

INSTRUCTIONS FOR INSTALLING THE 174235 OR 178834
MODIFICATION KIT TO PROVIDE MODEL 28 TYPING REPER-
FORATOR (LPR) WITH FULLY PERFORATED TAPE, POWER
RETRACT PUNCH PINS AND PRINTING BETWEEN FEED HOLES

I. GENERAL

a. The 174235 or 178834 Modification Kit, when installed on a Model 28 Typing Reperforator, produces tape in which the code and feed holes are fully perforated; also, there are pierced indentations between the feed holes.

b. The 174235 and 178834 Modification Kits modify the spring retracting punch pins of a Model 28 Typing Reperforator to power retracting punch pins.

c. The 174235 and 178834 Modification Kits provide legible printing on the feed line between the feed holes on fully perforated tape.

d. The 174235 Modification Kit modifies units equipped with the 156431 or 162347 Ribbon Drive Arm in the ribbon feed mechanism. (Early Design)

The 178834 Modification Kit modifies units equipped with the 164543 Adjustable Extension Lever in the ribbon feed mechanism. (New and improved design)

e. The 192999 Modification Kit (not furnished with kits 174235 or 178834), covered in Teletype Specification 50136S, may be ordered to provide vacuum removal of chad.

f. The 174235 and 178834 Modification Kits consist of:

| | | | <u>174235</u> | <u>178834</u> |
|---|--------|------------------|---------------|---------------|
| 1 | 2191 | Washer, Lock | X | X |
| 1 | 3606 | Nut | X | X |
| 1 | 7002 | Washer, Flat | X | X |
| 2 | 85823 | Spacer | X | X |
| 2 | 110743 | Washer, Lock | X | X |
| 1 | 119649 | Ring, Retainer | X | X |
| 2 | 151073 | Screw | X | X |
| 1 | 151630 | Screw | X | X |
| 1 | 156558 | Washer, Felt | X | X |
| 2 | 153841 | Screw | X | X |
| 1 | 159560 | Spring | X | X |
| 1 | 163674 | Chute, Chad | X | X |
| 1 | 170219 | Stud, Die Wheel | X | X |
| 1 | 170241 | Screw, Adjusting | X | X |

| | | | <u>174235</u> | <u>178834</u> |
|---|--------|-----------------------------|---------------|---------------|
| 1 | 170242 | Slide, Feed | X | X |
| 5 | 170243 | Slide, Code | X | X |
| 1 | 170247 | Guide, Slide | X | X |
| 1 | 170779 | Wheel, Feed | X | X |
| 1 | 170788 | Wheel, Die | X | X |
| 1 | 173754 | Spacer, Typewheel | X | X |
| 1 | 173755 | Ribbon Guide | X | X |
| 1 | 173756 | Lever, Print Hammer | X | X |
| 1 | 173770 | Punch Holder Assembly | X | X |
| 1 | 173775 | Shaft, Typewheel | X | X |
| 1 | 173977 | Shaft, Print Hammer | X | X |
| 1 | 173978 | Spring | X | X |
| 1 | 173979 | Head, Hammer | X | X |
| 1 | 173981 | Accelerator w/Stud | X | X |
| 1 | 176441 | Extension, Adjustable | X | |
| 1 | 176639 | Arm, Ribbon Drive | X | |
| 1 | 176640 | Guard, Tape | X | X |
| 1 | 178178 | Lever, Adjustable Extension | | X |

NOTE

The necessary Typewheel is not furnished in the modification kit and must be ordered separately.

g. For part numbers referred to and for parts ordering information refer to Teletype Model 28 Typing Reperforator Parts Bullentin 1167B.

2. INSTALLATION (Figures 6 through 14)

NOTE

If the unit being modified is equipped with a print hammer mounting bracket which has a 1/4 - 40 instead of a 10 - 32 tapped hole (for the print hammer shaft), the mounting bracket must be replaced with a 156931 Mounting Bracket (not included in kit), and the lock nut must be replaced with a 112626 Nut (not included in kit).

a. References made to left or right, up or down, front or rear apply to the unit in its normal operating position as viewed from the front, unless specifically stated otherwise.

b. The 174235 and 178834 Modification Kits

(1) Remove the ribbon feed mechanism by removing two 151632 Screws and 2191 Lock Washers.

(2) Unhook lower end of 82787 Rocker Arm Spring from the 156884 Rocker Arm W/Pivot and disconnect 156412 Perforator Drive Link by lifting it up.

(3) Remove and retain the following parts from the 156024 Rear Plate: 159621 Screw with washer and lock washer, 151631 Screw with washer and lock washer, and 151632 Screw with washer, and lock washer, and nut. Carefully remove perforator mechanism.

(4) Unhook the lower end of the four 55063 Retractor Bail Springs of the perforator mechanism. Remove four 152893 Screws with lock washers. Remove punch block assembly. Remove the four 55063 Retractor Bail Springs from the 156172 Retractor Bail Rod. Discard the punch block and retain the four 55063 Retractor Bail Springs and four 152893 Screws with lock washers.

(5) Remove and retain 152893 Screw and 110743 Lock Washer on the right top edge of the 156024 Rear Plate W/Bushing. Remove and retain the 151630 Screw and 2191 Lock Washer, connecting the 156028 Front Plate and 156042 Spacing Post. Remove and retain the 41382 Detent Spring and 91120 Feed Pawl Spring. Separate the 156028 Front Plate and 156024 Rear Plate by pulling them apart.

(6) Remove two 3599 Nuts, two 110743 Lock Washers, two 125011 Flat Washers and 156163 Punch Slide Guide from 156024 Rear Plate. Remove two 156173 Guide Mounting Stud, two 110743 Lock Washers, two 125011 Flat Washer and 156069 Punch Slide Downstop Plate. First mount the 170247 Punch Slide Guide (upper slotted edge outwards) and two 156173 Guide Mounting Studs with lock washers and flat washer, then the 156069 Punch Slide Downstop Plate and two 3599 Nuts with lock washers and flat washers.

NOTE

The 170247 Punch Slide Guide must be behind the 156069 Punch Slide Downstop Plate.

(7) On the 156024 Rear Plate unhook the five 159560 Punch Slide Springs from the 156020 Punch Slides. Remove the 156015 Spring Plate with five springs from slots in the 156016 and 156099 Drag Links, and add the sixth spring, 159560 from the kit. Replace five 156020 Punch Slides with five 170243 Code Slides and add one 170242 Feed Slide. Mount 156015 Spring Plate and hook 159560 Punch Slide Springs to code and feed slides.

(8) Remove and discard 172638 Screw, 2191 Lock Washer, 7002 Flat Washer, 159982 Tape Guide and 159981 Tape Guide Spacer from the Punch Front Plate Mechanism; remove and retain 1036 Nut and 2191 Lock Washer from the 156090 Adjusting Screw. Remove and retain 160948 Screw and 90791 Lock Washer from 156045 Feed Wheel Shaft. Remove 156045 Feed Wheel Shaft. Unhook one end of the 156047 Tape Shoe Spring from 156061 Tape Shoe Arm. Remove 151630 Screw and 2191 Lock Washer from 156040 Tape Guide Post. Remove and discard the 164511 Tape Feed Disabler Lever and the 164515 Torsion Spring. Remove 156008 Feed Wheel, 156055 Die Wheel and 156090 Adjusting Screw together by screwing in 156090 Adjusting Screw. Replace 156044 Die Wheel Eccentric Stud with 170219 Die Wheel Eccentric Stud transferring 93356 Felt Washer from the 156044 Stud to the 170219 Stud. Replace 156008 Feed Wheel with 170779 Feed Wheel, 156055 Die Wheel with 170788 Die Wheel, 156090 Adjusting Screw with 170241 Adjusting Screw. Assemble these parts in reverse order as described above.

