BULLETIN 250B

ADJUSTMENTS AND LUBRICATION
MODEL 28
PERFORATOR TRANSMITTER
LAK, LPE, LTPE, LAAC

TELETYPIE® CORPORATION
SUBSIDIARY OF Western Electric Company INC.
CHICAGO, ILLINOIS, U.S.A.

CHANGE 1
BULLETIN 250B

ADJUSTMENTS AND LUBRICATION
MODEL 28
PERFORATOR TRANSMITTER
LAK, LPE, LTPE, LAAC

TELETYPE®
CORPORATION
SUBSIDIARY OF Western Electric Company INC.
CHICAGO, ILLINOIS, U.S.A.

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**OCTOBER, 1958**

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The above list indicates the effective pages as of the date of issue. Upon receipt of change pages, insert them numerically and discard superseded pages.
The MODEL 2B AUTOMATIC SEND-RECEIVE SET (ASR) is made up of a group of basic component units in various combinations. These include a keyboard, page printer, perforator (typing or non-typing), perforator (typing or non-typing), transmitter distributor, transmitter distributor base, electrical service unit, console cabinet and motor unit.

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The following chart lists the numbers of bulletin covering components of the ASR set, such as, parts ordering (P), adjustments and lubrication (A & L), description and theory of operation (D & T). (Bell System refer to standardized A & L information)

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- Adjustments and lubrication of these components are covered in this bulletin.

NOTES:
1. See specification SB73S for installation Instructions covering typical ASR sets.
2. See bulletin 10728 for parts ordering information and specification SB845 for adjustments and lubrication of TW13 Tape Winder used with some ASR cabinets.
3. See bulletin 11248 for ordering information on special tools.
MODEL 28 TYPING PERFORATOR
LTPE

CHANGE 1
MODEL 28 PERFORATOR TRANSMITTER
Mounted in
AUTOMATIC SEND-RECEIVE SET
2508

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1. GENERAL

a. The adjustments of each unit are arranged in a sequence that should be followed if a complete readjustment of the unit were undertaken. The tools and spring scales required to perform these adjustments are listed in Teletype Bulletin 11248, but are not supplied as part of the equipment. After an adjustment is completed, be sure to tighten any nuts or screws that are loosened. The adjusting illustrations indicate tolerances, positions of moving parts, spring tensions and the angles at which scales should be applied when measuring spring tensions. If a part that is mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same number is replaced when the part is remounted.

b. The spring tensions given in this bulletin are indicated values and should be checked with proper spring scales in the positions indicated.

c. References made to left or right, up or down, front or rear etc. apply to the unit in its normal operating position as viewed from the front.

d. When a requirement calls for a clutch to be disengaged, the clutch shoe lever must be fully latched between its trip lever and latch lever so that the clutch shoes (Figure 1-3) release their tension on the clutch drum. When engaged, the clutch shoe lever is unlatched and the clutch shoes are wedged firmly against the clutch drum.

NOTE

When the main shaft of the perforator is rotated by hand, the clutch does not fully disengage upon reaching its stop position. In order to relieve drag and permit the main shaft to rotate freely, apply pressure on the lug of the clutch disk (Figure 1-3) with a screwdriver to cause it to engage its latch lever and fully disengage the clutch.

e. K, K-T and T refer to corresponding positions of the keyboard control knob. Unless otherwise specified, adjustments are made in K-T position.

f. When instructions call for the removal of parts or subassemblies, refer to Disassembly or Reassembly, Paragraph 6, Page 1-44.

g. To manually operate perforator, proceed as follows: Rotate the main shaft counterclockwise until the clutch disengages. Trip the clutch by pivoting the main trip lever counterclockwise (see Figure 1-57). Unlatch the punch slides (see Figure 1-23) corresponding to the marking elements of the code combination to be processed (The slides are numbered 1 to 5 from rear to front). Rotate the main shaft counterclockwise until the required condition is set up or the code combination is processed through the unit.

h. In addition to the standard adjustments in Section 1, Variable Feature adjustments are covered in Section 2 of this bulletin. When these adjustments affect normal adjusting sequence, cross reference information has been included in Section 1. Variable Feature adjustments that do not affect the adjusting sequence may be made at any time.
2. KEYBOARD MECHANISM

(B) CODE LEVER UNIVERSAL BAIL SPRING TENSION REQUIREMENT
GENERATOR CLUTCH DISENGAGED.
MIN. 1 OZ.,
MAX. 2 OZS.
TO START BAIL MOVING.

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

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

(C) SPACE BAR BAIL PIVOT REQUIREMENT
MIN. SOME END PLAY.
MAX. 0.010 INCH.
SPACE BAR FREE FROM BIND.
TO ADJUST
POSITION SPACE BAR WITH PILOT SCREWS.

FIGURE 1-1. CODE BAR AND SPACE BAR MECHANISMS

CHANGE 1
ADJUSTING DISK, CLAMP SCREWS

CLUTCH CAM DISK

ADJUSTING DISK

CLUTCH DISK STOP LUG

GEAR SLEEVE

CLUTCH SHOE LEVER

REQUIREMENT

CLUTCH ENGAGED

MIN. 0.080 INCH

MAX. 0.100 INCH

BETWEEN CLUTCH SHOE LEVER AND CLUTCH DISK STOP LUG.

TO ADJUST

POSITION ADJUSTING DISK WITH ITS CLAMP SCREWS LOOSENEO.

NOTE

AFTER ADJUSTMENT IS MADE, DISENGAGE CLUTCH AND CHECK

FOR DRAG ON DRUM. HOOK SCALE ON GEAR TOOTH AND PULL

AT RIGHT ANGLE TO THE RADIUS OF THE GEAR, IF MORE THAN

12 OZS. IS REQUIRED TO MOVE THE DRUM, RECTIFY ADJUSTMENT.

FIGURE 1-2. SIGNAL GENERATOR CLUTCH AND GEAR MECHANISMO
(B) CLUTCH STOP LEVER SPRING TENSION
REQUIREMENT
CLUTCH ENGAGED AND ROTATED 1/4 TURN.
MIN. 2 OZS.
MAX. 3 OZS.
TO START LEVER MOVING.

(A) CLUTCH STOP LEVER
REQUIREMENT
SHOULD FULLY ENGAGED CLUTCH SHOE
LEVER.
DURING ROTATION, THE LEVER SHOULD
NOT TOUCH THE CLUTCH DRUM AT ANY
POINT.
TO ADJUST
POSITION STOP LEVER WITH ITS CLAMP
SCREW LOOSENED.

(C) CLUTCH LATCH LEVER SPRING TENSION
REQUIREMENT
CLUTCH LATCH LEVER RESTING ON THE
HIGHEST POINT OF CLUTCH DISK.
MIN. 2 OZS.
MAX. 3 OZS.
TO START LATCH LEVER MOVING.

FIGURE 1-3. SIGNAL GENERATOR CLUTCH AND LEVER MECHANISM
(A) Transfer bail detent latch spring tension requirement

Maximum: 4-1/4 ozs.
To start latch moving.

(B) Transfer bail detent plate requirement
Equal L.H. and R.H. clearance within .002
To adjust rotate detent plate right or left by means of screwdriver with mounting screws loosened.

(C) Contact box contact clearance requirement
Marking and spacing gaps should be equal within 0.001 inch.
To check depress key lever and rotate signal generator cam sleeve until each contact has fully opened.
To adjust loosen mounting screws and move contact box by means of eccentric.

Note
Check by means of signal checking device where possible, and carefully refine the adjustment to eliminate all bias from the signals by equalizing the current-on and current-off intervals.

(D) Contact box drive link spring tension requirement
Spring removed from link
Minimum: 11 ozs.
Maximum: 13 ozs.
at .438 inch

(E) Contact box spring tension requirement
Transfer bail held clear of drive link
Minimum: 2 ozs.
Maximum: 3 ozs.
To start link moving.

Figure 1-4. Code bar bail and contact box mechanism
NOTE: IF NECESSARY REMOVE CHARACTER COUNTER ASSEMBLY. SEE DISASSEMBLY AND REASSEMBLY.

(A) CODE BAR AND CODE LEVER CLEARANCE
REQUIREMENT
CARRIAGE RETURN KEY DEPRESSED BUT NOT ENOUGH TO TRIP OFF UNIVERSAL BAIL LATCH OR CLUTCH BAR.
MIN. 0.010 INCH
MAX. 0.015 INCH
MEASURED AT CODE BAR #5.
TO ADJUST
POSITION GUIDE BY ADJUSTING SLOT WITH 4 MOUNTING SCREWS LOOSENED.

(B) CLUTCH TRIP BAR SPRING TENSION
REQUIREMENT
BLANK KEY PRESSED TO ALLOW THE CLUTCH TRIP BAR TO FALL TO RIGHT.
SPRING UNHOOKED FROM BRACKET
MIN. 8 OZS.
MAX. 12 OZS.
TO PULL SPRING TO INSTALLED LENGTH

(C) CODE BAR SPRING TENSION
REQUIREMENT
KEYBOARD IN K POSITION, LETTERS KEYLEVER DEPRESSED (POWER OFF) HOLD TRANSFER LEVERS (REF. FIGURE 14) TO THE RIGHT SO THEY DO NOT AFFECT THE CODE BARS.
MIN. 3 OZS.
MAX. 5 OZS.
TO START CODE BAR MOVING.

FIGURE 1-5. CODE BAR AND CODE LEVER MECHANISM

CHANGE 1
(A) FUNCTION BAIL AND CODE LEVER CLEARANCE
REQUIREMENT
MIN. 0.015 INCH BETWEEN ANY FUNCTION BAIL AND ITS ADJACENT CODE LEVER.
TO ADJUST
POSITION FUNCTION BAIL ASSEMBLY WITH MOUNTING SCREWS AND TYPING UNIT LOCATING STUDS LOOSENED.

FUNCTION BAIL
FUNCTION BAIL ASSEMBLY

CODE LEVER
FUNCTION LEVER

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

(b) LOCK BALL CHANNEL
REQUIREMENT
THERE SHOULD BE SOME TO 0.006 INCH CLEARANCE BETWEEN END OF LOCK BALL CHANNEL AND ADJUSTING SCREW WHEN MOST OF THE CODE LEVERS ARE CENTRALLY LOCATED IN THE LOCK BALL CHANNEL SLOTS.
TO CHECK
REMOVE THE LOCK BALL RETAINER. REMOVE A WEDGE FROM EACH END AND ONE FROM THE CENTER IN ORDER TO VIEW THE POSITION OF THE CODE LEVER.

LOCK BALL CHANNEL
WEDGE
CODE LEVER
LATERAL ADJUSTING SCREW

TO ADJUST
LOosen THE LOCK BALL CHANNEL MOUNTING SCREWS. BACK OFF LATERAL ADJUSTING SCREWS AND POSITION CHANNEL. TURN ONE ADJUSTING SCREW IN AGAINST THE END OF THE CHANNEL AND LOCK IT. TURN THE OTHER ADJUSTING SCREW IN TO THE END OF THE CHANNEL AND BACK IT OFF 1/4 TURN. LOCK THE SCREW. REPLACE THE WEDGES AND CHECK THEIR POSITION WITH RESPECT TO THE BALLS. PULL CHANNEL ASSEMBLY DOWNWARD UNTIL ALL CODE LEVERS STRIKE THEIR UPSTOP WITHOUT WEDGES JUMPING OUT OF POSITION. REPLACE LOCK BALL RETAINER. BACK OFF BALL-END-PLAY ADJUSTING SCREW.

FIGURE 1-6. FUNCTION BAIL AND LOCK BALL TRACK MECHANISMS

CHANGE 1
(A) **CODE BAR BAIL LATCH SPRING TENSION**

REQUIREMENT

MIN. 1/2 OZS.
MAX. 1 1/2 OZS.
TO START CODE BAR BAIL LATCH MOVING.

---

(B) **CODE BAR BAIL**

REQUIREMENT

CAM ECCENTRIC AND ARM WHICH HOLD THE BAIL IN EXTREME RESET POSITION TO THE LEFT.
MIN. SOME
MAX. 0.006 INCH
BETWEEN CODE BAR BAIL ROLLER AND CODE BAR BAIL LATCH
TO ADJUST
WITH LOCK NUT LOOSENED,
ADJUST ECCENTRIC STUD SO THAT HIGH POINT IS IN UPPER HALF OF ARC.

---

(C) **NON-REPEAT LEVER SPRING TENSION**

REQUIREMENT

ANY KEYLEVER DEPRESSED
MIN. 2-1/4 OZS.
MAX. 3-1/4 OZS.
TO START NON-REPEAT LEVER MOVING DOWNWARD.

---

(D) **CODE BAR BAIL AND NON-REPEAT LEVER CLEARANCE**

REQUIREMENT

MECHANISM IN INITIAL TRIP-OFF POSITION, ANY KEY DEPRESSED,
NO POWER,
MIN. 0.010 INCH
MAX. 0.030 INCH
BETWEEN ROLLER OF CODE BAR BAIL AND NON-REPEAT LEVER PICK-UP STEP
TO ADJUST
LOOSEN LOCK NUT AND SHOULDER SCREW AND MOVE MECHANISM LEFT OR RIGHT

---

**FIGURE 1-7. FUNCTION BAIL, CODE BAR BAIL, AND NON-REPEAT LEVER MECHANISMS**
(B) UNIVERSAL BAIL LATCH SPRING TENSION REQUIREMENT
CLUTCH DISENGAGED, UNIVERSAL BAIL HELD AWAY FROM LATCH LEVER
MIN.: 3-1/2 OZS.
MAX.: 4-1/4 OZS.
TO START LATCH LEVER MOVING.

(A) UNIVERSAL BAIL LATCH LEVER REQUIREMENT (POWER OFF)
KEYLEVER HELD AGAINST ITS UPSTOP CLEARANCE BETWEEN UNIVERSAL BAIL LATCH LEVER AND ROLLER ON UNIVERSAL BAIL EXTENSION
MIN.: 0.005 INCH
MAX.: 0.015 INCH
TO ADJUST ROTATE ECCENTRIC. KEEP HIGH PART OF ECCENTRIC UP.

(E) UNIVERSAL BAIL EXTENSION REQUIREMENT (POWER OFF)
UNIVERSAL BAIL EXTENSION ROLLER RESTING AGAINST END OF UNIVERSAL BAIL LATCH LEVER
MIN.: 0.060 INCH
MAX.: 0.080 INCH
BETWEEN EXTENSION AND NON-REPEAT LEVER
TO CHECK DEPRESS LETTERS KEYLEVER AND RELEASE IT. CHECK CLEARANCE.
TO ADJUST POSITION THE EXTENSION WITH ITS CLAMP SCREW LOOSENED.

(D) PLUNGER SPRING TENSION REQUIREMENT
WITH PLUNGER OPERATING KEYLEVER DEPRESSED
MIN.: 3 OZS.
MAX.: 5 OZS.
TO START PLUNGER MOVING DOWNWARD.

(C) LOCAL LINE FEED TRIP LINK SPRING TENSION REQUIREMENT
MIN.: 5 OZS.
MAX.: 10 OZS.
TO START LINK MOVING.

FIGURE 1-8. UNIVERSAL BAIL LATCH LEVER AND LOCAL LINE FEED TRIP LINK MECHANISMS
(B) LOCK BALL END PLAY
REQUIREMENT
THE TRIP OFF PRESSURE OF ANY KEYLEVER
SHOULD BE BETWEEN 3 AND 5 OZS. WHEN
KEYBOARD IS OPERATING.
THE CLUTCH SHOULD TRIP CONSISTENTLY
WHEN ANY TWO KEYS ARE OPERATED ALTERNATELY
BY A SMOOTH, ROLLING ACTION—NOT GRITTY OR BUMPY.
THE CLUTCH SHOULD NOT TRIP WHEN TWO
KEYS ARE DEPRESSED SIMULTANEOUSLY.
THE LOCK BALL ADJUSTMENT SHOULD NOT
PREVENT ANY DEPRESSED CODE LEVER
MEETING ITS UPSTOP.
TO ADJUST
ROTATE THE LOCK BALL ADJUSTING SCREW.

(A) BALL WEDGELOCK AND BALL TRACK CLEARANCE
REQUIREMENT
ADJUSTMENT SCREW BACKED OUT TO PERMIT MAXIMUM
BALL MOVEMENT WITHOUT THE BALLS ROLLING OUT OF
THE TRACK.
A OR P KEYLEVER FULLY DEPRESSED.
MIN. 0.015 INCH.
MAX. 0.020 INCH.
BETWEEN THE TIP OF THE WEDGELOCK AND THE BALL TRACK
TO ADJUST
LOosen MOUNTING SCREWS AT EACH END OF THE BALL
TRACK AND ADJUST TRACK UP OR DOWN
NOTE: REMOVE KEYBOARD ASSEMBLY HOOD
BEFORE ADJUSTING CLEARANCE BETWEEN
THE BALL WEDGELOCK AND THE BALL TRACK.

FIGURE 1-9. WEDGELOCK AND BALL TRACK MECHANISM
(A) LOW TAPE SWITCH
REQUIREMENT
SWITCH SHOULD OPERATE WHEN DIAMETER OF TAPE ROLL IS BETWEEN 2-5/8 INCH AND 2-3/8 INCH.
TO ADJUST
POSITION SWITCH ASSEMBLY WITH MOUNTING SCREWS LOOSENED. CHECK WITH TEST LAMP.

(b) KEYBOARD LOCK BAR SWITCH
SPRING
REQUIREMENT
LOCK BAR LATCHED (SEND KEY LEVER DEPRESSED IF EQUIPPED WITH ELECTRICAL LOCK-OUT)
MIN. 10 OZS.
MAX. 15 OZS.
TO START SWITCH SPRING MOVING.

(c) KEYBOARD LOCK BAR SWITCH
(1) REQUIREMENT
WITH THE RECEIVE KEY DEPRESSED THE CONTACT GAP OF THE NORMALLY OPEN CONTACT (NO'S 1, 2, 3) SHOULD BE
MIN. 0.008 INCH
MAX. 0.012 INCH
(2) REQUIREMENT
WITH THE SEND KEY DEPRESSED CONTACT GAP OF THE NORMALLY CLOSED CONTACT NO. 4 SHOULD BE
MIN. 0.008 INCH
MAX. 0.012 INCH
(3) REQUIREMENT
ALL CONTACTS SHOULD CLOSE WITH SOME OVER-TRAVEL
TO ADJUST BEND CONTACT SPRINGS

FIGURE 1-10. LOW TAPE SWITCH AND KEYBOARD LOCK BAR SWITCH

CHANGE 1
(A) CLUTCH SHOE LEVER SPRING TENSION
REQUIREMENT
CLUTCH ENGAGED,
CAM DISK HELD TO PREVENT TURNING.
MIN. 15 OZS.
MAX. 20 OZS.
TO MOVE SHOE LEVER IN CONTACT WITH STOP LUG.

(b) CLUTCH SHOE SPRING TENSION
NOTE
IN ORDER TO CHECK THIS SPRING TENSION, IT IS NECESSARY TO REMOVE
THE CLUTCH FROM THE MAIN SIGNAL GENERATOR DRIVE SHAFT. THERE-
FORE, IT SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO
BELIEVE THAT IT DOES NOT MEET ITS REQUIREMENT.
REQUIREMENT
CLUTCH DRUM REMOVED.
MIN. 3 OZS.
MAX. 5 OZS.
TO START PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE AT
POINT OF CONTACT.

FIGURE 1-11. SIGNAL GENERATOR CLUTCH MECHANISM
(2) REQUIREMENT
THERE SHOULD BE A BARELY PRECEPTIBLE AMOUNT OF BACKLASH BETWEEN THE INTERMEDIATE DRIVING GEAR AND THE INTERMEDIATE DRIVEN GEAR AT THE POINT WHERE THE BACKLASH IS THE LEAST.
TO ADJUST
RAISE OR LOWER THE FRONT END OF THE INTERMEDIATE GEAR BRACKET BY MEANS OF THE FILLISTER HEAD ADJUSTING AND CLAMPING SCREWS LOCATED AT THE FRONT END OF THE BRACKET, REFINE REQUIREMENTS IF NECESSARY.

