33 TAPE PUNCH

ADJUSTMENTS

CONTENTS PAGE

1. GENERAL

1.01 This section provides adjustment and maintenance information for the 33 tape punch. It is reissued to provide exclusive coverage of the 33 tape punch and to update the section. Since this is a general revision, marginal arrows ordinarily used to indicate changes and additions are omitted.

1.02 Figure 1 shows the tape punch area where the punch adjustments and spring tension checks are made.

1.03 In the adjustments covered in this section, 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 TP185830 Maintenance Tool Kit and are listed in Section 570-005-800.

1.04 The sequence in which the adjustments appear should be followed when a complete readjustment of the tape punch is undertaken. No adjustment should be undertaken without completely understanding the procedure and the requirements. Read a procedure all the way through before making an adjustment or checking a spring tension.

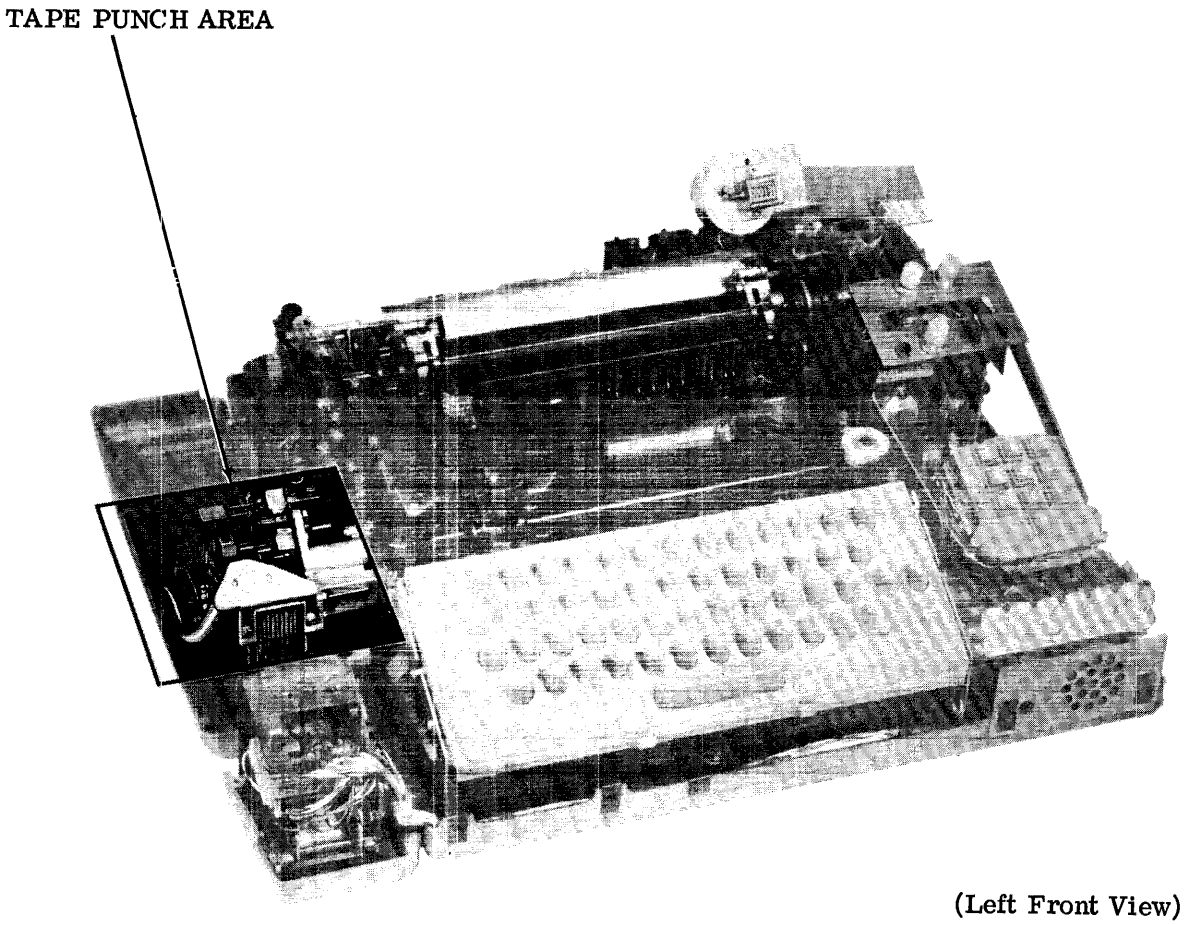


Figure 1 - Tape Punch Area

Note: Remove all electrical power sources from unit before checking or performing any adjustments.

1.05 References to left, right, front, or rear, etc consider the tape punch to be viewed from a position where the tape guide assembly faces up and the backspace lever is located to the viewer's left.

1.06 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.

1.07 If the tape punch is removed from the typing unit to facilitate making an adjustment and then replaced, recheck any adjustment that may have been affected. Also, if parts are removed from the tape punch to facilitate making an adjustment, be sure that they are replaced. Recheck any adjustment that may have been affected by the removal of the parts.

1.08 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 springs that directly affect the operation of the tape punch are measured, however, others may 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 satisfied.

Note 1: Use spring scales which are listed in the Maintenance Tools Section 570-005-800.

Note 2: Spring tensions may be checked in any sequence.

1.09 Certain adjustments require that the tape punch be either "on" or "off." These conditions can be identified as follows:

(a) "Off" condition

(1) Manual (Punch) Controls: A tape punch is "off" when the control lever is in its clockwise detented position and fully engages the drive post.

(2) Automatic (Punch) Controls: An "automatic" tape punch is "off" when the associated typing unit is in the stop condition and the On-Off bail assembly is latched by the latch bail.

Note 1: If the automatic punch is equipped with the "On Lock" option, the "unlock" button must be depressed to enable the On-Off bail assembly to be latched.

Note 2: If the automatic punch is equipped with the interlock mechanism, the nonprint codebar must be in its unoperated position — solenoid not energized.

(b) "On" condition

(1) Manual (Punch) Controls: A tape punch is "on" when the control lever is detented in its counterclockwise position and the drive post is fully engaged by the drive link.

(2) Automatic (Punch) Controls: An automatic tape punch is "on" when the On-Off bail assembly is in its unlatched counterclockwise position.

1.10 With the tape punch and typing unit assembled together, all adjusting 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.

Note: When the typing unit is in the stop condition and the punch is "on," the tape punch is said to be in the off position.

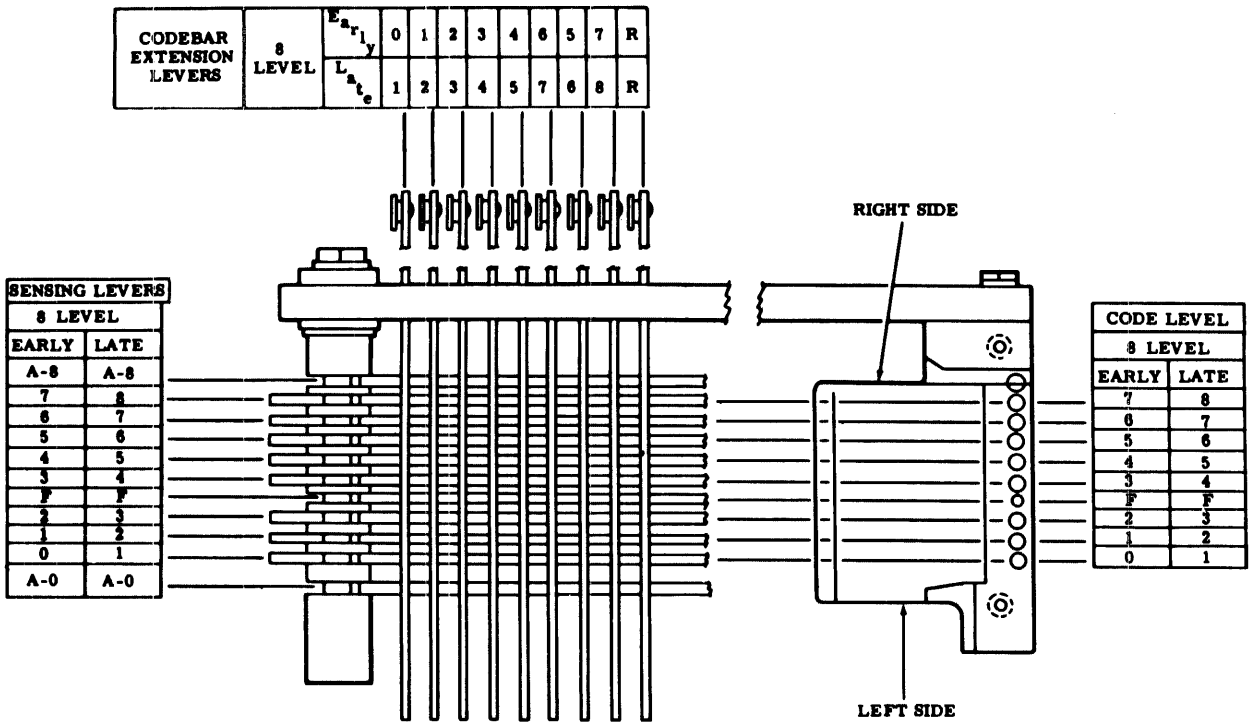
1.11 To place the typing unit in the stop condition, hold the selector armature in its attracted (frontward) position. Rotate the main shaft clockwise (as viewed from the left) until all clutches are fully disengaged as instructed in 1.12.

1.12 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.

Note 1: The clutch stop position is that position where a shoe lever contacts a trip lever.

Note 2: If the shaft is turned by hand, a clutch will not fully disengage upon reaching a stop position. To fully disengage a clutch, 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.

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.



(Top View)

Figure 2 - Tape Punch Code Level Cross Reference Chart

1.13 Manual Operation: To manually operate the typing unit, place it in the stop condition as instructed in 1.11. 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.

1.14 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 code combination is 1--45-78, strip the push levers from the 2, 3, and 6, selector levers.

1.15 The relationship between code levels, sensing levers, and codebar extensions is illustrated in Figure 2.

1.16 General Maintenance Principles

(a) Lubrication instructions and intervals are given in the appropriate lubrication sections.

(b) To maintain operating effectiveness of the equipment, it is recommended that certain parts be replaced at uniform intervals. Indicated below is the recommended overhaul interval as recorded in typing unit operating hours.

Operating Speed	Overhaul Interval	Estimated Service Life
100 wpm or 75 wpm	1500 hrs*	4500 hrs*

*Typing unit operating hours

Replacement parts are available in overhaul maintenance kits.

2. BASIC UNIT

2.01 Tape Punch Area

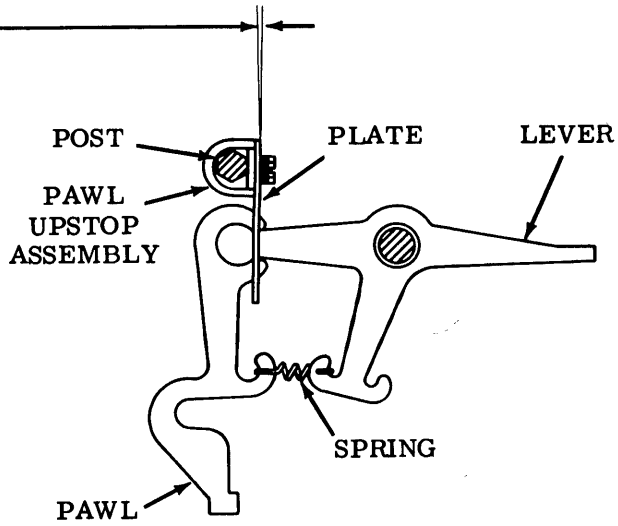
Note 1: These adjustments are to be made only if these areas have been disturbed during disassembly.

Note 2: Prior to making adjustments, remove the chad extension. Reassemble when the adjustments are completed.

PAWL UPSTOP ASSEMBLY — PRELIMINARY

Requirement
The pawl upstop assembly should be positioned so that it is vertical or within 2° clockwise from vertical, as gauged by eye.

To Adjust
Loosen the screw which secures the pawl upstop assembly post to the tape punch casting and position pawl upstop assembly. Tighten screw.



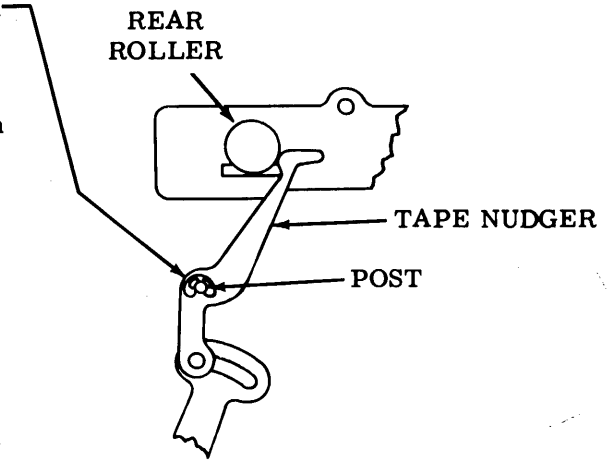
(Left Side View)

TAPE NUDGER

Note 3: This adjustment applies only to tape punch castings which have an elongated tape nudger post mounting hole.

