BULLETIN 217B

ADJUSTMENTS AND LUBRICATION

MODEL 28

PAGE PRINTER SET

LP, LK, LB, LAC

TELETYPE®

CORPORATION

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**MARCH, 1959**

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SECTION 4 - EARLIER DESIGN MECHANISM ADJUSTMENTS

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   - Clutch stop lever                                                4-8
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   - Code bar bail bumper                                              4-17
   - Code bar bounce suppressor bracket support screw                 4-18
   - Code bar guides                                                  4-15
   - Code bar latch                                                   4-18
   - Code lever bail                                                  4-19
   - Code lever bail latch lever eccentric                             4-15
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   - Code lever guide                                                  4-18
   - Detent toggle stop bracket                                        4-4
   - Flutter lever                                                     4-6
   - Generator contact                                                4-10
   - Intermediate gear bracket                                        4-20
   - Intermediate lever stop plate                                     4-5
   - Keyleve lock-ball channel and lock-ball end play                 4-14
   - Non-repeat lever                                                 4-13
   - Rocker bail detent                                                4-2
   - Rocker bail pivot screw                                           4-1
   - Rocker extension                                                  4-3
   - Space bar pivot                                                  4-19
   - Selector lever guide                                              4-1

   b. Spring Tensions:

   - Clutch latch lever                                               4-9
   - Clutch stop lever                                                4-8
   - Clutch trip bar                                                  4-17
   - Code bar                                                         4-17
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## 2. TYPING UNIT.                                                    4-23

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### b. Spring Tensions:

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3. VARIABLE FEATURES

Horizontal tabulator

a. Adjustments:

Cam plate stripper bail
Columnar tabulator stops
Operating lever adjusting plate
Operating lever slide arm
Pawl mounting arm operating range (final)
Pawl mounting arm operating range (preliminary)
Right margin
Spacing cut-out transfer bail set collar
Tabulator shaft mounting brackets
Tabulator stop setting
Trip arm latch bail
Trip arm latch bail adjusting plate

b. Spring Tensions:

Horizontal tabulator slide arm
Operating lever cam plate
Operating lever tension link
Space suppression by-pass
Tabulator pawl
Tabulator shaft
Trip arm latch bail

Miscellaneous features

a. Adjustments:

Back space transfer bail adjusting lever - vertical adjustment
Back space transfer bail adjusting lever - horizontal adjustment
Repeat-on-space lever
Time delay disabling device

b. Spring Tensions:

Back space transfer bail
Back space trip link horizontal
Back space trip link vertical
Break key lever
Break lever
Eccentric follower pawl
Repeat-on-space lever
SECTION 1 - STANDARD UNIT ADJUSTMENTS

1. GENERAL

a. The adjustments of each unit are arranged in a sequence that would be followed if a complete re-adjustment of the unit were undertaken. Tools and spring scales required to perform the adjustments are listed in Teletype bulletin 1124B but are not supplied as part of the equipment. After an adjustment has been completed, be sure to tighten any nuts or screws that may have been loosened. The adjusting illustrations, in addition to indicating the adjusting tolerances, positions of moving parts, and spring tension, also show the angle at which the scale should be applied when measuring spring tensions. If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

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

NOTE

When rotating the main shaft of the Typing Unit by hand, the clutches do not fully DISENGAGE upon reaching their stop positions. In order to relieve the drag on the clutches and permit the main shaft to ROTATE freely, apply pressure on the lug of each clutch disk (Figure 1-35) with a screwdriver to cause it to ENGAGE its latch lever and thus fully DISENGAGE the internal expansion clutch. This procedure should always be followed prior to placing the Typing Unit on the base and switching on the power.

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 operator's position in front of the unit.

d. When the 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 1-35) 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.

e. The Typing Unit may be safely placed in any one of three positions for servicing: (1) in upright position on its four feet, (2) tilted backward so that it rests on its rear feet and rear points of side frames, (3) bottom upwards so that it rests on two upper points of each side frame.

f. When cleaning plastic parts, use soap or detergent and water. Do not use solvents containing alcohol or chlorinated compounds.

g. Reference made to KEYBOARD means Keyboard base or sending and receiving base. Reference to BASE means receiving only base.

h. Where instructions call for the removal of parts or subassemblies, refer to Disassembly and Reassembly Paragraph 10. Page 1-89.

i. MANUAL SELECTION OF CHARACTERS OR FUNCTIONS

(1) To manually operate the Typing Unit while removed from Keyboard or Base hold the selector magnet armature (Figure 1-17) operated by means of an armature clip and rotate the main shaft in a counterclockwise direction (by means of the handwheel listed in bulletin 1124B) to bring all clutches to their disengaged position.

NOTE

The armature clip is attached to the armature by carefully inserting the flat-formed end of the clip over the top of the armature between the pole pieces and hooking the extruded projection under the edge of the armature. The top end of the clip should then be hooked over the top of the selector coil terminal bakelite guard. The spring tension of the clip will hold the armature in the marking (attracted) position.

(2) Fully disengage all clutches as described in the preceding note. Release armature momentarily to permit the selector clutch to engage. Turn the main shaft slowly until the No. 5 selector lever has just moved to the peak of its cam. Strip from the selector levers the push levers which are spacing in the code combination of the character or function that is being selected. It should be noted that selector levers (Figure 1-24) move in succession starting with the inner (Number One). Continue to rotate main shaft until all operations initiated by selector action clear through unit.
j. VARIABLE FEATURES

In addition to standard unit adjustments, which are covered in section 1 of this bulletin, adjustments for a number of Variable Features appear in Section 2. Where adjustments of these Variable Features affect the adjusting sequence, cross reference information has been included in Section 1. Variable Feature adjustments which do not affect the adjusting sequence may be done at any time during the adjusting procedure.

k. EARLIER DESIGNED MECHANISMS

Section 1 contains illustrations and adjusting procedure for mechanism currently being manufactured. Illustrations and adjusting procedure for mechanisms of earlier design are located in section 4. Where a new mechanism has replaced one of earlier design, reference has been made in section 1 to the corresponding mechanism in section 4.
2. KEYBOARD (NEW DESIGN)*

(a) CODE LEVER UNIVERSAL BAIL SPRING TENSION

REQUIREMENT
GENERATOR CLUTCH DIENRANGED
MIN. 1 OZ.
MAX. 2 OZS.
TO START BAIL MOVING

(b) CODE LEVER UNIVERSAL BAIL SPRING MOUNTING SCREWS

(c) CODE BAR GUIDE MOUNTING SCREWS

(A) CODE BAR GUIDE CLEARANCE

REQUIREMENT
MIN. SOME CLEARANCE.
MAX. 0.006 INCH.
ALL CODE BARS SHOULD MOVE FREELY WITHOUT BIND.
TO ADJUST
LOSEN MOUNTING SCREWS AND POSITION CODE BAR GUIDE.

(B) REAR BLADE

(C) SPACE BAR PIVOT

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

* See page 1-2 Paragraph k.

FIGURE 1-1 KEYBOARD, CODE BAR AND SPACE BAR MECHANISMS
ADJUSTING DISK CLAMP SCREWS

CLUTCH SHOE LEVER

(TOP VIEW)

CLUTCH CAM DISK

ADJUSTING DISK

CLUTCH DISK STOP LUG

GEAR SLEEVE

CLUTCH SHOE LEVER REQUIREMENT
CLEARANCE WHEN CLUTCH IS DISENGAGED SHOULD BE 0.055 INCH TO 0.085 INCH LESS THAN WHEN CLUTCH IS ENGAGED.

TO CHECK
LATCH CLUTCH IN DISENGAGED POSITION AND MEASURE CLEARANCE. ROTATE GEAR UNTIL OIL HOLE IS UPWARD. ENGAGE CLUTCH AND MEASURE CLEARANCE.

TO ADJUST
LOOSEN THE TWO ADJUSTING DISK CLAMP SCREWS TO POSITION DISK.

NOTE:
AFTER ABOVE ADJUSTMENT IS MADE, CHECK FOR DRAG ON DRUM AS FOLLOWS: DISENGAGE CLUTCH. HOOK SPRING SCALE ON TOP TOOTH OF GEAR AND PULL AT RIGHT ANGLE TO RADIUS OF GEAR. IF PULL OF 8 OZS. OR MORE IS REQUIRED TO MOVE THE DRUM, REFINE ABOVE ADJUSTMENT.

(REAR VIEW)

FIGURE 1-2 KEYBOARD, SIGNAL GENERATOR CLUTCH AND GEAR MECHANISM

1-4
(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 ENGAGE 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 KEYBOARD, SIGNAL GENERATOR CLUTCH AND LEVER MECHANISM
(A) **TRANSFER BAIL DETENT LATCH SPRING TENSION**

**REQUIREMENT**

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

**TO START LATCH MOVING**

**SCREWDRIVER ADJUSTMENT**

-BUTTON BOX CONTACT CLEARANCE

**REQUIREMENT**

- MARKING AND SPACING GAPS SHOULD BE EQUAL WITHIN 0.001 INCH.
- TO CHECK
  - DEPRESS V KEYLEVER AND ROTATE SIGNAL GENERATOR CAM SLEEVES 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.

-BUTTON BOX DRIVE LINK SPRING TENSION

**REQUIREMENT**

- SPRING REMOVED FROM LINK
  - MIN. 11 OZS.
  - MAX. 13 OZS.
  - AT .438 INCH

**FIGURE 1-4 KEYBOARD, TRANSFER BAIL AND CONTACT BOX MECHANISM**
(A) CLUTCH TRIP BAR SPRING TENSION
REQUIREMENT
CLUTCH DISENGAGED, POWER OFF.
MIN. 9 OZS.
MAX. 12 OZS.
TO MOVE BAR.

(B) CODE BAR SPRING TENSION
REQUIREMENT
LETTERS KEY LEVER DEPRESSED.
MIN. 3 OZS.
MAX. 5 OZS.
TO START CODE BAR MOVING.

(C) LOCK BAR SPRING TENSION
REQUIREMENT
CLUTCH DISENGAGED, KEYBOARD LOCK KEY LEVER DEPRESSED.
MIN. 4 OZS.
MAX. 7 OZS.
TO START LOCK BAR MOVING.

(D) CODE BAR AND CODE LEVER CLEARANCE
REQUIREMENT
CARRIAGE RETURN KEY DEPRESSED BUT NOT ENOUGH TO TRIP OFF
UNIVERSAL BAIL LATCH OR CLUTCH BAR.
MIN. 0.006 INCH.
MAX. 0.015 INCH.
MEASURED AT CODE BAR #5.
TO ADJUST
POSITION GUIDE BY ADJUSTING SLOT WITH (4) MOUNTING SCREWS
LOOSENED.

FIGURE 1-5 KEYBOARD, CODE BAR AND CODE LEVER MECHANISM
(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 LOOSENED.

FUNCTION BAIL
FUNCTION BAIL ASSEMBLY
CODE LEVER
FUNCTION LEVER
CODE LEVER
BASE
MOUNTING SCREW

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.

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 KEYBOARD, FUNCTION BAIL AND LOCK BALL TRACK MECHANISMS
(A) CODE BAR BAIL LATCH SPRING TENSION
REQUIREMENT
MIN. 1/2 OZS.
MAX. 1 1/2 OZS.
TO START CODE BAR BAIL LATCH MOVING

(C) NON-REPEAT LEVER SPRING TENSION
REQUIREMENT
ANY KEY DEPRESSED
MIN. 1/2 OZ.
MAX. 1 1/2 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 LIP 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 KEYBOARD, FUNCTION BAIL, CODE BAR BAIL AND NON-REPEAT LEVER MECHANISMS

CHANGE 4
(B) UNIVERSAL BAIL LATCH SPRING TENSION

Requirement
Clutch disengaged, universal bail held away from latch lever
Min. 7 ozs.
Max. 8 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.

ECCENTRIC BUSHING

CODE LEVER UNIVERSAL BAIL EXTENSION

UNIVERSAL BAIL LATCH LEVER SPRING

UNIVERSAL BAIL LATCH LEVER

CODE BAR BAIL LATCH

ROLLER

NON-REPEAT LEVER

CODE LEVER UNIVERSAL BAIL

UNIVERSAL BAIL EXTENSION

UNIVERSAL BAIL LATCH LEVER

(U) LOCAL LINE FEED TRIP LINK SPRING

PLUNGER SPRING

PLUNGER LOCK SPRING (FLAT SPRING)

LOCAL LINE FEED TRIP LINK SPRING

LOCAL LINE FEED TRIP LINK

FIGURE 1-8 KEYBOARD, UNIVERSAL BAIL LATCH LEVER AND LOCAL LINE FEED TRIP LINK MECHANISMS

CHANGE 4
(B) LOCK BALL END PLAY

REQUIREMENT (UNDER POWER)

THE TRIP OFF PRESSURE OF ANY KEYLEVER IN THE
THIRD ROW SHOULD BE BETWEEN 3 AND 5 OZS.

WITH 6 OZS. OF PRESSURE APPLIED PERPENDICULAR TO THE A KEYLEVER IN THE THIRD ROW
AND CR DEPRESSED ALTERNATELY, THE A KEYLEVER
SHOULD TRIP EACH TIME.

THE CLUTCH SHOULD NOT TRIP WHEN TWO KEYLEVERS
ARE DEPRESSED SIMULTANEOUSLY. THE LOCK BALL
ADJUSTMENT SHOULD NOT PREVENT THE CODE
LEVER OF A DEPRESSED KEY FROM MEETING ITS UPSTOP.

TO ADJUST

DEPRESS CR KEYLEVER AGAINST ITS UPSTOP.

ROTATE THE ADJUSTING SCREW WITH FINGERS
UNTIL A SLIGHT RESISTANCE IS FELT. RELEASE
CR KEYLEVER, TURN ADJUSTING SCREW 1/4 TURN
AND TIGHTEN LOCK NUT.

NOTE: IT MAY BE NECESSARY TO RECHECK CODE
BAR BAIL, CODE BAR BAIL AND NON-REPEAT LEVER CLEARANCE, UNIVERSAL BAIL
LATCH LEVER, AND UNIVERSAL BAIL EXTENSION.

(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

FIGURE 1-9 KEYBOARD, WEDGELOCK AND BALL TRACK MECHANISM

CHANGE 4
(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 1-10 KEYBOARD, SIGNAL GENERATOR CLUTCH MECHANISM
(2) REQUIREMENT

There should be a barely perceptible 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 filister head adjusting and clamping screws located at the front end of the bracket. Refine requirements if necessary.

(1) REQUIREMENT

There should be a barely perceptible 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 1-11 KEYBOARD OR BASE, MOTOR AND TYPING UNIT GEARING, LEFT SIDE VIEW
(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.
MIN. 6 OZS.
MAX. 8 OZS.
TO ACTUATE SENSITIVE SWITCH

FIGURE 1-12 KEYBOARD, 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.

(B) LOCAL CARRIAGE FUNCTION BAIL SPRING TENSION

(REQUIRED CODE LEVER AND BAIL SPRING)

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

FIGURE 1-13 KEYBOARD, CODE LEVER AND LOCAL CARRIAGE FUNCTION BAIL MECHANISMS
(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 7 LEVERS MOVING.

(C) MARGIN INDICATOR SPRING TENSION
REQUIREMENT
MIN. 7 OZS,
MAX. 11 OZS,
TO START LEVER MOVING.
MOUNTING TYPING UNIT ON KEYBOARD OR BASE

**REQUIREMENT**

WHEN PLACING THE TYPING UNIT ON THE BASE HOLD IT TILTED SLIGHTLY TO THE RIGHT AND LOWER THE RIGHT END INTO ENGAGEMENT WITH THE RIGHT LOCATING STUD. WHILE EASING THE LEFT END DOWNWARD ROTATE THE MOTOR BY HAND TO PROPERLY MESH THE GEARS. SECURE BY FOUR MOUNTING SCREWS.

ROTATE THE MOTOR BY HAND TO INSURE PROPER MESHING OF GEARS.

**FIGURE 1-15** MOUNTING TYPING UNIT ON KEYBOARD OR BASE, TOP VIEW
PLASTIC WINDOW
MOUNTING SCREW
KEYLEVER COVER

PLASTIC WINDOW
REQUIREMENT
PLASTIC WINDOW SHOULD BE FULLY SEATED IN POSITION BEFORE TIGHTENING MOUNTING SCREW.
TO ADJUST POSITION WINDOW WITH MOUNTING SCREW LOOSENED.

FIGURE 1-16 KEYBOARD, PLASTIC WINDOW
3. BASE

THE FOLLOWING KEYBOARD ADJUSTMENTS CONSTITUTE THE ADJUSTMENT FOR THE BASE:

a. ADJUSTMENTS
   (1) STANDARD
      (a) INTERMEDIATE GEAR BRACKET - FIGURE 1-11
      (b) MOUNTING TYPING UNIT ON BASE - FIGURE 1-15
   (2) VARIABLE FEATURES
      (a) BREAK LEVER EXTENSION - FIGURE 2-6
      (b) TIME DELAY DISABLING DEVICE - FIGURE 2-5
      (c) TIME DELAY MECHANISM POSITION - FIGURE 2-4
      (d) TIME DELAY SWITCH POSITION - FIGURE 2-2

b. SPRING TENSIONS
   (1) STANDARD
      (a) LOCAL CARRIAGE RETURN BAIL - FIGURE 4-22
      (b) LOCAL LINE FEED TRIP LINK - FIGURE 4-22
      (c) MARGIN INDICATOR - FIGURE 1-14
   (2) VARIABLE FEATURES
      (a) BREAK KEYLEVER - FIGURE 2-6
      (b) CONTACT LATCH PAWL - FIGURE 2-3
      (c) CONTACT PAWL - FIGURE 2-3
      (d) ECCENTRIC FOLLOWER PAWL - FIGURE 2-5
      (e) TIME DELAY RATCHET WHEEL - FIGURE 2-2

4. TYPING UNIT

WHEN MAKING A COMPLETE ADJUSTMENT OF TYPING UNIT, THE FOLLOWING CONDITIONING OPERATIONS SHOULD BE PERFORMED TO PREVENT DAMAGE:

a. LOOSEN THE SHIFT LEVER DRIVE ARM CLAMP SCREW, (FIGURE 1-26)

b. MOVE THE RIGHT AND LEFT VERTICAL POSITIONING LEVER ECCENTRIC STUDS (FIGURES 1-39 AND 1-40) IN ROCKER SHAFT BRACKETS TO THEIR LOWEST POSITION.

c. LOOSEN THE TWO BEARING STUD MOUNTING SCREWS AND THE TWO CONNECTING STRIP CLAMP SCREWS IN THE HORIZONTAL POSITIONING DRIVE LINKAGE (FIGURE 1-46).

   (1) PRINTING CARRIAGE POSITION (FIGURE 1-57).
   (2) PRINTING HAMMER BEARING STUD. (FIGURE 1-57).
   (3) PRINTING HAMMER STOP BRACKET. ALSO SEE NOTE. (FIGURE 1-60).
   (4) CARRIAGE WIRE ROPE. (FIGURE 1-48).

k. CHECK THE FOLLOWING ADJUSTMENTS DURING EACH LUBRICATING PERIOD:
   (1) PRINTING CARRIAGE POSITION (FIGURE 1-57).
   (2) PRINTING HAMMER BEARING STUD. (FIGURE 1-57).
   (3) PRINTING HAMMER STOP BRACKET. ALSO SEE NOTE. (FIGURE 1-60).
   (4) CARRIAGE WIRE ROPE. (FIGURE 1-48).
NOTE
TO FACILITATE MAKING THE FOLLOWING ADJUSTMENTS, REMOVE THE RANGE FINDER AND SELECTOR MAGNET ASSEMBLIES. TO INSURE BETTER OPERATION, PULL A PIECE OF PAPER BETWEEN THE ARMATURE AND THE POLE PIECES TO REMOVE ANY OIL OR FOREIGN MATTER THAT MAY BE PRESENT. MAKE CERTAIN THAT NO LINT OR PIECES OF PAPER REMAIN BETWEEN THE POLE PIECES AND ARMATURE.

1. POSITION ARMATURE SPRING ADJUSTING NUT TO HOLD ARMATURE FIRMLY AGAINST PIVOT EDGE OF CASTING.
2. POSITION ARMATURE AND BACKSTOP WITH MOUNTING SCREWS LOOSENED.

FIGURE 1-17 TYPING UNIT, SELECTOR MAGNET
SELECTOR MAGNET BRACKET

(1) REQUIREMENT

SPACING LOCK LEVER ON HIGH PART OF CAM.
ARMATURE IN CONTACT WITH POLE PIECE.
CLEARANCE BETWEEN END OF ARMATURE EXTENSION
AND SHOULDERS ON SPACING LOCK LEVER.
MIN. 0.020 INCH
MAX. 0.035 INCH

TO ADJUST
LOosen TWO MAGNET BRACKET MOUNTING SCREWS
AND ADJUSTING LINK CLAMP SCREW. POSITION
MAGNET BRACKET BY MEANS OF ADJUSTING LINK
AND TIGHTEN LINK CLAMP SCREW ONLY.

(2) REQUIREMENT

SPACING LOCK LEVER ON HIGH PART OF CAM. ARMATURE IN CONTACT
WITH POLE PIECE. SOME CLEARANCE BETWEEN UPPER SURFACE OF ARMATURE
EXTENSION AND LOWER SURFACE OF SPACING LOCK LEVER WHEN LOCK LEVER
IS HELD DOWNWARD.
MAX. 0.003 INCH

TO ADJUST
POSITION UPPER END OF MAGNET BRACKET. TIGHTEN TWO MAGNET
BRACKET MOUNTING SCREWS. RECHECK REQUIREMENT (1).

FIGURE 1-18 TYPING UNIT, RIGHT SIDE VIEW
SELECTOR ARMATURE SPRING

REQUIREMENT
MARKING LOCK LEVER, SPACING LOCK LEVER, AND START LEVER ON HIGH PART OF THEIR CAMS. SCALE APPLIED AS NEARLY VERTICAL AS POSSIBLE UNDER END OF ARMATURE EXTENSION.
APPROX. 3 OZS.
TO PULL ARMATURE TO MARKING POSITION. IT MAY BE NECESSARY TO READJUST THIS SPRING TENSION WHEN MAKING DISTORTION TOLERANCE TESTS OF THE UNIT.
TO ADJUST POSITION ADJUSTING NUT.

FIGURE 1-19 TYPING UNIT, SELECTOR MECHANISM, RIGHT SIDE VIEW

CHANGE 4
RESET BAIL

SELECTOR LEVER

SELECTOR PUSH LEVER SPRING

REQUIREMENT

PUSH LEVER IN SPACING POSITION
MIN. 3/4 OZ.
MAX. 1-1/2 OZS.
TO MOVE PUSH LEVER FROM SELECTOR LEVER. CHECK FIVE SPRINGS.

SELECTOR LEVER SPRING

REQUIREMENT

TYPING UNIT UPSIDE DOWN.
RESET BAIL ON PEAK OF ITS CAM.
MIN. 1-1/4 OZS.
MAX. 2-1/2 OZS.
TO START EACH LEVER MOVING,
CHECK FIVE SPRINGS. IF NECESSARY,
UNHOOK START LEVER SPRING TO CHECK NO. 4 SELECTOR LEVER SPRING.

CAM-CLUTCH ASSEMBLY

SELECTOR CLUTCH DRUM

REQUIREMENT

CLUTCH LATCHED IN STOP POSITION. CLUTCH DRUM AGAINST SHOULDER ON MAIN SHAFT. CAM-CLUTCH ASSEMBLY SHOULD HAVE SOME END PLAY
MAX. 0.010 INCH
TO ADJUST POSITION CLUTCH DRUM WITH MOUNTING SCREW LOOSENED.

FIGURE 1-20 TYPING UNIT, SELECTOR CAM CLUTCH
**PUSH LEVER RESET BAIL**

**SPACING LOCK LEVER**

**PUSH LEVER RESET BAIL SPRING**

**SPACING LOCK LEVER SPRING**

**LATCH LEVER SPRING**

**SELECTOR CLUTCH LATCH LEVER SPRING**

**SPACING LOCK LEVER SPRING**

**SELECTOR ARMATURE RELEASED, SPACING LOCK LEVER ON LOW PART OF ITS CAM, SPRING SCALE APPLIED TO LOWER END OF SPACING LOCK LEVER.**

**MIN. 3 OZS.**

**MAX. 6 OZS.**

**TO MOVE SPACING LOCK LEVER FROM ITS PIVOT SHAFT.**

**PUSH LEVER RESET BAIL SPRING**

**REQUIREMENT**

PUSH LEVER RESET BAIL ON LOW PART OF CAM. 32 OZ. SCALE APPLIED TO RESET BAIL.

**MIN. 4 OZS.**

**MAX. 8 OZS.**

**TO MOVE BAIL FROM CAM.**

**LATCH RESTING ON LOW PART OF ITS CAM DISK.**

**MIN. 2 OZS.**

**MAX. 3-1/2 OZS.**

**TO START LATCH MOVING.**

**SELECTOR ARMATURE RELEASED, SPACING LOCK LEVER ON LOW PART OF ITS CAM, SPRING SCALE APPLIED TO LOWER END OF SPACING LOCK LEVER.**

**MIN. 3 OZS.**

**MAX. 6 OZS.**

**TO MOVE SPACING LOCK LEVER FROM ITS PIVOT SHAFT.**

**FIGURE 1-21 TYPING UNIT, SELECTOR CLUTCH MECHANISM, RIGHT SIDE VIEW**
(A) RANGE FINDER KNOB PHASING

REQUIREMENT

WITH RANGE FINDER KNOB TURNED TO EITHER END OF RACK, ZERO MARK ON SCALE SHOULD BE WITHIN 3 POINTS OF Scribed LINE ON RANGE FINDER PLATE.

TO ADJUST

REMOVE MOUNTING NUT, DISENGAGE KNOB FROM RACK AND POSITION KNOB. RE-ENGAGE KNOB WITH RACK AND REPLACE MOUNTING NUT.

(B) SELECTOR CLUTCH STOP ARM

REQUIREMENT

RANGE SCALE SET AT 60. SELECTOR CLUTCH DISENGAGED. ARMATURE IN MARKING POSITION. CLUTCH STOP ARM SHOULD ENGAGE CLUTCH SHOE LEVER BY APPROXIMATELY FULL THICKNESS OF SHOE LEVER.

TO ADJUST

POSITION STOP ARM ON STOP ARM BAIL WITH CLAMP SCREW LOOSENED.

FIGURE 1-22 TYPING UNIT, RANGE FINDER MECHANISM, RIGHT SIDE VIEW
START LEVER SPRING
REQUIREMENT
LATCH LEVER SPRING UNHOOKED. STOP ARM BAIL IN INDENT OF ITS CAM. RANGE SCALE SET AT 60.
MIN. 2-1/2 OZS.
MAX. 4-1/2 OZS.
TO START STOP ARM MOVING.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-24

SELECTOR RECEIVING MARGIN
WHEN A SIGNAL DISTORTION TEST SET IS USED FOR DETERMINING THE RECEIVING MARGINS OF THE SELECTOR, AND WHERE THE CONDITION OF THE COMPONENTS IS EQUIVALENT TO THAT OF NEW EQUIPMENT, THE RANGE AND DISTORTION TOLERANCES BELOW SHOULD BE MET.

SELECTOR RECEIVING MARGIN MINIMUM REQUIREMENTS

<table>
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<th>CURRENT</th>
<th>W.P.M.</th>
<th>POINTS RANGE</th>
<th>PERCENTAGE OF MARKING AND SPACING BIAS TOLERATED</th>
<th>END DISTORTION TOLERATED WITH SCALE AT BIAS OPTIMUM SETTING</th>
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<td>0.060 AMP.</td>
<td>60</td>
<td>72</td>
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<td>100</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.020 AMP.</td>
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<td>40</td>
<td>35</td>
</tr>
<tr>
<td>(WINDINGS SERIES)</td>
<td>75</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

TO ADJUST: REFINE THE SELECTOR ARMATURE SPRING (FIGURE 1-19)

FIGURE 1-23 TYPING UNIT, SELECTOR CLUTCH MECHANISM, RIGHT SIDE VIEW

1-26 CHANGE 4
COMMON TRANSFER LEVER SPRING TENSION REQUIREMENT
TRANSFER LEVER IN SPACING POSITION SCALE APPLIED NEAR UPPER END OF COMMON TRANSFER LEVER.
MIN. 1/2 OZ.
MAX. 1 1/4 OZS.
TO START LEVER MOVING

TRANSFER LEVER ECCENTRIC REQUIREMENT
PUSH LEVERS POSITIONED FOR E OR LETTERS, SELECTOR CLUTCH DIS ENGAGED. CODE BAR SHIFT LEVER LINK IN UPPERMOST POSITION, CLEARANCE BETWEEN REAR CODE BAR SHIFT LEVER AND CODE BAR SHIFT BAR FARDEST FROM REAR CODE BAR SHIFT LEVER
MIN. 0.010 INCH
MAX. 0.025 INCH
WHEN PLAY OF SHIFT BAR IS TAKEN UP FOR MAXIMUM CLEARANCE.
TC ADJUST
ROTATE ECCENTRIC BUSHING WITH CLAMP SCREW LOOSENED. KEEP BOTH HOLES IN ECCENTRIC BUSHING ABOVE HORIZONTAL CENTER.
NOTE
ONE OR MORE CODE BAR SHIFT BARS CAN TOUCH CODE BAR SHIFT LEVERS.

TRANSFER LEVER SPRING TENSION REQUIREMENT
TRANSFER LEVER HELD IN SPACING POSITION
MIN. 1 1/2 OZ.
MAX. 2 1/2 OZS.
TO START INTERMEDIATE ARM MOVING

FIGURE 1-24 TYPING UNIT, CODE BAR SHIFT MECHANISM

CHANGE 4

1-27
FRONT CODE BAR
SHIFT LEVER
SHIFT BAR INNER STEP
TRANSFER LEVERS
1 2 3 4 5
INTERMEDIATE ARMS
(FRONT VIEW)
SELECTOR LEVER CAM
LOCK LEVER CAM
(LUBRICATOR RESERVOIR
BRACKET MOUNTING SCREWS
WICK
CLAMP SCREWS
BACKSTOP BRACKET
PUSH LEVER
CODE BAR SHIFT LEVER
SELECTOR CLUTCH DISENGAGED. CODE BAR SHIFT LEVER LINK IN LOWERMOST POSITION. CLEARANCE BETWEEN FRONT CODE BAR SHIFT LEVER AND INNER STEP OF CODE BAR SHIFT BAR FARthest FROM FRONT CODE BAR SHIFT LEVER MIN. 0.010 INCH MAX. 0.025 INCH WHEN PLAY IN PARTS IS TAKEN UP FOR MAXIMUM CLEARANCE.
TO ADJUST POSITION BACKSTOP BRACKET WITH ITS TWO CLAMP SCREWS LOOSENED.

(CODEBAR SHIFT LEVER LINK BRACKET

THE LUBRICATOR TUBE SHOULD CLEAR THE HIGH PART OF THE LOCK LEVER CAM MIN. 0.020 INCH THE HIGH PART OF THE SELECTOR LEVER CAMS SHOULD TOUCH THE LUBRICATOR WICK, BUT SHOULD NOT RAISE IT MORE THAN 1/32 INCH.
NOTE: THERE SHOULD BE SOME CLEARANCE BETWEEN THE MARKING LOCK LEVER SPRING AND THE RESERVOIR.
TO ADJUST POSITION THE LUBRICATOR BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 1-25 TYPING UNIT, CODE BAR SHIFT MECHANISM
TRANSFER LEVERS

CODE BAR SHIFT LEVER

ROLLER

CODE BAR SHIFT LEVER DRIVE ARM

REQUIREMENT
CODE BAR SHIFT LEVER LINK IN THE UPPERMOST POSITION.
THERE SHOULD BE SOME CLEARANCE BETWEEN THE TOP OF THE ROLLERS AND THE TOP OF THE CAM SLOTS IN THE CODE BAR SHIFT LEVERS MAX. 0.025 INCH ON THE CLOSEST LEVER.

TO ADJUST
LOOSE THE CLAMP SCREW, POSITION THE CODE BAR SHIFT LEVER DRIVE ARM ON ITS SHAFT TO MEET THE REQUIREMENT AND TO PROVIDE SOME END PLAY, NOT MORE THAN 0.006 INCH.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-25
CODE BAR SHIFT LEVER LINK BRACKET

REQUIREMENT
MOTION OF FRONT AND REAR CODE BAR SHIFT LEVERS SHOULD BE EQUALIZED WITH RESPECT TO CODE BAR TRAVEL.

TO CHECK (FRONT)
SELECT BLANK COMBINATION AND ROTATE MAINSHAFT UNTIL CODE BAR SHIFT LEVER LINK REACHES HIGHEST TRAVEL. TAKE UP PLAY FOR MAXIMUM CLEARANCE. CLEARANCE BETWEEN FRONT CODE BAR SHIFT LEVER AND SHOULDER ON NEAREST CODE BAR SHIFT BAR
MIN. 0.002 INCH
MAX. 0.025 INCH

TO CHECK (REAR)
SELECT LETTERS COMBINATION. CHECK CLEARANCE BETWEEN REAR CODE BAR SHIFT LEVER AND SHOULDER OF CODE BAR SHIFT BAR IN SAME WAY.
MIN. 0.002 INCH
MAX. 0.025 INCH

TO ADJUST
POSITION ADJUSTING PLATES (FRONT AND REAR) WITH CLAMP SCREWS LOOSENED.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-26

FIGURE 1-27 TYPING UNIT, CODE BAR SHIFT MECHANISM
TRIP SHAFT

CODE BAR CLUTCH
LATCH LEVER SPRING

CODE BAR CLUTCH
LATCH LEVER

STOP LUG

CODE BAR CLUTCH LATCH LEVER SPRING (EXCEPT SELECTOR)

REQUIREMENT
CLUTCH TURNED TO STOP POSITION BUT WITH LATCH LEVER NOT LATCHED.
MIN. 5 OZS.
MAX. 7 1/4 OZS.

TO MOVE LATCH LEVER FROM LUG. THIS REQUIREMENT APPLIES TO CODE BAR CLUTCH, FUNCTION CLUTCH, SPACING CLUTCH, LINE FEED CLUTCH, AND TYPE BOX CLUTCH

SELECTOR CLUTCH CAM

CLAMP SCREW

CODE BAR CLUTCH

TRIP LEVER

SELECTOR CLUTCH CAM

TRIP SHAFT LEVER SPRING TENSION

REQUIREMENT
TRIP SHAFT LEVER ON LOW PART OF CAM. CODE BAR CLUTCH ENGAGED.
ROTATE 1/4 TURN.
MIN. 1 OZ.
MAX. 2 OZS.

TO START LEVER MOVING

FIGURE 1-28 TYPING UNIT, CODE BAR CLUTCH TRIP SHAFT MECHANISM

CHANGE 4
CLUTCH OB LEVER

FUNCTION CLUTCH

CLUTCH SHOE LEVER

FUNCTION CLUTCH TRIP LEVER

REQUIREMENT
CODE BAR CLUTCH AND FUNCTION CLUTCH DISENGAGED. FUNCTION CLUTCH TRIP LEVER SHOULD ENGAGE CLUTCH SHOE LEVER BY FULL THICKNESS OF SHOE LEVER. (CHECK AT LUG WITH LEAST BITE ON TWO STOP CLUTCHES)

TO ADJUST
POSITION TRIP LEVER ON ITS SHAFT WITH CLAMP SCREW LOOSENED, LETTING SHAFT HAVE END PLAY
MIN. SOME
MAX. 0.006 INCH

CODE BAR CLUTCH CAM FOLLOWER SPRING

REQUIREMENT
CAM FOLLWTER ROLLER ON THE LOW PART OF CAM, THE SPRING UNHOOKED FROM SPRING BRACKET.
MIN. 20 OZS.
MAX. 24 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

FIGURE 1-29  TYPING UNIT, FUNCTION CLUTCH MECHANISM

CHANGE 4
(A) **CLUTCH TRIP SHAFT SET COLLARS**

1. **REQUIREMENT**
   - SPACING CLUTCH LATCH LEVER SHOULD HAVE SIDE PLAY
   - MIN. SOME
   - MAX. 0.008 INCH

   TO ADJUST:
   - POSITION SPACING CLUTCH LATCH LEVER SET COLLAR.

2. **REQUIREMENT**
   - APPROXIMATE ALIGNMENT OF RIGHT END OF STOP EXTENSIONS ON TRIP LEVER AND SHOE LEVER

   TO ADJUST:
   - POSITION LINE FEED CLUTCH TRIP LEVER SET COLLAR.

3. **REQUIREMENT**
   - LINE FEED CLUTCH LATCH LEVER SHOULD HAVE SIDE PLAY
   - MIN. SOME
   - MAX. 0.008 INCH

   TO ADJUST:
   - POSITION LINE FEED CLUTCH LATCH LEVER SET COLLAR.

---

### NOTE: ANTI-DEFLECTION PLATE ADJUSTMENT APPLIES ONLY TO UNITS SO EQUIPPED.

1. **REQUIREMENT**
   - ANTI-DEFLECTION PLATE WITH TYPING UNIT UPSIDE DOWN AND FUNCTION, SPACING, LINE FEED, AND TYPE BOX CLUTCHES LATCHED DISENGAGED.
   - MIN. 1 L.B.
   - MAX. 5 LBS

   TO PULL TRIP SHAFT AWAY FROM ANTI-DEFLECTION PLATE.

   TO ADJUST:
   - POSITION PLATE WITH MOUNTING SCREWS LOOSENED.

---

**FIGURE 1-30** TYPING UNIT, TRIP LATCH MECHANISM

**CHANGE 4**
FIGURE 1-31 TYPING UNIT, SPACING CLUTCH MECHANISM
A. TYPE BOX CLUTCH TRIP LEVER ECCENTRIC POST

REQUIREMENT
TYPE BOX CLUTCH DISENGAGED.
TRIP LEVER SHOULD ENGAGE THE CLUTCH SHOE LEVER BY THE FULL THICKNESS OF THE SHOE LEVER

TO ADJUST
POSITION THE TRIP LEVER ECCENTRIC POST.

B. LINE FEED CLUTCH TRIP LEVER ECCENTRIC POST

REQUIREMENT
TRIP LEVER ADJUSTING SCREW BACKED OFF.
LINE FEED CLUTCH IN ITS STOP POSITION.
TRIP LEVER SHOULD ENGAGE THE CLUTCH SHOE LEVER BY THE FULL THICKNESS OF THE SHOE LEVER.
CHECK AT STOP LUG WITH LEAST BITE.

TO ADJUST
POSITION THE TRIP LEVER ECCENTRIC POST

C. LINE FEED CLUTCH TRIP LEVER ADJUSTING SCREW

REQUIREMENT
LINE FEED FUNCTION SLIDE ARM IN REAR POSITION.
CLUTCH TRIP LEVER AGAINST ITS ECCENTRIC POST.
TRIP ARM HELD AGAINST ITS FUNCTION SLIDE ARM.
SOME CLEARANCE BETWEEN THE END OF THE TRIP LEVER ADJUSTING SCREW AND THE TRIP ARM.
MAX. 0.006 INCH

TO ADJUST
POSITION THE ADJUSTING SCREW.

FIGURE 1-32 TYPING UNIT, TYPE BOX CLUTCH AND LINE FEED CLUTCH MECHANISM

CHANGE 4
TYPE BOX CLUTCH TRIP LEVER

(1) REQUIREMENT

CLUTCH TRIP SHAFT CAM FOLLOWER ROLLER (SEE FIG. 1-29) ON LOWEST SURFACE OF CAM (LOCATED ON CODE BAR CLUTCH). CLEARANCE BETWEEN INNER FACE OF TYPE BOX CLUTCH TRIP LEVER AND THE CLUTCH DISK STOP LUG.