INTERMEDIATE GEAR BRACKET
(1) REQUIREMENT
THERE SHOULD BE A BARELY PRECEPTIBLE AMOUNT OF BACKLASH BETWEEN THE TYPING UNIT DRIVEN GEAR AND THE TYPING UNIT DRIVING GEAR AT THE POINT WHERE BACKLASH IS THE LEAST.
TO ADJUST
POSITION THE COMPLETE INTERMEDIATE GEAR MECHANISM BRACKET BY UTILIZING THE ADJUSTING SLOTS WITH THE THREE HEXAGON HEAD SCREWS LOOSENED, ALIGN THE GEARS AT THIS TIME.

FIGURE 1-12. TYPING UNIT AND MOTOR PINION INTERMEDIATE GEAR ASSEMBLY
(A) **CODE BAR BAIL SPRING TENSION**

**REQUIREMENT**
- CLUTCH DISENGAGED, SPRING UNHOOKED FROM ARM.
- **MIN. 9 OZS.**
- **MAX. 11 OZS.**
- **TO PULL TO INSTALLED LENGTH.**

(B) **LINE BREAK LEVER SPRING TENSION**

**REQUIREMENT**
- (COMBINED CODE LEVER AND BREAK LEVER SPRING)
- **MIN. 3 OZS.**
- **MAX. 4 OZS.**
- **TO MOVE SWITCH BREAK LEVER IN CONTACT WITH SWITCH PLUNGER.**

**FIGURE 1-13 CODE BAR BAIL AND LINE BREAK LEVER**
(A) **CODE LEVER SPRING TENSION**

1. **REQUIREMENT**
   - MIN. 1 OZ.
   - MAX. 2 OZS.
   - TO START CODE LEVER MOVING DOWNWARD.

2. **REQUIREMENT**
   - POWER ON.
   - GENERATOR CLUTCH DISENGAGED.
   - MIN. 3 OZS.
   - MAX. 5 OZS.
   - TO OPERATE KEYLEVER OR SPACE BAR.

(B) **LOCAL CARRIAGE RETURN FUNCTION BAIL SPRING TENSION**

(COMBINED CODE LEVER AND BAIL SPRING)

**REQUIREMENT**

- MIN. 1 OZ.
- MAX. 3 OZS.
- TO MOVE KEYLEVER DOWNWARD.

---

**FIGURE 1-14**  **CODE LEVER AND LOCAL CARRIAGE FUNCTION BAIL MECHANISMS**

**CHANGE 1**  **1-15**
(B) TRANSFER LEVER LOCKING BAIL SPRING TENSION
REQUIREMENT
SPRING UNHOOKED FROM POST,
MIN. 5 OZS,
MAX. 6 OZS,
TO PULL TO INSTALLED LENGTH.

(A) TRANSFER LEVER SPRING TENSION
REQUIREMENT
CLUTCH DISENGAGED,
MIN. 1 1/2 OZS,
MAX. 2 1/2 OZS,
TO START EACH OF 6 LEVERS MOVING.

(C) MARGIN INDICATOR SPRING TENSION
REQUIREMENT
MIN. 7 OZS,
MAX. 11 OZS,
TO START LEVER MOVING.

FIGURE 1-15 TRANSFER LEVER AND MARGIN INDICATOR MECHANISMS
3. PERFORATOR UNIT (Typing or Non-Typing)

NOTE: UNLESS OTHERWISE SPECIFIED, THESE
ADJUSTMENTS APPLY TO BOTH TYPING
AND NON-TYPING PERFORATOR.

(A) FUNCTION CLUTCH SHOE LEVER
TO CHECK

(1) DISSENGAGE CLUTCH. MEASURE CLEARANCE.
(2) ALIGN HEAD OF CLUTCH DRUM MOUNTING
SCREW WITH STOP LUG. ENGAGE CLUTCH.
MANUALLY PRESS SHOE LEVER AND STOP LUG
TOGETHER AND ALLOW TO SNAP APART.
MEASURE CLEARANCE.

REQUIREMENT
CLEARANCE BETWEEN SHOE LEVER AND STOP LUG:
MIN. 0.050 INCH ------ MAX. 0.080 INCH
GREATER WHEN CLUTCH ENGAGED (2) THAN WHEN
DISENGAGED (1). 0.080 TO 0.100

TO ADJUST
ENGAGE WRENCH OR SCREWDRIVER WITH LUG ON
ADJUSTING DISK. ROTATE DISK WITH CLAMP
SCREWS LOOSENED.

NOTE:
AFTER MAKING ADJUSTMENT, DISSENGAGE CLUTCH.
REMOVE DRUM MOUNTING SCREW. ROTATE DRUM
IN NORMAL DIRECTION AND CHECK TO SEE IF IT
DRAGS ON SHOE. IF IT DOES REFINISH ADJUSTMENT.

FUNCTION CLUTCH
DRUM

FUNCTION CAM SLEEVE

COLLAR MOUNTING SCREW

COLLAR

CLUTCH SHOE
LEVER

STOP LUG

ADJUSTING DISK

FUNCTION CLUTCH DRUM END PLAY
REQUIREMENT
WITH FUNCTION CLUTCH DISENGAGED:
MIN. SOME ------ MAX. 0.010 INCH
BETWEEN CAM SLEEVE AND COLLAR WHEN
PLAY IS TAKEN UP TO MAKE CLEARANCE
MAXIMUM.

TO ADJUST
POSITION COLLAR WITH MOUNTING
SCREW LOOSENED.

FIGURE 1-16. FUNCTION CLUTCH
(A) CLUTCH SHOE LEVER SPRING
TO CHECK ENGAGE CLUTCH, HOLD CAM DISK TO PREVENT ITS TURNING.
REQUIREMENT FOR TYPING PERFORATOR ONLY
MIN. 15 OZS ----- MAX. 20 OZS
FOR NON-TYPING PERFORATOR ONLY
MIN. 16 OZS ----- MAX. 22 OZS
CHECK BOTH SHOE LEVERS

(B) CLUTCH SHOE SPRING
NOTE: IN ORDER TO CHECK THIS SPRING TENSION, IT IS NECESSARY TO REMOVE THE CLUTCH FROM THE MAIN SHAFT. THEREFORE, IT SHOULD NOT BE CHECKED UNLESS THERE IS REASON TO BELIEVE IT WILL NOT MEET ITS REQUIREMENT.

TO CHECK REMOVE CLUTCH FROM DRUM.
REQUIREMENT
MIN. 3 OZS, ------MAX. 5 OZS.
TO START PRIMARY SHOE MOVING.

FIGURE 1-17 CLUTCH ASSEMBLIES
(A) ROCKER BAIL
REQUIREMENT
WITH ROCKER BAIL POSITIONED TO ITS
EXTREME LEFT AND UPPER ROLLER IN
CONTACT WITH FUNCTION CAM:
MIN. SOME --- MAX. 0.003 INCH
CLEARANCE BETWEEN CAM AND LOWER
ROLLER AT POINT OF LEAST CLEARANCE.
TO ADJUST
POSITION LOWER ROLLER MOUNTING
SCREW IN ELONGATED SLOT WITH LOCK
NUT LOOSENED. CHECK THROUGHOUT
A COMPLETE REVOLUTION FOR BINDS.

(B) ROCKER BAIL GUIDE BRACKET
(TYPING PERFORATOR ONLY)
REQUIREMENT
(1) ROCKER BAIL ROLLERS SHOULD ENGAGE
FULL THICKNESS OF FUNCTION CAM.
(2) LIFTER ROLLER IN FULL ENGAGEMENT
WITH ROCKER BAIL CAMMING SURFACE.
SEE FIGURE 1-39.
TO ADJUST
POSITION ROCKER BAIL AND GUIDE
BRACKET WITH GUIDE BRACKET MOUNT-
ING SCREWS LOOSENED.

ROCKER BAIL GUIDE BRACKET
(NON-TYPING PERFORATOR ONLY)
REQUIREMENT
CLEARANCE BETWEEN UPPER ROLLER AND RESET PINS; BETWEEN LOWER ROLLER SCREW
HEAD AND FRONT CAM; BETWEEN ROCKER BAIL AND REAR ROCKER CAM.
MIN. 0.010 INCH
TO ADJUST
POSITION ROCKER BAIL WITH GUIDE MOUNTING SCREWS LOOSENED.

FIGURE 1-18 FUNCTION MECHANISM
(A) **FUNCTION CLUTCH TRIP LEVER**

**REQUIREMENT**

1. With release resting on main trip lever (see below), function clutch trip lever should engage full thickness of shoe lever.
2. **TRIP LEVER END PLAY:**
   - **MIN. SOME**
   - **MAX. 0.006 INCH**

**TO ADJUST**

Position trip lever on its shaft with clamp screw loosened.

---

(B) **RESET ARM**

**TO CHECK**

Trip function clutch and position main shaft so that reset arm is held in its highest position by cam.

**REQUIREMENT**

1. Clearance between release and main trip lever:
   - **NON-TYPING**
     - **PERFORATOR**
     - **MIN. 0.005 INCH**
     - **MAX. 0.025 INCH**
   - **TYING**
     - **PERFORATOR**
     - **MIN. 0.010 INCH**
     - **MAX. 0.030 INCH**
2. **LATCH LEVER END PLAY:**
   - **MIN. SOME**
   - **MAX. 0.010 INCH**

**TO ADJUST**

Position reset arm on its shaft with its clamp screw loosened.

---

**FIGURE 1-19 FUNCTION MECHANISM**
(C) MAIN TRIP LEVER SPRING
REQUIREMENT
MIN. 1 1/2 OZS.
MAX. 3 OZS.
TO PULL TRIP LEVER AWAY FROM RELEASE.

RELEASE DOWNSTOP BRACKET
CLAMP SCREW

RESET BAIL TRIP LEVER
MAIN TRIP LEVER SPRING
MAIN TRIP LATCH LEVER
CAM

(WICK

WICK

RELEASE SPRING
CLUTCH RELEASE
RESET LEVER
FELT OILER

(D) RELEASE DOWNSTOP BRACKET
REQUIREMENT: (NON-TYPING PERFORATOR ONLY)
WHEN THE RESET LEVER REACHES THE LOWEST POINT OF ITS TRAVEL, IT SHOULD JUST TOUCH THE FELT OILER ON THE SHAFT ASSEMBLY.

TO ADJUST
ALLOW RESET LEVER TO FALL ONTO RELEASE DOWNSTOP BRACKET. ADJUST UNTIL RESET LEVER TOUCHES FELT OILER.

(E) CLUTCH TRIP BAR LINK RETURN SPRING
(SEE FIGURE 34.)
REQUIREMENT
CLUTCH DisENGAGED AND IN K-T POSITION.
MIN. 3 OZS.
MAX. 4 OZS.
TO START MAIN TRIP LEVER LATCH MOVING.

FIGURE 1-20. PERFORATOR TRIP LEVER MECHANISM
(A) PUNCH POSITION — PRELIMINARY

REQUIREMENT
PUNCH MOUNTING SCREWS CENTRALLY LOCATED IN
ELONGATED MOUNTING HOLES
PUNCH SLIDE LATCHES SHALL BE VISUALLY
HORIZONTAL WHEN ENGAGED WITH THE
PUNCH SLIDES.

TO ADJUST
REMOVE THE MOUNTING SCREW AT THE LOWER EDGE
OF THE PUNCH MECHANISM BACKPLATE. REMAINING
BACKPLATE MOUNTING SCREWS AND BRACKET
MOUNTING SCREW FRICITION TIGHT. PUNCH SLIDES
IN RESET CONDITION. MEET REQUIREMENT.
TIGHTEN ALL SCREWS.

NOTE:
BEFORE PROCEEDING WITH THE FOLLOWING
ADJUSTMENTS, CHECK ROCKER BAIL LOWER
ROLLER ADJUSTMENT (SEE FIGURE 1-18)

(B) ROCKER ARM
TO CHECK
TRIP FUNCTION CLUTCH AND ROTATE MAIN
SHAFT UNTIL ROCKER BAIL UPPER ROLLER IS ON
HIGH PART OF FUNCTION CAM (SEE FIGURE 1-18)
PLACE 159926 GAUGE AS SHOWN. TAKE UP PLAY
TO MAKE CLEARANCE BETWEEN GAUGE AND FEED
PAWL STUD MINIMUM.

REQUIREMENT *
(1) CLEARANCE
MIN. 0.002 INCH — MAX. 0.005 INCH
(2) MIN. 0.002 INCH END PLAY IN ROCKER
ARM SHAFT.
(3) MAX. 0.015 INCH CLEARANCE BETWEEN
ROCKER ARM AND BEARING HUB.

TO ADJUST
SELECT BLANK CODE COMBINATION. TRIP FUNCTION
CLUTCH. REMOVE PUNCH SLIDE GUIDE. LOOSEN DOWN-
STOP STUDS. ROTATE MAIN SHAFT UNTIL ROCKER BAIL
UPPER ROLLER IS ON HIGH PART OF FUNCTION CAM (SEE
FIGURE 1-18) WITH CLAMP SCREW LOOSENED, POSITION
ROCKER ARM ON TOGGLE BAIL SHAFT TO MEET
REQUIREMENT. TIGHTEN CLAMP SCREW. PLACE DOWNSTOP IN
ITS LOWEST POSITION AND TIGHTEN DOWNSTOP STUDS,
REPLACE PUNCH SLIDE GUIDE AND POSITION IT SO THAT
ITS SLOTS ARE ALIGNED (AS GAUGED BY EYE) WITH COR-
RESPONDING PUNCH PINS (SEE FIGURE 1-22) TIGHTEN
MOUNTING NUTS.

* AFTER FEED PAWL ADJUSTMENT (FIGURE 1-24) HAS BEEN MADE, IF PUNCH PIN PENETRATION (FIGURE
14) AND FEED PAWL REQUIREMENTS ARE MET, THIS REQUIREMENT SHOULD BE CONSIDERED FULFILLED.

FIGURE 1-21 PUNCH MECHANISM

1-22
(A) PUNCH SLIDE DOWNSTOP POSITION

REQUIREMENT
FUNCTION CLUTCH DISENGAGED, UP AND DOWN PLAY AT LEFT END OF PUNCH SLIDES TAKEN UP TOWARD TOP, CLEARANCE BETWEEN PUNCH SLIDES AND THEIR DOWNSTOP PLATE MIN. SOME MAX. 0.008 INCH

TO ADJUST
REMOVE PUNCH SLIDE GUIDE, LOOSEN DOWNSTOP PLATE MOUNTING STUDS AND POSITION THE DOWNSTOP PLATE, TIGHTEN STUDS AND REPLACE GUIDE SO THAT PUNCH SLIDES ALIGN WITH PUNCH PINS (AS GUAGED BY EYE).

(C) PUNCH PIN PENETRATION

REQUIREMENT
LETTERS MANUALLY SELECTED, CLUTCH ENGAGED AND ROTATED UNTIL PUNCH PINS HAVE TRAVELED MAXIMUM DISTANCE INTO THE DIE PLATE, CLEARANCE BETWEEN LOWER EDGE OF PUNCH RETRACTOR BAIL AND UPPER SIDE OF GUIDE PLATE (MEASURED AT LEFT EDGE OF PUNCH PINS WHERE CLEARANCE IS LEAST), MIN. 0.060 INCH MAX. 0.070 INCH

TO ADJUST
ROTATE THE TOGGLE BAIL ECCENTRIC SHAFT WITH ITS LOCK NUT LOOSENE4D, KEEP THE INDENTATION IN THE ECCENTRIC SHAFT TO THE LEFT OF A VERTICAL CENTERLINE THROUGH THE SHAFT.

(B) PUNCH SLIDE GUIDE POSITION

REQUIREMENT
LETTERS SELECTED, FUNCTION CLUTCH ENGAGED AND ROTATED UNTIL THE PUNCH SLIDES JUST TOUCH THE PUNCH PINS, THE PUNCH SLIDES SHOULD ALIGN CENTRALLY WITH THEIR RESPECTIVE PUNCH PINS (GAUGED BY EYE).

TO ADJUST
POSITION THE PUNCH SLIDE GUIDE WITH ITS MOUNTING NUTS LOOSENED.

FIGURE 1-22 PUNCH MECHANISM

CHANGE 1

Turn to Page 1-56
PUNCH POSITION --- FINAL (TYPING PERFORATOR ONLY)

1. To check
   Select letters code combination (12345). Rotate main shaft until function clutch trips.
   Requirement
   Clearance between punch slide and punch slide latch
   Min. 0.020 inch; Max. 0.030 inch
   At slide where clearance is least.
   To adjust
   Loosen punch mounting screws, adjusting clamp lock screw, adjusting clamp pivot screw
   and anchor bracket screw until friction tight. Place tip of screwdriver between screw and rim
   of pry hole and pry punch up or down.
   Tighten only adjusting clamp lock screw.

2. To check
   Select "V" code combination (-2345). Trip function clutch and move rocker bail to extreme left.
   Requirement
   Clearance between stripper plate and typewheel
   Character "M":
   Min. 0.075 inch; Max. 0.095 inch
   To adjust
   Remove ribbon from carrier (figure 42). Position punch with two mounting screws, adjusting
   clamp pivot screw and anchor bracket screw loosened. Check reset bail trip lever requirement (figure 16)
   for some clearance and adjust if necessary.

![Diagram of punch mechanism]

Figure 1-23 Punch Mechanism
PUNCH SLIDE RESET BAIL

(1) REQUIREMENT

FUNCTION CLUTCH DISENGAGED AND LATCHED. CLEARANCE AT PUNCH SLIDE LATCH CLOSEST TO PUNCH SLIDE:

(A) FOR NON-TYPING PERFORATOR ONLY
MIN. 0.015 INCH
MAX. 0.025 INCH

(B) FOR TYPING PERFORATOR ONLY
MIN. SOME
MAX. 0.008 INCH

TO ADJUST

ROTATE THE RESET BAIL ECCENTRIC SHAFT WITH ITS LOCK NUT LOOSENED. KEEP THE INDENTATION IN THE ECCENTRIC SHAFT HIGH AND TO THE LEFT OF A VERTICAL CENTERLINE THROUGH THE SHAFT.

FEED PAWL

REQUIREMENT

FUNCTION CLUTCH DISENGAGED, INDENTATION IN DETENT LEVER ECCENTRIC AT RIGHT ANGLE TO LEVER, DETENT ROLLER IN CONTACT WITH RATCHET WHEEL, HIGH PART OF FEED PAWL ECCENTRIC TO THE RIGHT OF ITS LOCK SCREW, THE FEED PAWL SHOULD ENGAGE THE FIRST TOOTH BELOW A HORIZONTAL CENTERLINE THROUGH THE RATCHET WHEEL WITH NO PERCEPTIBLE CLEARANCE.

TO ADJUST

ROTATE THE FEED PAWL ECCENTRIC WITH LOCK SCREW LOOSENED. THIS ADJUSTMENT IS RELATED TO FEED HOLE SPACING AND THE TWO ADJUSTMENTS MUST BE MADE AT THE SAME TIME.

FIGURE 1-24 PUNCH UNIT RESET AND FEEDING MECHANISM

CHANGE 1
FEED HOLE SPACING (PRELIMINARY)
REQUIREMENT
WITH INDENT OF DIE WHEEL ECCENTRIC STUD POINTING DOWNWARD, CLEARANCE BETWEEN DIE WHEEL AND FEED WHEEL:

MIN. 0.002 INCH

MAX. 0.004 INCH

TO ADJUST POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED.

NOTE: BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS (FIGURE 1-29)

FEED HOLE SPACING (FINAL)
(1) REQUIREMENT
WITH TAPE REMOVED, MIN. OF 0.002 INCH CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL.

(2) TO CHECK PERFORATE IN ORDER SIX SEQUENCES MADE UP OF NINE BLANK CODE COMBINATIONS FOLLOWED BY A LETTERS COMBINATION. OPEN CHADS SO THAT CODE HOLES ARE VISIBLE. PLACE TAPE OVER SMOOTH SIDE OF 156011 GAUGE SO THAT FIRST NO. 2 CODE HOLE IS CONCENTRIC WITH FIRST (0.072 INCH) HOLE IN GAGE (SEE NOTE BELOW). REQUIREMENT SECOND THROUGH FIFTH HOLE IN GAUGE VISIBLE THROUGH NO. 2 CODE HOLES IN TAPE. CIRCULAR PORTION OF SIXTH NO. 2 CODE HOLE ENTIRELY WITHIN CORRESPONDING (0.086 INCH) HOLE IN GAUGE.

