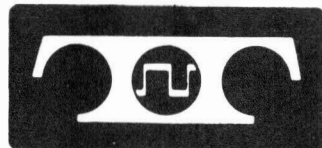


**BULLETIN 282B**

**TECHNICAL MANUAL  
MODEL 35  
RECEIVING-ONLY  
REPERFORATOR SET  
(LPR, LRB, LRC, LT)**

**CONTENTS**

**DESCRIPTION  
ADJUSTMENTS  
LUBRICATION  
DISASSEMBLY - REASSEMBLY  
INSTALLATION  
TROUBLE SHOOTING**



**TELETYPE<sup>®</sup>  
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## INTRODUCTION

Bulletin 282B is a technical manual that provides descriptive and maintenance information for the Receiving-Only Typing Reperforator Set.

The manual is made up of a group of appropriate independent sections. These are separately identified by title and section number. The pages of each section are numbered consecutively, independent of other sections.

The identifying number of each section, a 9-digit number, appears on each page of the section in the upper left corner of left-hand pages and the upper right corner on right-hand pages.

The sections are arranged in numerical order as shown in the table of contents on the following page. To locate specific information proceed as follows:

- Find the involved equipment in the first column of the table of contents.
- Find the type of information in the second column.
- Find the correct 9-digit number in the third column.
- Turn to the contents on Page 1 of the section.

Note: For information on motor units, see Bulletin 295B.



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35 RECEIVE-ONLY TYPING REPERFORATOR SETS

DESCRIPTION AND OPERATION

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1. GENERAL (Figures 1, 2, and 3)

1.01 This section provides description and operation for 35 Receive-Only Typing Reperforator (ROTR) Sets. It is reissued to include information on private line sets, to add engineering changes, and to rearrange the text. Since there are many changes, marginal arrows ordinarily used to indicate changes and additions are omitted.

1.02 The 35 Receiving-Only Typing Reperforator Set is an electromechanical apparatus for receiving and recording on paper tape messages transmitted over various transmission facilities including telegraph lines, telephone networks and radio channels. Messages are received in the form of coded (teletypewriter) electrical signals and recorded on the tape both as fully-perforated code holes and typed characters. It will operate at speeds up to 100 words per minute.

1.03 On most ROTR Sets only the graphic characters are printed in black ink. Printing of control functions (such as EOT and signal bell) and unassigned code permutations is suppressed. On some sets, all characters are printed with the graphics in black and the control functions in red. In both cases, all information received is perforated in the tape.

2. VARIATIONS

2.01 ROTR sets are available in several configurations to meet varying installation and operational requirements.

(a) Individually Mounted Set - a single set with its own cover, base, and motor unit (Figure 1). With minor changes, this set is suitable for either private line or switched network use.

(b) Multiple-Mounted Set - Three typing reperforator units, mounted on one base, all driven by a single motor (Figure 3). A multiple reperforator and base may constitute a complete set, or two multiple reperforators may be combined in one cabinet. These sets, too, may be used for either private line or switched network application.

2.02 The operation of the ROTR Sets may differ from set to set depending on the equipment complement and the application (switched network or private line). Ordinarily, switched-network sets are connected to telephone lines and switching facilities through call control units and data sets, the latter of which convert the incoming tone frequency signals to dc pulses. In private line applications, the ROTR with other teletypewriter sets may be connected either

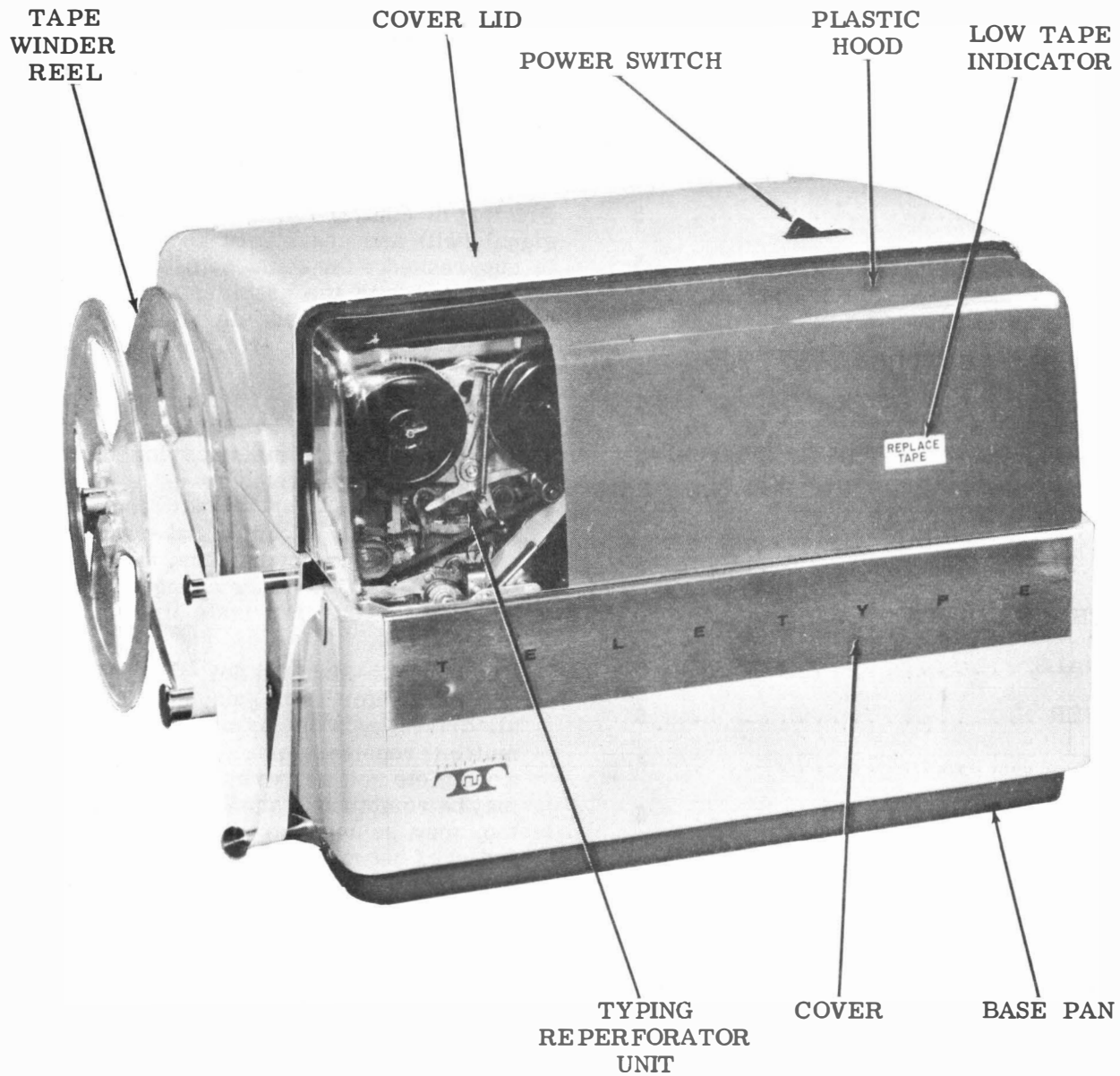


Figure 1 - Typical 35 Receive-Only Typing Reperforator Set

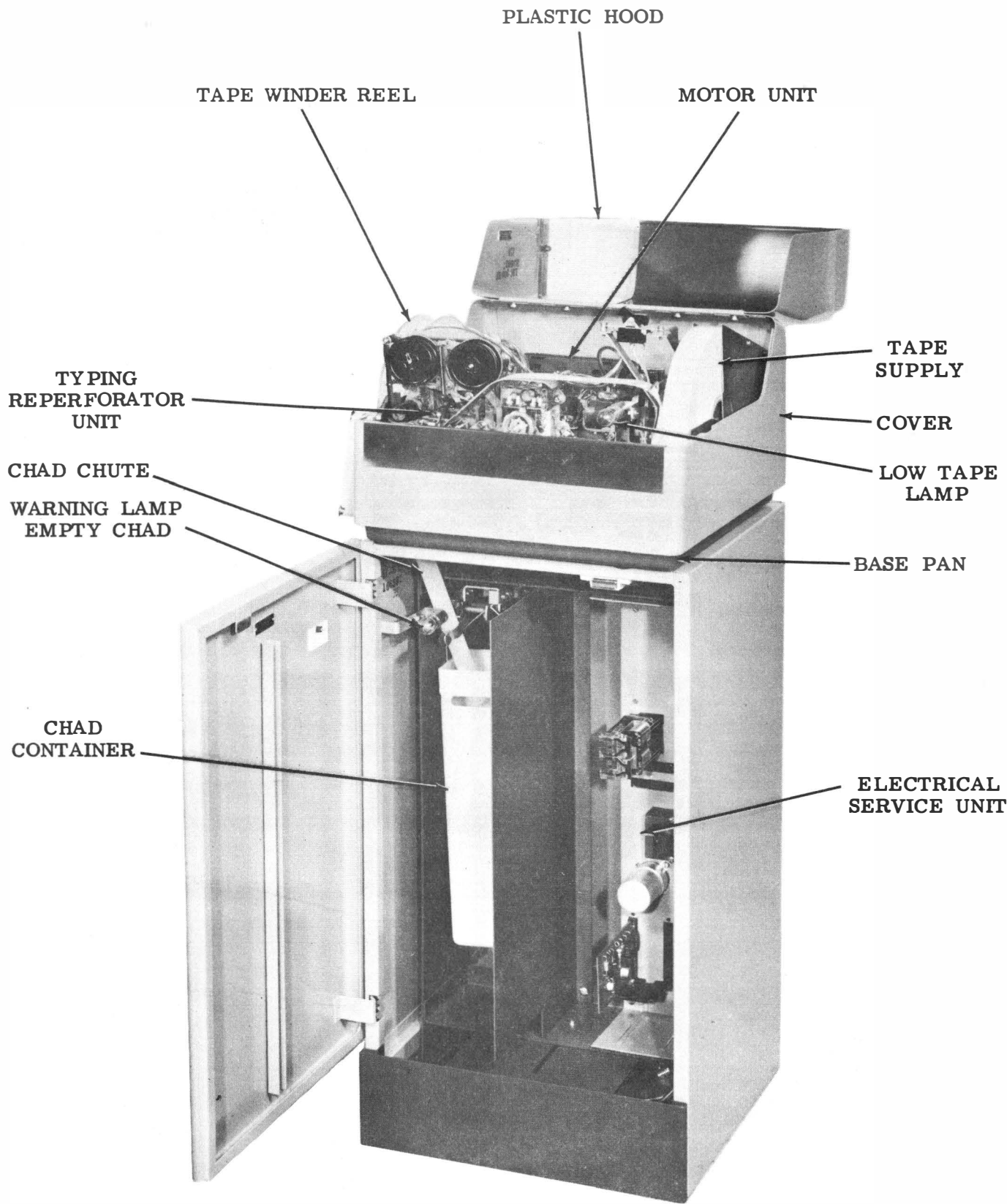


Figure 2 - Typical 35 Receive-Only Typing Reperforator Set with Table

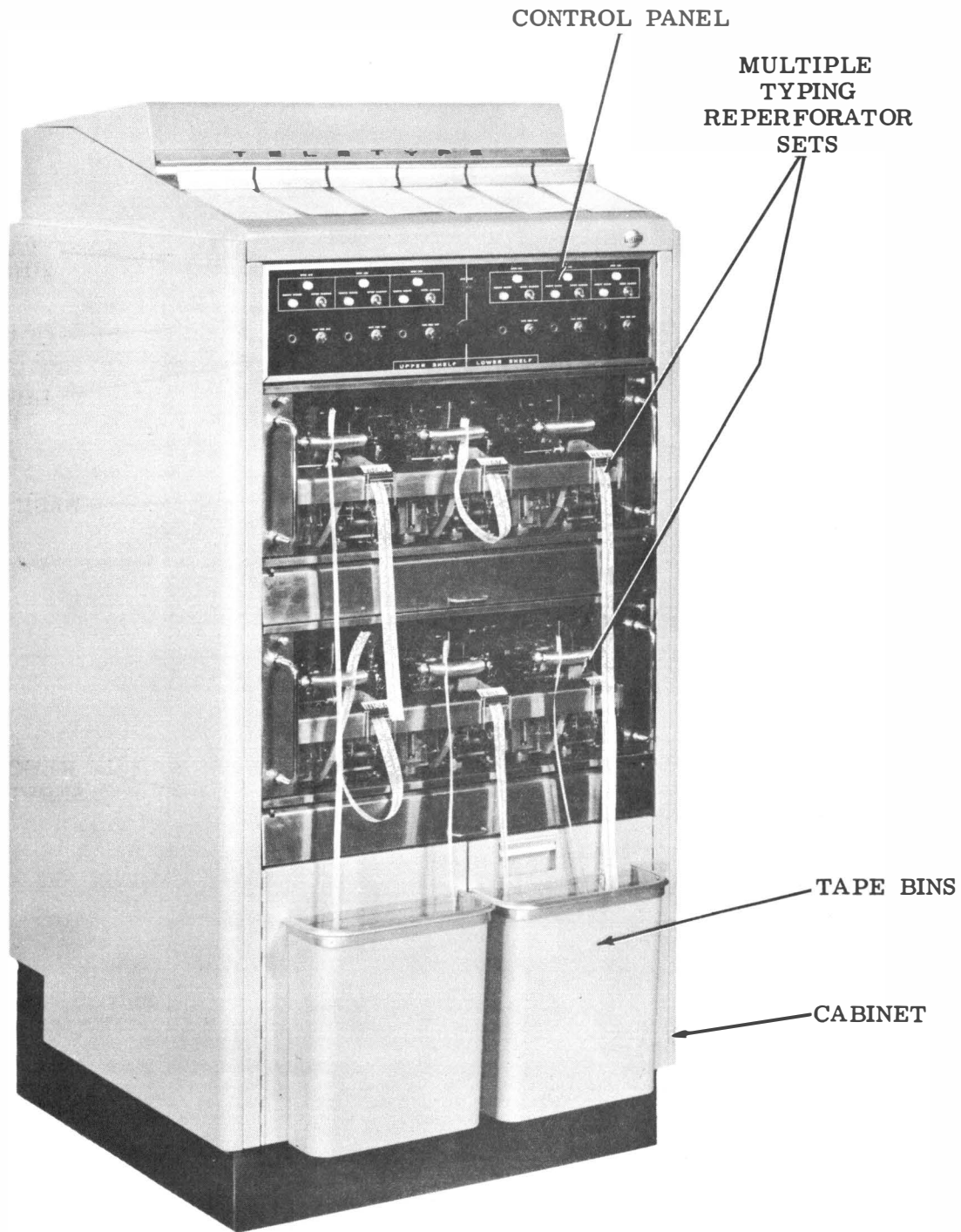


Figure 3 - Typical 35 Multiple Mounted Receive-Only Typing Reperforator Set



directly to a telegraph loop or through a data set to a dedicated telephone line.

### 3. COMPONENTS

3.01 The component complement of an ROTR set varies with the installation. At a minimum, it may consist of only a typing reperforator, motor unit, and base. However, it may consist of a typing reperforator unit, motor unit, electrical service unit, base, cover, and table. A multiple-mounted set has three typing reperforator units. These various components are each covered in detail in separate sections.

#### TYPING REPERFORATOR UNIT

3.02 The typing reperforator unit is a combination tape printer and punch. It receives teletypewriter signals electrically and translates them into motions which print and perforate messages in tape. Printing of the graphics occurs in black ink. Functions and unassigned graphics are either suppressed or printed in red ink, depending on the unit. A function box is included to provide special functions such as signal bell and EOT (end of transmission).

#### MOTOR UNIT

3.03 The motor unit furnishes the motive power for the typing reperforator and a tape winder mechanism where used. A synchronous or a series (governed) type motor may be used, depending on the power source. In a multiple-mounted set, a single motor drives three typing reperforator units.

#### ELECTRICAL SERVICE UNIT

3.04 The electrical service unit is a convenient center for interconnecting and mounting various electrical assemblies and components for the typing reperforator. The unit includes a terminal board and the cable assemblies which connect to it. It may also include the selector magnet driver, used to shape and amplify incoming signals. Generally, a rectifier, tape feed-out relay, and reperforator control relay, which can blind the reperforator to line signals, are also part of the electrical service unit.

#### BASE

3.05 The base provides a resilient mounting for the typing reperforator and motor unit. It has a pan to catch any oil or grease which might be thrown by the mechanisms. It

also includes tape facilities, an ON-OFF switch, and a drive mechanism and timing belt to transfer power from motor to reperforator. It may also have mechanisms to permit changes in operating speed. In a multiple-mounted set, a gear system can be used which will permit each of the typing reperforators to operate at its own speed.

#### COVER

3.06 The cover encloses the base and its mounted components. A hinged lid with a plastic front provides easy access to the interior for replenishing tape and ribbon supplies. On sets equipped with a tape-out warning system, the words REPLACE TAPE appear on the right side of the plastic front when the tape-out warning light goes on. Some sets have an audible alarm in parallel with the low-tape warning light so that a buzzer sounds when the tape is low. This buzzer can be silenced by operating a switch, but the light stays on until the tape is replenished.

#### TABLE

3.07 The reperforator table, used with the individually mounted set, supports the set and provides mounting facilities for an electrical service unit and chad container assembly. The chad container holds the chad for up to three 1000-foot rolls of 50% perforated, standard 1-inch tape.

### 4. VARIABLE FEATURES

4.01 When desired, the basic ROTR set can be modified at the factory or in the field for special operations such as:

- (a) Tape Feed Out - to provide a length of blank or rubout perforated tape at the end of a message for convenience in tape handling. Feed out may be interfering or non-interfering, manual or automatic.
- (b) Data Set Application - to permit the ROTR Set to operate with data sets requiring the EIA bipolar voltage interface.
- (c) Remote Control - to permit the set to be turned on and off from a distant station.
- (d) Tape Supply Warnings - to provide visual and audible indications when the tape supply should be replenished.
- (e) Chad Container Warning - to provide visual warnings that the chad container is practically full.

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(f) Print Suppression - to prevent printing the control and unassigned code permutations and, in some applications, selected graphic characters as well.

5. OPERATION

5.01 ROTR Sets are used in both private line and switched network applications.

PRIVATE LINE

5.02 In private line applications, the arrangement is such that the ROTR Sets always respond to all traffic on the signal line as long as the set is turned on.

5.03 Putting the power switch ON puts the motor into operation and turns on the set. Turning the power switch OFF shuts off the motor and the set. Since the selector magnet driver is energized whenever the signal line is idle, switching does not cause the reperforator to punch spurious characters.

5.04 Sets operating on private lines can be remotely controlled by adding a motor control relay in series with the line. In this case, the power switch is kept ON during operating hours, and the set is remotely controlled through the motor control relay. The sending station turns on the set by sending a BREAK and turns it off by sending the EOT (end of transmission) code.

SWITCHED NETWORK

5.05 In switched network applications, transmission is by means of tone (or frequency) modulation, and the ROTR set is connected to the line through a data set and call control unit. The data set converts the modulated signals to dc pulses. The call control unit permits the ROTR set to be called by rotary, pushbutton, or card dialing, depending on the equipment.

SET FUNCTIONS

5.06 The function box, a built-in switching device, provides means for remote control of the equipment. Of the six control functions available, two are programmed for the BELL and EOT code permutations, and four are for the customer's specific applications.

5.07 When the BELL function is received, the signal bell is operated through contacts in the function box.

5.08 In sets equipped with an electrical motor control assembly, receipt of the EOT code causes function box contacts to energize the motor control stop magnet. Where a data set is used, the EOT code causes the data set to provide a disconnect without introducing bit characters.

6. TECHNICAL DATA

SIGNALS

Code . . . . . 8-level American Standard Code for Information Interchange (ASCII)

Characteristics . . . 11-unit, equal bit code consisting of a start bit (always spacing); 8 intelligence bits (the eighth always marking except where the set is equipped to provide even parity); and a two-bit stop pulse (always marking)

Line Current

DC Signal . . . . . .020 or .060 ampere, marking; 0 ampere, spacing

Modulated Signal . .020 ampere furnished by data set which demodulates tone signal

Output of Selector

Magnet Driver . . . .500 ampere

POWER

Requirement . . . . . 115v ac ± 10%, single phase, 60 cycles ± 0.5 cycle

Fuse . . . . . 4 ampere time delay for set; 3/8 ampere for primary of selector magnet driver transformer

TAPE

Width . . . . . 1 inch  
Perforation . . . . . Fully perforated  
Character Count. . . 10 per inch  
Printing . . . . . Between feed holes

DIMENSIONS

Set Height . . . . . 34"  
Table Width. . . . . 13"  
Table Depth. . . . . 14"  
Table Height . . . . . 25-1/2"  
Base Width . . . . . 13-9/32"  
Base Length . . . . . 12-13/16"

35 RECEIVE-ONLY TYPING REPERFORATOR (ROTR) SETS  
 INSTALLATION

CONTENTS	PAGE	
1. GENERAL . . . . .	1	application. The procedures given are for a typical installation and apply generally to ROTR Sets consisting of the following components:
2. UNPACKING . . . . .	1	Table Model Sets (Figures 1 and 2)
3. TABLE MODEL SETS . . . . .	3	(a) Typing Reperforator Unit
ASSEMBLING THE COMPONENTS . .	3	(b) Base (with set of gears for a specific operating speed)
A. Electrical Service Unit . . . . .	3	(c) Cover
B. Intermediate Gears . . . . .	3	(d) Electrical Service Unit (See 1.03.)
C. Motor Unit . . . . .	3	(e) Table (See 1.03.)
D. Typing Reperforator Unit . . . . .	3	(f) Motor Unit
E. Gear Alignment . . . . .	5	Multiple Mounted Sets (Figure 4)
F. Tape Container . . . . .	6	(a) Typing Reperforator Units (3)
G. Tape Winder . . . . .	6	(b) Motor Unit
H. Chad Chute . . . . .	6	(c) Base (with sets of driven gears for specific operating speeds)
I. Base and Table . . . . .	6	1.03 To install table model ROTR Sets not equipped with the electrical service unit and table as shown in Figure 1, omit references to these components in the installation procedure (Part 3).
CONNECTING THE SIGNAL LINE . . .	6	1.04 Refer to the appropriate wiring diagrams for specific information concerning signal and power connections. Refer also to the appropriate sections for adjustments and lubrication required after installation is completed.
A. Private Line Sets . . . . .	6	1.05 All references to left or right and up or down are made from a position in front of the set.
B. Switched Network Sets . . . . .	6	2. UNPACKING
4. MULTIPLE MOUNTED SETS . . . . .	6	2.01 The components are usually packaged separately. Mounting hardware and other loose parts may be in a cloth bag attached to a
ASSEMBLING THE COMPONENTS . .	6	
A. Motor Unit . . . . .	6	
B. Typing Reperforator Units . . . . .	8	
C. Power and Signal Connections . . . . .	9	
5. OPERATIONAL CHECKOUT . . . . .	9	
1. GENERAL		
1.01 This section provides installation instructions for 35 Receive-Only Typing Reperforator (ROTR) Sets. It is reissued to include private line sets and to rearrange the text. Since there are many changes, marginal arrows ordinarily used to indicate changes and additions are omitted.		
1.02 The installation procedure for ROTR Sets will vary from set to set depending on the particular component complement and		

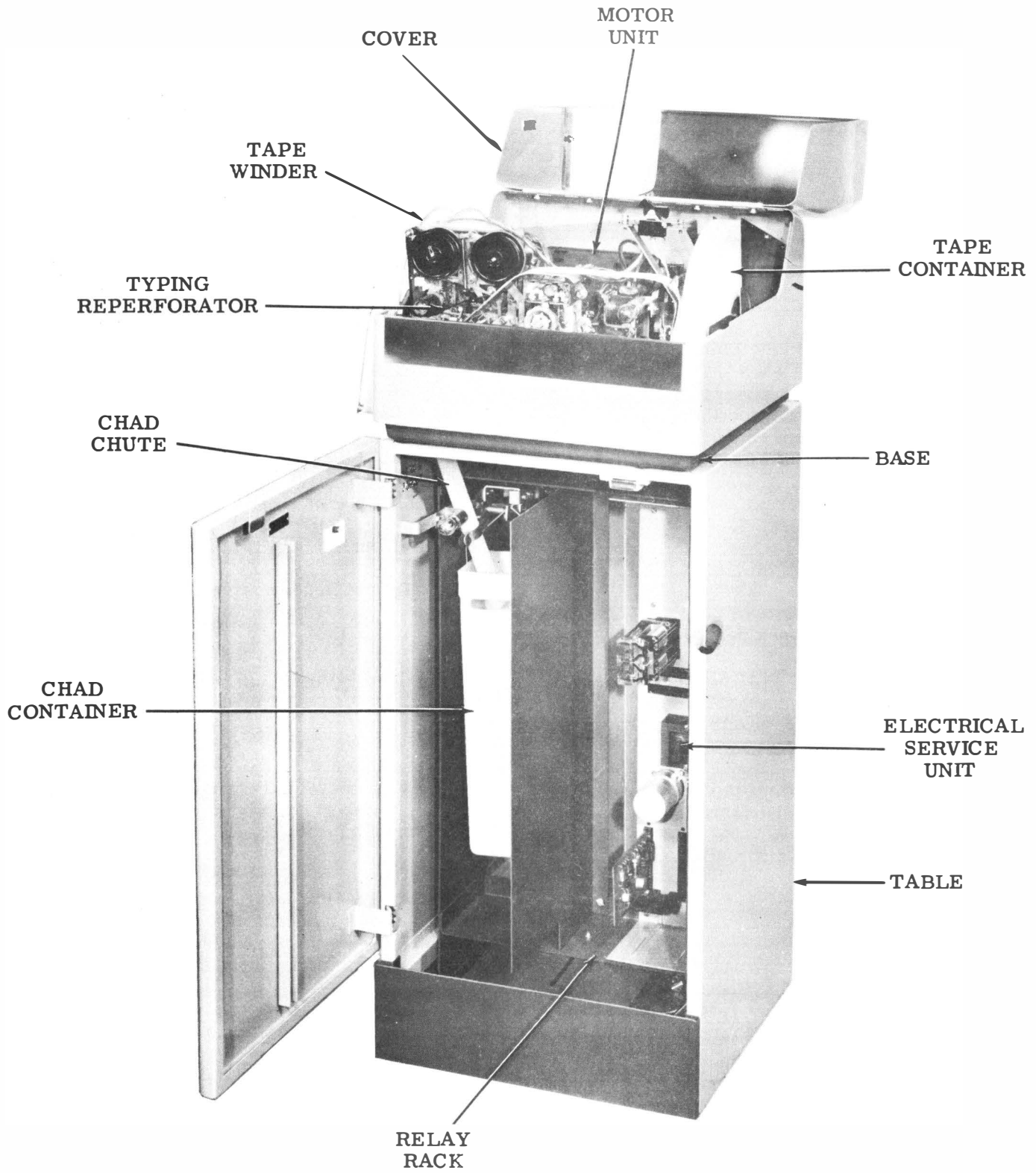


Figure 1 - Typical 35 ROTR Set

component or wrapped separately and packed in the same carton. Specific unpacking instructions and wiring diagrams are also included.

2.02 Unpack each of the cartons. Observe all unpacking instructions. Take care to avoid damaging the equipment or its finish. Keep loose bags and parts with the unpacked equipment.

### 3. TABLE MODEL SETS

ASSEMBLING THE COMPONENTS (Figures 1, 2, and 3)

#### A. Electrical Service Unit

3.01 Mount the electrical service unit to the far right side of the relay rack with the hardware furnished with the unit (Figures 1 and 2).

3.02 Pull the two cables on the electrical service unit through the rectangular hole in table top. Refer to the appropriate wiring diagrams for terminal connections.

#### B. Intermediate Gears

3.03 Remove the screws and lockwashers which hold the gear guard to the intermediate shaft casting on the base and set them aside with the gear guard (Figure 2).

3.04 Remove and retain the bag of driver gear hardware attached to the base.

3.05 Locate the proper driver gear and install it loosely on the hub (counterbored holes away from the hub) with the supplied hardware (Figure 3).

3.06 Slide the gear and hub (hub first) onto the intermediate shaft. Tighten the mounting screws. This is to align the gear and hub. Slide the two off the shaft, turn them around and slide them back on with the gear first. Replace the hub mounting screw and lockwasher.

3.07 Install the proper motor gear on the motor shaft with the screw and lockwasher furnished with the motor unit.

#### C. Motor Unit

3.08 Select the motor mounting stud and install it loosely into the motor mounting post nearest the intermediate shaft (Figure 3).

3.09 Install the adjusting bracket on the gear end of the motor unit with the hardware furnished. The center hole in the bracket should extend beyond the motor mounting plate. See Figure 3.

3.10 Place the motor (with bracket) over the motor mounting posts so that the holes in the bracket are above the posts. Install the motor unit mounting hardware (supplied with the motor unit) and tighten.

3.11 Install the sprocket on the hub of the typing reperforator unit with the hardware on the hub. The screw heads and lockwashers should be on the side of the deepest inset in the sprocket.

#### D. Typing Reperforator Unit

3.12 Place the typing reperforator unit over its mounting holes in the base (Figures 2 and 3).

3.13 Remove and retain the bag containing typing reperforator unit mounting hardware from the base.

3.14 Loosen the screw holding the L-shaped bracket to the left-front of the typing reperforator unit (Figure 3).

3.15 Place the screw lockwasher and flat washer in the L-shaped bracket and into the tapped hole in the base. Do not tighten yet.

3.16 Start the three screws, lockwashers, and flat washers through the holes in the typing reperforator unit casting. Do not tighten yet.

3.17 Press the L-shaped bracket against the base plate and tighten the screw holding the bracket to the typing reperforator unit.

3.18 Tighten the screw which holds the bracket to the base.

3.19 Tighten the three remaining mounting screws.

3.20 Loosen the three screws which hold the intermediate shaft assembly to the base. Place the timing belt (from the bag of parts) over the sprockets on the intermediate shaft assembly and typing reperforator unit (Figure 3). Take up slack in the belt by moving the intermediate shaft assembly away from the motor unit. The belt should have just enough slack so

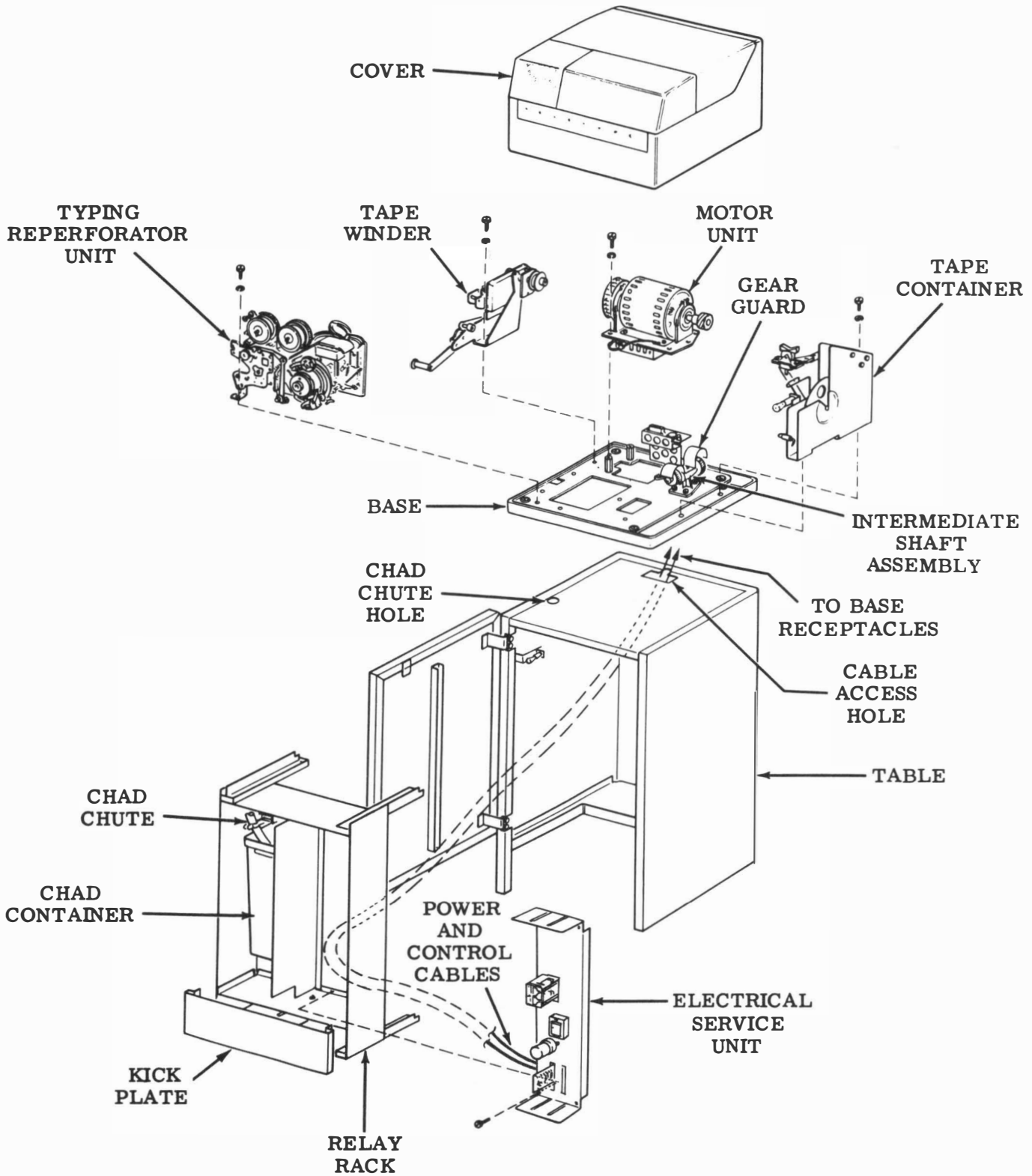


Figure 2 - 35 ROTR Set, Exploded View of Components

that a slight pressure near the middle will deflect the belt  $1/16$  of an inch. It should not be tight. Tighten the intermediate gear assembly mounting screws.

#### E. Gear Alignment

3.21 The gears should have a barely perceptible amount of backlash at the closest point between the motor gear and its driven gear. Adjust by rotating the adjusting stud in

the motor mounting post under the gear end of the motor unit (Figure 3).

3.22 If the gears do not mesh at right angle, shift the intermediate gear bracket. Keep proper tension on the timing belt. Tighten mounting screws and recheck backlash.

3.23 Install the gear guard on the intermediate shaft assembly (Figure 2).

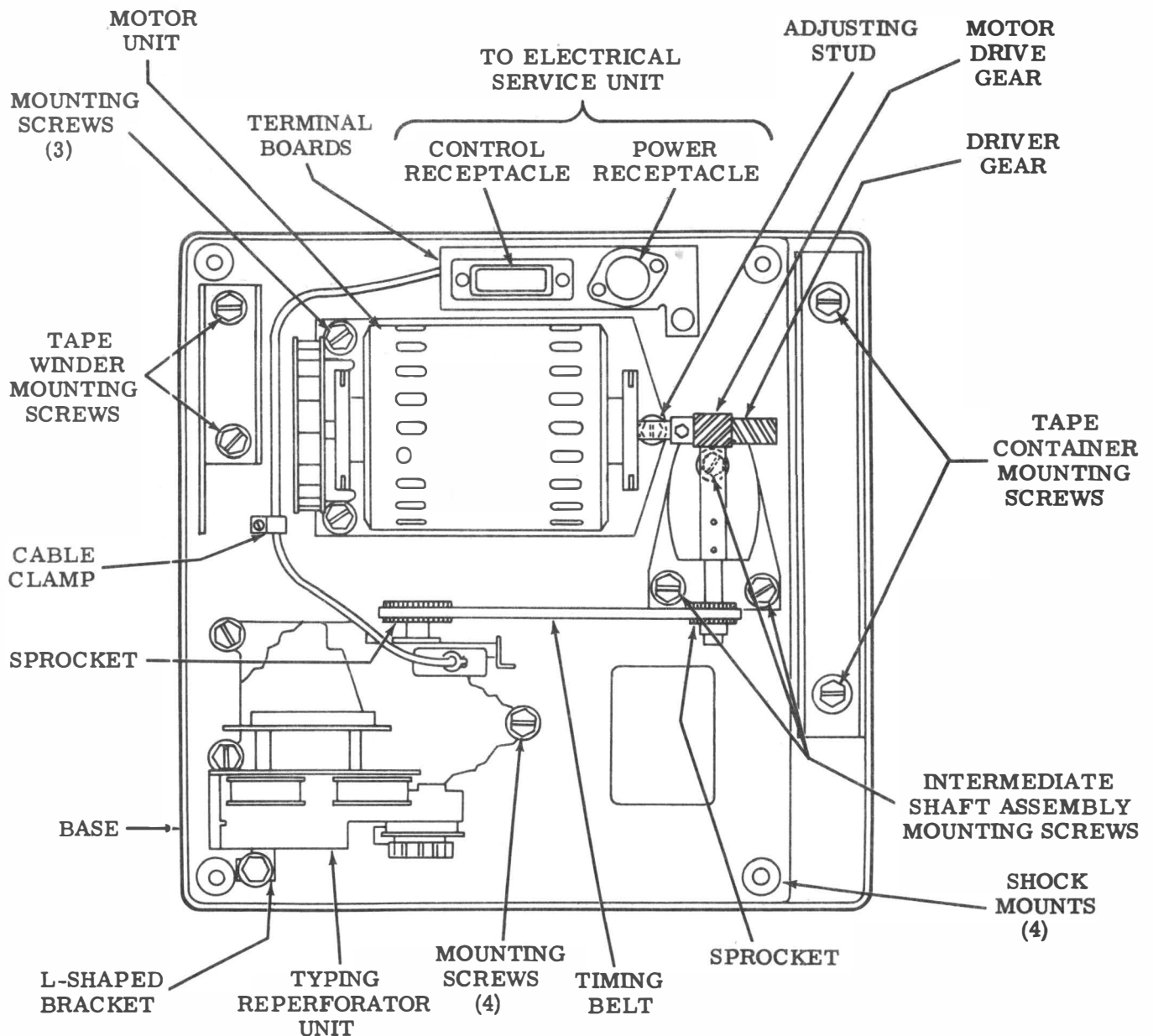


Figure 3 - 35 ROTR Set, Top View, Cover Removed

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### F. Tape Container

3.24 Mount the tape container onto the right side of the base with two screws, lockwashers and flat washers (Figure 2).

### G. Tape Winder

3.25 Mount the tape winder to the left rear corner of the base with two screws and lockwashers (Figure 2).

3.26 Install the tape winder pulley on the motor shaft with a screw and two lockwashers and flat washers.

3.27 Install the belt between the motor pulley and tape winder pulley.

### H. Chad Chute

3.28 Install the chad chute on the typing reperforator unit with two screws, lockwashers, and flat washers.

### I. Base and Table

3.29 Place the base on the table with the shock mounts over the locating screw heads on the table top. Make sure the power switch is off. Connect the cable and power cord and fasten them to the base by means of the cable clamp provided on the base. Refer to the appropriate wiring diagrams for terminal connections.

3.30 Clamp the control cable from the electrical service unit to the bottom of the table top with the clamp provided. Provide sufficient slack in the cable so that the relay rack may be pulled out for servicing.

3.31 Connect the cable with two leads on the chad disposal assembly to the wiring field of the electrical service unit as indicated in the appropriate wiring diagram.

3.32 Position the relay rack under the table. Push the plastic chad chute up through the hole in the table top and into engagement with the chad chute on the typing reperforator unit (Figure 2).

3.33 The plastic tube should overlap with the chad chute at least one inch. Position the chad chute so that the cut-out partition of the tube faces the rear. Position the kick plate so that it rests against the front edge of the table.

3.34 Place the cover on the base.

## CONNECTING THE SIGNAL LINE

### A. Private Line Sets

**CAUTION: MAKE SURE THE SET'S POWER CORD IS NOT CONNECTED TO THE POWER SOURCE BEFORE PROCEEDING.**

3.35 Remove the cover from the terminal block on the basic facilities assembly of the electrical service unit. Connect the signal line to the terminal block as indicated on the appropriate wiring diagram. Replace the cover after the connections are made.

3.36 For half duplex operation two signal line connections (positive and negative) are required.

3.37 When the ROTR Set is used in conjunction with Send-Receive Sets in a full-duplex application, two connections are made for the receive loop (positive and negative) and, in addition, both sides of the send loop at the ROTR set are taped together to complete the circuit.

### B. Switched Network Sets

3.38 Refer to the appropriate wiring diagram for cabling information between the ROTR Set and the call control unit in the associated ASR or KSR Set.

## 4. MULTIPLE MOUNTED SETS

### ASSEMBLING THE COMPONENTS (Figure 4)

#### A. Motor Unit

4.01 Remove the gear guard from the base.

4.02 Install the motor pinion on the motor shaft with the screw and lockwasher on the shaft.

4.03 Screw the motor mounting stud (included in a bag attached to the base) loosely into the motor mounting post.

4.04 Remove the motor adjusting bracket and its four mounting screws and lockwashers from the bag attached to the base. Mount the adjusting bracket to the gear end of the motor unit with two screws and lockwashers. The center hole in the adjusting bracket extends beyond the mounting plate.

4.05 Place the motor unit over the three motor mounting posts with the hole in the adjusting bracket passing over the stud nearest



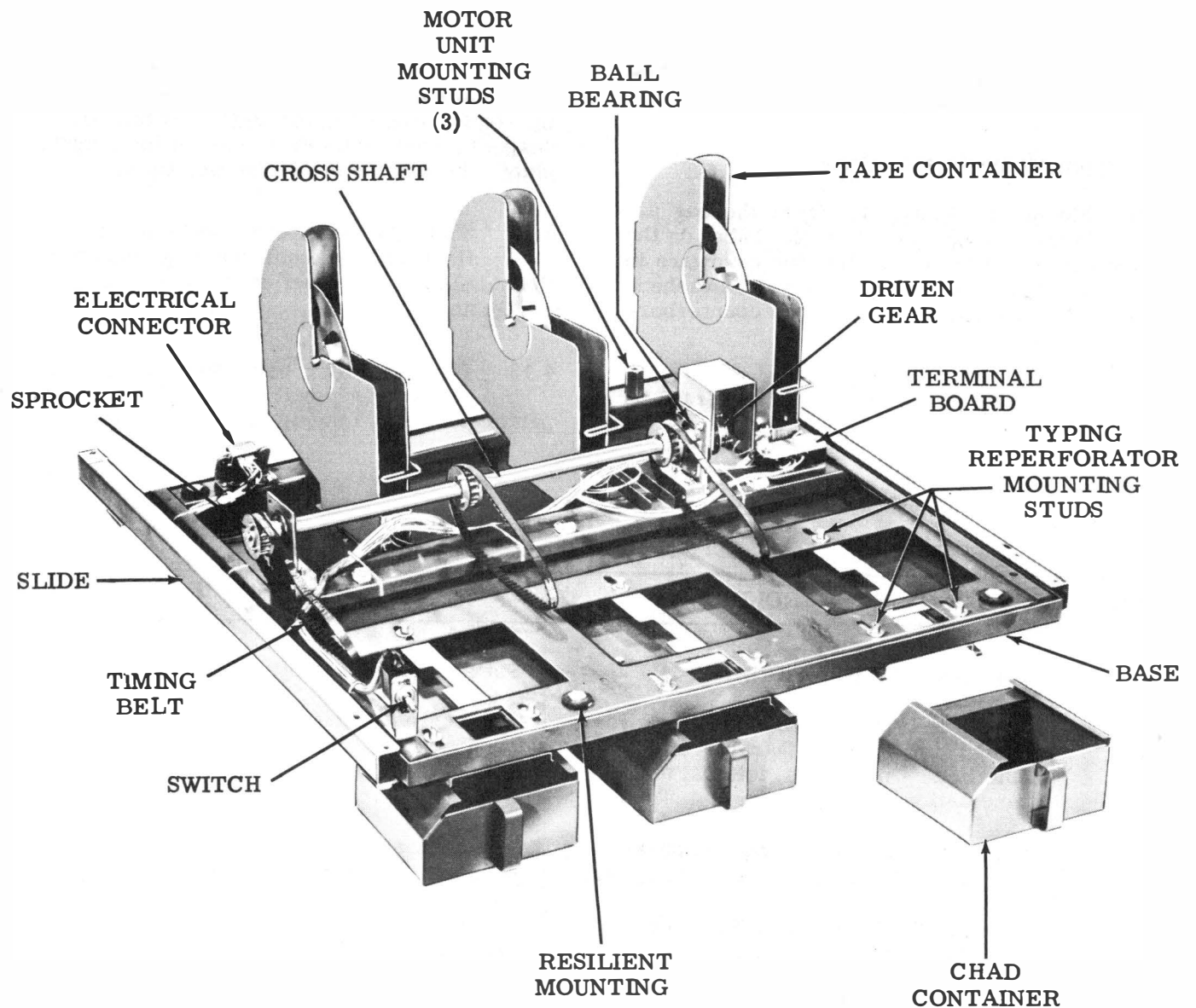


Figure 4 - Typical 35 Multiple Typing Reperforator Base (Gear Guard Removed)

the driven gear. Fasten the far end of the motor unit to the two posts with two screws and lockwashers.

4.06 Place a nut and lockwasher on the stud which holds the motor adjusting plate. Do not tighten yet.

4.07 Select the appropriate mating gear for the motor pinion and install it on the right end of the cross shaft using the hardware in the gear hub.

Note: To properly secure the inner races of the ball bearings to the cross shaft (both ends), check that the retaining rings are seated properly in their grooves. Tighten the screw in each end of the cross shaft before tightening the screws that fasten the gear hubs to the cross shaft.

4.08 Adjust the gear mesh of the motor pinion and driven gear by adjusting the stud in the motor mounting post up or down as required. The gears should have a barely perceptible amount of backlash at their point of minimum

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clearance. Tighten the nut on the stud while holding the stud in position.

**B. Typing Reperforator Units**

4.09 Mount the sprockets (from the bag attached to the base) to the hubs on the typing reperforator units. Use the hardware in the hub. The screw heads and lockwashers should be on the side of shallowest counterbore in the sprockets.

4.10 Place a unit over its mounting studs on the base.

4.11 Remove the hardware holding the L-shaped bracket to the mounting plate of the typing reperforator unit. Install the L-shaped bracket on the front side of the mounting plate. Tighten the screw friction tight.

4.12 Start three screws, lockwashers, and flat washers (from the bag attached to the base) into the proper studs on the base. Do not tighten yet.

4.13 Place a timing belt over the sprockets on the cross shaft and the left typing reperforator unit. Take up slack in timing belt by

TABLE I - OPERATIONAL CHECKS

STEP	PROCEDURE	FUNCTION
1.	Turn the set's power ON.	Set's motor should operate.
2.	Sequentially depress each of the keys assigned to graphic characters (non-functions) - numerals, letters, and punctuation marks.	The corresponding symbols should be punched and printed on the tape.
3.	With SHIFT key depressed, depress each of the keys for graphic characters.	The corresponding symbols should be punched and printed on the tape.
4.	With the REPT key depressed, depress any graphic character key.	Repeated punching and printing of the selected character should occur.
5.	Depress the RETURN key.	Punching of the RETURN code should occur but printing should be suppressed*.
6.	Depress the LINE FEED key.	Punching of the LINE FEED code should occur but printing should be suppressed*.
7.	Depress the RUBOUT key.	The RUBOUT code should be punched but printing should be suppressed*.
8.	With the CTRL key depressed, depress the BELL key.	The signal bell should ring (if set is so equipped), the BELL code should be punched, but printing should be suppressed*.
9.	With the CTRL key depressed, depress the EOT key.	Private line sets with electrical motor control should turn off. Switched network sets should disconnect.  * Printing should occur in red on sets equipped with two color ribbons.

moving the unit away from the cross shaft. There should be just enough slack so that a slight pressure in the middle of the belt will cause it to deflect 1/8 inch.

- 4.14 Tighten the mounting screws holding the typing reperforator unit.
- 4.15 Press the L-shaped bracket against the base plate and tighten the screw which holds the bracket to the typing reperforator unit.
- 4.16 Secure the L-shaped bracket to the base with the screw, lockwasher, and flat washer supplied.
- 4.17 Repeat the above procedure for each typing reperforator unit.
- 4.18 Reinstall the gear guard. Install the chad containers.

## C. Power and Signal Connections

- 4.19 Refer to the appropriate wiring diagrams for power and signal line connections.

## 5. OPERATIONAL CHECKOUT

- 5.01 Arrange the equipment in a test circuit and perform the procedures listed in Table 1. The test circuit must include a sending set (eg, ASR or KSR), for the ROTR has no sending facilities. References to depression of keys in Table 1 apply to this sending set.
- 5.02 Should the equipment fail to operate satisfactorily after installation, make a visual inspection to determine if the trouble is caused by loose signal or power connections, improperly set switches, erratic motor speed, etc. Otherwise, refer to the appropriate trouble shooting section.



35 RECEIVE-ONLY TYPING REPERFORATOR SET  
TROUBLE SHOOTING

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1. GENERAL

1.01 This section provides trouble shooting for the 35 Receive-Only Typing Reperforator (ROTR) Set. Refer to appropriate sections for additional servicing information (eg, adjustments and lubrication).

1.02 The trouble shooting procedure consists of operational and electrical checks which can be used to isolate troubles in the ROTR Set. A thorough understanding of the operating principles of the set and its components is important. Refer to the appropriate sections for this information.

1.03 The method used is to first identify the faulty component, then determine which mechanism or electrical part in the component has failed. The procedure below includes suggestions for isolating the faulty component and locating the defective part. A more detailed procedure is given in Table II.

2. TERMS

2.01 Terms used in the trouble shooting procedures are explained below:

2.02 An open condition refers to a circuit through which current will not flow because of a break, poor connection, or a defective

contact mechanism. A closed condition is a normally- or intermittently-open circuit through which current will flow because of a short, sticky, dirty, or poorly adjusted contact mechanism.

2.03 Running open is a condition created by an open signal circuit which causes continuous operation of the printing and perforating mechanisms. With an open signal circuit there are no marking bits and the typing reperforator unit's function clutch does not latch.

2.04 Running closed is a condition created by a closed signal circuit and results in failure of the printing and perforating mechanisms to respond to a signal. The cause may be missing start and spacing bits in the signal, or mechanical failure.

2.05 Garbling is a condition in which the response of the printing and perforating mechanisms does not correspond with the signal input.

2.06 Blind is a condition in which the set is turned off or disconnected to assure non-response to various signal inputs.

3. VISUAL INSPECTION

3.01 Make a visual inspection of the equipment to determine if the trouble is caused by loose signal or power connections, improperly set switches, erratic motor speed, or improper range finder setting.

4. TEST CIRCUIT AND OPERATIONAL CHECKS

4.01 Arrange the equipment in a test circuit and perform the procedures listed in Table I. Although this procedure is usually performed after installation of new or repaired equipment, it is also useful in localizing troubles at other times. The test circuit must include a sending set (eg, ASR or KSR), for the ROTR has no sending facilities. References to depression of keys in Table I apply to this sending set.

TABLE I - OPERATIONAL CHECKS

STEP	PROCEDURE	FUNCTION
1.	Turn the set's power ON.	Set's motor should operate.
2.	Sequentially depress each of the keys assigned to graphic characters (non-functions) - numerals, letters, and punctuation marks.	The corresponding symbols should be punched and printed on the tape.
3.	With SHIFT key depressed, depress each of the keys for graphic characters.	The corresponding symbols should be punched and printed on the tape.
4.	With the REPT key depressed, depress any graphic character key.	Repeated punching and printing of the selected character should occur.
5.	Depress the RETURN key.	Punching of the RETURN code should occur but printing should be suppressed.*
6.	Depress the LINE FEED key.	Punching of the LINE FEED code should occur but printing should be suppressed.*
7.	Depress the RUBOUT key.	The RUBOUT code should be punched but printing should be suppressed.*
8.	With the CTRL key depressed, depress the BELL key.	The signal bell should ring (if set is so equipped), the BELL code should be punched, but printing should be suppressed.*
9.	With the CTRL key depressed, depress the EOT key.	Private line sets with electrical motor control should turn off. Switched network sets should disconnect.
		* Printing should occur in red on sets equipped with two color ribbons.

## 5. ELECTRICAL CHECKS

**5.01 Electrical Troubles:** Most electrical troubles occur at the various contacts in the equipment. These include switch contacts, plug-in connector and pin contacts, wiring field terminals, soldered contacts (including spliced wires), and chassis ground contacts. The electrical circuits in the ROTR Set have terminal connections at the points where tests should be made. Do not disturb the wiring more than necessary when testing or inspecting. Use the appropriate schematic and actual wiring diagrams for point-to-point circuit checks.

**5.02 Power Supply Checks:** Check the input power and ac circuits before making other tests. This should include a check of the

normal operation of the parts in these circuits and the requirements of all adjustments which may be affected by the trouble. When checking adjustments, do not disturb the adjustment or related adjustments. Check for interruptions in the ac power input by checking the power cord connections on the terminal board (usually in the electrical service unit). Check for open fuses. If the power fuse is open, rotate the associated motor by hand and check for excessive mechanical load before replacing the fuse. If a replaced fuse opens immediately after installation, check for shorted wiring in the motor unit, selector magnets, or copy light transformer.

**5.03 Continuity Checks:** The continuity check is used to locate suspected open circuits. When making continuity checks, be sure parallel

current paths are disconnected. Make the test by checking the continuity through the suspected faulty circuit. Be sure no other part is shunting the circuit being tested. If necessary, disconnect certain leads. Check all suspected circuits in this manner. If after all possible causes have been checked and the fault cannot be located, make a continuity check of the entire circuit. If continuity is indicated, test one-half of the circuit. Continue subdividing the circuit until the open point is definitely located.

**5.04 Resistance Checks:** The resistance check is used to locate suspected open or shorted coil windings, transformer windings, motor windings, fixed resistors and inductors. Make these checks following the same general procedures used in continuity checks (5.03).

**5.05 Capacitor Checks:** The capacitor check is used to locate shorted or partially shorted (leaky) capacitors. To make the test, first discharge the suspected capacitor with an insulated shorting jumper. Then disconnect one lead and connect the capacitor to an ohmmeter. Use the highest resistance range. A good capacitor is indicated when the ohmmeter pointer moves up the scale rapidly and then returns slowly toward the infinity mark. An open capacitor will indicate a constant reading of infinite ohms. A shorted capacitor will give a

reading of constant value between zero and infinity, depending on the resistance of the short.

**WARNING: BE EXCEPTIONALLY CAREFUL WHEN HANDLING CHARGED CAPACITORS. A SEVERE ELECTRICAL SHOCK MAY BE RECEIVED FROM THE CAPACITOR OR LEADS CONNECTED TO A POWER SUPPLY IN OPERATION. REMOVE THE AC POWER CORD FROM THE OUTLET BEFORE PERFORMING THE CONTINUITY, RESISTANCE, AND CAPACITOR CHECKS.**

## 6. TROUBLE SHOOTING CHART

Equipment failures can be traced functionally with the trouble shooting chart, Table II. A step-by-step analysis of the equipment's behavior in response to the listed checks will indicate in which area the trouble exists. Since in most cases each step is conditioned by the procedures in preceding steps, note the condition of all controls before rechecking steps or performing checks out of sequence. Comprehensive electrical analysis is not usually required in trouble shooting this equipment.

Note: Refer to appropriate schematic and actual wiring diagrams when making electrical checks.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
1.	Power switch off; motor off; reperforator selector mechanism energized.	Motor is on. Reperforator selector mechanism de-energized.	Check wiring at power switch. Check signal line continuity. Check output of selector magnet driver. Check for an open circuit between selector magnet coils and selector magnet driver. Check continuity and resistance of selector magnet coils.

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
1. Cont.			<p>Check adjustment of selector mechanism armature spring. See appropriate section.</p> <p>Check adjustment of selector mechanism range finder. See appropriate section.</p>
2.	<p>Power switch on; motor on; reperforator selector mechanism energized. Set not equipped with electrical motor control (Step 5).</p>	<p>Motor is off.</p> <p>Synchronous motor unit runs at incorrect speed.</p> <p>Reperforator selector mechanism de-energized.</p>	<p>Check power line connections.</p> <p>Check wiring at power switch.</p> <p>Check wiring between motor unit and electrical service unit.</p> <p>Check thermostatic cutout switch in motor unit (if so equipped).</p> <p>Check that power line frequency is correct (60 cps).</p> <p>Check signal line continuity.</p> <p>Check output of selector magnet driver.</p> <p>Check for an open circuit between selector magnet coils and selector magnet driver.</p> <p>Check continuity and resistance of selector magnet coils.</p> <p>Check adjustment of selector mechanism armature spring. See appropriate section.</p> <p>Check adjustment of selector mechanism range finder. See appropriate section.</p>
3.	<p>ROTR Set properly prints and perforates all nonfunction characters received from sending equipment.</p>	<p>Reperforator runs closed - does not receive the transmitted information.</p>	<p>Check signal line to verify presence of marking and spacing bits.</p> <p>Check output of selector magnet driver.</p> <p>Check selector mechanism armature spring adjustment. See appropriate section.</p>



TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
3. Cont.		<p>Selector mechanism receiving margin is short.</p> <p>Reperforator makes intermittent errors or garbles.</p>	<p>Check that selector magnet driver input is not shorted.</p> <p>Check output of selector magnet driver (0.500 amperes).</p> <p>Check selector mechanism for foreign matter or oil between magnets and armature.</p> <p>Check selector mechanism adjustments. See appropriate section.</p> <p>Check motor speed.</p> <p>Check output of selector magnet driver (0.500 amperes).</p> <p>Check selector mechanism for foreign matter or oil between magnets and armature.</p> <p>Check selector mechanism adjustments. See appropriate section.</p> <p>Check motor speed.</p> <p>Check printing and perforator mechanism adjustments. See appropriate section.</p>
4.	<p>When signal code combination for signal bell is received from sending equipment, ROTR Set bell rings, the code combination is perforated, and printing of the function is suppressed.</p>	<p>Signal bell does not ring.</p>	<p>Check continuity of signal bell circuitry.</p> <p>Check signal bell function box contacts for an open condition. Contacts should be closed.</p> <p>Check that code combination has been set up properly in selector mechanism.</p> <p>Check that function box function lever has operated properly.</p> <p>Check that function box function lever is properly coded.</p>

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
4. Cont.		Printing is not suppressed.	<p>Check continuity of print suppression magnet circuitry.</p> <p>Check operation of print suppression contacts in reperforator.</p> <p>Check adjustment of print suppression lever (located under print suppression magnet). See appropriate section.</p>
5.	ROTR Set equipped with electrical motor control; set is off; operation of BREAK key at sending equipment turns the set's motor on.	<p>Motor remains off.</p> <p>Reperforator selector mechanism is de-energized.</p>	<p>Check power contact and wiring in electrical motor control assembly for continuity.</p> <p>Check power line connections.</p> <p>Check wiring at power switch.</p> <p>Check wiring between motor unit and electrical service unit.</p> <p>Check thermostatic cutout switch in motor unit (if so equipped).</p> <p>Check motor start magnets in electrical motor control assembly for proper de-energize-energize sequence. This sequence must occur to close contacts and turn the set on.</p> <p>Check signal line continuity.</p> <p>Check output of selector magnet driver.</p> <p>Check for an open circuit between selector magnet coils and selector magnet driver.</p> <p>Check continuity and resistance of selector magnet coils.</p> <p>Check adjustment of selector mechanism armature spring. See appropriate section.</p> <p>Check adjustment of selector mechanism range finder. See appropriate section.</p>

TABLE II - TROUBLE SHOOTING CHART FOR ROTR SETS (Cont.)

STEP	PROCEDURE AND NORMAL INDICATION	TROUBLE	CHECK
5. Cont.		<p>Motor start magnets in electrical motor control assembly energize each time a marking bit is received.</p> <p>ROTR Set does not turn off upon receipt of EOT (end of transmission) code combination from sending equipment.</p>	<p>Check continuity across motor start magnet shunt contacts.</p> <p>Check electrical motor control assembly internal wiring, specifically in area of motor start magnets and shunt contacts.</p> <p>Check continuity of motor stop magnets and related wiring.</p> <p>Check that EOT code combination has been set up properly in selector mechanism.</p> <p>Check operation of function box function lever.</p> <p>Check function box function bar coding.</p> <p>Check operation and continuity of function box contacts.</p>



35 ELECTRICAL SERVICE UNIT

GENERAL DESCRIPTION AND PRINCIPLES OF OPERATION

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1.02 The 35 electrical service unit serves as an area of concentration for the wiring of 35-type apparatus and provides mounting facilities for various electrical assemblies and components.

1.03 The operational facilities provided by the electrical service unit vary, depending upon the number and complexity of functions performed by the set.

1.04 Complete operation of an electrical service unit requires connections with other components of a set with which it is used. Additional information concerning the support functions of the unit may be found in sections discussing specific components and complete sets. Only independent features in the electrical service unit are discussed in this section, under principles of operation.

1.05 The electrical service units discussed in this section are used in all models of the following sets:

- (a) 35 Receive Only (RO) Set.
- (b) 35 Keyboard Send-Receive (KSR) Set.
- (c) 35 Automatic Send-Receive (ASR) Set.
- (d) 35 Receive Only Typing Reperforator (ROTR) Set.

These sets may be utilized in a variety of installation configurations, including: private line applications, data communications networks, circuit switching networks, and computer installations.

1. GENERAL

1.01 This section has been generally revised to include information on recent 35 electrical service units. Because this issue is a general revision, marginal arrows that indicate changes have been omitted.

2. DESCRIPTION (See Figures 1, 2, and 3)

2.01 The electrical service unit consists, basically, of a rectangular, metal chassis (or container) and a number of mounting plate assemblies. Each mounting plate assembly consists of a functional group of components. They are mounted on the chassis and are interconnected, as required, with strapping.

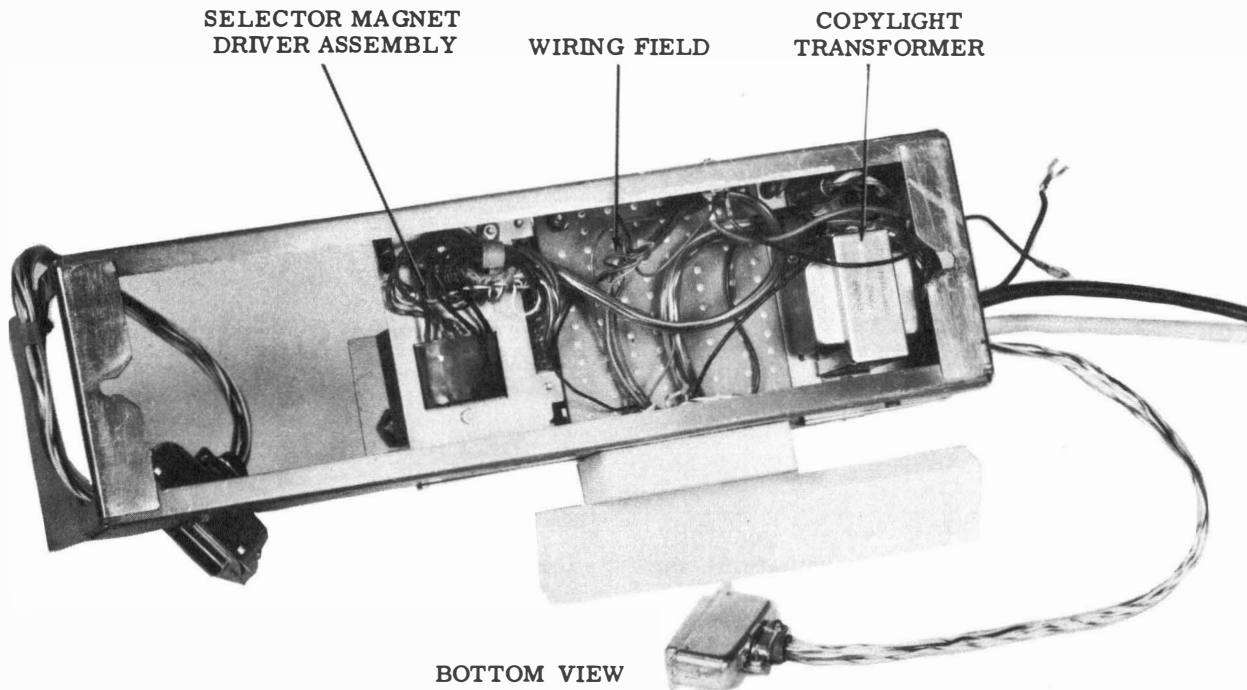
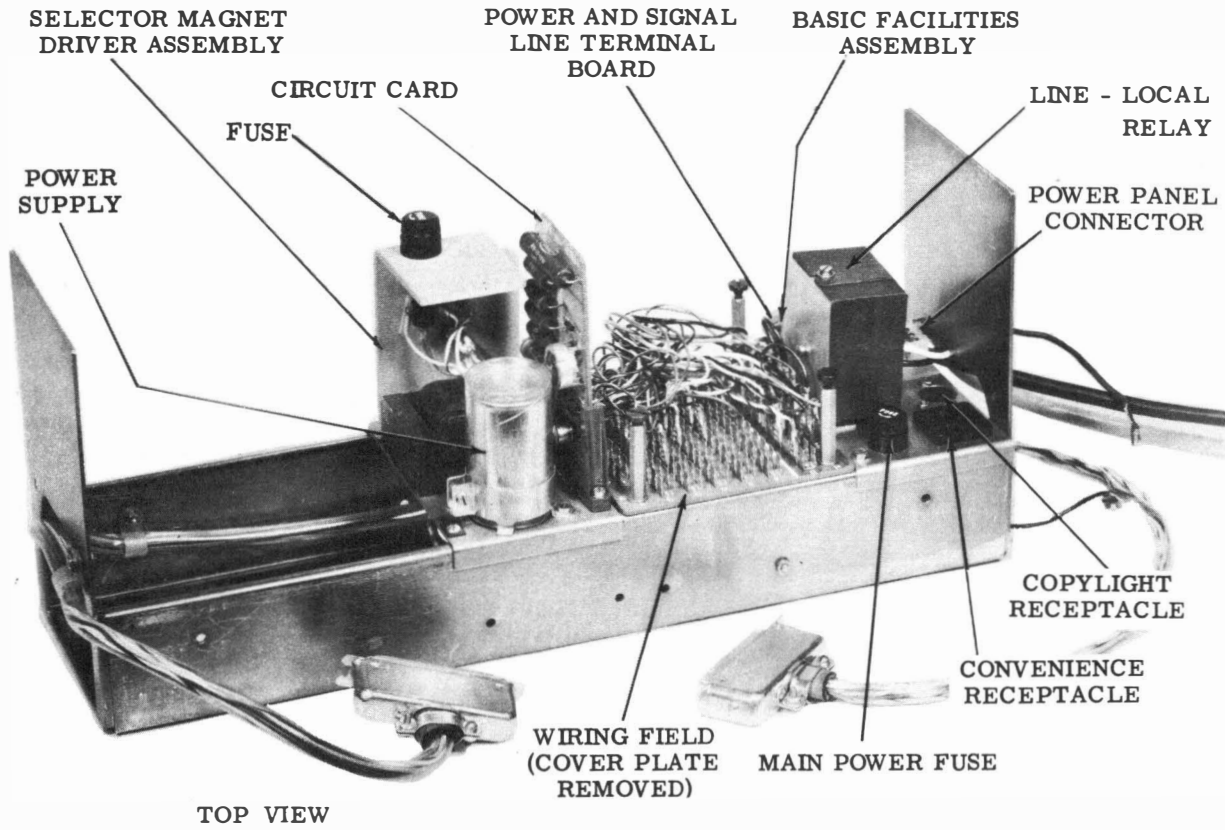


Figure 1 - Typical Electrical Service Unit for 35 KSR Set

2.02 Some of the features that may be mounted on the unit are listed below:

- (a) A copylight transformer to supply power to the set's copylights.
- (b) A copylight receptacle.
- (c) A convenience receptacle.
- (d) Fuses for protection of the main power and other circuits.
- (e) A power and signal line terminal board.
- (f) A line-local relay to provide switching to either online or independent, local operation.
- (g) A main terminal board to provide a wiring field for connection of cable assemblies to the electrical service unit.
- (h) A motor control relay for remote control of the set's motor.
- (i) A main power on-off switch.
- (j) Ground strapping.
- (k) Cable assemblies, as required, for interconnection with other components of the set. The set's power cord may also be included.
- (l) A transistorized selector magnet driver assembly, to amplify the incoming line signal to 500 milliamperes for operation of the receiving circuit selector magnets. More than one assembly may be installed to accommodate the receiving circuits of a set. For example, in an ASR set, two assemblies may be used: one for the typing unit, the other for a reperforator.
- (m) A signal regenerator circuit to improve the output of the keyboard signal generator.
- (n) A tape feed-out relay to pulse a reperforator's tape feed-out magnet.
- (o) A reperforator control relay to blind a typing reperforator's selector magnets to line signals.
- (p) An automatic turn around traffic control circuit card and disabling switch.
- (q) Control panel and cable assemblies, typically consisting of two panels and cabling. One panel may support the mode and other pushbutton controls, the other the end-of-line indicator lamp. In some electrical service units, only the cabling to the external controls panels is provided.
- (r) A noncontention (NCT) relay to prevent a sending station's answer-back from operating when transmitting a WRU code.
- (s) Automatic mode switch relays, or a manually operated rotary mode selector switch.
- (t) A line jack connected across the external signal line for testing purposes.
- (u) An auxiliary power supply.
- (v) Character counter suppression components.
- (w) A line-shunt relay, used in conjunction with a line test key and an auxiliary power supply, to allow local set operation.

2.03 The electrical service unit used with standard (dc) sets is wired to provide half duplex signal line operation. The unit may be wired (optional) to obtain full duplex operation, which permits receiving messages and transmitting them at the same time without interference between the two signals. This is accomplished by electrically separating the sending and receiving loops of the set by making wiring changes in the electrical service unit and connecting the loops to the appropriate duplex signal lines.

### 3. PRINCIPLES OF OPERATION

#### GENERAL

3.01 Since the major function of the electrical service unit is to provide support for circuit facilities, only general operating principles of selected components are presented below. Detailed operating principles will be found in the sections which discuss these components in relation to set operation.

3.02 The wiring diagram for the electrical service unit is incorporated into the schematics which appear in the appropriate section for each 35 set (ie, RO, KSR, and ASR).

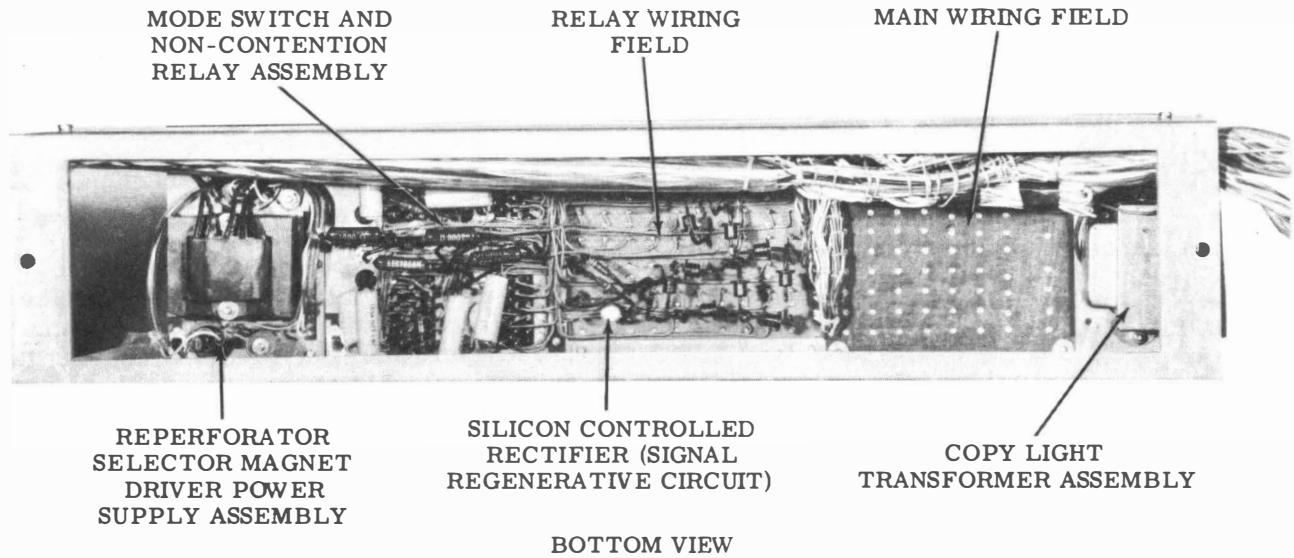
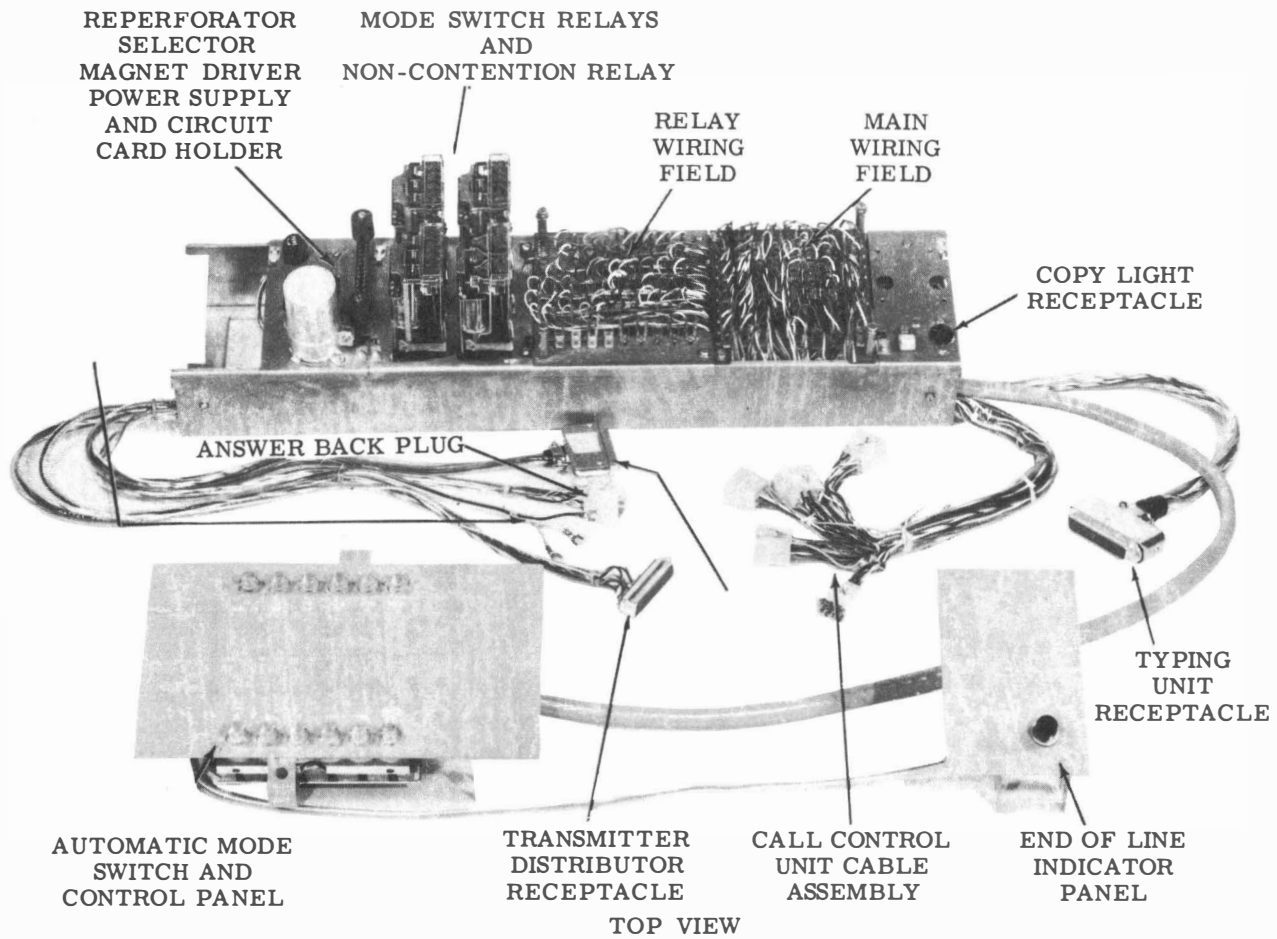


Figure 2 - Typical Electrical Service Unit for 35 ASR Set



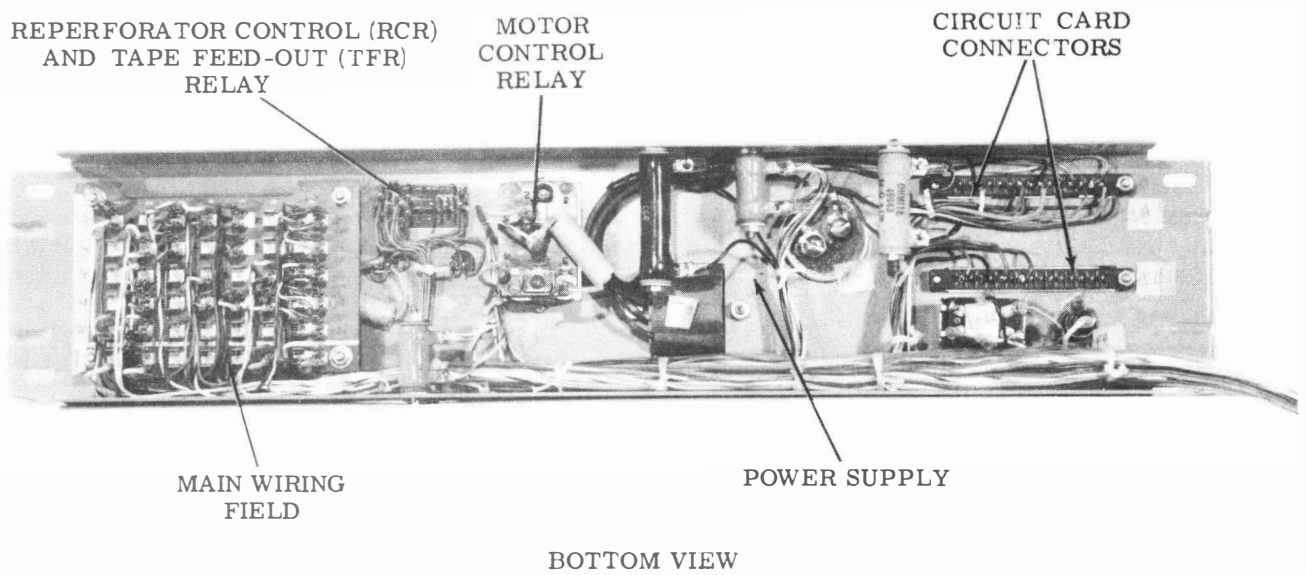
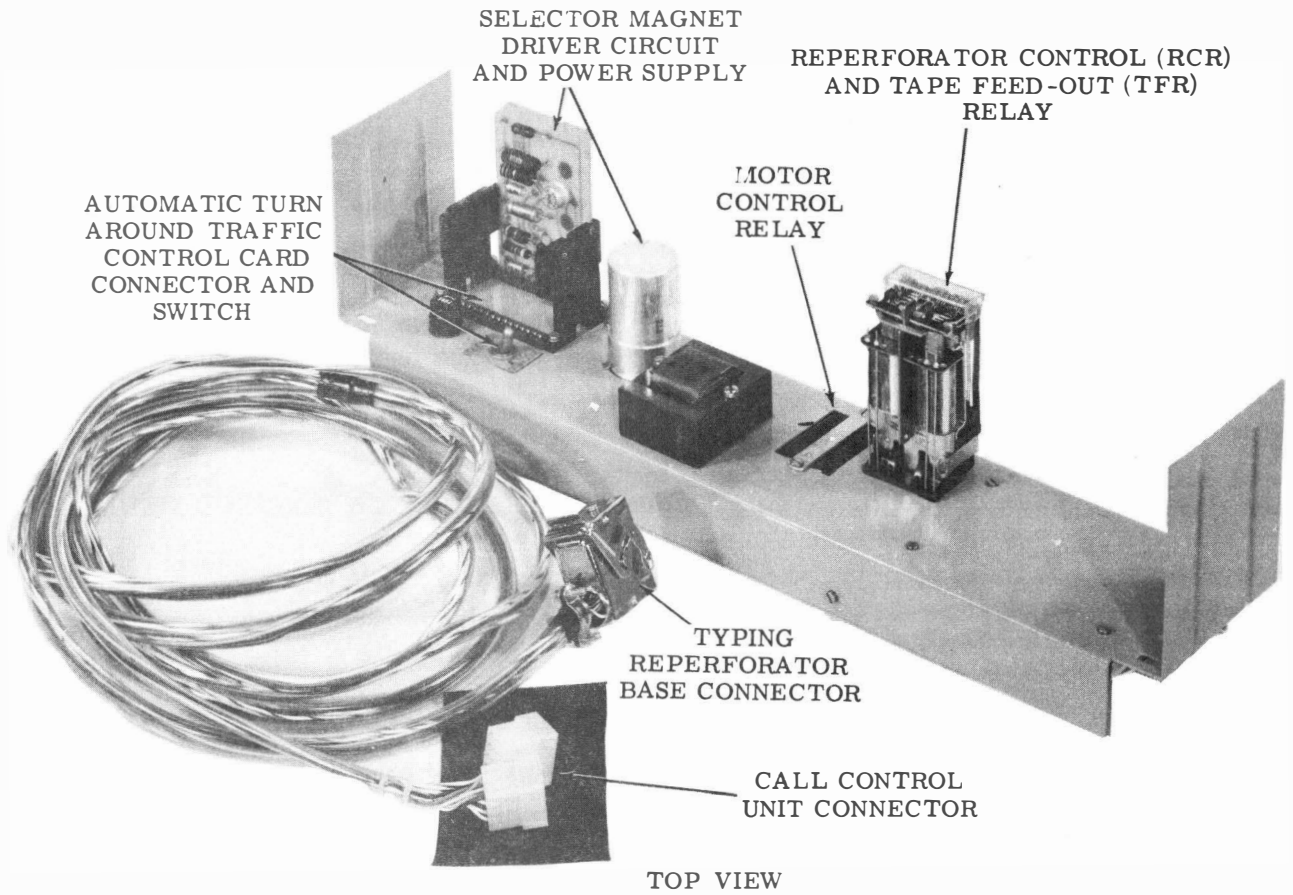


Figure 3 - Typical Electrical Service Unit for 35 ROTR Set

### SELECTOR MAGNET DRIVER

3.03 The selector magnet driver assembly is a two stage transistorized amplifier capable of switching high output currents (0.500 ampere) at very closely controlled input current levels. The output of the driver is adjustable to 0.500 ampere output, but may change slightly due to normal supply voltage and component variations. Selector magnet driver assemblies are available which operate from either a 20 milliamperes or a 60 milliamperes line signal input.

CAUTION: DISCONNECT POWER TO SELECTOR MAGNET DRIVER ASSEMBLY - BEFORE REMOVING CIRCUIT CARD - TO AVOID DAMAGING TRANSISTORS.

### LINE-LOCAL RELAY

3.04 The line-local relay is used to switch a set to either online or local operation. It is used in standard sets (dc) and is controlled by a rotary type power switch. With the switch in the ON position, the line-local relay energizes, placing the set's sending and receiving circuit in series with the signal line. The relay is energized via the selector magnet driver power supply (3.03).

3.05 Turning the power switch to the OFF position de-energizes the line-local relay. The external signal line to the set is shunted, but the selector magnets in the set's receiving circuits are held energized to prevent spurious characters from being typed or punched when the set is turned on and off.

3.06 With the power switch in the ONLINE position, the line-local relay is energized, and the signal generating and monitoring circuits of the set are connected into the signal line.

3.07 When the power switch is in the LOC (local) position, the set may be operated offline. The line-local relay de-energizes, shunting the external signal line to the set and connecting a local signal battery in series with the set's signal circuit.

### ELECTRICAL MOTOR CONTROL

3.08 This feature permits a set's motor to be controlled remotely via the signal line. So equipped, the set may operate unattended. The sending station can turn the set on by send-

ing a break, or turn it off after the data has been transmitted by sending the EOT code.

### MOTOR CONTROL RELAY

3.09 The motor control relay is energized by the closing of the OR/AN relay contacts in the ASR or KSR set (a local key in these sets is also provided to energize this relay). The motor control relay is held operated until the motor hold contact on the feed-out mechanism of the typing reperforator breaks at the end of the feed-out cycle.

### REPERFORATOR CONTROL RELAY

3.10 The reperforator control relay (RCR) has five sets of contacts used for the following functions:

- (a) Selector magnet driver control.
- (b) RCR relay locking.
- (c) Tape-feed relay control.
- (d) Feed-out magnet control.
- (e) ROTR on lamp (in ASR) control.

The relay is energized by the closing of the R1 on contact in the ASR or KSR stunt box, or the ROTR ON key on the ASR control panel. The RCR relay is held energized by one of its own contacts, which is in series with the R1 off contact in the ASR or KSR stunt box.

3.11 The selector magnet driver control contact is normally closed, and shunts the signal line to the selector magnet driver, binding it to any signal. When the RCR relay is energized, the selector magnet driver will respond to the incoming signal.

### AUTOMATIC TURN AROUND TRAFFIC CONTROL

3.12 The purpose of the automatic turn around traffic control (ATATC) is to blind the typing reperforator selector magnet driver to locally (ASR or KSR set) generated traffic, while allowing incoming traffic through. An all-traffic switch is provided to disable the ATATC.

## TAPE FEED-OUT CONTROL RELAY

3.13 The tape feed-out control relay (TFR) is controlled by the reperforator control relay (RCR). A make contact on the TFR relay and a break contact on the RCR relay are wired in series with the tape feed-out magnet on the typing reperforator. When both relays are operated, the RCR contact is opened and the TFR contact is closed. When the RCR relay releases, the RCR contact closes and the TFR contact remains closed for 65 milliseconds (slow release). This allows the tape feed-out magnet to energize, initiating tape feed-out.

## LINE-SHUNT RELAY

3.14 This feature permits local operation of a set in addition to online operation. When the LINE-TEST key is placed in the TEST position, the line-shunt relay de-energizes, shunting the external signal line and switching in an auxiliary power supply in series with the set's signal circuit.

## CHARACTER COUNTER SUPPRESSION

3.15 Suppression of the character counter mechanism (ASR sets) is desirable from a standpoint of operating flexibility. Suppressing the character counter allows the operator to prepare tape in the tape mode, switch to keyboard mode and use the keyboard, and return to the tape mode without disturbing the character count.

## MODE SWITCHING COMPONENTS

## A. Automatic

3.16 Automatic mode switching components for ASR sets provide the following operating features:

- (a) The ability to prepare tape while transmitting or receiving traffic.
- (b) The ability to transmit or receive traffic using codes foreign to the set.
- (c) The ability to receive traffic on tape and by page printer simultaneously.
- (d) The ability to revert to a common mode of operation when clearing the set.

3.17 To provide these features, mode switching relays, which operate in conjunction with a pushbutton control panel, allow the operator to automatically select the set's operating mode. One of five modes may be selected: keyboard (K), keyboard-tape (KT), tape (T), tape-tape send (TTS), or tape-tape receive (TTR).

## B. Manual

3.18 Manual mode switching components for ASR sets provide the (a), (b), and (c) operating features listed in Paragraph 3.16. A conveniently located rotary selector switch allows the operator to manually select the set's operating mode. One of five operating modes may be selected: K, KT, T, TTS, or TTR (see 3.17).



35 RECEIVING-ONLY TYPING REPERFORATOR COVER

DESCRIPTION AND ADJUSTMENTS

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1. GENERAL

1.01 This section contains description and adjustments for the 35 Receiving-Only Typing Reperforator Cover.

1.02 The cover serves to enclose and protect the tape perforating and printing mechanism while providing a visual access to the output tape. A hinged lid permits tape or ribbon servicing without removal of the cover.

2. DESCRIPTION

2.01 The cover totally encloses the 35 Receiving-Only Reperforator with its associated motor unit and base. It is approximately 13-7/16 inches wide by 13-13/16 inches deep by 8-3/8 inches high and weighs approximately 8-3/4 pounds.

2.02 The cover rests on the sub-base portion of the base without touching the upper base at any point. An opening at the left side of the cover, near the base mounting edge, accommodates an external tape winder when used.

2.03 A tape emission slot at the left side of the cover permits discharge of the tape.

2.04 Openings at the rear of the cover are for admission of cables from the electrical service unit or other external circuitry. An opening is also provided for the power switch.

2.05 Access to the reperforator to load tape or change ribbons can be done by opening the lid on the cover. The lid pivots on a hinge at the rear of the cover. The left side of the lid is clear to provide visual access to the tape as it is printed.

2.06 A means of indicating a low tape condition on the reperforator is provided at the right side of the lid. A rectangular translucent area bears the words REPLACE TAPE, which becomes visible when the tape-out lamp on the base is illuminated.

2.07 The maximum permissible average ambient temperature rise within the cover is 40° F during normal operation of the set.

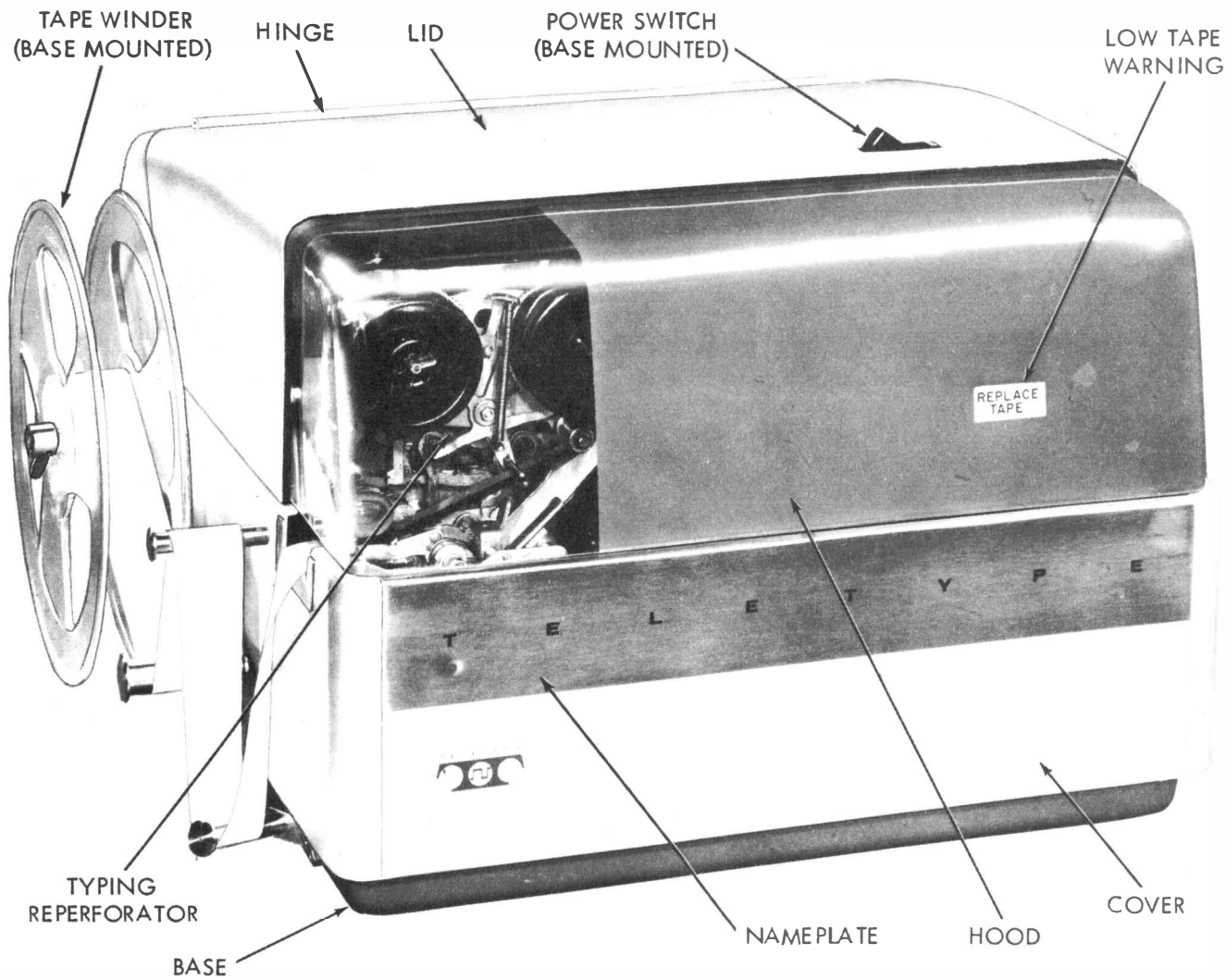
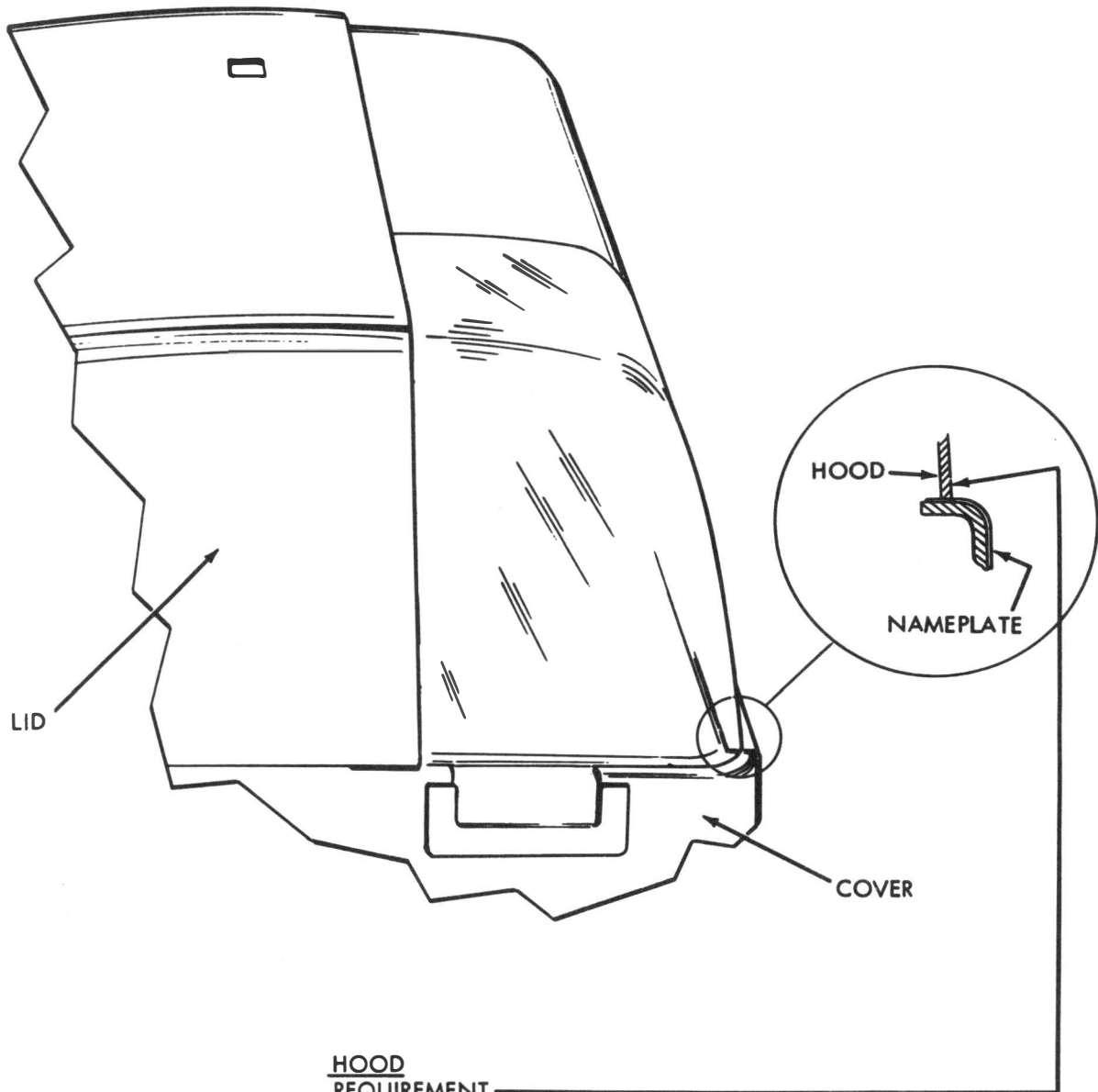


Figure 1 - Receiving-Only Typing Reperforator Cover

3. ADJUSTMENTS

3.01 Hood



HOOD  
REQUIREMENT

FRONT EDGE OF PLASTIC HOOD  
APPROXIMATELY CENTERED ON  
COVER AND NAMEPLATE.

TO ADJUST  
POSITION HOOD WITH NUTS HOLD-  
ING IT TO LID LOOSENED.

CAUTION: DO NOT OVER TIGHTEN NUTS  
SO AS TO CRACK OR DAMAGE HOOD.





35 REPERFORATOR BASES

DESCRIPTION AND PRINCIPLES OF OPERATION

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4. AUXILIARY REPERFORATOR BASE .....	6

1. GENERAL

1.01 This section provides descriptive and operating information for 35 reperforator bases.

1.02 The 35 reperforator bases consist of three different types: the 35 receiving-only (RO) base, the 35 multiple reperforator base, and the 35 auxiliary reperforator base. The bases provide a foundation for a motor unit and either one or three reperforator units, and for electrical and mechanical operational devices and accessories.

1.03 The approximate dimensions of the bases are shown below:

Base	Approximate Dimensions (Inches)		
	Height	Width	Depth
RO Reperforator Base			
Single-Plate	9-1/2	11	12-13/16
Double-Plate	10	13-9/32	12-13/16
Multiple Reperforator Base	9*	20-7/10	20-4/5
Auxiliary Reperforator Base	13	9-1/2	13

\* With components and tape rolls.

2. RECEIVING-ONLY REPERFORATOR BASES

SINGLE-PLATE BASE (Not Illustrated)

2.01 This base contains a plate that rests on four metal feet and which serves as a foundation for the other components and accessories. Wiring, a power switch, a fuse, two terminal boards, and two electrical connectors comprise the electrical circuitry, and are mounted on a bracket at the rear of the plate. The reperforator unit is mounted by four tapped holes at the left front of the plate. The motor unit is supported by three posts and an adjusting plate. A tape container with roller, a wire guide and wooden filler for a tape roll is attached to the extreme right of the plate. A tape-out mechanism incorporating two switches which may be connected to visual or audible alarms is located in the rear of the tape container. A chad chute is provided for disposal of chad.

2.02 Motion is transferred from the motor unit to the reperforator by a single-speed drive mechanism. Gear sets may be interchanged to obtain different operating speeds.

DOUBLE-PLATE BASE (Figure 1)

2.03 In this base, an upper plate is separated from a somewhat larger lower plate, or subbase, by rubber vibration mounts. The subbase rests on the lower extension of the vibration mounts. Wiring, a power switch, a connector and two terminal boards comprise the electrical circuitry. (A variation of this base contains one electrical connector and one terminal board.)

2.04 The tape container, tape-out mechanism (Figure 2), and the mounting facilities for the motor unit are identical to those of the single-plate base (2.01). A low-tape lamp is mounted by a bracket on the tape container.

2.05 Motion is transferred from the motor unit to the reperforator unit through a single-speed drive mechanism. Gear sets may be interchanged to obtain different operating speeds.

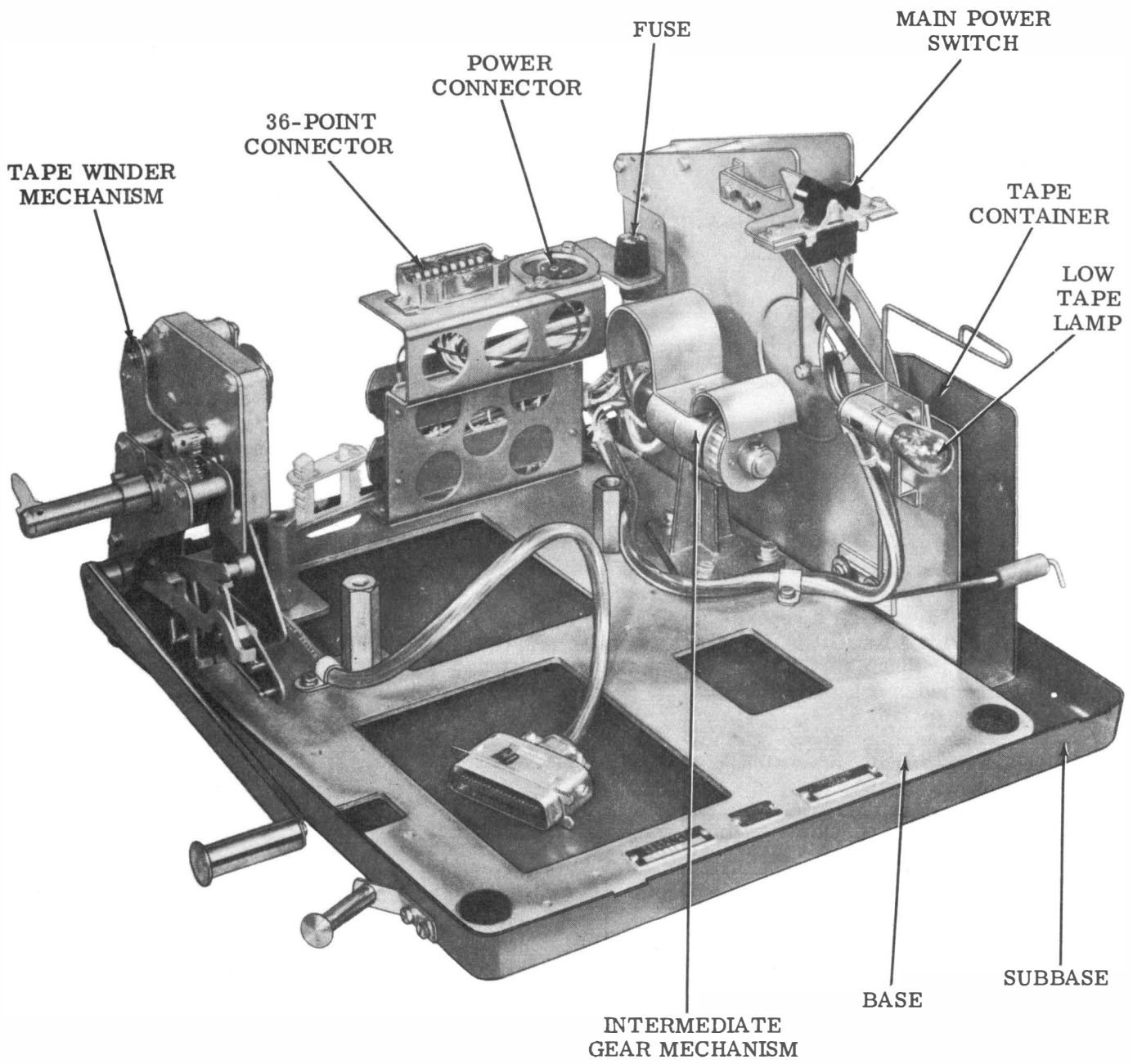


Figure 1 - Typical 35 Receiving-Only Reperforator Base

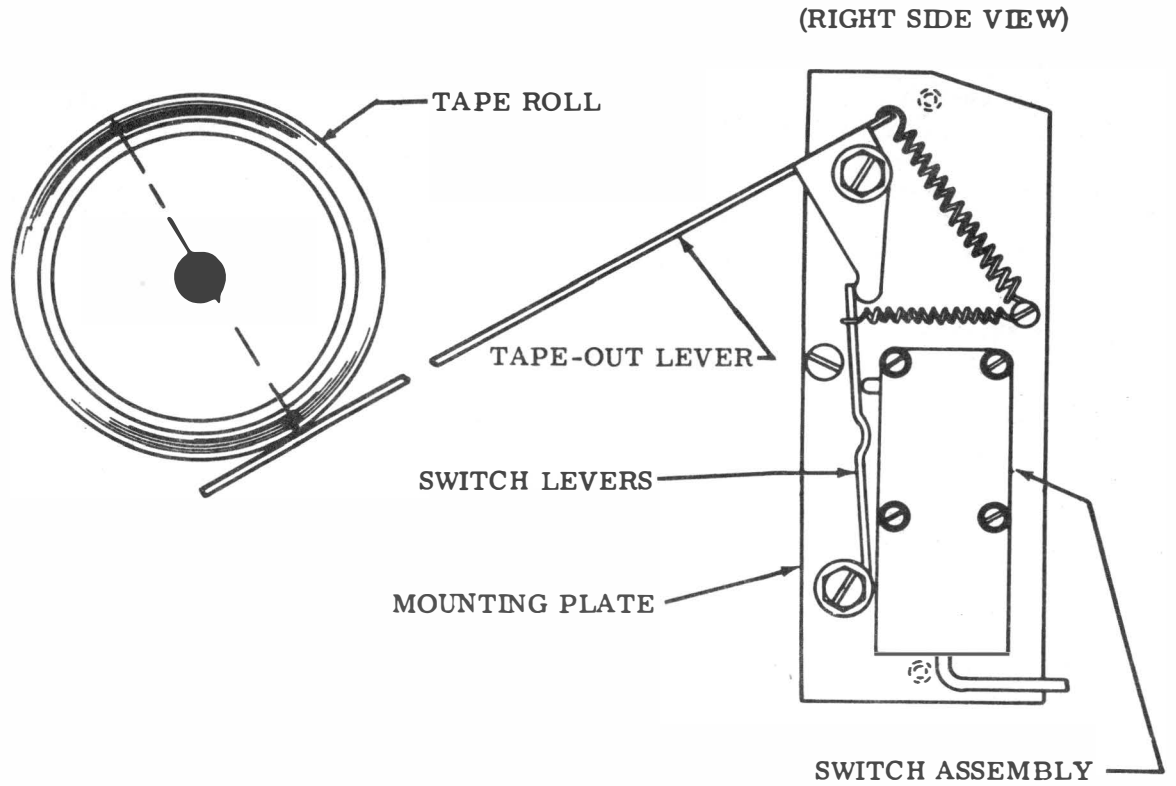


Figure 2 - Tape-Out Mechanism

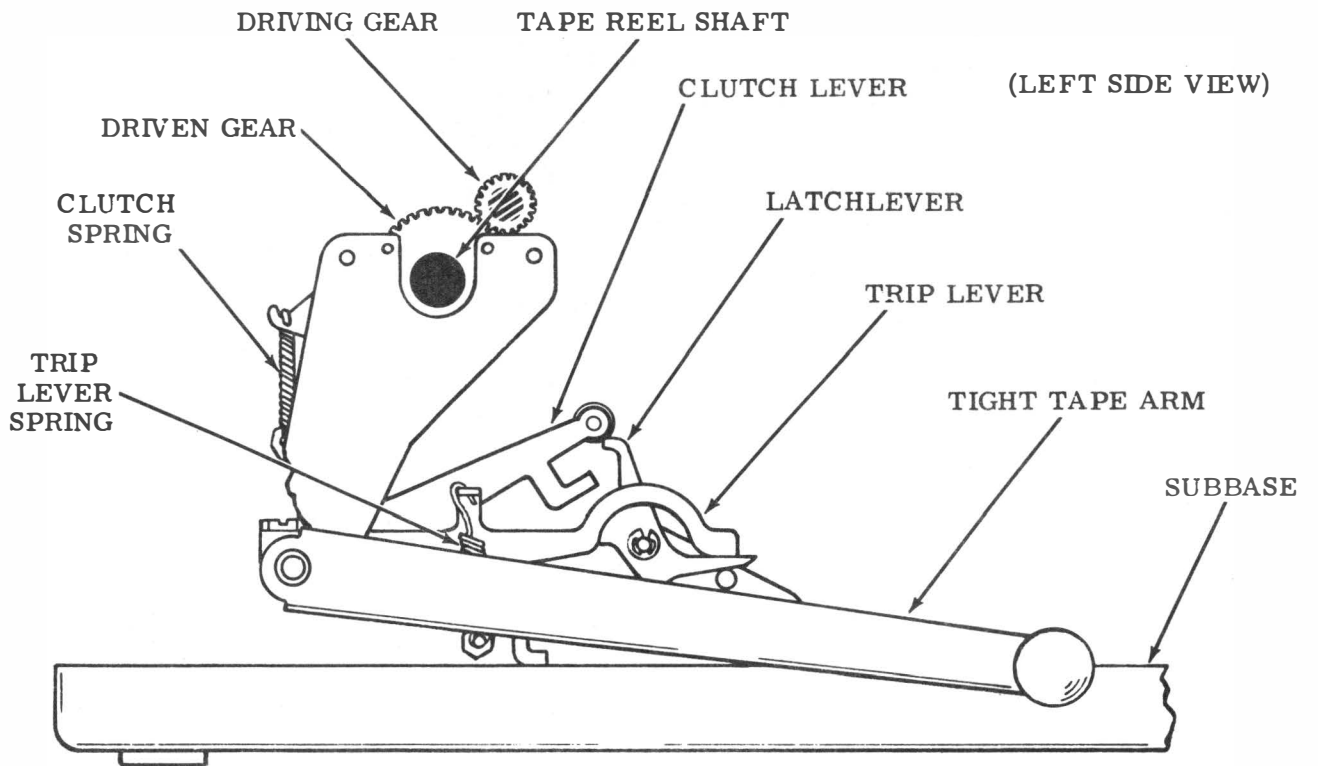


Figure 3 - Tape Winder Mechanism

2.06 Some bases are equipped with a tape winder mechanism (Figure 3) which winds the perforated tape on a tape reel. The tape winder mechanism mounts on the left side of the base and extends a rotating shaft and a tight-tape arm beyond the left side of the cover. The tape winder is driven off the rear of the motor unit by a belt and pulley. A sealed gear reduction mechanism drives the shaft and reel of tape attached to it. In its normally raised position, when the equipment is idling, the tight-tape arm and its associated trip lever and latch hold the driving gear upward, out of engagement with the driven gear. When the tape feeds from the reperforator, the tape arm is permitted to

drop until the trip lever engages the right extension of the latchlever. The upper arm of the latchlever, rotating clockwise, releases the clutch lever which drops, under tension of its spring, permitting the gears to mesh. The tape winder is rotated in a clockwise direction until the tape arm is again raised, and the clutch lever lifts the gears out of engagement.

