

14 AND 20 NONTYPING REPERFORATOR  
REQUIREMENTS AND ADJUSTMENTS

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Outer motor-unit slip-connector springs .....	11	1. GENERAL	
Main-Shaft Mechanism		1.01 This section contains the apparatus requirements and adjusting procedures for the maintenance of the 14 and 20 type nontyping reperforators.	
Clutch driven-member .....	3	1.02 This section is reissued to:	
Clutch-throwout-lever spring ..	3	(a) Suggest in 2.12 that the punch-block cleaning tool be used.	
Main-shaft clutch spring .....	3	(b) Make some minor corrections and additions. Marginal arrows are omitted.	
Main-shaft clutch teeth .....	3	2. REQUIREMENTS AND ADJUSTMENTS	
Punch operating-lever-cam friction-clutch .....	3	2.01 Selector-clutch Torque: After the clutch has been relubricated and motor has been run for at least 10 minutes, a pull of minimum 14 ounces, maximum 18 ounces applied at right angles to the selector stoparm, when the motor is running, should hold the selector cam sleeve from rotating when the selector stoparm is held just clear of its stop. (See Figure 1.)	
Selector-clutch torque .....	1	To Adjust: Replace the felt friction washers, add or remove the spring adjusting washers, replace the spring or, on units equipped with an adjustable capstan nut, readjust the nut.	
Motor Unit		Note: Replacing the felt washers will usually be satisfactory since the spring holds its adjustment over long periods. Before replacing the spring, check to see if the spring can be adjusted by the addition of washer-shims TP96763 (0.012 inch), TP96764 (0.016 inch) or TP96765 (0.020 inch), around the shoulder of the TP72515 nut at the end of the spring nearest the bearing.	
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Motor pinion .....	3		
Punch Mechanism			
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(1) To replace the felt washers: remove the range-finder assembly, remove the mounting-post nut and loosen the shoulder screw that mounts the space-out lever and swing the space-out lever to one side, detach the locking-lever spring and remove the retaining disc noting that it has a left-hand thread and unscrews to the right (clockwise); remove the outer felt washer, cam-sleeve assembly, cam-sleeve disc, and inner felt washer, holding the selector levers away from the shaft and rotating the cam-sleeve disc until the notch in its edge registers with points of the selector levers.

Note: When installing new washers, lubricate them in accordance with the general lubrication section and the section covering the lubrication procedures for the 14 and 20 nontyping reperforator.

(2) To remove the friction-clutch spring or add adjusting washers, proceed as in (1) and remove the clutch driving disc and spring.

CAUTION: THE FOLLOWING ADJUSTMENT SHOULD NOT BE MADE WITHOUT FIRST ATTEMPTING TO MEET CLUTCH TORQUE REQUIREMENTS BY REPLACING THE CLUTCH WASHERS AS DIRECTED IN (1).

(3) On units equipped with an adjustable capstan nut, the nut may be adjusted to compensate for variations in spring tension. This can be done by turning the capstan nut with the blade of a 3-inch screwdriver. Turning the nut in a counterclockwise direction, as viewed from the selector end of the shaft, increases the tension.

2.02 The Motor should be located so that the axis of the pinion shaft lies approximately in the mid-plane of the main-shaft gear.

Gauge: By eye.

To Adjust: Loosen the motor mounting screws and reposition the motor on its mounting plate, keeping the edges of the motor base and the mounting plate parallel.