STANDARD WITH STUNT CASE MECH.

<table>
<thead>
<tr>
<th>MIN.</th>
<th>MAX.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.045</td>
<td>0.065</td>
</tr>
</tbody>
</table>

TO ADJUST

LOOSEN CLAMP SCREW AND POSITION STOP.

(2) REQUIREMENT

WHEN POSITIONING THE TRIP ARM DETERMINE THAT THE LATCH LEVER HAS SOME SIDE PLAY

MAX. 0.008 INCH

TO ADJUST

POSITION THE CLUTCH TRIP ARM ON ITS SHAFT WITH THE CLAMP SCREW LOOSENED.

CLUTCH SHOE LEVER

REQUIREMENT

GAP BETWEEN CLUTCH SHOE LEVER AND ITS STOP LUG SHOULD BE 0.055 INCH TO 0.085 INCH GREATER WHEN CLUTCH IS ENGAGED THAN WHEN THE CLUTCH IS DISENGAGED.

TO CHECK


NOTE

ON MULTIPLE STOP CLUTCHES CHECK THE CLEARANCE AT THE STOP LUG THAT IS ADJACENT TO THE NOTCH IN THE CLUTCH ADJUSTING DISK.

LOOSEN THE TWO CLAMP SCREWS ON THE CLUTCH DISK. ENGAGE A WRENCH OR SCREWDRIVER ON THE LUG OF THE ADJUSTING DISK AND ROTATE THE DISK.

NOTE

AFTER THE ABOVE ADJUSTMENT IS MADE, DISENGAGE THE CLUTCH, REMOVE THE DRUM MOUNTING SCREW AND ROTATE THE DRUM IN ITS NORMAL DIRECTION OF ROTATION TO MAKE CERTAIN THAT IT DOES NOT DRAG ON THE SHOE. IF THE DRUM DRAGS, REFINE THE ABOVE ADJUSTMENT.

FIGURE 1-33 TYPING UNIT, TYPE BOX CLUTCH MECHANISM

FIGURE 1-34 TYPING UNIT, CLUTCH SHOE MECHANISM (ALL CLUTCHES)
CLUTCH SHOE LEVER SPRING TENSIONS

REQUIREMENT
CLUTCH ENGAGED. HOLD CAM DISK TO PREVENT TURNING. SPRING SCALE PULLED AT TANGENT TO CLUTCH.
MIN. 15 OZS. ONE-STOP CLUTCHES
MAX. 20 OZS.
MIN. 16 OZS. MULTIPLE-STOP CLUTCHES
MAX. 22 OZS.
TO MOVE THE SHOE LEVER IN CONTACT WITH THE STOP LUG.

CLUTCH DRUM POSITION (EXCEPT SELECTOR)

REQUIREMENT
CLUTCH SHOE LEVER HELD DISENGAGED. CLUTCH SHOULD HAVE SOME END PLAY
MAX. 0.020 INCH
TO ADJUST
POSITION EACH DRUM AND SPACING CLUTCH SET COLLAR WITH MOUNTING SCREWS LOOSENED.

CLUTCH SHOE SPRING TENSION

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 GOOD REASON TO BELIEVE THAT IT DOES NOT MEET ITS REQUIREMENT.

REQUIREMENT
CLUTCH DRUM REMOVED. SPRING SCALE APPLIED TO PRIMARY SHOE AT A TANGENT TO THE FRICTION SURFACE.
MIN. 3 OZS.
MAX. 5 OZS.
TO START THE PRIMARY SHOE MOVING AWAY FROM SECONDARY SHOE AT POINT OF CONTACT.

FIGURE 1-35 TYPING UNIT, CLUTCH MECHANISM LEFT SIDE VIEW
B. SPACING GEAR PHASING REQUIREMENT

SPACING CLUTCH DISENGAGED. INDEX LINE ON THE SPACING PAWL SHOULD BE AS NEAR AS POSSIBLE TO THE CENTER OF THE TWO LINES ON THE PAWL RETAINING WASHER.

TO ADJUST

REMOVE THE MOUNTING SCREW FROM THE SPACING SHAFT GEAR. HOLD THE PAWLS IN ALIGNMENT AND ENGAGE THE SPACING SHAFT GEAR WITH THE CLUTCH GEAR AT A POINT WHERE THE SPACING SHAFT GEAR MOUNTING SCREW HOLE IS IN LINE WITH THE TAPPED HOLE IN THE SPACING SHAFT AND INSERT THE MOUNTING SCREW.

A. SPACING GEAR CLEARANCE REQUIREMENT

CARRIAGE FULLY RETURNED. MINIMUM BACKLASH OF SPACING GEARS WITHOUT BIND.

TO ADJUST

INSERT SHIMS BETWEEN THE SPACING SHAFT BEARING AND FRONT PLATE AT UPPER MOUNTING SCREW TO INCREASE CLEARANCE AND AT LOWER MOUNTING SCREW TO DECREASE BACKLASH.

FIGURE 1–36 TYPING UNIT, SPACING MECHANISM
LINE FEED CLUTCH PHASING

REQUIREMENT
LINE FEED CLUTCH DISENGAGED.
Both line-feed bars should engage teeth of line feed spur gear.

TO ADJUST
Loosen assembly bearing post. Mesh line feed eccentric spur gear with clutch gear.

ECCENTRIC BEARING
ASSEMBLY BEARING POST
LEFT SIDE FRAME
ROCKER SHAFT LEFT BRACKET
REQUIREMENT
ROCKER SHAFT LEFT BRACKET FIRMLY SEATED AGAINST INNER BEARING RACE.

TO ADJUST
Hold rocker shaft in extreme left position and position the bracket against the inner bearing race with mounting screws loosened.

INNER BEARING RACE
MOUNTING SCREWS
ROCKER SHAFT
BALL BEARING
LEFT SIDE FRAME
ROCKER SHAFT LEFT BRACKET

FIGURE 1-37  TYPING UNIT, LINE FEED AND ROCKER SHAFT MECHANISMS

CHANGE 4
ROCKER SHAFT BRACKET ECCENTRIC STUD

REQUIREMENT
TYPE BOX CLUTCH DISENGAGED. PLAY IN LOCKING ARM TAKEN TOWARDS FRONT. GAP BETWEEN LOWER SIDE OF LOCK LEVER-ROLLER AND TOP EDGE OF SHOULDER ON HORIZONTAL POSITIONING LOCK LEVER
MIN. 0.065 INCH
MAX. 0.080 INCH

TO ADJUST
POSITION ECCENTRIC STUD IN LOWER END OF ROCKER SHAFT LEFT BRACKET. KEEP HIGH PART OF ECCENTRIC MARKED WITH DOT BELOW CENTER LINE OF DRIVE LINK.

NOTE:
ANY CHANGE IN THIS ADJUSTMENT WILL REQUIRE A RECHECKING OF THE FOLLOWING ADJUSTMENTS: HORIZONTAL POSITIONING DRIVE LINKAGE (FIGURE 1-46), RIGHT VERTICAL POSITIONING LEVER ECCENTRIC STUD (FIGURE 1-39), LEFT VERTICAL POSITIONING LEVER ECCENTRIC STUD (FIGURE 1-40), VERTICAL POSITIONING LOCK LEVER (FIGURE 1-47), RIBBON FEED LEVER STOP BRACKET (FIGURE 1-63), FUNCTION STRIPPER BLADE ARMS (FIGURE 4-37), SPACING TRIP LEVER BAIL CAM PLATE (FIGURE 1-42), PRINTING TRACK (FIGURE 1-59), PRINTING ARM (FIGURE 1-60) AND REVERSING SLIDE BRACKETS (FIGURE 1-45).

FIGURE 1-38 TYPING UNIT, SHIFT AND POSITIONING MECHANISMS.
TYPE BOX CLUTCH DISENGAGED, COMMON CODE BAR IN SPACING POSITION. PLAY TAKEN UP BY PRESSING DOWNWARD ON COMMON CODE BAR AT GUIDE BLOCK:

MIN.
MAX.

0.030 INCH
0.050 INCH

CLEARANCE BETWEEN THE TOE OF VERTICAL POSITIONING LEVER AND THE BOTTOM OF THE COMMON CODE BAR WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE A MINIMUM TO ADJUST

POSITION THE ECCENTRIC STUD IN THE RIGHT ROCKER SHAFT BRACKET. POSITION HIGH PART OF ECCENTRIC (MARKED WITH DOT) TOWARD THE REAR.

VERTICAL POSITIONING LEVER TOE

VERTICAL POSITIONING LEVER SPRING TENSION

VERTICAL POSITIONING LEVER TOES (RIGHT AND LEFT) IN CONTACT WITH THE SUPPRESSION CODE BAR, LEVERS NOT BUCKLED.

MIN.
MAX.

4 OZS.
12 OZS.

TO MOVE THE LINK EXTENSION AWAY FROM THE VERTICAL POSITIONING LEVER.
CHECK BOTH RIGHT AND LEFT SPRINGS.

ROCKER SHAFT BRACKET

ECCENTRIC STUD

FIGURE 1-39  TYPING UNIT, VERTICAL POSITIONING MECHANISM, RIGHT SIDE
VERTICAL POSITIONING LOCK LEVER

SPRING TENSION

REQUIREMENT

TYPE BOX CLUTCH DISENGAGED
MIN. 2 OZS.
MAX. 4 OZS.
TO START LOCK LEVER MOVING.
CHECK RIGHT AND LEFT SPRINGS

LEFT VERTICAL POSITIONING LOCK LEVER

LEFT VERTICAL POSITIONING LEVER

COMMON CODE BAR

VERTICAL POSITIONING LEVER TOE

LEFT VERTICAL POSITIONING LEVER ECCENTRIC STUD

REQUIREMENT

RIGHT AND LEFT VERTICAL POSITIONING LEVERS SHOULD BUCKLE EQUALLY WITHIN 0.006 INCH

TO CHECK

COMMON CODE BAR IN SPACING POSITION. TRIP TYPE BOX CLUTCH. ROTATE MAIN SHAFT UNTIL RIGHT VERTICAL POSITIONING LEVER TOE TOUCHES COMMON CODE BAR, BUCKLING ITS LOWER LINK 0.008 INCH (MAXIMUM)

LEFT VERTICAL POSITIONING LEVER TOE SHOULD TOUCH COMMON CODE BAR, BUCKLING ITS LOWER LINK EQUALLY WITHIN 0.006 INCH

TO ADJUST

POSITION ECCENTRIC STUD ON ROCKER SHAFT LEFT BRACKET INNER ARM. POSITION HIGH PART OF CAM (MARKED WITH DOT) TOWARD REAR.

FIGURE 1-40 TYPING UNIT, VERTICAL POSITIONING MECHANISM LEFT SIDE
OSCILLATING RAIL SLIDE POSITION

REQUIREMENT

CARRIAGE RETURN RING AND AUTOMATIC CARRIAGE
RETURN-LINE FEED RING FREE TO ROTATE
ON SPACING DRUM (FIVE MOUNTING SCREWS LOOSENED.)
SPACING CLUTCH DISENGAGED. FEED PAWL,
WHICH IS FARthest ADVANCED, ENGAGING TOOTH
IMMEDIATELY ABOVE CUT-AWAY SECTION OF RATCHET
CLEARANCE BETWEEN SLIDE AND PULLEY
MIN. 0.025 INCH — MAX. 0.050 INCH

TO ADJUST
POSITION SLIDE ON WIRE ROPE WITH CLAMP
SCREWS LOOSENED.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-27

FIGURE 1-41 TYPING UNIT, SPACING MECHANISM
(A) SPACING TRIP LEVER BAIL CAM PLATE

REQUIREMENT
SPACING TRIP LEVER ARM IN UPWARD POSITION. TYPE BOX CLUTCH ROTATED THROUGH APPROXIMATELY ONE-HALF OF ITS CYCLE. ALL FUNCTION PAWLS DISENGAGED FROM FUNCTION BAR. CLEARANCE BETWEEN TOP SURFACE OF TRIP LEVER ARM EXTENSION AND SPACING TRIP LEVER SHOULDER.
MIN. 0.010 INCH
MAX. 0.040 INCH

TO ADJUST
POSITION CAM PLATE ON ROCKER SHAFT WITH MOUNTING SCREWS LOOSENED. POSITION FORWARD EDGE OF CAM PLATE PARALLEL TO SHAFT.

(B) SPACING TRIP LEVER SPRING TENSION

REQUIREMENT
TYPE BOX CLUTCH DISENGAGED.
MIN. 2 1/2 OZS.
MAX. 5 OZS.
TO START LEVER MOVING.

(C) SPACING TRIP LEVER BAIL SPRING TENSION

REQUIREMENT
SPACING TRIP LEVER BAIL AGAINST STOP.
SPACING TRIP LEVER BAIL SPRING UNHOOKED.
MIN. 8 OZS.
MAX. 12 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

FIGURE 1-42  TYPING UNIT, SPACING MECHANISM
FIGS-LTRS SHIFT CODE BAR OPERATING MECHANISM

(1) REQUIREMENT
  With function clutch rotated until clutch disk stop lug is toward bottom of unit, hook figures function pawl over the end of the function bar. Clearance between upper guide plate extension and shift slide.
  Max. 0.020 when play is taken up for maximum.

(2) REQUIREMENT
  With 32 oz. pull applied to function pawl there should be min. 0.002 inch between shoulder of figures function pawl and face of function bar.

(3) REQUIREMENT
  Repeat the procedure for the letters function pawl. Check clearance between lower guide plate extension and shift slide.

To adjust position upper and/or lower guide plate by the adjusting slot with the clamp nuts loosened.

---

ADJUSTING SLOT
FIGURES FUNCTION PAWL
FIGURES SHIFT SLIDE
UPPER GUIDE PLATE EXTENSION
ADJUSTING SLOT
CLAMP NUTS
32 OZ. PULL
FUNCTION PAWL
0.002 INCH
FUNCTION BAR
FUNCTION LEVER
LOWER GUIDE PLATE EXTENSION
LETTERS SHIFT SLIDE
LETTERS FUNCTION PAWL
ADJUSTING SLOT

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-28

FIGURE 1-43 TYPING UNIT, SHIFT CODE BAR OPERATING MECHANISM
(A) FUNCTION RESET BAIL BLADE

(1) REQUIREMENT
FUNCTION AND TYPE BOX CLUTCHES DISENGAGED, FUNCTION PAWLS UNLATCHED. FUNCTION BAR HELD IN MAXIMUM REARWARD POSITION. CLEARANCE BETWEEN FUNCTION BAR AND RESET BAIL BLADE:
MIN. 0.018 INCH  MAX. 0.035 INCH

(B) FUNCTION RESET BAIL SPRING

REQUIREMENT
RESET BAIL SPRINGS IN MINIMUM LENGTH POSITION
MIN. 10 OZS.  MAX. 22 OZS.

TO CHECK
MEASURE CLEARANCE AT BARS LOCATED IN STUNT BOX SLOTS 1, 4, 11, 18, 23, 33, 38 AND 41. IF THERE IS NO BAR IN A DESIGNATED SLOT, USE NEAREST BAR. IF THERE IS A BAR ON EACH SIDE OF A DESIGNATED VACANT SLOT, USE BAR IN HIGHEST NUMBERED SLOT. (NOTE: FACING REAR OF UNIT, SLOTS ARE NUMBERED FROM LEFT TO RIGHT).

TO ADJUST
POSITION BLADE ON RESET BAIL WITH ITS MOUNTING SCREWS FRICTION TIGHT.

(2) REQUIREMENT
FUNCTION PAWL SHOULD OVER TRAVEL FUNCTION BAR BY A MIN. OF 0.002 INCH.

TO CHECK
IF CARRIAGE RETURN LEVER ADJUSTMENT HAS NOT BEEN MADE, ITS CLAMP SCREW SHOULD BE LOOSENED. POSITION FUNCTION CLUTCH SO THAT LUG ON CLUTCH DISK IS TOWARD BOTTOM OF UNIT. STRIPE OFF ANY SELECTED FUNCTION PAWLS. HOLD FUNCTION LEVER IN MAXIMUM REARWARD POSITION (DO NOT PUT OVER 2 LBS. OF TENSION ON LEVER) AND HOLD FUNCTION PAWL TO REAR WITH A TENSION OF 32 OZS. (AS LOAD ON RESET BAIL AFFECTS OVER TRAVEL, DO NOT LATCH MORE THAN ONE PAWL AT A TIME). MEASURE CLEARANCE. REPEAT FOR EACH FUNCTION PAWL ON STUNT BOX.

TO ADJUST
IF NECESSARY, REFINE THE ABOVE ADJUSTMENT WITHIN THE FOLLOWING LIMITS:
MIN. 0.018  MAX. 0.035 INCH

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-29

FIGURE 1-44 TYPING UNIT, RESET BAIL MECHANISM
(A) REVERSING SLIDE
DETENT SPRING
REQUIREMENT
SLIDE IN LEFT HAND POSITION. SCALE
HOOKED IN UPPER RIGHT HAND DETENT NOTCH
MIN. 2 OZS.
MAX. 4-1/2 OZS.
TO START DETENT MOVING

(B) REVERSING SLIDE ADJUSTING STUD
REQUIREMENT
TYPE BOX CLUTCH DISENGAGED.
WITH NO. 3 CODE BAR IN SPACING POSITION (RIGHT), THE REVERSING SLIDE DETENT
ROLLERS SHOULD BE FULLY SEATED IN THE RIGHT-HAND NOTCHES OF THE DETENT LEVER.
WITH NO. 3 CODE BAR IN MARKING POSITION (LEFT), THE REVERSING SLIDE DETENT
ROLLERS SHOULD BE FULLY SEATED IN THE LEFT-HAND NOTCHES OF THE DETENT LEVER.
TO ADJUST
POSITION THE REVERSING SLIDE STUD IN ITS ELONGATED HOLE WITH ITS MOUNTING
NUT LOOSENED.

(C) REVERSING SLIDE BRACKETS
REQUIREMENT
TYPE BOX CLUTCH, CODE BAR CLUTCH, AND FUNCTION
CLUTCH DISENGAGED. REVERSING SLIDE MOVED TO
RIGHT AND LEFT THROUGH ITS FULL TRAVEL. RIGHT
MOTION SHOULD BUCKLE LEFT HORIZONTAL POSITION-
ING DRIVE LINKAGE AND LEFT MOTION SHOULD BUCKLE
RIGHT HORIZONTAL POSITIONING DRIVE LINKAGE.
THE AMOUNT OF BUCKLING IN EACH CASE SHOULD BE
MIN. 0.030 INCH
MAX. 0.045 INCH
MEASURED AT POINT OF MAXIMUM CLEARANCE
TO ADJUST
POSITION EACH REVERSING SLIDE BRACKET WITH THEIR CLAMP SCREWS LOOSENED.

FIGURE 1-45 TYPING UNIT, HORIZONTAL MOTION REVERSING MECHANISM FRONT VIEW
NOTE: THESE ADJUSTMENTS APPLY ONLY TO HORIZONTAL POSITIONING DRIVE MECHANISMS EQUIPPED WITH TORSION SPRINGS.

HORIZONTAL POSITIONING DRIVE LINKAGE REQUIREMENT

TYPE BOX CLUTCH DISENGAGED.

CODE BARS 4 AND 5 TO SPACING (RIGHT).

CLEARANCE BETWEEN EACH SIDE OF CENTER HORIZONTAL STOP SLIDE AND DECELERATING SLIDES, ON SIDE WHERE KNEE LINK IS STRAIGHT SHOULD BE EQUAL (WITHIN 0.008 INCH)

MIN. 0.015 INCH
MAX. 0.040 INCH

TO ADJUST

LOOSEN BEARING STUD MOUNTING SCREWS AND CONNECTING STRIP MOUNTING SCREWS FRICTION TIGHT.
POSITION ONE OR BOTH BEARING STUDS ON THE CONNECTING STRIP TO PROVIDE 0.025 INCH TO 0.035 INCH BETWEEN THE CENTER HORIZONTAL SLIDE AND THE DECELERATING SLIDE ON THE SIDE WHERE THE LINKAGE IS NOT BUCKLED. TIGHTEN THE TWO INNER MOUNTING SCREWS. CHANGE POSITION OF REVERSING SLIDE AND CHECK OPPOSITE CLEARANCE. EQUALIZE BY SHIFTING BOTH STUDS AND CONNECTING STRIP AS A UNIT.
HOLD THE DRIVE LINKAGE HUB AGAINST THE LOWER VERTICAL LINK OF THE DRIVE LINKAGE. TIGHTEN THE TWO OUTER BEARING STUD MOUNTING SCREWS. CHECK THE LINKAGE FOR FREENESS THROUGHOUT A COMPLETE CYCLE.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-30

FIGURE 1-46 TYPING UNIT, HORIZONTAL POSITIONING DRIVE MECHANISM, FRONT VIEW

CHANGE 4
VERTICAL POSITIONING LOCK LEVER

(1) REQUIREMENT
LETTERS COMBINATION SET UP ON CODE BARS. MAIN SIDE OPERATING LEVERS AT UPPER END OF TRAVEL. UPPER NOTCH OF VERTICAL POSITIONING LOCK LEVER FULLY ENGAGED (MANUALLY IF NECESSARY) WITH VERTICAL SLIDE PROJECTION. UPPER SURFACE OF FOLLOWER ARM REAR EXTENSION SHOULD BE MIN. IN CONTACT WITH MAX. 0.004 INCH AWAY FROM INNER EXTENSION OF MAIN SIDE LEVER.

(2) REQUIREMENT
WITH PLAY TAKEN UP BY PULLING UPWARD WITH 8 OZS. TENSION ON TYPE BOX CARRIAGE TRACK, VERTICAL SURFACES MIN. IN CONTACT WITH MAX. 0.012 INCH AWAY FROM EACH OTHER TO ADJUST POSITION RIGHT AND LEFT VERTICAL POSITIONING LOCK LEVERS WITH CLAMP SCREWS LOOSENED.

FIGURE 1-47 TYPING UNIT, VERTICAL POSITIONING MECHANISM, LEFT SIDE VIEW
CLEARANCE BETWEEN LOWER WIRE ROPE AND CARRIAGE RETURN LATCH BAIL POST SHOULD BE AT LEAST 0.006 INCH. WITH THE HORIZONTAL POSITIONING MECHANISM IN ITS LOWEST POSITION, CLEARANCE BETWEEN THE LOWER WIRE ROPE AND THE LEFT HORIZONTAL POSITIONING DRIVE LINKAGE SHOULD BE MIN. 0.030 INCH.

TO ADJUST
RETURN THE PRINTING CARRIAGE TO ITS LEFT HAND POSITION. LOOSEN THE ROPE CLAMP SCREW ONE TURN ONLY. POSITION THE PULLEY BEARING STUDS WITH THEIR MOUNTING SCREWS LOOSENED TO MEET THE REQUIREMENT. MAKE CERTAIN THAT THE ROPE MOVES AROUND ITS CLAMP SCREW TO AN EQUALIZED POSITION. TIGHTEN THE CLAMP SCREW AND MOUNTING SCREWS.
CARRIAGE RETURN SPRING
REQUIREMENT
SPACING DRUM IN ITS RETURNED POSITION. PRINTING TRACK IN LOWER
POSITION TRANSFER SLIDE AND CARRIAGE RETURN LATCH HELD AWAY
MIN. 3 LBS.
MAX. 3 3/4 LBS.
TO START THE SPRING DRUM MOVING.
TO ADJUST
ROTATE THE SPRING DRUM RATCHET WHEEL WITH THE SPRING DRUM
NUT LOOSENED TO INCREASE TENSION. OPERATE ESCAPEMENT LEVER
TO DECREASE IT.

SPACING FEED PAWL RELEASE LINK
SPRING TENSION
REQUIREMENT
MIN. 1/2 OZ.
MAX. 2 1/2 OZS.
TO START SPRING STRETCHING
Carriage Return Latch Bail

Requirement

Carriage fully returned (see Figure 1-53)
Play in carriage return bail taken up to right by holding right side of bail against its retainer. Clearance between carriage return latch bail and carriage return lever.

Min. 0.004 inch
Max. 0.040 inch

To adjust position latch bail plate with clamp screw loosened

Spacing Feed Pawl

Spacing Drum

Carriage Return Lever

Carriage Return Latch Bail

Clamp Screw

Latch Bail Plate

Carriage Return Latch Bail Spring

Figure 1-50 Typing Unit, Carriage Return Mechanism, Front View

1-52 Change 4
CARRIAGE RETURN LEVER — REQUIREMENT (UNITS EQUIPPED WITH ONE-STOP FUNCTION CLUTCH)
CARRIAGE RETURN FUNCTION SET UP ON SELECTOR. MAIN SHAFT ROTATED UNTIL FUNCTION CLUTCH STOP LUG IS TOWARD BOTTOM OF UNIT. CARRIAGE RETURN FUNCTION PAWL HOOKED OVER ITS FUNCTION BAR. SPACING DRUM HELD SO THAT CARRIAGE RETURN LATCH BAIL IS LATCHED. CLEARANCE BETWEEN LATCH BAIL AND CARRIAGE RETURN LEVER. MIN. 0.006 INCH — MAX. 0.035 INCH

CARRIAGE RETURN LEVER — REQUIREMENT (UNITS EQUIPPED WITH TWO-STOP FUNCTION CLUTCH)
SAME EXCEPT MAIN SHAFT SHOULD BE ROTATED UNTIL FUNCTION CLUTCH IS DISENGAGED IN STOP POSITION THAT RESULTS IN LEAST CLEARANCE. TO ADJUST POSITION CARRIAGE RETURN LEVER ON CARRIAGE RETURN BAIL WITH CLAMP SCREW LOOSENED.

FIGURE 1-51 TYPING UNIT, CARRIAGE RETURN MECHANISM
DASH POT VENT SCREW

REQUIREMENT
TYPE BOX CARRIAGE SHOULD RETURN FROM ANY LENGTH OF LINE WITHOUT BOUNCING.

TO CHECK
PRINTER OPERATED AT ANY SPEED FROM AUTOMATIC TRANSMISSION WITH ONE CR AND ONE LF SIGNAL BETWEEN LINES. FIRST CHARACTER OF EACH LINE SHOULD BE PRINTED IN SAME LOCATION AS IF UNIT WAS MANUALLY OPERATED SLOWLY.

TO ADJUST
TURN DOWN VENT SCREW UNTIL SLIGHT PNEUMATIC BOUNCE IS PERCEPTIBLE. BACK OFF SCREW UNTIL EFFECT DISAPPEARS. FOR DASHPOTS WITH ONE VENT HOLE; THEN BACK SCREW OFF 1/4 FULL TURN. TIGHTEN NUT. FOR DASHPOTS WITH TWO VENT HOLES; THEN BACK SCREW OFF 1/4 TURN. TIGHTEN NUT.

TRANSFER SLIDE SPRING TENSION

REQUIREMENT
TRANSFER SLIDE IN EXTREME LEFT POSITION. SPRING UNHOOKED.
MIN. 3 1/2 OZS.
MAX. 4 1/2 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

KEYBOARD LOCK LEVERS SLIDE ARM

KEYBOARD LOCK LEVER SPRING TENSION
(If unit is equipped)

REQUIREMENT (UNIT UPSIDE DOWN)
SCALE APPLIED TO BELL CRANK
MIN. 1/2 OZ.
MAX. 1 1/2 OZ.
TO START KEYBOARD LOCK LEVER MOVING

FIGURE 1-52 TYPING UNIT, DASHPOT AND KEYBOARD LOCK MECHANISMS
PRINTING CARRIAGE POSITION
USE STANDARD ADJUSTMENT
(Figure 1-57)

LEFT MARGIN
(1) REQUIREMENT

TYPE BOX CLUTCH DISENGAGED. SPACING DRUM
IN RETURNED POSITION. TYPE BOX SHIFTED
TO LETTERS POSITION.
CLEARANCE BETWEEN LEFT EDGE OF PLATEN AND
LETTERS PRINT INDICATOR.
MIN. 15/16 INCH  MAX. 1-1/16 INCH

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-31

SPACING DRUM

NOTE: THE MARGIN MAY BE VARIED AS REQUIRED. RANGE OF ADJUSTMENT
IS 0 TO 85 CHARACTERS.
MOUNTING SCREWS.

SPACE SUPPRESSION RING

217B

SPACING CUT-OUT TRANSFER BAIL

RIGHT MARGIN

REQUIREMENT

TYPE BOX CLUTCH DISENGAGED. CARRIAGE IN
POSITION TO PRINT CHARACTER ON WHICH SPACING
CUTOUT IS TO OCCUR. FRONT FEED PAWL FARTHEST
ADVANCED. SPACING CUTOOUT TRANSFER BAIL
HELD IN ITS UPPERMOST POSITION.

CLEARANCE BETWEEN EXTENSION ON SPACE
SUPPRESSION RING AND TRANSFER BAIL

MIN. 0.006 INCH MAX. 0.025 INCH

TO ADJUST

POSITION SPACE SUPPRESSION RING WITH FOUR
INDICATED MOUNTING SCREWS LOOSENED.

NOTE

(1) RANGE OF ADJUSTMENT IS FROM 0 TO 85
CHARACTERS.

(2) ON UNITS EQUIPPED WITH AUTOMATIC CARRIAGE
RETURN - LINE FEED RING, THIS ADJUSTMENT
IS NOT APPLICABLE. (SEE FIGURE 1-71)

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-32

FIGURE 1-54 TYPING UNIT, SPACE SUPPRESSION
DECELERATING SLIDE SPRING TENSION REQUIREMENT
PRINTING BAIL IN DOWNWARD POSITION, PRINTING CARRIAGE AND DECELERATING SLIDE ASSEMBLY IN RIGHT HAND POSITION.
MIN. 1/2 OZ.
MAX. 1 1/2 OZS.
TO START THE SLIDE MOVING.
WITH THE PRINTING CARRIAGE AND DECELERATING SLIDE IN THEIR LEFT HAND POSITION
CHECK THE LEFT HAND DECELERATING SLIDE SPRING

FIGURE 1-55 TYPING UNIT, DECELERATING SLIDE (FRONT VIEW)
Printing Carriage Lower Roller Requirement
- Carriage wire rope clamp screws loosened. Play of carriage on track - min. without bind, throughout tracks full length.
- To adjust (eccentric bushing)
  - Position lower roller with screw nut loosened. Keep high part of eccentric (chamfered corner) toward the right.
  - To adjust (sliding screw)
  - Position lower roller with mounting screw loosened.

Type Box Carriage Roller Arm Spring Requirement
- Min. 28 ozs.
- Max. 36 ozs.
- To start upper roller, nearest type box latch, moving away from carriage track.

NOTE: For earlier design see Figure 4-33

Figure 1-56 Typing Unit, Printing and Type Box Carriage
TYPE BOX IN LETTERS POSITION. M TYPE PALLET SELECTED. TYPE BOX IN PRINTING POSITION. M TYPE PALLET SHOULD BE APPROXIMATELY IN CENTER OF PRINTING HAMMER WHEN HAMMER IS JUST TOUCHING M TYPE PALLET.

TO ADJUST
POSITION PRINTING CARRIAGE ON WIRE ROPE WITH CLAMP SCREWS LOOSENED.

TYPE BOX AT MIDPOINT OF PLATEN AND IN POSITION TO PRINT PERIOD. PRINTING HAMMER IN CONTACT WITH TYPE PALLET AND PRESSED DOWNWARD AT BEARING POST. FACE OF HAMMER SHOULD BE FULLY ON END OF TYPE PALLET.

TO ADJUST
ADD OR REMOVE SHIMS BETWEEN SHOULDER ON BEARING POST AND STOP BRACKET.
(A) SHIFT LINKAGE
REQUIREMENT
CARRIAGE NEAR MIDPOINT OF PLATEN. TYPE BOX IN POSITION TO PRINT M. MANUALLY BUCKLE RIGHT SHIFT LINKAGE. SHIFT TYPE BOX TO LEFT.
PERIOD TYPE PALLET SHOULD BE APPROXIMATELY IN CENTER OF PRINT HAMMER WHEN HAMMER IS JUST TOUCHING PERIOD TYPE PALLET TO ADJUST

POSITION LEFT SHIFT LINKAGE ON OSCILLATOR RAIL WITH TWO CLAMP SCREWS LOOSENED

TO RECHECK
SHIFT ALTERNATELY FROM M TO PERIOD. TAKE UP PLAY IN EACH DIRECTION. REFINE ADJUSTMENT IF NECESSARY.

NOTE: FOR SHIFT MECHANISMS WITH TORSION SPRINGS SEE FIGURE 4-34

(FRONT VIEW)

RIGHT SHIFT LINKAGE

SHIFT LINKAGE SPRING

(B) SHIFT LINKAGE SPRING TENSION
REQUIREMENT
LINK IN STRAIGHT POSITION
MIN. 7 OZS.
MAX. 14 OZS.
TO START EACH LINK MOVING.

NOTE: FOR SHIFT MECHANISMS WITH TORSION SPRINGS SEE FIGURE 4-34

FIGURE 1-58 TYPING UNIT, SHIFT MECHANISM
(A) PRINTING TRACK REQUIREMENT

PRINTING TRACK IN ITS EXTREME DOWNWARD POSITION. BLANK SELECTION IN FIGURES.
PRINTING HAMMER OPERATING BAIL LATCHING EXTENSION HELD WITH LEFT FACE IN LINE
WITH THE LATCH SHOULDER. PRINTING ARM SLIDE POSITIONED ALTERNATELY OVER EACH
TRACK MOUNTING SCREW. PRINTING BAIL RESET EACH TIME. CLEARANCE BETWEEN LATCHING
EXTENSION AND OPERATING BAIL LATCH SHOULD BE
MIN. 0.015 INCH
MAX. 0.040 INCH

TO ADJUST
POSITION THE PRINTING TRACK UP OR DOWN WITH ITS MOUNTING SCREWS LOOSENED.

(B) PRINTING HAMMER PLUNGER SPRING REQUIREMENT

MIN. 3 OZS.
MAX. 5 3/4 OZS.
TO START PLUNGER MOVING.

(C) PRINTING HAMMER OPERATING BAIL SPRING TENSION (NOT AS ILLUSTRATED) REQUIREMENT

OPERATING BAIL LATCHED.
SPRING ADJUSTING BRACKET IN LEFT-
HAND NOTCH. HAMMER YIELD SPRING
UNHOOKED.
MIN. 10 OZS.
MAX. 13 OZS.
TO START BAIL MOVING.

(D) PRINTING HAMMER YIELD SPRING TENSION REQUIREMENT

PRINTING HAMMER OPERATING BAIL AGAINST ITS STOP.
MIN. 1 OZ.
MAX. 2 1/2 OZS.
TO START HAMMER BAIL MOVING
(HORIZONTAL POSITION).

(E) PRINTING HAMMER OPERATING BAIL LATCH SPRING TENSION (NOT AS ILLUSTRATED) REQUIREMENT

PRINTING TRACK IN ITS EXTREME UPWARD
POSITION.
MIN. 3 OZS.
MAX. 4 1/2 OZS.
TO START LATCH MOVING.

FIGURE 1-59 TYPING UNIT, PRINTING MECHANISM
PRINTING HAMMER STOP BRACKET

REQUIREMENT

TYPE BOX IN POSITION TO PRINT M PRINTING TRACK IN ITS MAXIMUM DOWNWARD POSITION. PRINTING HAMMER STOP BRACKET HELD TOWARD THE PLATEN WITH 8 OZS. OF PRESSURE. CLEARANCE BETWEEN PRINTING HAMMER AND M TYPE PALLET MIN. 0.005 INCH MAX. 0.035 INCH CHECK AT BOTH ENDS OF PLATEN.

TO ADJUST POSITION STOP BRACKET BY MEANS OF ITS MOUNTING SCREW

NOTE

THE PRINTING ARM ADJUSTMENT SHOULD ALWAYS BE MADE WITH THE PRINTING HAMMER OPERATING BAIL SPRING BRACKET IN THE NO. 1 POSITION. POSITIONS NO. 2 AND 3 ARE TO BE USED ONLY FOR MAKING MULTIPLE COPIES.

FIGURE 1-60 TYPING UNIT, PRINTING MECHANISM
NOTE: THIS ADJUSTMENT APPLIES ONLY TO UNITS SO EQUIPPED AND SHOULD BE MADE WITH THE TYPEBOX IN ITS UPPER POSITION.

TYPE BOX ALIGNMENT
REQUIREMENT
PRINTED IMPRESSION OF CHARACTERS AT TOP AND AT BOTTOM SHOULD BE EQUAL. (GAUGE VISUALLY)

TO ADJUST
LOOSE NUT. OPERATE PRINTER UNDER POWER. REPEAT CHARACTERS E AND Z. TURN ADJUSTING SCREW IN OR OUT (IN STEPS OF 1/4 TURN) TO MEET REQUIREMENT. TIGHTEN NUT.

NOTE: SOME TYPING UNITS ARE EQUIPPED WITH A RIBBON GUIDE WHICH HAS A TYPE BOX RETAINING CLIP WITH A LIMITED YIELD. IN CASES WHERE IT IS NECESSARY TO BACK THE ADJUSTING SCREW OUT TO PROVIDE HEAVIER PRINTING AT THE TOP OF A CHARACTER, IT MAY BE NECESSARY TO BEND THE SPRING CLIP ON THE RIBBON GUIDE TOWARD THE FRONT SO THAT THE TAB AT THE BOTTOM OF THE TYPE BOX IS HELD AGAINST THE HEAD OF THE ADJUSTING SCREW.

FIGURE 1-61 TYPING UNIT, TYPE BOX

CHANGE 4
RIBBON REVERSING LEVER - RIGHT
RIBBON REVERSING LEVER - LEFT

RIBBON REVERSE SHAFT

(A) RIBBON REVERSE SPUR GEAR REQUIREMENT
WHEN RIGHT REVERSING LEVER IS IN MAXIMUM DOWNWARD POSITION, THE LEFT REVERSING LEVER SHOULD BE IN ITS MAXIMUM UPWARD POSITION.
TO ADJUST
LOOSEN THE SET SCREWS IN THE DETENT CAM. LOOSEN THE LEFT SPUR GEAR NUT. SECURELY TIGHTEN THE RIGHT SPUR GEAR NUT. MOVE THE RIGHT REVERSING LEVER TO ITS MAXIMUM DOWNWARD POSITION AND HOLD LEFT REVERSING LEVER IN ITS MAXIMUM UPWARD POSITION. THEN TIGHTEN THE LEFT SPUR GEAR NUT.

(B) RIBBON REVERSE DETENT

REQUIREMENT
RIBBON REVERSE DETENT LINK BUCKLED IN ITS DOWNWARD POSITION, CLEARANCE BETWEEN DETENT LINK AND DETENT LEVER
MIN. SOME - MAX. 0.040 INCH
WHEN PLAY IN THE LEVER IS TAKEN UP LIGHTLY TOWARD THE RIGHT SIDE OF THE PRINTER.
TO ADJUST
HOLD LEFT RIBBON REVERSING LEVER IN ITS DOWNWARD POSITION, POSITION DETENT LINK, AND TIGHTEN THE UPPER SET SCREW IN THE HUB OF THE DETENT LINK. BUCKLE THE DETENT LINK UPWARD AND TIGHTEN LOWER SET SCREW.

