

# IBM

## ELECTRIC TYPEWRITER

### MODEL C-1

## CUSTOMER ENGINEERING

### REFERENCE MANUAL

#### Mechanical Principles and Adjustments

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# IBM ELECTRIC

## STANDARD TYPEWRITER

### MODEL C-1

This section describes the new features of the Model C1 typewriter, serial numbers 1,100,000 and above.

**APPEARANCE.** The case and cover sections have been completely redesigned to include many functional and aesthetic improvements.

**DECELERATOR.** The decelerator improves and quiets the carriage action during tabulation and carriage return by enabling the centrifugal governor to operate during either operation.

**RESILIENT KEYBOARD CONTROL.** This control positions spring fingers under the keylevers and permits the operator to set the touch to suit his or her individual requirements.

**SHIFT.** The shift mechanism has been improved in operation and the adjustments simplified.

**MARGIN RESET.** The margin reset mechanism has been made easier to operate and the possibility of malfunction eliminated.

**PLATEN RATCHET.** The platen ratchet has been enclosed within the left-hand carriage-end cover.

**RIBBON MECHANISM—FABRIC.** The fabric ribbon feed mechanism has been completely redesigned to provide cleaner, faster ribbon changing, and positive feeding.

**RIBBON MECHANISM—CARBON.** The carbon ribbon mechanism is completely contained within the typewriter case and has been improved to provide easier threading and more accurate feeding.

**CARRIAGE.** The Model C typewriter is available in 13, 17, 20, 24 and 30 inch carriage lengths.

### CASE AND COVER SECTIONS

The typewriter is contained in a bottom case-section or shell. A rear cover-section mounts to the bottom case with two long screws. The front cover-section is hinged to the bottom case-section and latched down over the keyplate by a latch at each front corner of the bottom case-section (Figure 1). Lugs in the bottom case-section anchor the keyplate. Carriage-end covers contain the carriage-release buttons and are secured over each end of the carriage by Bristo screws inside of the end covers.

Four rubber mounts, screwed to the typewriter

side frames set into the bottom case. Base feet pass through the bottom case and screw into the rubber mounts. This gives the typewriter a resilient mounting when in its case and provides protection to the desk and typewriter when it is removed for servicing.

A locking bar inside the bottom case-section anchors the typewriter to two desk mounts, secured to the desk. By sliding the locking bar laterally the machine may be quickly and easily attached to or removed from the desk.

A removable bottom panel slides into the bottom-case section and serves to protect the typewriter. This panel can be easily removed to make adjustments and may also be used to protect the desk when working on the machine.

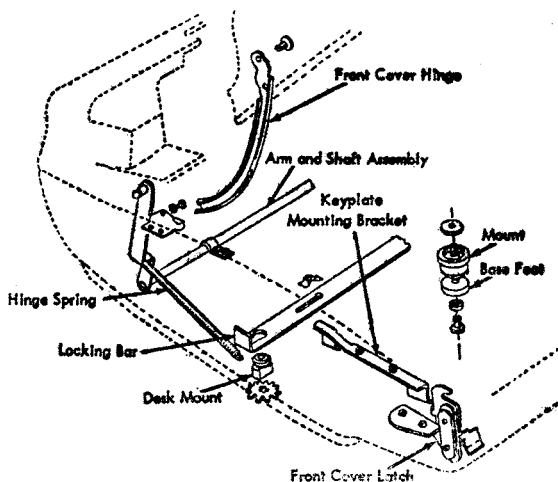


Figure 1. Case and Cover Mechanism  
Removal

## CASE and COVERS

1. Release the front cover-latches.
2. Remove the rear cover by removing its two mounting screws.
3. Disconnect the hinges from the arm and shaft assembly, on each side of the machine, by removing the C clips and pushing in on the arms, and remove the front cover.

4. Remove the keyplate by removing the keyplate mounting-brackets and raising the front edge of the keyplate.

5. Disconnect the line cord at the typewriter by separating the male and female plug.

6. Turn the machine up on its back, unscrew the four base feet, and allow the power frame to tip back free of the base section.

**CARRIAGE END COVERS.** Remove the platen, feed-roll-release, or detent-release lever and loosen the two end-cover mounting-screws.

**TOP PAPER TABLE.** Pull the rear edge up and forward.

## Adjustments

### CASE and COVERS

1. **KEYPLATE.** Adjust by forming the keyplate mounting-brackets so that the keyplate joins the front case-section smoothly. The keybuttons shall operate freely without binding.

2. **HINGES.** Adjust so there is sufficient vertical motion when the latches are released for the front case-section to clear the bottom case at the front edge. The front case shall not contact the bail roll in full raised position.

3. **LATCHES.** Adjust by positioning the latch

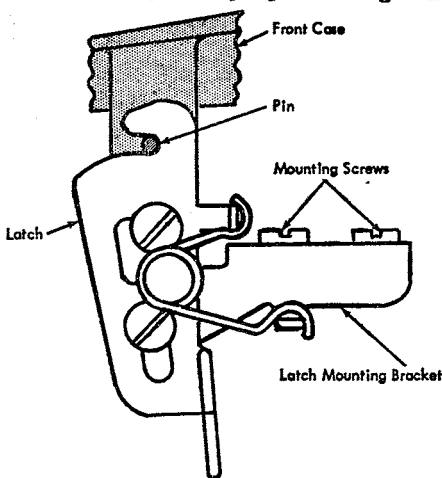


Figure 2. Front Cover Latch

mounting bracket so that the latches bottom against the front-case-section pin by stock thickness plus  $\frac{1}{32}$ "-0. There shall be a maximum of  $\frac{1}{64}$ " between the front and bottom case-sections when latched (Figure 2).

**4. PLATEN KNOBS.** Adjust to have equal clearance between the left and right carriage-end covers of  $\frac{1}{32}$ " to  $\frac{3}{64}$ ".

## MOTOR AND DRIVE

The motor, drive, and electrical mechanisms remain essentially the same in operation as the Model B machine. Changes have been made in design to simplify removal and adjustment procedures, and to conform to the new case design.

The motor is a new 3" design used to allow more space for rear-rail mechanisms and to save weight. The ring mount is the same as the Model B; however, the left mounting has been placed on the rear frame to simplify motor removal procedures (Figure 3).

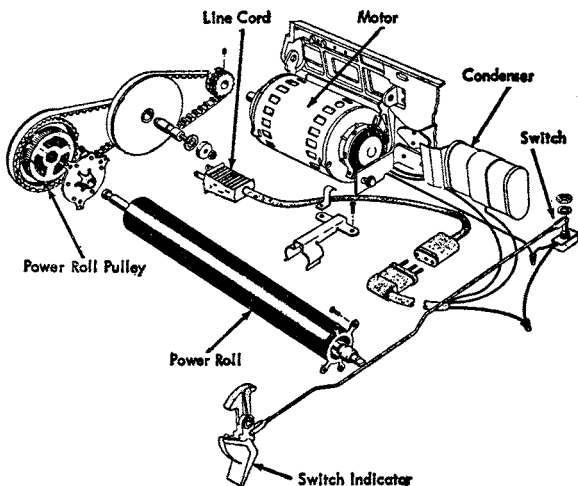


Figure 3. Motor and Drive

### Removal

**CAUTION:** Unplug machine when servicing the motor, drive, and electrical components.

### LINE CORD

The line cord is removable by means of a pluggable

unit attached to the rear frame. Access is through a slot low in the rear portion of the bottom case.

**CAUTION:** Plug must be properly seated, when re-installing, to prevent possible shock hazard.

### **MOTOR**

1. Remove complete case and cover sections.
2. Remove the belts and the belt tension adjusting-screw from the left side-frame.
3. Disconnect the tab-lever spring, tab-actuating-lever spring, and the tab-set and tab-clear links.
4. Remove the six mounting studs that hold the rear frame to the side frames, and remove the motor and rear frame.

### **SWITCH**

The switch may be removed from the right side-frame by removing the rear cover, the switch nut, and disconnecting the switch wiring.

### **POWER ROLL**

1. Remove complete case and cover sections.
  2. Refer to Model B1, Power Roll Removal.
- Note: The lower power-roll-bearing-retainer screw is longer and serves also as a spring anchor for the ribbon mechanism.

## Adjustments

1. **SWITCH.** Refer to Model B1, Motor and Drive, Adjustment 1.
2. **BEARINGS.** Refer to Model B1, Motor and Drive, Adjustment 2.
3. **POWER ROLL END PLAY.** Refer to Model B1, Motor and Drive, Adjustment 3.
4. **DRIVEN BELT.** Refer to Model B1, Motor and Drive, Adjustment 4.
5. **POWER ROLL SPEED.** Refer to Model B1, Motor and Drive, Adjustment 5.
6. **DRIVE BELT.** Refer to Model B1, Motor and Drive, Adjustment 6.
7. **MOTOR MOUNTINGS.** Belt tension may be adjusted without removing the typewriter from the bottom case-section by loosening the mounting screws and repositioning the motor.

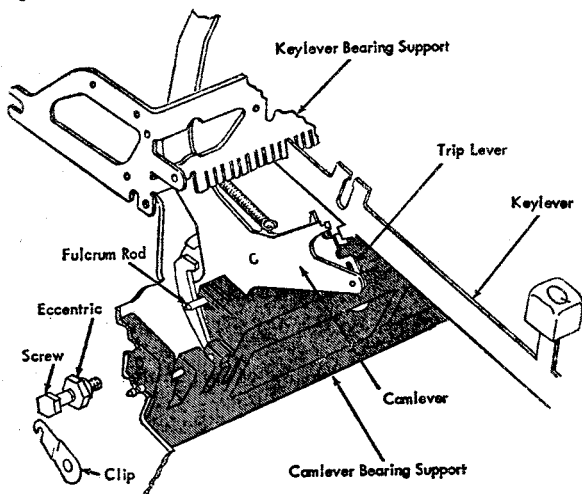
## KEYLEVERS, CAMS, TYPEBARS

The keylever, cam, and typebar operation of the Model C is theoretically the same as on the Model B. However, the keylevers, cams, and trip levers have

been slightly redesigned in order to improve their operation. These parts are not interchangeable with previous model typewriters.

An 86 or 88 character keyboard is available. The underscore is the only repeat/non-repeat letter key provided as standard equipment and is available in either position 39 or 41.

The keylevers are mounted in a redesigned keylever-bearing support and fulcrum on a heavier fulcrum rod held by formed lugs in the keylever-bearing support. The assembly is mounted to the side frames and is adjustable in order to obtain proper keylever to trip lever clearance (Figure 4).



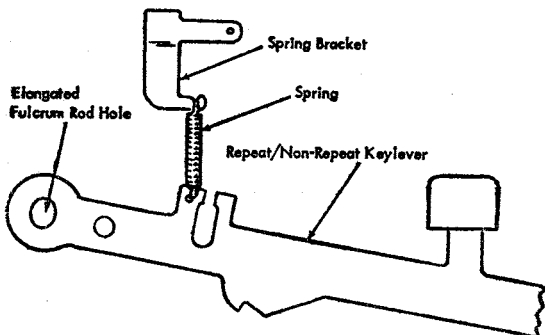
*Figure 4. Keylever Bearing Support*

Each row of keylevers has a different restoring spring, color coded for easy identification, to provide uniform touch. The keylever locking bar is designed so that all functional and letter keylevers except the shift are locked when the switch is in the OFF position.

Redesign of the repeat letter keylever to eliminate the spring-loaded plunger has caused the keylever guide-comb to be redesigned. Plunger positions are available for carriage return, tab, and backspace only. Repeat/non-repeat letter key operation has been altered by replacing the spring-loaded plunger with a single piece keylever containing an elongated



fulcrum-rod hole. A spring is connected between the keylever and a spring bracket above the keylever (Figure 5). As the keylever is depressed a single operation takes place. As more pressure is applied the resistance of the upper spring is overcome and the fulcrum point of the keylever is lowered. This places the repeat step of the trip-lever lug in the operating position.



*Figure 5. Repeat/Non-Repeat Keylever*

If additional repeat/non-repeat letter cams are desired a two-piece keylever may be installed in any keylever position.

The letter cam has been reshaped for smoother operation and is not interchangeable with previous models.

## Removal

### KEYLEVERS

1. Remove the typewriter from the base section.
2. Remove the resilient-keyboard-control indicator.
3. Disconnect the spacebar-switch-lock shaft.
4. Remove the front frame by removing the four mounting studs.
5. Disconnect the keylever spring.
6. Insert a follow-up fulcrum rod to the depth of the desired keylever.
7. Remove the two mounting studs from the keylever guide-comb and pivot the guide-comb forward.
8. Lower the rear of the keylever between the cams and push it toward the rear of the machine until the keylever clears the guide-comb.
9. Remove the keylever by pulling forward.

**LETTER CAMS**

Refer to Model B1, Cam Removal Procedure.

