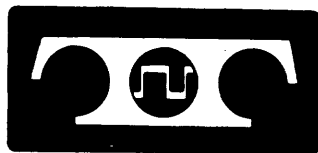


**38 MAINTENANCE MANUAL 343
VOL 2**

**TECHNICAL MANUAL
38 AUTOMATIC SEND-RECEIVE (ASR)
TELETYPEWRITER SET**



TELETYPE[®]
CORPORATION
5555 TOUHY AVENUE, SKOKIE, ILLINOIS

**MAINTENANCE MANUAL 343
VOLUME 2**

INTRODUCTION

Maintenance Manual 343 is a technical manual that provides general and specific information about the 38 Automatic Send-Receive (ASR) Teletypewriter Set and its components.

Maintenance Manual 343 is made up of 3 Volumes: Volume 1 contains description, troubleshooting, lubrication, disassembly and reassembly. Volume 2 contains adjustments and Volume 3 contains parts.

Each volume is made up of independent sections identified by a 9-digit number, such as the first section in this volume numbered 574-421-700TC.

To locate specific information, refer to the table of contents. Find the name of the component in column one and the title in column two. The 9-digit section will then be found in column three. The sections are arranged in the order shown in the table of contents.

Each section in this manual may be ordered separately, by 9-digit number, from Teletype Corporation.

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38 KEYBOARD

ADJUSTMENTS

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(see figure). Unless otherwise stated, screws and nuts should be friction tight when making an adjustment and tightened when the adjustment is made.

1.04 When using pry points or slots to make an adjustment, place the blade of a screwdriver between points or in the slots and pry in the proper direction. Information for tools and scales necessary for making adjustments will be found in Section 570-005-800TC.

1.05 When cleaning plastic parts such as the keyboard cover, use soap or detergent and water. Do not use solvents containing alcohol or chlorinated ingredients.

CAUTION: IF KEYBOARD IS ATTACHED TO PRINTER, DISCONNECT POWER FROM THE EQUIPMENT BEFORE MAKING ADJUSTMENTS.

1.06 When the keyboard and reset mechanism are mated (on the printer), first make the TRIP ARM adjustment found in Section 574-422-700TC.

1.07 Adjustments in this section also apply to keyboards used in APL (A Programming Language) sets.

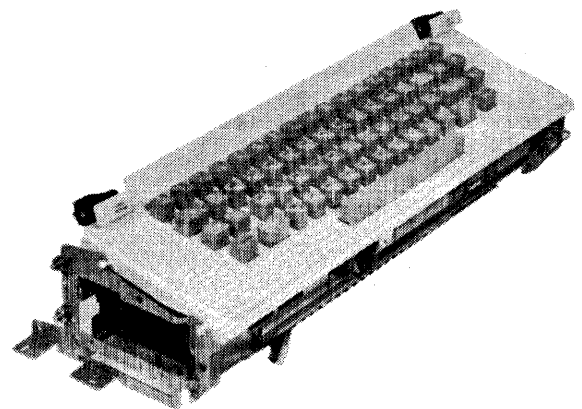
1. GENERAL

1.01 This section provides adjustment information for model 38 keyboard. It is reissued to make a few minor corrections. Marginal arrows indicate the corrections. The adjustments are arranged in a sequence that should be followed if a complete readjustment of the mechanism is necessary. Read a procedure all the way through before making an adjustment.

NOTE: Perform adjustments with the typing assembly removed from the set. Instructions for removal are found in Section 574-400-702TC.

1.02 After adjustments are completed, make sure to tighten any screws or nuts that may have been loosened during the adjustment procedure. Spring tension values are scale readings which should be obtained with the proper scales. Springs not meeting specified requirements should be replaced (except when an adjustment is indicated). All spring tensions are in ounces unless otherwise specified.

1.03 References made to right or left, front or rear apply to the keyboard as viewed by the operator in its normal operating position



38 Keyboard

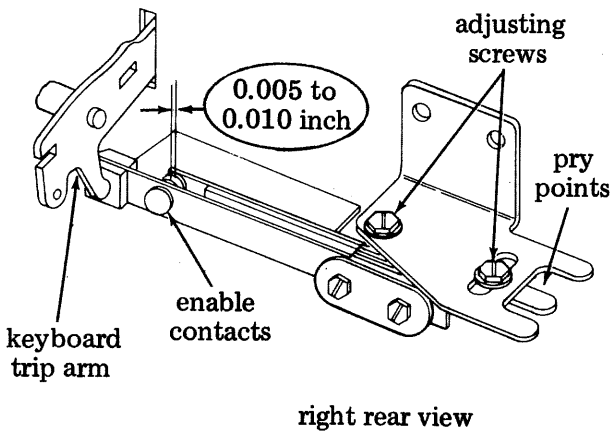
2. BASIC UNIT

ENABLE CONTACT

- Keyboard in unoperated condition.
- Trip arm latched and in contact with insulated tip of contact.

Requirement — 0.005 to 0.010 inch gap between contacts.

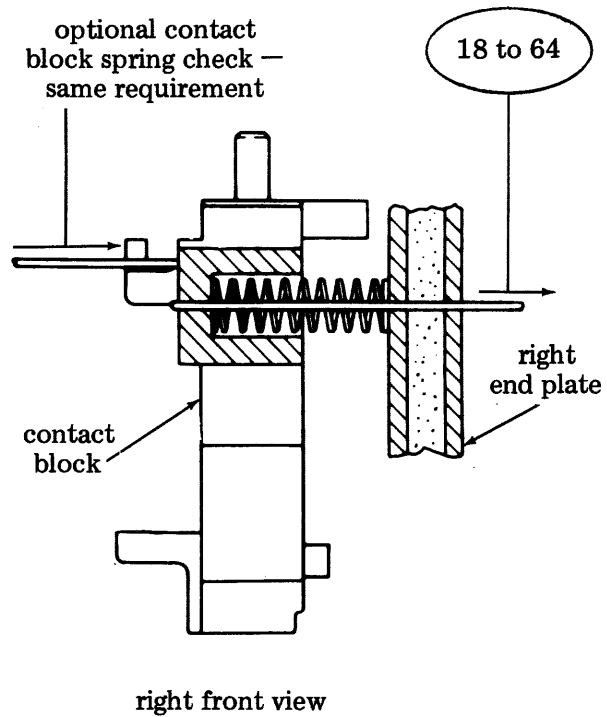
Adjust — Loosen adjusting screws.
Use pry points to meet requirement.



CONTACT BLOCK SPRING

- Remove T-lever guide.

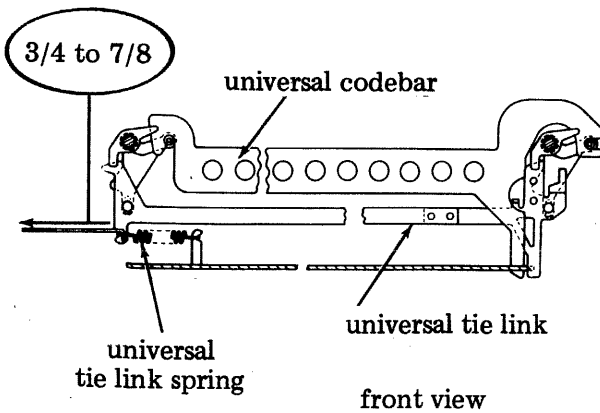
Requirement — 18 to 64 to start contact block moving (each spring location).



UNIVERSAL TIE LINK SPRING

- Unhook spring from tie link.
- Depress any primary key to normal down-stop position.

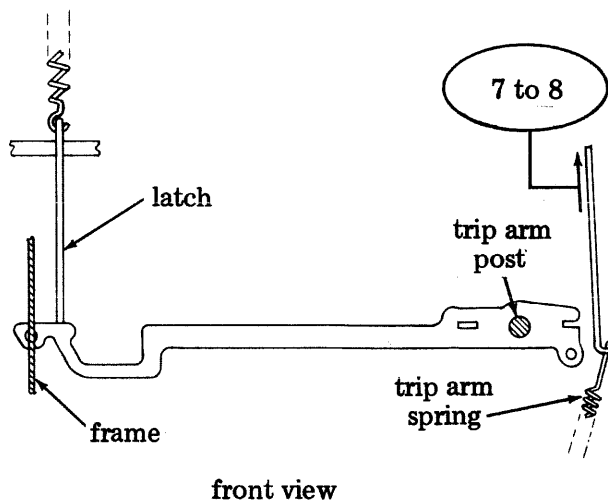
Requirement — 3/4 to 7/8 to stretch spring to normal downstop working length.



TRIP ARM SPRING

- Keyboard in latched position.

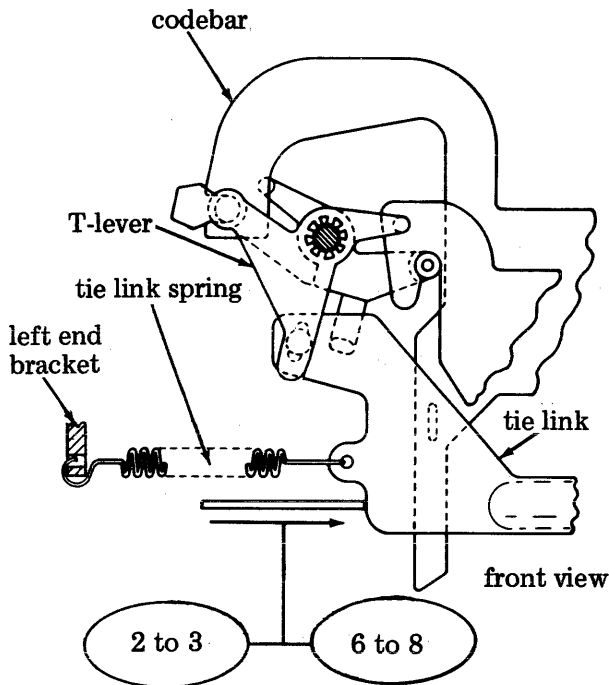
Requirement — 7 to 8 to stretch spring to installed length.



SHIFT OR CONTROL TIE LINK SPRINGS

- Keyboard in unshifted position.

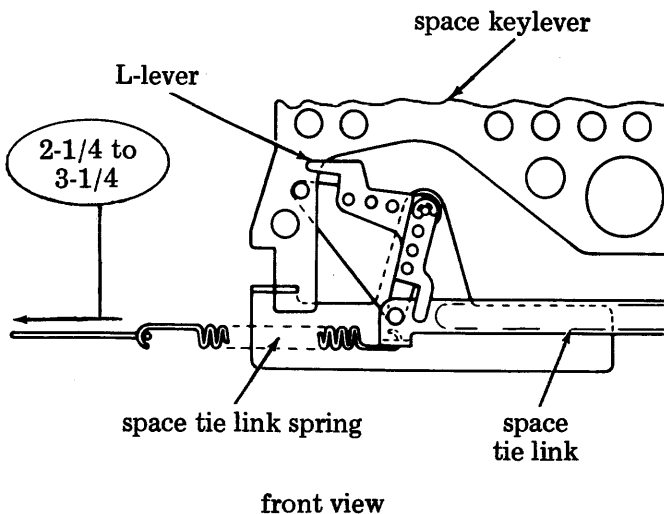
Requirement — Shift tie link: 2 to 3; control tie link 6 to 8 to start tie link moving.



SPACE TIE LINK SPRING

- Unhook spring from frame.

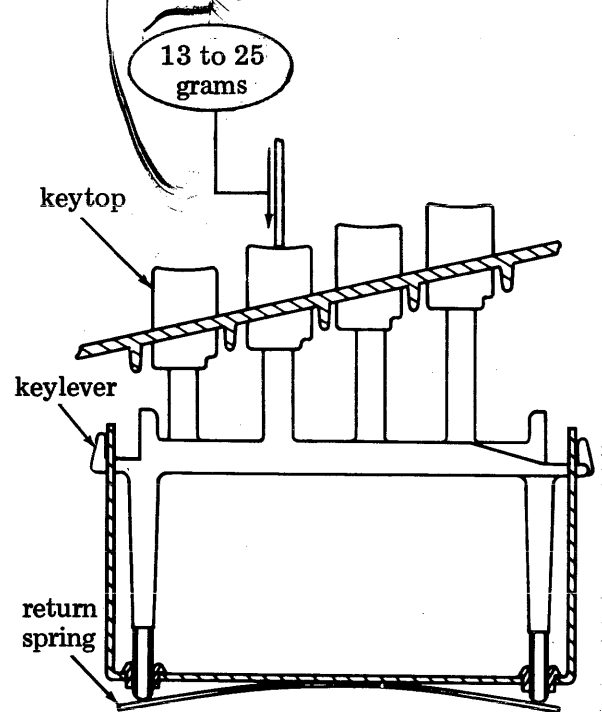
Requirement — 2-1/4 to 3-1/4 to extend spring to installed length.



KEYLEVER RETURN SPRING

- Depress any keytop (nonrepeat) to normal downstop position and release.

Requirement — 13 to 25 grams to start key-lever moving.

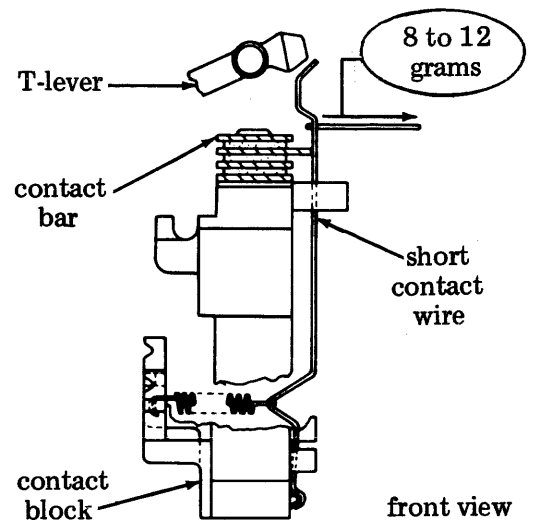


SHORT CONTACT WIRE SPRING

- Position T-lever away from contact wire.
- Check contact wire in closed position.

Requirement — 8 to 12 grams to start contact wire moving.

CAUTION: DO NOT ADJUST CONTACT WIRES.



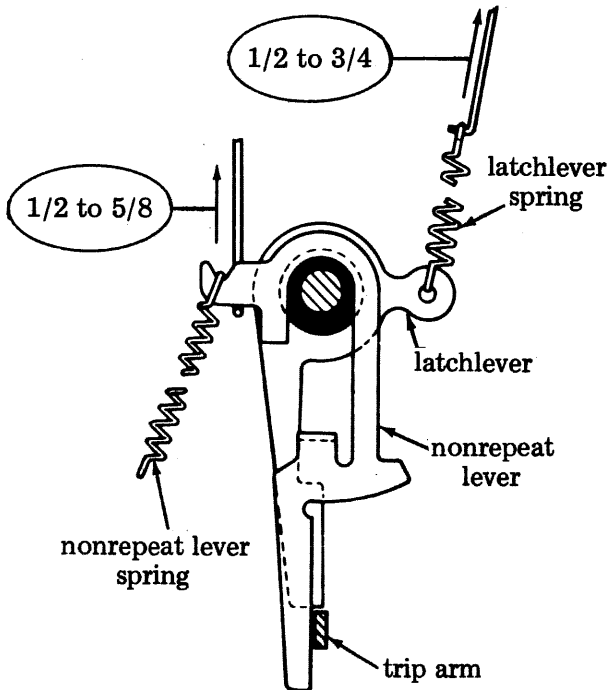
LATCHLEVER AND NONREPEAT LEVER SPRINGS

- Unhook latchlever spring.
- Hold trip arm in overtravel position.

Requirement 1 — 1/2 to 3/4 to extend spring to installed length.

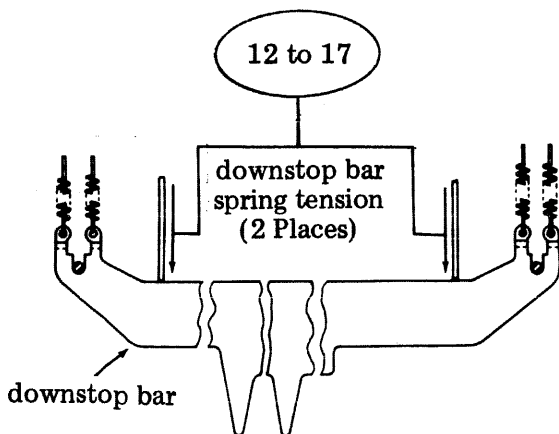
- Move latch away from nonrepeat lever.

Requirement 2 — 1/2 to 5/8 to start non-repeat lever moving.



DOWNSTOP BAR SPRING

Requirement — 12 to 17 to start downstop bar moving.



KEYTOP FORCE AND CODEBAR BINDS

- Attach keyboard to reset mechanism.
- Depress keylever.

Requirement — Maximum 7 to depress key to normal downstop position.

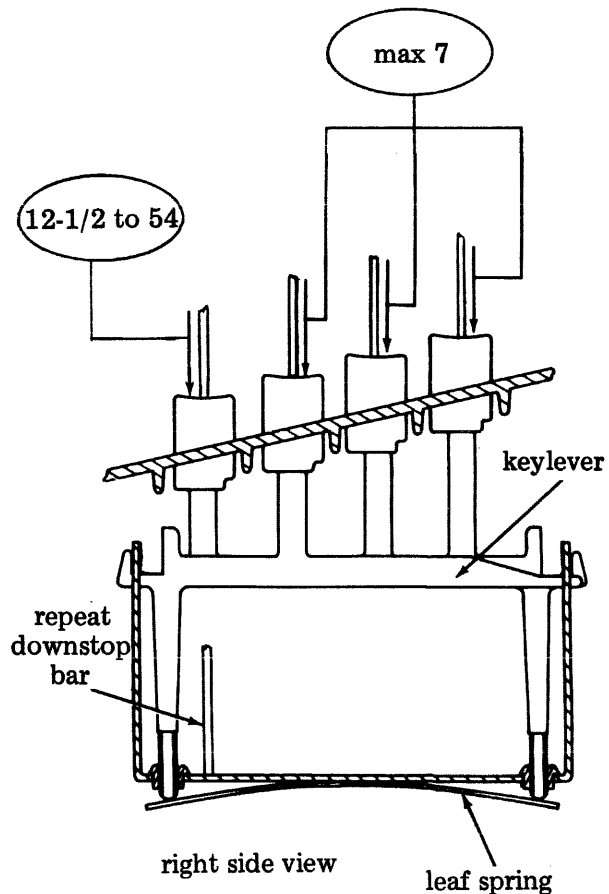
- Hold trip arm in overtravel position to check for codebar binds.
- Depress O (letter).
- Depress 0 (figure).
- • Depress LINE FEED.

→ Requirement — Maximum 7 oz to normal downstop.

REPEAT FORCE

- Depress any repeatable key past normal downstop position.

Requirement — 12-1/2 to 54 to trip keylever.



38 PRINTER

ADJUSTMENTS

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1. GENERAL

1.01 This section provides adjustment information for the 38 wide platen and standard platen printers. It is reissued to include the latest engineering changes. Marginal arrows ordinarily used to indicate changes have not been used.

1.02 All tolerances in the adjustments, unless stated otherwise, are in inches. All spring values, unless stated otherwise, are in ounces.

1.03 In the adjustments, code combinations are given in this manner:

Example: 1-4-6-8

The numerals represent marking bits; the dashes represent spacing bits. Codes are not always given as parity codes.

1.04 In the adjustments location of clearances, position of parts, and point and angle of scale applications are illustrated by line drawings. Requirements and procedures are set forth in the several texts that accompany the line drawings. Required tools are included in 185830 maintenance tool kit and are listed in Section 570-005-800TC. A DXD800 Signal Distortion Test Set was used to determine the requirements for the selector receiving margins.

1.05 The F and S following an adjustment title mean that the adjustment applies only to friction feed (F) or sprocket feed (S) printers. No letter designation indicates that the adjustment applies to both types of equipment.

1.06 Following the title of the adjustments are designations that identify the particular adjustment by area and number. These designations will be helpful in referencing a particular adjustment. Some adjustments have no designation.

(MRA)	motor area
(DBA)	distributor area
(MSA)	main shaft area
(SLA)	selector area
(FNA)	function area
(CRA)	carriage area
(SPA)	spacing area
(PLA)	platen area
(FOA)	form feed area
(ABA)	answer-back area
(KBA)	keyboard area
(MDA)	margin and dashpot area

Example: (DBA-1) identifies the adjustment as being the no. 1 adjustment in the distributor area.

The adjustments as presented need not necessarily be in consecutive order.

1.07 Adjustments are presented in a definite order which is considered the best to follow when completely readjusting the equipment. Certain interrelated adjustments, which appear on the same page, should be checked and adjusted in the order given. No single adjustment should be undertaken without first completely understanding the procedure and knowing the requirements. Therefore, read a procedure all the way through before making an adjustment or checking a spring tension.

NOTE: Disconnect the typing unit from any ac or dc potential prior to inspection, minor repair, extensive maintenance, or a complete readjustment.

1.08 References to left, right, front, rear, etc, consider the typing unit to be viewed from a position where the carriage area faces up and the selector area is located to the viewer's left.

1.09 Unless specifically stated otherwise, make screws or nuts friction tight to make an adjustment and tighten them securely once the adjustment has been made.

1.10 When a procedure calls for using pry points or slots to make an adjustment, place a screwdriver between the points or in the slots and pry parts in the proper direction.

1.11 Due to a high degree of congestion within certain areas of some typing units, some disassembly will be required prior to making certain adjustments. If parts or sub-assemblies are removed from the typing unit to facilitate the making of an adjustment, be sure that they are subsequently replaced. Recheck any adjustments that may have been affected by the removal of parts or subassemblies.

NOTE 1: Do not remove parts and/or sub-assemblies unless it is considered absolutely necessary to perform an adjustment.

NOTE 2: Instructions for the disassembly and reassembly of parts and/or subassemblies are given in the appropriate disassembly and reassembly section and/or appropriate illustrated parts section.

NOTE 3: Do not lift typing unit while holding any part of the selector mechanism. Excessive strain on the selector mechanism, due to the weight of the typing unit, may cause selector malfunctioning. See appropriate disassembly and reassembly section for the proper method of lifting typing unit from its subbase.

1.12 Related adjustments are primarily intended to aid in troubleshooting.

1.13 The spring tensions specified in this section are indications, not exact values. Therefore, to obtain reliable readings, it is important that spring tensions be measured by spring scales placed in the positions shown on pertinent line drawings. Springs that do not meet their requirements should be replaced by new ones. Only those springs that directly affect the operation of the typing unit are measured, however, others may be measured indirectly in the process. If, at first, the spring tension requirement cannot be met, replace the indicated spring being directly measured. Then if the requirement is not met, any springs that are indirectly measured in the procedure should be replaced, one at a time, with the performance of requirement checks each time a spring is replaced.

NOTE 1: Use only spring scales which are recommended by the manufacturer and found in Maintenance Tools Section 570-005-800TC.

NOTE 2: The spring tensions may be checked in any sequence.

1.14 All adjustment procedures should be started with the typing unit in the stop condition. It is in the stop condition when the selector armature is in its attracted (frontward) position and all clutches are disengaged.

1.15 To place the typing unit in the stop condition, use 185832 armature clip to hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are in a stop position. Fully disengage all of the clutches as instructed in 1.16.

NOTE 1: A stop position is that position where a shoe lever contacts a trip lever.

NOTE 2: The distributor clutch will not disengage if the typing unit is removed from a set unless the keyboard adjusting bracket is adjusted. Adjustment must be remade to set requirements when the typing unit is replaced in an ASR or KSR set.

NOTE 3: The distributor clutch will not disengage unless the answer-back drum is in its home position, which is the position where the control lever is fully detented into the indent on the answer-back drum.

1.16 When disengaged, a clutch is latched so that a shoe lever is held in its stop position by a trip lever while a corresponding latchlever is seated in a notch of the clutch disc. This allows the clutch shoes to release their tension on the clutch drum. With all clutches disengaged, the main shaft will turn freely without any clutch shoes dragging. See Figure 1.

NOTE: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. Where an adjustment procedure calls for disengagement, rotate the clutch to a stop position, apply a screwdriver to the associated stop-lug, and push the clutch disc in the normal direction of main shaft rotation until the corresponding latchlever seats in its clutch disc notch.

1.17 A clutch is engaged when a trip lever is moved up so that it no longer holds a shoe lever in its stop position. When this action occurs, the shoe lever and a stop-lug on the clutch disc move apart, and the clutch shoes wedge against the drum, so that when the shaft is

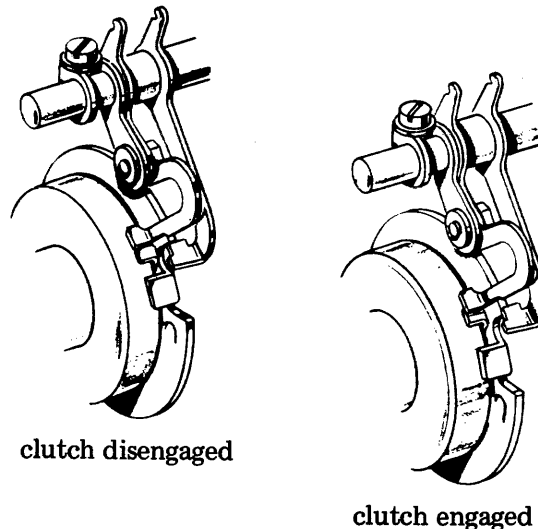


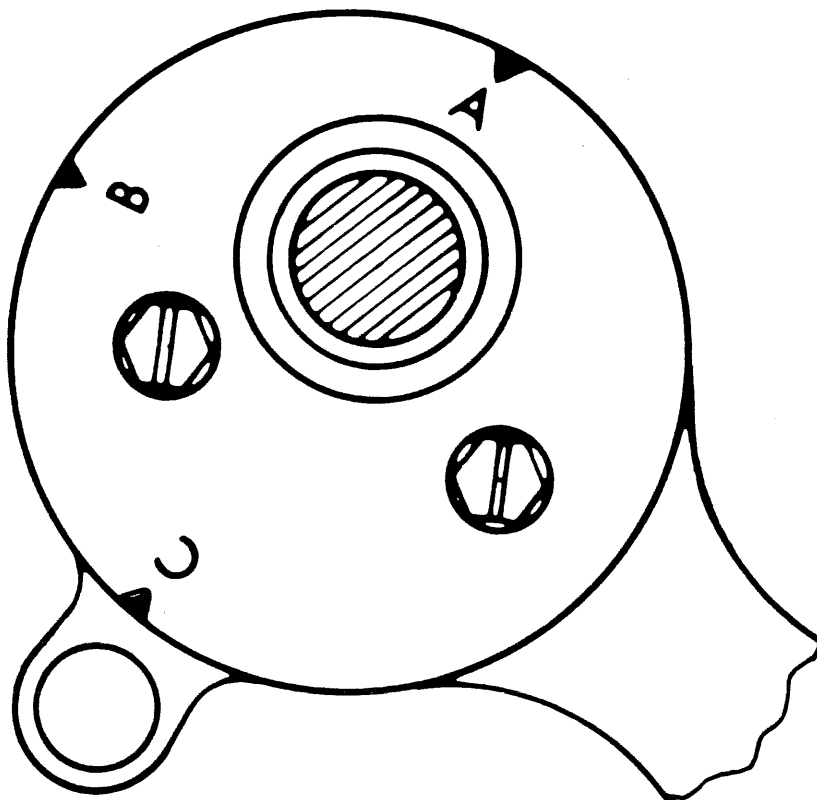
Figure 1 - Clutch Conditions

turned, the clutch will turn in unison with it. See Figure 1.

1.18 **Manual Operation:** To manually operate the typing unit, place it in the stop condition as instructed in 1.15 and 1.16. Momentarily permit the armature to move to its unattracted (rearward) position to trip the selector clutch. Slowly rotate the main shaft clockwise (as viewed from the left) until all push levers have moved under their respective selector levers. Using a spring hook, strip the push levers from under the selector levers corresponding to the spacing elements of the code combination to be set up. Then continue to rotate the main shaft until the proper condition is set up or the character is cleared through the typing unit.

1.19 The selector levers are numbered 1, 2, 3, 4, 5, 7, 6, and 8 from left to right. To set up the character "Y," for example, whose 8-level code combination is 1--45-78, strip the push levers from the 2, 3, and 6 selector levers.

1.20 As an aid in making various adjustments, the function clutch has notches lettered A, B, and C. The function bail will reach its highest point when letter "A" appears in the one o'clock position; its lowest position when "C" is in the one o'clock position. The carriage drive bail is in its rearmost position when "B" is in the one o'clock position. See Figure 2. All three positions are as viewed from the left side of the set.



left side view

Figure 2 - Function Clutch Markings

2. BASIC UNIT

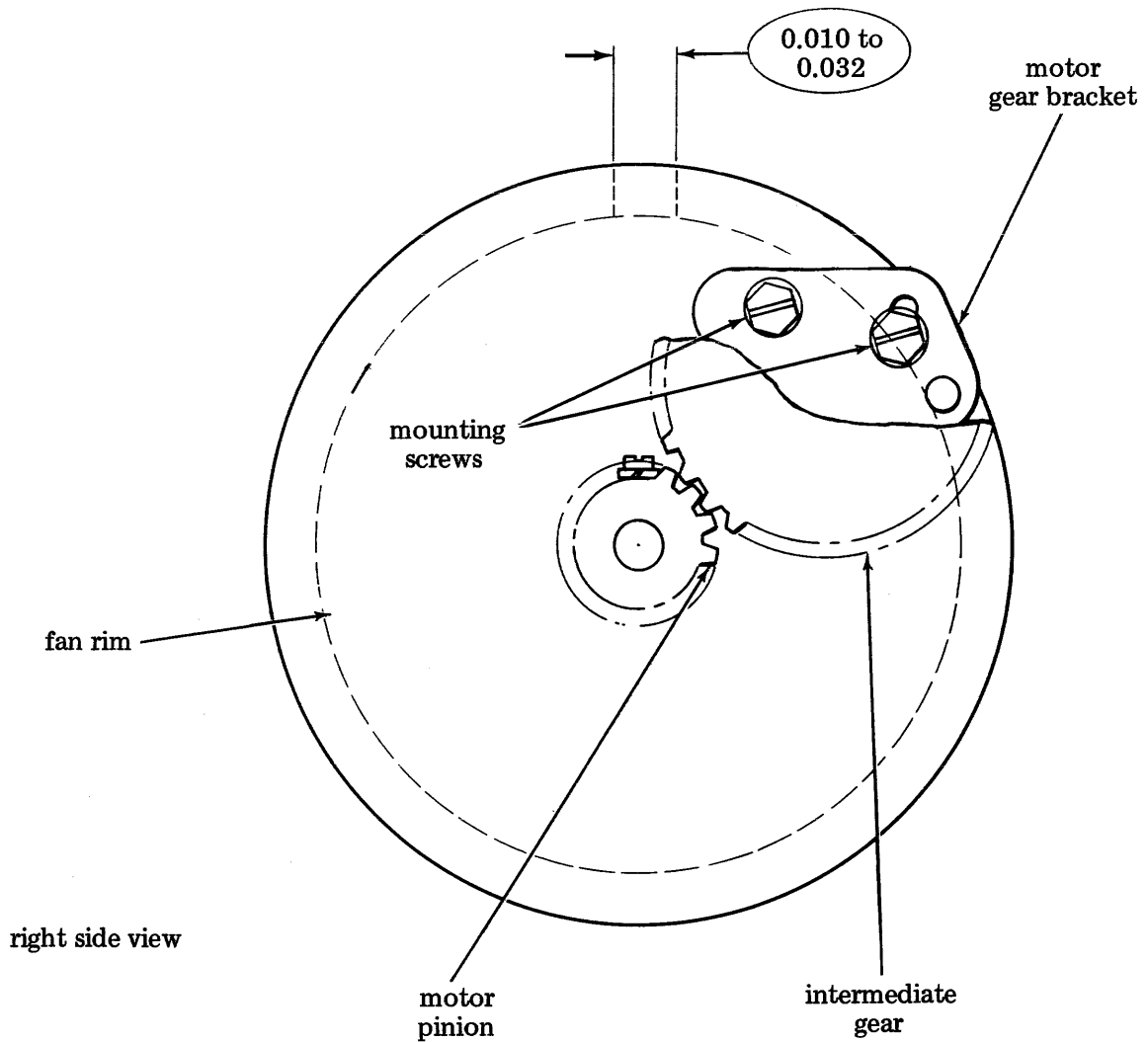
GEAR BACKLASH (MRA-1)

- Check requirement at point of tightest pinion and intermediate gear engagement.
- Hold intermediate gear stationary.

Requirement — 0.010 to 0.032 fan rim radial motion.

Adjust — Loosen mounting screws.
Position motor gear bracket.
Tighten screws.

“Adjust” affects:
BELT TENSION (MRA-2)



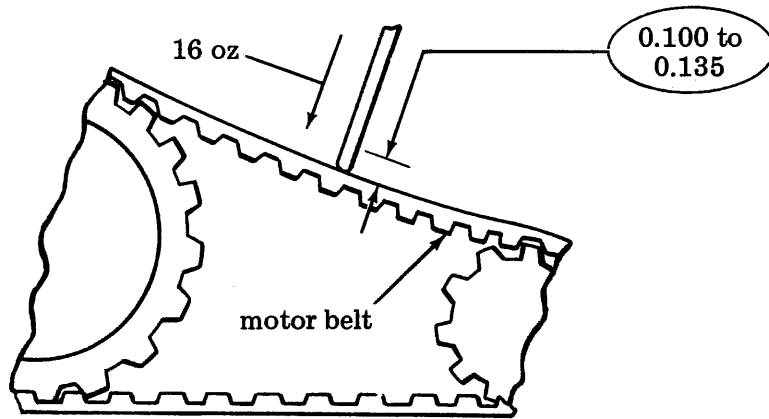
BELT TENSION (MRA-2)

- Rotate fan clockwise (view from left) until upper portion of motor belt becomes taut.
- Check requirement while applying a 16 oz force at center of belt.

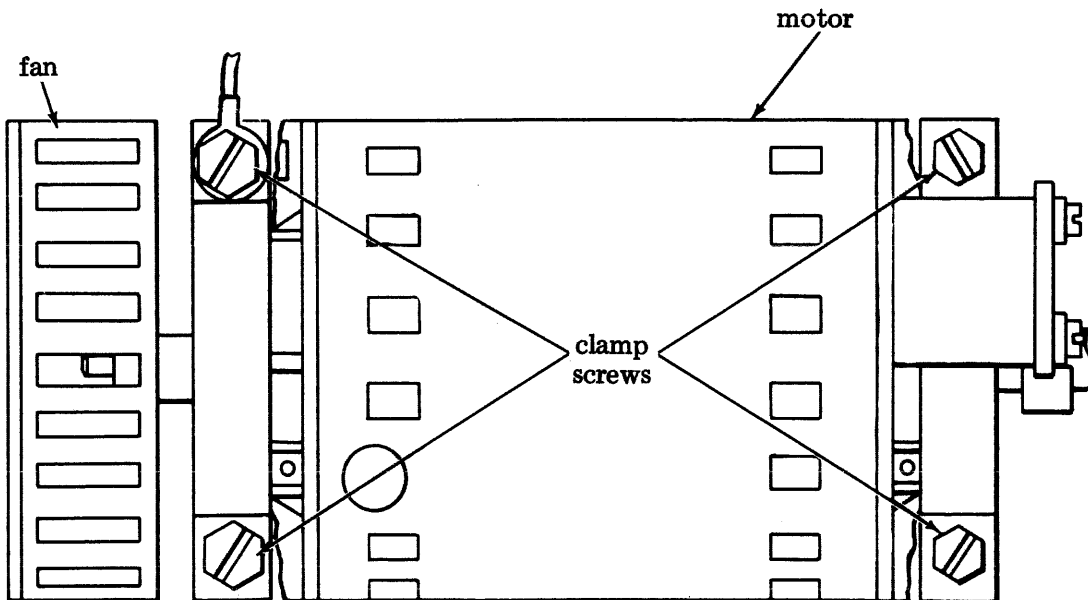
Requirement — 0.100 to 0.135 deflection at center of motor belt.

Adjust — Loosen clamp screws.
Rotate motor in cradle.
Tighten clamp screws.

“Requirement” affected by:
GEAR BACKLASH (MRA-1)



right side view



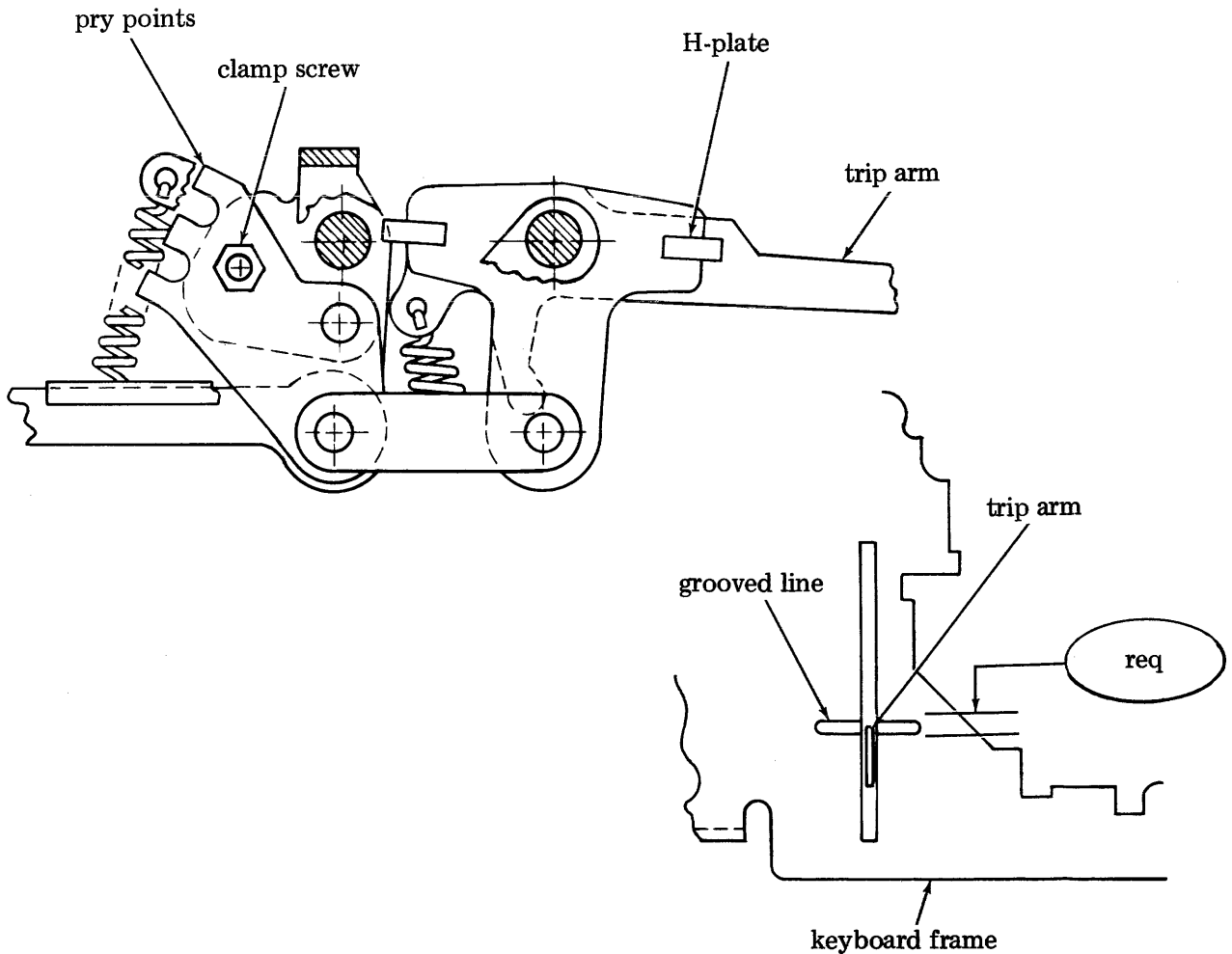
top view

TRIP ARM (KBA-9)

- Typing unit and keyboard must be mounted on the base.
- Engage distributor clutch.
- Rotate main shaft until trip arm reaches lowest point of travel.

Adjust — Loosen (friction tight) clamp screw.
Use pry points to position trip arm.
Tighten clamp screw.

Requirement — Top surface of trip arm positioned within width of grooved line on front of keyboard frame.



SHAFT LEFT BEARING GAP (DBA-2)

Requirement — Some to 0.012 between left bearing and clutch gear assembly (*gauge* by eye).

Adjust — Disengage distributor clutch.
Hold clutch gear assembly firmly to the right.
Loosen left bearing clamp screws.
Position left bearing.
Tighten clamp screws.

“Requirement” affected by:
BRUSH HOLDER GAP (DBA-1)

BRUSH HOLDER GAP (DBA-1)

- Disengage distributor clutch.

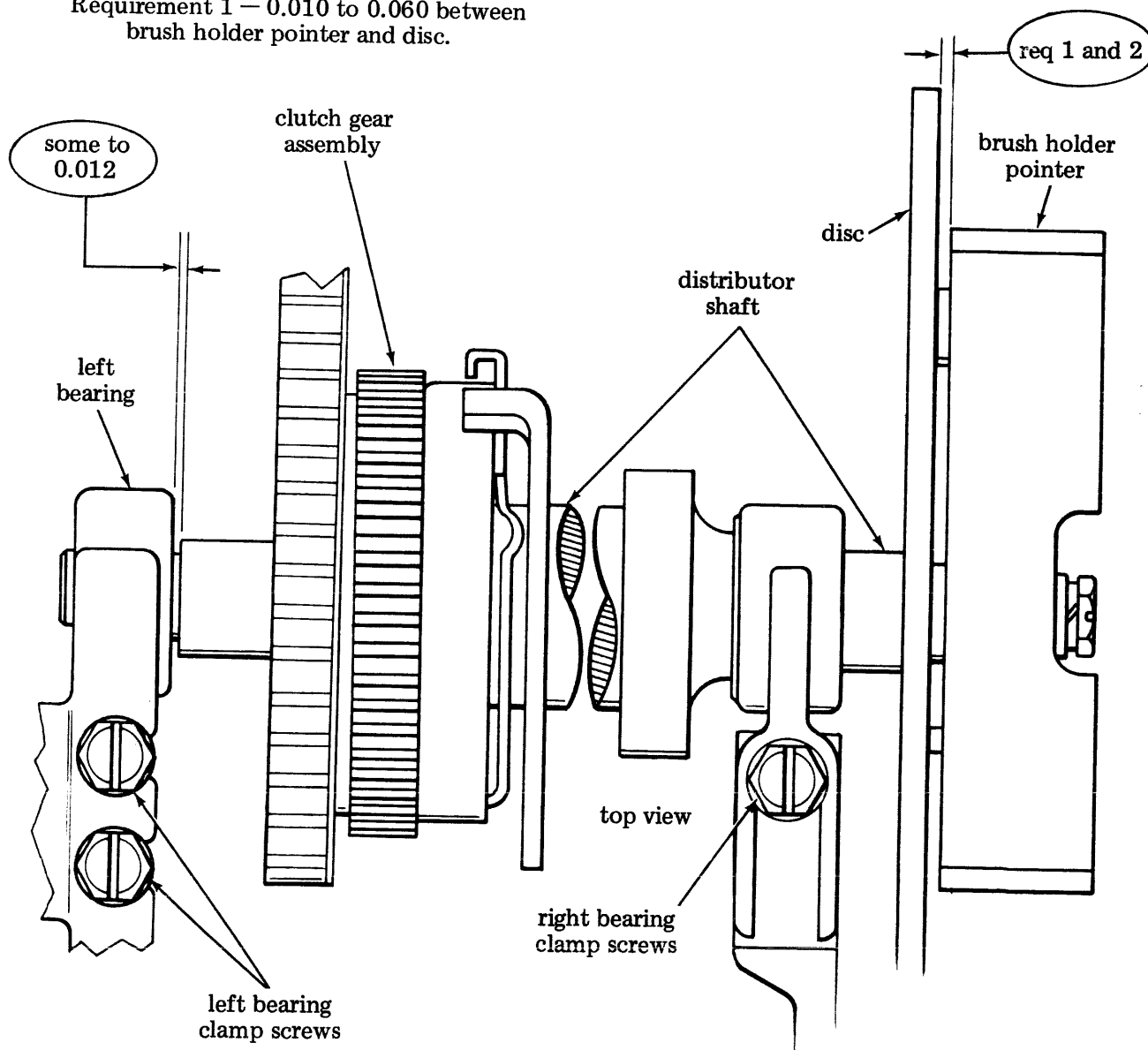
Requirement 1 — 0.010 to 0.060 between brush holder pointer and disc.

- Rotate brush holder one full rotation.

Requirement 2 — Minimum of 0.002 between brush holder and disc during entire rotation.

Adjust — Loosen left and right bearing clamp screws.
Position distributor shaft.
Tighten right bearing clamp screw.
Check SHAFT LEFT BEARING GAP (DBA-2) requirement.
Tighten left bearing clamp screws.

“Adjust” affects:
TRIP SHAFT POSITION (DBA-3)
DRIVEN GEAR LINE-UP (MSA-6)



TRIP SHAFT POSITION (DBA-3)

- Rotate distributor clutch until its shoe lever contacts the trip lever.
- Take up play to minimize clearances.

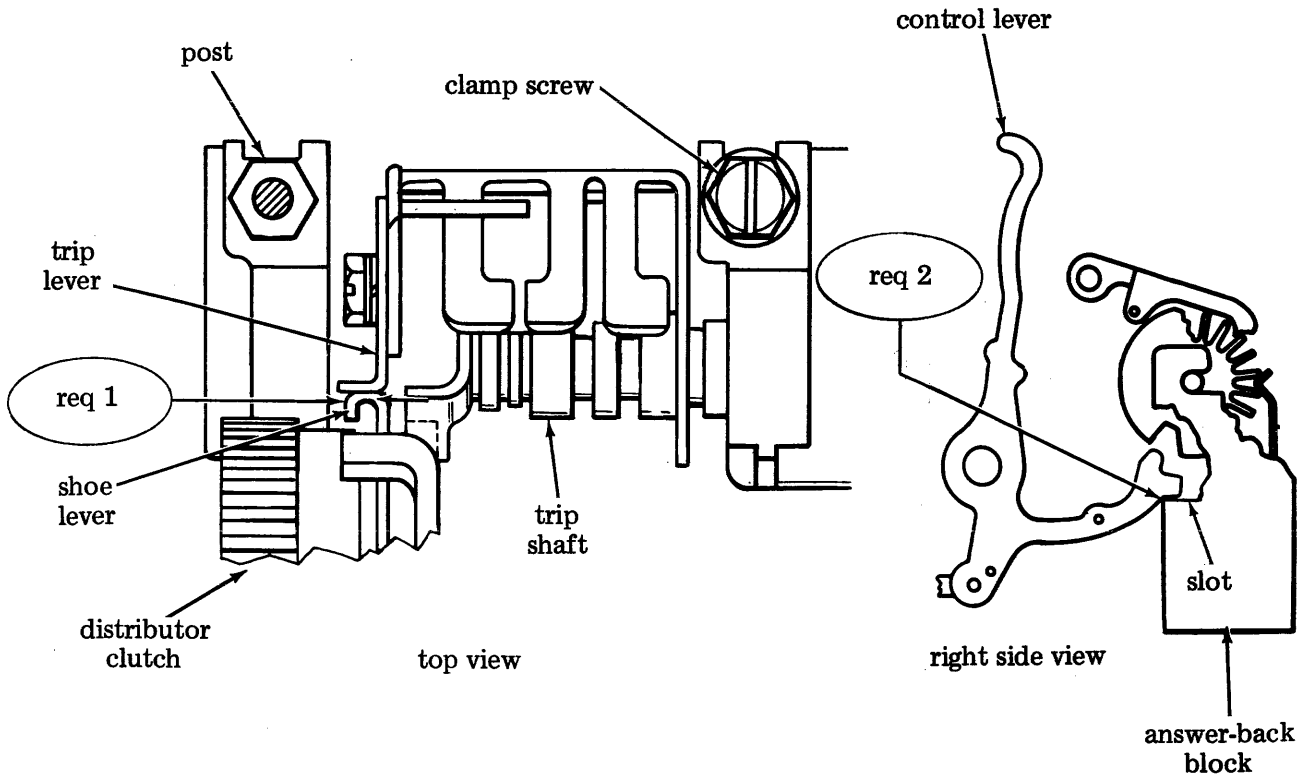
Requirement 1 — Trip lever should engage at least two-thirds width of formed end of shoe lever.

Requirement 2 — Control lever free of binds in answer-back block slot.

Adjust — Remove answer-back drum.
Use wrench to loosen (friction tight) clamp screw and post.
Position trip shaft.
Tighten clamp screw and post.
Replace answer-back drum.

“Adjust” affects:
FEED PAWL POSITION

“Requirement” affected by:
BRUSH HOLDER GAP (DBA-1)



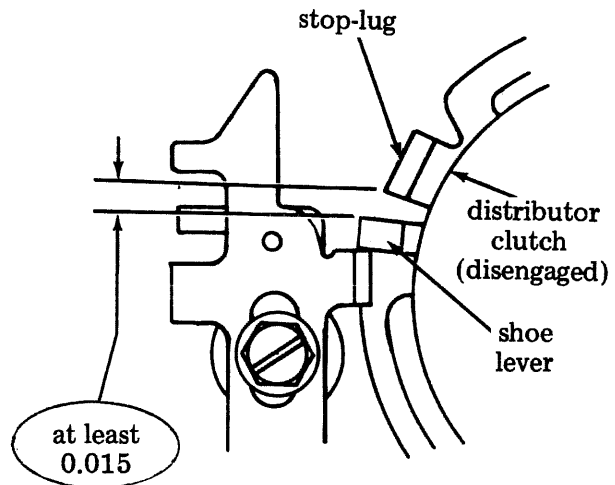
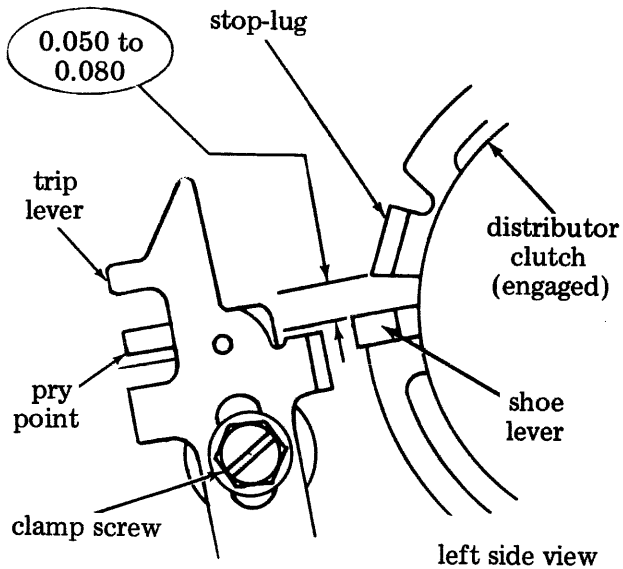
CLUTCH SHOE LEVER GAP (DBA-4)

- Position indent mark (in metal plate mounted to distributor gear pulley) directly above distributor shaft.
- Disengage distributor clutch.
- Measure and record gap between shoe lever and stop-lug.
- Move trip lever rearward to trip distributor clutch.
- Apply $32 \pm 1/2$ oz against shoe lever along its normal path of forward travel.
- Again measure and record gap between shoe lever and stop-lug.

Requirement 1 — At least 0.015 gap between stop-lug and shoe lever, when clutch is disengaged.

Requirement 2 — 0.050 to 0.080 greater gap between stop-lug and shoe lever when clutch is engaged than when disengaged.

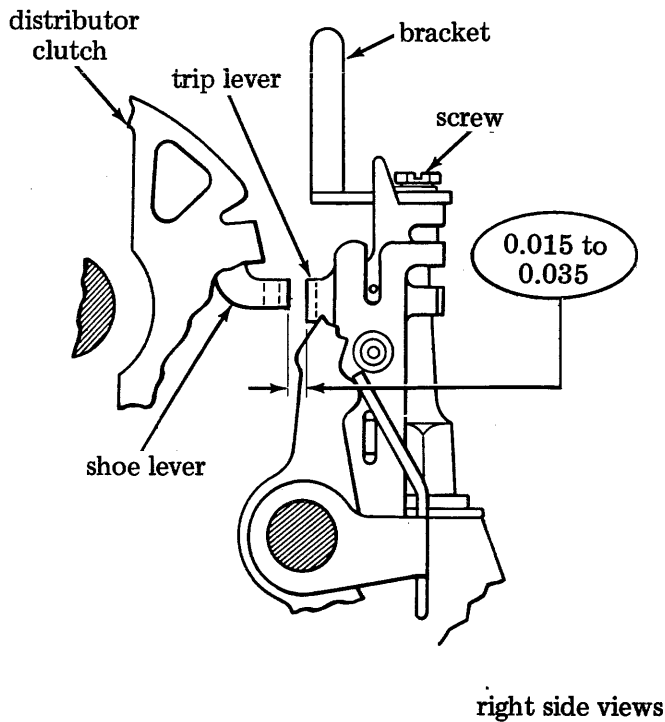
Adjust — Remove answer-back drum.
Loosen (friction tight) clamp screw.
Use pry point to position trip lever.
Tighten clamp screw.
Replace answer-back drum.



TRIP LEVER ENGAGEMENT (DBA-6)

- Typing unit must be mounted on subbase.
- Check that answer-back control arm and reader trip lever are not touching their respective stop bail adjusting tabs.
- Disengage distributor clutch.
- Depress any nonfunction keytop to unlatch distributor clutch. If necessary, loosen screw and position bracket to obtain clearance between bracket and trip lever — tighten screw.
- Rotate clutch to align upper edges of shoe lever and trip lever.

Requirement 1 — 0.015 to 0.035 between shoe lever and trip lever.



Adjust — Remove answer-back drum.
Use 180993 bending tool to bend center adjusting tab.
Replace answer-back drum.

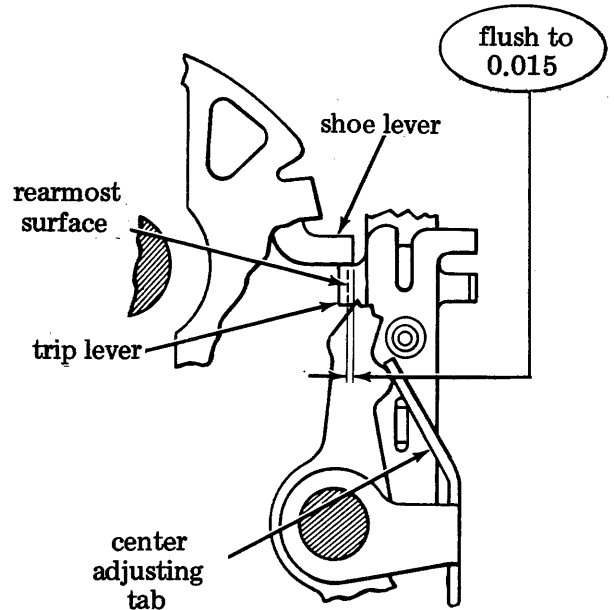
- Operate typing unit under power.

CAUTION: PREVENT ELECTRICAL SHOCK — EXERCISE CARE WHEN WORKING WITH UNIT UNDER POWER.

- Latch keyboard universal lever.

Requirement 2 — Shoe lever should be flush to 0.015 beyond rearmost surface of trip lever.

Adjust — Loosen (friction tight) screw.
Position bracket.
Tighten screw.



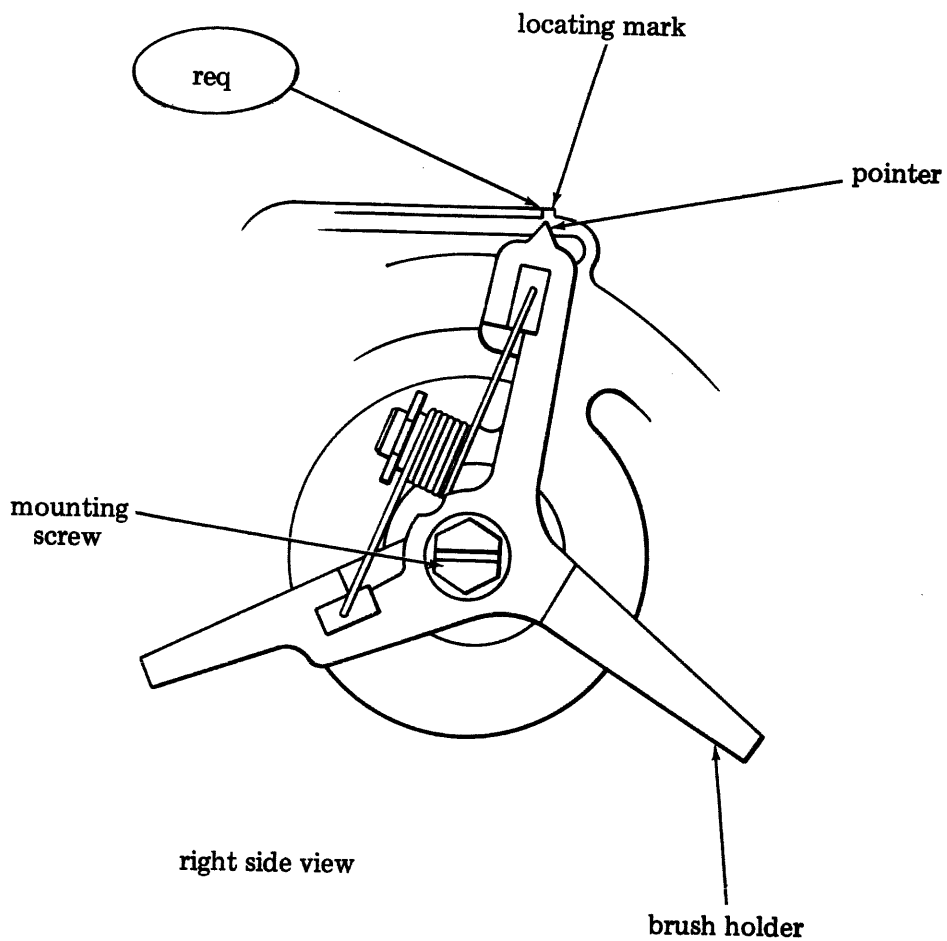
BRUSH HOLDER POSITION (DBA-5)

- Disengage distributor clutch.

Requirement — Pointer aligned within locating mark.

Adjust — Loosen mounting screw.
Rotate (clockwise only) brush holder.
Tighten screw.

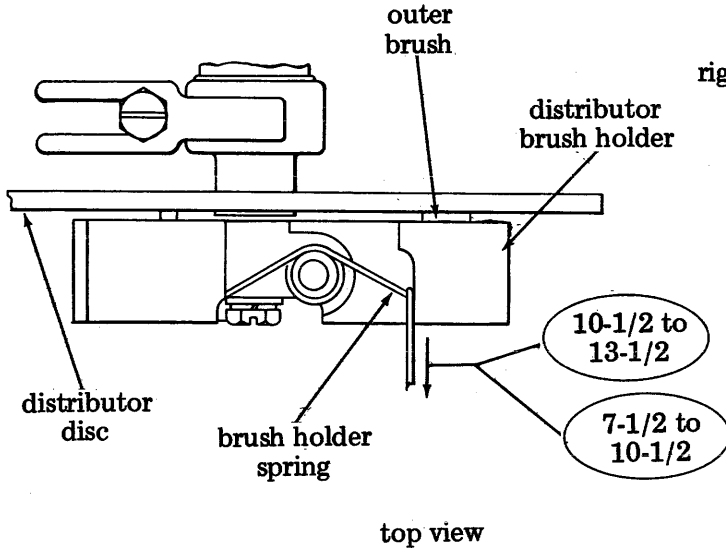
NOTE: Brush holder must be rotated in clockwise direction only.



BRUSH HOLDER SPRING

Requirement (with a new brush) — 10-1/2 to 13-1/2 to start outer brush moving.

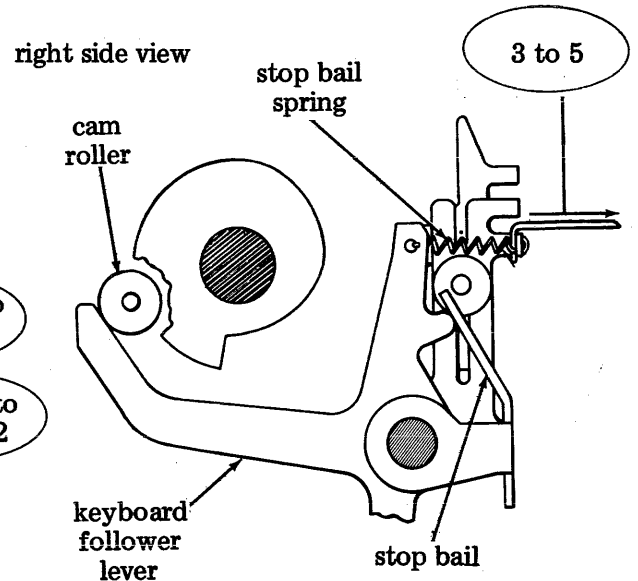
Requirement (with a brush worn to 1/4 inch length) — 7-1/2 to 10-1/2 to start outer brush moving.



STOP BAIL SPRING

- Place answer-back drum in home position.
- Engage distributor clutch.
- Rotate main shaft until cam roller moves keyboard follower lever to its lowest point.

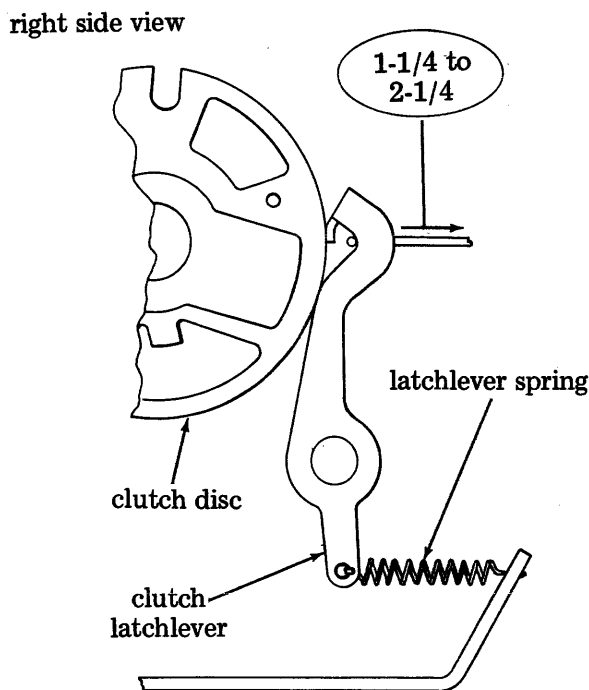
Requirement — 3 to 5 to start stop bail moving.



CLUTCH LATCHLEVER SPRING

- Engage clutch.
- Allow latchlever to rest on clutch disc as shown.

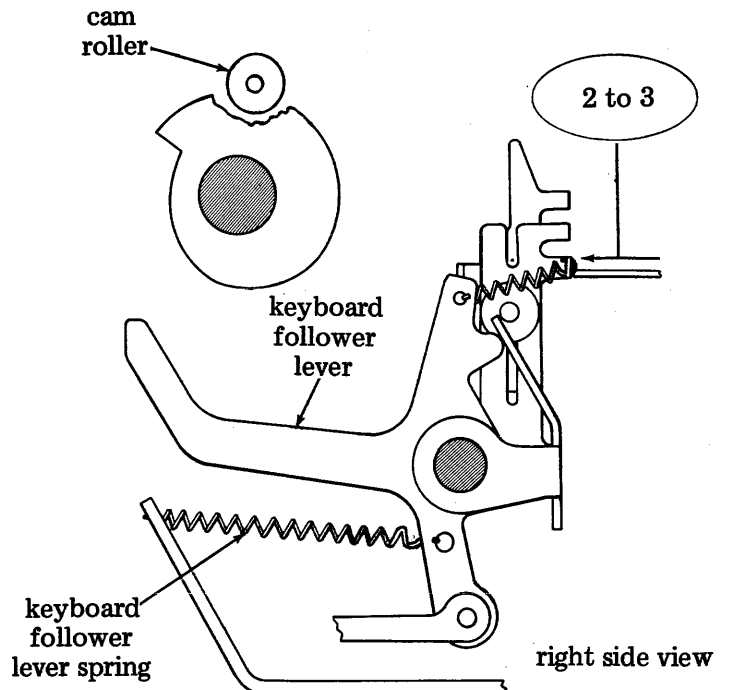
Requirement — 1-1/4 to 2-1/4 to start clutch latchlever moving.



KEYBOARD FOLLOWER LEVER SPRING

- Remove H-plate.
- Check that keyboard follower lever is not in contact with cam roller.

Requirement — 2 to 3 to start keyboard follower lever moving.

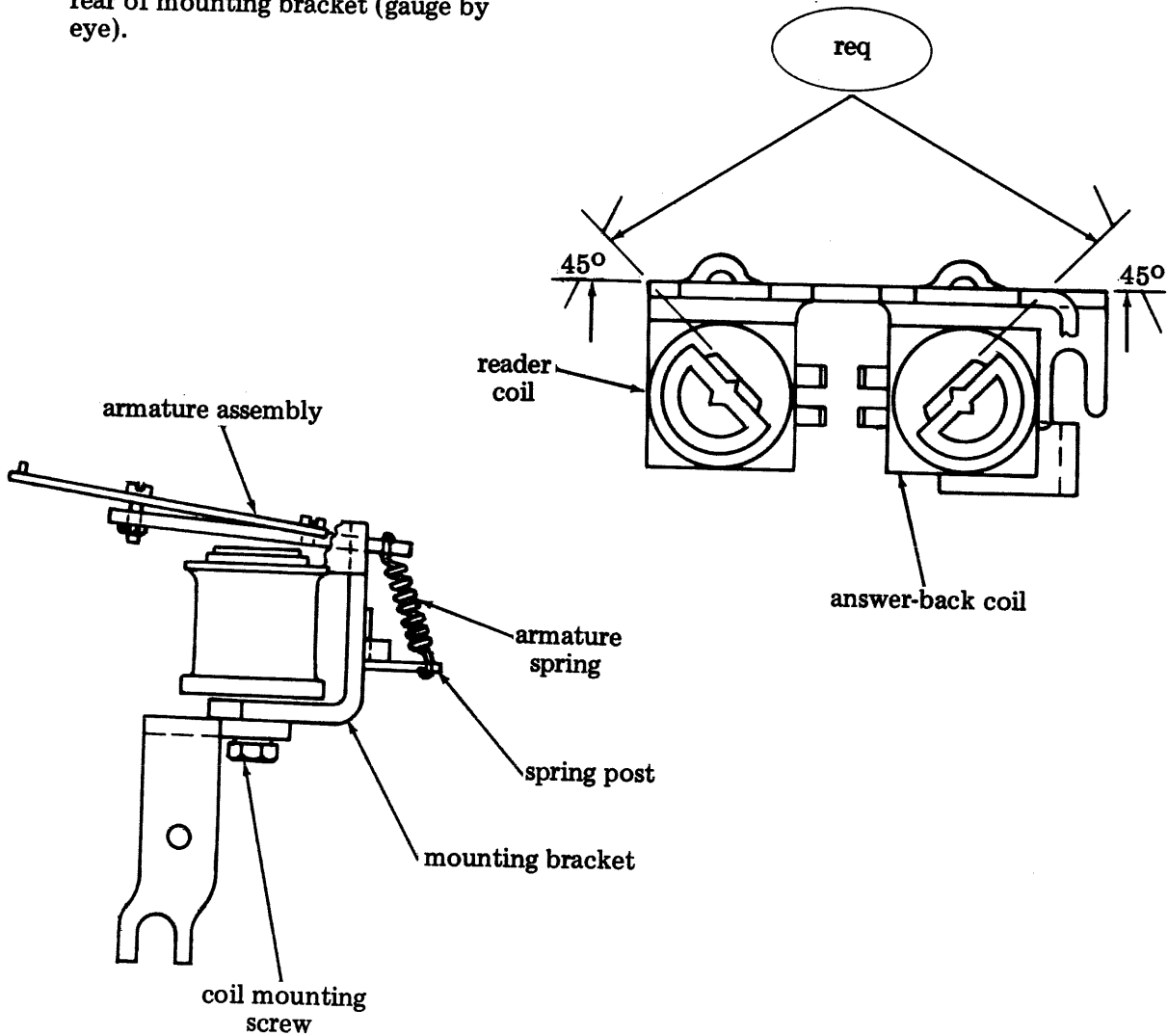


READER AND ANSWER-BACK COIL CORE POSITION (ABA-7)

- Remove spring and spring post from rear of armature assembly.
- Remove armature assembly.
(Replace assembly, spring, and post immediately if requirement is met.)

Requirement — Core approximately 45° to rear of mounting bracket (gauge by eye).

Adjust — Loosen coil mounting screw.
Position coil.
Tighten screw.
Replace armature assembly, spring, and post.



LEFT BEARING POSITION (MSA-1)

NOTE: If typing unit is to be completely readjusted, loosen all screws on main shaft EXCEPT collar screw immediately to right of left main shaft bearing.

- Position cam sleeve against left bearing.

Requirement 1 — Start cam follower, selector levers, and spacing locklever fully engage their respective cams.

Requirement 2 — Left bearing protrudes beyond selector side plate.

Adjust — Loosen clamp screws.
Position left bearing.
Tighten clamp screws.

“Adjust” affects:
FUNCTION SHAFT AND CASTING POSITION
DRIVEN GEAR LINE-UP (MSA-6)
CODEBAR CLUTCH TRIP LEVER LINE-UP (MSA-7)

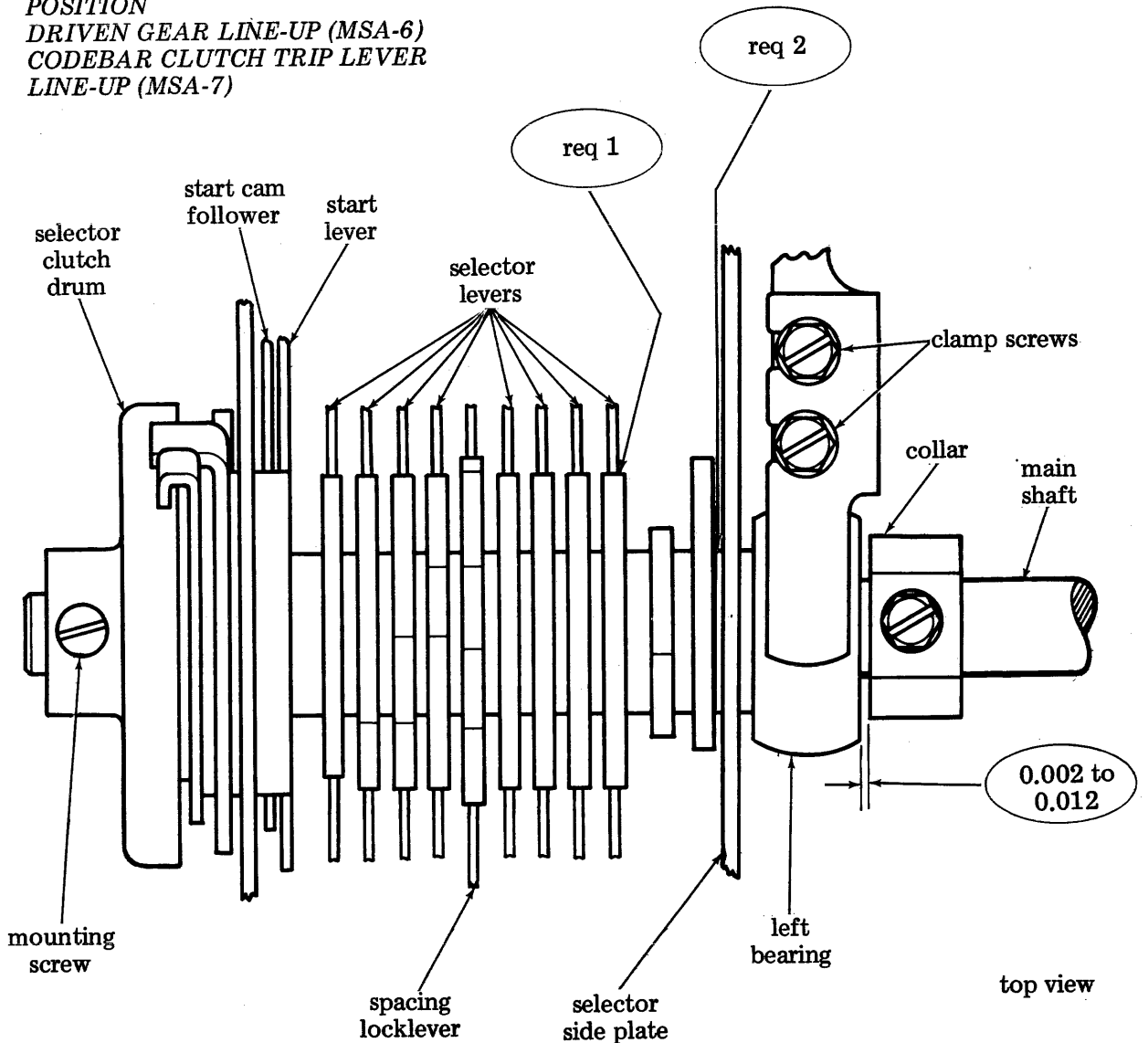
SELECTOR CAM ENDPLAY (MSA-2)

- Disengage selector clutch.
- Take up main shaft play to the right.

Requirement — 0.002 to 0.012 endplay between left bearing and collar.

Adjust — Loosen (friction tight) mounting screw.
Position selector clutch drum.
Tighten screw.

“Adjust” affects:
DRIVEN GEAR LINE-UP (MSA-6)
CODEBAR CLUTCH TRIP LEVER LINE-UP (MSA-7)



FUNCTION CLUTCH ENDPLAY (MSA-4)

- Disengage function clutch.
- Take up clearances to maximize function clutch endplay.

Requirement — 0.005 to 0.015 endplay in function clutch.

Adjust — Loosen collar clamp screw.
Position function clutch.
Tighten clamp screw.

“Requirement” affected by:
FUNCTION CLUTCH POSITION

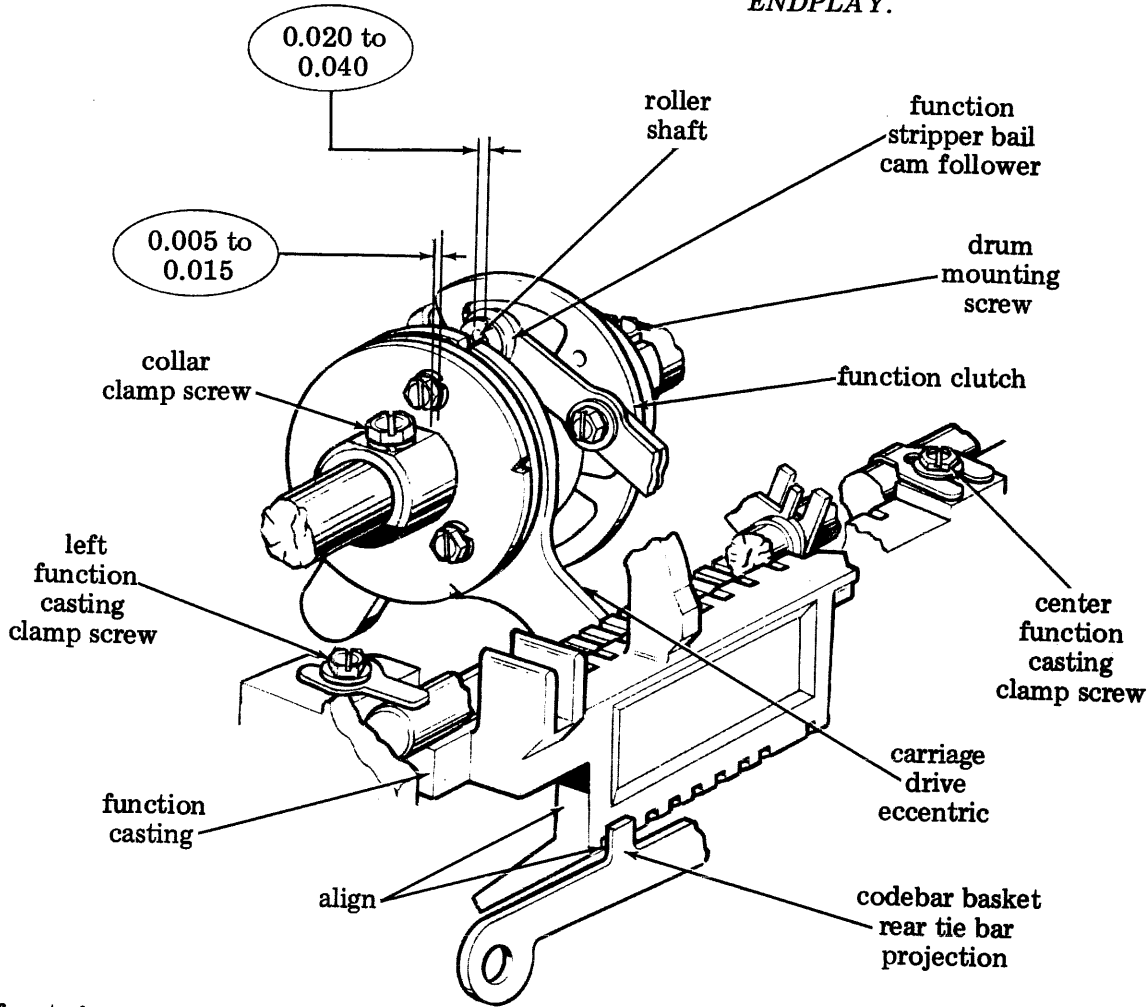
“Adjust” affects:
CODEBAR CLUTCH ENDPLAY (MSA-5)

FUNCTION CLUTCH POSITION — PRELIMINARY (MSA-3)

- Perform this adjustment only when completely readjusting the typing unit.
- Take up play to minimize required clearance.

Requirement — 0.020 to 0.040 between carriage drive eccentric and end of roller shaft (gauge by eye).

Adjust — Loosen (friction tight) left and right (NOT CENTER) function casting clamp screws.
Align function castings lower left side with left side of lower projection of codebar basket rear tie bar.
Loosen drum mounting screw.
Position function clutch.
Tighten all screws.
Check **FUNCTION CLUTCH ENDPLAY**.



left front view

CODEBAR CLUTCH ENDPLAY (MSA-5)

- Disengage codebar clutch.
- Take up clearances to maximize codebar clutch endplay.

Requirement — 0.005 to 0.015 codebar clutch endplay.

Adjust — Loosen codebar clutch mounting screw.
Position codebar clutch.
Tighten screw.

“Adjust” affects:
CODEBAR CLUTCH TRIP LEVER LINE-UP (MSA-7)
CODEBAR RESET LEVER LINE-UP (FNA-4)

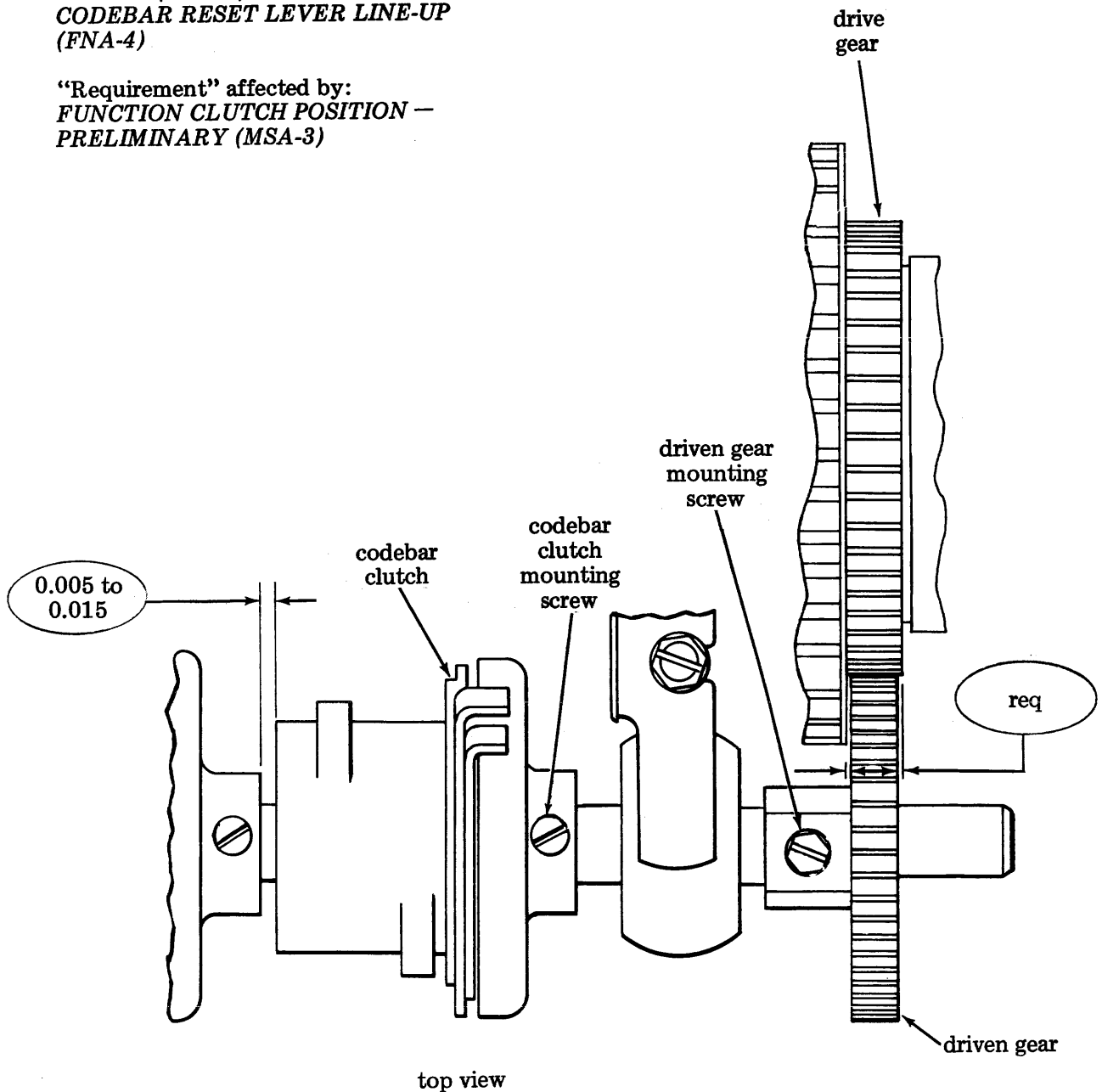
“Requirement” affected by:
FUNCTION CLUTCH POSITION — PRELIMINARY (MSA-3)

DRIVEN GEAR LINE-UP (MSA-6)

Requirement — Driven gear centered on drive gear (gauge by eye).

Adjust — Loosen driven gear mounting screw.
Position driven gear.
Tighten screw.

“Requirement” affected by:
LEFT BEARING POSITION (MSA-1)
BRUSH HOLDER GAP (DBA-1)
SELECTOR CAM ENDPLAY (MSA-2)



**CODEBAR CLUTCH TRIP LEVER
LINE-UP (MSA-7)**

Requirement 1 — Codebar clutch trip lever aligned with shoe lever, within 0.030 (gauge by eye).

Requirement 2 — Minimum of 0.005 between function clutch trip roller's shaft and codebar reset cam (with all play taken up to minimize gap).

Adjust — Loosen clamp screw.
Position trip lever (if necessary, reposition collar).
Tighten clamp screw.

“Adjust” affects:
TRIP SHAFT LATCHLEVER ENDPLAY (MSA-8)
CODEBAR CLUTCH TRIP LEVER ENGAGEMENT (MSA-9)

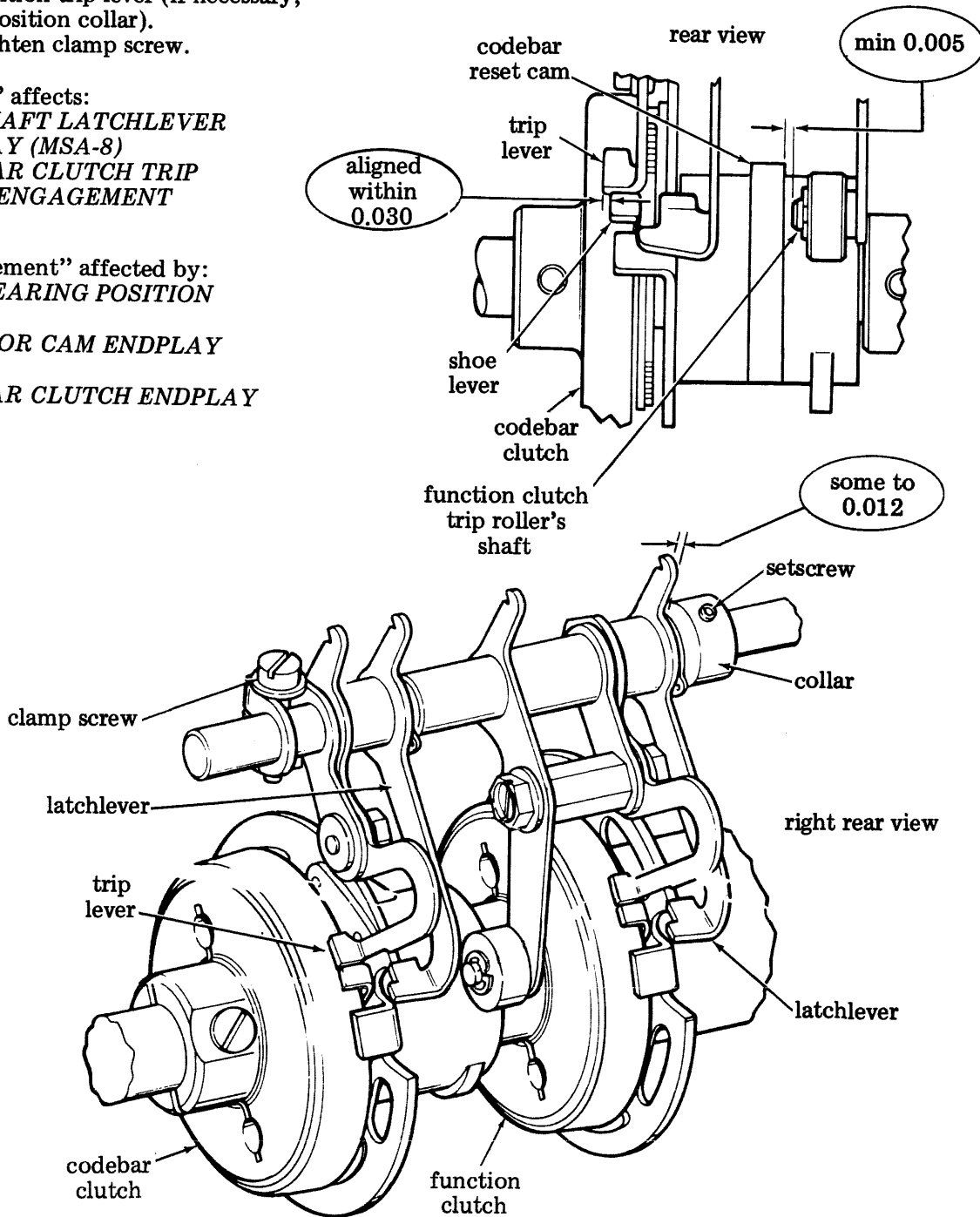
“Requirement” affected by:
LEFT BEARING POSITION (MSA-1)
SELECTOR CAM ENDPLAY (MSA-2)
CODEBAR CLUTCH ENDPLAY (MSA-5)

TRIP SHAFT LATCHLEVER ENDPLAY (MSA-8)

Requirement — Some to 0.012 endplay in latchlevers (gauge by eye).

Adjust — Loosen setscrew.
Position collar.
Tighten setscrew.

“Requirement” affected by:
CODEBAR CLUTCH TRIP LEVER LINE-UP (MSA-7)



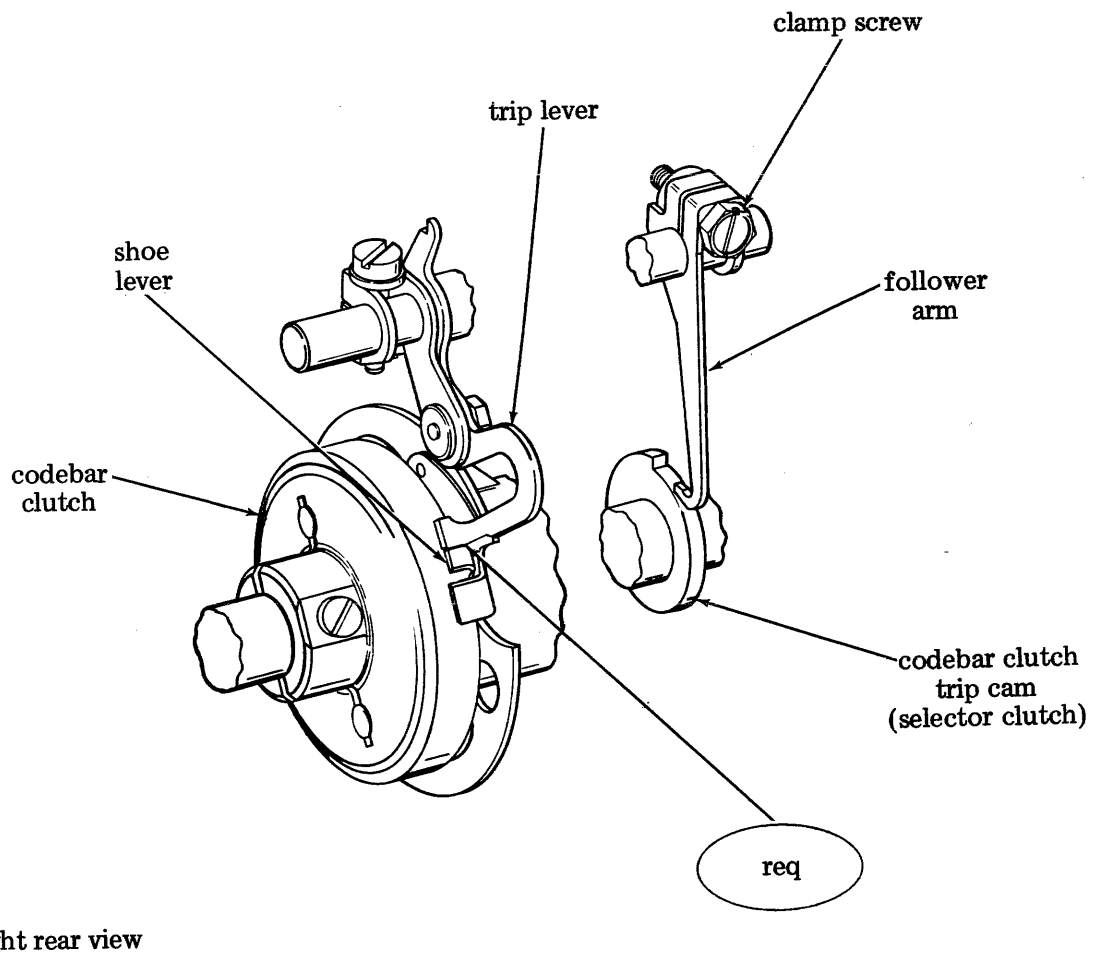
CODEBAR CLUTCH TRIP LEVER ENGAGEMENT (MSA-9)

- Place typing unit in stop condition.

Requirement — Upper surfaces of trip lever and shoe lever flush within 0.005.

Adjust — Loosen clamp screw.
Position codebar clutch trip cam follower arm.
Check that follower arm is centered on codebar clutch trip cam.
Tighten clamp screw.

“Requirement” affected by:
*CODEBAR CLUTCH TRIP LEVER
LINE-UP (MSA-7)*



**FUNCTION CLUTCH TRIP LEVER
ENGAGEMENT (MSA-10)**

- Place typing unit in stop condition.

Requirement — Upper surfaces of trip lever
and shoe lever flush within 0.005.

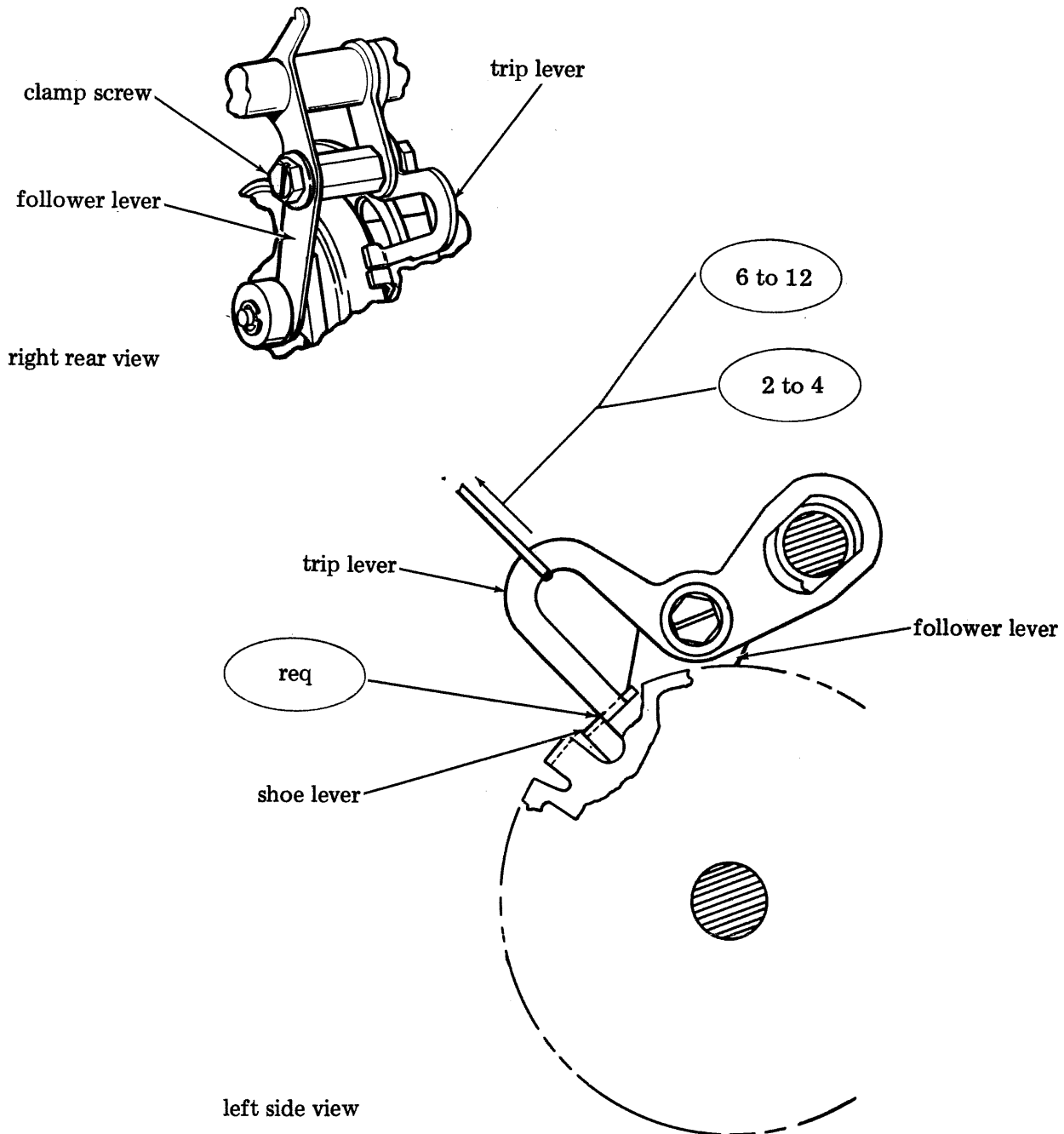
Adjust — Loosen clamp screw.
Position follower lever.
Tighten clamp screw.

TRIP LEVER SPRINGS

- Check both the codebar and the function
clutch trip lever springs.
- Engage clutch.

Requirement — Codebar clutch: 6 to 12 to
start trip lever moving.

Function clutch: 2 to 4 to start trip
lever moving.



**CODEBAR AND FUNCTION CLUTCH
SHOE LEVER GAPS (MSA-11)**

- Disengage clutch.
- Lift trip lever to trip clutch.
- Place trip lever on shoe lever.
- Apply slight pressure against shoe lever (along its normal path of forward travel) to fully seat clutch shoes.

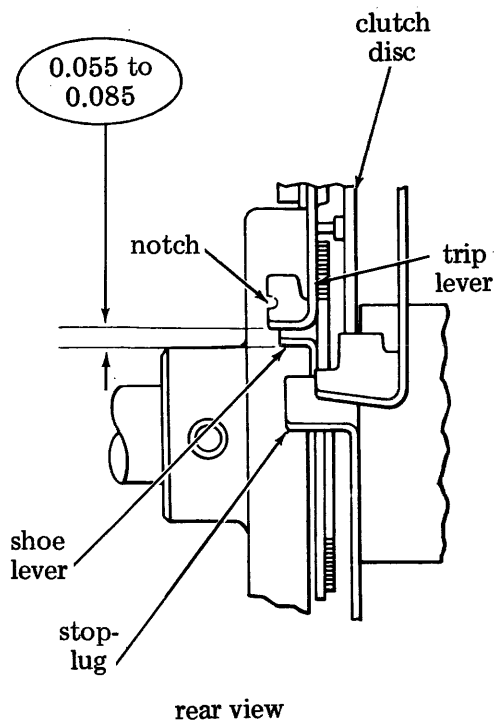
Requirement 1 — 0.055 to 0.085 between edge of trip lever and edge of shoe lever.

NOTE: On units so equipped, align trip lever notch or scribed line with edge of shoe lever.