3. MULTIPLE REPERFORATOR BASE  
(Figure 4)

3.01 This base provides mounting facilities for three reperforator units and one motor unit, and for the necessary accessory

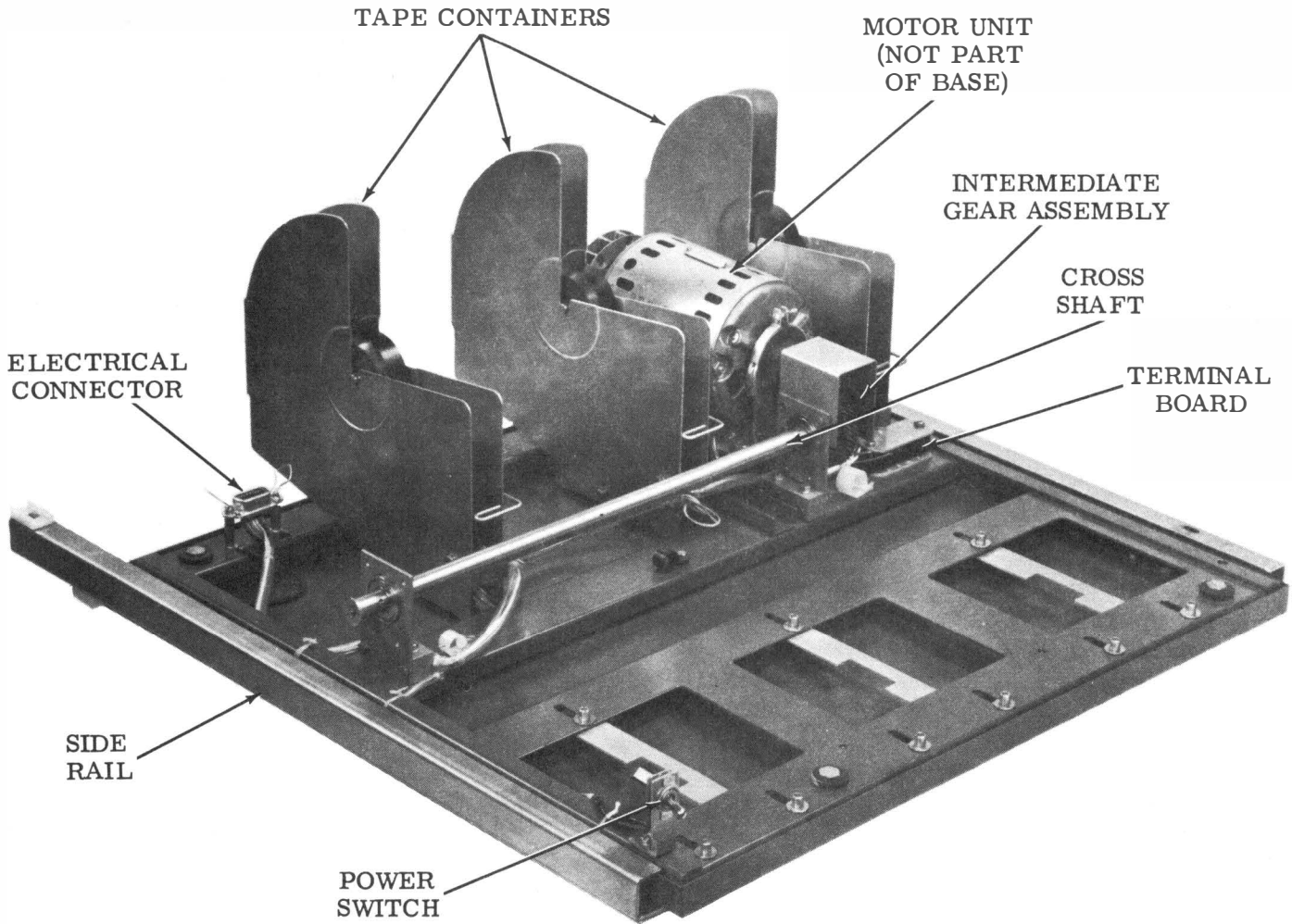


Figure 4 - Typical 35 Multiple Reperforator Base

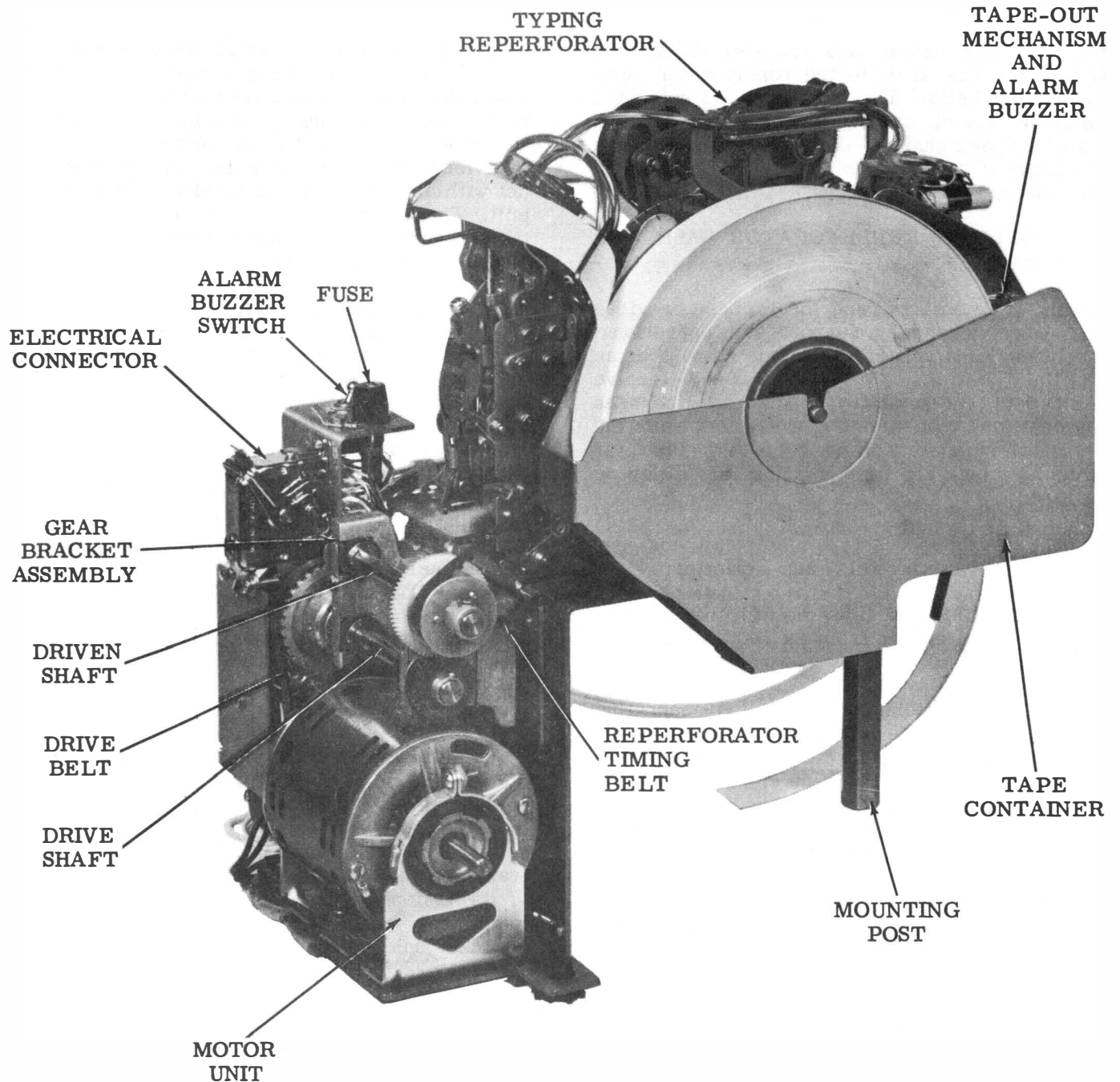


Figure 5 - Typical 35 Auxiliary Reperforator Base

equipment. A plate upon which the components are installed is separated from an oil pan by resilient mountings. Side rails are provided for installation of the base in a cabinet. Posts on an adjustment plate are provided for mounting a motor unit. Three tape containers equipped with tape-out switches, a connector, terminal blocks, and a main power switch, are also in-

cluded. Three chad containers are provided to accommodate fully-perforated tape output reperforator units.

3.02 The reperforator units, which are mounted near the front of the base, receive rotary motion from the motor unit through a cross-shaft assembly and timing belts. Inter-

mediate gear assemblies transfer the motion from the cross shaft to the reperforator units via timing belts. The units may operate at a common speed or at independently varied speeds. Speed changes are made by interchanging gears at the motor unit and in the intermediate gear assemblies.

#### 4. AUXILIARY REPERFORATOR BASE (Figure 5)

4.01 The auxiliary reperforator base provides the necessary support and operational facilities for a reperforator unit serving as an auxiliary unit in a 35 Automatic Send-Receive (ASR) Set. The auxiliary reperforator permits the monitoring of incoming messages while the primary reperforator is preparing tape for transmission. The base includes the following features:

- (a) A synchronous-type motor unit, equipped with starting relay and capacitor.
- (b) A gear bracket assembly for transferring rotary motion from the motor unit to the reperforator.
- (c) A power terminal block and connector, a fuse, a terminal board, a cable for connecting the reperforator, and a receptacle for interconnecting with an electrical service unit.
- (d) A tape container for an 8-inch diameter tape roll (2-inch diameter core).
- (e) A tape-out lamp, alarm buzzer, actuating switch assembly, and buzzer disabling switch.
- (f) Tape routing and chad disposal devices.
- (g) A base plate for mounting of the above features.

4.02 The base plate is mounted in the ASR cabinet by means of three hexagonal posts, with two posts supporting the rear of the plate and one longer post supporting the front of the plate. The plate is supported on the posts with rubber bushings which isolate it from the cabinet and prevent the transmission of vibration from the base to the cabinet.

4.03 The cable for connecting the reperforator supplies both the signal input and switched and fused power. When used with a typing reperforator it provides power for operation of the ribbon-shift mechanism and connects the tape-feed motor hold switch and tape-feed magnet with control circuits in the electrical service unit. These control circuits initiate tape feed-out and prevent the motor unit from turning off during a feed-out period.

4.04 The synchronous-type motor rotates at 3600 rpm and operates from 115 volts, 60 cycles ac power. It has two windings: a starting winding and a run winding. When power is applied to the motor unit initially, current flows through the start winding of the motor start relay which then closes the motor start contact, completing the series circuit to the start winding and capacitor. Current then flows through the starting and run windings of the motor, causing it to rotate. As the speed of the motor increases, current in the windings decreases. The motor start relay de-energizes, removing the starting winding and capacitor from the circuit, and current flows only through the motor run winding.

4.05 Rotary motion from the motor unit is transferred to the reperforator through the gear bracket assembly. The motion is coupled to the drive shaft of the gear bracket assembly through a 16-tooth motor sprocket, a drive belt, and a 32-tooth sprocket on the drive shaft. The drive shaft, rotating at 1800 rpm, transfers motion to the driven shaft by means of its 42-tooth gear which engages with a 63-tooth gear on the driven shaft. A 16-tooth sprocket on the driven shaft and a timing belt drive the 28-tooth sprocket on the reperforator main shaft at 685 rpm.

4.06 The tape-out circuitry consists of two switches mounted in tandem (Figure 2), an alarm buzzer, and a tape-out lamp. Operating current is supplied from circuitry in the associated electrical service unit. A normally-open tape-out switch contact is closed when the tape supply is low and illuminates the tape-out lamp and actuates the buzzer. A transfer contact operates a lamp and buzzer located on the ASR set cabinet and prevents automatic answer-back. A single-pole, double-throw switch permits the operator to turn off the buzzer when replacing the tape roll. The tape-out lamp remains on until the tape supply is replenished.

### 35 REPERFORATOR BASES

#### ADJUSTMENTS

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#### 1. GENERAL

1.01 This section provides adjustment information for the 35 receiving-only reperforator base, the 35 multiple reperforator base, and the 35 auxiliary reperforator base.

1.02 The adjustments in this section are arranged in a sequence that should be followed if a complete readjustment is undertaken. A complete adjusting procedure should be read before attempting to make the adjustment. After an adjustment is completed, be sure to tighten any nuts or screws that may have been loosened, unless otherwise instructed.

1.03 The adjusting illustrations indicate tolerances, positions of moving parts, spring tensions and the angle at which scales should be applied. The tools required to make adjustments and check spring tensions are not supplied with the equipment, but are listed in another section. Springs which do not meet the requirements, and for which there are no adjusting procedures, should be discarded and replaced by new springs.

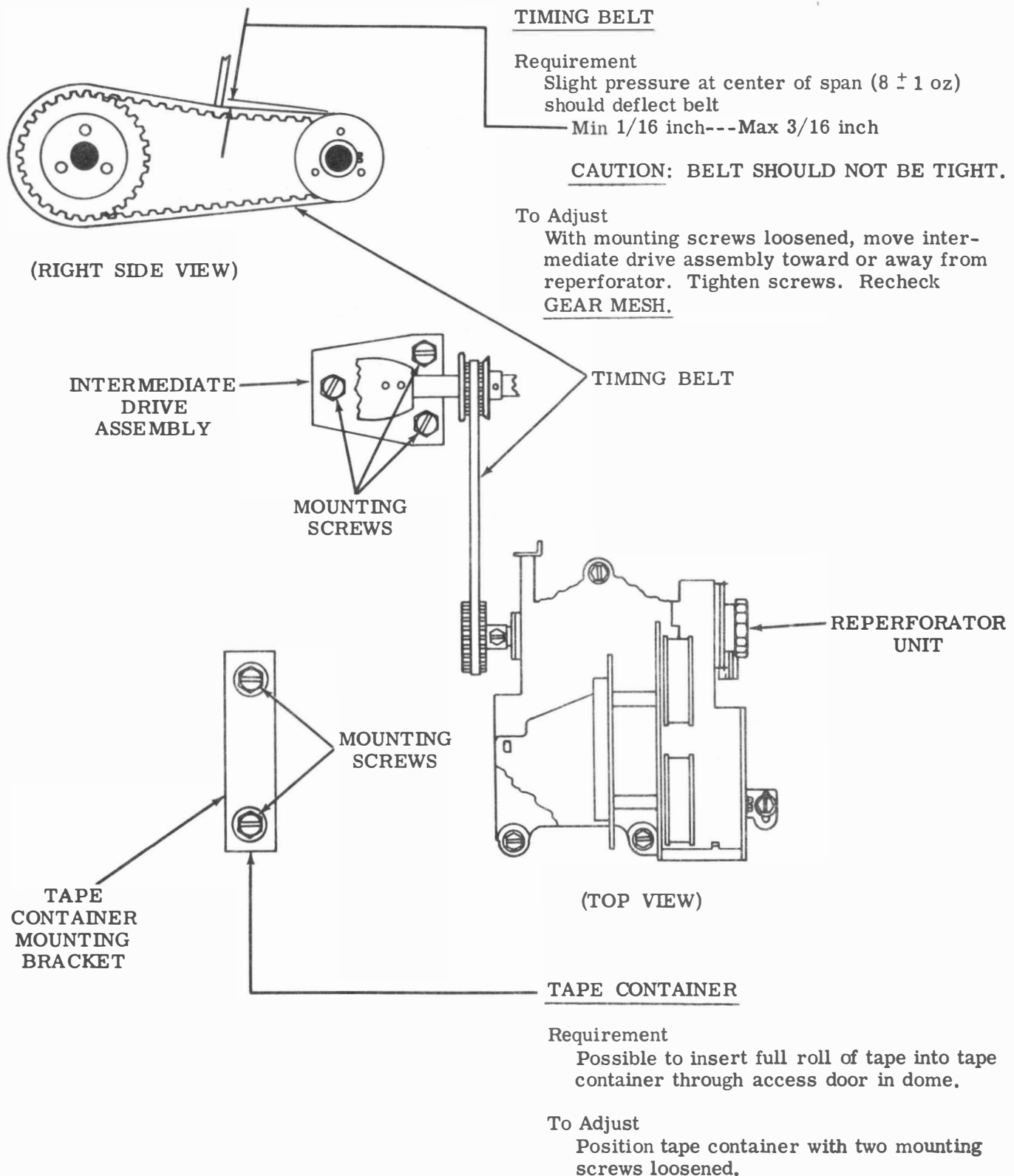
1.04 Where adjustment instructions call for removal of components, assemblies, subassemblies or parts, all adjustments which the removal of the parts might facilitate should be made before the parts are replaced or as the equipment is reassembled. When a part mounted on shims is removed, the number of shims and their location should be noted so that the identical pile-up can be made when the part is replaced.

1.05 References made to left or right, up or down, front or rear apply to the unit in its normal operating position as viewed from the operator's position in front of the unit.



2. RECEIVING-ONLY REPERFORATOR BASE

2.01 Tape Container and Timing Belt





2.02 Intermediate Gears and Tight Tape Arm

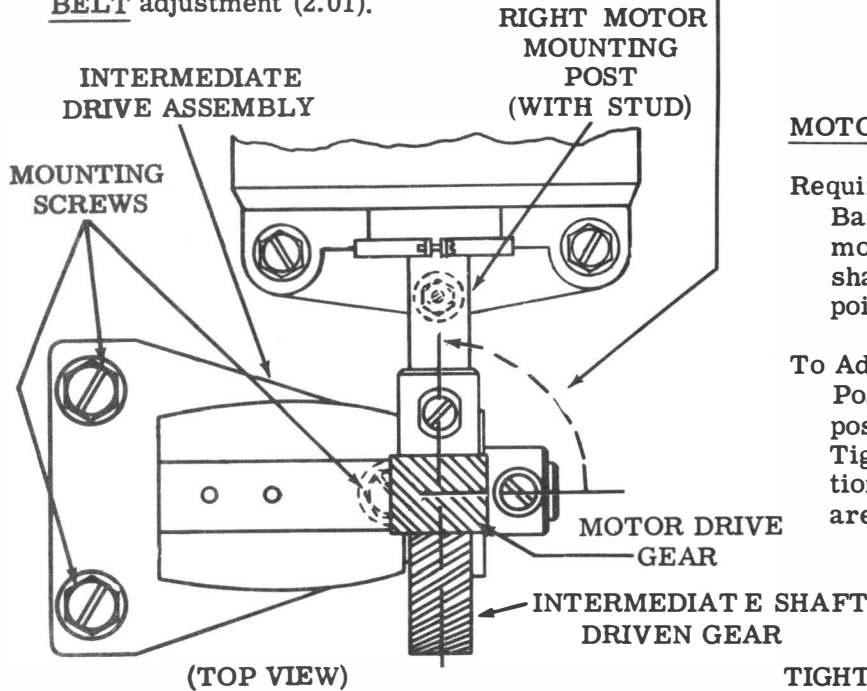
GEAR MESH

**Requirement**

Motor drive gear and intermediate shaft driven gear should mesh at right angles.

**To Adjust**

Position drive assembly with mounting screws loosened. Recheck TIMING BELT adjustment (2.01).



WIRE TAPE GUIDE

**Requirement**

Tape should pass freely through wire guide and be aligned with perforator guide assembly.

**To Adjust**

Bend or position wire guide.

MOTOR ADJUSTING STUD

**Requirement**

Barely perceptible backlash between motor drive gear and intermediate shaft driven gear with gears at closest point.

**To Adjust**

Position stud in right motor mounting post up or down to meet requirement. Tighten nut while holding stud in position. Check that motor mounting screws are tight. Recheck GEAR MESH.

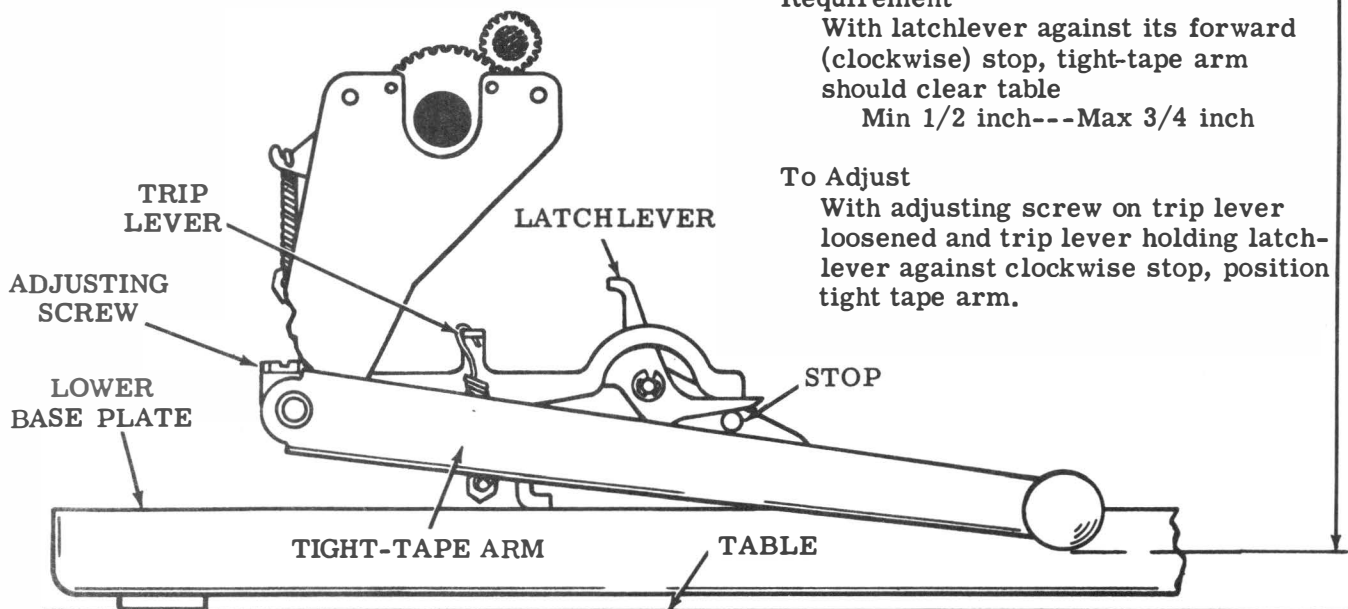
TIGHT-TAPE ARM

**Requirement**

With latchlever against its forward (clockwise) stop, tight-tape arm should clear table  
Min 1/2 inch---Max 3/4 inch

**To Adjust**

With adjusting screw on trip lever loosened and trip lever holding latchlever against clockwise stop, position tight tape arm.



2.03 Low Tape Mechanism

TAPE-OUT LEVER

**Requirement**

Tape-out lever should be able to push both switch levers away from switch actuators but should not be able to lift wood filler with depleted tape roll out of slots in tape container.

**To Adjust**

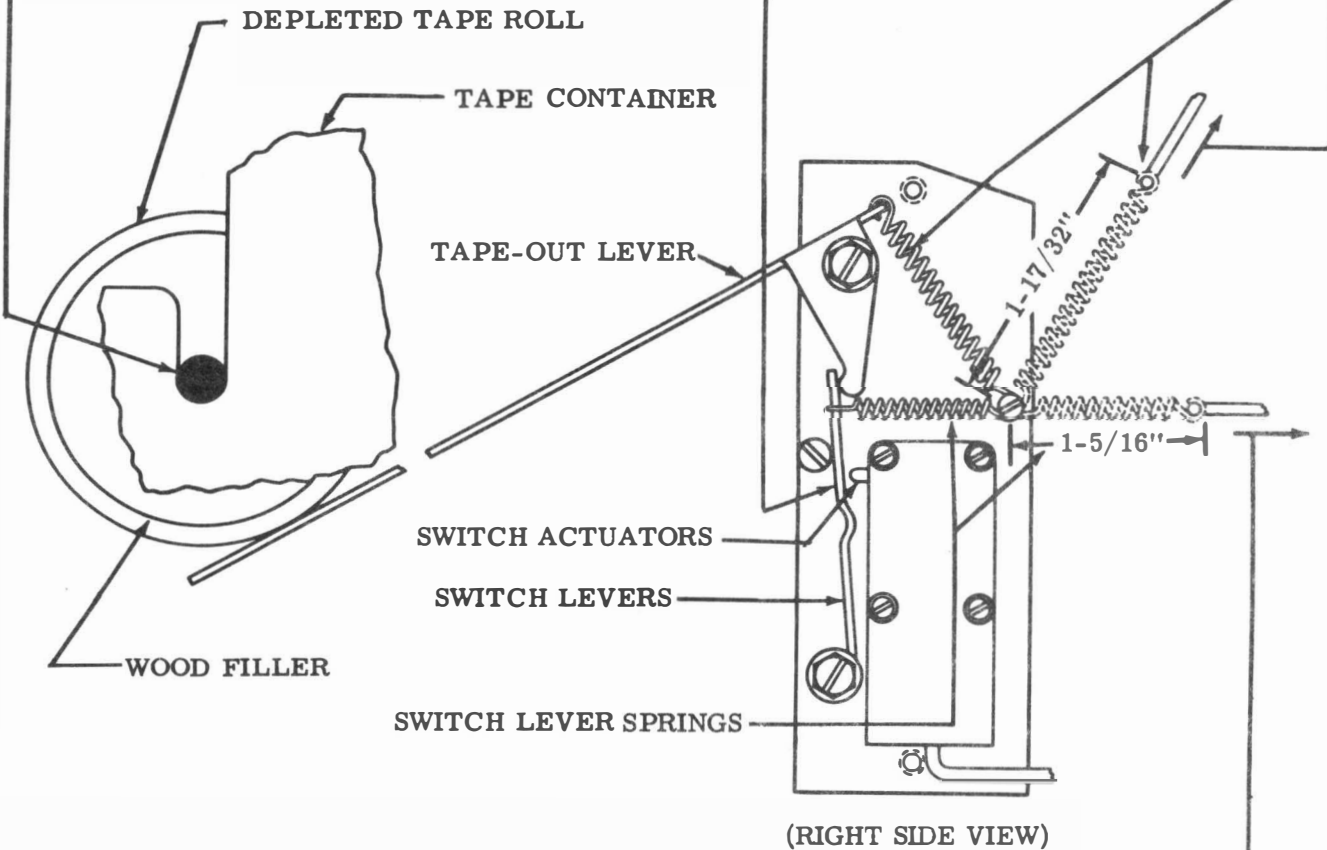
If requirement is not met, check TAPE-OUT LEVER and SWITCH LEVER SPRING tensions (below).

TAPE-OUT LEVER SPRING

**Requirement**

Min 6 oz---Max 8 oz  
To pull spring to length of 1-17/32 inches.

TAPE-OUT LEVER SPRING



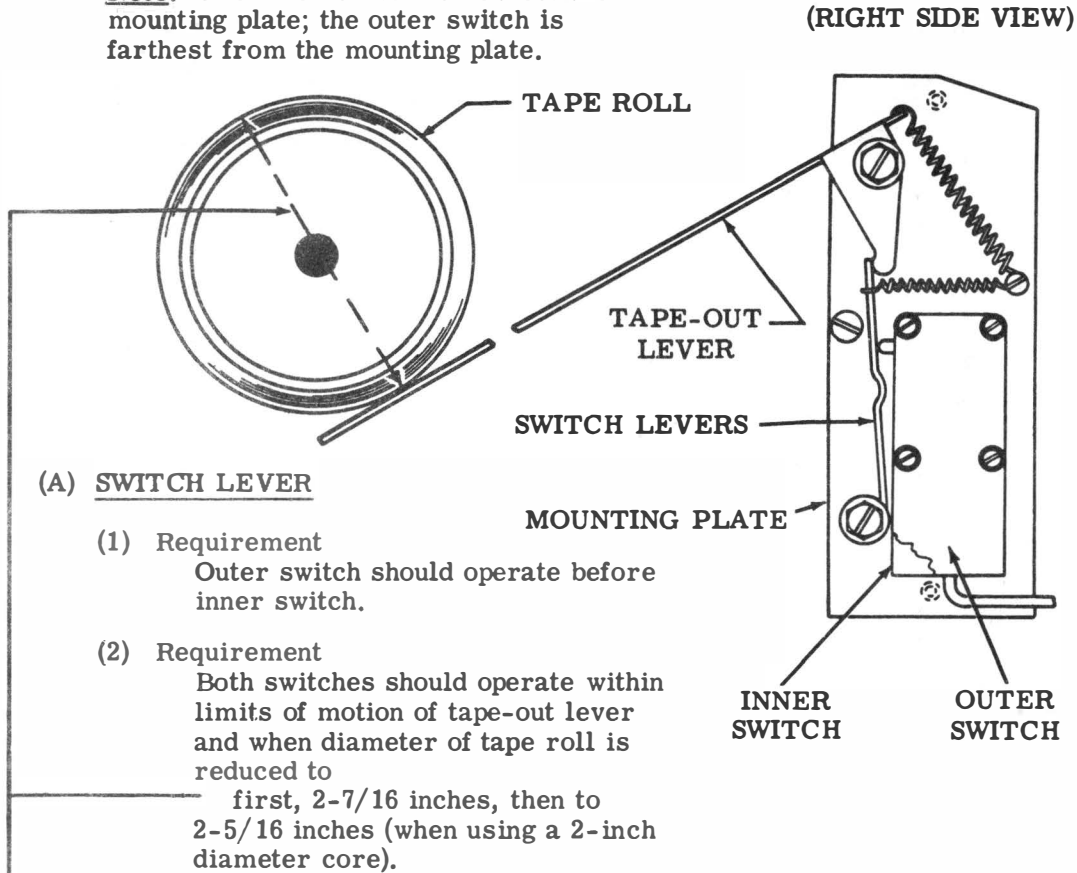
SWITCH LEVER SPRINGS (2)

**Requirement**

Min 1-3/4 oz---Max 2-1/4 oz  
To pull spring to length of 1-5/16 inches.

2.04 Low Tape Mechanism - Continued

**Note:** The inner switch is nearest the mounting plate; the outer switch is farthest from the mounting plate.



(A) SWITCH LEVER

- (1) Requirement  
Outer switch should operate before inner switch.
- (2) Requirement  
Both switches should operate within limits of motion of tape-out lever and when diameter of tape roll is reduced to first, 2-7/16 inches, then to 2-5/16 inches (when using a 2-inch diameter core).

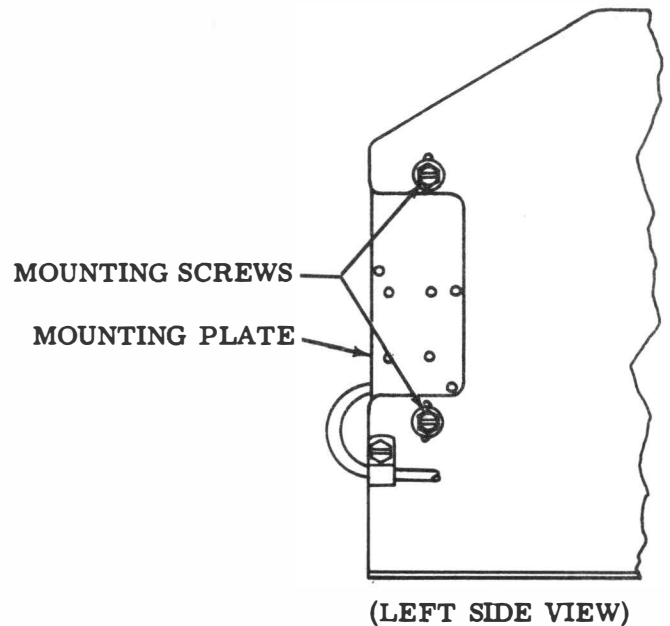
**To Adjust**  
Bend outer switch lever toward switch assembly.

**Note:** Adjustment can be facilitated by removing switch mechanism from tape container.

(B) SWITCH MECHANISM MOUNTING PLATE

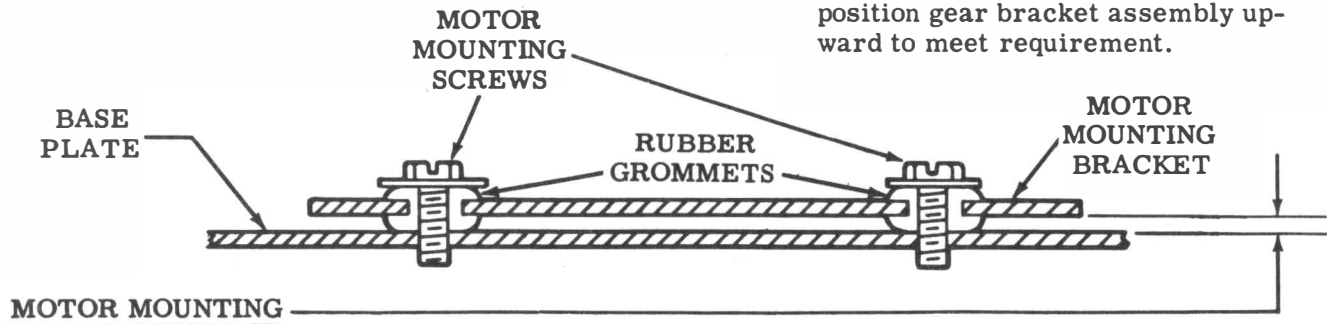
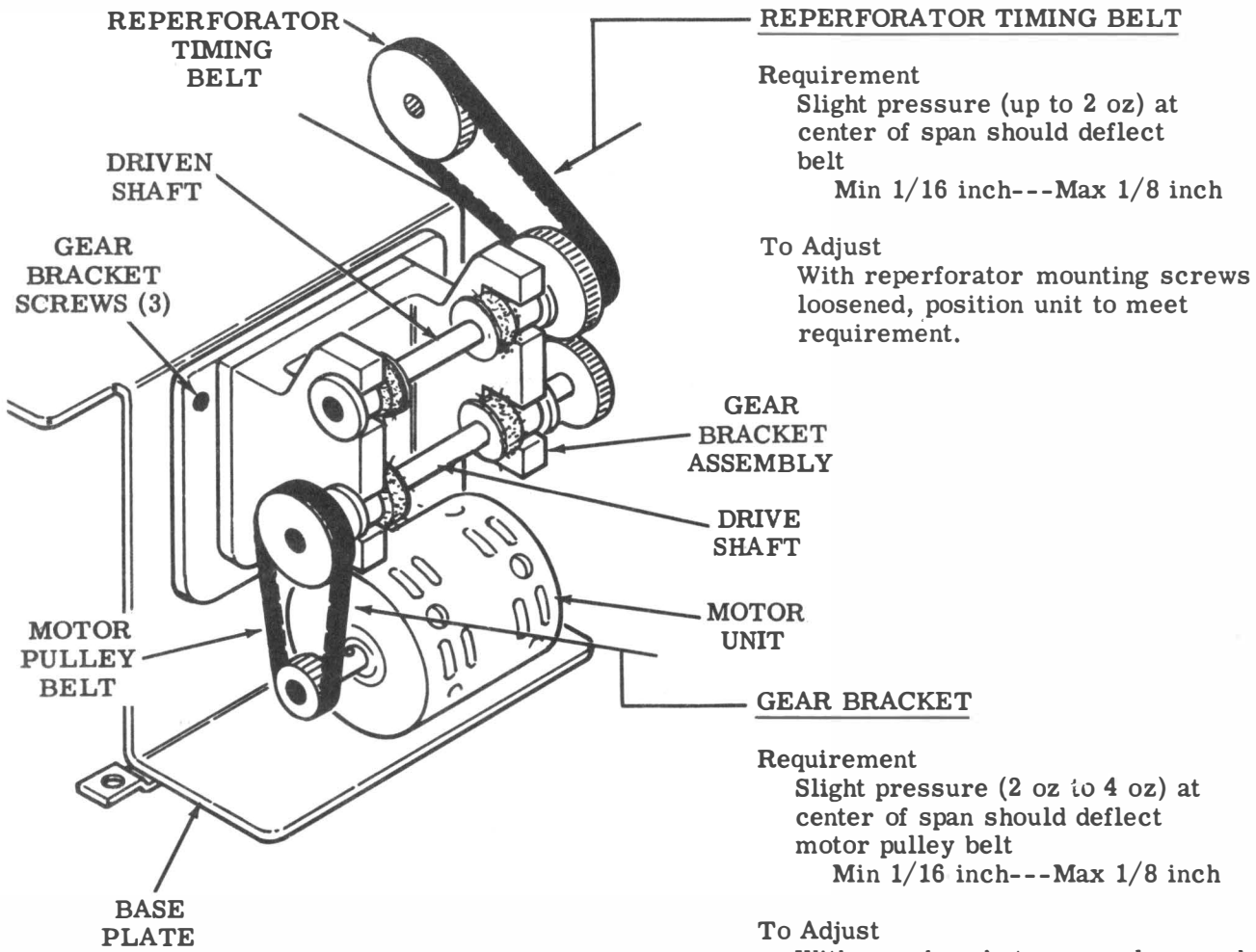
**Requirement**  
Outer switch should just operate when diameter of tape roll is reduced to 2-3/8 inches when using a 2-inch diameter core.

**To Adjust**  
Position mounting plate with mounting screws loosened.



3. AUXILIARY REPERFORATOR BASE

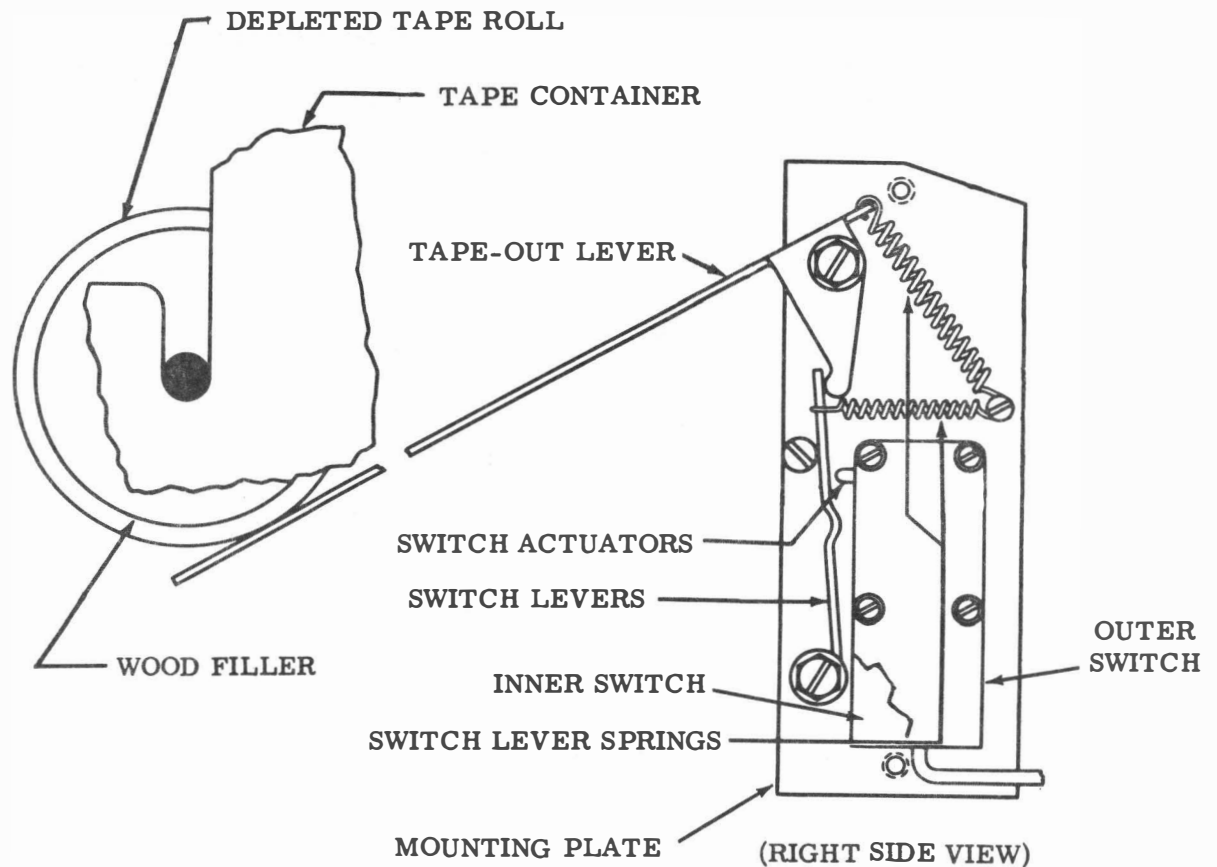
3.01 Gear Bracket Assembly and Motor Mounting



**Requirement**  
Motor mounting bracket should be spaced  
Min 0.030 inch---Max 0.060 inch from base plate.

**To Adjust**  
Tighten or loosen motor mounting screws to meet requirement.

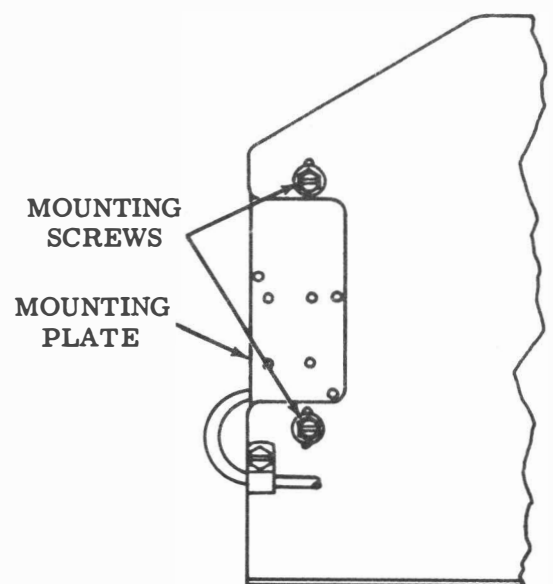
## 3.02 Low Tape Mechanism

LOW TAPE SWITCHES

- (1) Requirement  
Outer switch must operate first.
- (2) Requirement  
Inner switch should just close when tape is depleted to a diameter of between  $2\text{-}5/16$  inches and  $2\text{-}7/16$  inches.

**To Adjust**

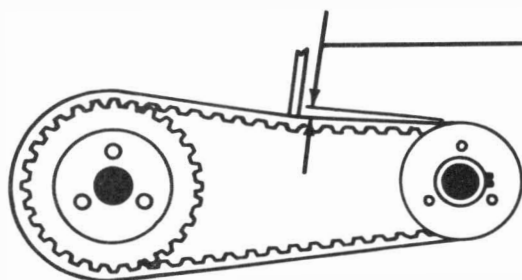
Bend switch actuator to meet requirement (1). Position mounting plate with mounting screws loosened to meet requirement (2).



4. MULTIPLE REPERFORATOR BASE

4.01 Timing Belt

Note: This adjustment should be made for each typing reperforator unit.



TIMING BELT

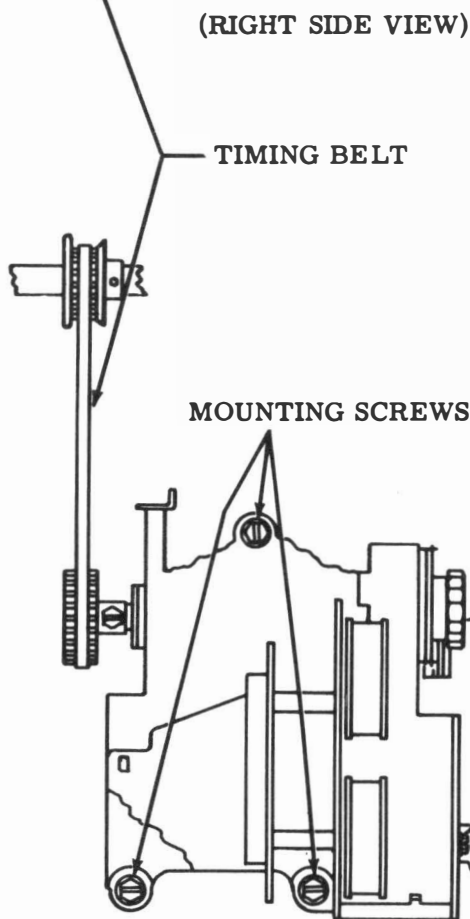
Requirement

Slight pressure at center of span ( $8 \pm 1$  oz) should deflect belt  
Min  $3/32$  inch---Max  $5/32$  inch

CAUTION: BELT SHOULD NOT BE TIGHT.

To Adjust

With two anchor bracket screws and three mounting screws loosened, position typing reperforator unit. Tighten three mounting screws. Press anchor bracket against base plate and tighten screw holding bracket to reperforator. Tighten screw holding bracket to base.



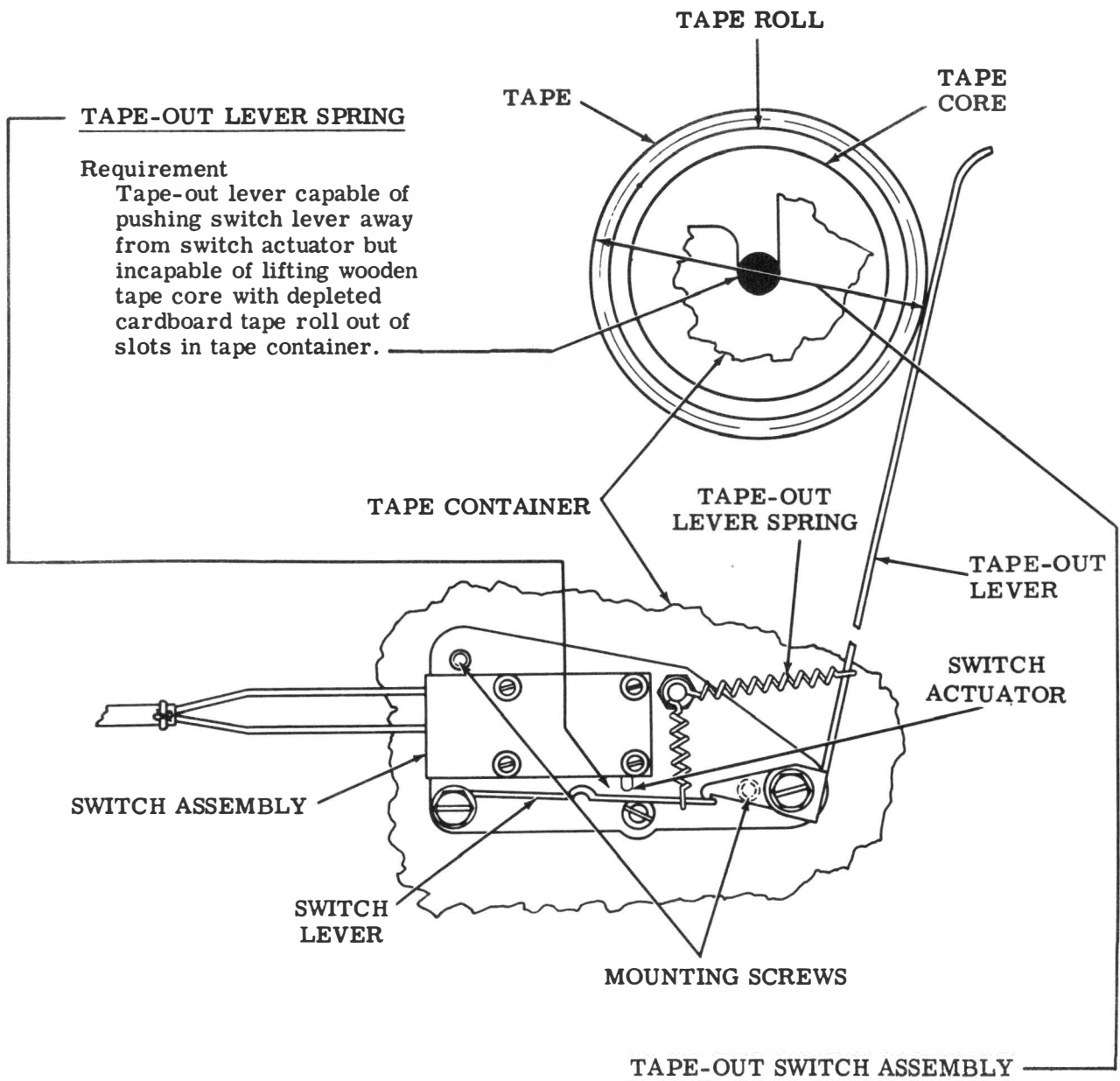
MOUNTING SCREWS

TYPING REPERFORATOR UNIT

ANCHOR BRACKET SCREWS

(TOP VIEW)

4.02 Low Tape Mechanism



TAPE-OUT LEVER SPRING

**Requirement**

Tape-out lever capable of pushing switch lever away from switch actuator but incapable of lifting wooden tape core with depleted cardboard tape roll out of slots in tape container.

TAPE-OUT SWITCH ASSEMBLY

**Requirement**

Switch should operate when diameter of tape roll is

Min 2-3/8 inch---Max 2-5/8 inch.  
(Check with test lamp.)

**To Adjust**

With two mounting screws loosened, position switch assembly on tape container.





## 35 REPERFORATOR BASES

### LUBRICATION

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#### 1. GENERAL

1.01 This section provides lubrication information for the following units: the 35 receiving-only reperforator base, the 35 auxiliary reperforator base (for Automatic Send-Receive (ASR) Set mounting), and the 35 multiple mounted reperforator base.

1.02 General areas of the bases are shown by photographs. Specific points of lubrication are indicated by line drawings and descriptive text. The symbols in the text indicate the following directions:

- O1 Apply one drop of oil.
- O2 Apply two drops of oil.
- G Apply thin coat of grease.

SAT Saturate with oil (felt washers, etc).

KS7470 oil and KS7471 grease should be used.

1.03 The equipment should be thoroughly lubricated, but over-lubrication which might allow oil to drop or grease to be thrown on other parts should be avoided. Special care should be exercised to prevent lubricants from getting between armature and pole faces or between electrical contact points in the associated units.

1.04 The following general instructions supplement the specific lubricating points illustrated on subsequent pages.

(a) Apply one drop of oil to all spring hooks.

(b) Apply oil to all sliding surfaces.

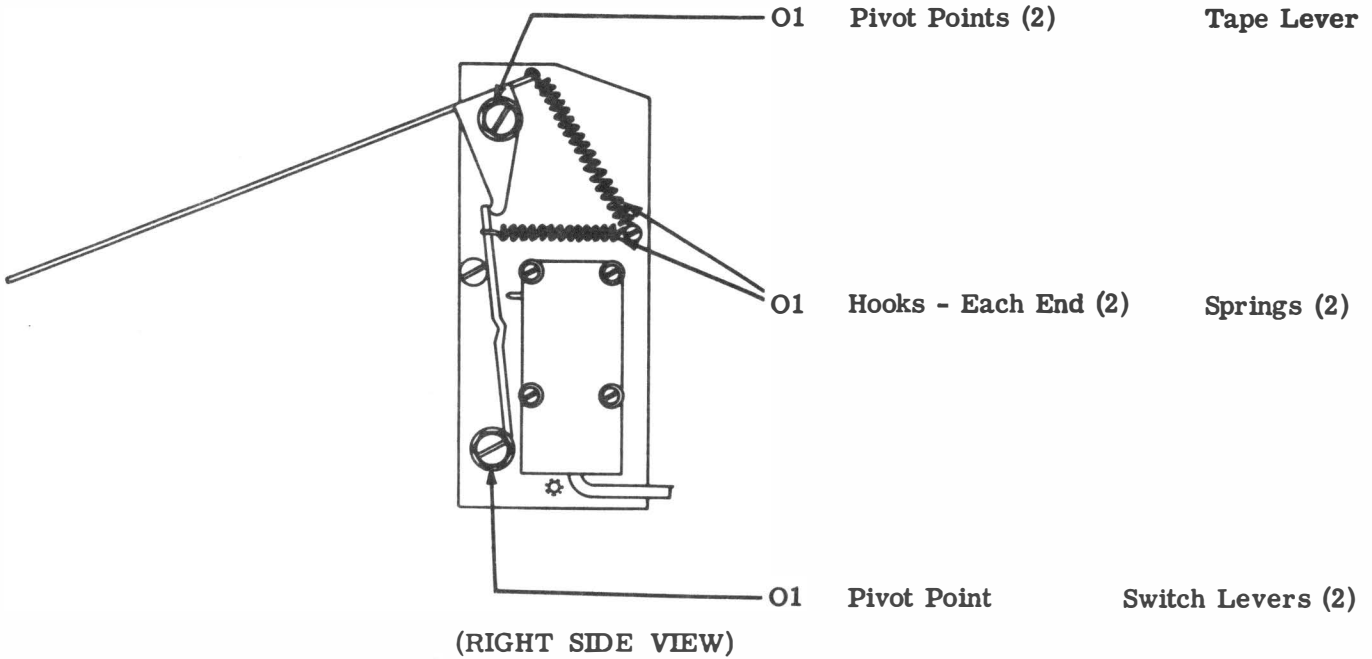
(c) Saturate all felt washers.

1.05 The bases should be lubricated before being placed in service or prior to storage. After a few weeks of service, relubricate to make sure that all specified points have received lubricant. Thereafter, lubricate the bases every 1,500 operating hours, or 6 months, whichever occurs first.

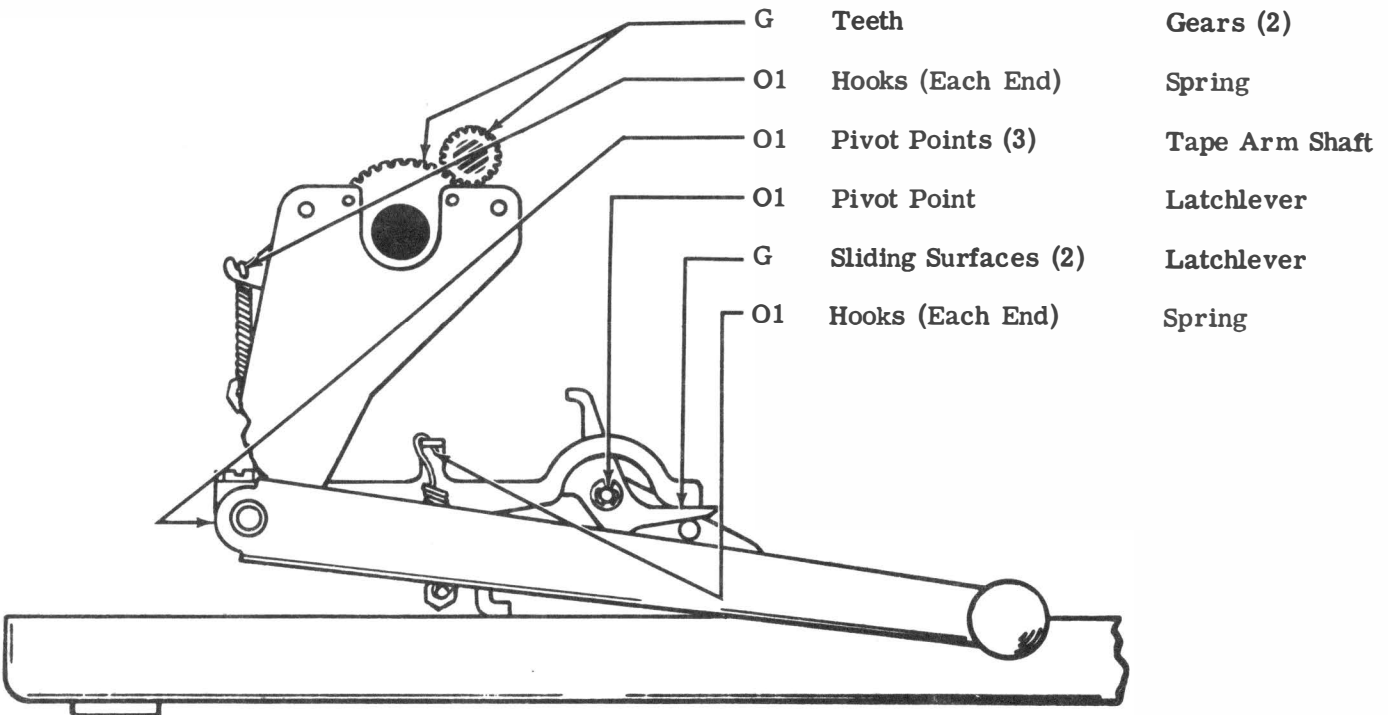
SECTION 574-232-704

2. REPERFORATOR BASES

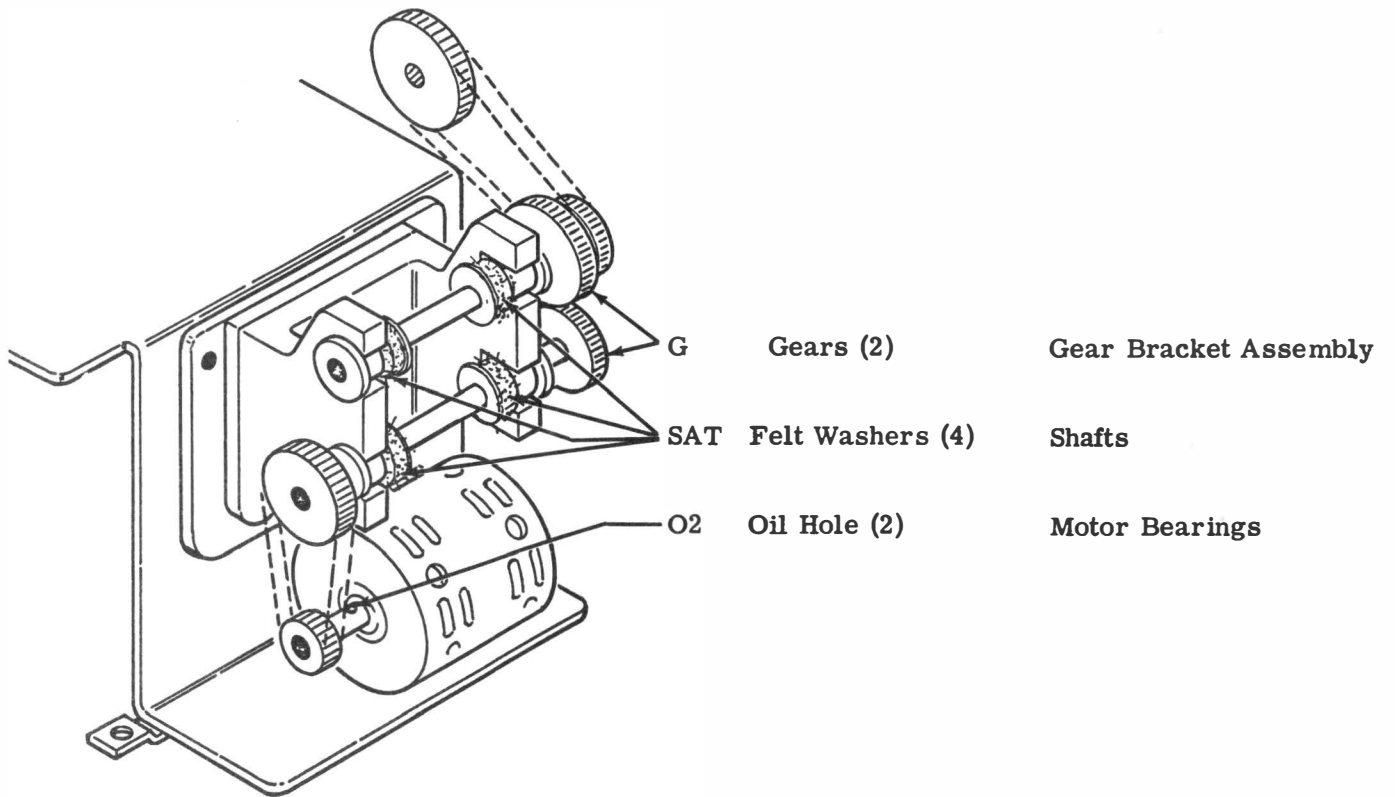
2.01 Tape-Out Switch Mechanism (All 35 Reperforator Bases)



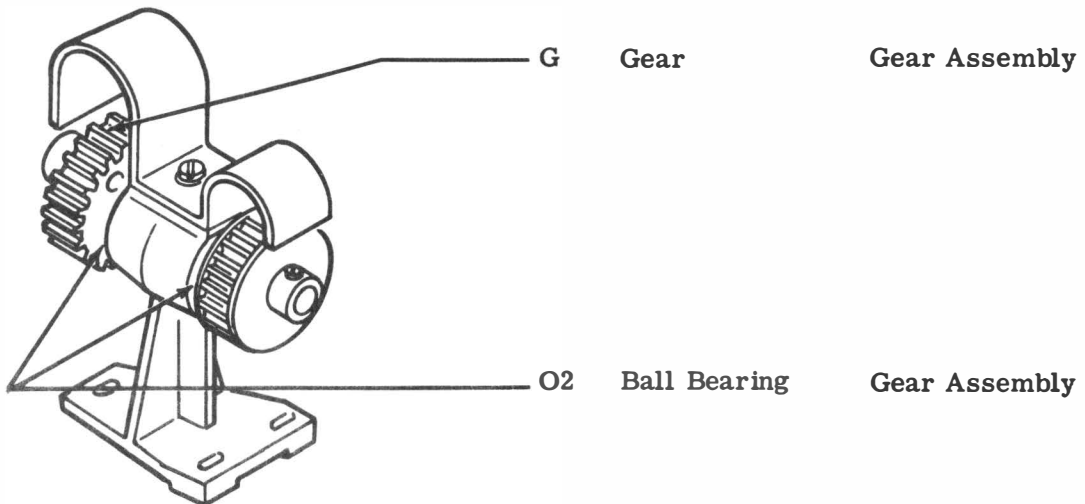
2.02 Tape Winder Mechanism (35 Receiving-Only Reperforator Bases)



2.03 Gear Bracket Assembly (35 Auxiliary Reperforator Base)



2.04 Intermediate Drive Assembly (35 Receiving-Only Reperforator Bases)





35 TYPING REPERFORATOR  
DESCRIPTION AND PRINCIPLES OF OPERATION

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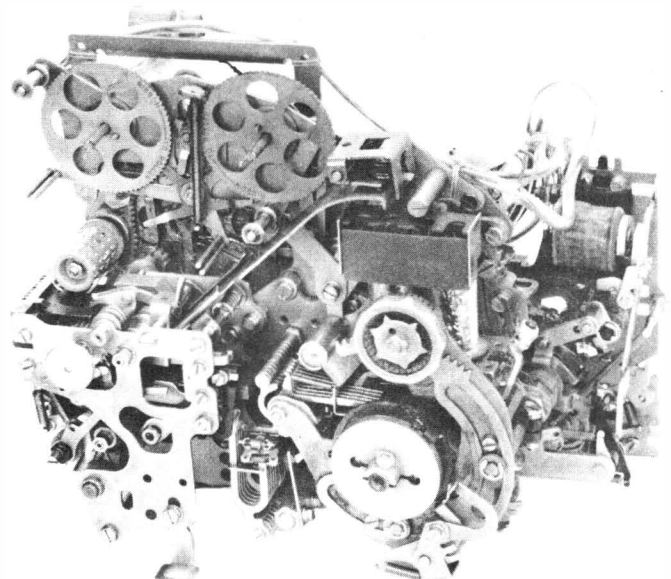


Figure 1 - 35 Typing Reperforator

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1. GENERAL (Figs. 1, 2 and 3)

1.01 This section is reissued to rearrange the text and to add engineering changes and a number of variable features. Since it is a general revision marginal arrows ordinarily used to indicate changes and additions are omitted.

1.02 The 35 typing reperforator is an electro-mechanical unit which records information on tape, both as printed characters and as code perforations. The information is received from a signal line in the form of an electrical signaling code (teletypewriter code), which is translated into mechanical motions to print and perforate. External gears permit operation at signaling speeds up to 100 wpm. Code and tape feed holes are fully perforated. The characters are printed between the feed holes. A number of variable features are available with the unit.

1.03 The unit is equipped to receive information transmitted in the eight level American Standard Code for Information Interchange (ASCII). See the applicable section for a detailed explanation of this code.

1.04 The characters perforated in the tape are six positions in advance of the printed characters. This should be considered when preparing the tape for transmission. The end of the tape should include all of the printed

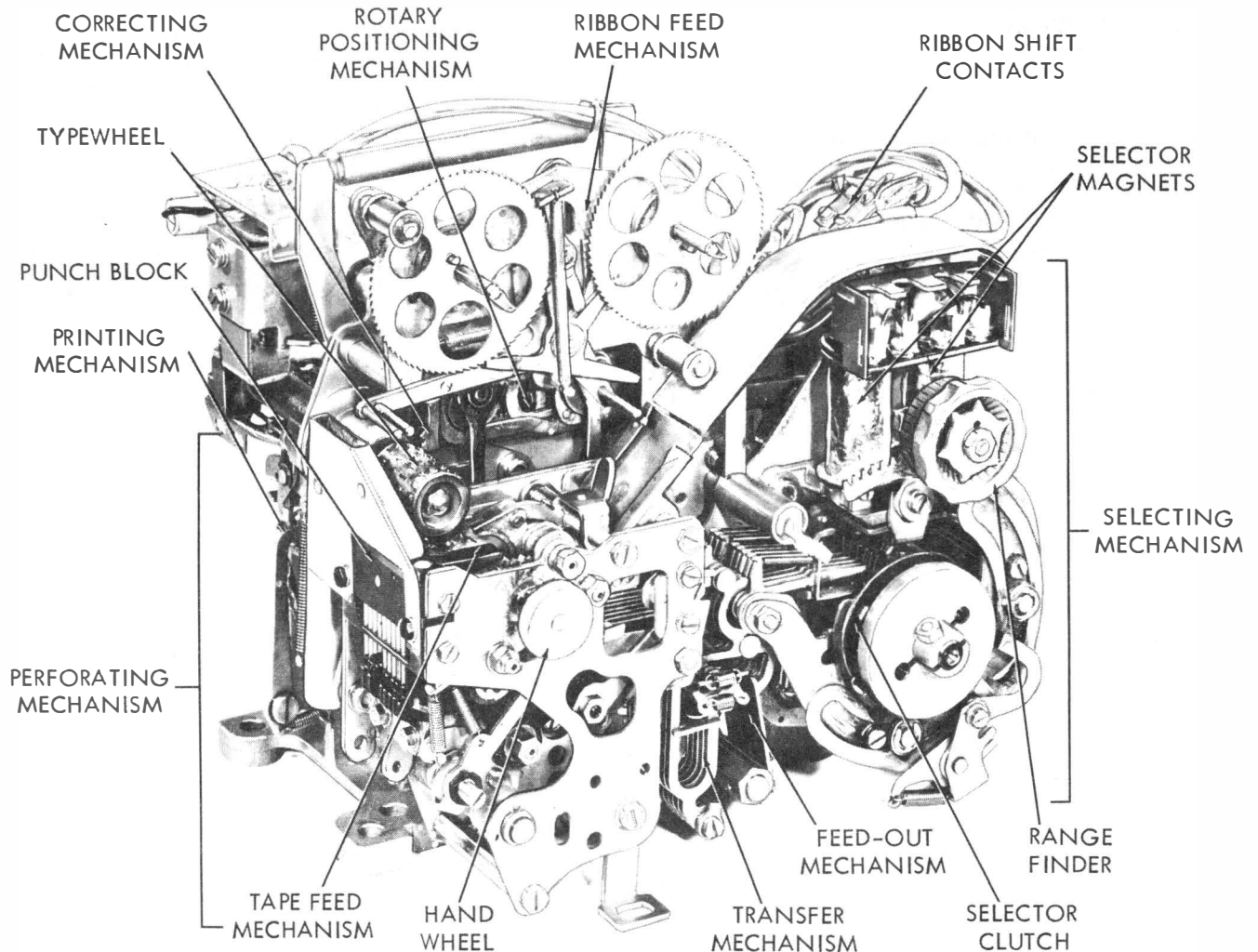


Figure 2 - Typical 35 Typing Reperforator (Left Front View)

characters in the message, and the first printed character of the message must be preceded by at least six sets of code perforations.

1.05 For most applications the unit is equipped with a black-inked ribbon. All graphic characters (such as A, B, C, 1, 2, 3, #, \*, %) are printed. Printing is suppressed when the code combination for a control function is received (eg, BELL, EOA, EOT). For special applications which require printing on receipt of control functions, the typing reperforator is equipped with a two-color ribbon (black and red). The graphic characters are printed in black; control functions are indicated by printing of their complementary graphic symbol in red. See Figure 4.

1.06 Perforated code holes correspond to the marking bits and unperforated code positions correspond to spacing bits. Reading from the rear as the tape feeds from the punch block, the code positions in the tape are: 1, 2 and 3, the feed hole, and the 4, 5, 6, 7, and 8 bits.

1.07 Unless stated otherwise, references in this section to "left" or "right" indicate the operator's right or left, facing the front of the unit (selector mechanism at the right, punch mechanism at the left). In illustrations, unless noted otherwise, the views show the equipment as viewed from the front. Pivot points are shown by circles or ellipses and are drawn solid black to indicate fixed points and crosshatched to indicate floating points.

## 2. DESCRIPTION

### GENERAL

2.01 The following paragraphs describe the mechanisms that comprise the typing reperforator and discuss the differences between the several variations of the unit. Refer to Figures 2 and 3.

### DRIVE MECHANISM (Fig. 2)

2.02 Rotary motion from an external source is received by a main shaft and distributed by two cam-clutch assemblies. External changes in speed of the driving source, through a gear shift mechanism or change gears, permit changes from 60 to 75 or 100

words per minute in the typing reperforator operating speed. A rocker bail further distributes the motion to the mechanisms involved in printing and perforation.

### SELECTING MECHANISM (Fig. 2)

2.03 A selecting mechanism, which includes a two-coil magnet wired to the signal line, converts the electrical signaling code combinations into mechanical arrangements which govern the printing and perforation operations. The magnets may be wired for 0.500 ampere line current furnished by an external selector magnet driver or, depending on the unit, they may be wired in series for 0.020 ampere operation or in parallel for 0.060 ampere operation. A range finder permits adjustment of the selector in relation to the signaling code.

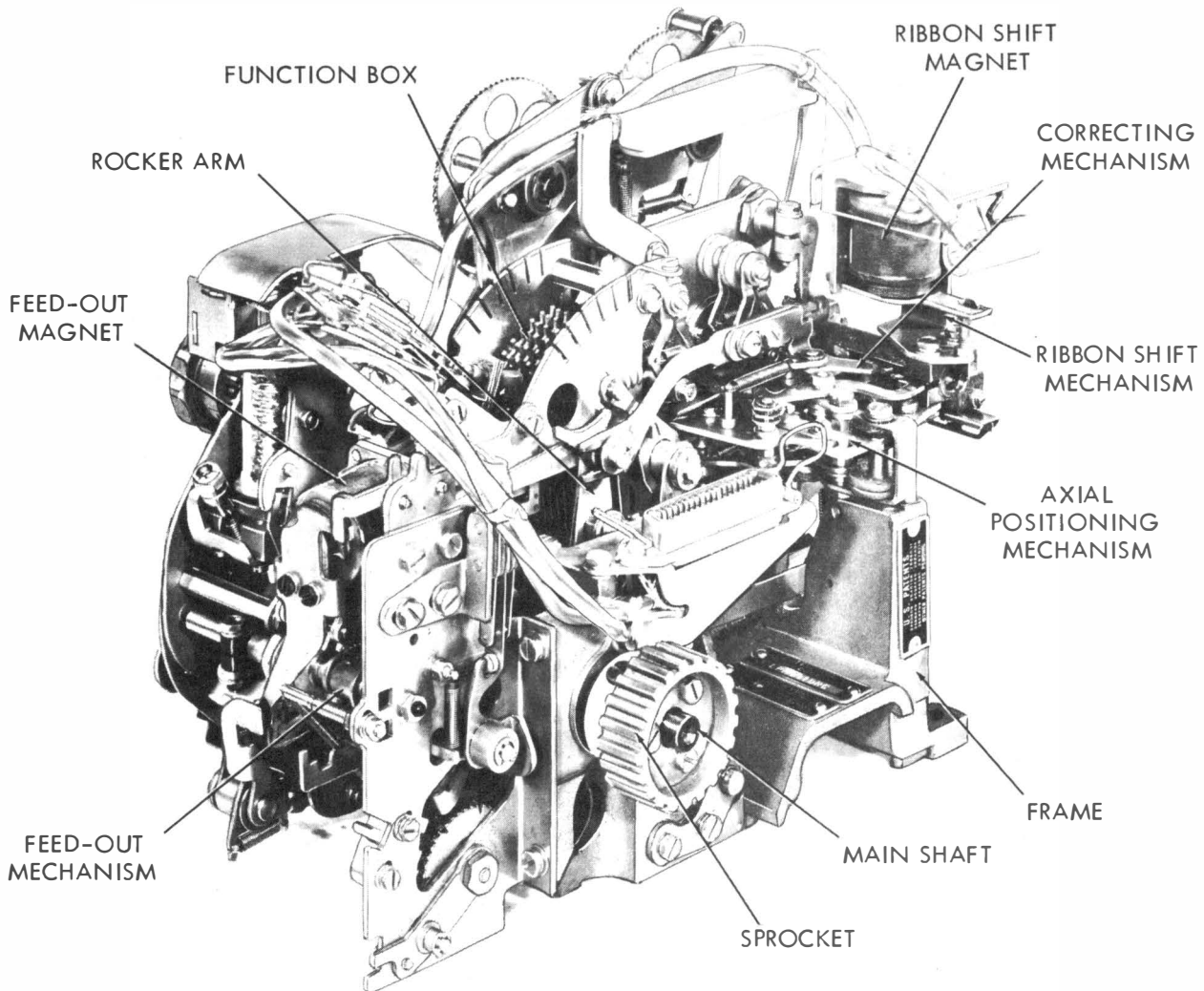


Figure 3 - Typical 35 Typing Reperforator (Left Rear View)



## TYPEWHEEL AND POSITIONING MECHANISMS (Fig. 2)

2.04 The characters used in printing are embossed on a metal typewheel which may be easily replaced to obtain different type faces and character arrangements. Controlled by the selecting and transfer mechanisms, axial and rotary positioning mechanisms in conjunction with a correcting mechanism select the proper characters by moving the typewheel.

## PRINTING MECHANISM (Fig. 2)

2.05 A printing mechanism utilizes a hammer to drive the tape and inked ribbon against the typewheel and imprint the selected character. Printing and perforating occur simultaneously at the punch block, but the characters are printed six positions to the right of the corresponding code combinations. On units equipped with the last character visibility feature, the typewheel is retracted at the end of each operating cycle to expose the last printed character.

## RIBBON FEED MECHANISM (Fig. 2)

2.06 The ribbon feed mechanism has two circular ratchets on which the ribbon spools are mounted. A feed pawl which receives its motion from the rocker bail advances the ribbon by rotating a ratchet once each cycle of operation. The direction of ribbon travel is automatically reversed when the supply spool is nearly depleted.

## PERFORATING MECHANISM (Fig. 2)

2.07 The perforating mechanism contains a punch block, punch pins, and drive parts. The punch pins, contained within the punch block, punch fully perforated code holes in the tape in response to mechanical arrangements received from the selector mechanism via punch slides and punch slides latches. A feed hole is perforated each cycle of operation. The mechanism receives its drive from a main bail assembly.

## RIBBON SHIFT - PRINT SUPPRESSION MECHANISMS (Fig. 3)

2.08 A ribbon shift mechanism is actuated by ribbon shift contacts associated with the function box. This mechanism permits the ribbon to advance fully to print graphics in black. When the signal code combinations for control functions are received, the ribbon shift mechanism will either actuate the print suppression

mechanism to prevent printing (units with one color ribbons) or retard the advance of the ribbon to print the control function's complementary graphic in red (units with two color ribbons).

## FUNCTION BOX (Fig. 3)

2.09 A function box enables the typing reperforator to perform various auxiliary functions, such as the actuation of signal bell and EOT contacts.

## FRAME ASSEMBLY (Figs. 2 and 3)

2.10 A cast frame provides mounting facilities for the various mechanisms which comprise the typing reperforator. The frame is in turn mounted on associated equipment through which the necessary electrical and motive power connections are made. A connector for all electrical input requirements is provided.

2.11 A variation of the typing reperforator contains an additional shaft that enables the perforator and typing mechanisms to be operated at a different speed from that of its selecting mechanism. It is used in applications such as the Automatic Send-Receive (ASR) Set and is described in another publication.

## VARIABLE FEATURES

2.12 A number of variable features are available with the typing reperforator. These features, some of which are described below, enable the unit to perform special operations and may be installed either at the factory or in the field.

(a) Contact Mechanisms: These mechanisms furnish electrical pulses for external use and include the following types:

- (1) Timing contacts for timed control of external equipment. For example, the selector mechanism may be equipped with contacts which provide a signal each time the selector reaches its rest position.
- (2) Letters - figures contacts which signal whether the typing reperforator is in the letters or figures condition.
- (3) Code reading contacts enable the typing reperforator to convert the received serial data into parallel form.

(4) Several types of audible and visual indicator actuating contacts are available, such as signal bell and end of transmission (EOT) contacts which are operated by the function box when their code combinations are received.

(b) Backspace Mechanism: Two types are available: manual and power drive. They are used to retract the tape in order to erase (obliterate) an error.

(c) Tape Feed-Out Mechanisms: Several different methods permit the inclusion of a predetermined length of blank or rubout perforated tape following the end of a message. The extra length of tape facilitates tape handling. Normally, the interfering tape feed-out mechanism operates at the end of a message. A message cannot be received during a feed-out period. The non-interfering tape feed-out mechanisms have provisions for copying messages received during the feed-out period. The mechanisms may be operated manually, automatically, or by remote control.

(d) Print Suppression on Function: This feature is a standard on one-color ribbon units and is available with two-color ribbon units to prevent printing when control functions are received.

(e) Universal Function Blade: This blade contains removable tines so that it may be coded to accommodate a desired function box requirement.

### 3. TECHNICAL DATA

#### APPROXIMATE DIMENSIONS

Width . . . . . 7-1/2 inches  
 Depth . . . . . 6-1/2 inches  
 Height . . . . . 8 inches  
 Weight . . . . . 7-1/2 pounds

#### SIGNAL

Code . . . . . Sequential, 11-unit start-stop (See 3.01)  
 Current . . . . . 0.500 ampere with selector magnet driver. (Other units available to operate on either 0.020 or 0.060 ampere signal)

#### TAPE

Type . . . . . Standard communications and ASCII  
 Width . . . . . 1 inch  
 Perforations . . . . . 8-level, fully perforated  
 Holes/ inch . . . . . 10  
 Feed holes and code holes in line

#### PRINTED CHARACTERS

Height  
 Standard . . . . . 0.100 inch  
 Maximum (Fractions) . . . . . 0.130 inch  
 Width . . . . . 0.050 inch

Type style and character arrangement variable.

#### SIGNALING CODE (Fig. 5)

3.01 Information is received by the reperforator in the form of an eleven bit, start-stop signaling code in which each character (graphic) or function is represented by a sequential combination of current and no-current time intervals. Intervals during which current flows in the signal circuit are referred to as marking and during which no current flows as spacing. Every combination includes eight bits that carry the intelligence, each of which may be either marking or spacing. In present applications, the eighth bit is always marking. For even parity code transmission, the eighth bit may be either marking or spacing, so that the number of marking bits in the transmitted code is always an even number. (See Fig. 5.) The intelligence bits are preceded by a start bit (always spacing) and are followed by two stop bits (always marking). Thus each combination consists of 11.0 units of time (referred to as an 11.0 unit transmission pattern). The start and stop bits ensure synchronization between the transmitting and receiving equipment by bringing the receiving equipment to a complete stop at the end of each combination. The marking condition of the eighth bit further enlarges the marking interval at the end of each code combination transmitted.

3.02 The code representations for the graphics U and \* are illustrated in Fig. 5. In these combinations, alternate marking and spacing condition for the intelligence bits are required.

CODE 1 2 3 4 5 6 7 8 *	CHARACTER REPRESENTATION	MEANING OF CHARACTER	CHARACTER PRINTED	COLOR
0 0 0 0 0 0 0 0	§ NULL	Blank	□	Red
● 0 0 0 0 0 0 ●	§ SOM	Start of Message		Red
0 0 0 0 0 0 0 0	§ EOA	End of Address	"	Red
● 0 0 0 0 0 0 ●	§ EOM	End of Message	#	Red
0 0 0 0 0 0 0 0	EOT	End of Transmission	\$	Red
● 0 0 0 0 0 0 ●	WRU	Who Are You	%	Red
0 0 0 0 0 0 0 0	RU	Are You	&	Red
● 0 0 0 0 0 0 ●	BELL	Bell	'	Red
0 0 0 0 0 0 0 0	§ FE <sub>0</sub>	Form Effector	(	Red
● 0 0 0 0 0 0 ●	TAB	Horizontal Tabulation	)	Red
0 0 0 0 0 0 0 0	LF	Line Feed	*	Red
● 0 0 0 0 0 0 ●	VT	Vertical Tabulation	+	Red
0 0 0 0 0 0 0 0	FORM	Form Feed	,	Red
● 0 0 0 0 0 0 ●	RETURN	Carriage Return	-	Red
0 0 0 0 0 0 0 0	§ SO	Shift Out	.	Red
● 0 0 0 0 0 0 ●	§ SI	Shift In	/	Red
0 0 0 0 0 0 0 0	§ DC <sub>0</sub>	Device Control	0	Red
● 0 0 0 0 0 0 ●	§ X On	Transmitter On	1	Red
0 0 0 0 0 0 0 0	R1 On (TAPE)	Receiver On	2	Red
● 0 0 0 0 0 0 ●	X Off	Transmitter Off	3	Red
0 0 0 0 0 0 0 0	R1 Off (TAPE)	Receiver Off	4	Red
● 0 0 0 0 0 0 ●	§ ERR	Error	5	Red
0 0 0 0 0 0 0 0	§ SYNC	Synchronization Character	6	Red
● 0 0 0 0 0 0 ●	§ LEM	Logical End of Medium	7	Red
0 0 0 0 0 0 0 0	§ S <sub>0</sub>	Information Separators	8	Red
● 0 0 0 0 0 0 ●	§ S <sub>1</sub>	Information Separators	9	Red
0 0 0 0 0 0 0 0	§ S <sub>2</sub>	Information Separators	:	Red
● 0 0 0 0 0 0 ●	§ S <sub>3</sub>	Information Separators	;	Red
0 0 0 0 0 0 0 0	§ S <sub>4</sub>	Information Separators	<	Red
● 0 0 0 0 0 0 ●	§ S <sub>5</sub>	Information Separators	=	Red
0 0 0 0 0 0 0 0	§ S <sub>6</sub>	Information Separators	>	Red
● 0 0 0 0 0 0 ●	§ S <sub>7</sub>	Information Separators	~	Red
0 0 0 0 0 0 0 0	§ CNFM	Conformation	\	Red
● 0 0 0 0 0 0 ●	ALT MODE	Escape (For Communicators)	⏏	Red
0 0 0 0 0 0 0 0	§ ESC	Escape (For Data Processing)	↑	Red
● 0 0 0 0 0 0 ●	RUB OUT	Delete (All Bits Marking)	←	Red

NOTE: Characters marked § have no associated keytop on 35 keyboards.

\*The above chart indicates the code arrangement for even parity. When even parity is not used, the 8th bit is always marking.

Figure 4 - 8-Level Data Interchange Code Language (Controls) for Two Color Typing Reperforators

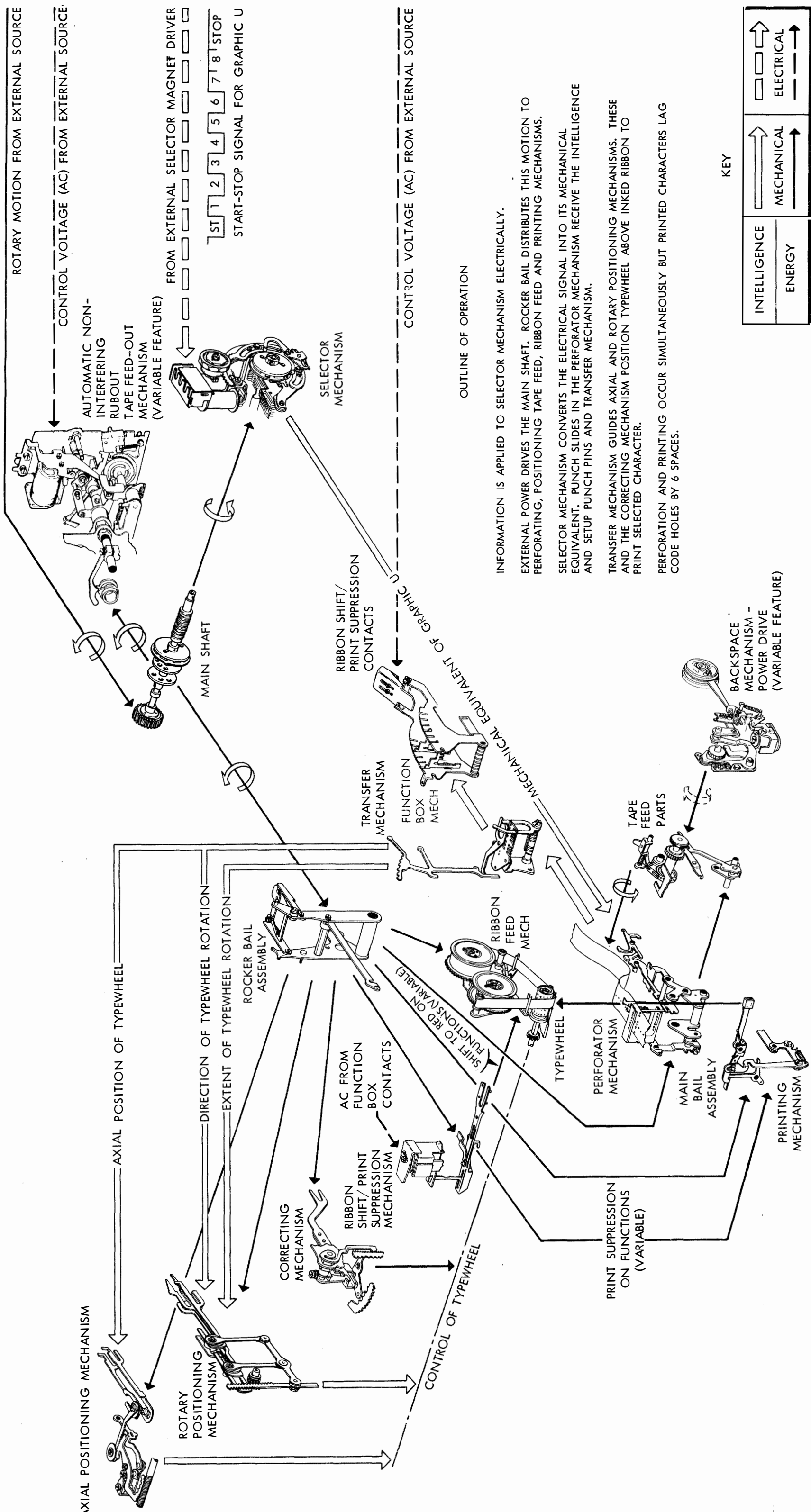
#### 4. GENERAL OUTLINE OF OPERATION

(Fig. 7)

4.01 The relationship of the operating mechanisms of the 35 typing reperforator are illustrated in the pictorial schematic diagram (Fig. 7). Rotary motion from an external source is applied to the main shaft through a sprocket. The main shaft rotates constantly as long as the unit is under power. An externally supplied 115 v ac circuit is used to pulse the tape feed-

out magnet and operate the ribbon shift magnet. The ribbon shift magnet is controlled by function box contacts to permit printing in black or red or, for one color ribbon units, to operate the print suppression mechanism which prevents printing on functions. The selector magnet coils usually operate on a 0.500 ampere circuit through a selector magnet driver. However, there are models available which are not used in conjunction with a selector magnet driver and these require 0.060 ampere to operate the selector magnet coils.





INFORMATION IS APPLIED TO SELECTOR MECHANISM ELECTRICALLY.  
 EXTERNAL POWER DRIVES THE MAIN SHAFT. ROCKER BAIL DISTRIBUTES THIS MOTION TO PERFORATING, POSITIONING TAPE FEED, RIBBON FEED AND PRINTING MECHANISMS.  
 SELECTOR MECHANISM CONVERTS THE ELECTRICAL SIGNAL INTO ITS MECHANICAL EQUIVALENT. PUNCH SLIDES IN THE PERFORATOR MECHANISM RECEIVE THE INTELLIGENCE AND SETUP PUNCH PINS AND TRANSFER MECHANISM.  
 TRANSFER MECHANISM GUIDES AXIAL AND ROTARY POSITIONING MECHANISMS. THESE AND THE CORRECTING MECHANISM POSITION TYPEWHEEL ABOVE INKED RIBBON TO PRINT SELECTED CHARACTER.  
 PERFORATION AND PRINTING OCCUR SIMULTANEOUSLY BUT PRINTED CHARACTERS LAG CODE HOLES BY 6 SPACES.

INTELLIGENCE	→	→	→
ENERGY	- - -	- - -	- - -
	———	———	———
	———	———	———

KEY

Figure 7 - Pictorial Diagram of Typical 35 Typing Reperforator



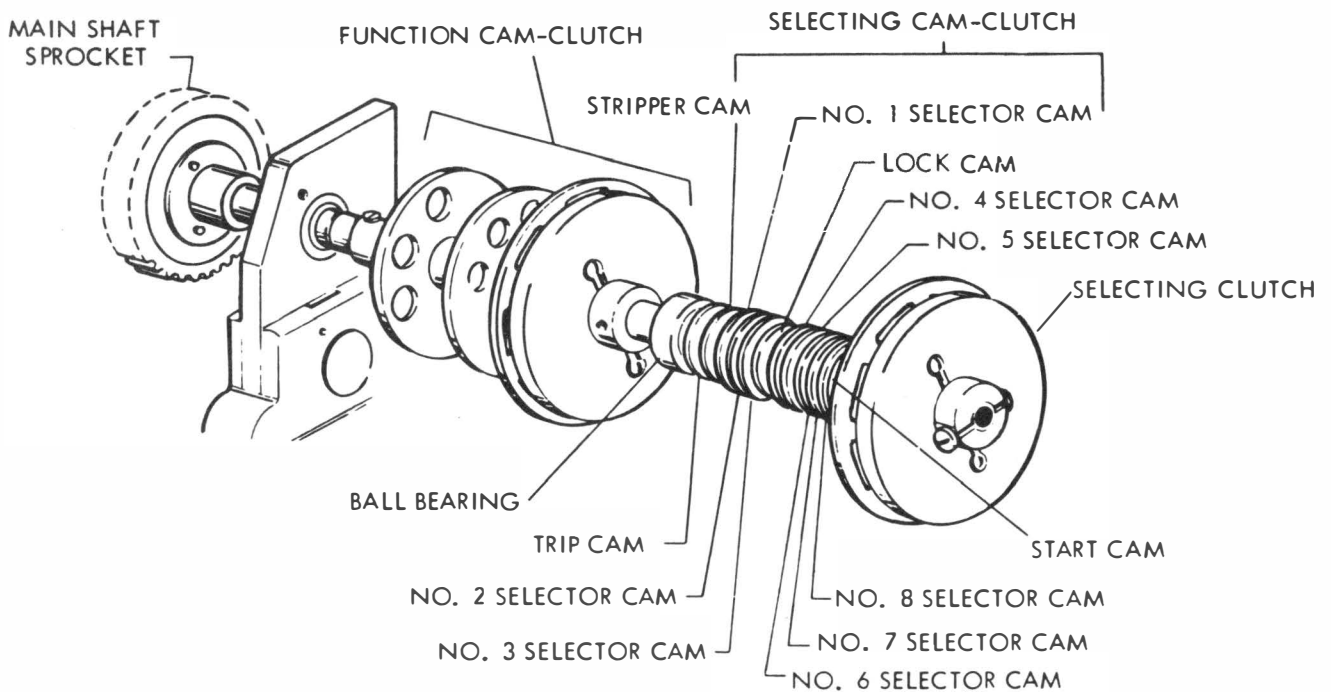


Figure 8 - Main Shaft

4.02 The signaling code combinations, such as the combination representing the graphic U, plotted at the left of Fig. 7, are applied to the selecting mechanism. The start bit of each code combination causes the selector, through a trip assembly, to trip the selecting cam-clutch. The main shaft then imparts motion to the cam-clutch throughout the selecting cycle. The cam-clutch mechanism, in turn, transfers timed motion to the selector, which converts the intelligence bits of the code combination into a corresponding mechanical arrangement. Near the end of the selecting cycle, the cam-clutch actuates the function trip assembly. The latter trips the function cam-clutch to operate the printing and perforating mechanisms. The selecting cam-clutch is then disengaged and remains inoperative until the next code combination is received.

4.03 The function cam-clutch, driven by the main shaft, imparts motion to the rocker bail throughout the function cycle. The rocker bail transfers the motion to the perforating mechanism, the positioning mechanisms, the tape feed mechanism and the printing mechanism.

4.04 The transfer mechanism, having received their arrangement from the selector, causes positioning of the axial and rotary positioning mechanisms, which select the type-wheel character to be printed.

4.05 The punch slides, having received their arrangement from the selector, cause the punch pins to perforate code holes in the tape corresponding to the code bits received by the selecting mechanism. Late in the function cycle, the tape feed parts advance the tape one character space. The function cam-clutch is then disengaged and remains stationary until again tripped by the selecting cam-clutch or by the tape feed-out mechanism. The operations of the reperforator may overlap if the code combinations are being received fast enough. For example, while the perforating mechanism is punching the code combination, advancing the tape and the printing mechanism is printing, the selecting mechanism may be processing the next code combination.

4.06 The backspace mechanism is operated manually or it receives its drive from the typing reperforator main shaft via an eccentric arm. It reverses the rotation of the tape feed wheel to retract the tape in the punch block.

## 5. SELECTION

### GENERAL

5.01 The selecting mechanism, made up of a selector (Par. 5.07), a clutch trip assembly (Fig. 9) and a cam-clutch (Fig. 8), translates the signaling code combinations into mechanical arrangements which govern tape

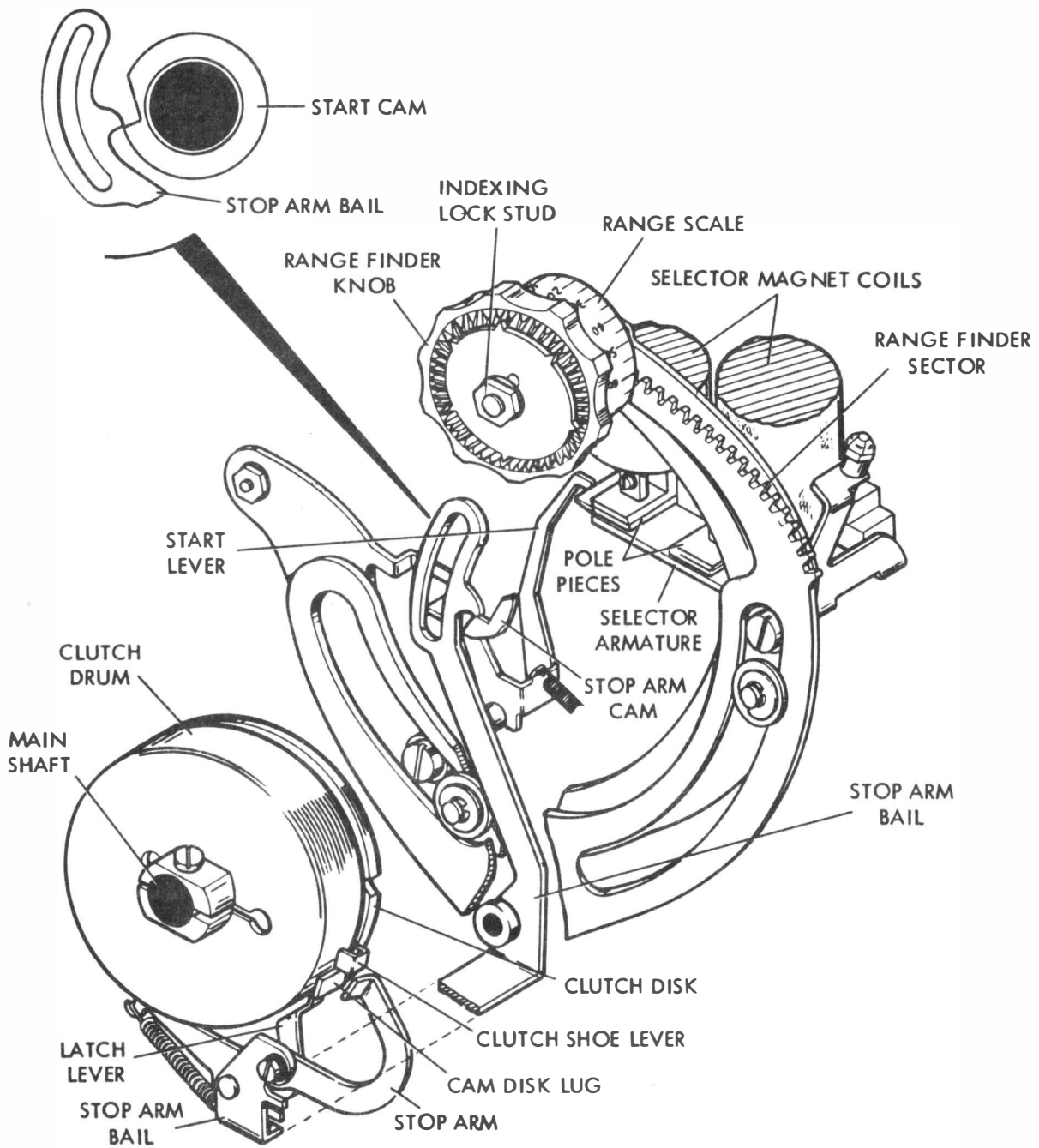


Figure 9 - Range Finder and Selecting Cam-Clutch Assembly



printing and perforation. The electrical pulses comprising each code combination are applied to a magnet of the selector. The magnet, through an armature, controls the clutch trip assembly and the parts associated with translation. The cam-clutch transfers timed motion to the selector and also trips the function cam-clutch. By means of a range finder assembly (Fig. 9), the selecting mechanism can be adjusted to sample the code bits at the most favorable time for optimum operation. The mechanical arrangements produced by the selecting mechanism are passed on through the transfer mechanism to control the positioning and printing mechanisms (Par. 5.13) and through the punch slides to control the perforating mechanism (Par. 5.09).

#### RECEPTION AND TRANSLATION

##### A. Selecting Cam-Clutch and Trip Assembly (Fig. 8 and 9)

5.02 The selecting cam-clutch includes (from right to left in Fig. 8) the clutch, the start cam, the eighth, seventh, sixth, fifth and fourth pulse cams, the lock cam, the third, second and first pulse cams, the stripper cam and the trip cam. During the time in which the signal line current is closed (marking), the selector magnet coils are energized and hold the selector armature up against the magnet pole pieces (Fig. 9). In this position, the armature blocks the start lever, and the cam-

clutch is held stationary between the stop arm and latch lever.

5.03 When a code combination is received, the start bit (spacing) de-energizes the magnet, and the selector armature under tension of its spring moves down out of the way of the start lever. The start lever turns clockwise under spring pressure and moves the stop arm bail into the indent of the start cam (Fig. 9). As the stop arm bail rotates about its pivot point, the attached stop arm is moved out of engagement with the clutch shoe lever. The selecting cam-clutch engages and begins to rotate counterclockwise. The stop arm bail immediately rides to the high part of the cam, where it remains to hold the start lever away from the armature while the intelligence bits of the code are received and processed by the selector (Par. 5.07 to 5.09).

5.04 When the stop bit at the end of the code combination is received, the armature is pulled up and blocks the start lever. Thus the stop arm bail is prevented from dropping into the low part of its cam, and the attached stop arm is held in position to stop the clutch stop lever. When the clutch shoe lever strikes the stop arm, the inertia of a cam disk causes it to continue to turn until its lug makes contact with the clutch shoe lever. At this point, a latch lever drops into an indent in the cam disk, and the clutch is held disengaged until the next code combination is received.

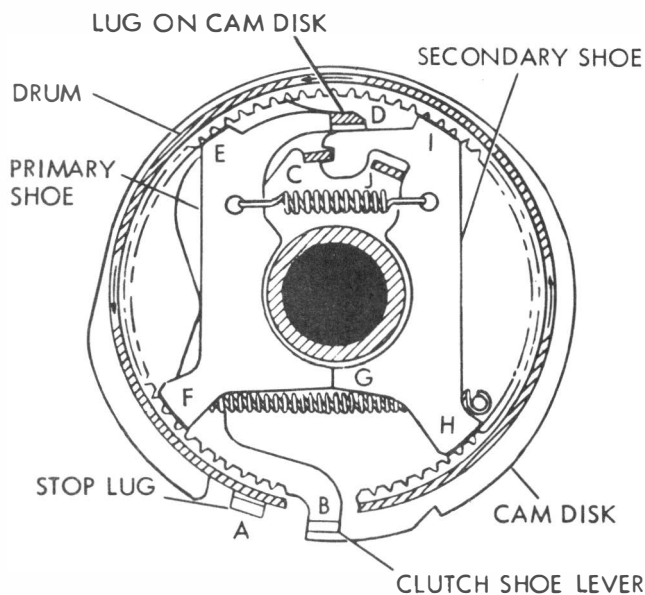


Figure 10 - Clutch, Engaged

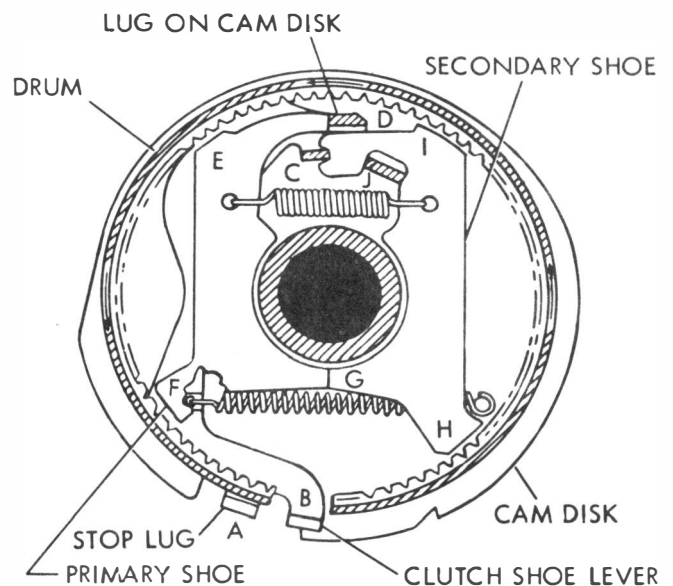


Figure 11 - Clutch, Disengaged

**B. Clutch Operation (Fig. 10 and 11)**

5.05 The clutch drum is attached to and rotates in unison with the main shaft (Fig. 8). In the disengaged position, as shown in Fig. 11, the clutch shoes do not contact the drum, and the shoes and cam disk are held stationary. Engagement is accomplished by moving the stop arm (Fig. 9) away from the clutch and thus releasing stop lug A and the lower end of shoe lever B (Fig. 10). The upper end of lever B pivots about its ear C, which bears against the upper end of the secondary shoe, and moves its ear D and the upper end of the primary shoe toward the left until the shoe makes contact with the notched inner surface of the rotating drum at point E. As the drum turns counterclockwise, it drives the primary shoe downward so that it again makes contact with the drum at point F. There, the combined forces acting on the primary shoe cause it to push against the secondary shoe at point G. The lever end of the secondary shoe then bears against the drum at point H. The drum drives this shoe upward so that it again makes contact with the drum at point I. The forces involved are multiplied at each of the preceding steps. The aggregate force is applied through the shoes to the lug J on the clutch cam disk, and the disk and attached cam turn in unison with the drum.

5.06 Disengagement is effected when the lower end of shoe lever B strikes the stop arm (Fig. 9). Lug A and the lower end of the shoe lever are brought together (Fig. 10), and the upper end of lever B pivots about its ear C and allows its other ear D to move toward the right. The upper spring then pulls the two shoes together and away from the drum. The latch lever seats in the indent in the cam disk (Par. 5.04) and the cam is held in its stop position until the clutch is again engaged.

**C. Selector Operation (Fig. 8, 9 and 12)**

5.07 The selector assembly consists primarily of two magnet coils (Fig. 9), an armature and associated bails, levers and latches (Fig. 12). Eight linkages, each of which consists of a selecting lever, a push lever and a punch slide latch, link the selector cam with the punch slides. Since the linkages are identical, only the No. 4 is shown in its entirety in Fig. 12. As the selecting bits of the code combination are applied to the magnet, the cam actuates the selecting levers. When a spacing bit is received, a marking lock lever is blocked by the end of the armature, and a spacing lock lever swings

to the right above the armature and locks it in the spacing position until the next signal transition occurs. Extensions on the marking lock lever prevent the selecting levers from following their cams. When a marking bit is received, the spacing lock lever is blocked by the end of the armature, and the marking lock lever swings to the right below the armature and locks it in the marking position until the next signal transition occurs. During this marking condition, the selecting levers are not blocked by the marking lock lever extensions, but are permitted to move against their respective cams. The selecting lever that is opposite the indent in its cam, while the armature maintains a marking condition, swings to the right, or selected, position, and the end of an associated push lever falls off a step on the selecting lever.

5.08 As the cam rotates, the selecting levers, together with any selected push levers, are moved to the left by the high part of their respective cams, where they remain until the next code combination is received. The unselected push levers remain to the right. When the next code combination is received, a selector reset bail, lifted by its cam (Fig. 12), strips the selected push levers from the selecting levers, and the push levers are returned to the right by their springs.

5.09 The selected push levers, in moving to the left, rotate associated punch slide latches counterclockwise (Fig. 12). Just before the eighth push lever is selected, the selecting cam through the function trip assembly causes the perforator reset bail to release the punch slides (Par. 5.13). The unselected latches retain their associated slides to the right, while the selected latches permit their slides to move to the left under spring tension. During the latter part of the function cycle, the reset bail returns the punch slides to their unselected position (Par. 8.02). The latches under spring tension return to their unselected position when the push levers are repositioned at the beginning of the next selecting cycle.

**ORIENTATION (Fig. 9)**

5.10 For optimum performance, the selecting mechanism should be adjusted to sample the signaling code bits at the most favorable time. To make this adjustment, the operating margins are established through the range finder, which provides a means of varying the time of sampling. The obtaining of this optimum setting is referred to as orientation.