**Adjustments**

1. **CAM CLEARANCE.** .015" to .020". Refer to Model B1 section.

2. **KEYLEVER BEARING SUPPORT.** Adjust by positioning the keylever-bearing support so that the keylevers trip the cams when the keylever is  $\frac{1}{32}$ " plus or minus  $\frac{1}{64}$ " from the bottom of the keylever guide-comb (Figure 4).

3. **INDIVIDUAL KEYLEVERS.** Raise or lower to conform to adjustment 2. Spread keylever lugs with screwdriver or compress lugs with pliers.

**NOTE:** Do not form keylevers with "T" bender or hammer as damage to the keylever-bearing support will result.

**RESILIENT KEYBOARD CONTROL**

The resilient-keyboard control, located to the left of the impression control indicator, provides the operator with a means of varying the resistance of the keylevers to suit her touch (Figure 6). This added resistance is supplied by flat springs, mounted in the path of travel of the keylevers, and is determined by varying the position of the flat springs. Three major settings are available to the operator:

1. L — No flat spring contact.
2. M — Some flat spring contact.
3. H — Maximum flat spring contact.

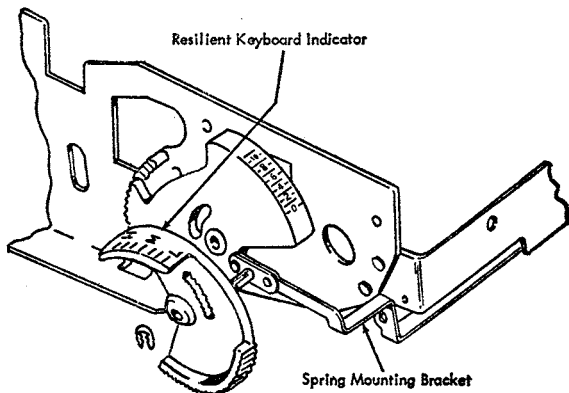


Figure 6. Resilient Keyboard Control

## Removal

1. Remove the resilient keyboard indicator.
2. Remove the left-hand mounting stud.

## Adjustment

**SPRING FINGERS.** Adjust by forming the spring-mounting bracket so that with the indicator at L and the keylevers depressed there is .001" to .010" between the spring fingers and the keylevers (Figure 7).

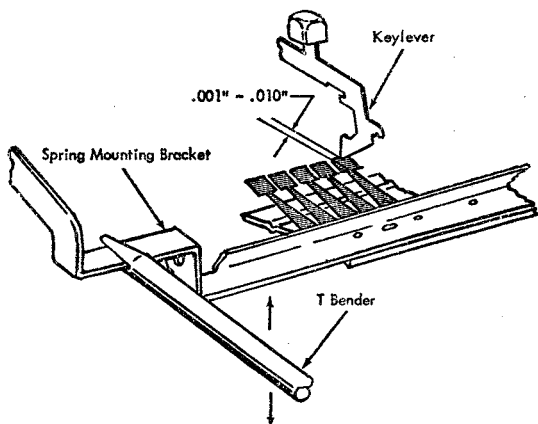


Figure 7. Resilient Keyboard Adjustment

## ESCAPEMENT

Escapement remains essentially the same on the Model C machines as on the Model B. The pawl is the .058" motion pawl for 8, 9, 10, and 12 pitch machines and the .038" motion pawl for the 6½ and 14 pitch, decimal tab, and lift platen typewriters. The pawl and trip lever are no longer mounted on the same bracket. The trip lever is now a part of the left-hand rail-brace, and the escapement pawl and spacer are part of the tab-lever-mounting bracket (Figure 8). The horseshoe shaped tab-lever mounting-bracket has been eliminated and the bracket anchored firmly to the rear rail.

## Removal

**UNIVERSAL BAR.** Refer to Model B1, Escapement, Removal Procedure.

**ESCAPEMENT PAWL ASSEMBLY.** Refer to Model C1, Tabulation, Tab-Lever-Mounting Bracket Removal.

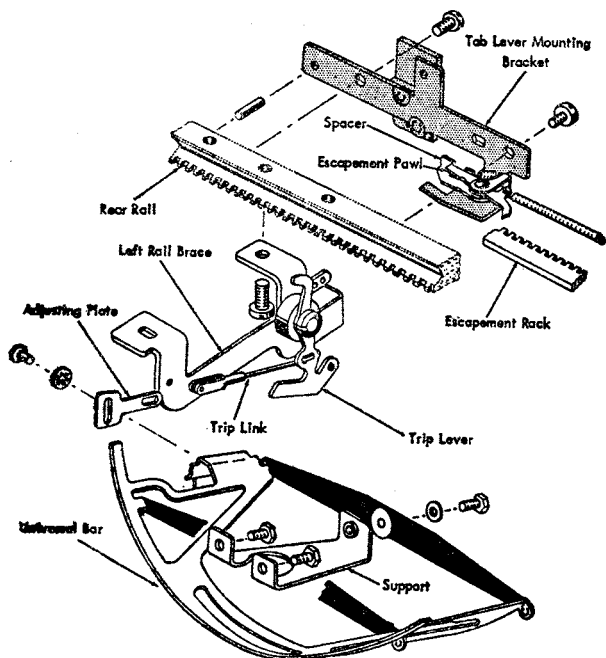


Figure 8. Escapement Mechanism

## Adjustments

**I. MAINSPRING. CAUTION:** Extreme care must be exercised when servicing this assembly to avoid injury resulting from a disengaged mainspring.

Tension is adjusted by placing the loop of the carriage tension-tape on various lugs of the mainspring drum. This adjustment may be checked through the following steps:

- A. Position the carriage so that the tip of the tab check-lever is directly opposite the last tab-stop on the right end of the rack.
- B. Set the last tab-stop.
- C. Hold the carriage to prevent any movement and latch the tab lever out.
- D. Gently position the set tab-stop against the tab-check lever and release the carriage.

E. The main spring should have sufficient tension to unlatch the tab.

A push-pull scale may be used to measure carriage tension in the following manner. Pull the carriage at a slow and steady rate from the extreme left position to the extreme right position, (excluding decelerator range). Tension shall be as follows:

13" Carriage --  $2\frac{1}{2}$  lbs. +  $\frac{1}{4}$  — 0 lbs. at start to  $3\frac{3}{8}$  lbs. maximum.

17" Carriage --  $2\frac{1}{2}$  lbs. +  $\frac{1}{4}$  — 0 lbs. at start to  $3\frac{1}{2}$  lbs. maximum.

20" Carriage --  $2\frac{3}{4}$  lbs. +  $\frac{1}{4}$  — 0 lbs. at start to  $3\frac{5}{8}$  lbs. maximum.

24" Carriage --  $2\frac{3}{4}$  lbs. +  $\frac{1}{4}$  — 0 lbs. at start to  $3\frac{7}{8}$  lbs. maximum.

30" Carriage -- 3 lbs. +  $\frac{1}{4}$  — 0 lbs. at start to  $4\frac{1}{8}$  lbs. maximum.

2. **UNIVERSAL BAR.** Refer to Model B1, Escapement, Adjustment 2.

3. **ADJUSTING PLATE ON UNIVERSAL BAR.** Refer to Model B1, Escapement, Adjustment 3.

4. **TRIP LINK.** Refer to Model B1, Escapement, Adjustment 4.

## SPACEBAR

The spacebar features a controlled repeat/non-repeat action. The spacebar cam release-lever rotation has been reversed to permit the use of a longer release link connected directly to the spacebar shaft. Depression of the spacebar through its normal travel

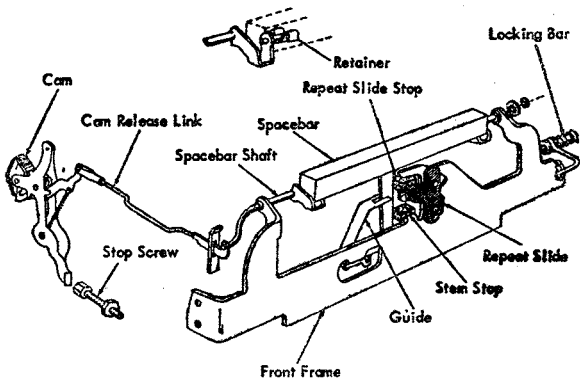


Figure 9. Spacebar Mechanism

trips the cam which in turn activates the escapement as in previous machines. The spacebar is restored to its rest position by a flat spring, mounted to the front frame by an adjustable support, which bears up against the spacebar stem (Figure 9).

Spacebar travel is limited by two rubber stops. The spacebar-stem stop is fixed to the front frame and determines the upper, or rest position, of the spacebar. The second stop is mounted to the repeat slide.

The repeat slide controls the downward travel of the spacebar during single or repeat actions. Two adjustable-shouldered-mounting screws pass through elongated holes in the repeat slide and front frame, and screw into the repeat stop (Figure 10). The repeat slide is spring loaded against the upper arm of the repeat stop. During repeat operation the spacebar stem moves the repeat slide down against this spring tension until the repeat slide contacts the lower arm of the repeat stop.

A locking bar is moved horizontally to a position below the spacebar stem, by an inclined surface on the switch lever, locking the spacebar when the switch is in the OFF position.

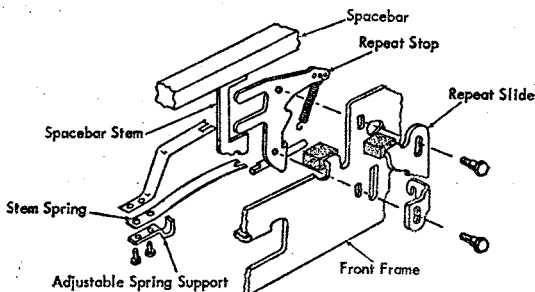


Figure 10. Repeat Slide Assembly  
Removal

**SPACEBAR.** Remove the spring retainers inside the plastic spacebar.

#### **CAM.**

1. Remove the base cover-section.
2. Loosen the cam-knockout bar by removing the fulcrum pins and springs. The knockout bar may now be moved upward out of the way, or removed from the typewriter.
3. Remove the resilient keyboard and impression indicators.

4. Remove the impression-control shaft by lifting it up out of its fulcrum slots.
5. Disconnect the operating link and the cam release link.
6. Move the operational cam fulcrum rod enough to free the cam. The left fulcrum rod is held in place by a C clip between the cam bearing support and the left side frame.

### Adjustments

1. **CAM CLEARANCE.** Adjust cam to power roll clearance at .010" to .015" using the adjustable-stop screw (Figure 9). Check by releasing the cam with the power OFF. The release-lever lug should rest on the rear half of the cam lug.
2. **CAM-RELEASE LINK.** Adjust so the cam trips when the keylever has been depressed  $\frac{1}{8}$ " from its rest position.
3. **SPRING-RETURN SUPPORT.** Adjust by forming, so the spring will just restore the spacebar to its rest position.
4. **REPEAT STOP.** Adjust by vertically positioning the mounting screws, so the travel of the spacebar between the non-repeat tripping point and the contact of the repeat slide is .015" to .025" (Figure 10).
5. **OPERATING LINK.** Adjust to trip the escapement pawl just before the high point of the cam is reached. With the cam on its high point there should be no choking off.

### MARGIN RESET

The margin-reset keylever is mounted to the right side-frame and fulcrums on a mounting stud (Figure 11). A keylever spring between the keylever and the side frame holds the keylever in its rest position. Depressing the key-button raises the push rod and causes the margin-reset lever to rotate about its mounting in the margin-reset bracket. The margin-reset lever passes in front of the margin rack and contains a pin that rides above the rack. In the operated position the margin-reset-lever pin engages the "V" shaped notch in the margin stop and depresses the spring-loaded slider. The pin on the slider disengages from the margin-rack teeth and allows repositioning of the stop. The carriage may be moved when the keylever is depressed without part damage.

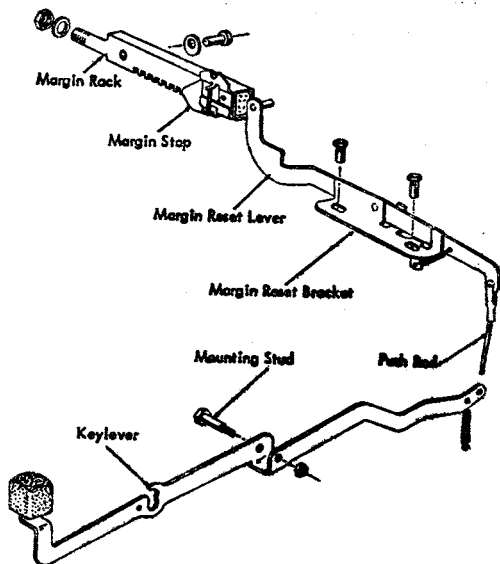


Figure 11. Margin Reset

### Adjustments

1. **MARGIN-RESET LEVER.** Adjust the push-rod clevis so that with the parts at rest there is a clearance of .005" to .015" between the bottom surface of the reset-lever pin and the top surface of either margin stop.
2. **MARGIN-RESET BRACKET-ASSEMBLY.** Position left or right on the rear rail so that the margin-reset-lever pin will center in the "V" groove of the margin stop.
3. **MARGIN STOPS.** The margin stops shall operate freely without excessive play and without binding.

