERMIT MAXIMUM BALL MOVEMENT WITHOUT THE BALLS ROLLING OUT OF TRACK. (FROM PREVIOUS LATERAL ADJUSTMENT)
APPLY 32 OZ OF PRESSURE TO THE "Q" OR THE "P" KEYLEVER
MIN 0.005 INCH
MAX 0.015 INCH
EQUAL WITHIN 0.005 INCH BETWEEN THE TIP OF THE WEDGE-LOCK AND THE BALL TRACK.

TO ADJUST

LOOSEN MOUNTING SCREWS AT EACH END OF THE BALL TRACK AND ADJUST TRACK UP OR DOWN.

NOTE: REMOVE KEYBOARD HOOD IN ORDER TO MAKE THIS ADJUSTMENT. SEE DISASSEMBLY AND REASSEMBLY

NOTE: WHEN GAUGING THESE CLEARANCES MAKE SURE THERE IS NO CLEARANCE BETWEEN THE LOWER EDGE OF CODE LEVER EXTENSIONS AND THE BOTTOM OF THE SLOTS IN THE WEDGES. A TOTAL OF 43 BALLS ARE REQUIRED IN THE BALL TRACK ASSEMBLY.



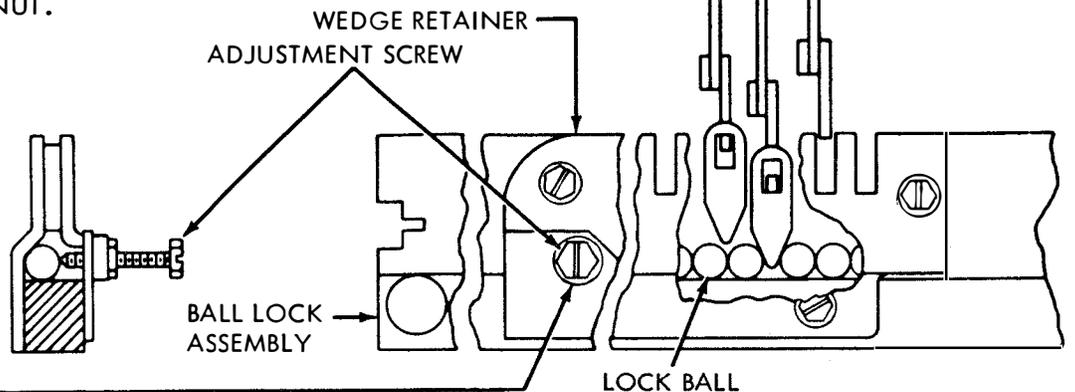
(B) LOCK BALL END PLAY

REQUIREMENT (PRELIMINARY)

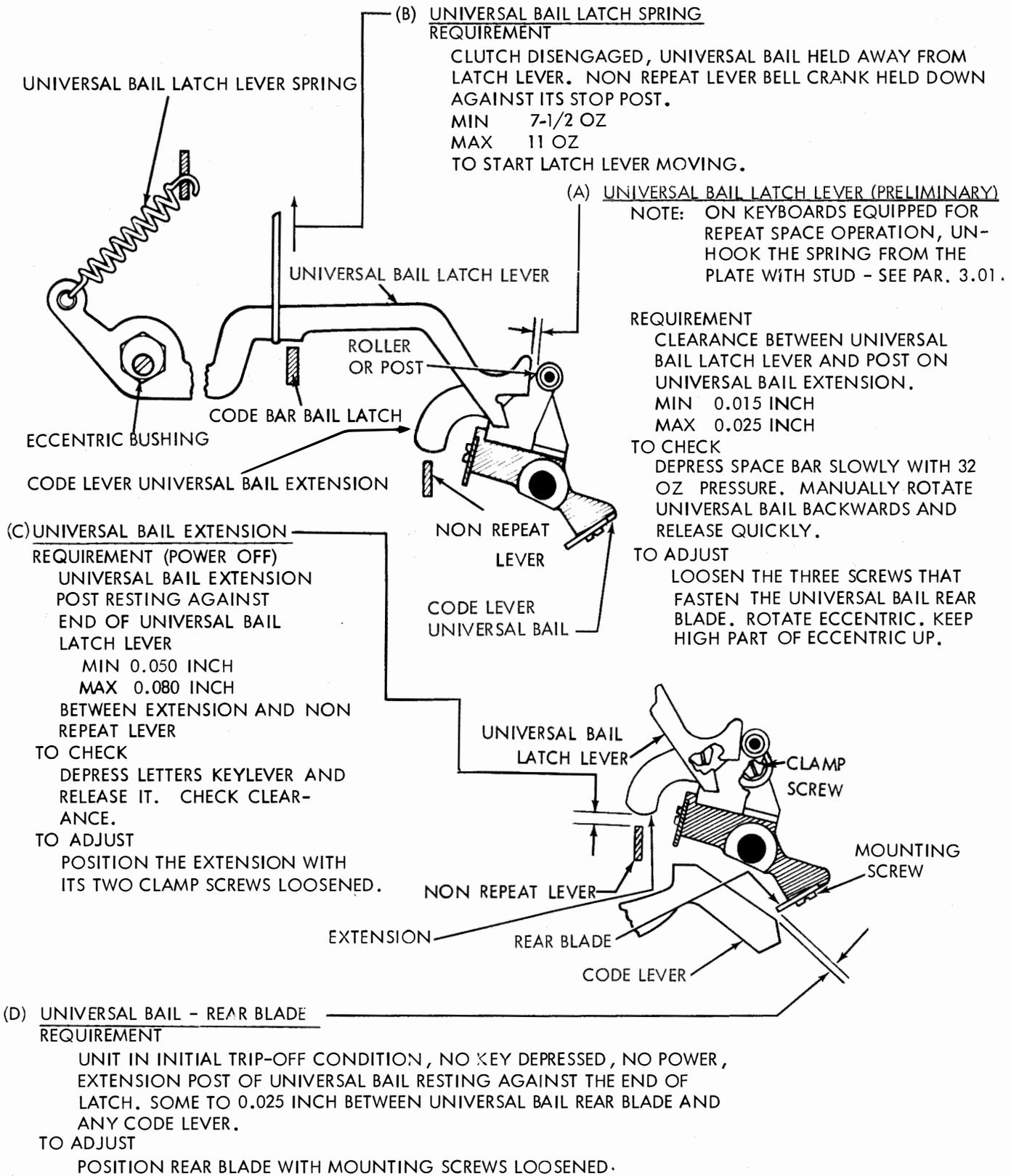
WITH A 32 OZ PRESSURE APPLIED TO THE CAR. RET. KEY, THE BALLS SHALL HAVE A MIN CLEARANCE

TO ADJUST

TURN IN BALL END PLAY ADJUSTMENT SCREW WITH FINGERS UNTIL A RESISTANCE IS FELT, TIGHTEN THE NUT.



2.10 Codebar Assembly continued



2.11 Keyboard Mechanism continued

BALL WEDGELOCK, BALL END PLAY AND UNIVERSAL BAIL LATCH ADJUSTMENTS - (FINAL)

CHECK UNDER POWER

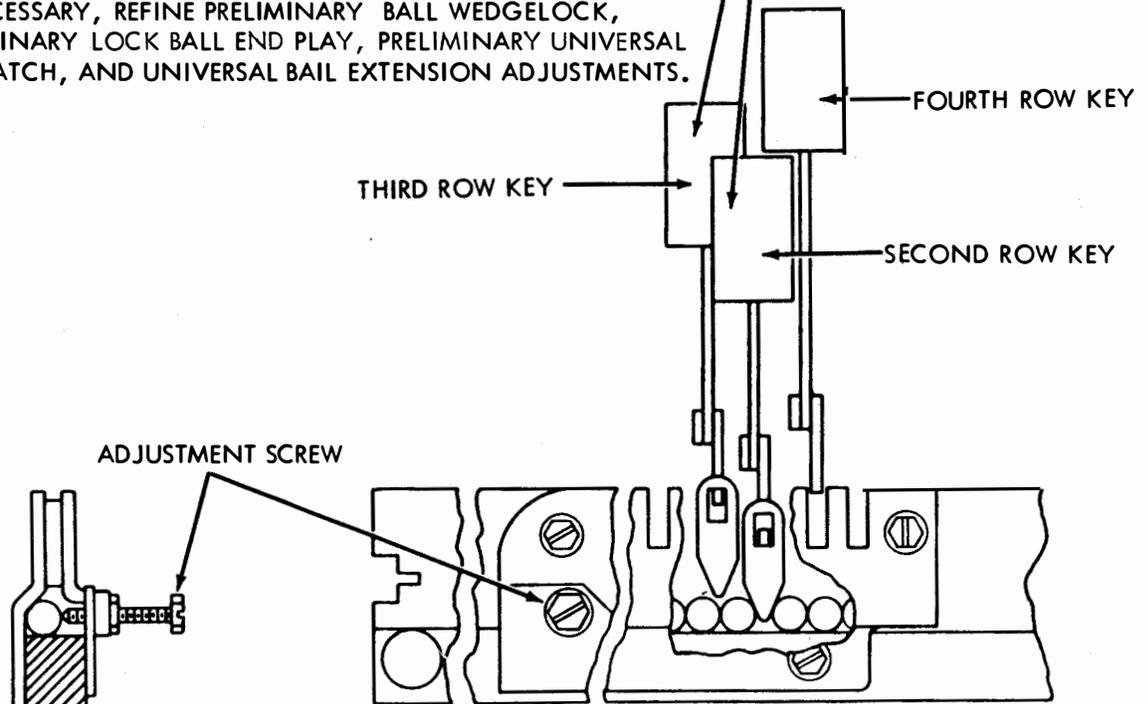
- (1) REQUIREMENT
MIN 2 OZ
MAX 6 OZ
TO TRIP ANY CENTER ROW KEY.
- (2) REQUIREMENT
WITH 6-1/2 OZ PRESSURE APPLIED PERPENDICULAR TO THE "A" KEY, DEPRESS EACH KEY IN THE THIRD ROW. THE "A" KEY SHALL TRIP EACH TIME A KEY IS RELEASED. REPEAT THIS CHECK WITH THE 6-1/2 OZ PRESSURE ON THE "CAR. RET." KEY.
- (3) REQUIREMENT
THE CLUTCH SHALL NOT TRIP WHEN ANY TWO KEYS ARE DEPRESSED SIMULTANEOUSLY.
- (4) REQUIREMENT
WITH $5\frac{1}{4} \pm \frac{1}{4}$ OZ APPLIED TO THE "SPACE BAR," DEPRESS "CAR. RET." KEY. THE "SPACE BAR" SHALL TRIP EACH TIME THE "CAR. RET." KEY IS RELEASED BY MOVING THE FINGER OFF THE KEY IN A HORIZONTAL DIRECTION.

NOTE

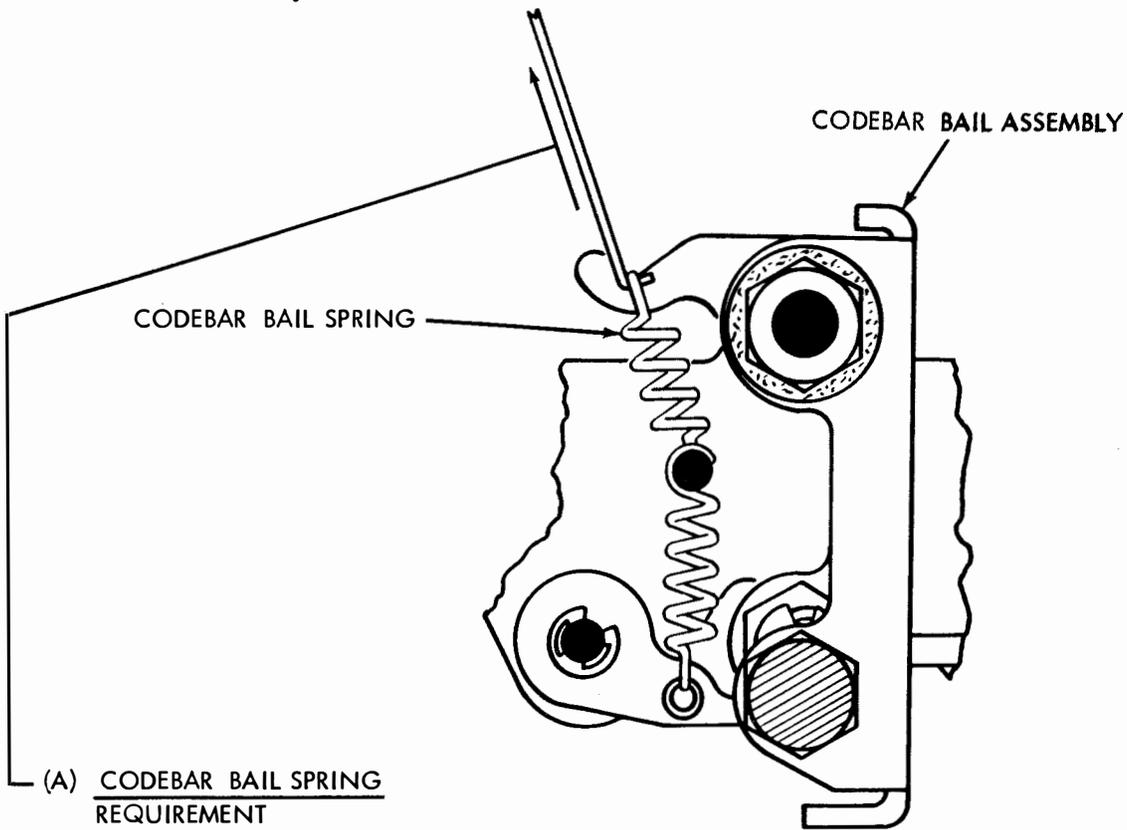
DISREGARD MULTIPLE SPACE OPERATION IF UNIT IS EQUIPPED WITH 163775 MODIFICATION KIT FOR REPEAT-SPACE OPERATION.

TO ADJUST

IF NECESSARY, REFINE PRELIMINARY BALL WEDGELOCK, PRELIMINARY LOCK BALL END PLAY, PRELIMINARY UNIVERSAL BAIL LATCH, AND UNIVERSAL BAIL EXTENSION ADJUSTMENTS.



2.12 Codebar Assembly continued

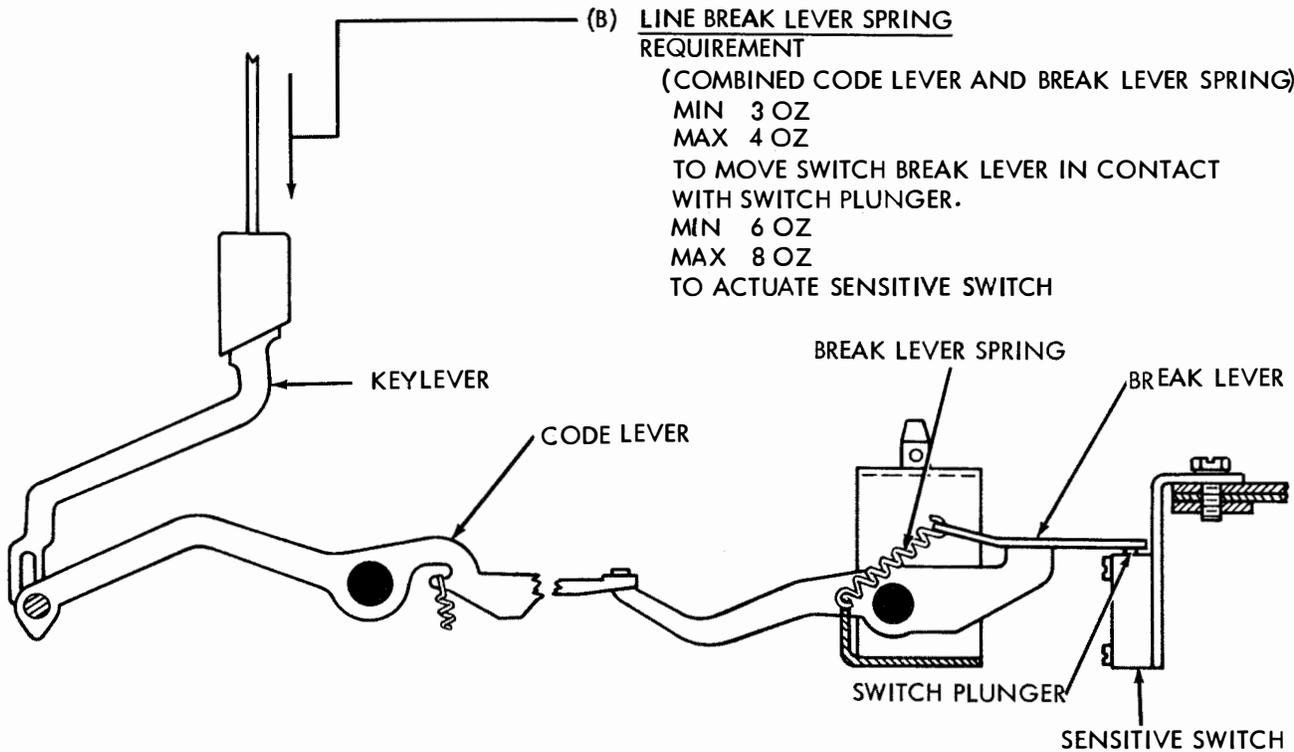


(A) CODEBAR BAIL SPRING
REQUIREMENT

CLUTCH DISENGAGED. SPRING UNHOOKED
FROM ARM.
MIN 9 OZ
MAX 11 OZ
TO PULL TO INSTALLED LENGTH.

(B) LINE BREAK LEVER SPRING
REQUIREMENT

(COMBINED CODE LEVER AND BREAK LEVER SPRING)
MIN 3 OZ
MAX 4 OZ
TO MOVE SWITCH BREAK LEVER IN CONTACT
WITH SWITCH PLUNGER.
MIN 6 OZ
MAX 8 OZ
TO ACTUATE SENSITIVE SWITCH



2.13 Keyboard Mechanism continued

(A) CODE LEVER SPRING

(1) REQUIREMENT

MIN 1 OZ

MAX 2 OZ

TO START CODE LEVER MOVING DOWNWARD.

(2) REQUIREMENT

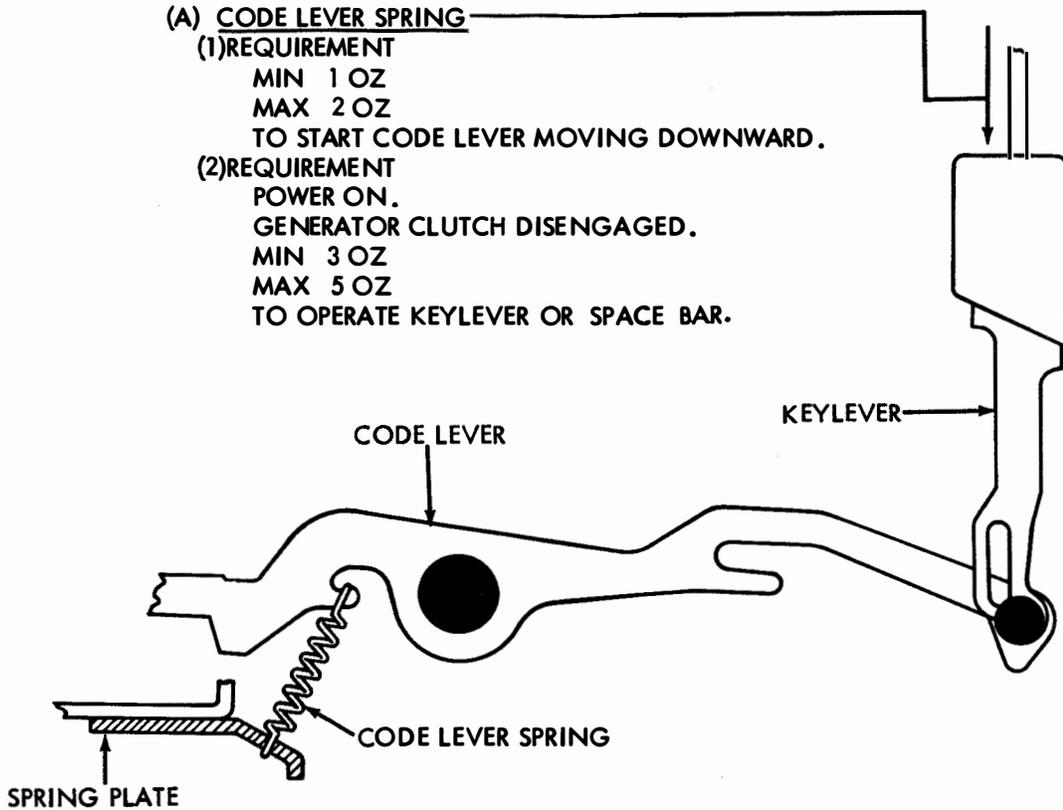
POWER ON.

GENERATOR CLUTCH DISENGAGED.

MIN 3 OZ

MAX 5 OZ

TO OPERATE KEYLEVER OR SPACE BAR.



(B) LOCAL CARRIAGE RETURN FUNCTION BAIL SPRING

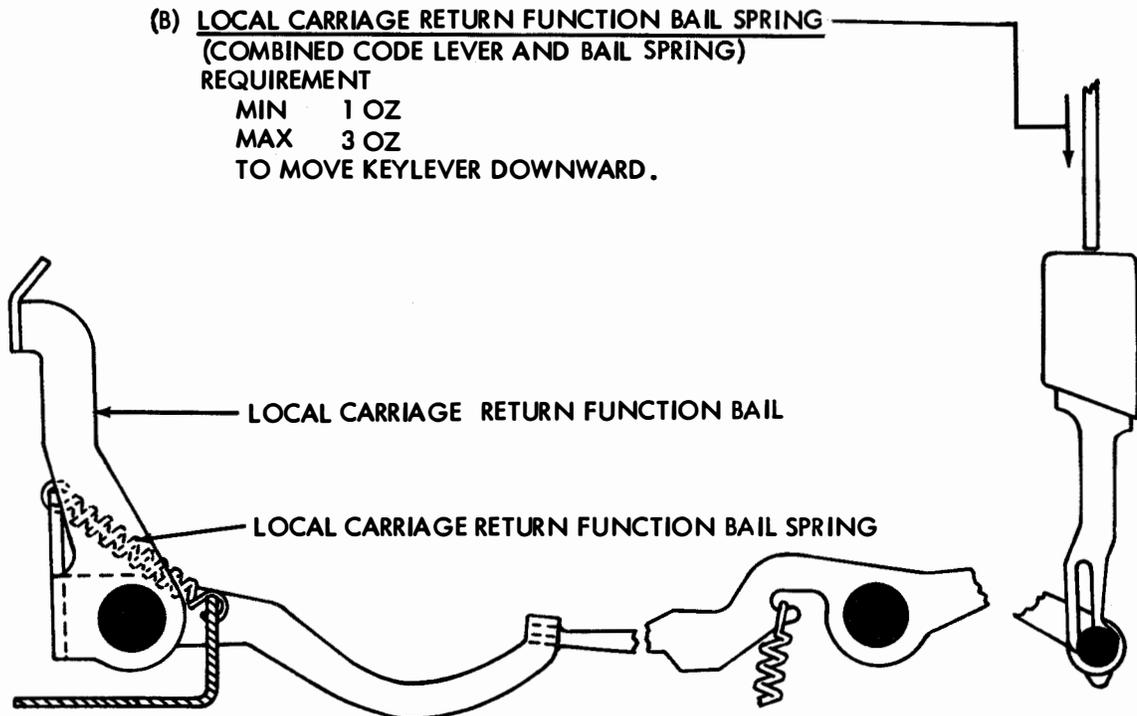
(COMBINED CODE LEVER AND BAIL SPRING)

REQUIREMENT

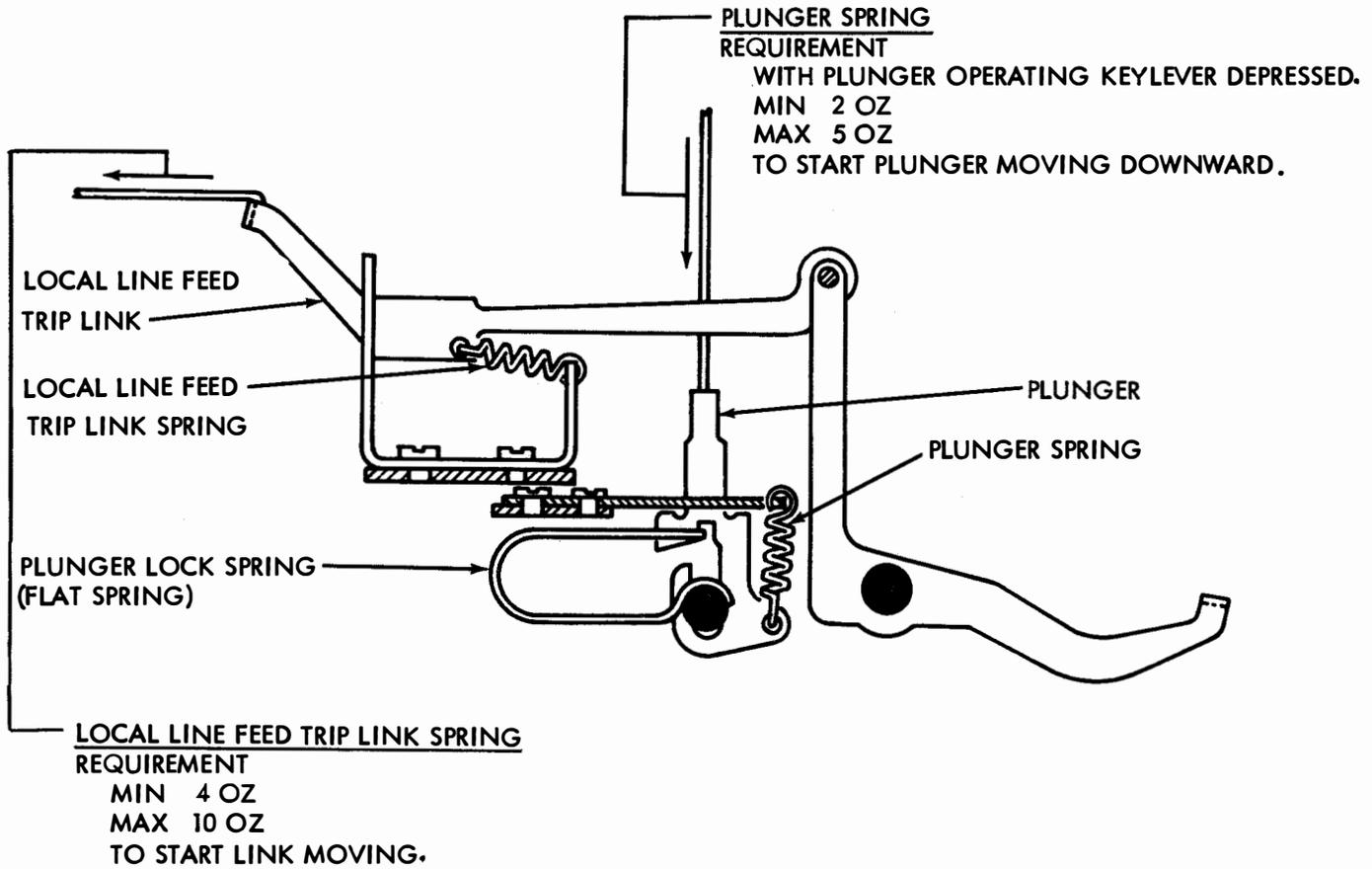
MIN 1 OZ

MAX 3 OZ

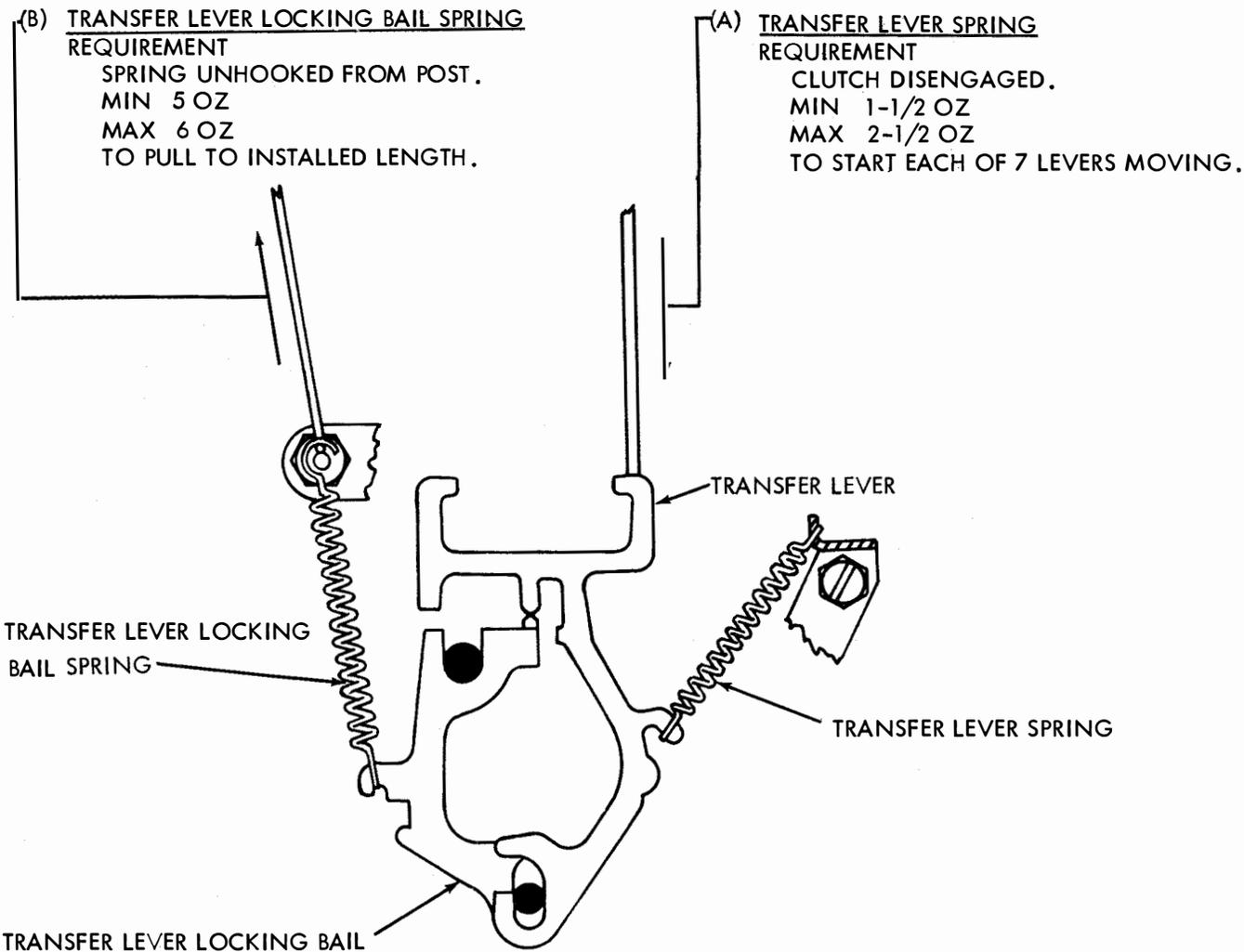
TO MOVE KEYLEVER DOWNWARD.



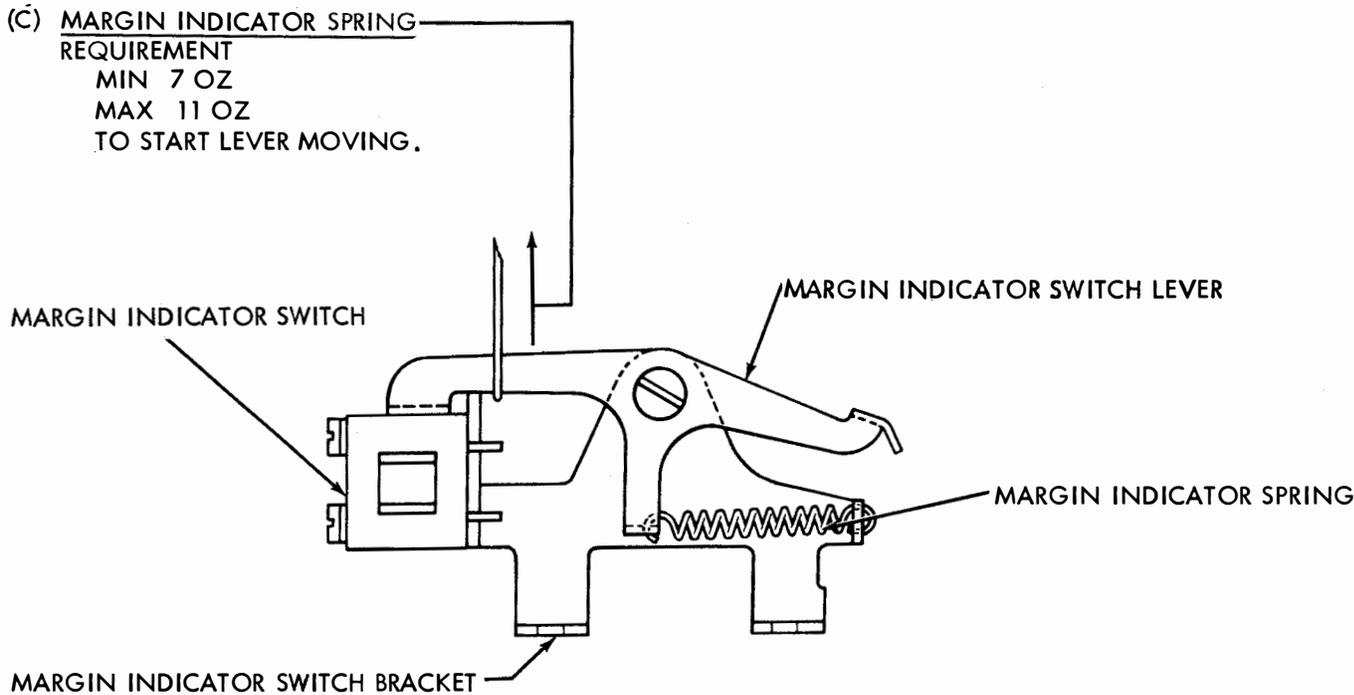
2.14 Keyboard Mechanism continued



2.15 Codebar Assembly and Signal Generator Mechanism continued



2.16 Interrelated Features



2.17 Interrelated Features continued

NOTE
 NOT APPLICABLE TO WALL MOUNTED PRINTER
 REFER TO PAR. 2.20

(2) REQUIREMENT

THERE SHOULD BE A BARELY PERCEPTIBLE AMOUNT OF BACKLASH BETWEEN THE INTERMEDIATE DRIVING GEAR AND THE INTERMEDIATE DRIVEN GEAR AT THE POINT WHERE THE BACKLASH IS THE LEAST.

TO ADJUST

RAISE OR LOWER THE FRONT END OF THE INTERMEDIATE GEAR BRACKET BY MEANS OF THE FILLISTER HEAD ADJUSTING AND CLAMPING SCREWS LOCATED AT THE FRONT END OF THE BRACKET. REFINE REQUIREMENTS IF NECESSARY.

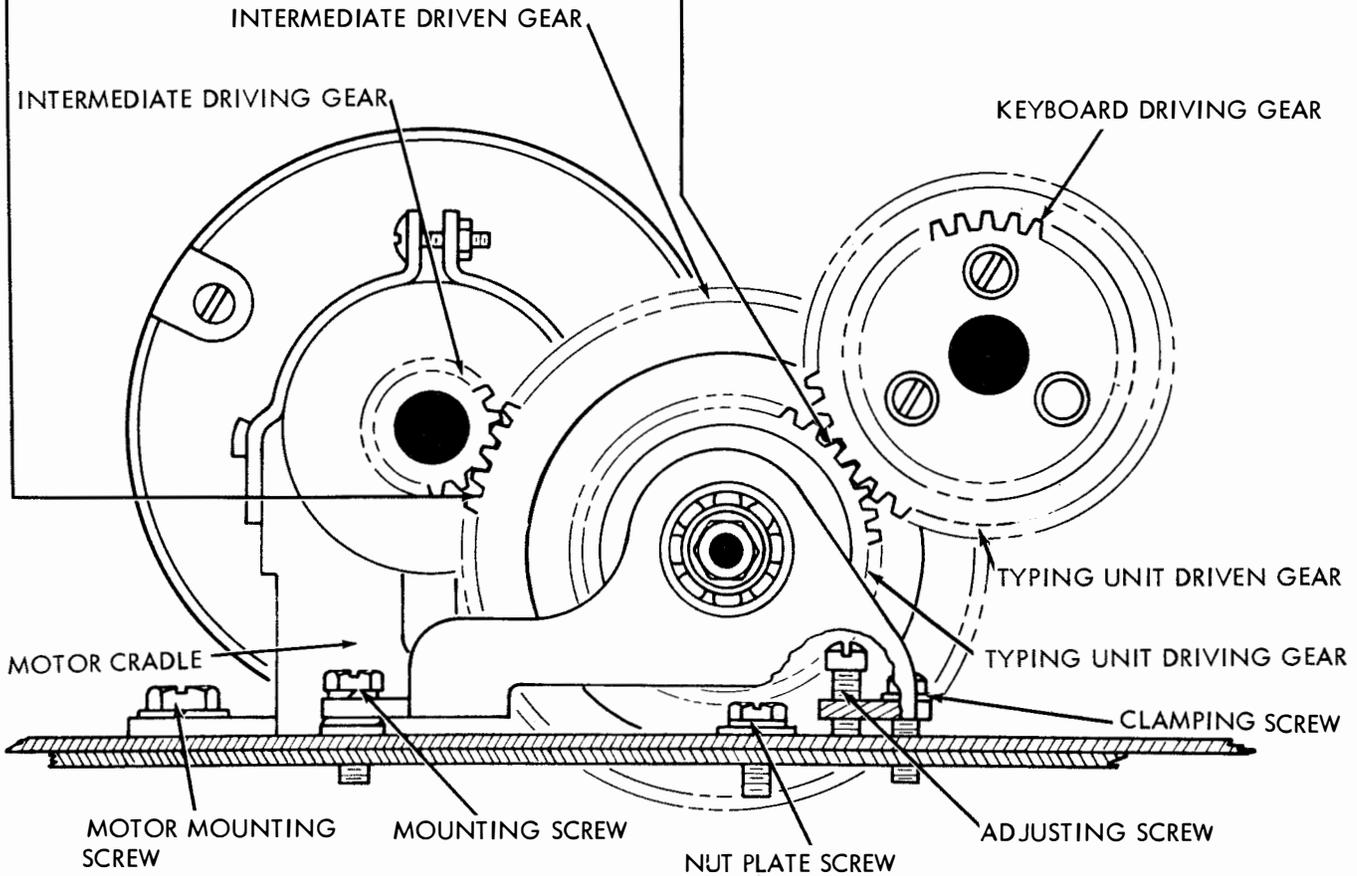
INTERMEDIATE GEAR BRACKET

(1) REQUIREMENT

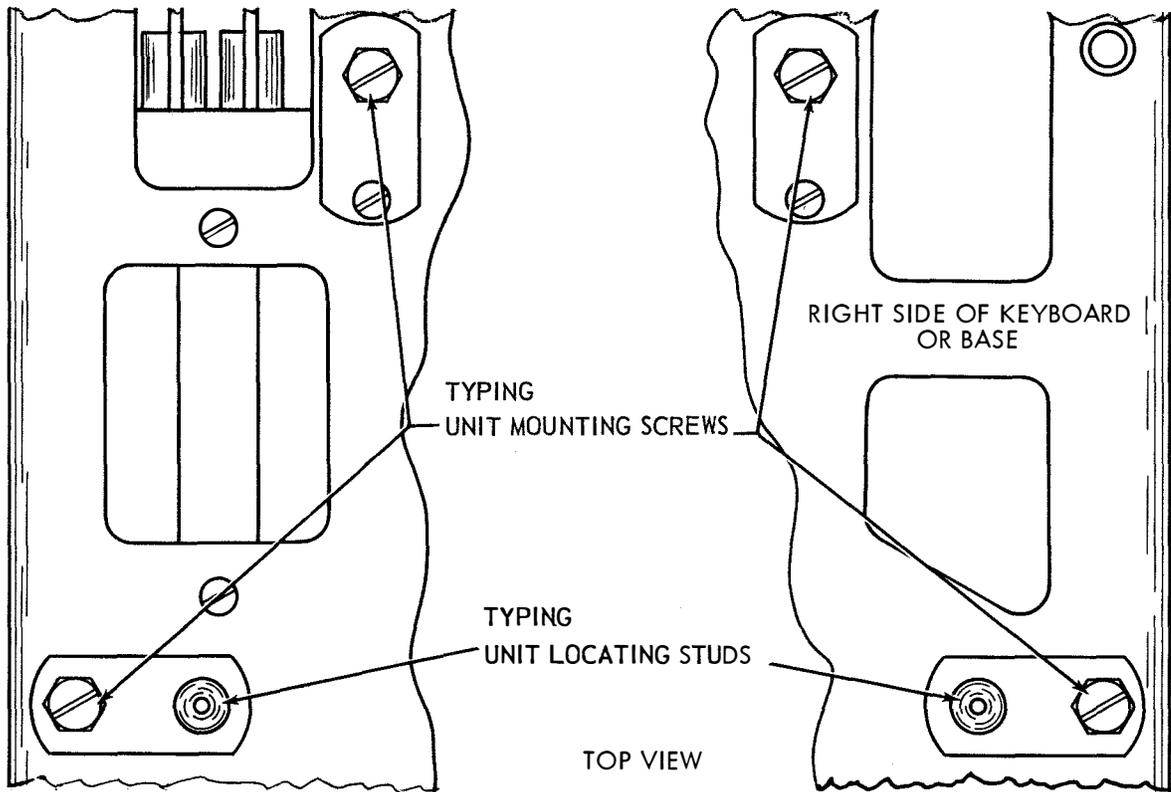
THERE SHOULD BE A BARELY PERCEPTIBLE AMOUNT OF BACKLASH BETWEEN THE TYPING UNIT DRIVEN GEAR AND THE TYPING UNIT DRIVING GEAR AT THE POINT WHERE BACKLASH IS THE LEAST.

TO ADJUST

POSITION THE COMPLETE INTERMEDIATE GEAR MECHANISM BRACKET BY UTILIZING THE ADJUSTING SLOTS WITH THE THREE HEXAGON HEAD SCREWS LOOSENED. ALIGN THE GEARS AT THIS TIME.



2.18 Interrelated Features continued



SIMILAR REQUIREMENTS FOR WALL MOUNTED PRINTER SEE PAR. 2.09

(A) MOUNTING TYPING UNIT ON KEYBOARD OR BASE
REQUIREMENT

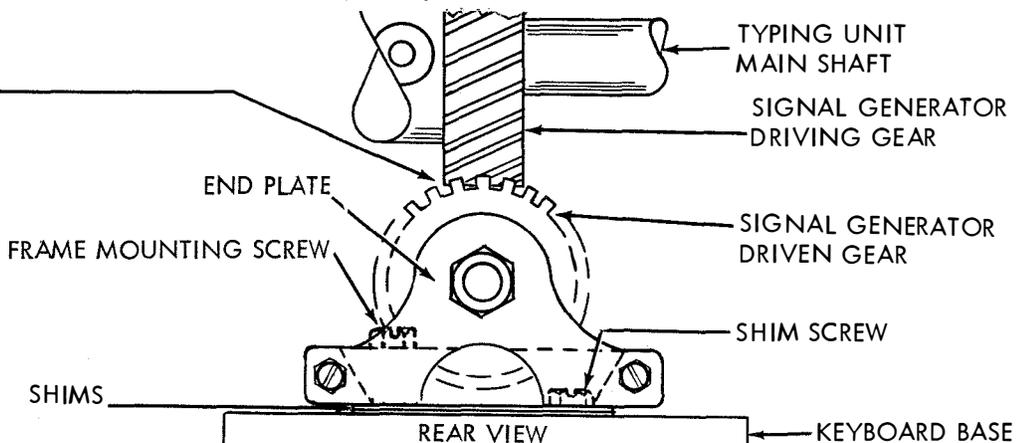
WHEN PLACING THE TYPING UNIT ON THE BASE HOLD IT TILTED SLIGHTLY TO THE RIGHT AND LOWER THE RIGHT END INTO ENGAGEMENT WITH THE RIGHT LOCATING STUD. WHILE EASING THE LEFT END DOWNWARD ROTATE THE MOTOR BY HAND TO PROPERLY MESH THE GEARS. SECURE BY FOUR MOUNTING SCREWS. ROTATE THE MOTOR BY HAND TO INSURE PROPER MESHING OF GEARS.

(B) 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.

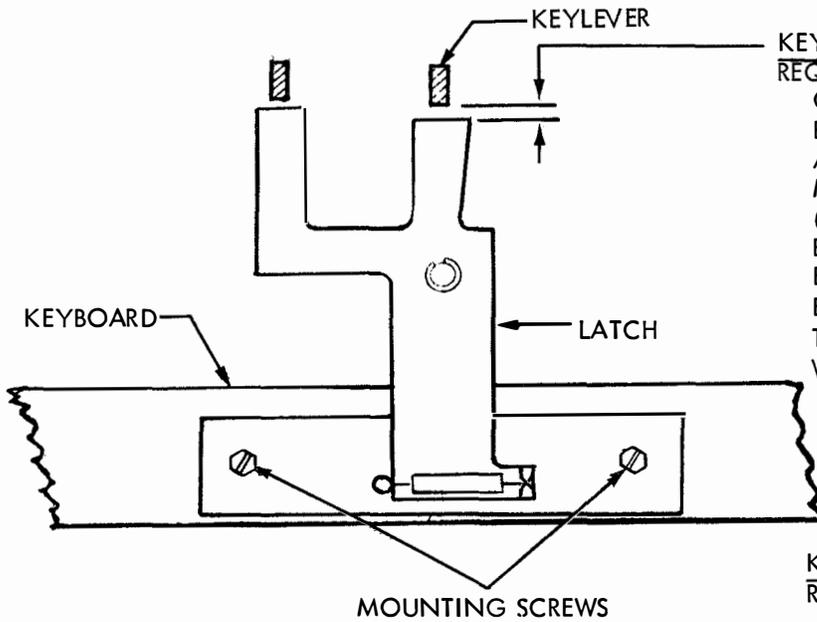
TO ADJUST

REMOVE THE SIGNAL GENERATOR FRAME REAR MOUNTING SCREW AND LOOSEN THE SHIM SCREW. ADD OR SUBTRACT SHIMS AS REQUIRED.