5.11 When the range finder knob (Fig. 9) is pushed inward and rotated, its attached range finder gear moves the range finder sector (which supports the stop arm bail, stop arm and latch lever) either clockwise or counter-clockwise about the selector cam-clutch. This changes the angular position at which the selector cam-clutch stops with respect to the marking and spacing lock levers. When an optimum setting is obtained, the range finder knob is released. Its inner teeth engage the teeth of the indexing lock stud and hold the range finder mechanism in position. The setting may be read on the range scale opposite a fixed index mark.

### TRANSFER (Fig. 13)

5.12 The function of the transfer mechanism is threefold:

- (1) It provides a path for the signal intelligence from the selector to the associated pushbar in the typewheel positioning mechanism.
- (2) It provides a path for the signal intelligence from other signal sources to the typewheel positioning mechanism, and

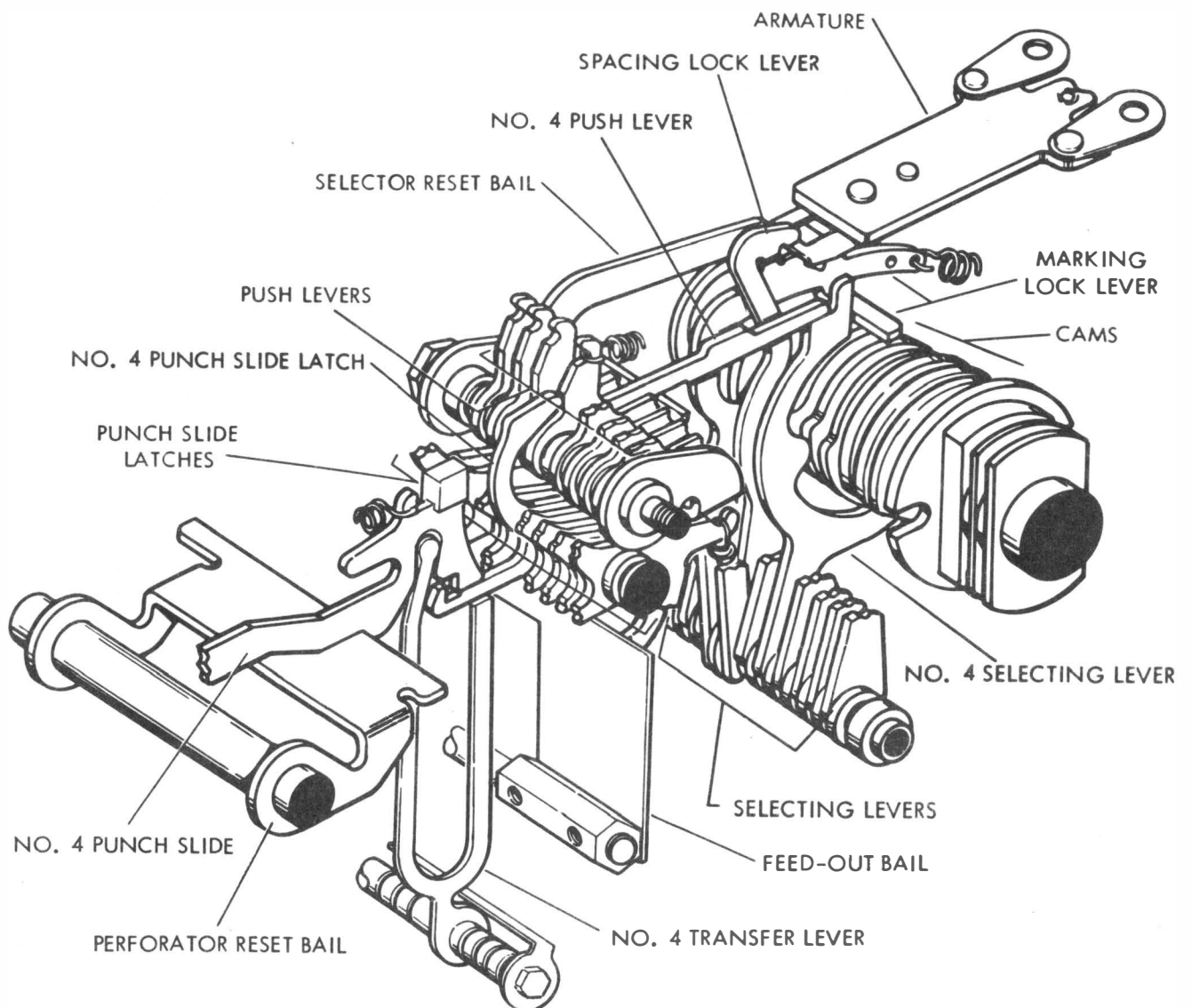


Figure 12 - Selector

(3) It provides a means for setting up the ribbon color shift contacts to condition ribbon for red or black printing or to initiate print suppression, determined by the unit.

5.13 The transfer levers engage the punch slides at one end, as illustrated by the No. 4 transfer lever in Fig. 13. The transfer levers all pivot about a common point and, at various distances from this pivot, engage their corresponding transfer beams. The opposite end of the transfer beam is coupled to one arm of a bell crank lever. The opposite arm of the number 1, 2, 3, 4, 5 and 7 bell crank lever engages its associated pushbar. Since the No. 6 and 8 bits do not control the position of the type-wheel, they do not have an associated pushbar. When a selected punch slide falls forward, the corresponding push bar is raised upwards and into engagement with the rocker bail. An additional extension on the lower end of the latch lever is arranged to engage a bail on the tape feed-out mechanism.

5.14 The No. 6 and 7 bell cranks have an additional arm which controls a transfer contact assembly in the function box. This pair of contacts is used to control the ribbon shift magnet which, in turn controls the color of the printed character or initiates print suppression (see 7.26 and 7.28). Current is allowed to pass through the contacts when the No. 6 and 7 bits are opposite polarity, such as No. 6 marking, No. 7 spacing, or No. 6 spacing, No. 7 marking. Current is not allowed to pass when the No. 6 and No. 7 bits are of the same polarity.

5.15 The bell cranks are provided with an arrangement of projections and slots which either block or permit the entrance of a sensing blade. The function box provides slots for up to six sensing blades which can be coded to respond to any of 256 code combinations. Contact assemblies associated with the sensing blades provide a means of supplying a pulse of between 10 and 14 milliseconds for control purposes with external circuitry.

## 6. MOTION FOR TYPING AND PERFORATING

### GENERAL

6.01 The motion of the main shaft is conveyed to the mechanisms concerned with typing and perforation by the function mechanism, which is comprised of a cam-clutch (Fig. 8), a clutch trip assembly (Fig. 14) and a rocker bail (Fig. 15).

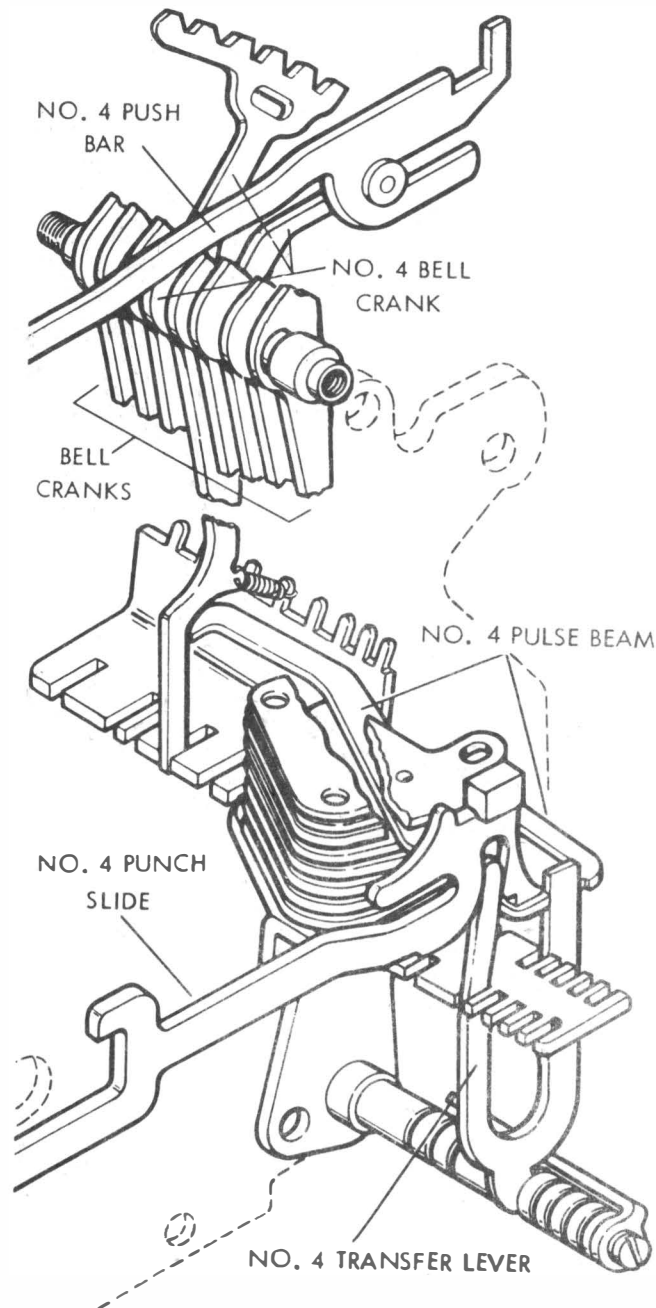


Figure 13 - Transfer Mechanism

### FUNCTION CAM-CLUTCH AND CLUTCH TRIP ASSEMBLY (Fig. 14)

6.02 The trip assembly is shown in its unoperated condition in Fig. 14. A follower lever rides on a function trip cam which is part of the selecting cam-clutch (Fig. 8). Near the

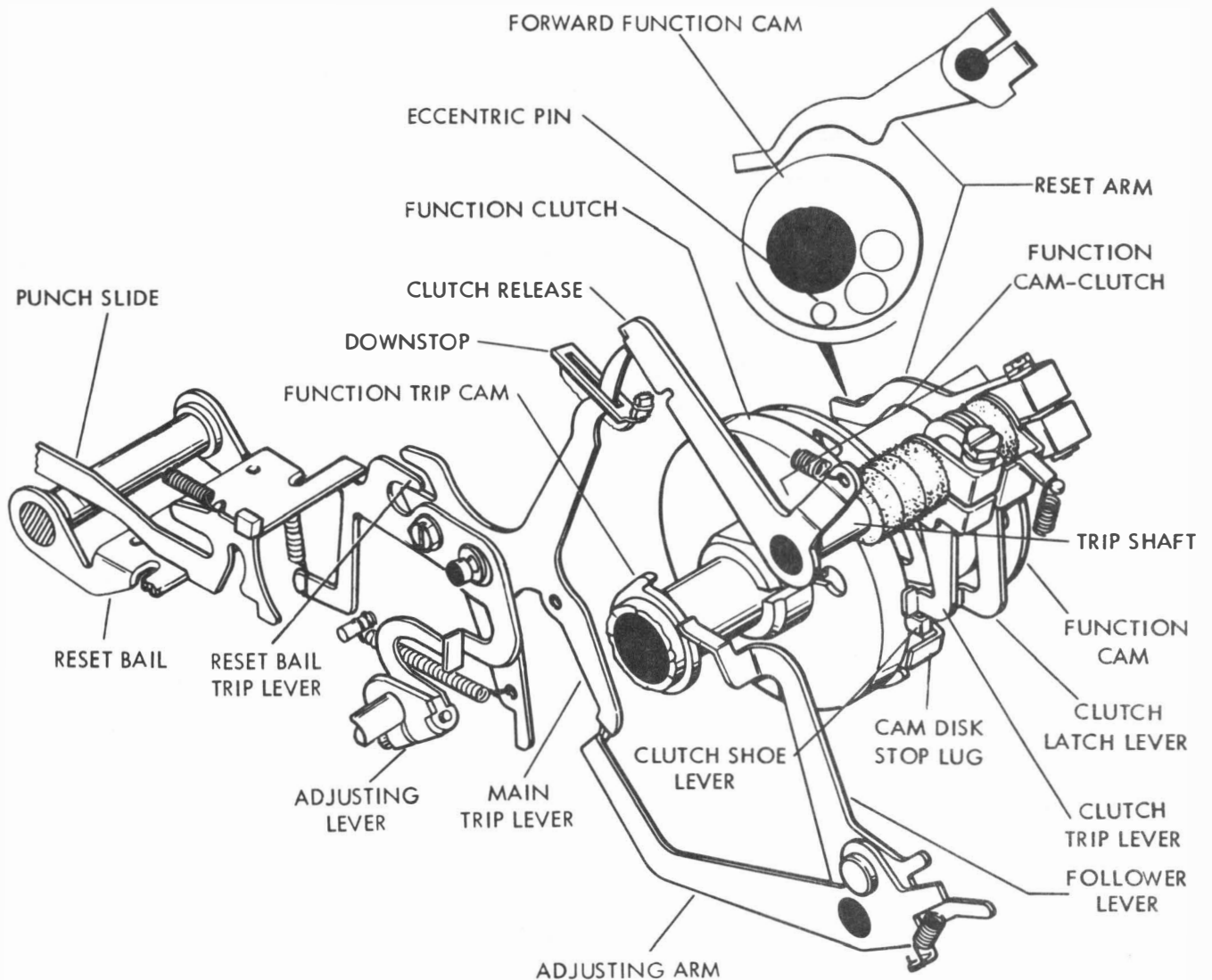


Figure 14 - Function Cam-Clutch and Clutch Trip Assembly

end of the selecting cycle, as the main shaft rotates counterclockwise, the high part of the cam pivots the follower lever (Fig. 14) which, through an attached adjusting arm, rotates a main trip lever counterclockwise. A reset bail trip lever attached to the main trip lever lowers the perforator reset bail and releases the punch slides (Par. 8.02), and an upper arm of the main trip lever moves out of the way of a clutch release, which falls against a downstop and rotates a trip shaft counterclockwise. Immediately, the low part of the trip cam allows the follower lever to return to its unoperated position, and the upper arm of the

main trip lever moves down against the release. When the trip shaft is rotated by the release, it moves an attached clutch trip lever out of engagement with the clutch shoe lever. The clutch engages, and the cam-clutch begins its cycle. The internal operation of the clutch is the same as that of the selector clutch, described in Par. 5.05 and 5.06 of this section.

6.03 About midway through the function cycle, an eccentric pin on the function cam lifts a reset arm, which rotates the trip shaft clockwise. The release is moved up and allows the main trip lever to fall against the adjusting

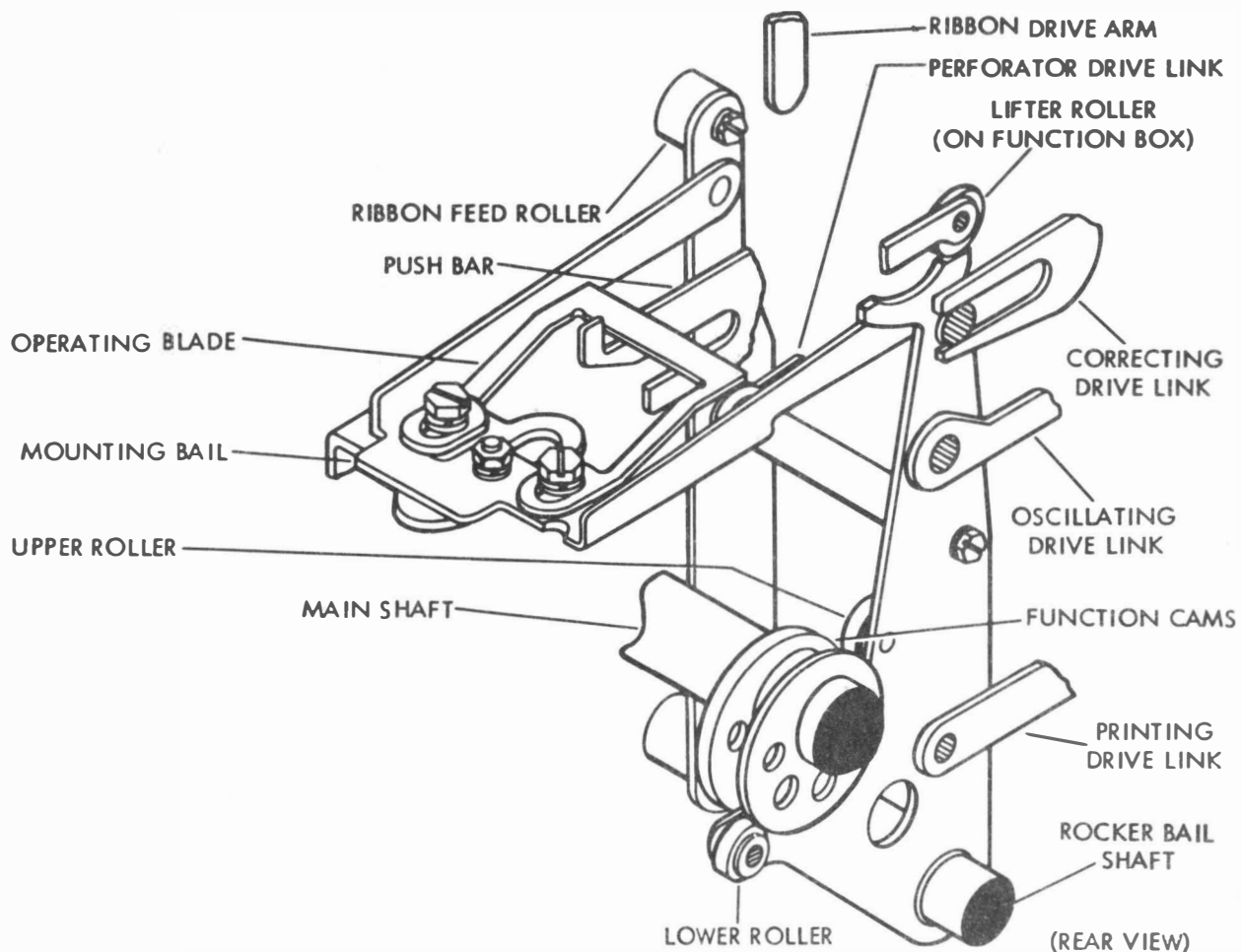


Figure 15 - Rocker Bail Assembly

arm and raise the reset bail. The eccentric pin then moves out from under the reset arm, and the release is permitted to return to its unoperated position against the main trip lever. When the cam-clutch assembly completes its cycle, the clutch shoe lever strikes the trip lever, and the clutch is disengaged.

#### ROCKER BAIL (Fig. 15)

6.04 The function cam and the rocker bail translate the rotation of the main shaft into simple harmonic motion, which the bail distributes to the following:

- (a) Ribbon feed mechanism.
- (b) Perforator.
- (c) Correcting mechanism.
- (d) Function box.
- (e) Printing mechanism.
- (f) Oscillating assembly.

- (g) Pushbars of the axial and rotary positioning mechanisms.

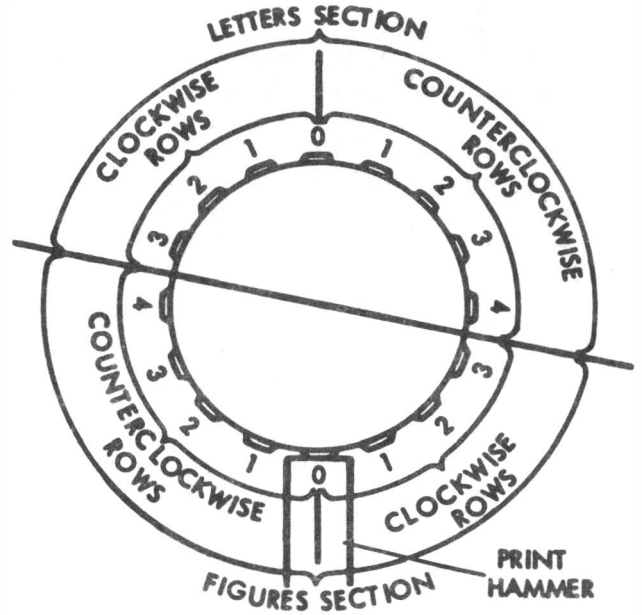
The bail is shown in its home position in Fig. 15. Each function cycle, the function cams bear against the rollers and cause the bail to rock to the right (as viewed from the rear in Fig. 15) during the first part of the cycle and then back to the home position during the latter part of the cycle.

## 7. TYPING

### GENERAL

7.01 The characters used to type the received intelligence — letters, figures, and symbols representing various functions — are embossed on the cylindrical surface of the metal typewheel (Fig. 16). During the function cycle, the axial and rotary positioning mechanisms (Fig. 17 and 19), having received the intelligence from the transfer mechanism, position the wheel so that the character represented by

the received code combination is selected. Following typewheel positioning the correcting mechanism (Fig. 17 and 19) accurately aligns the selected character. Then the printing mechanism (Fig. 21), by means of a hammer, drives the tape and inked ribbon against the wheel and imprints the character. A ribbon feed mechanism (Fig. 22) advances the ribbon and reverses its direction of feed when one of two ribbon spools is depleted. Near the end of the function cycle the axial positioning mechanism retracts the typewheel and a ribbon guide. On units equipped with the last character visibility feature, the forward portion of the ribbon is used for printing. When the typewheel and ribbon guide retract, the last printed character is visible. The letters or the figures code combination sets up an arrangement in the transfer mechanism which permits the function box (Fig. 20) to operate and cause the rotary positioning mechanism to shift the typewheel.

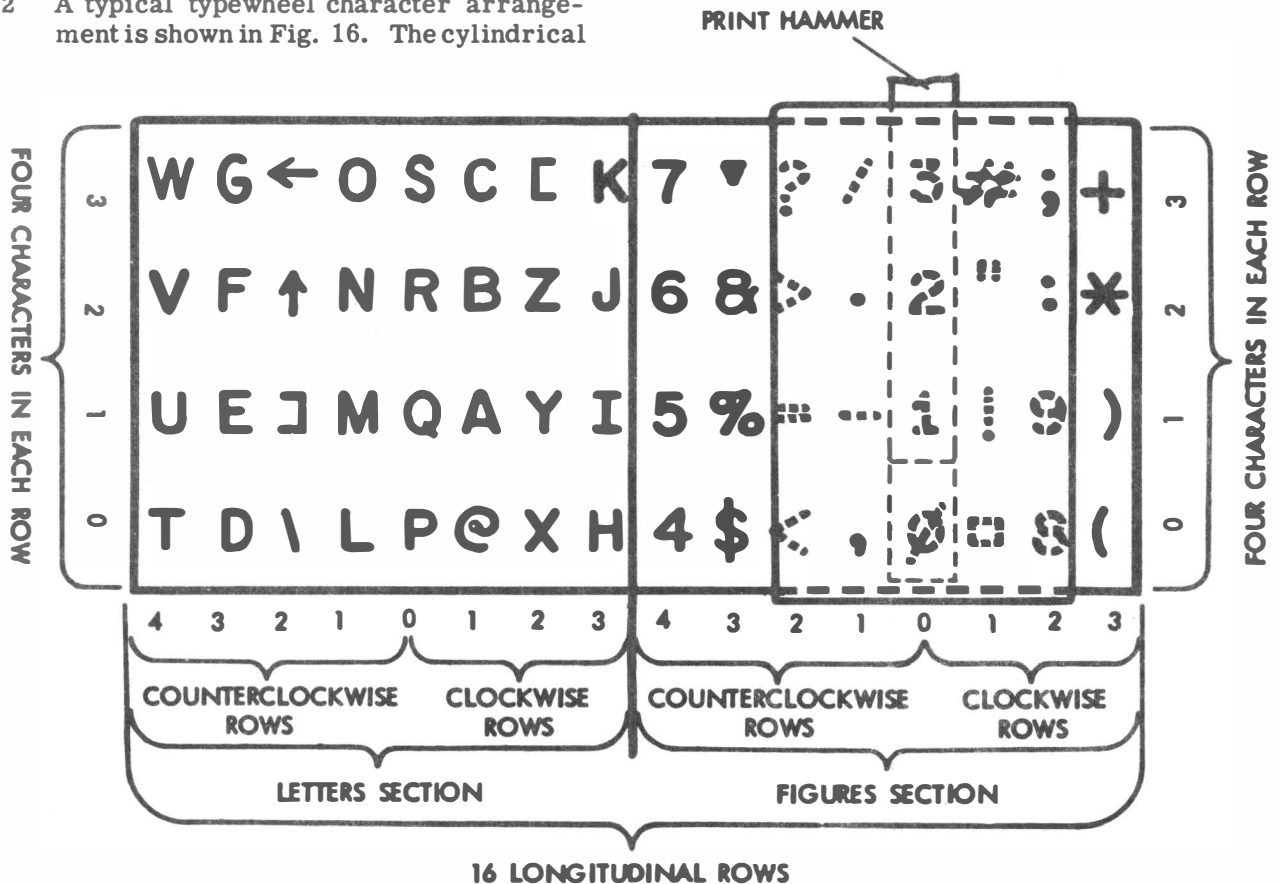


a.  
FRONT VIEW SHOWING 16 LONGITUDINAL ROWS

**TYPEWHEEL POSITIONING**

**A. General**

7.02 A typical typewheel character arrangement is shown in Fig. 16. The cylindrical



b.  
TOP VIEW SHOWING CYLINDRICAL SURFACE IN A PLANE

Figure 16 - Typical Typewheel Character Arrangement



surface of the wheel is shown rolled out into a plane. There are 16 longitudinal rows, each of which is made up of four characters numbered 0 to 4 from front to rear. The surface is divided into two sections, a letters and a figures, each containing eight rows. The fifth row counterclockwise from the division line in both sections is numbered 0, and there are four rows in one direction from 0 numbered 1 to 4 and designated as counterclockwise rows, and three rows in the other direction numbered 1 to 3 and designated as clockwise rows. It should be noted that the clockwise and counterclockwise modifiers refer to the direction of rotation of the wheel to select the rows and not to their position on the wheel.

7.03 Each printing operation (excluding those devoted to the letters-figures shift) begins and ends with the typewheel in the home position of the section containing the character to be printed, i e , with the No. 0 character of the No. 0 row at the point of contact of the print hammer. (Actually, inasmuch as the wheel is retracted to show the last printed character (Par. 7.11), the No. 0 character is slightly to the rear, but for this discussion it will be assumed that it is at the point of contact.) During the printing operation the axial and rotary positioning mechanisms, transferring separate but simultaneous motions to the wheel, position it so that the character represented by the received code combination is at the point of contact of the hammer at the time of printing. The rotary mechanism, which is controlled by the No. 3, 4 and 5 selecting elements of the code, revolves the wheel so as to select the proper row; and the axial mechanism, which is governed by the No. 1 and 2 elements, moves it forward and rearward along its axis so as to select the proper character in the row. Rotation of the typewheel to print in either the letters or the figures section is controlled by the No. 7 bit of the code.

7.04 To illustrate the above, if the wheel is in the figures condition, as shown in Fig. 16, and the numeral "0" is to be printed, there is no movement of the wheel during the printing operation, because "0" is already at the point of contact of the hammer. However, if the letter "F" is to be printed, the wheel is first shifted eight rows to the letters home position. Then during the next operation it is rotated three rows counterclockwise and moved forward two characters so that "F" is at the point of contact of the hammer. Printing takes place, and the wheel is then returned to the letters home position.

## B. Rotary Positioning (Fig. 17 and 18)

7.05 The rotary positioning mechanism revolves the typewheel so that the row containing the character to be printed is aligned with the print hammer at the time of printing. Mounted on the front plate, the mechanism includes two eccentric assemblies as shown in Fig. 17 and 18. Each assembly includes a primary shaft, a section of which is formed into a pinion. A secondary shaft, mounted in the primary and offset from its center, forms an eccentric, referred to as the rear eccentric. A portion of the secondary shaft is also a pinion, and a crank pin mounted on its disk-like forward surface forms a secondary, or front, eccentric. Each of the four pinions of the two eccentric assemblies is engaged by the rack of a pushbar: the No. 3 bar engages the right front pinion, the No. 4 engages the left rear pinion and the No. 5 engages the right rear pinion. The left front pinion is engaged by both the letters and the figures pushbar.

7.06 The eccentric assemblies are linked to a typewheel shaft by a drive assembly as shown in Fig. 17. The typewheel is secured to the front of the shaft which is supported by a bearing housing mounted at the left rear of the front plate (Fig. 19). A spur gear which meshes with a typewheel rack rides on the shaft in a bearing housing. The shaft is free to move axially in the housings and the spur gear, but flats in its circumference which bear against flats in the gear ensure its rotating when the gear rotates.

7.07 When in response to a marking bit a push bar is lifted by its bell crank, as described in Par. 5.13 of this section, the rocker bail operating blade (see Fig. 15 and 18) engages a slot in the bar and moves it to the left during the first part of the function cycle. The bar, by means of its rack and the mating pinion, rotates the associated eccentric one half revolution where it is locked in position by a detent assembly while printing takes place. When the bail rocks back to the right during the latter part of the cycle, it returns the bar and eccentric to their home position where the eccentric is again detented. The preceding does not apply to the No. 7 pushbar, covered in Par. 7.17. In both assemblies one-half revolution of the rear eccentric results in its maximum vertical displacement which is transferred through the front eccentric to a crank pin. Similarly, one-half revolution of the front eccentric results in its maximum displacement being transferred to the crank pin. If both eccentrics are



rotated, the displacement of the crank pin is equal to the algebraic sum of the two displacements which may be in either the same or opposite directions. Both assemblies are so designed that, if the displacement of the rear eccentric is taken to be one unit, the displacement of the front eccentric is four units. Four permutations are thus available: zero (neither eccentric displaced), one unit (rear eccentric displaced), four units (front eccentric displaced) and five or three units depending on how the assembly is set up (both eccentrics displaced).

7.08 In the right assembly the home position of the rear eccentric is down and the home position of front eccentric is up (Fig. 18). Thus their displacements are in opposite directions — up for the rear and down for the front — and their aggregate displacement is three units downward. Any displacement occurring in the right assembly is imparted to the typewheel rack in equal quantity but opposite direction. For example, if the No. 5 pushbar is selected, it causes the right rear eccentric to be displaced, and one unit of upward motion is transferred through a right output connecting rod to

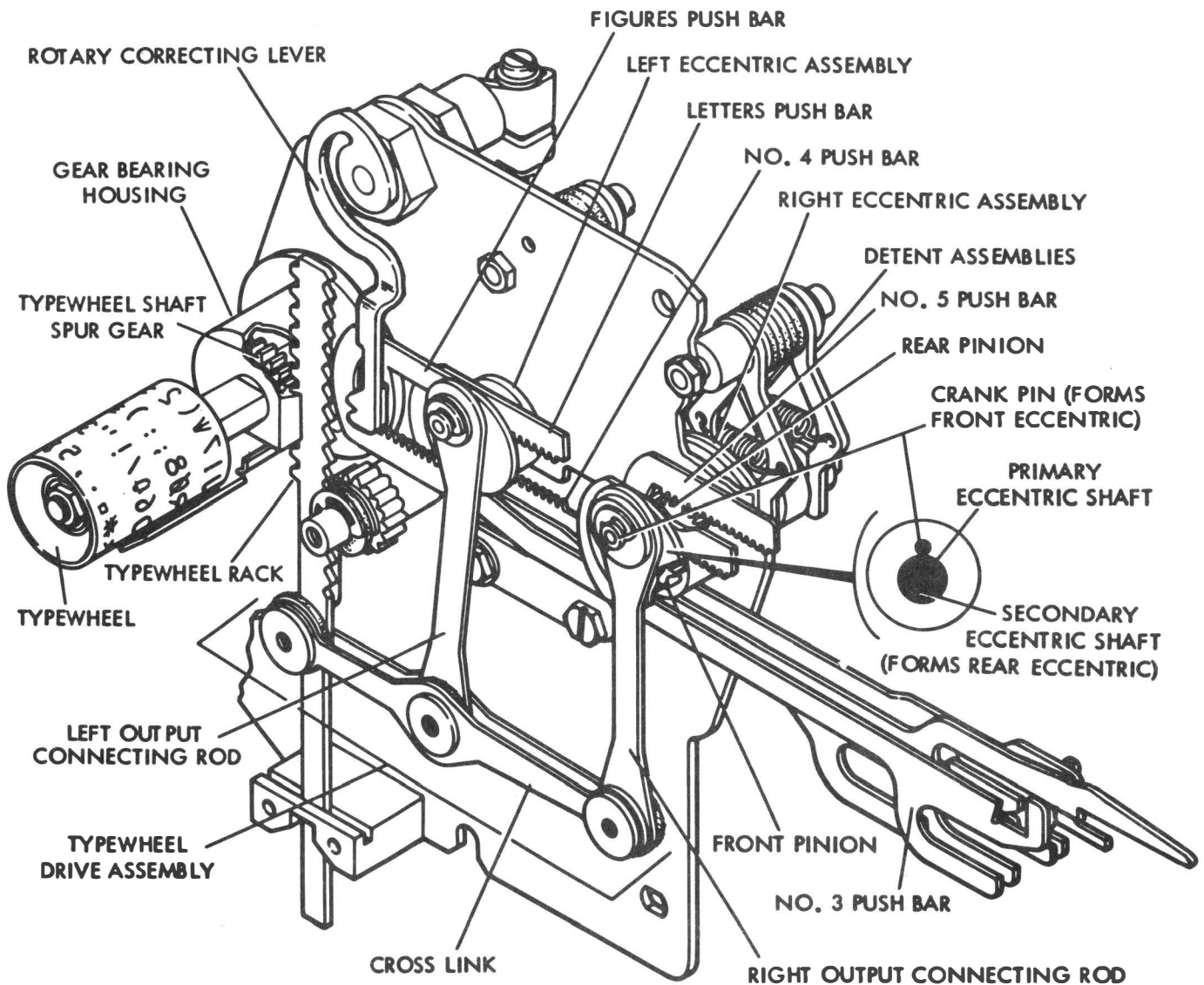


Figure 17. Rotary Positioning Mechanism

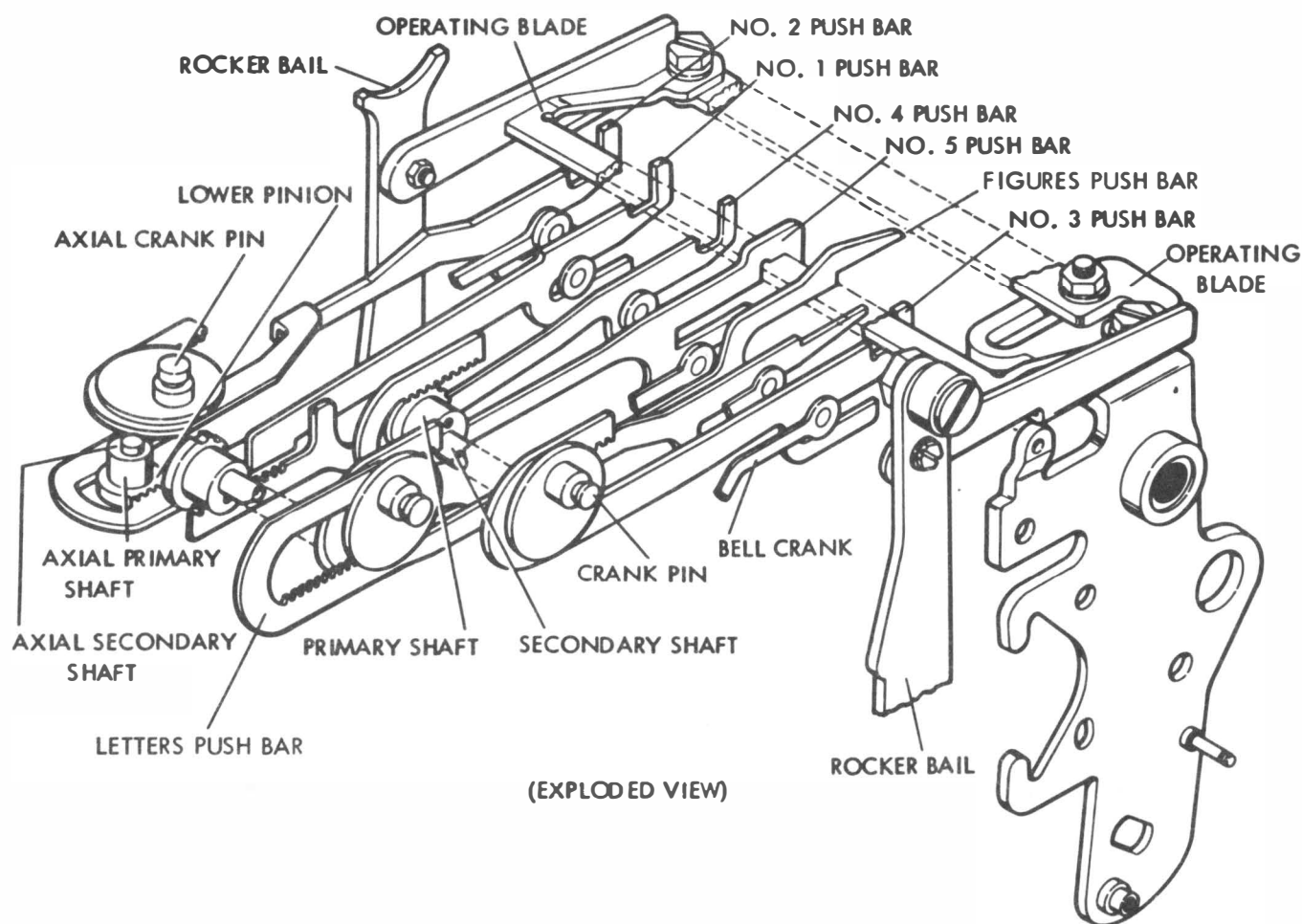


Figure 18. Pushbars and Eccentric Assemblies

the right end of a cross link (Fig. 17). The cross link pivots about a left output connecting rod and at its left end imparts one unit of downward displacement to the typewheel rack. The rack rotates the spur gear, shaft and typewheel one row of characters clockwise from the home position, and the No. 1 clockwise row (Fig. 16) is presented to the print hammer at the time of printing. On its right stroke the No. 5 pushbar returns the eccentric and the typewheel to their home positions. In a similar manner, selection of the No. 3 pushbar results in a four unit downward displacement of the right front eccentric and a four-row, counterclockwise rotation of the typewheel; and selection of both the three and five bars results in a three-row, counterclockwise rotation of the typewheel.

7.09 The home position of the left rear eccentric is up, and any displacement

appearing in the left assembly is transferred to the typewheel rack in double quantity in the same direction. When the No. 4 pushbar is selected, the left rear eccentric is displaced one unit downward. This movement is conveyed through the left output connecting rod to the approximate mid-point of the cross link. The cross link pivots about the right output connecting rod and its left end imparts two units of downward movement to the typewheel rack which rotates the typewheel two rows clockwise from its home position.

7.10 When both eccentric assemblies are displaced, the motion occurring in the typewheel rack is equal to the algebraic sum of the motions resulting from each assembly. For example, if the No. 3, 4 and 5 pushbars are all selected, three units of upward displacement

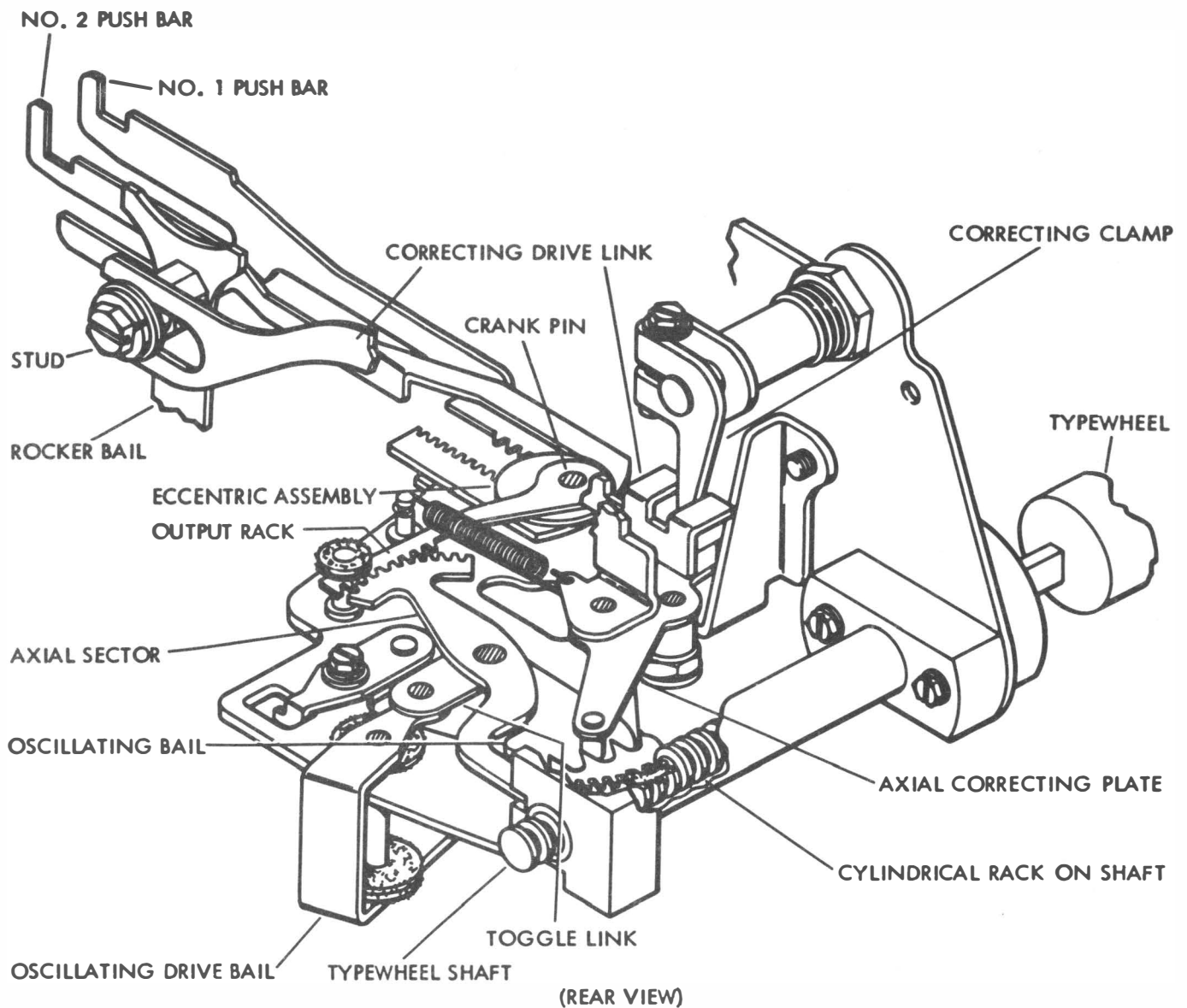


Figure 19. Axial Positioning Mechanism

from the right assembly and two units of downward displacement from the left assembly occur as one unit ( $3-2 = 1$ ) of upward displacement in the rack and a counterclockwise rotation of one row in the typewheel. If neither the No. 3, 4 nor 5 pushbar is selected, the mechanism remains inactive and printing takes place in the No. 0 row. Excluding the left-front eccentric, which is only used for the letters-figures shift, there are eight permutations available in the other three eccentrics, making it possible to select

any of the eight rows in a given section (Fig. 16).

### C. Axial Positioning (Fig. 18, 19 and 21)

7.11 The functions of the axial positioning mechanism are to position the typewheel so that the proper character in the selected row is aligned with the hammer at the time of printing and to retract the typewheel and ribbon guide at the end of the function cycle. The mech-

anism mounts on an axial bracket supported by the frame and the front plate and includes an eccentric assembly similar to those of the rotary positioning mechanism (Fig. 18 and 19). Two eccentrics, a lower whose pinion is driven by the No. 1 pushbar and upper whose pinion is driven by the No. 2 pushbar, rotate in a horizontal plane in bearing housings attached to the bracket. The eccentric assembly is linked to the typewheel shaft by an axial output rack and sector as shown in Fig. 19.

7.12 The selection of either the No. 1 or No. 2 pushbar results in the maximum displacement toward the rear of the associated eccentric, and the eccentrics are so designed that, if the displacement of the lower is taken to be one unit, that of the upper is two units. Again four permutations are available at the crank pin: zero (neither eccentric displaced), one unit (lower eccentric displaced), two units (upper eccentric displaced) and three units (both eccentrics displaced).

7.13 If during a function cycle neither pushbar is selected, no motion occurs in the axial positioning mechanism with the exception of that resulting from the oscillating assembly (Par. 7.14), and the No. 0 character of the selected row is aligned with the hammer at the time of printing (Fig. 16). On the other hand, if the No. 1 pushbar is selected, it causes the lower eccentric to revolve and one unit of displacement to be transferred by the crank pin to the axial output rack. The rack moves to the rear and passes the motion to the axial sector which pivots counterclockwise (as viewed from above). The right end of the sector, by means of a cylindrical rack in the typewheel shaft, moves the typewheel one character forward from its home position. The No. 1 character is printed, and when the pushbar reverts to its unselected position it returns the axial linkage and typewheel to their home position. If the No. 2 pushbar is selected the No. 2 character is printed, and if both pushbars are selected, the No. 3 character is printed. The cylindrical rack has no lead, and the shaft can thus be rotated while being moved axially.

7.14 With each cycle of the function clutch, an oscillating drive link transfers from the rocker bail an unselected motion to an oscillating drivebail (Fig. 19 and 21). This movement is passed by toggle links to an oscillating bail and the sector pivot. The effect of

this action is to introduce a separate motion to the sector tending to cause it to pivot about the teeth on the output rack. During the fore part of the function cycle, if no axial pushbar is selected, the right end of the sector is moved forward slightly and positions the No. 0 character for printing. At the end of any cycle the sector retracts the typewheel slightly so that the last printed character is visible. Concurrent with the above operation, a ribbon oscillating lever is made to pivot about its left end and with each cycle project and retract the ribbon guide which would obstruct the view of the character (Fig. 21).

#### D. Position Correction (Fig. 17 and 19)

7.15 After the typewheel has been positioned by the axial and rotary positioning mechanisms, the selected character is more accurately aligned for printing by the correcting mechanism which compensates for any play and backlash in the positioning linkages. Each function cycle the rocker bail transfers motion through a correcting drive link to a correcting clamp and shaft (Fig. 19). The shaft pivots a rotary correcting lever (Fig. 17) which is equipped with an indentation that engages a tooth in a typewheel rack. There is a tooth in the rack for each row of characters (16 in all), and they are so correlated with the typewheel that when a tooth is engaged by the corrector its row is accurately aligned with the print hammer. Axial correction, which is accomplished simultaneously, is similar to rotary correction: the drive link rotates an axial correcting plate counterclockwise (as viewed from the above), and a roller mounted on the plate engages a notch in the axial sector (Fig. 19). Thus the typewheel is accurately aligned in both fields of motion just before printing takes place. During the latter part of the function cycle, a correcting drive link spring returns the correcting mechanism to its home position.

7.16 Since the rocker bail is the source of motion for both the pushbars and the positioning mechanisms, correction must take place at a point near enough to the extreme travel of the bail that it does not interfere with the movement of the typewheel rack or axial sector. In addition, because the rocker bail controls the tripping of the print hammer, which occurs very late in the bail's stroke, it becomes necessary to utilize the time between the tripping of the hammer and its striking the paper to accomplish correction. The delay

in actuating the correcting mechanism is effected by allowing a drive stud on the rocker bail to slide in an elongated slot in the correcting drive link during the early part of the cycle.

#### E. Typewheel Shift (Fig. 17 and 20)

7.17 The typewheel shift from the letters to the figures printing segment (or figures to letters) is controlled by the No. 7 selector push lever through an associated train of levers in the transfer mechanism and two pushbars which engage a common pinion. The pushbars are connected to a common bell crank which is, in turn, controlled by the No. 7 pulse beam and transfer lever.

7.18 To shift the typewheel from the figures section to the letters section, a marking No. 7 bit must be received by the unit. This will cause the No. 7 punch slide to be selected and move to the left (Par. 5.08). As the No. 7 punch slide moves left, it rotates its associated transfer lever counterclockwise which, in turn, pivots the No. 7 pulse beam clockwise. This allows the associated bell crank to rotate counterclockwise, under spring tension, and lift the letters-figures pushbars until the step on the end of the letters pushbar is raised to a height which will bring it into engagement with the rocker bail operating blade, when the blade moves to the left (Par. 6.04). The operating blade simultaneously pushes the letters pushbar to the left and the figures pushbar to the right, resulting in rotation of the typewheel to the letters section. As long as the No. 7 bit is marking, the letters pushbar will remain in this left-most position.

7.19 When the No. 7 bit changes from marking to spacing, the punch slide will remain unselected, and the pushbars will not be lifted by the bell crank-transfer lever linkage. The figures pushbar, which is furthest to the right, will then be in such a position that the step on its end extension will be engaged (and pushed) by the rocker bail operating blade as the blade moves to the left, resulting in rotation of the typewheel to the figures position. As the figures pushbar moves left, the letters pushbar simultaneously moves to the right.

7.20 As long as the No. 7 bit is spacing, the letters-figures pushbars will not be lifted and, therefore, the letters pushbar will not be moved to the left (Par. 7.18). The typewheel will shift back to the letters section only upon receipt of a No. 7 marking bit by the reparator.

#### PRINTING (Fig. 21)

7.21 After the typewheel has been positioned and corrected, the printing mechanism supplies the impact which drives the paper and ribbon against the selected character. It effects this operation by means of a print hammer which is mounted on a shaft supported by a bracket attached to the typewheel bearing housing. In its unoperated condition, as illustrated in Fig. 21, the hammer is held against an accelerator by a relatively weak spring. The accelerator is mounted on the hammer shaft and is retained by a printing latch in its upper position against the tension of a relatively strong spring.

7.22 The rocker bail, during the fore part of the function cycle, moves a printing drive link to the right (as viewed from the rear in Fig. 21) and causes a pivot arm to rotate clockwise. The arm lowers a trip link which slides in an elongated slot. Near the end of the rocker bail's travel, the trip link pivots the latch which releases the accelerator. Under the spring tension, the accelerator snaps down and impels the hammer upward. The face of the hammer drives the tape and inked ribbon up against the typewheel and imprints the selected character on the tape. Near the end of its travel, the accelerator encounters a projection on a latch bracket, and inertia carries the hammer the rest of the way. As the rocker bail returns to its home position, it causes the trip link to move up, release the latch and return the accelerator to its latched position.

#### RIBBON FEEDING (Fig. 22)

7.23 The characters are typed in ink supplied by an inked ribbon which is held between the tape and the typewheel by a guide and advanced by the ribbon feed mechanism (Fig. 22). The path of the ribbon is down to the right off the top of a right spool, under a right roller, through the guide, up through left pins on the reversing arm, over a left roller, and to the right over the top of a left spool.

7.24 Each function cycle, as the rocker bail nears the end of its left travel, a roller mounted on its forward arm pivots a drive arm clockwise. The drive arm lifts a feed pawl which advances the ribbon by rotating a ratchet on one of the ribbon spools one tooth. A retaining pawl under spring tension detents the

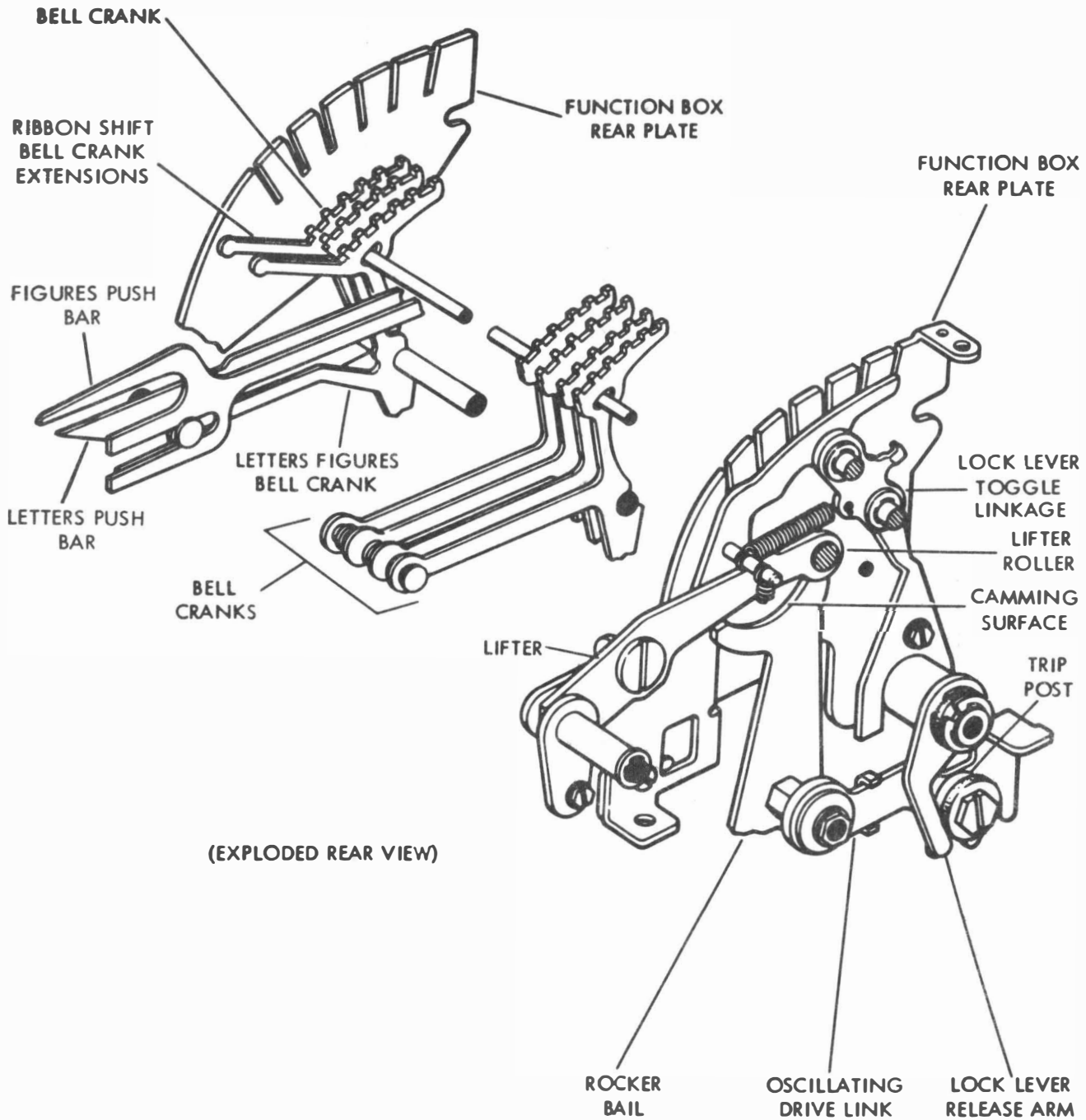


Figure 20 - Function Box

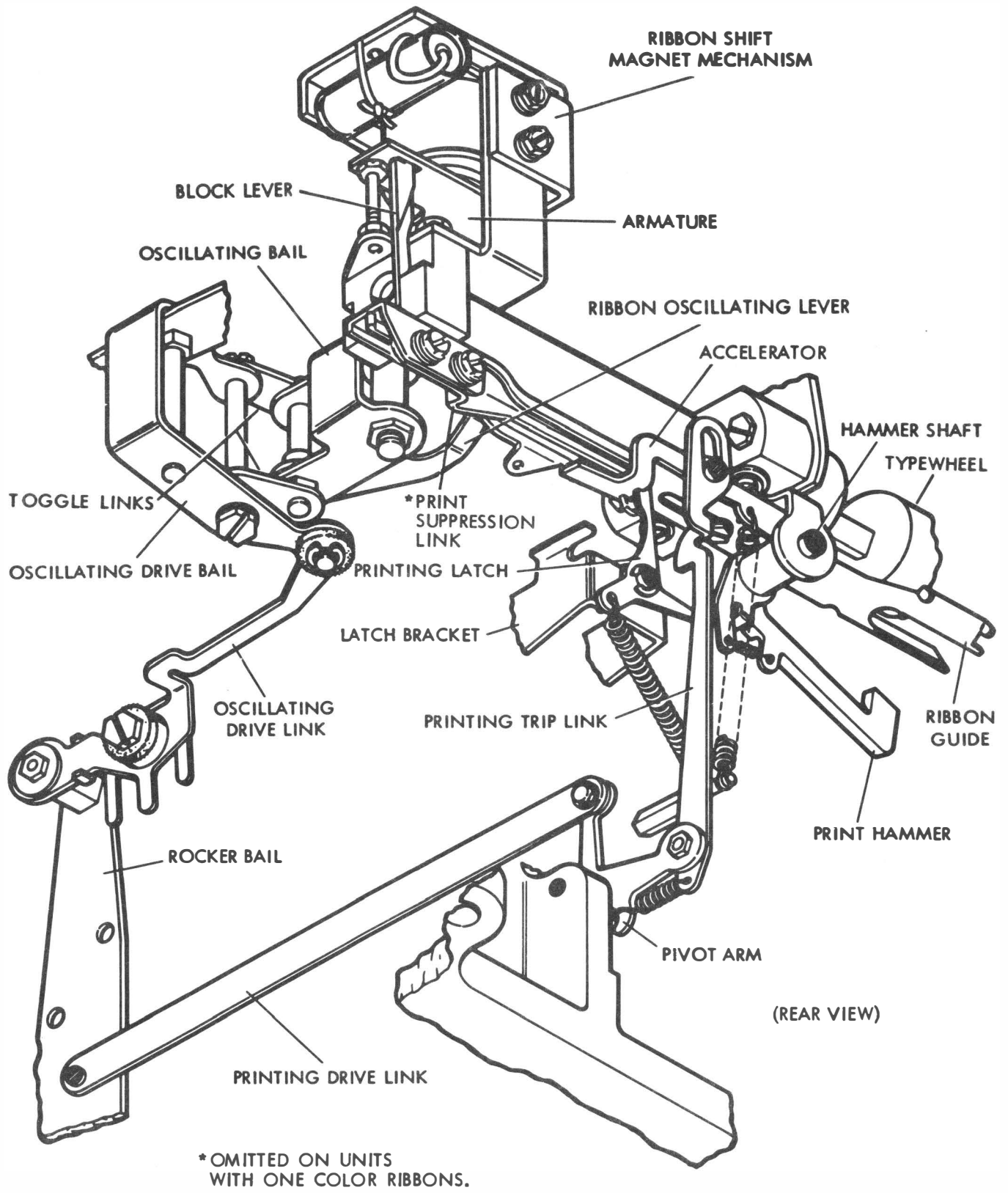


Figure 21 - Printing Mechanism



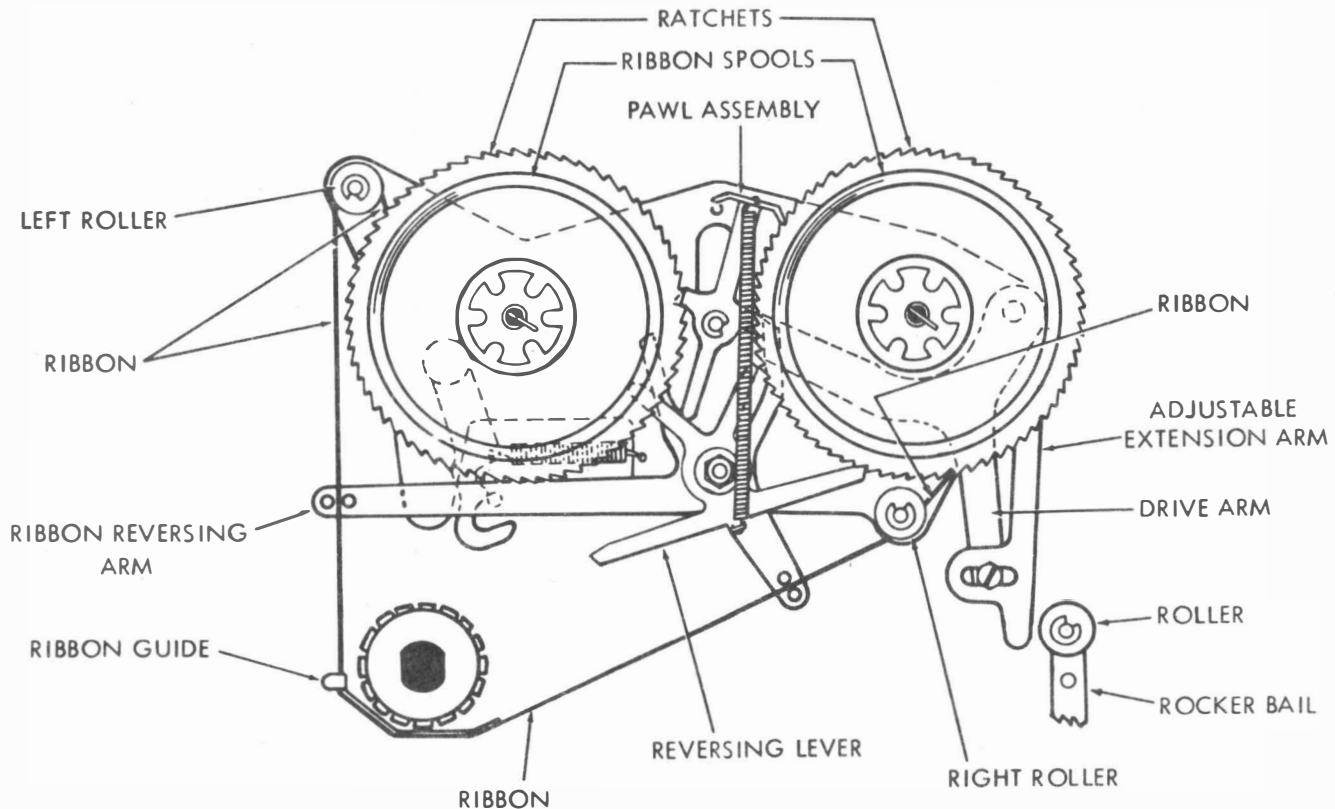


Figure 22 - Ribbon Feed Mechanism

ratchet while the feed pawl, during the latter part of the function cycle, is lowered so as to engage the next tooth. Each operation, the ribbon is advanced in this manner until the ribbon feed mechanism is reversed.

7.25 When a spool is almost depleted, a rivet in the ribbon encounters pins on the reversing arm, and the stress applied through the ribbon as it is rolled on the other spool pivots the arm. As the pawl assembly is lowered at the end of the next operation, an extension strikes the reversing arm, and the pawl is shifted against the other ribbon spool ratchet. The pawl's rounded lower extension pivots a reversing lever which shifts the retaining pawl so that it engages the opposite ratchet. The ribbon will then feed in the opposite direction until again reversed. A detent holds the reversing arm in position until its next reversal.

#### RIBBON SHIFT MECHANISM (Fig. 21)

7.26 On units designed for two color printing, as the ribbon carrier drive arm is driven by the motion of the axial oscillator lever, the ribbon carrier follows by the action of a

spring. If the ribbon color shift magnet is energized and its armature attracted, a block lever is raised into the path of the ribbon carrier and blocks the carrier from any further motion. In this case, a black ribbon is over the typewheel, causing a black character to be printed. If, on the other hand, the ribbon color shift magnet is not energized, the ribbon carrier is allowed to follow its operating arm, and the red portion of the ribbon is positioned over the print hammer, resulting in a red character.

7.27 When the No. 6 and 7 signal bits are the same, both marking or both spacing, the ribbon shift magnet is de-energized, and a red character is printed. If, however, the No. 6 and 7 bits are different, one marking, the other spacing, the ribbon shift magnet is energized, and a black character will be printed.

#### PRINT SUPPRESSION MECHANISM

7.28 Manual and automatic print suppression operate similarly to block the movement of the print hammer and prevent contact between the tape, inked ribbon and typewheel. Manually controlled suppression operates



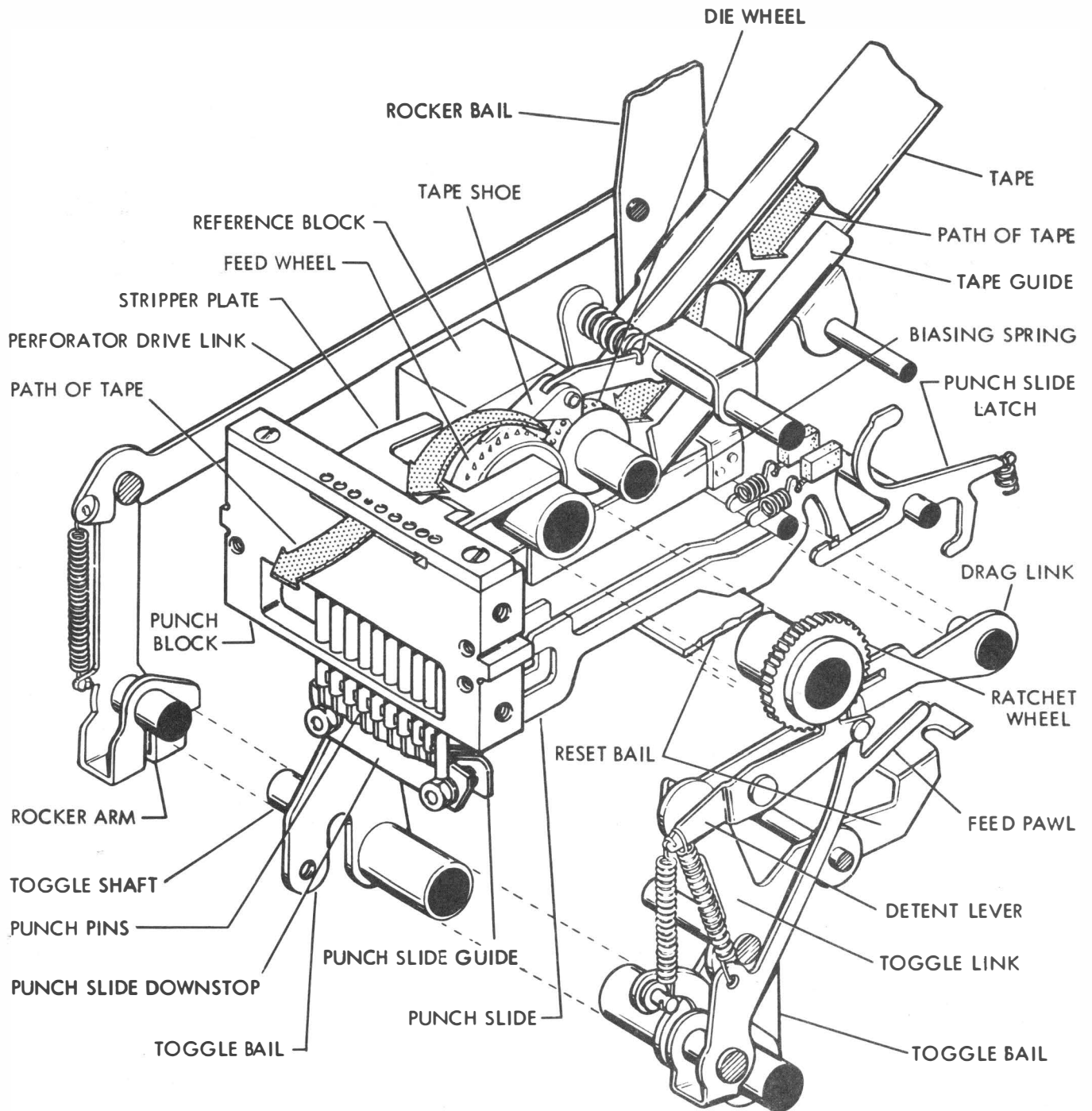


Figure 23 - Perforating Mechanism

through a lever extending from the front of the reperforator at the base of the punch pins.

**7.29** Manual print suppression is accomplished by raising the NO PRINT lever at the front of the typing reperforator. This rotates a blocking extension across the top of the print hammer, preventing all printing, regardless of the input code.

**7.30** Automatic printing suppression (Fig. 21) is a function controlled by the ribbon shift mechanism and is used by typing reperforators with one color ribbons. Automatic printing suppression is operative on control function code combinations. An accelerator blocking link attached to the ribbon carrier prevents the print hammer accelerator from rotating downward when the release latch is disengaged. As a result, printing is suppressed whenever a no-current condition keeps the ribbon shift blocking link engaged with the ribbon carrier.

## 8. TAPE PERFORATING AND FEEDING (Fig. 23)

### GENERAL

**8.01** The perforating mechanism rolls the tape between a feed wheel and a die wheel, which does not perforate the feed hole but merely regulates the amount of tape feed. The punch perforates round holes corresponding to the code combination received from the signal line and perforates a smaller feed hole positioned between the third and fourth intelligence levels. Intelligence is received from the selecting mechanism by the punch slides, which select the proper punch pins in a punch block assembly (Fig. 23). Motion from the rocker bail is distributed to the pins and the tape feed parts by a main bail assembly, which includes a toggle bail, a toggle shaft, a slide post, toggle links, drag links and the punch slide reset bail.

### PERFORATING

**8.02** As described in Par. 6.02 near the end of the selecting cycle, the reset bail is lowered and releases the eight punch slides (Fig. 13). The selected slides move to the left, and the unselected slides are retained to the right by their latches. In the selected position, a projection of each slide extends over the slide post. Since a feed hole is perforated every operation, the punch slide associated with the

feed hole punch pin is designed so that it is always in a selected position. During the first part of the function cycle, the rocker bail moves to the left and, by means of a drive link and rocker arm, rotates the toggle shaft and bail counterclockwise. Toggle links attached to the front and rear of the bail lift the slide post and move the reset bail to the left. The selected slides are carried upward by the post and force the associated pins through the tape. The slides thus become an integral part of the main bail assembly during the perforating stroke. Approximately midway through the function cycle, the function trip assembly lifts the reset bail.

**8.03** During the last half of the cycle, the toggle bail is rotated clockwise, pulling the slide post down and lowering the selected punch slides. The punch slides, which engage notches in their respective punch pins, pull the punch pins down below the tape. The main bail assembly and the selected punch slides and their associated punch pins move as a unit during the perforating stroke, both up and down. The punch pins are positively driven and retracted, to produce the fully perforated tape.

**8.04** A chad chute, mounted on the reperforator punch block, mates with a chute on the mounting base. The chutes carry chad punched from the tape into a chad container on the tape handling stand. Refer to the appropriate section for a detailed discussion of the chad storing mechanisms.

### FEEDING

**8.05** Tape feeding is accomplished after perforation during the last half of each function cycle. The tape is threaded down through a tape guide and then up between a feed wheel and die wheel (Fig. 23). A feed pawl, driven by the toggle bail, acts upon a ratchet and rotates the feed wheel which, by means of sharp pins and a slot in the die wheel, advances the tape one character at a time. A detent with a roller that rides on the ratchet holds the feed wheel and tape in position during perforation. The detent and feed pawl springs are so positioned that the pressure of the detent on the ratchet is high during the first half of the perforation, but is low during idling and the last half of the cycle to facilitate tape threading and feeding. A tape shoe retains the tape on the feed wheel, and a biasing spring holds it back against a reference block, so that the feed holes are punched a constant distance from the edge. The

tape is stripped from the feed wheel by a stripper plate, passes into the punch block, where it is perforated, and finally emerges at the left.

## 9. VARIABLE FEATURES

### CONTACT ASSEMBLIES

#### A. Selector Mechanism Timing Contacts (Fig. 24)

9.01 Operating in conjunction with an additional cam mounted on the selector cam assembly, this timing contact set (break-make transfer) operates each cycle of selection. The actuating lever maintains a relationship with the rest position of the selector cam, because its pivot point is on the range scale selector rack. Therefore, the contact set is used to signal that the selector cam is in the rest position.

#### B. Letters-Figures Contacts

9.02 The letters-figures contact assembly is mounted on the rear of the selector mechanism and is operated by the upper extension of the letters push bar. Its purpose is to give a remote signal to indicate whether the typing reperforator is in the letters or the figures condition. When the unit is in the letters condition, the letters push bar is positioned towards the right and in contact with the operating lever. In this position (rotated counterclockwise) the operating lever is not in contact with the center contact spring and the center and upper contact points are made.

9.03 When the figures code combination is received, the letters pushbar is moved to the left and permits the operating lever to rotate clockwise and engage the center contact spring

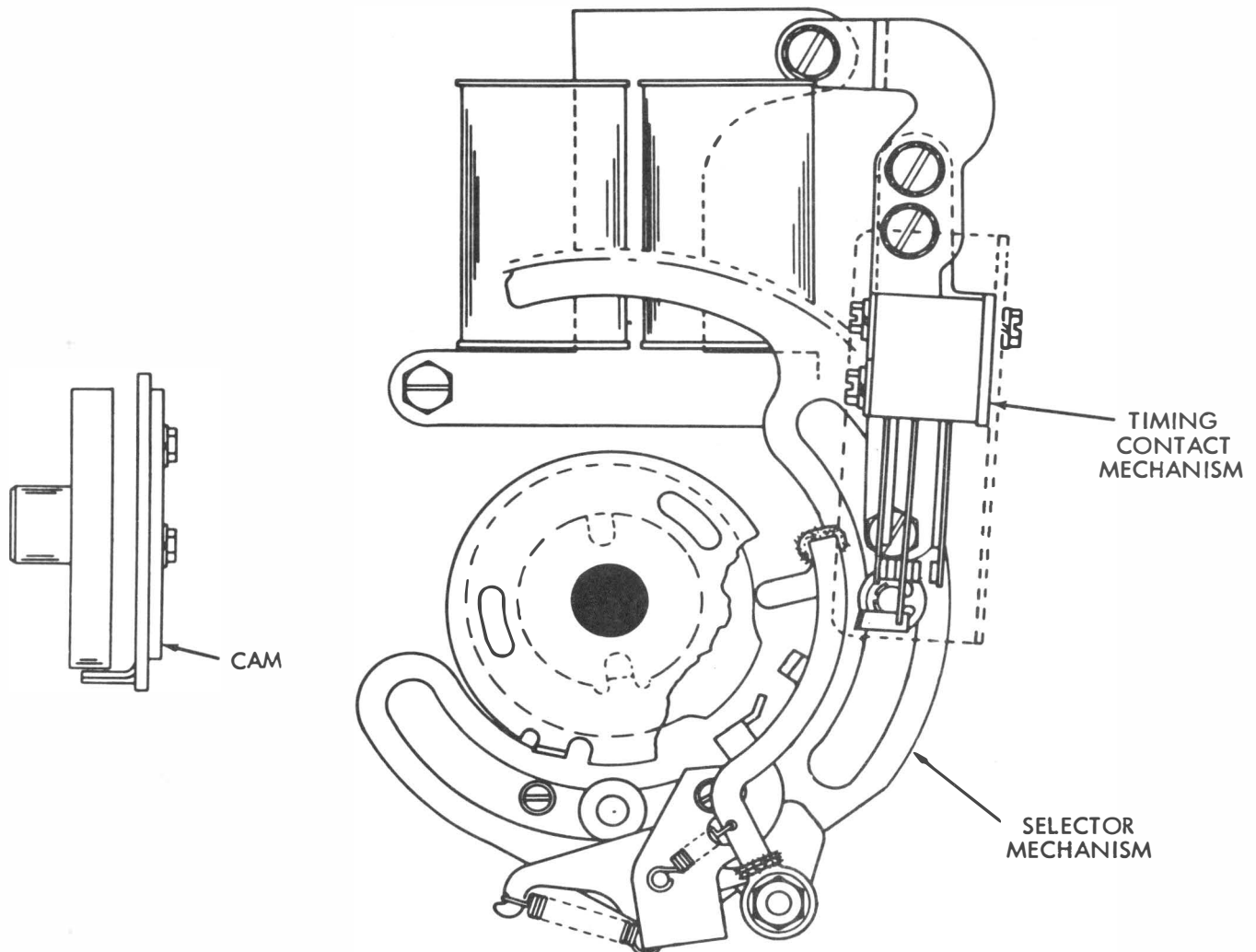


Figure 24 - Selector Magnet Timing Contacts

and break the contact between the center and upper contact points. As the operating lever rotates further, contact is made between the center and lower contact points.

C. Signal Bell Contacts (Fig. 25)

9.04 Mounted on and controlled by the function box, these contacts provide an electrical pulse to actuate an audible alarm when the typing reperforator receives the signal bell code combination.

9.05 With the unit in the figures condition and the signal bell code combination is received at the selector mechanism, the bell cranks rotate in response to the marking and spacing bits. The slotted arms at the top of the bell crank permit the signal bell function blade to drop under spring tension. The normally-open signal bell contacts, fixed to the function blade drops with the blade, and the contacts close. In the letters condition, the figures bell crank blocks the signal bell function blade.

D. End of Feed-Out Timing Contacts

9.06 Used in conjunction with the non-interfering rubout (or blank) tape feed out

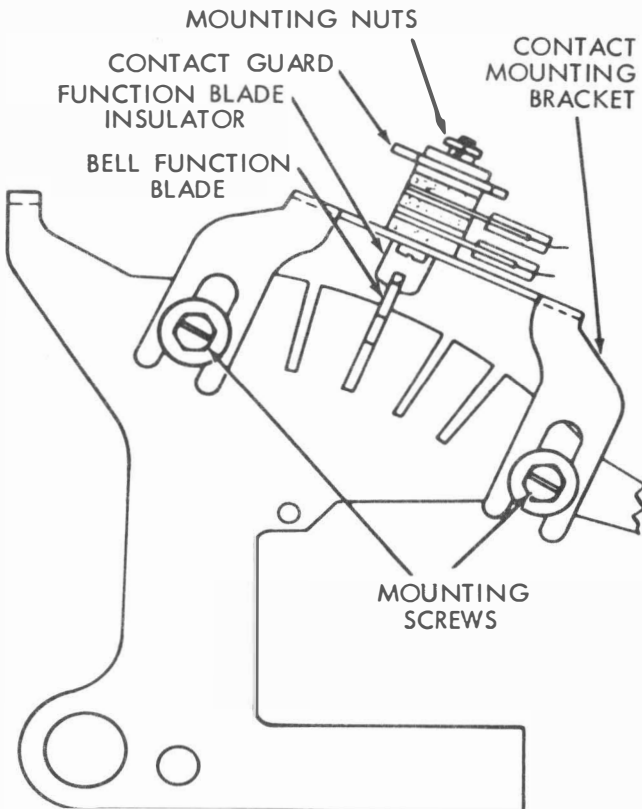


Figure 25 - Signal Bell Contacts

mechanism, this contact assembly furnishes an electrical pulse to indicate the termination of feed out. The contacts are actuated by a bail extension that receives its motion from the tape length adjusting plate (Fig. 28). When the feed out operation terminates, the plate engages and rotates the bail arm, causing the normally-open contact to close and the normally closed contact to open.

E. Code Reading Contacts

9.07 Consisting of a bank of eight contacts, each of which is actuated by a punch slide, the code reading contacts read the code combinations perforated by the typing reperforator and establish circuits corresponding to the eight elements. Either transfer or make contacts are available. Applications include error checking and parallel code output.

F. Timing Contacts

9.08 When connected to external circuits, the contacts provide electrical pulses which maybe synchronized with the code reading contacts (9.07) for circuitry control purposes. Either single- or double-contact mechanisms are available. The contacts, which are of the transfer type, are actuated by bails which receive motion from the typing reperforator function cam.

UNIVERSAL FUNCTION BLADE (Fig. 26)

9.09 This function blade may be coded for any desired character or shift condition by removing tines. The function blade has removable tines in the marking and spacing positions for all levels.

INTERFERING RUBOUT TAPE FEED-OUT

A. General

9.10 This feature enables the typing reperforator to step out tape containing successive rubout code combinations. The feed-out operation may be actuated locally by a hand lever or, with the addition of a separate set of parts, it may be controlled remotely by ener-

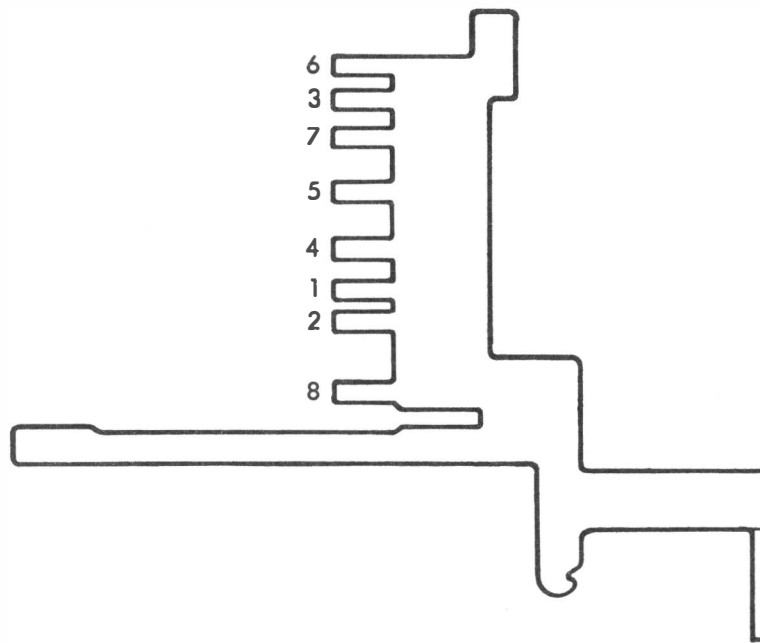


Figure 26 - Universal Function Blade

gizing a solenoid. Rubout feed-out will continue as long as the hand lever or solenoid is actuated. Since the mechanism's operation involves tripping the selector clutch while retaining the armature in its marking position, a message can not be received during the feed-out period. The mechanism is shown operated in Fig. 27.

#### B. Initiation

9.11 When the typing reperforator is in the idling condition, the selector magnet is energized and the start lever is blocked as shown in Fig. 8. Feed out is initiated by moving a hand lever to the left (Fig. 27). A drive shaft affixed to the hand lever rotates a trip lever which lifts the start lever. The latter clears the armature and under spring tension rotates clockwise. The selecting cam-clutch engages and the unit undergoes a complete cycle of operation. Since the selector remains energized, it is equivalent to all intelligence bits of the signaling code marking. As a result, the rubout symbols is printed, the rubout code combination (12345678) is perforated and the tape is advanced one feed hole. As long as the hand lever is retained to the left, the start lever will trip the selecting cam-clutch and feed out will continue.

#### C. Termination

9.12 Feed out is terminated by releasing the hand lever. The driver shaft and trip lever rotate clockwise under spring tension and lower the start lever. When the stop arm bail and start lever are moved to the left by the stop arm bail cam (5.03), the start lever is blocked by the armature, the selecting cam-clutch is disengaged and the typing reperforator is returned to its idling condition. A message received during feed out will be garbled.

#### D. Solenoid Operation

9.13 By the use of an additional set of parts, the rubout feed out operation can be initiated by an electrical pulse from an external source. When the solenoid (Fig. 27) is energized by the pulse, it pulls a plunger to the left. The plunger through a stop arm and the drive shaft causes the triplerver to lift the start lever, and feed out is effected as described in 9.11. Feed out will continue until the solenoid is de-energized at which time the plunger moves back to the right, the start lever is lowered, and feed out is terminated as described in 9.12.

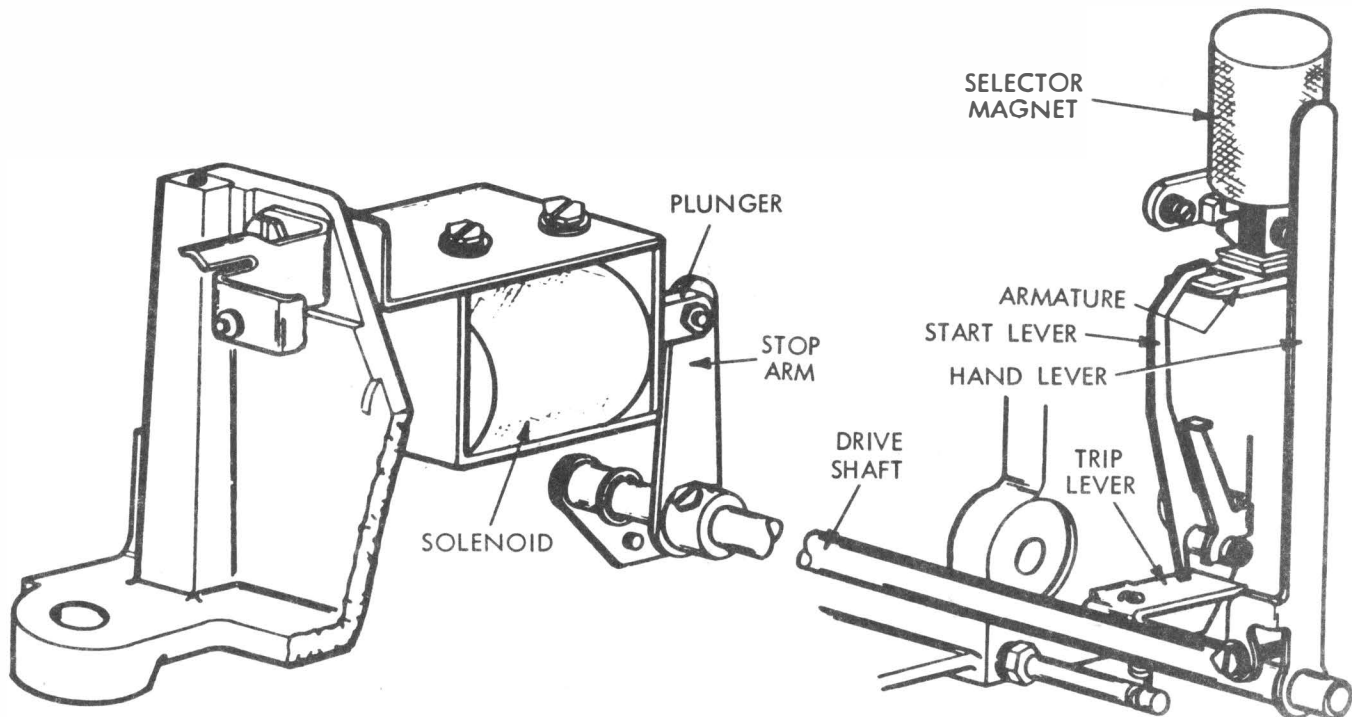


Figure 27 - Manual Interfering Rubout Tape Feed-Out Mechanism

#### REMOTE CONTROL NON-INTERFERING BLANK TAPE FEED OUT (Fig. 28)

##### A. General

9.14 This feature steps out a predetermined length of blank (unperforated) tape at the end of each message by remote control. The operation is initiated by an electrical pulse from a remote source that is applied to a tape feed-out magnet. The feed out is adjustable in steps of 0.6 inch, up to 18 inches. Messages received during any part of the feed out cycle will be processed without interference or loss of content. A non-repeat latch prevents successive tape feed-out operation from being initiated until the first feed-out sequence has been completed. At the end of the feed-out operation the mechanism stops and remains inactive until another cycle is initiated.

##### B. Initiation

9.15 The feed-out operation is initiated when an electrical pulse is applied to the feed-out magnet with the typing reperforator in the idle condition. With the magnet energized, the armature bail moves the blocking bail out of

engagement with the drive bail assembly. The spring loaded drive bail falls into the indent of its cam and the connecting link positions the release lever on the lower step of the latch lever. The non-repeat latch is delayed one cycle by the spring loaded blocking latch on the drive bail. (If the start magnet is held energized longer than one cycle, the non-repeat latch prevents the drive bail from again falling into the indent of its cam.) As the drive bail reaches the indent of its cam, the blocking latch rides over the non-repeat latch. The drive bail then reaches the high part of its cam and the non-repeat latch falls into engagement with the drive bail. When the start magnet is de-energized, the spring loaded blocking bail again engages the drive bail and, simultaneously, disengages the non-repeat latch.

##### C. Metering

9.16 When the drive bail positions the release levers on the lower step of the latch lever as described above (9.15), metering takes place. The release lever has now permitted the check pawl and feed pawl to engage two adjacent ratchets. One of the ratchets is fed continually by the feed pawl. This ratchet

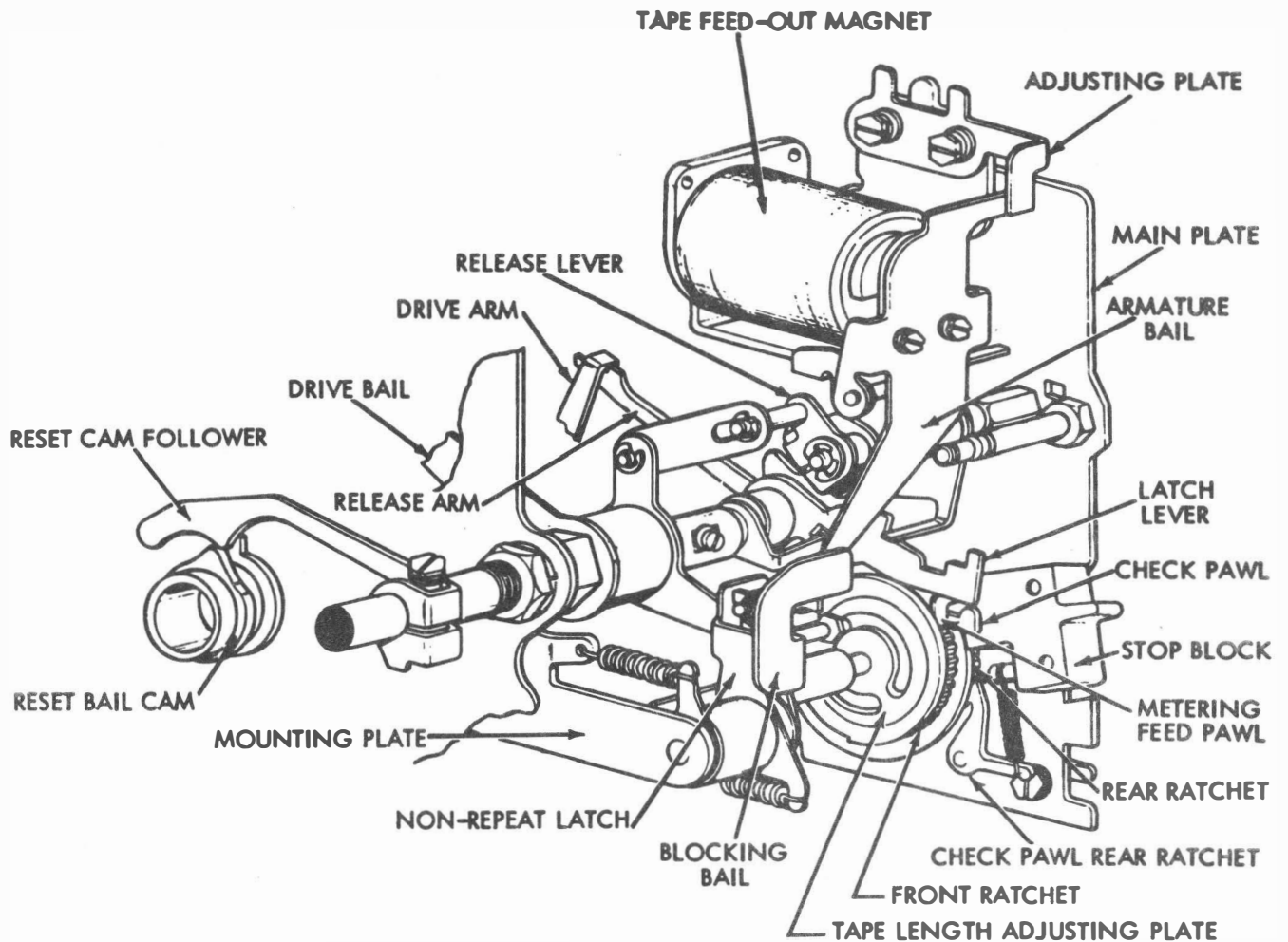


Figure 28 - Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism

has a deeper notch at every sixth tooth, so that the pawl engages the second ratchet on every sixth cycle. After the second ratchet has rotated an amount equivalent to two teeth, a follower, riding a cam attached to the ratchet, drops off its peak and unblocks the tripping mechanism. After a predetermined length of tape has been fed (as measured by the second ratchet), the latch lever is actuated, as it would be by the selector cam on receipt of a message, and the tripping mechanism is blocked to prevent further feeding. Simultaneously, the feed pawls are lifted off the ratchets, and the ratchets return to their zero position.

#### D. Tripping and Punch Blocking

9.17 A bail that follows a cam attached to the main shaft engages the function clutch trip lever. When the cam follower enters the indent of its cam, an operating spring causes the bail to operate the clutch trip lever. The

performing and printing mechanisms are then allowed to punch and print the character stored in the selector. However, to insure that only blank tape will be advanced, a blocking link is connected to the selector stripper cam follower shaft. When the magnet is energized and the drive bail positions the release lever on the lower step of the latch lever as described in 9.16, the left end of the blocking link moves to the left and under the punch slide reset bail. Now, when the function clutch is tripped, the marking punch slides are blocked by the punch slide reset bail. The slide post on the front toggle links clears the punch slide projection on its upward movement. The punch slide reset bail then falls off the blocking link, but the punch slides cannot move forward into the marking position because they are blocked by the slide post.

9.18 Each time the main shaft rotates one revolution, a blank tape feed-out cycle is initiated, provided the function clutch trip lever



bail is not blocked by the metering mechanism. Should an incoming message trip the metering mechanism, the tripping mechanism is immediately blocked from any further operation and the blocking link is pulled out of engagement with the punch slide reset bail.

### E. Storage

9.19 The purpose of the storage is to hold the reset bail (perforating mechanism) in engagement with the punch slides until the slides are fully reset, so that they may recognize the first character set up in the punch slide latches by the selecting mechanism. This mechanism consists of a latch that is operated by a link attached to the punch slide reset bail toggle. During reception of an incoming message, the toggle mechanism pushes the latch out of the way of the reset bail prior to its being stripped by the clutch trip lever.

### REMOTE CONTROL NON-INTERFERING RUBOUT TAPE FEED-OUT (Fig. 28)

9.20 The operation of this mechanism is essentially the same as that of the remote-control non-interfering blank tape feed out

mechanism (9.16). This feature, however, does not contain a blocking link on the stripper cam follower shaft (9.17). The tape output, therefore, is perforated in the rubout code combination (1-2-3-4-5-6-7-8).

### AUTOMATIC NON-INTERFERING RUBOUT TAPE FEED-OUT (Fig. 29)

#### A. General

9.21 This feature automatically initiates the feed out of a predetermined length of rubout perforated tape at the end of each message, following a fixed period of signal line idle time. The duration of delay between the termination of the message and the initiation of feed out is determined by one of several available cams. (At 100 words per minute operation, for example, delays of approximately 4 seconds and 16 seconds are available.) The length of tape feed out is also variable in increments of .6 inch up to 3.6 inches or 18 inches. The mechanism may be controlled remotely with the addition of a separate set of parts. Messages received during any part of the feed out cycle are processed without interference or loss of content.

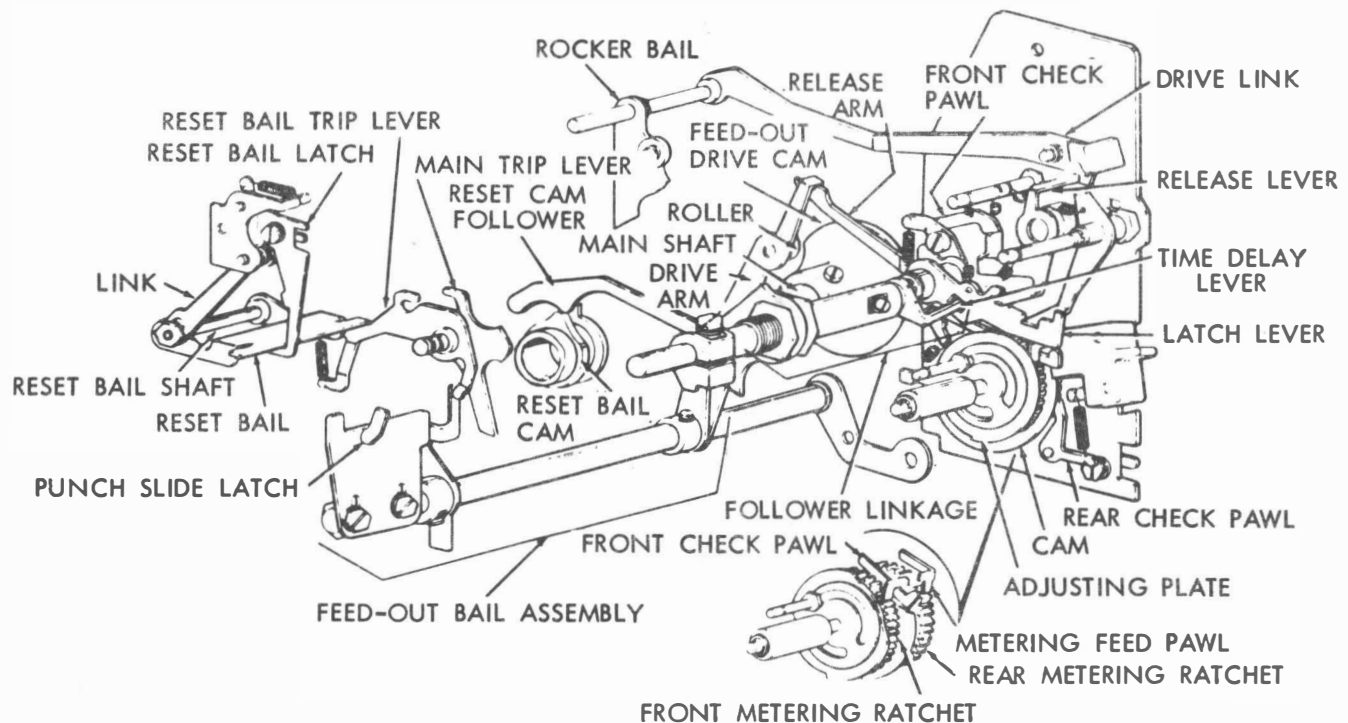


Figure 29 - Automatic Non-Interfering Rubout Tape Feed-Out Mechanism



## B. Initiation

9.22 The feed-out operation is automatically initiated by a fixed period of idle signal line. Through the interaction of a drive link operated by the rocker bail and a follower activated by the reset bail cam in the selector, the mechanism recognizes the end of a message. The timing of the selector while receiving a message is such that the reset bail cam raises its follower during the first part of the selector cycle. The follower, through a linkage, lowers a latch lever which permits a release lever to rotate clockwise. When the release lever is in its clockwise position, the mechanism is in its unoperated condition, as explained below. When the rocker bail goes to its extreme left position during the middle of the function cycle, the attached drive link rotates the release lever counterclockwise and places the mechanism in its operated condition, as explained in 9.26. Each time a new character is received, the above sequence occurs.

9.23 End of message recognition is obtained when the release lever is rotated counterclockwise by the rocker bail and then is not permitted to rotate clockwise by the follower.

## C. Metering and Feed Out

9.24 When the release lever rotates counterclockwise, it lowers a front check pawl onto two metering ratchets. These function as described in 9.22 above.

9.25 A time delay lever rides on a cam attached to the front ratchet. When the front ratchet rotates, the time delay lever rides to the low part of the cam and causes a release arm to release the drive arm of a feed out bail assembly. A roller on the drive arm then rides, under spring pressure, on a feed out drive cam on the main shaft. As the shaft rotates, each time the roller rides to the low part of the cam, the feed out bail assembly does two things: 1) rotates the main trip lever counterclockwise and trips the function clutch, and 2) rotates the punch slide latches counterclockwise and sets up a rubout code combination. Thus, the re-perforator feeds out rubout tape in the same manner as if the function clutch and punch slides had been actuated by the selector.

9.26 As the ratchets are rotated as described above, an adjusting plate on the front ratchet reaches the position where it rotates the

latch lever clockwise. The latch lever, in turn, performs two actions: 1) through the time delay lever causes the release arm to latch the drive arm and terminate feed out, and 2) permits the release lever to move to its clockwise position and lift the metering feed pawl and front check pawl off the ratchets. A spring returns the front ratchet to its start position. The mechanism remains in its unoperated condition until the next code combination is received. The adjusting plate is adjustable for varying lengths of tape feed out.

## D. Non-Interference

9.27 When the first character of an incoming message is received during feed out, the selector clutch is tripped and the reset cam follower causes the release lever to rotate clockwise. Feed-out is terminated, as described in 9.25. The incoming message is perforated.

9.28 When the first character is received during feed out, the relationship between the selector cam and the function cam could be such that the reset bail would release the punch slides before the slides are fully reset. In this case, the first character of the incoming message would be lost. The purpose of the storage assembly is to prevent this. The storage assembly consists of a reset bail latch that is moved by a link attached to the reset bail shaft. During normal reception of messages, the link pushes the latch out of the way of the reset bail prior to the bail's being lowered by the main trip lever. Whenever the condition described above occurs, the latch holds the bail in engagement with the slides until they are fully reset, so that they may recognize the first character set up in the punch slide latches by the selector.

## BACK SPACE MECHANISMS (Fig. 30)

### A. General

9.29 The back space mechanism steps the tape back through the punch block in order to delete perforated errors. The erroneously perforated code combination in the retracted tape is then obliterated by perforating the rubout code combination in its place. The back space mechanism may be operated manually or it may include power drive. The mechanisms are shown in Figure 30.

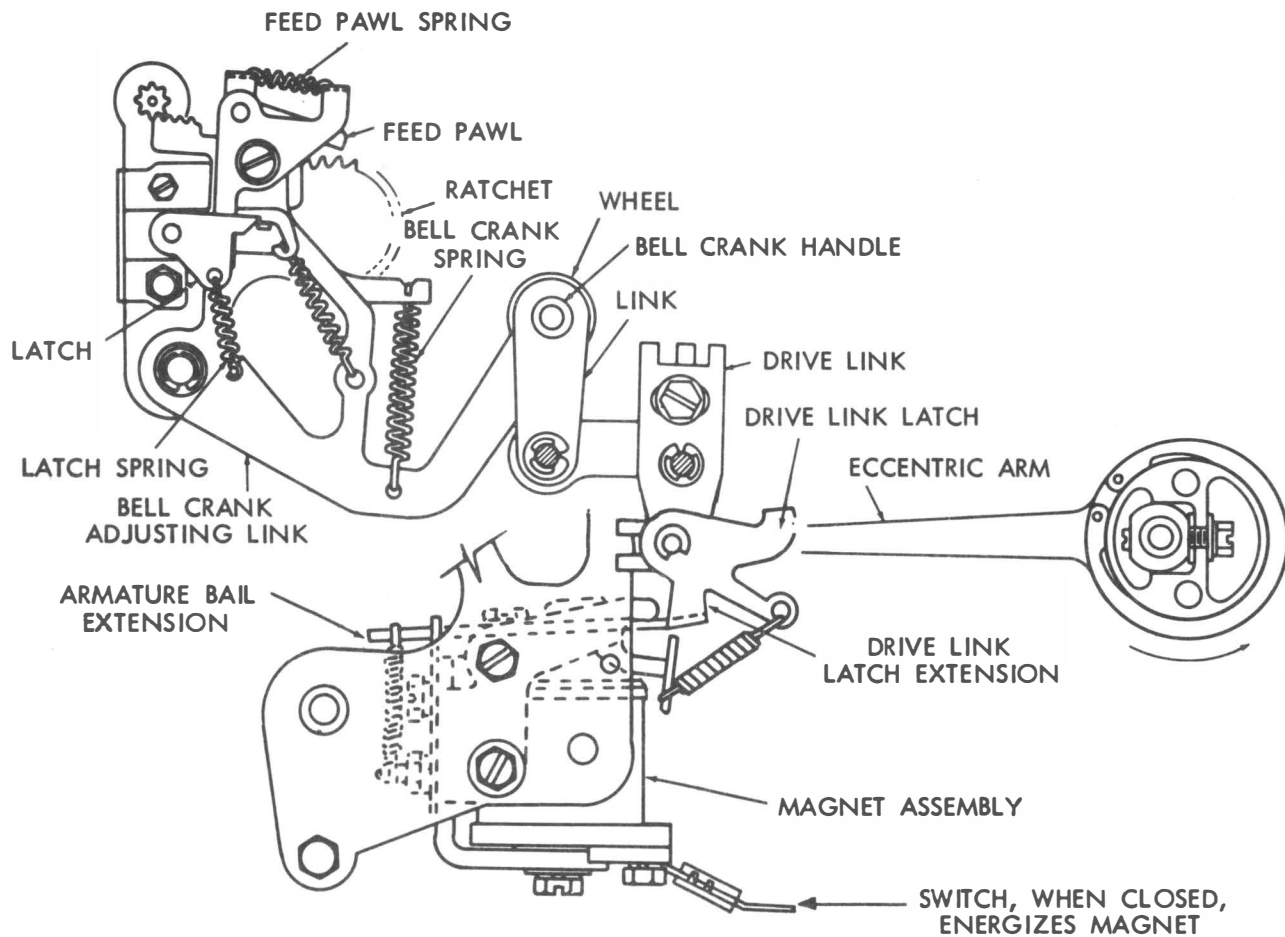


Figure 30 - Back Space Mechanisms

### B. Manual Back Space

9.30 Depressing the handle of the back-spacing bell crank disengages the perforator feed pawl from the feed wheel ratchet. The back-spacing feed pawl then engages the feed wheel ratchet and rotates the feed wheel clockwise, back-spacing the tape to the next row of perforations.

9.31 After the tape has been retracted into the punch block, the set of code holes above the punch pins may be replaced with the rubout code combination (all bits marking).

### C. Power Drive Back Space

9.32 A start magnet in the power drive mechanism is energized by a remote source. When energized, the armature bail is pulled downward. An extension of the bail disengages the drive link latch, which drops and engages a notch in the eccentric arm. The eccentric arm, driven by the perforator main shaft, moves to the right. This action causes the bell crank handle to be depressed through a system of linkages between the drive link latch and the bell crank. The subsequent operation is as described in paragraphs 9.30 and 9.31.

35 TYPING REPERFORATOR

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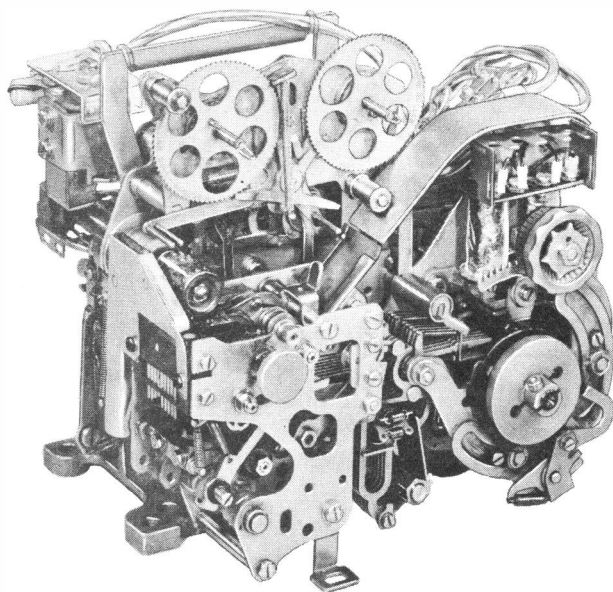


Figure 1 - Typical 35 Typing Reperforator  
(Left Front View)

1. GENERAL

1.01 This section is reissued to include complete adjustment requirements for the 35 typing reperforator. Changes and additions are indicated by marginal arrows.

1.02 This section contains specific requirements and adjustments for the 35 typing reperforator (Fig. 1). The basic equipment includes selector mechanism, transfer mechanism, eight-level fully perforating punch mechanism, and printing mechanism. The printing mechanism includes letters-figures contacts and magnet and may include print suppression, remote control non-interfering rubout tape feed-out, end of feed-out timing contacts and power drive backspace mechanisms.

1.03 Reference to left or right, front or rear and up or down refer to the apparatus in its normal operating position, as viewed from the front with the selector mechanism to the right and the punch mechanism to the left. It is assumed that the elements depicted in illustrations in this section are being viewed from a position in front of the equipment, unless the illustrations are specifically labeled otherwise. In the illustrations, pivot points are shown by circles or ellipses that are solid black to indicate fixed points and cross-hatched to indicate floating points.

1.04 Tools required to make the adjustments and test the spring tensions are listed in the appropriate section. Spring tensions given in this section are indications, not exact values, and should be checked with the correct scale applied in the positions shown in the drawings.

1.05 The unit is in its unoperated, or stop, condition when it is not under power. It is in its idling condition when it is under power and clutches are disengaged (steady marking condition of signal line). The unit is in the letters condition when the typewheel rack is in its upper position (the numerals appear on the top half of the typewheel). The unit is in the figures condition when the typewheel rack is in its lower position (the letters appear on the top half of the typewheel).