(C) RIBBON REVERSE DETENT LEVER SPRING TENSION
(IF UNIT IS EQUIPPED)
REQUIREMENT
DETENT LINK BUCKLED IN UPWARD POSITION
MIN. 10 OZS.
MAX. 18 OZS.
TO START DETENT LEVER MOVING TOWARD REAR.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-36

FIGURE 1-62 TYPING UNIT, RIBBON REVERSE MECHANISM
RIBBON FEED LEVER BRACKET

(1) REQUIREMENT (LEFT-HAND MECHANISM)

LEFT REVERSING LEVER IN UPWARD POSITION.
RIBBON MECHANISM IN UPPER POSITION.
RATCHET WHEEL HELD AGAINST THE DETENT LEVER.
CLEARANCE BETWEEN THE FRONT FACE OF THE FEED LEVER AND THE SHOULDER OF A TOOTH ON THE RATCHET WHEEL
MIN. 0.020 INCH
MAX. 0.030 INCH

TO ADJUST
POSITION THE FEED LEVER BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

RIBBON REVERSING LEVER–LEFT

RIBBON FEED LEVER SPRING TENSION

REQUIREMENT
RIBBON FEED LEVERS IN UPPERMOST POSITION. FOR LONG LEVER: PUSH DOWNWARD NEAR ITS SPRING. FOR SHORT LEVER: PUSH DOWNWARD AT POINT NEAR LONG LEVER SPRING.
MIN. 3/4 OZ.
MAX. 2 OZS.
TO START FEED LEVERS MOVING.
MEASURE ALL FOUR PAWLS.
NOTE: IF MINIMUM REQUIREMENT OF SHORT LEVER IS NOT MET, PULL LOWER END OF TORSION SPRING TO REAR.

RIBBON RATCHET WHEEL FRICITION

SPRING TENSION

REQUIREMENT
FEED LEVERS DISENGAGED.
MIN. 3 OZS.
MAX. 7 1/2 OZS.
TO START THE RATCHET WHEEL MOVING.

FIGURE 1-63  TYPING UNIT, RIBBON FEED MECHANISM, LEFT SIDE VIEW

CHANGE 4
**RIBBON LEVER SPRING TENSION**

**REQUIREMENT**

MIN. 1 1/2 OZS.  
MAX. 3 OZS.  
TO START THE LEVER MOVING. CHECK BOTH RIGHT AND LEFT SPRINGS.
FUNCTION LEVER SPRING TENSION

NOTE: IF A FUNCTION LEVER OPERATES A CONTACT OR A SLIDE, HOLD OFF THE CONTACT OR SLIDE WHEN CHECKING THE SPRING TENSION REQUIREMENT
- FUNCTION LEVER IN UNOPERATED POSITION.
- SUPPRESSION BAIL HELD FORWARD.
- MIN. 1 1/2 OZS.
- MAX. 2 3/4 OZS.
- TO START FUNCTION LEVER MOVING, CHECK EACH SPRING.

FUNCTION PAWL SPRING TENSION

REAR END OF FUNCTION PAWL RESTING ON FUNCTION BAR ONE STOP FUNCTION CLUTCH UNITS:
- MIN. 3 OZS.
- MAX. 5 OZS.
TWO STOP FUNCTION CLUTCH UNITS:
- MIN. 7 OZS.
- MAX. 10 1/2 OZS.
- TO START PAWL MOVING, CHECK EACH SPRING.

FUNCTION BAR SPRING TENSION

FUNCTION CLUTCH DISENGAGED.
FUNCTION PAWL HELD AWAY.
- MIN. 2 1/2 OZS.
- MAX. 3 1/2 OZS.
- TO START FUNCTION BAR MOVING.

CAUTION: SEVERE WEAR TO THE POINT OF OPERATIONAL FAILURE WILL RESULT IF THE TELETYPEWRITER IS OPERATED WITHOUT EACH FUNCTION PAWL HAVING EITHER A RELATED FUNCTION BAR OR, WHERE A FUNCTION BAR IS MISSING, A RELATED FUNCTION PAWL CLIP TO HOLD THE FUNCTION PAWL AWAY FROM THE STRIPPER BLADE.

FIGURE 1-65 TYPING UNIT, STUNT BOX MECHANISM
LEFT-HAND POSITION

CENTER POSITION

RIGHT-HAND POSITION

(FRONT TOP VIEW)

FUNCTION PAWL

FUNCTION LEVER

CLIP

STUNT BOX CLIP (FOR UNITS EQUIPPED WITH CLIPS ONLY)

(1) REQUIREMENT (RIGHT-HAND POSITION)
   THE CLIP SHOULD NOT PREVENT THE ASSOCIATED
   FUNCTION PAWL FROM ENGAGING ITS FUNCTION BAR.
   TO ADJUST
   POSITION THE CLIP TO ITS EXTREME RIGHT-HAND POSITION

(2) REQUIREMENT (CENTER POSITION)
   THE CLIP SHOULD HOLD THE FUNCTION PAWL OUT OF
   ENGAGEMENT WITH ITS FUNCTION BAR BUT SHOULD NOT
   INTERFERE WITH THE FUNCTION LEVER.
   TO ADJUST
   POSITION THE CLIP WITH ITS MOUNTING SCREW LOOSENED.

(3) REQUIREMENT (LEFT-HAND POSITION)
   THE CLIP SHOULD HOLD THE FUNCTION PAWL UPWARD OUT OF
   ENGAGEMENT WITH ITS FUNCTION BAR. IT SHOULD ALSO HOLD THE
   TOP END OF THE FUNCTION LEVER IN ITS REAR POSITION.
   TO ADJUST
   POSITION THE CLIP TO ITS EXTREME LEFT-HAND POSITION.

(RIGHT SIDE VIEW)

FUNCTION BAR

FIGURE 1-66 TYPING UNIT, STUNT BOX MECHANISM
PLATEN DETENT BAIL SPRING TENSION
REQUIREMENT
DETENT SEATED BETWEEN TWO TEETH ON LINE FEED SPUR GEAR.
MIN. 16 OZS.
MAX. 32 OZS.
TO START DETENT BAIL MOVING.

DETENT ECCENTRIC
DETENT STUD

LINE FEED BAR BELL CRANK SPRING TENSION
REQUIREMENT
LEFT-HAND LINE FEED BAR IN REAR POSITION.
MIN. 19 OZS.
MAX. 24 OZS.
TO START BAR MOVING.

HAND WHEEL
LINE FEED BAR RELEASE LEVER

LINE FEED BAR
LINE FEED SPUR GEAR

FIGURE 1-67 TYPING UNIT, LINE FEED MECHANISM, RIGHT SIDE
STRIPPER BLADE DRIVE CAM POSITION

REQUIREMENT

STRIPPER BLADE DRIVE CAM SHOULD MOVE EACH STRIPPER BLADE CAM ARM AN EQUAL DISTANCE ABOVE AND BELOW CENTER LINE OF ITS PIVOT (GAUGE BY EYE)

A. UPWARD DIRECTION

B. DOWNWARD DIRECTION

TO CHECK

WITH FUNCTION CLUTCH DISENGAGED OBSERVE ENGAGEMENT OF STRIPPER BLADE DRIVE CAM (UPPER PEAK) WITH STRIPPER BLADE CAM ARM. THEN ROTATE CLUTCH TO TURN CAM TO ITS EXTREME DOWNWARD POSITION AND OBSERVE ENGAGEMENT OF LOWER CAM PEAK.

TO ADJUST

WITH STRIPPER BLADE DRIVE ARM MOUNTING SCREWS LOOSENED, EQUALIZE THE OVERTRAVEL OF EACH CAM PEAK.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-37

FIGURE 1-68 TYPING UNIT, FUNCTION PAWL STRIPPER
SPACING SUPPRESSION BAIL SPRING TENSION REQUIREMENT
SPACING SUPPRESSION BAIL IN REAR POSITION. SCALE APPLIED NEAR CENTER OF HORIZONTAL PORTION OF BAIL.
MIN. 1/2 OZ.
MAX. 1 1/2 OZS.
TO START BAIL MOVING.

FUNCTION BAR

STRIPPER BLADE

LINE FEED STRIPPER BAIL SPRING TENSION REQUIREMENT
LINE FEED CLUTCH DISENGAGED. SCALE HOOKED UNDER LINE FEED STRIPPER BAIL.
MIN. 1/2 OZ.
MAX. 2 OZS.
TO START STRIPPER BAIL MOVING UPWARD.

FIGURE 1-69. TYPING UNIT, SPACING SUPPRESSION AND FUNCTION PAWL STRIPPER MECHANISMS
**SINGLE-DUPLICATE LINE FEED LEVER**

**SINGLE - DOUBLE LINE FEED STRIPPER BAIL ASSEMBLY SPRINGS**

1. **REQUIREMENT**
   - LINE FEED CLUTCH DISENGAGED AND SINGLE - DOUBLE LINE FEED LEVER IN SINGLE LINE FEED POSITION.
   - MIN. 1/2 OZ.
   - MAX. 2 OZS.
   - TO START STRIPPER BAIL ARM MOVING UPWARD.

2. **REQUIREMENT**
   - LINE FEED CLUTCH DISENGAGED AND SINGLE - DOUBLE LINE FEED LEVER IN DOUBLE LINE FEED POSITION
   - MIN. 1/2 OZ.
   - MAX. 2 OZS.
   - TO START ARM MOVING TO LEFT.

**NOTE:** FOR EARLIER DESIGN SEE FIGURE 4-39

**FIGURE 1-70** TYPING UNIT, SINGLE-DUPLICATE LINE FEED MECHANISM.
RIGHT MARGIN WITH

AUTOMATIC CARRIAGE RETURN-LINE FEED RING

REQUIREMENT

TYPE BOX CLUTCH DIENGAGED. CARRIAGE
POSITIONED TWO SPACES BEFORE CHARACTER
ON WHICH AUTOMATIC CARRIAGE RETURN-LINE
FEED IS TO OCCUR. FRONT FEED PAWL FARTHEST
ADVANCED.

CLEARANCE BETWEEN EXTENSION ON RING
AND AUTOMATIC CARRIAGE RETURN - LINE FEED
BELL CRANK.

MIN. 0.040 INCH——MAX. 0.055 INCH

TO ADJUST

POSITION RING WITH FOUR INDICATED
MOUNTING SCREWS LOOSENED

NOTE

RANGE OF LINE ADJUSTMENT IS FROM
0 TO 85 CHARACTERS.

NOTE: FOR ADJUSTMENT ON EARLIER MODELS SEE FIGURE 4-38

FIGURE 1-71 TYPING UNIT, AUTOMATIC CARRIAGE RETURN-LINE FEED MECHANISM
HORIZONTAL STOP SLIDE SPRING TENSION REQUIREMENT

- Code bars in marking position (left)
- Type box clutch rotated 1/4 turn from its stop position
- Horizontal motion decelerating slides (Fig. 1-46) held away from horizontal stop slides
- Min. 1/2 oz., max. 1 1/2 ozs. for upper and lower slides
- Min. 1 3/4 ozs., max. 3 ozs. for middle slide

To start slide moving:
- Note: When checking upper and lower slides, hold middle slide 1/32 inch forward.

**Figure 1-72 Typing Unit, Horizontal Motion Stop**

**Paper Straightener Collar - Left**

**Paper Straightener Collar - Right**

**Paper Straightener Shaft**

**Paper Straightener Lever Spring Requirement**

- Min. 1 1/2 ozs.
- Max. 4 ozs.

To start the lever moving:

**Figure 1-73 Typing Unit, Paper Mechanism**

1-74 Change 4
PAPER FINGER SHAFT

PAPER FINGER

PAPER

PAPER FINGER ADJUSTMENT

REQUIREMENT

THE PRESSURE END OF THE PAPER FINGERS SHOULD OVERLAP THE PAPER FROM 3/8 INCH TO 1/2 INCH.

TO ADJUST

POSITION THE PAPER FINGERS BY SLIDING THEM ON THEIR SHAFT.

PAPER FINGER SPRING TENSION

REQUIREMENT

PULL UPWARD ON RIGHT PAPER FINGER TO START LEFT PAPER FINGER MOVING FROM PLATEN.

MIN. 3 OZS.

MAX. 6 OZS.

NOTE: FOR SPROCKET FEED MECHANISM SEE SECTION 2

PRESSURE ROLLER

PRESSURE ROLLER LEVER

COMPRESSION SPRING

PRESSURE ROLLER LEVER SPRING

REQUIREMENT

MIN. 28 OZS

MAX. 36 OZS.

TO START EACH CENTER LEVER MOVING ALTERNATELY

PAPER PRESSURE BAIL SPRING TENSION

REQUIREMENT

SCALE HOOKED OVER PRESSURE BAIL AT EACH END OF PLATEN.

MIN. 10 OZS.

MAX. 20 OZS.

TO MOVE PRESSURE BAIL FROM PLATEN

FIGURE 1-74 PAPER MECHANISM

CHANGE 4
NOTE: FOR EARLIER DESIGN SEE FIGURE 4-40 AND 4-41

FUNCTION CONTACT SPRING

REQUIREMENT

CONTACT CLOSED

MIN. 1 OZ.

MAX. 2 OZS.

TO OPEN SWITCH CONTACT

CAUTION: CARE SHOULD BE EXERCISED IN SOLDERING TO CONTACT SPRINGS SINCE EXCESSIVE HEAT WILL ANNEAL THE SPRINGS. CONTACT SPRINGS ONCE SOLDERED SHOULD NOT BE USED AGAIN. TO REPLACE A SPRING, REMOVE THE TWO SCREWS WHICH MOUNT THE SWITCH ASSEMBLY TO THE STUNT BOX. CLEAN SOLDER FROM SPRING. COMPRESS LOOP OF SPRING AND REMOVE FROM TERMINAL PLATE. PLACE NEW SPRING IN TERMINAL PLATE AND SNAP INTO PLACE. REPLACE TERMINAL PLATE. RESOLDER CABLE. DO NOT OVERHEAT.

NOTE: BEFORE TIGHTENING TERMINAL PLATE SCREWS PROVIDE A MINIMUM OF 0.006 INCH CLEARANCE HERE. APPLY GREASE TO INSULATOR AND LEVER.

FIGURE 1-75 TYPING UNIT, FUNCTION CONTACTS
DISABLING SCREW

FUNCTION LEVER

FUNCTION PAWL

FUNCTION BAR

UNSHIFT-ON-SPACE FUNCTION PAWL

(1) REQUIREMENT
TO PREVENT UNSHIFT-ON-SPACE FUNCTION, PROVIDE CLEARANCE BETWEEN THE LOWER EDGE OF THE UNSHIFT-ON-SPACE FUNCTION PAWL AND ITS FUNCTION BAR.
MIN. 0.015 INCH
MAX. 0.060 INCH
TO ADJUST
LOOSEN THE LOCK NUT AND TURN THE DISABLING SCREW IN.

(2) REQUIREMENT
TO RESTORE THE UNSHIFT-ON-SPACE FUNCTION, BACK OFF THE SCREW SO THAT PAWL FULLY ENGAGES THE FUNCTION BAR. THEN CONTINUE TO TURN THE SCREW OUT ONE TO THREE TURNS.

FIGURE 1-76  TYPING UNIT, UNSHIFT-ON-SPACE MECHANISM, LEFT SIDE VIEW
CODE BAR DETENT
REQUIREMENT
FRONT PLATE REMOVED. ALL CLUTCHES DISENGAGED,
SUPPRESSION AND SHIFT CODE BARS SHOULD
DETENT EQUALLY (GAUGED BY EYE)
TO ADJUST
EQUALIZE THE DETENTING OF THE CODE BARS
BY ADDING OR REMOVING SHIMS BETWEEN
THE CASTING AND THE CODE BAR BRACKET.

NOTE
UNLESS THERE IS REASON TO BELIEVE THAT THESE
SPRINGS ARE CAUSING OPERATING FAILURE DO NOT
CHECK THIS REQUIREMENT.

REQUIREMENT
CODE BAR DETENT BRACKET CAREFULLY REMOVED
AND CODE BARS REMOVED FROM DETENT
BRACKET. SCALE APPLIED TO DETENT BALL AND
PULLED IN DIRECTION OF BALL TRAVEL
MIN.  1 1/2 OZS.
MAX.  3 1/2 OZS.
TO START BALL MOVING AGAINST COMPRESSION
OF SPRING. CHECK EACH BALL

SELECTOR CLUTCH, CODE BAR CLUTCH, AND TYPE BOX
CLUTCH DISENGAGED. NO. 1 CODE BAR IN SPACING
POSITION
MIN.  12 OZS.
MAX.  23 OZS.
TO START CODE BAR SHIFT BAR PIVOT MOVING AWAY
FROM CODE BAR. CHECK NO. 2 AND COMMON CODE
BAR SHIFT BAR IN THE SAME MANNER.

FIGURE 1-77 TYPING UNIT, CODE BAR DETENT MECHANISM
MARGIN INDICATOR LAMP

REQUIREMENT

OPERATING UNDER POWER, THE LAMP SHOULD LIGHT ON THE DESIRED CHARACTER.

TO ADJUST

SET THE TYPE BOX CARRIAGE TO PRINT THE DESIRED CHARACTER AND POSITION THE CAM DISK COUNTERCLOCKWISE ON THE SPRING DRUM WITH ITS THREE MOUNTING SCREWS LOOSENED SO THAT THE SWITCH JUST OPENS.
5. MOTORS

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. Avoid repeated depression.

SYNCHRONOUS MOTOR POSITIONING

FIGURE 1-79 SYNCHRONOUS MOTOR

GOVERNED MOTOR POSITIONING

FIGURE 1-80 GOVERNED MOTOR

A. GOVERNOR CONTACT

Requirement

The contacts should meet squarely and not overlap more than 0.010 inch.

To adjust

Position the stationary contact and contact arm with the clamp screw and post loosened.

B. GOVERNOR CONTACT BACKSTOP

Requirement

Clearance between the movable contact arm and its eccentric backstop.

Min. 0.030 inch
Max. 0.050 inch

To adjust

Rotate the eccentric backstop with clamping screw loosened.
GOVERNED MOTOR SPEED ADJUSTMENT

REQUIRED

WITH THE TARGET ILLUMINATED AND VIEWED THROUGH THE VIBRATING SHUTTERS OF A 120 VPS TUNING FORK, THE SPOTS SHOULD APPEAR STATIONARY WHILE ROTATING.

TO ADJUST

STOP THE MOTOR AND TURN THE ADJUSTING SCREW AS INDICATED ON THE GOVERNOR COVER.

NOTE

IT IS POSSIBLE TO ADJUST THE MOTOR AT SOME MULTIPLE OF THE CORRECT SPEED. TO CHECK FOR CORRECT SPEED, HAVE THE TYPE BOX CARRIAGE AT THE LEFT MARGIN, SET UP ANY CHARACTER ON THE SELECTOR AND MANUALLY TRIP THE TYPE BOX CLUTCH TRIP LEVER. IF THE UNIT IS EQUIPPED WITH GEAR FOR 60 SPEED OPERATION, IT SHOULD PRINT 70 CHARACTERS IN 10 SECONDS; WITH 75 SPEED GEARS – 44 CHARACTERS IN 5 SECONDS; WITH 100 SPEED GEARS – 57 CHARACTERS IN 5 SECONDS.

FIGURE 1-81 MOTOR GOVERNOR BRUSH AND MOTOR SPEED.
6. CABINET

(A) ARMATURE SPRING TENSION
REQUIREMENT
MIN. 1/2 OZ.  
MAX. 1 OZ.  
TO PUSH THE ARMATURE AGAINST THE CORE (VERTICALLY)

(B) REMOTE SIGNAL BELL
REQUIREMENT
ARMATURE HELD AGAINST THE MAGNET CORE.  
CLEARANCE BETWEEN THE ARMATURE BALL AND THE BELL.  
MIN. 0.020 INCH  
MAX. 0.030 INCH  
TO ADJUST  
BEND THE ARMATURE EXTENSION JUST BELOW THE ARMATURE SPRING.

(C) CRADLE
REQUIREMENT
TOP OF HINGE BRACKET PARALLEL TO TOP OF HINGE BAR.  
TO ADJUST  
TURN STOP SCREW WITH LOCK NUT LOOSENED.

STOP SCREW  
LOCK NUT

FIGURE 1-82 REMOTE SIGNAL BELL AND CRADLE
NOTE: THE FOLLOWING ADJUSTMENTS ARE MADE AT THE FACTORY AND SHOULD NOT BE DISTURBED UNLESS THERE IS REASON TO BELIEVE THAT THE PARTS ARE OUT OF ADJUSTMENT OR HAVE BEEN DISASSEMBLED.

(A) DOME

(1) REQUIREMENT

THE DOME SHOULD BE CENTERED ON THE CABINET FROM RIGHT TO LEFT AND PLACED MIN. 3/16 INCH MAX. 1/4 INCH FROM THE FRONT EDGE OF THE CABINET.

TO ADJUST

POSITION THE DOME WITH THE SIX NUTS WHICH SECURE THE DOME HINGES TO THE DOME LOOSENED. TIGHTEN THE NUTS.

(2) REQUIREMENT


TO ADJUST

POSITION THE DOME DOWNWARD WITH THE SIX NUTS, WHICH SECURE THE DOME HINGES TO THE CABINET LOOSENED. TIGHTEN THE NUTS.

(B) DOME CATCH

(1) REQUIREMENT


(2) REQUIREMENT

THE DOME CATCH SHOULD UN-LATCH WHEN THE CATCH BUTTON IS DEPRESSED NO DEEPER THAN THE OUTER SURFACE OF THE DOME.

TO ADJUST

BEND THE TWO DOME CATCHES.

(C) SMALL DOOR CATCH

(1) REQUIREMENT

THE SMALL DOOR SHOULD SECURELY LATCH.

(2) REQUIREMENT

WHEN THE DOOR IS RELEASED FROM ITS CATCH IT SHOULD SPRING OPEN AT LEAST 1/2 INCH.

TO ADJUST

BEND THE SMALL DOOR CATCH. RECHECK REAR OF DOOR TO MAKE CERTAIN IT IS FLUSH WITH OR SLIGHTLY ABOVE THE DOME.
HINGE EXTENSION

SMALL DOOR REQUIREMENT

The small door should be centered from right to left. It should be positioned so as to provide a light tight seal between the rubber gasket and the ledge of the dome at all points.

To adjust:
- Loosen the two nuts that secure detent bracket to dome bracket.
- Loosen the two nuts that secure detent arm to hinge extension.
- Loosen the four nuts that secure door hinges to dome bracket.
- Push hinges against dome bracket and tighten the four nuts that secure hinges to dome bracket.
- Loosen the three nuts that secure hinge extension to door.
- Slide door to its extreme forward position and centrally from side to side.
- Tighten the three nuts that secure hinge extension to door.
- Loosen the three nuts that secure hinge extension to door.
- Close door and slide it toward rear to provide a light tight seal at front corners of door.
- Tighten the three nuts that secure hinge extension to door.

DETENT ARM AND DETENT BRACKET

(1) REQUIREMENT

The detent arm should be horizontally in line with the upper edges of the two hinges.

To adjust:
- Position the arm and tighten the two nuts.

(2) REQUIREMENT

With the dome in fully raised position and the small door latch button depressed, the small door should not open beyond its detent. With the dome closed, the small door should spring open at least 1/2 inch when released from its catch.

To adjust:
- Position the detent bracket and tighten the two nuts. If necessary reposition the detent arm.
- Recheck all nuts for tightness.

COUNTERBALANCE

Requirement

The dome should remain in its maximum open position and not close unless moved manually.

To adjust:
- Turn the spring adjusting screw. (Figure 1-83)
(A) 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 mounting screws or nuts from the line guide shaft and turn the shaft. Remount the shaft and tighten screws or nuts.

(B) WINDOW AND PAPER GUIDE

(For sprocket feed units see section 2)

(1) REQUIREMENT
The paper guide on small door should clear the window when the door is opened or closed.
Min. 0.060 inch Max. 0.080 inch

To adjust:
Position window with its retainer screws loosened.

(2) REQUIREMENT
With small door closed, the bottom edge of the paper guide should be min. 7/64 inch max. 9/64 inch below bottom surface of window.

To adjust:
Position the paper guide with its mounting screws loosened.

(C) INDICATOR LAMP

REQUIREMENT
Clearance between indicator lamp and lens - approximately 1/16 inch

To adjust:
Position lamp holder on its bracket with mounting screws loosened.

(D) COPY LAMP

REQUIREMENT
Clearance between copy lamp and cover approximately 1/16 inch

To adjust:
Position lamp holder on its bracket with its mounting nut loosened.
7. ELECTRICAL SERVICE UNIT

(A) STOP ARMATURE SPRING TENSION REQUIREMENT
STOP ARMATURE LATCHED ON START ARMATURE. STOP ARMATURE SPRING UNHOOKED
MIN. 4 1/2 OZS.
MAX. 6 OZS.
TO PULL SPRING TO INSTALLED LENGTH

(B) INTERMEDIATE LEVER SPRING TENSION REQUIREMENT
WITH THE STOP AND START ARMATURES HELD AGAINST THEIR CORES, APPLY A GRAM SCALE TO THE UNDER SIDE OF THE INTERMEDIATE LEVER JUST TO THE RIGHT OF ITS DOWNWARD EXTENSION AND PUSH UPWARD
MIN. 10 GRAMS
MAX. 20 GRAMS
TO START THE LEVER MOVING UPWARD.

(C) START ARMATURE SPRING TENSION REQUIREMENT
STOP ARMATURE IN ATTRACTED POSITION. INTERMEDIATE LEVER HELD UPWARD. 8 OZ SCALE APPLIED TO START ARMATURE AT RIGHT OF INTERMEDIATE LEVER LOWER EXTENSION
MIN. 2 1/2 OZS.
MAX. 4 OZS.
TO HOLD START ARMATURE AGAINST CORES.

(D) START MAGNET CORE REQUIREMENT
STOP ARMATURE IN UNATTRACTED POSITION. CLEARANCE BETWEEN THE START MAGNET CORE AND ANTI-FREEZE RIVET ON THE START ARMATURE.

<table>
<thead>
<tr>
<th>ARMATURE</th>
<th>151409</th>
<th>152849</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN.</td>
<td>0.003 INCH</td>
<td>0.010 INCH</td>
</tr>
<tr>
<td>MAX.</td>
<td>0.006 INCH</td>
<td>0.015 INCH</td>
</tr>
</tbody>
</table>

TO ADJUST
ADVANCE OR RETARD THE START MAGNET CORES WITH SCREWDRIVER (LOCK NUT LOOSENED).

FIGURE 1-86 MOTOR CONTROL ASSEMBLY

CHANGE 4
8. PAPER AND RIBBON

a. To replenish the supply of friction feed paper, open the dome of the cabinet, move the paper release lever on the Typing Unit toward the rear, slide one of the spindle retainers toward the rear and remove the paper spindle. Insert the spindle in a fresh roll of paper and remount it so that the paper unwinds from underneath. Feed the paper over the paper straightener shaft (Figure 1-85) and fold the end of the paper backward to square it off. With the paper release lever toward the rear, start the paper feeding around the platen and then restore the release lever to its forward position. Depress the line feed wheel and continue to feed the paper upward. Do not disturb the ribbon. Make certain that the paper passes under the paper fingers which may be raised temporarily to facilitate the operation. It may be necessary to operate the release lever momentarily when finally straightening the paper.

*b. The Sprocket feed typing unit is capable of handling as many as 12 copies of stapled continuous form stationery or as many as 6 copies of unstapled form stationery. For stapled stationery, place the form supply box on the floor behind the cabinet or on the shelf provided in the 152349 paper supply box and form-accumulating shelf. For unstapled stationery, place the form supply box on a platform not more than 18 inches below the paper admission slot or on the shelf provided in the 159349 paper supply box and form-accumulating shelf.

c. To replace the ribbon, open the dome of the cabinet, raise the toggles on the ribbon spool shafts (Figure 1-86) to the vertical position and remove both spools. Engage the hook that is on the end of the new ribbon in the hub of the empty spool. Wind a few turns of the ribbon onto the empty spool to make sure that the reversing eyelet has been wound upon the spool. Place the spools on the ribbon spool shafts in such a manner that the ribbon feeds from the rear of each spool without twisting. Turn each spool shaft slightly until the driving pins on the spool shafts engage the holes in the spools. Thread the ribbon forward around both ribbon rollers, through the slots in the ribbon reverse levers, and through the ribbon guide on the type box carriage. Make certain that ribbon remains in guide slots and that both reversing eyelets are between ribbon spools and reverse levers. Eliminate slack in ribbon.
9. TOOLS

For a listing of tools required to maintain the Model 28 Printer Set, refer to Teletype Bulletin 1124B.

10. DISASSEMBLY AND REASSEMBLY. (For illustration of parts referred to herein, see Teletype Model 28 Printer Parts bulletin).

NOTE

If a part that is mounted on shims is to be removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is re-mounted. Retaining rings (Tru-are) are of spring steel and have a tendency to release suddenly. Loss of these can be minimized as follows: Hold the tru-arc with your left hand to prevent it from rotating. Place the blade of a suitable screwdriver in one of the slots of the tru-arc. Rotate the screwdriver in a direction to increase diameter of tru-arc. Tru-arc will come off easily without flying.

a. TYPING UNIT. To remove the Typing Unit from the Keyboard or Base proceed as follows: Remove the four 151678 screws that secure the Typing Unit to the Keyboard or Base. Remove the 152466 Cable Plug from the right side frame. Lift the typing unit from the Keyboard or Base.

(1) TYPE BOX

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

1. Trip the 150075 type box latch toggle to the right.

2. Lift the right end of the type box upward to an angle of approximately 45 degrees and pull the type box toward the right to disengage it from the left hand bearing stud.

*(b) To disassemble type box and replace a type pallet, proceed as follows:

1. Remove both screws and nuts that secure the front plate to the rear plate assembly. Separate the two plates.

2. Remove the spring from the pallet by compressing the spring slightly and pulling the formed end out of the slot in the pallet.

Note: This spring should be discarded once it has been removed from its assembly.

3. Replace pallet (omit this step if replacing spring only).

4. Install new pallet spring making sure that the formed end of the spring extends through the slot in the pallet.

5. Line up the front plate with the rear plate assembly and draw the two plates together until the head of the pallet leaves the rear plate by approximately 1/16". This may be accomplished by using two 6-40 screws (at least 11/32" long) and nuts in place of the screws and nuts removed in step 2 and tightening them only enough to hold the pallets as specified above. (Do not clamp the plates together until all pallets have been moved into their correct position).

6. Manipulate the pallets until they fall into their respective openings in the front plate and press plates together.

7. Replace screws and nuts used in step 5 with screws and nuts removed in step 1.

*(c) To reinstall type box, reverse the procedure used in removing it. CAUTION: THE TYPE BOX SHOULD BE FIRMLY SEATED ON THE BEARING STUDS AND THE POINT OF THE LATCH TOGGLE SHOULD BE PLACED IN THE NOTCH OF THE TYPE BOX PLATE BEFORE MOVING THE TOGGLE TO ITS LATCHED POSITION TO AVOID SPRINGING THE LATCH.

(2) PRINTING CARRIAGE

(a) To remove the printing carriage, proceed as follows:

1. Loosen the two 151152 screws which clamp the 150230 plate to the wire rope and disengage the carriage from the wire rope.

2. Move the carriage to the left of its track and tilt the lower part forward to disengage the rollers from the track.
3. The disassembly of the printing carriage is shown in bulletin 1149B.

(b) To reinstall the carriage, reverse the procedure used in removing it.

1. Make certain that the 150068 printing arm is correctly re-engaged with the 150598 printing track.

2. Position the carriage clamp on the wire rope for correct printing position as specified in figure 1-57.

(3) TYPE BOX CARRIAGE

(a) To remove the type box carriage, proceed as follows:

1. Move the type box carriage to its extreme right hand position.

2. Hold the 152548 and 152255 code bar shift bar levers in the marking position and rotate the main shaft so that the type box is in its uppermost position.

3. Remove the 119652 retainer ring from the stud in the right hand end of the 152503 type box carriage link and disengage the link from the carriage.

4. Hold the 153810 ribbon guide forward and the 150311 ribbon reverse lever back and pull the carriage toward the right to disengage it from the carriage track. For disassembly see 1149B.

(b) To reinstall the carriage, reverse the procedure used in removing it. (See Fig. 1-56)

(4) FRONT PLATE

(a) To remove the front plate, proceed as follows:

1. Remove the Typing Unit from the Base.

2. Remove the 119652 retainer ring from the right hand stud of the 152503 type box carriage link right hand stud and disengage the link from the carriage. (See instructions for removing the link retainer in paragraph 10.a.(3).

3. Remove the two 151659 or 152893 and 153841 screws, which secure the 150245 main ball drive bracket to the 150365 rocker shaft.

4. Remove the 150202 spacing shaft gear.

5. Remove the four 151606 screws which secure the front plate assembly to the typing unit side frames.

6. Pull the front plate assembly forward to disengage it from its connecting parts in the Typing Unit.

7. The disassembly of the front plate is shown in 1149B.

(b) To reinstall the front plate assembly, reverse the procedure used in removing it.

1. Make certain that the 150770 and 150771 code bar bell cranks, the 152596 letters-figures shift slide, the 152522 reversing slide shift lever, the 150438 automatic C.R. - L.F. bell crank, and the 152545 carriage return lever extension are properly engaged with their mating parts before tightening the front plate mounting screws.

2. Replace the 150202 spacing shaft gear. See figure 1-36 for adjustment on phasing the spacing gears.

(5) STUNT BOX

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

1. Remove the Typing Unit from the Base.

2. Remove the 151627 rear tie bar from the Typing Unit side frames.

3. Remove the 150915 or 155060 line feed function pawl stripper from the 150424 or 155061 stripper blade.

4. Remove the 151657 or 1010 single-double line feed lever screw and disengage the lever from the notch in the stripper blade.

5. Hold the stripper blade toward the right side of the Typing Unit and unhook the 152541 stripper blade left hand arm from the blade. (LP 3, 5, 7, only).

6. Pull the stripper blade toward the left side of the Typing Unit to disengage the stripper blade from the 152542 right hand arm and remove the stripper blade from the Typing Unit. (LP 3, 5, 7, only).
7. Remove the 151692 screws which secure the stunt box assembly in the Typing Unit.

8. Remove the 151637 screw from the 153291 cam shaft drive arm, and slide the drive arm to left out of engagement with the 153300 stripper blade drive arm. (on LP 6 and up.)

9. Lift the stunt box assembly upward to disengage it from its locating brackets and pull toward the rear to disengage all code bar forks from the code bars. Remove the contact assembly and cable clamp, if present, from the stunt box. Remove the stunt box.

10. Disassembly of the stunt box is shown in 1149B.

(b) To reinstall the stunt box assembly:

1. Push it forward in its guide rails to within 1/8 inch of its final position.

2. Manually disengage the function pawls from their function bars and push the stunt box assembly forward and downward until it is latched in place on its locating brackets.

3. Replace the stunt box mounting screws, receptacle and selector magnet wires.

(6) FUNCTION BAR, PAWL, AND LEVER

(a) To remove a function bar, proceed as follows:

1. Remove the stunt box from the Typing Unit - See paragraph 10.a.(5).

2. Unhook the 4703 function bar spring.

3. Hold the function bar toward the rear of the stunt box and disengage its function pawl from the function bar.

4. Pull the function bar toward the front to remove it from the stunt box.

(b) To remove a function pawl after the function bar has been removed:

1. Remove the pawl spring.

2. Hold associated function lever back.

3. Remove the pawl from top of stunt box.

(c) To remove a function lever after the function bar and function pawl have been removed:

1. Remove the 152889 shaft retainer plate.

2. Remove the 150547 shaft nearest the front of the stunt box.

3. Unhook spring from function lever and remove the lever through top of stunt box.

4. Disassembly of the stunt box is shown in 1149B.

(d) To replace the function bar, reverse the procedure used in removing it.

(7) CODE BARS

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

1. Remove the Typing Unit from the Base.

2. Remove the stunt box assembly. See paragraph 10.a.(5).

3. Remove the front plate assembly. See paragraph 10.a.(4).

4. Remove the 151657 screws and 2191 lock washers which secure the code bar assembly to the side frame.

5. Remove the 150301 code bar shift bar retainer plate from 152576 right hand code bar casting.

6. Remove the 152548 and 152255 code bar shift bars and 152257 springs from the code bars and pull the code bar assembly forward and to the left.

7. Disassembly of the code bars is shown in 1149B.

(b) To reinstall the code bar assembly, reverse the procedure used in removing it, except do not tighten the mounting screws.

1. Hook the short extension of the 152257 spring in the spring hole of the 152256 code bar shift bar. The short extension of the spring should be hooked from the bottom of the code bar and the long extension should be hooked over the top of the code bar shift bar.
2. Loosen the 151630 code bar assembly tie bar screws and hold the code bar castings back and downward firmly against their locating surfaces on the side frame and tighten the four mounting screws.

3. Tighten the two tie bar screws.

(8) MAIN SHAFT

(a) To remove the main shaft, proceed as follows:

1. Remove the Typing Unit from the Base.
2. Remove the selector cam-clutch assembly. See paragraph 10.a.(13).
3. Set the Typing Unit upside down.
4. Return the carriage to its left-hand position.
5. Remove the 151686 screw which secures the 150673 spacing shaft in the 150668 spacing pawl hub.
6. Remove the spacing shaft with gear.
7. Remove the 151686 screw which secures the 152454 or 153823 collar and the 152455 or 153824 clamp from right end of main shaft. Remove the 152573 main shaft right hand bearing retainer plate.
8. Remove the 150010 retainer plate at the 150046 clutch bearing and remove the 150244 link.
9. Remove the two 151630 screws from the 152537 main shaft left hand bearing clamp.
10. Unhook the 74701 or 135716, 74712 and 70388 spring from the trip levers and latch levers associated with all clutches. Position the code bar clutch so that the low part of the clutch cam clears the spring cam on the cam follower. Unhook the 74712 code bar clutch cam follower spring.
11. Remove the 153300 function clutch arm by removing the two 151630 screws and 119652 Retainer Ring if present.
12. Unhook the 154688 springs from the 153573 function bar reset bail.
13. Move the main shaft assembly toward the left to disengage the code bar clutch and function clutch links from their connecting pins.
14. Lift the left end of the shaft assembly out of the side frame and position the shaft so that the function clutch link passes the suppression assembly bracket and remove the shaft assembly from the typing unit.
15. When assembling the clutches which have cams and disks marked "O" for identification, the marked side of the parts should face away from the clutch side of the assembly. The function and code bar clutches should have their driving links assembled so that the longer end of the hub faces away from the clutch side of the assembly.
16. Disassembly of the main shaft and clutches is shown in 1149B.

(b) To re-install the shaft assembly, reverse the procedure used in removing it.

(c) To phase the spacing gears, see figures 1-36 and 1-37 respectively.

(d) Remake the stripper blade drive cam position adjustment (Figure 1-68).

(9) UPPER DRAW WIRE ROPE

(a) To remove the upper draw wire rope, proceed as follows:

1. Return the carriage to the left hand position.
2. Loosen the 112626 nut on the front end of the 150197 spring drum bearing post. Operate the 150237 ratchet escapement lever to unwind the 74712 carriage return spring.
3. Remove the 150712 wire rope from the 150230 clamp plate on the printing carriage, and the 152521 clamp on the 150728 oscillating rail slide.
4. Loosen the 151618 clamp screw which secures the wire rope to the 150827 spring drum, and remove the wire rope from the drum.
5. Remove the 151618 or 151658 screw in the spacing drum which secures the ends of the wire rope, and remove the rope from the drum.
6. Disassembly of the wire rope, spring drum and spacing drum is shown in 1149B.

(b) To replace the upper draw wire rope, reverse the procedure used in removing it.