### MARGIN RELEASE

The margin-release mechanism remains the same except for the redesigned actuating lever between the keylever and the tab-lever to conform with the new tab mechanism (Figure 12). The tab-lever spring provides positive contact between the tab-lever-actuating lever and margin-release lever.



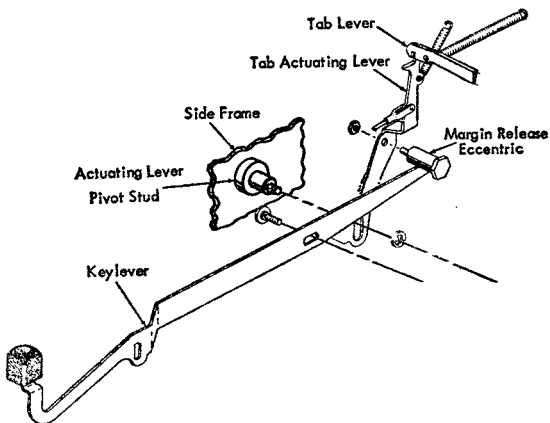


Figure 12. Margin Release

## Removal

Refer to Model B1, Margin Release. It is not necessary to remove the typewriter from the base section.

## Adjustment

**MARGIN RELEASE ECCENTRIC.** Adjust so that the margin control lever clears the underside of the margin rack by .010" to .015" (Figure 12).

## LINE LOCK

The line lock is essentially the same as on the previous model (Figure 13). It has been altered to conform to the new rear rail parts and to lock all letter keylevers when at the right margin. All functional and letter keylevers except the shift are locked when the switch is in the OFF position.

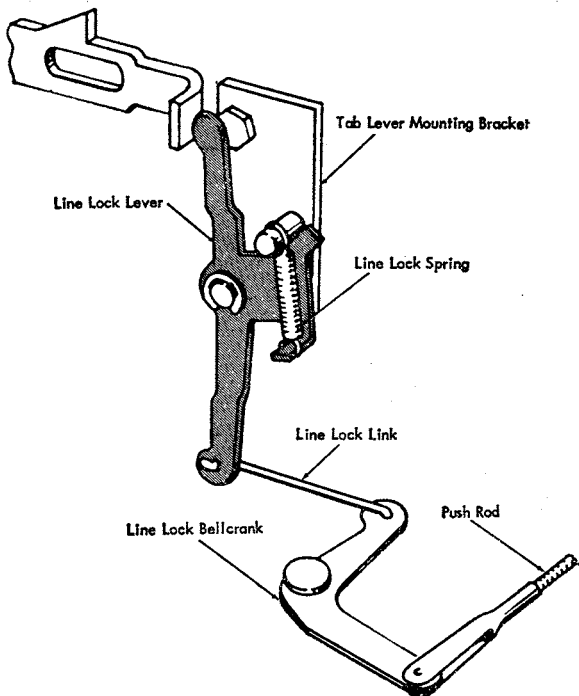


Figure 13. Line Lock

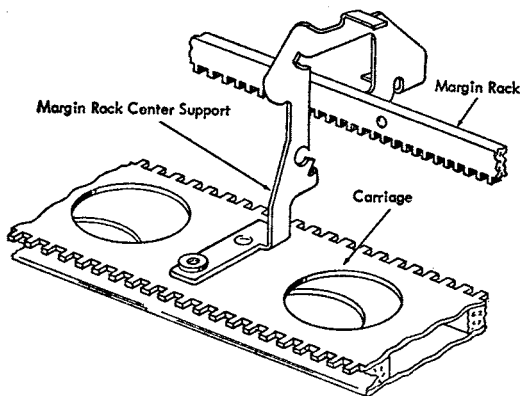
### Adjustment

**PUSH ROD.** Refer to Model B1, Line Lock, Adjustment 2.

## CARRIAGE AND RAILS

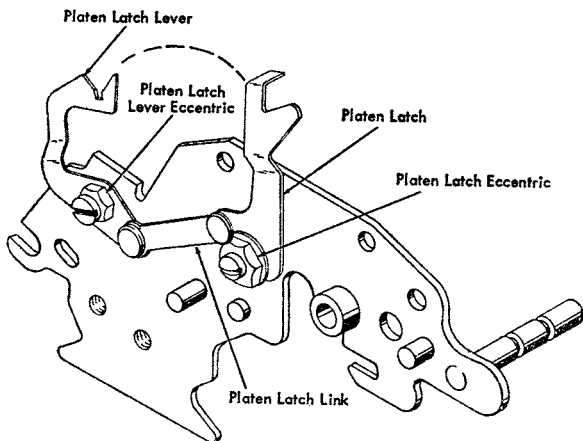
The carriage has retained its box-frame construction and operational characteristics. The following changes have been made to conform to the new case and cover section design and to increase machine flexibility.

Model C carriages are available in the following lengths: 13", 17", 20", 24" and 30". The margin and tab-rack center-support, on carriages 17" and longer, anchors to the carriage and bridges up and over the margin rack where it is attached at the rear (Figure 14). It mounts into the tab rack as before. This allows the operator to position either margin stop at any desired location on any length carriage.



*Figure 14. Margin Rack Center Support*

Platen latches have been altered to make them self-locking. The new latch consists of two levers, pivoting on eccentrics, connected by a flat platen-latch link. Pulling the latch toward the front pivots the latch lever over the platen shaft. The latch engages a notch in the latch lever, locking the two together (Figure 15).



*Figure 15. Platen Latches*

The multi-copy lever, feed-roll-release lever, variable-line-space lever, and the detent-release lever

operate as before. They have been altered to conform to the new cover design.

The carriage-release levers are operated through buttons contained in the carriage-end covers.

## RAILS

Rails, trucks, starwheels, and rollers remain the same as on the Model B. The carriage final-stop has been eliminated. Due to the new carriage lengths a new truck insertion method is used (Figure 16).

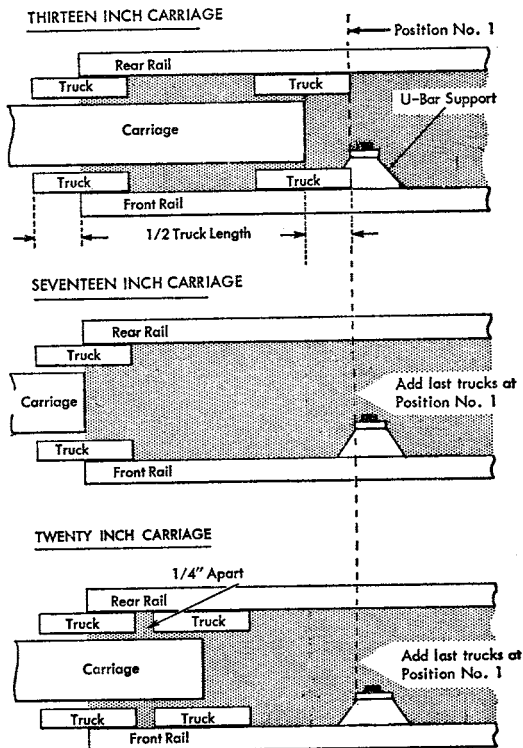


Figure 16. Carriage Truck Insertion

## Removal

**CARRIAGE AND RAILS.** The carriage and rails may be removed together as an assembly as follows:

1. Disconnect the left-hand tab-lever spring and the two decelerator-arm springs.

2. Unhook the backspace operating-link and the margin-reset link.
3. Unhook the pawl-release and clutch-unlatching links.
4. Unhook the line lock push-rod and the escapement-trip link.
5. Remove the ribbon from the corner ribbon guides.
6. Disconnect the carriage-return and carriage-tension tapes.
7. Remove the four rail-mounting screws and lift off the carriage and rails assembly.

**CARRIAGE.** The carriage may be removed from between the rails as follows:

1. Remove the rear cover.
2. Remove the right-hand carriage end-cover.
3. Disconnect the carriage-return and carriage tension tapes at the carriage.
4. Remove the margin-reset-lever assembly.
5. Move the carriage to the extreme left and depress the margin-control lever allowing the carriage end-plate to pass over it.
6. Remove the carriage by moving it to the left.

**INNER CARRIAGE.** The inner carriage may be removed without disturbing the rails or carriage adjustments by following the procedure outlined in the Model B1 section of the Reference Manual.

### Adjustments

1. **RAILS.** Refer to Model B1, Rail Adjustments, Adjustments 1, 2, and 3.
2. **PLATEN LATCH LEVER ECCENTRIC.** Adjust so that the platen is held firm with the high point of the eccentric in the forward half of its orbit. (Figure 15).
3. **PLATEN LATCH ECCENTRIC.** Adjust so that the latch firmly engages the platen latch lever.
4. **PLATEN CONTROL-YOKES.** Refer to Model B1, Carriage, Adjustment 2.
5. **PLATEN RETAINING-PLATES.** Refer to Model B1, Carriage, Adjustment 3.
6. **RING AND CYLINDER.** Refer to Model B1, Carriage, Adjustment 4.
7. **FEED-ROLL CENTER-SUPPORT.** Refer to Model B1, Carriage, Adjustment 5.

### PAPER FEED

The paper-feed mechanism is the same in principle as on the Model B. An additional set of feed rolls have been added to the 13" and 17" carriages to prevent paper slippage on these new carriage lengths.

## Removal

**FEED ROLLS.** Refer to Model B1 section.

**FRONT AND REAR PRESSURE-LEVERS.** Refer to Model B1 section.

## Adjustment

Refer to Model B1 section.

## DECELERATOR

The decelerator is a control mechanism for the centrifugal-governor. It consists of a series of spring clutches and cam arms that control the action of the centrifugal-governor (Figure 17). The decelerator-governor action absorbs carriage shock and controls the speed of the moving carriage. It eliminates the tab rebound check-lever, the air cylinder and the horseshoe shaped tab-lever mounting-bracket.

The centrifugal-governor operates as the carriage moves to the left during tabulation. As the main-spring and drum unwind they rotate the hub and gear assembly, which drives the pinion gear on the governor shaft. During left to right motion of the carriage, a spring clutch allows the mainspring and drum to rewind without rotating the hub and gear assembly and/or operating the governor.

A spring clutch is a ratchet like mechanism which utilizes a coiled spring fitted closely about a shaft. When turned in one direction the spring tightens

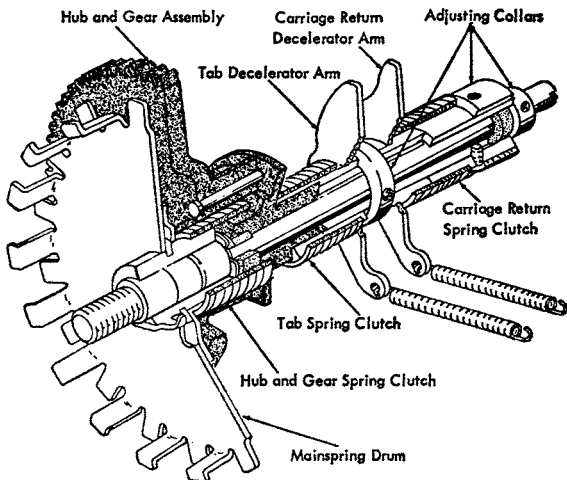


Figure 17. Decelerator

about the shaft and causes the shaft to rotate. When turned in the opposite direction the spring relaxes and slips about the shaft.

### CARRIAGE RETURN DECELERATION

During carriage return the left-margin-stop picks up the margin-control lever and moves it to the right, causing the margin-control bellcrank to operate and rotate the carriage-return-decelerator bellcrank (Figure 18). The carriage-return-decelerator-bellcrank forces the carriage-return-decelerator arm to rotate, tightening its spring clutch, and rotating the gear and hub assembly. The gear and hub assembly drives the pinion gear of the centrifugal-governor which decreases carriage speed during the last portion of the carriage return operation.