**CAUTION:** APPARATUS SHOULD NOT BE SEPARATED FROM ITS PROTECTIVE HOUSING UNLESS POWER IS DISCONNECTED. WHERE OPERATION OF THE EQUIPMENT IS REQUIRED AFTER IT HAS BEEN SEPARATED FROM ITS PROTECTIVE HOUSING, APPROPRIATE PRECAUTIONARY MEASURES SHOULD BE TAKEN TO PREVENT ACCIDENTS.

1.06 When a requirement calls for a clutch to be DISENGAGED, the clutch shoe lever must be fully latched between its trip lever (or stop arm) and latch lever. The main

shaft will then turn freely without the clutch shoes dragging. When the clutch is ENGAGED, the shoe lever and cam disk stop lug are moved apart, and the clutch shoes are wedged against the drum so that the clutch turns with the shaft.

Note: If the shaft is turned by hand, the clutch will not fully disengage upon reaching its stop position. Where a procedure calls for disengagement, rotate the clutch to its stop position, apply a screwdriver to the cam disk stop lug and turn the disk in the normal direction of shaft rotation until the latch lever seats in its notch in the disk.

1.07 To manually operate the 35 typing re-perforator, proceed as follows:

(a) Attach the armature clip to the selector magnet armature by carefully putting the flat formed end of the armature clip over the top of the armature between the pole pieces and then hooking the projection under the edge of the armature. The spring tension of the armature clip will hold the selector armature in the marking (attracted) position.

(b) While holding the selector magnet attracted by means of the armature clip, manually rotate the main shaft in a counterclockwise direction until all the clutches are brought to their disengaged position.

(c) Fully disengage the clutches in accordance with 1.06, Note.

(d) Release the selector magnet armature momentarily to permit the selector clutch to engage.

(e) Rotate the main shaft slowly until all the push levers have fallen to the left of their selecting levers.

(f) Strip the push levers from their selector levers if they are spacing in the code combination of the character or function that is being selected. Allow the push levers to move to the right. The push levers and selector levers move in succession, starting with the inner lever No. 1 to the outer lever No. 8.

(g) Continue to rotate the main shaft until all operations initiated by the selector action clear through the unit.

1.08 Parts dismantled to facilitate checking or readjustment should be reassembled after the operation is completed. If a part mounted on shims is to be dismantled, the number of shims used at each mounting screw should be noted so that the same shim pile-ups can be replaced when the part is remounted. When parts removed are replaced, related adjustments which may have been affected should be checked.

1.09 Parts that are worn to the extent that they can no longer be made to meet the specified requirements by authorized adjustments or which are worn to the extent that it seems probable that early further wear might cause a loss of adjustment should be replaced by new parts. Springs which do not meet the requirements and for which there are no adjusting procedures should be discarded and replaced by new springs.

1.10. All contact points should meet squarely. Smaller points should fall wholly within the circumference of larger mating points. Points that are the same size should not be out of alignment more than 25 per cent of the point diameter. Avoid sharp kinks or bends in the contact springs.

Note: Keep all electrical contacts free of oil and grease.

1.11 Where a 35 typing re-perforator is used as a component of a receive-only or a send-receive set, it is mounted on a base or keyboard base. Refer to the base, keyboard and other applicable sections for gear mesh and additional adjustment requirements.

## 2. BASIC UNIT

2.01 The following figures show the adjusting tolerances, position of parts and spring tensions. The illustrations are arranged so that the adjustments are in the sequence that would be followed if a complete readjustment of the apparatus were being made. In some cases, where an illustration shows interrelated parts, the sequence that should be followed in checking the requirements and making the adjustments is indicated by the letters (A), (B), (C), etc.

2.02 Selector Mechanism

2.03 Function Mechanism

NOTE: FOR GEAR MESH ADJUSTMENT, REFER TO APPLICABLE SECTIONS COVERING BASE OR KEYBOARD MOUNTING FACILITY.

(A) CLUTCH SHOE LEVER

NOTE:

THIS ADJUSTMENT SHOULD BE MADE FOR BOTH SELECTING AND FUNCTION CLUTCHES.

TO CHECK

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

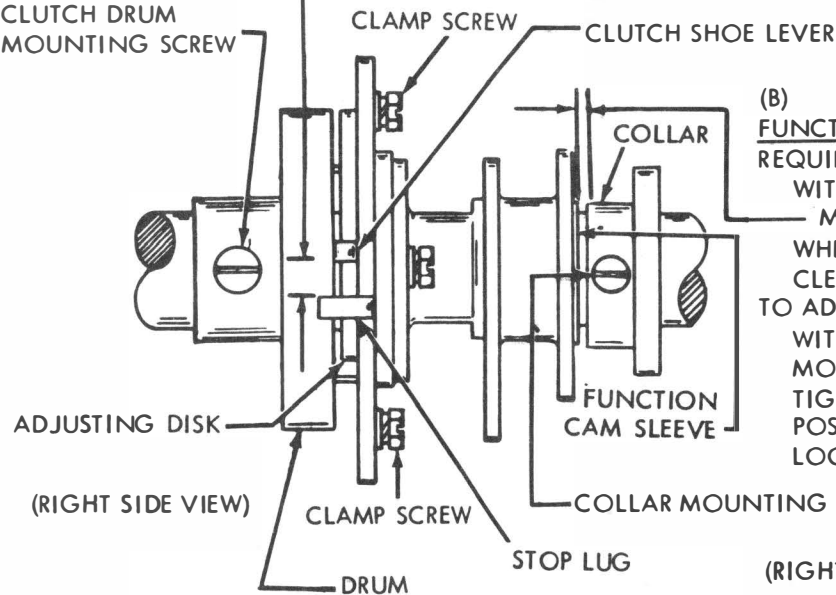
REQUIREMENT

CLEARANCE BETWEEN SHOE LEVER AND STOP LUG:  
MIN. 0.055 INCH---MAX. 0.085 INCH  
GREATER WHEN CLUTCH ENGAGED (2) THAN WHEN DISENGAGED (1).

TO ADJUST

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

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

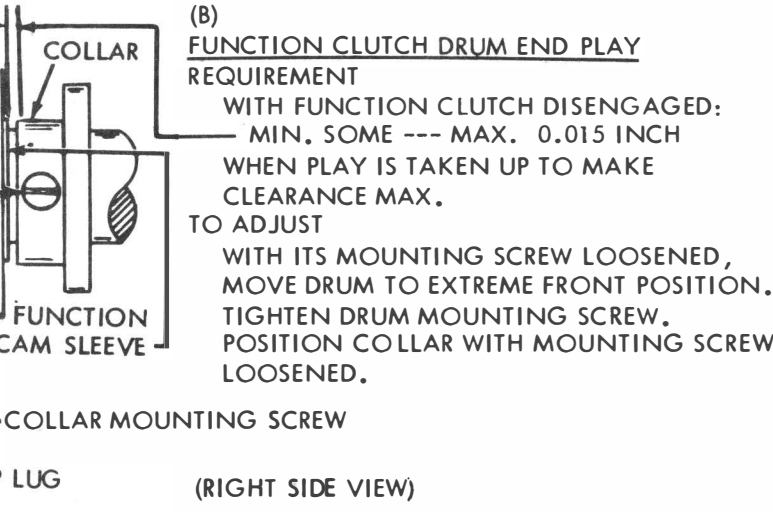


(B) FUNCTION CLUTCH DRUM END PLAY REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED:  
MIN. SOME --- MAX. 0.015 INCH  
WHEN PLAY IS TAKEN UP TO MAKE CLEARANCE MAX.

TO ADJUST

WITH ITS MOUNTING SCREW LOOSENED, MOVE DRUM TO EXTREME FRONT POSITION. TIGHTEN DRUM MOUNTING SCREW. POSITION COLLAR WITH MOUNTING SCREW LOOSENED.

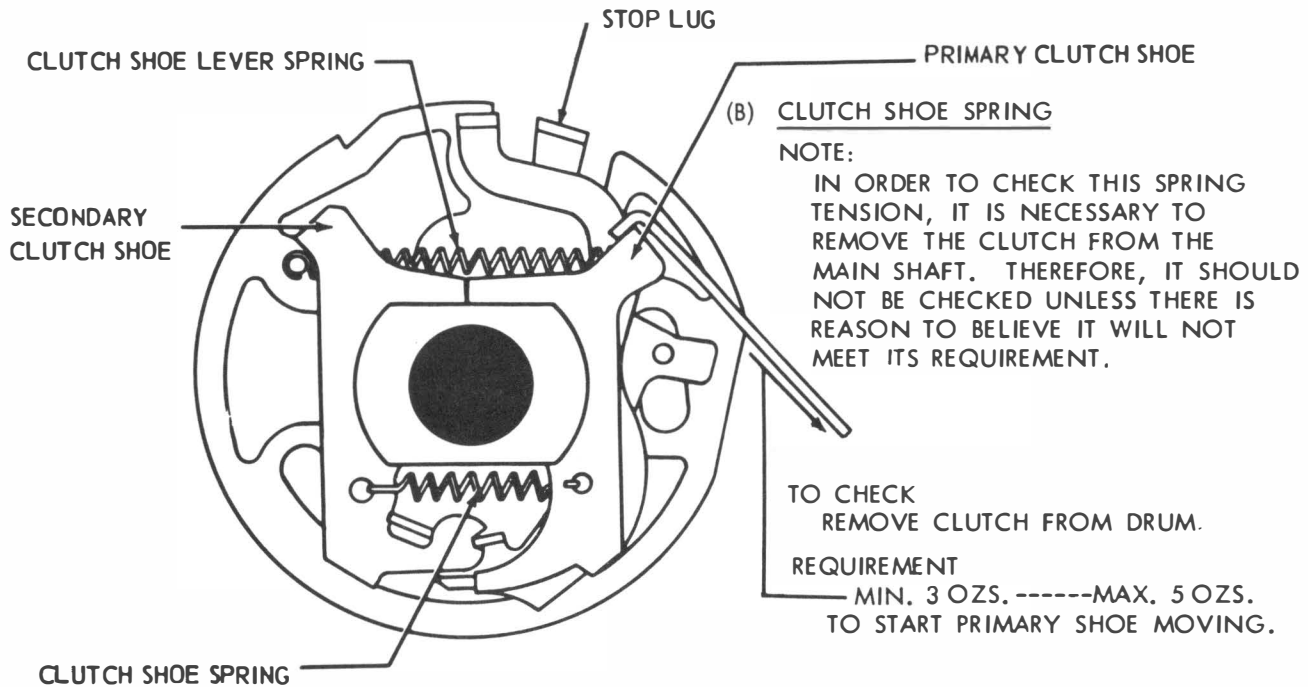
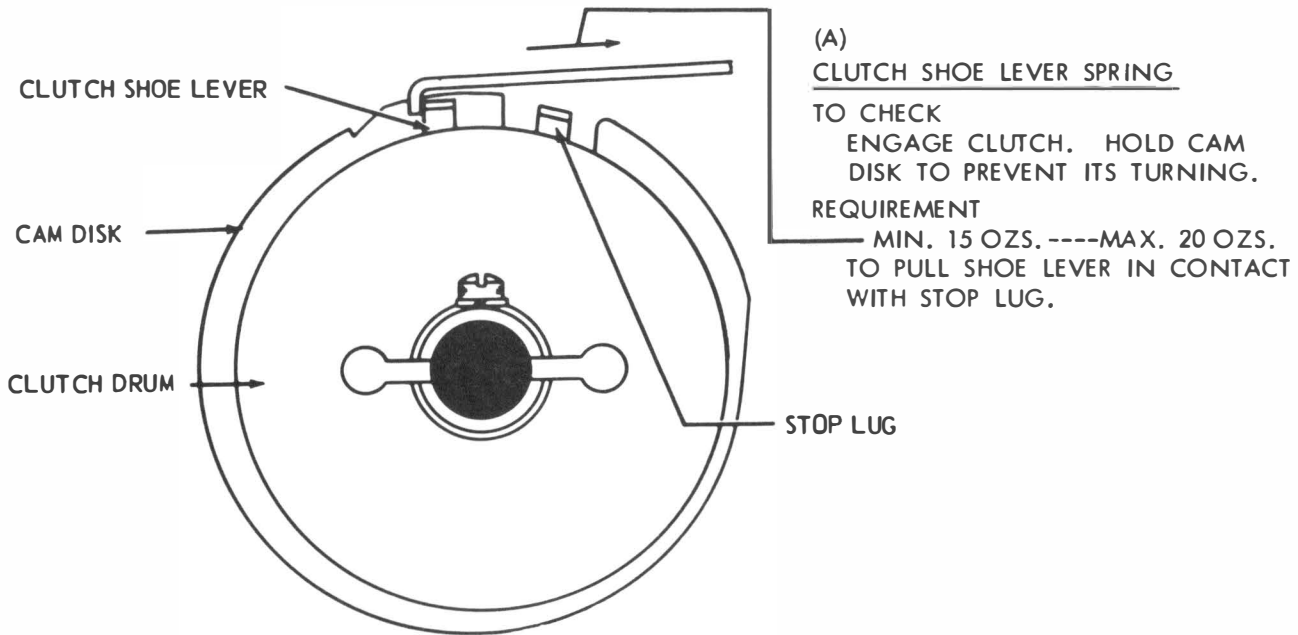


SECTION 574-233-700

2.04 Selector Mechanism (continued)

2.05 Function Mechanism (continued)

NOTE:  
THESE SPRING TENSIONS APPLY TO BOTH CLUTCHES.





## 2.06 Selector Mechanism (continued)

## NOTE

TO FACILITATE MAKING THE FOLLOWING ADJUSTMENTS, REMOVE THE RANGE FINDER ASSEMBLY AND SELECTOR MAGNET ASSEMBLY. TO INSURE BETTER OPERATION, PULL A PIECE OF BOND PAPER BETWEEN THE ARMATURE AND THE POLE PIECES TO REMOVE ANY OIL OR FOREIGN MATTER THAT MAY BE PRESENT. MAKE CERTAIN THAT NO LINT OR PIECES OF PAPER REMAIN BETWEEN THE POLE PIECES AND THE ARMATURE.

SELECTOR ARMATURE

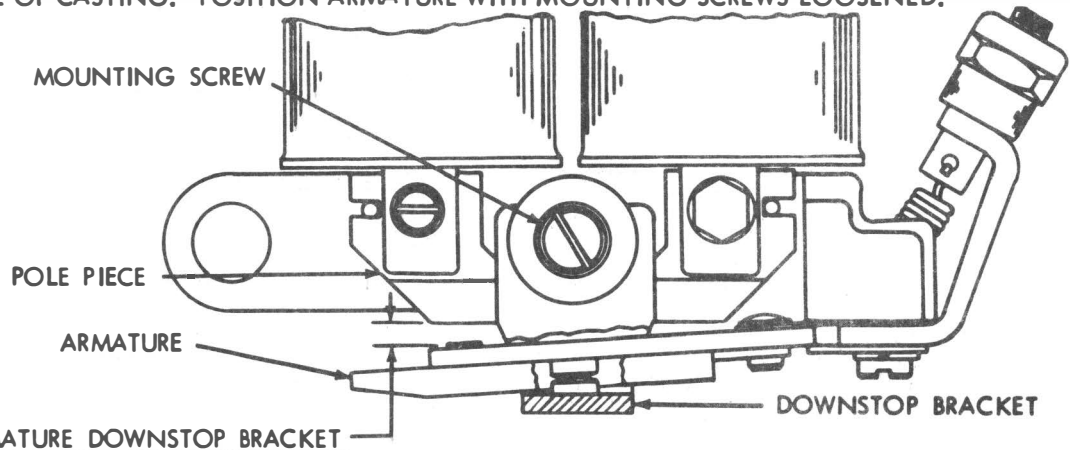
## NOTE

THESE REQUIREMENTS NEED NOT BE MADE NOR CHECKED IF THE SELECTOR MAGNET BRACKET AND RECEIVING MARGIN REQUIREMENTS ARE MET.

- (1) REQUIREMENT  
CLEARANCE  
MIN. 0.025 INCH  
MAX. 0.045 INCH  
BETWEEN ARMATURE CLAMP STRIP AND  
MAGNET BRACKET CASTING.
- (2) REQUIREMENT  
OUTER EDGE OF ARMATURE SHOULD BE FLUSH WITHIN 0.015 INCH  
WITH OUTER EDGE OF POLE PIECES.
- (3) REQUIREMENT  
START LEVER SHALL DROP FREELY INTO ARMATURE EXTENSION SLOT.

## TO ADJUST

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

SELECTOR ARMATURE DOWNSTOP BRACKET

## REQUIREMENT

REMOVE OIL SHIELD. WITH MAGNET DE-ENERGIZED, LOCK LEVERS ON HIGH PART OF THEIR CAM, AND ARMATURE RESTING AGAINST ITS DOWNSTOP, CLEARANCE BETWEEN END OF ARMATURE AND LEFT EDGE OF LEFT POLE PIECE

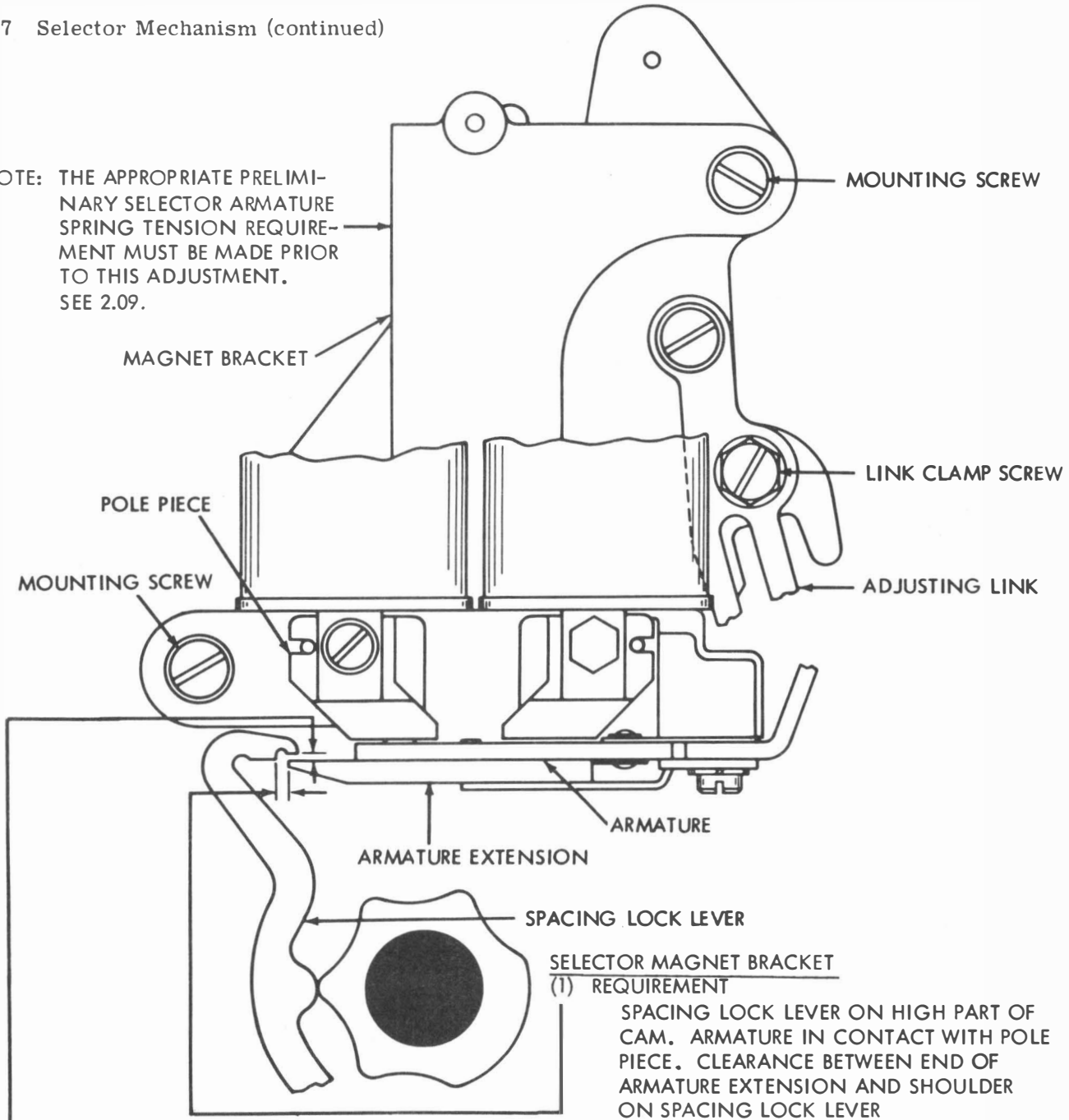
MIN. 0.025 INCH MAX. 0.030 INCH.

## TO ADJUST

POSITION DOWNSTOP BRACKET WITH MOUNTING SCREW LOOSENED. REPLACE OIL SHIELD AND CHECK OIL SHIELD ADJUSTMENT.

2.07 Selector Mechanism (continued)

NOTE: THE APPROPRIATE PRELIMINARY SELECTOR ARMATURE SPRING TENSION REQUIREMENT MUST BE MADE PRIOR TO THIS ADJUSTMENT. SEE 2.09.



SELECTOR MAGNET BRACKET  
(1) REQUIREMENT

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

(2) REQUIREMENT

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

TO ADJUST

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

TO ADJUST

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

NOTE

SEE FOLLOWING PAGE FOR REQUIREMENT (3).

2.08 Selector Mechanism (continued)

NOTE: SEE PRECEDING PAGE FOR SELECTOR MAGNET BRACKET ADJUSTMENTS (1) AND (2).

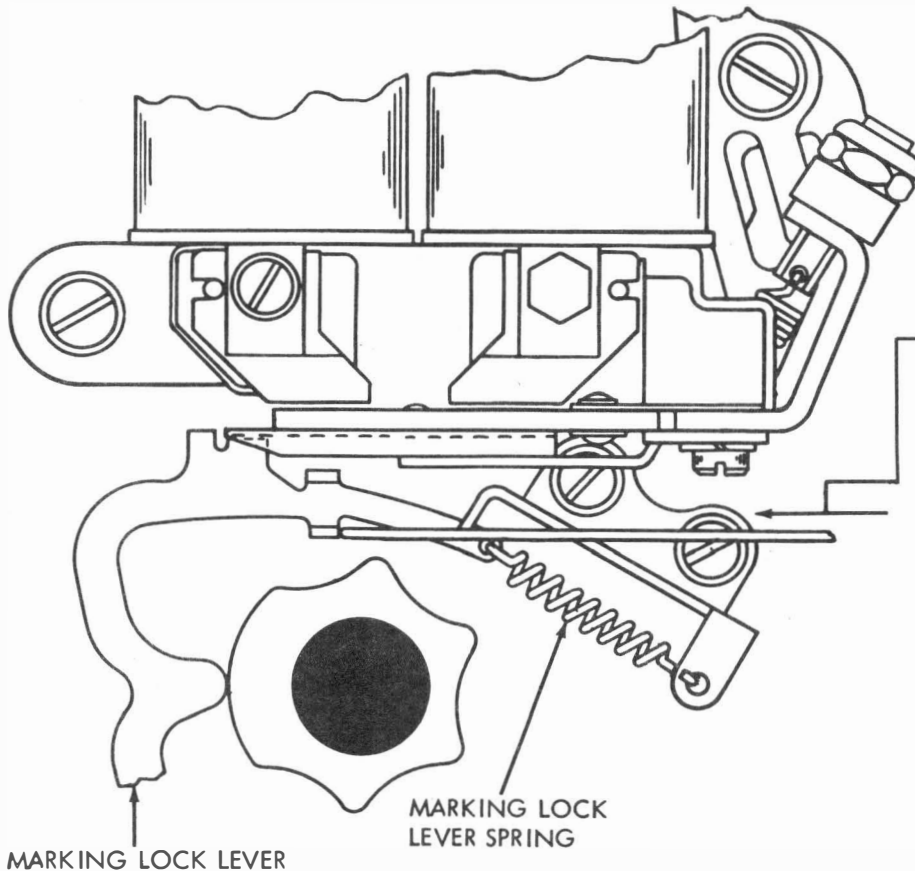
SELECTOR MAGNET BRACKET (continued)  
(3) REQUIREMENT

MARKING LOCK LEVER ON LOW PART OF CAM. MAGNET ENERGIZED, ARMATURE IN CONTACT WITH LEFT POLE PIECE. SOME CLEARANCE BETWEEN LOWER SURFACE OF ARMATURE EXTENSION AND UPPER SURFACE OF MARKING LOCK LEVER.

TO ADJUST POSITION UPPER END OF MAGNET BRACKET WITH MOUNTING SCREWS LOOSENED. TIGHTEN MOUNTING SCREWS AND RECHECK (1) AND (2). MARKING LOCK LEVER

ARMATURE EXTENSION

ARMATURE



MARKING LOCK LEVER SPRING REQUIREMENT

RUBOUT COMBINATION (12345678) SELECTED. MAIN SHAFT ROTATED UNTIL SELECTOR CLUTCH IS DISENGAGED. PUSH SCALE APPLIED TO LOWER EXTENSION OF LOCK LEVER.  
 MIN. 1-1/2 OZS.  
 MAX. 3 OZS.  
 TO START LEVER MOVING.

MARKING LOCK LEVER

MARKING LOCK LEVER SPRING

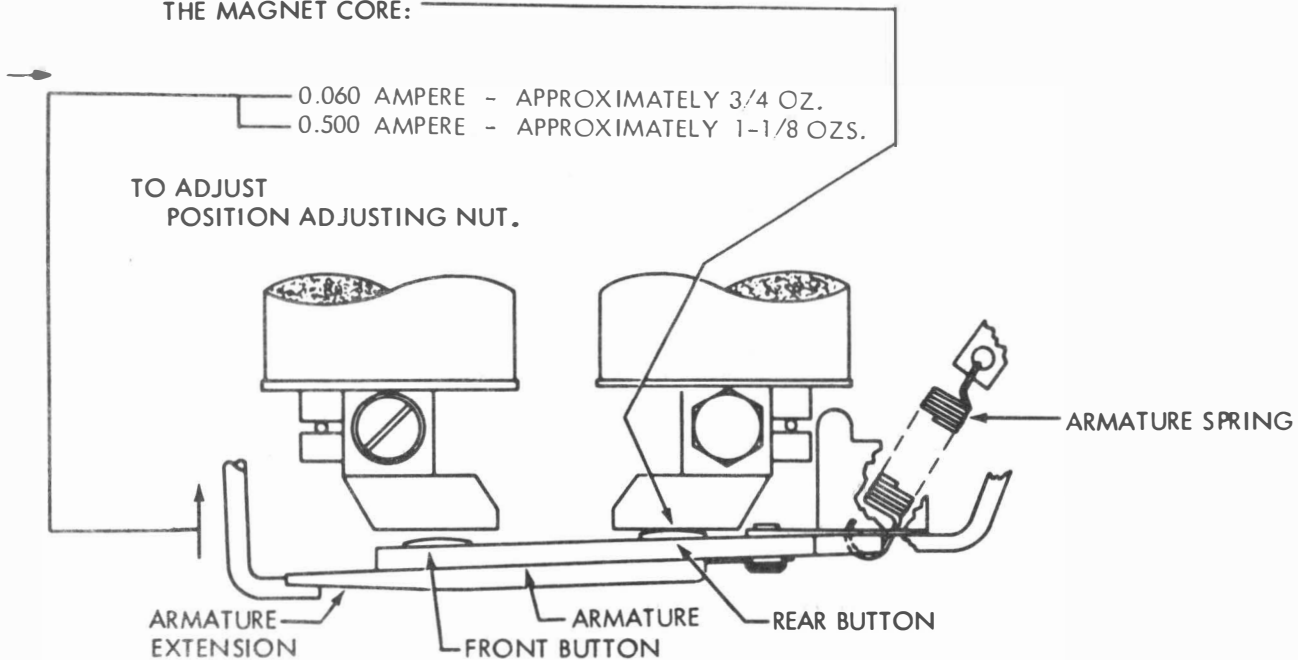
2.09 Selector Mechanism (continued)

SELECTOR ARMATURE SPRING

(FOR UNITS EMPLOYING SELECTOR ARMATURE WITH TWO ANTI-FREEZE BUTTONS ONLY).

REQUIREMENT (PRELIMINARY)

WITH LOCKING LEVERS AND START LEVER ON HIGH PART OF THEIR CAMS, SCALE APPLIED AS NEARLY VERTICAL AS POSSIBLE UNDER END OF ARMATURE EXTENSION. IT SHALL REQUIRE APPROXIMATELY THE FOLLOWING TENSIONS TO MOVE THE REAR ANTI-FREEZE BUTTON AGAINST THE MAGNET CORE:

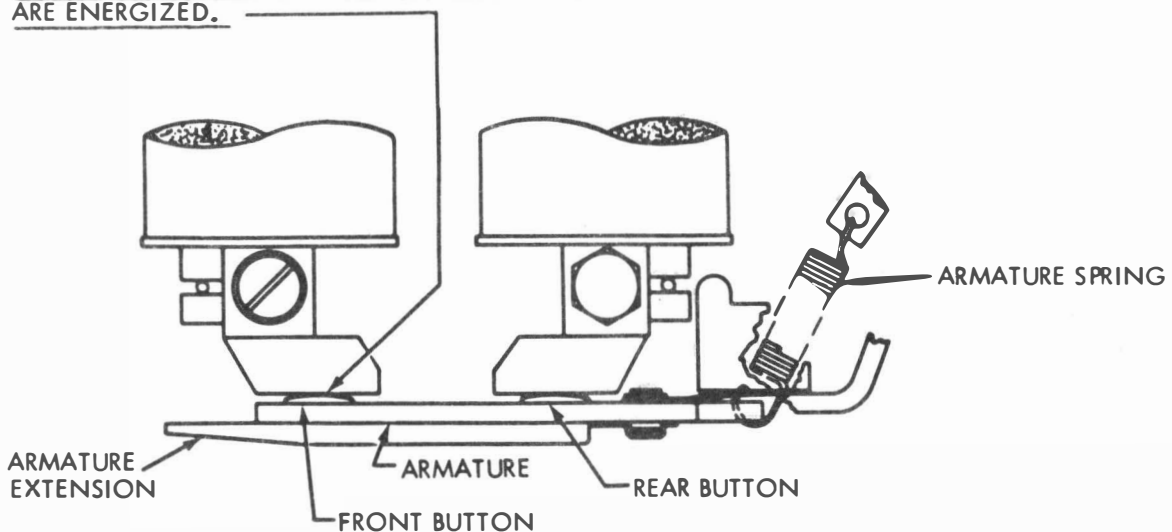


(SEE SELECTOR RECEIVING MARGIN ADJUSTMENT)

SELECTOR ARMATURE SPRING

REQUIREMENT (FINAL)

WHEN A DISTORTION TEST SET IS AVAILABLE, THE SELECTOR ARMATURE SPRING TENSION SHOULD BE REFINED, IF NECESSARY, TO OBTAIN SATISFACTORY RECEIVING MARGINS. THE FRONT ANTI-FREEZE BUTTON MUST CONTACT THE MAGNET CORE WHEN THE MAGNET COILS ARE ENERGIZED.



REQUIREMENT (FINAL)

SEE SELECTOR RECEIVING MARGIN ADJUSTMENT (PARAGRAPH 2.14)

2.10 Selector Mechanism (continued)

**SELECTOR ARMATURE SPRING**

(FOR UNITS EMPLOYING SELECTOR ARMATURE WITH SINGLE ANTI-FREEZE BUTTON ONLY).

**REQUIREMENT (PRELIMINARY)**

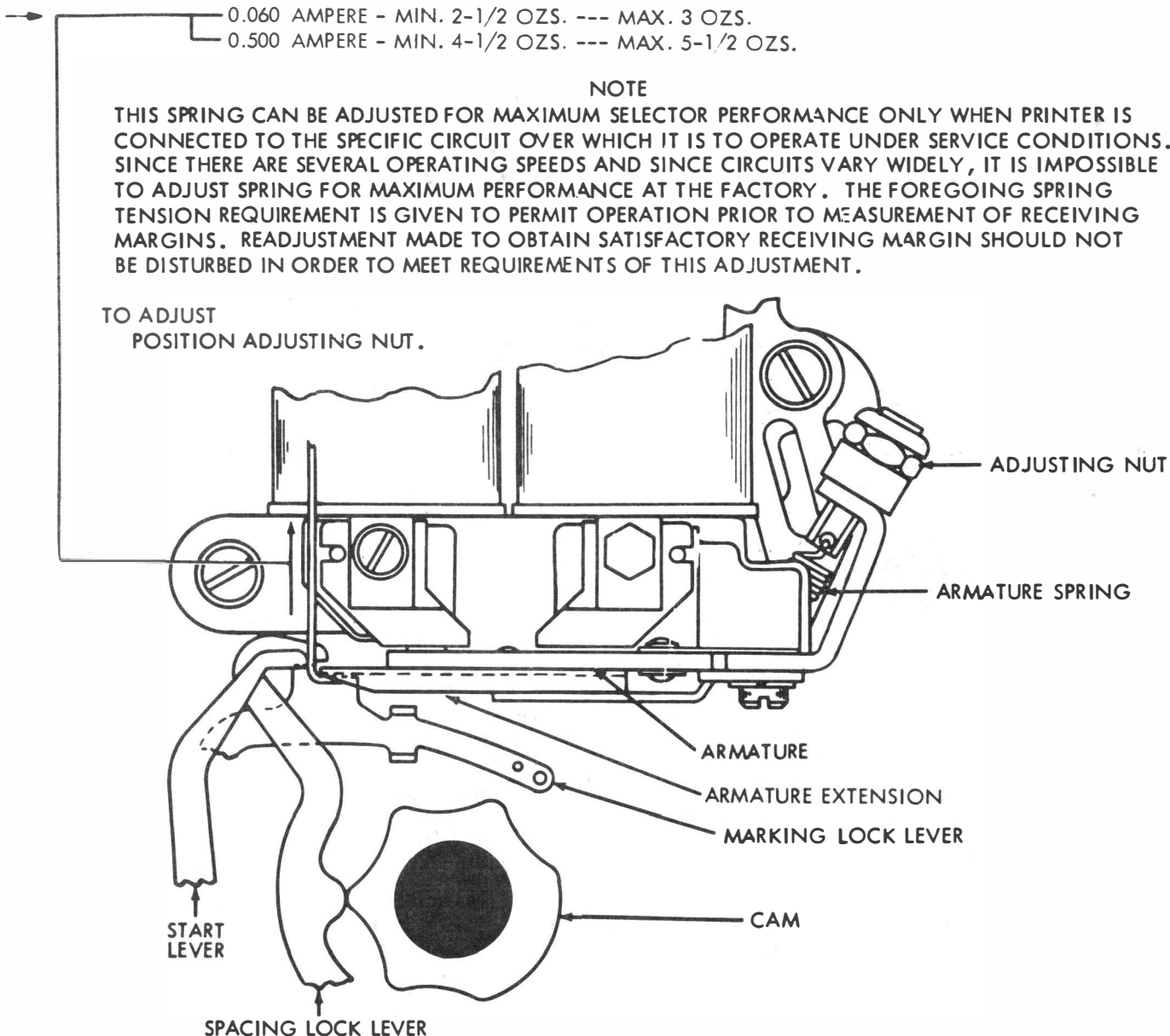
WITH LOCKING LEVERS AND START LEVER ON HIGH PART OF THEIR CAMS, SCALE APPLIED AS NEARLY VERTICAL AS POSSIBLE UNDER END OF ARMATURE EXTENSION. IT SHALL REQUIRE THE FOLLOWING TENSIONS TO MOVE ARMATURE TO MARKING POSITION:

- 0.060 AMPERE - MIN. 2-1/2 OZS. --- MAX. 3 OZS.
- 0.500 AMPERE - MIN. 4-1/2 OZS. --- MAX. 5-1/2 OZS.

**NOTE**

THIS SPRING CAN BE ADJUSTED FOR MAXIMUM SELECTOR PERFORMANCE ONLY WHEN PRINTER IS CONNECTED TO THE SPECIFIC CIRCUIT OVER WHICH IT IS TO OPERATE UNDER SERVICE CONDITIONS. SINCE THERE ARE SEVERAL OPERATING SPEEDS AND SINCE CIRCUITS VARY WIDELY, IT IS IMPOSSIBLE TO ADJUST SPRING FOR MAXIMUM PERFORMANCE AT THE FACTORY. THE FOREGOING SPRING TENSION REQUIREMENT IS GIVEN TO PERMIT OPERATION PRIOR TO MEASUREMENT OF RECEIVING MARGINS. READJUSTMENT MADE TO OBTAIN SATISFACTORY RECEIVING MARGIN SHOULD NOT BE DISTURBED IN ORDER TO MEET REQUIREMENTS OF THIS ADJUSTMENT.

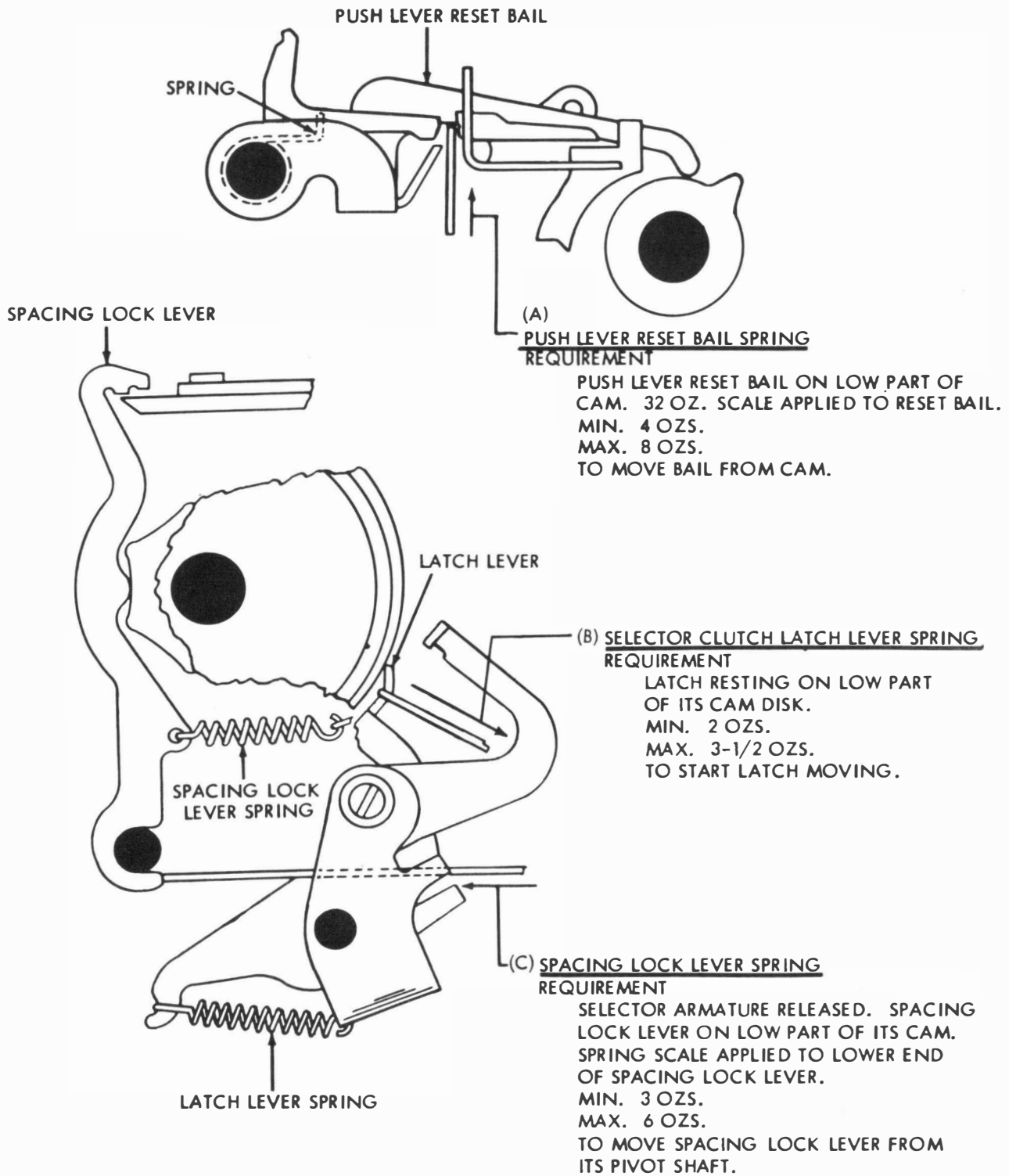
TO ADJUST  
POSITION ADJUSTING NUT.



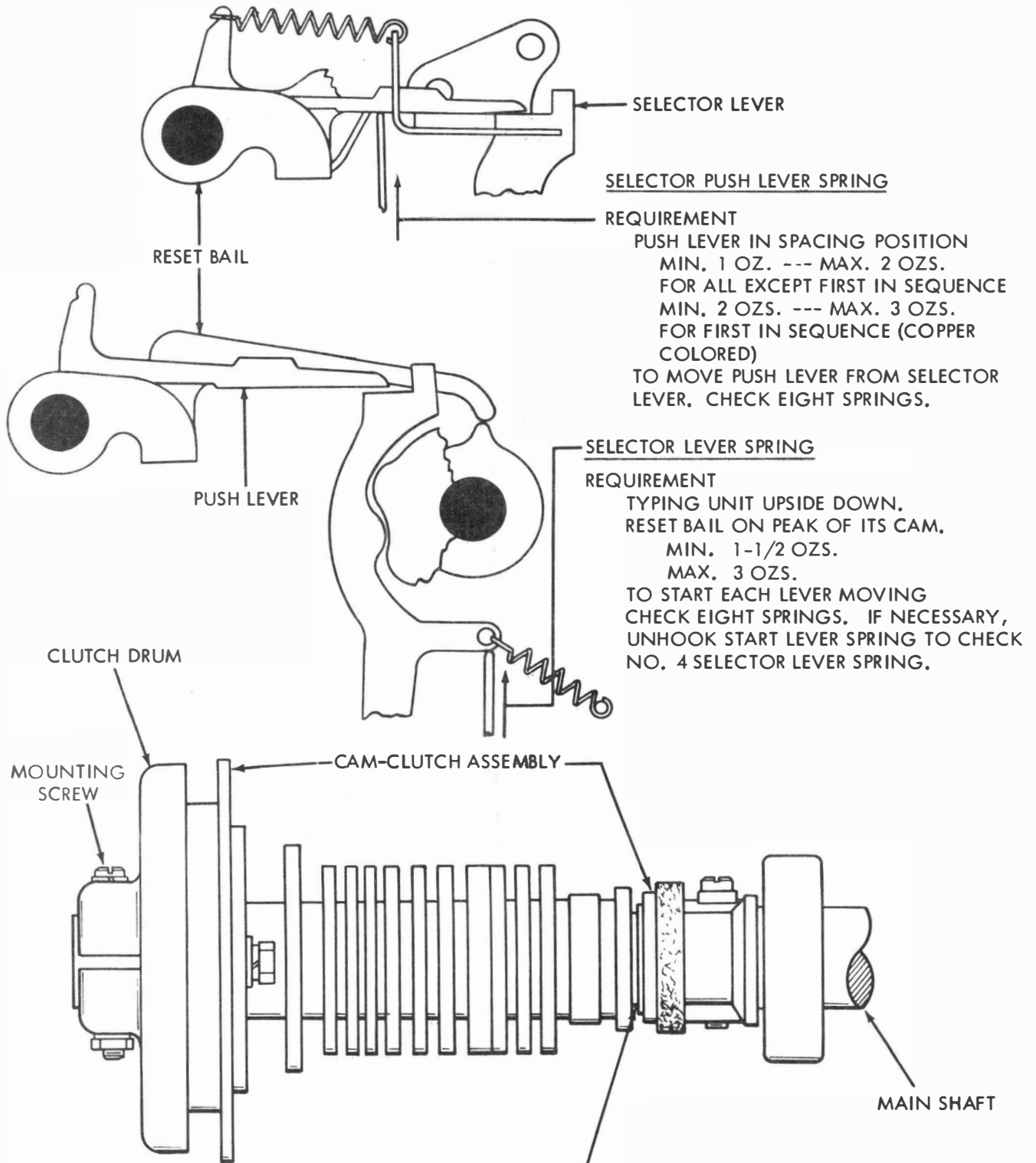
**REQUIREMENT (FINAL)**

SEE SELECTOR RECEIVING MARGIN ADJUSTMENT (PARAGRAPH 2.14)

2.11 Selector Mechanism (continued)



2.12 Selector Mechanism (continued)



SELECTOR PUSH LEVER SPRING

REQUIREMENT  
 PUSH LEVER IN SPACING POSITION  
 MIN. 1 OZ. --- MAX. 2 OZS.  
 FOR ALL EXCEPT FIRST IN SEQUENCE  
 MIN. 2 OZS. --- MAX. 3 OZS.  
 FOR FIRST IN SEQUENCE (COPPER  
 COLORED)  
 TO MOVE PUSH LEVER FROM SELECTOR  
 LEVER, CHECK EIGHT SPRINGS.

SELECTOR LEVER SPRING

REQUIREMENT  
 TYPING UNIT UPSIDE DOWN,  
 RESET BAIL ON PEAK OF ITS CAM,  
 MIN. 1-1/2 OZS.  
 MAX. 3 OZS.  
 TO START EACH LEVER MOVING  
 CHECK EIGHT SPRINGS. IF NECESSARY,  
 UNHOOK START LEVER SPRING TO CHECK  
 NO. 4 SELECTOR LEVER SPRING.

SELECTOR CLUTCH DRUM END PLAY

REQUIREMENT  
 CLUTCH LATCHED IN STOP POSITION, CAM ASSEMBLY SHOULD HAVE SOME END PLAY, NOT  
 MORE THAN 0.010 INCH.

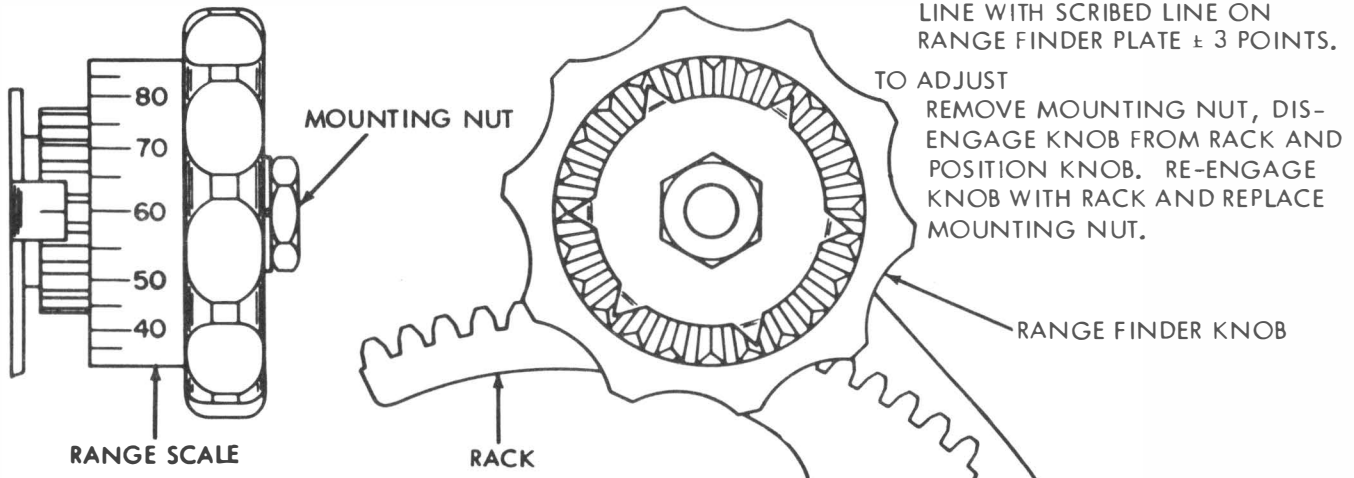
TO ADJUST  
 POSITION CLUTCH DRUM ON MAIN SHAFT WITH MOUNTING SCREW LOOSENED.

2.13 Selector Mechanism (continued)

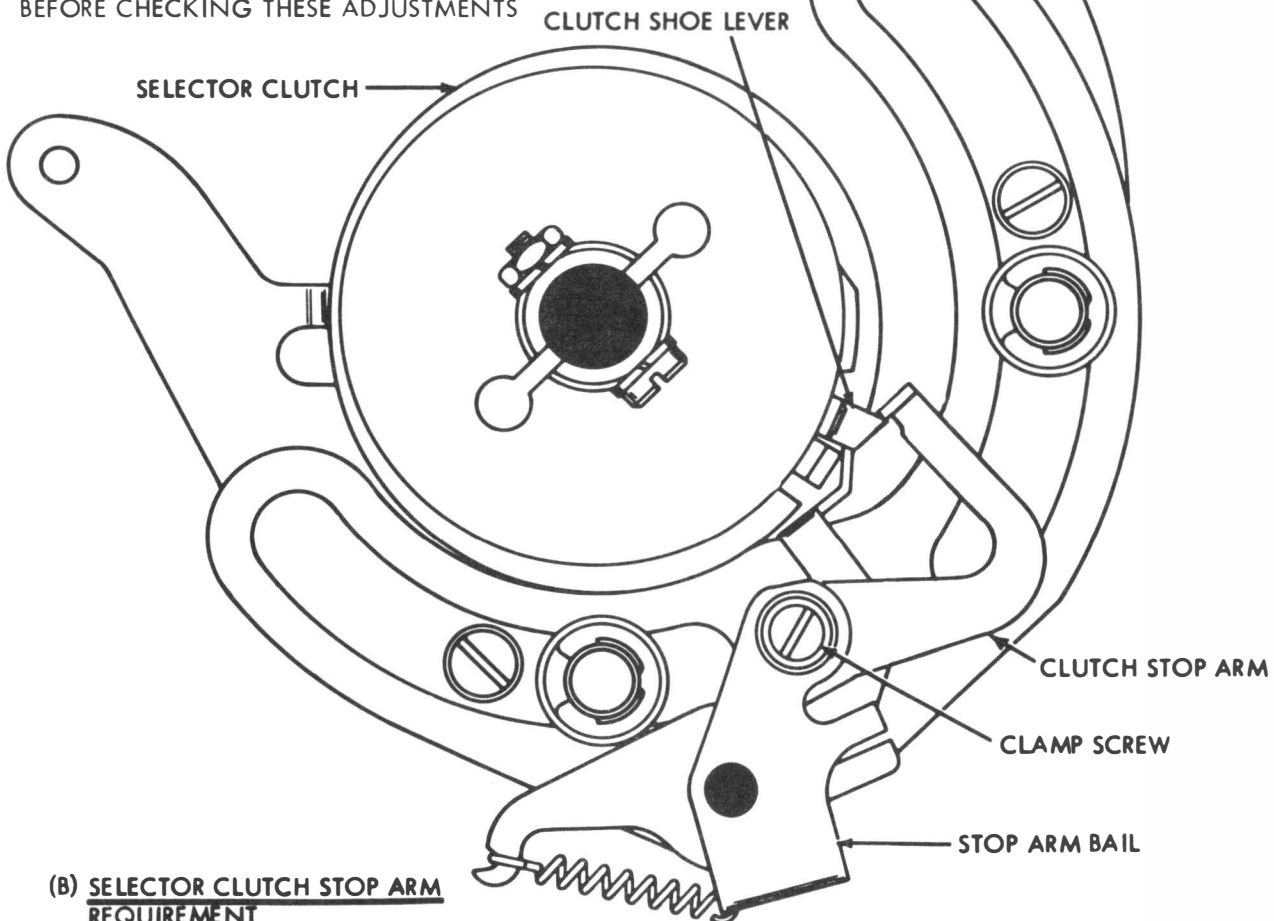
(A) RANGE FINDER KNOB PHASING

REQUIREMENT

WITH RANGE FINDER KNOB TURNED TO EITHER END OF RACK, ZERO MARK ON SCALE SHOULD BE IN LINE WITH SCRIBED LINE ON RANGE FINDER PLATE  $\pm 3$  POINTS.



NOTE: REPLACE RANGE FINDER AND SELECTOR MAGNET ASSEMBLY BEFORE CHECKING THESE ADJUSTMENTS



(B) SELECTOR CLUTCH STOP ARM  
REQUIREMENT

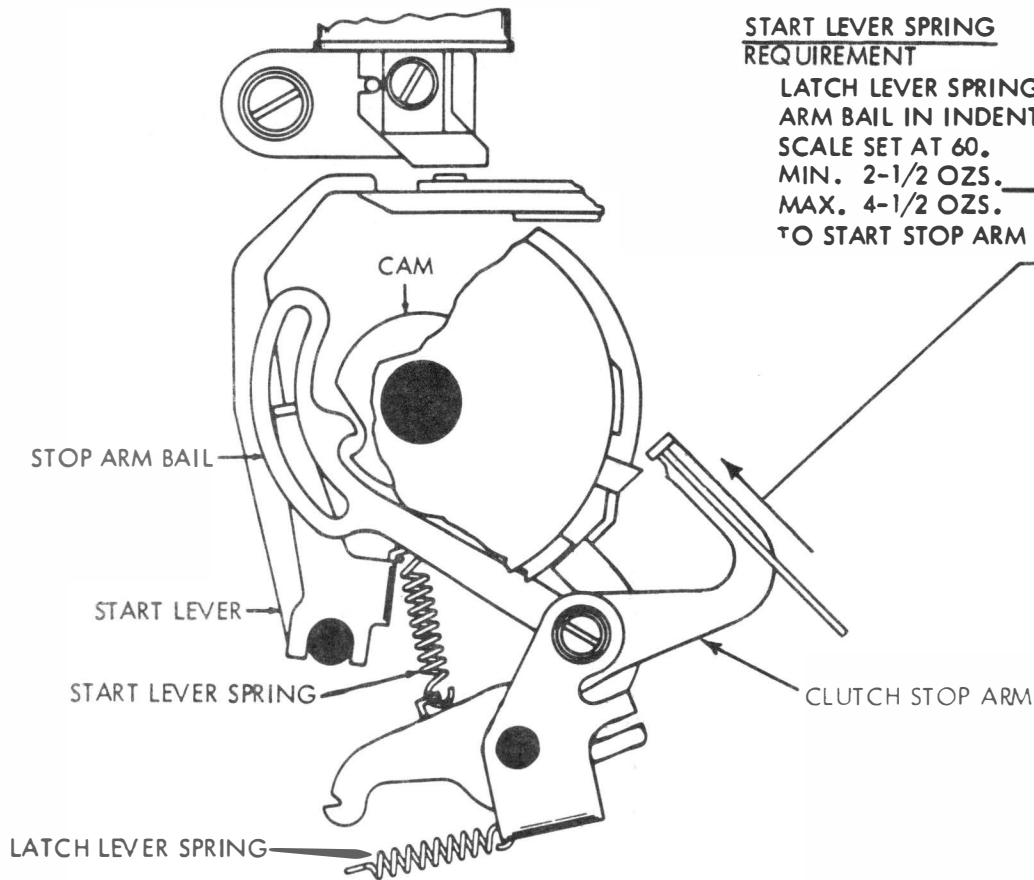
RANGE SCALE SET AT 60. SELECTOR CLUTCH DISENGAGED. ARMATURE IN MARKING POSITION. CLUTCH STOP ARM SHOULD ENGAGE CLUTCH SHOE LEVER BY APPROXIMATELY FULL THICKNESS OF STOP ARM.

TO ADJUST

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



2.14 Selector Mechanism (continued)



**START LEVER SPRING REQUIREMENT**

LATCH LEVER SPRING UNHOOKED. STOP ARM BAIL IN INDENT OF ITS CAM. RANGE SCALE SET AT 60.  
 MIN. 2-1/2 OZS.  
 MAX. 4-1/2 OZS.  
 TO START STOP ARM MOVING.

**SELECTOR RECEIVING MARGIN**

**REQUIREMENT (FOR UNITS EMPLOYING ARMATURE WITH ONE ANTI-FREEZE BUTTON)**

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

**REQUIREMENT (FOR UNITS EMPLOYING ARMATURE WITH TWO ANTI-FREEZE BUTTONS)**

WHEN A DISTORTION TEST SET IS AVAILABLE, THE SELECTOR ARMATURE SPRING TENSION SHOULD BE REFINED, IF NECESSARY, TO OBTAIN SATISFACTORY RECEIVING MARGINS. THE FRONT ANTI-FREEZE BUTTON MUST CONTACT THE MAGNET CORE WHEN THE MAGNET COILS ARE ENERGIZED.

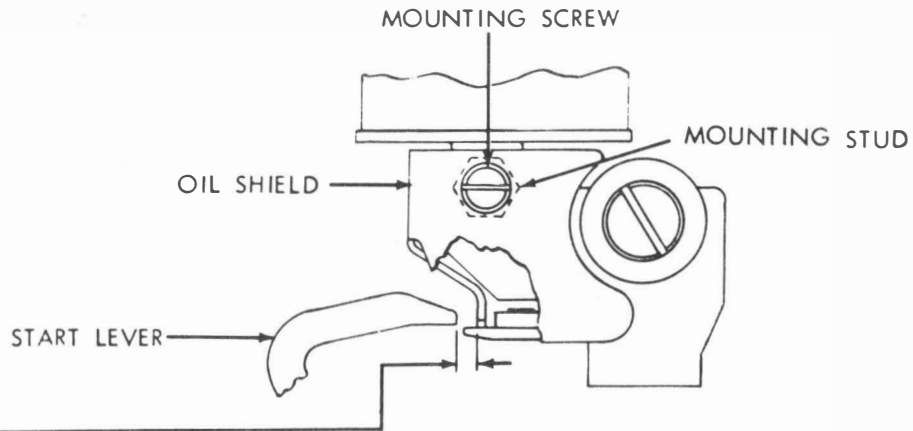
TO ADJUST: REFINE THE SELECTOR ARMATURE SPRING ADJUSTMENT

**SELECTOR RECEIVING MARGIN MINIMUM REQUIREMENTS**

CURRENT	SPEED IN W.P.M.	POINTS RANGE WITH ZERO DISTORTION	PERCENTAGE OF MARKING AND SPACING BIAS	END DISTORTION TOLERATED WITH SCALE AT BIAS OPTIMUM SETTING
0.500 AMP (WINDINGS SERIES)	100	72	38	35

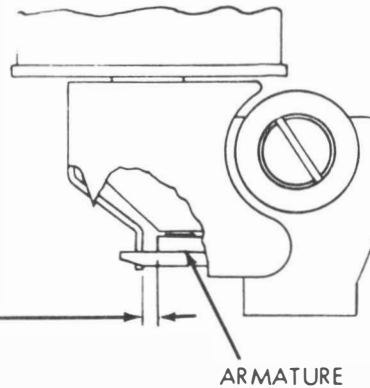
SECTION 574-233-700

2.15 Selector Mechanism (continued)



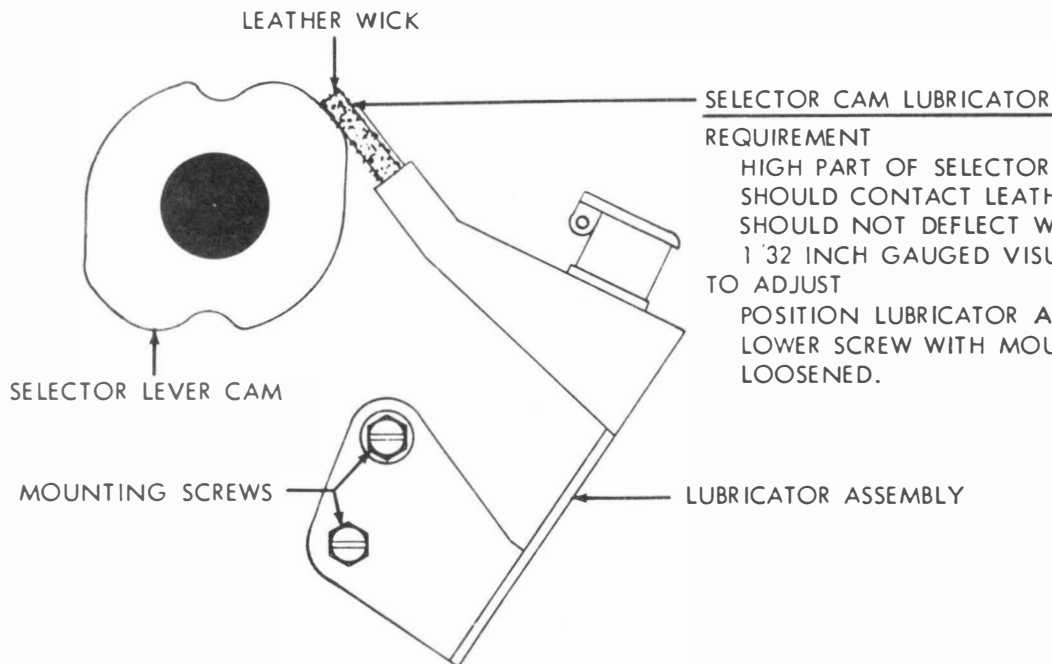
OIL SHIELD  
REQUIREMENT

(1) MAGNET DE-ENERGIZED. STOP ARM BAIL ON LOW PART OF ITS CAM. CLEARANCE BETWEEN START LEVER AND OIL SHIELD. MIN. 0.020 INCH



(2) MAGNET ENERGIZED. STOP ARM BAIL ON HIGH PART OF ITS CAM. CLEARANCE BETWEEN END OF ARMATURE AND OIL SHIELD. MIN. 0.010 INCH

TO ADJUST POSITION SHIELD WITH MOUNTING SCREW LOOSENED. MAKE SURE OIL SHIELD MOUNTING STUD IS SECURE BEFORE MAKING ADJUSTMENT.



SELECTOR CAM LUBRICATOR  
REQUIREMENT

HIGH PART OF SELECTOR LEVER CAMS SHOULD CONTACT LEATHER WICK BUT SHOULD NOT DEFLECT WICK MORE THAN 1/32 INCH GAUGED VISUALLY.

TO ADJUST POSITION LUBRICATOR ASSEMBLY AROUND LOWER SCREW WITH MOUNTING SCREWS LOOSENED.

2.16 Function Mechanism (continued)

NOTE: FOR UNITS EQUIPPED WITH AUTO-MATIC NON-INTERFERING RUBOUT TAPE FEED-OUT MECHANISM, SUBSTITUTE ADJUSTMENT IN VARIABLE FEATURES, PART 3.

(A) FOLLOWER LEVER REQUIREMENT

WITH FOLLOWER LEVER ON HIGH PART OF CAM:

- (1) CLEARANCE BETWEEN RELEASE AND MAIN TRIP LEVER:  
MIN. 0.010 INCH --- MAX. 0.030 INCH

- (2) SOME CLEARANCE BETWEEN MAIN TRIP LEVER AND DOWNSTOP BRACKET.  
TO ADJUST BY MEANS OF PRY POINT, POSITION ADJUSTING ARM ON FOLLOWER LEVER WITH LOCK NUT LOOSENED.

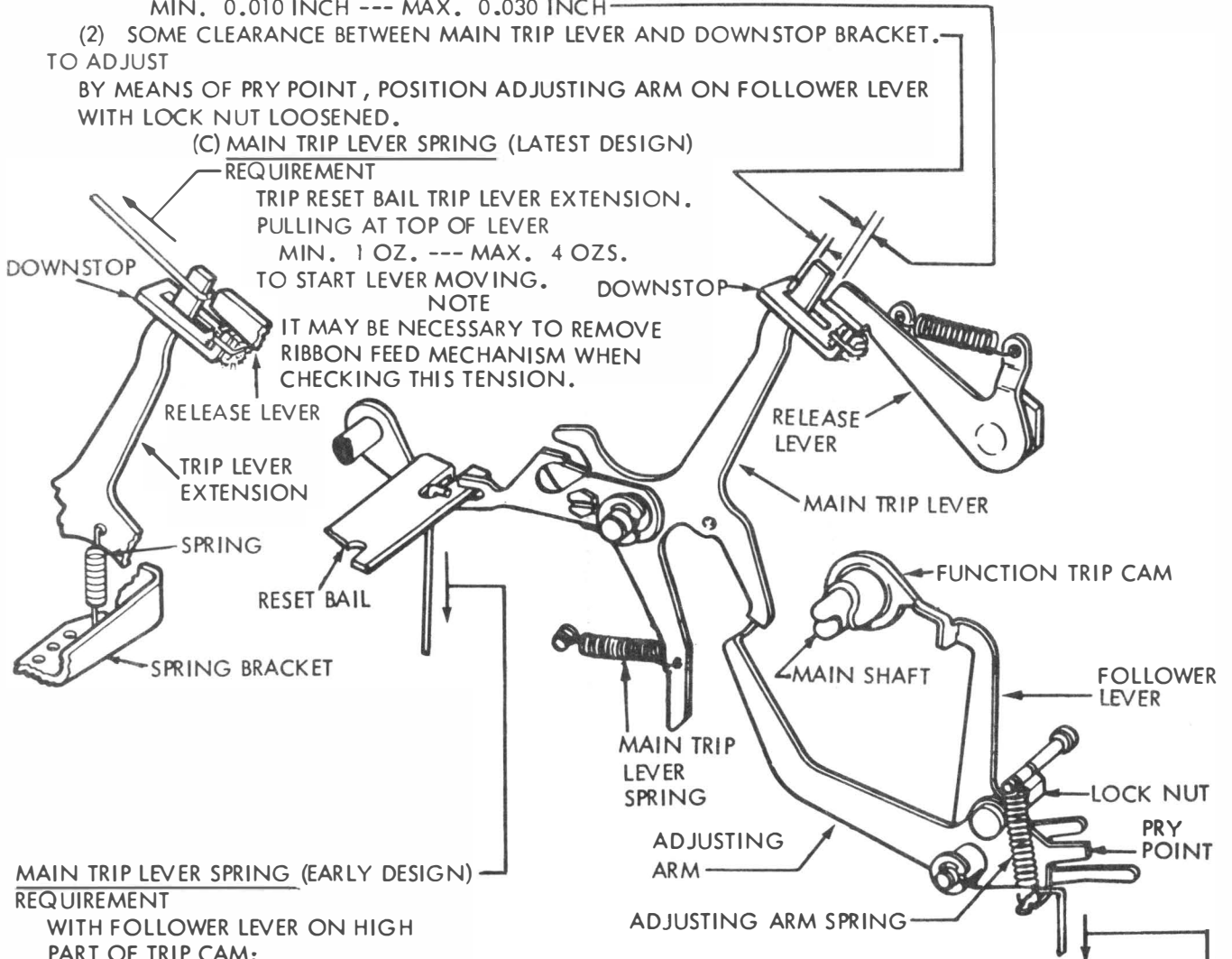
(C) MAIN TRIP LEVER SPRING (LATEST DESIGN)

REQUIREMENT

- TRIP RESET BAIL TRIP LEVER EXTENSION.  
PULLING AT TOP OF LEVER  
MIN. 1 OZ. --- MAX. 4 OZS.  
TO START LEVER MOVING.

NOTE

IT MAY BE NECESSARY TO REMOVE RIBBON FEED MECHANISM WHEN CHECKING THIS TENSION.



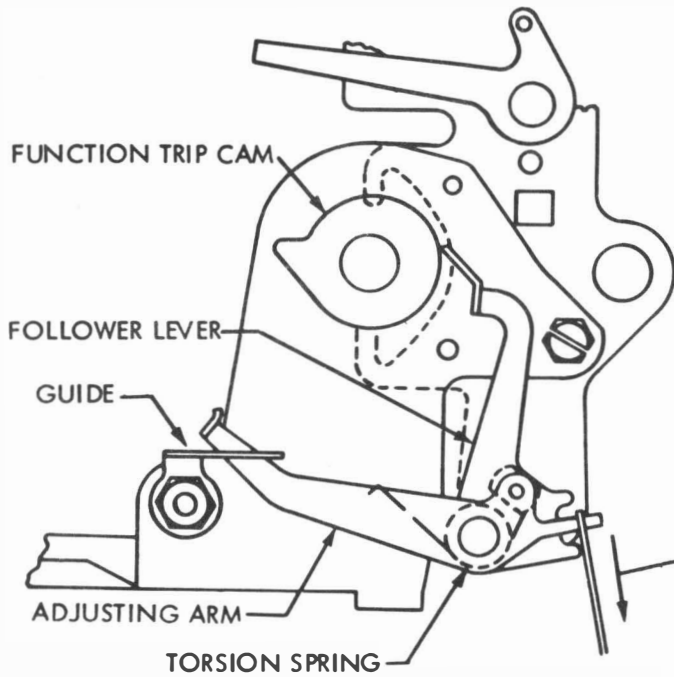
MAIN TRIP LEVER SPRING (EARLY DESIGN) REQUIREMENT

- WITH FOLLOWER LEVER ON HIGH PART OF TRIP CAM:  
MIN. 2-1/2 OZS. --- MAX. 4-1/2 OZS.  
TO START TRIP LEVER MOVING.

(B) ADJUSTING ARM SPRING REQUIREMENT (EARLY DESIGN)

- WITH FOLLOWER LEVER ON HIGH PART OF TRIP CAM AND MAIN TRIP LEVER HELD AWAY FROM ADJUSTING ARM:  
MIN. 2-1/2 OZS. --- MAX. 4 OZS.  
TO START ADJUSTING LEVER MOVING.

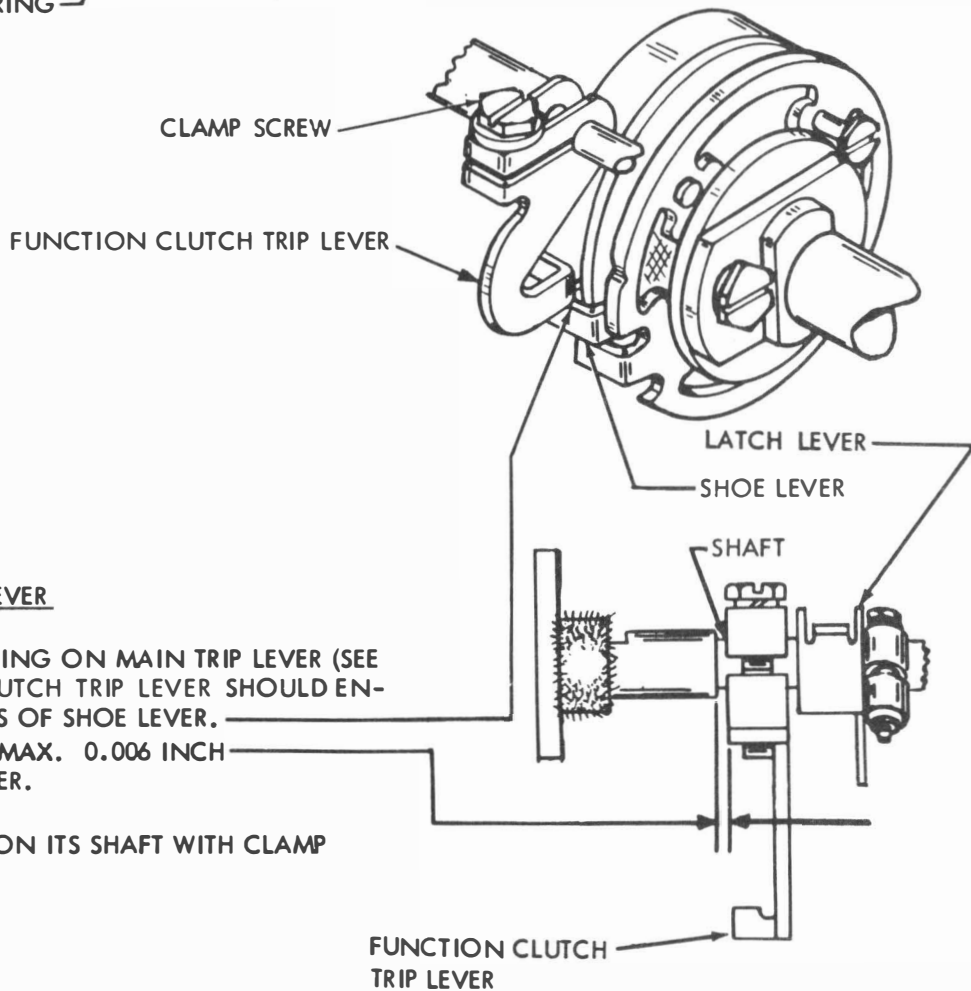
2.17 Function Mechanism (continued)



ADJUSTING ARM TORSION SPRING  
(LATEST DESIGN)

WITH FOLLOWER LEVER ON LOW  
PART OF TRIP CAM AND MAIN  
TRIP LEVER HELD AWAY FROM  
ADJUSTING ARM

MIN. 1 OZ. --- MAX. 4 OZS.  
TO START ADJUSTING LEVER MOVING.



FUNCTION CLUTCH TRIP LEVER  
REQUIREMENT

(1) WITH RELEASE RESTING ON MAIN TRIP LEVER (SEE  
2.18), FUNCTION CLUTCH TRIP LEVER SHOULD EN-  
GAGE FULL THICKNESS OF SHOE LEVER.

(2) MIN. SOME---MAX. 0.006 INCH  
END PLAY IN TRIP LEVER.

TO ADJUST  
POSITION TRIP LEVER ON ITS SHAFT WITH CLAMP  
SCREW LOOSENED.

(RIGHT SIDE VIEWS)

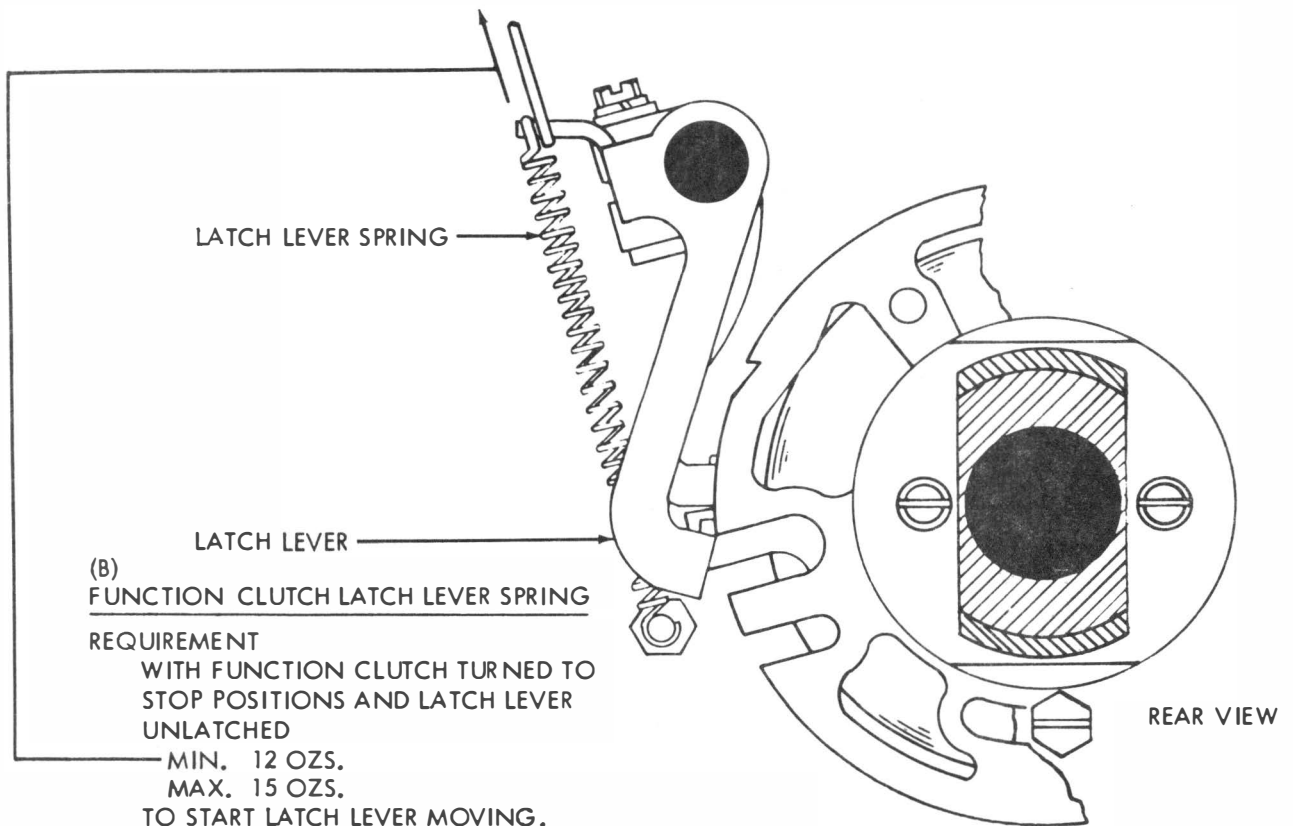
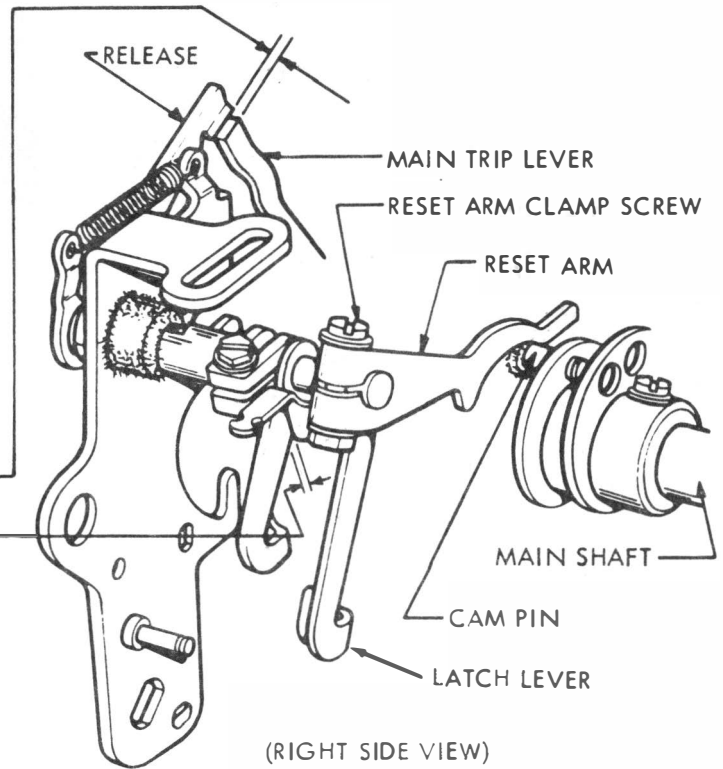
2.18 Function Mechanism (continued)

(A)  
RESET ARM  
 TO CHECK  
 TRIP FUNCTION CLUTCH AND POSITION  
 MAIN SHAFT SO THAT RESET ARM IS  
 HELD IN ITS HIGHEST POSITION BY CAM PIN.

REQUIREMENT

- (1) CLEARANCE BETWEEN RELEASE  
 AND MAIN TRIP LEVER:  
 MIN. 0.010 INCH----MAX. 0.030 INCH
- (2) LATCH LEVER END PLAY:  
 MIN. SOME----MAX. 0.010 INCH

TO ADJUST  
 POSITION RESET ARM WITH CLAMP  
 SCREW LOOSENED.



(B)  
FUNCTION CLUTCH LATCH LEVER SPRING  
 REQUIREMENT  
 WITH FUNCTION CLUTCH TURNED TO  
 STOP POSITIONS AND LATCH LEVER  
 UNLATCHED  
 MIN. 12 OZS.  
 MAX. 15 OZS.  
 TO START LATCH LEVER MOVING.

2.19 Function Mechanism (continued)

(A)

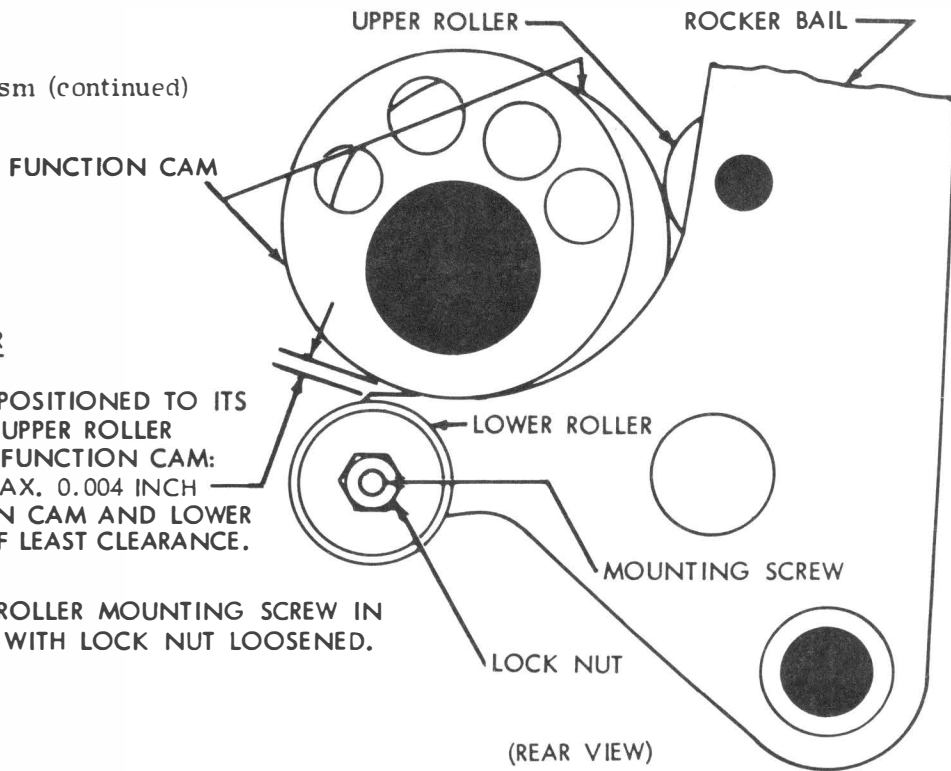
CAM FOLLOWER ROLLER  
REQUIREMENT

WITH ROCKER BAIL POSITIONED TO ITS  
EXTREME LEFT AND UPPER ROLLER  
IN CONTACT WITH FUNCTION CAM:

MIN. SOME----MAX. 0.004 INCH  
CLEARANCE BETWEEN CAM AND LOWER  
ROLLER AT POINT OF LEAST CLEARANCE.

TO ADJUST

POSITION LOWER ROLLER MOUNTING SCREW IN  
ELONGATED SLOT WITH LOCK NUT LOOSENED.



(REAR VIEW)

(B)

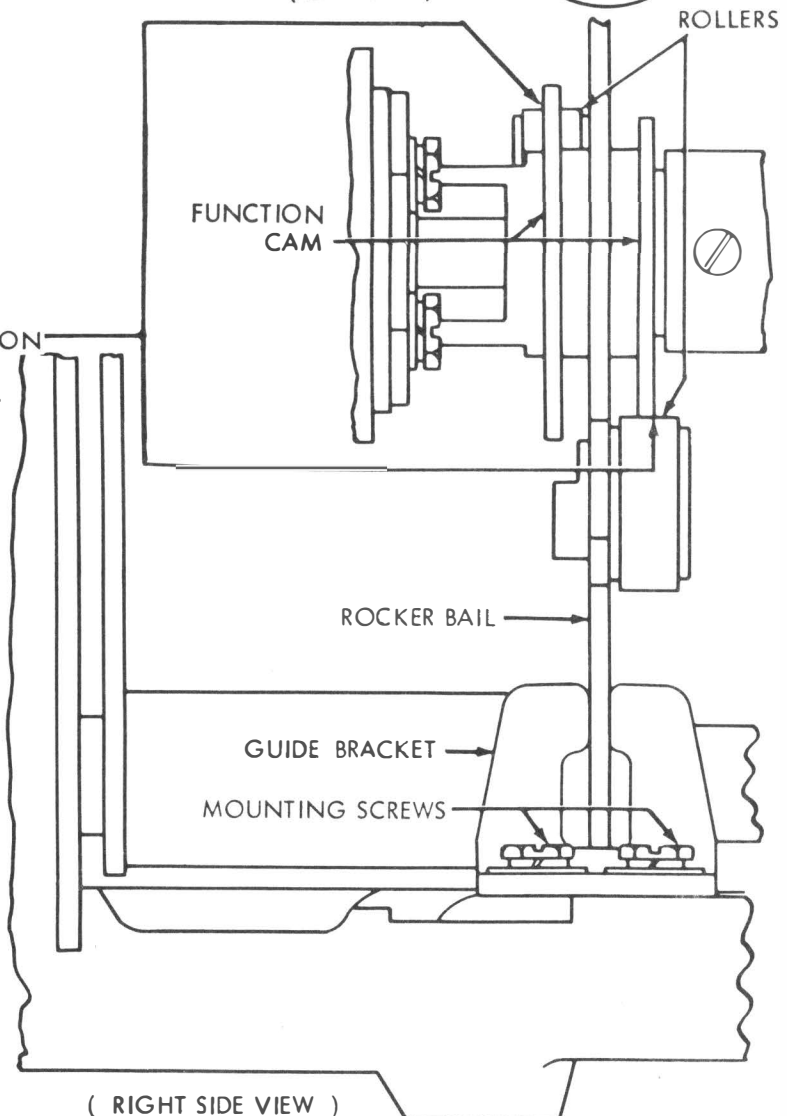
CAM FOLLOWER ROLLER ALIGNMENT  
REQUIREMENT

(1) ROCKER BAIL ROLLERS SHOULD  
ENGAGE FULL THICKNESS OF FUNCTION  
CAM.

(2) LIFTER ROLLER IN FULL ENGAGE-  
MENT WITH ROCKER BAIL CAMMING  
SURFACE..

TO ADJUST

POSITION ROCKER BAIL AND GUIDE  
BRACKET WITH GUIDE BRACKET  
MOUNTING SCREWS LOOSENED.

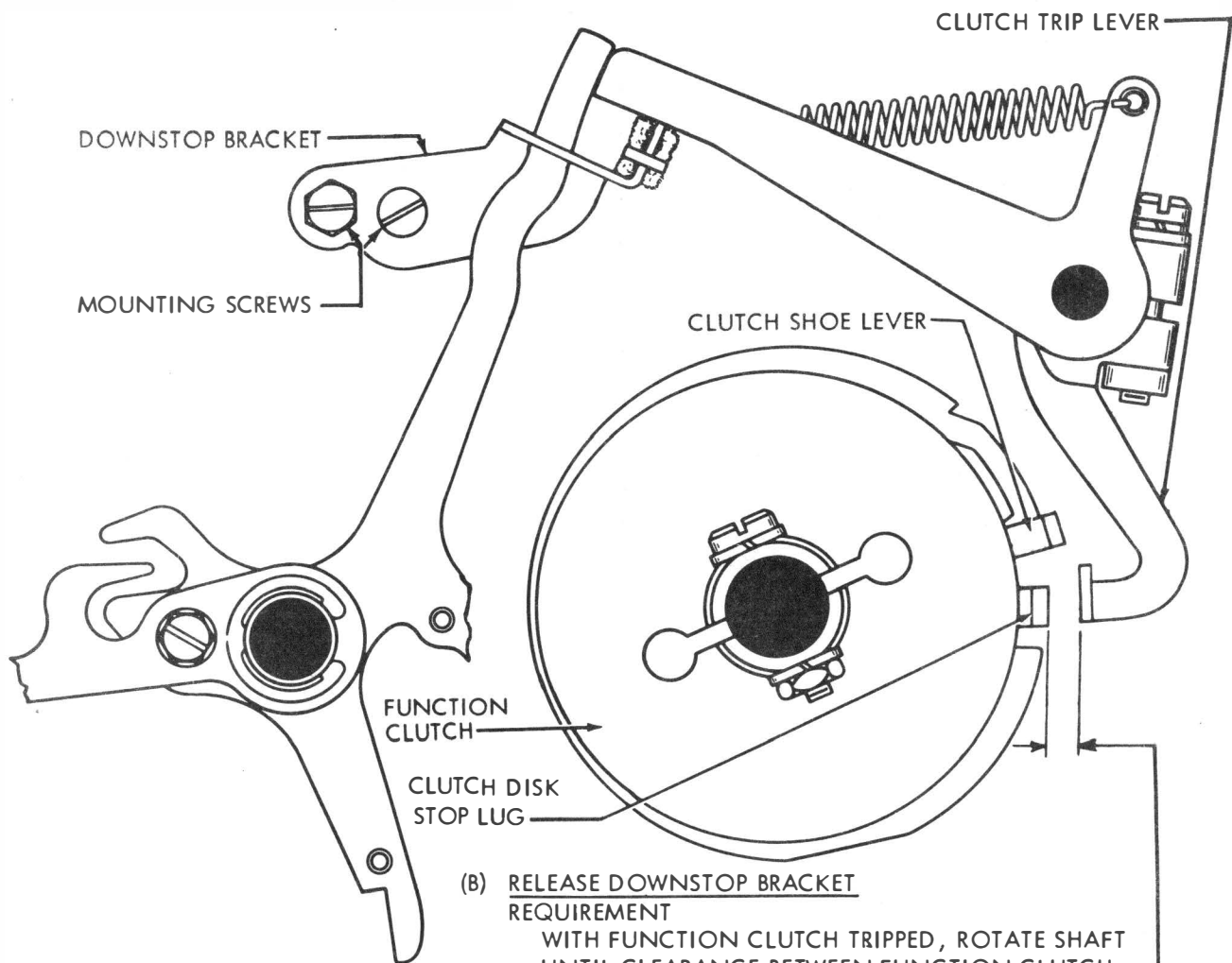
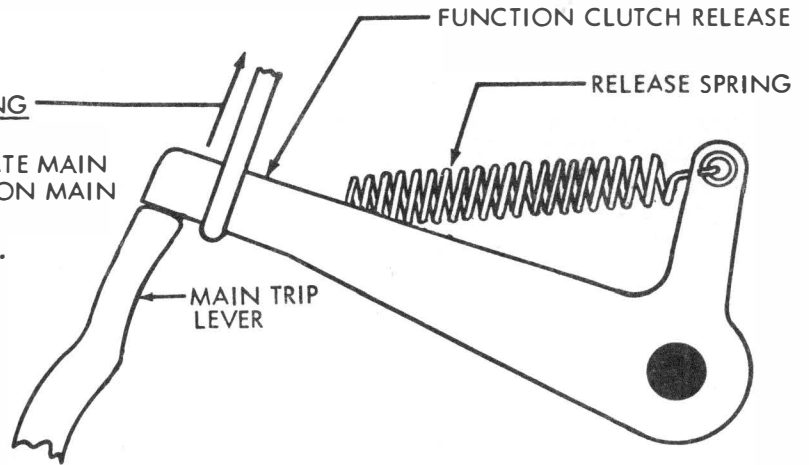


( RIGHT SIDE VIEW )

2.20 Function Mechanism (continued)

(A) FUNCTION CLUTCH RELEASE SPRING REQUIREMENT

TRIP FUNCTION CLUTCH. ROTATE MAIN SHAFT UNTIL RELEASE IS RESET ON MAIN TRIP LEVER.  
MIN. 5 OZS. --- MAX. 8 OZS. TO START RELEASE MOVING.



(B) RELEASE DOWNSTOP BRACKET REQUIREMENT

WITH FUNCTION CLUTCH TRIPPED, ROTATE SHAFT UNTIL CLEARANCE BETWEEN FUNCTION CLUTCH DISK STOP LUG AND CLUTCH STOP LEVER IS AT A MINIMUM. RELEASE RESTING AGAINST DOWNSTOP BRACKET. CLEARANCE BETWEEN FUNCTION CLUTCH DISK STOP LUG AND STOP LEVER:  
MIN. 0.002 INCH --- MAX. 0.045 INCH

TO ADJUST

REMOVE TAPE GUIDE. WITH DOWNSTOP BRACKET MOUNTING SCREWS FRICTION TIGHT POSITION BRACKET.

2.21 Punch Mechanism

PERFORATOR POSITION (PRELIMINARY)

REQUIREMENT

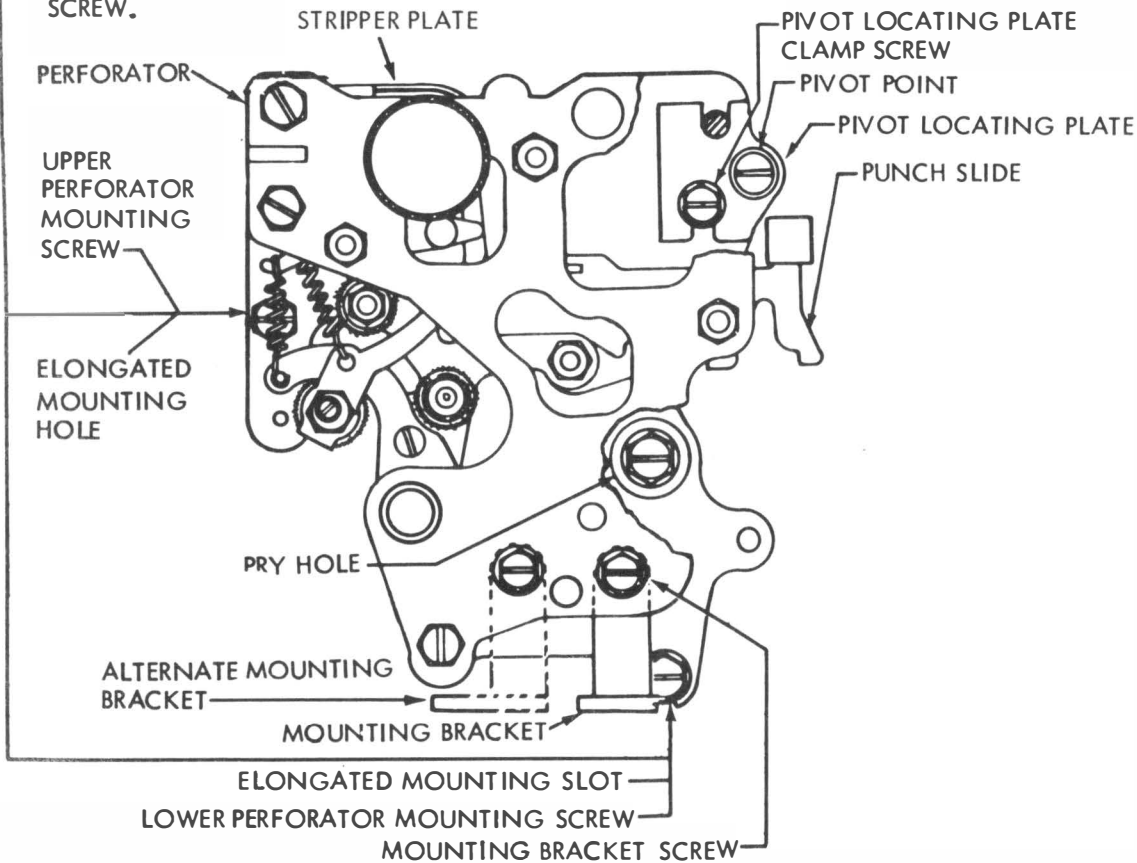
THE PERFORATOR MECHANISM MOUNTING SCREW BENEATH PUNCH BLOCK AND MOUNTING SCREW AT LOWER EDGE OF PERFORATOR MECHANISM BACKPLATE SHALL BE LOCATED CENTRALLY WITHIN THEIR RESPECTIVE MOUNTING HOLES.

NOTE

THE MOUNTING HOLES ARE OVERSIZE TO FACILITATE USE OF PERFORATOR MECHANISM ON THE TYPING REPERFORATOR.

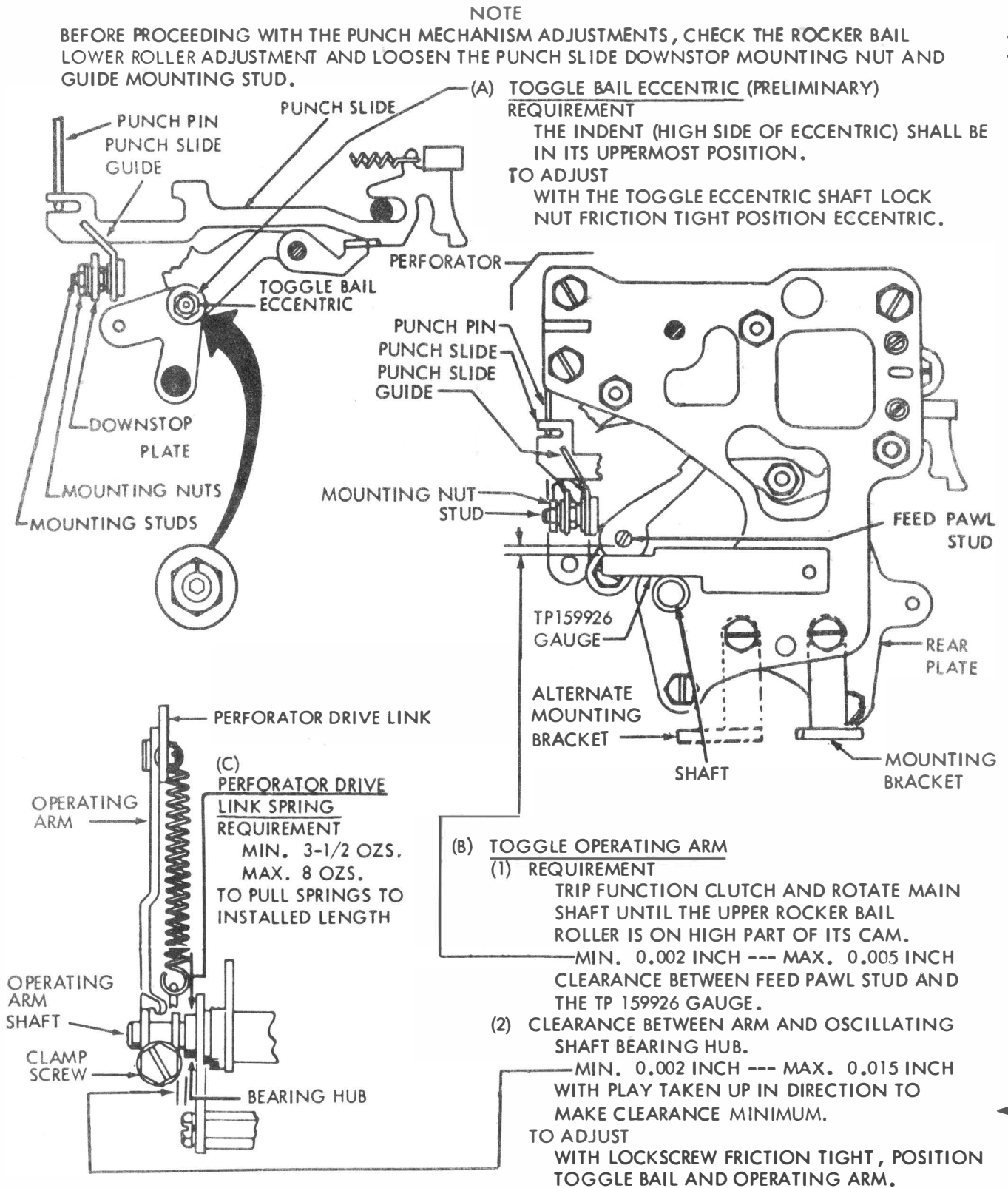
TO ADJUST

REMOVE MOUNTING SCREW AT THE LOWER EDGE OF PERFORATOR MECHANISM BACKPLATE, WITH THE TWO REMAINING BACKPLATE MOUNTING SCREWS AND MOUNTING BRACKET SCREW FRICTION TIGHT, POSITION PERFORATOR MECHANISM SO THAT THE TAPPED HOLE OF THE FRAME IS CENTRALLY LOCATED (AS GAUGED BY EYE) WITHIN LARGE BODY HOLE OF PUNCH MECHANISM BACKPLATE. TIGHTEN THE TWO BACKPLATE MOUNTING SCREWS AND RECHECK TO SEE THAT REQUIREMENT IS MET. REPLACE AND TIGHTEN THE LOWER BACKPLATE MOUNTING SCREW. TIGHTEN THE BRACKET MOUNTING SCREW.





2.22 Punch Mechanism (continued)



2.23 Punch Mechanism (continued)

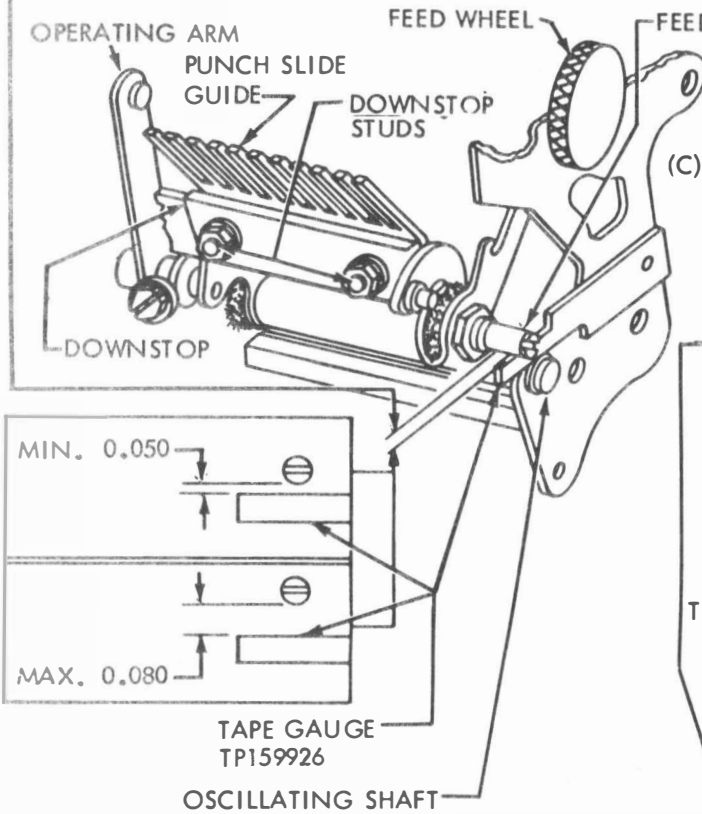
(A) PUNCH PIN PENETRATION REQUIREMENT

(1) WITH THE RUBOUT COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS ARE INTO OR ABOVE THE TAPE APERTURE IN PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION  
MIN. 0.050 INCH  
CLEARANCE BETWEEN FEED PAWL STUD AND THE GAUGE.

(2) WITH RUBOUT COMBINATION SELECTED, FUNCTION CLUTCH ENGAGED. ROTATE MAIN SHAFT UNTIL ALL PUNCH PINS HAVE CLEARED THE PUNCH BLOCK. WITH THE TP159926 GAUGE IN POSITION  
MIN. SOME --- MAX. 0.080 INCH  
CLEARANCE BETWEEN FEED PAWL STUD AND GAUGE.

TO ADJUST

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



(C) PUNCH SLIDE DOWNSTOP POSITION REQUIREMENT

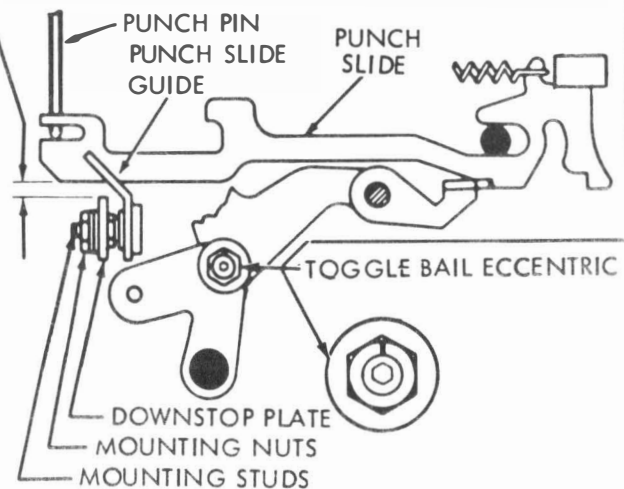
WITH FUNCTION CLUTCH DISENGAGED AND LATCHED. PLAY TAKEN UP TOWARD THE TOP, CLEARANCE BETWEEN BOTH THE FRONT AND REAR PUNCH SLIDES AND THE DOWNSTOP PLATE  
MIN. SOME --- MAX. 0.008 INCH  
ALL OTHER PUNCH SLIDES SHALL HAVE SOME CLEARANCE.

NOTE

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

TO ADJUST

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



(B) PUNCH SLIDE GUIDE REQUIREMENT

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

TO ADJUST

POSITION THE GUIDE WITH ITS MOUNTING STUDS FRICTION TIGHT.

PERFORATOR POSITION----FINAL

## (1) TO CHECK

SELECT RUBOUT CODE COMBINATION (12345678). ROTATE UNTIL FUNCTION CLUTCH TRIPS WITH PUNCH LEVERS IN EXTREME LEFT-HAND POSITION.

## REQUIREMENT

CLEARANCE BETWEEN PUNCH SLIDE AND PUNCH SLIDE LATCH:  
MIN. 0.015 INCH----MAX. 0.045 INCH  
AT SLIDE WHERE CLEARANCE IS LEAST.

## TO ADJUST

LOOSEN PERFORATOR MOUNTING SCREWS, ADJUSTING CLAMP LOCK SCREW, ADJUSTING CLAMP PIVOT SCREW AND ANCHOR BRACKET SCREW UNTIL FRICTION TIGHT. PLACE TIP OF SCREW DRIVER BETWEEN SCREW AND RIM OF PRY HOLE AND PRY PERFORATOR UP OR DOWN. TIGHTEN ONLY ADJUSTING CLAMP LOCK SCREW.

## (2) TO CHECK

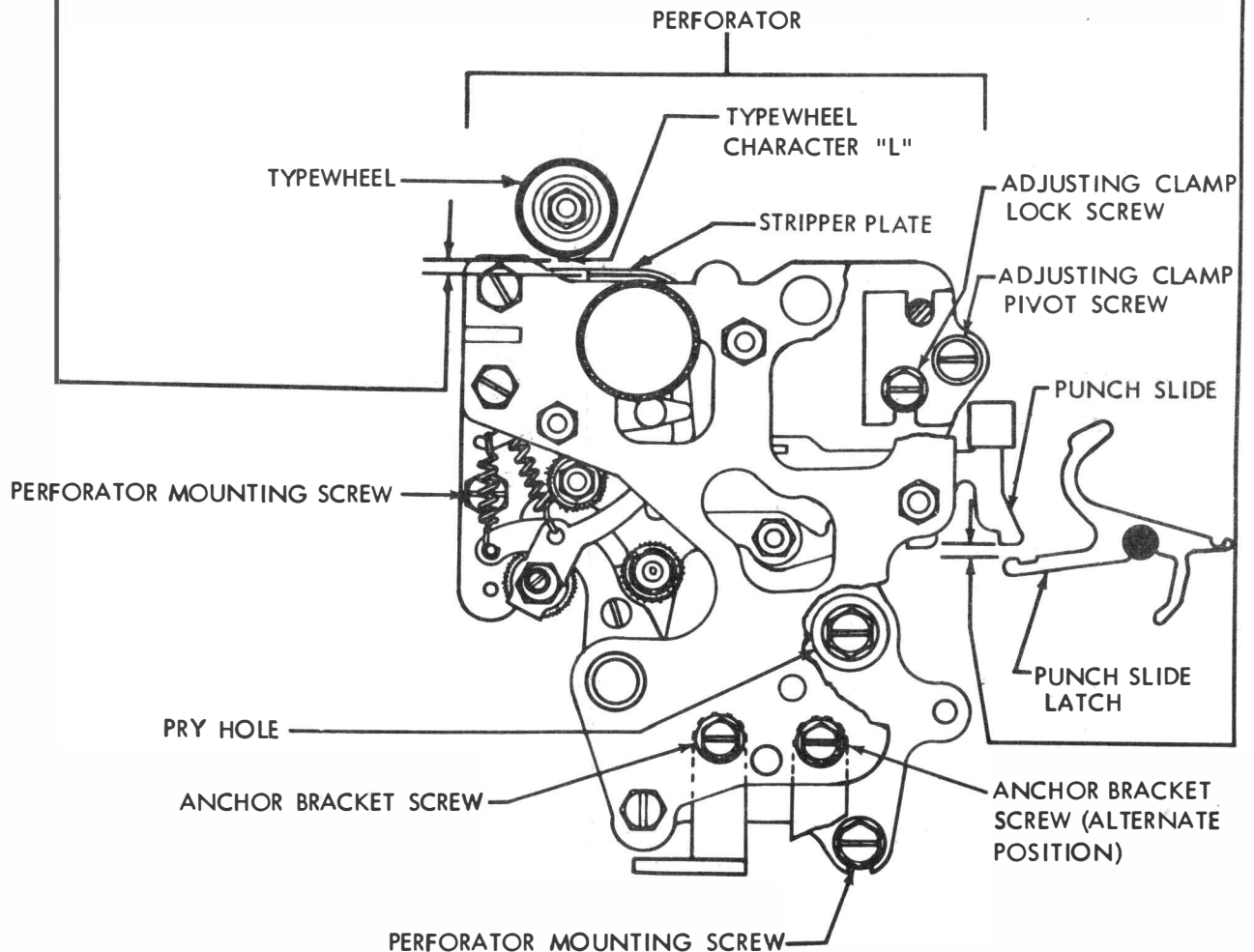
SELECT "L" CODE COMBINATION (--34--78). TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT.