(10) LOWER DRAW WIRE ROPE

(a) To remove the lower draw wire rope, proceed as follows:

1. Remove the 151618 or 151658 screw which secures the 150225 lower draw wire rope to the 152587 or 154627 spacing drum, and remove the end of the rope from the drum.

2. Loosen the 151637 screws which secure the 150796 margin indicator cam disk on the spring drum and position the disk to expose the wire rope mounting screw.

3. Remove the 151618 lower draw wire rope screw and move the rope from the spring drum.

4. Loosen the 151632 screws in the 150800 bearing studs which mount 150224 printing carriage pulleys and move the studs toward the center of the Typing Unit.

5. Disassembly of the lower draw wire rope is shown in 1149B.

(b) To replace the wire rope, reverse the procedure used in removing it.

1. Make certain that the lower draw wire rope is in front of the printing carriage wire rope in the track around the drums.

2. Adjust the position of the type box, the printing carriage, and the wire rope tension as specified in the figures 1-49, 1-53, and 1-56.

(11) PLATEN (FRICITION FEED)

(a) To remove the platen, proceed as follows:

1. Remove the 150715 line feed spur gear.

2. Remove the 150719 and 150720 platen bearing retainers.

3. Remove the 152832 paper finger shaft.

4. Hold off the 150900 detent and lift the platen out of the side frame.

5. Disassembly of the platen is shown in 1149B.

(b) To replace the platen, reverse the procedure used in removing it.

1. When replacing each platen bearing retainer, put its upper screw in first. Leave the screw slightly loose. Press the lower end of the retainer downward and hook it into the elongated hole in the side frame. Replace the lower screw. Tighten both screws.

*(12) PLATEN (SPROCKET FEED)

(a) To remove the platen, proceed as follows:

1. Remove the paper fingers or guide bracket assembly.

2. Remove the spur gear from left end.

3. Remove the 156719 and 150720 platen bearing retainers.

4. Hold off the 153676 detent and remove the platen.

5. Remove sprocket hub assembly from platen assembly.

6. Insert the 153673 shaft tool into the hub and fasten it with the 151346 screw.

7. Remove the 157286 clamp and 153699 cam from the assembly.

8. To replace a pin, rotate the hub assembly within the retaining tool with a t:..amy wrench inserted in the shaft tool until the desired pin is opposite the notch in the retaining tool. A pin may then be removed or replaced.

Note: While rotating the hub, the notch must be covered to prevent the pins from being released.


10. Disassembly of platen shown in 1149B.
(b) To replace the platen, reverse the procedure used in removing it. When replacing each platen bearing retainer, put its upper screw in first. Leave the screw slightly loose. Press the lower end of the retainer downward and hook it into the elongated hole in the side frame. Replace the lower screw. Tighten both screws.

(13) SELECTOR CAM-CLUTCH

(a) To remove the selector cam-clutch, proceed as follows:

1. Lift the 152410 push lever reset bail cam follower from its cam and latch it in its raised position on the push lever guide. Lift the selector levers and the marking lock lever by moving the marking lock lever forward until the armature drops behind it.

2. Remove the 151642 screw which mounts the 150001 selector clutch drum and position the cam clutch so that the stop lug on the 150028 disk is in the uppermost position.

3. Place 152410 or 158903 reset bail in raised position. Hold 152432 or 158928 stop arm and 152405 or 158902 marking lock lever to left, grasp cam-clutch by cam-disk (not by drum) and pull forward while rotating cam-clutch slowly. Cam-clutch should come off easily. Do not force it.

4. Disassembly of the selector cam clutch is shown in 11498.

(b) To replace the cam-clutch assembly, reverse the procedure used in removing it except:

1. As the cam-clutch approaches its fully installed position, move the trip shaft lever and the cam-clutch latch lever so that they ride on their respective cams.

2. Restore the push lever reset bail and the armature to their operating position.

(14) SELECTOR MECHANISM

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

1. In order to remove the selector mechanism from the Typing Unit the cam-clutch assembly must be removed. See paragraph 10.a.(13).

2. Remove the 152457 felt wick. Remove the 151658 screw which secures the selector mechanism to the 152546 bracket on the code bar positioning mechanism.

3. Remove from the selector mechanism the 150563 spring which connects with the 152640 common transfer lever on the code bar positioning mechanism.

4. Remove the remaining three 151630 selector mounting screws and lift the selector from the main shaft bearing housing.

5. Disassembly of the selector mechanism is shown in 11498.

(b) To replace the selector mechanism, reverse the procedure used in removing it.

(c) For readjustment of selector mechanism see the adjusting figures 1-17 to 1-19 and 1-21 to 1-23.

(15) CODE BAR POSITIONING MECHANISM

(a) To remove the code bar positioning mechanism, proceed as follows:

1. Remove from the selector the 150563 spring attached to the common transfer lever and restore any operating push levers to the spacing position by raising the 152410 reset bail.

2. Loosen the 151721 clamp screw on the 150447 shift lever drive arm, and remove the two screws which mount the mechanism - the 151630 to the side frame, and the 151658 to the 152400 selector plate.

3. Manipulate the 152635 to 152640 transfer levers and 152548 or 152255 code bar shift bars while gently twisting the mechanism so as to slide the mechanism off the code bar shift bars.

4. Disassembly of the code bar positioning mechanism is shown in 11498.

(b) To replace the mechanism on the Typing Unit, reverse the procedure used in removing it.

1. With the main shaft in the stop position, push the code bar shaft bars to the marking position (left front view). Manipulate the code bar shift bars and transfer levers so that the shift bars line up with their respective slots in the 150525 bracket, and slide...
the shift bars through the slots, one at a time (leave the bottom slot vacant).

(16) SELECTOR MAGNET ASSEMBLY

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

1. Remove the two 151657 screws and 3598 nut which mount the range finder to the selector.

2. Remove the 152468 cable from the 1028 coil terminal screws.

3. Remove the two 151658 magnet assembly mounting screws and lift the assembly out.

4. Disassembly of the selector magnet assembly is shown in 1149B.

b. KEYBOARD (EARLIER DESIGN) - Remove the four 151549 screws at each corner of the Keyboard that secure the Keyboard to the cradle. Remove the 152465 plug from its receptacle at the left rear corner of the base. Lift the keyboard from the cradle.

(1) SIGNAL GENERATOR

(a) To remove the signal generator from the Keyboard, proceed as follows:

1. Remove the two 151152 screws located to the right and left of the contact box, and raise the 151358 contact box. (Do not unsolder connections if box is connected to metal tubing). If wire connections to contact box are flexible, unsolder the wires inside the box and do not remove the box.

2. Remove the four 151642 mounting screws which mount the signal generator casting, two at the front end of the casting, and two at the rear. (NOTE: if the unit is equipped with an electrical signal line break mechanism, remove the mechanism by removing its two mounting screws.

3. Lift the signal generator upward from the Keyboard.

4. Disassembly of the signal generator is shown in 1149B.

(b) To replace the signal generator, reverse the procedure used in removing it.

1. The code lever bail latch should be under

the code lever bail latch lever, and in the notches of all code bars, trip bar and upstop bar, the break rod in its guide hole, and the clutch trip bail extension in the clutch trip bar notch.

2. Recheck the non-repeat lever adjustment figure 4-13, the contact box adjustment figure 4-10, and the code lever adjustment figure 4-19.

(2) KEYBOARD SELECTOR CAM ASSEMBLY

(a) To remove cam assembly from signal generator, proceed as follows:

1. Remove signal generator from Keyboard Base. See paragraph 10.b.(1) above.

2. Disconnect the 90260 clutch latch lever spring.

3. Disconnect the 31636 clutch stop lever spring.

4. Disconnect the 125268 flutter lever spring.

5. Remove the 112625 front nut of the 151157 stationary shaft.

6. Remove the two 151658 screws that hold the 151064 rear plate to casting.

7. Remove the shaft assembly by lifting it upward and pulling to the rear simultaneously.

8. Disassembly of the cam assembly is shown in 1149B.

(b) To replace the Keyboard selector cam assembly, reverse the procedure used in removing it.

(3) KEYBOARD LABEL

(a) To remove the labels, proceed as follows:

1. Remove the 151354 or 153118 plastic cover mounting screw and remove the plastic cover.

2. Pick up plastic cover at top edge first.

(b) To replace the Keyboard label, reverse the procedure used in removing it.

(4) KEYLEVER COVER
(a) To remove cover from the Keyboard, proceed as follows:
1. Remove the 151353 label covers and labels. See paragraph 10.b.(3).
2. Remove the four 151346 screws located under the labels, two at the extreme right side and two at the extreme left side.
3. Pull key lever cover forward to remove.
4. See 1149B for disassembly.

(b) To replace the key lever cover, reverse the procedure used in removing it.

(c) To remove the 153117 cover from base, proceed as follows:
1. Remove the two 151658 screws located inside the sealing plate, one at the right side and one at the left side.
2. Pull key lever cover forward and downward to unhook it from two studs near bottom.
3. See 1149B for disassembly.

(d) To replace the key lever cover, reverse the procedure used in removing it.

(5) KEY LEVER

(a) To remove key lever, proceed as follows:
1. Use key lever remover tool No. 151383 in the following manner. Insert the smaller lug of the key lever remover in the slot of the key lever and engage the shoulder of the larger lug on the top of the code lever. Pry upward to unsnap key lever from code lever. The plastic keytop should not be removed from any key lever to change a character.
2. See 1149B for disassembly.

(b) To replace the key lever, reverse the procedure used in removing it.

(6) SPACE BAR

(a) To remove space bar, proceed as follows:
1. Remove the key lever cover. See paragraph 10.b.(4).
2. Remove the two 151223 pivot shoulder screws on left and right sides of the 151045 space bar assembly.
3. See 1149B for disassembly of the space bar.

(b) To replace the space bar, reverse the procedure used in removing it.

(7) KEY LEVER GUIDE PLATE

(a) To remove key lever guide plate, proceed as follows:
1. Remove the key lever cover. See paragraph 10.b.(4).
2. Remove the six 151346 mounting screws on top side of guide plate.
3. See 1149B for disassembly.

(b) To replace the key lever guide plate, reverse the procedure used in removing it.

(8) KEYBOARD LOCK BALL CHANNEL

(a) To remove lock ball channel, proceed as follows:
1. Remove the key lever cover. (See paragraph 10.b.(4).
2. Remove the two 151637 channel mounting screws at the left and right ends.
3. Pull channel forward with caution to avoid dropping the wedges that are located on the code levers. Wedges must be replaced separately when reassembling.
4. See 1149B for disassembly.

(b) To replace the keyboard lock ball channel, reverse the procedure used in removing it.

(9) SEALING PLATE

(a) To remove sealing plate proceed as follows:
1. Remove the key lever cover. See paragraph 10.b.(4).
2. Remove the key levers. See paragraph 10.b.(5).
3. Disconnect the 151105 space bar link (keyboard only) at its snap connection.

4. Remove all sealing plate mounting screws.

5. See 1149B for disassembly.

(b) To replace the sealing plate, reverse the procedure used in removing it.

(10) KEYBOARD LOCK-LOCAL LINE FEED MECHANISM

(a) To remove keyboard lock-local line feed mechanism, proceed as follows:

1. Remove the signal generator from the keyboard. See paragraph 10.b.(1). above.

2. Unhook the 7618 code lever bail spring from the 151840 code lever bail.

3. Loosen the two 151090 pilot screws and remove the 151840 code lever bail.

4. Remove the 119651 retaining ring from the 151858 local line feed trip bail.

5. Remove the two 151692 mounting screws and remove the mechanism through the hole in the bottom of the base.

6. See 1149B for disassembly.

(b) To replace the keyboard lock-local line feed mechanism, reverse the procedure used in removing it.

(11) KEYBOARD CODE BAR ASSEMBLY

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

1. Remove the key lever cover. See paragraph 10.b.(4).

2. Remove the key levers. See paragraph 10.b.(5).

3. Disconnect the 151105 space bar link at its snap connection.

4. Remove the signal generator. See paragraph 10.b.(1).

5. Remove the two 151658 and two 151346 code bar assembly mounting screws located on top of base.

6. Remove the two 151692 mounting screws and remove the 151856 local C.R. bracket.

7. Remove the keyboard lock-local line feed mechanism. See paragraph 10.b.(10).

8. Remove the 3599 nut and the 151008 code lever bail latch lever with spring. Remove the three 151657 screws which mount the 151367 non-repeat bell crank plate assembly. Remove the plate assembly. Remove code bar assembly through the opening in top side of the base.

9. The disassembly of the keyboard code bar assembly is shown in 1149B.

(b) To replace the keyboard code bar assembly, reverse the procedure used in removing it.

(12) CODE BAR

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

1. Remove code bar assembly. See paragraph 10.b.(11).

2. Disconnect the 42661 code bar springs.

3. Remove the 151082 mounting screw and remove the 151102 lock bar pawl from the 151849 code lever guide.

4. Loosen the 151688 mounting screws for the left and right code bar guides until they are friction tight and lift the 151023 guides to their extreme upward position.

5. Remove code bar by sliding it to the left or right to get one end of the code bar out of its guide.

6. Disassembly of the code bar mechanism is shown in 1149B.

(b) To replace a code bar, reverse the procedure used in removing it.

c. KEYBOARD (NEW DESIGN)*

(1) SIGNAL GENERATOR

*See Page 1–2, Paragraph k.
(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 bail back so that the non-repeat lever clears and its spring will not be excessively stretched.

5. Disassembly of signal generator is shown in 1149B.

CAUTION

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

(b) To replace the signal generator, reverse the procedure used in removing it.

(2) KEYBOARD

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

1. Remove the typing unit and signal generator assembly as specified in paragraph 10.a. and b.(1).

2. Remove the plastic windows and labels, hood, seal, and seal plate as specified in paragraph 10.b.(3).

3. Remove the four 151631 screws which hold the 154210, 154211 front frames to the front of the 154000 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 bails - except the keyboard lock function lever - which fits on top of its function bail.

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

8. Disassembly of the Keyboard is shown in 1149B.

NOTE

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

(b) To replace the keyboard assembly, reverse the procedure used in removing it.

(3) 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 two 151632 screws at its front.

8. See 1149B for disassembly.

(b) To replace the Keyboard labels reverse the procedure used in removing it.

(4) 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 spring.

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 bail and lift off the assembly. It is most economical to replace the entire contact assembly if contacts need replacement.

5. Disassembly of the contact box is shown in 1149B.

(b) To replace the contact box, reverse the procedure used in removing it.

(5) TRANSFER LEVER LOCKING BAIL

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

1. Remove the signal generator assembly from the keyboard as specified in paragraph 10.b.(1).

2. Remove the contact box assembly as specified in paragraph 10.c.(4).

3. Remove the 70388 transfer lever locking bail spring.

4. Extract the 154140 locking bail by unlatching the clutch and rotating the shaft to position the cam in such a way so that the locking bail can be unhooked and dropped down from its guide post. Turn the locking bail clockwise until it forms a right angle with its guide and extract it out the bottom of the frame.

5. Disassembly of the mechanism is shown in 1149B.

(b) To replace the transfer lever locking bail, reverse the procedure used in removing it.

NOTE

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

(6) SIGNAL GENERATOR SHAFT

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

1. Remove the transfer lever locking bail as specified in paragraph 10.c.(5).

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 154034 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 bail eccentric follower, the 154138 felt washer, and the 154083 cam spacer will all 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.

6. Disassembly of the shaft assembly is shown in 1149B.

(b) To replace the shaft assembly, reverse the procedure used in removing it.

(7) KEYLEVER GUIDE PLATE

(a) To remove the keylever guide plate, proceed as follows:
1. Remove the plastic windows and labels, and hood as specified in paragraph 10.c.(3).

2. Remove the 151045 space bar by unscrewing the two 151223 shoulder screws that fasten it to the 154117 space bar bail.

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. Disassembly of the mechanism is shown in 1149B.

   (b) To replace the guide plate over the key-levers, flop 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.

d. MOTOR

Remove the four screws that secure the motor base plate to the base. Remove the screws that secure cover and remove the motor leads from terminals 1 and 2 of the terminal board.

(1) SYNCHRONOUS

   (a) Disassembly of the Synchronous Motor is shown in 1149B.

(2) GOVERNERED

   (a) Disassembly of the Governed Motor is shown in 1149B.

   (b) In order to prolong the life of governor slip ring brushes, the slip rings are machined to close concentricity requirements after assembly. These slip rings should not be replaced unless facilities for machining operation are available.

   (c) After the Governor parts are assembled, the Governor is carefully balanced to reduce vibration; therefore, when it becomes necessary to replace contacts, only the parts being replaced should be moved.

e. ELECTRICAL SERVICE UNIT

In order to remove the Electrical Service Unit completely from the Cabinet, it will be necessary to remove the wires from the 118759 terminal blocks. However, the panel may be turned bottom side upward for maintenance purposes by removing the two 151437 studs.
SECTION 2 - VARIABLE FEATURE ADJUSTMENTS

1. REPEAT SPACE MECHANISM

![Repeat Space Mechanism Diagram]

- **REPEAT SPACE LEVER**
- **RESET BAIL LATCH**
- **SPACE CODE LEVER**
- **REPEAT SPACE LEVER SPRING**

**REPEAT SPACE LEVER SPRING**

1. **REQUIREMENT**
   - MIN. 1 OZ.
   - MAX. 1-1/2 OZ.
   - TO PULL REPEAT SPACE LEVER IN ENGAGEMENT WITH RESET BAIL LATCH.

2. **REQUIREMENT**
   - WITH POWER APPLIED AND THE SPACE BAR FULLY DEPRESSED, THE SPACE CHARACTER SHOULD BE REPEATED AS LONG AS THE SPACE BAR IS HELD DEPRESSED.

**NOTE:** FOR EARLIER DESIGN SEE FIGURE 4-43

**FIGURE 2-1** KEYBOARD REPEAT ON SPACE MECHANISM
2. **TIME DELAY MECHANISM**

**TIME DELAY RATCHET WHEEL TENSION**

**REQUIREMENT**

- HOLD OFF ALL PAWLS.
- MIN. 2 OZS.
- MAX. 8 OZS.
- TO MOVE RATCHET WHEEL
- TO ADJUST
- REMOVE AND BEND THE FRICTION SPRINGS.

**RATCHET WHEEL**

**FRICTION SPRING**

**LATCH LEVER**

**CONTACT PAWL**

**MOUNTING SCREWS**

**TIME DELAY SWITCH POSITION**

**REQUIREMENT**

- CONTACT PAWL NOT BLOCKED BY LATCH LEVER AND ON HIGH PART OF THE RATCHET WHEEL. SOME CLEARANCE BETWEEN CONTACT PAWL AND SWITCH PLUNGER WHEN PLAY IN RATCHET WHEELS IS TAKEN UP IN DOWNWARD DIRECTION MAX. 0.010 INCH
- TO ADJUST
- POSITION THE SWITCH WITH THE TWO SWITCH MOUNTING SCREWS LOOSENED.

**FIGURE 2-2** KEYBOARD OR BASE, TIME DELAY MECHANISM

2-2

CHANGE 4
2. TIME DELAY MECHANISM

CONTACT LATCH PAWL SPRING TENSION REQUIREMENT

LATCH PAWL SPRING UNHOOKED AT ANCHOR
MIN. 12 OZS.
MAX. 15 OZS.
TO STRETCH SPRING TO INSTALLED LENGTH.

CONTACT PAWL SPRING TENSION REQUIREMENT

CONTACT PAWL LATCHED ON END OF LATCH LEVER.
MIN. 8 OZS.
MAX. 12 OZS.
TO START THE PAWL MOVING.

FIGURE 2-3 KEYBOARD OR BASE, TIME DELAY MECHANISM, LEFT SIDE VIEW
2. TIME DELAY MECHANISM

TO ADJUST


FIGURE 2-4 KEYBOARD OR BASE, TIME DELAY MECHANISM, LEFT SIDE VIEW
2. TIME DELAY MECHANISM

**ECCENTRIC FOLLOWER PAWL SPRING**

**REQUIREMENT**

ECCENTRIC FOLLOWER PAWL IN EXTREME FORWARD POSITION. 8 OZ. SCALE APPLIED TO PAWL NEAR RATCHET WHEEL AND PULLED UPWARD

MIN. 1-1/2 OZS.
MAX. 4 OZS.
TO START PAWL MOVING.

**TIME DELAY ECCENTRIC FOLLOWER PAWL**

**ADJUSTING LEVER**

**MOUNTING SCREW**

**ECCENTRIC FOLLOWER PAWL SPRING**

**RATCHET WHEEL**

**TIME DELAY DISABLING DEVICE**

**REQUIREMENT**

DISABLE THE TIME DELAY MECHANISM WHEN NOT REQUIRED.

TO ADJUST

LOOSEN THE ADJUSTING LEVER MOUNTING SCREW AND PRESS DOWNWARD ON THE LEVER TO RAISE ECCENTRIC FOLLOWER OUT OF ENGAGEMENT WITH ITS RATCHET WHEEL.

**NOTE:** FOR ADJUSTMENT OF EARLIER DESIGN MECHANISMS SEE FIGURE 4-44

**FIGURE 2-5 KEYBOARD OR BASE, TIME DELAY DISABLING DEVICE**
3. SIGNAL LINE BREAK MECHANISM (BASE)

BREAK KEYLEVER SPRING TENSION
REQUIREMENT
MIN. 25 OZS.
MAX. 30 OZS.
TO OPERATE SWITCH

KEYLEVER SPRING
LEVER EXTENSION
SWITCH
MOUNTING SCREW
LEVER
PLUNGER
(LEFT SIDE VIEW)

BREAK KEYLEVER
BRACKET

LEVER EXTENSION
REQUIREMENT
WHEN KEYLEVER IS DEPRESSED, EXTENSION
SHOULD OPERATE SWITCH PLUNGER
BEFORE BEING STOPPED BY BRACKET.
TO ADJUST
POSITION EXTENSION ON LEVER
WITH MOUNTING SCREW LOOSENED.

FIGURE 2-6 BASE, BREAK MECHANISM
4. 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.

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-23

FIGURE 2-7 KEYBOARD OR BASE, LOCAL PAPER FEED-OUT MECHANISM
5. **Sprocket Feed Mechanism**

**Type Box Position Requirement**

Type box and spacing clutches disengaged, type box shifted to letters position. Four mounting screws loosened so that space suppression ring, or automatic carriage return line feed ring, is free to rotate on drum. Units equipped with limited adjustment spacing drum: Spacing cut out and automatic carriage return line feed arms in maximum counter-clockwise position. See Fig. 4-27. Clearance between letters print indicator and center line of sprocket pins in right hub:

- **Min.** 5/16 inch
- **Max.** 7/16 inch

**To Adjust**

Loosen two type box clamp screws and two printing carriage clamp screws. Position type box. Tighten type box clamp screws. Do not tighten printing carriage clamp screws until printing carriage position adjustment is made.

**Figure 2-8 Typing Unit, Platen and Printing Mechanism**
5. SPROCKET FEED MECHANISM

(A) LEFT MARGIN

(1) REQUIREMENT
TYPE BOX CLUTCH DISENGAGED. SPACING DRUM FULLY RETURNED. TYPE BOX SHIFTED TO LETTERS POSITION. CLEARANCE BETWEEN CENTER OF LETTERS PRINT INDICATOR ON TYPE BOX AND CENTERLINE OF SPROCKET PINS IN LEFT HUB
MIN. $5/16$ INCH
MAX. $7/16$ INCH

(2) REQUIREMENT
SPACING CLUTCH DISENGAGED. FRONT SPACING FEED PAWL FARTHEST ADVANCED. SPACING DRUM FULLY RETURNED. PLAY IN SPACING SHAFT GEAR (FIG. 1-36) TAKEN UP CLOCKWISE. CLEARANCE BETWEEN PAWL AND SHOULDER OF RATCHET WHEEL TOOTH IMMEDIATELY AHEAD
MIN. $0.002$ INCH
MAX. $0.015$ INCH

(3) REQUIREMENT
REAR PAWL, WHEN FARTHEST ADVANCED, SHOULD REST AT BOTTOM OF INDENTATION BETWEEN RATCHET WHEEL TEETH TO ADJUST POSITION CARRIAGE RETURN RING WITH MOUNTING SCREWS LOOSENED.

(B) PRINTING HAMMER STOP BRACKET

(1) FOR UNITS WITH THICK TYPEBOX AND DUMMY TYPE PALLETS USE CORRESPONDING STANDARD ADJUSTMENT EXCEPT CLEARANCE BETWEEN PRINTING HAMMER AND DUMMY TYPE PALLETS SHOULD BE
MIN. SOME
MAX. 0.020 INCH

(2) FOR UNITS WITH THIN TYPEBOX - NO DUMMY TYPE PALLETS, USE CORRESPONDING STANDARD ADJUSTMENT.

(C) RIGHT MARGIN

(1) FOR UNITS WITH LIMITED ADJUSTMENT SPACING DRUM, USE CORRESPONDING STANDARD ADJUSTMENT.

(2) FOR UNITS WITH UNIVERSAL SPACING DRUM, USE CORRESPONDING STANDARD ADJUSTMENT.

(D) PRINTING CARRIAGE POSITION
USE STANDARD ADJUSTMENT

(E) TYPE BOX ALIGNMENT
USE STANDARD ADJUSTMENT

FOLLOWING THIS ADJUSTMENT, ALL SCREWS SHOULD BE TIGHTENED.

FIGURE 2-9 TYPING UNIT, PLATEN AND SPACING MECHANISM

CHANGE 4
5. SPROCKET FEED MECHANISM

(A) LINE FEED SPUR GEAR DETENT ECCENTRIC
USE STANDARD ADJUSTMENT

SPROCKET PIN

SPROCKET FEED PAPER

SPROCKET FEED PAPER

(B) PRINTED LINE
REQUIREMENT
THE BOTTOM OF THE PRINTED LINE
SHOULD BE 1/32 INCH ± 1/64 INCH
(PLUS A MULTIPLE OF 1/6 INCH
IF REQUIRED) ABOVE A HORIZON-
TAL LINE DRAWN EVEN WITH THE
BOTTOM EDGE OF ANY SPROCKET HOLE.
TO ADJUST
LOosen SCREWS AND POSITION
LEFT SPROCKET

NOTE: SPUR GEAR AND LEFT PLATEN RETAINER
MUST BE REMOVED TO MAKE PRINTED
LINE ADJUSTMENT.

(C) PLATEN END PLAY
REQUIREMENT
LINE FEED PAWLS DISENGAGED.
PLATEN SHAFT SHOULD HAVE SOME
END PLAY.
MAX. 0.010 INCH.
TO ADJUST
POSITION PLATEN SPUR GEAR WITH
CLAMP SCREW LOOSENED.

(D) SPROCKET PIN SEPARATION
(1) REQUIREMENT
WITH SINGLE SHEET OF SPROCKET FEED
PAPER PLACED ON THE PLATEN THE
SPROCKET PINS SHOULD BE CENTRALLY
LOCATED IN THE FEED HOLES OF THE PAPER

(2) REQUIREMENT
PRINTED LINE SHOULD BE PARALLEL
TO A LINE DRAWN PERPENDICULAR TO
EDGE OF PAPER WITHIN PLUS OR MINUS
1/32 INCH
TO ADJUST
POSITION RIGHT SPROCKET WITH CLAMP
SCREW LOOSENED.

FIGURE 2-10 TYPING UNIT, SPROCKET FEED PLATEN
5. SPROCKET FEED MECHANISM

(1) REQUIREMENT
SPROCKET PIN SHOULD BE CENTRALLY LOCATED IN THE PAPER FINGER OR GUIDE BRACKET SLOT.

(2) REQUIREMENT
THE GAP BETWEEN THE PLATEN AND THE PAPER FINGER OR GUIDE BRACKET SHOULD BE.

<table>
<thead>
<tr>
<th>Stapled</th>
<th>Single Copy or Unstapled Multiple Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN. 0.090 INCH</td>
<td>0.050 INCH</td>
</tr>
<tr>
<td>MAX. 0.105 INCH</td>
<td>0.060 INCH</td>
</tr>
</tbody>
</table>

TO ADJUST WITH PAPER FINGER OR GUIDE BRACKET ASSEMBLY IN LATCHED POSITION, LOOSEN BOTH CLAMP SCREWS, POSITION ASSEMBLY HORIZONTALLY TO MEET REQUIREMENT (1). ROTATE ASSEMBLY TO MEET REQUIREMENT (2).

(3) REQUIREMENT (NOT ILLUSTRATED)
MIN. 0.035 INCH
BETWEEN LEADING EDGE OF PAPER FINGER OR GUIDE BRACKET AND RIBBON GUIDE. BOTH RIGHT AND LEFT PAPER FINGERS MUST BE PARALLEL TO THE SAME PRINTED LINE AS GAUGED BY EYE.

TO ADJUST SELECT LETTERS COMBINATION AND ROTATE TYPE BOX CLUTCH 1/2 REVOLUTION. POSITION PAPER FINGERS BY MEANS OF ELONGATED MOUNTING HOLES. AFTER TIGHTENING THE SCREWS RECHECK THESE REQUIREMENTS.

FIGURE 2-11 TYPING UNIT, PLATEN MECHANISM
5. SPROCKET FEED MECHANISM

- **SPROCKET PIN SPRING**
  - Requirement:
    - MIN. 6 OZS.
    - MAX. 8 OZS.
  - To start depressing the pin.

- **PAPER GUIDE**
  - Requirement:
    - The clearance between the platen and the front edge of the paper guide should be:
      - STAPLED SINGLE COPY OR UNSTAPLED COPY
      - MIN. 0.090 INCH 0.050 INCH
      - MAX. 0.105 INCH 0.060 INCH
  - To adjust position the guide with its rear mounting screws loosened.

- **RIBBON REVERSE SPUR GEAR**
  - Use standard adjustment

- **RIBBON REVERSE DETENT**
  - Use standard adjustment

- **LINE FEED BAR BELL CRANK SPRING**
  - Use standard adjustment except
    - MIN. 28 OZS.
    - MAX. 38 OZS.
  - To start bar moving.

**FIGURE 2-12** TYPING UNIT, PLATEN AND PAPER TRAY
5. SPROCKET FEED MECHANISM

FRONT FORM GUIDE (CABINET)
REQUIREMENT
WITH TYPING UNIT IN CABINET AND LARGE AND SMALL DOORS LATCHED, CLEARANCE BETWEEN THE LOWER EDGE OF THE FRONT FORM GUIDE AND THE PLATEN SHOULD BE
MIN. 3/64 INCH
MAX. 5/64 INCH
TO ADJUST
LOosen THE FORM GUIDE MOUNTING SCREWS. PRESS THE PAPER GUIDE AGAINST THE PLATEN, THEN RAISE THE FORM GUIDE PARALLEL TO THE PLATEN.

REAR FORM GUIDE (CABINET)
REQUIREMENT
MIN. 3/64 INCH
MAX. 5/64 INCH
TO ADJUST
POSITION THE GUIDE POST WITH ITS MOUNTING NUT LOOSENEd.

GUIDE BRACKET (CABINET)
REQUIREMENT
THE GUIDE BRACKET SHOULD BE PLACED AS FAR AS POSSIBLE TO THE LEFT (REAR VIEW).
TO ADJUST
POSITION THE GUIDE BRACKET WITH ITS MOUNTING SCREWS LOOSENEd.

FIGURE 2-13 CABINET, FRONT AND REAR FORM GUIDES

CHANGE 4
5. The sprocket feed mechanism requires the small door to be open and positioned so that the clearance between the front form guide and the copy window is at minimum. If stapled paper is used, the minimum clearance should be 0.060 to 0.080 inches to allow staples to pass freely through the slot. If they do not, increase the clearance as required.

Diagram:

- Window retainers
- Mounting screws
- Copy window
5. SPROCKET FEED MECHANISM

(A) PAPER FINGER OR GUIDE BRACKET SHAFT SPRING
REQUIREMENT
MIN. 6 OZS.
MAX. 10 OZS.
TO MOVE PAPER FINGER OR
GUIDE BRACKET AGAINST THE PLATEN.

(B) PAPER FINGER OR GUIDE BRACKET LATCH SPRING
REQUIREMENT
PAPER FINGER OR GUIDE BRACKET AGAINST PLATEN
MIN. 8 OZS.
MAX. 12 OZS.
TO START LATCH MOVING.

PLATEN DETENT BAIL SPRING TENSION
USE STANDARD ADJUSTMENT (FIGURE 1-67)

FIGURE 2-15 TYPING UNIT, SPROCKET FEED MECHANISM
6. HORIZONTAL TABULATOR MECHANISM (NEW DESIGN)

NOTE: FOR EARLIER DESIGN SEE FIGURES 4-48 THROUGH 4-53.

- Trip Lever Arm
- Spacing Clutch Trip Lever
- Clutch Trip Lever
- Shoe Lever
- Spacing Clutch
- Adjusting Screw
- Clutch Trip Lever Spring Tension
- Clutch Trip Lever Spring
- Stop Lug

**Requirement**

**Spacing Clutch Disengaged, Trip Lever Arm and Intermediate Bail in Their Upward Position.** The outer surface of the Trip Lever should be flush with the outer surface of the Shoe Lever or under flush to .010 inch. Check at Stop Lug with least bite.

To adjust:

Use adjusting screw to position Spacing Clutch Trip Lever.

**Note**

If this adjustment is changed, check the Latch Bail Adjusting Plate - Fig. 2-18.

**Requirement**

Spacing Clutch Engaged. Rotate Clutch until Trip Lever rests on Stop Lug.

Min. 11 ozs.

Max. 16 ozs.

To move Trip Lever away from Stop Lug.

**Figure 2-16 Typing Unit, Horizontal Tabulator Mechanism, Left View**
6. HORIZONTAL TABULATOR MECHANISM

OPERATING LEVER SLIDE ARM

NOTE
PRIOR TO THIS ADJUSTMENT CHECK THE FUNCTION RESET BAIL BLADE ADJUSTMENT.

REQUIREMENT
ON UNITS WITH TWO-STOP FUNCTION CLUTCHES, FUNCTION CLUTCH DISENGAGED. TYPE BOX CLUTCH ROTATED 1/2 REVOLUTION PAST STOP POSITION. ON UNITS WITH ONE-STOP FUNCTION CLUTCH, ROTATE FUNCTION CLUTCH UNTIL FUNCTION PAWL STRIPPED BLADE IS IN ITS LOWER POSITION AND THE FUNCTION RESET BAIL ROLLER IS ON THE HIGH PART OF ITS CAM. HORIZONTAL TABULATOR FUNCTION PAWL PULLED TO REAR UNTIL LATCHED ON ITS FUNCTION BAR. CLEARANCE BETWEEN FRONT END OF OPERATING LEVER SLIDE ARM AND BLOCKING SURFACE OF BLOCKING LEVER MIN. 0.020 INCH MAX. 0.030 INCH

TO ADJUST POSITION SLIDE ARM ON OPERATING LEVER WITH MOUNTING STUD FRICION TIGHT.

NOTE
WHEN PULLING FUNCTION PAWL TO THE REAR, IF THE OPERATING LEVER CAM ARM SHOULD BE STRIPPED OFF THE TABULATOR SLIDE ARM BEFORE THE FUNCTION PAWL IS LATCHED ON THE FUNCTION BAR, TEMPORARILY DISABLE THE STRIPPER BAIL ARM BY LOOSENING ITS ADJUSTING SCREW.

OPERATING LEVER SLIDE ARM SPRING

REQUIREMENT
TRIP LEVER ARM LATCH BAIL SPRING UNHOOKED. OPERATING LEVER IN OPERATED POSITION WITH SLIDE ARM AGAINST BLOCKING LEVER.
MIN. 8-3/4 OZS. MAX. 10-3/4 OZS.

TO START LINK MOVING.

NOTE
ON UNITS EQUIPPED WITH TRANSMITTER CONTROL CONTACT, HOLD CONTACT SPRING AWAY FROM STUD WHEN MEASURING TENSION.

OPERATING LEVER ADJUSTING PLATE

REQUIREMENT
OPERATING LEVER IN UNOPERATED POSITION. TAKE UP PLAY IN SLIDE ARM AND BLOCKING LEVER TO MINIMIZE CLEARANCE. CLEARANCE BETWEEN FRONT END OF SLIDE ARM AND LOWER PROJECTION OF BLOCKING LEVER
MIN. 0.025 INCH MAX. 0.040 INCH

TO ADJUST POSITION ADJUSTING PLATE ON BRACKET WITH MOUNTING SCREWS LOOSENED.

NOTE
IF OPERATING LEVER SLIDE ARM OR OPERATING LEVER ADJUSTING PLATE ADJUSTMENT IS CHANGED ON UNITS EQUIPPED WITH TRANSMITTER CONTROL CONTACT, CHECK CONTROL CONTACT GAP AND REMAKE IF NECESSARY.

FIGURE 2-17 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, LEFT VIEW
6. HORIZONTAL TABULATOR MECHANISM

TRIP LEVER ARM LATCH BAIL

**REQUIREMENT**
- OPERATING LEVER UNOPERATED.
- TRIP LEVER ARM UP.
- CLEARANCE BETWEEN THE TRIP LEVER ARM AND THE TRIP LEVER ARM LATCH BAIL
  - MIN. 0.025 INCH
  - MAX. 0.035 INCH

**TO ADJUST**
- POSITION LATCH BAIL ADJUSTING SCREW WITH ITS LOCK NUT LOOSENED.

TRIP LEVER ARM LATCH BAIL SPRING

**REQUIREMENT**
- OPERATING LEVER UNOPERATED.
  - MIN. 2-1/2 OZS.
  - MAX. 4-1/2 OZS.

TO START LATCH BAIL MOVING.

INTERMEDIATE BAIL SPRING TENSION

**REQUIREMENT**
- TRIP LEVER ARM AND INTERMEDIATE BAIL IN UNOPERATED POSITION.
  - MIN. 1-1/2 OZS.
  - MAX. 3-1/2 OZS.

TO PULL SPRING TO INSTALLED LENGTH.

SPACE SUPPRESSION BAIL

CLUTCH SHOE LEVER

CLUTCH TRIP LEVER

LATCH BAIL ADJUSTING PLATE

**REQUIREMENT**
- OPERATING LEVER SLIDE ARM POSITIONED TO REAR AND LATCHED ON BLOCKING LEVER.
- TRIP LEVER ARM LATCH BAIL IN FULLY LATCHED POSITION.
- SPACING TRIP LEVER DISENGAGED FROM INTERMEDIATE BAIL BY PUSHING FORWARD ON SPACE SUPPRESSION BAIL.
- CLEARANCE BETWEEN CLUTCH TRIP LEVER AND CLUTCH SHOE LEVER
  - MIN. SOME
  - MAX. 0.008 INCH

TO ADJUST
- POSITION LATCH BAIL ADJUSTING PLATE WITH MOUNTING SCREWS LOOSENED.
- CHECK AT THE CLUTCH SHOE LEVER WITH THE LEAST CLEARANCE.

**FIGURE 2-18 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM (LEFT VIEW)**
6. HORIZONTAL TABULATOR MECHANISM

**Horizontal Tabulator Slide Arm Spring**

**Requirement**
Operating lever in operated position, slide arm in unoperated position.

- Min. 1 oz.
- Max. 4 oz.

To start slide arm moving.

**Stripper Bail Arm**

**Operating Lever Cam Arm Spring**

**Requirement**
Operating lever in unoperated position, horizontal tabulator function pawl unlatched.

- Min. 4 ozs.
- Max. 9 ozs.

To start stripper bail moving.