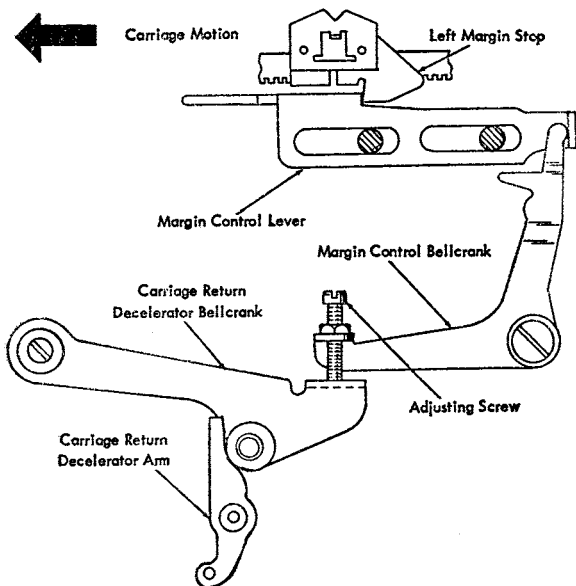


Figure 18. Carriage Return Deceleration

### TABULATION DECELERATION

As the tab lever latches the tab check-lever moves to the right, as far as its elongated mounting-slots will permit, under tension of the tab-decelerator-arm spring. As a set tab-stop contacts the tab check-lever and moves it to the left, the tab decelerator-link causes the tab decelerator-bellcrank to rotate

and operate the tab decelerator-arm (Figure 19). This action tightens the tab spring-clutch and gives an increased rotation to the already operating centrifugal-governor. This increased rotation slows the carriage during the last portion of a tabulation and absorbs the shock.

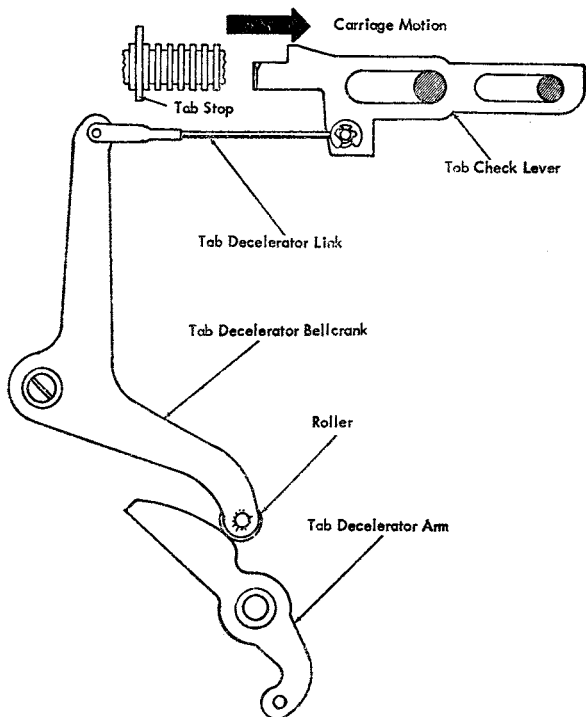


Figure 19. Tabulation Deceleration

### Removal

The decelerator, gear and hub assembly, and main-spring drum may be removed as a complete unit by following these steps:

1. Remove typewriter from the base section.
2. Disconnect the carriage-tension tape at the main-spring drum. **CAUTION:** Allow mainspring to unwind slowly.



3. Loosen the centrifugal-governor mounting-screws sufficiently to prevent stripping gear teeth.
4. Unhook the springs to the carriage-return and tab decelerator-arms.
5. Remove the rear frame.
6. Unscrew the spring-clutch decelerator-mounting shaft.

### Adjustments

1. **SPRING - CLUTCH COLLARS.** The tabulation and carriage-return spring-clutch collars should be positioned on the shaft so as to allow their decelerator arms to rotate freely without exceeding .003" end play of the arms on the shaft (Figure 17).

2. **SPRING-CLUTCH SHAFT.** Adjust by positioning the end collar so that the hub and gear assembly rotates freely with end play not to exceed .003".

### TABULATION

Tabulation on the Model C has been redesigned to incorporate the advantages of the decelerator

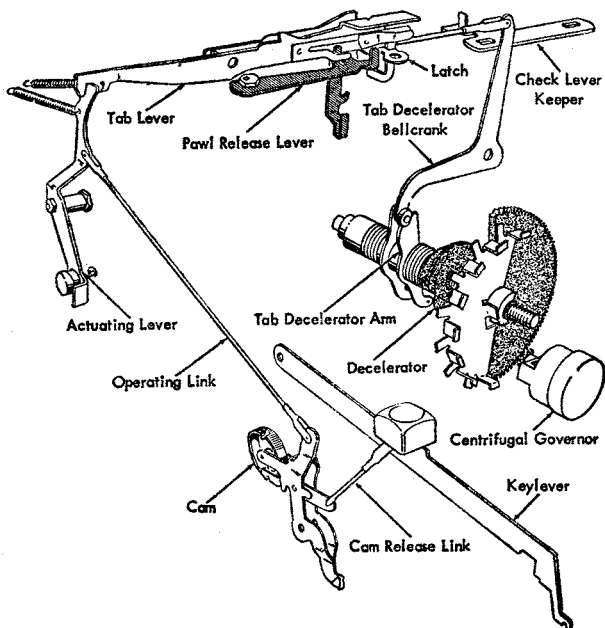


Figure 20. Tabulation

(Figure 20). One tab lever assembly serves all pitch Model C Typewriters. Tab stops may be set at every space on standard pitch machines without interfering with the operation. Tabulation is possible to each set tab stop on the 6 $\frac{1}{2}$  pitch machine and to every second tab stop, when consecutive stops are set, on all other standard pitches.

The tab latch is mounted atop the rear rail with an adjustable eccentric and works against a lower extension of the tab lever (Figure 27). The tab-check lever works against a lug on the tab latch to effect tab lever unlatching.

## Removal

### TAB LEVER

1. Remove the paper table and carriage end-covers. It is not necessary to remove the rear cover; however, it may aid the removal and reassembly procedure to do so.
2. Remove the margin rack.
3. Remove the line-lock operating-lever.
4. Disconnect the tab-lever spring, tab-latch spring, and the decelerator-bellcrank link.
5. Remove the tab-lever-pivot stud.
6. Remove the tab lever by lifting it up and toward the rear.

Reassembly may be accomplished by reversing the above procedure. Avoid over-tightening the self-locking nut on the tab-lever-pivot stud as this may cause binding of the tab lever.

### TAB LEVER MOUNTING BRACKET

1. Remove the rear cover.
2. Remove the carriage from between the rails.
3. Disconnect the tab operating link.
4. Disconnect the tab-lever spring and escapement pawl spring.
5. Remove the margin-control bellcrank.
6. Remove the line-lock operating-lever.
7. Block the carriage to prevent movement when the tab-lever mounting-bracket is removed.
8. Remove three screws that secure the tab-lever mounting-bracket to the rear rail and remove the bracket.

Replacement may be accomplished by reversing the above procedure. The escapement pawl and pawl spacer must be in front of the escapement trip-lever. Care must also be exercised in replacing the mounting screws as their shoulder depths vary. Improper reassembly may result in binds in the pawl-release bellcrank and intermediate-pawl-release lever.

**CAM**

Refer to Spacebar cam removal, in this section of the manual.

**Adjustments**

1. **CAM CLEARANCE.** Refer to Model C1, Spacebar, Adjustment 1.

2. **CAM RELEASE LINK.** Adjust so that the cam is tripped when the keylever is depressed from  $\frac{1}{2}$  to  $\frac{3}{4}$  of its downward travel.

3. **MARGIN CONTROL LEVER ECCENTRIC.** Refer to Model C1, Margin Release, Adjustment 1.

4. **TAB RACK.** The tab rack must be carefully adjusted to satisfy three conditions.

**A. LEFT TO RIGHT.** The tab rack should be adjusted left or right so that there is a clearance of  $.015'' \pm .002''$  between the working surfaces of the escapement pawl and an escapement rack tooth when the tab-check lever is in its extreme left position (Figure 21).

(1) Depress the tab cam with the power OFF and rotate the power roll by hand until the tab cam is near its high point.

(2) Allow the carriage to move to the left so that a set tab stop positions the tab-check lever to its extreme left position.

(3) Observe the clearance between the working surfaces of the escapement pawl and the escapement-rack tooth.

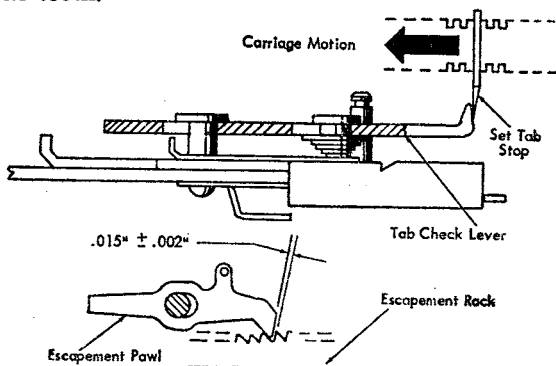


Figure 21. Tab Rack Adjustment, 4A

**B. PARALLEL TO RAILS.** Position the right end of the tab rack in its elongated mounting slot so that the rack is parallel to the carriage rails. This may be

checked by observing that the tab-check lever takes an equal bite on all set tab stops.

**C. PARALLEL TO TAB CHECK LEVER.** Position the tab rack about its axis so that the front face of a set tab stop is parallel to the tip of the tab-check lever (Figure 22).

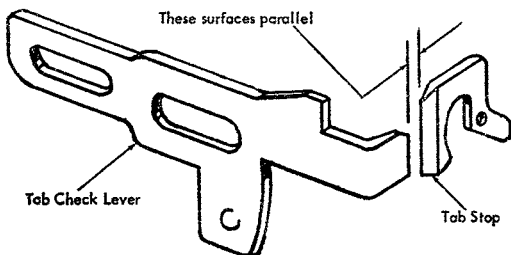


Figure 22. Tab Rack Adjustment, 4C

**NOTE:** Caution must be used in tightening the tab-rack mounting-nuts so as not to spring the carriage end-plates.

**5. TAB LATCH.** Adjust by positioning the eccentric mounting-stud so that the tab-check lever engages  $\frac{1}{2}$  to  $\frac{2}{3}$  of the exposed surface of a set tab stop when the tab lever is latched. The high side of the eccentric must be kept in the left half of its orbit (Figure 23).

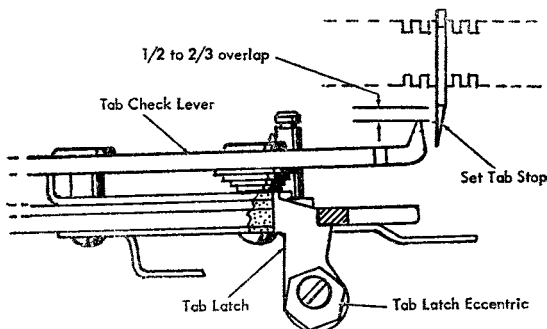


Figure 23. Tab Latch Adjustment

**6. TAB-LATCH.** Form the tab-latch, at the point of contact with the tab check-lever, so the tab unlatches when the tab check-lever is .040" to .045" from its full left-hand position (Figure 24.)

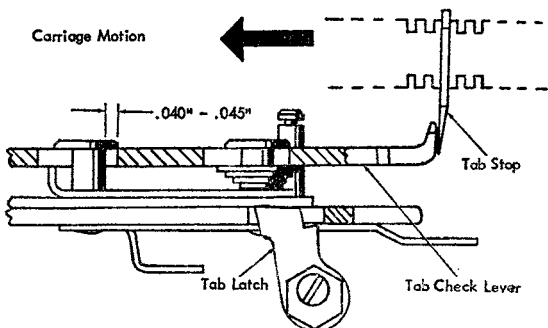


Figure 24. Tab Latch Adjustment

**7. TAB CHECK-LEVER KEEPER.** Position the tab check-lever keeper on the rear rail, left to right, so there is a clearance of .010" to .025" between the working surfaces of the tab check-lever and a tab stop when the parts are at rest (Figure 25). Position the keeper, front to rear, so that there is a clearance of .003" to .010" between the tab check-lever and the keeper with the tab lever latched to the rear (Figure 26.)

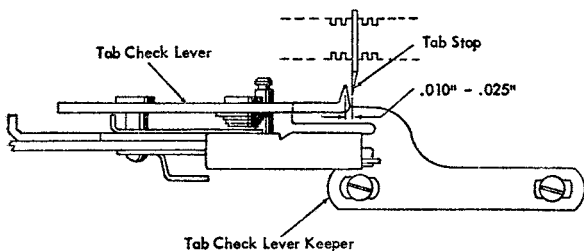


Figure 25. Tab Check Lever Adjustment

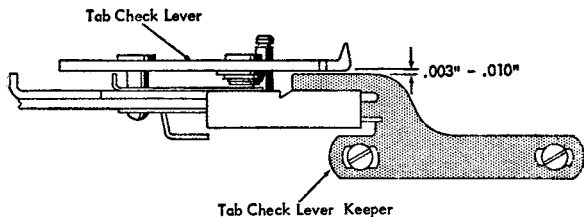


Figure 26. Tab Check Lever Adjustment

**8. OPERATING LINK.** Adjust the length of the link so there is a clearance of .015" to .020", between the contact surfaces of the tab latch and the tab lever, when the cam is on its high point (Figure 27).