(3) REQUIREMENT WITH TAPE SHOE HELD AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DISSOCIATED AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY.

TO ADJUST (1) WITH TAPE REMOVED, KEEPING INDENT BELOW CENTER OF STUD, POSITION DIE WHEEL ECCENTRIC STUD WITH LOCK NUT LOOSENED SO THAT CLEARANCE BETWEEN FEED WHEEL AND DIE WHEEL IS

MIN. 0.002 INCH

MAX. 0.004 INCH.

(2) REFINE THE ABOVE ADJUSTMENT TO MEET REQUIREMENT (2). MOVE INDENT IN ECCENTRIC STUD TOWARD FEED WHEEL TO DECREASE AND AWAY FROM FEED WHEEL TO INCREASE FEED HOLE SPACING. CAUTION: WITH TAPE REMOVED, MAKE SURE FEED WHEEL-DIE WHEEL CLEARANCE IS A MIN. OF 0.002 INCH. (3) FAILURE TO MEET REQUIREMENT (3) INDICATES DIE WHEEL ECCENTRIC STUD HAS BEEN OVER ADJUSTED. REFINE.

NOTE: FIRST THROUGH FIFTH HOLES IN GAUGE ARE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER). BUT SIXTH HOLE IN GAUGE IS LARGER (0.086 INCH). THIS ARRANGE-MENT ALLOWS 0.007 INCH VARIATION IN 5 INCHES.

FIGURE 1-25 TAPE FEED MECHANISM

1-26

CHANGE 1
DETENT

REQUIREMENT
A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION PERFORATED ON THE PERFORATOR MUST CONFORM TO THE 156011 TAPE GAUGE.

THE LATERAL CENTERLINE THROUGH THE CODE HOLES IN THE TAPE SHOULD COINCIDE WITH A LATERAL CENTERLINE THROUGH THE HOLES IN THE GAUGE.

TO ADJUST
ROTATE THE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED HOLES TOWARD THE HINGED EDGE OF THE CODE HOLES AND COUNTERCLOCKWISE TO MOVE THE FEED HOLES TOWARD THE TRAILING EDGE OF THE CODE HOLES. TIGHTEN THE ECCENTRIC LOCK NUT AND REFIN THE FEED PAWL ADJUSTMENT.

RECHECK FEED PAWL ADJUSTMENT

FIGURE 1-26 PUNCH DETENT
FEED HOLE LATERAL ALIGNMENT

REQUIREMENT
WHEN A PIECE OF TAPE CONTAINING NINE FEED HOLES FOLLOWED BY A LETTERS COMBINATION ARE PERFORATED BY THE PERFORATOR AND CHECKED BY THE TAPE GAUGE, THE CODE HOLES IN THE TAPE SHOULD BE CONCENTRIC WITH THE HOLES IN THE GAUGE

TO ADJUST
TURN THE FEED WHEEL ADJUSTING SCREW IN OR OUT WITH ITS LOCK NUT LOOSENED.

REFINE DETENT LEVER
ADJUSTMENT IF NECESSARY

FIGURE 1-27. TAPE FEED MECHANISM
(A) PUNCH SLIDE SPRING
REQUIREMENT
LETTERS COMBINATION SET UP AND PUNCH SLIDES IN SELECTED POSITION UNDER THE PUNCH PINS.
MIN. 2-1/4 OZS.
MAX. 3-1/4 OZS.
TO START EACH SLIDE MOVING

(B) PUNCH PIN RETRACTOR SPRING
(1) REQUIREMENT (COMPRESSION SPRING ONLY)
CLUTCH DIENGAGED AND LATCHED,
PUNCH RETRACTOR BAIL SPRINGS UNHOOKED AT LOWER END. SCALE APPLIED TO NO. 3 PUNCH PINS
MIN. 7 OZS.
MAX. 25 OZS.
TO LIFT THE RETRACTOR BAIL AWAY FROM THE LOWER GUIDE OF THE PUNCH BLOCK.

(2) REQUIREMENT (COMBINED COMPRESSION AND RETRACTOR BAIL SPRING) CLUTCH DIENGAGED AND LATCHED, RETRACTOR BAIL SPRINGS HOOKED, SCALE APPLIED TO NO. 3 PUNCH PIN TO START THE RETRACTOR BAIL MOVING.
MIN. 4 LBS.
MAX. 5 LBS.

FIGURE 1-28. PUNCH MECHANISM

CHANGE 1
(A) TAPE GUIDE SPRING (TAPE CHUTE)

REQUIREMENT
CLUTCH DIENGAGED AND TAPE INTHRED THROUGH THE PUNCH ASSEMBLY
IT SHOULD REQUIRE
MIN. 1/2 OZ.
MAX. 1 OZ.

TO JUST MOVE THE SPRING AWAY FROM THE TAPE
TO ADJUST BEND THE SPRING

(B) TAPE GUIDE SPRING (PUNCH BLOCK)

(1) REQUIREMENT
WITH THE TAPE REMOVED FROM THE PUNCH BLOCK THE TAPE GUIDE SPRING SHOULD REST AGAINST THE CLEARANCE SLOT IN THE BLOCK IN A SYMMETRICAL MANNER.

(2) REQUIREMENT
WITH TAPE IN THE PUNCH BLOCK AND THE PERFORATOR OPERATING UNDER POWER, THE SPRING SHOULD NOT DISTORT THE EDGE OF THE TAPE
TO ADJUST BEND THE SPRING AND POSITION IT WITH ITS MOUNTING SCREW LOOSENED

FIGURE 1-29. PUNCH MECHANISM
(A) FEED PAWL SPRING

REQUIREMENT
FUNCTION CLUTCH DISENGAGED AND LATCHED, DETENT SPRING UNHOOLED FROM TOGGLE BAIL

MIN. 3 OZS.
MAX. 4-1/2 OZS.

TO START THE DETENT LEVER MOVING

(B) DETENT LEVER SPRING

REQUIREMENT
FUNCTION CLUTCH DISENGAGED AND LATCHED, FEED PAWL SPRING UNHOOLED.

MIN. 7 OZS.
MAX. 10 OZS.

TO START THE DETENT LEVER MOVING.

FIGURE 1-30. TAPE FEED MECHANISM

CHANGE 1
(A) TAPE SHOE TORSION SPRING
REQUIREMENT
MIN. 13 OZS.
MAX. 18 OZS.
TO MOVE TAPE SHOE FROM FEED WHEEL

TORSION SPRING

FEED WHEEL

TAPE SHOE

(B) TAPE GUIDE
REQUIREMENT
ADJUSTING PLATE RESTING AGAINST ITS BACKSTOP POST AND WITH TAPE IN THE PUNCH, CLEARANCE BETWEEN BOTTOM OF TAPE GUIDE AND THE TAPE
MIN. 0.002 INCH
MAX. 0.006 INCH
TO ADJUST POSITION ADJUSTING PLATE WITH ITS CLAMP SCREW LOOSENED.

CLAMP SCREW

TAPE GUIDE

TAPE

BACKSTOP POST

ADJUSTING PLATE

(C) TAPE DEPRESSOR SLIDE SPRING
REQUIREMENT
ROCKER BAIL IN ITS EXTREME LEFT POSITION
MIN. 1-1/2 OZS.
MAX. 2-1/2 OZS.
TO START DEPRESSOR SLIDE MOVING

DEPRESSOR SLIDE SPRING

TAPE DEPRESSOR SLIDE

FIGURE 1-31. FEED WHEEL

CHANGE 1
NOTE: FIGURES 1-32 THROUGH 1-54 APPLY TO TYPING PERFORATOR ONLY

(b) RELEASE DOWNSSTOP BRACKET

REQUIREMENT

WITH FUNCTION CLUTCH TRIPPED, CLEARANCE BETWEEN TRIP LEVER AND CLUTCH SHOE LEVER:

MIN. 0.010 INCH — MAX. 0.030 INCH

AT POINT WHERE CLEARANCE IS LEAST.

TO ADJUST

REMOVE TAPE GUARD. POSITION DOWNSSTOP BRACKET WITH MOUNTING SCREWS FRICTION TIGHT.

FIGURE 1-32: FUNCTION MECHANISM
**(A) PUSH BAR OPERATING BLADE (PRELIMINARY)**

**TO CHECK**

Manually select letters code combination (12345). Rotate main shaft until function clutch trips. Hold No. 2 and 3 bell cranks against stop post.

**REQUIREMENT**

Operating blade parallel to (not necessarily flush with) No. 2 and 3 push bars.

**TO ADJUST**

With its mounting screws friction tight, pry transfer mounting bracket all the way to the right (see Figure 1-36) add or remove shims under operating blade. Place extra shims on rear mounting screw between blade and flat washer.

---

**(B) (1) TO CHECK**

Manually select letters code combination (12345). Rotate main shaft until function clutch trips. Manually seat push bars in detented position. In bar which is nearest left edge of blade, take up play to left and rear, and then release.

**REQUIREMENT**

Clearance between bar and left edge of blade:

- Min. 0.015 inch
- Max. 0.025 inch

**(2) REQUIREMENT**

Some clearance between right edge of blade and push bars when play in bars has been taken up to right and released.

**(3) REQUIREMENT**

With unit in stop position, some clearance between right edge of blade and bars when play in bars has been taken up to right and released.

**TO ADJUST**

With mounting screws loosened, position operating blade in elongated holes.

**NOTE:**

It may be necessary to refine this adjustment after rocker bail pilot stud adjustment (Figure 1-34).

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**PUSH BAR OPERATING BLADE**

**TOP VIEW**

**FIGURE 1-33. FUNCTION MECHANISM**

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1-34

CHANGE 1
(A) **ROCKER BAIL PILOT STUD**

TO CHECK
SELECT BLANK COMBINATION. POSITION ROCKERS BAIL TO ITS EXTREME LEFT.

**REQUIREMENT**
CLEARANCE BETWEEN FUNCTION BOX REAR PLATE AND PUSH BAR OPERATING BLADE:
MIN. 0.005 INCH -- 0.015 INCH
WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE MINIMUM.

TO ADJUST
POSITION ROCKERS BAIL PILOT STUD IN ELONGATED HOLE WITH LOCK NUT LOOSENED.

---

(b) **FUNCTION CLUTCH LATCH LEVER SPRING**

**REQUIREMENT**
WITH FUNCTION CLUTCH TURNED TO STOP POSITION AND LATCH LEVER UNLATCHED:
MIN. 12 OZS. -- MAX. 15 OZS.
TO START LATCH LEVER MOVING.

**FIGURE 1-34. FUNCTION MECHANISM**

CHANGE 1
FUNCTION BOX REAR PLATE

MOUNTING SCREWS

REAR VIEW

MOUNTING SCREW IN FRONT PLATE AT OTHER END OF SHAFT

MOUNTING SCREW

BELL CRANK SPRING BRACKET

PRY POINT

NO. 2 OR 3 PUSH BAR

OPERATING BLADE

FUNCTION BOX

TO CHECK
MANUALLY SELECT LETTERS CODE COMBINATION (12345).
ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS,
PUNCH SLIDES ARE DISENGAGED FROM LATCHES (FIGURE 1-24)
AND BLADE JUST TOUCHES PUSH BARS. IN NO. 2 AND 3
PUSH BARS, TAKE UP PLAY DOWNWARD AND RELEASE.
REQUIREMENT
TOP SURFACE OF OPERATING BLADE
FLUSH TO 0.010 INCH
BELOW TOP SURFACE OF NO. 2 AND 3 PUSH BARS.
TO ADJUST
USING PRY POINT, POSITION FUNCTION BOX WITH
THREE MOUNTING SCREWS IN REAR PLATE AND ONE
MOUNTING SCREW IN FRONT PLATE LOOSENED. CHECK
POSITION OF BELL CRANK SPRING BRACKET.

FIGURE 1-35 . FUNCTION BOX MECHANISM
TRANSFER MOUNTING BRACKET

TO CHECK
MANUALLY SELECT BLANK CODE COMBINATION. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS.
REQUIREMENT
WITH PUNCH SLIDES LATCHED (SEE FIGURE 14), CLEARANCE BETWEEN BELL CRANK AND STOP POST:
MAX. 0.018 INCH
AT BELL CRANK WHERE CLEARANCE IS MAXIMUM, WHEN BELL CRANK WITH MINIMUM CLEARANCE IS TOUCHING POST.

TO ADJUST
WITH MOUNTING SCREWS FRICTION TIGHT, PRY TRANSFER MOUNTING BRACKET TO LEFT UNTIL CLOSEST BELLCRANK TOUCHES POST. TIGHTEN MOUNTING SCREWS AND CHECK REQUIREMENT.
CAUTION: BELL CRANK THAT YIELDS MOST SHOULD NOT YIELD MORE THAN 0.007" MEASURED AT POST.

FIGURE 1-36. TRANSFER MECHANISM
(B) FIGURES ARM ASSEMBLY SPRING
REQUIREMENT
WITH ARM ASSEMBLIES IN LETTERS POSITION:
MIN. 1-1/2 OZS. — MAX. 3-1/2 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(C) FIGURES EXTENSION ARM SPRING
REQUIREMENT
WITH ARM ASSEMBLIES IN LETTERS POSITION AND LETTERS EXTENSION ARM MANUALLY HELD IN POSITION:
MIN. 5 OZS. — MAX. 8 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(A) LETTERS AND FIGURES YIELD ARMS
(1) TO CHECK
TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROCKER BAIL IS TO EXTREME LEFT. MANUALLY PLACE ARM ASSEMBLIES IN LETTERS POSITION. HOLD LETTERS-FIGURES BELL CRANK AGAINST LEFT EDGE OF STOP POST.

REQUIREMENT
MIN. SOME — MAX. 0.006 INCH *
CLEARANCE BETWEEN BELL CRANK AND LETTERS EXTENSION ARM.

(ADJUSTMENT IS CONTINUED ON (FIGURE 1-38)

*NOTE
REMOVAL OF FUNCTION BLADES (FIGURE 1-42) WILL FACILITATE MEASURING CLEARANCE.

FIGURE 1-37. FUNCTION BOX MECHANISM
(B) LETTERS ARM ASSEMBLY SPRING
REQUIREMENT
WITH ARM ASSEMBLIES IN FIGURES
POSITION:
MIN. 1-1/2 OZS. - MAX. 3-1/2 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(A) LETTERS AND FIGURES YIELD ARMS (CONTINUED
FROM FIGURE 1-37)/
(2) TO CHECK
MANUALLY PLACE ARM ASSEMBLIES IN
FIGURES POSITION,
HOLD LETTERS-FIGURES BELL CRANK AGAINST
RIGHT EDGE OF STOP POST.
REQUIREMENT
MIN. SOME-----MAX. 0.006 INCH*
CLEARANCE BETWEEN BELL CRANK
AND FIGURES EXTENSION ARM.

(C) LETTERS EXTENSION ARM SPRING
REQUIREMENT
WITH ARM ASSEMBLIES IN FIGURES
POSITION AND LETTERS EXTENSION ARM
MANUALLY HELD IN POSITION:
MIN. 5 OZS. - MAX. 8 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

*NOTE:
REMOVAL OF FUNCTION
BLADES (FIGURE 1-42) WILL
FACILITATE MEASURING
CLEARANCE.

LETTERS EXTENSION ARM
CLAMP SCREW
STOP POST
LETTERS-FIGURES
BELL CRANK

TO ADJUST
LOOSEN CLAMP SCREWS IN BOTH LETTERS AND FIGURES
YIELD ARMS.
PLACE ARM ASSEMBLIES IN LETTERS POSITION (FIGURE 1-37).
HOLD LETTERS-FIGURES BELL CRANK AGAINST LEFT SIDE
OF STOP POST, AND BY MEANS OF PRY POINT, POSITION
LETTERS YIELD ARM TO MEET CLEARANCE REQUIREMENT UNDER
(1) OF FIGURE 1-37. TIGHTEN LETTERS YIELD ARM CLAMP
SCREW.
PLACE ARM ASSEMBLIES IN FIGURES POSITION. HOLD
LETTERS-FIGURES BELL CRANK AGAINST RIGHT SIDE
OF STOP POST, AND BY MEANS OF PRY POINT
POSITION FIGURES YIELD ARM (FIGURE 1-27) TO MEET REQUIREMENT
UNDER (2) ABOVE. TIGHTEN FIGURES YIELD ARM
CLAMP SCREW. CAUTION: ARM ASSEMBLIES MAY CHANGE
POSITION DURING ADJUSTMENT. AS TIGHTENING OF SCREWS
MAY AFFECT ADJUSTMENT, RECHECK REQUIREMENTS.

FIGURE 1-38. FUNCTION BOX MECHANISM
TO CHECK
TRIP FUNCTION CLUTCH. MOVE ROCKER BAIL TO EXTREME LEFT POSITION AND OBSERVE TRAVEL OF LIFTER ROLLER ON RIGHT DWELL SURFACE. MOVE ROCKER BAIL TO EXTREME RIGHT POSITION AND OBSERVE TRAVEL OF ROLLER ON LEFT DWELL SURFACE.

REQUIREMENT
APPROXIMATELY EQUAL TRAVEL ON EACH DWELL SURFACE.

TO ADJUST *
LOOSEN LOCK PLATE SCREW UNTIL FRICTION TIGHT. WITH ECCENTRIC SCREW LOCK NUT FRICTION TIGHT, POSITION LIFTER ARM ON LIFTER. TIGHTEN LOCK PLATE SCREW. DO NOT TIGHTEN LOCK NUT.

(LIFTER ARM ECCENTRIC SCREW
REQUIREMENT
WITH FUNCTION CLUTCH DISENGAGED;
(1) CLEARANCE BETWEEN CLOSEST PROJECTION OF BELL CRANKS AND ASSOCIATED LETTERS OR FIGURES FUNCTION BLADE PROJECTION:
MIN. 0.008 INCH-----MAX. 0.016 INCH
(2) MIN. 0.005 INCH CLEARANCE FOR FUNCTION BLADES OTHER THAN LETTERS AND FIGURES IF UNIT IS SO EQUIPPED.

TO ADJUST
POSITION LIFTER ARM ECCENTRIC SCREW WITH LOCK NUT LOOSENED.

NOTE
REMOVE TIMING CONTACTS (FIGURE 2-17) IF UNIT IS SO EQUIPPED.

FIGURE 1-39. FUNCTION BOX MECHANISM
LOCK LEVER

REQUIREMENT

(1) WITH LETTERS CODE COMBINATION (12345) SELECTED AND ROCKER BAIL TO EXTREME LEFT, TOGGLE LINKAGE SHOULD MOVE THROUGH POINT WHERE TOGGLE LINK AND LOCK LEVER ARE IN STRAIGHT LINE WITHOUT RAISING LIFTER.

(2) WITH TOGGLE LINK AND LOCK LEVER IN STRAIGHT LINE, CLEARANCE BETWEEN TOGGLE LINK AND LIFTER PIN:

MIN. 0.005 INCH

MAX. 0.010 INCH

TO ADJUST POSITION LOCK LEVER ON LOCK ARM ASSEMBLY WITH CLAMP SCREW FRICITION TIGHT.

NOTE:
TO AVOID INTEREFEENCE WITH LOCK LEVER, IT MAY BE NECESSARY TO MOVE HIGH PART OF CORRECTING DRIVE LINK ECCENTRIC BUSHING (SEE FIGURE 1-46) ABOVE HORIZONTAL CENTER LINE.

NO. 5 PULSE BEAM SPRING

REQUIREMENT

MIN. 10 OZS. — MAX. 15 OZS.
TO PULL SPRING TO LENGTH OF 7/16 INCH.

FIGURE 1-40. PERFORATOR AND TRANSFER MECHANISMS

CHANGE 1
LOCK LEVER TRIP POST

REQUIREMENT
AS ROCKER BAIL APPROACHES EXTREME RIGHT
POSITION, LOCK LEVER TOGGLE LINKAGE
SHOULD BREAK AND LIFTER ROLLER SHOULD
DROP ONTO RIGHT DWELL SURFACE.