**Cam Arm Stripper Bail**

**Requirement**
Operating lever and tabulator slide arm in unoperated positions. Spacing clutch rotated until high part of spacing cam is opposite stripper bail. Clearance between spacing cam and stripper bail.

- Min. 0.010 inch
- Max. 0.025 inch

To adjust position stripper bail arm on stripper bail with stripper bail arm screw friction tight.

**Stripper Bail Arm Screw**

**Operating Lever**

**Operating Lever Cam Arm**

**Horizontal Tabulator Slide Arm**

**Operating Lever Cam Arm Spring**

**Stripper Bail**

**Spacing Cam**

**Transfer Bail Extension Arm**

**Spacing Cut-Out Transfer Bail**

**Set Collar**

**Adjusting Screw**

**Figure 2-19 Typing Unit, Horizontal Tabulator Mechanism**

*Change 4*
6. HORIZONTAL TABULATOR MECHANISM

RIGHT MARGIN

REQUIREMENT
CLEARANCE BETWEEN SPACING CUT-OUT LEVER ON SPACING DRUM AND BAIL EXTENSION ARM
MIN. 0.006 INCH
MAX. 0.025 INCH

TO CHECK
PLACE TYPE BOX IN POSITION TO PRINT CHARACTER ON WHICH SPACING CUT-OUT IS DESIRED. PULL FORWARD ON PART OF TRANSFER BAIL EXTENDING BELOW MOUNTING SHAFT UNTIL BAIL IS IN FULLY OPERATED POSITION. GAGE CLEARANCE.

TO ADJUST
POSITION CUT-OUT LEVER WITH CLAMP SCREW LOOSENED.

NOTE
FOUR SCREWS MUST BE LOOSENED TO ADJUST CIRCULAR CUT-OUT LEVERS. DO NOT LOOSEN HEX. HEAD SCREW THAT CLAMPS FRONT RING.

SPACE SUPPRESSION BY-PASS SPRING

FIGURE 2-20 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM
6. HORIZONTAL TABULATOR MECHANISM

NOTE:
BEFORE MAKING THIS ADJUSTMENT, CHECK LEFT MARGIN AND SPACING GEAR PHASING
ADJUSTMENTS.

PURPOSE
TO SELECT TABULATOR STOP TO BE USED AS REFERENCE IN MAKING FINAL TABULATOR PAWL
HORIZONTAL AND VERTICAL ADJUSTMENTS.

PROCEDURE
(1) BEGINNING WITH 15TH SLOT COUNTERCLOCKWISE FROM ROLLER ON TABULATOR RING,
PLACE TABULATOR STOPS APPROXIMATELY AN EQUAL NUMBER OF SLOTS APART AROUND REMAINING SLOTTED PERIPHERY OF RING CORRESPONDING TO LENGTH OF PRINTED LINE.

(2) TO MOVE STOPS, HOOK SMALL SPRING HOOK IN HOLE AND PULL OUT RADILY FROM
DRUM. HOLDING STOP AWAY FROM DRUM, SLIDE IT ON GARTER SPRING TO DESIRED LOCA
TION AND INSERT IN SLOT. SPACING DRUM MAY HAVE TO BE ROTATED TO MAKE SOME
SLOTS ACCESSIBLE. CAUTION: MAKE SURE ALL STOPS ARE FIRMLY SEATED AND NOT TURNED
SIDEWAYS.

(3) DISENGAGE ALL CLUTCHES SO FRONT SPACING FEED PAWL IS IN LOWER POSITION. PLACE
PAWL ADJUSTING PLATE AT CENTER OF HORIZONTAL AND VERTICAL ADJUSTMENT: TO ADJUST
VERTICALLY, LOOSEN BOTH MOUNTING SCREWS; TO ADJUST HORIZONTALLY, LOOSEN ONLY
LEFT SCREW. HORIZONTAL ADJUSTMENT SHOULD BE MADE AFTER VERTICAL. DISENGAGE
SPACING FEED PAWLS AND ALLOW DRUM TO ROTATE TO EXTREME COUNTERCLOCKWISE PO
SITION. KEEPING SPACING CLUTCH DISENGAGED, MANUALLY ADVANCE DRUM UNTIL FIRST
STOP IS IMMEDIATELY TO LEFT OF PAWL. POSITION ADJUSTING PLATE HORIZONTALLY SO
THAT STOP IS ALIGNED WITH LEFT EDGE OF PAWL SHOULDER.

(4) PLACE BLOCKING LEVER AND OPERATING LEVER SLIDE ARM IN UNBLOCKED POSITION.
DISENGAGE FEED PAWLS AND LET DRUM ROTATE TWO SPACES COUNTERCLOCKWISE. BOTH
FEED PAWLS SHOULD BE FULLY ENGAGED. BLOCK SLIDE ARM WITH BLOCKING LEVER. GAGE
AND NOTE CLEARANCE BETWEEN STOP AND SLOPE ON PAWL.

(5) ROTATE DRUM CLOCKWISE UNTIL NEXT STOP IS JUST TO LEFT OF PAWL. REPEAT PROCEDURE
DESCRIBED IN PARAGRAPH (4) FOR THIS STOP. REPEAT PROCEDURE FOR REMAINING STOPS,
NOTING EACH CLEARANCE.

(6) STOP WITH MAXIMUM CLEARANCE SHOULD BE USED AS REFERENCE IN MAKING FINAL
HORIZONTAL AND VERTICAL PAWL ADJUSTMENTS.

FIGURE 2-21 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, FRONT VIEW

CHANGE 4 2-21
6. HORIZONTAL TABULATOR MECHANISM

TABULATOR PAWL - VERTICAL (FINAL)

TO CHECK
POSITION SPACING DRUM SUCH THAT REFERENCE TABULATOR STOP, AS DETERMINED BY PRELIMINARY TABULATOR PAWL ADJUSTMENT (FIG. 2-21), IS OPPOSITE SHOULDER ON PAWL. BLOCK OPERATING LEVER SLIDE ARM WITH BLOCKING LEVER.

REQUIREMENT
CLEARANCE BETWEEN PAWL AND STOP:
MIN. 0.060 INCH MAX. 0.070 INCH

TO ADJUST
POSITION PAWL ADJUSTING PLATE WITH BOTH MOUNTING SCREWS LOOSENED.
TIGHTEN RIGHT SCREW ONLY, USING WRENCH TO PREVENT BUSHING FROM TURNING.

FIGURE 2-22 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, FRONT VIEW
6. HORIZONTAL TABULATOR MECHANISM

**TABULATOR PAWL - HORIZONTAL (FINAL)**

**TO CHECK**

1. Disengage all clutches so that front spacing feed pawl is in lower position (as shown in Fig. 2-21). Position spacing drum so that reference tabulator stop, as determined in preliminary tabulator pawl adjustment (Fig. 2-21), is immediately to left of pawl. Operating lever slide arm should be forward in unblocked position. Disengage feed pawls and allow drum to rotate one space counterclockwise. Both feed pawls should be fully engaged. Move slide arm to rear to blocked position.

2. Trip spacing clutch stop lever and slowly rotate main shaft until blocking lever is just tripped. Take up play in spacing shaft toward rear.

**REQUIREMENT**

Some portion of clutch disk stop lug should be aligned with rear surface of spacing shaft gear.

**TO ADJUST**

Repeat procedure set forth in paragraph (1) above. Trip spacing clutch and rotate shaft until middle of stop lug is in line with rear surface of gear. If blocking lever tripped too soon, with left mounting screw loosened, position pawl adjusting plate to left until slide arm can be blocked. Slowly move plate to right until blocking lever just trips. When adjusting trip-off point, care should be taken that blocking lever is cammed down by stop and not manually moved out of blocked position by accident. Recheck requirement.

**NOTE:**

After obtaining trip-off point, continue rotating main shaft until spacing clutch is disengaged. Pawl should be to right of stop. When slide arm is moved to rear, blocking lever should move to blocked position. If tip of pawl should rest on end of stop, readjust plate to right so that clearance between pawl and stop is:

- **MIN.** 0.003
- **MAX.** 0.008

FIGURE 2-23 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, FRONT VIEW
6. HORIZONTAL TABULATOR MECHANISM

TABULATOR STOP SETTINGS

NOTE:
FOR INSTRUCTIONS ON HOW TO MOVE TABULATOR STOPS, SEE TABULATOR PAWL PRELIMINARY ADJUSTMENT, FIGURE 2-21, PARAGRAPH 2

(1) COLUMNAR TABULATOR STOPS

PLACE CARRIAGE IN POSITION TO PRINT FIRST CHARACTER IN COLUMN. PLACE STOP IN SLOT IMMEDIATELY TO LEFT OF PAWL. TO FACILITATE INSERTING STOPS, MARK DESIRED SLOT AND ROTATE DRUM TO MORE ACCESSIBLE POSITION. FOR SETTINGS NEAR LEFT MARGIN, COUNT NUMBER OF SPACING OPERATIONS FROM LEFT MARGIN AND PLACE STOP CORRESPONDING NUMBER OF SLOTS COUNTERCLOCKWISE FROM ROLLER.

NOTE: WHEN PRINTING FORMS, CHECK STOP SETTINGS IN RELATION TO COLUMNS. CORRESPONDING STOPS ON ALL MACHINES ON A CIRCUIT MUST BE THE SAME NUMBER OF SLOTS FROM LEFT MARGIN.

(2) RIGHT MARGIN TABULATOR STOP (WITH WIDE SHELF)

NOTE: BEFORE MAKING THIS ADJUSTMENT, CHECK RIGHT MARGIN AND TABULATOR PAWL ADJUSTMENTS.

POSITION PRINTING CARRIAGE AT RIGHT MARGIN (SPACING CUTOUT OPERATED). INSERT STOP WITH WIDE SHELF IN SLOT IMMEDIATELY TO LEFT OF PAWL. SHELF SHOULD EXTEND TO RIGHT SO THAT PAWL RESTS ON IT.

FIGURE 2-24 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, FRONT VIEW
6. HORIZONTAL TABULATOR MECHANISM

NOTE
THE FOLLOWING TWO HORIZONTAL TABULATOR MECHANISM ADJUSTMENTS SHOULD BE CHECKED BEFORE MAKING THE TRANSMITTER CONTROL ADJUSTMENTS SHOWN BELOW.

1. OPERATING LEVER SLIDE ARM (FIGURE 2-17)
2. OPERATING LEVER ADJUSTING PLATE (FIGURE 2-17)

IF EITHER OF THE ABOVE ADJUSTMENTS ARE CHANGED, THE TRANSMITTER CONTROL ADJUSTMENTS SHOULD BE RECHECKED.

TRANSMITTER CONTROL CONTACT SPRING TENSION REQUIREMENT
OPERATING LEVER IN UNOPERATED POSITION.
MIN. 3-1/2 OZS.
MAX. 4-1/2 OZS.
TO JUST OPEN CONTACTS.

TO ADJUST BEND THE LONG CONTACT SPRING

LONG CONTACT SPRING

PIVOT

CONTACT ASSEMBLY BRACKET

BRACKET MOUNTING SCREW

TRANSMITTER CONTROL CONTACT GAP REQUIREMENT
OPERATING LEVER SLIDE ARM PULLED TO REAR UNTIL BLOCKED BY BLOCKING LEVER. CLEARANCE BETWEEN CONTACTS
MIN. 0.010 INCH
MAX. 0.020 INCH

TO ADJUST POSITION THE CONTACT ASSEMBLY BRACKET WITH THE MOUNTING SCREW LOOSENED. THE BRACKET PIVOTS ABOUT A PIN AT THE UPPER END OF THE BRACKET.

FIGURE 2-25 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM

CHANGE 4
7. PAGE FEED OUT MECHANISM

(A) PAGE FEED-OUT GEAR PLAY

REQUIREMENT
BARELY PERCEPTIBLE BACKLASH.
TO ADJUST
POSITION GEAR PIVOT POST WITH NUT LOOSENED.

INDEX PLATE
GEAR PIVOT POST
INDEXING DISK
PIVOT POST NUT
MOUNTING BRACKET
MOUNTING BRACKET MOUNTING SCREW

(B) MOUNTING BRACKET

REQUIREMENT
UPPER CASE 2 FUNCTION BAR SELECTED AND IN ITS MOST REARWARD POSITION. CLEARANCE.
MIN. 0.002 INCH
MAX. 0.010 INCH
TO ADJUST
POSITION LOWER PORTION OF MOUNTING BRACKET WITH MOUNTING SCREWS LOOSENED.

(C) BLOCKING ARM

SEE FIGURE 2-27

(D) INDEXING DISK

REQUIREMENT
LINE FEED CLUTCH DIS ENGAGED:
INDEX PLATE ADJACENT TO BAIL,
CLEARANCE
MIN. 0.020 INCH
MAX. 0.040 INCH
TO ADJUST
DISENGAGE GEAR FROM IDLER. TURN HANDWHEEL CLOCKWISE UNTIL CAM PLATE JUST OPERATES BAIL. ENGAGE FIRST TOOTH ON IDLER. POSITION INDEXING DISK WITH THREE MOUNTING SCREWS LOOSENED.

INDEXING DISK MOUNTING SCREWS
SWITCH MOUNTING SCREWS
SWITCH PLUNGER

(E) SWITCH OPERATING ARM

(USED ONLY WITH TRANSMITTER CONTROL)

REQUIREMENT
BLOCKING ARM IN POSITION TO BLOCK SLIDE. CLEARANCE
MIN. SOME
MAX. 0.005 INCH
TO ADJUST
POSITION SWITCH WITH TWO MOUNTING SCREWS LOOSENED.

SWITCH OPERATING ARM

PAGE FEED OUT SLIDE
7. PAGE FEED-OUT MECHANISM

(F) POINTER REQUIREMENT
LINE FEED CLUTCH: DIS ENGAGED.
INDEX PLATE: ADJACENT TO BAIL
AS SHOWN IN FIGURE 2-26. POINTER
SHOULD LINE UP WITH NOTCH IN INDEXING
DISK AND CLEAR DISK BY APPROXIMATELY
1/16 INCH.
TO ADJUST
POSITION POINTER WITH MOUNTING
SCREW LOOSENED.

(C) BLOCKING ARM REQUIREMENT
BAIL ON PEAK OF INDEX
PLATE: CLEARANCE
MIN. 0.010 INCH
MAX. 0.025 INCH
TO ADJUST
POSITION ADJUSTABLE ARM
WITH MOUNTING SCREWS
LOOSENED.
NOTE
IF REQUIREMENT CANNOT
BE MET FOR EACH PLATE,
REPOSITION PLATE WITH
MOUNTING SCREW LOOSENED.

(H) BLOCKING ARM SPRING TENSION REQUIREMENT
BLOCKING ARM IN UNBLOCKED
POSITION:
MIN. 3 OZS.
MAX. 5 OZS.
TO PULL SPRING TO OPERATING
LENGTH.

FIGURE 2-27 TYPING UNIT, PAGE FEED-OUT MECHANISM
8. SELECTIVE CALLING MECHANISM

TYPE BOX CLUTCH TRIPLEVER
(SELECTIVE-CALLING UNITS WITH OR WITHOUT OFF-LINE SHIFT SOLENOID)
CLEARANCE BETWEEN TYPE BOX CLUTCH TRIP LEVER AND CLUTCH DISK STOP LUG SHOULD BE
MIN. 0.030 INCH MAX. 0.065 INCH
SEE FIG. 1-33

SUPPRESSOR CODE BAR SPRING
REQUIREMENT
SUPPRESSOR CODE BAR TO LEFT.
MIN. 4 1/2 OZS. MAX. 7 1/2 OZS.
TO START CODE BAR MOVING.
CODE BAR SHOULD BE FREE OF BINDS.

NOTE: TO CHECK REQUIREMENTS (A, B, AND D), SET FUNCTION CLUTCH IN STOP POSITION AND ALL CODE BARS TO THE RIGHT.

A. CODE BAR SHIFT MECHANISM

REQUIREMENTS
1. WITH FUNCTION CLUTCH IN STOP POSITION, LATCH FUNCTION LEVER (SHIFT MECH.) ON ITS LOWER RELEASING LATCH. NOTCH IN SUPP. CODE BAR SHOULD ALIGN WITH NOTCHES IN OTHER CODE BARS WHEN ALL CODE BARS ARE SHIFTED TO THE RIGHT.

TO ADJUST
POSITION UPPER OR LOWER GUIDE PLATE (FIG. 1-43) WITH ITS CLAMP NUTS LOOSENED

2. REPEAT FOR EACH STUNT CASE CODE BAR SHIFT MECHANISM.

NOTE... POSITION THE ASSOCIATED GUIDE PLATE SO THAT THE MOVEMENT OF THE FORK IS NOT RESTRICTED WITHIN THE RANGE OF ADJUSTMENT

D. OFF LINE SHIFT BRACKET ASSEMBLY (OFF LINE ONLY)

REQUIREMENT
NOTCH IN SUPPRESSION CODE BAR SHOULD ALIGN WITH NOTCHES IN OTHER CODE BARS WHEN ALL CODE BARS ARE SHIFTED TO THE RIGHT.

TO ADJUST
POSITION THE SOLENOID BRACKET ASSEMBLY WITH ITS MOUNTING SCREWS LOOSENED.

B. CONDITION CODE (ZERO) CODE BAR SHIFT MECHANISM

REQUIREMENT
WITH FUNCTION CLUTCH IN STOP POSITION, LATCH FUNCTION LEVER (SHIFT MECH).
THE NOTCH IN CONDITION CODE (ZERO) CODE BAR SHOULD ALIGN WITH NOTCHES IN OTHER CODE BARS WHEN ALL CODE BARS ARE SHIFTED TO THE RIGHT.

TO ADJUST
POSITION THE UPPER OR LOWER GUIDE PLATE (FIG. 1-43) WITH ITS CLAMP NUTS LOOSENED

NOTE... POSITION THE ASSOCIATED GUIDE PLATE SO THAT THE MOVEMENT OF THE FORK IS NOT RESTRICTED WITHIN THE RANGE OF ADJUSTMENT.

FIGURE 2-28 TYPING UNIT, CODE BAR SHIFT MECHANISM
8. SELECTIVE CALLING MECHANISM

C. TYPE BAR CLUTCH SUPPRESSION ARM (WITH OR WITHOUT SOLENOID SHIFT)

REQUIREMENT

SUPPRESSION ARM IN BLOCKING POSITION. SHAFT ROTATED UNTIL
THE FUNCTION CLUTCH SHOE LEVER IS OPPOSITE THE FUNCTION
CLUTCH TRIP LEVER.

1. AT LEAST 0.003 INCH CLEARANCE BETWEEN TRIP ARM
   EXTENSION AND CLUTCH TRIP LEVER.
2. AT LEAST 0.006 INCH CLEARANCE BETWEEN THE FUNCTION
   CLUTCH SHOE LEVER AND FUNCTION CLUTCH TRIP LEVER.

TO ADJUST

POSITION SUPPRESSION ARM WITH ITS MOUNTING SCREWS LOOSENED.

SOLENOID BRACKET
MOUNTING SCREWS

OFF LINE STUNT SHIFT SOLENOID SPRING
REQUIREMENT

WITH SOLENOID UNOPERATED
MIN. 2 OZS. MAX. 4 1/2 OZS.
TO PULL SPRING TO ITS INSTALLED LENGTH.

1. LATCH FUNCTION LEVER OF ANY STUNT CASE CODE BAR SHIFT MECHANISM
   AND ROTATE MAIN SHAFT UNTIL LOWER SURFACE OF THE SUPPRESSION ARM IS
   ALIGNED (APPROX.) WITH BOTTOM SURFACE OF BLOCKING BAIL EXTENSION.
   CLEARANCE BETWEEN SUPPRESSION ARM AND BLOCKING BAIL EXTENSION, WITH
   PLAY TAKEN UP TO PRODUCE MINIMUM CLEARANCE.
   MIN. 0.008 INCH MAX. 0.035 INCH

TO ADJUST

POSITION EXTENSION WITH ITS MOUNTING SCREW LOOSENED. REFINE THE ADJUST­
MENT IF NECESSARY, AND RECHECK EACH SHIFT MECHANISM.
2. REFINE THE STUNT CASE CODE BAR SHIFT MECHANISM ADJUSTMENT OF ANY
   SHIFT MECHANISM THAT DOES NOT MEET THE ABOVE REQUIREMENT.

FIGURE 2-29 TYPING UNIT, OFF LINE STUNT SHIFT SOLENOID MECHANISM
8. SELECTIVE CALLING MECHANISM

**Line Feed (Stunt Case) Function Bar**

**Automatic Carriage Return – Line Feed Blocking Slide**

(Front View)

**Condition Code Shift Fork Spring Requirement**

With Condition Code Shift in its unoperated position.

- **MIN. 1 OZ.**
- **MAX. 3 OZS.**

To pull spring to its installed position.

**Blocking Slide Spring**

**Guide Plate**

**Lower Guide Plate**

**Automatic Carriage Return Function Bar**

(Top View)

**Automatic Carriage Return – Line Feed Blocking Slide Spring Requirement**

With Condition Code Shift Fork in its unoperated position.

- **MIN. 1 OZ.**
- **MAX. 3 OZS.**

To pull spring to its installed length.

**Figure 2-30 Typing Unit, Stunt Box Mechanism**
9. LOCAL BACK SPACE MECHANISM

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-46

BACK SPACE TRIP LINK HORIZONTAL SPRING
REQUIREMENT
TYPER UNIT REMOVED
MIN. 1 3/4 OZS.
MAX. 3 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

BACK SPACE TRIP LINK VERTICAL SPRING
REQUIREMENT
TYPER UNIT REMOVED
MIN. 1 1/2 OZS.
MAX. 3 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

BACK SPACE TRANSFER BAIL SPRING
REQUIREMENT
MIN. 1/2 OZ.
MAX. 1 OZ.
TO PULL SPRING TO INSTALLED LENGTH.

FIGURE 2-31 KEYBOARD, BACK SPACE MECHANISM
9. LOCAL BACK SPACE MECHANISM

SPACING FEED PAWL

REQUIREMENT
MIN. 0.020 INCH
MAX. 0.035 INCH
(SEE CAMMING BAIL STOP ARM ADJ.)

SPACING DRUM

TRANSFER BAIL ADJUSTING LEVER

(1) REQUIREMENT
DOWNWARD PRESSURE OF
MIN. 16 OZS.
MAX. 28 OZS.
TO OPERATE THE BACKSPACE KEYLEVER

(2) REQUIREMENT
AFTER THE KEYLEVER IS DEPRESSED AND
RELEASED THE CAMMING BAIL SHOULD
RETURN TO ITS UNOPERATED POSITION.
TO ADJUST
POSITION THE TRANSFER BAIL ADJUSTING
LEVER WITH ITS MOUNTING SCREW LOOSENED.
IF THE UNIT IS FORWARD-SPACING, THE
ADJUSTING LEVER MUST BE RAISED UNTIL
PROPER BACKSPACING IS ACCOMPLISHED.

NOTE: THIS ADJUSTMENT MAY HAVE TO BE
REMADE WHEN A DIFFERENT TYPING
UNIT IS USED ON THE BASE.

KEYLEVER

TRANSFER BAIL ADJUSTING LEVER

MOUNTING SCREW

NOTE: FOR EARLIER DESIGN SEE FIGURE 4-47

FIGURE 2-32 KEYBOARD, BACK SPACE MECHANISM
9. LOCAL BACK SPACE MECHANISM

**CAMMING BAIL STOP ARM REQUIREMENT**

Spacing clutch disengaged, front feed pawl in lower position, back space bail held operated, clutch tripped and main shaft rotated until the front feed pawl tooth is opposite the peak of the first spacing drum tooth that moves down past the pawl tooth. Clearance between pawl tooth and the tooth on the spacing drum ratchet wheel.

- **MIN.** 0.020 inch
- **MAX.** 0.035 inch

To adjust position the adjusting plate on the intermediate arm in the center of its adjusting range. Then position the camming bail stop arm with its mounting screw friction tight to meet the requirement.

**CAMMING BAIL SPRING REQUIREMENT**

- **MIN.** 1 ozs.
- **MAX.** 2-1/4 ozs.

To start bail moving

**Figure 2-33 Typing Unit, Backspace Mechanism**

Change 4
10. REVERSE LINE FEED MECHANISM

**REVERSE LINE FEED TRIP LINK VERTICAL SPRING REQUIREMENT**
- Typing unit removed.
  - MIN. 1 1/2 OZS.
  - MAX. 3 1/2 OZS.
  - To pull spring to installed length.

**REVERSE LINE FEED TRIP LINK HORIZONTAL SPRING REQUIREMENT**
- Typing unit removed.
  - MIN. 1 1/2 OZS.
  - MAX. 3 1/2 OZS.
  - To pull spring to installed length.

**TRIP LINK VERTICAL SPRING**

**TRIP LINK HORIZONTAL SPRING**

**KEYBOARD**

**SLIDE LINK STOP BRACKET**

**LINE FEED BARS**

**SLIDE LINK**

**MOUNTING SCREW**

**REVERSE LINE FEED SLIDE LINK SPRING REQUIREMENT**
- Slide link resting on its stop bracket, line feed clutch disengaged.
  - MIN. 1 1/2 OZS.
  - MAX. 3 1/2 OZS.
  - To pull spring to installed length.

**REVERSE LINE FEED SLIDE LINK STOP BRACKET REQUIREMENT**
- With the line feed bar nearest the slide link during a forward line feed operation, the clearance between the top surface of the slide link and the lower edge of the lower line feed bar should be:
  - MIN. .005 INCH
  - MAX. .030 INCH
  - Check both feed bars to adjust
  - Position the slide link stop bracket with mounting screws loosened.

**FIGURE 2-34 LOCAL REVERSE LINE FEED MECHANISM, LEFT VIEW**
10. REVERSE LINE FEED MECHANISM

**LINE FEED CLUTCH SPUR GEAR REQUIREMENT**

LINE FEED CLUTCH DISENGAGED. SLIDE LINK RAISED UPWARD SO AS TO FULLY ENGAGE THE END OF THE LOWER LINE FEED BAR, SLIDE HELD FORWARD BY ITS SPRING CLEARANCE BETWEEN SLIDE LINK AND LOWER LINE FEED BAR.

MIN. 0.005 INCH  
MAX. 0.040 INCH

TO ADJUST SET LINE FEED CLUTCH SPUR GEAR AT CENTER OF ADJUSTING RANGE
DISSINGAGE LINE FEED CLUTCH, LOOSEN ECCENTRIC ASSEMBLY BEARING POST. MESH THE TWO GEAR'S SO THAT THE FORWARD EDGES OF THE LOWER ENDS OF THE LINE FEED BARS ARE IN LINE WITH EACH OTHER WITHIN 0.040 INCH. ROTATE THE LINE FEED CLUTCH SPUR GEAR RELATIVE TO ITS MOUNTING PLATE WITH THE GEAR MOUNTING SCREWS LOOSENED. CHECK BOTH BARS FOR THE REQUIRED CLEARANCE AT EACH STOP POSITION OF THE CLUTCH.

---

**FIGURE 2-35 TYPING UNIT, LINE FEED MECHANISM, LEFT SIDE VIEW**

CHANGE 4
10. REVERSE LINE FEED MECHANISM

(B) PLATEN DETENT BAIL SPRING TENSION
REQUIREMENT
DETENT SEATED BETWEEN TWO TEETH ON LINE FEED SPUR GEAR.
MIN. 16 OZS.
MAX. 32 OZS.
TO START DETENT BAIL MOVING.

(C) LINE FEED BAR RELEASE LEVER SPRING TENSION
REQUIREMENT
MIN. 3 OZS.
MAX. 8 OZS.
TO START LEVER MOVING

DETECT ECCRNCIC

HAND WHEEL

LINE FEED BAR RELEASE LEVER

(A) LINE FEED SPUR GEAR DETENT ECCENTRIC
REQUIREMENT
LINE FEED CLUTCH DISENGAGED. PLATEN ROTATED UNTIL DETENT STUD IS SEATED BETWEEN TWO TEETH ON LINE FEED SPUR GEAR. WHEN HAND WHEEL IS RELEASED, MANUALLY SET THE TEETH ON THE FEED BARS INTO ENGAGEMENT WITH THE TEETH ON THE LINE FEED SPUR GEAR. THE DETENT STUD SHOULD CONTACT ONE GEAR TOOTH AND BE NOT MORE THAN 0.006 INCH FROM THE OTHER TOOTH

TO ADJUST
ROTATE THE DETENT ECCENTRIC WITH ITS MOUNTING SCREWS LOOSENED. KEEP HIGH PART OF ECCENTRIC UPWARD.

FIGURE 2-36 TYPING UNIT, LINE FEED MECHANISM, RIGHT SIDE VIEW
10. REVERSE LINE FEED MECHANISM

**LINE FEED BAR SPRINGS REUQIREMENT**
- LINE FEED BAR ENGAGED WITH PLATEN GEAR.
  - MIN. 2 1/2 Ozs.
  - MAX. 5 Ozs.
  - TO PULL EACH SPRING TO INSTALLED LENGTH.

**LINE FEED BAR SPRING REQUIREMENT**
- LINE FEED BAR IN REAR POSITION, SLIDE LINK UNOPERATED, LINE FEED BAR SPRINGS IN PLACE.
  - MIN. 19 Ozs.
  - MAX. 24 Ozs.
  - TO START LINE FEED BAR MOVING.

** FIGURE 2-37 TYPING UNIT, LINE FEED MECHANISM, RIGHT SIDE VIEW**
11. MOTOR CONTROL RELAY MECHANISM

**D**

SWITCH POSITION (IF UNIT IS SO EQUIPPED)

REQUIREMENT

WHEN THE SOLENOID PLUNGER IS DEPRESSED SLOWLY, THE SWITCH SHOULD OPERATE WHEN THE PLUNGER IS WITHIN MAX. 0.005 INCH FROM THE END OF ITS TRAVEL.

TO ADJUST

LOosen THE SWITCH MOUNTING SCREWS. HOLD THE PLUNGER DOWNWARD AND MOVE THE SWITCH TOWARD THE PLUNGER UNTIL IT OPERATES. TIGHTEN THE SCREWS.

**A**

MIDDLE CONTACT SPRING TENSION

REQUIREMENT

WITH SOLENOID PLUNGER UNOPERATED

MIN. 2 OZS.
MAX. 3 OZS.

TO BREAK CONTACT WITH INNER CONTACT

TO ADJUST

BEND MIDDLE CONTACT SPRING

**B**

OUTER CONTACT SPRING TENSION

REQUIREMENT

HOLD SOLENOID PLUNGER OPERATED

MIN. 12 OZS.
MAX. 16 OZS.

TO BREAK CONTACT WITH THE MIDDLE CONTACT SPRING.

TO ADJUST

BEND OUTER CONTACT SPRING.

**C**

INNER CONTACT SPRING GAP

REQUIREMENT

HOLD SOLENOID PLUNGER OPERATED

CLEARANCE BETWEEN INNER AND MIDDLE CONTACT SPRING CONTACT SURFACE

MIN. 0.025 INCH
MAX. 0.030 INCH

TO ADJUST

BEND THE INNER CONTACT SPRING.

**FIGURE 2-38** ELECTRICAL SERVICE UNIT, MOTOR CONTROL RELAY
12. END-OF-FORM ALARM MECHANISM (CABINET)

**END-OF-FORM LEVER**

**REQUIREMENT**


**TO ADJUST**

POSITION THE END-OF-FORM LEVER WITH ITS CLAMP SCREWS LOOSENED.

**FIGURE 2-39** CABINET, END-OF-FORM ALARM MECHANISM
13. OFF-SET COPYHOLDER

(A) PIVOT ARM AND LINE GUIDE

(1) REQUIREMENT
There should be sufficient tension on the pivot arm to hold it in the desired position.

To adjust:
Tighten the bearing plate mounting screws.

(2) REQUIREMENT
There should be sufficient tension on the line guide to prevent it from slipping down its pivot arm.

To adjust:
Remove the lower bearing plate. Remove the screw from the bottom of the pivot arm. Slip the line guide off the pivot arm. Rotate the bushing in the line guide to increase the tension of the torsion spring. Reassemble.

(B) COPY HOLDER BRACKET AND TOP BRACKET ALIGNMENT
ON TABLE MOUNTED CABINET (NOT ILLUSTRATED)

REQUIREMENT
With lower bracket in forward position, the hole in the top bracket should align with the top hole in copyholder bracket.

To adjust:
Position lower bracket along its elongated mounting holes by means of its two nuts.

14. DIRECTORY HOLDER (TWX)

DIRECTORY HOLDER (TABLE CABINET)

REQUIREMENT
The directory holder should fit snugly against the wall of the cabinet.

To adjust:
Loosen the four bottom inner set of nuts which secure the shock mounts and the holder. Push the holder against the wall of the cabinet and tighten the nuts.
15. PRINT SUPPRESSION DURING SELECTION

(1) REQUIREMENT
FUNCTION CLUTCH ROTATED UNTIL FUNCTION BARS ARE IN EXTREME REAR POSITION. LINE FEED FUNCTION PAWL HOOKED OVER ITS FUNCTION BAR AND THEN STRIPPED. THE NOTCH IN THE ZERO CODE BAR SHOULD LINE UP VERTICALLY WITH THE NOTCHES IN THE 4, 1, 5, 2, 3. CODE BARS BUT MAY BE OUT OF ALIGNMENT MAX. 0.010 INCH IN THE MARKING DIRECTION.

(2) REQUIREMENT
MAX. 0.002 INCH CLEARANCE BETWEEN GUIDE PLATE EXTENSION AND SLIDE. TO ADJUST POSITION THE GUIDE PLATE BY ITS LOWER ADJUSTING SLOT WITH ITS CLAMP NUTS LOOSENED.

SUPPRESSION CODE BAR MECHANISM

(1) REQUIREMENT
FUNCTION BARS IN REAR POSITION. CALL DIRECTING FUNCTION PAWL HOOKED OVER ITS FUNCTION BAR AND STRIPPED. NOTCH IN SUPPRESSION CODE BAR SHOULD LINE UP VERTICALLY WITH NOTCHES IN 4, 1, 5, 2, 3 CODE BARS BUT MAY BE OUT OF ALIGNMENT MAX. 0.010 INCH IN THE MARKING DIRECTION

(2) REQUIREMENT
MAX. 0.002 INCH CLEARANCE BETWEEN GUIDE PLATE EXTENSION AND SLIDE. TO ADJUST POSITION THE GUIDE PLATE BY ITS LOWER ADJUSTING SLOT WITH ITS CLAMP NUTS LOOSENED.

(3) REQUIREMENT
THERE SHOULD BE SOME CLEARANCE BETWEEN THE REAR END OF THE FUNCTION BAR AND THE FACE OF THE NOTCH ON THE FUNCTION PAWL WHEN THE LINE FEED FUNCTION PAWL AND CALL DIRECTING FUNCTION PAWL ARE ALTERNATELY HOOKED OVER THEIR RESPECTIVE FUNCTION BAR.

REFINE THE TWO ADJUSTMENTS ABOVE IF NECESSARY.

FIGURE 2-42 TYPING UNIT, PRINT SUPPRESSION MECHANISM
16. CONTINUOUS SPACING

SOLENOID PLUNGER SPRING

REQUIREMENT
SOLENOID DE-ENERGIZED, SPRING UNHOOKED
MIN. 1 1/2 OZS.
MAX. 3 OZS.
TO PULL SPRING TO POSITION LENGTH.

FUNCTION CLUTCH TRIP LEVER

REQUIREMENT

TO ADJUST
POSITION THE SOLENOID MOUNTING PLATE WITH ITS MOUNTING SCREWS LOOSENED. IN POSITIONING THE PLATE MOVE EACH END EQUALLY TO AVOID BINDS IN THE SOLENOID PLUNGER AND FUNCTION CLUTCH TRIP LEVER.

FIGURE 2-43  TYPING UNIT, CONTINUOUS SPACING AND TRIPLE LINE FEED MECHANISM
16. CONTINUOUS SPACING

SUPPRESSION BAIL ADJUSTING BRACKET

FUNCTION CLUTCH ROTATED UNTIL SUPPRESSION BAIL IS IN EXTREME FORWARD POSITION. CR AND LF FUNCTION SLIDE ARMS MANUALLY PUSHED FORWARD UNTIL THE CR AND LF LEVERS ARE TRIPPED. SLIDE ARMS RESTING BACK AGAINST THEIR SLIDE ARM BRACKETS. CLEARANCE BETWEEN PROJECTION ON CR SLIDE ARM AND GUIDE BAR MIN. 0.070 INCH MAX. 0.095 INCH

TO ADJUST
POSITION THE CONNECTING LINK ON THE ADJUSTING BRACKET WITH ITS CLAMP SCREW LOOSENED. RECHECK AFTER TIGHTENING SCREW. ON TWO-STOP CLUTCHES, CHECK WITH CLUTCH IN EACH POSITION.

NOTE
BEFORE MAKING THE FOLLOWING ADJUSTMENT CHECK THE CARRIAGE RETURN LEVER ADJUSTMENT. WITH THE STUNT BOX REMOVED, THE STANDARD ADJUSTING PROCEDURE CANNOT BE FOLLOWED. REFER TO FIGURE 1-51 AND USE THE FOLLOWING PROCEDURE.

CARRIAGE RETURN LEVER

WITH THE CR SLIDE ARM POSITIONED 0.055 INCH FUNCTION RESET BAIL IN FORWARD POSITION FROM THE GUIDE BAR, THE CLEARANCE BETWEEN THE CARRIAGE RETURN LATCH BAIL AND THE CARRIAGE RETURN LEVER (FIGURE 1-51) SHOULD BE MIN. 0.006 INCH MAX. 0.035 INCH

TO ADJUST
POSITION THE CR LEVER ON THE CR LATCH BAIL WITH THE CLAMP SCREW LOOSENED.

FIGURE 2-44 TYPING UNIT, CONTINUOUS SPACING AND TRIPLE LINE FEED MECHANISM

CHANGE 4
17. LINE TEST KEY

LINE TEST KEY
REQUIREMENT
WHEN KNOB IS MOVED TO DOWNWARD POSITION,
CONTACTS 9 - 10 SHOULD CLOSE BEFORE CONTACTS
8 - 10 AND 5 - 6 OPEN.

FIGURE 2-45. LINE TEST KEY

18. PAPER-OUT ALARM

BELL CRANK FOLLOWER SPRING
REQUIREMENT
SPRING SCALE APPLIED TO BELL CRANK
FOLLOWER WHERE IT MAKES CONTACT WITH
PAPER ROLL
MIN. 2 OZS.
MAX. 3 OZS.
TO START BELL CRANK MOVING.

LEFT SIDE FRAME
BELL CRANK FOLLOWER
FOLLOWER SPRING
MOUNTING SCREWS
SWITCH
PAPER SPINDLE

BELL CRANK FOLLOWER
REQUIREMENT
THE BELL CRANK FOLLOWER SHOULD BE
APPROXIMATELY 1/4 INCH FROM A FLAT
SIDE OF THE PAPER SPINDLE.
TO ADJUST
POSITION THE SWITCH WITH ITS MOUNTING
SCREWS LOOSENED.

FIGURE 2-46. TYPING UNIT, PAPER-OUT ALARM MECHANISM

CHANGE 4
19. OFF-LINE CONTACT

WITH THE GENERATOR CLUTCH LATCHED IN STOP POSITION EACH CONTACT GAP SHOULD BE MAX. 0.035 INCH MIN. 0.025 INCH

WITH THE CODE BAR RESET BAIL IN ITS EXTREME LEFT POSITION THE CLEARANCE BETWEEN THE BAKELITE INSULATOR AND CONTACT BRACKET SHOULD BE MIN. 0.015 INCH

CLEARANCE BETWEEN THE BAKELITE INSULATORS OF THE CONTACT ASSEMBLIES SHOULD BE MIN. 0.050 INCH

EACH BAKELITE INSULATOR SHOULD BE APPROXIMATELY CENTERED ON ITS RESPECTIVE CODE BAR EXTENSION.