Requirement
The post should be in its most rearward position.

To Adjust
Loosen the screw which secures the post to the tape punch casting and position the post. Tighten screw.



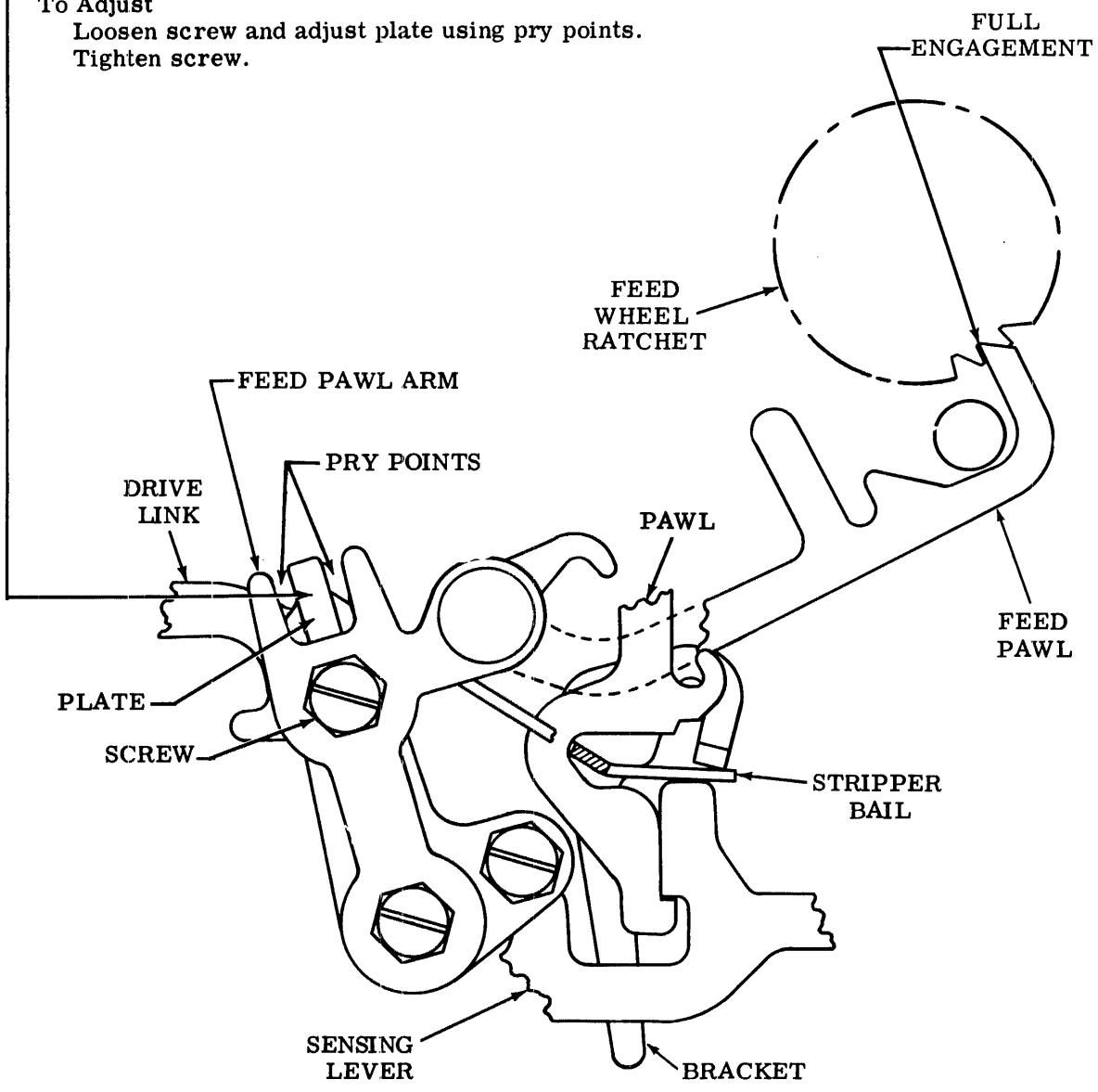
(Left Side View)

2.02 Tape Punch Area (continued)

FEED WHEEL RATCHET AND PAWL — PRELIMINARY

Requirement
The plate should be in middle of slot located in feed pawl arm, as gauged by eye.

To Adjust
Loosen screw and adjust plate using pry points. Tighten screw.



(Left Side View)

2.03 Tape Punch Area (continued)

STRIPPER BAIL UPSTOP

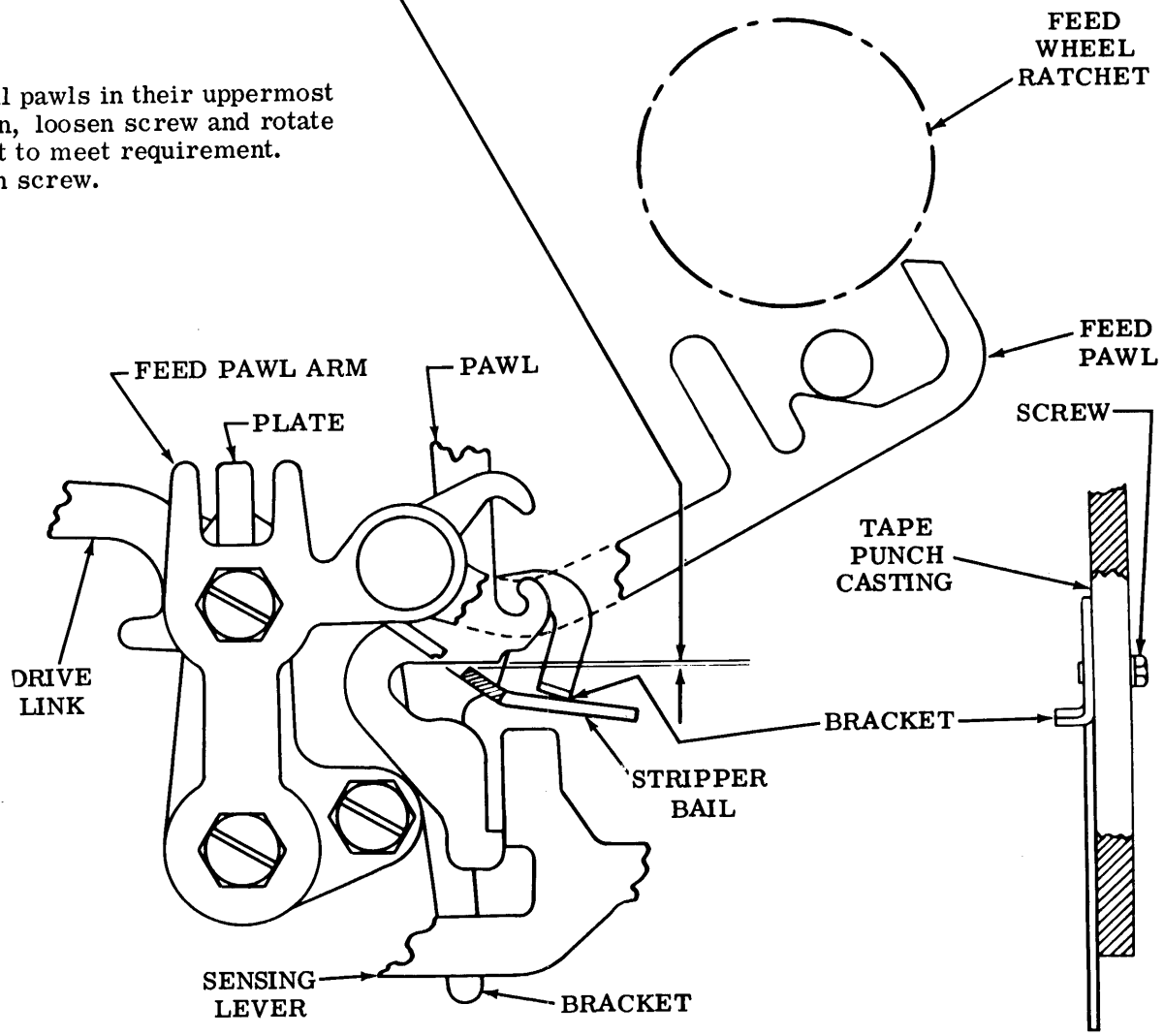
Requirement

With the tape punch "off" and all pawls in their uppermost position, the stripper bail should clear bottom corner of the stripping surface of lowermost pawl by

Min some---Max 0.012 inch

To Adjust

With all pawls in their uppermost position, loosen screw and rotate bracket to meet requirement. Tighten screw.



(Left Side View)

(Front View)

2.04 Tape Punch Area (continued)

Note 1: For the adjustments which follow, the tape punch should be mounted to the typing unit. For instructions, see section titled "33 Tape Punch, Disassembly and Reassembly."

Note 2: The following Tape Punch Area 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, TAPE NUDGER, FEED WHEEL RATCHET AND PAWL — PRELIMINARY, and STRIPPER BAIL UPSTOP.

TAPE PUNCH DRIVE

To Check

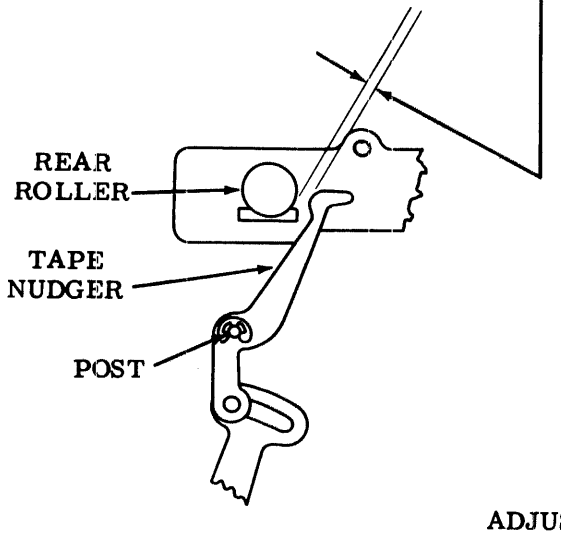
With no tape in the tape punch and with the tape punch "on," manually rotate the main shaft until the stripper bail is in its most forward position. Take up rear roller play toward rear and tape nudger play in a clockwise direction.

Requirement

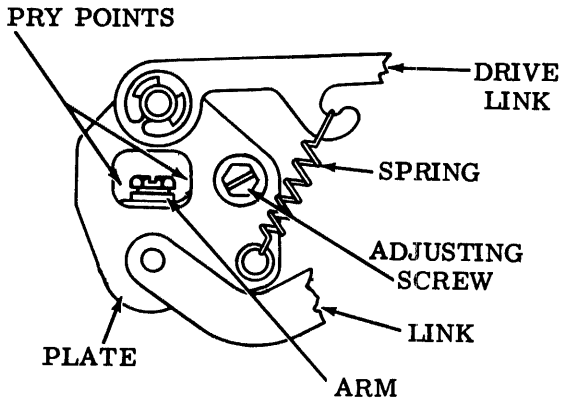
Min 0.030 inch---Max 0.080 inch at point of least clearance between rear roller and tape nudger.

To Adjust

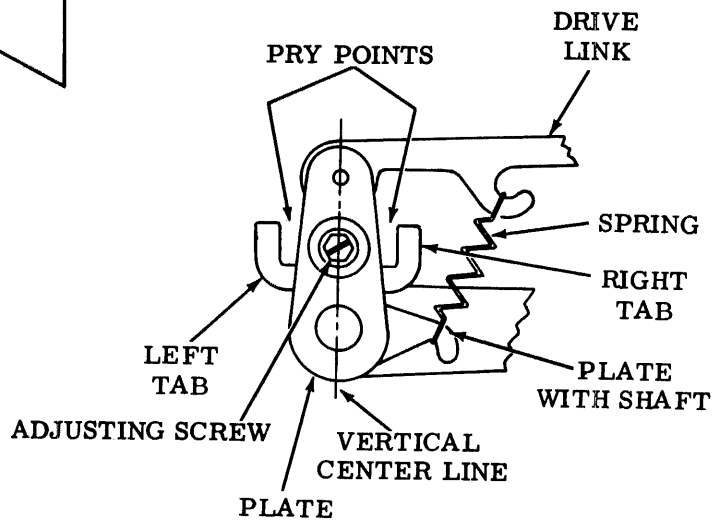
Loosen adjusting screw and use pry points to position plate. Tighten screw.