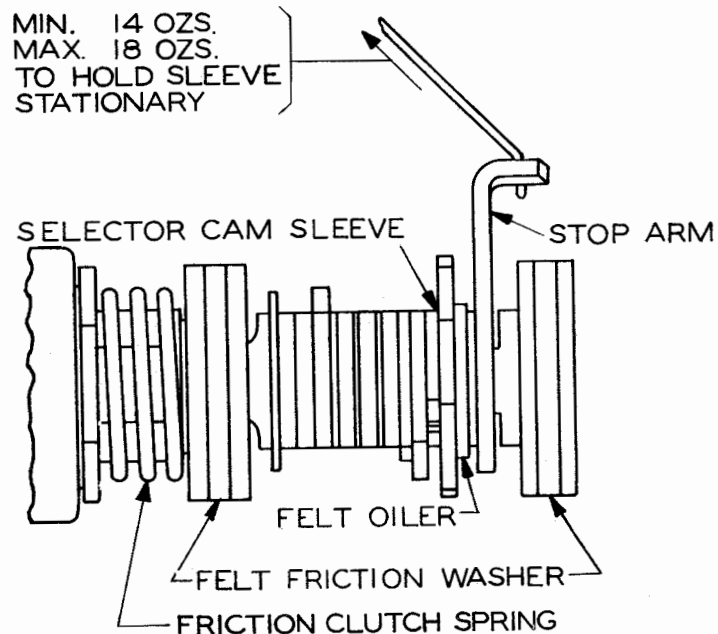


Figure 1

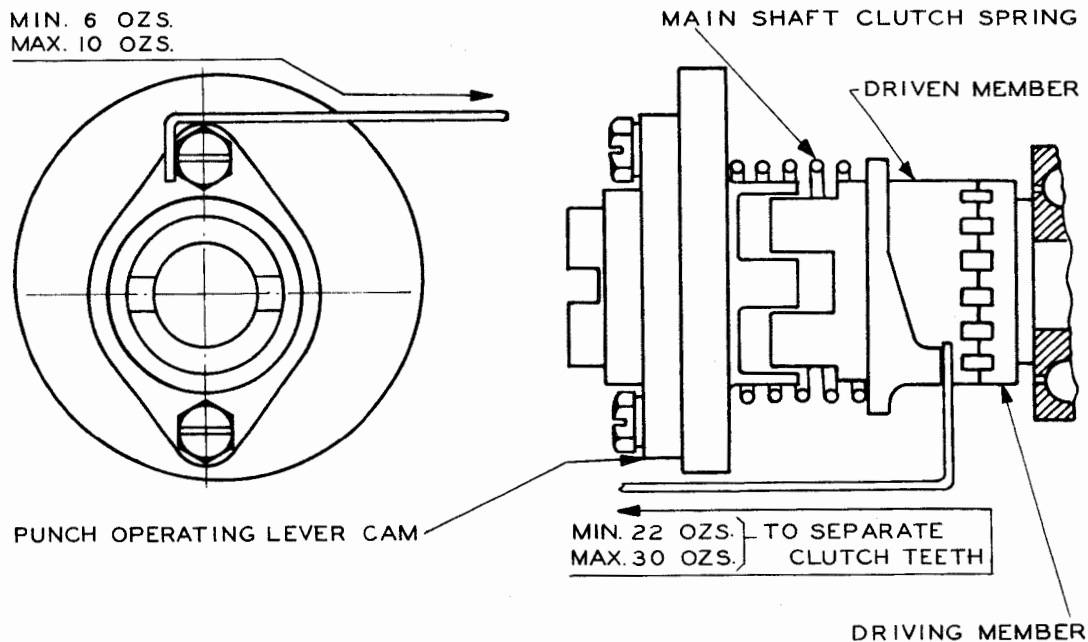


Figure 4

2.09 The Punch-arm Shaft should turn freely with just perceptible endplay and the end of the shaft should be flush with the front of the front bearing block when the punch-arm is held against the front bearing block.

Gauge: By eye and feel.

To Adjust: The position of the shaft, remove the punch-hammer spring and reposition the punch-arm by means of its set-screws. To adjust the endplay of the shaft, reposition the rear bearing-bracket collar by means of its setscrews. Reassemble the punch-hammer spring.

2.10 Punch-unit Bracket: The clearance between the engaging surfaces of the No. 5 sword and the armature extension with the armature unoperated should be the same within 0.005 inch as that between the No. 4 sword and the armature extension with the armature operated when the No. 4 transfer lever is in its left (spacing) position, the No. 5 transfer lever is in its right (marking) position, and the selector cam sleeve in the stop position. (See Figure 5.)

To Adjust: Loosen the two punch-unit-bracket mounting screws and reposition unit, using the rear screw as a pivot.

2.11 The Transfer Levers should be positioned so that their forked arms line up in the same vertical planes with the corresponding selector T levers. For identification of parts see Figure 5.

Gauge: By eye.

To Adjust: Loosen the transfer-lever-stud locknuts and reposition the stud.

2.12 The Punch-hammer Travel should be such that the punches are driven through the tape sufficiently to punch all holes clearly each time the hammer is operated.

(a) Gauge by punching tape several times with LTRS combination set up.

To Adjust: Back off the punch-hammer adjusting nut until the punches fail to perforate tape when LTRS combination is set up and the main shaft is rotated. Advance the adjusting nut slowly until all holes are just punched clean, and then advance the nut an additional 1/4 turn. For identification of parts see Figure 9.