- Disengage clutch.

Requirement 2 — At least 0.015 between shoe lever and stop-lug.

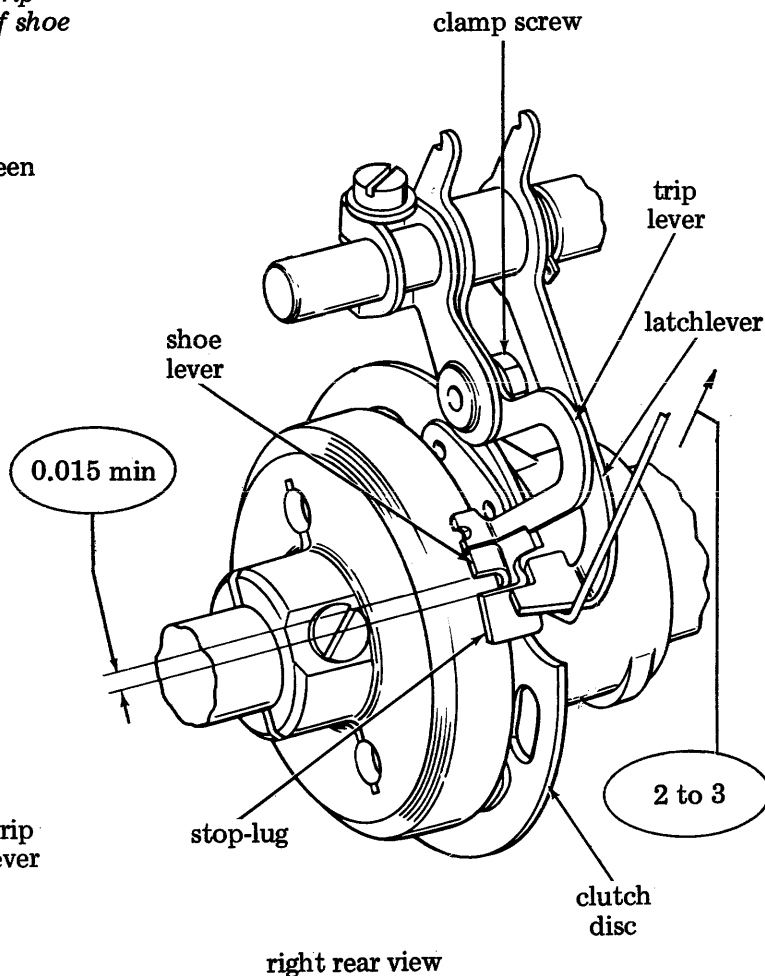
Adjust — Loosen clamp screw.
Position trip lever.
Tighten clamp screw.



**CODEBAR AND FUNCTION CLUTCH
LATCHLEVER SPRINGS**

- Position latchlever on high part of clutch disc.

Requirement — 2 to 3 to start latchlever moving.



CLUTCH SHOE LEVER SPRING

- Engage clutch.
- Hold clutch disc to prevent its turning.

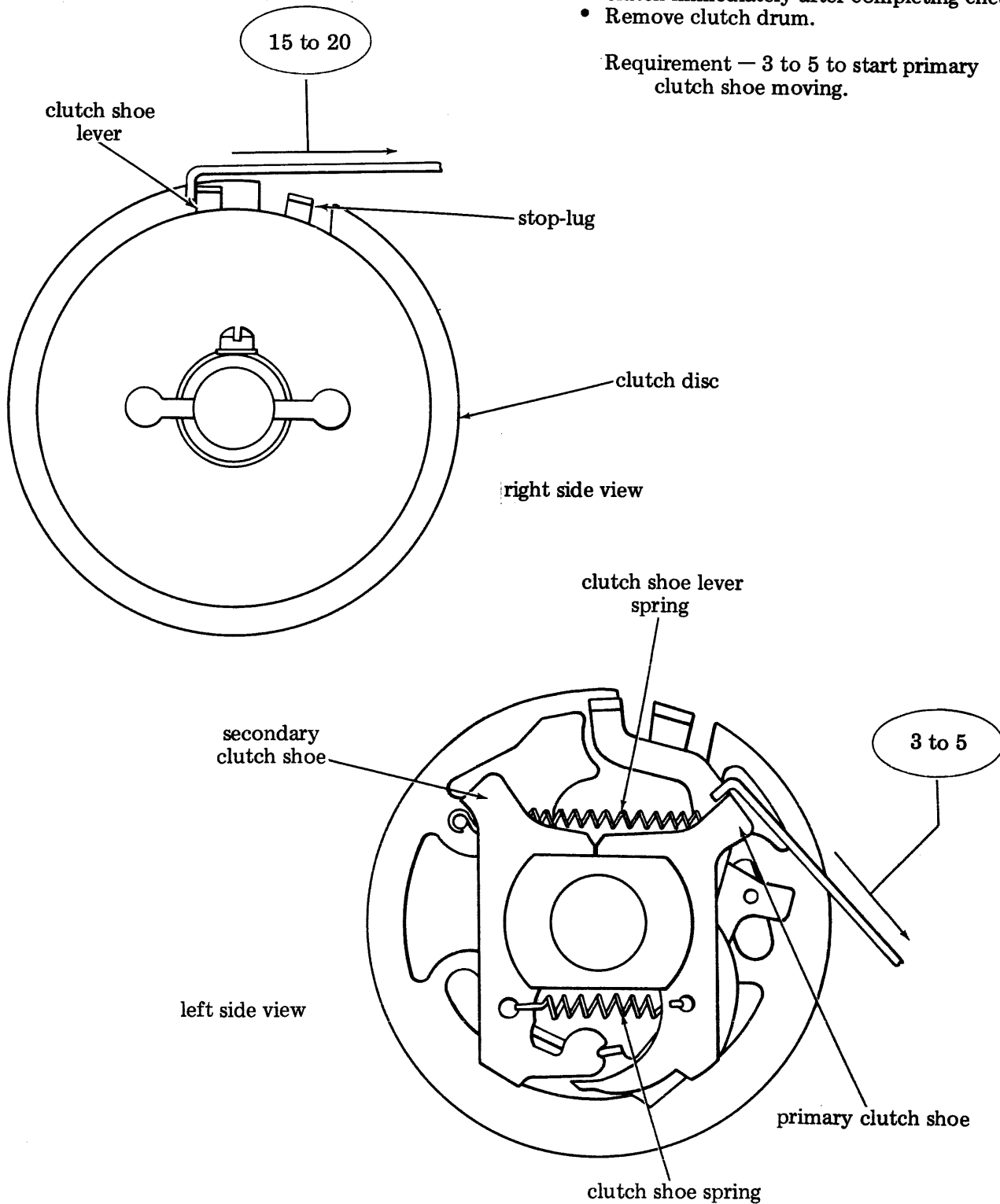
Requirement — 15 to 20 to pull clutch shoe lever into contact with stop-lug.

CLUTCH SHOE SPRING

NOTE: Check this spring tension only if there is good reason to suspect it will not meet its requirement.

- Remove clutch from main shaft. (Replace clutch immediately after completing check.)
- Remove clutch drum.

Requirement — 3 to 5 to start primary clutch shoe moving.

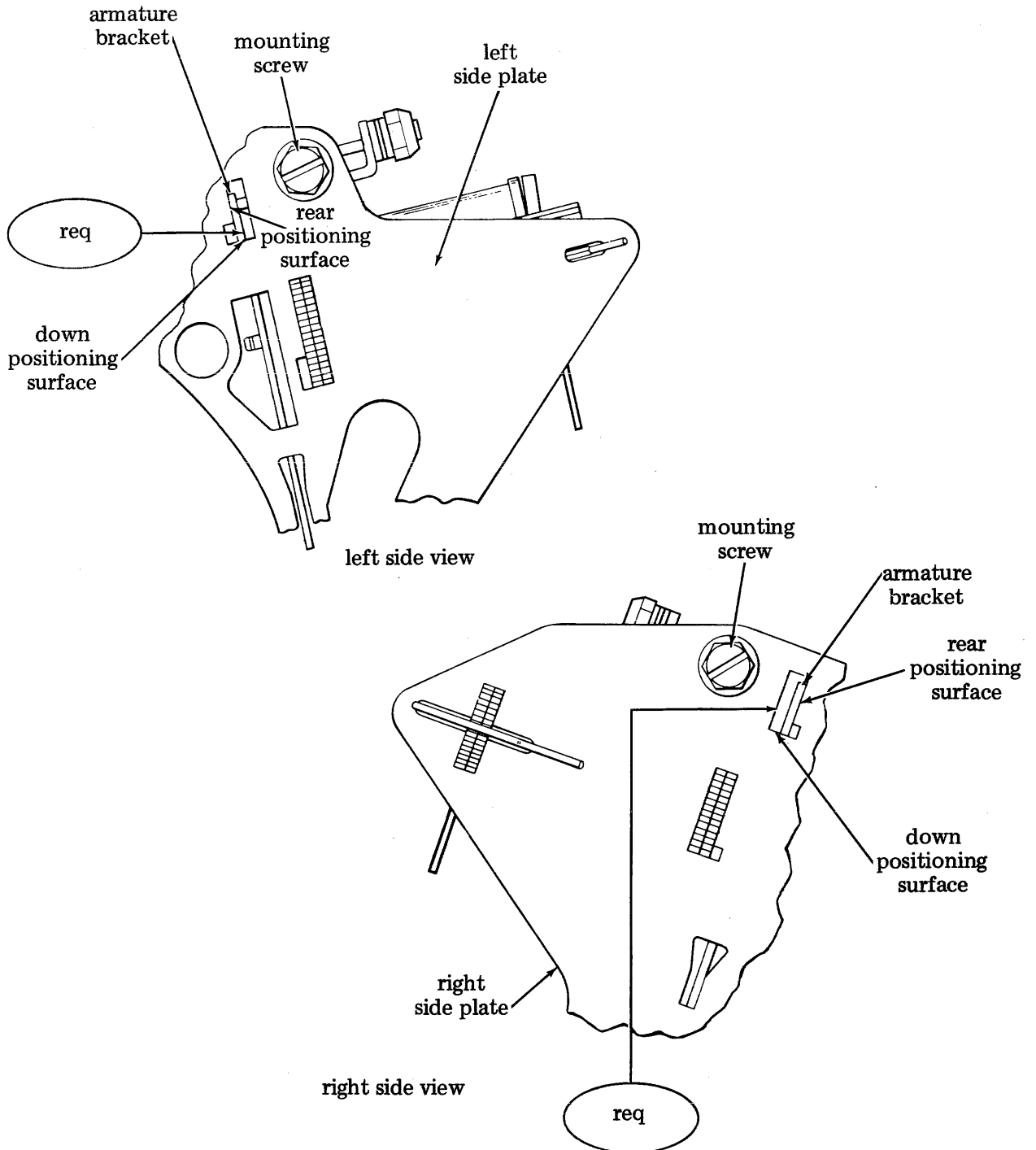


ARMATURE BRACKET POSITION — PRELIMINARY (SLA-2)

Requirement — Armature bracket against down and rear positioning surfaces (on both left and right side plates), and also parallel within 0.002 to the rear surfaces (measured at ends).

“Adjust” affects:
*ARMATURE SPRING
RECEIVING MARGINS
SHOE LEVER GAP AND TRIP LEVER
ENGAGEMENT (SLA-1)*

Adjust — Loosen two mounting screws.
Position armature bracket.
Tighten screws.



SHOE LEVER GAP AND TRIP LEVER ENGAGEMENT (SLA-1)

- Disengage selector clutch.
- Momentarily move armature rearward to trip selector clutch.
- Apply slight pressure against shoe lever (along its normal path of forward travel) to fully seat clutch shoes.

Requirement 1 — 0.055 to 0.085 between trip lever and shoe lever edges.

NOTE: On units so equipped, align trip lever notch or scribed line with edge of shoe lever.

- Disengage selector clutch.

Requirement 2 — 0.015 between shoe lever and stop-lug.

Trip lever should engage at least 2/3 thickness of shoe lever.

Adjust — Loosen (friction tight) clamp screw.
Use pry points to position trip lever.
Tighten clamp screw.

“Adjust” affects:
RECEIVING MARGINS

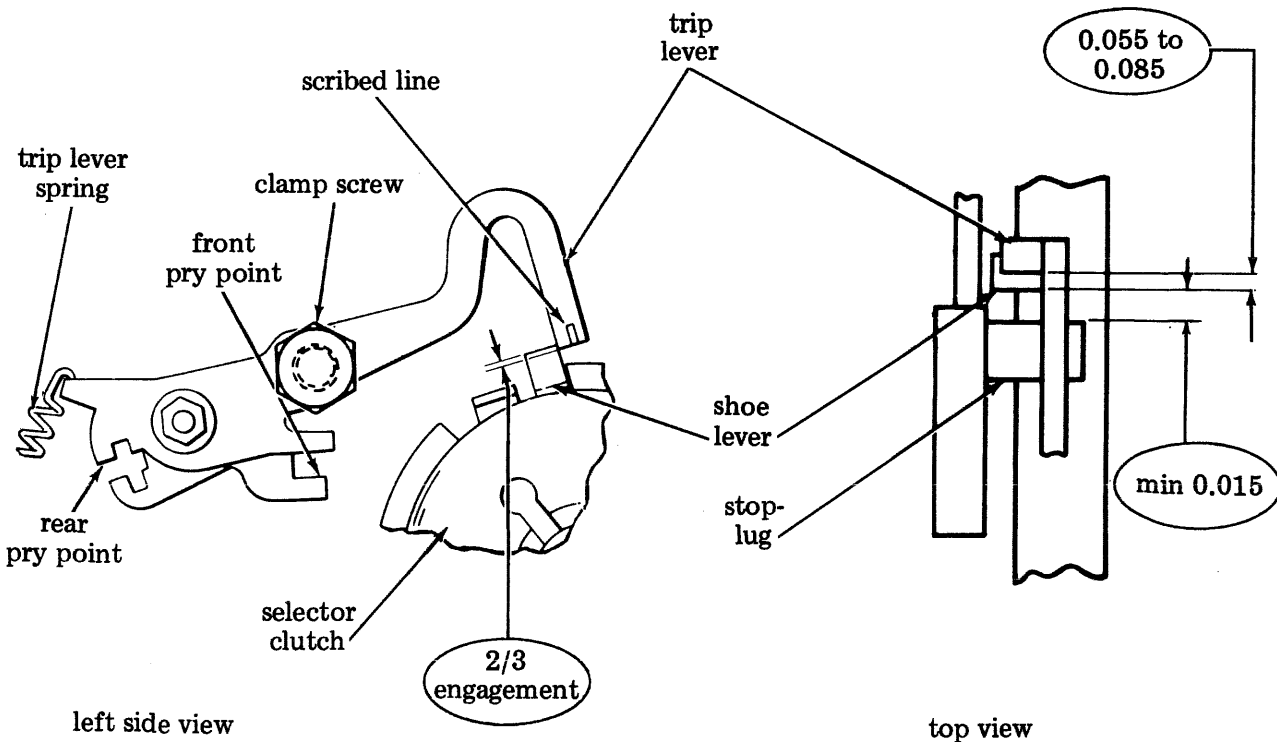
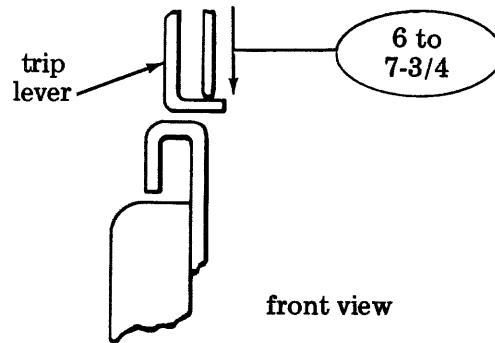
“Requirement” affected by:
ARMATURE BRACKET POSITION

TRIP LEVER SPRING

- Place typing unit in stop condition.
- Hold shoe lever away from trip lever.

Requirement — 6 to 7-3/4 to start trip lever moving.

NOTE: Before replacing TRIP LEVER SPRING, check that START LEVER SPRING and LATCHLEVER SPRING meet their requirement.



ARMATURE SPRING

NOTE: Do not perform this adjustment if the **RECEIVING MARGINS** adjustment requirements are met.

- Place typing unit in stop condition.
- Position carriage near right margin.
- Remove armature clip.
- Rotate selector clutch until start lever, selector levers, and spacing locklever do not contact armature.

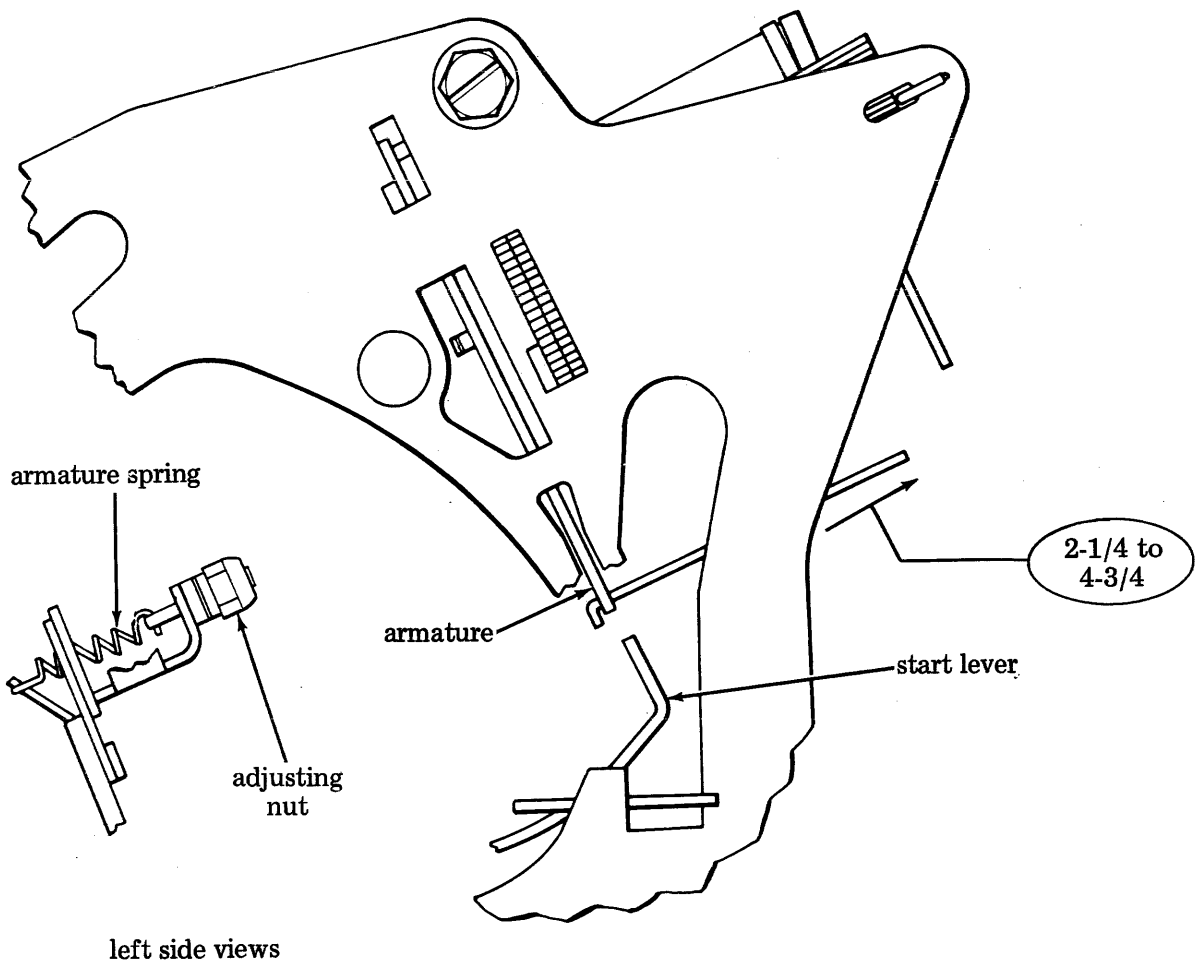
Requirement — 2-1/4 to 4-3/4 to pull armature to midpoint of travel.

Adjust — To increase armature tension: rotate adjusting nut clockwise.

To decrease armature tension: rotate adjusting nut counterclockwise.

“Adjust” affects:
RECEIVING MARGINS

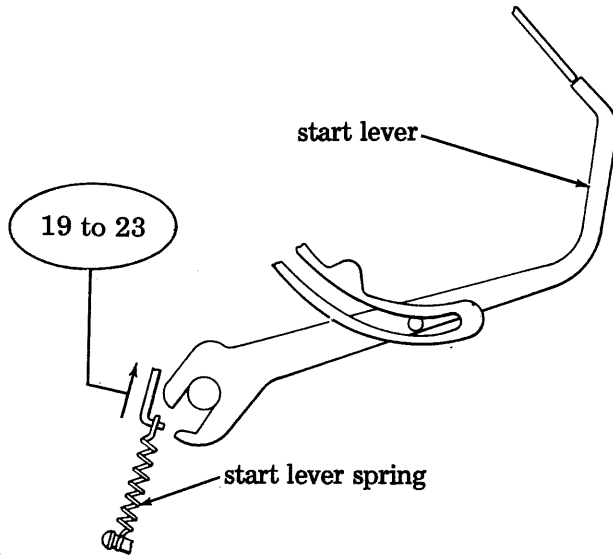
“Requirement” affected by:
ARMATURE BRACKET POSITION — PRELIMINARY (SLA-2)



START LEVER SPRING

- Place typing unit in stop condition.

Requirement — 19 to 23 to pull start spring to installed length.

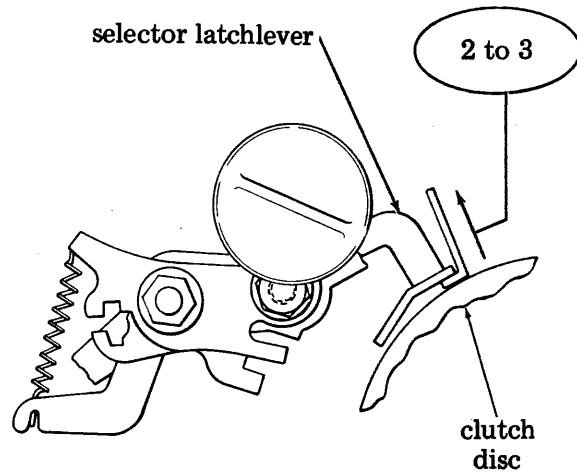


left side views

LATCHLEVER SPRING

- Position selector latchlever on high of clutch disc.

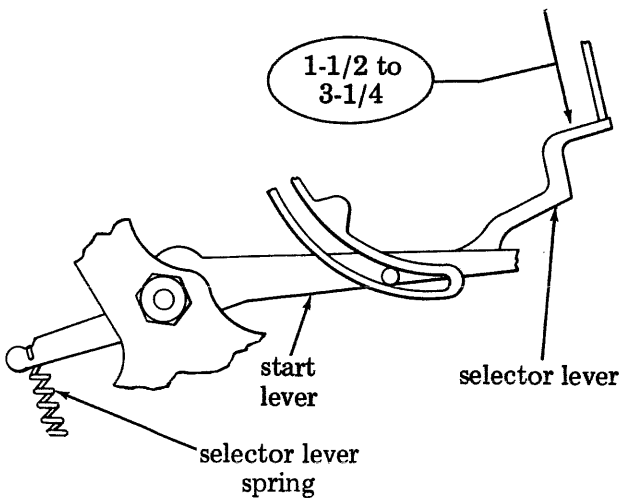
Requirement — 2 to 3 to start selector latchlever moving.



SELECTOR LEVER SPRINGS

- Set up an all spacing code combination in selector.
- Rotate main shaft until typing unit is in stop condition.
- Check each spring.

Requirement — 1-1/2 to 3-1/4 to start selector lever moving.

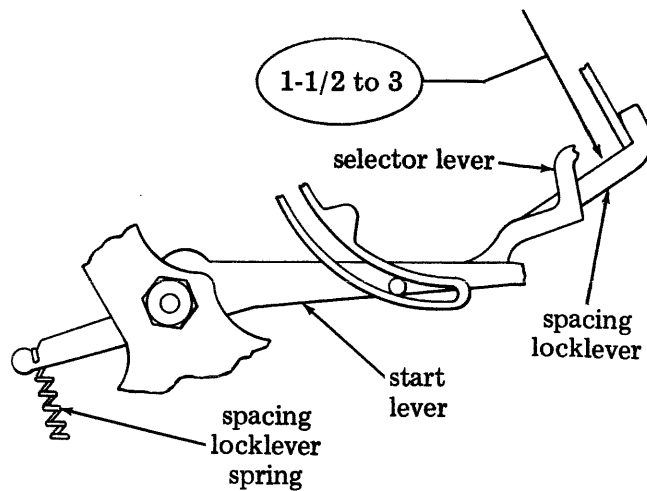


left side views

SPACING LOCKLEVER SPRING

- Set up an all spacing code combination in selector.
- Rotate main shaft until typing unit is in stop condition.

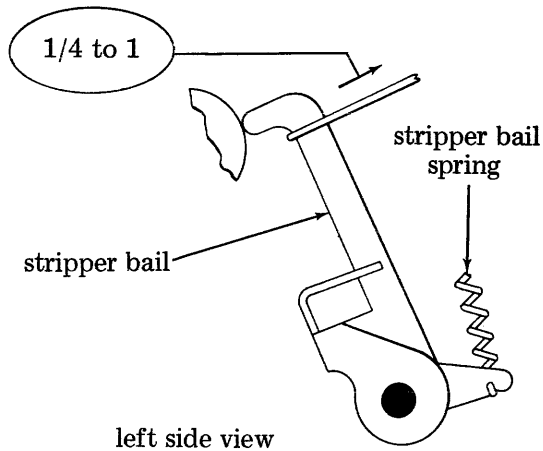
Requirement — 1-1/2 to 3 to start locklever moving.



STRIPPER BAIL SPRING (CRA-16)

- Set range finder at 60.
- Set up an all spacing code combination in selector.
- Rotate main shaft until typing unit is in stop condition.

Requirement — 1/4 to 1 to start stripper bail moving.



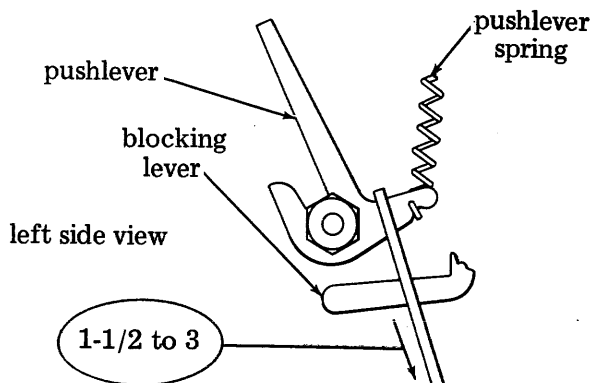
PUSHLEVER SPRINGS

NOTE: Check this spring tension only if there is good reason to suspect it will not meet its requirement.

CAUTION: BEFORE REMOVING SELECTOR CLUTCH ASSEMBLY, PLACE ARMATURE IN ITS SPACING POSITION AND USE 184098 TOOL TO POSITION SELECTOR LEVERS AWAY FROM CLUTCH ASSEMBLY.

- Remove selector mechanism.
- Position blocking lever away from pushlever.
- Check each spring.

Requirement — 1-1/2 to 3 to start pushlever moving.

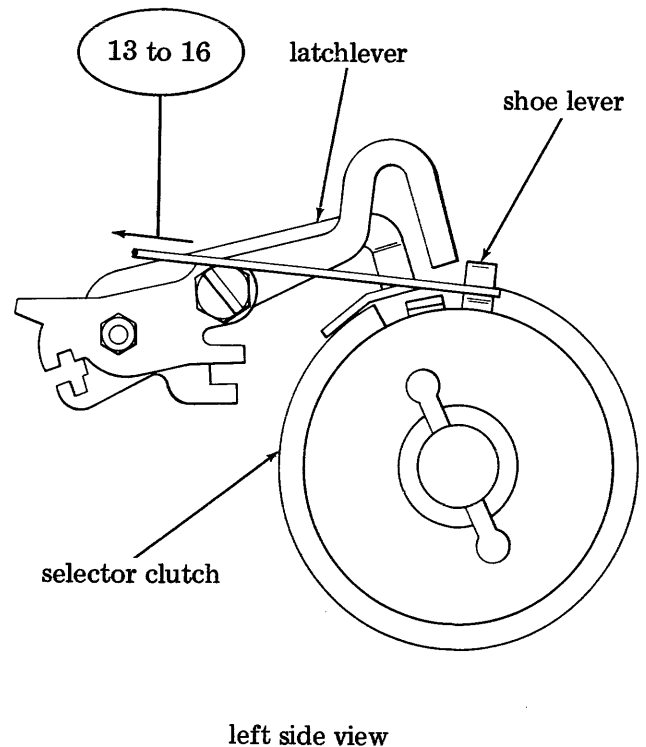


SELECTOR CLUTCH TORQUE

CAUTION: TAKE CARE TO PREVENT ELECTRICAL SHOCK WHEN WORKING WITH TYPING UNIT UNDER POWER.

- Use 185832 armature clip to hold armature in its attracted position.
- Connect typing unit to call control unit.
- Apply power to typing unit.
- Hold shoe lever with spring scale (as shown) while moving armature rearward to trip selector clutch.
- Allow clutch to advance until latchlever is disengaged.
- After checking requirement, remove all power connections.

Requirement — 13 to 16 to hold shoe lever.



MAIN SHAFT ROTATION (FNA-3)

NOTE: This requirement should be checked when related typing unit drive system adjustments are altered.

- Remove motor belt.
- Disengage all clutches.
- Check requirement.
- Replace motor belt.
- Again, check requirement.

Requirement — No excessive drag or binding detected while main shaft is manually rotated.

Adjust — Check the following adjustments:

GEAR BACKLASH (MRA-1)
BELT TENSION (MRA-2)
LEFT BEARING POSITION (MSA-1)
SELECTOR CAM ENDPLAY (MSA-2)
FUNCTION CLUTCH ENDPLAY (MSA-4)
CODEBAR CLUTCH ENDPLAY (MSA-5)
DRIVEN GEAR LINE-UP (MSA-6)
FORM FEED CLUTCH ENDPLAY — S (FOA-1)
SHOE LEVER GAP AND TRIP
LEVER ENGAGEMENT (SLA-1)
BEARING ALIGNMENT (FNA-2)

BEARING ALIGNMENT (FNA-2)

NOTE: Perform this adjustment only if the main shaft bearing, distributor shaft bearing, function rocker shaft bearing, or codebar reset bail bearing clamps have been loosened, or if a bind is detected in any of the associated shafts.

Requirement — Bearings aligned with their respective shaft.

Adjust — Main shaft and function rocker shaft bearings:

- Loosen center support bearing mounting screws.
- Loosen bearing clamps and position bearing using finger pressure while rotating associated shaft.
- Tighten clamp screws.
- If bind still exists, keep bearing clamp tightened and apply a light tap vertically to top of bearing clamp.
- Tighten center support bearing mounting screws.

Adjust — Distributor shaft and codebar reset bearings:

- Loosen bearing clamps and position bearing using finger pressure while rotating associated shaft. Tighten clamp screws.
- If bind still exists, keep bearing clamp tightened and apply a light tap vertically to top of bearing clamp.

ROCKER SHAFT POSITION AND ENDPLAY (FNA-1)

Requirement 1 — Both bearings centered on base casting (gauge by eye).

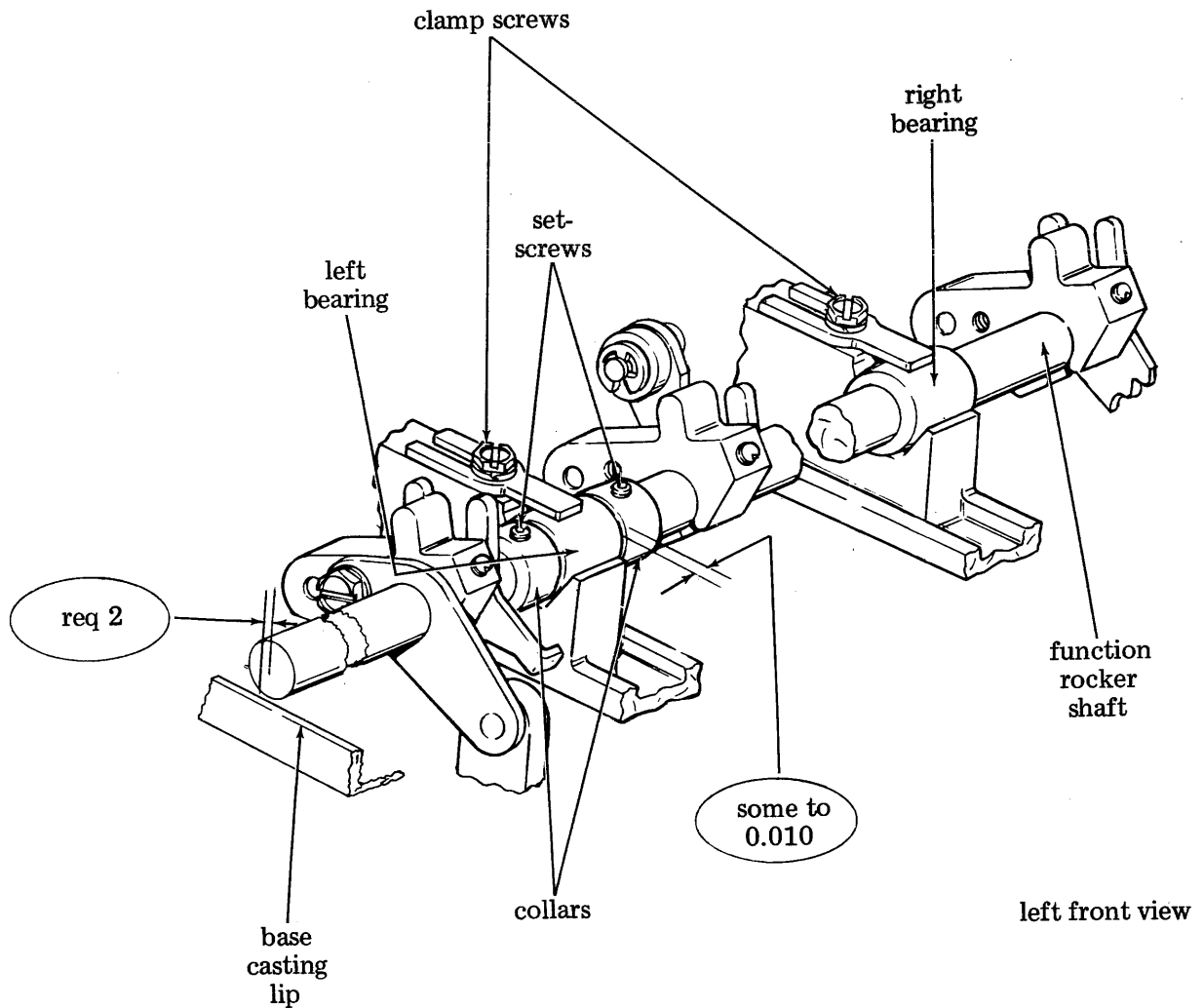
Adjust — Loosen collar setscrews and bearing clamp screws.
Position bearings.
Tighten clamp screws.

Requirement 2 — Left end of rocker shaft aligned with inside top edge of base casting lip with: 0.030 misalignment to the left permitted; 0.060 misalignment to the right permitted.

Requirement 3 — Some to 0.010 endplay in function rocker shaft.

Adjust — Loosen setscrews.
Position function rocker shaft and both collars.
Tighten setscrews.

“Adjust” affects:
CODEBAR RESET LEVER LINE-UP (FNA-4)
CODEBAR RESET LEVER POSITION (FNA-5)
PRINT SUPPRESSION LATCH — HORIZONTAL CLEARANCE (FNA-6)



**CODEBAR RESET LEVER LINE-UP
(FNA-4)**

- Place typing unit in stop condition.
- Center cam follower roller on reset cam (gauge by eye).

Requirement 1 — Maximum of 0.020 overhang permitted on right side only.

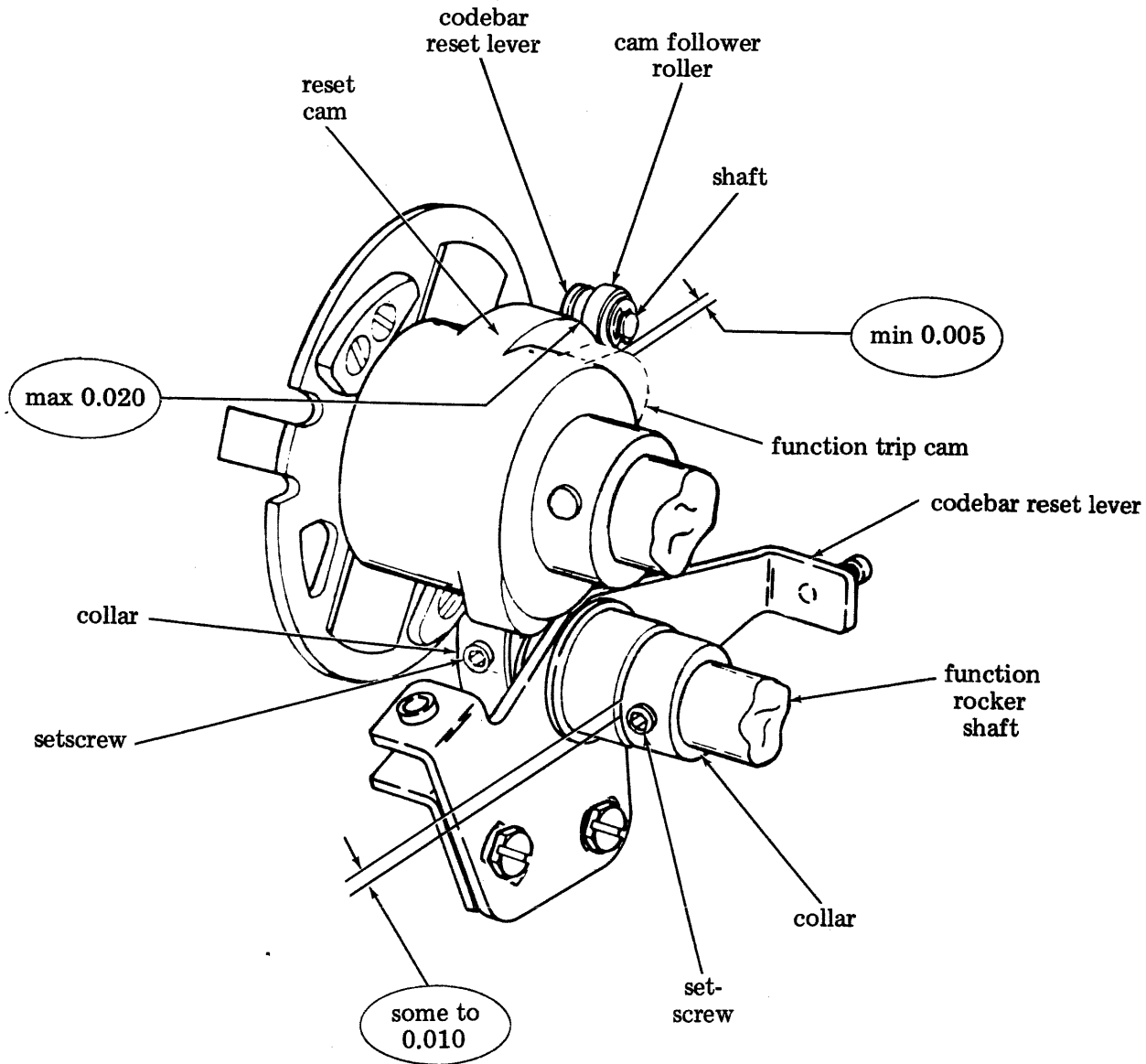
Requirement 2 — Some to 0.010 endplay in codebar reset lever.

Requirement 3 — At least 0.005 between cam follower roller shaft and function trip cam.

Adjust — Loosen setscrews.
Position both collars.
Tighten setscrews.

“Adjust” affects:
**CODEBAR RESET LEVER POSITION
(FNA-5)**

“Requirement” affected by:
**ROCKER SHAFT POSITION AND
ENDPLAY (FNA-1)
CODEBAR CLUTCH ENDPLAY (MSA-5)**



left rear view

**CODEBAR RESET LEVER POSITION
(FNA-5)**

- Place typing unit in stop condition.
- Position selector stripper bail forward to allow blocking levers to assume their spacing position.
- Take up play to minimize requirement 1 gap.

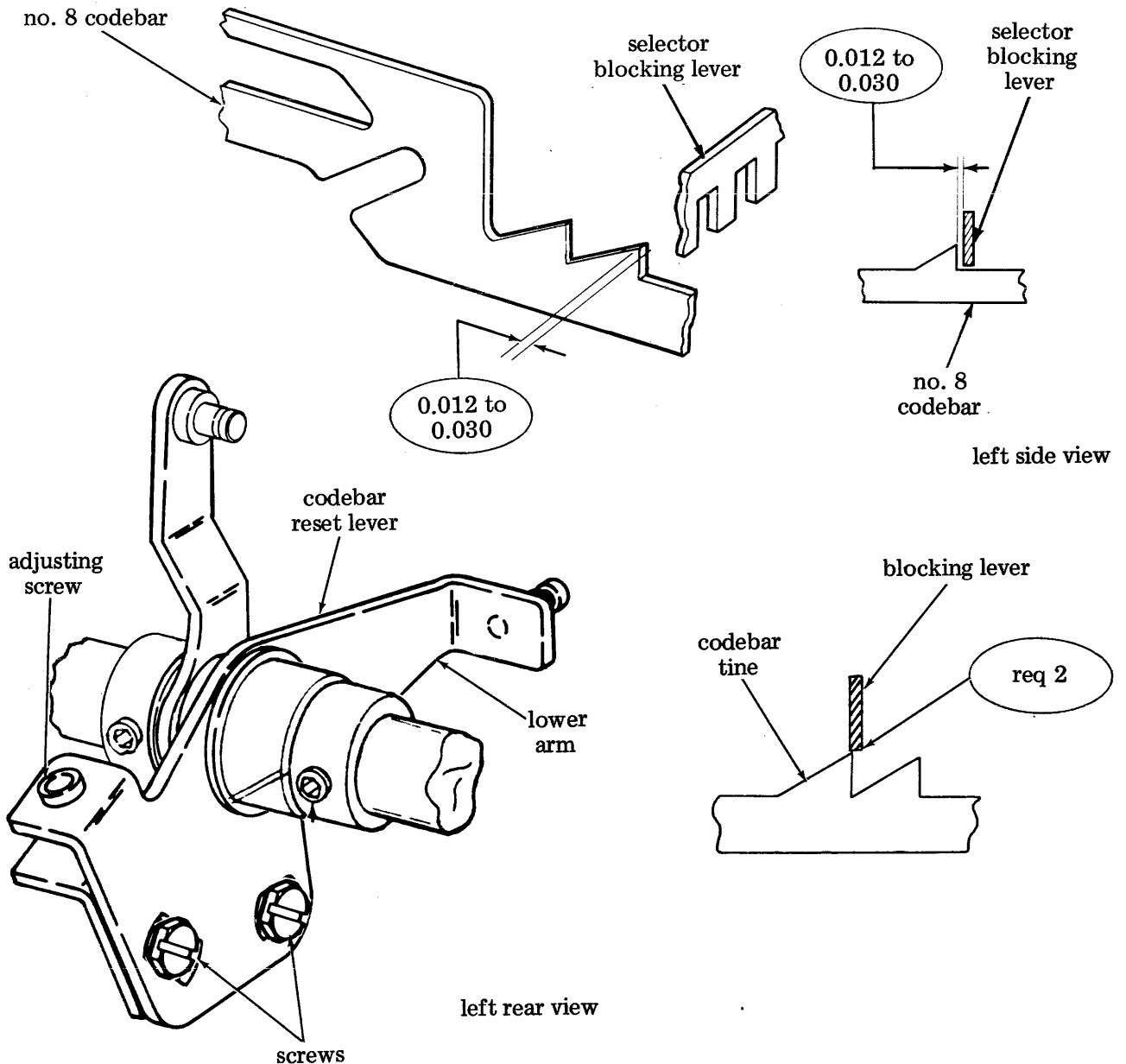
Requirement 1 — 0.012 to 0.030 between no. 8 codebar and its selector blocking lever.

Adjust — Loosen two screws on the codebar reset lever.
Adjust by turning adjusting screw.
Tighten clamp screws.

- Set up all marking code combination in selector.
- Trip codebar clutch and rotate main shaft until reset bail is in its leftmost position.
- Lift the no. 1 blocking lever to its upstop and release.

Requirement 2 — The second tine on the no. 1 codebar should bear against its selector blocking lever.

Adjust — Refine requirement 1. If requirement 2 cannot be met by refinement of requirement 1, bend lower arm of reset lever toward codebar reset bail. Recheck requirement.



**PRINT SUPPRESSION LATCH —
HORIZONTAL CLEARANCE (FNA-6)**

- Position typing unit in stop condition.

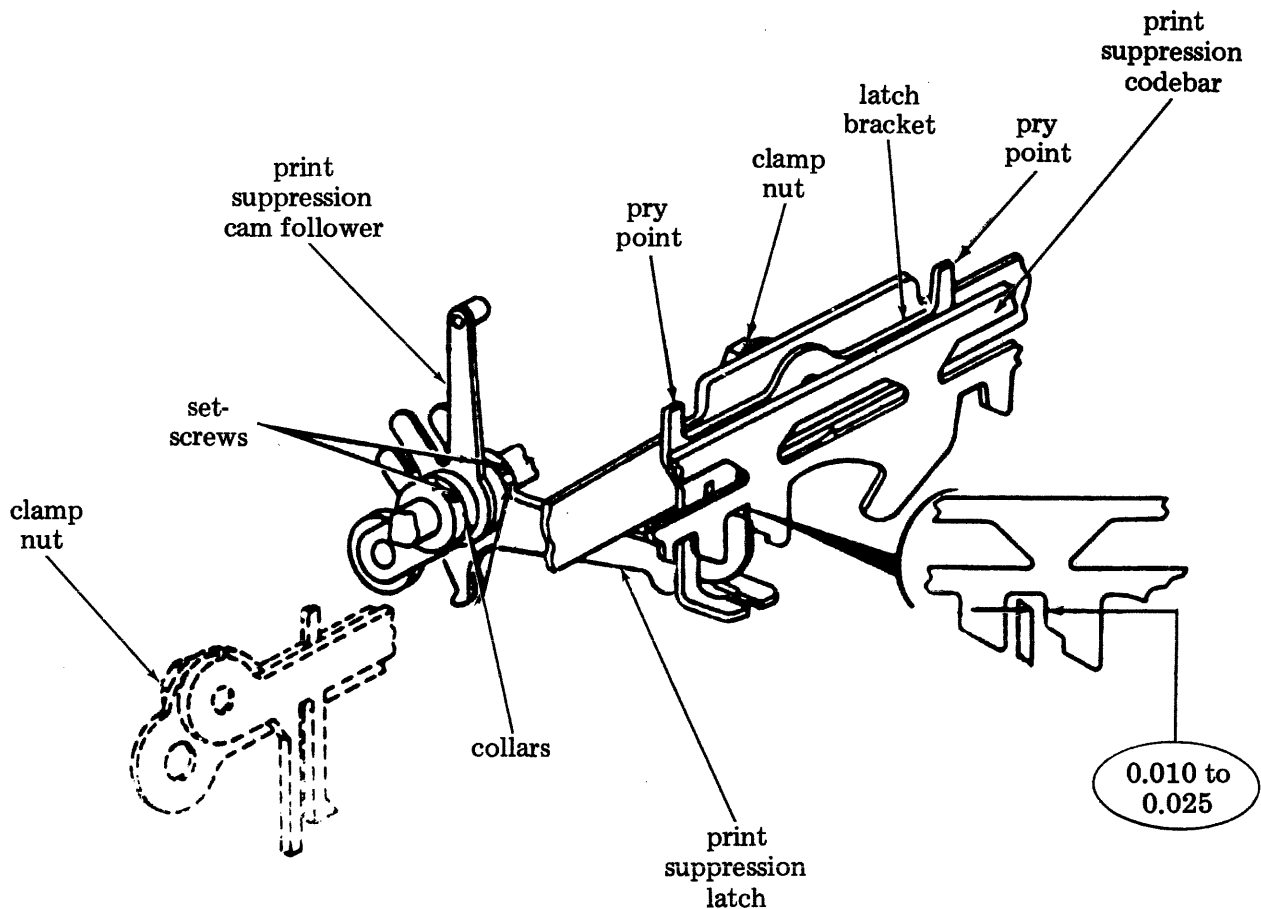
Requirement 1 — 0.010 to 0.025 between
print suppression latch and print
suppression codebar.

Requirement 2 — Print suppression cam
follower and latch move freely.

Adjust — Loosen clamp nuts and setscrews.
Use pry points to position latch bracket
to meet requirement 1.
Tighten clamp nuts.
Position collars to meet requirement 2.
Tighten setscrews.

“Adjust” affects:
*FUNCTION SHAFT AND CASTING
POSITION*

“Requirement” affected by:
*ROCKER SHAFT POSITION AND
ENDPLAY (FNA-1)
CODEBAR RESET LEVER POSITION
(FNA-5)*



left front view

**CODEBAR RESET GUIDE POSITION
(FNA-7)**

Requirement 1 — No noticeable curvature when codebars are viewed from their ends.

NOTE: Check the following only on units equipped with 181574 EOT function lever, 180801 universal function lever, or similar function levers.

- Set up an all marking code combination in selector.
- Rotate main shaft until function lever reaches its highest point of travel.
- Carefully take up play between function lever and codebars.

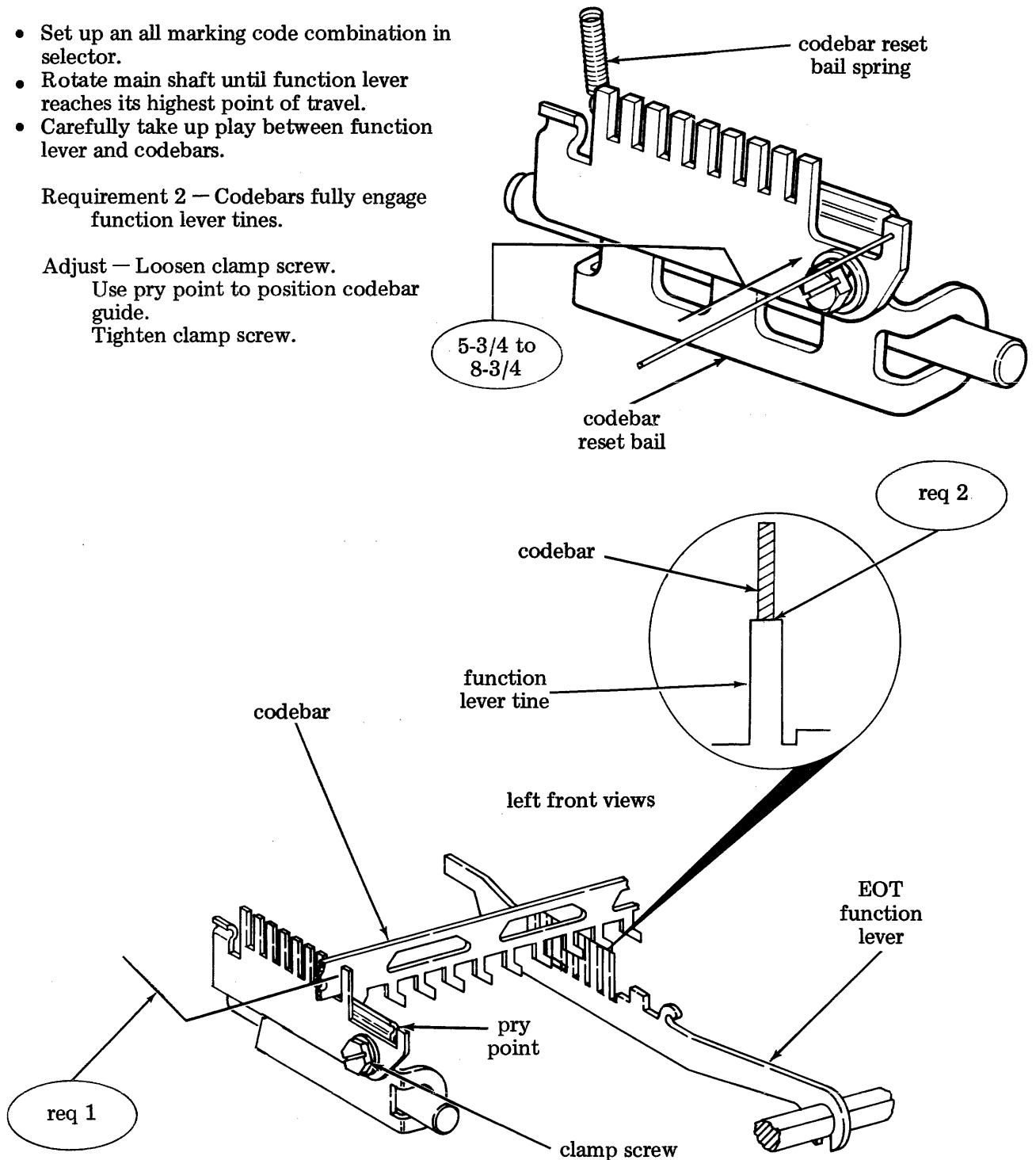
Requirement 2 — Codebars fully engage function lever tines.

Adjust — Loosen clamp screw.
Use pry point to position codebar guide.
Tighten clamp screw.

CODEBAR RESET BAIL SPRING

- Set up an all spacing code combination in selector.
- Rotate main shaft until codebar reset bail is in its highest position.

Requirement — 5-3/4 to 8-3/4 to start codebar reset bail moving.



**SELECTOR BLOCKING LEVERS
POSITIONING (FNA-8)**

- Set range finder at 80.
- Set up all marking code combination in selector.
- Rotate main shaft until no. 1 codebar (left end) is flush with no. 1 blocking lever (left outer edge).

Requirement 1 — 0.006 to 0.050 between no. 1 blocking lever and its codebar.

Requirement 2 — At least 0.003 between remaining blocking levers and associated codebars.

- Hold armature forward (marking position).
- Rotate main shaft until selector clutch shoe lever passes 12 o'clock position and reaches 3 o'clock position.

Requirement 3 — No visible vertical motion of no. 1 or no. 2 blocking levers as shoe lever passes from 12 to 3 o'clock positions.

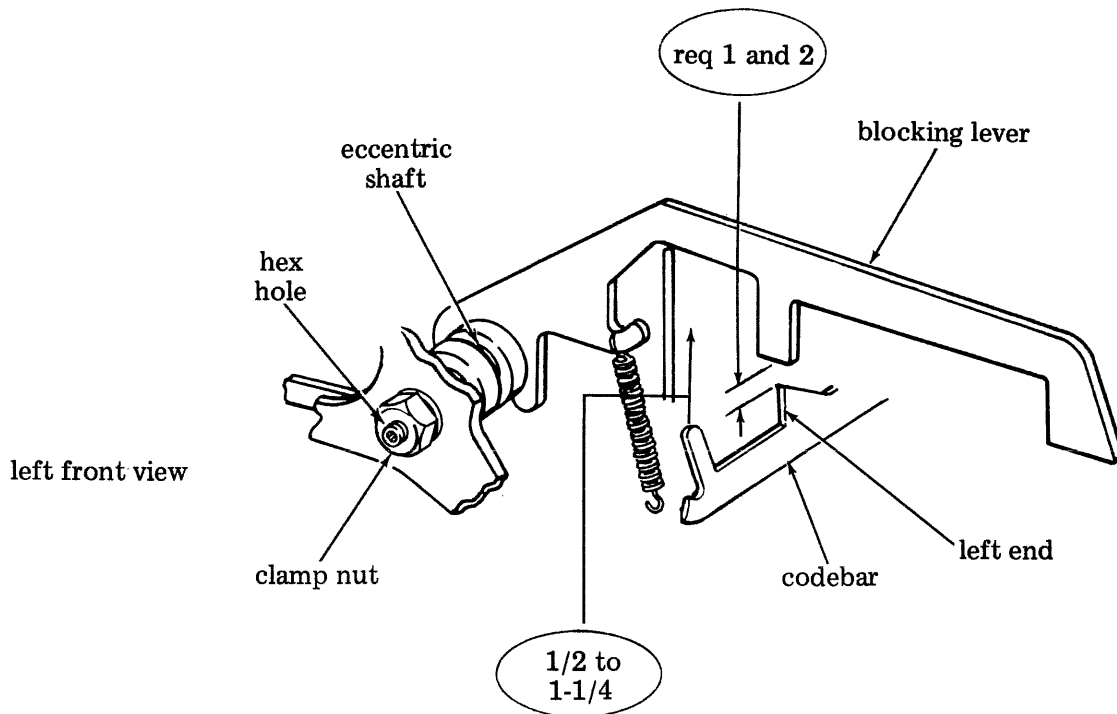
Adjust — Loosen clamp nut.
Use hex key wrench to position eccentric — keep eccentric high toward rear of typing unit.
Tighten clamp nut.

“Adjust” affects:
CODEBAR GUIDE POSITION

BLOCKING LEVER SPRINGS

- Set up all spacing code combinations in selector.
- Rotate main shaft until typing unit is in stop condition.
- Check each spring.

Requirement — 1/2 to 1-1/4 to start blocking lever moving.



CODEBAR GUIDE POSITION (FNA-19)

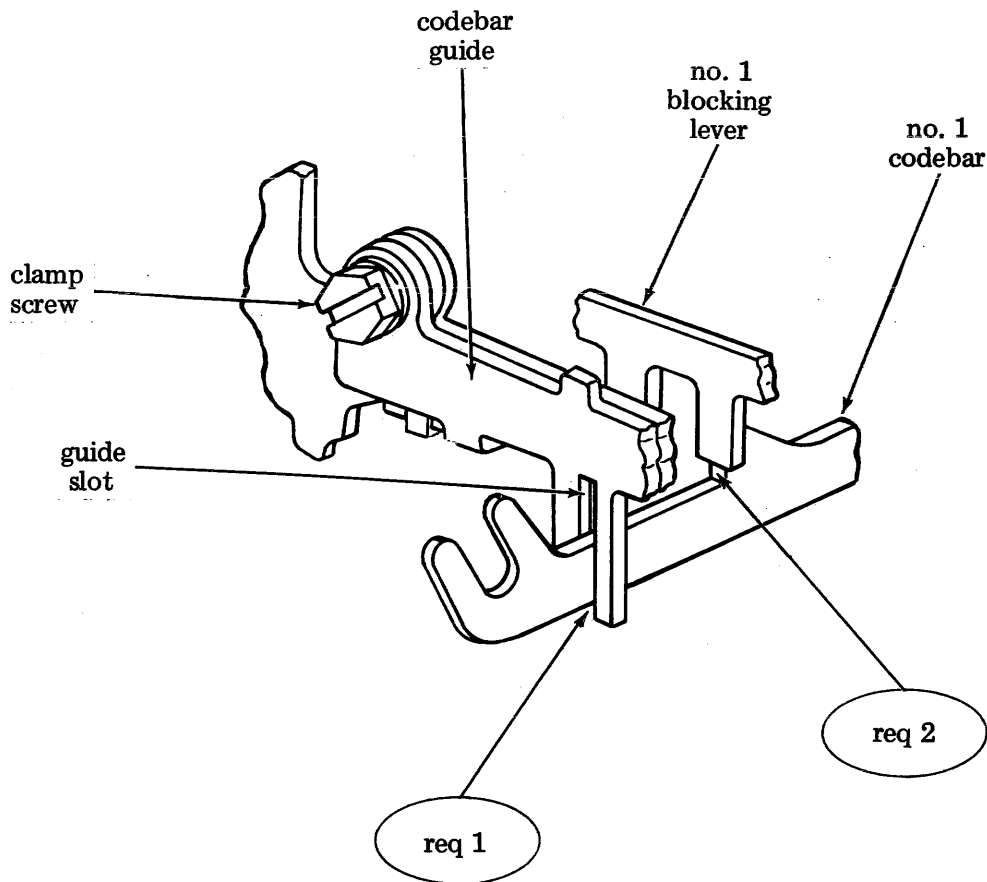
- Place typing unit in stop condition.
- Turn main shaft to place no. 1 blocking lever in its lowest position.

Requirement 1 — No. 1 codebar centrally located in guide slot (gauge by eye).

Requirement 2 — No. 1 blocking lever engages full thickness of no. 1 codebar.

Adjust — Loosen clamp screw.
Position codebar guide.
Tighten clamp screw.

“Requirement” affected by:
**SELECTOR BLOCKING LEVERS
POSITIONING (FNA-8)**



left front view

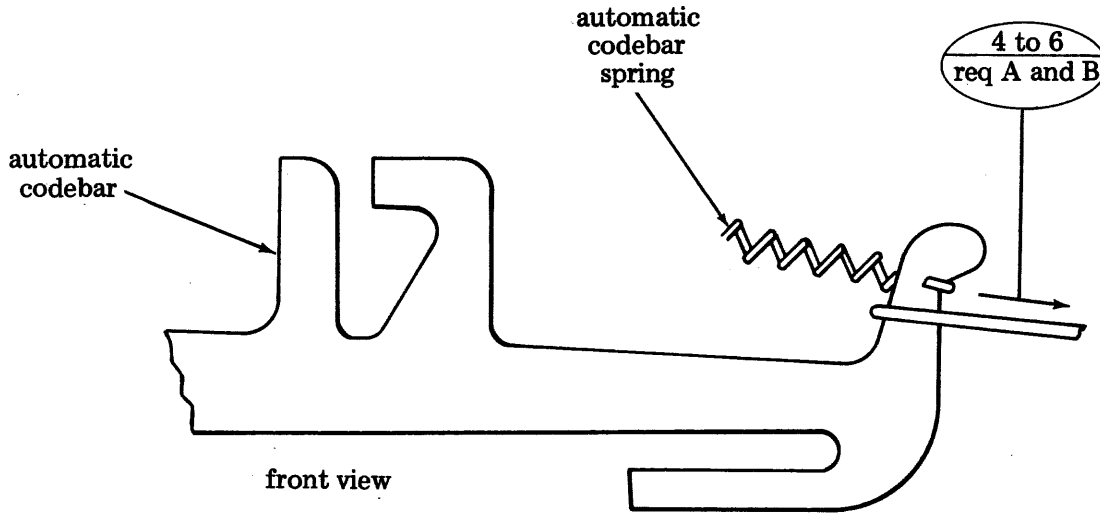
AUTOMATIC CODEBAR SPRING

- Carriage at left margin.

Requirement — (Wide Platen Printer): 4 to 6 to start automatic codebar moving.

Requirement — (Standard Platen Printer):

- A. 180948 automatic codebar; 1/2 to 1-3/4 to start codebar moving.
- B. 183495, 183496, 183497 automatic codebars; 2 to 3 to start codebar moving.

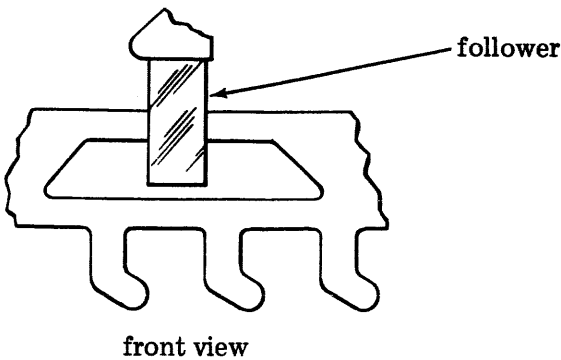


PRINT SUPPRESSION AND NO. 4 CODEBAR SPRING

- Printer in stop condition.
- No. 4 codebar follower on carriage lifted.

Requirement — 12 to 15 to start codebar moving.

NOTE: Check the print suppression and no. 4 codebar spring.

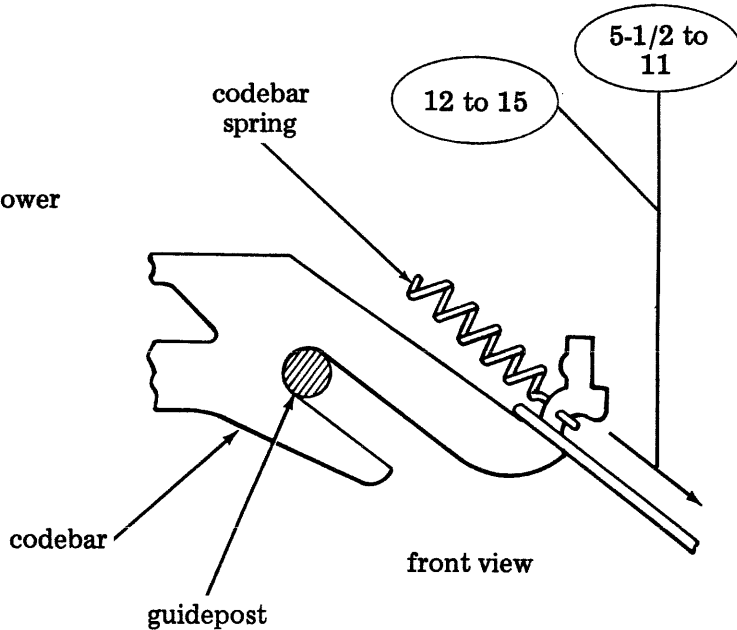


CODEBAR SPRINGS

NOTE: Check each codebar spring other than automatic, print suppression, and no. 4.

- Printer in stop condition.
- Codebar follower lifted.

Requirement — 5-1/2 to 11 to start codebar moving.



FUNCTION PAWL SPRING

- Printer in stop condition.
- Remove all external loads which would affect the requirement.

Pawl	49420	86283	180863
Spring (26 turns)	(38 turns)	(33 turns)	

9 to 13 1-1/4 to 2-1/2 3 to 5-1/2

To start each function pawl moving.

Check each pawl spring.

180863 — carriage return

86283 — answer-back blocking function
pawl

49420 — BELL and EOT

49420 or 86283 — All other function pawl
springs.

LEFT ROCKER DRIVE (FNA-9)

- Set up carriage return code in selector (1-34--8).
- Rotate main shaft until function clutch is in position "A."
- Take up carriage return function lever play in an upward direction to minimize clearance.

Requirement — 0.015 to 0.050 between carriage return function lever and its function pawl.

Adjust — Loosen clamp screw.

Use pry point to adjust rocker drive arm.

Tighten clamp screw.

"Adjust" affects:

RIGHT ROCKER DRIVE (FNA-10)

CARRIAGE RETURN LEVER — LATCH CLEARANCE (SPA-6)

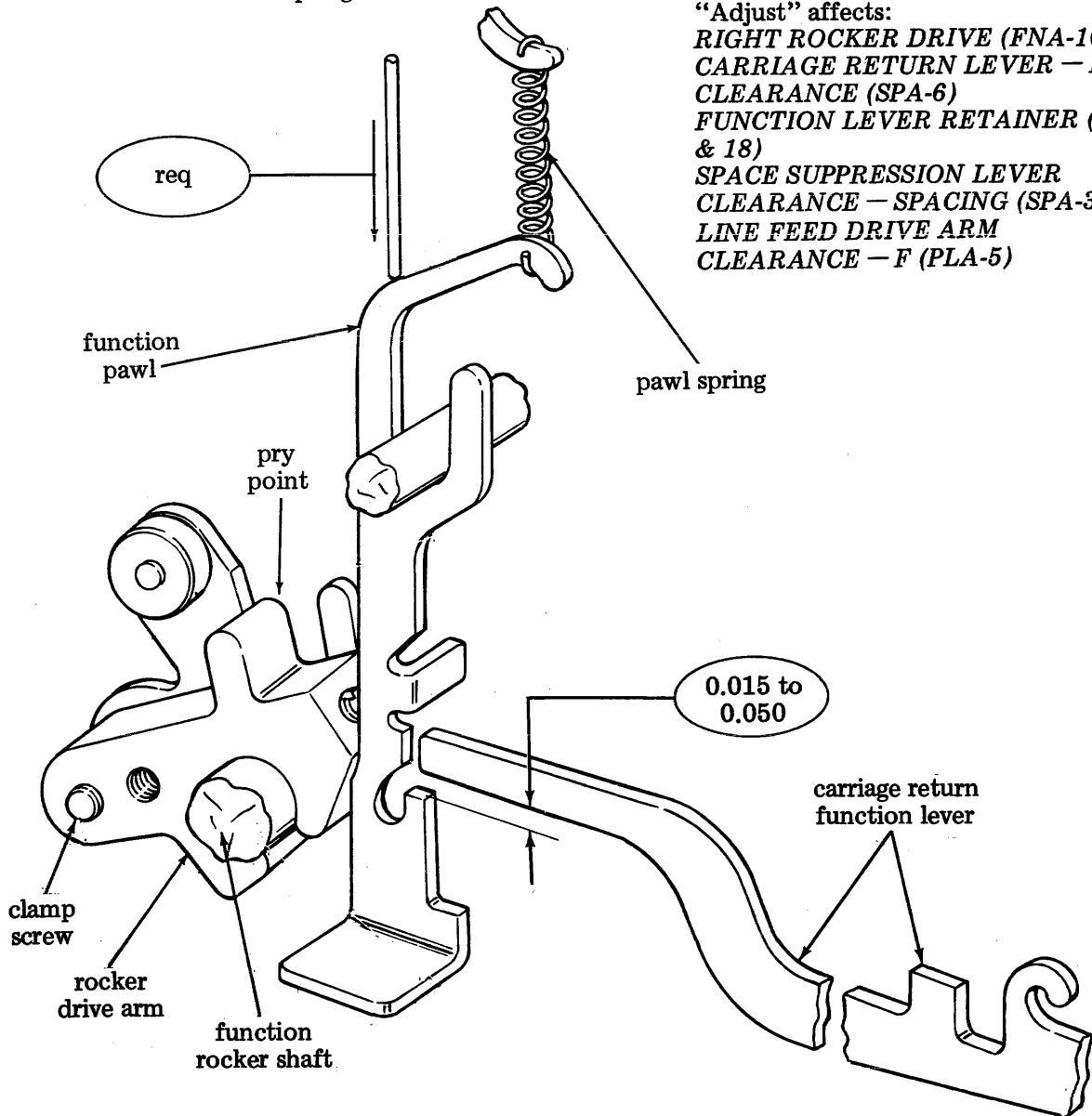
FUNCTION LEVER RETAINER (FAN 17 & 18)

SPACE SUPPRESSION LEVER

CLEARANCE — SPACING (SPA-3)

LINE FEED DRIVE ARM

CLEARANCE — F (PLA-5)



left front view

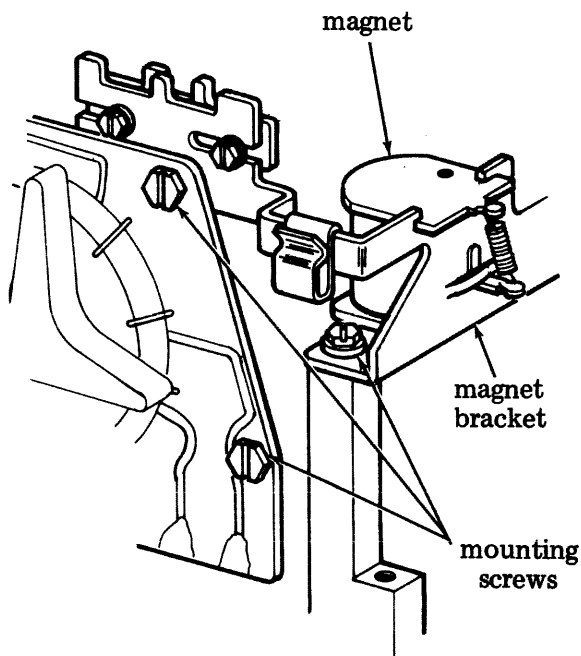
TRIP MAGNET POSITION (ABA-10)

NOTE: This adjustment applies only to typing units equipped with an answer-back trip mechanism.

Requirement — Position magnet bracket as far forward and to the left (on its base casting post) as possible.

Adjust — Loosen three mounting screws.
Position magnet bracket.
Tighten screws.

“Adjust” affects:
TRIP LEVER OVERTRAVEL AND
ARMATURE GAP (ABA-11)
TRIP LEVER ADJUSTING TAB
CLEARANCE (ABA-3)
TRIP MAGNET (Section 574-424-700TC)
CHARACTER SUPPRESSION CONTACT
WIRE GAP (ABA-9)

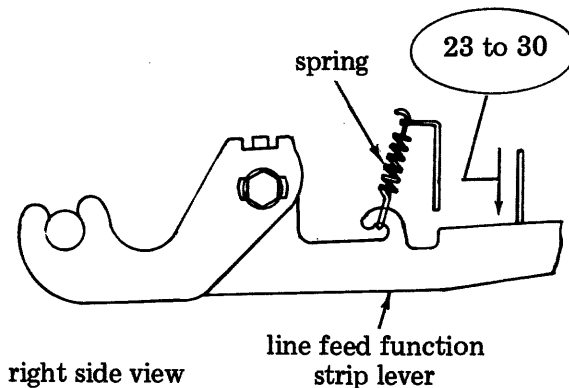


right rear side view

LINE FEED FUNCTION STRIP LEVER SPRING

- Position spring scale on line feed function strip lever.

Requirement — 23 to 30 to start the function strip lever moving.



right side view

FUNCTION LEVER SPRING

- Check the following requirements to start each function lever moving.

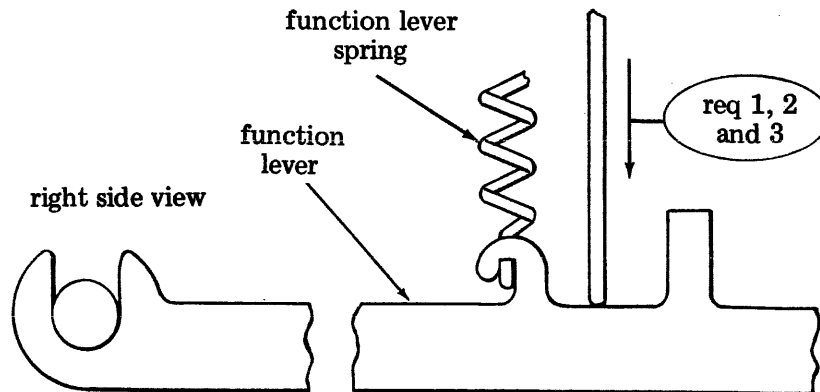
Requirement 1 — 19 to 24 to start LF, AUTO LF, ESCAPE, RIBBON BLOCKING LEVER, END OF LINE BELL, and AUTOMATIC CARRIAGE RETURN function levers moving.

NOTE 1: Hold blocking pawl up when checking this requirement.

Requirement 2 — 3-1/2 to 5-1/2 to start carriage return function lever moving.

NOTE 2: Hold carriage return lever in forward position.

Requirement 3 — 3-1/2 to 5-1/2 to start remaining function levers moving.



right side view

RIGHT ROCKER DRIVE (FNA-10)

- Disengage distributor clutch.
- Set up ENQ in selector (1-3----). See *NOTE*.
- Rotate main shaft until function clutch is in position "A."
- Make sure distributor clutch has not been tripped.
- Take up answer-back function lever play in an upward direction at the pivot to minimize clearance.

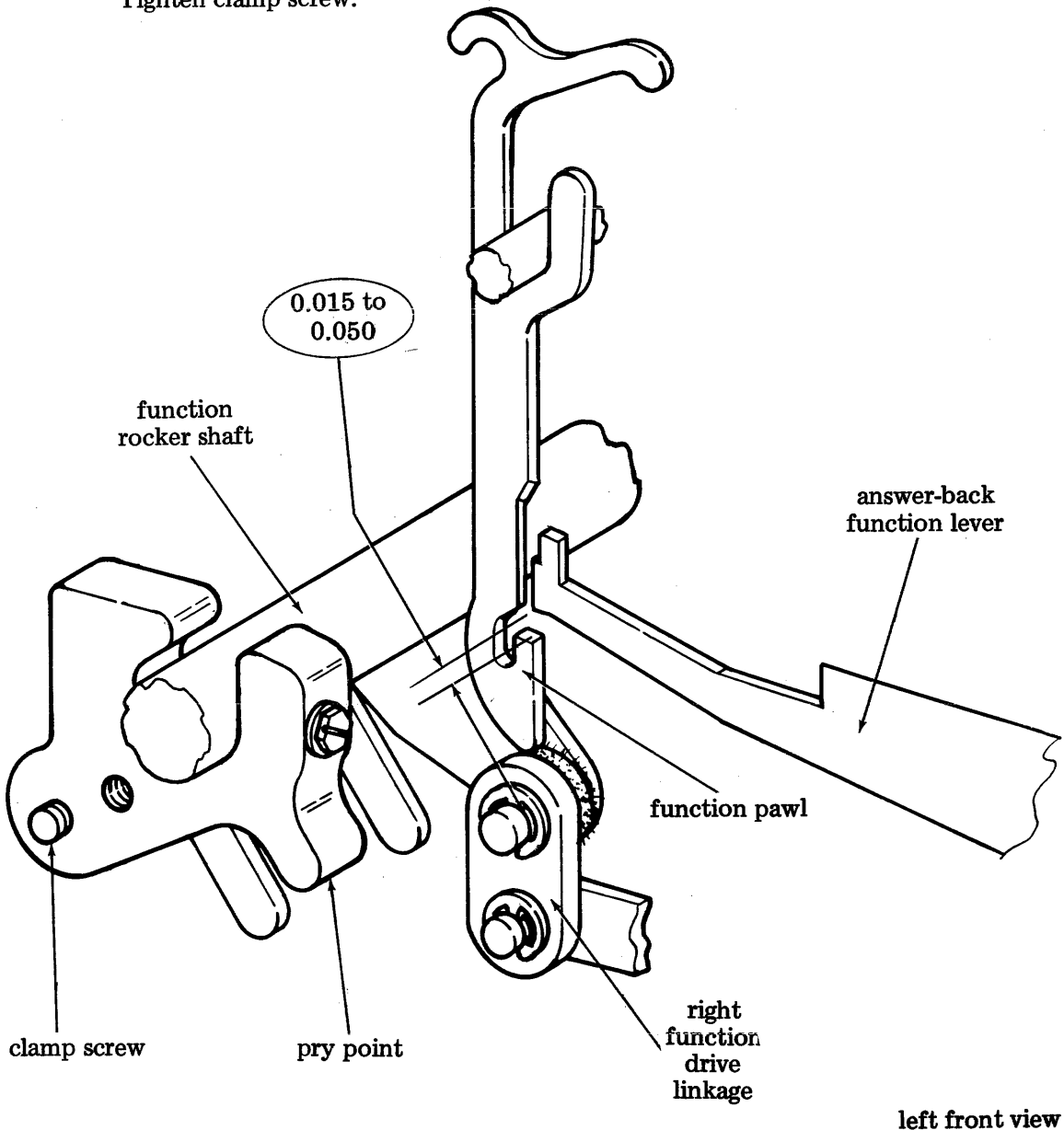
Requirement — 0.015 to 0.050 between function lever and its function pawl.

Adjust — Loosen clamp screw.
Use pry point to adjust right rocker arm.
Tighten clamp screw.

"Adjust" affects:
FORM OUT LEVER OVERTRAVEL — S (FOA-7)
LINE FEED PAWL STRIPPING — S (TRIPBAIL POSITIONING (ABA-8))

"Requirement" affected by:
LEFT ROCKER DRIVE (FNA-9)

NOTE: If printer is not equipped with the answer-back feature, select a code combination which will permit the right-most function lever to be selected. Rotate main shaft until function clutch is in position "A."

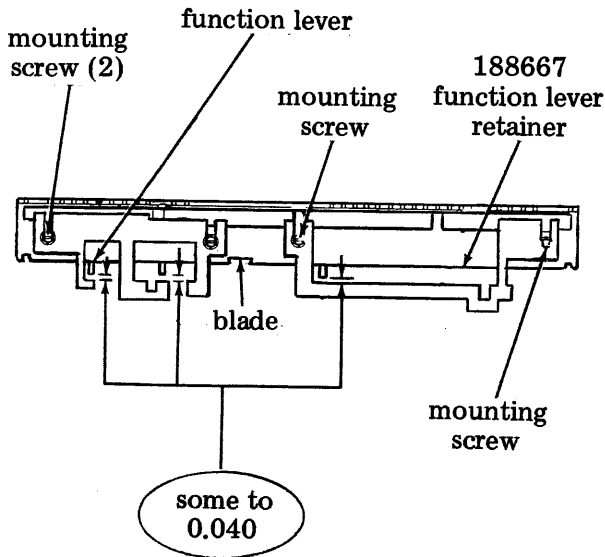


FUNCTION LEVER RETAINER (FNA-17)

- All spacing code in selector.
- Manually operate printer until function clutch is in position "A."

Requirement — Some to 0.040 between function lever retainers and function levers at closest point.

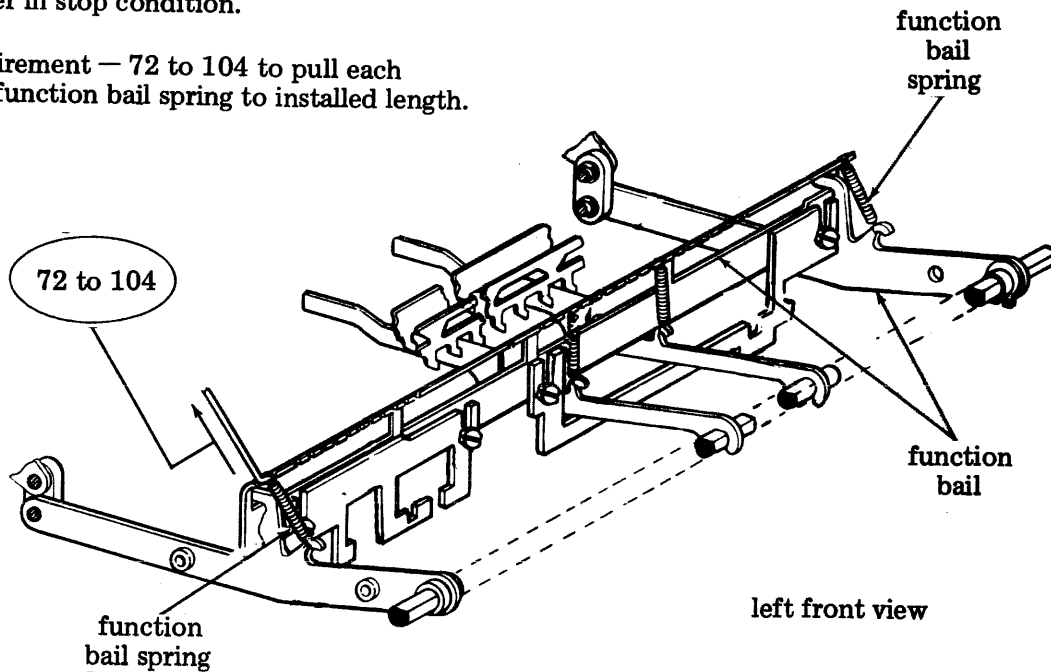
Adjust — Loosen mounting screws.
Position retainers.
Tighten screws.



FUNCTION BAIL SPRING

- Printer in stop condition.

Requirement — 72 to 104 to pull each function bail spring to installed length.



STRIPPER BAIL CLEARANCE

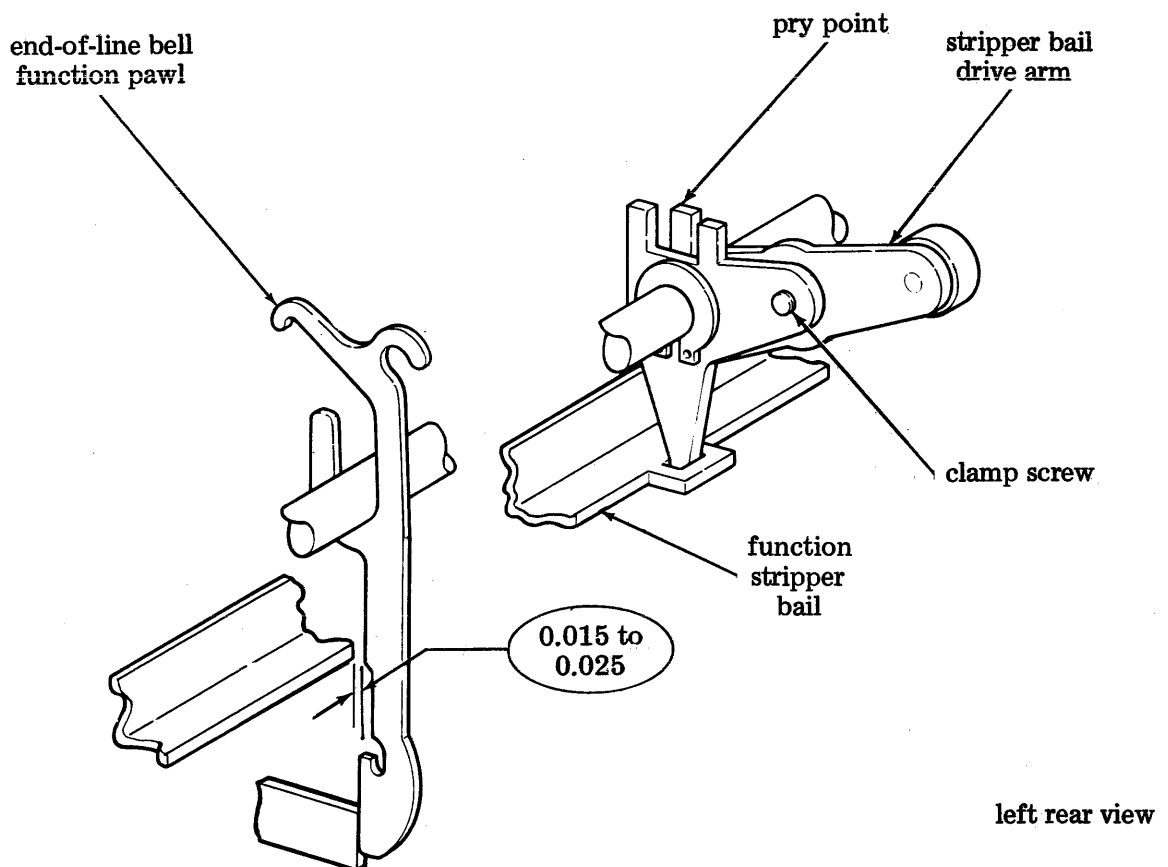
- Printer in stop condition.

Requirement — 0.015 to 0.025 between function stripper bail and edge of stripped end of line bell function pawl.

NOTE: For printers not equipped with end-of-line bell function pawl, check requirement at the 180792 function pawl closest to slot "F" in function casting.

Adjust — Loosen clamp screw.
Use pry point to position stripper bail drive arm.
Tighten clamp screw.

"Adjust" affects:
**LINE FEED STRIPPER PLATE
CLEARANCE — F (PLA-9)**



**PRINT SUPPRESSION LATCH —
VERTICAL CLEARANCE (FNA-12)**

- Printer in stop condition.
- Print suppression cam follower roller resting on its cam.

Requirement — 0.015 to 0.050 between print suppression latch and print suppression codebar.

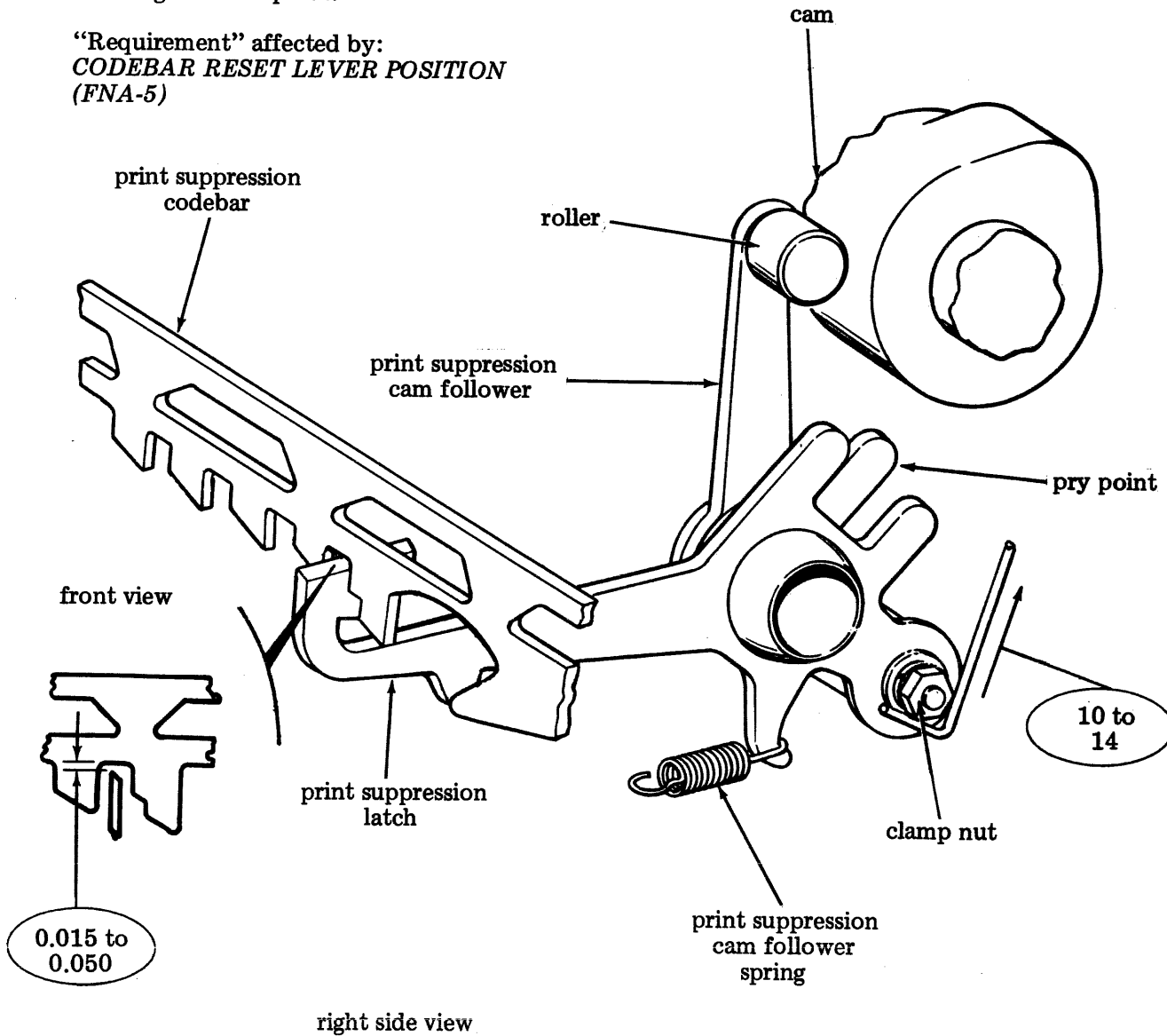
Adjust — Loosen clamp nut.
Using pry point, position print suppression cam follower.
Tighten clamp nut.

“Requirement” affected by:
CODEBAR RESET LEVER POSITION (FNA-5)

PRINT SUPPRESSION CAM FOLLOWER SPRING

- Printer in stop condition.

Requirement — 10 to 14 to start print suppression cam follower moving.



FUNCTION SHAFT AND CASTING POSITION (FNA-13)

Requirement 1 — Some to 0.010 between stripper bail cam follower and left side of slot in function casting.

Adjust — Loosen clamp screws and position shaft.

Requirement 2 — The shaft should be in contact with, or not more than 0.003 away from the vertical surface at the center of the function casting.

Adjust — With center and two end clamp screws loosened, position to meet requirements 1 and 2 .

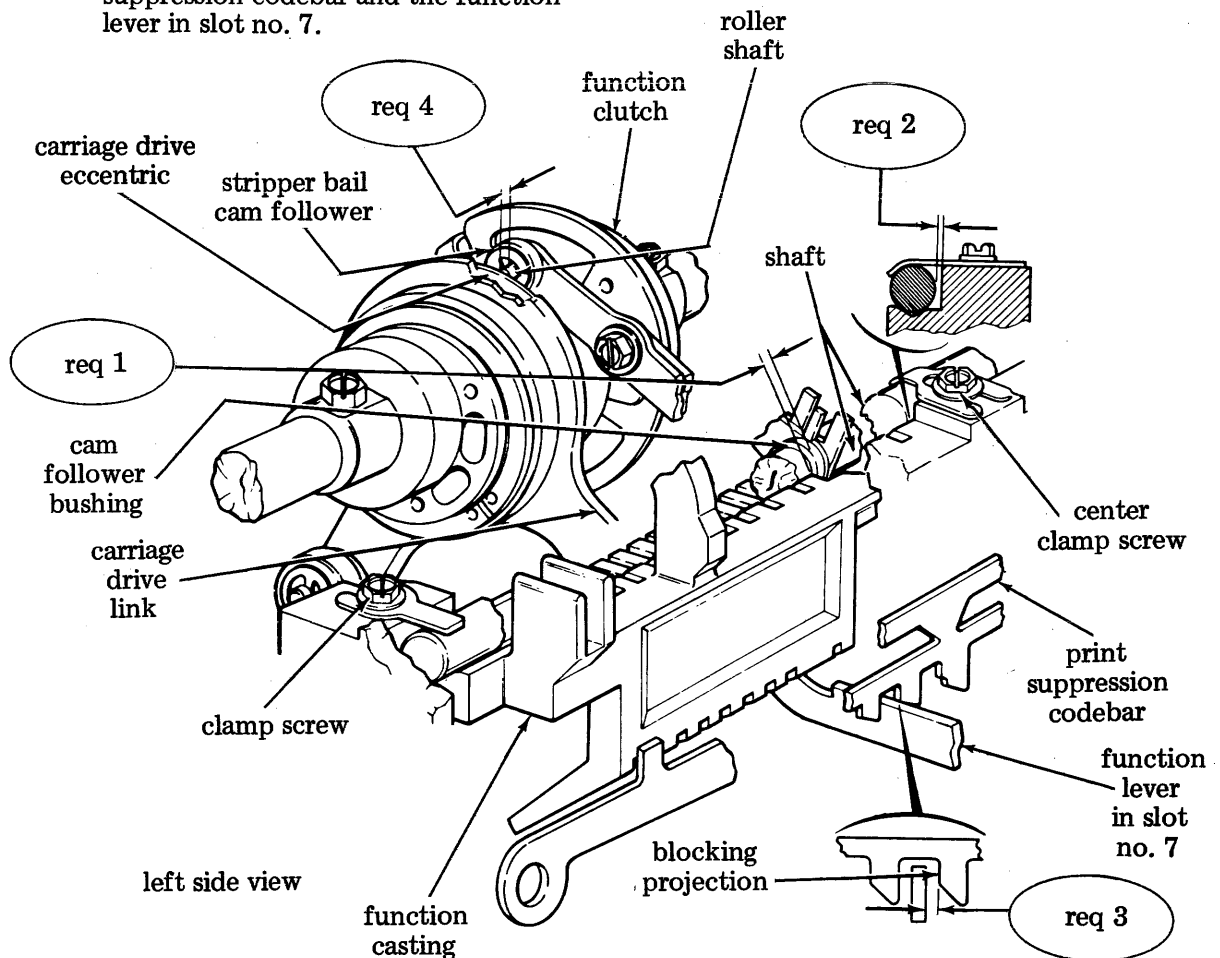
- Manually set up BELL (1238)
- Rotate main shaft until suppression cam follower just begins to rise on its cam.

Requirement 3 — 0.030 to 0.050 between blocking projection on print suppression codebar and the function lever in slot no. 7.

Requirement 4 — Minimum 0.005 between carriage drive eccentric and roller shaft on stripper bail cam follower with play taken up to make clearance a minimum.

Adjust — Loosen two end clamp screws. Position casting to meet requirements 3 and 4. Tighten clamp screws.

“Requirements 1 through 4” affected by:
CODEBAR RESET LEVER POSITION (FNA-5)
PRINT SUPPRESSION LATCH — HORIZONTAL (FNA-6)
LEFT BEARING POSITION (MSA-1)



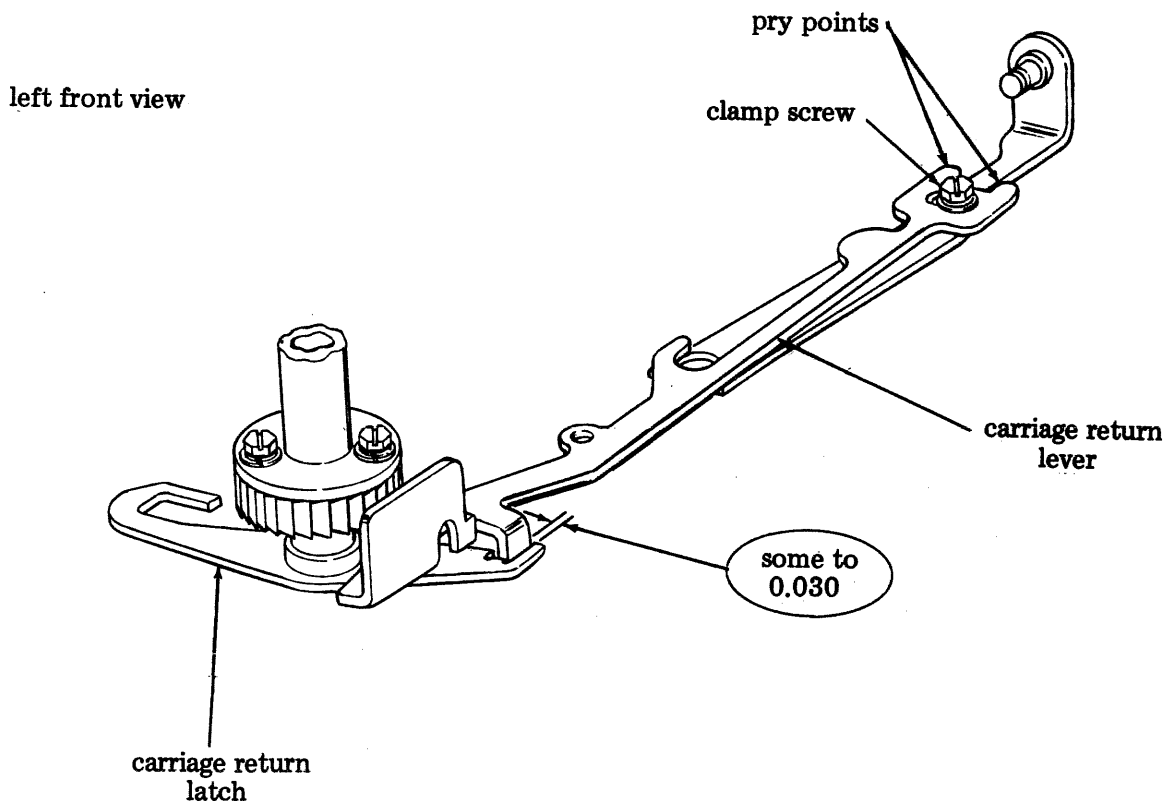
CARRIAGE RETURN LEVER — LATCH CLEARANCE (FNA-14)

- Place carriage at center of typing unit.
- Carefully remove carriage return spring (replace spring immediately if requirement is met).
- Set up carriage return (1-34--8) in selector.
- Place function clutch in position C.
- Eliminate play in carriage return lever to maximize required gap.