## REQUIREMENT

CLEARANCE BETWEEN STRIPPER PLATE AND TYPEWHEEL CHARACTER "L":  
MIN. 0.075 INCH----MAX. 0.085 INCH

## TO ADJUST

REMOVE RIBBON FROM CARRIER. POSITION PERFORATOR WITH TWO MOUNTING SCREWS, ADJUSTING CLAMP PIVOT SCREW AND ANCHOR BRACKET SCREW LOOSENED. CHECK RESET BAIL TRIP LEVER REQUIREMENT FOR SOME CLEARANCE AND ADJUST IF NECESSARY.



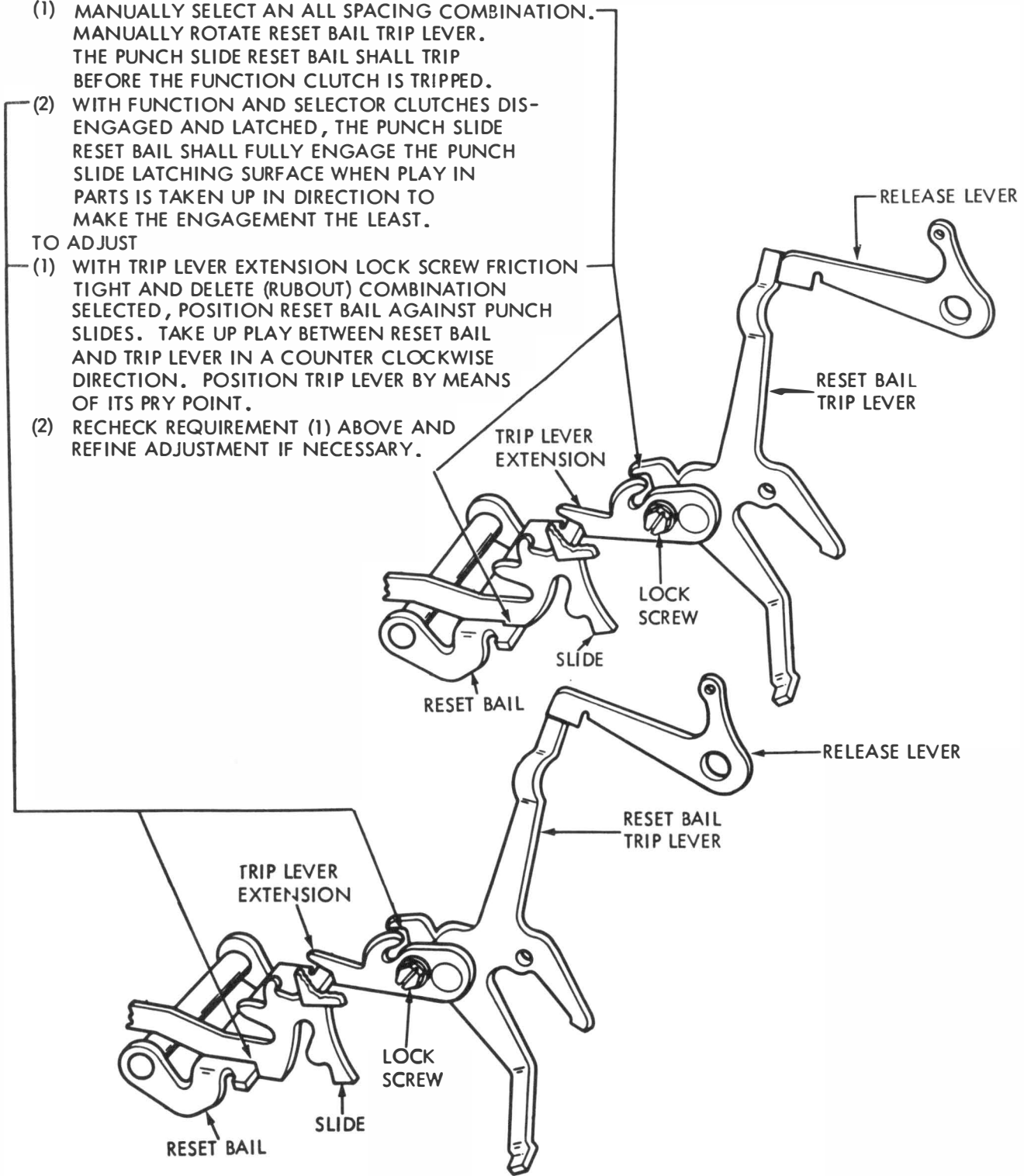
2.25 Punch Mechanism (continued)

RESET BAIL TRIP LEVER  
REQUIREMENT

- (1) MANUALLY SELECT AN ALL SPACING COMBINATION. MANUALLY ROTATE RESET BAIL TRIP LEVER. THE PUNCH SLIDE RESET BAIL SHALL TRIP BEFORE THE FUNCTION CLUTCH IS TRIPPED.
- (2) WITH FUNCTION AND SELECTOR CLUTCHES DIS-ENGAGED AND LATCHED, THE PUNCH SLIDE RESET BAIL SHALL FULLY ENGAGE THE PUNCH SLIDE LATCHING SURFACE WHEN PLAY IN PARTS IS TAKEN UP IN DIRECTION TO MAKE THE ENGAGEMENT THE LEAST.

TO ADJUST

- (1) WITH TRIP LEVER EXTENSION LOCK SCREW FRICTION TIGHT AND DELETE (RUBOUT) COMBINATION SELECTED, POSITION RESET BAIL AGAINST PUNCH SLIDES. TAKE UP PLAY BETWEEN RESET BAIL AND TRIP LEVER IN A COUNTER CLOCKWISE DIRECTION. POSITION TRIP LEVER BY MEANS OF ITS PRY POINT.
- (2) RECHECK REQUIREMENT (1) ABOVE AND REFINE ADJUSTMENT IF NECESSARY.



2.26 Punch Mechanism (continued)

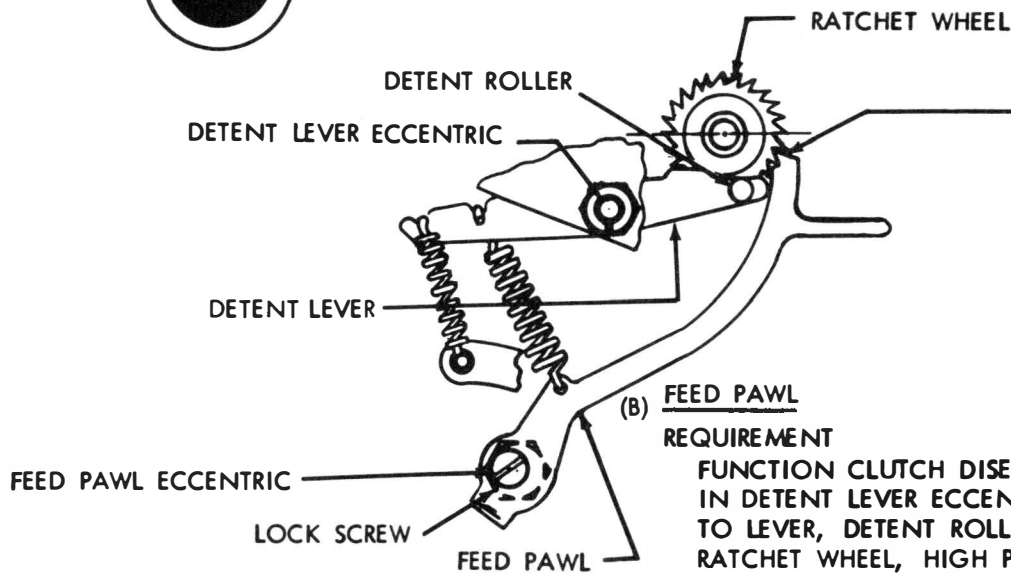
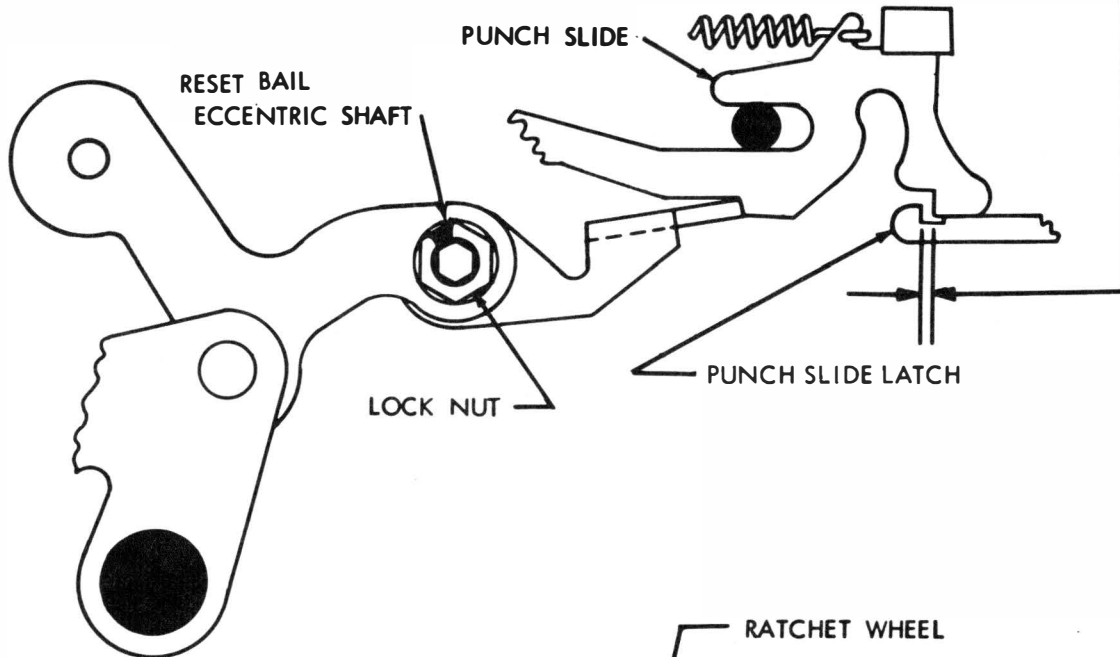
(A) PUNCH SLIDE RESET BAIL

REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED:  
 MIN. 0.005 INCH---MAX. 0.015 INCH  
 BETWEEN PUNCH SLIDE AND PUNCH SLIDE LATCH.

TO ADJUST

ROTATE THE RESET BAIL ECCENTRIC SHAFT WITH ITS LOCK NUT LOOSENED.  
 KEEP THE INDENTATION IN THE ECCENTRIC ABOVE CENTER OF SHAFT.



(B) FEED PAWL  
 REQUIREMENT

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

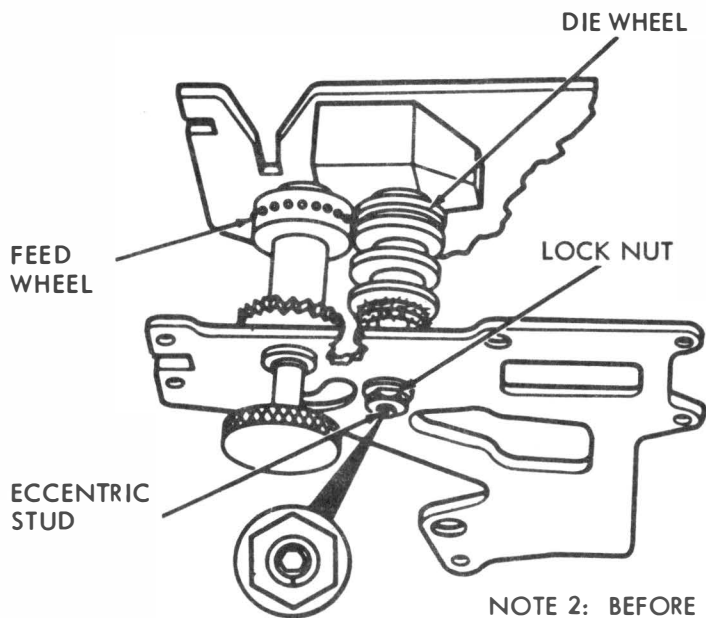
TO ADJUST

ROTATE THE FEED PAWL ECCENTRIC WITH LOCK  
 SCREW LOOSENED.

NOTE

THIS ADJUSTMENT IS RELATED TO FEED HOLE  
 SPACING, AND TWO ADJUSTMENTS SHOULD BE  
 MADE AT SAME TIME.

2.27 Punch Mechanism (continued)



FEED HOLE SPACING----PRELIMINARY REQUIREMENT

INDENT OF DIE WHEEL ECCENTRIC STUD POINTING DOWNWARD.

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

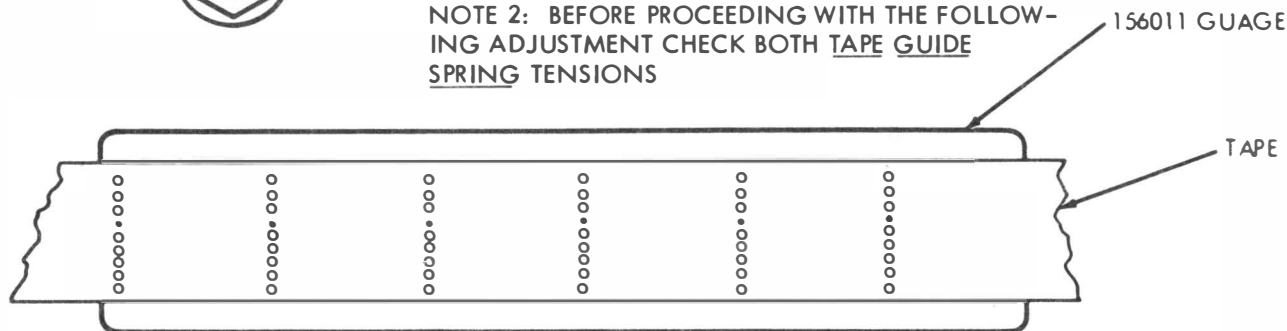
NOTE 1: BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENTS, CHECK BOTH TAPE GUIDE SPRING TENSIONS

FEED HOLE SPACING----FINAL

(1) REQUIREMENT

WITH TAPE SHOE BLOCKED AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DISENGAGED, AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY. CHECK THROUGH 3 OR 4 REVOLUTIONS OF FEED WHEEL. REFINE PRELIMINARY (ABOVE) IF NECESSARY TO MEET REQUIREMENT.

NOTE 2: BEFORE PROCEEDING WITH THE FOLLOWING ADJUSTMENT CHECK BOTH TAPE GUIDE SPRING TENSIONS



FEED HOLE SPACING

(1) REQUIREMENT

WITH A PIECE OF TAPE PERFORATED WITH SIX SERIES OF 9 SPACE CODE COMBINATIONS FOLLOWED BY A RUBOUT COMBINATION PLACED OVER THE SMOOTH SIDE OF THE 156011 TAPE GAUGE SO THAT THE CIRCULAR PORTION OF THE FIRST NUMBER 2 CODE HOLE IN THE TAPE IS CONCENTRIC WITH THE FIRST HOLE OF THE TAPE GAUGE. THE NEXT FOUR HOLES IN THE TAPE GAUGE SHOULD BE VISIBLE THROUGH THE NUMBER 2 CODE HOLES IN THE TAPE AND THE CIRCULAR PORTION OF THE LAST (SIXTH) NUMBER 2 CODE HOLE IN THE TAPE SHALL BE ENTIRELY WITHIN THE 0.086 DIAMETER HOLE OF THE TAPE GAUGE.

(2) REQUIREMENT

WITH TAPE SHOE HELD AWAY FROM FEED WHEEL, FEED PAWL AND DETENT DISENGAGED AND TAPE REMOVED, FEED WHEEL SHOULD ROTATE FREELY.

TO ADJUST

WITH TAPE REMOVED FROM PUNCH MECHANISM, LOOSEN ECCENTRIC LOCK NUT AND ROTATE DIE WHEEL ECCENTRIC SHAFT UNTIL IT BINDS AGAINST FEED WHEEL. BACK OFF ECCENTRIC UNTIL DIE WHEEL IS JUST FREE. CHECK THROUGH 3 OR 4 ROTATIONS. KEEP THE INDENT OF ECCENTRIC BELOW THE HORIZONTAL CENTERLINE OF THE STUD. REFINE ADJUSTMENT FOR REQUIREMENT (1), IF NECESSARY, BY MOVING THE DIE WHEEL TOWARD THE FEED WHEEL TO DECREASE THE CHARACTER SPACING AND AWAY FROM THE FEED WHEEL TO INCREASE THE CHARACTER SPACING.

CAUTION: WITH TAPE REMOVED. MAKE SURE FEED WHEEL AND DIE WHEEL DO NOT BIND. RECHECK REQUIREMENT (1). IF NECESSARY, REFINE.

NOTE 3: FIRST THROUGH FIFTH HOLES IN GAUGE ARE SAME SIZE AS CODE HOLES IN TAPE (0.072 INCH DIAMETER). SIXTH HOLE IN GAUGE IS LARGER (0.086 INCH). THIS ARRANGEMENT ALLOWS  $\pm 0.007$  INCH VARIATION IN 5 INCHES.

## 2.28 Punch Mechanism (continued)

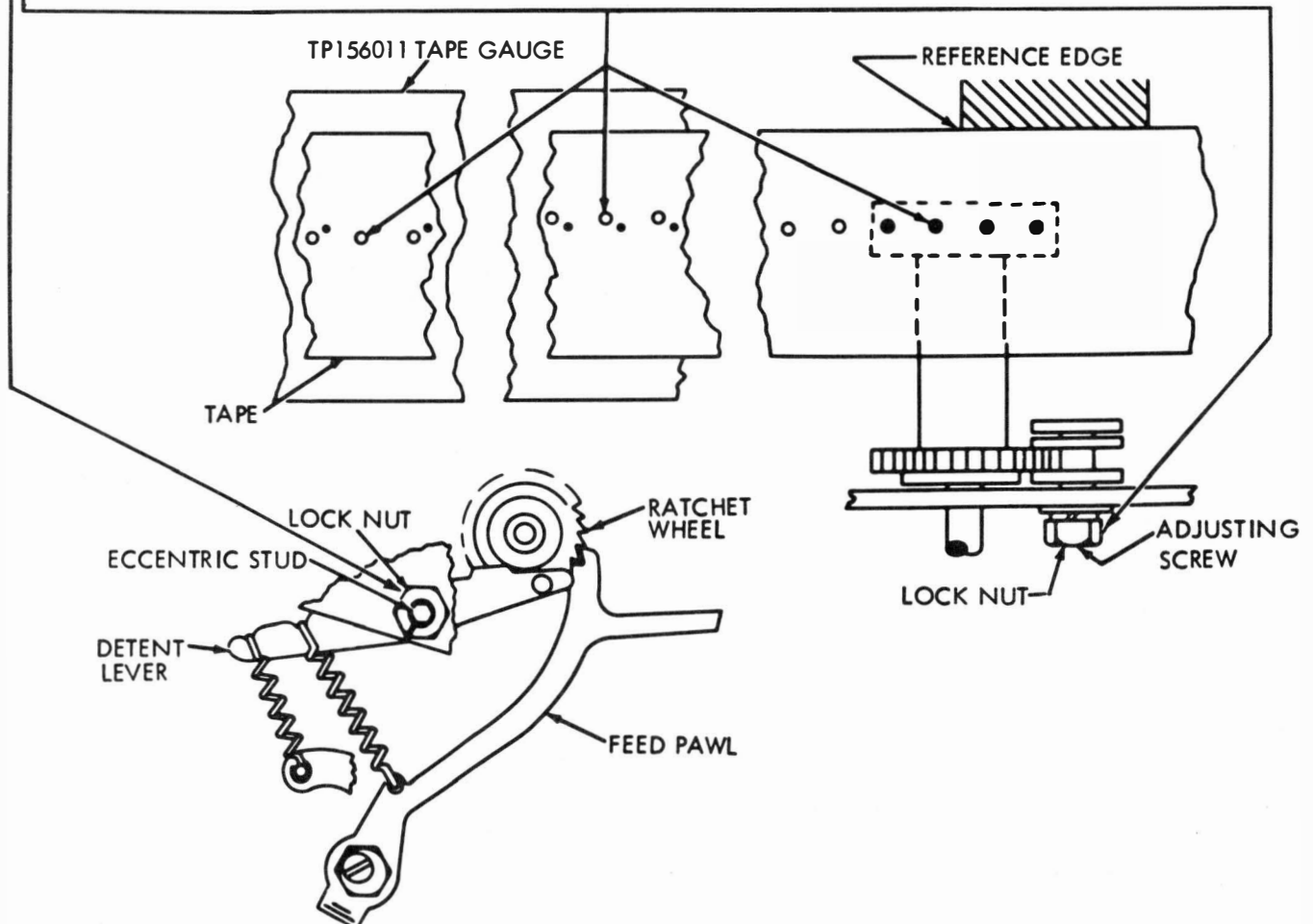
(FOR LATEST DESIGN SEE PARAGRAPH 2.29)

LATERAL AND FRONT TO REAR FEED WHEEL POSITION DETENT (EARLY DESIGN)REQUIREMENT

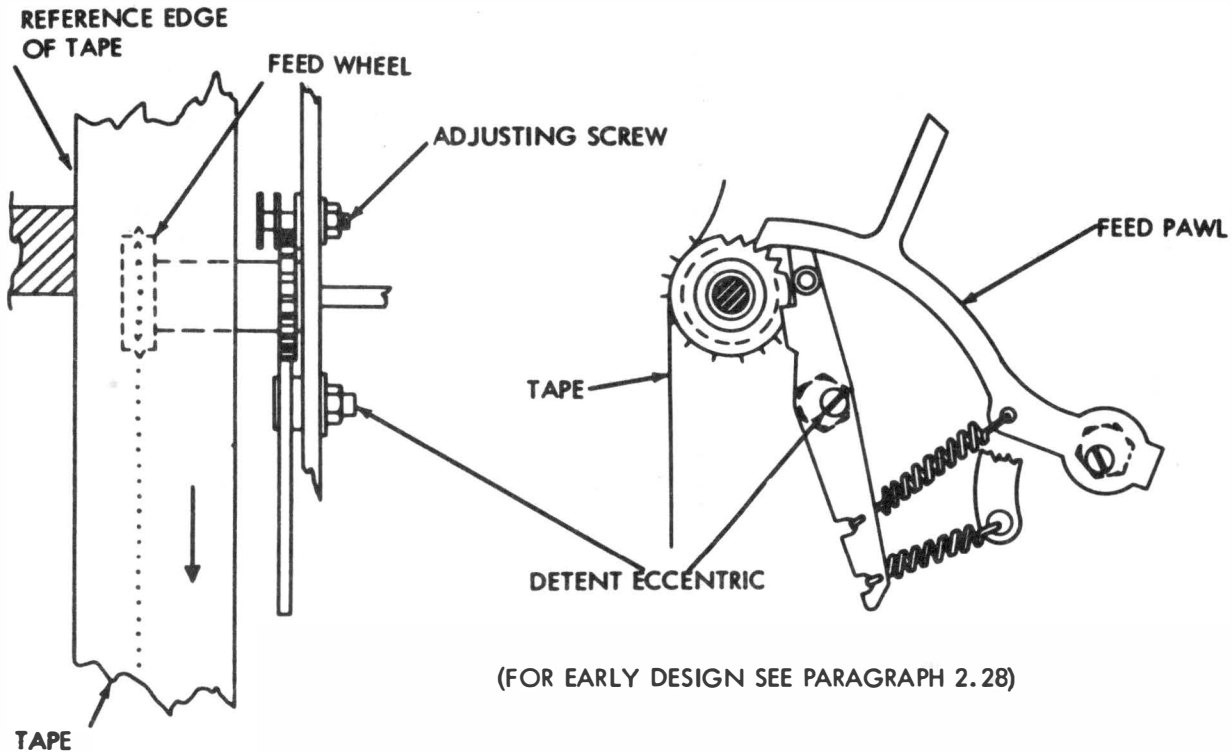
WITH THE REPERFORATOR OPERATING UNDER POWER, OBTAIN A TAPE SAMPLE CONSISTING OF A SERIES OF "SPACE" PERFORATIONS, BY A VISUAL INSPECTION OF THE PERFORATED FEED HOLES, LATERALLY AND FRONT TO REAR, THE INDENTATIONS OF THE FEED WHEEL SHALL BE FULLY PUNCHED OUT.

TO ADJUST

- (1) TO MEET THE LATERAL REQUIREMENT. LOOSEN THE DETENT ECCENTRIC STUD LOCK NUT AND ROTATE THE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED WHEEL PERFORATIONS TOWARDS THE LEAD EDGE OF THE FEED HOLE AND ROTATE THE DETENT ECCENTRIC COUNTER CLOCKWISE TO MOVE THE FEED WHEEL PERFORATION TOWARDS THE TRAILING EDGE OF THE FEED HOLE. REFINE THE FEED PAWL ADJUSTMENT.
- (2) TO ADJUST TO MEET THE FRONT TO REAR REQUIREMENT WITH RESPECT TO THE REFERENCE EDGE OF THE TAPE, LOOSEN THE ADJUSTING SCREW LOCK NUT AND POSITION THE ADJUSTING SCREW. TO MOVE THE INDENTATIONS IN THE TAPE AWAY FROM THE REFERENCE EDGE OF THE TAPE, MOVE THE FEED WHEEL TOWARDS THE FRONT PLATE OF THE PUNCH MECHANISM BY ROTATING THE ADJUSTING SCREW COUNTER CLOCKWISE. TO MOVE THE INDENTATIONS IN THE TAPE TOWARDS THE REFERENCE EDGE OF THE TAPE, MOVE THE FEED WHEEL TOWARDS THE BACK PLATE OF THE PUNCH MECHANISM BY ROTATING THE ADJUSTING SCREW CLOCKWISE. REFINE THE DETENT ADJUSTMENT TO ALIGN THE LATERAL INDENTATIONS OF THE FEED WHEEL IF REQUIRED.



2.29 Punch Mechanism (continued)



LATERAL AND FRONT TO REAR FEED WHEEL POSITION DETENT (LATEST DESIGN) REQUIREMENT

THE INDENTATIONS PUNCHED BY THE FEED WHEEL SHOULD BE CENTRALLY LOCATED BETWEEN THE PUNCHED FEED HOLES (GAUGED BY EYE) AND ON SAME HORIZONTAL CENTERLINE. THE UNIT MUST BACKSPACE THE TAPE AT LEAST 30 CHARACTERS WITHOUT LOSING ITS POINT OF REGISTRATION.

**TO CHECK**

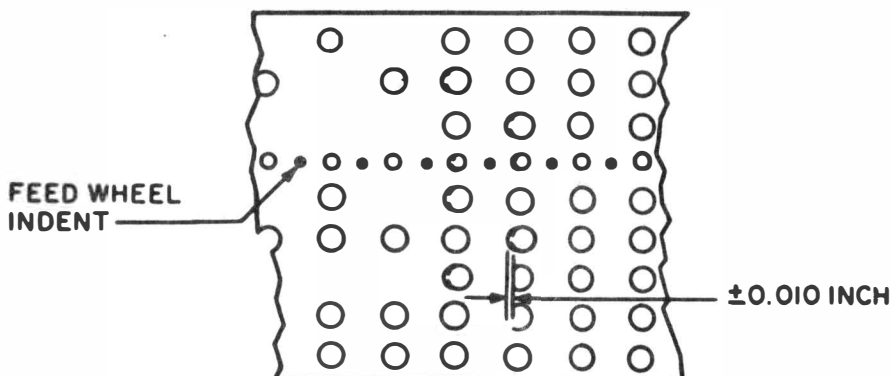
PERFORATE 6 INCHES OF RY TAPE. BACK SPACE 30 CHARACTERS. REPERFORATE WITH RUBOUT CHARACTERS. CODE HOLES MUST COINCIDE EXCEPT FOR FIRST TWO CHARACTERS WHICH MAY BE ELONGATED  $\pm 0.010$  INCH.

**TO ADJUST (LATERALLY)**

ROTATE DETENT ECCENTRIC CLOCKWISE TO MOVE THE FEED WHEEL PERFORATION TOWARD THE LEADING EDGE OF THE FEED HOLE AND ROTATE ECCENTRIC COUNTERCLOCKWISE TO MOVE THE PERFORATION TOWARD THE TRAILING EDGE OF THE FEED HOLE. TIGHTEN LOCK NUT. REFINE FEED PAWL ADJUSTMENT IF NECESSARY.

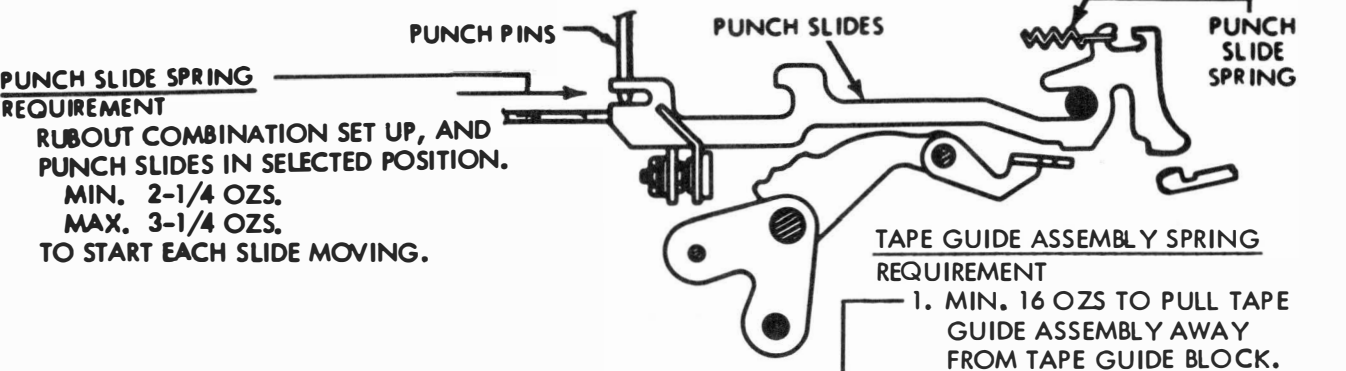
**TO ADJUST (FRONT TO REAR)**

LOOSEN LOCK NUT ON ADJUSTING SCREW AND ROTATE THE SCREW COUNTERCLOCKWISE TO MOVE THE INDENTATIONS IN THE TAPE AWAY FROM THE REFERENCE EDGE (REAR) OF THE TAPE. TO MOVE INDENTATIONS IN THE TAPE TOWARD THE REFERENCE EDGE OF THE TAPE, ROTATE ADJUSTING SCREW CLOCKWISE. REFINE THE DETENT ADJUSTMENT IF NECESSARY.



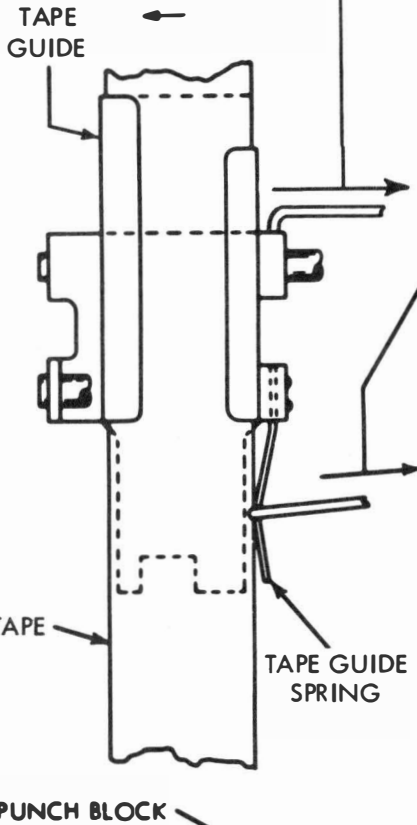


2.30 Punch Mechanism (continued)



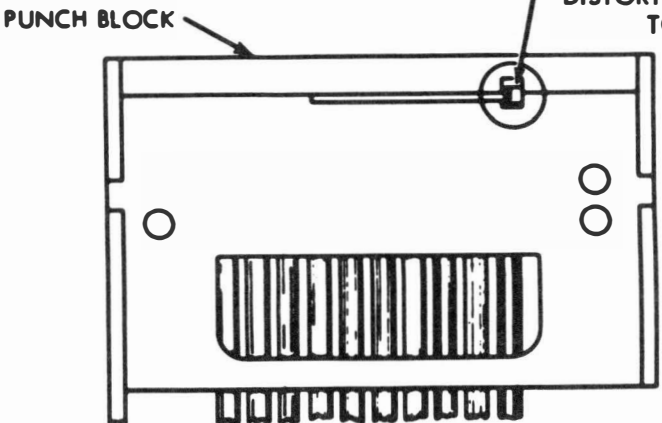
**PUNCH SLIDE SPRING REQUIREMENT**  
 RUBOUT COMBINATION SET UP, AND PUNCH SLIDES IN SELECTED POSITION.  
 MIN. 2-1/4 OZS.  
 MAX. 3-1/4 OZS.  
 TO START EACH SLIDE MOVING.

**TAPE GUIDE ASSEMBLY SPRING REQUIREMENT**  
 1. MIN. 16 OZS TO PULL TAPE GUIDE ASSEMBLY AWAY FROM TAPE GUIDE BLOCK.  
 2. TAPE GUIDE ASSEMBLY SHOULD MOVE FREELY ON SHAFT.  
 TO ADJUST POSITION MOUNTING POST.

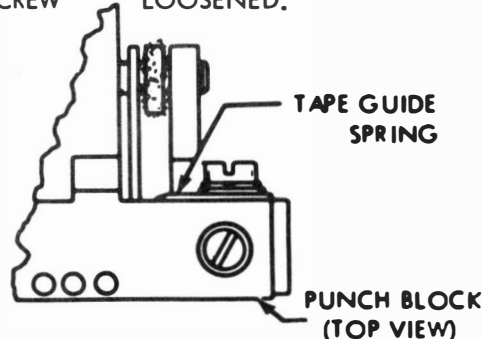


**TAPE GUIDE SPRING REQUIREMENT**  
 WITH SELECTOR AND FUNCTION CLUTCHES DISENGAGED AND LATCHED, TAPE THREADED THROUGH PUNCH MECHANISM, IT SHOULD REQUIRE  
 MIN. 1-1/4 OZS.  
 MAX. 2-1/4 OZS.  
 TO JUST MOVE THE SPRING AWAY FROM THE TAPE.  
 TO ADJUST BEND THE SPRING.

**NOTE**  
 IT IS NECESSARY TO REMOVE SEVERAL PARTS, ON UNITS EQUIPPED WITH BACK SPACE MECHANISM. IN ORDER TO CHECK THIS SPRING TENSION. IT SHOULD NOT BE CHECKED UNLESS THERE IS GOOD REASON TO BELIEVE THAT REQUIREMENTS ARE NOT MET.



**TAPE GUIDE SPRING (PUNCH BLOCK) REQUIREMENT**  
 (1) REQUIREMENT  
 WITH TAPE REMOVED FROM THE PUNCH BLOCK THE TAPE GUIDE SPRING SHOULD REST AGAINST THE CLEARANCE SLOT IN THE BLOCK IN A SYMETRICAL MANNER.  
 (2) REQUIREMENT  
 WITH TAPE IN THE PUNCH BLOCK AND THE REPERFORATOR OPERATING UNDER POWER, THE SPRING SHOULD NOT DISTORT THE EDGE OF THE TAPE.  
 TO ADJUST BEND THE SPRING AND POSITION IT WITH ITS MOUNTING SCREW LOOSENED.



SECTION 574-233-700

2.31 Punch Mechanism (continued)

FEED PAWL SPRING

**REQUIREMENT**

FUNCTION CLUTCH DISENGAGED AND LATCHED. DETENT SPRING UNHOOKED FROM TOGGLE BAIL

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

TO START THE DETENT LEVER MOVING

DETENT SPRING

TOGGLE BAIL

DETENT LEVER  
FEED PAWL SPRING

FEED PAWL SPRING  
DETENT LEVER

DETENT LEVER SPRING

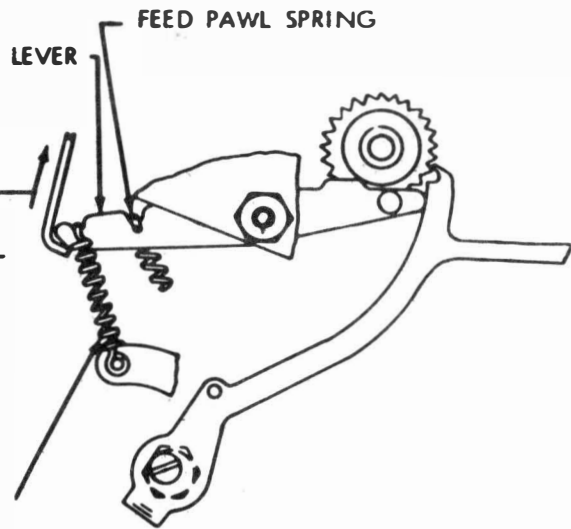
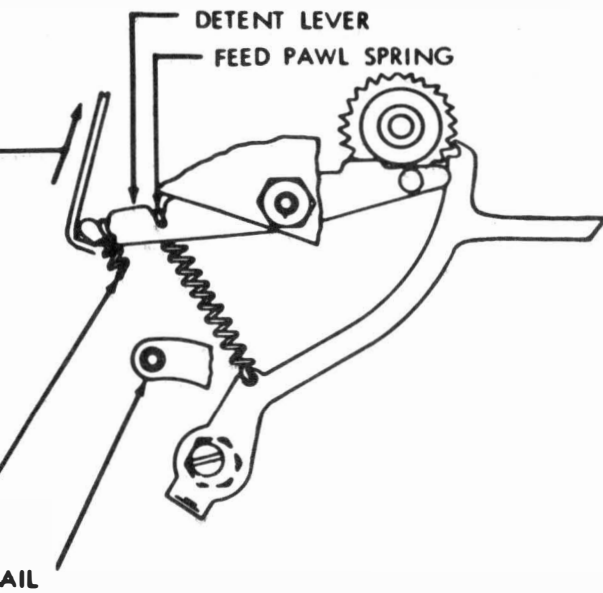
**REQUIREMENT**

FUNCTION CLUTCH DISENGAGED AND LATCHED. FEED PAWL SPRING UNHOOKED.

MIN. 7 OZS.  
MAX. 10 OZS.

TO START THE DETENT LEVER MOVING.

DETENT LEVER SPRING

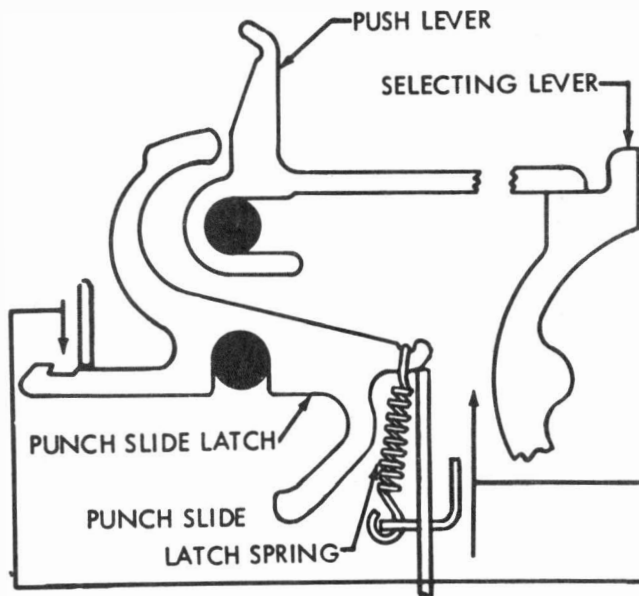
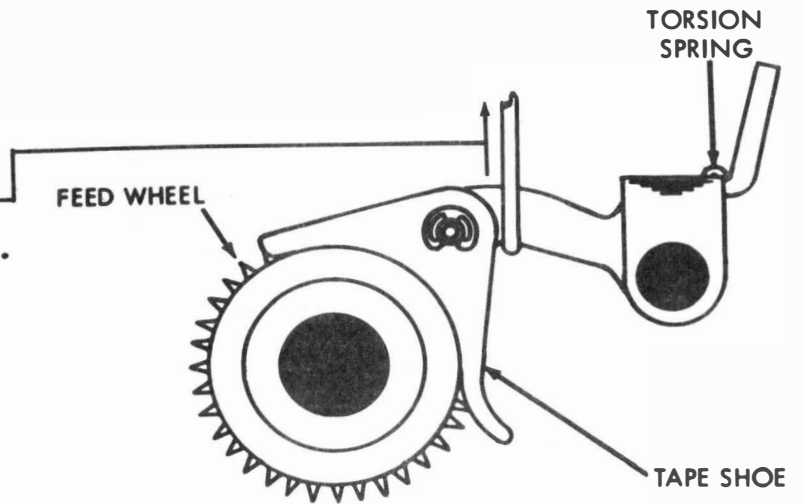


2.32 Punch Mechanism (continued)

TAPE TORSION SPRING

REQUIREMENT

MIN. 13 OZS.  
 MAX. 18 OZS.  
 TO MOVE TAPE SHOE FROM FEED WHEEL.



PUNCH SLIDE LATCH SPRING TO CHECK

SELECT RUBOUT CODE COMBINATION (12345678). POSITION ROCKER BAIL TO EXTREME LEFT. STRIP PUSH LEVERS FROM SELECTING LEVERS.

REQUIREMENT

FOR ONE-SHAFT UNIT  
 --- MIN. 1 OZS. --- MAX. 3 OZS.  
 TO START LATCH MOVING.

FOR TWO-SHAFT UNIT  
 --- MIN. 3/4 OZS. --- MAX. 2 OZS.  
 TO START LATCH MOVING.

2.33 Typing Mechanism

(A) PUSH BAR OPERATING BLADE (PRELIMINARY)

TO CHECK

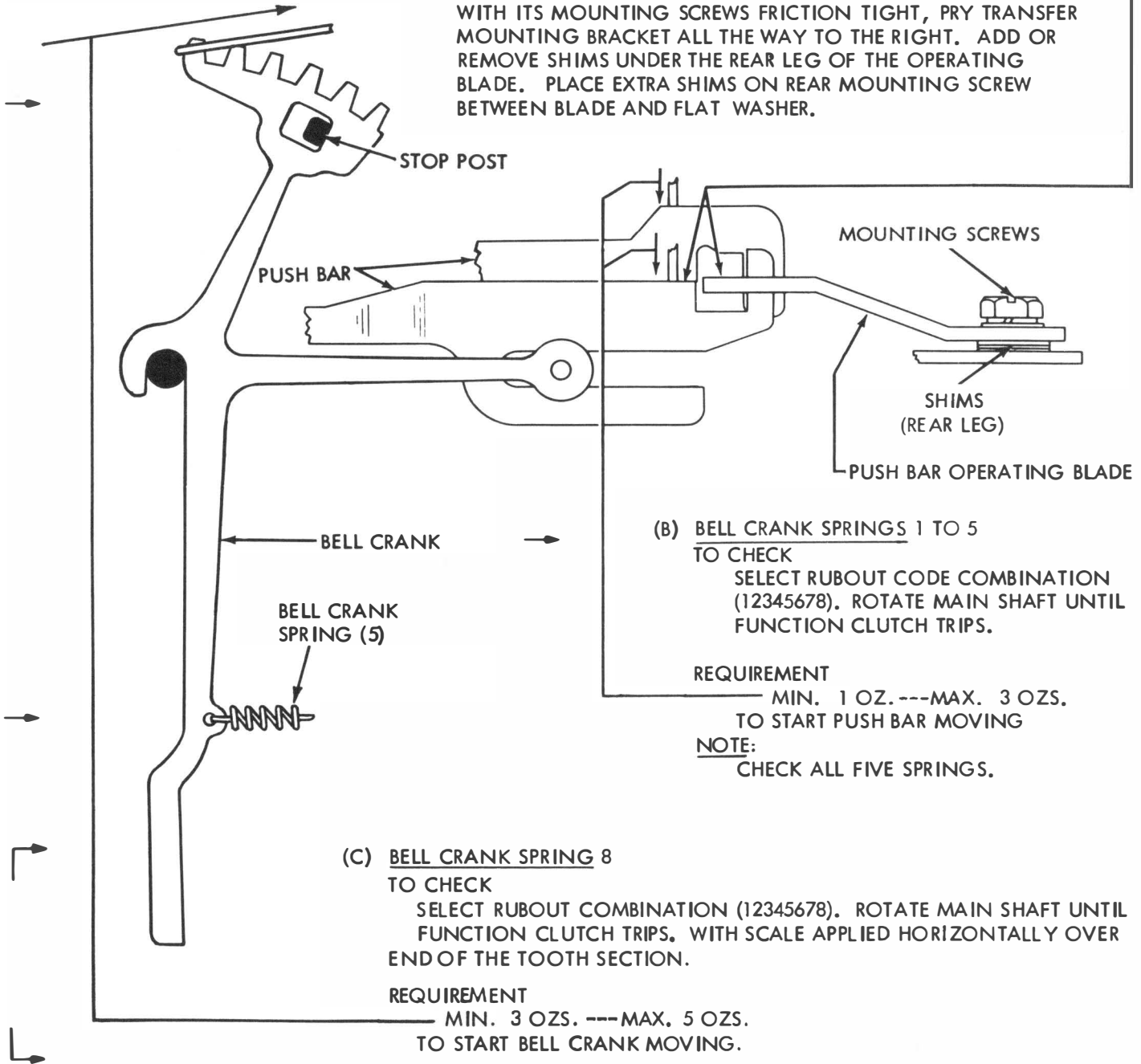
MANUALLY SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. HOLD NO. 2 AND 3 BELL CRANKS AGAINST STOP POST.

REQUIREMENT

OPERATING BLADE PARALLEL TO (NOT NECESSARILY FLUSH WITH) NO. 2 AND 3 PUSH BARS.

TO ADJUST

WITH ITS MOUNTING SCREWS FRICTION TIGHT, PRY TRANSFER MOUNTING BRACKET ALL THE WAY TO THE RIGHT. ADD OR REMOVE SHIMS UNDER THE REAR LEG OF THE OPERATING BLADE. PLACE EXTRA SHIMS ON REAR MOUNTING SCREW BETWEEN BLADE AND FLAT WASHER.



(B) BELL CRANK SPRINGS 1 TO 5

TO CHECK

SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS.

REQUIREMENT

MIN. 1 OZ. ---MAX. 3 OZS.  
TO START PUSH BAR MOVING

NOTE:

CHECK ALL FIVE SPRINGS.

(C) BELL CRANK SPRING 8

TO CHECK

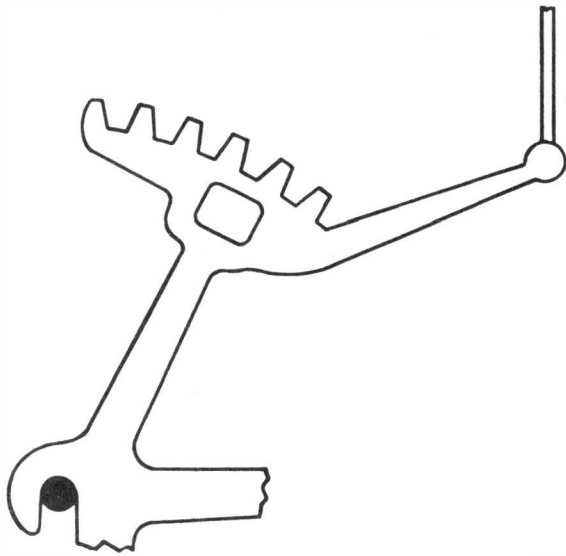
SELECT RUBOUT COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. WITH SCALE APPLIED HORIZONTALLY OVER END OF THE TOOTH SECTION.

REQUIREMENT

MIN. 3 OZS. ---MAX. 5 OZS.  
TO START BELL CRANK MOVING.

NOTE: THIS ADJUSTMENT IS COMPLETED ON THE FOLLOWING PAGE.

2.34 Typing Mechanism (continued)



(D) BELL CRANK SPRINGS 6 AND 7 TO CHECK

SELECT RUBOUT COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS.

(1) REQUIREMENT (BELL CRANK SPRING 6) WITH SCALE APPLIED VERTICALLY TO BALL END OF BELL CRANK CONTACT OPERATING ARM.

MIN. 2 OZS. --- MAX. 4 OZS. TO START BELL CRANK MOVING

(2) REQUIREMENT (BELL CRANK SPRING 7) WITH SEVEN-PULSE BEAM SPRING REMOVED AND SCALE APPLIED VERTICALLY TO BALL END OF BELL CRANK OPERATING ARM.

MIN. 3 OZS. --- MAX. 6 OZS. TO START BELL CRANK MOVING.

PUSH BAR OPERATING BLADE (FINAL)

(1) TO CHECK

MANUALLY SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. MANUALLY SEAT PUSH BARS IN DETENTED POSITION. IN BAR WHICH IS NEAREST LEFT EDGE OF BLADE, TAKE UP PLAY TO LEFT AND REAR, AND THEN RELEASE.

REQUIREMENT

CLEARANCE BETWEEN BAR AND LEFT EDGE OF BLADE:

MIN. 0.015 INCH --- MAX. 0.030 INCH

(2) REQUIREMENT

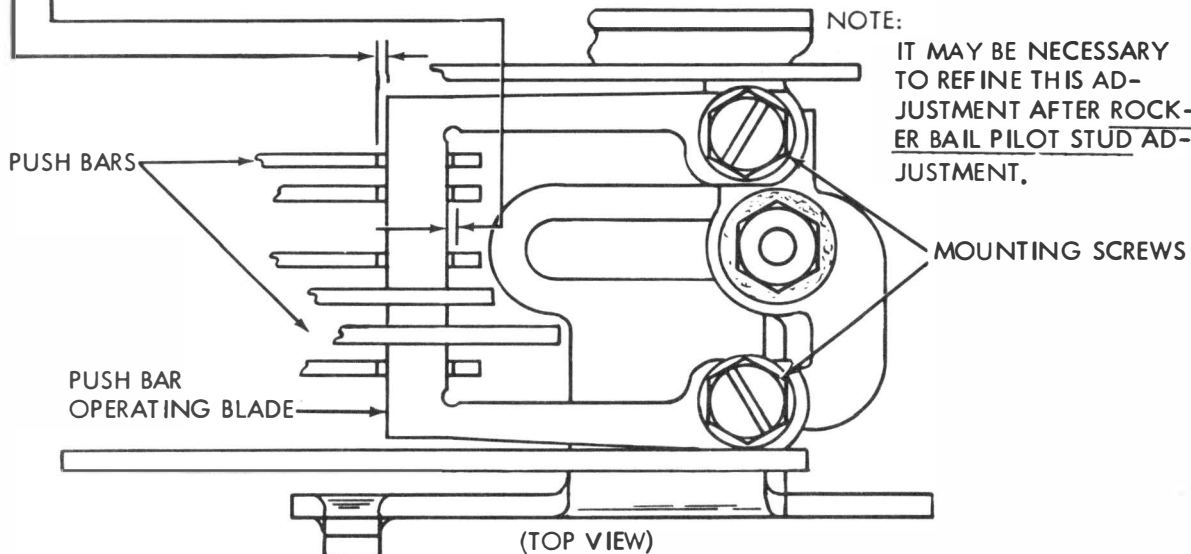
SOME CLEARANCE BETWEEN RIGHT EDGE OF BLADE AND PUSH BARS WHEN PLAY IN BARS HAS BEEN TAKEN UP TO RIGHT AND RELEASED.

(3) REQUIREMENT

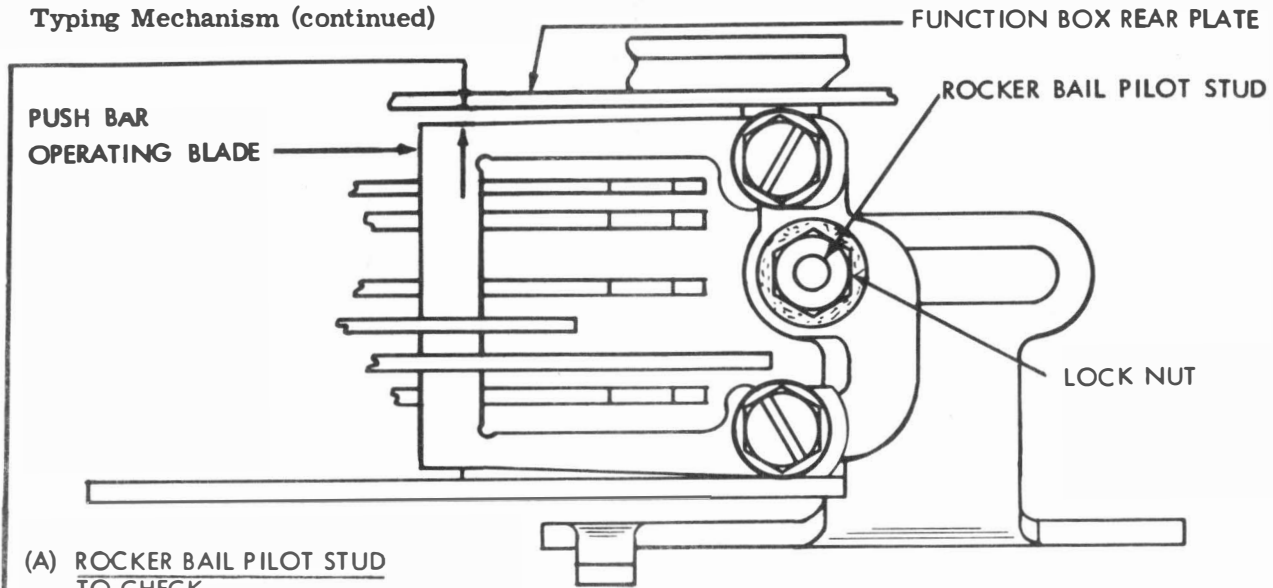
WITH UNIT IN STOP POSITION, SOME CLEARANCE BETWEEN RIGHT EDGE OF BLADE AND BARS WHEN PLAY IN BARS HAS BEEN TAKEN UP TO RIGHT AND RELEASED.

TO ADJUST

WITH MOUNTING SCREWS LOOSENED, POSITION OPERATING BLADE IN ELONGATED HOLES.



2.35 Typing Mechanism (continued)



(A) ROCKER BAIL PILOT STUD TO CHECK

SELECT SPACE COMBINATION. POSITION ROCKER BAIL THROUGH A COMPLETE CYCLE TO INSURE THE CLEARANCE IS A MINIMUM.

REQUIREMENT

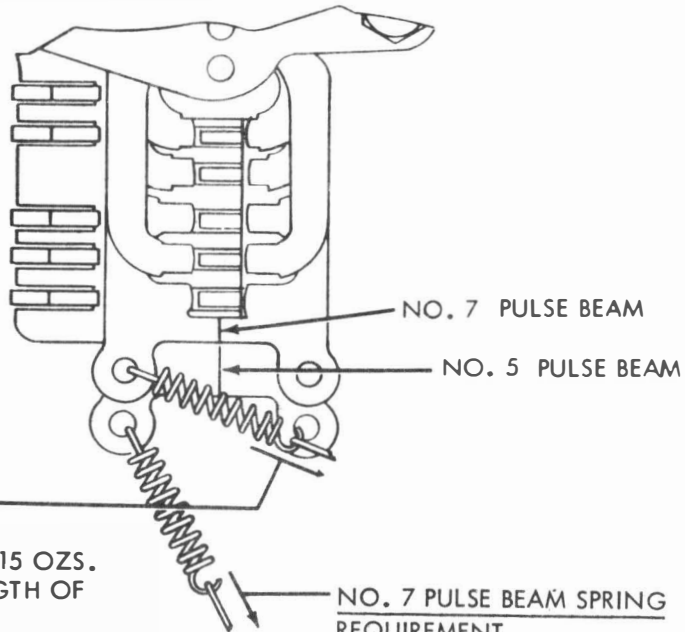
CLEARANCE BETWEEN FUNCTION BOX REAR PLATE AND PUSH BAR OPERATING BLADE:

MIN. 0.005 INCH ---- MAX. 0.020 INCH AT A POINT IN THE CYCLE WHERE PLAY IS TAKEN UP TO MAKE CLEARANCE MINIMUM.

TO ADJUST

POSITION ROCKER BAIL PILOT STUD IN ELONGATED HOLE WITH LOCK NUT LOOSENED.

(TOP VIEW)



NO. 5 PULSE BEAM SPRING

REQUIREMENT

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

NO. 7 PULSE BEAM SPRING

REQUIREMENT  
MIN. 20 OZS. --- MAX. 25 OZS. TO PULL SPRING TO LENGTH OF 7/16 INCH.

(TOP VIEW)

2.36 Typing Mechanism (continued)

FUNCTION BOX  
REQUIREMENT

WITH LETTERS (RUBOUT) PUSH BAR TO EXTREME RIGHT AND FULLY DETENTED, RUBOUT CODE (12345678) SELECTED, PUNCH SLIDES DISENGAGED AND FUNCTION CLUTCH TRIPPED. ELIMINATE PLAY IN DOWNWARD DIRECTION, THEN RELEASE. KEEP OPERATING BLADE PARALLEL WITH NO. 2 AND NO. 3 PUSH BARS AND TAKE-UP FUNCTION BOX PLAY IN A CLOCKWISE DIRECTION. THE TOP OF THE OPERATING BLADE SHALL BE

MIN. FLUSH --- MAX. 0.020 INCH

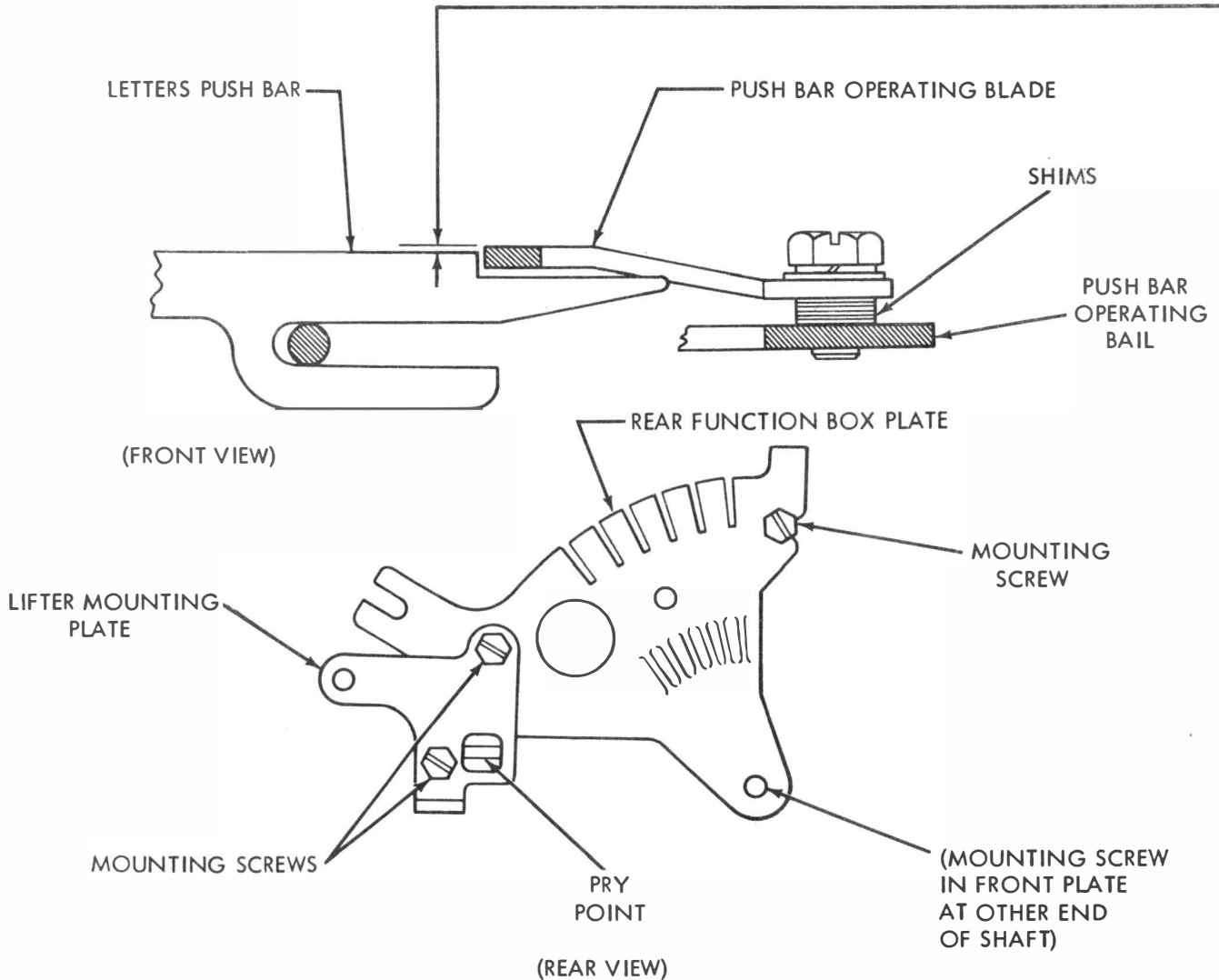
ABOVE TOP RUBOUT PUSH BARS.

TO ADJUST

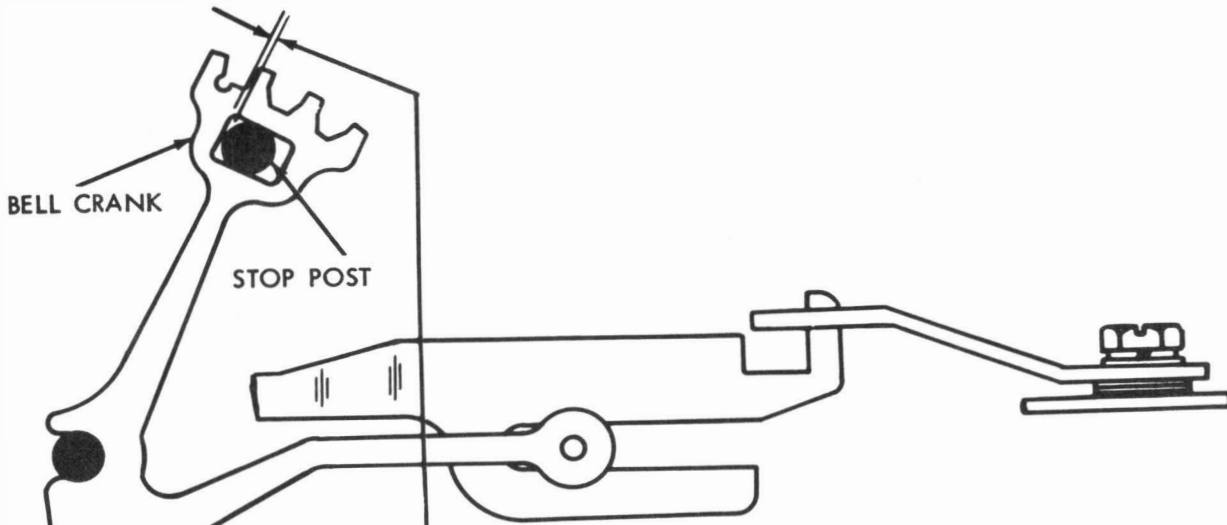
- (1) LOOSEN TWO SCREWS MOUNTING FUNCTION BOX TO FRONT PLATE SPACER POSTS
- (2) USING PRY POINT, ROTATE ENTIRE FUNCTION BOX.
- (3) TAKE UP SPACER POST PLAY TO RIGHT AND TIGHTEN SCREWS.

TO CHECK

- (1) FUNCTION BOX SHALL BE FREE TO ROTATE AT LEAST 0.010 INCH IN ITS MOUNTING AS MEASURED AT LIFTER MOUNTING PLATE SHOULDER SCREWS.
- (2) SELECT ALL MARKING CODE COMBINATIONS, TRIP FUNCTION CLUTCH AND CHECK FOR FREE MOVEMENT OF FUNCTION BOX PLATE.



2.37 Typing Mechanism (continued)



**TRANSFER MOUNTING BRACKET**

**TO CHECK**

MANUALLY SELECT ALL SPACE CODE COMBINATIONS. ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS.

**REQUIREMENT**

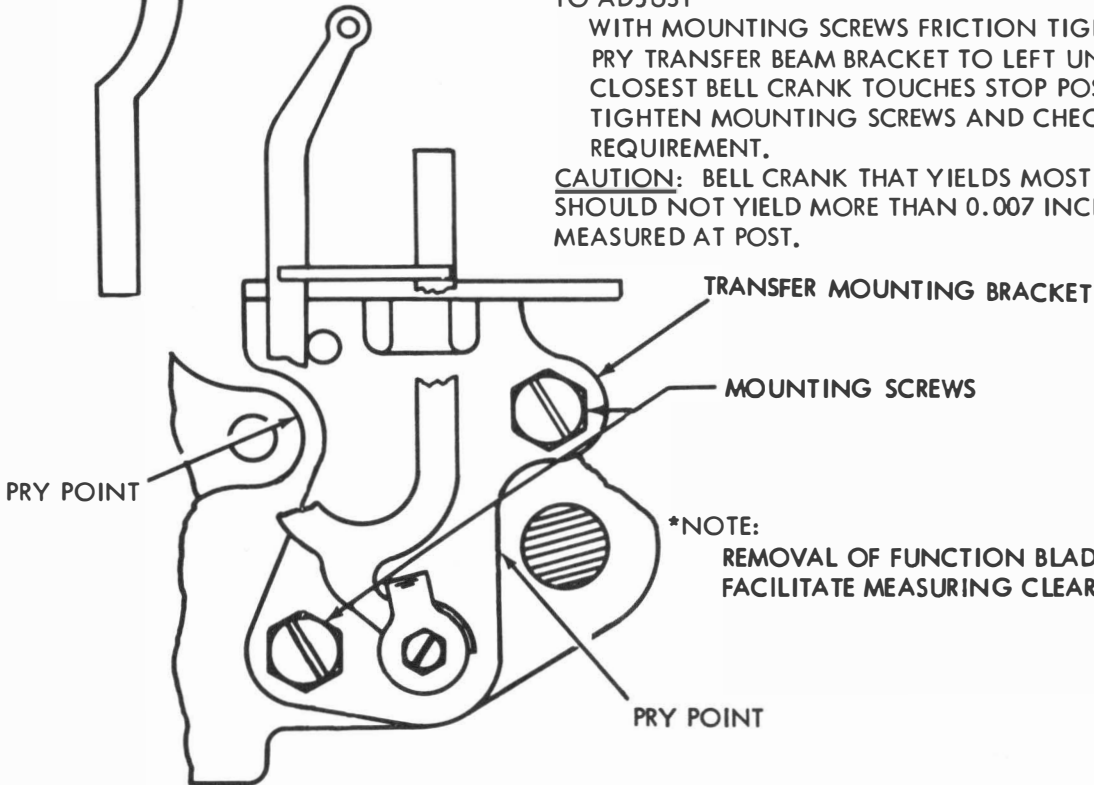
WITH PUNCH SLIDES LATCHED, CLEARANCE BETWEEN THE LEFT EDGE OF ALL BELL CRANK SLOTS AND THE LEFT FLAT OF BELL CRANK STOP POST SHALL BE  
MAX. 0.007 INCH\*

(PRELIMINARY FOR NO. 6 AND NO. 7 BELL CRANKS.)

**TO ADJUST**

WITH MOUNTING SCREWS FRICTION TIGHT, PRY TRANSFER BEAM BRACKET TO LEFT UNTIL CLOSEST BELL CRANK TOUCHES STOP POST. TIGHTEN MOUNTING SCREWS AND CHECK REQUIREMENT.

**CAUTION:** BELL CRANK THAT YIELDS MOST SHOULD NOT YIELD MORE THAN 0.007 INCH MEASURED AT POST.



TRANSFER MOUNTING BRACKET

MOUNTING SCREWS

PRY POINT

PRY POINT

\*NOTE:

REMOVAL OF FUNCTION BLADES WILL FACILITATE MEASURING CLEARANCE.



## 2.38 Ribbon Shift and Print Suppression Mechanism

NOTE: REFER TO VARIABLE FEATURES (PART 3) FOR ADDITIONAL ADJUSTMENTS APPLYING TO PRINT SUPPRESSION ONLY.

RIBBON SHIFT AND PRINT SUPPRESSION CONTACTS

## REQUIREMENT

DISCONNECT ALL POWER FROM UNIT. REMOVE CONTACT ASSEMBLY FROM FUNCTION BOX.

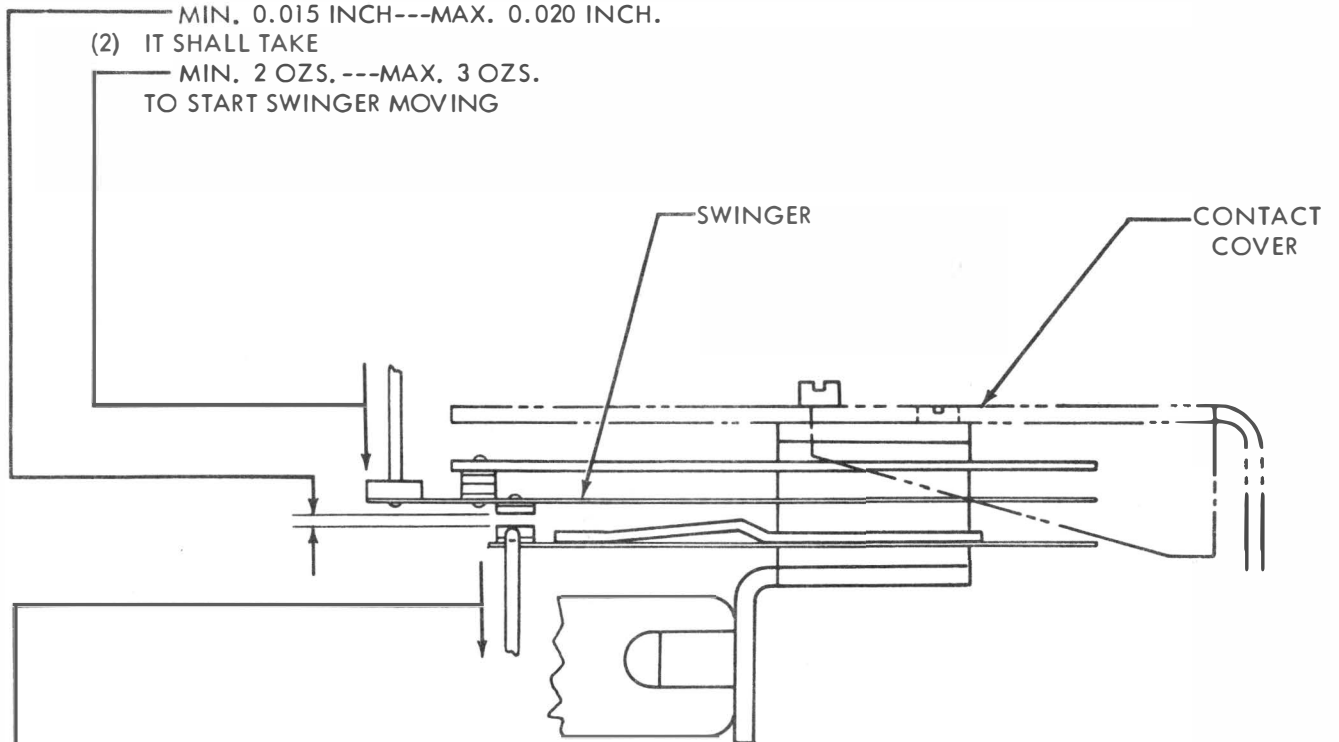
- (1) CLEARANCE BETWEEN SWINGER CONTACT POINTS AND NORMALLY OPEN CONTACT POINTS SHALL BE

MIN. 0.015 INCH---MAX. 0.020 INCH.

- (2) IT SHALL TAKE

MIN. 2 OZS. ---MAX. 3 OZS.

TO START SWINGER MOVING



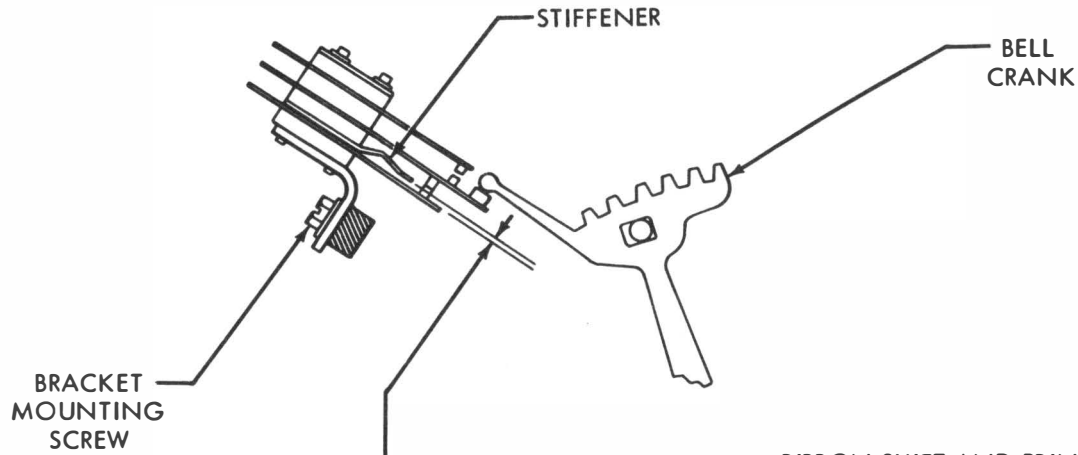
- (3) IT SHALL TAKE  
MIN. 2 OZS. ---MAX. 3 OZS.

TO START NORMALLY OPEN CONTACT MOVING.

TO ADJUST

REMOVE COVER AND REPLACE COVER SCREWS. BEND CONTACTS WITH CONTACT ADJUSTING TOOL.

2.39 Ribbon Shift and Print Suppression Mechanism (continued)

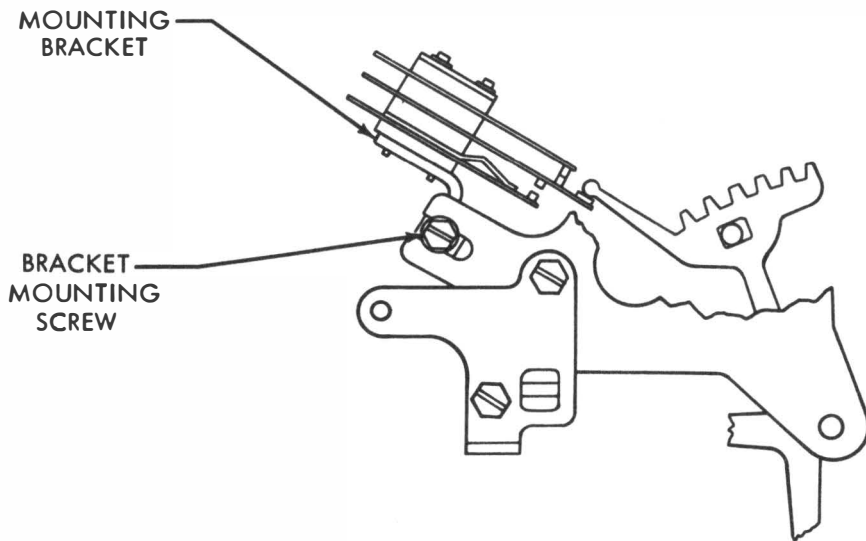


RIBBON SHIFT AND PRINT SUPPRESSION CONTACT POSITION

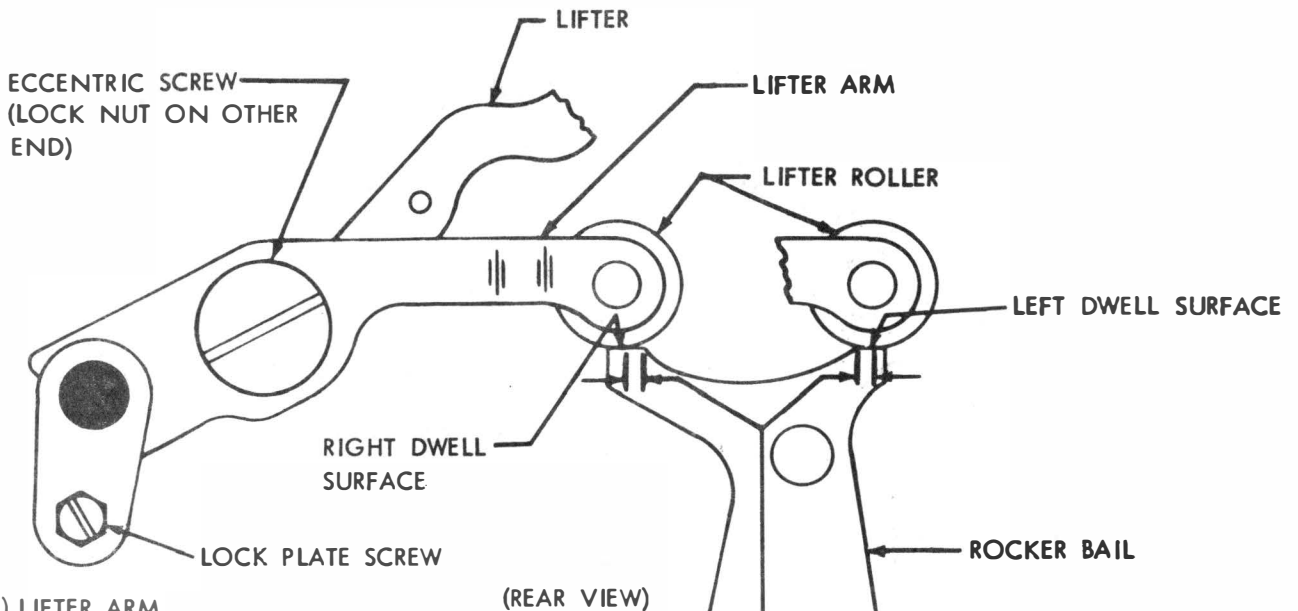
REQUIREMENT  
MANUALLY SELECT ALL SPACING COMBINATION (-----) AND TRIP FUNCTION CLUTCH. TAKE UP FUNCTION BOX PLAY IN CLOCKWISE DIRECTION.

—MIN. SOME---MAX. 0.004 INCH CLEARANCE BETWEEN SPACING CONTACT AND STIFFENER.

TO ADJUST POSITION CONTACT MOUNTING BRACKET WITH ITS MOUNTING SCREWS LOOSENED.



2.40 Typing Mechanism (continued)



TO CHECK TRIP FUNCTION CLUTCH. MOVE ROCKER BAIL TO EXTREME LEFT POSITION AND OBSERVE TRAVEL OF LIFTER ROLLER ON RIGHT DWELL SURFACE. MOVE ROCKER BAIL TO EXTREME RIGHT POSITION AND OBSERVE TRAVEL OF ROLLER ON LEFT DWELL SURFACE.

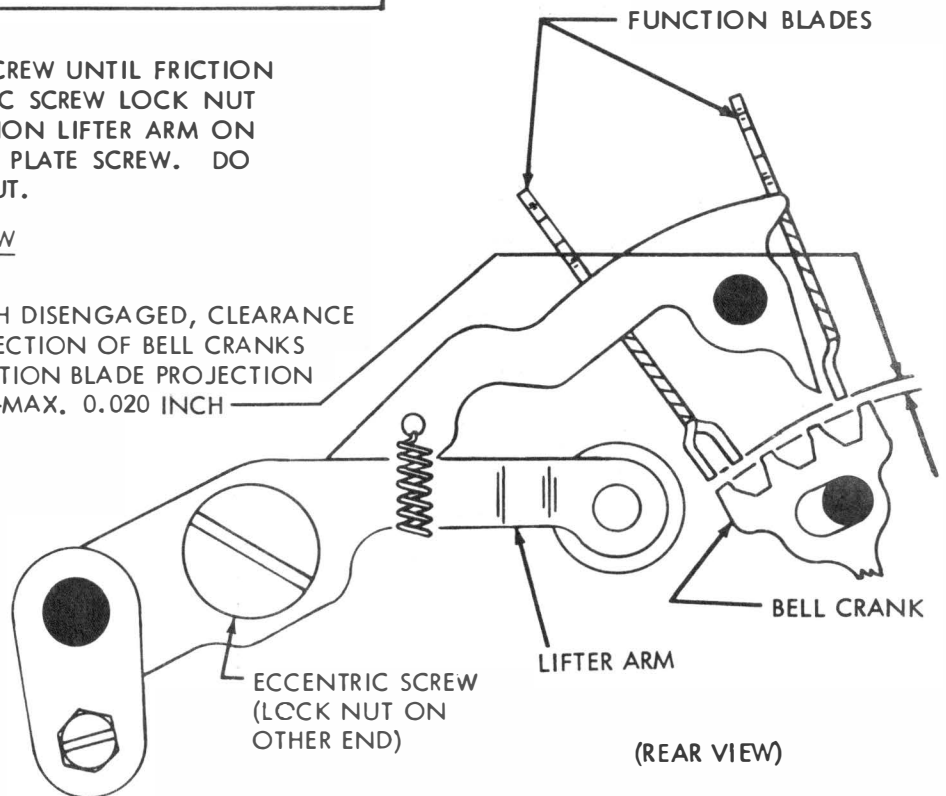
REQUIREMENT APPROXIMATELY EQUAL TRAVEL ON EACH DWELL SURFACE.

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

(B) LIFTER ARM ECCENTRIC SCREW

REQUIREMENT WITH FUNCTION CLUTCH DISENGAGED, CLEARANCE BETWEEN CLOSEST PROJECTION OF BELL CRANKS AND ASSOCIATED FUNCTION BLADE PROJECTION  
MIN. 0.008 INCH----MAX. 0.020 INCH

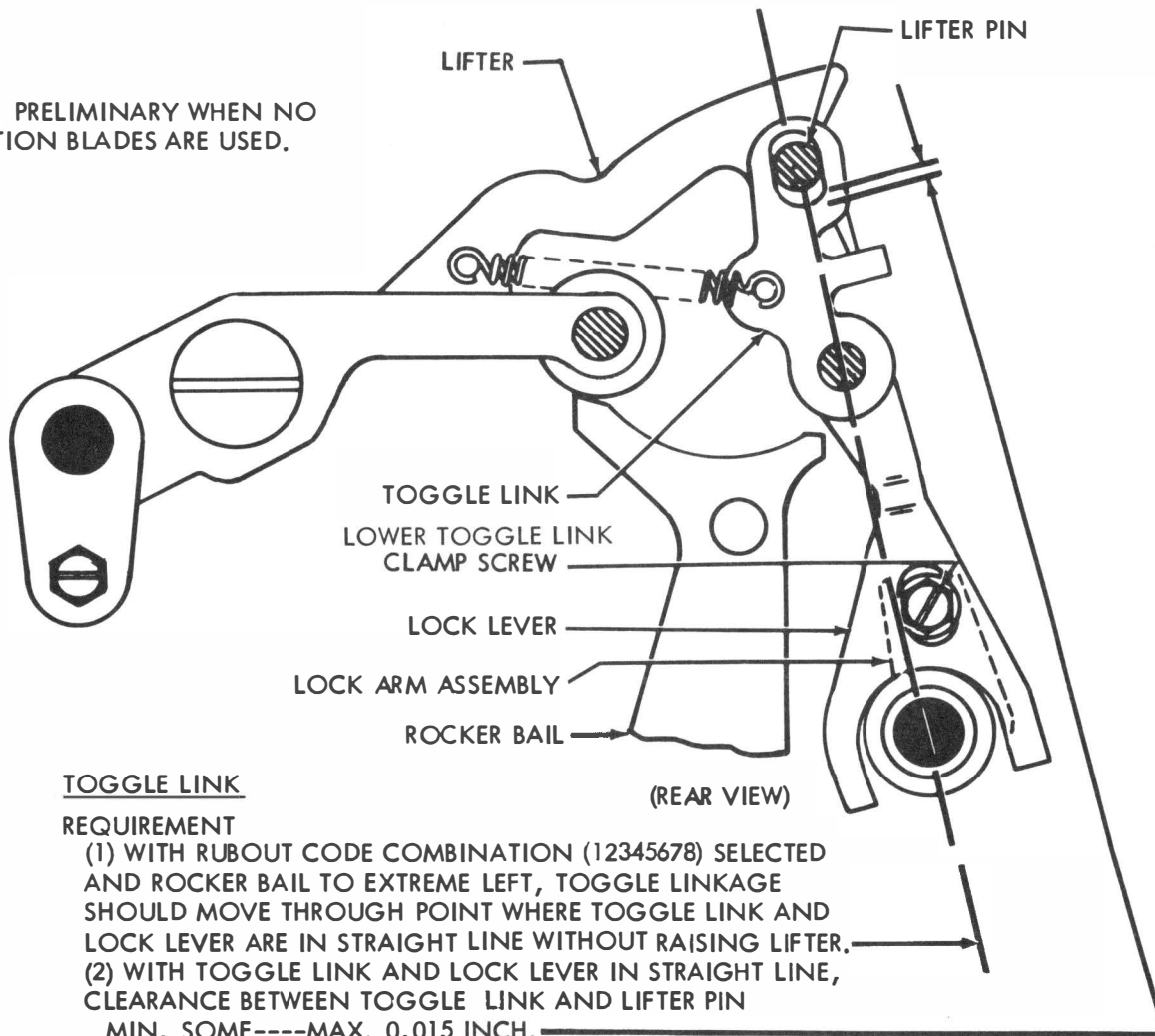
TO ADJUST POSITION LIFTER ARM ECCENTRIC SCREW WITH LOCK NUT LOOSENED.



SECTION 574-233-700

2.41 Typing Mechanism (continued)

NOTE: PRELIMINARY WHEN NO  
FUNCTION BLADES ARE USED.



TOGGLE LINK

REQUIREMENT

- (1) WITH RUBOUT CODE COMBINATION (12345678) SELECTED AND ROCKER BAIL TO EXTREME LEFT, TOGGLE LINKAGE SHOULD MOVE THROUGH POINT WHERE TOGGLE LINK AND LOCK LEVER ARE IN STRAIGHT LINE WITHOUT RAISING LIFTER.
- (2) WITH TOGGLE LINK AND LOCK LEVER IN STRAIGHT LINE, CLEARANCE BETWEEN TOGGLE LINK AND LIFTER PIN MIN. SOME----MAX. 0.015 INCH.

TO ADJUST

POSITION TOGGLE LINK ON LOCK ARM ASSEMBLY WITH CLAMP SCREW FRICTION TIGHT.

NOTE

TO AVOID INTERFERENCE WITH LOCK LEVER, IT MAY BE NECESSARY TO MOVE HIGH PART OF CORRECTING DRIVE LINK ECCENTRIC BEARING ABOVE HORIZONTAL CENTER LINE.

## 2.42 Typing Mechanism (continued)

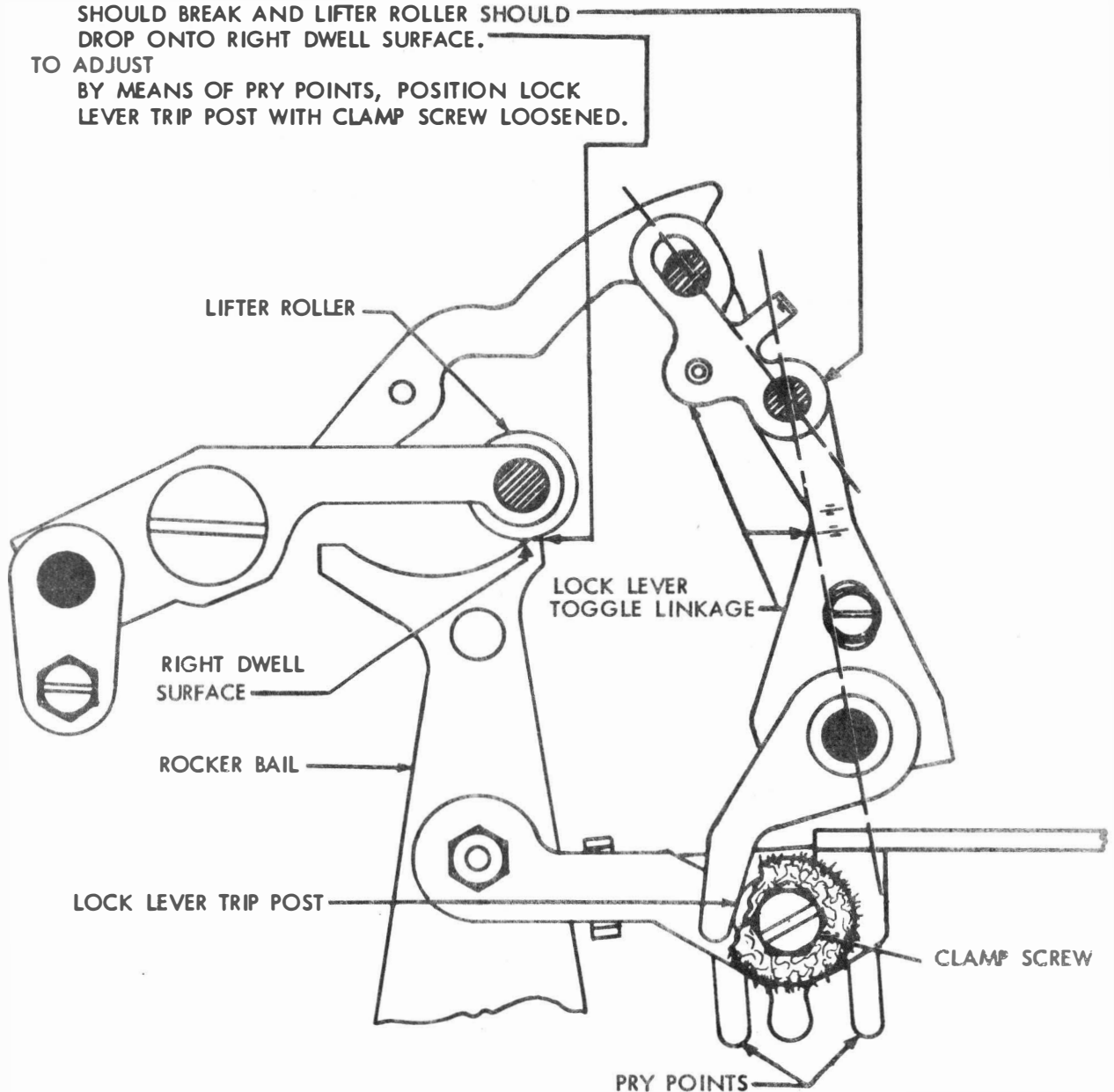
→ NOTE: PRELIMINARY WHEN NO FUNCTION BLADES ARE USED.

TOGGLE TRIP ARMREQUIREMENT

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

TO ADJUST

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

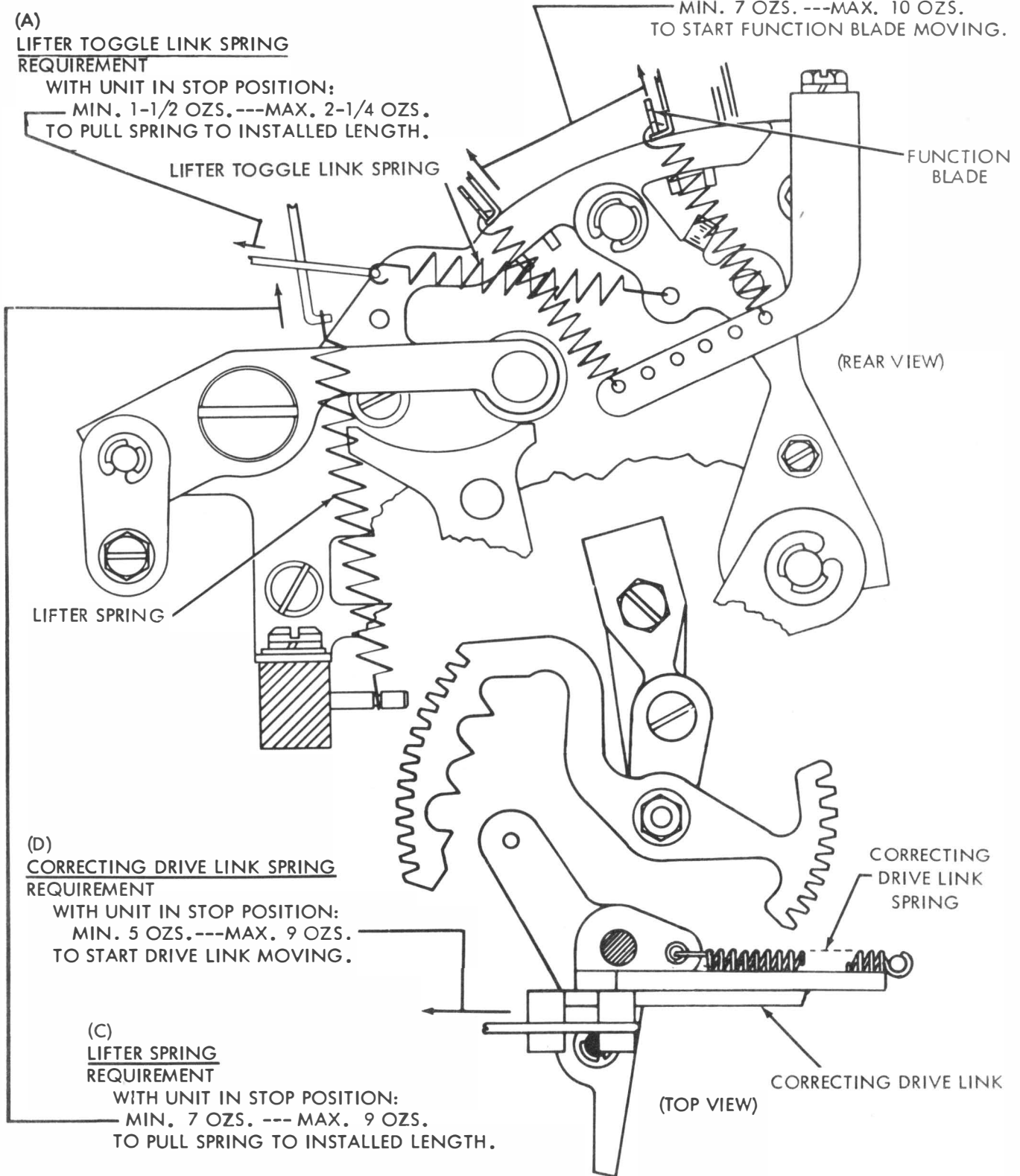


(REAR VIEW)

2.43 Typing Mechanism (continued)

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

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



(D) CORRECTING DRIVE LINK SPRING  
REQUIREMENT  
WITH UNIT IN STOP POSITION:  
MIN. 5 OZS. ---MAX. 9 OZS.  
TO START DRIVE LINK MOVING.

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

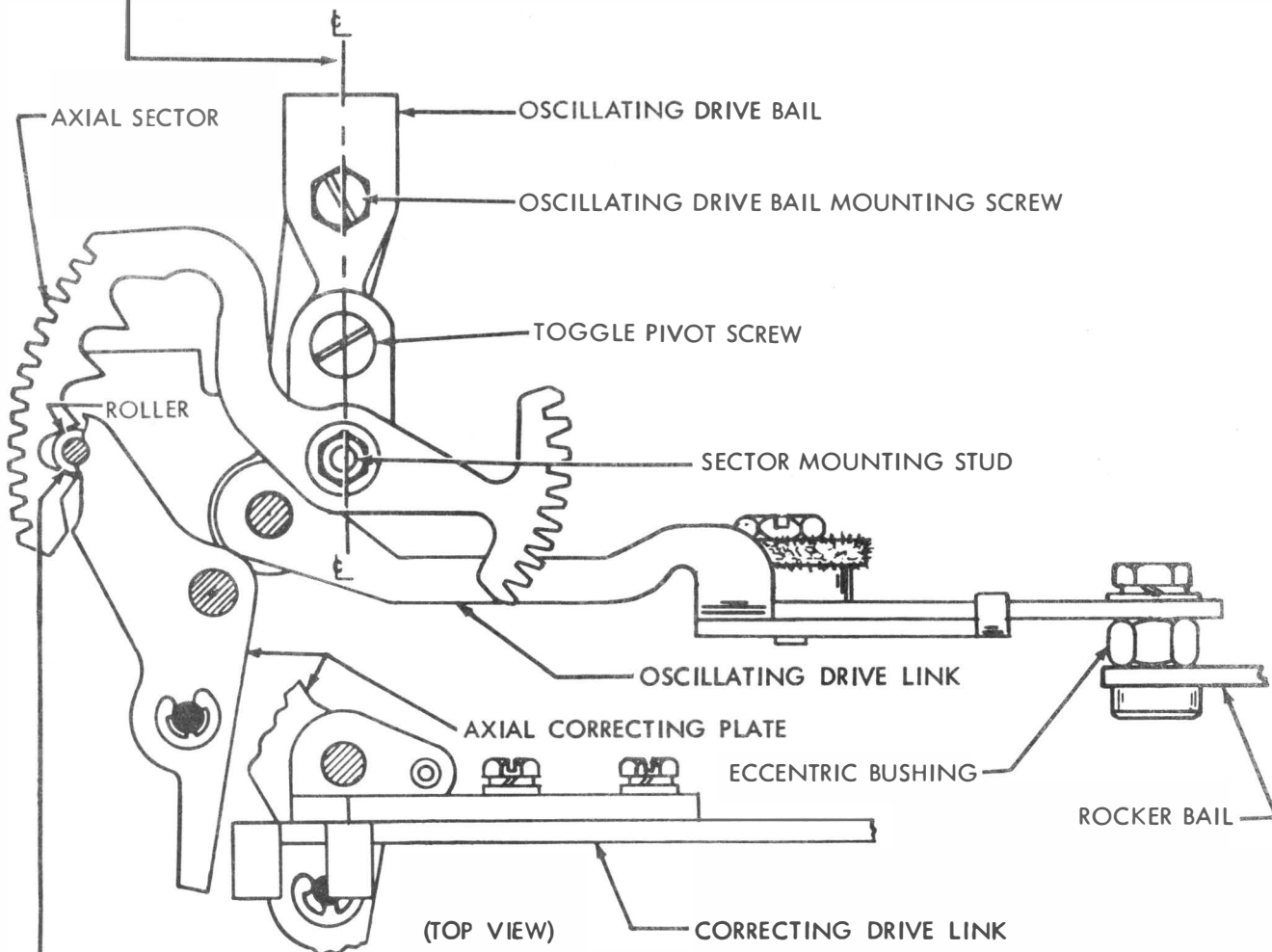
2.44 Typing Mechanism (continued)

(A) OSCILLATING DRIVE LINK

TO CHECK  
POSITION ROCKER BAIL TO ITS EXTREME LEFT.

REQUIREMENT  
SECTOR MOUNTING STUD, TOGGLE PIVOT SCREW AND OSCILLATING DRIVE BAIL MOUNTING SCREW SHOULD APPROXIMATELY LINE UP.

TO ADJUST  
POSITION OSCILLATING DRIVE LINK BY MEANS OF ITS ECCENTRIC BUSHING.



(B)

AXIAL CORRECTOR (NON-YIELDING)

TO CHECK  
MANUALLY SELECT ALL SPACING CODE COMBINATION. ROTATE MAIN SHAFT UNTIL ROCKER BAIL IS TO EXTREME LEFT.

REQUIREMENT  
ROLLER ON AXIAL CORRECTING PLATE SEATED FIRMLY IN CENTER OF FIRST NOTCH OF AXIAL SECTOR.

TO ADJUST

- (1) LOOSEN DRIVE LINK ADJUSTING SCREWS. FIRMLY SEAT AXIAL CORRECTOR ROLLER INTO FIRST NOTCH OF SECTOR BY MANUALLY APPLYING AND HOLDING THIS POSITION FOR NEXT PART OF ADJUSTMENT.
- (2) APPLY MANUAL PRESSURE ON DRIVE LINK TO BOTTOM ITS SLOT AGAINST ROCKER BAIL BUSHING.
- (3) MAINTAIN PRESSURE AT THESE TWO PLACES. TIGHTEN ADJUSTING SCREWS.

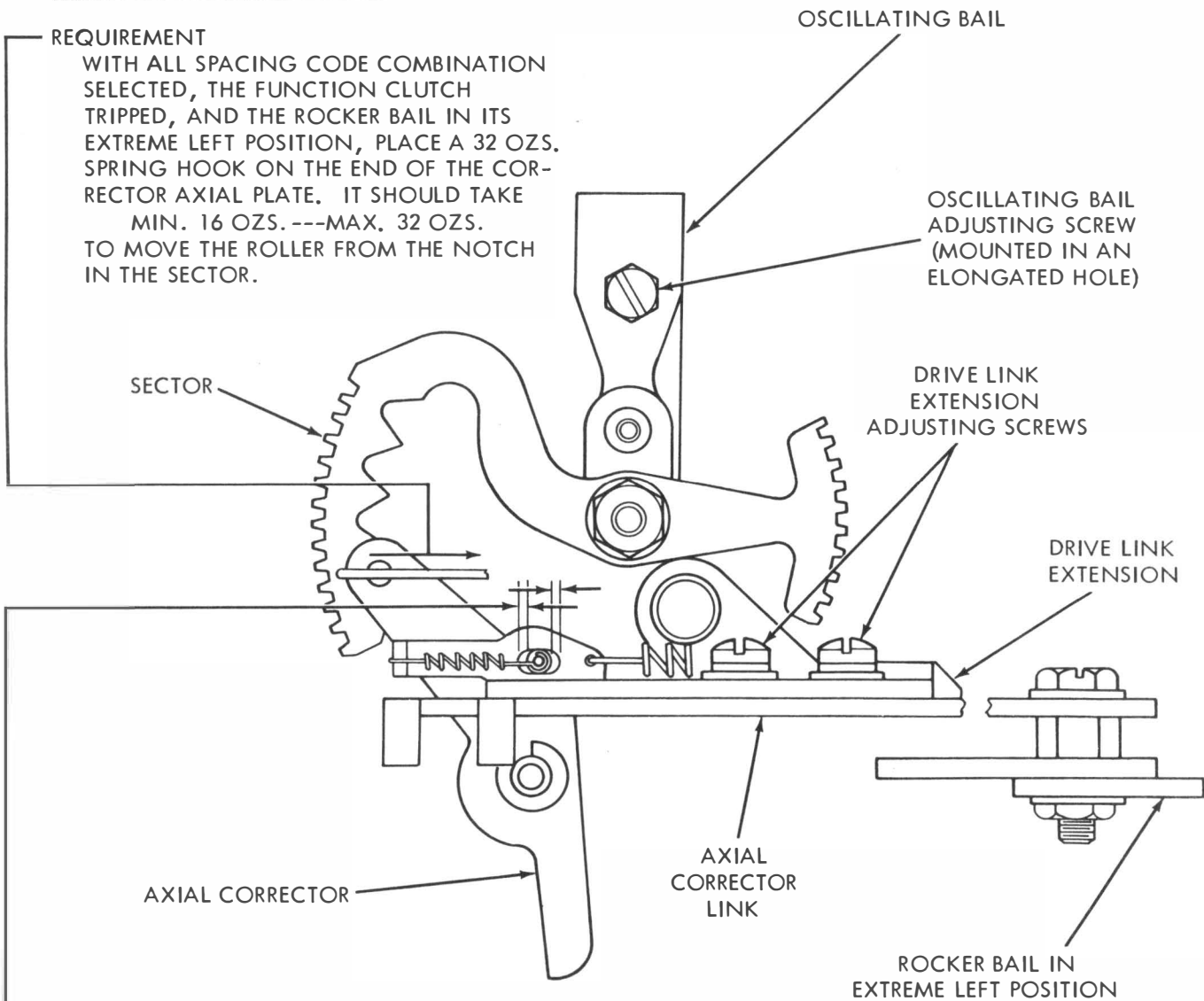
SECTION 574-233-700

2.45 Typing Mechanism (continued)

CORRECTOR DRIVE LINK (YIELDING)  
EXTENSION SPRING TENSION

REQUIREMENT

WITH ALL SPACING CODE COMBINATION SELECTED, THE FUNCTION CLUTCH TRIPPED, AND THE ROCKER BAIL IN ITS EXTREME LEFT POSITION, PLACE A 32 OZS. SPRING HOOK ON THE END OF THE CORRECTOR AXIAL PLATE. IT SHOULD TAKE MIN. 16 OZS. ---MAX. 32 OZS. TO MOVE THE ROLLER FROM THE NOTCH IN THE SECTOR.



AXIAL CORRECTOR (YIELDING)

REQUIREMENT

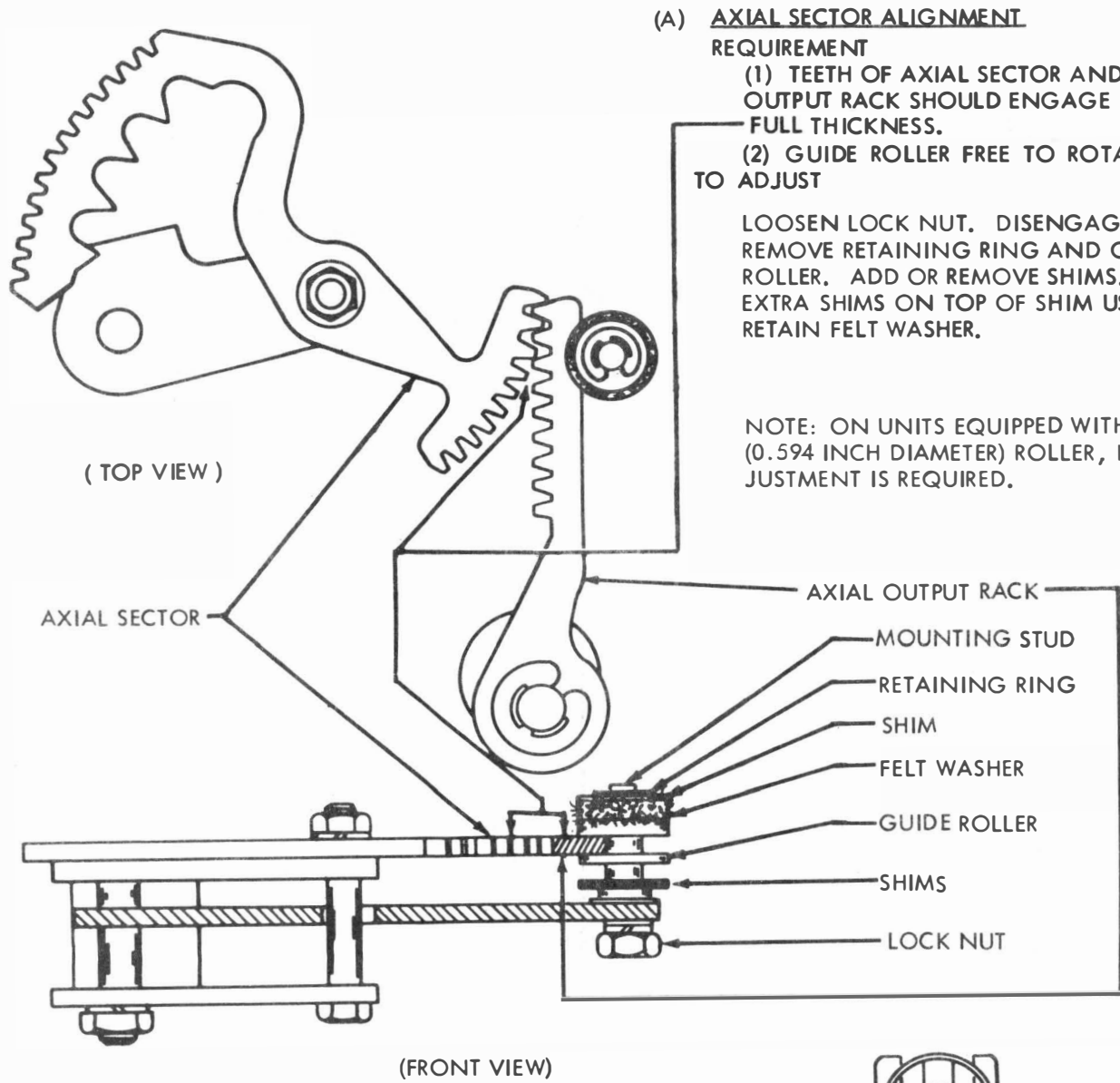
WITH ALL SPACING CODE COMBINATION SELECTED, FUNCTION CLUTCH TRIPPED AND ROCKER BAIL IN ITS EXTREME LEFT POSITION, THE AXIAL CORRECTOR ROLLER SHOULD SEAT IN THE FIRST SECTOR NOTCH AND THERE SHOULD BE MIN. 0.005 INCH BETWEEN THE ENDS OF THE SLOT AND THE SPRING POST. CHECK BOTH SIDES AND CHECK SEATING IN FOURTH NOTCH (LETTERS SELECTION). TURN THE RETAINING RING THAT FASTENS THE DRIVE LINK EXTENSION TO THE CORRECTOR PLATE TO CHECK THE MINIMUM REQUIREMENT.