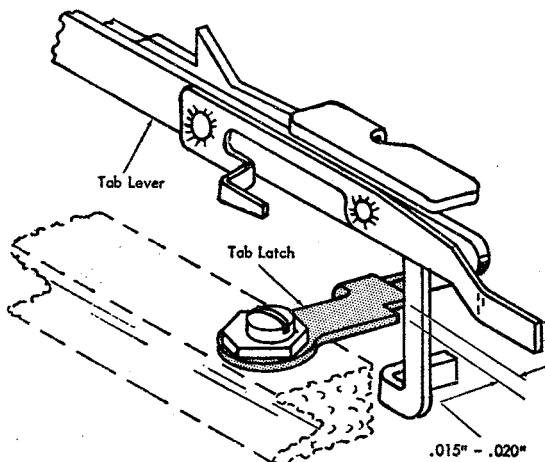


Figure 27. Operating Link Adjustment

**9. TAB-LEVER EXTENSION.** With the cam on its high point there should be a clearance of .001" to .005" between the overthrow stop on the tab check-lever keeper and the tab-lever extension. Obtain this clearance by forming the tab-lever extension.

**10. PAWL RELEASE LEVER.** Form the rear upright-lug so the escapement pawl clears the escapement rack by .010" to .020".

**11. DECELERATOR LINK.** Adjust the length of this link to obtain the maximum cushioning of the carriage without interfering with tabulation (Figure 19).

**12. CENTRIFUGAL GOVERNOR.** Refer to Model B1, Tabulation, Adjustment 10a.

**13. TAB SET AND TAB CLEAR.** Refer to Model B1, Tabulation, Adjustments 11, 12, 13, and 14.

## BACKSPACE

The backspace mechanism is the same as on the Model B1. Refer to that section of this manual for Removal and Adjustment procedures.

### CARRIAGE RETURN

The carriage return mechanism has been modified to permit the decelerator to replace the air cylinder. The clutch latch has been modified to provide a more positive latching and unlatching action (Figure 28).

Release of the carriage-return cam pulls the clutch lever forward causing the clutch to engage and develop a pull on the carriage-return tape. The line-space and pawl release operations remain the same as on the Model B1.

As the carriage approaches the left margin the margin stop picks up the margin-control lever. This

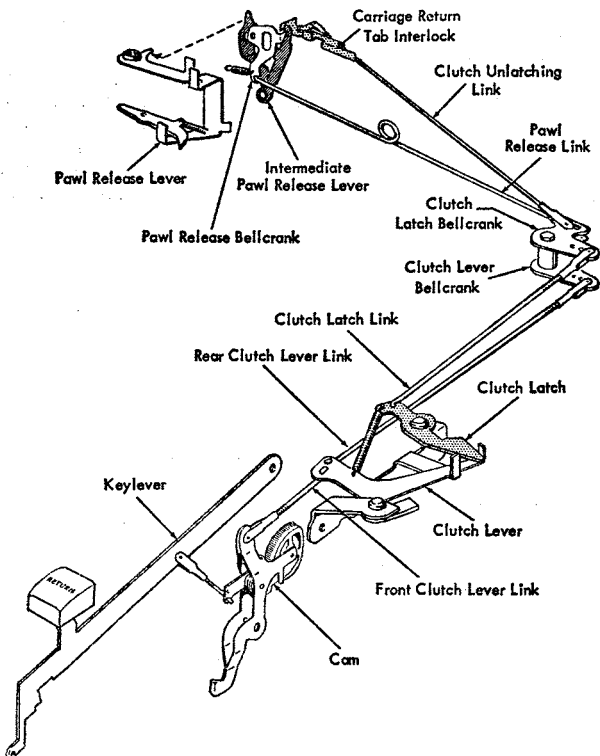


Figure 28. Carriage Return

pivots the margin-control bellcrank which performs three actions:

1. Allows the escapement pawl to restore by unlatching the intermediate-pawl-release lever from the pawl-release bellcrank.
2. Unlatches the clutch by rotating the carriage-return-tab interlock.
3. Cushions the shock of carriage return by operating the centrifugal-governor through the carriage-return-decelerator bellcrank. (Refer to Decelerator section of this manual).

### Removal

Refer to Model B1 section.

### Adjustments

1. **CAM CLEARANCE.** Refer to Model C1, Spacebar, Adjustment 1.
2. **CAM-RELEASE LINK.** Adjust so that the cam is released when the keylever is depressed from  $\frac{3}{4}$  to full normal travel. This will allow the cam to repeat when the plunger has been depressed  $\frac{1}{16}$ ".
3. **FRONT CLUTCH-LEVER LINK.** Adjust so that there is a clearance of .010" to .030" between the con-

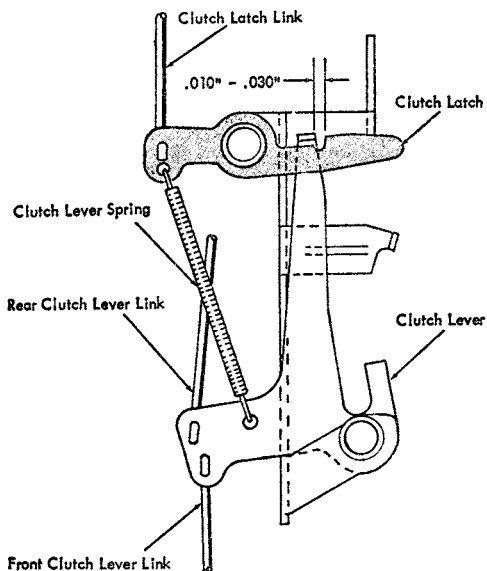


Figure 29. Front Clutch Lever Link Adjustment



tact surfaces of the clutch lever and the clutch latch when the cam is on its high point (Figure 29).

**4. REAR CLUTCH-LEVER LINK.** Position the clevis in the center hole of the bell-crank and adjust so with the clutch unlatched the elongated hole in the bellcrank is parallel to the rear rail.

**5. CLUTCH LATCH LINK.** Place in the center hole of the bellcrank and adjust so the slot in the clutch-latch bellcrank is in line with the hole in the carriage-return-tab interlock when the clutch is latched.

**6. CLUTCH UNLATCHING LINK.** Adjust the link so the clutch unlatches during the last .100" to .050" of the carriage travel. Latch the clutch and return the carriage by hand to observe this condition.

**7. PAWL RELEASE LINK.** Refer to Model B1, Carriage Return, Adjustment 16.

**8. MARGIN-CONTROL-BELLCRANK STOP.** Position the eccentric stop to permit maximum move-

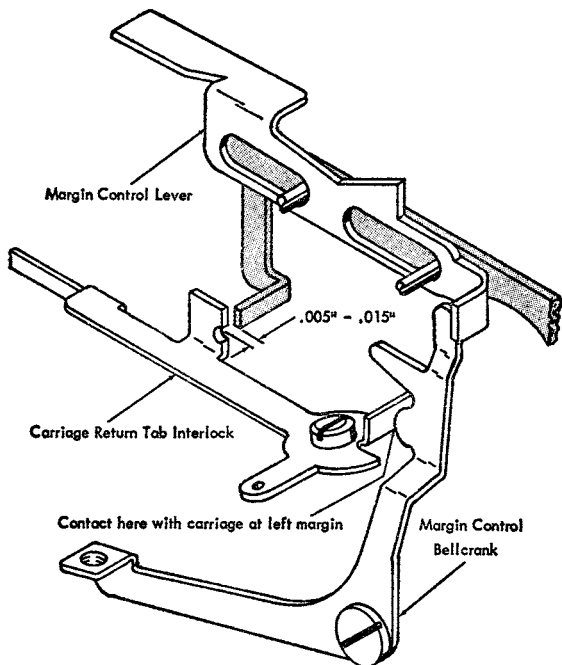


Figure 30. Carriage Return Tab Interlock Adjustment

ment of the margin-control lever without interfering with the linelock operating-lever.

**9. INTERMEDIATE PAWL-RELEASE LEVER.** Form the upright lug so the intermediate pawl-release lever touches the margin-control bellcrank and the pawl-release bellcrank when the carriage is 1 to 2 spaces from the left-hand margin.

**10. CARRIAGE-RETURN-TAB INTERLOCK.** Adjust the interlock as follows:

A. Disconnect the clutch unlatching link.

B. With the carriage at the left margin form the interlock so it clears the tab-lever lug by .005" to .015" when the left-hand lug of the interlock contacts the margin-control bellcrank (Figure 30).

**11. CLUTCH PLATE CLEARANCE.** Refer to Model B1, Carriage Return, Adjustment 18.

**12. COMPRESSION SPRING.** Adjust so the carriage will return to the left margin, from any position along the writing line, with the variable linespace lever to the rear.

**13. MARGIN-CONTROL-LEVER DECELERATOR-SCREW.** Adjust the screw so the carriage comes to rest with a minimum of shock. Lower the screw to increase the decelerator action (Figure 18).

**14. OVERBANK.** Move the carriage from left to right and observe that the escapement pawl drops over an escapement-rack tooth when the margin-control lever is from .010" to .015" from its full right position (Figure 31).

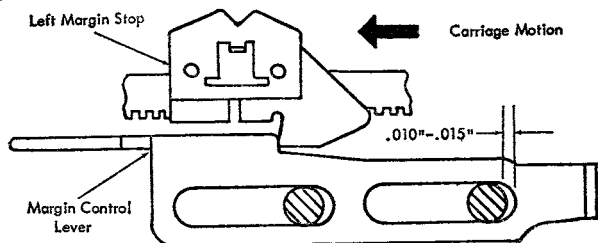


Figure 31. Overbank Adjustment

## SHIFT

The shift mechanism has been improved operationally and to simplify adjustment. The equal pin-clearance adjustment has been relocated on the shift toggle assembly to simplify adjustment and minimize binding of the shaft assembly. Eccentric studs mount

the segment to the type basket and aid in establishing "even top and bottom" during manufacture without upsetting the pin clearance (Figure 32).

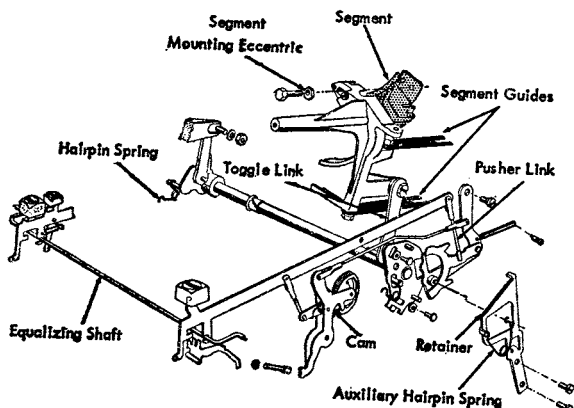


Figure 32. Shift Mechanism

## Removal

### PUSHER AND LEVERS ASSEMBLY

1. Remove the auxiliary hairpin-spring.
2. Remove the retainer mounting-screws and the retainer.
3. Disconnect the operating link at the rear.
4. Unhook the shift-pusher link at the keylever.
5. Disconnect the shift-pusher-lever spring.
6. Remove the shoulder screw and the pusher-and-levers assembly through the right side-frame.

## Adjustments

Ring and cylinder must be properly adjusted before making any adjustments to the shift mechanism.

1. **CAM CLEARANCE.** Refer to Model B1, Shift Mechanism, Adjustment 3.
2. **CAM RELEASE LINK.** Refer to Model B1, Shift Mechanism, Adjustment 4.
3. **EVEN TOP-AND-BOTTOM.** Refer to Model B1, Shift Mechanism Adjustment 1.

NOTE: The eccentric segment-mountings may be used to adjust for even top and bottom. Care must be used to insure that the segment is not tilted.

4. **MOTION.** Refer to Model B1, Shift Mechanism, Adjustment 2.

**5. EQUAL PIN-CLEARANCE.** Loosen the adjusting screws and position the shift-pin toggle-plate so that the clearance between the upper and lower pins and their respective pusher arms are equal (Figure 33).

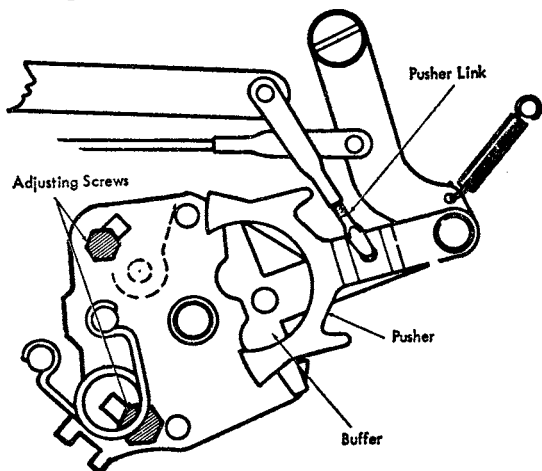


Figure 33. Pin Clearance Adjustments

**6. PUSHER LINK.** Refer to Model B1, Shift Mechanism, Adjustment 6.

**7. OPERATING LINK.** Refer to Model B1, Shift Mechanism, Adjustment 7.

**8. SHIFT-LOCK BRACKET.** Refer to Model B1, Shift Mechanism, Adjustment 8.

### RIBBON MECHANISM - CARBON RIBBON

The Model C carbon ribbon mechanism is completely contained within the case of the typewriter and has been redesigned to provide easier threading and more accurate feeding.