Requirement — Some to 0.030 between carriage return lever and carriage return latch.

Adjust — Loosen clamp screw.
Use pry points to position carriage return lever.
Tighten clamp screw.
Replace carriage return spring.

“Requirement” affected by:
LEFT ROCKER DRIVE



CARRIAGE DRIVE BAIL ENDPLAY (FNA-15)

- Rotate main shaft until carriage drive bail is parallel to base casting.

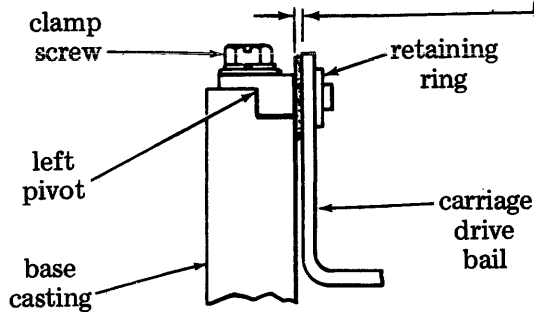
Requirement — Some to 0.015 endplay in carriage drive bail.

Adjust — Loosen clamp screw.
Position carriage drive bail left pivot.
Tighten clamp screw.

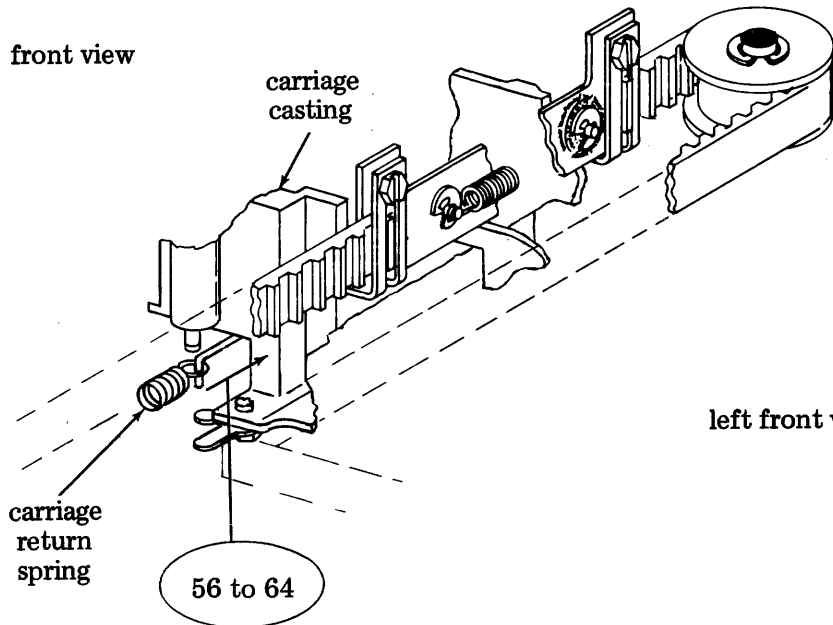
CARRIAGE RETURN SPRING

- Place typing unit in stop condition.
- Position carriage at right margin.

Requirement — 56 to 64 to pull carriage return spring to installed length.



front view



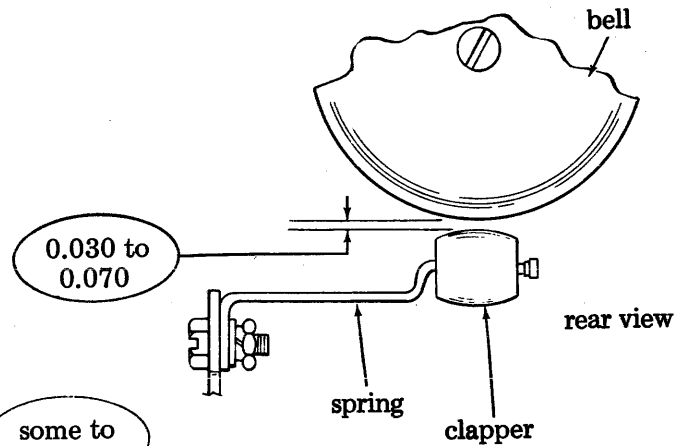
left front view

BELL CLAPPER GAP (FNA-16)

- Place typing unit in stop condition.

Requirement — (a) 0.030 to 0.070 between clapper and bell.
(b) bell is audible when operated.

Adjust — Use pliers to bend clapper spring.



rear view

**SELECTOR BLOCKING LEVER UPSTOP
(FNA-20)**

- Position carriage at center of platen.

Requirement — Blocking lever upstop parallel to casting (gauge by eye).

Adjust — Loosen upstop mounting screw.
Position blocking lever upstop.
Tighten screw.

Requirement — 0.020 to 0.030 between front edge of stop arm and print drive lever.

Adjust — Loosen (friction tight) downstop clamp screw.
Use pry points to position downstop.
Tighten clamp screw.

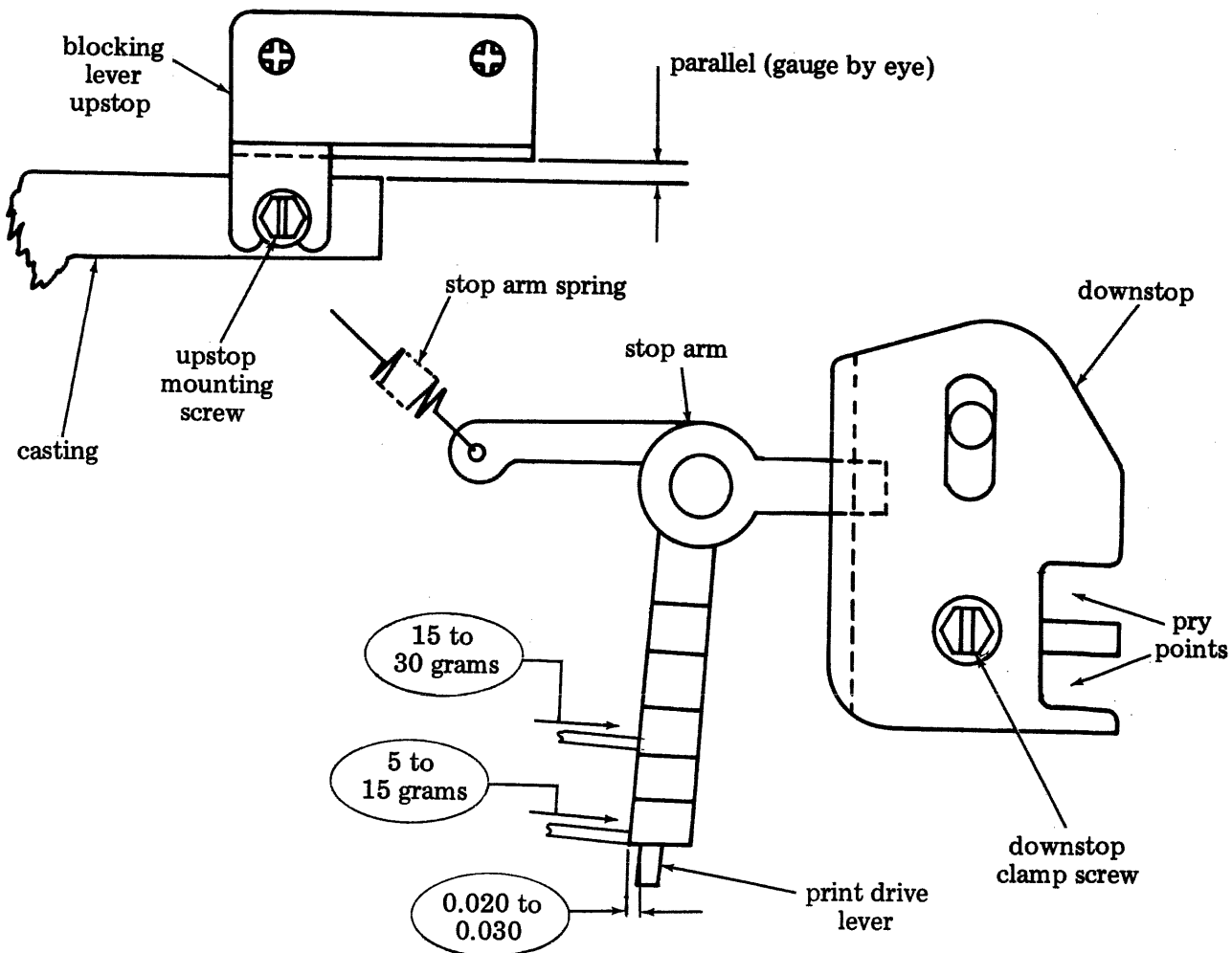
**VERTICAL STOP ARM DOWNSTOP
(CRA-4)**

- Remove carriage mechanism from typing unit (replace immediately after making this adjustment or after checking STOP ARM SPRING tension).
- Position stop arms against downstop.
- Position print drive lever against common stop (longest extension).

STOP ARM SPRINGS

- Remove carriage return mechanism from typing unit (replace after checking tensions).

Requirement — Longest stop: 5 to 15 grams
Third stop from bottom: 15 to 30 grams to start lever moving.



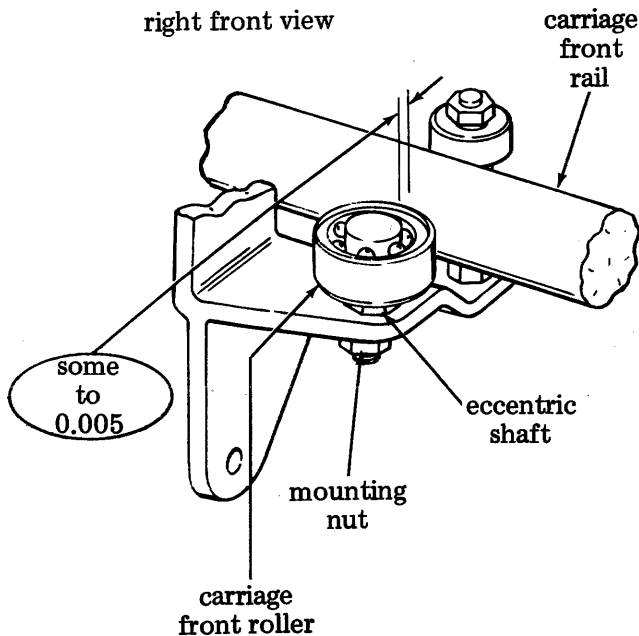
FRONT ROLLERS CLEARANCE (CRA-1)

- Place typing unit in stop condition.
- Take up roller play toward front of typing unit.

Requirement — Some to 0.005 between carriage front roller and carriage front rail.

NOTE: A slight drag condition is permissible at some carriage positions, providing the condition does not noticeably increase carriage friction.

Adjust — Loosen mounting nut.
 Rotate eccentric shaft to position each roller against rail.
 Slowly back off eccentric shaft to meet requirement.
 Tighten nut.



“Adjust” affects:

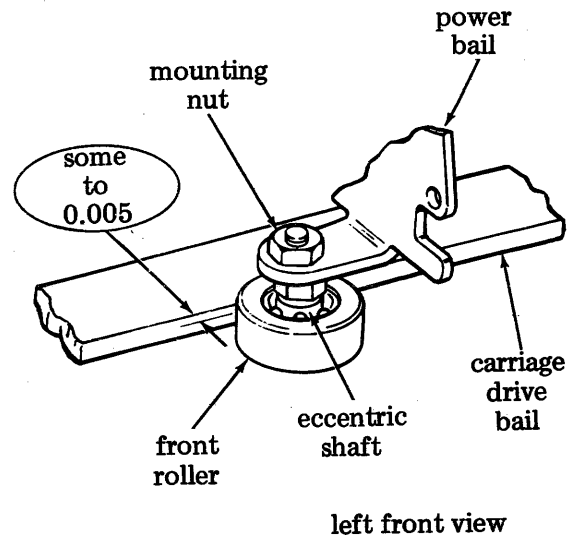
- PRINT DRIVE LEVER POSITIONING
- PRINT SUPPRESSION LATCHLEVER RELEASE
- RIBBON POWER LEVER DRIVE
- PLATEN HORIZONTAL POSITION — F
- PLATEN HORIZONTAL POSITION — S

POWER BAIL ROLLER CLEARANCE (CRA-3)

- Engage function clutch.
- Rotate main shaft until carriage drive bail is at lowest point of travel.

Requirement — Some to 0.005 between front roller and carriage drive bail.

Adjust — Loosen mounting nut.
 Rotate eccentric shaft to position front roller.
 Tighten nut.



REAR RAIL POSITION (CRA-5)

- Position dashpot plunger just outside dashpot cylinder.
- Place selector no. 1 code level in marking condition.
- Rotate main shaft until shift slide barely touches rear surface of stop plate.
- Take up play to minimize required gap.
- Check Requirement 1 and record measured gap.
- Position carriage with its type wheel 1/2 inch from right hand margin.
- Again check Requirement 1 and record measured gap.

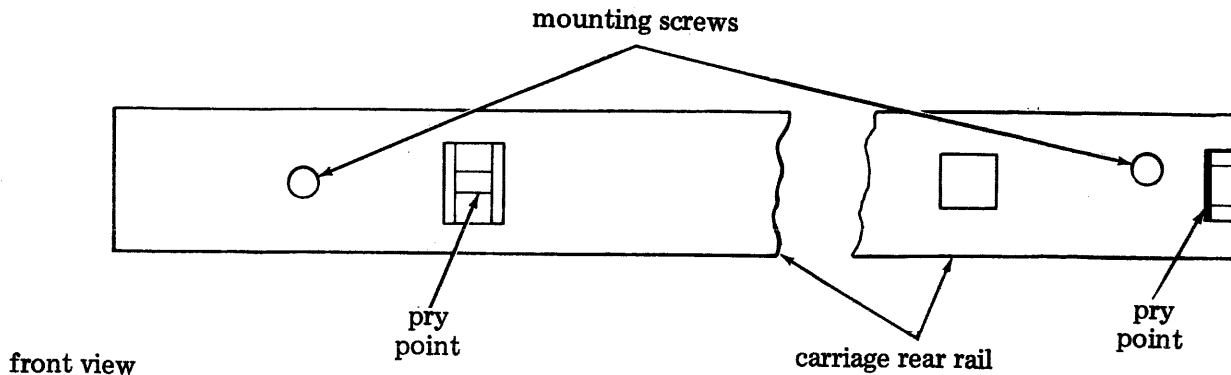
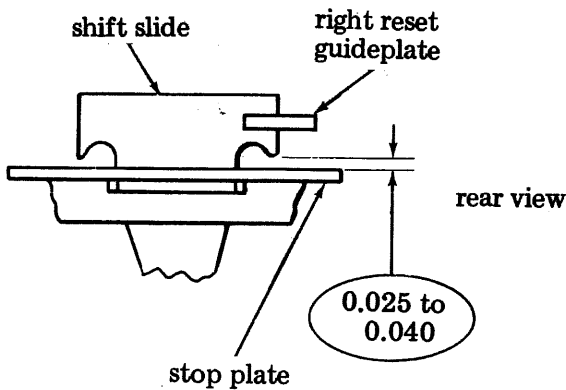
Requirement 1 — 0.025 to 0.040 between bottom edge of shift slide and top edge of stop plate.

Requirement 2 — No more than 0.010 difference between the two recorded checks.

Adjust — Loosen (friction tight) mounting screws.
Use pry point to position carriage rear rail.
Tighten mounting screws.

“Adjust” affects:
PRINT DRIVE LEVER POSITIONING
FOURTH PULSE LINKAGE POSITIONING
RESET LEVER POSITIONING
PRINT SUPPRESSION LATCHLEVER RELEASE
PRESSURE ROLLER CLEARANCE
REAR ROLLER CLEARANCE
RIGHT SLIDE GUIDEPLATE RESET
LEFT SLIDE GUIDEPLATE RESET
PRINT HAMMER TRIP LEVER RELEASE
PRINT HAMMER TRIP LEVER RESET
RIBBON POWER LEVER DRIVE
VERTICAL TYPE ALIGNMENT — F
VERTICAL TYPE ALIGNMENT — S

“Requirements” affected by:
(FUNCTION) CODEBAR RESET LEVER POSITION



REAR ROLLER CLEARANCE (CRA-2)

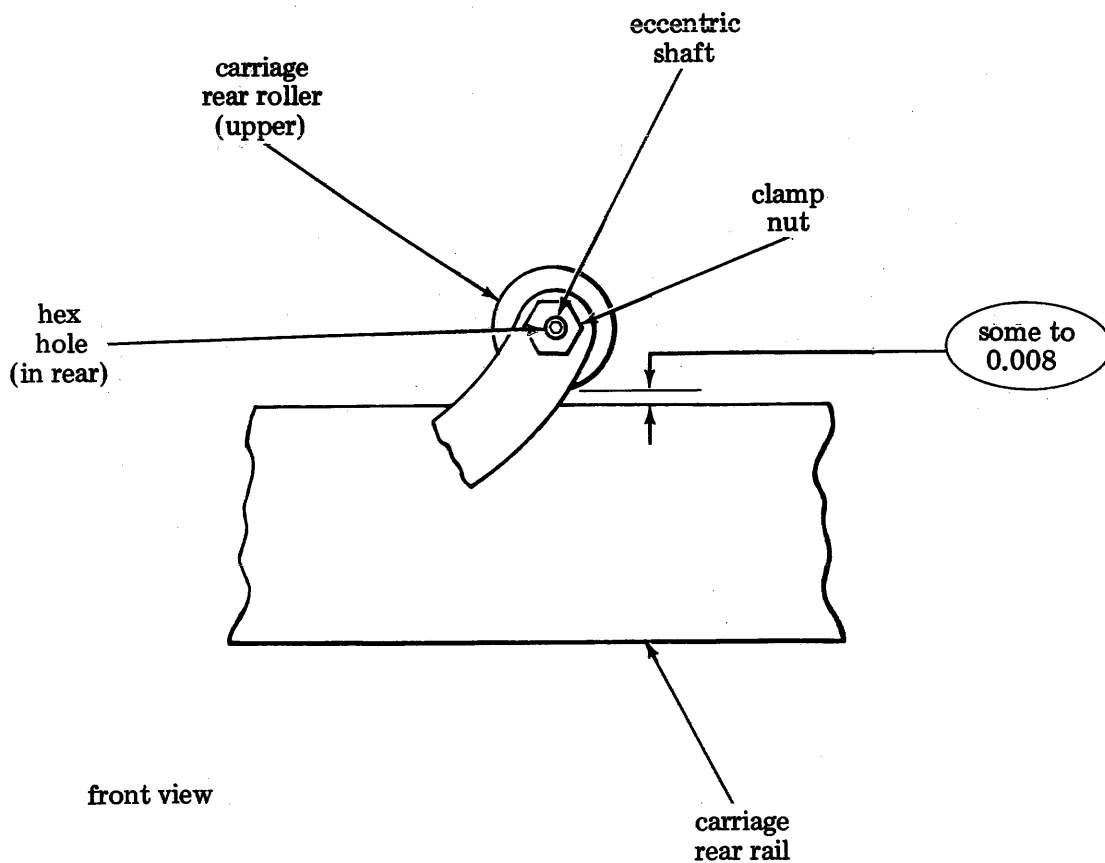
- Rotate main shaft to place function clutch in position B.

Requirement — Some to 0.008 between carriage rear rail and carriage rear roller (upper).

Adjust — Loosen clamp nut.
Use hex wrench in hex hole to position eccentric shaft.
Tighten nut.

“Adjust” affects:
FOURTH PULSE LINKAGE POSITIONING
PRINT DRIVE LEVER POSITIONING
RESET LEVER POSITIONING
RIGHT SLIDE GUIDEPLATE RESET
PRINT HAMMER TRIP LEVER RELEASE
PRINT HAMMER TRIP LEVER RESET

“Requirement” affected by:
REAR RAIL POSITION



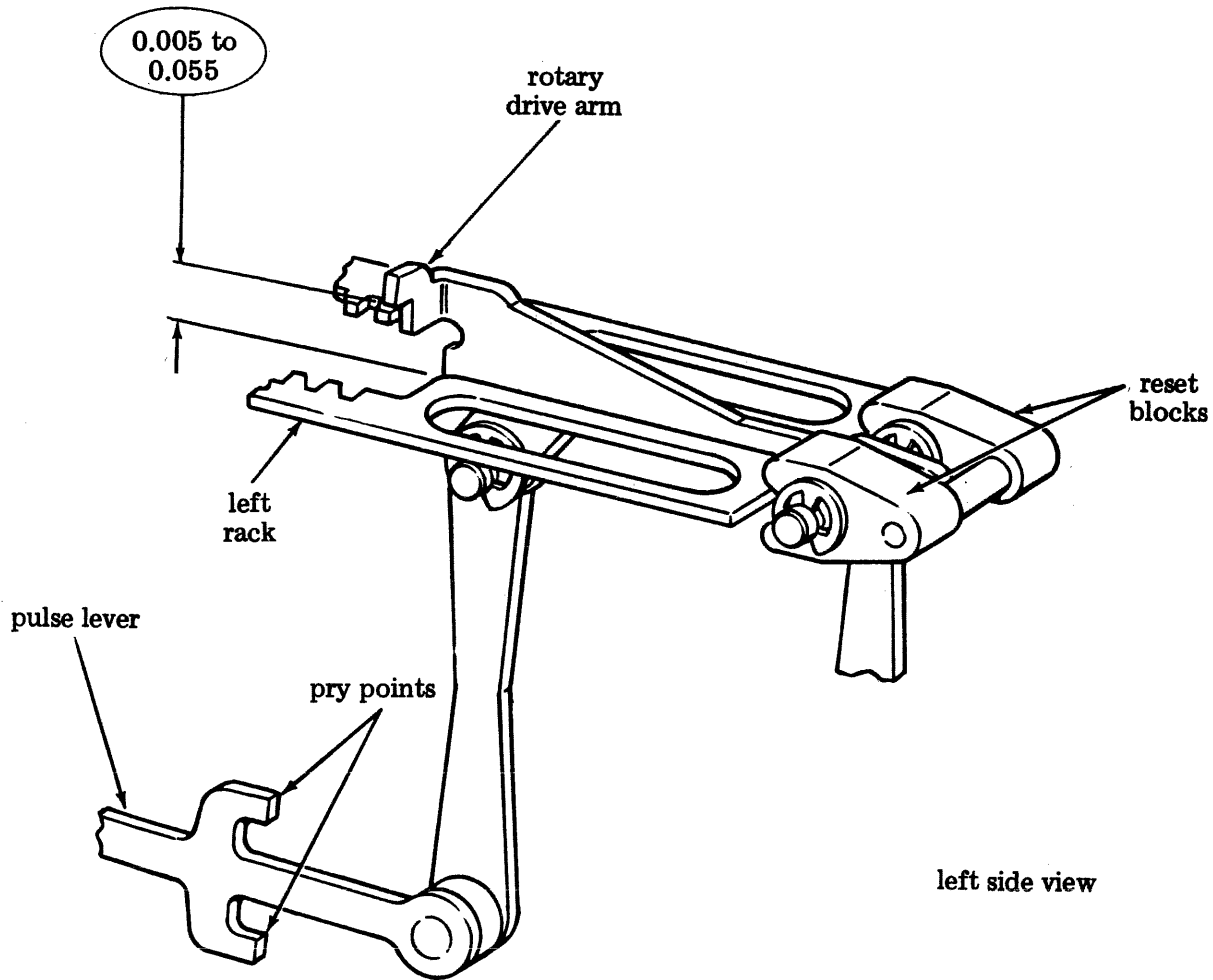
FOURTH PULSE LINKAGE POSITIONING (CRA-9)

- Position carriage at center of platen.
- Place all marking code combination in selector.
- Rotate main shaft until function clutch just trips.
- Take up pulse lever play in an upward direction.

Adjust — Use pry points to bend pulse lever.

“Requirement” affected by:
**(FUNCTION) CODEBAR RESET LEVER
POSITION
REAR RAIL POSITION
REAR ROLLER CLEARANCE**

Requirement — 0.005 to 0.055 between rotary drive arm and left rack.



PRINT DRIVE LEVER POSITIONING (CRA-6)

- Place typing unit in stop condition.
- Position carriage power bail rollers directly above carriage drive link.
- Take up vertical drive bail play in a downward direction.
- Take up common stop arm play to the left.

Requirement — 0.070 to 0.090 between vertical drive bail and common stop arm.

Adjust — Loosen clamp screw.
Use pry points to position print drive lever.
Tighten clamp screw.

“Adjust” affects:

RIGHT SLIDE GUIDEPLATE RESET (CRA-7)

PRINT HAMMER TRIP LEVER RESET (CRA-11)

LEFT SLIDE GUIDEPLATE RESET (CRA-7)

VERTICAL TYPE ALIGNMENT — F (PLA-2)

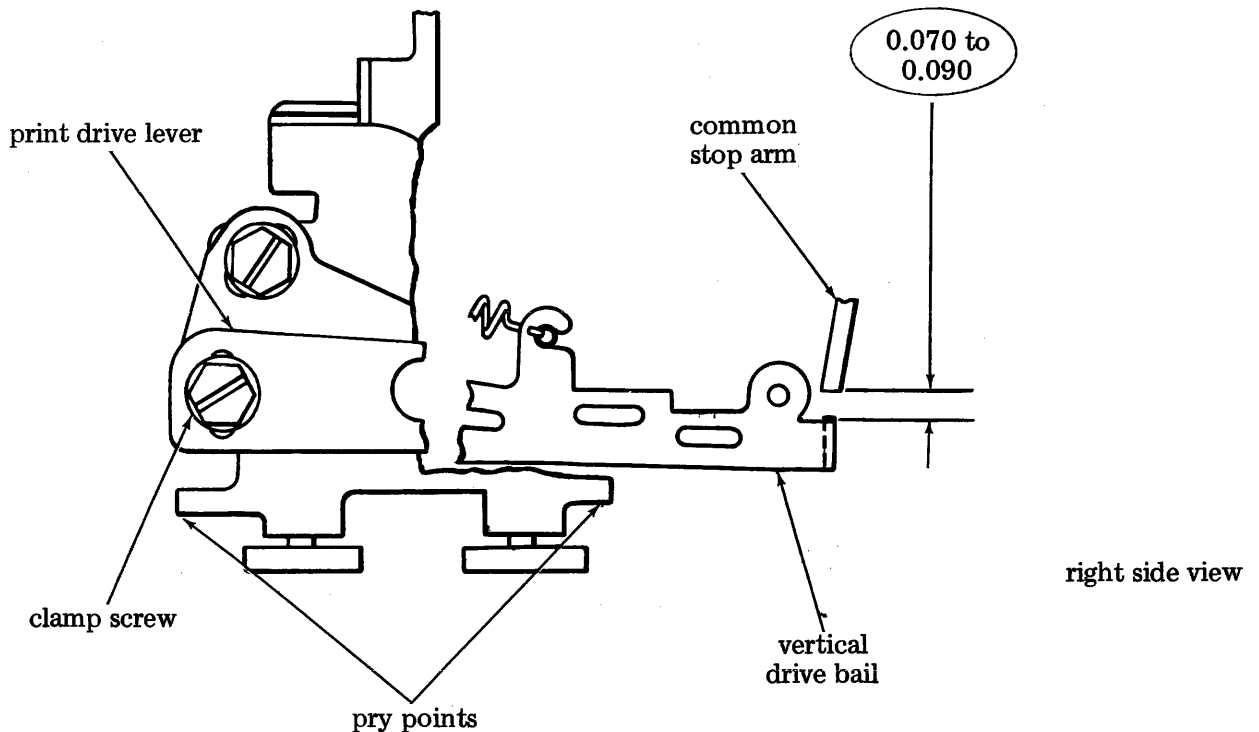
*VERTICAL TYPE ALIGNMENT — S
PRINT SUPPRESSION LATCHLEVER
ENDPLAY (CRA-12)*

“Requirement” affected by:

REAR RAIL POSITION (CRA-5)

FRONT ROLLERS CLEARANCE (CRA-1)

REAR ROLLER CLEARANCE (CRA-2)



RESET LEVER POSITIONING (CRA-10)

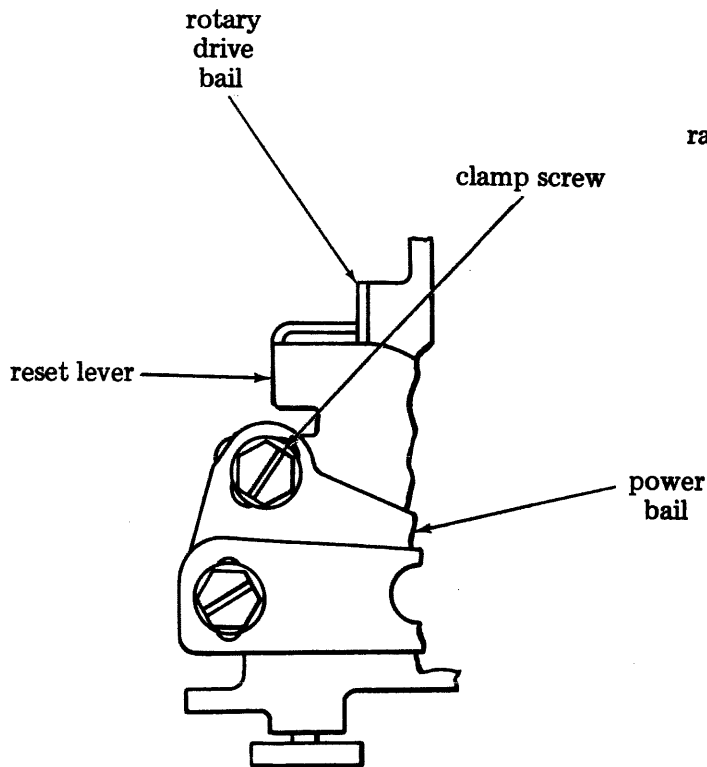
- Place typing unit in stop condition.

Requirement — Racks completely reset.

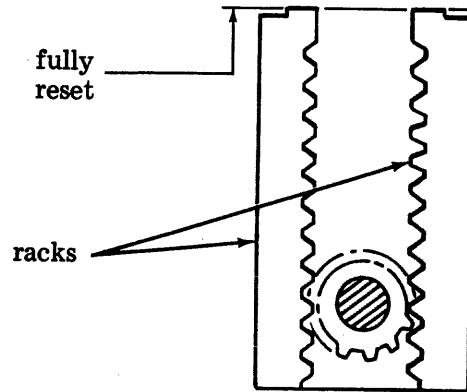
Adjust — Position carriage at center of typing unit.
Loosen clamp screw.
Allow positioning spring to fully reset racks.
Tighten clamp screw.

“Adjust” affects:
RIBBON POWER LEVER DRIVE

“Requirement” affected by:
REAR RAIL POSITION
REAR ROLLER CLEARANCE



right side view



top view

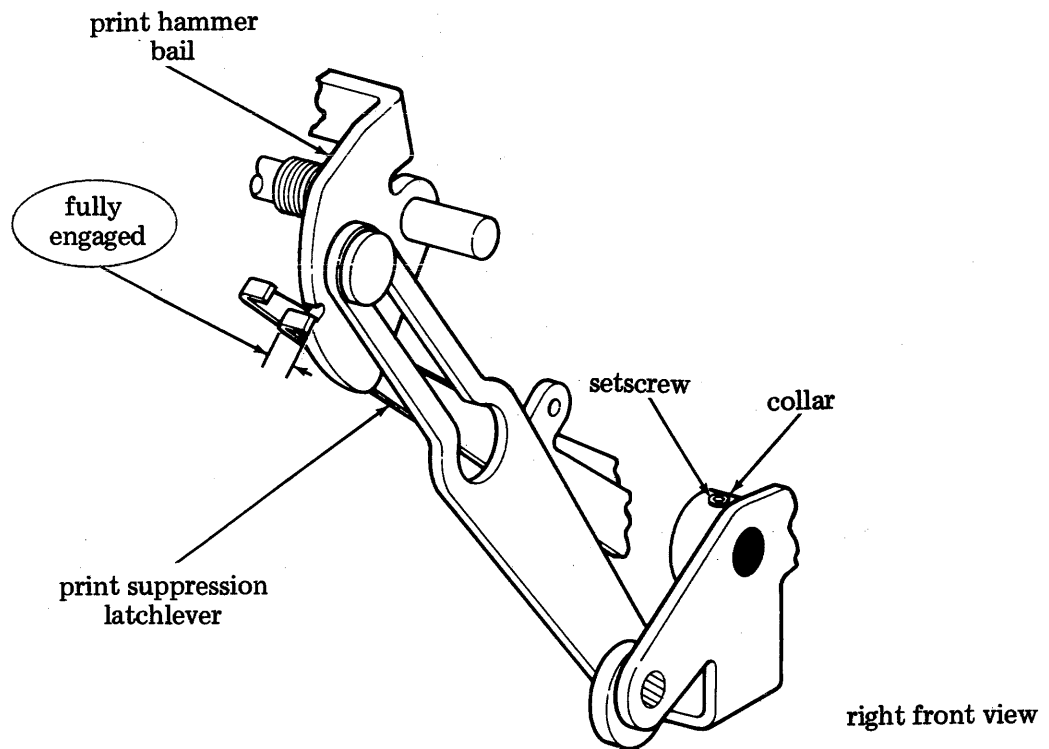
PRINT SUPPRESSION LATCHLEVER ENDPLAY (CRA-12)

- Take up print suppression latchlever play toward carriage casting.

Requirement — Print suppression latchlever fully engages print hammer bail with no binds.

Adjust — Use hex key wrench to loosen setscrew.
Position collar.
Tighten setscrew.

“Requirement” affected by:
PRINT DRIVE LEVER POSITIONING

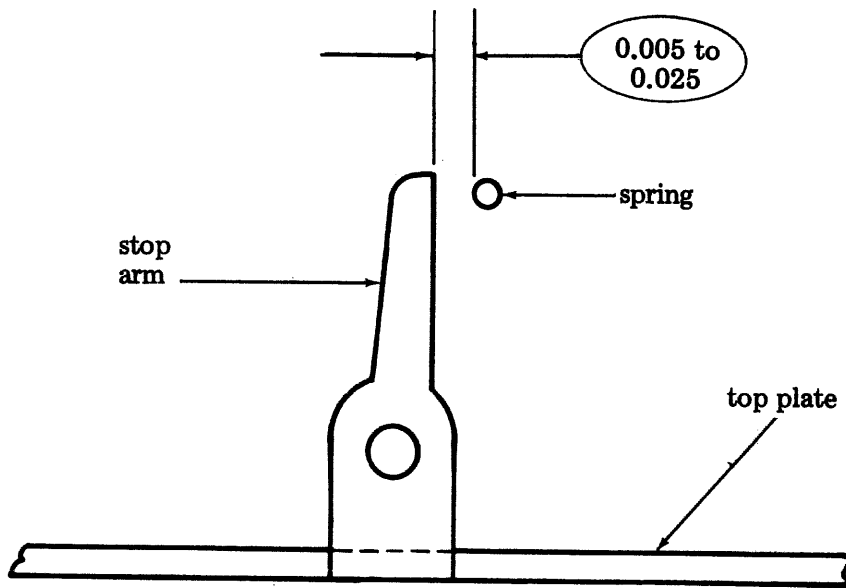


PRINT HAMMER BAIL SPRING STOP (CRA-14)

- Set up lower case w (123-567) code in selector.
- Rotate main shaft until type wheel reaches its highest position and print hammer releases.
- Hold type wheel toward front of unit against its stop.

Requirement — 0.005 to 0.025 between print hammer bail spring and its stop arm.

Adjust — Bend arm to meet requirement.



**TYPE WHEEL POSITIONING —
PRELIMINARY (CRA-13)**

- Set up J code (-2-4-78) in selector.
- Rotate main shaft until function clutch is in position B.
- Check Requirement.
- Set up B code (-2---7-) in selector.
- Again, position function clutch at its B position.
- Check Requirement.

Requirement — Type wheel correctly positions vertical row which contains character selected.

Adjust — Place typing unit in stop condition. Open *LEFT SLIDE GUIDEPLATE RESET* and *RIGHT SLIDE GUIDEPLATE RESET* adjustments. Loosen (friction tight) clamp screws.

Place 0.028 inch gauge (or if available, 180587 adjusting tool) across end of racks. Hold reset lever in place.

Rotate adjusting screws to position entire slide assembly tight against racks and gauge (or adjusting tool).

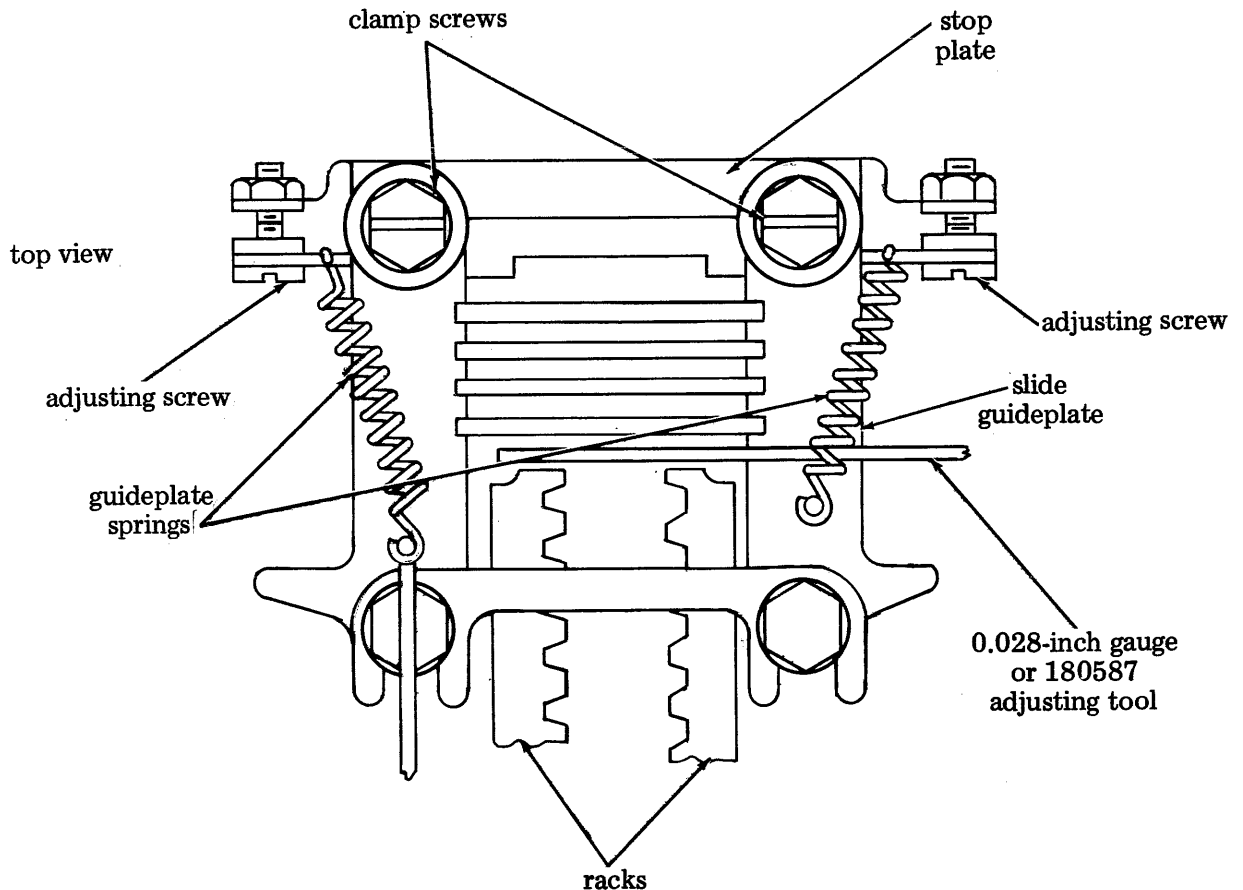
“Adjust” affects:
LEFT SLIDE GUIDEPLATE RESET
RIGHT SLIDE GUIDEPLATE RESET

SLIDE GUIDEPLATE SPRINGS

NOTE: Check this requirement only if it is suspected that it will not be met.

- Remove carriage mechanism from typing unit. (Replace immediately after checking requirement.)
- Check both springs.

Requirement — 1 to 3 to pull spring to installed length.



TYPEWHEEL "HOME" POSITION (CRA-20)

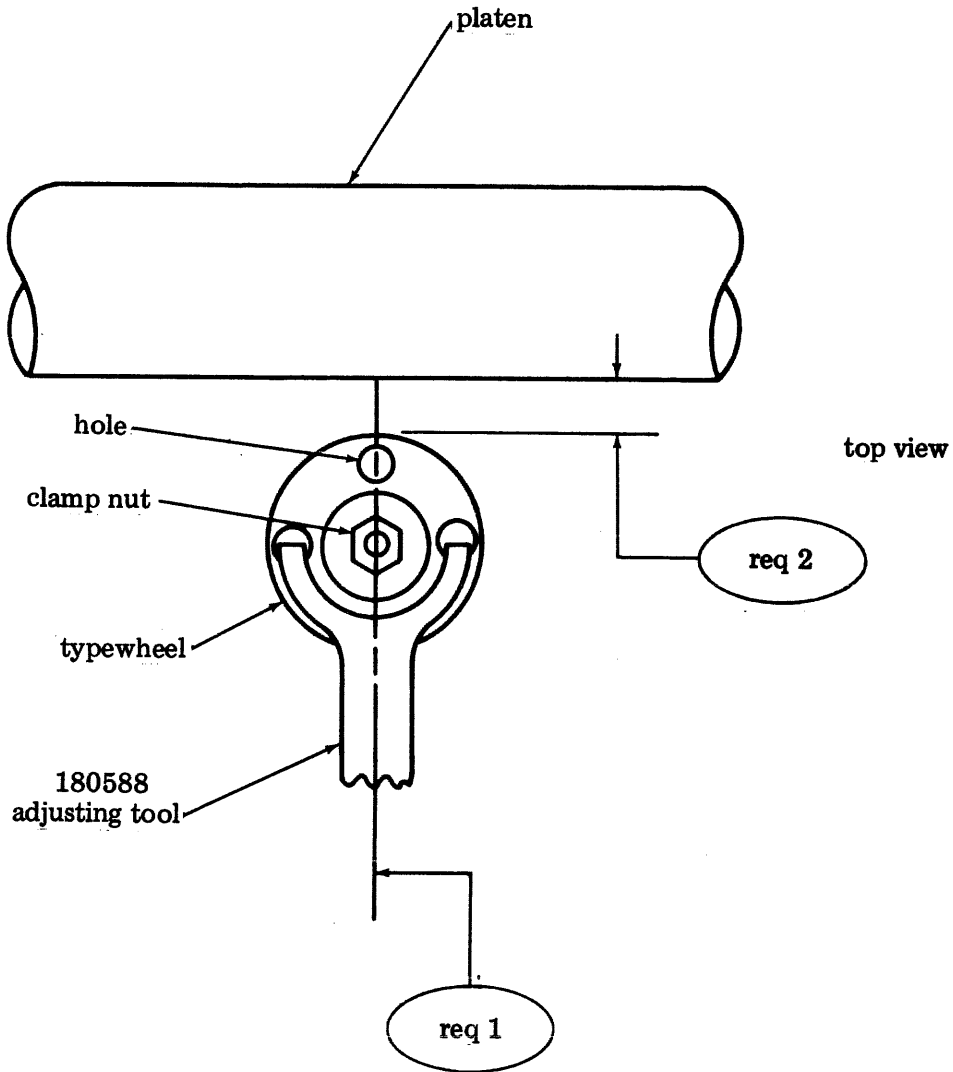
- Printer in stop condition.

Requirement 1 — The typewheel top surface projection should be at its closest point to the platen.

Requirement 2 — The typewheel top surface hole and the clamp nut should be aligned perpendicular to the platen. Gauge by eye.

Adjust — Loosen clamp nut.
Position typewheel using 180588 adjusting tool.
Tighten clamp nut.

“Adjust” affects:
FINAL PRINTING ALIGNMENT (FOA-23)



CARRIAGE BOUNCE

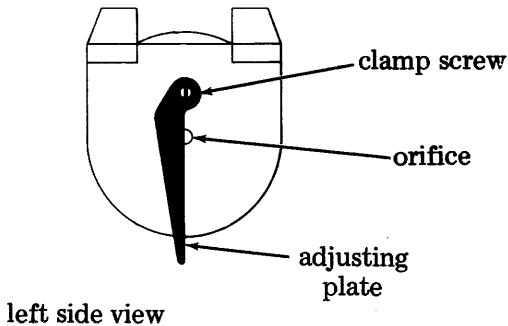
- Place carriage at 72nd character.
- Manually disengage the check pawl and feed pawl of the spacing mechanism.

CAUTION: *ONCE THE CHECK PAWL AND FEED PAWL ARE RELEASED, THE CARRIAGE RETURNS TO THE LEFT MARGIN AT HIGH SPEED.*

Requirement — No bounce of carriage upon its return.

Adjust — Loosen clamp screw.
 Close orifice completely.
 Gradually open orifice until bounce is eliminated while operating the printer.
 Tighten clamp screw.

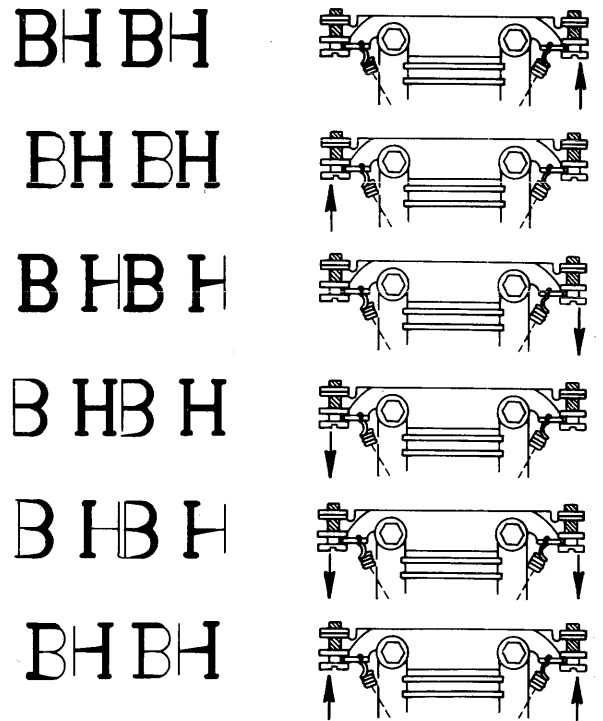
NOTE: *Damage to the carriage could result if the orifice is left completely uncovered.*



STOP PLATE ADJUSTMENT (CRA-16)

- If characters appear as shown below, make the necessary adjustments as follows:

Adjust — Make stop plate adjustments in the direction indicated by arrows.



“Requirement” affected by:
 TYPEWHEEL “HOME” POSITION
 (CRA-20)

RIGHT SLIDE GUIDEPLATE RESET (CRA-7)

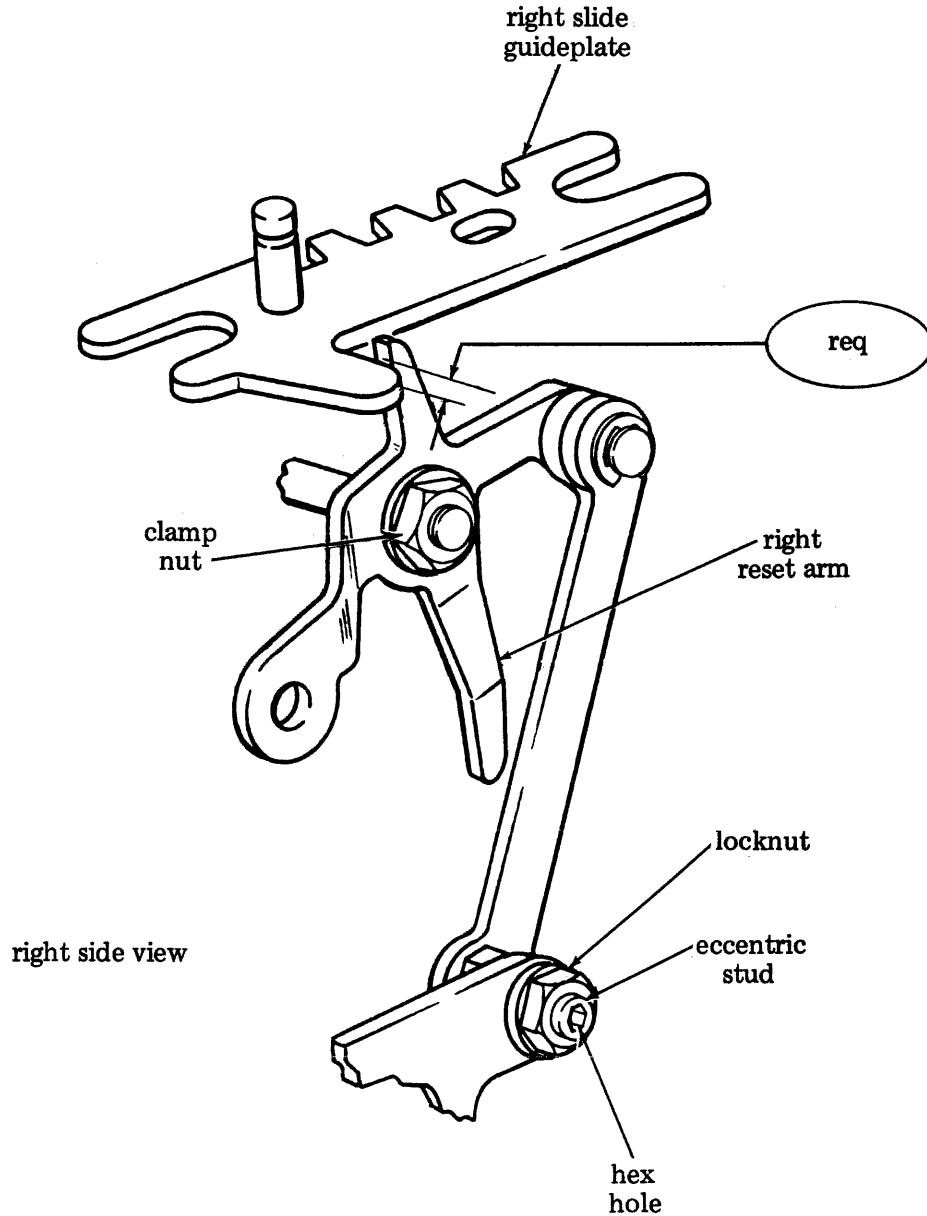
- Place printer in stop position.

Requirement — Some to 0.015 between right slide guideplate and right reset arm when right and left slide guideplates are held toward front for maximum clearance.

Adjust — Loosen eccentric stud locknut.
Rotate eccentric stud locknut with hex wrench in hex hole.
Tighten eccentric stud locknut.

“Adjust” affects:
LEFT SLIDE GUIDEPLATE RESET (CRA-7)
PRINT HAMMER TRIP LEVER RELEASE (CRA-8)

“Requirement” affected by:
REAR RAIL POSITION (CRA-5)
REAR ROLLER CLEARANCE (CRA-2)
PRINT DRIVE LEVER POSITIONING (CRA-6)
TYPE WHEEL POSITIONING (CRA-13)



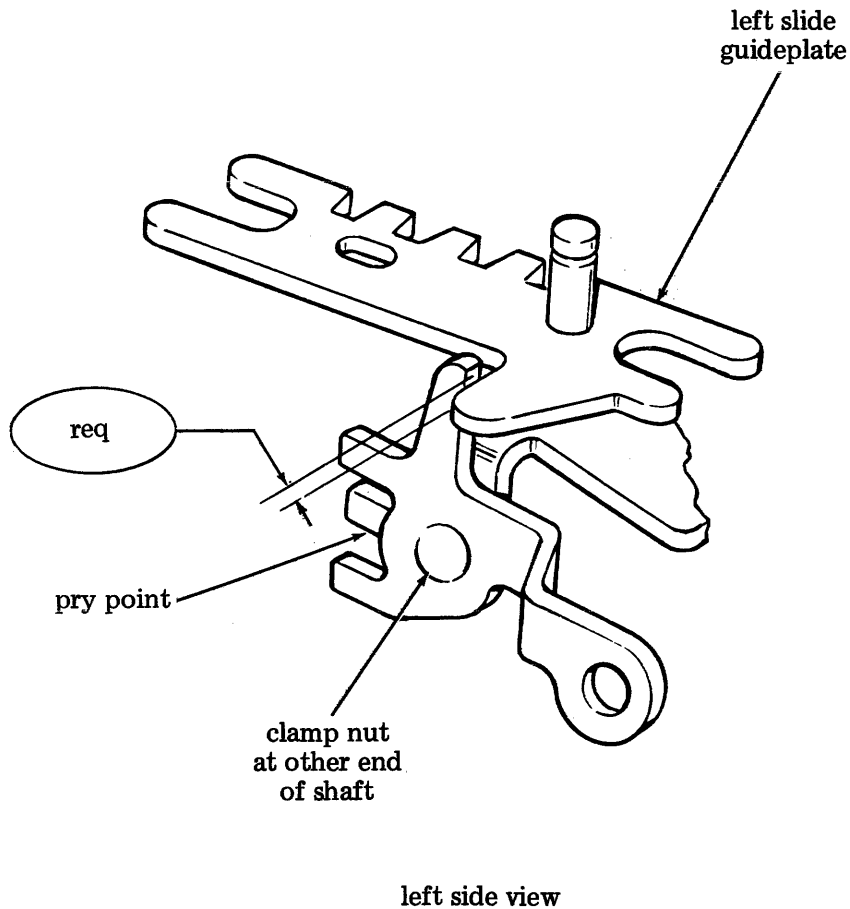
LEFT SLIDE GUIDEPLATE RESET (CRA-7)

- Place printer in stop position.

Requirement — Some to 0.015 between left slide guideplate and left reset arm when right and left slide guideplates are held toward front for maximum clearance.

Adjust — Loosen left reset arm nut.
Position left reset arm using pry point.
Tighten left reset arm nut.

“Requirement” affected by:
REAR RAIL POSITION (CRA-5)
PRINT DRIVE LEVER POSITIONING (CRA-6)
TYPE WHEEL POSITIONING (CRA-13)
RIGHT SLIDE GUIDEPLATE RESET (CRA-7)



PRINT HAMMER TRIP LEVER RELEASE (CRA-8)

- Place carriage over drive bracket mounting screw.
- Rotate main shaft until function clutch is in position B.
- Take up play to minimize required clearance.

Requirement 1 — 0.040 to 0.110 between print hammer bail and print hammer trip lever.

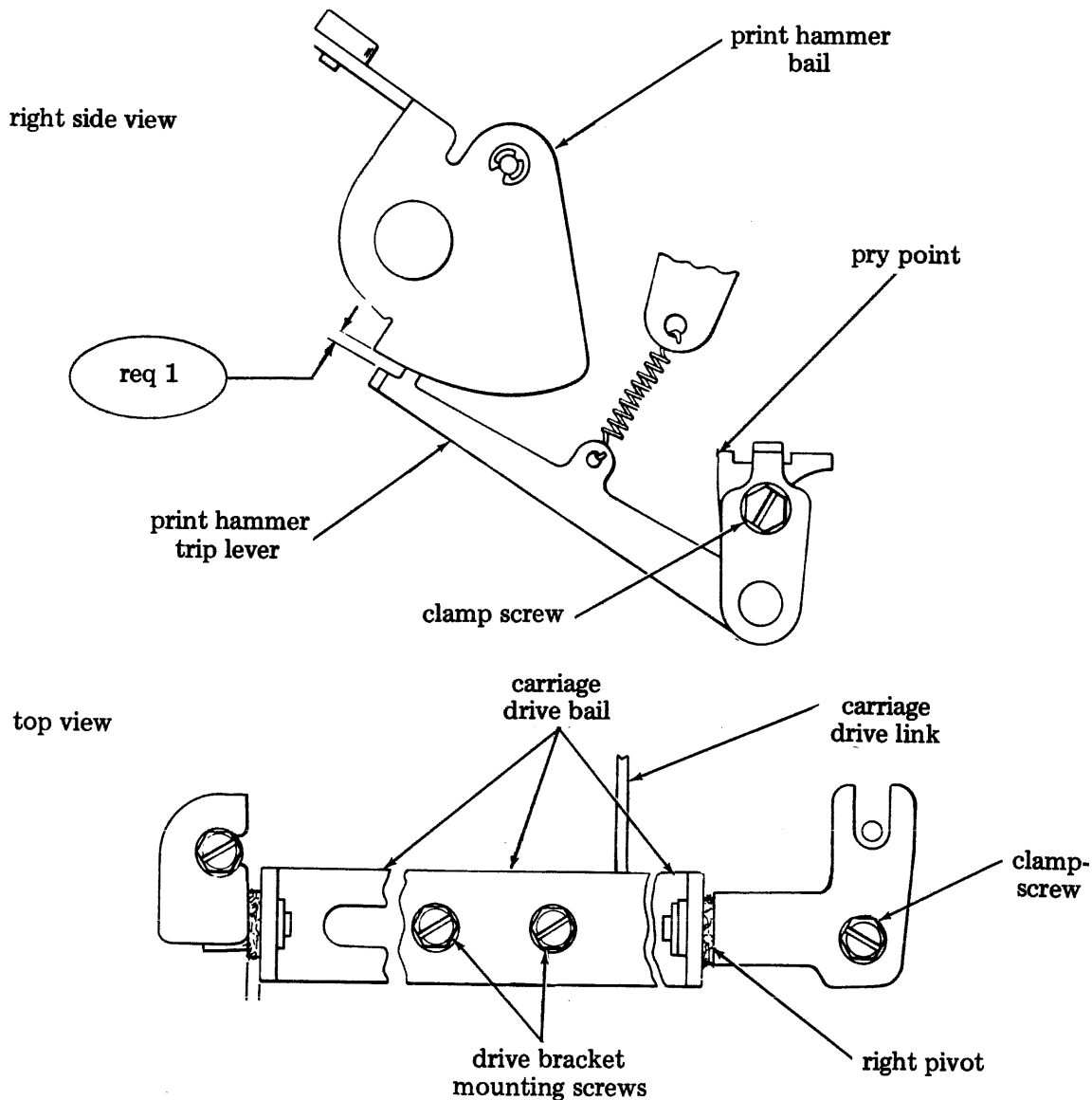
Adjust — Loosen print hammer trip lever clamp screw.
Position print hammer trip lever by using pry point.
Tighten clamp screw.

- Place carriage at right margin.

Requirement 2 — Clearance between print hammer bail and print hammer trip lever should be within 0.020 of requirement 1.

Adjust — Loosen right pivot clamp screw
friction tight.
Position right pivot.
Tighten clamp screw.

“Adjust” affects:
FEED PAWL STOP POSITION (SPA-1)
PRINT HAMMER TRIP LEVER RESET (CRA-11)
RIGHT SLIDE GUIDEPLATE RESET (CRA-7)
REAR RAIL POSITION (CRA-5)
REAR ROLLER CLEARANCE (CRA-2)



PRINT HAMMER TRIP LEVER RESET (CRA-11)

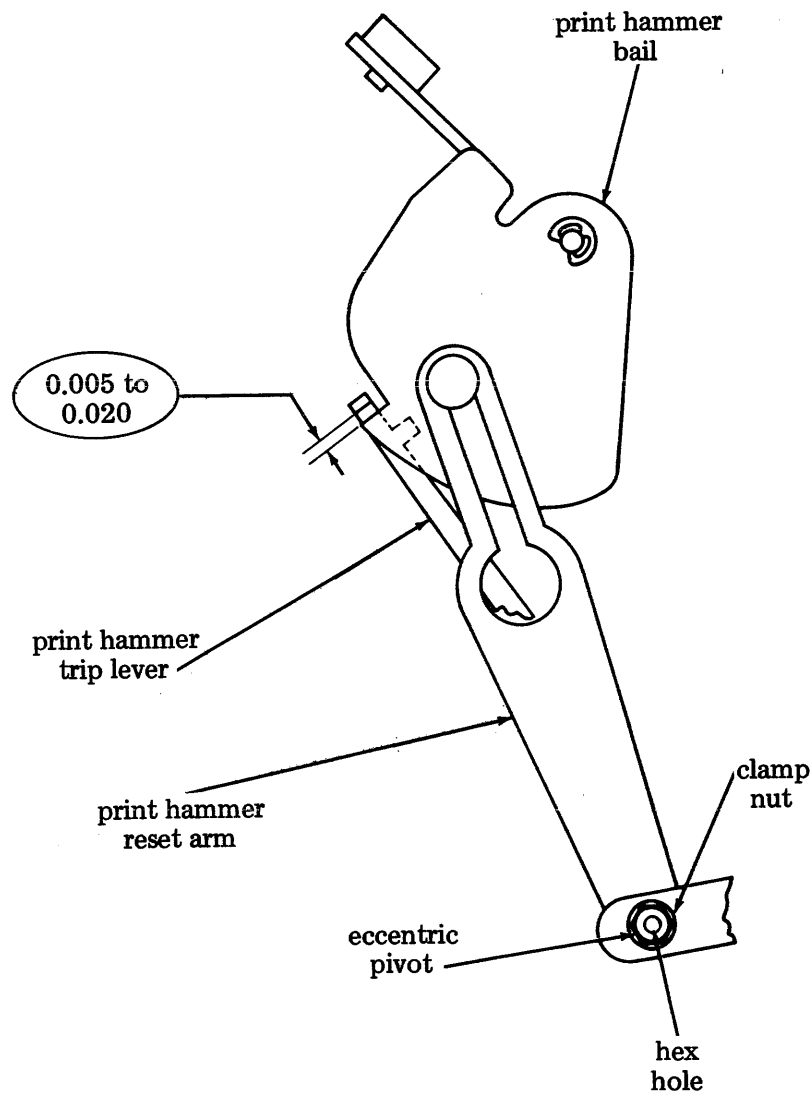
- Set reset arm to lowest position.

Requirement — 0.005 to 0.020 between
print hammer bail and print hammer
trip lever.

Adjust — Loosen clamp nut.
Position print hammer reset arm
eccentric pivot with hex key.
Tighten clamp nut.

NOTE: Keep high part of eccentric pivot
toward front of printer.

“Requirement” affected by:
REAR RAIL POSITION (CRA-5)
REAR ROLLER CLEARANCE (CRA-2)
PRINT DRIVE LETTER POSITIONING
(CRA-6)
PRINT HAMMER TRIP LEVER RELEASE
(CRA-8)



left side view

PRINT SUPPRESSION LATCHLEVER RELEASE (CRA-15)

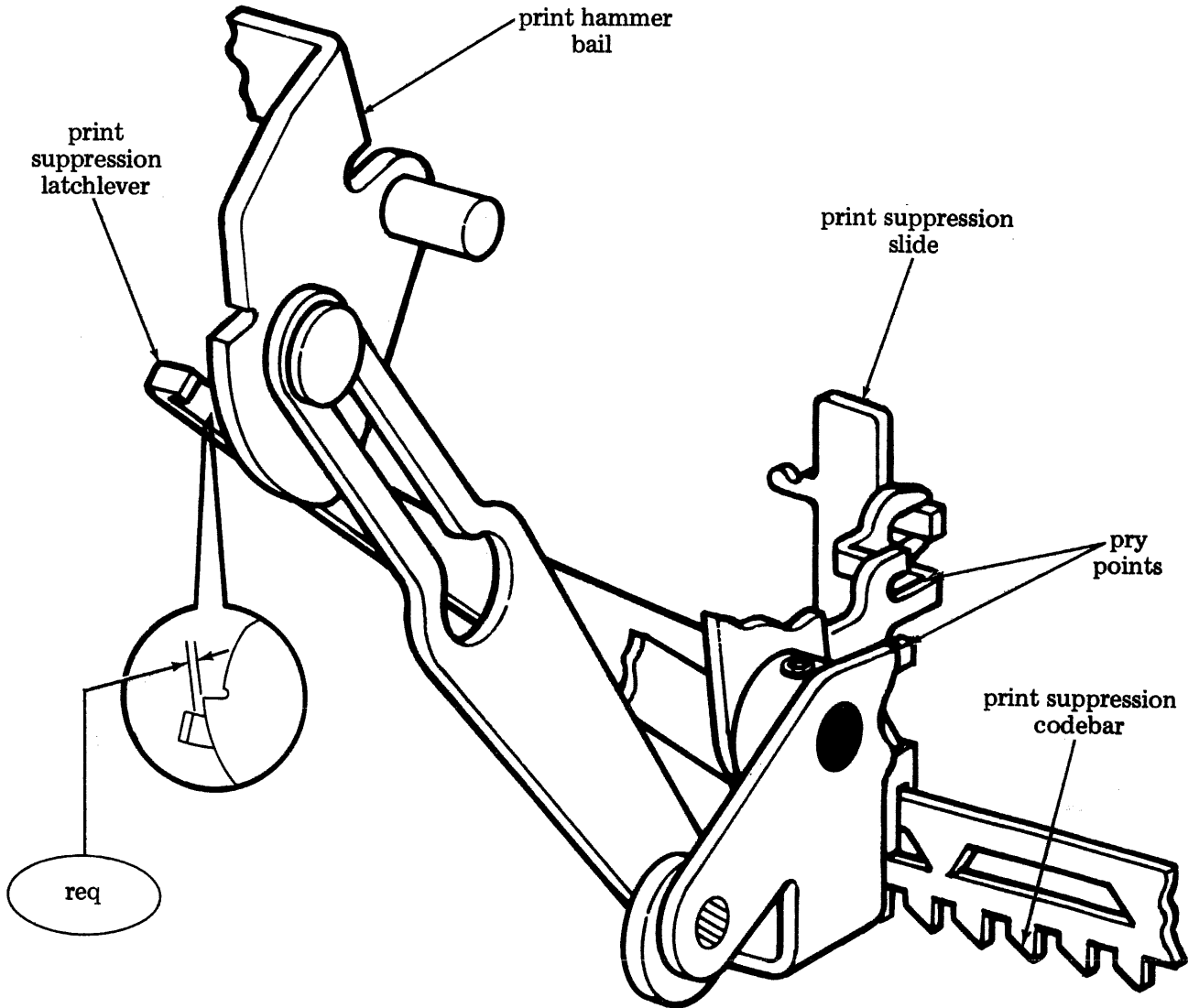
- Place carriage about 1/2 inch from left margin and set up "T" code (-3-5-78).
- Rotate main shaft until function clutch is in position "B."
- Position print suppression codebar fully upward.
- Take up play in print suppression latchlever for minimum gap.

Requirement — 0.015 to 0.055 between print suppression latchlever and print hammer bail.

Adjust — Bend print suppression latchlever using pry points while holding print suppression latchlever against print hammer bail.

NOTE: Use top pry point for larger gap and bottom pry point for smaller gap.

"Requirement" affected by:
REAR RAIL POSITION (CRA-5)
FRONT ROLLERS CLEARANCE (CRA-1)
CODEBAR RESET LEVER POSITION (FNA-5)

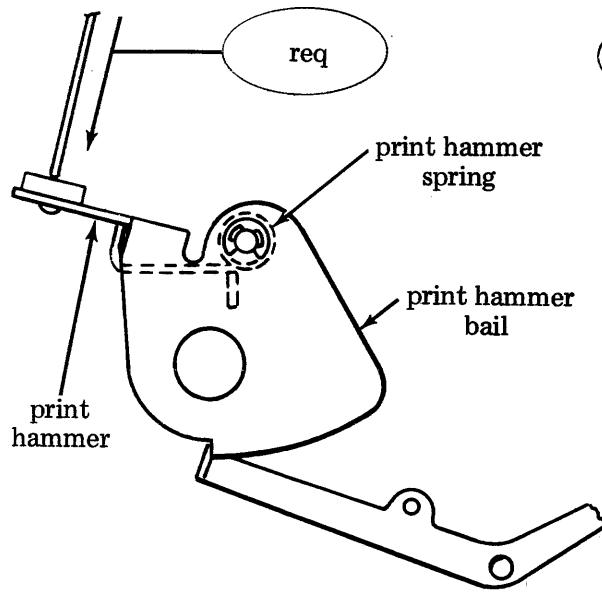


right side view

PRINT HAMMER BAIL SPRING

- Place printer in stop position.

Requirement — 3 to 4-1/2 to start print hammer moving.

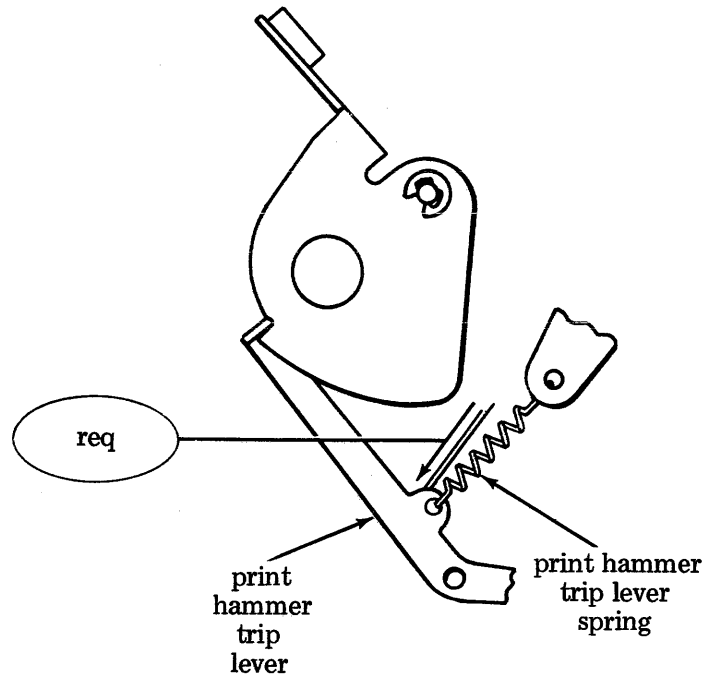


right side view

PRINT HAMMER TRIP LEVER SPRING

- Place printer in stop position.

Requirement — 1 to 2-1/2 to start print hammer trip lever moving.

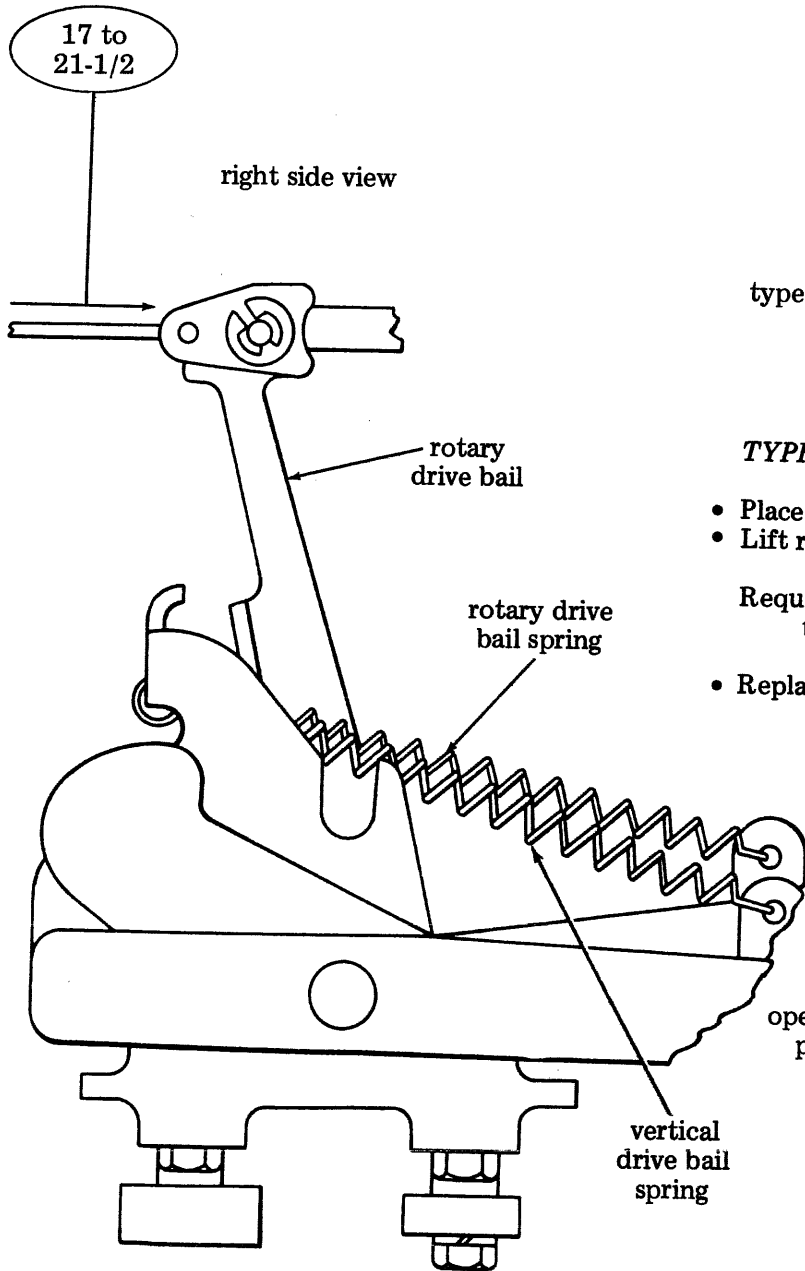


right side view

ROTARY DRIVE BAIL SPRING

- Set up an all marking code.
- Rotate main shaft until function clutch is in position "B."

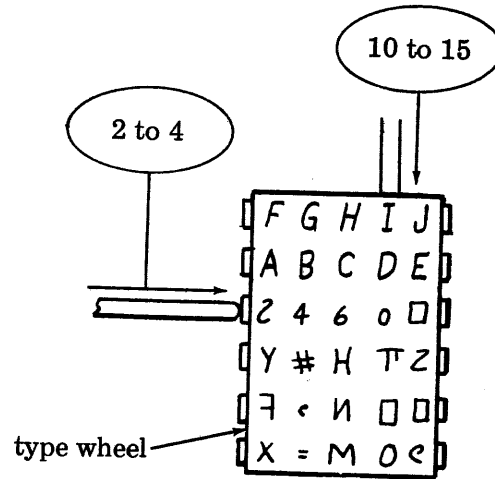
Requirement — 17 to 21-1/2 to start rotary drive bail moving.



VERTICAL DRIVE BAIL SPRING

- Place printer in stop position.

Requirement — 10 to 15 to start type wheel moving.

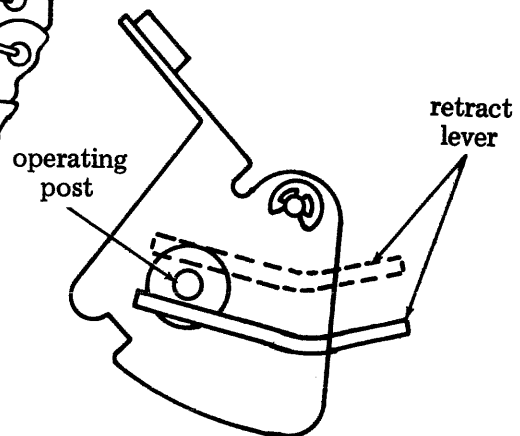


TYPE WHEEL RETURN SPRING

- Place printer in stop position.
- Lift retract lever over operating post.

Requirement — 2 to 4 to move type wheel to platen.

- Replace retract lever under post.

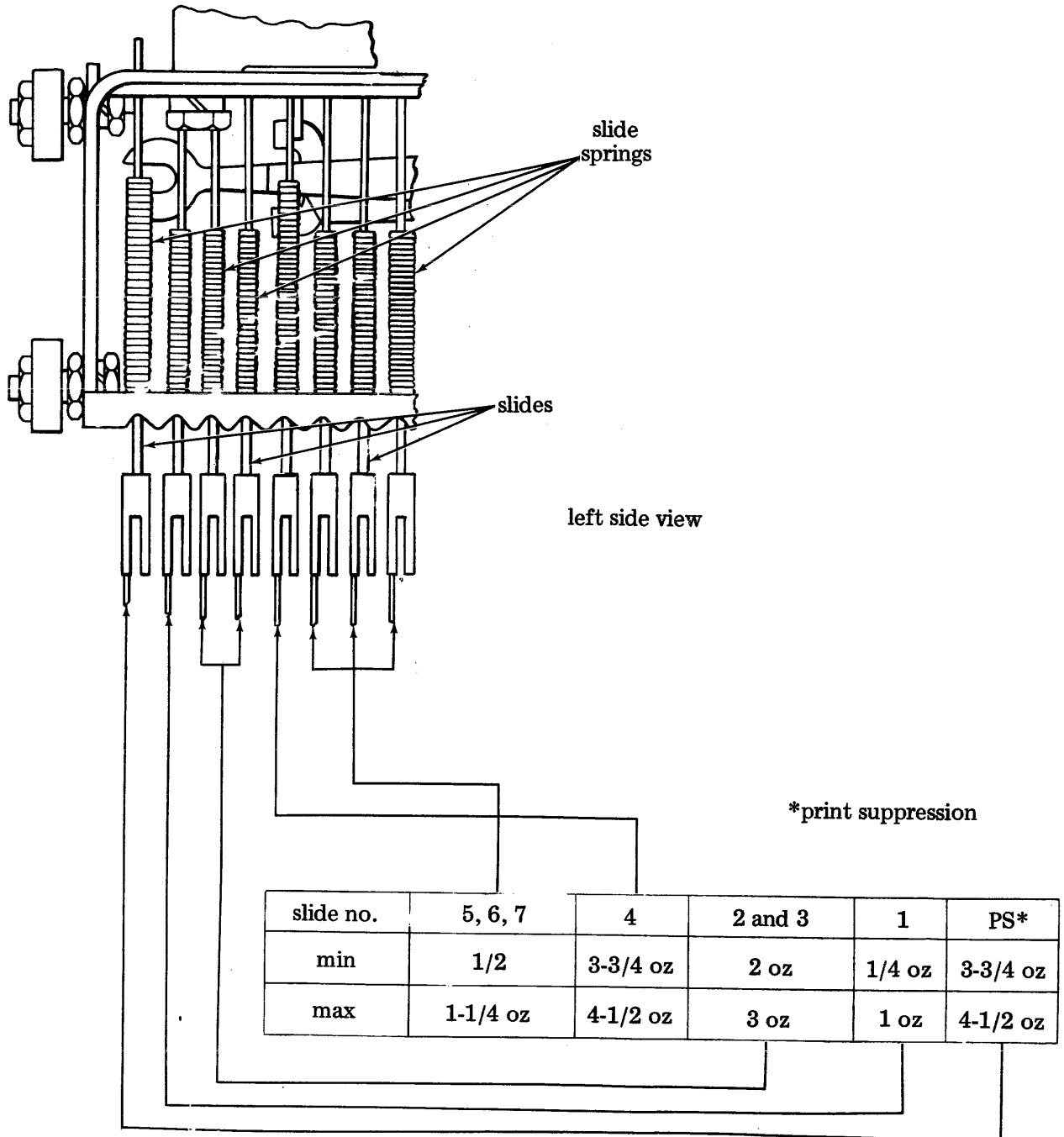


SLIDE SPRINGS

NOTE: Remove carriage mechanism (Section 574-422-702TC) to simplify checking of slide spring tensions. Do not check spring tensions unless there is reason to believe spring tensions are incorrect.

- Place carriage power bail to its stop position.

Requirement — See chart for pressures required to start slides moving.



RIBBON POWER LEVER DRIVE (CRA-17)

- Manually operate typing unit until carriage drive bail is in its forwardmost position.
- Rotate left ribbon ratchet until ribbon spool shaft and ribbon spool pin are approximately aligned with the tip of the feed pawl.
- Set feed pawl against left ribbon ratchet.

Requirement 1 — 0.010 to 0.045 between face of left ribbon ratchet tooth and corner tip of check pawl.

- Apply preceding instructions to right ribbon ratchet.

Requirement 2 — 0.010 to 0.045 between face of right ratchet tooth and corner tip of check pawl.

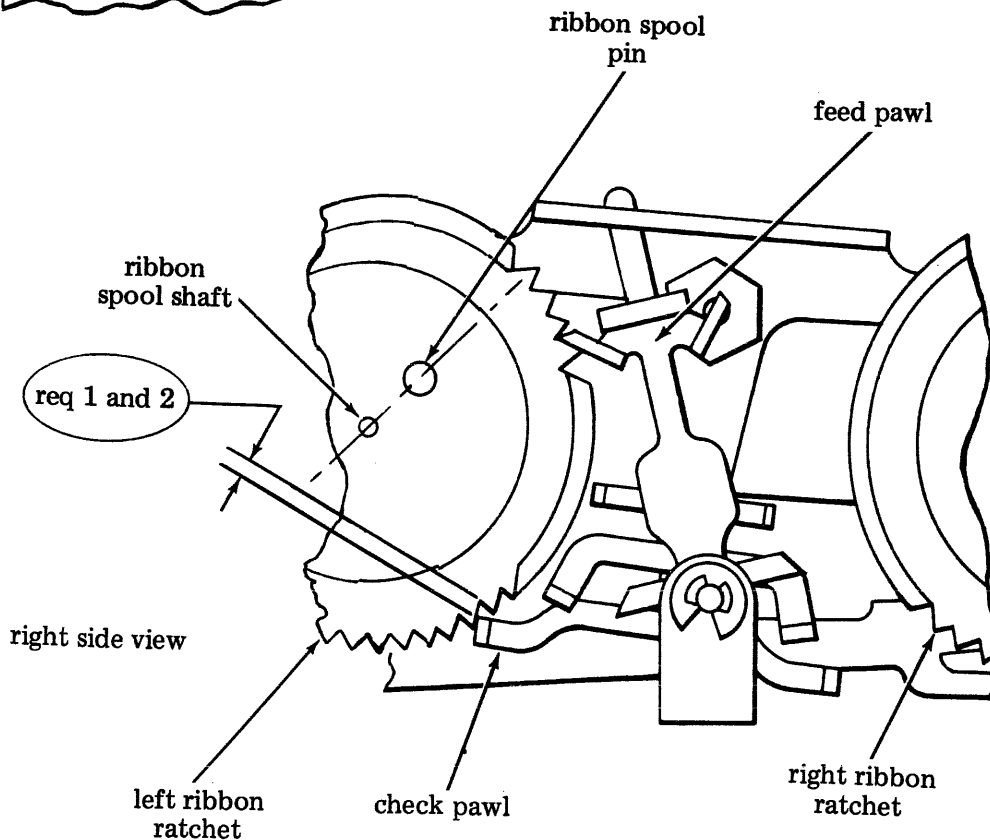
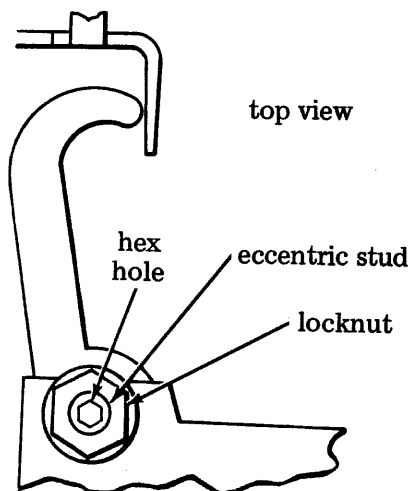
Adjust — Loosen locknut.

Position the eccentric stud with hex key wrench in hex hole.

Tighten locknut.

NOTE: Position eccentric stud to bottom of its mounting slot when tightening locknut.

“Requirement” affected by:
FRONT ROLLERS CLEARANCE (CRA-1)
REAR RAIL POSITION (CRA-5)
RESET LEVER POSITIONING (CRA-10)



RIBBON RATCHET SPRING

Requirement — With feed and check pawls disengaged from ratchet wheel 1-1/2 to 3-1/2 to start ratchet wheel moving.

RIBBON FEED PAWL SPRING

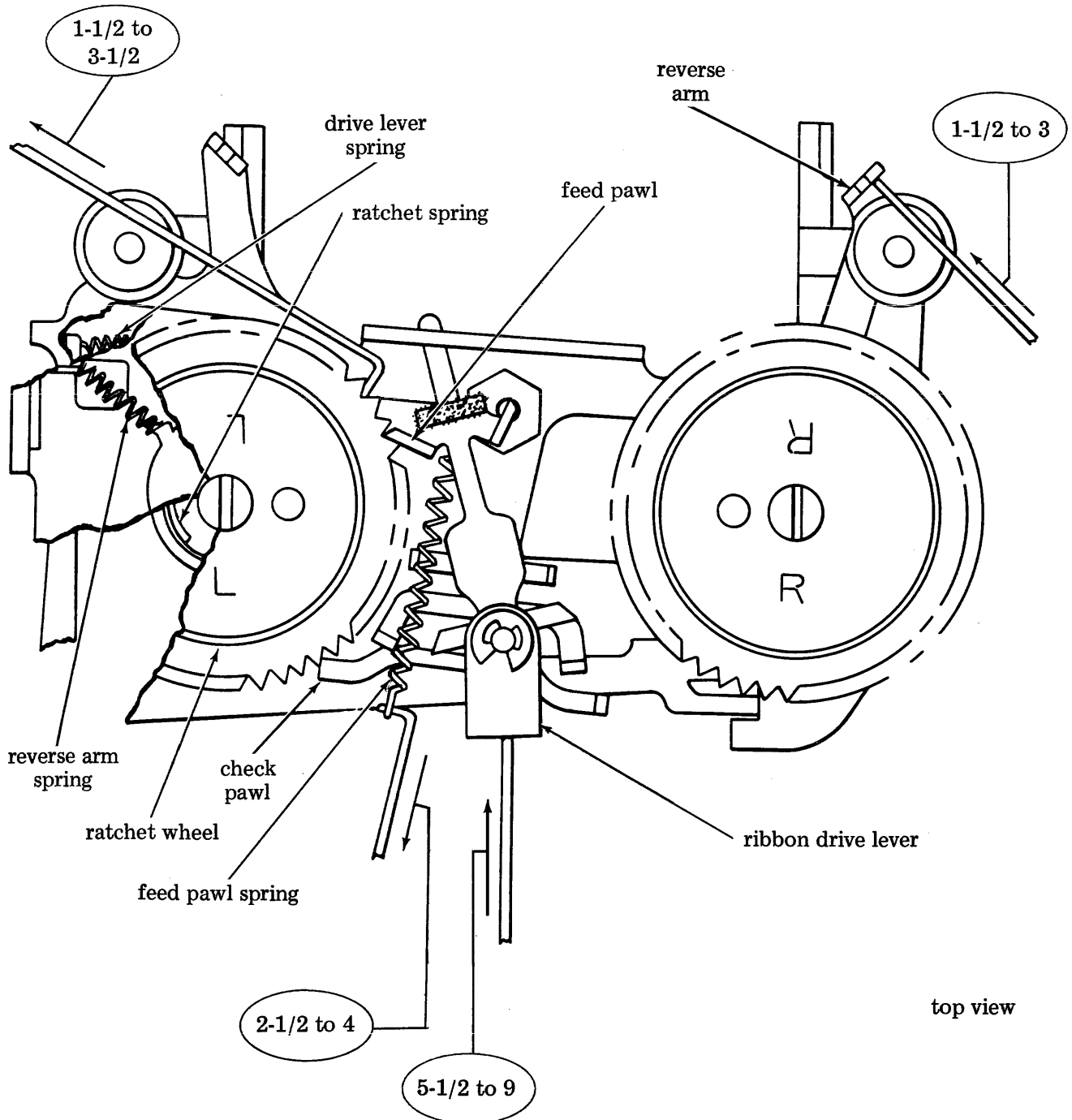
Requirement — With typing unit in stop condition 2-1/2 to 4 to pull feed pawl spring to installed length.

RIBBON REVERSE ARM SPRING

Requirement — With typing unit in stop condition and ribbon removed 1-1/2 to 3 to start reverse arm moving.

RIBBON DRIVE LEVER SPRING

Requirement — With typing unit in stop condition 5-1/2 to 9 to start ribbon drive lever moving.



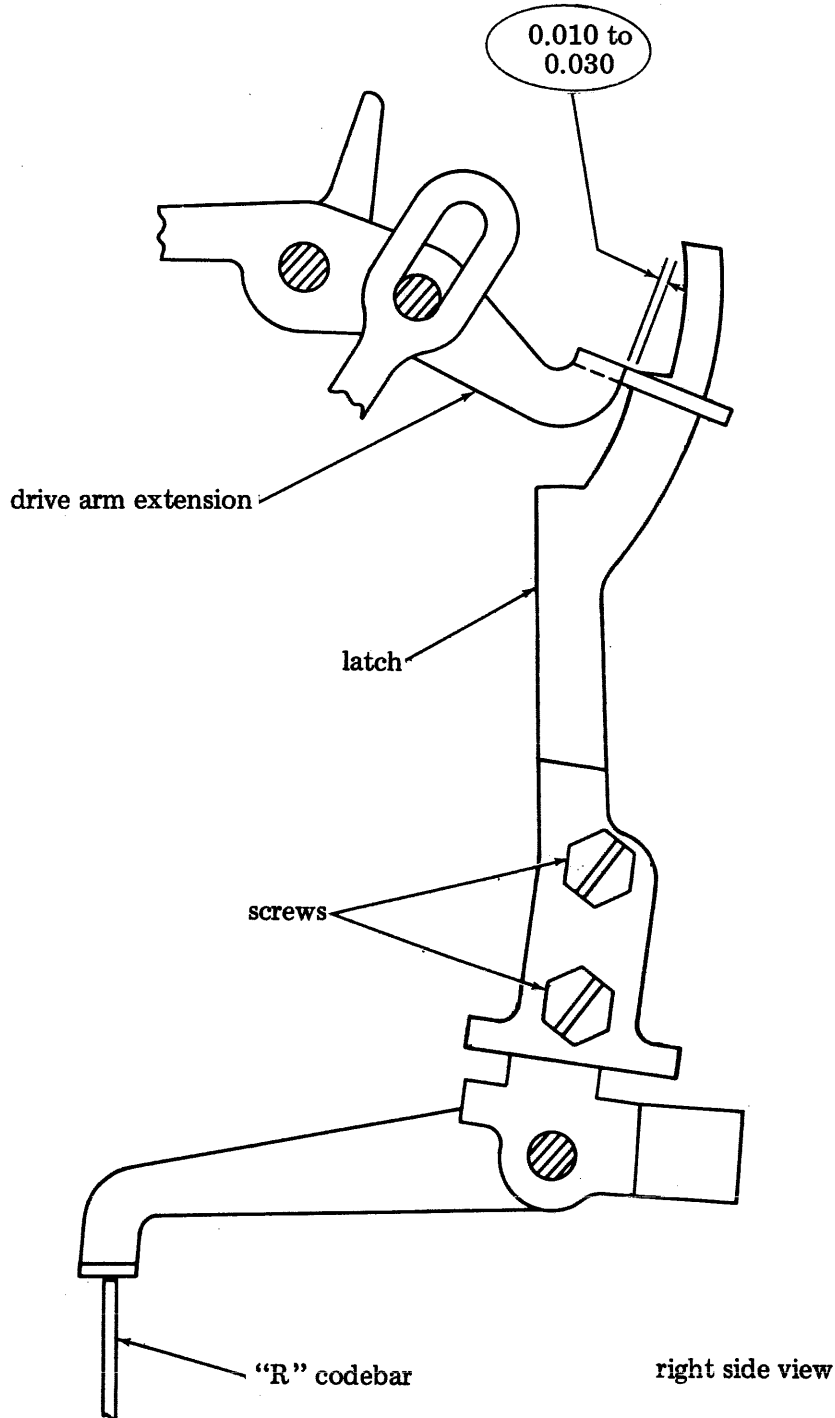
COLOR SELECTION LATCH OVERTRAVEL (CRA-18)

- Place printer in the red printing mode.
- Trip selector clutch.
- Rotate main shaft until top of drive arm extension is flush with top stop on latch.

Adjust — Loosen screws.
Position latch bellcrank.
Tighten screws.

Requirement — 0.010 to 0.030 between
drive arm extension and latch
bellcrank.

“Requirement” affected by:
BLOCKING LINK CLEARANCE (ABA-1)



RIBBON GUIDE SPRING

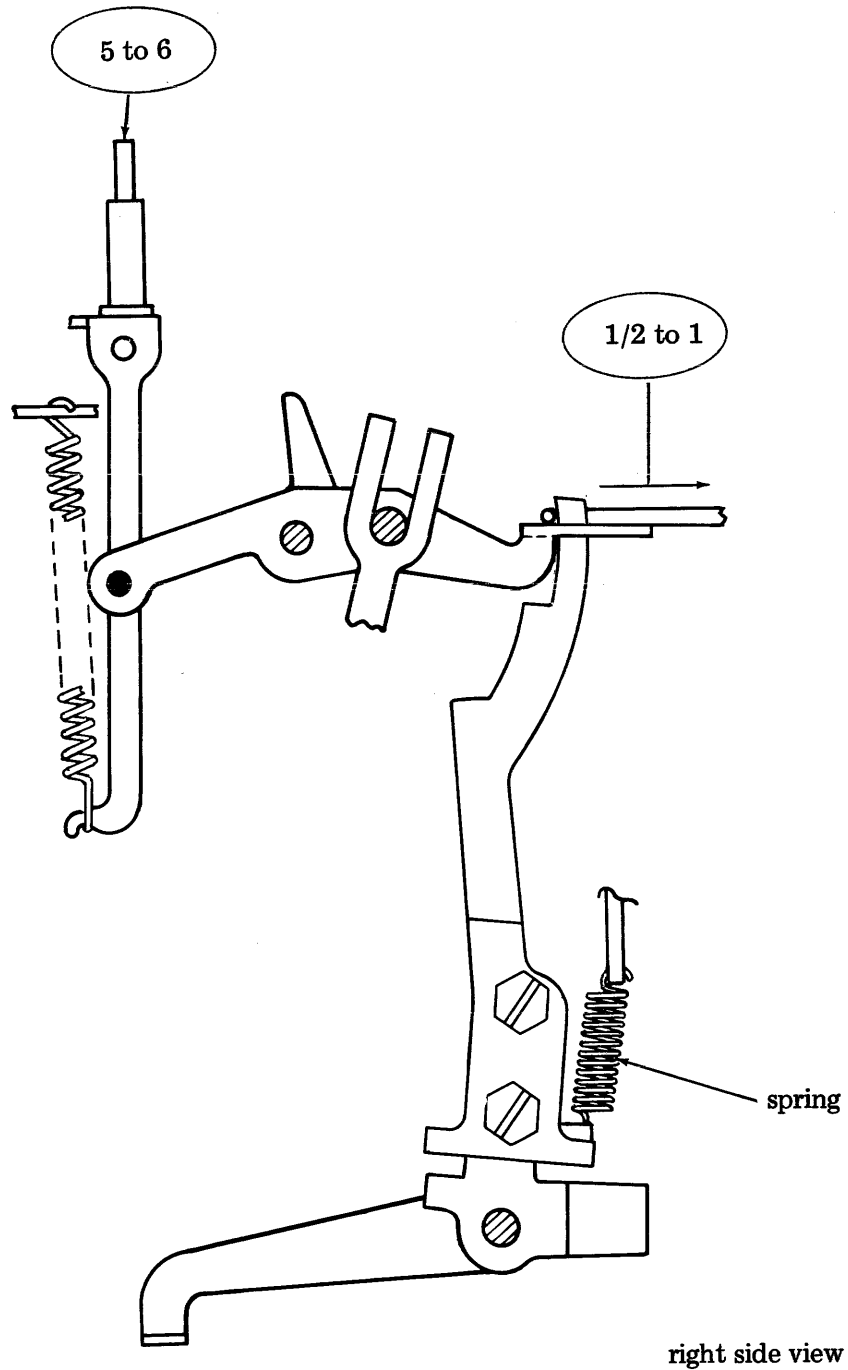
- Printer in stop condition.
- Engage function clutch.
- Rotate main shaft until ribbon guide rises to its highest position.

Requirement — 5 to 6 to start ribbon guide moving.

LATCH BELLCRANK SPRING

- Printer in stop condition.

Requirement — 1/2 to 1 to start latch bellcrank moving.