(9) Connect the 156028 Front Plate and 156024 Rear Plate. Mount the 173770 Punch Holder Assembly and four 55063 Retractor Bail Springs. Mount 91120 Feed Pawl Spring and 41382 Detent Spring.

(10) Remove and retain 3598 Nut, 2191 Lock Washer, and 7002 Flat Washer from the front of the typewheel shaft. Remove and discard the typewheel and its 156390 Spacer. Remove and retain the 119651 Retaining Ring holding the 159512 Printing Trip Link to the print hammer accelerator. Unhook the 116879 Printing Trip Link Spring from the 159539 Print Pivot Arm and remove and retain the 159512 Printing Trip Link. Remove and retain the 95378 Print Hammer Accelerator Spring. Remove the 151630 Screw and 2191 Lock Washer from the rear of the 160943 Typewheel Shaft Housing. Remove the 151630 Screw and 2191 Lock Washer from the rear of the 160943 Typewheel Shaft Housing. Remove and retain two 151442 Screws and 2191 Lock Washers from the front of the 160943 Typewheel Shaft Housing. Remove the 160943 Typewheel Shaft Housing and associated parts. (This will also disconnect the 161323 Spur Gear Housing). Replace the 156332 Typewheel Shaft with the 173775 Typewheel Shaft, and the 156869 Ribbon Guide with the 173755 Ribbon Guide. Remove and retain the 112626 Lock Nut for the print hammer shaft. Remove and retain the 119649 Retaining Ring from the print hammer shaft. Remove and discard the print hammer shaft, the print hammer, the print hammer accelerator, the felt washer and the print hammer return spring from the print hammer mounting bracket. Remount the print hammer shaft housing with associated parts using the previously removed 151630 Screw and 2191 Lock Washer and the two 151442 Screws and 2191 Lock Washers. Slip the 173979 Print Hammer Head over the shouldered end of the 173756 Print Hammer Lever with the concave surface of the hammer head up. Place the 173756 Print Hammer Lever and the 173981 Accelerator with Stud in the same relative position as the old print hammer and accelerator levers removed previously. The left leg of the print hammer lever should be on the outside of the left leg of the accelerator. Thread the 173977 Print Hammer Shaft through the tapped hole in the print hammer mounting bracket. Then through the left leg of the print hammer lever and accelerator lever. Place the 173978 Print Hammer Return Tension Spring with its arm downwards, between the left leg of the accelerator and the right leg of the print hammer lever, then slide the print hammer shaft through the spring and the right leg of the print hammer and accelerator lever. Place the 156558 Felt Washer between the accelerator and the right leg of the mounting bracket. Then continue to slide the shaft through the felt washer and through the mounting bracket. Thread the shaft approximately 1/4 of the way through the tapped hole in the mounting bracket. With the print hammer and accelerator lever against the shoulder of the print hammer shaft, install the previously removed 119649 Retaining Ring to the shaft. Hook the arms of the 173978 Print Hammer Return Torsion Spring over the upper edges of the print hammer and accelerator levers. Install the previously removed 112626 Nut on the print hammer shaft. Reassemble the previously removed 159512 Printing Trip Link to the 173981 Accelerator Lever and secure with the previously removed 119651 Retaining Ring. Reassemble the 110879 Printing Trip Link Spring, and the previously removed 95378 Accelerator Spring. Assemble the new typewheel (this special typewheel is not furnished with this kit and must be ordered separately to have the proper code arrangement) with a 173754 Spacer and the previously removed 7002 Flat Washer, 2191 Lock Washer and 3598 Nut.

(11) With the 174235 Modification Kit install the perforator mechanism. In the ribbon feed mechanism replace the 156431 or 162347 Ribbon Drive Arm with the 176639 Ribbon Drive Arm and 176441 Adjustable Extension (See Figure 7). Install the ribbon feed mechanism placing the 85823 Spacers between the ribbon feed mechanism and the 159535 Plate; discard 151632 Screws and use 153841 Screws and 2191 Washer. Replace the 156475 Tape Guard with the 176640 Tape Guard.

(12) With the 178834 Modification Kit install the perforator mechanism. In the ribbon feed mechanism replace the 164543 Adjustable Extension Lever with the 178178 Adjustable Extension Lever. Install the ribbon feed mechanism placing the 85823 Spacers between the ribbon feed mechanism and the 159535 Plate; discard 151632 Screws and use 153841 Screws and 2191 Washers. Replace the 156475 Tape Guard with the 176640 Tape Guard.

(13) Mount the 163674 Chad Chute to the punch block with the 151073 Screws.

(14) Cut base as necessary under the 163674 Chad Chute to furnish outlet for chad. (See Figure 8)

3. ADJUSTMENTS AND LUBRICATION

a. For standard adjustments and lubrication procedure refer to Teletype Model 28 Typing Reperforator Set Bulletin 247B. Bell System refer to standardized information. U.S. Navy see NAVSHIPS 94456.

b. There are new adjustments, the Ten Characters Per Inch, Detent, Feed Hole Lateral Alignment, and Type Wheel Positioning and Print Hammer, which are made after the Punch Slide Downstop Position Adjustment.

c. There are changes in adjustments as shown on the attached figures. Make all the adjustments referenced. Referring to Figure 7 of this specification make the Ribbon Feed Eccentric Stud Adjustment given in Teletype Bulletin 247B, changing the "To Adjust" to the following: To Adjust - Position the adjustable extension with mounting screw friction tight. Make the Type Wheel Positioning and Print Hammer Adjustment in place of the Print Hammer adjustment given in Teletype Bulletin 247B.

NOTES

With the 179274 Feed Wheel, not furnished with the kits, operation is the same as with the 170779 Feed Wheel, only the indentation is punched out.

Referring to the Rocker Arm Adjustment in Teletype Bulletin 247B, requirement (1) is changed from MIN. 0.002" and MAX. 0.005" to: some to MAX. 0.009". This adjustment should now be considered final.

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(A) PUNCH PIN PENETRATION REQUIREMENT

(1) WITH THE RUBOUT COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS ARE INTO OR ABOVE THE TAPE APERTURE IN PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION

MIN. 0.050 INCH

CLEARANCE BETWEEN FEED PAWL STUD AND THE GAUGE.

(2) WITH RUBOUT COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS HAVE CLEARED THE PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION

MAX. 0.080 INCH

CLEARANCE BETWEEN FEED PAWL STUD AND GAUGE.

TO ADJUST

REFINE THE TOGGLE BAIL ECCENTRIC ADJUSTMENT KEEPING THE INDENT TO THE RIGHT OF A VERTICAL CENTERLINE THROUGH THE SHAFT.