(b) If the tape does not move freely, the TP99947 punch-block cleaning tool should be inserted between the guide plate and the

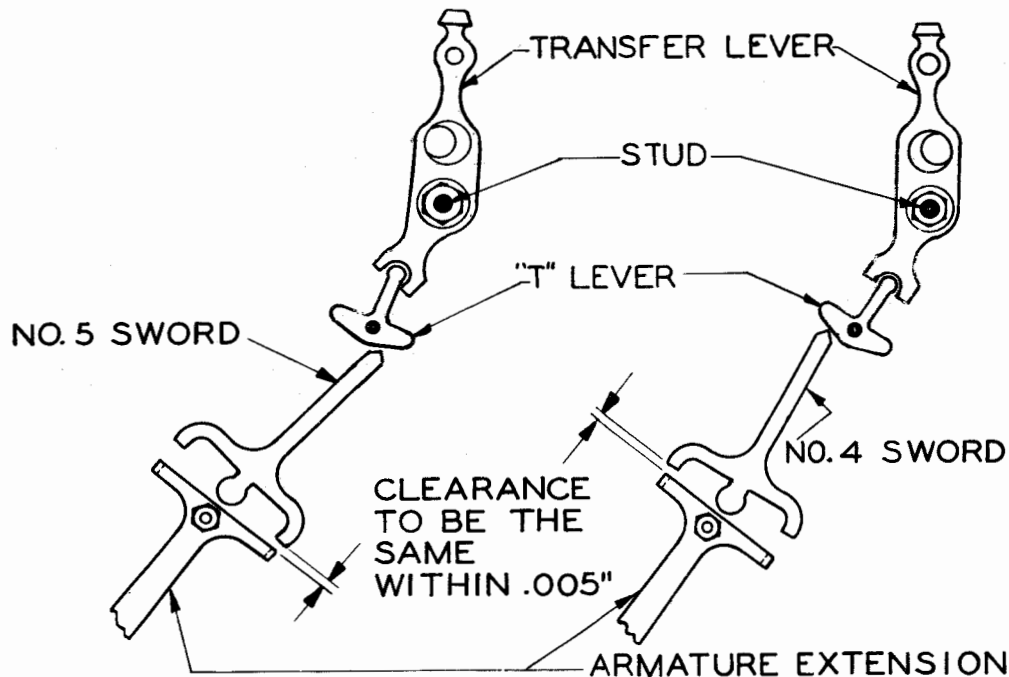


Figure 5

die plate of the punch block and moved forward and backward a few times to remove the lint and paper scraps.

**CAUTION: DO NOT TAKE APART DEFECTIVE PUNCH BLOCKS. IF SATISFACTORY PUNCHING CANNOT BE OBTAINED REPLACE THE ENTIRE PUNCH-BLOCK ASSEMBLY. THE RUST PREVENTIVE SHOULD BE REMOVED FROM THE REPLACING BLOCK BEFORE IT IS ASSEMBLED TO THE PERFORATOR.**

2.13 The Lock-bail Wedge should be seated firmly between at least two transfer levers, with the Y combination set up and the main shaft rotated until the punch hammer is in its extreme upward position. For identification of parts see Figure 6.

Gauge: By eye and feel.

To Adjust: Reposition the lock-bail eccentric-shaft.

2.14 The Lock-bail Wedge should clear the transfer levers as indicated in Figure 6 when the main shaft is in its stopped position and the transfer levers are held in center of their travel. (See Figure 6.)

To Adjust: Loosen the roller-arm mounting screws and reposition the roller arm. Tighten the mounting screws.

2.15 The Tape-tension Lever should be centrally located with respect to the feed-roll pins. This should be measured as follows:

- (1) Take up the feed-roll endplay towards the star wheel and the tension-lever endplay towards its adjusting nut. The edge of the lever slot may touch the feed-roll pins on the side of the pins nearest the ratchet but there must be clearance on the other side.
- (2) Take up the feed-roll endplay away from the star wheel and the tension-lever endplay away from the tension-adjusting nut. The edge of the lever slot may touch the feed-roll pins on the side farthest away from the ratchet but there must be clearance on the other side.

To Adjust: Add or remove shims between the shoulder on the tape-tension-lever stud and its mounting bracket.

2.16 The Lock-bail Spring Tension should be minimum 6 ounces, maximum 10 ounces measured at the center of the lock-bail locking