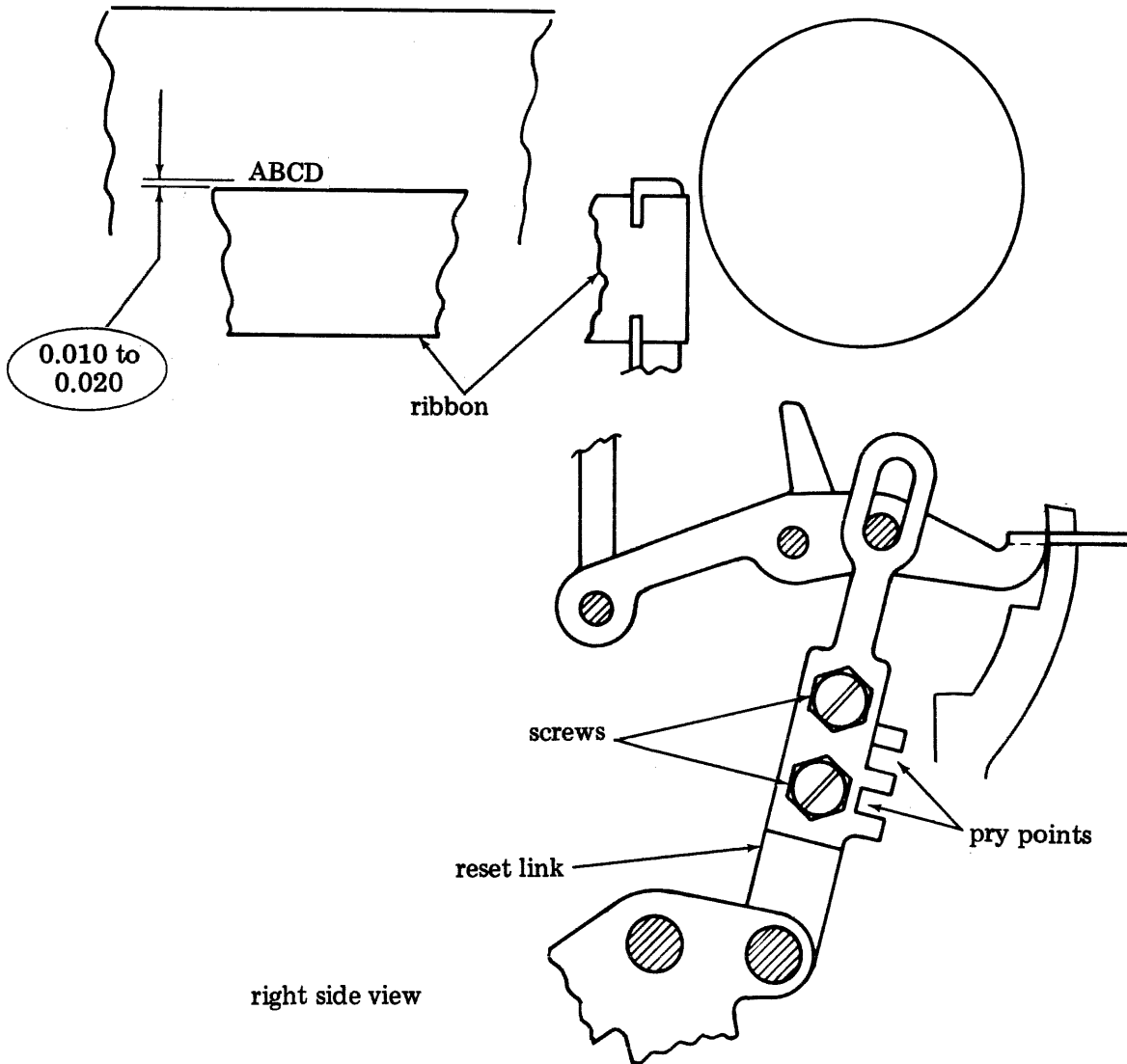


RIBBON LIFTER RESET LINK (CRA-19)

- Print any four characters, as illustrated.
- Place printer in stop condition.

Requirement — 0.010 to 0.020 between the top horizontal edge of ribbon and lower edge of printed characters, as gauged by eye.

Adjust — Loosen screws.
Position reset link using pry points.
Tighten screws.



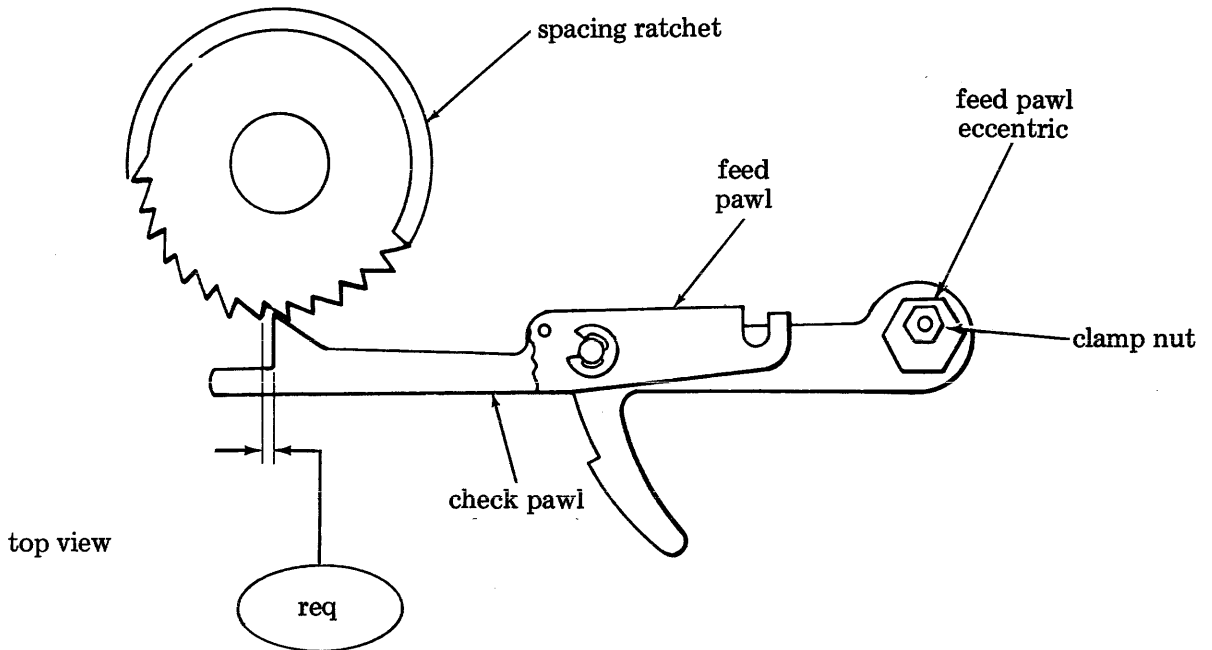
FEEED PAWL STOP POSITION (SPA-1)

- Place carriage at center of platen.
- Place printer in stop position.
- Fully engage feed pawl with spacing ratchet.

Requirement — 0.004 to 0.018 between check pawl and spacing ratchet tooth.

Adjust — Loosen clamp nut.
 Rotate feed pawl eccentric.
 Keep high part of eccentric toward front.
 Tighten clamp nut.

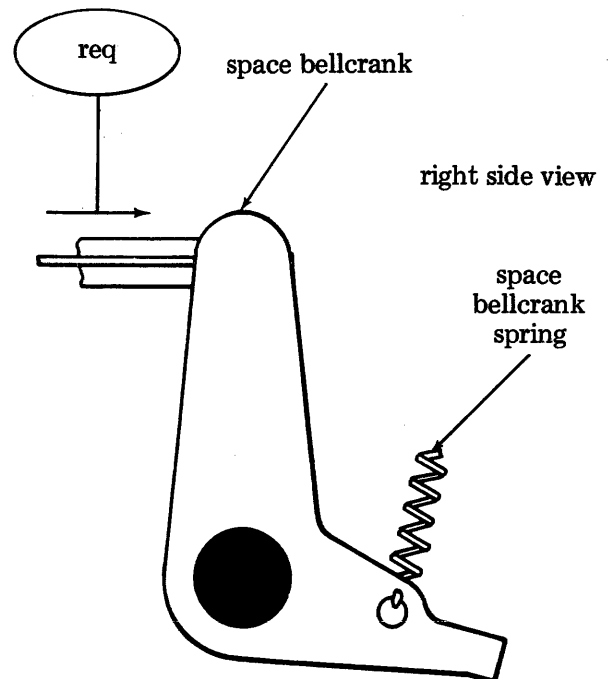
“Requirement” affected by:
 PRINT HAMMER TRIP LEVER RELEASE
 (CRA-8)



SPACE BELLCRANK SPRING

- Place printer in stop position.

Requirement — 3 to 5 to start bellcrank moving.



SPACE SUPPRESSION LEVER CLEARANCE — PRINTING (SPA-2)

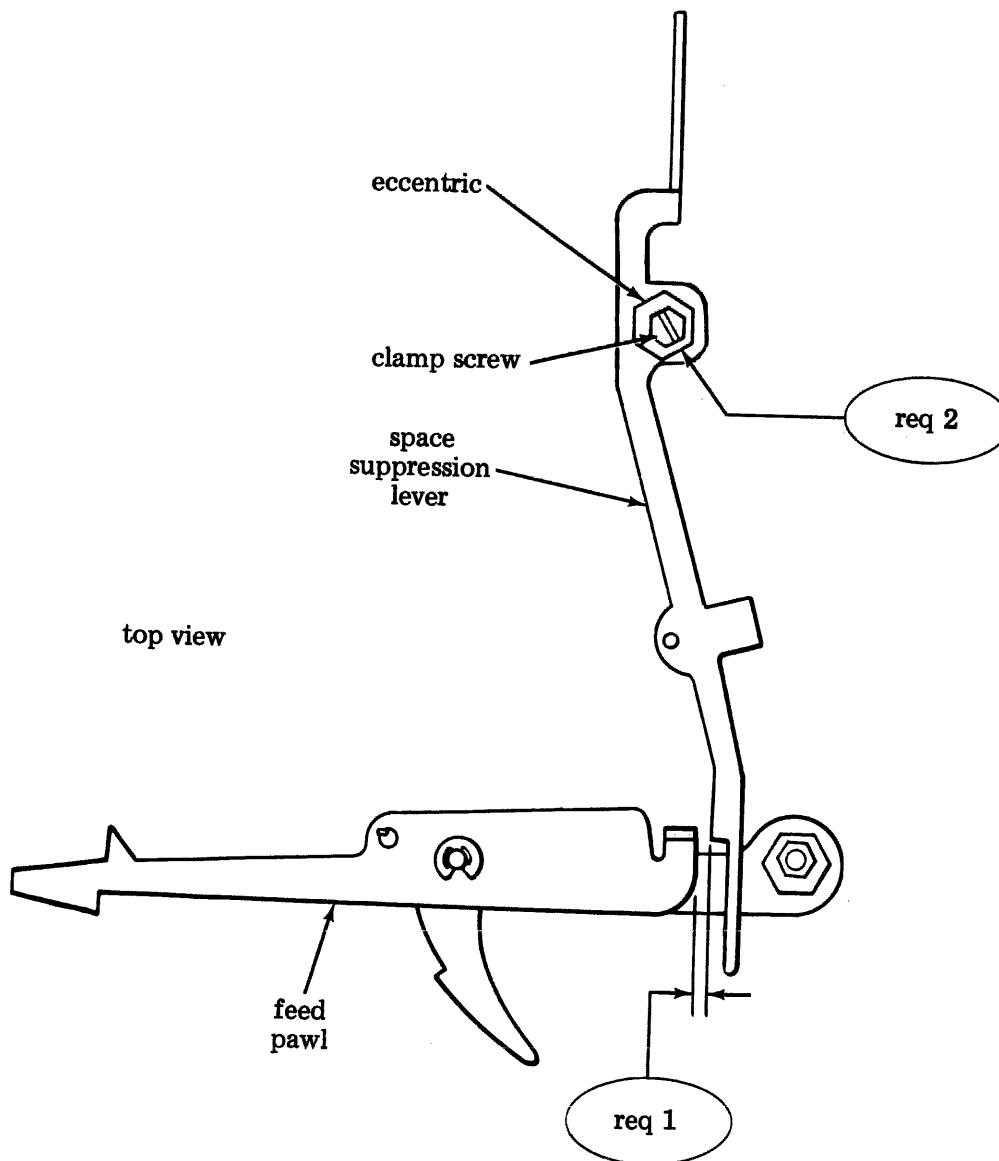
- Place carriage to center of platen.
- Set up code @ (-----78).
- Rotate main shaft until front vertical surface of right end of feed pawl is aligned with notch on space suppression lever.
- Take up all play to minimize gap.

Requirement 1 — 0.005 to 0.040 between right end of feed pawl and tip of notch on space suppression lever.

Requirement 2 — High part of eccentric should be toward rear of printer.

Adjust — Loosen eccentric clamp screw
friction tight.
Position eccentric.
Tighten eccentric clamp screw.

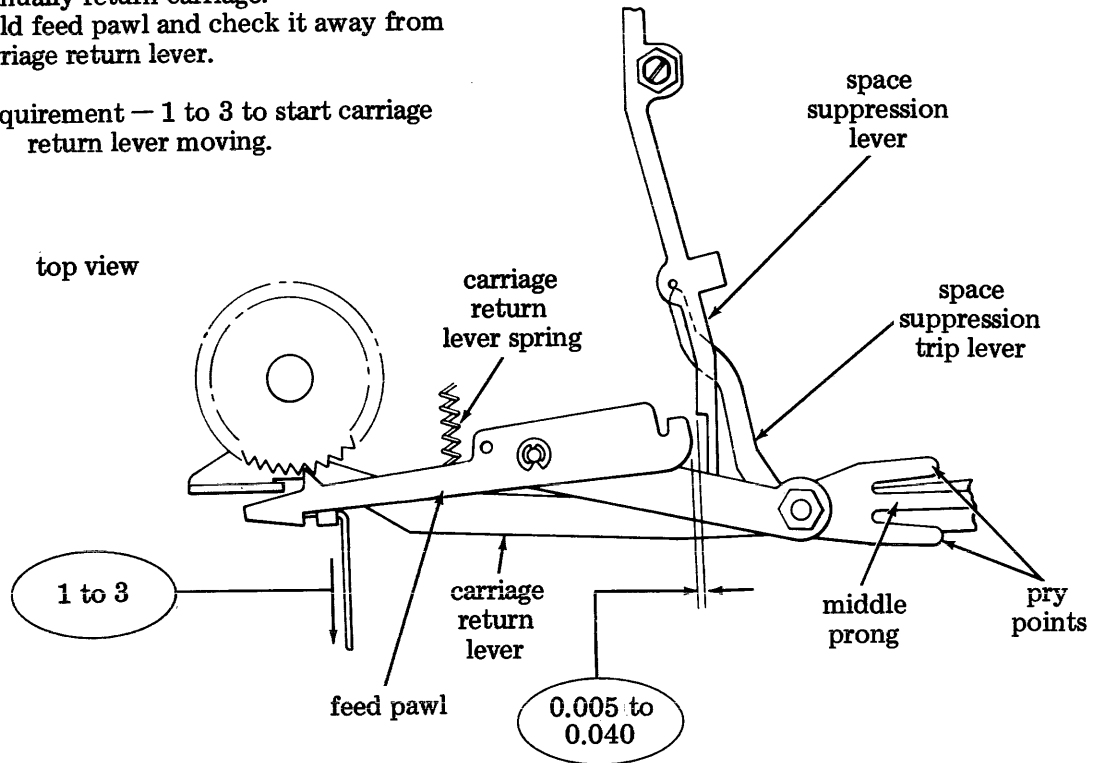
“Requirement” affected by:
CODEBAR RESET LEVER POSITION (FNA-5)



CARRIAGE RETURN LEVER SPRING

- Place printer in stop position.
- Manually return carriage.
- Hold feed pawl and check it away from carriage return lever.

Requirement — 1 to 3 to start carriage return lever moving.



SPACE SUPPRESSION LEVER CLEARANCE — SPACING (SPA-3)

- Move carriage to center of platen.
- Set up space code (---6-8).
- Rotate main shaft until front vertical surface of right end of feed pawl is aligned with notch on space suppression lever.
- Take up all play to minimize gap.

Requirement — 0.005 to 0.040 between right end of feed pawl and tip of notch on space suppression lever.

Adjust — (units with pry points)

Position space suppression trip lever by bending middle prong using proper pry point.

NOTE: Use front pry point to increase clearance and rear pry point to decrease clearance.

Adjust — (units with eccentric)

Loosen clamp nut.
Position eccentric toward bottom.
Rotate high part of eccentric to rear to increase gap and forward to decrease gap.

“Requirement” affected by:
LEFT ROCKER DRIVE (FNA-9)

SPACE SUPPRESSION LEVER SPRING

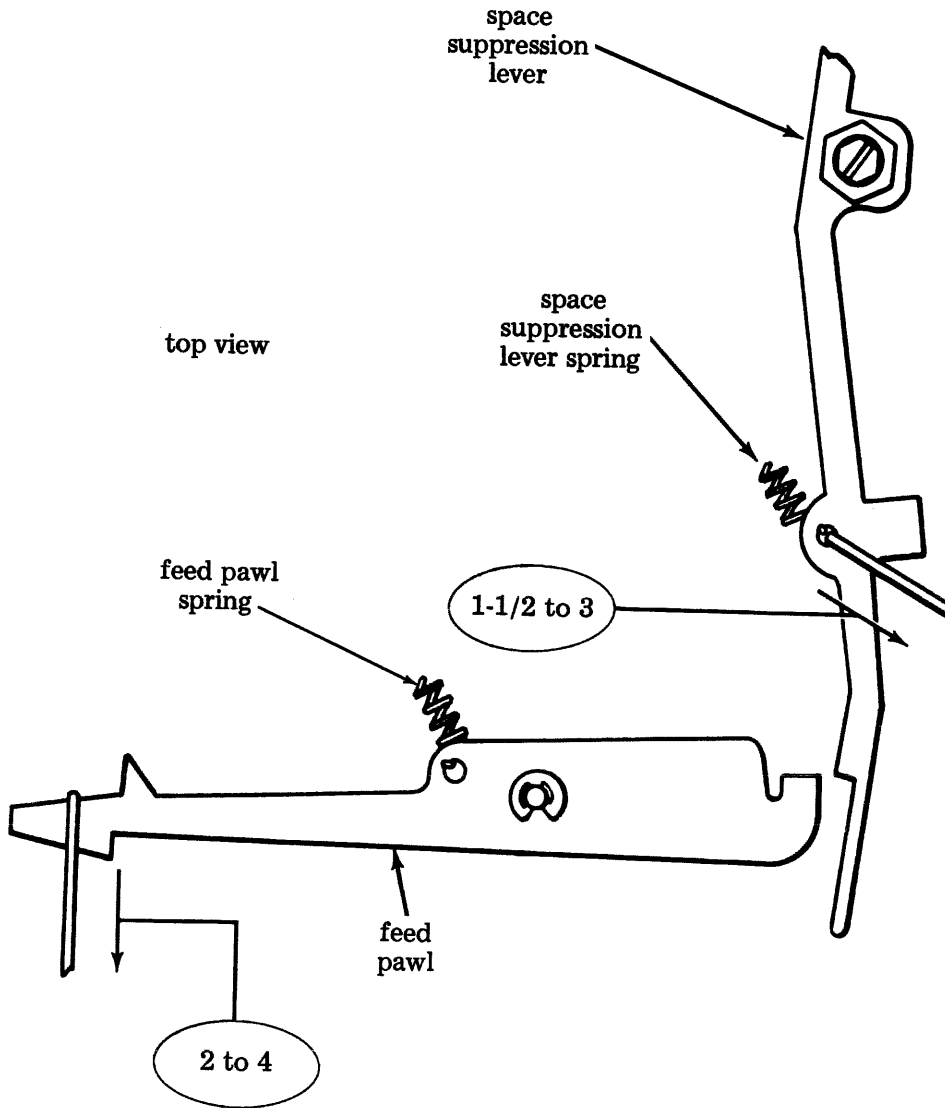
- Printer in stop condition.

Requirement — 1-1/2 to 3 to start space suppression lever moving.

FEED PAWL SPRING

- Printer in stop condition.
- Feed pawl disengaged from spacing ratchet.

Requirement — 2 to 4 to start feed pawl moving.



FEED PAWL TRAVEL

- Place carriage at left margin.
- Set up "M" code (1-34--78) in selector.
- Rotate main shaft until function clutch is in position "B."
- Hold check pawl away from ratchet.

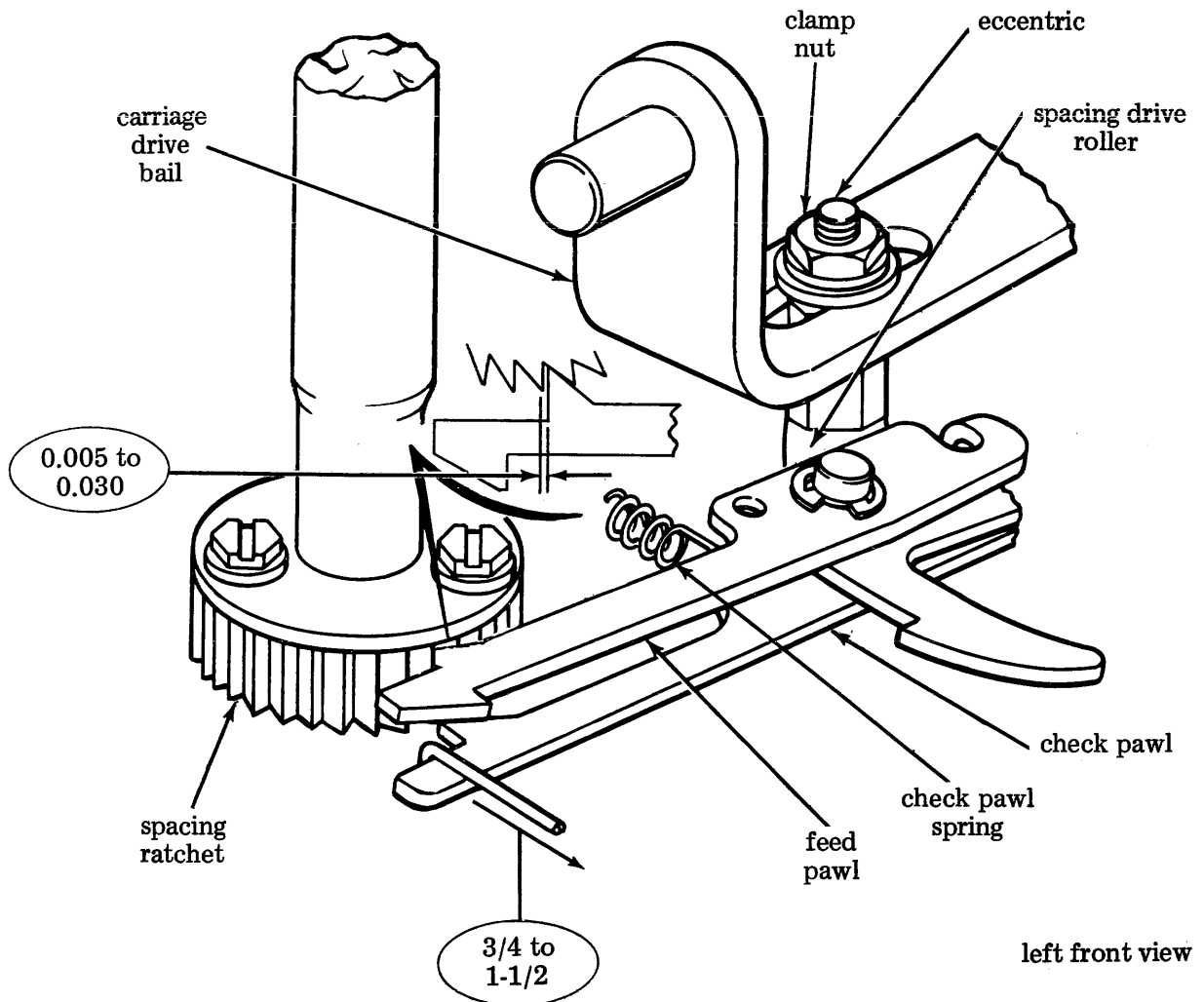
Requirement — 0.005 to 0.030 between the feeding surface of the feed pawl and the face of ratchet.

Adjust — Loosen clamp nut friction tight.
 Face high point of eccentric to right and place spacing drive roller on center of feed pawl camming surface.
 Position spacing drive roller with eccentric.
 Tighten clamp nut.

CHECK PAWL SPRING

- Place printer in stop condition.

Requirement — 3/4 to 1-1/2 to start check pawl moving.



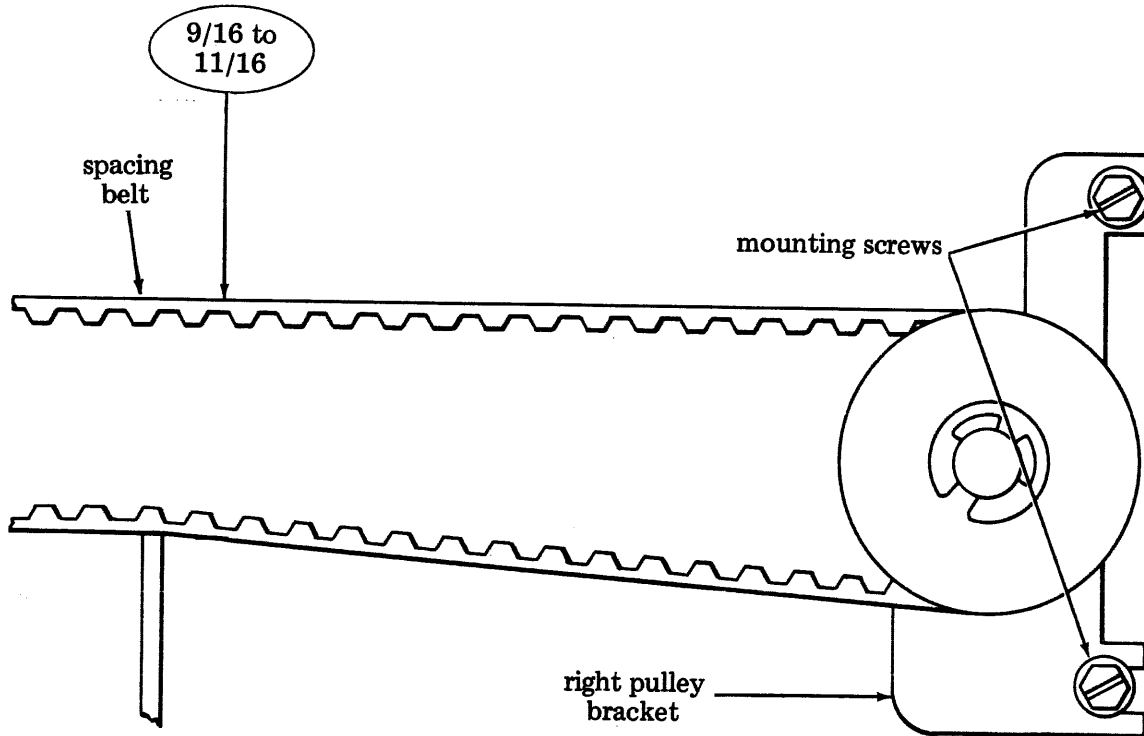
SPACING BELT TENSION (SPA-5)

- Printer in stop condition.
- Carriage at left margin.
- Apply 10 ounces of pressure at center of belt.

Requirement — 9/16 to 11/16 between outer surfaces of belt.

Adjust — Loosen mounting screws.
Position right pulley bracket.
Tighten screws.

“Adjust” affects:
LEFT MARGIN PRINTING (FOA-15)
FEED PAWL TRAVEL



top view

CARRIAGE RETURN LEVER — UNLATCH CLEARANCE (SPA-6)

- Move carriage to left margin by placing carriage return lever in its forward latched position.
- Take up all play to minimize clearances.

Requirement 1 — Some to 0.050 between the carriage return latch and vertical extension of the carriage return lever.

Adjust — Loosen clamp screw.
Use pry points to position carriage return latch.
Tighten clamp screw.

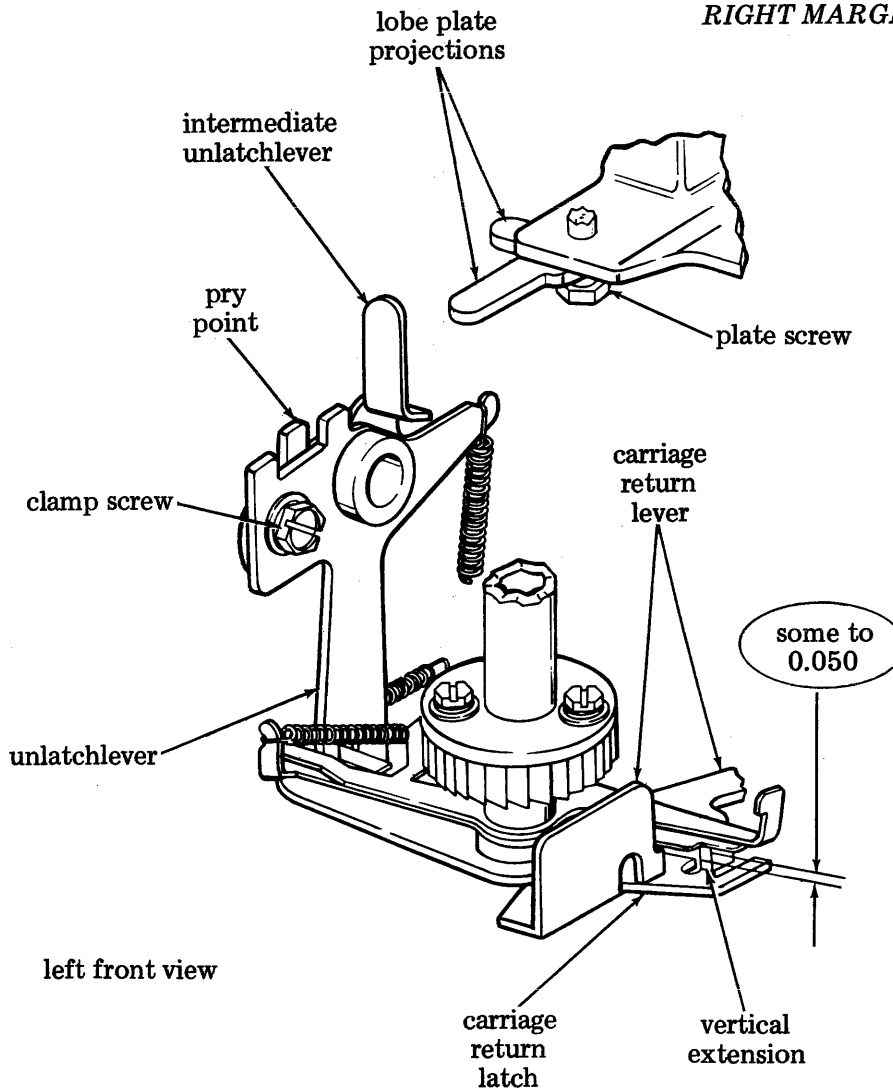
Check requirement 2 only if the printer is being completely readjusted.

Repeat the two preliminary steps to requirement 1.

Requirement 2 — The intermediate unlatch lever should be aligned with the lobe plate projection which most nearly touches it.

Adjust — Loosen plate screw.
Position lobe projection plate.
Tighten plate screw.
Check **FRONT ROLLERS CLEARANCE (CRA-1)** adjustment.

“Requirements 1 and 2” affected by:
LEFT MARGIN POSITION (FOA-35)
RIGHT MARGIN POSITION (FOA-36)



CARRIAGE RETURN ARM SPRINGS

- Place typing unit in stop condition.
- Engage feed pawl and check pawl with spacing ratchet.

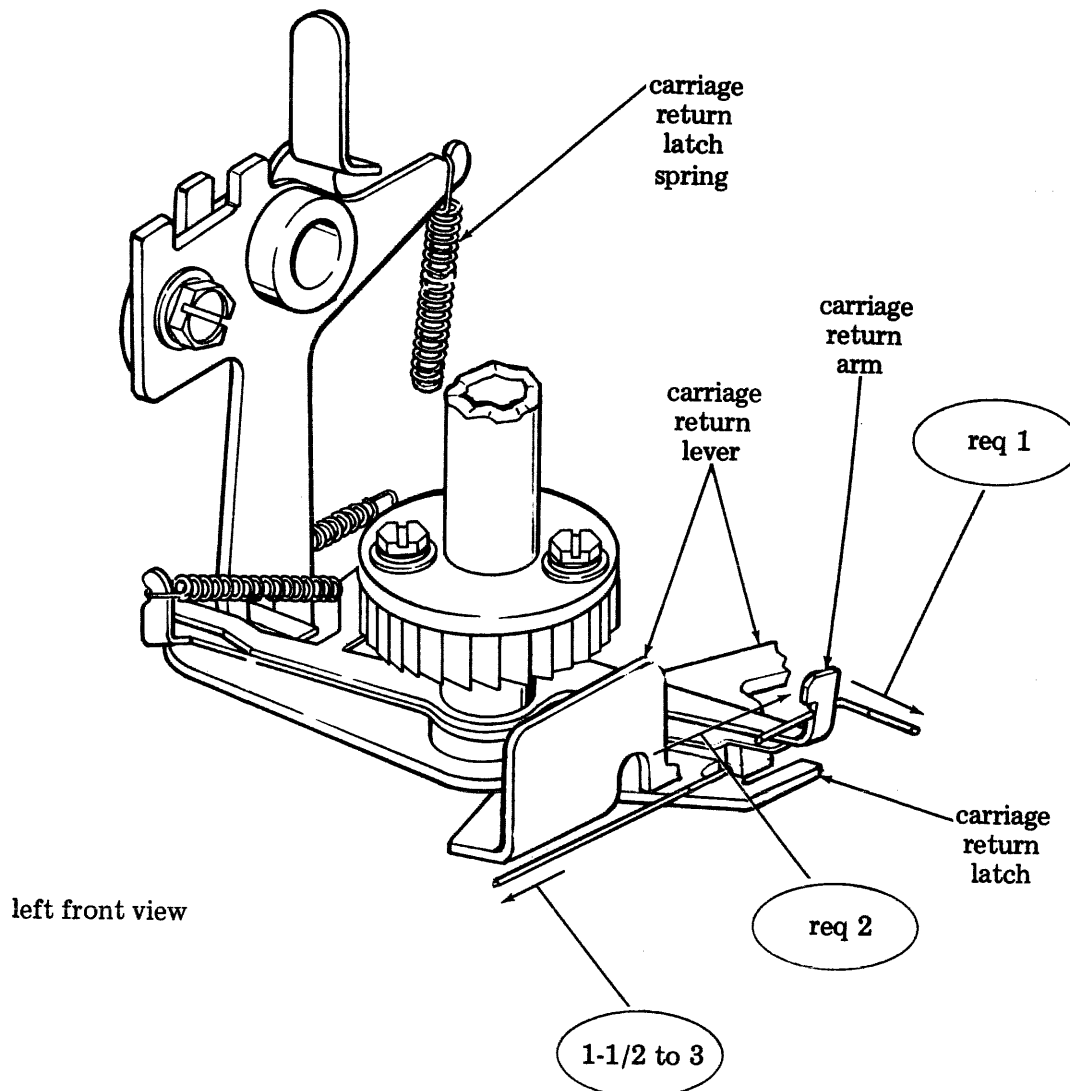
Requirement 1 — 1 to 2 to start carriage return arm moving.

Requirement 2 — 1/2 to 1-1/2 to start arm moving.

CARRIAGE RETURN LATCH SPRING

- Place typing unit in stop condition.
- Carriage return lever unlatched.
- Place carriage away from left margin.

Requirement — 1-1/2 to 3 to start carriage return latch moving.



PAPER GUIDE SPRING

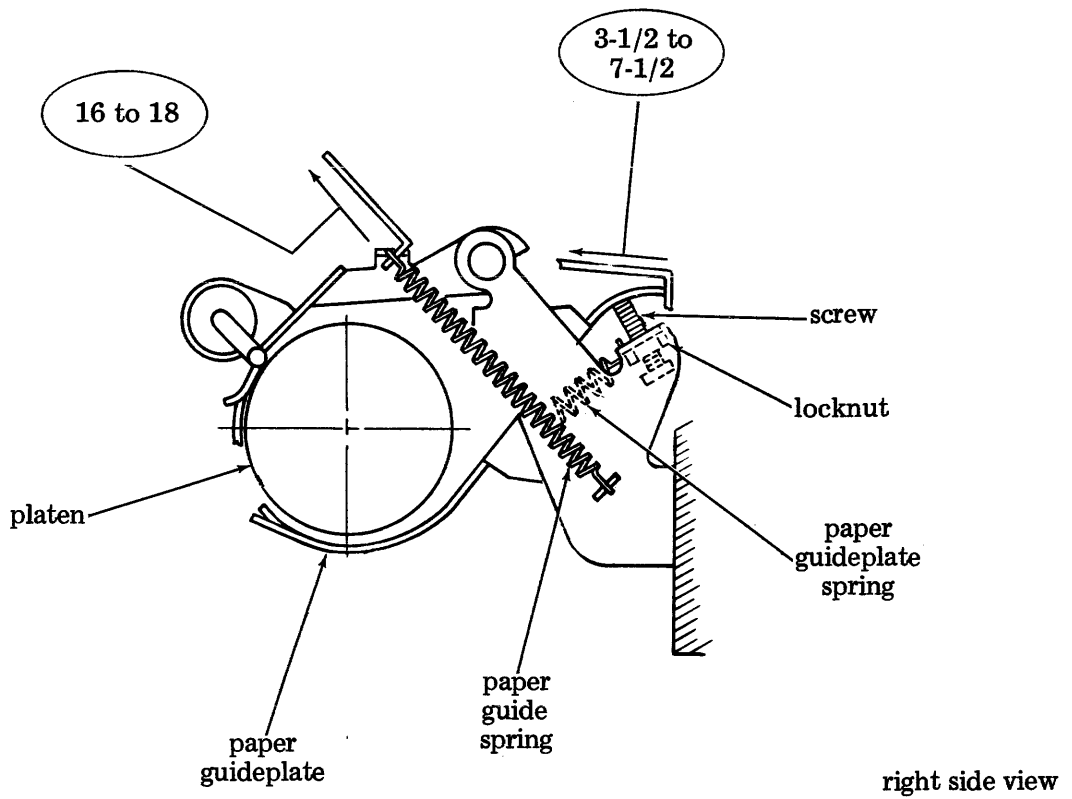
- Paper guides resting on platen.

Requirement — 16 to 18 to pull each paper guide spring to installed length.

PAPER GUIDEPLATE SPRING

- Spring scale positioned at middle of paper guideplate.

Requirement — 3-1/2 to 7-1/2 to start guideplate moving.

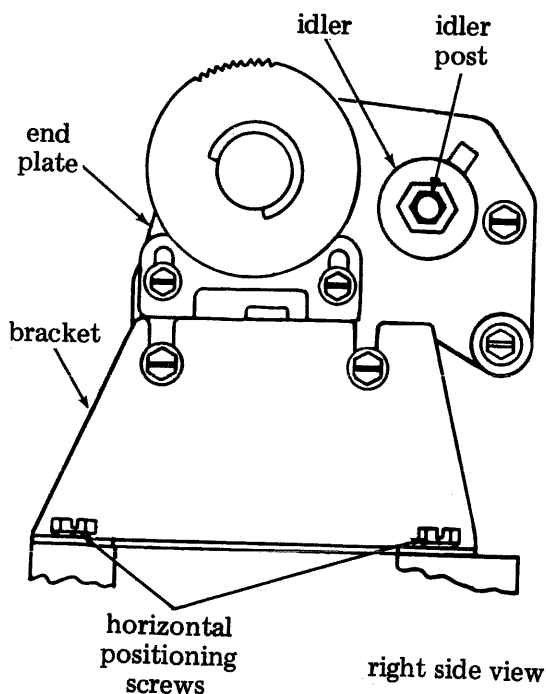
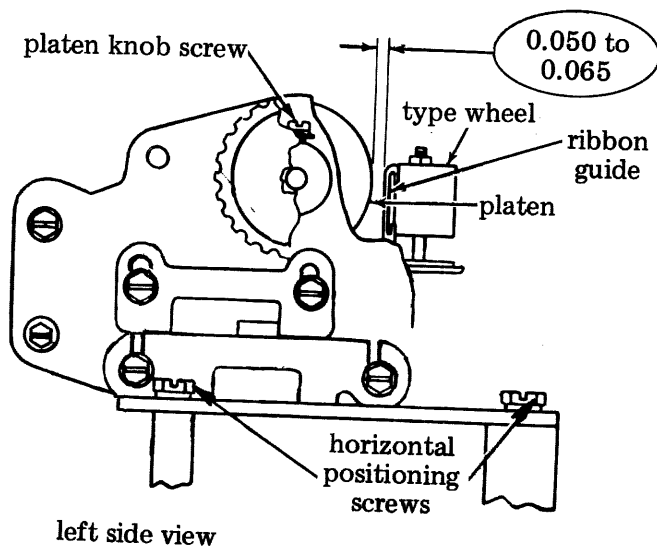


PLATEN — HORIZONTAL POSITION (PLA-1)

NOTE: If the idler has not been previously backed off, loosen the nut securing the idler post and position idler to low point in slot before making the adjustment.

- Place platen knob screw up.
- Permit detent ratchet pawl to seat in a groove of detent ratchet.
- Place carriage at left margin; check requirement.
- Move carriage to right margin; check requirement.

Requirement 1 — 0.050 to 0.065 between ribbon guide and platen at both left and right margins.



- Remove paper and ribbon from typing unit.
- Place carriage at center of platen.
- Rotate platen until maximum clearance is obtained between platen and ribbon guide.
- Set up "E" (1-3---78) in selector.
- Rotate main shaft until function clutch is in position "B."
- Push type wheel to rear until it touches platen.

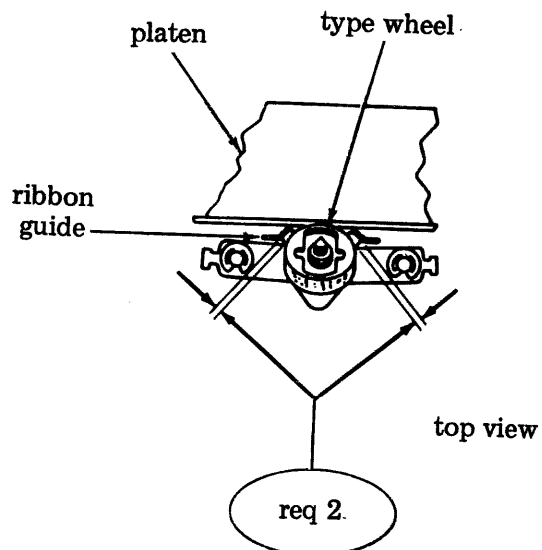
Requirement 2 — Type wheel should not touch side of either ribbon guide.

Adjust — Loosen four horizontal position screws.
Position platen horizontally.
Tighten screws.

NOTE: If the idler has not been previously backed off, loosen the nut securing the idler post and back off the idler before making the VERTICAL TYPE ALIGNMENT.

"Requirements 1 and 2" affected by:
FRONT ROLLERS CLEARANCE (CRA-1)

"Adjust" affects:
VERTICAL TYPE ALIGNMENT (PLA-2)
IDLER POSITION (FOA-25)
DETENT POSITION (FOA-26)
FORM FEED BELT TENSION (FOA-3)
CAM ZERO POSITION (FOA-31)
WIRE GUIDE POSITION (FOA-29)



PAPER GUIDEPLATE CLEARANCE (PLA-13)

- Remove sprocket forms from platen.

Requirement — 0.008 to 0.025 between platen and left and right ends of the paper guideplate adjacent to fingers. Record the two clearances if not within requirement.

Adjust — Loosen locknut and adjust screw. Tighten locknut.

NOTE 1: If adjustment cannot be made, remove platen mechanism. See Section 574-422-702TC. Then proceed as follows.

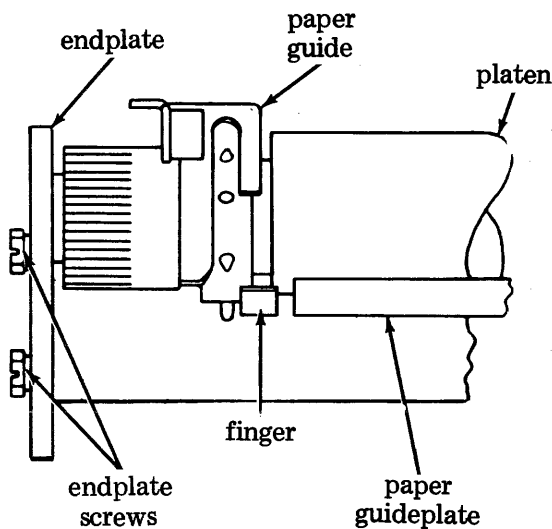
Requirement (preliminary) — With the screw backed off and no sprocket forms in the platen, zero to 0.012 between the platen and the left and right ends of paper guideplate — adjacent to the fingers. Record the two clearances (see NOTE 2).

Adjust (preliminary) — Loosen endplate screws friction tight and position endplates. Tighten screws.

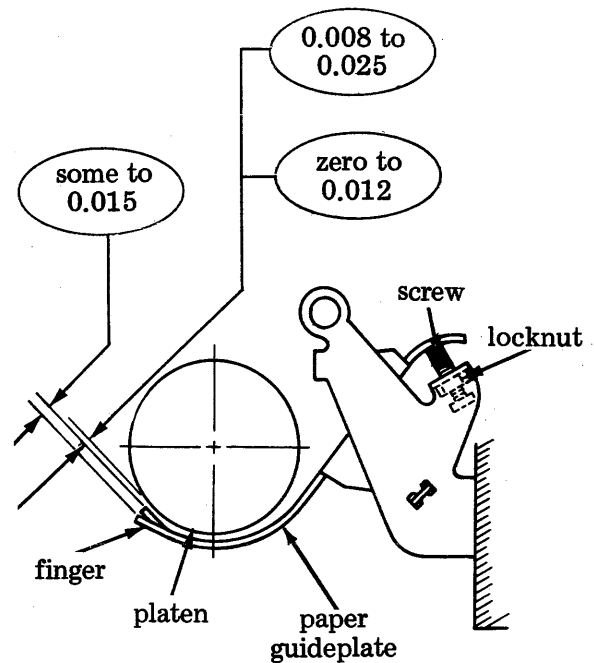
NOTE 2: The fingers at both the left and right ends of the platen should be some to 0.015 beyond the recorded gap between the platen and the left and right ends of the paper guideplate. Bend fingers to meet requirement.

NOTE 3: Replace platen mechanism. Check requirement.

“Adjust” affects:
PAPER ALARM CONTACT LEVER CLEARANCE — S (FOA-41)



front view



right side view

VERTICAL TYPE ALIGNMENT (PLA-2)

- Make sure there is paper in the typing unit.
- Set up the E code (1-3---78) in the selector.
- Rotate main shaft until character is printed.
- Repeat several times along length of platen.

Requirement — Shading in printed character should be approximately the same, with no overscoring or underscoring.

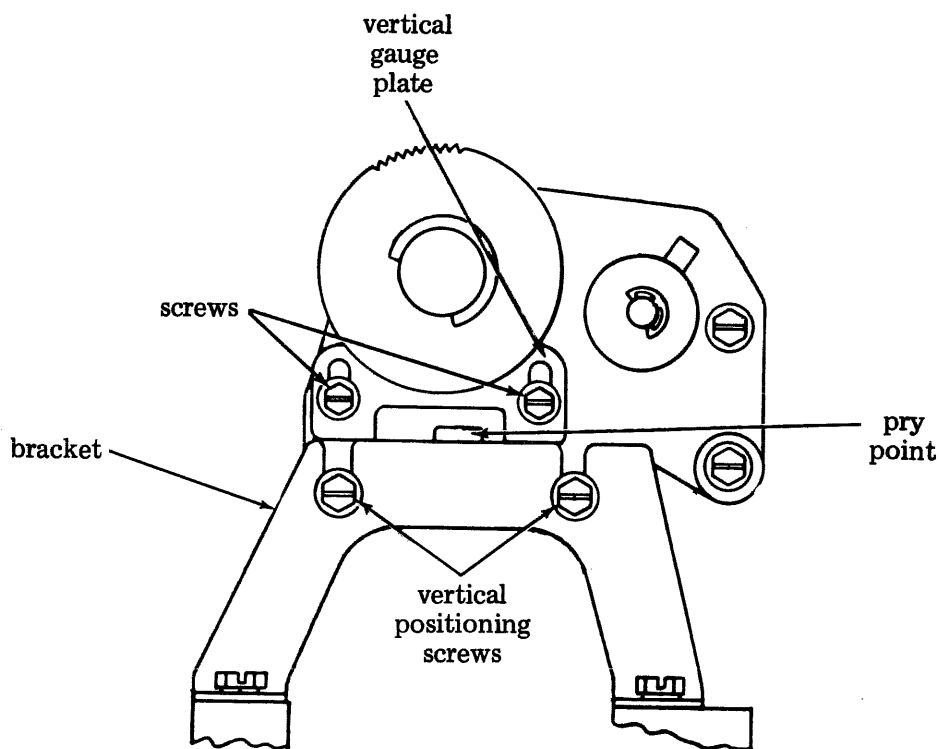
Adjust — Loosen vertical gauge plate screws. Back off the vertical gauge plate on each side of the platen. Loosen four vertical positioning screws; position platen using pry point. Do not twist platen. After adjusting, position each vertical gauge plate so that it is resting on top of its associated bracket. Tighten all screws.

“Adjust” affects:

IDLER POSITION (FOA-25)
DETENT POSITION (FOA-26)
CAM ZERO POSITION (FOA-31)
WIRE GUIDE POSITION (FOA-29)

“Requirement” affected by:

PLATEN — HORIZONTAL POSITION (PLA-1)
REAR RAIL POSITION
PRINT DRIVE LEVER POSITIONING



right side view

FORM FEED CLUTCH ENDPLAY (FOA-1)

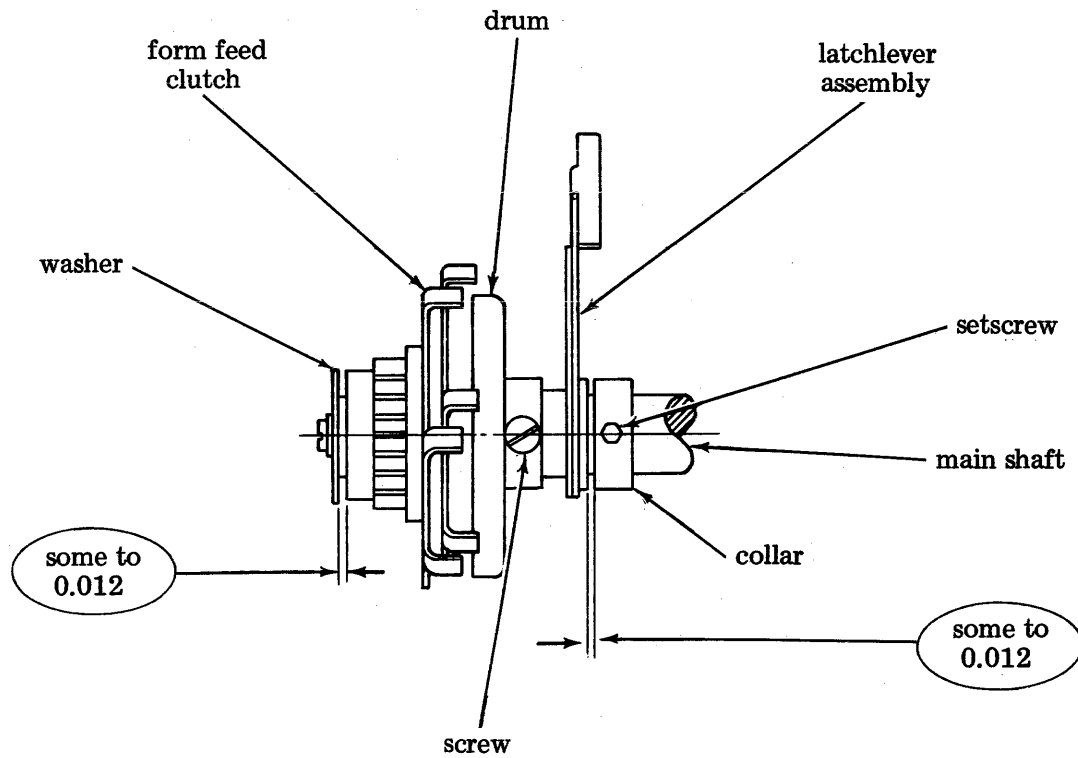
Requirement — Some to 0.012 endplay
between washer and form feed clutch.

Adjust — Loosen drum screw and position
drum.

LATCHLEVER ENDPLAY (FOA-2)

Requirement — Some to 0.012 endplay
between latchlever assembly and collar.

Adjust — Loosen setscrew and position
collar.
Tighten setscrew.



top view

FORM FEED BELT TENSION (FOA-3)

- Check tension only if the form feed belt is suspected of not meeting its requirement.

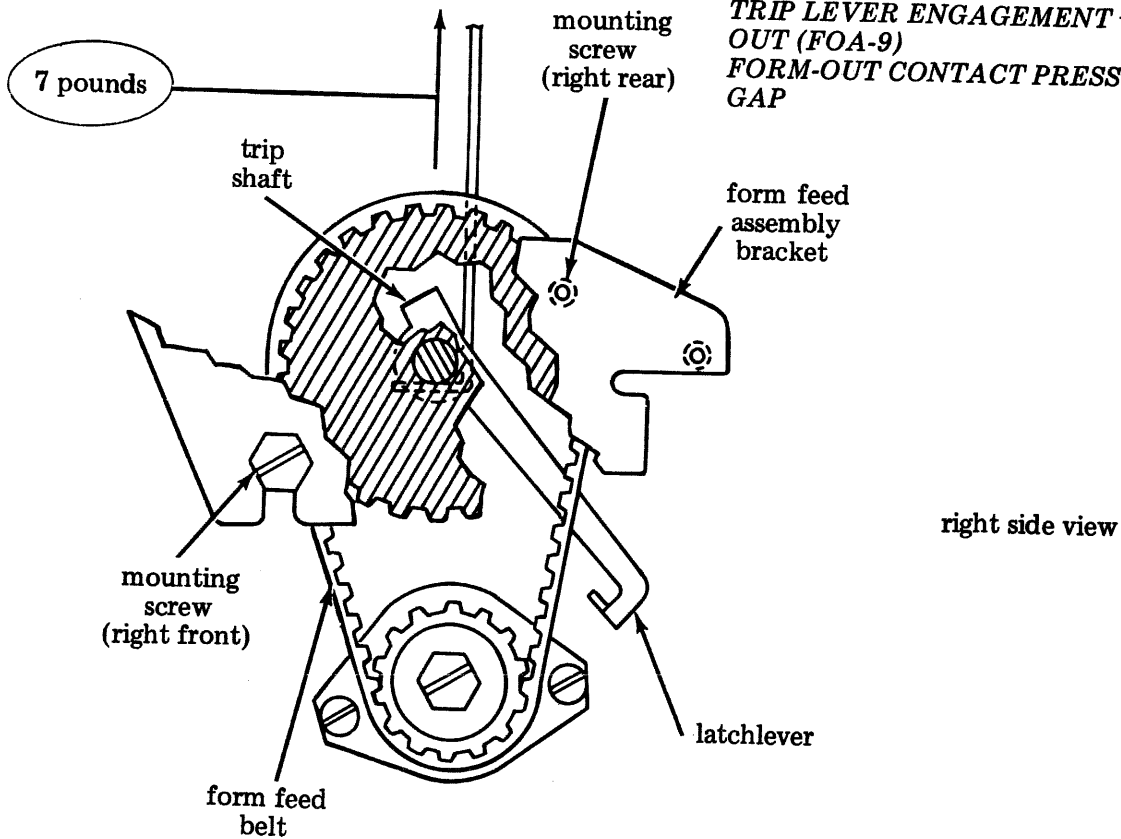
Requirement — The form feed belt tension should not be too tight or too loose.

Adjust — Loosen three form feed assembly bracket mounting screws.
Hook a spring scale under the trip shaft at the latchlever.
Position and pull up with a force of 7 pounds and hold.
Tighten the three form feed assembly mounting screws in the following order: first, the right front mounting screw; second, the right rear mounting screw; third, the left mounting screw.

NOTE 1: Make sure that the shaft is free by rotating reset follower lever. If necessary, free trip shaft by repositioning the left mounting bracket of the form feed assembly against the form feed assembly bracket.

NOTE 2: The left mounting screw is located on the left side of the form feed bracket.

“Adjust” affects:
FORM-OUT LEVER OVERTRAVEL (FOA-7)
FORM-OUT LEVER — RESET CLEARANCE (FOA-10)
TRIP LEVER ENGAGEMENT — LINE FEED
TRIP LEVER UPSTOP POSITION — S LINE FEED SELECTION
IDLER POSITION (FOA-25)
DETENT POSITION (FOA-26)
RESET FOLLOWER LEVER — RESET POSITION (FOA-30)
CAM ZERO POSITION (FOA-31)
CLUTCH SHOE LEVER GAP (FOA-4)
TRIP SHAFT ENDPLAY
TRIP LEVER ENGAGEMENT — FORM-OUT (FOA-9)
FORM-OUT CONTACT PRESSURE AND GAP



CLUTCH SHOE LEVER GAP (FOA-4)

- Rotate main shaft until form feed clutch is in that stop position which brings the flat surface of the adjusting disc to the position illustrated.
- The head of the clutch drum mounting screw should be up.
- Disengage the form feed clutch.

Requirement 1 — 0.015 to 0.040 between the stop-lug and shoe lever. Measure and record clearance.

Adjust — Loosen clamp screw.
Position trip lever.
Tighten clamp screw.

NOTE: Do not make the following adjustment unless requirement 1 cannot be met. If the clutch screws are disturbed, they must be resealed with 186171 Glyptal adhesive.

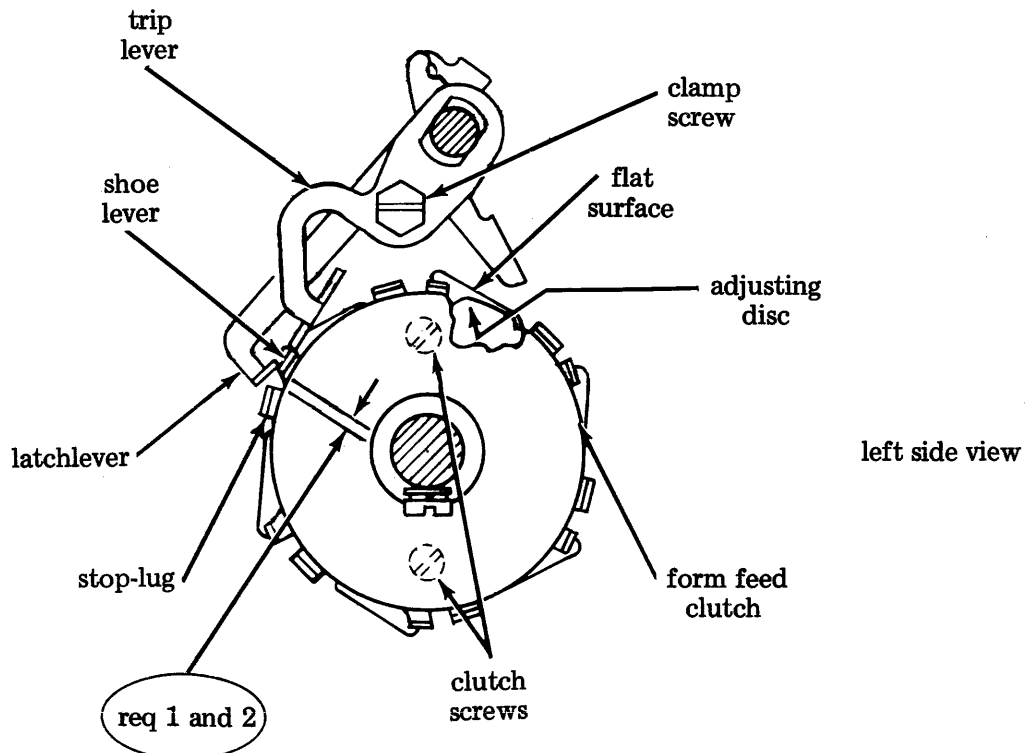
- Raise trip lever to engage form feed clutch.
- Fully seat clutch shoes by applying 32 ±1/2 oz pressure against shoe lever along its normal path of forward travel.
- Again measure and record shoe lever, stop-lug clearance.

Requirement 2 — Clearance between stop-lug and shoe lever should be 0.055 to 0.085 greater when form feed clutch is engaged than when disengaged.

Adjust — Loosen two clutch screws friction tight and position adjusting disc.
Apply Glyptal adhesive to clutch screw threads.
Tighten both screws before adhesive dries.

“Adjust” affects:
TRIP LEVER ENGAGEMENT — LINE FEED
TRIP LEVER ENGAGEMENT — FORM-OUT (FOA-9)
TRIP LEVER ENGAGEMENT — PRELIMINARY (FOA-14)

“Requirements 1 and 2” affected by:
FORM FEED BELT TENSION (FOA-3)

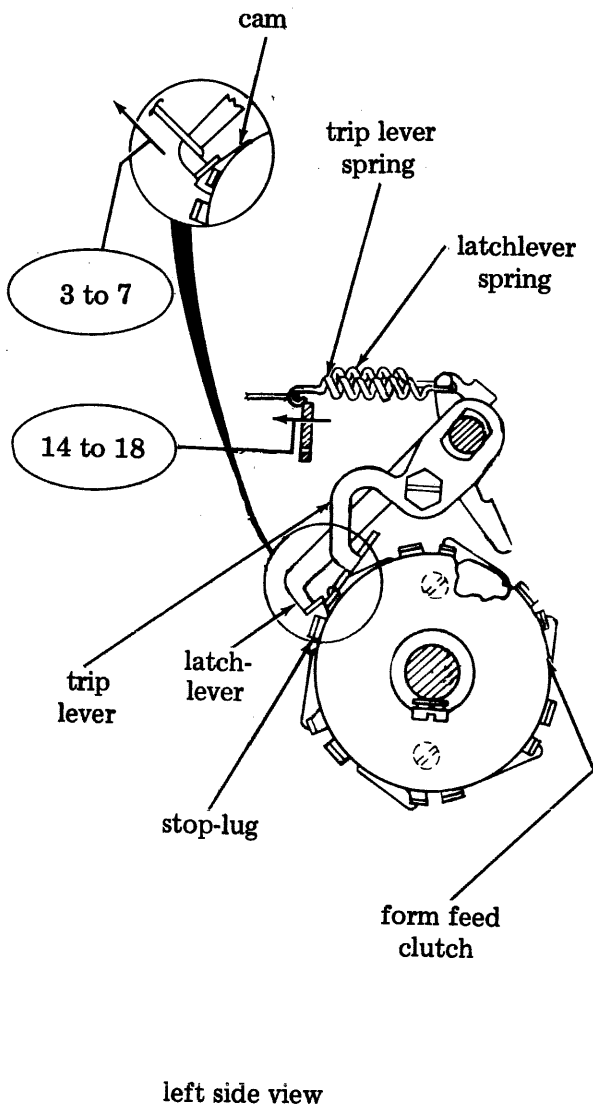


LATCHLEVER SPRINGS — S

Requirement — With latchlever resting on the high part of cam, 3 to 7 to start latchlever moving.

TRIP LEVER SPRINGS — S

Requirement — With trip lever tab resting on top of a stop-lug, 14 to 18 to pull trip lever spring to installed length.



TRIP LEVER ENGAGEMENT — PRELIMINARY (FOA-14)

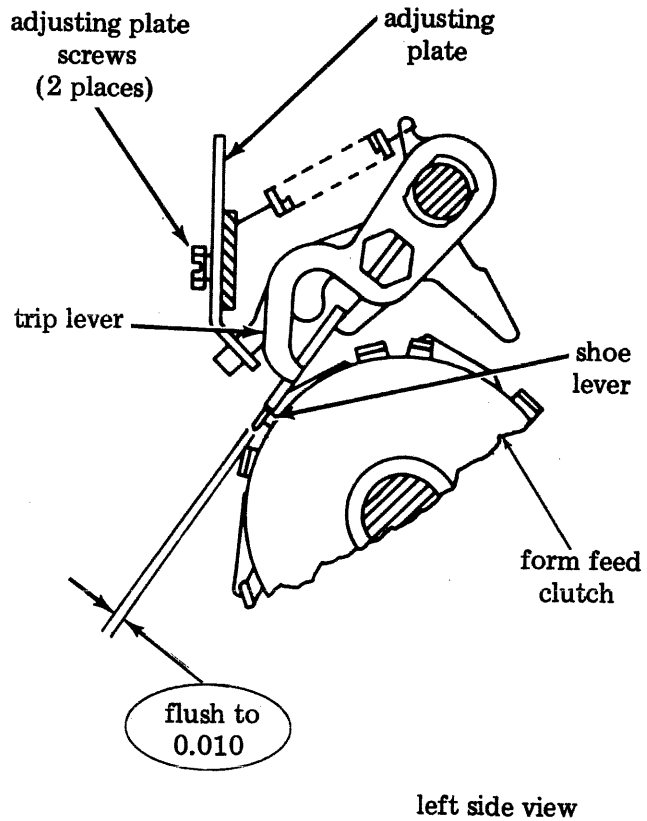
- Rotate form feed clutch until a shoe lever is just about to contact the trip lever.

Requirement — Top surface of trip lever should be flush to 0.010 below top surface of shoe lever.

Adjust — Loosen two adjusting plate screws. Position adjusting plate. Tighten screws.

“Adjust” affects:
TRIP LEVER ENGAGEMENT — FINAL (FOA-9)

“Requirement” affected by:
CLUTCH SHOE LEVER GAP (FOA-4)



**LINE FEED LEVER LINE-UP AND
ENDPLAY (FOA-6) (Early Design).**

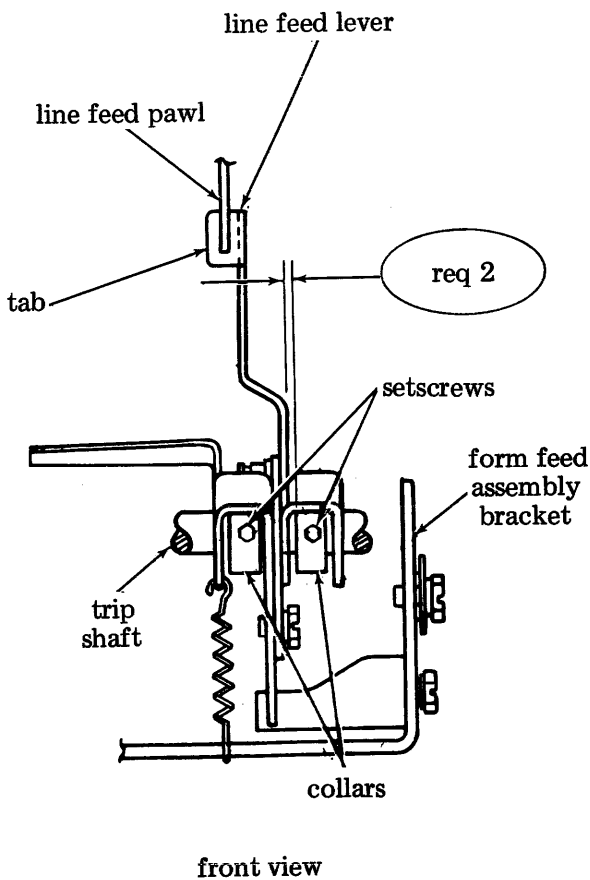
Requirement 1 — The line feed stripper pawl should engage the flat on the tab of the line feed lever.

Requirement 2 — With all endplay taken up toward the right, some to 0.012 between line feed lever and collar.

Requirement 3 — There must be some clearance between the line feed lever and the main shaft gear.

Adjust — Loosen collar setscrews and position collars to meet requirements 1 and 2.
Loosen main shaft gear screw and position main shaft gear to meet requirement 3.
Tighten all screws.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)



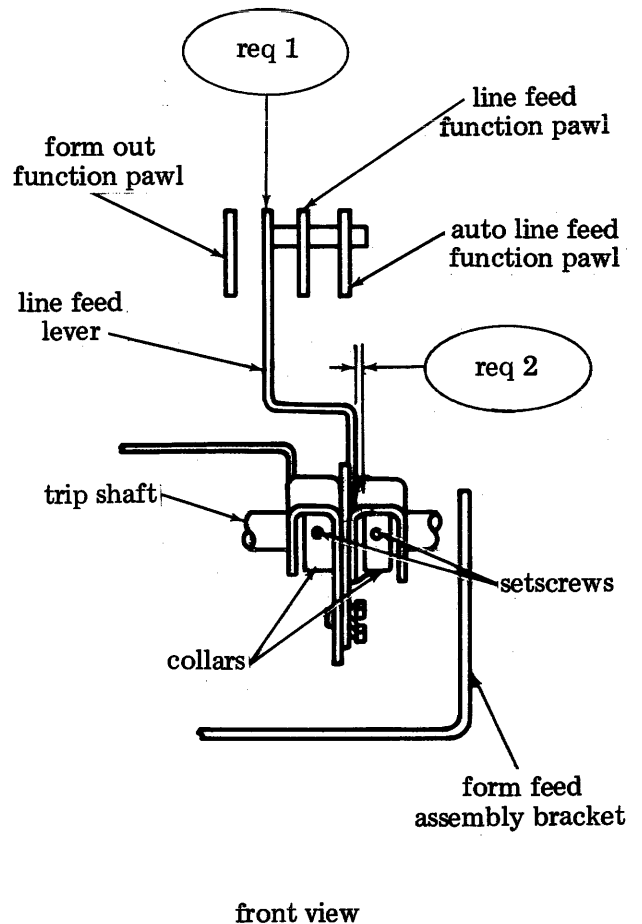
**LINE FEED LEVER LINE UP AND END-
PLAY (FOA-47) (Late Design)**

Requirement 1 — Line feed lever should be approximately centered between form out function pawl and line feed function pawl.

Requirement 2 — With all endplay taken up toward the right some to 0.012 between line feed lever and collar.

Requirement 3 — Some clearance between the line feed lever and the main shaft gear.

Adjust — Loosen collar setscrews. Position collars to meet requirements 1 and 2.
Loosen main shaft gear screw. Position main shaft gear to meet requirement 3.
Tighten all screws.



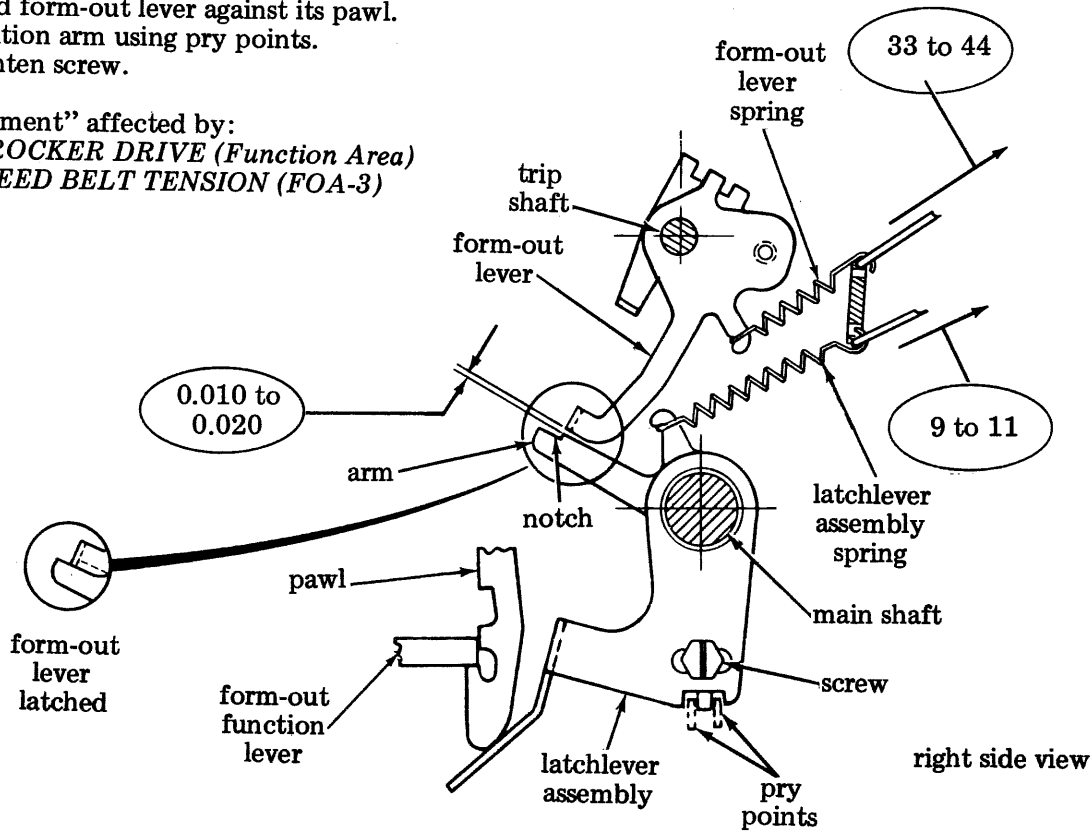
**FORM-OUT LEVER OVERTRAVEL
(FOA-7)**

- Reset lever on low part of cam.
- Form-out code (--34--8) set up in selector.
- Rotate main shaft until the form-out function lever is in its lowermost position.

Requirement — 0.010 to 0.020 between form-out lever and notch of arm.

Adjust — Loosen screw.
Hold form-out lever against its pawl.
Position arm using pry points.
Tighten screw.

“Requirement” affected by:
RIGHT ROCKER DRIVE (Function Area)
FORM FEED BELT TENSION (FOA-3)



FORM-OUT LEVER SPRING

Requirement — With form-out lever latched, 34 to 44 to pull form-out lever spring to installed length.

LATCHLEVER ASSEMBLY SPRING — S

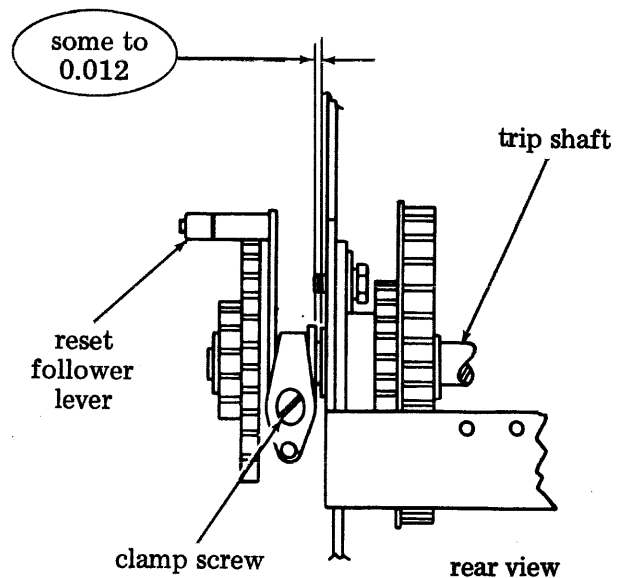
Requirement — With the form-out lever latched, 9 to 11 to pull latchlever assembly spring to installed length.

TRIP SHAFT ENDPLAY (FOA-5)

Requirement — Some to 0.012 endplay of the trip shaft.

Adjust — Loosen clamp screw.
Position reset follower lever on trip shaft.
Tighten clamp screw.

“Requirement” affected by:
FORM FEED BELT TENSION (FOA-3)



CAM LOBE POSITION (FOA-8)

NOTE: Cam lobes, in addition to the one opposite the three closely spaced grooves, should be adjusted according to the **FORM-OUT LEVER RESET CLEARANCE (FOA-10)**.

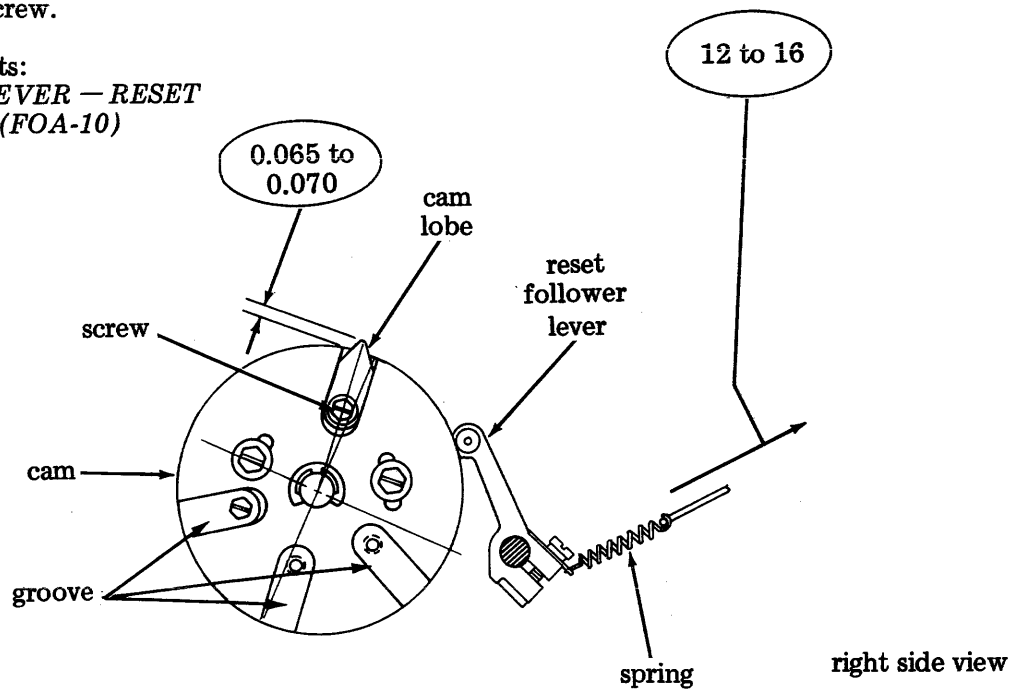
Requirement — The top of the cam lobe should be 0.065 to 0.070 above the low point of the cam.

Adjust — Loosen screw and position cam lobe.
Tighten screw.

“Adjust” affects:
FORM-OUT LEVER — RESET CLEARANCE (FOA-10)

RESET FOLLOWER LEVER SPRING

Requirement — With reset follower lever on low part of cam 12 to 16 to pull reset follower lever spring to installed length.



IDLER POSITION (FOA-25)

NOTE: For units having common roller adjustment, the following requirement will apply to the tighter belt, if one of the belts is tighter than the other. If there is no appreciable difference in belt tightness then the requirement applies to the outer belt. On units having independent roller adjustment the requirement applies to both belts.

Requirement — With a 16 oz spring load applied to the belts between the idler roller and the platen pulley, the belt should deflect 1/32 to 1/16 inch.

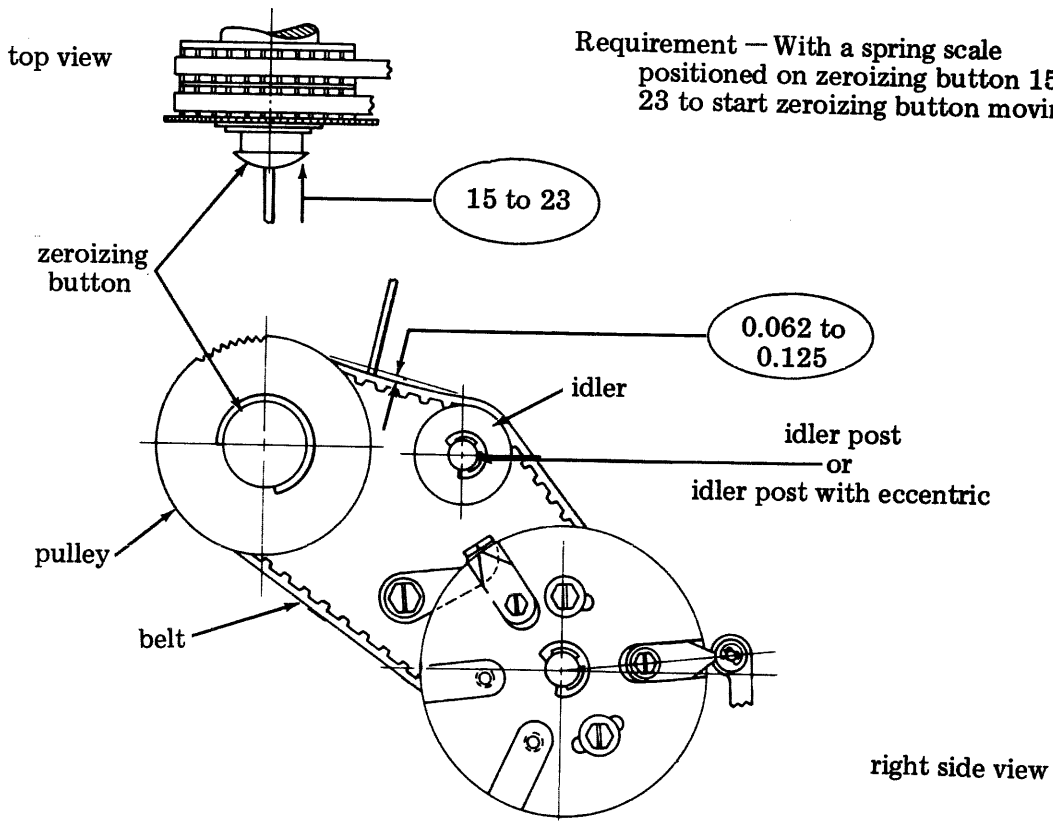
Adjust — For units with common adjustment loosen nut on idler post and position to meet requirement. For units with independent adjustment loosen nut on idler post and position for inner belt. Loosen eccentric clamp nut and position eccentric for outer belt.

“Adjust” affects:
DETENT POSITION (FOA-26)
RESET FOLLOWER LEVER — RESET POSITION (FOA-30)
CAM ZERO POSITION (FOA-31)
PRINTING LINE POSITION FINAL — S

“Requirement” affected by:
VERTICAL TYPE ALIGNMENT — S (PLA-2)

ZEROIZING BUTTON

Requirement — With a spring scale positioned on zeroizing button 15 to 23 to start zeroizing button moving.



FORM-OUT LEVER — RESET CLEARANCE (FOA-10)

- Manually rotate main shaft until all clutch mounting screwheads are vertical.
- Place reset follower lever on low part of cam by pushing zeroizing button and rotating pulley.
- Push latchlever arm down to unlatch form-out lever.

Requirement 1 — The trip lever and latch-lever should have some to 0.012 endplay. Reset lever should just touch underside of form-out lever extension.

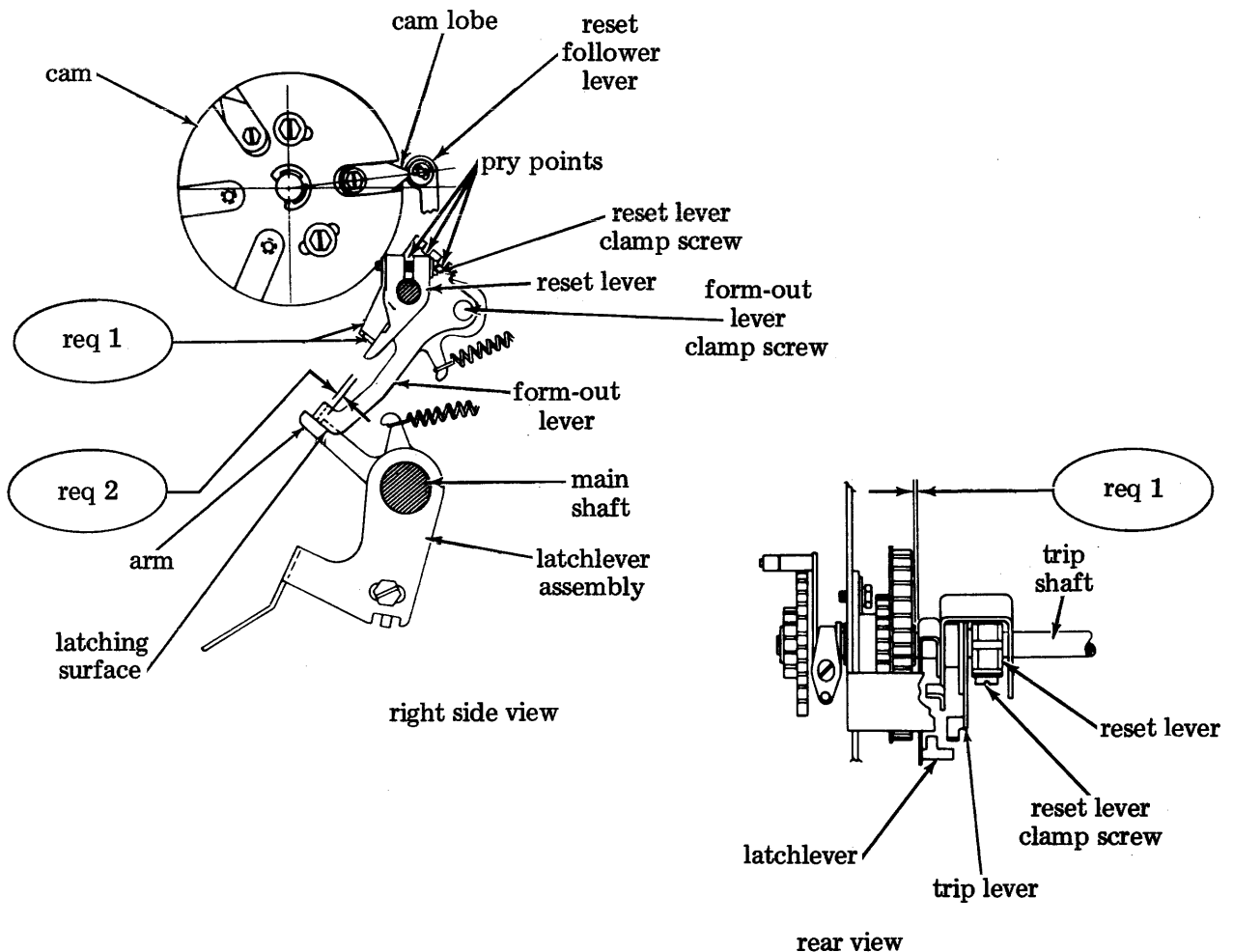
Adjust — Loosen reset lever clamp screw. Position reset lever by using pry point. Tighten clamp screw.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)
CAM LOBE POSITION (FOA-8)

- Manually rotate main shaft until all clutch mounting screwheads are vertical.
- Place reset follower lever on high part of cam lobe by pushing zeroizing button and rotating pulley.

Requirement 2 — 0.005 to 0.020 between latching surface of arm and form-out lever.

Adjust — Loosen form-out lever clamp screw friction tight. Position form-out lever by using pry points. Tighten clamp screw.



**TRIP LEVER ENGAGEMENT —
FORM-OUT (FOA-9)**

- Rotate form feed clutch until shoe lever almost contacts trip lever.
- Hold form-out lever against latching surface.

NOTE 1: To simplify adjustments, loosen reset lever clamp screw and reposition reset lever. Loosen line feed downstop screw and place downstop in lowermost position. Reposition line feed lever so that line feed bail does not interfere with adjustment.

Requirement 1 — Surface of shoe lever should not be above surface of trip lever.

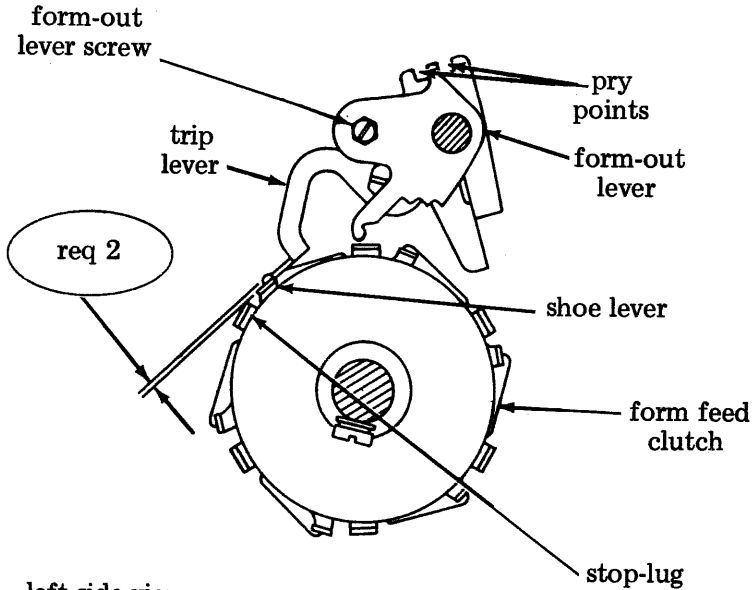
Requirement 2 — Minimum 2/3 thickness of trip lever.

NOTE 2: Check requirements at all six shoe levers.

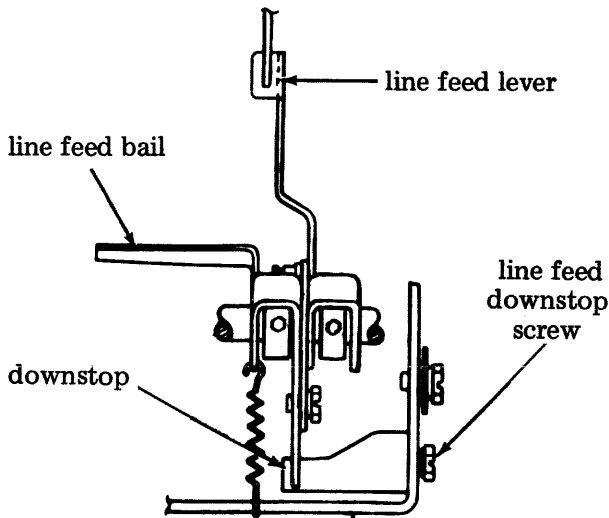
Adjust — Loosen form-out lever screw.
Hold form-out lever against latching surface and position trip lever by using pry points.
Tighten all screws.

“Adjust” affects:
TRIP LEVER ENGAGEMENT — FINAL (FOA-16)
LINE FEED SELECTION (FOA-17)

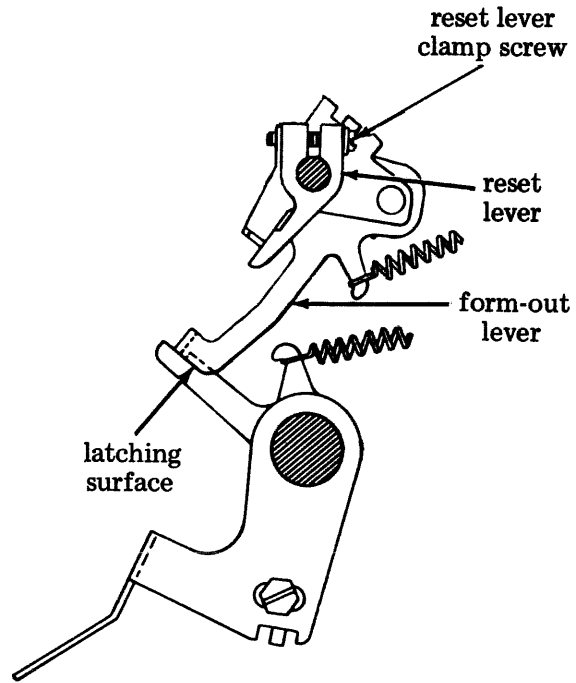
“Requirement” affected by:
FORM FEED BELT TENSION (FOA-3)
CLUTCH SHOE LEVER GAP (FOA-4)



left side view



top view



right side view

**TRIP LEVER ENGAGEMENT — FINAL
(FOA-16)**

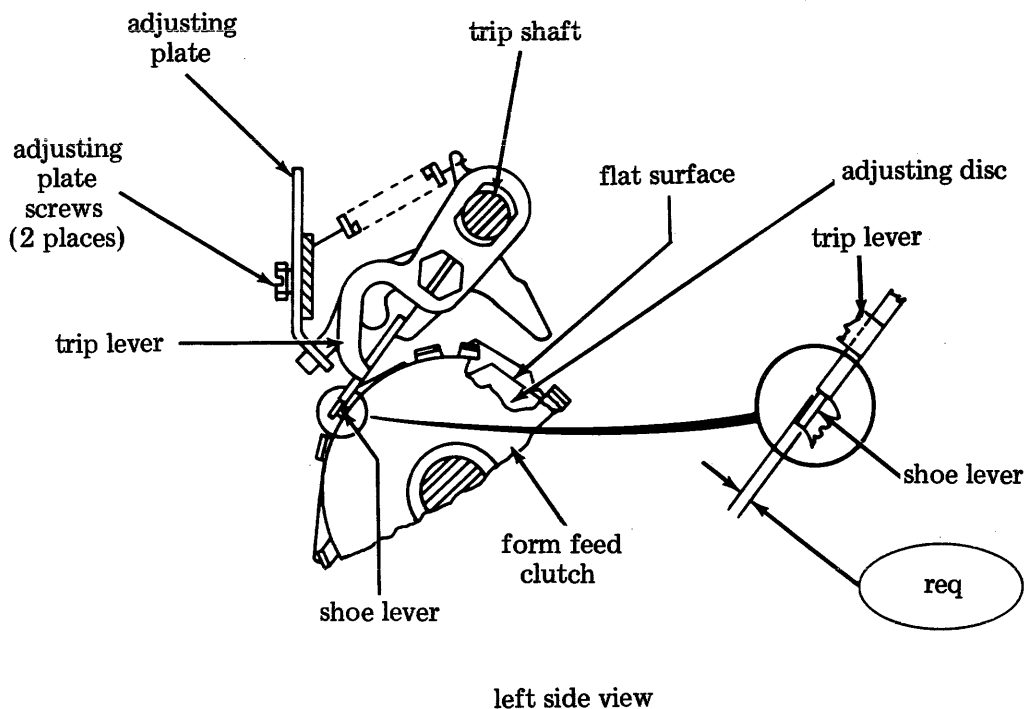
- Rotate main shaft until flat surface of form feed clutch adjusting disc is positioned as shown.
- Disengage form feed clutch.
- Continue rotating main shaft until all clutch mounting screwheads are vertical.
- Trip form feed clutch and rotate main shaft until advancing shoe lever almost contacts trip lever.

Requirement — Shoe lever should be aligned with trip lever.

Adjust — Loosen two adjusting plate screws friction tight. Position adjusting plate. Tighten screws.

“Adjust” affects:
FORM-OUT CONTACT OPERATING BAIL CLEARANCE (FOA-20)

“Requirement” affected by:
TRIP LEVER ENGAGEMENT — PRELIMINARY (FOA-14)



CABLE CLAMP (FOA-42) (Early Design)

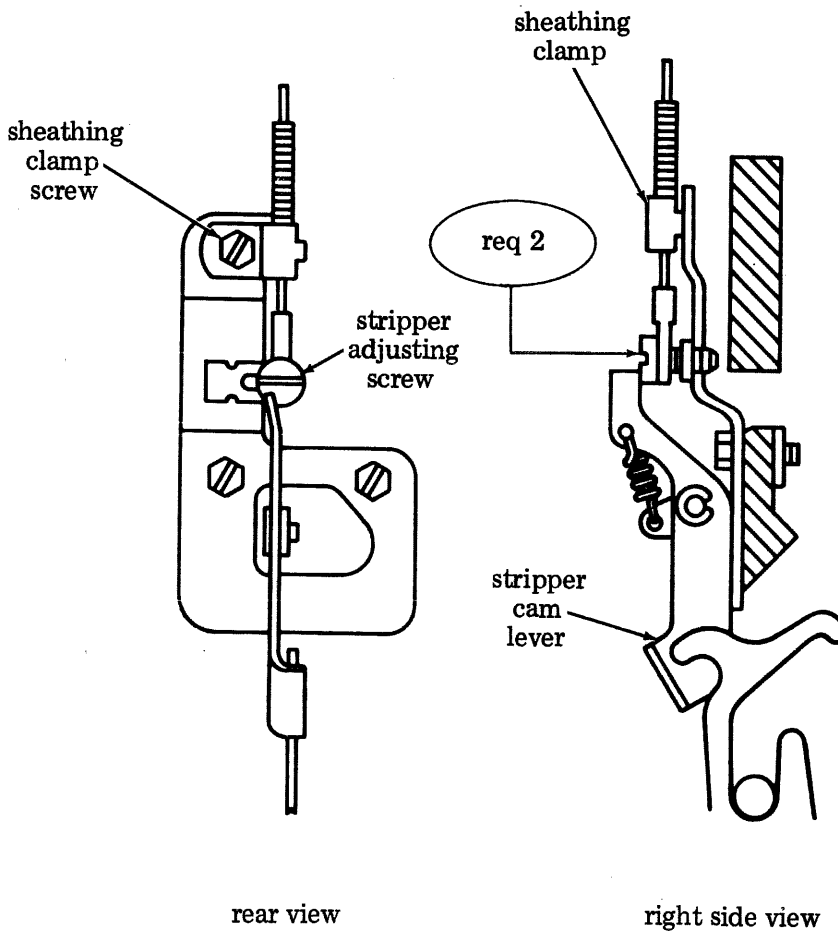
- Operate single-double line feed lever.

Requirement 1 — Cable should operate freely inside its sheathing.

Adjust — The function casting end of the cable must be adjusted first. With the sheathing clamp loosened, position end of sheathing approximately flush with lower end of clamp. Tighten clamp screw.

Requirement 2 — The stripper adjusting screw should either interfere or clear the stripper cam lever depending on the mode selected.

Adjust — Loosen sheathing clamp screw at other end of cable and position sheathing to meet requirement 2. Tighten clamp screws.



CABLE CLAMP (FOA-44) (Late Design)

NOTE: Before making this adjustment rotate stripper adjusting screw (S2) until the underside of the head is approximately 1/16 inch from nut plate.

Operate single-double line feed lever.

Requirement 1 — Cable should move freely in its sheathing.

Requirement 2 — The stripper adjusting screw (S2) (single line feed) should block or clear the stripper lever depending on the mode selected.