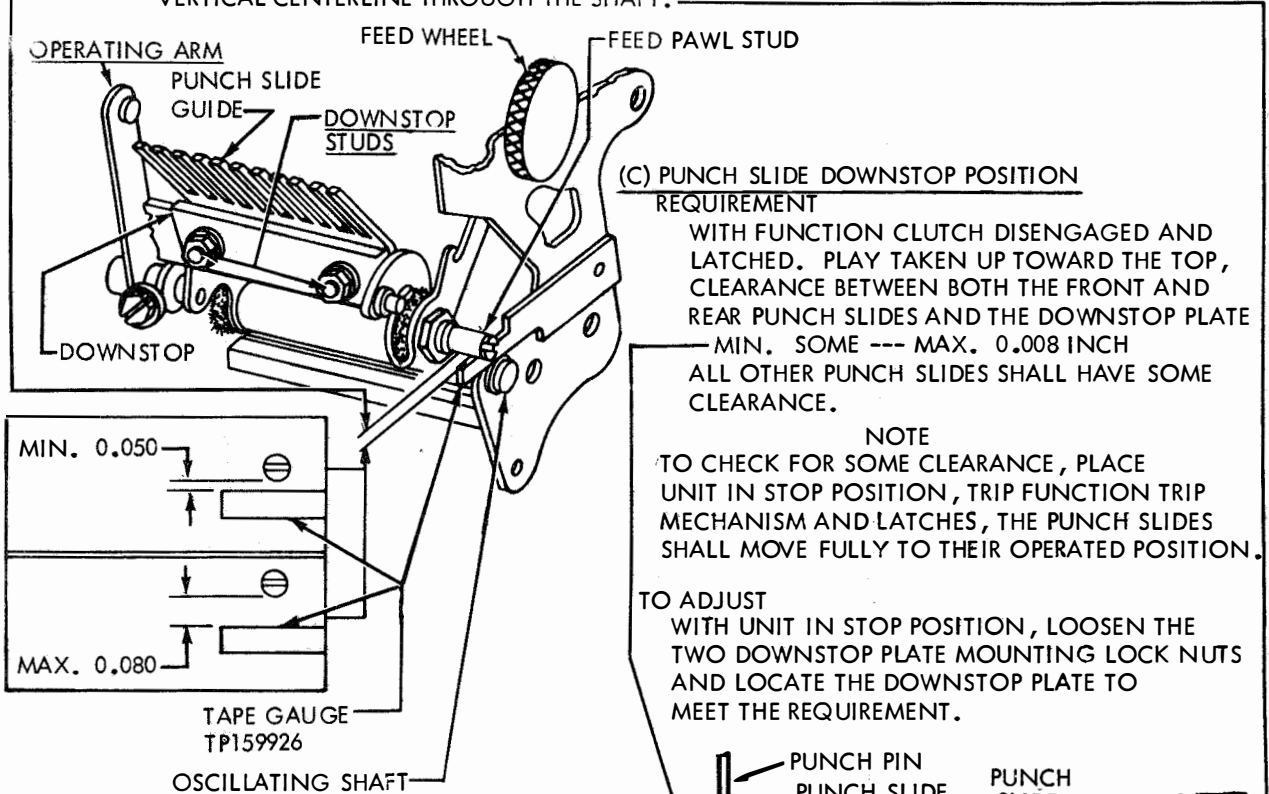


FIGURE 1.

(B) PUNCH SLIDE GUIDE REQUIREMENT

THE PUNCH SLIDES SHOULD ALIGN WITH THEIR CORRESPONDING PUNCH PINS AND BE FREE OF BINDS AFTER TIGHTENING THE GUIDE MOUNTING STUDS. EACH PUNCH SLIDE SHOULD RETURN FREELY AFTER BEING PUSHED IN NOT MORE THAN 1/16 INCH.

TO ADJUST

POSITION THE GUIDE WITH ITS MOUNTING STUDS FRICTION TIGHT.

(C) PUNCH SLIDE DOWNSTOP POSITION REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED AND LATCHED. PLAY TAKEN UP TOWARD THE TOP, CLEARANCE BETWEEN BOTH THE FRONT AND REAR PUNCH SLIDES AND THE DOWNSTOP PLATE

MIN. SOME --- MAX. 0.008 INCH

ALL OTHER PUNCH SLIDES SHALL HAVE SOME CLEARANCE.

NOTE

TO CHECK FOR SOME CLEARANCE, PLACE UNIT IN STOP POSITION, TRIP FUNCTION TRIP MECHANISM AND LATCHES, THE PUNCH SLIDES SHALL MOVE FULLY TO THEIR OPERATED POSITION.

TO ADJUST

WITH UNIT IN STOP POSITION, LOOSEN THE TWO DOWNSTOP PLATE MOUNTING LOCK NUTS AND LOCATE THE DOWNSTOP PLATE TO MEET THE REQUIREMENT.

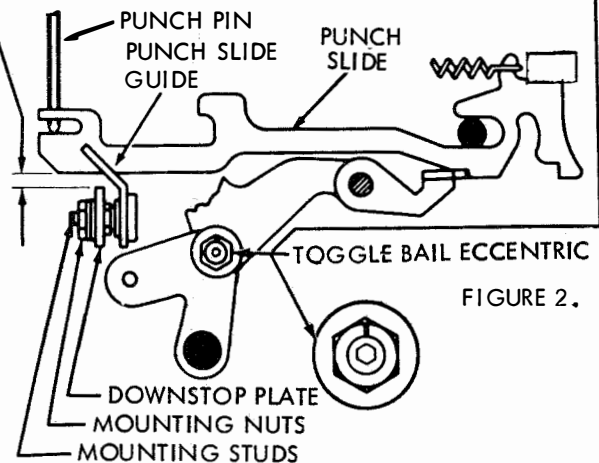


FIGURE 2.

TEN CHARACTERS PER INCH
REQUIREMENT

500385

NOTE: CHECK PUNCH BLOCK BIAS AND TAPE CHUTE BIAS SPRING, ADJUSTMENTS BEFORE MAKING THIS ADJUSTMENT.

- (1) WITH TAPE SHOE BLOCKED AWAY FROM FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHOULD ROTATE FREELY. CHECK THROUGH 3 OR 4 ROTATIONS.
- (2) PERFORATE SIX SERIES OF (9) "BLANKS" COMBINATIONS FOLLOWED BY (1) "LETTERS" COMBINATION. PLACE THE TAPE OVER THE SMOOTH SIDE OF THE 156011 TAPE GAGE SO THAT THE FIRST NUMBER TWO CODE HOLE IN THE TAPE IS CONCENTRIC WITH THE FIRST (.072) HOLE OF THE TAPE GAGE (SEE NOTE). THE NEXT FOUR .072 DIA. HOLES IN THE TAPE GAGE SHALL BE VISIBLE THROUGH THE NUMBER TWO CODE HOLES IN THE TAPE AND THE LAST (SIXTH) NUMBER TWO SHALL BE ENTIRELY WITHIN THE .086 DIA. HOLE OF THE TAPE GAGE.

NOTE: THE FIRST FIVE HOLES IN THE GAGE ARE THE SAME SIZE AS THE CODE HOLES IN THE TAPE (.072 INCH DIAMETER) BUT THE SIXTH HOLE IN THE GAGE IS LARGER THAN THE FIRST FIVE (.086 INCH DIAMETER). THIS ARRANGEMENT ALLOWS + .007 INCH VARIATION IN FIVE (5) INCHES.

TO ADJUST

- (1) WITH THE TAPE REMOVED FROM THE PUNCH MECHANISM, LOOSEN THE DIE WHEEL ECCENTRIC STUD LOCK NUT AND ADJUST THE DIE WHEEL SO THAT IT JUST BINDS ON THE FEED WHEEL, BACK OFF THE ECCENTRIC SO THE DIE WHEEL IS JUST FREE (CHECK FREENESS THROUGH 3 OR 4 ROTATIONS). KEEP THE INDENT OF THE ECCENTRIC STUD BELOW THE HORIZONTAL CENTER LINE OF THE STUD.
- (2) CHECK THE TEN CHARACTERS PER INCH REQUIREMENT AND REFINE THE FEED WHEEL DIE WHEEL CLEARANCE ADJUSTMENT TO MEET THE REQUIREMENT BY MOVING THE INDENT OF THE DIE SHEEL ECCENTRIC STUD TOWARD THE FEED WHEEL TO DECREASE THE CHARACTER SPACING AND AWAY FROM THE FEED WHEEL TO INCREASE THE CHARACTER SPACING.

