

TELETYPEWRITER SERVICE MANUAL

CONTENTS

INDEX

GENERAL

USE OF CRITICAL ADJUSTMENTS

RECEIVING ORIENTATION AND SENDING DISTORTION TESTS

MODEL 14 APPARATUS

TYPING REPERFORATOR UNIT

TRANSMITTER -DISTRIBUTOR

MODELS 15 & 19 APPARATUS

TYPING UNIT

KEYBOARD, PERFORATOR -TRANSMITTER

MODELS 28 & 35 APPARATUS

TYPING UNITS

KEYBOARD, MODEL 28

TYPING AND NON-TYPING PERFORATOR

TYPING REPERFORATOR

TRANSMITTER -DISTRIBUTOR

MODEL 33 APPARATUS

MISCELLANEOUS

TELETYPEWRITER SERVICE MANUAL

1. GENERAL

1.01 This section is reissued to add descriptive information and technical data for 33 Teletypewriter Sets. Since this is a general revision of the section, marginal arrows ordinarily used to indicate changes have been omitted.

1.02 These critical mechanical adjustments are those that experience has shown to contribute most to trouble-free mechanical operation of teletypewriter apparatus. These adjustments are usually associated with a group of other connected and related adjustments. The verification of the critical adjustment can be an indicator of the connected and related adjustments.

1.03 Experience has shown that teletypewriter assemblies with the critical adjustments specified in this section meeting the requirements will be in acceptable operating condition for trouble-free service. Each servicing visit to a teletypewriter in the field should include the necessary checks to assure that the apparatus meets the critical adjustment standards.

1.04 The service benefits from maintaining these standards are:

(a) On a servicing visit, a quick check will disclose whether adjustments are required and the apparatus can easily be maintained at the acceptable trouble-free standard.

(b) On a trouble visit, the repairman is assured that the apparatus has been meeting the adjustment

standards. Disclosure of an adjustment out of limits usually results in quick analysis and pinpointing the mechanical defect.

1.05 This information is assembled from Bell System Practices and Teletype Corporation Bulletins now authorized for use. This Section does not replace authorized Bell System Practices in the field. It is intended to supplement them and provide teletypewriter servicemen with a basic standard from which to work.

1.06 From time to time, the American Company may issue standard Bell System Practice change notices specifying revisions in teletypewriter adjustments already incorporated in Section 570-001-901MS. When this occurs, the revised requirements shall be considered as superseding the requirements in Section 570-001-901MS. The latter will eventually be brought into agreement with the change notes.

2. USE OF CRITICAL ADJUSTMENTS

2.01 This Section provides critical adjustments for teletypewriter assemblies for the following work forces:

(a) For the Western Electric Company teletypewriter shop personnel in preparing rebuilt, reconditioned, and completely assembled teletypewriters where authorized by the Telephone Company. An exception is to be made in the case of the receiving and sending distortion requirements specified in Section 570-001-901MS. These requirements shall not apply to Western

Electric Company operations since test procedures presently in use are adequate.

(b) For Telephone Company Installation personnel where teletypewriter assemblies are received from Western Electric Company shops where the critical adjustment program is not in effect. In this case the installer will check and adjust where necessary to assure that the teletypewriter assembly meets the critical adjustment standards.

(c) For Telephone Company servicing personnel charged with maintaining teletypewriter machines. The teletypewriter serviceman should check critical adjustments and adjust where necessary to keep the teletypewriter in a trouble-free condition.

(d) For Telephone Company repair personnel in locating trouble and mechanical defects in the mechanical portion of the assembly. Checking of critical adjustments will result in a quick analysis and locating of the machine defects causing malfunctions.

2.02 The critical adjustment charts should be used as follows:

(a) The critical adjustment charts applying to the teletypewriter assembly to be checked should be selected from the index of the General section. The adjustment charts are provided with large tabs appropriately designated.

(b) In most cases the first sheet behind the tabs will be an illustration of the component being checked. The second sheet will be a block diagram check list. In checking the critical adjustments the order established in the block diagrams should be followed.

(c) The requirements for critical adjustments should be carefully followed in checking the adjustments. Complete details of checking the adjustment are contained on each adjustment chart.

(d) When a critical adjustment does not meet the requirements, the Bell System Practice describing the adjustment should be used in adjusting. Each chart has listed the appropriate Section numbers for making adjustments.

3. RECEIVING ORIENTATION AND SENDING DISTORTION TESTS

3.01 This section prescribes tests made locally at test centers; at servicing centers; and tests made over lines, loops, or legs between test centers; and at teletypewriter stations. The testing method consists of:

1. Measuring the distortion of signals produced by the station transmitting apparatus.
2. Determining the tolerances of the station receiving apparatus to distorted or undistorted signals.

3.02 Check Test Receiving - Receiving apparatus should receive at least two complete lines of undistorted signals (the quick brown fox, etc.) without errors, with a selector range of at least 80 points. If distorted signals are available, and they are biased 20% both marking and spacing, the selector range should be approximately 40 points depending on the coefficient of the circuit.