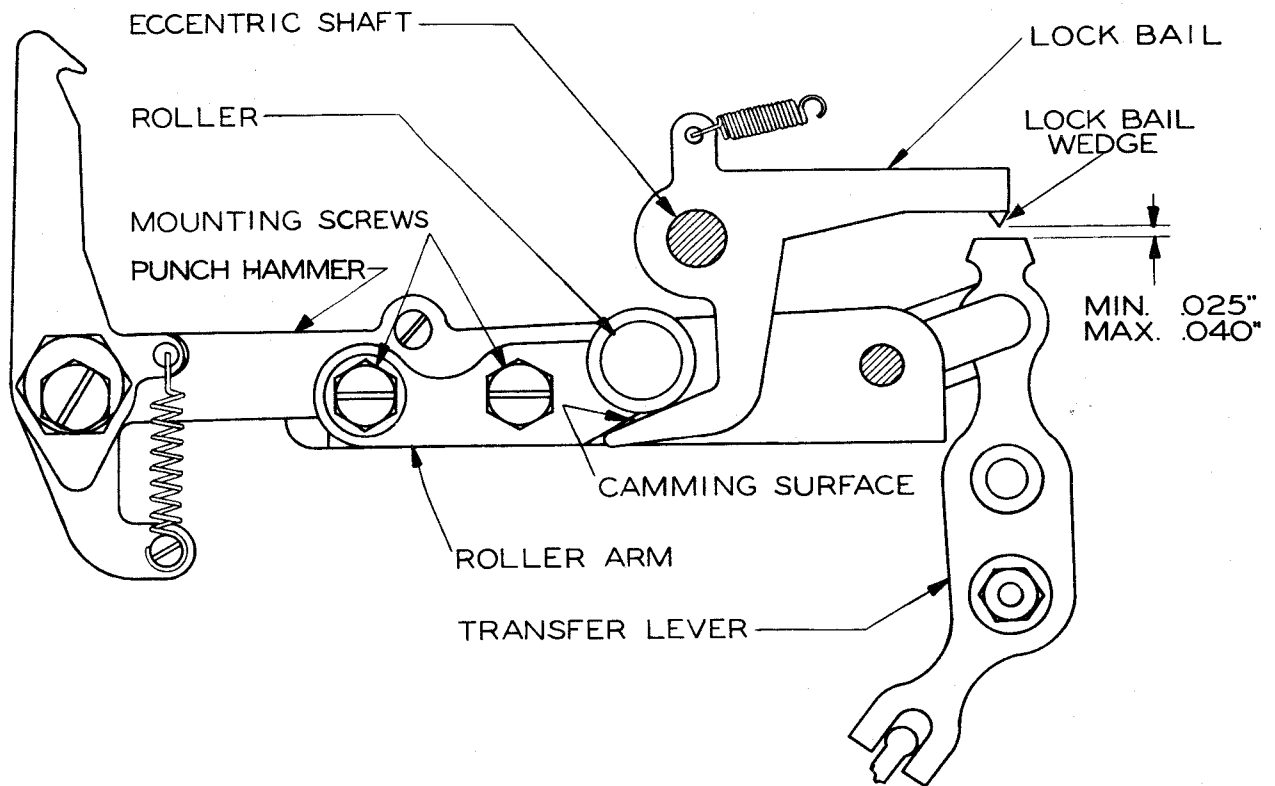


Figure 6

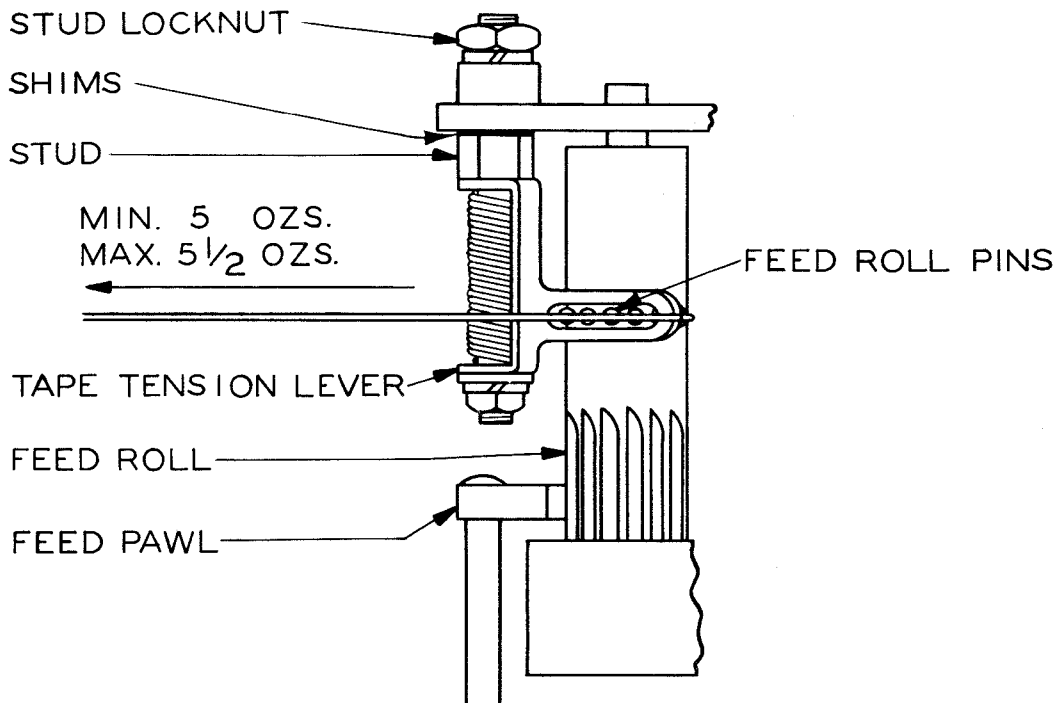


Figure 7

edge as the bail starts to move when the main shaft is in the stop position.