2.19 Wall Mounted Keyboard

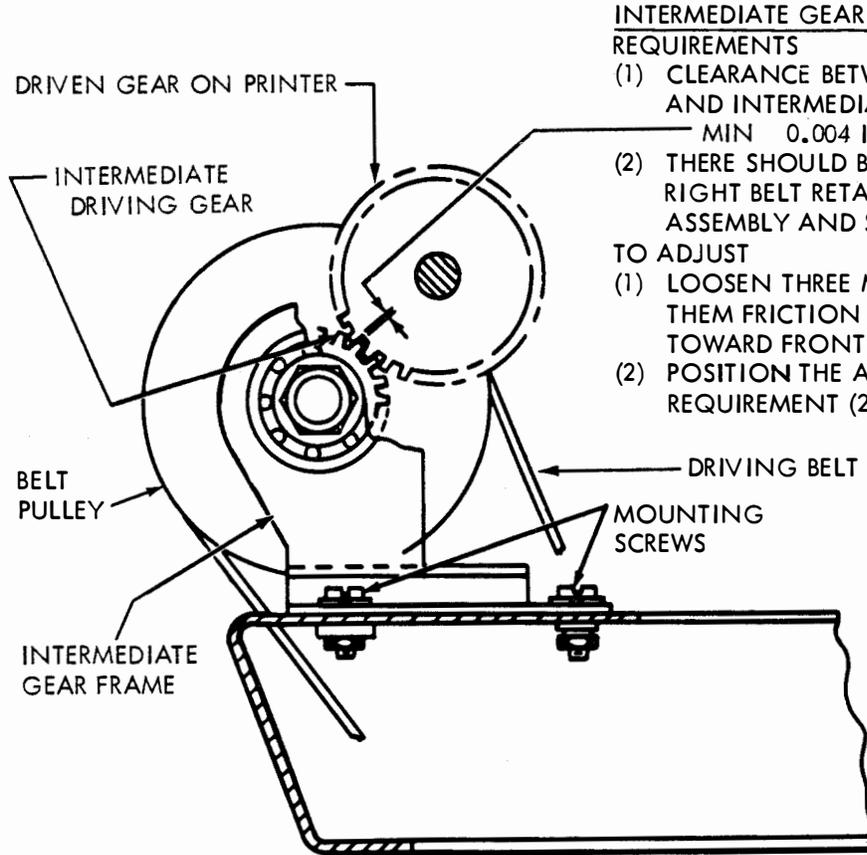
WALL MOUNTED PRINTER (28K, 28N TELETYPEWRITER BASES)



KEYTOP MECHANISM
 REQUIREMENT --- WITH KEYBOARD IN UN-OPERATED POSITION. (1) CLEARANCE BETWEEN TOP OF RIGHT END OF LATCH AND BOTTOM OF ASSOCIATED KEYLEVER MIN 0.025 INCH --- MAX 0.045 INCH (2) BOTTOM OF LATCH MOUNTING BRACKET SHALL BE PARALLEL TO BOTTOM EDGE OF BALL LOCK CHANNEL (GAUGE BY EYE). SEE PAR. 2.09 TO ADJUST --- POSITION THE MECHANISM WITH ITS MOUNTING SCREWS LOOSENED.

KEYLOCK LATCH SPRING
 REQUIREMENT --- WITH SPRING SCALE APPLIED TO TOP OF FUNCTION PERIOD KEYTOP, PUSH DOWNWARD UNTIL KEYTOP IS FULLY DEPRESSED (PAR. 2.09). MIN 2-1/2 OZ --- MAX 5-1/2 OZ TO OPERATE KEYLEVER

2.20 Wall Mounted Keyboard continued



INTERMEDIATE GEAR ASSEMBLY
REQUIREMENTS

- (1) CLEARANCE BETWEEN DRIVEN GEAR ON PRINTER AND INTERMEDIATE GEAR SHOULD BE
MIN 0.004 INCH --- MAX 0.008 INCH
- (2) THERE SHOULD BE SOME CLEARANCE BETWEEN RIGHT BELT RETAINER ON INTERMEDIATE GEAR ASSEMBLY AND SPACING CUTOUT LEVER ON PRINTER.

TO ADJUST

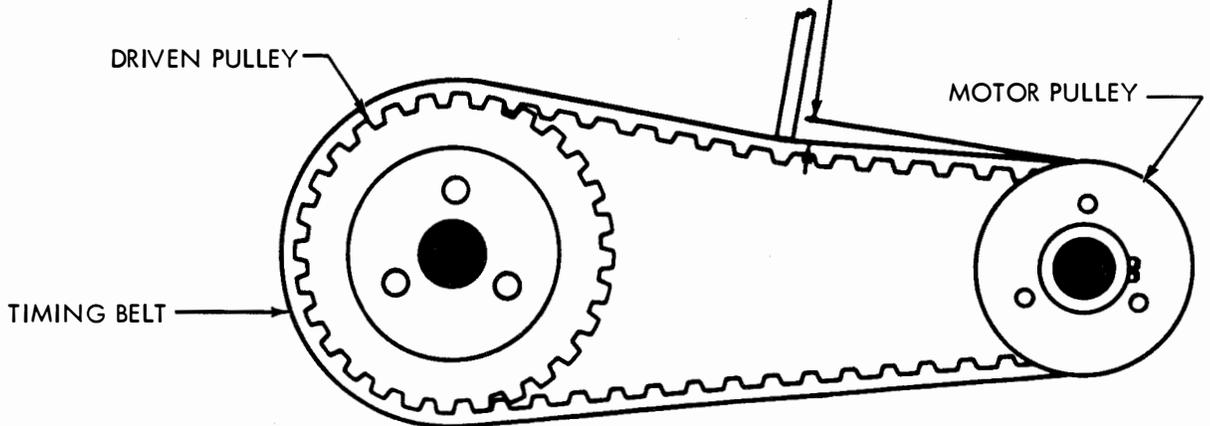
- (1) LOOSEN THREE MOUNTING SCREWS AND MAKE THEM FRICTION TIGHT. POSITION THE ASSEMBLY TOWARD FRONT OR REAR TO MEET REQUIREMENT (1).
- (2) POSITION THE ASSEMBLY TOWARD THE LEFT TO MEET REQUIREMENT (2). TIGHTEN SCREWS.

TIMING BELT
REQUIREMENT

FORCE OF $2 \pm 1/2$ 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.



2.21 Signal Generator Mechanism continued

SIGNAL CONTACT CLEARANCE (USING SIGNAL TEST SET --- SUCH AS 1A OR 28-TYPE TELETYPEWRITER TEST SETS) PRELIMINARY --- WITH ELECTRICAL NOISE SUPPRESSOR DISCONNECTED FROM CIRCUIT, CONNECT SIGNAL CONTACTS SO AS TO INTERRUPT (KEY) CURRENT TO "STROBE" LAMP OF 1A OR 28-TYPE TELETYPEWRITER TEST SETS. TEST SET AND KEYBOARD MUST OPERATE AT SAME SPEED. (SEE TABLE 1-1).

REQUIREMENTS

- (1) WITH BLANKS COMBINATION SELECTED, ORIENT SCALE OF TEST SET TO ALIGN ZERO MARK OF STOP SEGMENT WITH BEGINNING OF STOP PULSE IMAGE. LENGTH OF TRACE SHALL BE FROM THE ZERO MARK TO MIN 141-1/2 DIVISIONS -----MAX 142-1/2 DIVISIONS. (7.42 UNIT CODE ONLY) TO ADJUST - IF VARIATIONS OCCUR, POSITION SCALE SO THAT VARIATIONS EXTEND EQUALLY ON RIGHT & LEFT OF 142 MARK.
- (2) NOMINAL LENGTH OF PULSES NO. 1, 2, 3, 4, & 5 IS 100 DIVISIONS. TO ADJUST - RECHECK CONTACT CLEARANCE REQUIREMENT PAR. 2.04. REFINE CLEARANCE, WHERE NECESSARY, TO FAVOR PULSES 1 THRU 5 BY ORIENTING BEGINNING OF STOP PULSE TRACE UP TO ± 5 DIVS. FROM ZERO MARK OF SEGMENT (REFER TO REQUIREMENTS "A" AND "B" BELOW)
- (3) EACH PULSE TRACE (SEE "C" BELOW) TO BE FREE OF UNDERSIRABLE BREAKS. TO ADJUST - RECHECK TRANSFER BAIL DETENT PLATE REQUIREMENT. (PAR. 2.04) AND WHERE NECESSARY, REFINE ADJUSTMENT. NOTE --- DETENT PLATE MAY BE ROTATED EITHER LEFT OR RIGHT AS LONG AS DETENT TOGGLE LATCH CONTINUES TO CAM OFF PROJECTION OF TRANSFER BAIL.

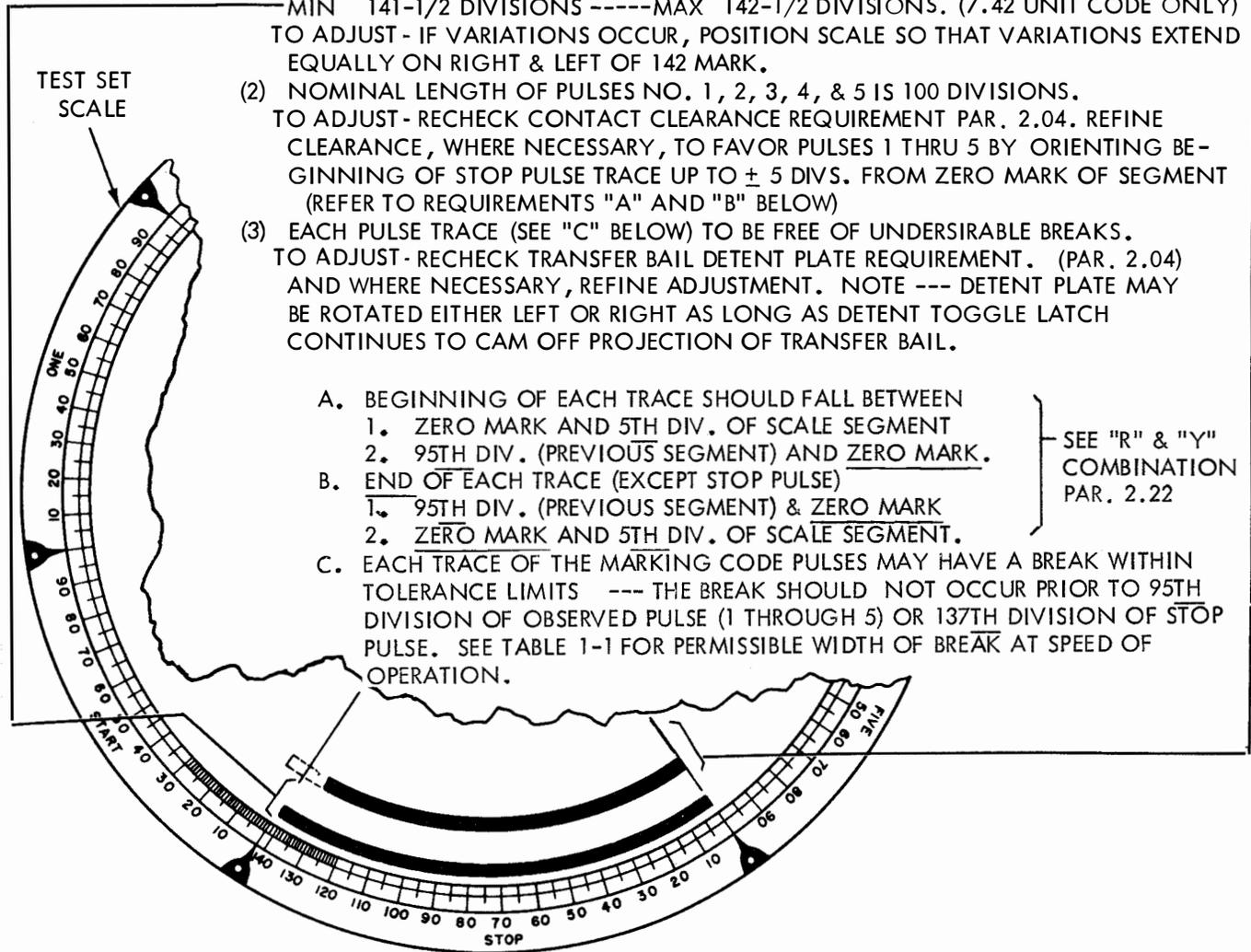
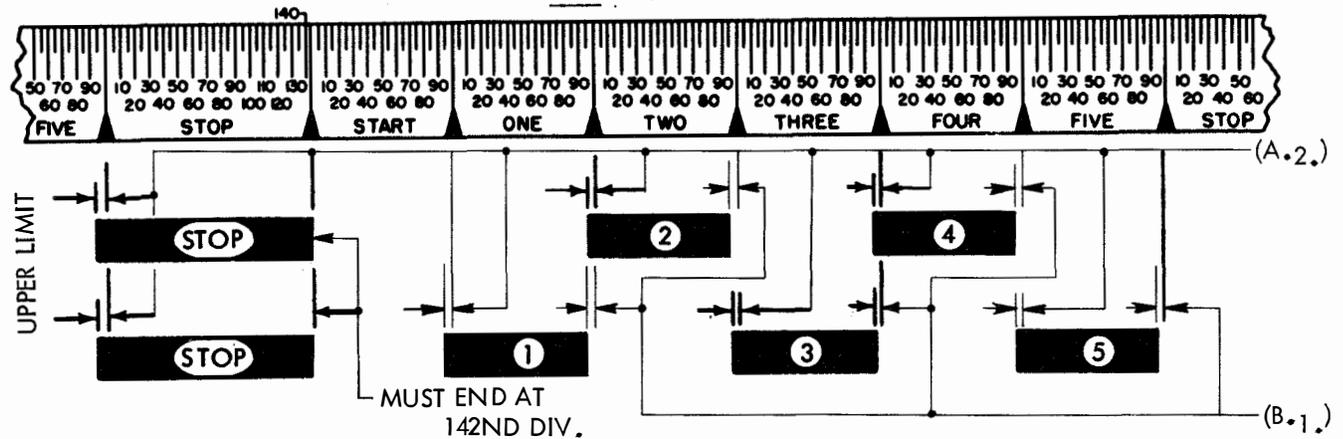
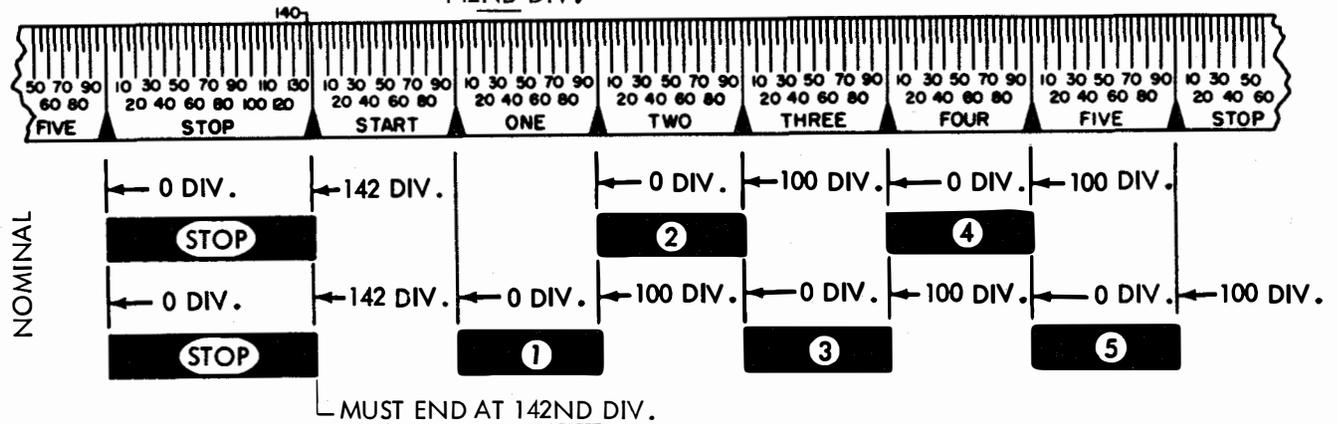
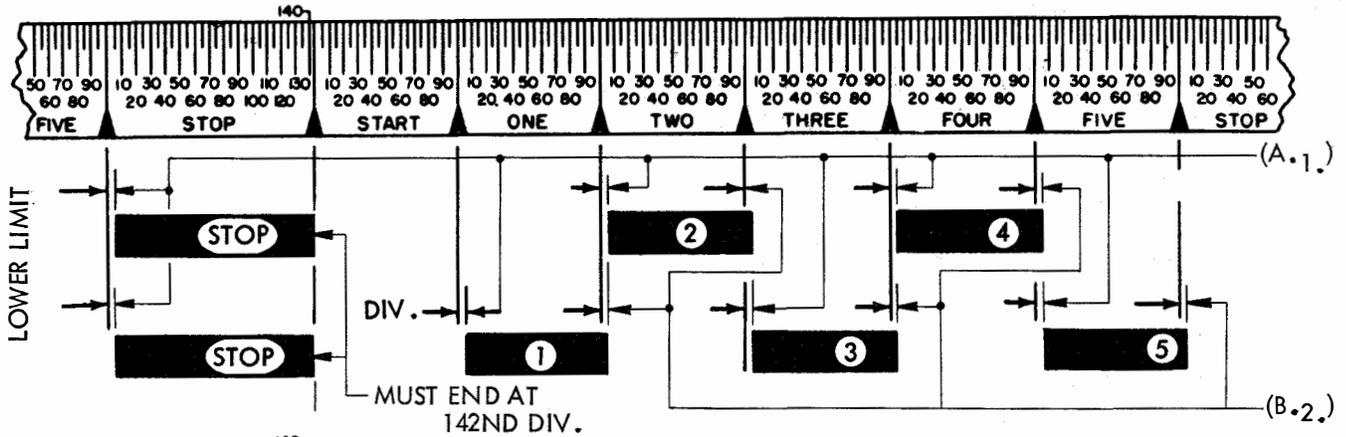


TABLE 1-1 SIGNALING PULSE SPEED AND PERMISSIBLE WIDTH OF BREAK

SPEED	OPERATIONS PER MINUTE	WIDTH OF BREAK NOT TO EXCEED	REMARKS
60 WPM	338.182	1 DIVISION	MARKING PULSES (1 THROUGH 5 & STOP)
75 WPM	460.00	1-1/2 DIVISIONS	MARKING PULSES (1 THROUGH 5 & STOP)
100 WPM	600.00	2 DIVISIONS	MARKING PULSES (1 THROUGH 5 & STOP)

2.22 Signal Generator Mechanism continued

"R" AND "Y" COMBINATION



"R" AND "Y" COMBINATION

FOR UNITS WITH SPACING CONTACTS OF SIGNAL GENERATOR WIRED FOR POLAR OPERATION REQUIREMENTS ---

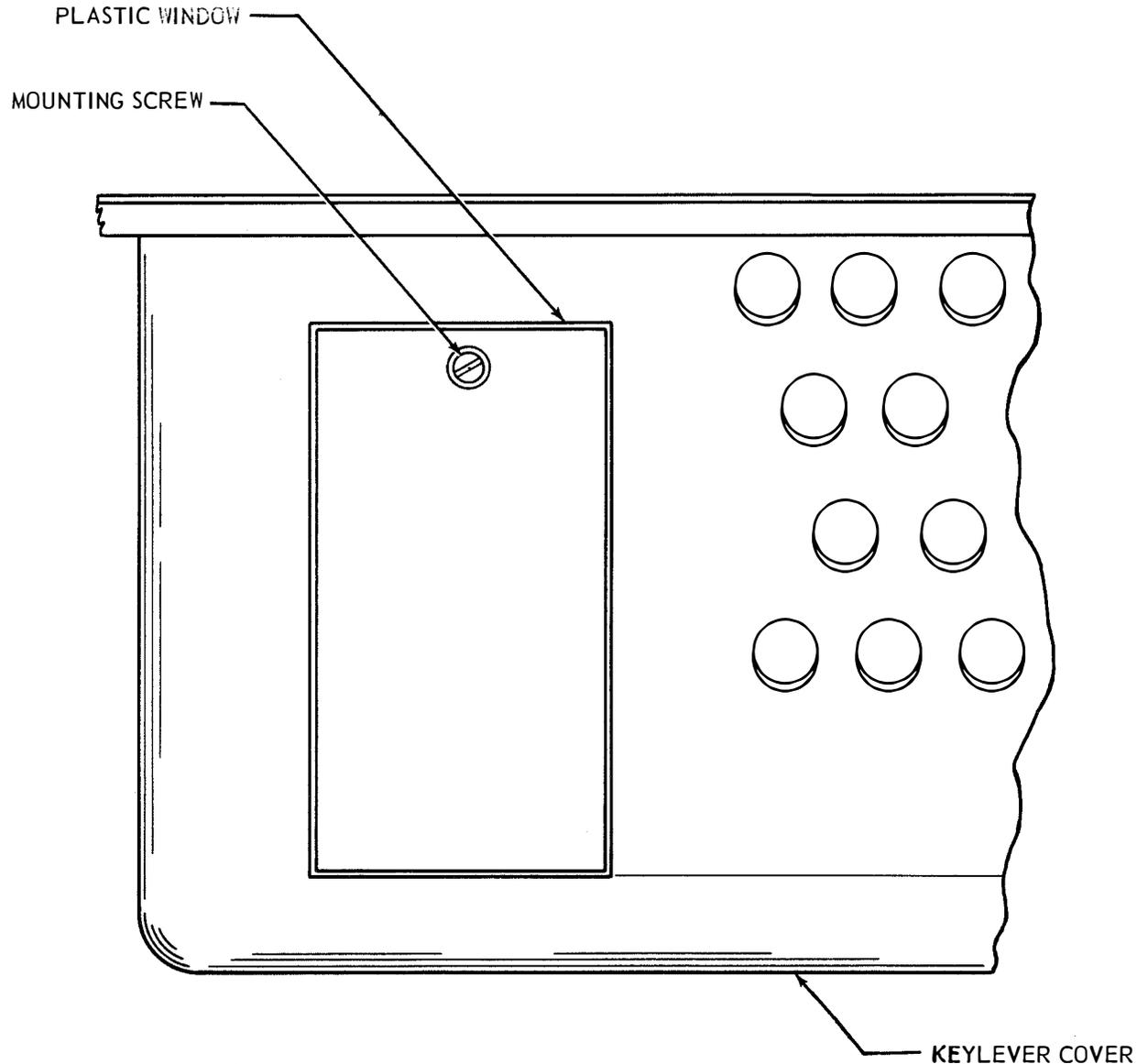
- (1) SPACING PULSES SHALL START NO EARLIER THAN 94TH DIV. OF PREVIOUS SEGMENT AND NO LATER THAN 6TH DIV. OF PULSE UNDER OBSERVATION.
- (2) TRACE OF SPACING PULSE SHALL END NO EARLIER THAN 94TH DIV. OF PULSE UNDER OBSERVATION AND END NO LATER THAN 6TH DIV. OF FOLLOWING PULSE.
- (3) TRACE OF START PULSE SHALL BEGIN NO EARLIER THAN 136TH DIV. OF STOP SEGMENT AND NO LATER THAN 6TH DIV. OF START SEGMENT. START PULSE SHALL END NO EARLIER THAN 94TH DIV. OF START SEGMENT AND END NO LATER THAN 6TH DIV. OF NO. 1. SEGMENT.
- (4) SPACING PULSE MAY HAVE A BREAK PROVIDED THE BREAK IS NOT OVER ONE DIVISION WIDE AND IT DOES NOT OCCUR PRIOR TO 95TH DIV. OF PULSE UNDER OBSERVATION.

2.23 Signal Generator Mechanism continued

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 SPECIAL LOW-VOLTAGE APPLICATIONS. SEE (PAR. REFERENCE 1.B 1.13) FOR SERVICING INSTRUCTIONS.

2.24 Keyboard Mechanism continued



PLASTIC WINDOW

REQUIREMENT

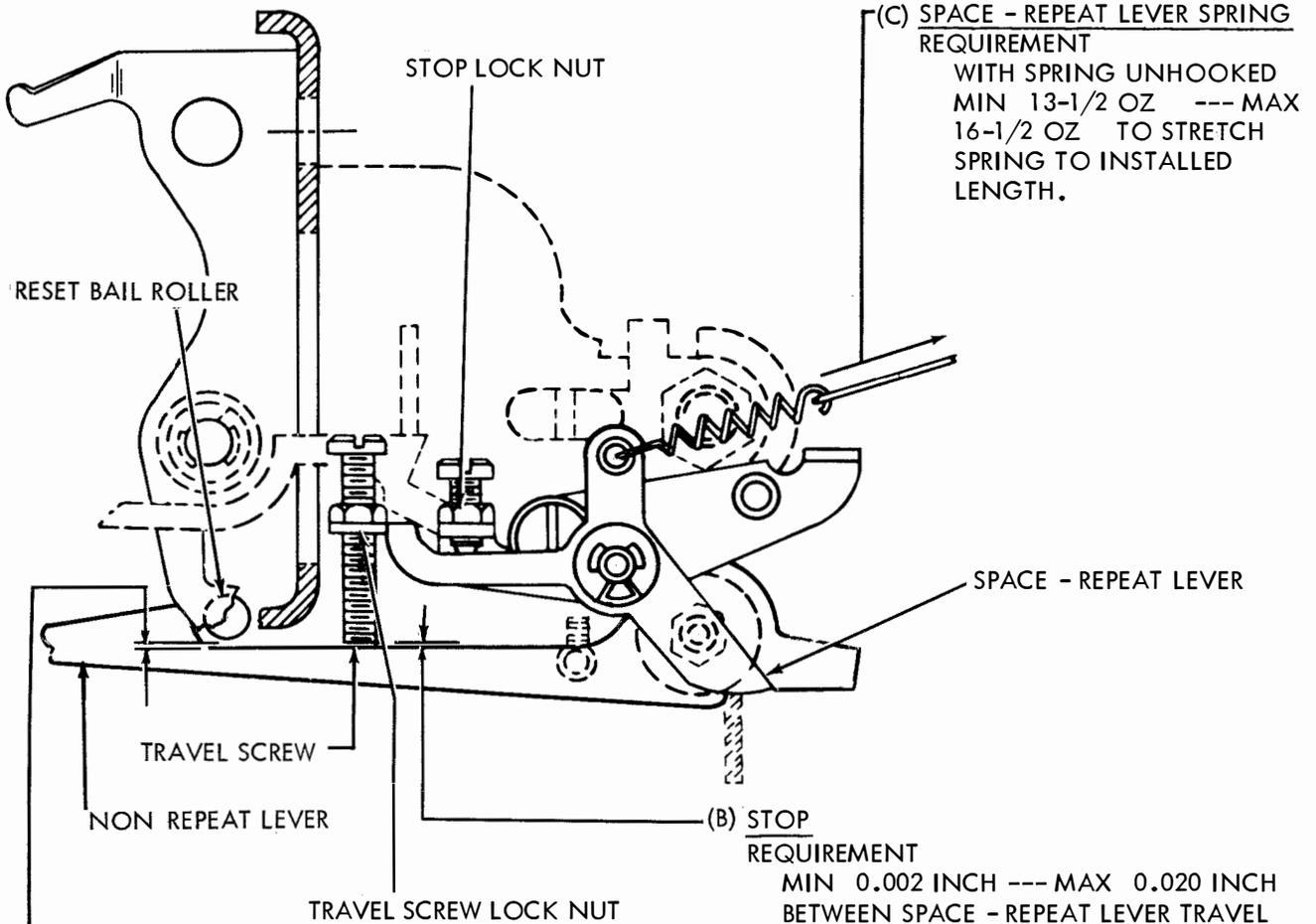
PLASTIC WINDOW SHOULD BE FULLY SEATED IN POSITION BEFORE TIGHTENING MOUNTING SCREW.

TO ADJUST

POSITION WINDOW WITH MOUNTING SCREW LOOSENED.

3. VARIABLE FEATURES

3.01 Repeat-On-Space Mechanism



(C) SPACE - REPEAT LEVER SPRING REQUIREMENT
 WITH SPRING UNHOOKED
 MIN 13-1/2 OZ --- MAX
 16-1/2 OZ TO STRETCH
 SPRING TO INSTALLED
 LENGTH.

(B) STOP REQUIREMENT
 MIN 0.002 INCH --- MAX 0.020 INCH
 BETWEEN SPACE - REPEAT LEVER TRAVEL
 SCREW AND NON REPEAT LEVER.
 TO ADJUST
 DEPRESS "G" KEYLEVER TO TRIP KEY-
 BOARD CLUTCH. POSITION STOP BY
 LOOSENING STOP LOCK NUT.
 RECHECK AFTER ADJUSTMENT.

(A) TRAVEL SCREW REQUIREMENT
 WITH SPACE KEY FULLY DEPRESSED:
 MIN 0.035 INCH --- MAX 0.080 INCH
 BETWEEN RESET BAIL ROLLER AND
 NON REPEAT LEVER.
 TO ADJUST
 WITH SPACE KEY FULLY DEPRESSED,
 ADJUST TRAVEL SCREW BY LOOSENING
 TRAVEL SCREW LOCK NUT. RECHECK
 AFTER ADJUSTMENT.

NOTE
 SPACE BAR TOUCH TO OBTAIN A
 REPEAT IS AFFECTED BY THIS ADJUST-
 MENT. TO GET A LIGHTER TOUCH
 ADJUST TO UPPER LIMIT. TO OBTAIN
 A HEAVIER TOUCH ADJUST TO THE
 LOWER LIMIT.

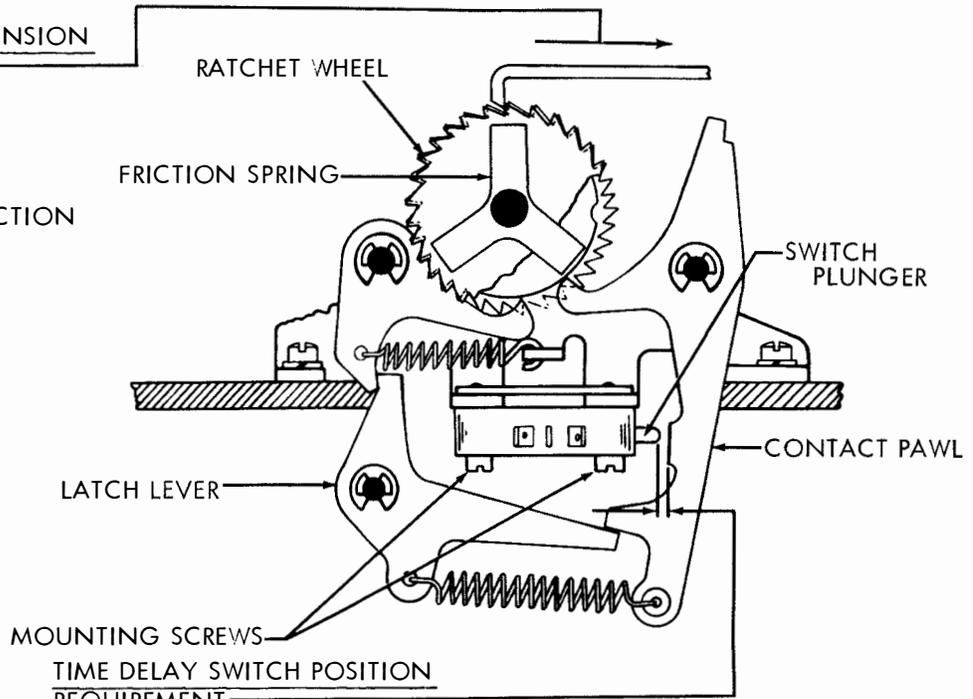


(D) SPACE BAR REQUIREMENT
 (1) REQUIREMENT (SINGLE SPACE)
 NORMAL KEY TOP PRESSURE
 TO TRANSMIT SINGLE SPACE.
 (2) REQUIREMENT (REPEAT SPACE)
 SPACE BAR FULLY DEPRESSED AND
 HELD DOWN TO EFFECT CON-
 TINUOUS SPACE TRANSMISSION.

3.02 Time Delay Mechanism

TIME DELAY RATCHET WHEEL TENSION REQUIREMENT

HOLD OFF ALL PAWLS.
MIN 2 OZ --- MAX 8 OZ
TO MOVE RATCHET WHEEL
TO ADJUST
REMOVE AND BEND THE FRICTION
SPRINGS.



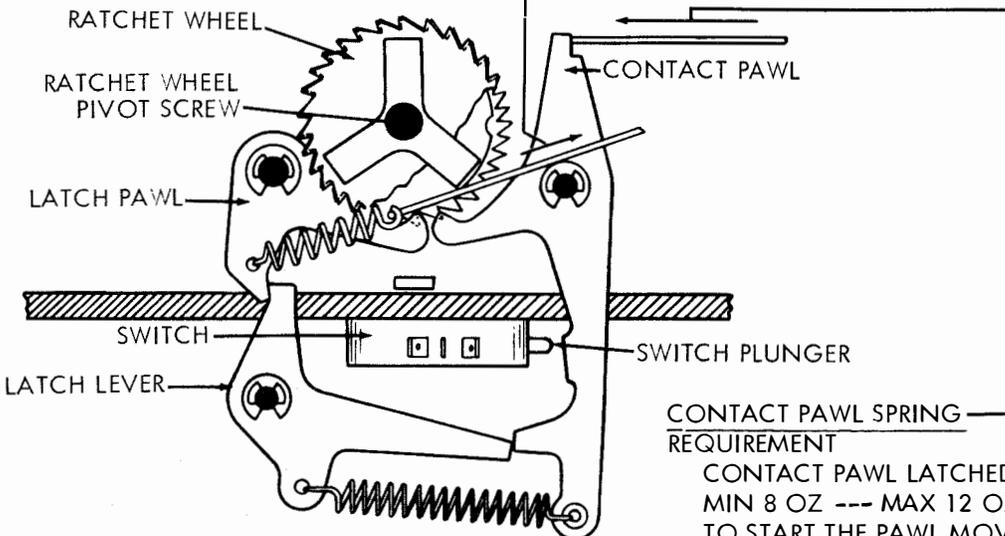
TIME DELAY SWITCH POSITION REQUIREMENT

CONTACT PAWL NOT BLOCKED BY LATCH LEVER AND ON HIGH PART OF THE RATCHET WHEEL. SOME CLEARANCE BETWEEN CONTACT PAWL AND SWITCH PLUNGER WHEN PLAY IN RATCHET WHEELS IS TAKEN UP IN DOWNWARD DIRECTION MAX 0.010 INCH
TO ADJUST
POSITION THE SWITCH WITH THE TWO SWITCH MOUNTING SCREWS LOOSENED.

3.03 Time Delay Mechanism continued

CONTACT LATCH PAWL SPRING REQUIREMENT

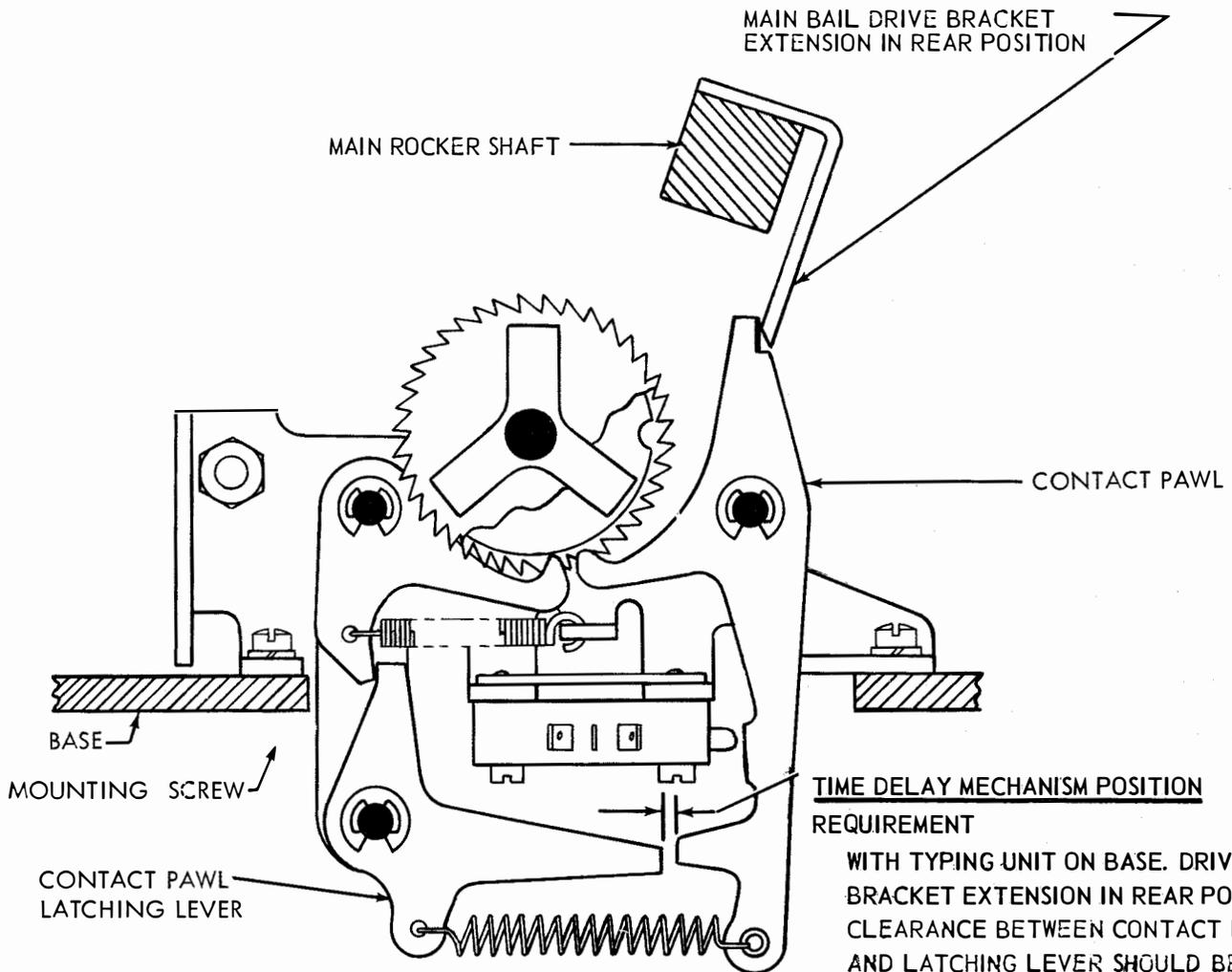
LATCH PAWL SPRING UNHOOKED AT ANCHOR.
MIN 12 OZ --- MAX 15 OZ
TO STRETCH SPRING TO INSTALLED LENGTH AS SHOWN.



CONTACT PAWL SPRING REQUIREMENT

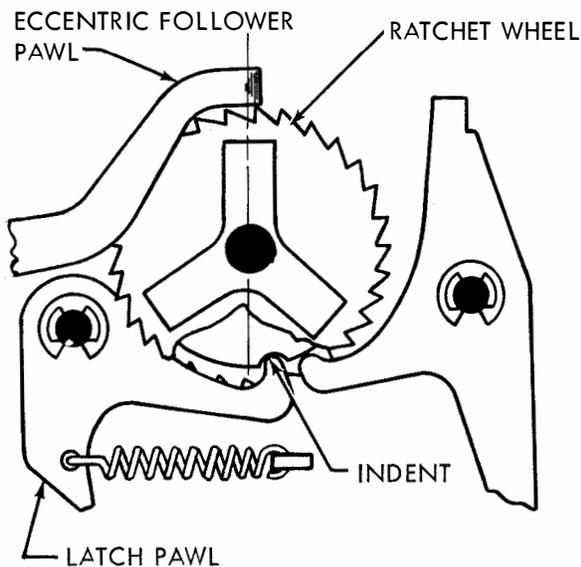
CONTACT PAWL LATCHED ON END OF LATCH LEVER.
MIN 8 OZ --- MAX 12 OZ
TO START THE PAWL MOVING.

3.04 Time Delay Mechanism continued



TIME DELAY MECHANISM POSITION REQUIREMENT

WITH TYPING UNIT ON BASE. DRIVE BRACKET EXTENSION IN REAR POSITION. CLEARANCE BETWEEN CONTACT PAWL AND LATCHING LEVER SHOULD BE MIN 0.020 INCH



TO ADJUST

REMOVE THE TYPING UNIT FROM THE BASE. LOOSEN THE TIME DELAY MOUNTING SCREWS. ROTATE THE RATCHET WHEELS UNTIL THE LATCH PAWL DROPS INTO THE INDENTS IN THE TWO RATCHET WHEELS. LIFT THE ECCENTRIC FOLLOWER PAWL UPWARD. TAKE UP THE PLAY BY PRESSING THE RATCHET WHEELS BACKWARD. WITH THE ECCENTRIC FOLLOWER PAWL AT THE END OF ITS EXTREME FORWARD TRAVEL, POSITION THE MECHANISM SO THAT THE POINT OF THE LOWER BEVELED EDGE OF THE FOLLOWER PAWL RESTS ON THE PEAK OF THE FIRST RATCHET-WHEEL TOOTH FORWARD OF A VERTICAL CENTERLINE THROUGH THE RATCHET WHEEL OR OVER TRAVELS THE PEAK BY NOT MORE THAN 0.010 INCH. RECHECK MINIMUM CLEARANCE OF 0.020 INCH WITH TYPING UNIT ON KEYBOARD BASE. IF NECESSARY, REFINE ADJUSTMENT.

3.05 Time Delay Mechanism continued

ECCENTRIC FOLLOWER PAWL SPRING

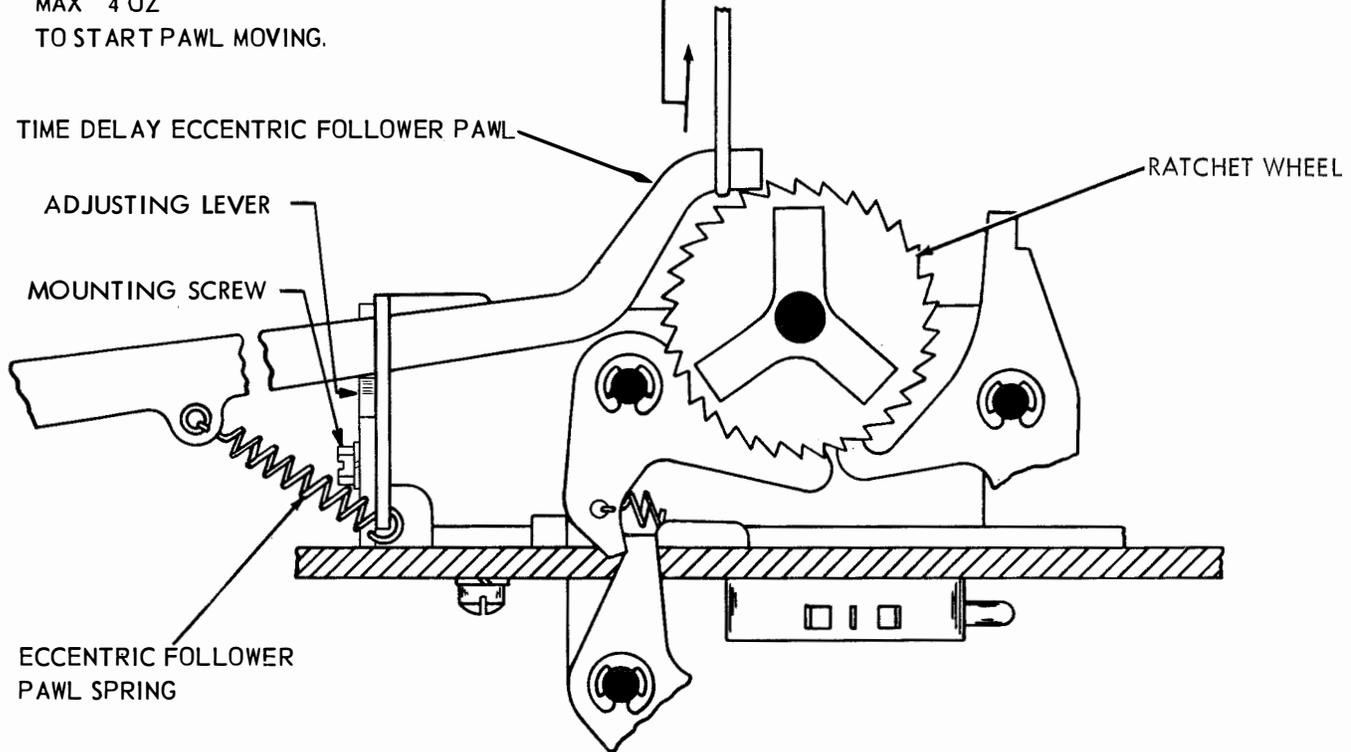
REQUIREMENT

ECCENTRIC FOLLOWER PAWL IN EXTREME FORWARD POSITION. 8 OZ SCALE APPLIED TO PAWL NEAR RATCHET WHEEL AND PULLED UPWARD

MIN 1-1/2 OZ

MAX 4 OZ

TO START PAWL MOVING.



TIME DELAY DISABLING DEVICE

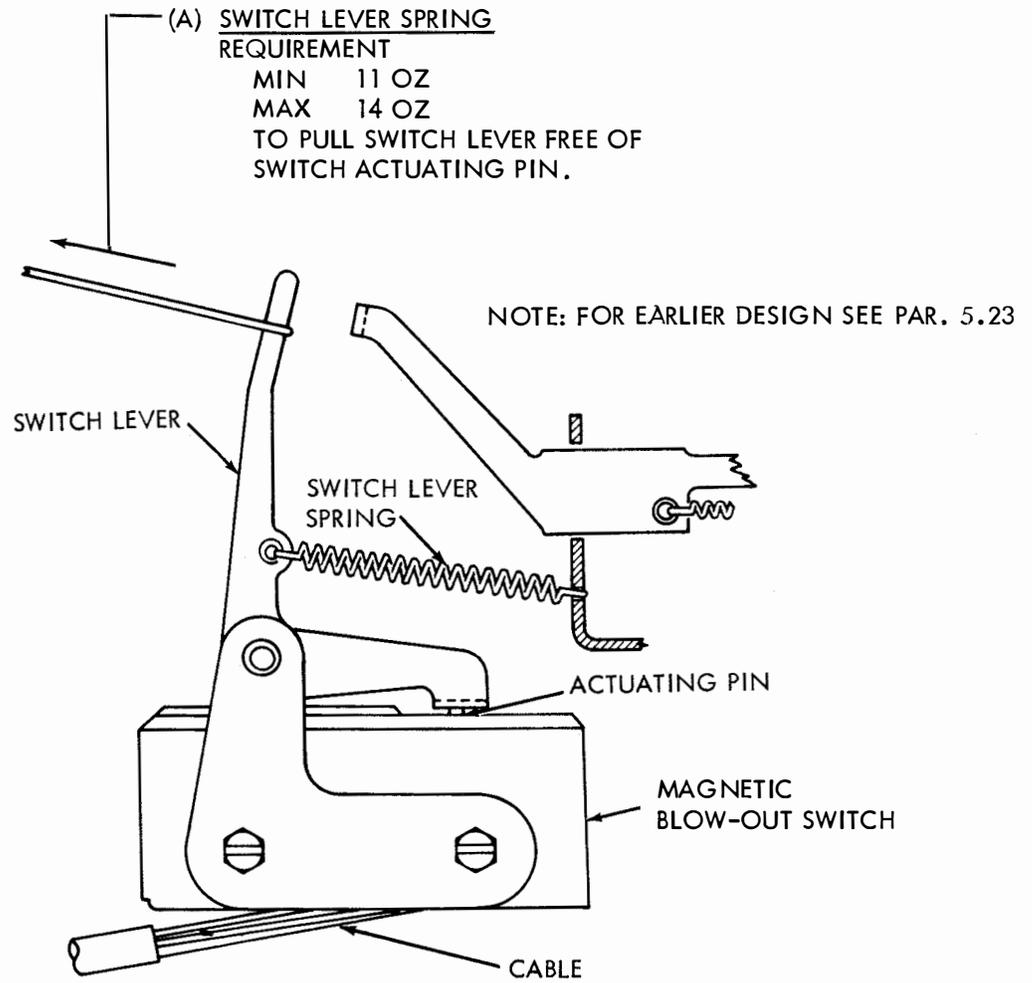
REQUIREMENT

DISABLE THE TIME DELAY MECHANISM WHEN NOT REQUIRED. TO ADJUST

LOOSEN THE ADJUSTING LEVER MOUNTING SCREW AND PRESS DOWNWARD ON THE LEVER TO RAISE ECCENTRIC FOLLOWER PAWL OUT OF ENGAGEMENT WITH ITS RATCHET WHEEL.