TO ADJUST
BY MEANS OF PRY POINTS, POSITION LOCK
LEVER TRIP POST WITH CLAMP SCREW LOOSENED.

FIGURE 1-41. FUNCTION BOX MECHANISM
(A) LIFTER TOGGLE LINK SPRING
REQUIREMENT
WITH UNIT IN STOP POSITION:
MIN. 1 1/2 OZS. --- MAX. 2 1/4 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(B) FUNCTION BLADE SPRINGS (2 OR MORE)
REQUIREMENT
WITH UNIT IN STOP POSITION:
MIN. 7 OZS. --- MAX. 10 OZS.
TO START FUNCTION BLADE MOVING.

(C) LIFTER SPRING
REQUIREMENT
WITH UNIT IN STOP POSITION:
MIN. 7 OZS. --- MAX. 9 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(D) CORRECTING DRIVE LINK SPRING
REQUIREMENT
WITH UNIT IN STOP POSITION:
MIN. 2 OZS. --- MAX. 4 OZS.
TO START DRIVE LINK MOVING.

FIGURE 1-42. FUNCTION BOX AND CORRECTING MECHANISMS

CHANGE 1
(A) OSCILLATING DRIVE LINK

TO CHECK POSITION ROCKE`R BAIL TO ITS EXTREME LEFT.
REQUIREMENT
SECTOR MOUNTING STUD, TOGGLE PIVOT SCREW AND OSCILLATING DRIVE BAIL MOUNTING SCREW SHOULD APPROXIMATELY LINE UP.
TO ADJUST POSITION OSCILLATING DRIVE LINK BY MEANS OF ITS ECCENTRIC BUSHING.

(B) OSCILLATING DRIVE BAIL

TO CHECK MANUALLY SELECT BLANK CODE COMBINATION.
ROTATE MAIN SHAFT UNTIL ROCKE`R BAIL IS TO EXTREME LEFT.
REQUIREMENT
(1) ROLLER ON AXIAL CORRECTING PLATE SEATED FIRMLY IN CENTER OF FIRST NOTCH OF AXIAL SECTOR.
(2) OSCILLATING DRIVE BAIL SHOULD BE LOOSE AND IN POSITION CORRESPONDING TO THAT OF CORRECTING PLATE.
TO ADJUST WITH OSCILLATING DRIVE BAIL MOUNTING SCREW LOOSENEED, POSITION CORRECTING DRIVE LINK SO THAT ROLLER FITS SNUGLY IN FIRST NOTCH. ROLLER SHOULD RIDE CENTRALIZED IN NOTCH WITH NOTCH TOUCHING BOTH SIDES.

FIGURE 1-43. AXIAL POSITIONING MECHANISM
(A) **AXIAL SECTOR ALIGNMENT**
**REQUIREMENT**
1. TEETH OF AXIAL SECTOR AND AXIAL OUTPUT RACK SHOULD ENGAGE BY THEIR FULL THICKNESS.
2. GUIDE ROLLER FREE TO ROTATE.
**TO ADJUST**
LOosen LOCK NUT DISENGAGE RACK, REMOVE RETAINING RING AND GUIDE ROLLER, ADD OR REMOVE SHIMS. PLACE EXTRA SHIMS ON TOP OF SHIM USED TO RETAIN FELT WASHER.

(ECCENTRIC SHAFT)
(b) **DETENT LEVER SPRINGS (6)**
MIN. 7 OZS. —- MAX. 10 OZS.
TO START DETENT LEVER MOVING.
**NOTE:**
CHECK ALL 6 SPRINGS, THERE ARE TWO ON THE AXIAL POSITIONING MECHANISM AND FOUR ON THE ROTARY POSITIONING MECHANISM.

**FIGURE 1-44** AXIAL POSITIONING MECHANISM
(A) AXIAL OUTPUT RACK GUIDE ROLLER

TO CHECK
SELECT LINE FEED CODE COMBINATION (+2----), ROTATE MAIN SHAFT UNTIL ECCENTRIC HAS ROTATED 90 DEGREES.
TAKE UP PLAY TO MAKE CLEARANCE BETWEEN OUTPUT RACK AND GUIDE ROLLER MAXIMUM,
REQUIREMENT
MIN. SOME-------MAX. 0.007 INCH

TO ADJUST
POSITION GUIDE ROLLER MOUNTING STUD IN ELONGATED HOLE WITH LOCK NUT LOOSENED (SEE FIGURE 1-44).

(TOP VIEW)

(B) PUSH BAR GUIDE BRACKET

MOUNTING SCREWS

TO CHECK
MANUALLY SELECT CARRIAGE RETURN CODE COMBINATION (-----4), ROTATE MAIN SHAFT SO THAT NO. 4 PUSH BAR MOVES THROUGH COMPLETE RANGE OF TRAVEL,
REQUIREMENT
WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE MAXIMUM:
MIN. SOME-------MAX. 0.005 INCH
BETWEEN NO. 4 PUSH BAR AND GUIDE BRACKET THROUGHOUT COMPLETE TRAVEL OF BAR.

TO ADJUST
POSITION GUIDE BRACKET WITH MOUNTING SCREWS LOOSENED.

FIGURE 1-45. AXIAL AND ROTARY POSITIONING MECHANISMS
(A) **CORRECTING DRIVE LINK**

1. **TO CHECK**
   - SELECT BLANK CODE COMBINATION. TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT.
   - ROLLER ON AXIAL CORRECTING PLATE FIRMLY SEATED IN FIRST NOTCH OF AXIAL SECTOR.
2. **TO CHECK**
   - SELECT LETTERS CODE COMBINATION (12345). TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT.
   - ROLLER ON AXIAL CORRECTING PLATE FIRMLY SEATED IN FOURTH NOTCH OF AXIAL SECTOR.

**TOP VIEW**

**ADJUSTING SCREWS**

**CORRECTING DRIVE LINK**

**ECCENTRIC BUSHING**

**ROCKER BAIL**

**FIRST NOTCH**

**ROLLERS**

**MOUNTING SCREW**

**ADJUSTING HOLES**

**TOP VIEW**

**HORIZONTAL CENTER LINE OF SHAFT**

**ECCENTRIC SHAFT**

**IDLER GEAR**

**TYPEWHEEL RACK**

**TO ADJUST**

LOOSEN DRIVE LINK ADJUSTING SCREWS. HOLDING ROLLER FIRMLY SEATED IN FIRST NOTCH AND HOLDING DRIVE LINK DOWN (BOTTOMED) AGAINST BUSHING, TIGHTEN ADJUSTING SCREWS.

(B) **IDLER GEAR ECCENTRIC SHAFT**

**REQUIREMENT**

- WITH UNIT IN LETTERS CONDITION AND FUNCTION CLUTCH DISENGAGED;

- MIN. 0.003 INCH --- MAX. 0.012 INCH CLEARANCE BETWEEN TYPEWHEEL RACK TOOTH AND IDLER GEAR TOOTH.

**TO ADJUST**

WITH MOUNTING SCREW LOOSENED, POSITION IDLER GEAR ECCENTRIC SHAFT BY MEANS OF THREE ADJUSTING HOLES. CHECK RACK THROUGHOUT ITS TRAVEL FOR BINDS.

**FIGURE 1-46. CORRECTING MECHANISM**

CHANGE 1
ROTARY CORRECTING LEVER

(1) TO CHECK
LOosen CORRECTING CLAMP ADJUSTING SCREW. WITH UNIT IN FIGURES CONDITION,
SELECT NO. 9 CODE COMBINATION (---45). TRIP FUNCTION CLUTCH AND POSITION
ROCKER BAIL TO EXTREME LEFT. MANUALLY SEAT ROTARY CORRECTING LEVER IN TYPE
WHEEL RACK.
REQUIREMENT
SECOND TOOTH FROM TOP OF RACK SEATED BETWEEN LOBES OF CORRECTING LEVER.
TO ADJUST
LOosen ECCENTRIC BUSHING LOCK NUT. WITH CLAMP ADJUSTING SCREW LOOSENED
AND CORRECTING LEVER PIVOT TO RIGHT OF CENTER LINE, POSITION CORRECTING
LEVER. TIGHTEN BUSHING LOCK NUT. DO NOT TIGHTEN CLAMP ADJUSTING SCREW
AT THIS TIME.

(2) TO CHECK
IN A MANNER SIMILAR TO THAT DESCRIBED ABOVE CHECK ENGAGEMENT OF FIFTH
TOOTH (---34- CODE COMBINATION SELECTED IN FIGURES CONDITION), NINTH TOOTH
(--4- CODE COMBINATION SELECTED IN LETTERS CONDITION) AND SIXTEENTH TOOTH
(--3-5 CODE COMBINATION SELECTED IN LETTERS CONDITION).
TO ADJUST
REFINE ADJUSTMENT UNDER (1) ABOVE.

FIGURE 1-47, CORRECTING MECHANISM
ROTARY CORRECTING LEVER (CONTINUED FROM FIGURE 1-47)

(3) TO CHECK
WITH UNIT IN LETTERS CONDITION, SELECT LETTERS CODE COMBINATION (12345). POSITION ROCKER BAIL TO EXTREME LEFT, MANUALLY SEAT CORRECTING LEVER IN RACK.

REQUIREMENTS
A. LOBES OF ROTARY CORRECTING LEVER FIRMLY SEATED IN TYPEWHEEL RACK.
B. END PLAY BETWEEN CORRECTING CLAMP AND ECCENTRIC BUSHING:
   MIN. SOME----MAX. 0.006 INCH

TO ADJUST
WITH CORRECTING CLAMP ADJUSTING SCREW LOOSENED, TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROLLER ON AXIAL CORRECTING PLATE APPROACHES SEATED POSITION IN NOTCH OF AXIAL SECTOR. WHEN CLEARANCE BETWEEN ROLLER AND SECTOR IS MIN. SOME----MAX. 0.005 INCH
POSITION CORRECTING LEVER FINGER-TIGHT AGAINST RACK. TIGHTEN CORRECTING CLAMP ADJUSTING SCREW.

FIGURE 1-48. CORRECTING MECHANISM
RIBBON CARRIER
REQUIREMENT
WITH FUNCTION CLUTCH DISENGAGED:
(1) RIBBON SHOULD OVERLAP TAPE BY A
SMALL AMOUNT.
(2) LAST PRINTED CHARACTER SHOULD BE
VISIBLE.
TO ADJUST
WITH LOCK SCREW LOOSENED, POSITION
RIBBON OSCILLATING LEVER BY MEANS OF
ADJUSTING SLOT.

FIGURE 1-49. RIBBON OSCILLATING MECHANISM
(A) PRINTING TRIP LINK
TO CHECK
TRIP FUNCTION CLUTCH AND POSITION ROCKER
BAIL TO EXTREME LEFT. MANUALLY LIFT ACCELERATOR
SO THAT LATCHING SURFACES OF PRINTING LATCH
AND ACCELERATOR ARE EVEN.
REQUIREMENT
MIN. SOME----MAX. 0.010 INCH
CLEARANCE BETWEEN ACCELERATOR AND LATCH.
TO ADJUST
WITH LOCK NUT LOOSENED, POSITION PRINTING
TRIP LINK BY MEANS OF ECCENTRIC MOUNTING
SCREW. KEEP HIGH PART OF SCREW TO LEFT OF
CENTER LINE.

(B) ACCELERATOR SPRING
REQUIREMENT
WITH UNIT IN IDLE
CONDITION:
MIN. 20 OZS.----MAX. 26 OZS.
TO PULL SPRING TO INSTALLED
LENGTH.

(C) PRINT HAMMER SPRING
REQUIREMENT
WITH UNIT IN IDLE CONDITION:
MIN. 1-1/2 OZS.----MAX. 2 1/2 OZS.
TO PULL SPRING TO INSTALLED
LENGTH.

(D) PRINTING LATCH SPRING
REQUIREMENT
WITH UNIT IN IDLE CONDITION:
MIN. 5 OZS.----MAX. 7 OZS.
TO PULL SPRING TO POSITION
LENGTH.

(E) PRINTING TRIP LINK SPRING
REQUIREMENT
MIN. 4 OZS.----MAX. 7 OZS.
TO PULL SPRING TO POSITION
LENGTH.

FIGURE 1-50. PRINTING MECHANISM
(A) TYPEWHEEL
TO CHECK
SELECT "M" CODE COMBINATION (53-345). PLACE
ROCKER BAIL TO EXTREME LEFT. CORRECTING LEVER
SHOULD BE FIRMLY SEATED IN TYPEWHEEL RACK.
REQUIREMENT
TYPEWHEEL ALIGNED SO THAT FULL CHARACTER
IS PRINTED UNIFORMLY.

TO ADJUST
POSITION TYPEWHEEL WITH LOCK NUT LOOSENED.
CHECK PRINTING BY MANUALLY LIFTING ACCELERATOR
(FIG. 1-50) TO LATCHED POSITION AND RELEASING IT.

NOTE:
FOR BEST RESULTS IT MAY BE NECESSARY TO MAKE
PRINT HAMMER ADJUSTMENT (BELOW) AND THEN
REFINE THIS ADJUSTMENT.

(B) PRINT HAMMER
REQUIREMENT
WHEN OPERATING UNDER POWER, PRINT
HAMMER AND TYPEWHEEL ALIGNED SO AS
TO OBTAIN BEST QUALITY OF PRINTING.
TO ADJUST
POSITION ECCENTRIC STUD WITH LOCK
NUT LOOSENED.

NOTE:
IT MAY BE NECESSARY TO REMAKE TYPEWHEEL
ADJUSTMENT (ABOVE) AND THEN REFINE THIS
ADJUSTMENT.

FIGURE 1-51. PRINTING MECHANISM
(A) RIBBON FEED PAWL SPRING
REQUIREMENT
WITH ROCKER BAIL TO EXTREME LEFT:
MIN. 6 OZS. --- MAX. 8 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(B) RIBBON FEED ECCENTRIC STUD
REQUIREMENT
WITH ROCKER BAIL TO EXTREME LEFT, THERE
SHOULD BE
MIN. 0.004 INCH --- MAX. 0.012 INCH
BETWEEN RETAINING PAWL AND RATCHET
TOOTH ON SIDE WHERE CLEARANCE IS
LEAST.
TO ADJUST
POSITION ECCENTRIC STUD WITH LOCK NUT
LOOSENED.

FIGURE 1-52. RIBBON FEED MECHANISM
(A) RIBBON FEED DRIVE ARM SPRING
REQUIREMENT
WITH UNIT IN STOP POSITION:
MIN. 3 OZS. ---- MAX. 5 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

(RIBBON FEED DRIVE ARM SPRING)

(RATCHET WHEEL)

(REAR VIEW)

(RETAINING PAWL)

(DOWNSTOP ECCENTRIC (LOCK NUT ON OTHER END))

(RIBBON FEED PAWL)

(RETAINING RINGS)

(SPRING WASHER)

(RETAINING RING AND BEND SPRING WASHER)

NOTE:
MAKE THIS ADJUSTMENT FOR BOTH RATCHET WHEELS.

(B) RIBBON FEED PAWL DOWNSTOP ECCENTRIC
TO CHECK
DISENGAGE FUNCTION CLUTCH, TAKE UP BACKLASH IN RATCHET WHEEL SO THAT CLEARANCE BETWEEN FEED PAWL AND RATCHET TOOTH IS AT MINIMUM, MEASURE CLEARANCE.
REPEAT FOR OTHER RATCHET WHEEL.
REQUIREMENT
(1) CLEARANCE BETWEEN FEED PAWL AND RATCHET TOOTH:
MIN. 0.010 INCH ---- MAX. 0.030 INCH
ON SIDE WHERE CLEARANCE IS LEAST.
(2) PAWL SHOULD FEED ONE TOOTH AT A TIME.
TO ADJUST
POSITION DOWNSTOP ECCENTRIC WITH LOCK NUT LOOSENED.

(C) RIBBON RATCHET WHEEL SPRING WASHERS
REQUIREMENT
WITH FEED PAWL AND RETAINING PAWL SHIFTED TO OPPOSITE RATCHET WHEEL:
MIN. 1 OZ. ---- MAX. 2 1/2 OZS.
TO START WHEEL TURNING.
TO ADJUST
REMOVE RETAINING RING AND BEND SPRING WASHER.

FIGURE 1-52. RIBBON FEED MECHANISM
(A) RIBBON REVERSING PLATE

TO CHECK
POSITION ROCKER BAIL TO EXTREME LEFT.
HOLD REVERSING ARM UNDER REVERSING PLATE
AND MEASURE CLEARANCE.
WITH FEED PAWL AGAINST OTHER RATCHET,
REPEAT PROCEDURE FOR OTHER REVERSING ARM,
REQUIREMENT
CLEARANCE BETWEEN REVERSING ARM AND
REVERSING PLATE:
MIN. 0.003 INCH—MAX. 0.012 INCH
AT REVERSING ARM WHERE CLEARANCE IS
LEAST.
TO ADJUST
POSITION REVERSING PLATE WITH CLAMP SCREW
LOOSENED.

(b) RIBBON FEED REVERSING ARM SPRING

REQUIREMENT
WITH FEED PAWL IN HIGHEST POSITION:
MIN. 5 OZS.—MAX. 15 OZS.
TO START REVERSING ARM MOVING.

FIGURE 1-54. RIBBON FEED MECHANISM

CHANGE 1
FIGURES 1-55 THROUGH 1-61 APPLY TO BOTH TYPING AND NON-TYPING PERFORATORS

Selector lever in K.T. position
K.T. = Keyboard Tape

PERFORATOR ALIGNMENT
(1) REQUIREMENT
Punch slide latches should align with code bar extensions
MIN. 0.000 -- MAX. 0.030 INCH TO RIGHT OF CODE BAR EXTENSION.

(2) REQUIREMENT
Reset cam should align with its cam follower roller
Approximately 0.030 INCH FORWARD OF THE REAR EDGE OF THE ROLLER.

TO ADJUST
Loosen set screws and disengage flexible couplings, loosen two alignment bracket screws and three perforator mounting screws. Set extension guide pin in middle of guide bracket slot and align perforator and reset cam. Tighten perforator mounting screws. Position alignment bracket so that it contacts perforator casting for its full length, and tighten screws. Position rear bearing bracket until perforator drive shaft lines up with bearing bracket shaft, and tighten screws. Engage flexible coupling, if necessary, refine line up of punch slide latches and code bar extensions by adjusting the code bar extension guide bracket in its mounting holes.

FIGURE 1-55. PERFORATOR SHAFT AND PUNCH MECHANISM
(A) FOLLOWER LEVER SPRING
REQUIREMENT
PERFORATOR CLUTCH DISENGAGED
MIN. 12 OZS.
MAX. 18 OZS.
TO START ROLLER AWAY FROM RESET CAM.

(B) CODE BAR BAIL
REQUIREMENT
CONTROL KNOB IN T POSITION. CODE BAR BAIL AT EXTREME LEFT. CLEARANCE
MIN. SOME
MAX. 0.006 INCH
BETWEEN CODE BAR BAIL LATCH LEVER AND ROLLER.
TO ADJUST
POSITION ECCENTRIC STUD WITH LOCK SCREW LOOSENED TO MEET REQUIREMENT.
RECHECK AFTER TIGHTENING LOCK SCREW.

NOTE
WITH ALL CLUTCHES LATCHED, DEPRESS LTRS KEY. AFTER CODE BARS
HAVE FALLEN TO RIGHT, THERE MUST BE 0.010 INCH MINIMUM GAP
BETWEEN RESET LEVER AND PIN ON CLUTCH TRIP BAR AS MEASURED
BETWEEN RESET CAM AND ROLLER. IF GAP CANNOT BE OBTAINED,
REPOSITION PERFORATOR TO RIGHT OR LEFT AND READJUST.