Gauge: By pulling vertically upward.

2.17 The Punch Levers should be free of bind and in alignment with their respective punch-block tape pins when the punch hammer is in its unoperated (lower) position.

Gauge: By eye.

To Adjust: Loosen the punch-hammer-pivot-screw locknuts and relocate the hammer by repositioning the pivot screws. In locating the pivot screws make sure that the punch hammer is free in its bearings with just perceptible endplay and then tighten the pivot-screw locknuts.

2.18 The Feed Roll should rotate freely and have not more than 0.004 inch endplay when the tape-tension lever, feed pawl and the feed-roll detent lever are held clear of the roll.

Gauge: By feel.

To Adjust: Reposition the feed-roll bearing plate to eliminate bind and add or remove shims between the punch block and the feed-roll bearing-plate to adjust endplay.

2.19 The Feed-roll-detent Spring Tension should be minimum 24 ounces, maximum 32 ounces measured behind the spring hole in the detent lever as the detent roller starts moving from the star wheel.

Gauge: By pulling in line with the spring.

2.20 The Tape-stripper Plate upper edge should clear the feed roll by not more than 0.10 inch throughout a complete revolution of the feed roll.

Gauge: By eye.

To Adjust: Loosen the tape-stripper-plate mounting screws and reposition the plate.

2.21 Tape-tension-lever Spring: The tape-tension lever should bear against the feed roll with a pressure as indicated in Figure 5 measured at the end of the lever and perpendicular to a plane passing through the center of the tension-lever stud and the end of the lever. (See Figure 7.)

To Adjust: Loosen the tape-tension-lever-stud locknut and rotate the stud clockwise or counterclockwise to increase or decrease spring tension.