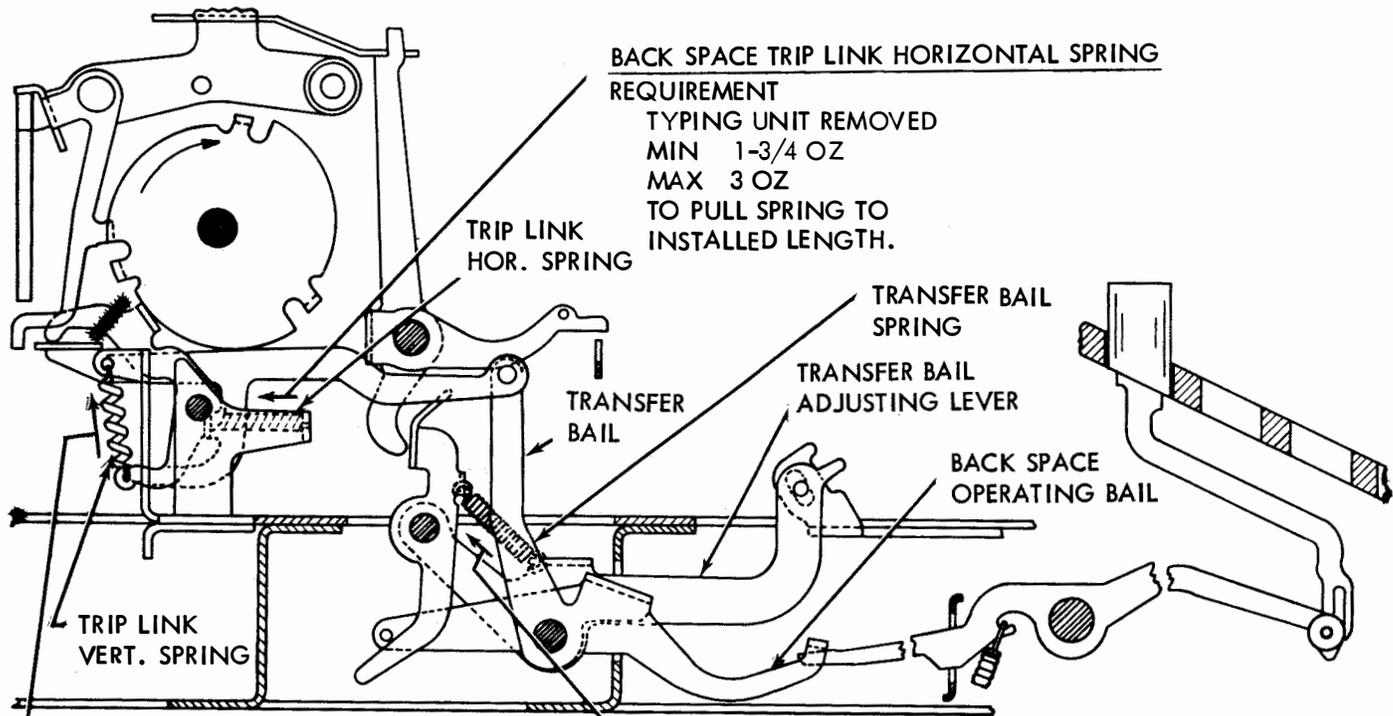
NOTE: FOR ADJUSTMENT OF EARLIER DESIGN MECHANISMS SEE PAR. 5.24

3.06 Local Paper Feed-Out Mechanism



3.07 Local Backspace Mechanism

NOTE: FOR EARLIER DESIGN SEE PAR. 5.27



BACK SPACE TRIP LINK HORIZONTAL SPRING

REQUIREMENT
TYPING UNIT REMOVED
MIN 1-3/4 OZ
MAX 3 OZ
TO PULL SPRING TO
INSTALLED LENGTH.

BACK SPACE TRIP LINK VERTICAL SPRING

REQUIREMENT
TYPING UNIT REMOVED
MIN 1-1/2 OZ
MAX 3 OZ
TO PULL SPRING TO INSTALLED
LENGTH.

BACK SPACE TRANSFER BAIL SPRING

REQUIREMENT
MIN 1/2 OZ
MAX 1 OZ
TO PULL SPRING TO INSTALLED
LENGTH.

3.08 Local Backspace Mechanism continued

TRANSFER BAIL ADJUSTING LEVER(1) REQUIREMENT

DOWNWARD PRESSURE OF
MIN 16 OZ
MAX 28 OZ

TO OPERATE THE BACKSPACE KEYLEVER

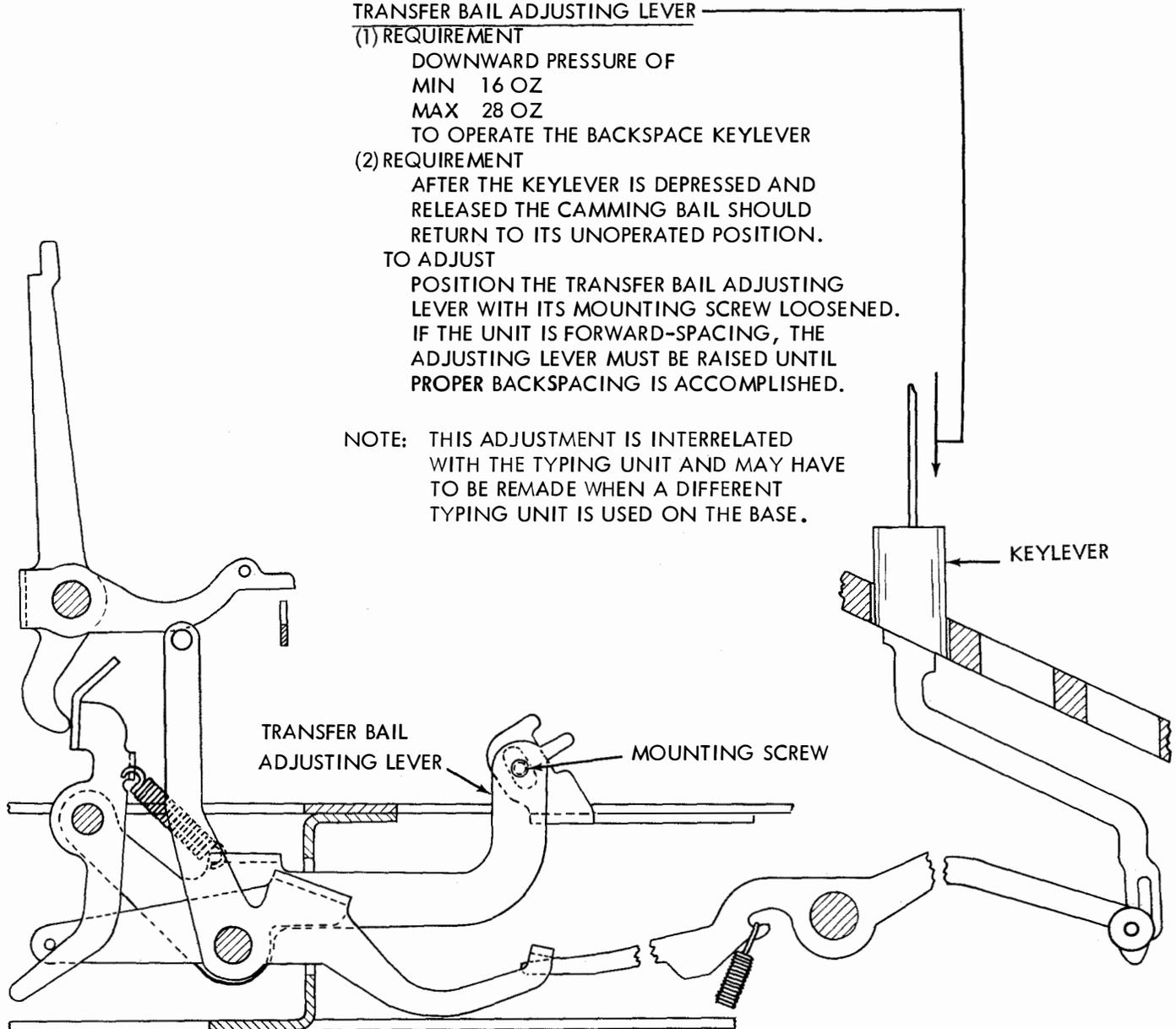
(2) REQUIREMENT

AFTER THE KEYLEVER IS DEPRESSED AND
RELEASED THE CAMMING BAIL SHOULD
RETURN TO ITS UNOPERATED POSITION.

TO ADJUST

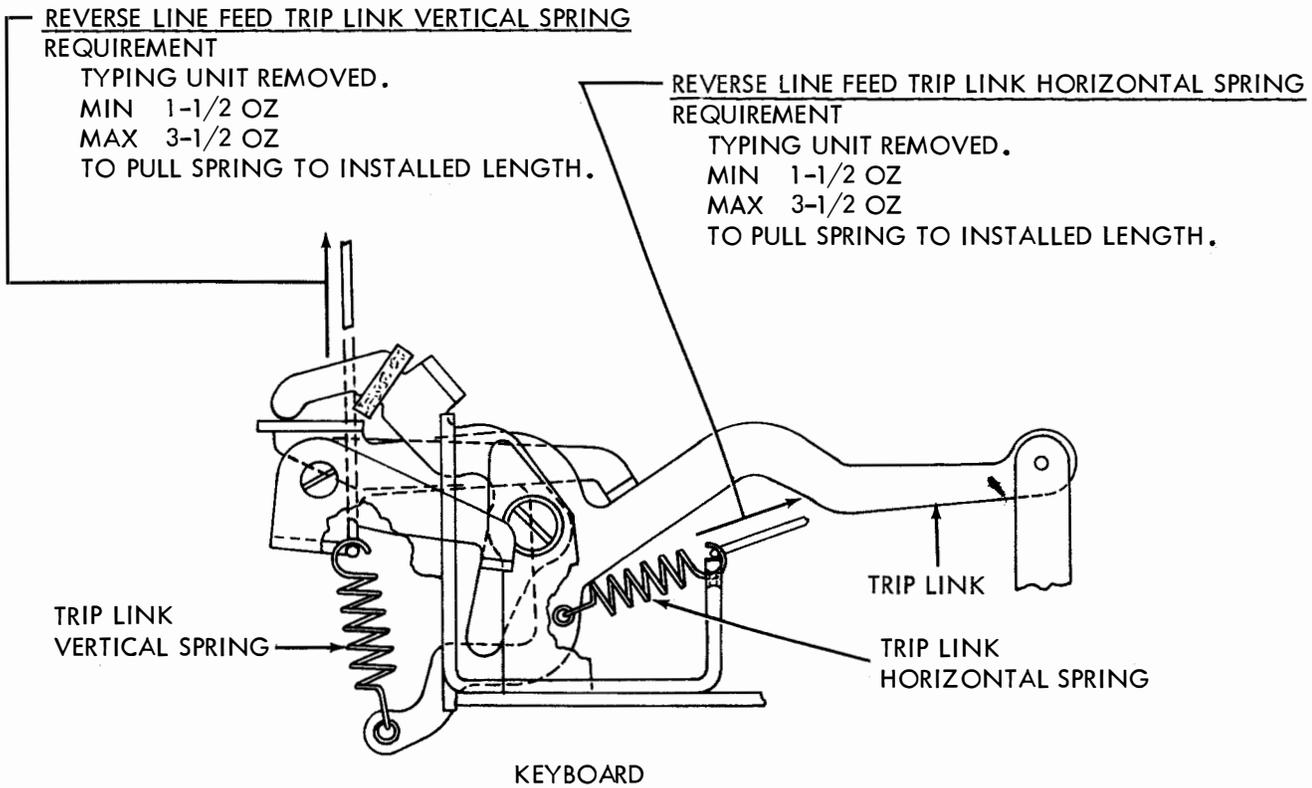
POSITION THE TRANSFER BAIL ADJUSTING
LEVER WITH ITS MOUNTING SCREW LOOSE-
NED. IF THE UNIT IS FORWARD-SPACING,
THE ADJUSTING LEVER MUST BE RAISED UNTIL
PROPER BACKSPACING IS ACCOMPLISHED.

NOTE: THIS ADJUSTMENT IS INTERRELATED
WITH THE TYPING UNIT AND MAY HAVE
TO BE REMADE WHEN A DIFFERENT
TYPING UNIT IS USED ON THE BASE.

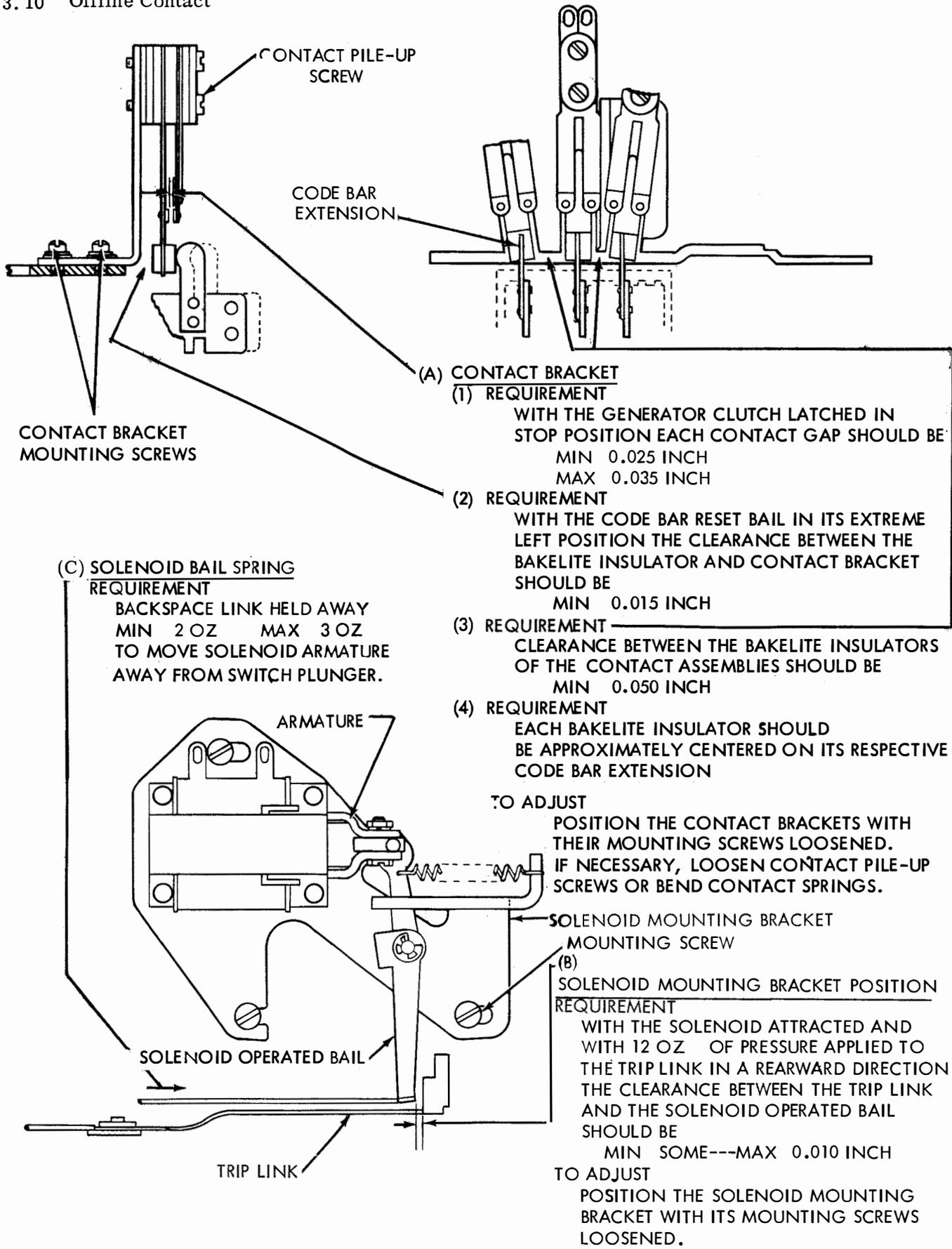


NOTE: FOR EARLIER DESIGN SEE PAR. 5.28

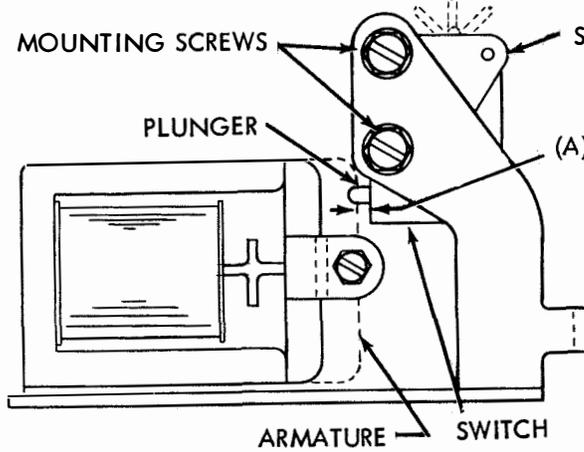
3.09 Reverse Line Feed Mechanism



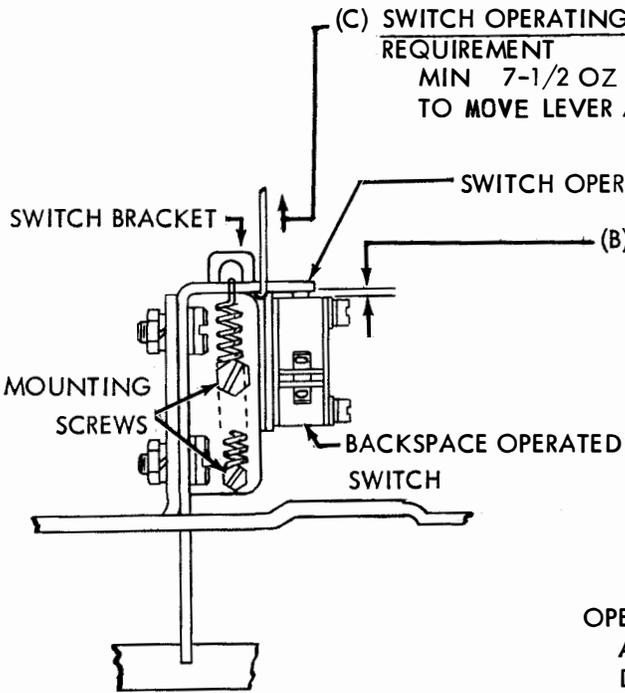
3.10 Offline Contact



3.11 Offline Contact continued



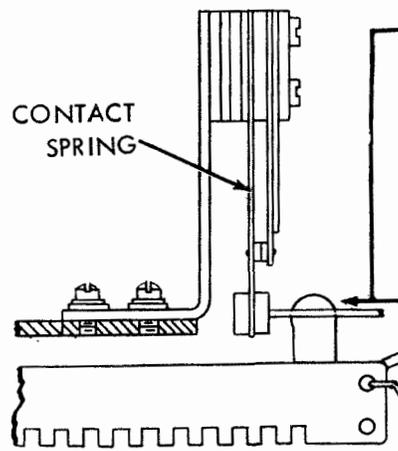
(A) SOLENOID OPERATED SWITCH PLATE POSITION REQUIREMENT
 WITH THE SOLENOID DE-ENERGIZED, THE CLEARANCE BETWEEN ARMATURE AND THE SWITCH (NOT THE PLUNGER) SHOULD BE
 MIN 0.025 INCH
 MAX 0.035 INCH
 TO ADJUST POSITION THE SWITCH PLATE WITH ITS MOUNTING SCREWS LOOSENED.



(C) SWITCH OPERATING LEVER SPRING REQUIREMENT
 MIN 7-1/2 OZ MAX 10-1/2 OZ
 TO MOVE LEVER AWAY FROM PLUNGER.

(B) BACKSPACE KEYLEVER OPERATED SWITCH POSITION REQUIREMENT
 WITH THE BACKSPACE KEYLEVER IN ITS NORMAL UNOPERATED POSITION, THE CLEARANCE BETWEEN THE BACKSPACE KEYLEVER OPERATED SWITCH AND THE SWITCH OPERATING LEVER SHOULD BE
 MAX 0.055 INCH
 TO ADJUST POSITION THE SWITCH BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

OPERATIONAL CHECK: WITH A TYPING UNIT ON THE BASE, AND AC POWER APPLIED (SELECTOR MAGNETS ENERGIZED), DEPRESS LOCAL BACKSPACE KEYLEVER. CUT OFF AC POWER. RELEASE THE LOCAL BACKSPACE KEYLEVER SO THAT THE BACKSPACE LINK CLEARS THE SOLENOID OPERATED BAIL EXTENSION AND LATCHES UP UNDER IT BY AT LEAST 0.010 INCH CLEARANCE. WITH AC POWER APPLIED THE BACKSPACE SOLENOID SHOULD BECOME ENERGIZED. IF NECESSARY, REFINE THE SOLENOID OPERATED SWITCH PLATE POSITION.



(D) CONTACT SPRING REQUIREMENT
 WITH CR KEYLEVER DEPRESSED CHECK FRONT CONTACT
 WITH SPACE BAR DEPRESSED CHECK CENTER AND REAR CONTACTS
 MIN 1 OZ MAX 2 OZ
 TO OPEN CONTACTS
 TO ADJUST BEND CONTACT SPRING. IF NECESSARY REMOVE CONTACT ASSEMBLY.

(E) CODE BAR SPRING REQUIREMENT
 SPACE BAR DEPRESSED
 MIN 3 OZ MAX 4 OZ
 TO START EACH CODE BAR MOVING

3.12 Universal Keyboard Switch

(A) KEYBOARD UNIVERSAL SWITCH

PRELIMINARY REQUIREMENT

CENTERLINE OF INSULATED PORTION OF UNIVERSAL SWITCH ASSEMBLY SHOULD ALIGN WITH CENTERLINE OF CODE BAR LEVER.

TO ADJUST POSITION UNIVERSAL SWITCH ASSEMBLY Laterally ON RETAINER BAR WITH ITS MOUNTING SCREW LOOSENED.

BRACKET MOUNTING SCREW

RETAINER BAR BRACKET

RETAINER BAR

BAR MOUNTING SCREW

CODE BAR LEVER

SWITCH ASSEMBLY

ASSEMBLY MOUNTING SCREW

FRONT VIEW

(B) KEYBOARD UNIVERSAL SWITCH - HORIZONTAL

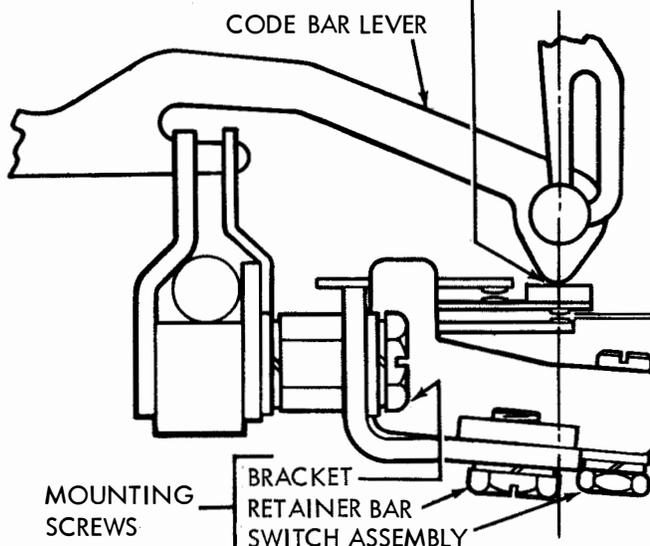
REQUIREMENT

CENTERLINE OF INSULATED PORTION OF UNIVERSAL SWITCH ASSEMBLY SHOULD ALIGN WITH CENTERLINE OF LOWERMOST PORTION OF CODE BAR LEVER.

TO ADJUST

POSITION RETAINER BAR FORWARD OR REARWARD ON ITS BRACKETS WITH ITS MOUNTING SCREWS LOOSENED.

CODE BAR LEVER



MOUNTING SCREWS

BRACKET
RETAINER BAR
SWITCH ASSEMBLY

(C) KEYBOARD UNIVERSAL SWITCH - VERTICAL
REQUIREMENT

1. CLEARANCE BETWEEN CENTER AND LOWER CONTACT POINTS SHOULD BE MIN 0.015 INCH --- MAX 0.025 INCH

TO CHECK

PULL CONTACT FUNCTION LEVER DOWN AGAINST CODE BAR BASKET AT REAR OF BASKET AND FRONT OF CONTACT LEVER TOUCHING CENTER OF CONTACT INSULATOR

TO ADJUST

BEND UPPER CONTACT SPRING

2. CLEARANCE BETWEEN CENTER AND LOWER CONTACT POINTS SHOULD BE AT LEAST 0.010 INCH

TO CHECK

DEPRESS CONTACT OPERATING KEY WITH 16 OZ PRESSURE.

3. CENTER AND LOWER CONTACTS SHOULD CLOSE WITH SOME OVER-TRAVEL

TO CHECK

FULLY DEPRESS CONTACT OPERATING KEY

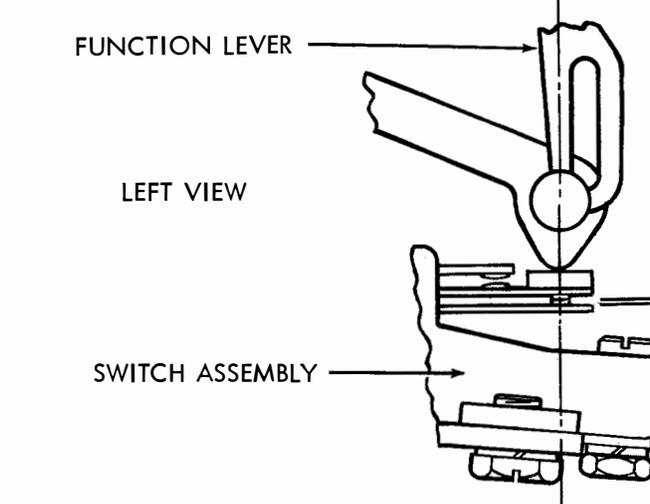
TO ADJUST

POSITION COMPLETE ASSEMBLY WITH RIGHT AND LEFT BRACKET MOUNTING SCREWS LOOSENED.

FUNCTION LEVER

LEFT VIEW

SWITCH ASSEMBLY



3. 13 Blinding Contact (Pulsing Contact) Mechanism

NOTE: CHECK ADJUSTMENTS (A), (B), (C) BEFORE INSTALLING CONTACT ASSEMBLY ON SIGNAL GENERATOR

(A) CONTACT ALIGNMENT
REQUIREMENT

CONTACT SURFACES SHOULD BE REASONABLY PARALLEL TO EACH OTHER.
TO ADJUST
BEND LARGE CONTACT SPRING

(B) CAM FOLLOWER ARM (UPPER EXTENSION)
REQUIREMENT

CLEARANCE BETWEEN UPPER EXTENSION OF CAM FOLLOWER ARM AND CONTACT SPRING INSULATOR SHOULD BE
MIN 0.015 INCH --- MAX 0.025 INCH
TO CHECK
CAM FOLLOWER ARM RESTING AGAINST ITS STOP SCREW
TO ADJUST
POSITION STOP SCREW WITH ITS LOCKNUT LOOSENED.

(C) CONTACT SPRING
REQUIREMENT

MIN 3-1/2 OZ --- MAX 4-1/2 OZ
TO JUST SEPARATE THE CONTACTS
TO ADJUST
BEND LARGE CONTACT SPRING. RE-CHECK (A).

SIGNAL GENERATOR CONTACT BOX

(D) CONTACT GUARD
SEE PAR. 3.14

UPPER EXTENSION

CLUTCH DISC

SIGNAL GENERATOR FRONT PLATE

CAM

STOP SCREW

MOUNTING BRACKET

CLUTCH LATCH LEVER

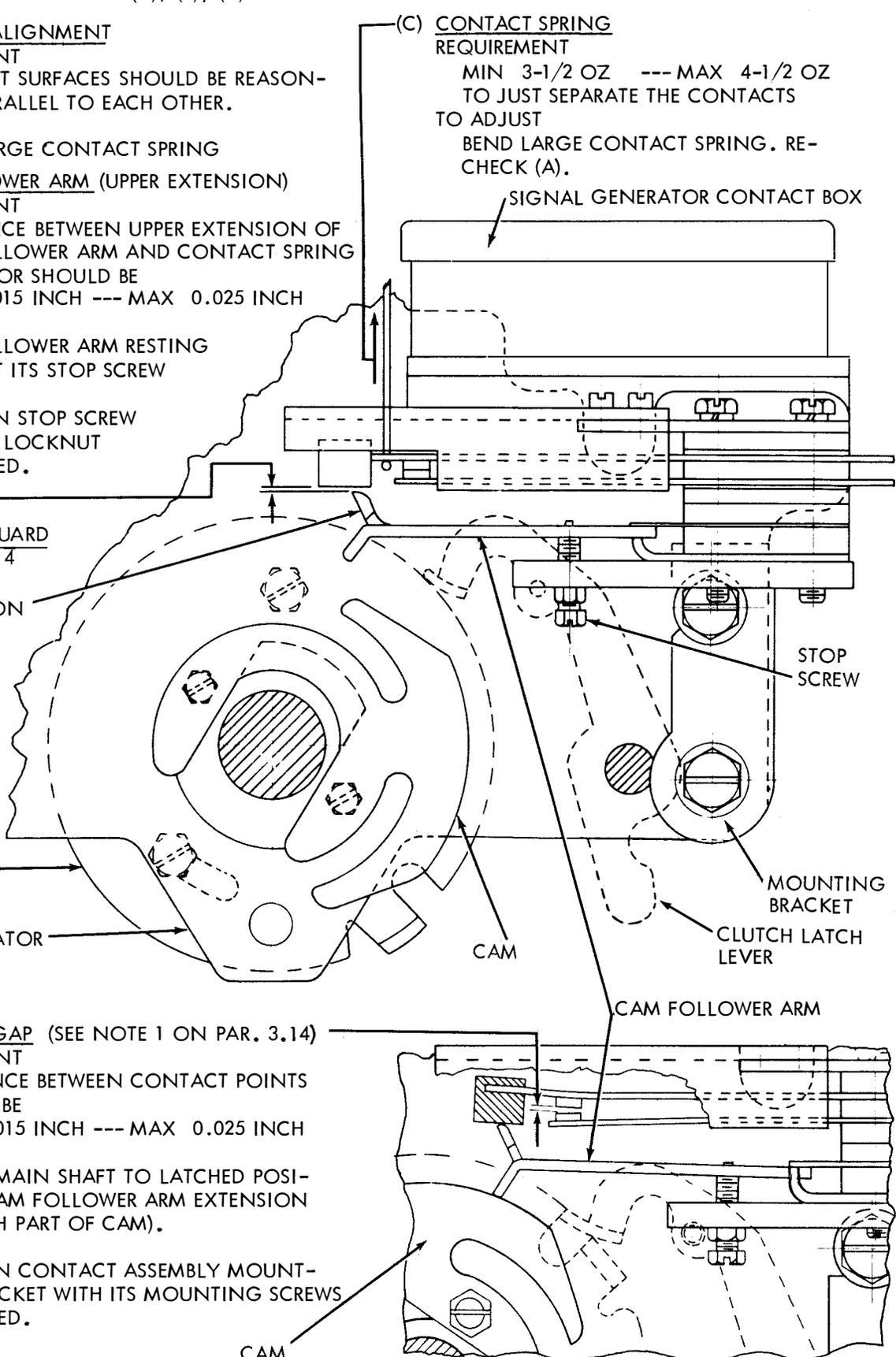
CAM FOLLOWER ARM

(E) CONTACT GAP (SEE NOTE 1 ON PAR. 3.14)
REQUIREMENT

CLEARANCE BETWEEN CONTACT POINTS SHOULD BE
MIN 0.015 INCH --- MAX 0.025 INCH
TO CHECK
ROTATE MAIN SHAFT TO LATCHED POSITION (CAM FOLLOWER ARM EXTENSION ON HIGH PART OF CAM).

TO ADJUST
POSITION CONTACT ASSEMBLY MOUNTING BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

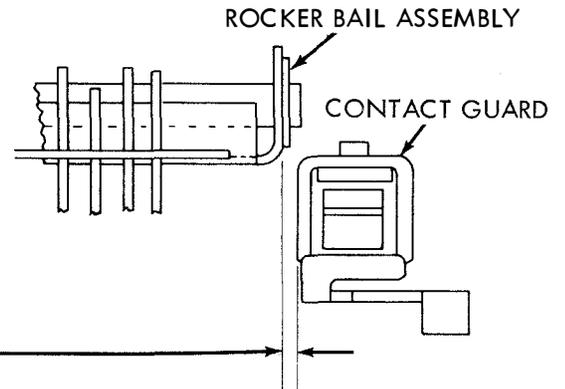
CAM



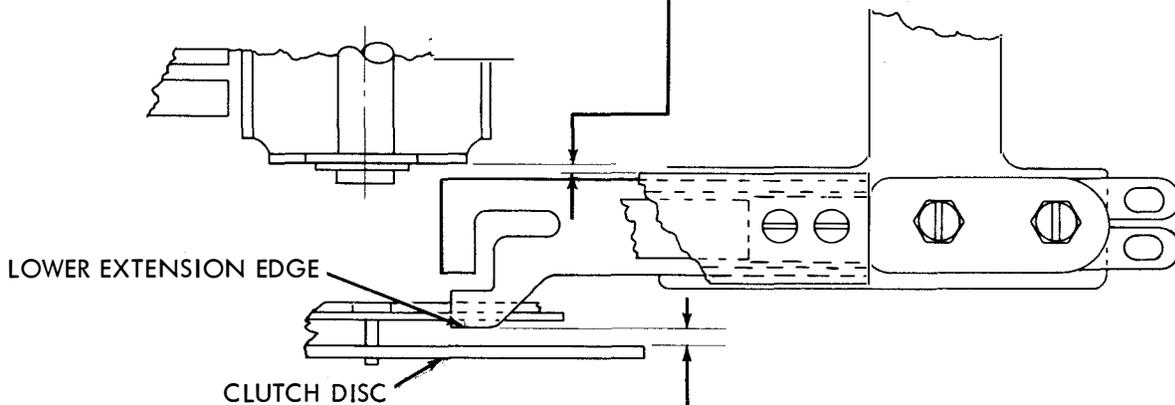
3.14 Blinding Contact (Pulsing Contact) Mechanism continued

- NOTE: 1. CHECK ADJUSTMENTS (D), (E), (F) WITH CONTACT ASSEMBLY INSTALLED ON SIGNAL GENERATOR AND BEFORE INSTALLATION OF SIGNAL GENERATOR ON KEYBOARD.
 2. THE BLINDING CONTACT IS NOT ADJUSTABLE TO OTHER THAN THE TIMING OF THE STOP PULSE OF THE SIGNAL GENERATOR.

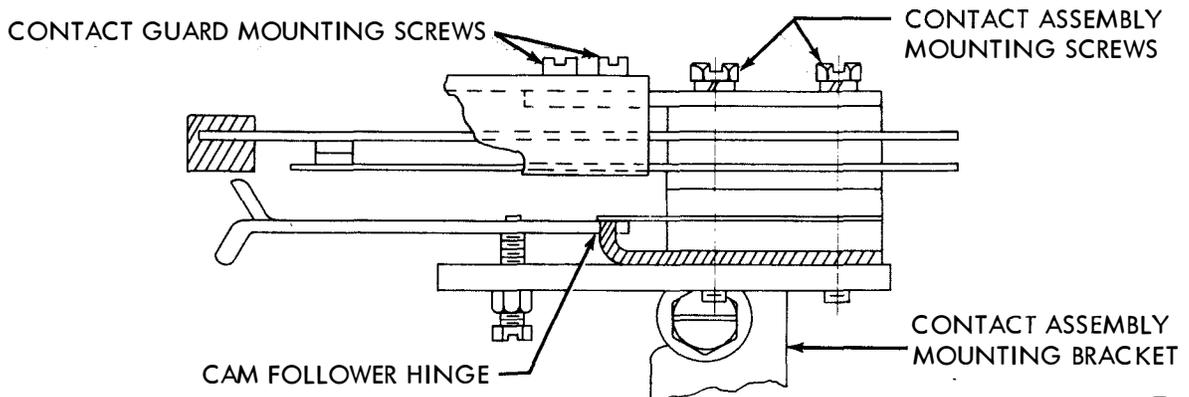
(D) CONTACT GUARD
 REQUIREMENT
 CLEARANCE BETWEEN CONTACT GUARD AND ROCKER BAIL ASSEMBLY SHOULD BE MIN 0.010 INCH
 TO ADJUST
 POSITION CONTACT ASSEMBLY WITH TWO MOUNTING SCREWS LOOSENED. MAINTAIN EQUAL CLEARANCE BETWEEN CONTACT SPRINGS AND CONTACT GUARD.



(E) CONTACT GAP
 SEE PAR. 3.13



(F) CAM FOLLOWER ARM (LOWER EXTENSION)
 REQUIREMENT
 CLEARANCE BETWEEN LOWER EXTENSION EDGE OF CAM FOLLOWER ARM AND INSIDE SURFACE OF CLUTCH DISC SHOULD BE MIN 0.015 INCH
 TO ADJUST
 POSITION CAM FOLLOWER HINGE WITH ITS TWO MOUNTING SCREWS LOOSENED.
 NOTE --- ROTATE MAIN SHAFT SEVERAL TIMES AND CHECK THE ENTIRE CYCLE. MAKE SURE LOWER EXTENSION OF FOLLOWER ARM DOES NOT COME IN CONTACT WITH ADJUSTING DISC MOUNTING SCREWS.



3.15 Blinding Contact (Pulsing Contact) Mechanism continued

(G) SPECIAL REQUIREMENTS (FOLLOWING INSTALLATION OF SIGNAL GENERATOR) PROCEED TO (H) IF A DISTORTION TEST SET IS AVAILABLE

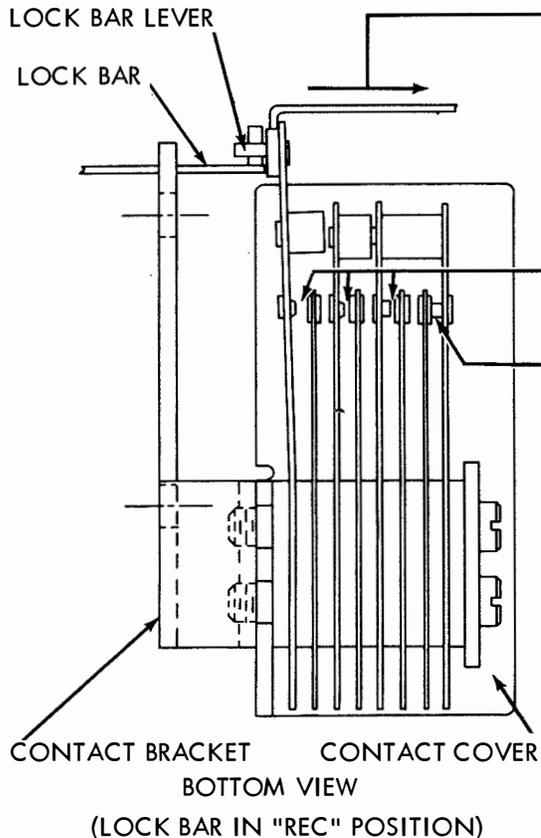
1. CONNECT INDICATOR LAMP ACROSS PULSING CONTACTS. ROTATE MAIN SHAFT UNTIL CLUTCH BECOMES LATCHED.
2. SET UP LETTERS COMBINATION AND ROTATE MAIN SHAFT SLOWLY. THE LAMP SHOULD LIGHT WHEN THE THIRD TRANSFER LEVER BEGINS TO MOVE DOWN ON THE TRANSFER BAIL (START PULSE) AND REMAIN LIT UNTIL JUST BEFORE THE SIXTH TRANSFER LEVER LATCHES UP ON THE TRANSFER BAIL (FIFTH PULSE).
3. REFINE THE ADJUSTMENTS, IF NECESSARY. CHECK THE BLINDING CYCLE WITH THE ASSOCIATED UNIT IN THE CIRCUIT WHILE OPERATING UNDER MOTOR POWER.

(H) STROBE REQUIREMENTS (FOLLOWING INSTALLATION OF SIGNAL GENERATOR) IF A DISTORTION TEST SET IS AVAILABLE.

SET UP "LETTERS" CODE COMBINATION AND ORIENT SCALE OF TEST SET WITH SIGNAL. INTRODUCE THE BLINDING CONTACT INTO THE CIRCUIT (CONTINUE TO TRANSMIT "LETTERS" CODE COMBINATION) AND ADJUST BLINDING CONTACT TO OBTAIN THE FOLLOWING RESULTS:

- a. BLINDING CONTACT SHOULD CLOSE BEFORE BEGINNING OF START PULSE AND REMAIN CLOSED TILL AFTER END OF 5TH PULSE.
- b. SLIGHT BREAKS (1 OR 2 DIVISIONS) ARE PERMISSIBLE AT EACH END OF BLINDING PULSE. NONE ARE PERMISSIBLE IN THE GENERAL BLINDING SCALE RANGE.

3.16 Lockbar Contacts (Electrical Send-Receive Break Mechanism)



(B) LOCK BAR CONTACT TENSION
REQUIREMENT

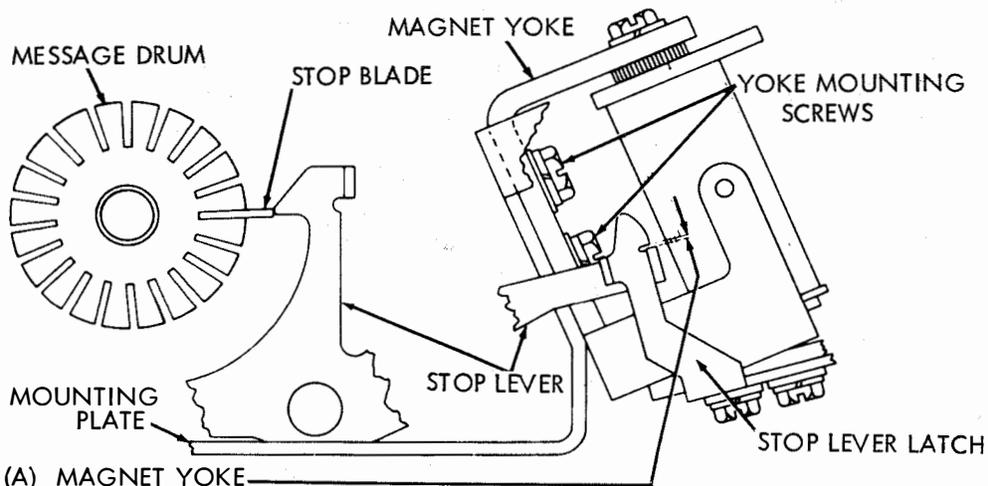
- MIN 10 OZ --- MAX 15 OZ
TO START CONTACT SWINGER MOVING
TO CHECK ---
LATCH THE LOCK BAR ("SEND" KEY DEPRESSED AND RELEASED)
TO ADJUST
BEND CONTACT SPRINGS. RECHECK ADJUSTMENT (A)

(A) LOCK BAR CONTACTS
REQUIREMENT

1. GAP BETWEEN NORMALLY OPEN CONTACTS SHOULD BE
MIN 0.008 INCH --- MAX 0.012 INCH
TO CHECK --- DEPRESS "REC" KEY
 2. GAP BETWEEN NORMALLY CLOSED CONTACTS SHOULD BE
MIN 0.008 INCH --- MAX 0.012 INCH
TO CHECK --- DEPRESS "SEND" KEY AND RELEASE
 3. ALL CONTACTS SHOULD CLOSE WITH A SMALL AMOUNT OF OVERTRAVEL.
- TO ADJUST
BEND CONTACT SPRINGS USING CONTACT BENDING TOOL. AVOID DISTORTING THE CONTACT SPRINGS

3.17 Answer-Back Mechanism (Switched Circuit Network)
Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C"

NOTE: ADJUSTMENTS ON THIS PAGE SHOULD BE MADE WITH THE ANSWER-BACK MECHANISM REMOVED FROM THE KEYBOARD.



(A) MAGNET YOKE
REQUIREMENT

CLEARANCE BETWEEN LATCHING SURFACES OF
STOP LEVER EXTENSION AND STOP LEVER
LATCH SHOULD BE
MIN 0.005 INCH
MAX 0.015 INCH

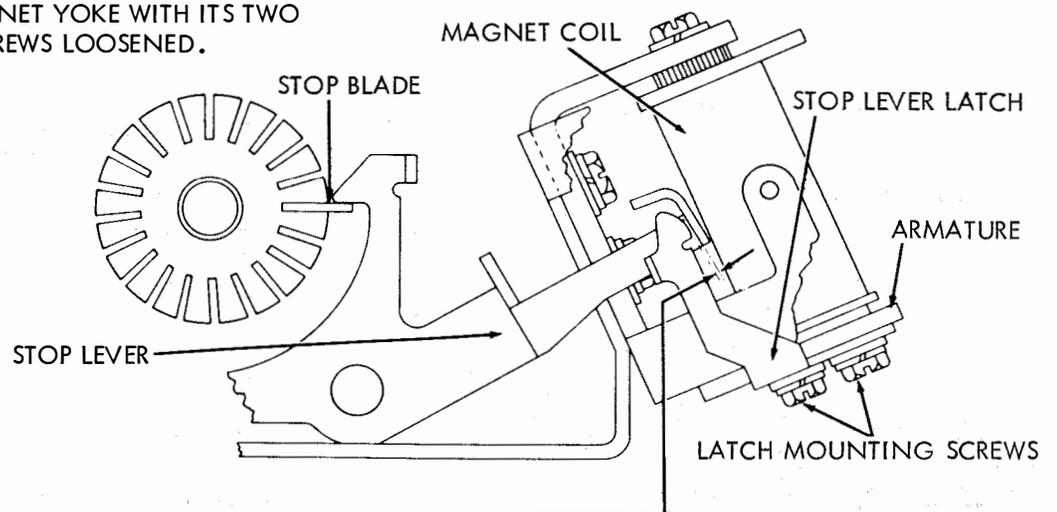
TO CHECK

HOLD TIP OF STOP LEVER AGAINST STOP BLADE.

TO ADJUST

POSITION MAGNET YOKE WITH ITS TWO
MOUNTING SCREWS LOOSENED.

FOR "HERE-IS" KEYLEVER SWITCH REQUIREMENTS
SEE KEYBOARD UNIVERSAL SWITCH ADJUSTMENTS,
PAR. 3.12. FOR PULSING CONTACT REQUIRE-
MENT, SEE BLINDING CONTACT ADJUSTMENTS,
PAR. 3.13 THROUGH 3.16.



