

37 TYPING UNIT

DISASSEMBLY AND REASSEMBLY

1. GENERAL

- 1.001 This addendum, which supplements Section 574-320-705, Issue 2, is issued to add assembly information for the typebox, 2.04 (3) including CAUTION and Note.
- 1.002 Insert the attached page in accordance with the filing instructions given above.

Attached:

Page 3 dated August 1972, reissued

Page 4 dated August 1972, revised

37 TYPING UNIT
DISASSEMBLY AND REASSEMBLY

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1. GENERAL	
1.01 This section provides the procedures for the disassembly and reassembly of the principle sub- assemblies that comprise the standard 37 typing unit, code 37P003 and up – Figures 1 and 2, and the wide platen typing unit – Figure 3. Since this section is a general revision, marginal arrows normally used to show changes or additions, have been omitted.	
1.02 Photographs and line drawings are used to identify mechanisms and specific parts. For detailed dis- assembly and reassembly illustrations, exploded parts views, and for parts identification, refer to parts Section 574-320-801.	

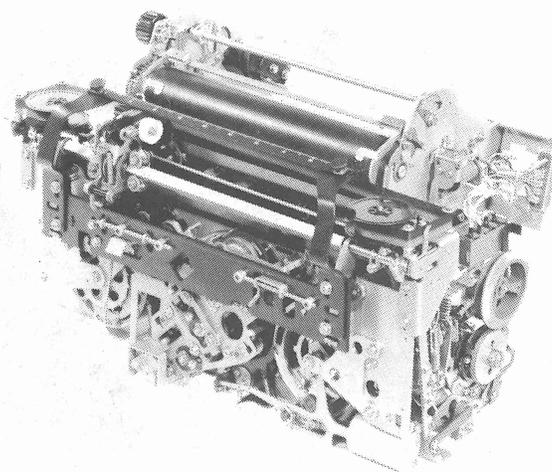


Figure 1 - 37 Typing Unit

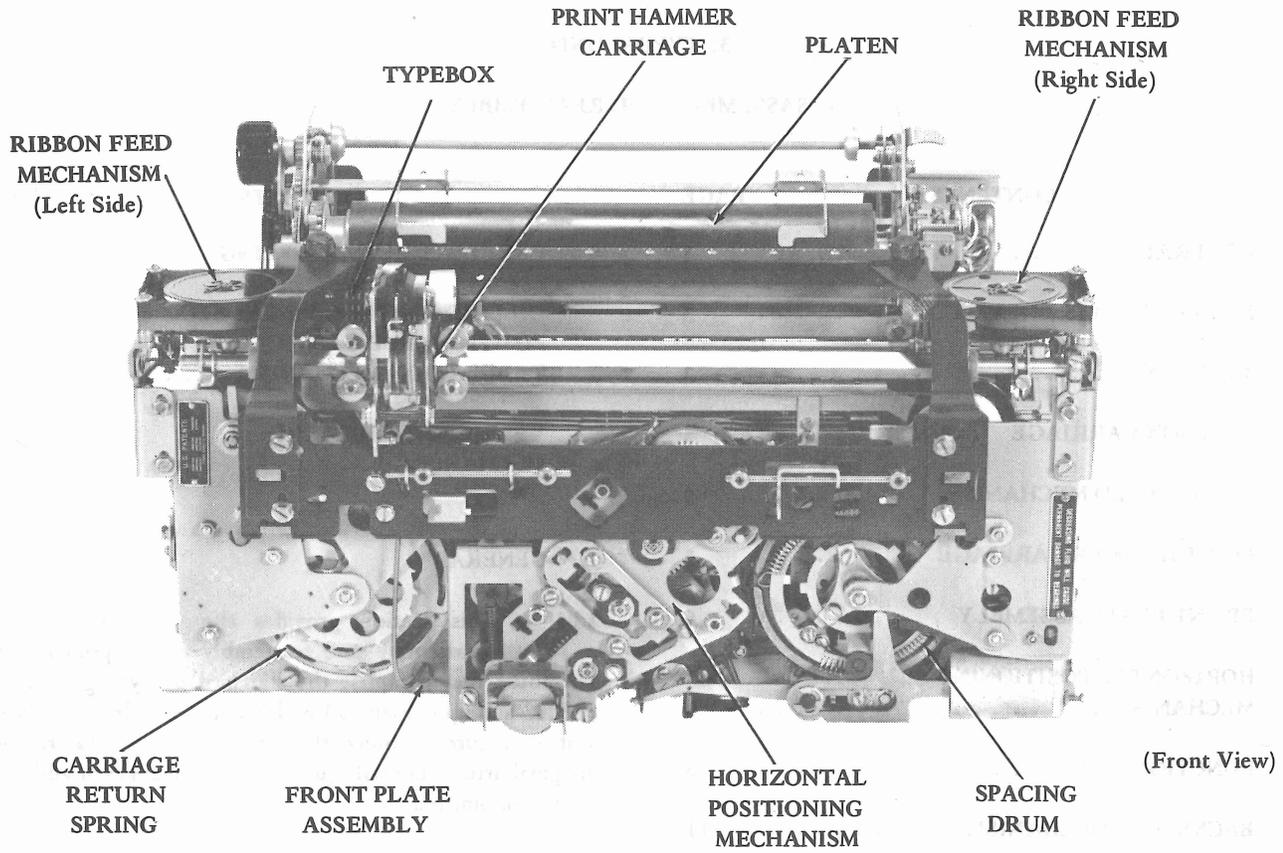


Figure 2 - 37 Standard Typing Unit (Friction Feed)

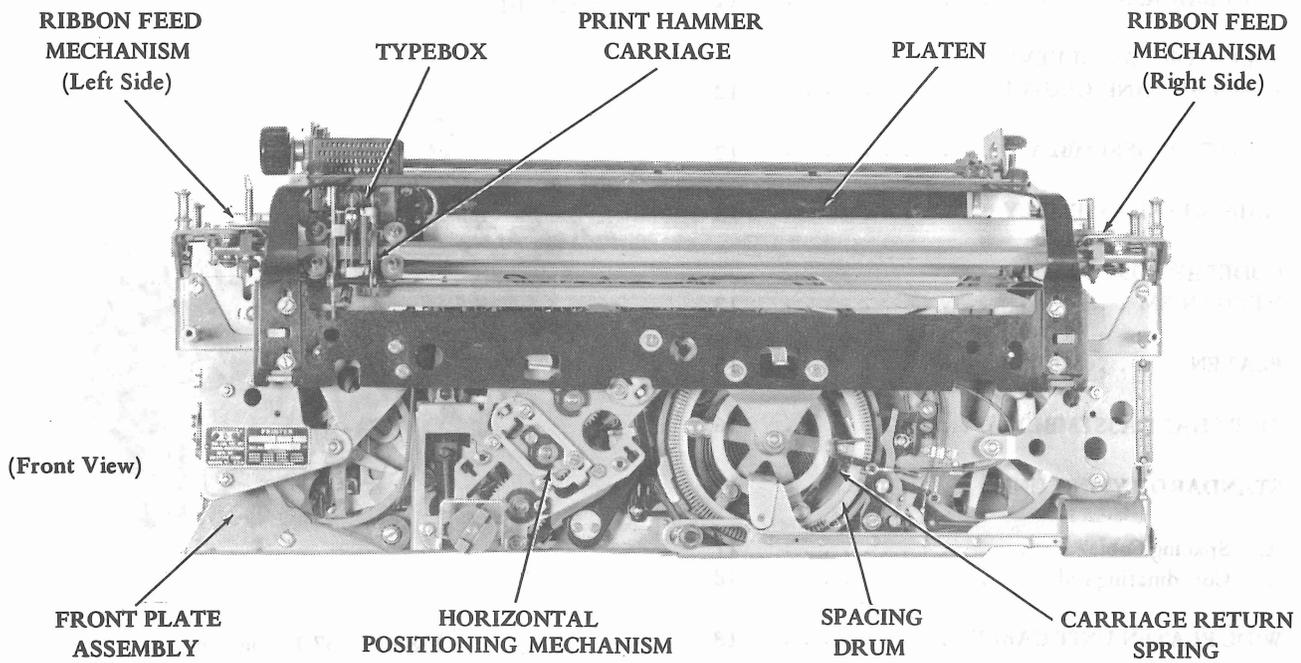


Figure 3 - 37 Wide Platen Typing Unit (Sprocket Feed)

1.03 All disassembly and reassembly procedures provided in this section are applicable to the standard 37 typing unit and also to the 37 wide platen typing unit, except where noted otherwise.

1.04 Refer to maintenance tools Section 570-005-800 for information on tools necessary to perform the disassembly and reassembly procedures.

1.05 Use maintenance pad TP124828 to protect furniture and floor coverings from oil, grease, and dirt, during the disassembly and reassembly of the typing unit.

1.06 After disassembly and reassembly of certain mechanisms, specific adjustments must be rechecked. These adjustments are listed in appropriate paragraphs in the text. See Section 574-320-705 for all adjustment requirements to insure that the unit is operating properly.

1.07 Lubricate the typing unit according to lubrication Section 574-320-704, before placing unit back in service. Make a visual inspection of the unit for general lubrication requirements. Check oil locations on felt washers, oil cups, and in locations where parts rub or move with respect to each other. Apply grease to gears, rollers, points of heavy pressure, and on some ball bearings.

1.08 If a part is mounted on shims, the number of shims used at each mounting screw must be noted; when the part is remounted, the same shim pile-up must be used.

1.09 Retaining rings are made of spring steel and have a tendency to release suddenly on removal. To minimize loss of these retainers, use the following removal procedures.

- (1) Hold the retainer in one hand to prevent it from rotating.
- (2) Place the blade of a screwdriver in one of the slots of the retainer.
- (3) Rotate the screwdriver in a direction to increase the diameter of the retainer, allowing easy removal of the retainer.

1.10 Avoid loss of springs in disassembly by holding one spring loop with one hand while gently removing the opposite loop with a spring hook. Do not stretch or distort springs.

1.11 Reference in the procedures to left or right, up or down, top or bottom, etc, refer to the unit as viewed facing the front plate assembly (Figures 2 and 3).

CAUTION: DISCONNECT POWER BEFORE REMOVING THE TYPING UNIT FROM THE KEYBOARD AND BASE ASSEMBLY.

2. SUBASSEMBLIES

2.01 In removing a subassembly from the unit, the procedure followed and the location from where the part is removed must be carefully noted, so that proper reassembly can be accomplished. For reassembly, reverse the procedure used in removing the subassembly, except when different instructions are stated.

TYPEBOX

2.02 To remove the typebox from the carriage (Figure 4), trip the typebox latch toggle to the right. Lift the right end of the typebox up to an angle of 45 degrees, and pull the typebox toward the right to disengage it from the left hand bearing stud.

CAUTION: DO NOT OPERATE TYPING UNIT WITH TYPEBOX REMOVED, UNLESS TYPEBOX LATCH TOGGLE IS CAMMED OVER THE TYPEBOX CARRIAGE.

Typebox Disassembly

2.03 If it is necessary to replace the pallet or pallet spring TP157238, the typebox must be disassembled (Figure 4). The method used is as follows.

- (1) Remove both screws and nuts that secure the front plate to the rear plate assembly. Separate the two plates and the typebox cover TP326183.
- (2) To remove the pallet spring TP157238 from the pallet, compress the pallet spring slightly and pull the formed-end (hooked-end) out of the slot in the pallet.
- (3) Remove the pallet from the typebox.

Note: Discard the pallet spring TP157238 once it has been removed.

- (4) Replace the pallet (raised mark indicates top of pallet).
- (5) Install a new pallet spring; make certain that the formed-end (hooked-end) of the pallet spring extends through the slot in the pallet and hooks onto the other side.

Typebox Reassembly

2.04 After replacing the pallet or pallet spring TP157238, the typebox must be reassembled (Figure 4). The method used is as follows.