It is not possible to accommodate both the fabric ribbon and carbon-paper ribbon mechanisms on the same machine simultaneously. If a change of ribbon type is desired the original mechanism must be removed and the alternate device installed.

The letter cams operate the ribbon-lift bail which accomplishes ribbon lift and trips the ribbon cam. The cam activates the ribbon-feed link and drives the pressure rollers as on the Model B.

The supply spool is held on an inclined plate mounted to the right side-frame (Figure 34). Ribbon

quantity is indicated by a lever mounted on the switch-lever stud and visible through the switch-indicator window. The indicator is controlled by a follower that contacts the ribbon spool.

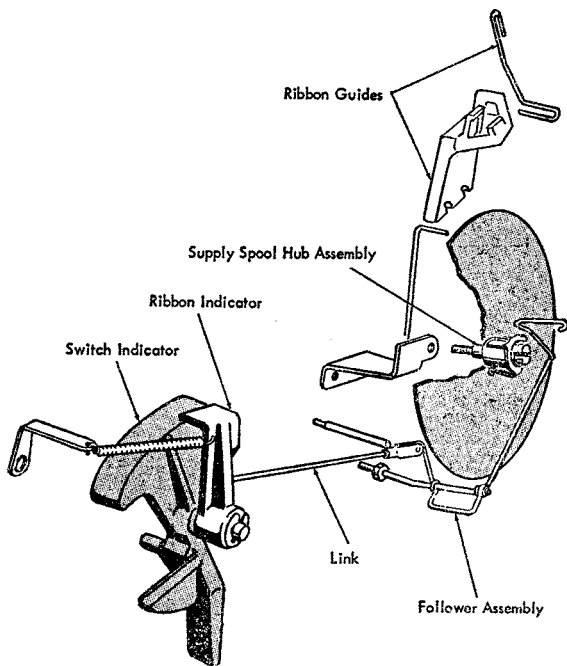
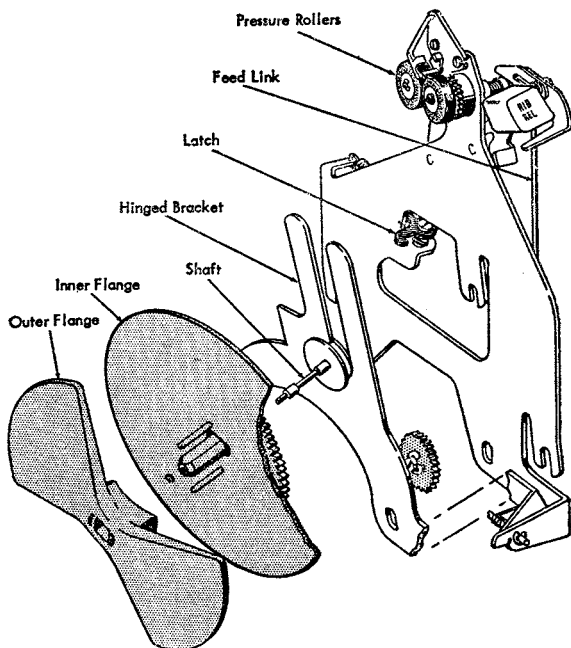


Figure 34. Carbon Ribbon Supply

Mounted to a bracket on the left-side-frame are the take-up spool assembly and the feed mechanism (Figure 35). The bracket is inclined for easier removal of the used ribbon. Take-up action is accomplished through a friction drive-gear attached to the power-roll pulley and engaging gear teeth on the inside flange of the take-up spool.

The take-up spool fits into a slot in the feed bracket so hinged that the gears may be disengaged and the spool removed. The two halves of the spool pull apart for removal of the used ribbon. A spring latch locks the bracket in the closed position and releases it whenever the release lever is operated to disengage the pressure rollers.



*Figure 35. Carbon Ribbon Take Up*  
Installing the Ribbon

To install a ribbon on the new carbon-ribbon mechanism:

1. Push the ribbon-release button to the rear, opening the pressure rollers and unlatching the take-up spool.
2. Slide the take-up spool up and out of its mounting bracket.
3. Separate the two halves of the ribbon spool and discard the used ribbon.
4. Replace the re-assembled ribbon take-up spool and latch the mounting bracket.
5. Place a full spool of ribbon on the right mounting plate with the inked side of the ribbon toward you as it comes off of the spool.
6. Thread the ribbon through the right corner-guide, center lift-guide, left corner-guide, pressure guide and onto the take-up spool.
7. Push the ribbon-release button up, re-engaging the pressure rollers.

## Adjustments

1. **CAM CLEARANCE.** Refer to Model B1, Ribbon, Adjustment 1.
2. **CAM RELEASE LINK.** Refer to Model B1, Ribbon, Adjustment 2.
3. **OPERATING LINK.** Refer to Model B1, Ribbon, Adjustment 3.
4. **FEED LINK.** Adjust the feed link to feed sufficient ribbon to accommodate the largest character without overlap.
5. **INDICATOR LINK.** Adjust the link so the ribbon indicator is fully visible when the ribbon spool is empty.
6. **REWIND MOUNTING PLATE.** Position the plate to insure positive engagement of the take-up spool gear teeth with the friction drive-gear on the power-roll pulley.

## RIBBON MECHANISM - FABRIC

The fabric ribbon mechanism provides cleaner and faster ribbon changing, and positive ribbon feed. A rapid rewind feature enables the operator to wind the used ribbon onto the left spool, ready for changing, by depressing a key-button to the left of the ribbon-control button. An interlock system automatically reverses the direction of feed onto the left

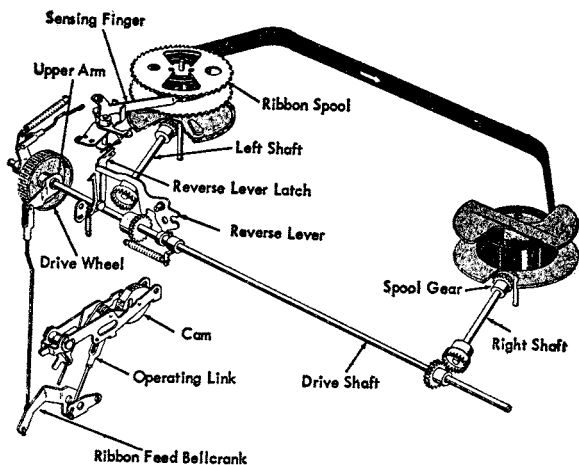


Figure 36. Ribbon Feed, Right Spool Driving

spool, if necessary, and stops the mechanism when the ribbon is rewound.

### Operation

The ribbon-lift mechanism and the method of tripping the ribbon cam through the action of the ribbon-lift vane remain the same as on the Model B1.

An operating link from the ribbon cam connects to a bellcrank which in turn operates the ribbon feed-link and upper-arm assembly (Figure 36). Rotation of the upper arm causes the inside spring-clutch to tighten about a hub on the plastic drive-wheel, rotating the wheel and the drive shaft to which it is connected. Gears connected to the drive shaft transfer this rotation to the ribbon spools. The lateral position of the shaft controls which gears will be engaged and which ribbon spool will feed.

Ribbon reverse takes place as follows: As the left ribbon spool empties the sensing finger engages a notch in the spool, rotating the sensing finger cam (Figure 37). This forces the unlatching lever to the rear and develops a pull on the wire link connected to the reverse-lever latch, unlatching the reverse lever. Unlatching the reverse lever allows it to rotate clockwise about its mounting and position the

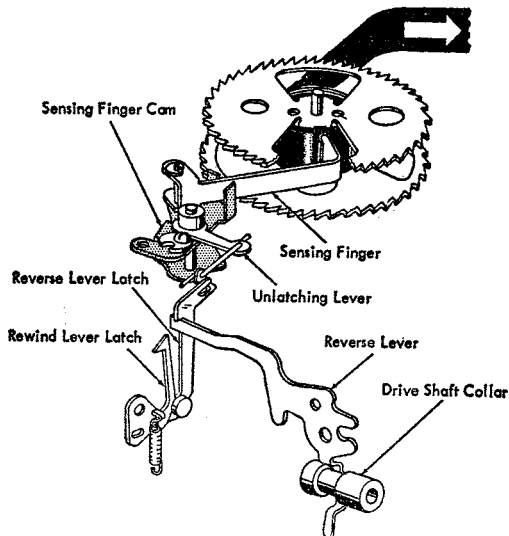


Figure 37. Ribbon Reverse, Left Spool Empty



drive shaft so the left spool is in the feeding position and the right spool is free to rotate.

To insure positive operation with various ribbon spools the sensing finger may also be forced to the left by the rotation of the empty ribbon spool. The resulting counterclockwise rotation of the sensing finger cam insures that the wire link will unlatch the reverse lever.

As the right spool empties, its sensing finger engages a notch in the right-hand ribbon spool allowing the sensing-finger shaft to rotate and position a pawl between teeth of the drive-shaft primary-cam (Figure 38). As the drive shaft rotates the secondary cam, pinned to the drive shaft, climbs the high points of the now stationary primary cam. This pulls the drive shaft to the right and engages the right gears in feeding position. This movement of the shaft is also transferred to the reverse-lever, latching it under the reverse-lever latch, so as to maintain this condition.

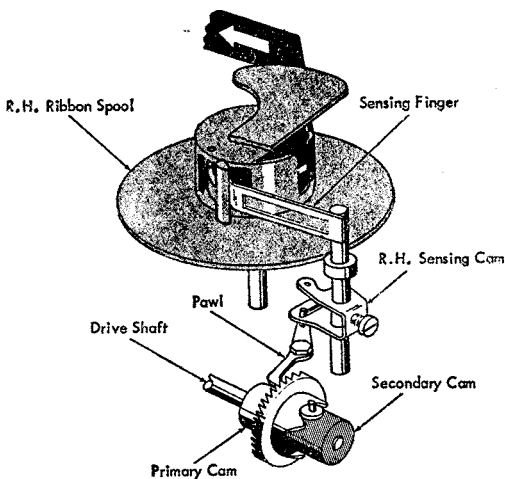


Figure 38. Ribbon Reverse, Right Spool Empty

Rapid rewind of the ribbon takes place as follows: Depressing the ribbon rewind keybutton raises the button link (Figure 39). A formed lug on the rear of the button link raises the button latch and causes the rewind lever, part of the same assembly, to pivot clockwise about its mounting. As the left end of the

rewind lever assembly raises, it carries the rewind-lever latch upward. This results in pivoting the reverse-lever latch to its unlatched position and allows the reverse lever to pivot clockwise about its mounting. This action moves the drive shaft to the left and insures that the left-hand spool will be feeding.

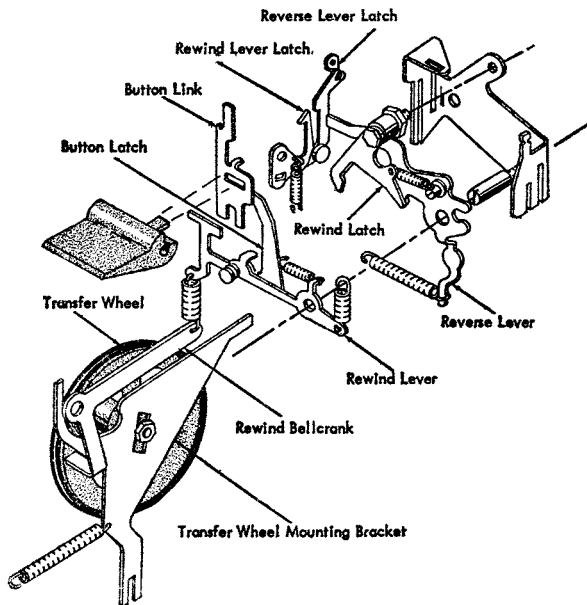


Figure 39. Rapid Ribbon Rewind

### Adjustments

The ribbon mechanism will, when properly adjusted, provide positive ribbon feed in either direction and reverse dependably at either end.

**1. LEFT - HAND AND RIGHT - HAND DRIVE SHAFT MOUNTING BRACKETS.** Position the brackets on the keylever-bearing support so there is .002" to .005" play between the ribbon spools and their drive gears.

**2. SPOOL GEARS.** Position the spool gears on the left-hand and right-hand drive shafts for minimum backlash without binding (Figure 36).