CAUTION: WITH THE TAPE REMOVED FROM THE PUNCH MECHANISM, BE SURE THE DIE WHEEL DOES NOT BIND.

- (3) WITH THE TAPE SHOE AWAY FROM THE FEED WHEEL, THE FEED PAWL AND DETENT DISENGAGED, AND THE TAPE REMOVED FROM THE PUNCH MECHANISM, THE FEED WHEEL SHALL ROTATE FREELY. FAILURE TO MEET THIS REQUIREMENT INDICATES THE DIE WHEEL ECCENTRIC HAS BEEN OVER-ADJUSTED. TO MEET THIS REQUIREMENT, REFINE THE ADJUSTMENT.

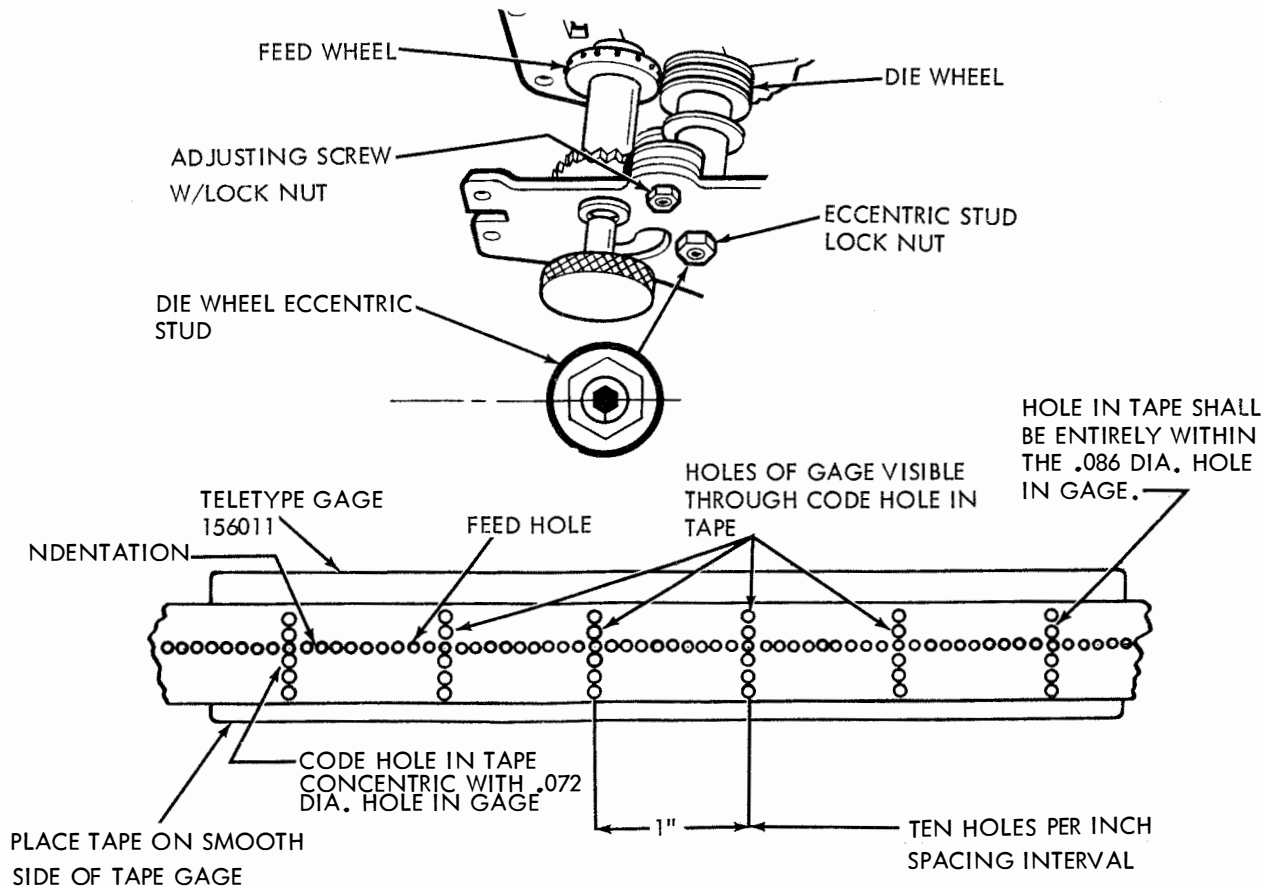


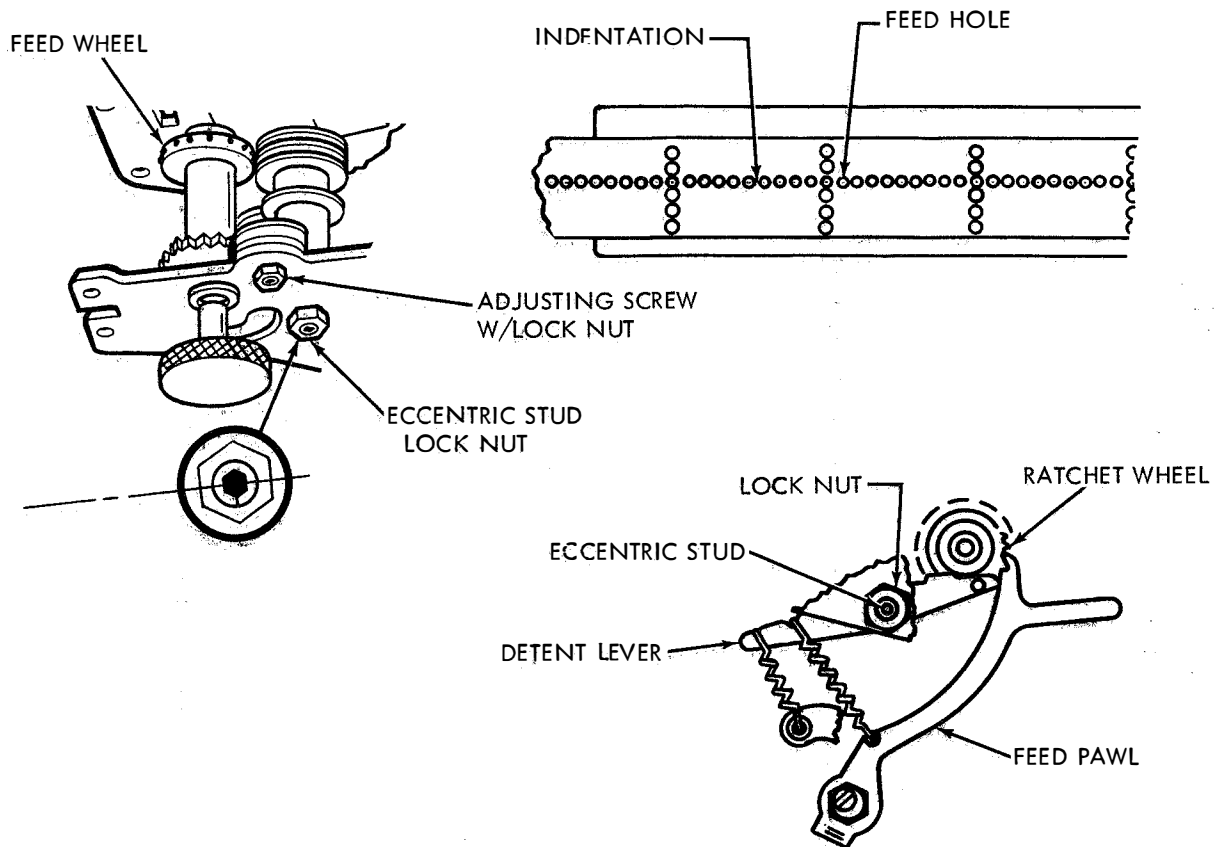
FIGURE 3.