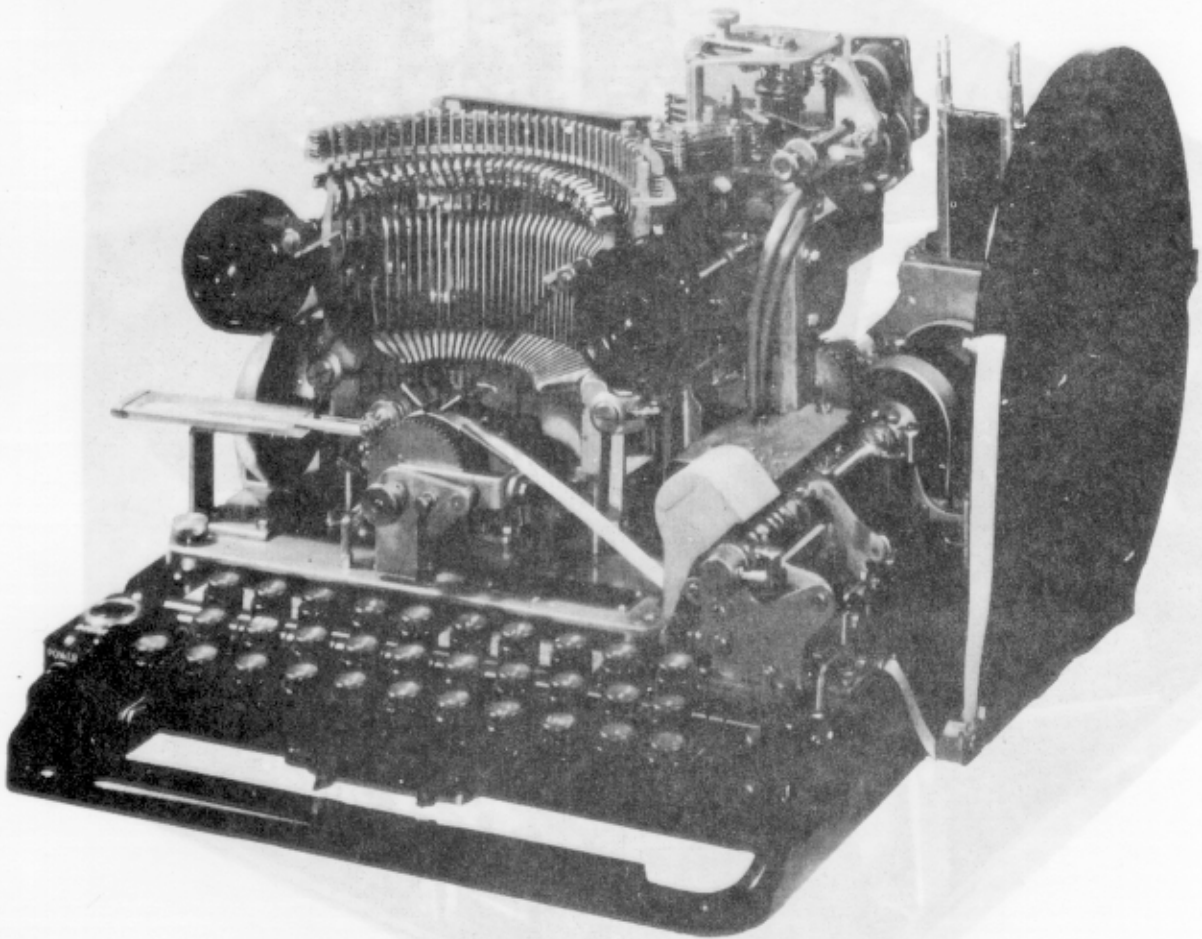
3.03 Readjust Test Receiving - Make tests as prescribed in check test. Observe high and low selector range scale readings and set the range scale at optimum point. For example, the orientation range scale setting midway between the upper limit found with

20% marking bias and the lower limit found with 20% spacing bias would be the optimum point for the range scale setting for normal signals.

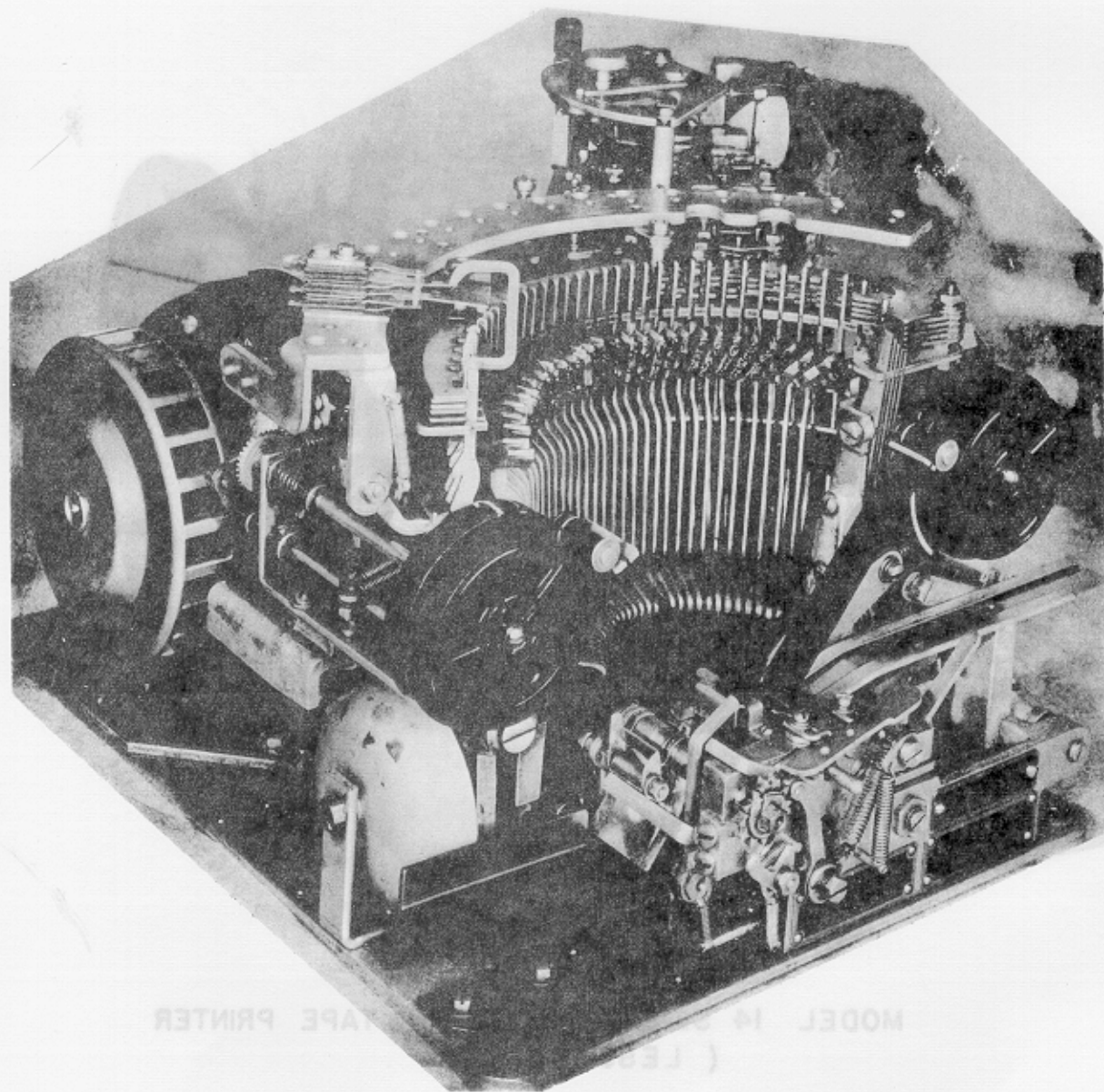
3.04 Check Test Sending - Requirements as specified in Bell System Practice Section 570-006-500 should be applied whenever equipment has been serviced, reconditioned, repaired, or inspected--also when changes have been made that affect transmission in the settings or adjustments of the station equipment or the line or loop connecting circuits. When checking sending signals into a "local" or "test" condition, and measuring them with a 164 C-() telegraph