FIGURE 1-56: CODE BAR BAIL AND CAM FOLLOWER MECHANISMS

CHANGE 1
(A) MAIN TRIP LEVER
REQUIREMENT
CLUTCH LATCHED, PUNCH
RESET BAIL MUST BE IN ITS
UPPERMOST POSITION WHEN
THE TRIP LEVER IS
MIN. 0.015 INCH
MAX. 0.025 INCH
BELOW THE END OF THE RELEASE.
TO ADJUST
POSITION MAIN TRIP LEVER
WITH ITS CLAMP SCREW LOOSENED.

(B) FUNCTION CLUTCH RELEASE SPRING
REQUIREMENT
PERFORATOR CLUTCH DISENAGED,
MIN. 5 OZS.
MAX. 8 OZS.
TO START RELEASE MOVING.

FIGURE 1-57. PERFORATOR TRIP LEVER MECHANISM
(C) CODE BAR EXTENSION AND PUNCH SLIDE LATCH

(1) REQUIREMENT
CONTROL KNOB IN "T" POSITION.
BLANK KEY LEVER DEPRESSED, PUNCH
SLIDES LATCHED. CLEARANCE SHOULD BE
MIN. SOME — MAX. 0.006 INCH
BETWEEN CODE BAR EXTENSIONS AND
CLOSEST PUNCH SLIDE LATCH.

(2) REQUIREMENT
LTRS KEY LEVER DEPRESSED, CODE BAR
EXTENSIONS SHOULD ROTATE PUNCH
SLIDE LATCHES TO RELEASE ALL PUNCH
SLIDES.

TO ADJUST
POSITION GUIDE VERTICALLY WITH GUIDE
LOCK NUT LOOSENED TO OBTAIN REQUIRED
CLEARANCE. TIGHTEN LOCK NUT.

(A) PUNCH SLIDE LATCH SPRING
REQUIREMENT
MIN. 3/4 OZS.
MAX. 2 OZS.
TO START LATCH MOVING.

(b) CODE BAR EXTENSION SPRING
REQUIREMENT
MIN. 4 OZS.
MAX. 5 OZS.
TO START EACH EXTENSION MOVING.

FIGURE 1-58 - CODE BAR EXTENSION AND PUNCH LATCH MECHANISMS
PERFORATOR CLUTCH RELEASE TRIP
REQUIREMENT
PERFORATOR CLUTCH SHOULD TRIP CONSISTENTLY IN T AND K-T POSITIONS
WHEN BLANK AND REPEAT KEYLEVERS ARE DEPRESSED SIMULTANEOUSLY.
WHEN THE CONTROL KNOB IS TURNED FROM K POSITION TO K-T POSITION,
THE PERFORATOR CLUTCH SHOULD TRIP WHEN THE FIRST KEYLEVER IS DEPRESSED.
CLEARANCE BETWEEN MAIN TRIP LEVER AND CLUTCH RELEASE
MIN. 0.015 INCH
MAX. 0.025 INCH

TO ADJUST
PLACE CONTROL KNOB IN T POSITION. LOOSEN MAIN TRIP LEVER LATCH CLAMP SCREWS AND MOVE LATCH TO EXTREME LEFT, WITH CODE BARS TO THE RIGHT.
STRIKE BLANK KEYLEVER AND MOVE STOP BRACKET TO RIGHT UNTIL IT DISENGAGES LATCH, MOVE CLUTCH TRIP BAR EXTENSION TO RIGHT UNTIL IT LATCHES POSITION MAIN TRIP LEVER LATCH TO RIGHT TO OBTAIN REQUIRED CLEARANCE.
TIGHTEN SCREWS.

TO CHECK
WITH THE STOP BRACKET SCREWS Friction Tight, MOVE THE STOP BRACKET SLOWLY TO THE LEFT UNTIL THE LATCH JUST TRIPS. TURN ON MOTOR. DEPRESS BLANK AND REPEAT KEYLEVERS SIMULTANEOUSLY. IF OPERATION IS SATISFACTORY, TURN TO K-T POSITION AND REPEAT. TURN TO K POSITION AND BACK TO K-T POSITION. DEPRESS A KEYLEVER. PERFORATOR CLUTCH SHOULD TRIP. IF IT DOES NOT, MOVE STOP BRACKET SLIGHTLY TO THE RIGHT AND REPEAT THE ABOVE ADJUSTMENT.

NOTE: CHECK FOR CLEARANCE BETWEEN RESET BAIL AND SLIDES WHEN THE RESET LEVER IS TRIPPED. REFINE ADJUSTMENT IF NECESSARY TO OBTAIN OPERATIONAL CLEARANCE.

FIGURE 1-59. PERFORATOR CLUTCH RELEASE MECHANISM
CODE BAR EXTENSION BLOCKING ASSEMBLY

REQUIREMENT

CONTROL KNOB IN K POSITION. CODE BAR EXTENSIONS AND CHARACTER COUNTER BARS SHOULD NOT OPERATE.

(1) CLEARANCE BETWEEN RIGHT END AT CODE BAR EXTENSIONS AND CODE BARS. MIN. SOME MAX. 0.025 INCH

(2) CLEARANCE BETWEEN BLOCKING LEVER AND SIDE OF NOTCH IN CHARACTER COUNTER CODE BARS. MIN. SOME MAX. 0.010 INCH

TO ADJUST

WITH CLUTCH LATCHED, TURN CONTROL KNOB TO THE K POSITION. STRIKE LTS KEYLEVER AND ROTATE SIGNAL GENERATOR SHAFT TO RETURN CODE BARS TO EXTREME LEFT. WITH ADJUSTING SCREW FRICTION TIGHT, POSITION EXTENSION BAIL TO OBTAIN REQUIREMENT (1) AND POSITION BLOCKING LEVER TO OBTAIN REQUIREMENT (2) MAKE CERTAIN THAT THE CODE BAR EXTENSION BAIL IS FREE ON ITS GUIDE POST. TEST OPERATION IN K, K-T AND T POSITIONS.

DETENT LEVER SPRING

CONTROL CAM

DETECT LEVER

DETECT LEVER SPRING

MIN. 4 LBS.
MAX. 5 LBS
TO START LEVER MOVING.

FIGURE 1-60. CODE BAR EXTENSION AND DETENT LEVER MECHANISMS
FIGURE 1-61. RESET CAM FOLLOWER AND KEYBOARD CONTROL SWITCH MECHANISM
CAUTION
IF THE MOTOR SHOULD BECOME BLOCKED FOR
SEVERAL SECONDS, THE THERMAL CUT-OUT
SWITCH WILL BREAK THE CIRCUIT. SHOULD THIS
Happen, ALLOW THE MOTOR TO COOL AT LEAST
5 MINUTES BEFORE MANUALLY DEPRESSING THE
RED BUTTON.

SYNCHRONOUS MOTOR POSITIONING
REQUIREMENT
TWO OILERS SHOULD BE UPWARD AND APPROXIMATELY EQUIDISTANT FROM A VERTICAL
LINE THROUGH THE MOTOR SHAFT.
TO ADJUST
POSITION THE MOTOR WITH BOTH CLAMP SCREWS LOOSENED.

FIGURE 1-62. SYNCHRONOUS MOTOR
5. CABINET

DOME

DOME HINGE

DOME LATCH

CABINET

DOME REQUIREMENT
THE DOME SHOULD BE CENTERED ON THE CABINET FROM RIGHT TO LEFT AND PLACED
APPROXIMATELY 0.050 INCH
FROM THE FRONT EDGE OF THE CABINET
TO ADJUST
POSITION THE DOME WITH THE SCREWS, WHICH SECURE THE DOME HINGE
TO THE CABINET, LOOSENEO.

NOTE: IF NECESSARY TO CHECK REQUIREMENT,
REMOVE BLANK CONTROL PANEL.

DOME LATCH

DOME LATCH REQUIREMENT
WITH THE DOME CLOSED AND TOUCHING
THE CABINET, THE DOME LATCHES SHOULD
BE LATCHED WITH A CLEARANCE OF
MIN. SOME
MAX. 0.015 INCH
BETWEEN THE LATCHING SURFACE OF EACH LATCH
AND ITS LATCHING SURFACE OF THE CABINET
TO ADJUST
POSITION EACH LATCH WITH ITS MOUNTING
SCREW LOOSENEO.

FIGURE 1-63. CABINET DOME
TORSION BAR

REQUIREMENT
THE TORSION BARS SHOULD LIFT THE DOME ABOVE THE FRONT EDGE OF THE CABINET
MIN. 5 INCHES
MAX. 7 INCHES
WHEN RELEASED FROM ITS LATCHES
TO ADJUST
TURN THE SHOULDER NUTS ON THE EYE BOLTS CLOCKWISE TO INCREASE THE
SPRING TORQUE, AND COUNTERCLOCKWISE TO DECREASE THE SPRING TORQUE.

TOP DOORS (RIGHT AND LEFT)
REQUIREMENT
THE DOORS SHOULD SET SQUARELY AND UNIFORMLY ON THE CONTOUR OF THE DOME.
TO ADJUST
POSITION EACH DOOR WITH ITS HINGE MOUNTING SCREWS LOOSENED.

TOP MIDDLE DOOR
REQUIREMENT
THE DOOR SHOULD REST FLAT AND SQUARELY ON THE DOME. THE REINFORCEMENT
CHANNEL SHOULD FIT OVER ITS GUIDE BRACKET IN THE DOME.
TO ADJUST
REMOVE THE SPRING DETENT FROM CENTER OF DOME AND POSITION THE DOOR WITH
ITS HINGE MOUNTING SCREWS AND BRACKET MOUNTING SCREWS LOOSENED.

RIGHT FRONT DOOR
REQUIREMENT
THE RIGHT AND LEFT EDGES OF THE RIGHT FRONT DOOR SHOULD BE EVEN WITH THE
RIGHT TOP DOOR. WITH THE DOOR CLOSED IT SHOULD REST FLAT ON THE
HORIZONTAL SURFACE OF THE DOME.
TO ADJUST
REMOVE THE THUMB SCREWS, LATCHES, AND SPRINGS FROM THE DOOR, AND POSITION
THE DOOR WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 1-64. CABINET DOME
RIGHT TOP DOOR

PAPER GUIDE

REQUIRED
WITH THE RIGHT TOP DOOR CLOSED, THE BOTTOM EDGE
OF THE PAPER GUIDE SHOULD BE FLUSH WITH THE
BOTTOM SURFACE OF THE WINDOW IN THE RIGHT
FRONT DOOR.

TO ADJUST
POSITION THE TAPE GUIDE WITH ITS MOUNTING
SCREWS LOOSENED.

WINDOW

REQUIRED
WHEN RIGHT FRONT DOOR IS OPENED OR CLOSED,
THE WINDOW SHOULD CLEAR THE PAPER GUIDE
BY 1/16 INCH

TO ADJUST
POSITION THE WINDOW WITH ITS RETAINER
MOUNTING SCREWS LOOSENED.

LATCH THUMB SCREW

PAPER GUIDE

MOUNTING SCREW

RETAINER MOUNTING SCREWS

LATCH

ADJUSTING BRACKET

LEFT FRONT DOOR

(1) REQUIREMENT
THE DOOR SHOULD SET SQUARELY ON
ITS OPENING IN THE DOME AND FLAT
ON THE DOME.

TO ADJUST
REMOVE LATCH THUMB SCREW AND
LATCH. REMOVE TORSION SPRING
ANCHOR POST. POSITION THE DOOR
WITH ITS HINGE MOUNTING SCREWS
LOOSENED.

(2) REQUIREMENT
THE TORSION SPRING SHOULD RAISE
THE DOOR UPWARD UNTIL STOPPED BY
ITS STOP GUIDE BEFORE IT REACHES A
VERTICAL POSITION.

TO ADJUST
ROTATE THE TORSION SPRING POST TO
ACQUIRE SUFFICIENT LIFTING POWER.
POSITION THE GUIDE STOP WITH ITS
MOUNTING SCREW LOOSENED.

(3) REQUIREMENT
THE DOOR LATCH SHOULD HAVE
SUFFICIENT LATCHING SURFACE ON ITS
BRACKET AND SHOULD HOLD THE DOOR
CLOSED REASONABLY TIGHT.

TO ADJUST
POSITION ITS ADJUSTING BRACKET
HORIZONTALLY WITH ITS MOUNTING
SCREWS LOOSENED. MODIFY UP OR
DOWN POSITION OF BRACKET IF
NECESSARY.

CABINET

STOP GUIDE

TORSION SPRING ANCHOR POST

DOME

LEFT FRONT DOOR

TORSION SPRING

MOUNTING SCREWS

FIGURE 1-65. CABINET DOME
LAMP POSITION

REQUIREMENT
CLEARANCE BETWEEN EACH LAMP AND ITS LENS OR THE DOME
MIN. 1/16 INCH

TO ADJUST
POSITION LAMP HOLDER ON ITS BRACKET
WITH MOUNTING SCREWS LOOSENED.

COPYHOLDER

REQUIREMENT
THERE SHOULD BE SUFFICIENT TENSION
ON THE LINE GUIDE TO PREVENT IT FROM
SLIPPING DOWN ITS SHAFT. IT SHOULD
ALSO HOLD THE COPY IN PLACE.

TO ADJUST
REMOVE THE NUTS FROM THE SHAFT
MOUNTING POST AND TURN THE SHAFT.
REPLACE THE SHAFT MOUNTING POST.

FIGURE 1-66. COPYHOLDER; PAPER GUIDE
CRADLE

(1) REQUIREMENT
UNDER NORMAL LOAD, THE TOP OF THE CRADLE RAILING SHOULD BE 2 INCHES FROM THE SHELF OF THE CABINET
TO ADJUST
LOOSEN THE LOCK NUTS ON VIBRATION DAMPENER NO. 1, 2, AND 3 ON TOP OF THE LEFT AND RIGHT RAILS. LOOSEN THE NUT ON THE LOWER END OF STUD IN MOUNT NO. 4. ROTATE THE ADJUSTING STUDS UNTIL THE RAILS HAVE REACHED THE DESIRED HEIGHT. TIGHTEN ALL NUTS PREVIOUSLY LOOSENED.

(2) REQUIREMENT
THE FRONT RAIL SHOULD BE POSITIONED APPROXIMATELY 3-11/32 INCH FROM AND PARALLEL TO THE FRONT OF THE CABINET.
TO ADJUST
POSITION THE BASE RAIL ASSEMBLY WITH ITS FOUR MOUNTING SCREWS AND TWO LOCATING ECCENTRICS LOOSENED AFTER POSITIONING THE RAIL ASSEMBLY TO DESIRED POSITION, ROTATE THE ECCENTRICS AGAINST THE REAR RAIL AND LOCK IN POSITION.

FIGURE 1-67 CRADLE

CHANGE 1
6. DISASSEMBLY AND REASSEMBLY

a. Introduction

For further disassembly of parts not herein described, refer to the exploded views in parts bulletin 11698. To reassemble the unit, reverse the disassembly procedure. After reassembly, be sure to check all adjustments, clearances, and spring tensions.

NOTE

When removing a part which is mounted on shims, the number of shims used at each mounting screw should be noted so that the same shim pile-up can be replaced when the part is remounted. Retaining rings (tru-arcs) are of spring steel and have a tendency to release suddenly. Loss of these can be minimized as follows: Hold retaining ring with the left hand to prevent rotation. Place the blade of a suitable screwdriver in one of the slots of the retaining ring. Rotate the screwdriver in a direction to increase the diameter of the retaining ring. It will come off easily without springing.

b. Assemblies

(1) Character Counter

(a) To remove the character counter assembly, proceed as follows:

1. Remove the two 151631 screws which hold the 155969 character counter bracket to the keyboard base.

2. Raise the character counter and remove the two 151685 screws which hold the 158050 switch to its 158021 bracket.

(2) Tape Container

(a) To remove the tape container assembly, proceed as follows:

1. Remove the four 151632 screws which hold the 158233 panel mounting bracket to the base.

(3) Perforator

(a) To remove the perforator assembly, proceed as follows:

1. Loosen the two set screws on the 158020 coupling located on the 158073 rear shaft and slide the coupling to the rear to disengage it.

2. Remove the three 74014 screws which hold the 158169 perforator frame to the base, and remove the 151631 screw which holds the 156184 bracket to the base.

3. Raise the perforator slightly from the base being careful not to injure the code bar extension or perforator clutch latch spring.

4. If unit is equipped with power backspace, unscrew the leads from under the 224M magnet assembly before removing the perforator entirely.

(4) Punch Assembly

(a) To remove the punch assembly, magnet assembly, and backspace mechanism, proceed as follows:

1. Unhook the 151736 perforator drive link spring, and disengage the 156412 link.

2. Remove the three 151631 screws which hold the 159473 perforator main plate to the 158169 perforator frame.

3. Disengage the 159961 eccentric arm and the assemblies will come free as a unit.

(5) Ribbon Feed Mechanism (Typing Perforator Only)

(a) Remove the ribbon. Remove the two 151632 mounting screws and 2191 lockwashers. Remove the ribbon feed mechanism.

(b) To replace the ribbon feed mechanism, reverse the procedure used to remove it.

(6) Transfer Mechanism (Typing Perforator Only)

(a) Remove the 49084 main trip lever spring. Remove the 151631 and 151632 mounting screws, 2191 lock washer and 7002 flat washers. Remove the transfer mechanism.

(b) To remount the transfer mechanism, reverse the procedure used to remove it.

(7) Typing Mechanism (Typing Perforator Only)

(a) To Remove Typing Mechanism:

1. Remove the 156872 operating blade from the rocker ball assembly by removing the two 151657 mounting screws, 2191 lock washers, 8330 washers, 3649 washer and 82392 shims. Remove the 119651 retaining ring and disconnect the 159512 printing trip link. Remove the 3598 nut, 2191 lock washer and 125015 flat washer from the 156396 eccentric on the rocker ball assembly, and disconnect the 159526 oscillating drive link. Remove 33828 spring from the 156478 accelerator and the 90606 spring from the 156252 lifter.
2. Remove the 110017 screw and 92260 washer that fastens the 159434 lifter plate to the 156474 bar on the frame. Remove the 151630 screw and 2191 lock washer that secure the 159525 axial bracket to the 159404 post on the frame. Remove the 151631 screw, 2191 lock washer, and 7002 flat washer that fasten the 159487 function box front plate to the 159472 main plate. Remove the 119653 retaining ring from the 159659 eccentric shaft; and remove the 151629 nut, 159536 Idler gear, 159639 shaft and 2191 lock washer by removing the 159658 mounting screw. Remove the three 151631 screws, 2191 lock washers and 7002 flat washers that secure the 159535 front plate to the frame. Remove the typing mechanism from the frame assembly.

3. To remount the typing mechanism, reverse the procedure used to remove it.

(b) To Remove Function Box Mechanism:

1. Remove the 151631 mounting screw, 2191 lock washer and 7002 flat washer from the 159535 front plate. Remove the function box from the typing mechanism.

2. To remount the function box, reverse the procedure used to remove it.

(c) To Remove Axial Plate Assembly:

1. Remove the 3870 correcting drive link spring. Remove the 156413 correcting drive link by removing the 119651 retaining ring. Remove the 119649 retaining ring and disconnect 156869 ribbon guide from the 156870 ribbon oscillating lever.

2. Remove the three 151630 mounting screws and 2191 lock washers from the axial plate. Remove the axial plate assembly.

3. To remount the axial plate assembly, reverse the procedure used to remove it. The rearmost tooth of the rack on the 156332 typewriter shaft must mesh with the rearmost tooth space in the 156294 axial sector, and the forward tooth on the sector must mesh with the second tooth space on the shaft: there is an extra tooth space on the forward portion of the shaft's rack.

(d) After the function box mechanism and axial plate assembly have been removed, the remainder of the typing mechanism is the front plate assembly.

(8) After the typing mechanism has been removed, the following remain on the frame assembly: the function clutch trip assembly, the two shaft assemblies and the rocker bail assembly (Typing Perforator Only).

(9) Margin Indicator

(a) To remove the margin indicator assembly, proceed as follows:

1. Remove the two 151637 screws which hold the 158162 switch mounting bracket to the 158160 reset cam follower lever assembly bracket.

(10) Reset Cam Follower

(a) To remove the reset cam follower lever assembly, proceed as follows:

1. Remove the two 151631 screws which hold the 158160 reset cam follower lever assembly bracket to the 158113 basket frame.