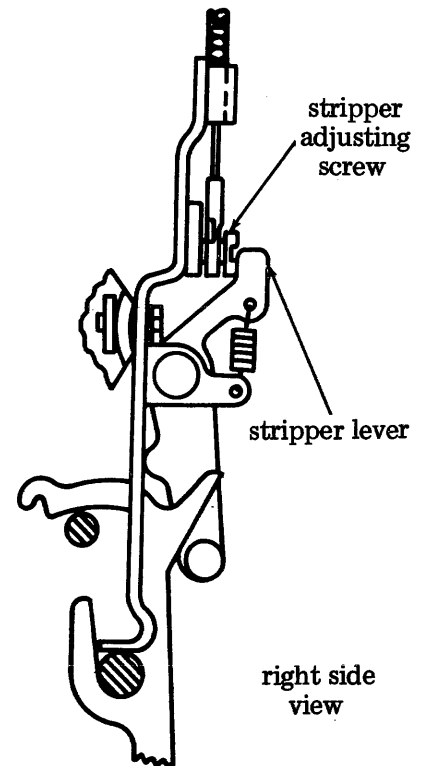
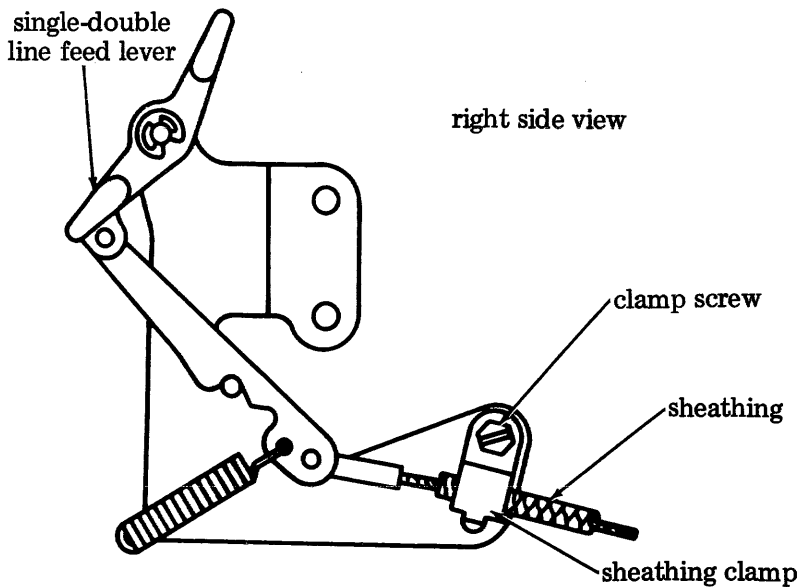
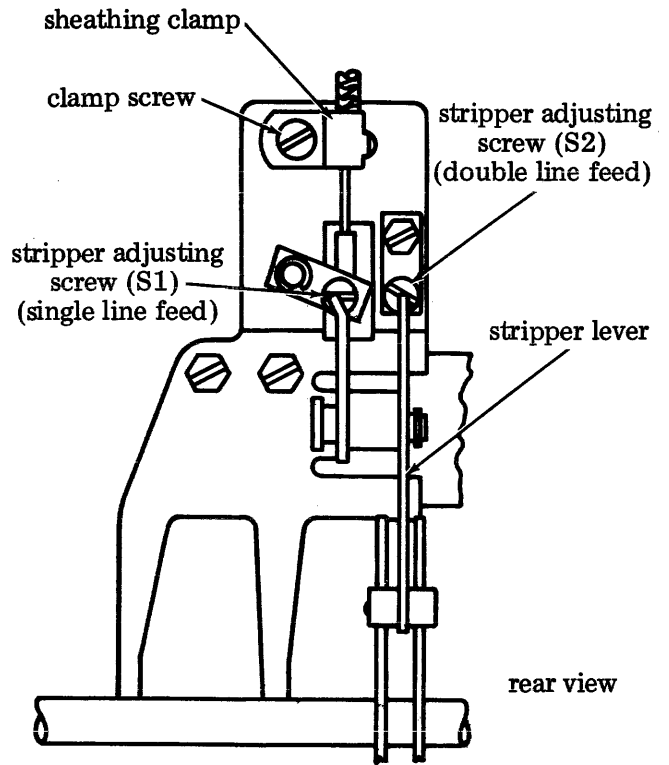
NOTE 1: The adjusting screw clears the stripper lever when the stripper lever is rotated until the right leg strikes the stripper adjusting screw.

NOTE 2: Make sure the adjusting screw (S1) is turned in far enough so that it does not come down on top of the stripper lever.

Adjust: Adjust the function casting end of the cable first.

For requirement 1: Loosen the sheathing clamp.
Position end of sheathing approximately flush with lower end of clamp.
Tighten clamp screw.

For requirement 2: Loosen sheathing clamp screw at other end of cable and position sheathing.
Tighten clamp screw.



SINGLE LINE FEED ADJUSTMENT (FOA-11) (Early Design)

NOTE: Double line feed adjustment (FOA-12) must be made first.

PRELIMINARY

- Place printer in stop condition. Line feed selection lever in single line feed position.
- Rotate the stripper adjusting screw until head of screw just touches strip cam lever and moves freely.
- Loosen clamp screws friction tight and position assembly in its elongated slots in function casting.

Requirement 1 — Some to 0.015 between function pawl and strip cam lever.

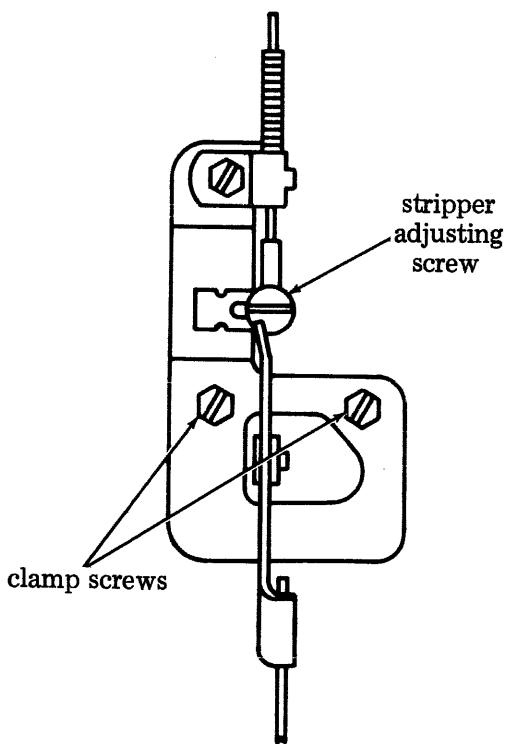
Requirement 2 — Some clearance between stripper cam lever and clutch trip lever.

FINAL

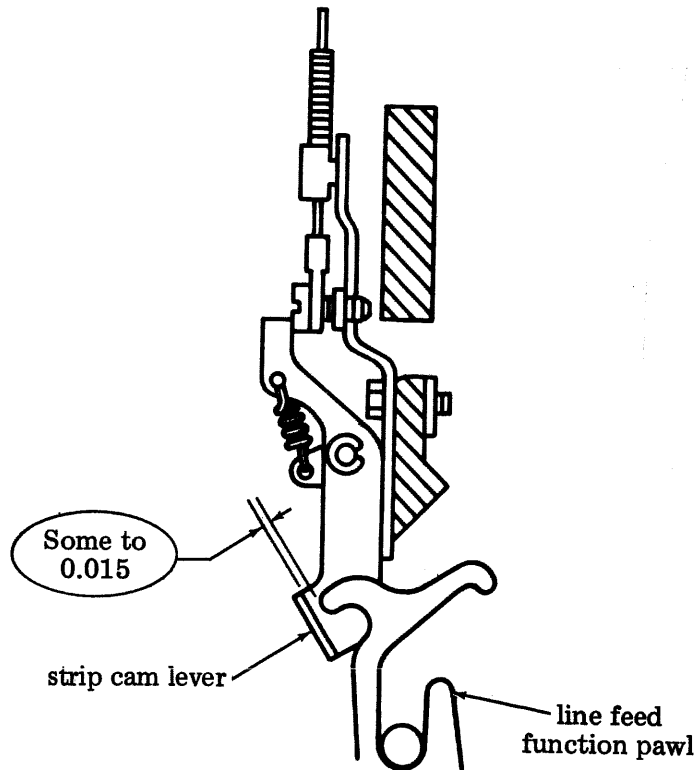
- Set up line feed code (-2-4---8) in selector and rotate main shaft until the line feed clutch trip lever trips and just passes over the first shoe lever.

Requirement — The cam lever should trip the line feed function pawl as soon as the trip lever on the line feed clutch passes over the shoe lever and as late as when the trip lever falls on the first stop lug.

Adjust — Rotate stripper adjusting screw.



rear view



right side view

DOUBLE LINE FEED ADJUSTMENT (FOA-12) (Early Design)

- Selector lever in double line feed mode.
- Push the line feed strip lever down and allow the line feed upstop pawl to assume its normal position against the line feed strip lever.
- Set up the line feed code (-2-4---8) in selector and rotate main shaft until the line feed clutch trip lever trips.

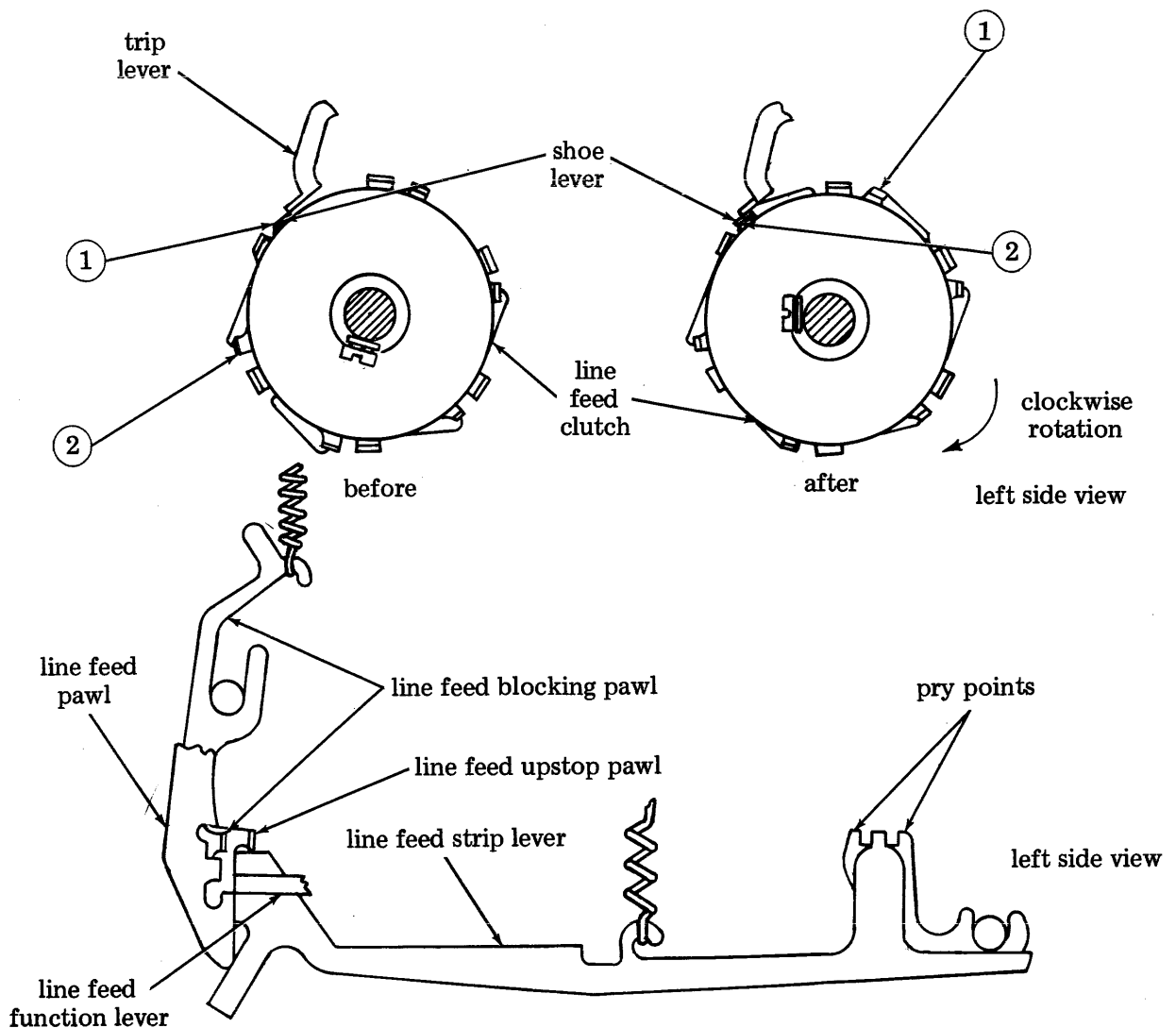
Requirement — After the line feed clutch trip lever has just passed over the second of two shoe levers, the line feed pawl should strip the line feed function lever.

Adjust — Place printer in stop condition. Push line feed strip lever down and allow the line feed upstop pawl to assume its normal position against the line feed strip lever.

After loosening the screw friction tight and positioning it to the most forward position in its elongated hole, set up the line feed code in the selector. Rotate the main shaft until the line feed clutch trip lever trips and just passes over the second of two shoe levers. Using pry points, carefully pry the line feed strip lever to the rear to where the line feed pawl just strips off the line feed function lever. Repeat if necessary.

“Requirement” affected by:
RIGHT ROCKER DRIVE ARM (FNA-10)

“Adjust” affects:
LINE FEED SELECTION (PLA-3)



SINGLE LINE FEED ADJUSTMENT (FOA-45) (Late Design)

PRELIMINARY

- Printer in stop condition.
- Single-double line feed lever in single line feed position.
- Rotate stripper adjusting screw (S1) until head of screw just touches stripper lever and moves freely.
- Position the stripper assembly on the function casting by homing it against the function pawl pivot shaft, and maintaining approximately equal clearance between the long right leg of stripper lever and the two adjacent function pawls.

FINAL

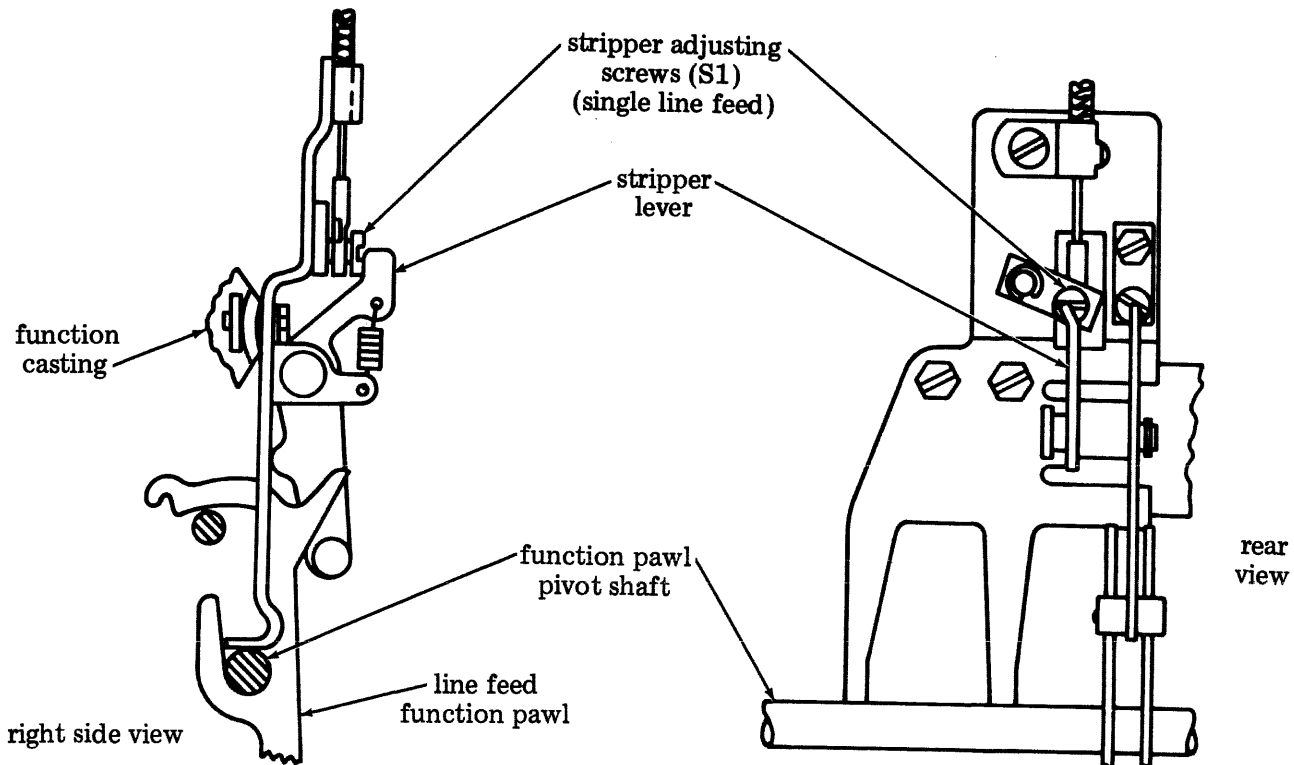
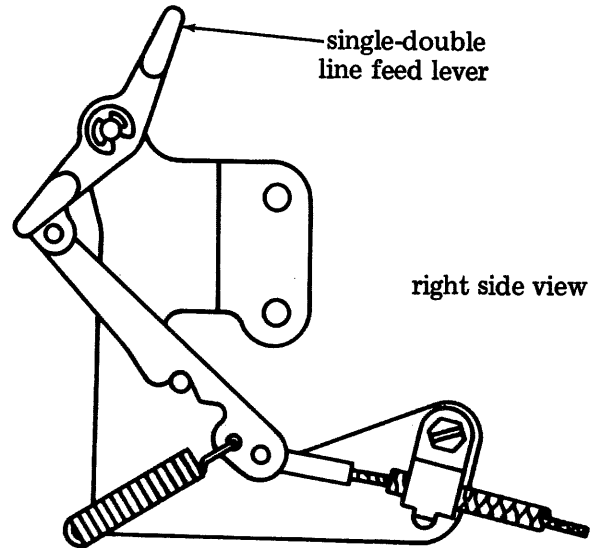
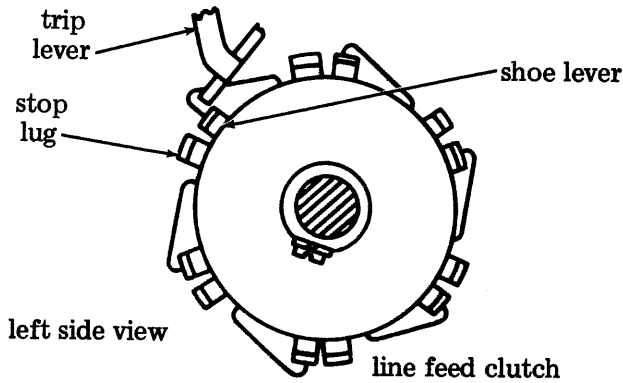
- Set up line feed code (-2-4--8) in selector and rotate main shaft until the line feed clutch trip lever trips and just passes over the tripped clutch shoe lever.

Requirement — The stripper lever should strip the line feed function pawl.

NOTE 1: Stripping of the pawl should occur as soon as the engaging surface of the trip lever passes over the shoe lever.

NOTE 2: The engaging surface of the trip lever should fall on the stop lug.

Adjust — Rotate stripper adjusting screw (S1) (clockwise rotation — strip action delayed. Counterclockwise rotation — strip action advanced.)



DOUBLE LINE FEED ADJUSTMENT (FOA-12) (Late Design)

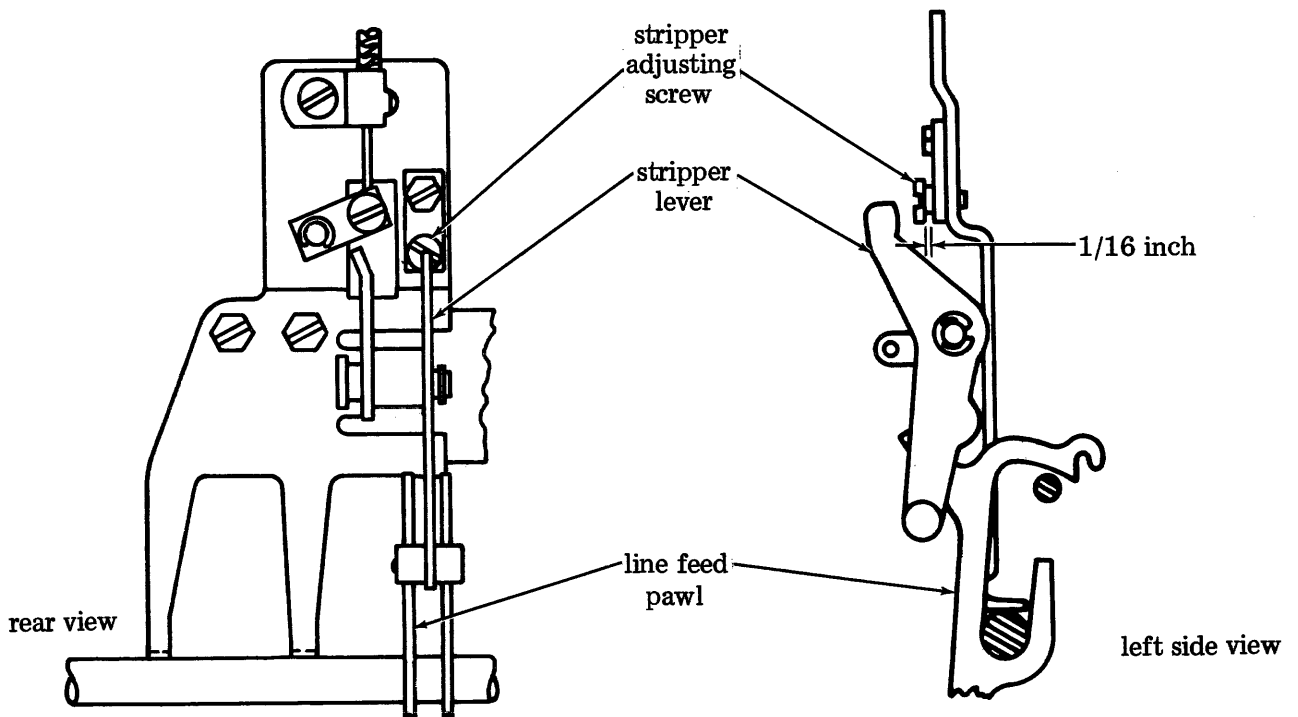
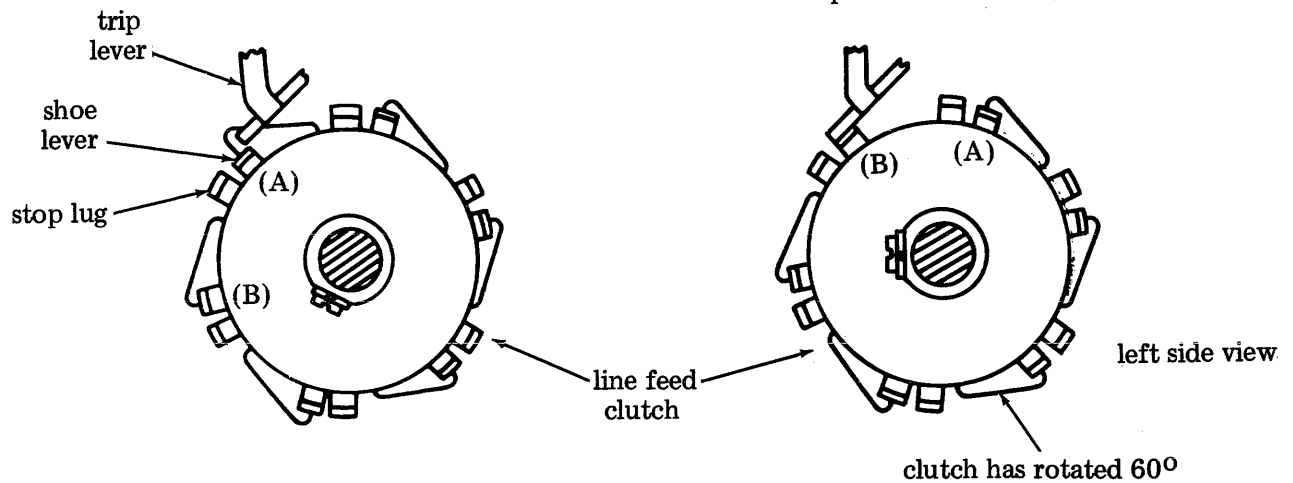
- Printer in stop condition.
- Single-double line feed lever in double line feed position.
- Rotate stripper adjusting screw until the bottom of the screw head is approximately 1/16 inch from nut plate.
- Set up line feed code (-2-4--8) in selector.
- Rotate main shaft until the line feed clutch trips and the clutch rotates (approx. 60°) so that the second shoe lever just passes under the engaging surface of the trip lever.

Requirement — The stripper lever should strip the line feed function pawl.

NOTE 1: Stripping of the pawl should occur as soon as the engaging surface of the trip lever passes over the shoe lever.

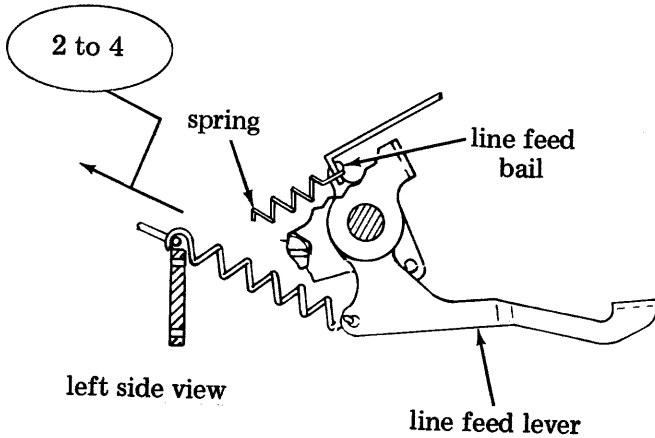
NOTE 2: The engaging surface of the trip lever should fall on the stop lug.

Adjust — Rotate stripper adjusting screw (clockwise rotation — strip action delayed; counterclockwise rotation — strip action advanced).



LINE FEED BAIL SPRING

Requirement — 2 to 4 to pull spring to installed length.



LINE FEED SELECTION (FOA-17)
(Early Design)

Requirement 1 — Single Line Feed: 0.110 to 0.130 between pawl and line feed lever.

Requirement 2 — Double Line Feed: zero to 0.010 between pawl and line feed lever.

Adjust — Loosen screw friction tight.
Position line feed lever by using pry points.
Tighten screw.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)
TRIP LEVER ENGAGEMENT — FORM-OUT (FOA-9)

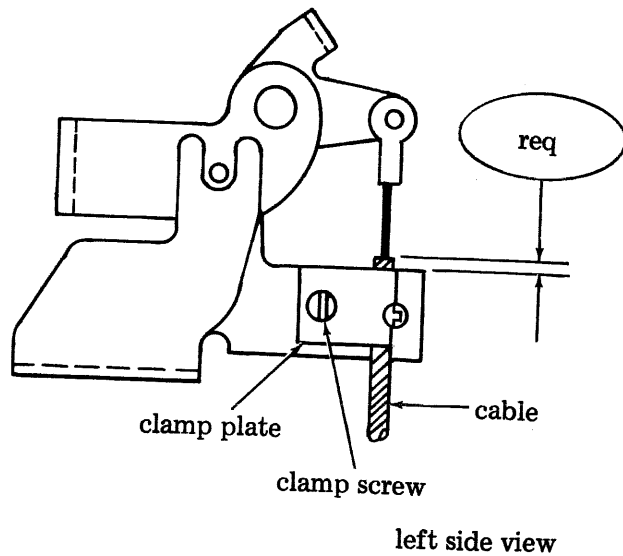
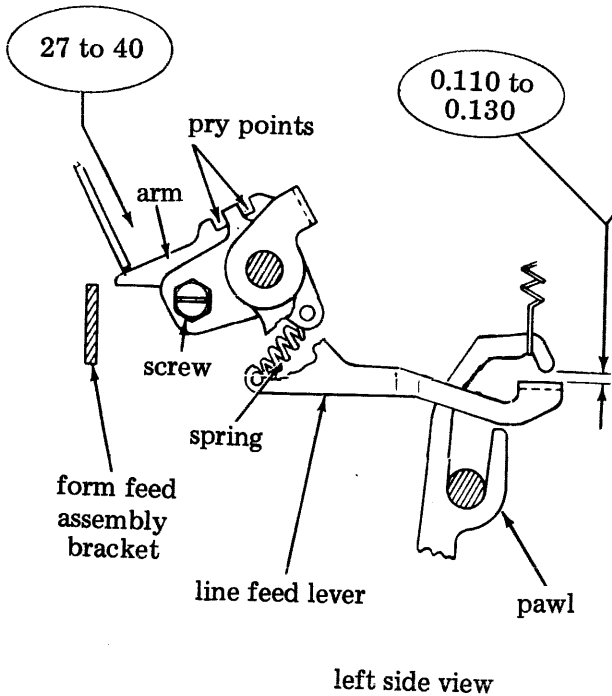
MANUAL LINE FEED CABLE (FOA-13)

Requirement — Cable should be flush to 0.125 overflush of clamp plate.

Adjust — Loosen cable clamp screw.
Position cable.
Tighten screw.

LINE FEED LEVER SPRING

Requirement — 27 to 40 to push arm down until line feed lever contacts pawl.



LINE FEED SELECTION (FOA-43) (Late Design)

- Place printer in stop condition.

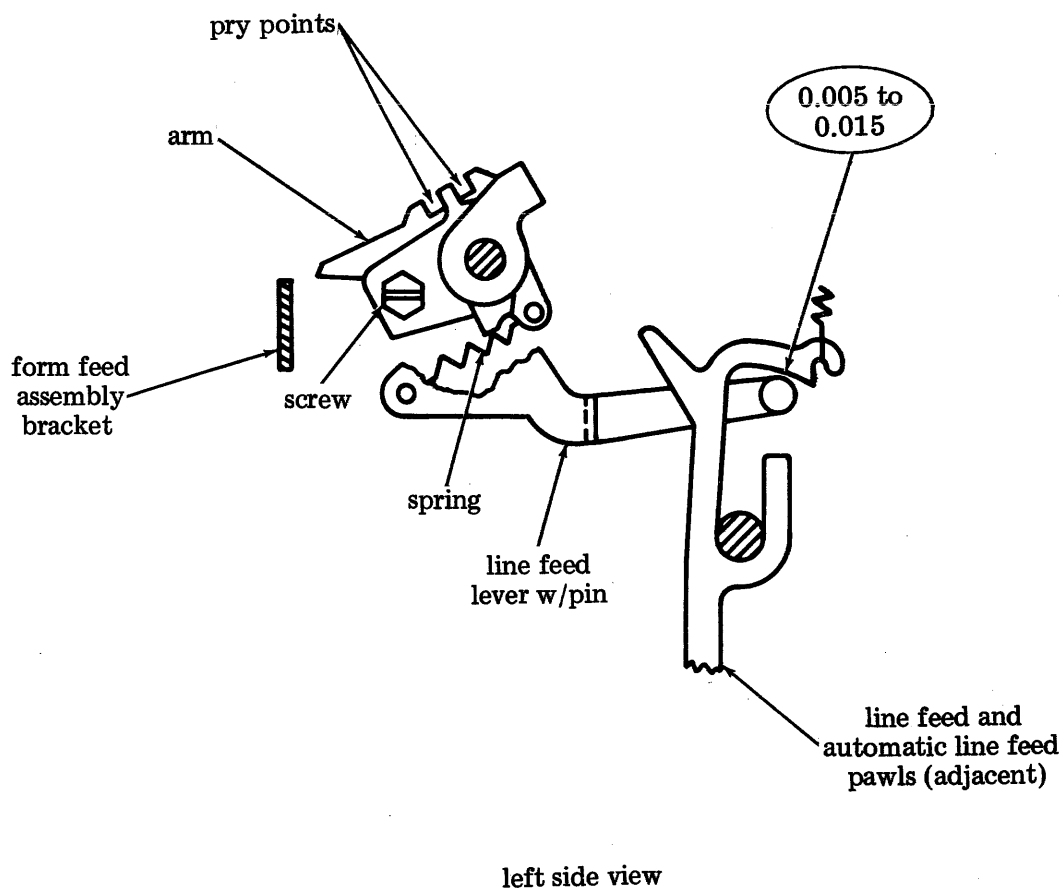
Requirement 1 — 0.005 to 0.015 between
line feed pawl and line feed lever pin.

Adjust — Loosen screw.
Position line feed lever using pry
points.

Requirement 2 — 0.005 to 0.015 between
automatic line feed pawl and line
feed lever pin.

Adjust — Refine requirement 1.
Tighten screw.

“Requirements” affected by:
FORM FEED BELT TENSION (FOA-3)



DETENT POSITION (FOA-26)

CAUTION: USE CARE WHEN WORKING WITH PRINTER UNDER POWER.

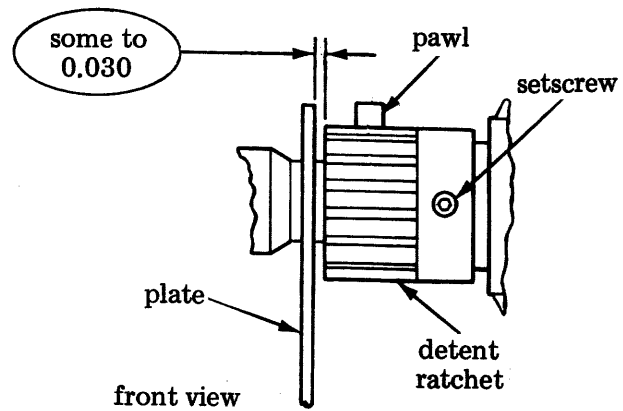
- Set up line feed code (-2-4--8).
- Insert armature clip in selector to keep armature attracted.
- Connect printer cables J6 and J8 to connector panel on printer.
- Apply power.
- Engage codebar clutch for one complete line feed cycle.
- Disconnect power, and printer cables J6 and J8.

Requirement 1 — Maximum 0.007 between pawl (fully seated) and detent ratchet tooth.

Requirement 2 — Some to 0.030 between plate and detent ratchet.

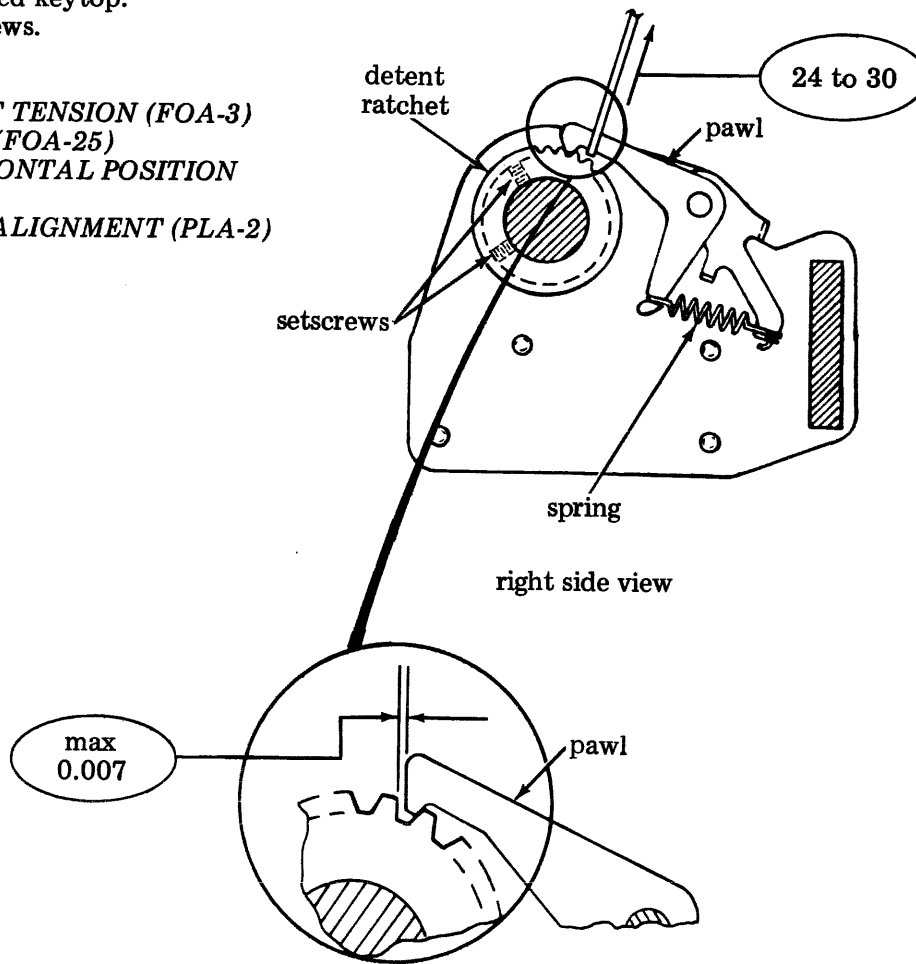
Adjust — Loosen two setscrews.
With finger pressure, engage and hold pawl firmly in detent ratchet.
Depress line feed keytop.
Tighten setscrews.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)
IDLER POSITION (FOA-25)
PLATEN — HORIZONTAL POSITION (PLA-1)
VERTICAL TYPE ALIGNMENT (PLA-2)



DETENT RATCHET PAWL SPRING — S

Requirement — 24 to 30 with spring scale under detent ratchet pawl to start pawl moving.



RESET FOLLOWER LEVER — RESET POSITION (FOA-30)

CAUTION: USE CARE WHEN WORKING WITH PRINTER UNDER POWER.

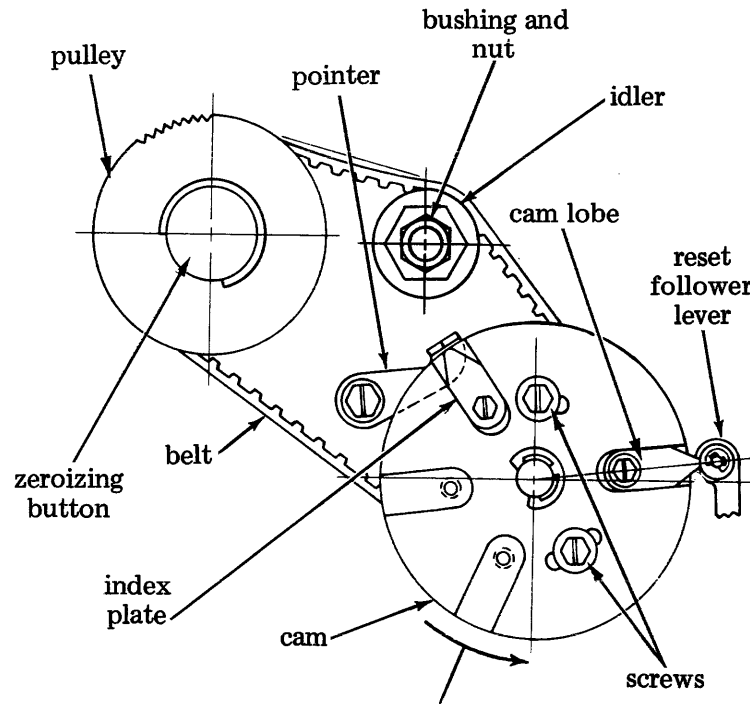
- Set up form-out code (--34--8).
- Insert armature clip in selector to keep armature attracted.
- Connect printer cables J6 and J8 to connector panel on printer.
- Apply power.
- Engage codebar clutch for one complete form-out cycle.
- Disconnect power, and printer cables J6 and J8.

Requirement — After one complete form-out cycle, reset follower lever should be on flat surface of cam lobe.

Adjust — Loosen screws.
Position cam.
Tighten screws.

“Adjust” affects:
CAM ZERO POSITION (FOA-31)

“Requirement” affected by:
FORM FEED BELT TENSION (FOA-3)
IDLER POSITION (FOA-25)
PLATEN — HORIZONTAL POSITION (PLA-1)
VERTICAL TYPE ALIGNMENT (PLA-2)



right side view

CAM ZERO POSITION (FOA-31)

- Position cam lobes and index plates as shown on line drawing.
- Set printer to stop condition.

(a) One Cam Lobe: (FOA-32)

Requirement 1 — Some to 0.035 between bottom surface of pointer and low part of cam.

Requirement 2 — When viewed along line-of-sight shown in drawing, tip of pointer should be aligned with index plate aluminized surface.

(b) Two Cam Lobes: (FOA-33)

Requirement 1 — Some to 0.035 between bottom surface of pointer and low part of cam.

Requirement 2 — When viewed along line-of-sight shown in drawing, tip of pointer should be aligned with index plate aluminized surface.

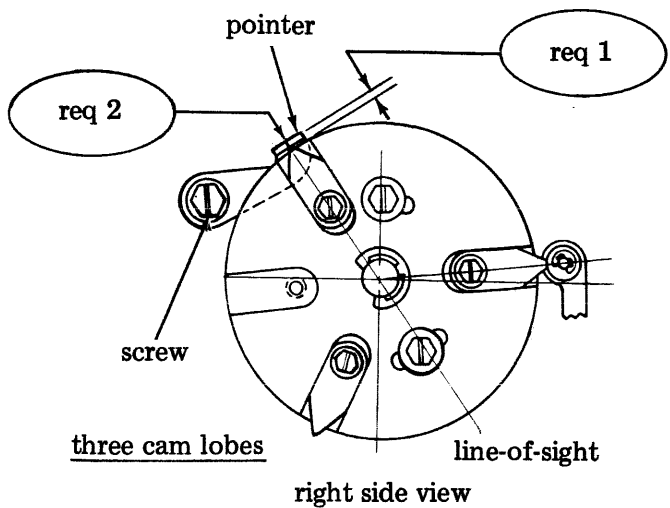
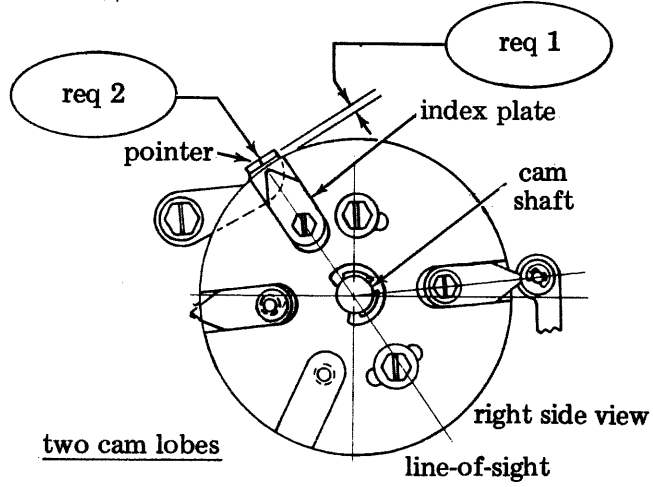
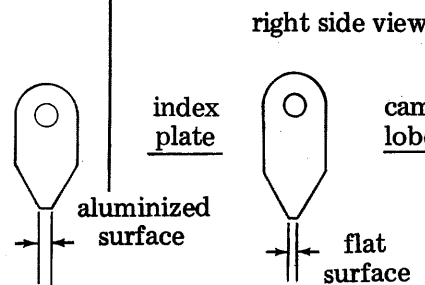
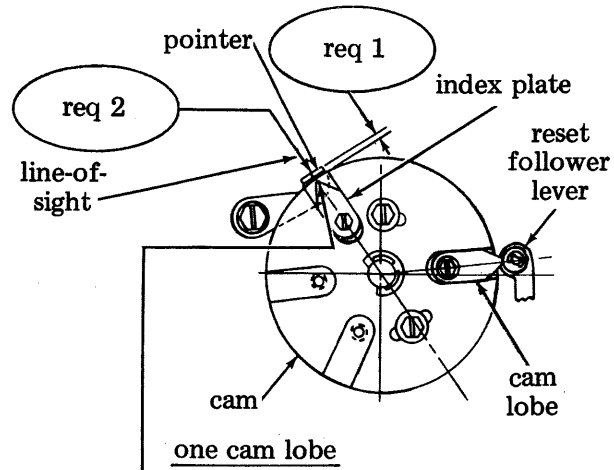
(c) Three Cam Lobes: (FOA-34)

Requirement 1 — Some to 0.035 between bottom surface of pointer and low part of cam.

Requirement 2 — When viewed along line-of-sight shown in drawing, tip of pointer should be aligned with index plate aluminized surface.

Adjust — Loosen screw.
Position pointer.
Tighten screw.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)
IDLER POSITION (FOA-25)
RESET FOLLOWER LEVER — RESET POSITION (FOA-30)



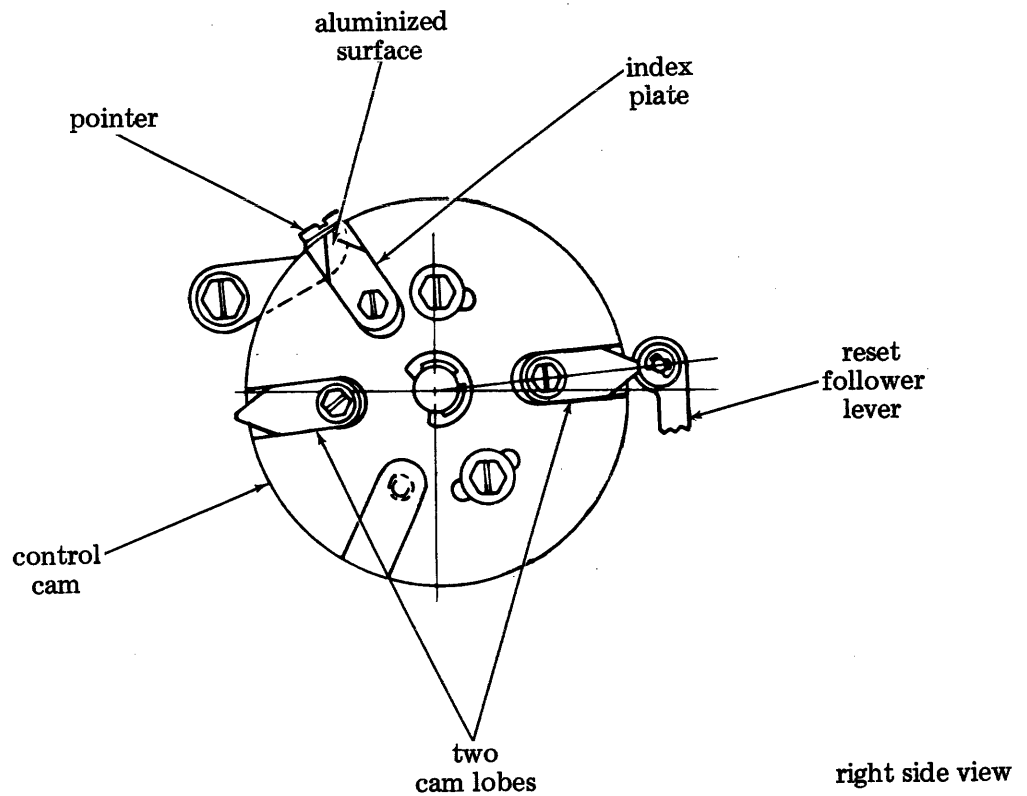
FORM LENGTH SELECTION (FOA-39)

- The control cam normally has two cam lobes which cause a feed-out of one-half the basic form length.

Requirement — Longer form length.

Adjust — Align pointer with aluminized surface of index plate.
Remove and discard cam lobe opposite reset follower lever.

NOTE: For a gear listing of form feed lengths, refer to Section 574-422-800TC.



**FORM-OUT CONTACT OPERATING BAIL
CLEARANCE (FOA-20)**

- Place printer in stop position.
- Depress zeroizing button, and rotate pulley until reset follower arm is resting on low part of cam.

Requirement 1 — 0.005 to 0.015 between form-out bail and insulator.

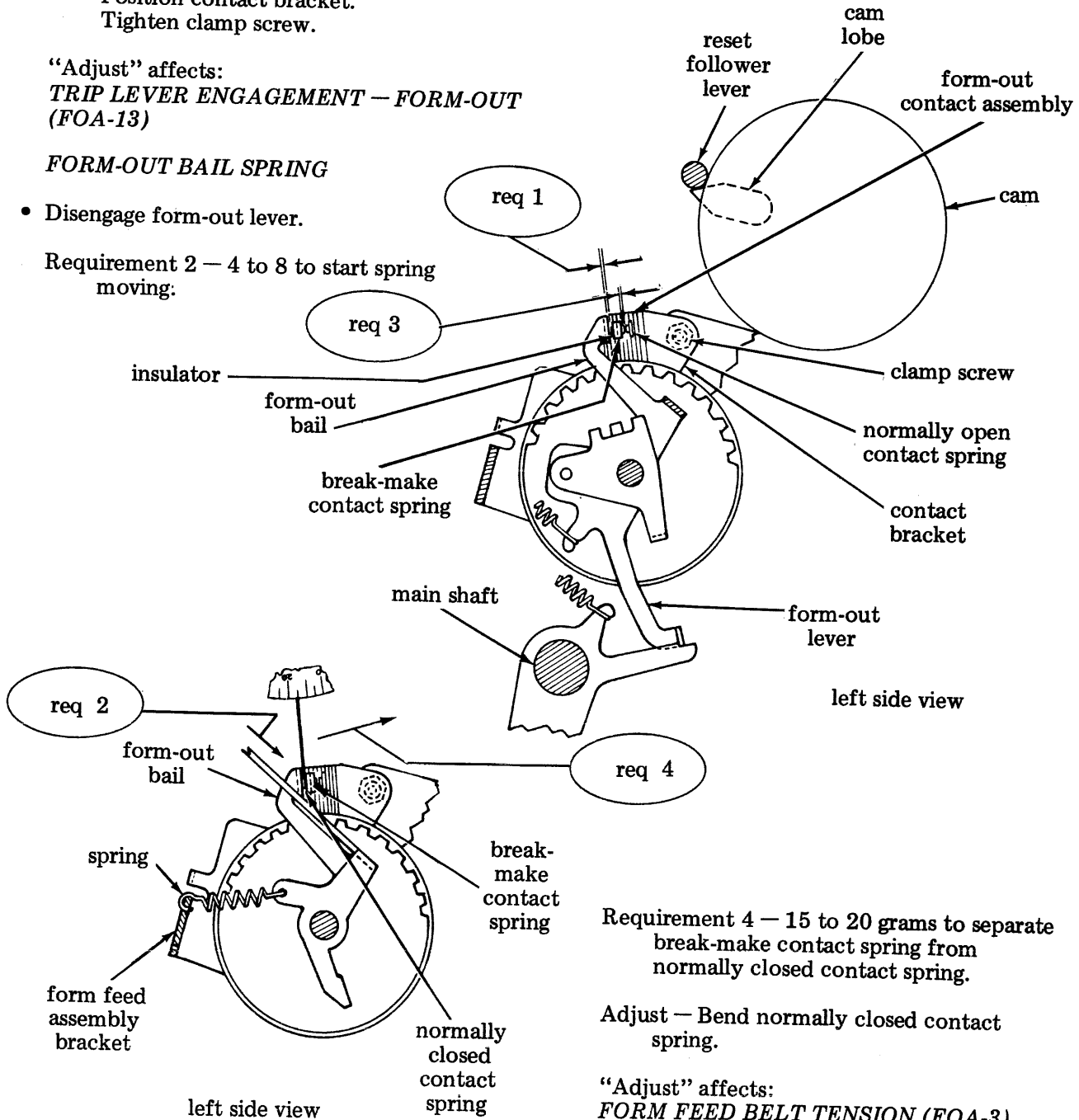
Adjust — Loosen clamp screw.
Position contact bracket.
Tighten clamp screw.

“Adjust” affects:
TRIP LEVER ENGAGEMENT — FORM-OUT (FOA-13)

FORM-OUT BAIL SPRING

- Disengage form-out lever.

Requirement 2 — 4 to 8 to start spring moving.



FORM-OUT CONTACT PRESSURE AND GAP (FOA-1)

- Form-out bail must not contact insulator.

Requirement 3 — 0.008 to 0.018 between break-make contact spring and normally open contact spring.

Adjust — Bend normally open contact spring.

Requirement 4 — 15 to 20 grams to separate break-make contact spring from normally closed contact spring.

Adjust — Bend normally closed contact spring.

“Adjust” affects:
FORM FEED BELT TENSION (FOA-3)

PRINTING LINE POSITION — PRELIMINARY (FOA-27)

Requirement 1 — Left sprocket ring pins should be centrally located within the paper guide slot.

Adjust — Loosen setscrews.
Position left sprocket ring.

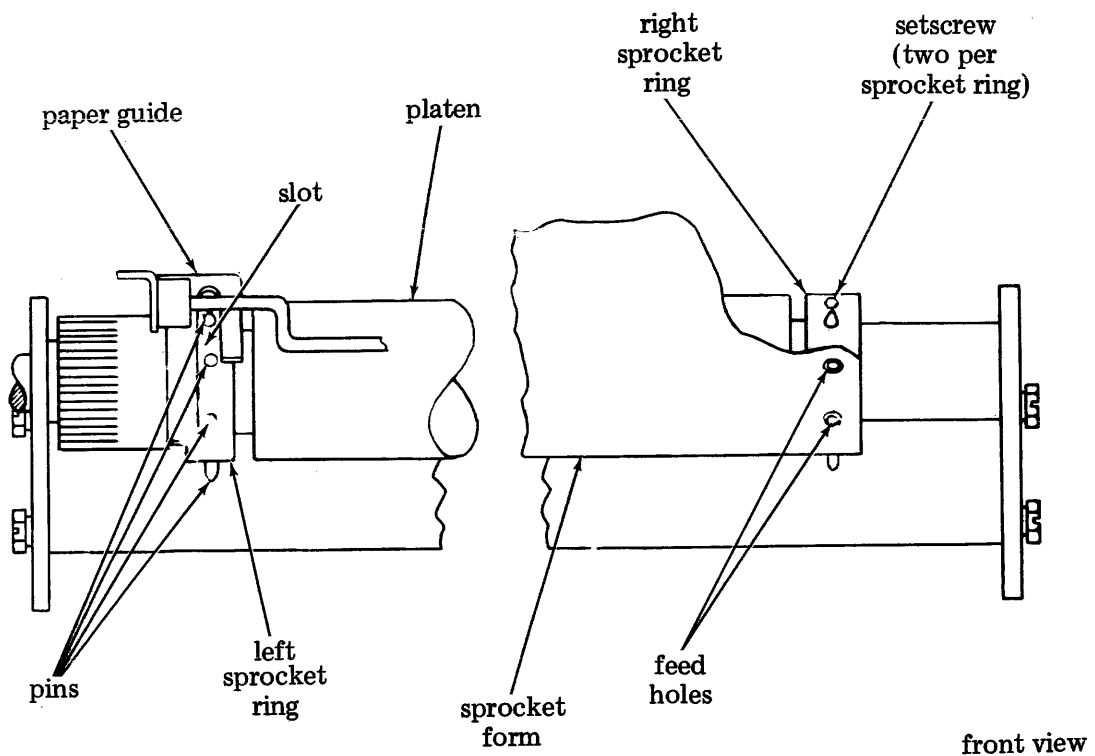
NOTE: *Tighten setscrews after adjustment has been completed.*

- Align left and right sprocket ring setscrews.
- Place a sprocket form on the platen with feed holes over the left and right sprocket ring pins.

Requirement 2 — The left and right sprocket ring pins should be in line and centrally located in the form feed holes.

Adjust — Loosen setscrews.
Position left and right sprocket rings as required.
Tighten setscrews.

“Adjust” affects:
RIGHT PAPER GUIDE POSITION (FOA-28)



PRINTING LINE POSITION — FINAL (FOA-27)

- Insert a sprocket form in the platen mechanism.
- Type the character M until a printed line is established.

NOTE: On nonprinted forms, draw a line across bottom to connect feed holes.

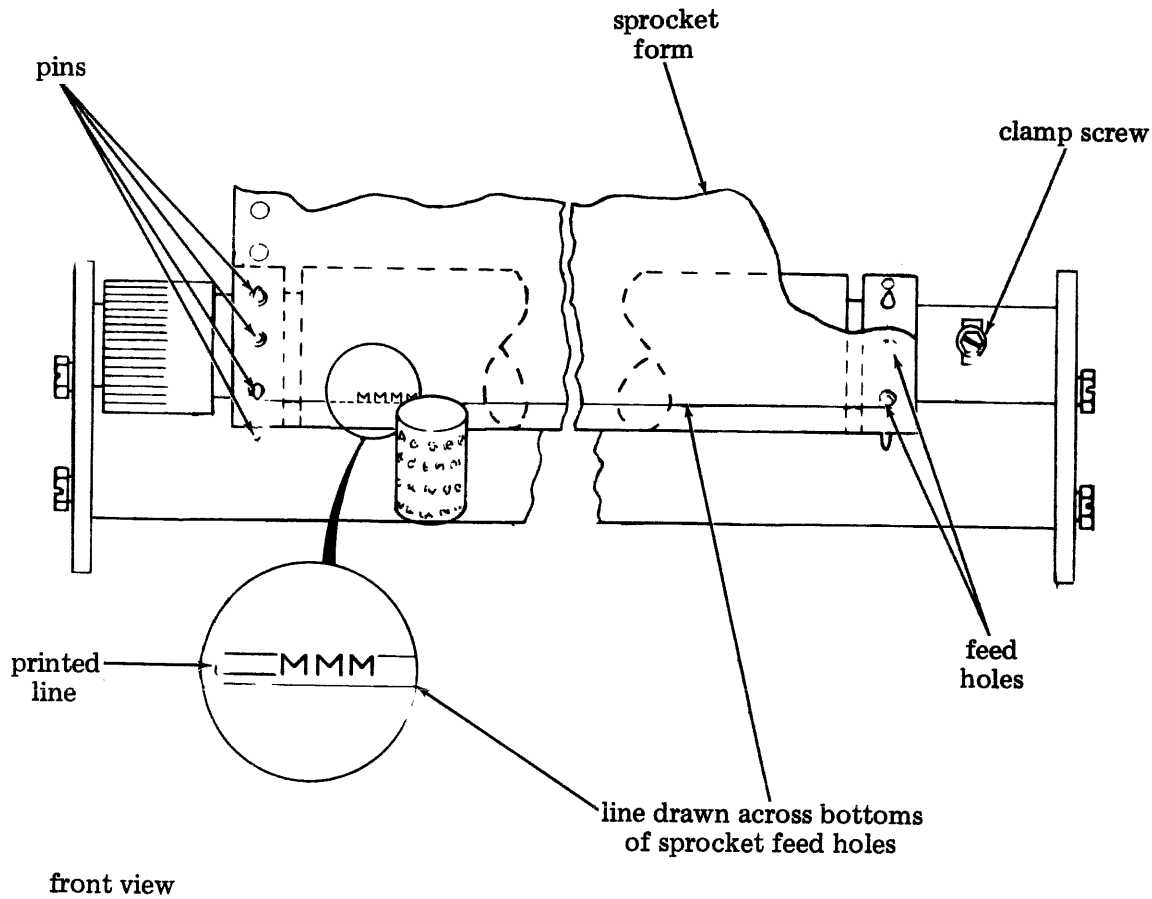
Requirement — On printed forms; printed line should be aligned with sprocket form lines.

On nonprinted forms; printed line should be aligned with and not touch drawn line. It should not be more than 1/16 inch above drawn line with maximum variation of 1/32 inch along entire length.

Adjust — Loosen clamp screw.
Position platen.
Tighten clamp screw.

“Adjust” affects:
RIGHT PAPER GUIDE POSITION (FOA-28)

“Requirement” affected by:
PRINTING LINE POSITION — PRELIMINARY (FOA-27)

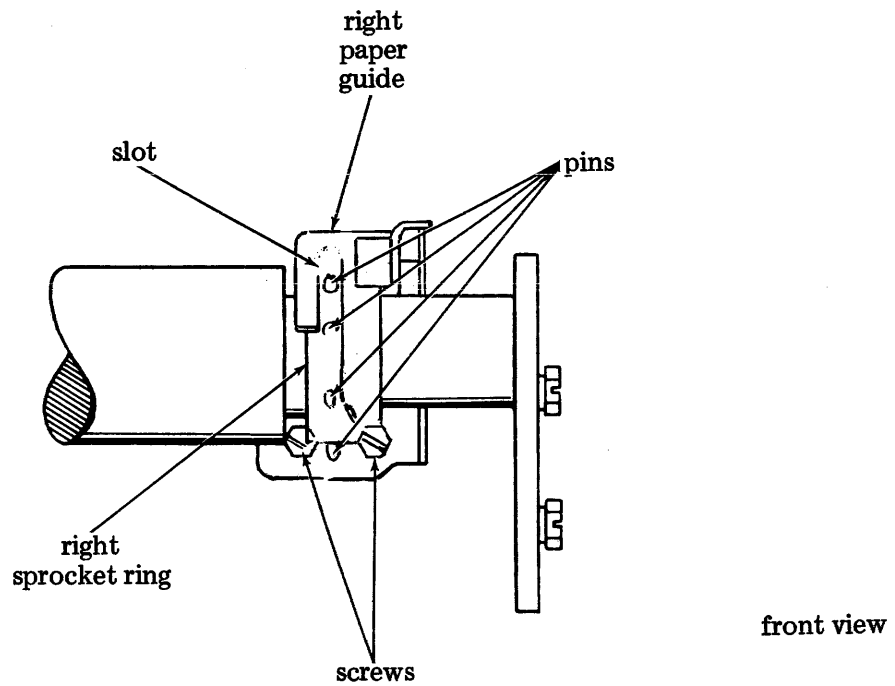


RIGHT PAPER GUIDE POSITION (FOA-28)

Requirement — The right sprocket ring pins should be centrally located within the paper guide slot.

Adjust — Loosen screws.
Position right paper guide.
Tighten screws.

“Adjust” affects:
PRINTING LINE POSITION — FINAL
(FOA-27)



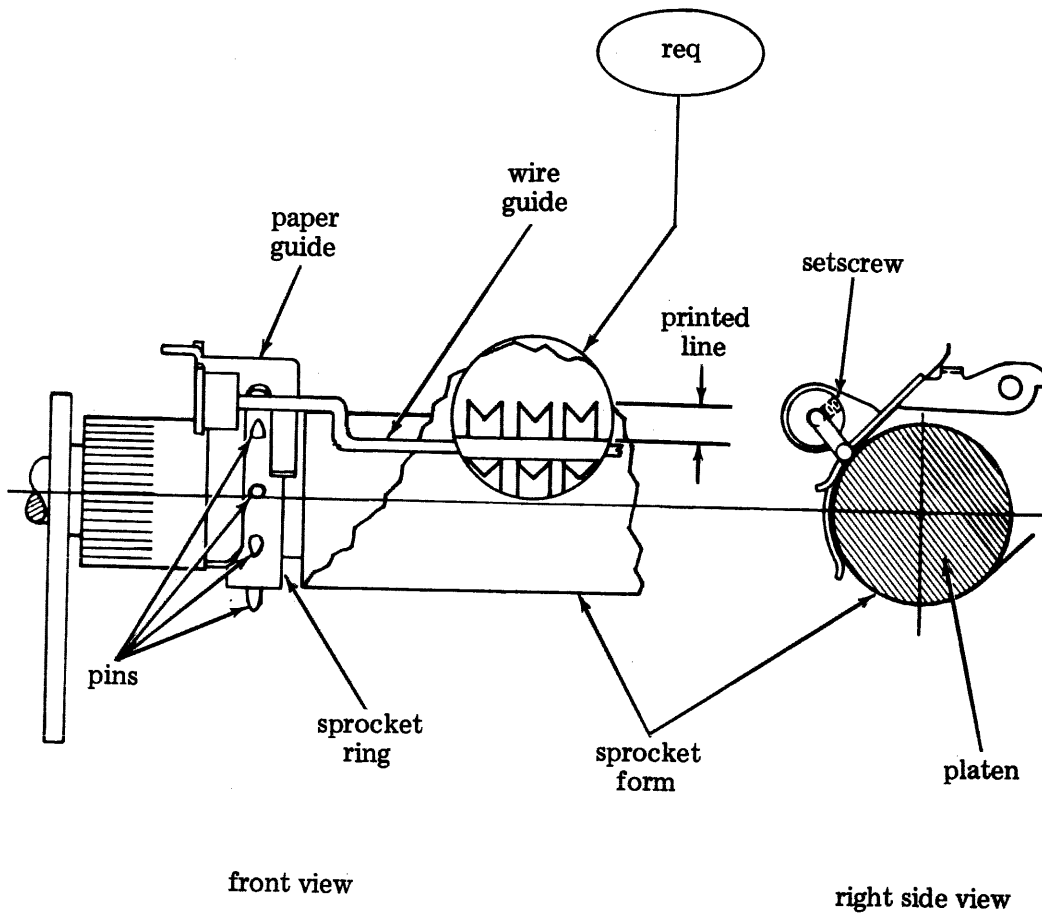
WIRE GUIDE POSITION (FOA-29)

- Insert a sprocket form with several lines of text.
- Place platen in its detented position with top edge of feed holes engaging top edge of sprocket pins.
- Place left and right paper guides in contact with their sprocket rings.

Requirement — Wire guide should fully contact sprocket form and be centrally located between printed lines with maximum 1/2 line overlap.

Adjust — Loosen setscrew at each end of wire guide.
Hold paper guides against sprocket rings.
Position wire guide.
Tighten setscrews.

“Adjust” affects:
PLATEN — HORIZONTAL POSITION (PLA-1)
VERTICAL TYPE ALIGNMENT (PLA-2)



LEFT MARGIN POSITION (FOA-35)

- Position platen knob screw vertically.
- Move carriage to the left hand margin.
- Fully seat piston in dashpot cylinder.

Requirement 1 (Wide Platen) — 1/2 between edge of sprocket pin and the edge of the center hole on top of type wheel (in its "home position").

Requirement 2 (3/8 Inch Standard Platen) — Min 0.030 between closest sprocket pin and ribbon guide.

Adjust — Loosen dashpot cylinder mounting screws (2).
Position dashpot cylinder.
Tighten screws.

"Adjust" affects:
RIGHT MARGIN POSITION (FOA-36)
CARRIAGE RETURN LEVER —
UNLATCH CLEARANCE (SPA-6)
LEFT MARGIN PRINTING (FOA-15)

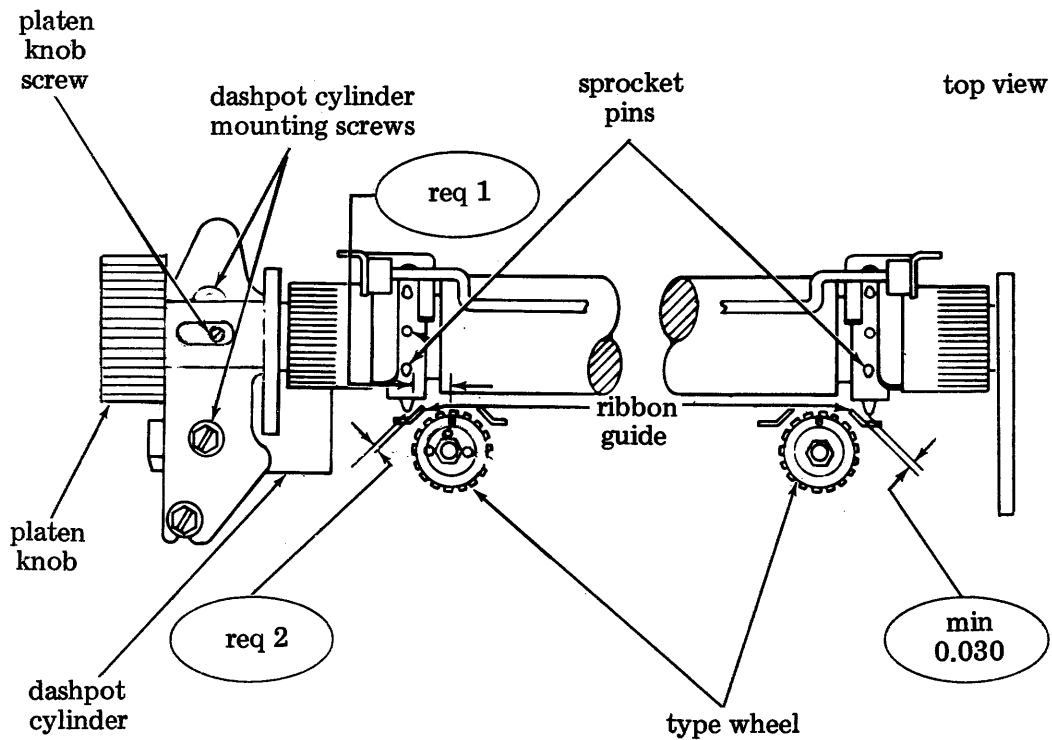
RIGHT MARGIN POSITION (FOA-36)

- Move carriage to the right of the 134th character position.
- Hold feed pawl out of engagement with spacing ratchet, so that only check pawl is engaged.

Requirement — 0.030 between right sprocket pin and ribbon guide.

Adjust — Refine *LEFT MARGIN POSITION*.

"Requirement" affected by:
LEFT MARGIN POSITION (FOA-35)



**PAPER ALARM CONTACT PRESSURE
AND GAP (FOA-40)**

- Paper alarm lever should not contact insulator.

Requirement 1 — 15 to 20 grams to separate the break-make contact spring from the normally closed contact spring.

PAPER LEVER SPRING

- Insert a sprocket form between paper alarm lever and paper guideplate.
- Hold form taut over cutout in paper guideplate and place paper alarm lever on form.
- Place a spring scale over paper alarm lever at opening in paper guideplate.

Requirement 2 — 1 to 1-1/2 to move paper alarm lever from sprocket form.

Requirement 3 — 0.010 to 0.020 between the break-make contact spring and normally open contact spring.

Adjust — Bend normally closed contact spring.

“Requirement” affected by:
**PAPER GUIDEPLATE CLEARANCE
(PLA-13)**

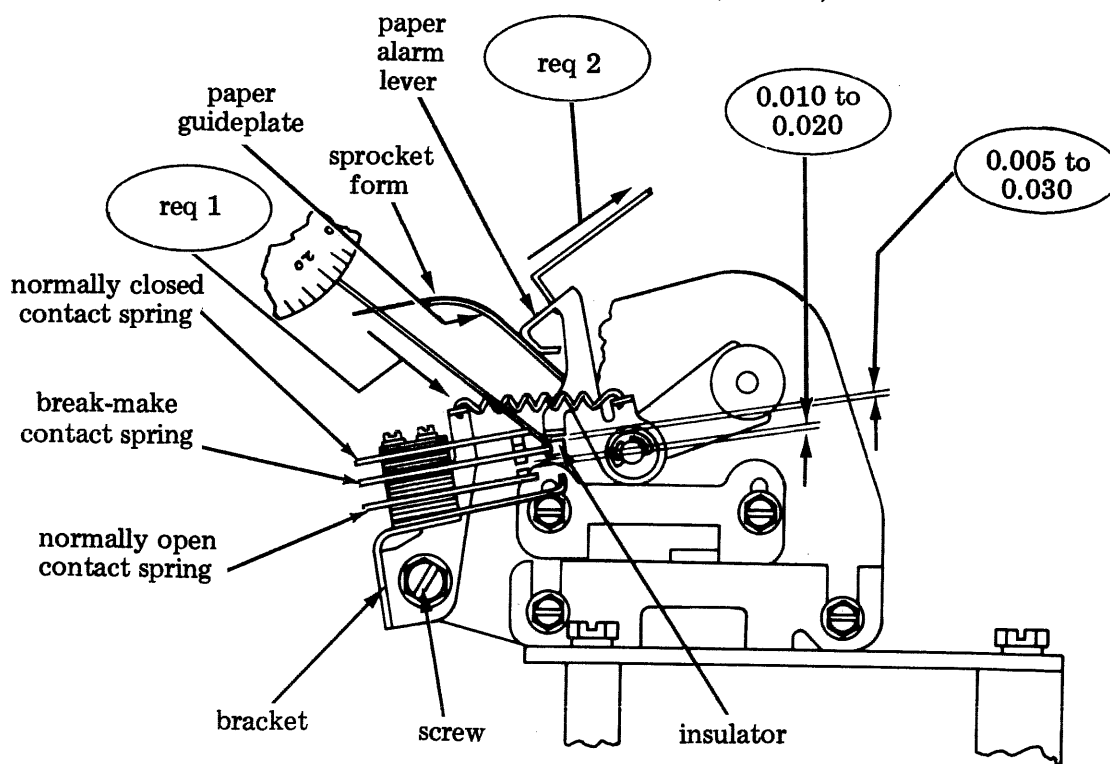
**PAPER ALARM CONTACT CLEARANCE
(FOA-41)**

- Insert a sprocket form between paper alarm lever and paper guideplate. Hold form taut over cutout in paper guideplate.

Requirement — 0.005 to 0.030 between insulator and paper alarm lever.

Adjust — Loosen screw.
Position bracket.
Tighten screw.

“Requirement” affected by:
**PAPER GUIDEPLATE CLEARANCE
(PLA-13)**



left side view

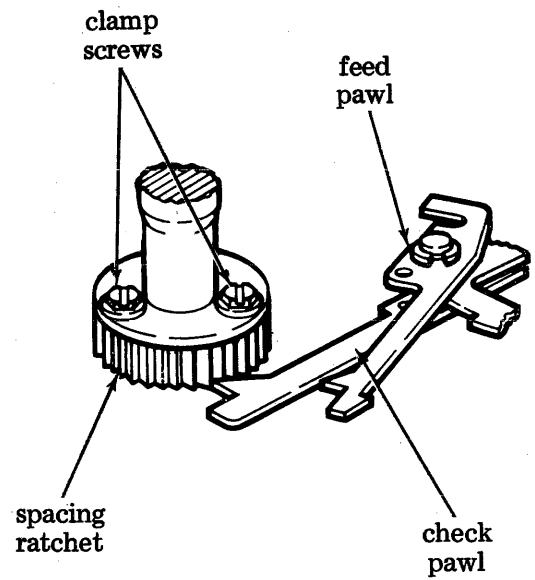
LEFT MARGIN PRINTING (FOA-15)

- Print two RH characters at left margin and at center of line.

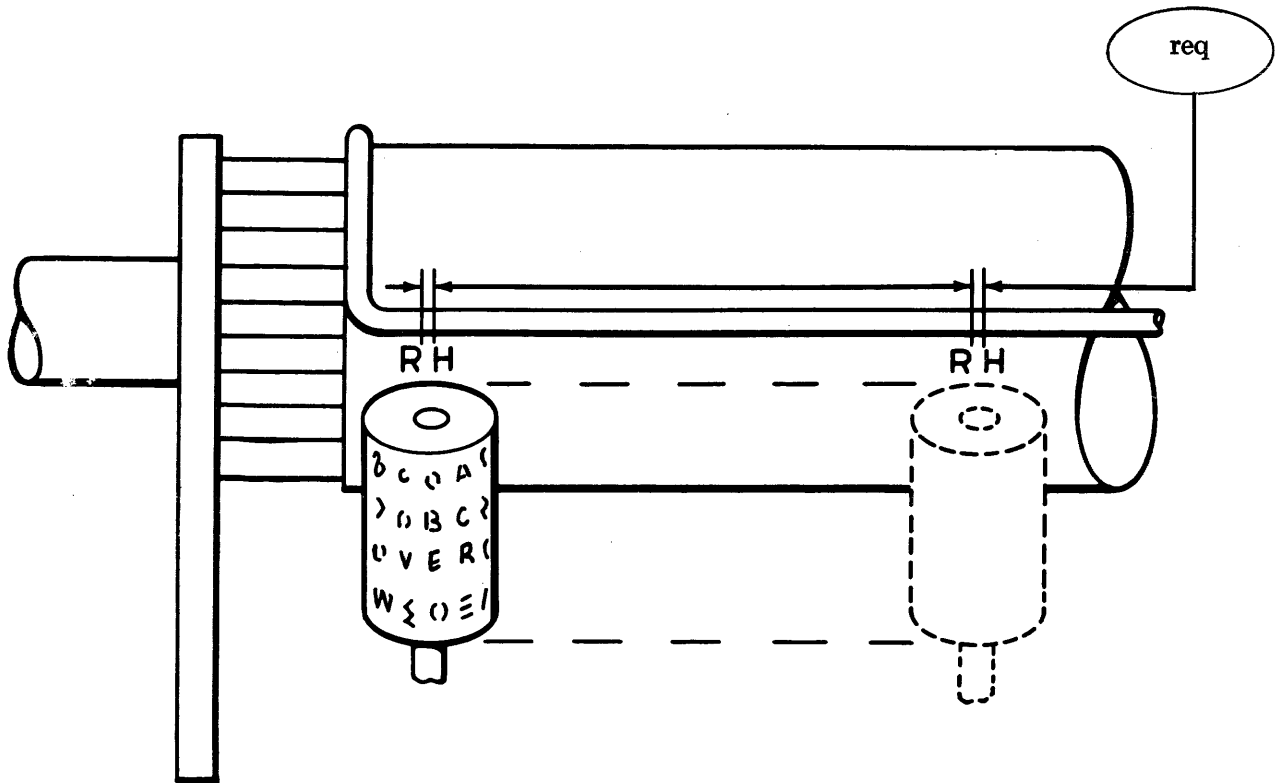
Requirement — Spacing at left margin and at center of line should be about the same.

Adjust — Loosen spacing ratchet clamp screws friction tight.
 Seat piston firmly in dashpot.
 Rotate carriage return arm counter-clockwise until feed pawl and check pawl move toward spacing ratchet.
 Position spacing ratchet until check pawl rests on top of a ratchet tooth.
 Tighten clamp screws.

“Adjust” affects:
 SPACING BELT TENSION (SPA-5)
 LEFT MARGIN POSITION — F (MDA-2)
 RIGHT MARGIN POSITION (FOA-36)



left front view



front view

LINE LENGTH SELECTION (FOA-18)

- Place carriage at 133 character position.
- Rotate main shaft until function clutch is in position "C".

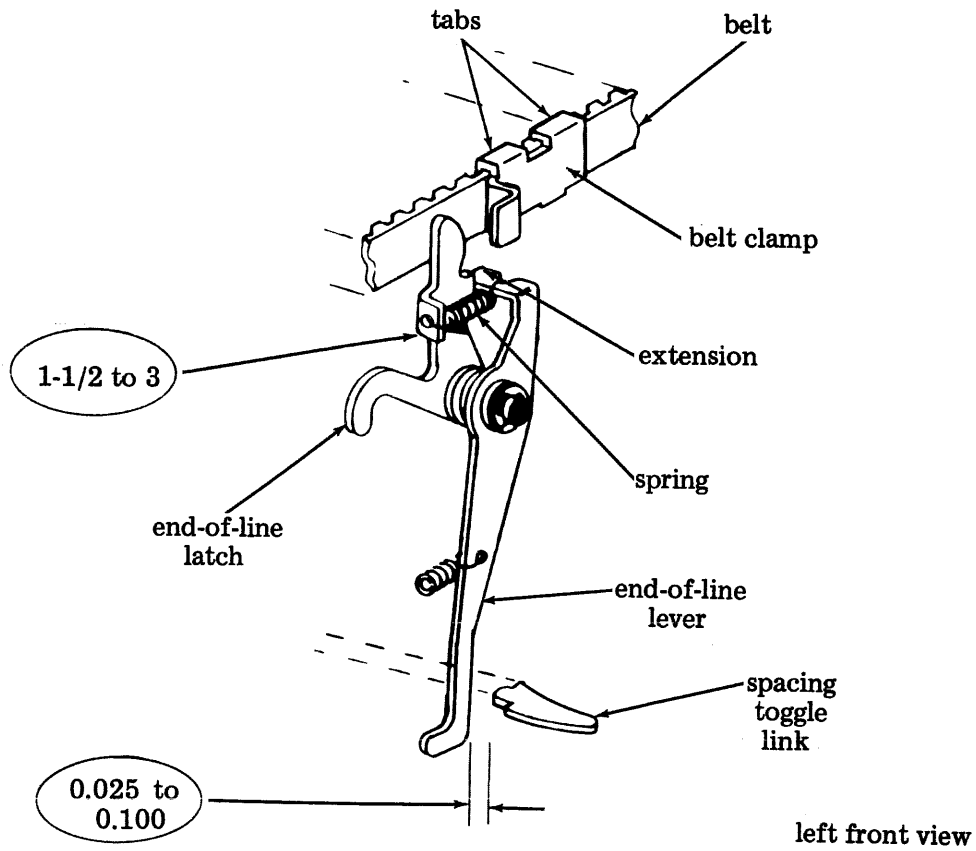
Requirement — 0.025 to 0.100 between end-of-line lever and spacing toggle link.

Adjust — Bend tabs away from belt.
Position belt clamp.
Crimp belt clamp and tabs securely.

END-OF-LINE LATCH SPRING

- Place printer in stop position.
- Unlatch carriage return lever.

Requirement — 1-1/2 to 3 to start end-of-line latch moving.

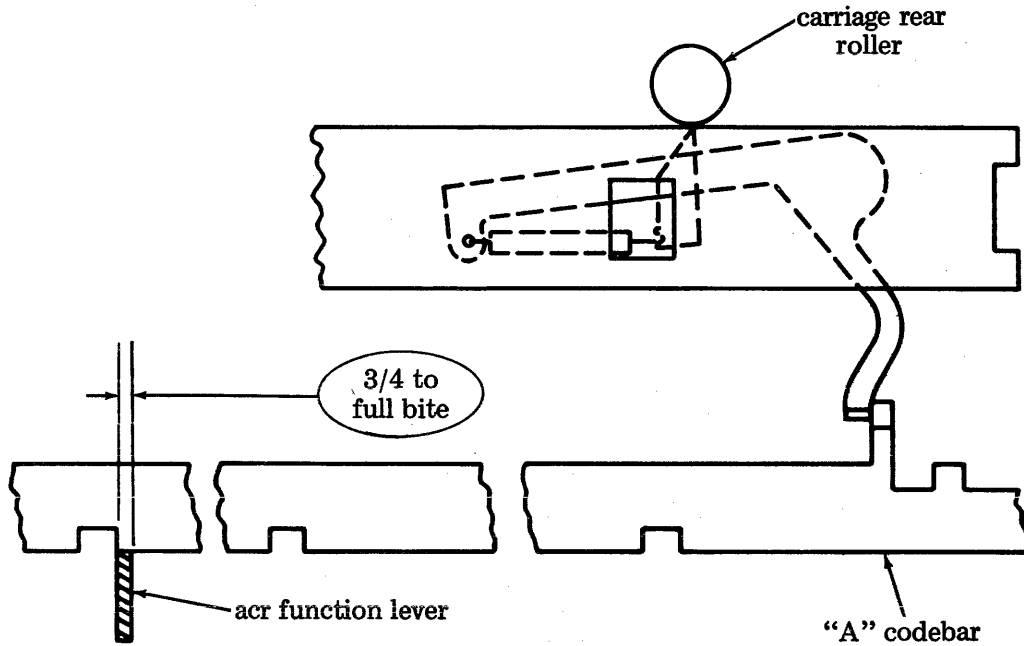


AUTOMATIC CARRIAGE RETURN AND LINE FEED (MDA-3)

- Position carriage rear roller over margin bell latch.
- Rotate main shaft until function clutch is in position "A".

Adjust — Using 180993 bending tool bend function lever extension to meet requirement.

Requirement 1 — There should be approximately 3/4 to full bite of the automatic carriage return function lever with the "A" codebar.

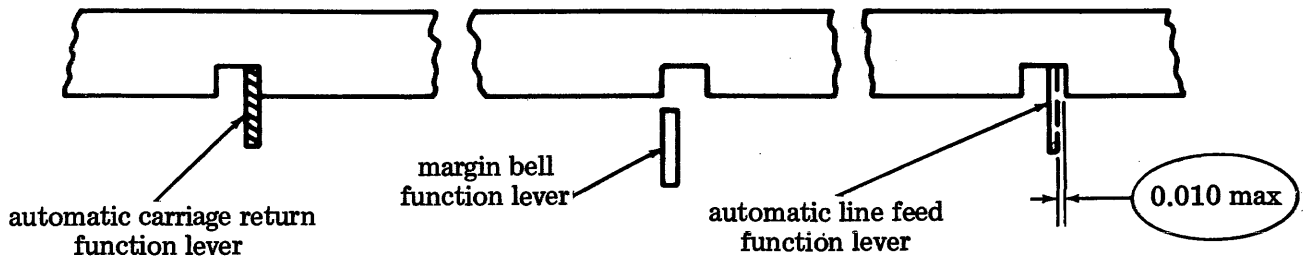


front view

- Place carriage at center of printer.
- Place function clutch to position "A".
- Depress margin bell function lever and move "A" codebar to right until the automatic carriage return function lever falls into the slot of the "A" codebar.
- Release the "A" codebar and margin bell function lever.

Requirement 2 — With the "A" codebar resting against the right side of the automatic carriage return function lever the automatic line feed function lever should fall into its slot in the "A" codebar with a maximum clearance of 0.010.

Adjust — Using 180993 bending tool, bend the automatic line feed function lever extension to meet requirement.



front view

MARGIN BELL BELLCRANK CLEARANCE (MDA-4)

NOTE: This adjustment applies only to printers with an end-of-line bell to ring on approximately the 124th character.

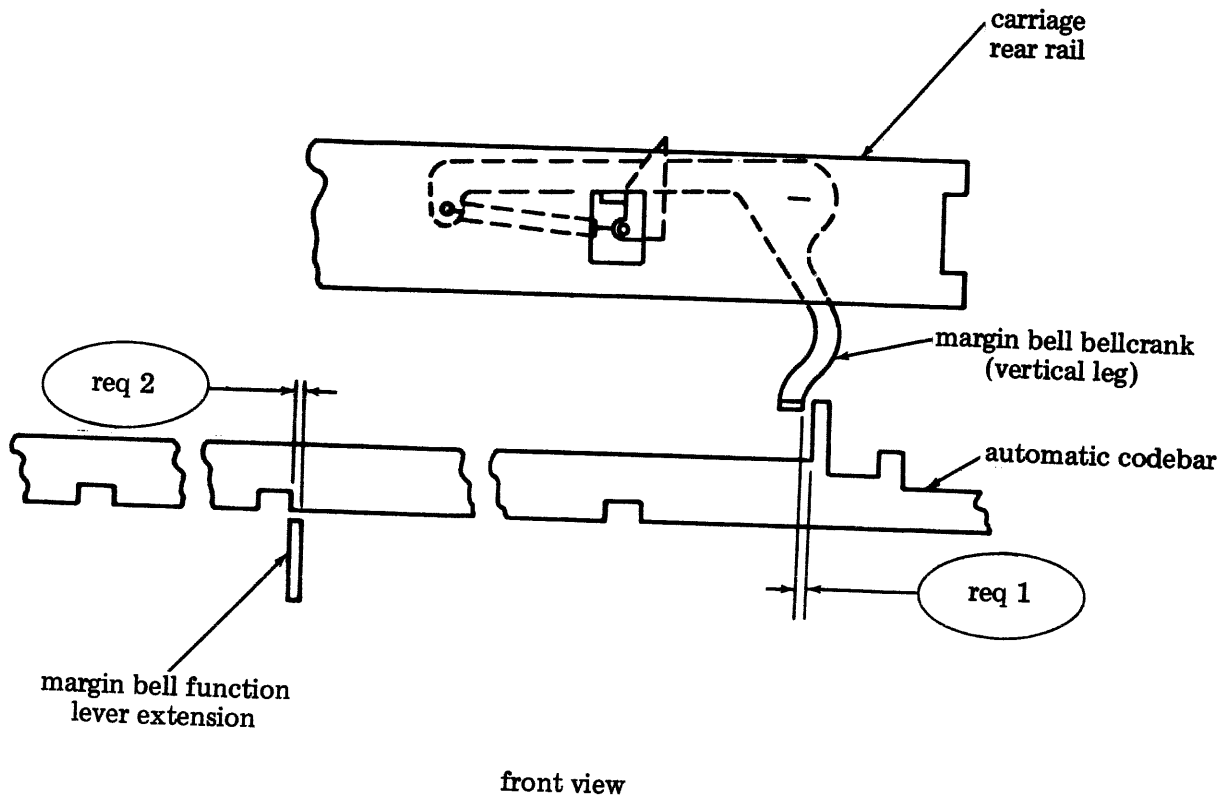
Place carriage at left margin.
Place function bail at high point of its travel and the end-of-line bell function lever unselected.

Requirement 1 — 0.005 to 0.020 between the bellcrank extension and the automatic codebar when the bellcrank upstop is held against the upper surface of the cut-out in the rear rail.

Requirement 2 — Approximately full material bite between the margin bell function lever extension and the automatic codebar.

Adjust — Using 180993 bending tool, twist vertical leg of bellcrank to meet requirement 1.

Bend end-of-line bell function lever extension to meet requirement 2.



RECEIVING MARGINS (FOA-22)

- Set up test situation using printer and signal distortion test set to check selector receiving margins.

Requirement — Obtain the following minimum selector receiving margins using the above setup.

SPEED	RANGE ZERO DISTORTION	OVERALL BIAS	END DISTORTION
All speeds	No requirement	35 percent*	33 percent*

*Some range scale setting.

Adjust — Refine ARMATURE SPRING and if necessary, ARMATURE BRACKET POSITION (preliminary) (SLA-2) and/or BELT TENSION (MRA-2) adjustments.

NOTE: Refining the ARMATURE BRACKET POSITION (preliminary) (SLA-2) or BELT TENSION (MRA-2) adjustments need not be performed unless refinement of the ARMATURE SPRING adjustment fails to bring about the minimum selector receiving margins.

“Requirement” affected by:
ARMATURE BRACKET POSITION (SLA-2)
ARMATURE SPRING
SHOE LEVER GAP AND TRIP LEVER ENGAGEMENT (SLA-1)

FINAL PRINTING ALIGNMENT (FOA-23)

NOTE: When printer is adjusted as instructed on previous pages, quality of printed copy should be good. However, minor readjustments may be necessary.

- Print TH at various points along length of line.

Requirement — Quality of printed characters should be good.

Adjust — Use the following guide in making readjustments:

Shading at top and bottom of characters not equal.

Underscoring or overscoring of characters.

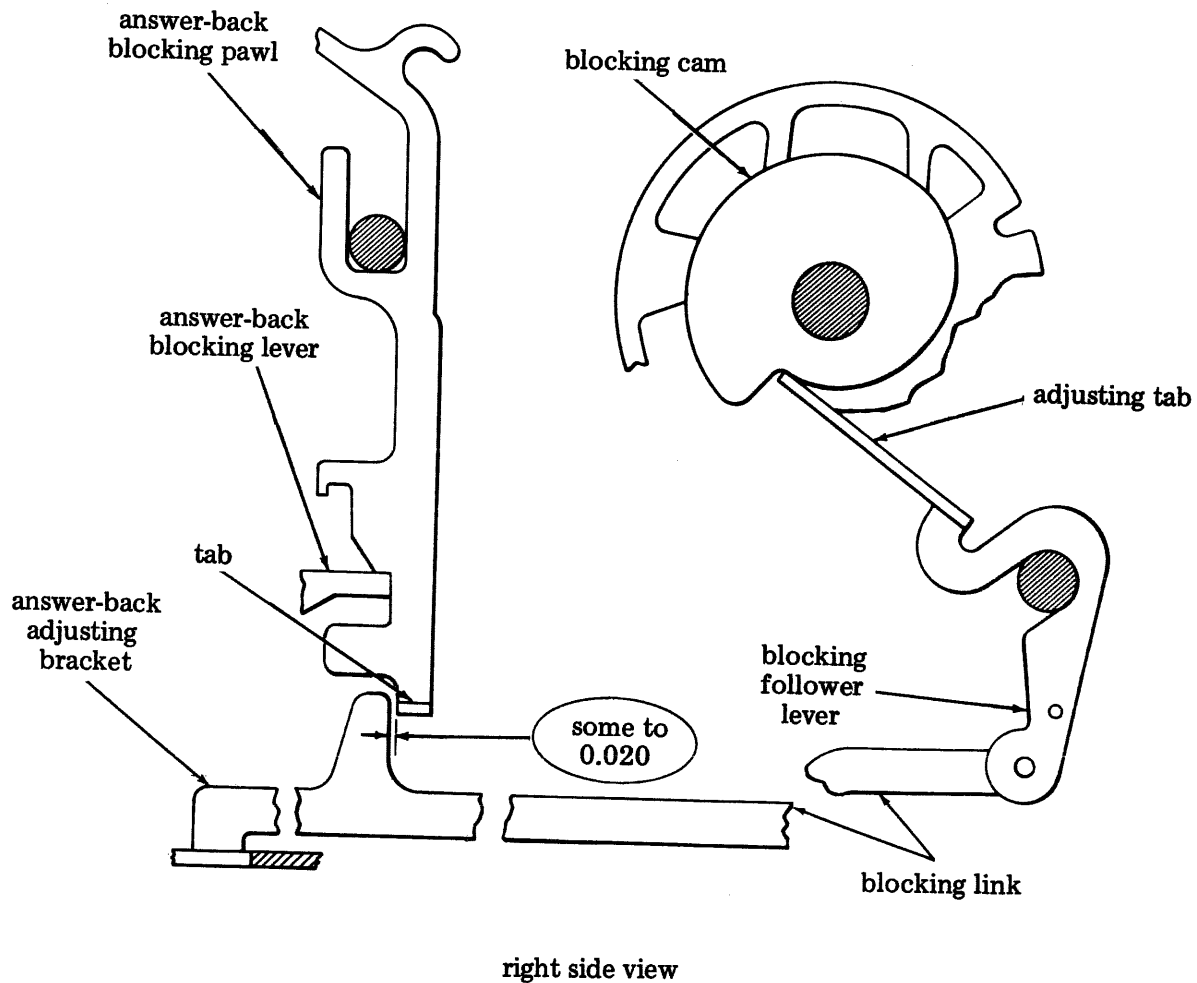
Refine VERTICAL TYPE ALIGNMENT (PLA-2) by moving platen toward portion of light shading.

BLOCKING LINK CLEARANCE (ABA-1)

- Adjusting tab should clear control lever.
- Disengage distributor and function clutches.
- Engage answer-back blocking lever fully in indent of answer-back blocking pawl.
- Take up play in the answer-back blocking pawl toward front of printer.

Requirement — Some to 0.020 between blocking link and tab on answer-back blocking pawl.

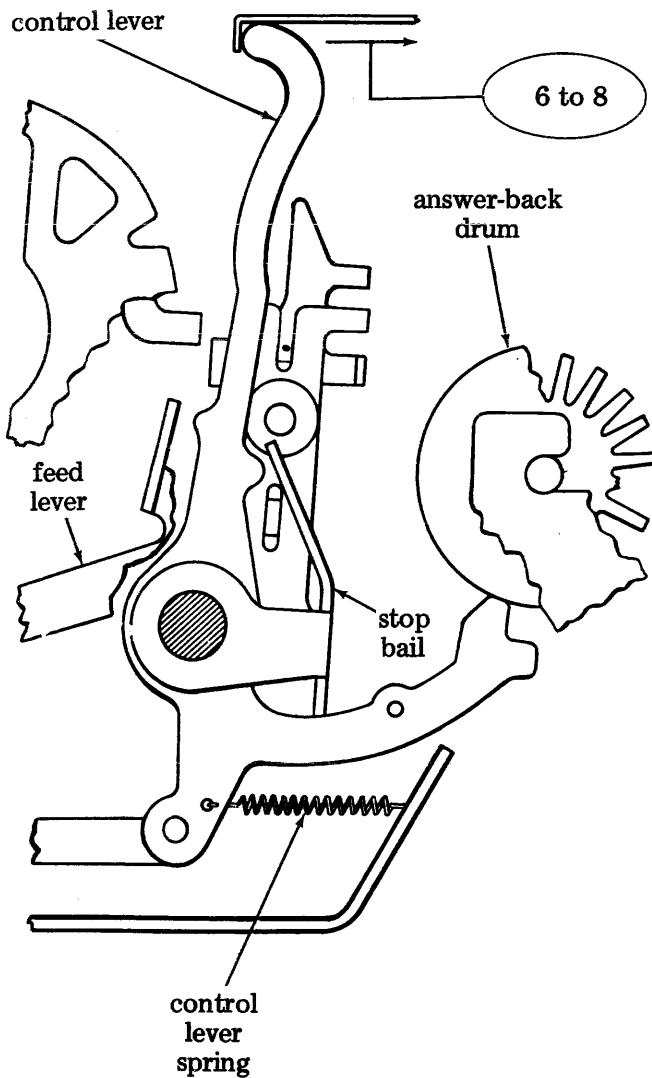
Adjust — Bend adjusting tab on blocking follower with 180993 bending tool.



**CONTROL LEVER SPRING —
HORIZONTAL**

- Adjusting tab should clear control lever.
- Place control lever out of indent and on high part of answer-back drum.
- Rotate main shaft until feed lever is moved by cam roller to its lowest position.

Requirement — 6 to 8 to start control lever moving.

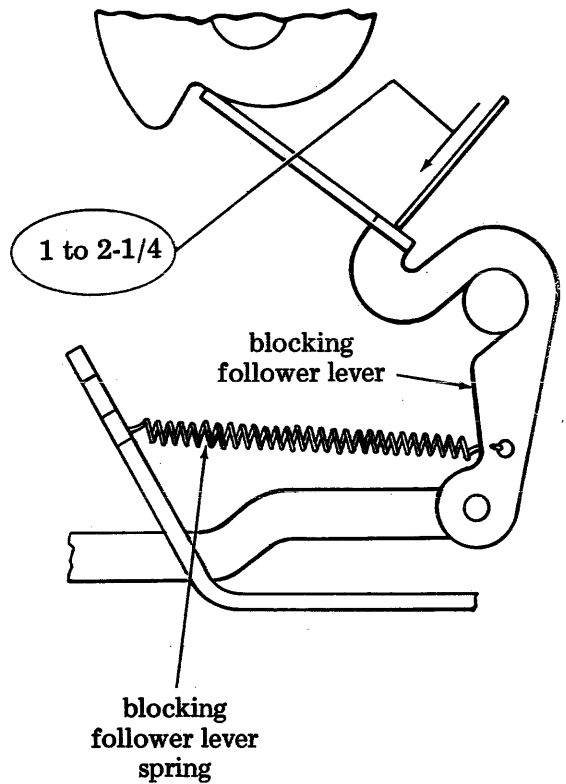


right side view

BLOCKING FOLLOWER LEVER SPRING

- Adjusting tab should clear control lever.
- Disengage distributor clutch.