TO ADJUST

LOOSEN TWO DRIVE LINK ADJUSTING SCREWS. POSITION DRIVE LINK TO MEET THE REQUIREMENT AND RETIGHTEN THE SCREWS.



2.46 Typing Mechanism (continued)



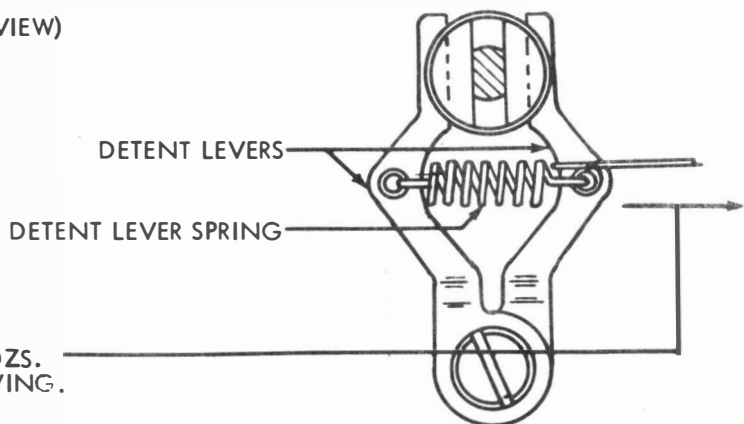
(A) AXIAL SECTOR ALIGNMENT  
REQUIREMENT

- (1) TEETH OF AXIAL SECTOR AND AXIAL OUTPUT RACK SHOULD ENGAGE BY THEIR FULL THICKNESS.
- (2) GUIDE ROLLER FREE TO ROTATE.

TO ADJUST

LOOSEN LOCK NUT. DISENGAGE RACK. REMOVE RETAINING RING AND GUIDE ROLLER. ADD OR REMOVE SHIMS. PLACE EXTRA SHIMS ON TOP OF SHIM USED TO RETAIN FELT WASHER.

NOTE: ON UNITS EQUIPPED WITH LARGER (0.594 INCH DIAMETER) ROLLER, NO ADJUSTMENT IS REQUIRED.



(TOP VIEW OF SPRINGS ON AXIAL POSITIONING MECHANISM)

ECCENTRIC SHAFT

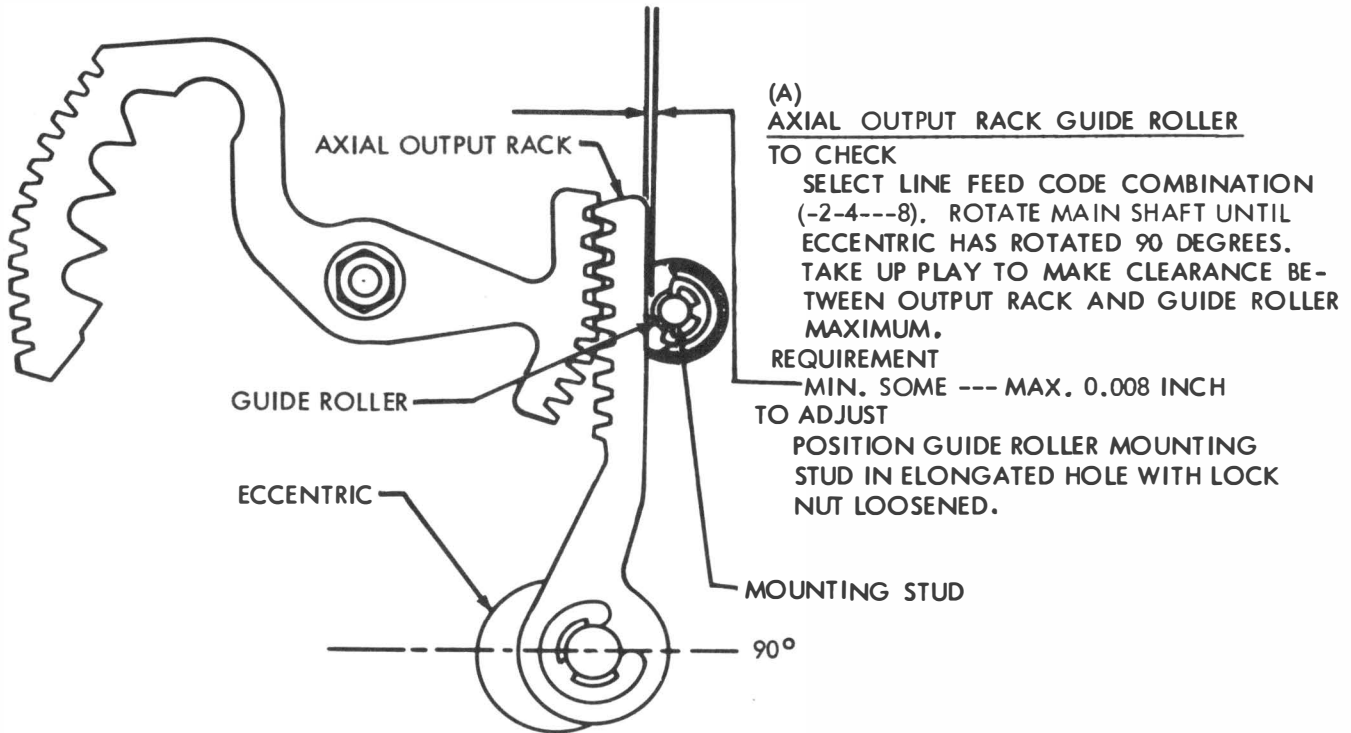
(B) DETENT LEVER SPRING (6)

MIN. 7 OZS. ---MAX. 10 OZS.  
TO START DETENT LEVER MOVING.

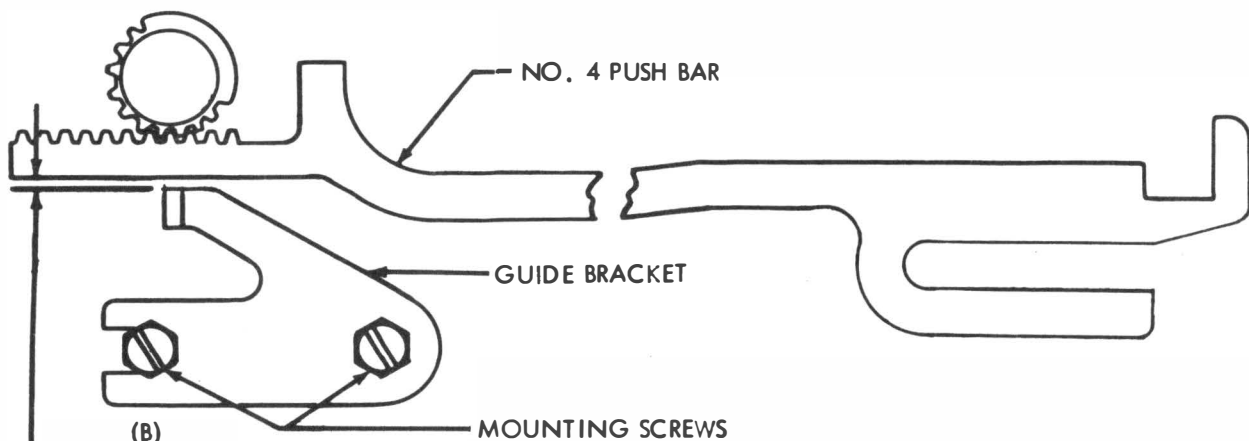
NOTE:

CHECK ALL 6 SPRINGS. THERE ARE TWO ON THE AXIAL POSITIONING MECHANISM AND FOUR ON THE ROTARY POSITIONING MECHANISM.

2.47 Typing Mechanism (continued)



(TOP VIEW)



(A)

CORRECTING DRIVE LINK

(1) TO CHECK

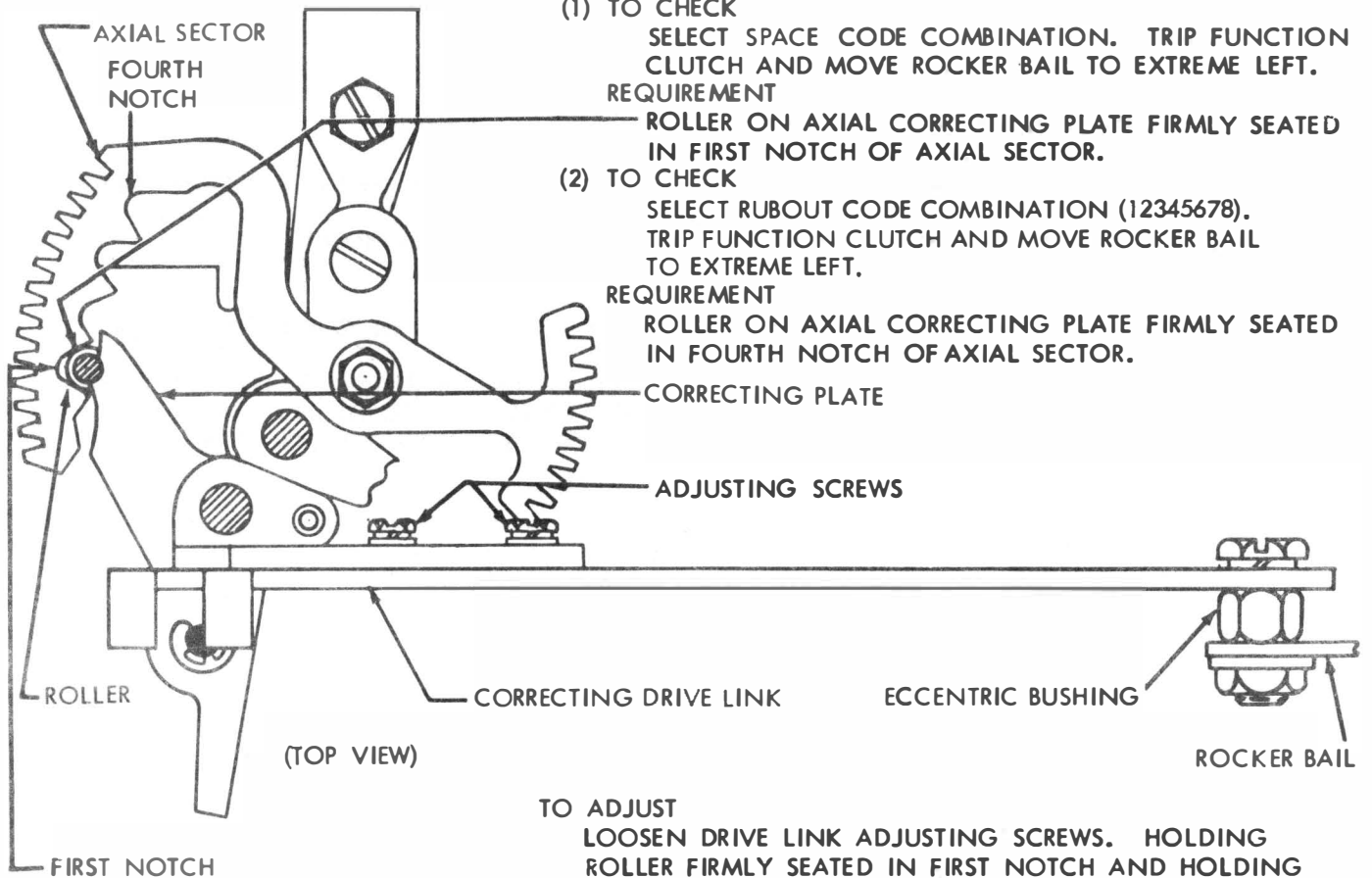
SELECT SPACE CODE COMBINATION. TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT. REQUIREMENT

ROLLER ON AXIAL CORRECTING PLATE FIRMLY SEATED IN FIRST NOTCH OF AXIAL SECTOR.

(2) TO CHECK

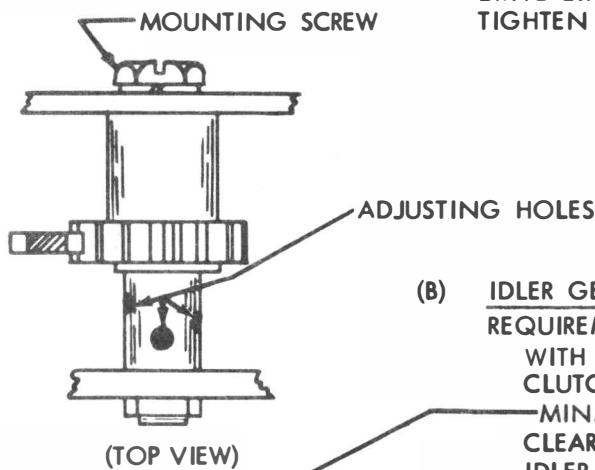
SELECT RUBOUT CODE COMBINATION (12345678). TRIP FUNCTION CLUTCH AND MOVE ROCKER BAIL TO EXTREME LEFT. REQUIREMENT

ROLLER ON AXIAL CORRECTING PLATE FIRMLY SEATED IN FOURTH NOTCH OF AXIAL SECTOR.



TO ADJUST

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



(B)

IDLER GEAR ECCENTRIC SHAFT

REQUIREMENT

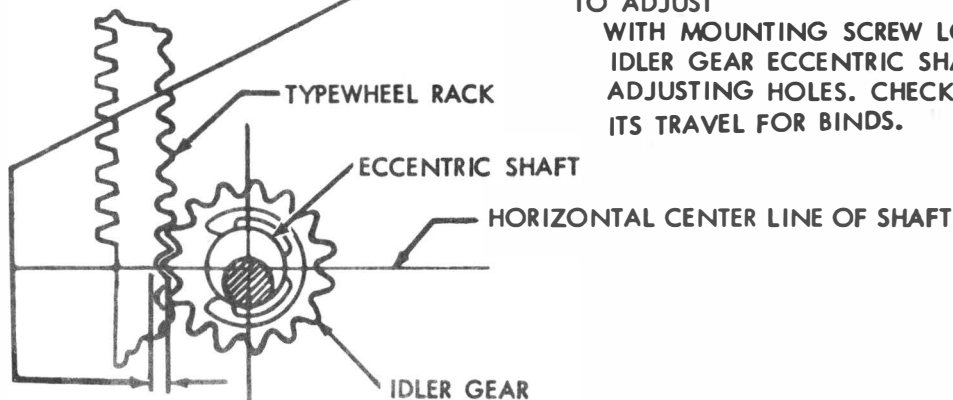
WITH UNIT IN RUBOUT CONDITION AND FUNCTION CLUTCH DISENGAGED;

MIN. SOME ---- MAX. 0.015 INCH

CLEARANCE BETWEEN TYPEWHEEL RACK TOOTH AND IDLER GEAR TOOTH.

TO ADJUST

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



2.49 Typing Mechanism (continued)

ROTARY CORRECTING LEVER

(1) TO CHECK

LOOSEN CORRECTING CLAMP ADJUSTING SCREW. WITH UNIT IN FIGURES CONDITION SELECT "X" CODE COMBINATION (---45-78). TRIP FUNCTION CLUTCH AND POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY SEAT ROTARY CORRECTING LEVER IN TYPEWHEEL RACK.

REQUIREMENT

SECOND TOOTH FROM TOP OF RACK SEATED BETWEEN LOBES OF CORRECTING LEVER.

TO ADJUST

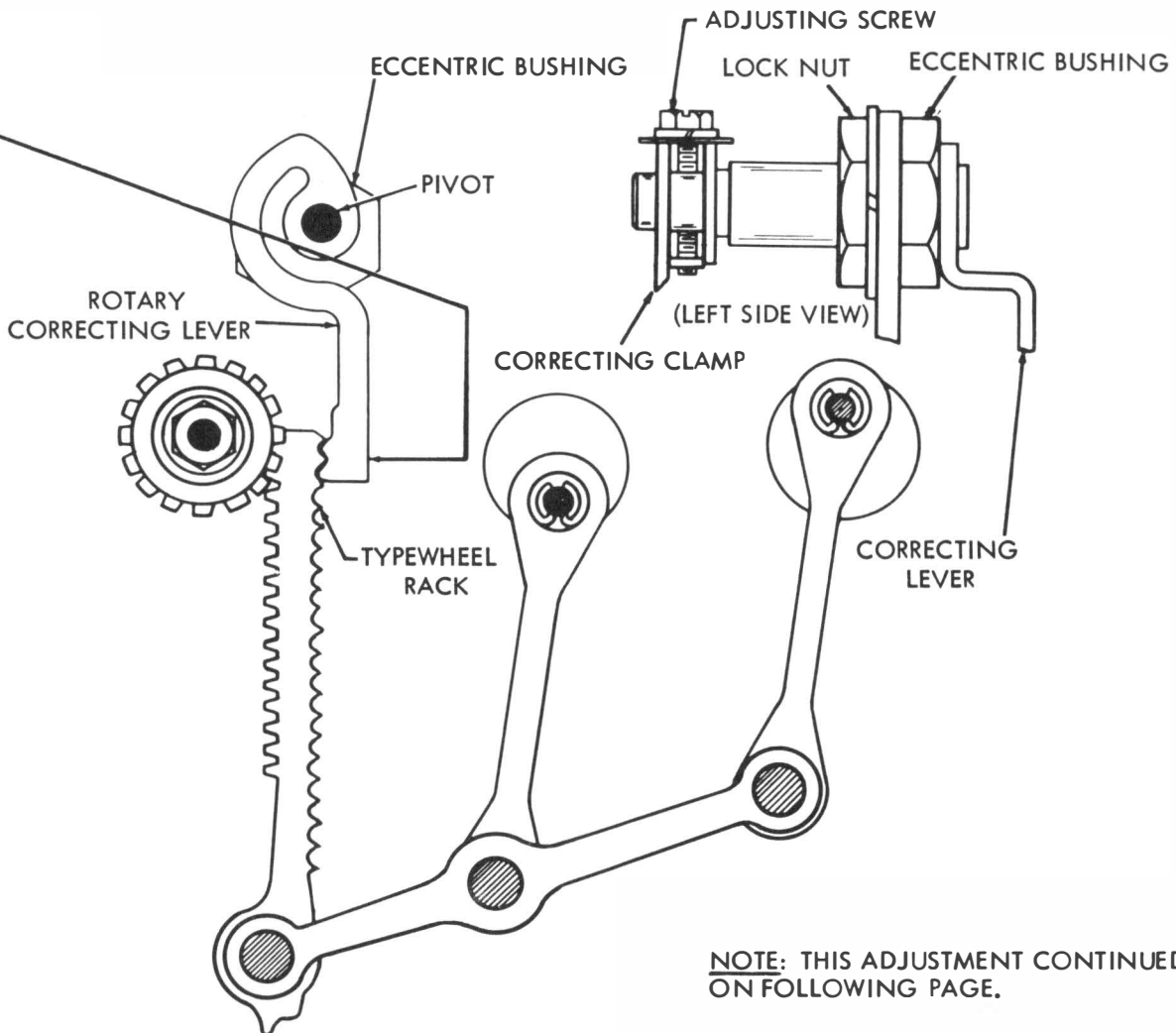
LOOSEN ECCENTRIC BUSHING LOCK NUT. WITH CLAMP ADJUSTING SCREW LOOSENED AND CORRECTING LEVER PIVOT TO RIGHT OF CENTER LINE, POSITION CORRECTING LEVER. TIGHTEN BUSHING LOCK NUT. DO NOT TIGHTEN CLAMP ADJUSTING SCREW AT THIS TIME.

(2) TO CHECK

IN A MANNER SIMILAR TO THAT DESCRIBED ABOVE, CHECK ENGAGEMENT OF FIFTH TOOTH (--34--78) , NINTH TOOTH (---4---8) AND SIXTEENTH TOOTH (--3-5--8).

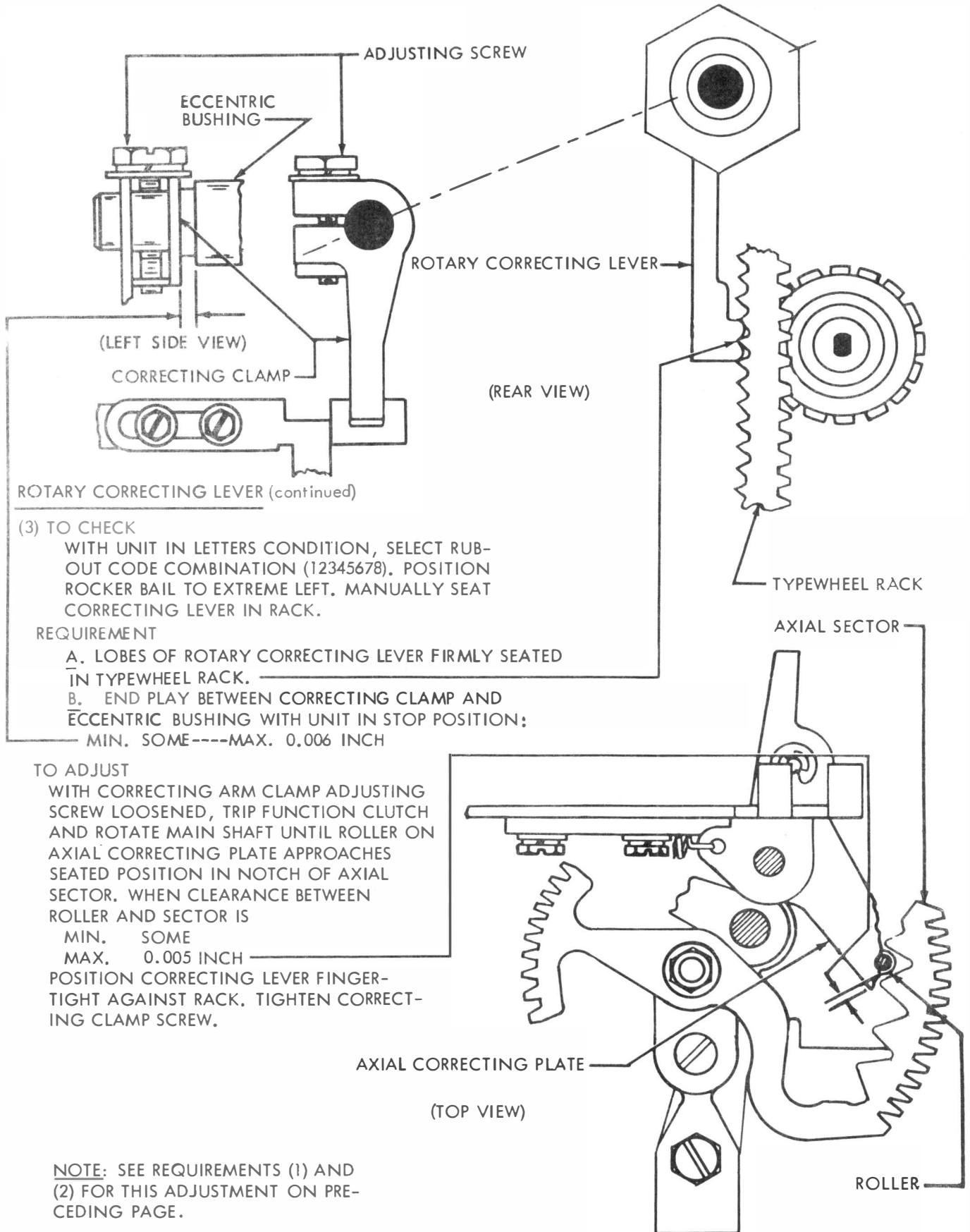
TO ADJUST

REFINE ADJUSTMENT UNDER (1) ABOVE.



NOTE: THIS ADJUSTMENT CONTINUED ON FOLLOWING PAGE. ←

2.50 Typing Mechanism (continued)



ROTARY CORRECTING LEVER (continued)

(3) TO CHECK

WITH UNIT IN LETTERS CONDITION, SELECT RUB-OUT CODE COMBINATION (12345678). POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY SEAT CORRECTING LEVER IN RACK.

REQUIREMENT

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

TO ADJUST

WITH CORRECTING ARM CLAMP ADJUSTING SCREW LOOSENED, TRIP FUNCTION CLUTCH AND ROTATE MAIN SHAFT UNTIL ROLLER ON AXIAL CORRECTING PLATE APPROACHES SEATED POSITION IN NOTCH OF AXIAL SECTOR. WHEN CLEARANCE BETWEEN ROLLER AND SECTOR IS

- MIN. SOME
- MAX. 0.005 INCH

POSITION CORRECTING LEVER FINGER-TIGHT AGAINST RACK. TIGHTEN CORRECTING CLAMP SCREW.

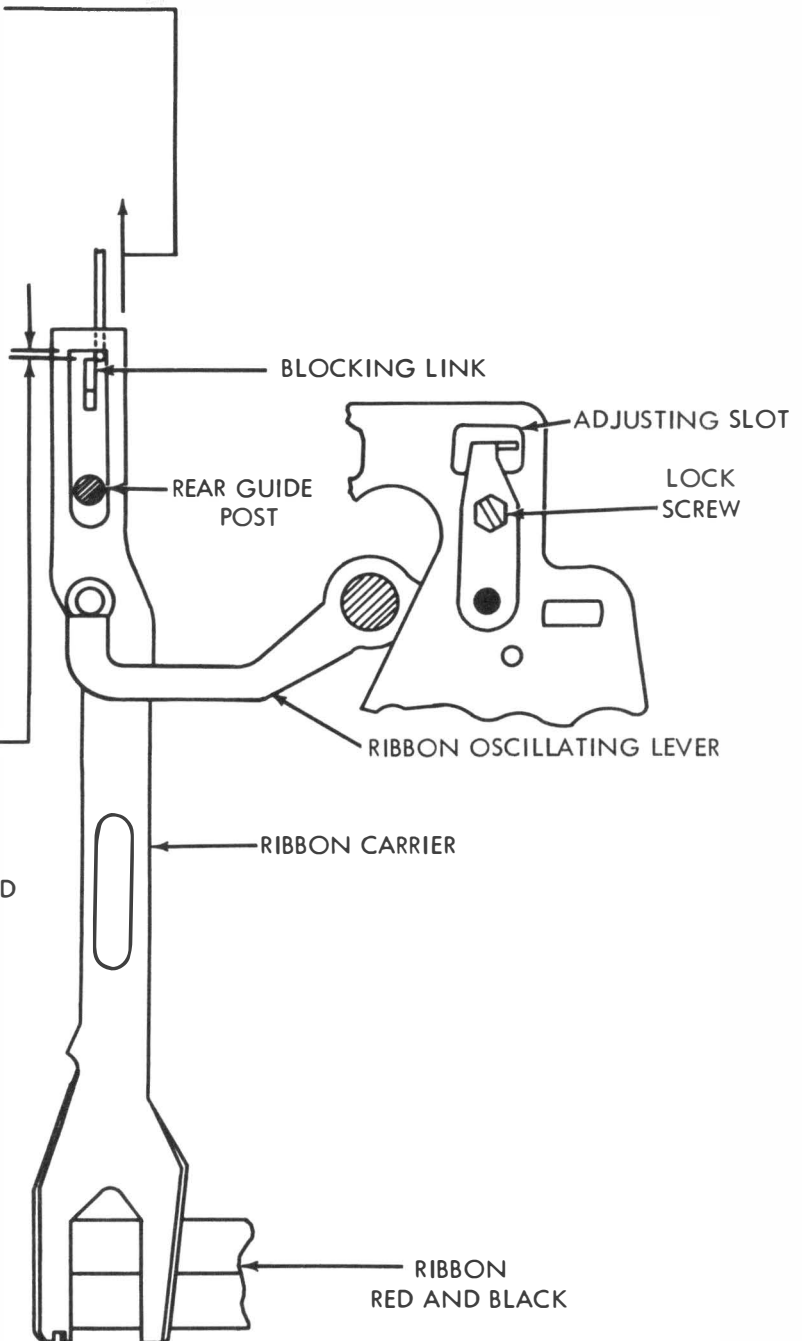
NOTE: SEE REQUIREMENTS (1) AND (2) FOR THIS ADJUSTMENT ON PRECEDING PAGE.

SECTION 574-233-700

2.51 Ribbon Shift and Print Suppression Mechanism (continued)

RIBBON CARRIER SPRING  
REQUIREMENT

WITH UNIT IN STOP POSITION  
MIN. 7 OZS. ---MAX. 10 OZS.  
TO START CARRIER MOVING.



RIBBON CARRIER  
REQUIREMENT

WITH FUNCTION CLUTCH DISENGAGED:  
MIN. 0.040 INCH  
MAX. 0.055 INCH  
CLEARANCE BETWEEN BLOCKING LINK AND  
RIBBON CARRIER.

TO ADJUST  
LOOSEN LOCK SCREW. POSITION RIBBON  
OSCILLATING LEVER, USING ADJUSTING  
SLOT.

2.52 Ribbon Shift and Print Suppression Mechanism - Early Design (continued)

(B) ARMATURE AIR GAP

REQUIREMENT

WITH ARMATURE ON DOWNSTOP SCREW  
 MIN. 0.015 INCH---MAX. 0.020 INCH  
 CLEARANCE BETWEEN MAGNET CORE  
 AND ARMATURE AT CLOSEST POINT AND  
 MIN. SOME---MAX. 1/32 INCH  
 CLEARANCE BETWEEN REAR OF ARMATURE  
 SLOT AND BLOCKING LINK AS GAGED  
 BY EYE.

TO ADJUST

POSITION MAGNET BRACKET WITH SCREWS  
 LOOSENED. CHECK FOR BINDS.

(D) ARMATURE SPRING

REQUIREMENT

WITH SPRING DISCONNECTED  
 MIN. 3-1/2 OZS. ---MAX. 4-1/2 OZS.  
 WHEN PULLED TO INSTALLED LENGTH.

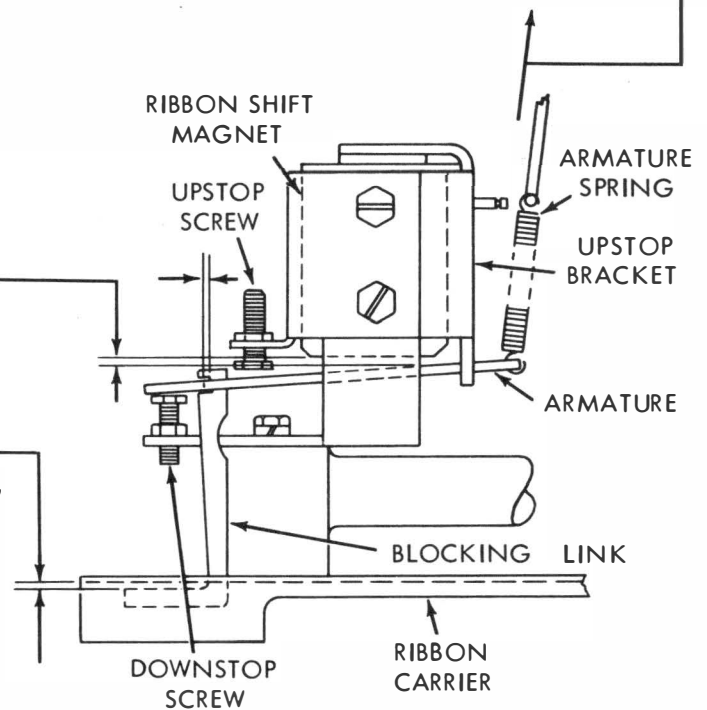
(A) ARMATURE DOWNSTOP

REQUIREMENT

WITH ROCKER BAIL IN EXTREME LEFT POSITION  
 AND RIBBON CARRIER BIASED DOWNWARD  
 MIN. SOME---MAX. 0.005 INCH  
 CLEARANCE BETWEEN TOP SURFACE OF BLOCKING  
 LINK AND LOWER SURFACE OF RIBBON CARRIER

TO ADJUST

POSITION ARMATURE DOWNSTOP SCREW WITH  
 LOCK NUT LOOSENED.



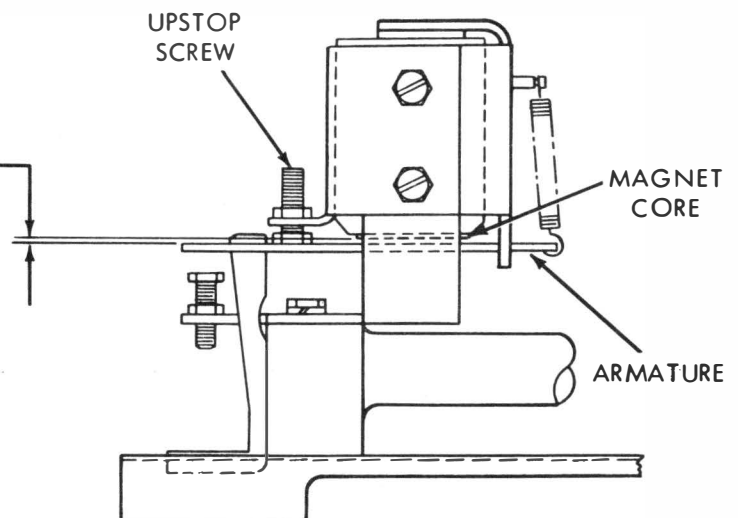
(C) ARMATURE UPSTOP

REQUIREMENT

WITH ARMATURE HELD AGAINST  
 UPSTOP SCREW (MAGNET IS NOT  
 TO BE ENERGIZED)  
 MIN. 0.004 INCH---MAX. 0.007 INCH  
 CLEARANCE BETWEEN MAGNET CORE  
 AND ARMATURE AT CLOSEST POINT.

TO ADJUST

POSITION UPSTOP SCREW WITH LOCK  
 NUT LOOSENED.



NOTE: REFER TO PART 3 FOR ADDITIONAL PRINT SUPPRESSION ADJUSTMENTS.

SECTION 574-233-700

2.53 Ribbon Shift and Print Suppression Mechanism - Latest Design (continued)

(C) ARMATURE AIR GAP AND DOWNSTOP

REQUIREMENT

WITH ARMATURE RESTING ON DOWNSTOP SCREW

MIN. 0.015 INCH---MAX. 0.020 INCH  
CLEARANCE BETWEEN MAGNET CORE AND  
ARMATURE AT CLOSEST POINT.

TO ADJUST

POSITION DOWNSTOP SCREW WITH LOCK  
NUT LOOSENED.

(B) BLOCKING LINK

REQUIREMENT

WITH ARMATURE HELD AGAINST UPSTOP  
SCREW (MAGNET IS NOT TO BE ENERGIZED)  
AND RIBBON CARRIER BIASED UPWARD

MIN. SOME---MAX. 0.008 INCH  
CLEARANCE BETWEEN BLOCKING LINK  
LOWER SURFACE AND RIBBON CARRIER TOP  
SURFACE AT CLOSEST POINT AND

MIN. SOME---MAX. 1/32 INCH  
CLEARANCE BETWEEN REAR OF ARMATURE  
SLOT AND BLOCKING LINK AS GAGED  
BY EYE.

TO ADJUST

POSITION MAGNET BRACKET WITH SCREW  
LOOSENED.

(A) ARMATURE UPSTOP

REQUIREMENT

WITH ARMATURE HELD AGAINST UPSTOP  
SCREW (MAGNET IS NOT TO BE ENERGIZED)  
RIBBON CARRIER BIASED UPWARD

MIN. 0.005 INCH---MAX. 0.010 INCH  
CLEARANCE BETWEEN MAGNET CORE AND  
ARMATURE AT CLOSEST POINT.

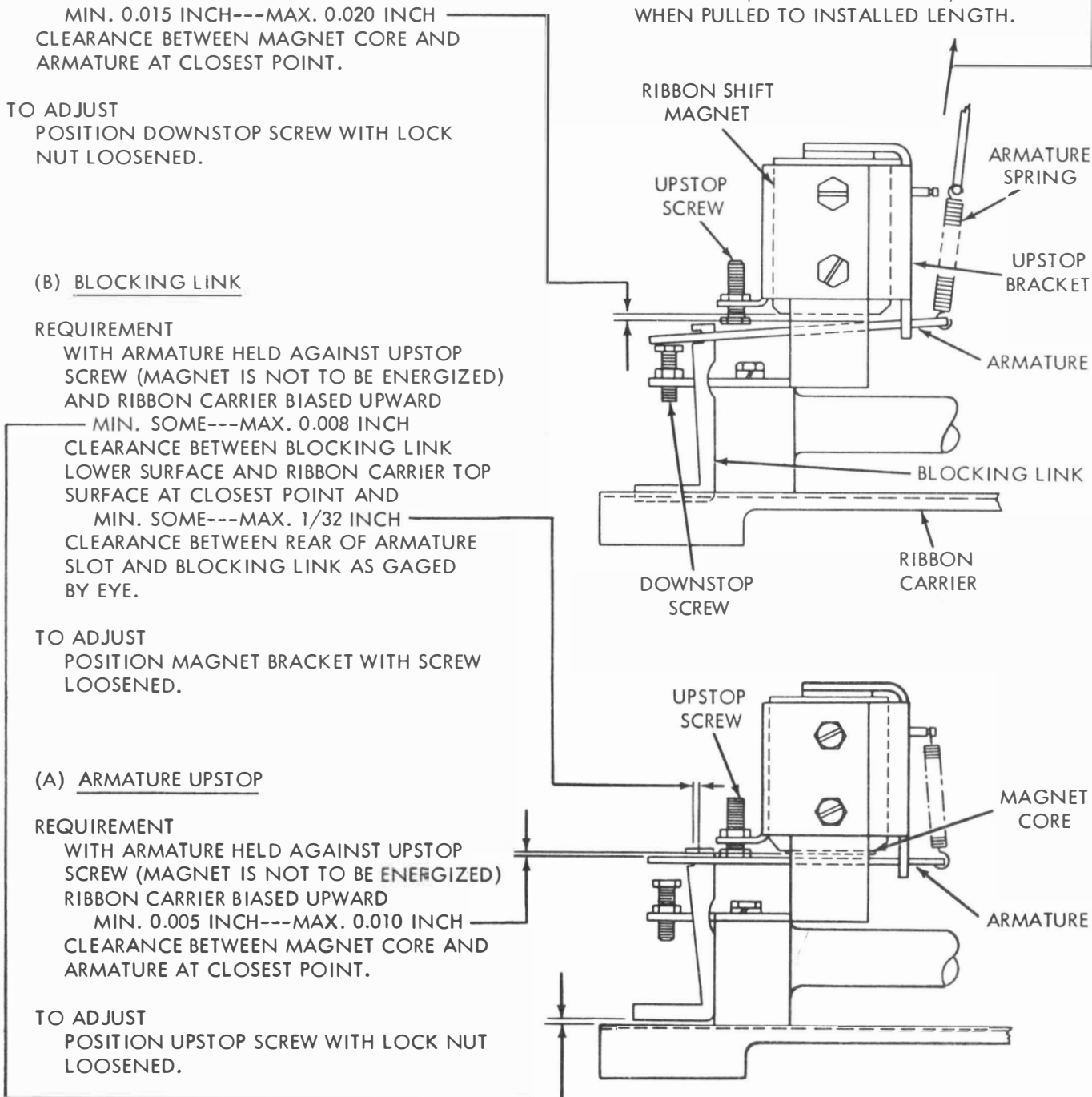
TO ADJUST

POSITION UPSTOP SCREW WITH LOCK NUT  
LOOSENED.

(D) ARMATURE SPRING

REQUIREMENT

WITH SPRING DISCONNECTED  
MIN. 3-1/2 OZS.---MAX. 4-1/2 OZS.  
WHEN PULLED TO INSTALLED LENGTH.



NOTE: REFER TO PART 3 FOR ADDITIONAL PRINT SUPPRESSION ADJUSTMENTS.



2.54 Typing Mechanism (continued)

PRINTING TRIP LINK

TO CHECK

TRIP FUNCTION CLUTCH AND POSITION ROCKER BAIL TO EXTREME LEFT. MANUALLY LIFT ACCELERATOR SO THAT LATCHING SURFACES OF PRINTING LATCH AND ACCELERATOR ARE EVEN.

REQUIREMENT

MIN. SOME----MAX. 0.015 INCH CLEARANCE BETWEEN ACCELERATOR AND LATCH.

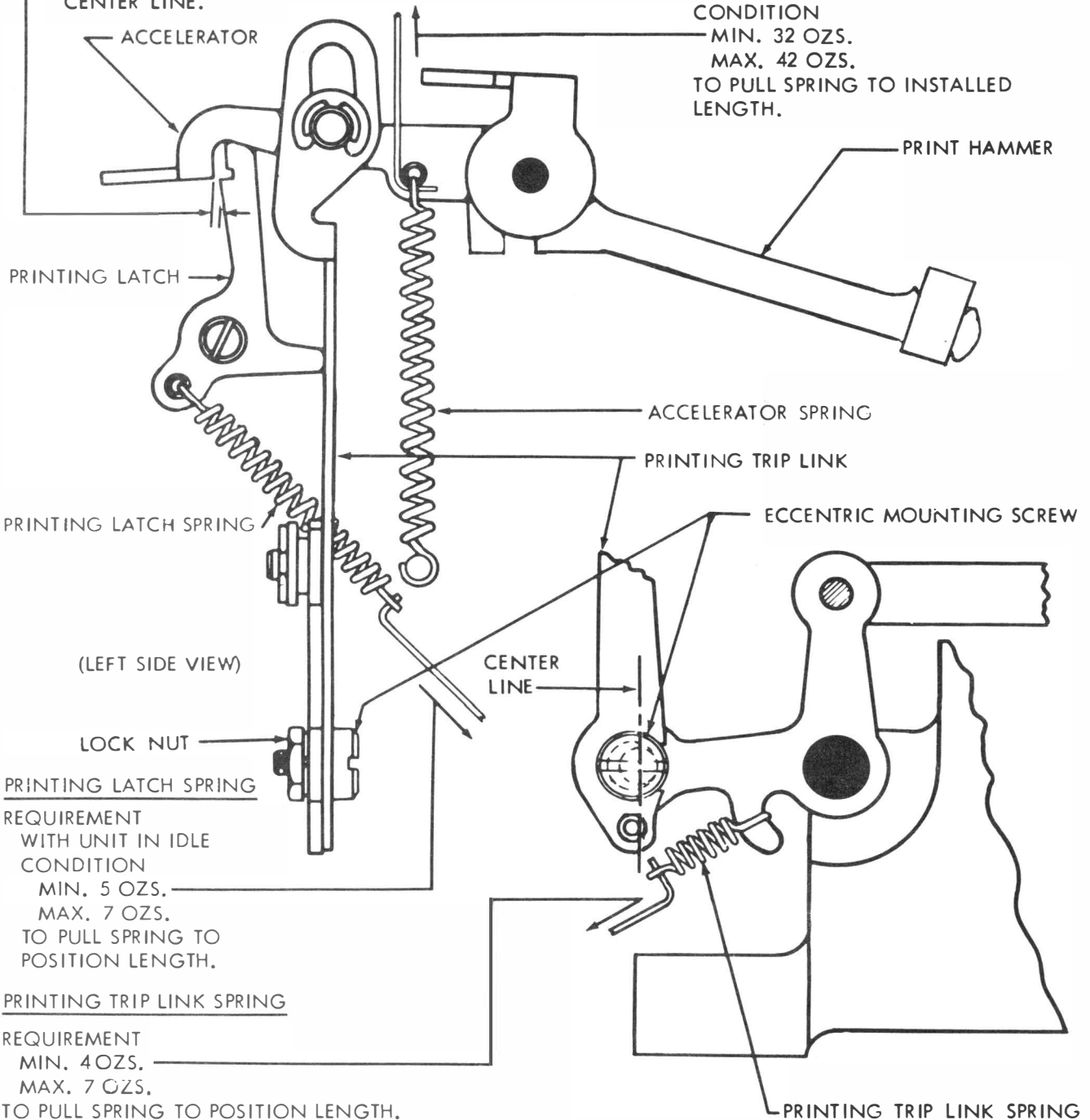
TO ADJUST

WITH LOCK NUT LOOSENED, POSITION PRINTING TRIP LINK BY MEANS OF ECCENTRIC MOUNTING SCREW. KEEP HIGH PART OF SCREW TO LEFT OF CENTER LINE.

ACCELERATOR SPRING

REQUIREMENT WITH UNIT IN STOP CONDITION

MIN. 32 OZS.  
MAX. 42 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.



PRINTING LATCH SPRING

REQUIREMENT WITH UNIT IN IDLE CONDITION

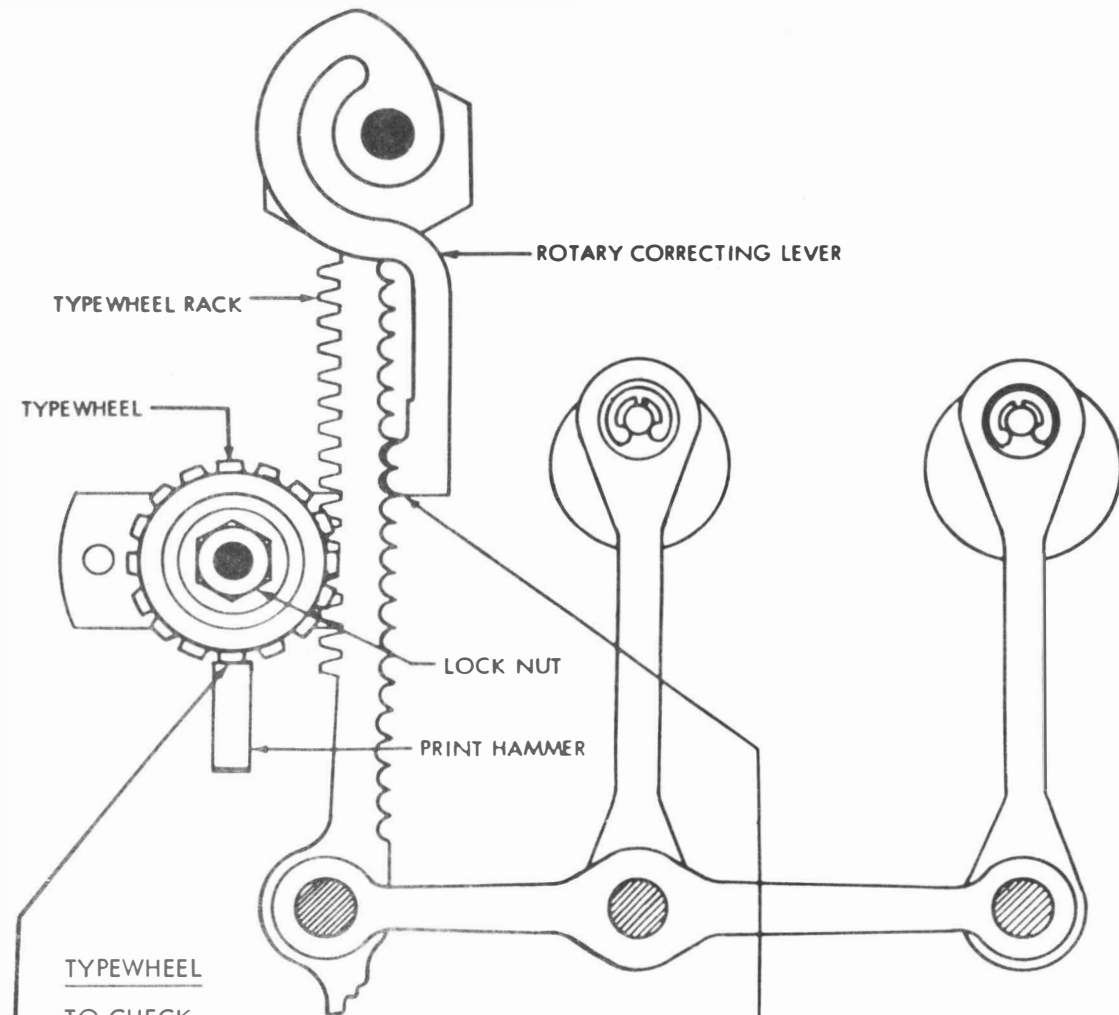
MIN. 5 OZS.  
MAX. 7 OZS.  
TO PULL SPRING TO POSITION LENGTH.

PRINTING TRIP LINK SPRING

REQUIREMENT

MIN. 4 OZS.  
MAX. 7 OZS.  
TO PULL SPRING TO POSITION LENGTH.

2.55 Typing Mechanism (continued)



TYPEWHEEL

TO CHECK  
SELECT "L" CODE COMBINATION (--34--78). PLACE  
ROCKER BAIL TO EXTREME LEFT. CORRECTING LEVER  
SHOULD BE FIRMLY SEATED IN TYPEWHEEL RACK.

REQUIREMENT

TYPEWHEEL ALIGNED SO THAT FULL CHARACTER IS  
PRINTED UNIFORMLY AND 6-1/2 CODE HOLE SPACES  
BEHIND ITS PERFORATED CODE HOLE.

TO ADJUST

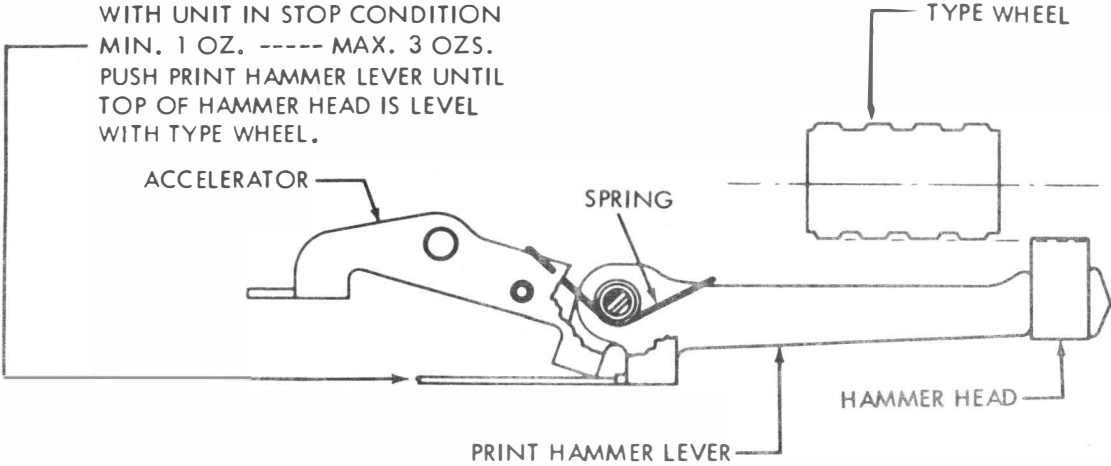
POSITION TYPEWHEEL WITH LOCK NUT LOOSENED.  
CHECK PRINTING BY MANUALLY LIFTING ACCELERATOR  
TO LATCHED POSITION AND RELEASING IT.

NOTE

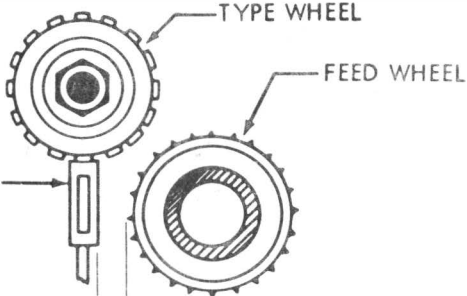
FOR BEST RESULTS, IT MAY BE NECESSARY TO MAKE  
PRINT HAMMER ADJUSTMENT AND THEN REFINE THIS  
ADJUSTMENT.

2.56 Typing Mechanism (continued)

PRINT HAMMER SPRING  
REQUIREMENT  
 WITH UNIT IN STOP CONDITION  
 MIN. 1 OZ. ----- MAX. 3 OZS.  
 PUSH PRINT HAMMER LEVER UNTIL  
 TOP OF HAMMER HEAD IS LEVEL  
 WITH TYPE WHEEL.



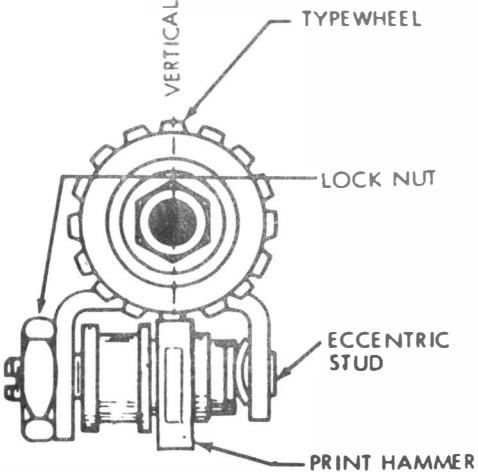
PRINTING BETWEEN PERFORATED  
FEED HOLES  
REQUIREMENT  
 CLEAR PRINTING BETWEEN  
 PERFORATED FEED HOLES.  
 MIN. 0.030 INCH --- MAX. 0.040 INCH  
 FROM PIN POINT OF FEED WHEEL TO  
 SIDE OF PRINT HAMMER.



TO ADJUST  
 POSITION ECCENTRIC STUD WITH  
 LOCK NUT LOOSENED. REPEAT  
 PROCEDURE IF NECESSARY.

NOTE  
 IT MAY BE NECESSARY TO  
REMAKE TYPE WHEEL  
ADJUSTMENT.

FRONT VIEW



2.57 Typing Mechanism (continued)

FEED PAWL SPRING

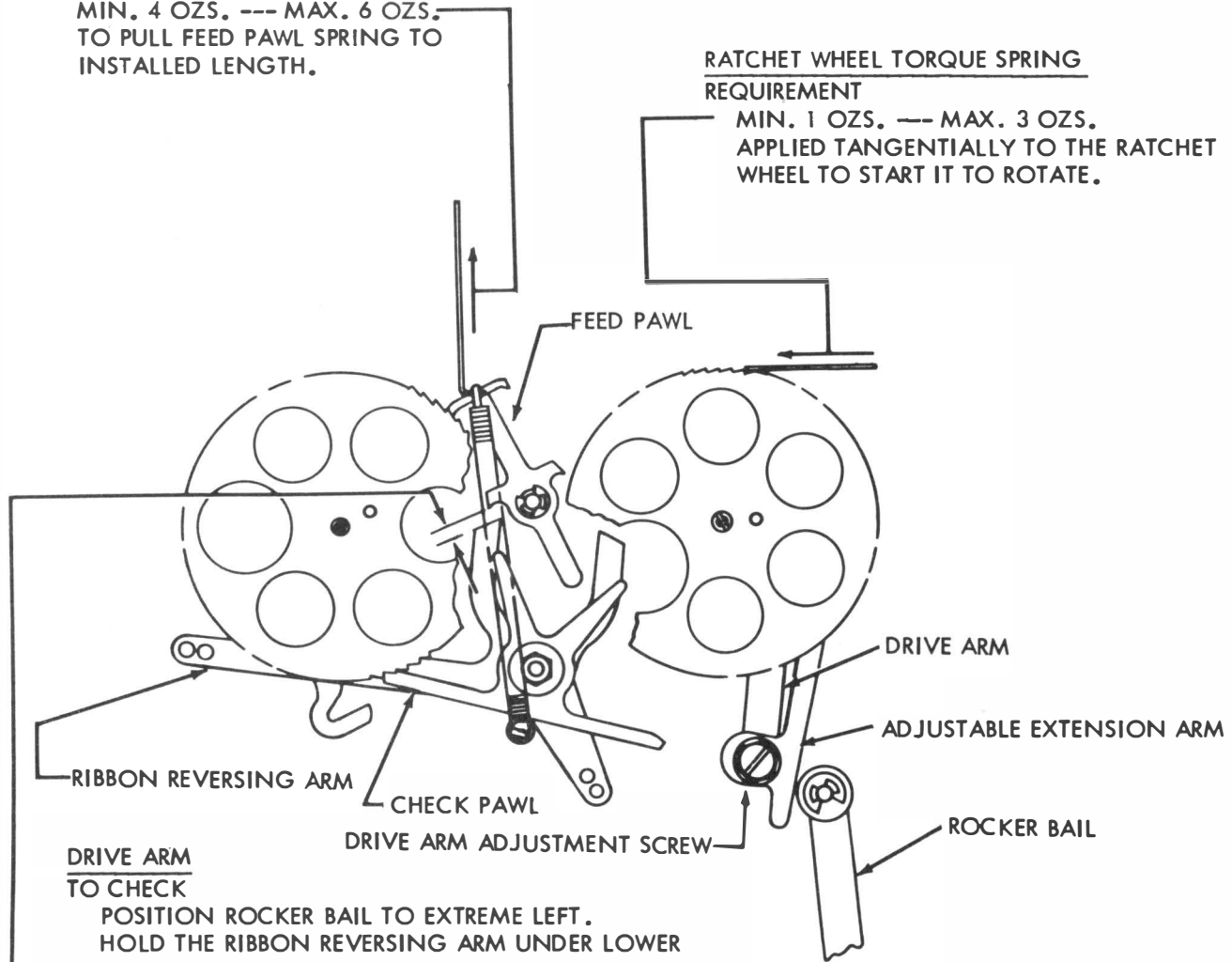
REQUIREMENT

WITH ROCKER BAIL TO EXTREME RIGHT:  
MIN. 4 OZS. --- MAX. 6 OZS.  
TO PULL FEED PAWL SPRING TO  
INSTALLED LENGTH.

RATCHET WHEEL TORQUE SPRING

REQUIREMENT

MIN. 1 OZS. --- MAX. 3 OZS.  
APPLIED TANGENTIALLY TO THE RATCHET  
WHEEL TO START IT TO ROTATE.



DRIVE ARM  
TO CHECK

POSITION ROCKER BAIL TO EXTREME LEFT.  
HOLD THE RIBBON REVERSING ARM UNDER LOWER  
REVERSING EXTENSION OF FEED PAWL.

REQUIREMENT

- (1) CLEARANCE BETWEEN BLOCKING EDGE OF  
RIBBON REVERSE ARM AND REVERSING  
EXTENSION OF FEED PAWL:  
MIN. SOME
- (2) CLEARANCE SHALL NOT BE SO GREAT AS  
TO ALLOW FEED PAWL TO FEED MORE  
THAN TWO TEETH AT A TIME.
- (3) FEED PAWL DETENTED IN BOTH ITS RIGHT  
AND LEFT POSITION.

TO ADJUST

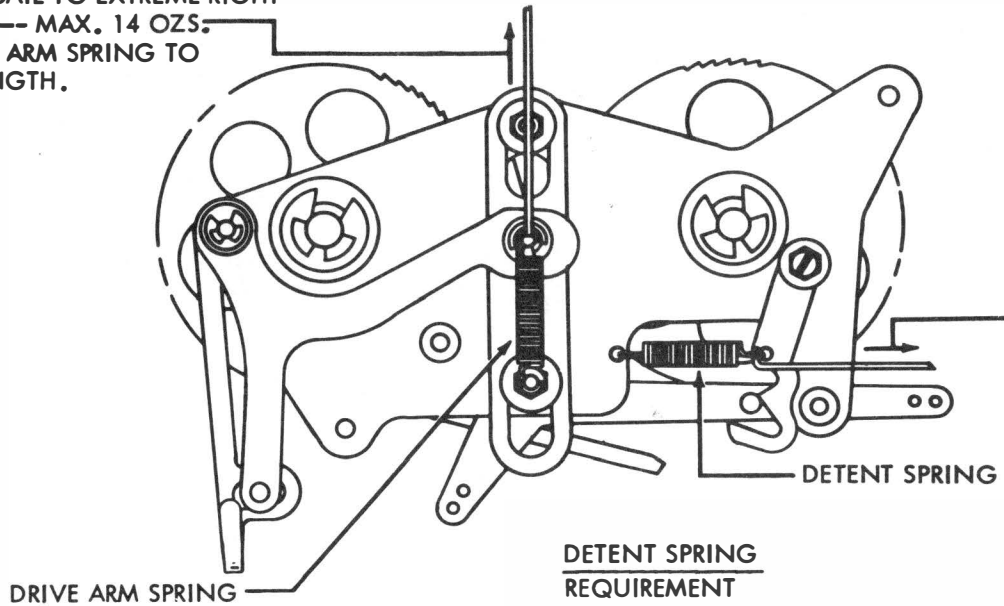
POSITION DRIVE ARM ADJUSTABLE EXTENSION  
LEVER WITH ITS MOUNTING SCREW LOOSENED.

2.58 Typing and Tape Depressor Mechanisms

DRIVE ARM SPRING

REQUIREMENT

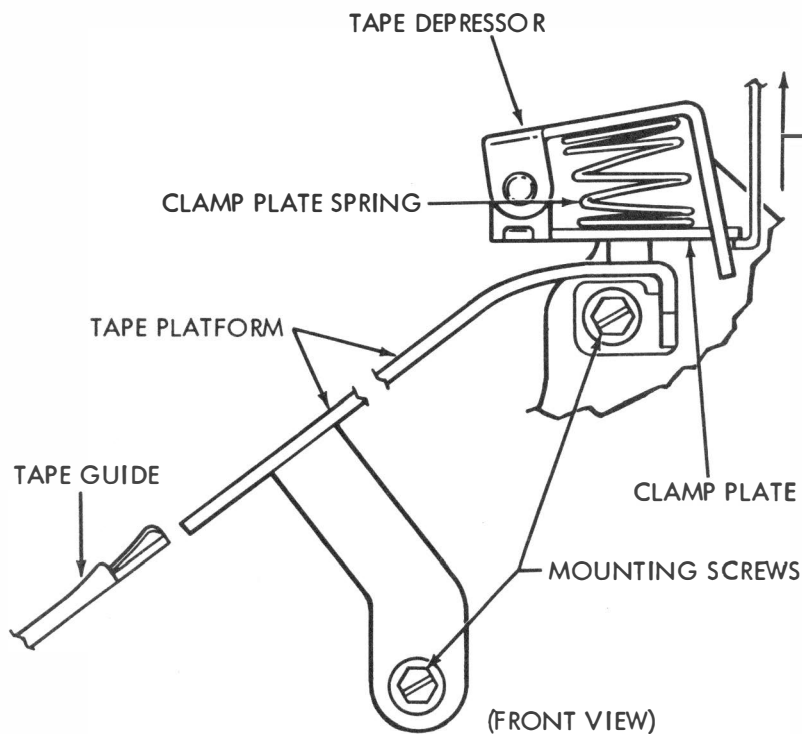
WITH ROCKER BAIL TO EXTREME RIGHT  
MIN. 9 OZS. --- MAX. 14 OZS.  
TO PULL DRIVE ARM SPRING TO  
INSTALLED LENGTH.



DETENT SPRING

REQUIREMENT

WITH REVERSING ARM IN ITS EXTREME  
RIGHT OR LEFT POSITION:  
MIN. 2 OZS. --- MAX. 4 OZS.  
TO PULL DETENT SPRING TO ITS  
INSTALLED LENGTH.



TAPE PLATFORM

REQUIREMENT

TOP SURFACE OF TAPE PLATFORM  
SHOULD BE FLUSH WITH TOP  
SURFACE OF TAPE GUIDE.

TO ADJUST

WITH TAPE PLATFORM MOUNTING  
SCREWS LOOSENED, POSITION  
TAPE PLATFORM.

CLAMP PLATE SPRING

REQUIREMENT

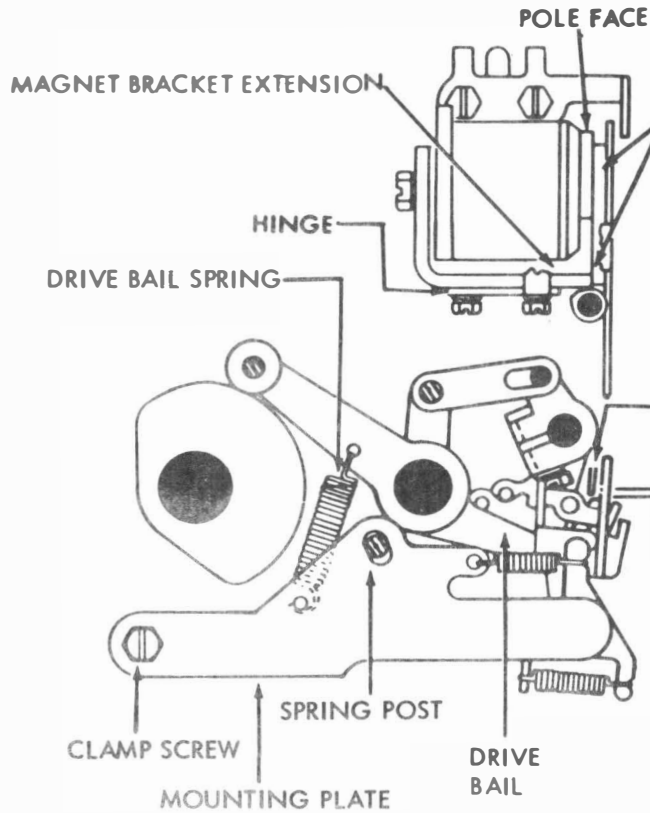
FUNCTION CLUTCH DISENGAGED  
AND LATCHED. CLAMP PLATE SPRING  
BOWED TO THE RIGHT.

MIN. 18 OZS. --- MAX. 24 OZS.  
TO MOVE CLAMP PLATE FROM BOTTOM  
OF SLOT IN TAPE DEPRESSOR.

3. VARIABLE FEATURES

REMOTE CONTROL NON-INTERFERING RUBOUT TAPE FEED-OUT MECHANISM

3.01 Remote Control Non-Interfering RUBOUT Tape Feed-Out Mechanism

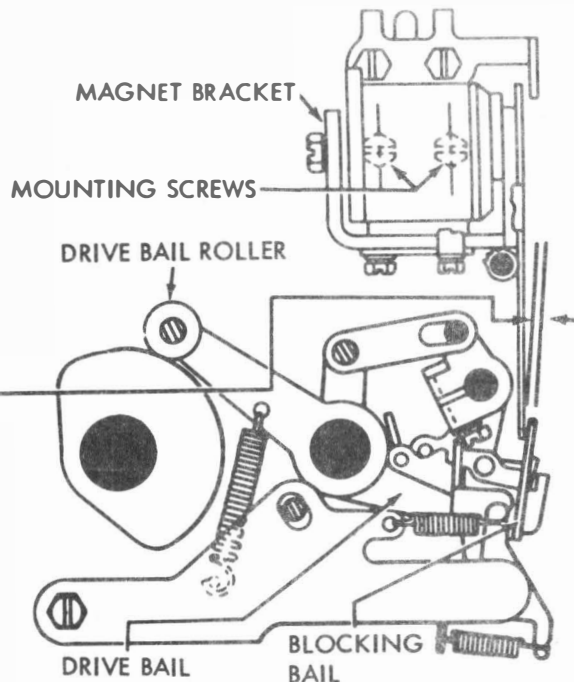


(A) ARMATURE HINGE  
 REQUIREMENT  
 WITH ARMATURE MANUALLY OPERATED, IT SHALL BE FLUSH AGAINST POLE FACE AND MAGNET BRACKET EXTENSION.  
 TO ADJUST  
 LOOSEN ARMATURE HINGE BRACKET MOUNTING SCREWS, POSITION ARMATURE AND TIGHTEN SCREWS.

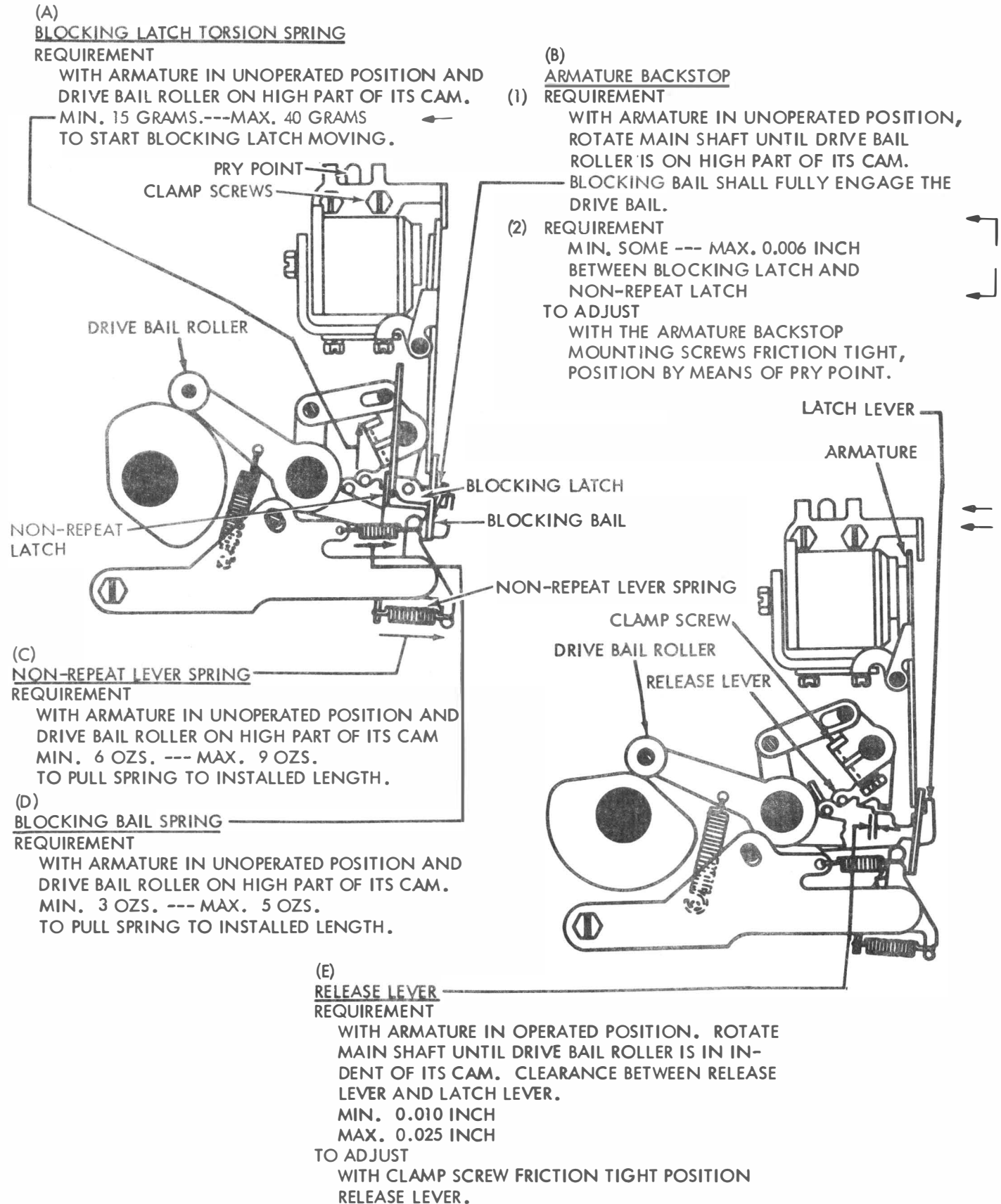
(B) DRIVE BAIL SPRING  
 REQUIREMENT  
 ROTATE MAIN SHAFT UNTIL DRIVE BAIL IS ON HIGH PART OF ITS CAM.  
 MIN. 20 OZS. --- MAX. 28 OZS.  
 TO START THE DRIVE BAIL MOVING.

(C) MOUNTING PLATE  
 REQUIREMENT  
 WITH ARMATURE IN UNOPERATED POSITION, ROTATE MAIN SHAFT UNTIL DRIVE BAIL IS ON HIGH PART OF ITS CAM. CLEARANCE BETWEEN THE BLOCKING BAIL AND DRIVE BAIL SURFACE.  
 MIN. 0.036 INCH  
 MAX. 0.015 INCH  
 TO ADJUST  
 POSITION BLOCKING BAIL WITH MOUNTING PLATE CLAMP SCREW AND SPRING POST FRICTION TIGHT.

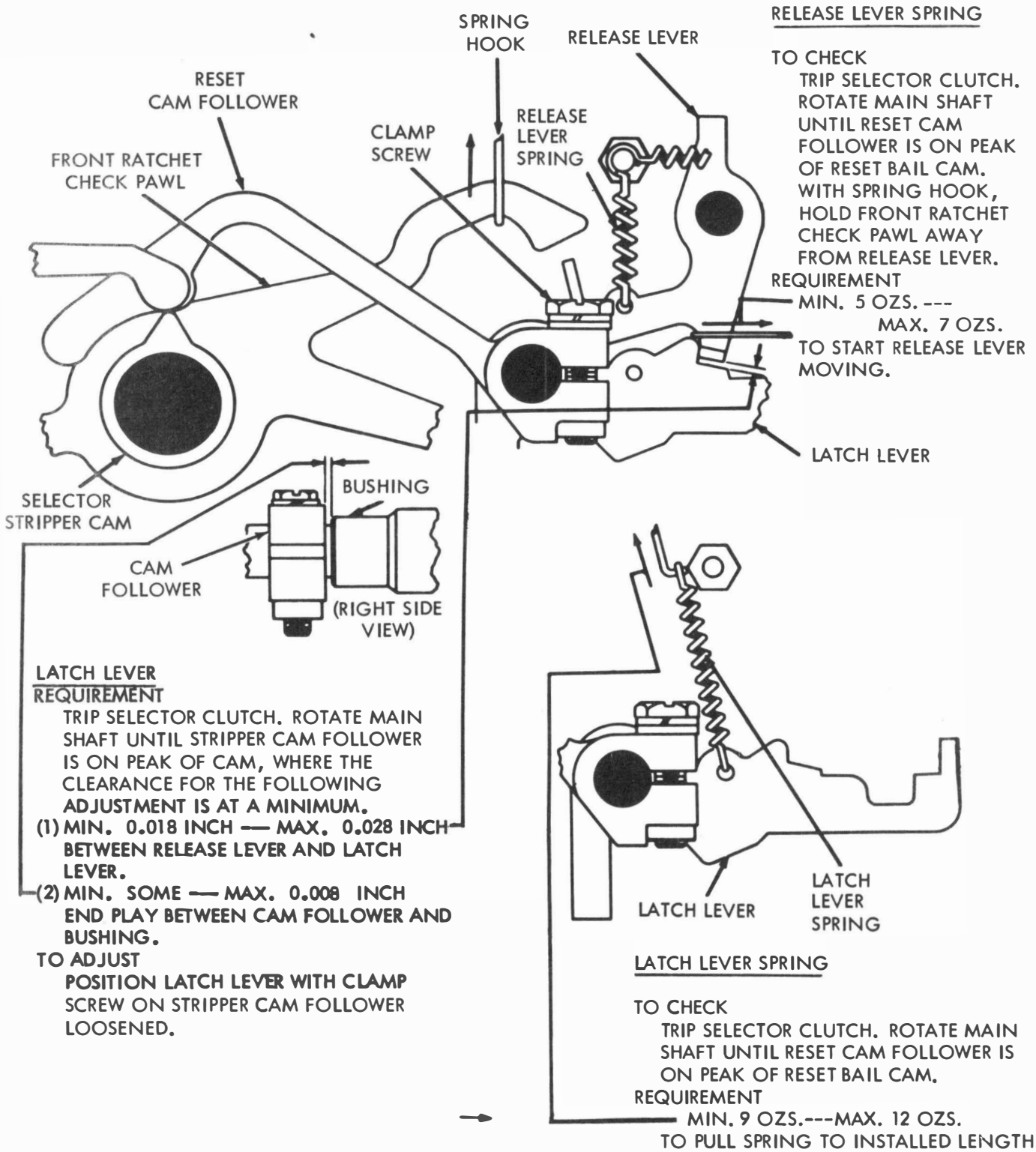
(D) MAGNET ASSEMBLY  
 REQUIREMENT  
 WITH ARMATURE HELD IN OPERATED POSITION, ROTATE MAIN SHAFT UNTIL DRIVE BAIL ROLLER IS ON HIGH PART OF ITS CAM. CLEARANCE BETWEEN BLOCKING BAIL AND RIGHT EDGE OF DRIVE BAIL.  
 MIN. 0.005 INCH  
 MAX. 0.015 INCH  
 TO ADJUST  
 POSITION MAGNET ASSEMBLY, ARMATURE HELD AGAINST MAGNET POLE PIECE WITH MAGNET BRACKET MOUNTING SCREWS FRICTION TIGHT.



3.02 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)



3.03 Remote Control Non-Interfering RUBOUT Tape Feed-Out Mechanism (continued)



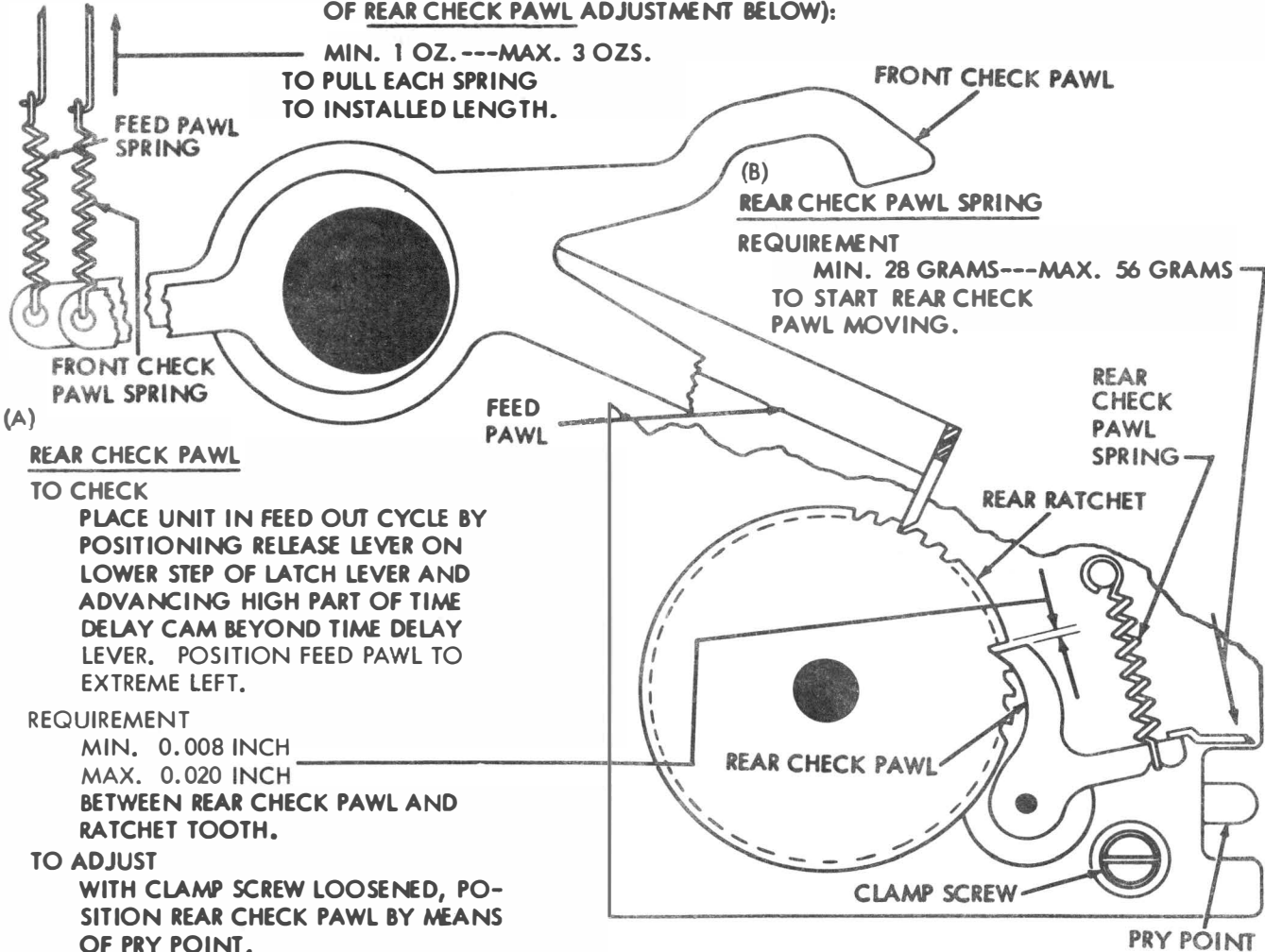


3.04 Remote Control Non-Interfering RUBOUT Tape Feed-Out Mechanism (continued)

(C) FEED PAWL AND FRONT CHECK PAWL SPRINGS

**REQUIREMENT**  
WITH UNIT IN FEED OUT CYCLE (SEE "TO CHECK"  
OF REAR CHECK PAWL ADJUSTMENT BELOW):

MIN. 1 OZ. ---MAX. 3 OZS.  
TO PULL EACH SPRING  
TO INSTALLED LENGTH.



(A) REAR CHECK PAWL

**TO CHECK**  
PLACE UNIT IN FEED OUT CYCLE BY  
POSITIONING RELEASE LEVER ON  
LOWER STEP OF LATCH LEVER AND  
ADVANCING HIGH PART OF TIME  
DELAY CAM BEYOND TIME DELAY  
LEVER. POSITION FEED PAWL TO  
EXTREME LEFT.

**REQUIREMENT**  
MIN. 0.008 INCH  
MAX. 0.020 INCH  
BETWEEN REAR CHECK PAWL AND  
RATCHET TOOTH.

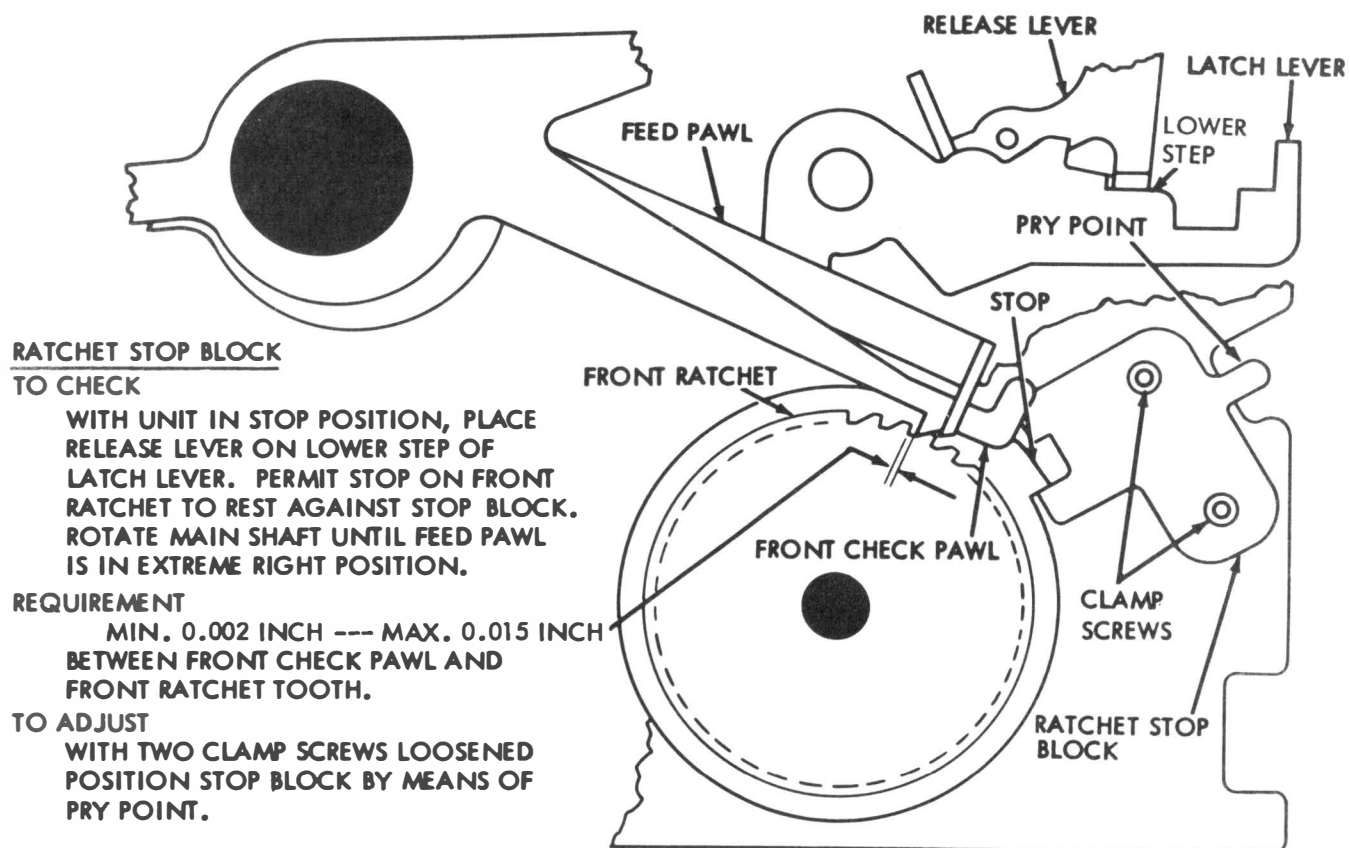
**TO ADJUST**  
WITH CLAMP SCREW LOOSENED, PO-  
SITION REAR CHECK PAWL BY MEANS  
OF PRY POINT.

(B) REAR CHECK PAWL SPRING  
**REQUIREMENT**  
MIN. 28 GRAMS ---MAX. 56 GRAMS  
TO START REAR CHECK  
PAWL MOVING.

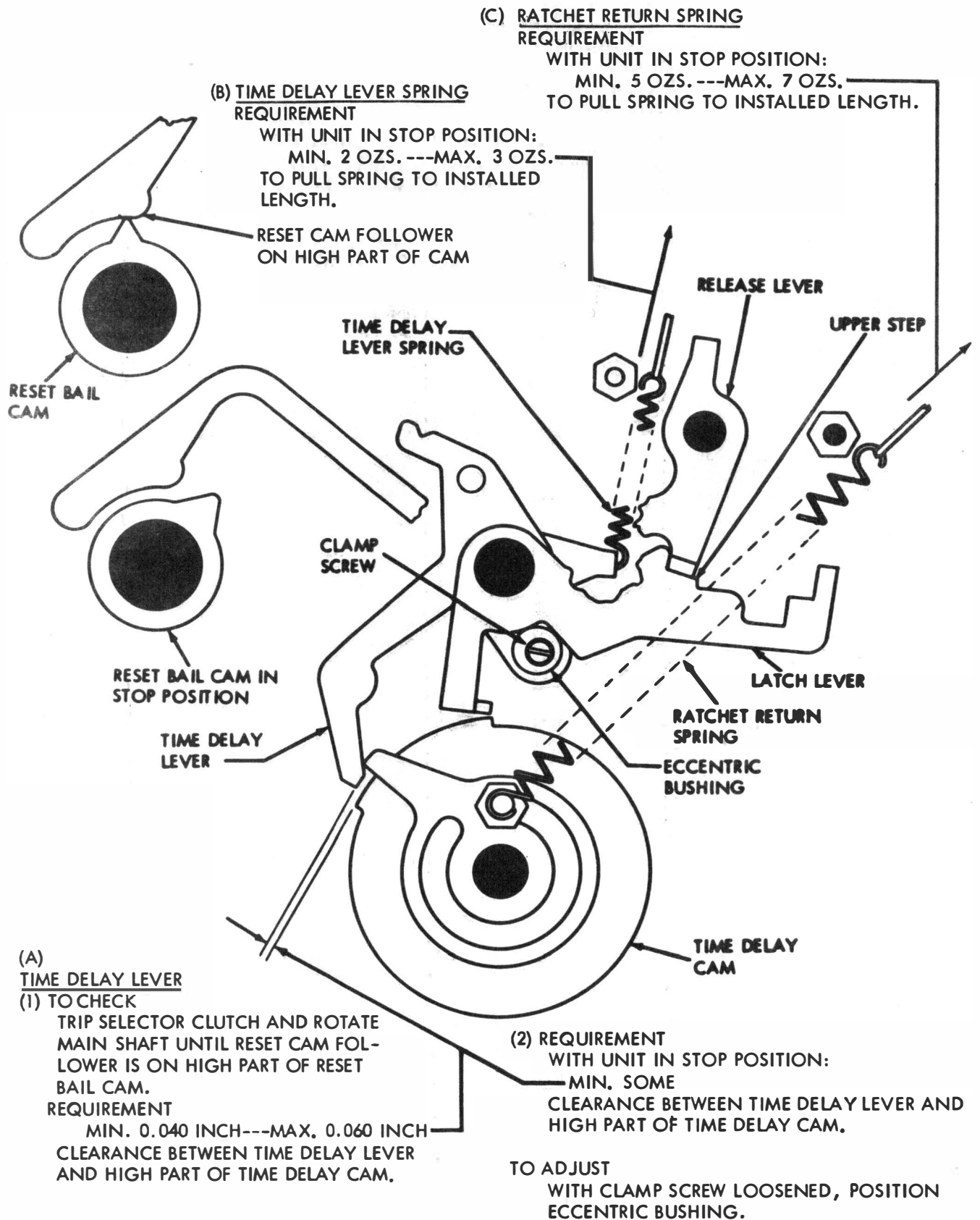
**NOTE:** PROCEED TO RATCHET  
STOP BLOCK ADJUSTMENT  
(PARAGRAPH 3.05).

3.05 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)

**NOTE: SEE REAR CHECK PAWL  
ADJUSTMENT (PARAGRAPH 3.04)  
BEFORE MAKING THIS ADJUSTMENT.**



3.06 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)



3.07 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)

(A) RELEASE ARM

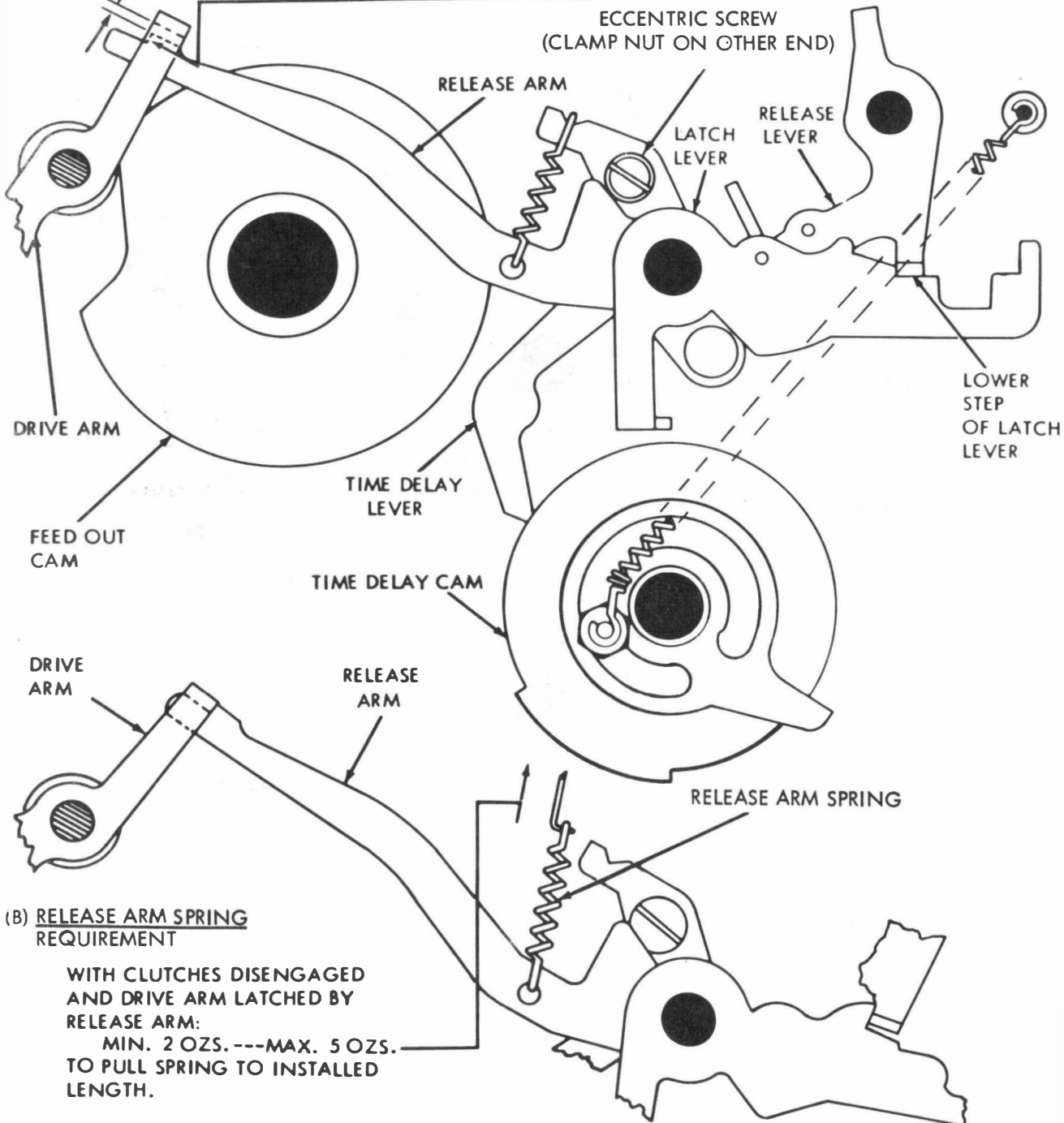
(1) REQUIREMENT

WITH UNIT IN THE FEED-OUT CYCLE,  
RATCHETS ADVANCED BEYOND THE TIME  
DELAY, CLEARANCE BETWEEN THE DRIVE  
ARM AND UPPER SURFACE OF RELEASE ARM  
MIN. 0.010 INCH  
MAX. 0.030 INCH  
POSITION CAM SO SURFACES ARE IN LINE.

(2) REQUIREMENT

WITH UNIT IN STOP POSITION THE SURFACE  
OF THE DRIVE ARM BAIL THAT DOES NOT  
ENGAGE THE RELEASE ARM SHALL NOT EXCEED  
MAX. 0.015 INCH

TO ADJUST  
WITH CLAMP NUT FRICTION TIGHT, POSITION  
RELEASE ARM BY MEANS OF ECCENTRIC  
SCREW ON TIME DELAY LEVER.



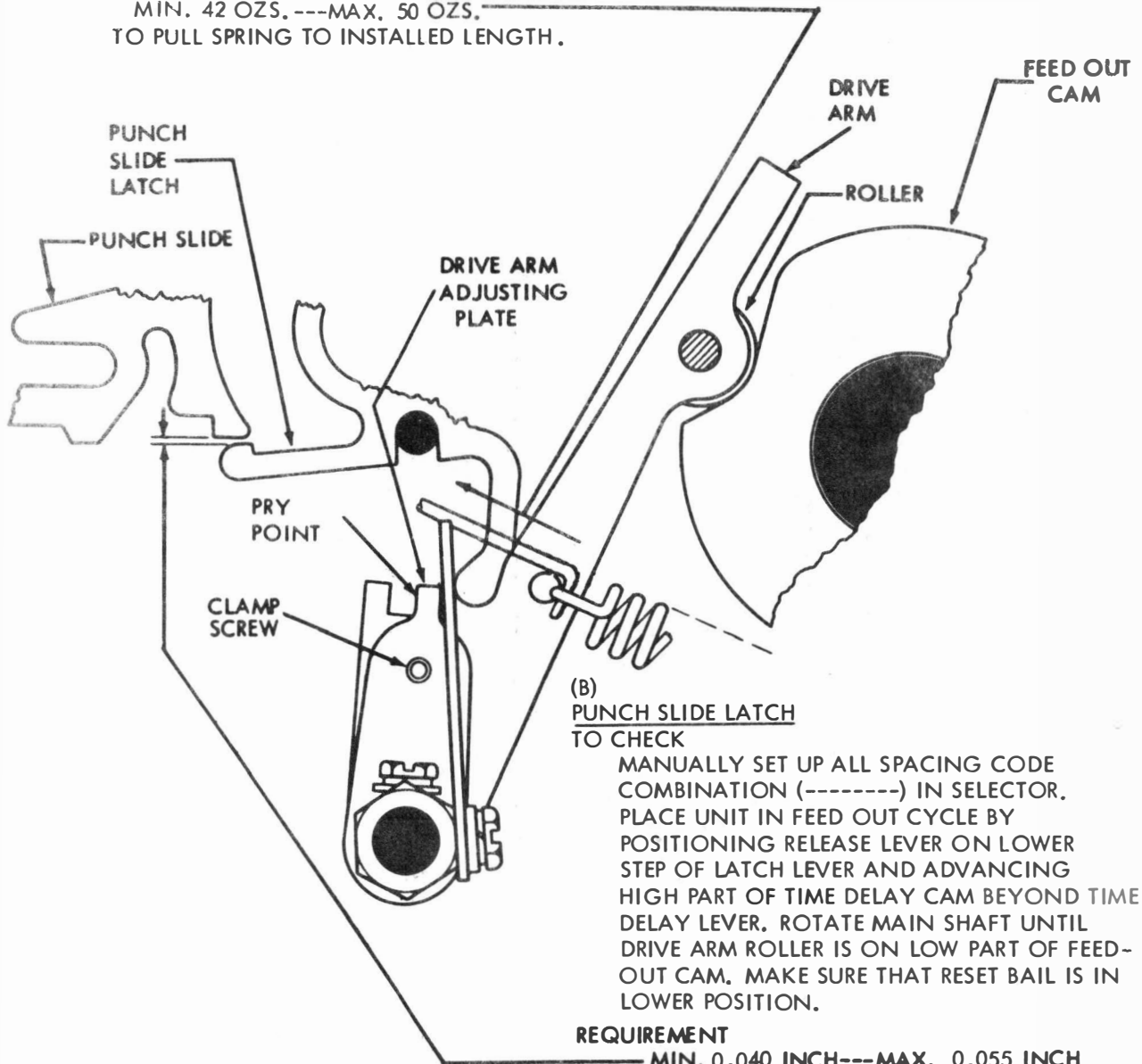
(B) RELEASE ARM SPRING  
REQUIREMENT

WITH CLUTCHES DISENGAGED  
AND DRIVE ARM LATCHED BY  
RELEASE ARM:  
MIN. 2 OZS. --- MAX. 5 OZS.  
TO PULL SPRING TO INSTALLED  
LENGTH.

3.08 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)

(A) DRIVE ARM SPRING  
REQUIREMENT

WITH UNIT IN FEED-OUT CYCLE AND DRIVE ARM  
ROLLER HELD FIRMLY AGAINST ITS CAM INDENT.  
MIN. 42 OZS. ---MAX. 50 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.



(B) PUNCH SLIDE LATCH  
TO CHECK

MANUALLY SET UP ALL SPACING CODE  
COMBINATION (-----) IN SELECTOR.  
PLACE UNIT IN FEED OUT CYCLE BY  
POSITIONING RELEASE LEVER ON LOWER  
STEP OF LATCH LEVER AND ADVANCING  
HIGH PART OF TIME DELAY CAM BEYOND TIME  
DELAY LEVER. ROTATE MAIN SHAFT UNTIL  
DRIVE ARM ROLLER IS ON LOW PART OF FEED-  
OUT CAM. MAKE SURE THAT RESET BAIL IS IN  
LOWER POSITION.

REQUIREMENT

MIN. 0.040 INCH ---MAX. 0.055 INCH  
BETWEEN PUNCH SLIDE AND PUNCH SLIDE LATCH AT  
SLIDE WHERE CLEARANCE IS LEAST.

TO ADJUST

WITH CLAMP SCREW LOOSENED, POSITION DRIVE  
ARM ADJUSTING PLATE BY MEANS OF PRY POINT.

NOTE: THERE SHALL BE SOME CLEARANCE BETWEEN THE PUNCH SLIDE LATCHES  
AND THE PUNCH SLIDE LATCH TRIP PLATE WHEN THE DRIVE ARM IS LATCHED BY  
THE RELEASE ARM AND THE RELEASE ARM ROLLER IS OVER THE INDENT OF THE  
CAM. REFINE ADJUSTMENT IF NECESSARY.

3.09 Remote Control Non-Interfering RUBOUT Tape Feed-Out Mechanism (continued)

**(B) ADJUSTING LEVER TO CHECK**

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING RELEASE LEVER ON LOWER STEP OF LATCH LEVER AND ADVANCING HIGH PART OF TIME DELAY CAM BEYOND TIME DELAY LEVER. POSITION MAIN SHAFT SO THAT DRIVE ARM ROLLER IS ON LOW PART OF CAM.

**REQUIREMENT**

- (1) MIN. 0.010 INCH --- MAX. 0.030 INCH BETWEEN RELEASE AND MAIN TRIP LEVER.
- (2) SOME CLEARANCE BETWEEN MAIN TRIP LEVER AND DOWNSTOP BRACKET.

**TO ADJUST**

LOOSEN THE CLAMP SCREW ON THE ADJUSTING LEVER AND POSITION MAKING SURE THE ADJUSTING LEVER RIDES FULLY ON THE SLIDE TRIP LEVER. TIGHTEN SCREW.

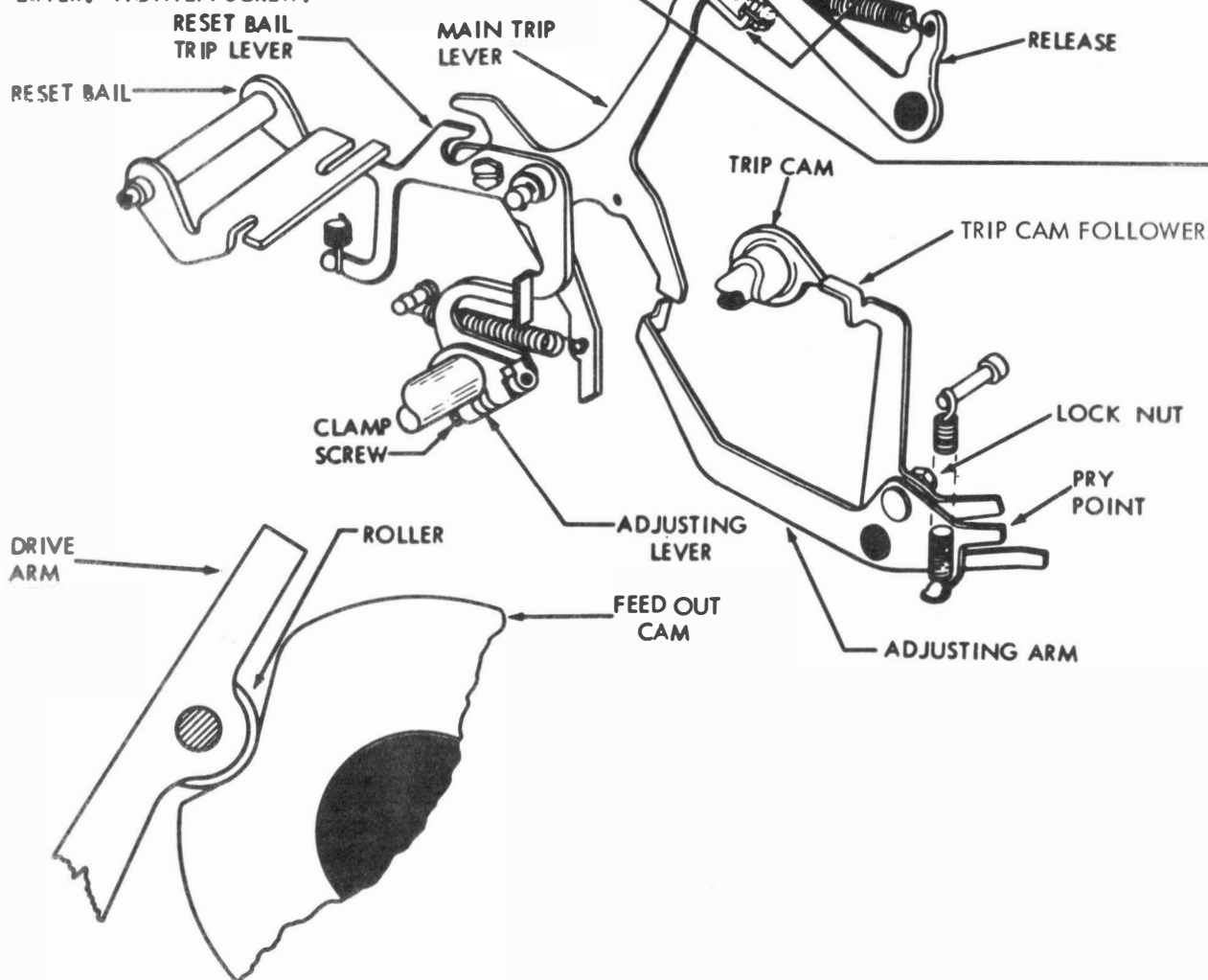
**(A) TRIP CAM FOLLOWER REQUIREMENT**

WITH FOLLOWER LEVER ON HIGH PART OF TRIP CAM:

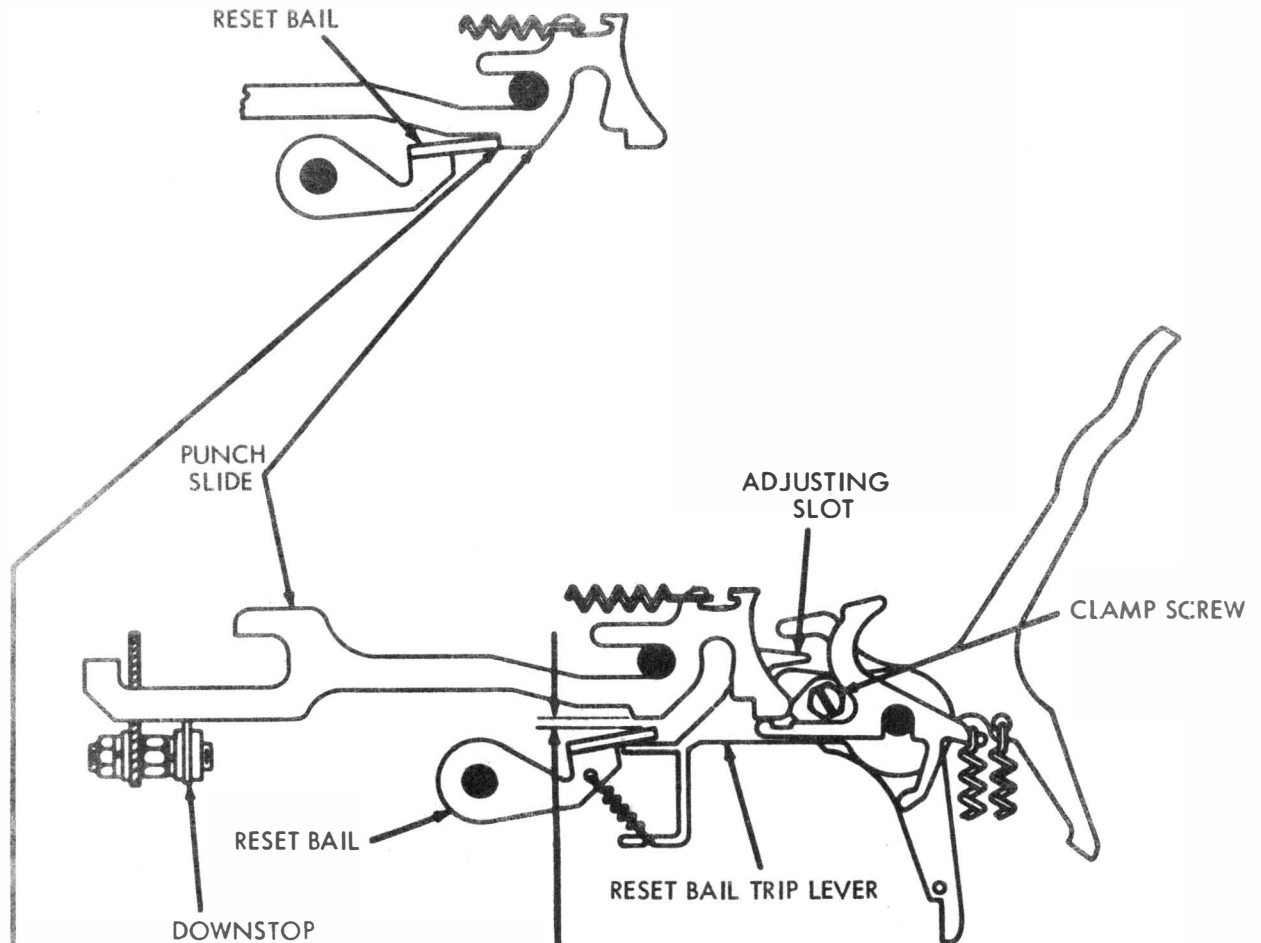
- (1) MIN. 0.010 INCH --- MAX. 0.030 INCH BETWEEN RELEASE AND MAIN TRIP LEVER.
- (2) SOME CLEARANCE BETWEEN MAIN TRIP LEVER AND DOWNSTOP BRACKET.