**DETENT
REQUIREMENT**

WITH THE UNIT OPERATING UNDER POWER, THE INDENTATIONS OF THE FEED WHEEL SHALL BE CENTRALLY LOCATED BETWEEN TWO FULLY PERFORATED FEED HOLES, AS GAGED BY EYE.

TO ADJUST

LOOSEN THE DETENT LEVER ECCENTRIC STUD LOCK NUT AND TURN THE ECCENTRIC STUD CLOCKWISE TO MOVE THE INDENTATION TOWARD THE LEADING EDGE OF THE FEED HOLE AND COUNTERCLOCKWISE TO MOVE THE INDENTATION TOWARD THE TRAILING EDGE. TIGHTEN THE LOCK NUT AND RE-CHECK THE FEED PAWL ADJUSTMENT.



**FEED WHEEL FRONT TO REAR
REQUIREMENT**

WITH THE UNIT OPERATING UNDER POWER, THE INDENTATIONS OF THE FEED WHEEL SHOULD BE ON A CENTERLINE THROUGH THE FULLY PERFORATED FEED HOLES, AS GAGED BY EYE.

TO ADJUST

WITH THE ADJUSTING SCREW LOCK NUT LOOSE TURN THE ADJUSTING SCREW CLOCKWISE TO MOVE THE INDENTATION TOWARD THE REAR AND COUNTERCLOCKWISE TO MOVE THE INDENTATIONS TOWARD THE FRONT.

FIGURE 4.

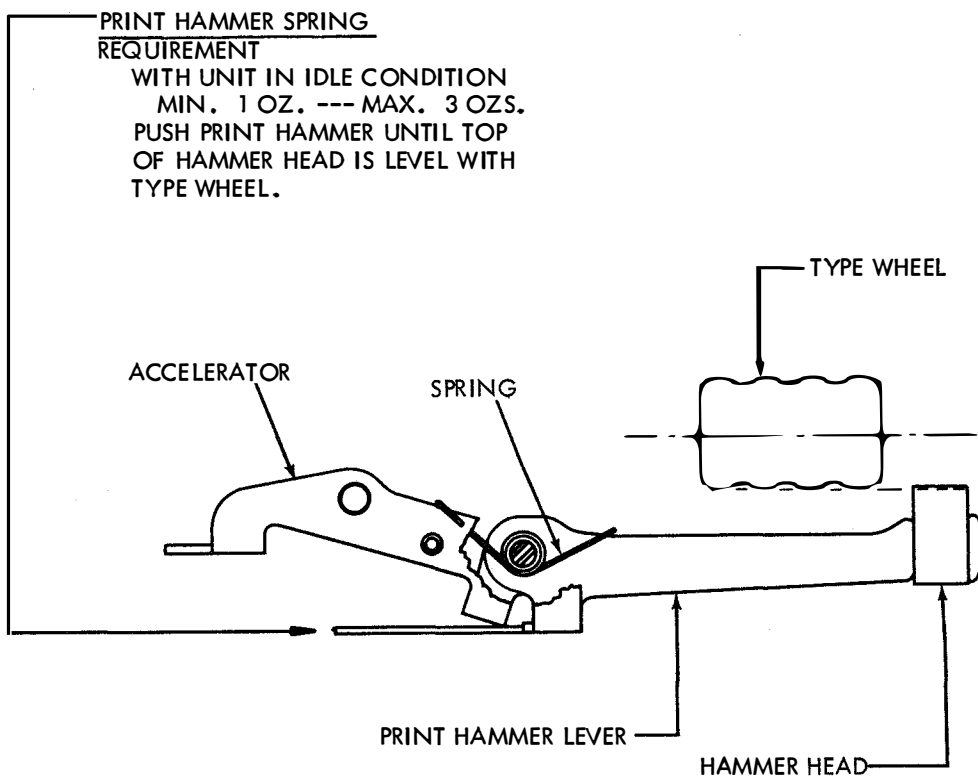
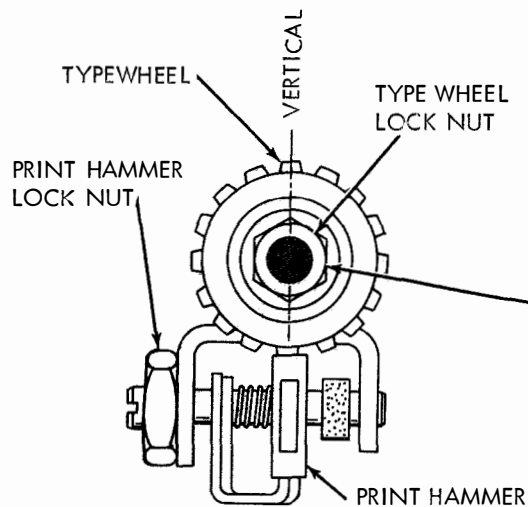
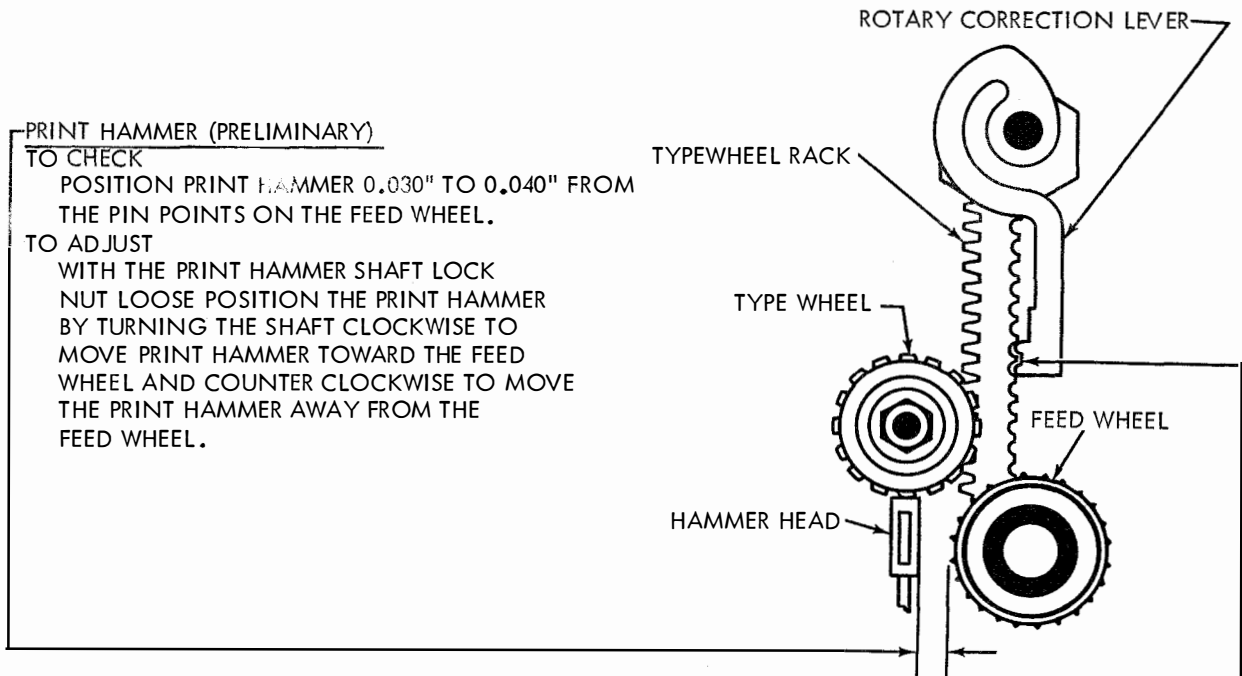
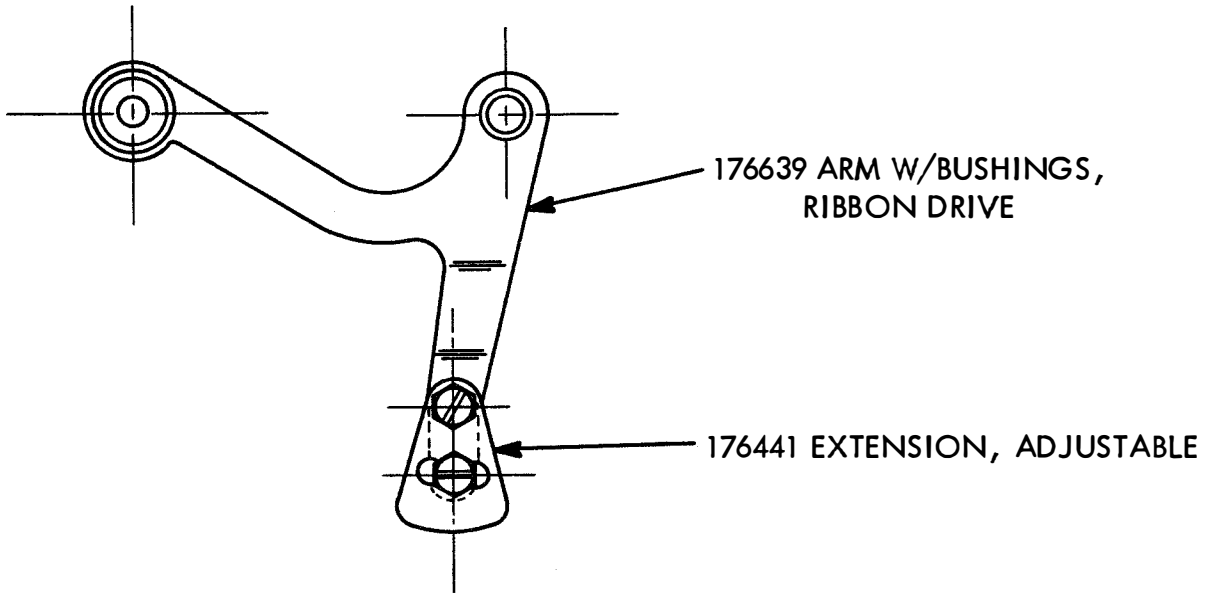