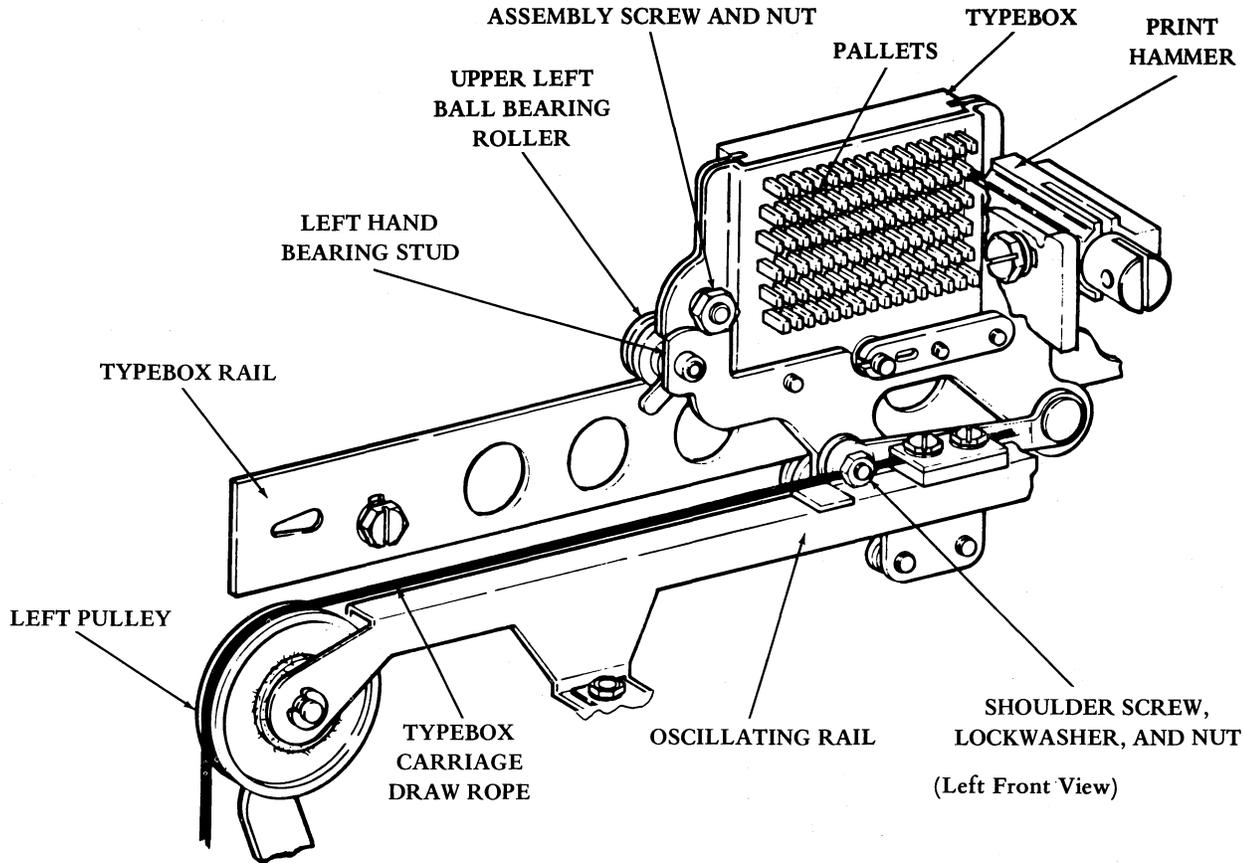


Figure 4 - Typebox, Typebox Carriage and Oscillating Rail

(1) 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 1/16 inch. Use two 6-40 screws (11/32-inch long) and nuts, in place of the two screws and nuts removed in 2.03(1) and tighten them only enough to hold the pallets as specified above. Do not clamp the plates together until all the pallets have been moved into their correct position.

(2) Manipulate the pallets until they fall into their respective openings in the front plate. Press the plates together.

(3) Replace the aligning screws and nuts used in 2.04(1) with the mounting screws and nuts removed in 2.03(1). With the mounting screws and nuts friction tight, align the front and rear guideplates of the typebox such that the type pallets are perpendicular to both plates as gauged by eye. Tighten the mounting screws and nuts. Rebuilt typeboxes must be dipped in KS7470 oil; all excess oil must be drained before installing.

CAUTION: FAILURE TO PERFORM THE ALIGNMENT SPECIFIED ABOVE CAN RESULT

IN UNEVEN PRINTING DENSITY FROM THE LEFT TO RIGHT OF THE CHARACTER.

Note: Check for a damaged or misaligned typebox by operating the typing unit with a known good typebox.

2.05 To replace the typebox (Figure 4), reverse the procedure used for removal.

CAUTION: TO AVOID SPRINGING THE TYPEBOX LATCH, THE TYPEBOX SHOULD BE FIRMLY SEATED ON THE BEARING STUDS AND THE POINT OF THE LATCH TOGGLE SHOULD BE PLACED IN THE NOTCH OF THE TYPEBOX PLATE BEFORE MOVING THE TOGGLE TO ITS LATCHED POSITION.

TYPEBOX CARRIAGE

2.06 To remove the typebox carriage from the unit proceed as follows (Figure 4).

(1) Set all codebars to the marking position and turn the main shaft until the typebox is in the uppermost position.

(2) Remove the TP332268 shoulder screw, lock-washer, and nut which are used to connect the TP332262 oscillating rail slide to the typebox arm.

(3) Loosen the screw, which mounts the upper left ball bearing roller on the typebox carriage, and slide the bearing roller upward in its slot; then remove the carriage from the track.

2.07 To replace the typebox carriage (Figure 4), reverse the procedure used for removal. Check Carriage Roller adjustment.

RIBBON FEED MECHANISM

2.08 To remove the ribbon feed mechanism (Figures 2, 3, and 5) from the unit – left side, proceed as follows.

- (1) Remove the two ribbon spools from the ribbon feed mechanism.
- (2) Remove one retaining ring that mounts the connecting rod to the TP334304 left reversing lever; then disconnect the rod.
- (3) Remove one retaining ring from the TP334303 drive arm clamp and TP334302 drive link connection.
- (4) Remove two mounting screws from the left ribbon bracket and lift the assembly from the unit.

2.09 To replace the ribbon feed mechanism – left side (Figure 5), reverse the procedure used in removal. Check the following adjustments:

- (a) Ribbon Feed Main Brackets Left and Right
- (b) Ribbon Feed Lever Left and Right
- (c) Ribbon Reversing Connecting Rod

2.10 To remove the ribbon feed mechanism from the unit – right side (Figure 2 or 3) proceed as follows.

- (1) Remove the two ribbon spools from the ribbon feed mechanism.
- (2) Remove one retaining ring that mounts the connecting rod to the TP334305 right reversing lever; then disconnect the rod.
- (3) Remove one retaining ring from the TP334303 drive arm clamp and TP334302 drive link connection.

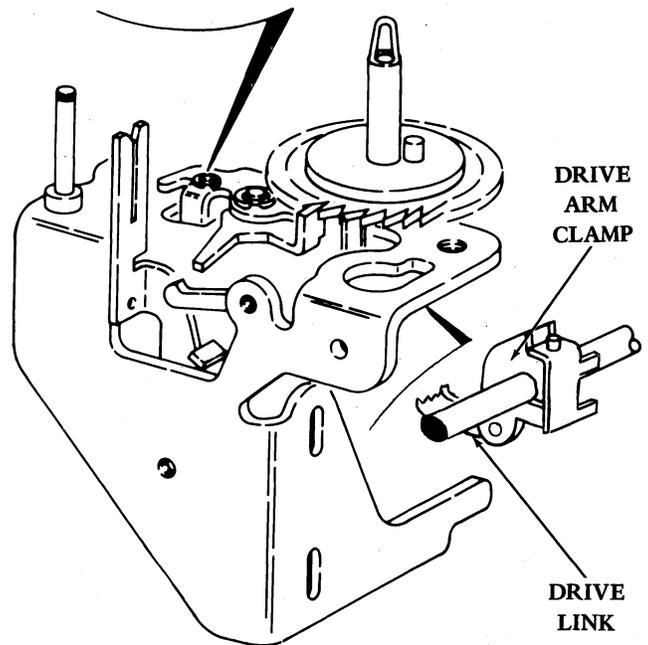
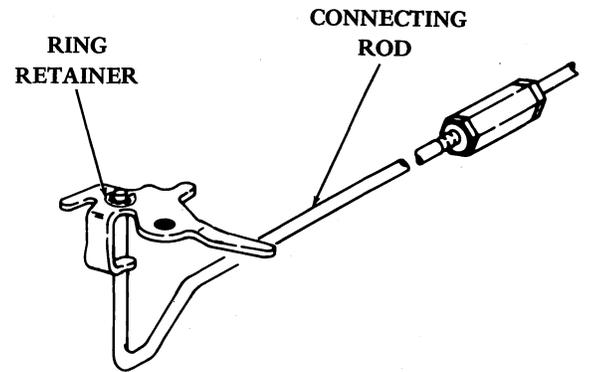


Figure 5 - Ribbon Feed Mechanism (Left Side)

- (4) Remove two mounting screws from the right ribbon bracket and lift the assembly from the unit.

2.11 To replace the ribbon feed mechanism – right side (Figure 2 or 3), reverse the procedure used in removal. Check Ribbon Reversing Connecting Rod adjustment.

PRINT HAMMER CARRIAGE

2.12 To remove the print hammer carriage from the unit (Figure 2 or 3), proceed as follows.

- (1) Remove the two screws which mount the TP334349 ribbon positioning bracket to the print hammer carriage; the bracket does not have to be

removed from the unit. Loosen the print hammer carriage cable clamp screw and disconnect the cable; remove the left ribbon feed mechanism as described in 2.08.

- (2) Remove the right ribbon bracket mounting screws. Take off the retaining ring from the TP332451 print hammer lower drive arm and TP319510 drive link connection. Separate the link and arm. Loosen the coordinating cable spring adjustment arm clamp nut to reduce tension on the pulleys. Also reduce carriage return spring tension to a minimum by loosening the nut on the front of the spring drum bearing post, and then operating the ratchet escape lever (Figure 19). Remove the four print carriage guideplate mounting screws and then remove the guideplate. The left bearing bracket may now be removed from the shaft to allow print carriage removal from the square shaft.

2.13 To replace the print hammer carriage (Figure 2 or 3), reverse the procedure used in removal. Check the following adjustments:

- (a) Carriage Return Spring
- (b) Coordinating Cable Spring Tension and Equalization (Standard Unit) or Cable Tension (Wide Platen Unit)
- (c) Vertical Print Hammer Alignment
- (d) Print Hammer Latch
- (e) Print Hammer Position
- (f) Spacing Rope Alignment
- (g) Print Point Indicator
- (h) Pointer Clearance
- (i) Ribbon Feed Main Brackets Left and Right
- (j) Ribbon Feed Lever Left and Right
- (k) Ribbon Guide Alignment.

FRONT PLATE ASSEMBLY

2.14 To remove the front plate assembly from the unit, proceed as follows (Figures 2, 3, 6, 7, and 8).

- (1) Set all codebars to the marking position and turn the main shaft until the typebox is in the uppermost position. Remove the shoulder screw, lockwasher, and nut used to connect the oscillating rail slide to the typebox arm. Remove the two screws used to mount

the ribbon positioning bracket to the print hammer carriage; the bracket does not have to be removed from the unit. Take off the retaining ring from the print hammer lower drive arm and link connection. Separate the link and arm. Disconnect the line feed cable at the back of the unit by loosening the screw at the end of the line feed clutch trip support post and remove bracket and lever (Figure 7).

- (2) Loosen the screw (under the printer) used to mount the print hammer lower drive shaft bearing clamp (Figure 6); rotate clamp to the left side. Center the bearing under the clamp when replacing the clamp. Remove the horizontal dampener spring TP78823, located at the lower left hand corner of the front plate (Figure 8).

- (3) If the unit has horizontal tab-stop control, disconnect the horizontal control cables from the function levers in slots 15 and 16. Loosen the cable clamp on the codebar assembly and slip the cables from under the cable clamp. When the unit is equipped with horizontal tab-stop control, remove the horizontal tab connecting link; also remove the retaining ring which connects the link to the horizontal tab arm.

- (4) Standard Unit – Remove the four front plate mounting screws and remove the front plate.

Wide Platen Unit – Remove the six front plate mounting screws – four from the front left and right ends of the unit, and two from the casting at rear of unit in approximate center position. Remove the front plate.

2.15 To replace the front plate assembly (Figures 2, 3, 6, 7, and 8), reverse the procedure used in removal. The carriage return lever must be in the slot in the carriage return link assembly. The horizontal positioning slide trip levers must be connected to their respective codebars.