transmission measuring set, or equivalent, the maximum allowable distortion from a keyboard is 8% and from transmitter-distributors 5%. When sending to a test center, the maximum allowable distortion will vary depending on the coefficient of the circuit or the type of Data set used. This is determined by the test center.

3.05 Readjust Test Sending - With the teletypewriter conditioned to be in the "test" or "local" mode and measuring signals with a 164 C-() or equivalent, the maximum allowable distortion from keyboards is 7% and from transmitter - distributors 4%. When sending to test centers, these readings shall be obtained from the testboardman.



MODEL 14 SENDING—RECEIVING TAPE PRINTER
(LESS COVER)

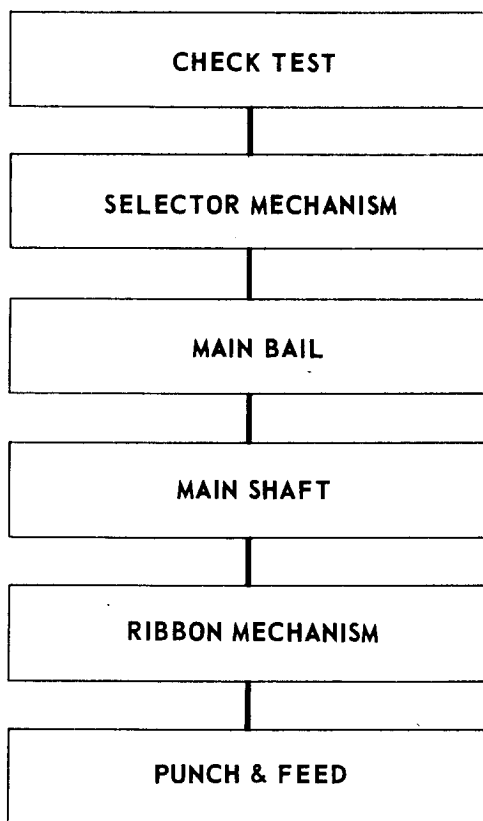


REPERFORATOR

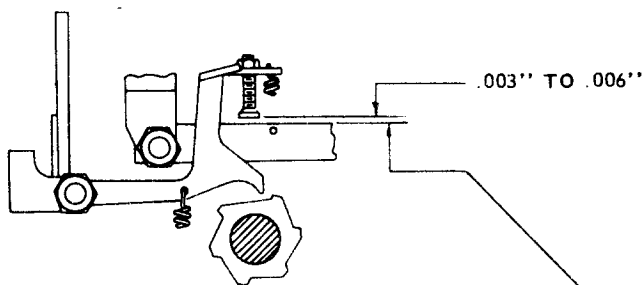
MODEL 14

PAGE 2

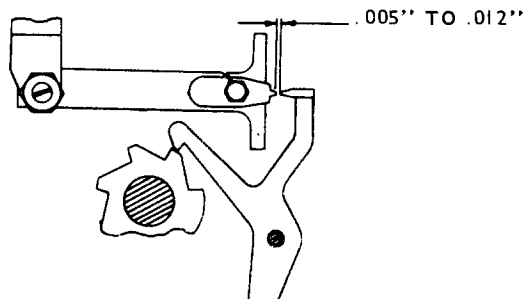
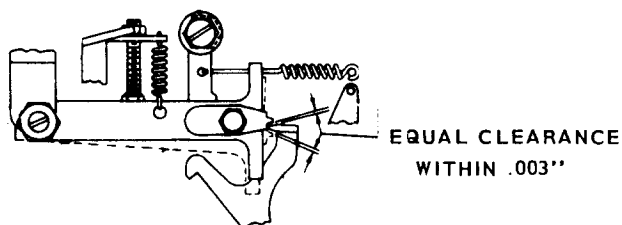
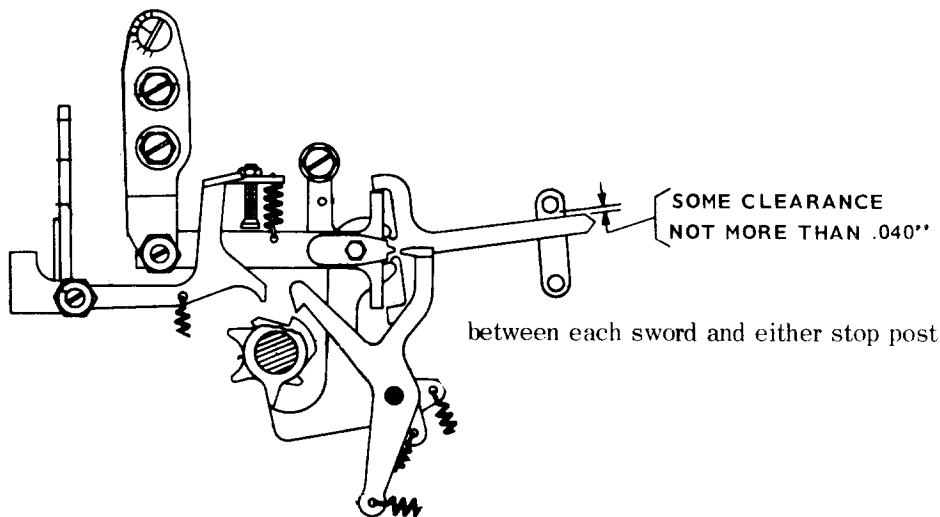
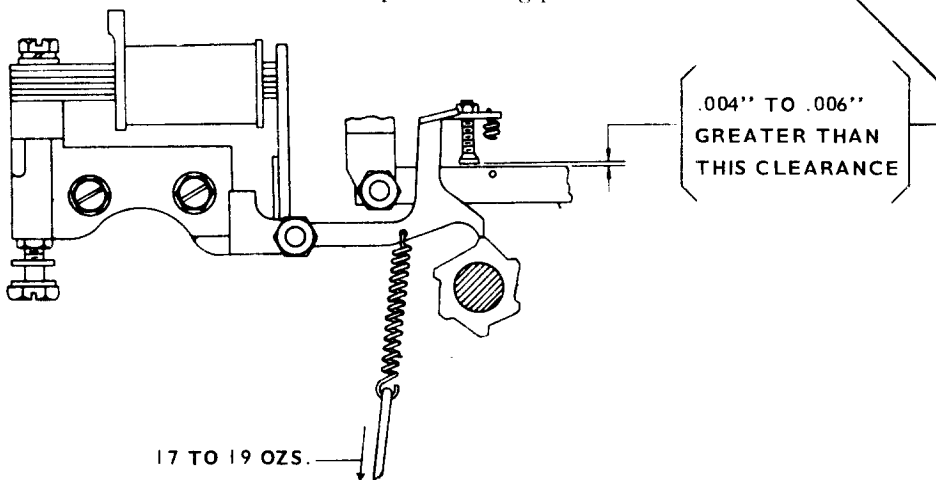
14 REPERFORATOR