(B) STOP LEVER LATCH

(1) REQUIREMENT

CLEARANCE BETWEEN STOP LEVER AND STOP LEVER LATCH SHOULD BE
MIN 0.002 INCH---MAX 0.007 INCH

TO CHECK

HOLD ARMATURE AGAINST THE MAGNET CORE AND THE STOP LEVER IN ITS MAXIMUM
COUNTER-CLOCKWISE POSITION.

(2) REQUIREMENT

CLEARANCE BETWEEN STOP LEVER AND STOP LEVER LATCH THROUGHOUT A COMPLETE
TRAVEL OF THE STOP LEVER---MIN 0.002 INCH

TO CHECK---HOLD ARMATURE AGAINST MAGNET CORE.

TO ADJUST---POSITION STOP LEVER LATCH WITH ITS TWO MOUNTING SCREWS LOOSENED.

3. 18 Answer-Back Mechanism (Switched Circuit Network)
Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C" continued

NOTE: TO FACILITATE MAKING THIS ADJUSTMENT, REMOVE MESSAGE DRUM AND DRIVE PLATE ASSEMBLY FROM MECHANISM.

(B) SENSING LEVER SPRINGS

REQUIREMENT

WITH THE SIGNAL GENERATOR CLUTCH IN STOP POSITION AND THE MESSAGE DRUM REMOVED IT SHOULD REQUIRE
MIN 1/4 OUNCE
MAX 1-1/4 OUNCES
TO START EACH SENSING LEVER MOVING.

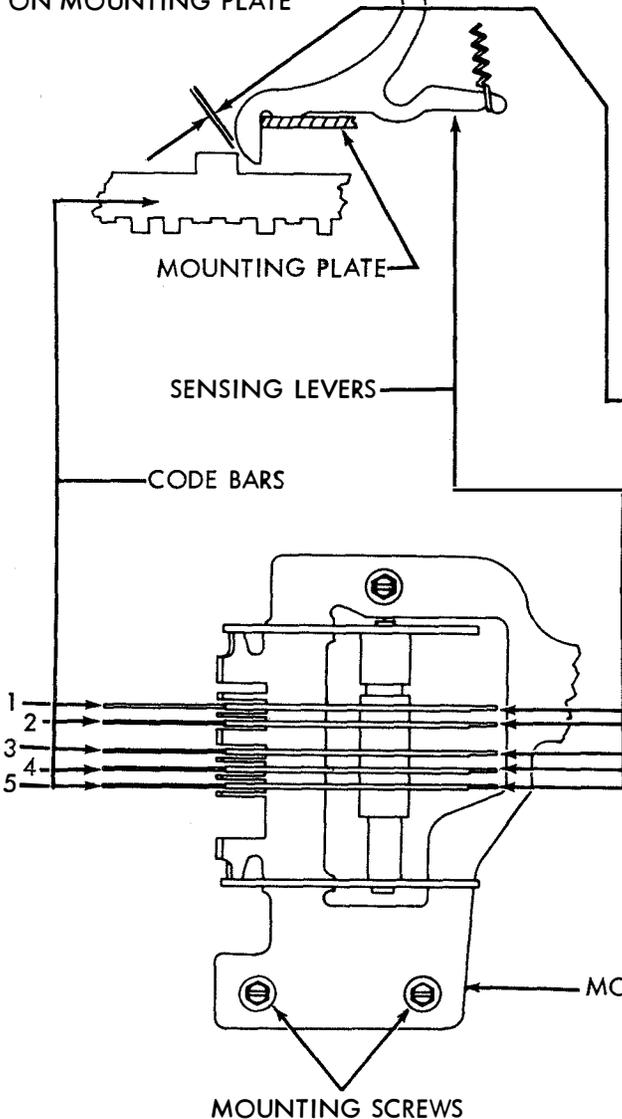
(C) DETENT LEVER SPRING

REQUIREMENT

WITH THE SIGNAL GENERATOR CLUTCH IN STOP POSITION AND THE MESSAGE DRUM REMOVED IT SHOULD REQUIRE
MIN 22 OUNCES
MAX 26 OUNCES
TO START THE DETENT LEVER MOVING.

SENSING LEVERS RESTING ON MOUNTING PLATE

DETENT LEVER RESTING ON MOUNTING PLATE



(A) CHARACTER GENERATOR MOUNTING PLATE

(1) REQUIREMENT

SENSING LEVERS SHOULD BE CENTERED ON THE FULL WIDTH OF THEIR ASSOCIATED CODE BAR.

(2) REQUIREMENT

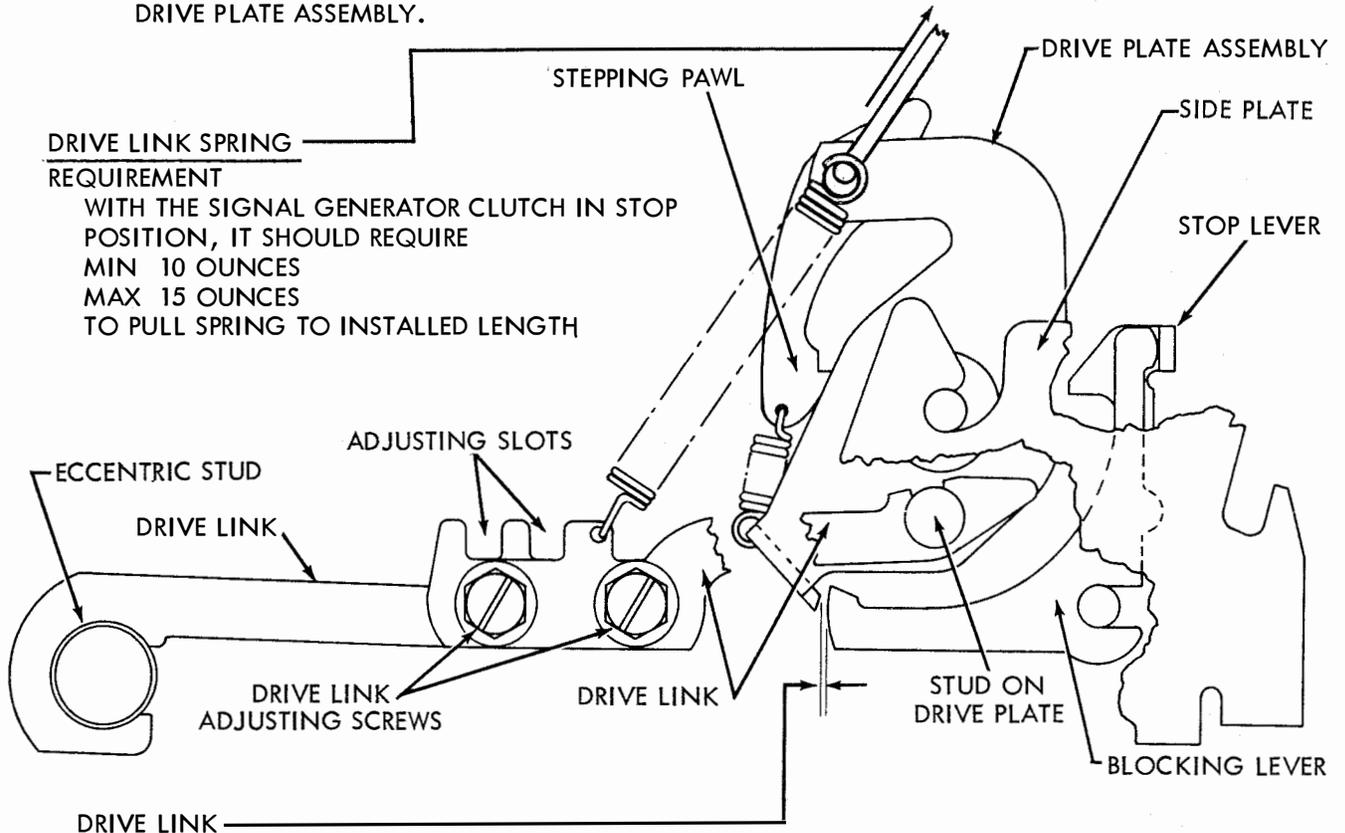
CLEARANCE BETWEEN SHOULDERS OF CODE BARS #1 AND #5 AND THEIR ASSOCIATED SENSING LEVERS SHOULD BE
MIN 0.002 INCH
MAX 0.012 INCH

TO ADJUST

POSITION THE MOUNTING PLATE WITH THE THREE MOUNTING SCREWS LOOSENED.

3. 19 Answer-Back Mechanism (Switched Circuit Network)
Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C" continued

PERFORM THIS ADJUSTMENT BEFORE FINAL INSTALLATION OF MESSAGE DRUM AND DRIVE PLATE ASSEMBLY.



DRIVE LINK SPRING

REQUIREMENT

WITH THE SIGNAL GENERATOR CLUTCH IN STOP POSITION, IT SHOULD REQUIRE
MIN 10 OUNCES
MAX 15 OUNCES
TO PULL SPRING TO INSTALLED LENGTH

DRIVE LINK

REQUIREMENT

CLEARANCE BETWEEN DRIVE PLATE EXTENSION AND BLOCKING LEVER SHOULD BE
MIN 0.002 INCH
MAX 0.007 INCH

TO CHECK

SIGNAL GENERATOR CAM ECCENTRIC AND ARM HOLDING CODE BAR BAIL IN EXTREME RESET POSITION TO THE LEFT.

TO ADJUST

LOOSEN THE TWO ADJUSTING SCREWS AND POSITION THE TWO DRIVE LINKS BY MEANS OF THE ADJUSTING SLOTS.

NOTE

THE STANDARD KEYBOARD ADJUSTMENTS LISTED BELOW SHOULD BE CHECKED DURING INSTALLATION OF THE ANSWER-BACK MECHANISM.

- A. CODE BAR AND CODE LEVER CLEARANCE, PAR. 2.05 .
- B. CODE BAR BAIL - PAR. 2.08 . REFINE THIS ADJUSTMENT TO 0.004 TO 0.006 INCH .
- C. CODE BAR BAIL AND NON REPEAT LEVER CLEARANCE, PAR. 2.08.
- D. UNIVERSAL BAIL LATCH LEVER, PAR. 2.10.
- E. UNIVERSAL BAIL EXTENSION, PAR. 2.10 .

3.20 Answer-Back Mechanism (Switched Circuit Network)
Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C" continued

THE FOLLOWING FINAL ADJUSTMENTS FOR ANSWER-BACK MECHANISM SHOULD BE MADE AFTER INSTALLATION OF THE MECHANISM ON THE KEYBOARD.

STEPPING PAWL
REQUIREMENT

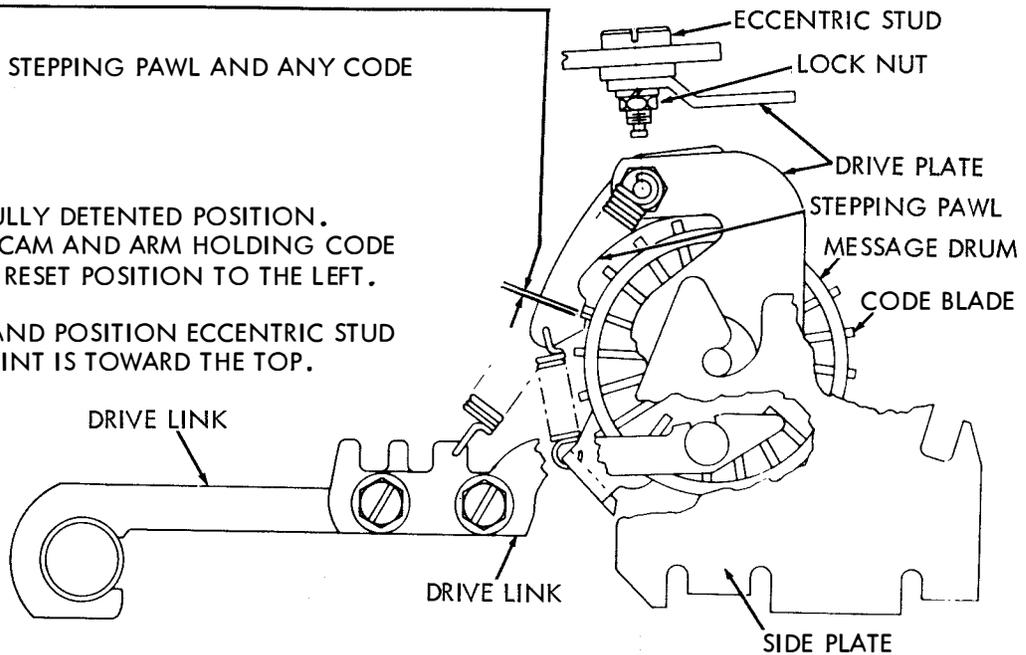
CLEARANCE BETWEEN STEPPING PAWL AND ANY CODE BLADE SHOULD BE
MIN 0.018 INCH
MAX 0.030 INCH

TO CHECK

MESSAGE DRUM IN FULLY DETENTED POSITION.
SIGNAL GENERATOR CAM AND ARM HOLDING CODE BAR BAIL IN EXTREME RESET POSITION TO THE LEFT.

TO ADJUST

LOOSEN LOCK NUT AND POSITION ECCENTRIC STUD SO THAT ITS HIGH POINT IS TOWARD THE TOP.



STEPPING PAWL SPRING
REQUIREMENT

WITH SIGNAL GENERATOR CLUTCH IN STOP POSITION
MIN 2-1/2 OUNCES
MAX 3-1/2 OUNCES
TO START PAWL MOVING.

LATCH OPERATING LEVER SPRING
REQUIREMENT

WITH SIGNAL GENERATOR CLUTCH IN STOP POSITION
MIN 5 OUNCES
MAX 6 OUNCES
TO START LEVER MOVING.

LATCH OPERATING LEVER

CODE BAR BAIL LATCH
LATCH OPERATING LEVER ADJUSTING SCREW

LATCH OPERATING LEVER ADJUSTING SCREW
REQUIREMENT

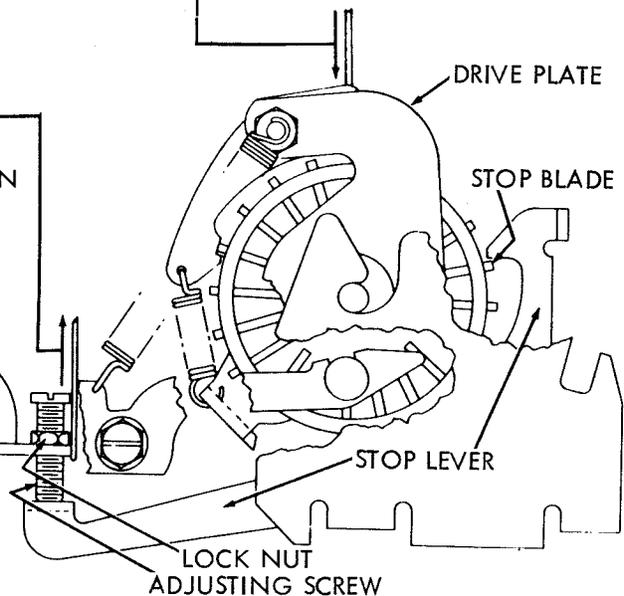
CLEARANCE BETWEEN EXTENSION ON LATCH OPERATING LEVER AND CODE BAR BAIL LATCH SHOULD BE
MIN 0.005 INCH --- MAX 0.015 INCH

TO CHECK

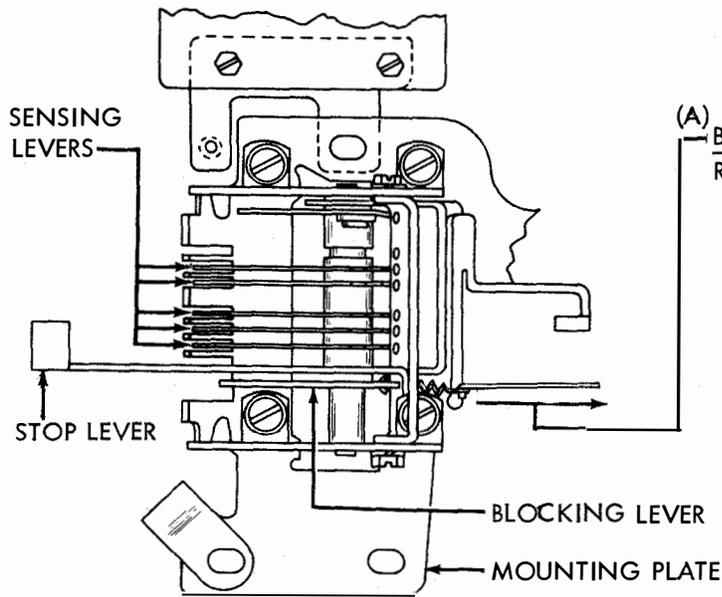
SIGNAL GENERATOR CLUTCH FULLY DISENGAGED. STOP LEVER LATCHED ON MAGNET ARMATURE LATCH.

TO ADJUST

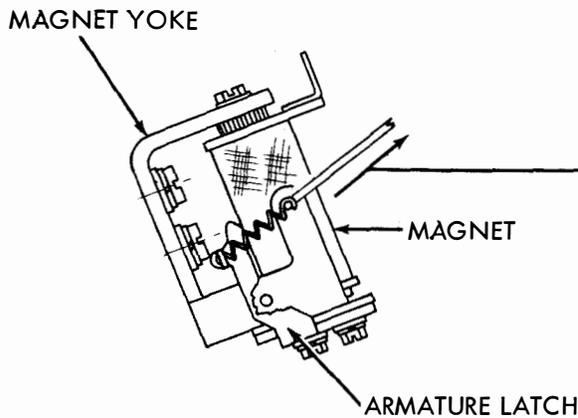
WITH LOCK NUT LOOSENED, POSITION LATCH OPERATING ADJUSTING SCREW.



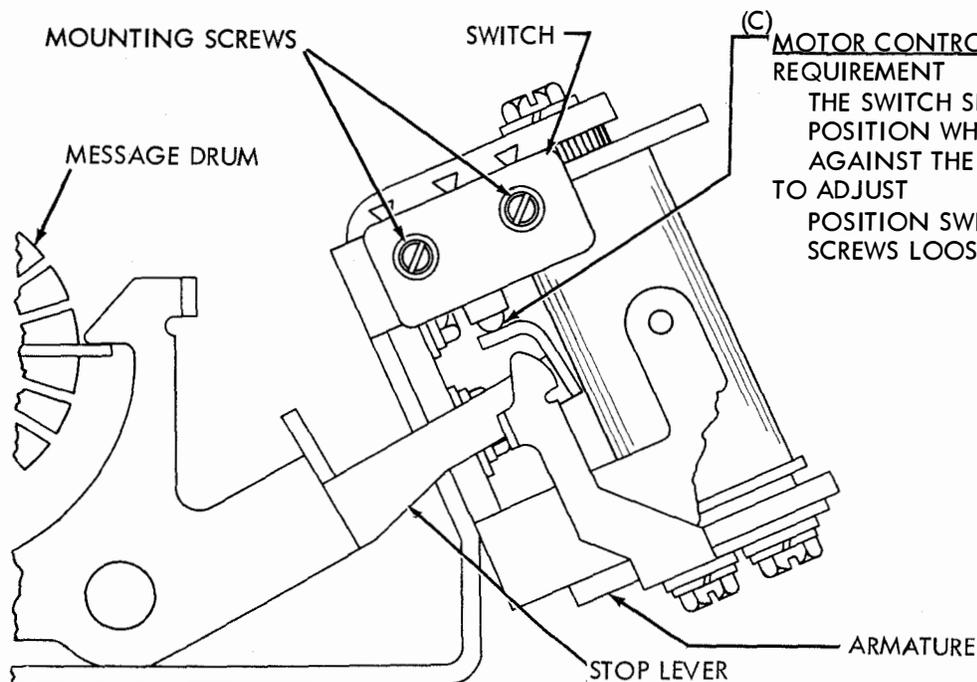
3. 21 Answer-Back Mechanism (Switched Circuit Network)
 Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C" continued



(A) BLOCKING LEVER SPRING
 REQUIREMENT
 WITH SIGNAL GENERATOR CLUTCH IN STOP POSITION, UNHOOK BLOCKING LEVER SPRING FROM STOP LEVER.
 MIN 1 OUNCE
 MAX 2 OUNCES
 TO PULL SPRING TO INSTALLED LENGTH

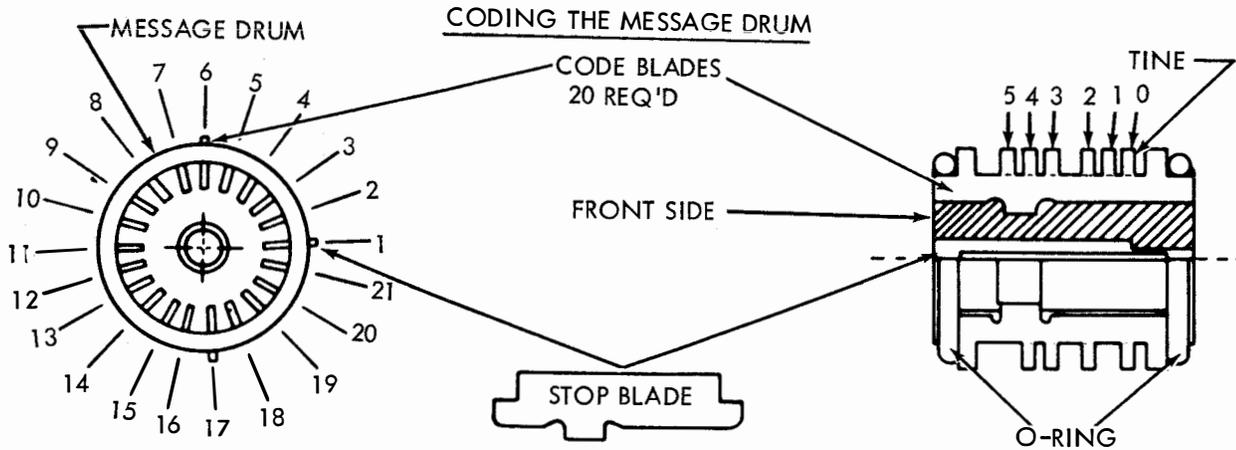


(B) ARMATURE LATCH SPRING
 REQUIREMENT
 WITH SIGNAL GENERATOR CLUTCH IN STOP POSITION, UNHOOK ARMATURE LATCH SPRING FROM SPRING POST ON MAGNET YOKE.
 MIN 2 OUNCES
 MAX 4 OUNCES
 TO PULL SPRING TO INSTALLED LENGTH.



(C) MOTOR CONTROL RELAY SWITCH
 REQUIREMENT
 THE SWITCH SHOULD BE IN ITS OPERATED POSITION WHEN THE ARMATURE IS HELD AGAINST THE MAGNET CORE.
 TO ADJUST POSITION SWITCH WITH ITS MOUNTING SCREWS LOOSENED.

3.22 Answer-Back Mechanism (Switched Circuit Network)
Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "C" continued

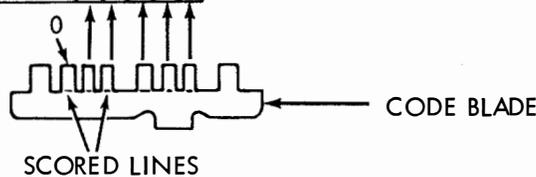


1. REMOVE MESSAGE DRUM FROM ANSWER-BACK ASSEMBLY AND TAKE OUT CODE BLADES AS FOLLOWS: REMOVE DRIVE LINK SPRING ALLOWING DRIVE LINK TO DROP OUT OF ENGAGEMENT WITH STUD ON DRIVE PLATE. LIFT MESSAGE DRUM FROM NOTCHES. DEPRESS STEPPING PAWL EXTENSION AND PULL DRUM OFF SHAFT. REMOVE "O" RING FROM ONE END OF DRUM AND TAKE OUT TWENTY CODE BLADES. IT IS NOT NECESSARY TO TAKE OUT STOP BLADE. (REFER TO PARTS BULLETIN 1149B).
2. CODE A BLADE BY BREAKING OFF UNWANTED TINES AT SCORED LINE AT BASE OF EACH TINE. THE FIGURE BELOW INDICATES TINES TO BE REMOVED FOR A PARTICULAR CHARACTER. HOLD EACH BLADE SECURELY NEAR SCORE MARK OF TINE TO BE REMOVED. IN STANDARD 5 LEVEL OPERATION, THE O CODE LEVEL TINE IS DISREGARDED.

LETTERS	TYPICAL FIG.ARRGT.	CODE				
		1	2	3	4	5
A	—	■	■	■	■	■
B	?	■	■	■	■	■
C	:	■	■	■	■	■
D	4	■	■	■	■	■
E	3	■	■	■	■	■
F	1	■	■	■	■	■
G	4	■	■	■	■	■
H	*	■	■	■	■	■
I	8	■	■	■	■	■
J	.	■	■	■	■	■
K	{	■	■	■	■	■
L	}	■	■	■	■	■
M	,	■	■	■	■	■
N	;	■	■	■	■	■
O	9	■	■	■	■	■
P	0	■	■	■	■	■
Q	1	■	■	■	■	■
R	4	■	■	■	■	■
S	BELL	■	■	■	■	■
T	5	■	■	■	■	■
U	7	■	■	■	■	■
V	;	■	■	■	■	■
W	2	■	■	■	■	■
X	7	■	■	■	■	■
Y	6	■	■	■	■	■
Z	"	■	■	■	■	■
CARRIAGE RETURN		■	■	■	■	■
LINE FEED		■	■	■	■	■
LETTERS SHIFT		■	■	■	■	■
FIGURES SHIFT		■	■	■	■	■
SPACE		■	■	■	■	■
BLANK		■	■	■	■	■

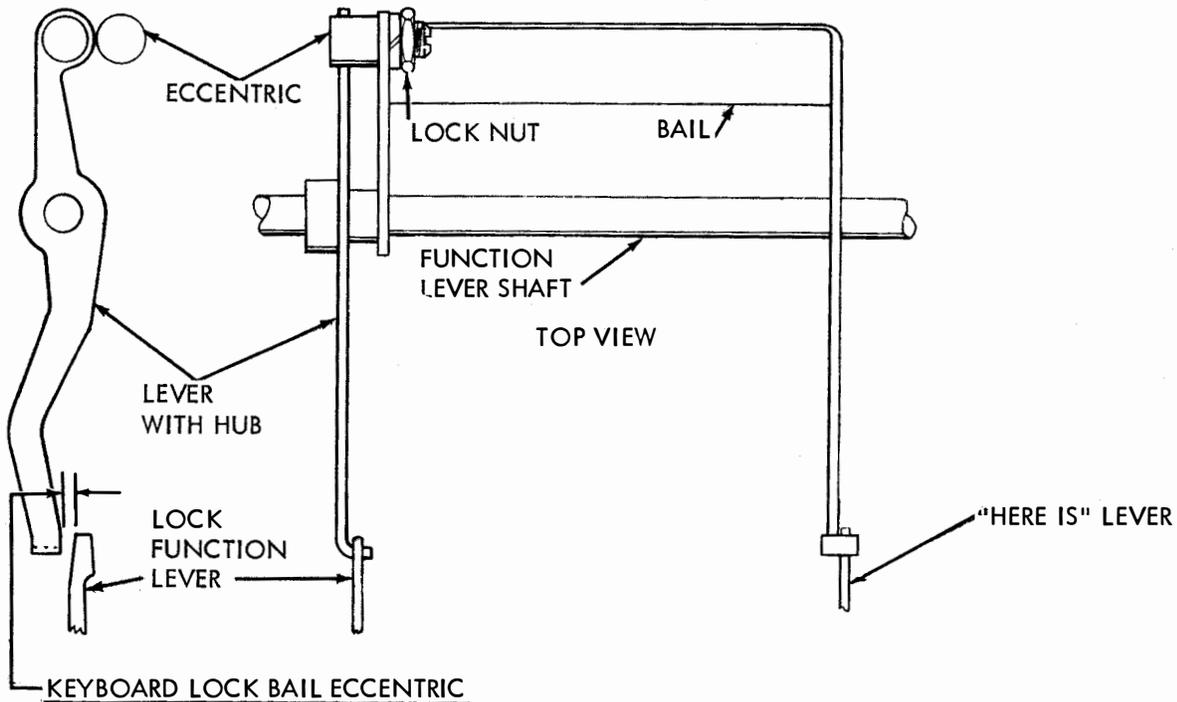
3. CODE THE DRUM IN A COUNTER-CLOCKWISE DIRECTION STARTING WITH NO. 2 CODE BLADE (ADJACENT TO STOP BLADE). BEGIN MESSAGE WITH "LETTERS" (STOP BLADE) FOLLOWED BY "CARRIAGE RETURN" AND "LINE FEED". END MESSAGE WITH "CARRIAGE RETURN" AND "LINE FEED". THIS LEAVES 16 CHARACTERS AVAILABLE FOR MESSAGE PROPER. CODE ANY UNUSED CHARACTERS WITH "LETTERS" OR "BLANKS", SINCE EACH SLOT POSITION IN DRUM MUST BE OCCUPIED BY A CODE BLADE.
4. INSTALL CODED BLADES IN PROPER SLOTS IN DRUM - INSERT END OF BLADE UNDER REMAINING "O" RING AND ROTATE THE BLADE TOWARD CENTER OF DRUM UNTIL IT IS FULLY SEATED. WHEN ALL THE SLOTS ARE FILLED REPLACE "O" RING REMOVED IN 1. ABOVE
5. APPLY GREASE TO SHAFT OF MESSAGE DRUM. REASSEMBLE MECHANISM REVERSING PROCEDURE OF STEP 1. BE SURE PARTS ARE PROPERLY SEATED. LUBRICATE PER INSTRUCTION IN APPROPRIATE SECTION.

■ — LEAVE TINE
□ — REMOVE TINE



3.23 Answer-Back Mechanism Keyboards LK6 and Up (Bell 28D and Up) "FIGS" "D"

NOTE: ADJUSTMENT REQUIREMENTS FOR "FIGS" "D" ANSWER-BACK OPERATION ARE IDENTICAL TO REQUIREMENTS FOR "FIG" "C" OPERATION (SEE PAR. 3.17 THROUGH 3.23) EXCEPT FOR THE ADDITIONAL ADJUSTMENT GIVEN BELOW.



KEYBOARD LOCK BAIL ECCENTRIC
REQUIREMENT

CLEARANCE BETWEEN KEYBOARD LOCK LEVER W/HUB AND KEYBOARD LOCK FUNCTION LEVER
SHOULD BE
MIN SOME --- MAX 0.006 INCH

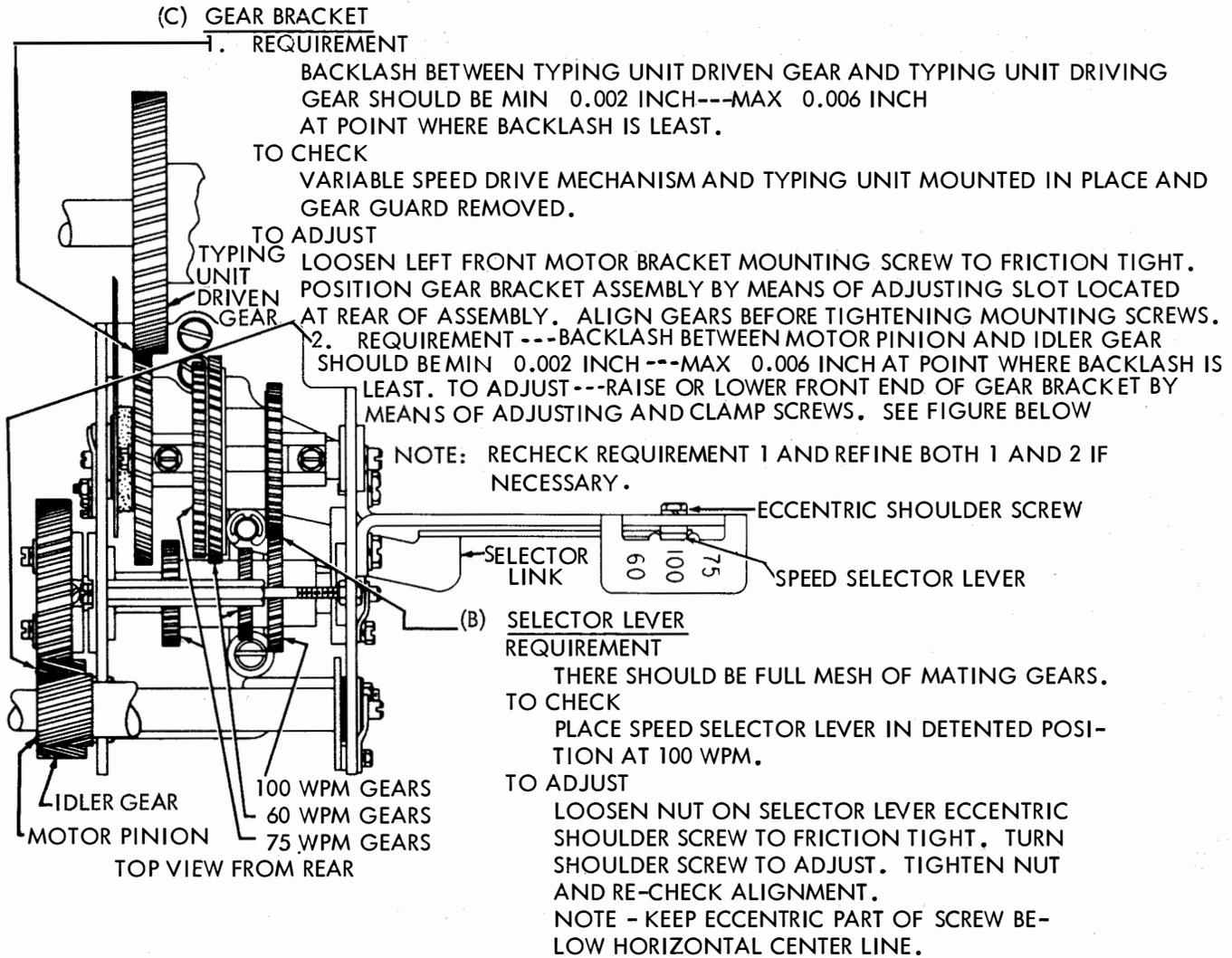
TO CHECK

FULLY DEPRESS BOTH "KYBD LOCK" AND "HERE IS" KEYS (HOLD LIGHTLY).

TO ADJUST

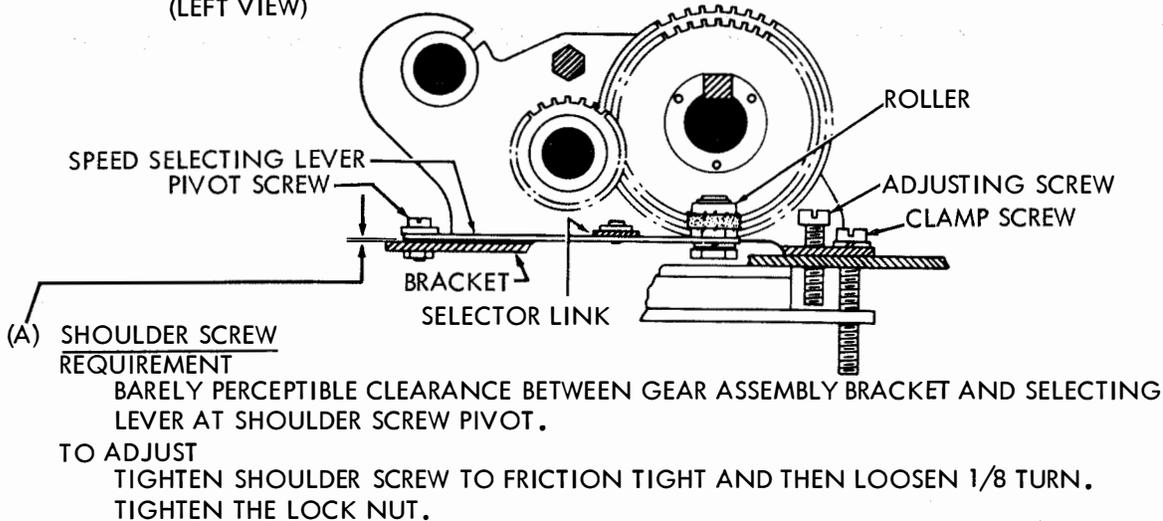
LOOSEN LOCK NUT AND POSITION ECCENTRIC WITH ITS HIGH POINT TOWARD FRONT OF KEYBOARD.

3.24 Variable Speed Drive Mechanism



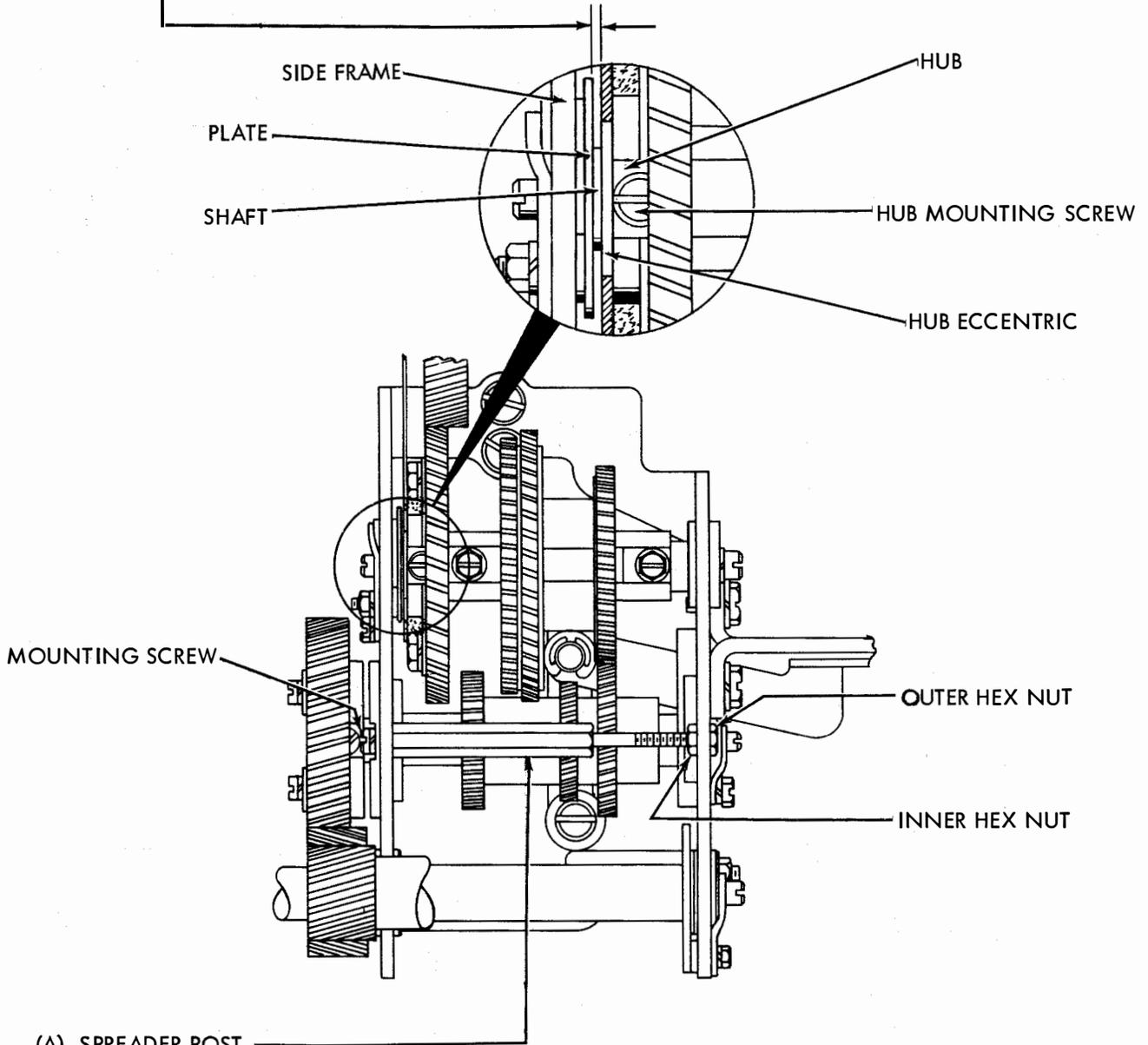
PERFORM ADJUSTMENT (A) AND (B) BEFORE INSTALLATION OF DRIVE ASSEMBLY.

SECTION THROUGH SPEED SELECTING LEVER
 (LEFT VIEW)



3.25 Variable Speed Drive Mechanism continued

- (B) HUB POSITION
 REQUIREMENT
 CLEARANCE BETWEEN HUB ECCENTRIC AND PLATE SHOULD BE
 MIN 0.005 INCH
 TO ADJUST
 POSITION HUB ON SHAFT WITH ITS MOUNTING SCREW LOOSENED.



- (A) SPREADER POST
 REQUIREMENT
 THE SPREADER POST SHOULD NOT SPREAD OR COMPRESS SIDES OF VARIABLE SPEED DRIVE
 ASSEMBLY.
 TO ADJUST
 LOOSEN BOTH SPREADER POST HEX NUTS, TIGHTEN POST MOUNTING SCREW. TURN INNER
 HEX NUT UNTIL IT TOUCHES INNER SIDE OF BRACKET. TIGHTEN OUTER HEX NUT TO LOCK
 POST IN POSITION.

CAUTION: IMPROPER ASSEMBLY MAY CAUSE MISALIGNMENT RESULTING IN SHORTENED
 BEARING LIFE.

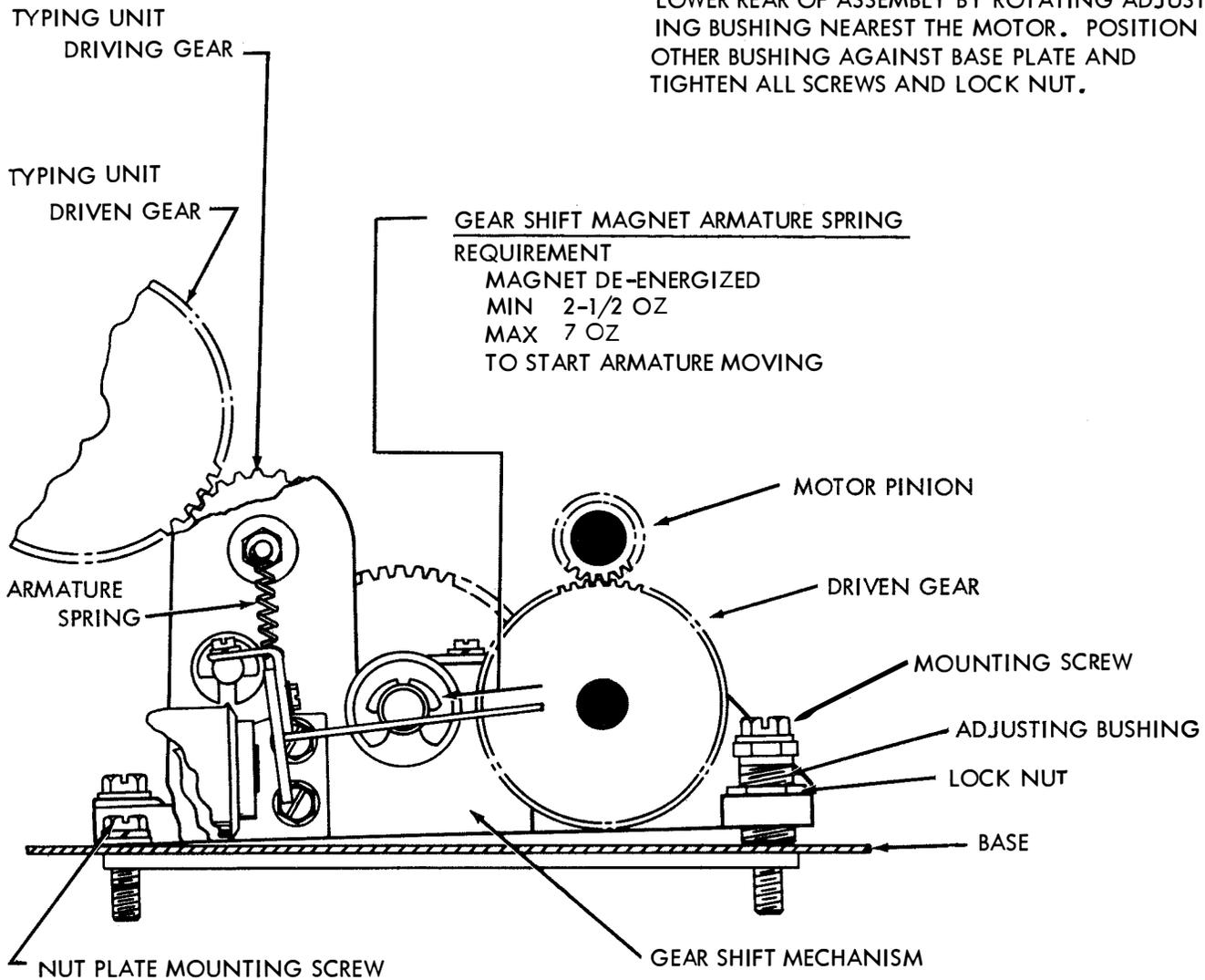
3.26 Remote Control Gear Shift Mechanism

GEAR SHIFT MECHANISM
REQUIREMENT

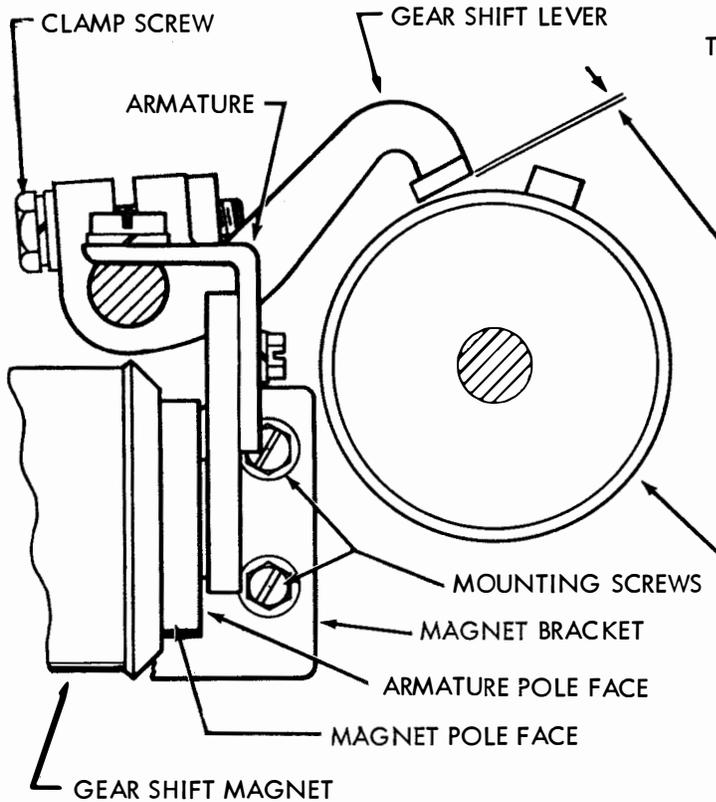
THE BACKLASH BETWEEN THE MOTOR PINION AND ITS DRIVEN GEAR AND BETWEEN THE TYPING UNIT DRIVEN GEAR AND ITS DRIVING GEAR SHOULD BE MIN 0.004 INCH --- MAX 0.008 INCH AT POINT OF MINIMUM BACKLASH.