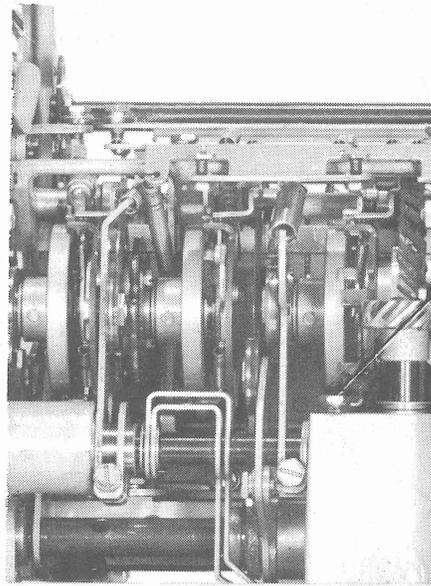
Note: Make sure the horizontal dampener spring TP78823 has been replaced.

Before tightening the plate mounting screws, there must be some backlash in the horizontal drive gears and in the spacing drive gears. Check the following adjustments:

- (a) Ribbon Guide Alignment
- (b) Spacing Gear Phasing.

HORIZONTAL POSITIONING MECHANISM

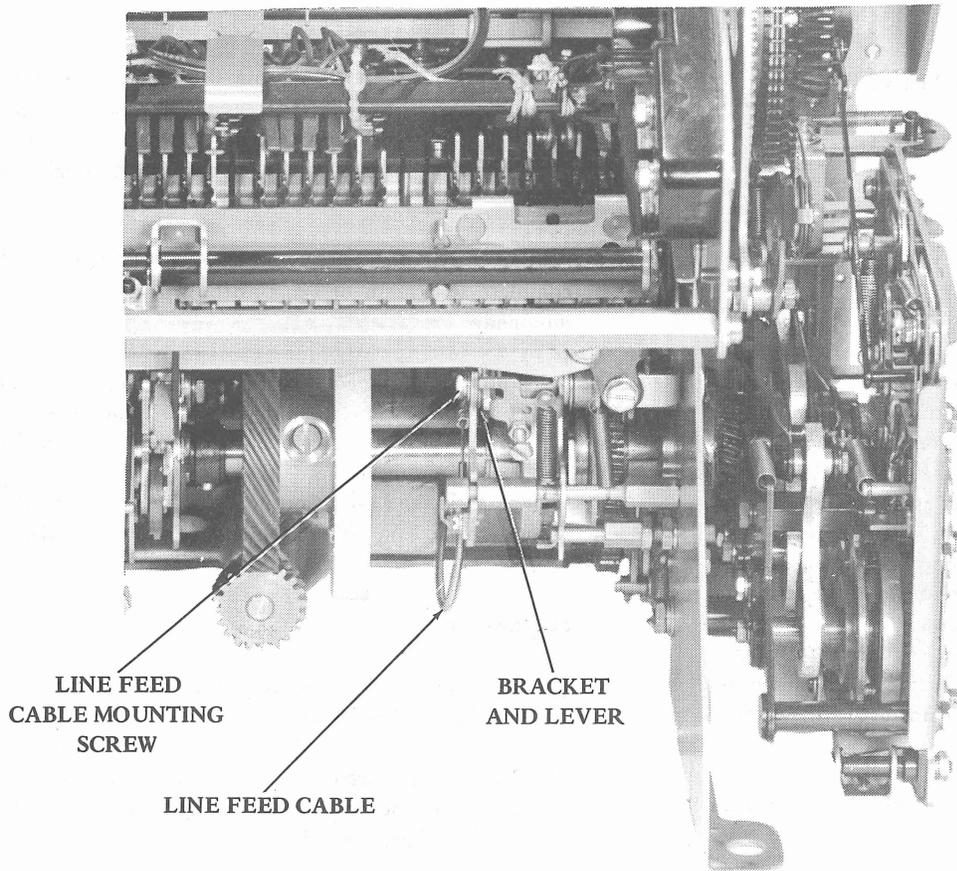
2.16 To remove the horizontal positioning mechanism (Figure 2 or 3) from the unit, proceed as follows.



PRINT HAMMER LOWER
DRIVE SHAFT BEARING
SCREW AND CLAMP

(Left Bottom View)

Figure 6 - Bottom Section of Unit Used in Connection With Front Plate Assembly Removal



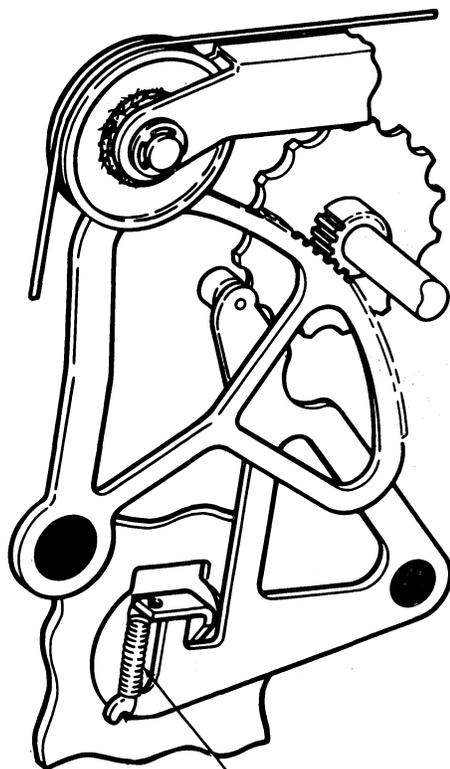
LINE FEED
CABLE MOUNTING
SCREW

LINE FEED CABLE

BRACKET
AND LEVER

(Left Rear View)

Figure 7 - Rear Section of Unit Used in Connection With Front Plate Assembly Removal



HORIZONTAL DAMPENING SPRING
(Front View)

Figure 8 - Horizontal Detent Dampening Assembly

- (1) Remove the front plate assembly as described in 2.14. Loosen the coordinating cable spring adjustment arm clamp nut to reduce tension on the pulleys. To reduce carriage return spring tension to a minimum, loosen the nut on the front of the spring drum bearing post and then operate the ratchet escape lever.
- (2) Check and RECORD Ribbon Feed Main Brackets Left and Right adjustment. Remove the four print hammer carriage guideplate screws to release the guideplate. Remove the screw used to connect the aggregate motion output bail to the oscillating rail. Remove the screws from the three aggregate motion drive shaft gears and remove the shaft.

Note: Thrust washers and bearing with sleeve can remain on the shaft.

- (3) Remove the eight nuts from the back and front ends of the clutch shafts. Unhook the clutch latch springs. Take off the two springs from the aggregate

linkage. Remove the auxiliary plate by removing the four front auxiliary plate mounting screws. Remove the two idler gears from the clutch shafts. Check gears on the clutch drums. Remove the horizontal positioning mechanism from the front plate.

2.17 To replace the horizontal positioning mechanism (Figure 2 or 3), reverse the procedure used in removal. Make sure that the third idler gear is placed in position before mounting the horizontal positioning mechanism to the front plate. Remount print carriage guideplate; then set Ribbon Feed Main Brackets Left and Right adjustment to setting, recorded in 2.16(2), by moving the print carriage guide up or down. Check the following adjustments:

- (a) Aggregate - Dampener Synchronization
- (b) Carriage Return Spring
- (c) Coordinating Cable Spring Tension and Equalization
- (d) Ribbon Guide Alignment

FUNCTION BOX

2.18 To remove the function box from the unit, proceed as follows (Figures 9, 10, and 11). (On units with sprocket feed, remove the paper tray.) Remove the connector mounting screws and feed connector through the side frame.

Note 1: Do not remove connector TP161238 if complete separation of function box from unit is not intended.

When the unit is equipped with horizontal and/or vertical tab-stop control, disconnect control cables from function levers in slots 15 and 16 and in slots 39 and 40. From the stripper blade drive mechanism, take off the two retaining rings, felt washers, and link. Continue disassembly using the appropriate instruction, either standard unit or wide platen unit.

Standard Unit

- (1) Remove the two mounting screws from the rear of the function box side plates.
- (2) Remove one screw used to mount the function box brace to the trip shaft casting and remove the function box from the unit.

Note 2: When removing function box, hold the line feed clutch trip lever in the tripped position to prevent the function box from catching on the trip arm.