EARLY OR LATE DESIGN
(Left Side View)



EARLY DESIGN
(Left Side View)



LATE DESIGN
(Left Side View)

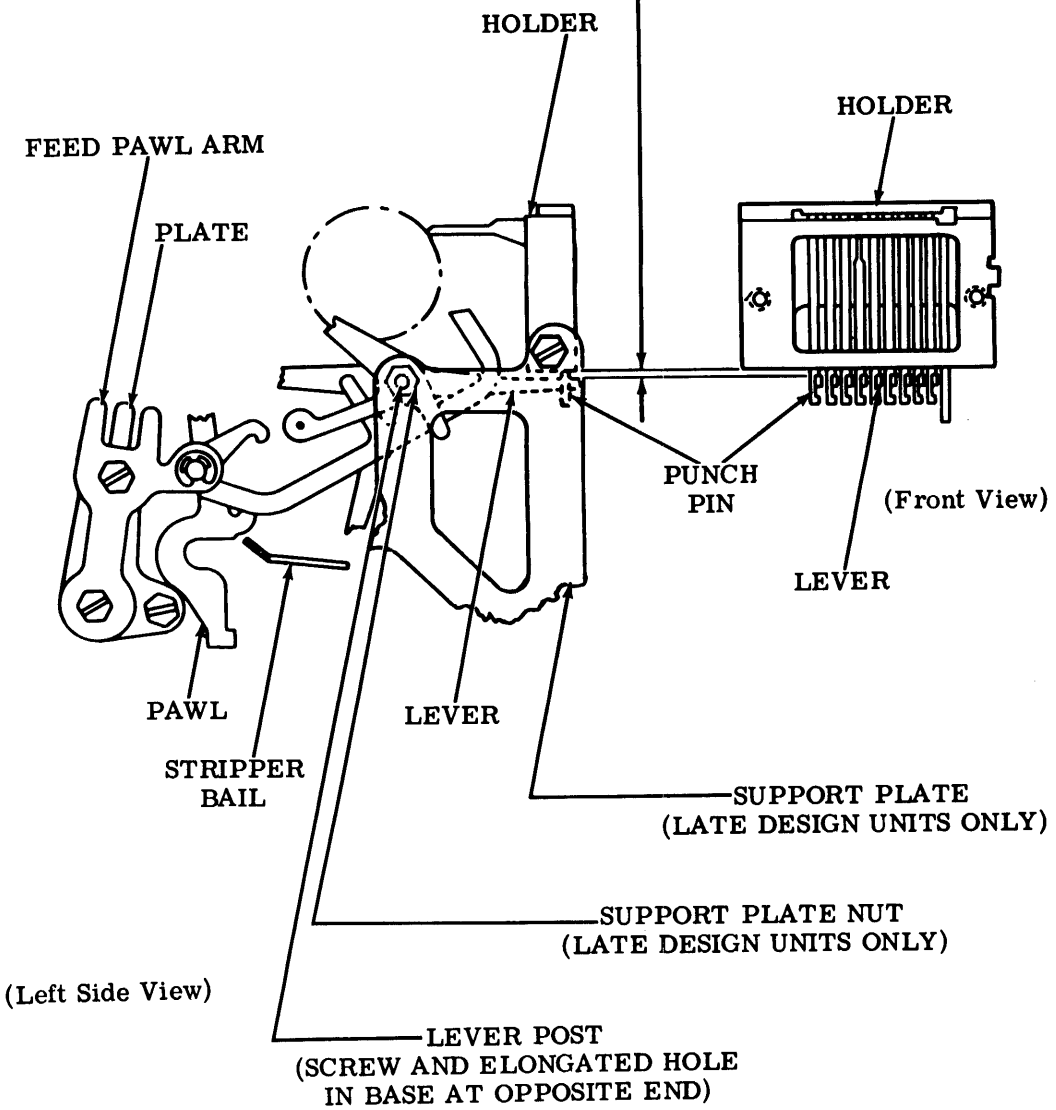
2.05 Tape Punch Area (continued)

PUNCH PENETRATION

To Check
With the tape punch "on," set up an all-marking code combination in the selector. Manually rotate the main shaft until the stripper bail is in its most forward position.

Requirement
—Min 0.017 inch---Max 0.037 inch between bottom surface of holder and top surface of any lever.

To Adjust
With code lever post mounting screw (and support plate nut on late design units) friction tight, position post within the elongated base hole (and support plate hole — late design units). Tighten screw and nut.



2.06 Tape Punch Area (continued)

PAWL UPSTOP ASSEMBLY — FINAL

To Check
With the tape punch "on," set up an all-marking code combination in the selector. Manually rotate the main shaft until the stripper bail is in its rearmost position.

Note 1: For tape punches equipped with the answer-back blocking option or automatic controls, use the following "To Check" procedure:

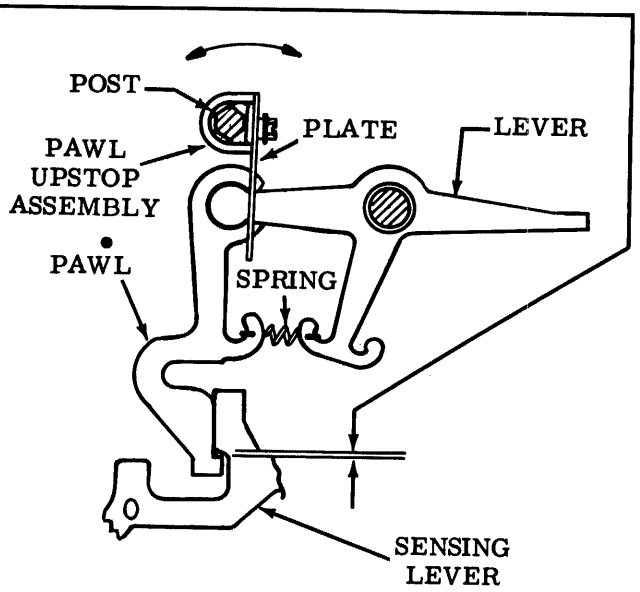
To Check
With the tape punch "on," set up the code combination in the selector that will cause the special feature to operate. Manually rotate the main shaft until the stripper bail is in its rearmost position. Check requirement (1). Then, set up an all-marking code combination in selector. Manually rotate the main shaft until the stripper bail is in its rearmost position. Check requirement (2).

(1) Requirement
Min 0.005 inch---Max 0.020 inch between the leftmost sensing lever (Figure 2) and its associated pawl.

Note 2: For tape punches equipped with automatic controls, the requirement will be checked between the second from the left sensing lever (Figure 2) and its associated pawl.

Note 3: There should also be some clearance between the rightmost sensing lever (Figure 2) and its associated pawl.

Note 4: "Some clearance" can be determined by feeling movement when pressing down on a sensing lever while holding its assembled lever in its most downward position.



(Left Side View)

(2) Requirement
Some clearance between the feed lever and its associated pawl and each sensing lever and its associated pawl.

To Adjust
Loosen the screw which secures the pawl upstop assembly post to the tape punch casting. Provide proper clearance by rotating the pawl upstop assembly. Tighten screw. Recheck requirement (1) above and refine if necessary. Remake STRIPPER BAIL UPSTOP (Tape Punch Area) adjustment.

CAUTION: EXERCISE CARE AND SEE THAT THE PLATE OF THE PAWL UPSTOP ASSEMBLY ALWAYS GUIDES THE PAWL AND LEVER SIMULTANEOUSLY. AVOID ROTATING PLATE IN A COUNTERCLOCKWISE DIRECTION FROM ITS VERTICAL POSITION IF POSSIBLE.

2.07 Tape Punch Area (continued)

FEED WHEEL RATCHET AND PAWL — FINAL

To Check

With no tape in the tape punch and with the tape punch "on," set up an all-marking code combination in the selector. Manually rotate the main shaft until the stripper bail is in its rearmost position. Take up all play in stripper bail toward the front.

Requirement

With feed wheel ratchet in its fully detented position

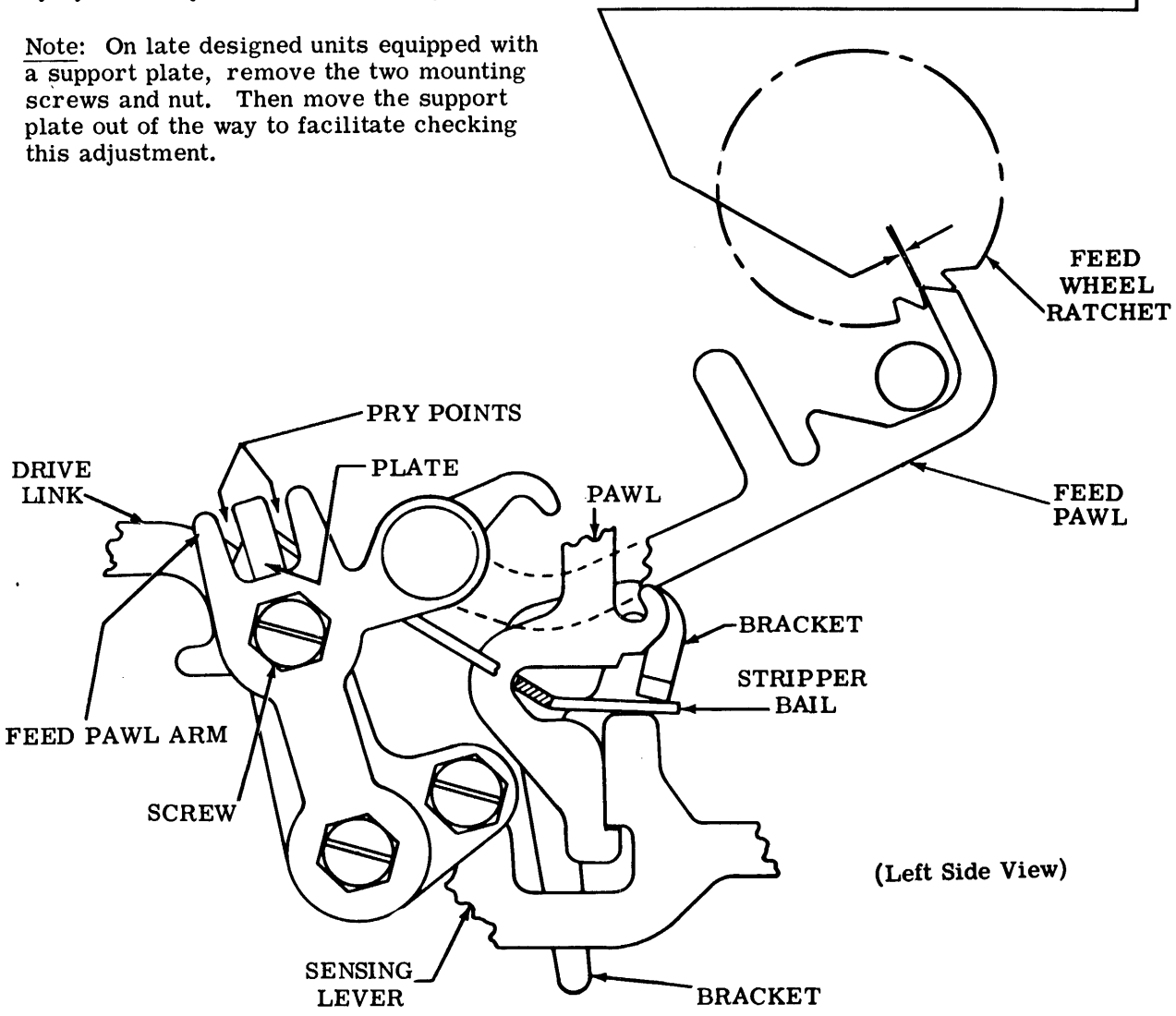
Min some---Max 0.005 inch

between the feed pawl and feed wheel ratchet tooth.

To Adjust

Loosen screw and position plate w/bushing using pry points. Tighten screw. Backspace feed wheel ratchet one full revolution, one tooth at a time, using backspace lever. Check each tooth to see if the requirement is met. Gauge by eye. Readjust where necessary.

Note: On late designed units equipped with a support plate, remove the two mounting screws and nut. Then move the support plate out of the way to facilitate checking this adjustment.



2.08 Tape Punch Area (continued)

TEN CHARACTERS PER INCH

Note: From left to right, with the smooth side of TP156011 gauge up, there are six holes in line — five holes with 0.072-inch diameters and one hole with a 0.086-inch diameter.

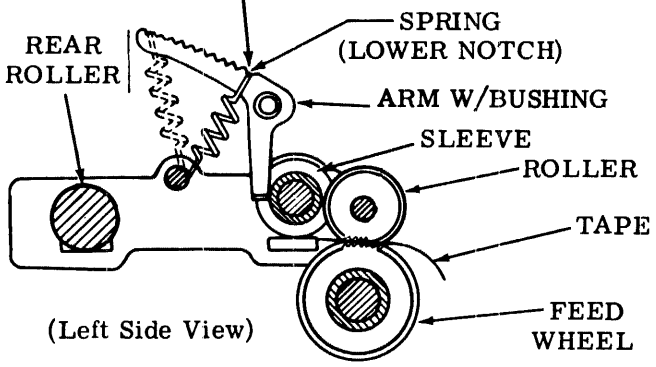
To Check

Position one end of spring to lower notch of arm w/bushing. Operate the typing unit under power and perforate an alternate R and "hyphen" code combination in approximately 8 inches of tape. Tear the 8-inch length of punched tape from the tape punch and place it to the smooth side of TP156011 gauge. Concentrically align a no. 2 code hole of the punched tape with the first 0.072-inch diameter hole of TP156011 gauge.