**TO ADJUST**

WITH LOCK NUT LOOSENED, POSITION ADJUSTING ARM BY MEANS OF PRY POINT.



3.10 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)



RESET BAIL TRIP LEVER

(1) TO CHECK

SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. POSITION PUNCH SLIDES AGAINST DOWNSTOP. TRIP CAM FOLLOWER ON HIGH PART OF CAM.

REQUIREMENT

MIN. 0.008 INCH---MAX. 0.020 INCH  
BETWEEN PUNCH SLIDE AND RESET BAIL.

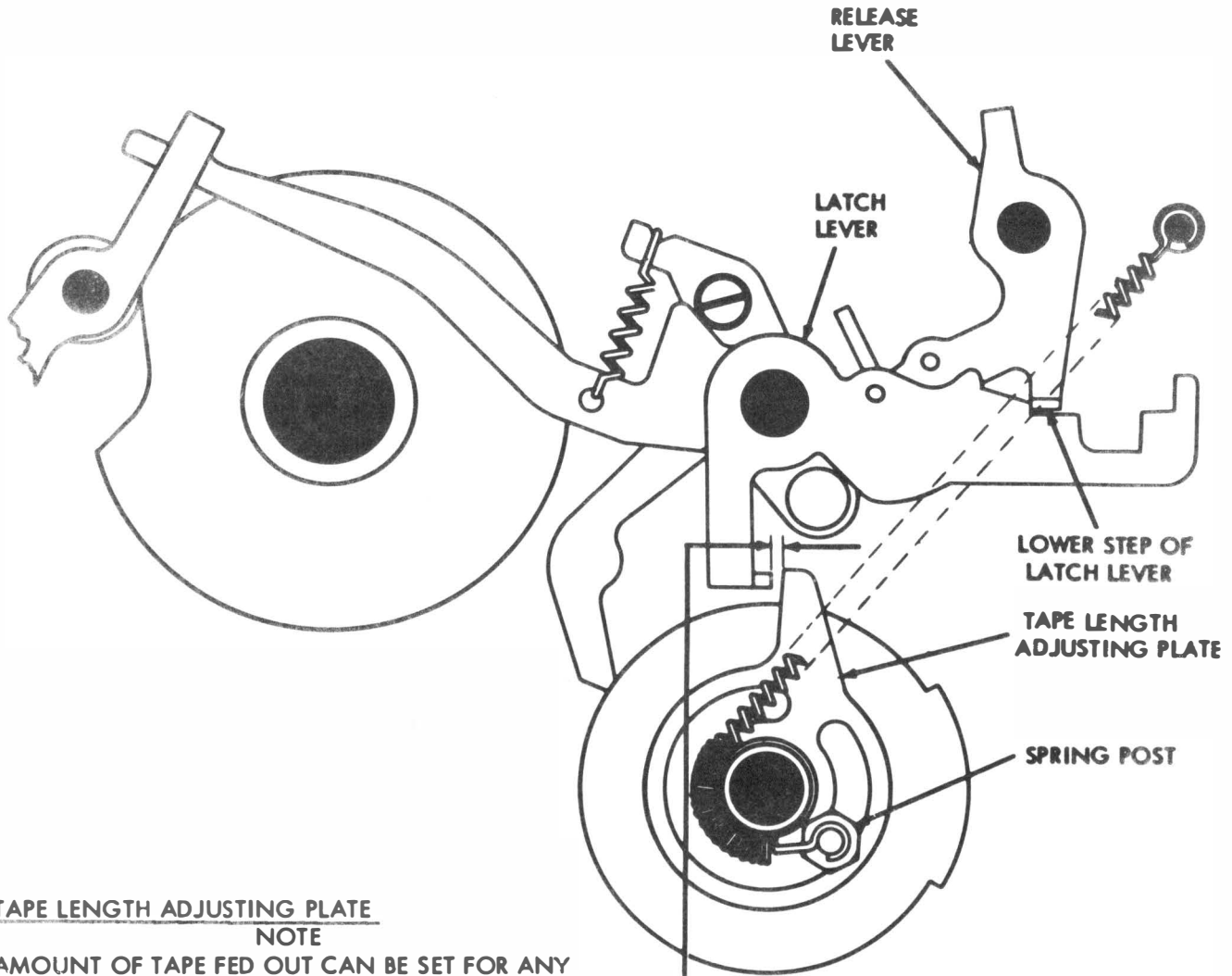
(2) REQUIREMENT

WITH CLUTCHES FULLY DISENGAGED AND LATCHED, RESET BAIL SHOULD FULLY ENGAGE NOTCHES IN PUNCH SLIDES.

TO ADJUST

WITH CLAMP SCREW LOOSENED, POSITION RESET BAIL TRIP LEVER BY MEANS OF ADJUSTING SLOT.

3.11 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)



TAPE LENGTH ADJUSTING PLATE

NOTE

AMOUNT OF TAPE FED OUT CAN BE SET FOR ANY  
LENGTH UP TO 18 INCHES.

(1) REQUIREMENT

PLACE UNIT IN FEED OUT CYCLE BY POSITIONING  
RELEASE LEVER ON LOWER STEP OF LATCH LEVER.  
MANUALLY ADVANCE RATCHETS SO THAT FRONT  
RATCHET IS IN THE TOOTH PRECEDING TRIP OFF.  
ROTATE MAIN SHAFT UNTIL FEED PAWL IS IN THE  
EXTREME LEFT POSITION. CLEARANCE BETWEEN  
ADJUSTING PLATE AND LATCH LEVER PROJECTION:  
MIN. 0.002 INCH  
MAX. 0.020 INCH

(2) REQUIREMENT

WHEN OPERATING UNDER POWER, UNIT  
SHOULD FEED OUT CORRECT LENGTH OF TAPE.

TO ADJUST

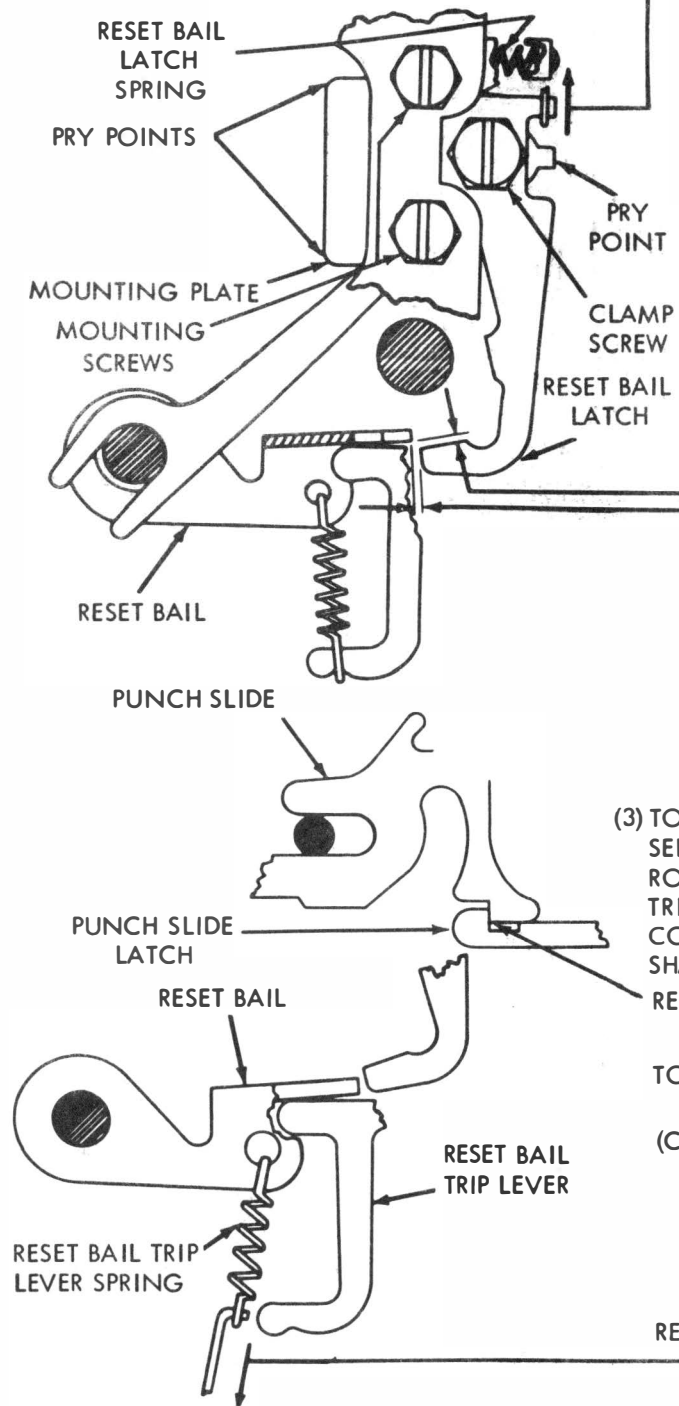
WITH SPRING POST FRICTION TIGHT. POSITION  
ADJUSTING PLATE.



3.12 Remote Control Non-Interfering  
RUBOUT Tape Feed-Out Mechanism (continued)

(B) RESET BAIL LATCH SPRING  
REQUIREMENT

WITH UNIT IN STOP CONDITION  
MIN. 1 OZ. ----MAX. 3 OZS.  
TO START RESET BAIL LATCH MOVING.



(A) RESET BAIL LATCH

TO CHECK

(VERTICAL CLEARANCE) SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS AND PUNCH SLIDES ARE TO EXTREME LEFT. MANUALLY SET UP ALL SPACING CODE COMBINATION (-----) IN SELECTOR. ROTATE MAIN SHAFT UNTIL PUNCH SLIDES ARE JUST LATCHED.

(1) REQUIREMENT

MIN. 0.008 INCH----MAX. 0.020 INCH  
BETWEEN RESET BAIL AND RESET BAIL LATCH.

TO ADJUST

WITH MOUNTING SCREWS LOOSENED, POSITION MOUNTING PLATE BY MEANS OF PRY POINTS.

(2) REQUIREMENT (HORIZONTAL CLEARANCE)

WITH CLUTCHES DISENGAGED,  
MIN. 0.005 INCH---MAX. 0.020 INCH  
BETWEEN RESET BAIL AND RESET BAIL LATCH.

TO ADJUST

POSITION RESET BAIL SO THAT APPROX. HALF ITS THICKNESS IS BELOW TOP SURFACE OF ITS LATCH. WITH CLAMP SCREW LOOSENED, POSITION RESET BAIL LATCH BY MEANS OF PRY POINT.

(3) TO CHECK

SELECT RUBOUT CODE COMBINATION (12345678). ROTATE MAIN SHAFT UNTIL FUNCTION CLUTCH TRIPS. MANUALLY SET UP ALL SPACING CODE COMBINATION (-----). ROTATE MAIN SHAFT TO STOP POSITION.

REQUIREMENT

PUNCH SLIDES LATCHED BY PUNCH SLIDE LATCHES.

TO ADJUST

REFINE (1) AND (2) ABOVE.

(C) RESET BAIL TRIP LEVER SPRING

TO CHECK

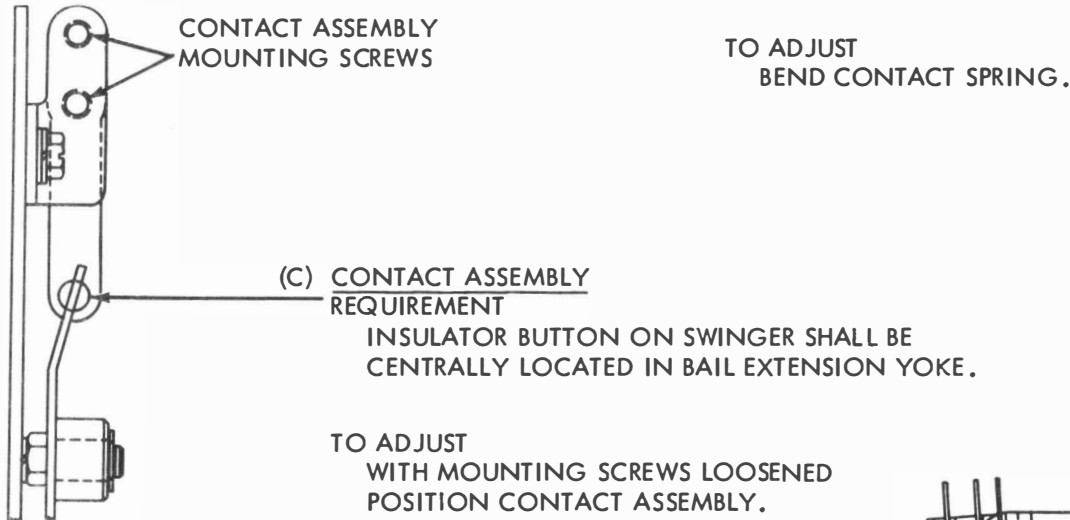
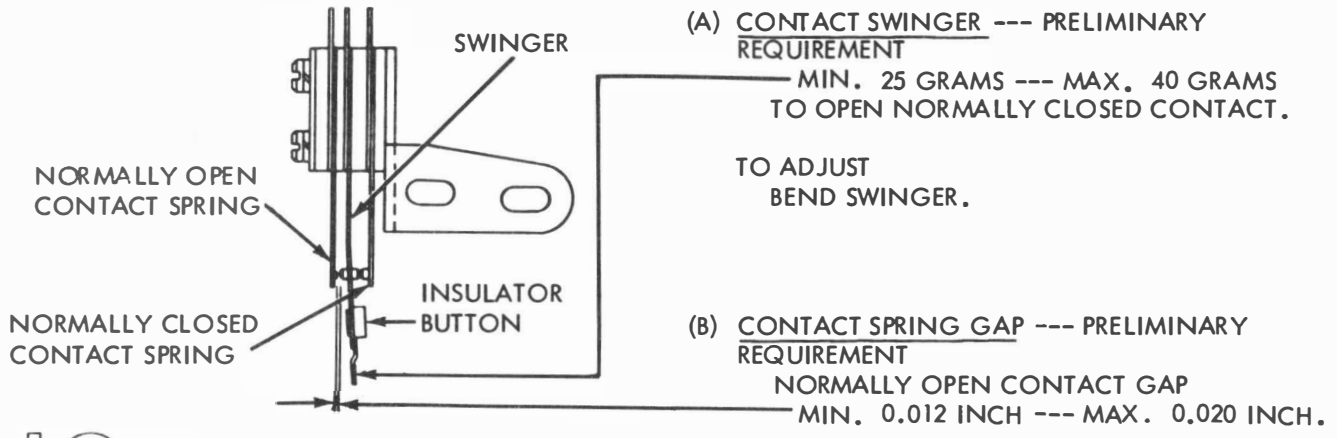
DISENGAGE BOTH CLUTCHES. TRIP FUNCTION CLUTCH BY PIVOTING MAIN TRIP LEVER COUNTERCLOCKWISE. HOLD RESET BAIL TRIP LEVER UP AGAINST RESET BAIL.

REQUIREMENT

MIN. 18 OZS. ----MAX. 24.OZS.  
TO PULL SPRING TO INSTALLED LENGTH.

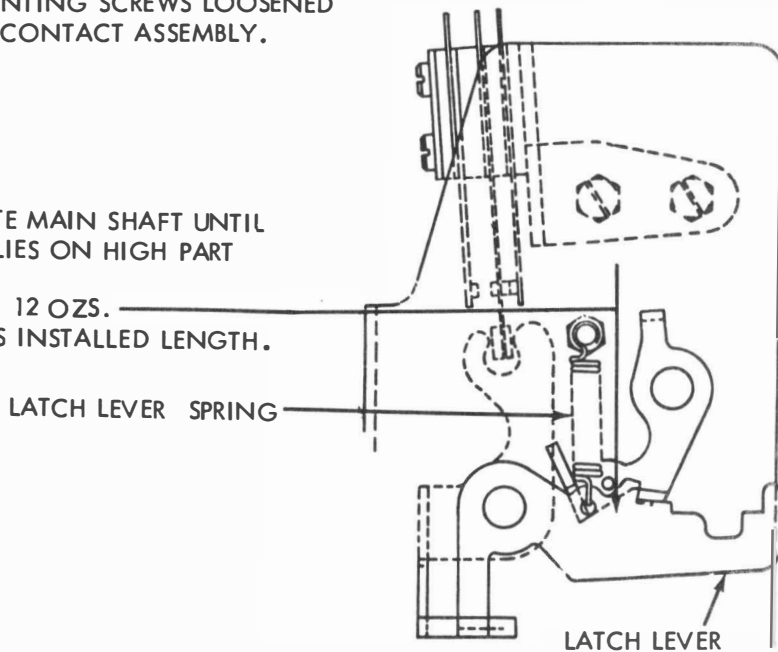
TIMING CONTACTS

3. 13 End of Feed-Out Contacts for Non-Interfering RUBOUT Tape Feed-Out Mechanism.



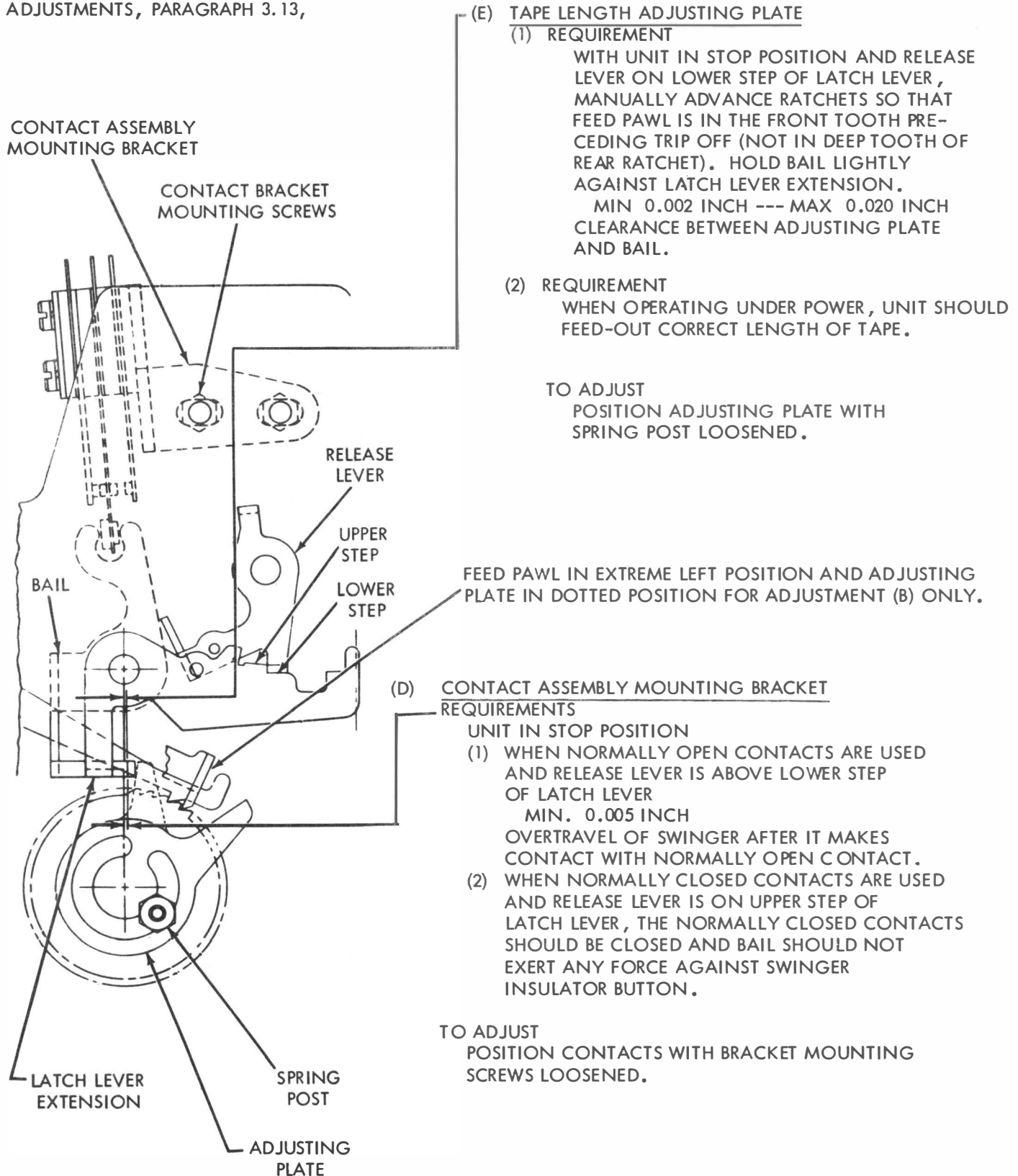
LATCH LEVER SPRING REQUIREMENT

TRIP SELECTOR AND ROTATE MAIN SHAFT UNTIL STRIPPER CAM FOLLOWER LIES ON HIGH PART OF ITS CAM  
 MIN. 9 OZS. --- MAX. 12 OZS.  
 TO STRETCH SPRING TO ITS INSTALLED LENGTH.



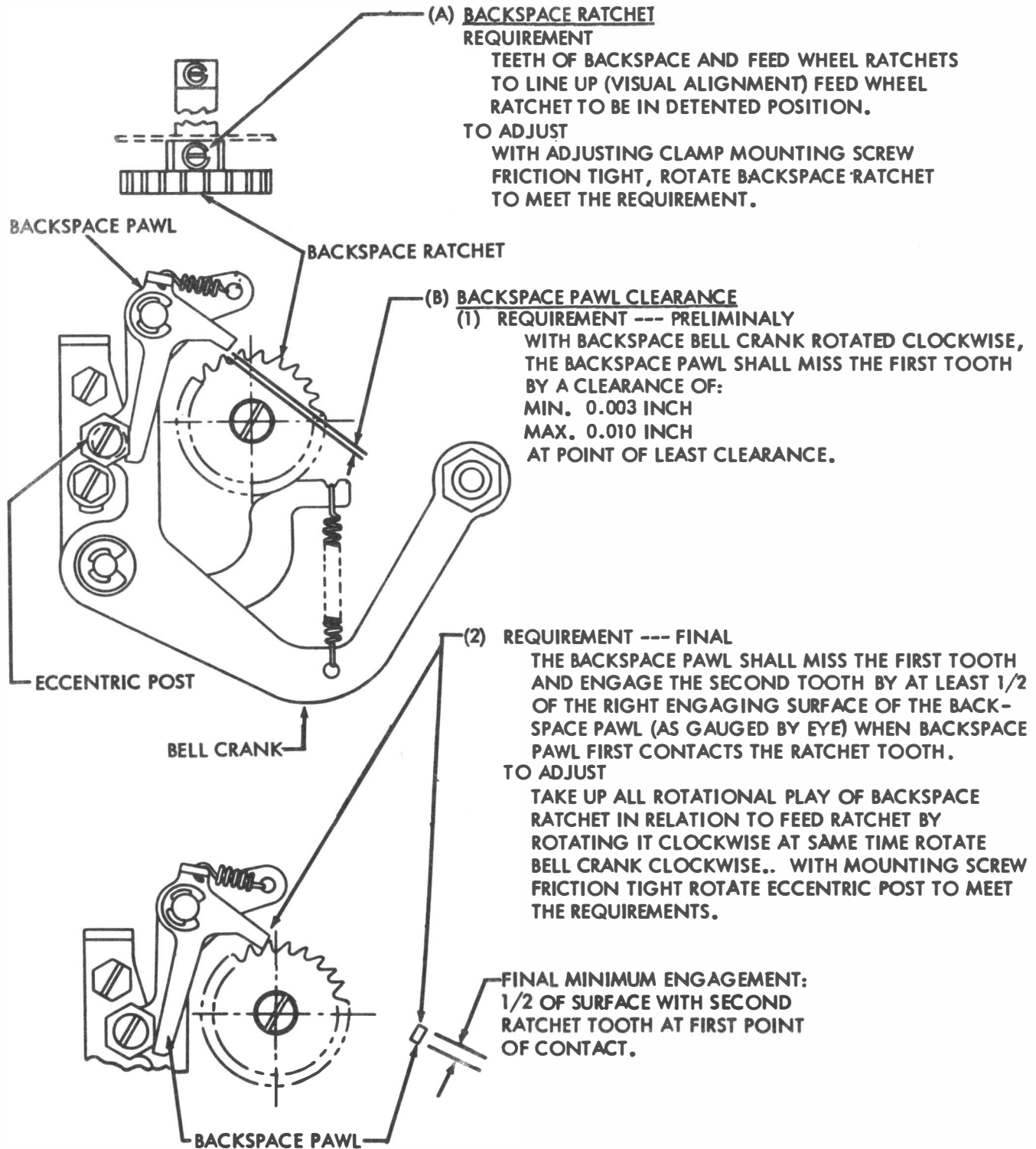
### 3.14 End of Feed-Out Contacts for Non-Interfering RUBOUT Tape Feed-Out Mechanism (continued)

NOTE: SEE PRELIMINARY CONTACT ADJUSTMENTS, PARAGRAPH 3.13,



MANUAL AND POWER DRIVE BACKSPACE MECHANISMS

3.15 Manual Backspace Mechanism

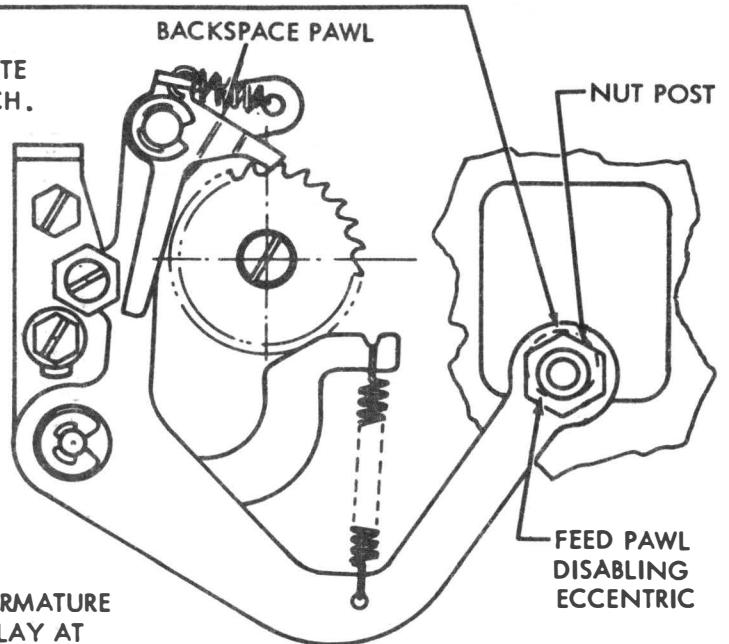


3.16 Manual and Power Drive Backspace Mechanism

(A) FEED PAWL DISABLING REQUIREMENT

WHEN BELL CRANK IS IN OPERATED POSITION HIGH SIDE OF FEED PAWL DISABLING ECCENTRIC SHOULD BE IN UPPERMOST POSITION.

TO ADJUST  
WITH NUT POST FRICTION TIGHT, ROTATE ECCENTRIC WITH A 0.060" ALLEN WRENCH.

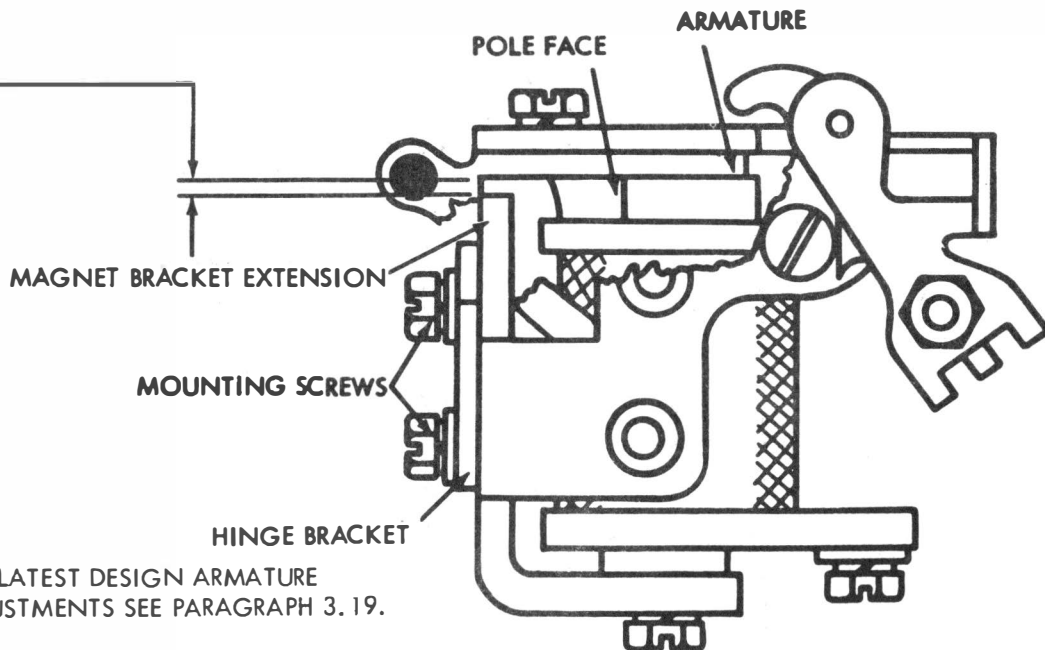


(B) ARMATURE HINGE (EARLY DESIGN) REQUIREMENT

WITH ARMATURE BAIL SPRING REMOVED, ARMATURE HELD AGAINST THE POLE FACE, TAKE UP PLAY AT HINGE IN A DOWNWARD DIRECTION. CLEARANCE BETWEEN THE ARMATURE AND MAGNET BRACKET. MIN. SOME  
MAX. 0.004 INCH

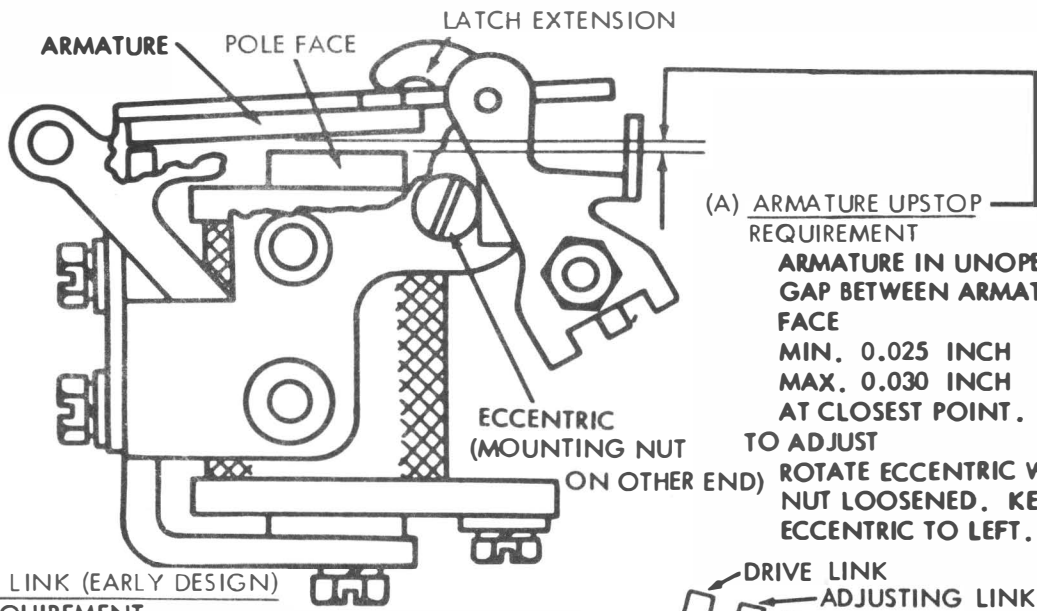
TO ADJUST  
WITH HINGE MOUNTING SCREWS FRICTION TIGHT, POSITION HINGE. ARMATURE SHOULD TOUCH FRONT AND REAR OF POLE FACE. TIGHTEN SCREWS AND RECHECK ADJUSTMENT.

NOTE: FOR DC OPERATION, THE ARMATURE SHALL BE POSITIONED SO THAT THE SIDE MARKED "C" FACES POLE FACE OF MAGNET CORE. FOR AC OPERATION, UN-MARKED SIDE FACES POLE.

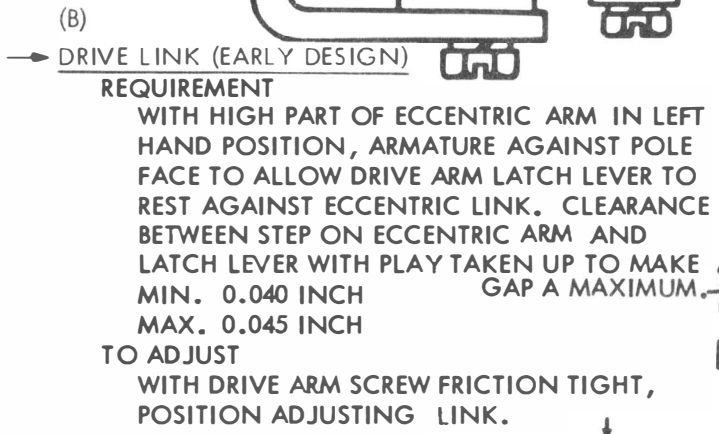


NOTE: FOR LATEST DESIGN ARMATURE ADJUSTMENTS SEE PARAGRAPH 3.19.

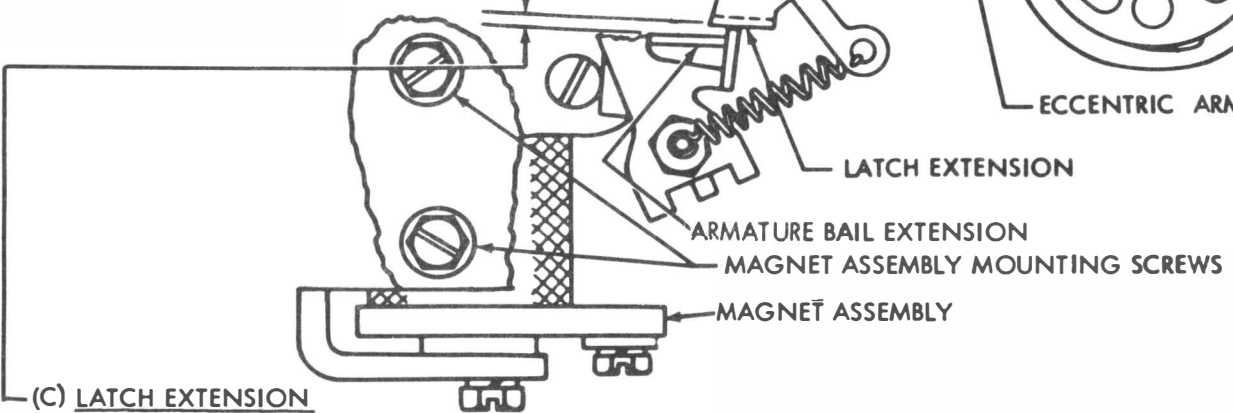
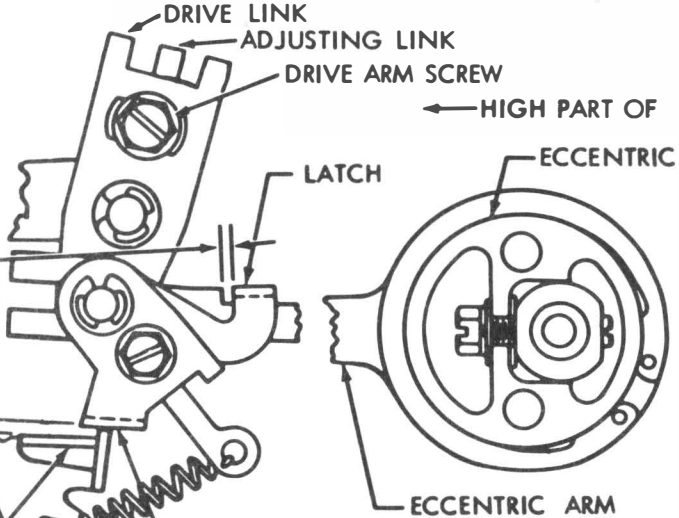
→ 3.17 Power Drive Backspace Mechanism



(A) ARMATURE UPSTOP  
 REQUIREMENT  
 ARMATURE IN UNOPERATED POSITION.  
 GAP BETWEEN ARMATURE AND POLE  
 FACE  
 MIN. 0.025 INCH  
 MAX. 0.030 INCH  
 AT CLOSEST POINT.  
 TO ADJUST  
 ROTATE ECCENTRIC WITH MOUNTING  
 NUT LOOSENED. KEEP HIGH PART OF  
 ECCENTRIC TO LEFT.

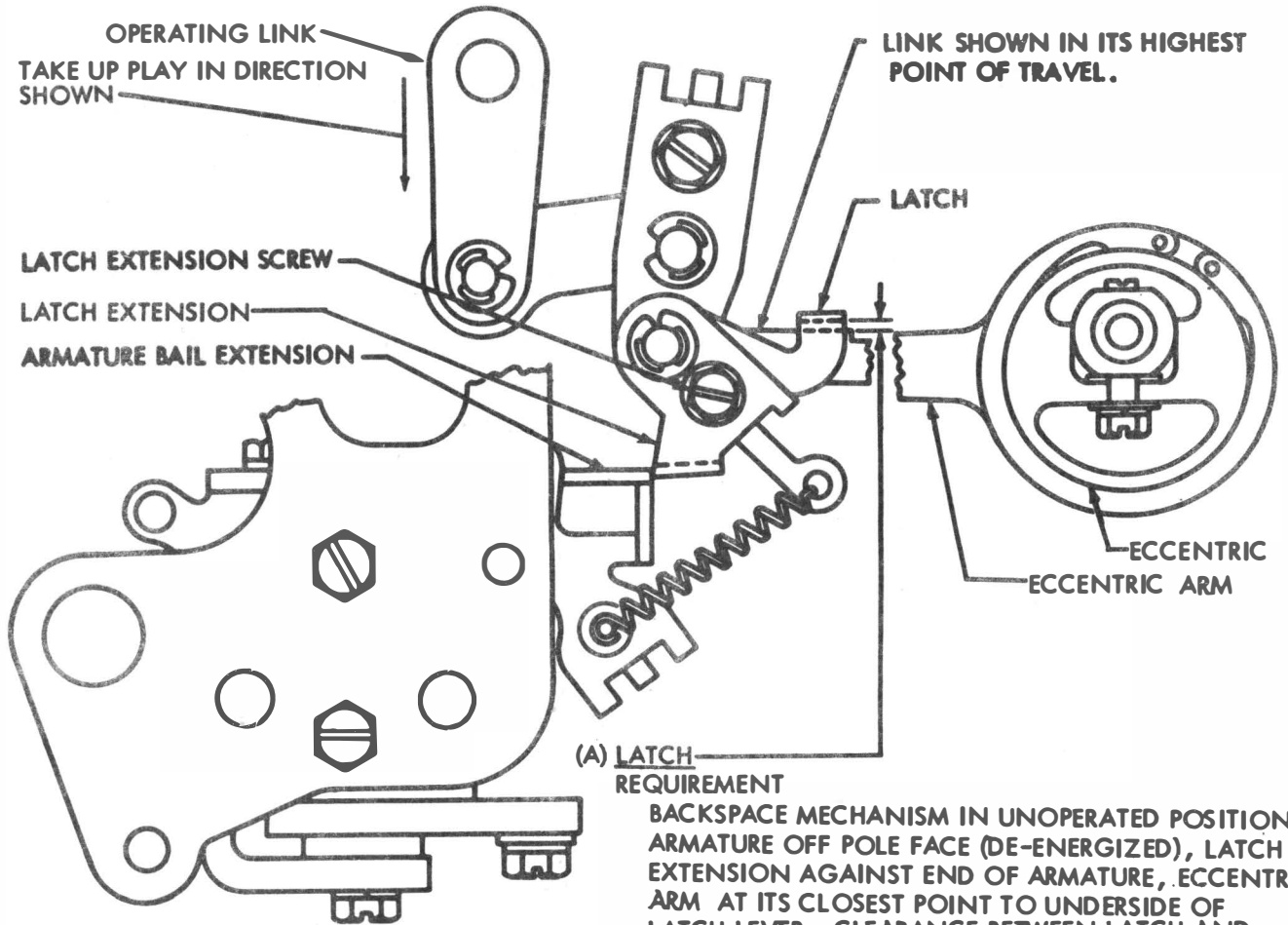


(B) DRIVE LINK (EARLY DESIGN)  
 REQUIREMENT  
 WITH HIGH PART OF ECCENTRIC ARM IN LEFT  
 HAND POSITION, ARMATURE AGAINST POLE  
 FACE TO ALLOW DRIVE ARM LATCH LEVER TO  
 REST AGAINST ECCENTRIC LINK. CLEARANCE  
 BETWEEN STEP ON ECCENTRIC ARM AND  
 LATCH LEVER WITH PLAY TAKEN UP TO MAKE  
 MIN. 0.040 INCH  
 MAX. 0.045 INCH  
 TO ADJUST  
 WITH DRIVE ARM SCREW FRICTION TIGHT,  
 POSITION ADJUSTING LINK.



(C) LATCH EXTENSION  
 REQUIREMENT  
 WITH BACKSPACE MECHANISM IN UNOPERATED POSITION,  
 ECCENTRIC HIGH PART OF THE LEFT, ARMATURE AGAINST  
 THE POLE FACE, LATCH RESTING ON THE ECCENTRIC ARM  
 NOTCH. CLEARANCE BETWEEN TOP OF ARMATURE EX-  
 TENSION AND LATCH EXTENSION.  
 MIN. 0.005 INCH  
 MAX. 0.020 INCH  
 TO ADJUST  
 WITH MAGNET MOUNTING SCREWS FRICTION TIGHT,  
 SWING MAGNET LEFT OR RIGHT.

3.18 Power Drive Backspace Mechanism (continued)

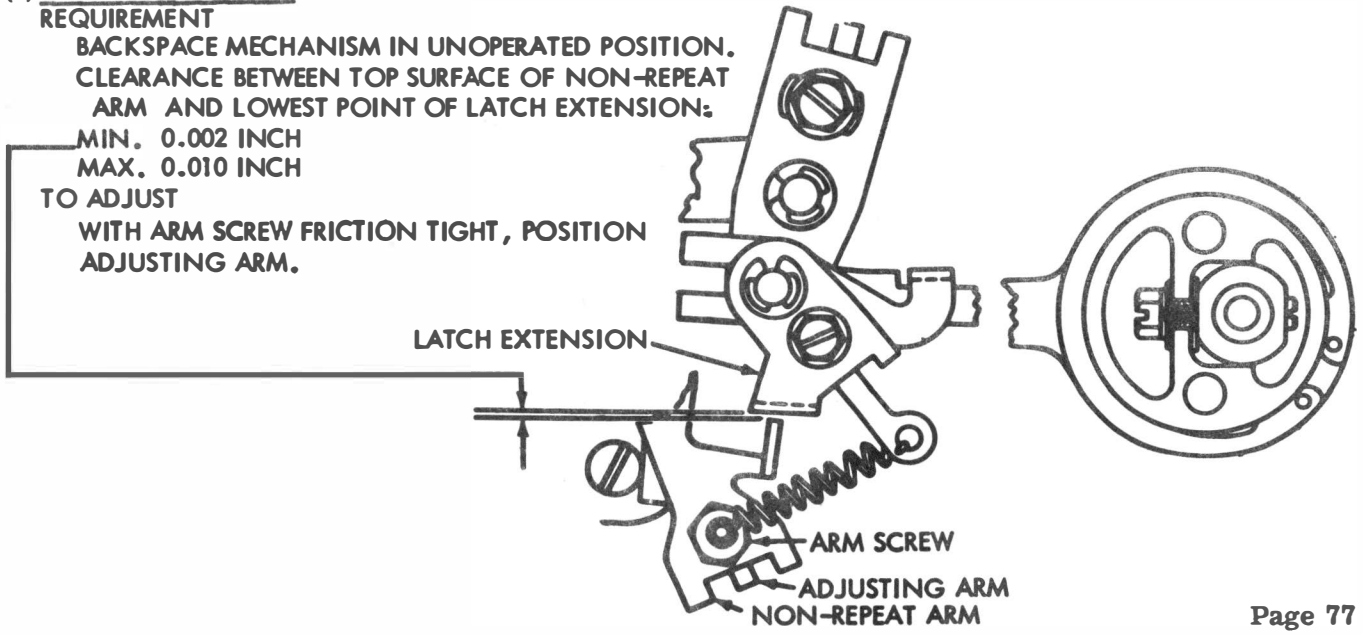


**(A) LATCH REQUIREMENT**  
 BACKSPACE MECHANISM IN UNOPERATED POSITION, ARMATURE OFF POLE FACE (DE-ENERGIZED), LATCH EXTENSION AGAINST END OF ARMATURE, ECCENTRIC ARM AT ITS CLOSEST POINT TO UNDERSIDE OF LATCH LEVER. CLEARANCE BETWEEN LATCH AND ECCENTRIC ARM WITH PLAY IN THE LINKS TAKEN UP TO MAKE THE CLEARANCE A MINIMUM SHOULD BE:  
 MIN. 0.005 INCH  
 MAX. 0.025 INCH

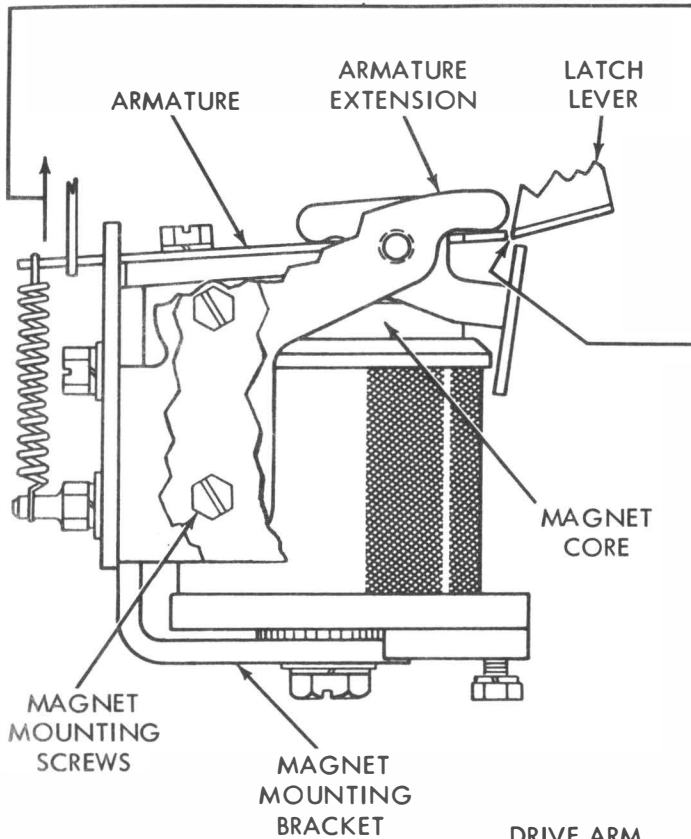
TO ADJUST WITH LATCH EXTENSION SCREW FRICTION TIGHT, POSITION LATCH.

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

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



3.19 Power Drive Backspace Mechanism (continued)



NOTE: FOR EARLY DESIGN ADJUSTABLE MAGNET ASSEMBLY SEE PARAGRAPH 3.16.

ARMATURE SPRING (LATEST DESIGN)

REQUIREMENT  
MIN. 15 OZS. ---MAX. 20 OZS.  
TO PULL SPRING TO INSTALLED LENGTH.

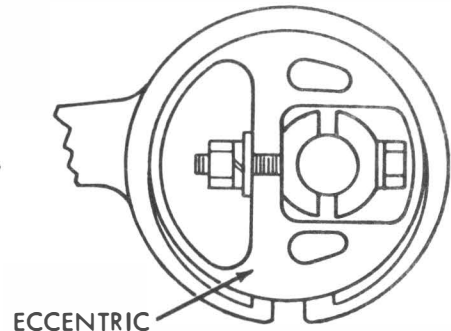
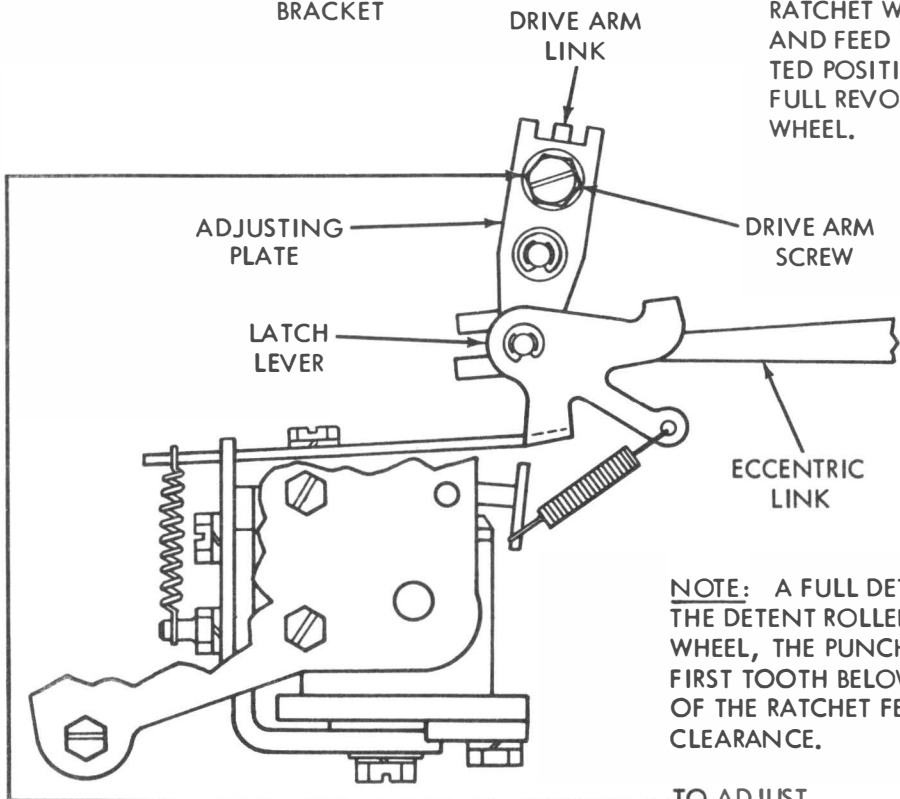
(A) MAGNET POSITION (LATEST DESIGN)

REQUIREMENT  
MAGNET DEENERGIZED. ARMATURE EXTENSION  
SHOULD ENGAGE LATCH BY APPROXIMATELY  
ITS FULL THICKNESS.

TO ADJUST  
POSITION MAGNET MOUNTING BRACKET  
BY LOOSENING TWO MOUNTING SCREWS.

(B) FINAL POWER ADJUSTMENT (LATEST DESIGN)

REQUIREMENT  
UNIT OPERATING UNDER POWER. TAPE IN  
PUNCH. PLACE FEED WHEEL SHAFT OIL HOLE  
IN UPPERMOST POSITION, AND OPERATE  
BACKSPACE MECHANISM ONCE. BACKSPACE  
RATCHET WHEEL SHALL BE BACKED ONE SPACE  
AND FEED WHEEL RATCHET TO A FULLY DETENTED  
POSITION. RECHECK EVERY 90° FOR ONE  
FULL REVOLUTION OF THE BACKSPACE RATCHET  
WHEEL.



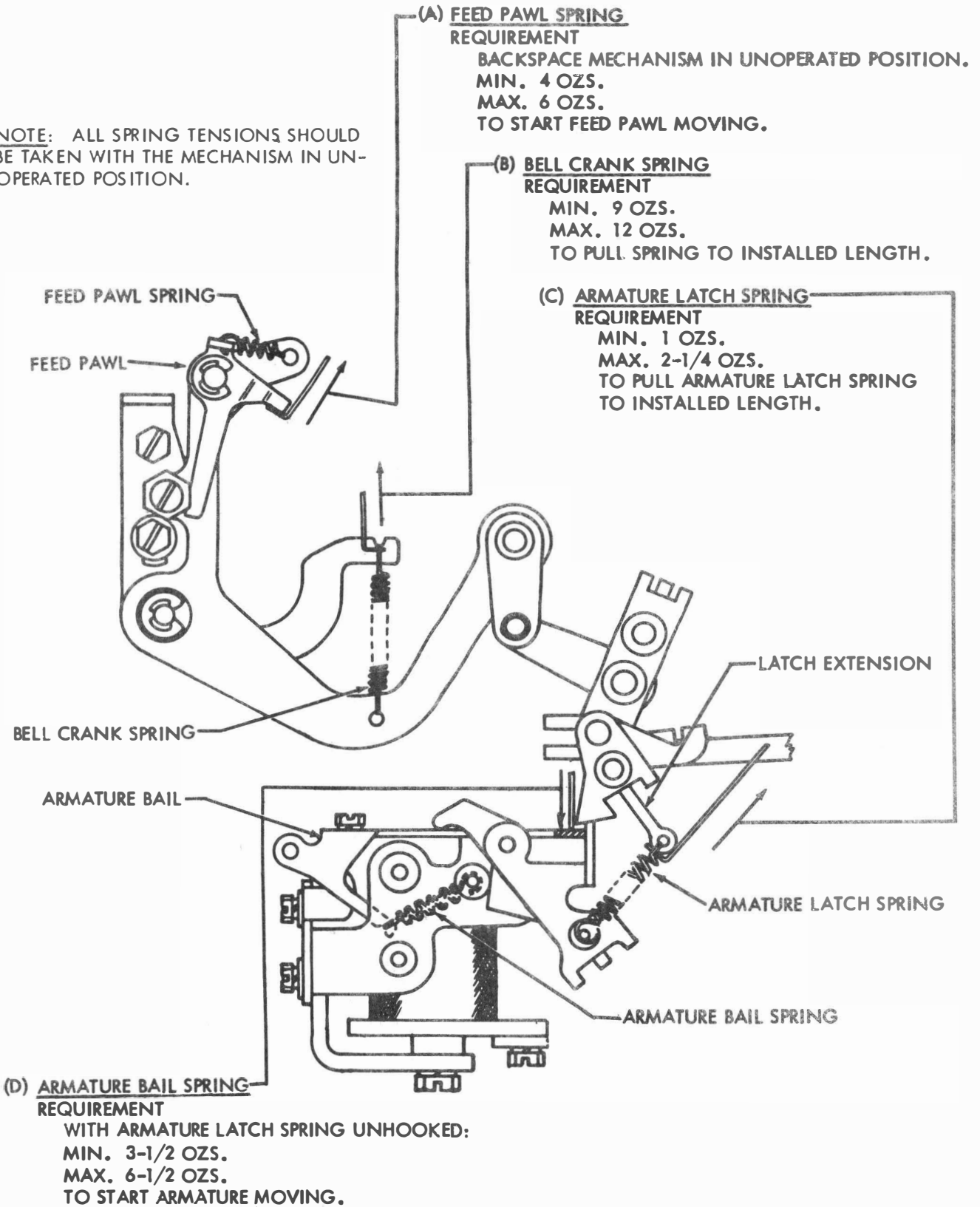
NOTE: A FULL DETENTED POSITION IS WHEN WITH  
THE DETENT ROLLER IN CONTACT WITH THE RATCHET  
WHEEL, THE PUNCH UNIT FEED PAWL ENGAGES THE  
FIRST TOOTH BELOW THE HORIZONTAL CENTER LINE  
OF THE RATCHET FEED WHEEL WITH NO PERCEPTIBLE  
CLEARANCE.

TO ADJUST  
LOOSEN ARM ADJUSTING SCREW AND MOVE ADJUST-  
ING PLATE.



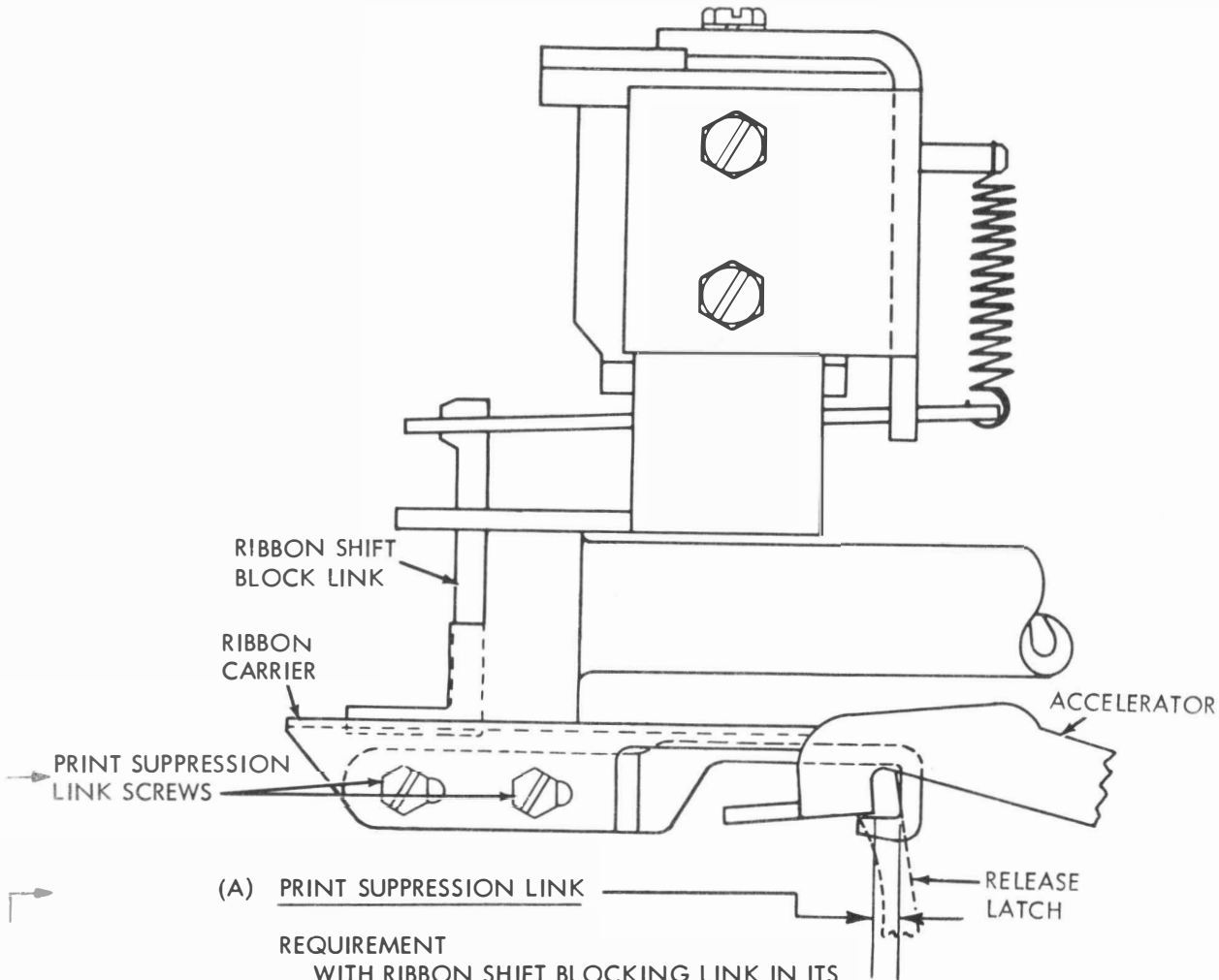
3.20 Power Drive Backspace Mechanism (continued)

NOTE: ALL SPRING TENSIONS SHOULD BE TAKEN WITH THE MECHANISM IN UNOPERATED POSITION.



PRINT SUPPRESSION MECHANISMS

3.21 Print Suppression Link



REQUIREMENT

WITH RIBBON SHIFT BLOCKING LINK IN ITS BLOCKING POSITION AND ACCELERATOR LATCHED THERE SHOULD BE

MIN. 0.065 INCH---MAX. 0.095 INCH CLEARANCE BETWEEN ACCELERATOR LEVER AND PRINT SUPPRESSION LINK.

TO ADJUST

REMOVE ACCELERATOR LATCH LEVER SPRING, TRIP FUNCTION CLUTCH, AND ROTATE MAIN SHAFT UNTIL ROCKER BAIL IS IN EXTREME LEFT POSITION. WITH SCREWS LOOSENED POSITION PRINT SUPPRESSION LINK HORIZONTALLY AND UPWARD AGAINST RIBBON CARRIER TO MEET REQUIREMENT.

NOTE: REFER TO PART 2 FOR PRELIMINARY ADJUSTMENTS IN COMMON WITH RIBBON SHIFT ADJUSTMENTS IN ALL UNITS.

## 3.22 Manual Print Suppression Mechanism

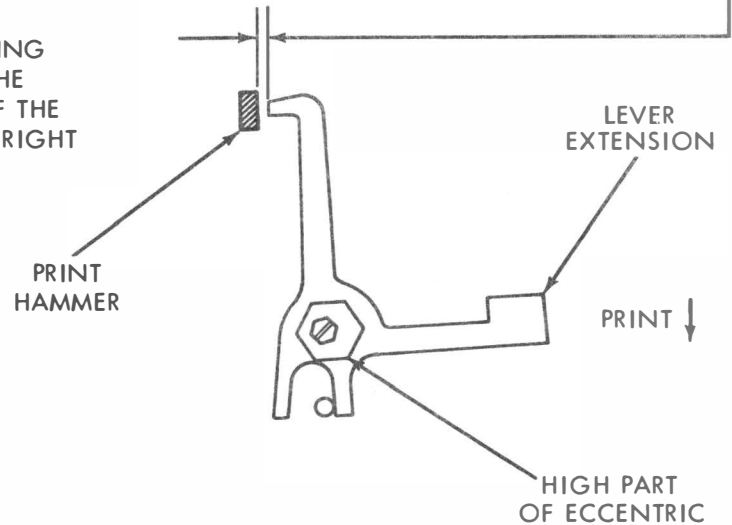
CONTROL LEVER (MANUAL)

## REQUIREMENT

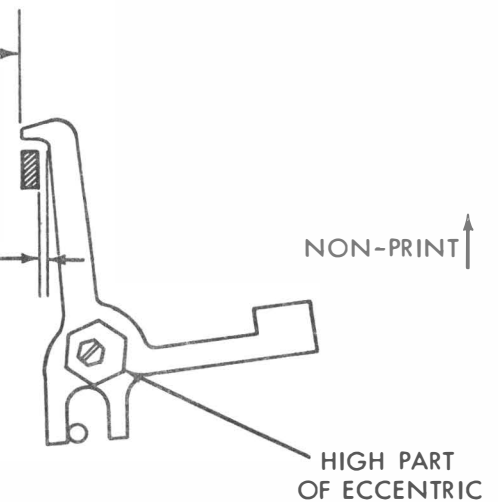
- (1) THERE SHALL BE A CLEARANCE OF  
MIN. 0.015 INCH  
BETWEEN THE PRINT SUPPRESS LEVER AND  
THE PRINT HAMMER WHEN THE LEVER  
EXTENSION IS IN THE PRINT POSITION  
(DOWN).
- (2) WHEN THE LEVER EXTENSION IS IN THE  
NON-PRINT POSITION (UP), THE BLOCK-  
ING EXTENSION SHOULD EXTEND ACROSS  
THE FULL THICKNESS OF THE PRINT HAMMER  
WITH A CLEARANCE OF  
MIN. 0.015 INCH  
AT THE SIDE OF THE PRINT HAMMER.

## TO ADJUST

LOOSEN THE ECCENTRIC BUSHING MOUNTING  
NUT AND POSITION THE BUSHING UNTIL THE  
REQUIREMENTS ARE MET. THE HIGH PART OF THE  
ECCENTRIC SHOULD BE DOWN AND TO THE RIGHT  
AS VIEWED FROM THE REAR OF THE UNIT.



LEVER SHOULD EXTEND ACROSS  
FULL THICKNESS OF PRINT HAMMER.



SIGNAL BELL AND EOT CONTACTS

3.23 Signal Bell and EOT Contacts

NOTE 1

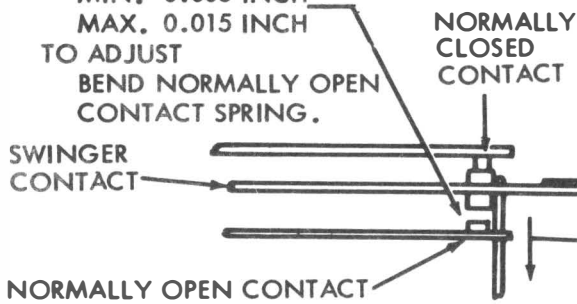
THE FOLLOWING ADJUSTMENTS SHOULD BE MADE PRIOR TO INSTALLING THE CONTACT BRACKET ASSEMBLY ON UNIT.

(A) NORMALLY OPEN CONTACT GAP

REQUIREMENT

MIN. 0.008 INCH  
MAX. 0.015 INCH

TO ADJUST  
BEND NORMALLY OPEN  
CONTACT SPRING.



(B) NORMALLY CLOSED CONTACT

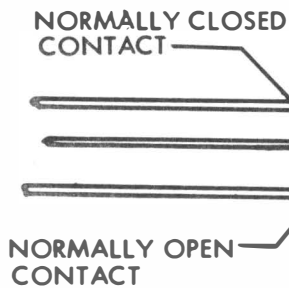
REQUIREMENT

MIN. 8 GRAMS  
MAX. 15 GRAMS

TO MOVE SWINGER THE SWINGER CONTACT  
AWAY FROM THE NORMALLY CLOSED CONTACT.  
TO ADJUST  
BEND NORMALLY CLOSED  
CONTACT SPRING.

NOTE 2

THE FOLLOWING ADJUSTMENTS SHOULD BE MADE AFTER THE CONTACT BRACKET ASSEMBLY IS MOUNTED TO THE UNIT.



(C) NORMALLY OPEN CONTACT GAP

(1) REQUIREMENT

WITH THE FUNCTION BLADE IN ITS LOWEST  
POSITION IN THE NON-SELECTED CONDITION.  
CLEARANCE BETWEEN THE CONTACT SWINGER  
INSULATOR BUTTON AND THE FUNCTION BLADE:  
MIN. SOME

(2) REQUIREMENT

CONTACT GAP:  
MIN. 0.008 INCH  
MAX. 0.015 INCH

TO ADJUST

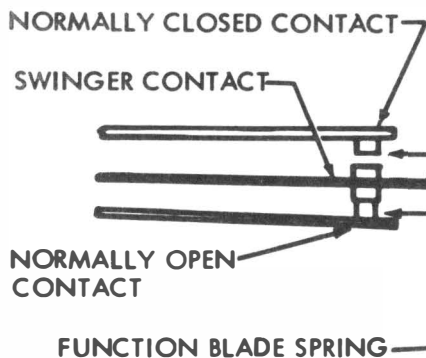
BEND NORMALLY CLOSED CONTACT SPRING

(3) REQUIREMENT

WITH THE FUNCTION BLADE IN ITS LOWEST  
POSITION IN THE SELECTED CONDITION.  
GAP BETWEEN THE SWINGER CONTACT AND  
NORMALLY CLOSED (NOW OPEN) CONTACT:  
MIN. 0.015 INCH  
AND SOME OVERTRAVEL OF THE NORMALLY  
OPEN CONTACT.

TO ADJUST

BEND NORMALLY CLOSED CONTACT SPRING.  
REFINE PREVIOUS ADJUSTMENTS TO MAIN-  
TAIN REQUIREMENTS



FUNCTION BLADE

35 TYPING REPERFORATOR

LUBRICATION

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are indicated by line drawings and descriptive text. The symbols in the text indicate the following directions:

- O Apply one drop of oil.
- O2 Apply two drops of oil.
- O3 Apply three drops of oil, etc.
- G Apply thin coat of grease.
- SAT Saturate with oil. (Felt washers, etc.)

KS7470 oil and KS7471 grease should be used.

1.03 The equipment should be thoroughly lubricated, but over-lubrication which might allow oil to drop or grease to be thrown on other parts should be avoided. Special care should be exercised to prevent lubricant from getting between armatures and pole faces or between electrical contact points.

1.04 The following general instructions supplement the specific lubricating points illustrated on subsequent pages:

- Apply one drop of oil to all spring hooks.
- Apply a light film of oil to all cam surfaces.
- Apply a thick coat of grease to all gears.
- Saturate all felt washers, oilers, etc.
- Apply oil to all pivot points.
- Apply oil to all sliding surfaces.

1. GENERAL

1.01 This section is reissued to include additional lubrication procedures for the 35 typing reperforator. Arrows in the margins indicate changes and additions.

1.02 This section provides lubrication information for the 35 typing reperforator. General areas of the equipment are shown by photographs. Specific points to receive lubricant

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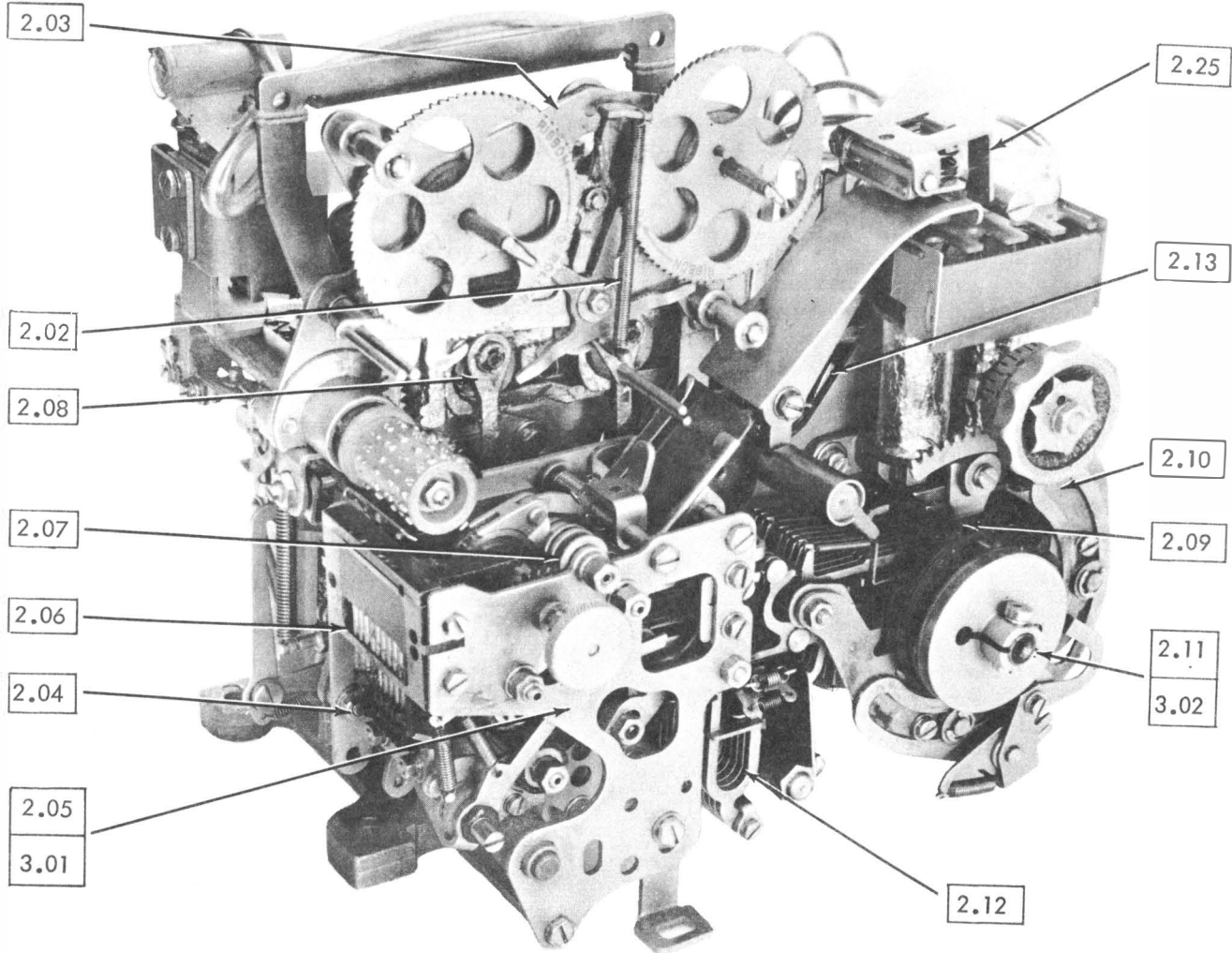
1.05 All equipment should be lubricated before being placed in service or prior to storage. After a few weeks of service, relubricate to make certain that all specified points have received lubricant. Thereafter, the following schedule should be adhered to:

<u>Operating Speed</u>	<u>Lubrication Interval</u>
60 W.P.M.	3000 hours or 1 year*
75 W.P.M.	2400 hours or 9 months*
100 W.P.M.	1500 hours or 6 months*

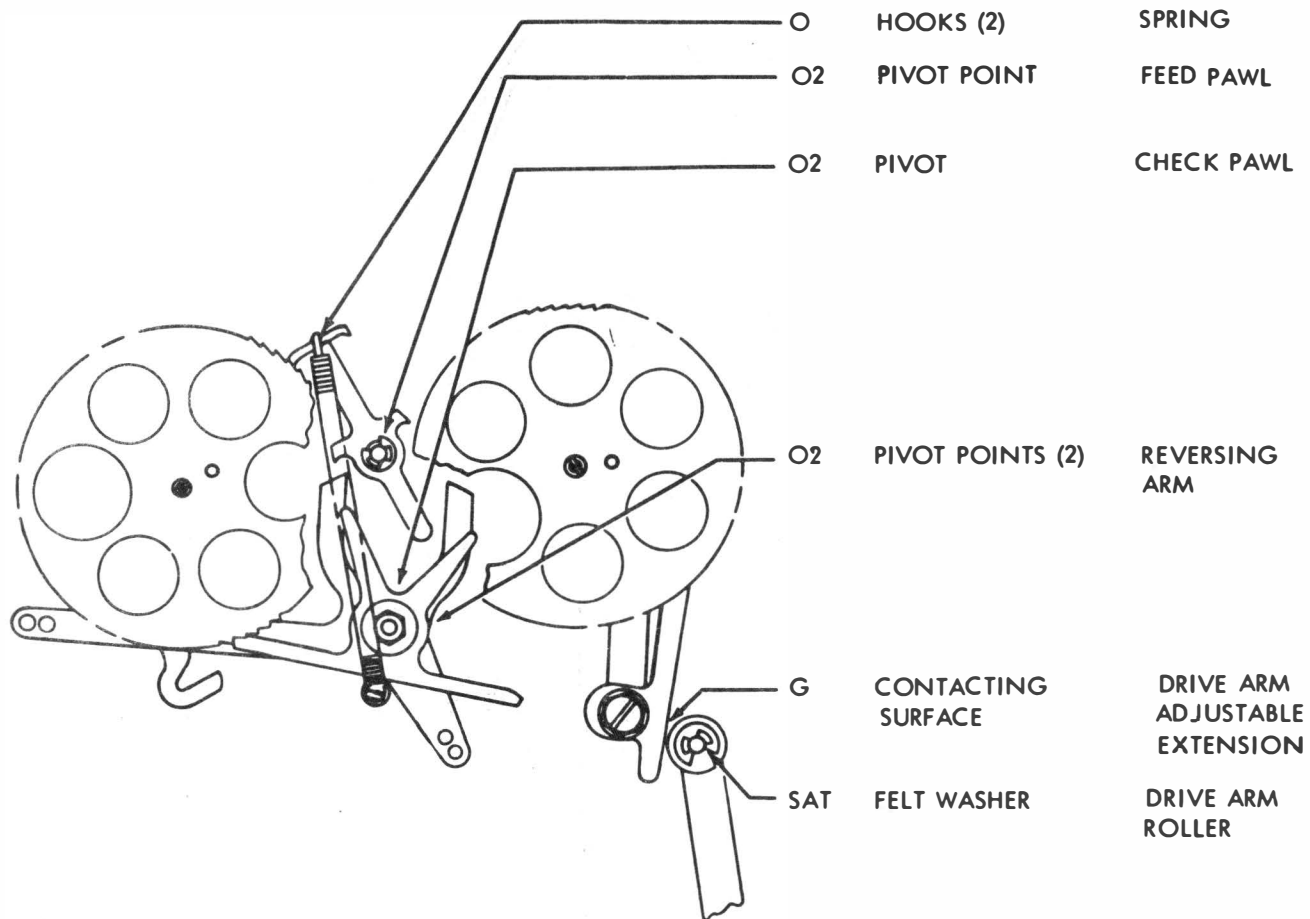
\*Whichever occurs first.

2. BASIC UNIT

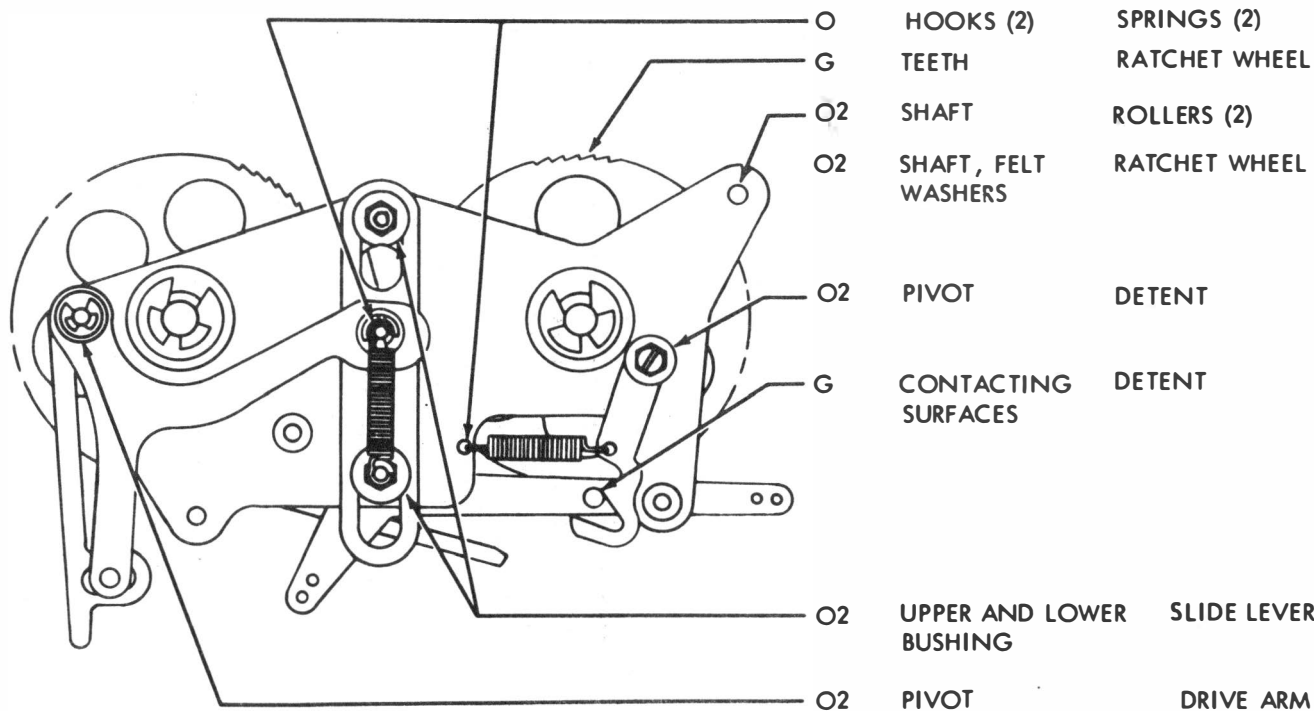
2.01 Typing Reperforator (Left Front View)



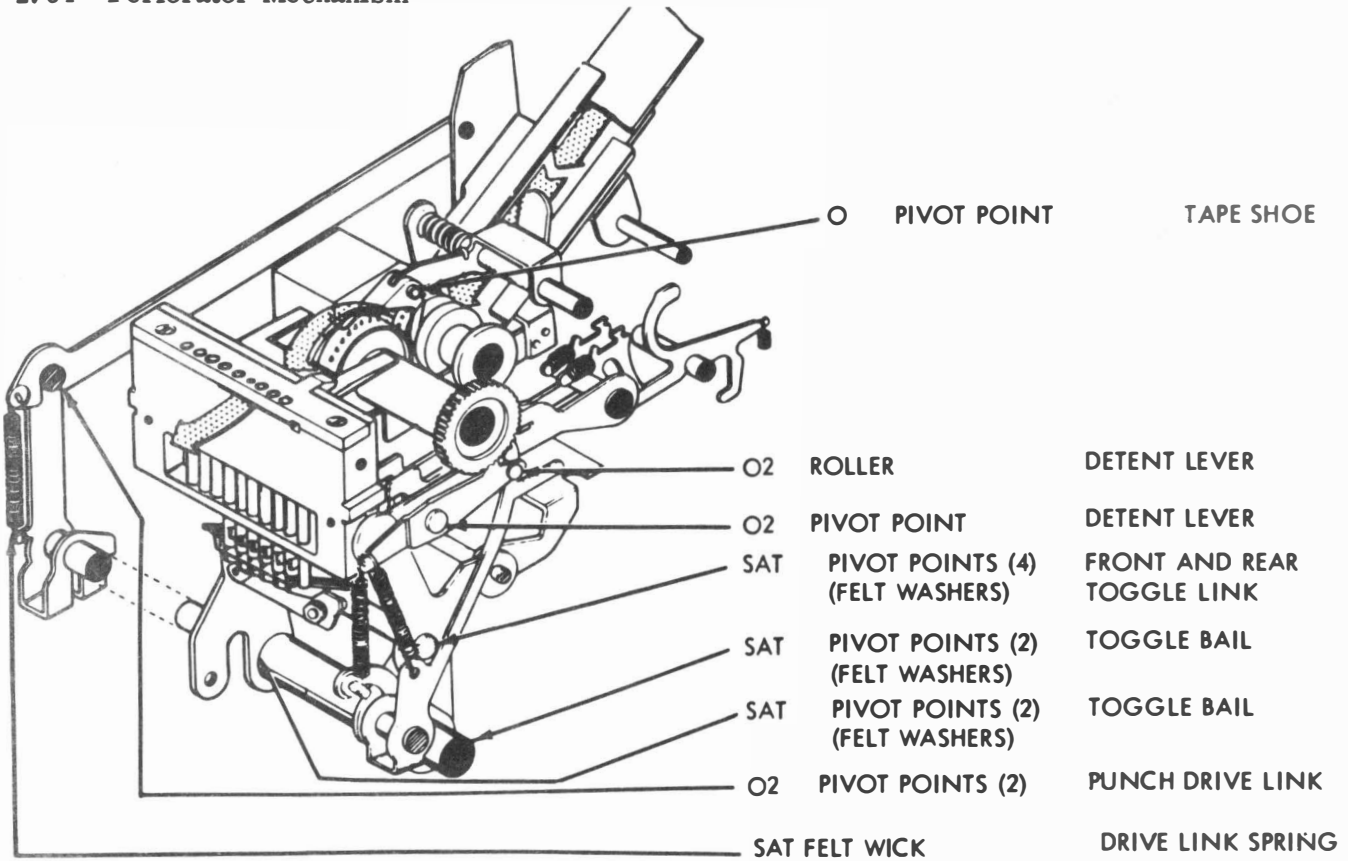
2.02 Ribbon Feed Mechanism



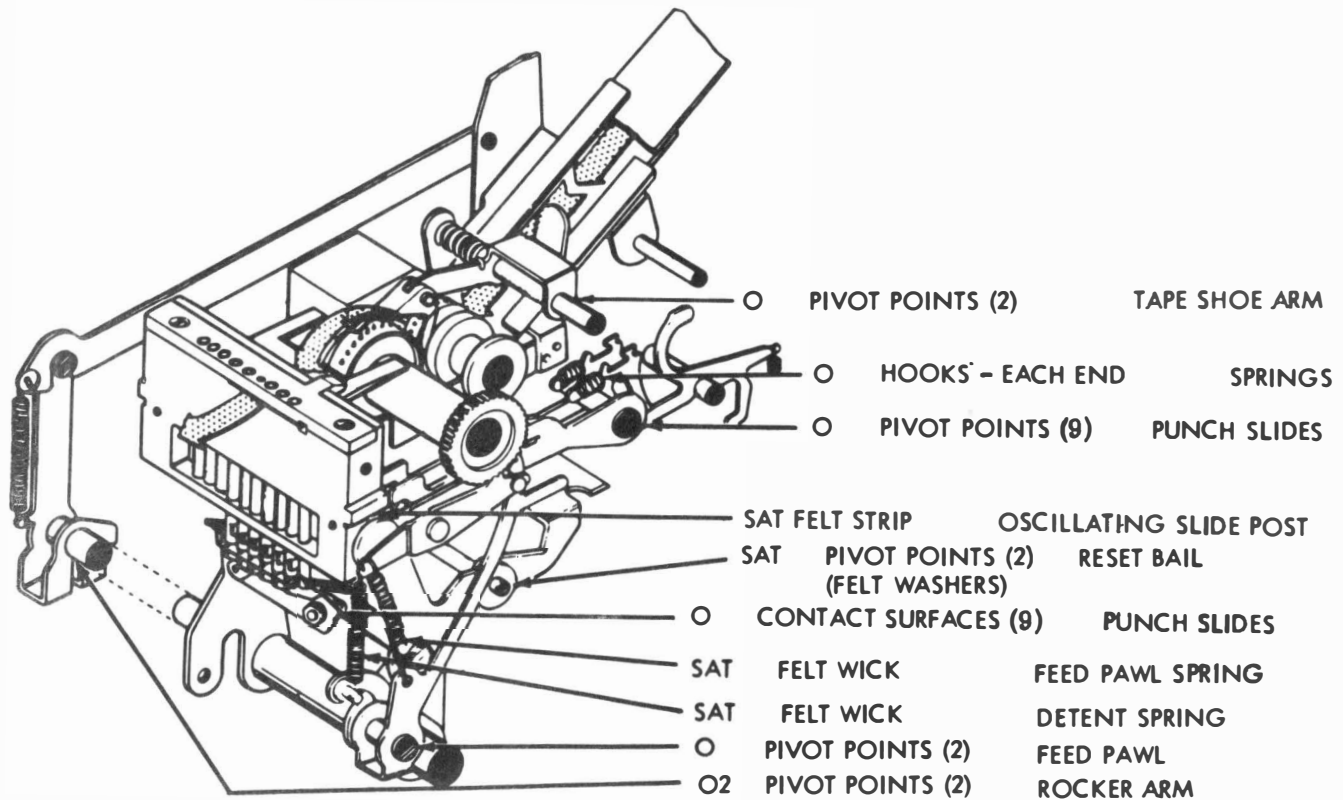
2.03 Ribbon Feed Mechanism (continued)



2.04 Perforator Mechanism

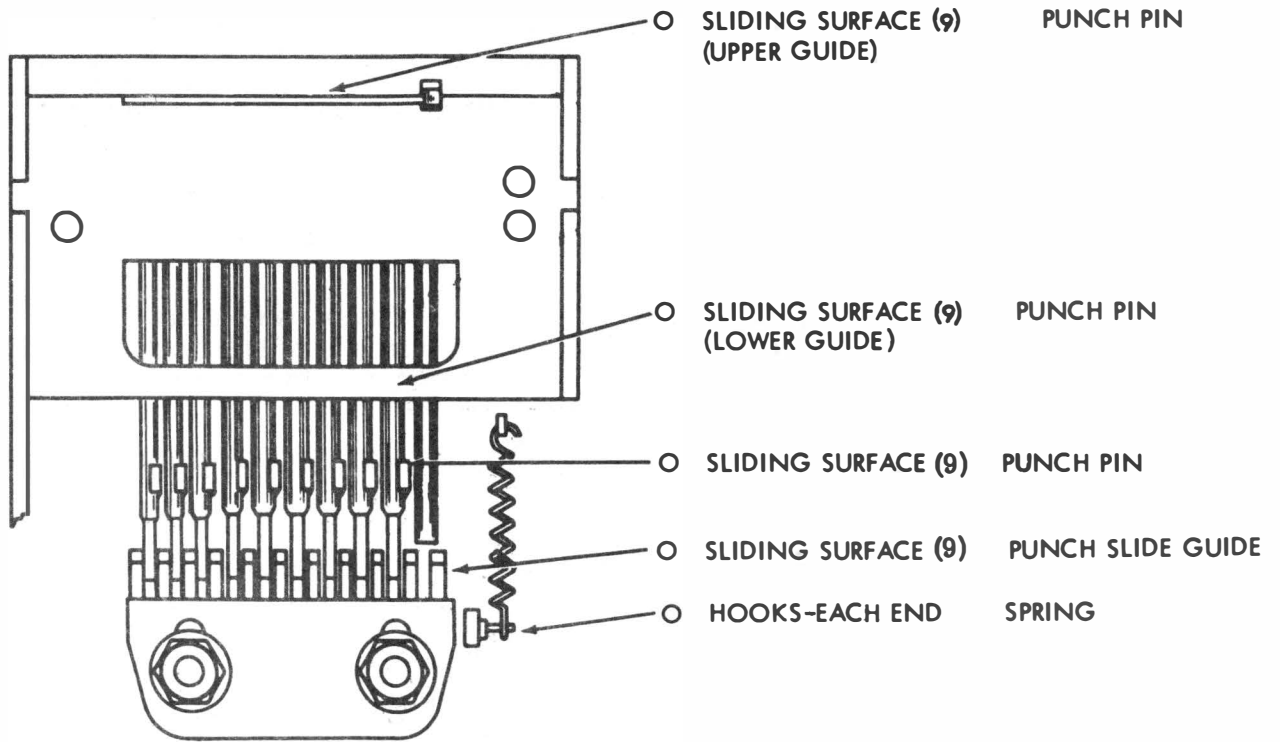


2.05 Perforator Mechanism (continued)

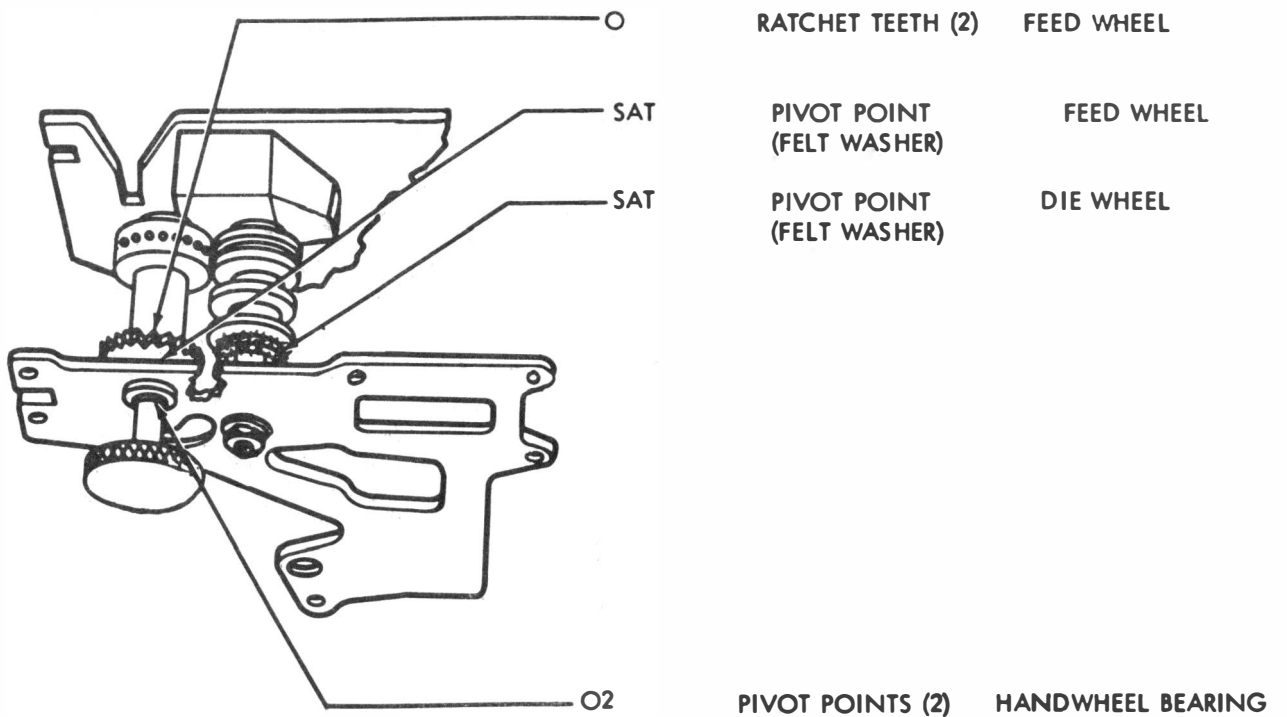




2.06 Punch Mechanism

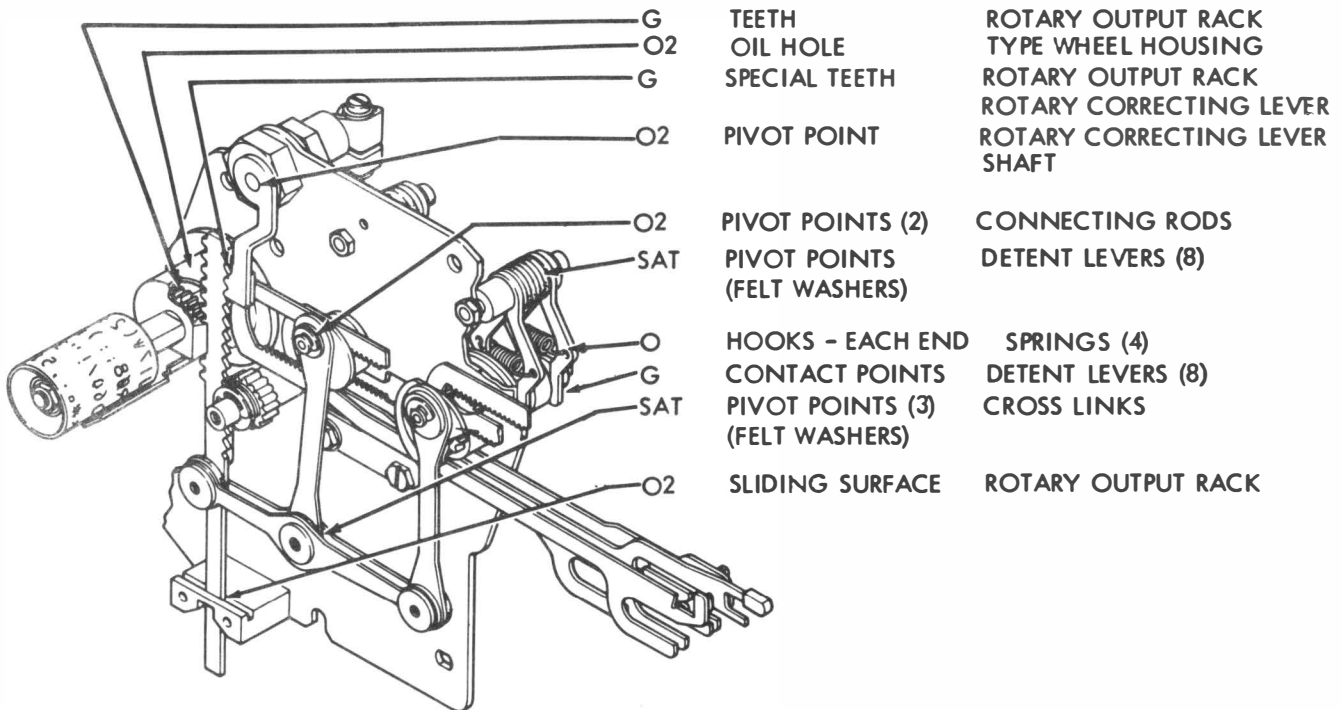


2.07 Feed Mechanism

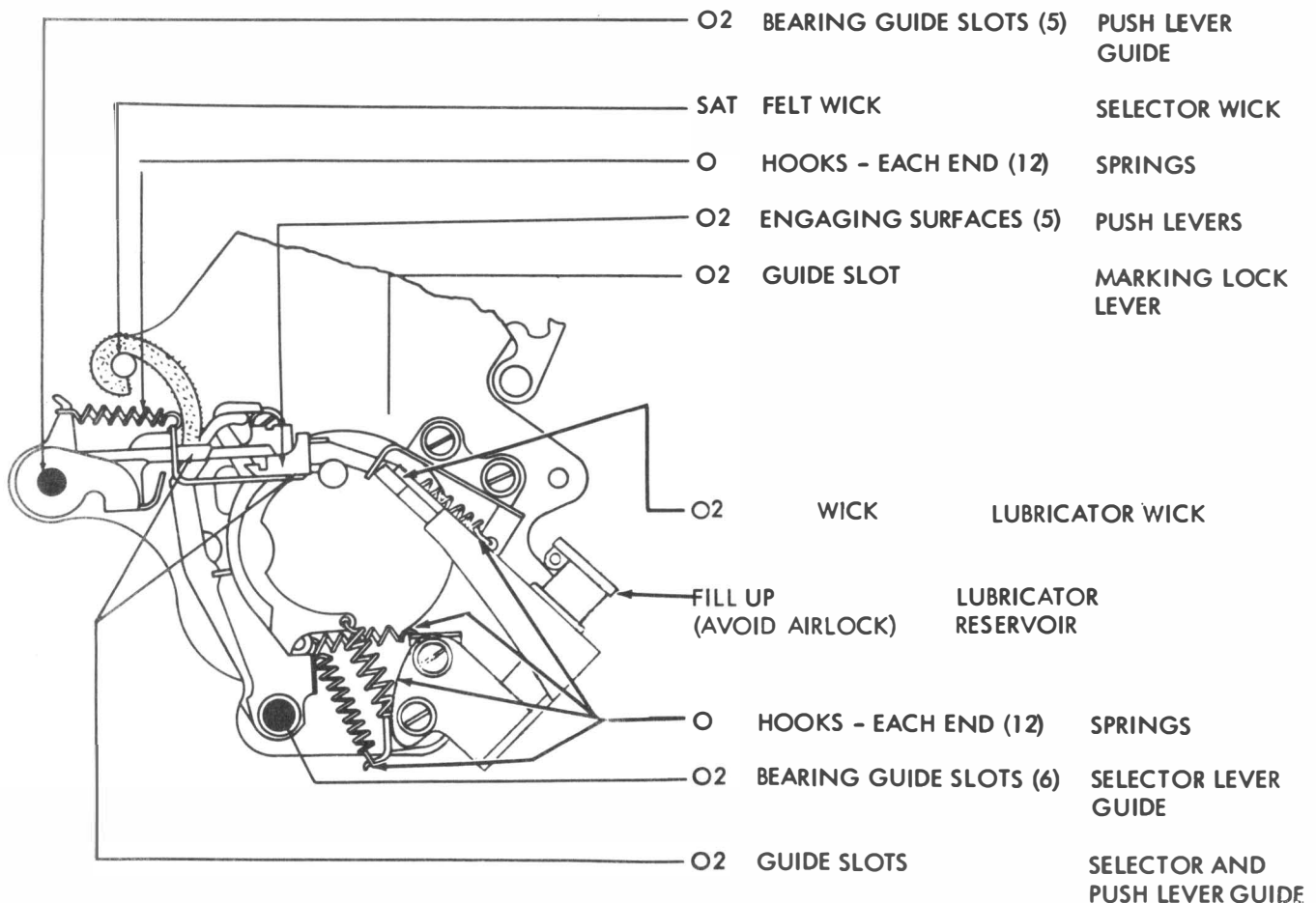


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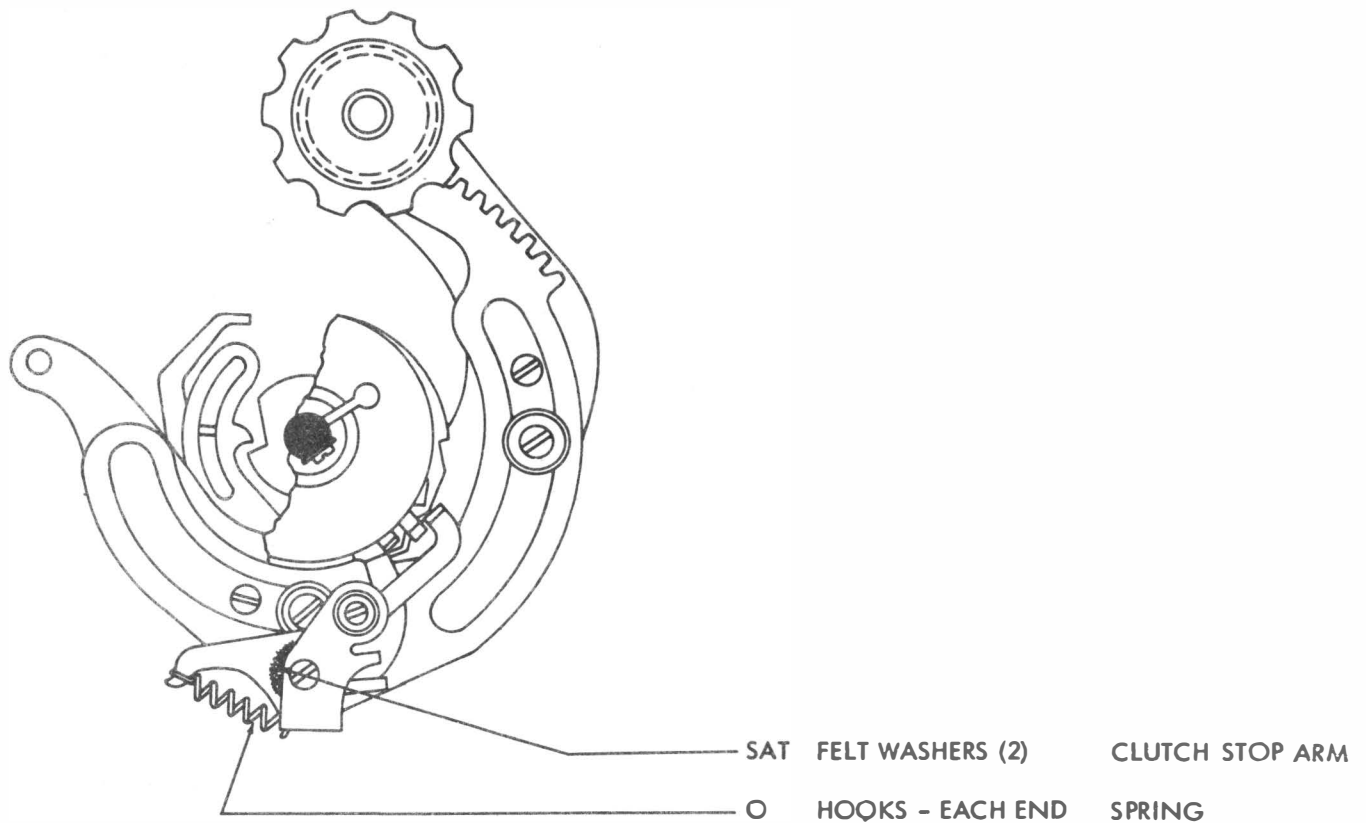
2.08 Rotary Positioning Mechanism