FIGURE 5.



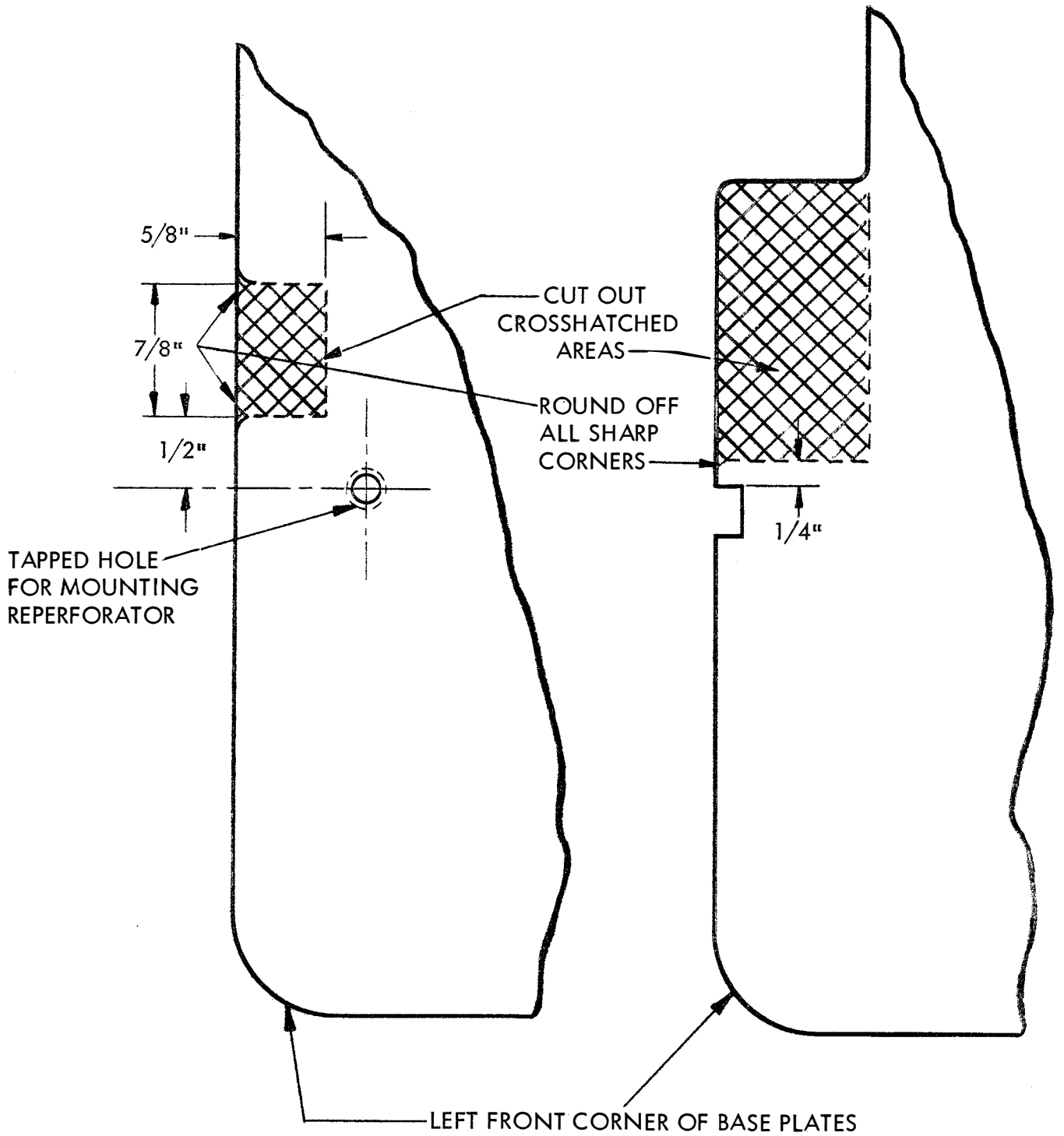
FRONT VIEW

FIGURE 6.



ASSEMBLY OF THE ADJUSTABLE EXTENSION ON THE RIBBON DRIVE ARM FOR THE 176641 RIBBON FEED MECHANISM .

FIGURE 7.