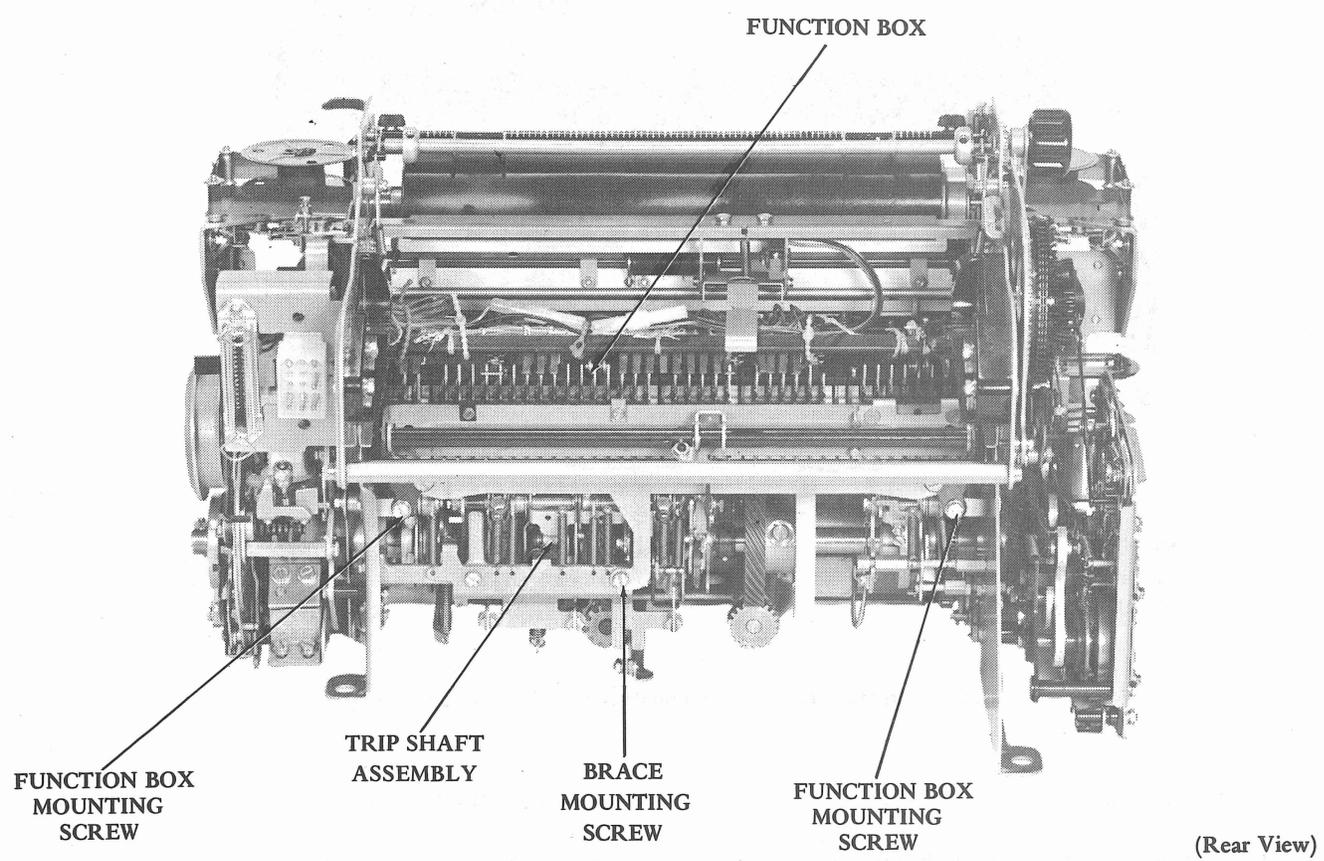


Figure 9 - Function Box and Trip Shaft Assembly – Standard Typing Unit

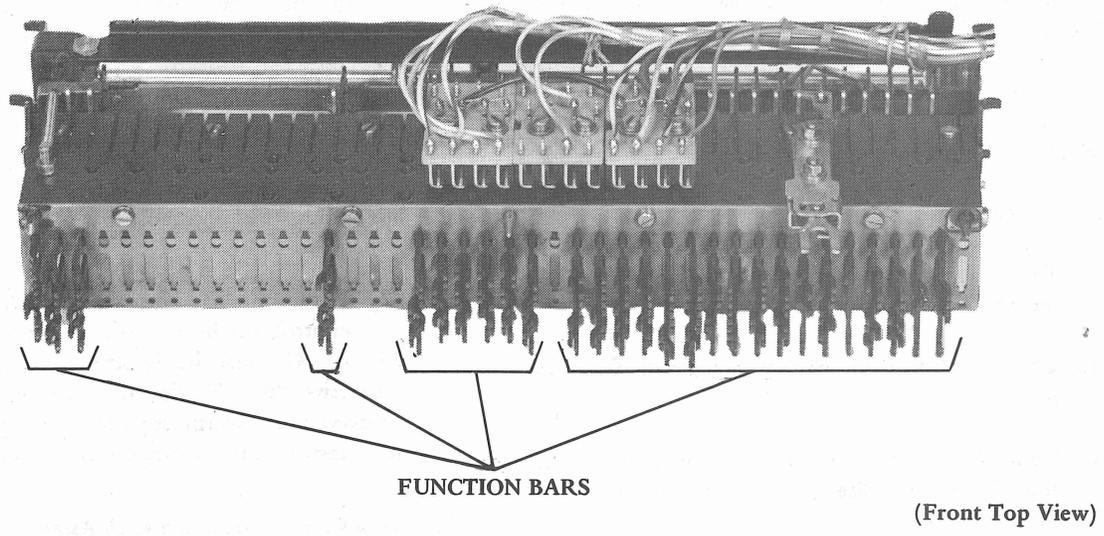


Figure 10 - Function Box

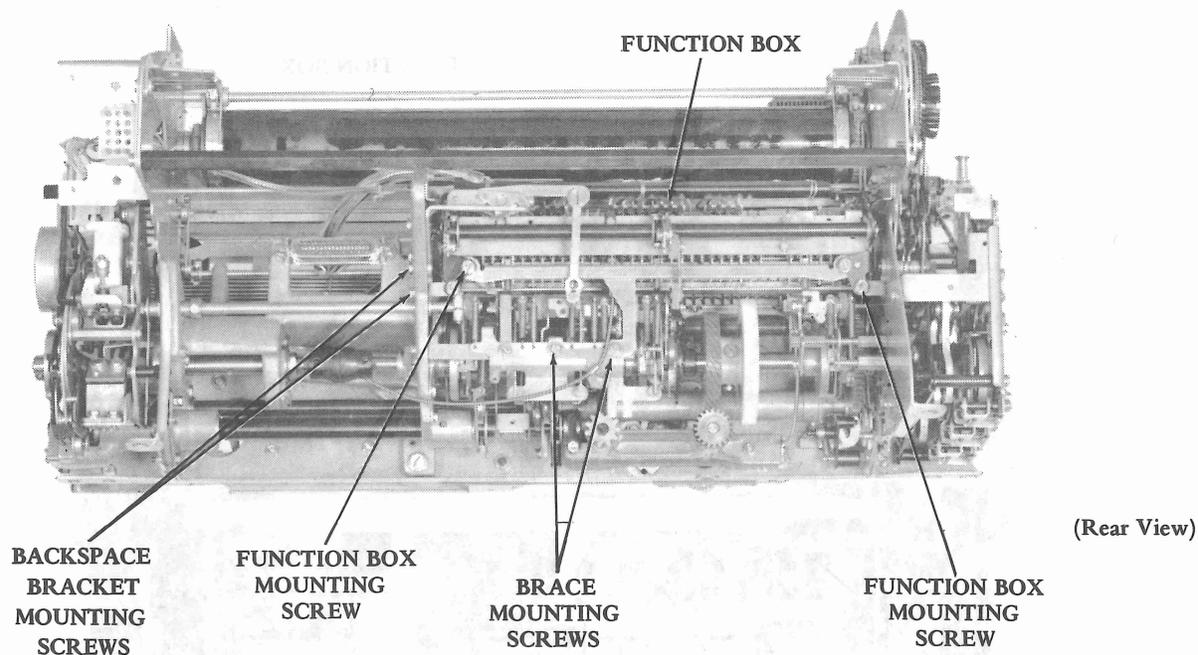


Figure 11 - Function Box and Trip Shaft Assembly – Wide Platen Unit

Wide Platen Unit

- (1) Remove the backspace mechanism from the unit using the procedure given in 2.25.
- (2) Remove the two mounting screws from the rear of the function box side plates.
- (3) Remove one screw used to mount the function box brace to the trip shaft casting and remove the function box from the unit.

2.19 After the function box is removed from the unit (Figure 10), function bars may be removed or replaced (2.20). Function box replacement is given in 2.22.

Function Bar Removal

- 2.20 The function bar is removed by the following method.
- (1) Unhook the function bar spring from the function bar.
 - (2) Hold the function bar toward the rear of the function box and disengage the function pawl from the function bar.
 - (3) Pull the function bar toward the front to remove the function bar from the function box.

Function Bar Replacement

- 2.21 Reverse the procedure used in removal (Figure 10) in 2.20.
- 2.22 To replace the function box, reverse the procedure used in removal (Figures 9, 10 and 11).
- (1) During installation of the function box, the function clutch should be tripped and the main shaft rotated until the reset blade is toward the front of the unit. The shift forks must be in line with their respective posts on the codebar mechanism. Push the function box forward on its guide rails to 1/8 inch of its final position. Next manually disengage the function pawls from their function bars and push the function box into its final position.
 - (2) If the unit has horizontal and/or vertical tab-stop control, the bottom of the function levers in slots 17 and 41 must be inserted into the slot in their respective slides. To do this, raise the function lever to its maximum uppermost position, and push the function lever forward until it drops into the slot in the slide.

Springs or Contact Arms in Switch Assembly

- 2.23 To remove the springs or contact arms in the switch assembly, proceed as follows.

- (1) Remove the two screws and lockwashers used to secure the switch to the function box. Unsolder any connections to the terminal and spring. When unsoldering the cable to the contact spring and when lacing or routing cables, do not tug or pull on the contact spring, because this will cause distortion to the spring.
- (2) Remove the top plate with spring and the contact arms. To remove the spring from the top plate, clean the solder from the spring and place the end of an orange stick on the shoulder of the spring and push downward.

2.24 To replace the contact spring, proceed as follows.

- (1) Place the loop end of the spring into the required position in the terminal plate. Hook a spring hook into the loop of the spring and pull the spring into position. Before mounting the contact plate on the switch block, check that the end of the spring is on top of the formed-over contact end.
- (2) Mount the terminal plate with spring and block in the required location on the function box; replace screws and lockwashers. Resolder the cables to their respective locations. Insert the pointed end of the contact arm between the bent up end of the spring and the formed end of the contact; the notch of the contact arm must be in the downward position. Push the arm into position, so that the notch is engaged. Check that the contact arm insulator is in alignment with the function lever. Loosen the screws and position the switch to meet this requirement.
- (3) Also check that there is some clearance between the contact arm and the vertical face of the clip. Check both contacts if the switch is a transfer type with contact on the front and rear.

BACKSPACE MECHANISM

Wide Platen Unit Only

2.25 To remove the backspace mechanism from the unit, proceed as follows:

- (1) Disengage (latch) all clutches on the main shaft and select the backspace function (4 and 8 marking) in the selector. Trip the codebar positioning clutch and rotate the main shaft until the number 9 function pawl is fully selected. Measure and record clearance between backspace mechanism bail extension and number 9 function bar.
- (2) Loosen and remove the two screws that mount the backspace mechanism to the casting.

- (3) Remove the mechanism by disengaging the link connection from the post on the spacing clutch stop bail; lower the assembly allowing the clutch stop bail post to pass through the keyhole opening in the link.

2.26 To replace the backspace mechanism, reverse the procedure used for removal. Reinstall backspace bracket assembly on intermediate casting after positioning link on stop bail post. Position the stop bail bracket to the clearance measured prior to removal 2.25(1). Then tighten bracket mounting screws.

VERTICAL POSITIONING MECHANISM

2.27 To remove the vertical positioning mechanism from the unit (Figure 12), remove the retaining ring from the retraction reset arm post. Remove the screw from the upper right hand corner of the vertical positioning rear mounting plate. Remove the nuts from the bottom two posts on the inside of the left side frame. Now remove the mechanism from the unit. Notice the position of the loose gear and coupling assembly from the rear of the mechanism.

2.28 To replace the vertical positioning mechanism (Figure 12), set all codebars in the marking position. Rotate the main shaft so that the male portion of the coupling on the end of the main shaft is in the vertical position. Check that the gear and coupling on the back of the mechanism are in place and in position to line up with the main shaft coupling. Place vertical slides in the downward position and rotate clutches until aggregate is in the uppermost position. Also check that the racks and typebox rail are in the uppermost position. Replace the mechanism.

CODEBAR ASSEMBLY

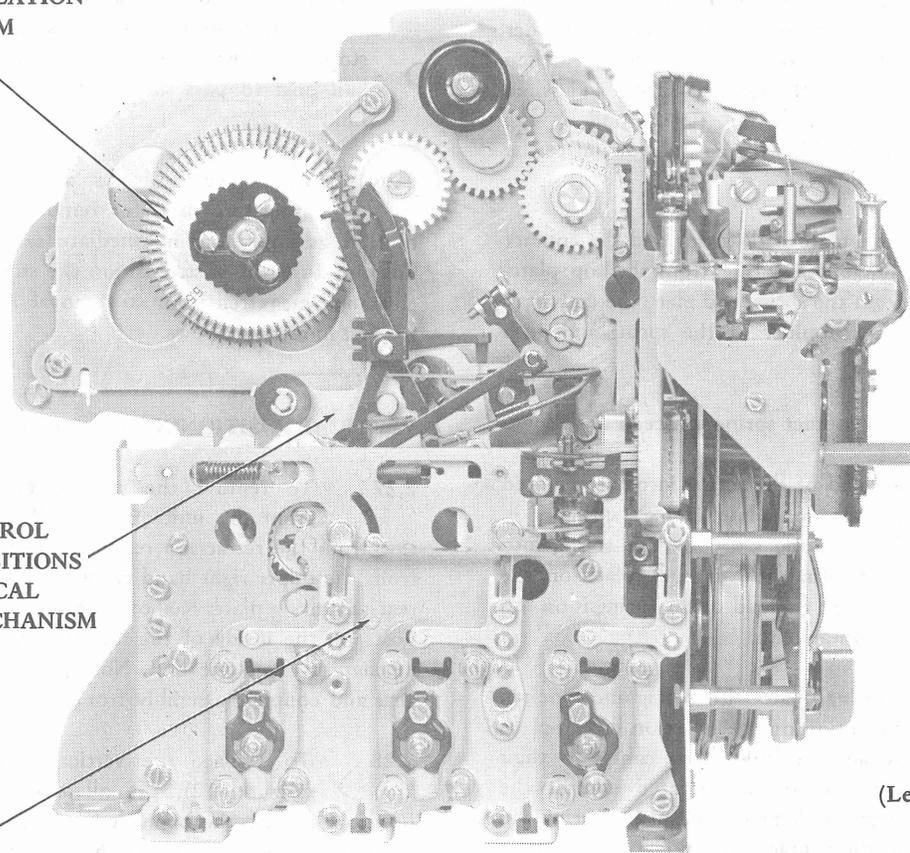
2.29 To remove the codebar assembly from the unit, proceed as follows.

- (1) Remove the front plate assembly as in 2.14. Remove the two mounting screws from the rear of the function box side plates. Remove one screw used to mount the function box brace to the trip shaft casting. Pull the function box toward the rear of the unit to take the pressure of the function bars off of the codebars.
- (2) Remove one screw and loosen the other screw that mount the codebar shiftbar guideplate. Remove the two screws on either side frame used to mount the codebar guide castings.
- (3) Pull the codebar shiftbars forward and to the right, to allow the codebar assembly to pass by the codebar shiftbars.

VERTICAL TABULATION
MECHANISM

ON-LINE CONTROL
OF TAB-STOP POSITIONS
FOR VERTICAL
TABULATION MECHANISM

VERTICAL
POSITIONING
MECHANISM



(Left Side View)

Figure 12 - Interrelated Positions of Three Vertical Movement Mechanisms

2.30 To replace the codebar assembly, reverse the procedure used in removal. If either tie bar mounting screw is loose, make sure both are loosened friction tight before mounting codebar assembly. Replace and tighten the four screws mounting the codebar assembly. Tighten the tie bar mounting screws. Replace the function box as described in 2.22. Replace the front plate assembly as described in 2.15.