TO ADJUST POSITION THE CONTACT BRACKETS WITH THEIR MOUNTING SCREWS LOOSENED. IF NECESSARY, LOOSEN CONTACT PILE-UP SCREWS OR BEND CONTACT SPRINGS.

WITH THE SOLENOID ATTRACTION AND WITH 12 OZS. OF PRESSURE APPLIED TO THE TRIP LINK IN A REARWARD DIRECTION THE CLEARANCE BETWEEN THE TRIP LINK AND THE SOLENOID OPERATED BAIL SHOULD BE MIN. 0.005 INCH MAX. 0.010 INCH

TO ADJUST POSITION THE SOLENOID MOUNTING BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 2-47. KEYBOARD, OFF-LINE CONTACTS AND EXTERNAL TAPE BACKSPACE MECHANISM
19. OFF-LINE CONTACT

SWITCH PLATE

(A) SOLENOID OPERATED SWITCH PLATE POSITION

WITH THE SOLENOID DE-ENERGIZED, THE CLEARANCE BETWEEN ARMATURE AND THE SWITCH (NOT THE PLUNGER) SHOULD BE

MIN. 0.025 INCH
MAX. 0.035 INCH

TO ADJUST POSITION THE SWITCH PLATE WITH ITS MOUNTING SCREWS LOOSENED.

(C) SWITCH OPERATING LEVER SPRING

REQUIREMENT
MIN. 7 1/2 OZS. MAX. 10 1/2 OZS.
TO MOVE LEVER AWAY FROM PLUNGER.

(B) BACKSPACE KEYLEVER OPERATED SWITCH POSITION

REQUIREMENT

WITH THE BACKSPACE KEYLEVER IN ITS NORMAL UNOPERATED POSITION, THE CLEARANCE BETWEEN THE BACKSPACE KEYLEVER OPERATED SWITCH AND THE SWITCH OPERATING LEVER SHOULD BE

MAX. 0.055 INCH

TO ADJUST POSITION THE SWITCH BRACKET WITH ITS MOUNTING SCREWS LOOSENED.

OPERATIONAL CHECK: WITH A TYPING UNIT ON THE BASE, AND AC POWER APPLIED (SELECTOR MAGNETS ENERGIZED), DEPRESS LOCAL BACKSPACE KEYLEVER. CUT OFF AC POWER. RELEASE THE LOCAL BACKSPACE KEYLEVER SO THAT THE BACKSPACE LINK CLEARS THE SOLENOID OPERATED BAIL EXTENSION AND LATCHES UP UNDER IT BY AT LEAST 0.010 INCH CLEARANCE. WITH AC POWER APPLIED THE BACKSPACE SOLENOID SHOULD BECOME ENERGIZED. IF NECESSARY, REFINE THE SOLENOID OPERATED SWITCH PLATE POSITION.

(D) CONTACT SPRING TENSION

REQUIREMENT

WITH CR KEYLEVER DEPRESSED CHECK FRONT CONTACT
WITH SPACE BAR DEPRESSED CHECK CENTER AND REAR CONTACTS

MIN. 1 OZ. MAX. 2 OZS.

TO OPEN CONTACTS

TO ADJUST BEND CONTACT SPRING. IF NECESSARY REMOVE CONTACT ASSEMBLY.

(E) CODE BAR SPRING TENSION

REQUIREMENT

SPACE BAR DEPRESSED

MIN. 3 OZS. MAX. 4 OZS.

TO START EACH CODE BAR MOVING

FIGURE 2-48. KEYBOARD, EXTERNAL TAPE BACKSPACE AND OFF-LINE CONTACT MECHANISM
SECTION 3 - LUBRICATION

1. GENERAL

1.01 The printer set 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 printer just prior to placing it in service. After a few weeks in service, re-lubricate to make certain that all points receive lubrication. The following lubrication schedule should be followed thereafter.

OPERATING SPEED LUBRICATING INTERVAL
(100 words per minute) (Whichever occurs first)

- 60 - - - - 3000 hrs. or 1 yr.
- 75 - - - - 2400 hrs. or 9 mo.
- 100 - - - - 1500 hrs. or 6 mo.

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 should be avoided. Special care must be taken to prevent any oil or grease from getting between the selector armature and its magnet pole faces or between electrical contacts.

1.04 Apply a thick film of grease to all gears and the spacing clutch reset cam plate.

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.

NOTE: During each lubrication period, check the following adjustments:

1. PRINTING CARRIAGE POSITION
2. PRINTING HAMMER BEARING STUD
3. PRINTING HAMMER STOP BRACKET
   (Also see note after "Printing Arm" adjustment)
4. CARRIAGE WIRE ROPE
2. DISASSEMBLY
2.01 CABINET DISASSEMBLY

PERFORM OPERATIONS IN NUMERICAL SEQUENCE

1. DISCONNECT THE PLUG ON THE CABLE FROM THE RECEPTACLE ON THE RIGHT SIDE OF THE TYPING UNIT
2. DISCONNECT THE PLUG ON THE CABLE FROM THE RECEPTACLE ON THE LEFT SIDE OF THE KEYBOARD.
3. REMOVE THE CROSS BAR FROM THE FRONT OF THE CABINET BY LOOSENING THE TWO KNURLED THUMB SCREWS.

2.02 BASE DISASSEMBLY

4. REMOVE THE FOUR SCREWS HOLDING THE KEYBOARD TO THE CRADLE ASSEMBLY AND REMOVE THE KEYBOARD WITH TYPING UNIT ATTACHED.

2.03 KEYLEVER COVER DISASSEMBLY

5. REMOVE THE FOUR SCREWS HOLDING THE TYPING UNIT TO THE KEYBOARD AND REMOVE TYPING UNIT.

6. REMOVE THE SCREW HOLDING THE PLASTIC WINDOW (RIGHT AND LEFT) TO THE KEYLEVER GUIDE PLATE. REMOVE THE TWO SCREWS HOLDING THE KEYLEVER COVER (RIGHT AND LEFT) AND REMOVE KEYLEVER COVER.
3. CABINET

O BEARING SURFACES (2 LEVERS)
G HOOKS - EACH END (4 SPRINGS)
D BEARING SURFACES (2 ROLLERS)
G ENGAGING SURFACE DOOR LATCH (3 SPRINGS)
O BEARING SURFACES (3 PLACES)
O BEARING SURFACES (3 PLACES)
G SPRING LOOPS (2 SPRINGS)
O BEARING SURFACES (4 PLACES)
G SLIDING GROOVE

DOME LATCH LEVER
SPRING
DOME LATCH ROLLER
SPRING
DOOR LATCH
SPRING
DOME STOP ARM
DOME STOP ARM
DOME COUNTERBALANCE ARMS
DOME COUNTERBALANCE ARM
DOME HINGES

G ENGAGING SURFACES (SEE FIG. 3.01)

3.01 ELECTRICAL SERVICE UNIT

G ENGAGING SURFACES STOP MAGNET ARMATURE

CHANGE 4
4. KEYBOARD (EARLIER DESIGN)

4.01 REST KEYBOARD BOTTOM SIDE UP.

4.02 CODE LEVER MECHANISM

- G CONTACTING SURFACE
- O GUIDE SLOTS (34 LEVERS)
- SAT FELT WASHERS (7 WASHERS)
- O BEARING SURFACES (34 WEDGES)
- O HOOKS—EACH END (38 SPRINGS)

4.03 LOCAL CARRIAGE RETURN MECHANISM

- O HOOK EACH END
- O2 BEARING SURFACE
- G ENGAGING SURFACE
- SPRING LOCAL CARRIAGE RETURN TRIP SHAFT
- LOCAL CARRIAGE RETURN FUNCTION ARM
4.04 LOCAL LINE FEED MECHANISM

- O2 GUIDE SLOT
- 0 HOOKS-EACH END
- O2 BEARING SURFACE
- O2 BEARING SURFACE
- G ENGAGING SURFACE

LOCAL LINE FEED TRIP LINK
SPRING
LOCAL LINE FEED TRIP ARM
LOCAL LINE FEED TRIP SHAFT
LOCAL LINE FEED FUNCTION ARM

4.05 KEYBOARD LOCK MECHANISM

- O2 GUIDE SLOT
- 0 HOOKS-EACH END
- O2 BEARING SURFACE
- G ENGAGING SURFACE
- O2 BEARING SURFACE

KEYBOARD LOCK PLUNGER
SPRING
KEYBOARD LOCK FUNCTION ARM
KEYBOARD LOCK ARM TRIP SHAFT

4.06 REST KEYBOARD IN UPRIGHT POSITION

4.07 MARGIN INDICATING MECHANISM

- O2 BEARING SURFACE
- 0 HOOKS-EACH END
- 0 CONTACTING SURFACE

MARGIN INDICATOR CONTACT LEVER
SPRING
SWITCH PLUNGER
4.08 CONTACT BOX

DISASSEMBLY: REMOVE NUT AND LOCK WASHER SECURING CONTACT BOX COVER AND REMOVE COVER.

4.09 CODE BAR MECHANISM

4.10

4.11

3-6
4.12 CODE BAR MECHANISM (Continued)

4.13

4.14 KEYBOARD SELECTOR MECHANISM
4.15 SIGNAL GENERATOR MECHANISM
REST KEYBOARD IN UPRIGHT POSITION

4.16
(REAR VIEW)

4.17
(FRONT VIEW)

02 OILER—EACH END (RIGHT AND LEFT)

G TEETH (2 GEARS)

02 BALL BEARING

MOTOR SHAFT

INTERMEDIATE GEARS

INTERMEDIATE GEAR SHAFT
4.18 SIGNAL GENERATOR MECHANISM (Continued)

- SAT FELT WASHER
- G GEAR TEETH
- D OIL HOLE
- 04 INTERNAL MECHANISM
- SAT FELT WICK
- 02 CAMMING SURFACE
- SAT FELT OILER

- 02 CAMMING SURFACE EACH CAM
- SAT FELT WASHER

- SIGNAL GENERATOR SHAFT
- SIGNAL GENERATOR GEAR
- SIGNAL GENERATOR SHAFT
- KEYBOARD CAM CLUTCH
- CLUTCH DISK
- CAM SLEEVE FELT
- SIGNAL GENERATOR CAM SLEEVE
- SIGNAL GENERATOR SHAFT

4.19

- 02 BEARING SURFACES (3 GUIDES)
- INT. LEVER ROLLERS
- 02 ENGAGING SURFACES (3 PLACES)
- INT. LEVERS
- 0 HOOKS—EACH END (3 SPRINGS)
- SPRING
- 02 BEARING SURFACE
- FLUTTER LEVER
4.20 SIGNAL GENERATOR MECHANISM (Continued)

- 02 BEARING SURFACE
- SAT FELT WASHER
- 02 ENGAGING SURFACE
- 02 BEARING SURFACE
- 02 BEARING SURFACE
- 02 BEARING SURFACE
- 02 GUIDE HOLE

- 02 BEARING SURFACE
- SAT FELT WASHER
- 02 HOOKS—EACH END
  (2 SPRINGS)
- 02 ENGAGING SURFACE
- 02 BEARING SURFACE
- 02 BEARING SURFACE
- 02 BEARING SURFACE
- 02 GUIDE HOLE

- DETENT TOGGLE
- DETENT TOGGLE
- SPRING
- BREAK BAIL
- OSCILLATING LEVER
- BREAK ROD
- BREAK ROD

- HOOKS—EACH END
  (2 SPRINGS)
- LATCHING SURFACE
- SAT FELT WASHER
  (2 WASHERS—FRONT & REAR)
- 02 ENGAGING SURFACE

- SPRING
- CLUTCH STOP LEVER AND
  THROWOUT BAIL LEVER
- THROWOUT BAIL AND
  TRIP BAIL
- CLUTCH TRIP BAIL

- SAT FELT WASHER
- G BEARING SURFACE
- 02 GUIDE SLOT
- SAT FELT WASHER
- G TEETH (2 WHEELS)
- 02 BEARING SURFACE -
  EACH END
- SAT FELT WASHER
- G ENGAGING SURFACE
- SAT FELT WASHER
- SAT FELT WASHER
- 02 HOOKS—EACH END
  (3 SPRINGS)

- ECCENTRIC FOLLOWER PAWL
- ECCENTRIC FOLLOWER PAWL
- ECCENTRIC FOLLOWER PAWL
- LATCH PAWL
- RATCHET WHEELS
- RATCHET WHEEL SHAFT
- CONTACT PAWL
- ECCENTRIC FOLLOWER PAWL
- LATCH LEVER
- SPRING

CHANGE 1
5. TYPING UNIT
5.01 REST TYPING UNIT IN UPRIGHT POSITION

5.02 PRINTING MECHANISM

- SAT FELT WASHERS (2 WASHERS)
- SAT FELT WICK
- G ENGAGING SURFACE
- G ENGAGING SURFACE
- G ENGAGING SURFACE
- SAT FELT WICK
- D HOOKS—EACH END (4 SPRINGS)
- SAT FELT WASHER
- O2 ENGAGING SURFACES (2 PLACES)

PRINTING HAMMER
OPERATING BAIL
SPRING WICK
SECONDARY PRINTING ARM
PRINTING HAMMER STOP
PRINTING HAMMER
SPRING WICK
SPRING
OPERATING BAIL LATCH
OPERATING BAIL LATCH

CHANGE 1
5.03 PRINTING MECHANISM (Continued)

- SAT FELT WASHERS (3 WASHERS)
- PRINTING CARRIAGE ROLLERS
- PRINTING ARM EXTENSION
- GUIDING SURFACE
- PRINTING TRACK
- TRACK SURFACE
- PRINTING ARM
- SAT FELT WASHERS (2 WASHERS)

5.04 TYPE BOX CARRIAGE MECHANISM

- TYPE BOX CARRIAGE LATCH TOGGLE
- TYPE BOX CARRIAGE ROLLERS
- TYPE BOX CARRIAGE LATCH
- TYPE BOX CARRIAGE LINK
- BEARING SURFACE
- BEARINGS (3 ROLLERS)
- SPRING
- HOOK—EACH END FELT WICK
- TYPE BOX CARRIAGE LINK
2178

5.05 CODE BAR MECHANISM
ALSO LOCATION OF PAPER FEED MECHANISM (5.09)

REST TYPING UNIT IN UPRIGHT POSITION

(FRONT VIEW)

5.06

D2 GUIDE SLOTS (RIGHT CENTER, AND LEFT-9 BARS)

CODE BARS

0 HOOKS—EACH END (3 PLACES)

SPRING

CHANGE 1
5.07 CODE BAR MECHANISM (Continued)

REST TYPING UNIT IN UPRIGHT POSITION

5.08

- O2 BEARING BALLS (9 BALLS)
- CODE BAR DETENT

(LEFT SIDE VIEW)

5.09 PAPER FEED MECHANISM (FRONT VIEW)

- 0 HOOKS—EACH END
- O2 BEARING SURFACE
- O2 BEARING SURFACES (EACH END)
- O2 BEARING SURFACES (EACH END)
- O2 BEARING SURFACES (EACH END)
- O HOOKS—EACH END
- O2 BEARING SURFACE
- PAPER PRESSURE ROLLER SHAFTS (WIPE OFF EXCESS OIL)
- PAPER STRAIGHTENER SHFT
- PAPER STRAIGHTENER LEVERS
- SPRING
- PLATEN DETENT BAIL
- PAPER FINGER SHAFT
- PLATEN GEARS
- PLATEN SHAFT
- PAPER PRESSURE ROLLER SHAFTS (WIPE OFF EXCESS OIL)
- PAPER STRAIGHTENER SHAFT
- SPRING
- RELEASE LEVER
- RELEASE LEVER LINK

(LEFT SIDE)

(RIGHT SIDE)
5.10 REST TYPING UNIT IN UPRIGHT POSITION

5.11

5.12 RIBBON FEED MECHANISM (RIGHT SIDE)

- O2 BEARING SURFACE
- O2 BEARING SURFACE
- SAT FELT WASHER
- O HOOKS—EACH END
- O2 ENGAGING SURFACE
- O HOOKS—EACH END
- G TEETH
- SAT FELT WASHERS (2 WASHERS)
- O2 BEARING SURFACE
- O HOOKS—EACH END
- O2 BEARING SURFACES (2 PLACES)
- O2 BEARING SURFACE (2 PLACES)
- RIBBON ROLLER SHAFT
- RIBBON SPOOL TOGGLE
- RIBBON SPOOL SHAFT
- RIBBON FEED LEVER SPRING
- RIBBON DETENT LEVER
- RIBBON RATCHET WHEEL SPRING
- RIBBON RATCHET WHEEL
- RIBBON FEED LEVER BAIL
- RIBBON LEVER SPRING
- RATCHET FEED LEVER SHAFT
- RIBBON DETENT LEVER SHAFT
5.13 RIBBON FEED MECHANISM (Continued)

RIBBON REVERSE LEVER
RIBBON REVERSE LEVERS
RIBBON REVERSE LEVER
RIBBON REVERSE SPUR GEAR

5.14 VERTICAL POSITIONING MECHANISM (RIGHT SIDE)

SAT FELT WASHER
02 BEARING SURFACE
02 ENGAGING SURFACE
0 ENGAGING SURFACES (4 PLACES)
0 HOOKS—EACH END
02 BEARING SURFACES (2 PLACES)
SAT FELT WASHERS (2 WASHERS)
02 GUIDING SURFACE
02 BEARING SURFACE
0 HOOKS—EACH END
02 BEARING SURFACE
02 ENGAGING SURFACE
02 BEARING SURFACE
SAT FELT WASHER
SAT FELT OILER
0 HOOKS—EACH END
SAT FELT NICK
02 BEARING SURFACE
02 BALL BEARING

VERTICAL POSITIONING LEVER
RIBBON DRIVE LINK
VERTICAL POSITIONING LEVER
VERTICAL POSITIONING LEVER
SPRING
VERTICAL POSITIONING LEVER
MAIN SIDE LEVER FOLLOWER ARM
STRIPPER BLADE
RIBBON DRIVE LINK
SPRING
CODE BAR CLUTCH TRIP SHAFT
OPERATING LEVER
MAIN SIDE LEVER FOLLOWER ARM
STRIPPER BLADE ARM
CODE BAR CLUTCH TRIP SHAFT
OPERATING LEVER EXTENSION
VERTICAL POSITIONING LEVER
SPRING
SPRING WICK
ROCKER SHAFT BRACKET
MAIN ROCKER SHAFT
5.15 RIBBON FEED MECHANISM (LEFT SIDE)

- 0 HOOKS - EACH END
- 0 BEARING SURFACE
- 02 BEARING SURFACE
- SAT FELT WASHER
- 02 ENGAGING SURFACE

(LEFT SIDE VIEW)

- SAT FELT WASHERS (2 WASHERS)
- 02 BEARING SURFACE
- G TEETH
- 0 HOOKS - EACH END
- 02 ENGAGING SURFACE
- 02 BEARING SURFACES (2 PLACES)

(REAR VIEW)

5.16 RIBBON FEED MECHANISM (Continued)

- 02 BEARING SURFACE
- RIBBON DETENT LEVER
- 02 ENGAGING SURFACE
- RIBBON REVERSE LEVER
- 02 ENGAGING SURFACE
- RIBBON REVERSE LEVER
- G TEETH
- RIBBON REVERSE SPUR GEAR
5.17 VERTICAL POSITIONING MECHANISM (LEFT SIDE)

- Guiding Surface
- Bearing Surface
- Felt Washer
- Engaging Surfaces (4 Places)
- Hooks—Each End Engaging Surface
- BEARING SURFACE
- BEARING SURFACES (2 PLACES)
- Felt Washers (2 Washers)
- Felt Oilier
- Camming Surface
- Felt Wick
- HOOKS—Each End
- Ball Bearing
- BEARING SURFACE
- BEARING SURFACE

5.18 REST TYPING UNIT IN UPRIGHT POSITION

-STRIPPER BLADE
- RIBBON DRIVE LINK
- VERTICAL POSITIONING LEVER
- VERTICAL POSITIONING LOCK LEVER
- SPRING
- VERTICAL POSITIONING LEVER
- RIBBON DRIVE LINK
- VERTICAL POSITIONING LEVER
- MAIN SIDE LEVER FOLLOWER ARM
- VERTICAL POSITIONING LEVER
- MAIN SIDE LEVER FOLLOWER ARM
- SPRING WICK
- SPRING
- MAIN ROCKER SHAFT
- ROCKERSHAFT BRACKET
- STRIPPER BLADE ARM

5.19

5.20

5.21

(RIGHT SIDE VIEW)
5.19 CODE BAR MECHANISM

- 02 GUIDE SLOTS
- 02 ENGAGING SURFACE BEARING GUIDE SLOTS (6 SLOTS)
- 02 ROLLER BEARINGS (4 ROLLERS)
- 02 BEARING SURFACES (2 PLACES)
- 02 BEARING GUIDE SLOTS (5 SLOTS)
- SAT FELT WASHERS (2 WASHERS)
- 0 HOOKS—EACH END (5 SPRINGS)
- 03 OIL HOLE
- 02 GUIDE SLOTS (5 SLOTS)
- SHIFT LEVERS
- SHIFT AND TRANSFER LEVERS
- TRANSFER LEVER GUIDE BEARING
- SHIFT LEVER LINK ROLLERS
- SHIFT LEVER LINK SHAFT
- SPRING
- INTERMEDIATE ARMS AND TRANSFER LEVERS
- SHIFT LEVERS
- INTERMEDIATE ARM GUIDE BEARING
- SHIFT LEVER LINK
- SHIFT LEVER DRIVE ARM SHAFT

5.20 SELECTOR MECHANISM

- 02 BEARING GUIDE SLOTS (5 SLOTS)
- SAT FELT WICK
- 02 ENGAGING SURFACES (5 LEVERS)
- 02 GUIDE SLOT WICK
- 02 GUIDE SLOTS
- 0 HOOKS—EACH END (12 SPRINGS)
- FILL CUP (AVOID AIR LOCK)
- 02 BEARING GUIDE SLOTS (6 SLOTS)
- PUSH LEVER GUIDE BEARING
- SELECTOR WICK
- PUSH LEVERS
- MARKING LOCK LEVER
- LUBRICATOR WICK
- SELECTOR AND PUSH LEVERS
- SPRINGS
- LUBRICATOR RESERVOIR
- SELECTOR LEVER GUIDE BEARING

CHANGE 3
5.21 SELECTOR MECHANISM (Continued)

SAT FELT WASHERS (2 WASHERS)
O HOOKS–EACH END

CLUTCH TRIP LEVER
SPRING

5.22 WEST TYPING UNIT IN UPRIGHT POSITION

5.23

5.24
5.25
5.26
5.27
5.28

(REAL VIEW)

(REAL VIEW)

CHANGE 2
5.27 SHIFT MECHANISM

- 0 ENGAGING SURFACES
- 0 ENGAGING SURFACE
- 02 GUIDING SURFACES (EACH SLIDE)
- 02 ENGAGING SURFACE

- LETTERS FUNCTION SLIDE
- FIGURES FUNCTION SLIDE
- LETTERS AND FIGURES FUNCTION SLIDES
- LETTERS-FIGURES CODE
- BAR FORK

5.28 FUNCTION ROCKER SHAFT MECHANISM

- SAT FELT WASHER
- SAT FELT WASHERS (2 WASHERS)
- SAT FELT WASHER (2 WASHERS)
- SAT FELT WASHERS (2 WASHERS)

- SPACE SUPPRESSION BAIL
- CARRIAGE RETURN SLIDE ARM
- FUNCTION ROCKER SHAFT
- FUNCTION BAIL TOGGLE LINK
- FUNCTION BAIL
5.29 REST TYPING UNIT ON ITS BACK

5.30 SPACING DRUM DRIVE MECHANISM (EARLIER DESIGN)

- 02 ENGAGING SURFACE
  - (2 PAWL)
- 02 ENGAGING SURFACE
- 02 BEARING (OUTER AND INNER END)
- SAT FELT WASHER
- SPACE PAWLS
- SPACING CUTOUT LEVER
- SPACING DRUM SHAFT
- TRANSFER SLIDE
- STOP ARM ROLLER
- CARRIAGE RETURN LATCH BAIL
- DASH POT
- SPRING
- SPACING DRUM FEED PAWLS ECCENTRICS
- CARRIAGE RETURN LATCH BAIL SPRING WICK
- TRANSFER SLIDE ROLLERS
- SPACING DRUM RATCHET WHEEL
- SPACING DRUM

(SEE PARAGRAPH 6·08)
5.31 CARRIAGE RETURN MECHANISM

SAT FELT OILER
02 BETWEEN LAYERS
G CAM DISK SURFACE
02 BEARING (OUTER AND INNER END)
SAT FELT WASHER
O HOOKS—EACH END
SAT FELT WICK
02 BEARING SURFACE
02 CABLE GROOVES

PRINTING TRACK GUIDE
CARRIAGE RETURN SPRING
MARGIN INDICATOR CAM DISK
CARRIAGE RETURN SPRING DRUM SHAFT
SPRING
SPRING WICK
TENSION PULLEY BAIL

MAIN BAIL
PULLEY
CARRIAGE RETURN SPRING DRUM

5.32

02 ENGAGING SURFACES (2 PLACES)
02 BEARING SURFACE
0 HOOKS—EACH END
02 ENGAGING SURFACE
02 BEARING SURFACES (2 PLACES)
0 HOOKS—EACH END

AUTOMATIC CARRIAGE RETURN BELL CRANK
AUTOMATIC CARRIAGE RETURN BELL CRANK
SPRING
SPACING DRUM FEED PAWL RELEASE LINK
SPACING DRUM FEED PAWL RELEASE LINK
SPRING

5.33

SAT FELT OILER

PRINTING TRACK GUIDE

3-24

CHANGE 1
5.34 REST TYPING UNIT ON ITS BACK

5.35 HORIZONTAL POSITIONING MECHANISM (FRONT VIEW)

- SAT FELT WASHER
- O2 ENGAGING SURFACE
- O2 DETENTS (2 DETENTS)
- O2 ENGAGING SURFACE
- SAT FELT WASHERS (2 WASHERS)
- O2 BEARING SURFACE

HORIZONTAL REVERSING SLIDE SHIFT LEVER
DETENT BAILS
HORIZONTAL REVERSING SLIDE SHIFT LEVER
OSCILLATING RAIL SHIFT SLIDE
HORIZONTAL REVERSING SLIDE SHIFT LEVER
OSCILLATING RAIL SHIFT SLIDE

CHANGE 1
5.36 HORIZONTAL POSITIONING MECHANISM (Continued)

(TOP VIEW)

5.37

(FRONT VIEW)

NOTES

1. WITH SPRINGS LOCATED ON REAR SIDE OF SLIDE
2. WITH SPRINGS LOCATED ABOVE THE SLIDE

5.38 HORIZONTAL POSITIONING MECHANISM (Continued)
5.39 REST TYPING UNIT IN UPRIGHT POSITION

5.40 LETTERS–FIGURES SHIFT MECHANISM

- O2 GUIDING SURFACES (2 SLIDES)
- SAT FELT WASHER
- 02 BEARING SURFACE
- SAT FELT WASHER
- SHIFT LINK BREAKER SLIDE
- LETTERS–FIGURES SHIFT SLIDE POST
- LETTERS–FIGURES SHIFT SLIDE
5.44 REST TYPING UNIT IN BOTTOM UPWARD POSITION

SAT FELT WASHERS (3 WASHERS)

SAT FELT WASHER

O2 BEARING SURFACES (3 PLACES)

OSCILLATING RAIL GUIDE ARM

OSCILLATING RAIL SHIFT LINK

PULLEYS

OSCILLATING RAIL GUIDE ARM

(BOTTOM VIEW)

CHANGE 4
5.45 MAIN SHAFT (CLUTCHES, GEARS, ETC.)

- FELT WASHER
- INTERNAL MECHANISM (2 CLUTCHES)
- FELT WICKS
- TEETH (4 GEARS)
- BEARING SURFACES (2 CLUTCHES)
- BALL BEARING
- CAMMING SURFACES (2 DISKS)
- BEARING SURFACE
- DRIVE LINK
- CLUTCH ASSEMBLY
- MAIN SHAFT GEAR
- CLUTCH SLEEVES
- MAIN SHAFT BEARING
- CLUTCH DISKS
- DRIVE LINK BEARING

5.46

- FELT WASHER (2 WASHERS)
- INTERNAL MECHANISM (2 CLUTCHES)
- FELT WICKS
- BEARING SURFACES (2 CAMS)
- BALL BEARING
- BEARING SURFACES (3 CLUTCHES)
- CAMMING SURFACES (4 DISKS)
- SELECTOR CAM ASSEMBLY
- ECCENTRIC FOLLOWER ARM BEARINGS
- CLUTCH ASSEMBLY
- ECCENTRIC FOLLOWER ARM CAMS
- MAIN SHAFT BEARING
- CLUTCH SLEEVE
- CLUTCH DISKS

5.47 SELECTOR CAM + CLUTCH ASSEMBLY

- FELT WASHERS (2 WASHERS)
- CAMMING SURFACES
- SELECTOR CAM ASSEMBLY
- SELECTOR CLUTCH
- SELECTOR CAM

CHANGE 1
5.48 MAIN SHAFT (CLUTCHES, GEARS, ETC.)—Continued

5.45 REST TYPING UNIT IN BOTTOM UPWARD POSITION

(BOTTOM VIEW)
5.50 SPACING MECHANISM

- O2 ENGAGING SURFACES
- SAT FELT WASHERS (2 WASHERS)
- SAT FELT WASHER
- SAT FELT WASHER
- O2 ENGAGING SURFACE
- G ENGAGING SURFACE
- HOOKS—EACH END (2 SPRINGS)
- SPACING TRIP LEVER
- SPACING SUPPRESSION SLIDE
- SPACING TRIP LEVER
- SPACING TRIP LEVER BAIL SHAFT
- SPACING TRIP LEVER BAIL
- TRIP RESET CAM SPRING PLATE
- SPACING CUT-OUT TRANSFER BAIL
- SPACING CUT-OUT TRANSFER BAIL
- SPACING CUT-OUT BAIL
- SPACING CUT-OUT BAIL
- CARRIAGE RETURN BAIL SHAFT
- SPRING

5.51

- O2 OIL HOLE
- SPACING SHAFT
- G TEETH
- SPACING SHAFT GEAR

5.52 SPACING MECHANISM (Continued)
5.53 REST TYPING UNIT IN BOTTOM UPWARD POSITION

(REAR VIEW)

5.54 LINE FEED MECHANISM

0 HOOKS—EACH END
02 BEARING SURFACE

02 BEARING SURFACE

G TEETH
(2 GEARS)
02 ENGAGING SURFACE
02 GUIDING SURFACE

02 GUIDING SURFACES
(2 BARS)

02 ENGAGING SURFACE
0 HOOKS—EACH END
02 GUIDING SURFACES
(2 BARS)

02 BEARING SURFACE
(2 BEARINGS)

G TEETH

02 BEARING SURFACE

0 SPRING
02 PLATEN HAND WHEEL

02 PLATEN IDLER SPUR GEAR
02 PLATEN SPUR GEARS
02 LINE FEED BARS
02 LINE FEED BAR RELEASE LEVER
02 LINE FEED BARS
02 LINE FEED BAR RELEASE LEVER
02 SPRING
02 LINE FEED BAR BELL CRANK

02 LINE FEED BAR ECCENTRIC BEARING
02 LINE FEED CLUTCH SPUR GEAR
02 LINE FEED CLUTCH SPUR GEAR SHAFT
6. VARIABLE FEATURES

6.01 REST KEYBOARD IN UPRIGHT POSITION.

6.02 REPEAT ON SPACE MECHANISM

6.03 SIGNAL LINE BREAK MECHANISM (ELECTRICAL)
6.04 REST TYPING UNIT IN UPRIGHT POSITION.

6.05 SPROCKET FEED-LINE FEED MECHANISM

- G TEETH
- 02 BEARING SURFACE
- HANDWHEEL GEAR
- PLATEN DETENT BAIL
- G TEETH
- 02 BEARING SURFACE
- IDLER GEAR
- IDLER GEAR
- G TEETH
- BEARING SURFACE
- (2 PLACES)
- PLATEN GEAR
- PLATEN GEAR
- 0 HOOKS - EACH END
- SPRING

( RIGHT SIDE VIEW)
6.06 SPROCKET FEED—PAPER GUIDE MECHANISM

- 0 HOOKS — EACH END SPONGE
- 02 PIVOTS (2 PLACES)
- 02 PIVOTS (2 PLACES)
- 0 HOOKS — EACH END SPONGE
- G PACK PIN AND SPRING SPROCKET CAVITIES (22 PLACES)

NOTE: SEE DISASSEMBLY AND REASSEMBLY
(RIGHT SIDE VIEW)

6.07 REST TYPING UNIT IN UPRIGHT POSITION.
6.08 Universal Drum Mechanism (New Design)

6.09 Horizontal Tabulator - Tabulator Shaft Mechanism (Earlier Design)

6.10 Horizontal Tabulator - Space Suppression Mechanism

(Front View)

(Right Side View)
6.11 REST TYPING UNIT BOTTOM SIDE UP.

6.12 HORIZONTAL TABULATOR – OPERATING LEVER MECHANISM (EARLIER DESIGN)

- 02 ENGAGING SURFACES (2 PLACES)
- 0 HOOKS – EACH END
- 02 ENGAGING SURFACE
- 02 BEARING SURFACE
- 02 BEARING SURFACES (2 PLACES)
- 02 BEARING SURFACE
- 0 HOOKS – EACH END
- 02 GUIDE SURFACE
- 02 ENGAGING SURFACES (2 PLACES)
- 02 BEARING SURFACE

SPACING TRIP ARM
SPRING
OPERATING LEVER
BLOCKING ARM
TRIP ARM LATCH BAIL
OPERATING LEVER
SPRING
BLOCKING ARM
SLIDE ARM
SLIDE ARM

(LEFT SIDE VIEW)
6.13 HORIZONTAL TABULATOR - SPACING CLUTCH MECHANISM (EARLIER DESIGN)

- 02 GUIDE SURFACE
- 02 GUIDE SURFACE
- 0 HOOKS - EACH END
- 02 ENGAGING SURFACE
- 02 BEARING SURFACES
- 0 HOOKS - EACH END
- SAT FELT WICK
- 02 CAMMING SURFACE
- SAT FELT WASHERS (5)
- G CAMMING SURFACE

CAM ARM
TABULATOR SLIDE ARM
SPRING
CAM ARM
CAM ARM
SPRING
CAM ARM
CLUTCH TRIP SHAFT
SPACING CLUTCH
RESTORING CAM

6.14 REST TYPING UNIT IN UPRIGHT POSITION

( REAR VIEW)
6.15 SELECTIVE CALLING - STRIPPER BAIL MECHANISM

- 02 BEARING SURFACES (2 BEARINGS)
- G ENGAGING SURFACES (EACH ARM)
- G ENGAGING SURFACES (2 ARMS)
- SAT FELT WASHERS (4 WASHERS)
- 02 GUIDE SLOTS (EACH END)
- G CAMMING SURFACES (2 CAMS)
- SAT FELT WASHER

(LEFT SIDE VIEW)

6.16 SELECTIVE CALLING - SHIFT AND STRIPPER BAIL MECHANISMS

- 02 ENGAGING SURFACES
- 02 SLIDING SURFACES (2 SLIDES)
- 02 SLIDING SURFACES
- 0 HOOKS - EACH END (2 SPRINGS)
- 02 ROLLERS AND PIVOTS
- 02 SLIDING SURFACES
- 02 SLIDING SURFACES
- 0 ENGAGING SURFACES
- 0 ENGAGING SURFACE
- 02 GUIDE SURFACES (2 PLACES)
- 02 GUIDE SURFACES (EACH END)
- G ENGAGING SURFACES (2 PLACES)
- 02 ENGAGING SURFACE

(TOP VIEW)

- CODE BAR FORKS
- BLOCKING SLIDE
- SPRINGS
- FUNCTION SLIDES
- FUNCTION SLIDES
- FUNCTION SLIDES
- LINE FEED
- STRIPPER SLIDE
- STRIPPER SLIDE
- STRIPPER BLADE
- STRIPPER BLADE
- STRIPPER BAIL

(REAR VIEW)
6.17 REST TYPING UNIT IN UPRIGHT POSITION.
REMOVE STUNT BOX (SEE PAGE 1-90).

6.18 SELECTIVE CALLING - SINGLE -
DOUBLE LINE FEED MECHANISM

- PIVOT
- ENGAGING SURFACE
- GUIDE SURFACES
- SAT FELT WASHER
- ENGAGING SURFACES (4 SURFACES)
- COILS
- HOOKS - EACH END

SINGLE - DOUBLE LINE FEED LEVER
OPERATING ARM
OPERATING ARM
OPERATING ARM
STRIPPER BAIL
TORSION SPRING
SPRING
SPRING

CHANGE 4
6.19 SELECTIVE CALLING – FUNCTION RESET BAIL MECHANISM

- 0 HOOKS—EACH END (2 SPRINGS)
- SAT FELT WICKS (2 SPRINGS)
- SAT FELT WASHERS (2 BEARINGS)
- 02 BEARINGS (3 ROLLERS)
- SAT FELT WASHERS (EACH END)
- SAT FELT WASHERS (2 PIVOTS)
- G ENGAGING SURFACE
- SAT FELT WASHER

(LEFT SIDE VIEW)

6.20 REST TYPING UNIT IN UPRIGHT POSITION.
6.21 SELECTIVE CALLING – CLUTCH SUPPRESSION MECHANISM

- 02 BEARING SURFACES (2 PLACES)
- 0 HOOKS—EACH END
- 02 ENGAGING SURFACES (2 PLACES)
- SAT FELT WASHERS (2 PLACES)
- SOLENOID BELL CRANK LEVER
- SPRING
- BLOCKING BAIL

(LEFT SIDE VIEW)

6.22 REST KEYBOARD IN UPRIGHT POSITION

(TOP VIEW)
6.23 LOCAL BACK SPACE MECHANISM

(LEFT SIDE VIEW)

6.24 LOCAL REVERSE LINE FEED MECHANISM

(LEFT SIDE VIEW)

6.25 REST TYPING UNIT IN UPRIGHT POSITION

(FRONT VIEW)
6.26 LOCAL BACK SPACE MECHANISM

( FRONT VIEW)

6.27 REST TYPING UNIT BOTTOM SIDE UP

( BOTTOM VIEW)
6.28 LOCAL REVERS LINE FEED MECHANISM

![Diagram of Local Revers Line Feed Mechanism]

6.29 LOCAL BACK SPACE MECHANISM

![Diagram of Local Back Space Mechanism]
6.30 REST TYPING UNIT IN UPRIGHT POSITION

6.31 PAPER SPINDLE LATCH MECHANISM

(REAR VIEW)

6.32 LOCAL REVERSE LINE FEED MECHANISM

G TEETH (2 GEARS)
02 GUIDE SURFACE

02 GUIDE SURFACES (2 BARS)

O HOOKS--EACH END
SAT FELT OILER

02 BEARING SURFACE

02 BEARING SURFACES (2 BEARINGS)

G TEETH

02 BEARING SURFACE

02 BEARING SURFACE

G TEETH

02 BEARING SURFACES

02 BEARING SURFACE

0 ENGAGING SURFACES (2 PLACES)

0 HOOKS--EACH END

PLATEN SPUR GEARS
LINE FEED BAR
RELEASE LEVER
LINE FEED BARS
SPRINGS (2)
LINE FEED BAR BELL CRANK
LINE FEED BAR BELL CRANK
SPRING
LINE FEED BAR
ECCENTRIC
LINE FEED CLUTCH
SPUR GEAR
SPUR GEAR
LINE FEED BAR BELL CRANK
PLATEN SPUR GEAR
INTERMEDIATE LEVER
ROLLER
REVERSE LINE FEED
SLIDE LINK
LINE FEED BARS (2)
SPRING

(RIGHT SIDE VIEW)
6.33 Rest typing unit in upright position.