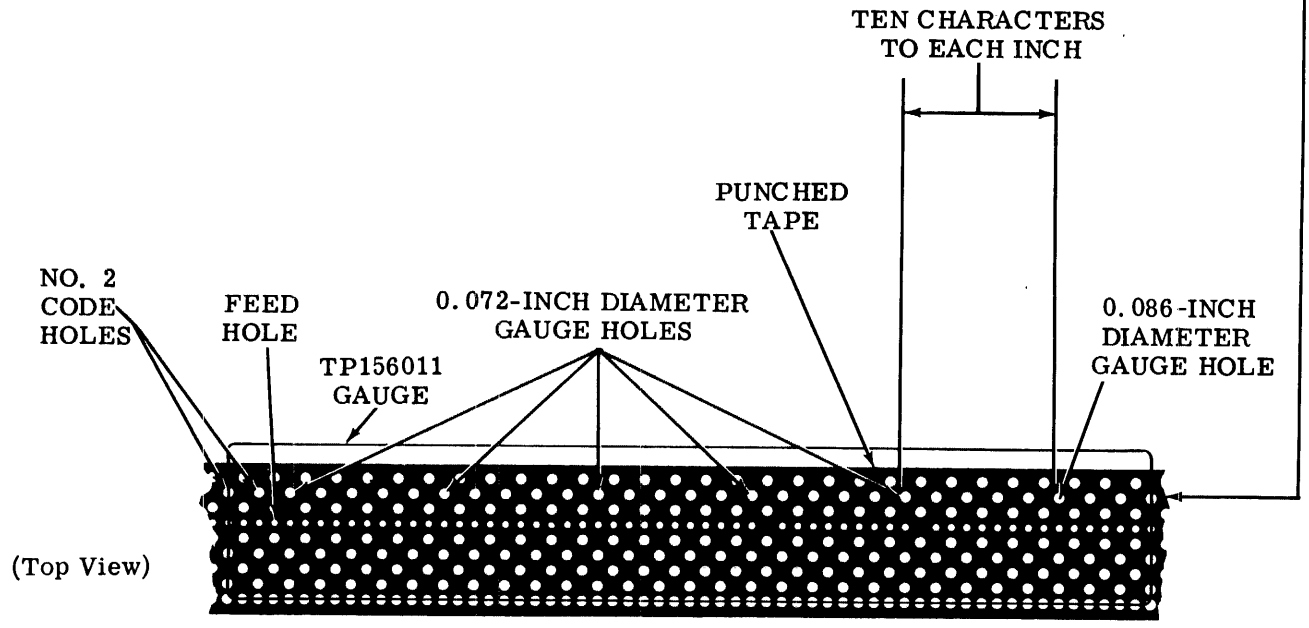
(1) Requirement
The four remaining 0.072-inch diameter gauge holes should be visible through corresponding no. 2 code holes in the punched tape.

(2) Requirement
The no. 2 code hole which corresponds with the 0.086-inch diameter gauge hole should lie entirely within the perimeter of that guage hole.

To Adjust
Position spring up arm w/bushing, notch by notch, until requirement is met.



(Left Side View)



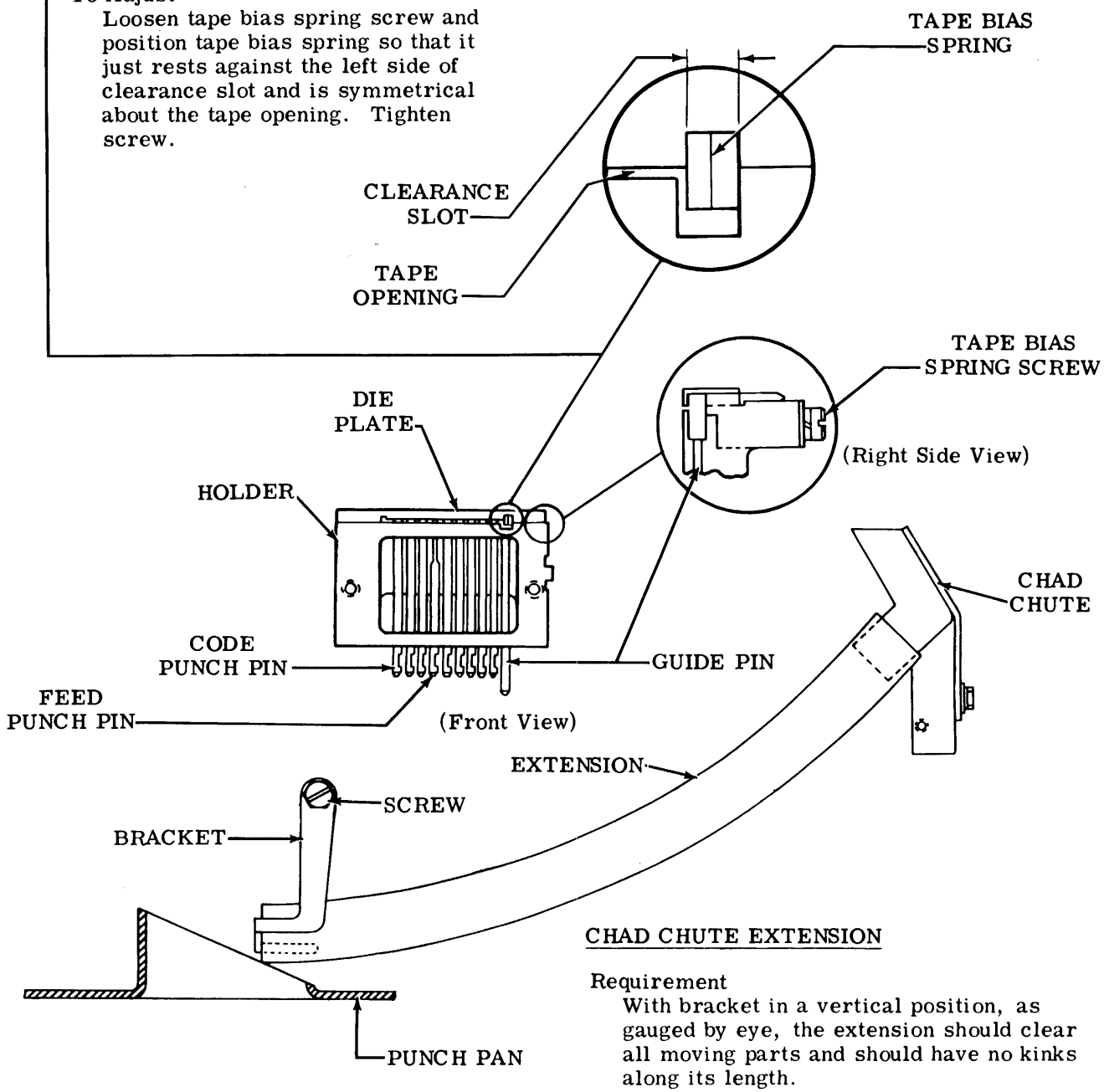
(Top View)

2.09 Tape Punch Area (continued)

TAPE BIAS SPRING

Requirement
With tape removed from the tape punch, tape bias spring should rest against side of die plate and should be symmetrical about the tape opening, as gauged by eye.

To Adjust
Loosen tape bias spring screw and position tape bias spring so that it just rests against the left side of clearance slot and is symmetrical about the tape opening. Tighten screw.



CHAD CHUTE EXTENSION

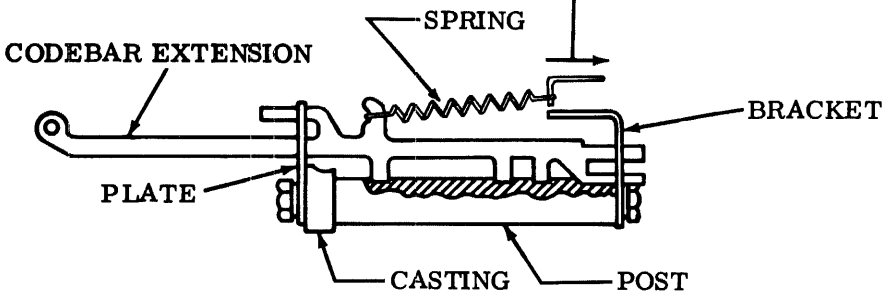
Requirement
With bracket in a vertical position, as gauged by eye, the extension should clear all moving parts and should have no kinks along its length.

To Adjust
Loosen screw and position bracket to meet requirement. Tighten screw.

2.10 Tape Punch Area (continued)

CODEBAR EXTENSION SPRINGS

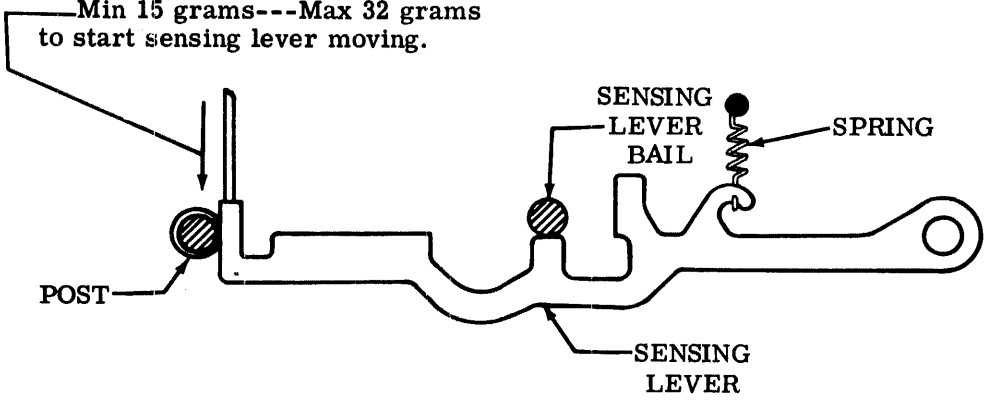
Requirement
With the typing unit in stop condition
Min 3/4 oz---Max 1-1/4 oz
to pull spring to its installed length.



(Rear View)

SENSING LEVER SPRINGS

Requirement
With the tape punch in off position
Min 15 grams---Max 32 grams
to start sensing lever moving.



(Left Side View)

2.11 Tape Punch Area (continued)

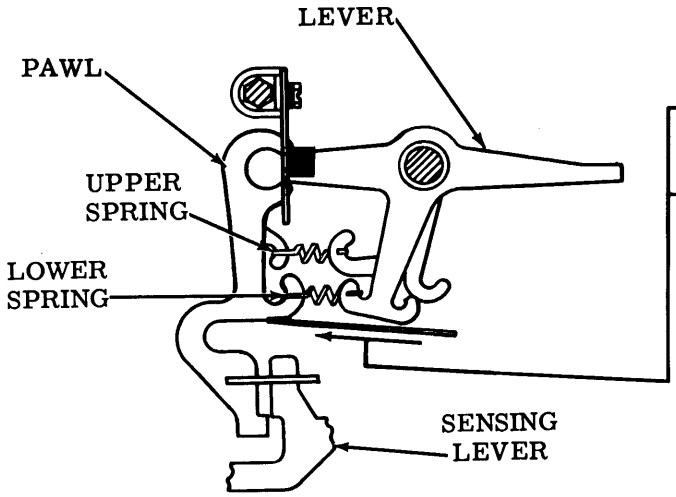
PAWL AND LEVER SPRINGS

Requirement
With the tape punch "off"

Upper spring
Min 1 oz---Max 2 oz

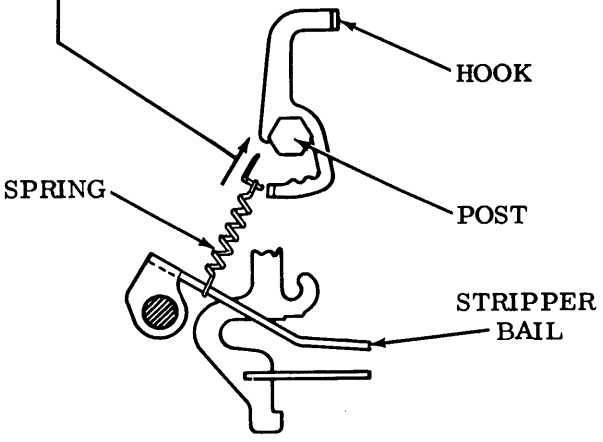
Lower spring
Min 1-1/2 oz---Max 2-1/2 oz

to start pawl moving.



STRIPPER BAIL SPRING

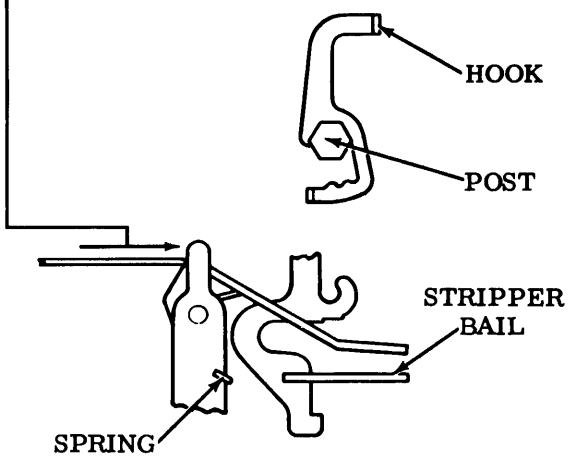
Requirement
With the tape punch in off position
Min 12 oz---Max 15 oz
to pull spring to its installed length.