SELECTOR CAM SLEEVE ASSEMBLY AND CLUTCH

2.31 To remove selector cam sleeve assembly and clutch from unit, remove selector clutch drum mounting nut, screw, and washers. Remove the selector clutch and cam sleeve assembly.

Note: Perform the following operations to insure easy removal of the cam sleeve assembly.

- (1) Latch the push lever reset bail up and out of the way on the notch (maintenance step) provided in the lever guide slot.

- (2) Push the mark locklever to the left and insert a pin in the hole provided on the lever extension, so that the lever (and consequently the selecting levers) is held away from the cam by the mark locklever guide bracket.

- (3) Hold the space locklever and start lever to the left. Hold lifter lever down. Slip the selector cam sleeve assembly off the shaft, at the same time rotating the assembly counterclockwise.

2.32 To replace the selector cam sleeve assembly and clutch, reverse the procedure used in removal, but rotate the selector cam sleeve assembly counterclockwise. To insure easy replacement when the sleeve is almost in place, pull the trip lever arm and selector clutch latchlever away from their respective cams.

SELECTOR ASSEMBLY

2.33 To remove the selector assembly from the unit, proceed as follows (Figure 13).

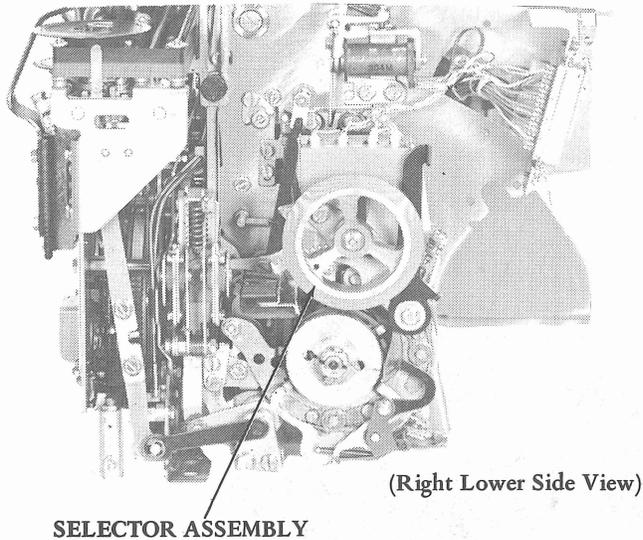


Figure 13 - Selector Assembly Mounted in Typing Unit

- (1) Remove the selector cam sleeve assembly and clutch as in 2.31. Next remove the screw that secures the selector assembly to the intermediate bracket on the code positioning mechanism.
- (2) Remove the retract arm cam follower spring TP90260 from the cam follower. Disconnect the cam follower arm from the retract oscillating shaft.
- (3) Remove the three remaining selector assembly mounting nuts and lift the selector assembly from the main shaft bearing housing.

2.34 To replace the selector assembly (Figure 13), reverse the procedure used in removal. Replace the selector cam sleeve assembly and clutch as in 2.32. Check the following adjustments:

- (a) Selector Magnet Bracket
- (b) Intermediate Arm Latch Bail
- (c) Intermediate Arm Back Stop Bracket

MAIN SHAFT ASSEMBLY

2.35 To remove the main shaft assembly from the basic unit or wide platen unit, proceed as follows:

- (1) Wide Platen Unit Only – Loosen two set screws that secure the flexible coupling to the main shaft and extension shaft. Slide the coupling toward the main shaft until clearance is visible between the coupling and extension shaft.

- (2) Remove the selector cam sleeve assembly and clutch as in 2.31. Remove the vertical positioning mechanism as in 2.27.
- (3) Next engage all clutches; then remove all main shaft clutch drum mounting screws. From the selector end of the main shaft, remove screw and collar.
- (4) Remove the screws from the two collars at the center of the main shaft. Remove the main shaft drive gear mounting screw and loosen the two setscrews. Take out the screw from the bearing collar at the left end of the main shaft.
- (5) Take off the retaining ring used to connect the codebar shift lever link and separate the link and arm. Remove the retaining ring that connects the print hammer lower drive shaft arm to the square shaft drive links and separate the link and arm.
- (6) Take off the print hammer cam follower spring TP334339 and codebar positioning cam follower arms spring TP82861. Tap the right end of the shaft with the handle of a screwdriver or soft hammer, until the shaft loosens up from the bearing in the right side frame.
- (7) Pull the shaft out of the left end of the unit, leaving the clutches in their plate. Remove all clutches that are required.

Note: When removing cams from clutches, note that the round circle stamped on the face of the cam should face toward the left end of the unit.

2.36 To replace the main shaft assembly (Figures 14, 15, and 16), reverse the procedure used in removal. Do not disengage the clutch drum from the shoes when feeding the clutch onto the shaft. Replace the selector cam sleeve assembly and clutch as in 2.32. Replace the vertical positioning mechanism as in 2.28.

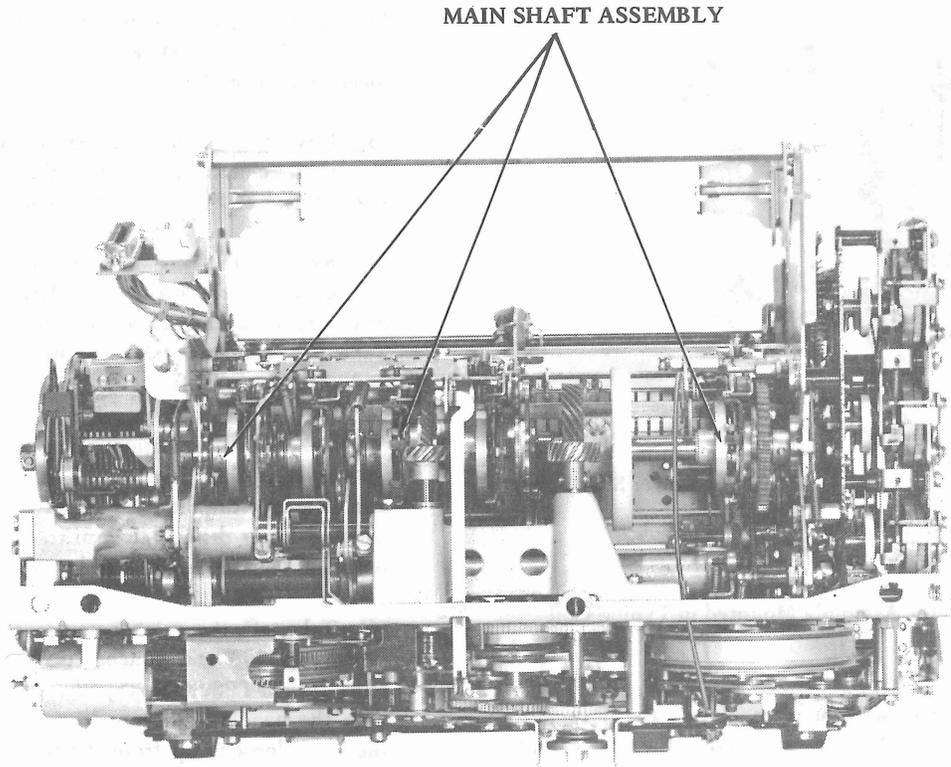
Note: When reinstalling the wide platen unit main shaft, a light coat of KS7471 grease must be placed on the shaft end prior to positioning the shaft coupling.

Check the following adjustments:

- (a) Main Shaft Clutch Disc Endplay
- (b) Line Feed Clutch Phasing

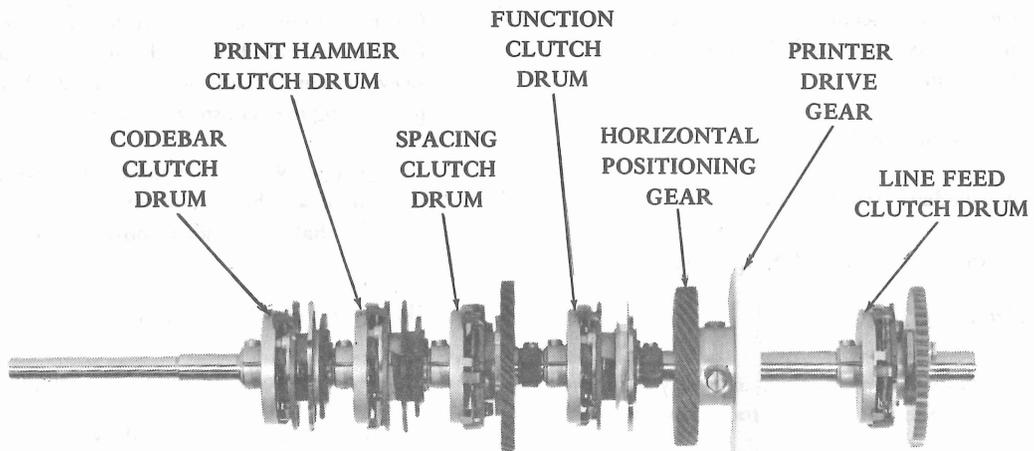
CODEBAR POSITIONING MECHANISM

2.37 To remove the codebar positioning mechanism from the unit, proceed as follows (Figure 18).



(Bottom View)

Figure 14 - Main Shaft Assembly Mounted in Standard Typing Unit



Note: Installation position shown;
trip levers in up positions.

(Bottom View)

Figure 15 - Main Shaft Assembly – Standard Unit

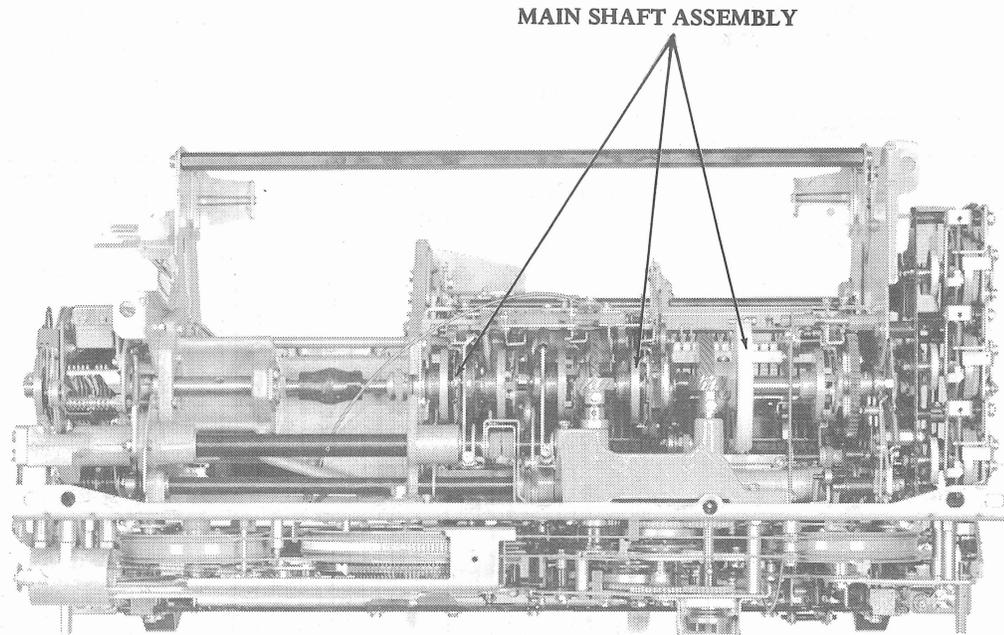


Figure 16 - Main Shaft Assembly – Wide Platen Unit

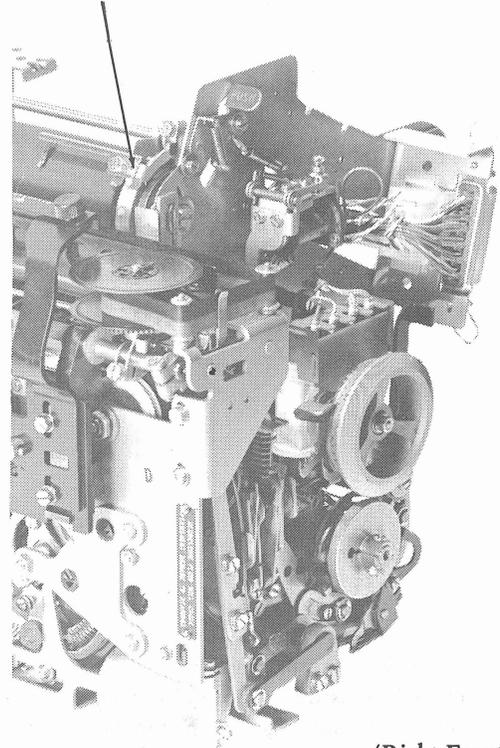
- (1) Remove the front plate assembly as in 2.14. Remove the two range finder plate assembly mounting screws, nut, and washers; then remove the range finder plate assembly. Remove the retaining ring from the codebar positioning drive arm and shift lever drive link connection and separate link and arm.
- (2) Remove the three mounting screws: The one on the selector, codebar positioning drive shaft casting, and side frame flange.
- (3) Manipulate the transfer levers and codebar shiftbars, while gently twisting and sliding the mechanism off of the codebar shiftbars.