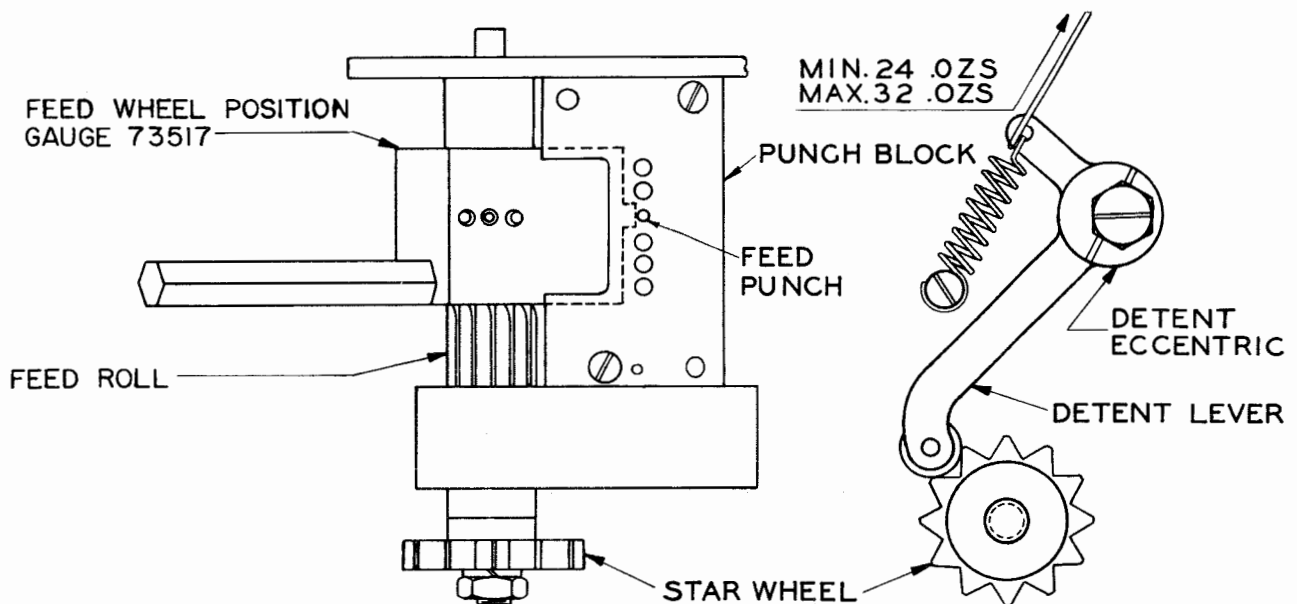


Figure 8A

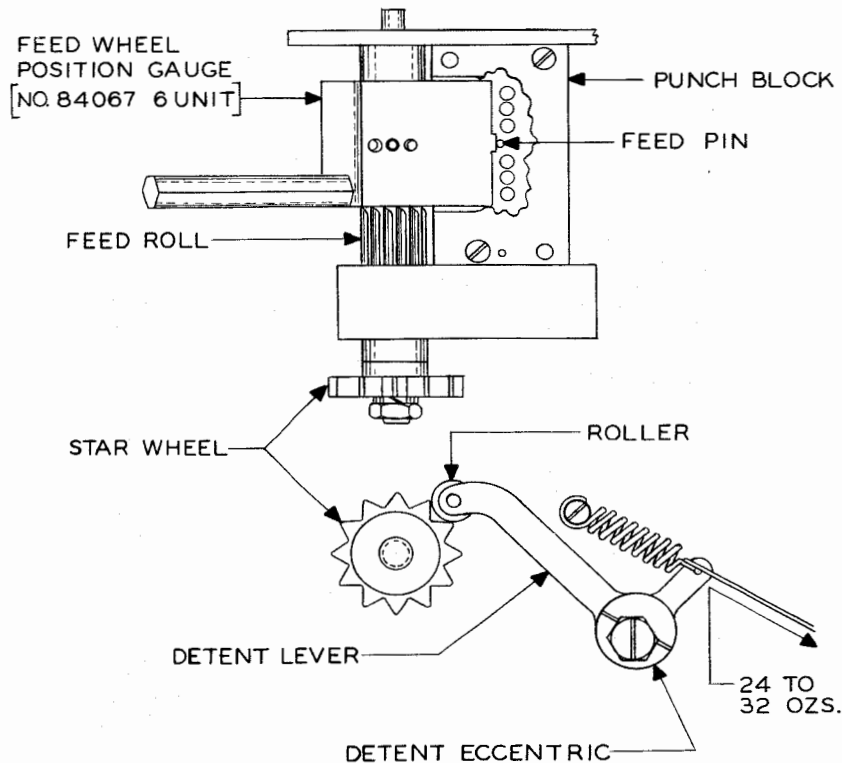


Figure 8B

**2.22 Feed-roll Detent, Preliminary Setting (Final Setting 2.25):** The distance from the center of the feed punch to the center of a feed-roll pin should be approximately 0.600 inch when the punch-arm roller is on a high part of its cam.

**To Check:** Hold the tape-tension lever away from the feed roll and insert feed-wheel position gauge (Use gauge TP73517 for the 14 nontyping reperforator, see Figure 8A. For the 20 nontyping reperforator use gauge TP84067, see Figure 8B.) in the punch block so that the projection of the gauge stops against the feed punch. With the gauge in this position a feed-roll pin should line up with the middle hole in the gauge. (See Figures 8A and 8B.)

**To Adjust:** Loosen the feed-roll-detent-lever screw and turn the eccentric bushing until the middle hole of the gauge fits freely over the feed-roll pin. Tighten the feed-roll-detent screw, remove the gauge, and restore the tape-tension lever to its normal position.

**2.23 The Feed Pawl should engage the next feed-roll ratchet tooth when the main shaft has been rotated until the selected punch levers clear the punch pins as indicated in Figure 10.**

**To Adjust:** Reposition the feed-pawl eccentric.

**2.24 Feed-pawl Spring:** It should require a pull as indicated in Figure 10 to start the feed pawl moving.

**2.25 Feed-roll Detent, Final Setting (Preliminary Setting 2.22):** Perforations in the tape should be evenly spaced, 10 to the inch, with an allowable variation of  $\pm 0.007$  inch in a 4-inch length.

**To Check:** Perforate a series of nine BLANK and one LTRS combinations seven or eight times, place the tape on top of a TP95960 gauge, then hold the tape and the gauge up to a light background and align a No. 3 code hole in the tape with the hole 1-1/2 inches from the left end of the gauge. Gauge holes should be visible through all