SELECTOR



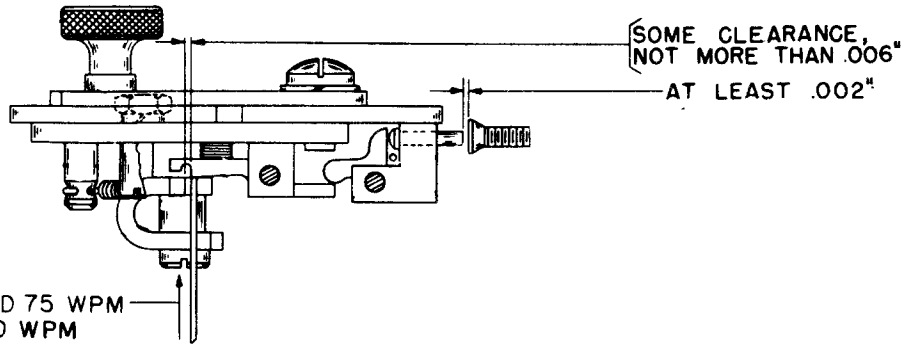
the selector arm should be kept in marking position



To Adjust:
B. S. P. 572-006-700

SELECTOR RANGE FINDER ASSEMBLY

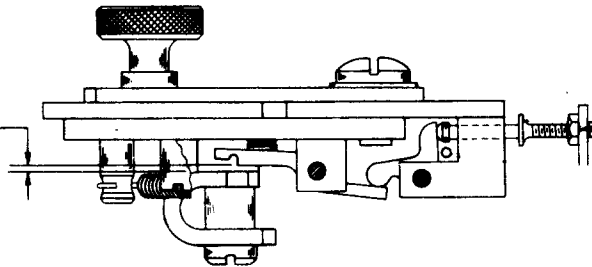
MAGNET MARKING



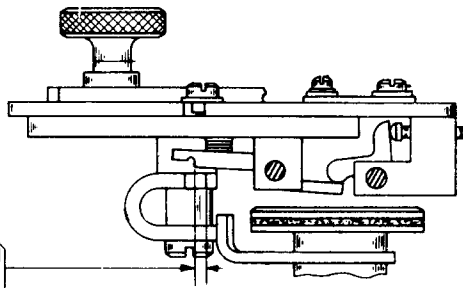
1 TO 1-1/2 OZS.—60 AND 75 WPM
2-3/4 TO 3-1/4 OZS.—100 WPM

MAGNET SPACING

SOME CLEARANCE, NOT MORE THAN .004"



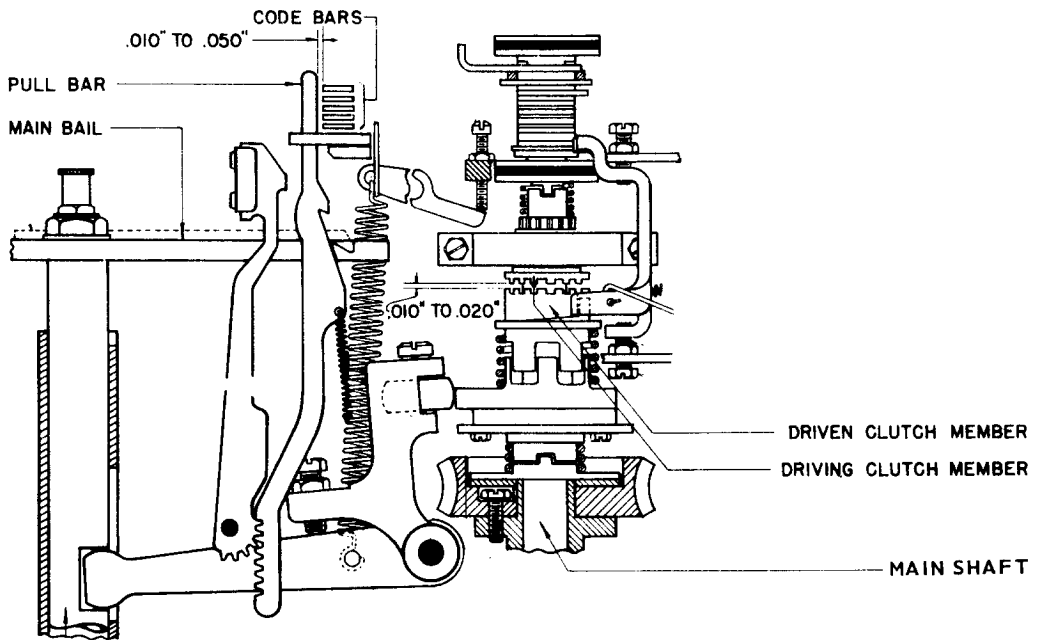
AT LEAST 1/2 BUT NOT MORE THAN WIDTH OF STOP LEVER