2.38 Replace the codebar positioning mechanism (Figure 18) by reversing the procedure used in removal, except push the shiftbars to the marking position (left/pushed in). Manipulate the shiftbars and transfer levers so that the shiftbars line up with their respective slots in the guide bracket and slide shiftbars one at a time through the slots. Replace the front plate assembly as described in 2.15.

PLATEN

2.39 To remove the platen from the unit (Figure 2 or 3), remove the platen bearing retainers. Remove the paper finger shaft (friction feed) or the guide bracket (sprocket feed, Figure 17). Remove driving gear. Hold off the detent and lift the platen out of the side frame.

SPROCKET FEED MECHANISM



(Right Front View)

Figure 17 - 37 Standard Typing Unit (Sprocket Feed)

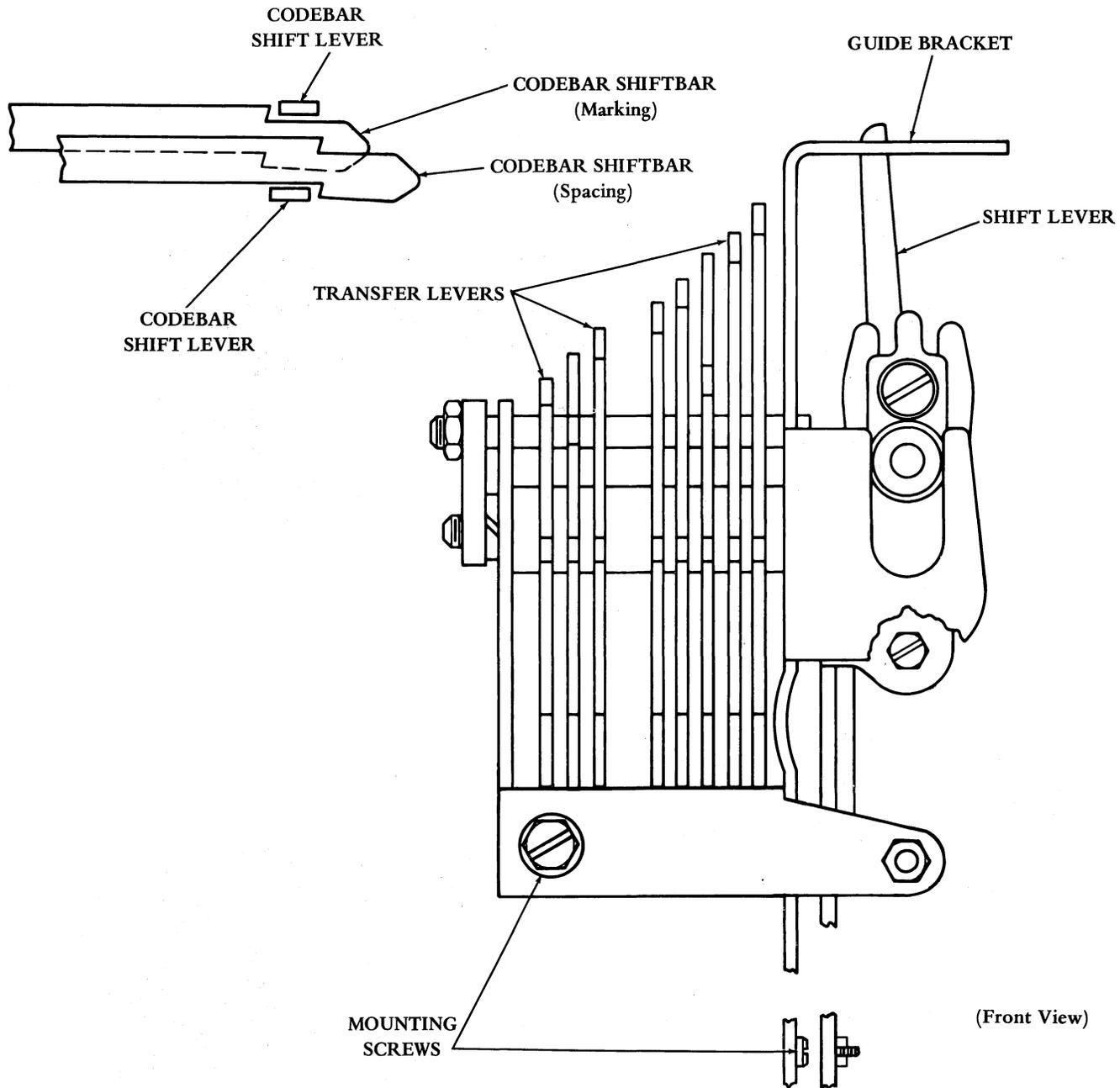


Figure 18 - Codebar Positioning Mechanism

2.40 To replace the platen (Figure 2 or 3), reverse the procedure used in removal. First put in the retainer upper screw when replacing the platen bearing retainers. Leave the retainer upper screw slightly loose. Press the lower end of the retainer down and hook it into the elongated hole in the side frame. Replace the lower screw; tighten both screws.

TRIP SHAFT ASSEMBLY

2.41 To remove the trip shaft assembly from the unit, proceed as follows (Figure 9).

- (1) Remove the function box as in 2.18. Disconnect all springs from the spring bracket which is mounted on the trip shaft casting. Remove the two screws used to

mount the spring bracket and remove the spring bracket. Loosen the print hammer clutch trip clamp mounting screw.

(2) For units equipped with horizontal tab, remove the retaining ring used to connect the horizontal tab blocking slide. Remove the screw used to mount the horizontal tab arm to the horizontal tab bail. Remove the horizontal tab arm.

(3) Loosen the two trip shaft bearing clamp plates and remove. Lift the trip shaft assembly up and out of the unit.

2.42 To replace the trip shaft assembly (Figure 9 or 11), proceed as follows.

(1) Reverse the procedure used in removal. Check function clutch trip parts for their proper position.

(2) When installing the horizontal tab arm, make sure that the "C" shaped hole is fully seated on the raised portion of the horizontal tab bail.

(3) Before tightening the screws, align the bearing clamps over the center of the bearings. Check the following adjustments:

(a) Function Clutch Trip Arm
(requirement no. 2)

(b) Printing Clutch Trip Lever

STANDARD TYPING UNIT

A. Spacing Cable

2.43 To remove the spacing cable (wire rope) (Figures 19 and 20) from the front plate, proceed as follows.

(1) Return the carriages to the left position. Unwind the carriage return spring by loosening the nut on the front of the spring drum bearing post and operate the ratchet escapement lever. Release the cable from the clamp on the printing carriage and also from the clamp

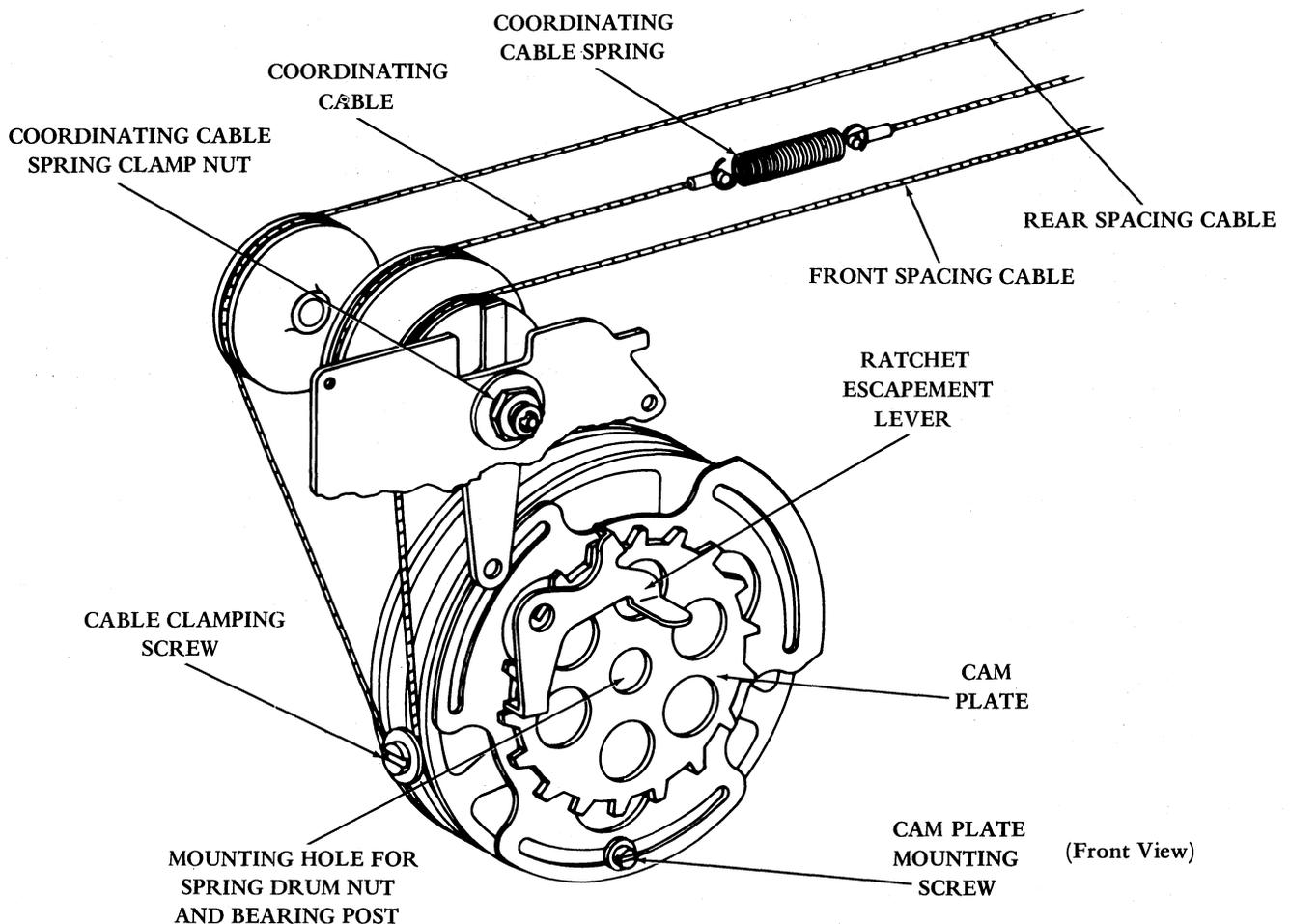


Figure 19 - Spring Drum and Cables

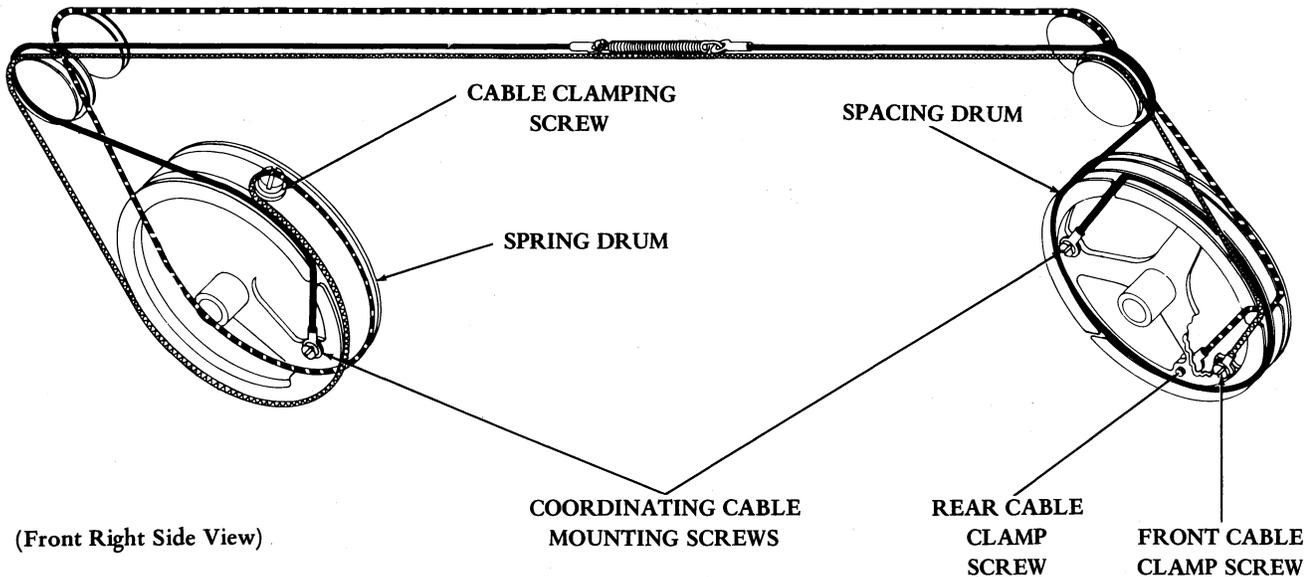


Figure 20 - Standard Unit Cable Routing

on the oscillating rail slide. Remove the cable clamp screw used to secure the spacing cable to the spring drum and remove the cable from the drum.