EARLY DESIGN

STRIPPER BAIL SPRING

Requirement
With tape punch in off position
Min 7 oz---Max 13 oz
to start the stripper bail moving.



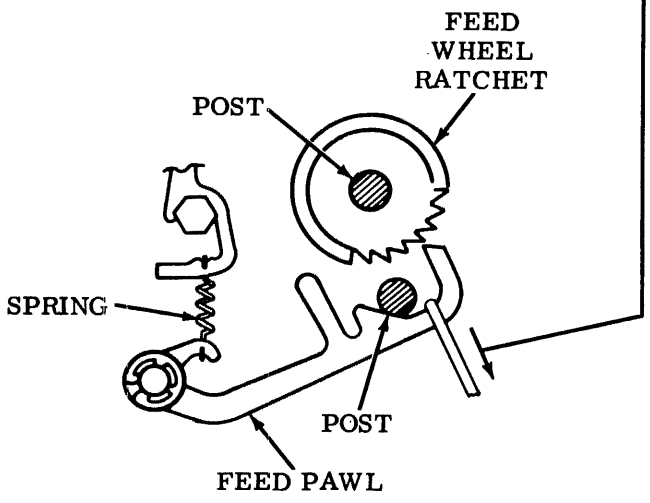
LATE DESIGN

(Left Side Views)

2.12 Tape Punch Area (continued)

FEED PAWL SPRING

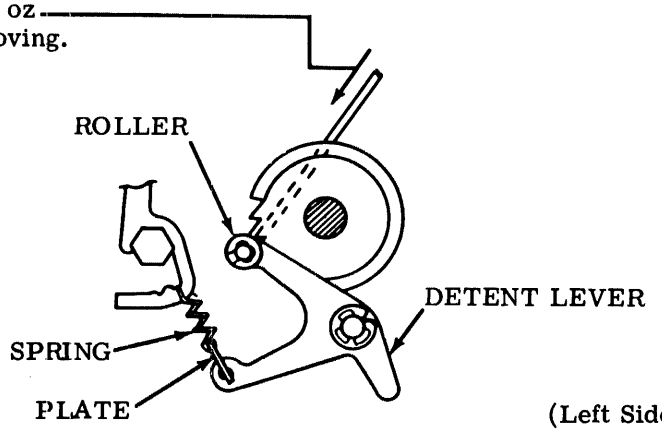
Requirement
With tape punch in off position
Min 1/2 oz---Max 1 oz
to start feed pawl moving.



(Left Side View)

DETENT LEVER SPRING

Requirement
With the tape punch "off"
Min 13 oz---Max 17 oz
to start detent lever moving.

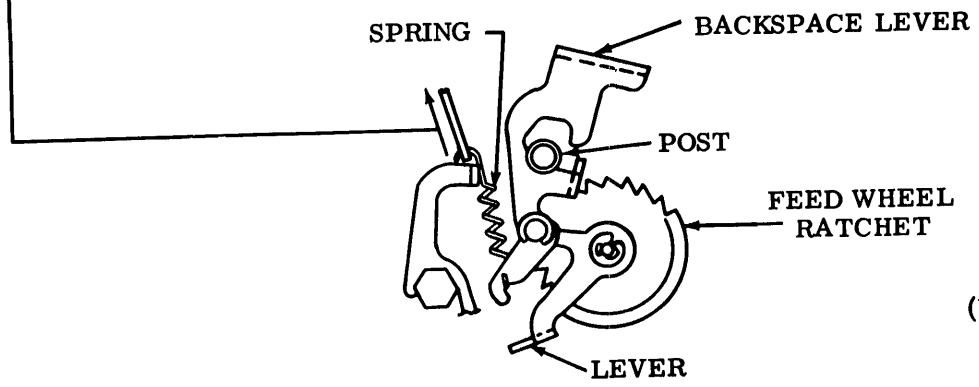


(Left Side View)

2.13 Tape Punch Area (continued)

BACKSPACE LEVER SPRING

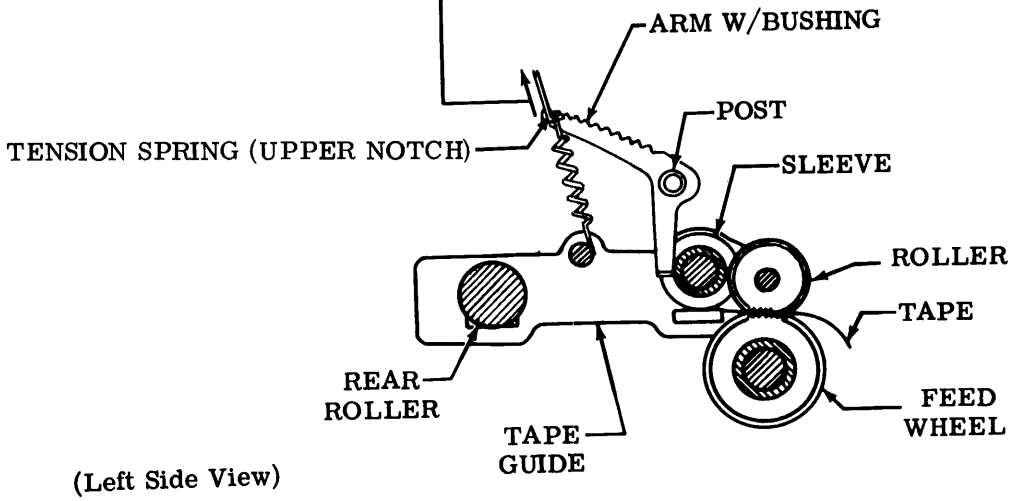
Requirement
With the tape punch in off position
—Min 3/4 oz---Max 1-1/2 oz
to pull spring to its installed length.



(Left Side View)

TAPE GUIDE TENSION SPRING

Requirement
Min 34 oz---Max 38 oz
to pull spring to its installed
(upper notch) length.



(Left Side View)

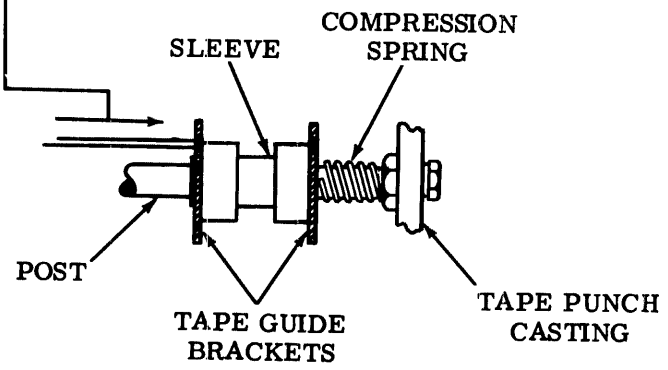
2.14 Tape Punch Area (continued)

TAPE GUIDE COMPRESSION SPRING

Requirement

Remove the tape guide tension spring. Place roller slightly above the feed wheel

Min 24 oz---Max 48 oz to start tape guide moving.



(Front View)

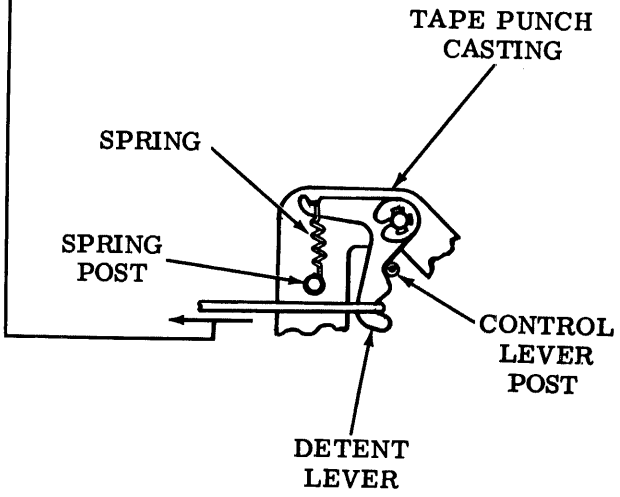
CONTROL DETENT LEVER SPRING

Note: This adjustment applies only to tape punches equipped with TP182843 detent lever.

Requirement

With the tape punch "off"

Min 10-1/2 oz---Max 14-1/2 oz to start detent lever moving.

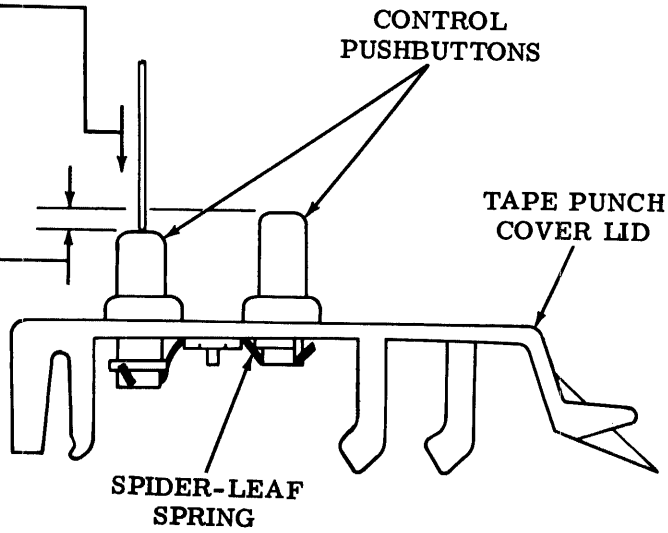


(Left Side View)

CONTROL PUSHBUTTONS

Requirement

Min 1/2 oz---Max 1-1/2 oz to push each control pushbutton down 1/8 inch as gauged by eye, while remaining control pushbuttons remain in their normal upward positions.

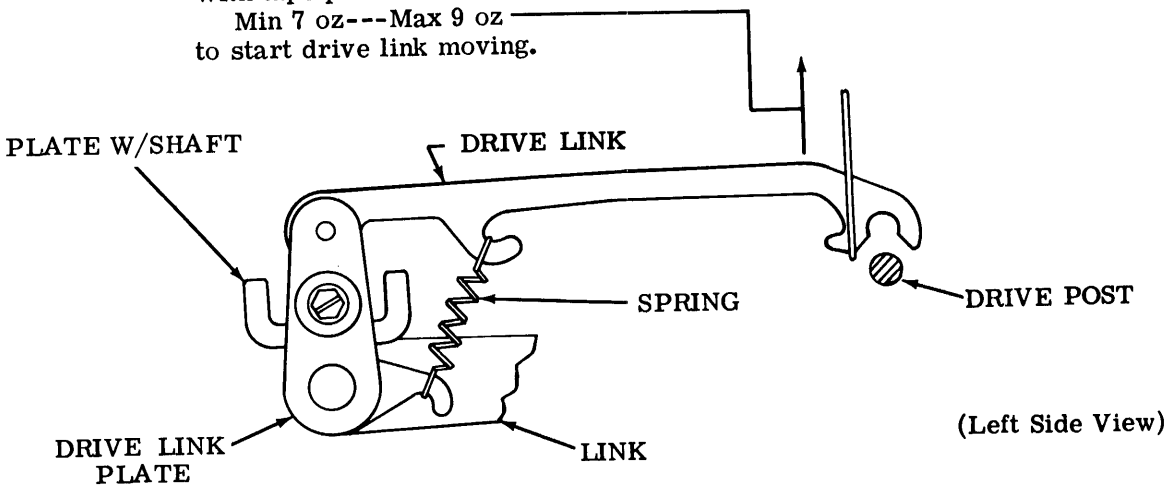


(Left Side View)

2.15 Tape Punch Area (continued)

DRIVE LINK SPRING

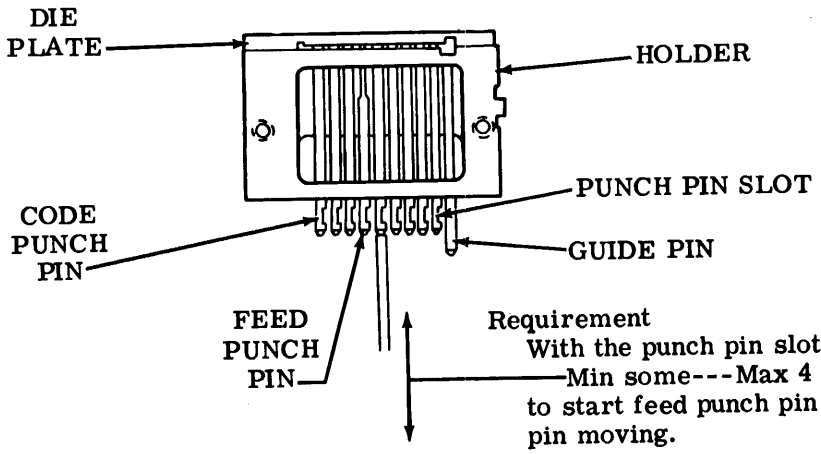
Requirement
With tape punch "off"
Min 7 oz---Max 9 oz
to start drive link moving.