TO ADJUST

LOOSEN THE FOUR SCREWS WHICH MOUNT THE ASSEMBLY BRACKET TO BASE. LOOSEN THE NUT-PLATE MOUNTING SCREW AT FRONT OF ASSEMBLY BRACKET. LOOSEN LOCK NUTS ON ADJUSTING BUSHINGS. POSITION GEAR SHIFT BRACKET ASSEMBLY FRONT TO REAR. RAISE OR LOWER REAR OF ASSEMBLY BY ROTATING ADJUSTING BUSHING NEAREST THE MOTOR. POSITION OTHER BUSHING AGAINST BASE PLATE AND TIGHTEN ALL SCREWS AND LOCK NUT.



3.27 Remote Control Gear Shift Mechanism continued

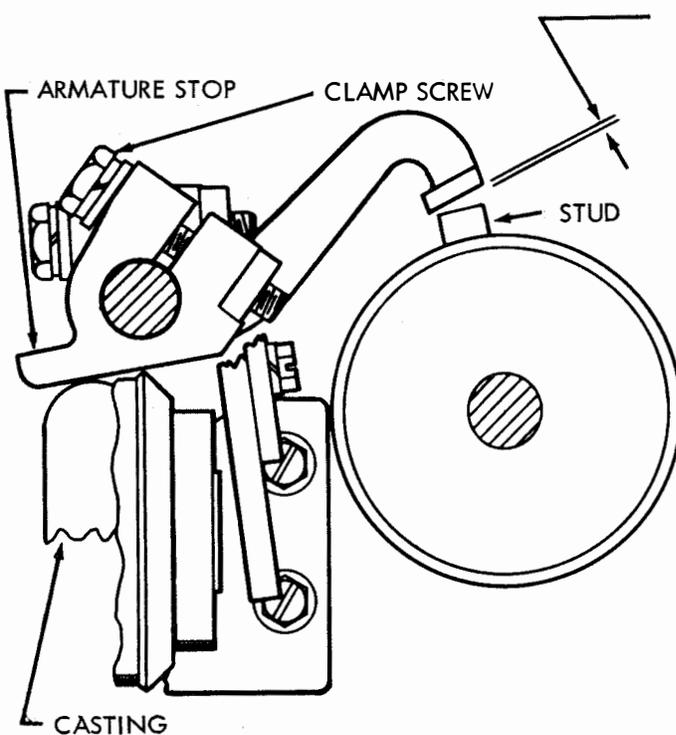


GEAR SHIFT MAGNET
REQUIREMENT

THE POLE FACE OF THE ARMATURE SHOULD MEET THE POLE FACE OF THE MAGNET SQUARELY TO ADJUST POSITION ARMATURE WITH GEAR SHIFT LEVER CLAMP SCREW LOOSENED AND POSITION MAGNET BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

CLUTCH STOP LEVER
REQUIREMENT

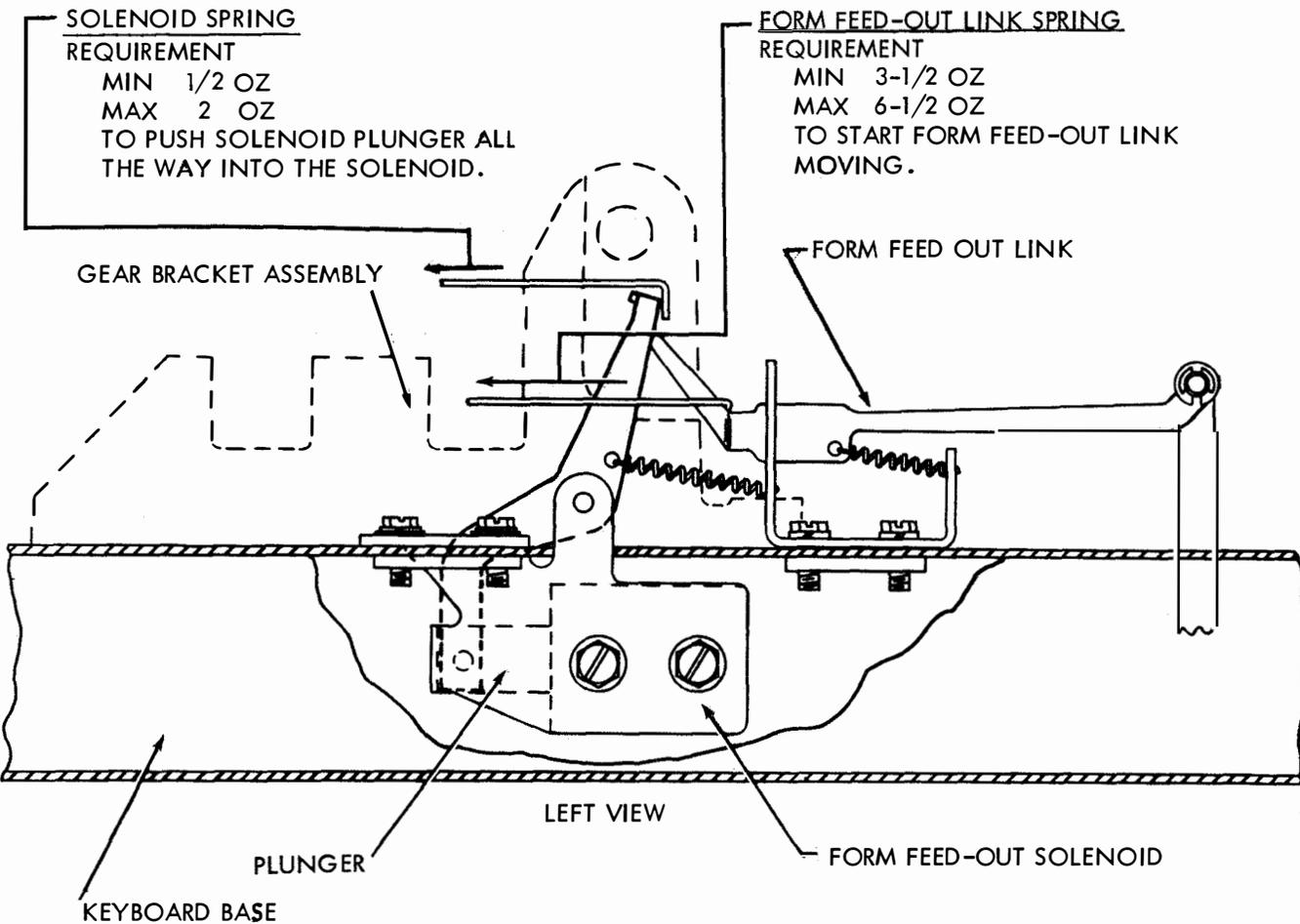
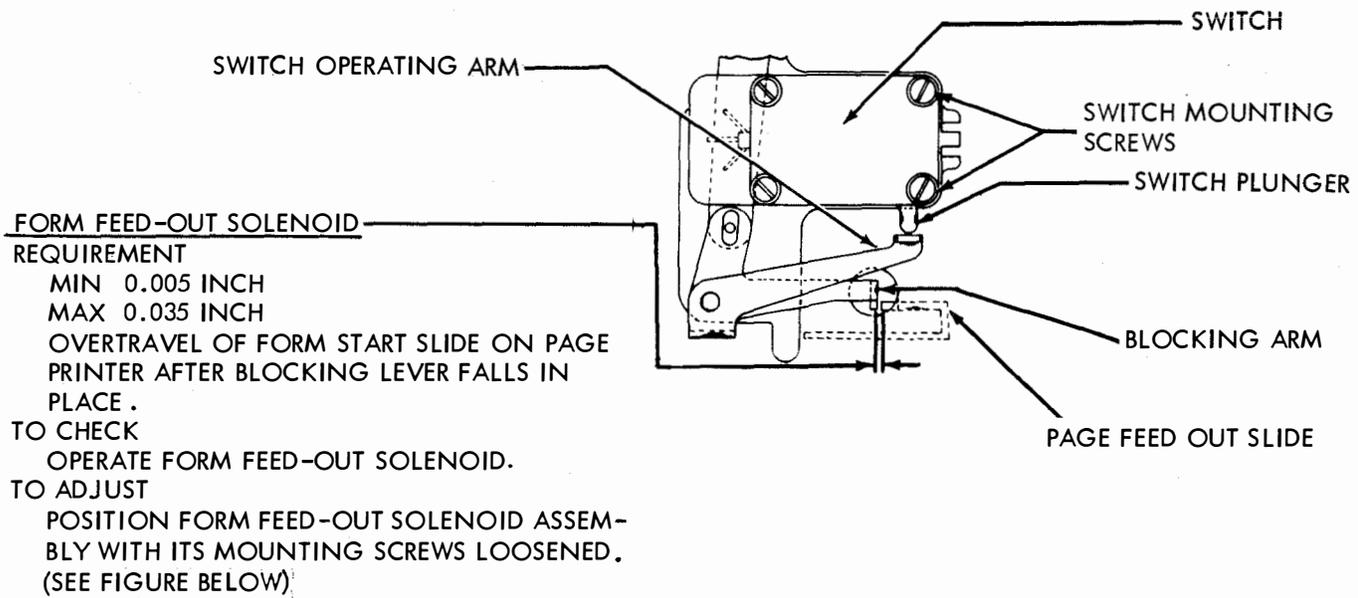
ARMATURE RESTING AGAINST MAGNET POLE FACE, CLEARANCE BETWEEN GEAR SHIFT LEVER AND THE SLEEVE
MIN 0.002 INCH
MAX 0.010 INCH
TO ADJUST POSITION GEAR SHIFT LEVER WITH ITS CLAMP SCREW LOOSENED.



ARMATURE STOP
REQUIREMENT

WITH ARMATURE IN ITS OPEN POSITION AND THE ARMATURE STOP AGAINST THE CASTING, CLEARANCE BETWEEN GEAR SHIFT LEVER AND STUD ON SLEEVE
MIN 0.010 INCH
MAX 0.020 INCH
TO ADJUST HOLD GEAR SHIFT LEVER IN POSITION AND POSITION ARMATURE STOP WITH ITS CLAMP SCREW LOOSENED UNTIL REQUIREMENT IS MET.

3.28 Form Feed-Out Mechanism



3.29 Synchronous Pulse Mechanism

MOUNTING BRACKET

TO CHECK

WITH MAGNET NOT ATTRACTED AND CLUTCH TRIP BAR IN FURTHEST LEFT POSITION.

REQUIREMENT

MIN 0.005 INCH --- MAX 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST

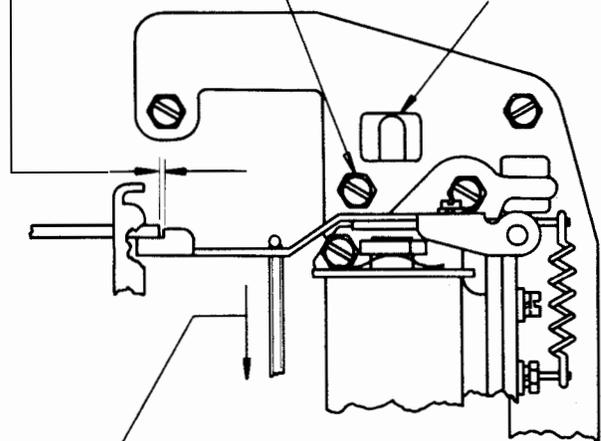
POSITION MOUNTING BRACKET WITH THREE MOUNTING SCREWS LOOSE BY MEANS OF PRY POINT.

NOTE

TIGHTEN REAR LEFT MOUNTING SCREW AND MAKE MOUNTING BRACKET ADJUSTMENT

REAR LEFT MOUNTING SCREW

PRY POINT



MAGNET ARMATURE

TO CHECK

CLUTCH TRIP BAR IN EXTREME LEFT POSITION. HOOK 32 OZ SCALE TO ARMATURE LEVER AS SHOWN. MEASURE AT RIGHT ANGLE TO ARMATURE LEVER AS INDICATED.

REQUIREMENT

MIN 3 OZ --- MAX 5 OZ TO PULL ARMATURE LEVER FROM CLUTCH TRIP BAR.

ARMATURE HINGE

REQUIREMENT

WITH ARMATURE IN ATTRACTED POSITION ARMATURE FLUSH WITH POLE FACE AND MAGNET BRACKET EXTENSION.

TO ADJUST

POSITION ARMATURE WITH HINGE BRACKET MOUNTING SCREW AND SPRING POST LOOSE.

MOUNTING BRACKET

TO CHECK

WITH ARMATURE LEVER HELD AGAINST MAGNET POLE FACE AND CLUTCH TRIP BAR IN FURTHEST RIGHT POSITION.

REQUIREMENT

MIN 0.005 INCH --- MAX 0.015 INCH BETWEEN CLUTCH TRIP BAR AND ARMATURE LEVER.

TO ADJUST

WITH RIGHT REAR AND LEFT FRONT MOUNTING BRACKET SCREWS LOOSE POSITION MOUNTING BRACKET BY MEANS OF PRY POINT.

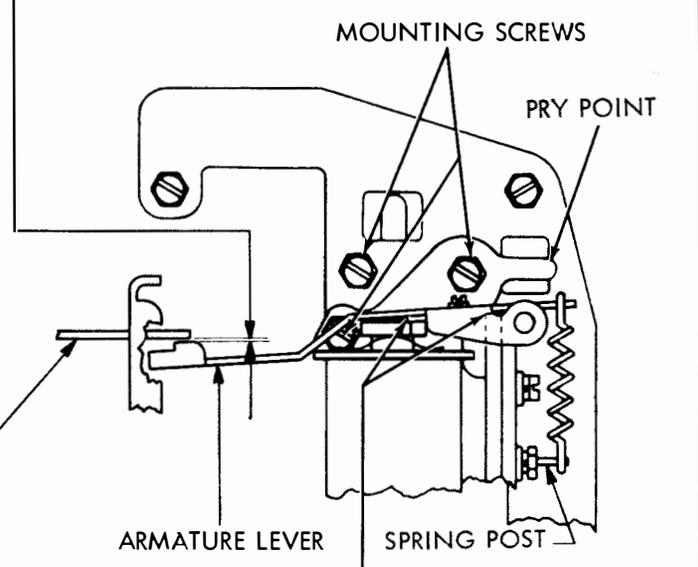
MOUNTING SCREWS

PRY POINT

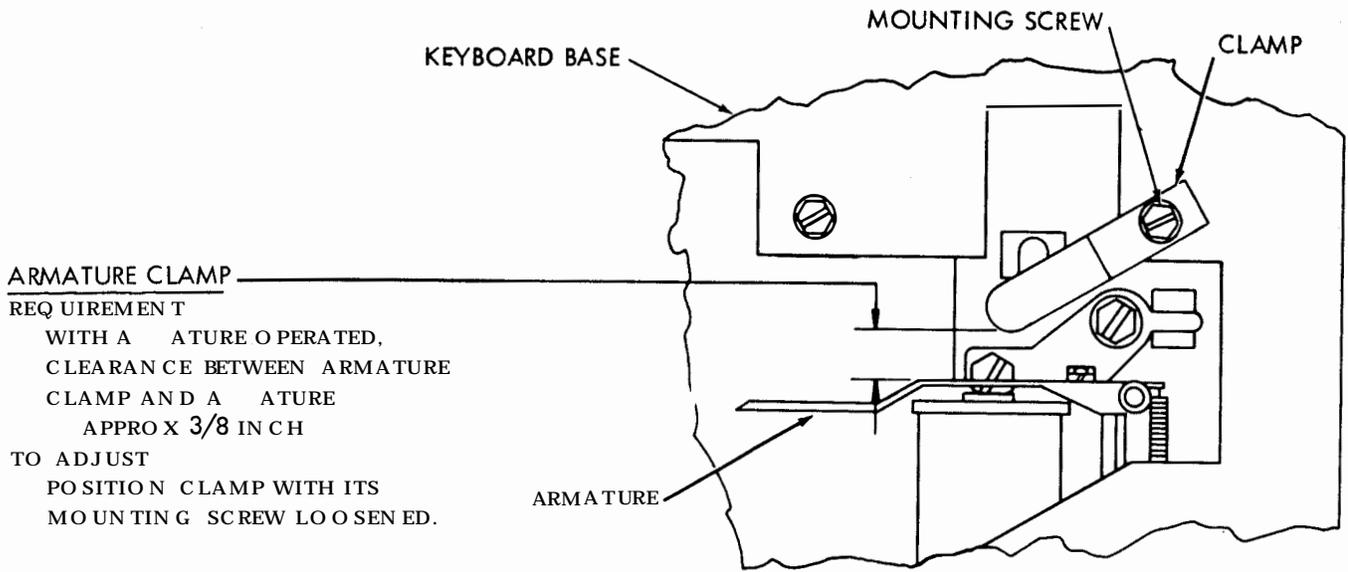
CLUTCH TRIP BAR

ARMATURE LEVER

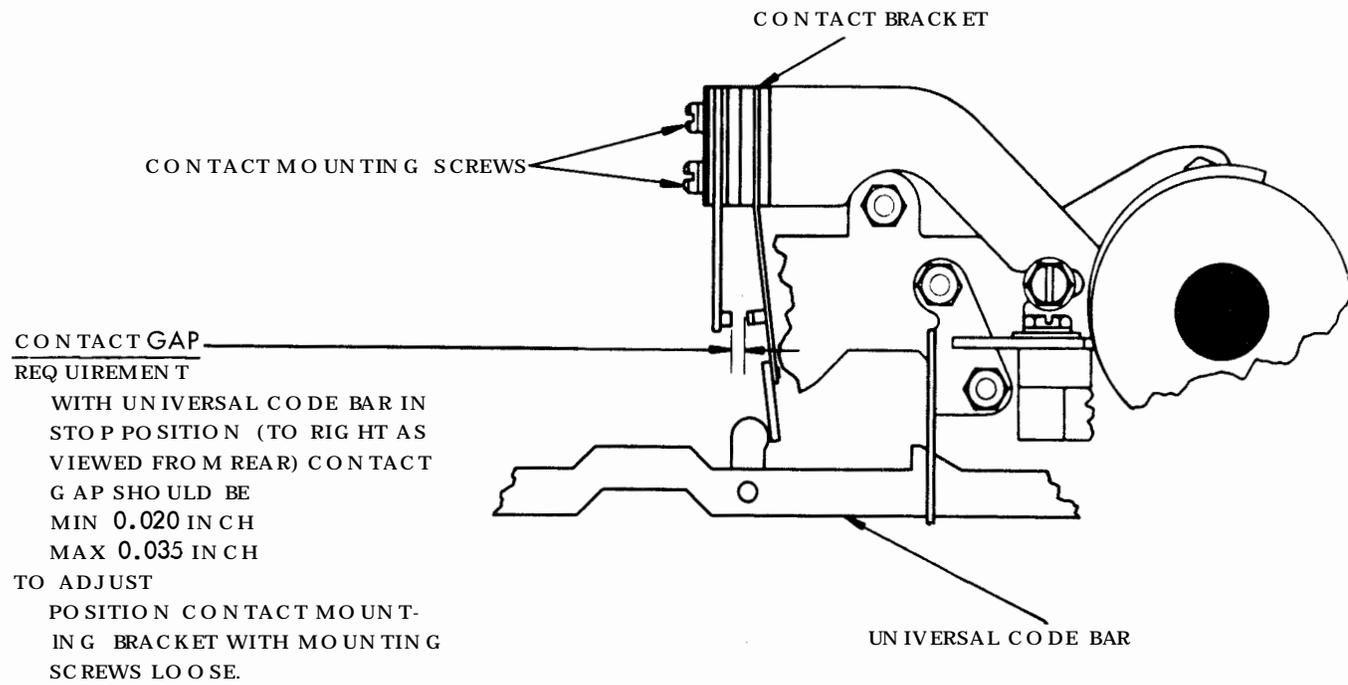
SPRING POST



3.30 Synchronous Pulse Mechanism continued



ARMATURE CLAMP
 REQUIREMENT
 WITH ARMATURE OPERATED,
 CLEARANCE BETWEEN ARMATURE
 CLAMP AND ARMATURE
 APPROX $3/8$ INCH
 TO ADJUST
 POSITION CLAMP WITH ITS
 MOUNTING SCREW LOOSENED.

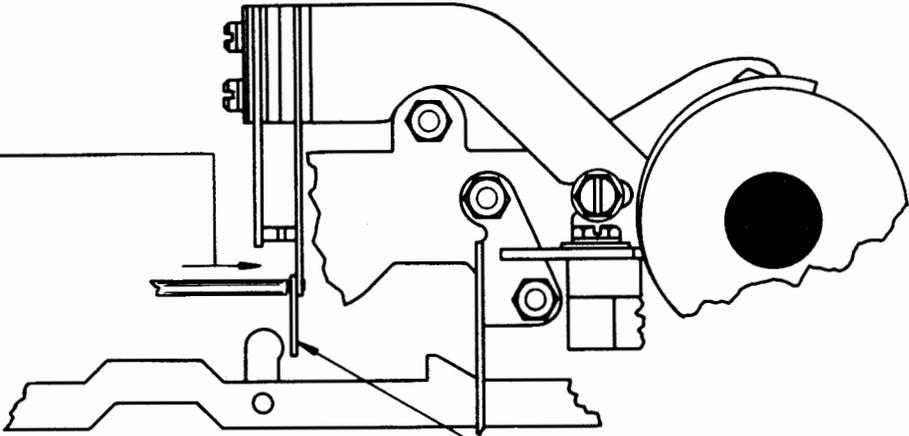


CONTACT GAP
 REQUIREMENT
 WITH UNIVERSAL CODE BAR IN
 STOP POSITION (TO RIGHT AS
 VIEWED FROM REAR) CONTACT
 GAP SHOULD BE
 MIN 0.020 INCH
 MAX 0.035 INCH
 TO ADJUST
 POSITION CONTACT MOUNT-
 ING BRACKET WITH MOUNTING
 SCREWS LOOSE.

3.31 Synchronous Pulse Mechanism continued

UNIVERSAL CODE BAR CONTACT
REQUIREMENT

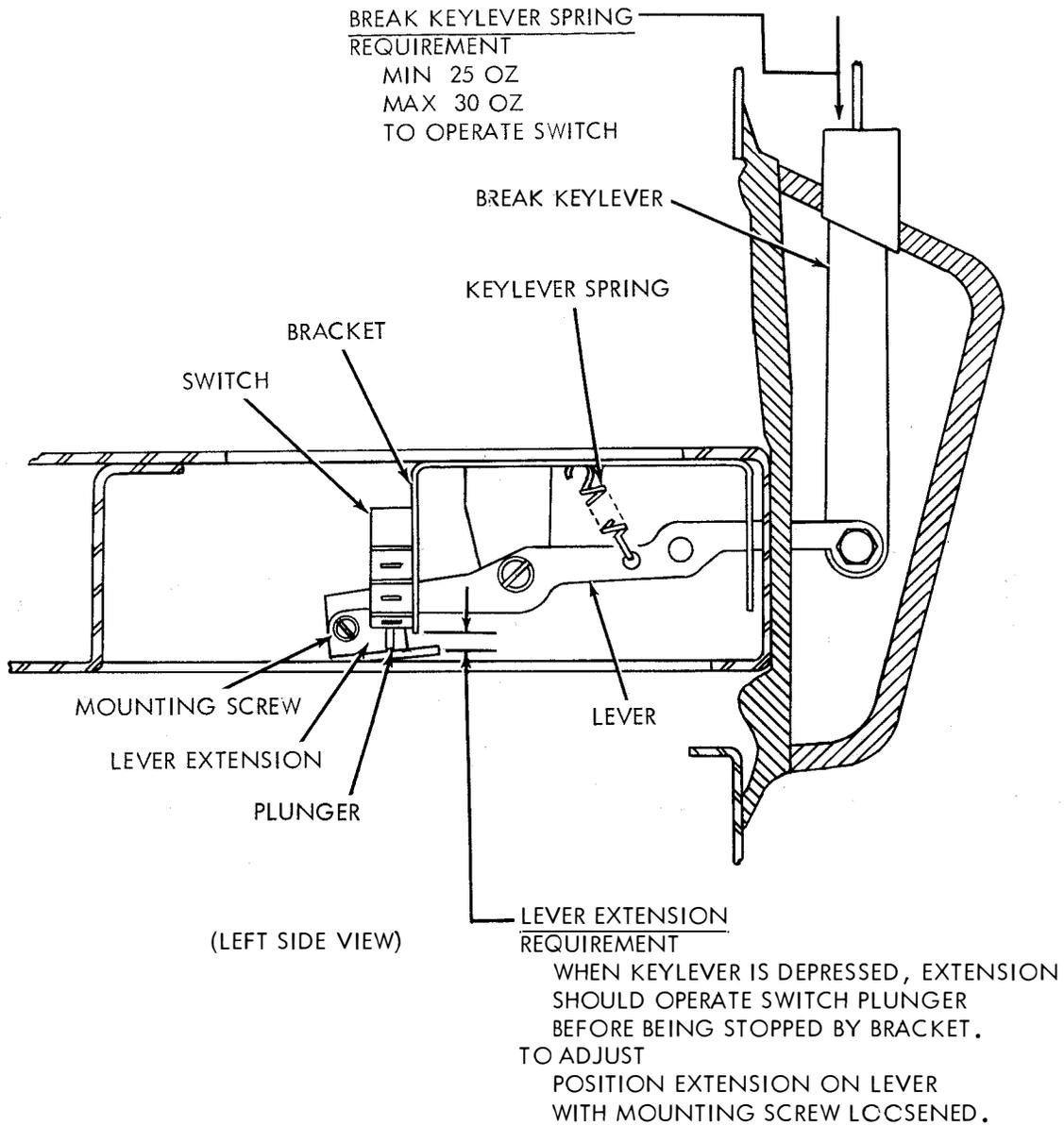
WITH UNIVERSAL CODE BAR IN
OPERATED POSITION (TO THE
LEFT AS VIEWED FROM REAR)
MIN 3-1/2 OZ
MAX 4-1/2 OZ
TO OPEN CONTACTS.
TO ADJUST
BEND CONTACT SWINGER.



CONTACT SWINGER

4. BASE (RECEIVE-ONLY)

4.01 Signal Line Break Mechanism



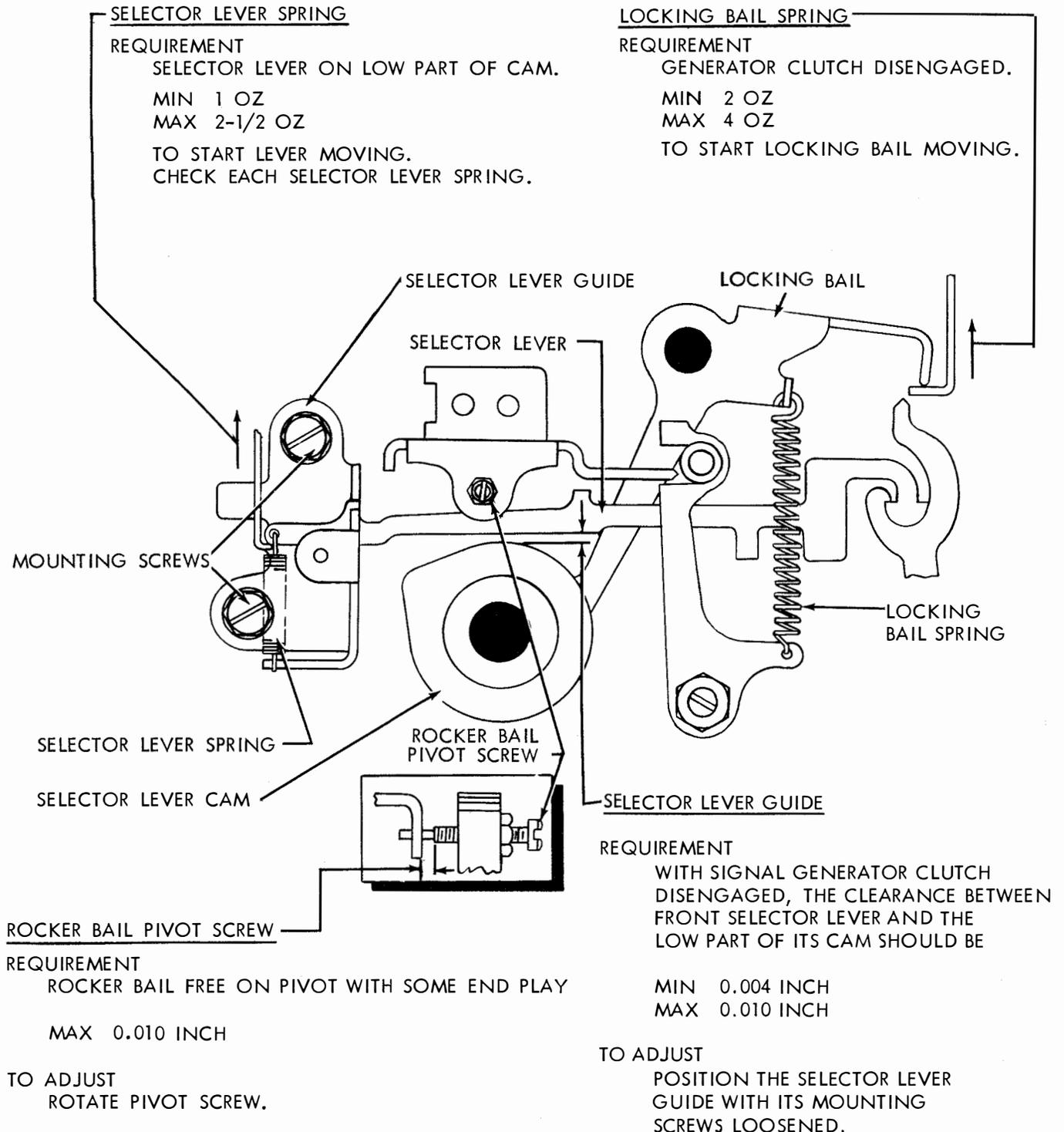
4.02 The following requirement should be met:

- (a) INTERMEDIATE GEAR BRACKET (PAR. 2.17)
- (b) MOUNTING TYPING UNIT ON KEYBOARD OR BASE (PAR. 2.18)
- (c) LOCAL LINE FEED TRIP LINK SPRING (PAR. 2.14)
- (d) LOCAL CARRIAGE RETURN BAIL SPRING (PAR. 2.13)
- (e) MARGIN INDICATOR SPRING (PAR. 2.15)

5. EARLIER DESIGN

5.01 Signal Generator Mechanism

NOTE: IN ORDER TO PERFORM ALL SIGNAL GENERATOR ADJUSTMENTS, IT WILL BE NECESSARY TO REMOVE GENERATOR FROM THE KEYBOARD. SEE APPROPRIATE SECTION.



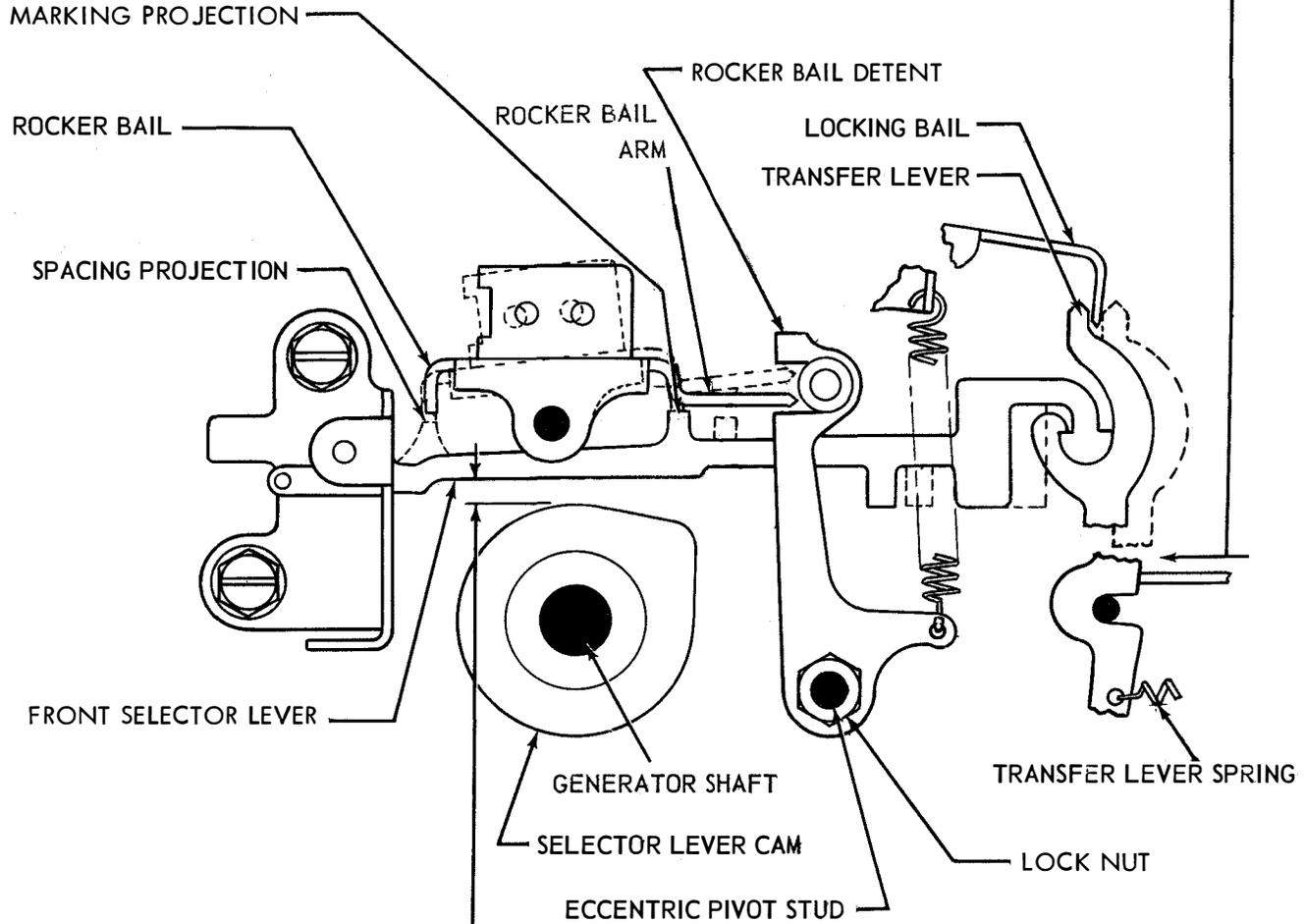
5.02 Signal Generator Mechanism continued

TRANSFER LEVER SPRING

REQUIREMENT

TRANSFER LEVERS IN MARKING POSITION. CODE BAR BAIL LATCH SPRING REMOVED START TRANSFER LEVER (5TH FROM FRONT) MANUALLY MOVED TO MARKING POSITION.

TRANSFER LEVERS	START LEVER
MIN 5-1/2 OZ	7-1/2 OZ
MAX 8 OZ	10 OZ TO START LEVER MOVING.



ROCKER BAIL DETENT

REQUIREMENT

CLEARANCE BETWEEN THE ROCKER BAIL ARM AND BOTH THE MARKING AND THE SPACING PROJECTIONS OF THE SELECTOR LEVERS SHOULD BE EQUAL WITHIN 0.005 INCH

TO CHECK

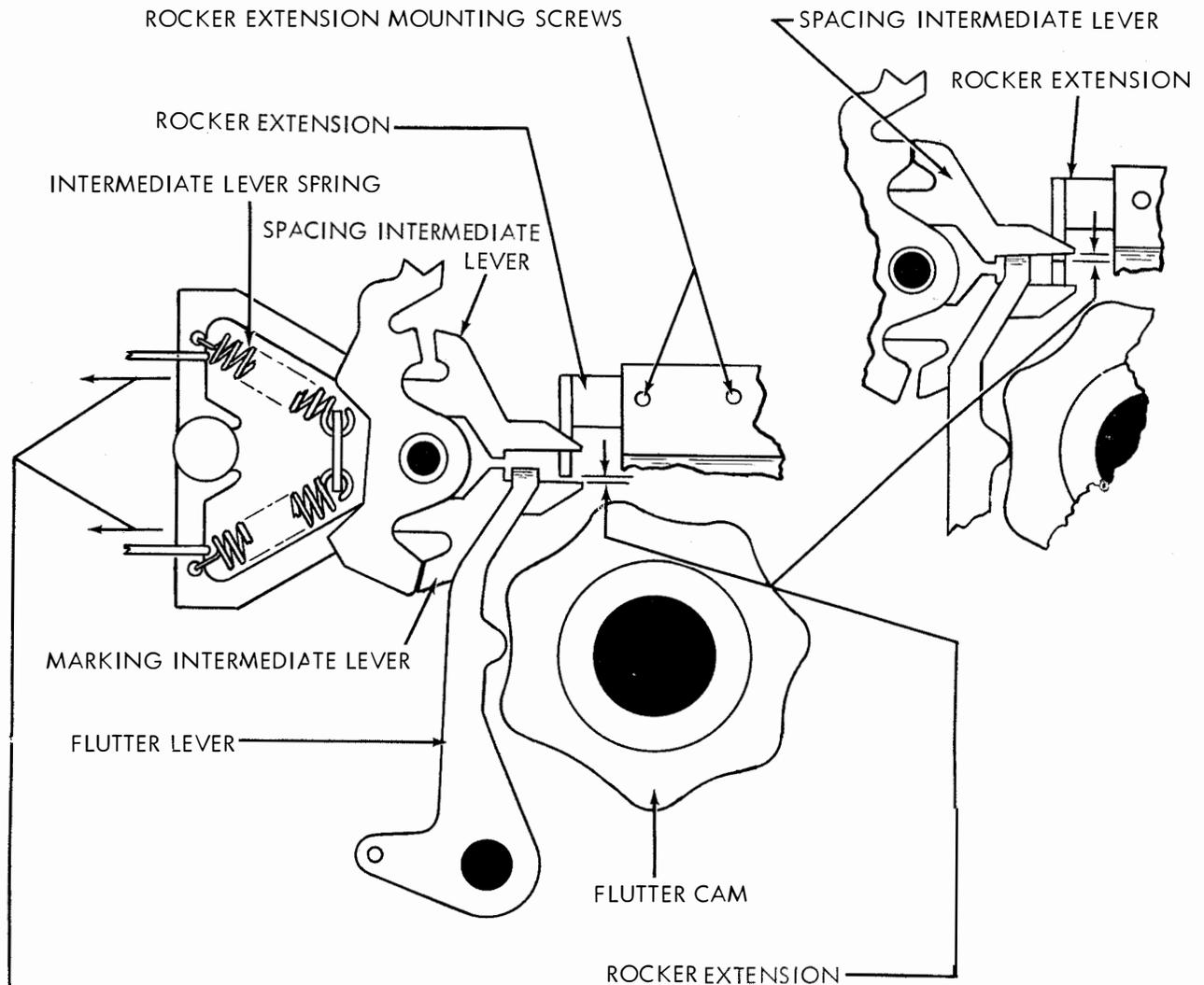
ROTATE THE CAM SLEEVE UNTIL THE FRONT SELECTOR LEVER HAS COME DOWN OFF THE PEAK OF ITS CAM AND IS OPPOSITE THE LOW PART OF ITS CAM. WITH THE FRONT SELECTOR LEVER IN THE MARKING (LEFT) POSITION, AND THE ROCKER BAIL ARM AGAINST THE LOWER STOP OF ITS DETENT, HOLD THE SELECTOR LEVER LIGHTLY UP AGAINST THE ROCKER BAIL AND GAUGE THE CLEARANCE BETWEEN THE SELECTOR LEVER AND THE CAM. SHIFT THE ROCKER BAIL ARM AGAINST THE UPPER STOP OF ITS DETENT AND HOLD FRONT SELECTOR LEVER TO THE RIGHT AND UP SO THAT THE SPACING PROJECTION TOUCHES THE ROCKER BAIL. GAUGE THE CLEARANCE BETWEEN THE SELECTOR LEVER AND THE CAM. THESE TWO CLEARANCES SHOULD BE EQUAL WITHIN 0.005 INCH.

TO ADJUST

EQUALIZE CLEARANCES BY ROTATING THE ECCENTRIC PIVOT STUD OF THE DETENT WITH ITS LOCK NUT LOOSENED. KEEP THE HIGH PART OF THE ECCENTRIC TOWARD THE GENERATOR SHAFT.

5.03 Signal Generator Mechanism continued

NOTE: REMOVE MECHANICAL BREAK LEVER AND SPRING OR ELECTRICAL BREAK LEVER, SPRING AND SWITCH, IF EQUIPPED. SEE PAR. 5.26.



INTERMEDIATE LEVER SPRING
REQUIREMENT

CLUTCH DISENGAGED. PULL HORIZONTALLY,
PARALLEL TO INTERMEDIATE LEVER'S PATH
MIN 2 OZ
MAX 4 OZ
TO START LEVER MOVING. CHECK SPACING
AND MARKING LEVERS.

ROCKER EXTENSION
REQUIREMENT

EQUAL CLEARANCE (WITHIN 0.005 INCH)
BETWEEN THE ROCKER EXTENSION
AND BOTH THE MARKING AND THE
SPACING INTERMEDIATE LEVERS WHEN
SELECTED INDIVIDUALLY.

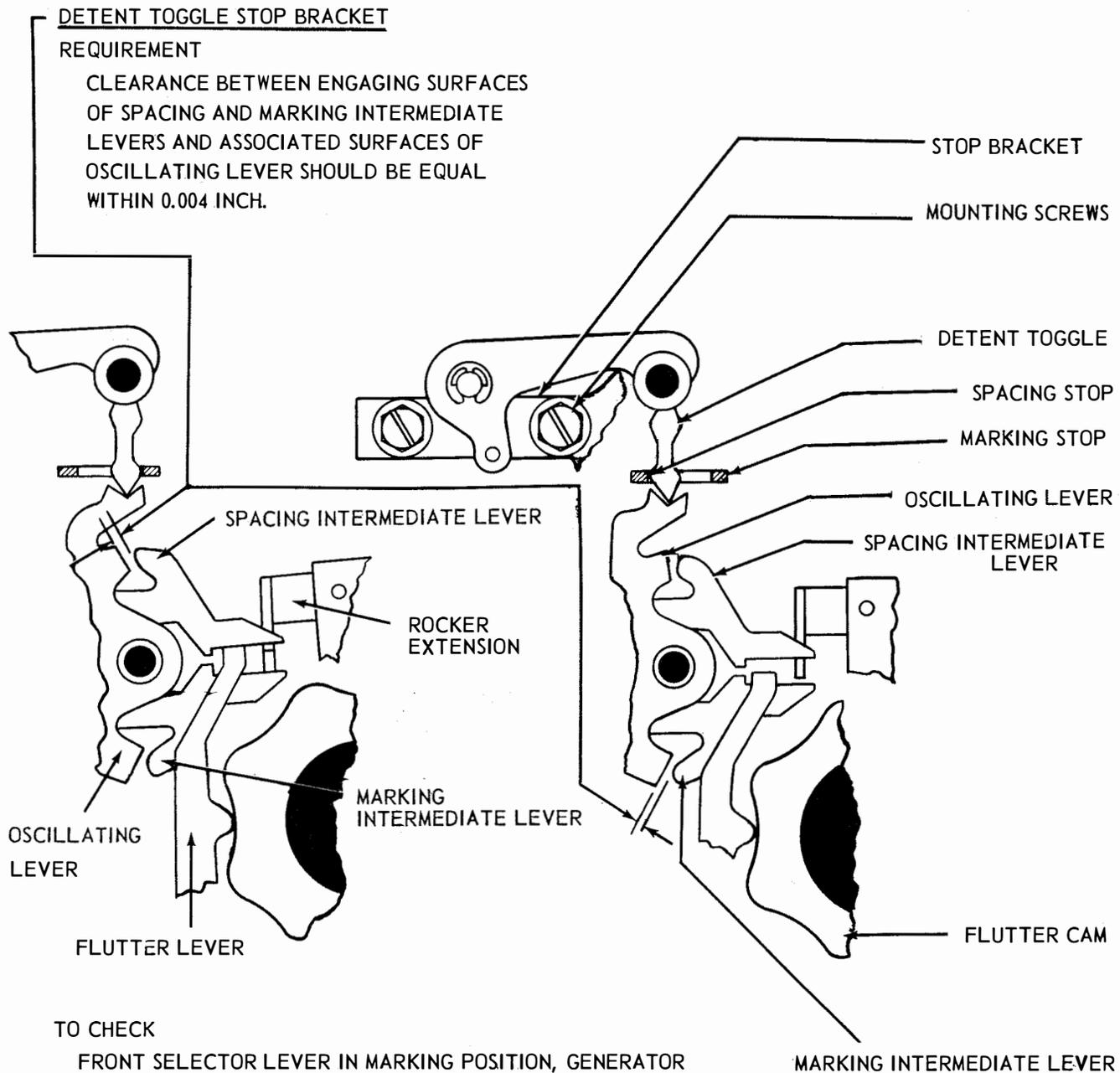
TO CHECK

ROTATE THE SHAFT UNTIL THE MARKING
INTERMEDIATE LEVER IS SELECTED AND
THE FLUTTER LEVER IS ON LOW PART
OF CAM. GAUGE CLEARANCE IN LEFT FIGURE
REPEAT PROCEDURE FOR SPACING INTERMEDIATE
LEVER. GAUGE CLEARANCE IN RIGHT FIGURE.

TO ADJUST

EQUALIZE CLEARANCES BY POSITIONING
THE ROCKER EXTENSION WITH ITS
MOUNTING SCREWS LOOSENED.

5.04 Signal Generator Mechanism continued



5.05 Signal Generator Mechanism continued

DETENT LEVER SPRING

REQUIREMENT

MIN 8-1/2 OZ

MAX 10-1/2 OZ

TO START DETENT LEVER MOVING.