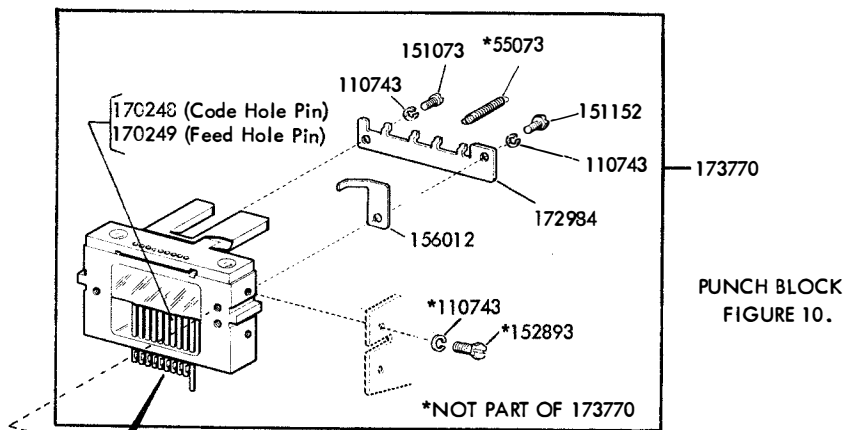
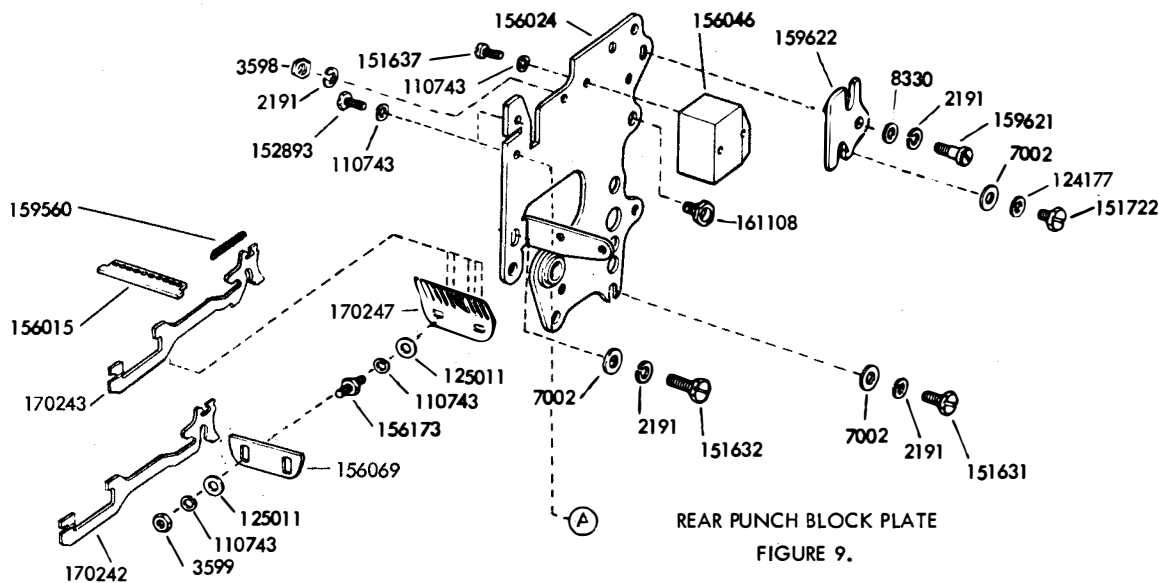


**156879 UPPER BASE PLATE
OR
*156966 BASE PLATE

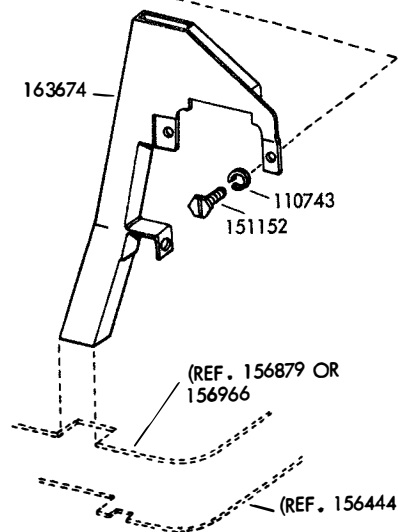
**156444 LOWER
BASE PLATE

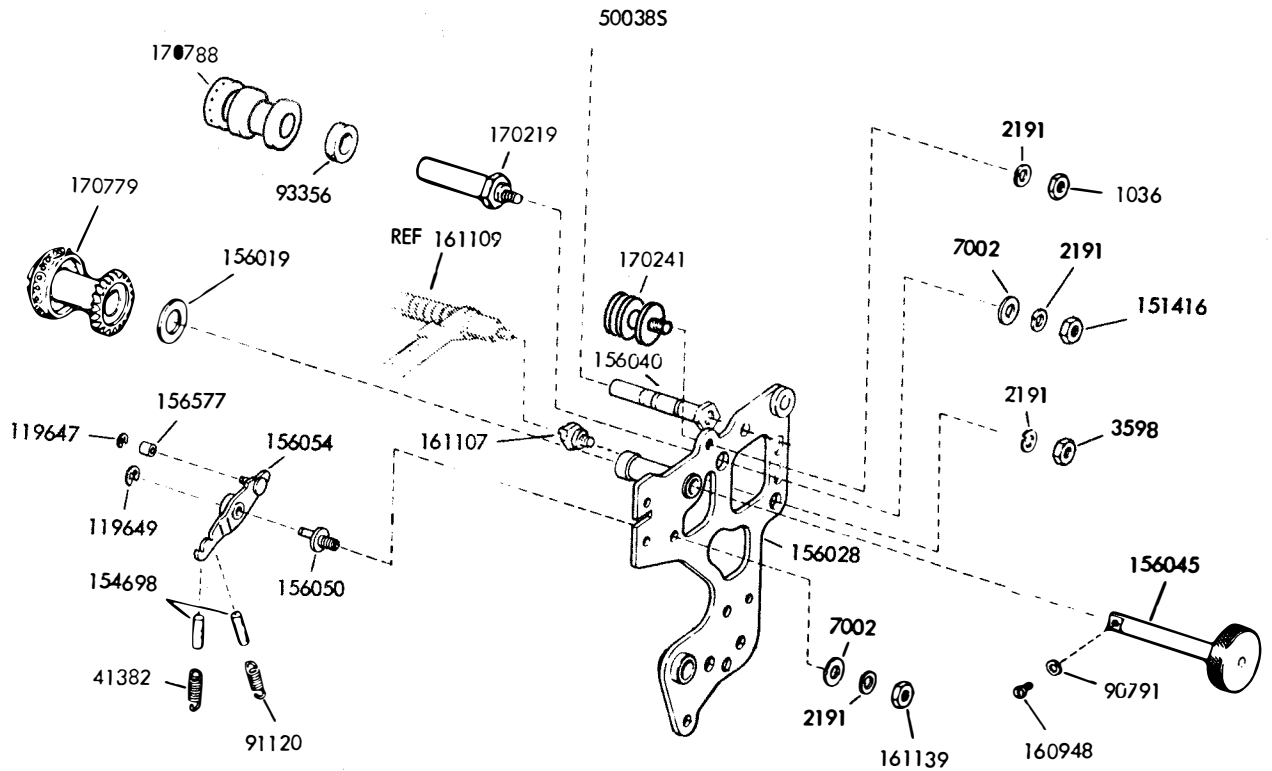
*ON BASE WITH SINGLE BASE PLATE
**ON BASE WITH DOUBLE BASE PLATE

FIGURE 8.