Requirement — 1 to 2-1/4 to start blocking follower lever moving.



right side view

DRUM POSITION (ABA-2)

- Engage lower extension of control lever in indent of answer-back drum and locate detent lever between ST and row 20 on answer-back drum.
- Disengage distributor clutch.
- Hold feed pawl out of engagement with answer-back drum.
- Manually move the upper extension of the control lever toward the rear of the printer while checking to see that the drum is fully detented.
- Move the upper extension of the control lever toward the front of the printer while noticing any clockwise movement of the drum.

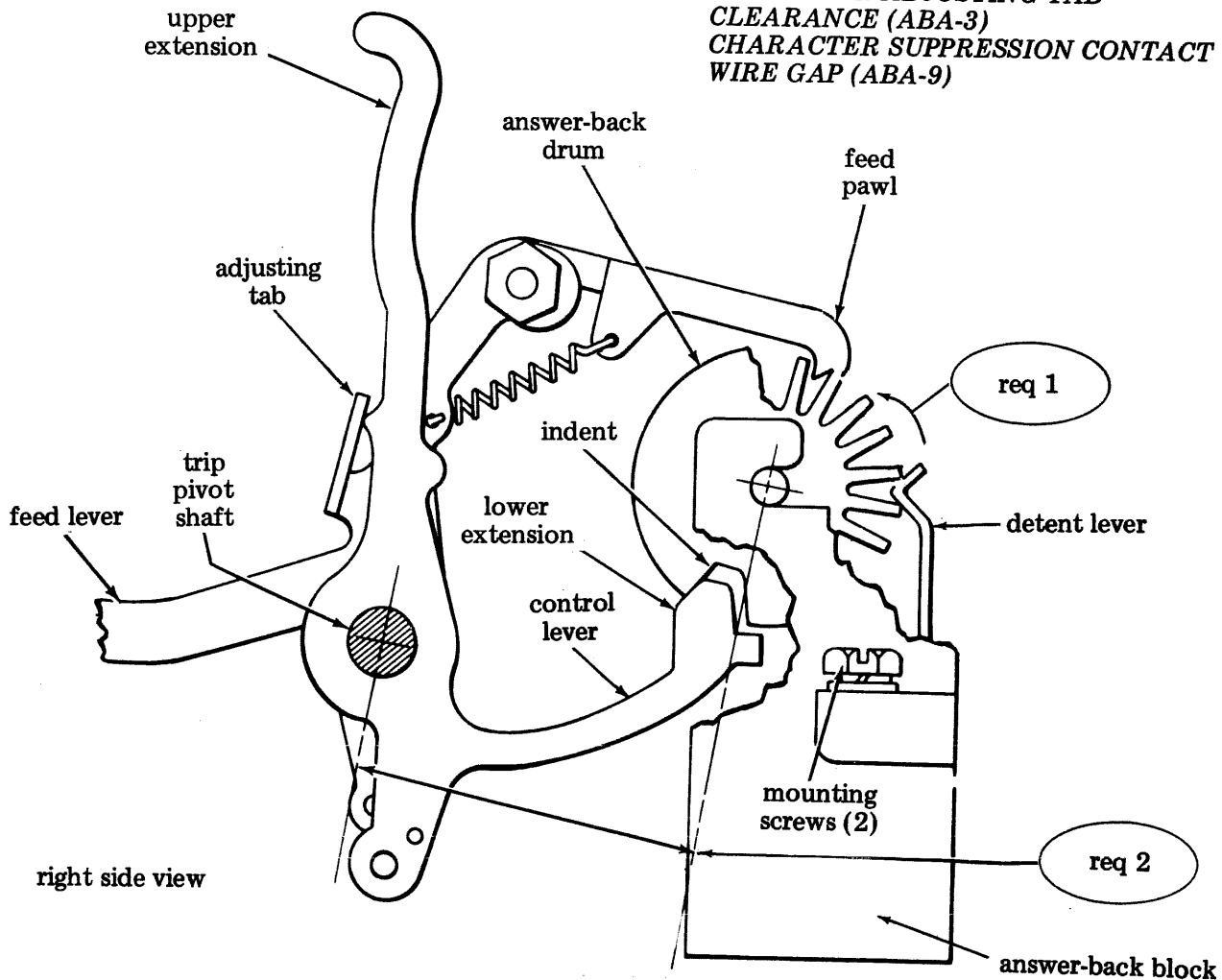
NOTE: If necessary to insure clearance between the feed lever adjusting tab and the control lever, bend the feed lever adjusting tab toward the front of the printer.

Requirement 1 — Barely perceptible clockwise movement of drum from its fully detented position when upper extension of control lever is moved toward front of printer.

Requirement 2 — The axis of the drum should be parallel to the trip pivot shaft. Gauge by eye.

Adjust — Loosen HERE IS adjusting bracket clamp screw and answer-back bracket clamp screw.
With mounting screws friction tight, position block to meet requirements.
Tighten screws.

“Adjust” affects:
TRIP LEVER CLEARANCE (ABA-4)
FEED PAWL POSITION (ABA-6)
FEED LEVER POSITION (ABA-5)
TRIPBAIL POSITIONING (ABA-8)
TRIP LEVER ADJUSTING TAB CLEARANCE (ABA-3)
CHARACTER SUPPRESSION CONTACT WIRE GAP (ABA-9)



TRIP LEVER CLEARANCE (ABA-4)

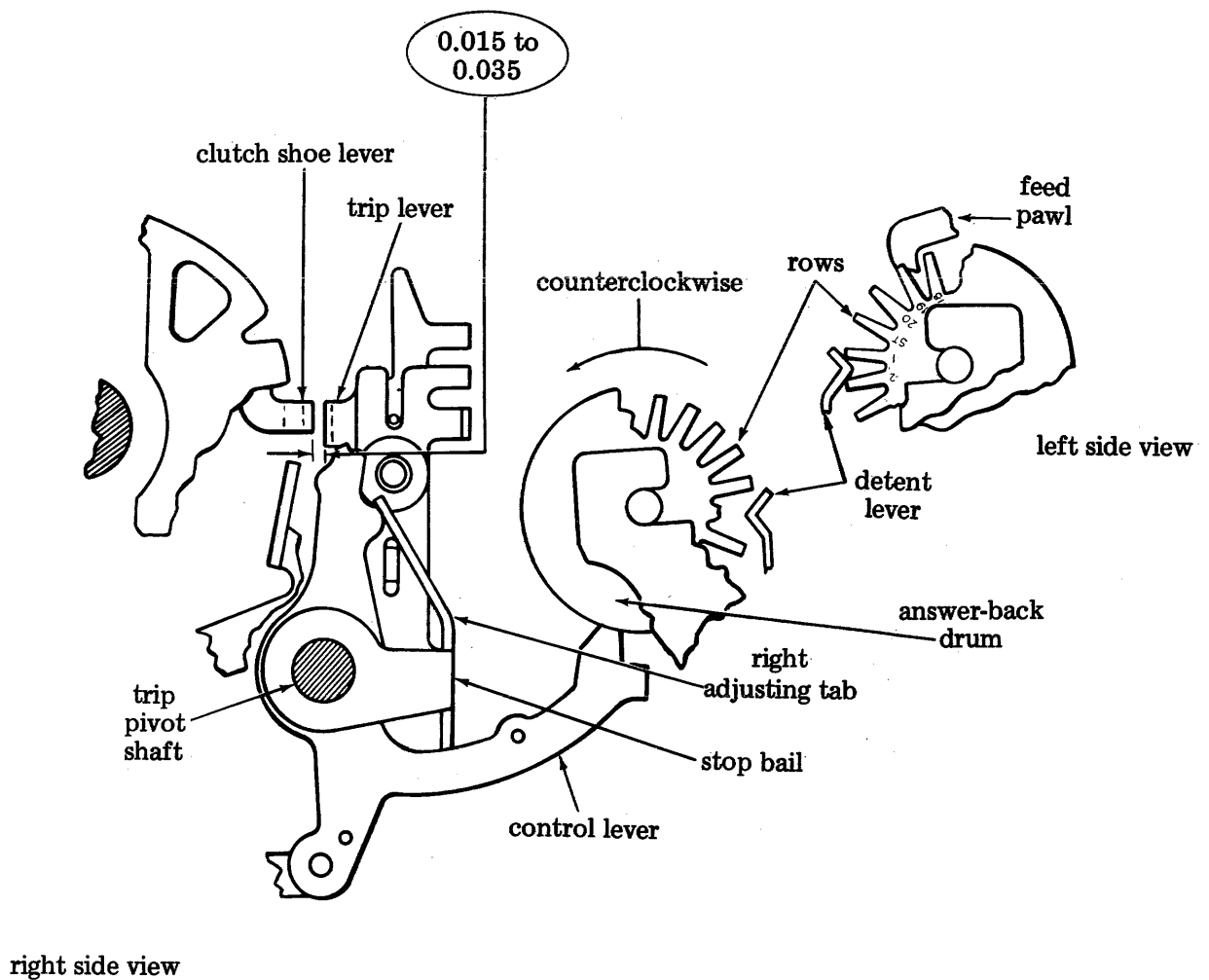
- Trip distributor clutch and manually rotate main shaft to place upper edge of clutch shoe lever in line with upper edge of trip lever.
- Lift feed pawl.
- Manually rotate answer-back drum counterclockwise until detent lever is located between row 1 and 2 of drum.

Requirement — 0.015 to 0.035 between clutch shoe lever and trip lever.

Adjust — Bend right adjusting tab using 180993 bending tool.

NOTE: The plane of right adjusting tab should be parallel to the axis of trip pivot shaft. Gauge by eye.

“Requirement” affected by:
DRUM POSITION (ABA-2)



FEED LEVER POSITION (ABA-5)

- Fully detent the answer-back drum in its home position.
- Trip distributor clutch and manually rotate main shaft until cam roller is adjacent to high part of feed lever.
- Rotate cam roller to minimize clearance.
- Hold feed pawl clear of answer-back drum.

Requirement — Some to 0.005 between feed lever and cam roller.

Adjust — Bend feed lever adjusting tab with 180993 bending tool.

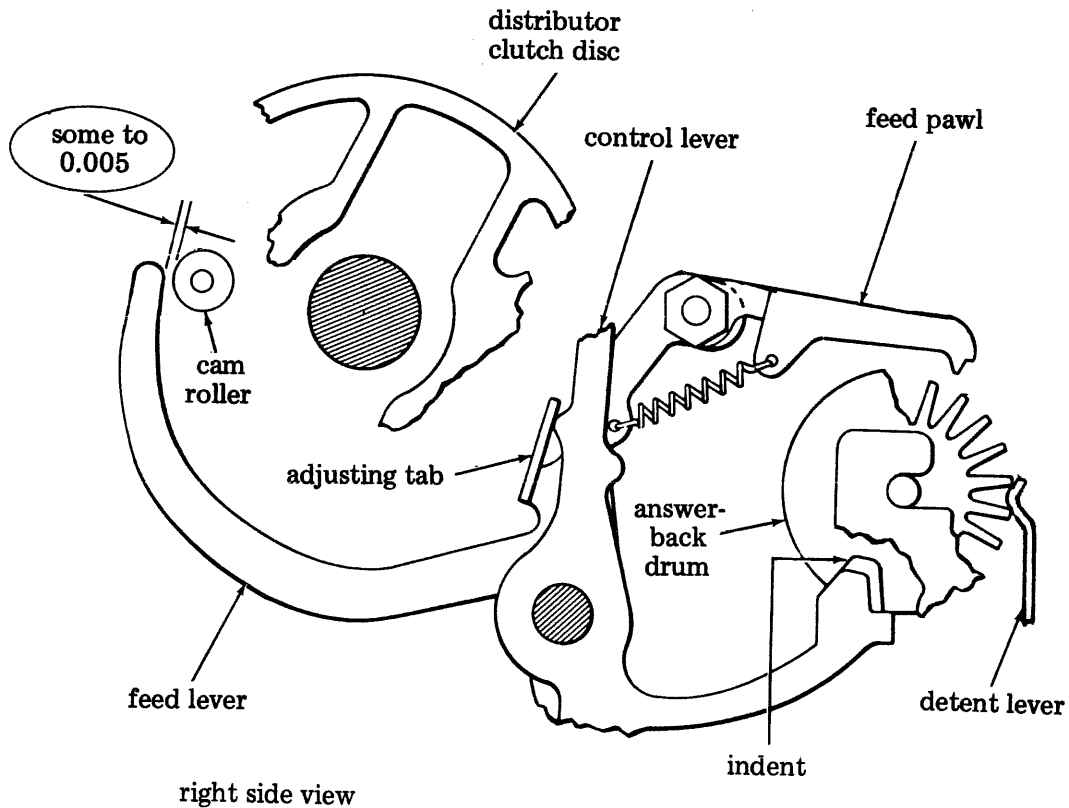
“Adjust” affects:
TRIPBAIL POSITIONING (ABA-8)
FEED PAWL POSITION (ABA-6)

“Requirement” affected by:
DRUM POSITION (ABA-2)

NOTE 1: Rollers with identifying groove near clutch disc do not require rotation to determine minimum clearance.

NOTE 2: The “some” requirement is met if there is no perceptible movement of the answer-back feed pawl when rotating the distributor shaft to its stop position.

NOTE 3: For increased feed margin, particularly when changing drums, hold requirement to minimum side.



FEED PAWL POSITION (ABA-6)

- Place answer-back drum fully detented in its home position.
- Disengage distributor clutch.
- Manually trip distributor clutch and rotate main shaft until cam roller is adjacent to high part of feed lever.
- Position feed pawl fully within answer-back ratchet.
- Take up all play to minimize required clearance.

Requirement 1 — Some to 0.005 between feed pawl and rear face of no. 16 drum tooth.

NOTE: Minimum requirement is met if feed pawl spring repositions the pawl after it has been raised and then released above answer-back drum.

Adjust — Loosen adjusting nut and screw friction tight.
Position feed pawl.
Tighten nut and screw.

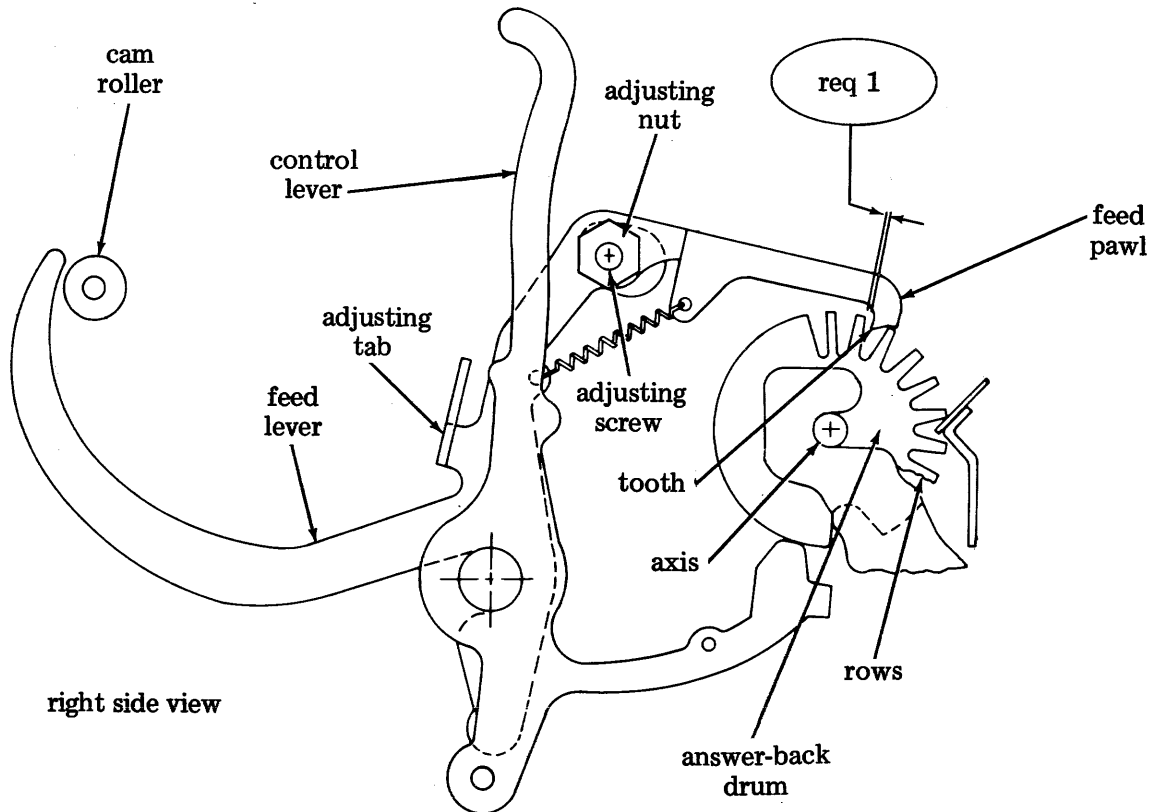
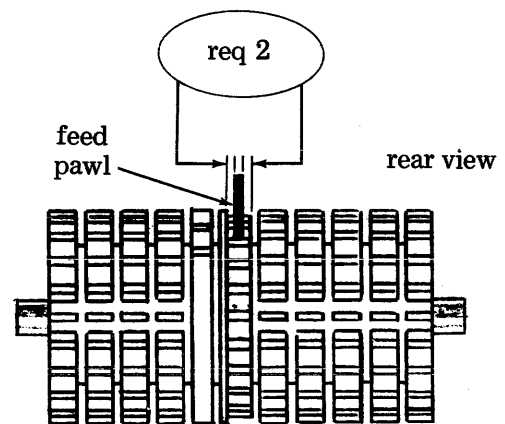
- Push top of control lever toward rear of printer and simultaneously rotate main shaft.
- Observe operation of feed pawl.

Requirement 2 — The feed pawl should be centrally located on feed ratchet teeth.

Adjust — Bend feed lever just below feed pawl.

“Adjust” affects:
TRIP BAIL POSITIONING (ABA-8)

“Requirement” affected by:
DRUM POSITION (ABA-2)
TRIP SHAFT POSITION (DBA-3)
FEED LEVER POSITION (ABA-5)



TRIP BAIL POSITIONING (ABA-8)

- Place printer in stop condition.
- Trip function clutch and rotate main shaft until function clutch is in position A.
- Push answer-back function pawl down until its notch is engaged by its function lever.
- Trip distributor clutch and continue to rotate the main shaft until answer-back function pawl reaches its lowest point of travel.

NOTE: The feed pawl will move back to pick up the next tooth on the answer-back drum feed ratchet.

- With the feed pawl centered on the answer-back drum feed ratchet, take up play in feed pawl toward the rear.

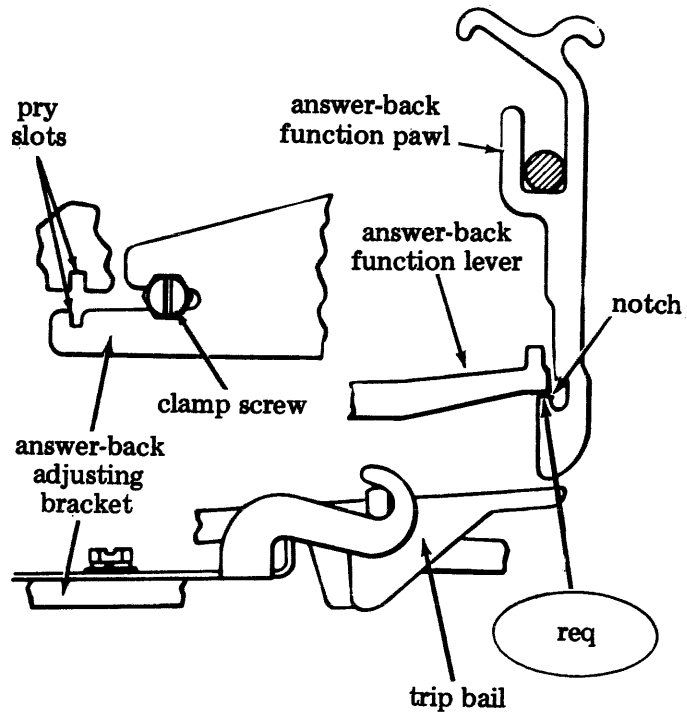
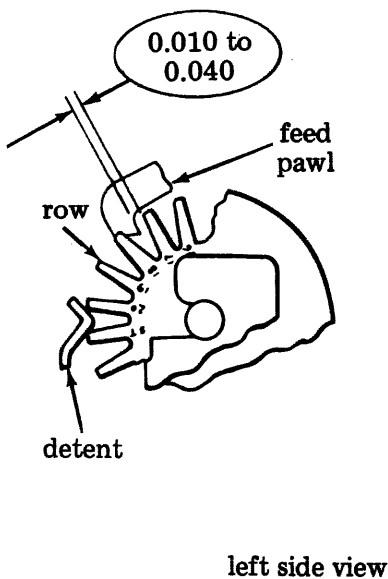
Requirement — 0.010 to 0.040 overtravel between feed pawl and face of answer-back drum feed ratchet of row 17.

- With printer in stop condition.
- Set up code combination for answer-back call character in selector.
- Rotate main shaft until answer-back function pawl moves forward to its selected position.
- Observe forward movement of answer-back function pawl.

Requirement — Answer-back function pawl must move forward freely to its selected position without hesitation.

Adjust — Loosen clamp screw friction tight. Position answer-back adjusting bracket using pry points. Tighten clamp screw.

“Requirement” affected by:
DRUM POSITION (ABA-2)
FEED PAWL POSITION (ABA-6)
RIGHT ROCKER DRIVE (FNA-10)



TRIP LEVER OVERTRAVEL AND ARMATURE GAP (ABA-11)

- Answer-back drum fully detented in its home position.
- Trip distributor clutch and rotate main shaft until pointer of distributor brush holder is in line with intersection of conductor path and stop segment.
- Control lever must be clear of answer-back to trip lever adjusting tab.
- If necessary, bend tab forward to provide clearance.
- Place armature in its attracted position.
- Take up play toward rear of typing unit.

Requirement 1 — 0.006 to 0.015 between the end of armature extension and end of answer-back blocking latch.

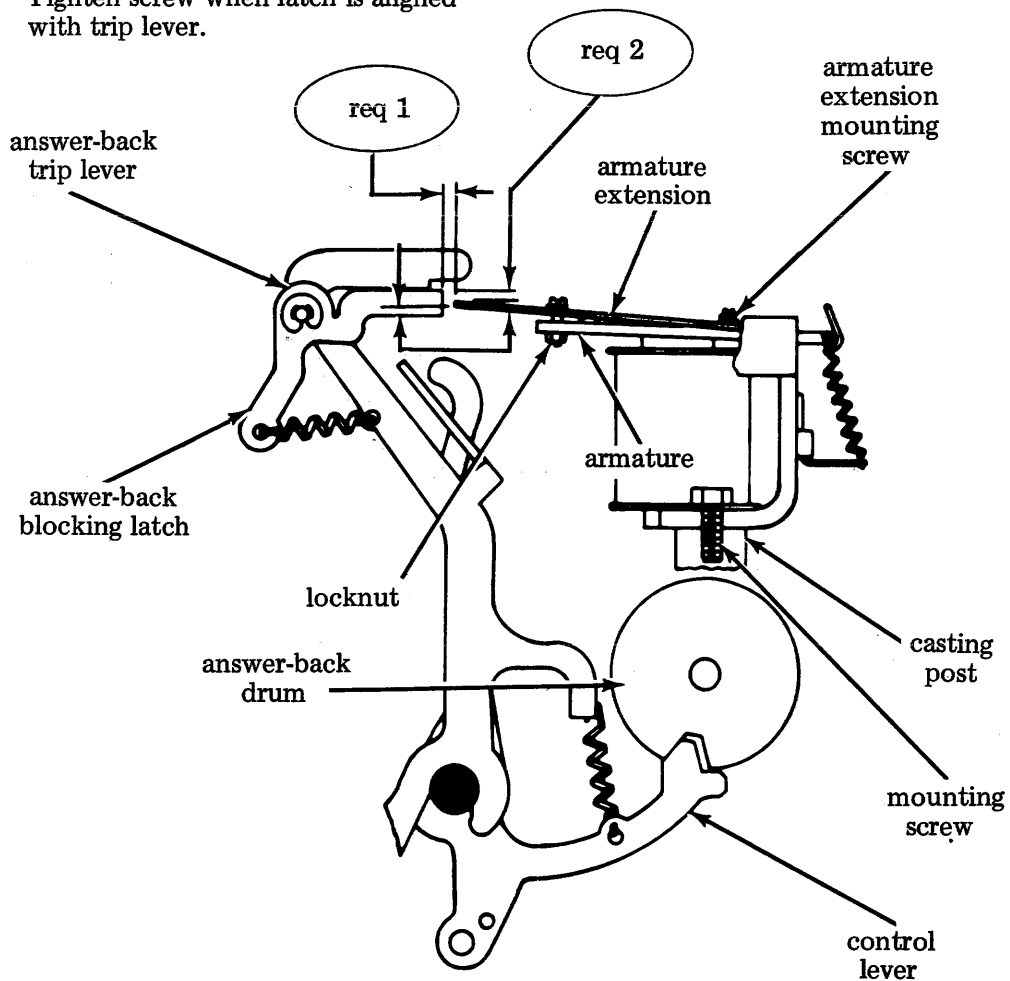
Adjust — Loosen armature extension mounting screw friction tight. Position armature extension using pry points. Tighten screw when latch is aligned with trip lever.

Requirement 2 — Front of armature extension should be vertically centered between top and bottom surfaces of answer-back blocking latch as gauged by eye.

Adjust — Loosen armature extension adjusting screw locknut friction tight. Position armature extension using adjusting screw. Tighten locknut.

“Adjust” affects:
TRIP LEVER ADJUSTING TAB CLEARANCE (ABA-3)
CHARACTER SUPPRESSION CONTACT WIRE GAP (ABA-9)

“Requirement” affected by:
TRIP MAGNET POSITION (ABA-10)



right side view

NOTE: The following adjustment applies to typing units equipped with an answer-back trip magnet mechanism.

TRIP LEVER ADJUSTING TAB CLEARANCE (ABA-3)

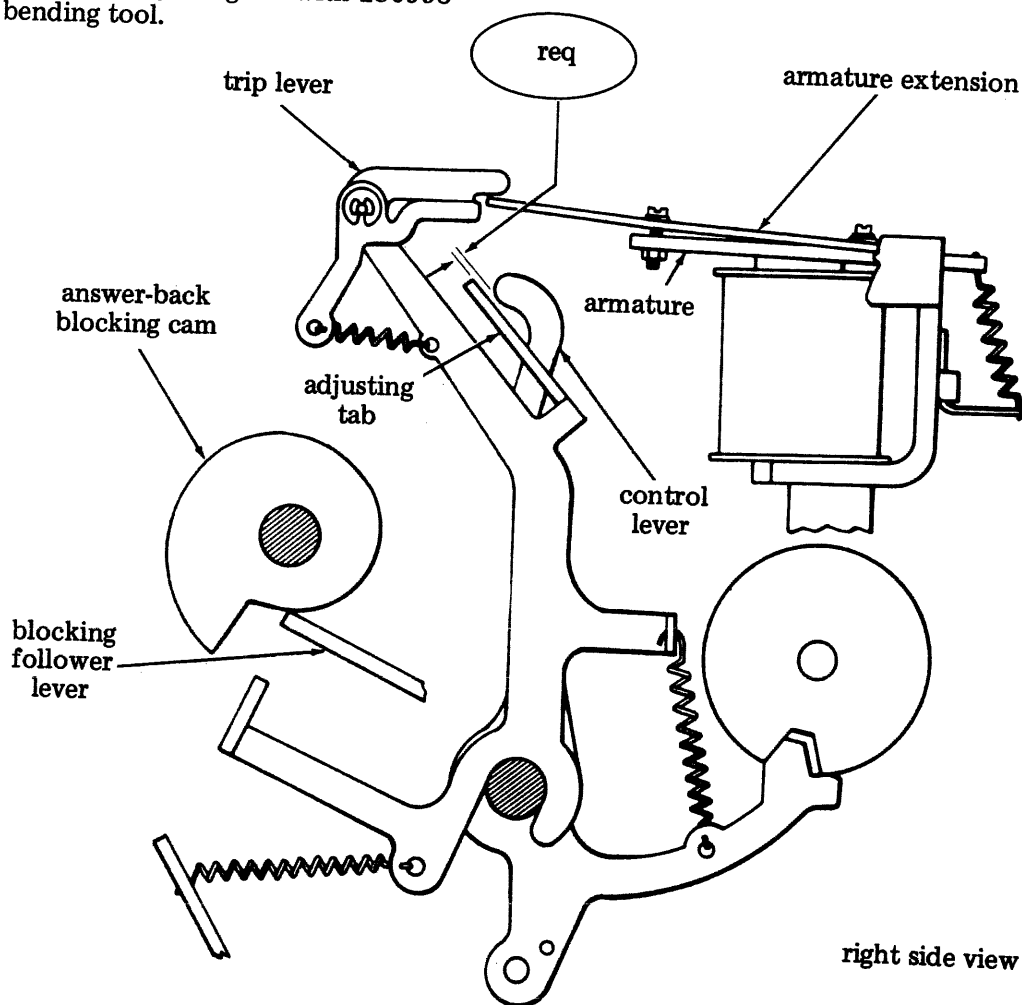
- Position answer-back drum fully detented in its home position.
- Place printer in its stop condition.
- Place armature in its unattracted position, biased toward the rear.
- Center trip lever between armature extension guide ears.
- Center control lever on adjusting tab of trip lever.

“Adjust” affects:
CHARACTER SUPPRESSION CONTACT WIRE GAP (ABA-9)

“Requirement” affected by:
TRIP MAGNET POSITION (ABA-10)
TRIP LEVER OVERTRAVEL AND ARMATURE GAP (ABA-11)
DRUM POSITION (ABA-2)

Requirement — Some to 0.020 between adjusting tab and tip of control lever.

Adjust — Bend adjusting tab with 180993 bending tool.



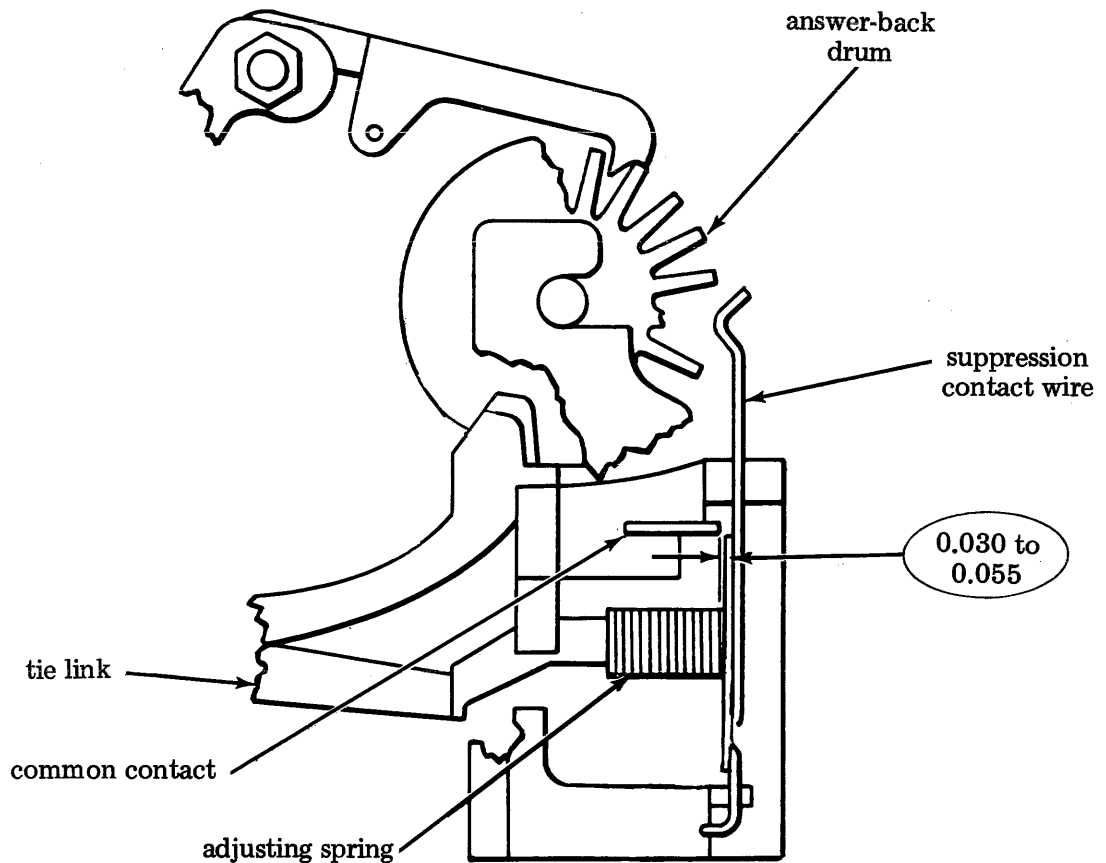
CHARACTER SUPPRESSION CONTACT WIRE GAP (ABA-9)

- Answer-back drum should be fully detented in its home position.
- Disengage the distributor clutch.

Requirement — 0.030 to 0.055 clearance between suppression contact wire and common contact.

Adjust — Position adjusting spring on the tie link.

“Requirement” affected by:
TRIP LEVER OVERTRAVEL AND ARMATURE GAP (ABA-11)
DRUM POSITION (ABA-2)
TRIP LEVER ADJUSTING TAB CLEARANCE (ABA-3)
TRIP MAGNET POSITION (ABA-10)



right side view

BLOCKING LATCH SPRING

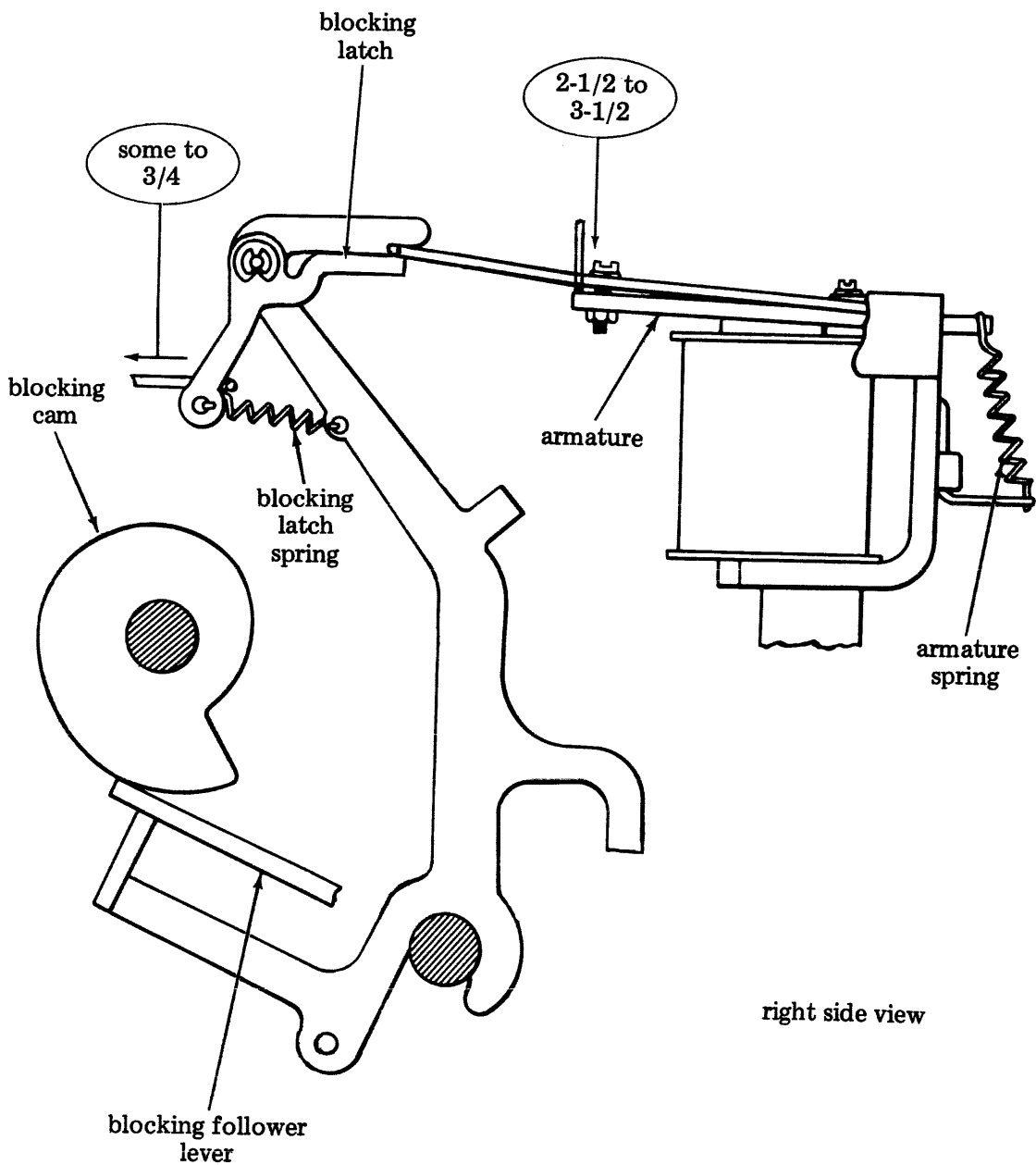
- The distributor clutch should be disengaged.

Requirement — Some to 3/4 to start blocking latch moving.

ARMATURE SPRING

- Trip distributor clutch.
- Rotate main shaft until the blocking follower lever is on high part of the blocking cam.
- Armature is in its unattracted position.

Requirement — 2-1/2 to 3-1/2 to start armature moving.



TRIP LEVER SPRING

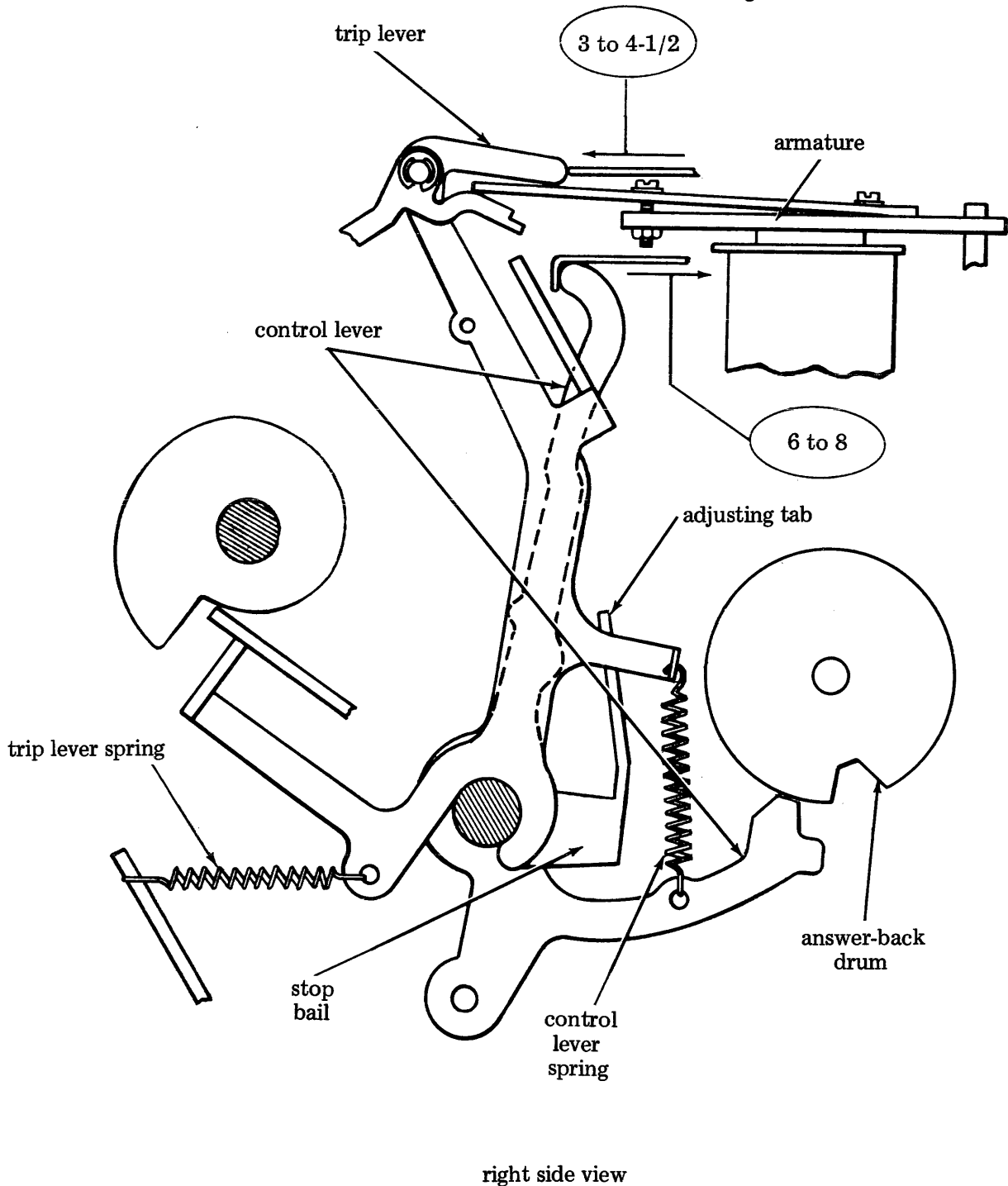
- Disengage distributor clutch.
- Manually trip the armature.
- Position stop bail so that its adjusting tab does not interfere with the control lever.
- Hold armature in its attracted position.

Requirement — 3 to 4-1/2 to start trip lever moving.

CONTROL LEVER SPRING — VERTICAL

- Disengage distributor clutch.
- Manually rotate the answer-back drum until control lever is on high part of answer-back drum.
- Position stop bail so that its adjusting tab does not interfere with the control lever.

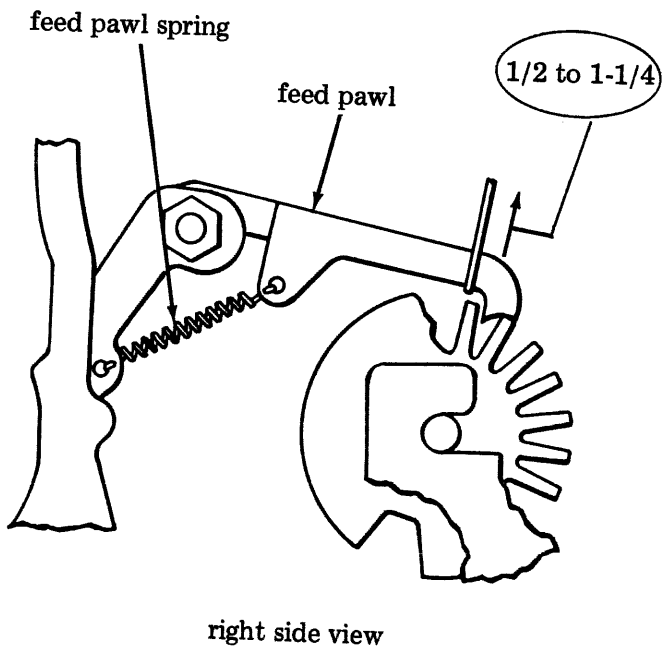
Requirement — 6 to 8 to start control lever moving.



FEED PAWL SPRING

- Disengage distributor clutch.

Requirement — 1/2 to 1-1/4 to start feed pawl moving.

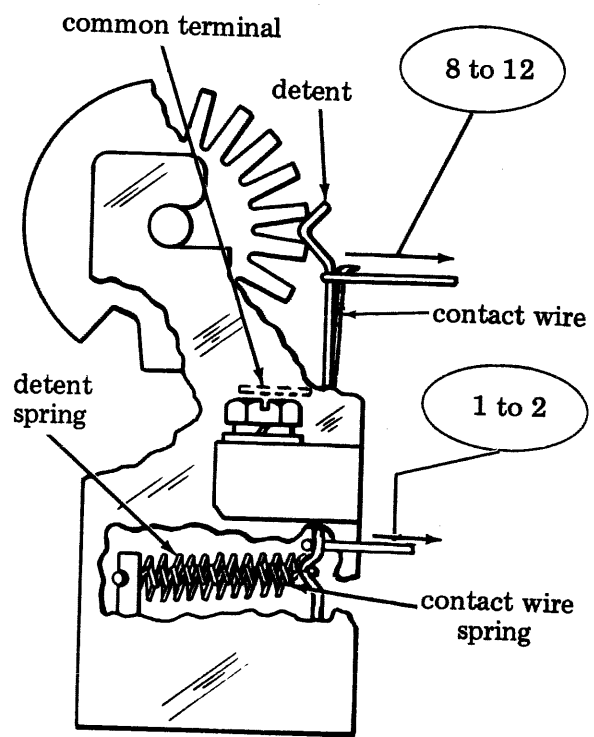


DETENT SPRING

Requirement — 8 to 12 to start detent moving.

CONTACT WIRE SPRING

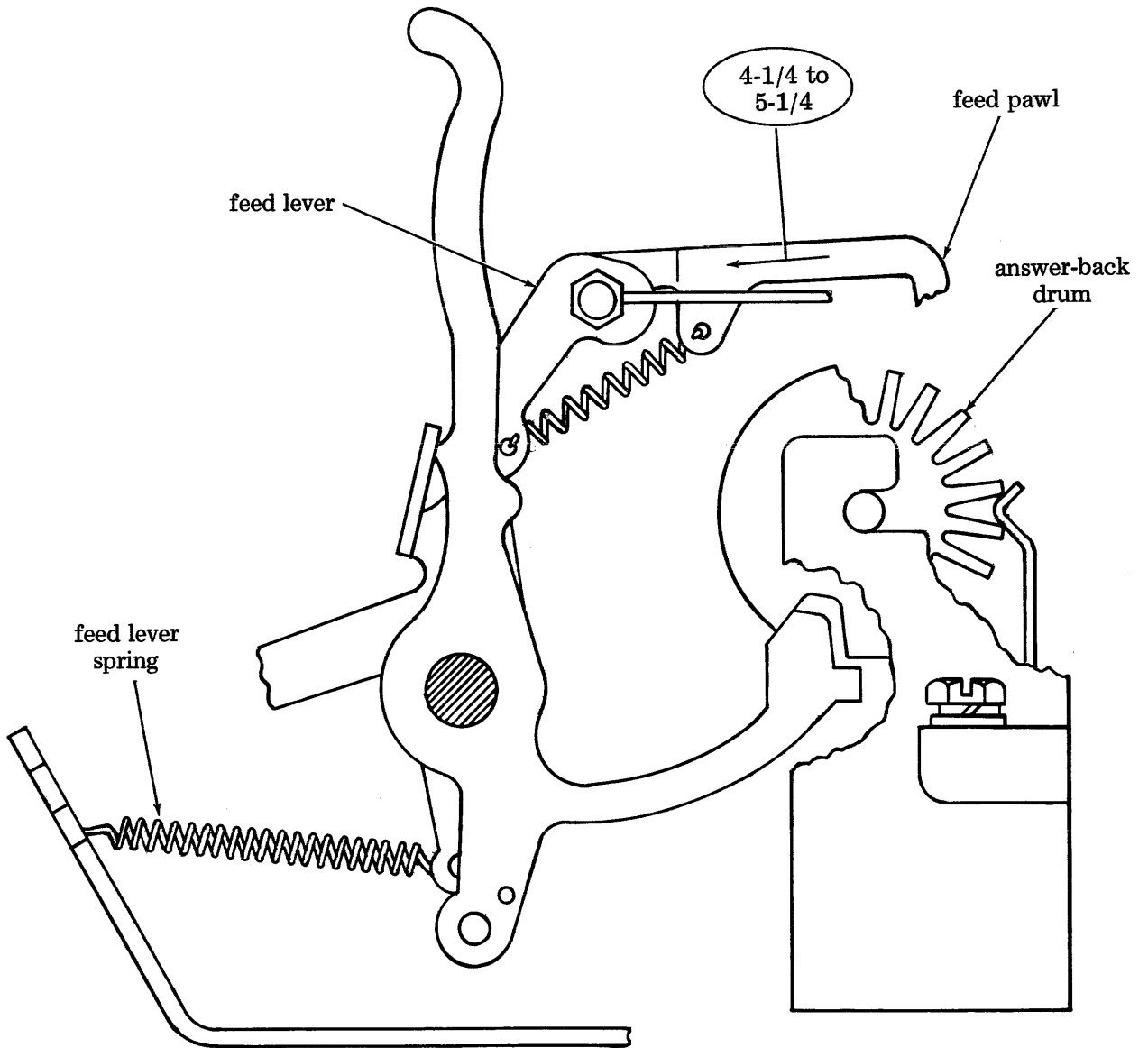
Requirement — 1 to 2 to start contact wire moving away from the common terminal.



FEED LEVER SPRING

- Disengaged distributor clutch.
- Feed pawl held out of engagement with answer-back drum.

Requirement — 4-1/4 to 5-1/4 to start feed lever moving.



right side view

CONTACT ASSEMBLY POSITION (ABA-12)

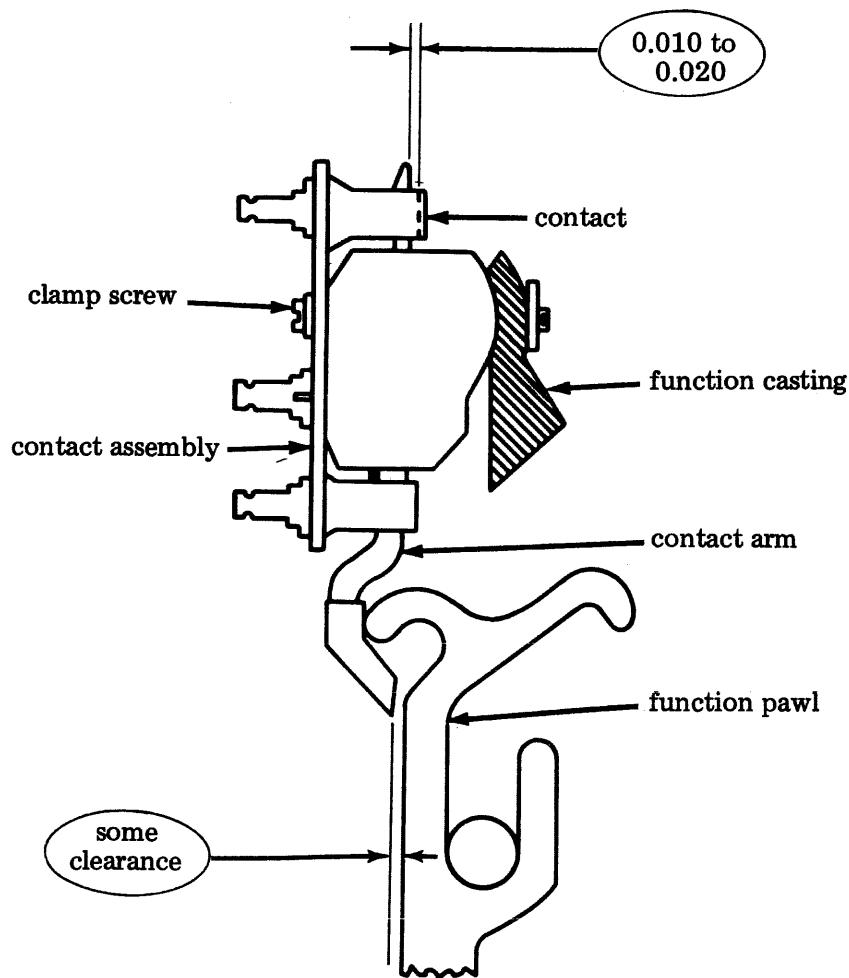
- Set up a code in the selector that will operate a function pawl associated with a contact arm.
- Rotate the main shaft until the function clutch is in position A.
- The contact arm must line up and be in contact with the function pawl.

Requirement 1 — 0.010 to 0.020 between the contact arm and contact at the closest point.

- Place the typing unit in the stop condition.

Requirement 2 — Some clearance between the function pawl and the tip of the contact arm.

Adjust — Loosen the two clamp screws friction tight. Position the contact assembly on the function casting. Bend the upper contact, if necessary. Tighten clamp screws.



left side view

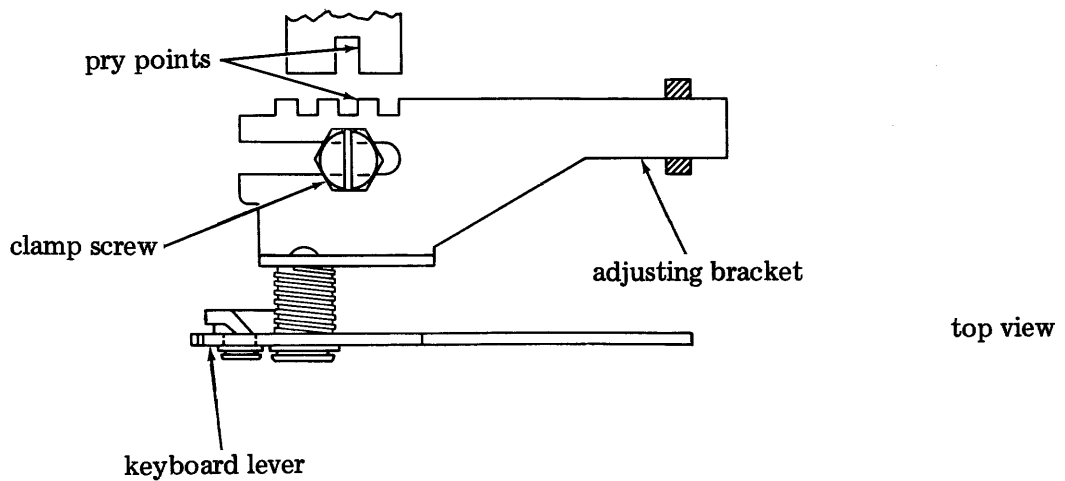
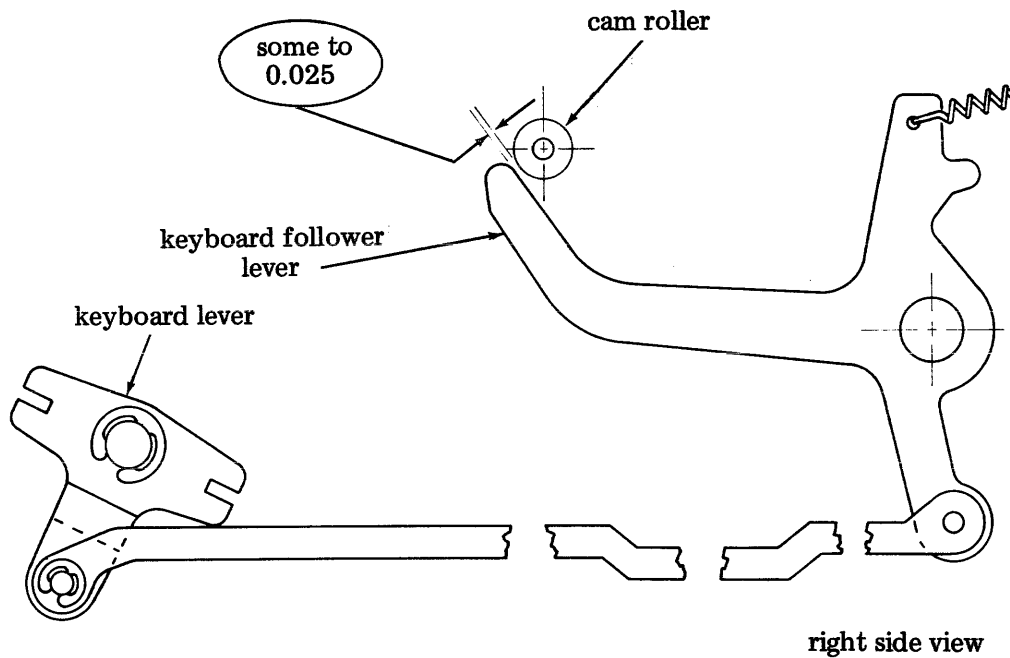
**KEYBOARD ADJUSTING BRACKET
POSITION (ABA-13)**

NOTE: This adjustment applies only to standard platen RO only (8-1/2 inch wide paper).

- Trip the distributor clutch.
- Rotate main shaft until cam roller is on high part of keyboard follower lever.
- Place keyboard lever in its lowest position.

Requirement — Some to 0.025 between keyboard follower lever and cam roller as gauged by eye.

Adjust — Loosen clamp screw friction tight. Move adjusting bracket using pry points. Tighten clamp screw.



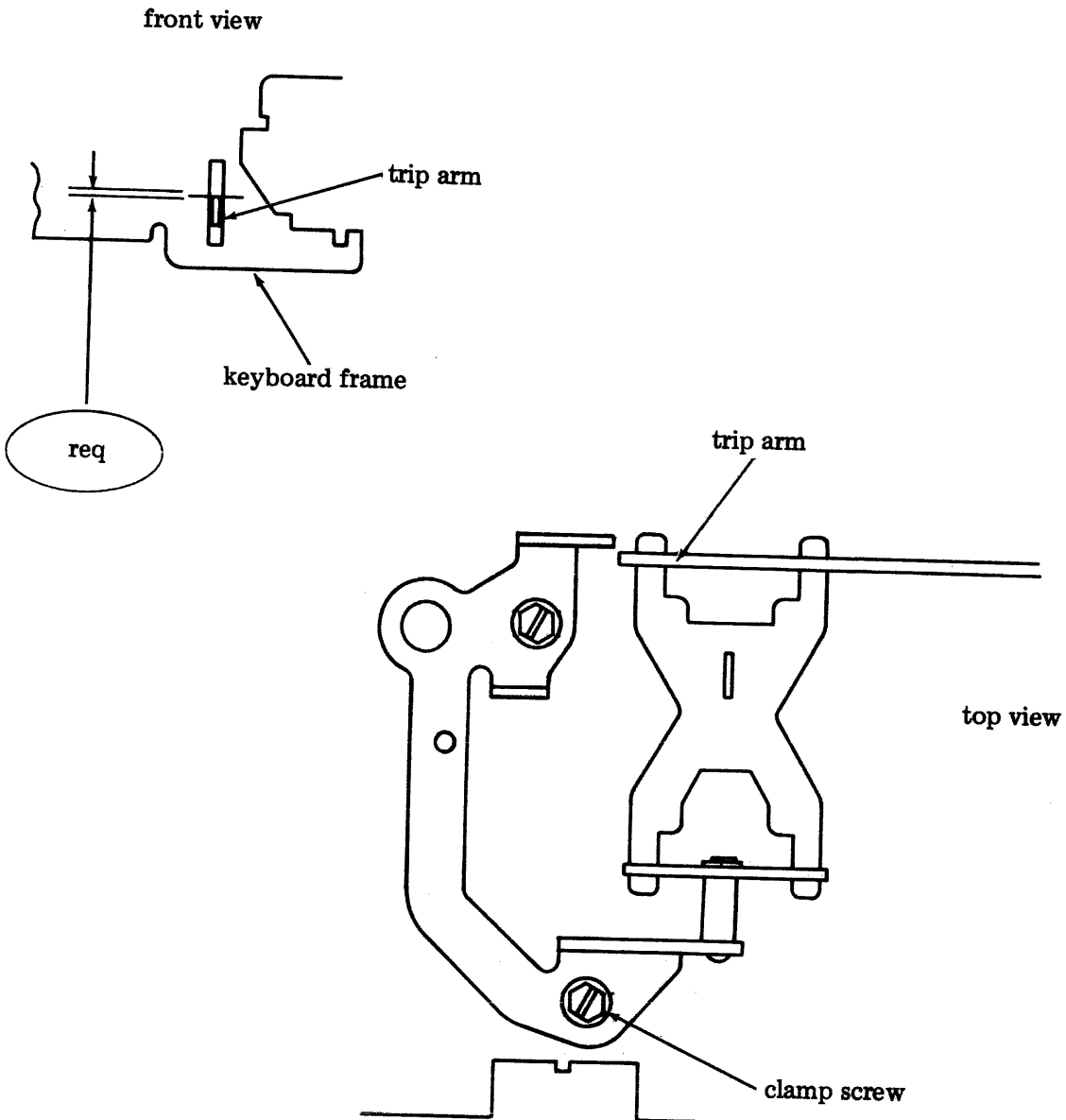
TRIP ARM (KBA-8)

NOTE: The typing unit and keyboard must be assembled on the base to make this adjustment.

- Engage distributor clutch.
- Rotate main shaft until trip arm reaches lowest point of travel.

Requirement — At lowest point of travel, top surface of trip arm is within grooved line on front of keyboard frame.

Adjust — Loosen clamp screw friction tight. Using pry points, position trip arm to meet requirement. Tighten clamp screw.



LINE FEED STRIPPER PLATE CLEARANCE (PLA-9)

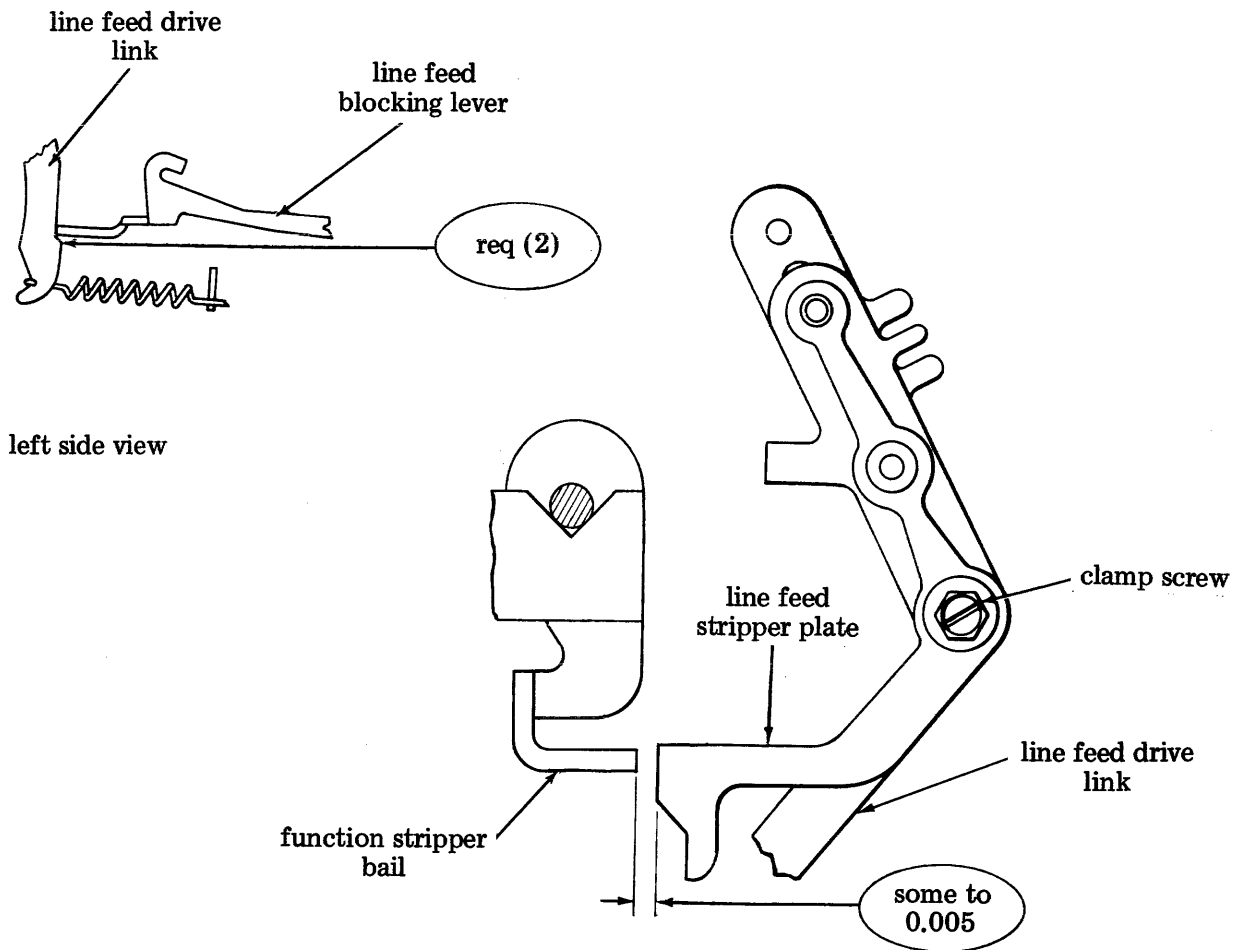
- Set up the line feed code combination (-2-4--8) on the selector.
- Rotate main shaft until function clutch is in position "C."
- Hold line feed drive link firmly against line feed blocking lever.

Adjust — Loosen clamp screw.
Position line feed stripper plate.
Tighten clamp screw.

"Requirement" affected by:
STRIPPER BAIL CLEARANCE (FNA-11)
PLATEN — HORIZONTAL POSITION (PLA-1)

Requirement 1 — Some to 0.005 between line feed stripper plate and function stripper bail.

Requirement 2 — Line feed blocking lever fully engaged with feed drive link.



LINE FEED DRIVE ARM CLEARANCE — F (PLA-5)

- Place carriage to center of platen.
- Set up the line feed code combination (-2-4---8) on the selector.
- Rotate main shaft until function clutch is in position "A."
- Hold print suppression codebars to the right and take up upward play of the line feed function lever.
- Release print suppression codebar and take up downward play of blocking lever.
- Release all levers.

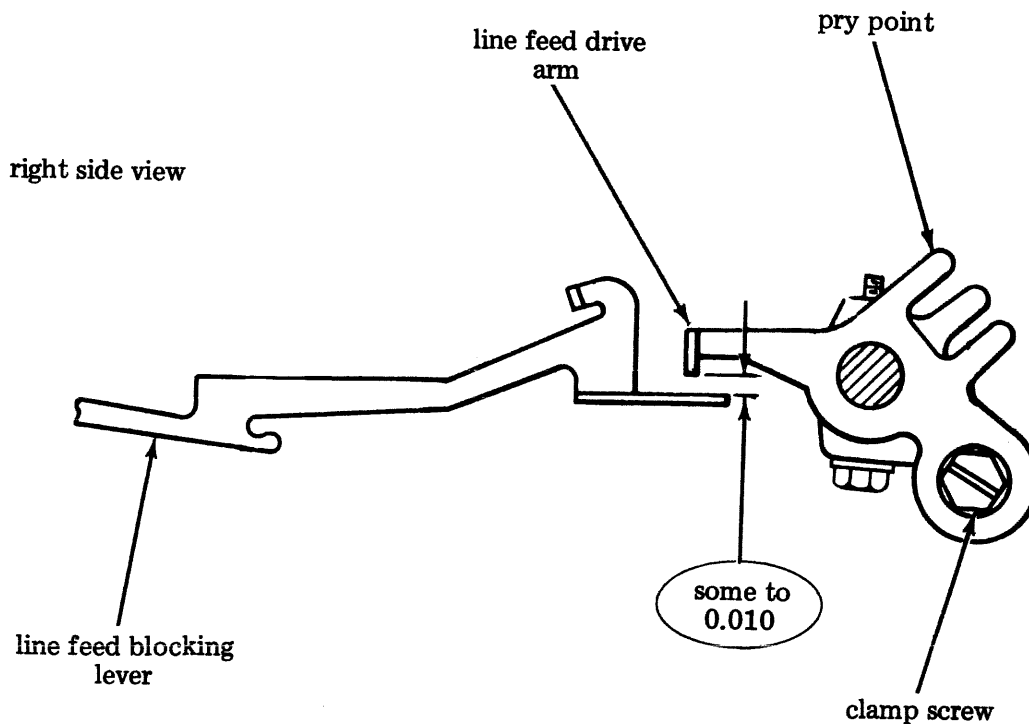
Requirement — Some to 0.010 between line feed drive arm and line feed blocking lever.

NOTE: Requirement (some) is considered met if no clearance exists between drive arm and blocking lever.

Adjust — Loosen clamp screw.
Use pry point to position line feed drive arm.
Tighten clamp screw.

"Adjust" affects:
LINE FEED UPSTOP BRACKET POSITION (PLA-6)
LINE FEED PAWL DOWNSTOP POSITION (PLA-8)

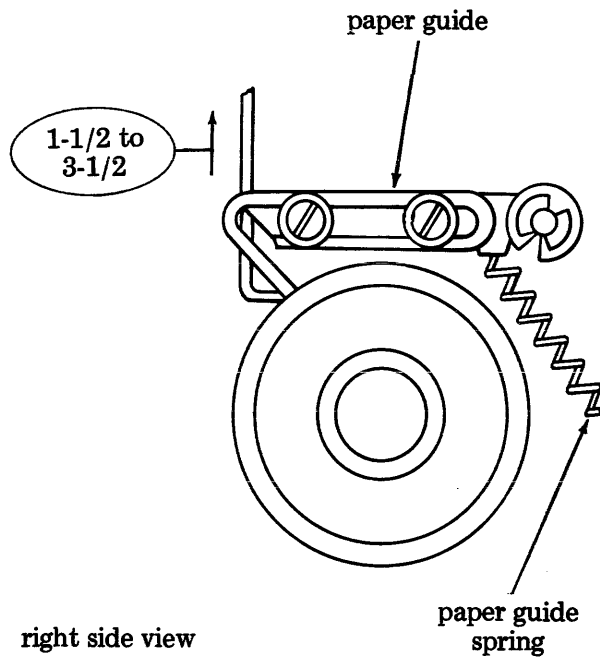
"Requirement" affected by:
LEFT ROCKER DRIVE (FNA-9)



PAPER GUIDE SPRINGS – F

- Scale at either left or right end of paper guide.

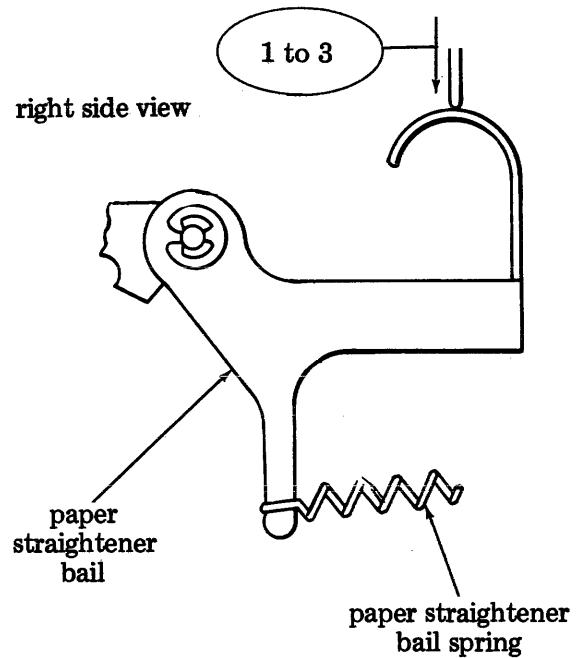
Requirement – 1-1/2 to 3-1/2 to start paper guide moving.



PAPER STRAIGHTENER BAIL SPRING – F

- Place scale at center of paper straightener bail.

Requirement – 1 to 3 to start bail moving.

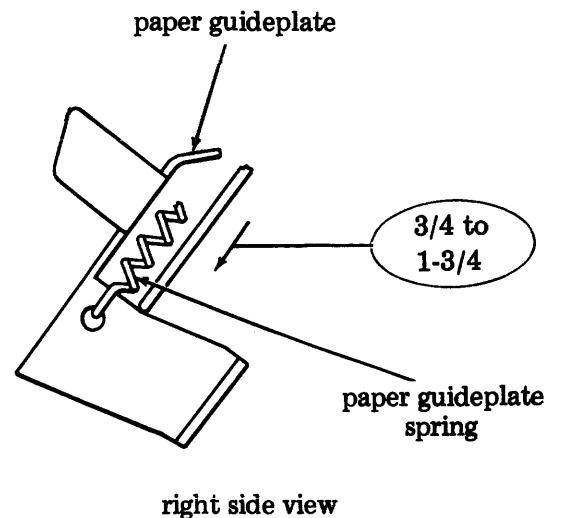


PAPER GUIDEPLATE SPRINGS – F

- Release pressure lever.

Requirement – 3/4 to 1-3/4 to start paper guideplate moving.

NOTE: Check both springs.



LINE FEED DRIVE LINK SPRING — VERTICAL — F

- Place typing unit in stop position.

Requirement — 6 to 9 to start line feed drive link.

LINE FEED BLOCKING LEVER SPRING — F

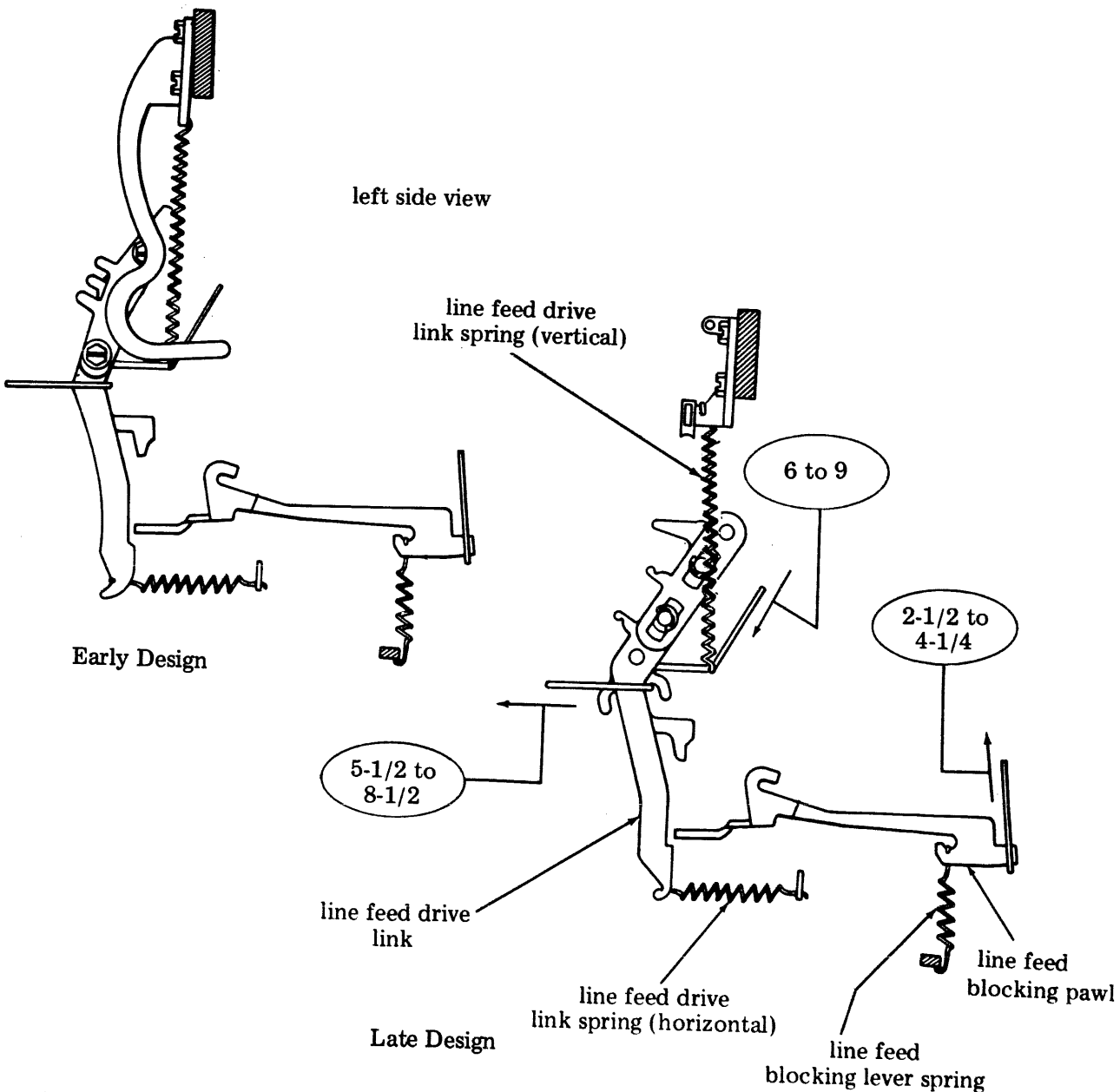
- Set up any code combination except a line feed in the selector.
- Rotate main shaft until the function bail is at its highest point.
- Hold line feed drive link away from line feed blocking lever.

Requirement — 2-1/2 to 4-1/4 to start line feed blocking lever moving.

LINE FEED DRIVE LINK SPRING — HORIZONTAL — F

- Place typing unit in stop position.

Requirement — 5-1/2 to 8-1/2 to start line feed drive link moving.



PLATEN — HORIZONTAL POSITION — F (PLA-1)

- Place the flat surface on the left side of the platen up so it is horizontal with base casting.
- Check requirement at both left and right margins.

Requirement 1 — 0.050 to 0.065 between ribbon guide and platen at both left and right margins.

- Place carriage in center of platen.
- Rotate platen to obtain maximum clearance between platen and ribbon guide.
- Set up E code (1-3--78) on selector.
- Rotate main shaft to place carriage drive bail in rearmost position.
- Push type wheel rearward until it just touches platen.

NOTE: The typing unit should not have ribbon and paper installed.

Requirement 2 — Type wheel should not touch inside of either ribbon guide.

Adjust — Loosen four horizontal positioning screws.

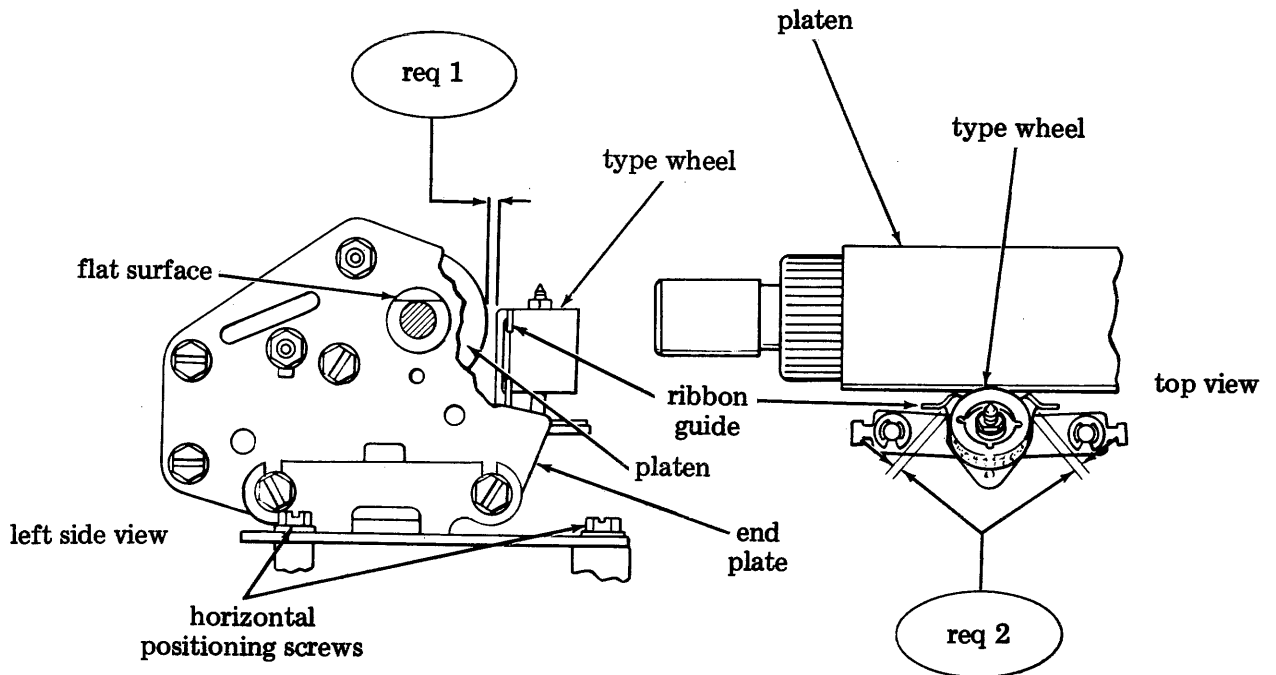
Position platen horizontally.
Tighten screws.

“Adjust” affects:

LINE FEED STRIPPER PLATE CLEARANCE (PLA-9)

“Requirement” affected by:

FRONT ROLLERS CLEARANCE (CRA-1)



VERTICAL TYPE ALIGNMENT — F (PLA-2)

- Place paper in typing unit.
- Set up "E" code (1-3--78) on the selector.
- Rotate main shaft until the character is printed.
- Repeat several times along the length of the platen.

Requirement — Shading of each character should be the same with no overscoring or underscoring.

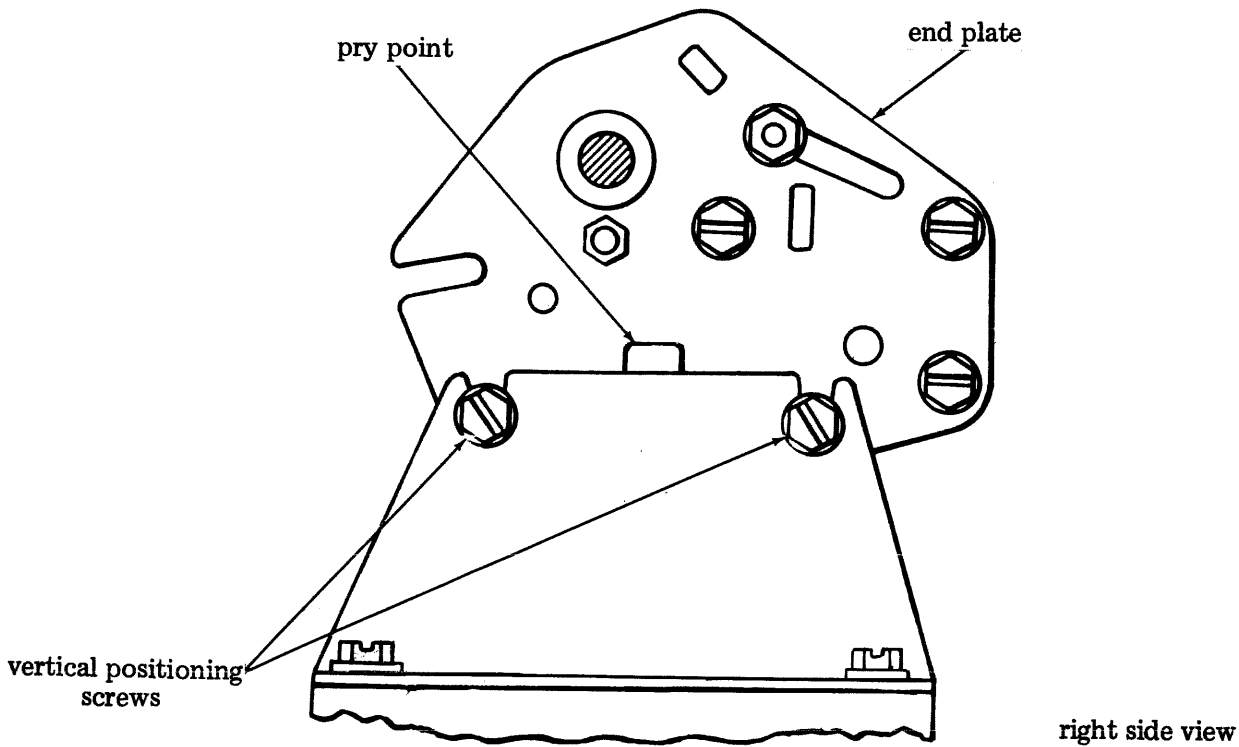
Adjust — Loosen four vertical positioning screws.
Position platen using pry points.
Do not twist platen.
Tighten positioning screws.

"Adjust" affects:

LINE FEED DRIVE ARM CLEARANCE — F (PLA-5)
LINE FEED PAWL DOWNSTOP POSITION — F (PLA-8)
LINE FEED UPSTOP BRACKET POSITION — F (PLA-6)
PRESSURE ROLLER CLEARANCE (PLA-10)
LINE FEED DRIVE LINK POSITION — F (PLA-7)

"Requirement" affected by:

REAR RAIL POSITION (CRA-5)
PRINT DRIVE LEVER POSITIONING (CRA-6)



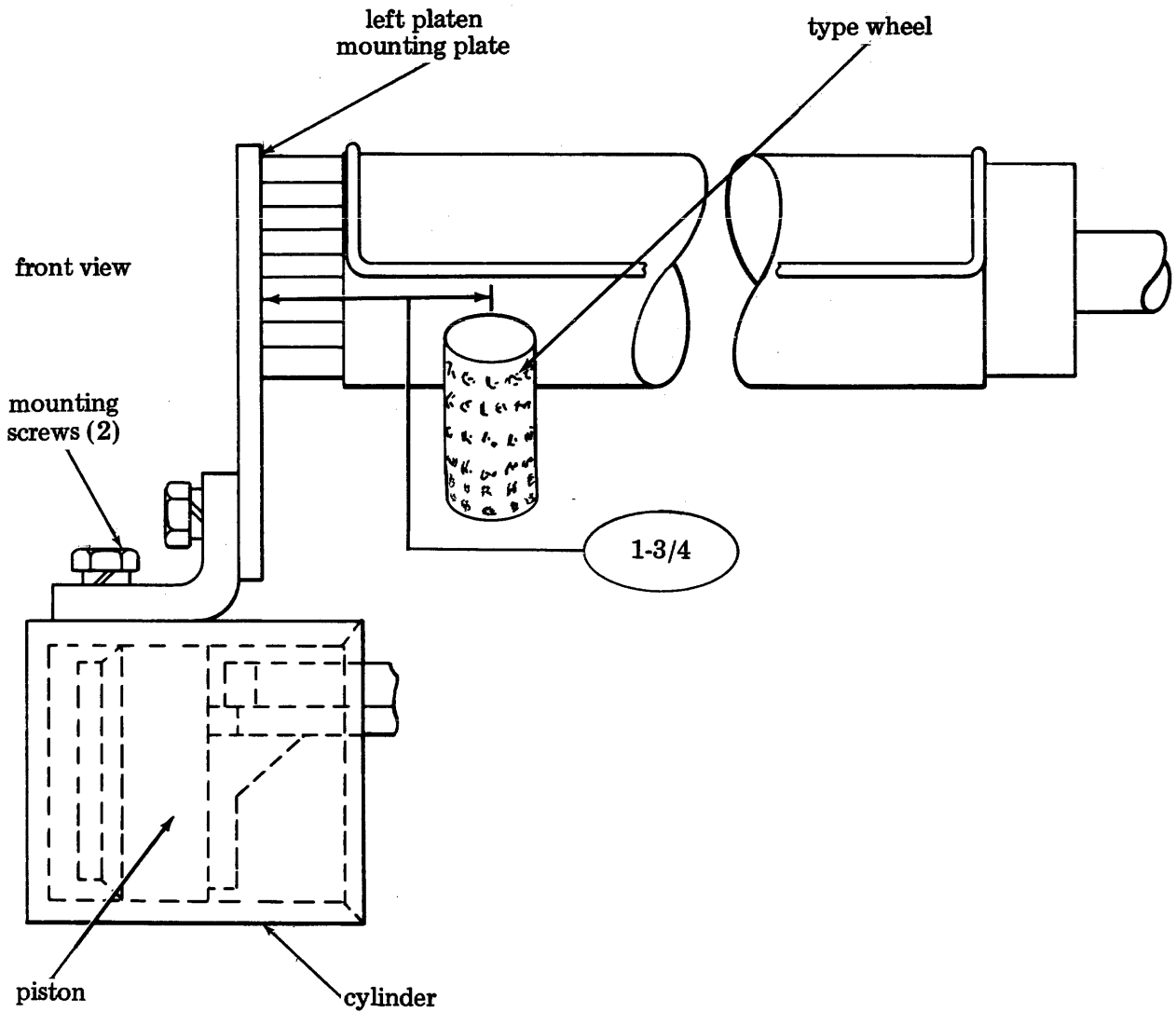
LEFT MARGIN POSITION — F (PLA-3)

Requirement — 1-3/4 between first printed character and left platen mounting plate.

Adjust — Align center of type wheel with imaginary point on platen 1-3/4 inches from left mounting plate.
Loosen two dashpot cylinder mounting screws.
Holding carriage in place, push dashpot cylinder firmly onto piston.

Make sure dashpot is square to piston.
Tighten screws.

“Adjust” affects:
**CARRIAGE RETURN LEVER —
UNLATCH CLEARANCE
LEFT MARGIN PRINTING (FOA-15)**

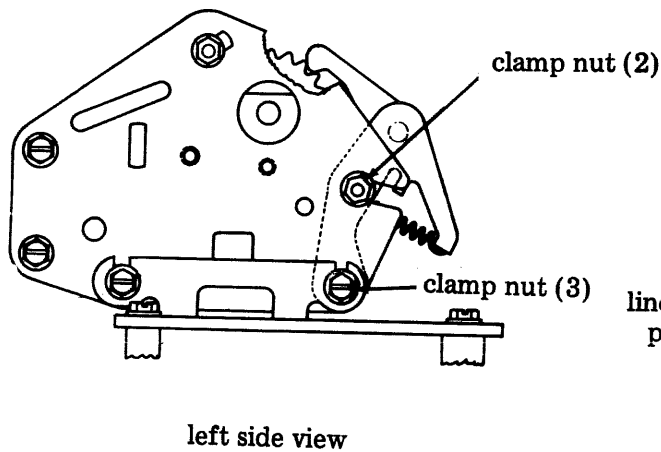


DETENT POSITION — F (PLA-4)

- Place typing unit in single line feed condition.

Requirement — When operated by finger pressure, line feed pawl should fully seat in platen ratchet without interference from teeth.

Adjust — Loosen clamp nuts (2) and (3).
Position platen detent pawl.
Tighten clamp nuts.



“Adjust” affects:

LINE FEED DRIVE LINK POSITION — F (PLA-7)

“Requirement” affected by:

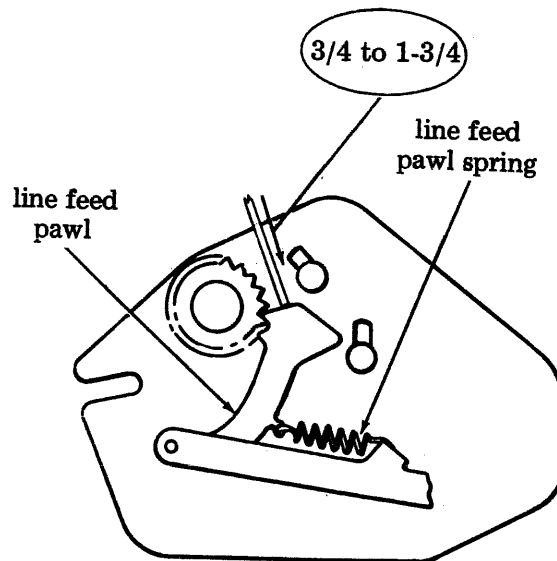
VERTICAL TYPE ALIGNMENT — F (PLA-2)

LINE FEED SELECTION — F (PLA-3)

LINE FEED PAWL SPRING — F

- Place typing unit in stop condition.

Requirement — $\frac{3}{4}$ to $1\text{-}\frac{3}{4}$ to start line feed pawl moving.



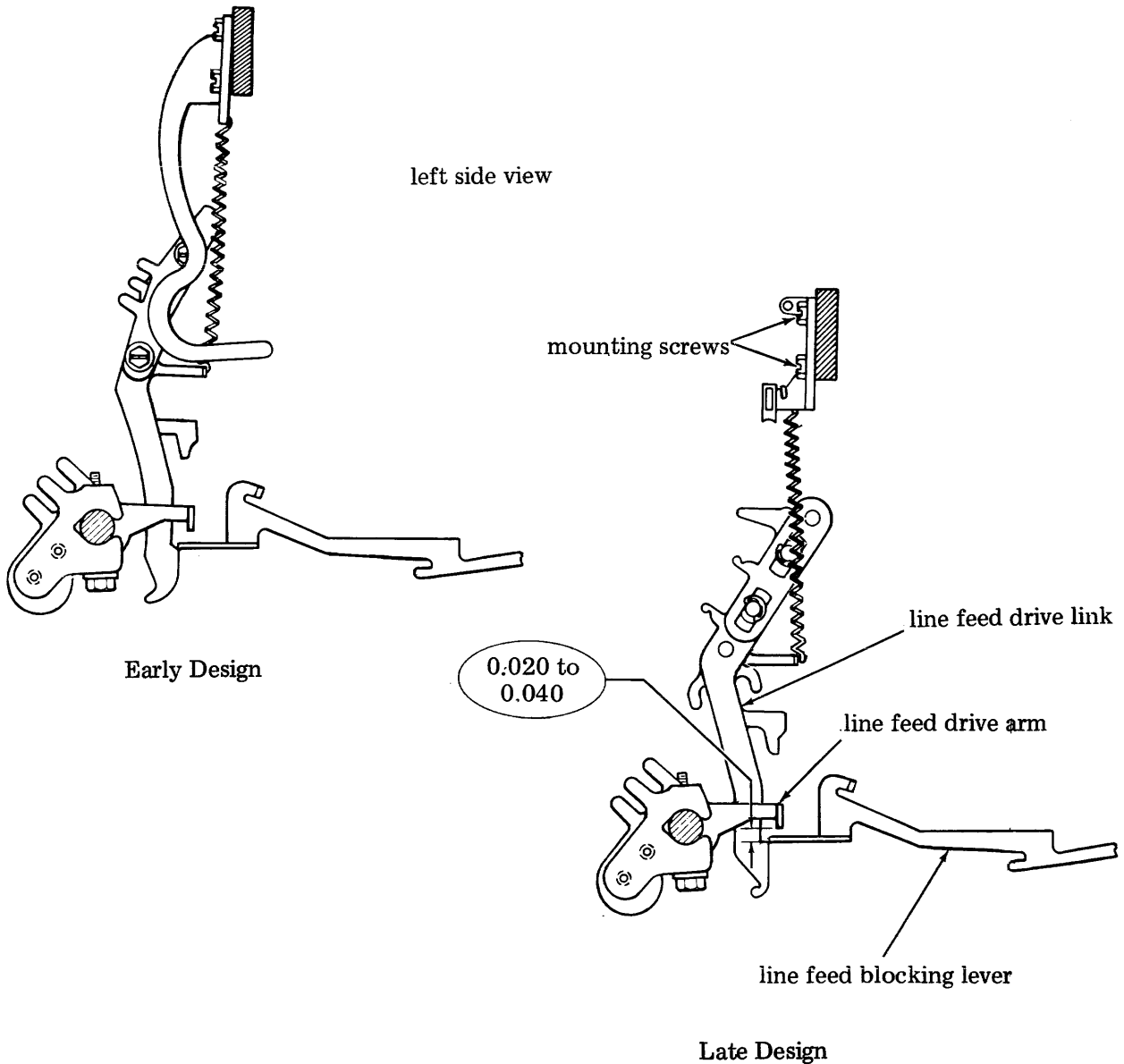
LINE FEED UPSTOP BRACKET POSITION -- (PLA-6)

- Place typing unit in stop position.
 - Trip function clutch.
 - Rotate main shaft until function clutch is in position "A."
- Push down on line feed drive link to engage and latch line feed blocking lever.

Requirement — 0.020 to 0.040 between line feed drive arm and line feed blocking lever.

Adjust — Loosen mounting screws.
Position line feed upstop bracket.
Tighten mounting screws.

"Requirement" affected by:
VERTICAL TYPE ALIGNMENT (PLA-2)
LINE FEED DRIVE ARM CLEARANCE (PLA-5)



LINE FEED SELECTION — F (PLA-3)

Requirement 1 — Upstop stud should be at bottom of slot for single line feed or at top of slot for double line feed.

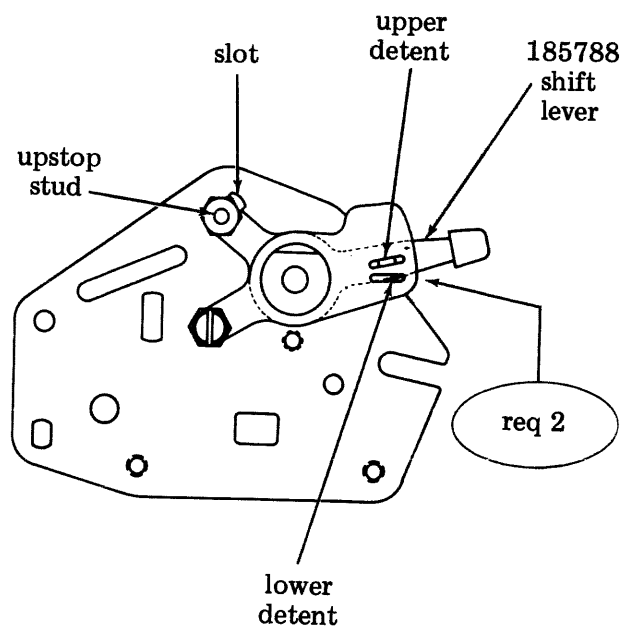
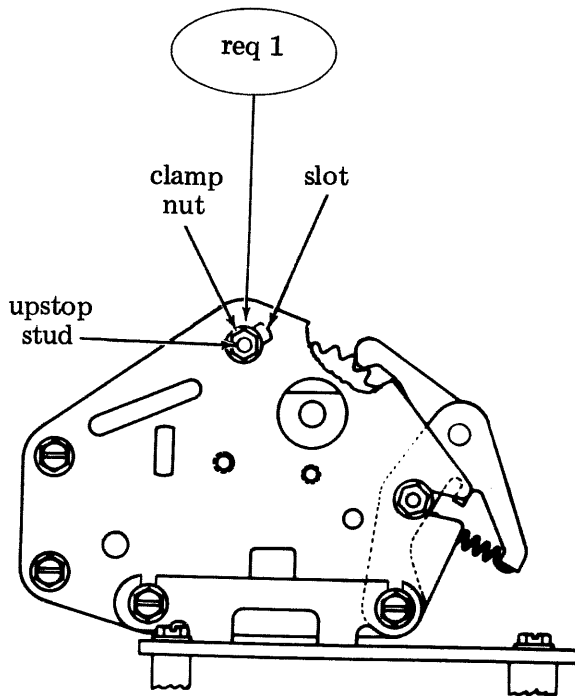
Adjust — Loosen clamp nut.
Position upstop stud.
Tighten clamp nut.