DETENT LEVER SPRING

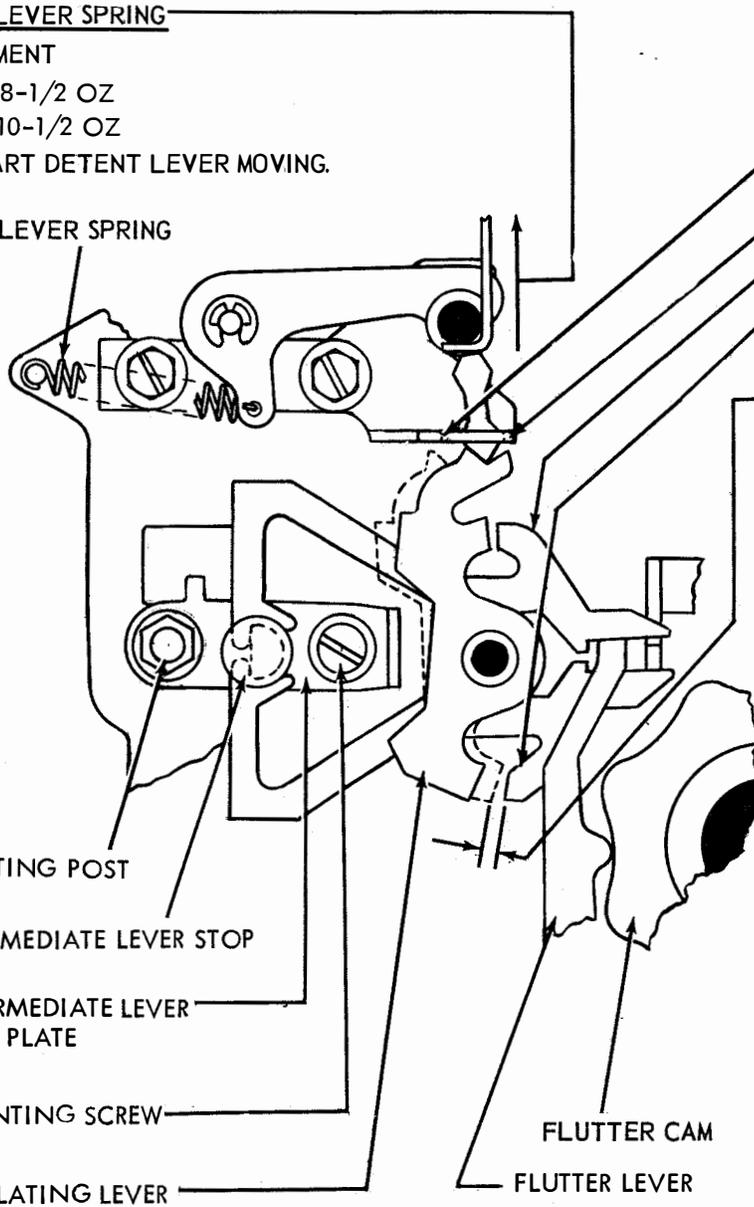
MOUNTING POST

INTERMEDIATE LEVER STOP

INTERMEDIATE LEVER STOP PLATE

MOUNTING SCREW

OSCILLATING LEVER



SPACING STOP

MARKING STOP

SPACING INTERMEDIATE LEVER

MARKING INTERMEDIATE LEVER

INTERMEDIATE LEVER STOP PLATE

REQUIREMENT

CLEARANCE BETWEEN ENGAGING SURFACES OF INTERMEDIATE LEVERS AND OSCILLATING LEVER

MIN SOME CLEARANCE

MAX 0.006 INCH

TO CHECK

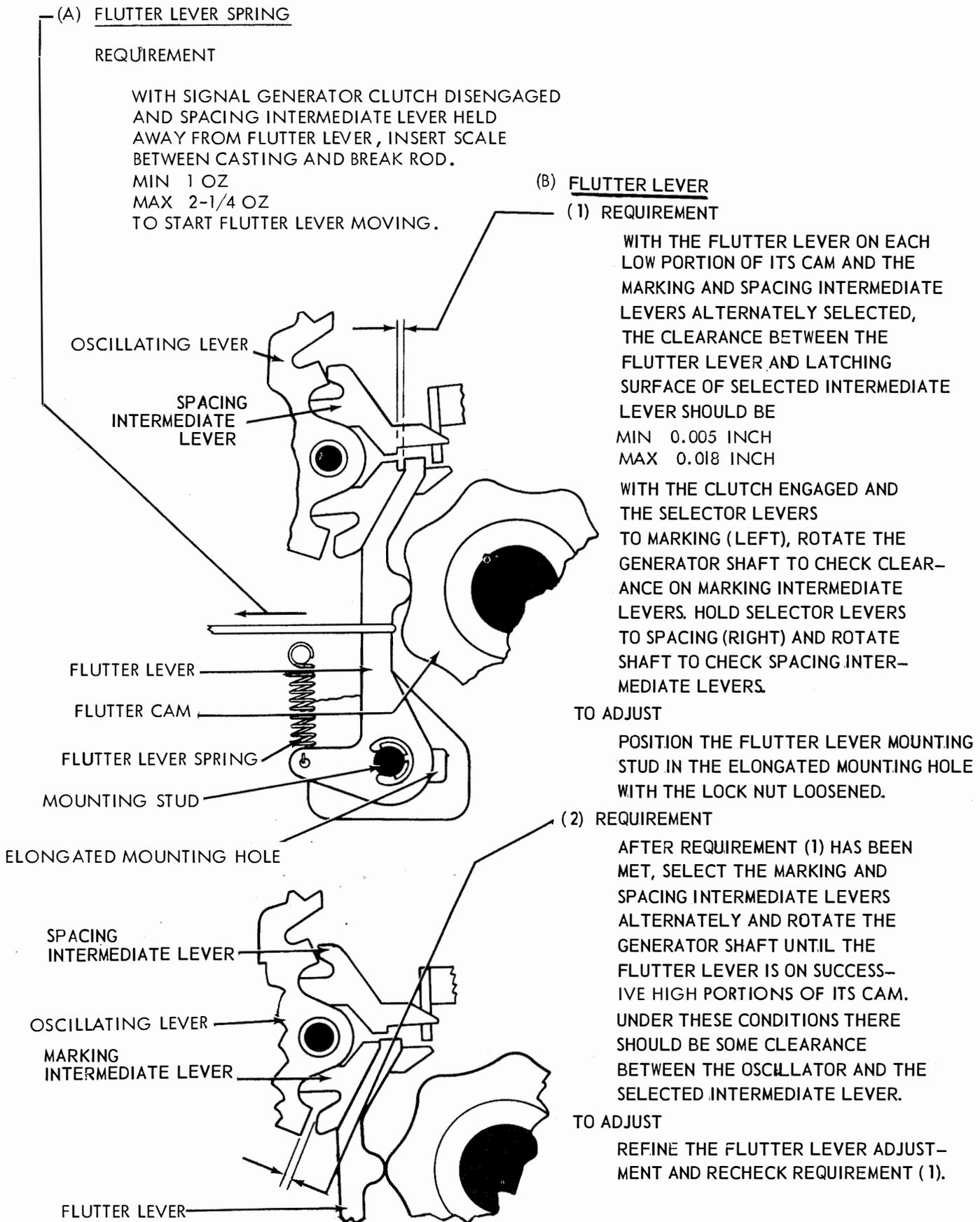
WITH THE FRONT SELECTOR LEVER IN ITS MARKING POSITION, ROTATE THE GENERATOR SHAFT UNTIL FRONT SELECTOR LEVER IS ON PEAK OF ITS CAM. MOVE OSCILLATING LEVER TOWARD MARKING INTERMEDIATE LEVER AND GAUGE GAP. WITH FRONT SELECTOR LEVER IN ITS SPACING POSITION AND ON PEAK OF ITS CAM, MOVE OSCILLATING LEVER TOWARD SPACING INTERMEDIATE LEVER AND GAUGE GAP.

TO ADJUST

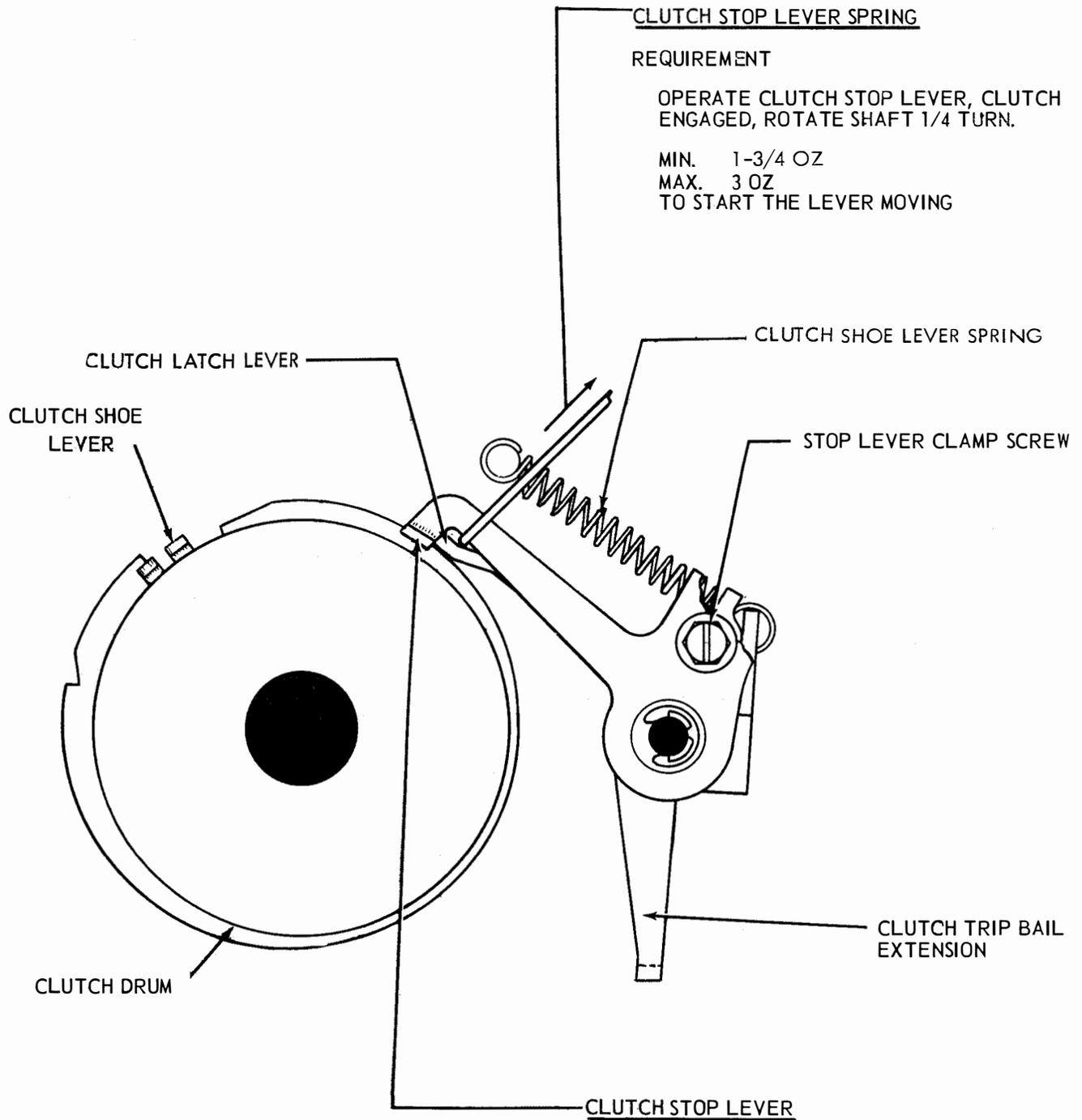
POSITION INTERMEDIATE LEVER STOP PLATE WITH MOUNTING POST AND MOUNTING SCREW LOOSENED.

NOTE: REPLACE THE BREAK LEVER AND ASSOCIATED PARTS

5.06 Signal Generator Mechanism continued



5.07 Signal Generator Mechanism continued



CLUTCH STOP LEVER SPRING

REQUIREMENT

OPERATE CLUTCH STOP LEVER, CLUTCH ENGAGED, ROTATE SHAFT 1/4 TURN.

MIN. 1-3/4 OZ

MAX. 3 OZ

TO START THE LEVER MOVING

CLUTCH STOP LEVER

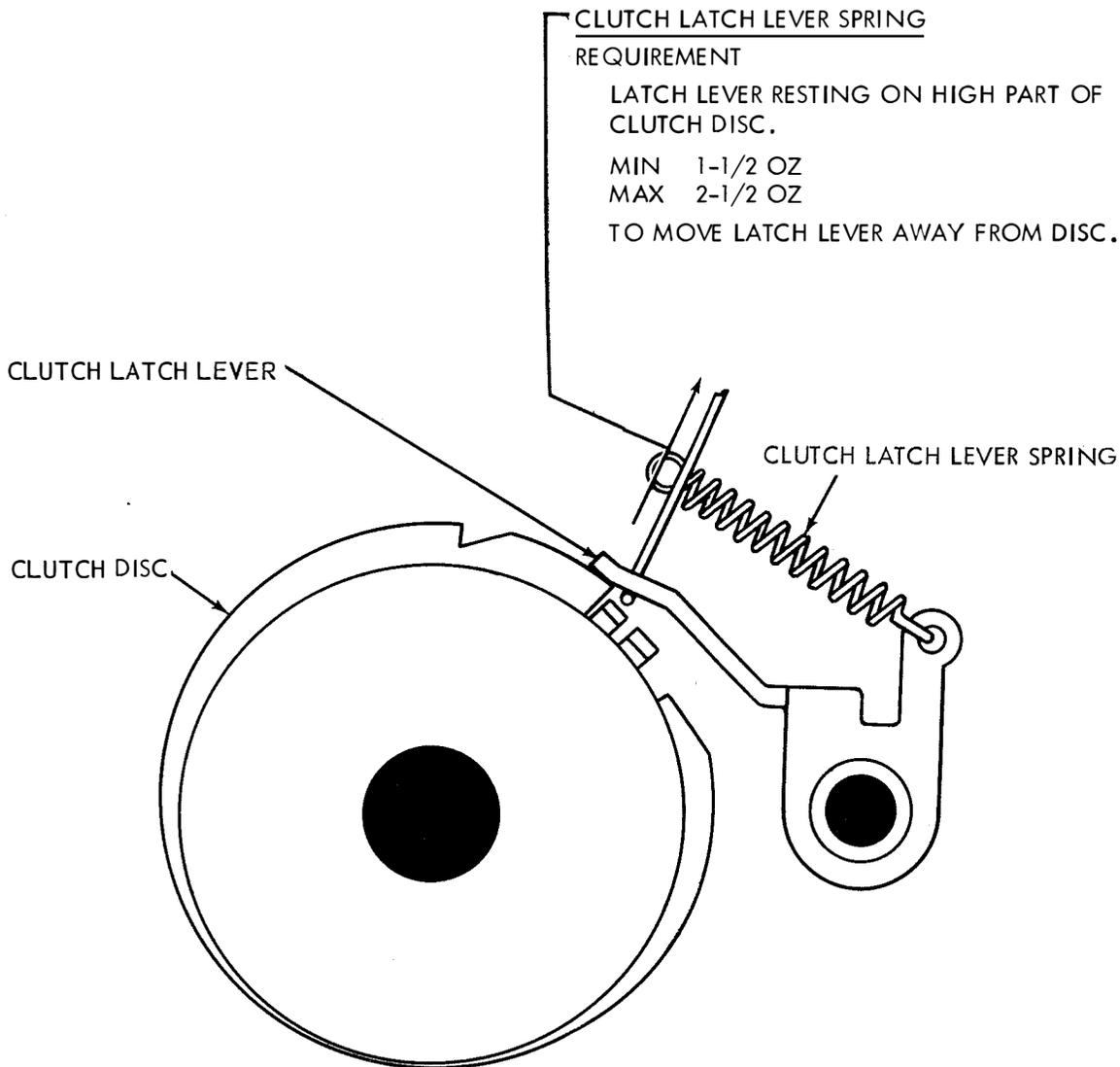
REQUIREMENT

CLUTCH STOP LEVER SHOULD FULLY ENGAGE THE CLUTCH SHOE LEVER VERTICALLY.

TO ADJUST

POSITION THE STOP LEVER WITH ITS CLAMP SCREW LOOSENED.

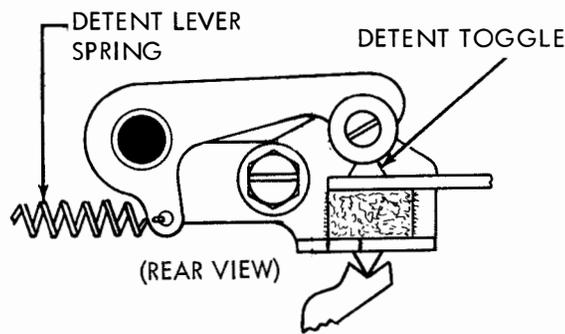
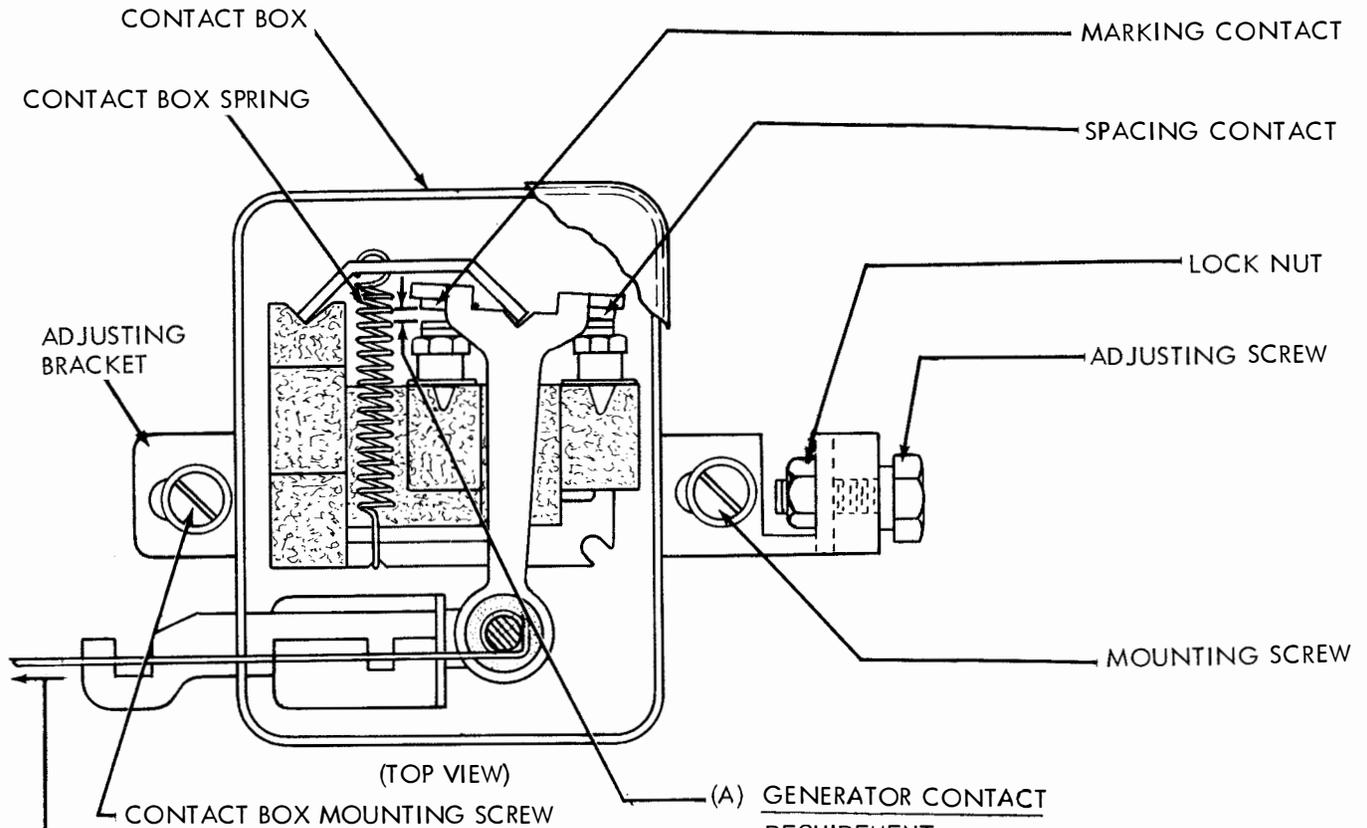
5.08 Signal Generator Mechanism continued



NOTE

REPLACE SIGNAL GENERATOR ON THE KEYBOARD. MAKE CERTAIN THAT THE CODE BAR BAIL LATCH LEVER (PAR. 5.10) IS UNDER CODE LEVER BAIL LATCH LEVER (PAR. 5.12) THAT (IF EQUIPPED) BREAK KEY ROD, ATTACHED TO BREAK LEVER (PAR. 5.26) IS IN ITS GUIDE HOLE IN CODE LEVER GUIDE, AND THAT THE CLUTCH TRIP BAIL EXTENSION (PAR. 5.07) IS IN THE NOTCH PROVIDED IN THE CLUTCH TRIP BAR (REAR) AND THAT THE CODE BAR BAIL (PAR. 5.10) IS RESTING IN THE NOTCHES OF THE FIVE CODE BARS, THE CLUTCH TRIP BAR AND THE KEYLEVER UPSTOP BAR. SEE APPROPRIATE SECTION.

5.09 Signal Generator Mechanism continued



(B) CONTACT BOX SPRING
REQUIREMENT

CONTACT BOX COVER REMOVED. DETENT LEVER SPRING DISCONNECTED.

MIN 2 OZ
MAX 4 OZ
TO BREAK CONTACT

(A) GENERATOR CONTACT
REQUIREMENT

THE MARKING AND SPACING CONTACT GAPS SHOULD BE EQUAL

TO CHECK

REMOVE THE COVER FROM THE CONTACT BOX. FIRST, MOVE THE DETENT TOGGLE AGAINST ITS SPACING STOP AND GAUGE THE MARKING CONTACT GAP. THEN MOVE THE DETENT TOGGLE AGAINST ITS MARKING STOP AND GAUGE SPACING CONTACT GAP.

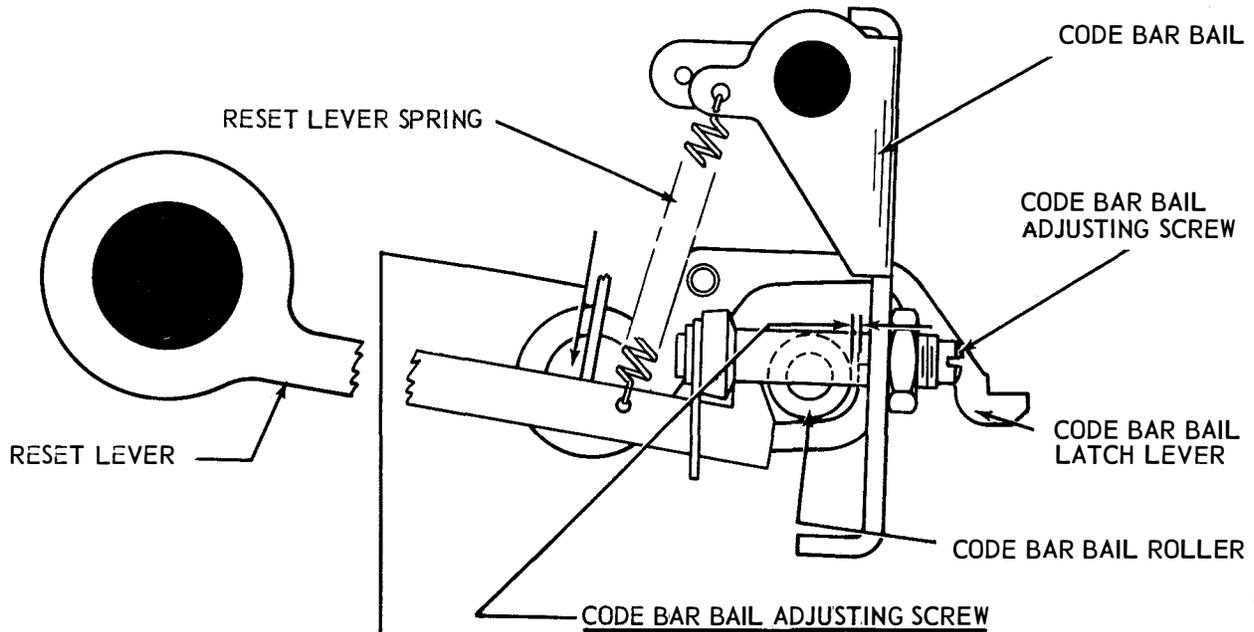
TO ADJUST

ROTATE THE CONTACT BOX ADJUSTING SCREW WITH ITS LOCK NUT LOOSENED AND WITH THE CONTACT BOX MOUNTING SCREWS FRICTION TIGHT. REPLACE CONTACT BOX COVER.

NOTE

CHECK BY MEANS OF A 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.

5.10 Codebar Assembly



RESET LEVER SPRING

REQUIREMENT

CLUTCH DISENGAGED.

MIN 2 OZ

MAX 4 OZ

TO START THE RESET LEVER
MOVING.

CODE BAR BAIL ADJUSTING SCREW
REQUIREMENT

CLUTCH ENGAGED. LTRS. COMBINATION SELECTED
CLUTCH ROTATED 1/2 TURN UNTIL RESET
LEVER IS IN EXTREME LEFT HAND POSITION
CLEARANCE BETWEEN THE CODE BAR BAIL
LATCH LEVER AND CODE BAR BAIL ROLLER.

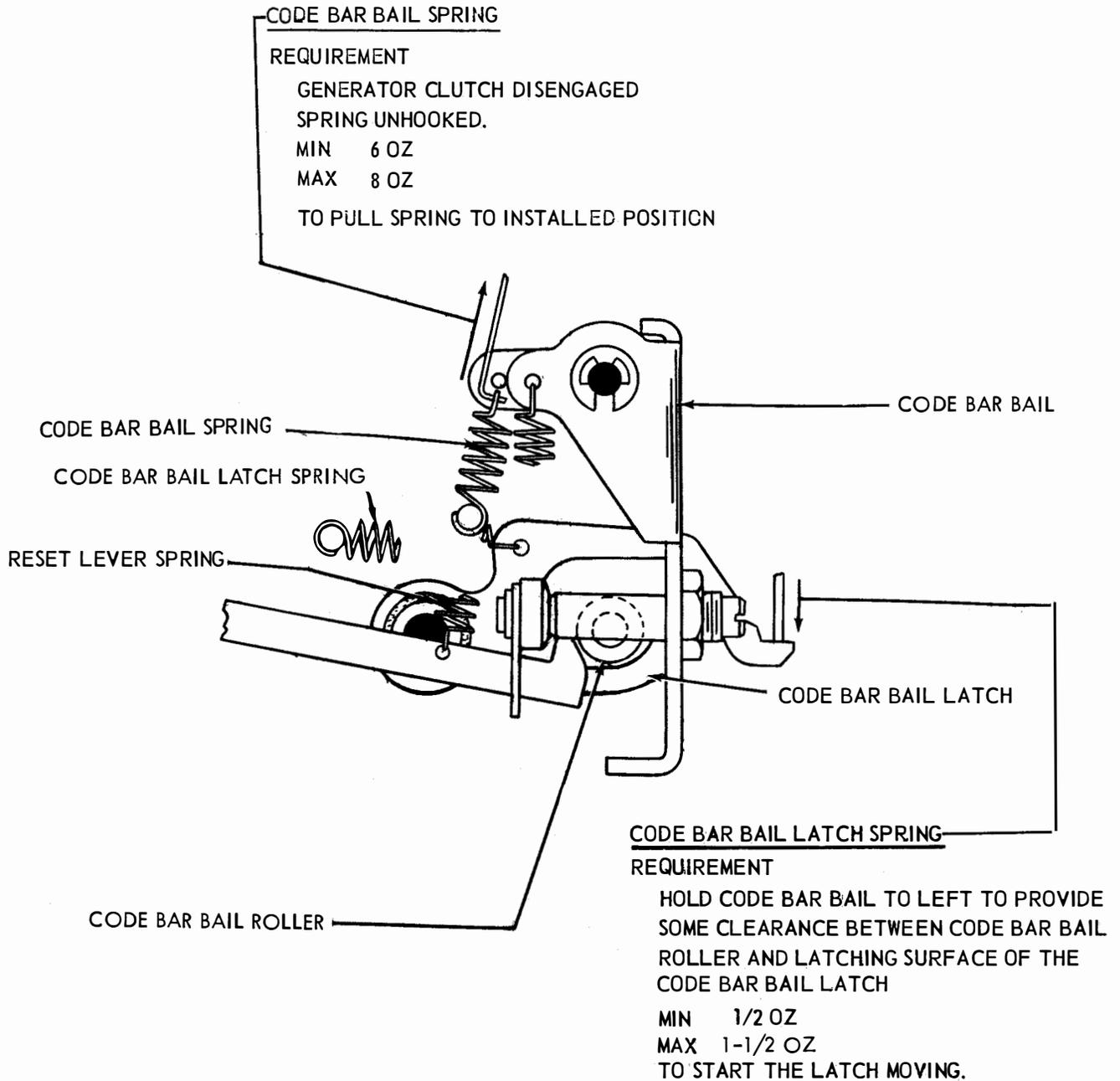
MIN 0.004 INCH

MAX 0.008 INCH

TO ADJUST

POSITION THE CODE BAR BAIL ADJUSTING
SCREW WITH ITS LOCK NUT LOOSENED.

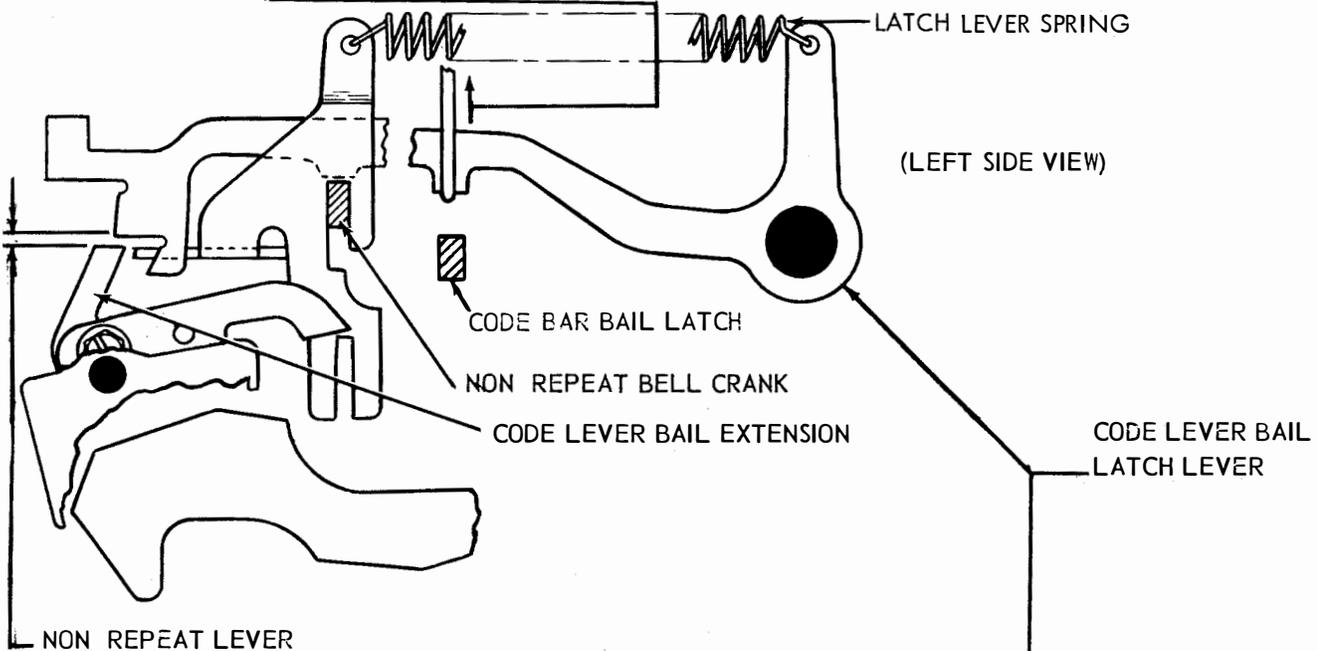
5.11 Codebar Assembly continued



5.12 Codebar Assembly continued

CODE LEVER BAIL LATCH LEVER SPRING
REQUIREMENT

SIGNAL GENERATOR CLUTCH DISENGAGED CODE BAR BAIL LATCH TRIPPED.
CODE LEVER BAIL EXTENSION HELD AWAY FROM LATCHING SURFACE OF CODE
LEVER BAIL LATCH LEVER.
MIN 3 OZ ---MAX 5 OZ
TO START CODE LEVER BAIL LATCH LEVER MOVING.



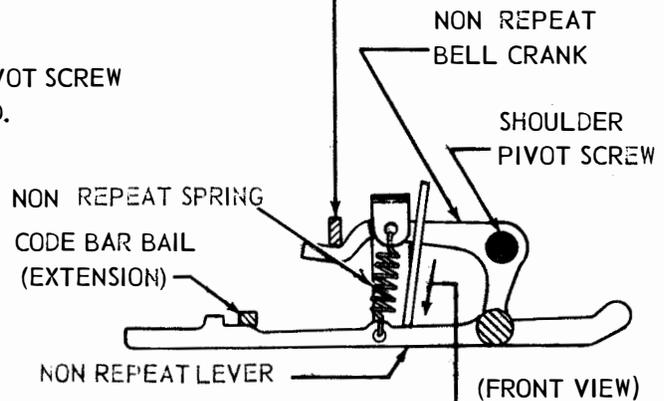
NON REPEAT LEVER

REQUIREMENT

ANY KEYLEVER DEPRESSED, SIGNAL GENERATOR SHAFT ROTATED
UNTIL CLUTCH IS DISENGAGED. CLEARANCE BETWEEN CODE LEVER
BAIL EXTENSION AND CODE LEVER BAIL LATCH LEVER
MIN 0.020 INCH
MAX 0.030 INCH
LET UP ON KEYLEVER UNTIL SURFACES TO BE MEASURED
ARE IN LINE.

TO ADJUST

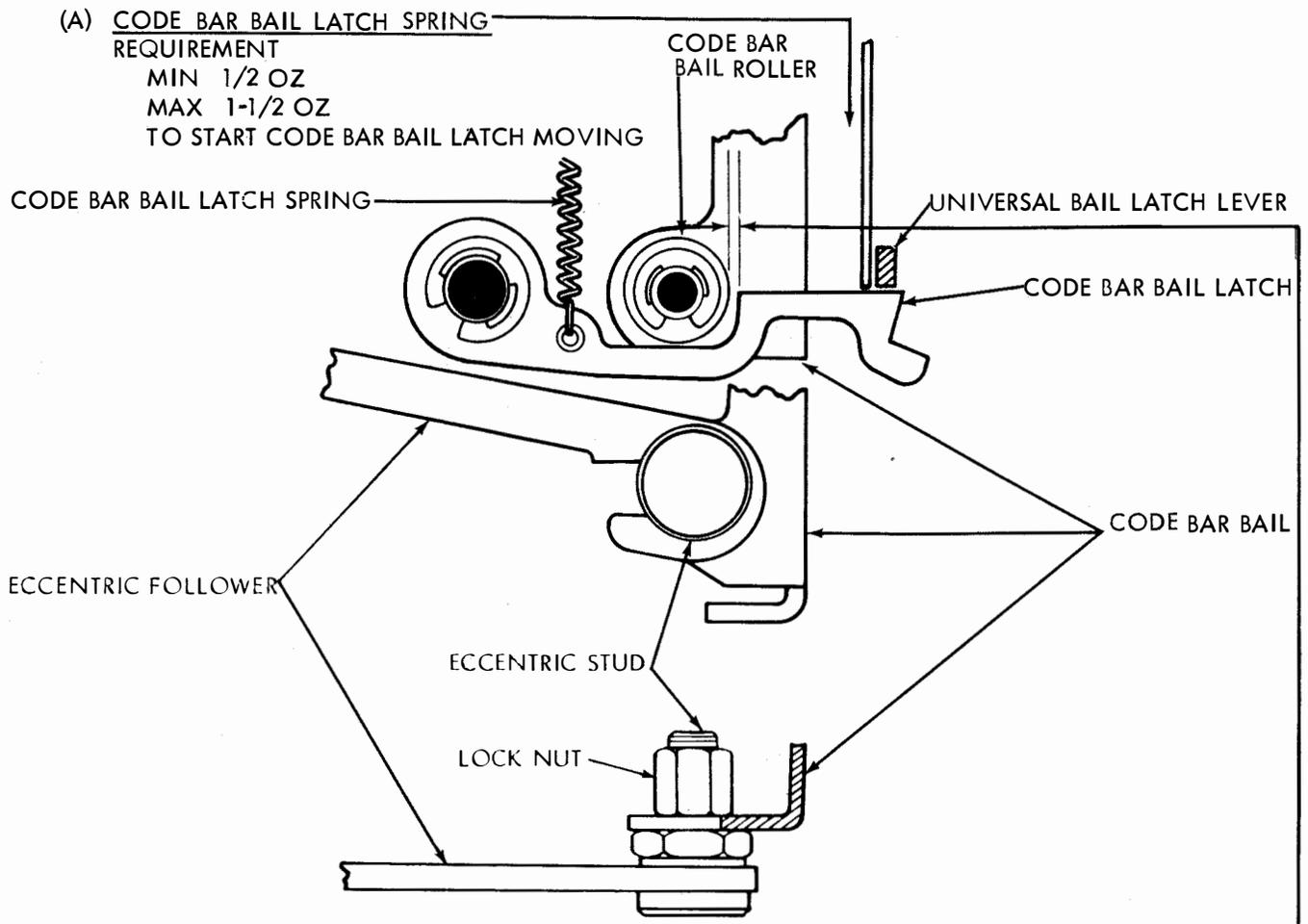
POSITION NON REPEAT BELL CRANK SHOULDER PIVOT SCREW
IN ITS ELONGATED HOLE WITH LOCK NUT LOOSENED.



NON REPEAT SPRING
REQUIREMENT

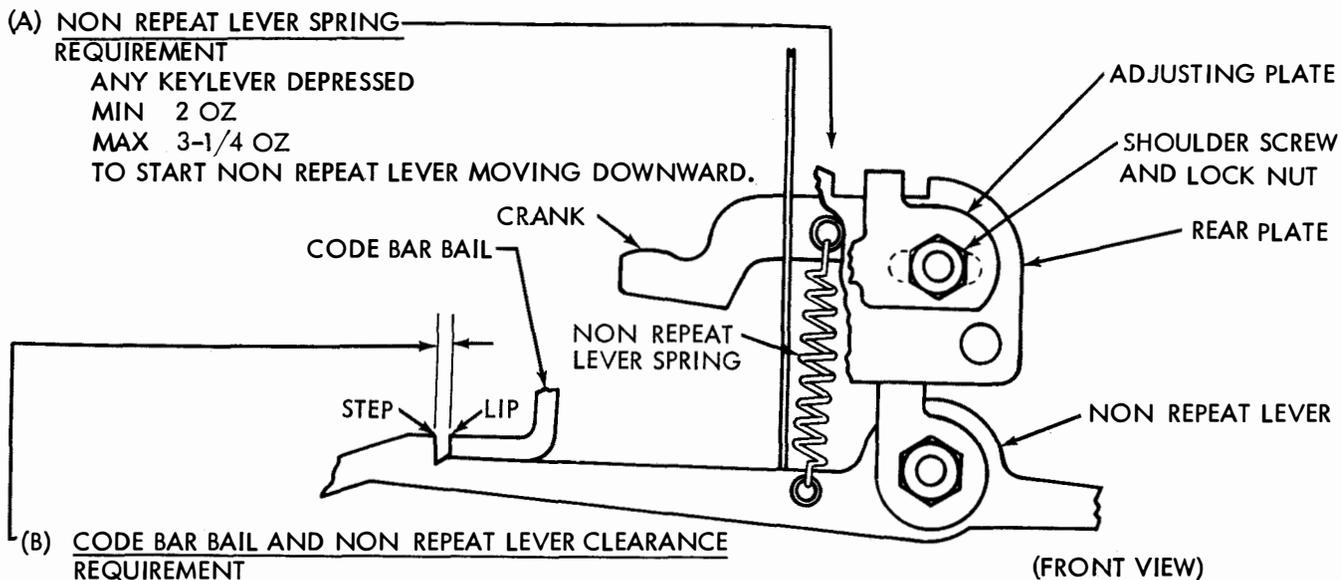
GENERATOR CLUTCH DISENGAGED. ANY KEYLEVER DEPRESSED.
MIN 1/2 OZ ---MAX 1-1/2 OZ
TO START NON REPEAT LEVER MOVING DOWNWARD.

5.13 Codebar Assembly continued

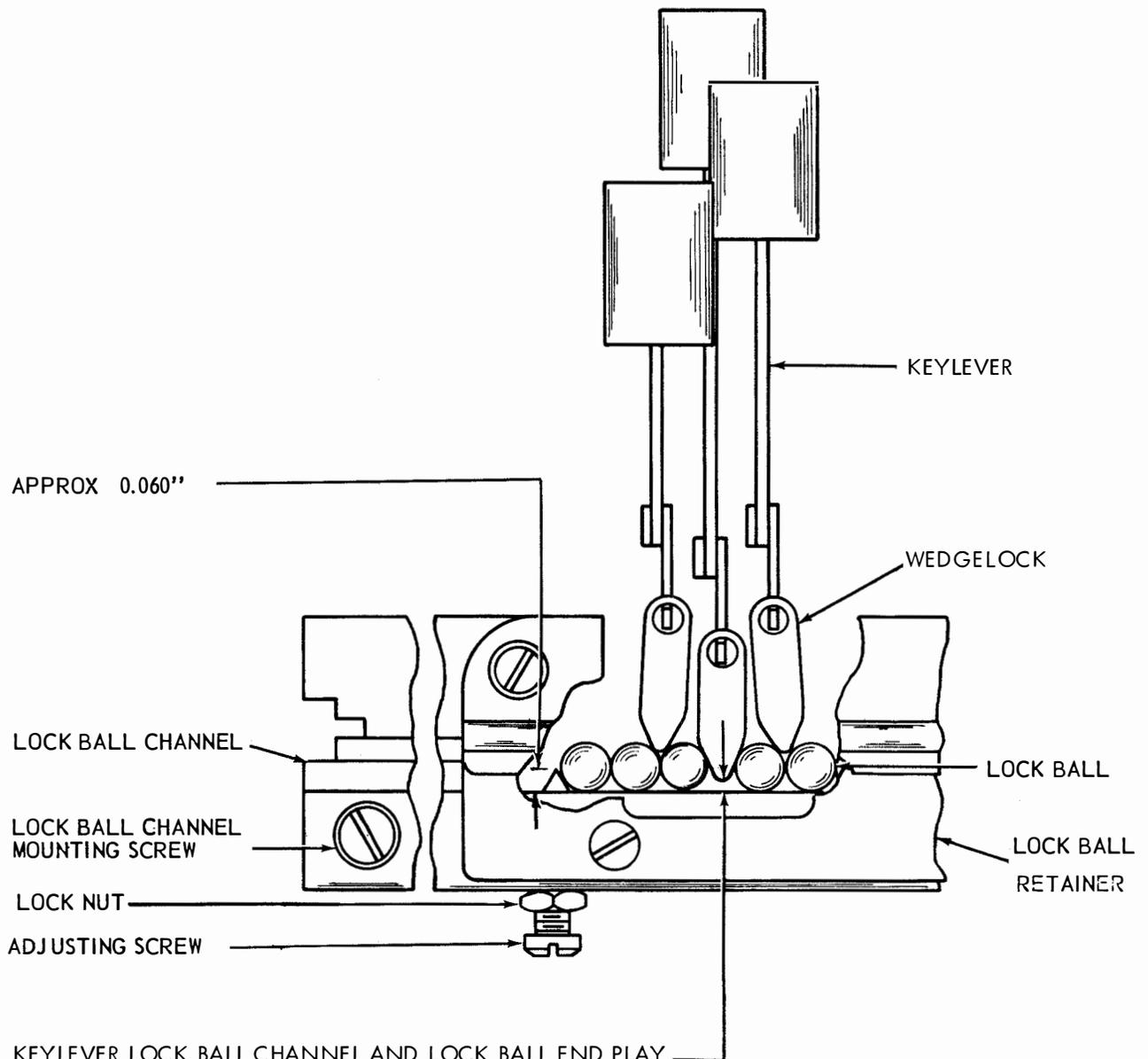


(B) CODE BAR BAIL
 REQUIREMENT
 CAM ECCENTRIC AND ARM WHICH HOLD THE BAIL IN EXTREME RESET POSITION TO THE LEFT.
 MIN 0.004 INCH
 MAX 0.012 INCH
 BETWEEN CODE BAR BAIL ROLLER AND CODE BAR BAIL LATCH
 TO ADJUST
 ADJUST ECCENTRIC STUD WITH LOCK NUT LOOSENED.

5. 14 Nonrepeat Lever Mechanism



5.15 Keyboard Mechanism



KEYLEVER LOCK BALL CHANNEL AND LOCK BALL END PLAY

REQUIREMENT

GENERATOR SHAFT ROTATING, CLUTCH SHOULD TRIP CONSISTENTLY WHEN TWO KEYLEVERS ARE DEPRESSED ALTERNATELY. CLUTCH SHOULD NOT TRIP WHEN TWO KEYLEVERS ARE DEPRESSED SIMULTANEOUSLY. WHEN EITHER Q OR P KEYLEVER IS FULLY DEPRESSED, CLEARANCE SHOULD BE

MIN SOME CLEARANCE

MAX 0.020 INCH

BETWEEN TIP OF WEDGELOCK AND BOTTOM OF CHANNEL.

TO ADJUST

POSITION CHANNEL WITH MOUNTING SCREWS LOOSENED. POSITION LOCK BALL ADJUSTING SCREW

APPROXIMATELY 0.060 INCH ABOVE BOTTOM OF BALL CHANNEL.

5. 16 Codebar Assembly continued.

CODE LEVER BAIL LATCH LEVER ECCENTRIC

(1) REQUIREMENT

KEYLEVER WITH SHORTEST DOWNWARD STROKE FULLY DEPRESSED. CLEARANCE BETWEEN FRONT VERTICAL SURFACE OF THE CODE LEVER BAIL EXTENSION AND THE STOP ON THE REAR END OF THE CODE LEVER BAIL LATCH LEVER.

MIN 0.025 INCH
MAX 0.040 INCH

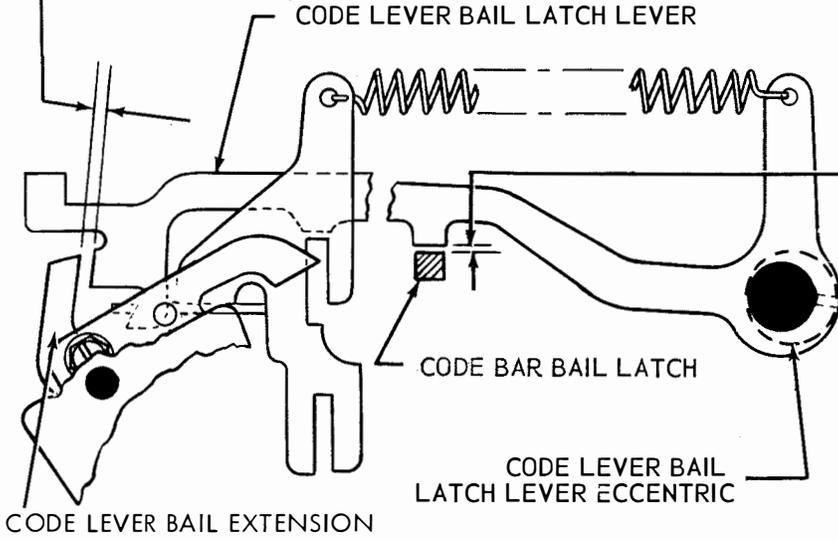
(2) REQUIREMENT

GENERATOR CLUTCH DISENGAGED. CLEARANCE BETWEEN CODE LEVER BAIL LATCH LEVER AND THE CODE BAR BAIL LATCH

MIN 0.005 INCH
MAX 0.035 INCH

TO ADJUST

ROTATE THE CODE LEVER BAIL LATCH LEVER ECCENTRIC.



CODE LEVER BAIL SPRING

REQUIREMENT

GENERATOR CLUTCH DISENGAGED. NON REPEAT LEVER HELD AWAY.