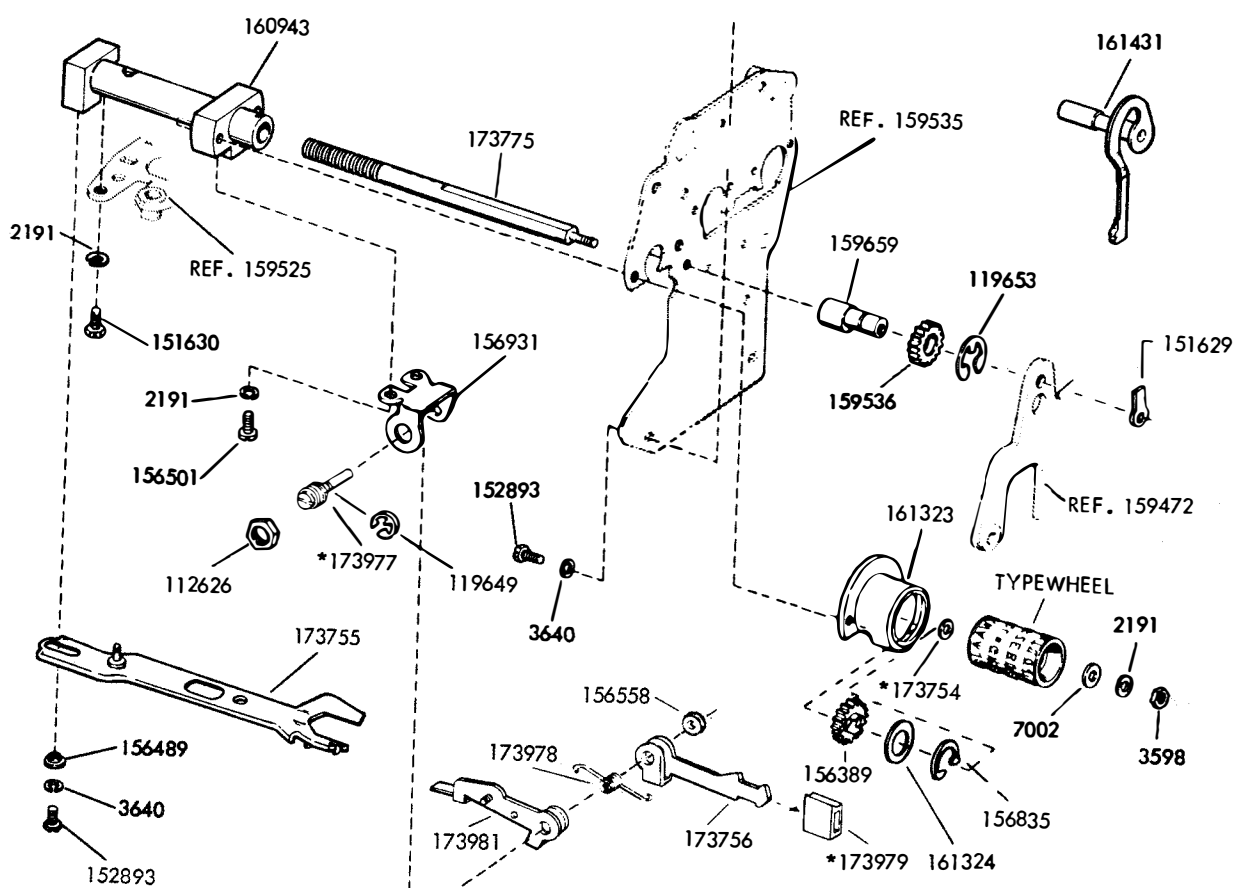


Note: Due to special assembly processes, it is recommended that when part replacement becomes necessary on this portion of the Punch Block Assembly it be returned to Teletype for repair.



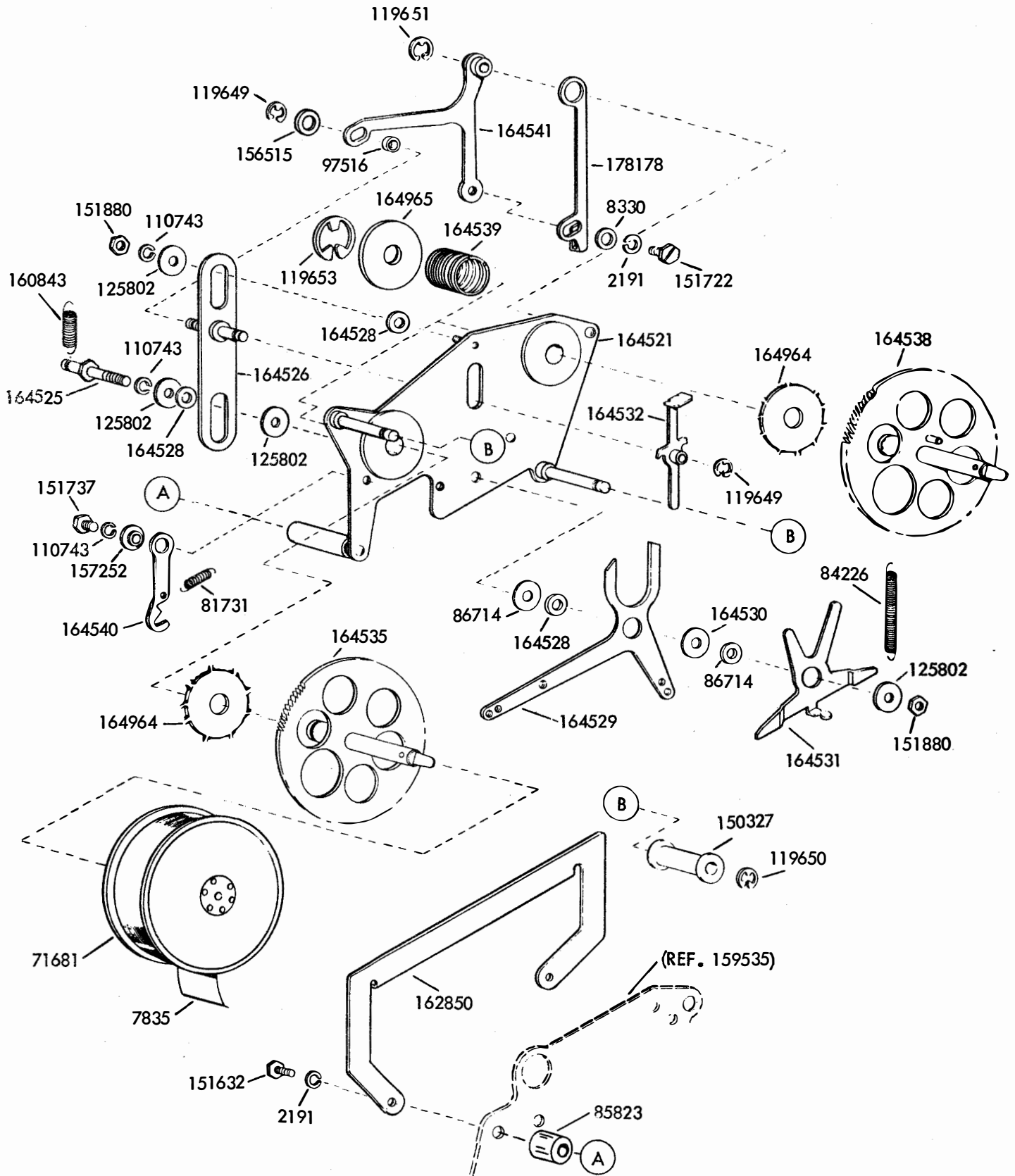


FRONT PUNCH PLATE MECHANISM
FIGURE 12.



ROTARY POSITIONING MECHANISM
FIGURE 13.

50038S



RIBBON FEED MECHANISM (NEW DESIGN)

FIGURE 16.

Teletype Corporation
Skokie, Illinois, U.S.A.

Addendum to Specification 50038S
Issue 5, Dated
February, 1964

ADDENDUM TO SPECIFICATION 50038S, ISSUE 5, DATED
FEBRUARY, 1964 COVERING THE 174235 AND 178834 MOD-
IFICATION KITS

1. Add the following note after Paragraph 1.e. of the Specification:

NOTE

If the unit being modified is equipped with a backspace mechanism, manual or power, the manual portion of the backspace mechanism must be replaced with the 178917 Backspace Modification Kit not included with these kits. If the backspace mechanism has a cover, it should be replaced by the 178918 Backspace Cover Modification Kit not included with these kits.

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