NOTE: The following requirement 2 applies only to units equipped with operator controlled line feed feature using 185788 shift lever.

Requirement 2 — Same as requirement 1.

Adjust — Place 185788 shift lever in upper detent for single line feed.
Place 185788 shift lever in lower detent for double line feed.

“Adjust” affects:
DETENT POSITION (PLA-4)



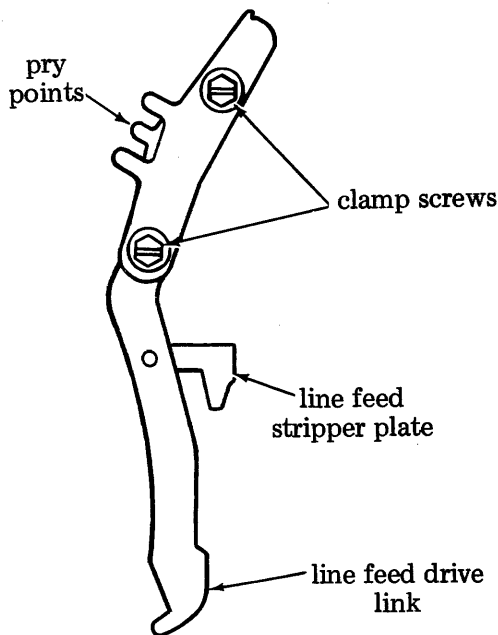
left side views

**LINE FEED DRIVE LINK POSITION
(PLA-7)**

- Place carriage in center of platen.
- Place the flat surface on the left side of the platen upward and horizontal to base casting.
- Set up line feed code (-2-4--8) on selector.
- Rotate main shaft until function bail is at lowest point.
- Notice motion supplied by drive arm of function rocker shaft to line feed pawl.

Requirement -- Motion supplied by drive arm of function rocker shaft to line feed pawl should be adequate to rotate platen the required amount.

Adjust -- Loosen line feed stripper plate clamp screw (**LINE FEED STRIPPER PLATE CLEARANCE**)
Loosen two clamp screws.
Use pry points to position line feed drive link so that line feed pawl indexes platen one tooth and platen detent pawl seats fully in ratchet.
Tighten clamp screws.



left side view

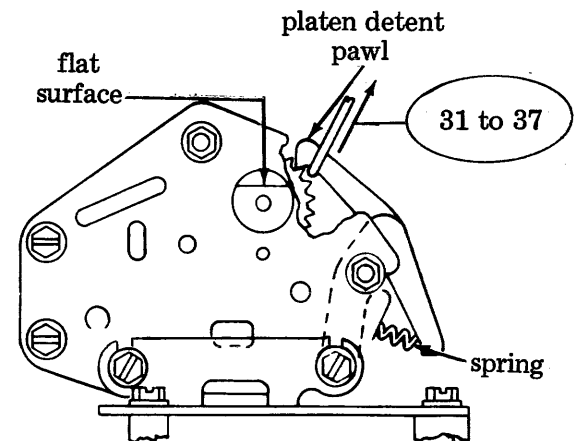
NOTE: Hold platen detent pawl away from ratchet and rotate main shaft until function bail is in its lowest position. Lower platen detent pawl into its seat between two ratchet teeth. The platen should barely move.

“Adjust” affects:
LINE FEED PAWL DOWNSTOP POSITION (PLA-8)

“Requirement” affected by:
DETENT POSITION (PLA-4)
LINE FEED DRIVE ARM CLEARANCE (PLA-5)

PLATEN DETENT PAWL SPRING

Requirement -- 31 to 37 to start platen detent pawl moving.



left side view

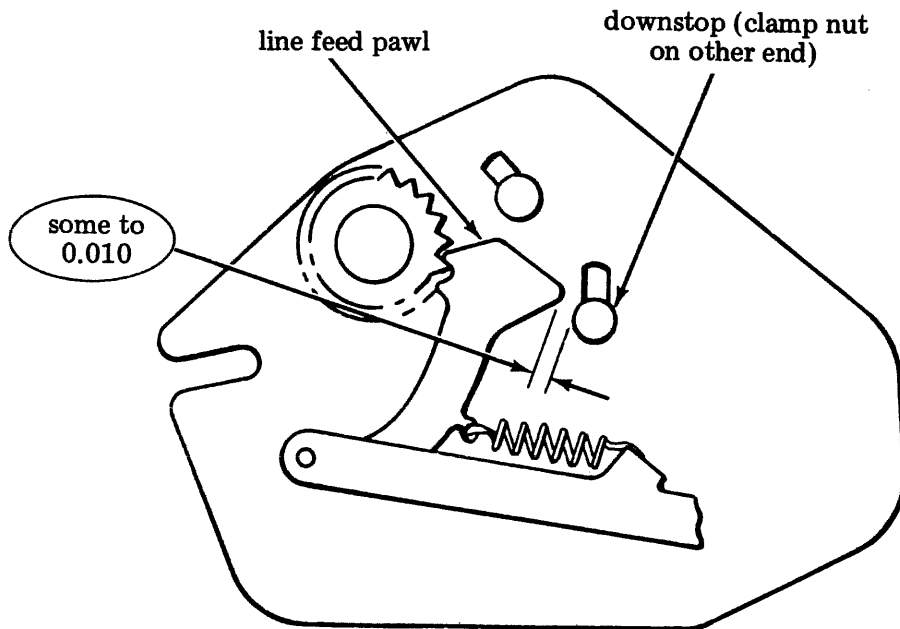
LINE FEED PAWL DOWNSTOP POSITION (PLA-8)

- Place the flat surface on the left side of the platen upward and horizontal to the base casting.
- Set up line feed code (-2-4--8) in the selector.
- Rotate main shaft until function bail reaches its lowest position.
- Take up play of platen in left end plate toward the rear.

Requirement — Some to 0.010 between back of line feed pawl and its downstop with platen detent fully seated in ratchet.

Adjust — Loosen downstop clamp nut.
Position downstop.
Tighten clamp nut.

“Requirement” affected by:
LINE FEED DRIVE ARM CLEARANCE (PLA-5)
LINE FEED DRIVE LINK POSITION (PLA-7)
VERTICAL TYPE ALIGNMENT (PLA-2)



right side view

PRESSURE ROLLER CLEARANCE (PLA-10)

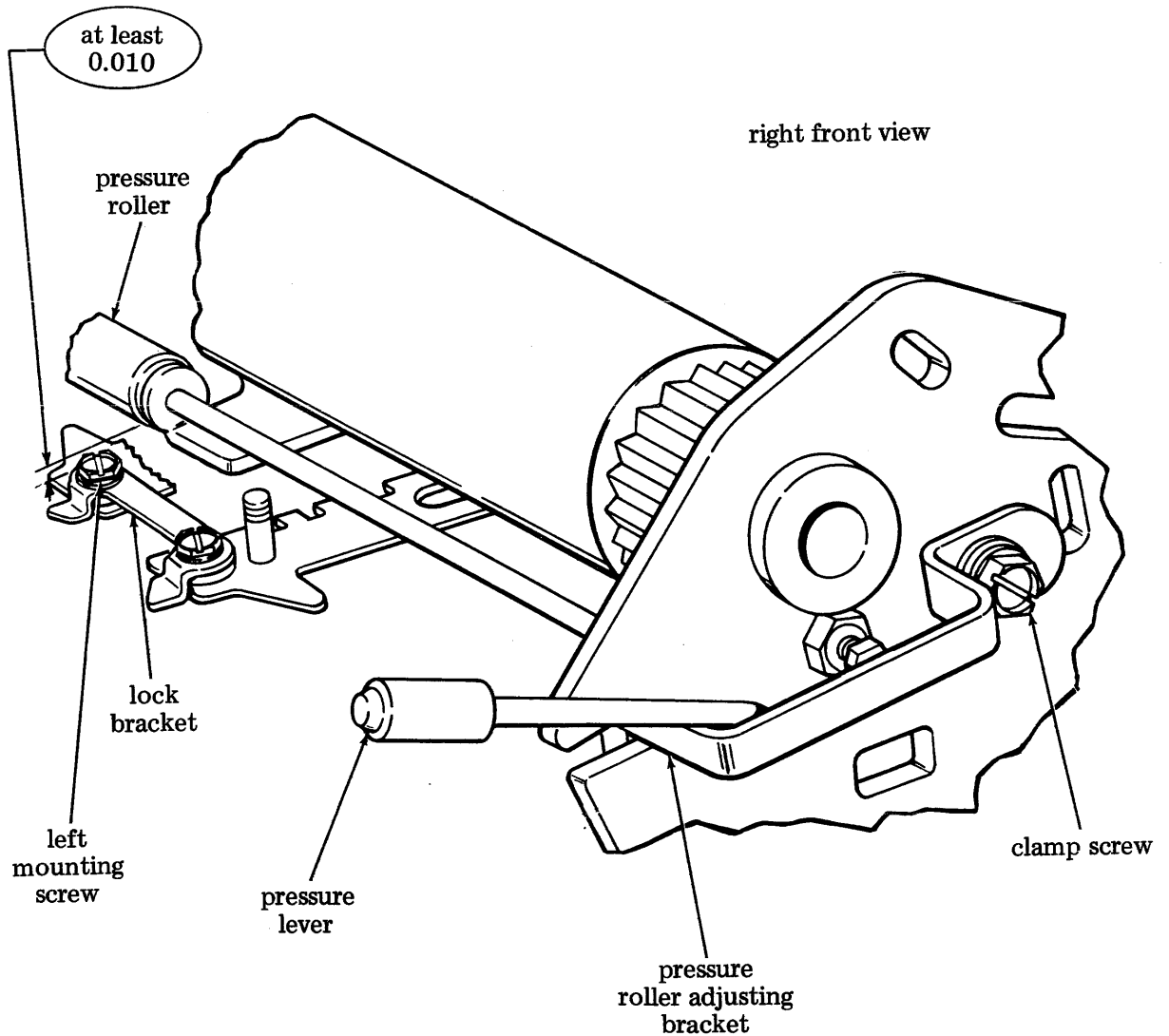
- Position carriage with the left lock bracket mounting screw directly under the pressure roller.
- Release pressure roller.

Requirement — At least 0.010 between pressure roller and left mounting screw.

NOTE: Clearance should not be so large that the roller is not detented in released position.

Adjust — Loosen clamp screw.
Position pressure roller adjusting bracket.
Tighten clamp screw.

“Requirement” affected by:
REAR RAIL POSITION (CRA-5)
VERTICAL TYPE ALIGNMENT — F (PLA-2)



COPYHOLDER WIRE POSITION — F (PLA-11)

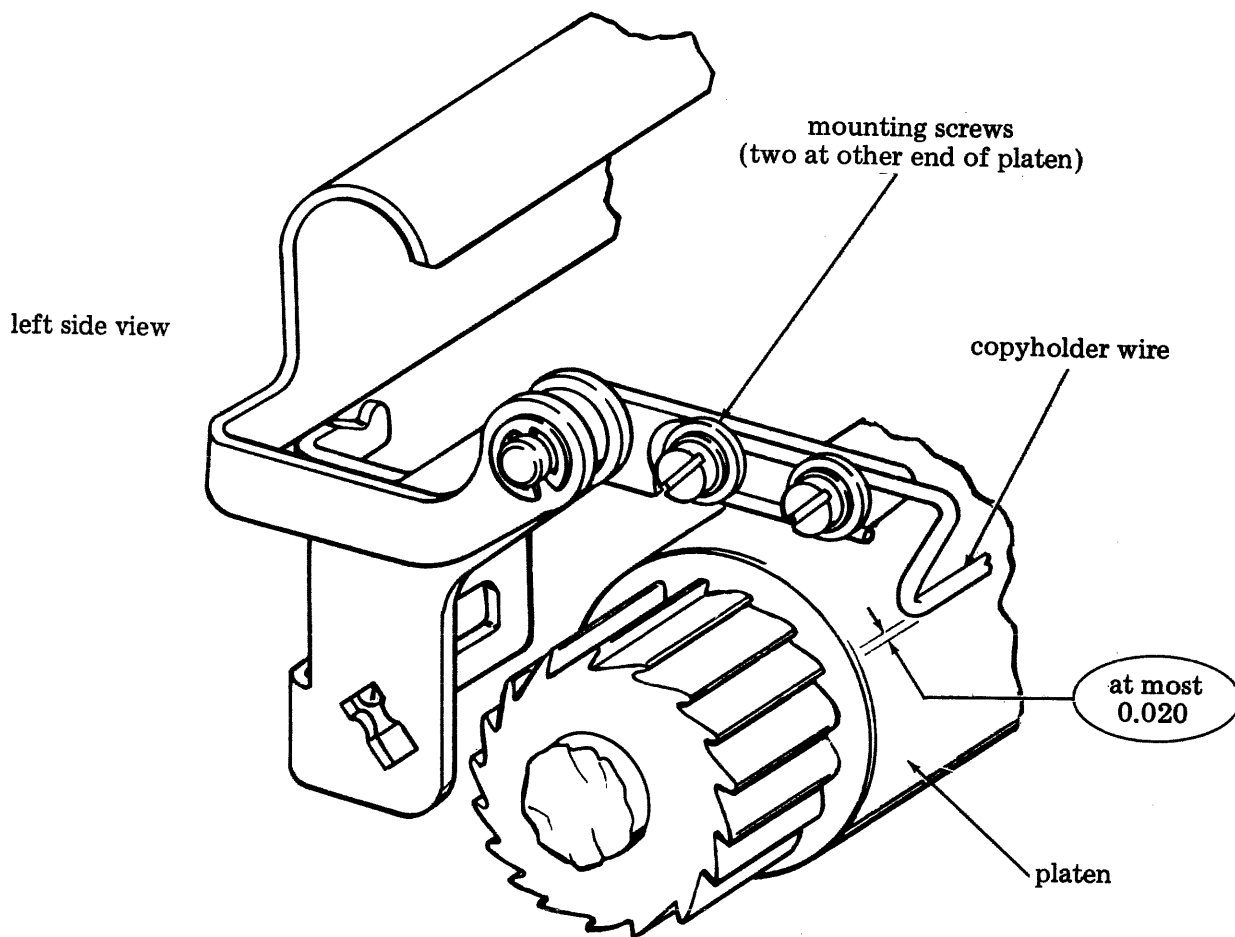
Requirement 1 — The copyholder wire should fall somewhere between two lines of printed copy, not obscuring more than 1/2 the height of either line.

Adjust — Loosen four mounting screws.
Position copyholder wire.
Tighten screws.

- Raise and release the copyholder wire.

Requirement 2 — At most 0.020 between platen and copyholder wire at left and right ends with copyholder wire resting against center of platen.

Adjust — Bend copyholder wire.

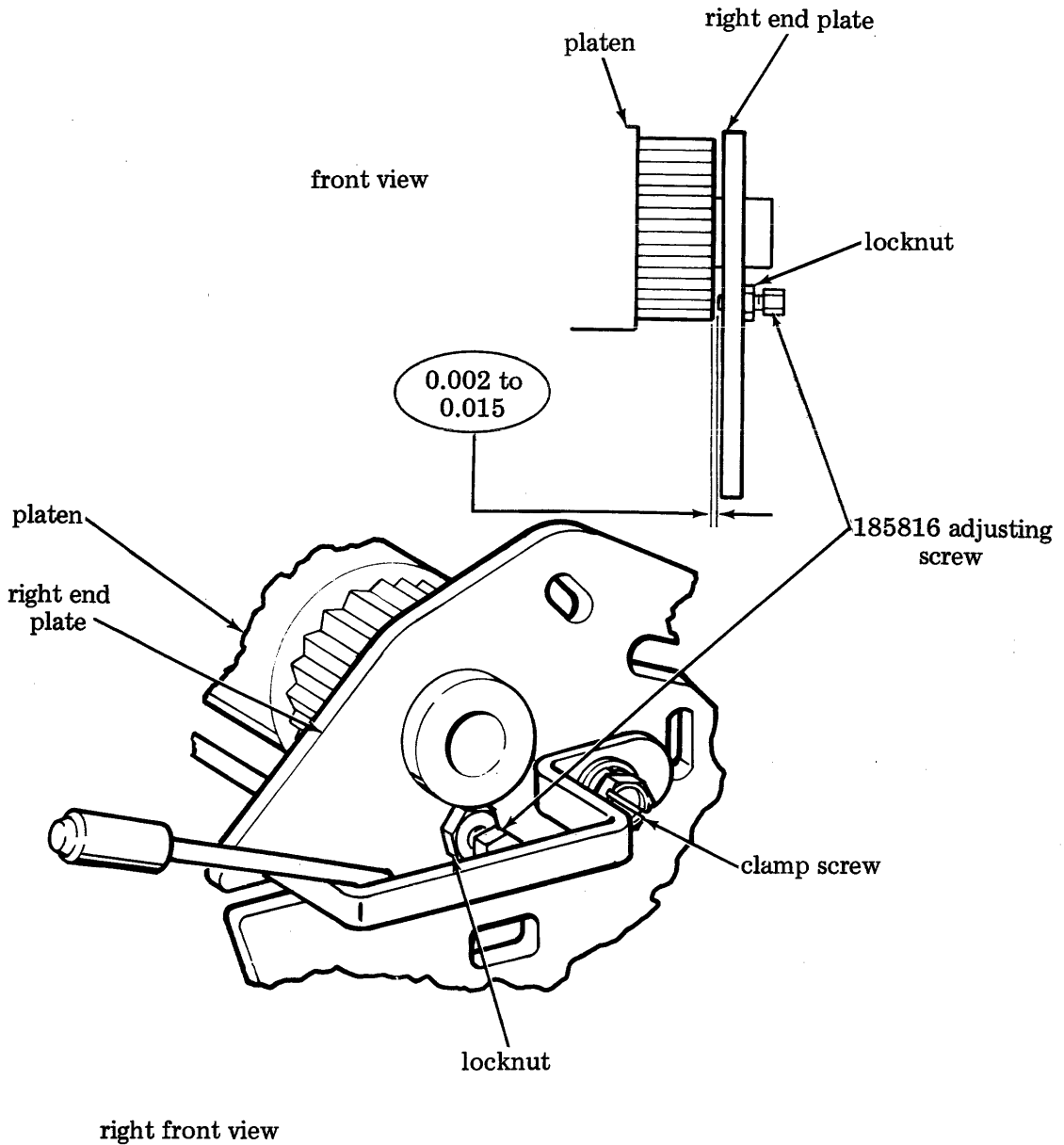


PLATEN ENDPLAY – F (PLA-12)

- Position platen against the left end plate.

Requirement – 0.002 to 0.015 between the 185816 adjusting screw and the right end of the platen.

Adjust – Loosen locknut.
Position platen against the left end plate.
Position 185816 adjusting screw.
Tighten locknut.



38 TAPE READER

ADJUSTMENTS

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1. GENERAL

1.01 This section provides adjustment information for model 38 tape reader which incorporates a single step feature. When adjustments are made, related adjustments should be checked.

1.02 Before proceeding with any adjustment, read the serviceable portion of the adjusting text carefully. After adjustment is completed, make sure to tighten any screws or nuts that may have been loosened during adjustment procedure.

1.03 Spring tension values are scale readings which should be obtained when proper scales are used. Springs not meeting specified requirements should be replaced (except when an adjustment is indicated).

1.04 Tools required to perform adjustments are contained in 185830 tool kit and are listed in Maintenance Tool Section 570-005-800TC. Special tools, 180993 bending tool, 110445 spring bender, and 183103 tool are required specifically for the model 38 set.

1.05 To provide a universal method of adjustment identification, alpha-numeric adjustment codes (example RRA-1 - Reader Area, sequence number 1) are used to supplement adjustment titles. All adjustment clearances are in inches, and all spring tensions are in ounces unless otherwise specified.

NOTE: Requirements that specify the armature in the attracted position can be accomplished with motor power turned off and the trip magnet armature manually engaged.

CAUTION 1: DISCONNECT POWER CABLE BEFORE PROCEEDING WITH ADJUSTMENTS.

CAUTION 2: HIGH VOLTAGE FOR FEED MAGNET AND TRIP MAGNET WILL CONTINUE FROM POWER PACK FOR APPROXIMATELY 10 SECONDS AFTER POWER CABLE IS DISCONNECTED.

2. BASIC UNIT

MAGNET CORE

Requirement — Magnet core slot to be perpendicular to magnet bracket pivot surface (gauge by eye).

Adjust — Loosen trip coil mounting screw.
Position clutch trip coil.
Tighten screw.

TRIP MAGNET

Requirement — Magnet bracket to be positioned on base casting post as far forward and to the left as possible.

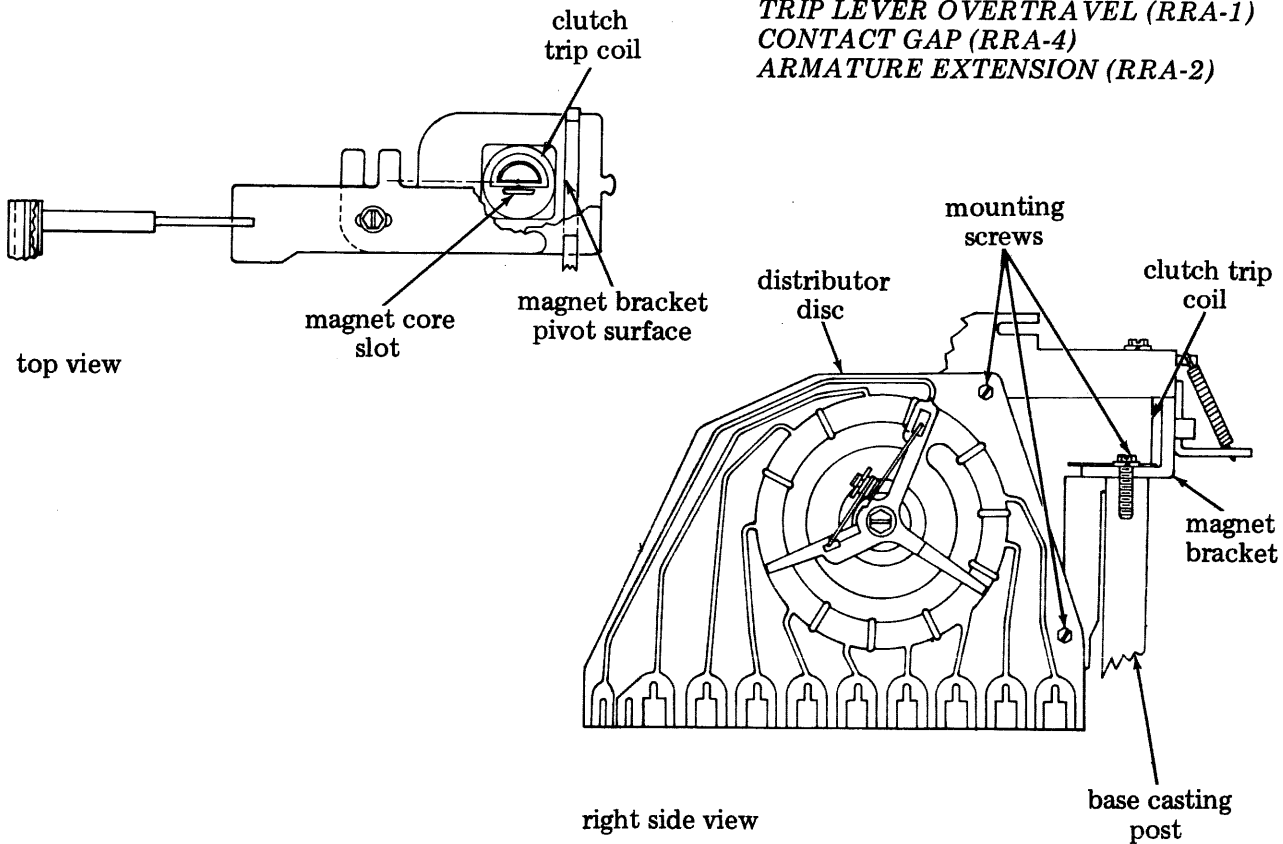
Adjust — Position magnet bracket with three mounting screws loosened.
Tighten screws.

“Adjust” affects:

TRIP LEVER OVERTRAVEL (RRA-1)

CONTACT GAP (RRA-4)

ARMATURE EXTENSION (RRA-2)

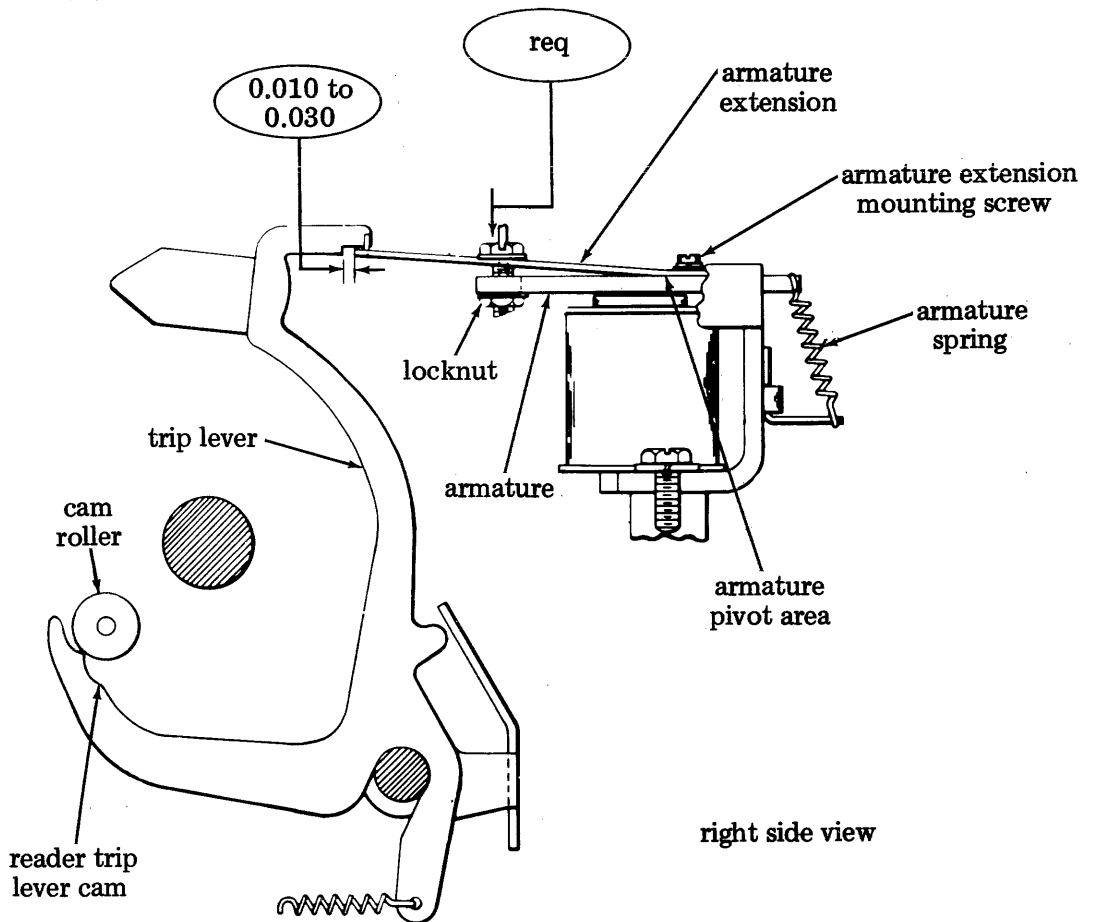
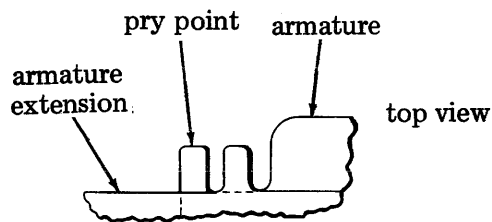


TRIP LEVER OVERTRAVEL (RRA-1)

- Armature in unattracted position.
- Cam roller on high part of trip lever cam.
- Take up and release play in armature extension pivot to rear of reader.

Requirement — 0.010 to 0.030 between end of armature extension and latching surface of trip lever.

Adjust — Loosen armature extension mounting screw (friction tight).
Use pry points to position armature extension and meet requirement.
Tighten mounting screw.



TRIP MAGNET ARMATURE SPRING

- Armature in unattracted position.
- Cam roller on high part of trip lever cam.

Requirement — 2 to 4 to start armature moving.

ARMATURE EXTENSION (RRA-2)

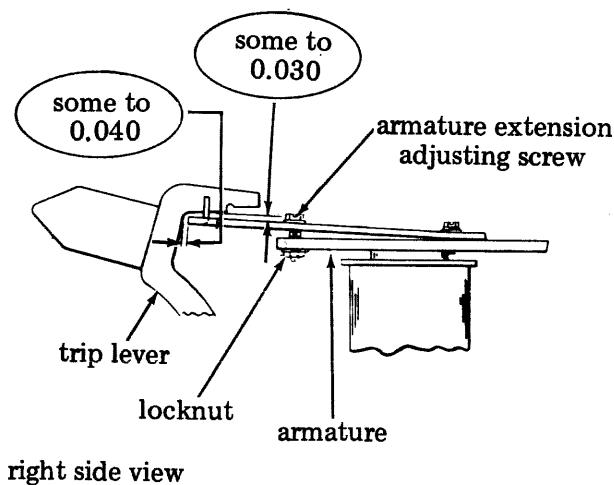
- Place distributor clutch in stop position.
- Hold armature in attracted position.
- Rotate distributor clutch for requirement.

Requirement 1 — Some to 0.040 between end of armature extension and trip lever.

Requirement 2 — Some to 0.030 vertical clearance between armature extension and trip lever at closest point.

Adjust — Loosen extension adjusting screw locknut.

Position armature extension with adjusting screw to meet requirement. Tighten locknut.



right side view

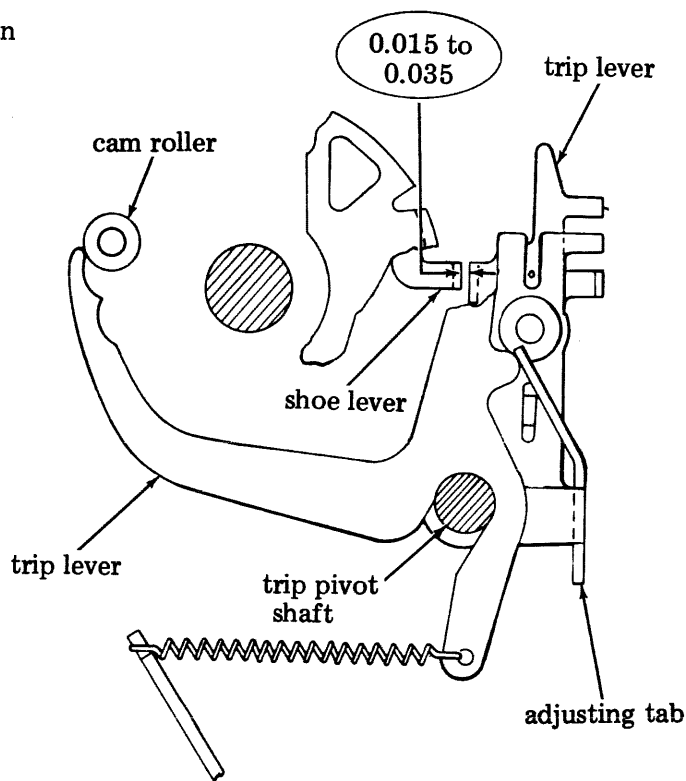
CLUTCH TRIP LEVER (RRA-3)

- Trip distributor clutch by momentarily holding armature in its attracted position.
- Rotate main shaft until upper edge of shoe lever is in line with upper edge of trip lever.

Requirement — 0.015 to 0.035 between clutch shoe release lever and clutch trip lever.

Adjust — Bend (with bending tool 180993) clutch trip bail adjusting tab keeping plane of tab parallel to axis of trip shaft (gauge by eye).

"Adjust" affects:
TRIP LEVER ENGAGEMENT (DBA-6)
(Section 574-422-700TC)



right side view

CONTACT GAP (RRA-4)

- Armature in unattracted position.
- Distributor clutch in stop position.
- Place trip lever in the center of armature extension.

Requirement 1 — Some clearance between contact springs and contact assembly cover.

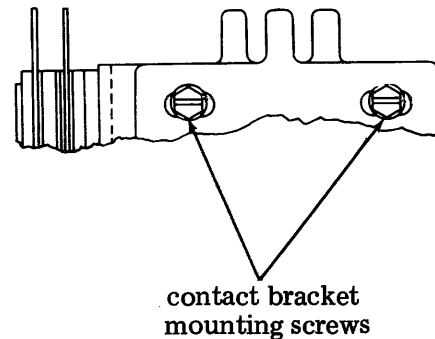
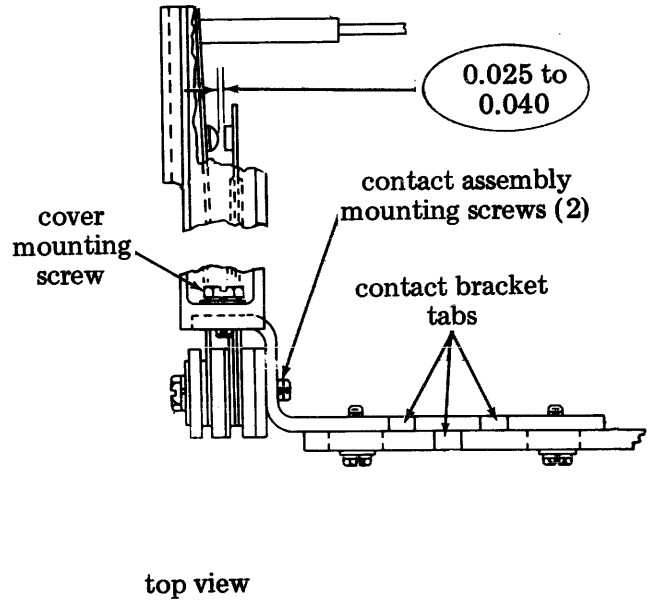
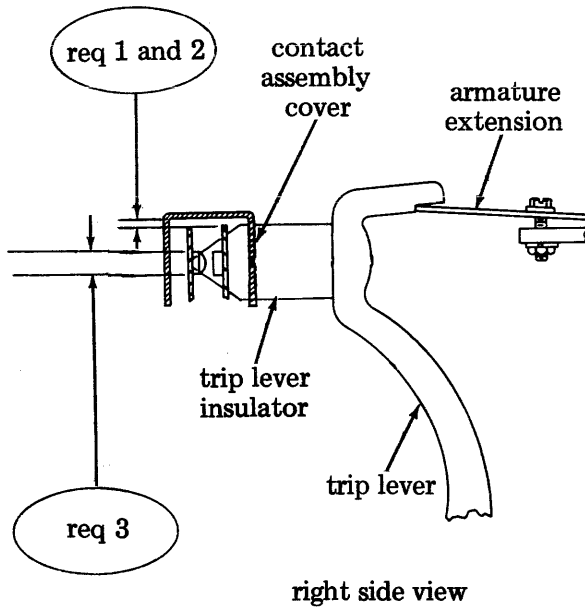
Requirement 2 — Some clearance between trip lever insulator and cover.

Requirement 3 — Contacts must be in line (gauge by eye).

Adjust — Loosen cover mounting screw and two contact assembly mounting screws. Position contact springs and cover to meet requirement. Tighten screws.

Requirement 4 — 0.025 to 0.040 gap between contacts.

Adjust — Loosen two contact bracket mounting screws friction tight. Insert blade of screwdriver between pry points. Position contact bracket to meet requirement. Tighten screws.

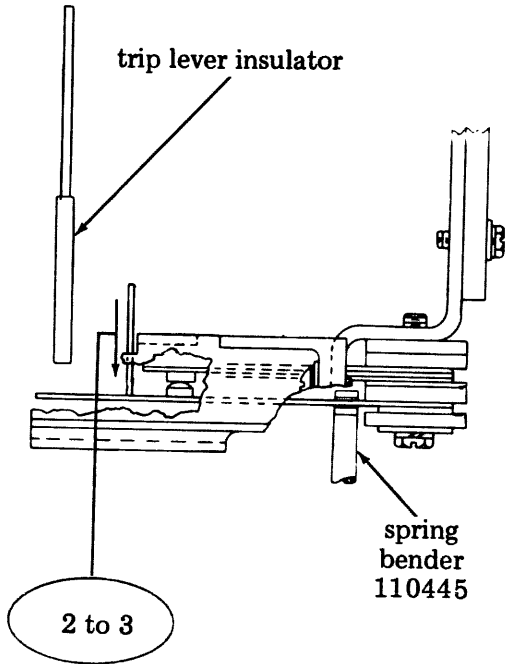


FEED MAGNET CONTACT SPRING

- Trip lever insulator not contacting swinger contact spring.

Requirement — 2 to 3 to open contacts.

Adjust — Bend swinger spring near insulators with spring bender 110445.

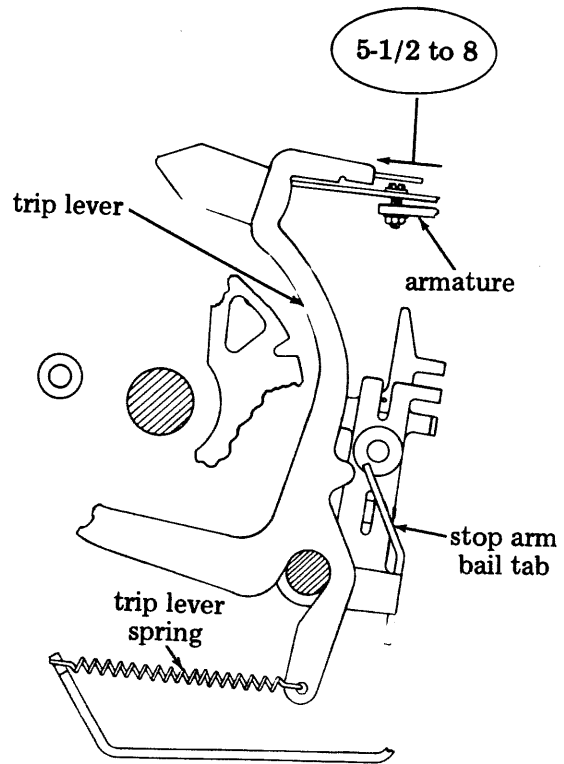


top view

TRIP LEVER SPRING

- Place distributor clutch in stop position.
- Armature in attracted position.
- Stop arm bail tab not contacting trip lever.

Requirement — 5-1/2 to 8 to start trip lever moving.



right side view

DETENT LEVER (RRA-5)

- Move control lever to its FREE position.
- Rotate feed wheel in direction of tape travel to where feed wheel pins are at their maximum advance position with respect to the sensing pins.

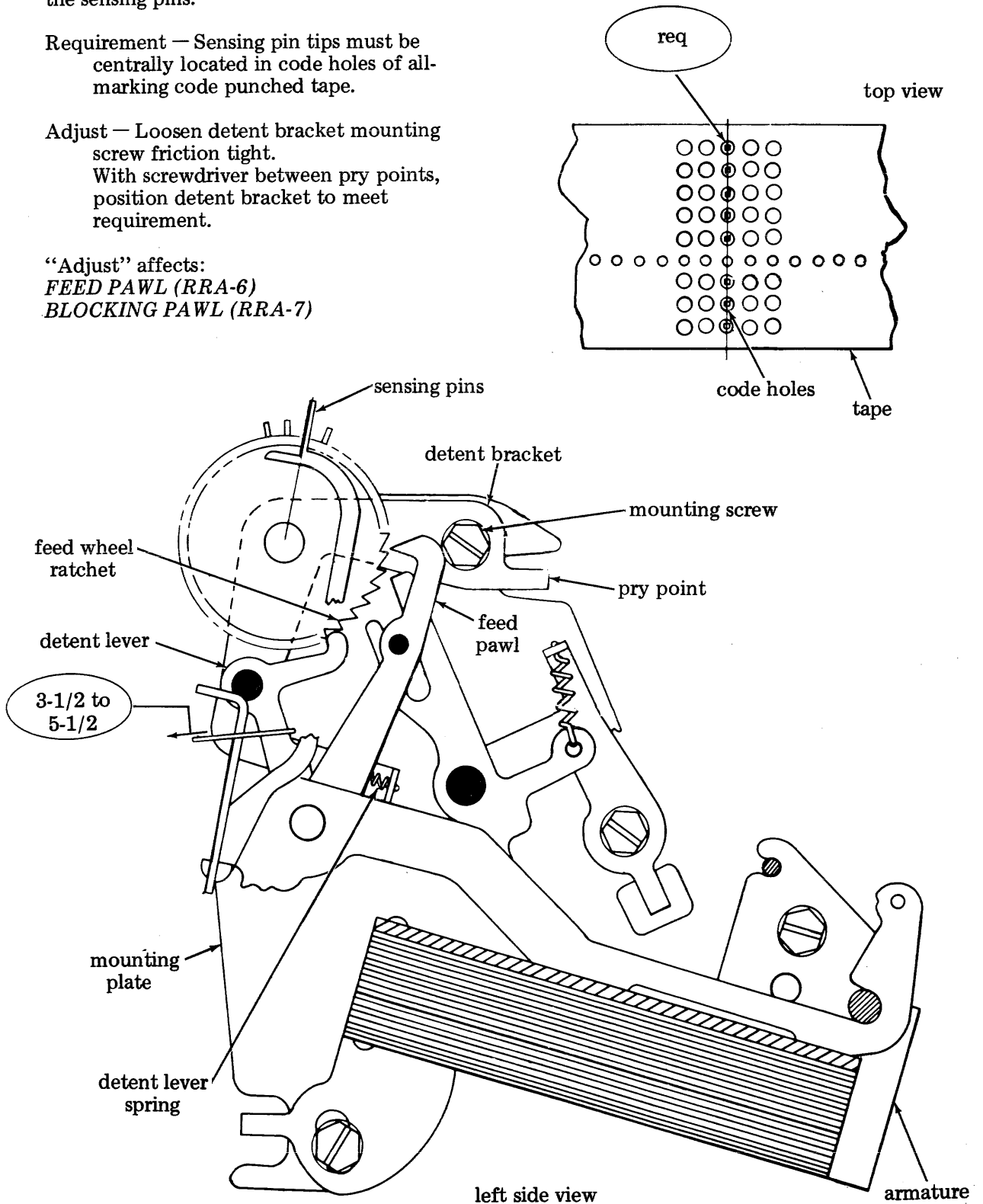
Requirement — Sensing pin tips must be centrally located in code holes of all-marking code punched tape.

Adjust — Loosen detent bracket mounting screw friction tight. With screwdriver between pry points, position detent bracket to meet requirement.

“Adjust” affects:
FEED PAWL (RRA-6)
BLOCKING PAWL (RRA-7)

DETENT SPRING

Requirement — 3-1/2 to 5-1/2 to start detent moving.



FEED PAWL (RRA-6)

- Place armature in unattracted position.
- Check for some clearance between the blocking pawl and ratchet tooth. If some clearance is not present provide some clearance with the BLOCKING PAWL (RRA-7) adjustment.
- Rotate ratchet to a position that provides the least clearance between feed pawl and ratchet tooth.

Requirement 1 — Some to 0.008 between feed pawl and ratchet tooth and a total of 5 ratchet teeth between detent and feed pawl.

Adjust — Place armature in unattracted position.
Loosen three bracket mounting screws. Insert screwdriver between pry points and position the magnet bracket to meet requirement.
Tighten mounting screws.

- Place armature in attracted position.

Requirement 2 — 0.020 to 0.045 between feed pawl and ratchet tooth and a total of 6 ratchet teeth between detent and feed pawl.

Adjust — Place armature in attracted position.

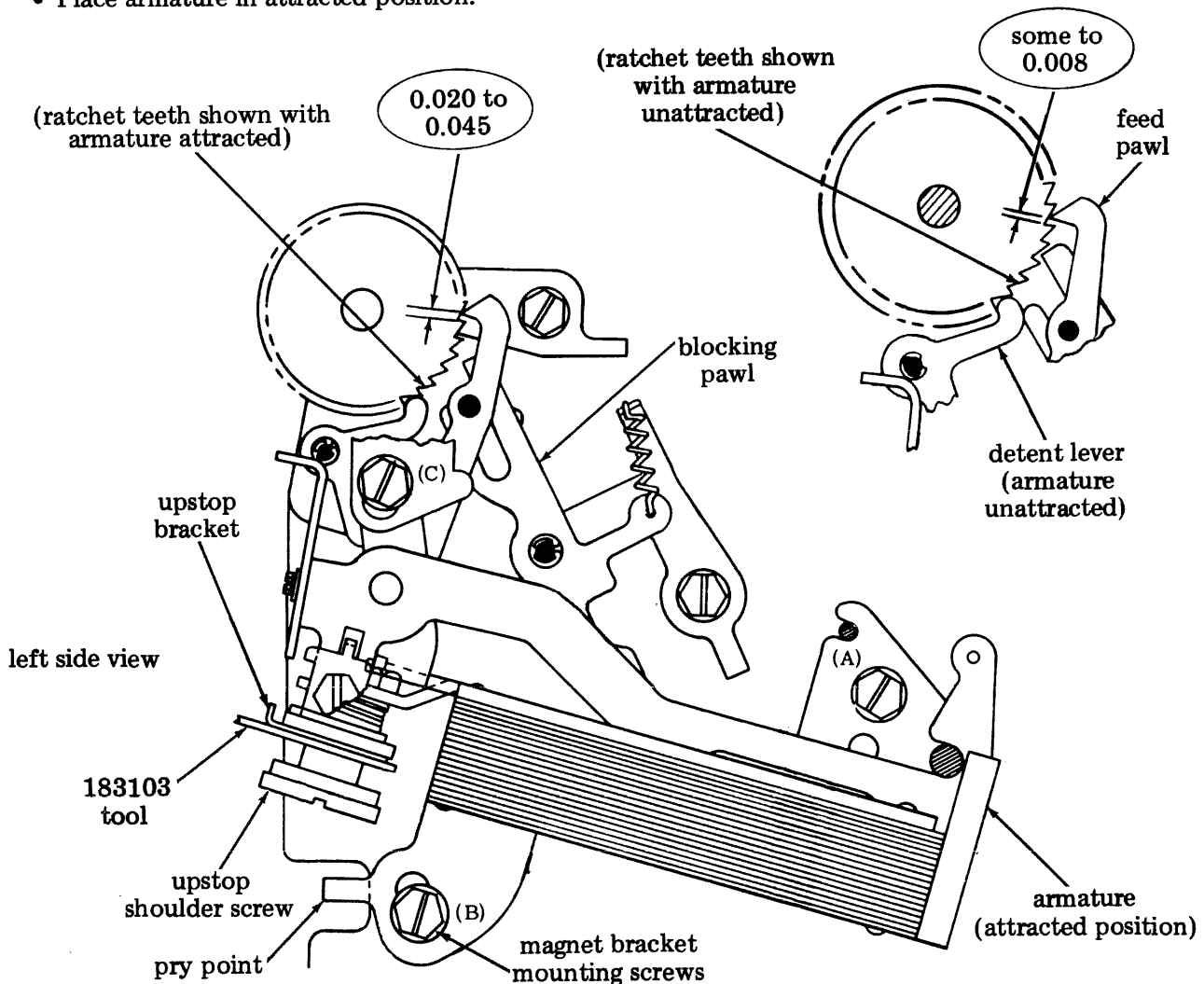
Loosen two bracket mounting screws so that upstop bracket is free to move. Insert 183103 tool between upstop bracket and shoulder of upstop shoulder screw.

Tighten mounting screws. Remove tool.

NOTE: Tighten magnet bracket mounting screws A and B first. Rotate vibration damper plate up until lower finger contacts the contact block extension. Continue rotating damper plate until play in block is just removed.

“Adjust” affects:
BLOCKING PAWL (RRA-7)
SENSING PIN (RRA-8)

“Requirement” affected by:
TRIP LEVER OVERTRAVEL (RRA-1)



UPSTOP SPRING

Requirement — 14 to 20 to start upstop bushing moving with armature spring post removed from its slot in magnet bracket.

BLOCKING PAWL (RRA-7)

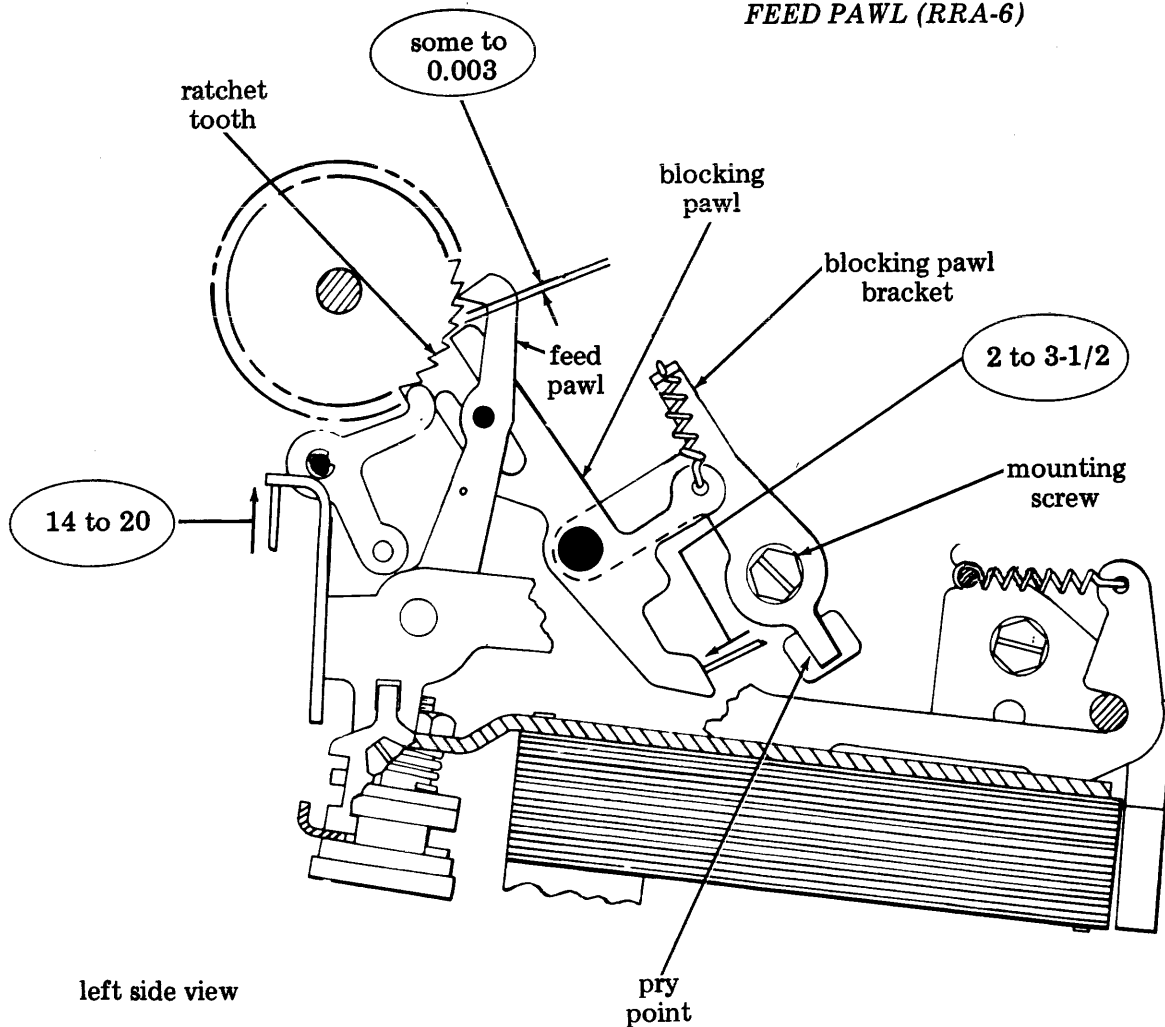
Requirement 1 — 2 to 3-1/2 to start blocking pawl moving. Armature should be in unattracted position and control lever in START position.

- Armature in unattracted position.
- Some clearance between feed pawl and ratchet tooth.
- Rotate ratchet to a position of least clearance between blocking pawl and ratchet teeth.

Requirement 2 — Some to 0.003 clearance at closest point between end of blocking pawl and ratchet tooth.

Adjust — Loosen blocking pawl mounting screw friction tight. Using pry point, position blocking pawl bracket to meet requirement. Tighten mounting screw.

“Adjust” affects:
DETENT LEVER (RRA-5)
FEED PAWL (RRA-6)



SENSING PIN (RRA-8)

- Armature in unattracted position.

Requirement — 0.005 to 0.020. All sensing pin tips should be below top surface of top plate.

Adjust — Loosen sensing pin guide mounting screws (2) friction tight. Use pry points to position sensing pin guide to meet requirement. Tighten mounting screws.

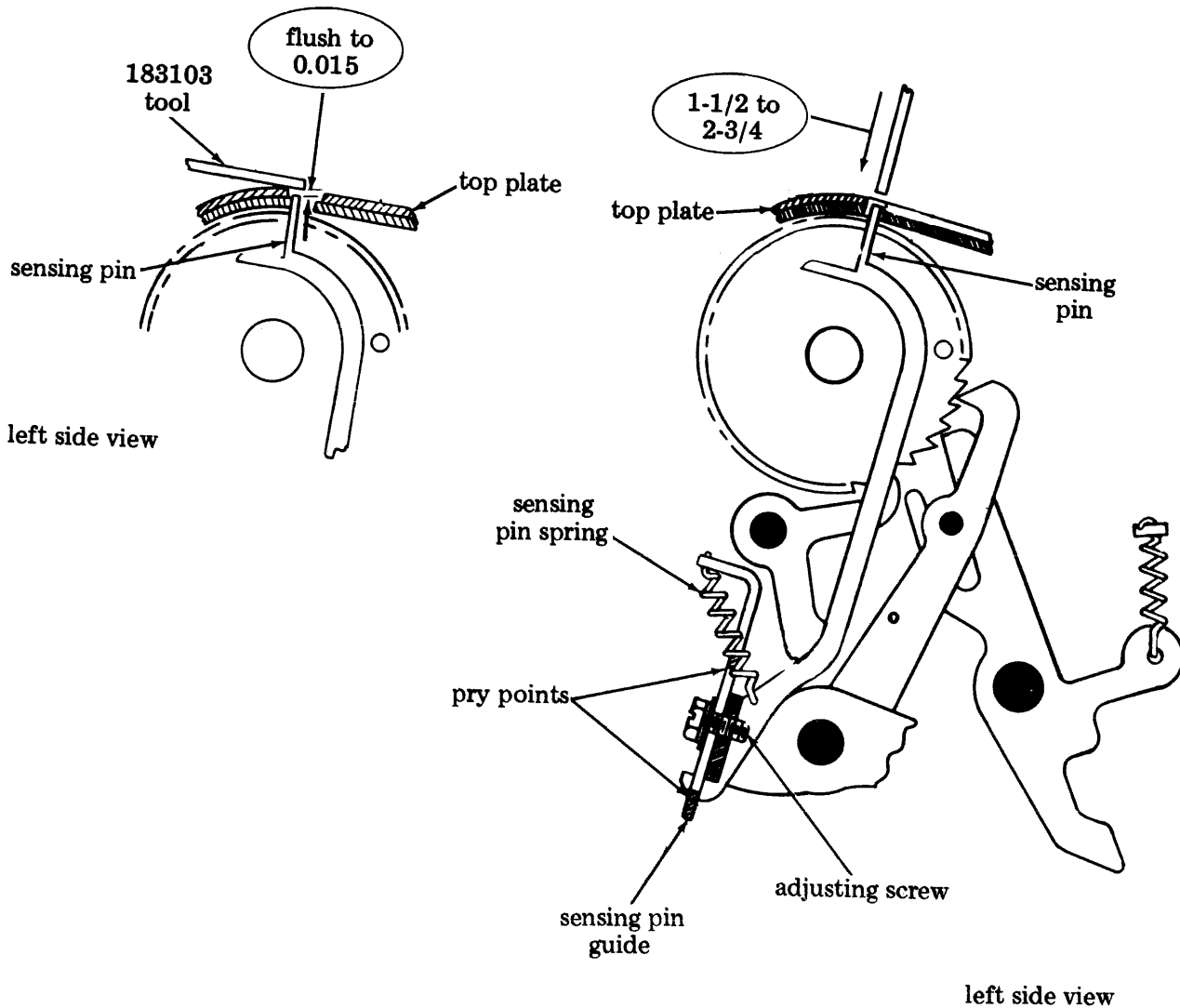
“Adjust” affects:
FEED PAWL (RRA-6)

NOTE: Make adjustment using thin-slotted end of gauge. Measure clearance holding the gauge directly above sensing pins.

SENSING PIN SPRING

- Armature in attracted position.

Requirement — 1-1/2 to 2-3/4 to deflect each (8) sensing pin flush with top plate.



TAPE LID LATCH (RRA-10)

- Tape lid closed.
- Take up and release lid latch spring play against top plate.

Requirement — 0.005 to 0.030 clearance between top plate and lid latch spring. Some clearance between lid latch and tape lid.

Adjust — Loosen mounting screw friction tight.
Position lid latch up or down to meet requirement.
Tighten mounting screw.

TAPE LID SPRING

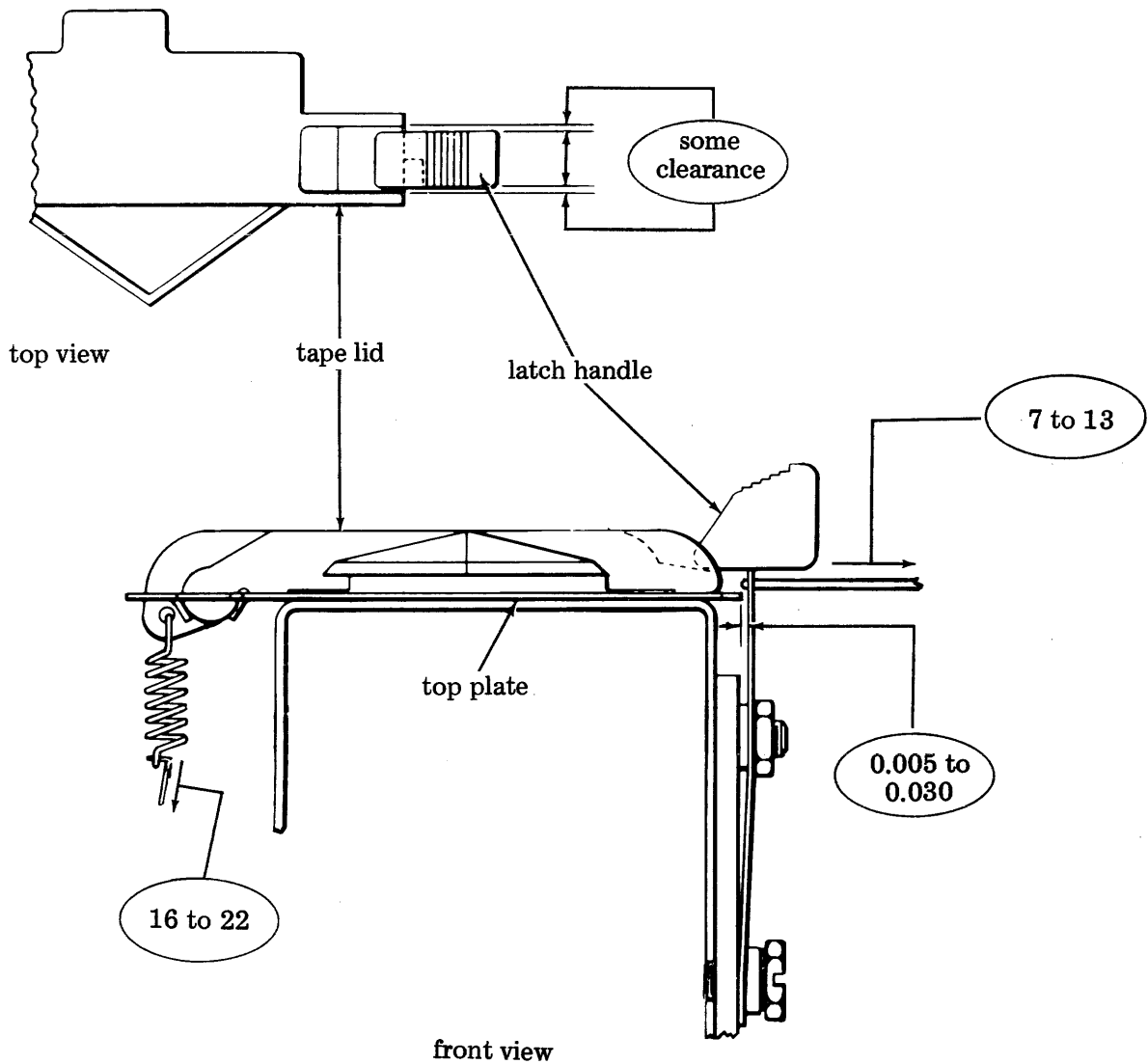
- Tape lid closed.

Requirement — 16 to 22 to pull spring to its installed length.

LATCH SPRING

- Tape lid open.

Requirement — 7 to 13 to start latch spring moving.



START CONTACT WIRE (RRA-12)

- Place control lever in ON position.

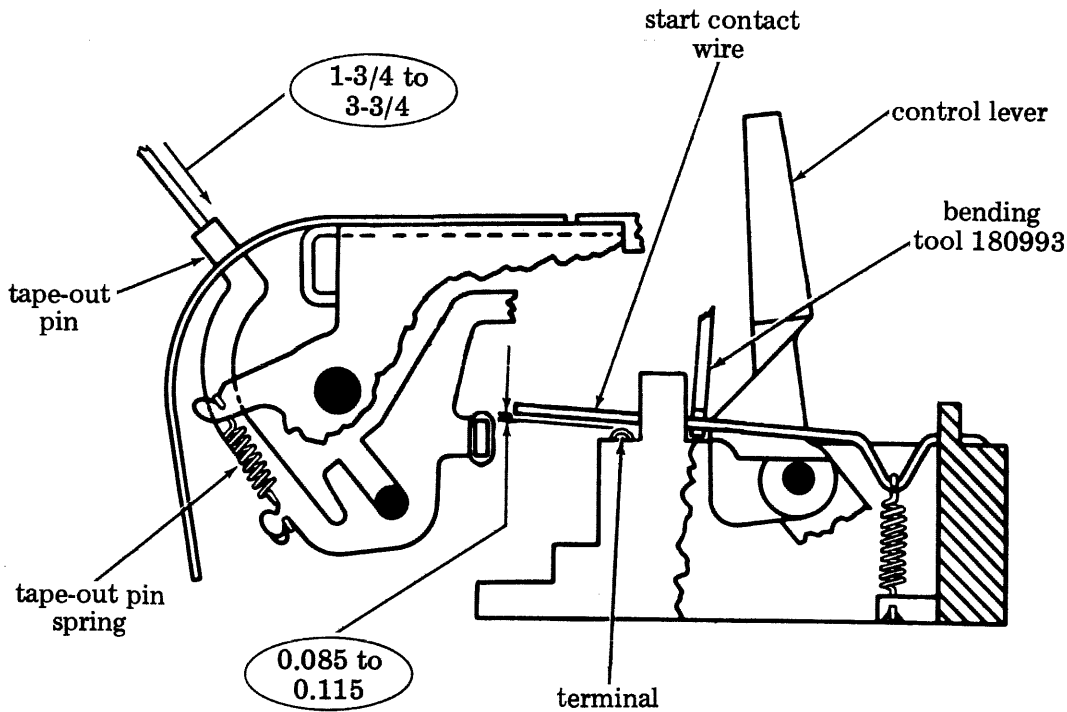
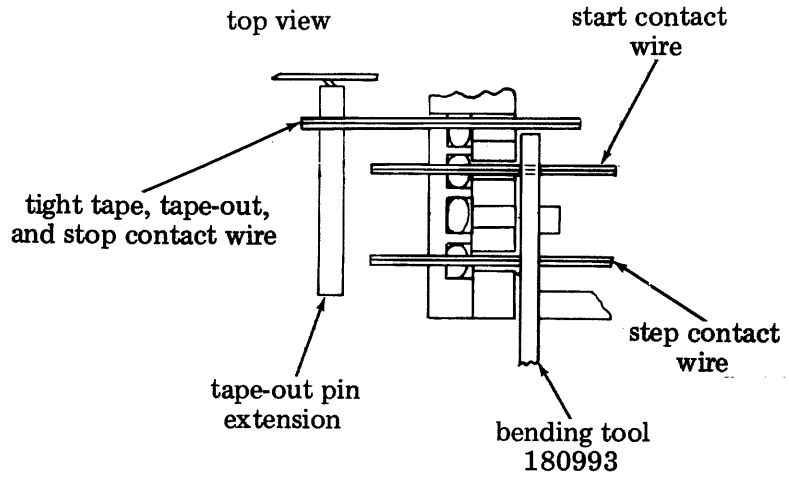
Requirement — 0.085 to 0.115 clearance between start contact wire and its terminal.

Adjust — Bend contact wire between contact block and cam surface on control lever with bending tool.

TAPE-OUT PIN SPRING

- Tape lid open.
- Tight-tape contact wire held free of tape-out pin.
- Control lever in ON position.

Requirement — 1-3/4 to 3-3/4 to start tape-out pin moving.



left side view

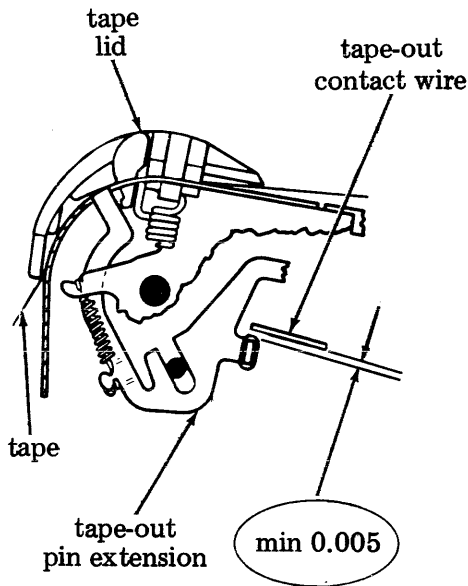
TAPE-OUT CONTACT WIRE (RRA-13)

- Tape-out pin in fully up position.

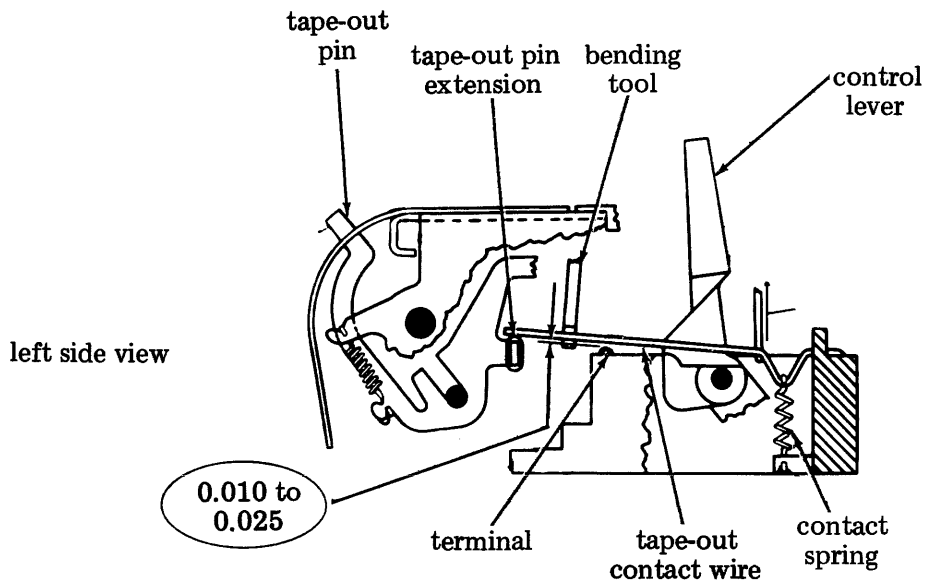
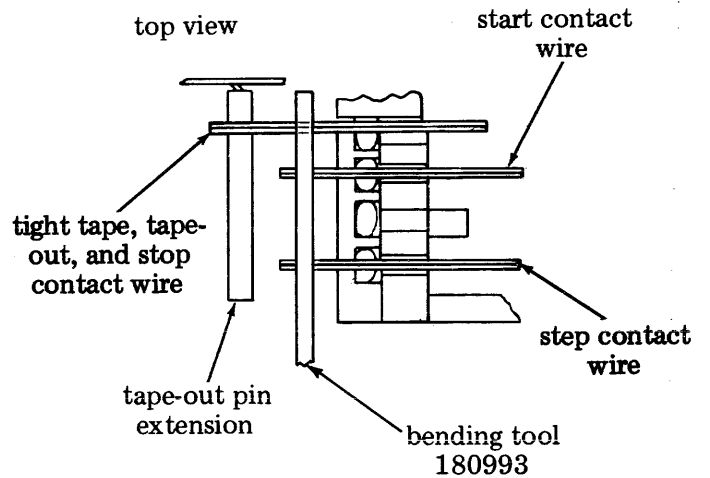
Requirement 1 — 0.010 to 0.025 clearance between tape-out contact wire and its terminal.

Requirement 2 — Minimum 0.005 clearance between tape-out contact wire and tape-out pin extension with control lever in ON position, tape in reader, and tape lid closed.

Adjust — Bend contact wire in between the terminal and tape-out pin extension with bending tool 180993.



left side view



left side view

SENSING CONTACT WIRE

- Armature in attracted position.

Requirement 1 — 3/4 to 1-3/4 to start contact wire moving.

TIGHT-TAPE LEVER SPRING

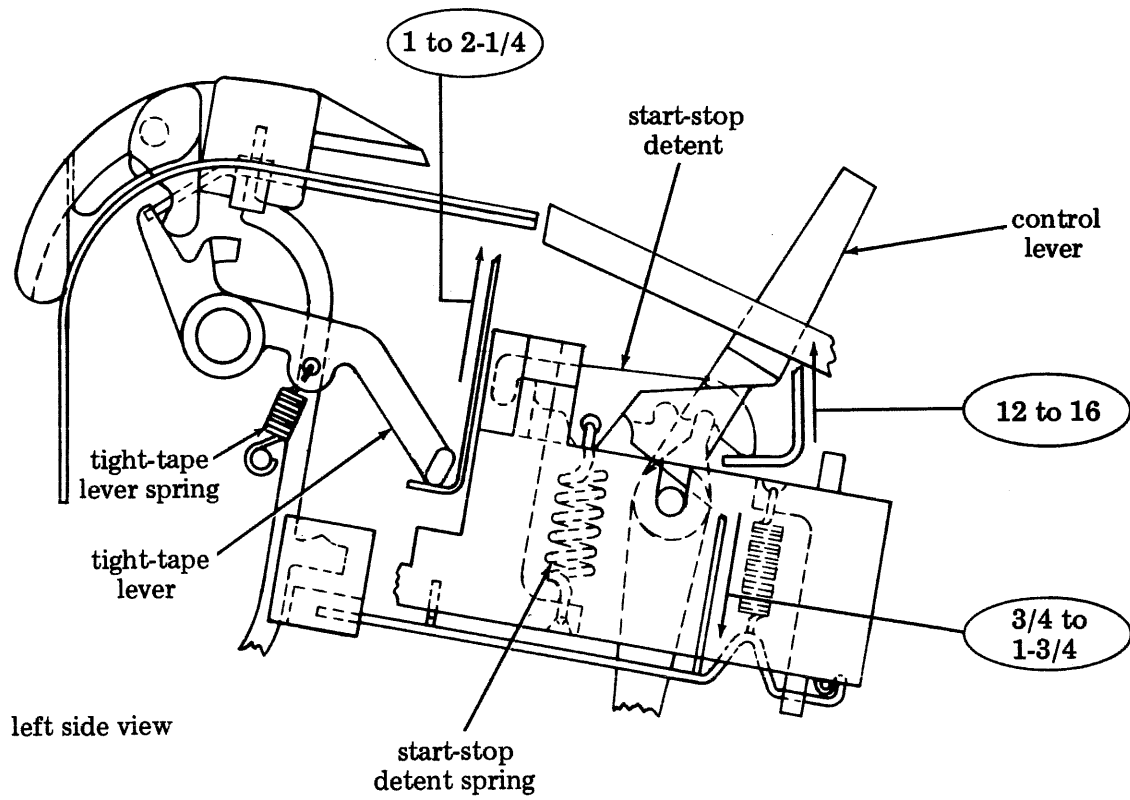
- Tape lid closed.

Requirement 2 — 1 to 2-1/4 to start tight-tape lever moving.

START-STOP DETENT SPRING

- Control lever in ON position.

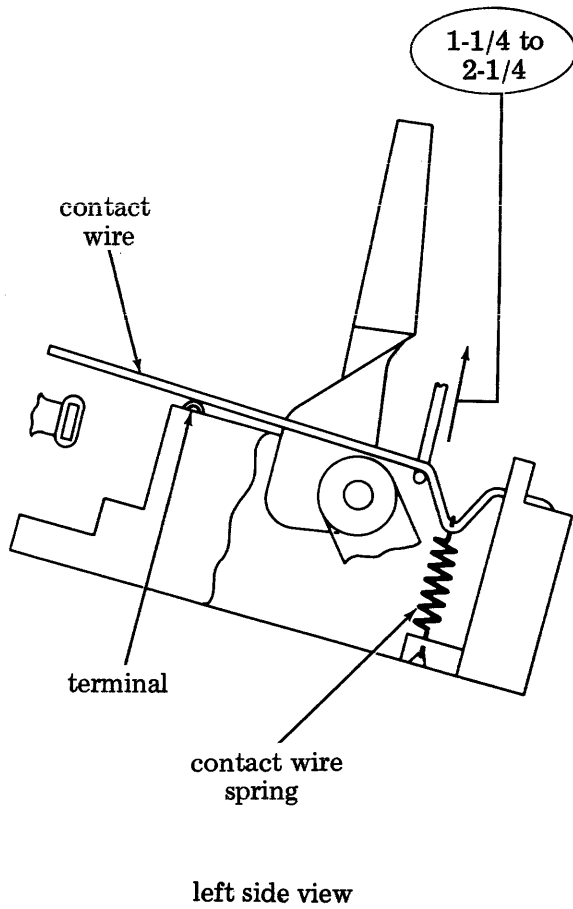
Requirement — 12 to 16 to start detent moving.



**START, STOP, TIGHT-TAPE, TAPE-OUT
CONTACT WIRE SPRINGS**

- Control lever in ON position.
- Tape-out pin fully depressed.

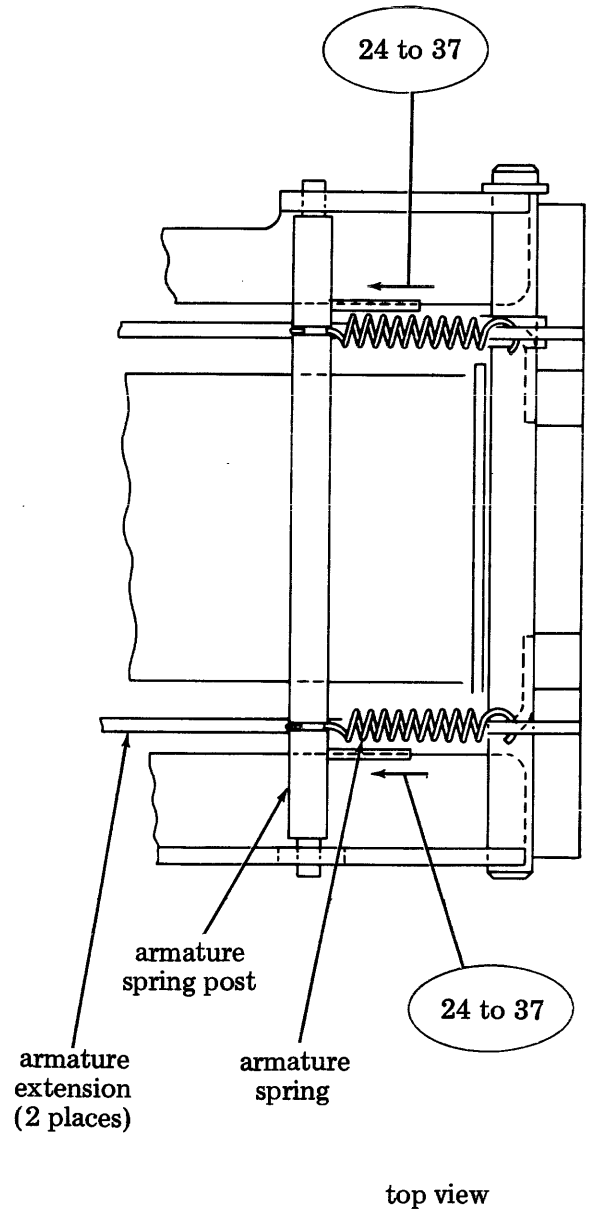
Requirement — 1-1/4 to 2-1/4 to start
contact wires moving.



ARMATURE SPRING

- Armature in unattracted position.

Requirement — 24 to 37 to start spring post
moving (measure at two places).



TIE LINK OVERTRAVEL

- Armature in attracted position.

Requirement — 0.018 to 0.025 clearance between primary latch and tie link.

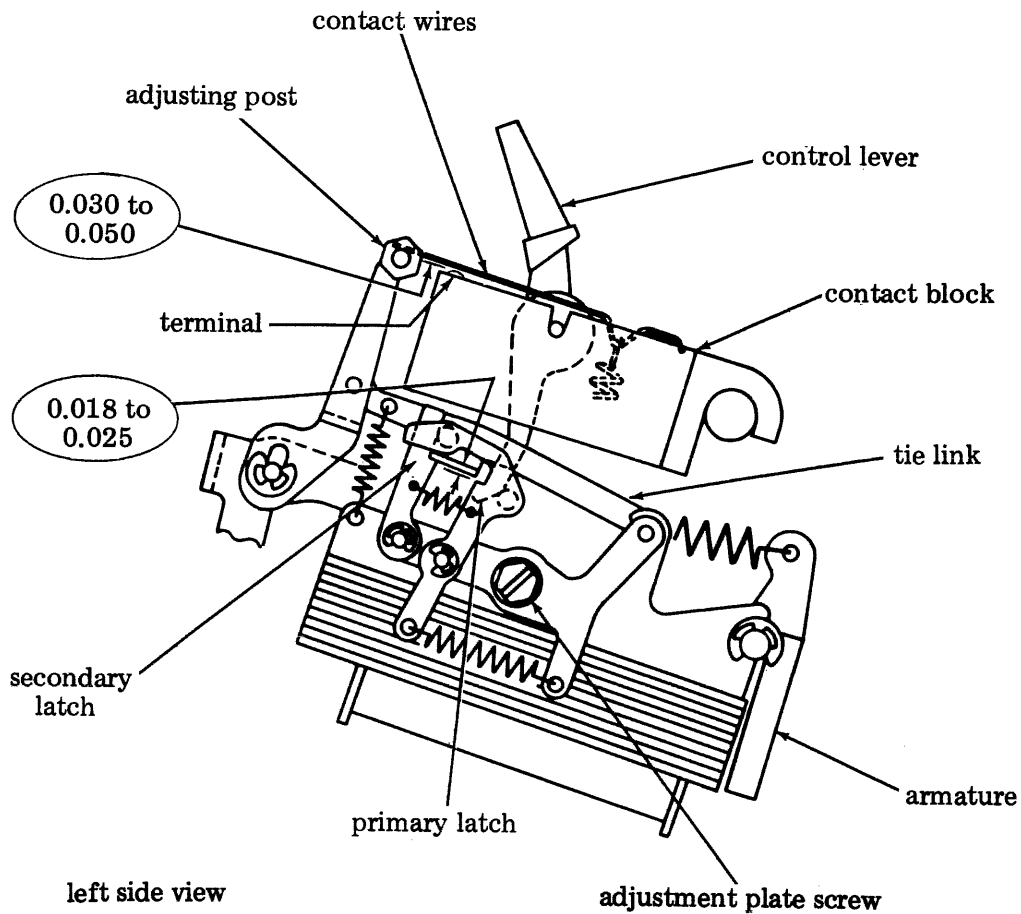
Adjust — Loosen adjustment plate screw.
Rotate plate to meet requirement.
Tighten screw.

STEP CONTACT WIRE GAP

- Armature in unattracted position.
- Tie link resting on secondary latch.
- Rotate control lever to leave a gap between contact wires and the cam of the control lever.

Requirement — 0.030 to 0.050 between contact wires and terminal.

Adjust — Loosen adjustment post nut.
Position post to meet requirement.
Tighten nut.



SINGLE STEP SPRING

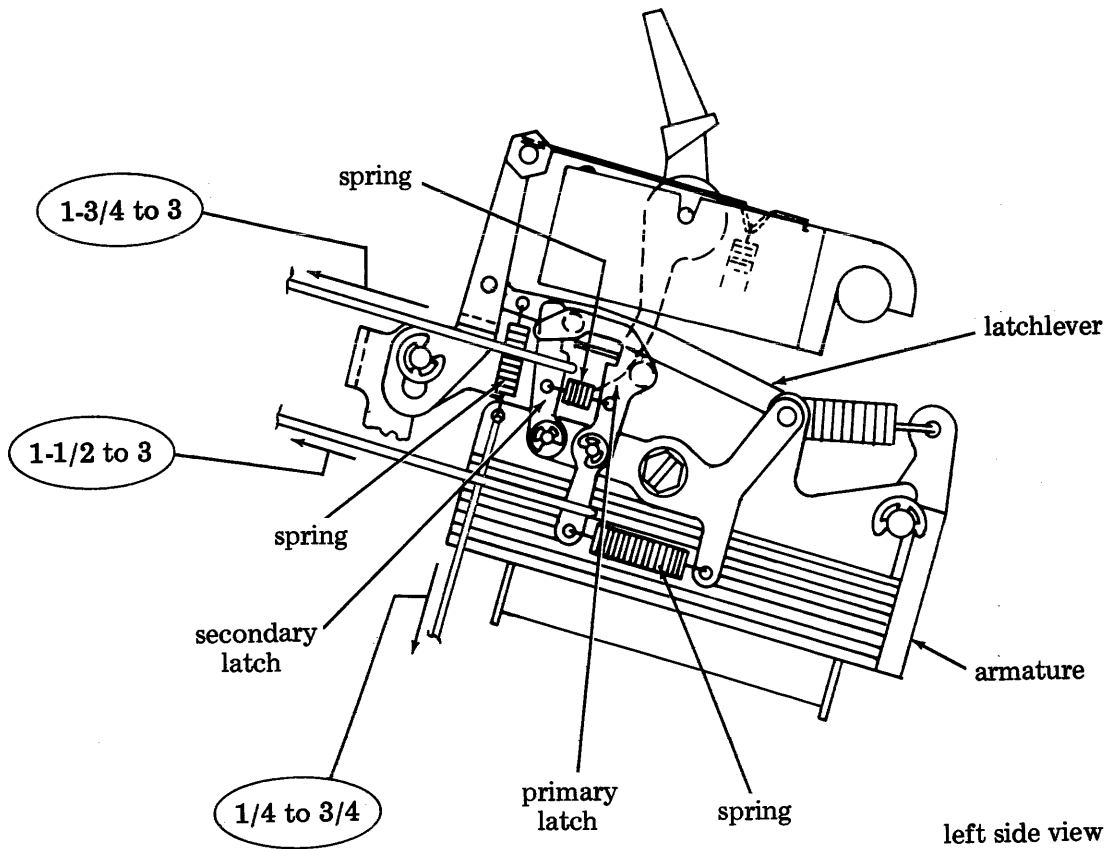
- Armature in attracted position.

Requirement 1 — 1-3/4 to 3 to move secondary latch.

Requirement 2 — 1-1/2 to 3 to move primary latch.

Requirement 3 — 1/4 to 3/4 to pull latch-lever spring to its installed length.

CAUTION: CHECK ALL MOVING PARTS TO MAKE SURE THEY ARE FREE OF BINDS BEFORE OPERATING THE SET UNDER POWER.



38 TAPE PUNCH
ADJUSTMENTS

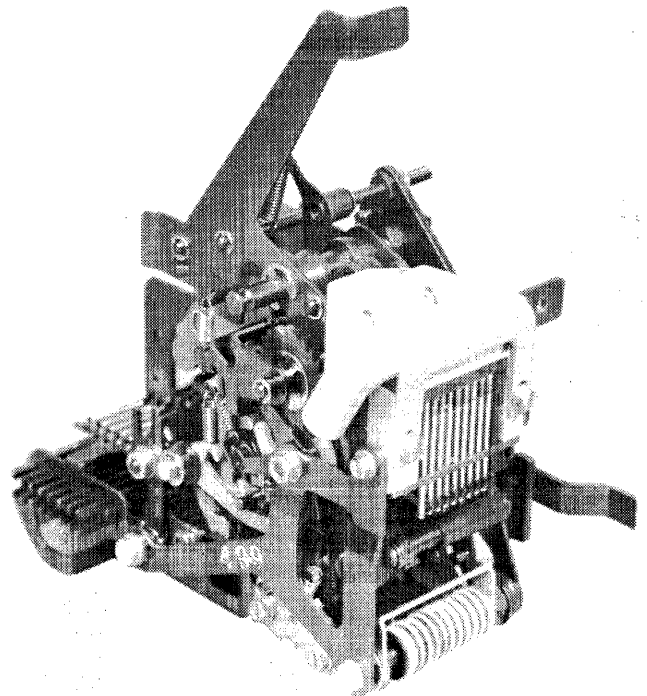
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1. GENERAL

1.01 This section provides Model 38 Tape Punch (see figure) adjustment information. Tools required to perform these adjustments are included in the 185830 maintenance tool kit and are listed in Section 570-005-800TC.

NOTE: Remove all electrical power sources from the unit before checking or performing any adjustments.

1.02 The sequence of the adjustments given in this section should be followed when a complete readjustment of the tape punch is undertaken.



38 Tape Punch

1.03 Read the entire adjustment procedure to fully understand the requirement prior to making an adjustment. Illustration references, left, right, front, rear, etc, refer to the punch as normally viewed (installed in a teletypewriter set) by an operator.

NOTE: All requirement clearances are given in inches, unless specified otherwise.

1.04 Spring tensions may be checked in any sequence. To obtain reliable readings, it is important that the tensions be measured with the spring scales placed as shown on the associated line drawings. Springs that do not meet their requirements should be replaced.

NOTE 1: All spring requirements are given in ounces, unless specified otherwise.

NOTE 2: When a spring tension is measured, other springs may also be measured indirectly in the process. If this is the case and the requirement is not met, replace the springs one at a time, starting with the indicated spring, until the requirement is met.

NOTE 3: Unless specified otherwise, check spring tensions with the punch in the OFF condition.

1.05 Certain adjustments require that the tape punch be either ON or OFF. These conditions are met as follows:

Tape Punch ON

- Control arm positioned at ON.
- On-off bail assembly unlatched.
- Feed pawl engages feed wheel ratchet.

Tape Punch OFF

- Control arm positioned at OFF.
- On-off bail assembly latched.
- Feed pawl cammed away from feed wheel ratchet.

1.06 To set up a specific code combination in the punch:

- Place typing unit selector armature in its attracted (forward) position.
- Latch all typing unit clutches.
- Momentarily allow the selector armature to move to its unattracted (rearward) position and trip selector clutch.
- Rotate main shaft until all typing unit pushlevers are moved under their respective selector levers.
- Use a spring hook to strip the pushlevers from under the selector levers which correspond to the spacing element(s) of the code combination to be set up. For example, to set up nos. 2 and 5 code levels marking, strip the pushlevers from nos. 1, 3, 4, 7, 6, and 8 selector levers.

NOTE: The selector levers are numbered 1, 2, 3, 4, 5, 7, 6, and 8 from left to right.

- Rotate the main shaft until the condition called for in the associated punch adjustment is obtained.

1.07 Some adjustment procedures call for specific positioning (A, B, or C) of the typing unit function clutch. These positions are attained by rotating the typing unit main shaft until the specified lettered notch in the clutch is aligned with the notch in the drive bail link. These function clutch notches, when aligned with the drive bail link notch, place the typing unit in the following conditions:

<u>Alignment</u>	<u>Typing Unit Condition</u>
A	Function bail up
B	Carriage drive bail rearward
C	Function bail down

1.08 Adjustments should be performed with the automatic punch operation blocking clips (mounted on the sensing lever guidepost) removed.

1.09 The chad chute extension may be removed to facilitate making adjustments. Be sure to replace the extension immediately after the adjustments are completed.

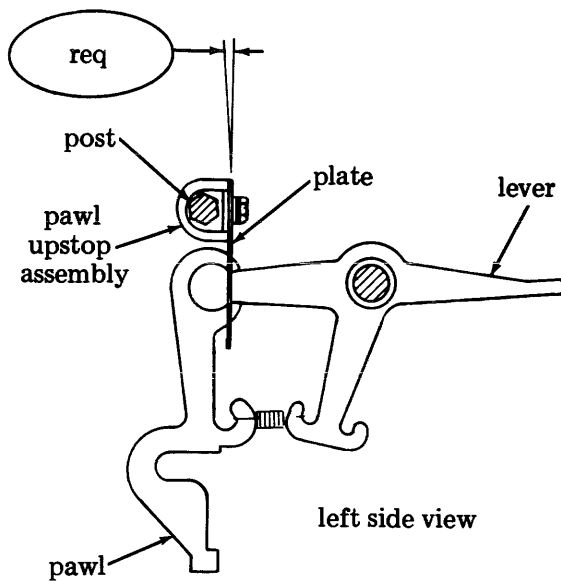
2. BASIC UNIT

PAWL UPSTOP ASSEMBLY — PRELIMINARY

NOTE: Perform this adjustment only after the punch has been disassembled and then reassembled.

Requirement — Pawl upstop assembly positioned so that it is vertical or within 2 degrees clockwise from vertical (gauge by eye).

Adjust — Loosen screw which secures pawl upstop assembly post to tape punch casting.
Position pawl upstop assembly.
Tighten screw.

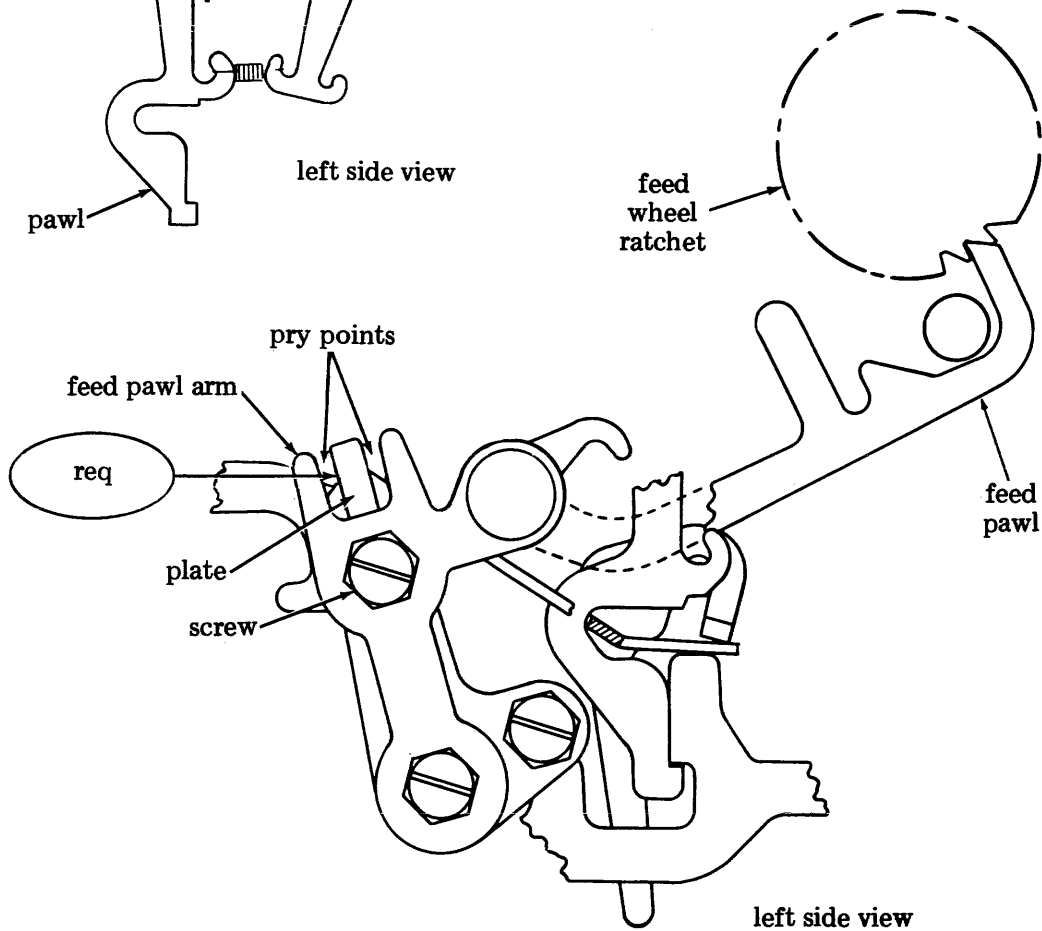


left side view

FEED WHEEL RATCHET AND PAWL — PRELIMINARY

Requirement — Plate centered in feed pawl arm.

Adjust — Loosen screw.
Use pry points to position plate.
Tighten screw.



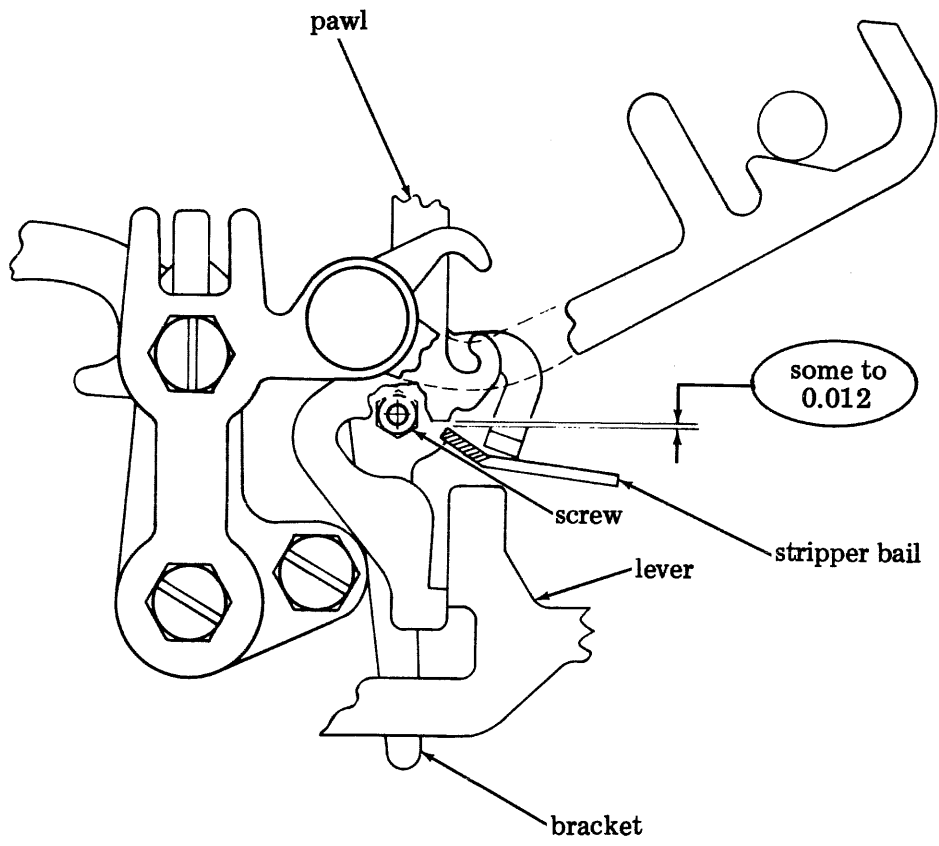
left side view

STRIPPER BAIL UPSTOP

- Turn punch OFF.
- Place all sensing pawls in uppermost (unlatched) position.

Adjust — Loosen screw.
Rotate bracket.
Tighten screw.

Requirement — Some to 0.012 between stripping surface of sensing (lowermost) pawl and stripper bail.



left side view

NOTE 1: For the adjustments which follow, the tape punch should be mounted to a typing unit.