MIN 1-3/4 OZ
MAX 3 OZ

TO START THE BAIL MOVING.

CODE BAR GUIDES

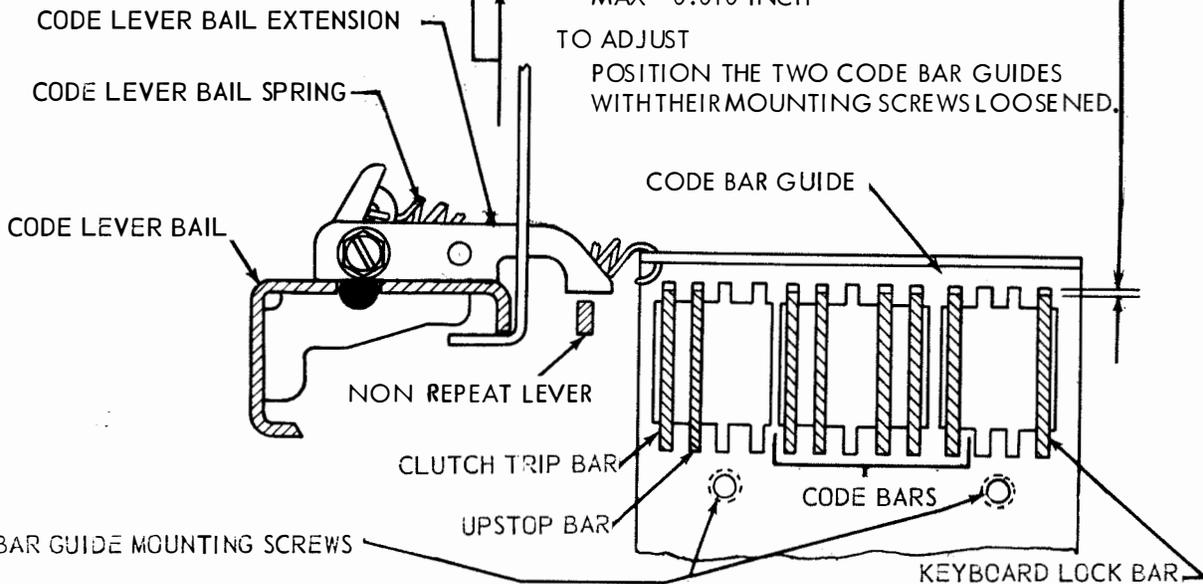
REQUIREMENT

CLEARANCE BETWEEN CODE BARS AND CODE BAR GUIDES

MIN SOME CLEARANCE
MAX 0.010 INCH

TO ADJUST

POSITION THE TWO CODE BAR GUIDES WITH THEIR MOUNTING SCREWS LOOSENED.

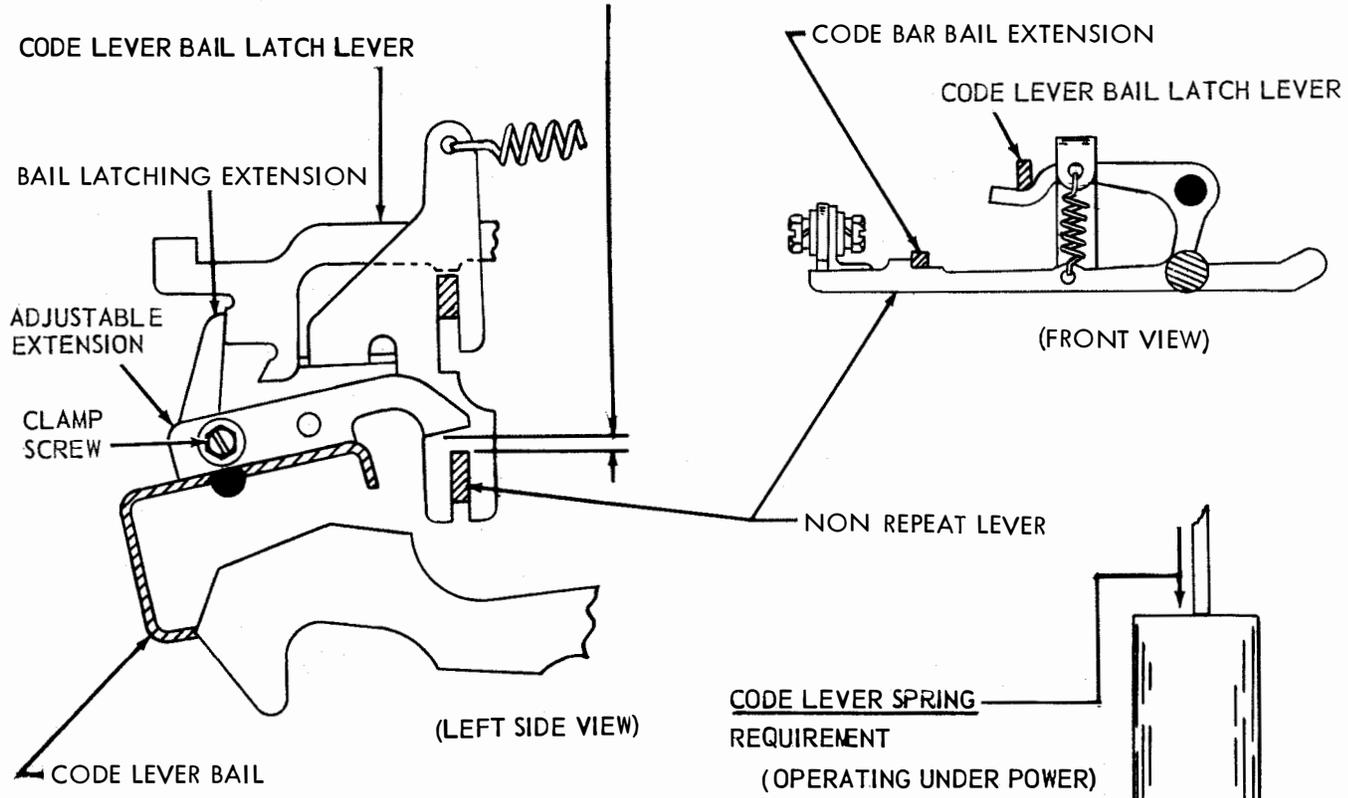


5. 17 Codebar Assembly continued

CODE LEVER BAIL NON REPEAT EXTENSION
REQUIREMENT

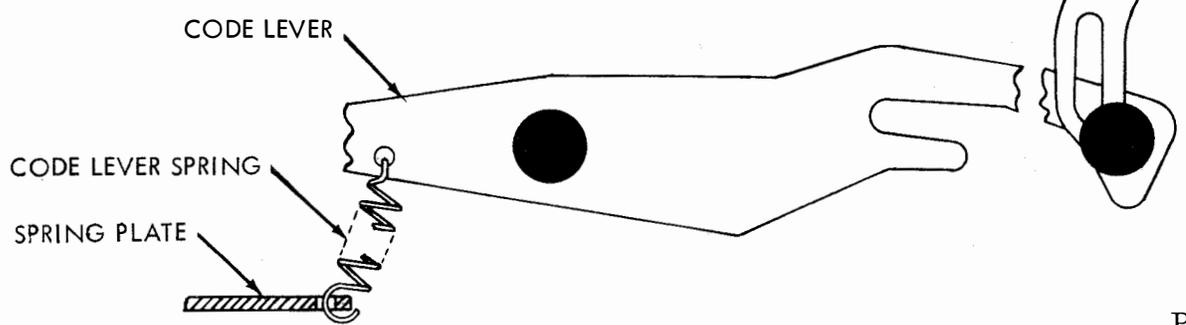
GENERATOR CLUTCH DISENGAGED. CODE LEVER BAIL ROTATED UNTIL CODE LEVER BAIL LATCH LEVER JUST TRIPS. WITH BAIL LATCHING EXTENSION RESTING AGAINST VERTICAL SURFACE OF LATCH LEVER AND SHAFT ROTATED UNTIL NON REPEAT LEVER IS FULLY LATCHED ON CODE BAR BAIL EXTENSION
MIN SOME CLEARANCE---MAX 0.015 INCH BETWEEN ADJUSTABLE EXTENSION AND NON REPEAT LEVER.

TO ADJUST
POSITION ADJUSTABLE EXTENSION WITH CLAMP SCREW LOOSENED.



CODE LEVER SPRING
REQUIREMENT

(OPERATING UNDER POWER)
WITH THE GENERATOR
CLUTCH DISENGAGED
MIN 3-1/2 OZ
MAX 8 OZ
TO OPERATE A KEY.



5.18 Codebar Assembly continued

LOCK BAR SPRING

REQUIREMENT

GENERATOR CLUTCH DISENGAGED.
 KEYBOARD LOCK KEY HELD DEPRESSED.
 MIN 5 OZ
 MAX 9 OZ
 TO START LOCK BAR MOVING.

CODE BAR SPRING

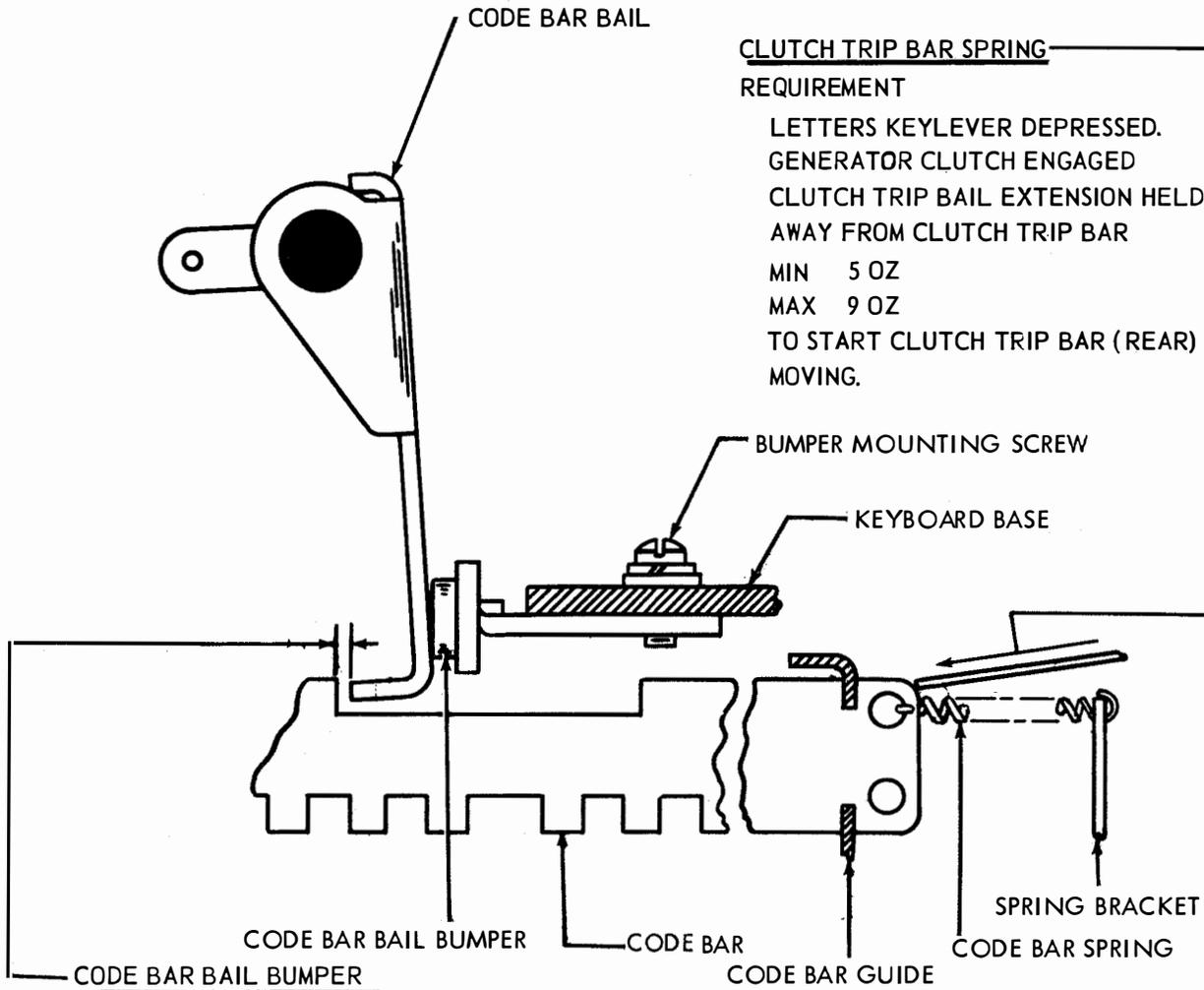
REQUIREMENT

LETTERS KEYLEVER DEPRESSED.
 GENERATOR CLUTCH ENGAGED.
 MIN 3 OZ
 MAX 4 OZ
 TO START A CODE BAR MOVING.

CLUTCH TRIP BAR SPRING

REQUIREMENT

LETTERS KEYLEVER DEPRESSED.
 GENERATOR CLUTCH ENGAGED
 CLUTCH TRIP BAIL EXTENSION HELD
 AWAY FROM CLUTCH TRIP BAR
 MIN 5 OZ
 MAX 9 OZ
 TO START CLUTCH TRIP BAR (REAR)
 MOVING.



REQUIREMENT

LETTERS SELECTION APPLIED TO CODE BAR.
 CLEARANCE BETWEEN SHOULDER ON CLOSEST
 CODE BAR AND ENGAGING FACE OF CODE BAR BAIL.
 MIN 0.010 INCH
 MAX 0.020 INCH

TO ADJUST

POSITION BUMPER WITH MOUNTING SCREWS.
 LOOSENED.

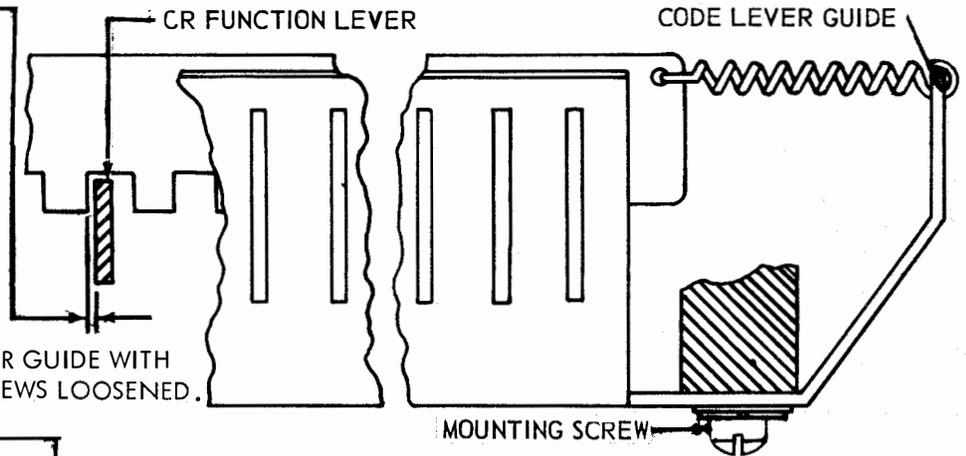
5.19 Codebar Assembly continued

CODE LEVER GUIDE REQUIREMENT

CR KEYLEVER HELD DEPRESSED WHILE DISENGAGING CLUTCH. CLEARANCE BETWEEN CR FUNCTION LEVER AND STOPPING EDGE OF NUMBER 5 CODEBAR
 MIN 0.005 INCH
 MAX 0.015 INCH

TO ADJUST

POSITION THE CODE LEVER GUIDE WITH ITS FOUR MOUNTING SCREWS LOOSENED.

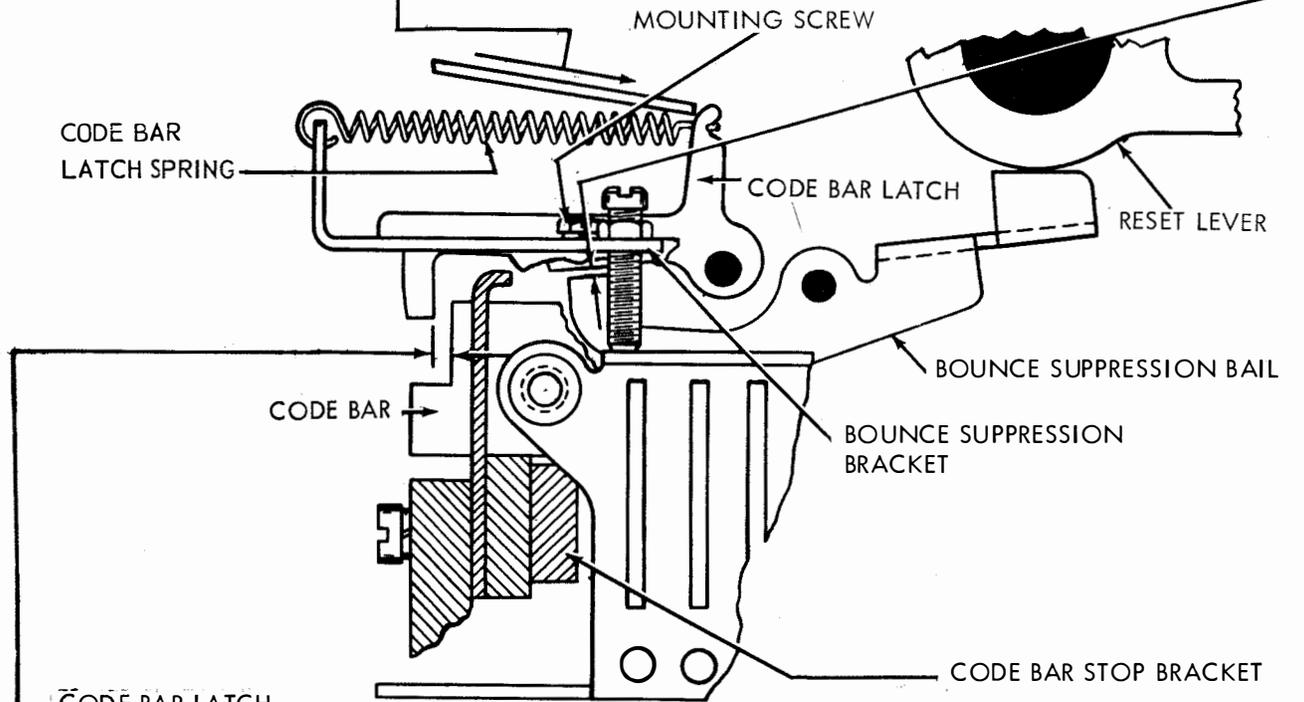


CODE BAR LATCH SPRING REQUIREMENT

GENERATOR CLUTCH COMPLETELY DISENGAGED
 MIN 1/4 OZ
 MAX 1-1/4 OZ
 TO START LATCH MOVING.

CODE BAR BOUNCE SUPPRESSOR BRACKET SUPPORT SCREW REQUIREMENT

GENERATOR CLUTCH DISENGAGED, LETTERS SELECTION APPLIED TO CODE BARS, BOUNCE SUPPRESSOR BAIL HELD AGAINST RESET LEVER WITH PRESSURE OF 3 OUNCES APPLIED VERTICALLY TO BAIL BETWEEN NO. 2 AND NO. 3 CODE BAR LATCH, CLEARANCE BETWEEN BOUNCE SUPPRESSOR BAIL AND NO. 5 CODE BAR LATCH SHOULD BE
 MIN SOME CLEARANCE---MAX 0.015-INCH
 TO ADJUST
 POSITION SUPPORT SCREW WITH ITS LOCK NUT LOOSENED.

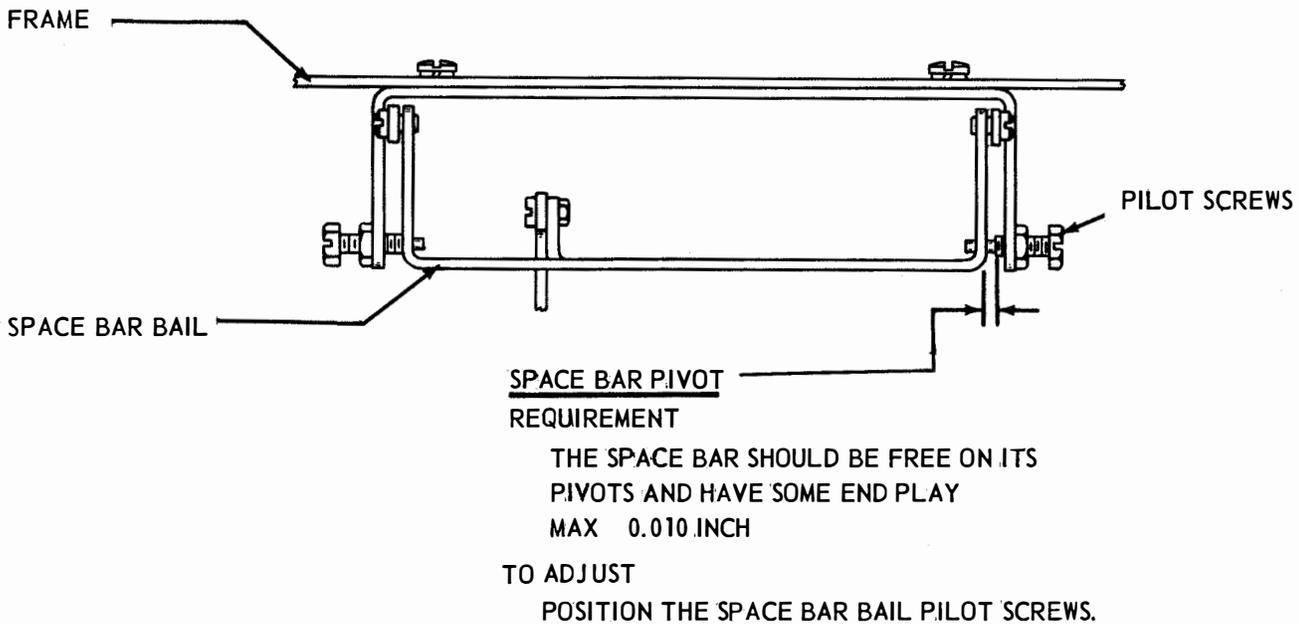
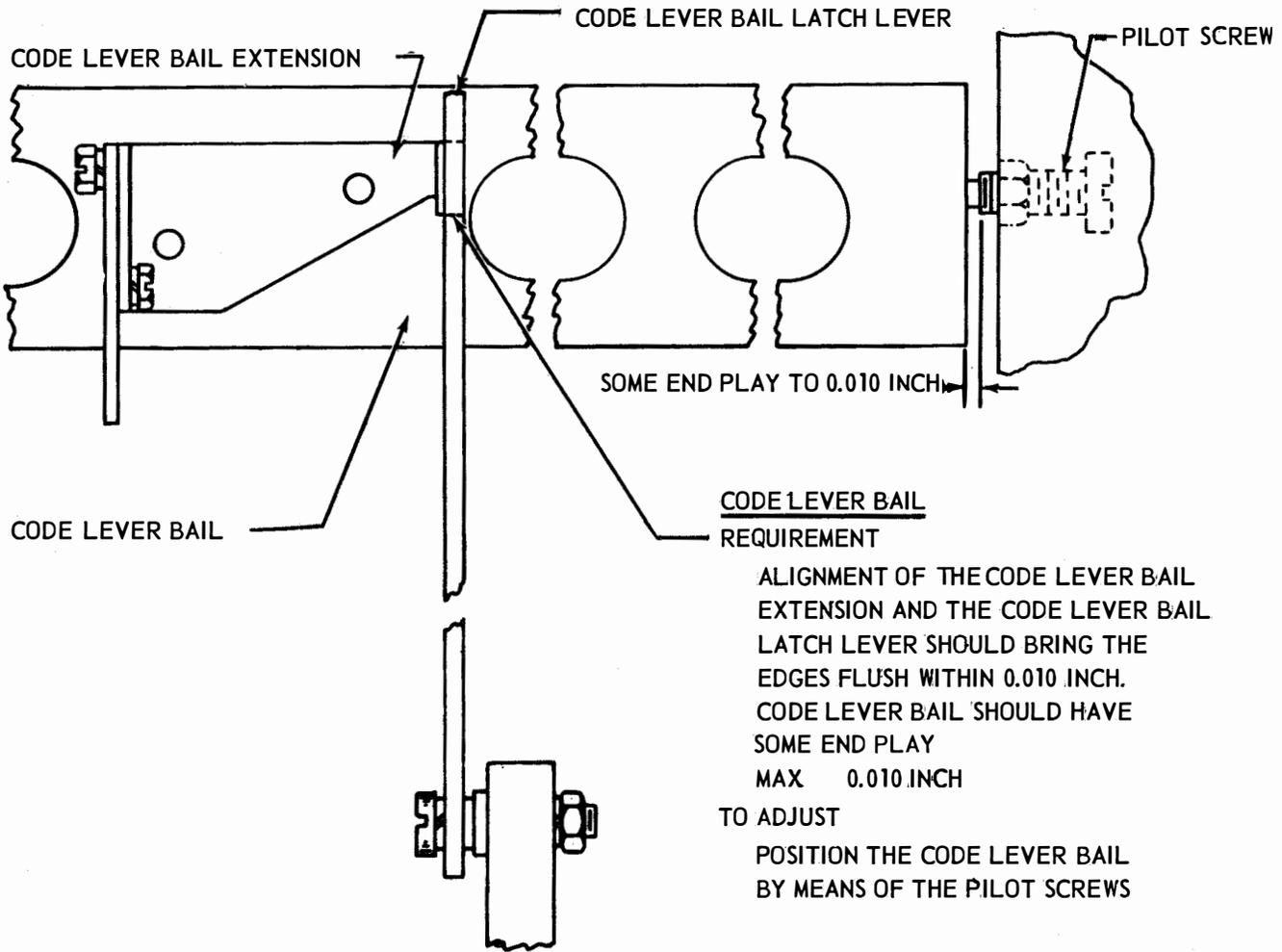


CODE BAR LATCH (1) REQUIREMENT

LETTERS SELECTION APPLIED TO THE CODE BARS AND THE CODE BARS AGAINST THEIR STOP. CLEARANCE BETWEEN CODE BAR AND LATCH
 MIN 0.010 INCH---MAX 0.025 INCH

(2) REQUIREMENT

BOUNCE SUPPRESSOR BAIL SHOULD RIDE CENTRALLY ON RESET LEVER.
 TO ADJUST
 POSITION BOUNCE SUPPRESSOR BRACKET WITH MOUNTING SCREWS LOOSENED.



5.21 Interrelated Features

(2) REQUIREMENT

THERE SHOULD BE A BARELY PERCEPTIBLE AMOUNT OF BACKLASH BETWEEN THE INTER-MEDIATE DRIVING GEAR AND THE INTER-MEDIATE DRIVEN GEAR AT THE POINT WHERE THE BACKLASH IS THE LEAST.

TO ADJUST

RAISE OR LOWER THE FRONT END OF THE INTERMEDIATE GEAR BRACKET BY MEANS OF THE FILISTER HEAD ADJUSTING AND CLAMPING SCREWS LOCATED AT THE FRONT END OF THE BRACKET. REFINE REQUIREMENTS IF NECESSARY

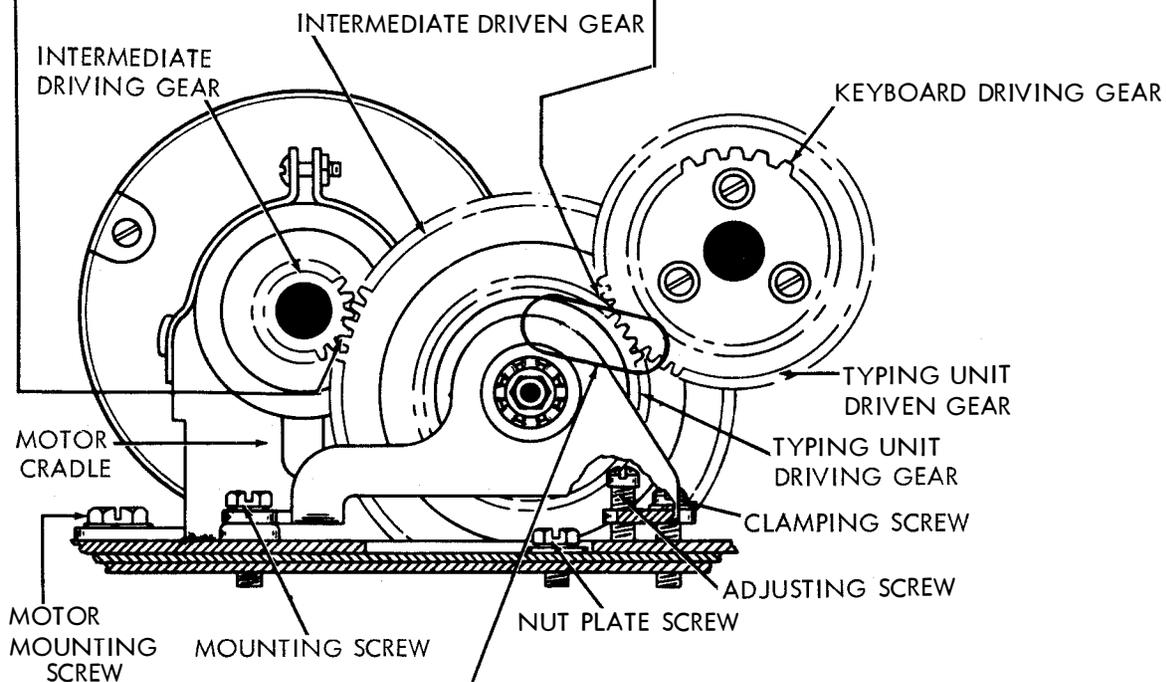
(A) INTERMEDIATE GEAR BRACKET

(1) REQUIREMENT

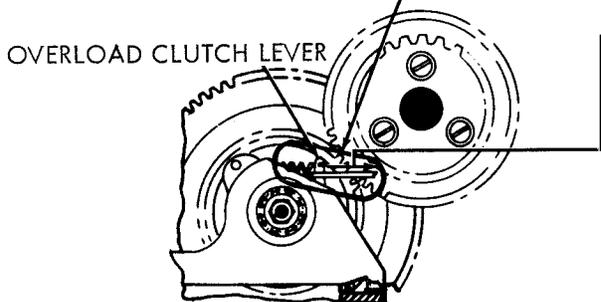
THERE SHOULD BE A BARELY PERCEPTIBLE AMOUNT OF BACKLASH BETWEEN THE TYPING UNIT DRIVEN GEAR AND THE TYPING UNIT DRIVING GEAR AT THE POINT WHERE BACKLASH IS THE LEAST.

TO ADJUST

POSITION THE COMPLETE INTERMEDIATE GEAR MECHANISM BRACKET BY UTILIZING THE ADJUSTING SLOTS WITH THE THREE HEXAGON HEAD SCREWS LOOSENED. ALIGN THE GEARS AT THIS TIME.



NOTE: OVERLOAD MECHANISM SPRING ADJUSTMENT
APPLIES ONLY TO UNITS SO EQUIPPED



(B) OVERLOAD MECHANISM SPRING
REQUIREMENT

OVERLOAD CLUTCH LEVER IN
 ITS NOTCH
 MIN 40 OZ
 MAX 64 OZ
 TO START LEVER MOVING
 LEVER MUST NOT JUMP FROM
 NOTCH WITH LESS THAN 64
 OUNCES.

5.22 Keyboard Assembly continued

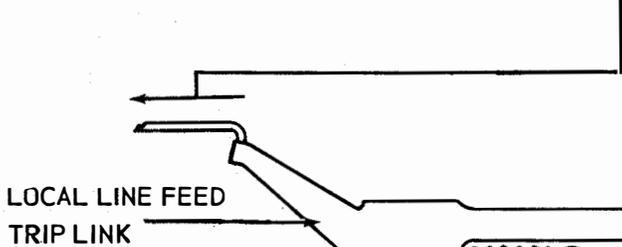
LOCAL LINE FEED TRIP LINK SPRING

REQUIREMENT

MIN 5 OZ

MAX 10 OZ

TO START THE LINK MOVING.



LOCAL LINE FEED TRIP LINK

LOCAL LINE FEED TRIP LINK SPRING

* LOCK BAIL SPRING

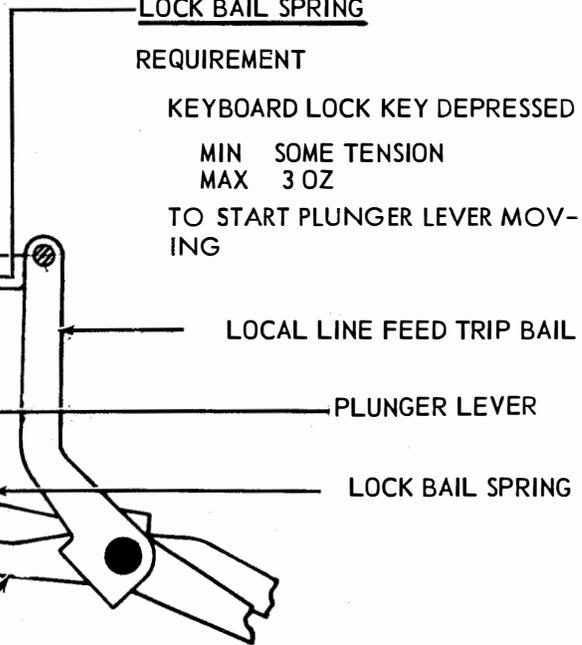
REQUIREMENT

KEYBOARD LOCK KEY DEPRESSED

MIN SOME TENSION

MAX 3 OZ

TO START PLUNGER LEVER MOVING



LOCAL LINE FEED TRIP BAIL

PLUNGER LEVER

LOCK BAIL SPRING

LOCK BAIL

LOCAL CARRIAGE RETURN BAIL SPRING

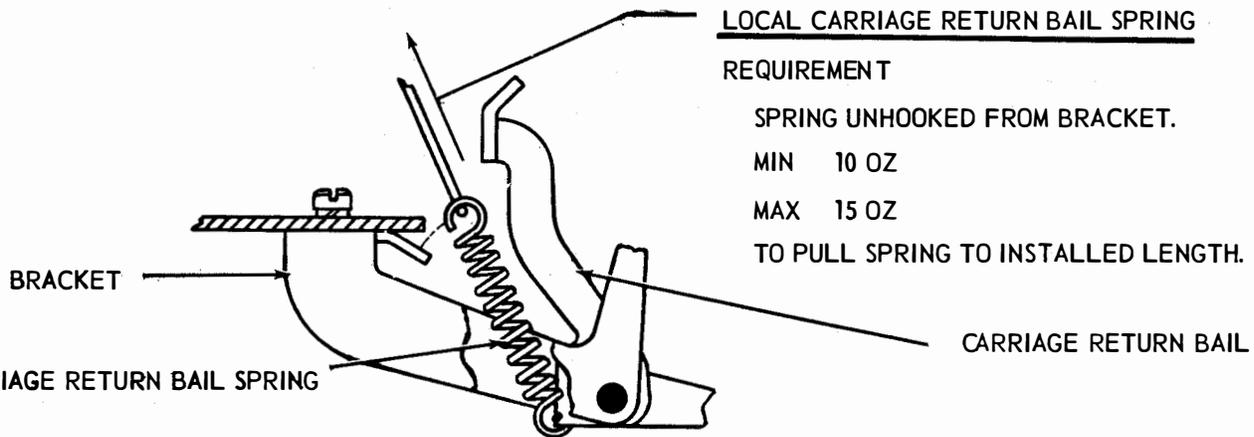
REQUIREMENT

SPRING UNHOOKED FROM BRACKET.

MIN 10 OZ

MAX 15 OZ

TO PULL SPRING TO INSTALLED LENGTH.



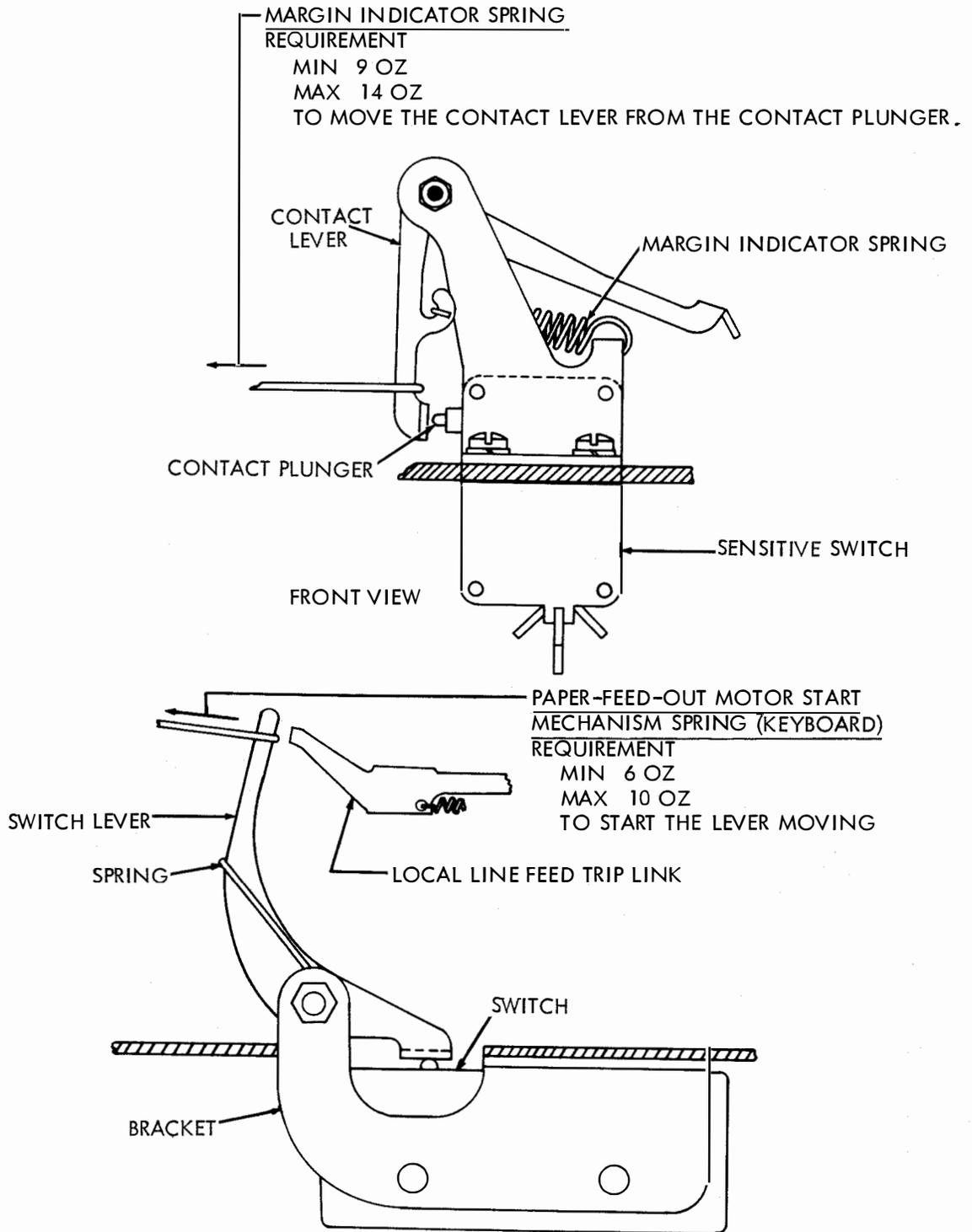
BRACKET

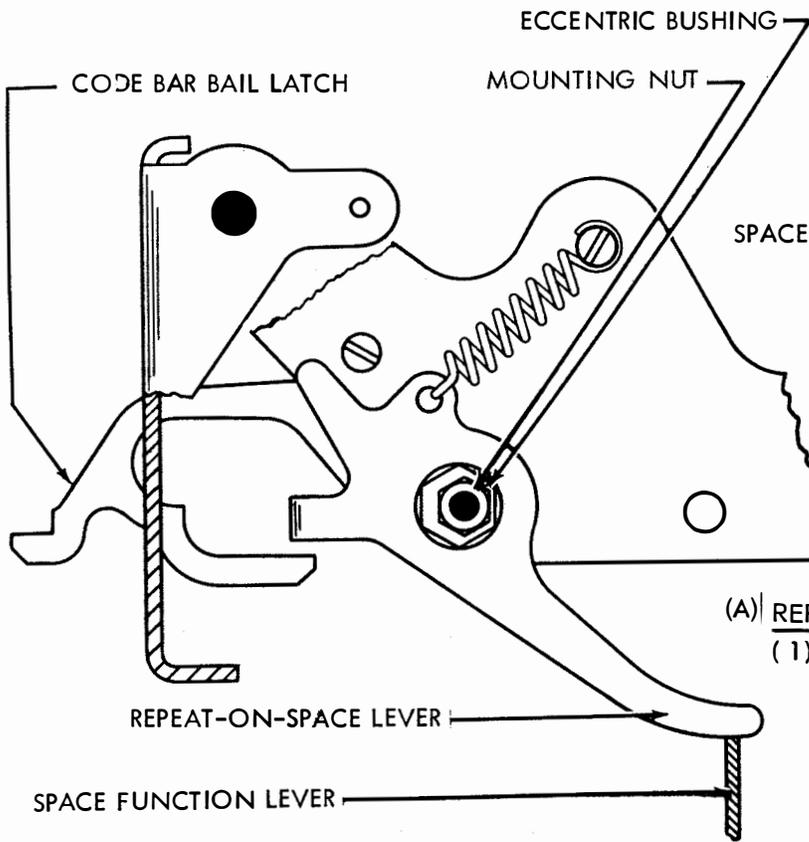
CARRIAGE RETURN BAIL SPRING

CARRIAGE RETURN BAIL

* APPLIES TO KEYBOARD ONLY

5.23 Keyboard Assembly continued





(LEFT SIDE VIEW)

(A) REPEAT-ON-SPACE LEVER

(1) REQUIREMENT (MOTOR RUNNING)

MIN 3-1/2 OZ MAX 8 OZ
TO TRANSMIT SINGLE SPACE.

TO CHECK

GRADUALLY APPLY PRESSURE
TO SPACE BAR.

(2) REQUIREMENT (MOTOR RUNNING)

MAX 10 OZ
TO EFFECT CONTINUOUS SPACE
TRANSMISSION.

TO CHECK

ABRUPTLY APPLY PRESSURE TO
SPACE BAR AND HOLD IT DOWN.

NOTE: ABRUPT OPERATION IS NECESSARY
TO DISABLE CODE BAR BAIL LATCH
WITHIN THE 10 OZ MAX. REQUIREMENT.

TO ADJUST

FULLY DEPRESS SPACE BAR.
POSITION ECCENTRIC BUSHING
WITH MOUNTING NUT FRICTION
TIGHT, GENERATOR SHAFT
ROTATING UNDER POWER.

(B)

REPEAT-ON-SPACE LEVER SPRING

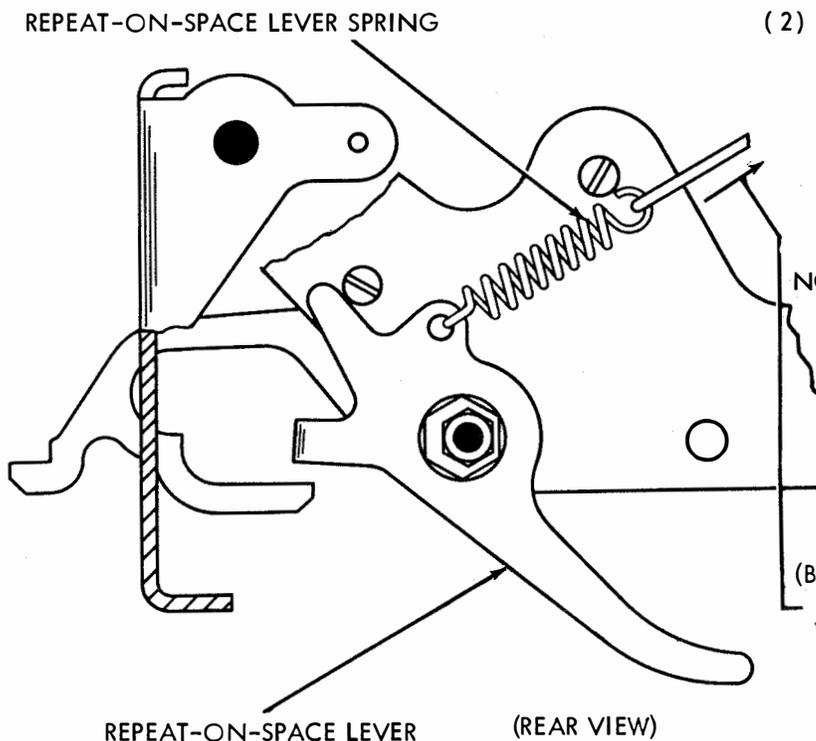
REQUIREMENT

GENERATOR CLUTCH DISENGAGED
SPRING UNHOOKED FROM POST

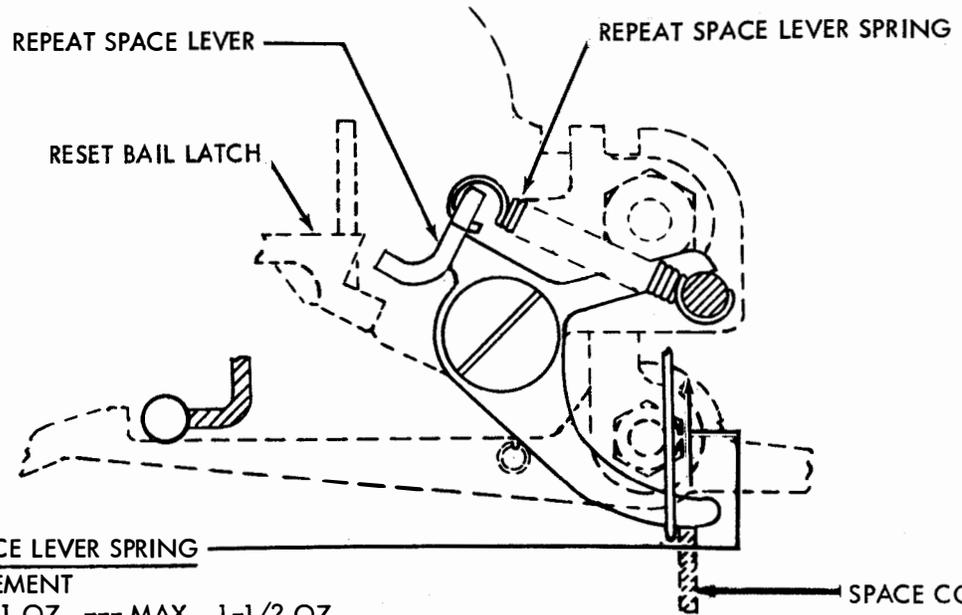
MIN 1/2 OZ

MAX 1-1/2 OZ

TO PULL SPRING TO POSITION LENGTH.



5.25 Variable Features continued



REPEAT SPACE LEVER SPRING

(1) REQUIREMENT

MIN 1 OZ --- MAX 1-1/2 OZ

TO PULL REPEAT SPACE LEVER IN ENGAGEMENT WITH RESET BAIL LATCH.

(2) REQUIREMENT

WITH POWER APPLIED AND THE SPACE BAR FULLY DEPRESSED, THE SPACE CHARACTER SHOULD BE REPEATED AS LONG AS THE SPACE BAR IS HELD DEPRESSED.