**3. LEFT-HAND SENSING CAM.** Position the left-hand sensing cam vertically on its shaft so the sensing

finger is centered between the ribbon-spool flanges (Figure 37).

**4. RIBBON CORNER GUIDES.** Adjust so the ribbon feeds off each ribbon spool without touching either ribbon spool flange.

**5. COVER INTERLOCK LINK.** A cover interlock, linked to the left-hand sensing cam, permits the sensing finger to clear the left-hand ribbon spool when the front cover is open. Adjust the link to permit the sensing finger to clear the spool with the front cover open. The link must not prevent the sensing finger from bottoming in the slot in the empty ribbon spool.

**6. CAM CLEARANCE.** Refer to Model B1, Ribbon, Adjustment 1.

**7. CAM RELEASE LINK.** Refer to Model B1, Ribbon, Adjustment 2.

**8. CAM LINK.** Refer to Model B1, Ribbon, Adjustment 3.

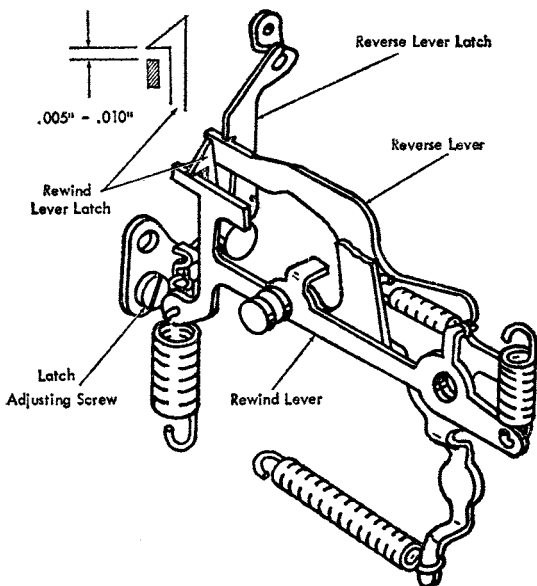


Figure 40. Rewind Lever Latch

**9. RIBBON FEED LINK.** Adjust the link to provide one revolution of the ribbon spool for  $32 \pm 4$  cam operations.

**10. REWIND LEVER LATCH.** With the reverse lever latched down, position the rewind latch vertically by moving its mounting plate. There should be a clearance of .005" to .010" between the rewind lever and the rewind-lever latch (Figure 40).

**11. DRIVE SHAFT.** With the reverse lever unlatched, position the drive shaft to the left so there is a clearance of  $\frac{3}{16}$ " between the C clip on the shaft and the left-hand bushing in the keylever bearing-support (Figure 41). Set the nylon primary cam against the keylever bearing-support and tighten the set screw in the secondary cam.

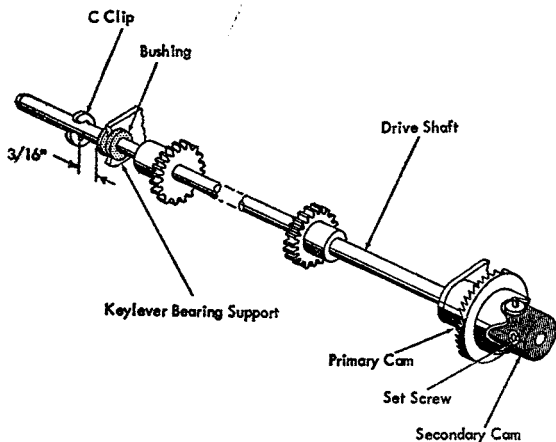


Figure 41. Drive Shaft Adjustment

**12. DRIVE SHAFT COLLAR.** With the reverse-lever latched move the drive shaft to the right until there is a clearance of  $\frac{1}{8} + \frac{1}{64} - 0$  between the key-lever bearing support and the primary cam (Figure 42). Move the drive-shaft collar to the right until the left flange of the collar contacts the reverse lever.

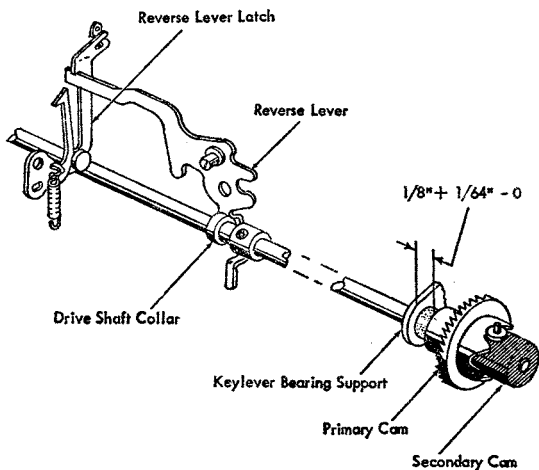


Figure 42. Drive Shaft Collar Adjustment

**13. REVERSE - LEVER ECCENTRIC - STOP.** With the reverse lever unlatched adjust the eccentric stop until the primary cam clears the keylever bearing-support by  $.006'' \pm .002''$  (Figure 43).

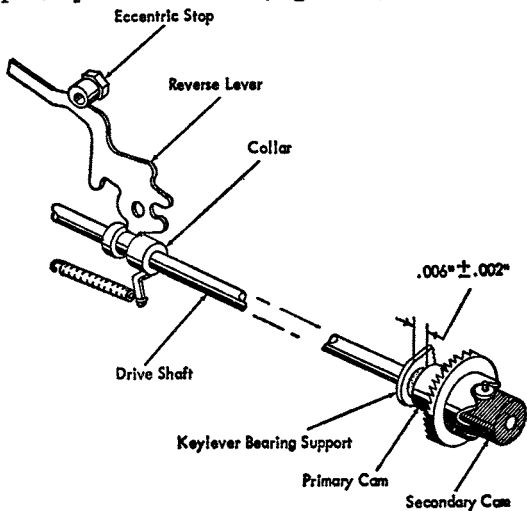


Figure 43. Reverse Lever Eccentric Stop

**14. REVERSE LEVER STUD.** To insure winding the ribbon fully onto the left ribbon spool during rapid rewind, the rewind lever must not be released from its raised position before the reverse lever is latched (Figure 44). Position the stud in the reverse lever to release the rewind latch from the rewind lever, when the reverse lever has moved counter clockwise past its latch .005" to .008".

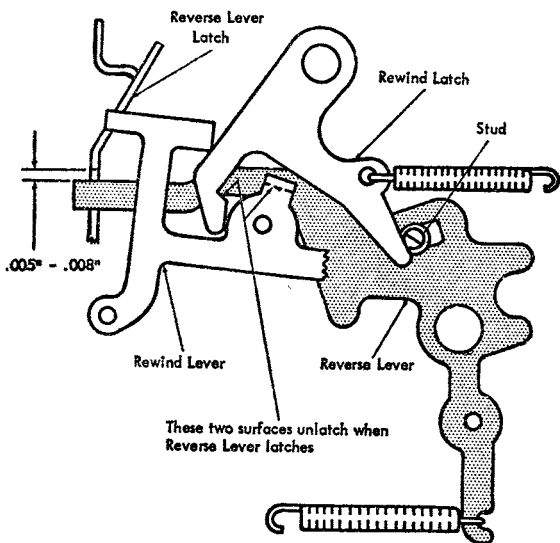


Figure 44. Reverse Lever Stud

**15. BUTTON-LATCH LUG.** Latch the reverse lever and hold the drive shaft to prevent movement. Form the button-latch lug so the button latch cams off of the button link when the button link is raised to a point  $\frac{1}{8}$ " from its upper limit of travel (Figure 45).

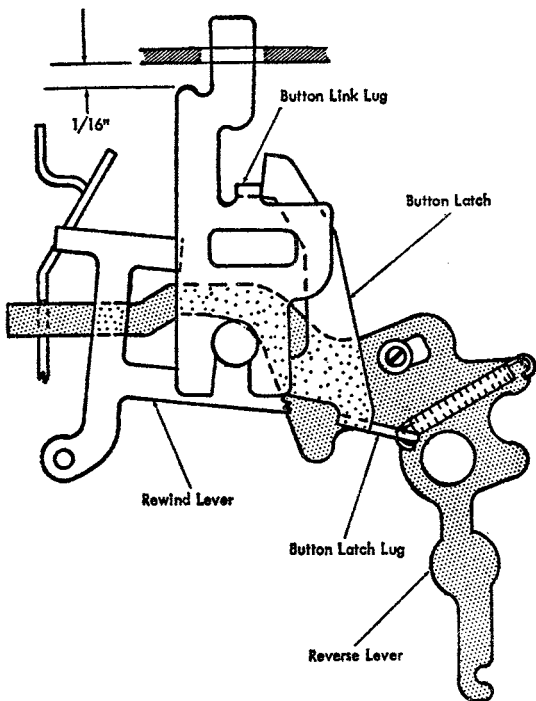


Figure 45. Button Latch Lug Adjustment

**16. RIGHT REVERSING CAM.** With the reverse lever unlatched and the right sensing finger bottomed in the right ribbon-spool notch, position the right-hand cam on the sensing finger shaft so the reversing pawl bottoms between the teeth on the primary cam (Figure 38). The sensing finger should be located vertically to center between the ribbon spool flanges.

**17. LEFT REVERSING ECCENTRIC.** With the reverse lever latched and the left sensing finger resting against the ribbon spool hub, position the eccentric washer to just contact the unlatching lever (Figure 37).

**18. DRIVE SHAFT GEARS.** With the reverse lever latched adjust the right gear for maximum engagement without binding. Unlatch the reverse lever and

adjust the left gear for maximum engagement without binding. Care must be taken to insure that only one of set gears is engaged at a given time.

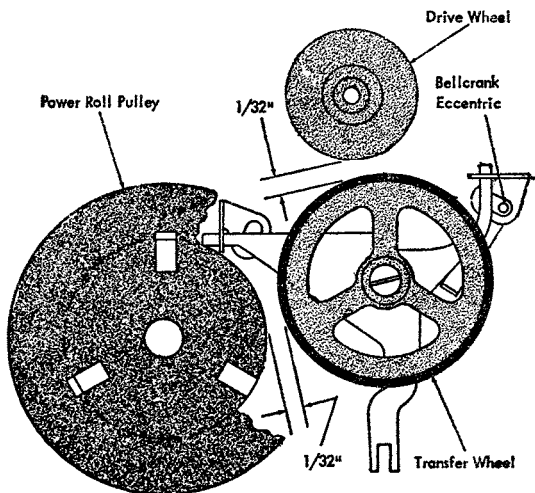


Figure 46. *Transfer Wheel Adjustment*

**19. TRANSFER WHEEL.** With the rewind lever latched down adjust the transfer wheel, by positioning its mounting, so it clears the drive wheel by  $\frac{1}{32}$ " (Figure 46).

**20. TRANSFER WHEEL BELLCRANK.** With the rewind lever latched position the bellcrank-eccentric mounting-stud so that the transfer wheel clears the flange on the power roll pulley by  $\frac{1}{32}$ " (Figure 46).  
NOTE: Adjustments 19 and 20 should be considered together to insure that the transfer wheel contacts the drive-shaft wheel and the flange on the power-roll pulley when the rewind lever is  $\frac{1}{8}$ " from its latched position.

### Ribbon Lift Adjustments

Refer to Model B1, Ribbon Lift, Adjustments 1 through 5.



## SHIFTING OFF CYLINDER IN UPPER CASE

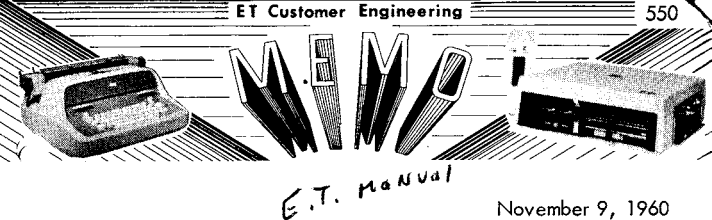
For more even color and impression between upper and lower case characters, the amount of "shifting off cylinder" in upper case may require adjustment. Some type styles require a different amount of shifting off from other type styles. These exceptions are listed in the following chart.

The amount of shifting off may be increased by adding shims under the front or by removing shims from under the rear of the upper segment guide springs.

Shifting off may be checked by testing the difference in ring and cylinder between upper and lower case characters by using a strip of .003" paper as a feeler gauge between the platen and typebar when checking the lower case and additional strips when checking the upper case.

### SHIFT OFF SPECIFICATIONS

Type Style	Type Mark	Shift Off Inches	
		Fabric Ribbon	Carbon Ribbon
Standard Styles	-	.001-.006	.004-.007
Executive Styles	-	.005-.008	.006-.010
Bookface Academic	BA	.004-.007	.006-.010
Pica Inverted	PI	.004-.007	.006-.010
Pica Gothic Inverted	HI	.004-.007	.006-.010
Diplomat	B2	.004-.007	.006-.010
Elite Gothic DC	F	.001-.006	.006-.010
Regent Gothic	RG	.001-.006	.006-.010
Large Bookface	LB	.001-.006	.006-.010
Prestige Elite	SE	.001-.006	.006-.010
Prestige Pica	SP	.001-.006	.006-.010
Boldface #1	PO	.005-.008	.007-.012



November 9, 1960

SUBJECT: Modified Fabric Ribbon Mechanism

PURPOSE: To announce a new Fabric Ribbon Mechanism.