(2) When equipped with horizontal tab, remove the three screws used to mount the horizontal tab ring on the spacing drum; position the horizontal tab ring to allow access to cable mounting screws. Remove the cable mounting screws from the spacing drum used to secure the ends of the spacing cable; remove the spacing cable from the drum.

2.44 To replace the spacing cable (Figures 19 and 20), reverse the procedure used in removal. Check the following adjustments:

- (a) Carriage Return Spring
- (b) Right Hand Margin
- (c) Print Hammer Position
- (d) Spacing Rope Alignment
- (e) Left Hand Margin

B. Coordinating Cable

2.45 To remove the coordinating cable from the standard unit front plate, proceed as follows (Figures 19 and 20). For information to remove the cables from the wide platen unit proceed to 2.47.

(1) Loosen the coordinating cable spring adjusting arm clamp unit. Unhook the coordinating cable spring from the cable eyelets.

(2) Loosen the cam plate mounting screw on the spring drum, and rotate the cam plate to gain access to the cable clamping screw if necessary.

(3) When equipped with horizontal tab, remove the three screws used to mount the horizontal tab ring on the spacing drum; position the horizontal tab ring to allow access to the cable mounting screw. Remove the two cable mounting screws used to secure the ends of the cable to the spacing drum. Remove the coordinating cable from the drum.

2.46 To replace the coordinating cable (Figures 19 and 20), reverse the procedure used in removal.

Note: Check that the short cable is connected to the spring drum.

Check the following adjustments:

- (a) Coordinating Cable Tension and Equalization
- (b) Margin Indicator Lamp

WIDE PLATEN UNIT CABLE

2.47 To remove the spacing and typebox carriage cable assembly from the wide platen unit front plate assembly, proceed as follows (Figures 21 and 22).

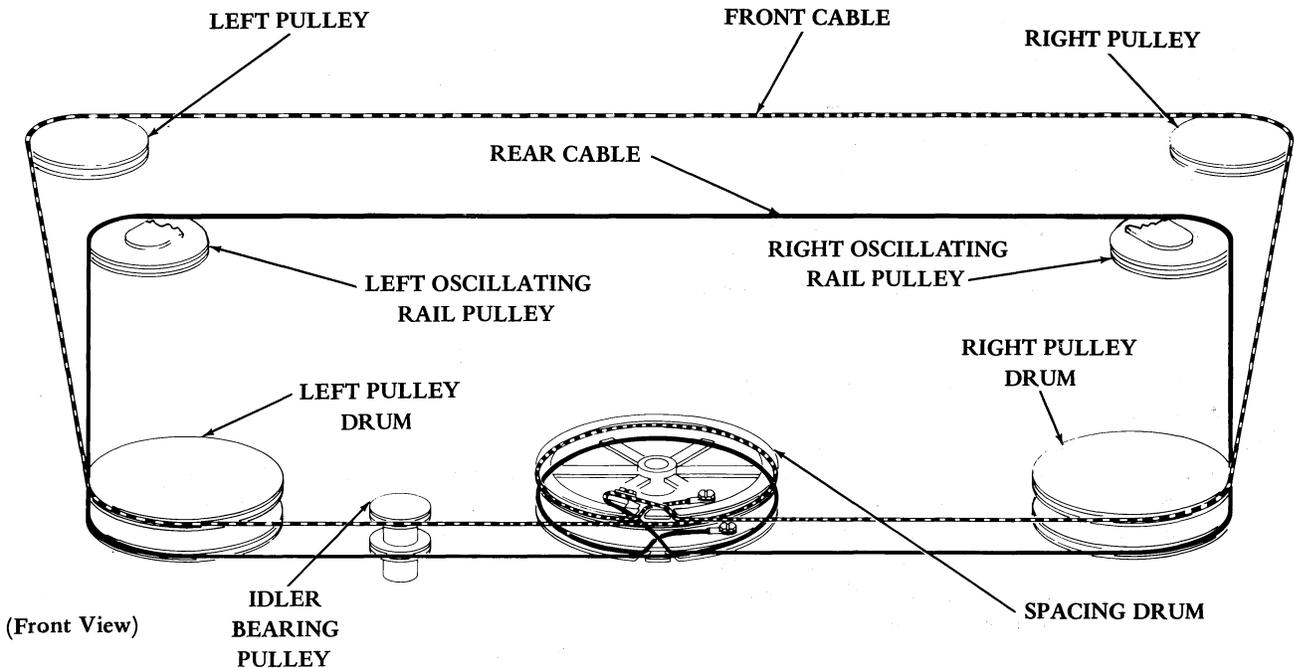
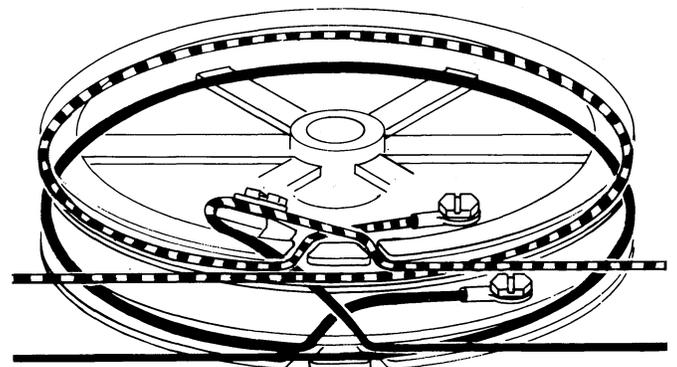


Figure 21 - Cable Assembly (Wide Platen Unit)

- (1) Manually operate the local carriage return lever to return printing carriage to left margin position.
- (2) Loosen the nut on the spacing drum post and operate the ratchet escapement lever (located behind spacing drum) until the carriage return spring is completely unwound.
- (3) Loosen cable clamp screws on printing carriage and the clamp on the oscillating rail slide. Then remove the cable from the clamps.
- (4) If unit is equipped with horizontal tabulation, remove the three screws used to secure the horizontal tabulating ring on the spacing drum; position ring to allow access to cable mounting screws.
- (5) Remove the two screws that secure each cable terminal to spacing drum (Figure 22).
- (6) Remove the bushing screw used for holding the cable to the spacing drum and remove cable from drum.
- (2) Find cable center by doubling assembly such that the eyes of the terminals are in line. Allow resulting loop to hang free.
- (3) Place center of cable loop beneath bushing screw on spacing drum and tighten bushing screw friction tight.
- (4) Rear cable routing is shown by heavy solid line in Figures 21 and 22. Route end loop of rear cable out from right rearmost groove in spacing drum.



(Lower Front View)

Figure 22 - Wide Platen Spacing Drum

2.48 To replace the carriage cable assembly on the wide platen unit, proceed as follows:

- (1) Position spacing drum full counterclockwise until drum rests against its stop post.

Continue routing cable through rearmost cable groove in right pulley drum, right oscillating rail pulley, left oscillating rail pulley, and idler bearing pulley. Wrap cable once counterclockwise around rearmost spacing drum groove. Place terminal through leftmost groove and secure in position using mounting screw.

CAUTION: CABLE SYMMETRY MUST BE MAINTAINED DURING ROUTING ON THE SPACING DRUM. DO NOT CRISS-CROSS CABLES.

- (5) Front cable routing is broken line shown in Figures 21 and 22. Route front cable out from frontmost groove in spacing drum. Continue routing cable through frontmost groove in right pulley drum, right front plate rope pulley, left front plate rope pulley, left pulley drum, and idler bearing pulley. Wrap cable once counterclockwise around frontmost spacing drum groove placing terminal through top leftmost groove. Secure into place using mounting screw.
- (6) Place the horizontal tabulating ring on the spacing drum, if removed in the preceding instructions, and remainder of cable to printing carriage assembly and oscillating rail slide by reversing the removal procedure.

2.49 After completing reassembly of the cable assembly on the wide platen unit spacing drum, the carriage return spring tension may be adjusted by placing a 5/8 inch open-end type wrench on the TP336570 bushing and rotating it counterclockwise. The clamp nut on the spacing drum post must be loosened when the bushing is rotated and then tightened after the proper tension is set.

Note: The TP336520 bushing is fitted into machined keyways on the TP336586 ratchet hub.

Check the following adjustments:

- (a) Carriage Return Spring
- (b) Right Hand Margin
- (c) Print Hammer Position
- (d) Spacing Rope Alignment
- (e) Left Hand Margin

CARRIAGE RETURN SPRING

Standard Unit

2.50 To remove the carriage return spring from the standard unit carriage return drum assembly, proceed as follows:

- (1) Orientate the unit so that the front plate is in the upturned or topmost position.
- (2) Manually operate the local carriage return lever to return printing carriage to left hand margin.
- (3) Engage (trip) vertical positioning clutches and rotate main shaft until oscillating rail is in uppermost position.
- (4) Loosen the nut on the carriage return drum post (left pulley shaft) and operate the ratchet escapement lever until the carriage return spring is completely unwound.
- (5) Loosen the clamp screws holding the cable wire assembly to the printing carriage and the oscillating rail slide. Then remove cables from the clamps.
- (6) Remove one TP119652 retainer ring from the TP319510 arm with shaft, then disengage the TP332451 linkage from TP319510 drive link.
- (7) Remove four screws that mount TP332101 printing carriage guideplate. (It is not necessary to disengage the local line feed cable loop and sheathing unless complete removal of guideplate is desired.) Remove two screws that mount ribbon indicator bracket to printing carriage. Lift the guideplate and print position indicator assembly from the unit. Carefully allow guideplate to hang from local line feed cable; place print position indicator on bench.
- (8) Remove two screws, flat washers, and lockwashers that mount the left TP334334 ribbon feed mechanism to the front plate. Remove the two screws, flat washers, and lockwashers that mount the right TP334333 ribbon feed mechanism to the front plate. Lift left and right ribbon mechanisms from the unit and place on bench until later reassembly.
- (9) Loosen mounting nut for top leftmost cable pulley mounted on front plate to further reduce cable tension.
- (10) Remove four mounting nuts and lockwashers from the TP332086 left pulley plate and remove plate.
- (11) Remove one remaining screw from the TP332249 plate with bearing and remove plate.

CAUTION: THE CARRIAGE RETURN SPRING WOUND WITHIN THE SPRING DRUM HUB IS UNDER TENSION. DO NOT ATTEMPT ITS REMOVAL WITHOUT TAKING ADEQUATE SAFETY PRECAUTIONS.

(12) Loosen three screws mounting the TP150796 carriage return disc to the spring drum assembly. Rotate carriage return disc until coordinating cable (wire rope) mounting screw is accessible for removal from left pulley drum. Remove screw and cable.

(13) Remove mounting screws securing front and rear spacing cable terminals to left pulley spring drum.

(14) Remove spacer and left pulley spring drum assembly from shaft.

(15) Before proceeding to remove carriage return spring from drum assembly, it is recommended that wire ties or equivalent be used to secure the spring coil at several places to prevent violent unravelling upon removal.