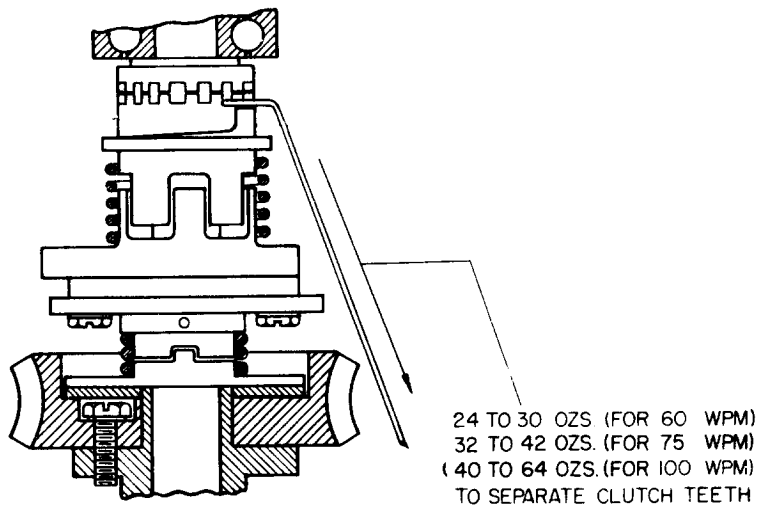
With the selector magnet armature in the spacing position, rotate the selector cam sleeve until the stop arm moves the stop lever to its maximum travel beyond the step of the trip latch. The over-travel of the step lever beyond the trip latch is at least half but not more than the width of the stop lever. This should be checked with the range indicator set at 0, 60, and 120 on the range scale.

To Adjust:
B.S.P. 572-006-700

MAIN BAIL

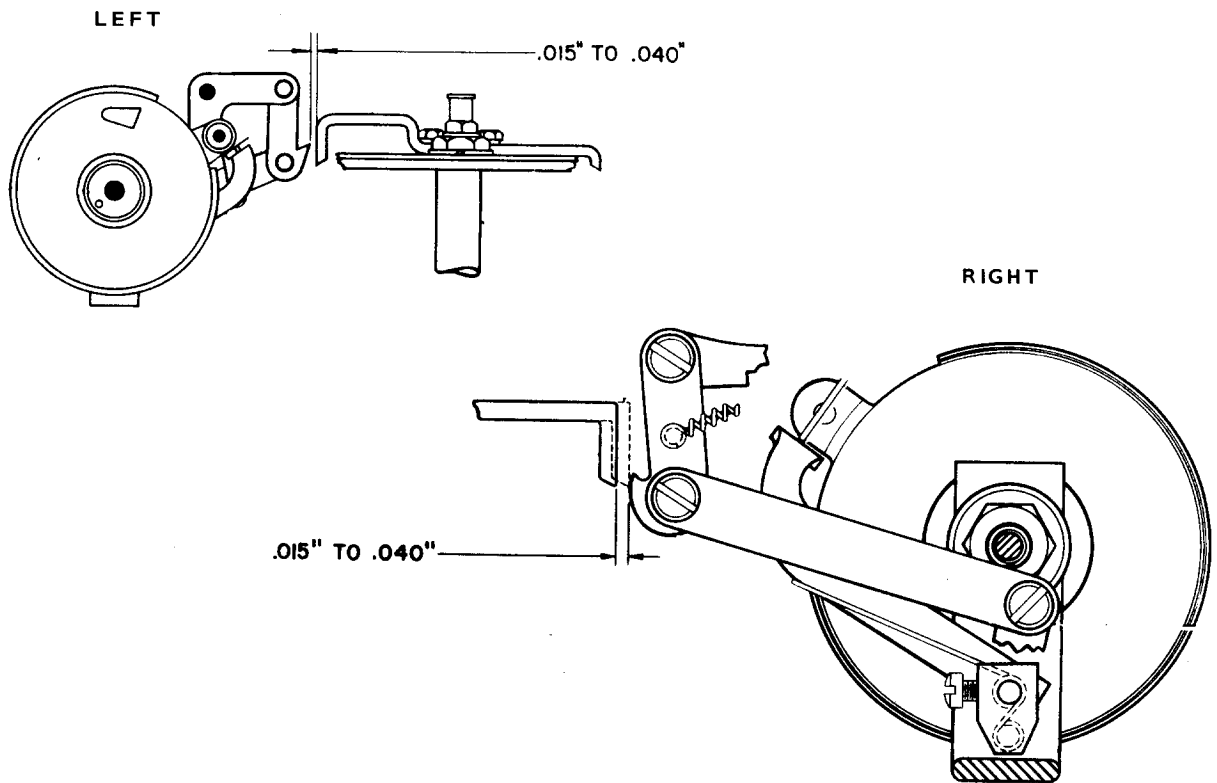


MAIN SHAFT CLUTCH SPRING

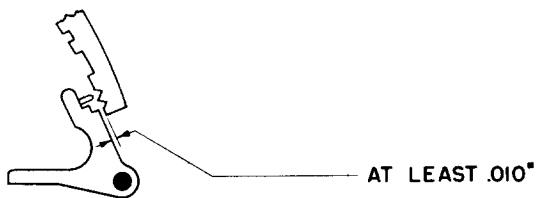


To Adjust:
B. S. P. 572-105-700

RIGHT AND LEFT RIBBON REVERSE



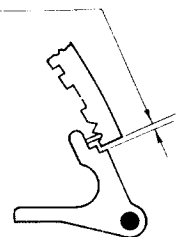
CODE BAR BELL CRANKS



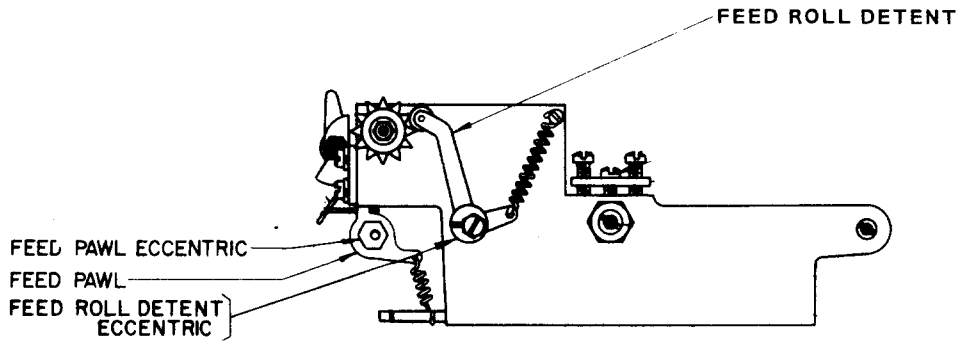
With the code bars positioned for **LETTERS** selection and the main bail cam roller on the high part of its cam,