INFORMATION: Current production Standard Model C ET's with fabric ribbon are equipped with a modified ribbon mechanism. It features simplified adjustments, more positive operation, and fewer parts. It also permits the operator to stop rewind by lifting the rewind button. The former style bearing support and ribbon feed assembly (P/N 1118354) will no longer be available. Individual parts for former style ribbon feed assembly will be available for replacement purposes. If the former style assembly must be replaced, it will be necessary to order B/M 1271389 (Modified Ribbon Feed).

Listed below are the adjustments for the modified ribbon mechanism:

Cam Clearance. Adjust so the release lever falls on the rear half of the cam lug when the cam is tripped with the power off.

Release Link. Adjust to trip the cam when any typebar is  $3/4'' \pm 1/8''$  from the platen.

Operating Link. Adjust so the feed bellcrank arm rests  $5/16'' \pm 1/32''$  from the frame (Figure 9).

Left and Right Drive Plates. Adjust the grip clip so there is .002" to .005" vertical end play (Figure 1).

CENTERED BETWEEN  
SPOOL FLANGES

MINIMUM GEAR LASH,  
BUT FREE AND SMOOTH  
OPERATION FOR 360  
DEGREE ROTATION

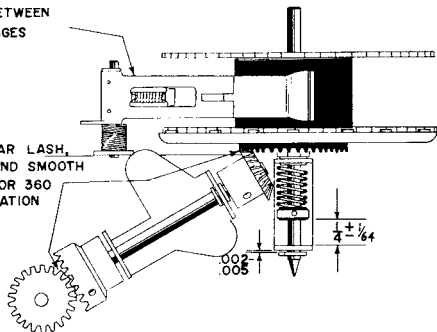


Figure 1

Left and Right Tension Springs. Adjust the retaining collars so they are approximately  $1/4''$  from the mounting bracket. Be sure there is equal tension on both sides (Figure 1).

Spool Gears. Adjust the mounting brackets for minimum backlash but smooth operation for  $360^\circ$  (Figure 1).

Left Sensing Finger. There are two adjustments for the sensing finger. 1. Form the sensing finger so it centers between the spool flanges. 2. The sensing finger extension should be formed so that it unlatches the reverse lever when the tip of the sensing finger is  $1/8'' \pm 1/16''$  from the spool shaft (Fig 1 & 2).

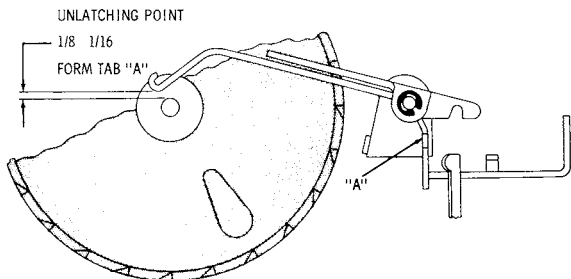


Figure 2

Drive and Check Clutches. Adjust for minimum lost motion without binds.

Primary Secondary Cam Assembly. Position on its shaft so when the secondary cam is on its high point there is no remaining "left-to-right" motion of the drive shaft. Do not spring the bearing support (Figure 3).

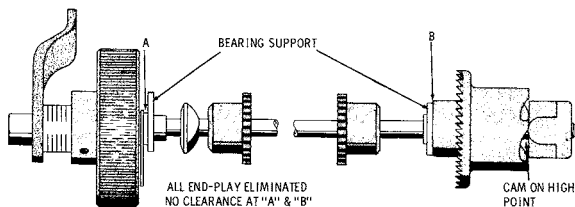


Figure 3

Drive Shaft Collar. With the reverse lever unlatched, adjust the collar so there is  $.002''$  to  $.005''$  clearance between the primary cam and keylever bearing support. Check both lobes (Fig 4).

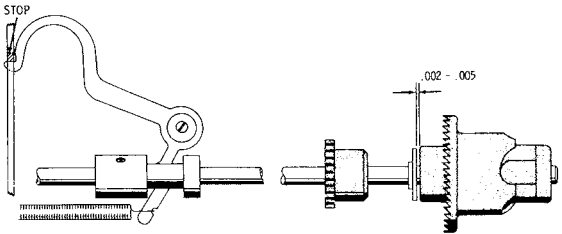


Figure 4

Drive Gears. Adjust the drive gears so when in a meshed position (Figure 5) the inside edge of the drive gear extends  $.030''$  to  $.040''$  away from the driven gear.

Driven Gears. Adjust the driven gears for minimum backlash but smooth operation for  $360^\circ$ .

Button Latch. Adjust left or right so the button unlatches when the left drive gear is  $.005''$  to  $.015''$  to the right of the driven gear (Figure 6).

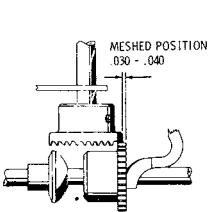


Figure 5

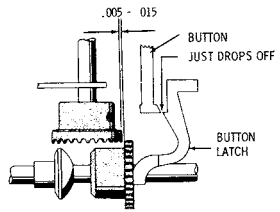


Figure 6

Right Sensing Cam. Adjust so when the sensing finger is bottomed in the spool notch the reversing pawl is bottomed in the teeth of the primary cam. Also center the sensing finger between the spool flanges.

Cone Follower. With the reverse lever unlatched and the side play in the cone follower held to the right, the follower should clear the right edge of the cone collar by  $.010''$  to  $.015''$  (Figure 7).

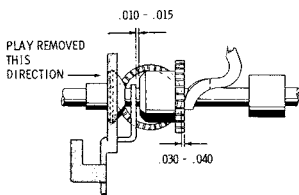


Figure 7

Upper Extension of Cone Follower. With the rewind button latched and the cone follower held in contact with the smallest diameter of the cone, form the upper extension so there is .001" to .005" clearance between the button extension and cone follower extension (Figure 8).

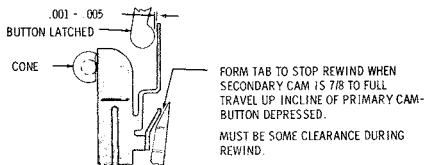


Figure 8

Side Extension of Cone Follower. Form the side extension of the cone follower so when the rewind button is held depressed at the end of a rewind cycle, the secondary cam will travel 7/8 to full travel up the incline of the primary cam. During rewind there should be clearance between the side extension and tip of the transfer wheel bracket (Figure 8). Note: Flicking the rewind button may cause the RH secondary cam to over-ride the primary cam occasionally.

Transfer Wheel Mounting Bracket. Form the lower stop so the transfer wheel clears the power roll pulley flange by .005" to .015" when at rest (Figure 9). There must be a clearance between the transfer wheel and the drive wheel.

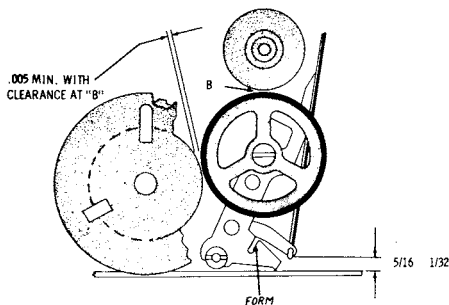


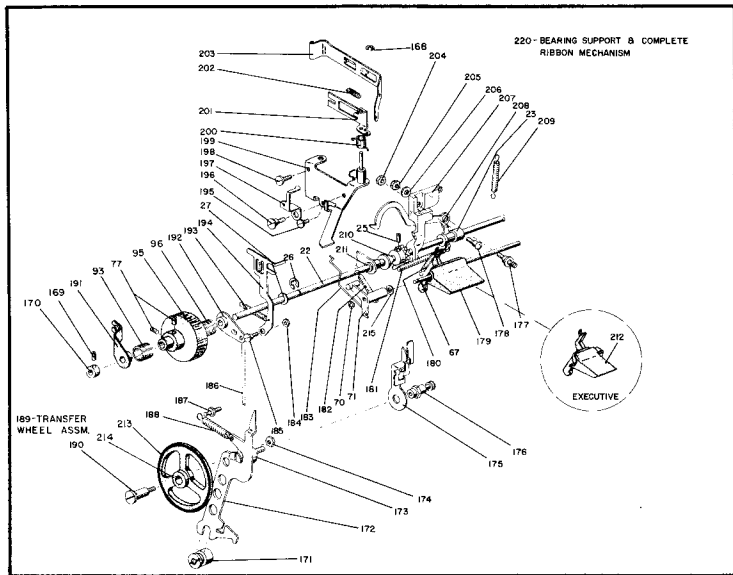
Figure 9

Cover Interlock Link. Form so the interlock lever clears the sensing finger extension when the cover is closed and the sensing finger tip is resting against the spool shaft.

Color Control Button. Adjust to be in line with the rewind button when in the center lift position.

NOTE: In order to rewind the ribbon to the right the following steps should be followed:

With the machine on and the left drive gear engaging the left driven gear, move the drive shaft to the right by pushing on the left end of the shaft until the right drive gear just contacts the right driven gear. While holding the shaft in this position, depress the rewind button. This will give you the desired rapid rewind to the right.



Ref	Part No.	Price	Description
22	1118270	.90	Shaft
23	1118292	.35	Collar
25	1077919	.15	Screw, bristo
26	264641	.05	C clip
27	1090394	.05	Washer
67	1118332	.50	Shaft
70	219633	.01	Clip
71	1118331	.20	Lever, interlock
77	1077919	.15	Screw
93	1118296	.60	Clutch spring
96	1118295	.25	Clutch spring
168	219633	.01	Clip
169	1078469	.15	Screw
170	1063797	.35	Collar
171	1116189	.35	Nut
172	1116190	1.50	Bracket
173	1116188	.40	Screw
174	38051	.04	Nut
175	1116111	.55	Lever
176	1116125	1.05	Stud
177	1116340	.15	Screw
178	1116375	.05	Screw
179	1116099	.55	Button, tan std
	1116100	.55	Button, blue std
180	1090794	.15	Spring
181	1116343	.25	Spring
182	1090435	.15	Spring

Ref	Part No.	Price	Description
183	1116195	.75	Link
184	1090268	.05	Nut
185	1110241	.10	Screw
186	1116135	.25	Link
187	1117426	.05	Stud
188	43373	.15	Spring
189	1116148	.90	Wheel assembly
190	1116191	.75	Stud
191	1118353	.85	Arm
192	1118274	.80	Lever
193	1071687	.15	Spring
194	1116341	1.00	Latch
195	196298	.01	Screw
196	1116391	.10	Screw
197	1116197	.55	Lever
198	196298	.01	Screw
199	1116124	1.00	Bracket
200	1116146	.25	Spring
201	1116161	.65	Sensing finger
202	1116102	.15	Spring
203	1116116	.50	Sensing finger
204	1090268	.05	Nut
205	7341	.01	Nut
206	1090394	.05	Washer
207	1116163	.75	Lever
208			Lever
209	1091073	.15	Spring

Ref	Part No.	Price	Description
210	1116106	.95	Hub & gear asm
211	1118253	.05	Bushing
212			Button, tan exec
			Button, blue exec
213	1116164	.30	Tire
214	1116112	.60	Wheel, rapid rewind
215	1090657	.05	Washer
220	1116379	30.00	Bearing support and complete ribbon mechanism
	1271389	35.00	F.I. B/M modified fabric ribbon feed

Parts not shown are listed under Model C Standard Fabric Ribbon Mechanism in the 1960 Parts Manual

NOTE: Part Numbers for Reference Numbers 208 and 212 will be provided when available.



CEM 550, page 8

ORDER:

All component parts of B/M 1271389 are available in EPC's.

B/M 1271389 is not available in EPC's. Order B/M 1271389 and P/N 1116379 on P & S Requisition from Lexington Plant.

RECORDS:

Substitution Data:

1118354 (Bearing support and ribbon feed assembly) is now obsolete. For replacement purposes order 1271389 (F.I. B/M - Modified Fabric Ribbon Feed).

B/M 1271009 is no longer available. Use present stock until depleted.

Parts Manual Changes:

Delete 1118354 (page 17) and 1271009 (page 18), Model C Section, 1960 Parts Manual.

Add 1116127 (Bearing support keylever - modified ribbon) to page 25, Model C Section, 1960 Parts Manual.

File: Under "Ribbon" index tab after CEM 549.

NOTE: Each Customer Engineer should receive two copies of this memo. One is for the CEM book and one to be kept in the Service Case.