6.34 Page feed-out mechanism

- G Teeth
- 0 Pivot
- 02 Bearing surface
- G Teeth
- 0 Pivot
- 0 Hooks—Each end
- 02 Engaging surface

IDLER GEAR
ADJUSTABLE ARM
HANDWHEEL
GEAR

BLOCKING ARM
SPRING
SLIDE

(LEFT SIDE)
6.35 SIGNAL LINE BREAK MECHANISM (BASE)

6.36 REST BASE IN UPRIGHT POSITION

6.37 PAPER FEED OUT MECHANISM (KEYBOARD)
6.38 CABINET DOME OPEN

6.39 END-OF-FORM ALARM MECHANISM (CABINET)

6.40 PAPER-OUT ALARM MECHANISM

- G ENGAGING SURFACE
- THIN FILM
- SWITCH PLUNGER
- 02 BEARING SURFACE
- END-OF-FORM LEVER
- TYPING UNIT
- LEFT SIDE FRAME
- 0 HOOK-EACH END
- SPRING
- 02 BEARING SURFACE
- BELL CRANK
- FOLLOWER HUB
6.41 CONTINUOUS SPACING MECHANISM

SAT FELT WASHER
01 HOOKS—EACH END
02 BEARING SURFACE
02 ENGAGING SURFACE

TRIP LEVER
FUNCTION CLUTCH
SPRING
SPRING

6.42

02 ENGAGING SURFACE
(TWO BRACKETS)
SAT FELT WASHERS
(EACH END)
02 ENGAGING SURFACE
(EACH END)
C.R. SLIDE ARM BRACKET
L.F. SLIDE ARM BRACKET
CONNECTING LINK
COMPRESSION SPRING
(LP 6 & 9 ONLY)

6.43

6.44 REST TYPING UNIT IN UPRIGHT POSITION

CHANGE 4
6.45 REST TYPING UNIT IN UPRIGHT POSITION

6.46 REST TYPING UNIT BOTTOM SIDE UP
6.47 HORIZONTAL TABULATOR - BLOCKING LEVER

6.48 HORIZONTAL TABULATOR - SLIDE ARM

6.49 HORIZONTAL TABULATOR - OPERATING LEVER

CHANGE 4
6.50 HORIZONTAL TABULATOR - LATCH BAIL

6.51 HORIZONTAL TABULATOR - OPERATING LEVER

6.52 HORIZONTAL TABULATOR - INTERMEDIATE BAIL

6.53

6.54

3-54
6.55 OFF-LINE CONTACTS

6.56 KEYBOARD - TOP VIEW

6.57 SOLENOID BAIL

6.58 CONTACT INSULATORS

6.59 SWITCH OPERATING LEVER

- FORK AND PIN
- SOLENOID ARMATURE
- HOOKS - EACH END
- SPRING
- BEARING SURFACE
- AND RETAINING RING
- SOLENOID
- ENGAGING SURFACE
- BACKSPACE LINK
- ENGAGING SURFACE
- CONTACT INSULATOR
- HOOKS - EACH END
- SPRING
- SLIDING SURFACE
- OPERATING LEVER
- ENGAGING SURFACE
- FUNCTION LEVER

CHANGE 4
7. NEW DESIGN KEYBOARD
7.01 REST KEYBOARD BOTTOM SIDE UP

7.02 SPACE BAR MECHANISM

BEARING SURFACE (LEFT & RIGHT) SPACE BAR

7.03 KEYLEVER MECHANISM

ENGAGING SURFACE (36 LEVERS) KEYTOP LEVERS
7.04 BREAK LEVER MECHANISM

- ENGAGING SURFACE
- BEARING SURFACE
- CONTACT SURFACE

7.05 CODE LEVER MECHANISM

- CONTACTING SURFACE (32 LEVERS)
- GUIDE SLOTS (32 LEVERS)
- FELT WASHERS (6 WASHERS)
- BEARING SURFACE (32 WEDGES)
- HOOKS-EACH END (40 SPRINGS)

7.06 KEYBOARD LOCK MECHANISM

- GUIDE SLOT
- HOOKS-EACH END
- BEARING SURFACE
- ENGAGING SURFACE
- BEARING SURFACE

CHANGE 4
7.07 REST KEYBOARD IN UPRIGHT POSITION

7.08 CODE BAR MECHANISM

0 HOOKS-EACH END (7 SPRINGS)

0 SPRING

0 GUIDE SLOTS (LEFT AND RIGHT- TOP AND BOTTOM)

0 CODE BAR GUIDES

7.09 LOCAL CARRIAGE RETURN MECHANISM

0 HOOKS-EACH END

0 SPRING

0 BEARING SURFACE (2 PLACES)

0 LOCAL CARRIAGE RETURN FUNCTION

0 BAIL

0 ENGAGING SURFACE

0 LOCAL CARRIAGE RETURN FUNCTION

0 LEVER

CHANGE 4
7.10 SIGNAL GENERATOR MECHANISM REST KEYBOARD IN UPRIGHT POSITION

7.11 NON-REPEAT LEVER MECHANISM

- SAT FELT WASHER
- 0 HOOKS-EACH END SPRING
- 02 BEARING SURFACE NON-REPEAT LEVER CRANK
- 02 BEARING SURFACE NON-REPEAT LEVER CRANK
- G ENGAGING SURFACE
- 02 GUIDE SLOT NON-REPEAT LEVER

7.12 TRANSFER LEVER MECHANISM

- 0 GUIDE SLOTS TRANSFER LEVERS (7 LEVERS)
- 0 HOOKS-EACH END (7 SPRINGS) SPRING
- 0 GUIDE SLOTS TRANSFER LEVERS (7 LEVERS)
- SAT FELT WASHERS (4 WASHERS) CAMMING SURFACES
- 0 GUIDE SLOTS TRANSFER LEVERS (7 LEVERS)
7.13 CONTACT BOX

DISASSEMBLY: REMOVE NUT AND LOCK WASHER SECURING CONTACT BOX COVER AND REMOVE COVER.

7.14 TRANSFER BAIL MECHANISM

7.15 FUNCTION CLUTCH MECHANISM
7.16 MARGIN INDICATING MECHANISM

- ENGAGING SURFACE
- BEARING SURFACE
- HOOKS-EACH END

MARGIN INDICATOR SWITCH
SWITCH LEVER
SPRING

7.17 LOCAL LINE FEED MECHANISM

- GUIDE SLOT
- BEARING SURFACE
- HOOKS-EACH END
- BEARING SURFACE

LOCAL LINE FEED TRIP LINK
LOCAL LINE FEED FUNCTION LEVER
SPRING
FUNCTION BAIL
LOCAL LINE FEED FUNCTION LEVER

7.18 SHAFT MECHANISM

- SAT FELT WASHER
- G GEAR TEETH
- 02 OIL HOLE
- 04 INTERNAL MECHANISM
- SAT FELT WICK
- 02 OIL HOLE
- 02 CAMMING SURFACE EACH CAM
- SAT FELT WASHER

SIGNAL GENERATOR SHAFT
SIGNAL GENERATOR SHAFT
SIGNAL GENERATOR SHAFT
KEYBOARD CLUTCH
SIGNAL GENERATOR CAM
SIGNAL GENERATOR CAM
SIGNAL GENERATOR SHAFT

7.19 INTERMEDIATE GEAR MECHANISM

- 02 OILER-EACH END (RIGHT & LEFT)
- G TEETH (2 GEARS)
- 02 BALL BEARING (2 BEARINGS)
- SAT FELT WASHER

MOTOR SHAFT
INTERMEDIATE GEARS
INTERMEDIATE GEAR SHAFT
7.20 SIGNAL GENERATOR MECHANISM (continued) REST KEYBOARD IN UPRIGHT POSITION

**RIGHT SIDE VIEW**

### 7.21 LOCKING BAIL MECHANISM

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

### 7.22 CODE BAR BAIL MECHANISM

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

- HOOKS (EACH END)
- FELT WASHER
- GUIDE SLOT (EACH SIDE OF SLOT)
- ENGAGING SURFACE
- SPRING
- UNIVERSAL BAIL LATCH LEVER
- UNIVERSAL BAIL LATCH LEVER
- RESET BAIL LATCH

7.24 NEW DESIGN KEYBOARD AND VARIABLE FEATURES
REST KEYBOARD IN UPRIGHT POSITION

LEFT SIDE VIEW

7.25 ELECTRICAL LINE BREAK MECHANISM

- HOOKS-EACH END
- SPRING
- CONTACT SURFACE
- SENSITIVE SWITCH
- BEARING SURFACE
- BREAK LEVER
7.26 CODE LEVER UNIVERSAL BAIL MECHANISM

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

7.27 LOCK BAR LATCH MECHANISM

- BEARING SURFACE LOCK BAR LATCH

7.28 LOCAL PAPER FEED-OUT MECHANISM

- ENGAGING SURFACE LOCAL LINE FEED TRIP LINK
- HOOKS-EACH END SPRING
- BEARING SURFACE LEVER
- ENGAGING SURFACE MAGNETIC BLOWOUT SWITCH
SECTION 4 - EARLIER DESIGN MECHANISM ADJUSTMENTS

1. KEYBOARD

NOTE
IN ORDER TO PERFORM ALL SIGNAL GENERATOR ADJUSTMENTS, IT WILL BE NECESSARY TO REMOVE GENERATOR FROM THE KEYBOARD. SEE DISASSEMBLY AND REASSEMBLY PARAGRAPH 10.b.(1)

SELECTOR LEVER SPRING TENSION

REQUIREMENT
SELECTOR LEVER ON LOW PART OF CAM.
MIN. 1 OZ.
MAX. 2-1/2 OZS.
TO START LEVER MOVING. CHECK EACH SELECTOR LEVER SPRING.

LOCKING BAIL SPRING TENSION

REQUIREMENT
GENERATOR CLUTCH DISENGAGED.
MIN. 2 OZS.
MAX. 4 OZS.
TO START LOCKING BAIL MOVING.

FIGURE 4-1 KEYBOARD, SIGNAL GENERATOR, FRONT VIEW
TRANSFER LEVER SPRING TENSION

**REQUIREMENT**

TRANSFER LEVERS IN MARKING POSITION.
CODE BAR BAIL LATCH SPRING REMOVED
START TRANSFER LEVER (5TH FROM FRONT)
MANUALLY MOVED TO MARKING POSITION.

<table>
<thead>
<tr>
<th>TRANSFER LEVERS</th>
<th>START LEVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIN. 5 1/2 OZS.</td>
<td>7 1/2 OZS.</td>
</tr>
<tr>
<td>MAX. 8 OZS.</td>
<td>10 OZS.</td>
</tr>
</tbody>
</table>

TO START LEVER MOVING.

ROCKER BAIL DETENT

**REQUIREMENT**

CLEARANCE BETWEEN THE ROCKER BAIL ARM AND BOTH THE MARKING AND THE SPACING PROJECTIONS OF THE SELECTOR LEVERS SHOULD BE EQUAL WITHIN 0.005 INCH.

TO CHECK


TO ADJUST

EQUALIZE CLEARANCES BY ROTATING THE ECCENTRIC PIVOT STUD OF THE DETENT WITH ITS LOCK NUT LOOSENED. KEEP THE HIGH PART OF THE ECCENTRIC TOWARD THE GENERATOR SHAFT.

**FIGURE 4-2** KEYBOARD, SIGNAL GENERATOR, FRONT VIEW

CHANGE 4
NOTE: REMOVE MECHANICAL BREAK LEVER AND SPRING OR ELECTRICAL BREAK LEVER SPRING AND SWITCH, IF EQUIPPED. See Figure 4-45

ROCKER EXTENSION MOUNTING SCREWS

ROCKER EXTENSION

INTERMEDIATE LEVER SPRING

SPACING INTERMEDIATE LEVER

MARKING INTERMEDIATE LEVER

FLUTTER LEVER

INTERMEDIATE LEVER SPRING TENSION REQUIREMENT

CLUTCH DISENGAGED. PULL HORIZONTALLY, PARALLEL TO INTERMEDIATE LEVER'S PATH MIN. 2 OZS.
MAX. 4 OZS.
TO START LEVER MOVING, CHECK SPACING AND MARKING LEVERS.

ROCKER EXTENSION REQUIREMENT

EQUAL CLEARANCE (WITHIN 0.005 INCH) BETWEEN THE ROCKER EXTENSION AND BOTH THE MARKING AND THE SPACING INTERMEDIATE LEVERS WHEN SELECTED INDIVIDUALLY.

TO CHECK

ROTATE THE SHAFT UNTIL THE MARKING INTERMEDIATE LEVER IS SELECTED AND THE FLUTTER LEVER IS ON LOW PART OF CAM. GAUGE CLEARANCE IN LEFT FIG. REPEAT PROCEDURE FOR SPACING INTERMEDIATE LEVER. GAUGE CLEARANCE IN RIGHT FIGURE.

TO ADJUST

EQUALIZE CLEARANCES BY POSITIONING THE ROCKER EXTENSION WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 4-3 KEYBOARD, SIGNAL GENERATOR, REAR VIEW
DETENT TOGGLE STOP BRACKET
REQUIREMENT
CLEARANCE BETWEEN ENGAGING SURFACES
OF SPACING AND MARKING INTERMEDIATE
LEVERS AND ASSOCIATED SURFACES OF
OSCILLATING LEVER SHOULD BE EQUAL
WITHIN 0.004 INCH.

TO CHECK
FRONT SELECTOR LEVER IN MARKING POSITION, GENERATOR
SHAFT ROTATED UNTIL FRONT SELECTOR LEVER IS ON PEAK
OF ITS CAM, MOVE OSCILLATING LEVER TOWARD
MARKING INTERMEDIATE LEVER AND GAUGE THE GAP.
THEN WITH FRONT SELECTOR LEVER IN SPACING POSITION
AND ON PEAK OF ITS CAM, MOVE OSCILLATING LEVER
TOWARD SPACING INTERMEDIATE LEVER AND CHECK GAP.

TO ADJUST
EQUALIZE THE CLEARANCES BY POSITIONING THE STOP BRACKET
WITH ITS MOUNTING SCREWS LOOSENED.

FIGURE 4-4  KEYBOARD, SIGNAL GENERATOR, REAR VIEW
**DETENT LEVER SPRING TENSION**

**REQUIREMENT**

- **MIN.** 8 1/2 OZS.
- **MAX.** 10 1/2 OZS.

**TO START DETENT LEVER MOVING.**

**DETENT LEVER SPRING**

**INTERMEDIATE LEVER**

**STOP PLATE**

**MOUNTING SCREW**

**OSCILLATING LEVER**

**FLUTTER CAM**

**FLUTTER LEVER**

**INTERMEDIATE LEVER STOP PLATE**

**REQUIREMENT**

CLEARANCE BETWEEN ENGAGING SURFACES OF INTERMEDIATE LEVERS AND OSCILLATING LEVER

- **MIN.** SOME CLEARANCE
- **MAX.** 0.006 INCH

**TO CHECK**

WITH THE FRONT SELECTOR LEVER IN ITS MARKING POSITION, ROTATE THE GENERATOR SHAFT UNTIL FRONT SELECTOR LEVER IS ON PEAK OF ITS CAM. MOVE OSCILLATING LEVER TOWARD MARKING INTER. MEDIATE LEVER AND GAUGE GAP. WITH FRONT SELECTOR LEVER IN ITS SPACING POSITION AND ON PEAK OF ITS CAM, MOVE OSCILLATING LEVER TOWARD SPACING INTER. MEDIATE LEVER AND GAUGE GAP.

**TO ADJUST**

POSITION INTERMEDIATE LEVER STOP PLATE WITH MOUNTING POST AND MOUNTING SCREW LOOSENED.

**NOTE:** REPLACE THE BREAK LEVER AND ASSOCIATED PARTS

**FIGURE 4-5** KEYBOARD, SIGNAL GENERATOR, REAR VIEW
(A) FLUTTER LEVER SPRING TENSION REQUIREMENT
WITH SIGNAL GENERATOR CLUTCH DISENGAGED AND SPACING INTERMEDIATE LEVER HELD AWAY FROM FLUTTER LEVER, INSERT SCALE BETWEEN CASTING AND BREAK ROD MIN. 1 OZ.
MAX. 2 1/4 OZS.
TO START FLUTTER LEVER MOVING.

(B) FLUTTER LEVER
(1) REQUIREMENT
WITH THE FLUTTER LEVER ON EACH LOW PORTION OF ITS CAM AND THE MARKING AND SPACING INTERMEDIATE LEVERS ALTERNATELY SELECTED, THE CLEARANCE BETWEEN THE FLUTTER LEVER AND LATCHING SURFACE OF SELECTED INTERMEDIATE LEVER SHOULD BE
MIN. 0.005 INCH
MAX. 0.018 INCH
WITH THE CLUTCH ENGAGED AND THE SELECTOR LEVERS (FIG. 2) TO MARKING (LEFT), ROTATE THE GENERATOR SHAFT TO CHECK CLEARANCE ON MARKING INTERMEDIATE LEVERS. HOLD SELECTOR LEVERS TO SPACING (RIGHT) AND ROTATE SHAFT TO CHECK SPACING INTERMEDIATE LEVERS.
TO ADJUST POSITION THE FLUTTER LEVER MOUNTING STUD IN THE ELONGATED MOUNTING HOLE WITH THE LOCK NUT LOOSENED.

(2) REQUIREMENT
AFTER REQUIREMENT (1) HAS BEEN MET, SELECT THE MARKING AND SPACING INTERMEDIATE LEVERS ALTERNATELY AND ROTATE THE GENERATOR SHAFT UNTIL THE FLUTTER LEVER IS ON SUCCESSIVE HIGH PORTIONS OF ITS CAM. UNDER THESE CONDITIONS THERE SHOULD BE SOME CLEARANCE BETWEEN THE OSCILLATOR AND THE SELECTED INTERMEDIATE LEVER.
TO ADJUST
REFINE THE FLUTTER LEVER ADJUSTMENT AND RECHECK REQUIREMENT (1).

FIGURE 4-6 KEYBOARD, SIGNAL GENERATOR, REAR VIEW
FOR CLUTCH SHOE LEVER SPRING TENSION AND CLUTCH SHOE SPRING TENSION SEE FIGURE 1-35

ADJUSTING DISK CLAMP SCREWS

CLUTCH DISK

ADJUSTING DISK

CLUTCH DISK STOP LUG

GEAR SLEEVE

CLUTCH SHOE LEVER

CHANGE 4 REQUIREMENT

CLEARANCE WHEN CLUTCH IS DISENGAGED SHOULD BE 0.055 INCH TO 0.085 INCH LESS THAN WHEN CLUTCH IS ENGAGED.

TO CHECK

LATCH CLUTCH IN DISENGAGED POSITION AND MEASURE CLEARANCE. ROTATE GEAR UNTIL OIL HOLE IS UPWARD. ENGAGE CLUTCH AND MEASURE CLEARANCE.

TO ADJUST

LOSEN THE TWO ADJUSTING DISK CLAMP SCREWS TO POSITION DISK.

NOTE

AFTER ABOVE ADJUSTMENT IS MADE, CHECK FOR DRAG ON DRUM AS FOLLOWS: DISENGAGE CLUTCH. HOOK SPRING SCALE ON TOP TOOTH OF GEAR AND PULL AT RIGHT ANGLE TO RADIUS OF GEAR. IF PULL OF 8 OZS. OR MORE IS REQUIRED TO MOVE THE DRUM, REFINE ABOVE ADJUSTMENT.
CLUTCH STOP LEVER SPRING TENSION

REQUIREMENT

OPERATE CLUTCH STOP LEVER, CLUTCH ENGAGED, ROTATE SHAFT 1/4 TURN.

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

---

CLUTCH STOP LEVER SPRING

CLUTCH LATCH LEVER

CLUTCH DRUM

STOP LEVER CLAMP SCREW

CLUTCH TRIP BAIL EXTENSION

CLUTCH STOP LEVER

REQUIREMENT

CLUTCH STOP LEVER SHOULD FULLY ENGAGE THE CLUTCH SHOE LEVER VERTICALLY.

TO ADJUST

POSITION THE STOP LEVER WITH ITS CLAMP SCREW LOOSENED.

FIGURE 4-8 KEYBOARD, CLUTCH MECHANISM
CLUTCH LATCH LEVER SPRING
REQUIREMENT
LATCH LEVER RESTING ON HIGH PART OF
CLUTCH DISK.
MIN. 1 1/2 OZS.
MAX. 2 1/2 OZS.
TO MOVE LATCH LEVER AWAY FROM DISK.

NOTE
REPLACE SIGNAL GENERATOR ON THE KEYBOARD. MAKE CERTAIN THAT THE CODE BAR BAIL LATCH LEVER (FIG. 4-11) IS UNDER CODE LEVER BAIL LATCH LEVER (FIG. 4-13), THAT (IF EQUIPPED) BREAK KEY ROD, ATTACHED TO BREAK LEVER (FIG. 4-45) IS IN ITS GUIDE HOLE IN CODE LEVER GUIDE, AND THAT THE CLUTCH TRIP BAIL EXTENSION (FIG. 4-8) IS IN THE NOTCH PROVIDED IN THE CLUTCH TRIP BAR (REAR) AND THAT THE CODE BAR BAIL (FIGURE 4-11) IS RESTING IN THE NOTCHES OF THE FIVE CODE BARS, THE CLUTCH TRIP BAR AND THE KEYLEVER UPSTOP BAR. SEE DISASSEMBLY AND REASSEMBLY PARAGRAPH 10.b.(1).

FIGURE 4-9 KEYBOARD, CLUTCH MECHANISM
CONTRACT BOX MOUNTING SCREW

CONTACT BOX SPRING

ADJUSTING BRACKET

CONTACT BOX COVER REMOVED. DETENT LEVER SPRING DISCONNECTED.

MIN. 2 OZS.
MAX. 4 OZS.

TO BREAK CONTACT

MARKING CONTACT

SPACING CONTACT

LOCK NUT

ADJUSTING SCREW

GENERATOR CONTACT REQUIREMENT

THE MARKING AND SPACING CONTACT GAPS SHOULD BE EQUAL

TO CHECK

REMOVE THE COVER FROM THE CONTACT BOX. FIRST, MOVE THE DETENT TOGGLE AGAINST ITS SPACING STOP AND GAUGE THE MARKING CONTACT GAP. THEN MOVE THE DETENT TOGGLE AGAINST ITS MARKING STOP AND GAUGE SPACING CONTACT GAP.

TO ADJUST

ROTATE THE CONTACT BOX ADJUSTING SCREW WITH ITS LOCK NUT LOOSENED AND WITH THE CONTACT BOX MOUNTING SCREWS FRICITION TIGHT. REPLACE CONTACT BOX COVER.

NOTE

CHECK BY MEANS OF A 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.

FIGURE 4-10  KEYBOARD, CONTACT ASSEMBLY

4-10  CHANGE 4
RESET LEVER SPRING TENSION

REQUIREMENT

CLUTCH DISENGAGED.

MIN. 2 OZS.
MAX. 4 OZS.

TO START THE RESET LEVER MOVING.

CODE BAR BAIL ADJUSTING SCREW

REQUIREMENT

CLUTCH ENGAGED, LTRS. COMBINATION SELECTED
CLUTCH ROTATED 1/2 TURN UNTIL RESET LEVER IS IN EXTREME LEFT HAND POSITION.
CLEARANCE BETWEEN THE CODE BAR BAIL LATCH LEVER AND CODE BAR BAIL ROLLER.
MIN. 0.004 INCH
MAX. 0.008 INCH

TO ADJUST
POSITION THE CODE BAR BAIL ADJUSTING SCREW WITH ITS LOCK NUT LOOSENED.

FIGURE 4-11 KEYBOARD, CODE BAR BAIL MECHANISM, FRONT VIEW
CODE BAR BAIL SPRING TENSION

REQUIREMENT
GENERATOR CLUTCH DISENGAGED
SPRING UNHOOKED.
MIN. 6 OZS.
MAX. 8 OZS.
TO PULL SPRING TO INSTALLED POSITION.

CODE BAR BAIL SPRING
CODE BAR BAIL LATCH SPRING
RESET LEVER SPRING
CODE BAR BAIL ROLLER

CODE BAR BAIL LATCH SPRING TENSION
REQUIREMENT
HOLD CODE BAR BAIL TO LEFT TO PROVIDE
SOME CLEARANCE BETWEEN CODE BAR BAIL
ROLLER AND LATCHING SURFACE OF THE
CODE BAR BAIL LATCH
MIN. 1/2 OZ.
MAX. 1 1/2 OZS.
TO START THE LATCH MOVING.

FIGURE 4-12 KEYBOARD, CODE BAR BAIL, FRONT VIEW
CODE LEVER BAIL LATCH LEVER SPRING
REQUIREMENT
SIGNAL GENERATOR CLUTCH DISENGAGED CODE BAR BAIL LATCH TRIPPED. CODE LEVER BAIL EXTENSION HELD AWAY FROM LATCHING SURFACE OF CODE LEVER BAIL LATCH LEVER.
MIN. 3 OZS.
MAX. 5 OZS.
TO START CODE LEVER BAIL LATCH LEVER MOVING.

LATCH LEVER SPRING

NON-REPEAT LEVER
REQUIREMENT
ANY KEYLEVER DEPRESSED, SIGNAL GENERATOR SHAFT ROTATED UNTIL CLUTCH IS DISENGAGED. CLEARANCE BETWEEN CODE LEVER BAIL EXTENSION AND CODE LEVER BAIL LATCH LEVER
MIN. 0.020 INCH
MAX. 0.030 INCH
LET UP ON KEYLEVER UNTIL SURFACES TO BE MEASURED ARE IN LINE.
TO ADJUST
POSITION NON-REPEAT BELL CRANK SHOULDER PIVOT SCREW IN ITS ELONGATED HOLE WITH LOCK NUT LOOSENED.

NON-REPEAT LEVER

NON-REPEAT BELL CRANK
CODE LEVER BAIL EXTENSION

NON-REPEAT SPRING
CODE BAR BAIL (EXTENSION)

NON-REPEAT SPRING TENSION
REQUIREMENT
GENERATOR CLUTCH DISENGAGED.
ANY KEYLEVER DEPRESSED.
MIN. 1/2 OZ.
MAX. 1 1/2 OZS.
TO START NON-REPEAT LEVER MOVING DOWNWARD.

FIGURE 4-13 KEYBOARD, NON-REPEAT MECHANISM
KEYLEVER LOCK-BALL CHANNEL AND LOCK BALL END PLAY

REQUIREMENT

GENERATOR SHAFT ROTATING, CLUTCH SHOULD TRIP CONSISTENTLY WHEN TWO KEYLEVERS ARE DEPRESSED ALTERNATELY. CLUTCH SHOULD NOT TRIP WHEN TWO KEYLEVERS ARE DEPRESSED SIMULTANEOUSLY. WHEN EITHER Q OR P KEYLEVER IS FULLY DEPRESSED, CLEARANCE SHOULD BE MIN. 0.015 INCH

MAX. 0.150 INCH BETWEEN TIP OF WEDGELOCK AND BOTTOM OF CHANNEL.

TO ADJUST
POSITION CHANNEL WITH MOUNTING SCREWS LOOSENED, POSITION LOCK BALL ADJUSTING SCREW APPROXIMATELY 0.060 INCH ABOVE BOTTOM OF BALL CHANNEL.

FIGURE 4-14 KEYBOARD, KEYLEVER LOCKING MECHANISM
(1) REQUIREMENT
KEY LEVER WITH SHORTEST DOWNWARD STROKE FULLY DEPRESSED. CLEARANCE BETWEEN FRONT VERTICAL SURFACE OF THE CODE LEVER BAIL EXTENSION AND THE STOP ON THE REAR END OF THE CODE LEVER BAIL LATCH LEVER.
MIN. 0.025 INCH
MAX. 0.040 INCH

(2) REQUIREMENT
GENERATOR CLUTCH DISENGAGED. CLEARANCE BETWEEN CODE LEVER BAIL LATCH LEVER AND THE CODE BAR BAIL LATCH MIN. 0.005 INCH
MAX. 0.035 INCH
TO ADJUST
ROTATE THE CODE LEVER BAIL LATCH LEVER ECCENTRIC.

FIGURE 4-15 KEYBOARD CODE LEVER BAIL LATCH MECHANISM, LEFT SIDE VIEW

CODE LEVER BAIL SPRING TENSION
REQUIREMENT
GENERATOR CLUTCH DISENGAGED. NON-REPEAT LEVER HELD AWAY.
MIN. 1-3/4 OZS.
MAX. 3 OZS.
TO START THE BAIL MOVING.

CODE BAR GUIDES
REQUIREMENT
CLEARANCE BETWEEN CODE BARS AND CODE BAR GUIDES MIN. SOME CLEARANCE
MAX. 0.010 INCH
TO ADJUST
POSITION THE TWO CODE BAR GUIDES WITH THEIR MOUNTING SCREWS LOOSENED.

FIGURE 4-16 KEYBOARD, CODE BAR MECHANISM, LEFT SIDE VIEW

CHANGE 4
CODE LEVER BAIL NON-REPEAT EXTENSION

REQUIREMENT
GENERATOR CLUTCH DISENGAGED. CODE LEVER BAIL
ROTATED UNTIL CODE LEVER BAIL LATCH LEVER
JUST TRIPS. WITH BAIL LATCHING EXTENSION RESTING
AGAINST VERTICAL SURFACE OF LATCH LEVER AND
SHAFT ROTATED UNTIL NON-REPEAT LEVER IS
FULLY LATCHED ON CODE BAR BAIL EXTENSION
MIN. SOME CLEARANCE
MAX. 0.015 INCH
BETWEEN ADJUSTABLE EXTENSION AND NON-
REPEAT LEVER.

TO ADJUST
POSITION ADJUSTABLE EXTENSION WITH CLAMP
SCREW LOOSENED.

(LEFT SIDE VIEW)

CODE LEVER BAIL LATCH LEVER

BAIL LATCHING EXTENSION

ADJUSTABLE EXTENSION

CLAMP SCREW

CODE LEVER BAIL

(FRONT VIEW)

CODE BAR BAIL EXTENSION

CODE LEVER BAIL LATCH LEVER

NON-REPEAT LEVER

CODE LEVER SPRING TENSION

REQUIREMENT
(OPERATING UNDER POWER)
WITH THE GENERATOR
CLUTCH DISENGAGED
MIN. 3 1/2 OZS.
MAX. 8 OZS.
TO OPERATE A KEY.

FIGURE 4-17 KEYBOARD, NON-REPEAT MECHANISM
LOCK BAR SPRING TENSION
REQUIREMENT
GENERATOR CLUTCH DISENGAGED.
KEYBOARD LOCK KEY HELD DEPRESSED.
MIN. 5 OZS.
MAX. 9 OZS.
TO START LOCK BAR MOVING.

CODE BAR SPRING TENSION
REQUIREMENT
LETTERS KEYLEVER DEPRESSED.
GENERATOR CLUTCH ENGAGED.
MIN. 3 OZS.
MAX. 4 OZS.
TO START A CODE BAR MOVING.

CLUTCH TRIP BAR SPRING TENSION
REQUIREMENT
LETTERS KEYLEVER DEPRESSED.
GENERATOR CLUTCH ENGAGED
CLUTCH TRIP BAIL EXTENSION HELD
AWAY FROM CLUTCH TRIP BAR
MIN. 5 OZS.
MAX. 9 OZS.
TO START CLUTCH TRIP BAR (REAR)
MOVING.

BUMPER MOUNTING SCREW
KEYBOARD BASE

CODE BAR SPRING
CODE BAR BAIL BUMPER

CODE BAR BAIL BUMPER
REQUIREMENT
LETTERS SELECTION APPLIED TO CODE BAR.
CLEARANCE BETWEEN SHOULDER ON CLOSEST
CODE BAR AND ENGAGING FACE OF CODE BAR BAIL.
MIN. 0.010 INCH
MAX. 0.020 INCH
TO ADJUST
POSITION BUMPER WITH MOUNTING SCREWS.
LOOSENED.

FIGURE 4-18 KEYBOARD, CODE BAR MECHANISM

CHANGE 4
CODE LEVER GUIDE

REQUIREMENT
CR KEYLEVER HELD DEPRESSED WHILE DISENGAGING CLUTCH. CLEARANCE BETWEEN CR FUNCTION LEVER AND STOPPING EDGE OF NUMBER 5 CODE BAR MIN. 0.005 INCH MAX. 0.015 INCH TO ADJUST POSITION THE CODE LEVER GUIDE WITH ITS FOUR MOUNTING SCREWS LOOSENED.

CODE BAR LATCH SPRING

REQUIREMENT
GENERATOR CLUTCH COMPLETELY DISENGAGED MIN. 1/4 OZ. MAX. 1 1/4 OZS. TO START LATCH MOVING.

CODE BAR LATCH

(1) REQUIREMENT
LETTERS SELECTION APPLIED TO THE CODE BARS AND THE CODE BARS AGAINST THEIR STOP. CLEARANCE BETWEEN CODE BAR AND LATCH MIN. 0.010 INCH MAX. 0.025 INCH

(2) REQUIREMENT
BOUNCE SUPPRESSOR BAIL SHOULD RIDE CENTRALLY ON RESET LEVER. TO ADJUST POSITION BOUNCE SUPPRESSOR BRACKET WITH MOUNTING SCREWS LOOSENED.

FIGURE 4-19 KEYBOARD, CODE BAR MECHANISM, FRONT VIEW
ALIGNMENT OF THE CODE LEVER BAIL EXTENSION AND THE CODE LEVER BAIL LATCH LEVER SHOULD BRING THE EDGES FLUSH WITHIN 0.010 INCH. CODE LEVER BAIL SHOULD HAVE SOME END PLAY MAX. 0.010 INCH

TO ADJUST POSITION THE CODE LEVER BAIL BY MEANS OF THE PILOT SCREWS

THE SPACE BAR SHOULD BE FREE ON ITS PIVOTS AND HAVE SOME END PLAY MAX. 0.010 INCH

TO ADJUST POSITION THE SPACE BAR BAIL PILOT SCREWS
(2) REQUIREMENT

There should be a barely perceptible 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 filister head adjusting and clamping screws located at the front end of the bracket. Refine requirements if necessary.

(A) INTERMEDIATE GEAR BRACKET

(1) REQUIREMENT

There should be a barely perceptible 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.

NOTE: OVERLOAD MECHANISM SPRING ADJUSTMENT APPLIES ONLY TO UNITS So EQUIPPED

OVERLOAD CLUTCH LEVER IN ITS NOTCH
MIN. 40 OZS.
MAX. 64 OZS.
To start lever moving lever must not jump from notch with less than 64 OZS.
LOCAL LINE FEED TRIP LINK SPRING TENSION

REQUIREMENT

MIN. 5 OZS.
MAX. 10 OZS.

TO START THE LINK MOVING.

LOCAL LINE FEED TRIP LINK

LOCAL LINE FEED TRIP LINK SPRING

LOCAL CARRIAGE RETURN BAIL SPRING

REQUIREMENT

SPRING UNHOOKED FROM BRACKET.
MIN. 10 OZS.
MAX. 15 OZS.

TO PULL SPRING TO INSTALLED LENGTH.

CARRIAGE RETURN BAIL

LOCAL CARRIAGE RETURN BAIL SPRING

REQUIREMENT

LOCK BAIL SPRING

KEYBOARD LOCK KEY DEPRESSED
MIN. SOME TENSION
MAX. 3 OZS.

LOCK BAIL

LOCK BAIL SPRING

LOCAL LINE FEED TRIP BAIL

PLUNGER LEVER

LOCAL LINE FEED TRIP LINK SPRING

CARRIAGE RETURN BAIL SPRING

BRACKET

*APPLIES TO KEYBOARD ONLY

FIGURE 4-22 KEYBOARD LOCK, LOCAL LINE FEED, AND CARRIAGE RETURN MECHANISM, LEFT SIDE VIEW.
MARGIN INDICATOR SPRING TENSION
REQUIREMENT
MIN. 9 OZS.
MAX. 14 OZS.
TO MOVE THE CONTACT LEVER FROM THE CONTACT PLUNGER.

CONTACT LEVER

MARGIN INDICATOR SPRING

CONTACT PLUNGER

SENSITIVE SWITCH

FRONT VIEW

PAPER-FEED-OUT MOTOR START
MECHANISM SPRING (KEYBOARD)
REQUIREMENT
MIN. 6 OZS.
MAX. 10 OZS.
TO START THE LEVER MOVING

SWITCH LEVER

SPRING

LOCAL LINE FEED TRIP LINK

BRACKET

FIGURE 4-23 KEYBOARD, MARGIN INDICATING AND PAPER FEED-OUT MECHANISMS
2. TYPING UNIT

NOTE: BAIL LEVER GUIDE ADJUSTMENT APPLIES ONLY TO UNITS EQUIPPED WITH ADJUSTABLE GUIDES

START LEVER SPRING REQUIREMENT
LATCH LEVER SPRING UNHOOKED. STOP ARM BAIL IN INDENT OF ITS CAM. RANGE SCALE SET AT 60
MIN. 2-1/2 OZS.
MAX. 4-1/2 OZS.
TO START THE STOP ARM MOVING.

SELECTOR MAGNET

MOUNTING NUT

RANGE FINDER PLATE

STOP ARM BAIL

START LEVER (EXTENSION)

START LEVER

START LEVER SPRING

BAIL LEVER GUIDE

REQUIREMENT
SOME CLEARANCE BETWEEN EACH SIDE OF GUIDE FORK AND EXTENSION OF START LEVER THROUGHOUT ITS TRAVEL.
TO ADJUST POSITION BAIL LEVER GUIDE WITH MOUNTING NUT LOOSENEO.

FIGURE 4-24 TYPING UNIT, SELECTOR CLUTCH MECHANISM, RIGHT SIDE VIEW

CHANGE 4
TRANSFER LEVERS

CODE BAR SHIFT LEVER
ROLLER

CODE BAR SHIFT LEVER DRIVE ARM

REQUIREMENT
CODE BAR SHIFT LEVER LINK IN THE UPPERMOST POSITION.
THERE SHOULD BE SOME CLEARANCE BETWEEN THE TOP OF THE ROLLERS AND
THE TOP OF THE CAM SLOTS IN THE CODE BAR SHIFT LEVERS
MAX. 0.025 INCH
ON THE CLOSEST LEVER.

TO ADJUST
LOOSEN THE CLAMP SCREW. POSITION
THE CODE BAR SHIFT LEVER DRIVE ARM ON ITS SHAFT TO MEET THE
REQUIREMENT AND TO PROVIDE SOME END PLAY, NOT MORE THAN 0.006 INCH

CODE BAR SHIFT LEVER LINK

CODE BAR SHIFT LEVER DRIVE ARM

CLAMP SCREW

(FRONT VIEW)

CODE BAR SHIFT LEVER DRIVE ARM

(RIGHT SIDE VIEW)

FIGURE 4-25 TYPING UNIT, CODE BAR SHIFT MECHANISM
REAR CODE BAR SHIFT LEVER
CODE BAR SHIFT BAR (MARKING)
CODE BAR SHIFT BAR (SPACING)

CODE BAR SHIFT BAR INNER STEP
FRONT CODE BAR SHIFT LEVER
TRANSFER LEVERS

(TOP VIEW)

CODE BAR
SHIFT LEVER

CODE BAR
SHIFT LEVER LINK

MOUNTING SCREWS (3)

CODE BAR SHIFT LEVER LINK BRACKET

REQUIREMENT
MOTION OF FRONT AND REAR CODE BAR SHIFT LEVERS SHOULD BE EQUALIZED WITH RESPECT TO CODE BAR TRAVEL.