With the code bars positioned for **BLANK** selection and the locking lever resting against the code bars,

.010\" TO .050\"



FEED PAWL ECCENTRIC



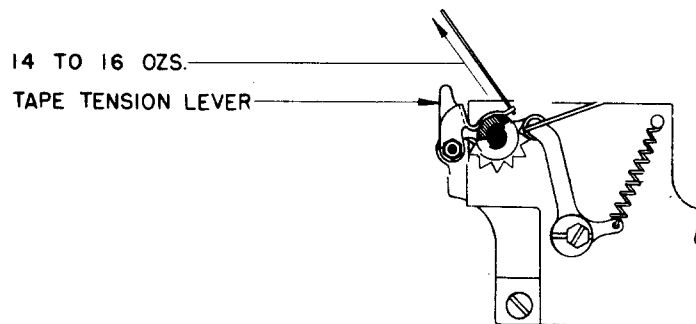
With the punch arm cam roller on the low part of its cam, the feed pawl should rest in the bottom of the notch which is just below the horizontal center line of the feed roll.

GAUGING TAPE

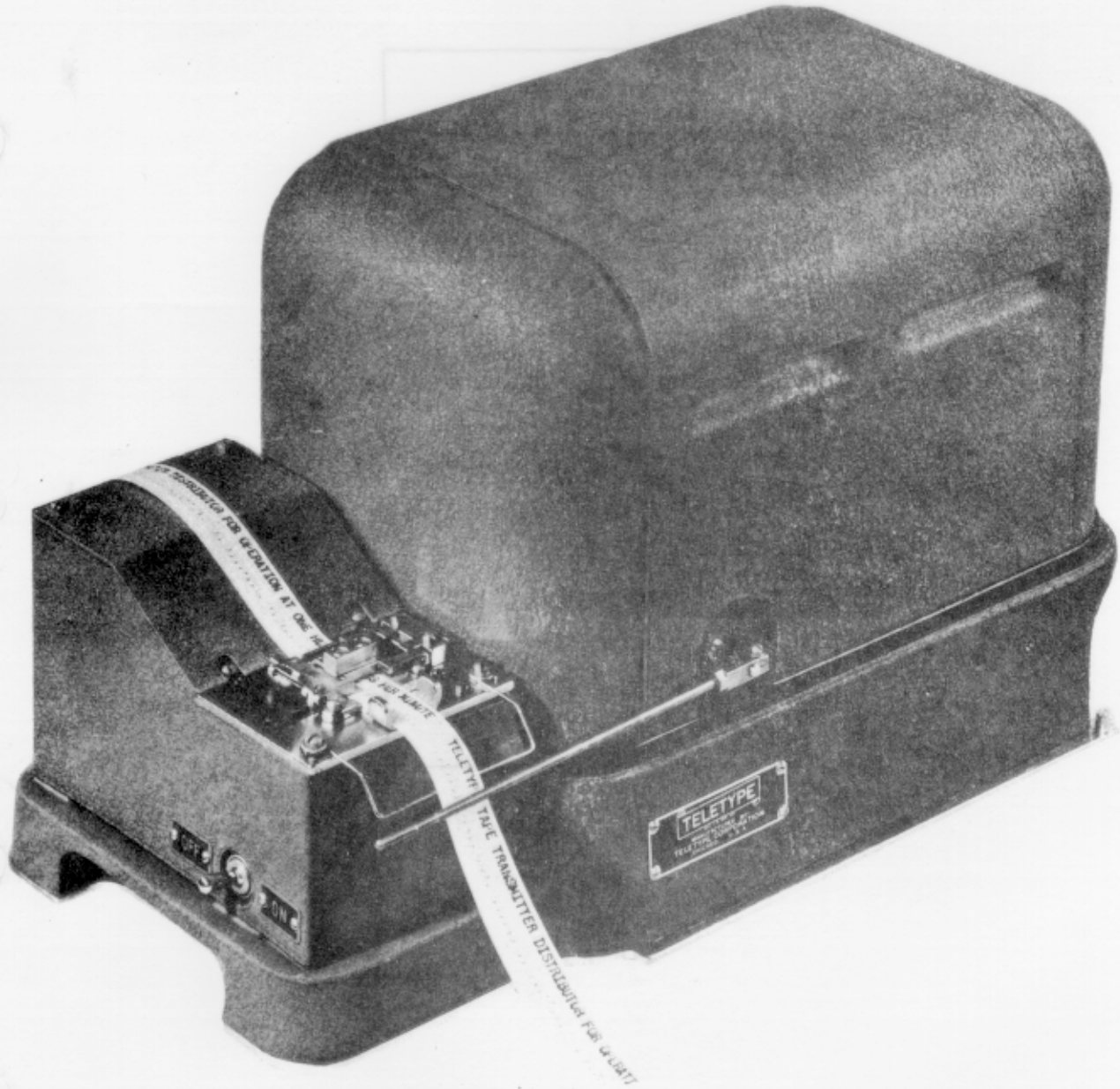
Perforations in tape should be evenly spaced, 10 to the inch, with an allowable variation of $\pm 0.007''$ in a 4'' length.

- (a) To check, perforate a series of nine Blanks, and one LTRS combination seven or eight times, bend back the lids of all No. 3 code holes, place the tape on top of a TP95960 gauge.