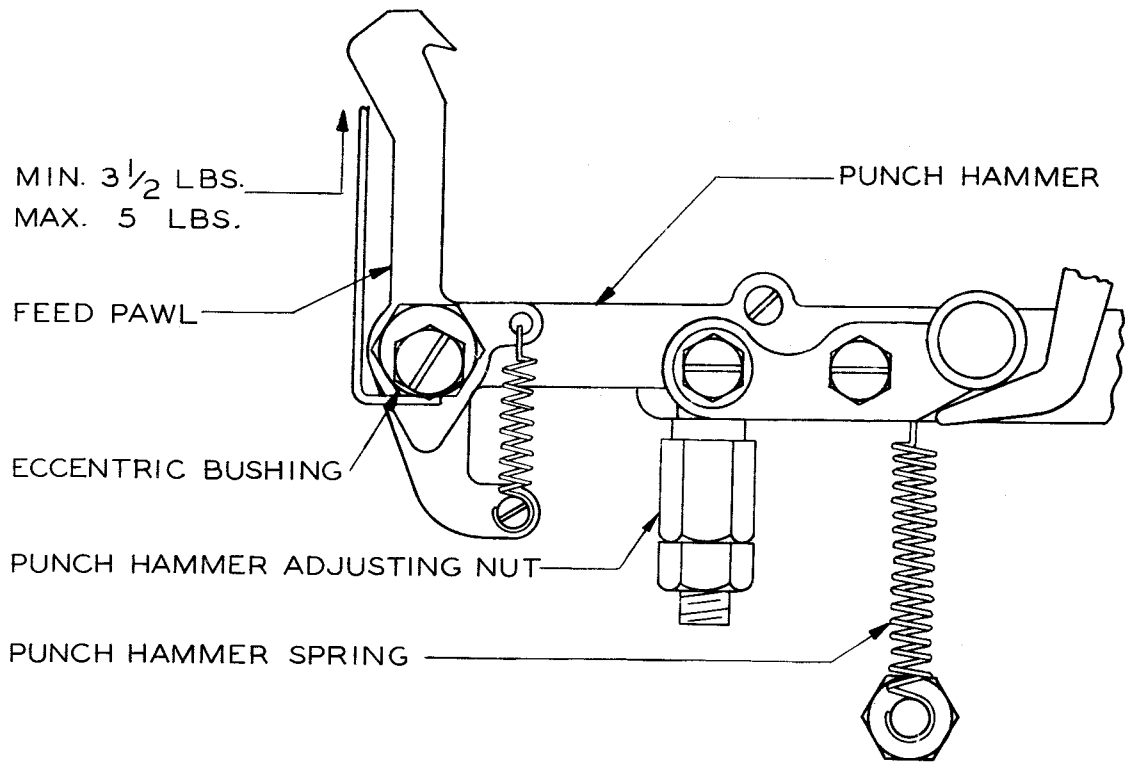


Figure 9

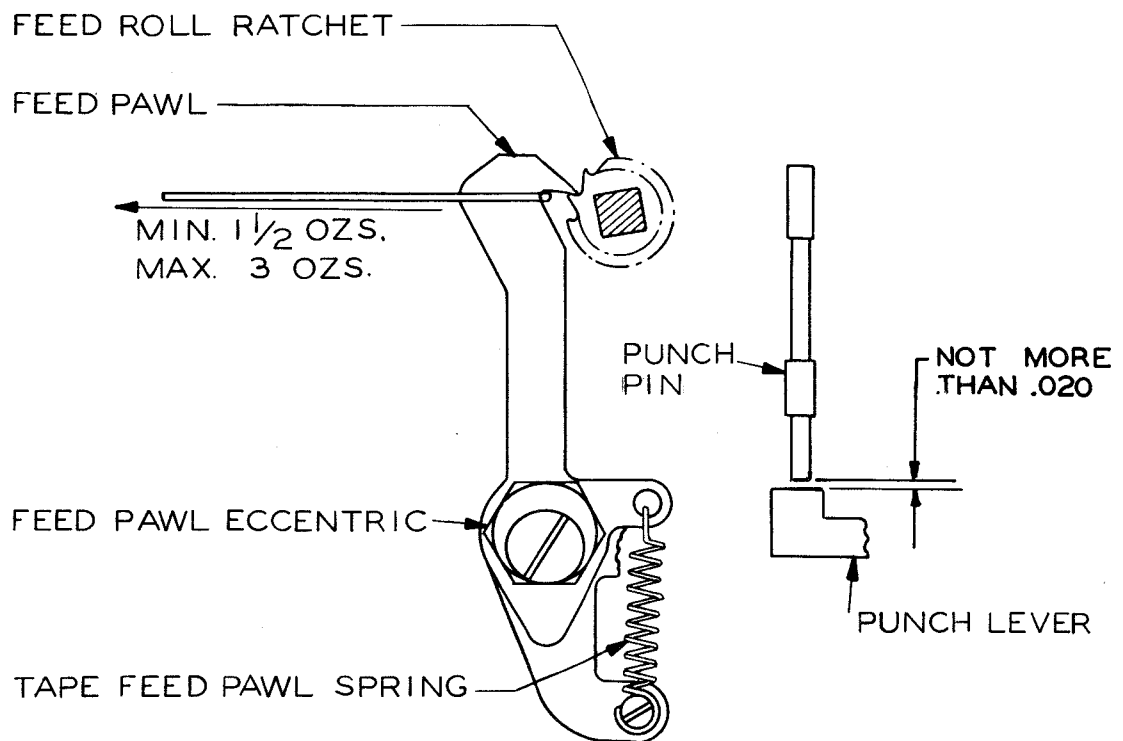


Figure 10



No. 3 code holes to the right of the point of alignment and the code hole above the large hole at the right end of the gauge should fall entirely within the circumference of the gauge hole.