(16) **REMEMBER TO EXERCISE CAUTION TO PREVENT SPRING UNRAVELLING** – Place spring drum assembly on bench and remove the three screws mounting carriage return disc to the drum assembly.

(17) Invert drum assembly, cam disc facing bench top, and press spring coil out from spring drum assembly. Disengage slot in spring end from TP150843 spring hook in drum assembly.

2.51 To replace the standard unit carriage return spring into the left spring drum assembly, proceed as follows.

WARNING: THE TP154310 CARRIAGE SPRING IS SENT FROM THE FACTORY IN A SPRING CLAMP AND TIED TO PREVENT UNRAVELLING. DO NOT REMOVE SPRING FROM RETAINING CLAMP.

(1) Remove two retaining ties from spring and clamp.

(2) Pull out leader end of spring until it extends approximately 2 inches beyond shipping clamp.

(3) With rear of spring drum assembly resting on bench top, install spring as follows:

(4) Turn spring leader to clockwise direction. Hook slot of spring on spring hook in drum. Position spring and clamp over drum for insertion.

(5) Place spring against drum assembly, align spring coil to inner diameter of drum, then press spring out from clamp into recess of drum. Discard spring shipping clamp.

(6) Place TP150796 disc on drum assembly and secure with three screws. Rotate disc counterclockwise until screws are positioned against slots in disc. Run screws in until friction tight.

(7) Assemble the ratchet with hub to spring drum assembly. Press ratchet hub into inner coil of spring. Rotate ratchet clockwise until hub is completely inside spring. Rotate ratchet counterclockwise and engage tab on hub with slot in spring.

(8) Reassemble the spring drum into the unit by reversing the removal procedure.

Check the following adjustments:

(a) See 2.44(a), (b), (c), (d), and (e)

(b) Coordinating Cable Spring Tension and Equalization

(c) Local Carriage Return

(d) Ribbon Guide to Platen

(e) Ribbon Retract Position

(f) Ribbon Print Position

(g) Oscillator Downstop

(h) Vertical Print Hammer Alignment

(i) Front Spacing Cable Alignment

(j) Print Position Pointer

(k) Pointer Clearance

(l) Vertical Position of Indicator Bracket

(m) Horizontal Position of Indicator Bracket

(n) Ribbon Guide Position

Wide Platen Unit

2.52 To remove the carriage return spring from the wide platen unit spacing drum assembly (Figure 23), proceed as follows:

(1) Orientate the unit so that the front plate is in the upturned or topmost position.

(2) Manually operate the local carriage return lever to return printing carriage to left hand margin.

(3) Using spring hook tool, remove two TP49084 spacing feed pawl springs from TP336556 bracket.

(4) Unhook dashpot slide return spring from post on front plate. Loosen TP336580 carriage return ring mounting screws from spacing drum and disengage it

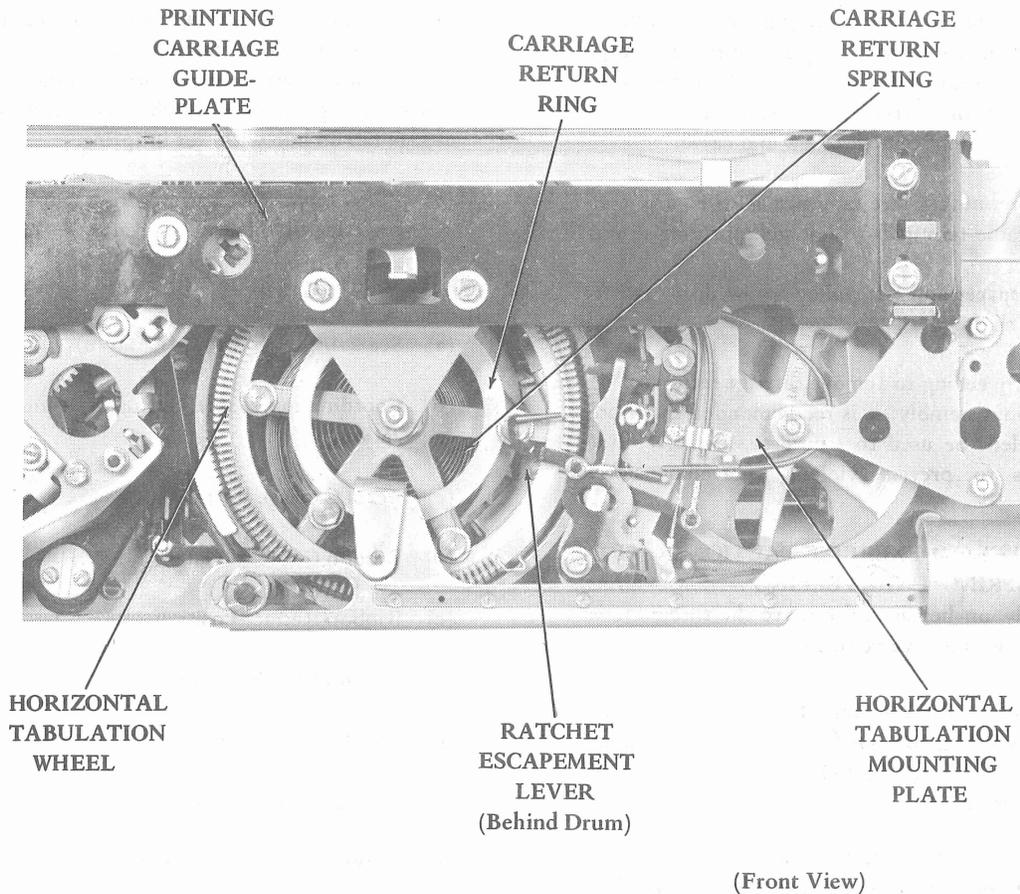


Figure 23 - Wide Platen Unit Spacing Drum Assembly

from dashpot slide. Remove retainer rings from dashpot slide guidepost (3 places) and remove rollers and spring bail.

(5) Remove nut and lockwasher on backside of front plate that mounts dashpot slide guidepost. Lift post upward slightly to the left until threaded end is removed from front plate. Disengage piston from dashpot and place post and transfer slide to one side for later reassembly.

(6) If the unit is equipped with horizontal tabulation, remove three nuts and lockwashers mounting the TP332236 plate to the right cable pulley drum, remove plate and spacer. Remove screw and lockwasher from backside of front plate that mounts support stud for TP336710 horizontal tabulation mounting plate. Lift mounting plate (it may be necessary to loosen cable sheathing clamps or disconnect the cable loops) upward off the right pulley shaft to provide clearance for spacing drum removal – **DO NOT BEND OR KINK CABLES.**

(7) Loosen nut friction tight on spacing drum post and operate ratchet escapement lever (in back of spacing drum) until carriage return spring is completely unwound. Remove nut and lockwasher.

(8) Remove two screws that mount ribbon indicator bracket to printing carriage.

(9) Remove five screws that mount the TP336591 printing carriage guideplate. (It is not necessary to disengage the local line feed cable and lever unless complete removal of guideplate is desired.) Lift the guideplate and print position indicator from the unit and carefully allow the guideplate to hang from the local line feed cable; place print position indicator on bench.

(10) Remove carriage return ring from spacing drum (loosened in 2.52(4)). If the unit is equipped with horizontal tabulate, loosen three mounting screws and remove horizontal tabulate wheel assembly from spacing drum.

- (11) Loosen screw on idler bearing pulley to allow slack in front and rear cables. Loosen two screws on typebox sled cable clamp, one screw on printing carriage cable clamp, and then disengage cable from clamps.
- (12) Loosen mounting nut for top leftmost cable pulley adjusting plate mounted on front plate to further reduce cable tension.
- (13) Remove three screws that mount the cable into the spacing drum. Remove cable from drum and rest of unit.
- (14) Remove the spring from the local carriage return lever spring post. Remove carriage return lever mounting plate by removing spring post and mounting screw.

CAUTION: THE CARRIAGE RETURN SPRING WOUND WITHIN THE SPACING HUB IS UNDER TENSION. DO NOT ATTEMPT ITS REMOVAL WITHOUT TAKING ADEQUATE SAFETY PRECAUTIONS.

- (15) Before proceeding to remove carriage return spring, it is recommended that wire ties or equivalent be used to secure the spring coil at several places to prevent violent unravelling upon removal.
- (16) To prevent the TP336586 ratchet hub from pulling the carriage return spring out when spacing drum is lifted from its shaft, place a screwdriver between the ratchet and front plate. Using the screwdriver to support the ratchet, move the ratchet and spacing drum out of the unit (use an orange stick to hold spacing feed pawls off from spacing drum).

Note: The TP336570 bushing may be removed from the spacing drum prior to removal. This allows tilting of spacing drum during removal and prevents possible interferences with other mechanisms.

- (17) Disengage slot in TP336586 ratchet hub from spacing drum spring by carefully lifting it from the spacing drum assembly.
- (18) REMEMBER TO EXERCISE CAUTION TO PREVENT SPRING UNRAVELLING – Place spacing drum on bench, spring side facing downward, and press spring coil out from spacing drum assembly. Disengage slot in spring end from TP336576 spring hooks in spacing drum.

2.53 To replace the wide platen unit carriage return spring into the spacing drum assembly, proceed as follows.

WARNING: THE TP336567 CARRIAGE SPRING IS SENT FROM THE FACTORY IN A SPRING RETAINING CLAMP AND TIED TO PREVENT UNRAVELLING. DO NOT REMOVE SPRING FROM RETAINING CLAMP.

- (1) Remove two retaining ties from spring and clamp.
- (2) Pull out leader end of spring until it extends approximately 2 inches beyond shipping clamp.
- (3) With front of spacing drum assembly facing bench top, install spring as follows: Turn spring leader to counterclockwise direction. Hook slot of spring leader on spring hook in spacing drum. Position spring and clamp over drum for insertion.
- (4) Place spring against drum assembly, align spring coil to inner diameter of drum, then press spring out from clamp into recess of drum. Discard spring shipping clamp.
- (5) Align slot of TP336586 ratchet hub into inner coil of spring and rotate ratchet clockwise until hub is completely inside spring and spring slot is positioned on ratchet hub post.
- (6) Reassemble the spring drum into the unit by reversing the removal procedure.

Check the following adjustments:

- (a) Carriage Return Spring
- (b) Cable Tension
- (c) Right and Left Hand Margin
- (d) Print Hammer Position
- (e) Spacing Cable Alignment
- (f) Print Point Indicator
- (g) Ribbon Retract Position
- (h) Oscillator Downstop
- (i) Dashpot Clearance
- (j) Backspace Latchlever
- (k) Local Line Feed
- (l) Horizontal Tabulate Mechanism (All Adjustments)

ON-LINE CONTROL OF TAB-STOP POSITIONS FOR VERTICAL TABULATION MECHANISM

2.54 To remove the on-line control of tab-stop positions for vertical tabulation mechanism, proceed as follows (Figure 12).

- (1) Remove retaining rings from function lever in slots 39 and 40. Disconnect cable eyelets from post on function lever. Remove cables from guide brackets and feed out gradually through hole in left side frame, until inner cable can pass through small gap into large opening.
- (2) Remove nut, lockwasher, and flat washer from lower post on vertical tabulator. Remove retaining ring from upper post on vertical tabulator. Remove the assembly from the unit.

2.55 To replace the on-line control of tab-stop positions for vertical tabulation mechanism (Figure 12), reverse the procedure used in removal. Check the following adjustments:

- (a) Mounting Plate
- (b) Tab Arm Spring Tension
- (c) Tab Set Arm
- (d) Tab Clear Arm
- (e) Latch

- (f) Latch Release
- (g) Latch Spring

VERTICAL TABULATION MECHANISM

2.56 To remove the vertical tabulation mechanism (Figure 12) from the unit, remove the three screws, flat washers, lockwashers, and spacers used to hold the mounting plate assembly to the left side frame. Remove the pointer which is located between the mounting plate and the flat washer on the top mounting screw. Remove the mounting plate. Take out the vertical tabulation mechanism.

2.57 To replace the vertical tabulation mechanism (Figure 12), reverse the procedure used in removal. Check the following adjustments:

- (a) Mounting Bracket
- (b) Form Gear Play
- (c) Tab Wheel
- (d) Pointer
- (e) Blocking Levers
- (f) Sensing Arm Spring Tension
- (g) Sensing Pawl Spring Tension
- (h) Tab Wheel Synchronization