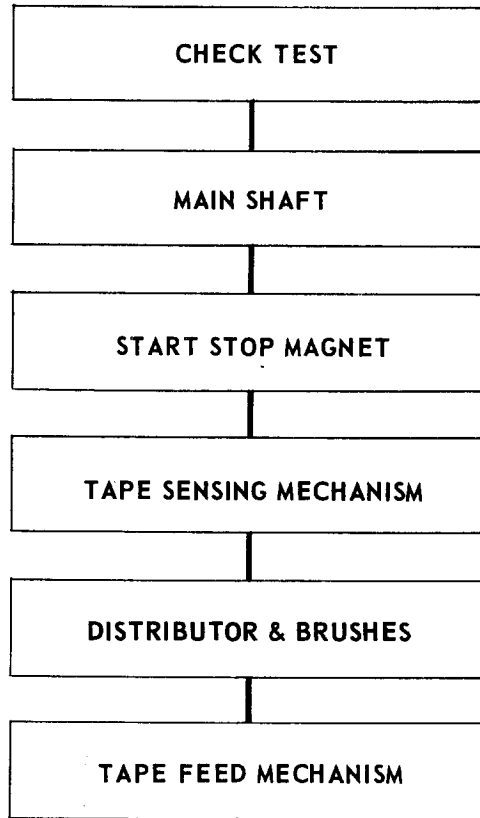
TAPE TENSION LEVER



14 TRANSMITTER DISTRIBUTOR



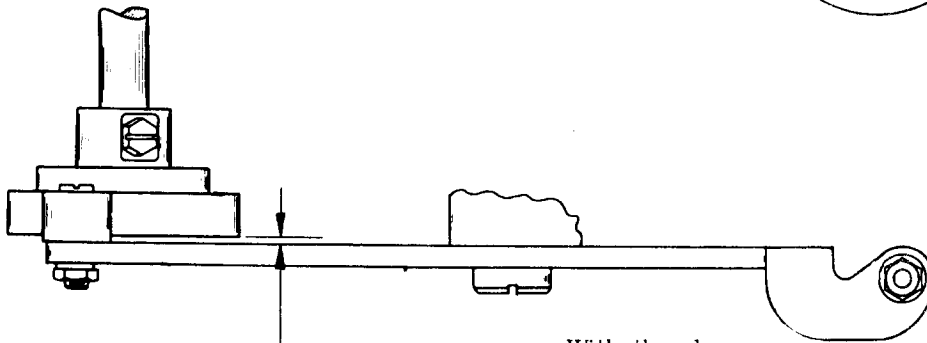
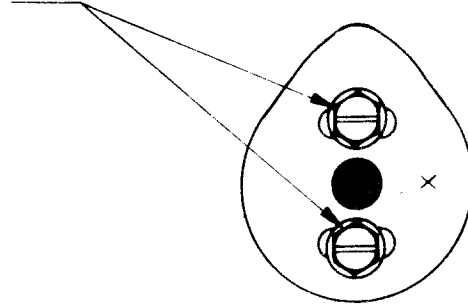
14 TRANSMITER DISTRIBUTOR



MAIN SHAFT

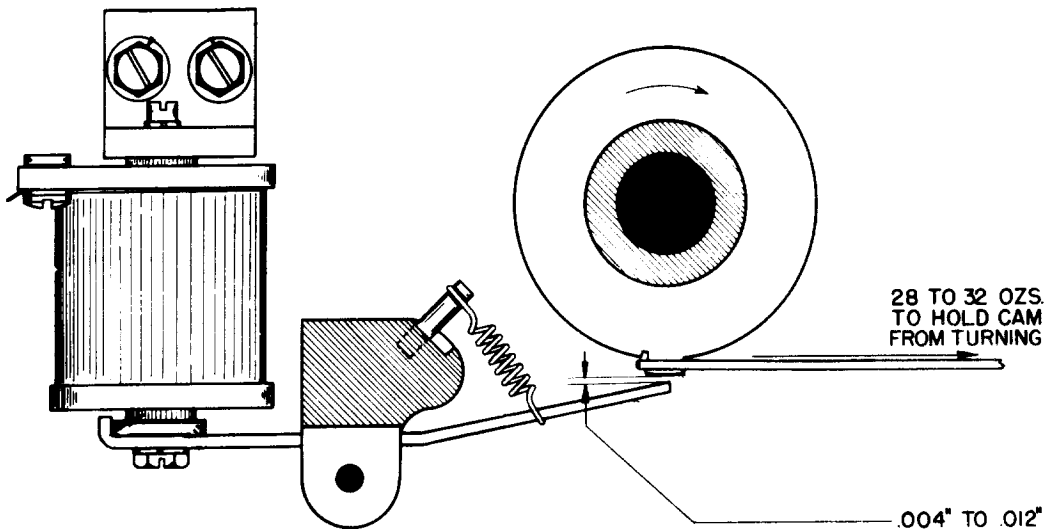
The trailing edge of the carbon brush should be on an oblique angle to the leading edge of the STOP segment. The trailing inside corner of the carbon brush should be $1/32''$ to $1/16''$ from the leading edge of the STOP segment,

The operating cam should be positioned so that the No. 5 Transmitter Contact Tongue leaves the lower (MARKING) contact screw when the distributor brush is on the STOP