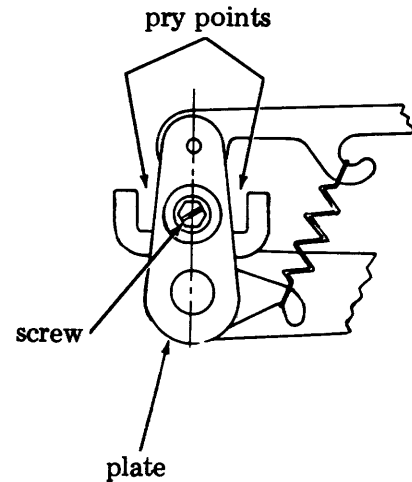
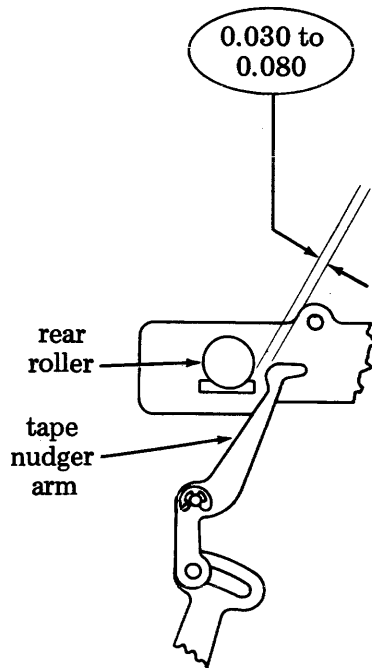
NOTE 2: The following adjustments must be made in sequence: **TAPE PUNCH DRIVE**, **PUNCH PENETRATION**, **PAWL UPSTOP ASSEMBLY — FINAL**, and **FEED WHEEL RATCHET AND PAWL — FINAL**. Prior to making the above adjustments, check or make the following Tape Punch Area adjustments: **PAWL UPSTOP ASSEMBLY — PRELIMINARY**, **FEED WHEEL RATCHET AND PAWL — PRELIMINARY**, and **STRIPPER BAIL UPSTOP**.

TAPE PUNCH DRIVE

- Remove tape from punch.
- Place function clutch in position "C."
- Take up play in roller and tape nudger arm to maximize gap.

Requirement — 0.030 to 0.080 between rear roller and tape nudger arm.

Adjust — Loosen screw (friction tight).
Use pry points to position plate.
Tighten screw.



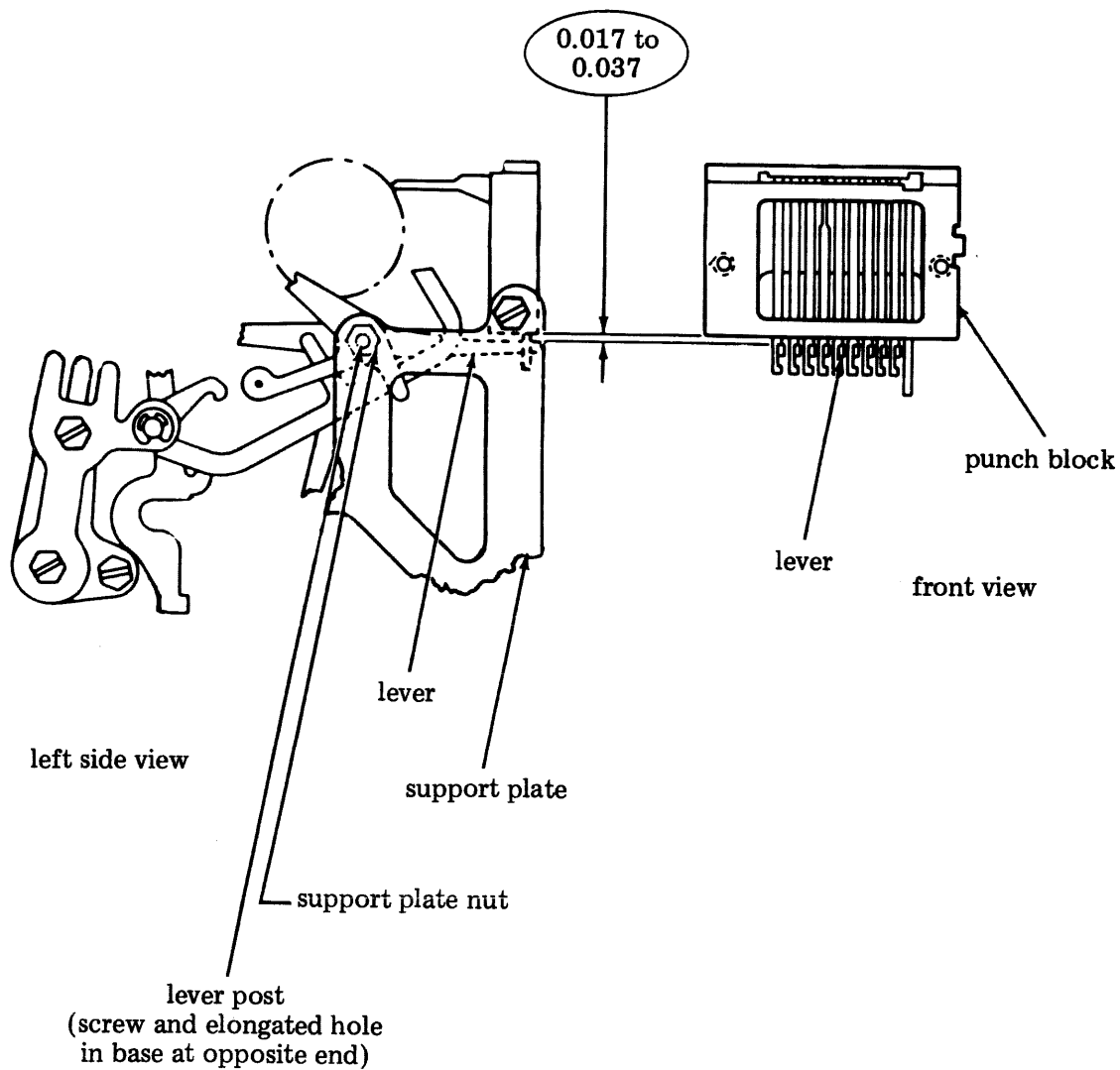
left side view

PUNCH PENETRATION

- Turn punch ON.
- Set up “rubout” code (all levels marking) in punch.
- Place function clutch in position “C.”

Requirement — 0.017 to 0.037 between top surface of any lever and bottom of punch block.

Adjust — Loosen (friction tight) lever post mounting screw and support plate nut. Use pry point (directly under mounting post) to position lever post within the elongated base and support plate holes. Tighten screw and nut.



PAWL UPSTOP ASSEMBLY – FINAL

- Set up “rubout” code (all levels marking) in punch.
- Place function clutch in position “A.”

Requirement 1 – 0.005 to 0.020 between no. 1 sensing lever and pawl (second pawl from outside).

Requirement 2 – Some clearance between each remaining sensing lever and pawl, and between feed lever and pawl.

NOTE: Do not adjust just to bias the low or high side of the clearance.

Adjust – Loosen screw which secures pawl upstop assembly post to punch casting. Rotate pawl upstop assembly.

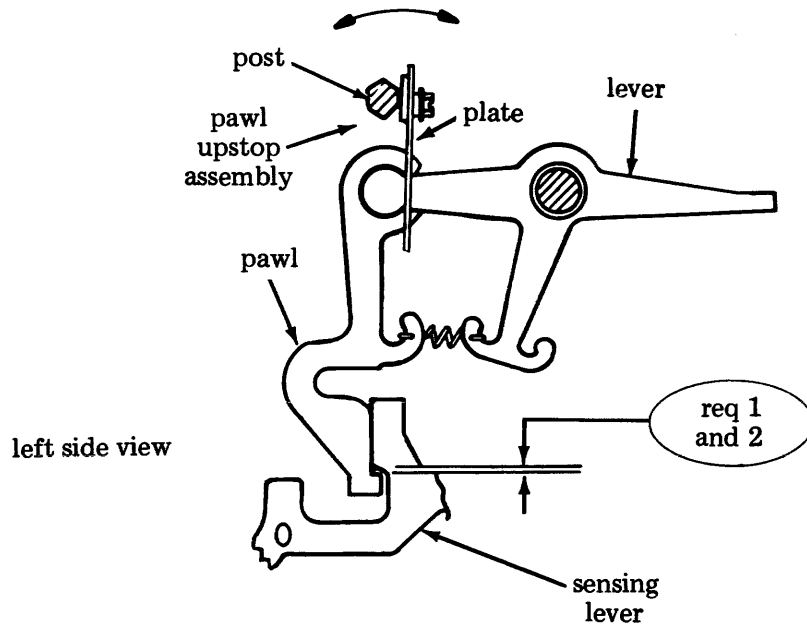
CAUTION: AVOID ROTATING PLATE COUNTERCLOCKWISE FROM ITS VERTICAL POSITION. CHECK THAT PAWL UPSTOP ASSEMBLY ALWAYS GUIDES PAWL AND LEVER SIMULTANEOUSLY.

Tighten screw.
Check *TAPE PUNCH DRIVE* adjustment.

- Manually bias codelevers downward at front of punch pins.
- Press down on rearmost portion of each sensing lever.

Requirement 3 – Some movement in each sensing lever before pawl is moved.

Adjust – Recheck requirement 1.



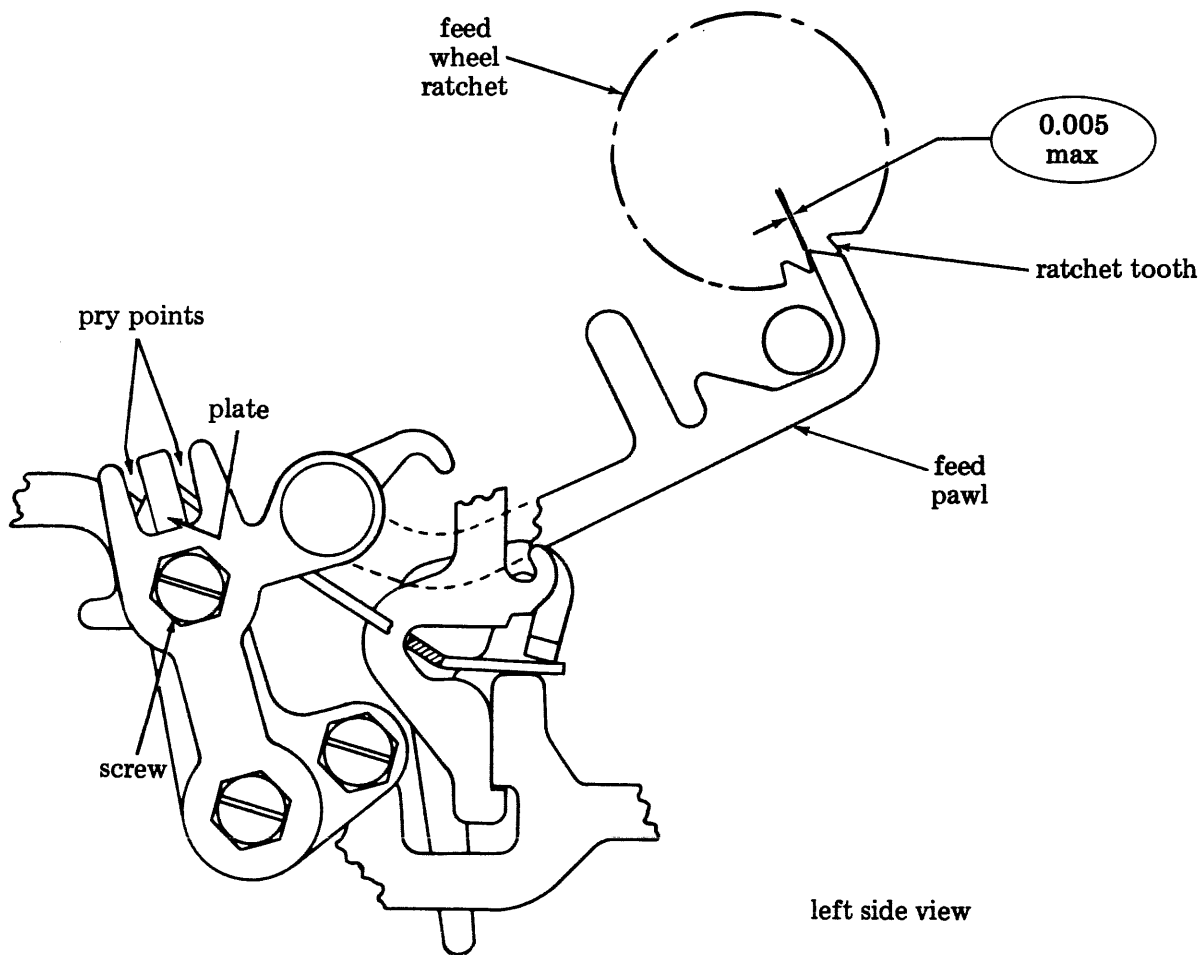
FEED WHEEL RATCHET AND PAWL — FINAL

- Turn punch ON.
- Remove tape from punch.
- Place function clutch in position "A."
- Take up stripper bail play toward front.
- Position feed wheel ratchet fully detented.

Requirement 1 — 0.005 maximum clearance between feed pawl and ratchet tooth.

Requirement 2 — When feed pawl is pulled out of engagement with the feed wheel tooth then released, it should fall back into full engagement with the same feed wheel tooth.

Adjust — Loosen screw (friction tight). Use pry points to position plate. Tighten screw. Backspace ratchet one full revolution in one tooth intervals and recheck (gauge by eye) requirements 1 and 2.



TEN CHARACTERS PER INCH

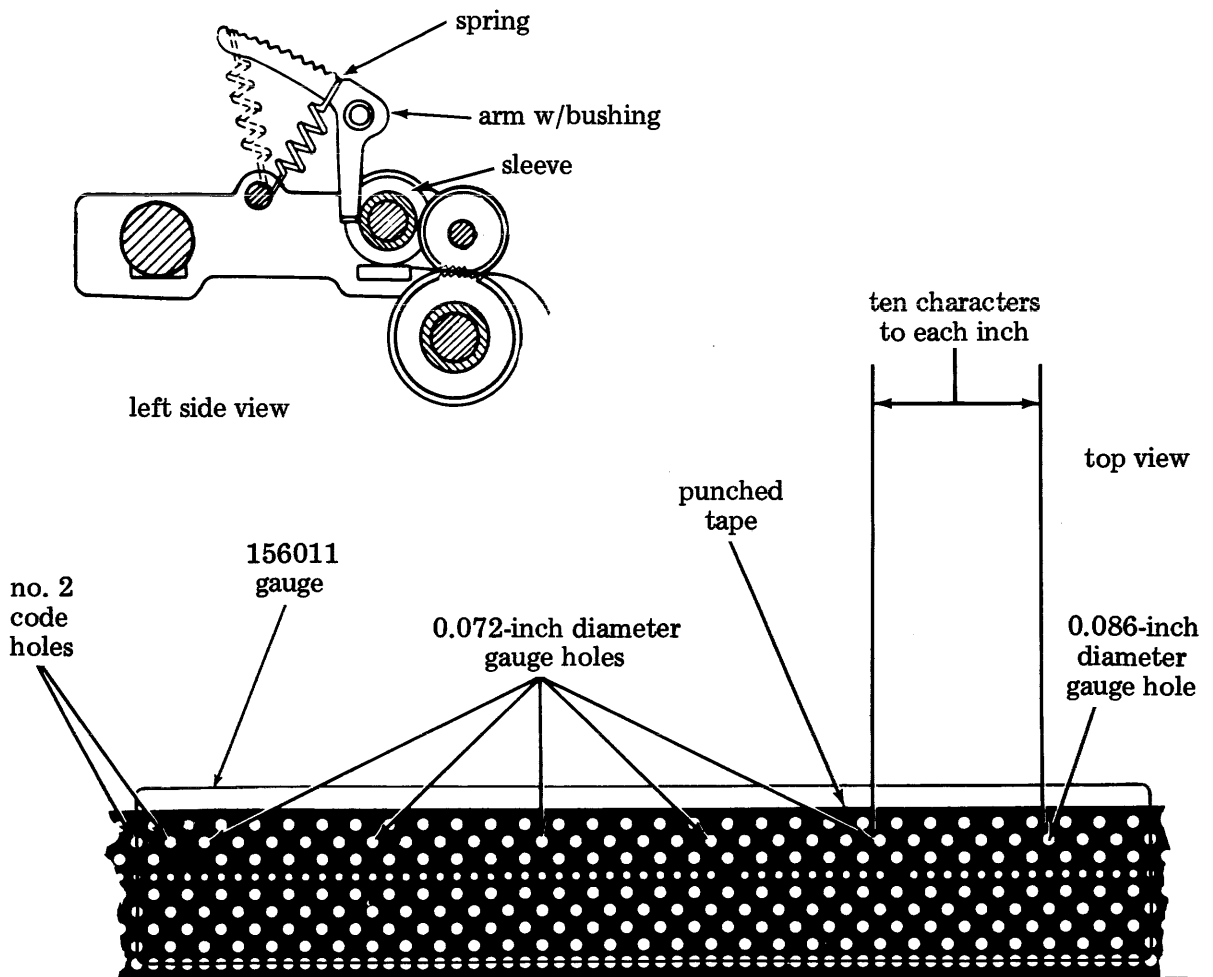
- Operate punch under power.
- Prepare 8 inches of tape with alternate "R" and hyphen codes.
- Place a no. 2 punched code hole concentrically over the first 0.072-inch hole of 156011 gauge.

NOTE: There are six holes in the 156011 gauge — five with 0.072-inch diameters and one with a 0.086-inch diameter.

Requirement 1 — Remaining four 0.072-inch gauge holes visible through corresponding no. 2 code holes.

Requirement 2 — Sixth no. 2 code hole, which corresponds with 0.086-inch gauge hole, lies entirely within perimeter of that gauge hole.

Adjust — Reposition spring in higher or lower notch.



TAPE BIAS SPRING

- Remove tape from punch.

Requirement — Tape bias spring should rest against side of die plate, symmetrical about tape opening (gauge by eye).

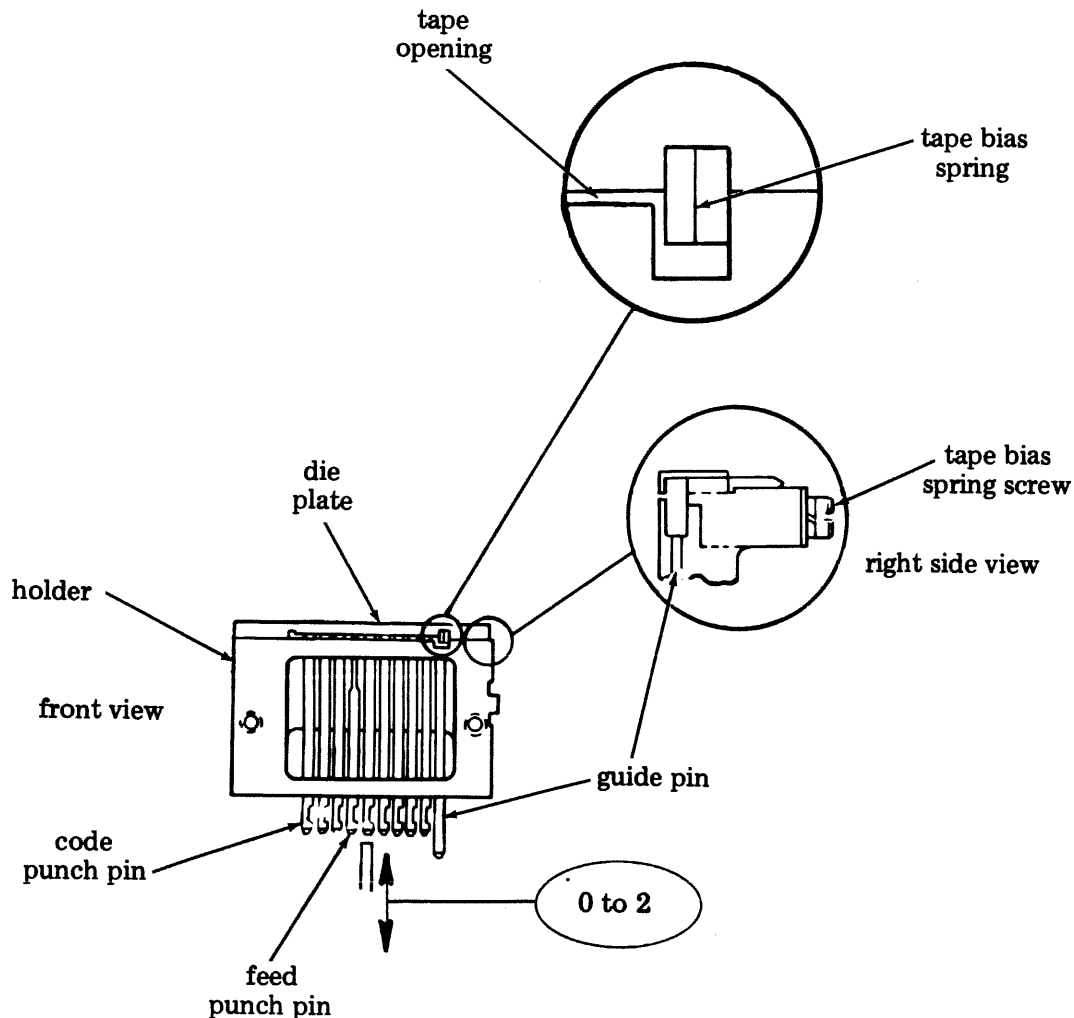
Adjust — Loosen tape bias spring screw.
Position tape bias spring.
Tighten screw.

PUNCH BLOCK ASSEMBLY

- Remove punch block assembly from tape punch (replace assembly immediately after completing this adjustment).
- Position punch pin slots to face guide pin.
- Check requirement thru entire distance of each pin's travel in holder.

Requirement — 0 to 2 to start punch pin moving.

Adjust — If properly lubricated punch pins fail to meet the requirement, replace assembly.



CONTROL BAIL ASSEMBLY

- Hold typing unit selector armature in its attracted (forward) position.
- Latch (fully disengage) all typing unit clutches.
- Turn punch ON.
- Gently rock control bail assembly forward and rearward.

Requirement 1 — Control bail assembly is free of binds along its normal travel.

Requirement 2 — When released from counterclockwise position, control bail assembly returns freely, under spring tension, to its clockwise position.

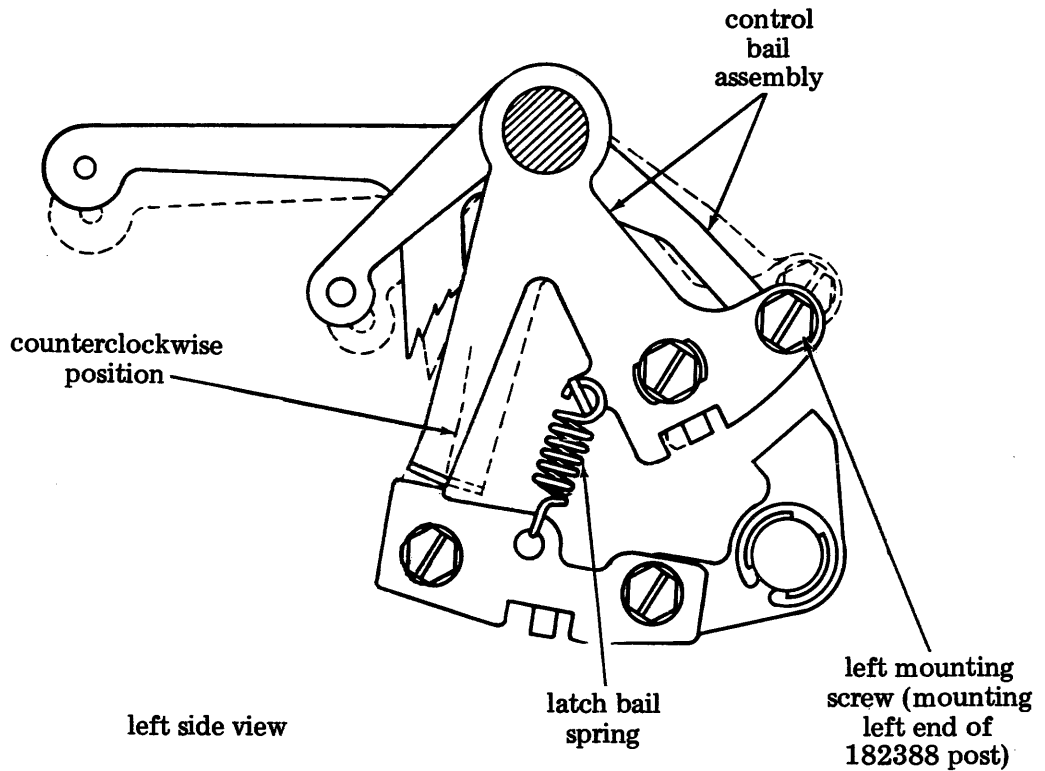
Adjust — Remove latch bail spring, control bail spring (not shown) and screw which mounts the left side of 182388 post.

Loosen, then immediately retighten mounting screw on right side. If post threaded hole is not concentric with left mounting screw hole, bend post about its right mounting screw (not shown).

Replace and tighten screw.

Replace springs.

Recheck requirements.

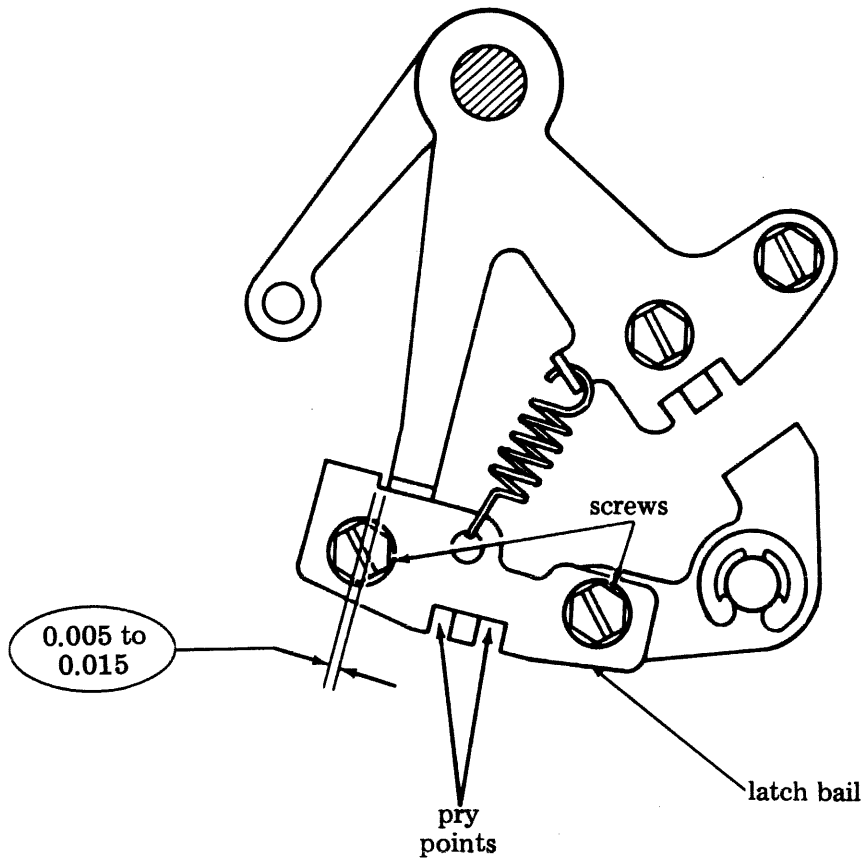


LEVER OVERTRAVEL

- Set up "punch off" code (nos. 3 and 5 code levels marking) in the typing unit.
- Rotate main shaft until function clutch is in position "C."

Requirement — 0.005 to 0.015 between lever and latch bail.

Adjust — Loosen screws.
Use pry points to position latch bail.
Tighten screws.



left side view

FEED WHEEL RATCHET AND PAWL GAP

- Turn punch OFF.
- Rotate main shaft to obtain minimum clearance between feed pawl and a feed wheel ratchet tooth.

Requirement 1 — 0.015 to 0.030 between feed pawl and ratchet tooth.

- Turn punch ON.
- Rotate main shaft until feed pawl engages a feed wheel ratchet tooth.

Requirement 2 — Feed pawl fully engages ratchet tooth.

Adjust — Loosen screw.

Use pry points to position lever.

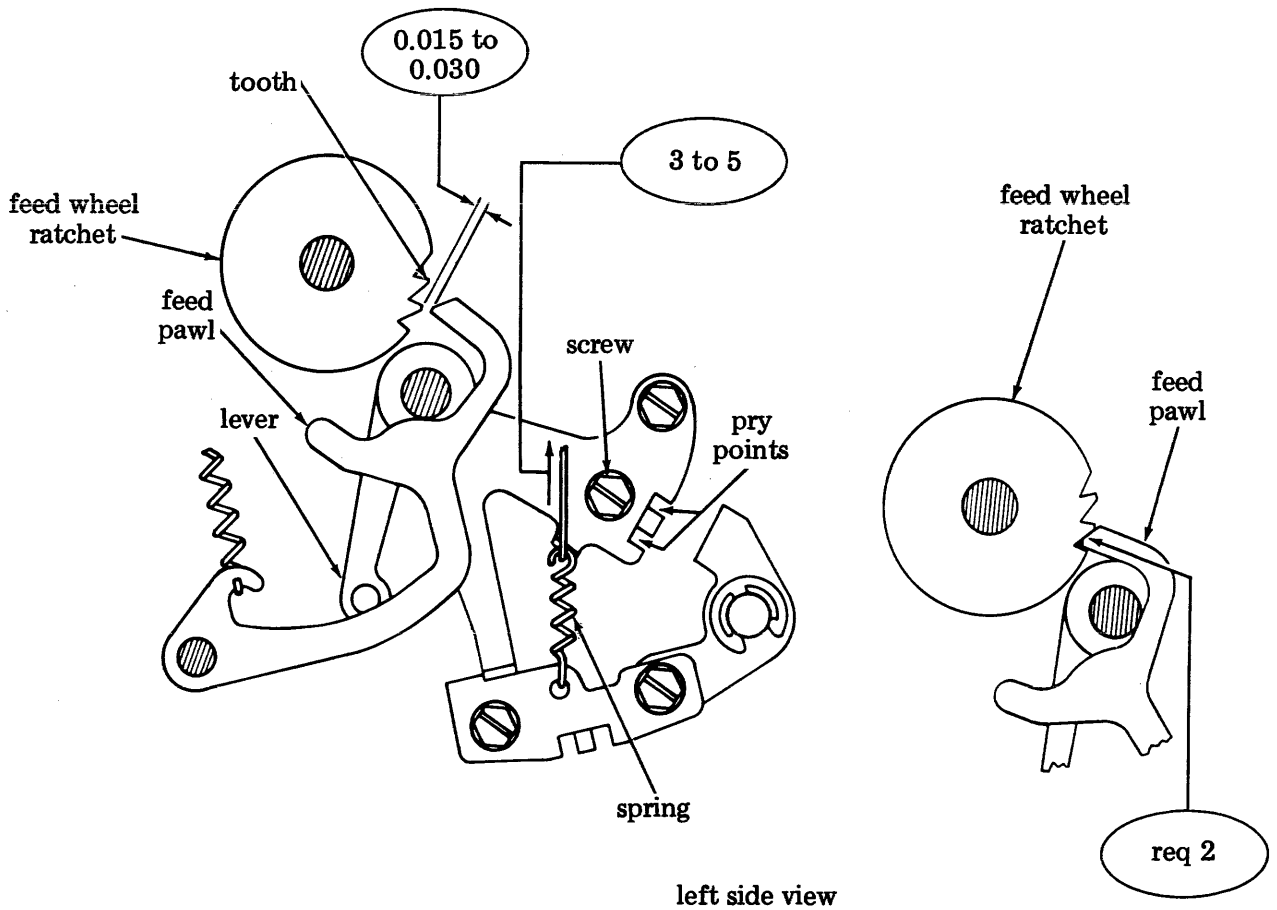
Tighten screw.

Recheck each requirement, refine adjustment if necessary.

LATCH BAIL SPRING

- Turn punch OFF.

Requirement — 3 to 5 to pull spring to installed length.

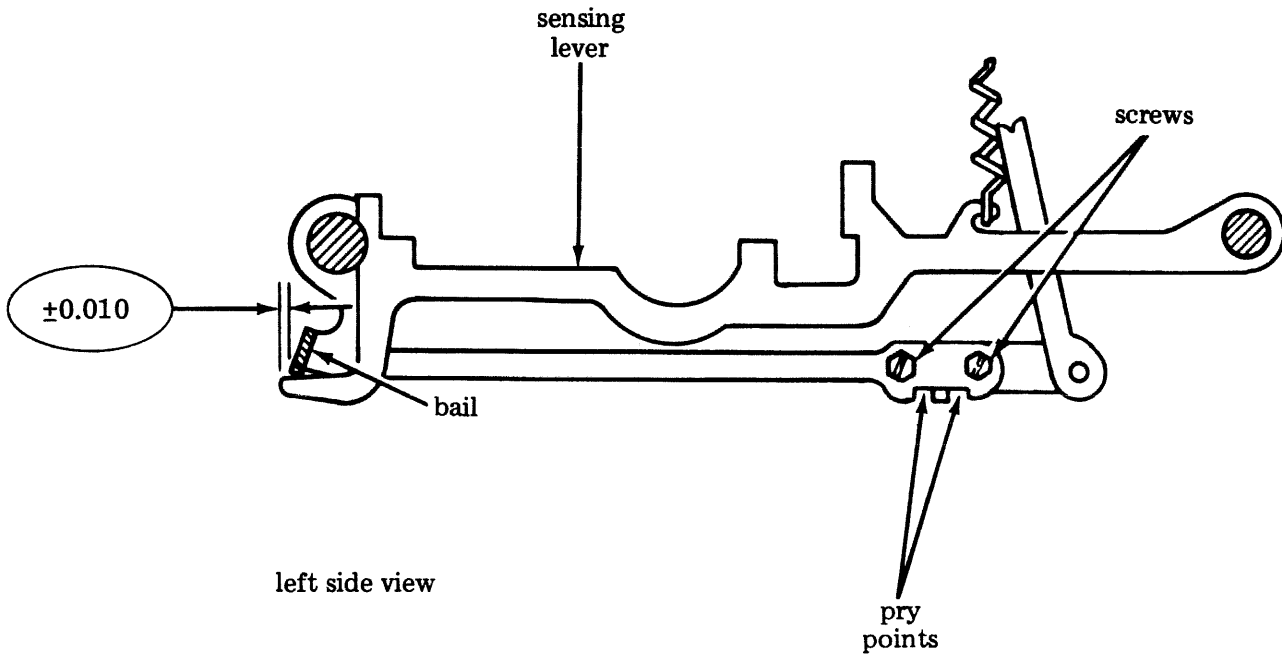


SENSING LEVER AND BAIL GAP

- Turn punch OFF.

Requirement — Leftmost sensing lever 0.010 underflush to 0.010 overflush with the bail.

Adjust — Loosen screws.
Use pry points to position bail.
Tighten screws.

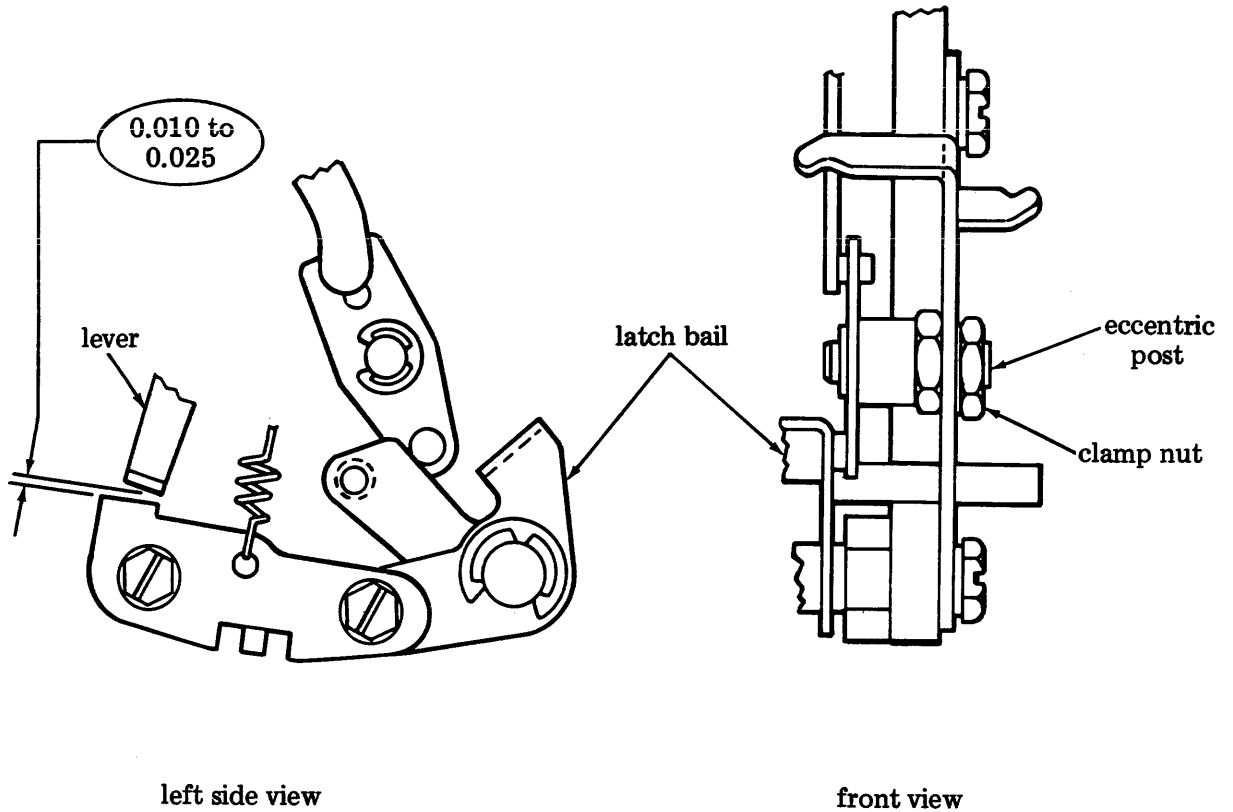


AUTOMATIC "ON"

- Turn punch ON.
- Set up nos. 2 and 5 code levels marking in typing unit.
- Rotate main shaft until drive link is in its most forward position.

Requirement — 0.010 to 0.025 between latch bail and lever.

**Adjust — Loosen clamp nut.
Rotate eccentric post.
Tighten nut.**

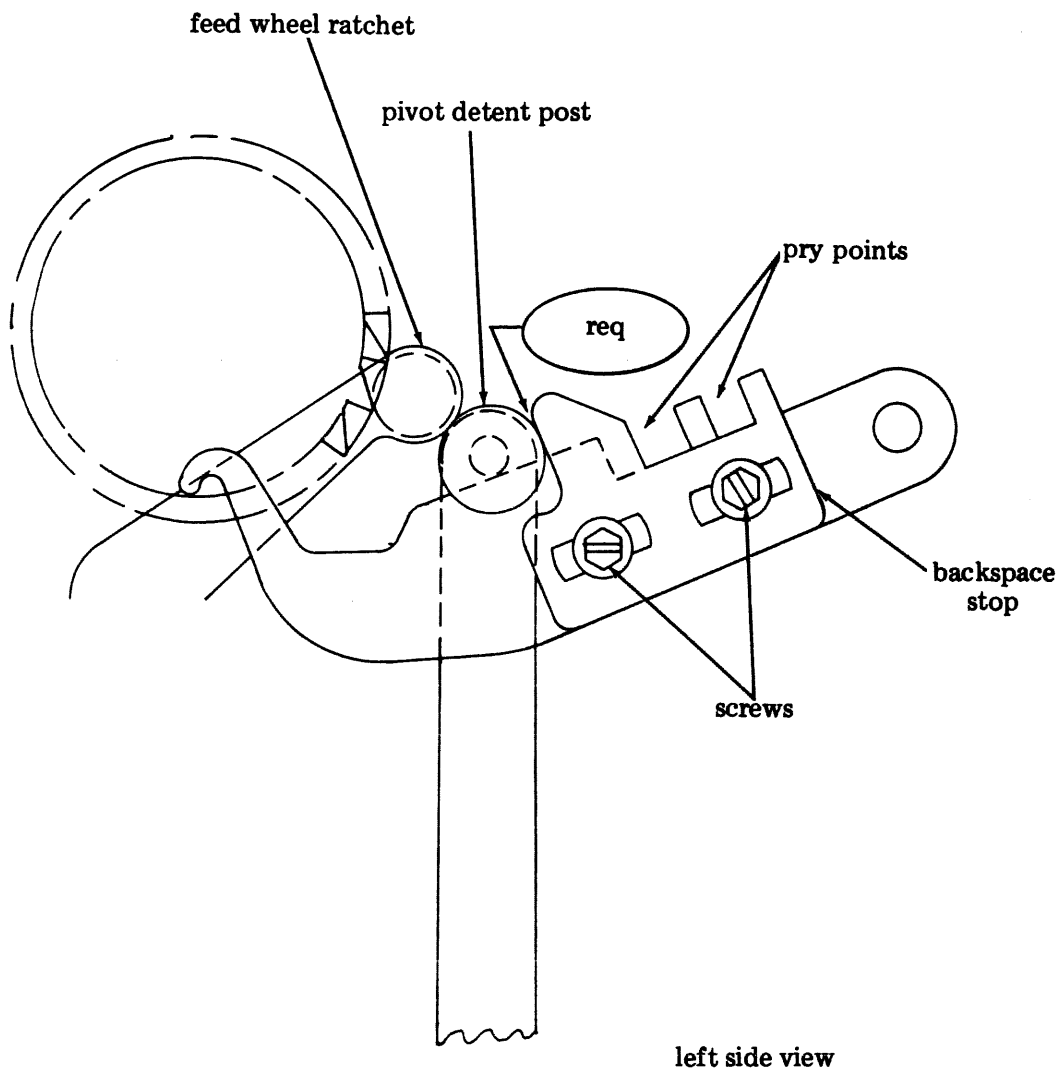


BACKSPACE STOP

- Turn punch OFF.
- Operate control arm to provide a backspace.
- Position feed wheel ratchet fully detented.

Requirement — Backspace stop against (lightly) the larger diameter of pivot detent post.

Adjust — Loosen screws.
Use pry points to position backspace stop.
Tighten screws.



MANUAL CONTROL

- Turn punch OFF.
- Position control arm to rest on latch bail pin.

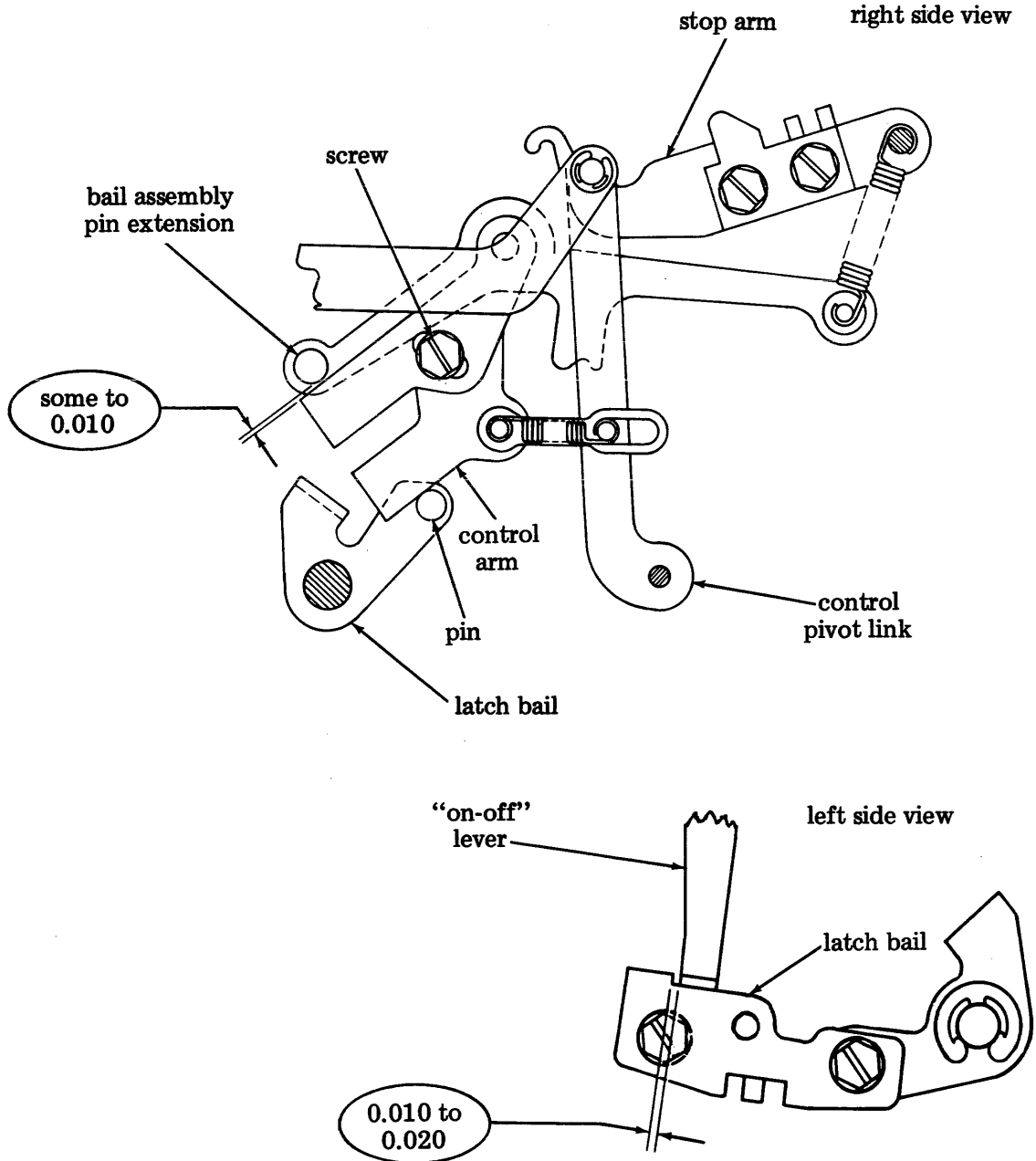
Requirement 1 — Some to 0.010 between control arm and bail assembly pin extension.

Adjust — Loosen screw.
Position control arm.
Tighten screw.

- Position control pivot link forward and against its stop arm.

Requirement 2 — 0.010 to 0.020 between “on-off” lever and latch bail.

Adjust — Loosen nut on eccentric post.
Rotate eccentric post.
Tighten nut.

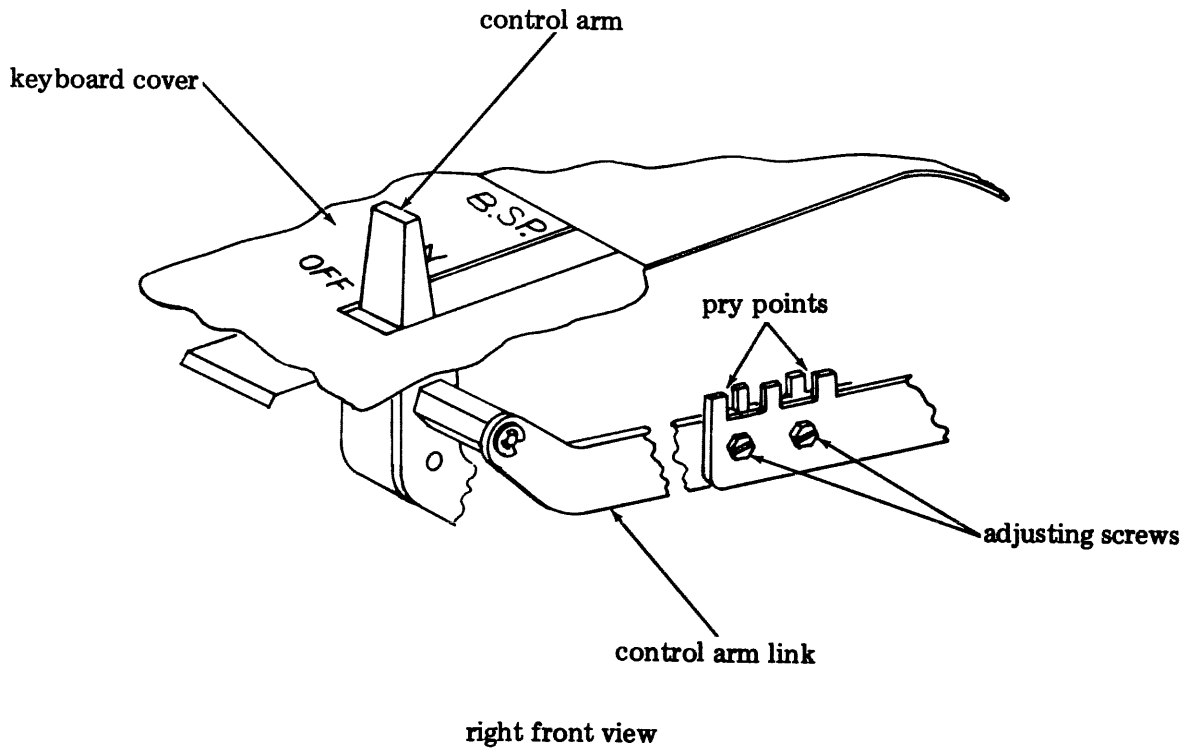


CONTROL ARM ALIGNMENT

- Turn punch OFF.
- Put keyboard hood on.

Requirement — Control arm aligned with OFF position marked on keyboard cover.

Adjust — Loosen adjusting screws.
Use pry points to position control arm link.
Tighten screws.



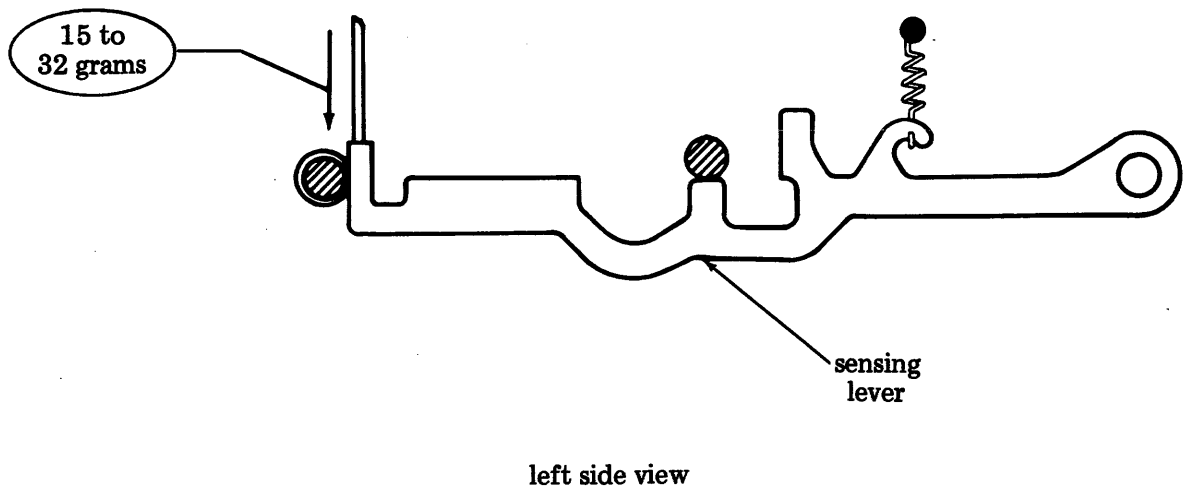
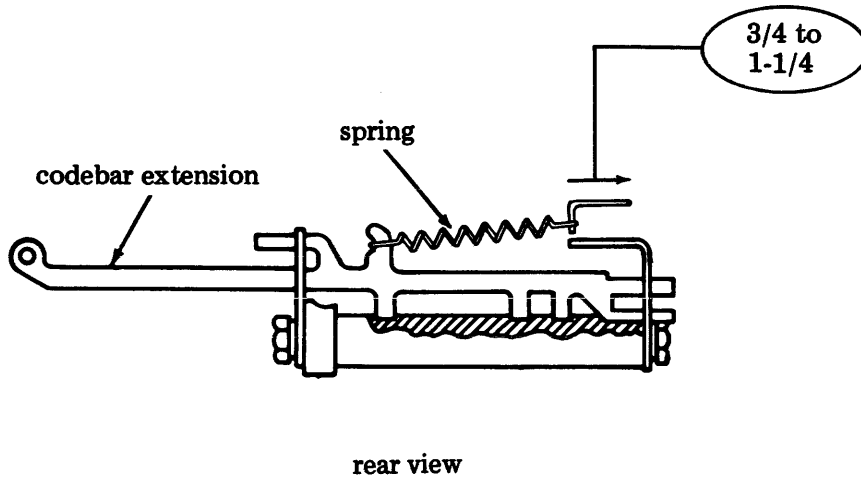
CODEBAR EXTENSION SPRINGS

- Latch (fully disengage) all typing unit clutches.

Requirement — $3/4$ to $1-1/4$ to pull codebar extension spring to its installed length.

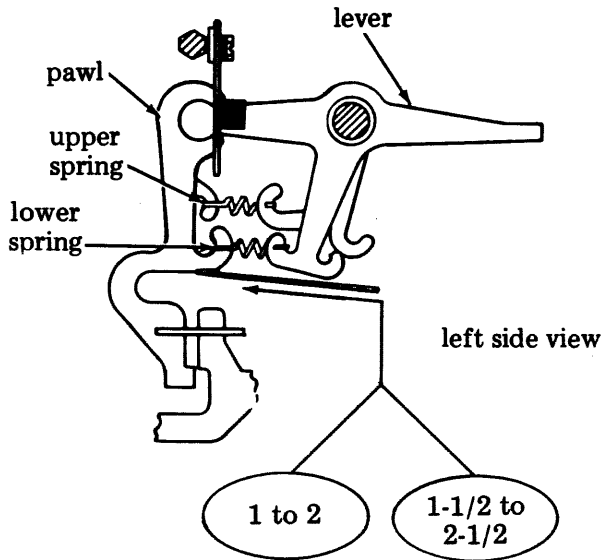
SENSING LEVER SPRINGS

Requirement — 15 to 32 grams to start sensing lever moving.



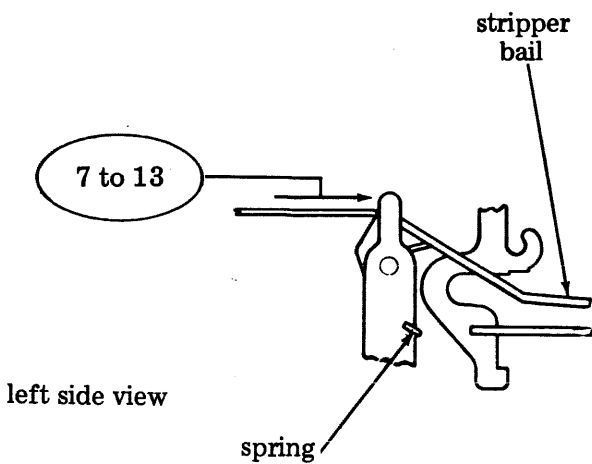
PAWL AND LEVER SPRINGS

Requirement — Upper spring: 1 to 2
Lower spring: 1-1/2 to 2-1/2 to start pawl moving.



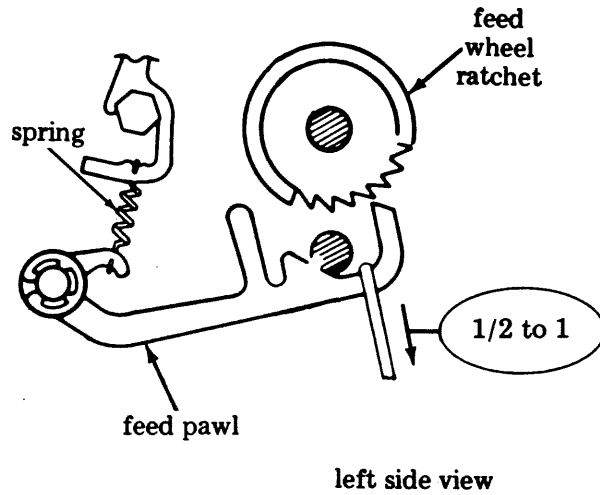
STRIPPER BAIL SPRING

Requirement — 7 to 13 to start stripper bail moving.



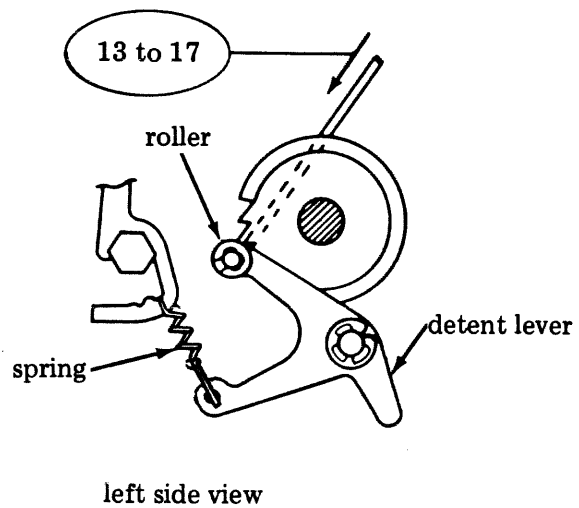
FEED PAWL SPRING

Requirement — 1/2 to 1 to start feed pawl moving.



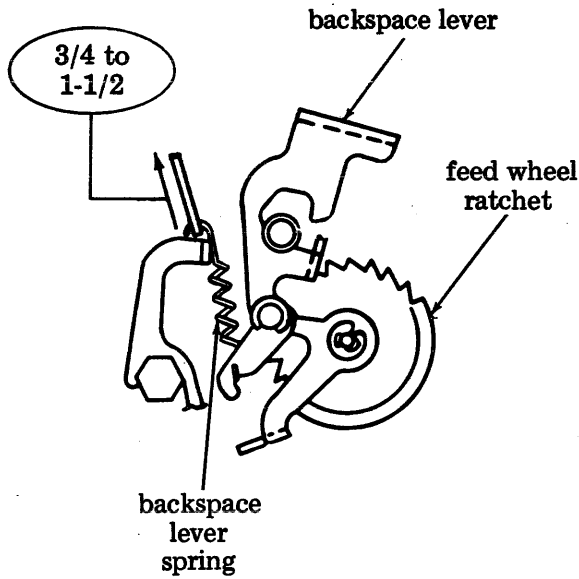
DETENT LEVER SPRING

Requirement — 13 to 17 to start detent lever moving (while pushing down on inside of lever at roller).



BACKSPACE LEVER SPRING

Requirement — 3/4 to 1-1/2 to pull backspace lever spring to its installed length.

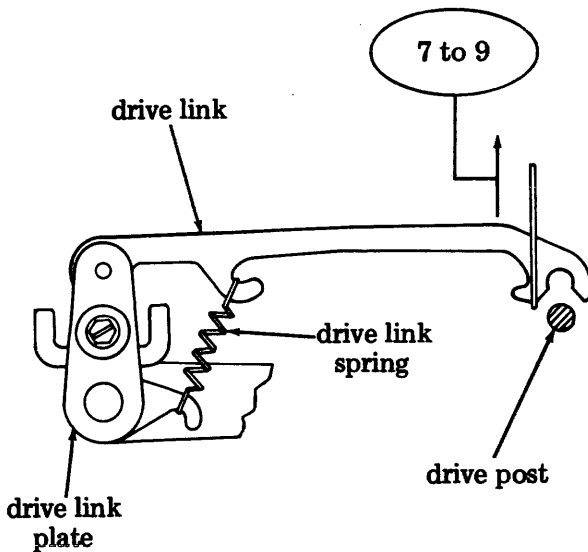


left side view

DRIVE LINK SPRING

- Latch (fully disengage) all typing unit clutches.
- Turn punch OFF.

Requirement — 7 to 9 to move drive link.

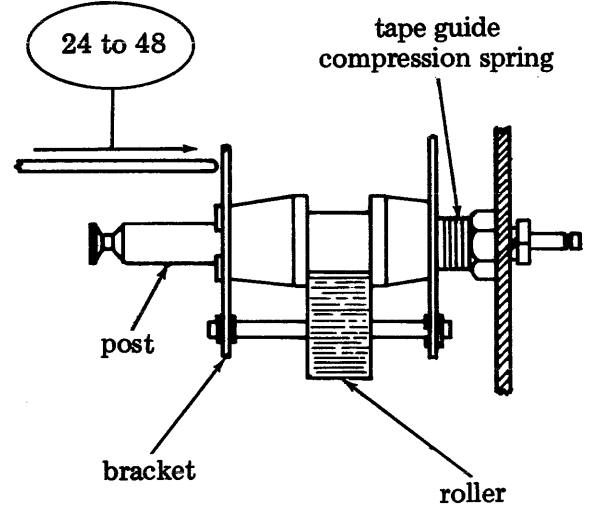


left side view

TAPE GUIDE COMPRESSION SPRING

- Remove tape guide tension spring.
- Raise roller slightly above feed wheel.

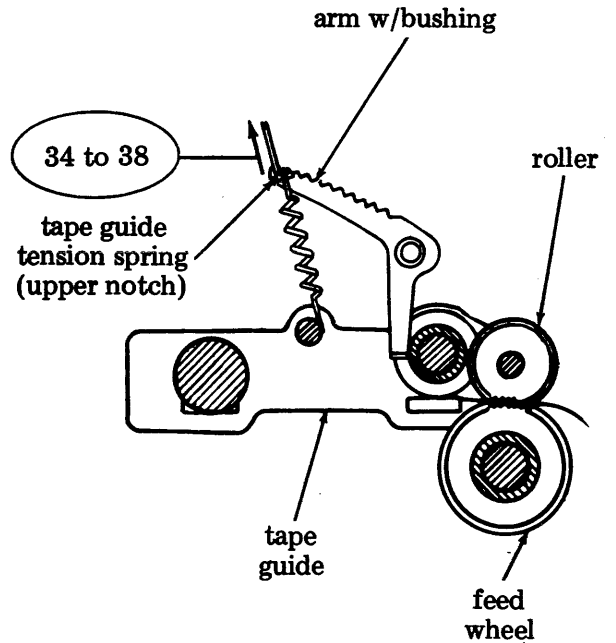
Requirement — 24 to 48 to start tape chute assembly moving.



front view

TAPE GUIDE TENSION SPRING

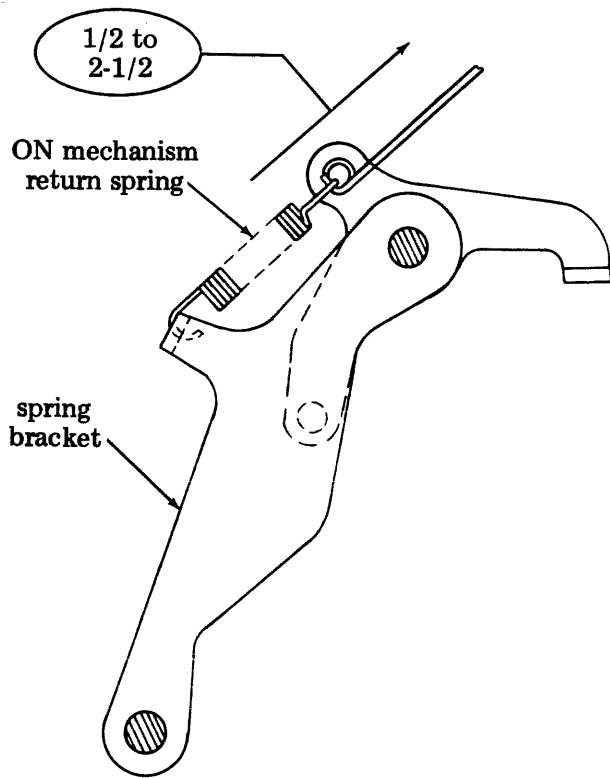
Requirement — 34 to 38 to pull tape guide tension spring to its installed (upper notch) length.



left side view

"ON" MECHANISM RETURN SPRING

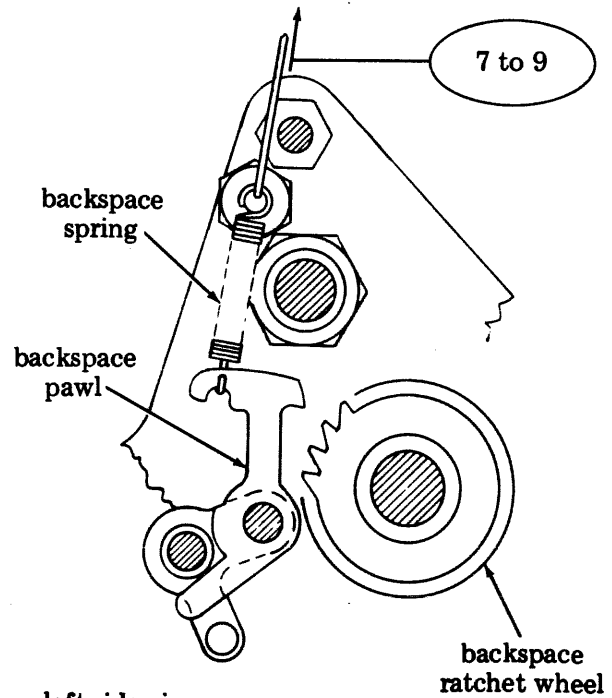
Requirement — 1/2 to 2-1/2 to pull ON mechanism return spring to its installed length.



right side view

BACKSPACE SPRING

Requirement — 7 to 9 to pull backspace spring to its installed length.



left side view

"ON-OFF" BAIL RETURN SPRING

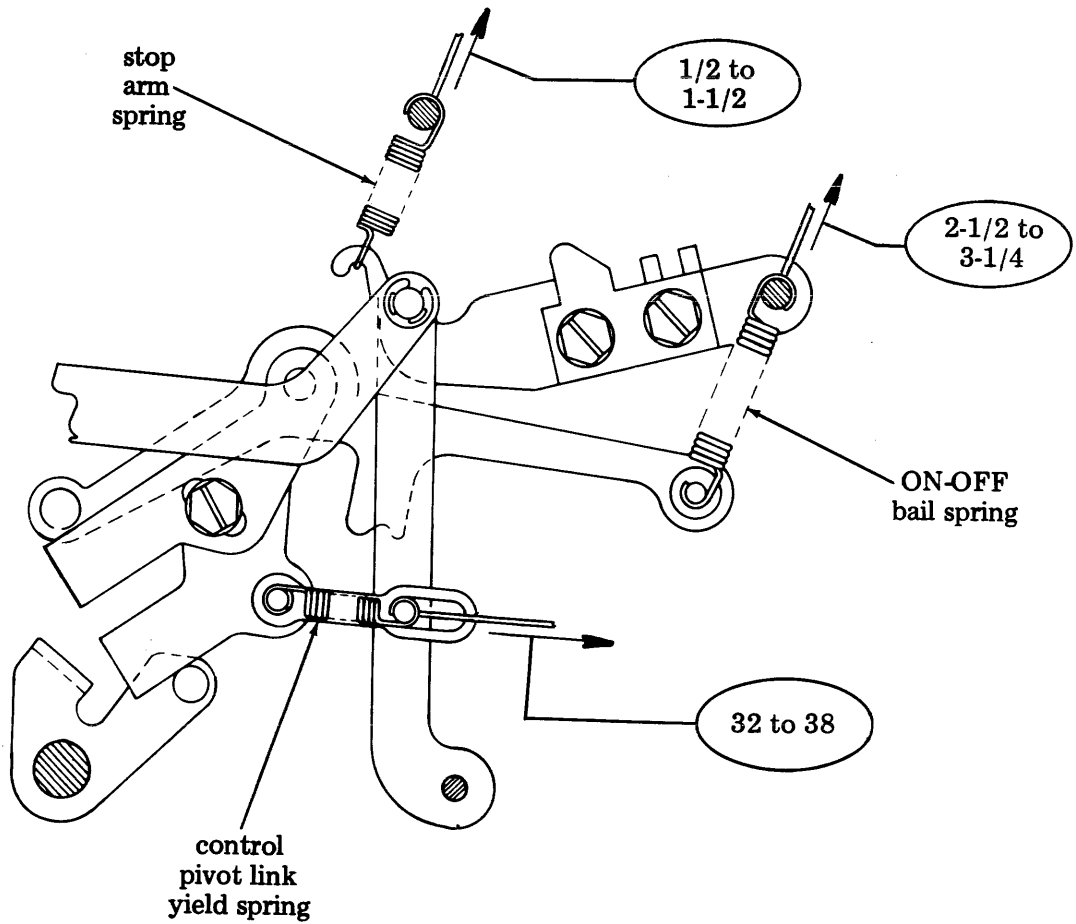
Requirement — 2-1/2 to 3-1/4 to pull ON-OFF bail spring to its installed length.

CONTROL PIVOT LINK YIELD SPRING

Requirement — 32 to 38 to pull control pivot link yield spring to its installed position.

STOP ARM SPRING

Requirement — 1/2 to 1-1/2 to pull stop arm spring to its installed length.



38 COVER AND TABLE

ASR

ADJUSTMENTS

CONTENTS	PAGE
1. GENERAL	1
2. BASIC UNIT	2
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Front cover	5
Front door	4
Keyboard	2
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Paper advance	6
Reader to cabinet	3
Rear door	4
Window	5
Table	7
Left door latch	8
Right door	7
Right door latch	7

wise, loosen screws or nuts friction tight while making an adjustment, then tighten after adjustment is made.

1.05 Special tools to perform adjustments are found in 185830 maintenance tool kit and are listed in Section 570-005-800TC. Check Section 574-426-702TC for approved disassembly and reassembly procedure of cover and parts.

NOTE: When a stop position is called for, the clutch shoe lever contacts a trip lever.

CAUTION: DISCONNECT POWER FROM SET BEFORE MAKING ANY ADJUSTMENTS.

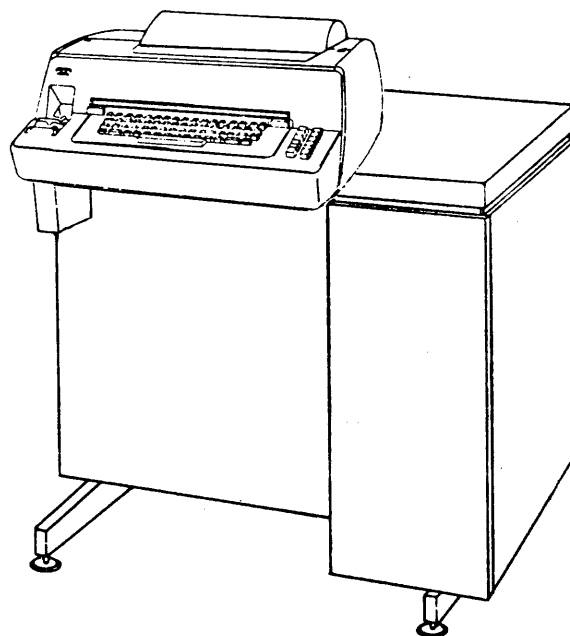
1. GENERAL

1.01 This section is issued to provide adjustment information for the Model 38 cover and table. The requirements apply to Automatic Send-Receive (ASR) Sets only (see figure).

1.02 After completing adjustments, place covers in their operating positions and replace any parts that were removed. All adjustment clearances are in inches and all spring tensions are in ounces unless otherwise specified.

1.03 In the adjustments covered in this section, location of clearances and position of parts are illustrated by line drawings. Requirements and procedures are set forth in the texts that accompany the line drawings.

1.04 References to left, right, front, or rear are to be considered as viewed from the normal operating position. Unless stated other-



38 ASR Set and Table

2. BASIC UNIT

Cover

KEYBOARD

- To make the following adjustments the reader should be mounted to the printer, keyboard to pan, and keyboard hood to keyboard.

Requirement — The keyboard top plate, reader top plate, and keyboard hood mating surfaces must be approximately flush and have equal spacing as gauged by eye.

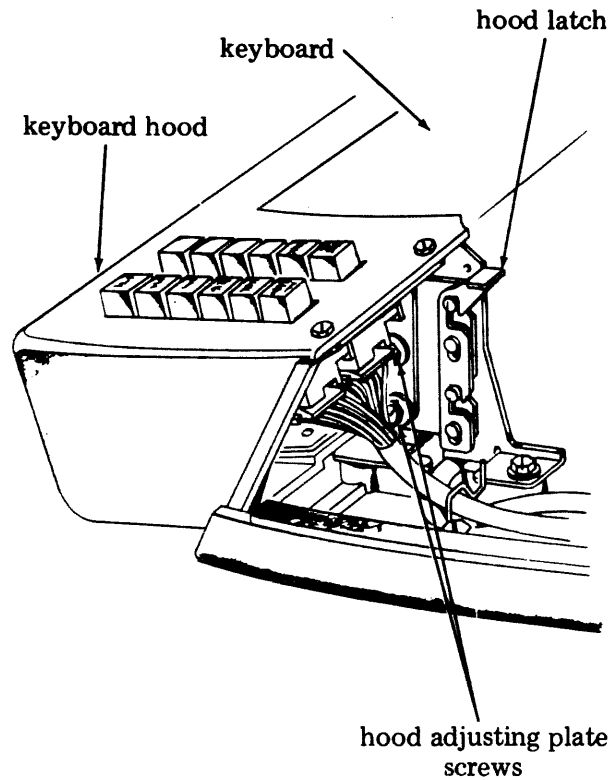
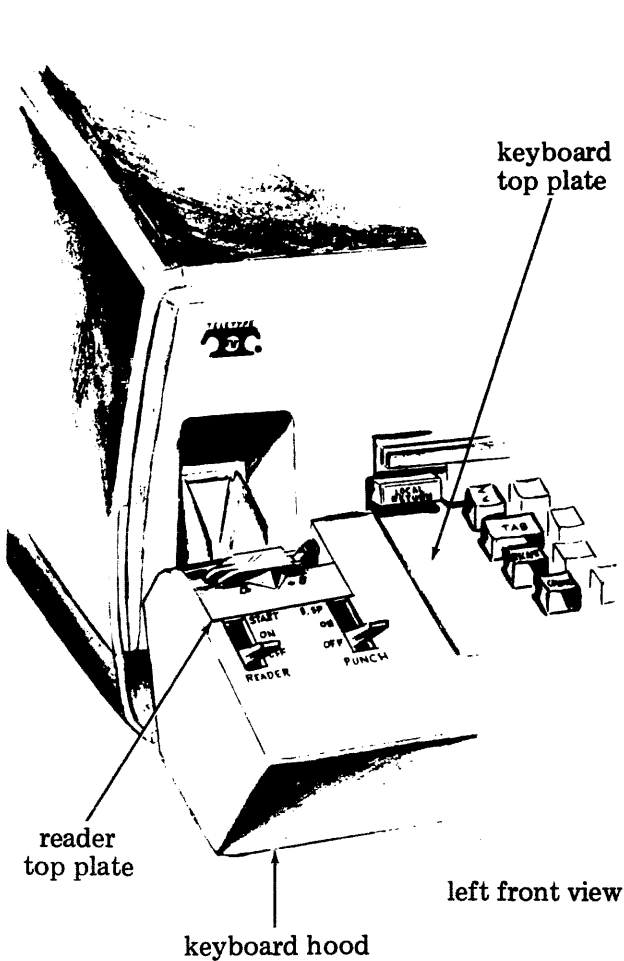
Adjust 1 — Loosen reader mounting bracket screws.

Move reader to satisfy requirement.
Tighten mounting screws friction tight.

Adjust 2 — Remove keyboard hood.

Loosen hood adjusting plate screws (right and left sides) friction tight.
Replace keyboard hood on keyboard and latch in place.

Position hood to meet requirement.
Tighten plate screws.



READER TO CABINET

Requirement 1 — Reader top plate must be approximately flush with top surface and rear of keyboard hood.

The gap between reader top plate and keyboard hood should be equal at all points (gauge by eye).

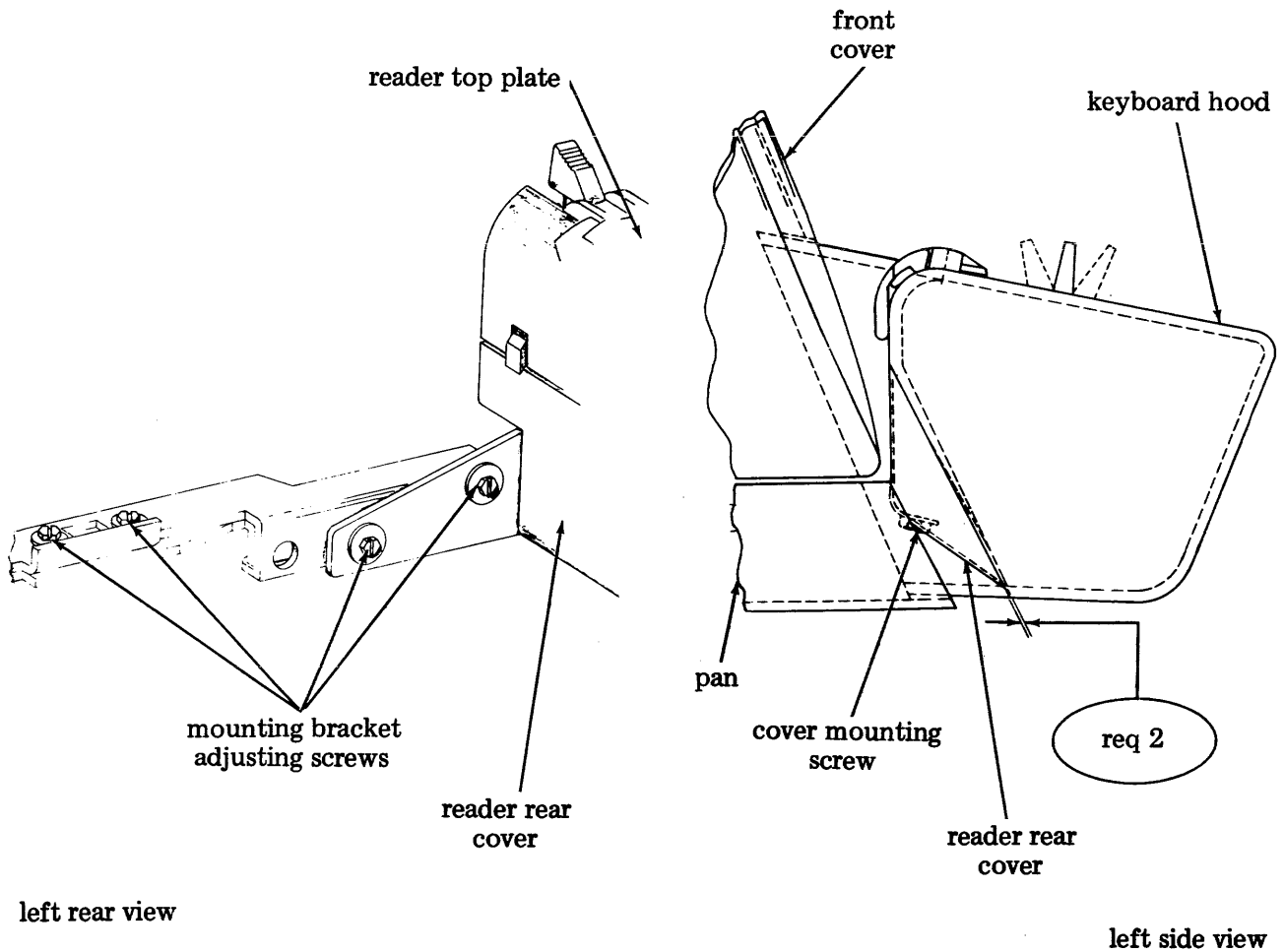
Adjust 1 — Loosen reader mounting bracket adjusting screws (4) friction tight. Position reader to satisfy requirement. Tighten adjusting screws.

NOTE: The above alignment may have to be made over after some operating time has past, due to relaxing of the shock mounts which hold the printer in place on the pan.

Requirement 2 — Minimum gap between reader rear cover and keyboard cover.

Adjust 2 — Loosen rear cover mounting screw friction tight. Position rear cover to satisfy requirement 2. Tighten cover screw.

CAUTION: MAKE SURE REAR COVER DOES NOT TOUCH ANY READER MOVING PARTS.



REAR DOOR

Requirement — The gap between rear door and cover should be equal and flush at all points with the cover top (gauge by eye).

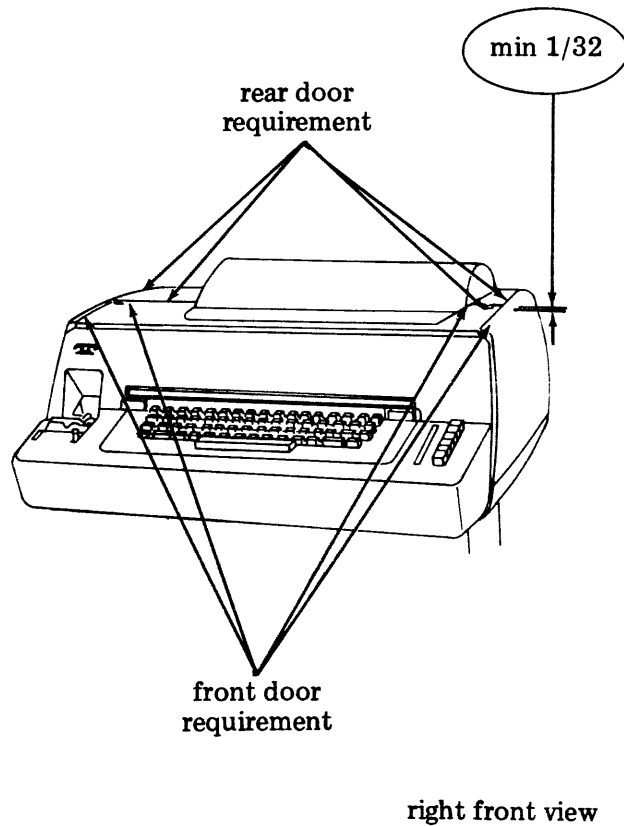
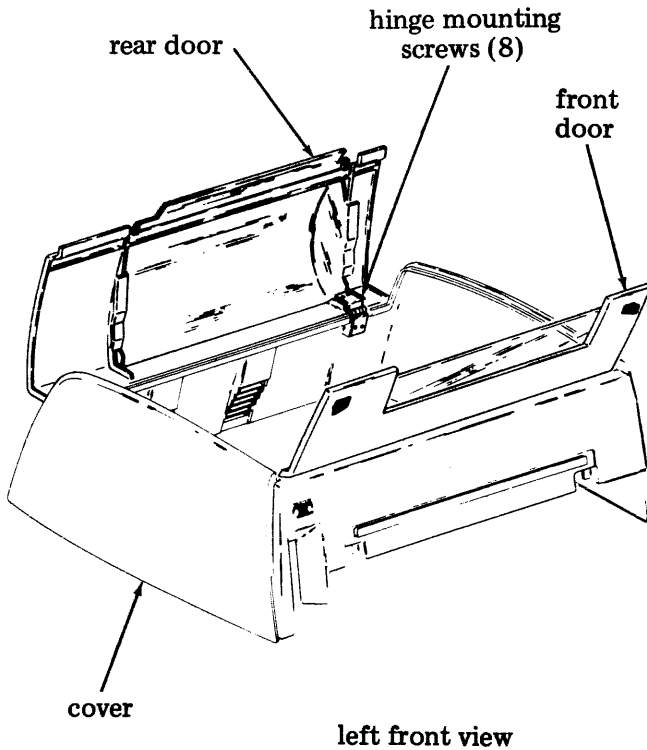
Adjust — Loosen eight rear door hinge mounting screws friction tight. Position door to meet requirement. Tighten hinge mounting screws.

FRONT DOOR

Requirement — The gap between front door and cover should be equal and flush at all points with the cover top (gauge by eye).

A minimum gap of 1/32 should be held between the front and rear doors.

Adjust — Loosen eight front door hinge mounting screws friction tight. Position door to meet requirement. Tighten hinge mounting screws.



FRONT COVER

Requirement — Center front cover to the set cover, leaving a minimum gap between front cover and front door.

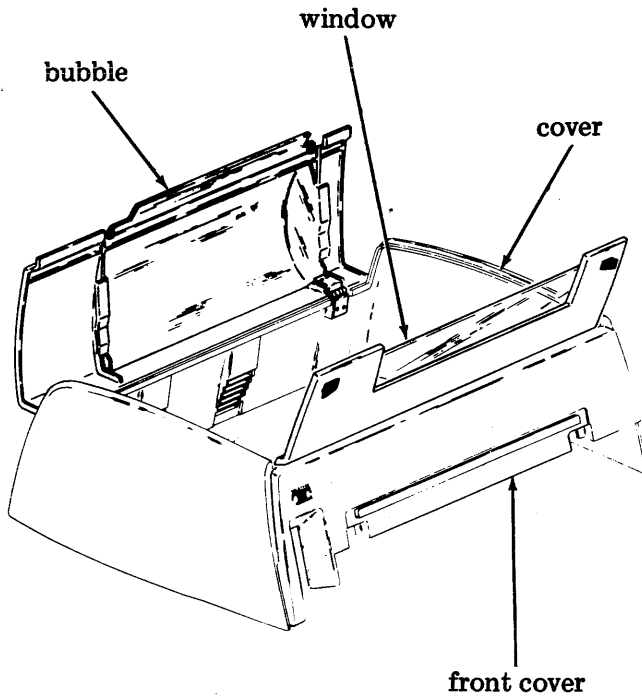
Adjust — Loosen seven front cover hinge mounting screws friction tight. With front door closed, position front cover to meet requirement. Operate front door while checking for interference with front cover. Tighten mounting screws.

WINDOW

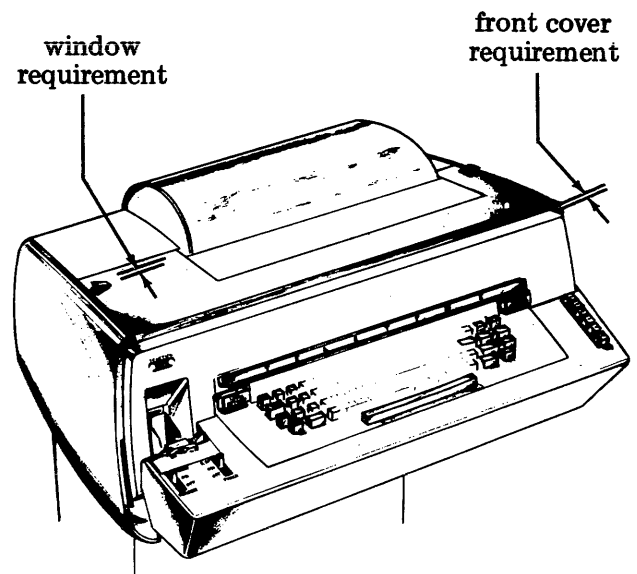
Requirement — Leave minimum gap between front window and plastic bubble without restricting page copy exit.

Adjust — Loosen five window clamp screws friction tight. Position window to meet requirement. Tighten five clamp screws.

NOTE: *Opening at page copy exit should be large enough (depending on number of copies) to let page copy move through without jamming.*



left front view



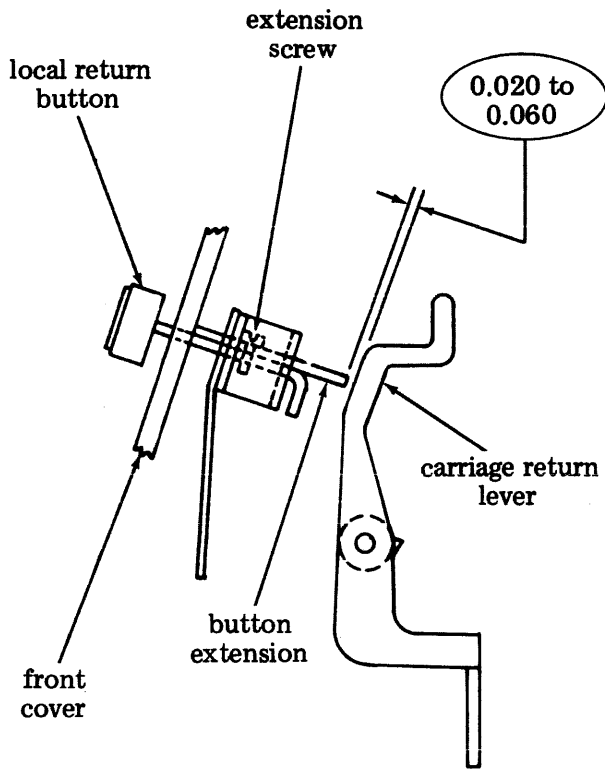
left front view

LOCAL RETURN

- With printer in stop position.

Requirement — 0.020 to 0.060 between carriage return lever and local return button extension.

Adjust — Loosen extension screw.
Position extension to meet requirement.
Tighten clamp screw.



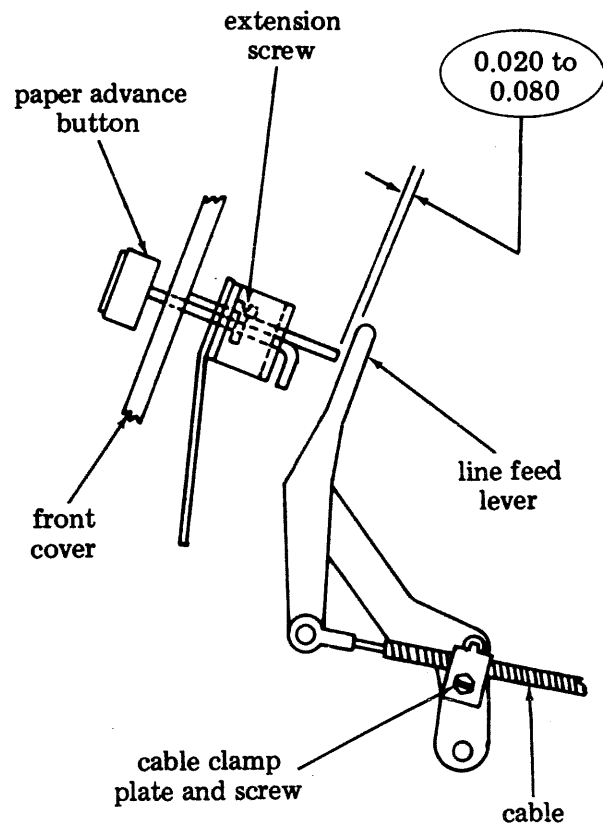
right side view

PAPER ADVANCE

- With printer in stop position.

Requirement — 0.020 to 0.080 between line feed lever and paper advance button extension.

Adjust — Loosen extension screw.
Position extension to its approximate center position.
Tighten clamp screw.
Loosen cable clamp plate screw.
Position cable and line feed lever to meet requirement.
Tighten clamp screw.



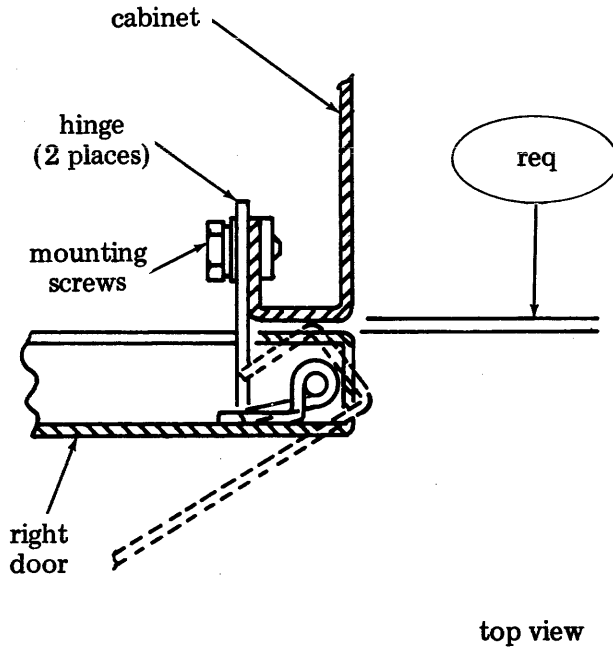
right side view

Table

RIGHT DOOR

Requirement — The right door should pivot on its hinges without binding or rubbing on the cabinet.

Adjust — Loosen four hinge mounting screws friction tight.
Position door to meet requirement.
Tighten mounting screws.

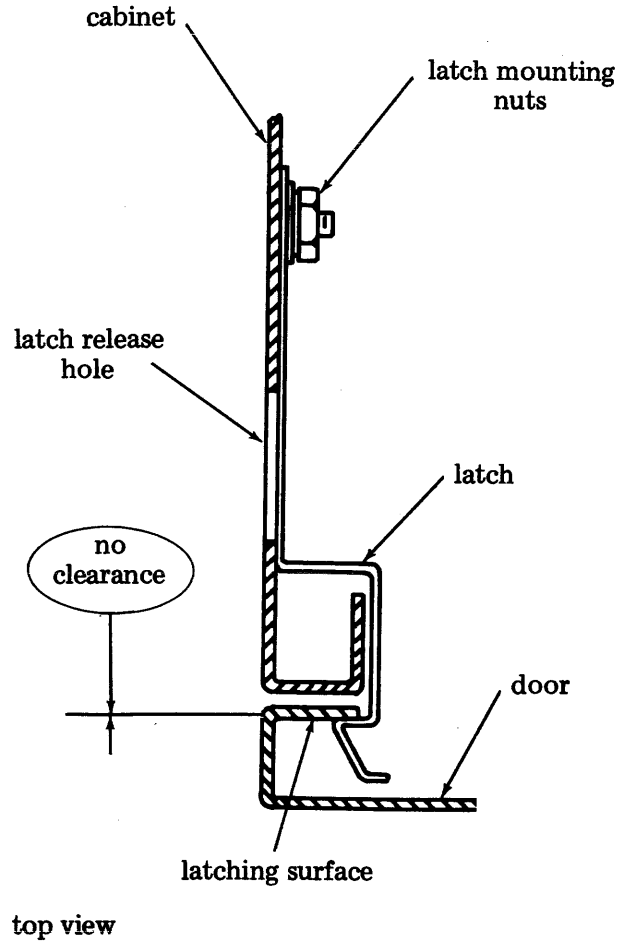


RIGHT DOOR LATCH

- Right door in closed position.
- Rubber bumpers (2) should be contacting cabinet (may be slightly compressed).

Requirement — No clearance between latch and latching surface.

Adjust — Loosen two latch mounting nuts.
Position latch to meet requirement.
Tighten mounting nuts.

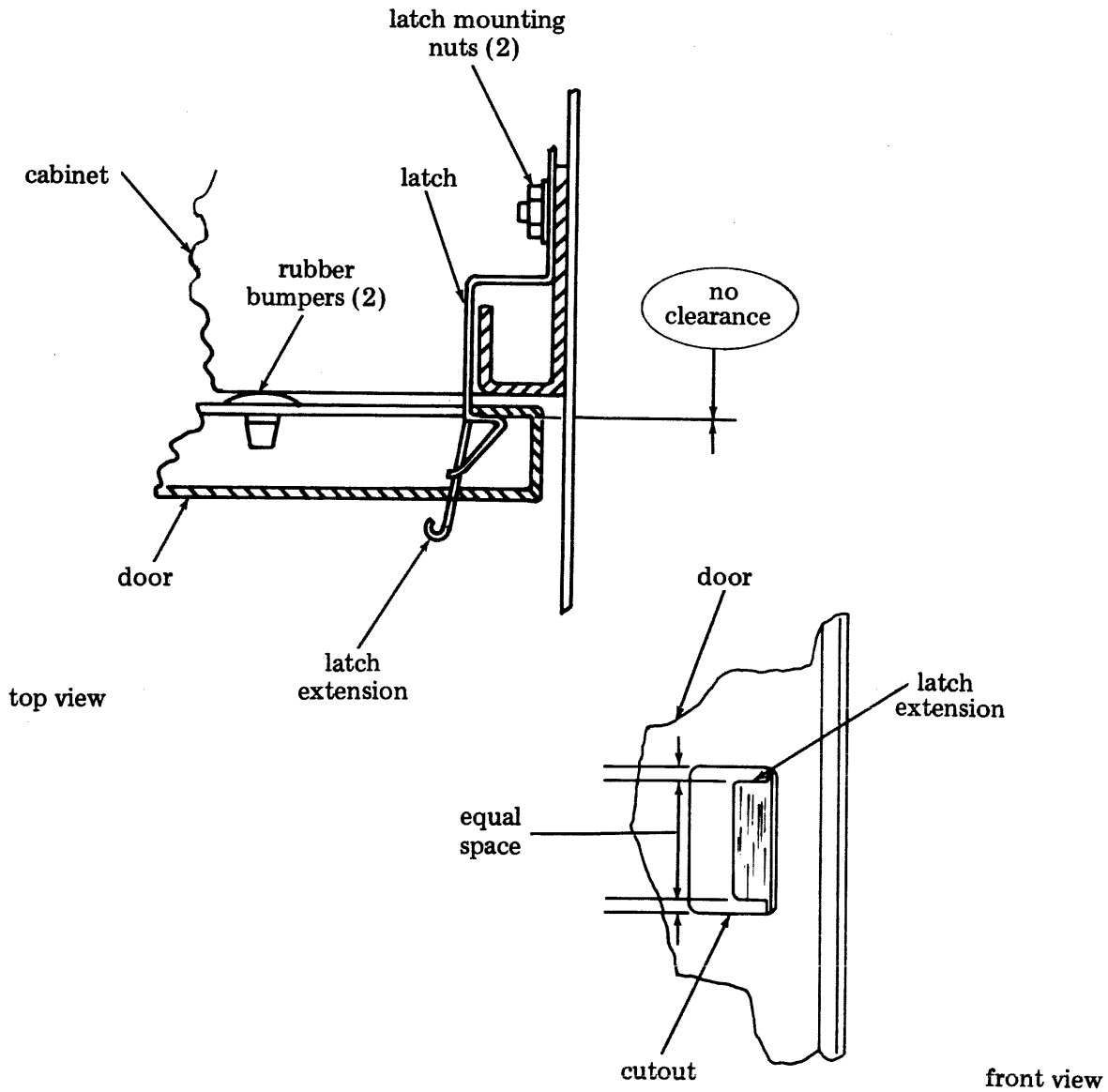


LEFT DOOR LATCH

- Left door in closed position.
- Rubber bumpers (2) on door in contact with cabinet (may be slightly compressed).

Requirement — Latch extension centered in latch cutout.
No clearance between latch and latching surface.

Adjust — Loosen two latch mounting nuts.
Position latch to meet requirement.
Tighten mounting nuts.



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MAINTENANCE MANUAL 343B
VOLUME 2