TO CHECK (FRONT)
SELECT BLANK COMBINATION AND ROTATE MAIN SHAFT UNTIL CODE BAR SHIFT LEVER LINK REACHES HIGHEST TRAVEL.
TAKE UP PLAY FOR MAXIMUM CLEARANCE. CLEARANCE BETWEEN FRONT CODE BAR SHIFT LEVER AND SHOULDER ON NEAREST CODE BAR SHIFT BAR.
MIN. 0.002 INCH
MAX. 0.025 INCH

TO CHECK (REAR)
SELECT LETTERS COMBINATION. CHECK CLEARANCE BETWEEN REAR CODE BAR SHIFT LEVER AND SHOULDER OF CODE BAR SHIFT BAR IN SAME WAY.
MIN. 0.002 INCH
MAX. 0.025 INCH

TO ADJUST
POSITION CODE BAR SHIFT LEVER LINK BRACKET BY MEANS OF MOUNTING SCREWS (3).

FIGURE 4-26 TYPING UNIT, CODE BAR SHIFT MECHANISM
OSCILLATING RAIL SLIDE POSITION REQUIREMENT

SPACING CUTOUT LEVER AND AUTOMATIC CR-LF ARM IN MAXIMUM COUNTERCLOCKWISE POSITION ON SPACING DRUM. SPACING CLUTCH DISENGAGED. FARthest ADVANCED SPACING PAWL ENGAGED WITH TOOTH JUST ABOVE CUT-AWAY SECTION IN RATCHET WHEEL. RIGHT END OF OSCILLATING RAIL SLIDE SHOULD CLEAR PULLEY

MIN. 0.025 INCH
MAX. 0.050 INCH

TO ADJUST POSITION SLIDE ON WIRE ROPE WITH CLAMP SCREWS LOOSENED.

NOTE:
ON UNITS EQUIPPED FOR 6 SPACES PER INCH, THIS TENSION SHOULD BE

MIN. 8 OZS.
MAX. 10 OZS.

TO PULL SPRINGS TO INSTALLED LENGTH.

FIGURE 4-27 TYPING UNIT, SPACING MECHANISM
NOTE: 1. THIS ADJUSTMENT APPLIES ONLY TO UNITS WITH NON-ADJUSTABLE GUIDE PLATES
2. FOR UNITS WITH ADJUSTABLE GUIDE PLATES AND ONE STOP FUNCTION CLUTCHES SEE FIG. 1-43
3. FOR UNITS WITH ADJUSTABLE GUIDE PLATES AND TWO STOP FUNCTION CLUTCHES SEE FIG. 1-43
CHANGE FIRST SENTENCE IN REQUIREMENT TO:"DISENGAGE FUNCTION CLUTCH AT STOP GIVING LEAST CLEARANCE" THEN PROCEED AS SPECIFIED.

GUIDE PLATE EXTENSION
GUIDE PLATE
MOUNTING NUTS
LETTER FUNCTION SLIDE

SHIFT FORK

TOP VIEW

FIGURES FUNCTION SLIDE

FUNCTION LEVER
FUNCTION PAWL
FUNCTION BAR

SHIFT CODE BAR OPERATING MECHANISM

REQUIREMENT: (FOR TWO STOP FUNCTION CLUTCH)
DISENGAGE FUNCTION CLUTCH AT POSITION GIVING LEAST CLEARANCE. ROTATE TYPE BOX CLUTCH 1/2 REVOLUTION. HOLD FIGURES FUNCTION LEVER IN REARWARD POSITION WITH TENSION OF 32 OZS.
CLEARANCE BETWEEN THE FUNCTION PAWL SHOULDER AND FACE OF FUNCTION BAR
MIN. 0.002 INCH
MAX. 0.015 INCH
WHEN PLAY IN PAWL IS TAKEN FOR MAXIMUM CLEARANCE.
DISENGAGE FIGURES FUNCTION PAWL CHECK LETTERS FUNCTION PAWL IN SAME MANNER.

TO ADJUST
POSITION SHIFT ASSEMBLY WITH CLAMP SCREWS LOOSENED. TAKE UP PLAY IN MOUNTING HOLES TO REAR.
CAUTION: MANUALLY OPERATE LETTERS AND FIGURES FUNCTION LEVER ALTERNATELY LEVERS SHOULD BE FREE OF BINDS.

FIGURE 4-28 TYPING UNIT, SHIFT MECHANISM

CHANGE 4
NOTE: 1. THIS ADJUSTMENT APPLIES ONLY TO UNITS WITH TWO STOP FUNCTION CLUTCHES.  
2. FOR UNITS WITH ONE STOP FUNCTION CLUTCHES SEE FIG. 1-44

FUNCTION RESET BAIL BLADE

(1) REQUIREMENT
FUNCTION CLUTCH DISENGAGED AT STOP POSITION GIVING LEAST CLEARANCE.  TYPE 
BOX CLUTCH DISENGAGED. ALL FUNCTION PAWLS UNLATCHED FROM THEIR FUNCTION BARS. 
FUNCTION BAR HELD IN MAXIMUM REARWARD POSITION. CLEARANCE BETWEEN FUNCTION BAR 
AND RESET BAIL BLADE  
MIN. 0.018 INCH MAX. 0.0351 INCH  

TO CHECK 
MEASURE CLEARANCE AT BARS LOCATED IN STUNT BOX SLOTS. 1, 4, 11, 18, 23, 33, 38,  
AND 41. IF THERE IS NO BAR IN A DESIGNATED SLOT, USE NEAREST BAR. IF THERE IS A 
BAR ON EACH SIDE OF A DESIGNATED VACANT SLOT, USE BAR IN HIGHEST NUMBERED SLOT.  
(NOTE: FACING REAR OF UNIT, SLOTS ARE NUMBERED FROM LEFT TO RIGHT)  

TO ADJUST 
POSITION BLADE ON RESET BAIL WITH BLADE MOUNTING SCREWS FRICTION TIGHT.  

(2) REQUIREMENT 
TYPE BOX CLUTCH ROTATED 1/2 REVOLUTION, FUNCTION LEVER HELD IN REARMOST  
POSITION WITH 2 LBS. MAXIMUM TENSION. LATCH ASSOCIATED PAWL ONLY ONE AT A TIME. 
WITH 32 OZS. TENSION APPLIED TO FUNCTION PAWL, IT SHOULD OVERTRAVEL ITS BAR  
MIN. 0.002 INCH  

TO ADJUST 
REFINE REQUIREMENT (1).  

FIGURE 4-29  TYPING UNIT, FUNCTION BAR RESET MECHANISM
NOTE: THESE ADJUSTMENTS APPLY ONLY TO HORIZONTAL POSITIONING DRIVE MECHANISMS EQUIPPED WITH TENSION SPRINGS.

NOTE: THE LOOPS OF THIS SPRING ARE OFF-SET FROM CENTER IN THE SAME DIRECTION. THE SPRING MUST BE HOOKED ON ITS ANCHORS SO THAT THE SIDE OF THE SPRING, ON WHICH THE LOOPS ARE LOCATED, IS TOWARD THE REAR OF THE MACHINE. WHEN REMOVING EITHER SPRING EXERCISE CARE TO AVOID KINKS IN LOOPS.

HORIZONTAL POSITIONING DRIVE LINKAGE SPRING TENSION REQUIREMENT
- SPRING UNHOOKED FROM ITS POST.
- LINKAGE IN ITS UNBUCKLED POSITION.
- MIN. 14 OZS.
- MAX. 18 OZS.

TO PULL SPRING TO INSTALLED LENGTH.

HORIZONTAL STOP SLIDES
- DECELERATING SLIDE

REVERSING SLIDE
- CONNECTING STRIP
- CONNECTING STRIP MOUNTING SCREWS
- BEARING STUD MOUNTING SCREWS
- HORIZONTAL POSITIONING DRIVE LINKAGE - VERTICAL LINK

HORIZONTAL POSITIONING DRIVE LINKAGE REQUIREMENT
- TYPE BOX CLUTCH DIS ENGAGED. CODE BARS 4 AND 5 TO SPACING (RIGHT).
- CLEARANCE BETWEEN EACH SIDE OF CENTER HORIZONTAL STOP SLIDE AND DECELERATING SLIDES ON SIDE WHERE KNEE LINK IS STRAIGHT, SHOULD BE EQUAL (WITHIN 0.005 INCH)
- MIN. 0.020 INCH
- MAX. 0.040 INCH

TO ADJUST
- LOOSEN BEARING STUD MOUNTING SCREWS AND CONNECTING STRIP MOUNTING SCREWS
- FRICTION TIGHT. POSITION ONE OR BOTH BEARING STUDS ON THE CONNECTING STRIP TO PROVIDE 0.025 INCH TO 0.035 INCH BETWEEN THE CENTER HORIZONTAL SLIDE AND THE DECELERATING SLIDE ON THE SIDE WHERE THE LINKAGE IS NOT BUCKLED. TIGHTEN THE TWO INNER MOUNTING SCREWS. CHANGE POSITION OF REVERSING SLIDE AND CHECK OPPOSITE CLEARANCE. EQUALIZE BY SHIFTING BOTH STUDS AND CONNECTING STRIP AS A UNIT.
- HOLD THE DRIVE LINKAGE HUB AGAINST THE LOWER VERTICAL LINK OF THE DRIVE LINKAGE. TIGHTEN THE TWO OUTER BEARING STUD MOUNTING SCREWS. CHECK THE LINKAGE FOR FREENESS THROUGHOUT A COMPLETE CYCLE.

FIGURE 4-30 TYPING UNIT, HORIZONTAL POSITIONING DRIVE MECHANISM, FRONT VIEW

CHANGE 4
(1) REQUIREMENT (FOR 72 CHARACTER LINE)
TYPE BOX CLUTCH DISENGAGED. SPACING DRUM IN RETURNED POSITION.
TYPE BOX SHIFTED TO THE LETTERS POSITION. CENTER OF THE LETTERS
PRINT INDICATOR ON THE TYPE BOX SHOULD BE
MIN. 15/16 INCH
MAX. 1-1/16 INCH
FROM THE LEFT EDGE OF THE PLATEN.

(2) REQUIREMENT
SPACING CLUTCH DISENGAGED.
FRONT SPACING FEED PAWL FARTHEST ADVANCED. SPACING
DRUM FULLY RETURNED. PLAY IN SPACING SHAFT GEAR (FIG.1-36)
TAKEN UP CLOCKWISE.
CLEARANCE BETWEEN PAWL AND SHOULDER OF RATCHET
WHEEL TOOTH IMMEDIATELY AHEAD
MIN. 0.002 INCH
MAX. 0.015 INCH

(3) REQUIREMENT
REAR PAWL, WHEN FARTHEST
ADVANCED, SHOULD REST AT
BOTTOM OF INDENTATION
BETWEEN RATCHET WHEEL TEETH.
TO ADJUST
POSITION STOP ARM ON SPACING
DRUM WITH MOUNTING SCREWS
LOOSENEO.

NOTE:
FOR OTHER LENGTHS OF LINE, RANGING FROM 55 TO 85 CHARACTERS
THE MARGIN CAN BE VARIED AS REQUIRED.

NOTE:
THIS VIEW SHOWS THE SPACING DRUM FULLY RETURNED.

FIGURE 4-31  TYPING UNIT, CARRIAGE RETURN MECHANISM
RIGHT MARGIN

Requirement (operating on base)
Type box carriage in position to print character on which spacing cutout is desired. Front spacing pawl farthest advanced. Clearance between upper edge of spacing cutout lever and cutout transfer bail when spacing cutout transfer bail is held in its extreme upper position
Min. 0.006 inch
Max. 0.025 inch
To adjust position the cutout lever with its clamp screw loosened.

SPACING CUTOUT LEVER
SPACING CUTOUT TRANSFER BAIL SPRING TENSION
Requirement
Min. 1 oz.
Max. 3-1/2 ozs.
To start bail moving.

DECELERATING SLIDE

DECELERATING SLIDE BELL CRANK (P...
TYPE BOX CARRIAGE ROLLER

REQUIREMENT
MINIMUM VERTICAL PLAY WITHOUT BIND IN TYPE BOX CARRIAGE TO CHECK

MOVE CARRIAGE TO RIGHT END OF TRACK. PLACE IN UPPER POSITION. REMOVE DRIVE LINK. CHECK THROUGHOUT ENTIRE TRAVEL OF CARRIAGE.

TO ADJUST
POSITION LOWER ROLLER ARM WITH CLAMP SCREW LOOSENED.

FIGURE 4-33 TYPING UNIT, PRINTING AND TYPE BOX CARRIAGE

NOTE: FOR SHIFT MECHANISMS WITH TORSION SPRINGS

SHIFT LINKAGE SPRING

RIGHT SHIFT LINKAGE

SHIFT LINKAGE SPRING TENSION

REQUIREMENT
LINK IN STRAIGHT POSITION.
MIN. 7 OZS.
MAX. 16 OZS.
TO START EACH LINK MOVING.

FIGURE 4-34 TYPING UNIT, SHIFT MECHANISM
(A) PRINTING HAMMER STOP BRACKET
(For thick type box with dummy pallets)

Requirement
Type box in blank or cr position (whichever does not print) and near center of platen. Printing track in its downward position. Printing hammer held against its stop with 8 ozs. of pressure. Clearance between printing hammer and dummy type pallet

Friction feed
Min. 0.008 inch
Max. 0.020 inch

To adjust
Position the stop bracket with its mounting screw and the printing hammer bail pivot stud loosened.

For sprocket feed units, see Figure 2-9)

Printing hammer
Bail pivot stud

Printing hammer
Operating bail

Latching
Extension

Operating
Bail latch

Secondary
Printing arm

NOTE
The printing arm adjustment should always be made with the printing hammer operating bail spring bracket (Figure 1-49) in the No. 1 position. Positions No. 2 and No. 3 are to be used only for making multiple copies.

(B) PRINTING ARM
(1) REQUIREMENT
Printing track in maximum downward position.
Printing hammer operating bail against its stop.
Some clearance between secondary printing arm and forward extension of hammer operating bail.
Max. 0.015 inch
When printing arm slide is held downward over each printing track mounting screw for maximum clearance.

(2) REQUIREMENT
Printing track in uppermost position. Latching extension of printing hammer operating bail should overtravel latching surface of operating bail latch by
Min. 0.006 inch
Check right and left position to adjust
Position secondary printing arm with clamp screws loosened.

(C) TYPE Pallet SPRING TENSION

Requirement
Type box removed from the unit. 8 oz. scale applied vertically to the end of the pallet shank.
Min. 1/4 oz.
Max. 3/4 oz.
To start pallet moving.

TYPE BOX
ASSEMBLY

TYPE Pallet

Pallet shank

8 ozs
Pressure

Mounting Screw

Hammer operating bail stop

Printing arm clamp screws

(Front view)

(Top view)

Printing arm

Change 4

FIGURE 4-35 TYPING UNIT, PRINTING MECHANISM

4-33
RIBBON REVERSING LEVER - RIGHT
RIBBON REVERSING LEVER - LEFT

(A) RIBBON REVERSE SPUR GEAR

REQUIREMENT
WHEN RIGHT REVERSING LEVER IS IN MAXIMUM DOWNWARD POSITION, THE LEFT REVERSING LEVER SHOULD BE IN ITS MAXIMUM UPWARD POSITION.

TO ADJUST
LOOSEN THE SET SCREWS IN THE DETENT CAM. LOOSEN THE LEFT SPUR GEAR NUT. SECURELY TIGHTEN THE RIGHT SPUR GEAR NUT. MOVE THE RIGHT REVERSING LEVER TO ITS MAXIMUM DOWNWARD POSITION AND HOLD LEFT REVERSING LEVER IN ITS MAXIMUM UPWARD POSITION. THEN TIGHTEN THE LEFT SPUR GEAR NUT.

DETENT CAM

(B) RIBBON REVERSE DETENT

REQUIREMENT
DETENT SEATED APPROXIMATELY EQUAL IN UPPER AND LOWER POSITIONS OF DETENT CAM

TO ADJUST
POSITION CAM ON SHAFT WITH SET SCREWS LOOSENED. LET LEFT END OF DETENT STUD BE APPROXIMATELY FLUSH WITH LEFT FACE OF CAM (PLAY IN DETENT TAKEN TO RIGHT OF PRINTER)

RIBBON REVERSE DETENT LEVER SPRING TENSION

REQUIREMENT
DETENT SEATED IN NOTCH OF CAM. RIGHT RIBBON REVERSING LEVER HELD DOWNWARD.
MIN. 6 1/2 OZS.
MAX. 9 OZS.
TO START THE DETENT LEVER MOVING.

FIGURE 4-36 TYPING UNIT, RIBBON REVERSE MECHANISM

CHANGE 4
FUNCTION PAWL

FUNCTION BAR

STRIPPER BLADE

STRIPPER BLADE ARM

SHOULDER BUSHING

FUNCTION STRIPPER BLADE ARMS

REQUIREMENT

TYPE BOX CLUTCH AND FUNCTION CLUTCH DISENGAGED. LEFT LINE FEED FUNCTION PAWL HELD IN ITS REAR POSITION AND RESTING ON THE UPPER EDGE OF THE STRIPPER BLADE. CLEARANCE BETWEEN UPPER EDGE OF FUNCTION BAR AND LOWER SURFACE OF NOTCHED SECTION OF FUNCTION PAWL.

MIN. 0.055 INCH
MAX. 0.065 INCH

THE LETTERS FUNCTION PAWL NEAR THE OPPOSITE END OF THE STRIPPER BLADE SHOULD HAVE THE SAME CLEARANCE.

TO ADJUST
POSITION THE SHOULDER BUSHING AT THE LOWER END OF THE RIGHT AND LEFT STRIPPER BLADE ARM WITH THE LOCK NUT LOOSENED.

NOTE
WHEN CHECKING THIS ADJUSTMENT SINGLE-DUDBLE LINEFEED LEVER MUST BE IN DOUBLE LINEFEED POSITION.

FIGURE 4-37 TYPING UNIT, FUNCTION PAWL STRIPPER MECHANISM

AUTOMATIC CARRIAGE RETURN ARM

SPACING DRUM

AUTOMATIC CARRIAGE RETURN AND LINE FEED ARM

REQUIREMENT (OPERATING ON BASE)
CARRIAGE IN POSITION TO PRINT TWO SPACES BEFORE THE LAST DESIRED CHARACTERS, AND FRONT SPACING PAWL FARthest ADVANCED. CLEARANCE BETWEEN LEADING END OF AUTOMATIC CARRIAGE RETURN ARM AND BELL CRANK.

MIN. 0.040 INCH
MAX. 0.055 INCH

TO ADJUST
POSITION AUTOMATIC CARRIAGE RETURN ARM WITH MOUNTING SCREWS LOOSENED.

NOTE
RANGE OF ADJUSTMENT IS FROM 65TH TO 85TH CHARACTERS.

NOTE
FOR UNITS EQUIPPED WITH UNIVERSAL SPACING DRUM, SEE FIGURE 142.

FIGURE 4-38 TYPING UNIT, HORIZONTAL MOTION STOP AND AUTOMATIC CARRIAGE RETURN MECHANISM

CHANGE 4

4-35
NOTE: THIS ADJUSTMENT APPLIES ONLY TO UNITS WITH A TWO-STOP FUNCTION CLUTCH

SINGLE-DOUBLE LINE FEED LEVER

LINE FEED FUNCTION PAWL

ADJUSTING SCREW

TO ADJUST
POSITION THE LEVER ADJUSTING SCREW

FIGURE 4-39 TYPING UNIT, SINGLE-DOUBLE LINE FEED MECHANISM
BELL OR MOTOR STOP FUNCTION CONTACT

(1) REQUIREMENT
FUNCTION LEVER AS SHOWN
CONTACT GAP
MIN. 0.010 INCH
MAX. 0.020 INCH
TO ADJUST
BEND THE LOWER ELECTRICAL CONTACT.

(2) REQUIREMENT
FUNCTION LEVER AS SHOWN
MIN. 1 1/4 OZS.
MAX. 1 3/4 OZS.
TO ADJUST
BEND THE UPPER ELECTRICAL CONTACT

(3) REQUIREMENT
RECHECK REQUIREMENT (1)

FIGURE 4-40  TYPING UNIT, FUNCTION CONTACT
CAUTION: CARE SHOULD BE EXERCISED IN SOLDERING TO CONTACT SPRINGS SINCE EXCESSIVE HEAT WILL ANNEAL THE SPRINGS. CONTACT SPRINGS ONCE SOLDERED SHOULD NOT BE USED AGAIN.
OPERATING UNDER POWER, THE LAMP SHOULD LIGHT ON THE DESIRED CHARACTER

TO ADJUST
SET THE TYPE BOX CARRIAGE TO PRINT THE DESIRED CHARACTER AND POSITION THE CAM DISK COUNTERCLOCKWISE ON THE SPRING DRUM WITH ITS THREE MOUNTING SCREWS LOOSENED SO THAT THE SWITCH JUST OPENS.

FIGURE 4-42 BASE AND TYPING UNIT, MARGIN INDICATING MECHANISM
3. VARIABLE FEATURES

(A) REPEAT-ON-SPACE LEVER
(1) REQUIREMENT (MOTOR RUNNING)
- MIN. 3 1/2 OZS.
- MAX. 8 OZS.
- TO TRANSMIT SINGLE SPACE.

TO CHECK
- GRADUALLY APPLY PRESSURE TO SPACE BAR.

(2) REQUIREMENT (MOTOR RUNNING)
- MAX. 10 OZS.
- TO EFFECT CONTINUOUS SPACE TRANSMISSION.

TO CHECK
- ABRUPTLY APPLY PRESSURE TO SPACE BAR AND HOLD IT DOWN.
- NOTE: ABRUPT OPERATION IS NECESSARY TO DISABLE CODE BAR BAIL LATCH WITHIN THE 10 OZ. MAX. REQUIREMENT.

TO ADJUST
- FULLY DEPRESS SPACE BAR.
- POSITION ECCENTRIC BUSHING WITH MOUNTING NUT FRICTION TIGHT, GENERATOR SHAFT ROTATING UNDER POWER.

(B) REPEAT-ON-SPACE LEVER SPRING
REQUIREMENT
- GENERATOR CLUTCH DISENGAGED
- SPRING UNHOOKED FROM POST
- MIN. 1/2 OZ.
- MAX. 1 1/2 OZS.
- TO PULL SPRING TO POSITION LENGTH.

FIGURE 4-43 KEYBOARD, REPEAT-ON-SPACE MECHANISM
ECCENTRIC FOLLOWER PAWL SPRING

REQUIREMENT
ECCENTRIC FOLLOWER PAWL IN EXTREME
FORWARD POSITION, 8 OZ. SCALE APPLIED
TO PAWL NEAR RATCHET WHEEL AND PULLED
UPWARD
MIN. 1 1/2 OZS.
MAX. 4 OZS.
TO START PAWL MOVING.

TIME DELAY ECCENTRIC FOLLOWER PAWL

RATCHET WHEEL

PILOT SCREW

LOCK NUT

ECCENTRIC FOLLOWER PAWL SPRING

TIME DELAY DISABLING DEVICE

REQUIREMENT
DISABLE THE TIME DELAY MECHANISM
WHEN NOT REQUIRED.

TO ADJUST
RAISE THE PILOT SCREW (LOCK NUT LOOSENED) AND ECCENTRIC FOLLOWER
PAWL UNTIL THE PAWL CLEAR THE
RATCHET WHEEL.

FIGURE 4-44 KEYBOARD OR BASE, TIME DELAY DISABLING DEVICE
BREAK LEVER SPRING

With spring unhooked

Min. 5 ozs.

Max. 7 ozs.

To stretch spring to installed length.

MECHANICAL
(REAR VIEW)

BREAK KEYLEVER SPRING

MIN. 12 OZS.

MAX. 20 OZS.

To operate switch

BREAK KEYLEVER SPRING

(REAR VIEW)

BREAK LEVER SPRING

Requirement

(LEFT SIDE VIEW)

BREAK KEYLEVER

SWITCH

BREAK LEVER

ELECTRICAL
(REAR VIEW)

FIGURE 4-45 KEYBOARD, SIGNAL LINE BREAK MECHANISMS

4-42

CHANGE 4
BACK SPACE TRIP LINK VERTICAL SPRING REQUIREMENT
TYPER UNIT REMOVED
MIN. 1 1/2 OZS.
MAX. 3 OZS.
TO PULL SPRING TO INSTALLED LENGTH.

BACK SPACE TRIP LINK HORIZONTAL SPRING REQUIREMENT
TYPER UNIT REMOVED
MIN. 1 3/4 OZS.
MAX. 3 OZS.
TO PULL SPRING TO INSTALLED LENGTH

BACK SPACE TRANSFER BAIL SPRING REQUIREMENT
MIN. 1/4 OZ.
MAX. 1 1/4 OZ.
TO START BAIL MOVING

NOTE
IN ORDER TO PUSH VERTICALLY DOWNWARD ON THE BAIL, THE ADJUSTING LEVER MAY HAVE TO BE MOVED TOWARD FRONT OF UNIT. REMAKE TRANSFER BAIL ADJUSTING LEVER HORIZONTAL ADJUSTMENT.

BACK SPACE TRANSFER BAIL ADJUSTING LEVER REQUIREMENT (VERTICAL ADJUSTMENT)
WITH THE TYPER UNIT REMOVED, THERE SHOULD BE SOME CLEARANCE BETWEEN THE TRANSFER BAIL AND THE STUD ON THE BACK SPACE OPERATING BAIL.
MAX. 0.006 INCH
TO ADJUST POSITION THE ADJUSTING LEVER BRACKET NEAR THE CENTER OF ITS ADJUSTING RANGE. POSITION THE ADJUSTING LEVER UP OR DOWN WITH ITS ADJUSTING LEVER SCREW FRICITION TIGHT TO MEET THE REQUIREMENT.

FIGURE 4-46 KEYBOARD, BACK SPACE MECHANISM
BACK SPACE TRANSFER BAIL ADJUSTING LEVER HORIZONTAL ADJUSTMENT

REQUIREMENT

- Typer unit installed, spacing clutch disengaged,
- Front feed pawl in lower position. Back space
- Key lever held depressed, main shaft rotated until
- Front feed pawl is opposite the peak of the first
- Ratchet wheel tooth that moves downward past
- The pawl tooth. Clearance should be:
  - Min. 0.020
  - Max. 0.035

TO ADJUST

- Loosen the mounting screw on the transfer bail
- Adjusting lever bracket. Depress the back space
- Key lever and push the adjusting lever and bracket
- Firmly to rear. Tighten the bracket mounting screw.

NOTE

- After this adjustment the camming bail should
  Return to its unoperated position when the
  Key lever is released. If it does not return refine the
  Adjustment. Recheck the transfer bail vertical adjustment

FIGURE 4-47 KEYBOARD, BACKSPACING MECHANISM

NOTE: IF A NEW TYPING UNIT IS INSTALLED ON THE
BASE, THIS ADJUSTMENT SHOULD BE CHECKED.
OPERATING LEVER SLIDE ARM

NOTE
PRIOR TO THIS ADJUSTMENT CHECK FUNCTION
RESET BAIL BLADE ADJUSTMENT (FIGURE 54)

REQUIREMENT
ON UNITS WITH TWO-STOP FUNCTION CLUTCHES.
FUNCTION CLUTCH DISENGAGED. TYPE BOX CLUTCH
ROTATED 1/2 REVOLUTION PAST STOP POSITION ON UNITS
WITH ONE-STOP FUNCTION CLUTCH, ROTATE CLUTCH
UNTIL FUNCTION PAWL STRIPPER BLADE IS IN ITS
LOWER POSITION AND THE FUNCTION RESET BAIL ROLLER
IS ON THE HIGH PART OF CAM, HORIZONTAL TABULATOR
FUNCTION PAWL PULLED TO REAR AND LATCHED OVER
FUNCTION BAR. CLEARANCE
MIN. 0.020 INCH
MAX. 0.030 INCH

TO ADJUST
POSITION SLIDE ARM ON OPERATING LEVER WITH
MOUNTING STUD FRICTION TIGHT.

OPERATING LEVER EXTENSION
LINK SPRING

REQUIREMENT
TRIP ARM LATCH BAIL SPRING
UNHOOKED, OPERATING LEVER
IN OPERATED POSITION.
SLIDE ARM AGAINST
BLOCKING LINK.
MIN. 8 3/4 OZS.
MAX. 10 3/4 OZS.
TO START LINK MOVING.

OPERATING LEVER ADJUSTING PLATE

REQUIREMENT
OPERATING LEVER IN UNOPERATED
POSITION. CLEARANCE
MIN. 0.070 INCH
MAX. 0.085 INCH

TO ADJUST
POSITION ADJUSTING PLATE ON
BRACKET WITH MOUNTING
SCREWS LOOSE.

FIGURE 4-48 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM (LEFT VIEW)
TRIP ARM LATCH BAIL

REQUIREMENT
OPERATING LEVER UNOPERATED.
SPACING TRIP ARM UP. CLEARANCE
MIN. 0.025 INCH
MAX. 0.035 INCH
TO ADJUST
POSITION LATCH BAIL.
ADJUSTING SCREW.
TIGHTEN LOCK NUT.

TRIP ARM LATCH BAIL ADJUSTING PLATE

REQUIREMENT
SPACING CLUTCH AND TYPE BOX
CLUTCH DISENGAGED.
OPERATING LEVER SLIDE ARM
TO REAR AND LATCHED ON BLOCKING ARM. LATCH BAIL IN FULLY LATCHED POSITION. SPACING TRIP ARM DOWN AND BEARING UP AGAINST LATCHING SURFACE OF LATCH BAIL. CLEARANCE
MIN. SOME
MAX. 0.008 INCH
TO ADJUST
POSITION LATCH BAIL ADJUSTING PLATE WITH MOUNTING SCREW
FRICITION TIGHT.

OPERATING LEVER
SPACING TRIP LEVER
MOUNTING SCREW
LATCH BAIL ADJUSTING PLATE

FIGURE 4-49 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM, LEFT VIEW

CHANGE 4
OPERATING LEVER CAM ARM
SPRING

HORIZONTAL TABULATOR SLIDE ARM SPRING

HORIZONTAL TABULATOR SLIDE ARM

OPERATING LEVER IN OPERATED POSITION.
SLIDE ARM IN UNOPERATED POSITION.
MIN. 1 OZ.
MAX. 4 OZS.
TO START SLIDE ARM MOVING.

STRIPPER BAIL ARM SCREW
CAM ARM FOLLOWER BAIL

OPERATING LEVER CAM PLATE SPRING
REQUIREMENT
OPERATING LEVER IN UNOPERATED POSITION. HORIZONTAL TABULATOR FUNCTION PAWL UNLATCHED.
MIN. 4 OZS.
MAX. 9 OZS.
TO START STRIPPER BAIL ARM MOVING.

(A) CAM PLATE STRIPPER BAIL
REQUIREMENT
OPERATING LEVER AND TABULATOR SLIDE ARM IN UNOPERATED POSITIONS. SPACING CLUTCH ROTATED UNTIL HIGH PART OF SPACING CAM IS OPPOSITE CAM ARM FOLLOWER BAIL CLEARANCE
MIN. 0.010 INCH
MAX. 0.025 INCH
TO ADJUST POSITION STRIPPER BAIL ARM ON CAM ARM FOLLOWER BAIL WITH STRIPPER BAIL ARM SCREW FRICITION TIGHT.

FIGURE 4-50 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM

CHANGE 4
(A) RIGHT MARGIN
REQUIREMENT
CLEARANCE
MIN. 0.006 INCH MAX. 0.025 INCH

TO CHECK
PLACE TYPE BOX IN POSITION TO PRINT CHARACTER ON WHICH SPACING CUTOUT IS DESIRED. PULL FORWARD ON PART OF TRANSFER BAIL EXTENDING BELOW MOUNTING SHAFT UNTIL BAIL IS IN FULLY OPERATED POSITION. GAGE CLEARANCE.

TO ADJUST
POSITION CUTOUT LEVER WITH CLAMP SCREW LOOSENED (FOR LOCATION OF CLAMP SCREW SEE FIGURE 4-32)
NOTE: FOUR SCREWS MUST BE LOOSENED TO ADJUST CIRCULAR CUTOUT LEVERS.

(B) SPACE SUPPRESSION BY-PASS SPRING
REQUIREMENT
MIN. 20 OZS.
MAX. 26 OZS.
TO START ARM MOVING.

(C) TABULATOR SHAFT MOUNTING BRACKETS
REQUIREMENT
LEVER SLIDE ARM TO REAR SO THAT BLOCKING ARM AND TABULATOR STOP ARE IN EXTREME UPPER POSITION. CLEARANCE
MIN. 0.050 INCH MAX. 0.065 INCH
CLEARANCE MEASURED NEAR LEFT AND RIGHT END OF SHAFT EQUAL WITHIN 0.007 INCH
TO ADJUST
POSITION MOUNTING BRACKETS WITH MOUNTING SCREWS LOOSENED.
NOTE: MAKE SURE SHAFT IS FREE OF BINDS.

FIGURE 4-51 TYPING UNIT, HORIZONTAL TABULATOR MECHANISM.
PAWL MOUNTING ARM OPERATING RANGE (PRELIMINARY)

NOTE . . . PRIOR TO THIS ADJUSTMENT, CHECK THE FOLLOWING: OSCILLATING RAIL SLIDE (FIGURE 51), PRINTING CARRIAGE POSITION (FIG. 1-57) AND PRINTING CARRIAGE LOWER ROLLER (FIG. 1-56).

REQUIREMENT (UNITS WITH FRICTION FEED PLATENS)

SPACING CLUTCH DISENGAGED, SPACING Pawl, WHICH IS FARTHEST ADVANCED, ENGAGING TOOTH IMMEDIATELY ABOVE CUTAWAY SECTION OF RATCHET. Tabulator Pawl Riding up on FIXED STOP. HIGH PART OF ECCENTRIC TOWARD FORK OF MOUNTING ARM. CLEARANCE MIN. 0.070 INCH MAX. 0.090 INCH

REQUIREMENT (UNITS WITH SPROCKET FEED PLATENS)

HIGH PART OF ECCENTRIC TOWARD LOWER ROLLER MOUNTING SCREW.

TO ADJUST
POSITION ECCENTRIC.

FIGURE 4-52 TYPING UNIT; HORIZONTAL TABULATOR MECHANISM.
TABULATOR PAWL

TABULATOR SHAFT

TABULATOR STOP NO. 1
(APPROX. ONE INCH FROM RIGHT MARGIN)

TABULATOR STOP NO. 2

TABULATOR STOP NO. 3.
(CENTER OF SHAFT)

TABULATOR STOP NO. 4.

TABULATOR STOP NO. 5.
(APPROX. ONE INCH FROM LEFT MARGIN)

PAWL MOUNTING ARM

OPERATING RANGE (FINAL)

REQUIREMENT
CLEARANCE MIDWAY BETWEEN MINIMUM AND MAXIMUM LIMITS OF OPERATING RANGE.

TO CHECK

TO DETERMINE MAXIMUM LIMIT... (A) SET FIVE TABULATOR STOPS AS SHOWN IN FIGURE. (B) POSITION PAWL IMMEDIATELY TO RIGHT OF STOP NO. 1. (C) POSITION ECCENTRIC TO SET CLEARANCE APPROXIMATELY 0.030 INCH. (NOTE: MEASURE ALL CLEARANCES AT STOP NO. 1. WITH PLAY TAKEN UP IN CARRIAGE TO REDUCE GAP TO MINIMUM) (D) MARK COLUMN LOCATION BY PRINTING A CHARACTER ON PAPER. (E) POSITION PAWL IMMEDIATELY TO RIGHT OF STOP NO. 2. AND MARK COLUMN LOCATION AS IN STEP (D). (F) REPEAT STEP (E) FOR OTHER THREE STOPS. (G) GRADUALLY INCREASE CLEARANCE UNTIL CARRIAGE STOPS ONE SPACE BEFORE ANY COLUMN WHILE RECEIVING FIGURES G LETTERS X FROM TRANSMITTER DISTRIBUTOR. (NOTE: IF UNIT IS NOT EQUIPPED WITH XD CONTROL, PUT Fill-IN CHARACTERS OF LETTERS OR FIGURES IN TAPE TO DELAY PRINTING UNTIL CARRIAGE COMPLETES TRAVEL.) (H) DECREASE CLEARANCE UNTIL TEN LINES OF TABULAR OPERATION CAN BE MADE WITHOUT ERROR. (I) GAUGE AND RECORD VALUES OF CLEARANCE. (J) GAUGE ALL CLEARANCES WITH FRONT FEED PAWL FARTHEST ADVANCED.

TO DETERMINE MINIMUM LIMITS... (A) REPEAT STEPS (B) AND (C) ABOVE. (B) GRADUALLY DECREASE CLEARANCE UNTIL CARRIAGE STOPS ONE SPACE AFTER ANY COLUMN. (C) INCREASE CLEARANCE UNTIL TEN LINES OF TABULAR OPERATION CAN BE MADE WITHOUT ERROR. (D) GAUGE AND RECORD VALUE OF CLEARANCE.

TO ADJUST

IF MINIMUM LIMIT IS POSITIVE, ADD IT TO MAXIMUM LIMIT AND DIVIDE THE SUM BY TWO. SET RESULTANT AMOUNT AS MIDPOINT OF RANGE. IF MINIMUM LIMIT IS ZERO OR LESS, DIVIDE MAXIMUM LIMIT BY TWO AND SET THIS AMOUNT AS MIDPOINT OF RANGE. THE DIFFERENCES BETWEEN LIMITS NORMALLY IS NOT LESS THAN 0.045 INCH.

TABULATOR STOP SETTING (NOT ILLUSTRATED)

RIGHT MARGIN TABULATOR STOP (WITH WIDE SHELF)

NOTE: PRIOR TO THIS ADJUSTMENT, CHECK THE FOLLOWING: RIGHT MARGIN (FIGURE 4-51 AND PAWL MOUNTING ARM OPERATING RANGE (FIGURE 4-52 AND 4-53), POSITION PRINTING CARRIAGE AT RIGHT MARGIN (SPACING CUTOUT OPERATED). INSERT STOP WITH WIDE SHELF IN SLOT IMMEDIATELY TO LEFT OF TABULATOR PAWL.

COLUMNAR TABULATOR STOPS

PLACE CARRIAGE IN POSITION TO PRINT FIRST CHARACTER IN COLUMN. INSERT STOP IN SLOT IMMEDIATELY TO LEFT OF TABULATOR PAWL. STORE EXTRA STOPS IN SLOTS BEYOND PRINTING LINE AT EITHER END OF SHAFT.

NOTE: WHEN PRINTING FORMS, CHECK STOP SETTINGS WITH RELATION TO COLUMNS. CORRESPONDING STOPS ON ALL MACHINES CONNECTED IN A CIRCUIT MUST BE THE SAME NUMBER OF SPACING OPERATIONS FROM LEFT MARGIN.

FIGURE 4-53 TYPING UNIT HORIZONTAL TABULATOR MECHANISM

4-50