2. Remove the five 151442 screws which hold the bracket to the base.

3. Disengage the follower lever assembly from the selector lever assembly.

(11) Auxiliary Electrical Switch

(a) To remove the auxiliary electrical switch and housing assembly, proceed as follows:

1. Disconnect the (6) switch cable leads from the 158250 terminal board located just to the right of the perforator drive shafting.

2. Remove the three 151631 screws which hold the 158202 auxiliary switch housing to the base.

3. Slide the housing to the rear and disengage the 158208 gear from the 158210 shaft and lift the housing out.

4. Disengage the drive shaft from the 158114 extension basket control cam.

(12) Code Bar Extension Basket

(a) To remove the code bar extension basket assembly, proceed as follows:

NOTE
For reassembly purposes, observe how the 158061 link guide pin and the 158060 trip bar link latch spring which encases it are engaged between the 158135 clutch trip bar link and the 158103 trip bar link latch.

1. Remove the 151631 screw which holds the left end of the extension basket to the base.

2. Slide the extension basket to the left and disengage the 158116 reset lever from the 158099 keyboard control selection lever assembly. Note: When reassembling, be sure that the selection lever assembly straddles the clutch trip bar extension lever, and that the selection lever fork engages its mating pin.

(13) Signal Generator

CHANGE 1
(a) To remove the signal generator assembly, proceed as follows:

1. Remove the typing unit if it is present.

2. Remove the 154131 contact box cover, and disconnect the signal line leads from the 154042, 154043 contact terminals.

3. Remove the two 153841 hold down screws at the front of the 154200 signal generator frame, and the 74805 screw at the right rear of the frame.

4. Lift the signal generator carefully, while holding the universal ball back so that the non-repeat lever clears and its spring will not be excessively stretched.

CAUTION

If the non-repeat lever is pulled down approximately 90 degrees from normal position, its spring might be stretched beyond elastic limits which will result in assembly malfunction.

(14) Keyboard

(a) To remove the keyboard assembly, proceed as follows:

1. Remove the typing unit and signal generator assembly as specified in paragraph (9).

2. Remove the plastic windows and labels, hood, seal, and seal plates as specified in paragraph (11).

3. Remove the four 151631 screws which hold the 154210, 154211 front frames to the front of the 158000 base.

4. Remove the two 151632 screws which hold the 154068, 154069 right and left code lever guide brackets on the top of the base, and the two 151632 screws at the extreme right and left of the 154055 front bracket which hold it on the base.

5. When these four screws in front and four on top of the base have been removed, tip up the front of the keyboard assembly and pull it forward, disengaging the function levers.

6. Note that all function levers are under their corresponding function balls - except the keyboard lock function lever - which fits on top of its function ball.

7. When reassembling, depress the keyboard lock key lever so that the lock function lever will go in over its ball instead of under as the other function levers should.

NOTE

It is easier to disassemble and reassemble the keyboard assembly with the base standing on its rear.

(15) Keyboard Labels

(a) To remove the plastic windows and labels, hood, seal, and seal plates, proceed as follows:

1. Remove the four 154202 screws which secure the 154198 windows and labels.

2. Remove the two 151632 screws underneath the 154110 hood which hold the hood to the 154203 hood mounting bracket; and remove the four 151659 screws on top of the hood which hold it to the 154210, 154211 left and right frame mounting brackets.

3. Pull the hood forward to remove.

4. Stretch the 154020 rubber keyboard seal off its 154057, 154058 plates.

5. Remove the four 151442 screws and two 154203 hood mounting brackets.

6. Remove the 154058 upper seal plate by unscrewing the three 151722 screws at its rear.

7. Remove the 154057 lower seal plate by unscrewing the 151632 screws at its front.

(16) Contact Box

(a) To remove the contact box assembly, proceed as follows:

1. Remove the 154131 contact box cover and disconnect the signal line leads.

2. Unhook the 86304 drive link.

3. Unscrew the two 151632 screws at the front of the 154009 front plate which hold the contact box assembly.

4. Disengage the 156644 drive link from the transfer ball and lift off the assembly. It is more economical to replace the entire contact assembly if the contacts need replacement.

(17) Transfer Lever Locking Ball

(a) To remove the transfer lever locking bail, proceed as follows:

1. Remove the signal generator assembly from the keyboard as specified in paragraph (9).
2. Remove the contact box assembly as specified in paragraph (12).

3. Remove the 70388 transfer lever locking ball spring.

4. To remove the 154140 locking ball, trip the clutch and rotate the shaft until the cam is positioned so that the ball can be unhooked and dropped from its guide post. Turn the locking ball clockwise until it is at right angles to the guide, and extract it from the bottom of the frame.

NOTE

It may be necessary to move the shaft back and forth to position the cam for maximum clearance.

(18) Signal Generator Shaft

(a) To remove the cam, clutch, and shaft assembly, proceed as follows:

1. Remove the transfer lever locking ball as specified in paragraph (13).

2. Remove the two 151631 screws which mount the 154101 clutch shaft rear mounting plate to the 154200 signal generator frame, and remove the 112626 nut which locks the shaft to the front of the frame.

3. Hold the 154033 clutch latch lever and the 154054 clutch stop lever away and pull back on the shaft rear mounting plate to disengage the shaft from the front plate.

4. Remove the entire cam, clutch, and shaft assembly by rotating it to clear the various transfer levers. The 154019 code bar ball eccentric follower, the 154138 felt washer and the 154083 cam spacer will fall free. These must be repositioned before reassembly.

5. To take the cam (with clutch assembly) off the shaft, disengage the clutch by holding the clutch shoe lever against the stop lug and slide the cam and clutch off.

(19) Key lever Guide Plate

(a) To remove the key lever guide plate, proceed as follows:

1. Remove the plastic windows and labels, and hood as specified in paragraph (11).

2. Remove the 151045 space bar by un-screwing the two 151223 shoulder screws that fasten it to the 154117 space bar ball.

3. Remove the 151659 screw on the key lever guide plate under the space bar and the two 151659 screws in the upper corners of the plate which hold the plate to the frame.

4. Work the guide plate off the keytops and let them fall free.

5. To replace the guide plate over the key levers, flap all levers to the rear. Place the front end of the guide plate down on the frame; and push the key levers into their respective holes, starting with the bottom row and proceeding upward to the top row.

(20) Power Drive Backspace

(a) To remove the power drive backspace mechanism, proceed as follows:

1. Unhook the 84575 spring from the 159958 drive link latch.

2. Loosen the 151632 screw on the 159960 eccentric and pull the 159961 eccentric arm off the 159963 hub.

3. Disengage the eccentric arm from its guide between the 159958 latch and 159955 drive link.

4. Unscrew the 159956 post from between the 159954 adjusting link and the front punch frame, and remove the link and latch assembly.

5. Remove the two 156632 screws on the front punch frame and extract the magnet assembly.

(21) Manual Backspace

(a) To remove the manual backspace mechanism, proceed as follows:

1. Unscrew the two 153817 screws which hold the 159900 plate to the rear punch frame and remove the 159902 rake shaft.

2. Remove the 153817 screw, the 122149 screw and 159916 eccentric from the 159987 bracket on the left side of the punch front plate. Remove the 159903 crank assembly.
1. Manual and Power Drive Backspace Mechanism

![Diagram of Backspace Mechanism]

**RAKE REQUIREMENT**

With rotational play in rake taken up to left, bottom surface of rake teeth should be in same vertical plane as left side of punch block.

To adjust:

- Remove two mounting screws from rear plate.
- Position rake shaft gear in relation to gear segment.
- Replace mounting screws.

**2nd REQUIREMENT**

With bellcrank spring unhooked and rake in operated position, clearance between bottom of rake teeth and lower surface of tape slot:

- Min. 0.008 inch
- Max. 0.010 inch (check at No. 1 & 5 pins.)

To adjust:

- Loosen four mounting screws until friction tight.
- Position front and rear plates, with bell crank handle fully depressed, until left edges of both plates are approximately in line with vertical plane of punch block and clearance meets the requirement.
- Tighten mounting screws and replace bell crank spring.

**FEED PAWL ADJUSTING PLATE REQUIREMENT**

When bell crank is rotated clockwise, feed pawl should miss first ratchet tooth and contact second tooth. Clearance between pawl and first ratchet tooth:

- Min. 0.004 inch
- Max. 0.020 inch

To adjust:

- Position adjusting plate with mounting screw friction tight.

![Diagram of Feed Pawl and Bell Crank]

**FIGURE 2-1. MANUAL BACKSPACE MECHANISM**
RETURN LATCH

**REQUIREMENT**

BACKSPACE MECHANISM IN UNOPERATED POSITION.
CLEARANCE BETWEEN RETURN LATCH AND FEED PAWL EXTENSION
MIN. 0.004 INCH
MAX. 0.020 INCH

TO ADJUST
ADJUST ECCENTRIC WITH MOUNTING SCREW FRICITION TIGHT.

FEED PAWL

**REQUIREMENT**

BACKSPACE MECHANISM IN OPERATED POSITION. FEED WHEEL RATCHET IN DETENTED POSITION. CLEARANCE BETWEEN FEED WHEEL RATCHET TOOTH AND FEED PAWL
MIN. SOME
MAX. 0.003 INCH

TO ADJUST
BY MEANS OF 0.060 INCH ALLEN WRENCH, ROTATE ECCENTRIC WITH NUT POST FRICITION TIGHT.

FIGURE 2-2. MANUAL BACKSPACE MECHANISM
(A) ARMATURE HINGE

REQUIREMENT

ARMATURE IN OPERATED POSITION. ARMATURE SHOULD BE FLUSH WITH POLE FACE AND MAGNET BRACKET EXTENSION TO ADJUST POSITION ARMATURE WITH HINGE MOUNTING SCREWS LOOSENED.

NOTE

THIS ADJUSTMENT IS MADE AT FACTORY AND SHOULD NOT BE DISTURBED UNLESS A REASSEMBLY OF THE UNIT IS UNDERTAKEN. IF NECESSARY TO MAKE THIS ADJUSTMENT, THE PUNCH UNIT SHOULD BE REMOVED. SEE DISASSEMBLY AND REASSEMBLY. REMAKE PUNCH UNIT POSITION ADJUSTMENT.

(b) ARMATURE UP-STOP

REQUIREMENT

ARMATURE IN UNOPERATED POSITION, GAP BETWEEN ARMATURE AND POLE FACE MIN. 0.025 INCH.
MAX. 0.030 INCH.
AT CLOSEST POINT.

TO ADJUST

ROTATE ECCENTRIC WITH MOUNTING NUT LOOSENED. KEEP HIGH PART OF ECCENTRIC TO LEFT.

NOTE

FOR A.C. VOLTAGE OPERATION, UNMARKED SIDE OF ARMATURE SHOULD FACE MAGNET POLE FACE. FOR D.C. VOLTAGE OPERATION, REMOVE TWO ARMATURE MOUNTING SCREWS AND REVERSE ARMATURE SO THAT SIDE STAMPED "C" FACES POLE FACE.

FIGURE 2-3. POWER DRIVE BACKSPACE MECHANISM

CHANGE 1
Backspace mechanism in operated position, feed wheel in detented position, latch engaged with eccentric arm. High part of eccentric to right. Clearance between feed pawl and feed wheel ratchet tooth:

- Min.: some
- Max.: 0.003 inch

To adjust, by means of pry point, position adjusting link with drive link screw friction tight.

Armature bail extension

- Note: This adjustment is made at factory and should not be disturbed unless a re-assembly of the unit is undertaken. If necessary to make this adjustment, punch should be removed. See disassembly and reassembly, remake punch position adjustment.

C. Latch extension

Requirement:

- Backspace mechanism in unoperated position, high part of eccentric to left, armature against pole face. Latch resting on eccentric arm notch. Clearance between top of armature bail extension and latch extension:
  - Min.: 0.005 inch
  - Max.: 0.020 inch

To adjust, swing magnet clockwise or counterclockwise, as necessary, with mounting screws friction tight.

B. Feed pawl (final for power drive mechanism)

To check:

- Back feed wheel ratchet one space to fully detented position, position eccentric arm to extreme right. Check clearance between pawl and ratchet tooth at four random positions about periphery of wheel.

Requirement:

- Clearance between feed pawl and ratchet tooth:
  - Min.: some
  - Max.: 0.003 inch

To adjust, by means of pry point, position adjusting link with drive link screw loosened.

Figure 2-4. Power drive backspace mechanism
LATCH EXTENSION SCREW

ARMATURE BAIL EXTENSION

LATCH EXTENSION

ARM SHOWN IN ITS HIGHEST POINT OF TRAVEL.

LATCH

ECCENTRIC

ECCENTRIC ARM

LATCH REQUIREMENT
BACKSPACE MECHANISM IN UNOPERATED POSITION, ARMATURE OFF POLE FACE (DE-ENERGIZED). LATCH EXTENSION AGAINST END OF ARMATURE BAIL EXTENSION, ECCENTRIC ARM AT ITS CLOSEST POINT TO UNDERSIDE OF LATCH. CLEARANCE BETWEEN LATCH AND ECCENTRIC ARM.

MIN. 0.005 INCH
MAX. 0.025 INCH

TO ADJUST POSITION LATCH WITH LATCH EXTENSION SCREW LOOSENED.

FIGURE 2-5. POWER DRIVE BACKSPACE MECHANISM

CHANGE 1
NON-REPEAT ARM

REQUIREMENT
BACKSPACE MECHANISM IN UNOPERATED POSITION, CLEARANCE BETWEEN TOP SURFACE OF NON-REPEAT ARM AND LOWEST POINT OF LATCH EXTENSION
MIN. 0.002 INCH
MAX. 0.010 INCH

TO ADJUST
POSITION ADJUSTING ARM WITH ARM SCREW LOOSENED FRICTION TIGHT.

FIGURE 2-6. POWER DRIVE BACKSPACE MECHANISM
LATCH SPRING REQUIREMENT
BACKSPACE MECHANISM IN UNOPERATED POSITION.
MIN. 2 1/2 OZS.
MAX. 3 1/2 OZS.
TO START LATCH MOVING.

FEED PAWL SPRING REQUIREMENT
BACKSPACE MECHANISM IN UNOPERATED POSITION.
MIN. 1-3/4 OZS.
MAX. 3-3/4 OZS.
TO START FEED PAWL MOVING.

BELL CRANK SPRING REQUIREMENT
SPRING UNHOOKED FROM PLATE EXTENSION.
MIN. 19 OZS.
MAX. 23 OZS.
TO PULL TO INSTALLED LENGTH.

PLATE EXTENSION

GEAR SEGMENT SPRING REQUIREMENT
SPRING UNHOOKED FROM BELL CRANK SPRING POST.
MIN. 22 OZS.
MAX. 26 OZS.
TO PULL TO INSTALLED LENGTH.

BELT CRANK

ARMATURE BAIL SPRING

LATCH SPRING

LATCH EXTENSION SPRING

ARMATURE BAIL

FIGURE 2-7. MANUAL AND POWER DRIVE BACKSPACE MECHANISM

CHANGE 1
2. CHARACTER COUNTER MECHANISM

(A) CHARACTER COUNTER END-OF-LINE SWITCH

1. REQUIREMENT (REMOVE CHARACTER COUNTER) THE SWITCH SHOULD CLOSE AT A PRESET NUMBER OF CHARACTERS WITH A SMALL AMOUNT OF OVERTRAVEL BY BOTH CONTACT SPRINGS.

2. REQUIREMENT CLEARANCE BETWEEN LONG CONTACT SPRING AND LOW PART OF CAM. MIN. SOME MAX. 0.005 INCH.

TO ADJUST 61/2
POSITION SW TCH BRACKET WITH ITS MOUNTING SCREWS LOOSENO AND SET COUNTER TO THE DESIRED COUNT. LOOSE CAM CLAMP SCREWS AND POSITION CAM UNTIL CONTACTS CLOSE WITH SOME OVERTRAVEL, REPLACE UNIT.

(B) RATCHET DRUM ASSEMBLY RETURN SPRING REQUIREMENT

2-3 OZS. WHEN INDICATOR POINTS TO 0 TO START EYELET MOVING.
5/8-1 1/16 OZS. WHEN INDICATOR POINTS TO 70 TO START EYELET MOVING.

(C) CHARACTER COUNTER SCALE BRACKET
REQUIREMENT INDICATOR SHOULD REST LIGHTLY ON BRACKET FOR ITS FULL TRAVEL FROM 0 TO 85.

TO ADJUST LOOSE LOCK SCREWS AND POSITION BRACKET, CORD SHOULD REMAIN IN STRAIGHT LINE.

FIGURE 2-8. CHARACTER COUNTER MECHANISM
RATCHET'S STOP
ANTI-BOUNCE LATCH
SCALE
ADJUSTING STUD
CORD (NO SLACK ALLOWED)
PULLEY
SCALE BRACKET
BAFFLE
STOP LEVER
ECCENTRIC NUT
RATCHET
DRIVER LEVER
LATCH LEVER

(A) CHARACTER COUNTER IDLER PULLEY
REQUIREMENT
THE INDICATOR CORD SHOULD HAVE ENOUGH TENSION TO KEEP IT FROM SAGGING.
TO ADJUST
LOosen ADJUSTING STUD MOUNTING SCREW AND POSITION PULLEY.
NOTE: HOLD PAWLs AWAY AND ROTATE DRUM TO MAKE CERTAIN THAT IT DOES NOT BIND AT ITS BEARING.

(C) ANTI-BOUNCE SPRING
REQUIREMENT
ANTI-BOUNCE LATCH RESTING AGAINST STOP LEVER,
MIN. 15 GRAMS.,
MAX. 25 GRAMS.,
TO START LATCH MOVING.

(B) STOP LEVER
(1) REQUIREMENT
MIN. 0.002 INCH,
MAX. 0.010 INCH.
(2) REQUIREMENT
THE ANTI-BOUNCE LATCH SHOULD NOT INTERFERE WITH THE ROTATION OF THE RATCHET.
TO ADJUST
HOLD THE FEED LEVER OUT OF ENGAGEMENT WITH THE RATCHET AND ROTATE THE STOP LEVER ECCENTRIC.

(D) CHARACTER COUNTER SCALE
REQUIREMENT
WHEN INDICATOR IS AT EXTREME LEFT OF SCALE, IT SHOULD POINT TO ZERO.
TO ADJUST
SET INDICATOR TO LEFT, LOosen LOCK SCREWS AND POSITION SCALE.

PLATE
INDICATOR
COUNTER SCALE
BRACKET
LOCK SCREWS

FIGURE 2-9. CHARACTER COUNTER MECHANISM
(A) CHARACTER COUNTER STROKE

REQUIREMENT

WHEN CHARACTER AND REPEAT KEYS ARE DEPRESSED, THE COUNTER SHOULD OPERATE CONSISTENTLY IN T OR K-T POSITION.
WHEN CARTRIDGE RETURN KEY IS DEPRESSED, THE COUNTER SHOULD RESET WITHOUT BINDING.
THE COUNTER MECHANISM SHOULD COUNT THE FIRST CHARACTER ON A RESTART AFTER RESET CONDITION.
MIN. 0.012 INCH
MAX. 0.018 INCH

BETWEEN DRIVE LEVER AND RATCHET TOOTH,
WHEN COUNTER IS SET NEAR MID-POINT OF ITS RANGE.

TO ADJUST

LOosen MOUNTING SCREWS,
WITH KEYBOARD IN T POSITION, START MOTOR AND STRIKE "CARRIAGE RETURN"
KEY, AND THEN E KEY.
TURN OFF MOTOR, DEPRESS E KEY.
POSITION CHARACTER COUNTER FRAME FOR CLEARANCE.
TURN CONTROL KNOB TO K-T POSITION AND RECHECK, REFINE IF NECESSARY.

(C) LATCH LEVER AND DRIVE LEVER SPRING

REQUIREMENT
MIN. 1/2 OZ.
MAX. 1 OZ.
TO MOVE EITHER LEVER.

(B) RESET LEVER EXTENSION SPRING

REQUIREMENT
MIN. 3/4 OZ.
MAX. 1 1/4 OZS.
TO START LEVER MOVING.