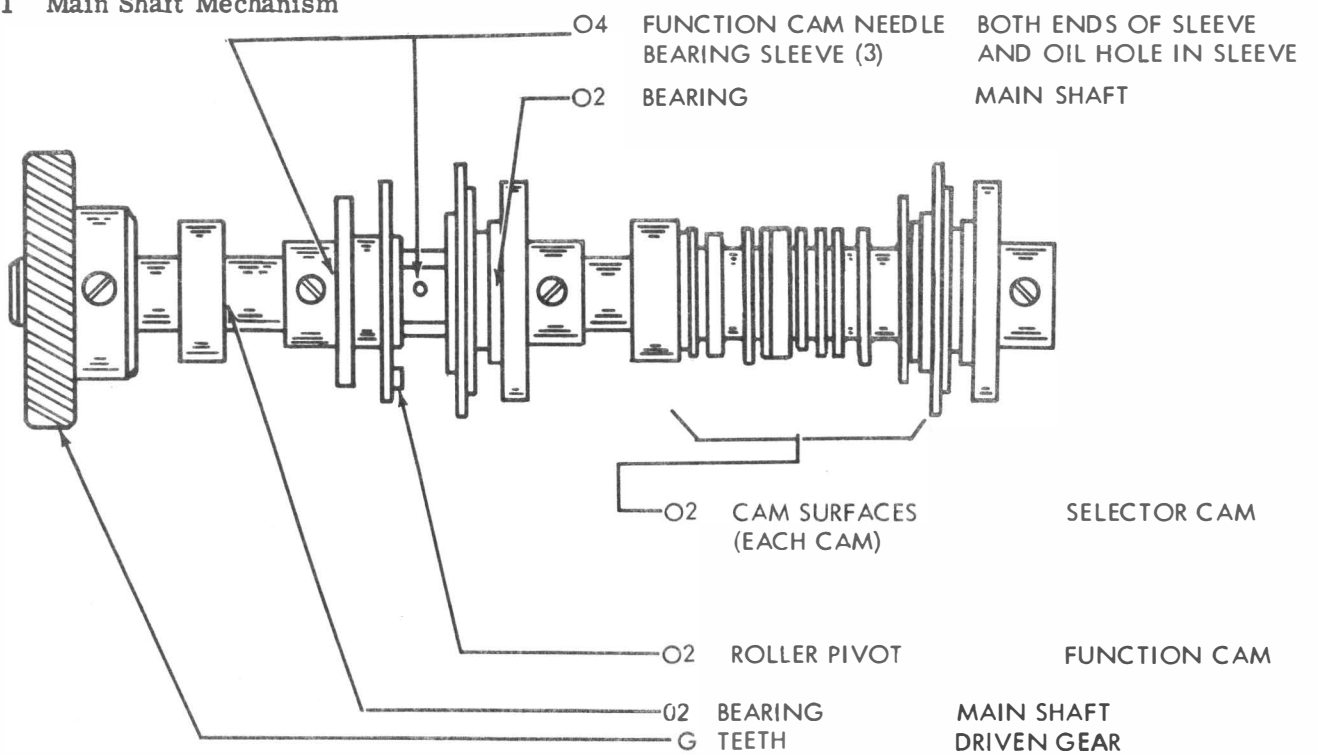
2.09 Selecting Mechanism



2.10 Range Finder Mechanism

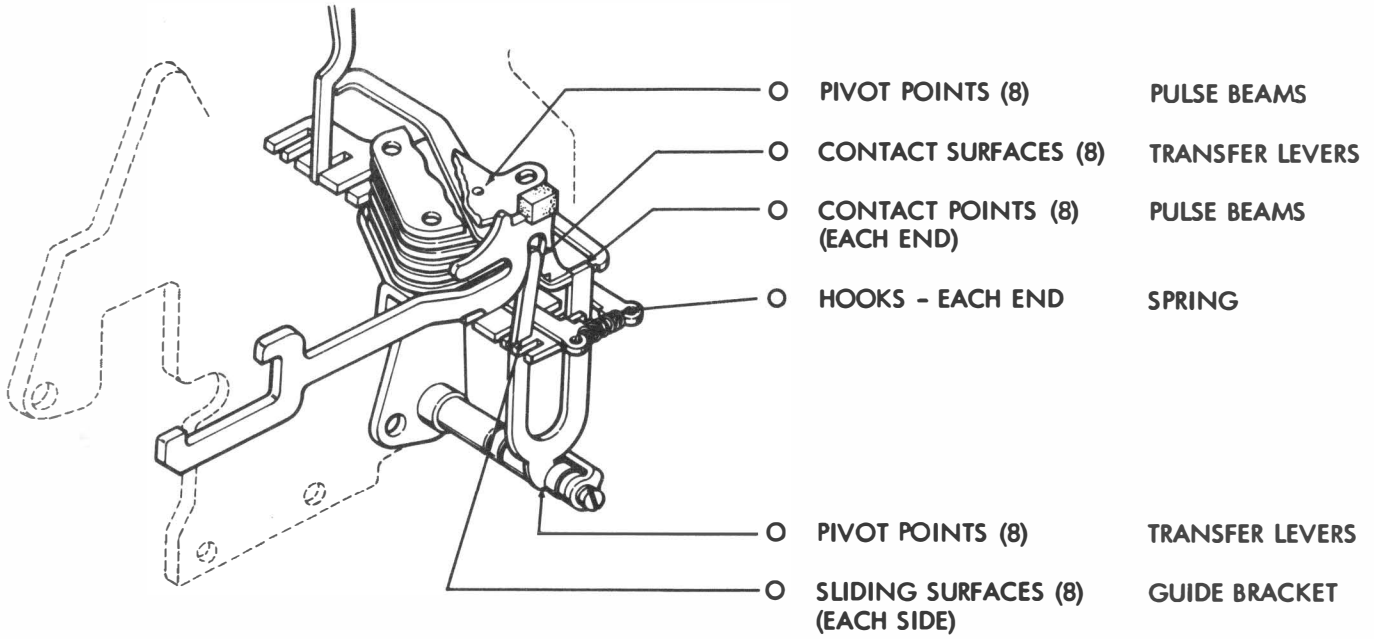


2.11 Main Shaft Mechanism

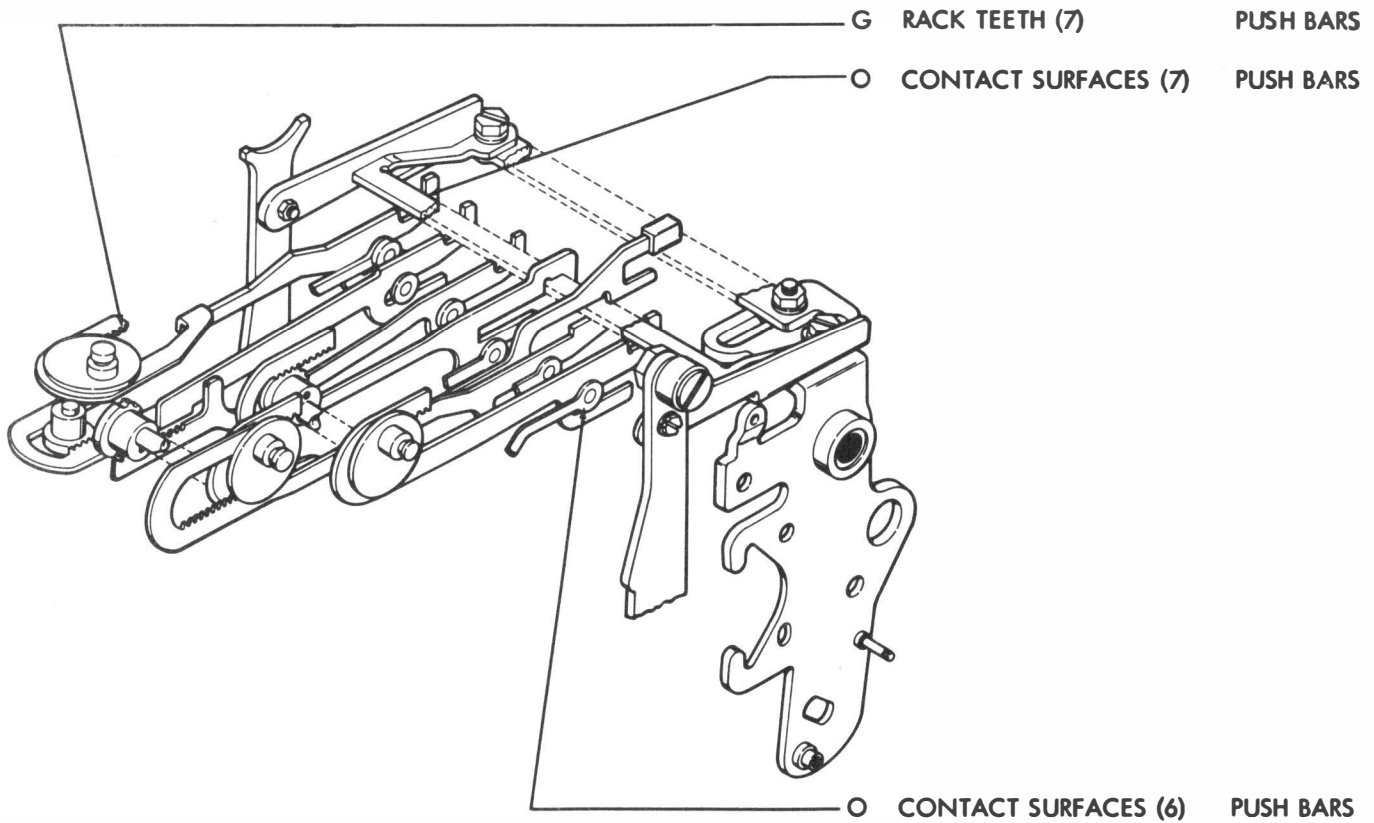


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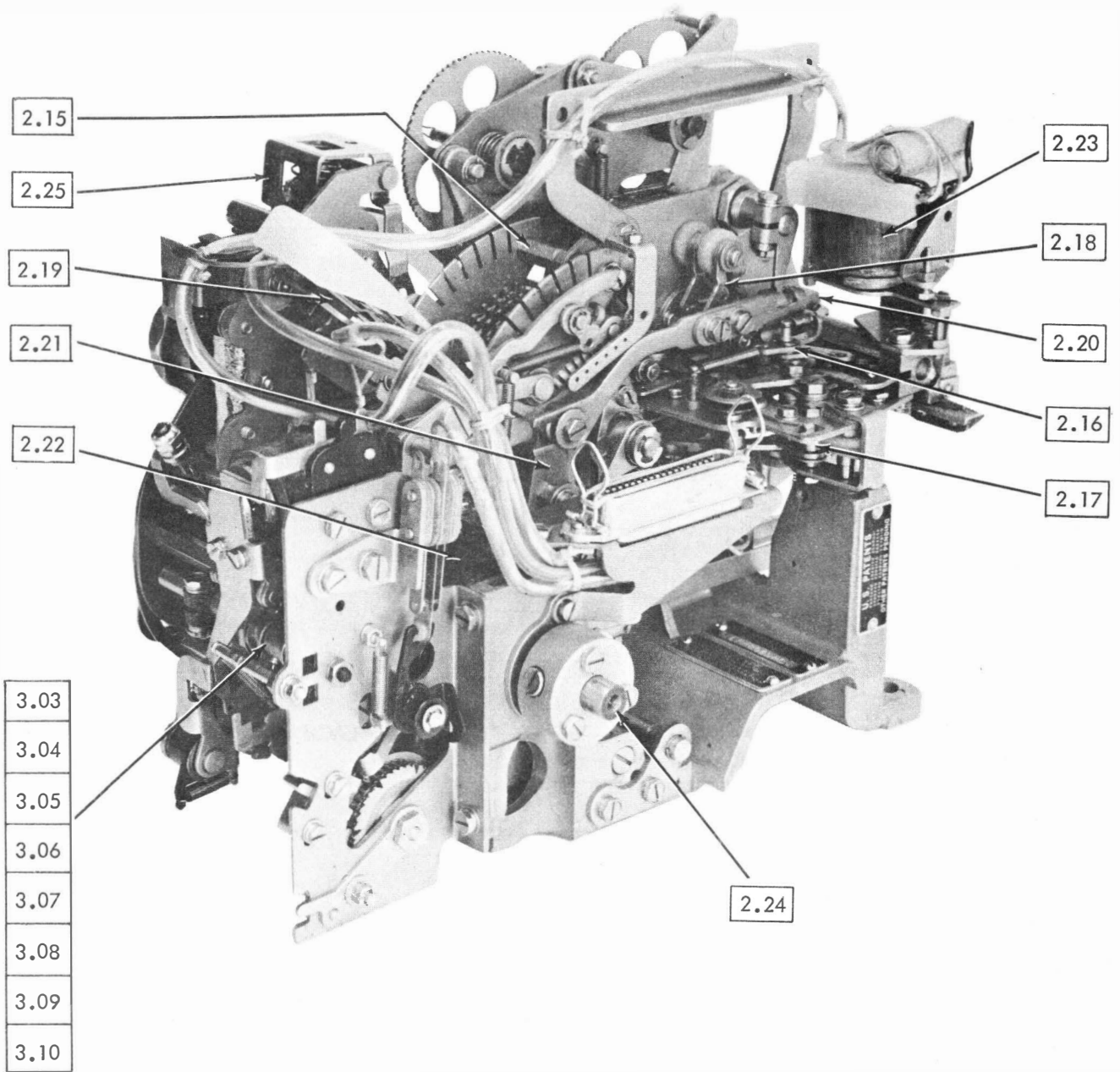
2.12 Transfer Mechanism



2.13 Push Bars

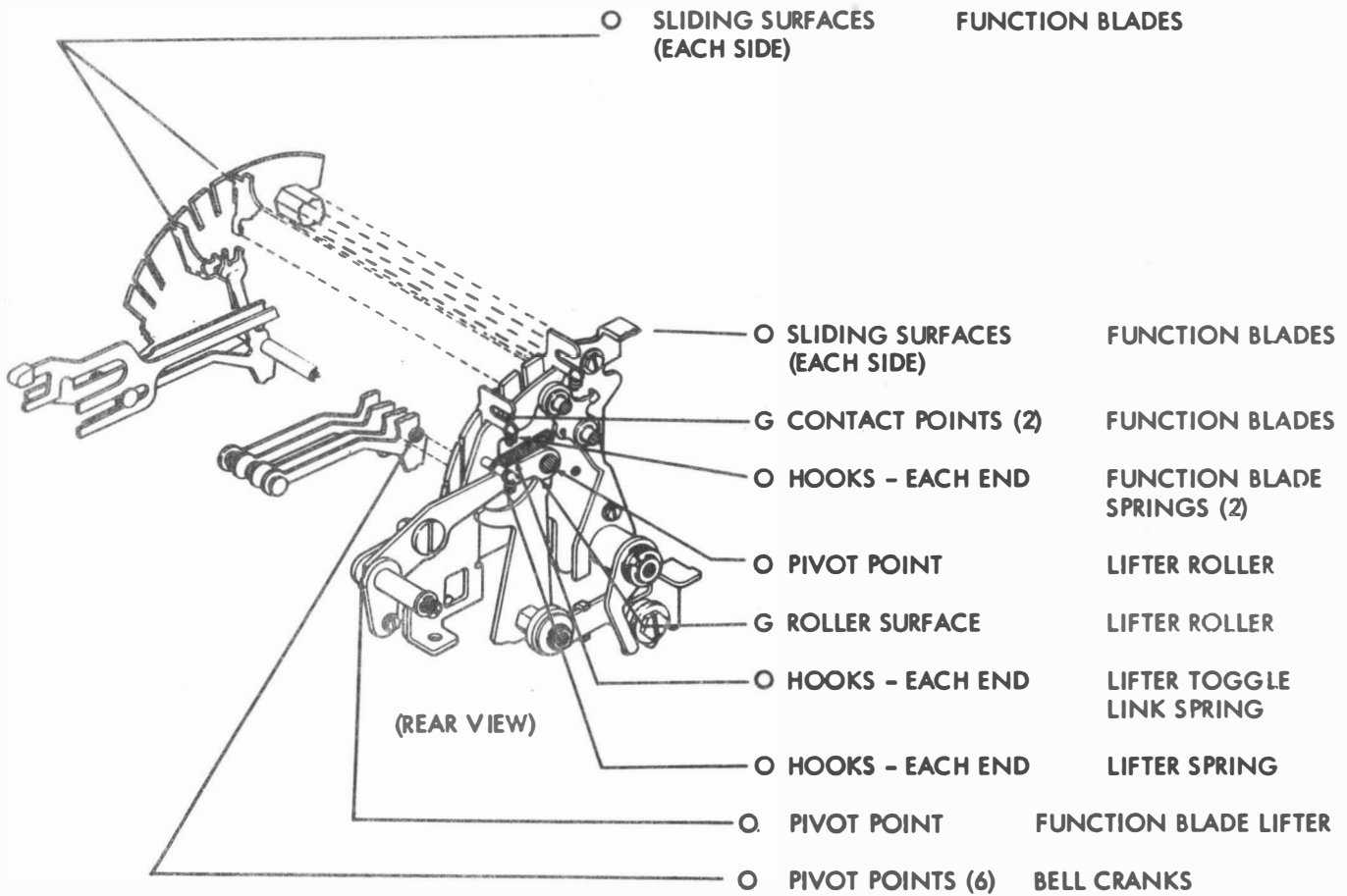


2.14 Typing Reperforator (Right Rear View)

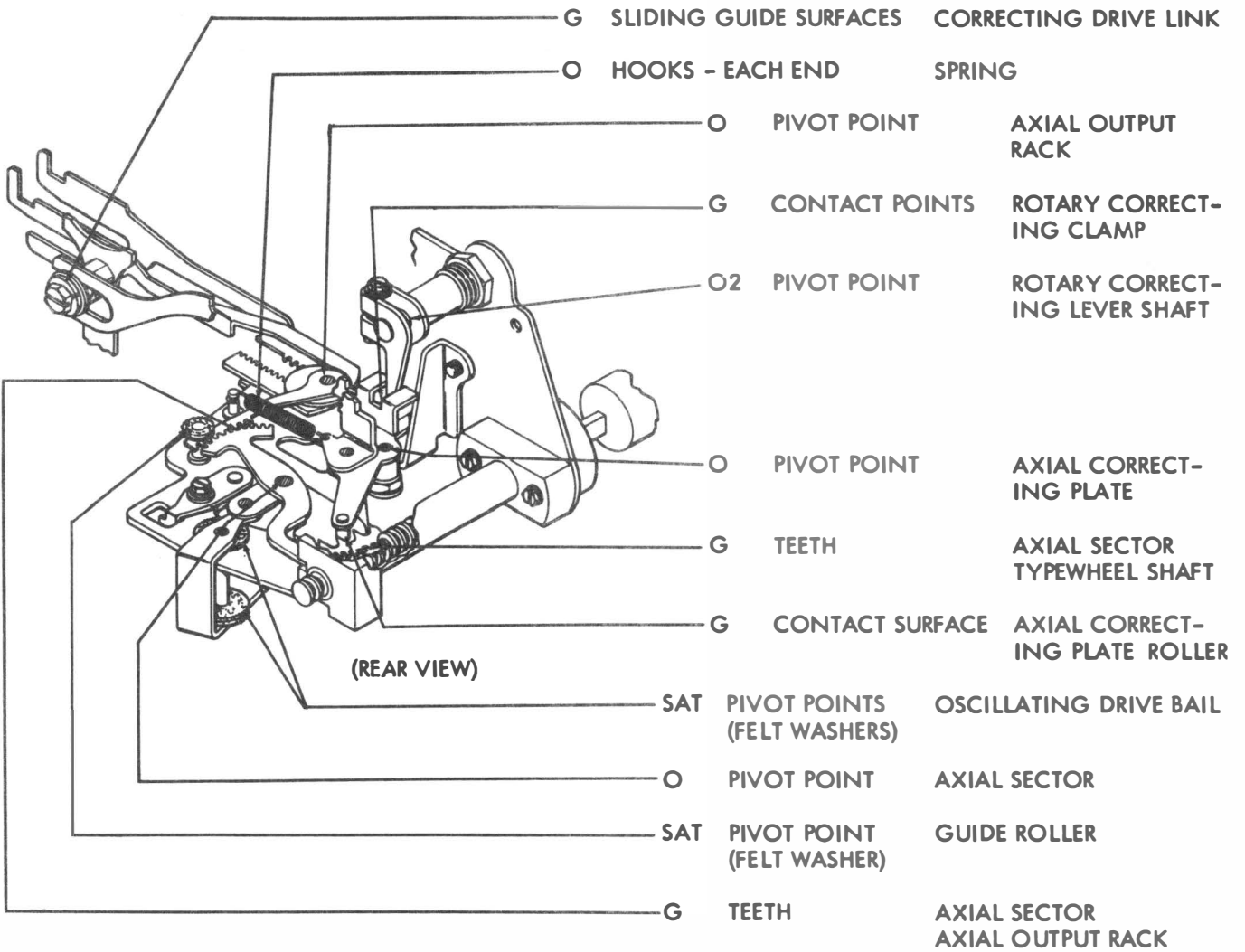


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2.15 Function Box

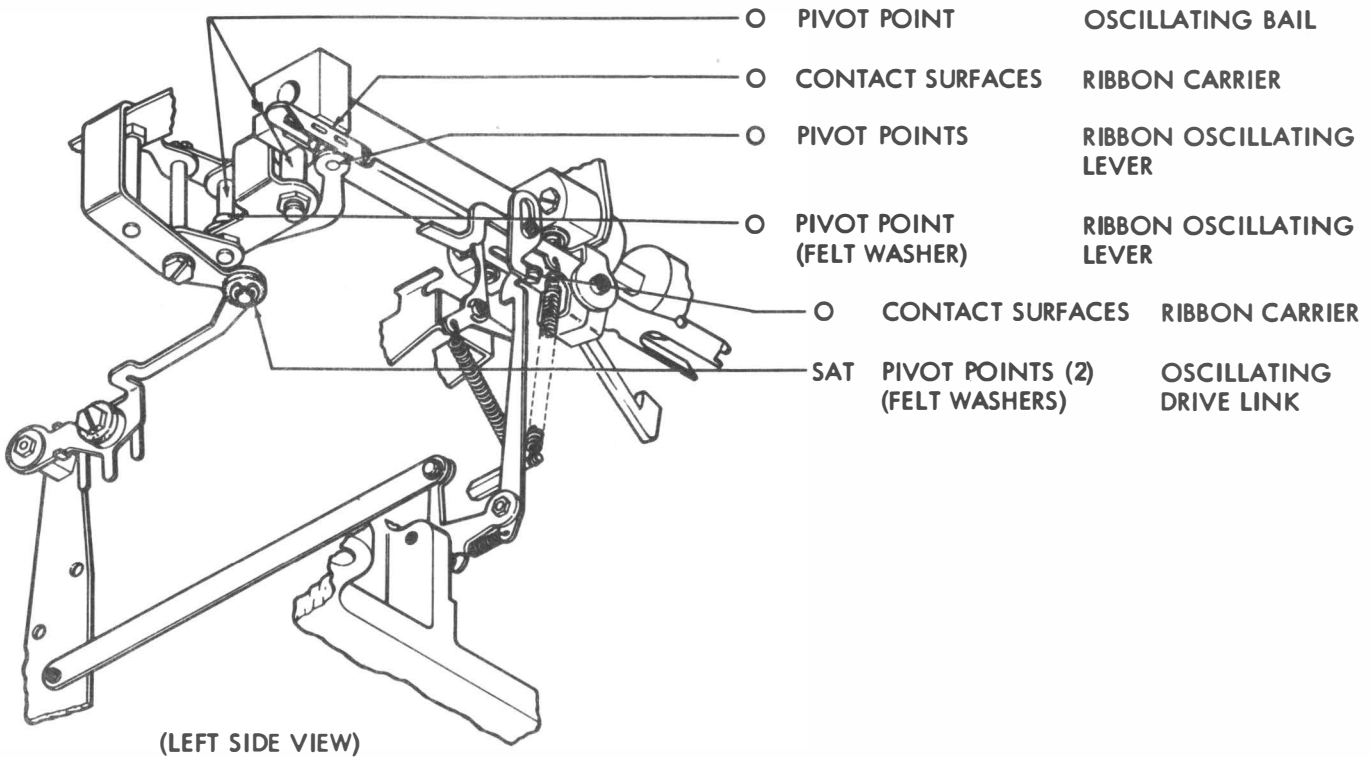


2.16 Axial Positioning Mechanism

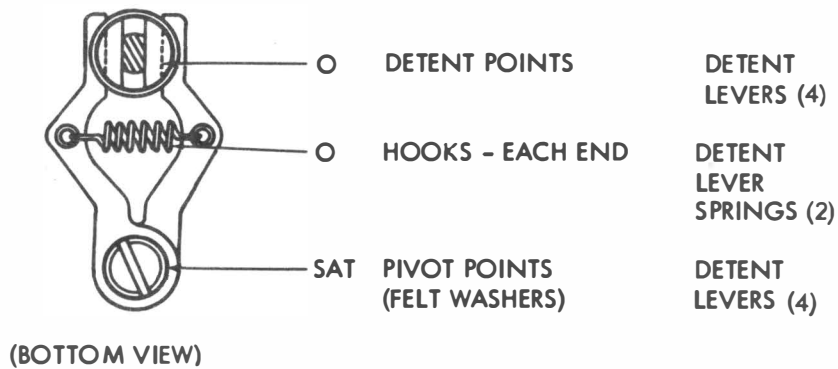


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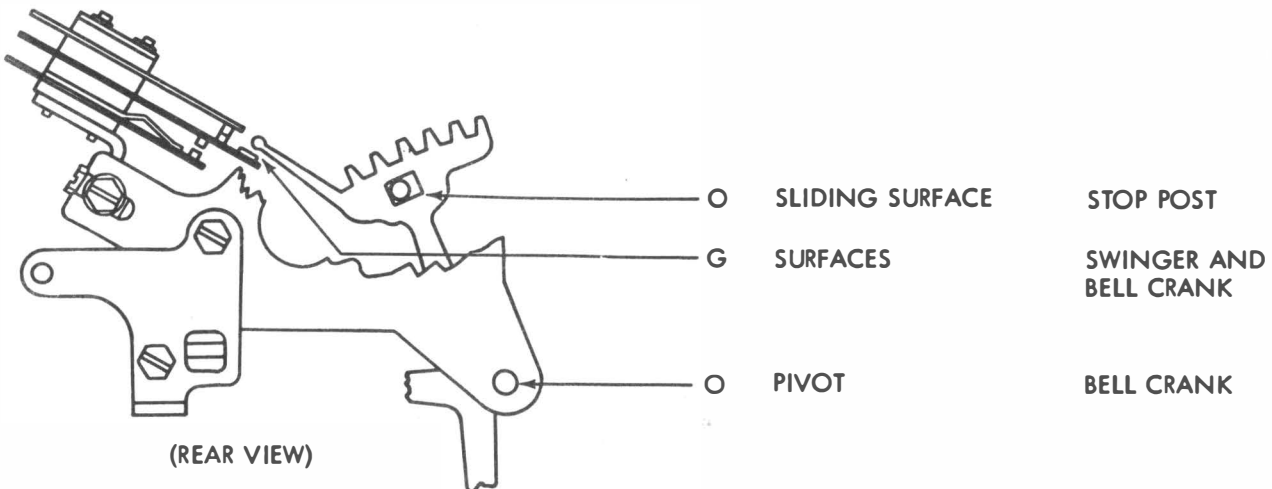
2.17 Axial Positioning Mechanism (continued)



2.18 Detent Assemblies

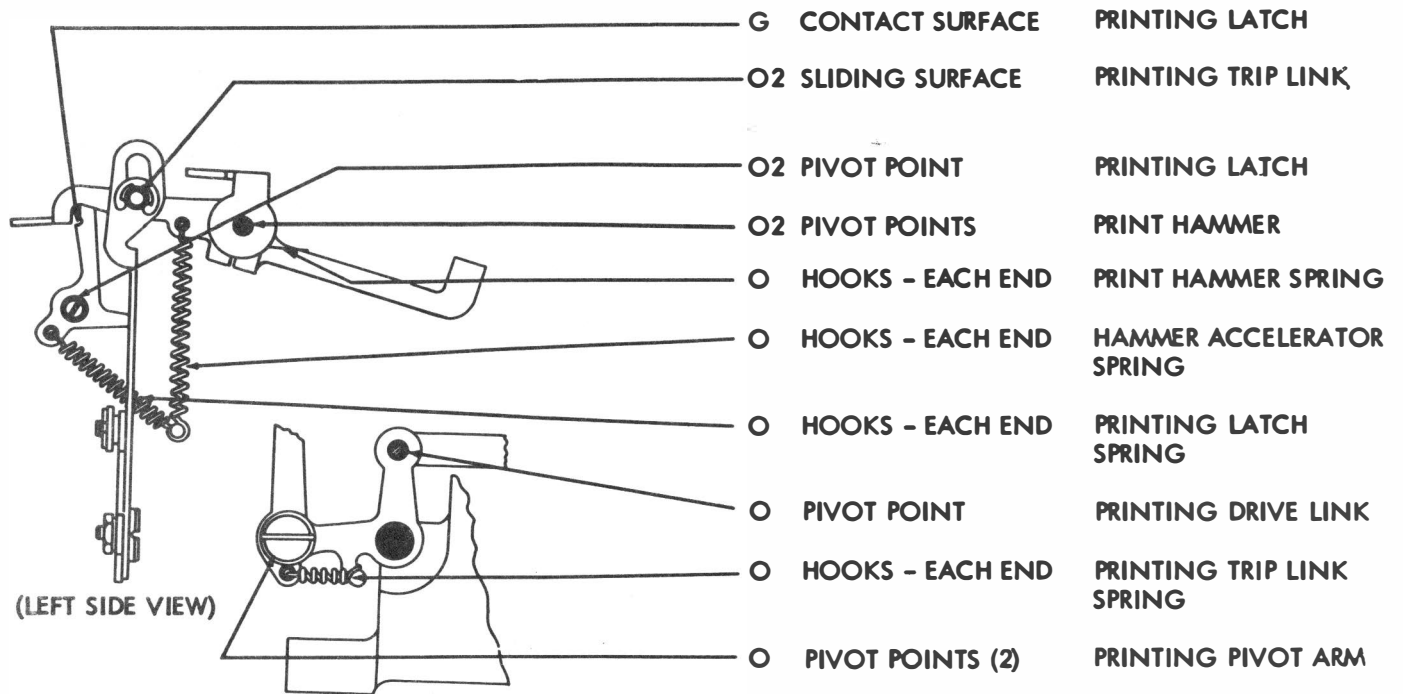


2.19 Ribbon Shift Contact

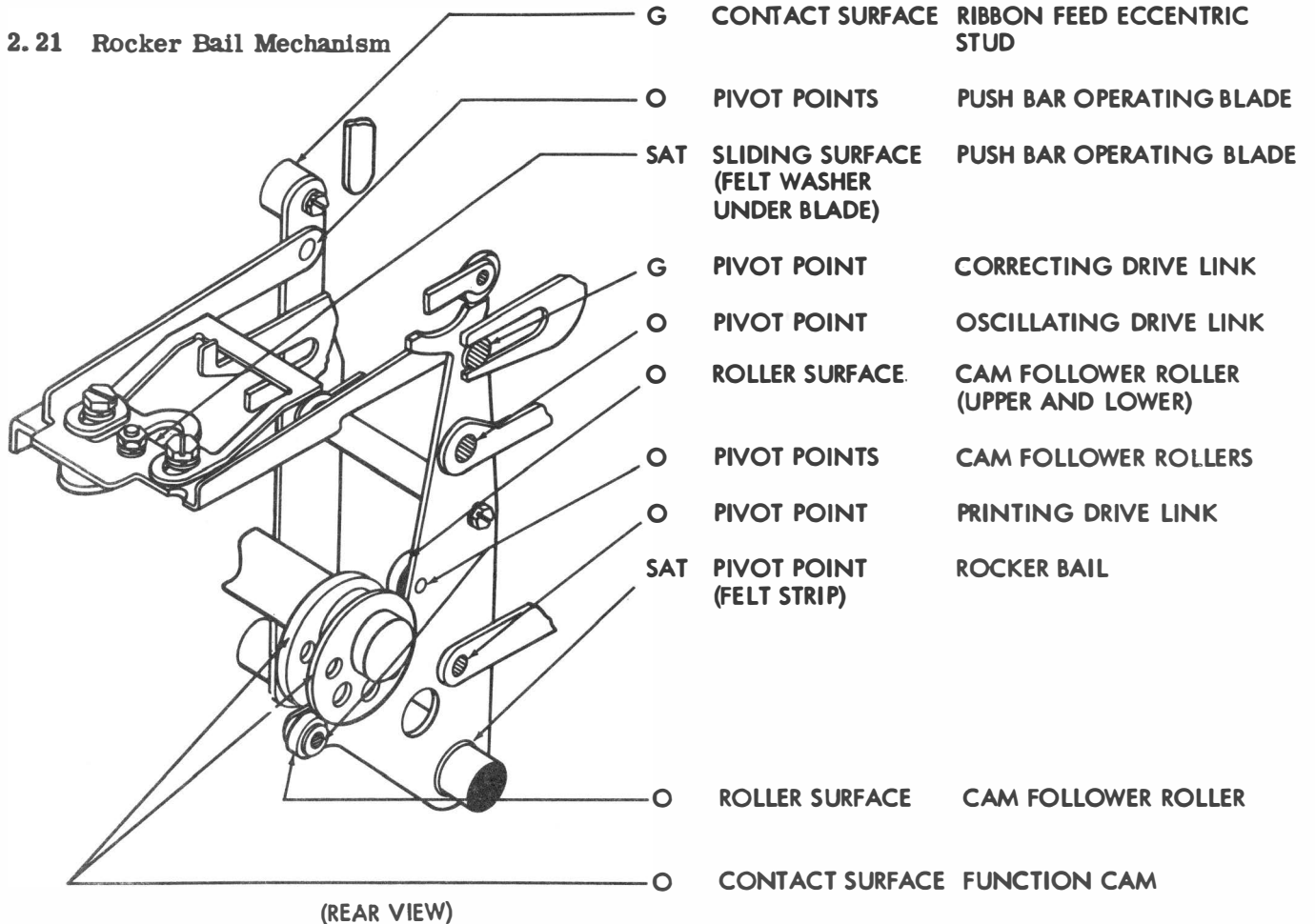




2.20 Printing Mechanism

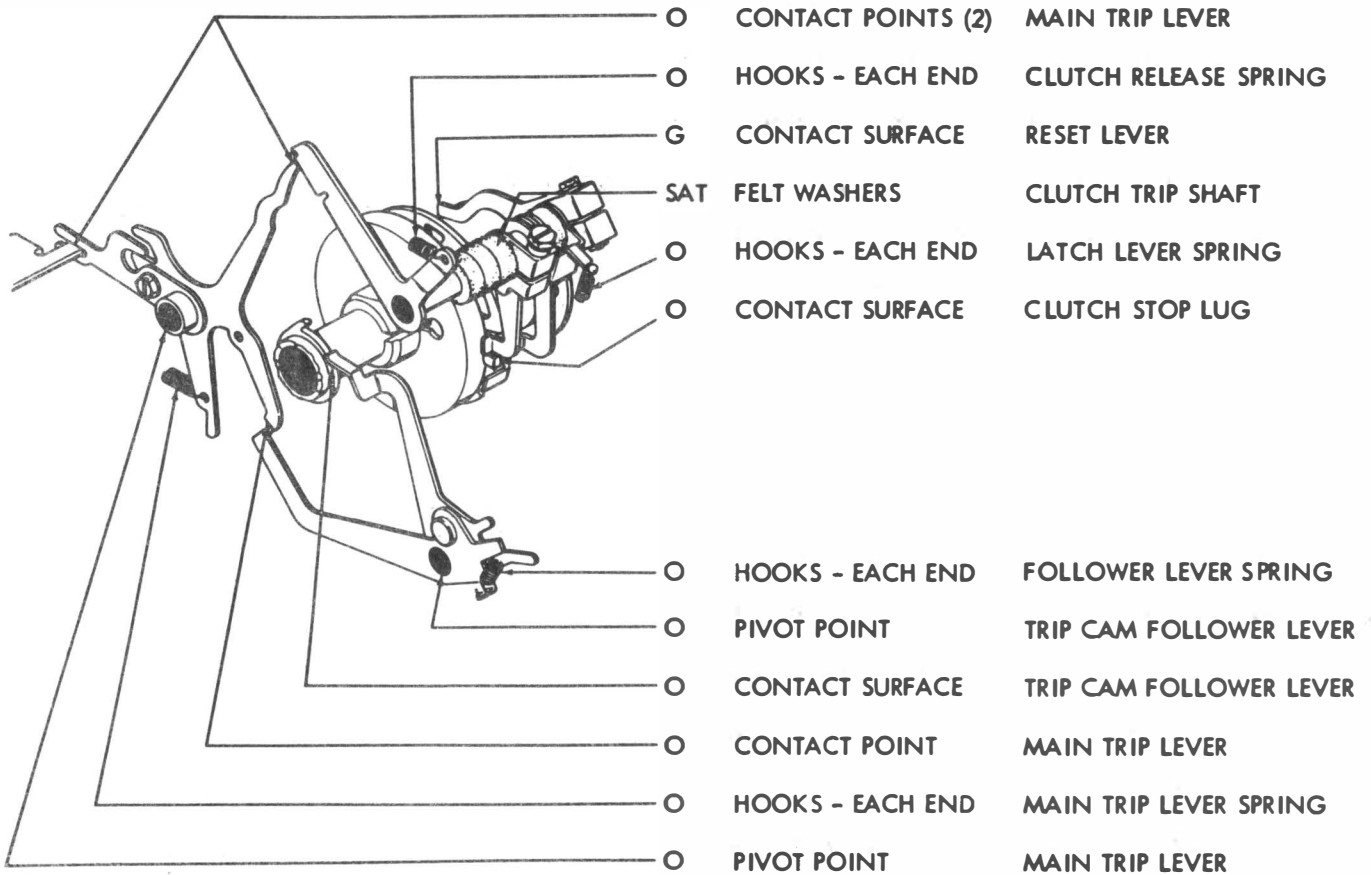


2.21 Rocker Bail Mechanism

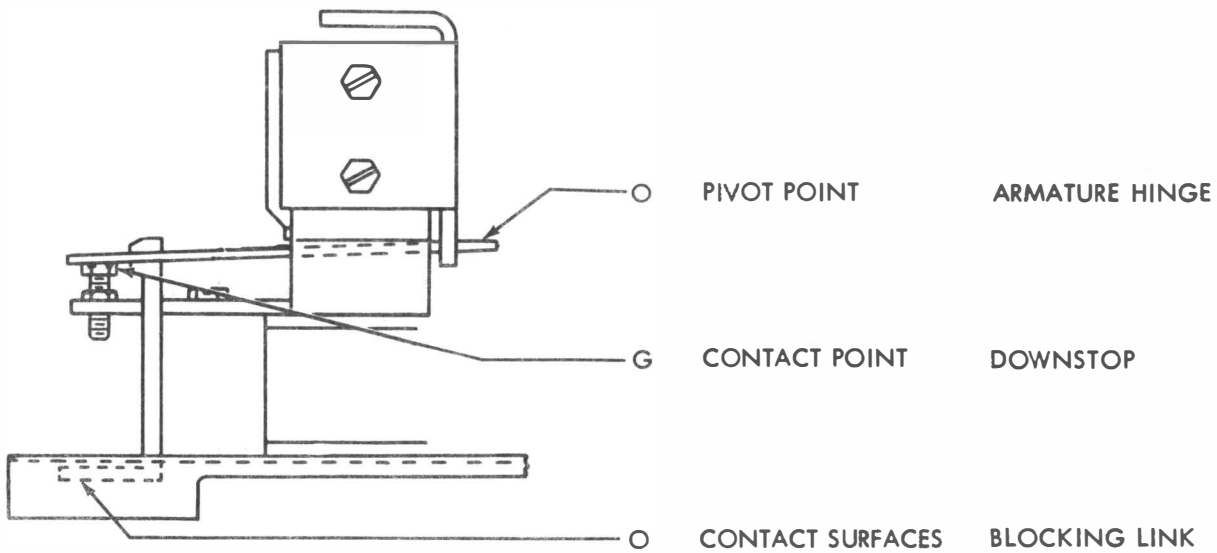


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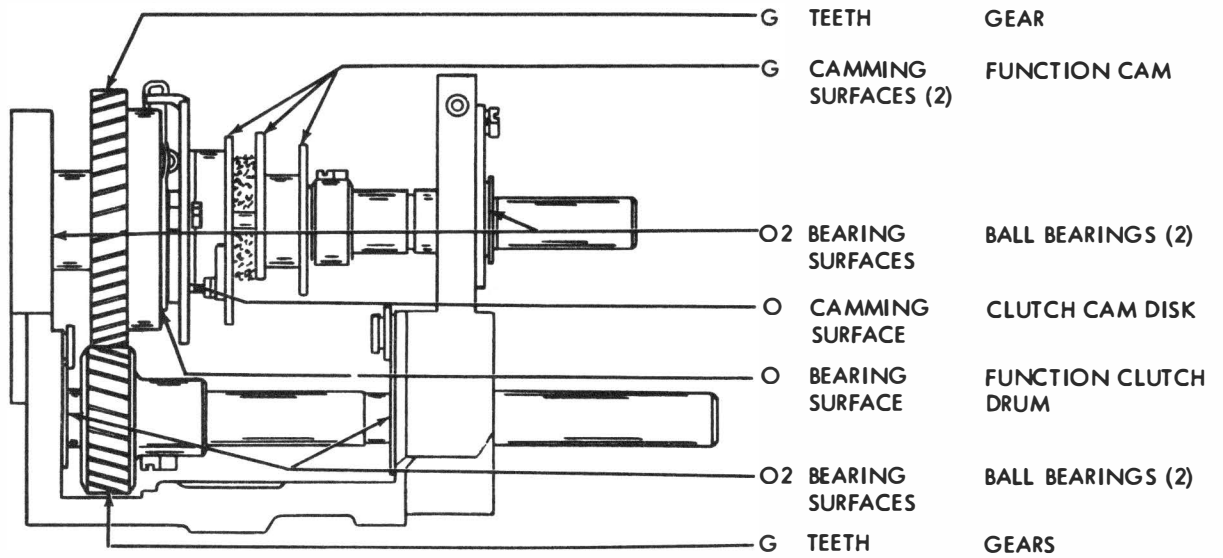
2.22 Function Cam-Clutch Trip Mechanism



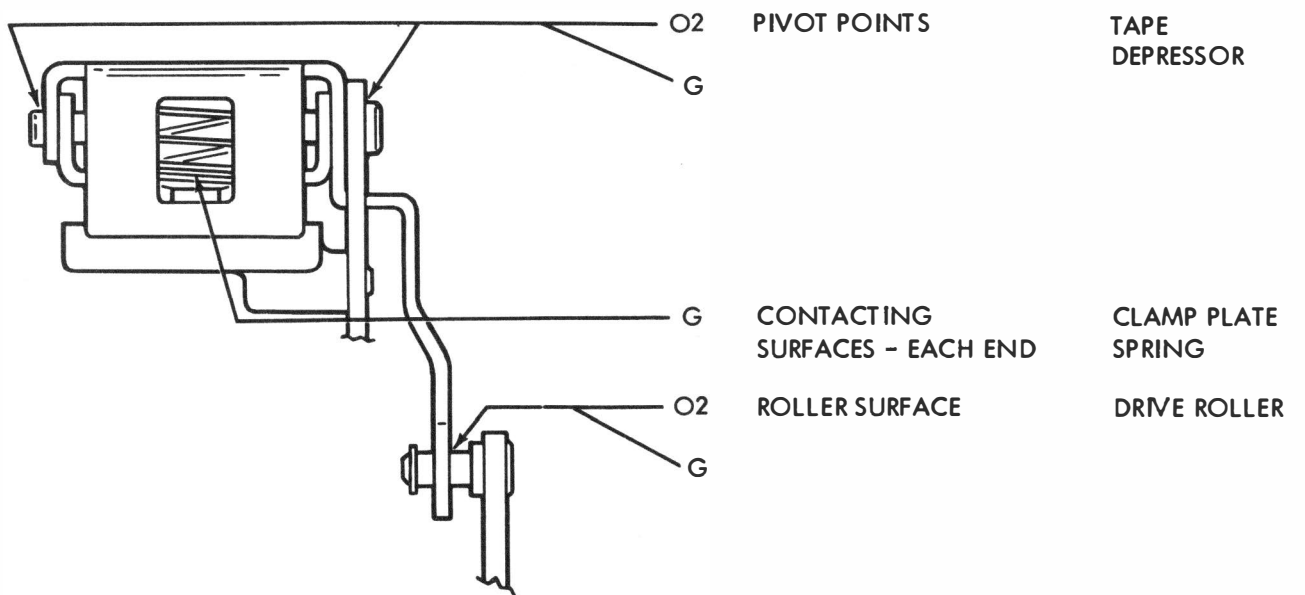
2.23 Ribbon Shift Magnet



2.24 Jack Shaft Mechanism

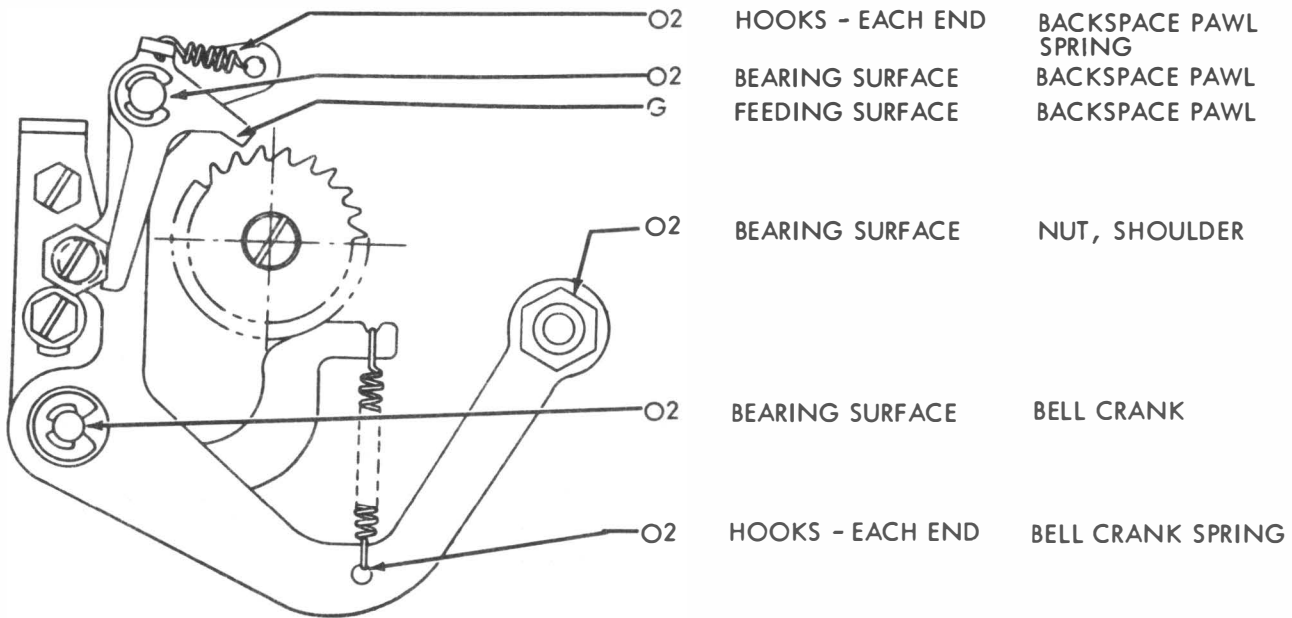


2.25 Tape Depressor Mechanism

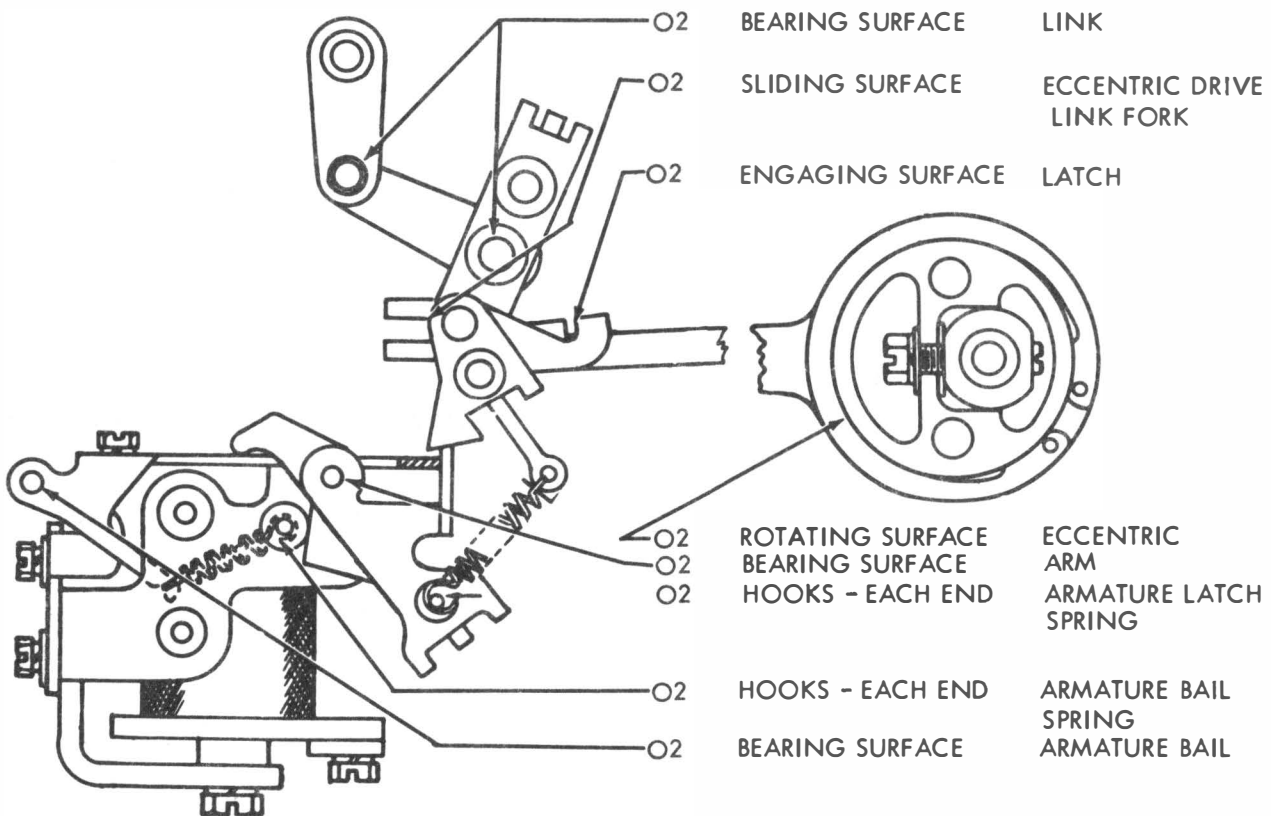


3. VARIABLE FEATURES

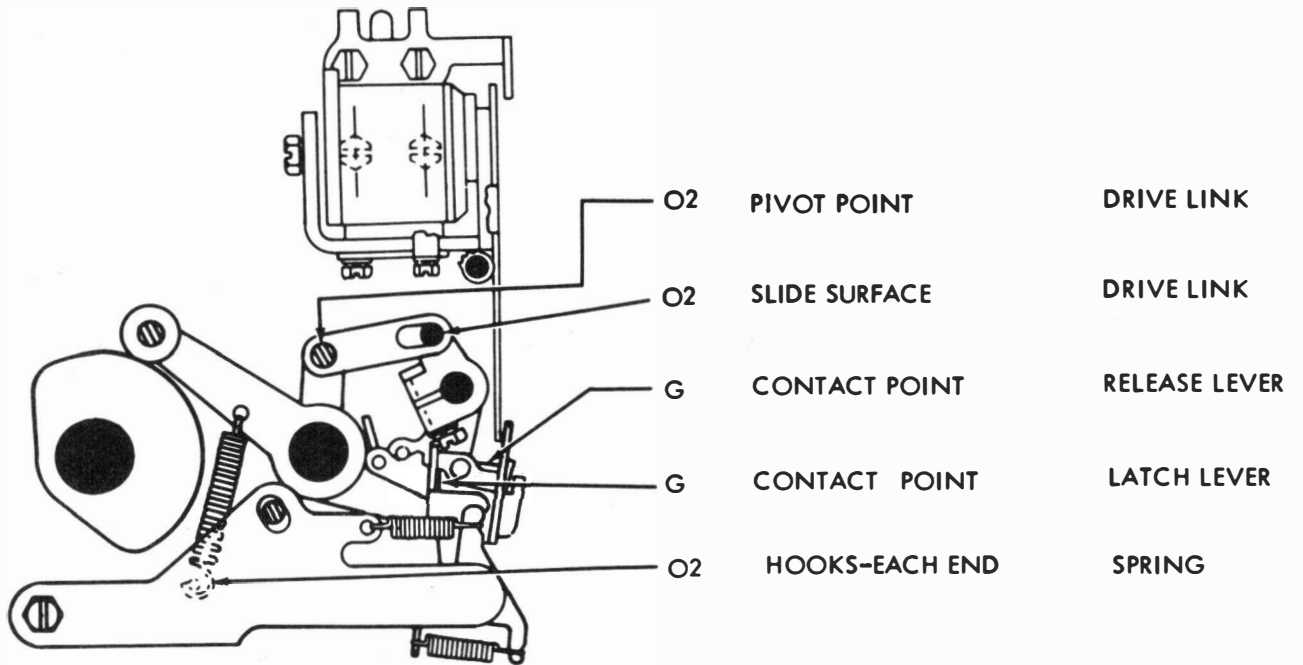
3.01 Manual Backspace Mechanism



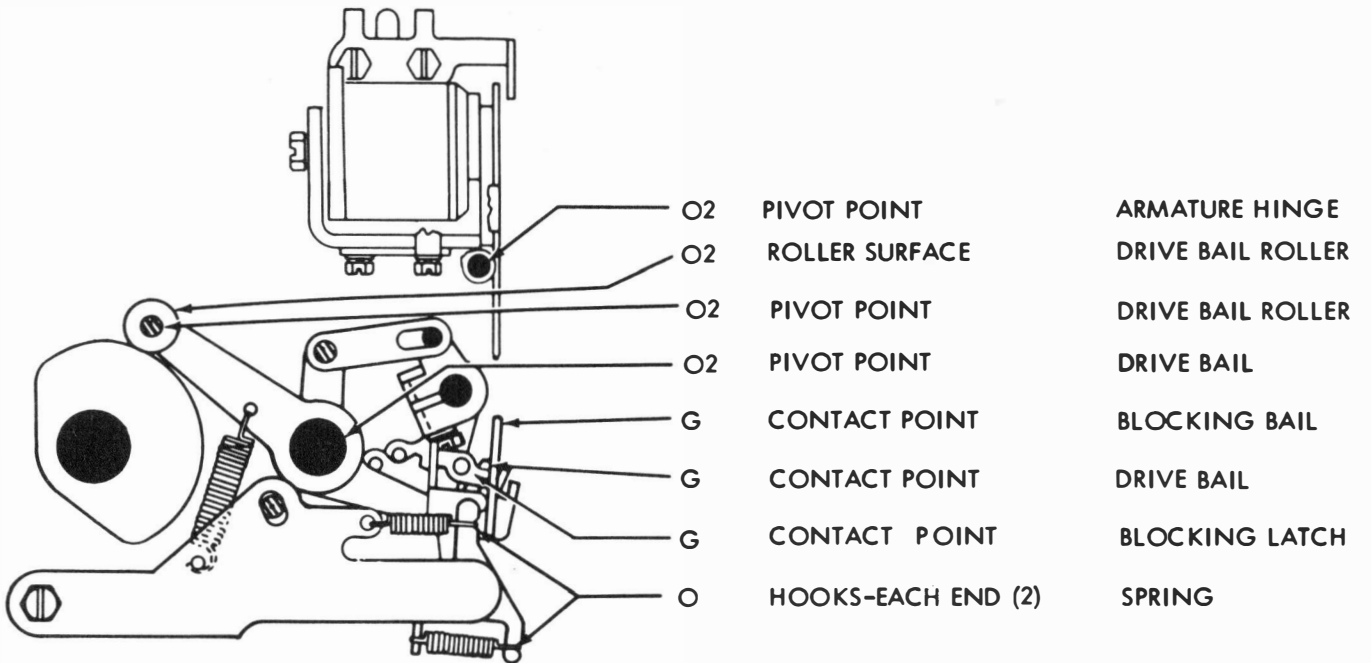
3.02 Power Drive Backspace Mechanism



3.03 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism

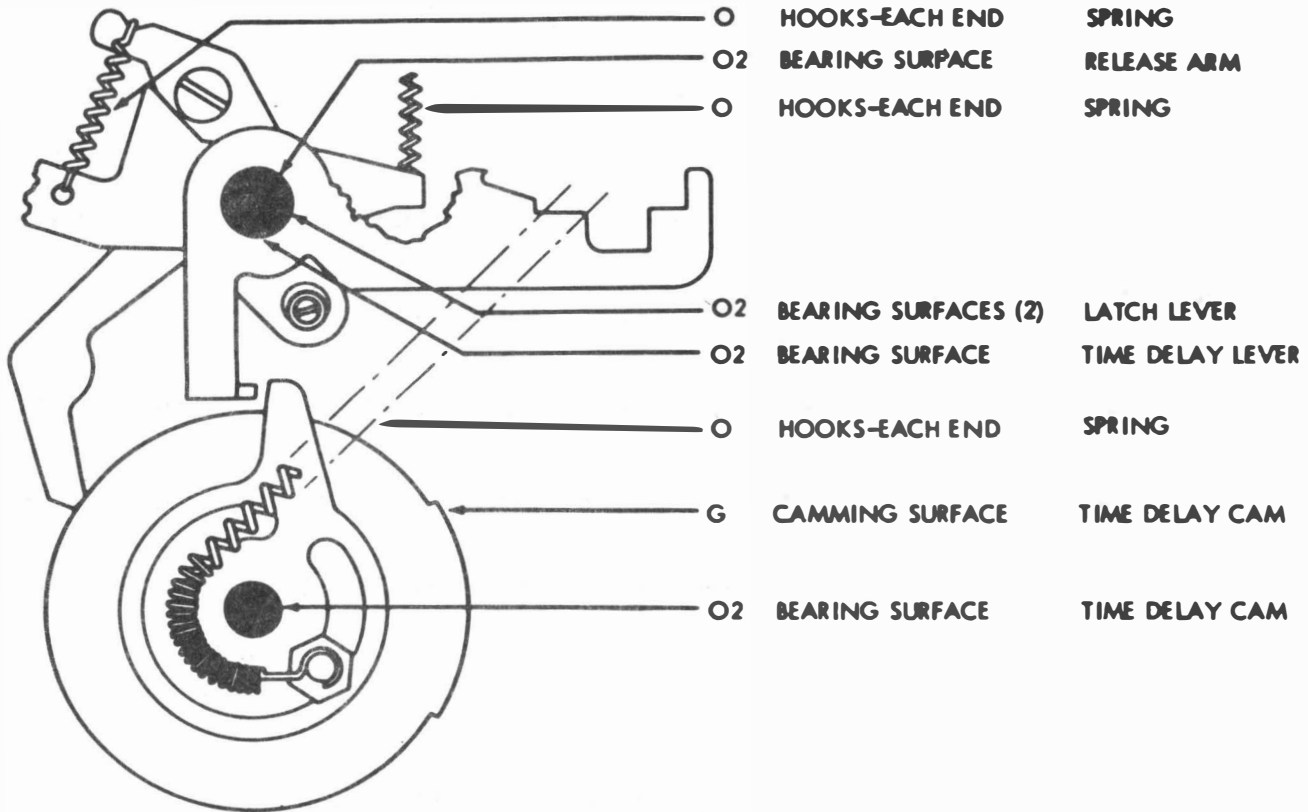


3.04 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)

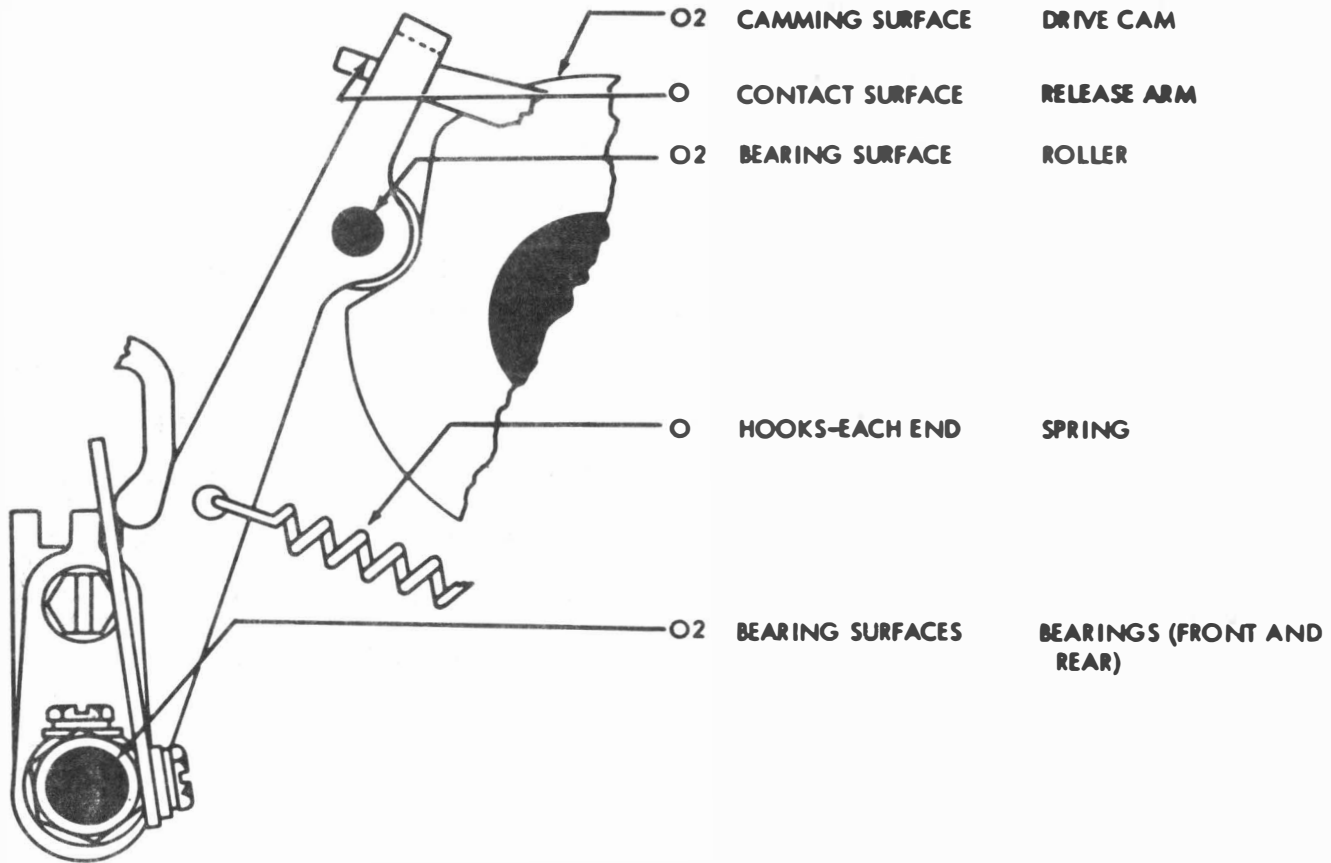


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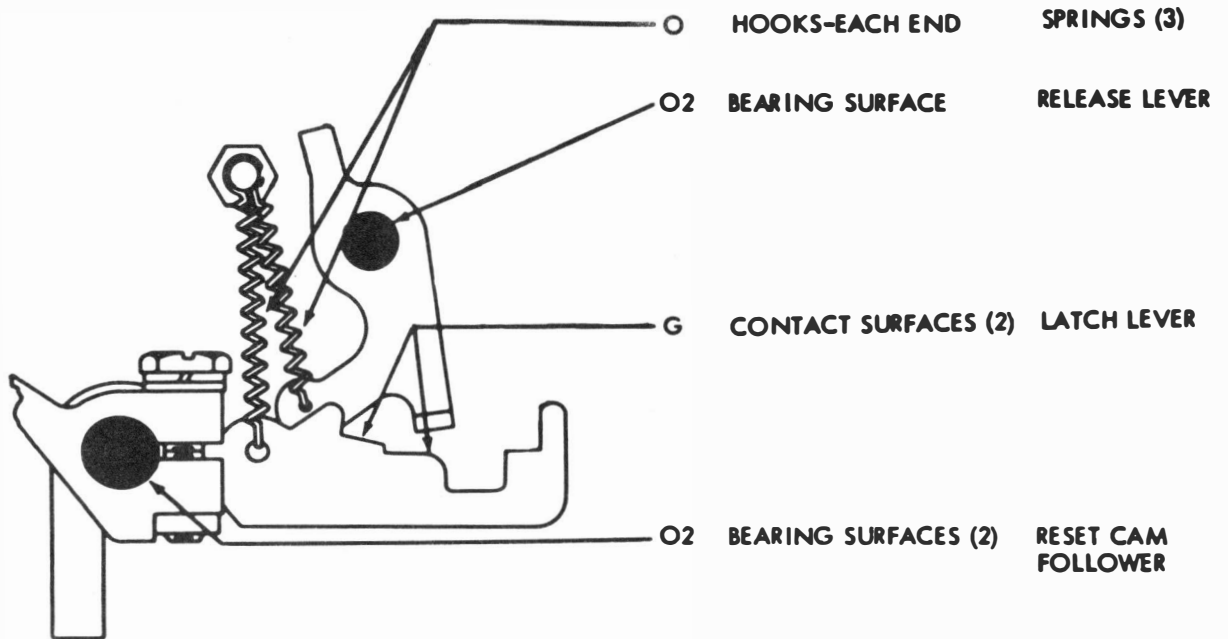
→ 3.05 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)



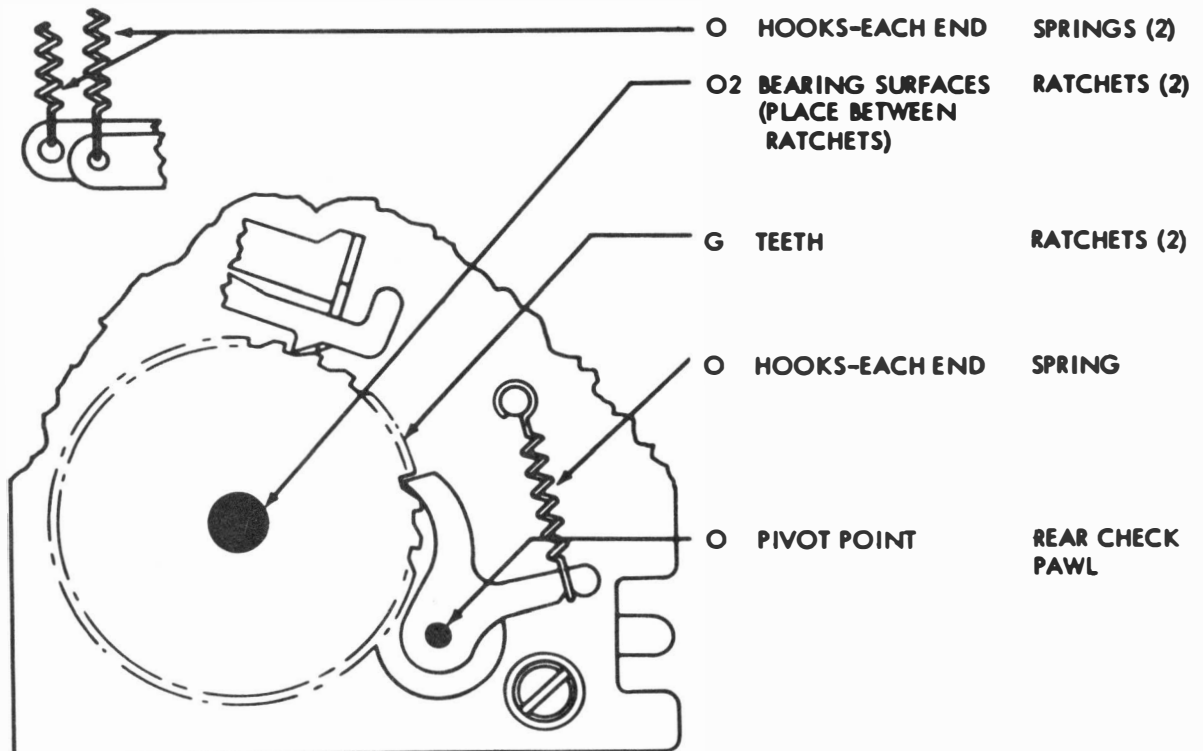
→ 3.06 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)



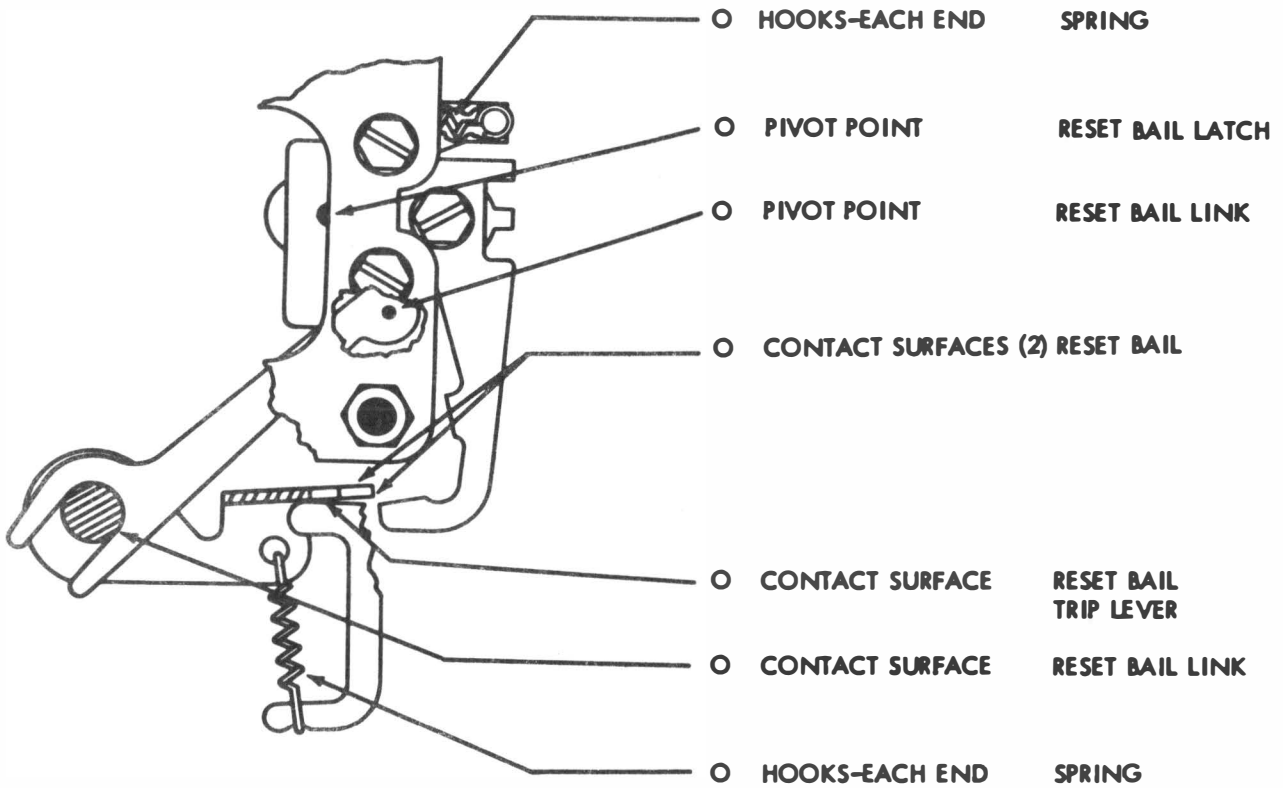
3.07 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)



3.08 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)

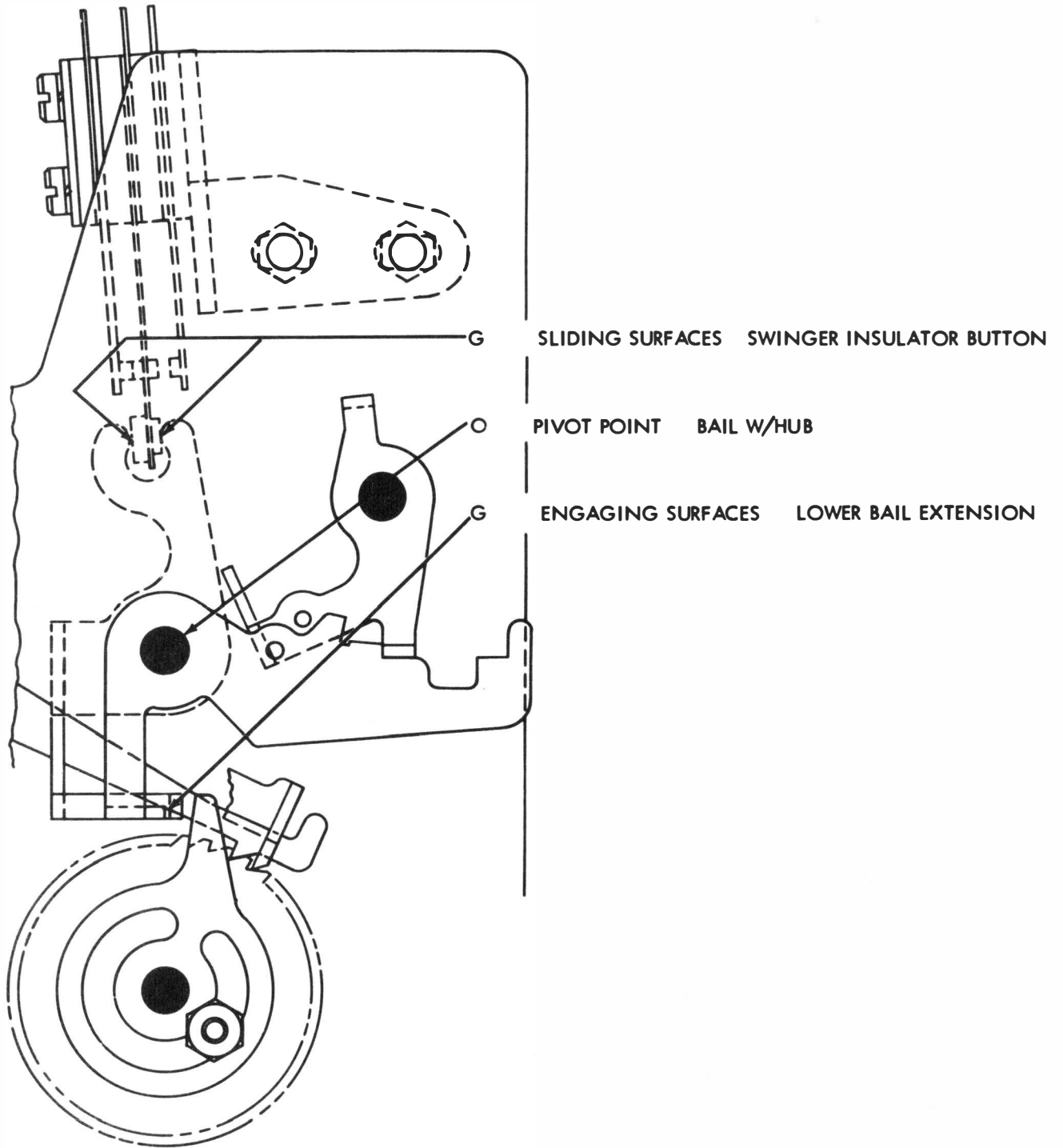


→ 3.09 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)





3.10 Remote Control Non-Interfering Rubout Tape Feed-Out Mechanism (continued)





35 TYPING REPERFORATOR  
DISASSEMBLY AND REASSEMBLY

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RIBBON FEED MECHANISM . . . . .	3
PERFORATOR MECHANISM . . . . .	3
TRANSFER MECHANISM . . . . .	3
TYPING MECHANISM . . . . .	3
ROCKER BAIL ASSEMBLY . . . . .	4
MAIN SHAFT ASSEMBLY . . . . .	4

1. GENERAL

1.01 This section is reissued to include additional disassembly and reassembly information. Changes and additions are noted by marginal arrows. The instructions given cover the principle subassemblies which make up the unit.

1.02 Figures 1 and 2 illustrate the 35 typing reperformator. The technician should refer to the exploded views found in the appropriate parts literature for an illustration of the mechanism to be disassembled, for location and visual identification of parts and detailed disassembly and reassembly features.

1.03 Most maintenance, lubrication and adjustments can be accomplished simply by removing the subject component from the cabinet. If possible, disassembly should be confined to sub-assemblies, which can, in some cases, be removed without disturbing adjustments. When reassembling the sub-assemblies, be sure to check all associated adjustments, clearances and spring tensions.

1.04 If a part that is mounted on shims is removed, the number of shims used at each of its mounting screws should be noted so that the same shim pile-up can be replaced when the part is remounted.

1.05 Retaining rings are made of spring steel and have a tendency to release suddenly when being removed. Loss of these retainers can be minimized as follows: Hold the retainer with the left hand to prevent it from rotating. Place the blade of a suitable screwdriver in one of the slots of the retainer. Rotate the screwdriver in a direction to increase the diameter of the retainer for removal.

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

1.07 Lift upward on the Reperformator Cover and remove it.

2. DISASSEMBLY AND REASSEMBLY

2.01 In removing a sub-assembly from the unit, the procedure followed and the location from which parts are removed must be carefully noted so that reassembly can be done correctly. Where no specific instructions are given for reassembly, reverse the procedure used in removing it.

2.02 Unplug the connecting cable at the rear of the unit. Remove the screw, lock washer and washer which secures the TP170199 anchor bracket to the base plate. Remove the three casting mounting screws, lock washers, and washers. Remove the Typing Reperformator from the base.

SELECTOR MECHANISM

2.03 Remove the screw, nut and lock washer that secure the selector clutch drum to the main shaft. Place the TP170238 reset bail in its raised position. Hold the TP170198 stop lever and the TP170236 marking lock lever out of the way while slowly pulling forward on the cam-clutch until it is removed.

2.04 Unhook the spring on the TP150355 function clutch latch lever. Remove the TP156472 spring post by removing its lock nut

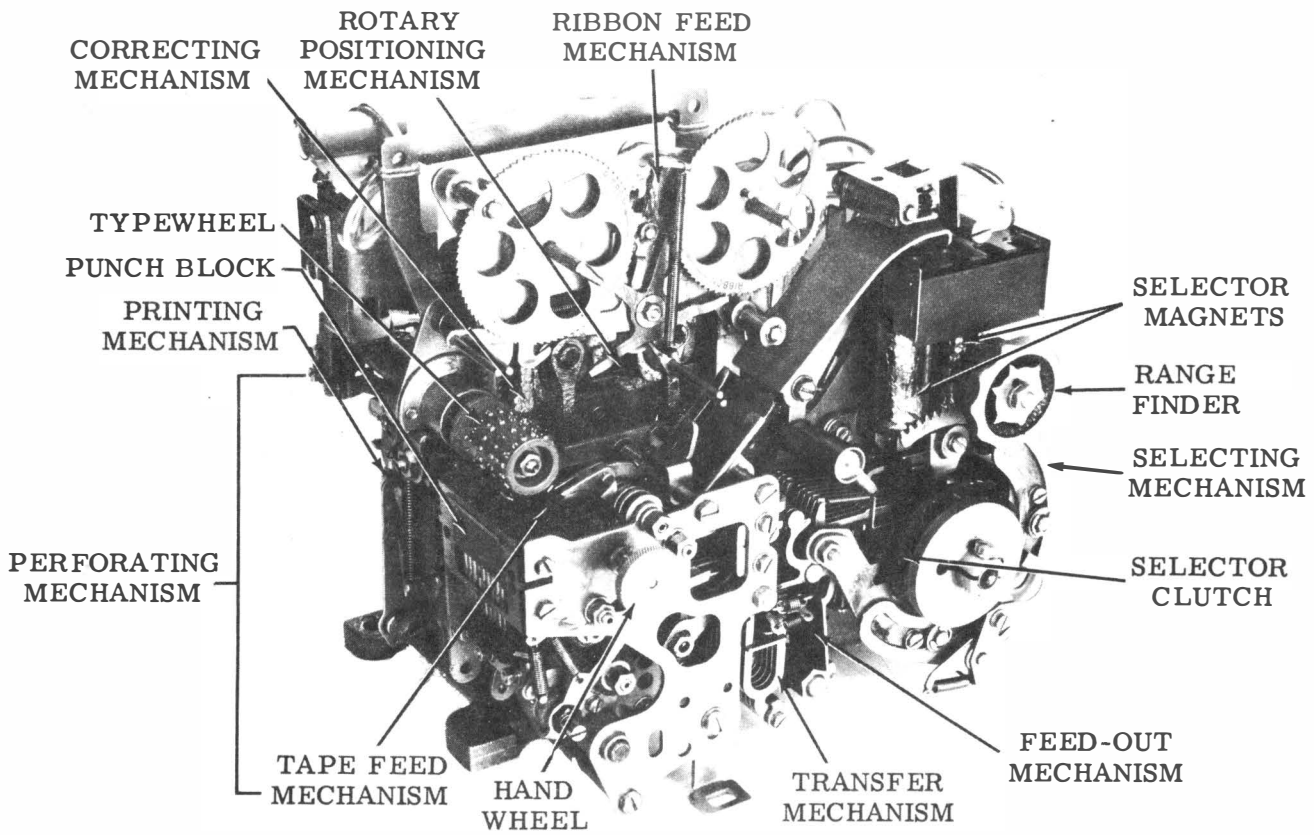


Figure 1 - Typical 35 Typing Reperforator (Left Front View)

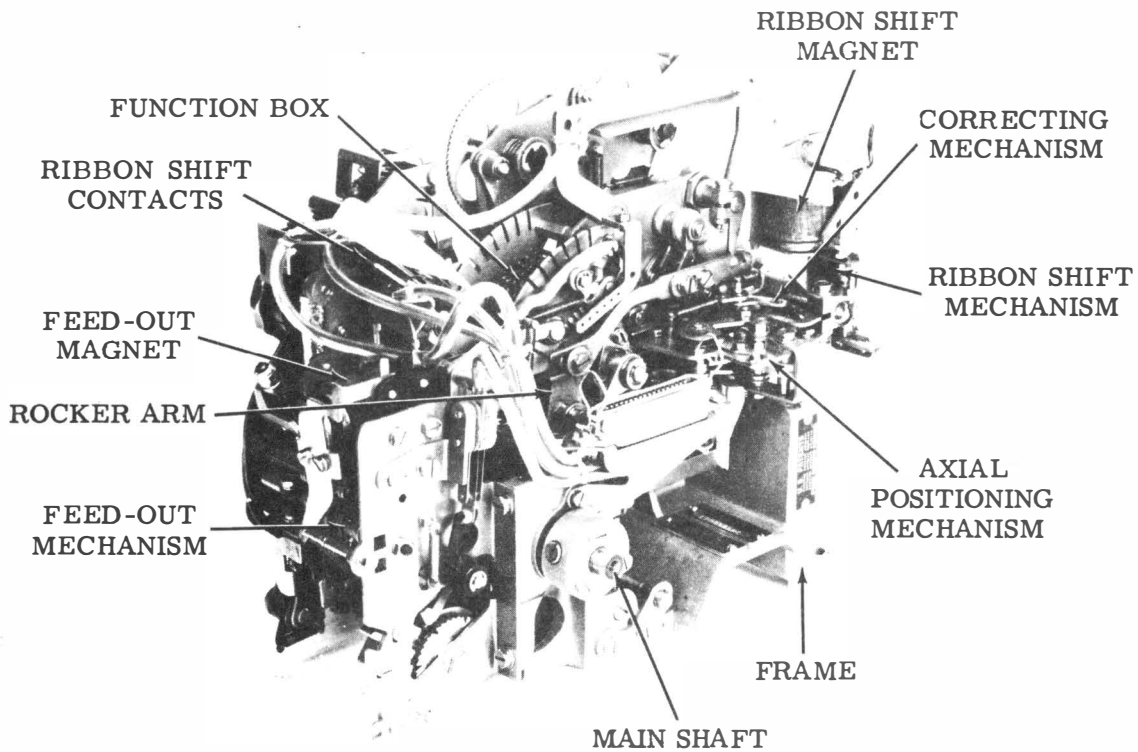


Figure 2 - Typical 35 Typing Reperforator (Left Rear View)

and lock washer. Remove the screw and lock washer that secure the TP170234 selector lever guide to the selector plate. Remove the oil wick holder. The selector mechanism can now be taken off.

#### RIBBON FEED MECHANISM

2.05 Remove the ribbon. Remove the two mounting screws that mount the ribbon feed mechanism plate. Remove the ribbon feed mechanism.

#### PERFORATOR MECHANISM

2.06 Remove spring from the TP156412 perforator drive link and the TP170211 rocker arm.

2.07 Remove the TP159621 pivot screw with lock washer from the TP159622 perforator adjusting clamp. Remove the TP151631 and TP151632 mounting screws (with lock washers and flat washers) that fasten the TP156024 rear plate to the main plate. Remove the perforator mechanism.

2.08 To remount the perforator mechanism, reverse the procedure used to remove it. Make certain that the TP162763 reset bail fits in the fork of the TP170203 reset bail trip lever and that the TP173756 print hammer fits in its slot in the perforator mechanism.

#### TRANSFER MECHANISM

2.09 Remove the TP151736 main trip lever spring. Remove the TP151631 and TP151632 mounting screws (with lock washers and flat washers) from the TP192820 transfer mounting bracket. Remove the transfer mechanism.

#### TYPING MECHANISM

2.10 To remove typing mechanism, remove the TP156872 operating blade from the rocker bail assembly by removing its two mounting screws with lock washers, flat washers and shims. Remove the retaining ring and disconnect the TP159512 printing trip link. Remove the nut, lock washer and flat washer from the TP156396 eccentric on the TP162350 rocker bail, and disconnect the TP159526 oscillating drive link. Remove TP33828 spring from the TP173981 accelerator and the spring from the TP156252 lifter.

2.11 Remove screw with lock washer that fastens the TP159434 lifter plate to the bar on the frame. Remove the screw with lock

washer that secures the TP159525 axial bracket to the post on the frame. Remove the TP151631 screw (with lock washer and flat washer) that fastens the TP192829 function box front plate to the TP192898 main plate. Remove the TP119653 retaining ring from the TP159659 idler gear eccentric shaft. Remove the eccentric shaft, TP159536 idler gear, TP151629 special nut and lock washer by removing the TP159658 mounting screw. Remove the three TP151631 screws (with lock washers and flat washers) that secure the TP192831 front plate to the frame. Remove the typing mechanism from the frame.

2.12 To remove function box mechanism, remove the TP151631 mounting screw (with lock washer and two flat washers) that passes through the TP192844 function box rear plate into the TP192831 front plate. Remove the function box from the typing mechanism.

2.13 To remove axial plate assembly, remove the TP3870 correcting drive link spring. Remove the TP156413 correcting drive link by removing the retaining ring from the TP156378 axial correcting plate. Remove the retaining ring and disconnect the TP192883 ribbon guide from the TP192882 ribbon oscillating lever.

2.14 Remove the three mounting screws and lock washers from the TP159525 axial plate. Remove the axial plate assembly.

2.15 To remount the axial plate assembly, reverse the procedure used to remove it. The rearmost tooth of the rack on the TP173775 typewheel shaft must mesh with the rearmost tooth space in the TP156294 axial sector, and the forward tooth space on the shaft: there is an extra tooth space on the forward portion of the shaft's rack.

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

2.17 To remove pushbars after removing the typing mechanism, remove the function box mechanism from the typing mechanism. Remove the pushbar by disengaging the pushbar rack from its associated pinion.

2.18 The correct gear tooth engagement of racks for pushbars 1 through 5 is as follows: In assembling the pushbars to the various eccentric assemblies, great care must be exercised to assure the correct rack-pinion gear mesh. The correct mesh is such that the first

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tooth on the pinion and the first tooth space on the rack are meshed. On later units this is identified by a mark on the push bar and a mark on the eccentric. The last tooth on the pinion and the last tooth space on the rack should therefore also mesh.

**CAUTION: MISALIGNMENT OF THE MESH BY AS LITTLE AS ONE TOOTH WILL PRODUCE A JAM IN THE MACHINE AND CAUSE PART BREAKAGE IF THE MACHINE IS PUT UNDER POWER WHILE THIS CONDITION EXISTS.**

### ROCKER BAIL ASSEMBLY

2.19 Disconnect the TP156937 printing drive link by removing the retaining ring at its left end. Remove the TP3598 nut, lock washer, flat washer, felt washer, bushing and TP151632 screw from the TP156871 operating blade mounting bail.

2.20 Remove the nut, lock washer and TP156921 adjusting lever guide, and remove the TP156366 rocker bail shaft. Remove the rocker bail.

### MAIN SHAFT ASSEMBLY

2.21 Remove the spring from the function clutch latch lever. Remove the retaining ring, spring washer and flat washers from the forward end of the TP170201 main shaft.

2.22 Remove the screw and lock washer from the TP150000 function clutch drum. Remove the screw and lock washer from the TP173340 collar. Remove the screw and lock washer from the TP158745 bearing clamp.

2.23 Pull main shaft out of rear of unit, removing the cam-clutch and collar.

**CAUTION: NOTE THE LOCATION OF THE MAIN SHAFT NEEDLE ROLLER BEARINGS AS SHOWN ON ILLUSTRATIONS OF PARTS IN APPROPRIATE SECTION. MOVE THE MAIN SHAFT TOWARD THE REAR OF THE UNIT A SMALL AMOUNT AT A TIME AND EXERCISE CARE NOT TO DROP OR CONTAMINATE THE 20 NEEDLE ROLLERS IN EACH RACE. A SMALL SPRING MAY BE STRETCHED AROUND THE SHAFT AND ROLLERS WITH THE ENDS OF THE SPRINGS HOOKED TOGETHER. THE GARTER SPRING IN CONJUNCTION WITH THE GREASE, WILL HOLD THE ROLLERS IN PLACE. WHEN REPLACING THE MAIN SHAFT, MAKE SURE THE ROLLERS ARE CLEAN. LUBRICATE THE RACE AND BEARINGS WITH BEACON 325 GREASE (TP195298). APPLY A LIBERAL AMOUNT OF OIL AT EACH END OF THE BEARING SLEEVE.**

**Note:** When the main shaft is inserted in the cam-clutch, hold the latter firmly so that the drum is not pushed off the clutch. Compress the drum and cam disk together so that holes in the drum and clutch bearings are aligned.

35 RECEIVING ONLY REPERFORATOR TABLE  
GENERAL DESCRIPTION AND PRINCIPLES OF OPERATION

CONTENTS	PAGE
1. GENERAL DESCRIPTION . . . . .	1
2. PRINCIPLES OF OPERATION . . . . .	1

1. GENERAL DESCRIPTION (Fig. 1)

1.01 This section is reissued to include as a standard a complete general description and basic principles of operation of the 35 Receiving Only Reperforator Table.

1.02 The equipment covered in this section provides a stand for the 35 Receiving Only Typing Reperforator, mounting facilities for the chad container and chad warning device, and mounting facilities for the 35 Electrical Service Unit. Refer to the applicable section for the description and principles of operation of any components mounted in or upon the table except the chad disposal mechanisms, which are considered a part of this table.

1.03 The front access door, with magnetic latch, is used for servicing the electrical service unit and emptying the chad container.

1.04 A red lens near the upper left corner of the door is illuminated as a warning to the operator that the chad container is full.

**CAUTION: IF THE CHAD CONTAINER IS NOT REPLACED WHEN EMPTIED, THE WARNING LAMP WILL NOT BE LIGHTED. BE SURE THE CONTAINER IS PROPERLY SUSPENDED FROM THE SUPPORT BEAM WHENEVER THE REPERFORATOR MOUNTED ON THE TABLE IS IN OPERATION.**

1.05 The chad container is large enough to hold the accumulation of chad produced from fifty percent perforation of three rolls of standard 1000 feet one-inch wide eight level tape.

1.06 The electrical service unit mounting rack is removable for servicing.

2. PRINCIPLES OF OPERATION (Fig. 2)

2.01 The chad disposal assembly provides the means of collecting the chad produced at the perforating unit and indicating when the container is full.

2.02 The chad disposal assembly is made up of a beam scale which weighs the chad and trips the warning lamp switch when the weight of the chad (and container) comes to approximately 25 ounces (container 2/3 full).

2.03 When the warning lamp switch is turned on, a lamp behind the door lens lights and illuminates the lens. The lamp is extin-

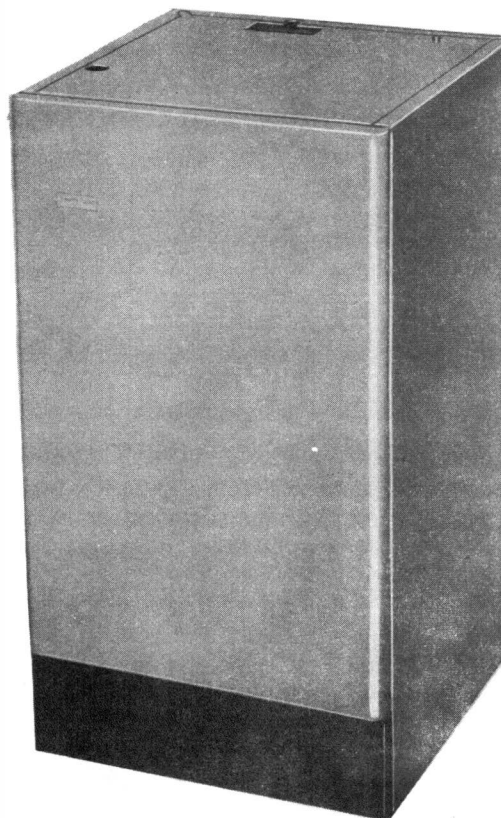


Figure 1 - 35 Receiving Only Reperforator Table

guished when the chad and container are removed from the scale beam and is not re-lighted by the weight of the container alone when it is replaced.

2.04 A cable with clip-on terminals is furnished with the chad disposal assembly. This cable connects to the wiring field in the

electrical service unit, which is also housed in the table.

2.05 The remainder of the 35 Receiving Only Reperforator Table consists of passive components which require no principles of operation.

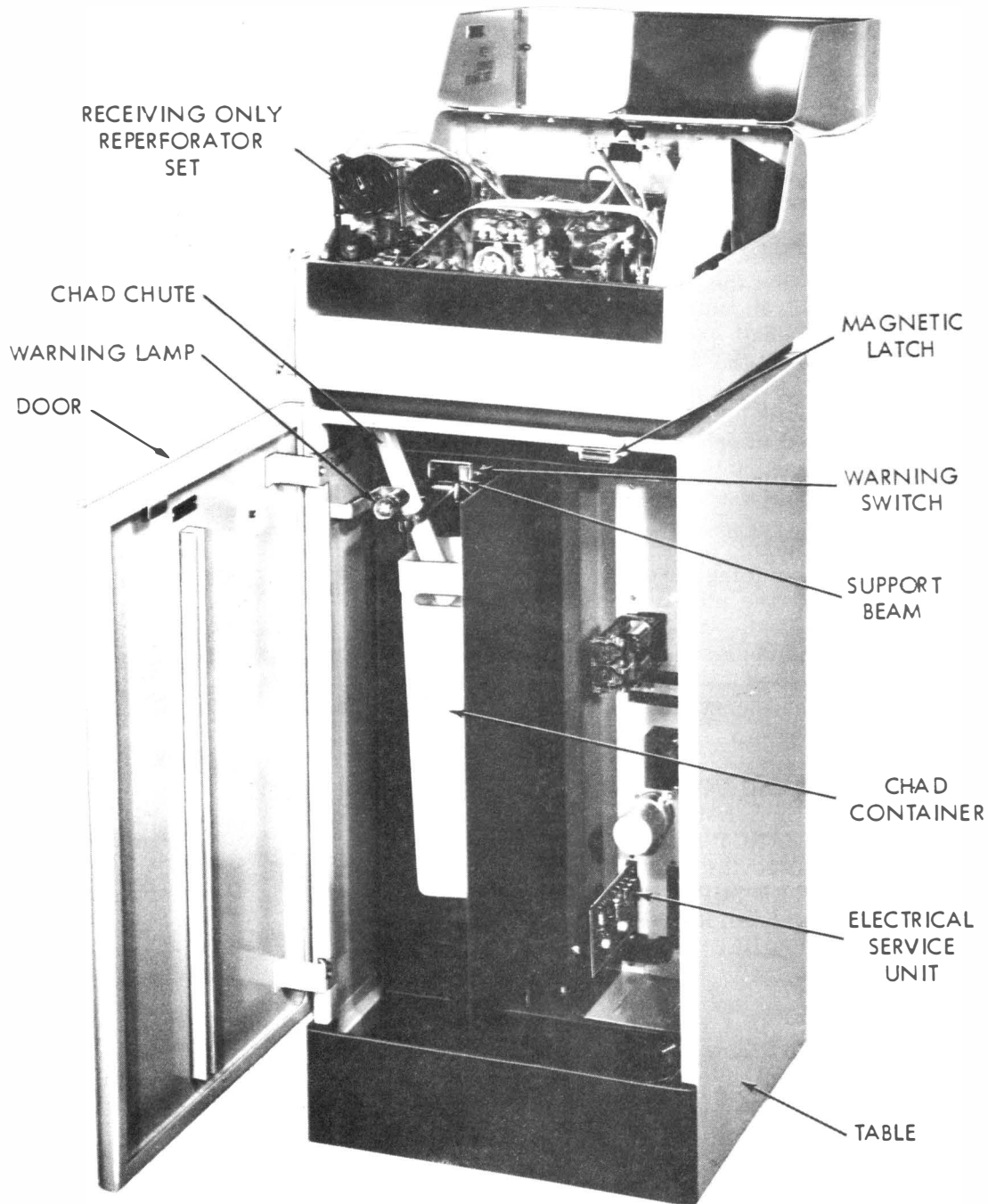


Figure 2 - 35 Reperforator Table with Receiving Only Set and Electrical Service Unit



35 RECEIVING ONLY REPERFORATOR TABLE

ADJUSTMENTS

CONTENTS	PAR. NO.
1. GENERAL . . . . .	1.01-1.07
2. ADJUSTMENTS . . . . .	2.01
Chad disposal counterweight . . . . .	2.01

1. GENERAL

1.01 This section is reissued to include complete adjustment requirements for the 35 Receiving Only Reperforator Table.

1.02 This equipment consists mainly of passive parts and requires only the chad disposal counterweight adjustment. The plastic chad disposal tube should be disconnected from the perforator and retracted through the hole in the top of the table before an adjustment is made. Necessary adjustments can be checked without disturbing the chad tube.

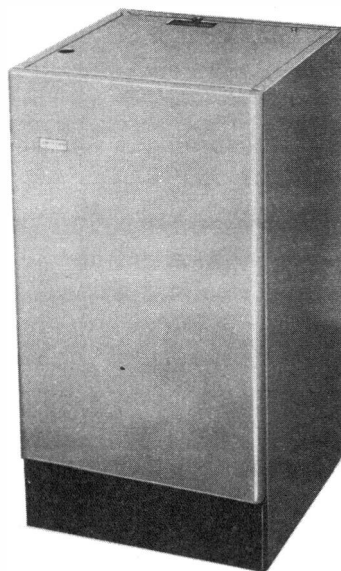


Figure 1 - 35 Receiving Only Reperforator Table

1.03 Reinstall the chad tube on the perforator chad chute when adjustments are completed. Insert the chad tube through the hole at the left side of the table top. Engagement between the chad chute and the chad tube should be at least one inch.

1.04 Reference to left or right, front or rear and up or down refer to the apparatus in its normal operating position, as viewed from the front. It is assumed that the elements depicted in illustrations in this section are being viewed from the front of the equipment, unless the illustrations are specifically labeled otherwise. In the illustrations, pivot points are shown by circles or ellipses that are solid black to indicate fixed points and cross-hatched to indicate floating points.

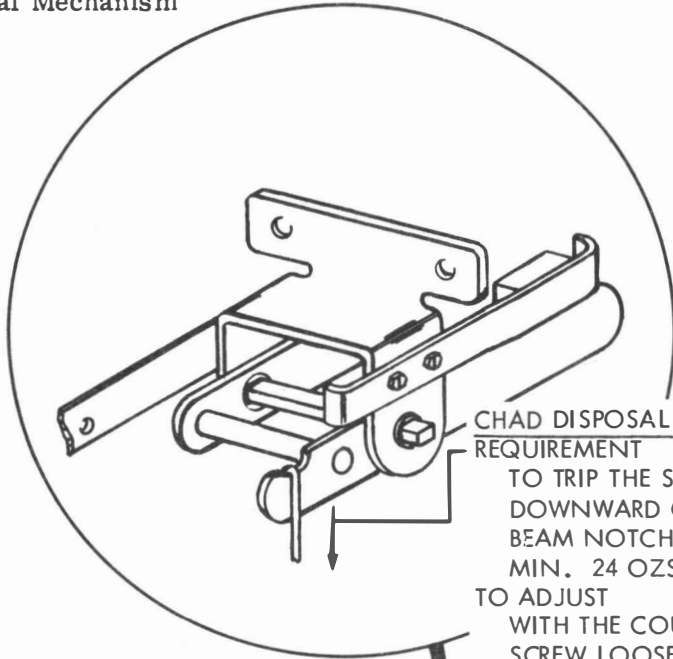
1.05 Tools required to make the adjustments and test the spring tensions are listed in the appropriate section. Spring tensions given in this section are indications, not exact values, and should be checked with the correct scale applied in the positions shown in the drawings.

1.06 Parts dismantled to facilitate checking or readjustment should be reassembled after the operation is completed. If a part mounted on shims is to be dismantled, the number of shims used at each mounting screw should be noted so that the same shim pile-ups can be replaced when the part is remounted. When parts removed are replaced, related adjustments which may have been affected should be checked.

1.07 Parts that are worn to the extent that they can no longer be made to meet the specified requirements by authorized adjustments or which are worn to the extent that it seems probable that early further wear might cause a loss of adjustment should be replaced by new parts. Springs which do not meet the requirements and for which there are no adjusting procedures should be discarded and replaced by new springs.

2. ADJUSTMENTS

2.01 Chad Disposal Mechanism



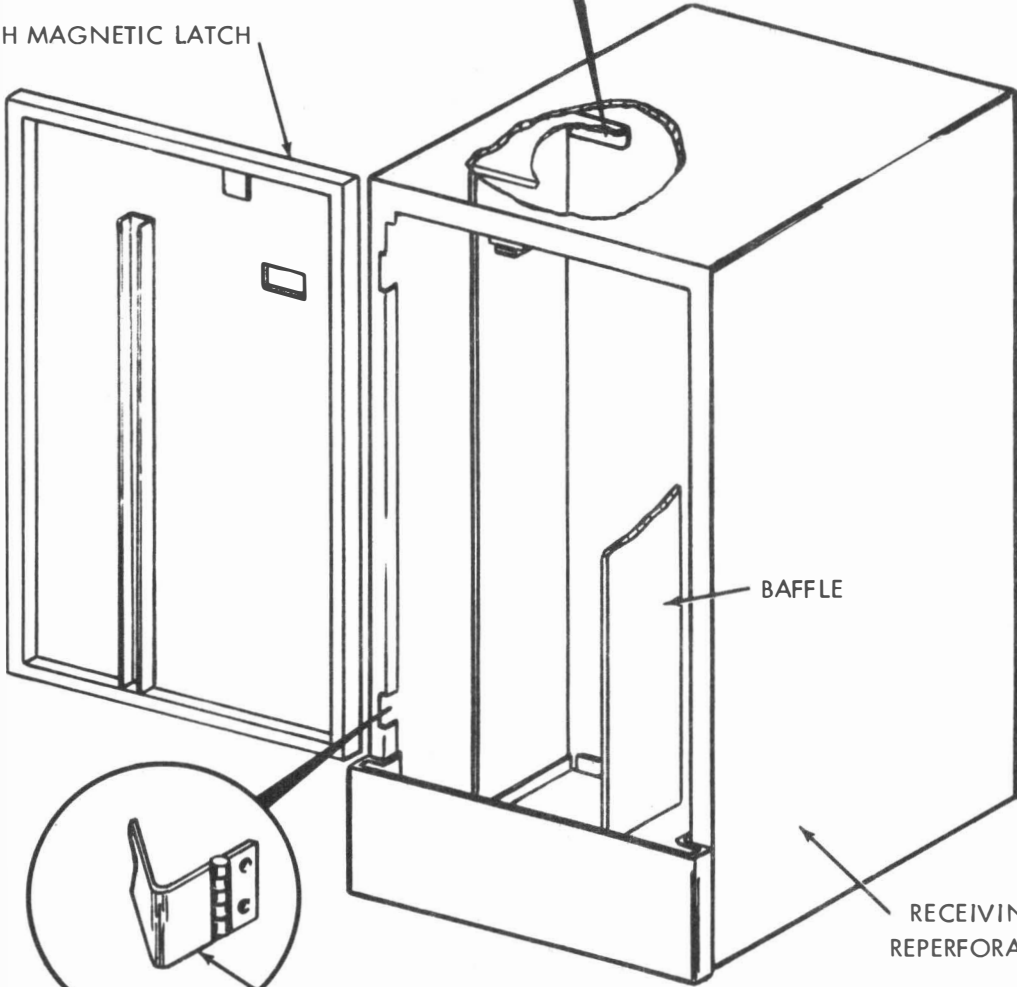
CHAD DISPOSAL COUNTERWEIGHT REQUIREMENT

TO TRIP THE SWITCH WHEN PULLING DOWNWARD ON THE CHAD BOX SUPPORT BEAM NOTCH.

MIN. 24 OZS. --- MAX. 27 OZS.

TO ADJUST WITH THE COUNTERWEIGHT MOUNTING SCREW LOOSE SLIDE THE COUNTERWEIGHT ON ITS BEAM TO MEET REQUIREMENT.

DOOR WITH MAGNETIC LATCH



BAFFLE

RECEIVING ONLY REPERFORATOR TABLE

DOOR HINGES

35 RECEIVING ONLY REPERFORATOR TABLE

LUBRICATION

CONTENTS	PAR. NO.
1. GENERAL . . . . .	1.01-1.05
2. LUBRICATION . . . . .	2.01-2.03
Hinge . . . . .	2.03
Knife . . . . .	2.02
Receiving Only Reperforator Table . . . . .	2.01

1. GENERAL

1.01 This section is reissued to include complete lubrication procedures for the 35 Receiving Only Reperforator Table as a standard.

1.02 The 35 Receiving Only Reperforator Table consists mainly of passive parts and requires only two points of lubrication. These points are shown by a photograph. Specific lubrication information is indicated by line drawings and descriptive text. The symbols in the text indicate the following directions:

- O Apply one drop of oil.
- O2 Apply two drops of oil.
- O3 Apply three drops of oil, etc.
- G Apply thin coat of grease.
- SAT Saturate with oil. (Felt washers, etc.)
- L Apply lubriplate.

KS7470 oil and KS7471 grease should be used.

1.03 The equipment should be thoroughly lubricated, but over-lubrication which might allow oil to drop or grease to be thrown on other parts should be avoided. Special care should be exercised to prevent lubricant from getting between electrical contact points.

1.04 The following general instructions supplement the specific lubricating points illustrated on subsequent pages.

Apply one drop of oil to all spring hooks.

Apply a light film of oil to all cam surfaces.

Apply a thick coat of grease to all gears.

Saturate all felt washers, oilers, etc.

Apply oil to all pivot points.

Apply oil to all sliding surfaces.

1.05 All equipment should be lubricated before being placed in service or prior to storage. After a few weeks of service, relubricate to make certain that all specified points have received lubricant. Thereafter, the following schedule should be adhered to:

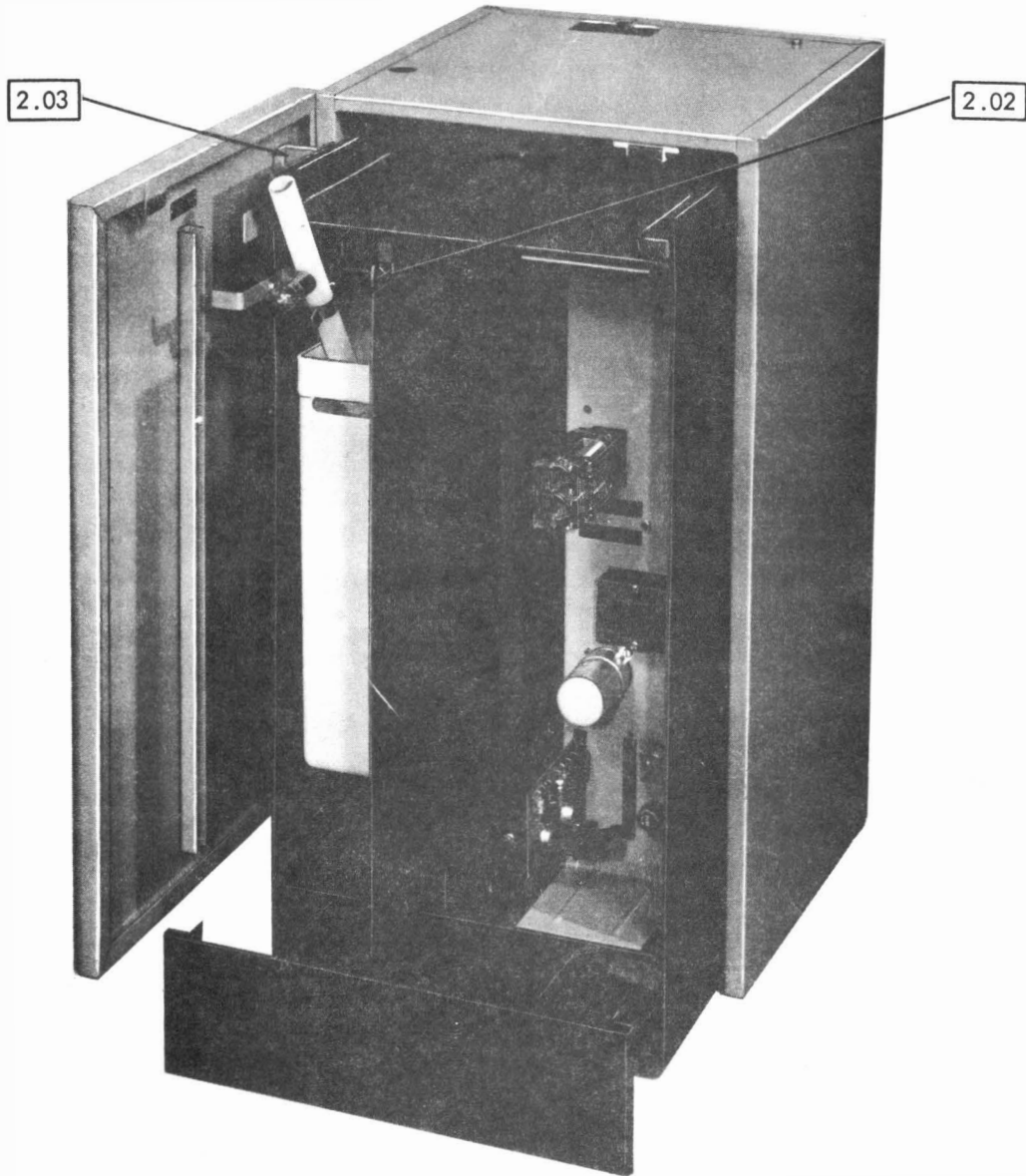
<u>Operating Speed</u>	<u>Lubrication Interval</u>
60 W.P.M.	3000 hours or 1 year*
75 W.P.M.	2400 hours or 9 months*
100 W.P.M.	1500 hours or 6 months*

\*Whichever comes first.

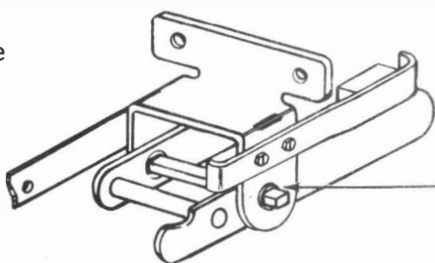
2. LUBRICATION

SECTION 574-234-701

2.01 Receiving Only Reperforator Table

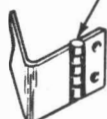


2.02 Knife



○ PIVOT POINTS (2) KNIFE

2.03 Hinge



○ PIVOT POINT HINGES (2)