ECCENTRIC FOLLOWER PAWL SPRING

REQUIREMENT

ECCENTRIC FOLLOWER PAWL IN EXTREME FORWARD POSITION. 8 OZ SCALE APPLIED TO PAWL NEAR RATCHET WHEEL AND PULLED UPWARD

MIN 1-1/2 OZ

MAX 4 OZ

TO START PAWL MOVING.

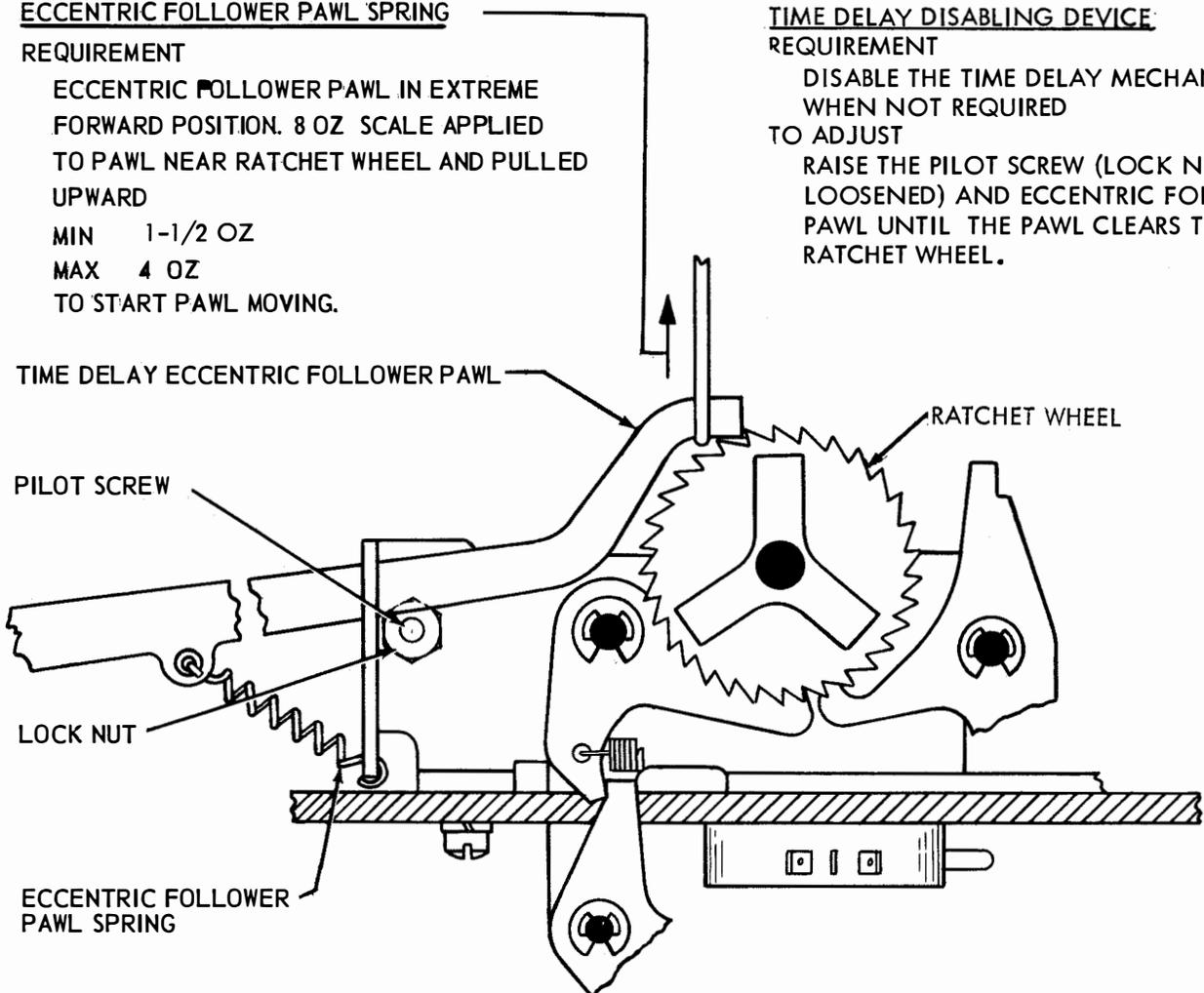
TIME DELAY DISABLING DEVICE

REQUIREMENT

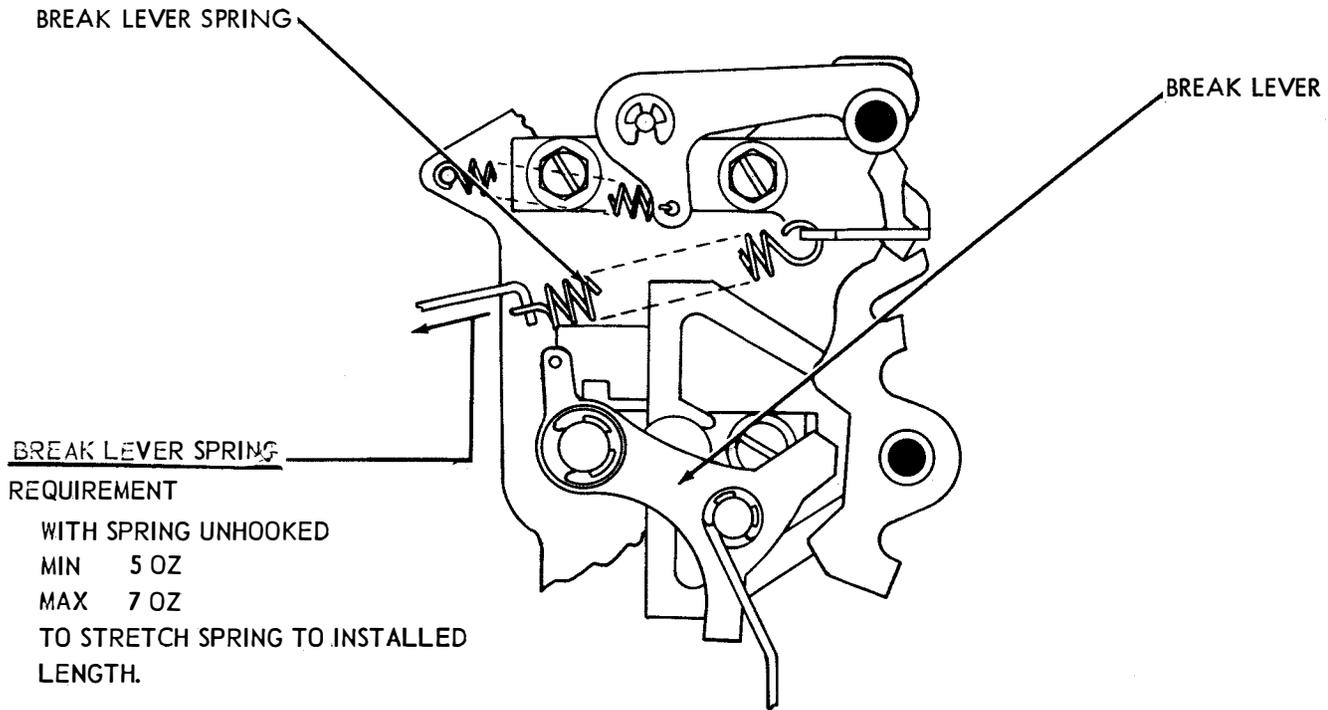
DISABLE THE TIME DELAY MECHANISM WHEN NOT REQUIRED

TO ADJUST

RAISE THE PILOT SCREW (LOCK NUT LOOSENED) AND ECCENTRIC FOLLOWER PAWL UNTIL THE PAWL CLEARS THE RATCHET WHEEL.



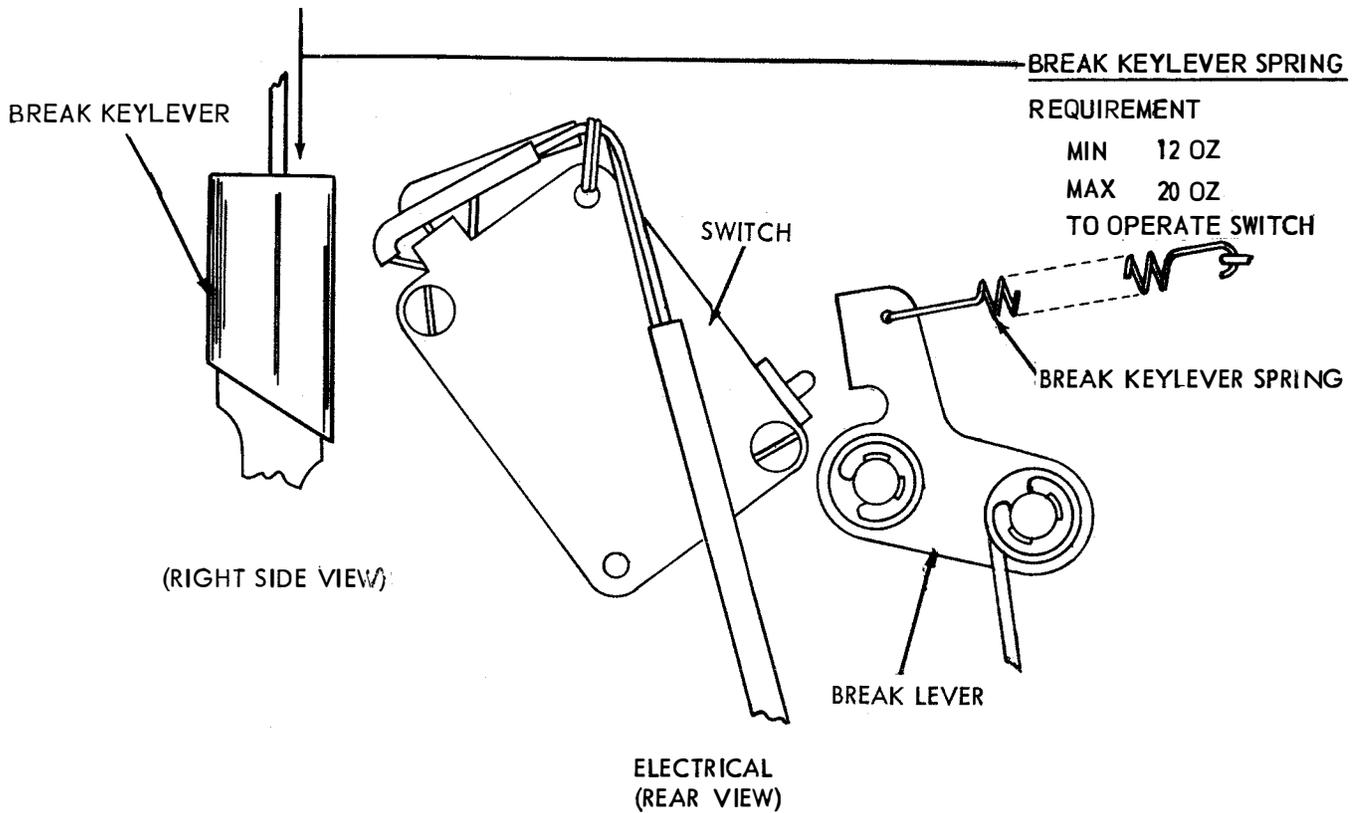
5.26 Variable Features continued



BREAK LEVER SPRING

REQUIREMENT
WITH SPRING UNHOOKED
MIN 5 OZ
MAX 7 OZ
TO STRETCH SPRING TO INSTALLED
LENGTH.

MECHANICAL
(REAR VIEW)



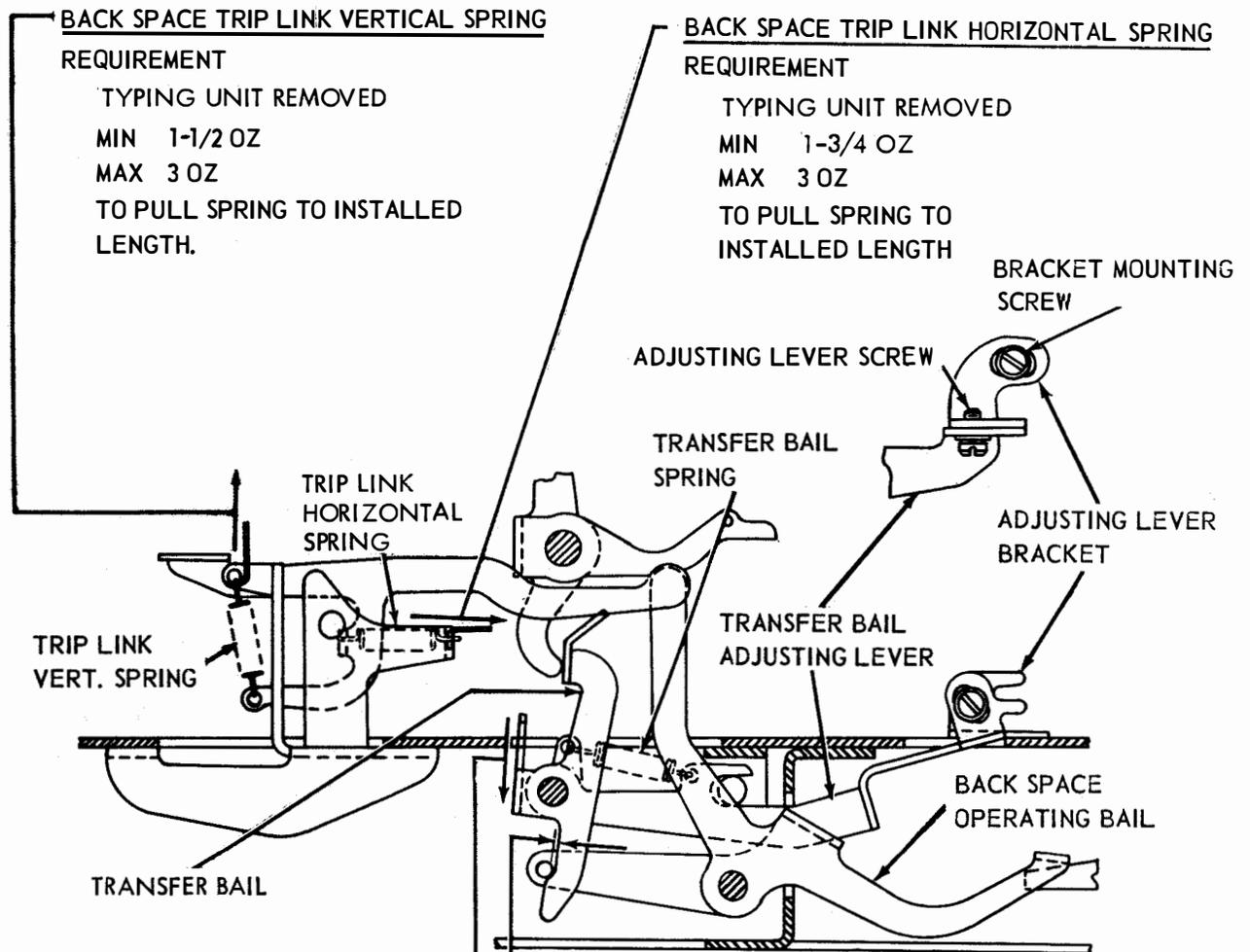
BREAK KEYLEVER SPRING

REQUIREMENT
MIN 12 OZ
MAX 20 OZ
TO OPERATE SWITCH

(RIGHT SIDE VIEW)

ELECTRICAL
(REAR VIEW)

5.27 Variable Features continued



BACK SPACE TRIP LINK VERTICAL SPRING REQUIREMENT
 TYPING UNIT REMOVED
 MIN 1-1/2 OZ
 MAX 3 OZ
 TO PULL SPRING TO INSTALLED LENGTH.

BACK SPACE TRIP LINK HORIZONTAL SPRING REQUIREMENT
 TYPING UNIT REMOVED
 MIN 1-3/4 OZ
 MAX 3 OZ
 TO PULL SPRING TO INSTALLED LENGTH

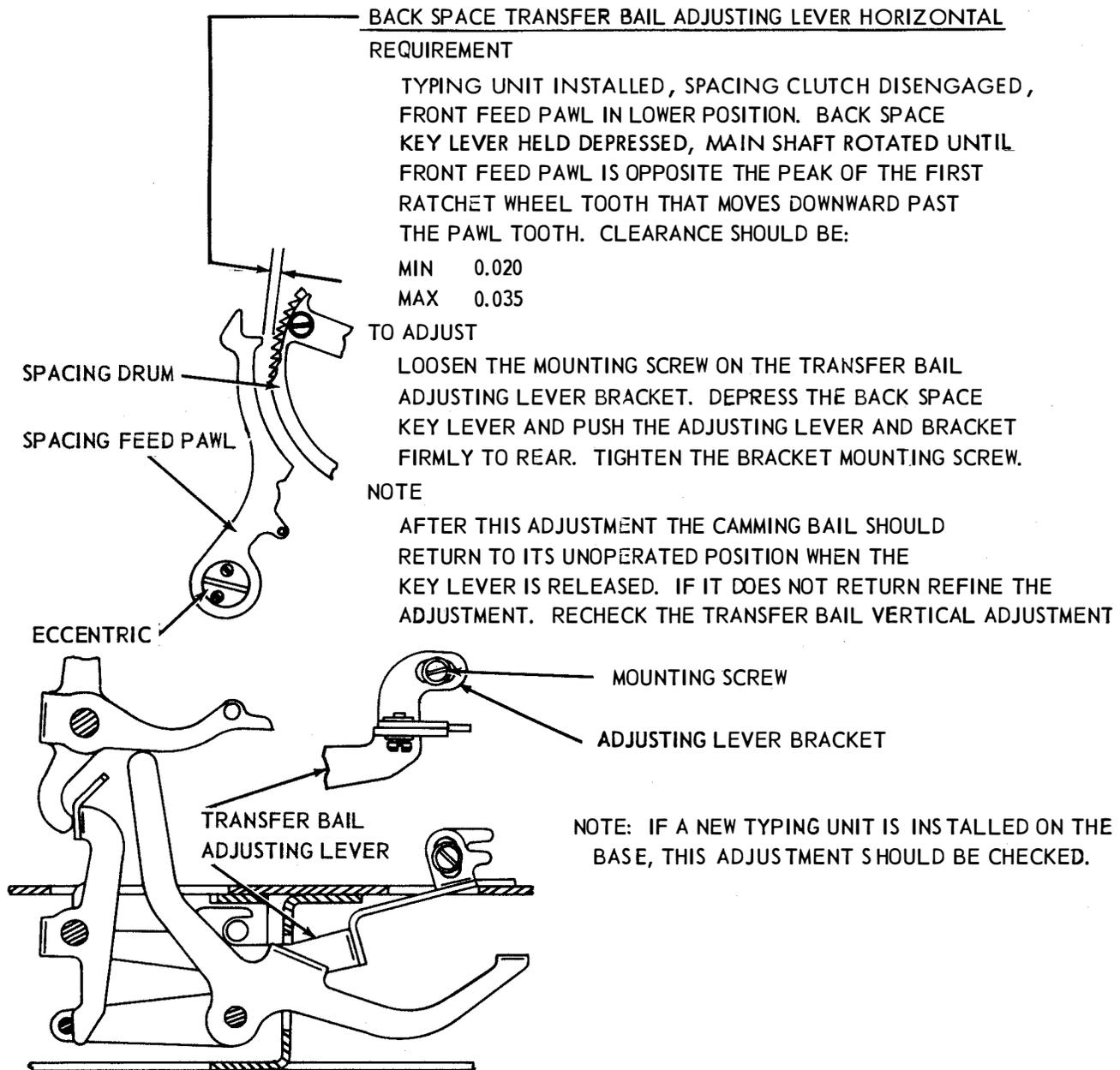
BACK SPACE TRANSFER BAIL SPRING REQUIREMENT
 MIN 1/4 OZ
 MAX 1-1/4 OZ
 TO START BAIL MOVING

BACK SPACE TRANSFER BAIL ADJUSTING LEVER REQUIREMENT (VERTICAL ADJUSTMENT)
 WITH THE TYPING UNIT REMOVED, THERE SHOULD BE SOME CLEARANCE BETWEEN THE TRANSFER BAIL AND THE STUD ON THE BACK SPACE OPERATING BAIL.
 MAX 0.006 INCH

NOTE
 IN ORDER TO PUSH VERTICALLY DOWNWARD ON THE BAIL, THE ADJUSTING LEVER MAY HAVE TO BE MOVED TOWARD FRONT OF UNIT. REMAKE TRANSFER BAIL ADJUSTING LEVER HORIZONTAL ADJUSTMENT.

TO ADJUST
 POSITION THE ADJUSTING LEVER BRACKET NEAR THE CENTER OF ITS ADJUSTING RANGE. POSITION THE ADJUSTING LEVER UP OR DOWN WITH ITS ADJUSTING LEVER SCREW FRICTION TIGHT TO MEET THE REQUIREMENT.

5.28 Variable Features continued

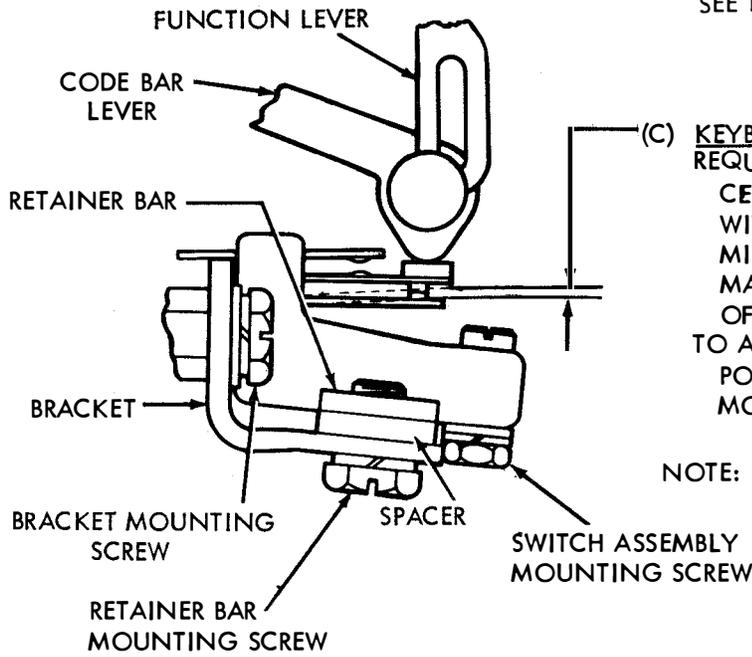


5.29 Answer-Back Mechanism (Switched Circuit Network)
 For Keyboards LK3, LK4 and LK5 (Bell 28A and 28C) "FIGS" "C"

"HERE-IS" KEYLEVER ADJUSTMENTS

(A) KEYBOARD UNIVERSAL SWITCH - (PRELIMINARY)
 SEE PAR. 3.12 (A)

(B) KEYBOARD UNIVERSAL SWITCH - (HORIZONTAL)
 SEE PAR. 3.12 (B)



(C) KEYBOARD UNIVERSAL SWITCH - VERTICAL
REQUIREMENT
 CENTER AND LOWER CONTACTS SHOULD CLOSE
 WITH
 MIN SOME
 MAX 0.005 INCH
 OF OVER-TRAVEL
 TO ADJUST
 POSITION RETAINER BAR ASSEMBLY WITH BRACKET
 MOUNTING SCREWS LOOSENED.

NOTE: KEEP CONTACTS FREE OF OIL AND GREASE

5.30 Answer-Back Mechanism (Switched Circuit Network)

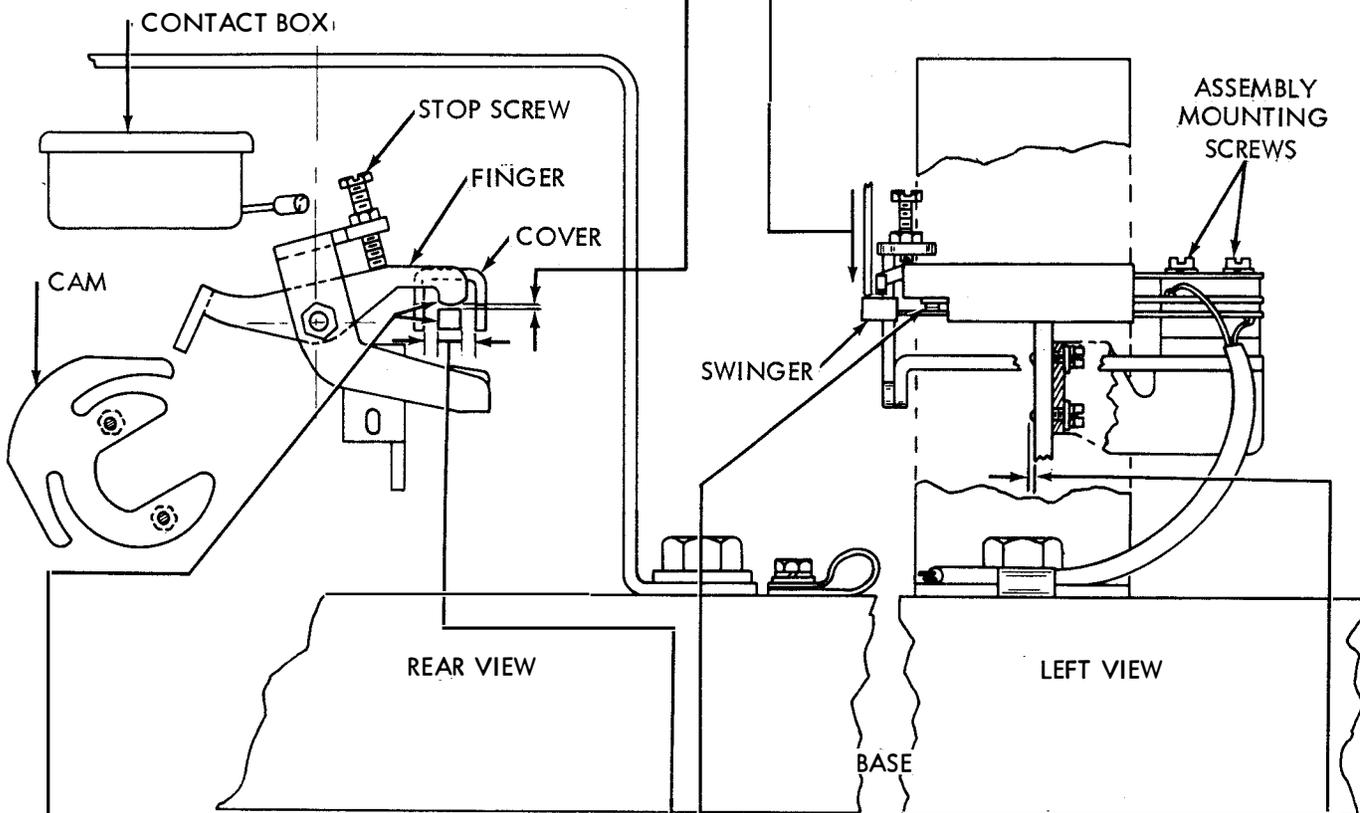
For Keyboards LK3, LK4 and LK5 (Bell 28A and 28C) "FIGS" "C" continued

PERFORM ADJUSTMENTS ON THIS PAGE DURING INSTALLATION OF PULSING CONTACT ASSEMBLY.

NOTE: KEEP CONTACTS FREE OF GREASE AND OIL.

- (C) STOP SCREW
 REQUIREMENT
 CLEARANCE BETWEEN FINGER AND SWINGER
 INSULATOR SHOULD BE
 MIN 0.010 INCH --- MAX 0.020 INCH
 TO CHECK
 TRIP CLUTCH AND ROTATE MAIN SHAFT UNTIL
 FINGER EXTENSION DROPS OFF OF CAM.
 TO ADJUST
 POSITION STOP SCREW WITH LOCK NUT
 LOOSENED.

- (B) SWINGER CONTACT LEAF
 REQUIREMENT
 WITH CONTACTS CLOSED
 MIN 3-1/2 OZ
 MAX 4-1/2 OZ
 TO JUST SEPARATE THE CONTACTS
 TO ADJUST
 BEND SWINGER CONTACT LEAF. RECHECK
 (A).



- (A) CONTACT ASSEMBLY
 REQUIREMENT
 1. CLEARANCE BETWEEN CONTACT SWINGER
 INSULATOR AND SIDES OF CONTACT
 COVER SHOULD BE EQUAL WITHIN 0.015
 INCH. GAUGE BY EYE.
 2. SWINGER AND SWINGER OPERATING FIN-
 GER SHOULD ALIGN WITHIN 0.015 INCH
 GAUGE BY EYE.
 3. CONTACTS ON CONTACT ASSEMBLY
 SHOULD ALIGN WITHIN 0.015 INCH
 TO ADJUST
 POSITION THE CONTACT ASSEMBLY PILE-
 UP WITH TWO MOUNTING SCREWS
 LOOSENED.

- (D) CONTACT ASSEMBLY BRACKET MOUNTING
SCREWS
 REQUIREMENT
 BRACKET MOUNTING SCREWS SHOULD NOT
 PROTRUDE MORE THAN 0.031 INCH BEYOND
 REAR SURFACE OF MOUNTING PLATE.
 TO ADJUST
 ADD FLAT WASHERS AS NECESSARY.

5.31 Answer-Back Mechanism (Switched Circuit Network)

For Keyboards LK3, LK4 and LK5 (Bell 28A and 28C) "FIGS" "C" continued

(A) PULSING CONTACTS

REQUIREMENT

(PERFORM THIS ADJUSTMENT DURING INSTALLATION OF CONTACTS)

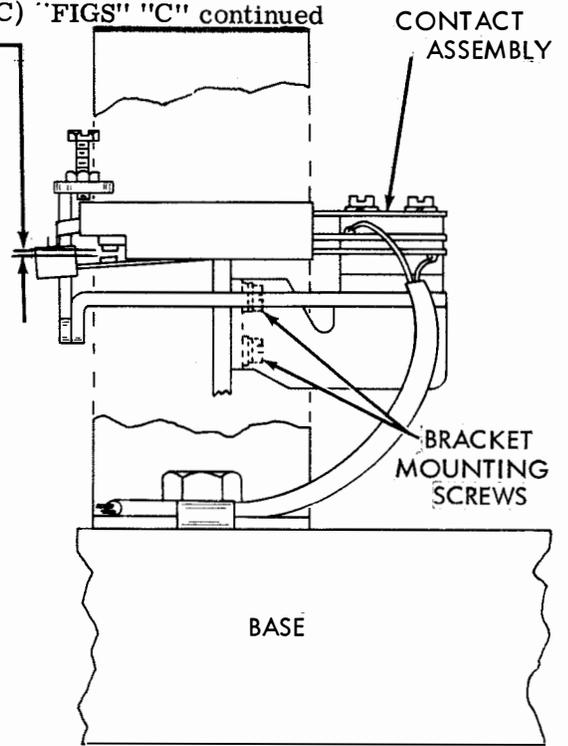
CLEARANCE BETWEEN CONTACT POINTS SHOULD BE
MIN 0.015 INCH
MAX 0.025 INCH

TO CHECK

TRIP CLUTCH AND ROTATE MAIN SHAFT UNTIL FINGER EXTENSION IS ON PEAK OF CAM.

TO ADJUST

POSITION THE CONTACT ASSEMBLY BRACKET WITH BRACKET MOUNTING SCREWS LOOSENED.



LEFT VIEW

KEEP CONTACTS FREE OF OIL AND GREASE

MAKE THE FOLLOWING ADJUSTMENTS BEFORE INSTALLING CHARACTER GENERATOR MECHANISM ON KEYBOARD.

(B) MAGNET YOKE

SEE PAR. 3.17 (A)

(C) STOP LEVER LATCH

SEE PAR. 3.17 (B)

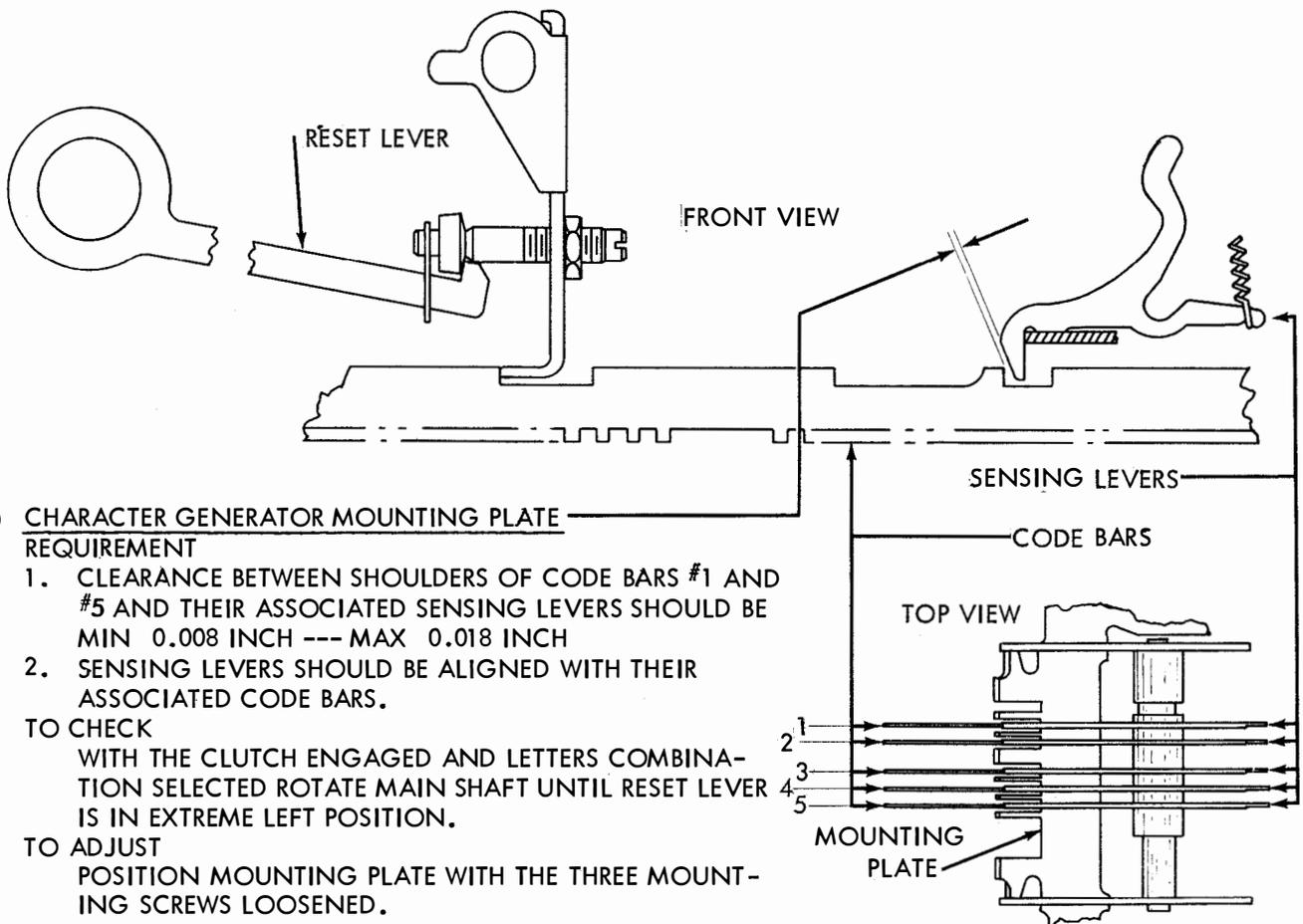
MAKE THE FOLLOWING ADJUSTMENTS DURING INSTALLATION OF ANSWER-BACK MECHANISM.

(D) SENSING LEVER SPRINGS

SEE PAR. 3.18 (B)

(E) DETENT LEVER SPRING

SEE PAR. 3.18 (C)



(F) CHARACTER GENERATOR MOUNTING PLATE

REQUIREMENT

1. CLEARANCE BETWEEN SHOULDERS OF CODE BARS #1 AND #5 AND THEIR ASSOCIATED SENSING LEVERS SHOULD BE MIN 0.008 INCH --- MAX 0.018 INCH
2. SENSING LEVERS SHOULD BE ALIGNED WITH THEIR ASSOCIATED CODE BARS.

TO CHECK

WITH THE CLUTCH ENGAGED AND LETTERS COMBINATION SELECTED ROTATE MAIN SHAFT UNTIL RESET LEVER IS IN EXTREME LEFT POSITION.

TO ADJUST

POSITION MOUNTING PLATE WITH THE THREE MOUNTING SCREWS LOOSENED.

SECTION 573-116-700

5.32 Answer-Back Mechanism (Switched Circuit Network)

For Keyboards LK3, LK4 and LK5 (Bell 28A and 28C) "FIGS" "C" continued

(A) DRIVE LINK SPRING

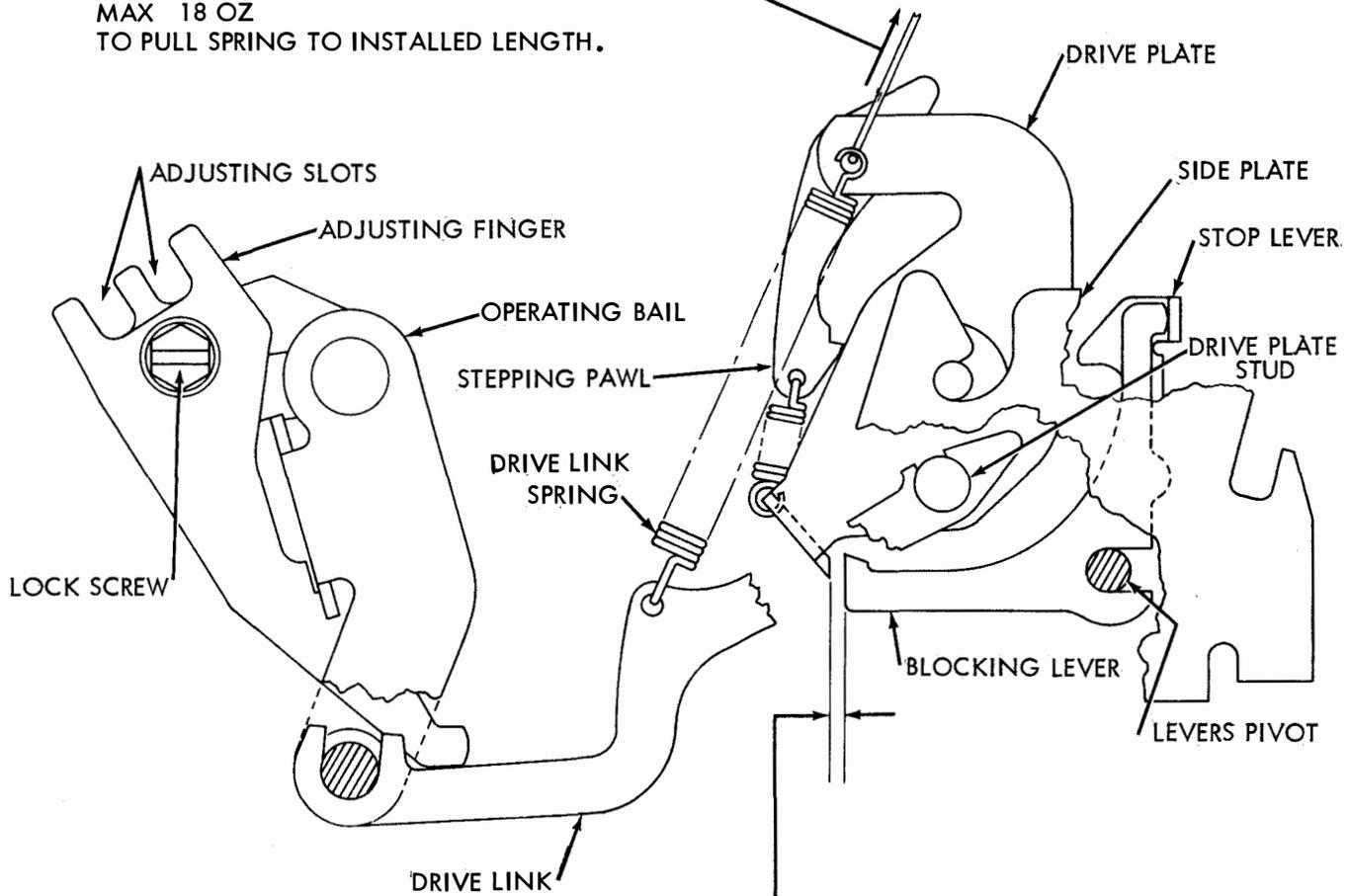
REQUIREMENT

WITH SIGNAL GENERATOR CLUTCH IN STOP POSITION

MIN 12 OZ

MAX 18 OZ

TO PULL SPRING TO INSTALLED LENGTH.



(B) DRIVE LINK

PERFORM THIS ADJUSTMENT BEFORE INSTALLATION OF MESSAGE DRUM AND DRIVE PLATE ASSEMBLY.

REQUIREMENT

CLEARANCE BETWEEN DRIVE PLATE EXTENSION AND BLOCKING LEVER SHOULD BE

MIN 0.002 INCH

MAX 0.007 INCH

TO CHECK

CODE BAR BAIL RESET LEVER IN EXTREME LEFT POSITION.

TO ADJUST

POSITION ADJUSTING FINGER AT ADJUSTING SLOTS WITH ADJUSTING FINGER LOCK-SCREW LOOSENED.

NOTE

THE STANDARD KEYBOARD ADJUSTMENTS LISTED BELOW SHOULD BE CHECKED DURING INSTALLATION OF THE ANSWER-BACK MECHANISM:

CODE BAR AND CODE LEVER CLEARANCE, PAR. 2.05 (D)

CODE BAR BAIL, PAR. 2.08 (B)

CODE BAR BAIL AND NON REPEAT LEVER CLEARANCE, PAR. 2.08 (D)

UNIVERSAL BAIL LATCH LEVER, PAR. 2.10

UNIVERSAL BAIL EXTENSION, PAR. 2.10

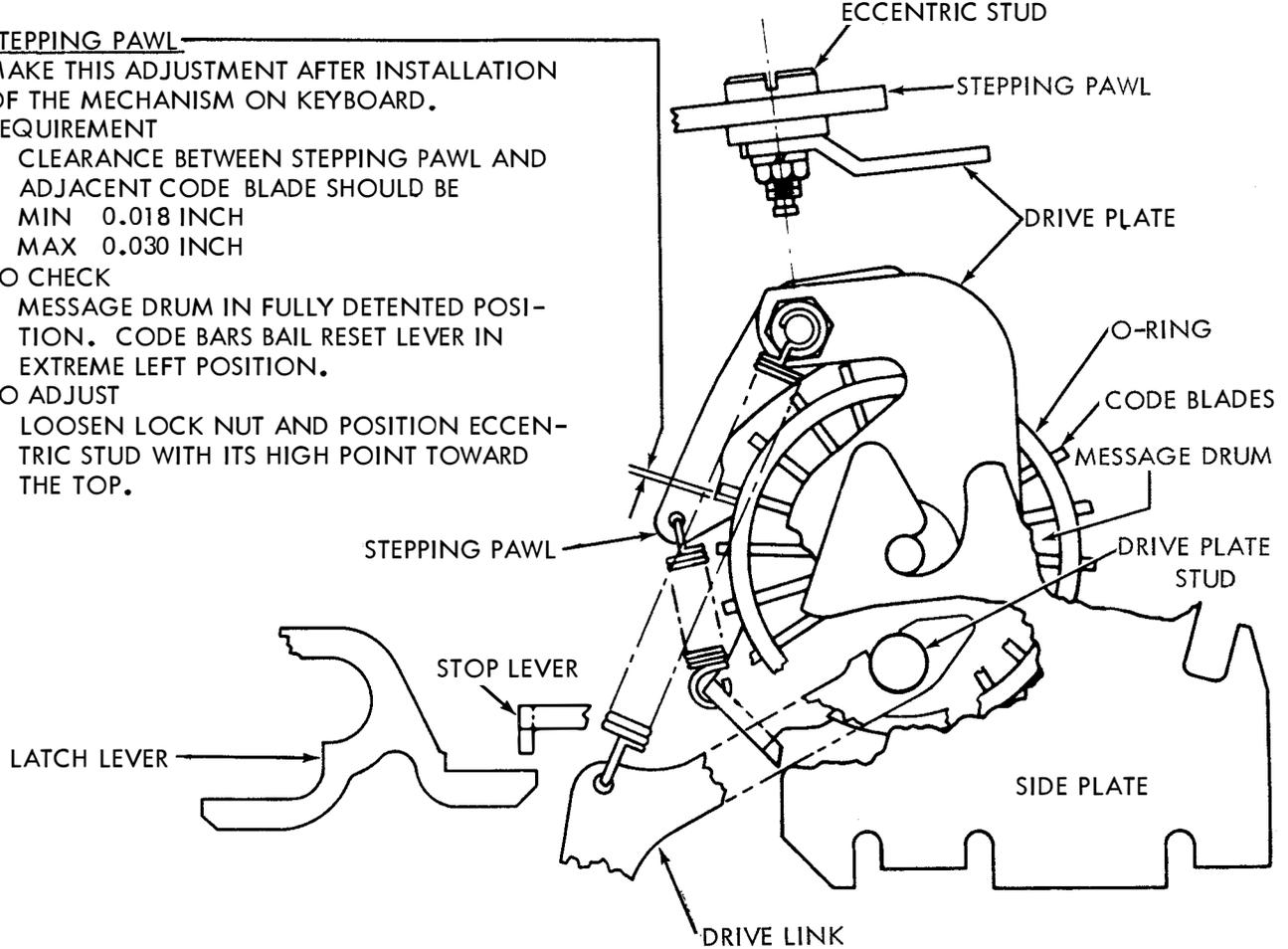
5.33 Answer-Back Mechanism (Switched Circuit Network)
 For Keyboards LK3, LK4 and LK5 (Bell 28A and 28C) "FIGS" "C" continued

- (A) STEPPING PAWL
 MAKE THIS ADJUSTMENT AFTER INSTALLATION
 OF THE MECHANISM ON KEYBOARD.
 REQUIREMENT

CLEARANCE BETWEEN STEPPING PAWL AND
 ADJACENT CODE BLADE SHOULD BE
 MIN 0.018 INCH
 MAX 0.030 INCH

TO CHECK
 MESSAGE DRUM IN FULLY DETENTED POSI-
 TION. CODE BARS BAIL RESET LEVER IN
 EXTREME LEFT POSITION.

TO ADJUST
 LOOSEN LOCK NUT AND POSITION ECCEN-
 TRIC STUD WITH ITS HIGH POINT TOWARD
 THE TOP.



- (B) STEPPING PAWL SPRING
 REQUIREMENT
 MECHANISM IN STOP POSITION
 MIN 2-1/2 OZ --- MAX 3-1/2 OZ
 TO START PAWL MOVING.

- (C) STOP LEVER SPRING
 REQUIREMENT
 STOP LEVER LATCHED. LATCH SPRING RE-
 MOVED. BLOCKING LEVER SPRING REMOVED
 MIN 6 OZ --- MAX 8 OZ
 TO START STOP LEVER MOVING

BLOCKING LEVER SPRING
 SEE PAR. 3.21 (A)

ARMATURE LATCH SPRING
 SEE PAR. 3.21 (B)

CODE BARS BAIL LATCH LEVER
CODING THE MESSAGE DRUM
 SEE PAR. 3.22