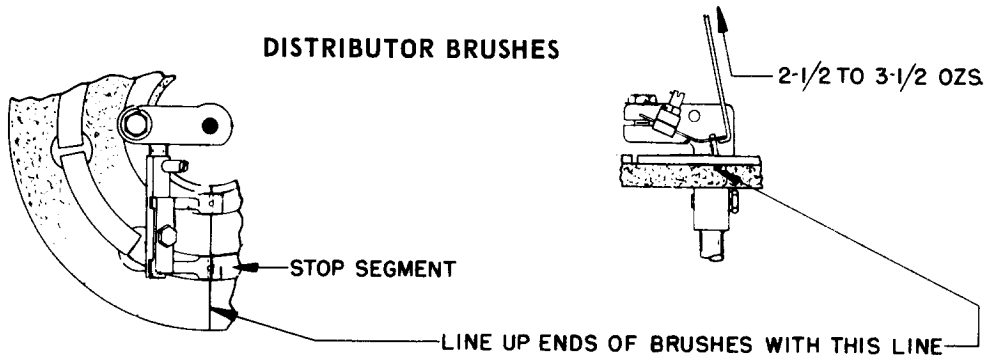
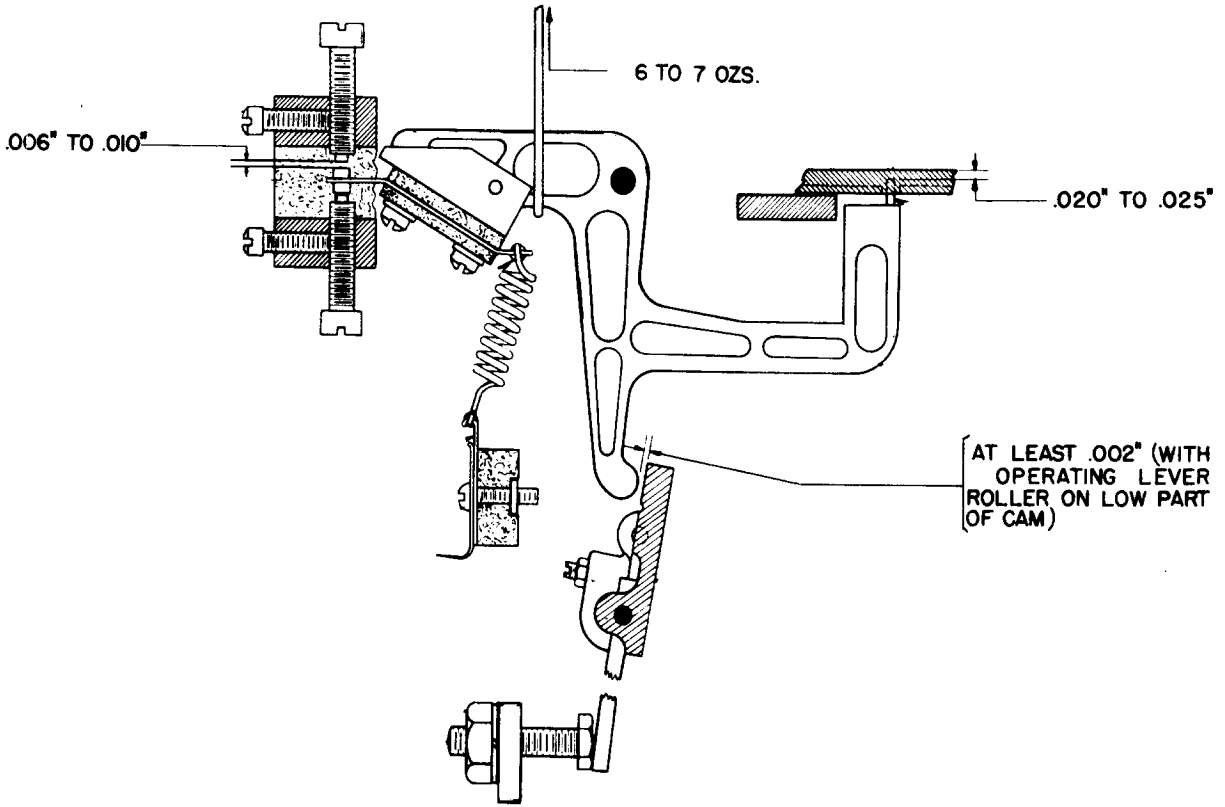
With the play in the operating lever taken up in a direction to make the clearance a maximum, this clearance should not exceed $.040''$.

TAPE STOP MAGNET



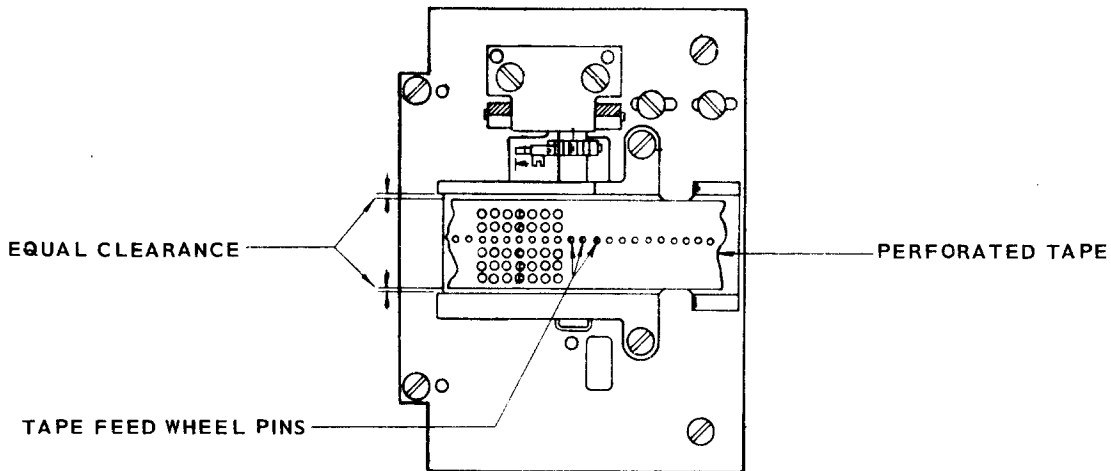
To Adjust:
B. S. P. 572-103-700

TAPE SENSING MECHANISM



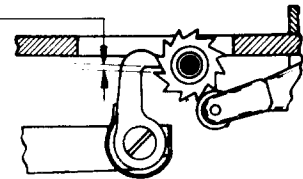
To Adjust:
B. S. P. 572-103-700

TAPE FEED MECHANISM



When the play of the tape on the feed wheel is taken up toward the left, the tape pin farthest to the right should just clear the right edge of its associated code hole.

When the operating-lever roller is on the highest part of its cam and the detent roller rests between two teeth on the feed-wheel ratchet, there should be some clearance, not over .010", between the face of a tooth on the ratchet wheel and the face of the feed pawl.



With the operating-lever roller on the low part of the operating cam and the detent roller resting in the notch between two teeth of the feed wheel ratchet, there should be .050" to .070" clearance between the face of feed pawl and the face of the first tooth above the horizontal center line of the feed-wheel ratchet. The feed lever should be in contact with the blocking surface of the feed lever stop.