FIGURE 2-10. CHARACTER COUNTER MECHANISM
3. ELECTRICAL LINE BREAK MECHANISM

(A) BREAK LEVER SPRING TENSION
REQUIREMENT
THE BREAK SWITCH SHOULD BE ACTUATED WHEN THE
BREAK KEY IS FULLY DEPRESSED AND SHOULD RETURN
TO ITS NORMALLY CLOSED CONDITION WHEN THE
BREAK KEY IS RELEASED.
MIN. 6 OZS.
MAX. 8 OZS.
TO ACTUATE BREAK SWITCH.

FIGURE 2-11. ELECTRICAL LINE BREAK MECHANISM

4. LOCAL PAPER FEED-OUT MECHANISM

(A) SWITCH LEVER SPRING TENSION
REQUIREMENT
MIN. 11 OZS.
MAX. 14 OZS.
TO PULL SWITCH LEVER FREE OF
SWITCH ACTUATING PIN.

FIGURE 2-12. LOCAL PAPER FEED-OUT MECHANISM
5. MAKE-ONLY CODE READING CONTACT MECHANISM

WHEN USING THE CONTACT SPRING BENDER, START WITH THE CONTACT PILE UP FARTHEST FROM THE HANDLE OF THE TOOL AND WORK TOWARD THE HANDLE SO AS NOT TO DISTURB ADJUSTMENTS ALREADY MADE.

IT IS RECOMMENDED THAT THE FOLLOWING ADJUSTMENTS BE MADE WITH THE CODE READING CONTACT ASSEMBLY REMOVED FROM THE UNIT.

(A) MARKING CONTACT BACKSTOPS

REQUIREMENT
AS GAUGED BY EYE, FIVE MARKING CONTACT SPRINGS SHOULD ALIGN WITH EACH OTHER AND BE PARALLEL WITH MOUNTING PLATE.
TO ADJUST
BEND MARKING CONTACT BACKSTOPS.

(B) MARKING CONTACT SPRINGS---PRELIMINARY

REQUIREMENT
WITH SWINGER CONTACT SPRING HELD AWAY:
MIN. 2 OZS.
MAX. 6 OZS.
TO MOVE EACH SPRING AWAY FROM BACKSTOP.
TO ADJUST
BEND MARKING CONTACT SPRINGS.
NOTE:
TO INCREASE TENSION OF MARKING CONTACT SPRING, IT MAY BE NECESSARY TO BEND BACKSTOP AWAY FROM SPRING, BEND SPRING AND THEN RE-BEND BACKSTOP TO MEET REQUIREMENT OF MARKING CONTACT BACKSTOPS ADJUSTMENT (ABOVE).

FIGURE 2-13. MAKE-ONLY CODE READING CONTACTS.
(A) Swinger Contact Springs
PRELIMINARY REQUIREMENT
MIN. 30 GRAMS
MAX. 40 GRAMS
TO OPEN MARKING CONTACTS.
TO ADJUST
BEND SWINGER CONTACT SPRINGS.

THE FOLLOWING CODE READING CONTACT ADJUSTMENTS
SHOULD BE MADE WITH THE CONTACT ASSEMBLIES
MOUNTED ON THE UNIT.

(Punch Slide Insulator)

(B) Contact Mounting Bracket
REQUIREMENT
WITH FUNCTION CLUTCH FULLY DISENGAGED,
CLEARANCE BETWEEN PUNCH SLIDE INSULATOR
AND CLOSEST MARKING CONTACT POINT:
MIN. 0.070 INCH
MAX. 0.090 INCH
TO ADJUST
POSITION CONTACT MOUNTING BRACKET WITH
MOUNTING SCREWS LOOSENED.

(C) Contact Mounting Plate
REQUIREMENT
EACH SWINGER CONTACT SPRING SHOULD
BE ALIGNED WITH ITS ASSOCIATED
PUNCH SLIDE INSULATOR AS GAUGED
BY EYE.
TO ADJUST
POSITION CONTACT MOUNTING PLATE
WITH MOUNTING SCREWS LOOSENED.

FIGURE 2-14. MAKE-ONLY CODE READING CONTACTS.
CONTACT BRACKET (APPLIES TO MAKE-TYPE CONTACTS ONLY) -- PRELIMINARY

(1) TO CHECK
MANUALLY SELECT BLANK CODE COMBINATION.
ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS AND PUNCH SLIDES ARE AGAINST THEIR RESPECTIVE LATCHES.
REQUIREMENT
CONTACT GAP:
MIN. 0.015 INCH
MAX. 0.020 INCH

PUNCH SLIDE

PUNCH SLIDE LATCH

(2) TO CHECK
MANUALLY SELECT LETTERS CODE COMBINATION.
ROTATE MAIN SHAFT UNTIL ALL PUNCH SLIDES ARE AGAINST THEIR DOWNSSTOP.
REQUIREMENT
CLEARANCE BETWEEN PUNCH SLIDE INSULATOR AND SWINGER CONTACT SPRING:
MIN. 0.010 INCH.

PUNCH SLIDE INSULATOR

SWINGER CONTACT SPRING

TO ADJUST
POSITION CONTACT BRACKET WITH MOUNTING SCREWS FRICITION TIGHT. TO PRY BRACKET TO LEFT,
INSERT SCREW DRIVER BETWEEN BRACKET AND LEFT EDGE OF MOUNTING SCREW; TO PRY BRACKET TO RIGHT, INSERT SCREW DRIVER BETWEEN BRACKET AND RIGHT EDGE OF MOUNTING SCREW.

FIGURE 2-15. MAKE-ONLY CODE READING CONTACTS.
6. SINGLE AUXILIARY TIMING CONTACTS MECHANISM

NOTE
THE FOLLOWING ADJUSTMENT SHOULD BE MADE WITH THE SINGLE AUXILIARY TIMING CONTACTS OFF THE PERFORATOR.

(A) NORMALLY OPEN CONTACT REQUIREMENT
MIN. 0.020 INCH
MAX. 0.025 INCH
TO ADJUST
BEND SWINGER. RECHECK SWINGER SPRING TENSION.

(B) NORMALLY CLOSED CONTACT SPRING REQUIREMENT
OPERATING BAIL HELD AWAY
MIN. 4 1/2 OZS.
MAX. 5 1/2 OZS.
TO OPEN NORMALLY CLOSED CONTACTS
TO ADJUST
BEND THE SWINGER.
RECHECK NORMALLY OPEN CONTACT GAP.

(C) NORMALLY CLOSED CONTACT REQUIREMENT
SWINGER HELD AGAINST ITS BACKSTOP, CONTACT GAP.
MIN. 0.020 INCH
MAX. 0.025 INCH
TO ADJUST
BEND THE STATIONARY CONTACT.

(D) NORMALLY OPEN CONTACT SPRING REQUIREMENT
SWINGER HELD AGAINST ITS BACKSTOP BY ITS OPERATING BAIL.
MIN. 4 1/2 OZS.
MAX. 5 1/2 OZS.
TO ADJUST
BEND THE SHORT CONTACT SPRING STIFFENER.
RECHECK BOTH CONTACT GAPS. REFINISH IF NECESSARY.

FIGURE 2-16. SINGLE AUXILIARY TIMING CONTACTS MECHANISM
NOTE
REPLACE SINGLE AUXILIARY TIMING CONTACTS ON PERFORATOR BEFORE MAKING FOLLOWING ADJUSTMENTS:

OPERATING BAIL SPRING

SWINGER

OPERATING BAIL

MOUNTING SCREW

CONTACT MOUNTING BRACKET POSITION
NOTE
BEFORE MAKING THE FOLLOWING ADJUSTMENT, LOOSEN CAM FOLLOWER ARM LOCKING SCREW AND POSITION CAM FOLLOWER ARM IN ITS ELONGATED MOUNTING HOLES SO THAT IT IS AS LONG AS POSSIBLE. TIGHTEN LOCKING SCREW.

REQUIREMENT
SELECTOR AND FUNCTION CLUTCHES DISENGAGED AND LATCHED. CLEARANCE BETWEEN BAIL AND SWINGER INSULATOR OF PILE-UP HAVING LEAST CLEARANCE SHOULD BE 0.118 INCH MINUS CLEARANCE "X" BETWEEN BACKSTOP AND SWINGER INSULATOR.

TO ADJUST
POSITION SWITCH BRACKET WITH ITS MOUNTING SCREW LOOSENED.

NOTE
THE RANGE OF THIS ADJUSTMENT IS TO BE 0.005 INCH. FOR EXAMPLE: IF CLEARANCE "X" IS 0.080 INCH, THE NOMINAL ADJUSTMENT IS 0.038 INCH. THE RANGE OF ADJUSTMENT IS 0.035 INCH TO 0.040 INCH.

FIGURE 2-17. SINGLE AUXILIARY TIMING CONTACTS MECHANISM
SIGNAL DISTORTION TEST

THE FOLLOWING TESTS REQUIRE THE USE OF A TELETYPE SIGNAL DISTORTION TEST SET. THEY SHOULD BE MADE AFTER THE CONTACT ASSEMBLIES HAVE BEEN ADJUSTED AS INSTRUCTED ON THE PRECEDING PAGES. WHERE REQUIREMENTS ARE NOT MET, DESIGNATED ADJUSTMENTS MUST BE REFINED.

ALL TESTS SHOULD BE MADE WITH THE PERFORATOR UNIT OPERATING AT 900 OPERATIONS PER MINUTE AND THE TEST SET EQUIPPED WITH SINGLE CYCLE TEST SCALE AND OPERATING AT 600 OPERATIONS PER MINUTE.

OBSERVATIONS OF A NEON TRACE ON GRADUATED DISK OF TEST SET ARE TO BE MADE. TRACE WILL HAVE TENDENCY TO "JUMP," THAT IS, IT WILL NOT BE STEADY ENOUGH TO BE ACCURATELY MEASURED. DEVIATIONS MAY BE AS HIGH AS 10 DIVISIONS OF SCALE. MINIMUM SIGNAL LENGTH IS MEASURED BETWEEN LATEST START AND EARLIEST END OF TRACE: MAXIMUM SIGNAL LENGTH IS MEASURED BETWEEN EARLIEST START AND LATEST END OF TRACE.

TO ZERO SET:

CONNECT NEON TRACE LAMP TO NO. 1 CODE READING CONTACT (REARMOST), WITH UNIT RECEIVING LETTERS CODE COMBINATIONS, OBSERVE AND NOTE POINT AT WHICH TRACE STARTS. TRACE WILL JUMP AS DESCRIBED ABOVE; NOTE ONLY LATEST START. REPEAT FOR OTHER CONTACTS.

OF FIVE TRACES OBSERVED, CHOOSE ONE THAT STARTS LATEST. SET "START ZERO" MARK OF SCALE AT LATEST START OF CHOSEN TRACE.

FIGURE 2-18. SIGNAL DISTORTION TEST
CODE READING CONTACTS
(1) ZERO TEST SET AS INSTRUCTED ON FIGURE 2-18.
(2) TO CHECK
   CONNECT NEON TRACE LAMP TO MARKING SIDE OF A CODE READING CONTACT
   (NORMALLY OPEN WHEN UNIT IS IN IDLE CONDITION). OBSERVE TRACE WHEN
   UNIT IS RECEIVING LETTERS CODE COMBINATION.
   REQUIREMENT
   A SIGNAL LENGTH:
      MIN. 235 DIVISION-----MAX. 350 DIVISIONS
   B MAX. BOUNCE WITHIN 20 DIVISIONS OF EARLIEST START AND LATEST END OF
   TRACE.
(3) REPEAT ABOVE PROCEDURE FOR EACH CONTACT
   TO ADJUST
   IF REQUIREMENT (2) A. (SIGNAL LENGTH) IS NOT MET, REFINE CONTACT BRACKET
   ADJUSTMENT FIGURE 2-15. IF REQUIREMENT (2) B. IS NOT MET, REFINE THE SHORT
   CONTACT SPRING TENSION. FIGURE 2-13. AND THE SWINGER SPRING TENSION.
   IF ANY REFINEMENTS ARE NECESSARY, REPEAT THE COMPLETE TEST PROCEDURE.

FIGURE 2-19. SIGNAL DISTORTION TEST
TIMING CONTACTS
(1) ZERO THE TEST SET AS INSTRUCTED ON FIGURE 2-18.
A TO CHECK
   CONNECT NEON TRACE LAMPS TO THE NORMALLY OPEN CONTACT (UNIT IN IDLE CONDITION).
REQUIREMENT
1 LATEST TRACE SHOULD END MIN. 22 DIV. BEFORE Earliest END OF CODE READING CONTACT TRACES
2 TRACE LENGTH MIN. 163 DIVISIONS - MAX. 200 DIVISIONS. BOUNCE SHOULD END WITHIN
   5 DIVISIONS OF START OR END OF ANY TRACE.
3 Earliest TRACE SHOULD START MIN. 22 DIVISIONS AFTER START ZERO
TO ADJUST
   IF THESE REQUIREMENTS ARE NOT MET REFINISH ADJUSTMENTS (A), (B), (C) AND (D) FIGURE 2-16.
   IF THERE IS EXCESSIVE BOUNCE, REFINISH ADJUSTMENT (B) FIGURE 2-16.

FIGURE 2-20 SIGNAL DISTORTION TEST
SLOW RELEASE RELAY
REQUIREMENT
THE RELAY SHOULD NOT DE-ENERGIZE WHILE
RECEIVING A SERIES OF BLANK CODE COMBINATIONS.
THE TIME REQUIRED TO STOP AN ASSOCIATED
TRANSMITTER AFTER RECEIPT OF LINE BREAK
SIGNAL SHALL NOT EXCEED
MAX. 800 MILISECONDS.

TO ADJUST
INSERT A 5 FOOT STRIP OF BLANK TAPE INTO THE TRANSMITTER.
TURN THE KEYPAD CONTROL KNOB TO THE K-T POSITION. TURN THE
LINE-TEST KEY TO THE TEST POSITION. DEPRESS THE SEND KEY.
LOosen THE RESIDUAL SCREW LOCK NUT ON THE ARMATURE OF THE SLOW
RELEASE RELAY AND TURN THE SCREW COUNTER CLOCWISr UNTIL NO GAP
EXISTS BETWEEN THE ARMATURE AND POLE PIECE. PRESS THE SLOW
RELEASE RELAY TEST BUTTON AND TURN ON THE TRANSMITTER. WITH
THE TAPE RUNNING THROUGH THE TRANSMITTER TURN THE RESIDUAL SCREWS
CLOCKWISE UNTIL THE SLOW RELEASE RELAY ARMATURE BEGINS TO VIB-
RATE. THEN TURN THE RESIDUAL SCREW COUNTER CLOCWISr SLOWLY
UNTIL THE ARMATURE STOPS VIBRATING. TIGHTEN THE LOCK NUT.
RERUN THE ENTIRE 5 FOOT STRIP OF TAPE THROUGH THE TRANSMITTER,
WHILE THE SLOW RELEASE RELAY TEST KEY IS HELD DEPRESSEd; THE
SLOW RELEASE RELAY ARMATURE MUST NOT DROP OUT.

INSERT A 5 FOOT STRIP OF LETTERS TAPE INTO THE TRANSMITTER.
PLAINLY MARK A ROW OF PERFORATIONS APPROXIMATELY THREE INCHES
BACK FROM THE SENSING PINS ON THE TRANSMITTER. HOLD THE SLOW
RELEASE RELAY TEST BUTTON DEPRESSEd, AND START THE TRANSMITTER.
WHEN THE PREVIOUSLY MARKED ROW OF PERFORATIONS REACH THE SENSING
PINS, DEPRESS THE LINE-BREAK KEY AND HOLD DEPRESSEd UNTIl
THE TRANSMITTER STOPS. MARK THE ROLL OF PERFORATIONS IMMEDIATELY
OVER THE SENSING PINS. REMOVE THE TAPE FROM THE TRANSMITTER
AND COUNT THE NUMBER OF PERFORATIONS BETWEEN THE TWO MARKED
LINES. THE NUMBER OF PERFORATIONS BETWEEN THESE LINES SHOULD
BE NO GREATER THAN,

1. EIGHT FOR 100 WPM OPERATION.
2. SIX FOR 75 WPM OPERATION.
3. FIVE FOR 60 WPM OPERATION.

SHOULd THE NUMBER OF PERFORATIONS BE GREATER THAN THAT SPECIFIED
ABOVE, TURN THE RESIDUAL SCREW CLOCKWISE APPROXIMATELY 1/8 TURN
AND REPEAT THE ABOVE TEST.

FIGURE 2-21. SLOW RELEASE RELAY
SECTION 3 - LUBRICATION

1. GENERAL

1.01 The perforator transmitter should be lubricated as directed in this section. The figures indicate points to be lubricated and the kind and quantity of lubricant to be used. Lubricate the perforator just prior to placing it in service. After a few weeks in service, relubricate to make certain that all points receive lubrication. The following lubrication schedule should be followed thereafter.

<table>
<thead>
<tr>
<th>OPERATING SPEED (WPM)*</th>
<th>LUBRICATING INTERVAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>3000 hrs. or 1 yr.</td>
</tr>
<tr>
<td>75</td>
<td>2400 hrs. or 9 mo.</td>
</tr>
<tr>
<td>100</td>
<td>1500 hrs. or 6 mo.</td>
</tr>
<tr>
<td>150</td>
<td>1000 hrs. or 6 mo.</td>
</tr>
</tbody>
</table>

*Words per minute

1.02 Use Teletype KS-7470 oil at all locations where the use of oil is indicated. Use KS-7471 grease on all surfaces where grease is indicated, except the motor bearings. Apply two drops of KS-7470 oil to motor bearings every four months (depress oiler with metal object). If the motor is disassembled at any time, repack the bearings with KS-7471 grease.

1.03 All spring wicks and felt oilers should be saturated. The friction surfaces of all moving parts should be thoroughly lubricated. Overlubrication, however, which will permit oil or grease to drip or be thrown on other parts, should be avoided. Special care must be taken to prevent any oil or grease from getting between the power backspace armature and its magnet pole face or between electrical contacts.

1.04 Apply a thick film of grease to all gears.

1.05 Apply oil to all cams, including the camming surfaces of each clutch disk.

1.06 The photographs show the paragraph numbers referring to particular line drawings of mechanisms and where these mechanisms are located on the unit. Parts in the line drawings are shown in an upright position unless otherwise specified.