(Left Side View)

PUNCH BLOCK ASSEMBLY

To Check
Remove the punch block assembly from the tape punch. Replace after performing this adjustment. (For instructions, see the appropriate tape punch section.)



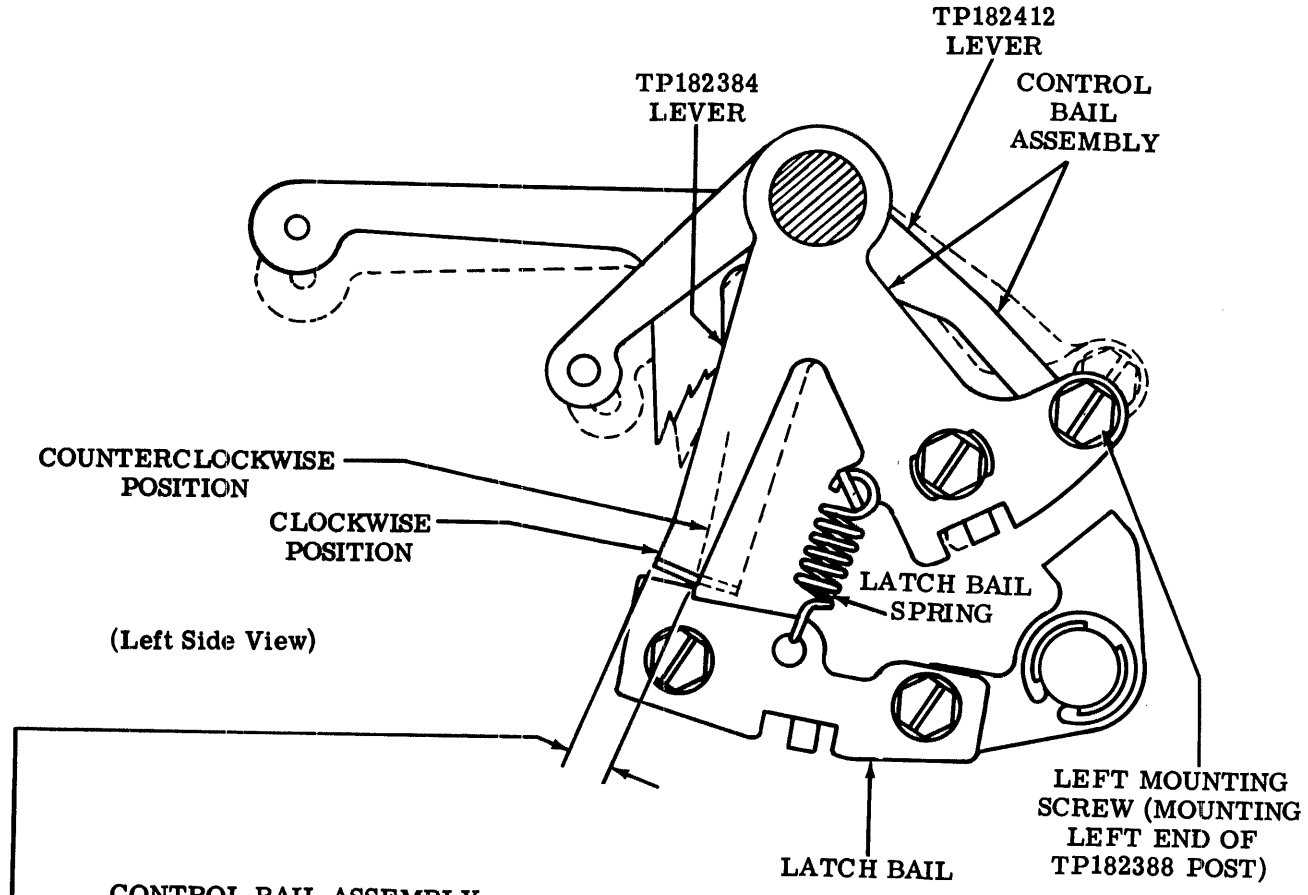
(Front View)

Requirement
With the punch pin slots facing the guide pin
Min some---Max 4 oz
to start feed punch pin and each code punch pin moving.

Note: The above requirement must be met anywhere along each punch pin's upward and downward travel in holder.

3. VARIATIONS TO THE BASIC UNIT

3.01 Automatic Control Mechanisms



CONTROL BAIL ASSEMBLY

To Check

With the typing unit in the stop condition and the tape punch "on," gently oscillate the control bail assembly from its clockwise position to its counterclockwise position and back again. Repeat this oscillating motion several times while noting requirements.

(1) Requirement

The control bail assembly should be free from binds along its normal travel.

(2) Requirement

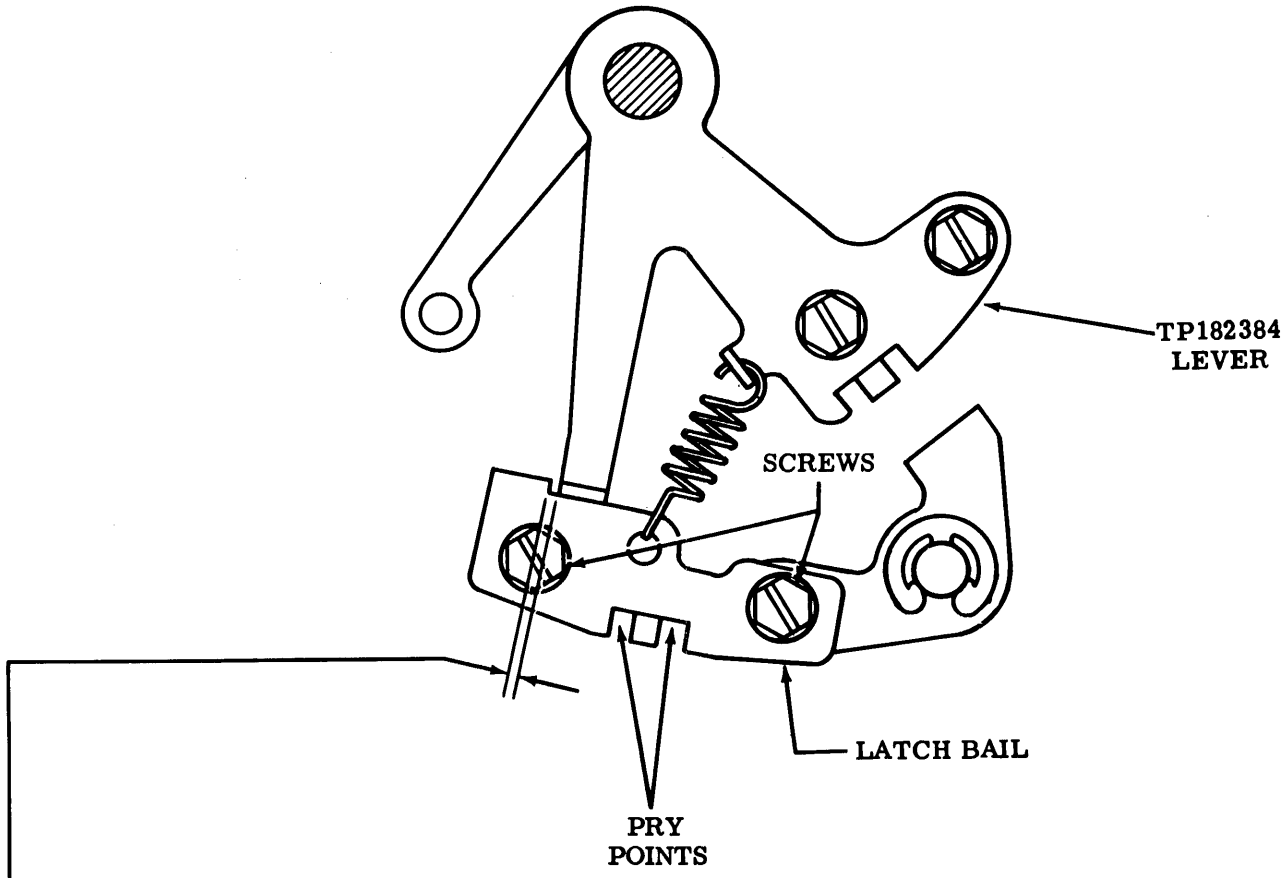
When released from its counterclockwise position, the control bail assembly should return to its clockwise position under spring tension.

To Adjust

Note: Parts should not be bent, other than specifically directed.

Remove the latch bail spring, control bail spring (not illustrated), and left mounting screw which secures the left side of TP182388 post. The TP182388 post threaded hole should be concentric to the left mounting screw hole. If necessary, bend TP182388 post about its right mounting screw (not illustrated). Reassemble left mounting screw and tighten. Replace springs. Recheck requirements and refine adjustment if necessary.

3.02 Automatic Control Mechanisms (continued)



(Left Side View)

LEVER OVERTRAVEL

To Check
With the tape punch "on," set up the ~~TAPE~~ (--3-5---) code combination in the selector. Manually rotate the main shaft until the function rocker shaft is in its most forward position.

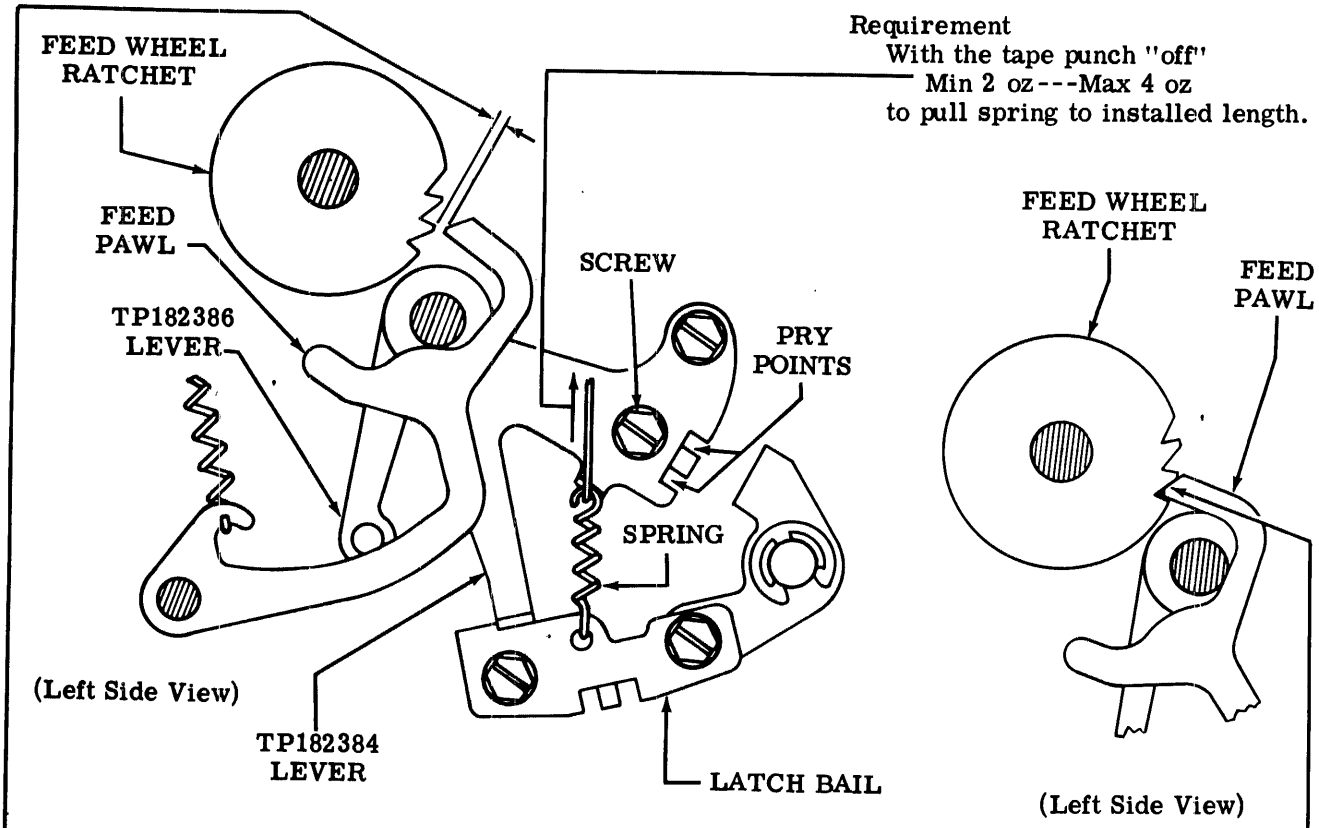
Requirement
Min 0.005 inch---Max 0.015 inch between the TP182384 lever and latch bail.

To Adjust
Loosen screws and position latch bail using pry points. Tighten screws.

3.03 Automatic Control Mechanisms (continued)

LATCH BAIL SPRING

Requirement
With the tape punch "off"
Min 2 oz---Max 4 oz
to pull spring to installed length.