To Adjust: Loosen the feed-roll-detent screw and reposition the eccentric bushing.

Note: If the feed-roll-detent eccentric is changed, recheck 2.23.

2.26 The Tape Guide should be positioned so that tape may be readily inserted into the punch block.

Gauge: By inserting tape.

To Adjust: Loosen the guide mounting screws and reposition the guide.

2.27 Punch-hammer Spring: It should require a pull as indicated in Figure 9 to start the punch hammer moving when the main-shaft clutch is disengaged and the lock bail is held away from the transfer levers.

2.28 The Space-out Lever should not bind and should hold the triplatch so that it clears the stoplever as indicated in Figure 11 when the space-out lever is in its down position.

Gauge: The minimum by eye and maximum with wire gauge.

To Eliminate Bind: Reposition the space-out lever guide-post. To adjust clearance, bend the lower end of the space-out lever.

2.29 Space-out-lever Spring Tension should be minimum 5 ounces, maximum 8 ounces, measured on top of the manual space-out lever as the lever starts to move.

Gauge: By pushing down on the lever.

2.30 Outer Motor-unit Slip-connector Springs should have a tension of minimum 2 pounds, maximum 4 pounds, measured at the end of the springs just below the head of the motor-block terminal screw as the springs break contact with the terminal screw when the motor unit is mounted in its proper position.

To Gauge: Remove the chad drawer and guide.

To Adjust: Remove the motor and bend the springs.

2.31 Inner Motor-unit Slip-connector Spring ends should be within 0.015 inch of a straightedge laid across the two outer slip-connector springs (adjusted in accordance with 2.30) when the motor is removed from the base.

To Adjust: Bend the springs.

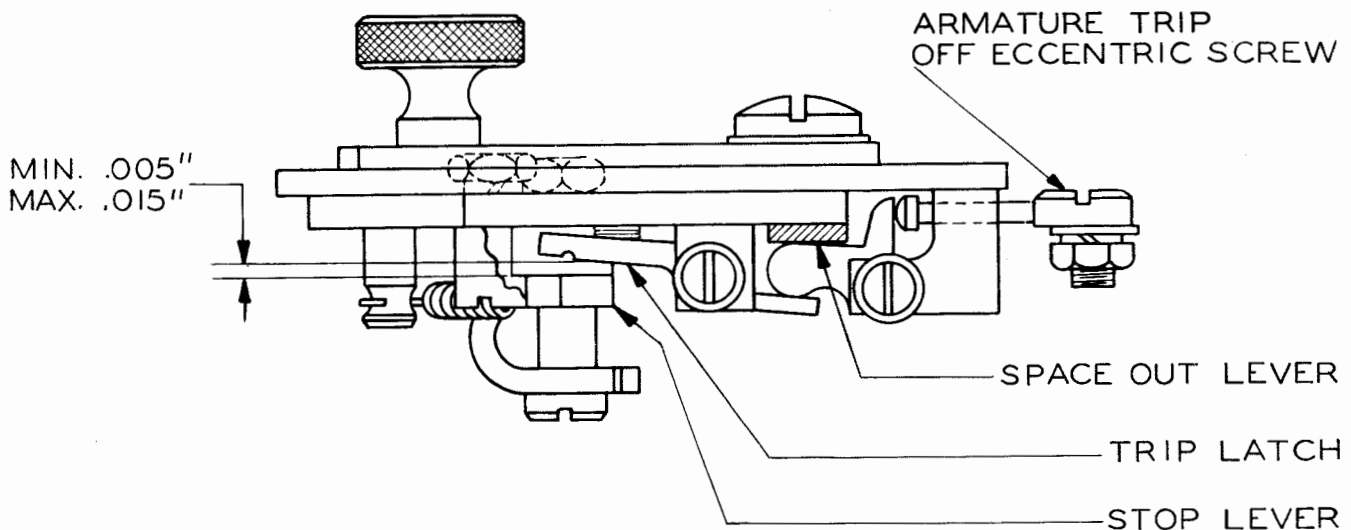


Figure 11