1.07 The illustration symbols indicate the following lubrication directions:

- 0 Apply 1 drop of oil.
- 02 Apply 2 drops of oil.
- 03 Apply 3 drops of oil.
- 020 Apply 20 drops of oil, etc.
- G Apply thin film of grease.
- SAT Saturate (Felt oilers, washer, wicks) with oil.
2. CABINET

- O3 SLIDING SURFACE - SPRING
- O BEARING SURFACE (2 PLACES)
- G LATCHING SURFACE (2 PLACES)
- G LATCHING SURFACE (ALL LATCHES)
- O BEARING SURFACES AND SPRING
- O BEARING SURFACE (2 PLACES)

- TORSION SPRING
- UPSTOP
- DOME LATCH
- DOME LATCH
- ALL DOORS
- RIGHT TOP DOOR
- UPSTOP ARM
- DOME UPSTOP ARM
3. PERFORATOR TRANSMITTER
3.01 REST PERFORATOR TRANSMITTER BOTTOM SIDE UP

3.02 SPACE BAR MECHANISM

3.03 KEYLEVER MECHANISM

ORIGINAL
3.04 BREAK LEVER MECHANISM

- ENGAGING SURFACE
- BEARING SURFACE
- CONTACT SURFACE
- BREAK KEY LEVER
- FUNCTION LEVER
- BREAK LEVER

3.05 CODE LEVER MECHANISM

- CONTACTING SURFACE (32 LEVERS)
- GUIDE SLOTS (32 LEVERS)
- FELT WASHERS (6 WASHERS)
- BEARING SURFACES (32 WEDGES)
- HOOKS-EACH END (40 SPRINGS)
- CODE LEVER UNIVERSAL BAIL
- CODE LEVERS
- CODE LEVER SHAFT
- LOCK BALL TRACK
- SPRING

3.06 KEYBOARD LOCK MECHANISM

- GUIDE SLOT
- HOOKS-EACH END
- BEARING SURFACE
- ENGAGING SURFACE
- BEARING SURFACE
- KEYBOARD LOCK PLUNGER
- SPRING
- KEYBOARD LOCK LEVER
- KEYBOARD LOCK FUNCTION LEVER
- FUNCTION BAIL
3.07 EXTENSION BASKET MECHANISM
REST PERFORATOR TRANSMITTER BOTTOM SIDE UP

(BOTTOM VIEW)

3.08 DETENT LEVER MECHANISM

- BEARING SURFACES (FRONT AND REAR)
- CONTROL CAM
- BEARING SURFACE
- DETENT LEVER
- HOOKS-EACH END
- SPRING
- BEARING SURFACE
- ROLLER

3.09 SELECTION LEVER MECHANISM

- HOOKS-EACH END (2 SPRINGS)
- SPRINGS
- SLIDING SURFACE
- RESET LEVER
- BEARING SURFACE
- KEYBOARD CONTROL SELECTION LEVER
- BEARING SURFACE
- RESET CAM FOLLOWER AND RESET LEVER
- BEARING SURFACE
- RESET CAM FOLLOWER
- CAMMING SURFACE
3.10 CODE BAR EXTENSION BAIL MECHANISM

- Camming Surface
- Slide Roller
- Hooks—Each End
- Spring
- Sliding Surface (2 Places)
- Lever and Extension
- Engaging Surfaces (Two Places)
- Lever
- Sliding Surface
- Lever
- Sliding Surface
- Control Cam

3.11 CODE BAR EXTENSION MECHANISM

- Guide Surfaces (5 Extensions—Two Places)
- Code Bar Extensions
- Hooks—Each End (5 Springs)
- Springs
- Contact Surface (5 Extensions)
- Code Bar Extension

3.12 CLUTCH TRIP BAR LINK MECHANISM

- Contact Surface
- Clutch Trip Bar Link Extension
- Compression Spring—Each End
- Link Guide Pin
- Contact Surface
- Trip Bar Link Latch
- Engaging Surface
- Clutch Trip Bar Link
- Bearing Surface
- Trip Bar Link Latch
- Contact Surface
- Bellcrank
- Bearing Surface and Sliding Surface
- Bellcrank and Clutch Trip Bar Link
- Contact Surface (Both Sides)
- Bellcrank
- Sliding Surface
- Clutch Trip Bar Link
3.13 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

3.14 CODE BAR MECHANISM

- HOOKS—EACH END (8 SPRINGS)
- SPRING
- GUIDE SLOTS (LEFT AND RIGHT—TOP AND BOTTOM)
- CODE BAR GUIDES

3.15 CODE LEVER UNIVERSAL BAIL MECHANISM

- HOOKS—EACH END
- SPRING
- BEARING SURFACE
- CODE LEVER UNIVERSAL BAIL

ORIGIINAL
3.16 LOCAL CARRIAGE RETURN MECHANISM

![Diagram of Local Carriage Return Mechanism]

- Hook(s)-Each End
- Bearing Surface (2 Places)
- Engaging Surface
- Spring
- Local Carriage Return Function Bail
- Local Carriage Return Function Lever

3.17 SIGNAL GENERATOR MECHANISM
REST PERFORATOR TRANSmitter IN UPRIGHT POSITION

![Diagram of Signal Generator Mechanism]

3.18 NON-REPEAT LEVER MECHANISM

![Diagram of Non-Repeat Lever Mechanism]

- SAT
- Felt Washer
- Hook(s)-Each End
- Bearing Surface
- Bearing Surface
- Engaging Surface
- Guide Slot
- Non-Repeat Lever Crank Spring
- Non-Repeat Lever Crank
- Non-Repeat Lever
- Non-Repeat Lever
- Non-Repeat Lever
3.19 CLUTCH TRIP BAR MECHANISM

3.20 TRANSFER LEVER MECHANISM

3.21 CONTACT BOX

DISASSEMBLY: REMOVE NUT AND LOCK WASHER SECURING CONTACT BOX COVER AND REMOVE COVER.
3.22 TRANSFER BAIL MECHANISM

SAT  FELT WASHERS (2 WASHERS)  LATCHES
G   ENGAGING SURFACES  TRANSFER BAIL
0   HOOKS-EACH END (2 SPRINGS)  SPRING
02  BEARING SURFACE (EACH END)  TRANSFER BAIL
SAT  OIL WICK  TRANSFER BAIL

3.23 KEYBOARD CLUTCH MECHANISM

02  LATCHING SURFACE  CLUTCH STOP LEVER AND CLUTCH LATCH LEVER
0   HOOKS-EACH END (2 SPRINGS)  SPRING
SAT  FELT WASHERS (2 FRONT & REAR)  CLUTCH TRIP BAIL

3.24 LOCK BAR LATCH MECHANISM

0   BEARING SURFACE  LOCK BAR LATCH

3.25 MARGIN INDICATING MECHANISM

0   ENGAGING SURFACE  MARGIN INDICATOR SWITCH
0   BEARING SURFACE  SWITCH LEVER
0   HOOKS-EACH END  SPRING
3.29 SIGNAL GENERATOR MECHANISM (continued) REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

3.30 LOCKING BAIL MECHANISM

- 0 HOOKS-EACH END SPRING
- SAT FELT WASHERS (2 WASHERS - FRONT AND REAR) LOCKING BAIL POST
- SAT FELT WICK CAMMING SUR-FACES
- 0 GUIDE SLOTS (3 SLOTS) LOCKING BAIL

3.31 CODE BAR BAIL MECHANISM

- SAT FELT WASHERS (TWO WASHERS) CODE BAR BAIL
- 0 BEARING SURFACE (2 PLACES) CODE BAR BAIL
- 0 HOOKS-EACH END (2 SPRINGS) SPRING
- SAT FELT WASHER CODE BAR BAIL LATCH
- 04 BEARING CODE BAR BAIL
- 02 BEARING SURFACE CODE BAR BAIL LATCH
- 02 ENGAGING SURFACE ECCENTRIC FOLLOWER
3.32 UNIVERSAL BAIL LATCH LEVER MECHANISM

- 0 HOOKS (EACH END)
- 02 GUIDE SLOT (EACH SIDE OF SLOT)
- ENGAGING SURFACE
- SAT FELT WASHER

3.33 PERFORATOR MECHANISM

RESET PERFORATOR MECHANISM IN UPRIGHT POSITION

3.34 RESET CAM FOLLOWER MECHANISM

- SAT FELT WASHER
- 0 BEARING SURFACE
- 0 FELT WASHERS (FRONT & REAR)
- 05 OIL HOLE
- 0 HOOKS-EACH END
- ENGAGING SURFACE
3.35 PERFORATOR CLUTCH DRIVING SHAFT MECHANISM (NON-TYPING ONLY)

02 BALL BEARING
PERFORATOR CLUTCH DRIVING SHAFT

3.36 PERFORATOR CLUTCH AND RESET CAM MECHANISM (NON-TYPING ONLY)

04 INTERNAL MECHANISM
PERFORATOR CLUTCH MECHANISM
03 CAMMING SURFACE (3 CAMS)
RESET CAM SLEEVE
SAT FELT WICK
RESET CAM SLEEVE

3.37 PERFORATOR CLUTCH MECHANISM (NON-TYPING ONLY)

SAT FELT WASHER
CLUTCH LATCH LEVER
0 HOOKS-EACH END
SPRING

3.38 PERFORATOR CLUTCH GEAR MECHANISM (NON-TYPING ONLY)

G GEAR TEETH
PERFORATOR CLUTCH DRIVE AND DRIVEN GEARS
0 LATCHING SURFACE
CLUTCH TRIP LEVER
0 LATCHING SURFACE
CLUTCH LATCH LEVER

3-14
CHANGE 1
3.39 ROCKER BAIL MECHANISM (NON-TYPING ONLY)

SAT FEEL WASHER ROCKEBAIL
SAT FEEL WICK (USE OIL HOLE) ROCKEBAIL

3.40 PERFORATOR MECHANISM (continued) REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

(FRONT VIEW)

3.41 REAR BEARING BRACKET GEAR MECHANISM

GEAR TEETH REAR BEARING BRACKET GEAR

CHANGE 1
3.42 PERFORATOR TRIP LEVER MECHANISM (NON-TYPING ONLY)

- CONTACT SURFACE
- FELT WICK
- FELT WASHER
- BEARING SURFACE
- HOOKS-EACH END
- ENGAGING SURFACE

PERFORATOR TRIP LEVER
PERFORATOR TRIP LEVER
CLUTCH RELEASE
PERFORATOR TRIP LEVER
SPRING
PERFORATOR TRIP LEVER LATCH

3.43 PUNCH SLIDE LATCH MECHANISM

- ENGAGING SURFACE (5 LATCHES)
- ENGAGING SURFACE (5 LATCHES)
- BEARING SURFACE (5 LATCHES)
- HOOKS-EACH END (5 SPRINGS)
- ENGAGING SURFACE (5 LATCHES)

PUNCH SLIDE LATCH
PUNCH SLIDE LATCH
PUNCH SLIDE LATCH
SPRINGS
PUNCH SLIDE LATCH

3.44 PUNCH MECHANISM REST-REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

(LEFT SIDE VIEW)
3.45 TAPE SHOE ARM MECHANISM

3.46 RETRACTOR BAIL MECHANISM

3.47 PUNCH PIN MECHANISM

3.48 PUNCH SLIDE MECHANISM

ORIGINAL 3-17
3.49 FEED WHEEL MECHANISM

- 0 BEARING SURFACE
- 0 RATCHET TEETH (2 PLACES)
- SAT FELT WASHER
- SAT FELT WASHER
- SAT FELT WICKS (2)
- SAT FELT WASHER
- 0 HOOKS-EACH END (2 SPRINGS)
- FEED WHEEL KNOB
- FEED WHEEL
- FEED WHEEL
- DIE WHEEL
- SPRING WICKS
- SPRING
- FEED PAWL

3.50 RESET BAIL MECHANISM

- SAT FELT WASHER (2 WASHERS - FRONT & REAR)
- SAT FELT WASHERS (2 WASHERS - FRONT & REAR)
- 0 ENGAGING SURFACE
- SAT FELT WASHERS (2 WASHERS - FRONT & REAR)
- SAT FELT WASHERS (2 WASHERS - FRONT & REAR)
- TOGGLE LINKS
- RESET BAIL
- RESET BAIL
- TOGGLE BAIL
- TOGGLE BAIL

3.51 ROCKER ARM MECHANISM

- SAT FELT WASHER
- 0 ENGAGING SURFACE
- 0 HOOKS-EACH END
- SAT FELT WICK
- 0 BEARING SURFACE
- DRIVE LINK
- ROCK ARM
- SPRING
- SPRING WICK
- ROCK ARM
3.52 TYPING PERFORATOR - PLACE PERFORATOR IN UPRIGHT POSITION.

3.53 RIBBON FEED MECHANISM (TYPING PERFORATOR ONLY)

- O2 PIVOT POINTS (2)
- HOOKS - EACH END (2)
- PIVOT POINT
- PIVOT POINTS (2)
- CONTACT SURFACE
- DRIVE ARM
- RIBBON ROLLER SPRINGS FEED PAWL REVERSING ARM
- RIBBON ROLLER REVERSING ARM RETAINING PAWL

CHANGE 1
3.56 TRANSFER MECHANISM (Typing Perforator Only)

- PIVOT POINTS (5)
- CONTACT SURFACES (5)
- CONTACT POINTS (5) (Each End)
- HOOKS - Each End
- PULSE BEAMS
- TRANSFER LEVERS
- PULSE BEAMS
- SPRING
- TRANSFER LEVERS
- GUIDE BRACKET

3.57 PUSH BARS (Typing Perforator Only)

- RACK TEETH (7)
- CONTACT SURFACES (7)
- CONTACT SURFACES (6)
- PUSH BARS
- PUSH BARS
- PUSH BARS
3.58 TYPING PERFORATOR - PLACE PERFORATOR IN UPRIGHT POSITION.

3.59 FUNCTION CAM — CLUTCH TRIP MECHANISM

- CONTACT POINTS (2)
- MAIN TRIP LEVER
- CLUTCH RELEASE SPRING
- CLUTCH STOP LUG
- HOOKS - EACH END
- CONTACT SURFACE
- RESET LEVER
- CLUTCH TRIP SHAFT
- FELT WASHERS
- LATCH LEVER SPRING
- CONTACT SURFACE
- CLUTCH STOP LUG
- HOOKS - EACH END
- CONTACT SURFACE
- PIVOT POINT
- MAIN TRIP LEVER
- MAIN TRIP LEVER SPRING
- MAIN TRIP LEVER
3.60 FUNCTION BOX (Typing perforator only)

- SLIDING SURFACES (Each side)
- FUNCTION BLADES
- HOOKS - EACH END (2)
- EXTENSION ARMSPRINGS
- PIVOT POINTS
- FIGURES ARM ASSEMBLY
- HOOKS - EACH END (2)
- LETTERS AND FIGURES ARM ASSEMBLY SPRINGS
- FUNCTION BLADES
- CONTACT POINTS (2)
- FUNCTION BLADE SPRINGS (2)
- HOOKS - EACH END
- LIFTER ROLLER
- PIVOT POINT
- LIFTER ROLLER
- ROLLER SURFACE
- LIFTER TOGGLE LINK SPRING
- HOOKS - EACH END
- LIFTER SPRING
- PIVOT POINT
- FUNCTION BLADE LIFTER
- PIVOT POINT
- BELL CRANKS
- PIVOT POINTS
- LETTERS ARM ASSEMBLY EXTENSION

3.61 AXIAL POSITIONING MECHANISM (Typing perforator only)

- SLIDING GUIDE SURFACES
- CORRECTING DRIVE LINK SPRING
- HOOKS - EACH END
- AXIAL OUTPUT RACK
- PIVOT POINT
- ROTARY CORRECTING CLAMP
- CONTACT POINTS
- ROTARY CORRECTING LEVER SHAFT
- PIVOT POINT
- AXIAL CORRECTING PLATE
- PIVOT POINT
- AXIAL SECTOR TYPEWHEEL SHAFT
- TEETH
- AXIAL CORRECTING PLATE ROLLER
- CONTACT SURFACE
- OSCILLATING DRIVE BAIL
- PIVOT POINTS (FELT WASHERS)
- AXIAL SECTOR
- PIVOT POINT
- GUIDE ROLLER
- PIVOT POINT (FELT WASHER)
- AXIAL SECTOR AXIAL OUTPUT RACK
- TEETH

CHANGE 1
3.62 AXIAL POSITIONING MECHANISM (TYPING PERFORATOR ONLY)

- PIVOT POINT
- CONTACT SURFACES
- PIVOT POINTS
- PIVOT POINT (FELT WASHER)
- CONTACT SURFACES

SAT PIVOT POINTS (2) (FELT WASHERS)

(LEFT SIDE VIEW)

DETENT ASSEMBLIES (TWO ON AXIAL POSITIONING MECHANISM)

SAT PIVOT POINTS (FELT WASHERS)

3.63 SHAFT MECHANISMS (TYPING PERFORATOR ONLY)

G

TEETH

CAMMING SURFACES (2) FUNCTION CAM

BEARING SURFACES BALL BEARINGS (2)

CAMMING SURFACE CLUTCH CAM DISK

BEARING SURFACE FUNCTION CLUTCH DRUM

BEARING SURFACES BALL BEARINGS (2)

O2

G

TEETH

GEAR

CHANGE 1
3.64 PRINTING MECHANISM (TYING PERFORATOR ONLY)

- G CONTACT SURFACE
- O2 SLIDING SURFACE
- O2 PIVOT POINT
- O2 PIVOT POINTS
- O HOOKS - EACH END
- O HOOKS - EACH END
- O HOOKS - EACH END
- O PIVOT POINT
- O HOOKS - EACH END
- O PIVOT POINTS (2)
- PRINTING LATCH
- PRINTING TRIP LINK
- PRINTING LATCH
- PRINT HAMMER
- PRINT HAMMER SPRING
- HAMMER ACCELERATOR SPRING
- PRINTING LATCH SPRING
- PRINTING DRIVE LINK
- PRINTING TRIP LINK SPRING
- PRINTING PIVOT ARM

3.65 ROCKER BAIL MECHANISM (TYING PERFORATOR ONLY)

- G CONTACT SURFACE
- O PIVOT POINTS
- SAT SLIDING SURFACE (FELT WASHER UNDER BLADE)
- SAT PIVOT POINT (FELT STRIP)
- O ROLLER SURFACE
- O ROLLER SURFACE
- O ROLLER SURFACE
- O CONTACT SURFACE
- FUNCTION CAM

- RIBBON FEED ECCENTRIC STUD
- PUSH BAR OPERATING BLADE
- PUSH BAR OPERATING BLADE
- CORRECTING DRIVE LINK
- OSCILLATING DRIVE LINK
- CAM FOLLOWER ROLLER (UPPER AND LOWER)
- CAM FOLLOWER ROLLERS
- PRINTING DRIVE LINK
- ROCKEBAIL
- CAM FOLLOWER ROLLER

(LEFT SIDE VIEW)

(REAR VIEW)
4. VARIABLE FEATURES

4.01 TAPE-OUT SWITCH MECHANISM (SEE PARAGRAPH 3.44 FOR LOCATION)

4.02 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

(FRONT VIEW)

4.03 MANUAL BACKSPACE MECHANISM

02 BEARING SURFACE (REAR) RAKE SHAFT
G GEAR TEETH GEAR SEGMENT
0 HOOKS-EACH END PAWL SPRING
02 BEARING SURFACE FEED PAWL
G CONTACT SURFACE FEED PAWL
0 HOOKS-EACH END (3 SPRINGS) SPRING
0 BEARING SURFACE BELL CRANK
4.04 POWER DRIVE BACKSPACE MECHANISM

02 BEARING SURFACE LINK
02 ROTATING SURFACE ECCENTRIC
02 SLIDING SURFACE ECCENTRIC DRIVE ARM FORK
02 BEARING SURFACE ARM
02 BEARING SURFACE ARMATURE BAIL
0 HOOKS-EACH END SPRINGS (2 SPRINGS)

4.05 REST PERFORATOR TRANSMITTER IN UPRIGHT POSITION

(REAR VIEW)

4.06 CHARACTER COUNTER MECHANISM

G ENGAGING SURFACE COUNTER SCALE BRACKET
0 BEARING SURFACE INDICATOR CORD PULLEY
0 HOOKS-EACH END SPRING
0 BEARING SURFACE RATCHET LATCH LEVER
0 BEARING SURFACE RATCHET DRIVE LEVER

CHANGE 1
4.07 CHARACTER COUNTER MECHANISM (continued)

- CONTACT SURFACE
- BEARING SURFACE
- BEARING SURFACE
- TEETH
- ENGAGING SURFACES (2 PLACES)
- HOOKS-EACH END (3 SPRINGS)
- BEARING SURFACE
- BEARING SURFACE
- ENGAGING SURFACES (3 SURFACES)
- ANTI-BOUNCE LATCH
- ANTI-BOUNCE LATCH
- RATCHET DRUM
- RATCHET
- RESET LEVER EXTENSION
- SPRING
- RESET BAIL
- DRIVE LEVER FEED BAIL
- DRIVE LEVER FEED BAIL & RESET BAIL

4.08 ELECTRICAL LINE BREAK MECHANISM

- HOOKS-EACH END
- CONTACT SURFACE
- BEARING SURFACE
- SPRING
- SENSITIVE SWITCH
- BREAK LEVER

4.09 LOCAL PAPER FEED-OUT MECHANISM

- ENGAGING SURFACE
- HOOKS-EACH END
- BEARING SURFACE
- ENGAGING SURFACE
- LOCAL LINE FEED TRIP LINK
- SPRING
- LEVER
- MAGNETIC BLOWOUT SWITCH
4.10 SINGLE AUXILIARY TIMING CONTACTS MECHANISM

G CONTACT SURFACE
C HOOKS-EACH END
SAT FELT WASHERS

CONTACT BAIL
SPRING
ARM AND CONTACT BAIL

CHANGE 1