FEED WHEEL RATCHET AND PAWL GAP

(1) To Check
With the tape punch "off," manually rotate the main shaft until the function rocker shaft positions the feed pawl so that there is a minimum clearance between it and a tooth of the feed wheel ratchet.

Requirement
Min 0.015 inch---Max 0.030 inch
between the feed pawl and a tooth of the feed wheel ratchet.

To Adjust
Loosen the screw and position the TP182386 lever using the pry points. Tighten screw.

(2) To Check
With the tape punch "on," manually rotate the main shaft until the function rocker shaft positions the feed pawl so that it engages a tooth of the feed wheel ratchet.

Requirement
The feed pawl should fully engage a tooth of the feed wheel ratchet.

To Adjust
Refine requirement under (1) To Check.

3.04 Automatic Control Mechanisms (continued)

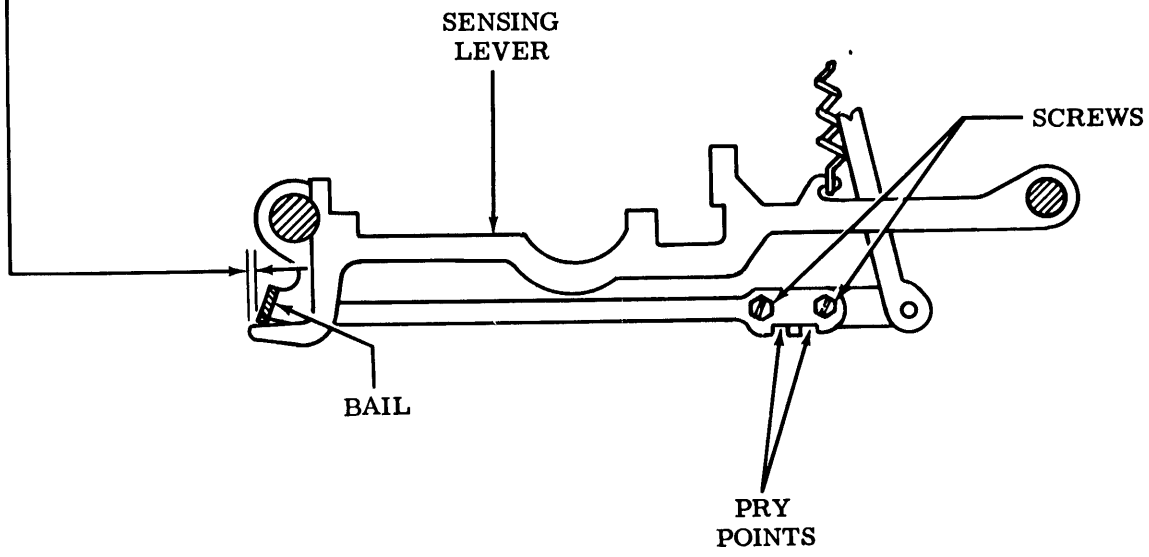
SENSING LEVER AND BAIL GAP

Note: This adjustment applies only to tape punches equipped with the sense suppression option — TP182430 bail etc.

To Check
Place the tape punch "off."

Requirement
The sensing lever associated with the leftmost code level (Figure 2) should be
—Min 0.010 inch underflush---Max 0.010 inch overflush
with the bail.

To Adjust
Loosen screws and position bail using pry points. Tighten screws.



(Left Side View)

3.05 Automatic Control Mechanisms (continued)

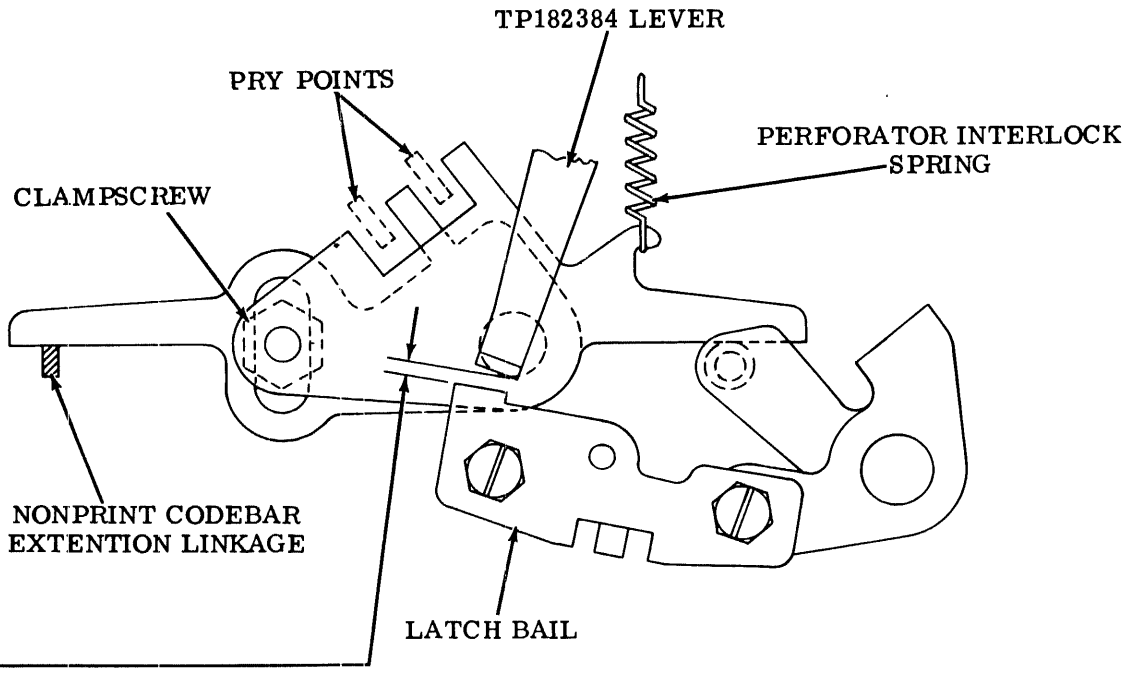
LATCH BAIL GAP

Note: This adjustment applies only to tape punches equipped with tape punch interlock mechanism.

To Check
Place the typing unit in the stop condition and the tape punch "off."
Place the nonprint codebar in its operated position (solenoid energized).

Requirement
Min 0.015 inch---Max 0.030 inch
between the latch bail and TP182384 lever.

To Adjust
Remove punch interlock spring. Loosen clampscrew and position lever using pry points. Tighten screw and replace spring.



(Left Side View)

3.06 Automatic Control Mechanisms (continued)

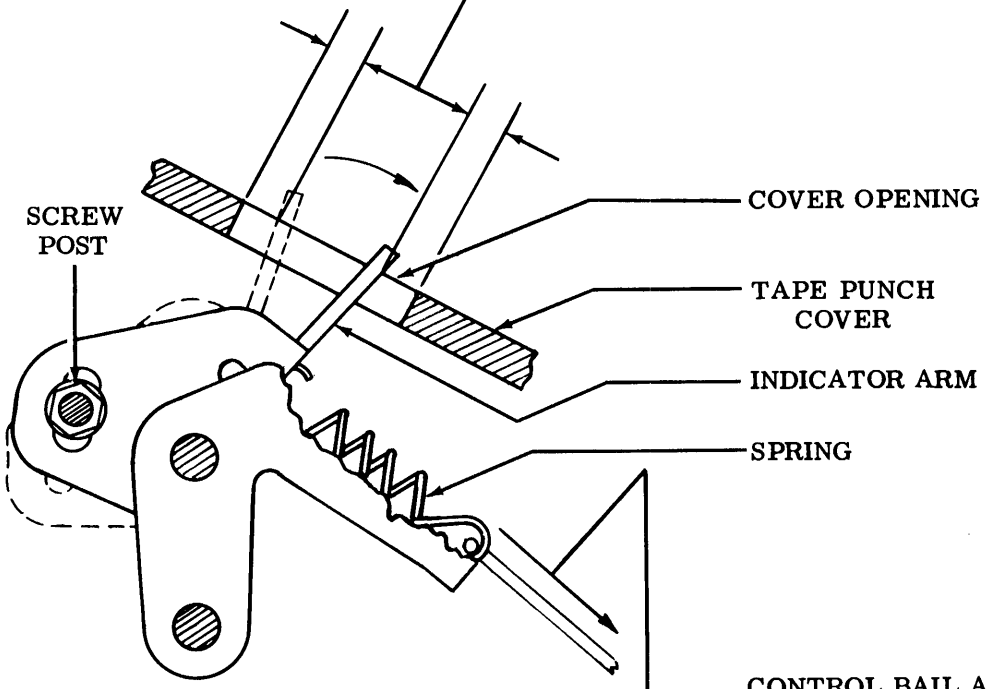
VISUAL "ON OFF" INDICATOR

Note: This adjustment applies only to tape punches equipped with the visual ON OFF indicator option.

To Check
With the tape punch cover in place over the tape punch, place the tape punch "off." Note the gap between the rear edge of the cover opening and the rear edge of the indicator arm. Place the tape punch "on." Note the gap between the front edge of the cover opening and the front edge of the indicator arm.

Requirement
The gaps should be equal, as gauged by eye.

To Adjust
With the tape punch lid removed from the tape punch cover, loosen screw post and position indicator arm. Tighten screw post.



(Left Side View)

CONTROL BAIL ASSEMBLY SPRING

Note: This adjustment applies only to tape punches equipped with the visual ON OFF indicator option.

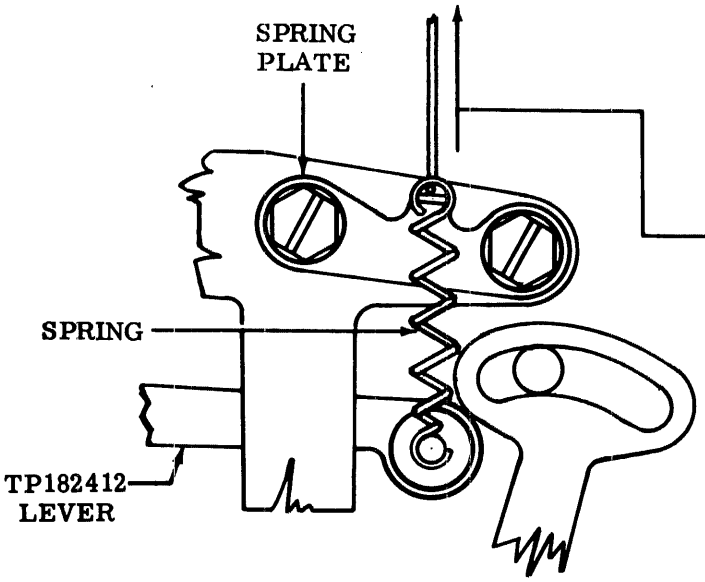
Requirement
With tape punch "off"
Min 2 oz---Max 3 oz
to pull spring to installed length.

3.07 Automatic Control Mechanisms (continued)

CONTROL BAIL ASSEMBLY SPRING

Note: This adjustment applies only to tape punches which are not equipped with visual ON OFF indicator option.

Requirement
With the tape punch "off"
—Min 2-1/2 oz---Max 3-1/4 oz
to pull the spring to installed length.



(Right Side View)

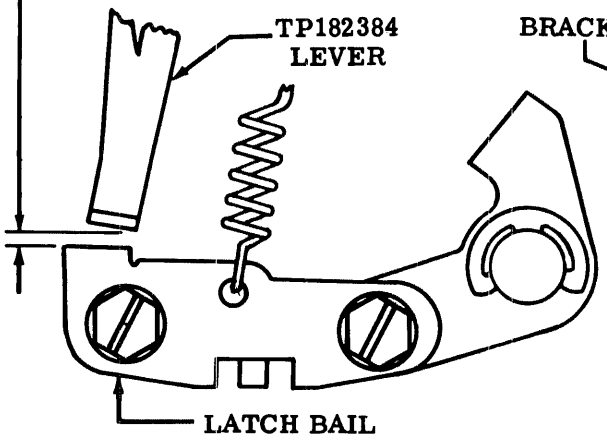
"LOCK ON"

Note: This adjustment applies only to tape punches equipped with the LOCK ON option — TP184200 lock bail, etc.

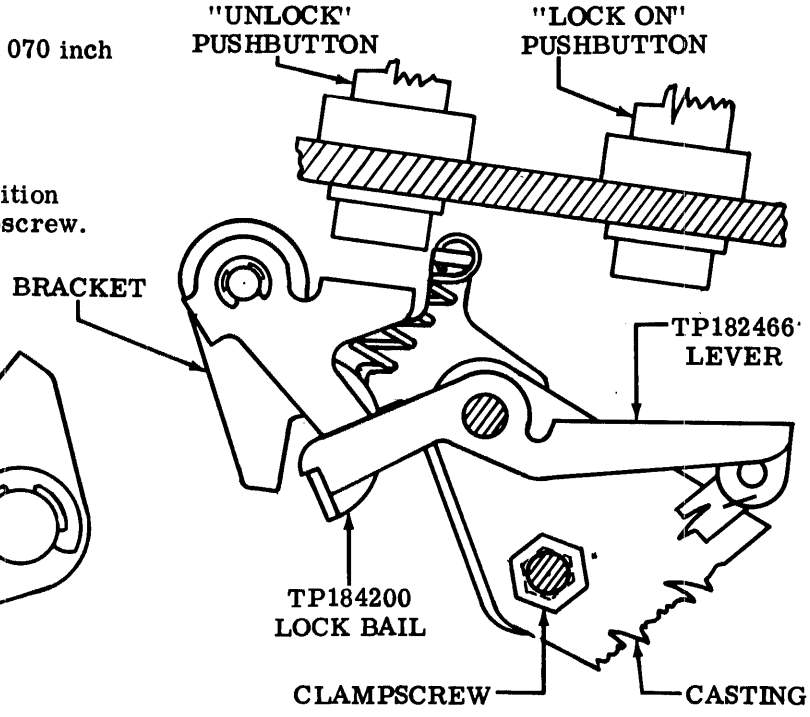
To Check
Place the tape punch in the "off" condition. Depress the LOCK ON pushbutton and allow the TP184200 lock bail to latch the TP182466 lever.

Requirement
—Min 0.050 inch---Max 0.070 inch between the latch bail and TP182384 lever.

To Adjust
Loosen clampscrew and position the bracket. Tighten clampscrew.



(Left Side View)



(Left Side View)

3.08 Automatic Control Mechanisms (continued)

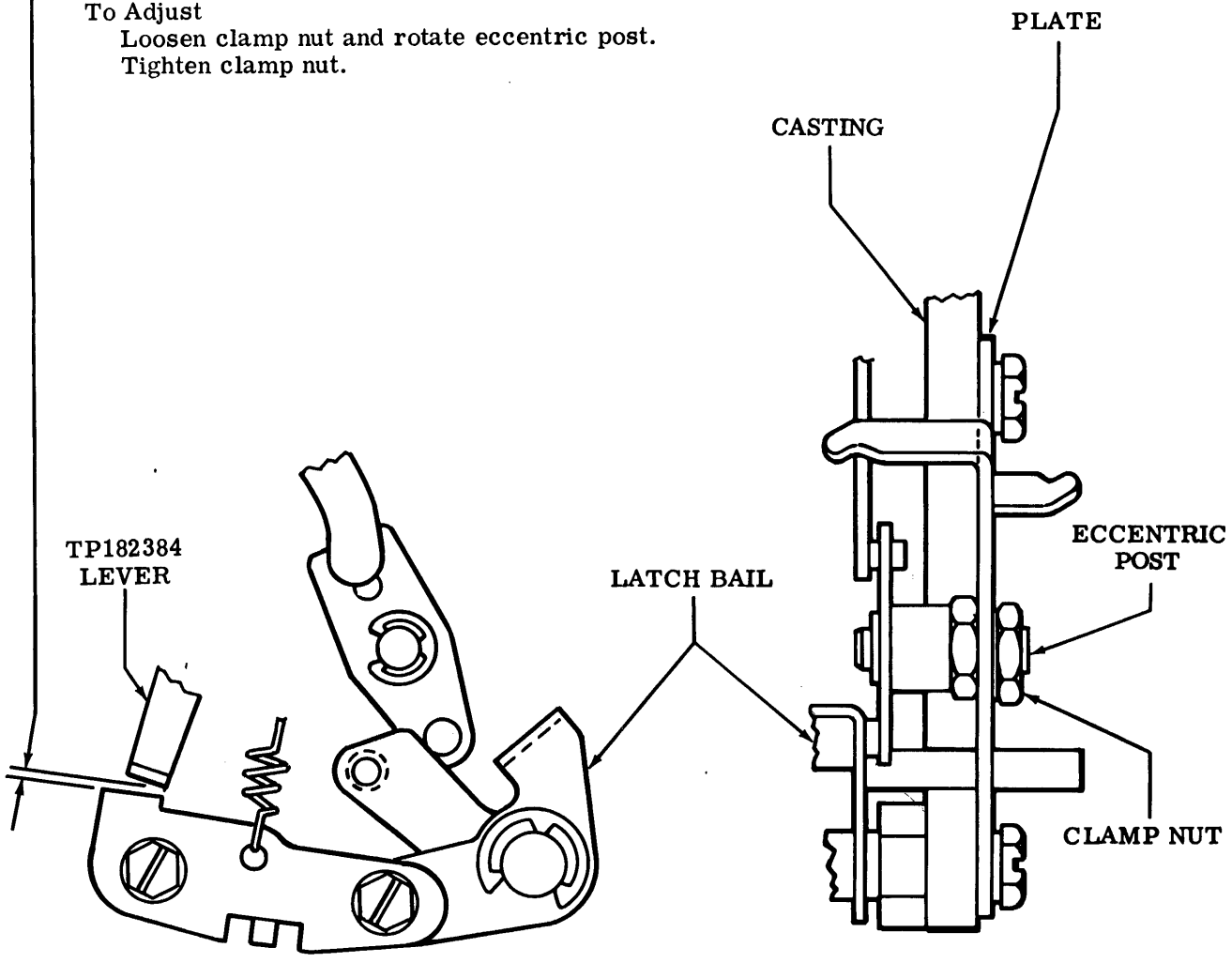
AUTOMATIC "ON"

Note: This adjustment applies only to tape punches equipped with the LOCK ON option.

To Check
With the tape punch "on," depress the UNLOCK pushbutton. Set up the TAPE (-2--5---) code combination in the selecor. Manually rotate the main shaft until the drive link is in its most forward position.

Requirement
Min 0.010 inch---Max 0.025 inch between the latch bail and TP182384 lever.

To Adjust
Loosen clamp nut and rotate eccentric post. Tighten clamp nut.

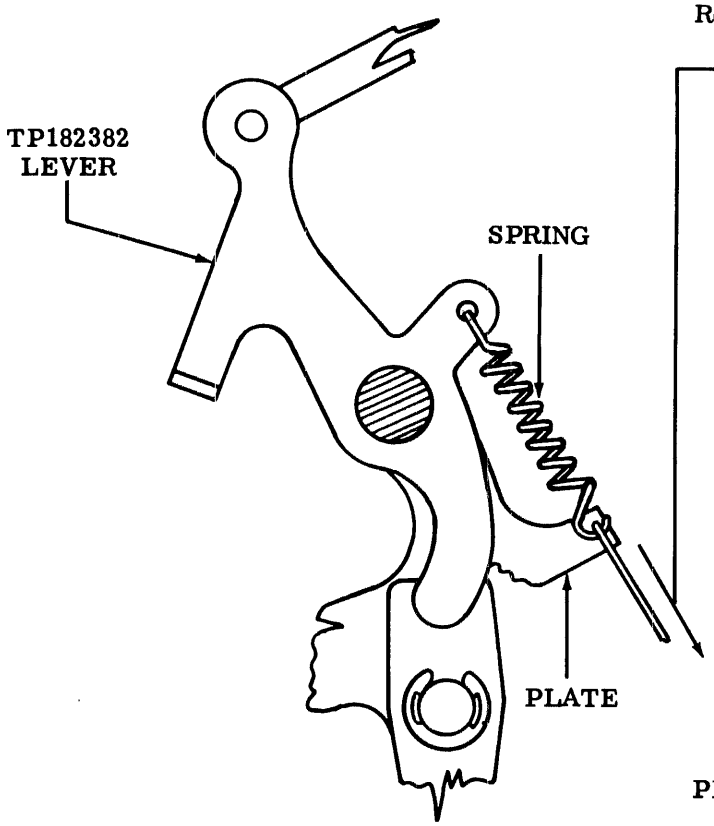


(Left Side View) (Front View)

3.09 Automatic Control Mechanisms (continued)

"ON" MECHANISM RETURN SPRING

Requirement
With the tape punch "off"
Min 1/2 oz---Max 2-1/2 oz
to pull spring to installed length.

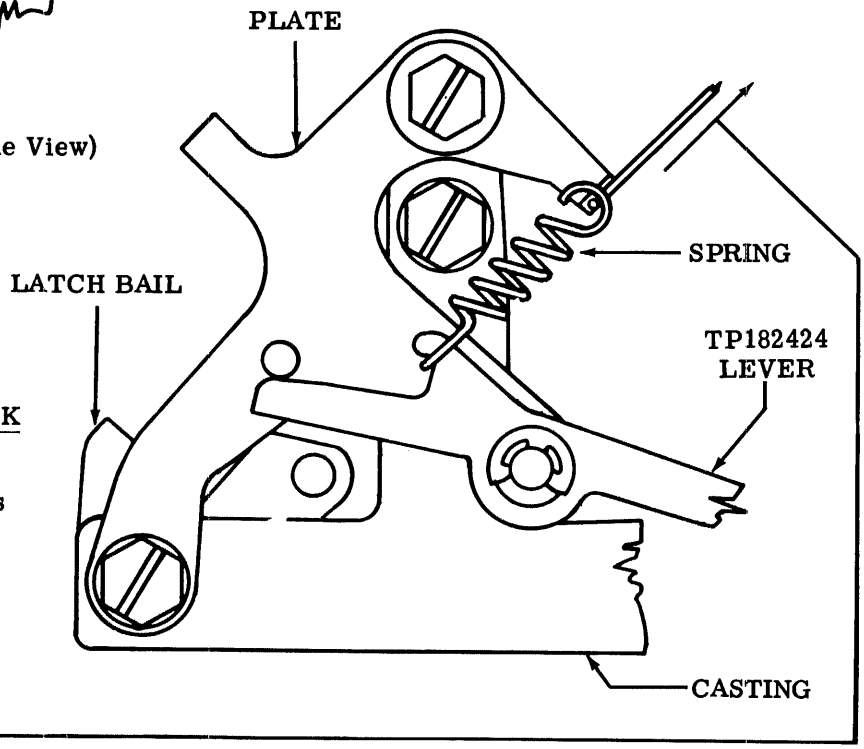


(Left Side View)

AUTOMATIC PUNCH INTERLOCK SPRING

Note: This adjustment applies only to tape punches equipped with the interlock mechanism.

Requirement
With nonprint codebar in its operated position (solenoid energized)
Min 4 oz---Max 6 oz
to pull spring to installed length.



(Right Side View)

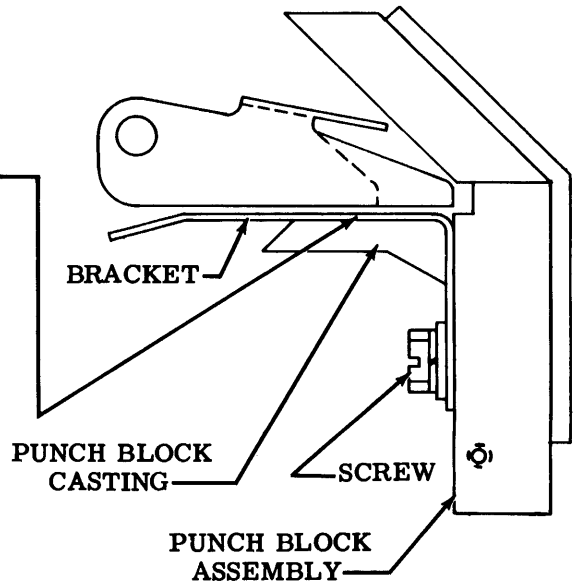
3.10 Miscellaneous

FOLDED TAPE GUIDE

(1) Requirement
With no tape in the punch, the bracket should be flush to the top surface of the punch block casting.

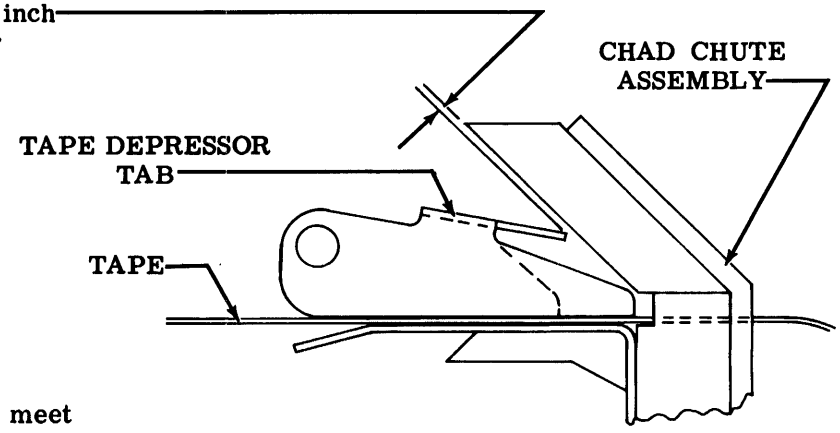
To Adjust
Loosen screw and position bracket. Tighten screw.

Note 1: This adjustment applies only to tape punches equipped with TP185705 folded tape guide modification kit.



(Left Side View)

(2) Requirement
With tape in punch
Min some---Max 0.015 inch between the tape depressor tab and underside of the chad chute.



To Adjust
Bend tape depressor tab to meet requirement.

Note 2: Check TEN CHARACTERS PER INCH requirement and refine if necessary.